* ELECTRICAL SYSTEM UNIFORM INSPECTION GUIDELINES *

Article Text

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Electrical System January 2000 Motorist Assurance Program
Standards For Automotive Repair

All Makes and Models

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INTRODUCTION TO MOTORIST ASSURANCE PROGRAM (MAP)

OVERVIEW OF MOTORIST ASSURANCE PROGRAM (MAP)

Automotive industry professionals and interested readers:
The Motorist Assurance Program (MAP) is the consumer outreach effort of the Automotive Maintenance and Repair Association, Inc. (AMRA). Participation in the Motorist Assurance Program is drawn from auto repair companies and independents, parts and equipment manufacturers and suppliers, vehicle manufacturers and industry associations.

Our organization's mission is to strengthen the relationship between the consumer and the auto repair industry. We encourage motorists to take greater responsibility for their vehicles-through proper, manufacturer-recommended, maintenance, and endorse participating service and repair shops (including franchisees and dealers) who adopt (1) the MAP Pledge of Assurance to their Customers and (2) the Motorist Assurance Program Standards of Service. All participating service providers have agreed to subscribe to this Pledge and to adhere to the promulgated Standards of Service demonstrating to their customers that they are serious about customer satisfaction.

These Standards of Service require an inspection of the vehicle's (problem) system and that the results be communicated to the customer according to industry standards. Since the industry did not have such standards, the Motorist Assurance Program successfully promulgated industry inspection communication standards in 1994-95 for the following systems: Exhaust, Brakes, ABS, Steering and Suspension, Engine Maintenance and Performance, HVAC, and Electrical Systems.

Further, revisions to all of these inspection communication standards are re-published periodically. In addition to the above, standards for Drive Train and Transmissions were promulgated and published in 1998. Participating shops utilize these Uniform Inspection & Communication Standards (UI&CS) as part of the inspection process and for communicating their findings to their customers.

The Motorist Assurance Program continues to work cooperatively and proactively with government agencies and consumer groups toward solutions that both benefit the customer and are mutually acceptable to both regulators and industry. We maintain the belief that industry must retain control over how we conduct our business, and we must be viewed as part of the solution and not part of the problem. Meetings with state and other government officials (and their representatives), concerned with auto repair and/or consumer protection, are conducted. Feedback from these sessions is brought back to the association governing body, and the program adjusted as needed.

To assure recourse for auto repair customers if they are not satisfied with a repair transaction, the Motorist Assurance Program offers mediation and arbitration through the BBB and other similar non-profit organizations. MAP conducted pilot programs in twelve states before announcing the program nationally in October 1998. During the pilots, participating repair shops demonstrated their adherence to the Pledge and Standards and agreed to follow the UI&CS in communicating the results of their inspection to their customers. Complaints and "come-backs" dropped significantly.

To put some "teeth" in the program, an accreditation requirement for shops was initiated. The requirements are stringent, and a self-policing technique has been incorporated which includes the "mystery shopping" of outlets. By year-end 1999, over 4,000 auto repair facilities had been accredited by the Motorist Assurance Program.

We welcome you to join us as we continue our outreach. With your support, both the automotive repair industry and your customers will reap the benefits. Please visit MAP at our Internet site www.motorist.org or contact us at:

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OVERVIEW OF SERVICE REQUIREMENTS & SUGGESTIONS

It is MAP policy that all exhaust, brake, steering, suspension, wheel alignment, drive-line, engine performance and

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maintenance, and heating, ventilation and air conditioning, and electrical services be offered and performed under the standards and procedures specified in these sections.

Before any service is performed on a vehicle, an inspection of the appropriate system must be performed. The results of this inspection must be explained to the customer and documented on an inspection form. The condition of the vehicle and its components will indicate what services/part replacements may be "Required" or "Suggested." In addition, suggestions may be made to satisfy the requests expressed by the customer.

When a component is suggested or required to be repaired or replaced, the decision to repair or replace must be made in the customer's best interest, and at his or her choice given the options available.

This section lists the various parts and the conditions that indicate a required or suggested service or part replacement. Although this list is extensive, it is not fully inclusive. In addition to this list, a technician may make a suggestion. However, any suggestions must be based on substantial and informed experience, or the vehicle manufacturer's recommended service interval and must be documented.

Some conditions indicate that service or part replacement is required because the part in question is no longer providing the function for which it is intended, does not meet a vehicle manufacturer's design specification or is missing.

* Example: An exhaust pipe has corroded severely and has a hole in it through which exhaust gases are leaking. Replacement of the exhaust pipe in this case is required due to functional failure.
* Example: A brake rotor has been worn to the point where it measures less than the vehicle manufacturer's discard specifications. Replacement of the rotor is required because it does not meet design specifications.

Some conditions indicate that a service or part replacement is suggested because the part is close to the end of its useful life or addresses a customer's need, convenience or request. If a customer's vehicle has one of these conditions, the procedure may be only to suggest service.

* Example: An exhaust pipe is rusted, corroded or weak, but no leaks are present. In this case, the exhaust pipe has not failed. However, there is evidence that the pipe may need replacement in the near future. Replacement of the pipe may be suggested for the customer's convenience in avoiding a

future problem.

* Example: The customer desires improved ride and/or handling, but the vehicle's shocks or struts have not failed. In this case, replacement may be suggested to satisfy the customer's wishes. In this case, replacement of the shocks or struts may not be sold as a requirement.

A customer, of course, has the choice of whether or not a shop will service his or her vehicle. He or she may decide not to follow some of your suggestions. When a repair is required, a MAP shop must refuse partial service on that system if, in the judgment of the service provider, proceeding with the work could create or continue an unsafe condition.

When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

The following reasons may be used for required and suggested services. These codes are shown in the "Code" column of the MAP Uniform Inspection & Communications Standards that follow:

Reasons to Require Repair or Replacement

A - Part no longer performs intended purpose
B - Part does not meet a design specification (regardless of performance)
C - Part is missing

NOTE: When a repair is required, the shop must refuse partial service to the system in question, if the repair creates or continues an unsafe condition.

Reasons to Suggest Repair or Replacement

1 - Part is close to the end of its useful life (just above discard specifications, or weak; failure likely to occur soon, etc.)
2 - To address a customer need, convenience, or request (to stiffen ride, enhance performance, eliminate noise, etc.)
3 - To comply with maintenance recommended by the vehicle's Original Equipment Manufacturer (OEM)
4 - Technician's recommendation based on substantial and informed experience

NOTE: Suggested services are always optional. When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions *** ELECTRICAL SYSTEM UNIFORM IN**

and make an informed decision about how to proceed.

ELECTRICAL SYSTEMS

SERVICE PROCEDURES REQUIRED AND SUGGESTED FOR PROPER VEHICLE OPERATION

NOTE: When working on electrical systems, if a potentially hazardous condition is observed, require repair or replacement of affected components prior to performing further work.

ACTUATOR MOTORS (SOLENOIDS) (ELECTRIC)

ACTUATOR MOTOR (SOLENOIDS) (ELECTRIC) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Inoperative	A	(2) Require replacement.
Linkage bent, affecting performance	A	Require repair or replacement of linkage.
Linkage bent, not affecting performance	2	Suggest repair or replacement of linkage.
Linkage binding, affecting performance	A	Require repair or replacement of linkage.
Linkage binding, not affecting performance	1	Suggest repair or replacement of linkage.

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Linkage broken ..... A ... Require repair or replacement of linkage.
Linkage loose, affecting performance ..... A ... Require repair or replacement of linkage.
Linkage loose, not affecting performance .. 1 ... Suggest repair or replacement of linkage.
Linkage missing ..... C ..... Require replacement.
Linkage noisy ..... 2 .. Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 1 ..... (1) Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 1 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

ACTUATOR MOTORS (VACUUM)

ACTUATOR MOTOR (VACUUM) INSPECTION

Condition Code Procedure

Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware

missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require replacement.
Leaking (vacuum) ..... A .. Require repair or replacement.
Linkage bent, affecting performance .. A ... Require repair or replacement of linkage.
Linkage bent, not affecting performance .. 2 ... Suggest repair or replacement of linkage.
Linkage binding, affecting performance .. A ... Require repair or replacement of linkage.
Linkage binding, not affecting performance .. 1 .. Suggest repair or replacement of linkage.
Linkage broken ..... A ... Require repair or replacement of linkage.
Linkage loose, affecting performance ..... A ... Require repair or replacement of linkage.
Linkage loose, not affecting performance .. 1 ... Suggest repair or replacement of linkage.
Linkage missing ..... C ..... Require replacement.
Linkage noisy ..... 2 .. Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

For all air bag components and conditions, refer to vehicle manufacturer's specifications for diagnosis and parts replacement.

ALTERNATORS AND GENERATORS

NOTE: If components have been added that increase vehicle electrical load requirement (for example, sound systems, air conditioning, alarm systems, etc.), charging system output must meet the increased demand.

ALTERNATOR AND GENERATOR INSPECTION

Condition	Code	Procedure
Alternator output meets OEM specification but is insufficient for add-on electrical load	2	Suggest upgrade of alternator or removal of excess electrical load.
Alternator's rated output is below OEM specification	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware non-functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Diode inoperative	A	(2) Require repair or replacement.
Housing broken, affecting performance	A	Require repair or replacement.
Housing broken, not affecting performance		No service suggested or required.

Housing cracked, affecting
performance ..... A .. Require repair or replacement.
Housing cracked, not
affecting performance .. 1 .. Suggest repair or replacement.
Inoperative ..... A ..... (2) Require repair or
replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Pulley incorrect ..... B ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Terminal resistance
(voltage drop) out of
specification ..... A .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Voltage drop out of
specification ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or
replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM
specification.

AMPLIFIERS

See
RECEIVERS, AMPLIFIERS, EQUALIZERS AND SUB-WOOFER VOLUME CONTROLS.

ANTENNAS

ANTENNA INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Broken	A	Require replacement.
Bent	2	Suggest repair or replacement.
Binding	2	Suggest repair or replacement.
Connector broken	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Inoperative	A	(2) Require replacement.
Insulation damaged, conductors exposed	A	Require repair or replacement.
Insulation damaged, conductors not exposed	1	Suggest replacement.
Missing	C	Require replacement.
Motor runs continuously	A	Require or replacement.
Power antenna noisy	2	Suggest repair or replacement.
Sticking	2	Suggest repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of specification.

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BATTERIES

Proper operation of any electrical system or component can be affected by battery condition. The battery(ies) must meet or exceed minimum specification for vehicle as equipped and test to that specific battery's CCA.

Definition of Terms

* Battery Performance Testing
  Testing that determines whether or not a battery meets both vehicle OEM and battery manufacturer's specifications.

* Cold Cranking Amp (CCA) Rating
  The number of amperes a new, fully charged battery at 0° F (-17.8° C) can deliver for 30 seconds and maintain at least a voltage of 1.2 volts per cell (7.2 volts for a 12-volt battery).

* Cranking Amps (CA)
  The number of amperes a new, fully charged battery, typically at 32° F (0° C) can deliver for 30 seconds and maintain at least a voltage of 1.2 volts per cell (7.2 volts for a 12-volt battery).

* OEM Cranking Amps
  The minimum CCA required by the original vehicle manufacturer for a specific vehicle.

BATTERY INSPECTION

Condition	Code	Procedure
Battery frozen		(1) Further inspection required.
Case leaking	A	Require replacement.
Casing swollen	A	(2) Further inspection required.
Circuit open internally	A	Require replacement.
Electrolyte contamination	A	(2) Further inspection required.
Electrolyte discoloration	A	(2) Further inspection

required.

Fails to accept and hold charge ..... A ..... (3) Require replacement.

Fluid level low ..... B ..... (4) Further inspection required.

Out of performance specification for battery ..... B ..... (5) Require replacement.

Out of specification for application ..... B ..... (5) Require replacement.

Post (top or side) burned, affecting performance .. A ..... (6) Require repair or replacement.

Post (top or side) burned, not affecting performance ..... 2 ..... (6) Suggest repair or replacement.

Post (top or side) corroded, affecting performance ..... A ..... Require repair.

Post (top or side) corroded, not affecting performance ..... 2 ..... Suggest repair.

Post (top or side) loose ..... A ..... Require replacement.

Post (top or side) melted, affecting performance .. A ..... (6) Require repair or replacement.

Post (top or side) melted, not affecting performance ..... 2 ..... (6) Suggest repair or replacement.

Specific gravity low .... B ..... (7) Further inspection required.

State of charge low ..... A ..... (7) Further inspection required.

Top dirty ..... 2 ..... Suggest cleaning battery.

Top wet ..... A ... (8) Require cleaning battery. Further inspection required.

Vent cap loose ..... A ... Require repair or replacement of vent cap.

Vent cap missing ..... C ..... Require replacement of vent cap.

(1) - DO NOT attempt to charge a frozen battery. Allow battery to warm thoroughly and then performance-test. If battery

fails performance test, require replacement.
(2) - No service suggested or required unless the battery fails performance test, in which case, require replacement.
(3) - This phrase refers to a battery that fails to either accept and/or retain a charge using appropriate times listed in the Battery Charging Guide of the BCI Service Manual, battery charger operating manual, or battery manufacturer's specifications.
(4) - Determine cause of low fluid level. Refill to proper level(s) with water (distilled water preferred). Recharge battery and performance-test. If battery does not meet specifications, require replacement. If battery is sealed type (non-removable filler caps), require replacement.
(5) - The battery may meet battery manufacturer's specifications but test below the minimum specification defined by the vehicle's OEM for that vehicle.
(6) - Determine cause and correct prior to repair or replacement of part.
(7) - Recharge and test to manufacturer's specifications. If battery fails performance test, require replacement.
(8) - Check fluid level and adjust to manufacturer's specification. Suggest checking charging system for proper operation.

BATTERY CABLES

See BATTERY CABLES, WIRES AND CONNECTORS.

BATTERY CABLES, WIRES AND CONNECTORS

BATTERY CABLE, WIRE AND CONNECTOR INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.

Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Insulation damaged, conductors exposed ..... A ..... (2) Require repair or replacement.
Insulation damaged, conductors not exposed . 1 ..... Suggest replacement.
Open ..... A .. Require repair or replacement.
Protective shield (conduit) melted ..... 2 ..... (1) Suggest repair or replacement.
Protective shield (conduit) missing ..... 2 .. Suggest repair or replacement.
Resistance (voltage drop) out of specification ... A .. Require repair or replacement.
Routed incorrectly ..... B ..... Require repair.
Secured incorrectly ..... B ..... Require repair.
Shorted ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Voltage drop out of specification ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Exposed conductor at replacement (aftermarket) terminal end does not require repair or replacement.

BATTERY HOLD DOWN HARDWARE

See BATTERY TRAYS AND HOLD DOWN HARDWARE.

BATTERY TRAYS AND HOLD DOWN HARDWARE

BATTERY TRAY AND HOLD DOWN HARDWARE INSPECTION

Condition	Code	Procedure
Battery improperly secured	2	Suggest repair.
Bent, affecting performance	A	Require repair or replacement.
Bent, not affecting performance		No service suggested or required.
Broken, affecting performance	A	Require repair or replacement.
Broken, not affecting performance		No service suggested or required.
Corroded, affecting performance	A	Require repair or replacement.
Corroded, not affecting performance	2	Suggest repair or replacement.
Cracked, affecting performance	A	Require repair or replacement.
Cracked, not affecting performance	1	Suggest repair or replacement.
Missing	C	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Water drain clogged	A	Require repair.

BATTERY WIRES

See BATTERY CABLES, WIRES AND CONNECTORS.

BELTS

BELT INSPECTION

Condition	Code	Procedure
Alignment incorrect	B	(1) Further inspection required.
Cracked	1	Suggest replacement.

Frayed ..... 1 ..... Suggest replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 ..... (2) Further inspection required.
Plies separated ..... A ..... Require replacement.
Tension out of specification ..... B ..... Require adjustment or replacement.
Worn beyond adjustment range ..... B ..... Require replacement.
Worn so it contacts bottom of pulley ..... A ..... Require replacement.

(1) - Determine cause of incorrect alignment and require repair.
(2) - Determine cause of noise and suggest repair.

BULB SOCKETS

BULB SOCKET INSPECTION

Condition Code Procedure

Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Bulb seized in socket ... A .. Require repair or replacement.
Burned, affecting performance ..... A ..... (1) Require repair or replacement.
Burned, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.
Broken ..... A .. Require repair or replacement.
Connector broken ..... A .. Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.

Corroded, affecting
performance ..... A .. Require repair or replacement.
Corroded, not affecting
performance ..... 2 .. Suggest repair or replacement.
Leaking ..... A .. Require repair or replacement.
Melted ..... A ..... (2) Require replacement.
Shorted ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (2) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or
replacement of socket.
(2) - Determine cause and correct prior to replacement of part.

BULBS, SEALED BEAMS AND LEDS

NOTE: Does not include soldered-in components.

BULB, SEALED BEAM AND LED INSPECTION

Condition Code Procedure

Adjustment out of
specification ..... B .. Require repair or replacement.
Application incorrect ... B ..... (1) Require replacement.
Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement.

of hardware.

Base burned, affecting performance ..... A ..... (2) Require repair or replacement.

Base burned, not affecting performance ..... 2 ..... (2) Suggest repair or replacement.

Base corroded, affecting performance ..... A .. Require repair or replacement.

Base corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Base leaking ..... A .. Require repair or replacement.

Base loose, affecting performance ..... B .. Require repair or replacement.

Base loose, not affecting performance ..... 1 .. Suggest repair or replacement.

Base melted ..... A ..... (2) Require replacement.

Bracket bent, affecting performance ..... A .. Require repair or replacement.

Bracket bent, not affecting performance .. .. No service suggested or required.

Bracket broken, affecting performance ..... A ..... Require replacement.

Bracket broken, not affecting performance .. .. No service suggested or required.

Bracket corroded, affecting performance .. A .. Require repair or replacement.

Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Bracket cracked, affecting performance ..... A .. Require repair or replacement.

Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket loose, affecting performance ..... A .. Require repair or replacement.

Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket missing ..... C ..... Require replacement.

Burned out ..... A ..... Require replacement.

Connector broken ..... A .. Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.

Connector melted ..... A ..... (2) Require repair or replacement.

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Connector missing ..... C ..... Require replacement.
Corroded, affecting
performance ..... A .. Require repair or replacement.
Corroded, not affecting
performance ..... 2 .. Suggest repair or replacement.
Cracked ..... A ..... Require replacement.
Intermittent ..... A ..... Require replacement.
Lamp base melted ..... A ..... (2) Require replacement.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Seized in socket ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (2) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 ..... (2) Suggest repair or
replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - Application incorrect includes wrong bulb coating or color.
(2) - Determine cause and correct prior to repair or replacement of part.

CD PLAYERS

See TAPE PLAYERS AND CD PLAYERS.

CIGARETTE LIGHTER ASSEMBLIES

CIGARETTE LIGHTER ASSEMBLY INSPECTION

Condition	Code	Procedure

Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Inoperative ..... A ..... (1) Require repair or replacement.
Loose ..... A .. Require repair or replacement.
Missing ..... 2 ..... Suggest replacement.
Sticking ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (2) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.
(2) - Determine cause and correct prior to repair or replacement of part.

CIRCUIT BREAKERS

See FUSES, FUSIBLE LINKS AND CIRCUIT BREAKERS.

CLUTCH SWITCHES

See SWITCHES.

CONNECTORS

See WIRING HARNESSES AND CONNECTORS.

CONTROL MODULES

CONTROL MODULE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Code set (if applicable)	A	(1) Further inspection required.
Connector broken	A	Require repair or replacement.
Connector melted	A	(2) Require repair or replacement.
Connector missing	A	Require repair.
Contaminated	A	(3) Require repair or replacement.
Inoperative	B	(4) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(2) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.

Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Refer to manufacturer's diagnostic trouble code procedure and require repair or replacement of affected component(s).
(2) - Determine cause and correct prior to repair or replacement of part.
(3) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(4) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

CRUISE CONTROL BRAKE SWITCHES

See SWITCHES.

CRUISE CONTROL CABLES

See CRUISE CONTROL LINKAGES AND CABLES.

CRUISE CONTROL CLUTCH SWITCHES

See SWITCHES.

CRUISE CONTROL LINKAGES AND CABLES

CRUISE CONTROL LINKAGE AND CABLE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ...	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.

*** ELECTRICAL SYSTEM UNIFORM INS**

Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Bent ..... A .. Require repair or replacement.
Binding ..... A .. Require repair or replacement.
Bracket bent, affecting performance ..... A .. Require repair or replacement.
Bracket bent, not affecting performance .. .. No service suggested or required.
Bracket broken, affecting performance ..... A ..... Require replacement.
Bracket broken, not affecting performance .. .. No service suggested or required.
Bracket corroded, affecting performance .. A .. Require repair or replacement.
Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Bracket cracked, affecting performance ..... A .. Require repair or replacement.
Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket loose, affecting performance ..... A .. Require repair or replacement.
Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Broken ..... A ..... Require replacement.
Cracked ..... A .. Require repair or replacement.
Disconnected ..... A .. Require repair or replacement.
Kinked ..... A .. Require repair or replacement.
Melted ..... A ..... (1) Require repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B ..... (2) Require repair or replacement.
Routed incorrectly ..... 2 ..... Suggest repair.
Seized ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Follow OEM recommended adjustment procedures. Require repair or replacement if out of specification.

CRUISE CONTROL RESERVOIRS

See CRUISE CONTROL VACUUM HOSES, TUBES AND RESERVOIRS.

CRUISE CONTROL TUBES

See CRUISE CONTROL VACUUM HOSES, TUBES AND RESERVOIRS.

CRUISE CONTROL VACUUM DUMP RELEASE VALVES

CRUISE CONTROL VACUUM DUMP RELEASE VALVE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Broken	A	Require repair or replacement.
Inoperative	A	(1) Require replacement.
Leaking	2	Suggest replacement.
Out of adjustment	B	(2) Further inspection required.

(1) - Inoperative includes intermittent operation or out of OEM specification.
(2) - Follow OEM recommended adjustment procedures. Require repair or replacement if out of specification.

CRUISE CONTROL VACUUM HOSES, TUBES AND RESERVOIRS

CRUISE CONTROL VACUUM HOSE, TUBE AND RESERVOIR INSPECTION

Condition	Code	Procedure
Leaking	A	Require repair or replacement.
Melted	A	Require replacement.
Missing	C	Require replacement.
Oil-soaked (spongy)	1	Suggest replacement.

*** ELE**

Restricted ..... A .. Require repair or replacement.
Surface cracks (dry-
rotted) ..... 1 ..... Suggest replacement.

CRUISE CONTROL VEHICLE SPEED SENSORS

CRUISE CONTROL VEHICLE SPEED SENSOR INSPECTION

Condition	Code	Procedure
Air gap incorrect	B	(1) Require adjustment to vehicle manufacturer's specifications.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Broken	A	Require replacement.
Housing cracked	A	Require replacement.
Internal resistance does not meet specifications	B	(2) Require replacement.
Lead routing incorrect	B	Require rerouting according to vehicle manufacturer's specifications.
Loose	B	(3) Require adjustment to vehicle manufacturer's specifications.
Missing	C	Require replacement.
Output signal incorrect	B	(2) Require repair or replacement.
Surface contaminated	2	Suggest cleaning; identify and correct source.
Tip bent	B	Require replacement.
Tip broken	B	Require replacement.
Tip missing	B	Require replacement.
Wire lead burned	A	Require replacement.
Wire lead conductors exposed	B	Require replacement.
Wire lead corroded	A	Require replacement.

*** ELECTRICAL SYSTEM UNIFORM INSPE**

Wire lead open ..... A ..... Require replacement.
Wire lead shorted ..... A ..... Require replacement.

(1) - If a sensor is not adjustable, further inspection is required to identify and correct cause.
(2) - Component failure may be caused by water intrusion into the wiring harness. Always check insulation for damage and wiring for excessive resistance.
(3) - Some integral bearing assemblies with sensors may require replacement.

DEFOGGERS

See HEATING ELEMENTS (DEFROSTERS, DEFOGGERS, ELECTRIC HEATERS AND SEATS).

DEFROSTERS

See HEATING ELEMENTS (DEFROSTERS, DEFOGGERS, ELECTRIC HEATERS AND SEATS).

DELAYS

DELAY INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Binding, affecting performance	A	Require repair or replacement.
Binding, not affecting performance	2	Suggest repair or replacement.
Broken	A	Require repair or replacement.
Burned, affecting performance	A	(1) Require repair or replacement.
Burned, not affecting		

performance ..... 2 ..... (1) Suggest repair or replacement.
Cracked, affecting performance ..... A .. Require repair or replacement.
Cracked, not affecting performance ..... 1 .. Suggest repair or replacement.
Inoperative ..... A ..... (2) Require repair or replacement.
Melted, affecting performance ..... A ..... (1) Require repair or replacement.
Melted, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

DIMMERS

DIMMER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ...	Require repair or replacement of hardware.
Attaching hardware		

missing ..... C ..... Require replacement of hardware.

Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.

Binding, affecting performance ..... A .. Require repair or replacement.

Binding, not affecting performance ..... 2 .. Suggest repair or replacement.

Broken ..... A .. Require repair or replacement.

Burned, affecting performance ..... A ..... (1) Require repair or replacement.

Burned, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.

Cracked, affecting performance ..... A .. Require repair or replacement.

Cracked, not affecting performance ..... 1 .. Suggest repair or replacement.

Inoperative ..... A ..... (2) Require repair or replacement.

Melted, affecting performance ..... A ..... (1) Require repair or replacement.

Melted, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.

Missing ..... C ..... Require replacement.

Terminal broken ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal corroded, affecting performance .. A .. Require repair or replacement.

Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.

Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

(2) - Inoperative includes intermittent operation or out of OEM specification.

ELECTRIC HEATERS

See HEATING ELEMENTS (DEFROSTERS, DEFOGGERS, ELECTRIC HEATERS AND SEATS).

EQUALIZERS

See RECEIVERS, AMPLIFIERS, EQUALIZERS AND SUB-WOOFER VOLUME CONTROLS.

FUSE BLOCKS

See FUSE BOXES AND BLOCKS.

FUSE BOXES AND BLOCKS

FUSE BOX AND BLOCK INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Broken, affecting performance	A	Require replacement.
Broken, not affecting performance	..	No service suggested or required.
Burned, affecting performance	A	(1) Require repair or replacement.
Burned, not affecting performance	2	(1) Suggest repair or replacement.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack		

type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Cover missing ..... C ... Require replacement of cover.
Cracked, affecting performance ..... A .. Require repair or replacement.
Cracked, not affecting performance ..... 1 .. Suggest repair or replacement.
Melted, affecting performance ..... A ..... (1) Require replacement.
Melted, not affecting performance ..... 2 ..... (1) Suggest replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

FUSES, FUSIBLE LINKS AND CIRCUIT BREAKERS

FUSE, FUSIBLE LINK AND CIRCUIT BREAKER INSPECTION

Condition Code Procedure

Application incorrect ... B ..... Require replacement.
Blown ..... A ..... (1) Require replacement.
Corroded, affecting performance ..... A .. Require repair or replacement.
Corroded, not affecting performance ..... 2 .. Suggest repair or replacement.
Cracked, affecting performance ..... A .. Require repair or replacement.

Cracked, not affecting
performance ..... 1 .. Suggest repair or replacement.
Inoperative ..... A ..... (2) Require replacement.
Insulation damaged,
conductors exposed ..... A .. Require repair or replacement.
Insulation damaged,
conductors not exposed . 1 ..... Suggest replacement.
Missing ..... C ..... Require replacement.
Routed incorrectly ..... B ..... Require repair.
Secured incorrectly ..... B ..... Require repair.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation.

FUSIBLE LINKS

See FUSES, FUSIBLE LINKS AND CIRCUIT BREAKERS.

GAUGES

NOTE: Includes odometers, speedometers and tachometers (except cable-driven).

GAUGE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ...	Require repair or replacement of hardware.

Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Leaking ..... A ..... Require replacement.
Lens broken ..... A ..... (2) Require repair or replacement.
Lens cloudy ..... 2 ..... (2) Suggest repair or replacement.
Lens missing ..... C ..... (2) Require repair or replacement.
Malfunctioning ..... A ..... (3) Require repair or replacement.
Mechanical head noisy ... 2 .. Suggest repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - If lens is available as a separate part, require replacement of lens only.
(3) - Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.

GENERATORS

See ALTERNATORS AND GENERATORS.

GROUND CABLES AND STRAPS

GROUND CABLE AND STRAP INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Corroded, affecting performance	A	Require repair or replacement.
Corroded, not affecting performance	2	Suggest repair or replacement.
Insulation damaged, exposing conductors	2	Suggest replacement.
Loose	A	Require repair.
Missing	C	Require replacement.
Open	A	Require repair or replacement.
Resistance high	A	Require repair or replacement.
Terminal resistance (voltage drop) is out of specification	B	Require repair or replacement.
Voltage drop out of specification	B	Require repair or replacement.

GROUND STRAPS

See GROUND CABLES AND STRAPS.

HEADLIGHT ADJUSTERS

HEADLIGHT ADJUSTER INSPECTION

Condition	Code	Procedure

Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Bent, preventing adjustment ..... A .. Require repair or replacement.
Broken ..... A .. Require repair or replacement.
Indicator broken ..... A ..... Require replacement.
Indicator missing ..... C ..... Require replacement.
Missing ..... C ..... Require replacement of adjusters.
Seized ..... A .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

HEATING ELEMENTS (DEFROSTERS, DEFOGGERS, ELECTRIC HEATERS AND SEATS)

HEATING ELEMENT (DEFROSTER, DEFOGGER, ELECTRIC HEATER AND SEAT) INSPECTION

Condition Code Procedure

Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require repair or

replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Wire lead burned ..... A .. Require repair or replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

HORNS AND SIRENS

HORN AND SIREN INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.

Inoperative ..... A ..... (2) Require repair or replacement.
Missing ..... C ..... Require replacement.
Out of adjustment ..... B ..... Require adjustment.
Sound quality poor ..... A .. Require repair or replacement. Further inspection required.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Wire lead burned ..... A .. Require repair or replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation.

IGNITION SWITCHES

See SWITCHES.

INDICATOR LIGHTS

INDICATOR LIGHT INSPECTION

Condition	Code	Procedure
Does not come on during bulb check		(1) Further inspection required.
Fails to function properly during test mode		(1) Further inspection

required.
On constantly .... (1) Further inspection required.
On intermittently .... (1) Further inspection required.

(1) - See service manual for further information.

KEYLESS ENTRY KEYPADS AND TRANSMITTERS

KEYLESS ENTRY KEYPAD AND TRANSMITTER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Malfunctioning	A	(2) Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.

Wire lead burned ..... A .. Require repair or replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Malfunctioning includes inoperative, intermittent operation, or failure to perform all functions.

KEYLESS ENTRY TRANSMITTERS

See KEYLESS ENTRY KEYPADS AND TRANSMITTERS.

LEDS

See BULBS, SEALED BEAMS AND LEDS.

LENSES

LENSE INSPECTION

Condition Code Procedure

Adjustment out of
specification ..... B ..... Require repair.
Application incorrect ... A ..... Require replacement.
Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Broken, affecting
performance ..... A ..... Require replacement.
Broken, not affecting
performance..... .. .. No service suggested or required.
Cracked ..... A ..... Require replacement.
Discolored ..... A ..... Require replacement.
Leaking ..... A .. Require repair or replacement.

*** ELECTRICAL SYSTEM UNIFORM INS**

Melted, affecting performance ..... A ..... Require replacement.
Melted, not affecting performance ..... 2 ..... Suggest replacement.
Missing ..... C ..... Require replacement.

MICROPHONES

See SPEAKERS AND MICROPHONES.

MIRRORS (ELECTROCHROMATIC AND HEATED)

MIRROR (ELECTROCHROMATIC AND HEATED) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Broken	A	Require repair or replacement.
Connector broken	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Cracked	A	Require replacement.
Inoperative	A	(2) Require replacement.
Missing	C	Require replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.

Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Wire lead burned ..... A .. Require repair or replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation.

MOTORS

MOTOR INSPECTION

Condition Code Procedure

Amperage draw out of
specification ..... A .. Require repair or replacement.
Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Bracket bent ..... A .. Require repair or replacement.
Bracket broken ..... A .. Require repair or replacement.
Bracket cracked ..... A .. Require repair or replacement.
Bracket holes elongated,
affecting performance .. A .. Require repair or replacement.
Bracket holes elongated,
not affecting
performance .... No service suggested or required.
Bracket missing ..... C ..... Require replacement.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack
type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement. *** ELECTRICAL SYSTEM UNIFORM INSPE**

Drive mechanism damaged,
affecting performance .. A ..... (2) Require repair or replacement.
Drive mechanism damaged,
not affecting
performance ..... 2 ..... (2) Suggest repair or replacement.
Fails to disengage ..... A .. Require repair or replacement.
Housing broken, affecting
performance ..... 2 .. Suggest repair or replacement.
Housing broken, not
affecting performance .. .. No service suggested or required.
Housing cracked, affecting
performance ..... A .. Require repair or replacement.
Housing cracked, not
affecting performance .. 1 .. Suggest repair or replacement.
Inoperative ..... A ..... (3) Require repair or replacement.
Linkage bent, affecting
performance ..... A ... Require repair or replacement of linkage.
Linkage bent, not
affecting performance .. .. No service suggested or required.
Linkage binding, affecting
performance ..... A ... Require repair or replacement of linkage.
Linkage binding, not
affecting performance .. 2 ... Suggest repair or replacement of linkage.
Linkage broken ..... A ... Require repair or replacement of linkage.
Linkage loose, affecting
performance ..... A ... Require repair or replacement of linkage.
Linkage loose, not
affecting performance .. 1 ... Suggest repair or replacement of linkage.
Linkage missing ..... C ..... Require replacement.
Linkage noisy ..... 2 .. Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B ..... (4) Further inspection required.
Resistance out of

*** ELECTRICAL SYSTEM UNIFORM INSPE(**

specification ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Wire lead burned ..... A .. Require repair or replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Further inspection required to determine cause.
(3) - Inoperative includes intermittent operation.
(4) - Follow OEM recommended adjustment procedures. Repair or replace if out of specification.

NEUTRAL SAFETY SWITCHES

See SWITCHES.

ODOMETERS

See GAUGES.

ODOMETERS, SPEEDOMETERS AND TACHOMETERS (CABLE-DRIVEN)

ODOMETER, SPEEDOMETER AND TACHOMETER (CABLE-DRIVEN) INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement of hardware

Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Drive cable broken ..... A ..... Require replacement.
Drive cable noisy ..... 2 .. Suggest repair or replacement.
Inoperative ..... A ..... (2) Further inspection required.
Leaking ..... A ..... Require replacement.
Lens broken ..... A ..... (3) Require repair or replacement.
Lens cloudy ..... 2 ..... (3) Suggest repair or replacement.
Lens missing ..... C ..... (3) Require repair or replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - If lens is available as a separate part, require replacement of lens only.
(3) - Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.

PULLEYS

PULLEY INSPECTION

Condition	Code	Procedure
Alignment incorrect	B	Require repair or replacement.
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bent	A	Require replacement.
Cracked	A	Require replacement.
Loose	A	Require repair or replacement.
Missing	C	Require replacement.
Pulley damaged, affecting belt life	A	Require replacement.

RECEIVERS, AMPLIFIERS, EQUALIZERS AND SUB-WOOFER VOLUME CONTROLS

RECEIVER, AMPLIFIER, EQUALIZER AND SUB-WOOFER VOLUME CONTROL INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector melted	A	(1) Require repair or

replacement.
Connector missing ..... C ..... Require replacement.
Malfunctioning ..... A ..... (2) Require repair or replacement.
Missing ..... C ..... Require replacement.
Sound quality poor ..... A ..... (3) Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Wire lead burned ..... A .. Require repair or replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Malfunctioning includes inoperative, intermittent operation, or failure to perform all functions.
(3) - Make sure poor sound quality is not caused by ignition/charging system or other forms of electrical interference.

RELAY BOXES

RELAY BOX INSPECTION

Condition Code Procedure

Attaching hardware broken ..... A ... Require repair or replacement of hardware.

Attaching hardware

missing ..... C ..... Require replacement of hardware.

Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.

Broken, affecting performance ..... A ..... Require replacement.

Broken, not affecting performance .... No service suggested or required.

Burned, affecting performance ..... A ..... (1) Require repair or replacement.

Burned, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.

Connector broken ..... A .. Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.

Connector melted ..... A ..... (1) Require repair or replacement.

Connector missing ..... C ..... Require replacement.

Cover missing ..... C ... Require replacement of cover.

Cracked, affecting performance ..... A .. Require repair or replacement.

Cracked, not affecting performance ..... 1 .. Suggest repair or replacement.

Melted, affecting performance ..... A ..... (1) Require replacement.

Melted, not affecting performance ..... 2 ..... (1) Suggest replacement.

Terminal broken ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal corroded, affecting performance .. A .. Require repair or replacement.

Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.

Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

RELAYS

RELAY INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Housing broken	A	Require replacement.
Housing cracked	2	Suggest replacement.
Inoperative	A	(1) Require replacement.
Missing	C	Require replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(2) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.
(2) - Determine cause and correct prior to repair or replacement of part.

SEALED BEAMS

See BULBS, SEALED BEAMS AND LEDS.

SEAT HEATERS

See HEATING ELEMENTS (DEFROSTERS, DEFOGGERS, ELECTRIC HEATERS AND SEATS).

SECURITY ALARM SENSORS

SECURITY ALARM SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Inoperative	B	(2) Require repair or replacement. Further inspection required.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not		

affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

SIRENS

See HORNS AND SIRENS.

SOLENOIDS

See ACTUATOR MOTORS (SOLENOIDS) (ELECTRIC).

NOTE: For starter solenoids that are integral to the starter assembly, see STARTERS.

NOTE: For starter relays, see RELAYS.

SPEAKERS AND MICROPHONES

SPEAKER AND MICROPHONE INSPECTION

Condition Code Procedure

Application incorrect ... A ..... Require replacement.
Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Connector broken ... A ... Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... B ..... (2) Require repair or replacement. Further inspection required.
Membrane torn ..... A ..... Require replacement.
Missing ..... C ..... Require replacement.
Polarity reversed ..... A ..... Require repair.
Sound quality poor ..... A ..... (3) Require repair or replacement. Further inspection required.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.
(3) - Make sure poor sound quality is not caused by ignition/charging system or other forms of electrical interference.

SPEEDOMETER AND TACHOMETER LINKAGES AND CABLES

SPEEDOMETER AND TACHOMETER LINKAGE AND CABLE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ...	Require repair or replacement

of hardware.

Attaching hardware missing ..... C ..... Require replacement of hardware.

Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.

Bent ..... A .. Require repair or replacement.

Binding ..... A .. Require repair or replacement.

Bracket bent, affecting performance ..... A .. Require repair or replacement.

Bracket bent, not affecting performance .. .. No service suggested or required.

Bracket broken, affecting performance ..... A ..... Require replacement.

Bracket broken, not affecting performance .. .. No service suggested or required.

Bracket corroded, affecting performance .. A .. Require repair or replacement.

Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Bracket cracked, affecting performance ..... A .. Require repair or replacement.

Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket loose, affecting performance ..... A .. Require repair or replacement.

Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket missing ..... C ..... Require replacement.

Broken ..... A ..... Require replacement.

Cracked ..... A .. Require repair or replacement.

Disconnected ..... A .. Require repair or replacement.

Kinked ..... A .. Require repair or replacement.

Melted ..... A ..... (1) Require repair or replacement.

Missing ..... C ..... Require replacement.

Noisy ..... 2 .. Suggest repair or replacement.

Routed incorrectly ..... 2 ..... Suggest repair.

Seized ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

SPEEDOMETER CABLES

See SPEEDOMETER AND TACHOMETER LINKAGES AND CABLES.

SPEEDOMETERS

See GAUGES.

STARTERS

NOTE: To prevent misdiagnosis, care should be taken to eliminate the possibilities of mechanical problems or high resistance in power and/or ground circuits.

STARTER INSPECTION

Condition	Code	Procedure
Amperage draw does not meet OEM specifications	B	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	(1) Require repair or replacement of hardware.
Bracket bent, affecting performance	A	Require repair or replacement.
Bracket bent, not affecting performance		No service suggested or required.
Bracket broken, affecting performance	A	Require replacement.
Bracket broken, not affecting performance		No service suggested or required.
Bracket corroded, affecting performance	A	Require repair or replacement.
Bracket corroded, not affecting performance	2	Suggest repair or replacement.
Bracket cracked, affecting performance	A	Require repair or replacement.

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Bracket cracked, not
affecting performance .. 1 .. Suggest repair or replacement.
Bracket holes elongated,
affecting performance .. A .. Require repair or replacement.
Bracket holes elongated,
not affecting
performance) .... No service suggested or
required.
Bracket loose, affecting
performance ..... A .. Require repair or replacement.
Bracket loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Drive gear damaged,
affecting performance .. A ..... (2) Require repair or
replacement.
Drive gear damaged, not
affecting performance .. 2 ..... (2) Suggest repair or
replacement.
Fails to disengage ..... A .. Require repair or replacement.
Housing broken, affecting
performance ..... 2 .. Require repair or replacement.
Housing broken, not
affecting performance .. .. No service suggested or
required.
Housing cracked, affecting
performance ..... A ... Require repair or replacement.
Housing cracked, not
affecting performance .. 2 .. Suggest repair or replacement.
Inoperative ..... A ..... (3) Require repair or
replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Shimmed incorrectly ..... B ..... Require repair.
Starter shaft bushing
missing ..... C ..... (4) Require replacement.
Starter shaft bushing
worn, affecting
performance ..... A ..... Require replacement.
Starter shaft bushing
worn, not affecting
performance ..... 1 ..... Suggest replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (5) Require repair or
replacement.
Terminal burned, not

*** ELECTRICAL SYSTEM UNIFORM INSPE**

affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.

(1) - Inspect block or bell housing mounting surface.
(2) - Further inspection required to determine cause. Require inspection of ring gear.
(3) - Inoperative includes intermittent operation.
(4) - Bushing may be in bell housing.
(5) - Determine cause and correct prior to repair or replacement of part.

SUB-WOOFER VOLUME CONTROLS

See
RECEIVERS, AMPLIFIERS, EQUALIZERS AND SUB-WOOFER VOLUME CONTROLS.

SWITCHES

SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Binding, affecting performance	A	Require repair or replacement.
Binding, not affecting performance	2	Suggest repair or replacement.
Broken	A	Require repair or replacement.
Burned, affecting performance	A	(1) Require repair or

replacement.

Burned, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.

Cracked, affecting performance ..... A .. Require repair or replacement.

Cracked, not affecting performance ..... 1 .. Suggest repair or replacement.

Leaking ..... A .. Require repair or replacement.

Malfunctioning ..... A ..... (2) Require repair or replacement.

Melted, affecting performance ..... A ..... (1) Require repair or replacement.

Melted, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.

Missing ..... C ..... Require replacement.

Out of adjustment ..... B .. Require repair or replacement.

Terminal broken ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal corroded, affecting performance .. A .. Require repair or replacement.

Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.

Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

Won't return ..... A .. Require repair or replacement.

Worn ..... 1 ..... Suggest replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Includes inoperative, intermittent operation, or failure to perform all functions.

TACHOMETER CABLES

See SPEEDOMETER AND TACHOMETER LINKAGES AND CABLES.

TACHOMETERS

See GAUGES.

TAPE PLAYERS AND CD PLAYERS

TAPE PLAYER AND CD PLAYER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Malfunctioning	A	(2) Require repair or replacement.
Missing	C	Require replacement.
Skips	A	Require repair or replacement.
Sound quality poor	A	(3) Require repair or replacement.
Speed incorrect	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.
Wire lead burned	A	Require repair or replacement.

Wire lead conductors

exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Malfunctioning includes inoperative, intermittent operation, or failure to perform all functions.
(3) - Make sure poor sound quality is not caused by ignition/charging system or other forms of electrical interference.

TENSIONERS

TENSIONER INSPECTION

Condition Code Procedure

Alignment incorrect ..... B .. Require repair or replacement.
Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Bearings worn ..... 1 ..... Suggest replacement.
Belt tension incorrect .. B ... Require adjustment or repair.
Cracked ..... 2 ..... Suggest replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 ..... Suggest replacement.
Pulley damaged, affecting belt life ..... A ..... Require replacement.
Seized ..... A .. Require repair or replacement.

TIMERS

TIMER INSPECTION

Condition Code Procedure

Attaching hardware *** ELECTRICAL SYSTEM UNIFORM INSPECTION GUIDELINES *Article Text (p.**

broken ..... A ... Require repair or replacement of hardware.

Attaching hardware missing ..... C ..... Require replacement of hardware.

Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.

Broken ..... A .. Require repair or replacement.

Burned, affecting performance ..... A ..... (1) Require repair or replacement.

Burned, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.

Cracked, affecting performance ..... A .. Require repair or replacement.

Cracked, not affecting performance ..... 1 .. Suggest repair or replacement.

Inoperative ..... A ..... (2) Require repair or replacement.

Melted, affecting performance ..... A ..... (1) Require repair or replacement.

Melted, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.

Missing ..... C ..... Require replacement.

Terminal broken ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal corroded, affecting performance .. A .. Require repair or replacement.

Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.

Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

(2) - Inoperative includes intermittent operation or out of OEM

specification.

TIRE PRESSURE SENSORS

TIRE PRESSURE SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Inoperative	A	(1) Require repair or replacement.
Loose	A	Require repair or replacement.
Missing	C	Require replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

TRANSCEIVERS

TRANSCEIVER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.

Malfunctioning ..... A ..... (2) Require repair or replacement.
Missing ..... C ..... Require replacement.
Sound quality poor ..... A ..... (3) Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Wire lead burned ..... A .. Require repair or replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Malfunctioning includes inoperative, intermittent operation, or failure to perform all functions.
(3) - Make sure poor sound quality is not caused by ignition/charging system or other forms of electrical interference.

TRANSDUCERS

TRANSDUCER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ...	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.

Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Drive mechanism damaged, affecting performance .. A ..... (2) Require repair or replacement.
Drive mechanism damaged, not affecting performance ..... 2 ..... (2) Suggest repair or replacement.
Inoperative ..... A ..... (3) Require repair or replacement.
Leaking (vacuum/fluid/air) ..... A ..... Require replacement.
Linkage bent, affecting performance ..... A ... Require repair or replacement of linkage.
Linkage bent, not affecting performance .. .. No service suggested or required.
Linkage binding, affecting performance ..... A ... Require repair or replacement of linkage.
Linkage binding, not affecting performance .. 2 ... Suggest repair or replacement of linkage.
Linkage broken ..... A ... Require repair or replacement of linkage.
Linkage loose, affecting performance ..... A ... Require repair or replacement of linkage.
Linkage loose, not affecting performance .. 1 ... Suggest repair or replacement of linkage.
Linkage missing ..... C ..... Require replacement.
Linkage noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B ..... (4) Further inspection required.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting

performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Further inspection required to determine cause.
(3) - Inoperative includes intermittent operation or out of specification.
(4) - Follow OEM recommended adjustment procedures. Repair or replace if out of specification.

VACUUM ACCUMULATORS (RESERVOIRS)

VACUUM ACCUMULATOR (RESERVOIR) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Leaking	A	Require repair or replacement.

VACUUM RESERVOIRS

See VACUUM ACCUMULATORS (RESERVOIRS).

VOLTAGE REGULATORS

VOLTAGE REGULATOR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Inoperative	A	(2) Require replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - NOTE: Inoperative includes intermittent operation or out of OEM specification.

WASHER FLUID LEVEL SENDERS

WASHER FLUID LEVEL SENDER INSPECTION

Condition	Code	Procedure

Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Inoperative ..... A ..... (1) Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (2) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.
(2) - Determine cause and correct prior to repair or replacement of part.

WASHER PUMPS

WASHER PUMP INSPECTION

Condition	Code	Procedure
Attaching hardware		

broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require repair or replacement.
Leaking externally ..... A .. Require repair or replacement.
Leaking internally ..... A .. Require repair or replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Resistance out of specification ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation.

WIPER ARMS AND BLADES

NOTE: Windshield coatings or waxes can cause blades to not function as intended. Clean surface before making final judgment about blade replacement.

WIPER ARM AND BLADE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Attaching socket stripped	A	Require replacement.
Bent	A	Require repair or replacement.
Loose	2	Suggest repair or replacement.
Missing	C	Require replacement.
Noisy	2	Suggest repair or replacement.
Size incorrect	2	Suggest replacement.
Tension insufficient	B	Require repair or replacement.
Torn	A	Require replacement.
Worn, affecting performance	A	Require replacement.
Worn, not affecting performance	1	Suggest replacement.

WIPER BLADES

See WIPER ARMS AND BLADES.

WIPER HOSES AND NOZZLES

WIPER HOSE AND NOZZLE INSPECTION

Condition	Code	Procedure
Attaching hardware		

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broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Blocked ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Oil-soaked (spongy) ..... 1 ..... Suggest replacement.
Spray pattern incorrect . 2 .. Suggest repair or replacement.
Surface cracks (dry-rotted) ..... 1 ..... Suggest replacement.

WIPER LINKAGES

WIPER LINKAGE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Attaching stud stripped	A	Require replacement.
Bent	A	Require repair or replacement.
Inoperative	A	(1) Require replacement.
Loose	2	Suggest repair or replacement.
Missing	C	Require replacement.
Noisy	2	Suggest repair or replacement.
Tension insufficient	B	Require repair or replacement.
Worn, affecting performance	A	Require replacement.
Worn, not affecting performance	1	Suggest replacement.

(1) - Inoperative includes intermittent operation.

WIPER NOZZLES

See WIPER HOSES AND NOZZLES.

WIPER PUMP RESERVOIRS

WIPER PUMP RESERVOIR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Cap missing	C	Require replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.

WIRING HARNESSES AND CONNECTORS

WIRING HARNESS AND CONNECTOR INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.

*** ELE**

Connector missing ..... C ..... Require replacement.
Insulation damaged,
conductors exposed ..... A .. Require repair or replacement.
Insulation damaged,
conductors not exposed . 1 ..... Suggest replacement.
Open ..... A .. Require repair or replacement.
Protective shield
(conduit) melted ..... 2 ..... (1) Suggest repair or replacement.
Protective shield
(conduit) missing ..... 2 .. Suggest repair or replacement.
Resistance (voltage drop)
out of specification ... A .. Require repair or replacement.
Routed incorrectly ..... B ..... Require repair.
Secured incorrectly ..... B ..... Require repair.
Shorted ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Voltage drop out of
specification ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

END OF ARTICLE

ELECTRICAL COMPONENT LOCATOR
Article Text
1996 Kia Sephia
For 1 1 1 1 1

Saturday, April 18, 2009 10:04PM

ARTICLE BEGINNING

1995-96 ELECTRICAL COMPONENT LOCATION
Kia Electrical Components

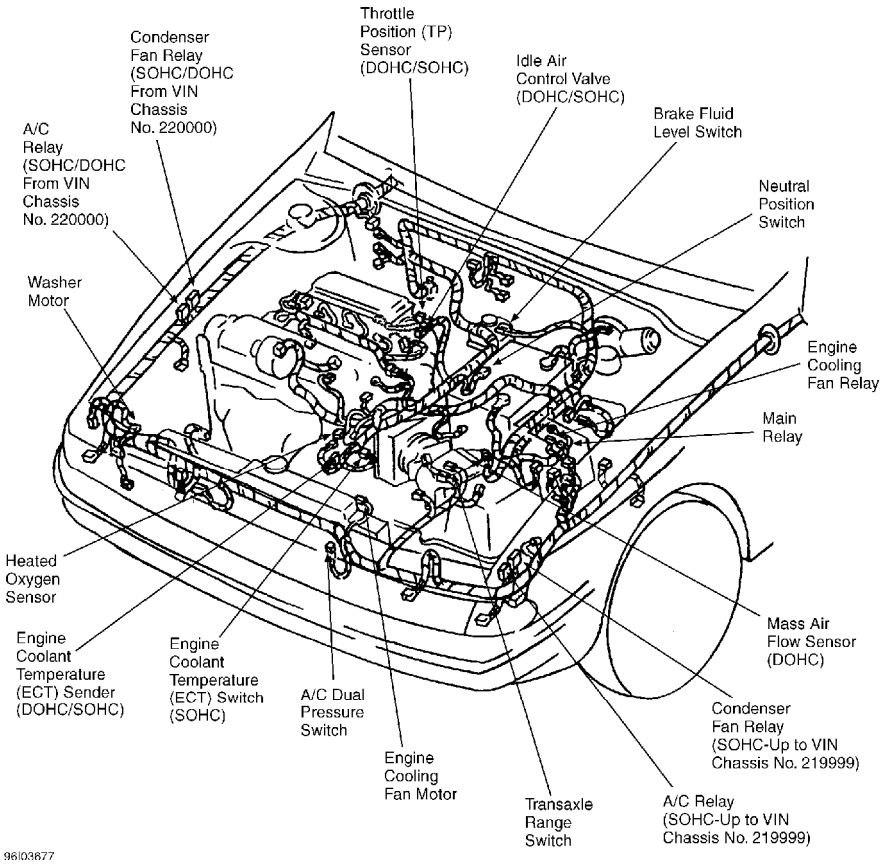
Sephia

SAFETY PRECAUTION

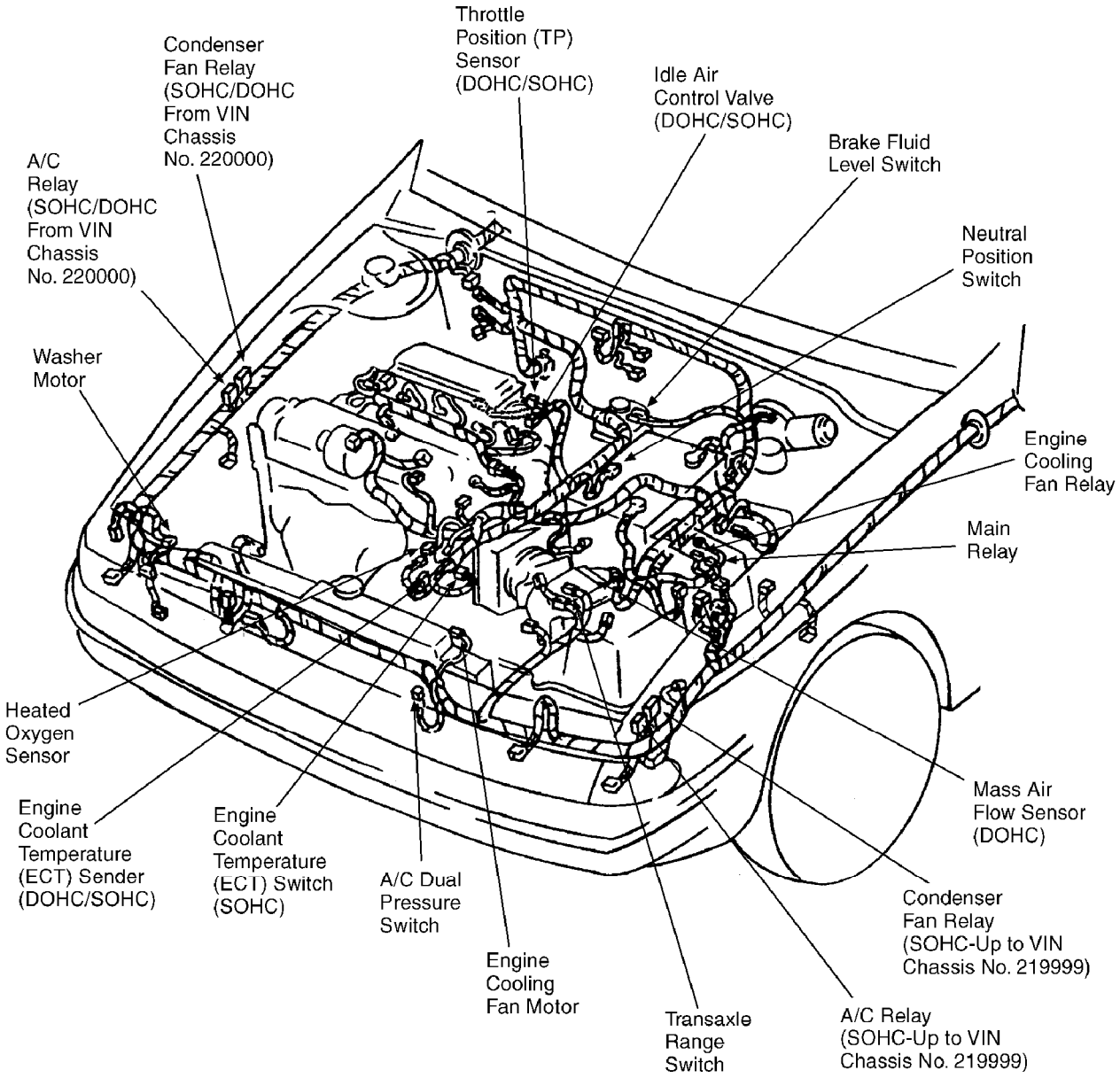
WARNING: When working on vehicles equipped with Supplemental Restraint System (SRS), never apply electrical voltage to the system. This could cause the SRS (air bag) to be deployed.

BUZZERS, RELAYS & TIMERS

Component	Component Location
A/C Relay (SOHC/DOHC-From VIN Chassis No. 220000)	On right side of engine compartment, on inner fender



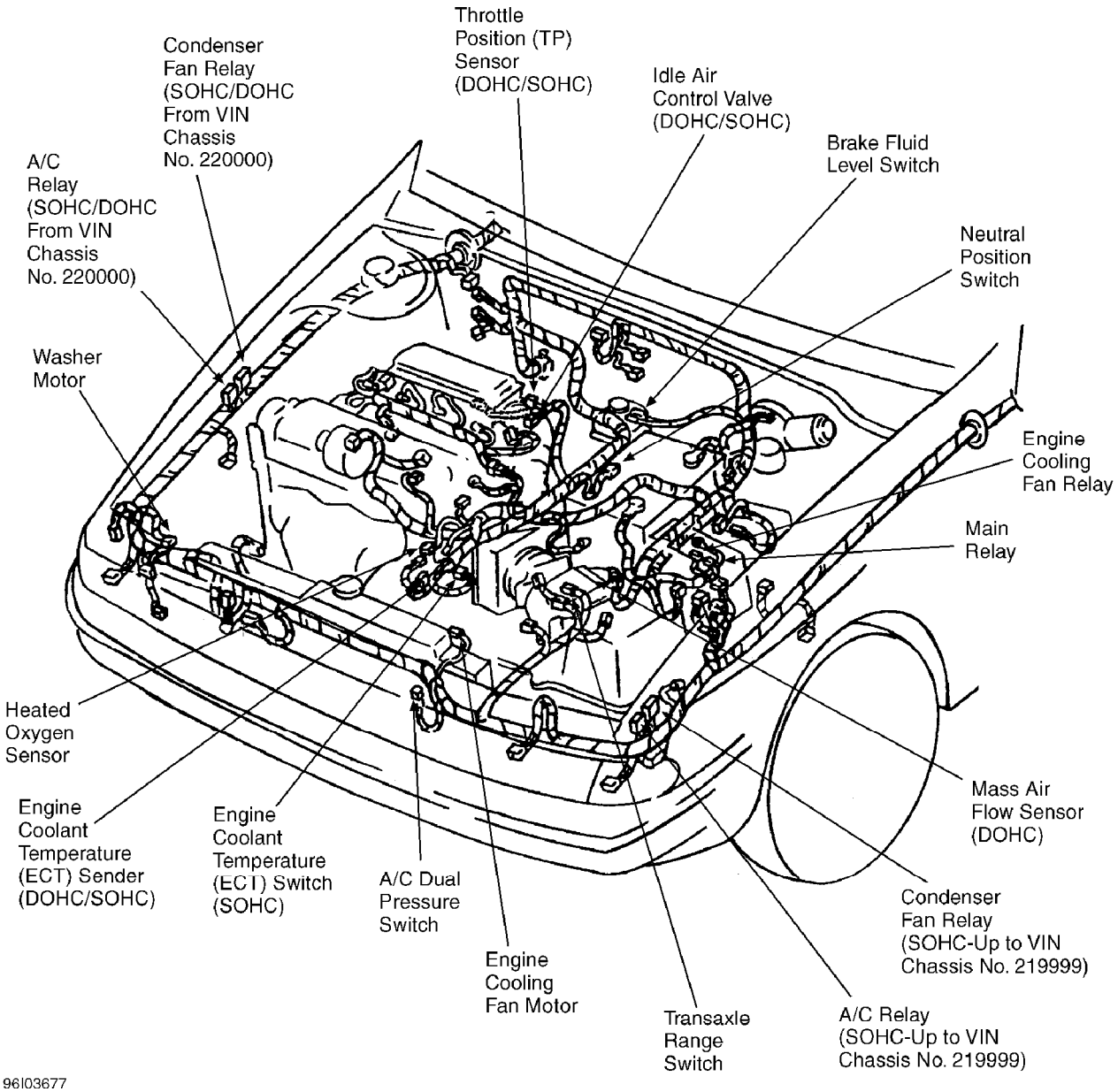
panel.



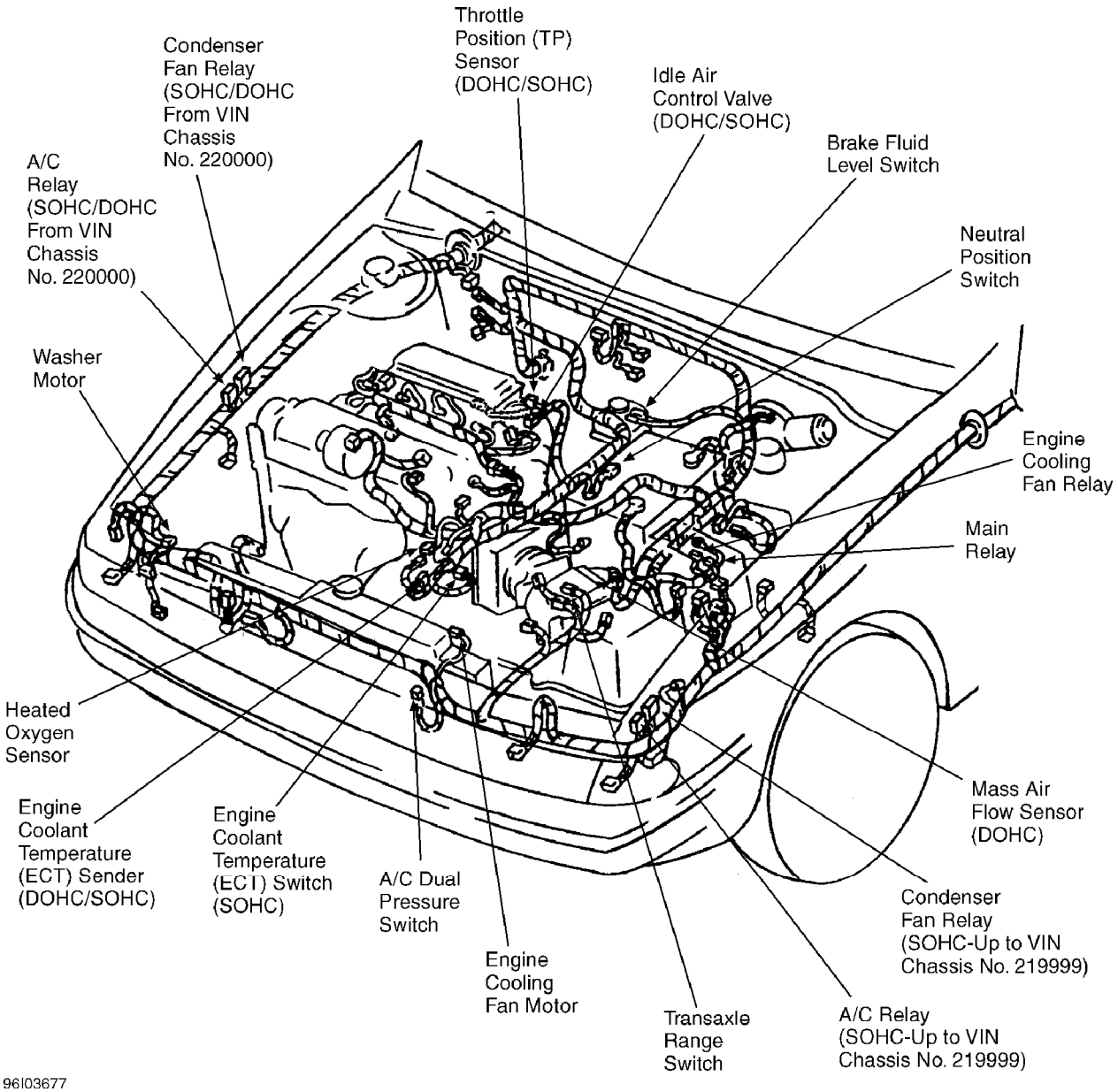
A/C Relay (SOHC-Up To VIN Chassis No. 219999) — On right side of engine compartment, on inner fender panel.

ABS Pump Motor Relay — On right rear corner of engine compartment panel.

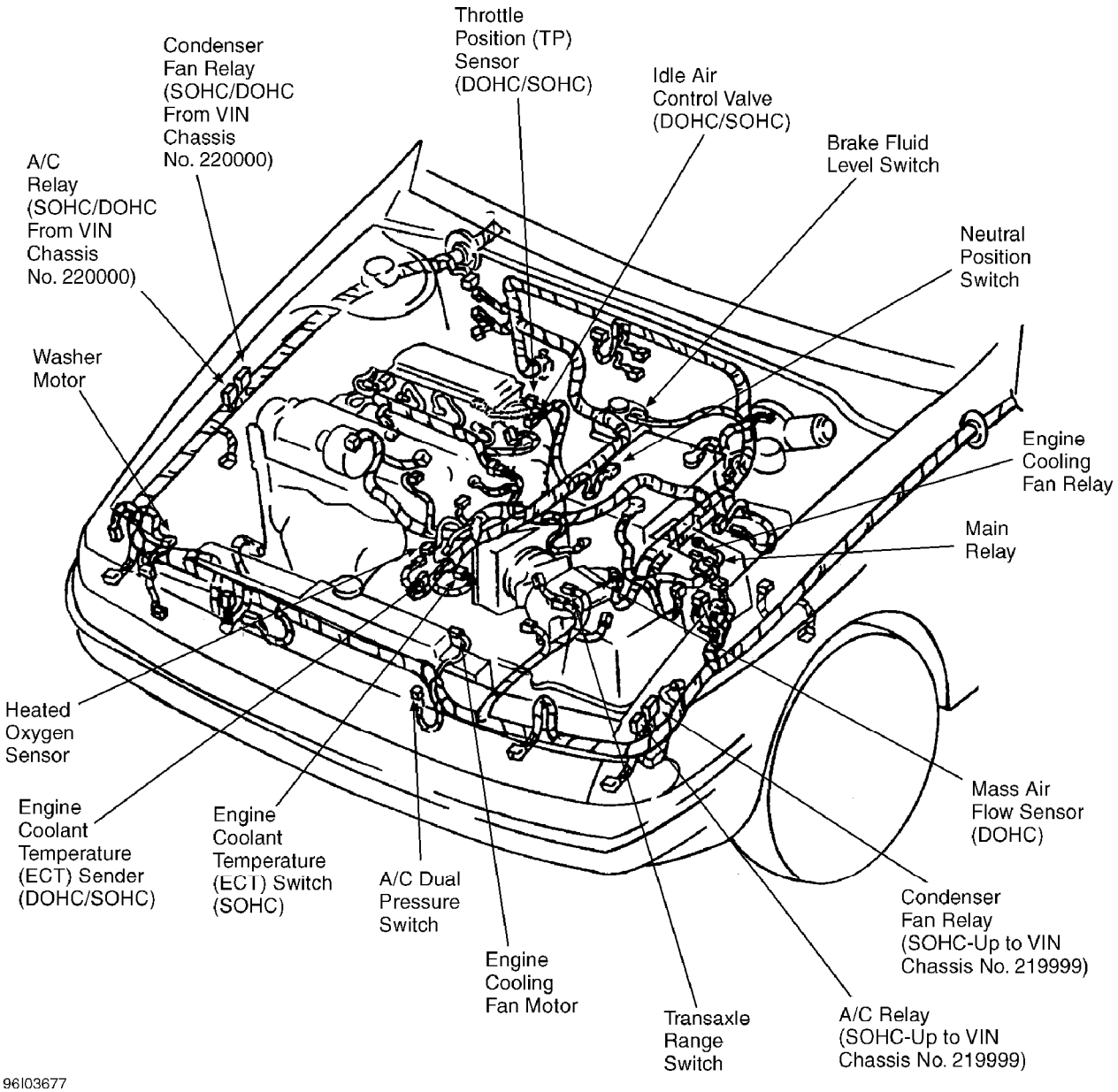
ELECTRICAL COMPONENT LOCATORArticle



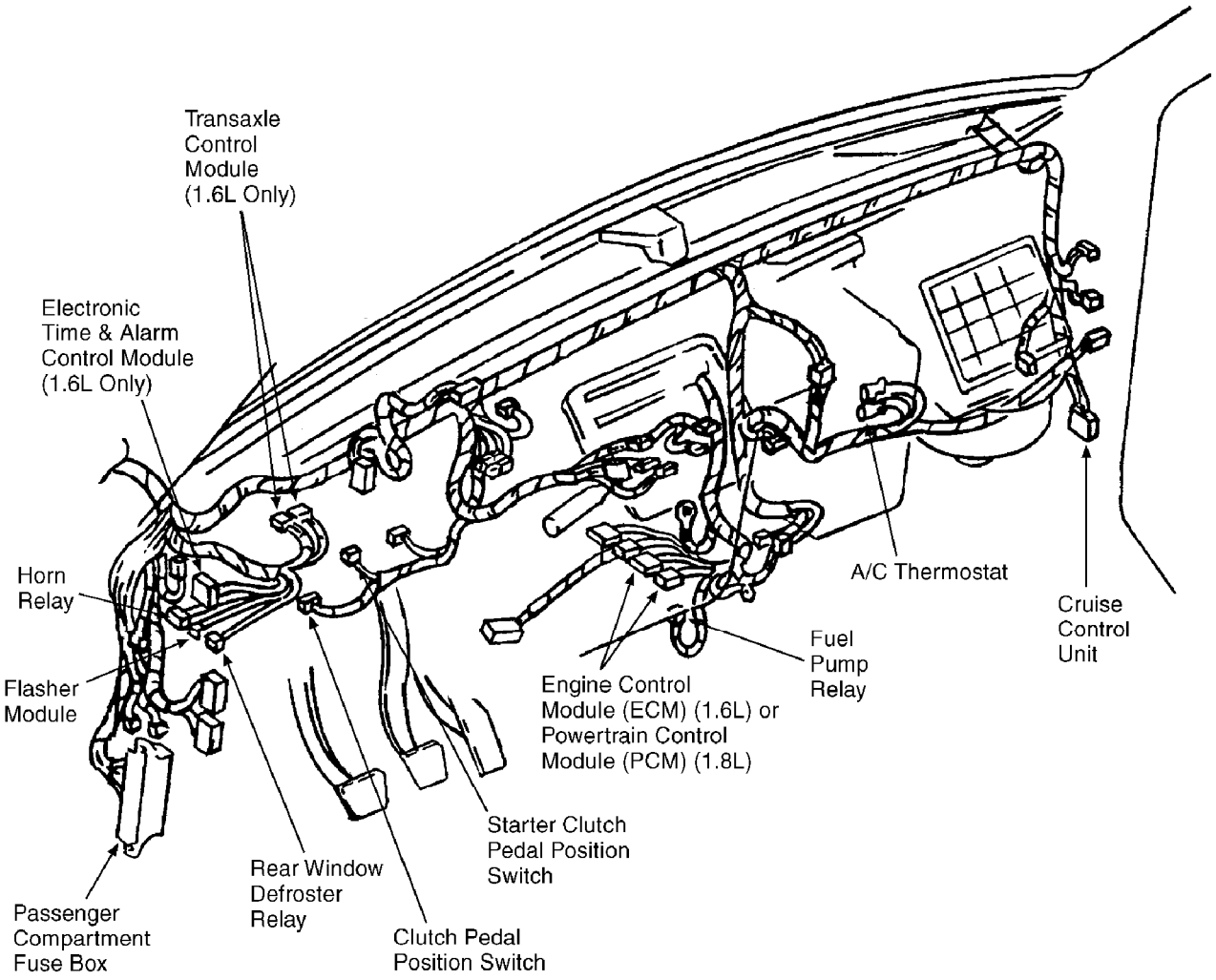
Condenser Fan Relay (SOHC/DOHC-From VIN Chassis No. 220000) On right side of engine compartment, on inner fender panel.



Condenser Fan Relay (SOHC-Up To VIN Chassis No. 219999)	On left front corner of engine compartment, on inner fender panel.

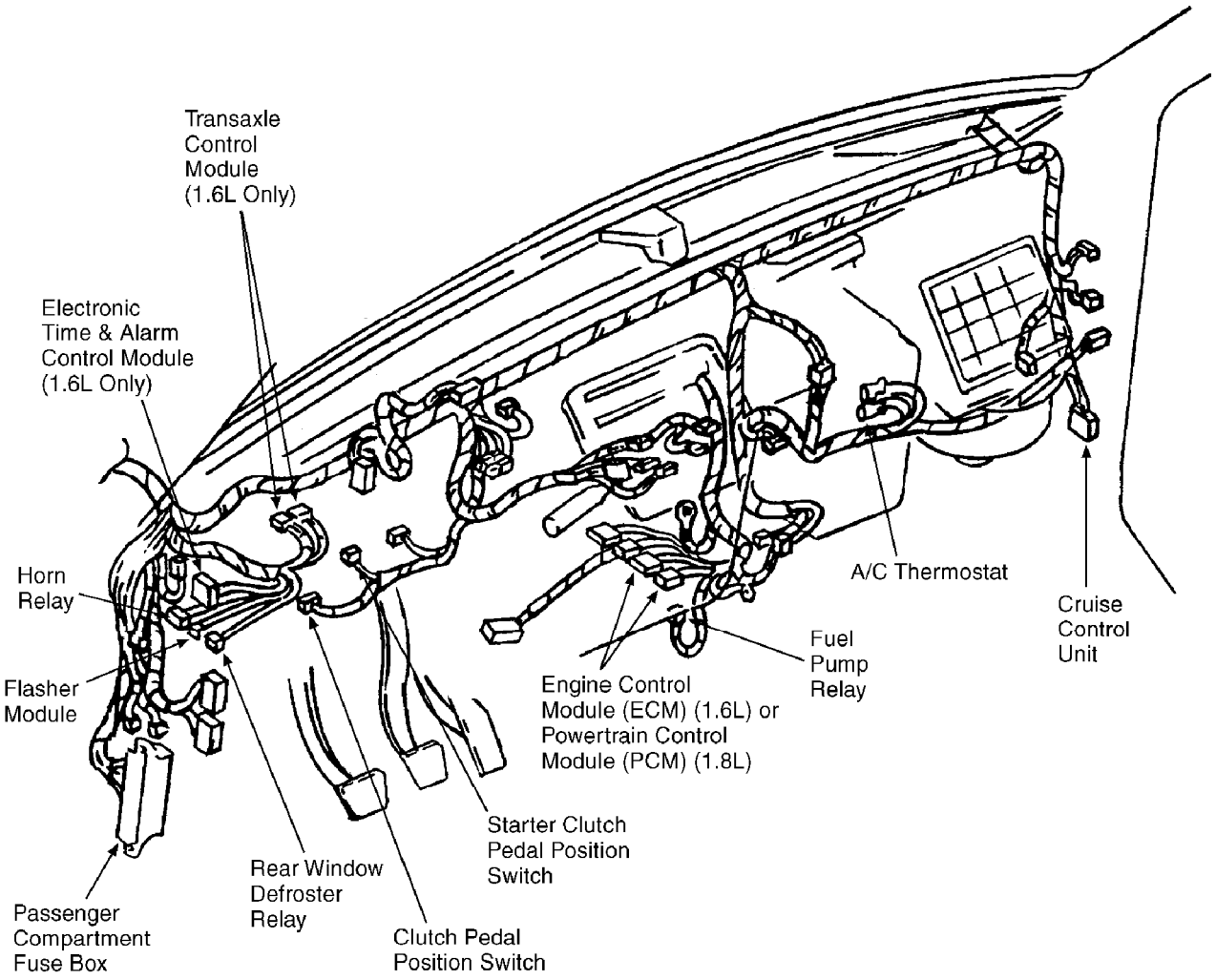


Engine Cooling Fan Relay In engine compartment fuse/relay box.

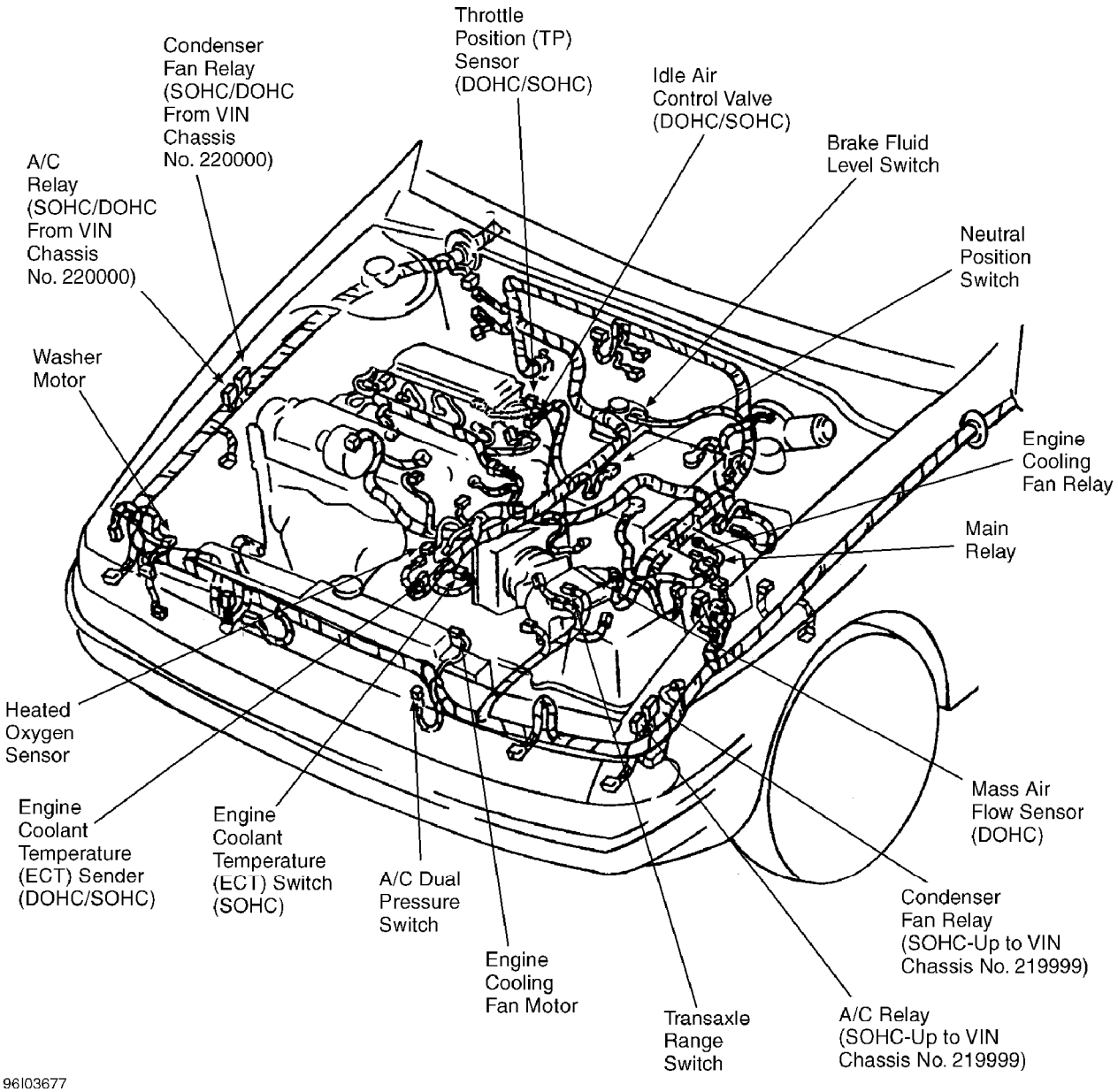


Fuel Pump Relay — Below center of dash, attached to ECM/PCM mounting bolt.

Headlamp Relay — In engine compartment fuse/relay box.



Horn Relay — Below left side of dash, on bracket above fuse box.



ELECTRICAL

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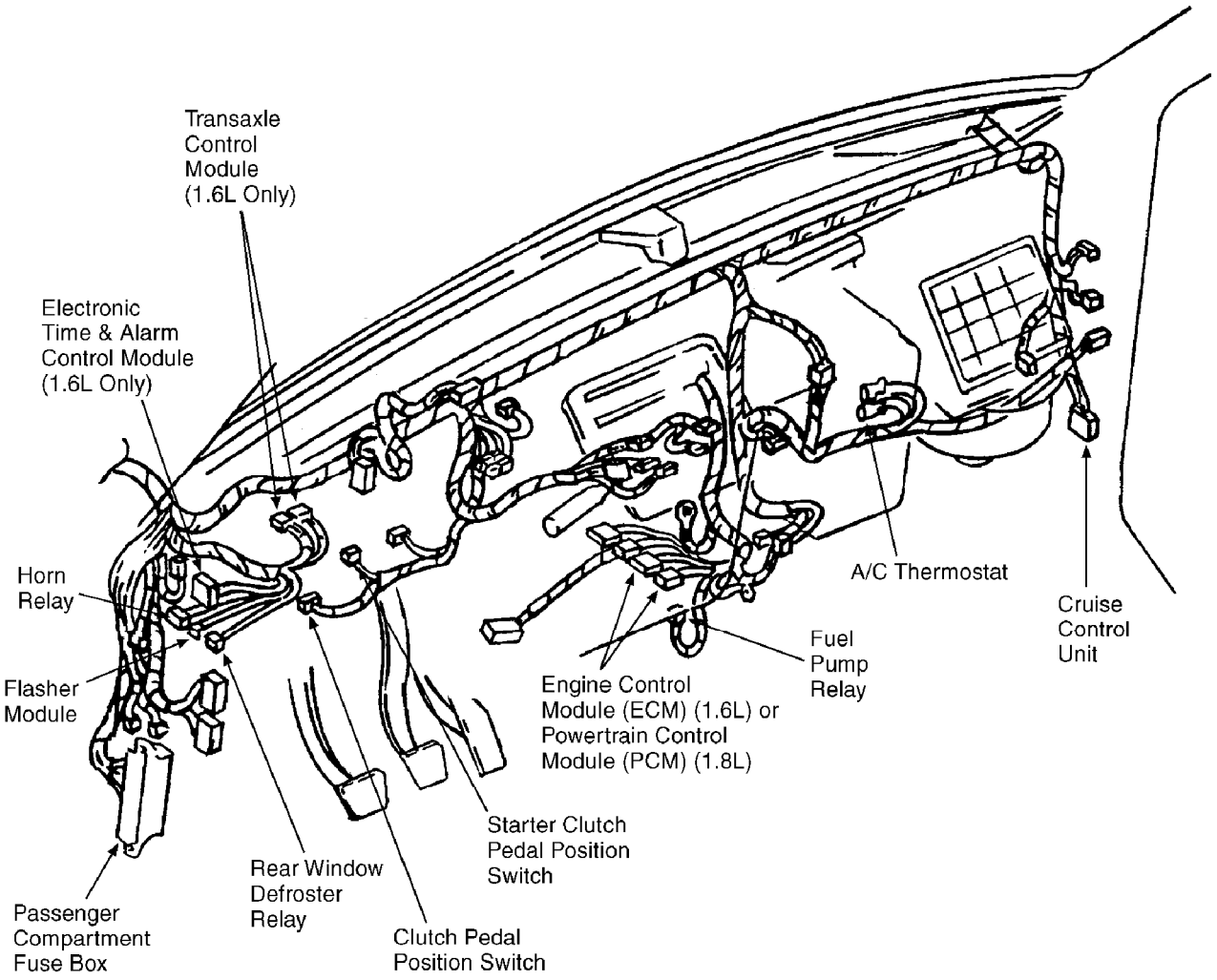
Main Relay — In engine compartment fuse/relay box.

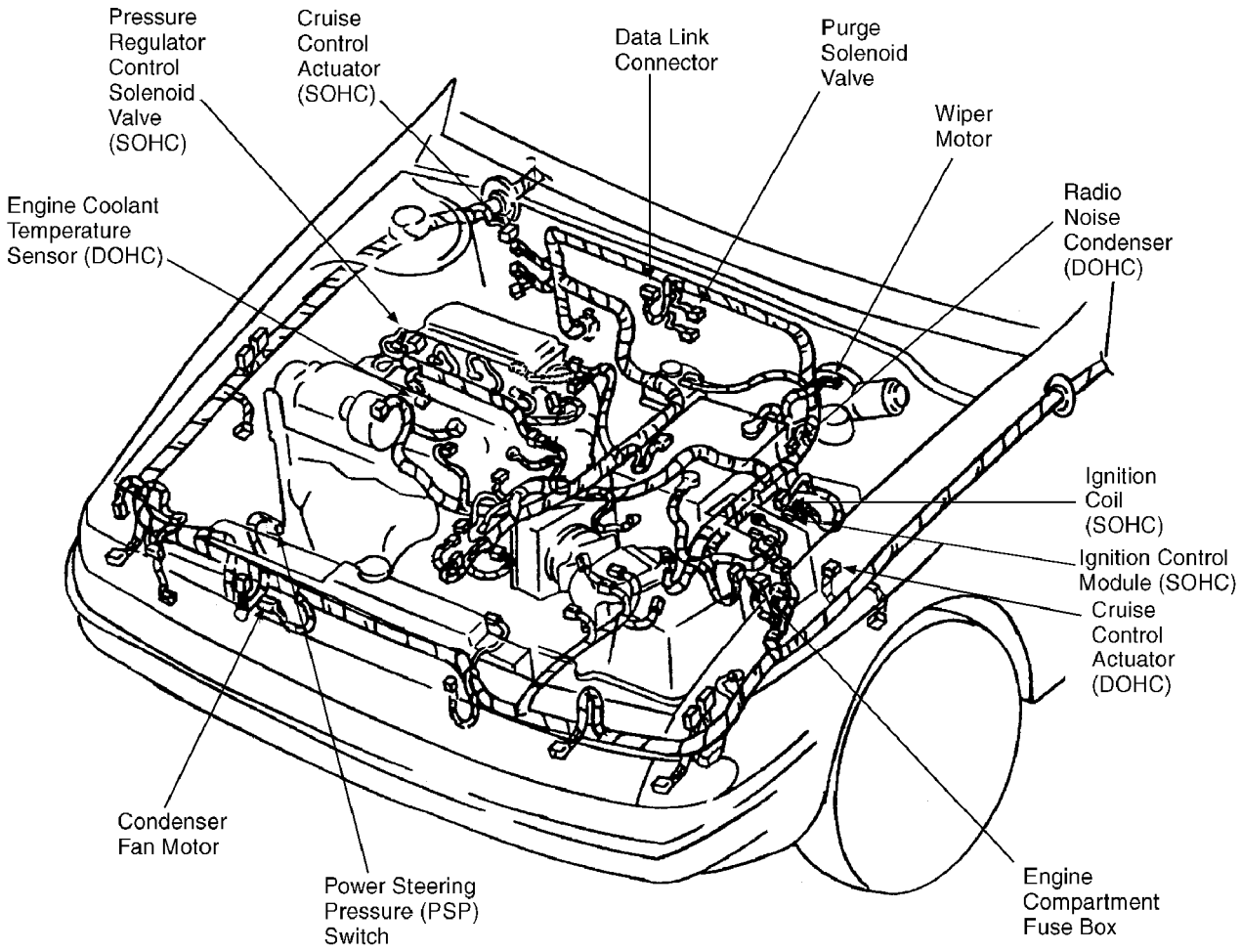


Rear Window Defroster Relay — Below left side of dash, on bracket above fuse box.

Taillamp Relay — Below left side of dash, above passenger compartment fuse box.

CIRCUIT PROTECTION DEVICES

Component	Component Location



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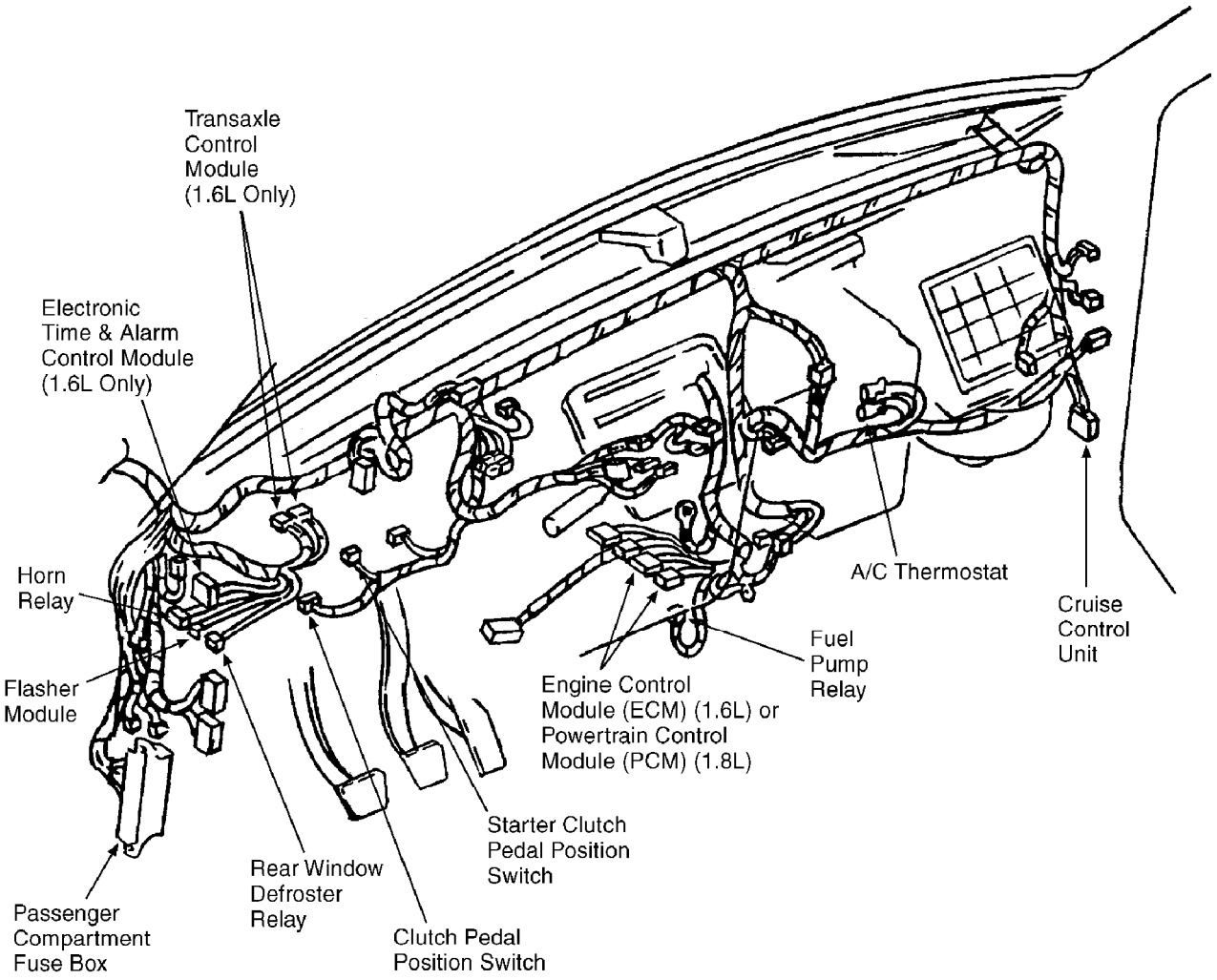
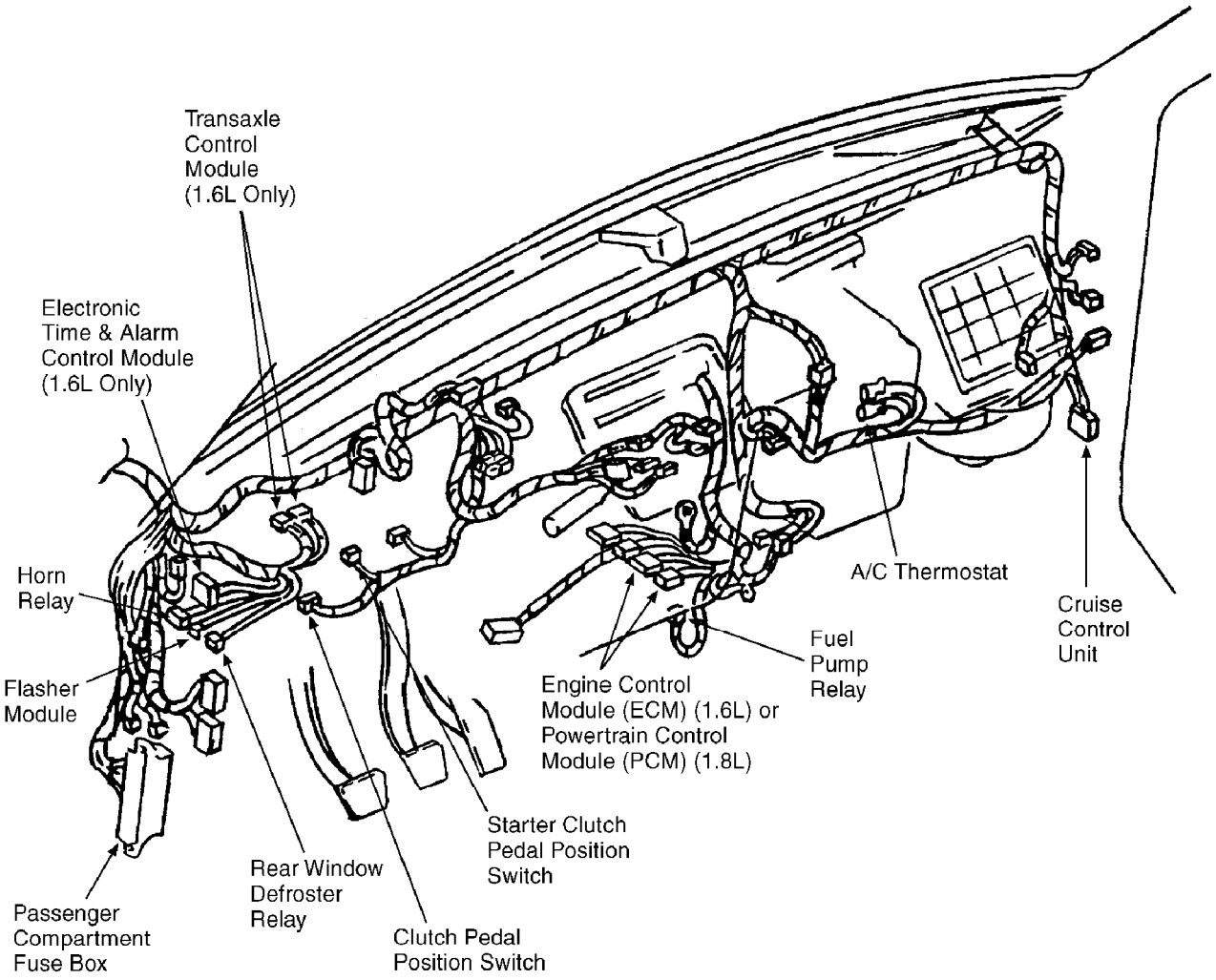
Engine Compartment Fuse/Relay Box	On left side of engine compartment.
In-Line Fuse	At center of dash, behind radio.



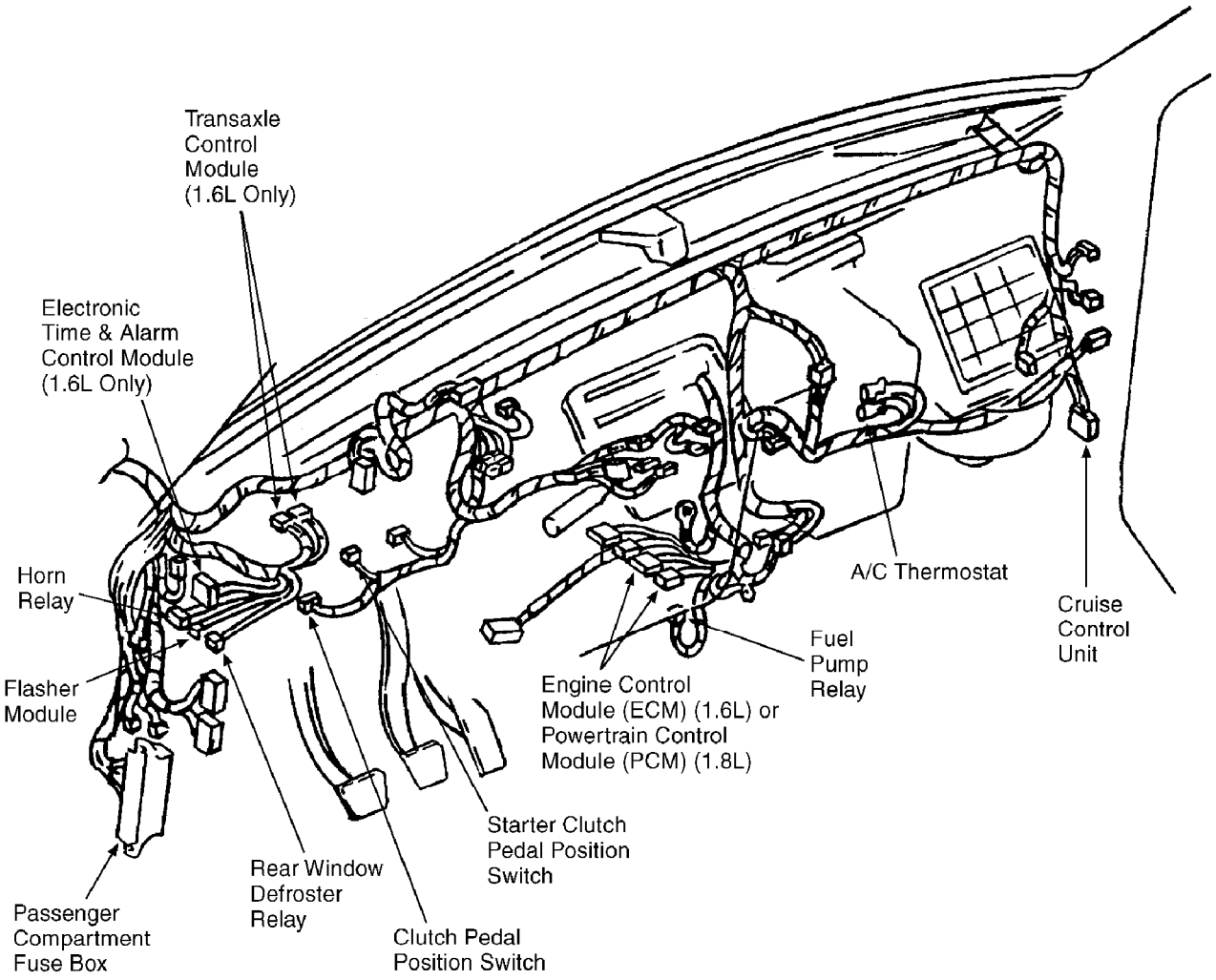
Passenger Compartment Fuse Box	Below left side of dash, at kick panel.

CONTROL UNITS

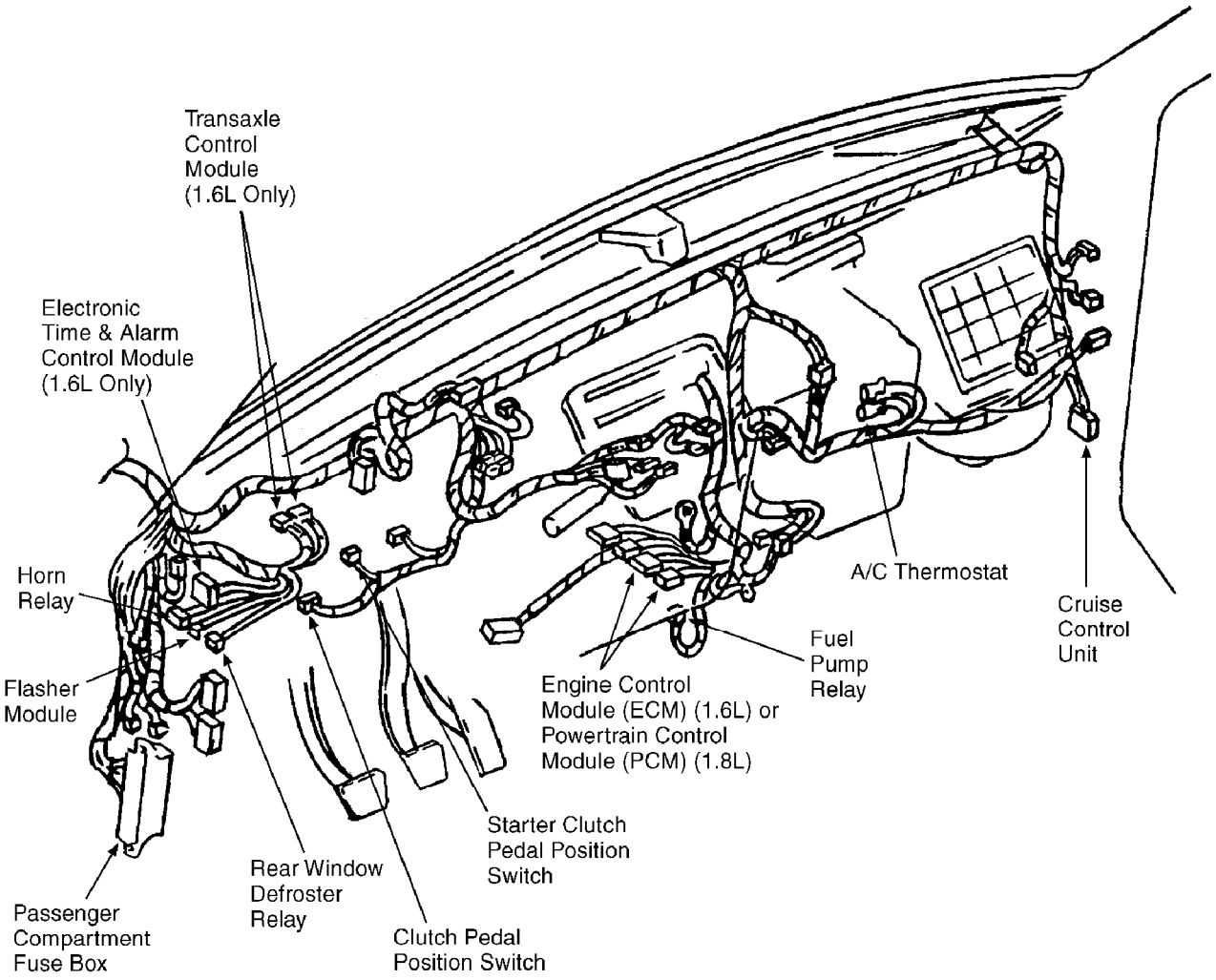
Component	Component Location
Air Bag Diagnostic Unit	Behind front of center console.
Anti-Lock Brake Control Unit	Beneath passenger's seat.



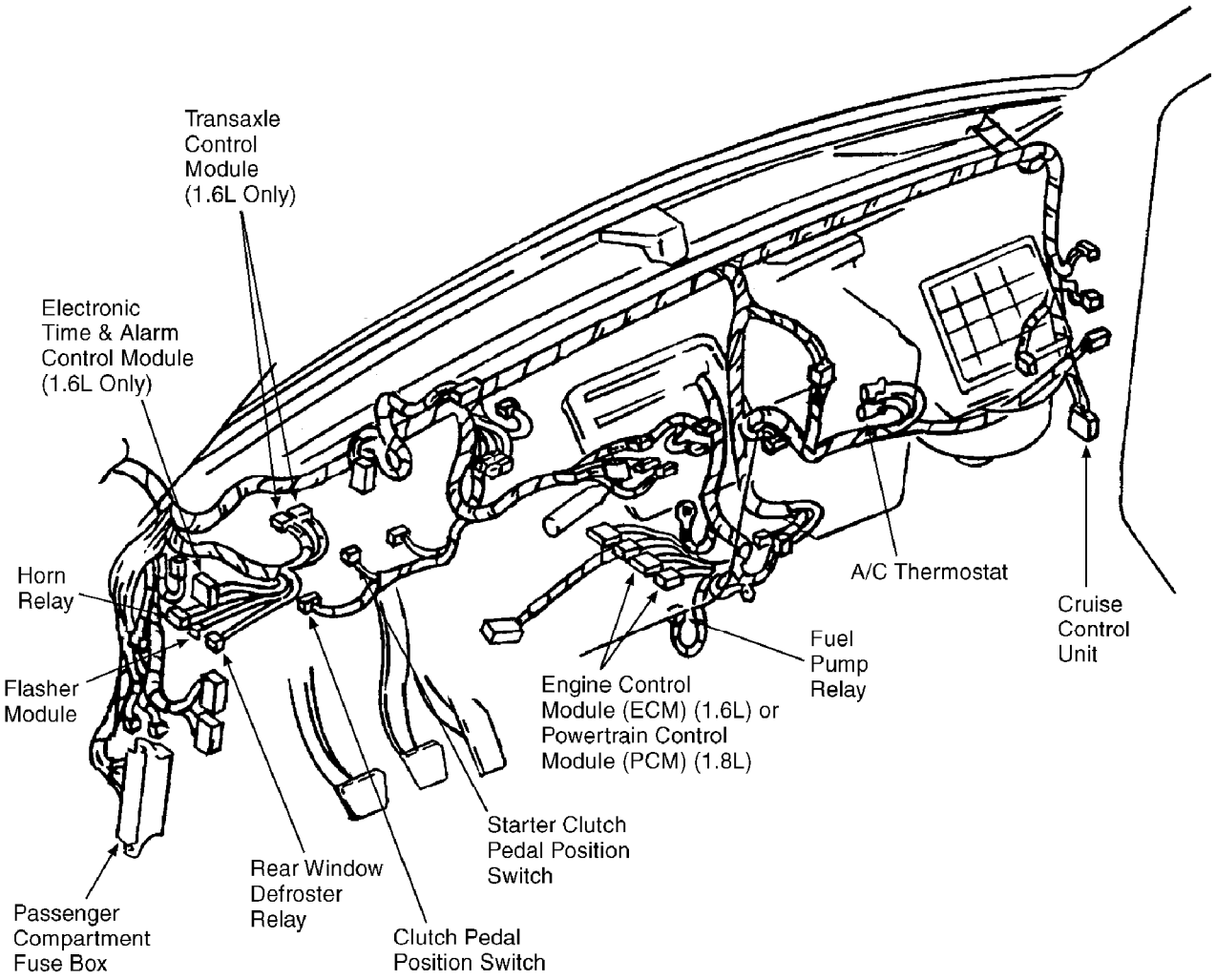
Cruise Control Unit Below right side of dash, at kick panel.



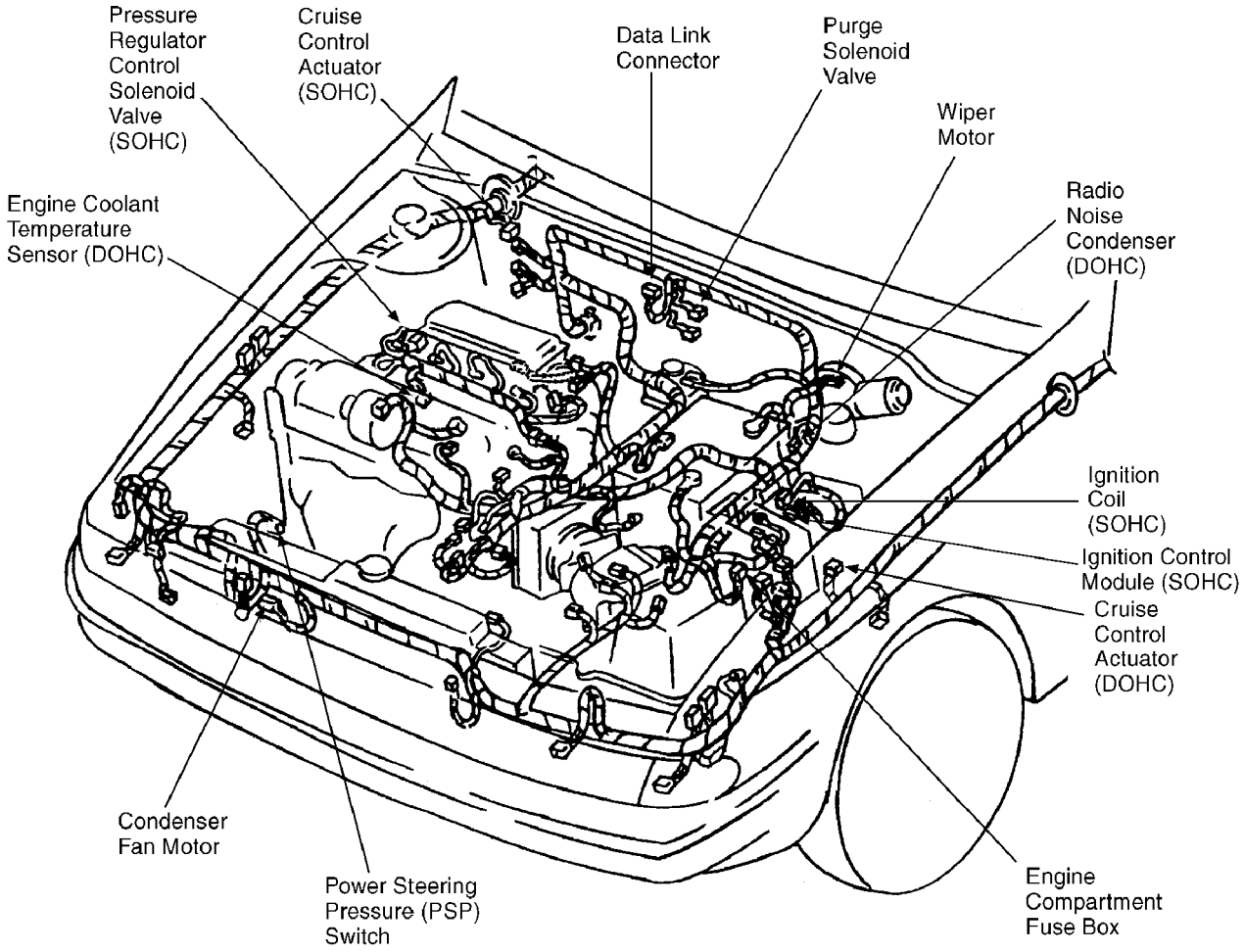
Electronic Time & Alarm Control Module (1.6L Only)	Below left side of dash, above fuse panel.



Engine Control Module (ECM) (1.6L)	Below center of dash, at front of center console.



Flasher Module Below left side of dash, on bracket above fuse box.



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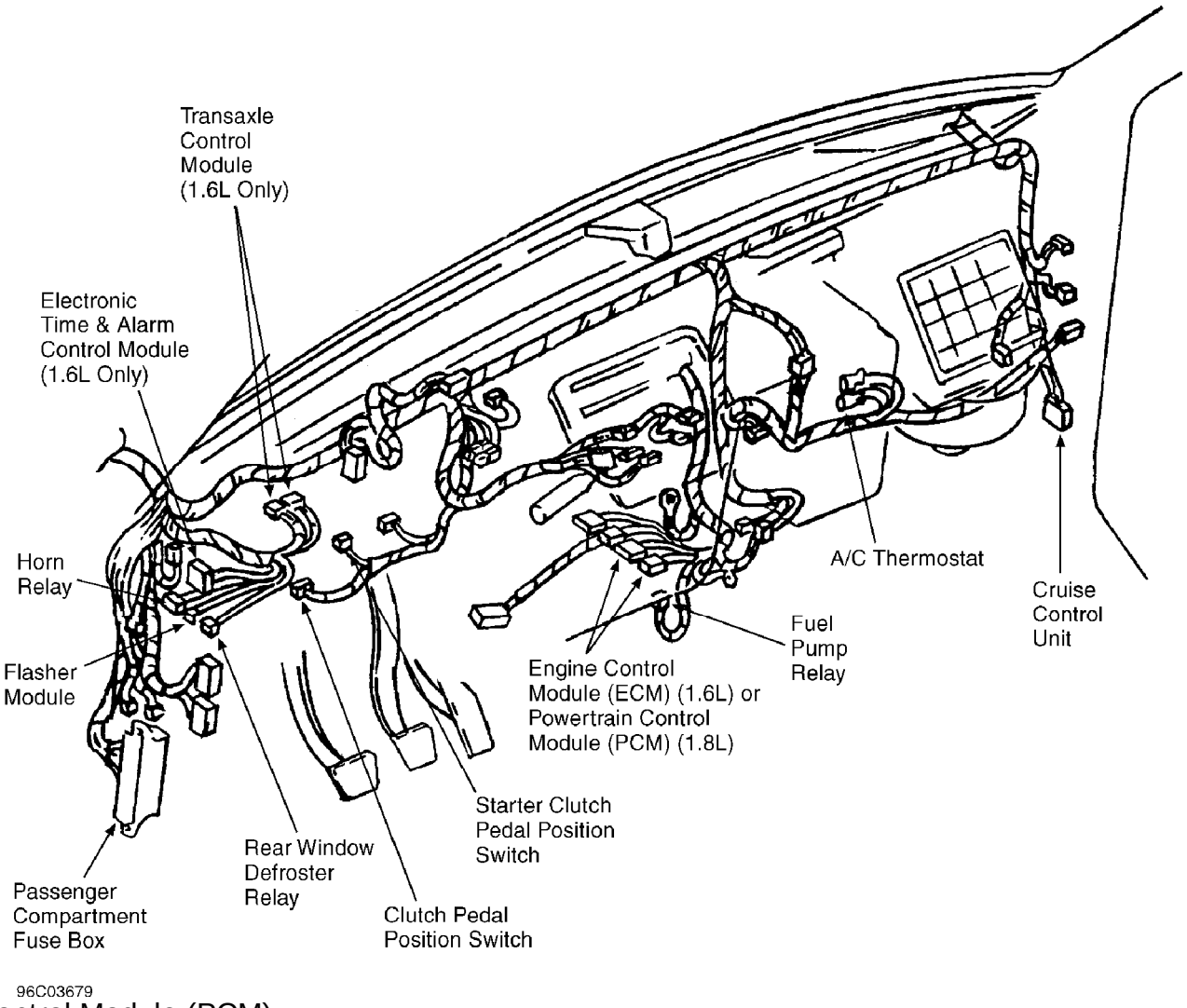
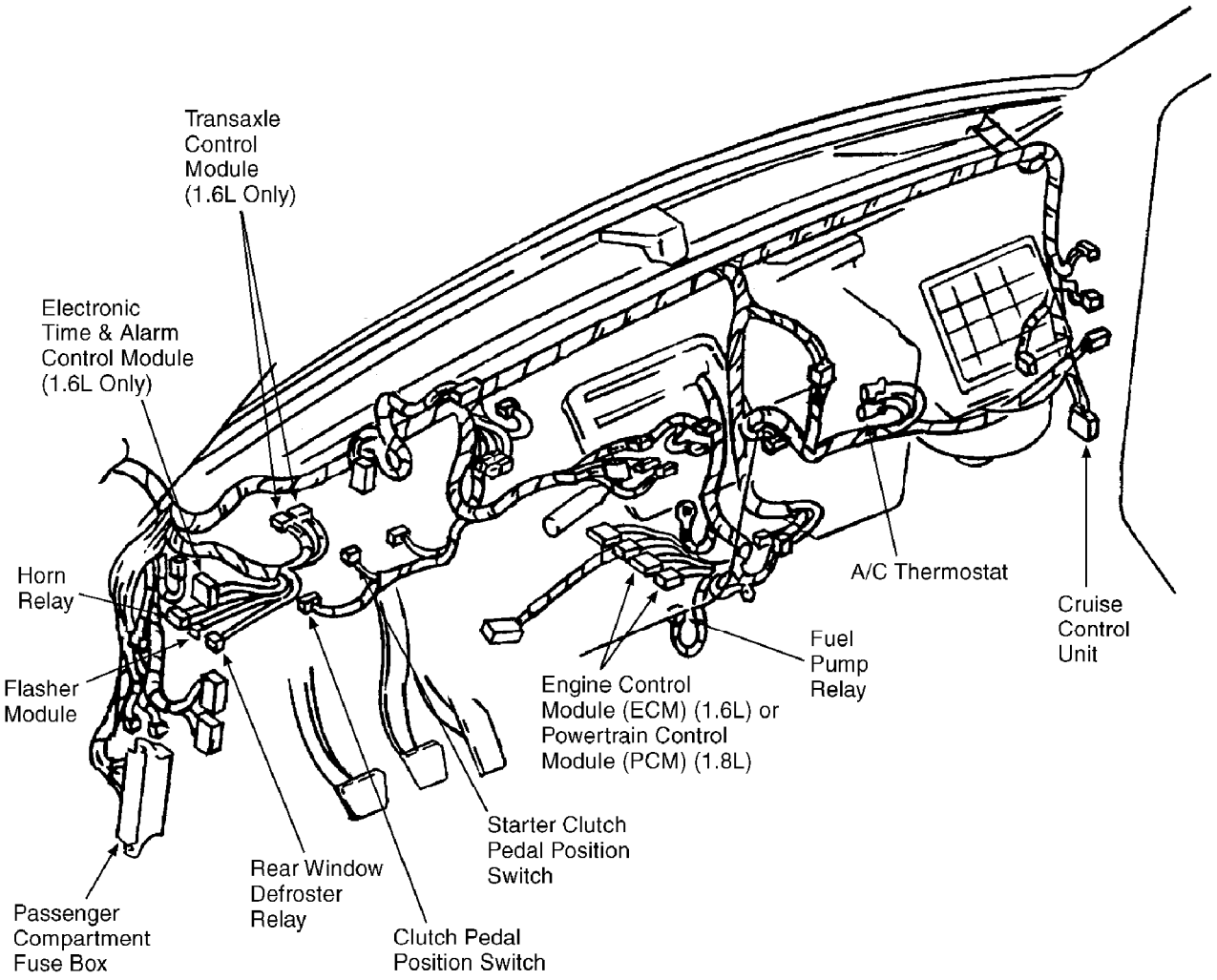
ELECTRICAL COMPONENT LOCATOR **Article Text (p. 16)**

Ignition Coil (SOHC)	On left side of engine compartment, below ignition coil.
Ignition Control Module (ICM) (DOHC)	Inside distributor.



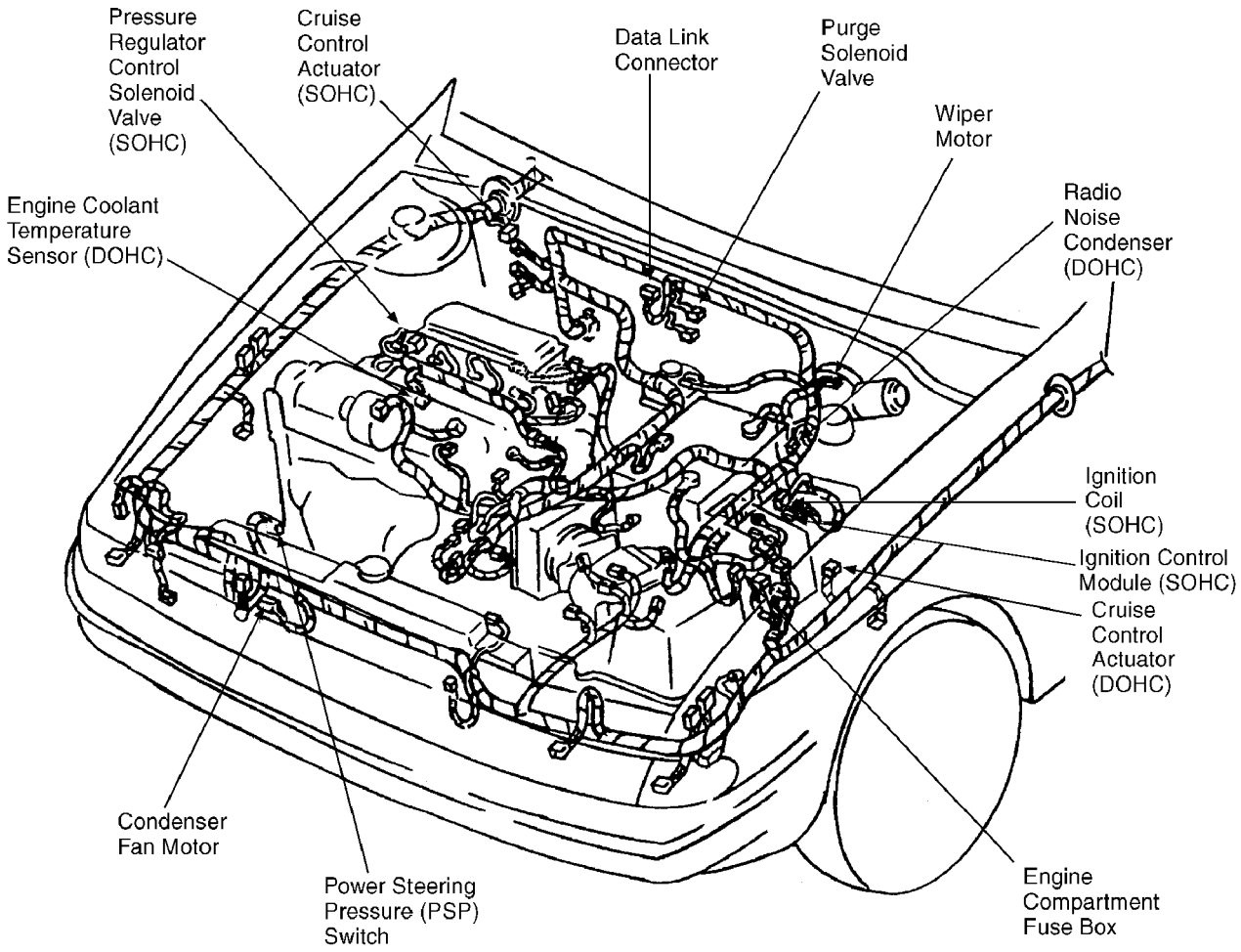
Powertrain Control Module (PCM) (1.8L)	Below center of dash, forward of center console.



Transaxle Control Module (TCM) (1.6L) Below left side of dash, above fuse box.

MOTORS

Component	Component Location
ABS Pump Motor	On right rear of engine compartment, on ABS hydraulic unit.
Blower Motor	Below right side of dash.



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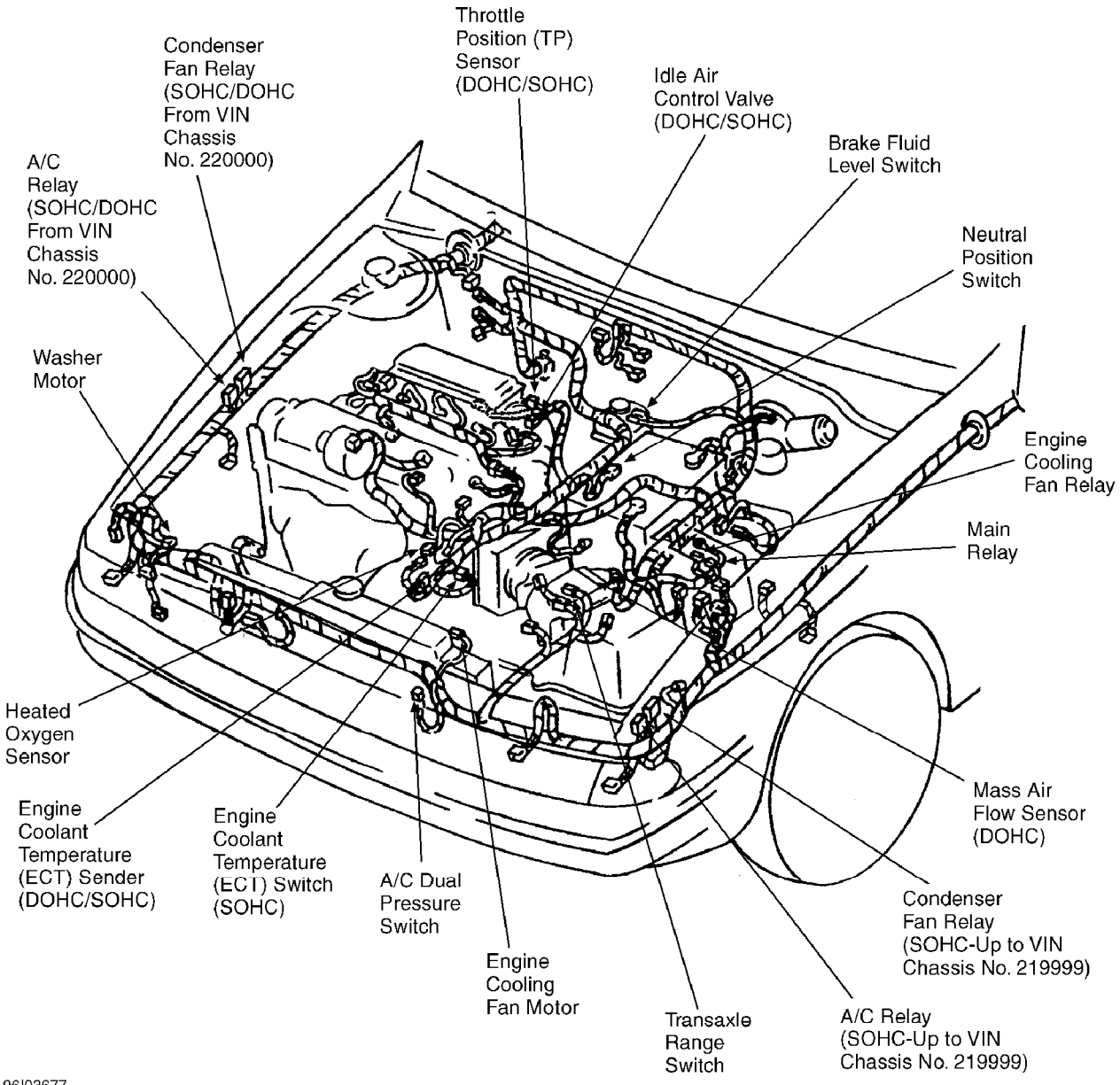
Condenser Fan Motor — In right front of engine compartment, behind grille.



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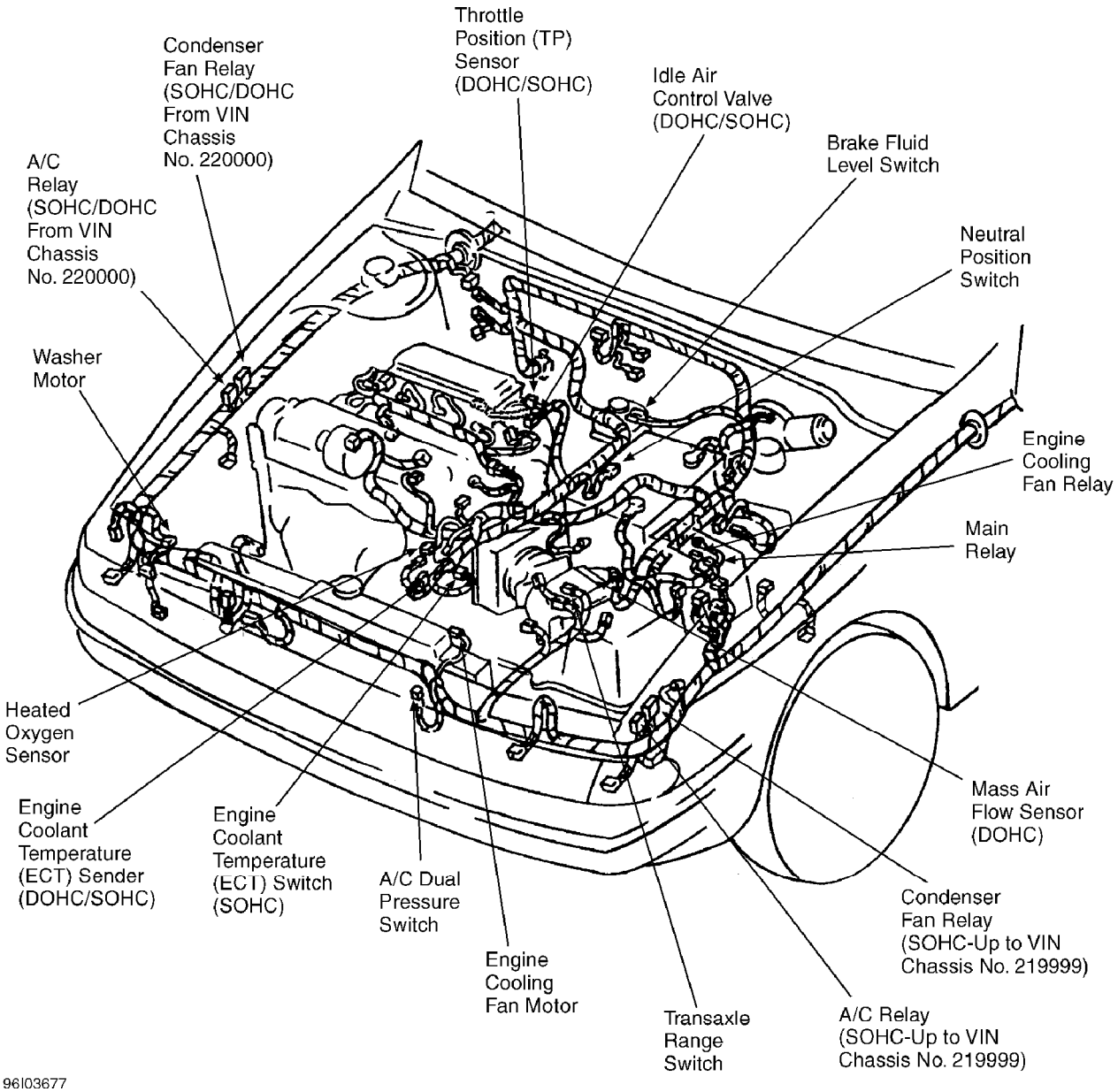
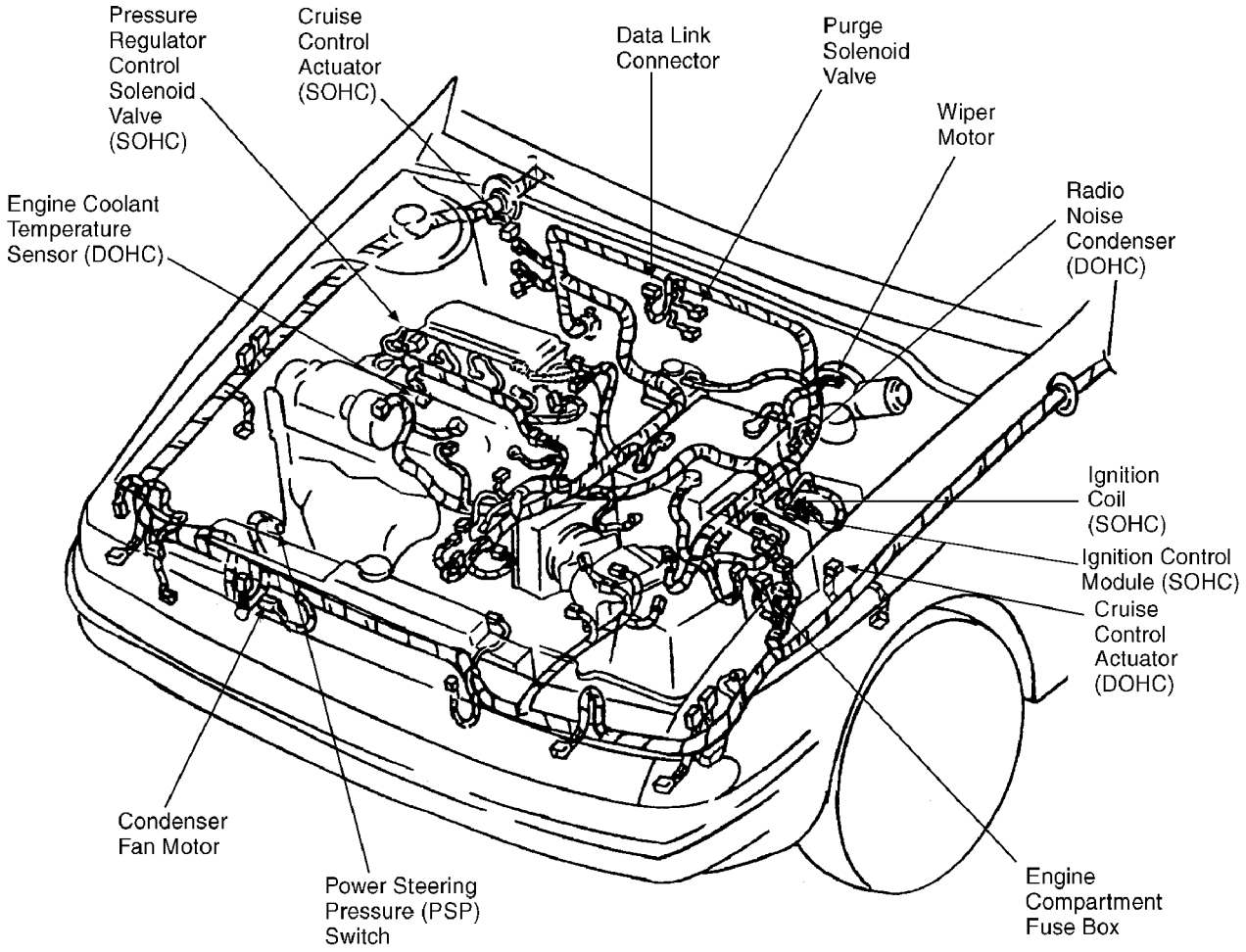
ELECTRICAL COMPONENT LOCATIONArticle Text (p. 20)

Engine Cooling Fan Motor	In left front of engine compartment, behind radiator.
Fuel Tank Unit	Beneath rear seat cushion.

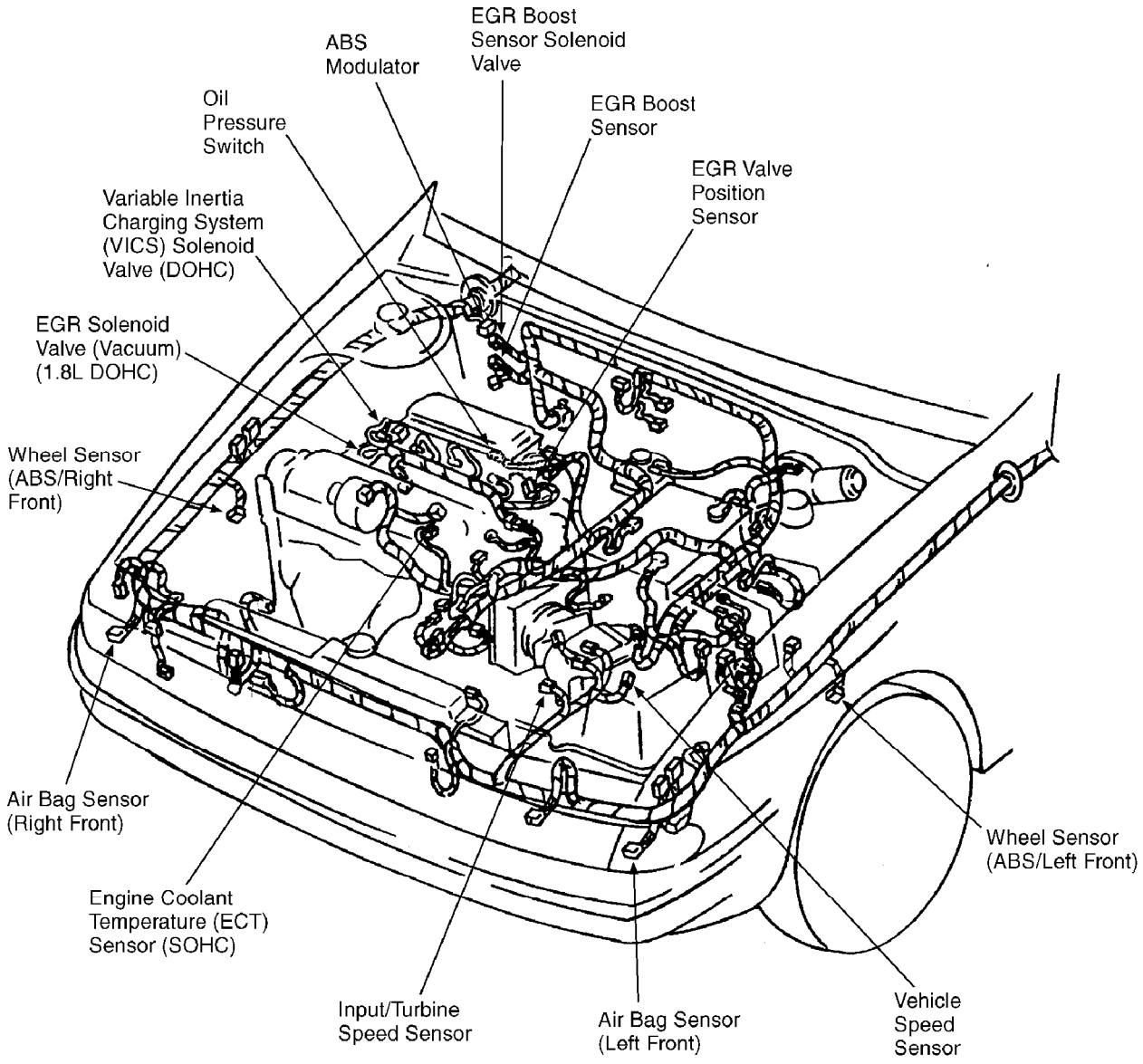


Washer Motor On underside of washer fluid reservoir.

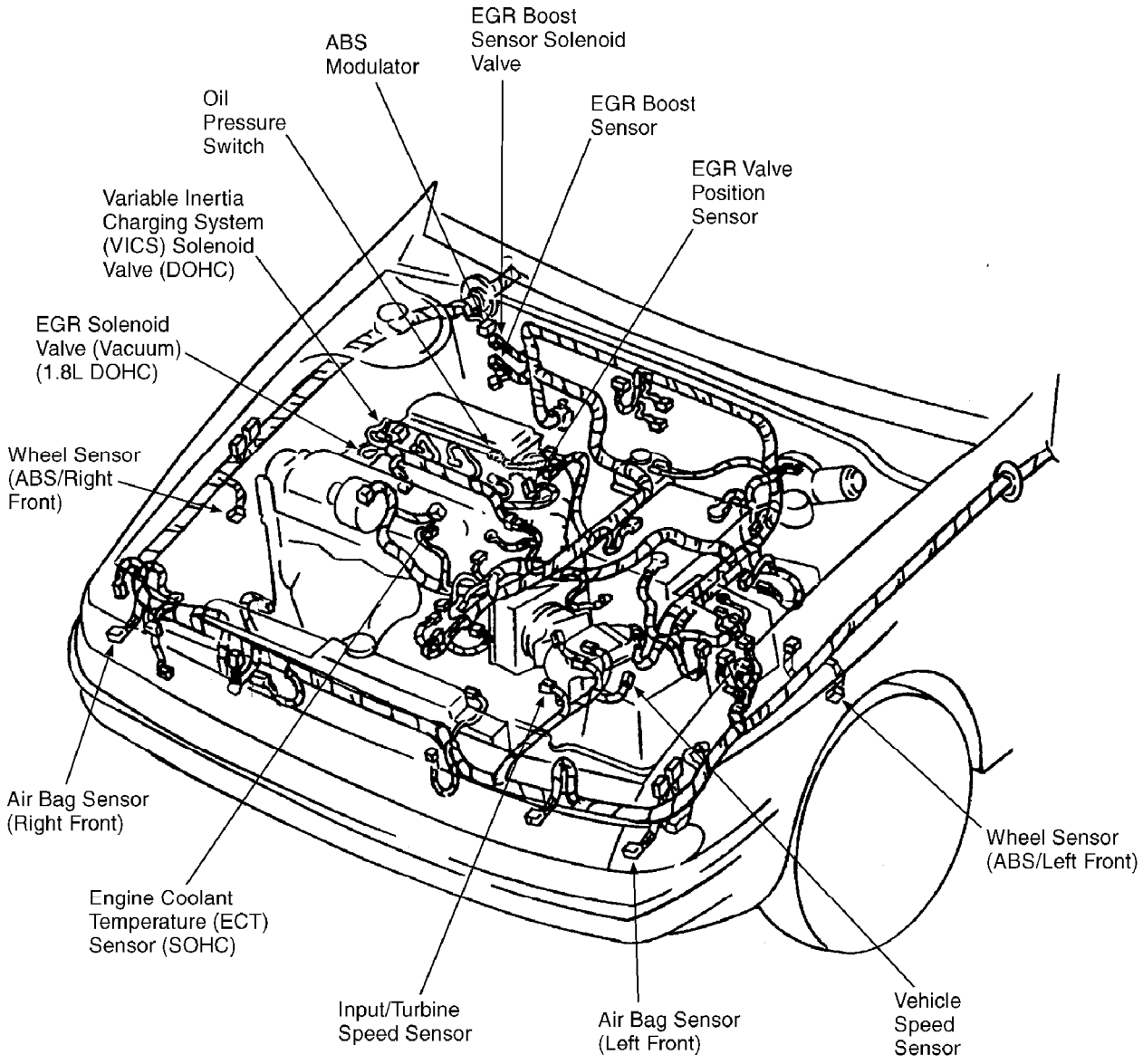


Wiper Motor	On left rear of engine compartment.

Component	Component Location



Air Bag Sensor (Left Front) On lower left front of engine compartment, below headlamp.



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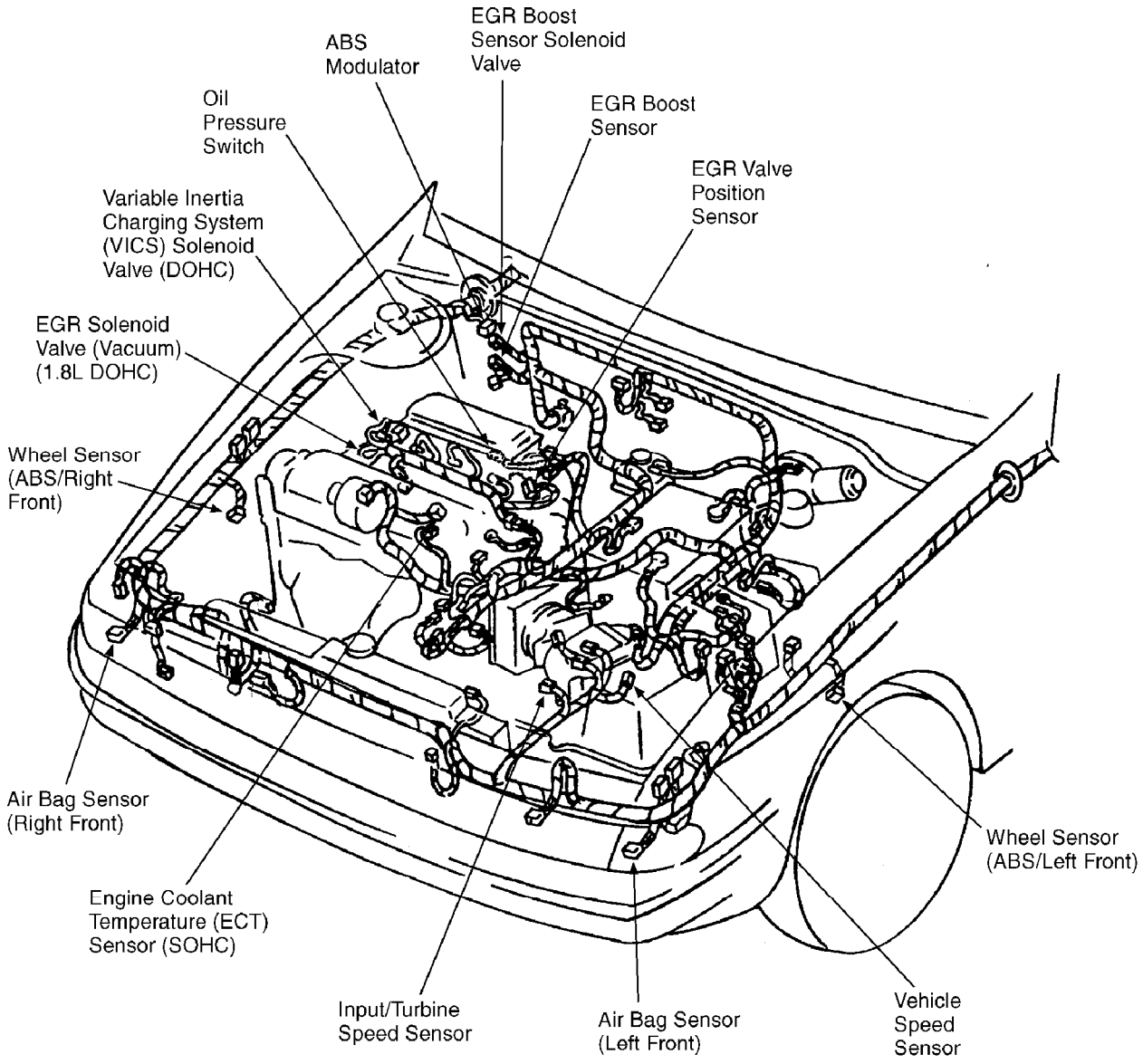
Air Bag Sensor (Right Front) On lower right front of engine compartment, below headlamp.

Crankshaft Position Sensor (SOHC) In the distributor.

Crankshaft Position Sensor (1.8L DOHC) On lower right side of engine, forward of crankshaft pulley.

Distributor (1.6L DOHC) (Camshaft Position Sensor) On top left front corner of engine.



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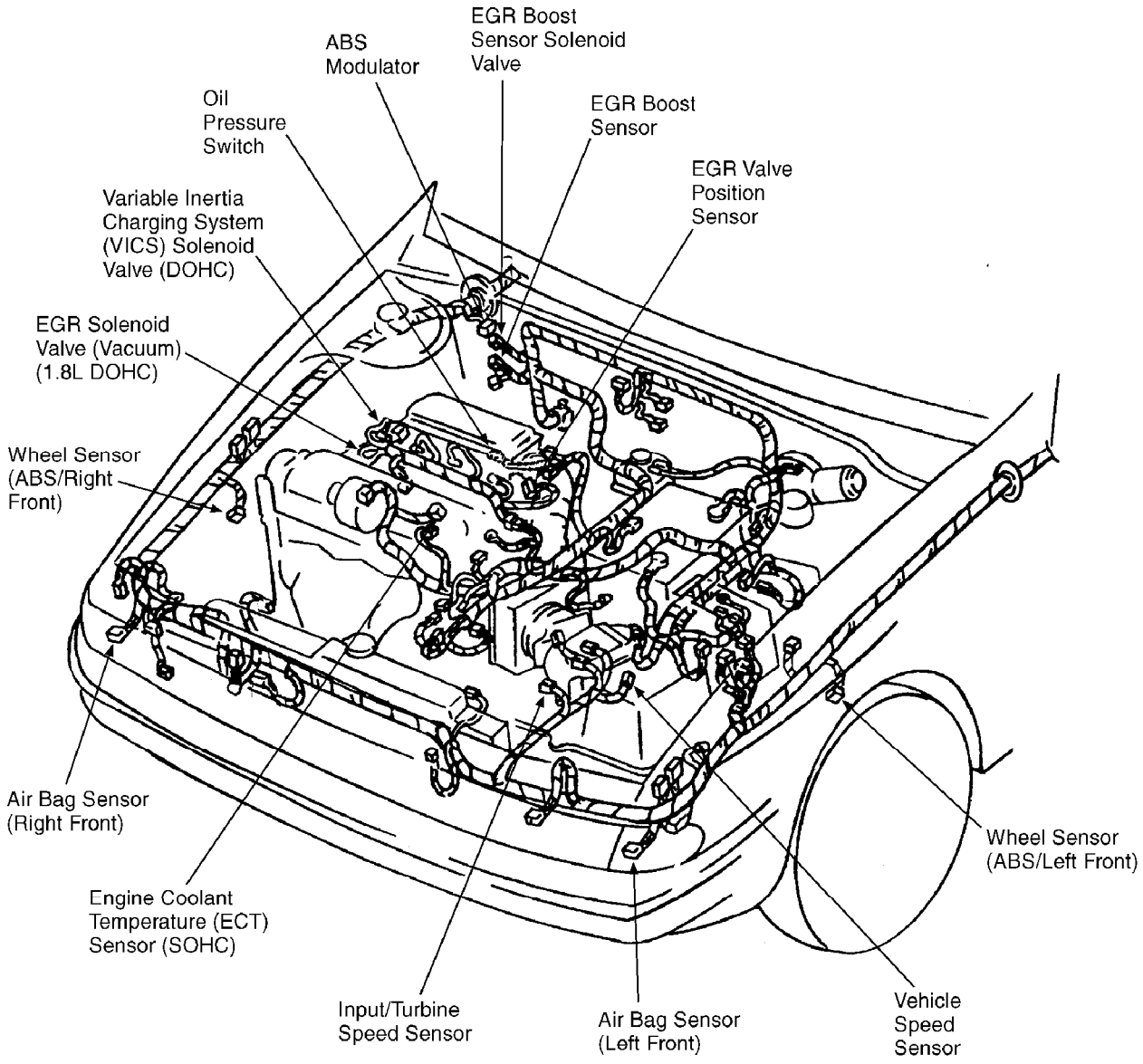
EGR Boost Sensor On right rear of engine compartment.



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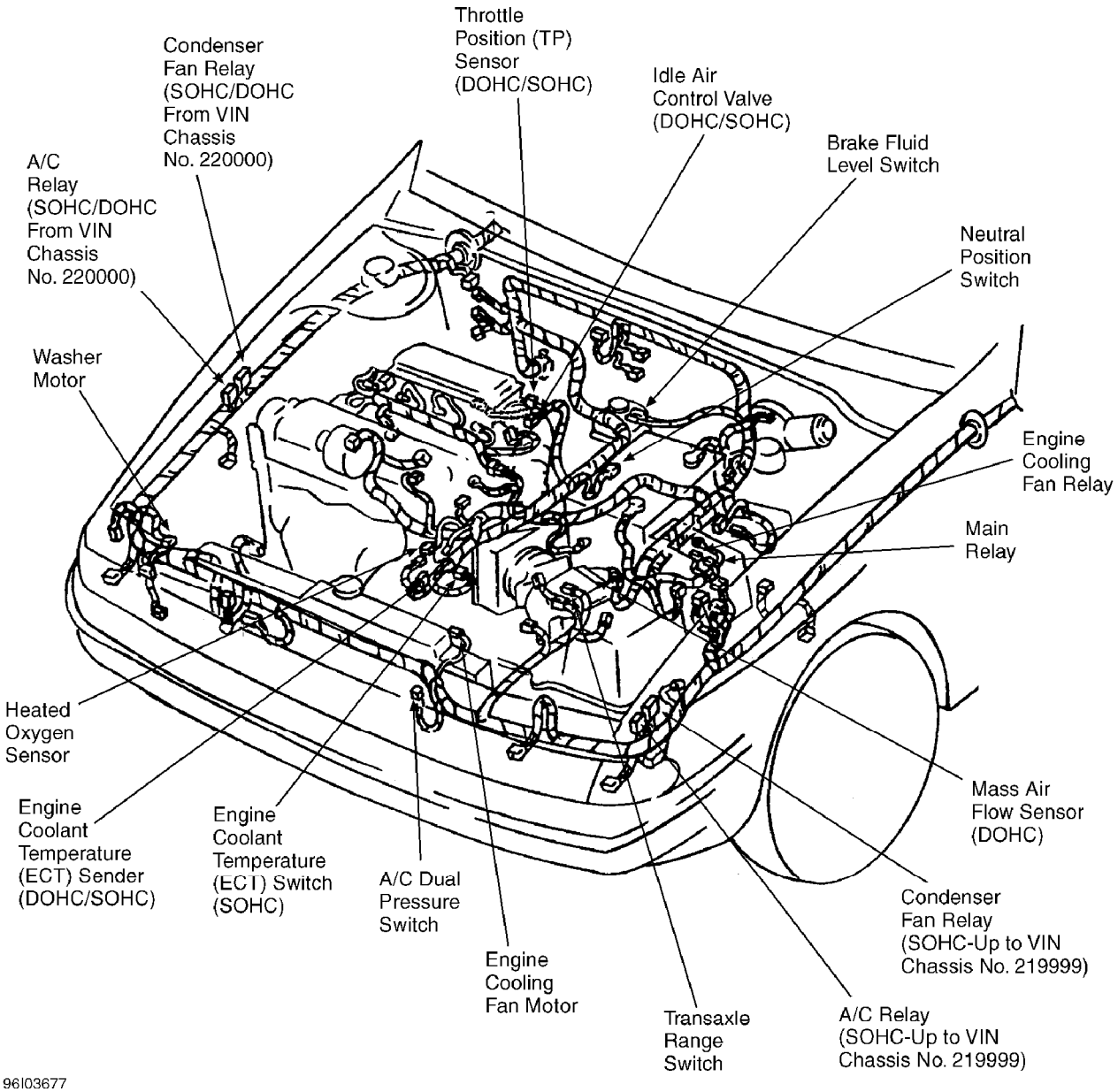
EGR Valve Position Sensor On top left side of engine.



Engine Coolant Temperature (ECT) Sender — On top left side of engine, below distributor.

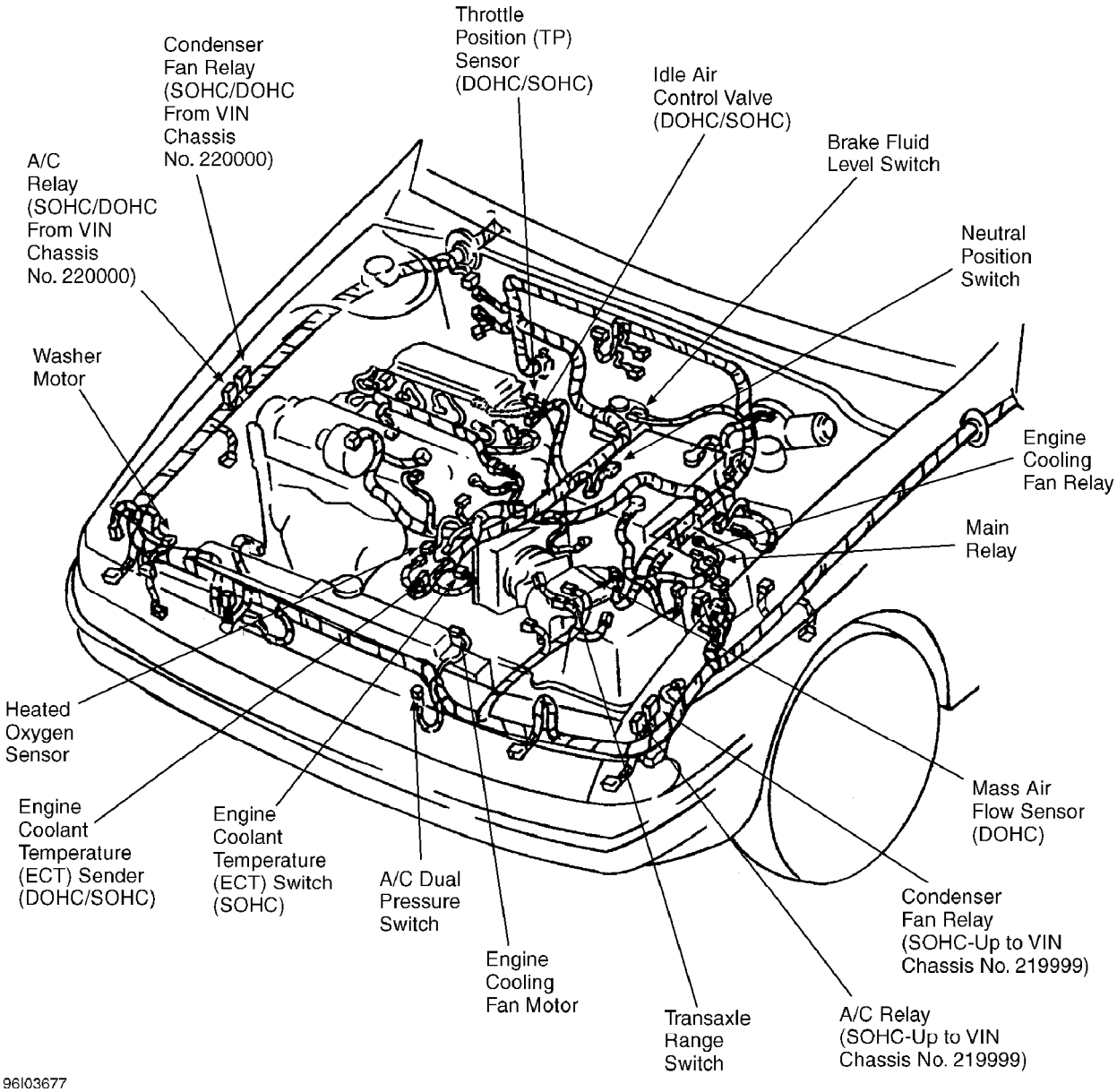
Engine Coolant Temperature (ECT) Sensor (1.6L DOHC) — Under/on the bottom of the intake manifold.

Engine Coolant Temperature (ECT) Sensor (1.6L SOHC) — Under/on the bottom of the intake manifold.

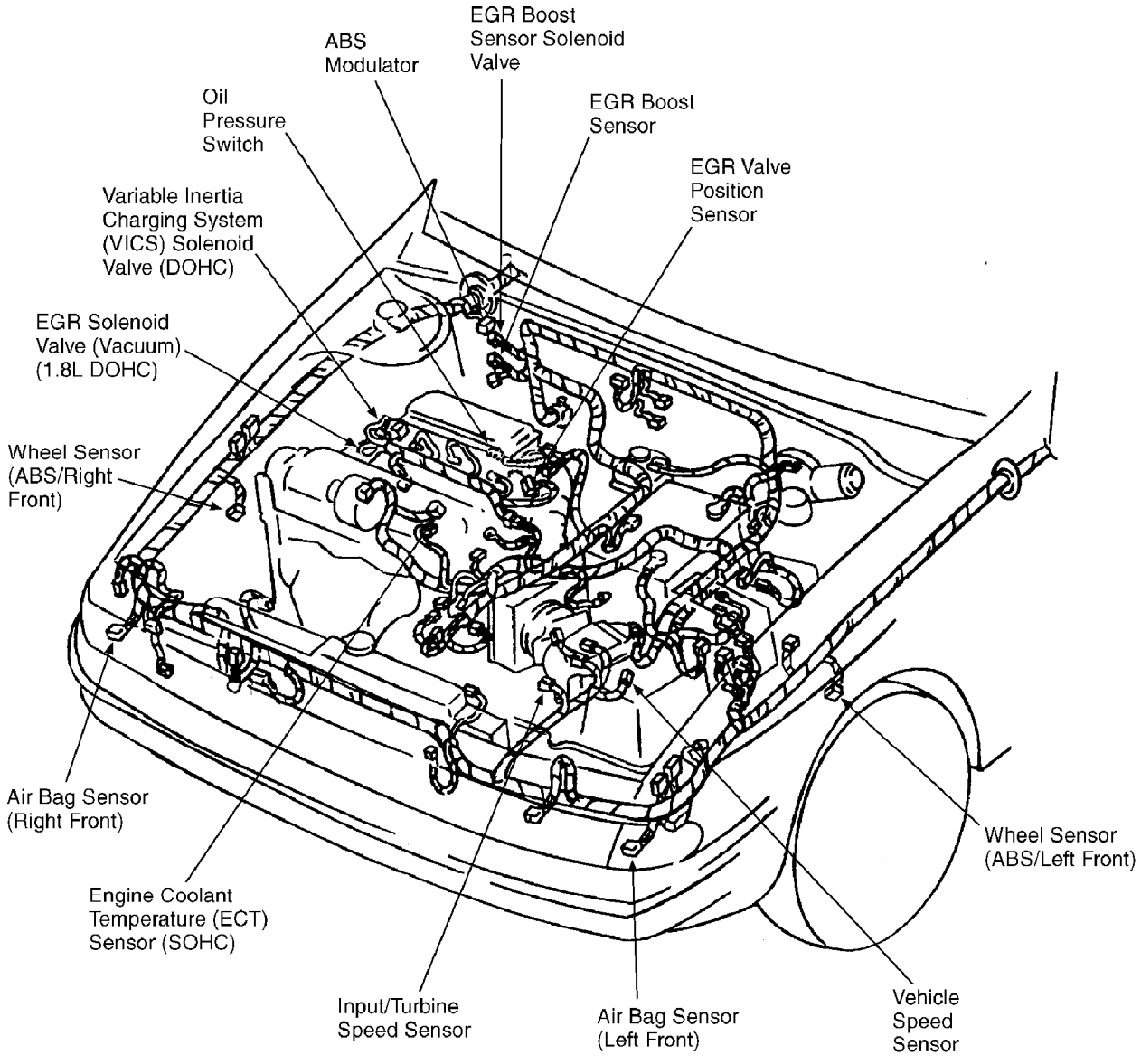
Engine Coolant Temperature (ECT) Sensor (1.8L DOHC) On cylinder head, near the thermostat.

Front Heated Oxygen Sensor (HO2S) (1.8L DOHC) On center front of engine in exhaust manifold.

Fuel Tank Unit (Fuel Gauge Sender) Beneath rear seat cushion.



Heated Oxygen Sensor (HO2S) (1.6L DOHC) On center front of engine in exhaust manifold.



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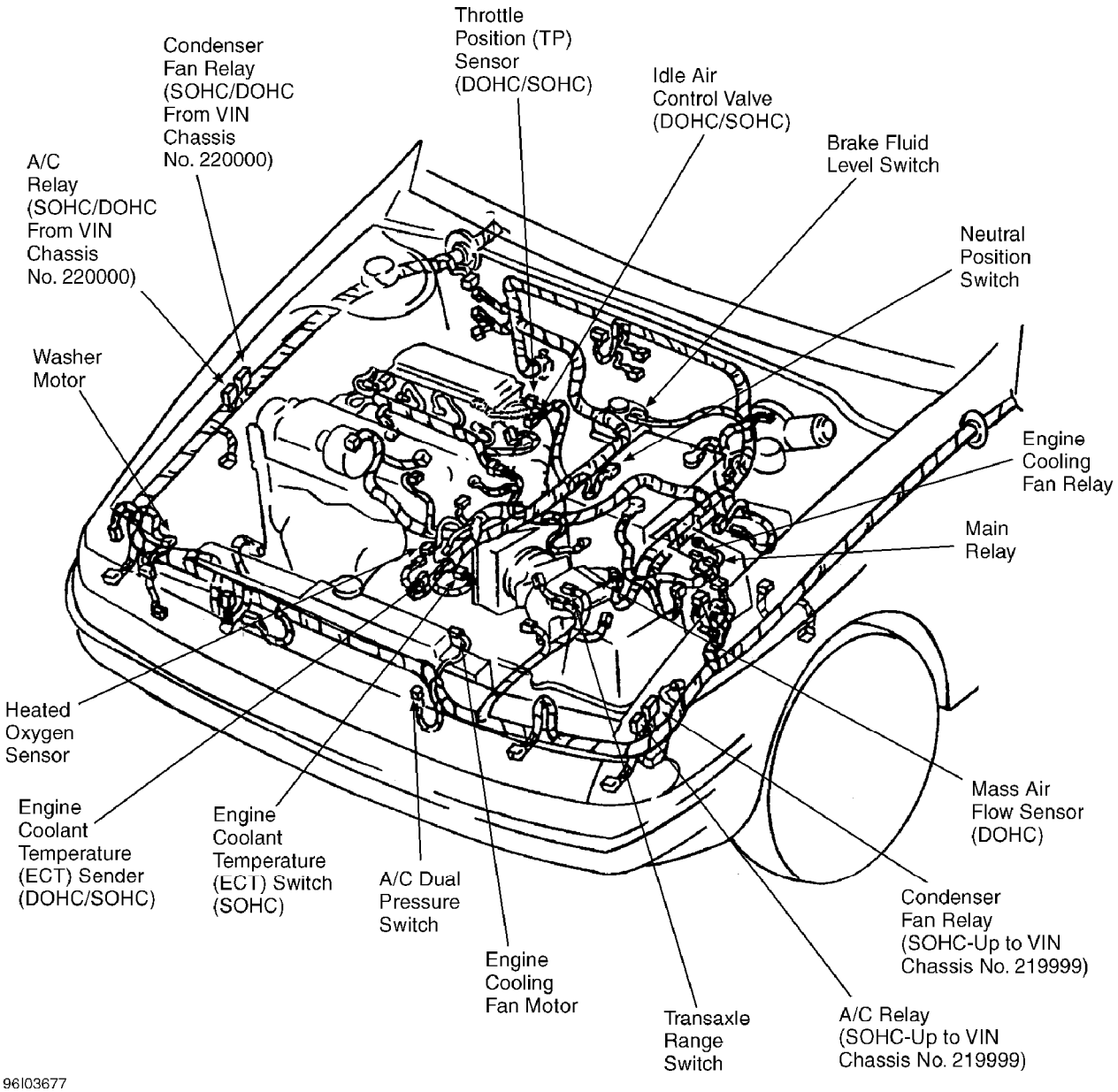
Input/Turbine Speed Sensor	On left side of automatic transaxle.

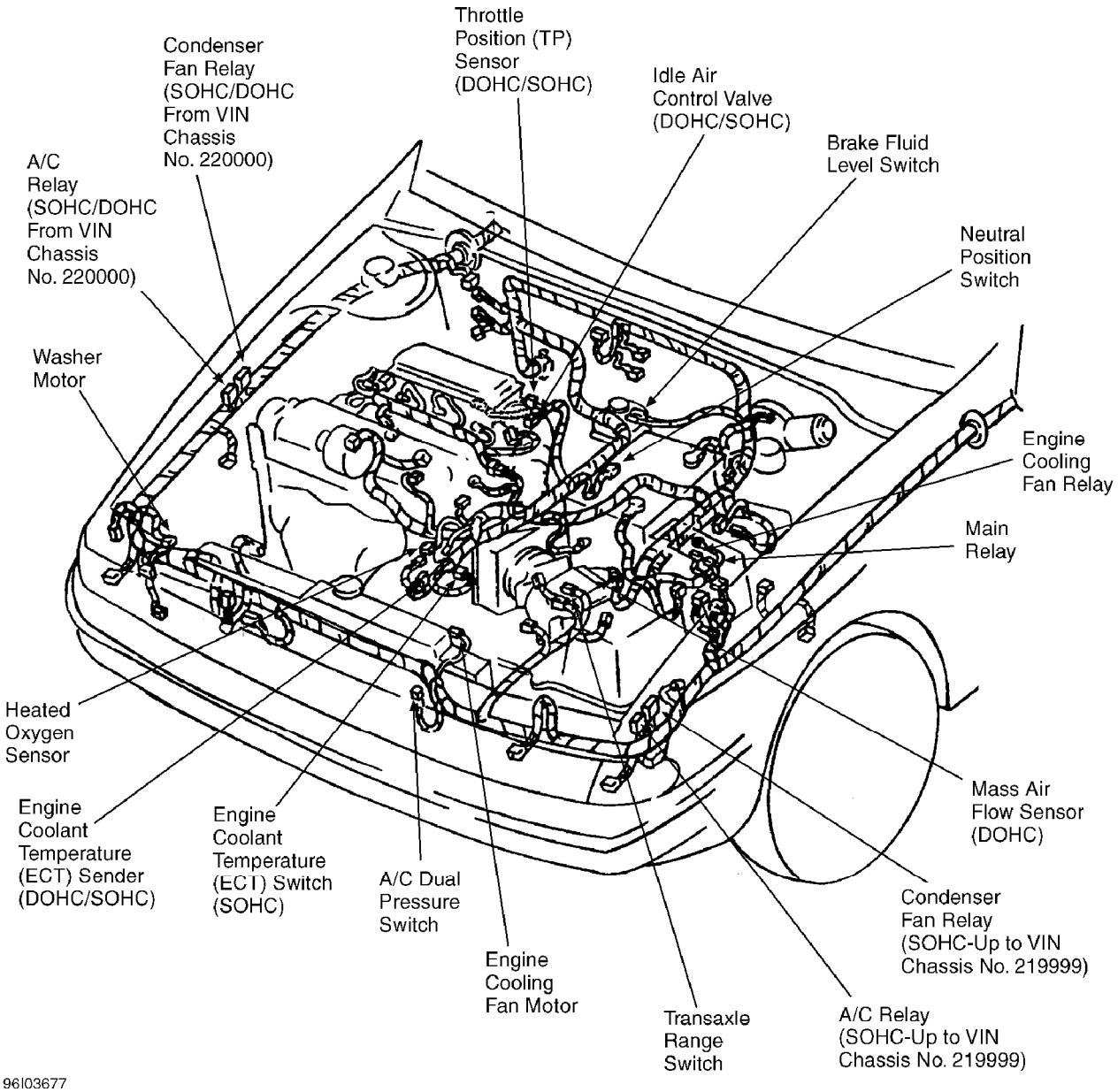


96I03677

Mass Air Flow (MAF) Sensor (DOHC) — On left front of engine compartment in air cleaner housing.

Oxygen Sensor (O2S) (SOHC) — On lower center front of engine in exhaust manifold.

Rear Heated Oxygen Sensor (HO2S) (1.8L DOHC) — Beneath center of vehicle, behind catalytic converter.



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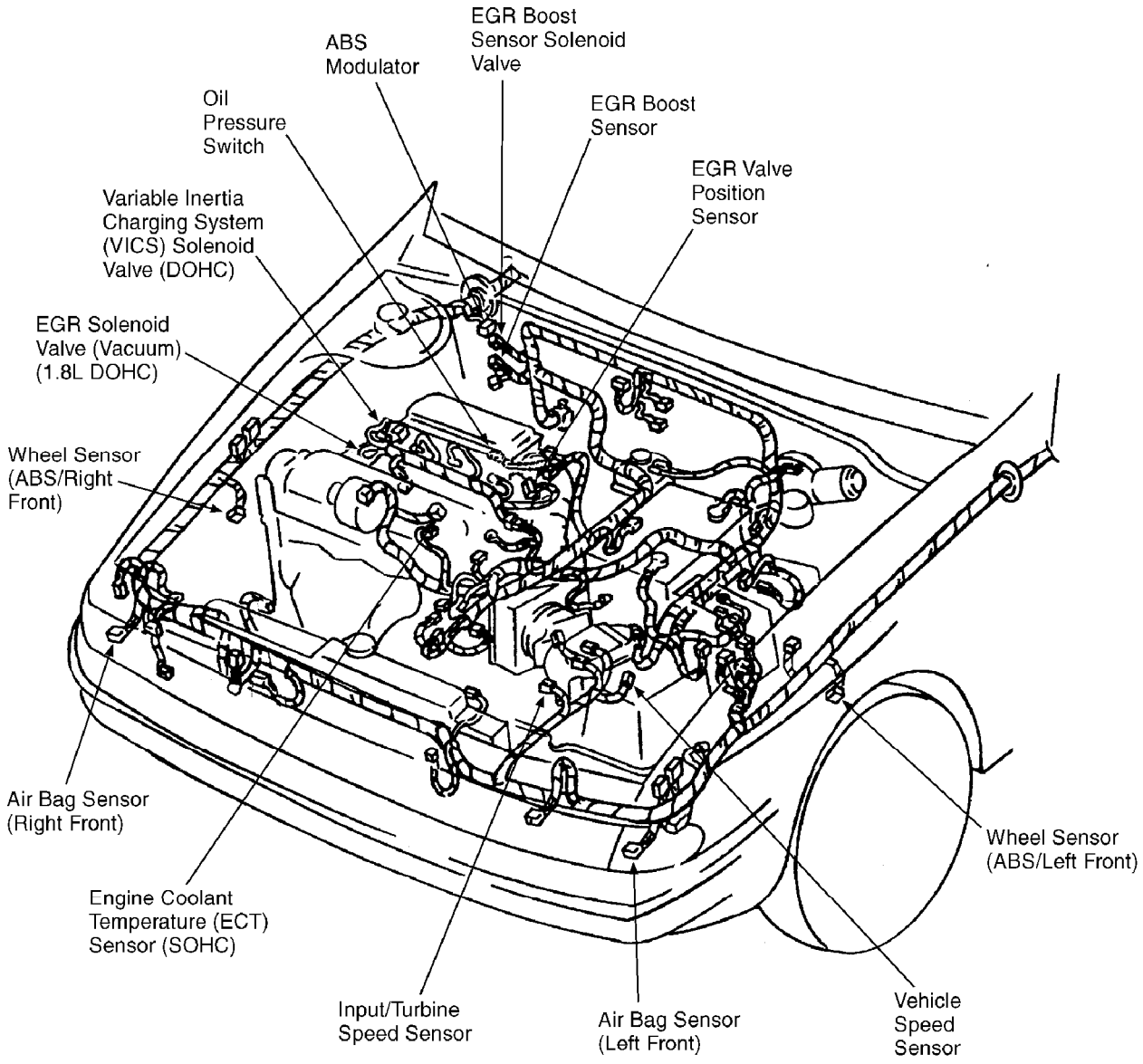
Throttle Position (TP) Sensor (DOHC & SOHC) On top left rear of engine, on throttle body.



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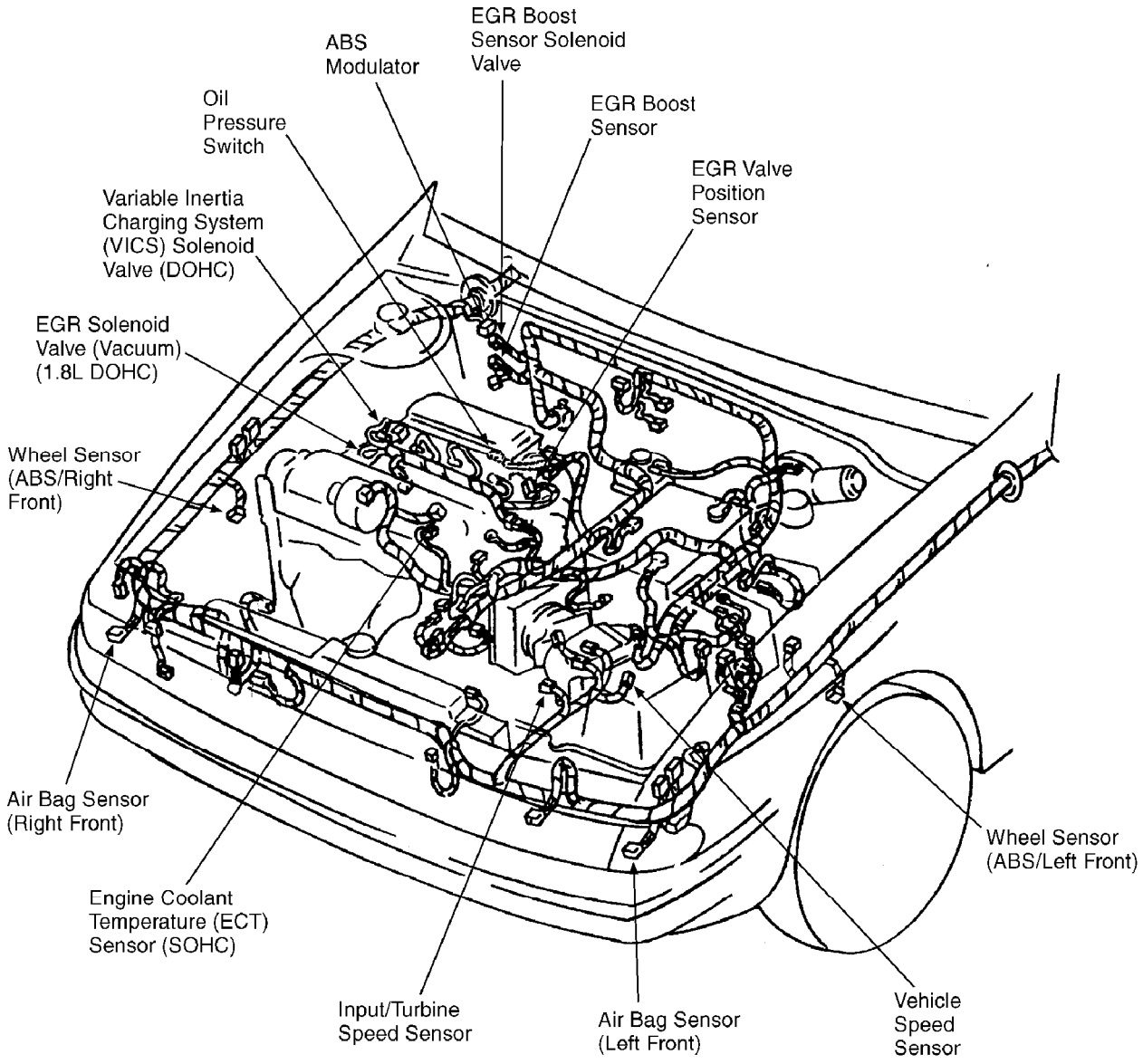
Vehicle Speed (VSS) Sensor — On top of transaxle.

Volume Air Flow (VAF) Sensor (SOHC) — On left front of engine compartment, in air cleaner housing.



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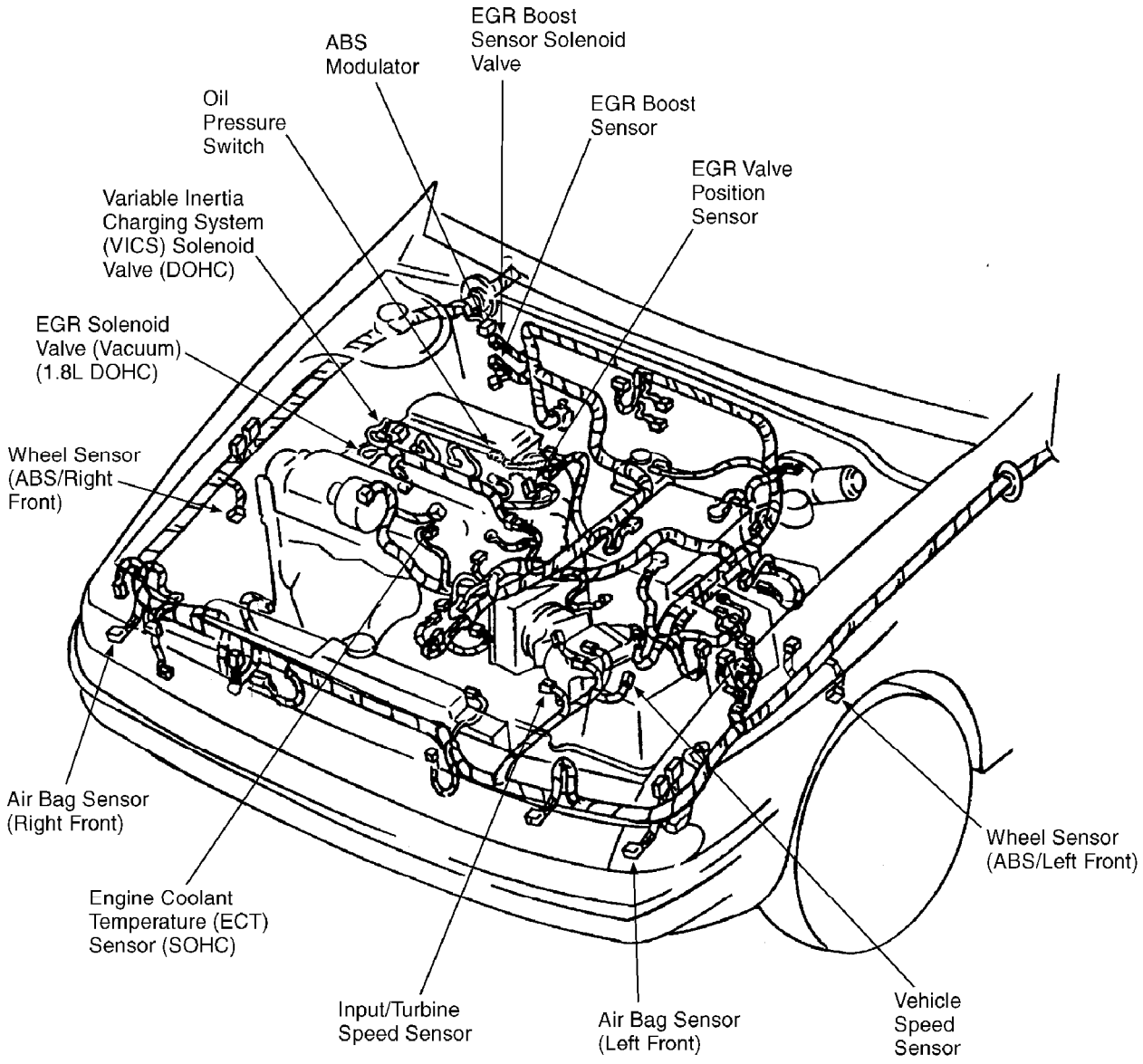
Wheel Sensor (ABS/Left Front)	Behind left front wheel.
Wheel Sensor (ABS/Left Rear)	Behind left rear wheel.



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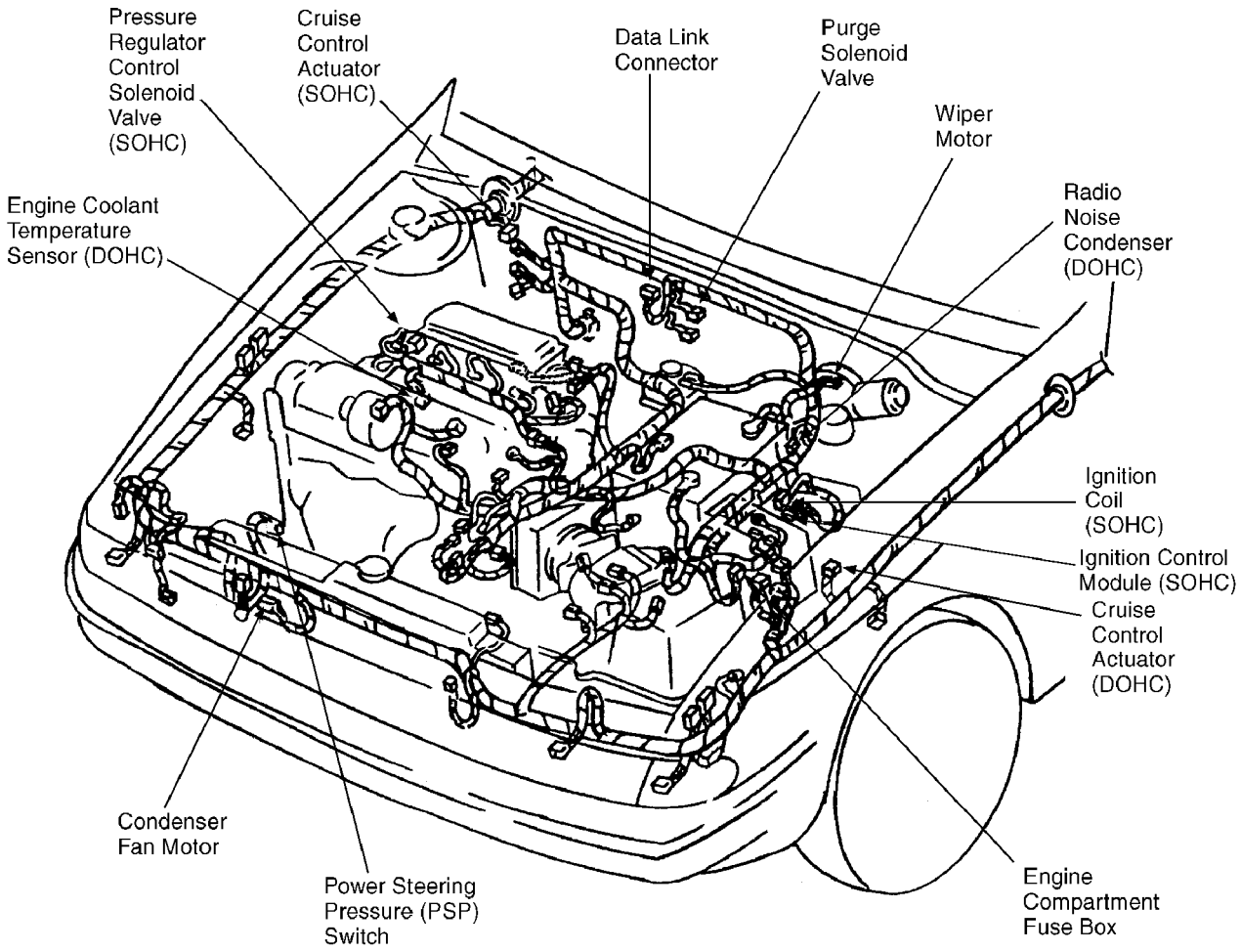
Wheel Sensor (ABS/Right Front) Behind right front wheel.

Wheel Sensor (ABS/Right Rear) Behind right rear wheel.

SOLENOIDS & SOLENOID VALVES

Component	Component Location
Air Mix Actuator	Behind left side of glove box.



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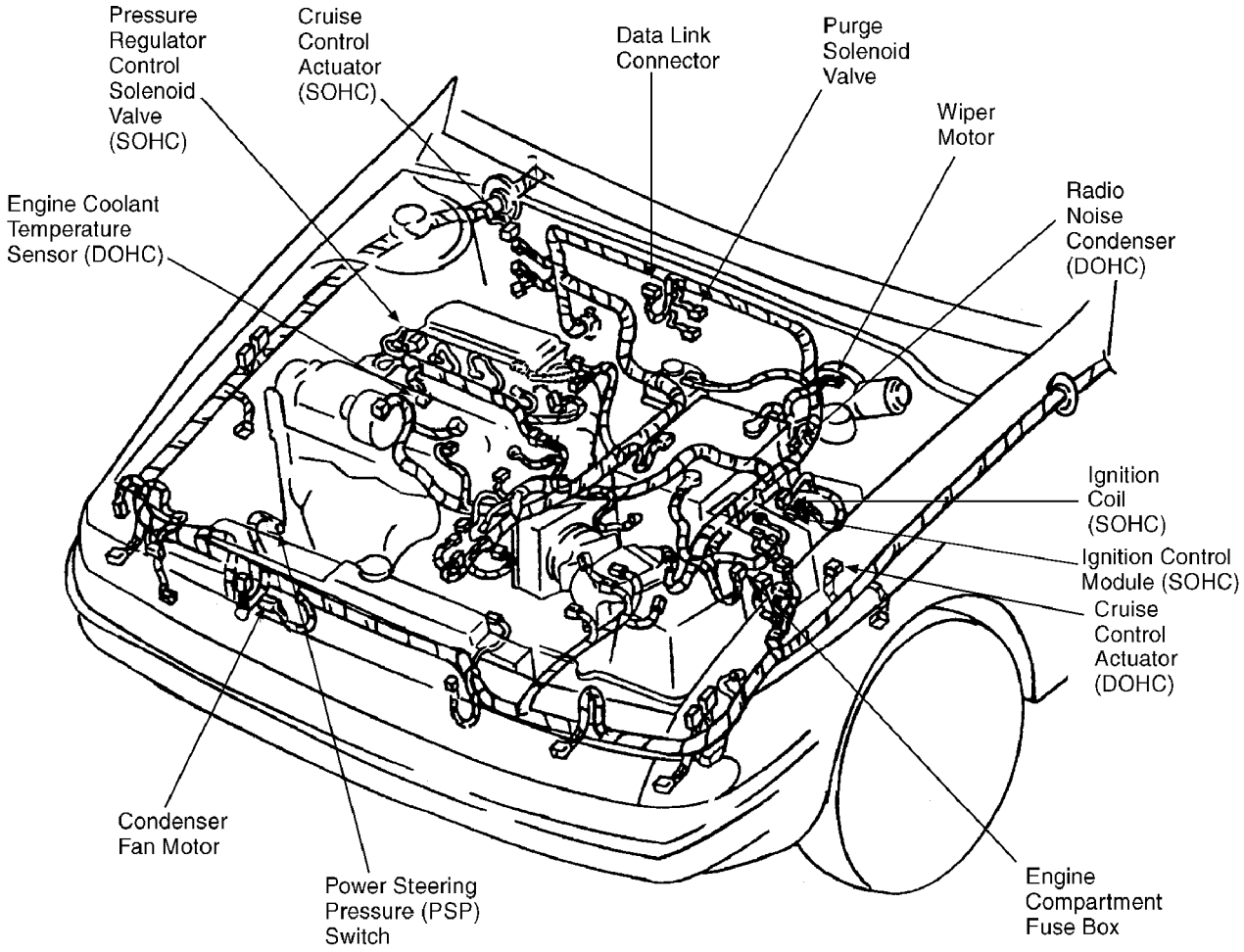
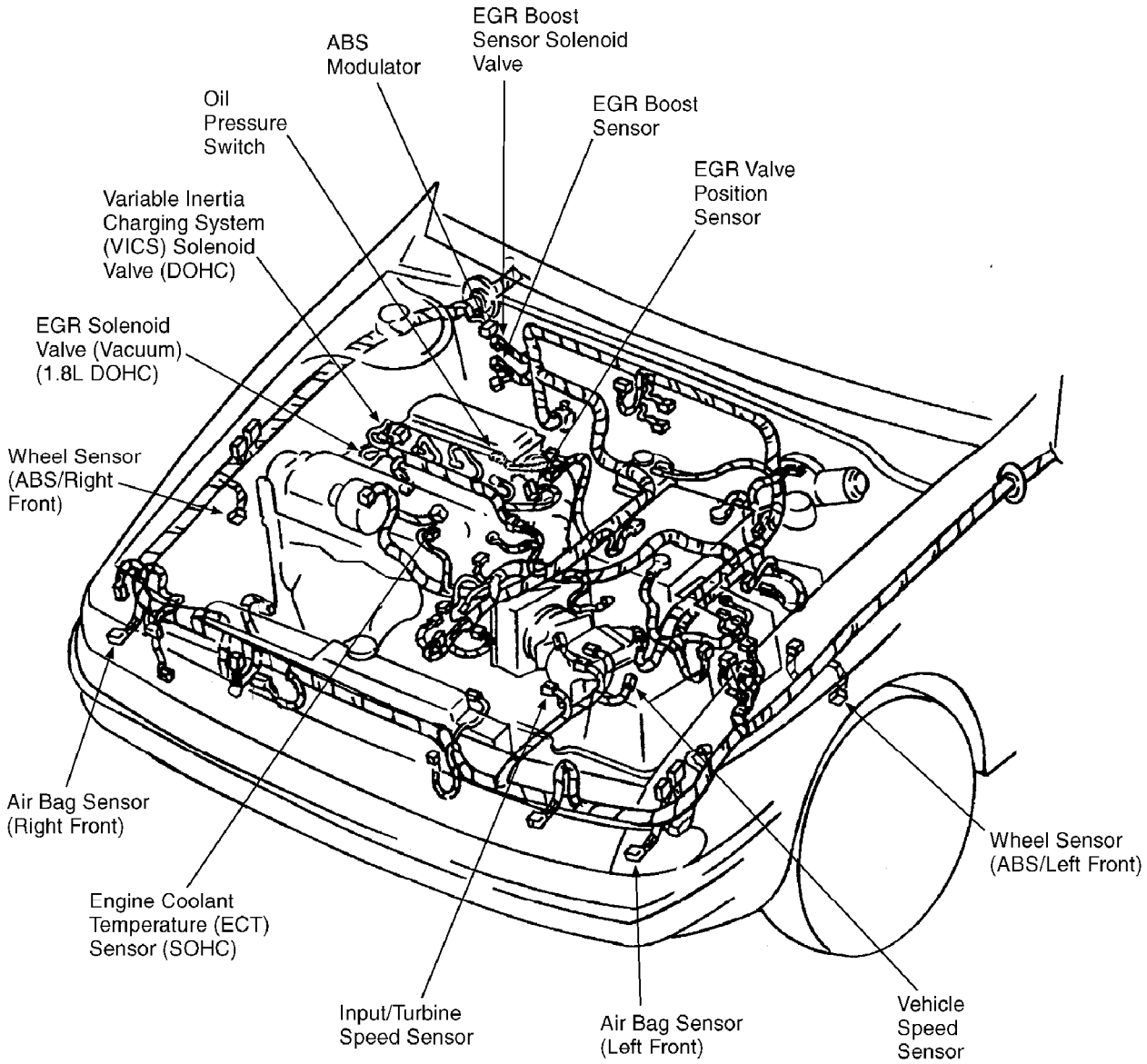
Cruise Control Actuator (DOHC) On left side of engine compartment.



96G03676

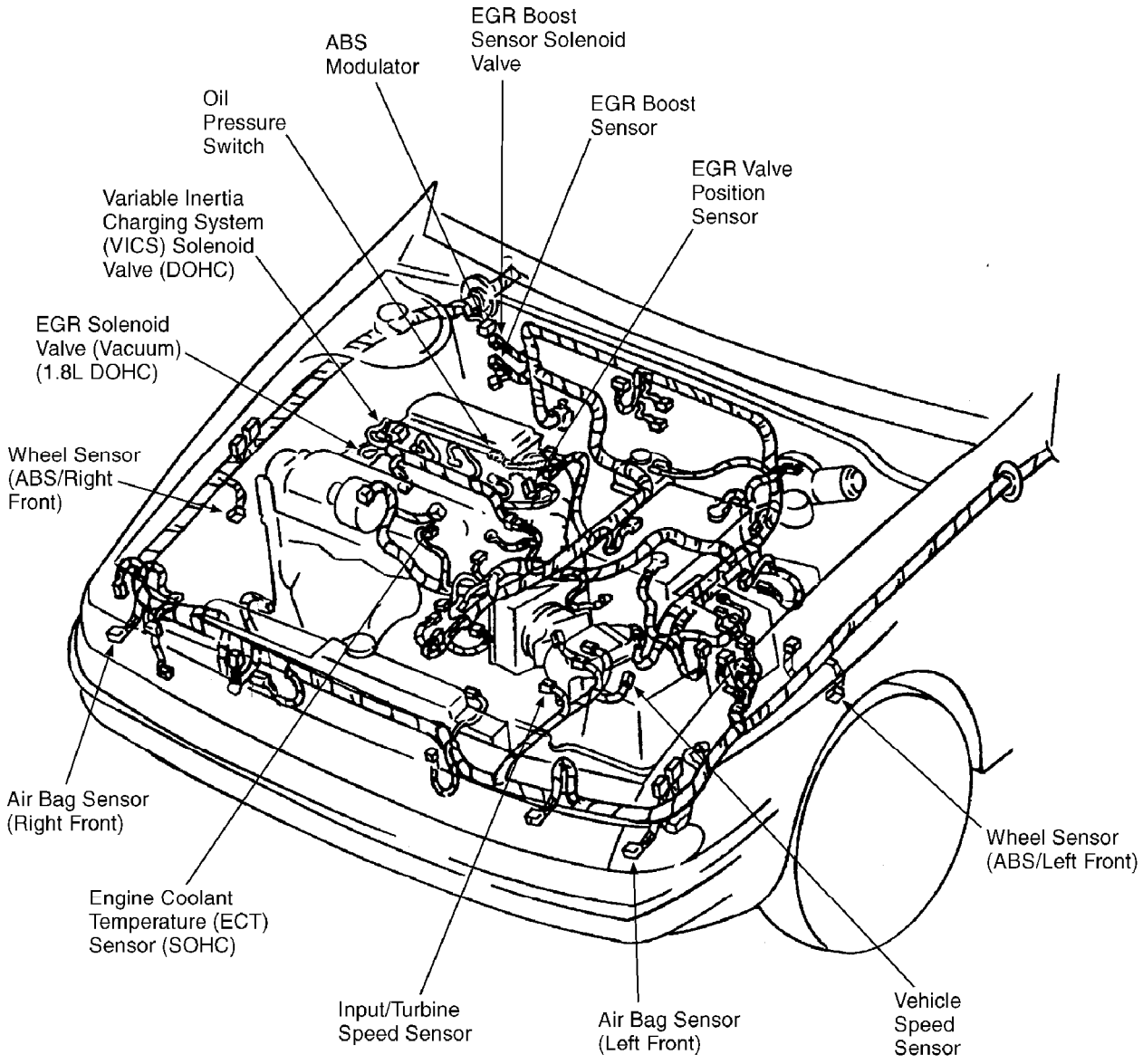
Cruise Control Actuator (SOHC) On right rear corner of engine compartment.



96A03678

EGR Boost Sensor Solenoid Valve (1.8L) (DOHC) — On right rear of engine compartment.

EGR Solenoid Valve (Vacuum) (1.6L DOHC) — On top right rear of engine.



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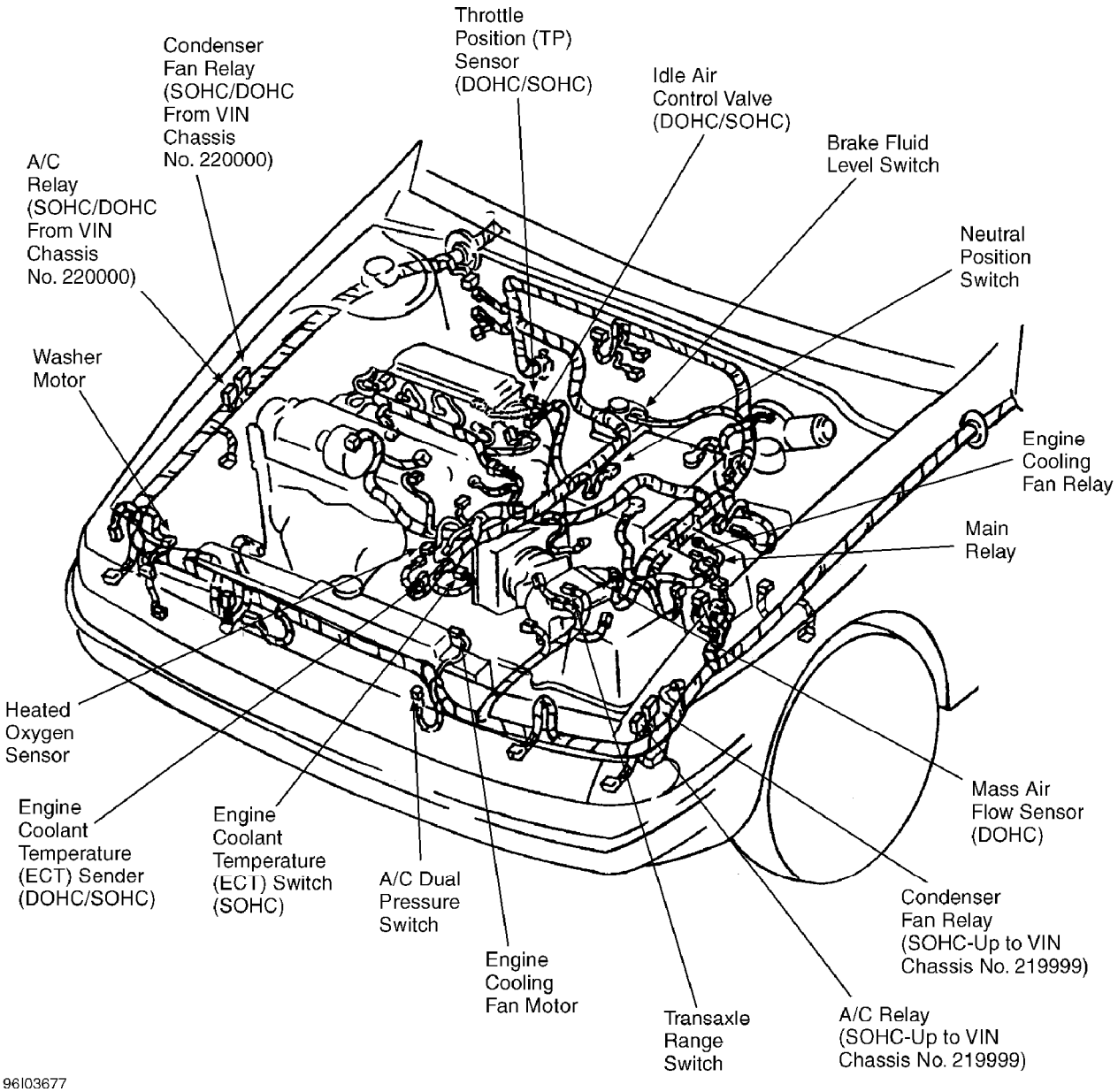
EGR Solenoid Valve (Vacuum)
(1.8L DOHC) On top right rear of engine.

EGR Solenoid Valve (Vent) (1.6L DOHC) On top right rear of engine.

EGR Solenoid Valve (Vent) (1.8L DOHC) On top right rear of engine.

Fresh/Recirculate Actuator Behind center of dash.

Fuel Tank PCV Solenoid Valve
(1.8L DOHC) Behind center of fuel tank.



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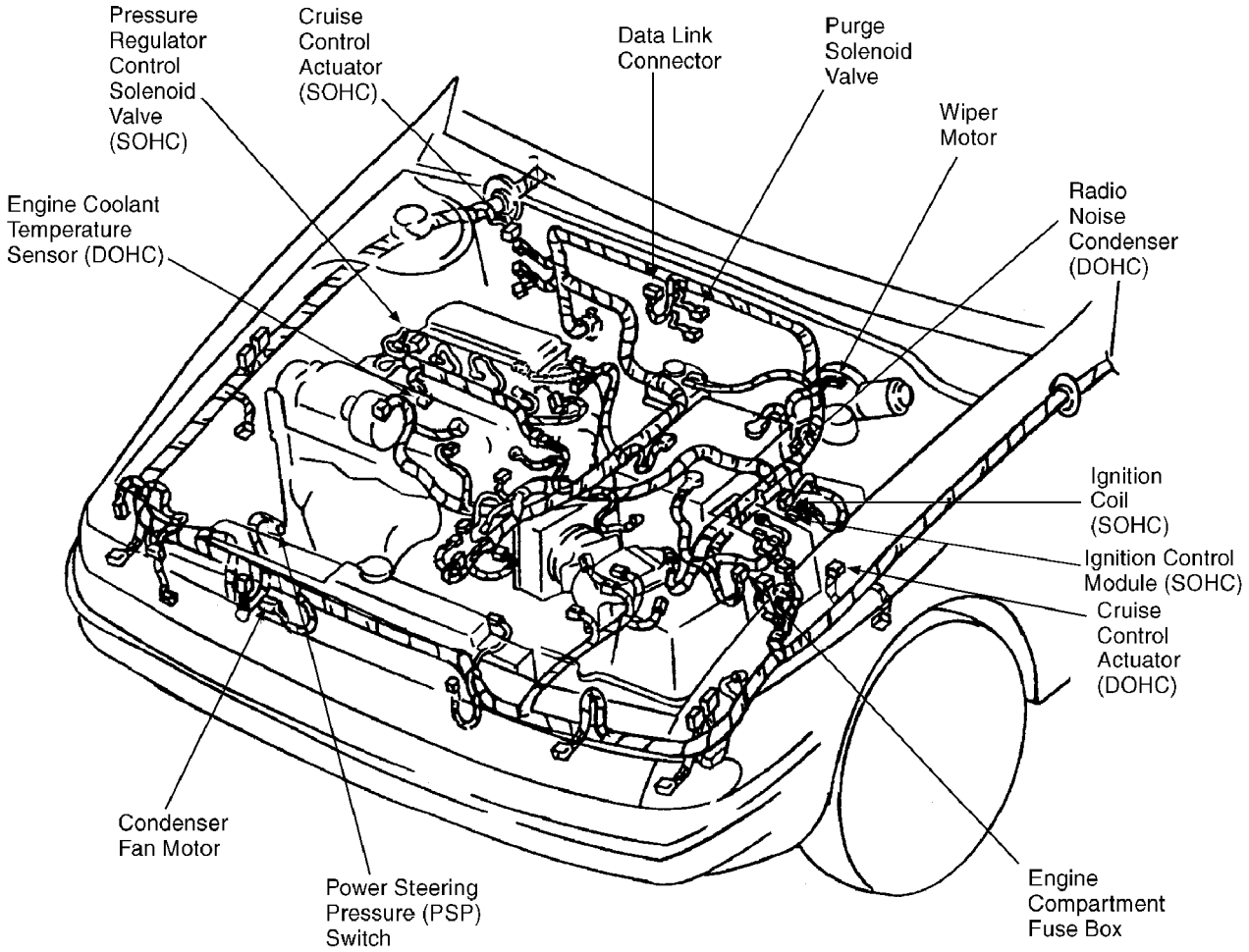
Idle Air Control Valve (DOHC & SOHC) On top left side of engine, below throttle body.



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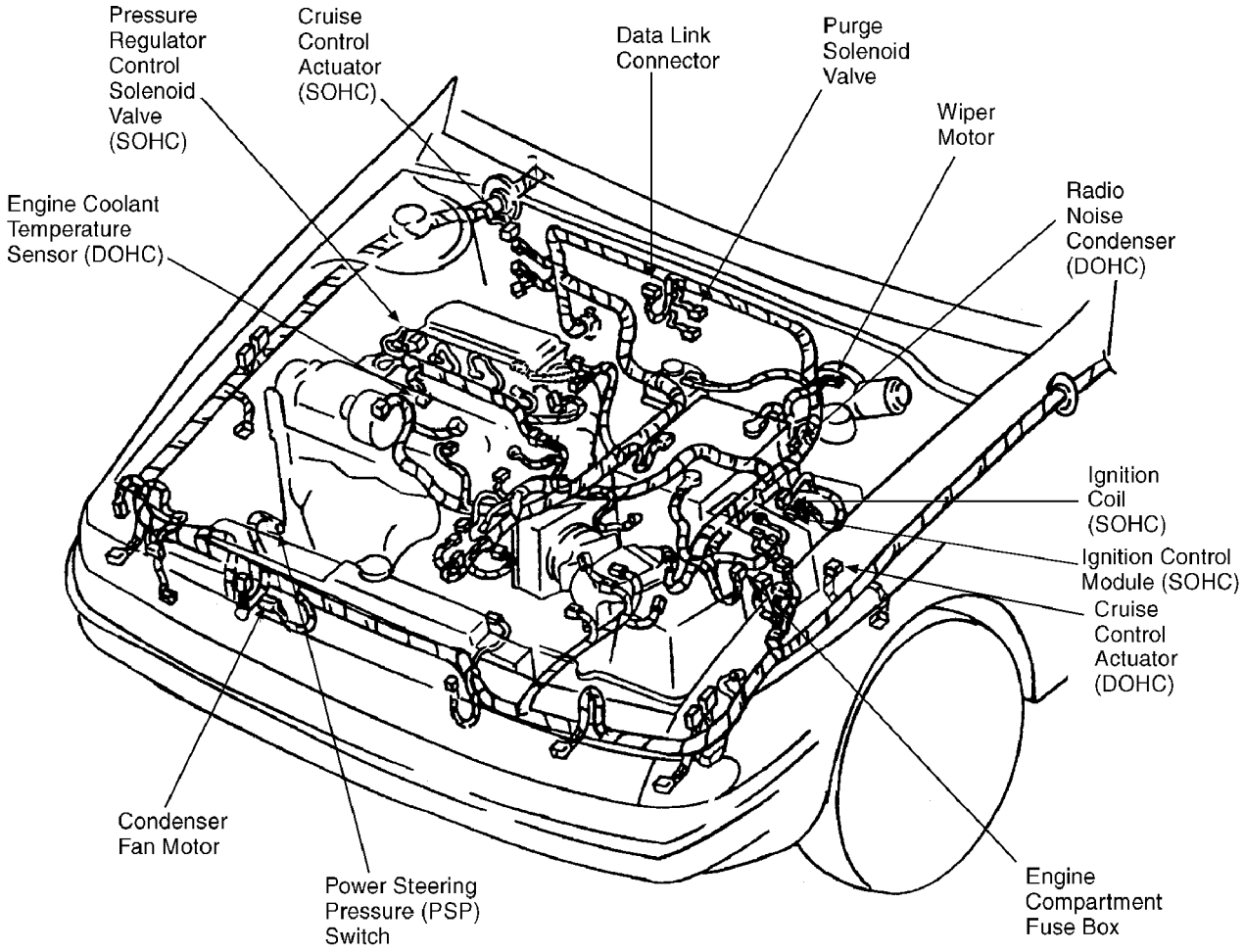
Pressure Regulator Control Solenoid Valve (SOHC) — On right side of engine, above generator.

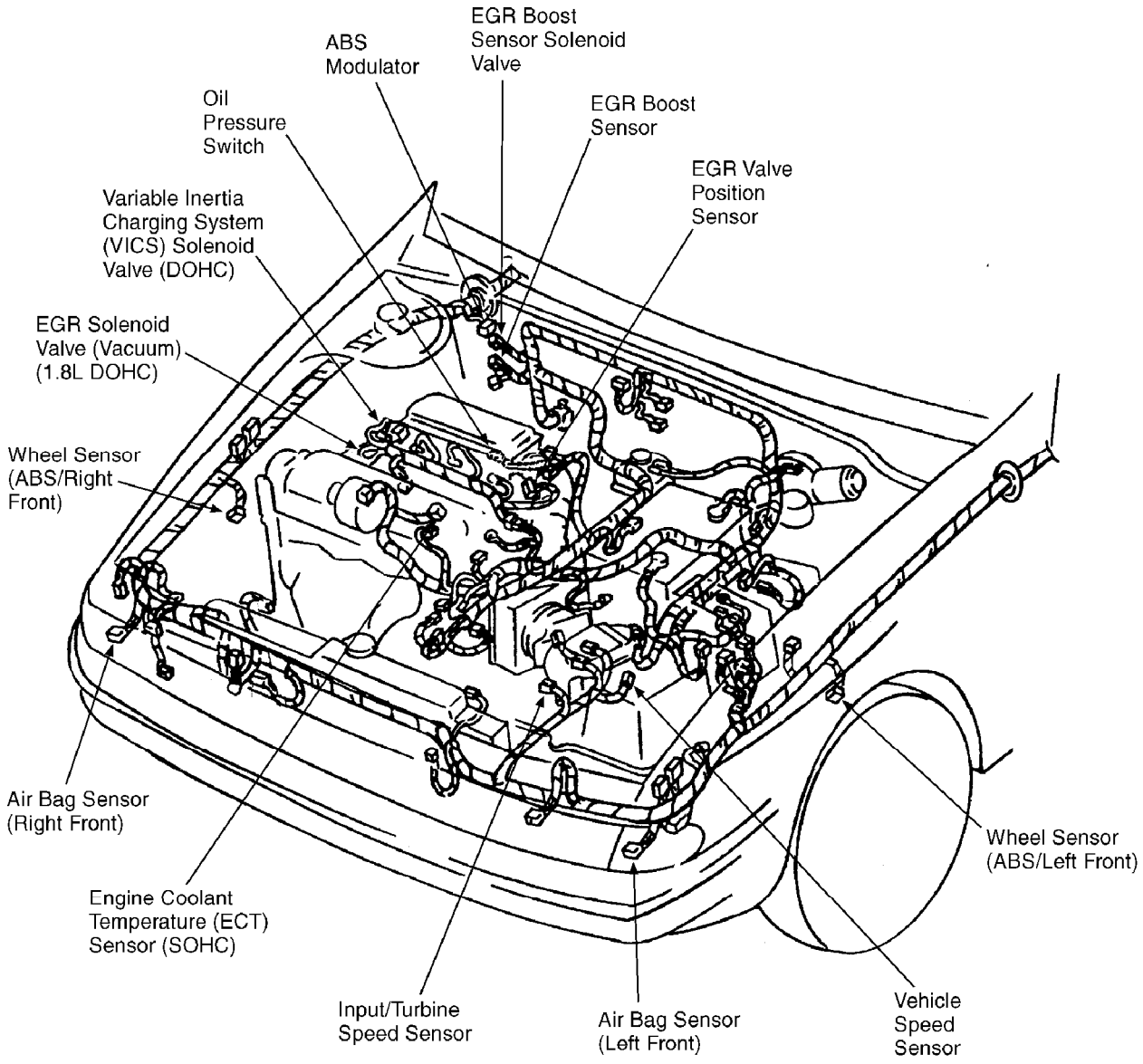
Pressure Regulator Control Solenoid Valve (1.8L) (DOHC) — On top right side of engine.

Pressure Regulator Control Solenoid Valve No. 1 (1.6L) (DOHC) — On top right side of engine, above generator.

Pressure Regulator Control Solenoid Valve No. 2 (1.6L) (DOHC) — On top right rear of engine.



Purge Solenoid Valve	On center rear of engine, compartment.
Purge Solenoid Valve (High) (1.8L)	On center rear of engine, compartment.
Purge Solenoid Valve (Low) (1.8L)	On center rear of engine, compartment.
Shift Lock Actuator	Beneath front of center console, under gear shift lever.

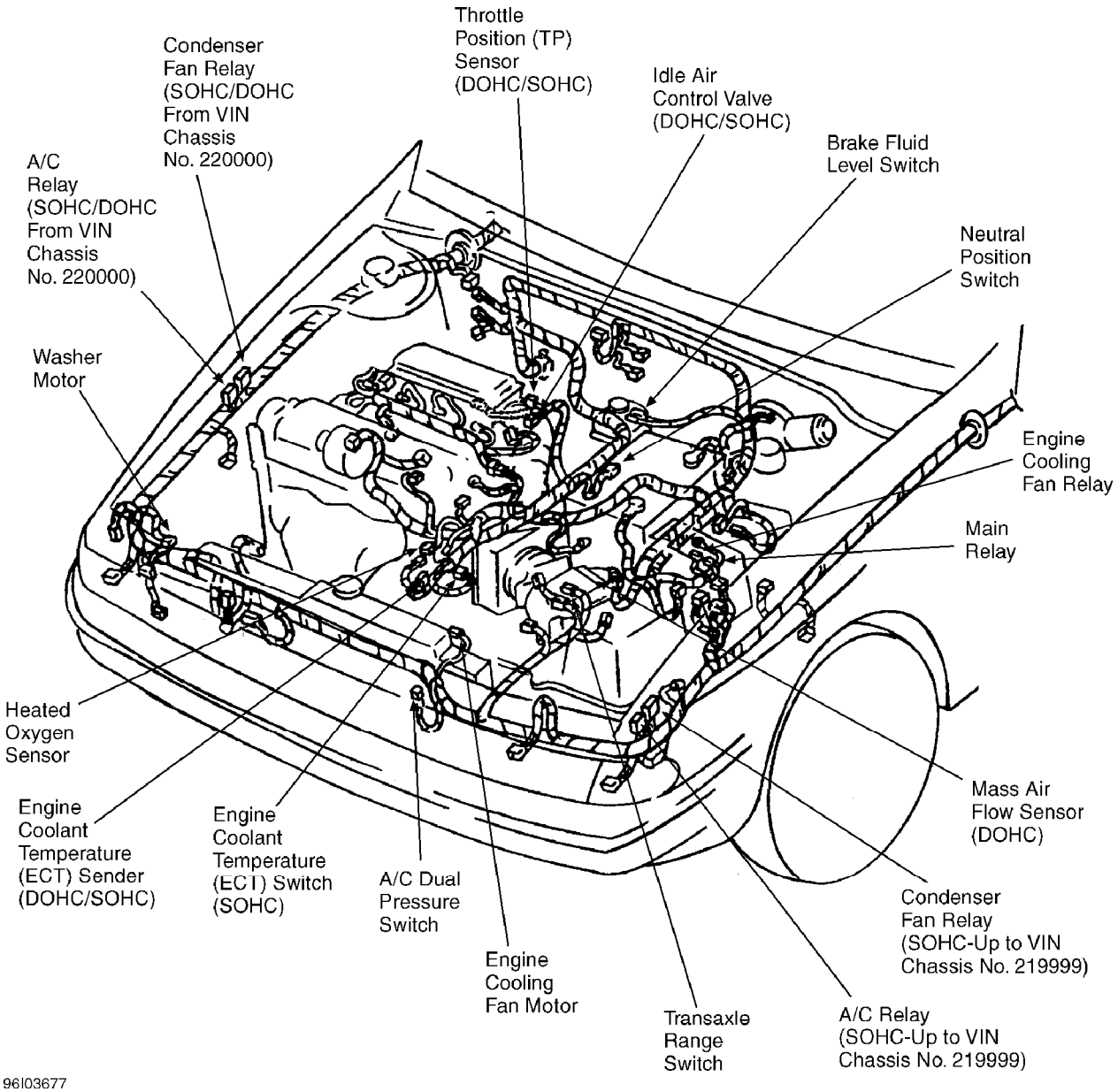


96A03678

Variable Inertia Charging System (VICS) Solenoid Valve (DOHC) On top right rear of engine.

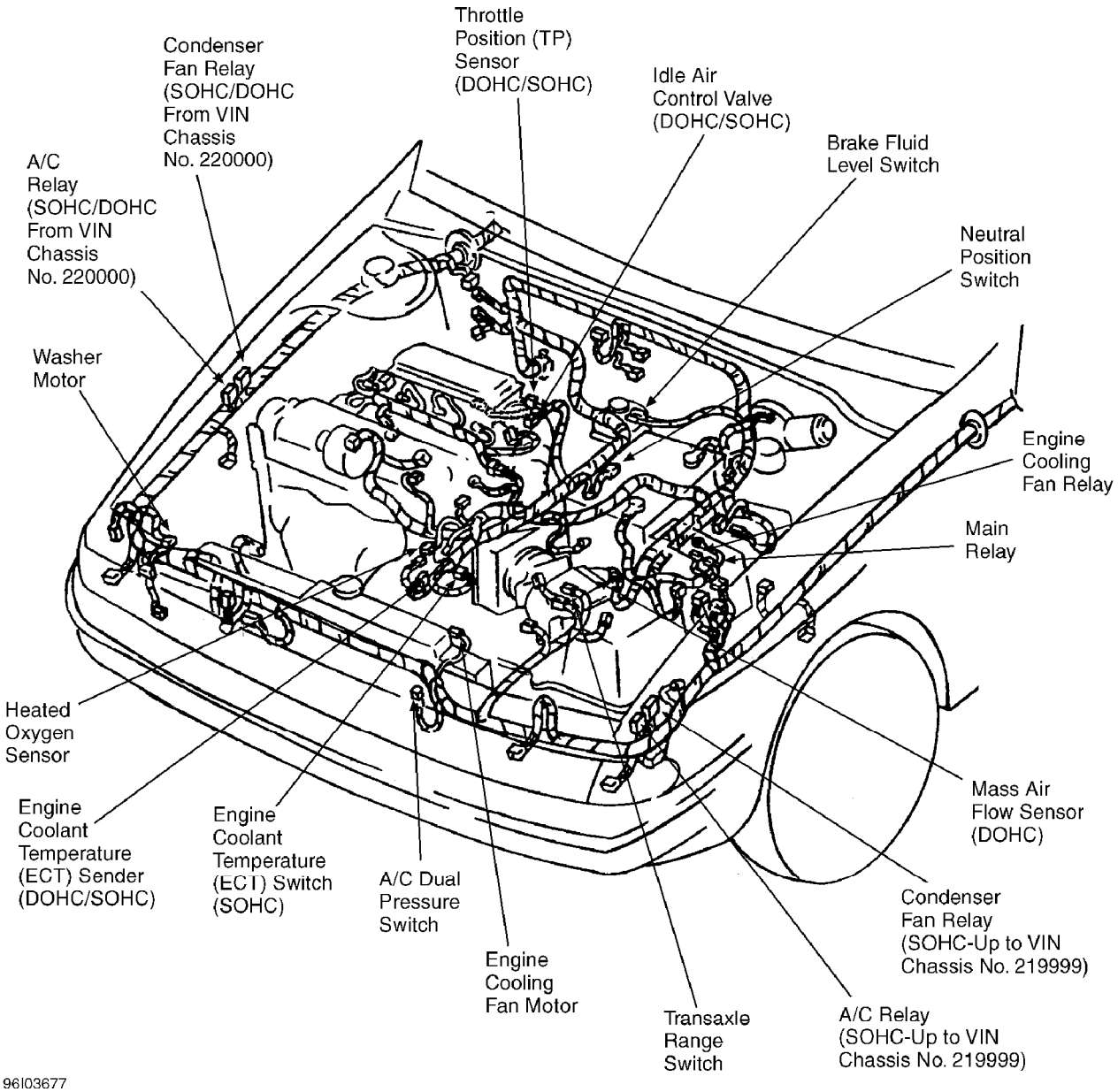
SWITCHES

Component	Component Location



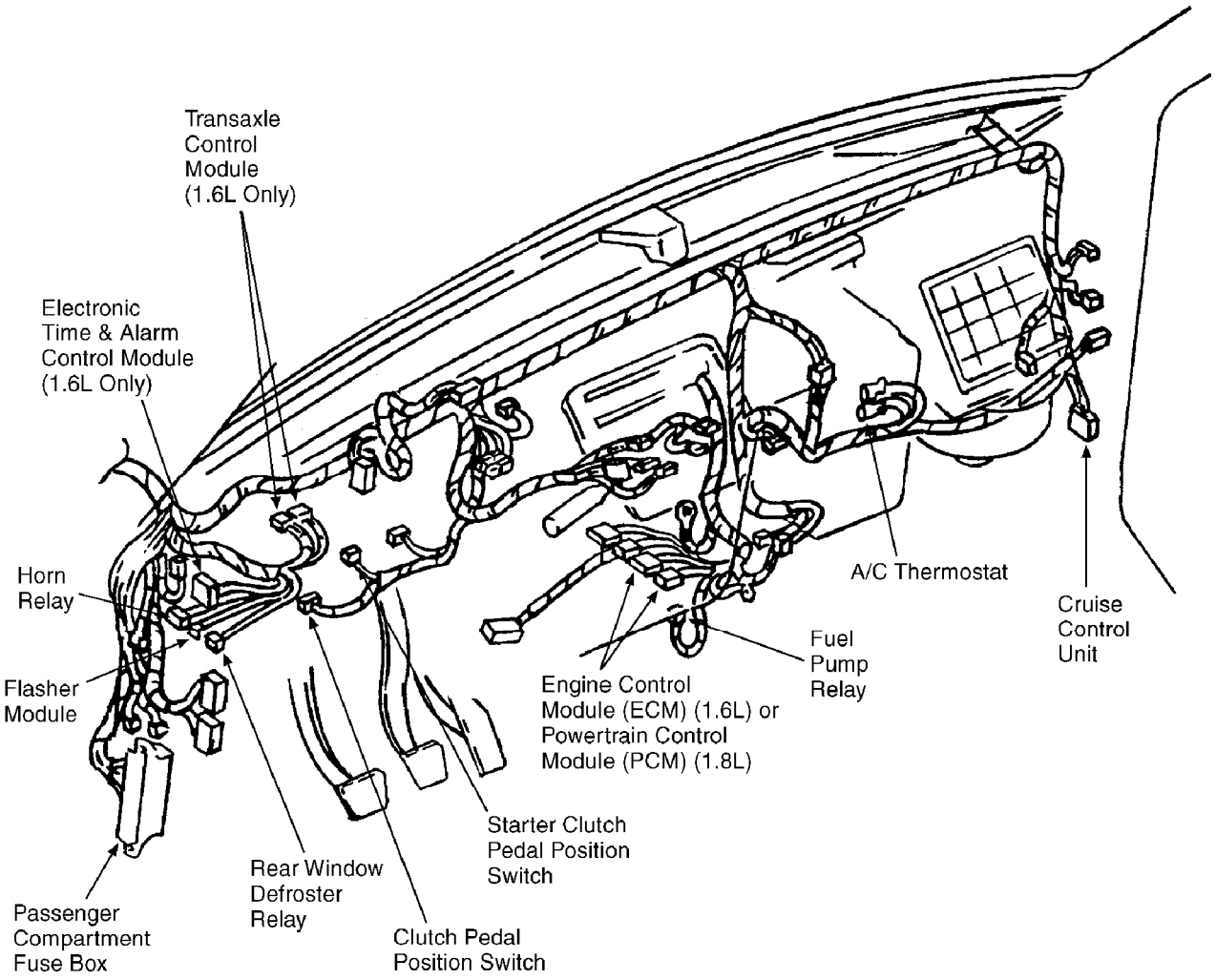
A/C Dual Pressure Switch — In front of radiator, on top of the receiver drier.

Back-Up Lamp Switch — On lower front of manual transaxle.

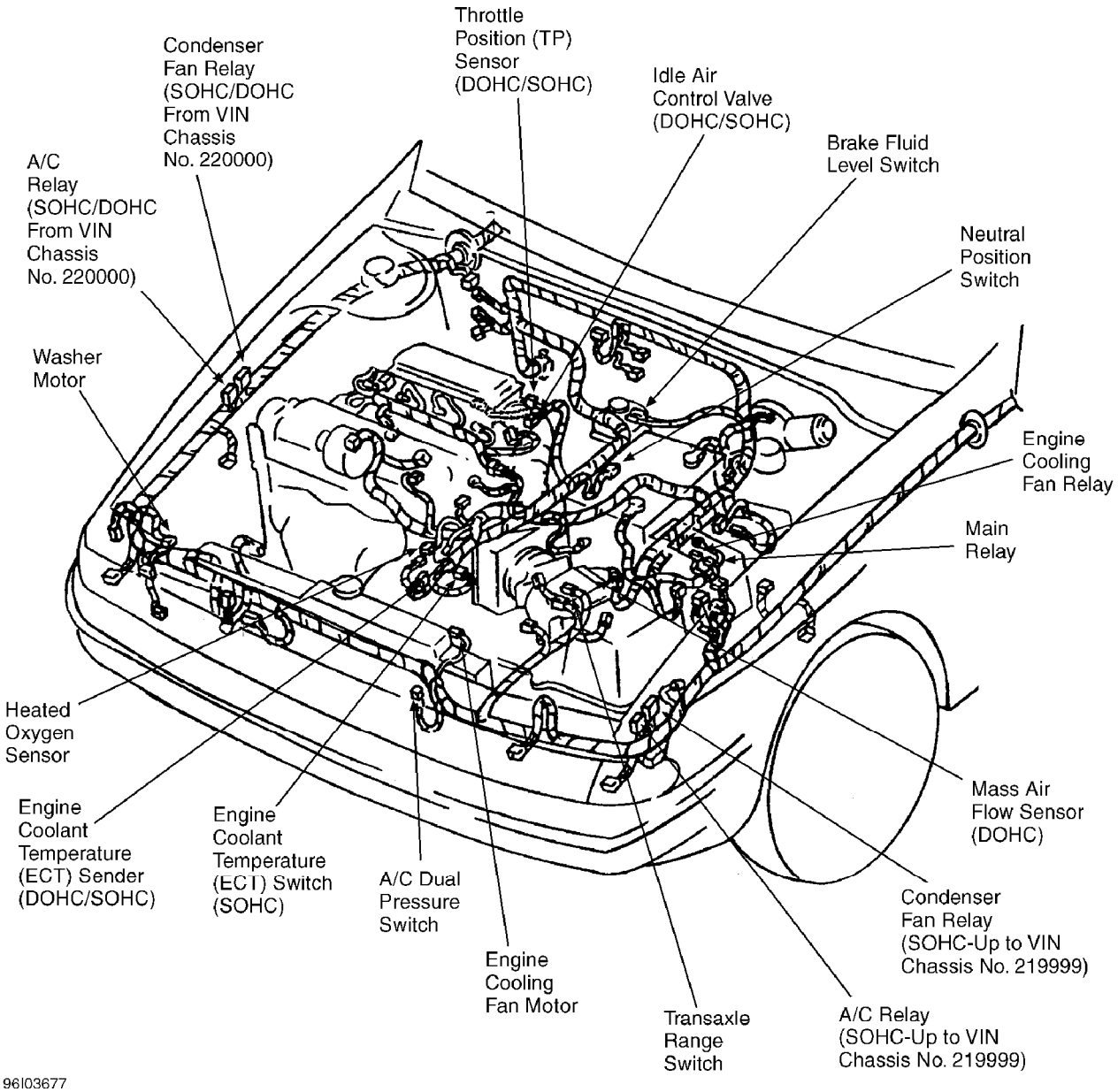


Brake Fluid Level Switch — In left rear of engine compartment, in brake fluid reservoir.

Brake Pedal Switch — Below left side of dash, on brake pedal support bracket.



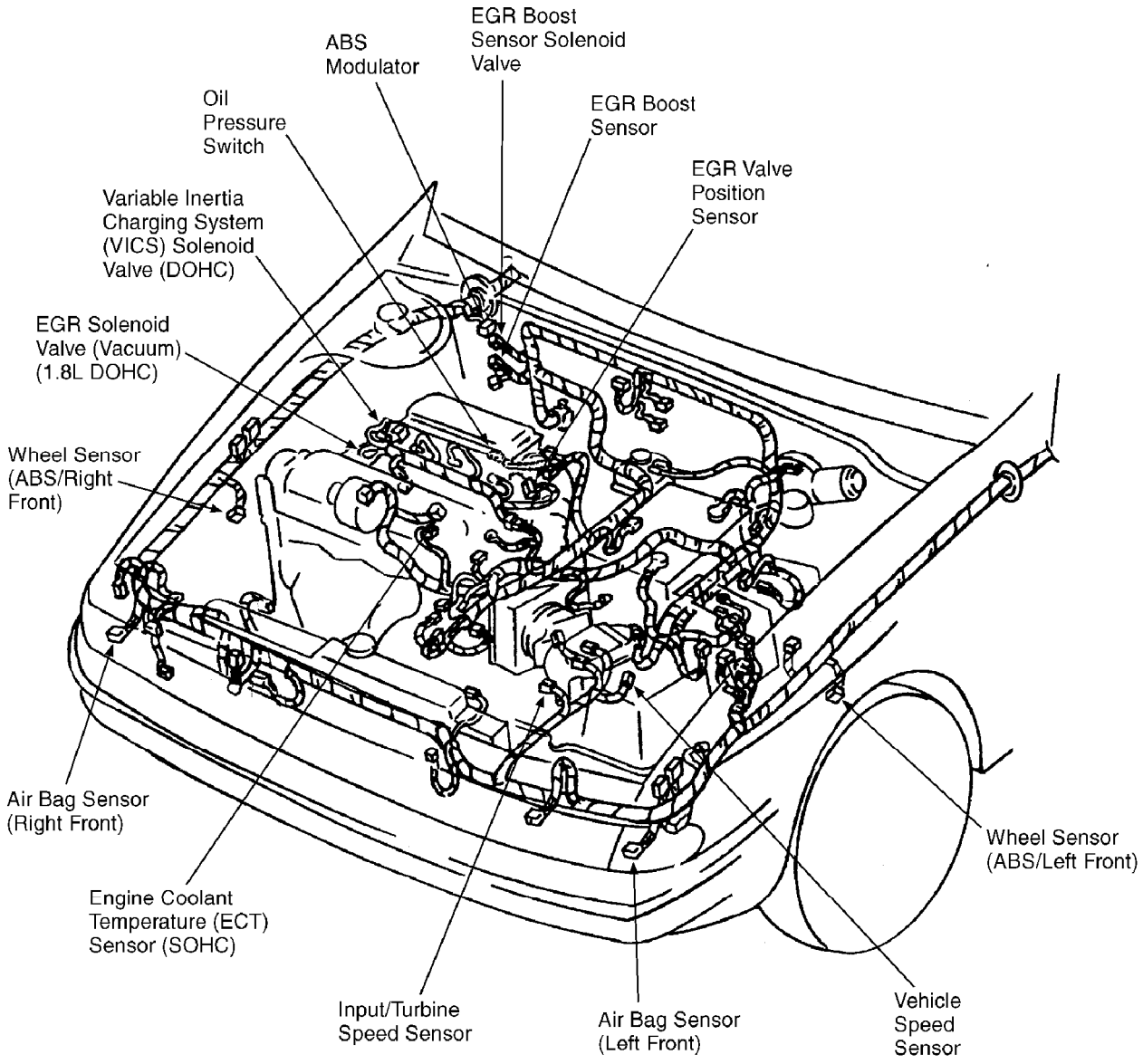
Clutch Pedal Position Switch Below left side of dash, on rear of support bracket.



ELECTRICAL

96I03677

Engine Coolant Temperature (ECT) Switch (SOHC)	On upper left side of engine at coolant inlet pipe.



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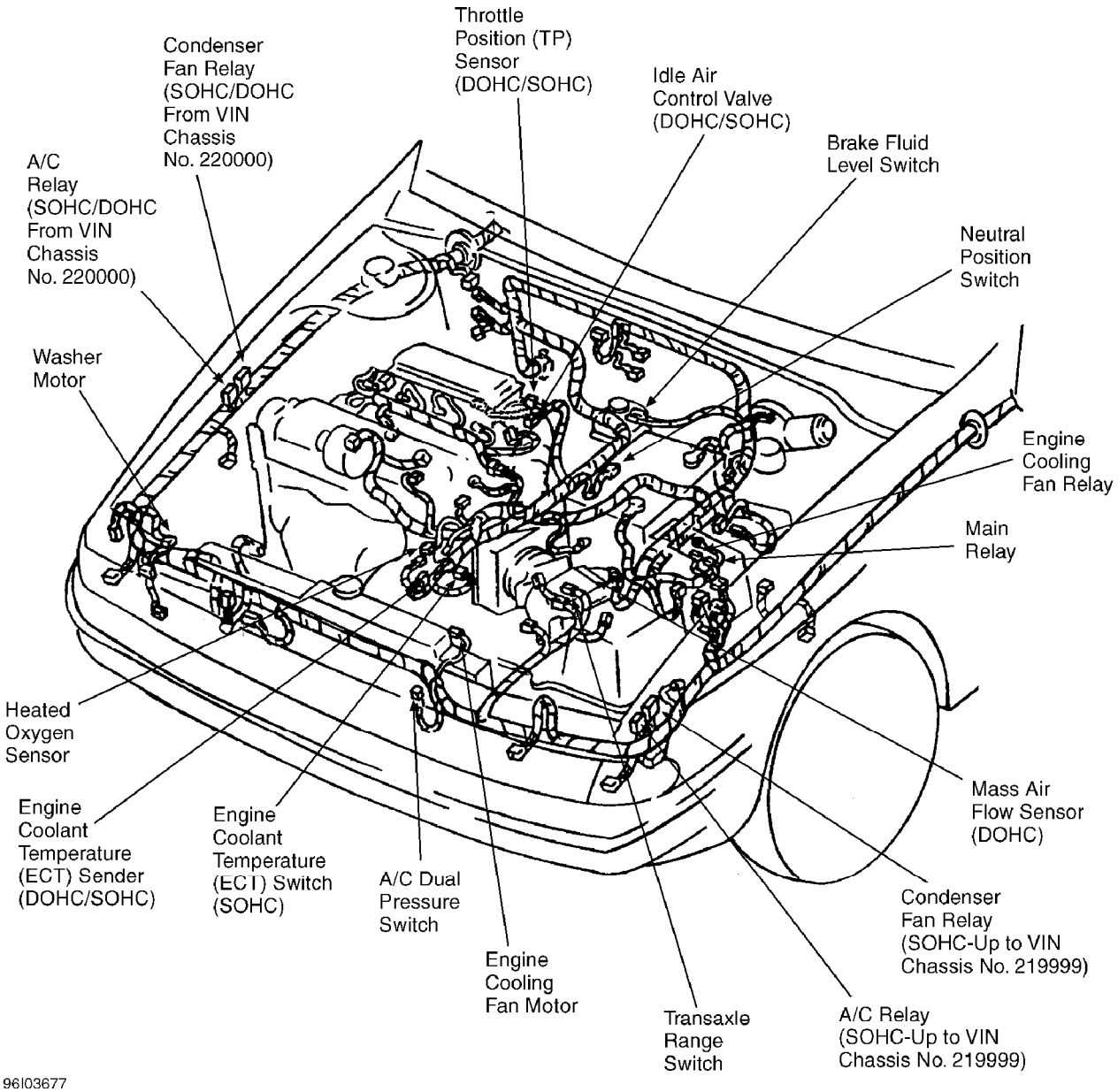
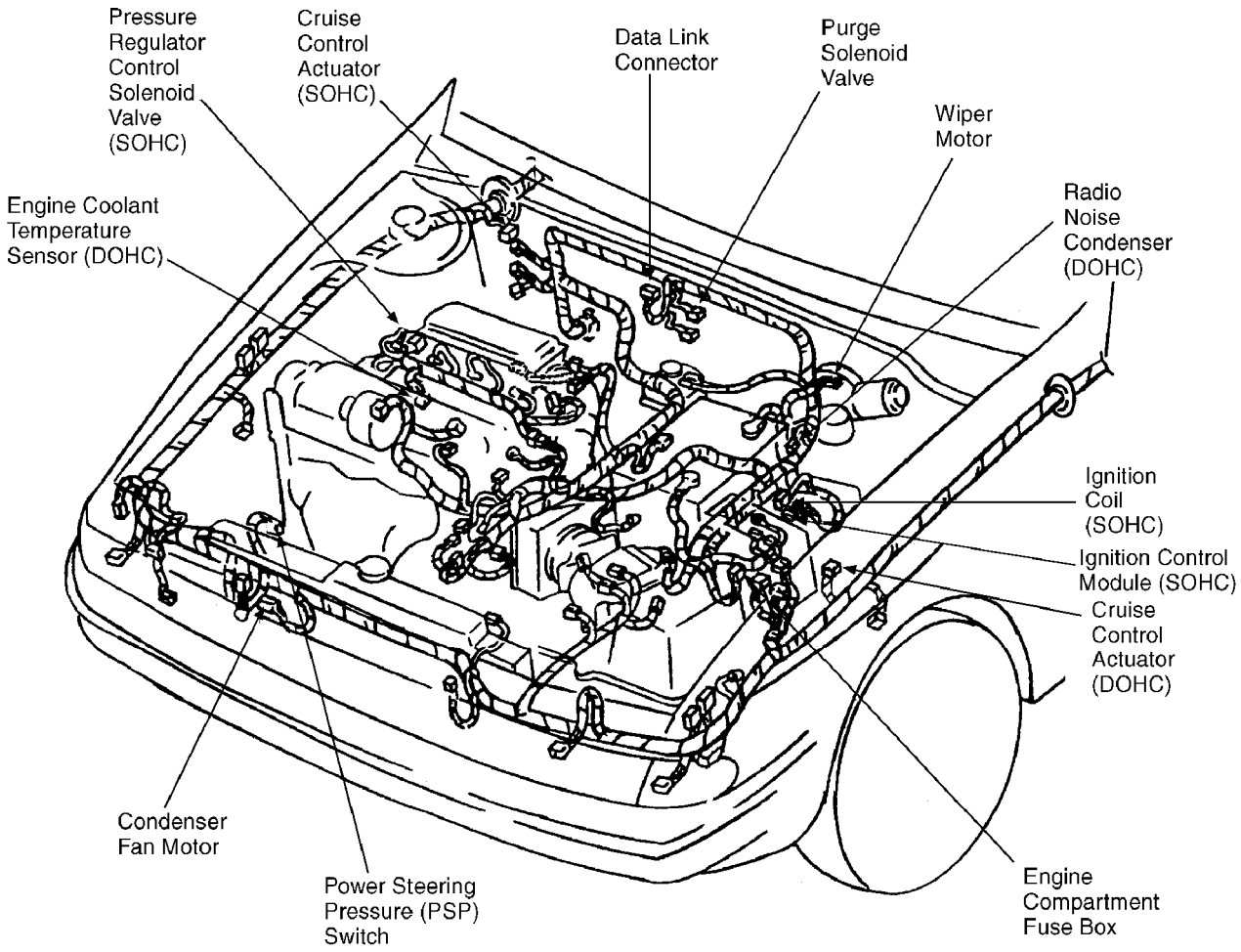
Oil Pressure Switch On rear center of engine, near oil filter.



Neutral Position Switch — On lower right rear of manual transaxle, below driveshaft.

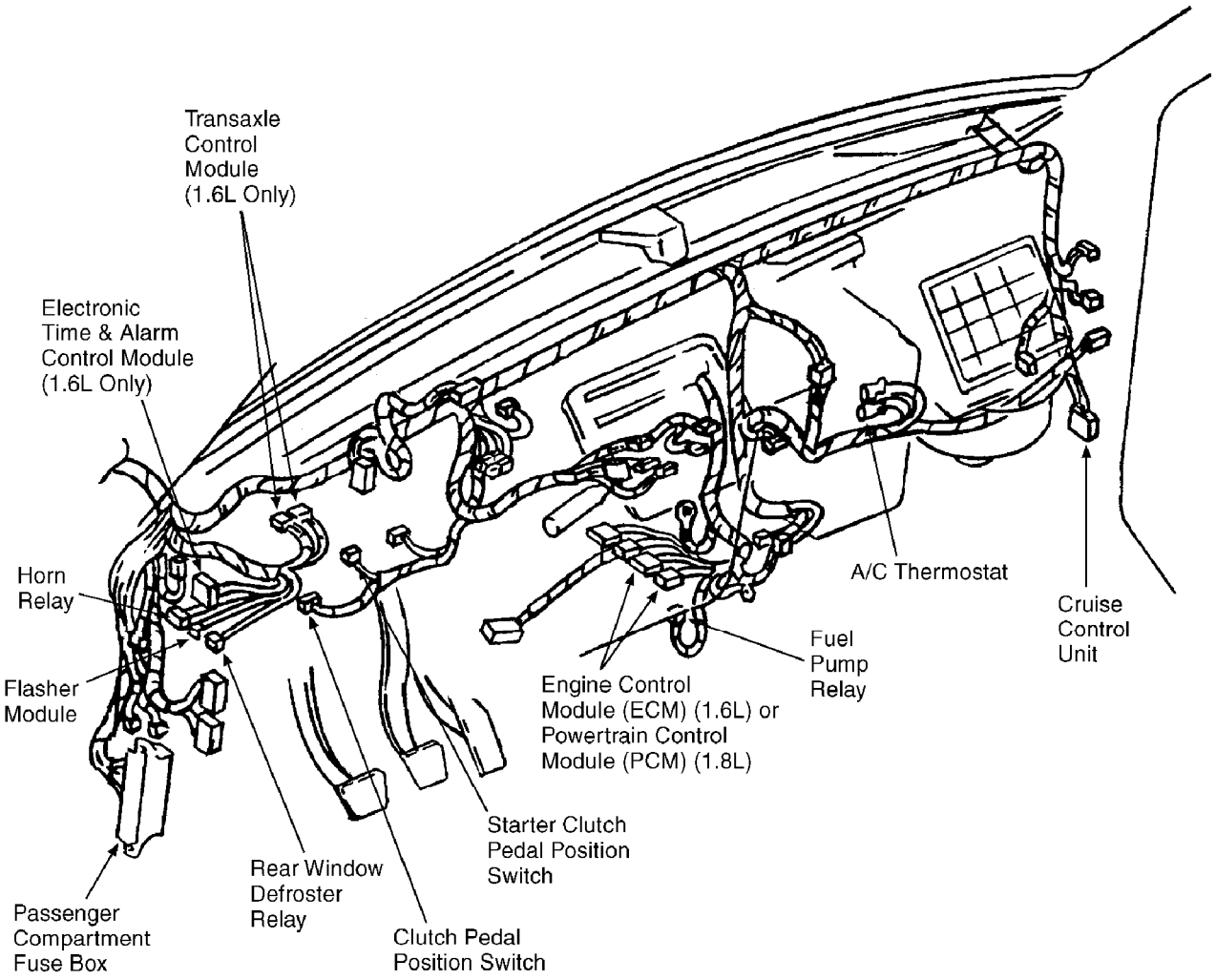
Park Range Switch — Beneath center console, at base of shift lever.

Parking Brake Switch — Beneath center console, at base of parking brake lever.

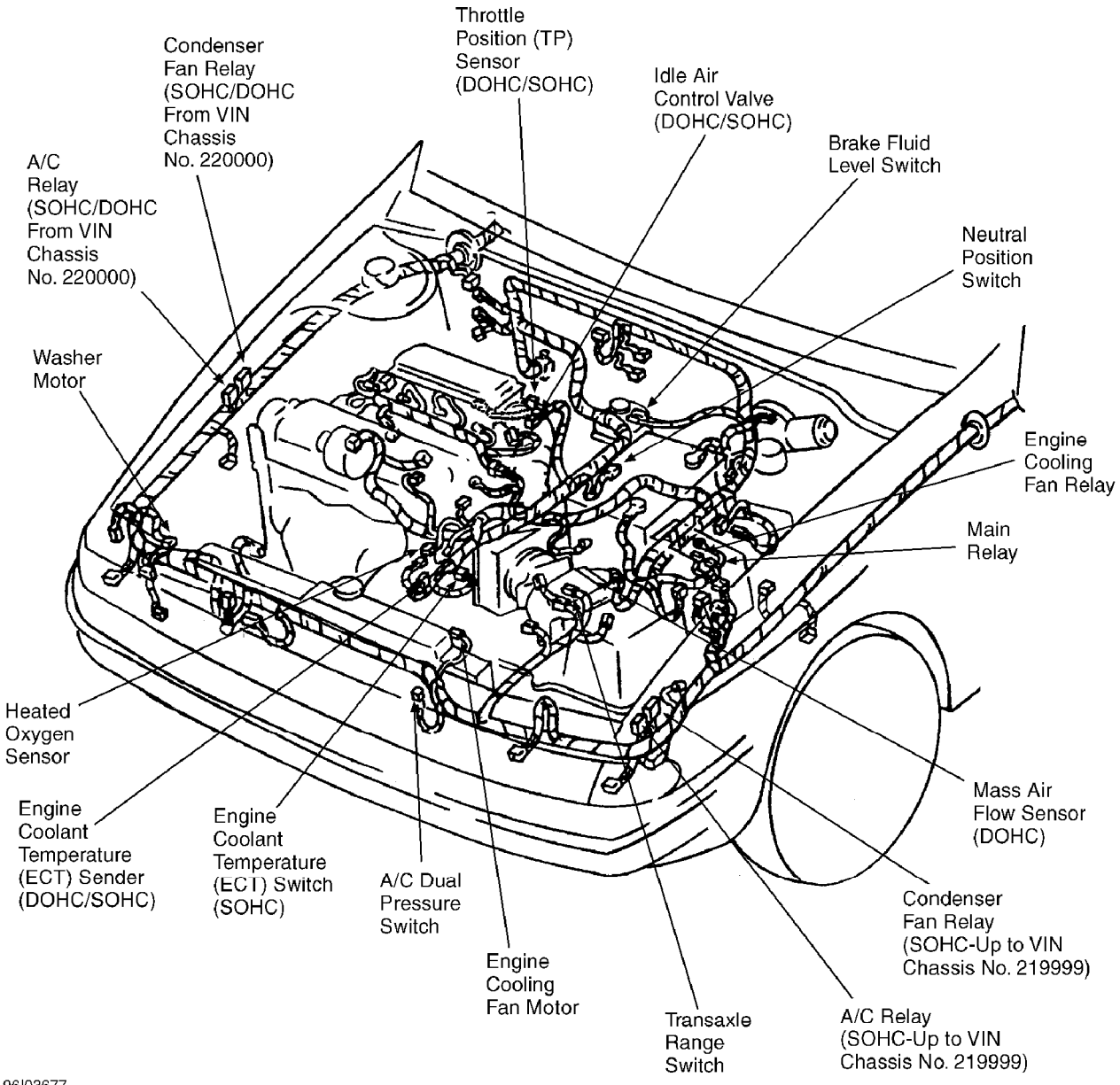


96G03676

Power Steering Pressure (PSP) Switch	On lower right front of engine compartment, on power steering pump.
Right Front Shoulder Belt Switch	Beneath rear of center console.
Seat Belt Switch	Rear of center console, in seat belt buckle.



Starter Clutch Pedal Position Switch	Below left side of dash, clutch pedal.	



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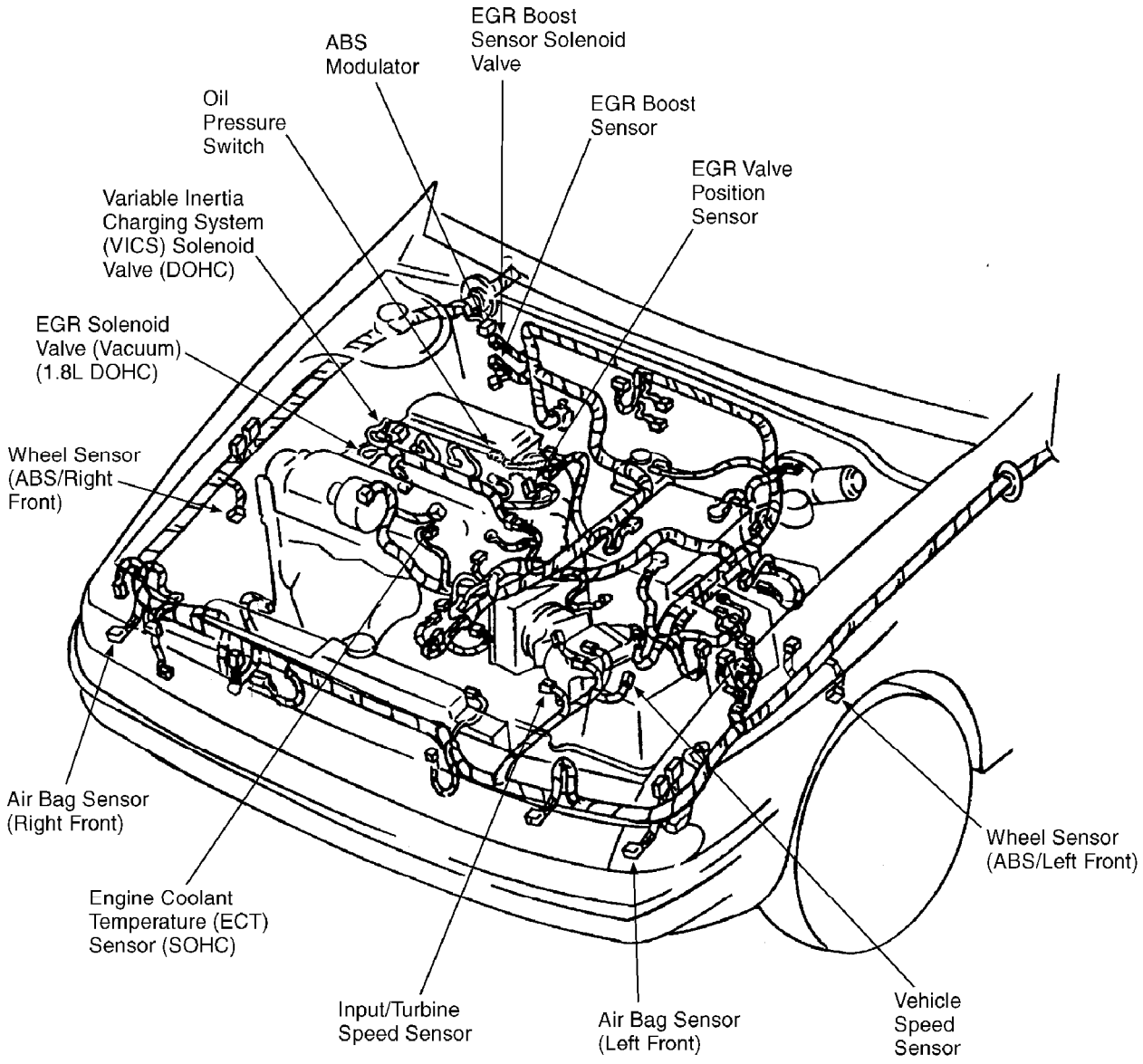
ELECTRICAL COMPONENT LOCATIONArticle Text ID: 511

Transaxle Range Switch	On top front of automatic transaxle.

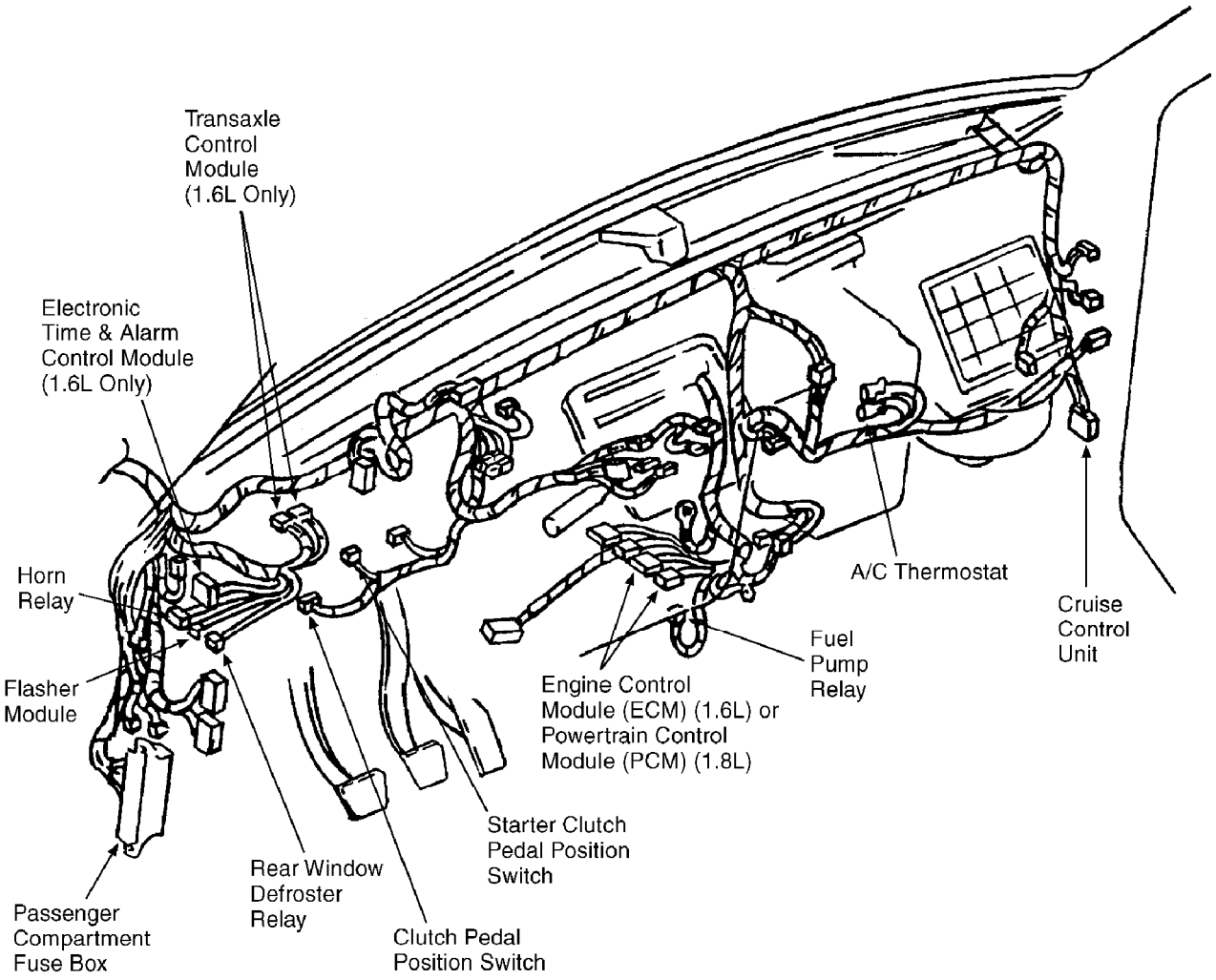
MISCELLANEOUS

Component	Component Location



96A03678

ABS Modulator On right rear of engine compartment.

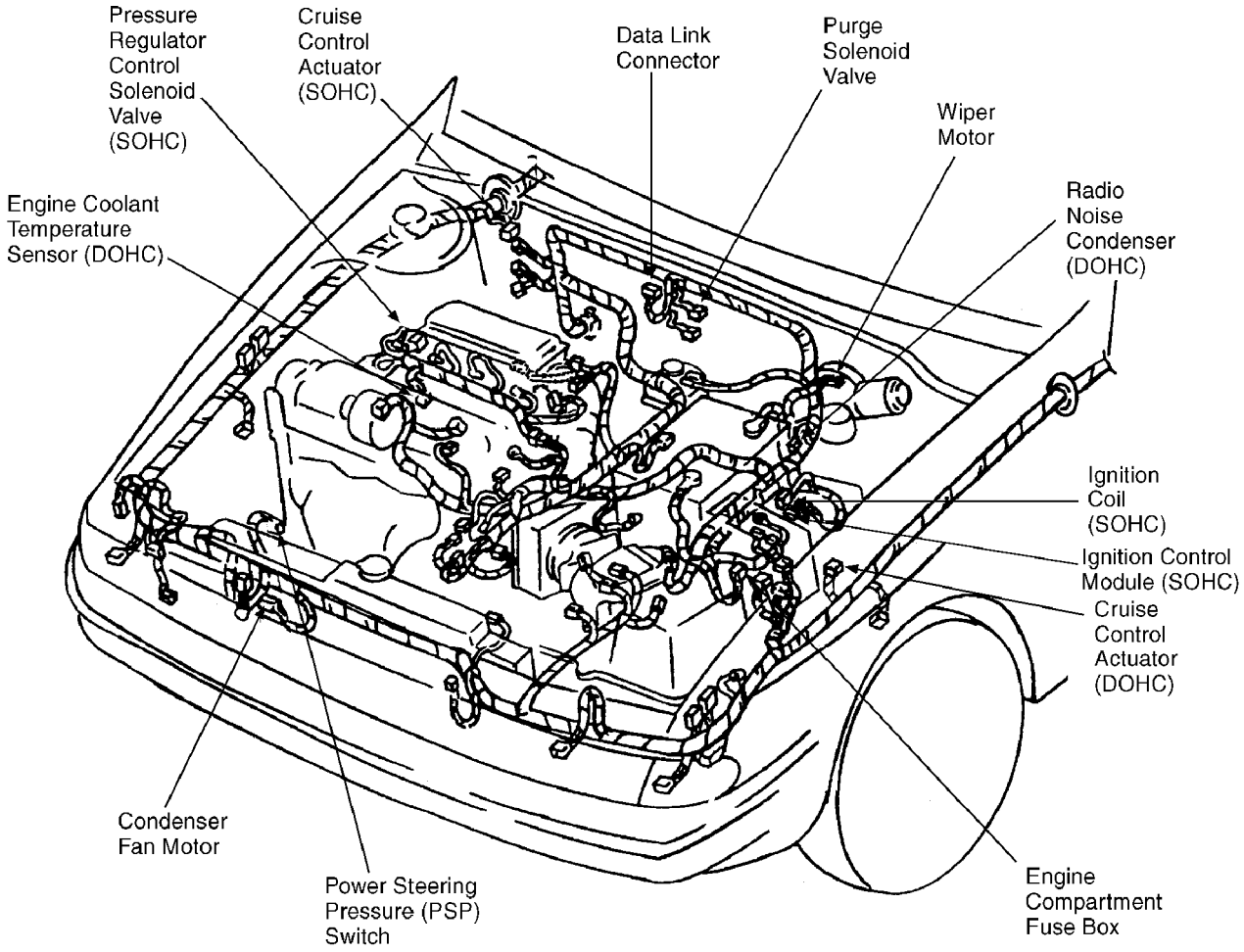


A/C Thermostat — Behind left side of glove box.

Blower Motor Noise Condenser — Below right side of dash, in in blower motor housing.

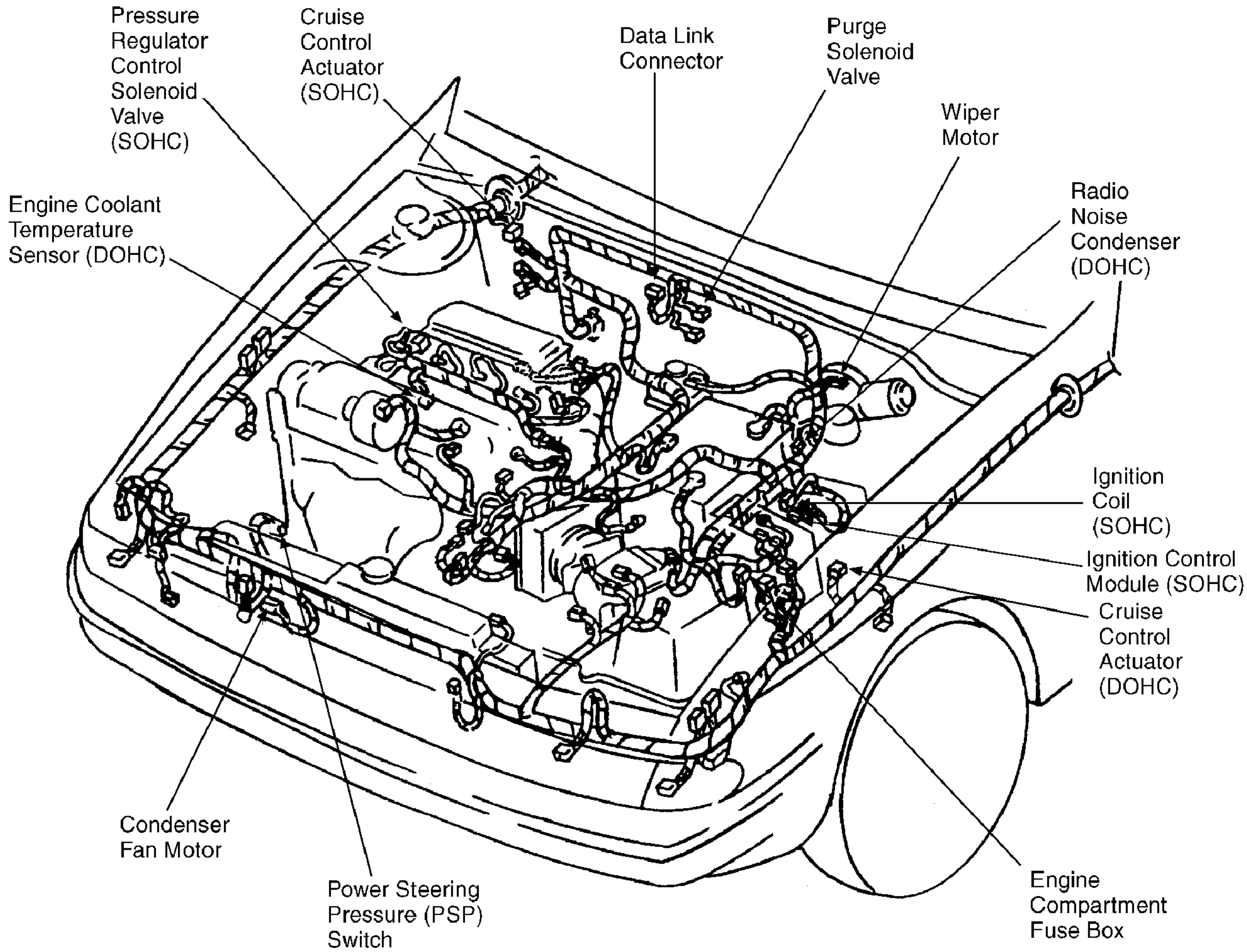
Blower Motor Resistors — Below right side of dash, in in blower motor housing.

Clockspring — On top of steering column, behind steering wheel.



Data Link Connector (DLC) In center rear of engine compartment.

Ignition Coil (DOHC) Inside the distributor.

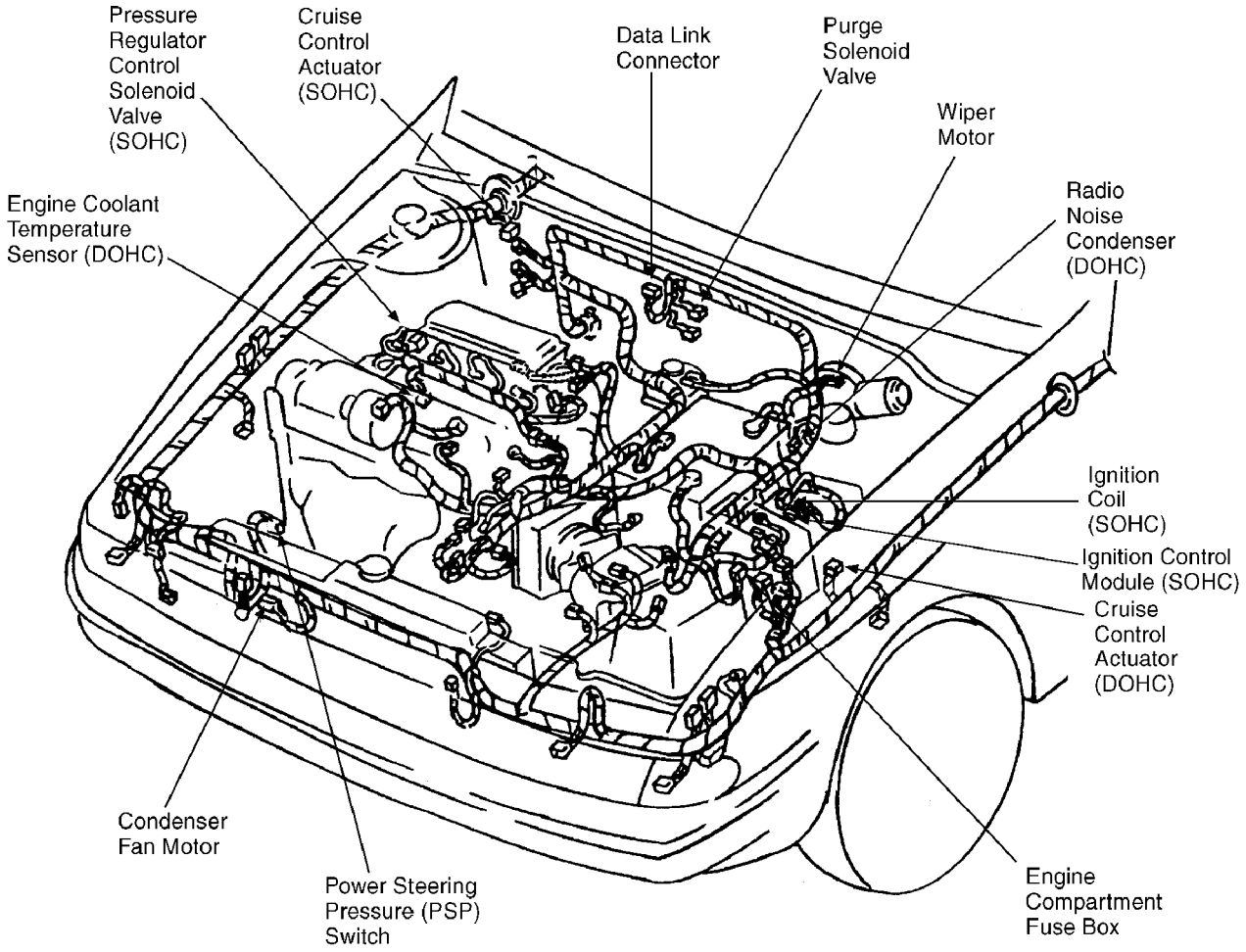


Ignition Coil (SOHC) On left side of engine compartment, near shock tower.

Ignition On left side of engine compartment, below ignition coil.

Noise Filter Center of dash, behind radio.

OBD-II Data Link Connector Mounted to lower left side of dash.



Radio Noise Condenser (DOHC)	On left side of engine.
Radio Noise Condenser (SOHC)	On left side of engine compartment, near ignition coil.

END OF ARTICLE

* ELECTRICAL SYSTEM UNIFORM INSPECTION GUIDELINES *

Article Text

1996 Kia Sephia

For 1 1 1 1 1

Saturday, April 18, 2009 10:04PM

ARTICLE BEGINNING

GENERAL INFORMATION
Electrical System January 2000 Motorist Assurance Program
Standards For Automotive Repair

All Makes and Models

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ELECTRIC HEATERS
EQUALIZERS
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FUSE BOXES AND BLOCKS
FUSES, FUSIBLE LINKS AND CIRCUIT BREAKERS
FUSIBLE LINKS
GAUGES
GENERATORS
GROUND CABLES AND STRAPS
GROUND STRAPS
HEADLIGHT ADJUSTERS
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HORNS AND SIRENS
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KEYLESS ENTRY TRANSMITTERS
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WASHER PUMPS
WIPER ARMS AND BLADES
WIPER BLADES
WIPER HOSES AND NOZZLES
WIPER LINKAGES
WIPER NOZZLES
WIPER PUMP RESERVOIRS
WIRING HARNESSES AND CONNECTORS

INTRODUCTION TO MOTORIST ASSURANCE PROGRAM (MAP)

OVERVIEW OF MOTORIST ASSURANCE PROGRAM (MAP)

Automotive industry professionals and interested readers:
The Motorist Assurance Program (MAP) is the consumer outreach effort of the Automotive Maintenance and Repair Association, Inc. (AMRA). Participation in the Motorist Assurance Program is drawn from auto repair companies and independents, parts and equipment manufacturers and suppliers, vehicle manufacturers and industry associations.

Our organization's mission is to strengthen the relationship between the consumer and the auto repair industry. We encourage motorists to take greater responsibility for their vehicles-through proper, manufacturer-recommended, maintenance, and endorse participating service and repair shops (including franchisees and dealers) who adopt (1) the MAP Pledge of Assurance to their Customers and (2) the Motorist Assurance Program Standards of Service. All participating service providers have agreed to subscribe to this Pledge and to adhere to the promulgated Standards of Service demonstrating to their customers that they are serious about customer satisfaction.

These Standards of Service require an inspection of the vehicle's (problem) system and that the results be communicated to the customer according to industry standards. Since the industry did not have such standards, the Motorist Assurance Program successfully promulgated industry inspection communication standards in 1994-95 for the following systems: Exhaust, Brakes, ABS, Steering and Suspension, Engine Maintenance and Performance, HVAC, and Electrical Systems.

Further, revisions to all of these inspection communication standards are re-published periodically. In addition to the above, standards for Drive Train and Transmissions were promulgated and published in 1998. Participating shops utilize these Uniform Inspection & Communication Standards (UI&CS) as part of the inspection process and for communicating their findings to their customers.

The Motorist Assurance Program continues to work cooperatively and proactively with government agencies and consumer groups toward solutions that both benefit the customer and are mutually acceptable to both regulators and industry. We maintain the belief that industry must retain control over how we conduct our business, and we must be viewed as part of the solution and not part of the problem. Meetings with state and other government officials (and their representatives), concerned with auto repair and/or consumer protection, are conducted. Feedback from these sessions is brought back to the association governing body, and the program adjusted as needed.

To assure recourse for auto repair customers if they are not satisfied with a repair transaction, the Motorist Assurance Program offers mediation and arbitration through the BBB and other similar non-profit organizations. MAP conducted pilot programs in twelve states before announcing the program nationally in October 1998. During the pilots, participating repair shops demonstrated their adherence to the Pledge and Standards and agreed to follow the UI&CS in communicating the results of their inspection to their customers. Complaints and "come-backs" dropped significantly.

To put some "teeth" in the program, an accreditation requirement for shops was initiated. The requirements are stringent, and a self-policing technique has been incorporated which includes the "mystery shopping" of outlets. By year-end 1999, over 4,000 auto repair facilities had been accredited by the Motorist Assurance Program.

We welcome you to join us as we continue our outreach. With your support, both the automotive repair industry and your customers will reap the benefits. Please visit MAP at our Internet site www.motorist.org or contact us at:

1444 I Street, NW - Suite 700
Washington, DC 20005
Phone (202) 712-9042 - Fax (202) 216-9646
E-mail map@bostromdc.org

OVERVIEW OF SERVICE REQUIREMENTS & SUGGESTIONS

It is MAP policy that all exhaust, brake, steering, suspension, wheel alignment, drive-line, engine performance and

*** ELECTRICAL SYSTEM UNIFC**

maintenance, and heating, ventilation and air conditioning, and electrical services be offered and performed under the standards and procedures specified in these sections.

Before any service is performed on a vehicle, an inspection of the appropriate system must be performed. The results of this inspection must be explained to the customer and documented on an inspection form. The condition of the vehicle and its components will indicate what services/part replacements may be "Required" or "Suggested." In addition, suggestions may be made to satisfy the requests expressed by the customer.

When a component is suggested or required to be repaired or replaced, the decision to repair or replace must be made in the customer's best interest, and at his or her choice given the options available.

This section lists the various parts and the conditions that indicate a required or suggested service or part replacement. Although this list is extensive, it is not fully inclusive. In addition to this list, a technician may make a suggestion. However, any suggestions must be based on substantial and informed experience, or the vehicle manufacturer's recommended service interval and must be documented.

Some conditions indicate that service or part replacement is required because the part in question is no longer providing the function for which it is intended, does not meet a vehicle manufacturer's design specification or is missing.

* Example: An exhaust pipe has corroded severely and has a hole in it through which exhaust gases are leaking. Replacement of the exhaust pipe in this case is required due to functional failure.
* Example: A brake rotor has been worn to the point where it measures less than the vehicle manufacturer's discard specifications. Replacement of the rotor is required because it does not meet design specifications.

Some conditions indicate that a service or part replacement is suggested because the part is close to the end of its useful life or addresses a customer's need, convenience or request. If a customer's vehicle has one of these conditions, the procedure may be only to suggest service.

* Example: An exhaust pipe is rusted, corroded or weak, but no leaks are present. In this case, the exhaust pipe has not failed. However, there is evidence that the pipe may need replacement in the near future. Replacement of the pipe may be suggested for the customer's convenience in avoiding a

future problem.

* Example: The customer desires improved ride and/or handling, but the vehicle's shocks or struts have not failed. In this case, replacement may be suggested to satisfy the customer's wishes. In this case, replacement of the shocks or struts may not be sold as a requirement.

A customer, of course, has the choice of whether or not a shop will service his or her vehicle. He or she may decide not to follow some of your suggestions. When a repair is required, a MAP shop must refuse partial service on that system if, in the judgment of the service provider, proceeding with the work could create or continue an unsafe condition.

When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

The following reasons may be used for required and suggested services. These codes are shown in the "Code" column of the MAP Uniform Inspection & Communications Standards that follow:

Reasons to Require Repair or Replacement

A - Part no longer performs intended purpose
B - Part does not meet a design specification (regardless of performance)
C - Part is missing

NOTE: When a repair is required, the shop must refuse partial service to the system in question, if the repair creates or continues an unsafe condition.

Reasons to Suggest Repair or Replacement

1 - Part is close to the end of its useful life (just above discard specifications, or weak; failure likely to occur soon, etc.)
2 - To address a customer need, convenience, or request (to stiffen ride, enhance performance, eliminate noise, etc.)
3 - To comply with maintenance recommended by the vehicle's Original Equipment Manufacturer (OEM)
4 - Technician's recommendation based on substantial and informed experience

NOTE: Suggested services are always optional. When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions *** ELECTRICAL SYSTEM UNIFORM IN**

and make an informed decision about how to proceed.

ELECTRICAL SYSTEMS

SERVICE PROCEDURES REQUIRED AND SUGGESTED FOR PROPER VEHICLE OPERATION

NOTE: When working on electrical systems, if a potentially hazardous condition is observed, require repair or replacement of affected components prior to performing further work.

ACTUATOR MOTORS (SOLENOIDS) (ELECTRIC)

ACTUATOR MOTOR (SOLENOIDS) (ELECTRIC) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Inoperative	A	(2) Require replacement.
Linkage bent, affecting performance	A	Require repair or replacement of linkage.
Linkage bent, not affecting performance	2	Suggest repair or replacement of linkage.
Linkage binding, affecting performance	A	Require repair or replacement of linkage.
Linkage binding, not affecting performance	1	Suggest repair or replacement of linkage.

*** ELECTRICAL SYSTEM UNIFORM IN**

Linkage broken ..... A ... Require repair or replacement of linkage.
Linkage loose, affecting performance ..... A ... Require repair or replacement of linkage.
Linkage loose, not affecting performance .. 1 ... Suggest repair or replacement of linkage.
Linkage missing ..... C ..... Require replacement.
Linkage noisy ..... 2 .. Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 1 ..... (1) Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 1 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

ACTUATOR MOTORS (VACUUM)

ACTUATOR MOTOR (VACUUM) INSPECTION

Condition Code Procedure

Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware

missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require replacement.
Leaking (vacuum) ..... A .. Require repair or replacement.
Linkage bent, affecting performance .. A ... Require repair or replacement of linkage.
Linkage bent, not affecting performance .. 2 ... Suggest repair or replacement of linkage.
Linkage binding, affecting performance .. A ... Require repair or replacement of linkage.
Linkage binding, not affecting performance .. 1 .. Suggest repair or replacement of linkage.
Linkage broken ..... A ... Require repair or replacement of linkage.
Linkage loose, affecting performance ..... A ... Require repair or replacement of linkage.
Linkage loose, not affecting performance .. 1 ... Suggest repair or replacement of linkage.
Linkage missing ..... C ..... Require replacement.
Linkage noisy ..... 2 .. Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

For all air bag components and conditions, refer to vehicle manufacturer's specifications for diagnosis and parts replacement.

ALTERNATORS AND GENERATORS

NOTE: If components have been added that increase vehicle electrical load requirement (for example, sound systems, air conditioning, alarm systems, etc.), charging system output must meet the increased demand.

ALTERNATOR AND GENERATOR INSPECTION

Condition	Code	Procedure
Alternator output meets OEM specification but is insufficient for add-on electrical load	2	Suggest upgrade of alternator or removal of excess electrical load.
Alternator's rated output is below OEM specification	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware non-functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Diode inoperative	A	(2) Require repair or replacement.
Housing broken, affecting performance	A	Require repair or replacement.
Housing broken, not affecting performance		No service suggested or required.

Housing cracked, affecting
performance ..... A .. Require repair or replacement.
Housing cracked, not
affecting performance .. 1 .. Suggest repair or replacement.
Inoperative ..... A ..... (2) Require repair or
replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Pulley incorrect ..... B ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Terminal resistance
(voltage drop) out of
specification ..... A .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Voltage drop out of
specification ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or
replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM
specification.

AMPLIFIERS

See
RECEIVERS, AMPLIFIERS, EQUALIZERS AND SUB-WOOFER VOLUME CONTROLS.

ANTENNAS

ANTENNA INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Broken	A	Require replacement.
Bent	2	Suggest repair or replacement.
Binding	2	Suggest repair or replacement.
Connector broken	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Inoperative	A	(2) Require replacement.
Insulation damaged, conductors exposed	A	Require repair or replacement.
Insulation damaged, conductors not exposed	1	Suggest replacement.
Missing	C	Require replacement.
Motor runs continuously	A	Require or replacement.
Power antenna noisy	2	Suggest repair or replacement.
Sticking	2	Suggest repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of specification.

*** ELE**

BATTERIES

Proper operation of any electrical system or component can be affected by battery condition. The battery(ies) must meet or exceed minimum specification for vehicle as equipped and test to that specific battery's CCA.

Definition of Terms

* Battery Performance Testing
  Testing that determines whether or not a battery meets both vehicle OEM and battery manufacturer's specifications.

* Cold Cranking Amp (CCA) Rating
  The number of amperes a new, fully charged battery at 0° F (-17.8° C) can deliver for 30 seconds and maintain at least a voltage of 1.2 volts per cell (7.2 volts for a 12-volt battery).

* Cranking Amps (CA)
  The number of amperes a new, fully charged battery, typically at 32° F (0° C) can deliver for 30 seconds and maintain at least a voltage of 1.2 volts per cell (7.2 volts for a 12-volt battery).

* OEM Cranking Amps
  The minimum CCA required by the original vehicle manufacturer for a specific vehicle.

BATTERY INSPECTION

Condition	Code	Procedure
Battery frozen		(1) Further inspection required.
Case leaking	A	Require replacement.
Casing swollen	A	(2) Further inspection required.
Circuit open internally	A	Require replacement.
Electrolyte contamination	A	(2) Further inspection required.
Electrolyte discoloration	A	(2) Further inspection

required.

Fails to accept and hold charge ..... A ..... (3) Require replacement.

Fluid level low ..... B ..... (4) Further inspection required.

Out of performance specification for battery ..... B ..... (5) Require replacement.

Out of specification for application ..... B ..... (5) Require replacement.

Post (top or side) burned, affecting performance .. A ..... (6) Require repair or replacement.

Post (top or side) burned, not affecting performance ..... 2 ..... (6) Suggest repair or replacement.

Post (top or side) corroded, affecting performance ..... A ..... Require repair.

Post (top or side) corroded, not affecting performance ..... 2 ..... Suggest repair.

Post (top or side) loose ..... A ..... Require replacement.

Post (top or side) melted, affecting performance .. A ..... (6) Require repair or replacement.

Post (top or side) melted, not affecting performance ..... 2 ..... (6) Suggest repair or replacement.

Specific gravity low .... B ..... (7) Further inspection required.

State of charge low ..... A ..... (7) Further inspection required.

Top dirty ..... 2 ..... Suggest cleaning battery.

Top wet ..... A ... (8) Require cleaning battery. Further inspection required.

Vent cap loose ..... A ... Require repair or replacement of vent cap.

Vent cap missing ..... C ..... Require replacement of vent cap.

(1) - DO NOT attempt to charge a frozen battery. Allow battery to warm thoroughly and then performance-test. If battery

fails performance test, require replacement.
(2) - No service suggested or required unless the battery fails performance test, in which case, require replacement.
(3) - This phrase refers to a battery that fails to either accept and/or retain a charge using appropriate times listed in the Battery Charging Guide of the BCI Service Manual, battery charger operating manual, or battery manufacturer's specifications.
(4) - Determine cause of low fluid level. Refill to proper level(s) with water (distilled water preferred). Recharge battery and performance-test. If battery does not meet specifications, require replacement. If battery is sealed type (non-removable filler caps), require replacement.
(5) - The battery may meet battery manufacturer's specifications but test below the minimum specification defined by the vehicle's OEM for that vehicle.
(6) - Determine cause and correct prior to repair or replacement of part.
(7) - Recharge and test to manufacturer's specifications. If battery fails performance test, require replacement.
(8) - Check fluid level and adjust to manufacturer's specification. Suggest checking charging system for proper operation.

BATTERY CABLES

See BATTERY CABLES, WIRES AND CONNECTORS.

BATTERY CABLES, WIRES AND CONNECTORS

BATTERY CABLE, WIRE AND CONNECTOR INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.

Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Insulation damaged, conductors exposed ..... A ..... (2) Require repair or replacement.
Insulation damaged, conductors not exposed . 1 ..... Suggest replacement.
Open ..... A .. Require repair or replacement.
Protective shield (conduit) melted ..... 2 ..... (1) Suggest repair or replacement.
Protective shield (conduit) missing ..... 2 .. Suggest repair or replacement.
Resistance (voltage drop) out of specification ... A .. Require repair or replacement.
Routed incorrectly ..... B ..... Require repair.
Secured incorrectly ..... B ..... Require repair.
Shorted ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Voltage drop out of specification ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Exposed conductor at replacement (aftermarket) terminal end does not require repair or replacement.

BATTERY HOLD DOWN HARDWARE

See BATTERY TRAYS AND HOLD DOWN HARDWARE.

BATTERY TRAYS AND HOLD DOWN HARDWARE

BATTERY TRAY AND HOLD DOWN HARDWARE INSPECTION

Condition	Code	Procedure
Battery improperly secured	2	Suggest repair.
Bent, affecting performance	A	Require repair or replacement.
Bent, not affecting performance		No service suggested or required.
Broken, affecting performance	A	Require repair or replacement.
Broken, not affecting performance		No service suggested or required.
Corroded, affecting performance	A	Require repair or replacement.
Corroded, not affecting performance	2	Suggest repair or replacement.
Cracked, affecting performance	A	Require repair or replacement.
Cracked, not affecting performance	1	Suggest repair or replacement.
Missing	C	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Water drain clogged	A	Require repair.

BATTERY WIRES

See BATTERY CABLES, WIRES AND CONNECTORS.

BELTS

BELT INSPECTION

Condition	Code	Procedure
Alignment incorrect	B	(1) Further inspection required.
Cracked	1	Suggest replacement.

Frayed ..... 1 ..... Suggest replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 ..... (2) Further inspection required.
Plies separated ..... A ..... Require replacement.
Tension out of specification ..... B ..... Require adjustment or replacement.
Worn beyond adjustment range ..... B ..... Require replacement.
Worn so it contacts bottom of pulley ..... A ..... Require replacement.

(1) - Determine cause of incorrect alignment and require repair.
(2) - Determine cause of noise and suggest repair.

BULB SOCKETS

BULB SOCKET INSPECTION

Condition Code Procedure

Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Bulb seized in socket ... A .. Require repair or replacement.
Burned, affecting performance ..... A ..... (1) Require repair or replacement.
Burned, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.
Broken ..... A .. Require repair or replacement.
Connector broken ..... A .. Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.

Corroded, affecting
performance ..... A .. Require repair or replacement.
Corroded, not affecting
performance ..... 2 .. Suggest repair or replacement.
Leaking ..... A .. Require repair or replacement.
Melted ..... A ..... (2) Require replacement.
Shorted ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (2) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or
replacement of socket.
(2) - Determine cause and correct prior to replacement of part.

BULBS, SEALED BEAMS AND LEDS

NOTE: Does not include soldered-in components.

BULB, SEALED BEAM AND LED INSPECTION

Condition Code Procedure

Adjustment out of
specification ..... B .. Require repair or replacement.
Application incorrect ... B ..... (1) Require replacement.
Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement.

of hardware.

Base burned, affecting performance ..... A ..... (2) Require repair or replacement.

Base burned, not affecting performance ..... 2 ..... (2) Suggest repair or replacement.

Base corroded, affecting performance ..... A .. Require repair or replacement.

Base corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Base leaking ..... A .. Require repair or replacement.

Base loose, affecting performance ..... B .. Require repair or replacement.

Base loose, not affecting performance ..... 1 .. Suggest repair or replacement.

Base melted ..... A ..... (2) Require replacement.

Bracket bent, affecting performance ..... A .. Require repair or replacement.

Bracket bent, not affecting performance .. .. No service suggested or required.

Bracket broken, affecting performance ..... A ..... Require replacement.

Bracket broken, not affecting performance .. .. No service suggested or required.

Bracket corroded, affecting performance .. A .. Require repair or replacement.

Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Bracket cracked, affecting performance ..... A .. Require repair or replacement.

Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket loose, affecting performance ..... A .. Require repair or replacement.

Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket missing ..... C ..... Require replacement.

Burned out ..... A ..... Require replacement.

Connector broken ..... A .. Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.

Connector melted ..... A ..... (2) Require repair or replacement.

*** ELECTRICAL SYSTEM UNIFORM INSPEC**

Connector missing ..... C ..... Require replacement.
Corroded, affecting
performance ..... A .. Require repair or replacement.
Corroded, not affecting
performance ..... 2 .. Suggest repair or replacement.
Cracked ..... A ..... Require replacement.
Intermittent ..... A ..... Require replacement.
Lamp base melted ..... A ..... (2) Require replacement.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Seized in socket ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (2) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 ..... (2) Suggest repair or
replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - Application incorrect includes wrong bulb coating or color.
(2) - Determine cause and correct prior to repair or replacement of part.

CD PLAYERS

See TAPE PLAYERS AND CD PLAYERS.

CIGARETTE LIGHTER ASSEMBLIES

CIGARETTE LIGHTER ASSEMBLY INSPECTION

Condition	Code	Procedure

Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Inoperative ..... A ..... (1) Require repair or replacement.
Loose ..... A .. Require repair or replacement.
Missing ..... 2 ..... Suggest replacement.
Sticking ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (2) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.
(2) - Determine cause and correct prior to repair or replacement of part.

CIRCUIT BREAKERS

See FUSES, FUSIBLE LINKS AND CIRCUIT BREAKERS.

CLUTCH SWITCHES

See SWITCHES.

CONNECTORS

See WIRING HARNESSES AND CONNECTORS.

CONTROL MODULES

CONTROL MODULE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Code set (if applicable)	A	(1) Further inspection required.
Connector broken	A	Require repair or replacement.
Connector melted	A	(2) Require repair or replacement.
Connector missing	A	Require repair.
Contaminated	A	(3) Require repair or replacement.
Inoperative	B	(4) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(2) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.

Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Refer to manufacturer's diagnostic trouble code procedure and require repair or replacement of affected component(s).
(2) - Determine cause and correct prior to repair or replacement of part.
(3) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(4) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

CRUISE CONTROL BRAKE SWITCHES

See SWITCHES.

CRUISE CONTROL CABLES

See CRUISE CONTROL LINKAGES AND CABLES.

CRUISE CONTROL CLUTCH SWITCHES

See SWITCHES.

CRUISE CONTROL LINKAGES AND CABLES

CRUISE CONTROL LINKAGE AND CABLE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ...	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.

*** ELECTRICAL SYSTEM UNIFORM INS**

Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Bent ..... A .. Require repair or replacement.
Binding ..... A .. Require repair or replacement.
Bracket bent, affecting performance ..... A .. Require repair or replacement.
Bracket bent, not affecting performance .. .. No service suggested or required.
Bracket broken, affecting performance ..... A ..... Require replacement.
Bracket broken, not affecting performance .. .. No service suggested or required.
Bracket corroded, affecting performance .. A .. Require repair or replacement.
Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Bracket cracked, affecting performance ..... A .. Require repair or replacement.
Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket loose, affecting performance ..... A .. Require repair or replacement.
Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Broken ..... A ..... Require replacement.
Cracked ..... A .. Require repair or replacement.
Disconnected ..... A .. Require repair or replacement.
Kinked ..... A .. Require repair or replacement.
Melted ..... A ..... (1) Require repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B ..... (2) Require repair or replacement.
Routed incorrectly ..... 2 ..... Suggest repair.
Seized ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Follow OEM recommended adjustment procedures. Require repair or replacement if out of specification.

CRUISE CONTROL RESERVOIRS

See CRUISE CONTROL VACUUM HOSES, TUBES AND RESERVOIRS.

CRUISE CONTROL TUBES

See CRUISE CONTROL VACUUM HOSES, TUBES AND RESERVOIRS.

CRUISE CONTROL VACUUM DUMP RELEASE VALVES

CRUISE CONTROL VACUUM DUMP RELEASE VALVE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Broken	A	Require repair or replacement.
Inoperative	A	(1) Require replacement.
Leaking	2	Suggest replacement.
Out of adjustment	B	(2) Further inspection required.

(1) - Inoperative includes intermittent operation or out of OEM specification.
(2) - Follow OEM recommended adjustment procedures. Require repair or replacement if out of specification.

CRUISE CONTROL VACUUM HOSES, TUBES AND RESERVOIRS

CRUISE CONTROL VACUUM HOSE, TUBE AND RESERVOIR INSPECTION

Condition	Code	Procedure
Leaking	A	Require repair or replacement.
Melted	A	Require replacement.
Missing	C	Require replacement.
Oil-soaked (spongy)	1	Suggest replacement.

*** ELE**

Restricted ..... A .. Require repair or replacement.
Surface cracks (dry-
rotted) ..... 1 ..... Suggest replacement.

CRUISE CONTROL VEHICLE SPEED SENSORS

CRUISE CONTROL VEHICLE SPEED SENSOR INSPECTION

Condition	Code	Procedure
Air gap incorrect	B	(1) Require adjustment to vehicle manufacturer's specifications.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Broken	A	Require replacement.
Housing cracked	A	Require replacement.
Internal resistance does not meet specifications	B	(2) Require replacement.
Lead routing incorrect	B	Require rerouting according to vehicle manufacturer's specifications.
Loose	B	(3) Require adjustment to vehicle manufacturer's specifications.
Missing	C	Require replacement.
Output signal incorrect	B	(2) Require repair or replacement.
Surface contaminated	2	Suggest cleaning; identify and correct source.
Tip bent	B	Require replacement.
Tip broken	B	Require replacement.
Tip missing	B	Require replacement.
Wire lead burned	A	Require replacement.
Wire lead conductors exposed	B	Require replacement.
Wire lead corroded	A	Require replacement.

*** ELECTRICAL SYSTEM UNIFORM INSPE**

Wire lead open ..... A ..... Require replacement.
Wire lead shorted ..... A ..... Require replacement.

(1) - If a sensor is not adjustable, further inspection is required to identify and correct cause.
(2) - Component failure may be caused by water intrusion into the wiring harness. Always check insulation for damage and wiring for excessive resistance.
(3) - Some integral bearing assemblies with sensors may require replacement.

DEFOGGERS

See HEATING ELEMENTS (DEFROSTERS, DEFOGGERS, ELECTRIC HEATERS AND SEATS).

DEFROSTERS

See HEATING ELEMENTS (DEFROSTERS, DEFOGGERS, ELECTRIC HEATERS AND SEATS).

DELAYS

DELAY INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Binding, affecting performance	A	Require repair or replacement.
Binding, not affecting performance	2	Suggest repair or replacement.
Broken	A	Require repair or replacement.
Burned, affecting performance	A	(1) Require repair or replacement.
Burned, not affecting		

performance ..... 2 ..... (1) Suggest repair or replacement.
Cracked, affecting performance ..... A .. Require repair or replacement.
Cracked, not affecting performance ..... 1 .. Suggest repair or replacement.
Inoperative ..... A ..... (2) Require repair or replacement.
Melted, affecting performance ..... A ..... (1) Require repair or replacement.
Melted, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

DIMMERS

DIMMER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ...	Require repair or replacement of hardware.
Attaching hardware		

missing ..... C ..... Require replacement of hardware.

Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.

Binding, affecting performance ..... A .. Require repair or replacement.

Binding, not affecting performance ..... 2 .. Suggest repair or replacement.

Broken ..... A .. Require repair or replacement.

Burned, affecting performance ..... A ..... (1) Require repair or replacement.

Burned, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.

Cracked, affecting performance ..... A .. Require repair or replacement.

Cracked, not affecting performance ..... 1 .. Suggest repair or replacement.

Inoperative ..... A ..... (2) Require repair or replacement.

Melted, affecting performance ..... A ..... (1) Require repair or replacement.

Melted, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.

Missing ..... C ..... Require replacement.

Terminal broken ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal corroded, affecting performance .. A .. Require repair or replacement.

Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.

Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

(2) - Inoperative includes intermittent operation or out of OEM specification.

ELECTRIC HEATERS

See HEATING ELEMENTS (DEFROSTERS, DEFOGGERS, ELECTRIC HEATERS AND SEATS).

EQUALIZERS

See RECEIVERS, AMPLIFIERS, EQUALIZERS AND SUB-WOOFER VOLUME CONTROLS.

FUSE BLOCKS

See FUSE BOXES AND BLOCKS.

FUSE BOXES AND BLOCKS

FUSE BOX AND BLOCK INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Broken, affecting performance	A	Require replacement.
Broken, not affecting performance	..	No service suggested or required.
Burned, affecting performance	A	(1) Require repair or replacement.
Burned, not affecting performance	2	(1) Suggest repair or replacement.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack		

type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Cover missing ..... C ... Require replacement of cover.
Cracked, affecting performance ..... A .. Require repair or replacement.
Cracked, not affecting performance ..... 1 .. Suggest repair or replacement.
Melted, affecting performance ..... A ..... (1) Require replacement.
Melted, not affecting performance ..... 2 ..... (1) Suggest replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

FUSES, FUSIBLE LINKS AND CIRCUIT BREAKERS

FUSE, FUSIBLE LINK AND CIRCUIT BREAKER INSPECTION

Condition Code Procedure

Application incorrect ... B ..... Require replacement.
Blown ..... A ..... (1) Require replacement.
Corroded, affecting performance ..... A .. Require repair or replacement.
Corroded, not affecting performance ..... 2 .. Suggest repair or replacement.
Cracked, affecting performance ..... A .. Require repair or replacement.

Cracked, not affecting
performance ..... 1 .. Suggest repair or replacement.
Inoperative ..... A ..... (2) Require replacement.
Insulation damaged,
conductors exposed ..... A .. Require repair or replacement.
Insulation damaged,
conductors not exposed . 1 ..... Suggest replacement.
Missing ..... C ..... Require replacement.
Routed incorrectly ..... B ..... Require repair.
Secured incorrectly ..... B ..... Require repair.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation.

FUSIBLE LINKS

See FUSES, FUSIBLE LINKS AND CIRCUIT BREAKERS.

GAUGES

NOTE: Includes odometers, speedometers and tachometers (except cable-driven).

GAUGE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ...	Require repair or replacement of hardware.

Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Leaking ..... A ..... Require replacement.
Lens broken ..... A ..... (2) Require repair or replacement.
Lens cloudy ..... 2 ..... (2) Suggest repair or replacement.
Lens missing ..... C ..... (2) Require repair or replacement.
Malfunctioning ..... A ..... (3) Require repair or replacement.
Mechanical head noisy ... 2 .. Suggest repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - If lens is available as a separate part, require replacement of lens only.
(3) - Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.

GENERATORS

See ALTERNATORS AND GENERATORS.

GROUND CABLES AND STRAPS

GROUND CABLE AND STRAP INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Corroded, affecting performance	A	Require repair or replacement.
Corroded, not affecting performance	2	Suggest repair or replacement.
Insulation damaged, exposing conductors	2	Suggest replacement.
Loose	A	Require repair.
Missing	C	Require replacement.
Open	A	Require repair or replacement.
Resistance high	A	Require repair or replacement.
Terminal resistance (voltage drop) is out of specification	B	Require repair or replacement.
Voltage drop out of specification	B	Require repair or replacement.

GROUND STRAPS

See GROUND CABLES AND STRAPS.

HEADLIGHT ADJUSTERS

HEADLIGHT ADJUSTER INSPECTION

Condition	Code	Procedure

Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Bent, preventing adjustment ..... A .. Require repair or replacement.
Broken ..... A .. Require repair or replacement.
Indicator broken ..... A ..... Require replacement.
Indicator missing ..... C ..... Require replacement.
Missing ..... C ..... Require replacement of adjusters.
Seized ..... A .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

HEATING ELEMENTS (DEFROSTERS, DEFOGGERS, ELECTRIC HEATERS AND SEATS)

HEATING ELEMENT (DEFROSTER, DEFOGGER, ELECTRIC HEATER AND SEAT) INSPECTION

Condition Code Procedure

Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require repair or

replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Wire lead burned ..... A .. Require repair or replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

HORNS AND SIRENS

HORN AND SIREN INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.

Inoperative ..... A ..... (2) Require repair or replacement.
Missing ..... C ..... Require replacement.
Out of adjustment ..... B ..... Require adjustment.
Sound quality poor ..... A .. Require repair or replacement. Further inspection required.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Wire lead burned ..... A .. Require repair or replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation.

IGNITION SWITCHES

See SWITCHES.

INDICATOR LIGHTS

INDICATOR LIGHT INSPECTION

Condition	Code	Procedure
Does not come on during bulb check		(1) Further inspection required.
Fails to function properly during test mode		(1) Further inspection

required.
On constantly .... (1) Further inspection required.
On intermittently .... (1) Further inspection required.

(1) - See service manual for further information.

KEYLESS ENTRY KEYPADS AND TRANSMITTERS

KEYLESS ENTRY KEYPAD AND TRANSMITTER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Malfunctioning	A	(2) Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.

Wire lead burned ..... A .. Require repair or replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Malfunctioning includes inoperative, intermittent operation, or failure to perform all functions.

KEYLESS ENTRY TRANSMITTERS

See KEYLESS ENTRY KEYPADS AND TRANSMITTERS.

LEDS

See BULBS, SEALED BEAMS AND LEDS.

LENSES

LENSE INSPECTION

Condition Code Procedure

Adjustment out of
specification ..... B ..... Require repair.
Application incorrect ... A ..... Require replacement.
Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Broken, affecting
performance ..... A ..... Require replacement.
Broken, not affecting
performance..... .. .. No service suggested or required.
Cracked ..... A ..... Require replacement.
Discolored ..... A ..... Require replacement.
Leaking ..... A .. Require repair or replacement.

*** ELECTRICAL SYSTEM UNIFORM INS**

Melted, affecting performance ..... A ..... Require replacement.
Melted, not affecting performance ..... 2 ..... Suggest replacement.
Missing ..... C ..... Require replacement.

MICROPHONES

See SPEAKERS AND MICROPHONES.

MIRRORS (ELECTROCHROMATIC AND HEATED)

MIRROR (ELECTROCHROMATIC AND HEATED) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Broken	A	Require repair or replacement.
Connector broken	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Cracked	A	Require replacement.
Inoperative	A	(2) Require replacement.
Missing	C	Require replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.

Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Wire lead burned ..... A .. Require repair or replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation.

MOTORS

MOTOR INSPECTION

Condition Code Procedure

Amperage draw out of
specification ..... A .. Require repair or replacement.
Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Bracket bent ..... A .. Require repair or replacement.
Bracket broken ..... A .. Require repair or replacement.
Bracket cracked ..... A .. Require repair or replacement.
Bracket holes elongated,
affecting performance .. A .. Require repair or replacement.
Bracket holes elongated,
not affecting
performance .... No service suggested or required.
Bracket missing ..... C ..... Require replacement.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack
type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement. *** ELECTRICAL SYSTEM UNIFORM INSPE**

Drive mechanism damaged,
affecting performance .. A ..... (2) Require repair or replacement.
Drive mechanism damaged,
not affecting
performance ..... 2 ..... (2) Suggest repair or replacement.
Fails to disengage ..... A .. Require repair or replacement.
Housing broken, affecting
performance ..... 2 .. Suggest repair or replacement.
Housing broken, not
affecting performance .. .. No service suggested or required.
Housing cracked, affecting
performance ..... A .. Require repair or replacement.
Housing cracked, not
affecting performance .. 1 .. Suggest repair or replacement.
Inoperative ..... A ..... (3) Require repair or replacement.
Linkage bent, affecting
performance ..... A ... Require repair or replacement of linkage.
Linkage bent, not
affecting performance .. .. No service suggested or required.
Linkage binding, affecting
performance ..... A ... Require repair or replacement of linkage.
Linkage binding, not
affecting performance .. 2 ... Suggest repair or replacement of linkage.
Linkage broken ..... A ... Require repair or replacement of linkage.
Linkage loose, affecting
performance ..... A ... Require repair or replacement of linkage.
Linkage loose, not
affecting performance .. 1 ... Suggest repair or replacement of linkage.
Linkage missing ..... C ..... Require replacement.
Linkage noisy ..... 2 .. Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B ..... (4) Further inspection required.
Resistance out of

*** ELECTRICAL SYSTEM UNIFORM INSPE(**

specification ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Wire lead burned ..... A .. Require repair or replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Further inspection required to determine cause.
(3) - Inoperative includes intermittent operation.
(4) - Follow OEM recommended adjustment procedures. Repair or replace if out of specification.

NEUTRAL SAFETY SWITCHES

See SWITCHES.

ODOMETERS

See GAUGES.

ODOMETERS, SPEEDOMETERS AND TACHOMETERS (CABLE-DRIVEN)

ODOMETER, SPEEDOMETER AND TACHOMETER (CABLE-DRIVEN) INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement of hardware

Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Drive cable broken ..... A ..... Require replacement.
Drive cable noisy ..... 2 .. Suggest repair or replacement.
Inoperative ..... A ..... (2) Further inspection required.
Leaking ..... A ..... Require replacement.
Lens broken ..... A ..... (3) Require repair or replacement.
Lens cloudy ..... 2 ..... (3) Suggest repair or replacement.
Lens missing ..... C ..... (3) Require repair or replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - If lens is available as a separate part, require replacement of lens only.
(3) - Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.

PULLEYS

PULLEY INSPECTION

Condition	Code	Procedure
Alignment incorrect	B	Require repair or replacement.
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bent	A	Require replacement.
Cracked	A	Require replacement.
Loose	A	Require repair or replacement.
Missing	C	Require replacement.
Pulley damaged, affecting belt life	A	Require replacement.

RECEIVERS, AMPLIFIERS, EQUALIZERS AND SUB-WOOFER VOLUME CONTROLS

RECEIVER, AMPLIFIER, EQUALIZER AND SUB-WOOFER VOLUME CONTROL INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector melted	A	(1) Require repair or

replacement.
Connector missing ..... C ..... Require replacement.
Malfunctioning ..... A ..... (2) Require repair or replacement.
Missing ..... C ..... Require replacement.
Sound quality poor ..... A ..... (3) Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Wire lead burned ..... A .. Require repair or replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Malfunctioning includes inoperative, intermittent operation, or failure to perform all functions.
(3) - Make sure poor sound quality is not caused by ignition/charging system or other forms of electrical interference.

RELAY BOXES

RELAY BOX INSPECTION

Condition Code Procedure

Attaching hardware broken ..... A ... Require repair or replacement of hardware.

Attaching hardware

missing ..... C ..... Require replacement of hardware.

Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.

Broken, affecting performance ..... A ..... Require replacement.

Broken, not affecting performance .... No service suggested or required.

Burned, affecting performance ..... A ..... (1) Require repair or replacement.

Burned, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.

Connector broken ..... A .. Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.

Connector melted ..... A ..... (1) Require repair or replacement.

Connector missing ..... C ..... Require replacement.

Cover missing ..... C ... Require replacement of cover.

Cracked, affecting performance ..... A .. Require repair or replacement.

Cracked, not affecting performance ..... 1 .. Suggest repair or replacement.

Melted, affecting performance ..... A ..... (1) Require replacement.

Melted, not affecting performance ..... 2 ..... (1) Suggest replacement.

Terminal broken ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal corroded, affecting performance .. A .. Require repair or replacement.

Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.

Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

RELAYS

RELAY INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Housing broken	A	Require replacement.
Housing cracked	2	Suggest replacement.
Inoperative	A	(1) Require replacement.
Missing	C	Require replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(2) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.
(2) - Determine cause and correct prior to repair or replacement of part.

SEALED BEAMS

See BULBS, SEALED BEAMS AND LEDS.

SEAT HEATERS

See HEATING ELEMENTS (DEFROSTERS, DEFOGGERS, ELECTRIC HEATERS AND SEATS).

SECURITY ALARM SENSORS

SECURITY ALARM SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Inoperative	B	(2) Require repair or replacement. Further inspection required.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not		

affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

SIRENS

See HORNS AND SIRENS.

SOLENOIDS

See ACTUATOR MOTORS (SOLENOIDS) (ELECTRIC).

NOTE: For starter solenoids that are integral to the starter assembly, see STARTERS.

NOTE: For starter relays, see RELAYS.

SPEAKERS AND MICROPHONES

SPEAKER AND MICROPHONE INSPECTION

Condition Code Procedure

Application incorrect ... A ..... Require replacement.
Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Connector broken ... A ... Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... B ..... (2) Require repair or replacement. Further inspection required.
Membrane torn ..... A ..... Require replacement.
Missing ..... C ..... Require replacement.
Polarity reversed ..... A ..... Require repair.
Sound quality poor ..... A ..... (3) Require repair or replacement. Further inspection required.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.
(3) - Make sure poor sound quality is not caused by ignition/charging system or other forms of electrical interference.

SPEEDOMETER AND TACHOMETER LINKAGES AND CABLES

SPEEDOMETER AND TACHOMETER LINKAGE AND CABLE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ...	Require repair or replacement

of hardware.

Attaching hardware missing ..... C ..... Require replacement of hardware.

Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.

Bent ..... A .. Require repair or replacement.

Binding ..... A .. Require repair or replacement.

Bracket bent, affecting performance ..... A .. Require repair or replacement.

Bracket bent, not affecting performance .. .. No service suggested or required.

Bracket broken, affecting performance ..... A ..... Require replacement.

Bracket broken, not affecting performance .. .. No service suggested or required.

Bracket corroded, affecting performance .. A .. Require repair or replacement.

Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Bracket cracked, affecting performance ..... A .. Require repair or replacement.

Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket loose, affecting performance ..... A .. Require repair or replacement.

Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket missing ..... C ..... Require replacement.

Broken ..... A ..... Require replacement.

Cracked ..... A .. Require repair or replacement.

Disconnected ..... A .. Require repair or replacement.

Kinked ..... A .. Require repair or replacement.

Melted ..... A ..... (1) Require repair or replacement.

Missing ..... C ..... Require replacement.

Noisy ..... 2 .. Suggest repair or replacement.

Routed incorrectly ..... 2 ..... Suggest repair.

Seized ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

SPEEDOMETER CABLES

See SPEEDOMETER AND TACHOMETER LINKAGES AND CABLES.

SPEEDOMETERS

See GAUGES.

STARTERS

NOTE: To prevent misdiagnosis, care should be taken to eliminate the possibilities of mechanical problems or high resistance in power and/or ground circuits.

STARTER INSPECTION

Condition	Code	Procedure
Amperage draw does not meet OEM specifications	B	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	(1) Require repair or replacement of hardware.
Bracket bent, affecting performance	A	Require repair or replacement.
Bracket bent, not affecting performance		No service suggested or required.
Bracket broken, affecting performance	A	Require replacement.
Bracket broken, not affecting performance		No service suggested or required.
Bracket corroded, affecting performance	A	Require repair or replacement.
Bracket corroded, not affecting performance	2	Suggest repair or replacement.
Bracket cracked, affecting performance	A	Require repair or replacement.

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Bracket cracked, not
affecting performance .. 1 .. Suggest repair or replacement.
Bracket holes elongated,
affecting performance .. A .. Require repair or replacement.
Bracket holes elongated,
not affecting
performance) .... No service suggested or
required.
Bracket loose, affecting
performance ..... A .. Require repair or replacement.
Bracket loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Drive gear damaged,
affecting performance .. A ..... (2) Require repair or
replacement.
Drive gear damaged, not
affecting performance .. 2 ..... (2) Suggest repair or
replacement.
Fails to disengage ..... A .. Require repair or replacement.
Housing broken, affecting
performance ..... 2 .. Require repair or replacement.
Housing broken, not
affecting performance .. .. No service suggested or
required.
Housing cracked, affecting
performance ..... A ... Require repair or replacement.
Housing cracked, not
affecting performance .. 2 .. Suggest repair or replacement.
Inoperative ..... A ..... (3) Require repair or
replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Shimmed incorrectly ..... B ..... Require repair.
Starter shaft bushing
missing ..... C ..... (4) Require replacement.
Starter shaft bushing
worn, affecting
performance ..... A ..... Require replacement.
Starter shaft bushing
worn, not affecting
performance ..... 1 ..... Suggest replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (5) Require repair or
replacement.
Terminal burned, not

*** ELECTRICAL SYSTEM UNIFORM INSPE**

affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.

(1) - Inspect block or bell housing mounting surface.
(2) - Further inspection required to determine cause. Require inspection of ring gear.
(3) - Inoperative includes intermittent operation.
(4) - Bushing may be in bell housing.
(5) - Determine cause and correct prior to repair or replacement of part.

SUB-WOOFER VOLUME CONTROLS

See
RECEIVERS, AMPLIFIERS, EQUALIZERS AND SUB-WOOFER VOLUME CONTROLS.

SWITCHES

SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Binding, affecting performance	A	Require repair or replacement.
Binding, not affecting performance	2	Suggest repair or replacement.
Broken	A	Require repair or replacement.
Burned, affecting performance	A	(1) Require repair or

replacement.

Burned, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.

Cracked, affecting performance ..... A .. Require repair or replacement.

Cracked, not affecting performance ..... 1 .. Suggest repair or replacement.

Leaking ..... A .. Require repair or replacement.

Malfunctioning ..... A ..... (2) Require repair or replacement.

Melted, affecting performance ..... A ..... (1) Require repair or replacement.

Melted, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.

Missing ..... C ..... Require replacement.

Out of adjustment ..... B .. Require repair or replacement.

Terminal broken ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal corroded, affecting performance .. A .. Require repair or replacement.

Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.

Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

Won't return ..... A .. Require repair or replacement.

Worn ..... 1 ..... Suggest replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Includes inoperative, intermittent operation, or failure to perform all functions.

TACHOMETER CABLES

See SPEEDOMETER AND TACHOMETER LINKAGES AND CABLES.

TACHOMETERS

See GAUGES.

TAPE PLAYERS AND CD PLAYERS

TAPE PLAYER AND CD PLAYER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Malfunctioning	A	(2) Require repair or replacement.
Missing	C	Require replacement.
Skips	A	Require repair or replacement.
Sound quality poor	A	(3) Require repair or replacement.
Speed incorrect	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.
Wire lead burned	A	Require repair or replacement.
Wire lead conductors		

exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Malfunctioning includes inoperative, intermittent operation, or failure to perform all functions.
(3) - Make sure poor sound quality is not caused by ignition/charging system or other forms of electrical interference.

TENSIONERS

TENSIONER INSPECTION

Condition Code Procedure

Alignment incorrect ..... B .. Require repair or replacement.
Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Bearings worn ..... 1 ..... Suggest replacement.
Belt tension incorrect .. B ... Require adjustment or repair.
Cracked ..... 2 ..... Suggest replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 ..... Suggest replacement.
Pulley damaged, affecting belt life ..... A ..... Require replacement.
Seized ..... A .. Require repair or replacement.

TIMERS

TIMER INSPECTION

Condition Code Procedure

Attaching hardware *** ELECTRICAL SYSTEM UNIFORM INSPECTION GUIDELINES *Article Text (p.**

broken ..... A ... Require repair or replacement of hardware.

Attaching hardware missing ..... C ..... Require replacement of hardware.

Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.

Broken ..... A .. Require repair or replacement.

Burned, affecting performance ..... A ..... (1) Require repair or replacement.

Burned, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.

Cracked, affecting performance ..... A .. Require repair or replacement.

Cracked, not affecting performance ..... 1 .. Suggest repair or replacement.

Inoperative ..... A ..... (2) Require repair or replacement.

Melted, affecting performance ..... A ..... (1) Require repair or replacement.

Melted, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.

Missing ..... C ..... Require replacement.

Terminal broken ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal corroded, affecting performance .. A .. Require repair or replacement.

Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.

Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

(2) - Inoperative includes intermittent operation or out of OEM

specification.

TIRE PRESSURE SENSORS

TIRE PRESSURE SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Inoperative	A	(1) Require repair or replacement.
Loose	A	Require repair or replacement.
Missing	C	Require replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

TRANSCEIVERS

TRANSCEIVER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.

Malfunctioning ..... A ..... (2) Require repair or replacement.
Missing ..... C ..... Require replacement.
Sound quality poor ..... A ..... (3) Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Wire lead burned ..... A .. Require repair or replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Malfunctioning includes inoperative, intermittent operation, or failure to perform all functions.
(3) - Make sure poor sound quality is not caused by ignition/charging system or other forms of electrical interference.

TRANSDUCERS

TRANSDUCER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ...	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.

Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Drive mechanism damaged, affecting performance .. A ..... (2) Require repair or replacement.
Drive mechanism damaged, not affecting performance ..... 2 ..... (2) Suggest repair or replacement.
Inoperative ..... A ..... (3) Require repair or replacement.
Leaking (vacuum/fluid/air) ..... A ..... Require replacement.
Linkage bent, affecting performance ..... A ... Require repair or replacement of linkage.
Linkage bent, not affecting performance .. .. No service suggested or required.
Linkage binding, affecting performance ..... A ... Require repair or replacement of linkage.
Linkage binding, not affecting performance .. 2 ... Suggest repair or replacement of linkage.
Linkage broken ..... A ... Require repair or replacement of linkage.
Linkage loose, affecting performance ..... A ... Require repair or replacement of linkage.
Linkage loose, not affecting performance .. 1 ... Suggest repair or replacement of linkage.
Linkage missing ..... C ..... Require replacement.
Linkage noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B ..... (4) Further inspection required.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting

performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Further inspection required to determine cause.
(3) - Inoperative includes intermittent operation or out of specification.
(4) - Follow OEM recommended adjustment procedures. Repair or replace if out of specification.

VACUUM ACCUMULATORS (RESERVOIRS)

VACUUM ACCUMULATOR (RESERVOIR) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Leaking	A	Require repair or replacement.

VACUUM RESERVOIRS

See VACUUM ACCUMULATORS (RESERVOIRS).

VOLTAGE REGULATORS

VOLTAGE REGULATOR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Inoperative	A	(2) Require replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - NOTE: Inoperative includes intermittent operation or out of OEM specification.

WASHER FLUID LEVEL SENDERS

WASHER FLUID LEVEL SENDER INSPECTION

Condition	Code	Procedure

Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Inoperative ..... A ..... (1) Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (2) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.
(2) - Determine cause and correct prior to repair or replacement of part.

WASHER PUMPS

WASHER PUMP INSPECTION

Condition	Code	Procedure
Attaching hardware		

broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require repair or replacement.
Leaking externally ..... A .. Require repair or replacement.
Leaking internally ..... A .. Require repair or replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Resistance out of specification ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation.

WIPER ARMS AND BLADES

NOTE: Windshield coatings or waxes can cause blades to not function as intended. Clean surface before making final judgment about blade replacement.

WIPER ARM AND BLADE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Attaching socket stripped	A	Require replacement.
Bent	A	Require repair or replacement.
Loose	2	Suggest repair or replacement.
Missing	C	Require replacement.
Noisy	2	Suggest repair or replacement.
Size incorrect	2	Suggest replacement.
Tension insufficient	B	Require repair or replacement.
Torn	A	Require replacement.
Worn, affecting performance	A	Require replacement.
Worn, not affecting performance	1	Suggest replacement.

WIPER BLADES

See WIPER ARMS AND BLADES.

WIPER HOSES AND NOZZLES

WIPER HOSE AND NOZZLE INSPECTION

Condition	Code	Procedure
Attaching hardware		

*** ELE**

broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Blocked ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Oil-soaked (spongy) ..... 1 ..... Suggest replacement.
Spray pattern incorrect . 2 .. Suggest repair or replacement.
Surface cracks (dry-rotted) ..... 1 ..... Suggest replacement.

WIPER LINKAGES

WIPER LINKAGE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Attaching stud stripped	A	Require replacement.
Bent	A	Require repair or replacement.
Inoperative	A	(1) Require replacement.
Loose	2	Suggest repair or replacement.
Missing	C	Require replacement.
Noisy	2	Suggest repair or replacement.
Tension insufficient	B	Require repair or replacement.
Worn, affecting performance	A	Require replacement.
Worn, not affecting performance	1	Suggest replacement.

(1) - Inoperative includes intermittent operation.

WIPER NOZZLES

See WIPER HOSES AND NOZZLES.

WIPER PUMP RESERVOIRS

WIPER PUMP RESERVOIR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Cap missing	C	Require replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.

WIRING HARNESSES AND CONNECTORS

WIRING HARNESS AND CONNECTOR INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.

*** ELE**

Connector missing ..... C ..... Require replacement.
Insulation damaged,
conductors exposed ..... A .. Require repair or replacement.
Insulation damaged,
conductors not exposed . 1 ..... Suggest replacement.
Open ..... A .. Require repair or replacement.
Protective shield
(conduit) melted ..... 2 ..... (1) Suggest repair or replacement.
Protective shield
(conduit) missing ..... 2 .. Suggest repair or replacement.
Resistance (voltage drop)
out of specification ... A .. Require repair or replacement.
Routed incorrectly ..... B ..... Require repair.
Secured incorrectly ..... B ..... Require repair.
Shorted ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Voltage drop out of
specification ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

END OF ARTICLE

* A/C-HEATER SYSTEM UNIFORM INSPECTION GUIDELINES *
Article Text
1996 Kia Sephia
For 1 1 1 1 1

Saturday, April 18, 2009 10:05PM

ARTICLE BEGINNING

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A/C-Heater System Motorist Assurance Program
Standards For Automotive Repair

All Makes and Models

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MOTORIST ASSURANCE PROGRAM (MAP)

OVERVIEW

The Motorist Assurance Program is the consumer outreach effort of the Automotive Maintenance and Repair Association, Inc. (AMRA). Participation in the Motorist Assurance Program is drawn from retailers, suppliers, independent repair facilities, vehicle manufacturers and industry associations.

Our organization's mission is to strengthen the relationship between the consumer and the auto repair industry. We produce materials that give motorists the information and encouragement to take greater responsibility for their vehicles-through proper, manufacturer-recommended, maintenance. We encourage participating service and repair shops (including franchisees and dealers) to adopt (1) a Pledge of Assurance to their Customers and (2) the Motorist Assurance Program Standards of Service. All participating service providers have agreed to subscribe to this Pledge and to adhere to the promulgated Standards of Service demonstrating to their customers that they are serious about customer satisfaction.

These Standards of Service require that an inspection of the vehicle's (problem) system be made and the results communicated to the customer according to industry standards. Given that the industry did not have such standards, the Motorist Assurance Program successfully promulgated industry inspection communication standards in 1994-95 for the following systems: Exhaust, Brakes, ABS, Steering and Suspension, Engine Maintenance and Performance, HVAC, and Electrical Systems. Further, revisions to all of these inspection communication standards are continually republished. In addition to these, standards for Drive Train and Transmissions have recently been promulgated. Participating shops utilize these Uniform Inspection & Communication Standards as part of the inspection process and for communicating their findings to their customers.

The Motorist Assurance Program continues to work cooperatively and proactively with government agencies and consumer groups toward solutions that both benefit the customer and are mutually acceptable to both regulators and industry. We maintain the belief that industry must retain control over how we conduct our business, and we must be viewed as part of the solution and not part of the problem. Meetings with state and other government officials (and their representatives), concerned with auto repair and/or consumer protection, are conducted. Feedback from these sessions is

brought back to the association, and the program adjusted as needed.

To assure auto repair customers recourse if they were not satisfied with a repair transaction, the Motorist Assurance Program offers mediation and arbitration through MAP/BBB-CARE and other non-profit organizations. MAP conducted pilot programs in twelve states before announcing the program nationally in October, 1998. During the pilots, participating repair shops demonstrated their adherence to the Pledge and Standards and agreed to follow the UICS in communicating the results of their inspection to their customers. To put some "teeth" in the program, an accreditation requirement for shops was initiated. The requirements are stringent, and a self-policing method has been incorporated which includes the "mystery shopping" of outlets.

We welcome you to join us as we continue our outreach... with your support, both the automotive repair industry and your customers will reap the benefits. Please visit MAP at our Internet site www.motorist.org or contact us at:

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January 1999

MAP UNIFORM INSPECTION GENERAL GUIDELINES

OVERVIEW OF SERVICE REQUIREMENTS & SUGGESTIONS

It is MAP policy that all exhaust, brake, steering, suspension, wheel alignment, drive-line, engine performance and maintenance, and heating, ventilation and air conditioning, and electrical services be offered and performed under the standards and procedures specified in these sections.

Before any service is performed on a vehicle, an inspection of the appropriate system must be performed. The results of this inspection must be explained to the customer and documented on an inspection form. The condition of the vehicle and its components will indicate what services/part replacements may be "Required" or "Suggested". In addition, suggestions may be made to satisfy the requests expressed by the customer.

When a component is suggested or required to be repaired or replaced, the decision to repair or replace must be made in the customer's best interest, and at his or her choice given the options available.

This section lists the various parts and conditions that indicate a required or suggested service or part replacement. Although this list is extensive, it is not fully inclusive. In

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addition to this list, a technician may make a suggestion. However, any suggestions must be based on substantial and informed experience, or the vehicle manufacturer's recommended service interval and must be documented.

Some conditions indicate that service or part replacement is required because the part in question is no longer providing the function for which it is intended, does not meet a vehicle manufacturer's design specification or is missing.

Example:
An exhaust pipe has corroded severely and has a hole in it through which exhaust gases are leaking. Replacement of the exhaust pipe in this case is required due to functional failure.

Example:
A brake rotor has been worn to the point where it measures less than the vehicle manufacturer's discard specifications. Replacement of the rotor is required because it does not meet design specifications.

Some conditions indicate that a service or part replacement is suggested because the part is close to the end of its useful life or addresses a customer's need, convenience or request. If a customer's vehicle has one of these conditions, the procedure may be only to suggest service.

Example:
An exhaust pipe is rusted, corroded or weak, but no leaks are present. In this case, the exhaust pipe has not failed. However, there is evidence that the pipe may need replacement in the near future. Replacement of the pipe may be suggested for the customer's convenience in avoiding a future problem.

Example:
The customer desires improved ride and/or handling, but the vehicle's shocks or struts have not failed. In this case, replacement may be suggested to satisfy the customer's wishes. In this case, replacement of the shocks or struts may not be sold as a requirement.

A customer, of course, has the choice of whether or not a shop will service his or her vehicle. He or she may decide not to follow some of your suggestions. When a repair is required, a MAP shop must refuse partial service on that system if, in the judgment of the service provider, proceeding with the work could create a condition

unsafe condition. When a procedure states that required or suggested repair or replacement is recommended, the customer must be informed of the generally acceptable repair/replacement options whether or not performed by the shop.

When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

The following reasons may be used for required and suggested services. These codes are shown in the "Code" column of the MAP Uniform Inspection & Communications Standards that follow:

Reasons to Require Repair or Replacement

A - Part no longer performs intended purpose
B - Part does not meet a design specification (regardless of performance)
C - Part is missing

NOTE: When a repair is required, the shop must refuse partial service to the system in question, if the repair creates or continues an unsafe condition.

Reasons to Suggest Repair or Replacement

1 - Part is close to the end of its useful life (just above discard specifications, or weak; failure likely to occur soon, etc.)
2 - To address a customer need, convenience, or request (to stiffen ride, enhance performance, eliminate noise, etc.)
3 - To comply with maintenance recommended by the vehicle's Original Equipment Manufacturer (OEM)
4 - Technician's recommendation based on substantial and informed experience

NOTE: Suggested services are always optional. When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

HEATING, VENTILATION, AND AIR CONDITIONING

SERVICE PROCEDURES REQUIRED AND SUGGESTED FOR PROPER VEHICLE OPERATION

CAUTION: Before working on any air conditioning system, be sure

to review current local, state, federal, and EPA regulations regarding charging, recycling, and disposal of refrigerant.

ACCUMULATORS

ACCUMULATOR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Beyond vehicle manufacturer's service interval	3	Suggest replacement.
Dessicant at the end of its useful life (saturated with moisture)	1	Suggest repair or replacement.
Dessicant bag deteriorated	A	(1) Require replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Tubing connection leaking	A	Require repair or replacement.

(1) - Inspect system to determine effects of dessicant bag deterioration.

ACTUATORS (ELECTRICAL)

ACTUATOR (ELECTRICAL) INSPECTION

Condition	Code	Procedure
Attaching hardware		

broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted, affecting performance .. A ..... (1) Require repair or replacement.
Connector melted, not affecting performance .. 2 ..... (1) Suggest repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require replacement.

Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 1 ..... (1) Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 1 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

ACTUATORS (VACUUM)

ACTUATOR (VACUUM) INSPECTION

Condition *Code Procedure

Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted, affecting performance .. A ..... (1) Require repair or replacement.
Connector melted, not affecting performance .. 2 ..... (1) Suggest repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require replacement.
Leaking (vacuum) ..... A .. Require repair or replacement.
Linkage bent, affecting performance ..... A ... Require repair or replacement of linkage.
Linkage bent, not affecting performance .. 2 ... Suggest repair or replacement of linkage.
Linkage binding, affecting performance ..... A ... Require repair or replacement of linkage.
Linkage binding, not affecting performance .. 1 ... Suggest repair or replacement of linkage.
Linkage broken ..... A ... Require repair or replacement of linkage.
Linkage loose, affecting performance ..... A ... Require repair or replacement of linkage.
Linkage loose, not affecting performance .. 1 ... Suggest repair or replacement of linkage.
Linkage missing ..... C ..... Require replacement.
Linkage noisy ..... 2 .. Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.

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Out of adjustment ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

AIR CONDITIONING FITTINGS

See AIR CONDITIONING METAL LINES, HOSES AND FITTING ASSEMBLIES.

AIR CONDITIONING HOSES

See AIR CONDITIONING METAL LINES, HOSES AND FITTING ASSEMBLIES.

AIR CONDITIONING METAL LINES, HOSES AND FITTING ASSEMBLIES

AIR CONDITIONING METAL LINE, HOSE AND FITTING ASSEMBLY INSPECTION

Condition	Code	Procedure
Abrasion damage, affecting structural integrity	A	Require repair or replacement.
Abrasion damage, not affecting structural integrity	..	No service suggested or required.
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Clamp corroded, not reusable	1	Suggest replacement.
Connected incorrectly	A	Require repair.
Corroded, affecting structural integrity	A	Require replacement.

Corroded, not affecting
structural integrity ... . No service suggested or
required.
Cracked ..... A .. Require repair or replacement.
Fitting type incorrect
(such as compression
fitting) ..... B ..... Require replacement.
Flange leaking ..... A .. Require repair or replacement.
Insufficient clamping
force, allowing hose to
leak ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Melted ..... 1 .. Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Outer covering damaged to
the extent that the inner
fabric is visible ..... A ..... Require replacement.
Protective sleeves
damaged ..... 2 . Suggest replacement of sleeves.
Protective sleeves
missing ..... C . Require replacement of sleeves.
Restricted, affecting
performance ..... A .. Require repair or replacement.
Routed incorrectly ..... 2 ..... Require repair.
Swollen ..... 1 ..... Suggest replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Type incorrect ..... 1 .. Suggest repair or replacement.

AIR CONTROL DOORS

See PLENUMS.

AIR DAMS (EXTERNAL)

AIR DAM (EXTERNAL) INSPECTION

Condition Code Procedure

Application incorrect,
affecting air
conditioning
system performance ..... A .. Require repair or replacement.
Attaching hardware

*** A/C-HEATER SYSTEM UNIFORM INSPECTI**

broken ..... A ... Require repair or replacement of hardware.

Attaching hardware missing ..... C ..... Require replacement of hardware.

Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.

Bent, affecting air conditioning system performance ..... A .. Require repair or replacement.

Blocked, affecting air conditioning system performance ..... A .. Require repair or replacement.

Broken, affecting air conditioning system performance ..... A .. Require repair or replacement.

Cracked, affecting air conditioning system performance ..... A .. Require repair or replacement.

Loose, affecting air conditioning system performance ..... A ..... Require repair.

Loose, not affecting air conditioning system performance ..... 2 ..... Suggest repair.

Missing, affecting air conditioning system performance ..... C ..... Require replacement.

AIR DISTRIBUTION SYSTEM

See PLENUMS.

BELTS

BELT INSPECTION

Condition	Code	Procedure
Alignment incorrect	B	(1) Further inspection required.
Cracked	1	Suggest replacement.
Frayed	1	Suggest replacement.
Missing	C	Require replacement.

Noisy ..... 2 ..... (2) Further inspection required.
Plies separated ..... A ..... Require replacement.
Serpentine belt routed incorrectly ..... B ..... Require repair.
Tension out of specification ..... B ..... Require adjustment or replacement.
Worn beyond adjustment range ..... B ..... Require replacement.

Worn so it contacts bottom of pulley ..... A ..... Require replacement.

(1) - Determine cause of incorrect alignment and require repair.
(2) - Determine cause of noise and suggest repair.

BLEND DOORS

See PLENUMS.

BLOWER FANS (BLOWER WHEEL OR SQUIRREL CAGE)

BLOWER FAN (BLOWER WHEEL OR SQUIRREL CAGE) INSPECTION

Condition Code Procedure

Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Application incorrect ... B .. Require repair or replacement.
Broken ..... A ..... Require replacement.
Cracked ..... A ..... Require replacement
Distorted ..... A ..... Require replacement.
Fins missing ..... C ..... Require replacement.
Hub separated ..... A ..... Require replacement.
Inoperative ..... A ..... (1) Require replacement.
Mounting loose ..... A .. Require repair or replacement.
Noisy ..... 2 ..... Suggest replacement. *** A/C-HEATER SYSTEM UNIFORM INSPECTIO**

Out of balance ..... A .. Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

BLOWER MOTORS

BLOWER MOTOR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted, affecting performance	A	(1) Require repair or replacement.
Connector melted, not affecting performance	2	(1) Suggest repair or replacement.
Connector missing	C	Require replacement.
Current draw out of specification	B	Require repair or replacement.
Inoperative	A	(2) Require replacement.
Missing	C	Require replacement.
Motor speed insufficient	2	Suggest repair or replacement.
Noisy	2	Suggest replacement.
Rotation incorrect for application	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not		

affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Vibration ..... 1 ..... Suggest replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Check fan motor/controls. Inoperative includes intermittent operation or out of OEM specification.

BLOWER RESISTORS

BLOWER RESISTOR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Conductor exposed	A	Require replacement.
Connector broken	A	Require repair or replacement.
Connector melted, affecting performance	A	(1) Require repair or replacement.
Connector melted, not affecting performance	1	(1) Suggest repair or replacement.
Connector missing	C	Require replacement.

Inoperative ..... A ..... (2) Require replacement.
Insulation overheated ... A ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

BLOWER SWITCHES

See SWITCHES.

CABIN AIR FILTERS

CABIN AIR FILTER INSPECTION

Condition	Code	Procedure
Air flow obstruction	A	Require cleaning or replacement.
Maintenance intervals ...	3	Suggest replacement.
Missing	C	Require replacement.

CIRCUIT BREAKERS

See FUSES, FUSIBLE LINKS AND CIRCUIT BREAKERS.

COMPRESSOR CLUTCH ASSEMBLIES

COMPRESSOR CLUTCH ASSEMBLY INSPECTION *** A/C-HEATER SYSTEM UNIFORM INSPEC**

Condition	Code	Procedure
Air gap incorrect	B	Require repair or replacement.
Bearing seized	A	Require replacement of bearing or assembly.
Bearing worn, affecting performance	A	Require replacement of bearing or assembly.
Coil shows signs of overheating	1	Suggest replacement of coil.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted, affecting performance	A	(1) Require repair or replacement.
Connector melted, not affecting performance	2	(1) Suggest repair or replacement.
Connector missing	C	Require replacement.
Hub broken	A	Require replacement.
Hub cracked	B	Require replacement.
Hub loose on shaft	A	Require replacement.
Hub scored, affecting performance	A	Require replacement.
Hub warped, affecting performance	A	Require replacement.
Inoperative	A	(2) Require repair or replacement.
Noisy	2	Suggest repair or replacement.
Slips	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.
Will not disengage	A	Require repair or replacement.

Wire lead burned ..... A .. Require repair or replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

COMPRESSORS

COMPRESSOR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bracket bent, affecting performance	A	Require repair or replacement.
Bracket bent, not affecting performance		No service suggested or required.
Bracket broken, affecting performance	A	Require replacement.
Bracket broken, not affecting performance		No service suggested or required.
Bracket corroded, affecting performance	A	Require repair or replacement.
Bracket corroded, not affecting performance	2	Suggest repair or replacement.
Bracket cracked, affecting performance	A	Require repair or replacement.
Bracket cracked, not affecting performance	1	Suggest repair or replacement.
Bracket holes elongated,		

affecting performance .. A .. Require repair or replacement.
Bracket holes elongated,
not affecting
performance .... No service suggested or
required.
Bracket loose, affecting
performance ..... A .. Require repair or replacement.
Bracket loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Housing broken, affecting
performance ..... A .. Require repair or replacement.
Housing broken, not
affecting performance .. .. No service suggested or
required.
Housing cracked, affecting
performance ..... A .. Require repair or replacement.
Housing cracked, not
affecting performance .. 1 .. Suggest repair or replacement.
Inoperative ..... A ..... (1) Require repair or
replacement.
Leaking ..... A .. Require repair or replacement.
Noisy ..... 2 ..... (2) Suggest repair or
replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Tubing connection
leaking ..... A .. Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.
(2) - Compressor noise can also be caused by low oil level, state of charge, air contamination, or type of refrigerant.

CONDENSER AIR SEALS

CONDENSER AIR SEAL INSPECTION

Condition	Code	Procedure
Leaking	A .	Require repair or replacement.
Missing	C	Require replacement.

CONDENSER FAN MOTORS

See COOLING FAN MOTORS.

CONDENSERS

CONDENSER INSPECTION

Condition	Code	Procedure
Abrasion damage, affecting structural integrity	A	Require repair or replacement.
Abrasion damage, not affecting structural integrity		No service suggested or required.
Air flow obstruction, affecting performance	A	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bent, affecting performance	A	Require repair or replacement.
Bent, not affecting performance		No service suggested or required.
Bracket bent, affecting performance	A	Require repair or replacement.
Bracket bent, not affecting performance		No service suggested or required.
Bracket broken, affecting performance	A	Require replacement.
Bracket broken, not affecting performance		No service suggested or required.
Bracket corroded, affecting performance	A	Require repair or replacement.
Bracket corroded, not		

affecting performance .. 2 .. Suggest repair or replacement.
Bracket cracked, affecting
performance ..... A .. Require repair or replacement.
Bracket cracked, not
affecting performance .. 1 .. Suggest repair or replacement.
Bracket holes elongated,
affecting performance .. A .. Require repair or replacement.
Bracket holes elongated,
not affecting
performance .... No service suggested or
required.
Bracket loose, affecting
performance ..... A .. Require repair or replacement.
Bracket loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Corroded, affecting
structural integrity ... A ..... Require replacement.
Corroded, not affecting
structural integrity ... . No service suggested or
required.
Fitting type incorrect
(such as compression
fitting) ..... B ..... Require replacement.
Flange leaking ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Restricted internally ... A .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

CONNECTORS

See WIRING HARNESSES AND CONNECTORS.

CONTROL CABLES

CONTROL CABLE INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware *** A/C-HEATER SYSTEM UNIFORM INSPECTION GUIDELINES *Article Text (p.**

missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Binding ..... A .. Require repair or replacement.
Bracket bent, affecting performance ..... A .. Require repair or replacement.
Bracket bent, not affecting performance .. .. No service suggested or required.
Bracket broken, affecting performance ..... A ..... Require replacement.
Bracket broken, not affecting performance .. .. No service suggested or required.
Bracket corroded, affecting performance .. A .. Require repair or replacement.
Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Bracket cracked, affecting performance ..... A .. Require repair or replacement.
Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket holes elongated, affecting performance .. A .. Require repair or replacement.
Bracket holes elongated, not affecting performance .... No service suggested or required.
Bracket loose, affecting performance ..... A .. Require repair or replacement.
Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Broken ..... A .. Require repair or replacement.
Cracked ..... 2 .. Suggest repair or replacement.
Disconnected ..... A .. Require repair or replacement.
Kinked ..... 2 .. Suggest repair or replacement.
Melted ..... A ..... (1) Require repair or replacement.
Missing ..... C ..... Require replacement.
Out of adjustment ..... B ..... (2) Require repair or replacement.
Routed incorrectly ..... 2 ..... Suggest repair.
Seized ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Follow OEM recommended adjustment procedures. Require repair or replacement if out of specification.

CONTROL HEADS (FUNCTION SELECTORS)

CONTROL HEAD (FUNCTION SELECTOR) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted, affecting performance	A	(1) Require repair or replacement.
Connector melted, not affecting performance	2	(1) Suggest repair or replacement.
Connector missing	C	Require replacement.
Contaminated	2	Suggest require replacement.
Leaking	A	Require repair or replacement.
Malfunctioning	A	(2) Require repair or replacement.
Melted, affecting performance	A	(1) Require repair or replacement.
Melted, not affecting performance		No service suggested or required.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.

Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Wire lead burned ..... A .. Require repair or replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Includes inoperative, intermittent operation, or failure to perform all functions.

CONTROL LINKAGES

CONTROL LINKAGE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bent	A	Require repair or replacement.
Binding	A	Require repair or replacement.
Bracket bent, affecting performance	A	Require repair or replacement.
Bracket bent, not affecting performance	.. ..	No service suggested or required.
Bracket broken, affecting performance	A	Require replacement.

Bracket broken, not
affecting performance .. .. No service suggested or required.
Bracket corroded,
affecting performance .. A . Require repair or replacement.
Bracket corroded, not
affecting performance .. 2 . Suggest repair or replacement.
Bracket cracked, affecting
performance ..... A . Require repair or replacement.
Bracket cracked, not
affecting performance .. 1 . Suggest repair or replacement.
Bracket holes elongated,
affecting performance .. A . Require repair or replacement.
Bracket holes elongated,
not affecting
performance .... No service suggested or required.
Bracket loose, affecting
performance ..... A . Require repair or replacement.
Bracket loose, not
affecting performance .. 1 . Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Broken ..... A ..... Require replacement.
Cracked ..... A . Require repair or replacement.
Disconnected ..... A . Require repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 . Suggest repair or replacement.
Out of adjustment ..... B ..... (1) Require repair or replacement.
Seized ..... A . Require repair or replacement.

(1) - Follow OEM recommended adjustment procedures. Require repair or replacement if out of specification.

CONTROL MODULES

NOTE: Includes, but not limited to: IRCM, Coolant Fan Control Module (CFCM), AC Controller, Amplifier, Programmers, Control Heads, Power Modules, etc.

CONTROL MODULE INSPECTION

Condition	Code	Procedure
Application incorrect ...	B	Require replacement.

Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware threads damaged ..... A ... Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing) ..... A ... Require repair or replacement of hardware.
Code set (if applicable) ..... A ..... (1) Further inspection required.
Connector broken ..... A .. Require repair or replacement.
Connector melted, affecting performance .. A ..... (2) Require repair or replacement.
Connector melted, not affecting performance .. 2 ..... (2) Suggest repair or replacement.
Connector missing ..... A ..... Require repair.
Contaminated ..... A ..... (3) Require repair or replacement.
Inoperative ..... B ..... (4) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (2) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors

*** A/C-HEATER SYSTEM UNIFORM INSPEC**

exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Refer to manufacturer's diagnostic trouble code procedure and require repair or replacement of affected component(s).
(2) - Determine cause and correct prior to repair or replacement of part.
(3) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement. Check for accepted cleaning procedure.
(4) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable.

COOLANT

COOLANT INSPECTION

Condition	Code	Procedure
Acidity (pH) incorrect	1	Suggest correction or replacement.
Contaminated	B	(1) Require replacement or recycling. Further inspection required.
Level incorrect	B	(2) Require filling to proper level.
Maintenance intervals	3	(3) Suggest replacement.
Mixture incorrect	B	Require correction or replacement.
Type incorrect	B	Require replacement.

(1) - Determine source of contamination and require correction prior to coolant replacement.
(2) - Determine source of incorrect level and suggest repair.
(3) - The system should be drained and/or flushed and refilled with correct coolant according to OEM recommended service interval and procedures.

COOLING FAN BLADES

COOLING FAN BLADE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bent	A	Require replacement.
Broken	A	Require replacement.
Cracked	A	Require replacement.
Loose	A	Require repair or replacement.
Missing	C	Require replacement.

COOLING FAN CLUTCHES

NOTE: Some lateral movement, measured at the fan blade tip, may be normal.

COOLING FAN CLUTCH INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bearing noisy	A	Require replacement.
Bearing worn	A	Require replacement.
Fastener loose	A	Require repair or replacement of fastener.
Inoperative	A	(1) Require replacement.
Leaking	1	Suggest replacement.
Seized	A	Require replacement.

Slips (insufficient fan speed) ..... A ..... Require replacement.
Thermal control incorrect ..... B .. Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

COOLING FAN MOTORS

COOLING FAN MOTOR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted, affecting performance	A	(1) Require repair or replacement.
Connector melted, not affecting performance	2	(1) Suggest repair or replacement.
Connector missing	C	Require replacement.
Hydraulic fan motor leaking	A	Require repair or replacement.
Inoperative	A	(2) Require replacement.
Missing	C	Require replacement.
Noisy	2	Suggest replacement.
Rotation incorrect for application	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not		

affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Vibration ..... 1 ..... Suggest replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Check fan motor/controls. Inoperative includes intermittent operation or out of OEM specification.

EVAPORATOR DRAIN TUBES

EVAPORATOR DRAIN TUBE INSPECTION

Condition	Code	Procedure
Disconnected	A	Require repair.
Leaking	A	Require replacement.
Missing	C	Require replacement.
Restricted	A	Require repair or replacement.
Routed incorrectly	B	Require repair.

EVAPORATOR PRESSURE REGULATORS (EPRS)

EVAPORATOR PRESSURE REGULATOR (EPR) INSPECTION

Condition	Code	Procedure
Inoperative	A	(1) Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

EVAPORATORS

EVAPORATOR INSPECTION

Condition	Code	Procedure
Abrasion damage, affecting structural integrity	A	Require repair or replacement.
Abrasion damage, not affecting structural integrity		No service suggested or required.
Air flow obstruction, affecting performance	A	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bracket bent, affecting performance	A	Require repair or replacement.
Bracket bent, not affecting performance		No service suggested or required.
Bracket broken, affecting performance	A	Require replacement.
Bracket broken, not affecting performance		No service suggested or required.
Bracket corroded, affecting performance	A	Require repair or replacement.
Bracket corroded, not affecting performance	2	Suggest repair or replacement.
Bracket cracked, affecting performance	A	Require repair or replacement.
Bracket cracked, not affecting performance	1	Suggest repair or replacement.
Bracket holes elongated, affecting performance	A	Require repair or replacement.
Bracket holes elongated,		

not affecting
performance .... No service suggested or
required.
Bracket loose, affecting
performance ..... A .. Require repair or replacement.
Bracket loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Corroded, affecting
structural integrity ... A ..... Require replacement.
Corroded, not affecting
structural integrity ... . No service suggested or
required.
Evaporator foam seal
leaking ..... A ..... Require replacement.
Evaporator foam seal
missing ..... C ..... Require replacement.
Fitting type incorrect
(such as compression
fitting) ..... B ..... Require replacement.
Flange leaking ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Restricted internally ... A .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

EXPANSION VALVES

EXPANSION VALVE INSPECTION

Condition Code Procedure

Application incorrect ... B ..... Require replacement.
Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement
of hardware.
Corroded internally ..... 1 ..... Suggest replacement.
Filter screen torn ..... A ... Require replacement of screen.

Inoperative ..... A ..... (1) Require repair or replacement.
Leaking ..... A ..... Require replacement.
Restricted ..... A .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

(1) - Expansion valve operation may be affected by capillary tube location, corrosion, and insulation tape. Inoperative includes intermittent operation.

FUNCTION SELECTORS

See CONTROL HEADS (FUNCTION SELECTORS).

FUSES, FUSIBLE LINKS AND CIRCUIT BREAKERS

FUSE, FUSIBLE LINK AND CIRCUIT BREAKER INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Blown	A	(1) Require replacement.
Corroded, affecting performance	A	Require repair or replacement.
Corroded, not affecting performance	2	Suggest repair or replacement.
Cracked, affecting performance	A	Require repair or replacement.
Cracked, not affecting performance	1	Suggest repair or replacement.
Inoperative	A	(2) Require replacement.
Insulation damaged, conductors exposed	A	Require repair or replacement.
Insulation damaged, conductors not exposed	1	Suggest repair or replacement.
Missing	C	Require replacement.
Routed incorrectly	B	Require repair.
Secured incorrectly	B	Require repair.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not		

affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to replacement of part.
(2) - Inoperative includes intermittent operation.

FUSIBLE LINKS

See FUSES, FUSIBLE LINKS AND CIRCUIT BREAKERS.

GASKETS

GASKET INSPECTION

Condition	Code	Procedure
Leaking	A	(1) Require repair or replacement.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary.

HEATER CASES

See PLENUMS.

HEATER CONTROL VALVES

HEATER CONTROL VALVE INSPECTION

Condition	Code	Procedure
Application incorrect ...	B	Require replacement.
Attaching hardware broken	A ...	Require repair or replacement of hardware.

Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Binding ..... 2 .. Suggest repair or replacement.
Coolant leak ..... A .. Require repair or replacement.
Disconnected ..... A .. Require repair or replacement.
Malfunctioning ..... A ..... (1) Require repair or replacement.
Missing ..... C ..... Require replacement.
Restricted ..... A .. Require repair or replacement.
Seized ..... A .. Require repair or replacement.
Vacuum leak ..... A .. Require repair or replacement.

(1) - Includes inoperative, intermittent operation, or failure to perform all functions.

HEATER CORES

HEATER CORE INSPECTION

Condition	Code	Procedure
Air flow obstruction	A	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connection leaking	A	Require repair or replacement.
Corroded	1	Suggest repair or replacement.
Disconnected	A	Require repair or replacement.
Fins damaged, affecting performance	A	Require repair or replacement.
Fins damaged, not affecting performance		No service suggested or required.
Internal restrictions, affecting performance	A	Require repair or replacement.

Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.

HEATER HOSES

HEATER HOSE INSPECTION

Condition Code Procedure

Application incorrect ... B ..... Require replacement.
Connected incorrectly ... A ..... Require repair.
Corroded, not reusable .. 1 ..... Suggest replacement.
Cracked ..... A .. Require repair or replacement.
Hard (brittle) ..... 1 .. Suggest repair or replacement.
Inner fabric (webbing)
damaged ..... A ..... Require replacement.
Insufficient clamping
force, allowing hose to
leak ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Maintenance intervals ... 3 ..... Suggest replacement.
Melted ..... 1 .. Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Outer covering damaged .. 1 ..... Suggest replacement.
Outer covering damaged to
the extent that the inner
fabric is visible ..... A ..... Require replacement.
Protective sleeves
damaged ..... 2 . Suggest replacement of sleeves.
Protective sleeves
missing ..... 2 . Suggest replacement of sleeves.
Restricted, affecting
performance ..... A .. Require repair or replacement.
Restricted, not affecting
performance ..... 2 .. Suggest repair or replacement.
Routed incorrectly ..... 2 ..... Suggest repair.
Safety clip missing ..... C ..... Require replacement.
Spongy ..... 1 .. Suggest repair or replacement.
Stripped ..... A ..... Require replacement.
Surface cracks (dry-
rotted) ..... 1 .. Suggest repair or replacement.
Swollen ..... B ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

Type incorrect ..... 1 .. Suggest repair or replacement.

HIGH PRESSURE RELIEF VALVES (HPRV)

HIGH PRESSURE RELIEF VALVE (HPRV) INSPECTION

Condition	Code	Procedure
Inoperative	A	(1) Require repair or replacement.
Leaking	A	.. Require repair or replacement.
Missing	C	Require replacement.
Threads damaged	A	.. Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

IDLERS

See TENSIONERS.

IN-LINE FILTERS

IN-LINE FILTER INSPECTION

Condition	Code	Procedure
Connection leaking	B	.. Require repair or replacement.
Leaking	A	.. Require repair or replacement.
Restricted	A	Require replacement.
Threads damaged	A	.. Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

METAL FITTINGS

See AIR CONDITIONING METAL LINES, HOSES AND FITTING ASSEMBLIES.

METAL LINES

See *** A/C-HEATER SYSTEM UNIFORM INSPECTIO**

AIR CONDITIONING METAL LINES, HOSES AND FITTING ASSEMBLIES.

MIX AND AIR CONTROL DOORS (BLEND DOORS)

See PLENUMS.

O-RINGS

O-RING INSPECTION

Condition	Code	Procedure
Leaking	A	(1) Require repair or replacement.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary.

ORIFICE TUBES

ORIFICE TUBE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Bypassing internally	A	Require repair or replacement.
Filter screen torn	A	Require replacement.
Installation incorrect	B	Require repair.
Restricted	A	Require repair or replacement.

PILOT-OPERATED ABSOLUTES (POAS)

PILOT-OPERATED ABSOLUTE (POA) INSPECTION

Condition	Code	Procedure
Connection damaged	B	Require repair or replacement.
Fitting damaged	B	Require repair or replacement.
Inoperative	A	(1) Require repair or replacement.
Leaking	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

PLENUMS

PLENUM INSPECTION

Condition	Code	Procedure
Air control door binding	A	Require repair or replacement
Air control door broken	A	Require repair or replacement.
Air control door leaking	A	Require repair or replacement.
Air control door seized	A	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Cracked	2	Suggest repair or replacement.
Drain hole restricted	A	Require repair.
Drain plugged	A	Require repair.
Duct disconnected	A	Require repair or replacement.
Duct leaking	A	Require repair or replacement.
Duct missing	C	Require replacement.
Duct restricted	A	Require repair or replacement.
Leaking	A	Require repair or replacement.
Noisy	2	Suggest cleaning or repair.
Odor	2	Suggest cleaning or repair.
Restricted	A	Require cleaning, repair, or replacement.

PRESSURE CONTROL VALVES

See:

*** A/C-HEATER SYSTEM UNIFORM INSPECTIO**

* EVAPORATOR PRESSURE REGULATORS (EPRS)
* HIGH PRESSURE RELIEF VALVES (HPRV)
* PILOT-OPERATED ABSOLUTES (POAS)
* SUCTION THROTTLING VALVES (STVS)
* VALVES IN RECEIVER (VIRS)

PRESSURE SENSORS

See THERMISTORS AND PRESSURE SENSORS.

PULLEYS

PULLEY INSPECTION

Condition	Code	Procedure
Alignment incorrect	B	Require repair or replacement.
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bearing noisy	2	Suggest replacement.
Bearing seized	A	Require repair or replacement.
Bearing worn	1	Suggest replacement.
Cracked	A	Require replacement.
Loose	A	Require repair or replacement.
Missing	C	Require replacement.
Pulley damaged, affecting belt life	A	Require replacement.

RADIATORS

RADIATOR INSPECTION

Condition	Code	Procedure
Air flow obstruction	A	Require repair.
Application incorrect	B	Require replacement.
Attaching hardware		

broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A .. Require repair or replacement of hardware.
Connection leaking ..... A .. Require repair or replacement.
Corroded ..... 1 .. Suggest repair or replacement.
Drain inoperative ..... A .. Require repair or replacement.
Fins damaged, affecting performance ..... A .. Require repair or replacement.
Fins damaged, not affecting performance .. .. No service suggested or required.
Internal oil cooler leaking ..... A .. Require repair or replacement.
Internal restrictions ... B .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A .. Require repair or replacement.
Tubes damaged, affecting performance ..... A .. Require repair or replacement.
Tubes damaged, not affecting performance .. .. No service suggested or required.

RECEIVER-DRIERS

NOTE: For VIRs, see VALVES IN RECEIVER (VIRS).

RECEIVER-DRIER INSPECTION

Condition Code Procedure

Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement

of hardware.

Contaminated, affecting performance ..... A ..... Require replacement.
Dessicant bag deteriorated ..... A ..... (1) Require replacement. Further inspection required.

Dessicant at the end of its useful life (saturated with moisture) ..... 1 .. Suggest repair or replacement.
Fusible plug leaking .... A .... Require replacement of plug.
Leaking ..... A ..... Require replacement.
Pressure relief device leaking ..... A . Require replacement of pressure relief device.
Restricted ..... A .. Require repair or replacement.
Sight glass no longer transparent ..... 2 ... Suggest replacement of drier.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Tubing connection leaking ..... A .. Require repair or replacement.

(1) - Inspect system to determine effects of dessicant bag deterioration.

REFRIGERANT

NOTE: Refrigerants include any SNAP (Significant New Alternative Policy)-approved blends.

REFRIGERANT INSPECTION

Condition	Code	Procedure
Contaminated (other than refrigerant blends)	B	Require service to remove contamination.
Different types of refrigerants in the same system (other than refrigerant blends)	B	Require repair.
Overcharged	B	Require repair.
Refrigerant type		

does not match
fittings and label ..... B ..... Require repair.
Undercharged ..... B ..... Require repair.

REFRIGERANT OIL

REFRIGERANT OIL INSPECTION

Condition Code Procedure

Contaminated ..... 1 .. Require repair or replacement.
Overfilled ..... B ..... Require repair.
Underfilled ..... B ..... Require repair.

RELAYS

RELAY INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Housing broken ..... A ..... Require replacement.
Housing cracked ..... 2 ..... Suggest replacement.
Inoperative ..... A ..... (1) Require replacement.
Melted, affecting
performance ..... A ..... (2) Require repair or replacement.
Melted, not affecting
performance ..... 2 ..... (2) Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (2) Require repair or replacement.
Terminal burned, not

affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.
(2) - Determine cause and correct prior to repair or replacement of part.

SEALS

SEAL INSPECTION

Condition	Code	Procedure
Leaking	A	(1) Require repair or replacement.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary.

SERVICE PORTS

SERVICE PORT INSPECTION

Condition	Code	Procedure
Application does not match refrigerant type	B	Require replacement.
Leaking	A ..	Require repair or replacement.
Threads damaged	A ..	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Valve cap leaking	A ...	Require repair or replacement of cap.
Valve cap missing	C	Require replacement of valve cap.

Valve core sticking ..... B .. Require repair or replacement.

SPRING LOCK COUPLINGS

SPRING LOCK COUPLING INSPECTION

Condition	Code	Procedure
Leaking	A	(1) Require repair or replacement.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary.

SUCTION THROTTLING VALVES (STVS)

SUCTION THROTTLING VALVE (STV) INSPECTION

Condition	Code	Procedure
Connection damaged	B ..	Require repair or replacement.
Fitting damaged	B ..	Require repair or replacement.
Inoperative	A	(1) Require repair or replacement.
Leaking	A ..	Require repair or replacement.
Threads damaged	A ..	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

SWITCHES (ELECTRICAL)

SWITCH (ELECTRICAL) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ...	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of

hardware.

Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.

Binding, affecting performance ..... A .. Require repair or replacement.

Binding, not affecting performance ..... 2 .. Suggest repair or replacement.

Broken ..... A .. Require repair or replacement.

Burned, affecting performance ..... A ..... (1) Require repair or replacement.

Burned, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.

Cracked, affecting performance ..... A .. Require repair or replacement.

Cracked, not affecting performance ..... 1 .. Suggest repair or replacement.

Malfunctioning ..... A ..... (2) Require repair or replacement.

Melted, affecting performance ..... A ..... (1) Require repair or replacement.

Melted, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.

Missing ..... C ..... (3) Require replacement.

Out of adjustment ..... B .. Require repair or replacement.

Pressure switch leaking . A .. Require repair or replacement.

Terminal broken ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal corroded, affecting performance .. A .. Require repair or replacement.

Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.

Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

Threads damaged ..... A .. Require repair or replacement.

Threads stripped (threads

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missing) ..... A ..... Require replacement.
Won't return ..... A .. Require repair or replacement.
Worn ..... 1 ..... Suggest replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Includes inoperative, intermittent operation, or failure to perform all functions.
(3) - Missing includes high pressure cut-off switches not installed during a retrofit from R12 to R134a.

TENSIONERS

TENSIONER INSPECTION

Condition Code Procedure

Alignment incorrect ..... B .. Require repair or replacement.
Application incorrect ... B ..... Require replacement.
Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Bearing worn ..... 1 ..... Suggest replacement.
Belt tension incorrect .. B ... Require adjustment or repair.
Bracket cracked ..... A .. Require repair or replacement.
Housing cracked ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 ..... Suggest replacement.
Pulley damaged, affecting belt life ..... A ..... Require replacement.
Seized ..... A .. Require repair or replacement.

THERMISTORS AND PRESSURE SENSORS

NOTE: Includes, but not limited to, In-Car Temperature, Ambient Air Temperature, Sun Load Sensor, etc.

THERMISTOR AND PRESSURE SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Calibration incorrect	B	Require repair or replacement.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted, affecting performance	A	(1) Require repair or replacement.
Connector melted, not affecting performance	2	(1) Suggest repair or replacement.
Connector missing	C	Require replacement.
Inoperative	A	(2) Require repair or replacement.
Missing	C	Require replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.
Wire lead burned	A	Require repair or replacement.
Wire lead conductors exposed	B	Require repair or replacement.
Wire lead open	A	Require repair or replacement.
Wire lead shorted	A	Require repair or replacement.

(1) - Determine cause and correct prior to repair or

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replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

THERMOSTATS AND HOUSINGS

THERMOSTAT AND HOUSING INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware corroded	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Cracked	A	Require replacement.
Housing corroded	1	Suggest replacement of housing.
Inoperative	A	(1) Require replacement.
Installation incorrect	B	Require repair or replacement.
Leaking	A	Require repair or replacement.
Thermostat missing	C	Require replacement of thermostat.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

VACUUM HOSES AND TUBES

VACUUM HOSE AND TUBE INSPECTION

Condition	Code	Procedure

Disconnected ..... A ..... Require repair.
Leaking ..... A .. Require repair or replacement.
Melted ..... A ..... Require repair replacement.
Missing ..... C ..... Require replacement.
Oil-soaked (spongy) ..... 1 ..... Suggest replacement.
Restricted ..... A .. Require repair or replacement.
Routing incorrect ..... B ..... Require repair.
Surface cracks (dry-
rotted) ..... 1 ..... Suggest replacement.

VACUUM RESERVOIRS

VACUUM RESERVOIR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Check valve leaking internally	A	Require replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Restricted	A	Require repair or replacement.

VACUUM TUBES

See VACUUM HOSES AND TUBES.

VALVES IN RECEIVER (VIRS)

VALVE IN RECEIVER (VIR) INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement.

of hardware.

Attaching hardware missing ..... C ..... Require replacement of hardware.

Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.

Bracket bent, affecting performance ..... A .. Require repair or replacement.

Bracket bent, not affecting performance .. .. No service suggested or required.

Bracket broken, affecting performance ..... A ..... Require replacement.

Bracket broken, not affecting performance .. .. No service suggested or required.

Bracket corroded, affecting performance .. A .. Require repair or replacement.

Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Bracket cracked, affecting performance ..... A .. Require repair or replacement.

Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket holes elongated, affecting performance .. A .. Require repair or replacement.

Bracket holes elongated, not affecting performance .... No service suggested or required.

Bracket loose, affecting performance ..... A .. Require repair or replacement.

Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket missing ..... C ..... Require replacement.

Connection damaged ..... B .. Require repair or replacement.

Contaminated, affecting performance ..... A ..... Require replacement.

Corroded internally ..... 1 ..... Suggest replacement.

Dessicant bag deteriorated ..... A ..... (1) Require replacement. Further inspection required.

Dessicant at the end of its useful life (saturated

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with moisture) ..... 1 .. Suggest repair or replacement.
Filter screen torn ..... A .. Require replacement of screen.
Fitting damaged ..... B .. Require repair or replacement.
Fusible plug leaking .... A .... Require replacement of plug.
Inoperative ..... A ..... (2) Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Pressure relief device leaking ..... A . Require replacement of pressure relief device.
Restricted ..... A .. Require repair or replacement.
Sight glass no longer transparent ..... 2 ... Suggest replacement of drier.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Tubing connection leaking ..... A .. Require repair or replacement.

(1) - Inspect system to determine effects of dessicant bag deterioration.
(2) - Inoperative includes intermittent operation or out of OEM specification.

WATER PUMPS (ELECTRIC AUXILIARY)

WATER PUMP (ELECTRIC AUXILIARY) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ...	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A ...	Require repair or replacement of hardware.
Connector broken	A ..	Require repair or replacement.
Connector (Weatherpack type) leaking	A ..	Require repair or replacement.
Connector melted, affecting performance ..	A	(1) Require repair or

Connector melted, not
affecting performance .. 2 ..... (1) Suggest repair or
replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require replacement.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 ..... Suggest replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Vibration ..... 1 .. Suggest replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or
replacement of part.
(2) - Inoperative includes intermittent operation or out of
OEM specification.

WIRING HARNESSES AND CONNECTORS

WIRING HARNESS AND CONNECTOR INSPECTION

Condition Code Procedure

Application incorrect ... B .. Require repair or replacement.
Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware

missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Circuit open ..... A .. Require repair or replacement.
Circuit resistance (voltage drop) out of specification ..... A .. Require repair or replacement.
Circuit shorted ..... A .. Require repair or replacement.
Connector melted, affecting performance .. A ..... (1) Require repair or replacement.
Connector melted, not affecting performance .. 2 ..... (1) Suggest repair or replacement.
Connector missing ..... C ..... Require replacement.
Diode open ..... A .. Require repair or replacement.
Diode shorted ..... A .. Require repair or replacement.
Insulation damaged, conductors exposed ..... A .. Require repair or replacement.
Insulation damaged, conductors not exposed . 1 ..... Suggest replacement.
Protective shield (conduit) melted ..... B ..... (1) Require replacement.
Protective shield (conduit) missing ..... C ..... Require replacement.
Routed incorrectly ..... B ..... Require repair.
Secured incorrectly ..... B ..... Require repair.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

Voltage drop out of
specification ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or
replacement of part.

END OF ARTICLE

* DRIVETRAIN SYSTEMS UNIFORM INSPECTION GUIDELINES *

Article Text

1996 Kia Sephia

For 1 1 1 1 1

Saturday, April 18, 2009 10:05PM

ARTICLE BEGINNING

GENERAL INFORMATION
Drivetrain/Transmission Motorist Assurance Program
Standards For Automotive Repair

All Makes and Models

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INTRODUCTION TO MOTORIST ASSURANCE PROGRAM (MAP)

OVERVIEW OF MOTORIST ASSURANCE PROGRAM

The Motorist Assurance Program is the consumer outreach

effort of the Automotive Maintenance and Repair Association, Inc. (AMRA). Participation in the Motorist Assurance Program is drawn from retailers, suppliers, independent repair facilities, vehicle manufacturers and industry associations.

Our organization's mission is to strengthen the relationship between the consumer and the auto repair industry. We produce materials that give motorists the information and encouragement to take greater responsibility for their vehicles-through proper, manufacturer-recommended, maintenance. We encourage participating service and repair shops (including franchisees and dealers) to adopt (1) a Pledge of Assurance to their Customers and (2) the Motorist Assurance Program Standards of Service. All participating service providers have agreed to subscribe to this Pledge and to adhere to the promulgated Standards of Service demonstrating to their customers that they are serious about customer satisfaction.

These Standards of Service require that an inspection of the vehicle's (problem) system be made and the results communicated to the customer according to industry standards. Given that the industry did not have such standards, the Motorist Assurance Program successfully promulgated industry inspection communication standards in 1994-95 for the following systems: Exhaust, Brakes, ABS, Steering and Suspension, Engine Maintenance and Performance, HVAC, and Electrical Systems. Further, revisions to all of these inspection were recently published. Further, revisions to all of these inspection communication standards are continually republished. In addition to these, standards for Drive Train and Transmissions have recently been promulgated. Participating shops utilize these Uniform Inspection & Communication Standards as part of the inspection process and for communicating their findings to their customers.

The Motorist Assurance Program continues to work cooperatively and proactively with government agencies and consumer groups toward solutions that both benefit the customer and are mutually acceptable to both regulators and industry. We maintain the belief that industry must retain control over how we conduct our business, and we must be viewed as part of the solution and not part of the problem. Meetings with state and other government officials (and their representatives), concerned with auto repair and/or consumer protection, are conducted. Feedback from these sessions is brought back to the association, and the program adjusted as needed.

To assure auto repair customers recourse if they were not satisfied with a repair transaction, the Motorist Assurance Program offers mediation and arbitration through MAP/BBB-CARE and other non-profit organizations. MAP conducted pilot programs in twelve states before announcing the program nationally in October, 1998. During the pilots, participating repair shops demonstrated their adherence to the Pledge and Standards and agreed to follow the UICS in communicating

the results of their inspection to their customers. To put some "teeth" in the program, an accreditation requirement for shops was initiated. The requirements are stringent, and a self-policing method has been incorporated which includes the "mystery shopping" of outlets.

We welcome you to join us as we continue our outreach... with your support, both the automotive repair industry and your customers will reap the benefits. Please visit MAP at our Internet site www.motorist.org or contact us at:

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MAP UNIFORM INSPECTION GENERAL GUIDELINES

OVERVIEW OF SERVICE REQUIREMENTS & SUGGESTIONS

It is MAP policy that all exhaust, brake, steering, suspension, wheel alignment, drive-line, engine performance and maintenance, and heating, ventilation and air conditioning, and electrical services be offered and performed under the standards and procedures specified in these sections.

Before any service is performed on a vehicle, an inspection of the appropriate system must be performed. The results of this inspection must be explained to the customer and documented on an inspection form. The condition of the vehicle and its components will indicate what services/part replacements may be "Required" or "Suggested". In addition, suggestions may be made to satisfy the requests expressed by the customer.

When a component is suggested or required to be repaired or replaced, the decision to repair or replace must be made in the customer's best interest, and at his or her choice given the options available.

This section lists the various parts and conditions that indicate a required or suggested service or part replacement. Although this list is extensive, it is not fully inclusive. In addition to this list, a technician may make a suggestion. However, any suggestions must be based on substantial and informed experience, or the vehicle manufacturer's recommended service interval and must be documented.

Some conditions indicate that service or part replacement is required because the part in question is no longer providing the function for which it is intended, does not meet a vehicle manufacturer's design specification or is missing.

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Example:
An exhaust pipe has corroded severely and has a hole in it through which exhaust gases are leaking. Replacement of the exhaust pipe in this case is required due to functional failure.

Example:
A brake rotor has been worn to the point where it measures less than the vehicle manufacturer's discard specifications. Replacement of the rotor is required because it does not meet design specifications.

Some conditions indicate that a service or part replacement is suggested because the part is close to the end of its useful life or addresses a customer's need, convenience or request. If a customer's vehicle has one of these conditions, the procedure may be only to suggest service.

Example:
An exhaust pipe is rusted, corroded or weak, but no leaks are present. In this case, the exhaust pipe has not failed. However, there is evidence that the pipe may need replacement in the near future. Replacement of the pipe may be suggested for the customer's convenience in avoiding a future problem.

Example:
The customer desires improved ride and/or handling, but the vehicle's shocks or struts have not failed. In this case, replacement may be suggested to satisfy the customer's wishes. In this case, replacement of the shocks or struts may not be sold as a requirement.

A customer, of course, has the choice of whether or not a shop will service his or her vehicle. He or she may decide not to follow some of your suggestions. When a repair is required, a MAP shop must refuse partial service on that system if, in the judgment of the service provider, proceeding with the work could create or continue an unsafe condition. When a procedure states that required or suggested repair or replacement is recommended, the customer must be informed of the generally acceptable repair/replacement options whether or not performed by the shop.

When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

The following reasons may be used for requiring inspection:

services. These codes are shown in the "Code" column of the MAP Uniform Inspection & Communications Standards that follow:

Reasons to Require Repair or Replacement

A - Part no longer performs intended purpose
B - Part does not meet a design specification (regardless of performance)
C - Part is missing

NOTE: When a repair is required, the shop must refuse partial service to the system in question, if the repair creates or continues an unsafe condition.

Reasons to Suggest Repair or Replacement

1 - Part is close to the end of its useful life (just above discard specifications, or weak; failure likely to occur soon, etc.)
2 - To address a customer need, convenience, or request (to stiffen ride, enhance performance, eliminate noise, etc.)
3 - To comply with maintenance recommended by the vehicle's Original Equipment Manufacturer (OEM)
4 - Technician's recommendation based on substantial and informed experience

NOTE: Suggested services are always optional. When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

DRIVE/POWER TRAIN ASSEMBLIES

SERVICE PROCEDURES REQUIRED AND SUGGESTED FOR PROPER VEHICLE OPERATION

NOTE: Whenever transmission or drivetrain service is performed that affects the suspension alignment, for example, removing the engine cradle, it is required that the alignment be checked and corrected if necessary.

AUTOMATIC TRANSMISSION/TRANSAXLE ASSEMBLIES

AUTOMATIC TRANSMISSION/TRANSAXLE ASSEMBLY INSPECTION

Any internal component failure that requires removal of the assembly from the vehicle for service. (1) ..... A ..... (2) Require repair or replacement of the automatic transmission/transaxle assembly.

(1) - It is Required that the torque converter and all other failure related components be inspected for cause and condition.
(2) - For components not requiring removal of the assembly, refer to the component listing in this document.

DIFFERENTIAL AND FINAL DRIVE ASSEMBLIES

NOTE: Does not include half shafts.

DIFFERENTIAL AND FINAL DRIVE ASSEMBLY INSPECTION

Condition	Code	Procedure
Any internal component failure that requires removal of the assembly from the vehicle for service. (1)	A ...	Require repair or replacement of the differential assembly.

(1) - For components not requiring removal of the assembly, refer to the component listing in this document.

MANUAL TRANSMISSION/TRANSAXLE ASSEMBLIES

MANUAL TRANSMISSION/TRANSAXLE ASSEMBLY INSPECTION

Condition	Code	Procedure
Any internal component failure that requires removal of the assembly from the vehicle for		

service. (1)	A	...	Require repair or replacement of the manual transmission/transaxle assembly.

(1) - For components not requiring removal of the assembly, refer to the component listing in this document.

TRANSFER CASE ASSEMBLIES

TRANSFER CASE ASSEMBLY INSPECTION

Condition	Code		Procedure
Any internal component failure that requires removal of the assembly from the vehicle for service. (1)	A	...	Require repair or replacement of the transfer case differential assembly.

(1) - For components not requiring removal of the assembly, refer to the component listing in this document.

DRIVE TRAIN/COMPONENTS

The conditions listed for the components included in this section assume that the problem has been isolated to the specific component through proper testing.

ACTUATORS (ELECTRICAL)

ACTUATOR (ELECTRICAL) INSPECTION

Condition	Code		Procedure
Attaching hardware broken	A	...	Require repair or replacement of hardware.
Attaching hardware missing	C	.....	Require replacement of hardware.
Attaching hardware not			

functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted, affecting performance .. A ..... (1) Require repair or replacement.
Connector melted, not affecting performance .. 2 ..... (1) Suggest repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 1 ..... (1) Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 1 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

ACTUATORS (VACUUM)

ACTUATOR (VACUUM) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement.

of hardware.

Attaching hardware missing ..... C ..... Require replacement of hardware.

Attaching hardware not functioning ..... A .. Require repair or replacement of hardware.

Connector broken ..... A .. Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.

Connector melted, affecting performance .. A ..... (1) Require repair or replacement.

Connector melted, not affecting performance .. 2 ..... (1) Suggest repair or replacement.

Connector missing ..... C ..... Require replacement.

Inoperative ..... A ..... (2) Require replacement.

Leaking (vacuum) ..... A .. Require repair or replacement.

Linkage bent, affecting performance ..... A ... Require repair or replacement of linkage.

Linkage bent, not affecting performance .. 2 ... Suggest repair or replacement of linkage.

Linkage binding, affecting performance ..... A ... Require repair or replacement of linkage.

Linkage binding, not affecting performance .. 1 ... Suggest repair or replacement of linkage.

Linkage broken A Require repair or replacement of linkage.

Linkage loose, affecting performance ..... A ... Require repair or replacement of linkage.

Linkage loose, not affecting performance .. 1 ... Suggest repair or replacement of linkage.

Linkage missing ..... C ..... Require replacement.

Linkage noisy ..... 2 .. Suggest repair or replacement.

Missing ..... C ..... Require replacement.

Noisy ..... 2 .. Suggest repair or replacement.

Out of adjustment ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or

replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

AXLES

AXLE INSPECTION

Condition	Code	Procedure
Bent	A	Require replacement.
Broken	A	Require replacement.
End play exceeds specifications	B	Require repair or replacement.
Flange bent	A	Require replacement.
Flange threads stripped	A	Require repair or replacement.
Twisted	A	Require replacement.
Worn, affecting performance	A	Require replacement.

BEARINGS AND RACES

NOTE: When replacing or repacking bearings, grease seal replacement is required. You are not required to replace these components in axle sets. Determine the need to replace based upon the individual component conditions that follow.

BEARING AND RACE INSPECTION

Condition	Code	Procedure

Bearing end-play exceeds specifications ..... B .. Require adjustment of bearing, if possible. If proper adjustment cannot be obtained, require replacement of bearing assembly.

Bearing rollers, balls or races are worn, pitted, or feel rough when rotated as an assembly ..... B .. Require replacement of bearing assembly.

BELL CRANKS

BELL CRANK INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bent	A	Require repair or replacement.
Broken	A	Require repair or replacement.
Cracked	A	Require repair or replacement.
Missing	C	Require replacement.
Worn, affecting performance	A	Require repair or replacement.

BELL HOUSINGS

See HOUSINGS (BELL, CASE, TAIL (EXTENSION) AND AUXILIARY).

BUSHINGS (EXTERNAL)

BUSHING (EXTERNAL) INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part if available; otherwise, replace bushing.
Attaching hardware broken	A	Require replacement of broken part if available; otherwise, replace bushing.
Attaching hardware corroded, affecting structural integrity	A	Require replacement of corroded part if available; otherwise, replace bushing.
Attaching hardware incorrect	A	Require replacement of incorrect part if available; otherwise, replace bushing.
Attaching hardware loose	A	Require repair or replacement of loose part if available; otherwise, replace bushing.
Attaching hardware missing	C	Require replacement of missing part if available; otherwise, replace bushing.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads if available; otherwise, replace bushing.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads if available; otherwise, replace bushing.
Binding	A	Require repair or replacement.
Contaminated	1	Suggest replacement.
Deteriorated, affecting performance	A	Require repair or replacement.
Distorted, affecting performance	A	Require repair or replacement.
Missing	A	Require replacement.

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Noisy ..... 2 ..... (1) Further inspection required.
Rubber separating from internal metal sleeve on bonded bushing ..... A ..... Require replacement.
Seized ..... A ..... Require replacement.
Shifted (out of position) ..... B .. Require repair or replacement.
Split ..... A ..... Require replacement.
Surface cracking (weather-checked) .... No service suggested or required.
Worn, affecting performance ..... A .. Require repair or replacement.
Worn close to the end of its useful life ..... 1 ..... Suggest replacement.

(1) - If noise isolated to bushing, suggest repair or replacement.
CAUTION: Use only approved lubricant on rubber bushings. Petroleum-based lubricants may damage rubber bushings.

CABLES (SPEEDOMETER)

CABLE (SPEEDOMETER) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bent	A	Require repair or replacement.
Binding	A	Require repair or replacement.
Bracket bent, affecting performance	A	Require repair or replacement.
Bracket bent, not affecting performance	.. ..	No service suggested or required.
Bracket broken, affecting		

performance ..... A ..... Require replacement.
Bracket broken, not
affecting performance .. .. No service suggested or required.
Bracket corroded,
affecting performance .. A .. Require repair or replacement.
Bracket corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Bracket cracked, affecting
performance ..... A .. Require repair or replacement.
Bracket cracked, not
affecting performance .. 1 .. Suggest repair or replacement.
Bracket loose, affecting
performance ..... A .. Require repair or replacement.
Bracket loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Broken ..... A ..... Require replacement.
Cracked ..... A .. Require repair or replacement.
Disconnected ..... A .. Require repair or replacement.
Kinked ..... A .. Require repair or replacement.
Melted ..... A ..... (1) Require repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Routed incorrectly ..... 2 ..... Suggest repair.
Seized ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

CABLES (TV, DETENT AND SHIFT)

CABLE (TV, DETENT AND SHIFT) INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement

of hardware.

Bent ..... A .. Require repair or replacement.
Binding ..... A .. Require repair or replacement.
Bracket bent, affecting performance ..... A .. Require repair or replacement.
Bracket bent, not affecting performance .. .. No service suggested or required.
Bracket broken, affecting performance ..... A ..... Require replacement.
Bracket broken, not affecting performance .. .. No service suggested or required.
Bracket corroded, affecting performance .. A .. Require repair or replacement.
Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Bracket cracked, affecting performance ..... A .. Require repair or replacement.
Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket loose, affecting performance ..... A .. Require repair or replacement.
Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Broken ..... A ..... Require replacement.
Cracked ..... A .. Require repair or replacement.
Disconnected ..... A .. Require repair or replacement.
Frayed ..... A ..... Require replacement.
Kinked ..... A .. Require repair or replacement.
Melted ..... A ..... (1) Require repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B ..... (2) Require repair or replacement.
Routed incorrectly ..... 2 ..... Suggest repair.
Seized ..... A .. Require repair or replacement.
Self-adjuster inoperative ..... A .. Require repair or replacement of self-adjuster.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

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(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Cable replacement is required if it cannot be adjusted within specifications.

CARRIER BEARINGS

See INTERMEDIATE SHAFT SUPPORT BEARINGS.

CLUTCH CABLES AND CABLE HOUSINGS

CLUTCH CABLE AND CABLE HOUSING INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Cable bent	A	Require replacement.
Cable binding	A	Require repair or replacement.
Cable mounting loose	B	Require repair or replacement.
Cable out of adjustment	B	Require repair or replacement.
Frayed	B	Require replacement.
Housing heat-damaged	1	Suggest replacement.
Missing	C	Require replacement.
Noisy	2	Suggest repair or replacement.
Seized	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn, affecting performance	A	Require replacement.

CLUTCH DISCS (MANUAL TRANSMISSION)

CLUTCH DISC (MANUAL TRANSMISSION) INSPECTION

Condition	Code	Procedure
Backing plate cracked	A	Require replacement.
Broken	A	Require replacement.
Contaminated with oil	A	Require replacement.
Damper cushion broken	A	Require replacement.
Damper cushion collapsed	A	Require replacement.
Damper spring collapsed	A	Require replacement.

Damper spring missing .. C ..... (1) Require replacement.
Friction material cracked through ..... B ..... Require replacement.
Friction material flaking or chunking ..... B ..... Require replacement.
Friction material surface cracking ..... B ..... No service suggested or required.
Grooved ..... B ..... No service suggested or required unless the pressure plate or flywheel is being resurfaced or replaced. In this case, replacement of clutch disc is required.
Ridged ..... B ..... No service suggested or required unless the pressure plate or flywheel is being resurfaced or replaced. In this case, replacement of clutch disc is required.
Splines worn, affecting performance ..... A ..... Require replacement.
Warped ..... A ..... Require replacement.
Wear exceeds specifications (where applicable) ..... B ..... Require replacement.
Worn close to the end of its useful life ..... 1 ..... Suggest replacement.
Worn, affecting performance ..... A ..... Require replacement.

(1) - Not all clutch discs have springs in all spring chambers on the disc.

CLUTCH FORKS

CLUTCH FORK INSPECTION

Condition Code Procedure

Bent ..... B ..... Require replacement.
Broken ..... A .. Require repair or replacement.
Cracked ..... B .. Require repair or replacement.
Worn close to the end of its useful life ..... 1 ..... Suggest replacement.

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Worn, affecting
performance ..... A ..... Require replacement.

CLUTCH LINKAGES (MECHANICAL)

See LINKAGES (EXTERNAL).

CLUTCH MASTER CYLINDERS

CLUTCH MASTER CYLINDER INSPECTION

Condition	Code	Procedure
Cover gasket distorted	A	Require replacement of cover gasket.
Cover gasket gummy	A	Require replacement of cover gasket.
Cylinder leaking fluid from rear of bore	A	Require repair or replacement.
Cylinder leaking fluid internally	A	Require replacement.
Dust boot missing	C	Require replacement of dust boot.
Dust boot punctured	A	Require replacement of dust boot.
Dust boot torn	A	Require replacement of dust boot.
Fluid level incorrect	B	Require fluid level adjustment.
Housing damaged, affecting performance	A	Require repair or replacement.
Master cylinder has residue in reservoir (make parallel w/brakes when they are done)	2	(1) Further inspection required.
Threads damaged	A	Require repair replacement
Threads stripped (threads missing)	A	Require replacement.

(1) - DO NOT replace master cylinder unless it exhibits conditions listed for replacement. You may suggest fluid change according to OEM service intervals.

CLUTCH PEDALS

CLUTCH PEDAL INSPECTION

Condition	Code	Procedure
Bent, affecting performance	A	Require repair or replacement.
Broken	A	Require repair or replacement.
Pedal pad missing	C	Require replacement of pedal pad.
Pivot bushings worn, affecting performance	A	Require replacement of pivot bushings.

CLUTCH PIVOTS

CLUTCH PIVOT INSPECTION

Condition	Code	Procedure
Bent	A	Require replacement.
Broken	A	Require repair or replacement.
Cracked	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn close to the end of its useful life	1	Suggest replacement.
Worn, affecting performance	A	Require replacement.

CLUTCH PRESSURE PLATES

See PRESSURE PLATES.

CLUTCH RELEASE BEARINGS

CLUTCH RELEASE BEARING INSPECTION

Condition	Code	Procedure
Collar broken	A	Require replacement.
Cracked	A	Require replacement.
Rough when rotated as		

assembly ..... B ..... Require replacement.
Seized ..... A ..... Require replacement.
Wear exceeds
specifications ..... B ..... Require replacement.
Worn close to the end of
its useful life ..... 1 ..... Suggest replacement.
Worn, affecting
performance ..... A ..... Require replacement.

CLUTCH SLAVE CYLINDERS (CONCENTRIC)

CLUTCH SLAVE CYLINDER (CONCENTRIC) INSPECTION

Condition Code Procedure

Bearing rough when rotated
as an assembly ..... B ..... Require replacement.
Bearing seized ..... A ..... Require replacement.
Bleeder pipe leaks ..... A .. Require repair or replacement.
Carrier assembly worn,
affecting performance .. A ..... Require replacement.
Collar broken ..... A ..... Require replacement.
Cracked ..... A ..... Require replacement.
Housing leaks ..... A ..... Require replacement.
Inoperative ..... A ..... Require replacement.
Release binding ..... A ..... Require replacement.
Spring broken ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Worn, affecting
performance ..... A ..... Require replacement.

CLUTCH SLAVE CYLINDERS (CONVENTIONAL OR EXTERNAL)

CLUTCH SLAVE CYLINDER (CONVENTIONAL OR EXTERNAL) INSPECTION

Condition Code Procedure

Binding ..... A .. Require repair or replacement.
Bleeder port damaged (not
repairable) ..... A ..... (1) Require replacement.
Bleeder port damaged
(repairable) ..... A ..... (1) Require repair.

Bleeder screw broken off
in slave cylinder ..... A ..... (1) Require replacement.
Bleeder screw seized .... A ..... (2) Require replacement.
Bore corroded (pitted) .. B ..... Require replacement.
Bore grooved ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - Only required if the hydraulic system must be opened.
(2) - Seized is defined as a bleeder screw that cannot be removed after a practical attempt at removing it has been made.

COMPANION FLANGES

See YOKES AND SLIP YOKES.

CONNECTORS

See WIRING HARNESSES AND CONNECTORS.

COOLER BYPASS VALVES

COOLER BYPASS VALVE INSPECTION

Condition Code Procedure

Inoperative ..... A ..... Require replacement.
Installed incorrectly ... A ..... Require repair.
Leaking ..... A .. Require repair or replacement.
Restricted ..... A .. Require repair or replacement.

COOLER LINES

COOLER LINE INSPECTION

Condition Code Procedure

Abrasion damage, affecting
structural integrity ... A .. Require repair or replacement.
Abrasion damage, not
affecting structural
integrity .... No service suggested o

required.
Application incorrect ... B ..... Require replacement.
Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement
of hardware.
Clamp corroded, not
reusable ..... 1 ..... Suggest replacement.
Connected incorrectly ... A ..... Require repair.
Corroded, affecting
structural integrity ... A ..... Require replacement.
Corroded, not affecting
structural integrity ... . No service suggested or
required.
Cracked ..... A .. Require repair or replacement.
Fitting type incorrect
(such as compression
fitting) ..... B ..... Require replacement.
Flange leaking ..... A .. Require repair or replacement.
Insufficient clamping
force, allowing hose to
leak ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Melted ..... 1 .. Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Outer covering damaged to
the extent that the inner
fabric is visible ..... A ..... Require replacement.
Protective sleeves
damaged ..... 2 . Suggest replacement of sleeves.
Protective sleeves
missing ..... C . Require replacement of sleeves.
Restricted, affecting
performance ..... A .. Require repair or replacement.
Routed incorrectly ..... 2 ..... Require repair.
Swollen ..... 1 ..... Suggest replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Type incorrect ..... 1 .. Suggest repair or replacement.

COOLERS

See TRANSMISSION COOLERS.

CV JOINTS

CV JOINT INSPECTION

Condition	Code	Procedure
Bearing, bushing or seal surface worn, affecting performance	A	Require repair or replacement.
Boot clamp broken	A	Require repair or replacement of clamp.
Boot clamp loose	A	Require repair or replacement of clamp.
Boot clamp missing	C	Require repair or replacement of clamp.
Boot leaking	A	Require replacement of CV boot.
Boot surface cracked, not leaking	2	Suggest replacement of CV boot.
Cage broken	A	Require repair or replacement of CV joint.
Housing damaged to the extent that it no longer performs its intended function	A	(1) Require repair or replacement of CV joint.
Housing worn to the extent that it no longer performs its intended function	A	(1) Require repair or replacement of CV joint.
Holes elongated	A	Require replacement.
Internal parts binding	A	Require repair or replacement.
Internal parts worn	A	Require repair or replacement.
Lubricant missing	C	Require cleaning, inspection, and repacking of CV joint.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Housing assembly may appear blue in color from normal manufacturing process of heat-treating the housing.

DIP STICK TUBES

DIP STICK TUBE INSPECTION

Condition	Code	Procedure
Broken	A	Require repair or replacement.
Checkball missing	C	Suggest repair or replacement.
Cracked	A	Require repair or replacement.
Hold down bracket broken	A	Require repair or replacement.
Hold down bracket missing	C	Require replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

DIP STICKS (FLUID LEVEL INDICATORS)

DIP STICK (FLUID LEVEL INDICATOR) INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Broken	A	Require replacement.
Compressed	A	Require repair or replacement.
Missing	C	Require replacement.
Modified	A	Require replacement.
Stretched	A	Require repair or replacement.

DOWEL PINS, GUIDES AND PILOT HOLES

DOWEL PIN, GUIDE AND PILOT HOLE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement.
Cracked	A	Require repair or replacement.
Distorted	A	Require repair or replacement.
Missing	C	Require replacement.
Positioned incorrectly	B	Require repair or replacement.

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Stepped ..... A .. Require repair or replacement.
Worn to the extent that it
no longer performs its
intended function ..... A .. Require repair or replacement.

DRIVE SHAFT FLANGES

See COMPANION FLANGES.

DRIVE SHAFTS AND HALF SHAFTS

DRIVE SHAFT AND HALF SHAFT INSPECTION

Condition Code Procedure

Balance weight missing .. C .. Require repair or replacement.
Bearing cap bore
distorted ..... A .. Require repair or replacement.
Bent ..... A ..... Require replacement.
Bolt holes elongated .... A .. Require repair or replacement.
Bushing or seal surface
worn, affecting
performance ..... A .. Require repair or replacement.
Leaking through soft yoke
plug ..... A ... Require repair or replacement
of soft yoke plug.
Out of balance ..... A .. Require repair or replacement.
Retainer strap bent ..... A ..... Require replacement of
retainer strap.
Slip yoke broken ..... A ..... Require replacement.
Splines worn, affecting
performance ..... A ..... Require replacement.
Splines worn close to
the end of their
useful life ..... 1 ..... Suggest replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
U-bolt damaged, affecting
performance ..... A . Require replacement of U-bolts.
Yoke damaged, affecting
performance ..... A .. Require repair or replacement.

DUST BOOTS

NOTE: Does not include CV boots.

DUST BOOT INSPECTION

Condition	Code	Procedure
Cracked, not leaking	1	Suggest replacement.
Missing	C	Require replacement.
Leaking	A	Require repair or replacement.
Torn	A	Require replacement.

ENGINE MOUNTS

See MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION).

EXCITER RINGS

See TOOTHED RINGS (TONE WHEELS).

FILLER TUBES

See DIP STICK TUBES.

FILTERS AND SCREENS

FILTER AND SCREEN INSPECTION

Condition	Code	Procedure
At service interval	3	Suggest replacement.
Bent	A	Require repair or replacement.
Exceeding service interval	3	Suggest replacement.
Missing	C	Require replacement.
Near service interval	3	Suggest replacement.
Restricted	A	(1) Require repair or replacement.
Torn	A	Require replacement.
Worn, affecting performance (metal or nylon screen type)	A	Require repair or replacement.

(1) - Further inspection may be required to determine the source of restriction or contamination.

FLANGES

See COMPANION FLANGES.

FLEX PLATES

FLEX PLATE INSPECTION

Condition	Code	Procedure
Bent, affecting performance	A	Require replacement.
Bent, not affecting performance	..	No service suggested or required.
Bolt or stud holes elongated	B	Require replacement.
Broken	A	Require replacement.
Cracked	A	Require replacement.
Ring gear worn close to the end of its useful life	1	Suggest replacement.
Ring gear worn to the extent that it no longer performs its intended function	A	Require replacement.
Weights missing	A	Require replacement.

FLUID LEVEL INDICATORS

See DIP STICKS (FLUID LEVEL INDICATORS).

FLUIDS AND LUBRICANTS

FLUID AND LUBRICANT INSPECTION

Condition	Code	Procedure
Application incorrect	B	(1) Require replacement.
At service interval	3	Suggest replacement.
Beyond service interval	3	Suggest replacement.
Burned	..	(2) Further inspection required.

Contaminated, for example,
fluid other than hydraulic
fluid present ..... A or B .... (3)(4) Require service.
Exceeding service
interval ..... 3 ..... Suggest replacement.
Hydraulic fluid
incorrect ..... B ..... (5) Require service.
Level incorrect ..... B ..... Require correction of fluid level.
Near service interval ... 3 ..... Suggest replacement.
Rubber master cylinder
cover gasket distorted
and gummy ..... A ..... (3) Require service.
Varnished .... (6) Further inspection required.

(1) - Determine and correct cause.
(2) - Fluid that is burned indicates a serious problem. Determine and correct the cause.
(3) - If a fluid other than hydraulic fluid is present in the hydraulic system which DOES affect the rubber parts, the required service is to: 1) remove all components having rubber parts from the system, 2) flush lines with denatured alcohol or hydraulic cleaner, 3) repair or replace all components having rubber parts, and 4) bleed and flush with correct hydraulic fluid. (Code A)
(4) - If a fluid other than hydraulic fluid is present in the hydraulic system which DOES NOT affect the rubber parts, the required service is to flush and fill with the correct hydraulic fluid. (Code B)
(5) - If a fluid other than specification hydraulic fluid is present in the hydraulic system, the required service is to flush and fill with the correct hydraulic fluid.
(6) - Fluid that is varnished may indicate a serious problem. Determine and correct the cause.

FLYWHEELS

NOTE: Clutch disc replacement does not necessitate flywheel reconditioning, unless other conditions justify the reason to do so.

FLYWHEEL INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Cracked (other than
mounting area) ..... A ..... (1) Require resurfacing or replacement.
Cracks in mounting area . B ..... Require replacement.
Hard spots ..... B .. Require repair or replacement.
Ring gear broken ..... A ..... Require replacement of ring gear.
Ring gear teeth worn,
affecting performance .. A ..... Require replacement of ring gear.
Runout exceeds
specifications ..... B .. Require repair or replacement.
Scored ..... B .. Require repair or replacement.
Surface cracks after
resurfacing to
manufacturer's minimum
specifications ..... B ..... Require replacement.
Wear exceeds
specifications ..... B ..... Require replacement.
Worn close to the end of
its useful life ..... 1 ..... Suggest replacement.
Worn, affecting
performance ..... A .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - Some manufacturers allow slight surface cracking in the friction surface.

FORCE MOTORS

See ACTUATORS (ELECTRICAL).

See DOWEL PINS, GUIDES AND PILOT HOLES.

HALF SHAFTS

See DRIVE SHAFTS AND HALF SHAFTS.

HOSES, LINES AND TUBES

HOSE, LINE AND TUBE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Connected incorrectly	A	Require repair.
Corroded, not reusable	1	Suggest replacement.
Cracked	A	Require replacement.
Dry-rotted	1	Suggest repair or replacement.
Hard	1	Suggest repair or replacement.
Inner fabric (webbing) damaged	A	Require replacement.
Insufficient clamping force, allowing hose to leak	A	Require repair or replacement.
Leaking	A	Require repair or replacement.
Maintenance intervals	3	Suggest replacement.
Melted	1	Suggest repair or replacement.
Missing	C	Require replacement.
Outer covering damaged	1	Suggest replacement.
Outer covering damaged to the extent that the inner fabric is visible	A	Require replacement.
Protective sleeves damaged	2	Suggest replacement of sleeves.
Protective sleeves missing	2	Suggest replacement of sleeves.
Restricted, affecting performance	A	Require repair or replacement.
Restricted, not affecting performance	2	Suggest repair or replacement.
Routed incorrectly	2	Suggest replacement.
Safety clip missing	C	Require replacement.
Spongy	1	Suggest repair or replacement.
Stripped	A	Require replacement.
Swollen	B	Require replacement.
Threads damaged	A	Require replacement.

Threads stripped (threads
missing) ..... A ..... Require replacement.
Type incorrect ..... 1 .. Suggest repair or replacement.

HOUSINGS (BELL, CASE, TAIL (EXTENSION) AND AUXILIARY)

HOUSING (BELL, CASE, TAIL (EXTENSION) AND AUXILIARY) INSPECTION

Condition Code Procedure

Bearing race loose
in bore ..... A .. Require repair or replacement.
Broken, affecting
performance ..... A .. Require repair or replacement.
Cracked ..... A .. Require repair or replacement.
Dowel pin holes worn,
affecting performance .. A ..... (1) Require repair or
replacement.
Machined surfaces damaged,
affecting performance .. A .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Worn, affecting
performance ..... A .. Require repair or replacement.

(1) - See DOWEL PINS, GUIDES AND PILOT HOLES.

INTERMEDIATE SHAFT SUPPORT BEARINGS

INTERMEDIATE SHAFT SUPPORT BEARING INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement
of hardware.
Bearing rollers, balls or

races are worn, pitted, noisy, or feel rough when rotated as an assembly . A .. Require replacement of bearing assembly.

Bracket bent, affecting performance ..... A .. Require repair or replacement.

Bracket bent, not affecting performance .. .. No service suggested or required.

Bracket broken, affecting performance ..... A ..... Require replacement.

Bracket broken, not affecting performance .. .. No service suggested or required.

Bracket corroded, affecting performance .. A .. Require repair or replacement.

Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Bracket cracked, affecting performance ..... A .. Require repair or replacement.

Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket holes elongated, affecting performance .. A .. Require repair or replacement.

Bracket holes elongated, not affecting performances) .... No service suggested or required.

Bracket loose, affecting performance ..... A .. Require repair or replacement.

Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket missing ..... C ..... Require replacement.

Cracked .... Require replacement.

Rough (brinelling, spalling) ..... A ..... Require replacement.

Rubber deteriorated, affecting performance .. A ..... Require replacement.

Seized ..... A ..... Require replacement.

KEY INTERLOCK SYSTEMS

See SHIFT INTERLOCK SYSTEMS (SELECTOR AND KEY INTERLOCK SYSTEMS).

LIMITED SLIPS

See DIFFERENTIAL AND FINAL DRIVE ASSEMBLIES.

LINES

See HOSES, LINES AND TUBES.

LINKAGES (EXTERNAL)

LINKAGE (EXTERNAL) INSPECTION

Condition	Code	Procedure
Components missing	C	Require replacement of missing components.
Linkage bent, affecting performance	A	Require repair or replacement of linkage.
Linkage bent, not affecting performance	2	Suggest repair or replacement of linkage.
Linkage binding, affecting performance	A	Require repair or replacement of linkage.
Linkage binding, not affecting performance	1	Suggest repair or replacement of linkage.
Linkage broken	A	Require repair or replacement of linkage.
Linkage loose, affecting performance	A	Require repair or replacement of linkage.
Linkage loose, not affecting performance	1	Suggest repair or replacement of linkage.
Linkage missing	C	Require replacement.
Linkage noisy	2	Suggest repair or replacement.
Out of adjustment	B	Require repair or replacement.
Worn to the extent that it no longer performs its intended function	A	Require repair or replacement.

LOCKING HUB ASSEMBLIES

LOCKING HUB ASSEMBLY INSPECTION

Condition	Code	Procedure
Inoperative	A	(1) Require repair or replacement.
Loose	A	Require repair or replacement.
Seized in any position	A	Require repair or replacement.

(1) - Inoperative includes intermittent operation.

LOCKING HUB CONTROL KNOBS

LOCKING HUB CONTROL KNOB INSPECTION

Condition	Code	Procedure
Damaged, affecting performance	A	Require replacement.
Missing	C	Require replacement.
Worn, affecting performance	A	Require replacement.

LUBRICANTS

See FLUIDS AND LUBRICANTS.

METAL-CLAD SEALS

See SEALS.

METALASTIC JOINTS

See RUBBER JOINTS (METALASTIC).

MODULATOR PINS

MODULATOR PIN INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Missing	C	Require replacement.

MODULATORS

MODULATOR INSPECTION

Condition	Code	Procedure
Bent, affecting performance	A	Require replacement.
Contaminated (water, fuel, etc.)	A	(1) Require replacement.
Housing cracked	A	Require replacement.
Inoperative	A	(2) Require replacement.
Leaking fluid externally	A	Require repair or replacement.
Leaking fluid internally	A	Require replacement.
Leaking vacuum	A	Require replacement.
Nipple broken	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Further inspection is required to determine the cause of the contamination.
(2) - Inoperative includes intermittent operation or out of OEM specification.

MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION)

MOUNT (ENGINE, TRANSAXLE AND TRANSMISSION) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Broken	A	Require replacement.
Leaking (hydraulic mount)	A	Require replacement.

Mounting hole worn, affecting performance	A	Require replacement.
Mounting hole worn, not affecting performance		No service suggested or required.
Rubber deteriorated, affecting performance	A	Require replacement.
Rubber deteriorated, not affecting performance		No service suggested or required.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

ODOMETER DRIVES (MECHANICAL)

See SPEEDOMETER/ODOMETER DRIVES (MECHANICAL).

ODOMETER HEADS (MECHANICAL)

See SPEEDOMETER/ODOMETER HEADS (MECHANICAL).

OIL PANS

See TRANSMISSION PANS.

PANS

See TRANSMISSION PANS.

PILOT HOLES

See DOWEL PINS, GUIDES AND PILOT HOLES.

PRESSURE PLATES

PRESSURE PLATE INSPECTION

Condition	Code	Procedure
Balance weight missing	C	Require replacement.
Broken	A	Require replacement.
Contact surface distorted	B	Require replacement.
Cracks	B	Require replacement.
Fingers bent	A	Require replacement.

Hard spots	B	Require replacement.
Scored	B	Require replacement.
Spring rate less than specifications	B	Require replacement.
Worn, affecting performance	A	Require replacement.
Worn beyond specifications	B	Require replacement.
Worn close to the end of its useful life	1	Suggest replacement.

PRESSURE SWITCHES

See SWITCHES.

RACES

See BEARINGS AND RACES.

RUBBER JOINTS (METALASTIC)

These joints may be found on half and/or drive shafts. They are usually found on European vehicles featuring a three-lug drive flange. They may be equipped with a centering ball or pin.

RUBBER JOINT (METALASTIC) INSPECTION

Condition	Code	Procedure
Drive flange bent	A	Require repair or replacement.
Drive flange damaged, affecting performance	A	Require replacement.
Rubber drive joint cracked	2	Suggest replacement.
Rubber drive joint damaged, affecting performance	A	Require replacement.
Rubber drive joint split between mounting holes	A	Require replacement.
Rubber drive joint torn at mounting holes	A	Require replacement.
Rubber drive joint weather-cracked		No service suggested or required.

SCREENS

See FILTERS AND SCREENS.

SEALS

SEAL INSPECTION

Condition	Code	Procedure
Leaking	A	(1) Require repair or replacement.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary. Check vent. A plugged vent may force fluid past the seal.

SEALS (METAL-CLAD)

See SEALS.

SELECTOR INTERLOCK SYSTEMS

See SHIFT INTERLOCK SYSTEMS (SELECTOR AND KEY INTERLOCK SYSTEMS).

SERVOS

See ACTUATORS (VACUUM).

SHIFT INTERLOCK SYSTEMS (SELECTOR AND KEY INTERLOCK SYSTEMS)

See:
ACTUATORS (ELECTRICAL)
CABLES
LINKAGES (EXTERNAL)
SWITCHES

SENSORS

SENSOR INSPECTION

Condition	Code	Procedure

Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require repair or replacement.
Leaking (vacuum/fluid/air) ..... A ..... Require replacement.
Out of adjustment ..... B ..... (3) Further inspection required.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of specification.
(3) - Follow OEM recommended adjustment procedures. Repair or replace if out of specification.

SIDE COVERS

See TRANSMISSION PANS.

SLIP YOKES

See YOKES AND SLIP YOKES.

SOLENOIDS

See:
ACTUATORS (ELECTRICAL)
ACTUATORS (VACUUM)

SPEED SENSORS (ELECTRONIC WHEEL AND VEHICLE)

SPEED SENSOR (ELECTRONIC WHEEL AND VEHICLE) INSPECTION

Condition	Code	Procedure
Air gap incorrect	B	(1) Require adjustment or replacement.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(2) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(3) Require repair or replacement.
Inoperative	B	(4) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Loose	A	Require repair or replacement.

Missing ..... C ..... Require replacement.
Resistance out of
specification ..... B .. Require repair or replacement.
Sensor housing cracked .. 2 ..... Suggest replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (2) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead misrouted ..... B .... Require re-routing according
to vehicle manufacturer's
specifications.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - If a sensor is not adjustable, further inspection is
required to identify and correct cause.
(2) - Determine cause and correct prior to repair or
replacement of part.
(3) - Determine source of contamination, such as metal particles
or water. Require repair or replacement.
(4) - Inoperative includes intermittent operation or out of OEM
specification. Some components may be serviceable;
check for accepted cleaning procedure.

SPEEDOMETER-DRIVEN GEAR HOUSINGS

See SPEEDOMETER/ODOMETER DRIVES (MECHANICAL).

SPEEDOMETER/ODOMETER DRIVES (MECHANICAL) *** DRIVETRAIN SYSTEMS UNIFORM INSPEC**

SPEEDOMETER/ODOMETER DRIVE (MECHANICAL) INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Inoperative	A	(1) Require replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Teeth broken	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn close to the end of its useful life	1	Suggest replacement.
Worn, affecting performance	A	Require replacement.

(1) - Inoperative includes intermittent operation.

SPEEDOMETER/ODOMETER HEADS (MECHANICAL)

SPEEDOMETER/ODOMETER HEAD (MECHANICAL) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Lens broken	A	(1) Require repair or

replacement.
Lens cloudy ..... 2 ..... (1) Suggest repair or replacement.
Lens missing ..... C ..... (1) Require repair or replacement.
Malfunctioning ..... A ..... (2) Require repair or replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

(1) - If lens is available as a separate part, require replacement of lens only.
(2) - Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.

SPEEDOMETERS AND ODOMETERS (ELECTRONIC)

SPEEDOMETER AND ODOMETER (ELECTRONIC) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Leaking	A	Require replacement.
Lens broken	A	(2) Require repair or replacement.
Lens cloudy	2	(2) Suggest repair or replacement.
Lens missing	C	(2) Require repair or

replacement.
Malfunctioning ..... A ..... (3) Require repair or replacement.
Mechanical head noisy ... 2 .. Suggest repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - If lens is available as a separate part, require replacement of lens only.
(3) - Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.

SWITCHES

SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Binding, affecting performance	A	Require repair or replacement.
Binding, not affecting		

performance ..... 2 .. Suggest repair or replacement.
Broken ..... A .. Require repair or replacement.
Burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Burned, not affecting
performance ..... 2 ..... (1) Suggest repair or replacement.
Cracked, affecting
performance ..... A .. Require repair or replacement.
Cracked, not affecting
performance ..... 1 .. Suggest repair or replacement.
Leaking ..... A .. Require repair or replacement.
Malfunctioning ..... A ..... (2) Require repair or replacement.
Melted, affecting
performance ..... A ..... (1) Require repair or replacement.
Melted, not affecting
performance ..... 2 ..... (1) Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Out of adjustment ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Won't return ..... A .. Require repair or replacement.
Worn ..... 1 ..... Suggest replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Includes inoperative, intermittent operation, or failure to perform all functions.

TONE WHEELS

See TOOTHED RINGS (TONE WHEELS).

TOOTHED RINGS (TONE WHEELS)

If the toothed ring requires replacement and cannot be replaced as a separate component, replace the assembly of which the ring is a part.

TOOTHED RING (TONE WHEEL) INSPECTION

Condition	Code	Procedure
Alignment incorrect	B	Require repair or replacement.
Bent	B	Require replacement.
Contaminated, affecting performance	A	Require repair. Identify and correct cause.
Cracked	B	Require replacement.
Loose	A	Require replacement of worn parts.
Missing	C	Require replacement.
Number of teeth incorrect	B	Require replacement.
Teeth broken	A	Require replacement.
Teeth damaged, affecting performance	A	Require replacement.

TORQUE CONVERTERS

TORQUE CONVERTER INSPECTION

Condition	Code	Procedure
Converter clutch lock-up operation is faulty	A	Require replacement.
Cover shell damaged, affecting performance	A	Require replacement.
Does not meet stall speed specification	B	Require replacement.
End play exceeds specifications	B	Require replacement.
Hub broken	A	Require replacement.
Hub cracked	A	Require replacement.

Internal component
failure ..... A ..... Require replacement.
Leaking ..... A .. Require repair or replacement.
Pilot broken ..... A ..... Require replacement.
Pilot worn, affecting
performance ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Weights missing ..... C ..... Require replacement.

TRANSAXLE MOUNTS

See MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION).

TRANSDUCERS (TRANSMISSION)

See SENSORS.

TRANSMISSION COOLERS

TRANSMISSION COOLER INSPECTION

Condition Code Procedure

Air flow obstruction .... A ..... Require repair.
Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A .. Require repair or replacement
of hardware.
Connection leaking ..... A .. Require repair or replacement.
Contaminated ..... A .. Require repair or replacement.
Corroded ..... 1 .. Suggest repair or replacement.
Fins damaged, affecting
performance ..... A .. Require repair or replacement.
Fins damaged, not
affecting performance .. .. No service suggested or
required.
Internal restrictions ... B .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement

Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A .. Require repair or replacement.
Tubes damaged, affecting performance ..... A .. Require repair or replacement.
Tubes damaged, not affecting performance .. .. No service suggested or required.

TRANSMISSION MOUNTS

See MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION).

TRANSMISSION PANS

TRANSMISSION PAN INSPECTION

Condition Code Procedure

Bent, interfering with filter or other internal components ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.

TRANSMISSION RANGE INDICATORS (PRNDL)

TRANSMISSION RANGE INDICATOR (PRNDL) INSPECTION

Condition Code Procedure

Binding ..... A .. Require repair or replacement.
Broken ..... A .. Require repair or replacement.
Components missing ..... C .. Require replacement of missing components.
Loose, affecting performance ..... A .. Require repair or replacement.
Out of adjustment ..... A ..... Require repair.
Worn, affecting performance ..... A .. Require repair or replacement.

TUBES

See HOSES, LINES AND TUBES.

UNIVERSAL JOINTS (CARDON OR CROSS TYPE)

UNIVERSAL JOINT (CARDON OR CROSS TYPE) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bearing cap distorted	B	Require replacement.
Binding	A	Require replacement.
Cross (trunion) worn, affecting performance	A	Require replacement.
Double cardon centering ball damaged	A	Require replacement.
Double cardon centering ball worn, affecting performance	A	Require replacement.
Double cardon centering spring broken	A	Require replacement.
Double cardon centering spring missing	C	Require replacement.
Double cardon centering spring weak	A	Require replacement.
End cap seal cracked	2	Suggest replacement.
End cap seal missing	C	Require replacement of seal.
Grease fitting broken	A	(1) Require replacement of grease fitting.
Grease fitting missing	C	(2) Require replacement of grease fitting.
Rust-colored powder around end cap seals	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn, affecting performance	A	Require replacement.

(1) - A broken grease fitting does not require replacement

of the U-Joint.
(2) - A missing grease fitting does not require replacement of the U-Joint.

VACUUM CONTROLS

See ACTUATORS (VACUUM).

VACUUM HOSES

See HOSES, LINES AND TUBES.

VACUUM MOTORS

See ACTUATORS (VACUUM).

VACUUM-OPERATED SWITCHES

See SWITCHES.

VEHICLE SPEED SENSORS

See SPEED SENSORS (ELECTRONIC WHEEL AND VEHICLE).

VENTS

VENT INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Missing	C	Require replacement.
Plugged	A	(1) Require repair or replacement.

(1) - A plugged vent may force fluid past the seal.

VIBRATION DAMPERS

VIBRATION DAMPER INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Missing	C	Require replacement.

Out of position ..... B .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

WHEEL ATTACHMENT HARDWARE

NOTE: For conditions noted below, also check conditions of wheel stud holes.

CAUTION: Proper lug nut torque is essential. Follow recommended torque specifications and tightening sequence. DO NOT lubricate threads unless specified by the vehicle manufacturer.

WHEEL ATTACHMENT HARDWARE INSPECTION

Condition Code Procedure

Bent ..... A ..... Require replacement.
Broken ..... A ..... (1) Require replacement.
Loose ..... B ... Require repair or replacement of affected component.
Lug nut installed
backward ..... B .. Require repair or replacement.
Lug nut mating surface
dished ..... A ..... Require replacement of nut.
Lug nut mating type
incorrect ..... B ..... Require replacement of nut.
Lug nut rounded ..... A . (2) Require replacement of nut.
Lug nut seized ..... A . (2) Require replacement of nut.
Stud incorrect ..... B .... Require replacement of stud.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - Some manufacturers require replacement of all studs on that wheel if two or more studs or nuts on the same wheel are broken or missing.
(2) - Only required if removing wheel.

WHEEL SPEED SENSORS

See SPEED SENSORS (ELECTRONIC WHEEL AND VEHICLE).

WIRING HARNESS AND CONNECTOR INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Insulation damaged, conductors exposed	A	Require repair or replacement.
Insulation damaged, conductors not exposed	1	Suggest replacement.
Open	A	Require repair or replacement.
Protective shield (conduit) melted	2	(1) Suggest repair or replacement.
Protective shield (conduit) missing	2	Suggest repair or replacement.
Resistance (voltage drop) out of specification	A	Require repair or replacement.
Routed incorrectly	B	Require repair.
Secured incorrectly	B	Require repair.
Shorted	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.

Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Transmission connector
leaking .... See TRANSMISSION ASSEMBLY.
Voltage drop out of
specification ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

YOKES AND SLIP YOKES

YOKE AND SLIP YOKE INSPECTION

Condition Code Procedure

Bearing cap bore
distorted ..... A .. Require repair or replacement.
Bent ..... A ..... Require replacement.
Bolt holes elongated .... A .. Require repair or replacement.
Bushing or seal surface
worn, affecting
performance ..... A .. Require repair or replacement.
Leaking through soft yoke
plug ..... A ... Require repair or replacement of soft yoke plug.
Retainer strap bent ..... A ..... Require replacement of retainer strap.
Slip yoke broken ..... A ..... Require replacement.
Splines worn, affecting
performance ..... A ..... Require replacement.
Splines worn close
to the end of their
useful life ..... 1 ..... Suggest replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
U-bolt damaged, affecting
performance ..... A ..... Require replacement of U-bolts.
Yoke damaged, affecting

performance ..... A .. Require repair or replacement.

END OF ARTICLE

* DRIVETRAIN SYSTEMS UNIFORM INSPECTION GUIDELINES *

Article Text

1996 Kia Sephia

For 1 1 1 1 1

Saturday, April 18, 2009 10:05PM

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Standards For Automotive Repair

All Makes and Models

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INTRODUCTION TO MOTORIST ASSURANCE PROGRAM (MAP)

OVERVIEW OF MOTORIST ASSURANCE PROGRAM

The Motorist Assurance Program is the consumer outreach

effort of the Automotive Maintenance and Repair Association, Inc. (AMRA). Participation in the Motorist Assurance Program is drawn from retailers, suppliers, independent repair facilities, vehicle manufacturers and industry associations.

Our organization's mission is to strengthen the relationship between the consumer and the auto repair industry. We produce materials that give motorists the information and encouragement to take greater responsibility for their vehicles-through proper, manufacturer-recommended, maintenance. We encourage participating service and repair shops (including franchisees and dealers) to adopt (1) a Pledge of Assurance to their Customers and (2) the Motorist Assurance Program Standards of Service. All participating service providers have agreed to subscribe to this Pledge and to adhere to the promulgated Standards of Service demonstrating to their customers that they are serious about customer satisfaction.

These Standards of Service require that an inspection of the vehicle's (problem) system be made and the results communicated to the customer according to industry standards. Given that the industry did not have such standards, the Motorist Assurance Program successfully promulgated industry inspection communication standards in 1994-95 for the following systems: Exhaust, Brakes, ABS, Steering and Suspension, Engine Maintenance and Performance, HVAC, and Electrical Systems. Further, revisions to all of these inspection were recently published. Further, revisions to all of these inspection communication standards are continually republished. In addition to these, standards for Drive Train and Transmissions have recently been promulgated. Participating shops utilize these Uniform Inspection & Communication Standards as part of the inspection process and for communicating their findings to their customers.

The Motorist Assurance Program continues to work cooperatively and proactively with government agencies and consumer groups toward solutions that both benefit the customer and are mutually acceptable to both regulators and industry. We maintain the belief that industry must retain control over how we conduct our business, and we must be viewed as part of the solution and not part of the problem. Meetings with state and other government officials (and their representatives), concerned with auto repair and/or consumer protection, are conducted. Feedback from these sessions is brought back to the association, and the program adjusted as needed.

To assure auto repair customers recourse if they were not satisfied with a repair transaction, the Motorist Assurance Program offers mediation and arbitration through MAP/BBB-CARE and other non-profit organizations. MAP conducted pilot programs in twelve states before announcing the program nationally in October, 1998. During the pilots, participating repair shops demonstrated their adherence to the Pledge and Standards and agreed to follow the UICS in communicating

the results of their inspection to their customers. To put some "teeth" in the program, an accreditation requirement for shops was initiated. The requirements are stringent, and a self-policing method has been incorporated which includes the "mystery shopping" of outlets.

We welcome you to join us as we continue our outreach... with your support, both the automotive repair industry and your customers will reap the benefits. Please visit MAP at our Internet site www.motorist.org or contact us at:

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January 1999

MAP UNIFORM INSPECTION GENERAL GUIDELINES

OVERVIEW OF SERVICE REQUIREMENTS & SUGGESTIONS

It is MAP policy that all exhaust, brake, steering, suspension, wheel alignment, drive-line, engine performance and maintenance, and heating, ventilation and air conditioning, and electrical services be offered and performed under the standards and procedures specified in these sections.

Before any service is performed on a vehicle, an inspection of the appropriate system must be performed. The results of this inspection must be explained to the customer and documented on an inspection form. The condition of the vehicle and its components will indicate what services/part replacements may be "Required" or "Suggested". In addition, suggestions may be made to satisfy the requests expressed by the customer.

When a component is suggested or required to be repaired or replaced, the decision to repair or replace must be made in the customer's best interest, and at his or her choice given the options available.

This section lists the various parts and conditions that indicate a required or suggested service or part replacement. Although this list is extensive, it is not fully inclusive. In addition to this list, a technician may make a suggestion. However, any suggestions must be based on substantial and informed experience, or the vehicle manufacturer's recommended service interval and must be documented.

Some conditions indicate that service or part replacement is required because the part in question is no longer providing the function for which it is intended, does not meet a vehicle manufacturer's design specification or is missing.

*** DRIVETRAIN SYSTEMS UNIF**

Example:
An exhaust pipe has corroded severely and has a hole in it through which exhaust gases are leaking. Replacement of the exhaust pipe in this case is required due to functional failure.

Example:
A brake rotor has been worn to the point where it measures less than the vehicle manufacturer's discard specifications. Replacement of the rotor is required because it does not meet design specifications.

Some conditions indicate that a service or part replacement is suggested because the part is close to the end of its useful life or addresses a customer's need, convenience or request. If a customer's vehicle has one of these conditions, the procedure may be only to suggest service.

Example:
An exhaust pipe is rusted, corroded or weak, but no leaks are present. In this case, the exhaust pipe has not failed. However, there is evidence that the pipe may need replacement in the near future. Replacement of the pipe may be suggested for the customer's convenience in avoiding a future problem.

Example:
The customer desires improved ride and/or handling, but the vehicle's shocks or struts have not failed. In this case, replacement may be suggested to satisfy the customer's wishes. In this case, replacement of the shocks or struts may not be sold as a requirement.

A customer, of course, has the choice of whether or not a shop will service his or her vehicle. He or she may decide not to follow some of your suggestions. When a repair is required, a MAP shop must refuse partial service on that system if, in the judgment of the service provider, proceeding with the work could create or continue an unsafe condition. When a procedure states that required or suggested repair or replacement is recommended, the customer must be informed of the generally acceptable repair/replacement options whether or not performed by the shop.

When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

The following reasons may be used for requiring inspection:

services. These codes are shown in the "Code" column of the MAP Uniform Inspection & Communications Standards that follow:

Reasons to Require Repair or Replacement

A - Part no longer performs intended purpose
B - Part does not meet a design specification (regardless of performance)
C - Part is missing

NOTE: When a repair is required, the shop must refuse partial service to the system in question, if the repair creates or continues an unsafe condition.

Reasons to Suggest Repair or Replacement

1 - Part is close to the end of its useful life (just above discard specifications, or weak; failure likely to occur soon, etc.)
2 - To address a customer need, convenience, or request (to stiffen ride, enhance performance, eliminate noise, etc.)
3 - To comply with maintenance recommended by the vehicle's Original Equipment Manufacturer (OEM)
4 - Technician's recommendation based on substantial and informed experience

NOTE: Suggested services are always optional. When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

DRIVE/POWER TRAIN ASSEMBLIES

SERVICE PROCEDURES REQUIRED AND SUGGESTED FOR PROPER VEHICLE OPERATION

NOTE: Whenever transmission or drivetrain service is performed that affects the suspension alignment, for example, removing the engine cradle, it is required that the alignment be checked and corrected if necessary.

AUTOMATIC TRANSMISSION/TRANSAXLE ASSEMBLIES

AUTOMATIC TRANSMISSION/TRANSAXLE ASSEMBLY INSPECTION

Any internal component failure that requires removal of the assembly from the vehicle for service. (1) ..... A ..... (2) Require repair or replacement of the automatic transmission/transaxle assembly.

(1) - It is Required that the torque converter and all other failure related components be inspected for cause and condition.
(2) - For components not requiring removal of the assembly, refer to the component listing in this document.

DIFFERENTIAL AND FINAL DRIVE ASSEMBLIES

NOTE: Does not include half shafts.

DIFFERENTIAL AND FINAL DRIVE ASSEMBLY INSPECTION

Condition	Code	Procedure
Any internal component failure that requires removal of the assembly from the vehicle for service. (1)	A ...	Require repair or replacement of the differential assembly.

(1) - For components not requiring removal of the assembly, refer to the component listing in this document.

MANUAL TRANSMISSION/TRANSAXLE ASSEMBLIES

MANUAL TRANSMISSION/TRANSAXLE ASSEMBLY INSPECTION

Condition	Code	Procedure
Any internal component failure that requires removal of the assembly from the vehicle for		

service. (1)	A	...	Require repair or replacement of the manual transmission/transaxle assembly.

(1) - For components not requiring removal of the assembly, refer to the component listing in this document.

TRANSFER CASE ASSEMBLIES

TRANSFER CASE ASSEMBLY INSPECTION

Condition	Code		Procedure
Any internal component failure that requires removal of the assembly from the vehicle for service. (1)	A	...	Require repair or replacement of the transfer case differential assembly.

(1) - For components not requiring removal of the assembly, refer to the component listing in this document.

DRIVE TRAIN/COMPONENTS

The conditions listed for the components included in this section assume that the problem has been isolated to the specific component through proper testing.

ACTUATORS (ELECTRICAL)

ACTUATOR (ELECTRICAL) INSPECTION

Condition	Code		Procedure
Attaching hardware broken	A	...	Require repair or replacement of hardware.
Attaching hardware missing	C	.....	Require replacement of hardware.
Attaching hardware not			

functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted, affecting performance .. A ..... (1) Require repair or replacement.
Connector melted, not affecting performance .. 2 ..... (1) Suggest repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 1 ..... (1) Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 1 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

ACTUATORS (VACUUM)

ACTUATOR (VACUUM) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement.

of hardware.

Attaching hardware missing ..... C ..... Require replacement of hardware.

Attaching hardware not functioning ..... A .. Require repair or replacement of hardware.

Connector broken ..... A .. Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.

Connector melted, affecting performance .. A ..... (1) Require repair or replacement.

Connector melted, not affecting performance .. 2 ..... (1) Suggest repair or replacement.

Connector missing ..... C ..... Require replacement.

Inoperative ..... A ..... (2) Require replacement.

Leaking (vacuum) ..... A .. Require repair or replacement.

Linkage bent, affecting performance ..... A ... Require repair or replacement of linkage.

Linkage bent, not affecting performance .. 2 ... Suggest repair or replacement of linkage.

Linkage binding, affecting performance ..... A ... Require repair or replacement of linkage.

Linkage binding, not affecting performance .. 1 ... Suggest repair or replacement of linkage.

Linkage broken A Require repair or replacement of linkage.

Linkage loose, affecting performance ..... A ... Require repair or replacement of linkage.

Linkage loose, not affecting performance .. 1 ... Suggest repair or replacement of linkage.

Linkage missing ..... C ..... Require replacement.

Linkage noisy ..... 2 .. Suggest repair or replacement.

Missing ..... C ..... Require replacement.

Noisy ..... 2 .. Suggest repair or replacement.

Out of adjustment ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or

replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

AXLES

AXLE INSPECTION

Condition	Code	Procedure
Bent	A	Require replacement.
Broken	A	Require replacement.
End play exceeds specifications	B	Require repair or replacement.
Flange bent	A	Require replacement.
Flange threads stripped	A	Require repair or replacement.
Twisted	A	Require replacement.
Worn, affecting performance	A	Require replacement.

BEARINGS AND RACES

NOTE: When replacing or repacking bearings, grease seal replacement is required. You are not required to replace these components in axle sets. Determine the need to replace based upon the individual component conditions that follow.

BEARING AND RACE INSPECTION

Condition	Code	Procedure

Bearing end-play exceeds specifications ..... B .. Require adjustment of bearing, if possible. If proper adjustment cannot be obtained, require replacement of bearing assembly.

Bearing rollers, balls or races are worn, pitted, or feel rough when rotated as an assembly ..... B .. Require replacement of bearing assembly.

BELL CRANKS

BELL CRANK INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bent	A	Require repair or replacement.
Broken	A	Require repair or replacement.
Cracked	A	Require repair or replacement.
Missing	C	Require replacement.
Worn, affecting performance	A	Require repair or replacement.

BELL HOUSINGS

See HOUSINGS (BELL, CASE, TAIL (EXTENSION) AND AUXILIARY).

BUSHINGS (EXTERNAL)

BUSHING (EXTERNAL) INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part if available; otherwise, replace bushing.
Attaching hardware broken	A	Require replacement of broken part if available; otherwise, replace bushing.
Attaching hardware corroded, affecting structural integrity	A	Require replacement of corroded part if available; otherwise, replace bushing.
Attaching hardware incorrect	A	Require replacement of incorrect part if available; otherwise, replace bushing.
Attaching hardware loose	A	Require repair or replacement of loose part if available; otherwise, replace bushing.
Attaching hardware missing	C	Require replacement of missing part if available; otherwise, replace bushing.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads if available; otherwise, replace bushing.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads if available; otherwise, replace bushing.
Binding	A	Require repair or replacement.
Contaminated	1	Suggest replacement.
Deteriorated, affecting performance	A	Require repair or replacement.
Distorted, affecting performance	A	Require repair or replacement.
Missing	A	Require replacement.

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Noisy ..... 2 ..... (1) Further inspection required.
Rubber separating from internal metal sleeve on bonded bushing ..... A ..... Require replacement.
Seized ..... A ..... Require replacement.
Shifted (out of position) ..... B .. Require repair or replacement.
Split ..... A ..... Require replacement.
Surface cracking (weather-checked) .... No service suggested or required.
Worn, affecting performance ..... A .. Require repair or replacement.
Worn close to the end of its useful life ..... 1 ..... Suggest replacement.

(1) - If noise isolated to bushing, suggest repair or replacement.
CAUTION: Use only approved lubricant on rubber bushings. Petroleum-based lubricants may damage rubber bushings.

CABLES (SPEEDOMETER)

CABLE (SPEEDOMETER) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bent	A	Require repair or replacement.
Binding	A	Require repair or replacement.
Bracket bent, affecting performance	A	Require repair or replacement.
Bracket bent, not affecting performance	.. ..	No service suggested or required.
Bracket broken, affecting		

performance ..... A ..... Require replacement.
Bracket broken, not
affecting performance .. .. No service suggested or required.
Bracket corroded,
affecting performance .. A .. Require repair or replacement.
Bracket corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Bracket cracked, affecting
performance ..... A .. Require repair or replacement.
Bracket cracked, not
affecting performance .. 1 .. Suggest repair or replacement.
Bracket loose, affecting
performance ..... A .. Require repair or replacement.
Bracket loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Broken ..... A ..... Require replacement.
Cracked ..... A .. Require repair or replacement.
Disconnected ..... A .. Require repair or replacement.
Kinked ..... A .. Require repair or replacement.
Melted ..... A ..... (1) Require repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Routed incorrectly ..... 2 ..... Suggest repair.
Seized ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

CABLES (TV, DETENT AND SHIFT)

CABLE (TV, DETENT AND SHIFT) INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement

of hardware.

Bent ..... A .. Require repair or replacement.
Binding ..... A .. Require repair or replacement.
Bracket bent, affecting performance ..... A .. Require repair or replacement.
Bracket bent, not affecting performance .. .. No service suggested or required.
Bracket broken, affecting performance ..... A ..... Require replacement.
Bracket broken, not affecting performance .. .. No service suggested or required.
Bracket corroded, affecting performance .. A .. Require repair or replacement.
Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Bracket cracked, affecting performance ..... A .. Require repair or replacement.
Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket loose, affecting performance ..... A .. Require repair or replacement.
Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Broken ..... A ..... Require replacement.
Cracked ..... A .. Require repair or replacement.
Disconnected ..... A .. Require repair or replacement.
Frayed ..... A ..... Require replacement.
Kinked ..... A .. Require repair or replacement.
Melted ..... A ..... (1) Require repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B ..... (2) Require repair or replacement.
Routed incorrectly ..... 2 ..... Suggest repair.
Seized ..... A .. Require repair or replacement.
Self-adjuster inoperative ..... A .. Require repair or replacement of self-adjuster.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

*** DRIVETRAIN SYSTEMS UNIFORM INSPEC**

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Cable replacement is required if it cannot be adjusted within specifications.

CARRIER BEARINGS

See INTERMEDIATE SHAFT SUPPORT BEARINGS.

CLUTCH CABLES AND CABLE HOUSINGS

CLUTCH CABLE AND CABLE HOUSING INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Cable bent	A	Require replacement.
Cable binding	A	Require repair or replacement.
Cable mounting loose	B	Require repair or replacement.
Cable out of adjustment	B	Require repair or replacement.
Frayed	B	Require replacement.
Housing heat-damaged	1	Suggest replacement.
Missing	C	Require replacement.
Noisy	2	Suggest repair or replacement.
Seized	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn, affecting performance	A	Require replacement.

CLUTCH DISCS (MANUAL TRANSMISSION)

CLUTCH DISC (MANUAL TRANSMISSION) INSPECTION

Condition	Code	Procedure
Backing plate cracked	A	Require replacement.
Broken	A	Require replacement.
Contaminated with oil	A	Require replacement.
Damper cushion broken	A	Require replacement.
Damper cushion collapsed	A	Require replacement.
Damper spring collapsed	A	Require replacement.

Damper spring missing .. C ..... (1) Require replacement.
Friction material cracked through ..... B ..... Require replacement.
Friction material flaking or chunking ..... B ..... Require replacement.
Friction material surface cracking ..... B ..... No service suggested or required.
Grooved ..... B ..... No service suggested or required unless the pressure plate or flywheel is being resurfaced or replaced. In this case, replacement of clutch disc is required.
Ridged ..... B ..... No service suggested or required unless the pressure plate or flywheel is being resurfaced or replaced. In this case, replacement of clutch disc is required.
Splines worn, affecting performance ..... A ..... Require replacement.
Warped ..... A ..... Require replacement.
Wear exceeds specifications (where applicable) ..... B ..... Require replacement.
Worn close to the end of its useful life ..... 1 ..... Suggest replacement.
Worn, affecting performance ..... A ..... Require replacement.

(1) - Not all clutch discs have springs in all spring chambers on the disc.

CLUTCH FORKS

CLUTCH FORK INSPECTION

Condition Code Procedure

Bent ..... B ..... Require replacement.
Broken ..... A .. Require repair or replacement.
Cracked ..... B .. Require repair or replacement.
Worn close to the end of its useful life ..... 1 ..... Suggest replacement.

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Worn, affecting
performance ..... A ..... Require replacement.

CLUTCH LINKAGES (MECHANICAL)

See LINKAGES (EXTERNAL).

CLUTCH MASTER CYLINDERS

CLUTCH MASTER CYLINDER INSPECTION

Condition	Code	Procedure
Cover gasket distorted	A	Require replacement of cover gasket.
Cover gasket gummy	A	Require replacement of cover gasket.
Cylinder leaking fluid from rear of bore	A	Require repair or replacement.
Cylinder leaking fluid internally	A	Require replacement.
Dust boot missing	C	Require replacement of dust boot.
Dust boot punctured	A	Require replacement of dust boot.
Dust boot torn	A	Require replacement of dust boot.
Fluid level incorrect	B	Require fluid level adjustment.
Housing damaged, affecting performance	A	Require repair or replacement.
Master cylinder has residue in reservoir (make parallel w/brakes when they are done)	2	(1) Further inspection required.
Threads damaged	A	Require repair replacement
Threads stripped (threads missing)	A	Require replacement.

(1) - DO NOT replace master cylinder unless it exhibits conditions listed for replacement. You may suggest fluid change according to OEM service intervals.

CLUTCH PEDALS

CLUTCH PEDAL INSPECTION

Condition	Code	Procedure
Bent, affecting performance	A	Require repair or replacement.
Broken	A	Require repair or replacement.
Pedal pad missing	C	Require replacement of pedal pad.
Pivot bushings worn, affecting performance	A	Require replacement of pivot bushings.

CLUTCH PIVOTS

CLUTCH PIVOT INSPECTION

Condition	Code	Procedure
Bent	A	Require replacement.
Broken	A	Require repair or replacement.
Cracked	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn close to the end of its useful life	1	Suggest replacement.
Worn, affecting performance	A	Require replacement.

CLUTCH PRESSURE PLATES

See PRESSURE PLATES.

CLUTCH RELEASE BEARINGS

CLUTCH RELEASE BEARING INSPECTION

Condition	Code	Procedure
Collar broken	A	Require replacement.
Cracked	A	Require replacement.
Rough when rotated as		

assembly ..... B ..... Require replacement.
Seized ..... A ..... Require replacement.
Wear exceeds
specifications ..... B ..... Require replacement.
Worn close to the end of
its useful life ..... 1 ..... Suggest replacement.
Worn, affecting
performance ..... A ..... Require replacement.

CLUTCH SLAVE CYLINDERS (CONCENTRIC)

CLUTCH SLAVE CYLINDER (CONCENTRIC) INSPECTION

Condition Code Procedure

Bearing rough when rotated
as an assembly ..... B ..... Require replacement.
Bearing seized ..... A ..... Require replacement.
Bleeder pipe leaks ..... A .. Require repair or replacement.
Carrier assembly worn,
affecting performance .. A ..... Require replacement.
Collar broken ..... A ..... Require replacement.
Cracked ..... A ..... Require replacement.
Housing leaks ..... A ..... Require replacement.
Inoperative ..... A ..... Require replacement.
Release binding ..... A ..... Require replacement.
Spring broken ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Worn, affecting
performance ..... A ..... Require replacement.

CLUTCH SLAVE CYLINDERS (CONVENTIONAL OR EXTERNAL)

CLUTCH SLAVE CYLINDER (CONVENTIONAL OR EXTERNAL) INSPECTION

Condition Code Procedure

Binding ..... A .. Require repair or replacement.
Bleeder port damaged (not
repairable) ..... A ..... (1) Require replacement.
Bleeder port damaged
(repairable) ..... A ..... (1) Require repair.

Bleeder screw broken off
in slave cylinder ..... A ..... (1) Require replacement.
Bleeder screw seized .... A ..... (2) Require replacement.
Bore corroded (pitted) .. B ..... Require replacement.
Bore grooved ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - Only required if the hydraulic system must be opened.
(2) - Seized is defined as a bleeder screw that cannot be removed after a practical attempt at removing it has been made.

COMPANION FLANGES

See YOKES AND SLIP YOKES.

CONNECTORS

See WIRING HARNESSES AND CONNECTORS.

COOLER BYPASS VALVES

COOLER BYPASS VALVE INSPECTION

Condition Code Procedure

Inoperative ..... A ..... Require replacement.
Installed incorrectly ... A ..... Require repair.
Leaking ..... A .. Require repair or replacement.
Restricted ..... A .. Require repair or replacement.

COOLER LINES

COOLER LINE INSPECTION

Condition Code Procedure

Abrasion damage, affecting
structural integrity ... A .. Require repair or replacement.
Abrasion damage, not
affecting structural
integrity .... No service suggested o

required.
Application incorrect ... B ..... Require replacement.
Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement
of hardware.
Clamp corroded, not
reusable ..... 1 ..... Suggest replacement.
Connected incorrectly ... A ..... Require repair.
Corroded, affecting
structural integrity ... A ..... Require replacement.
Corroded, not affecting
structural integrity ... . No service suggested or
required.
Cracked ..... A .. Require repair or replacement.
Fitting type incorrect
(such as compression
fitting) ..... B ..... Require replacement.
Flange leaking ..... A .. Require repair or replacement.
Insufficient clamping
force, allowing hose to
leak ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Melted ..... 1 .. Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Outer covering damaged to
the extent that the inner
fabric is visible ..... A ..... Require replacement.
Protective sleeves
damaged ..... 2 . Suggest replacement of sleeves.
Protective sleeves
missing ..... C . Require replacement of sleeves.
Restricted, affecting
performance ..... A .. Require repair or replacement.
Routed incorrectly ..... 2 ..... Require repair.
Swollen ..... 1 ..... Suggest replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Type incorrect ..... 1 .. Suggest repair or replacement.

COOLERS

See TRANSMISSION COOLERS.

CV JOINTS

CV JOINT INSPECTION

Condition	Code	Procedure
Bearing, bushing or seal surface worn, affecting performance	A	Require repair or replacement.
Boot clamp broken	A	Require repair or replacement of clamp.
Boot clamp loose	A	Require repair or replacement of clamp.
Boot clamp missing	C	Require repair or replacement of clamp.
Boot leaking	A	Require replacement of CV boot.
Boot surface cracked, not leaking	2	Suggest replacement of CV boot.
Cage broken	A	Require repair or replacement of CV joint.
Housing damaged to the extent that it no longer performs its intended function	A	(1) Require repair or replacement of CV joint.
Housing worn to the extent that it no longer performs its intended function	A	(1) Require repair or replacement of CV joint.
Holes elongated	A	Require replacement.
Internal parts binding	A	Require repair or replacement.
Internal parts worn	A	Require repair or replacement.
Lubricant missing	C	Require cleaning, inspection, and repacking of CV joint.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Housing assembly may appear blue in color from normal manufacturing process of heat-treating the housing.

DIP STICK TUBES

DIP STICK TUBE INSPECTION

Condition	Code	Procedure
Broken	A	Require repair or replacement.
Checkball missing	C	Suggest repair or replacement.
Cracked	A	Require repair or replacement.
Hold down bracket broken	A	Require repair or replacement.
Hold down bracket missing	C	Require replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

DIP STICKS (FLUID LEVEL INDICATORS)

DIP STICK (FLUID LEVEL INDICATOR) INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Broken	A	Require replacement.
Compressed	A	Require repair or replacement.
Missing	C	Require replacement.
Modified	A	Require replacement.
Stretched	A	Require repair or replacement.

DOWEL PINS, GUIDES AND PILOT HOLES

DOWEL PIN, GUIDE AND PILOT HOLE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement.
Cracked	A	Require repair or replacement.
Distorted	A	Require repair or replacement.
Missing	C	Require replacement.
Positioned incorrectly	B	Require repair or replacement.

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Stepped ..... A .. Require repair or replacement.
Worn to the extent that it
no longer performs its
intended function ..... A .. Require repair or replacement.

DRIVE SHAFT FLANGES

See COMPANION FLANGES.

DRIVE SHAFTS AND HALF SHAFTS

DRIVE SHAFT AND HALF SHAFT INSPECTION

Condition Code Procedure

Balance weight missing .. C .. Require repair or replacement.
Bearing cap bore
distorted ..... A .. Require repair or replacement.
Bent ..... A ..... Require replacement.
Bolt holes elongated .... A .. Require repair or replacement.
Bushing or seal surface
worn, affecting
performance ..... A .. Require repair or replacement.
Leaking through soft yoke
plug ..... A ... Require repair or replacement
of soft yoke plug.
Out of balance ..... A .. Require repair or replacement.
Retainer strap bent ..... A ..... Require replacement of
retainer strap.
Slip yoke broken ..... A ..... Require replacement.
Splines worn, affecting
performance ..... A ..... Require replacement.
Splines worn close to
the end of their
useful life ..... 1 ..... Suggest replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
U-bolt damaged, affecting
performance ..... A . Require replacement of U-bolts.
Yoke damaged, affecting
performance ..... A .. Require repair or replacement.

DUST BOOTS

NOTE: Does not include CV boots.

DUST BOOT INSPECTION

Condition	Code	Procedure
Cracked, not leaking	1	Suggest replacement.
Missing	C	Require replacement.
Leaking	A	Require repair or replacement.
Torn	A	Require replacement.

ENGINE MOUNTS

See MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION).

EXCITER RINGS

See TOOTHED RINGS (TONE WHEELS).

FILLER TUBES

See DIP STICK TUBES.

FILTERS AND SCREENS

FILTER AND SCREEN INSPECTION

Condition	Code	Procedure
At service interval	3	Suggest replacement.
Bent	A	Require repair or replacement.
Exceeding service interval	3	Suggest replacement.
Missing	C	Require replacement.
Near service interval	3	Suggest replacement.
Restricted	A	(1) Require repair or replacement.
Torn	A	Require replacement.
Worn, affecting performance (metal or nylon screen type)	A	Require repair or replacement.

(1) - Further inspection may be required to determine the source of restriction or contamination.

FLANGES

See COMPANION FLANGES.

FLEX PLATES

FLEX PLATE INSPECTION

Condition	Code	Procedure
Bent, affecting performance	A	Require replacement.
Bent, not affecting performance	..	No service suggested or required.
Bolt or stud holes elongated	B	Require replacement.
Broken	A	Require replacement.
Cracked	A	Require replacement.
Ring gear worn close to the end of its useful life	1	Suggest replacement.
Ring gear worn to the extent that it no longer performs its intended function	A	Require replacement.
Weights missing	A	Require replacement.

FLUID LEVEL INDICATORS

See DIP STICKS (FLUID LEVEL INDICATORS).

FLUIDS AND LUBRICANTS

FLUID AND LUBRICANT INSPECTION

Condition	Code	Procedure
Application incorrect	B	(1) Require replacement.
At service interval	3	Suggest replacement.
Beyond service interval	3	Suggest replacement.
Burned	..	(2) Further inspection required.

Contaminated, for example,
fluid other than hydraulic
fluid present ..... A or B .... (3)(4) Require service.
Exceeding service
interval ..... 3 ..... Suggest replacement.
Hydraulic fluid
incorrect ..... B ..... (5) Require service.
Level incorrect ..... B ..... Require correction of fluid level.
Near service interval ... 3 ..... Suggest replacement.
Rubber master cylinder
cover gasket distorted
and gummy ..... A ..... (3) Require service.
Varnished .... (6) Further inspection required.

(1) - Determine and correct cause.
(2) - Fluid that is burned indicates a serious problem. Determine and correct the cause.
(3) - If a fluid other than hydraulic fluid is present in the hydraulic system which DOES affect the rubber parts, the required service is to: 1) remove all components having rubber parts from the system, 2) flush lines with denatured alcohol or hydraulic cleaner, 3) repair or replace all components having rubber parts, and 4) bleed and flush with correct hydraulic fluid. (Code A)
(4) - If a fluid other than hydraulic fluid is present in the hydraulic system which DOES NOT affect the rubber parts, the required service is to flush and fill with the correct hydraulic fluid. (Code B)
(5) - If a fluid other than specification hydraulic fluid is present in the hydraulic system, the required service is to flush and fill with the correct hydraulic fluid.
(6) - Fluid that is varnished may indicate a serious problem. Determine and correct the cause.

FLYWHEELS

NOTE: Clutch disc replacement does not necessitate flywheel reconditioning, unless other conditions justify the reason to do so.

FLYWHEEL INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Cracked (other than
mounting area) ..... A ..... (1) Require resurfacing or replacement.
Cracks in mounting area . B ..... Require replacement.
Hard spots ..... B .. Require repair or replacement.
Ring gear broken ..... A ..... Require replacement of ring gear.
Ring gear teeth worn,
affecting performance .. A ..... Require replacement of ring gear.
Runout exceeds
specifications ..... B .. Require repair or replacement.
Scored ..... B .. Require repair or replacement.
Surface cracks after
resurfacing to
manufacturer's minimum
specifications ..... B ..... Require replacement.
Wear exceeds
specifications ..... B ..... Require replacement.
Worn close to the end of
its useful life ..... 1 ..... Suggest replacement.
Worn, affecting
performance ..... A .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - Some manufacturers allow slight surface cracking in the friction surface.

FORCE MOTORS

See ACTUATORS (ELECTRICAL).

See DOWEL PINS, GUIDES AND PILOT HOLES.

HALF SHAFTS

See DRIVE SHAFTS AND HALF SHAFTS.

HOSES, LINES AND TUBES

HOSE, LINE AND TUBE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Connected incorrectly	A	Require repair.
Corroded, not reusable	1	Suggest replacement.
Cracked	A	Require replacement.
Dry-rotted	1	Suggest repair or replacement.
Hard	1	Suggest repair or replacement.
Inner fabric (webbing) damaged	A	Require replacement.
Insufficient clamping force, allowing hose to leak	A	Require repair or replacement.
Leaking	A	Require repair or replacement.
Maintenance intervals	3	Suggest replacement.
Melted	1	Suggest repair or replacement.
Missing	C	Require replacement.
Outer covering damaged	1	Suggest replacement.
Outer covering damaged to the extent that the inner fabric is visible	A	Require replacement.
Protective sleeves damaged	2	Suggest replacement of sleeves.
Protective sleeves missing	2	Suggest replacement of sleeves.
Restricted, affecting performance	A	Require repair or replacement.
Restricted, not affecting performance	2	Suggest repair or replacement.
Routed incorrectly	2	Suggest replacement.
Safety clip missing	C	Require replacement.
Spongy	1	Suggest repair or replacement.
Stripped	A	Require replacement.
Swollen	B	Require replacement.
Threads damaged	A	Require replacement.

Threads stripped (threads
missing) ..... A ..... Require replacement.
Type incorrect ..... 1 .. Suggest repair or replacement.

HOUSINGS (BELL, CASE, TAIL (EXTENSION) AND AUXILIARY)

HOUSING (BELL, CASE, TAIL (EXTENSION) AND AUXILIARY) INSPECTION

Condition Code Procedure

Bearing race loose
in bore ..... A .. Require repair or replacement.
Broken, affecting
performance ..... A .. Require repair or replacement.
Cracked ..... A .. Require repair or replacement.
Dowel pin holes worn,
affecting performance .. A ..... (1) Require repair or
replacement.
Machined surfaces damaged,
affecting performance .. A .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Worn, affecting
performance ..... A .. Require repair or replacement.

(1) - See DOWEL PINS, GUIDES AND PILOT HOLES.

INTERMEDIATE SHAFT SUPPORT BEARINGS

INTERMEDIATE SHAFT SUPPORT BEARING INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement
of hardware.
Bearing rollers, balls or

races are worn, pitted, noisy, or feel rough when rotated as an assembly . A .. Require replacement of bearing assembly.

Bracket bent, affecting performance ..... A .. Require repair or replacement.

Bracket bent, not affecting performance .. .. No service suggested or required.

Bracket broken, affecting performance ..... A ..... Require replacement.

Bracket broken, not affecting performance .. .. No service suggested or required.

Bracket corroded, affecting performance .. A .. Require repair or replacement.

Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Bracket cracked, affecting performance ..... A .. Require repair or replacement.

Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket holes elongated, affecting performance .. A .. Require repair or replacement.

Bracket holes elongated, not affecting performances) .... No service suggested or required.

Bracket loose, affecting performance ..... A .. Require repair or replacement.

Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket missing ..... C ..... Require replacement.

Cracked .... Require replacement.

Rough (brinelling, spalling) ..... A ..... Require replacement.

Rubber deteriorated, affecting performance .. A ..... Require replacement.

Seized ..... A ..... Require replacement.

KEY INTERLOCK SYSTEMS

See SHIFT INTERLOCK SYSTEMS (SELECTOR AND KEY INTERLOCK SYSTEMS).

LIMITED SLIPS

See DIFFERENTIAL AND FINAL DRIVE ASSEMBLIES.

LINES

See HOSES, LINES AND TUBES.

LINKAGES (EXTERNAL)

LINKAGE (EXTERNAL) INSPECTION

Condition	Code	Procedure
Components missing	C	Require replacement of missing components.
Linkage bent, affecting performance	A	Require repair or replacement of linkage.
Linkage bent, not affecting performance	2	Suggest repair or replacement of linkage.
Linkage binding, affecting performance	A	Require repair or replacement of linkage.
Linkage binding, not affecting performance	1	Suggest repair or replacement of linkage.
Linkage broken	A	Require repair or replacement of linkage.
Linkage loose, affecting performance	A	Require repair or replacement of linkage.
Linkage loose, not affecting performance	1	Suggest repair or replacement of linkage.
Linkage missing	C	Require replacement.
Linkage noisy	2	Suggest repair or replacement.
Out of adjustment	B	Require repair or replacement.
Worn to the extent that it no longer performs its intended function	A	Require repair or replacement.

LOCKING HUB ASSEMBLIES

LOCKING HUB ASSEMBLY INSPECTION

Condition	Code	Procedure
Inoperative	A	(1) Require repair or replacement.
Loose	A	Require repair or replacement.
Seized in any position	A	Require repair or replacement.

(1) - Inoperative includes intermittent operation.

LOCKING HUB CONTROL KNOBS

LOCKING HUB CONTROL KNOB INSPECTION

Condition	Code	Procedure
Damaged, affecting performance	A	Require replacement.
Missing	C	Require replacement.
Worn, affecting performance	A	Require replacement.

LUBRICANTS

See FLUIDS AND LUBRICANTS.

METAL-CLAD SEALS

See SEALS.

METALASTIC JOINTS

See RUBBER JOINTS (METALASTIC).

MODULATOR PINS

MODULATOR PIN INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Missing	C	Require replacement.

MODULATORS

MODULATOR INSPECTION

Condition	Code	Procedure
Bent, affecting performance	A	Require replacement.
Contaminated (water, fuel, etc.)	A	(1) Require replacement.
Housing cracked	A	Require replacement.
Inoperative	A	(2) Require replacement.
Leaking fluid externally	A	Require repair or replacement.
Leaking fluid internally	A	Require replacement.
Leaking vacuum	A	Require replacement.
Nipple broken	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Further inspection is required to determine the cause of the contamination.
(2) - Inoperative includes intermittent operation or out of OEM specification.

MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION)

MOUNT (ENGINE, TRANSAXLE AND TRANSMISSION) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Broken	A	Require replacement.
Leaking (hydraulic mount)	A	Require replacement.

Mounting hole worn, affecting performance	A	Require replacement.
Mounting hole worn, not affecting performance		No service suggested or required.
Rubber deteriorated, affecting performance	A	Require replacement.
Rubber deteriorated, not affecting performance		No service suggested or required.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

ODOMETER DRIVES (MECHANICAL)

See SPEEDOMETER/ODOMETER DRIVES (MECHANICAL).

ODOMETER HEADS (MECHANICAL)

See SPEEDOMETER/ODOMETER HEADS (MECHANICAL).

OIL PANS

See TRANSMISSION PANS.

PANS

See TRANSMISSION PANS.

PILOT HOLES

See DOWEL PINS, GUIDES AND PILOT HOLES.

PRESSURE PLATES

PRESSURE PLATE INSPECTION

Condition	Code	Procedure
Balance weight missing	C	Require replacement.
Broken	A	Require replacement.
Contact surface distorted	B	Require replacement.
Cracks	B	Require replacement.
Fingers bent	A	Require replacement.

Hard spots	B	Require replacement.
Scored	B	Require replacement.
Spring rate less than specifications	B	Require replacement.
Worn, affecting performance	A	Require replacement.
Worn beyond specifications	B	Require replacement.
Worn close to the end of its useful life	1	Suggest replacement.

PRESSURE SWITCHES

See SWITCHES.

RACES

See BEARINGS AND RACES.

RUBBER JOINTS (METALASTIC)

These joints may be found on half and/or drive shafts. They are usually found on European vehicles featuring a three-lug drive flange. They may be equipped with a centering ball or pin.

RUBBER JOINT (METALASTIC) INSPECTION

Condition	Code	Procedure
Drive flange bent	A	Require repair or replacement.
Drive flange damaged, affecting performance	A	Require replacement.
Rubber drive joint cracked	2	Suggest replacement.
Rubber drive joint damaged, affecting performance	A	Require replacement.
Rubber drive joint split between mounting holes	A	Require replacement.
Rubber drive joint torn at mounting holes	A	Require replacement.
Rubber drive joint weather-cracked		No service suggested or required.

SCREENS

See FILTERS AND SCREENS.

SEALS

SEAL INSPECTION

Condition	Code	Procedure
Leaking	A	(1) Require repair or replacement.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary. Check vent. A plugged vent may force fluid past the seal.

SEALS (METAL-CLAD)

See SEALS.

SELECTOR INTERLOCK SYSTEMS

See SHIFT INTERLOCK SYSTEMS (SELECTOR AND KEY INTERLOCK SYSTEMS).

SERVOS

See ACTUATORS (VACUUM).

SHIFT INTERLOCK SYSTEMS (SELECTOR AND KEY INTERLOCK SYSTEMS)

See:
ACTUATORS (ELECTRICAL)
CABLES
LINKAGES (EXTERNAL)
SWITCHES

SENSORS

SENSOR INSPECTION

Condition	Code	Procedure

Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require repair or replacement.
Leaking (vacuum/fluid/air) ..... A ..... Require replacement.
Out of adjustment ..... B ..... (3) Further inspection required.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of specification.
(3) - Follow OEM recommended adjustment procedures. Repair or replace if out of specification.

SIDE COVERS

See TRANSMISSION PANS.

SLIP YOKES

See YOKES AND SLIP YOKES.

SOLENOIDS

See:
ACTUATORS (ELECTRICAL)
ACTUATORS (VACUUM)

SPEED SENSORS (ELECTRONIC WHEEL AND VEHICLE)

SPEED SENSOR (ELECTRONIC WHEEL AND VEHICLE) INSPECTION

Condition	Code	Procedure
Air gap incorrect	B	(1) Require adjustment or replacement.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(2) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(3) Require repair or replacement.
Inoperative	B	(4) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Loose	A	Require repair or replacement.

Missing ..... C ..... Require replacement.
Resistance out of
specification ..... B .. Require repair or replacement.
Sensor housing cracked .. 2 ..... Suggest replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (2) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead misrouted ..... B .... Require re-routing according
to vehicle manufacturer's
specifications.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - If a sensor is not adjustable, further inspection is
required to identify and correct cause.
(2) - Determine cause and correct prior to repair or
replacement of part.
(3) - Determine source of contamination, such as metal particles
or water. Require repair or replacement.
(4) - Inoperative includes intermittent operation or out of OEM
specification. Some components may be serviceable;
check for accepted cleaning procedure.

SPEEDOMETER-DRIVEN GEAR HOUSINGS

See SPEEDOMETER/ODOMETER DRIVES (MECHANICAL).

SPEEDOMETER/ODOMETER DRIVES (MECHANICAL) *** DRIVETRAIN SYSTEMS UNIFORM INSPEC**

SPEEDOMETER/ODOMETER DRIVE (MECHANICAL) INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Inoperative	A	(1) Require replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Teeth broken	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn close to the end of its useful life	1	Suggest replacement.
Worn, affecting performance	A	Require replacement.

(1) - Inoperative includes intermittent operation.

SPEEDOMETER/ODOMETER HEADS (MECHANICAL)

SPEEDOMETER/ODOMETER HEAD (MECHANICAL) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Lens broken	A	(1) Require repair or

replacement.
Lens cloudy ..... 2 ..... (1) Suggest repair or replacement.
Lens missing ..... C ..... (1) Require repair or replacement.
Malfunctioning ..... A ..... (2) Require repair or replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

(1) - If lens is available as a separate part, require replacement of lens only.
(2) - Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.

SPEEDOMETERS AND ODOMETERS (ELECTRONIC)

SPEEDOMETER AND ODOMETER (ELECTRONIC) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Leaking	A	Require replacement.
Lens broken	A	(2) Require repair or replacement.
Lens cloudy	2	(2) Suggest repair or replacement.
Lens missing	C	(2) Require repair or

replacement.
Malfunctioning ..... A ..... (3) Require repair or replacement.
Mechanical head noisy ... 2 .. Suggest repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - If lens is available as a separate part, require replacement of lens only.
(3) - Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.

SWITCHES

SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Binding, affecting performance	A	Require repair or replacement.
Binding, not affecting		

performance ..... 2 .. Suggest repair or replacement.
Broken ..... A .. Require repair or replacement.
Burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Burned, not affecting
performance ..... 2 ..... (1) Suggest repair or replacement.
Cracked, affecting
performance ..... A .. Require repair or replacement.
Cracked, not affecting
performance ..... 1 .. Suggest repair or replacement.
Leaking ..... A .. Require repair or replacement.
Malfunctioning ..... A ..... (2) Require repair or replacement.
Melted, affecting
performance ..... A ..... (1) Require repair or replacement.
Melted, not affecting
performance ..... 2 ..... (1) Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Out of adjustment ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Won't return ..... A .. Require repair or replacement.
Worn ..... 1 ..... Suggest replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Includes inoperative, intermittent operation, or failure to perform all functions.

TONE WHEELS

See TOOTHED RINGS (TONE WHEELS).

TOOTHED RINGS (TONE WHEELS)

If the toothed ring requires replacement and cannot be replaced as a separate component, replace the assembly of which the ring is a part.

TOOTHED RING (TONE WHEEL) INSPECTION

Condition	Code	Procedure
Alignment incorrect	B	Require repair or replacement.
Bent	B	Require replacement.
Contaminated, affecting performance	A	Require repair. Identify and correct cause.
Cracked	B	Require replacement.
Loose	A	Require replacement of worn parts.
Missing	C	Require replacement.
Number of teeth incorrect	B	Require replacement.
Teeth broken	A	Require replacement.
Teeth damaged, affecting performance	A	Require replacement.

TORQUE CONVERTERS

TORQUE CONVERTER INSPECTION

Condition	Code	Procedure
Converter clutch lock-up operation is faulty	A	Require replacement.
Cover shell damaged, affecting performance	A	Require replacement.
Does not meet stall speed specification	B	Require replacement.
End play exceeds specifications	B	Require replacement.
Hub broken	A	Require replacement.
Hub cracked	A	Require replacement.

Internal component
failure ..... A ..... Require replacement.
Leaking ..... A .. Require repair or replacement.
Pilot broken ..... A ..... Require replacement.
Pilot worn, affecting
performance ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Weights missing ..... C ..... Require replacement.

TRANSAXLE MOUNTS

See MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION).

TRANSDUCERS (TRANSMISSION)

See SENSORS.

TRANSMISSION COOLERS

TRANSMISSION COOLER INSPECTION

Condition Code Procedure

Air flow obstruction .... A ..... Require repair.
Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A .. Require repair or replacement
of hardware.
Connection leaking ..... A .. Require repair or replacement.
Contaminated ..... A .. Require repair or replacement.
Corroded ..... 1 .. Suggest repair or replacement.
Fins damaged, affecting
performance ..... A .. Require repair or replacement.
Fins damaged, not
affecting performance .. .. No service suggested or
required.
Internal restrictions ... B .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement

Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A .. Require repair or replacement.
Tubes damaged, affecting performance ..... A .. Require repair or replacement.
Tubes damaged, not affecting performance .. .. No service suggested or required.

TRANSMISSION MOUNTS

See MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION).

TRANSMISSION PANS

TRANSMISSION PAN INSPECTION

Condition Code Procedure

Bent, interfering with filter or other internal components ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.

TRANSMISSION RANGE INDICATORS (PRNDL)

TRANSMISSION RANGE INDICATOR (PRNDL) INSPECTION

Condition Code Procedure

Binding ..... A .. Require repair or replacement.
Broken ..... A .. Require repair or replacement.
Components missing ..... C .. Require replacement of missing components.
Loose, affecting performance ..... A .. Require repair or replacement.
Out of adjustment ..... A ..... Require repair.
Worn, affecting performance ..... A .. Require repair or replacement.

TUBES

See HOSES, LINES AND TUBES.

UNIVERSAL JOINTS (CARDON OR CROSS TYPE)

UNIVERSAL JOINT (CARDON OR CROSS TYPE) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bearing cap distorted	B	Require replacement.
Binding	A	Require replacement.
Cross (trunion) worn, affecting performance	A	Require replacement.
Double cardon centering ball damaged	A	Require replacement.
Double cardon centering ball worn, affecting performance	A	Require replacement.
Double cardon centering spring broken	A	Require replacement.
Double cardon centering spring missing	C	Require replacement.
Double cardon centering spring weak	A	Require replacement.
End cap seal cracked	2	Suggest replacement.
End cap seal missing	C	Require replacement of seal.
Grease fitting broken	A	(1) Require replacement of grease fitting.
Grease fitting missing	C	(2) Require replacement of grease fitting.
Rust-colored powder around end cap seals	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn, affecting performance	A	Require replacement.

(1) - A broken grease fitting does not require replacement

of the U-Joint.
(2) - A missing grease fitting does not require replacement of the U-Joint.

VACUUM CONTROLS

See ACTUATORS (VACUUM).

VACUUM HOSES

See HOSES, LINES AND TUBES.

VACUUM MOTORS

See ACTUATORS (VACUUM).

VACUUM-OPERATED SWITCHES

See SWITCHES.

VEHICLE SPEED SENSORS

See SPEED SENSORS (ELECTRONIC WHEEL AND VEHICLE).

VENTS

VENT INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Missing	C	Require replacement.
Plugged	A	(1) Require repair or replacement.

(1) - A plugged vent may force fluid past the seal.

VIBRATION DAMPERS

VIBRATION DAMPER INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Missing	C	Require replacement.

Out of position ..... B .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

WHEEL ATTACHMENT HARDWARE

NOTE: For conditions noted below, also check conditions of wheel stud holes.

CAUTION: Proper lug nut torque is essential. Follow recommended torque specifications and tightening sequence. DO NOT lubricate threads unless specified by the vehicle manufacturer.

WHEEL ATTACHMENT HARDWARE INSPECTION

Condition Code Procedure

Bent ..... A ..... Require replacement.
Broken ..... A ..... (1) Require replacement.
Loose ..... B ... Require repair or replacement of affected component.
Lug nut installed
backward ..... B .. Require repair or replacement.
Lug nut mating surface
dished ..... A ..... Require replacement of nut.
Lug nut mating type
incorrect ..... B ..... Require replacement of nut.
Lug nut rounded ..... A . (2) Require replacement of nut.
Lug nut seized ..... A . (2) Require replacement of nut.
Stud incorrect ..... B .... Require replacement of stud.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - Some manufacturers require replacement of all studs on that wheel if two or more studs or nuts on the same wheel are broken or missing.
(2) - Only required if removing wheel.

WHEEL SPEED SENSORS

See SPEED SENSORS (ELECTRONIC WHEEL AND VEHICLE).

WIRING HARNESS AND CONNECTOR INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Insulation damaged, conductors exposed	A	Require repair or replacement.
Insulation damaged, conductors not exposed	1	Suggest replacement.
Open	A	Require repair or replacement.
Protective shield (conduit) melted	2	(1) Suggest repair or replacement.
Protective shield (conduit) missing	2	Suggest repair or replacement.
Resistance (voltage drop) out of specification	A	Require repair or replacement.
Routed incorrectly	B	Require repair.
Secured incorrectly	B	Require repair.
Shorted	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.

Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Transmission connector
leaking .... See TRANSMISSION ASSEMBLY.
Voltage drop out of
specification ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

YOKES AND SLIP YOKES

YOKE AND SLIP YOKE INSPECTION

Condition Code Procedure

Bearing cap bore
distorted ..... A .. Require repair or replacement.
Bent ..... A ..... Require replacement.
Bolt holes elongated .... A .. Require repair or replacement.
Bushing or seal surface
worn, affecting
performance ..... A .. Require repair or replacement.
Leaking through soft yoke
plug ..... A ... Require repair or replacement of soft yoke plug.
Retainer strap bent ..... A ..... Require replacement of retainer strap.
Slip yoke broken ..... A ..... Require replacement.
Splines worn, affecting
performance ..... A ..... Require replacement.
Splines worn close
to the end of their
useful life ..... 1 ..... Suggest replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
U-bolt damaged, affecting
performance ..... A ..... Require replacement of U-bolts.
Yoke damaged, affecting

performance ..... A .. Require repair or replacement.

END OF ARTICLE

* BRAKE SYSTEM UNIFORM INSPECTION GUIDELINES *

Article Text

1996 Kia Sephia
For 1 1 1 1 1

Saturday, April 18, 2009 10:06PM

ARTICLE BEGINNING

GENERAL INFORMATION
Brake Systems - January 2000 Motorist Assurance Program
Standards For Automotive Repair

All Makes & Models

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INTRODUCTION TO MOTORIST ASSURANCE PROGRAM (MAP)

OVERVIEW OF MOTORIST ASSURANCE PROGRAM (MAP)

Automotive industry professionals and interested readers:
The Motorist Assurance Program (MAP) is the consumer outreach effort of the Automotive Maintenance and Repair Association, Inc. (AMRA). Participation in the Motorist Assurance Program is drawn from auto repair companies and independents, parts and equipment manufacturers and suppliers, vehicle manufacturers and industry associations.

Our organization's mission is to strengthen the relationship

between the consumer and the auto repair industry. We encourage motorists to take greater responsibility for their vehicles-through proper, manufacturer-recommended, maintenance, and endorse participating service and repair shops (including franchisees and dealers) who adopt (1) the MAP Pledge of Assurance to their Customers and (2) the Motorist Assurance Program Standards of Service. All participating service providers have agreed to subscribe to this Pledge and to adhere to the promulgated Standards of Service demonstrating to their customers that they are serious about customer satisfaction.

These Standards of Service require an inspection of the vehicle's (problem) system and that the results be communicated to the customer according to industry standards. Since the industry did not have such standards, the Motorist Assurance Program successfully promulgated industry inspection communication standards in 1994-95 for the following systems: Exhaust, Brakes, ABS, Steering and Suspension, Engine Maintenance and Performance, HVAC, and Electrical Systems.

Further, revisions to all of these inspection communication standards are re-published periodically. In addition to the above, standards for Drive Train and Transmissions were promulgated and published in 1998. Participating shops utilize these Uniform Inspection & Communication Standards (UI&CS) as part of the inspection process and for communicating their findings to their customers.

The Motorist Assurance Program continues to work cooperatively and proactively with government agencies and consumer groups toward solutions that both benefit the customer and are mutually acceptable to both regulators and industry. We maintain the belief that industry must retain control over how we conduct our business, and we must be viewed as part of the solution and not part of the problem. Meetings with state and other government officials (and their representatives), concerned with auto repair and/or consumer protection, are conducted. Feedback from these sessions is brought back to the association governing body, and the program adjusted as needed.

To assure recourse for auto repair customers if they are not satisfied with a repair transaction, the Motorist Assurance Program offers mediation and arbitration through the BBB and other similar non-profit organizations. MAP conducted pilot programs in twelve states before announcing the program nationally in October 1998. During the pilots, participating repair shops demonstrated their adherence to the Pledge and Standards and agreed to follow the UI&CS in communicating the results of their inspection to their customers. Complaints and "come-backs" dropped significantly.

To put some "teeth" in the program, an accreditation requirement for shops was initiated. The requirements are stringent, and a self-policing technique has been incorporated which includes the

"mystery shopping" of outlets. By year-end 1999, over 4,000 auto repair facilities had been accredited by the Motorist Assurance Program.

We welcome you to join us as we continue our outreach. With your support, both the automotive repair industry and your customers will reap the benefits. Please visit MAP at our Internet site www.motorist.org or contact us at:

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Washington, DC 20005
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MAP UNIFORM INSPECTION GENERAL GUIDELINES

OVERVIEW OF SERVICE REQUIREMENTS AND SUGGESTIONS

It is MAP policy that all exhaust, brake, steering, suspension, wheel alignment, drive-line, engine performance and maintenance, and heating, ventilation and air conditioning, and electrical services be offered and performed under the standards and procedures specified in these sections.

Before any service is performed on a vehicle, an inspection of the appropriate system must be performed. The results of this inspection must be explained to the customer and documented on an inspection form. The condition of the vehicle and its components will indicate what services/part replacements may be "Required" or "Suggested". In addition, suggestions may be made to satisfy the requests expressed by the customer.

When a component is suggested or required to be repaired or replaced, the decision to repair or replace must be made in the customer's best interest, and at his or her choice given the options available.

This section lists the various parts and conditions that indicate a required or suggested service or part replacement. Although this list is extensive, it is not fully inclusive. In addition to this list, a technician may make a suggestion. However, any suggestions must be based on substantial and informed experience, or the vehicle manufacturer's recommended service interval and must be documented.

Some conditions indicate that service or part replacement is required because the part in question is no longer providing the function for which it is intended, does not meet a vehicle manufacturer's design specification or is missing.

Example: *** BRAKE SYSTEM UNIFORM I**

An exhaust pipe has corroded severely and has a hole in it through which exhaust gases are leaking. Replacement of the exhaust pipe in this case is required due to functional failure.

Example:
A brake rotor has been worn to the point where it measures less than the vehicle manufacturer's discard specifications. Replacement of the rotor is required because it does not meet design specifications.

Some conditions indicate that a service or part replacement is suggested because the part is close to the end of its useful life or addresses a customer's need, convenience or request. If a customer's vehicle has one of these conditions, the procedure may be only to suggest service.

Example:
An exhaust pipe is rusted, corroded or weak, but no leaks are present. In this case, the exhaust pipe has not failed. However, there is evidence that the pipe may need replacement in the near future. Replacement of the pipe may be suggested for the customer's convenience in avoiding a future problem.

Example:
The customer desires improved ride and/or handling, but the vehicle's shocks or struts have not failed. In this case, replacement may be suggested to satisfy the customer's wishes. In this case, replacement of the shocks or struts may not be sold as a requirement.

A customer, of course, has the choice of whether or not a shop will service his or her vehicle. He or she may decide not to follow some of your suggestions. When a repair is required, a MAP shop must refuse partial service on that system if, in the judgment of the service provider, proceeding with the work could create or continue an unsafe condition. When a procedure states that required or suggested repair or replacement is recommended, the customer must be informed of the generally acceptable repair/replacement options whether or not performed by the shop.

When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

The following reasons may be used for required and suggested services. These codes are shown in the "Code" column of the MAP Uniform Inspection Communication Standards that follow.

Reasons to Require Repair or Replacement
A - Part no longer performs intended purpose
B - Part does not meet a design specification (regardless of performance)
C - Part is missing

NOTE: When a repair is required, the shop must refuse partial service to the system in question, if the repair creates or continues an unsafe condition.

Reasons to Suggest Repair or Replacement
1 - Part is close to the end of its useful life (just above discard specifications, or weak; failure likely to occur soon, etc.)
2 - To address a customer need, convenience, or request (to stiffen ride, enhance performance, eliminate noise, etc.)
3 - To comply with maintenance recommended by the vehicle's Original Equipment Manufacturer (OEM)
4 - Technician's recommendation based on substantial and informed experience

NOTE: Suggested services are always optional. When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

BRAKES

SERVICE PROCEDURES REQUIRED & SUGGESTED FOR PROPER VEHICLE OPERATION

Some states may have specifications that differ from OEM. Check your local/state regulations. Where state or local laws are stricter, they take precedence over these guidelines.

ACCELEROMETERS (G SENSOR OR LATERAL)

ACCELEROMETER INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Connector loose	A	Require repair or replacement.
Loose	B	Require repair or replacement.
Missing	C	Require replacement.

*** BRAKE SYSTEM UNIFORM INSPECTIC**

Out of position ..... B ..... Require re-positioning to vehicle manufacturer's specifications.
Output signal incorrect . B ..... Require replacement.

ACCUMULATORS

ACCUMULATOR INSPECTION

Condition	Code	Procedure
Leaking	B	Require replacement.
Missing	C	Require replacement.
Pre-charge incorrect	B	Require replacement.

ANCHOR PINS

See BACKING PLATES.

ANTI-LOCK BRAKE SYSTEMS

NOTE: Anti-lock brakes are an integral part of the brake system. It is essential that the anti-lock brakes function properly when brake service is performed.

Anti-lock brake systems are commonly referred to as "ABS" and will be referred to as "ABS" throughout these guidelines. Some ABS components also function as part of a traction control system (TCS).

WARNING: When diagnosing and servicing high pressure components, observe safety procedures and equipment requirements established by the vehicle manufacturer to reduce the possibility of serious personal injury.

NOTE: Intermittent electrical conditions are often caused by a loss of ground, poor connection, or water intrusion into the wiring harness.

NOTE: Electro-magnetic interference (EMI) may be caused by incorrect installation of accessories or components. EMI can result in improper system operation.

BACKING PLATES

BACKING PLATE INSPECTION

Condition	Code	Procedure
Anchor pin bent	B	Require repair or replacement.
Anchor pin broken	A	Require replacement.
Anchor pin worn, affecting structural integrity	B	Require replacement.
Backing plate bent	B	Require repair or replacement.
Backing plate broken	A	Require replacement.
Backing plate cracked	B	Require repair or replacement.
Corroded, affecting structural integrity	A	Require replacement.
Loose	B	Require repair or replacement.
Missing	C	Require replacement.
Shoe lands worn	A	Require repair or replacement.

BRAKE FLUID

CAUTION: Most manufacturers prohibit the use of DOT 5 brake fluid in a system equipped with ABS.

DOT 3, DOT 4, and DOT 5.1 brake fluids are clear or light amber in color. DOT 5 brake fluid is violet in color. Correct fluid required for the brake system is stamped on the master cylinder cover.

BRAKE FLUID INSPECTION

Condition	Code	Procedure
Beyond service interval	3	Suggest flushing and refilling with correct fluid.
Brake fluid type incorrect	B	Require flushing and refilling with correct fluid.
Contaminated, for example, fluid other than brake fluid present	A or B	(1) Require service.
Hydraulic component overhaul or replacement	3	Suggest flushing and refilling with correct fluid.
Rubber master cylinder cover gasket distorted and gummy	A	(2) Require replacement of gasket.

(1) - If a fluid other than brake fluid is present in the brake system which DOES affect the rubber parts, the required service is to:

* Remove all components having rubber parts from the system.
* Flush lines with denatured alcohol or brake cleaner
* Repair or replace all components having rubber parts
* Flush and fill with correct brake fluid. (Code A)

If a fluid other than brake fluid is present in the brake system which DOES NOT affect the rubber parts, the required service is to flush and fill with the correct brake fluid. (Code B)

(2) - This condition may indicate contaminated brake fluid.

BRAKE FRICTION MATERIAL

See FRICTION MATERIAL.

BRAKE PADS

See FRICTION MATERIAL.

BRAKE PEDALS

BRAKE PEDAL INSPECTION

Condition	Code	Procedure
Bent, affecting performance	A	Require repair or replacement.
Broken	A	Require repair or replacement.
Pedal pad missing	C	Require replacement of pedal pad.
Pedal pad worn	1	Suggest replacement.
Pivot bushings worn, affecting performance	A	Require replacement of pivot bushings.

BRAKE SHOES

See FRICTION MATERIAL.

BRAKE SHOE HARDWARE

See also SELF-ADJUSTING SYSTEMS.

BRAKE SHOE HARDWARE INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Distorted	A	Require replacement.
Missing	C	Require replacement.
Surfaces rust-pitted	1	Suggest replacement.
Worn, affecting performance	A	Require replacement.

BRAKE STOPLIGHT SWITCHES

BRAKE STOPLIGHT INSPECTION

Condition	Code	Procedure
Bent	B	Require replacement.
Broken	A	Require replacement.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require replacement.
Connector missing	C	Require replacement.
Missing	C	Require replacement.
Out of adjustment	B	Require adjustment or replacement.
Output signal incorrect	B	Require replacement.
Terminal burned, affecting performance	A	(2) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.
Threads damaged	A	Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.

(1) - Determine cause and correct prior to replacement of part.
(2) - Determine cause and correct prior to repair or replacement of part.

BULB SOCKETS

BULB SOCKET INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Broken	A	Require repair or replacement.
Bulb seized in socket	A	Require repair or replacement.
Burned, affecting performance	A	(1) Require repair or replacement.
Burned, not affecting performance	2	(1) Suggest repair or replacement.
Connector broken	A	Require repair or replacement.
Connector missing	C	Require replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(2) Require repair or replacement.
Corroded, affecting performance	A	Require repair or replacement.
Corroded, not affecting performance	2	Suggest repair or replacement.
Leaking	A	Require repair or replacement.
Melted	A	(2) Require replacement.
Shorted	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting		

performance ..... A ..... (2) Require repair
or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of socket.
(2) - Determine cause and correct prior to repair or replacement of part.

BULBS AND LEDS

NOTE: Copied from Electrical UIGs and modified. Does not include soldered-in components.

BULB AND LED INSPECTION

Condition	Code	Procedure
Application incorrect	B	(1) Require replacement.
Base burned, affecting performance	A	(2) Require repair or replacement.
Base burned, not affecting performance	2	(2) Suggest repair or replacement.
Base corroded, affecting performance	A	Require repair or replacement.
Base corroded, not affecting performance	2	Suggest repair or replacement.
Base loose, affecting performance	B	Require repair or replacement.
Base loose, not affecting performance	1	Suggest repair or replacement.
Burned out	A	Require replacement.
Intermittent	A	Require replacement.
Missing	C	Require replacement.

Seized in socket ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (2) Require repair
or replacement.
Terminal burned, not
affecting performance .. 2 ..... (2) Suggest repair
or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.

(1) - Application incorrect includes wrong bulb coating or color.
(2) - Determine cause and correct prior to repair or replacement of part.

CALIPER HARDWARE

CALIPER HARDWARE INSPECTION

Condition Code Procedure

Bent ..... A .. Require repair or replacement.
Broken ..... A .. Require repair or replacement.
Corroded, affecting
performance ..... A .. Require repair or replacement.
Dust boots on slider pin
(bolt) missing ..... C ... Require replacement of boots.
Dust boots on slider pin
(bolt) torn ..... A ... Require replacement of boots.
Missing ..... C ..... Require replacement.
Shim bent ..... A ..... (1) Require removal
or replacement.
Shim (OE standard)
missing ..... C ..... (2) Require replacement.
Shim out of position .... B ..... (1) Require removal
or replacement.
Shim worn ..... A ..... (1) Require removal
or replacement.

Slider pin (bolt) bent .. B ... Require replacement of slider pin or bolt and lubricants.
Slider pin (bolt) rust-pitted ..... A ... Require replacement of slider pin or bolt and lubricants.
Slider pin (bolt) worn .. A ... Require replacement of slider pin or bolt and lubricants.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Worn, affecting performance ..... A ..... Require replacement.

(1) - Removal is acceptable if shim is not OE.
(2) - Aftermarket shims may be suggested to reduce noise.

CALIPERS

You are not required to replace or rebuild calipers in axle sets. However, when replacing or rebuilding a caliper due to the conditions that follow, you may suggest servicing, rebuilding, or replacement of the other caliper (on the same axle) for improved performance and preventive maintenance (for example, the part is close to the end of its useful life, replacing the caliper may extend pad life, or contribute to more balanced braking).

CAUTION: When installing loaded calipers, it is required that friction material be matched in axle sets for consistent braking characteristics.

CALIPER INSPECTION

Condition Code Procedure

Bleeder port damaged .... A ... Require repair or replacement of caliper.
Bleeder screw broken off in caliper ..... A ..... (1) Require repair or replacement of caliper.
Bleeder screw plugged ... A ..... (1) Require repair or replacement of bleeder screw.
Bleeder screw seized .... A ..... (2) Require replacement of caliper.
Casting corroded, affecting structural

integrity ..... A ..... Require replacement.
Casting damaged, affecting structural integrity ... A ..... Require replacement.
Dust boot around caliper torn ..... A ..... Require replacement of dust boot.
Leaking ..... A .. Require repair or replacement.
Mounting pin threads damaged ..... A ... Require repair or replacement of component with damaged threads.
Mounting pin threads stripped in caliper bracket (threads missing) ..... A ... Require repair or replacement of caliper bracket.
Mounting pin threads stripped in steering knuckle (threads missing) ..... A ... Require repair or replacement of steering knuckle.
Mounting pin threads stripped (threads missing) ..... A ... Require repair or replacement of component with stripped threads.
Parking brake cable support, lever, or return spring bent ..... A ... Require replacement of parts.
Parking brake cable support, lever, or return spring broken ..... A ... Require replacement of parts.
Parking brake mechanism in caliper inoperative .... A .. Require repair or replacement.
Piston corroded (pitted or peeling chrome plating) ..... B ... Require replacement of piston and rebuilding or replacement of caliper.
Piston damaged, affecting performance ..... B ... Require replacement of piston and rebuilding or replacement of caliper.
Piston damaged, not affecting performance .. .. No service suggested or required.

Piston finish worn off .. B ... Require replacement of piston and rebuilding or replacement of caliper.
Piston sticking ..... A ..... Require rebuilding or replacement of caliper.
Slide mechanism sticking ..... A ... Require repair or replacement of slide mechanism.

(1) - Only required if the hydraulic system must be opened.
(2) - Seized is defined as a bleeder screw that cannot be removed after a practical attempt at removing. Only required if the hydraulic system must be opened.

CONTROLLERS

See ELECTRONIC CONTROLLERS.

DIGITAL RATIO AXLE CONTROLLERS AND BUFFERS (DRAC AND DRAB)

DIGITAL RATIO AXLE CONTROLLER AND BUFFER INSPECTION

Condition	Code	Procedure
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require replacement.
Connector missing	C	Require replacement.
Missing	C	Require replacement.
Output signal incorrect	B	Require repair or replacement.
Terminal burned, affecting performance	A	(2) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.

(1) - Determine cause and correct prior to replacement of part.
(2) - Determine cause and correct prior to repair or replacement of part.

DISABLE SWITCHES

See SWITCHES.

DRUMS

Determine the need to recondition based upon individual drum conditions that follow. Friction material replacement does not require drum reconditioning unless other justifications exist. DO NOT recondition new drums unless they are being pressed or bolted onto an existing hub. It is not necessary to replace drums in axle sets. However, when replacing or reconditioning a drum due to the conditions that follow, you may suggest reconditioning of the other drum on the same axle to eliminate uneven braking behavior. Always wash drums after servicing or before installing.

DRUM INSPECTION

Condition	Code	Procedure
Balance weight missing	..	No service suggested or required.
Bell-mouthed, affecting performance	A	Require reconditioning or replacement.
Cooling fin broken	..	No service suggested or required.
Cracked	B	Require replacement.
Drum diameter is greater than OEM "machine to" specifications but less than "discard at" specifications, and the drum does not require reconditioning	1	(1) Suggest replacement.
Drum diameter will exceed OEM "machine to" specifications after required reconditioning	B	(2) Require replacement.
Hard spotted	2	Suggest reconditioning.

			replacement.
Measured diameter is greater than OEM discard specifications	.....	B	..... Require replacement.
Out-of-round (runout), affecting performance	..	A	..... Require reconditioning or replacement.
Out-of-round (runout), exceeding manufacturer's specifications	.....	B	..... Require reconditioning or replacement.
Scored	.....	B	..... Require reconditioning or replacement.
Surface threaded due to improper machining	.....	B	..... Require reconditioning or replacement.
Tapered, affecting performance	.....	A	..... Require reconditioning or replacement.

(1) - Only applies to vehicles for which OEM "machine to" specifications exist. If OEM does not supply "machine to" specifications, the drum may be worn to discard specifications.
(2) - If OEM does not supply "machine to" specifications, you may machine to discard specifications.

ELECTRICAL PUMPS AND MOTORS

Copied fuel pump conditions from engine UIGs & deleted pulsator from leaking conditions.

ELECTRICAL PUMP AND MOTOR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	..... A	... Require repair or replacement of hardware.
Attaching hardware missing	 C	..... Require replacement of hardware.
Attaching hardware not functioning	..... A	... Require repair or replacement of hardware.

Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack
type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair
or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require replacement.
Inoperative ..... A ..... (3) Require repair
or replacement.
Leaking externally ..... A .. Require repair or replacement.
Leaking internally ..... A .. Require repair or replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair
or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specifications.

ELECTRONIC CONTROLLERS

ELECTRONIC CONTROLLER INSPECTION *** BRAKE SYSTEM UNIFORM INSPECTION GUIDELINE**

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Code set (if applicable)	A	(1) Further inspection required.
Connector broken	A	Require repair or replacement.
Connector melted	A	(2) Require repair or replacement.
Connector missing	A	Require repair.
Contaminated	A	Require repair or replacement.
Inoperative	B	Require repair or replacement. (3) Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(2) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Wire lead conductors exposed	B	Require repair or replacement.
Wire lead corroded	A	Require repair or replacement.

Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Refer to manufacturer's diagnostic trouble code procedure and require repair or replacement of affected component(s).
(2) - Determine cause and correct prior to repair or replacement of part.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable. Check for accepted cleaning procedure.

FLUID

See BRAKE FLUID.

FLUID LEVEL SENSOR SWITCHES

See SWITCHES.

FOUR WHEEL DRIVE SWITCHES

See SWITCHES.

FRICTION MATERIAL

NOTE: Original Equipment Manufacturer (OEM) specifications designate replacement at different thicknesses.

CAUTION: It is required that friction material be matched in axle sets for consistent braking characteristics.

FRICTION MATERIAL INSPECTION

Condition	Code	Procedure
Contaminated, for example, fluid that leaked from caliper, wheel cylinder, or axle seal	A	(1) Require replacement.
Cracked through	B	Require replacement.
Flaking or chunking	B	Require replacement.
Glazed (shiny)		No service suggested or required.
Grooves or ridges		(2) No service suggested or required.

Permanently attached hardware bent	A	Require replacement.	
Permanently attached hardware broken	A	Require replacement.	
Permanently attached hardware loose	A	Require replacement.	
Permanently attached hardware missing	C	Require replacement.	
Permanently attached hardware seized	A	Require repair or replacement.	
Rivets loose	B	Require replacement.	
Separating from backing	B	Require replacement.	
Shoe table or web bent	B	Require replacement.	
Shoe table or web cracked	A	Require replacement.	
Shoe table or web worn, affecting performance	A	Require replacement.	
Surface cracking		No service suggested or required. Further inspection may be necessary to determine cause.	
Tapered wear	B	(3) Suggest replacement.	
Thickness of one pad is greater than opposite pad in the same caliper (uneven wear)		(4) Replacement of friction material not suggested or required. Further inspection required. See CALIPERS and CALIPER HARDWARE.	
Wear indicator device (electronic) contacts rotor	B	(5) Require replacement of appropriate parts.	
Wear indicator device (mechanical) bent		(6) Further inspection required.	
Wear indicator device (mechanical) broken		(6) Further inspection required.	
Wear indicator device (mechanical) contacts rotor		(6) Further inspection required.	
Worn close to minimum specifications	1	(7) Suggest replacement.	

Worn to, or below minimum
specifications ..... B ..... Require replacement.

(1) - Identify and repair cause of contamination prior to replacing friction material.
(2) - When reconditioning or replacing drums or rotors, replacement of friction material may be suggested depending on the severity of the grooves or ridges.
(3) - Some vehicles use pads that are tapered by design. Refer to specific vehicle application. If not normal, require replacement of pads and correction of cause.
(4) - Uneven pad thickness is normal on some vehicles. Refer to specific vehicle applications.
(5) - The pad wear indicator light may come on due to other electrical problems.
(6) - Explain to the customer that the purpose of the wear indicator is to alert him or her to check for friction wear. Wear indicators may be bent or broken. Therefore, the friction material must be measured. The need for friction material replacement is determined based upon the conditions stated in this section. Periodic inspection is suggested.
(7) - When the part appears to be close to the end of its useful life, replacement may be suggested.

G SENSORS

See ACCELEROMETERS.

HOSES

HOSE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Blistered	B	Require replacement.

Fitting threads damaged . A .. Require repair or replacement.
Fitting threads stripped
(threads missing) ..... A ..... Require replacement.
Incorrectly secured ..... B ..... Require repair.
Inner fabric
(webbing) cut ..... B ..... Require replacement.
Leaking ..... A ..... Require replacement.
Missing ..... C ..... Require replacement.
Outer covering is cracked
to the extent that
inner fabric of hose
is visible ..... B ..... Require replacement.
Restricted ..... A ..... Require replacement.
Routed incorrectly ..... B ..... Require repair.

HYDRAULIC MODULATORS

NOTE: Many modulators can only be replaced as complete assemblies. Whenever possible, replace the failed component part. If replacement of the failed part is not possible, then replace the modulator assembly.

HYDRAULIC MODULATOR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require replacement.
Connector missing	C	Require replacement.
Disabled	A	Require repair or replacement.
Electrical failure	A	Require repair or replacement.
External leak	A	Require repair or replacement.
Housing cracked	B	Require repair or replacement.
Inoperative (2)	A	Require repair or replacement.

Internal leak ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Valve stuck ..... A .. Require repair or replacement.
Wire lead burned ..... A .. Require repair or replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

HYDRO-BOOSTERS

NOTE: Hydro-boosters and hydro-electric boosters are combined.

HYDRO-BOOSTER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement

of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack
type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require replacement.
Connector missing ..... C ..... Require replacement.
Does not apply assist, or
inadequate assist ..... A .. Require repair or replacement.
Leaking ..... B .. Require repair or replacement.
Leaks fluid at fitting .. B ..... Require tightening or
replacement.
Leaks fluid at unit ..... B .. Require repair or replacement.
Leaks fluid from pressure
hose(s) ..... B . Require replacement of hose(s).
Leaks fluid into passenger
compartment ..... B .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - Determine cause and correct prior to replacement of part.

HYDRO-ELECTRIC BOOSTERS (POWERMASTER)

See HYDRO-BOOSTERS.

IGNITION DISABLE SWITCHES

See SWITCHES.

LATERAL ACCELERATION SWITCHES

See ACCELEROMETERS.

LEDS

See BULBS AND LEDS.

LENSES

LENSE INSPECTION

Condition	Code	Procedure
Application incorrect	A	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Broken, affecting performance	A	Require replacement.
Broken, not affecting performance	..	No service suggested or required.
Cracked	A	Require replacement.
Discolored	A	Require replacement.
Leaking	A	Require repair or replacement.
Melted, affecting performance	A	Require replacement.
Melted, not affecting performance	2	Suggest replacement.
Missing	C	Require replacement.

MASTER CYLINDERS

MASTER CYLINDER INSPECTION

Condition	Code	Procedure
Brake fluid leaking from rear of master cylinder	A	Require repair or replacement.

Brake pedal drops
intermittently ..... A ..... (1) Require repair or replacement.
Fluid level low .... (2) Further inspection required.
Internal valve failure .. A .. Require repair or replacement.
Master cylinder leaking
brake fluid internally . A .. Require repair or replacement.
Piston does not return .. A .. Require repair or replacement.
Ports plugged ..... A .. Require repair or replacement.
Rubber master cylinder
cover gasket distorted
and gummy ..... A .. (3) Require replacement of the gasket.

(1) - This condition may be normal on some vehicles equipped with anti-lock brakes.
(2) - Refer to OEM procedures for adjusting low fluid level. Inspect for brake hydraulic system leaks and friction material wear.
(3) - This condition may indicate contaminated brake fluid. See BRAKE FLUID.

MODULATORS

See HYDRAULIC MODULATORS.

MOTORS

See ELECTRICAL PUMPS AND MOTORS.

PARKING BRAKE SWITCHES

See SWITCHES.

PARKING BRAKE SYSTEMS

NOTE: The parking brake is an integral part of the brake system. It is important that the parking brake function properly when brake service is performed.

PARKING BRAKE SYSTEM INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Cable improperly
adjusted ..... B ..... Require cable adjustment.
Cable or individual
wires in the cable
are broken ..... A .... Require replacement of cable assembly.
Cable sticking ..... A ..... Require cable lubrication.
Cable stuck inside conduit
and cannot be lubricated
so that parking brake
functions properly ..... A .... Require replacement of cable assembly.
Inoperative (1) ..... A ..... Require replacement of inoperative parts.
Parking brake
parts bent ..... B ... Require repair or replacement of bent parts.
Parking brake
parts broken ..... A ... Require replacement of broken parts.
Parking brake parts
missing ..... C .. Require replacement of missing parts.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - Inoperative includes intermittent operation.

PADS

See FRICTION MATERIAL.

PEDAL TRAVEL SWITCHES

See SWITCHES.

PEDALS

See BRAKE PEDALS.

POWERMASTER

See HYDRO-BOOSTERS.

PUMPS

See ELECTRICAL PUMPS AND MOTORS.

PRESSURE DIFFERENTIAL SWITCHES

See SWITCHES.

PRESSURE SWITCHES

See SWITCHES.

RELAYS

NOTE: Copied from Electrical UIGs

RELAY INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Housing broken	A	Require replacement.
Housing cracked	2	Suggest replacement.
Inoperative (1)	A	Require replacement.
Missing	C	Require replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(2) Require repair or replacement.
Terminal burned, not		

affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.
(2) - Determine cause and correct prior to repair or replacement of part.

ROTORS

Determine the need to recondition based upon individual rotor conditions that follow. Friction material replacement does not require rotor reconditioning unless other justifications exist. DO NOT recondition new rotors unless they are being pressed or bolted onto an existing hub. It is not necessary to replace rotors in axle sets. However, when replacing or reconditioning a rotor due to the conditions that follow, you may suggest reconditioning of the other rotor on the same axle to eliminate uneven braking behavior.

Determine the need to replace based upon the individual rotor conditions that follow. Reconditioning is defined as machining and block sanding, or block sanding only. Block sanding is defined as using 120-150 grit sandpaper with moderate to heavy force for 60 seconds per side. Always wash rotors after servicing or before installing.

ROTOR INSPECTION

Condition Code Procedure

Corrosion affecting
structural integrity ... A ..... (1) Require replacement.
Cracked ..... B ..... Require replacement.
Hard spots ..... 2 ..... Suggest reconditioning or replacement of rotor according to OEM specifications.
Lateral runout (wobble)
exceeds OEM
specifications ..... B ..... Require re-indexing.

reconditioning, or replacement
according to specifications.

Measured thickness is less than OEM discard specifications ..... B ..... Require replacement.

Rotor thickness is less than OEM "machine to" specifications but thicker than "discard at" specifications, and the rotor does not require reconditioning ..... 1 ..... (2) Suggest replacement.

Rotor thickness will be less than OEM "machine to" specifications after required reconditioning ..... B ..... (3) Require replacement.

Surface is rust-pitted .. B ..... Require reconditioning or replacement of rotor according to OEM specifications.

Surface is scored ..... B ... (4) Require reconditioning or replacement of rotor according to OEM specifications.

Thickness variation (parallelism) exceeds OEM specifications ..... B ..... Require reconditioning or replacement of rotor according to OEM specifications.

(1) - Examples of severe corrosion are: composite plate separated from friction surfaces and cooling fins cracked or missing.
(2) - Only applies to vehicles for which OEM "machine to" specifications exist. If OEM does not supply "machine to" specifications, the rotor may be worn to discard specifications.
(3) - If OEM does not supply "machine to" specifications, you may machine to discard specifications.
(4) - Scoring is defined as grooves or ridges in the friction contact surface. Some vehicle manufacturers require machining when scoring exceeds their allowable specifications.

SELF-ADJUSTING SYSTEM INSPECTION

Condition	Code	Procedure
Bent	A	Require repair or replacement of bent part.
Broken	A	Require repair or replacement of broken part.
Inoperative	A	(1) Require repair or replacement of inoperative parts.
Missing	C	Require replacement of missing part.
Star wheel does not turn freely	A	Require repair or replacement.

(1) - Inoperative includes intermittent operation.

SHOE HARDWARE

See BRAKE SHOE HARDWARE.

SHOES

See FRICTION MATERIAL.

SOCKETS

See BULB SOCKETS.

SPEED SENSORS (ELECTRONIC WHEEL AND VEHICLE)

NOTE: Copied Vehicle Speed Sensors from Engine UIGs & added Air Gap incorrect, loose, and wire lead misrouted. For "contaminated" removed coolant & fuel examples from note.

SPEED SENSOR INSPECTION

Condition	Code	Procedure
Air gap incorrect	B	(1) Require adjustment or replacement.
Attaching hardware missing	C	Require replacement of hardware.

Attaching hardware
threads damaged ..... A ... Require repair or replacement of hardware.
Attaching hardware
threads stripped
(threads missing) ..... A .. Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack
type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (2) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (3) Require repair or replacement.
Inoperative ..... B ..... (4) Require repair or replacement. Further inspection required.
Lead routing incorrect .. B ..... Require rerouting according to vehicle manufacturer's specifications.
Leaking ..... A .. Require repair or replacement.
Loose ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Resistance out of
specification ..... B .. Require repair or replacement.
Sensor housing cracked .. 2 ..... Suggest replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned,
affecting performance .. A ..... (2) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose,
affecting performance .. B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped
(threads missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.

Wire lead corroded ..... A .. Require repair or replacement.
Wire lead misrouted ..... B . Require re-routing according to vehicle manufacturer's specifications.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - If a sensor is not adjustable, further inspection is required to identify and correct cause.
(2) - Determine cause and correct prior to repair or replacement of part.
(3) - Determine source of contamination, such as metal particles or water. Require repair or replacement.
(4) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

STEEL BRAKE LINES

STEEL BRAKE LINE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Corroded, affecting structural integrity	A	Require replacement.
Fitting incorrect (for example, compression fitting)	B	Require replacement.
Flare type incorrect	B	Require repair or replacement.
Leaking	A	Require repair or replacement.
Line material incorrect (copper, etc.)	B	Require replacement.
Restricted	A	Require replacement.
Routed incorrectly	B	Require routing correction.
Rust-pitted	1	Suggest replacement.
Threads damaged	A	Require repair or replacement.

Threads stripped
(threads missing) ..... A ..... Require replacement.

STOPLIGHT SWITCHES

See BRAKE STOPLIGHT SWITCHES.

SWITCHES

NOTE: Copied from Electrical UIGs & added "float saturated" from old fluid level sensor switches.

STEEL BRAKE LINE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Binding, affecting performance	A	Require repair or replacement.
Binding, not affecting performance	2	Suggest repair or replacement.
Broken	A	Require repair or replacement.
Burned, affecting performance	A	(1) Require repair or replacement.
Burned, not affecting performance	2	(1) Suggest repair or replacement.
Cracked, affecting performance	A	Require repair or replacement.
Cracked, not affecting performance	1	Suggest repair or replacement.
Float saturated	A	Require replacement.
Leaking	A	Require repair or replacement.
Malfunctioning	A	(2) Require repair or replacement.
Melted, affecting		

performance ..... A ..... (1) Require repair or replacement.
Melted, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Out of adjustment ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Won't return ..... A .. Require repair or replacement.
Worn ..... 1 ..... Suggest replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Includes inoperative, intermittent operation, or failure to perform all functions.

TIRES

Consult the vehicle owner's manual or vehicle placard for correct size, speed ratings, and inflation pressure of the original tires.

TIRE INSPECTION

Condition	Code	Procedure
Tire diameter incorrect, affecting ABS or TCS	A	Require replacement.
Tire pressure incorrect, affecting ABS or TCS	A	Require repair or replacement.
Tire size incorrect, affecting ABS or TCS	A	Require replacement.

TOOTHED RINGS (TONE WHEEL)

NOTE: Copied from Drivetrain UIGs.

If the toothed ring requires replacement and cannot be replaced as a separate component, replace the assembly of which the ring is a part.

TOOTHED RING INSPECTION

Condition	Code	Procedure
Alignment incorrect	B	Require repair or replacement.
Bent	B	Require replacement.
Contaminated, affecting performance	A	Require repair. Identify and correct cause.
Cracked	B	Require replacement.
Loose	A	Require replacement of worn parts.
Missing	C	Require replacement.
Number of teeth incorrect	B	Require replacement.
Teeth broken	A	Require replacement.
Teeth damaged, affecting performance	A	Require replacement.

VACUUM BOOSTERS

VACUUM BOOSTER INSPECTION

Condition	Code	Procedure
Applies too much assist (oversensitive)	A	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not		

functioning ..... A ... Require repair or replacement of hardware.
Auxiliary vacuum pump inoperative ..... A ..... (1) Require repair or replacement.
Check valve grommet deteriorated, affecting performance ..... A .. Require replacement of grommet.
Check valve grommet deteriorated, not affecting performance .. 1 . Suggest replacement of grommet.
Check valve inoperative . A ..... (2) Require repair or replacement.
Check valve leaking ..... A .... Require replacement of check valve.
Check valve missing ..... C .... Require replacement of check valve.
Check valve noisy ..... 2 ..... Suggest replacement.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (3) Require replacement.
Connector missing ..... C ..... Require replacement.
Leaking ..... A ..... Require replacement.
Terminal burned, affecting performance ..... A ..... (3) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Vacuum hose filter leaking ..... A .. Require replacement of filter.
Vacuum hose filter restricted ..... A .. Require replacement of filter.
Wire lead burned ..... A .. Require repair or replacement.
Wire lead conductors

exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.
(2) - Inoperative includes intermittent operation.
(3) - Determine cause and correct prior to replacement of part.

VACUUM HOSES

See HOSES.

VALVES

VALVE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Leaking	B	Require repair or replacement.
Linkage bent (rear load valves)	A	Require repair or replacement of linkage.
Linkage broken (rear load valves)	A	Require repair or replacement of linkage.
Linkage disconnected (rear load valves)	C	Require repair or replacement of linkage.
Pressure out of specification	B	Require adjustment. If not possible, require replacement.
Seized	A	Require replacement.
Sticking	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or

replacement.

Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead burned ..... A .. Require repair or replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

WHEEL ATTACHING HARDWARE

For conditions noted below, also check condition of wheel stud holes.

CAUTION: Proper lug nut torque is essential. Follow manufacturer's torque specifications and tightening sequence. DO NOT lubricate threads unless specified by the vehicle manufacturer.

WHEEL ATTACHING HARDWARE INSPECTION

Condition Code Procedure

Bent ..... A ..... Require replacement.
Broken ..... A ..... (1) Require replacement.
Loose ..... B ... Require repair or replacement of affected component.
Lug nut flats rounded ... A ..... Require replacement of nut.
Lug nut installed
backward ..... B ..... Require repair.
Lug nut mating surface

*** BRAKE SYSTEM UNIFORM INSPECTION (**

dished ..... A ..... Require replacement of nut.
Lug nut mating type
incorrect ..... B ..... Require replacement of nut.
Lug nut seized ..... A ..... Require replacement of nut and/or stud.
Stud incorrect ..... B .... Require replacement of stud.
Threads damaged ..... A ... Require repair or replacement of component with damaged threads.
Threads stripped (threads
missing) ..... A ..... Require replacement of component with stripped threads.

(1) - Some manufacturers require replacement of all studs on any wheel if two or more studs or nuts on the same wheel are broken or missing.

WHEEL BEARINGS, RACES AND SEALS

NOTE: Grease seal replacement is required if seal is removed. You are not required to replace these components in axle sets. Determine the need to replace based upon the individual component conditions that follow.

WHEEL BEARINGS, RACES AND SEALS INSPECTION

Condition	Code	Procedure
Axle seal on drive axle leaking	A .	Require replacement of seal and inspection of axle, bearing, housing, and vent tube.
Bearing end-play exceeds specifications	B ..	Require adjustment of bearing, if possible. If proper adjustment cannot be obtained, require replacement of bearing assembly.
Bearing rollers, balls or races are worn, pitted, or feel rough when rotated as an assembly	B ..	Require replacement of bearing assembly.
Seal leaking	A ...	(E) Require replacement of

seal and inspection of bearings.
Spindle worn ..... B .. Require replacement of spindle and bearings.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary. Check vent. A plugged vent may force fluid past the seal.

WHEEL CYLINDERS

You are not required to replace or rebuild wheel cylinders in axle sets. However, when rebuilding or replacing a wheel cylinder due to the conditions that follow, you may suggest rebuilding or replacement of the other wheel cylinder (on the same axle) for preventive maintenance, for example, the part is close to the end of its useful life.

Determine the need to rebuild or replace based upon the individual wheel cylinder conditions that follow.

WHEEL CYLINDER INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require replacement of bent parts.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware corroded, affecting structural integrity	A	Require replacement of corroded parts.
Attaching hardware loose	A	Require repair or replacement.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bleeder port damaged (if non-repairable)	A	Require replacement.
Bleeder screw broken off in wheel cylinder (if non-repairable)	A	(1) Require replacement.

*** BRAKE SYSTEM UNIFORM INSPECTION C**

Bleeder screw plugged ... A ..... (1) Require repair or replacement of bleeder screw.
Bleeder screw seized .... A ..... (2) Require replacement.
Bore corroded (pitted) .. B ..... Require replacement.
Bore grooved ..... A ..... Require replacement.
Bore oversized ..... B ..... Require replacement.
Dust boot missing ..... C ..... Require replacement of dust boot.
Dust boot torn ..... A . (3) Require replacement of dust boot.
Leaking ..... A ..... (4) Require rebuilding or replacement.
Piston corroded, affecting performance ..... B ... Require replacement of piston and rebuilding or replacement of wheel cylinder.
Piston finish worn off .. B ... Require replacement of piston and rebuilding or replacement of wheel cylinder.
Piston stuck in bore .... A .... Require replacement of wheel cylinder.
Loose ..... B .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

(1) - Only required if the hydraulic system must be opened.
(2) - Seized is defined as bleeder screw that cannot be removed after a practical attempt at removing. Only required if the hydraulic system must be opened.
(3) - Inspect for conditions related to wheel cylinder.
(4) - Leaking is defined as a drop or more. Dampness is normal.

WIRING HARNESSES

NOTE: Copied from Electrical UIGs.

WIRING HARNESS INSPECTION

Condition Code Procedure

Application incorrect ... B .. Require repair or replacement.
Attaching hardware broken ..... A ... Require repair or replacement of hardware.

Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Insulation damaged, conductors exposed ..... A .. Require repair or replacement.
Insulation damaged, conductors not exposed . 1 ..... Suggest replacement.
Open ..... A .. Require repair or replacement.
Protective shield (conduit) melted ..... 2 ..... (1) Suggest repair or replacement.
Protective shield (conduit) missing ..... 2 .. Suggest repair or replacement.
Resistance (voltage drop) out of specification ... A .. Require repair or replacement.
Routed incorrectly ..... B ..... Require repair.
Secured incorrectly ..... B ..... Require repair.
Shorted ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Voltage drop out of specification ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

END OF ARTICLE

BELT ROUTING
Article Text
1996 Kia Sephia
For 1 1 1 1 1

Saturday, April 18, 2009 10:06PM

ARTICLE BEGINNING

1995-96 ENGINE COOLING
Kia Belt Routing

Sephia

BELT ADJUSTMENT SPECIFICATIONS

BELT ADJUSTMENT SPECIFICATIONS TABLE
(Tension in Lbs. (kg) Using Belt Tension Gauge)

Application	Tension
A/C Compressor	
New Belt	110-132 (50-60)
Used Belt	95-110 (43-50)
Generator	
New Belt	86-103 (39-47)
Used Belt	68-86 (31-39)
Power Steering	
New Belt	110-132 (50-60)
Used Belt	95-110 (43-50)

END OF ARTICLE

* ENGINE SYSTEMS UNIFORM INSPECTION GUIDELINES *
Article Text
1996 Kia Sephia
For 1 1 1 1 1

Saturday, April 18, 2009 10:06PM

ARTICLE BEGINNING

GENERAL INFORMATION
Engine Performance and Maintenance January 2000 Motorist Assurance Program
Standards For Automotive Repair

All Makes and Models

INTRODUCTION TO MOTORIST ASSURANCE PROGRAM (MAP)

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BOOST CONTROL MECHANISMS
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CASTING CORE PLUGS AND EXPANSION PLUGS
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DISTRIBUTOR ADVANCES AND RETARDERS (MECHANICAL AND VACUUM)
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EARLY FUEL EVAPORATION VALVES (HEAT RISER ASSEMBLIES)
EGR COOLERS
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EGR PLATES AND COOLERS
ELECTRONIC SPARK CONTROL MODULES

*** ENGINE SYSTEMS UNIFORM INSPECTION**

ELECTRONIC TRANSMISSION CONTROL DEVICES
ELECTRONIC TRANSMISSION FEEDBACK DEVICES
ENGINE COOLANT TEMPERATURE SENSORS
ENGINE COOLING SYSTEMS
ENGINE COVERS (OIL PAN, VALVE COVER, TIMING COVER)
ENGINE OIL
ENGINE OIL CANISTERS
ENGINE OIL COOLERS (EXTERNAL)
ENGINE OIL DRAIN PLUGS AND GASKETS
ENGINE OIL FILTERS AND CANISTERS
ENGINE OIL GASKETS
ENGINE OIL PRESSURE GAUGES (MECHANICAL)
EVAPORATIVE EMISSION (EVAP) CANISTER FILTERS
EVAPORATIVE EMISSION (EVAP) CANISTER PURGE DEVICES
EVAPORATIVE EMISSION (EVAP) CANISTERS
EVAPORATIVE EMISSION (EVAP) FEEDBACK DEVICES
EXHAUST GAS RECIRCULATION DEVICES
EXHAUST GAS RECIRCULATION FEEDBACK DEVICES
EXPANSION PLUGS
FAN CONTROL SENSORS
FUEL
FUEL ACCUMULATORS AND DAMPERS
FUEL AND COLD START INJECTORS
FUEL DAMPERS
FUEL DELIVERY CHECK VALVES
FUEL DISTRIBUTORS (BOSCH CIS)
FUEL FILLER NECKS AND RESTRICTORS
FUEL FILTERS
FUEL INJECTORS
FUEL LEVEL SENDERS7
FUEL PRESSURE REGULATORS
FUEL PUMPS (IN-TANK AND EXTERNAL, ELECTRICAL OR MECHANICAL)
FUEL RAILS
FUEL RESTRICTORS
FUEL TANKS
GAS CAPS
GASKETS
GROMMETS (VALVE COVER)
HARMONIC DAMPERS
HEATER CONTROL VALVES
HEATER CORES
HOSE AND TUBE COUPLERS, CONNECTORS AND CLAMPS
HOSE CLAMPS
HOSE CONNECTORS
HOSE COUPLERS
HOSES AND TUBES (FUEL LINES, RADIATOR, VACUUM, EMISSION)

HEATER, RECOVERY TANK AND OIL COOLERS)
HOUSINGS
IDLE AIR CONTROLS
IDLE SPEED CONTROL ACTUATORS
IGNITION BOOTS
IGNITION COIL TOWERS
IGNITION COILS
IGNITION CONTROL MODULES (ICM)
IGNITION SWITCHES
IGNITION TERMINALS
IGNITION WIRES, BOOTS, COIL TOWERS AND TERMINALS (SECONDARY)
IN-TANK FUEL STRAINERS
INERTIA FUEL SHUT-OFF SWITCHES
INTAKE AIR TEMPERATURE SENSORS
INTAKE MANIFOLDS
INTERCOOLERS
KNOCK SENSORS
LIQUID VAPOR SEPARATORS
MANIFOLD ABSOLUTE PRESSURE (MAP) SENSORS
MASS AIR FLOW (MAF) SENSORS
METAL AIR MANIFOLDS AND PIPES
METAL AIR PIPES
MIX CONTROL SOLENOIDS
MOTOR MOUNTS
O-RINGS, GASKETS, SEALS AND SPRING LOCKS
O2 SENSORS
OIL PRESSURE SENDING UNITS
OIL PUMP PICK-UP SCREENS
OIL PUMPS
PARK NEUTRAL POSITION SWITCHES
PCV BREATHER ELEMENTS
PCV ORIFICES
PCV VALVES
PICK-UP ASSEMBLIES (INCLUDES MAGNETIC, HALL EFFECT AND OPTICAL)
POWER STEERING PRESSURE SENSORS
POWERTRAIN CONTROL MODULES (PCM) AND PROM
POWERTRAIN CONTROL PROM
PRESSURIZED EXPANSION TANK CAPS
RADIATOR CAPS AND PRESSURIZED EXPANSION TANK CAPS
RADIATOR FAN BLADES
RADIATOR FAN CLUTCHES
RADIATORS
ROLL OVER VALVES
SEALING COMPOUNDS
SEALS

*** ENGINE SYSTEMS UNI**

SECONDARY AIR INJECTION SYSTEM MANAGEMENT DEVICES
SENSORS AND ACTUATORS
SHROUDS, BAFFLES AND DEFLECTORS
SPARK PLUGS
SPRING LOCKS
SUPER CHARGERS
SWITCHES
THERMAL VACUUM VALVES
THERMOSTATIC AIR DOOR ASSEMBLIES
THERMOSTATS AND HOUSINGS
THROTTLE BODIES
THROTTLE CABLES
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THROTTLE POSITION SENSORS
THROTTLE POSITION SWITCHES
TIMING BELT SPROCKETS
TIMING BELTS
TORQUE STRUTS
TRANSMISSION RANGE SWITCHES
TUBE CLAMPS
TUBE CONNECTORS
TUBE COUPLERS
TUBES
TURBO CHARGERS
VACUUM CONNECTIONS
VACUUM HOSES, TUBES AND CONNECTIONS (NON-METALLIC)
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VACUUM TUBES
VEHICLE SPEED SENSORS
VOLUME AIR FLOW SENSORS
WASTE GATE CONTROL SOLENOIDS
WASTE GATES AND BOOST CONTROL MECHANISMS
WATER PUMPS (ELECTRIC)
WATER PUMPS (NON-ELECTRIC)
WIRING HARNESSES AND CONNECTORS

INTRODUCTION TO MOTORIST ASSURANCE PROGRAM (MAP)

OVERVIEW OF MOTORIST ASSURANCE PROGRAM (MAP)

Automotive industry professionals and interested readers:
The Motorist Assurance Program (MAP) is the consumer outreach effort of the Automotive Maintenance and Repair Association, Inc. (AMRA). Participation in the Motorist Assurance Program is drawn from auto repair companies and independents, parts and equipment manufacturers and suppliers, vehicle manufacturers and industry associations.

Our organization's mission is to strengthen the relationship between the consumer and the auto repair industry. We encourage motorists to take greater responsibility for their vehicles-through proper, manufacturer-recommended, maintenance, and endorse participating service and repair shops (including franchisees and dealers) who adopt (1) the MAP Pledge of Assurance to their Customers and (2) the Motorist Assurance Program Standards of Service. All participating service providers have agreed to subscribe to this Pledge and to adhere to the promulgated Standards of Service demonstrating to their customers that they are serious about customer satisfaction.

These Standards of Service require an inspection of the vehicle's (problem) system and that the results be communicated to the customer according to industry standards. Since the industry did not have such standards, the Motorist Assurance Program successfully promulgated industry inspection communication standards in 1994-95 for the following systems: Exhaust, Brakes, ABS, Steering and Suspension, Engine Maintenance and Performance, HVAC, and Electrical Systems.

Further, revisions to all of these inspection communication standards are re-published periodically. In addition to the above, standards for Drive Train and Transmissions were promulgated and published in 1998. Participating shops utilize these Uniform Inspection & Communication Standards (UI&CS) as part of the inspection process and for communicating their findings to their customers.

The Motorist Assurance Program continues to work cooperatively and proactively with government agencies and consumer groups toward solutions that both benefit the customer and are mutually acceptable to both regulators and industry. We maintain the belief that industry must retain control over how we conduct our business, and we must be viewed as part of the solution and not part of the problem. Meetings with state and other government officials (and their representatives), concerned with auto repair and/or consumer protection, are conducted. Feedback from these sessions is brought back to the association governing body, and the program adjusted as needed.

To assure recourse for auto repair customers if they are not satisfied with a repair transaction, the Motorist Assurance Program offers mediation and arbitration through the BBB and other similar non-profit organizations. MAP conducted pilot programs in twelve states before announcing the program nationally in October 1998. During the pilots, participating repair shops demonstrated their adherence to the Pledge and Standards and agreed to follow the UI&CS in communicating the results of their inspection to their customers. Complaints and "come-backs" dropped significantly.

To put some "teeth" in the program, an accreditation requirement for shops was initiated. The requirements are stringent.

and a self-policing technique has been incorporated which includes the "mystery shopping" of outlets. By year-end 1999, over 4,000 auto repair facilities had been accredited by the Motorist Assurance Program.

We welcome you to join us as we continue our outreach. With your support, both the automotive repair industry and your customers will reap the benefits. Please visit MAP at our Internet site www.motorist.org or contact us at:

1444 I Street, NW - Suite 700
Washington, DC 20005
Phone (202) 712-9042 - Fax (202) 216-9646
E-mail map@bostromdc.org

OVERVIEW OF SERVICE REQUIREMENTS AND SUGGESTIONS

It is MAP policy that all exhaust, brake, steering, suspension, wheel alignment, drive-line, engine performance and maintenance, and heating, ventilation and air conditioning, and electrical services be offered and performed under the standards and procedures specified in these sections.

Before any service is performed on a vehicle, an inspection of the appropriate system must be performed. The results of this inspection must be explained to the customer and documented on an inspection form. The condition of the vehicle and its components will indicate what services/part replacements may be "Required" or "Suggested." In addition, suggestions may be made to satisfy the requests expressed by the customer.

When a component is suggested or required to be repaired or replaced, the decision to repair or replace must be made in the customer's best interest, and at his or her choice given the options available.

This section lists the various parts and the conditions that indicate a required or suggested service or part replacement. Although this list is extensive, it is not fully inclusive. In addition to this list, a technician may make a suggestion. However, any suggestions must be based on substantial and informed experience, or the vehicle manufacturer's recommended service interval and must be documented.

Some conditions indicate that service or part replacement is required because the part in question is no longer providing the function for which it is intended, does not meet a vehicle manufacturer's design specification or is missing.

* Example: An exhaust pipe has corroded severely and has a hole in it through which exhaust gases are leaking.

*** ENGINE SYSTEMS UNIFORM I**

Replacement of the exhaust pipe in this case is required due to functional failure.

* Example: A brake rotor has been worn to the point where it measures less than the vehicle manufacturer's discard specifications. Replacement of the rotor is required because it does not meet design specifications.

Some conditions indicate that a service or part replacement is suggested because the part is close to the end of its useful life or addresses a customer's need, convenience or request. If a customer's vehicle has one of these conditions, the procedure may be only to suggest service.

* Example: An exhaust pipe is rusted, corroded or weak, but no leaks are present. In this case, the exhaust pipe has not failed. However, there is evidence that the pipe may need replacement in the near future. Replacement of the pipe may be suggested for the customer's convenience in avoiding a future problem.
* Example: The customer desires improved ride and/or handling, but the vehicle's shocks or struts have not failed. In this case, replacement may be suggested to satisfy the customer's wishes. In this case, replacement of the shocks or struts may not be sold as a requirement.

A customer, of course, has the choice of whether or not a shop will service his or her vehicle. He or she may decide not to follow some of your suggestions. When a repair is required, a MAP shop must refuse partial service on that system if, in the judgment of the service provider, proceeding with the work could create or continue an unsafe condition.

When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

The following reasons may be used for required and suggested services. These codes are shown in the "Code" column of the MAP Uniform Inspection & Communications Standards that follow:

Reasons to Require Repair or Replacement

A - Part no longer performs intended purpose
B - Part does not meet a design specification (regardless of performance)
C - Part is missing

NOTE: When a repair is required, the shop must refuse partial

service to the system in question, if the repair creates or continues an unsafe condition.

Reasons to Suggest Repair or Replacement

1 - Part is close to the end of its useful life (just above discard specifications, or weak; failure likely to occur soon, etc.)
2 - To address a customer need, convenience, or request (to stiffen ride, enhance performance, eliminate noise, etc.)
3 - To comply with maintenance recommended by the vehicle's Original Equipment Manufacturer (OEM)
4 - Technician's recommendation based on substantial and informed experience

NOTE: Suggested services are always optional. When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

ENGINE ASSEMBLIES

SERVICE PROCEDURES REQUIRED AND SUGGESTED FOR PROPER VEHICLE OPERATION

CYLINDER HEAD ASSEMBLIES

NOTE: A Cylinder Head Assembly is a cylinder head fitted with valves, associated springs, retainers, and on overhead camshaft cylinder heads (OHC), camshaft, camshaft bearings, lash adjusters, tappets and rockers.

CYLINDER HEAD ASSEMBLY INSPECTION

Condition	Code	Procedure
Adjustable valve lash is out of specification	B	Require repair.
Internal component failure (any component)	A	(1) Require repair or replacement of cylinder head assembly.

(1) - It is Required that all other failure related components be inspected for cause and condition. Additional components or assemblies may be Suggested for repair or replacement, *** ENGINE SYSTEMS UNIFORM INSPE**

such as a water pump on a short block (reason code 4, technician's recommendation based on substantial and informed experience).

Example:
If there is a failed head gasket with an external coolant leak, in addition to Requiring replacement of the head gasket, inspection of the following for cause and condition is Required: Block, Cooling System, Cylinder Head. It may be Suggested that additional inspections be performed, such as the other head gasket on a V-type engine.

LONG BLOCK ASSEMBLIES

NOTE: A Long Block Assembly is a short block assembly together with a cylinder head assembly and all those components fitted within the rocker or cam cover, and timing cover (the whole presented as an assembly). A rebuilt or new oil pump, or kit shall be supplied or fitted as appropriate.

LONG BLOCK ASSEMBLY INSPECTION

Condition	Code	Procedure
Internal component failure (any component)	A	(1) Require repair or replacement of the long block assembly.

(1) - It is Required that all other failure related components be inspected for cause and condition. Additional components or assemblies may be Suggested for repair or replacement such as a water pump on a short block (reason code 4, technician's recommendation based on substantial and informed experience).

Example:
If there is a failed head gasket with an external coolant leak, in addition to Requiring replacement of the head gasket, inspection of the following for cause and condition is Required: Block, Cooling System, Cylinder Head. It may be Suggested that additional inspections be performed, such as the other head gasket on a V-type engine.

SHORT BLOCK ASSEMBLIES

NOTE: A Short Block Assembly is a cylinder block and all those components contained within the limits of the block deck or decks, the pan rail, the block rear face and the timing cover (where fitted), including the crankshaft.

SHORT BLOCK ASSEMBLY INSPECTION

Condition	Code	Procedure
Any internal component failure	A	(1) Require repair or replacement of the short block assembly.

(1) - It is Required that all other failure related components be inspected for cause and condition. Additional components or assemblies may be Suggested for repair or replacement, such as a water pump on a short block (reason code 4, technician's recommendation based on substantial and informed experience).

Example:
If there is a failed head gasket with an external coolant leak, in addition to Requiring replacement of the head gasket, inspection of the following for cause and condition is Required: Block, Cooling System, Cylinder Head. It may be Suggested that additional inspections be performed, such as the other head gasket on a V-type engine.

ENGINE COMPONENTS

ACCELERATOR PEDAL POSITION SENSORS

ACCELERATOR PEDAL POSITION SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware		

threads damaged ..... A ... Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing) ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... B ..... (2) Require repair or replacement. Further inspection required.
Missing ..... C ..... Require replacement.
Resistance out of specification ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

ACCESSORY BELTS

ACCESSORY BELT INSPECTION

Condition	Code	Procedure
Alignment incorrect	B	(1) Further inspection required.
Cracked	1	Suggest replacement.
Frayed	1	Suggest replacement.
Missing	C	Require replacement.
Noisy	2	(2) Further inspection required.
Plies separated	A	Require replacement.
Tension out of specification	B	Require adjustment or replacement.
Worn beyond adjustment range	B	Require replacement.
Worn so it contacts bottom of pulley	A	Require replacement.

(1) - Determine cause of incorrect alignment and require repair.
(2) - Determine cause of noise and suggest repair.

ACCESSORY PULLEYS

ACCESSORY PULLEY INSPECTION

Condition	Code	Procedure
Alignment incorrect	B	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bent	A	Require replacement.
Cracked	A	Require replacement.
Loose	A	Require repair or replacement.

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Missing ..... C ..... Require replacement.
Pulley damaged, affecting
belt life ..... A ..... Require replacement.

ACTUATORS

See SENSORS AND ACTUATORS.

AIR CONDITIONING CYCLING SWITCHES

AIR CONDITIONING CYCLING SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.

Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

AIR CONDITIONING PRESSURE SENSORS

AIR CONDITIONING PRESSURE SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.

Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack
type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Resistance out of
specification ..... B .. Require repair or replacement.
Restricted, affecting
performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of

OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

AIR DUCTS AND TUBES

AIR DUCT AND TUBE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Restricted, affecting performance	A	Require repair or replacement.

AIR FILTER ELEMENTS

AIR FILTER ELEMENT INSPECTION

Condition	Code	Procedure
Leaking	A	Require replacement.
Paper filter element oil-soaked	A	(1) Require replacement.
Maintenance intervals	3	Suggest replacement to comply with vehicle's OEM recommended service intervals.
Melted	A	Required replacement.
Missing	C	Require replacement.
Restricted, affecting performance	A	Require replacement.
Water-contaminated	A	(1) Require replacement.

(1) - Further inspection required to determine cause.

AIR FILTER GASKETS

See AIR FILTER HOUSINGS AND GASKETS.

AIR FILTER HOUSINGS AND GASKETS

AIR FILTER HOUSING AND GASKET INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.

AIR FUEL RATIO SENSORS

AIR FUEL RATIO SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contains cracks	A	(2) Require repair or

		replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A ..	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B ..	Require repair or replacement.
Restricted, affecting performance	A ..	Require repair or replacement.
Terminal broken	A ..	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance ..	2 ..	Suggest repair or replacement.
Terminal corroded, affecting performance ..	A ..	Require repair or replacement.
Terminal corroded, not affecting performance ..	2 ..	Suggest repair or replacement.
Terminal loose, affecting performance	B ..	Require repair or replacement.
Terminal loose, not affecting performance ..	1 ..	Suggest repair or replacement.
Threads damaged	A ..	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Wire lead conductors exposed	B ..	Require repair or replacement.
Wire lead corroded	A ..	Require repair or replacement.
Wire lead open	A ..	Require repair or replacement.
Wire lead shorted	A ..	Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

AIR INJECTION CONTROL SOLENOIDS

AIR INJECTION CONTROL SOLENOID INSPECTION *** ENGINE SYSTEMS UNIFORM INSPECTION (**

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Inoperative	B	(2) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Wire lead conductors		

exposed ..... B . Require repair or replacement.
Wire lead corroded ..... A . Require repair or replacement.
Wire lead open ..... A . Require repair or replacement.
Wire lead shorted ..... A . Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

AIR PLENUMS

AIR PLENUM INSPECTION

Condition	Code	Procedure
Integrated air or fuel control components inoperative	A	(1) Require repair or replacement.
Internal air or fuel components damaged, affecting performance	A	Require repair or replacement of component.
Internal air or fuel components damaged, not affecting performance		No service suggested or required.
Internal air or fuel components missing	C	Require replacement of component.
Leaking	A	Require repair or replacement.
Restricted	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

AIR PUMP BELTS

AIR PUMP BELT INSPECTION

Condition	Code	Procedure
Alignment incorrect	B	(1) Further inspection required.
Cracked	1	Suggest replacement.
Frayed	1	Suggest replacement.
Maintenance intervals	3	Suggest replacement to comply with vehicle OEM recommended service intervals.
Missing	C	Require replacement.
Noisy	2	(2) Further inspection required.
Plies separated	A	Require replacement.
Tension out of specification	B	Require adjustment or replacement.
Worn beyond adjustment range	B	Require replacement.
Worn so it contacts bottom of pulley	A	Require replacement.

(1) - Determine cause of incorrect alignment and require repair.
(2) - Determine cause of noise and suggest repair.

AIR PUMPS (ELECTRIC-DRIVEN)

AIR PUMP (ELECTRIC-DRIVEN) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.

Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require replacement.
Leaking ..... A ..... Require replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 ..... Suggest replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

AIR TUBES

See AIR DUCTS AND TUBES.

ASPIRATOR, CHECK AND DECEL VALVES

ASPIRATOR, CHECK AND DECEL VALVE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ...	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not		

functioning	A	...	Require repair or replacement of hardware.
Inoperative	A	.....	(1) Require repair or replacement.
Leaking	A	.....	Require replacement.
Melted, affecting performance	A	.....	Require replacement.
Melted, not affecting performance	..	.....	No service suggested or required.
Missing	C	.....	Require replacement.
Threads damaged	A	..	Require repair or replacement.
Threads stripped (threads missing)	A	..	Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

BAFFLES

See SHROUDS, BAFFLES AND DEFLECTORS.

BALLAST PRIMARY SUPPLY RESISTOR WIRES

See BALLAST RESISTORS AND PRIMARY SUPPLY RESISTOR WIRES.

BALLAST RESISTORS AND PRIMARY SUPPLY RESISTOR WIRES

BALLAST RESISTOR AND PRIMARY SUPPLY RESISTOR WIRE INSPECTION

Condition	Code		Procedure
Attaching hardware broken	A	...	Require repair or replacement of hardware.
Attaching hardware missing	C	.....	Require replacement of hardware.
Attaching hardware not functioning	A	...	Require repair or replacement of hardware.
Conductor exposed	A	.....	Require replacement.
Connector broken	A	..	Require repair or replacement.
Connector melted	A	.....	(1) Require repair or replacement.

Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require replacement.
Insulation overheated ... A ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

BAROMETRIC PRESSURE SENSORS

BAROMETRIC PRESSURE SENSOR INSPECTION

Condition Code Procedure

Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware
threads damaged ..... A ... Require repair or replacement
of hardware.
Attaching hardware
threads stripped
(threads missing) ..... A ... Require repair or replacement
of hardware.
Connector broken ..... A ... Require repair or replacement.
Connector (Weatherpack
type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or
replacement.
Connector missing ..... C ..... Require replacement.

Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Resistance out of specification ..... B .. Require repair or replacement.
Restricted, affecting performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

Proper operation of any electrical system or component can be affected by battery condition. The battery(ies) must meet or exceed minimum specification for vehicle as equipped and test to that specific battery's CCA.

Definition of Terms

* Battery Performance Testing
  Testing that determines whether or not a battery meets both vehicle OEM and battery manufacturer's specifications.

* Cold Cranking Amp (CCA) Rating
  The number of amperes a new, fully charged battery at 0° F (-17.8° C) can deliver for 30 seconds and maintain at least a voltage of 1.2 volts per cell (7.2 volts for a 12-volt battery).

* Cranking Amps (CA)
  The number of amperes a new, fully charged battery, typically at 32° F (0° C) can deliver for 30 seconds and maintain at least a voltage of 1.2 volts per cell (7.2 volts for a 12-volt battery).

* OEM Cranking Amps
  The minimum CCA required by the original vehicle manufacturer for a specific vehicle.

BATTERY INSPECTION

Condition	Code	Procedure
Battery frozen	..	(1) Further inspection required.
Case leaking	A	Require replacement.
Casing swollen	A	(2) Further inspection required.
Circuit open internally	A	Require replacement.
Electrolyte contamination	A	(2) Further inspection required.
Electrolyte discoloration	A	(2) Further inspection required.
Fails to accept and hold charge	A	(3) Require replacement.
Fluid level low	B	(4) Further inspection

required.

Out of performance specification for battery ..... B ..... (5) Require replacement.

Out of specification for application ..... B ..... (5) Require replacement.

Post (top or side) burned, affecting performance .. A ..... (6) Require repair or replacement.

Post (top or side) burned, not affecting performance ..... 2 ..... (6) Suggest repair or replacement.

Post (top or side) corroded, affecting performance ..... A ..... Require repair.

Post (top or side) corroded, not affecting performance ..... 2 ..... Suggest repair.

Post (top or side) loose ..... A ..... Require replacement.

Post (top or side) melted, affecting performance ..... A ..... (6) Require repair or replacement.

Post (top or side) melted, not affecting performance ..... 2 ..... (6) Suggest repair or replacement.

Specific gravity low .... B ..... (7) Further inspection required.

State of charge low ..... A ..... (7) Further inspection required.

Top dirty ..... 2 ..... Suggest cleaning battery.

Top wet ..... A ... (8) Require cleaning battery. Further inspection required.

Vent cap loose ..... A ... Require repair or replacement of vent cap.

Vent cap missing ..... C ..... Require replacement of vent cap.

(1) - DO NOT attempt to charge a frozen battery. Allow battery to warm thoroughly and then performance-test. If battery fails performance test, require replacement.

(2) - No service suggested or required unless the battery fails performance test, in which case, require

replacement.
(3) - This phrase refers to a battery that fails to either accept and/or retain a charge using appropriate times listed in the Battery Charging Guide of the BCI Service Manual, battery charger operating manual, or battery manufacturer's specifications.
(4) - Determine cause of low fluid level. Refill to proper level(s) with water (distilled water preferred). Recharge battery and performance-test.
(5) - The battery may meet battery manufacturer's specifications but test below the minimum specification defined by the vehicle's OEM for that vehicle.
(6) - Determine cause and correct prior to repair or replacement of part.
(7) - Recharge and test to manufacturer's specifications. If battery fails performance test, require replacement.
(8) - Check fluid level and adjust to manufacturer's specification. Suggest checking charging system for proper operation.

BATTERY CABLES, WIRES AND CONNECTORS

BATTERY CABLE, WIRE AND CONNECTOR INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Insulation damaged, conductors exposed	A	(2) Require repair or replacement.
Insulation damaged,		

conductors not exposed . 1 ..... Suggest replacement.
Open ..... A .. Require repair or replacement.
Protective shield
(conduit) melted ..... 2 ..... (1) Suggest repair or replacement.
Protective shield
(conduit) missing ..... 2 .. Suggest repair or replacement.
Resistance (voltage drop)
out of specification ... A .. Require repair or replacement.
Routed incorrectly ..... B ..... Require repair.
Secured incorrectly ..... B ..... Require repair.
Shorted ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Voltage drop out of
specification ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Exposed conductor at replacement (aftermarket) terminal end does not require repair or replacement.

BATTERY CONNECTORS

See BATTERY CABLES, WIRES AND CONNECTORS.

BATTERY TRAYS AND HOLD DOWN HARDWARE

BATTERY TRAY AND HOLD DOWN HARDWARE INSPECTION

Condition	Code	Procedure
Battery improperly		

secured ..... 2 ..... Suggest repair.
Bent, affecting
performance ..... A .. Require repair or replacement.
Bent, not affecting
performance .... No service suggested or required.
Broken, affecting
performance ..... A .. Require repair or replacement.
Broken, not affecting
performance .... No service suggested or required.
Corroded, affecting
performance ..... A .. Require repair or replacement.
Corroded, not affecting
performance ..... 2 .. Suggest repair or replacement.
Cracked, affecting
performance ..... A .. Require repair or replacement.
Cracked, not affecting
performance ..... 1 .. Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Water drain clogged ..... A ..... Require repair.

BATTERY WIRES

See BATTERY CABLES, WIRES AND CONNECTORS.

BELT-DRIVEN AIR PUMPS

BELT-DRIVEN AIR PUMP INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Inoperative	C	Require replacement.

Leaking ..... A ..... Require replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 ..... Suggest replacement.
Pulley alignment
incorrect ..... B .. Require repair or replacement.
Pulley bent ..... A ..... Require replacement.
Pulley cracked ..... A ..... Require replacement.
Pulley loose ..... A .. Require repair or replacement.
Pulley missing ..... C ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A .. Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

BELT IDLER ASSEMBLIES (ACCESSORY AND CAM BELTS)

BELT IDLER ASSEMBLY (ACCESSORY AND CAM BELT) INSPECTION

Condition Code Procedure

Alignment incorrect ..... B .. Require repair or replacement.
Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Bearings worn ..... 1 ..... Suggest replacement.
Cracked ..... 2 ..... Suggest replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 ..... Suggest replacement.
Seized ..... A .. Require repair or replacement.

BELT TENSIONERS (ACCESSORY AND CAM BELTS)

BELT TENSIONER (ACCESSORY AND CAM BELT) INSPECTION

Condition Code Procedure

Alignment incorrect ..... B .. Require repair or replacement.
Attaching hardware
broken ..... A .. Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Bearings worn ..... 1 ..... Suggest replacement.
Belt tension incorrect .. B ... Require adjustment or repair.
Cracked ..... 2 ..... Suggest replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 ..... Suggest replacement.
Pulley damaged, affecting
belt life ..... A ..... Require replacement.
Seized ..... A .. Require repair or replacement.

BOOST CONTROL MECHANISMS

See WASTE GATES AND BOOST CONTROL MECHANISMS.

CAMSHAFT POSITION SENSORS

CAMSHAFT POSITION SENSOR INSPECTION

Condition Code Procedure

Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware threads
damaged ..... A ... Require repair or replacement of hardware.
Attaching hardware
threads stripped
(threads missing) ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack
type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.

Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

CARBURETORS AND CHOKES

NOTE: Proper operation of a carburetor includes the ability to control air/fuel mixtures during all phases or driving operation to comply with all federal and local emissions standards. Adjustments are to be considered repairs.

CARBURETOR AND CHOKE INSPECTION

Condition	Code	Procedure
Air/fuel control incorrect	B	Require repair or replacement.
Application incorrect	B	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Components binding	A	Require repair or replacement.
Components damaged, affecting operation or performance	A	Require repair or replacement.
Components missing	C	Require replacement of components.
Contaminated	A	(1) Require repair or replacement. Further inspection required.
Controlling linkages binding	A	Require repair or replacement of linkage.
Leaking	A	Require repair or replacement.
Mechanical operation incorrect	B	Require repair or replacement.
Operating incorrectly	B	Require repair or replacement.

(1) - Some components may be serviceable; check for accepted cleaning procedure. Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.

CASTING CORE PLUGS AND EXPANSION PLUGS

CASTING CORE PLUG AND EXPANSION PLUG INSPECTION

Condition	Code	Procedure
Leaking	A	Require replacement.
Material type incorrect	2	Suggest replacement.

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CHARGE AIR COOLERS "INTERCOOLERS" (CAC)

CHARGE AIR COOLER "INTERCOOLER" (CAC) INSPECTION

Condition	Code	Procedure
Air-to-air intercooler leaking, affecting boost performance	A	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Leaking coolant	A	Require repair or replacement.
Missing	C	Require replacement.
Restricted, affecting performance	A	Require repair or replacement.

CHECK VALVES

See ASPIRATOR, CHECK AND DECEL VALVES.

CHOKES

See CARBURETORS AND CHOKES.

CLUTCH PEDAL POSITION SWITCHES

CLUTCH PEDAL POSITION SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.

Attaching hardware
threads stripped
(threads missing) ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... B ..... (2) Require repair or replacement. Further inspection required.
Missing ..... C ..... Require replacement.
Resistance out of
specification ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

See FUEL AND COLD START INJECTORS.

CONNECTORS

See WIRING HARNESSES AND CONNECTORS.

COOLANT

COOLANT INSPECTION

Condition	Code	Procedure
Acidity (pH) incorrect	1	Suggest correction or replacement.
Contaminated	B	(1) Require replacement or recycling. Further inspection required.
Level low	B	(2) Require filling to proper level.
Maintenance intervals	3	(3) Suggest replacement.
Mixture incorrect	B	Require correction or replacement.
Type incorrect	B	Require replacement.

(1) - Determine source of contamination and require correction prior to coolant replacement.
(2) - Determine source of incorrect level and suggest repair.
(3) - The system should be drained and/or flushed and refilled with correct coolant according to OEM recommended service interval and procedures.

COOLANT RECOVERY TANKS

COOLANT RECOVERY TANK INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement

of hardware.
Leaking ..... A . Require repair or replacement.
Missing (if original
equipment) ..... C ..... Require replacement.

COOLING FAN MOTOR MODULES

See COOLING FAN MOTOR RELAYS AND MODULES.

COOLING FAN MOTOR RELAYS AND MODULES

COOLING FAN MOTOR RELAY AND MODULE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Housing cracked	2	Suggest repair or replacement.
Malfunctioning	A	(2) Require repair or replacement.
Missing	C	Require replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting		

performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Includes inoperative, intermittent operation, failure to perform all functions, or out of OEM specification.

COOLING FAN MOTOR RESISTORS

COOLING FAN MOTOR RESISTOR INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Missing	C	Require replacement.
Open	A	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Shorted	A	Require replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.

Terminal burned, not
affecting performance ... 2 . Suggest repair or replacement.
Terminal corroded,
affecting performance ... A . Require repair or replacement.
Terminal corroded, not
affecting performance ... 2 . Suggest repair or replacement.
Terminal loose, affecting
performance ..... B . Require repair or replacement.
Terminal loose, not
affecting performance ... 1 . Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

COOLING FAN MOTOR SENSORS AND SWITCHES

COOLING FAN MOTOR SENSOR AND SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting		

performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

COOLING FAN MOTOR SWITCHES

See COOLING FAN MOTOR SENSORS AND SWITCHES.

COOLING FAN MOTORS

COOLING FAN MOTOR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ..	Require repair or replacement of hardware.
Attaching hardware missing	C	Replace as required.

hardware.

Attaching hardware not functioning ..... A .. Require repair or replacement of hardware.
Connector broken ..... A . Require repair or replacement.
Connector (Weatherpack type) leaking ..... A . Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Hydraulic fan motor leaking ..... A . Require repair or replacement.
Inoperative ..... A ..... (2) Require replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 ..... Suggest replacement.
Rotation incorrect for application ..... B . Require repair or replacement.
Terminal broken ..... A . Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 . Suggest repair or replacement.
Terminal corroded, affecting performance .. A . Require repair or replacement.
Terminal corroded, not affecting performance .. 2 . Suggest repair or replacement.
Terminal loose, affecting performance ..... B . Require repair or replacement.
Terminal loose, not affecting performance .. 1 . Suggest repair or replacement.
Vibration ..... 1 ..... Suggest replacement.
Wire lead conductors exposed ..... B . Require repair or replacement.
Wire lead corroded ..... A . Require repair or replacement.
Wire lead open ..... A . Require repair or replacement.
Wire lead shorted ..... A . Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Check fan motor/controls. Inoperative includes intermittent operation or out of OEM specification.

CRANKSHAFT POSITION SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	Require repair or replacement.
Inoperative	B	Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Wire lead conductors exposed	B	Require repair or replacement.

Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

DECEL VALVES

See ASPIRATOR, CHECK AND DECEL VALVES.

DEFLECTORS

See SHROUDS, BAFFLES AND DEFLECTORS.

DIP STICKS AND TUBES

DIP STICK AND TUBE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Bent	2	Suggest repair or replacement.
Broken, affecting performance (for example, fuel mixture)	A	Require repair or replacement.
Broken, not affecting performance	2	Suggest repair or replacement.
Leaking, affecting performance (for example, fuel mixture)	A	Require repair or replacement.
Leaking, not affecting performance	2	Suggest repair or replacement.
Missing	C	Require replacement.

DIP STICK TUBES

See DIP STICKS AND TUBES.

DISTRIBUTOR ADVANCES AND RETARDERS (MECHANICAL AND VACUUM)

DISTRIBUTOR ADVANCE AND RETARDER (MECHANICAL AND VACUUM) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Binding	A	Require repair or replacement.
Inoperative	A	(1) Require repair or replacement.
Leaking	A	Require replacement.
Out of specification	B	Require repair or replacement.

(1) - Inoperative includes intermittent operation.

DISTRIBUTOR BOOTS AND SHIELDS

DISTRIBUTOR BOOT AND SHIELD INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Deteriorated	A	Require replacement.
Leaking	A	Require replacement.
Missing	A	Require replacement.
Torn	A	Require replacement.

DISTRIBUTOR CAPS

DISTRIBUTOR CAP INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Arcing	A	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Burned	A	Require replacement.
Carbon button missing	A	Require replacement.
Carbon button worn, affecting performance	A	Require replacement.
Carbon button worn, not affecting performance	1	Suggest replacement.
Carbon-tracked	A	Require replacement.
Cracked	A	Require replacement.
Loose	2	Suggest repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal eroded, affecting performance	A	Require repair or replacement.
Terminal eroded, not affecting performance		No service suggested or required.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

DISTRIBUTOR RETARDERS (MECHANICAL AND VACUUM)

See DISTRIBUTOR ADVANCES AND RETARDERS (MECHANICAL AND VACUUM).

DISTRIBUTOR ROTORS

DISTRIBUTOR ROTOR INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Carbon-tracked	A	Require replacement.
Contact burned	A	Require replacement.
Corroded	1	Suggest replacement.
Eroded	1	Suggest replacement.
Loose	A	Require repair or replacement.
Out of specification	B	Require replacement.

DISTRIBUTOR SHIELDS

See DISTRIBUTOR BOOTS AND SHIELDS.

DISTRIBUTORS

DISTRIBUTOR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.

Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Bushings worn, affecting performance ..... A .. Require repair or replacement.
Bushings worn, not affecting performance .. 1 .. Suggest repair or replacement.
Cam lobes worn, affecting performance ..... A .. Require repair or replacement.
Cam lobes worn, not affecting performance .. 1 .. Suggest repair or replacement.
Gear broken ..... A .. Require repair or replacement.
Gear worn, affecting performance ..... A ..... Require replacement.
Gear worn, not affecting performance .... No service suggested or required.
Integrated pickup triggering device loose ..... A .. Require repair or replacement.
Integrated pickup triggering device magnetism incorrect .... A .. Require repair or replacement.
Leaking oil internally .. A .. Require repair or replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Pickup triggering device (reluctor) broken ..... A .. Require repair or replacement.
Pickup triggering device (reluctor) loose ..... A .. Require repair or replacement.
Pickup triggering device (reluctor) weak ..... A .. Require repair or replacement.
Reluctor (pickup triggering device) broken ..... A .. Require repair or replacement.
Reluctor (pickup triggering device) loose ..... A .. Require repair or replacement.
Reluctor (pickup triggering device) weak ..... A .. Require repair or replacement.
Shaft bent ..... A ..... Require replacement.
Thrust washer broken .... A .. Require repair or replacement.
Thrust washer missing ... C .. Require repair or replacement.

Thrust washer worn,
affecting performance .. A .. Require repair or replacement.
Thrust washer worn, not
affecting performance .. 1 .. Suggest repair or replacement.

EARLY FUEL EVAPORATION VALVES (HEAT RISER ASSEMBLIES)

EARLY FUEL EVAPORATION VALVE (HEAT RISER ASSEMBLY) INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement of affected parts.
Diaphragm inoperative	A	(1) Further inspection required.
Leaking	A	Require repair or replacement.
Noisy	2	Suggest repair or replacement.
Seized	A	Require replacement of affected parts.
Spring broken	B	Require replacement of spring(s).
Spring inoperative	A	(2) Require replacement of spring(s).

(1) - Inoperative includes intermittent operation or out of OEM specification. If the inoperative diaphragm is separate from the heat riser, then require replacement of the inoperative diaphragm. If the inoperative diaphragm is part of the heat riser, then replace the heat riser.
(2) - Inoperative includes intermittent operation or out of OEM specification.

EGR COOLERS

See EGR PLATES AND COOLERS.

EGR EXHAUST MANIFOLD PASSAGES

See EGR INTAKE AND EXHAUST MANIFOLD PASSAGES.

EGR INTAKE AND EXHAUST MANIFOLD PASSAGES

EGR INTAKE AND EXHAUST MANIFOLD PASSAGE INSPECTION

Condition	Code	Procedure
Leaking	A	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.

EGR PLATES AND COOLERS

EGR PLATE AND COOLER INSPECTION

Condition	Code	Procedure
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Restricted, affecting performance	A	Require repair or replacement.

ELECTRONIC SPARK CONTROL MODULES

ELECTRONIC SPARK CONTROL MODULE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	A	Require repair.
Contaminated	A	(2) Require repair or replacement.
Leaking	A	Require repair or replacement.

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Malfunctioning ..... A ..... (3) Require repair or replacement.
Missing ..... C ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement of source.
(3) - Includes inoperative, intermittent operation, failure to perform all functions, or out of OEM specification.

ELECTRONIC TRANSMISSION CONTROL DEVICES

ELECTRONIC TRANSMISSION CONTROL DEVICE INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A ...	Require repair or replacement

of hardware.

Attaching hardware threads stripped (threads missing) ..... A ... Require repair or replacement of hardware.

Connector broken ..... A .. Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.

Connector melted ..... A ..... (1) Require repair or replacement.

Connector missing ..... C ..... Require replacement.

Contaminated ..... A ..... (2) Require repair or replacement.

Leaking ..... A .. Require repair or replacement.

Malfunctioning ..... A ..... (3) Require repair or replacement.

Missing ..... C ..... Require replacement.

Resistance out of specification ..... B .. Require repair or replacement.

Restricted, affecting performance ..... A .. Require repair or replacement.

Terminal broken ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal corroded, affecting performance .. A .. Require repair or replacement.

Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.

Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

Threads damaged ..... A .. Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.

Wire lead conductors exposed ..... B .. Require repair or replacement.

Wire lead corroded ..... A .. Require repair or replacement.

Wire lead open ..... A .. Require repair or replacement.

Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Includes inoperative, intermittent operation, failure to perform all functions, or out of OEM specification.

ELECTRONIC TRANSMISSION FEEDBACK DEVICES

ELECTRONIC TRANSMISSION FEEDBACK DEVICE INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	*	Require repair or replacement.

Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

ENGINE COOLANT TEMPERATURE SENSORS

ENGINE COOLANT TEMPERATURE SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.

Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Resistance out of specification ..... B .. Require repair or replacement.
Restricted, affecting performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

ENGINE COOLING SYSTEMS

NOTE: Overheating, poor engine performance, and insufficient cabin heat can be affected by, but are not limited to, all of the components in the engine cooling system.

ENGINE COVERS (OIL PAN, VALVE COVER, TIMING COVER)

ENGINE COVER (OIL PAN, VALVE COVER, TIMING COVER) INSPECTION

Condition	Code	Procedure
Attaching hardware incorrect	B	Require replacement.
Attaching hardware loose	A	Require repair or replacement.
Attaching hardware missing	C	Require replacement.
Baffle loose	2	Suggest repair or replacement.
Baffle missing	C	Require replacement.
Bent, affecting performance	A	Require repair or replacement.
Bent, not affecting performance		No service suggested or required.
Cracked (not leaking)	2	Suggest repair or replacement.
Leaking externally	A	Require repair or replacement.
Leaking internally, causing fluid contamination	A	Require repair or replacement.
Missing	C	Require replacement.
Restricted passage	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.

ENGINE OIL

ENGINE OIL INSPECTION

Condition	Code	Procedure
Contaminated	A	(1) Require replacement of oil and filter.
Level high	B	Determine source of incorrect level and require repair.

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Level low ..... B ... Determine source of incorrect level and require repair.
Maintenance intervals ... 3 ... Suggest replacement to comply with vehicle's OEM recommended service intervals.

(1) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water when changing oil. Require repair or replacement.

ENGINE OIL CANISTERS

See ENGINE OIL FILTERS AND CANISTERS.

ENGINE OIL COOLERS (EXTERNAL)

ENGINE OIL COOLER (EXTERNAL) INSPECTION

Condition	Code	Procedure
Air flow restriction	A	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bypassed	A	Require repair or replacement.
Connection leaking	A	Require repair or replacement.
Corroded	1	Suggest repair or replacement.
Fins damaged, affecting performance	A	Require repair or replacement.
Fins damaged, not affecting performance	2	Suggest repair or replacement.
Fluid flow restrictions	A	Require repair or replacement.
Internal restrictions, affecting performance	A	Require repair or replacement.
Leaking	A	Require repair or replacement.
Missing	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

ENGINE OIL DRAIN PLUGS AND GASKETS

ENGINE OIL DRAIN PLUG AND GASKET INSPECTION

Condition	Code	Procedure
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Threads damaged	A	(1) Require repair or replacement.

(1) - Some OEMs require replacement of drain plug gasket when removing drain plug. Inspect threads in oil pan for damage.

ENGINE OIL FILTERS AND CANISTERS

ENGINE OIL FILTER AND CANISTER INSPECTION

Condition	Code	Procedure
Bulged	A	(1) Require replacement. Further inspection required.
Canister attaching hardware broken	A	Require repair or replacement of hardware.
Canister attaching hardware loose	A	Require repair.
Canister attaching hardware missing	C	Require replacement.
Canister attaching hardware not functioning	A	Require repair or replacement of hardware.
Center tube collapsed	A	(2) Require replacement. Further inspection required.
Contaminated	A	(3) Require replacement of oil and filter.
Dented	2	(4) Suggest replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Maintenance intervals	3	Suggest replacement to comply with vehicle's OEM recommended service intervals.

(1) - Inspect pressure relief valve.
(2) - Inspect bypass.
(3) - Determine cause of contamination, such as engine coolant, fuel, metal particles, or water when changing oil. Require repair or replacement.
(4) - Determine cause, such as broken motor mount.

ENGINE OIL GASKETS

See ENGINE OIL DRAIN PLUGS AND GASKETS.

ENGINE OIL PRESSURE GAUGES (MECHANICAL)

ENGINE OIL PRESSURE GAUGE (MECHANICAL) INSPECTION

Condition	Code	Procedure
Indicates out of range	B	(1) Further inspection required.
Inoperative	A	(2) Further inspection required.
Leaking	A	Require repair or replacement.
Reads inaccurately	2	Suggest repair or replacement.

(1) - Gauge may indicate problem with contaminated oil, level, pressure, or temperature, or problem with gauge.
(2) - Gauge may indicate problem with contaminated oil, level, pressure, or temperature, or problem with gauge. Inoperative includes intermittent operation, out of OEM specification, or out of range. Further inspection required to determine cause.

EVAPORATIVE EMISSION (EVAP) CANISTER FILTERS

EVAPORATIVE EMISSION (EVAP) CANISTER FILTER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of

hardware.

Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.

Maintenance interval .... 3 ... Suggest replacement to comply with OEM recommended service interval.

Missing ..... C ..... Require replacement.

Restricted, affecting performance ..... A ..... Require replacement.

Restricted, not affecting performance ..... 1 ..... Suggest replacement.

Water-contaminated ..... A ..... Require replacement.

EVAPORATIVE EMISSION (EVAP) CANISTER PURGE DEVICES

EVAPORATIVE EMISSION (EVAP) CANISTER PURGE DEVICE INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.

Restricted, affecting performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

EVAPORATIVE EMISSION (EVAP) CANISTERS

EVAPORATIVE EMISSION (EVAP) CANISTER INSPECTION

Condition	Code	Procedure
Inoperative	A	(1) Require repair or replacement.
Leaking	A	Require replacement.
Missing	C	Require replacement.
Saturated	A	Require replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

EVAPORATIVE EMISSION (EVAP) FEEDBACK DEVICES

EVAPORATIVE EMISSION (EVAP) FEEDBACK DEVICE INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.

Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

EXHAUST GAS RECIRCULATION DEVICES

EXHAUST GAS RECIRCULATION DEVICE INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.

Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Resistance out of specification ..... B .. Require repair or replacement.
Restricted, affecting performance ..... A .. Require repair or replacement.
Restricted, not affecting performance ..... 1 .. Suggest repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

EXHAUST GAS RECIRCULATION FEEDBACK DEVICE INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.
Restricted, not affecting performance	1	Suggest repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.

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Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

EXPANSION PLUGS

See CASTING CORE PLUGS AND EXPANSION PLUGS.

FAN CONTROL SENSORS

FAN CONTROL SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.

Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Resistance out of specification ..... B .. Require repair or replacement.
Restricted, affecting performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

FUEL

FUEL INSPECTION

Condition	Code	Procedure
Contaminated	B	(1) Require repair or replacement.
Fuel incorrect	B	(2) Require flushing of system.

(1) - Determine of source of contamination. Require repair or replacement.
(2) - If a fuel other than specification fuel is present in the system, the required service is to flush and fill with the correct fuel.

FUEL ACCUMULATORS AND DAMPERS

FUEL ACCUMULATOR AND DAMPER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connections leaking	A	Require repair or replacement.
Inoperative	A	(1) Require replacement.
Leaking	A	Require replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

FUEL AND COLD START INJECTORS

NOTE: You are not required to replace injectors in sets. However, you may suggest replacement of all injectors for

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preventive maintenance.

FUEL AND COLD START INJECTOR INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Flow restricted	B	Require repair or replacement.
Inoperative	B	(2) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Resistance out of specification	B	Require replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation, out of OEM specification. Some components may be serviceable.

FUEL DAMPERS

See FUEL ACCUMULATORS AND DAMPERS.

FUEL DELIVERY CHECK VALVES

FUEL DELIVERY CHECK VALVE INSPECTION

Condition	Code	Procedure
Inoperative	A	(1) Require replacement.
Leaking externally	A	Require repair or replacement.
Missing	C	Require replacement.
Pressure leaking (bleeds down)	A	Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

FUEL DISTRIBUTORS (BOSCH CIS)

FUEL DISTRIBUTOR (BOSCH CIS) INSPECTION

Condition	Code	Procedure
Inoperative	A	(1) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	(2) Require repair or replacement. Further inspection required.

(1) - Inoperative includes intermittent operation.
(2) - Some components may be serviceable; check for accepted cleaning procedure.

FUEL FILLER NECKS AND RESTRICTORS

FUEL FILLER NECK AND RESTRICTOR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Restricted	2	Suggest repair or replacement.

FUEL FILTERS

FUEL FILTER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Leaking	A	Require repair or replacement.
Maintenance interval	3	Suggest replacement to comply with OEM recommended service interval.
Missing	C	Require replacement.
Restricted, affecting performance	A	Require replacement.
Restricted, not affecting performance	1	Suggest replacement.

Water-contaminated ..... 2 ..... Suggest replacement.

FUEL INJECTORS

FUEL INJECTOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.
Restricted, not affecting performance	2	Suggest repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded,		

affecting performance .. A . Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 . Suggest repair or replacement.
Terminal loose, affecting
performance ..... B . Require repair or replacement.
Terminal loose, not
affecting performance .. 1 . Suggest repair or replacement.
Threads damaged ..... A . Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B . Require repair or replacement.
Wire lead corroded ..... A . Require repair or replacement.
Wire lead open ..... A . Require repair or replacement.
Wire lead shorted ..... A . Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

FUEL LEVEL SENDERS

FUEL LEVEL SENDER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Inoperative	A	(1) Require repair or replacement.
Leaking	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting		

performance	A		(2) Require repair or replacement.
Terminal burned, not affecting performance	2		Suggest repair or replacement.
Terminal corroded, affecting performance	A		Require repair or replacement.
Terminal corroded, not affecting performance	2		Suggest repair or replacement.
Terminal loose, affecting performance	B		Require repair or replacement.
Terminal loose, not affecting performance	1		Suggest repair or replacement.
Wire lead conductors exposed	B		Require repair or replacement.
Wire lead corroded	A		Require repair or replacement.
Wire lead open	A		Require repair or replacement.
Wire lead shorted	A		Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.
(2) - Determine cause and correct prior to repair or replacement of part.

FUEL PRESSURE REGULATORS

FUEL PRESSURE REGULATOR INSPECTION

Condition	Code	Procedure
Contaminated	2	(1) Suggest repair or replacement. Further inspection required.
Inoperative	B	(2) Require repair or replacement.
Leaking (internally or externally)	A	Require repair or replacement.
Pressure out of specification	B	Require repair or replacement.
Vapor bypass restricted	A	Require repair or replacement.

(1) - Some components may be serviceable; check for accepted cleaning procedure. Determine source of contamination. Require repair or replacement.
(2) - Inoperative includes intermittent operation or out of OEM specification.

FUEL PUMPS (IN-TANK AND EXTERNAL, ELECTRICAL OR MECHANICAL)

FUEL PUMP (IN-TANK AND EXTERNAL, ELECTRICAL OR MECHANICAL) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require replacement.
Inoperative	A	(3) Require repair or replacement.
Leaking externally (includes pulsator)	A	Require repair or replacement.
Leaking internally (includes pulsator)	A	Require repair or replacement.
Noisy	2	Suggest repair or replacement.
Out of specification	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	2	Suggest repair or replacement.

Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination. Require repair or replacement.
(3) - Inoperative includes intermittent operation.

FUEL RAILS

FUEL RAIL INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Contaminated	A	(1) Require replacement.
Leaking	A	Require repair or replacement.
Restricted	A	Require repair or replacement.
Rust-pitted	1	Suggest replacement.

(1) - Determine source of contamination. Require repair or replacement.

FUEL RESTRICTORS

See FUEL FILLER NECKS AND RESTRICTORS.

FUEL TANKS

FUEL TANK INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Baffles loose	A	Require repair or replacement.
Contaminated	A	(1) Require repair.
Corroded internally	A	Require repair or replacement.
Distorted, affecting performance	B	Require replacement.
Distorted, not affecting performance		No service suggested or required.
Leaking	A	Require repair or replacement.

(1) - Determine source of contamination. Require repair or replacement.

GAS CAPS

GAS CAP INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Fails to maintain proper pressure	A	Require replacement.
Gaskets missing	C	Require replacement.
Leaking	A	Require replacement.
Missing	C	Require replacement.
Plugged (vacuum and pressure relief)	A	Require replacement.
Seals missing	C	Require replacement.

GASKETS

GASKET INSPECTION

Condition	Code	Procedure
Leaking	A	(1) Require repair or replacement.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary.

GROMMETS (VALVE COVER)

GROMMET (VALVE COVER) INSPECTION

Condition	Code	Procedure
Leaking	2	(1) Suggest repair or replacement.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary.

HARMONIC DAMPERS

HARMONIC DAMPER INSPECTION

Condition	Code	Procedure
Application incorrect ...	B	Require replacement.
Attaching hardware broken	A ..	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A ..	Require repair or replacement of hardware.
Cracked	A	Require replacement.
Dented (fluid type only)	A	Require replacement.
Keyway distorted	A .	Require repair or replacement.
Leaking (Fluid damper only)	A	Require replacement.

Loose ..... A ..... Require replacement.
Noisy ..... A ..... Require replacement.
Outer ring slipped out of
position ..... A ..... Require replacement.
Positioned incorrectly .. A . Require repair or replacement.
Rubber damping material
deteriorated ..... 1 ..... Suggest replacement.
Seal surface worn, causing
a leak ..... A . Require repair or replacement.
Threads damaged ..... A . Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

HEATER CONTROL VALVES

HEATER CONTROL VALVE INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement
of hardware.
Bypassed ..... A ..... Require replacement.
Coolant leak ..... A .. Require repair or replacement.
Malfunctioning ..... A ..... (1) Require repair or
replacement.
Missing ..... C ..... Require replacement.
Restricted ..... A .. Require repair or replacement.
Vacuum leak ..... A .. Require repair or replacement.

(1) - Includes inoperative, intermittent operation, or
failure to perform all functions.

HEATER CORES

HEATER CORE INSPECTION

Condition Code Procedure

Air flow restriction .... A .. Require repair or replacement.
Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Bypassed ..... A .. Require repair or replacement.
Connection leaking ..... A .. Require repair or replacement.
Corroded ..... 1 .. Suggest repair or replacement.
Fins damaged, affecting
performance ..... A .. Require repair or replacement.
Fins damaged, not
affecting performance .. 2 .. Suggest repair or replacement.
Internal restrictions,
affecting performance .. A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.

HOSE AND TUBE COUPLERS, CONNECTORS AND CLAMPS

NOTE: When replacing fuel lines and hoses, replace with product that meets or exceeds OEM design specifications.

HOSE AND TUBE COUPLER, CONNECTOR AND CLAMP INSPECTION

Condition Code Procedure

Application incorrect ... B ..... Require replacement.
Connected incorrectly ... A ..... Require repair.
Corroded, not reusable .. 1 ..... Suggest replacement.
Cracked ..... A ..... Require replacement.
Insufficient clamping
force, allowing hose to
leak ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Safety clip missing (not
leaking) ..... C ... Require replacement of safety clip.
Stripped ..... A ..... Require replacement.

HOSE CLAMPS

See HOSE AND TUBE COUPLERS, CONNECTORS AND CLAMPS.

HOSE CONNECTORS

See HOSE AND TUBE COUPLERS, CONNECTORS AND CLAMPS.

HOSE COUPLERS

See HOSE AND TUBE COUPLERS, CONNECTORS AND CLAMPS.

HOSES AND TUBES (FUEL LINES, RADIATOR, VACUUM, BY PASS, HEATER, RECOVERY TANK AND OIL COOLERS)

HOSE AND TUBE (FUEL LINE, RADIATOR, VACUUM, BY PASS, HEATER, RECOVERY TANK AND OIL COOLER) INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Connected incorrectly	A	Require repair.
Corroded, not reusable	1	Suggest replacement.
Cracked	A	Require replacement.
Dry-rotted	1	Suggest repair or replacement.
Hard	1	Suggest repair or replacement.
Inner fabric (webbing) damaged	A	Require replacement.
Insufficient clamping force, allowing hose to leak	A	Require repair or replacement.
Leaking	A	Require repair or replacement.
Maintenance intervals	3	Suggest replacement.
Melted	1	Suggest repair or replacement.
Missing	C	Require replacement.
Outer covering damaged	1	Suggest replacement.
Outer covering damaged to the extent that the inner fabric is visible	A	Require replacement.
Protective sleeves damaged	2	Suggest replacement of sleeves.
Protective sleeves missing	2	Suggest replacement of sleeves.
Restricted, affecting		

performance ..... A .. Require repair or replacement.
Restricted, not affecting
performance ..... 2 .. Suggest repair or replacement.
Routed incorrectly ..... 2 .. Suggest repair or replacement.
Safety clip missing ..... C ..... Require replacement.
Spongy ..... 1 .. Suggest repair or replacement.
Stripped ..... A ..... Require replacement.
Swollen ..... B ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Type incorrect ..... 1 .. Suggest repair or replacement.

HOUSINGS

See THERMOSTATS AND HOUSINGS.

IDLE AIR CONTROLS

IDLE AIR CONTROL INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.

Missing ..... C ..... Require replacement.
Resistance out of
specification ..... B .. Require repair or replacement.
Restricted, affecting
performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

IDLE SPEED CONTROL ACTUATORS

IDLE SPEED CONTROL ACTUATOR INSPECTION

Condition Code Procedure

Attaching hardware
missing ..... C ..... Require replacement of

hardware.

Attaching hardware threads damaged ..... A ... Require repair or replacement of hardware.

Attaching hardware threads stripped (threads missing) ..... A ... Require repair or replacement of hardware.

Connector broken ..... A .. Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.

Connector melted ..... A ..... (1) Require repair or replacement.

Connector missing ..... C ..... Require replacement.

Contaminated ..... A ..... (2) Require repair or replacement.

Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.

Leaking ..... A .. Require repair or replacement.

Missing ..... C ..... Require replacement.

Resistance out of specification ..... B .. Require repair or replacement.

Terminal broken ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal corroded, affecting performance .. A .. Require repair or replacement.

Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.

Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

Threads damaged ..... A .. Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.

Wire lead conductors exposed ..... B .. Require repair or replacement.

Wire lead corroded ..... A .. Require repair or replacement.

Wire lead open ..... A .. Require repair or replacement.

Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

IGNITION BOOTS

See IGNITION WIRES, BOOTS, COIL TOWERS AND TERMINALS (SECONDARY).

IGNITION COIL TOWERS

See IGNITION WIRES, BOOTS, COIL TOWERS AND TERMINALS (SECONDARY).

IGNITION COILS

IGNITION COIL INSPECTION

Condition	Code	Procedure
Arcing	A	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Corroded, affecting performance	A	Require replacement.
Corroded, not affecting performance	2	Suggest replacement.

Distorted .... (2) No service suggested or required.
Inoperative ..... A ..... (3) Require replacement.
Oil leaking ..... A ..... Require replacement.
Out of specification .... B ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Distortion may be the result of overheating; coil should be tested.
(3) - Inoperative includes intermittent operation.

IGNITION CONTROL MODULES (ICM)

IGNITION CONTROL MODULE (ICM) INSPECTION

Condition Code Procedure

Application incorrect ... B ..... Require replacement.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware threads damaged ..... A ... Require repair or replacement of hardware.
Attaching hardware

threads stripped
(threads missing) ..... A ... Require repair or replacement of hardware.
Code set
(if applicable) ..... A ..... (1) Further inspection required.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack
type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (2) Require repair or replacement.
Connector missing ..... A ..... Require repair.
Contaminated ..... A ..... (3) Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Malfunctioning ..... A ..... (4) Require repair or replacement.
Missing ..... C ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (2) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Refer to manufacturer's diagnostic trouble code procedure and require repair or replacement of affected component(s).
(2) - Determine cause and correct prior to repair or replacement of part.
(3) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require

repair or replacement.
(4) - Includes inoperative, intermittent operation, or failure to perform all functions.

IGNITION SWITCHES

See SWITCHES.

IGNITION TERMINALS

See IGNITION WIRES, BOOTS, COIL TOWERS AND TERMINALS (SECONDARY).

IGNITION WIRES, BOOTS, COIL TOWERS AND TERMINALS (SECONDARY)

NOTE: You are not required to replace ignition wires in sets. However, you may suggest replacement of the entire secondary wire set for preventive maintenance.

IGNITION WIRE, BOOT, COIL TOWER AND TERMINAL (SECONDARY) INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Carbon-tracked	A	Require replacement.
Corroded	1	Suggest repair or replacement.
Insulation leaking (shorted)	A	Require repair or replacement.
Metal heat shield bent	2	Suggest repair or replacement.
Missing	C	Require replacement.
Oil-soaked (spongy)	1	Suggest replacement.
Resistance incorrect	B	Require replacement.
Routed incorrectly	2	(1) Suggest repair.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(2) Require repair or

replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - If improper routing affects the performance of other systems, require repair. Proper routing, hardware, heatshields, etc., are intended to prevent premature failure of secondary ignition components.
(2) - Determine cause and correct prior to repair or replacement of part.

IN-TANK FUEL STRAINERS

IN-TANK FUEL STRAINER INSPECTION

Condition	Code	Procedure
Missing	C	Require replacement.
Restricted	A	Require repair or replacement.
Torn	A	Require replacement.

INERTIA FUEL SHUT-OFF SWITCHES

INERTIA FUEL SHUT-OFF SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.

Connector broken ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require replacement.
Inoperative ..... A ..... (3) Require repair or replacement.
Missing ..... C ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification.

INTAKE AIR TEMPERATURE SENSORS

INTAKE AIR TEMPERATURE SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.

Attaching hardware
threads damaged ..... A ... Require repair or replacement of hardware.
Attaching hardware
threads stripped
(threads missing) ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack
type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Resistance out of
specification ..... B .. Require repair or replacement.
Restricted, affecting
performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

INTAKE MANIFOLDS

INTAKE MANIFOLD INSPECTION

Condition	Code	Procedure
Corroded, affecting sealability	A	Require repair or replacement.
Integrated air or fuel control components inoperative	A	(1) Require repair or replacement.
Internal air or fuel components damaged, affecting performance	A	Require repair or replacement of component.
Internal air or fuel components damaged, not affecting performance		No service suggested or required.
Internal air or fuel components missing	C	Require replacement of component.
Leaking	A	Require repair or replacement.
Out of specification	B	Require replacement.
Restricted	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require repair or replacement.
Warped	B	Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

INTERCOOLERS

See CHARGE AIR COOLERS "INTERCOOLERS" (CAC).

KNOCK SENSORS

KNOCK SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Inoperative	B	(2) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.

affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

LIQUID VAPOR SEPARATORS

LIQUID VAPOR SEPARATOR INSPECTION

Condition Code Procedure

Inoperative ..... A ..... (1) Require repair or replacement.
Leaking ..... A ..... Require replacement.
Missing ..... C ..... Require replacement.
Restricted ..... A .. Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSORS

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION

Condition Code Procedure

Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware
threads damaged ..... A ... Require repair or replacement of hardware.
Attaching hardware

threads stripped
(threads missing) ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Resistance out of specification ..... B .. Require repair or replacement.
Restricted, affecting performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant,

fuel, metal particles, or water. Require repair or replacement.

(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

MASS AIR FLOW (MAF) SENSORS

MASS AIR FLOW (MAF) SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.

Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

METAL AIR MANIFOLDS AND PIPES

METAL AIR MANIFOLD AND PIPE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Broken	A	Require repair of injection tube or replacement of manifold.
Corroded, affecting		

structural integrity ...	1	Suggest replacement of injection tube or manifold.
Leaking	A	Require repair of injection tube or replacement of manifold.
Loose	A	Require repair.
Missing	C	Require replacement.
Restricted	A	Require replacement of injection tube or manifold.
Threads damaged	A	Require repair.
Threads stripped (threads missing)	A	Require replacement.

METAL AIR PIPES

See METAL AIR MANIFOLDS AND PIPES.

MIX CONTROL SOLENOIDS

MIX CONTROL SOLENOID INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A ...	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A ...	Require repair or replacement of hardware.
Connector broken	A ..	Require repair or replacement.
Connector (Weatherpack type) leaking	A ..	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.

Missing ..... C ..... Require replacement.
Resistance out of
specification ..... B .. Require repair or replacement.
Restricted, affecting
performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

MOTOR MOUNTS

MOTOR MOUNT INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement

of hardware.

Attaching hardware missing ..... C ..... Require replacement of hardware.

Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.

Broken ..... A ..... Require replacement.

Leaking (hydraulic mount) ..... A ..... Require replacement.

Mounting hole worn, affecting performance .. A ..... Require replacement.

Mounting hole worn, not affecting performance .. .. No service suggested or required.

Rubber deteriorated, affecting performance .. A ..... Require replacement.

Rubber deteriorated, not affecting performance .. .. No service suggested or required.

Threads damaged ..... A .. Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.

O-RINGS, GASKETS, SEALS AND SPRING LOCKS

O-RING, GASKET, SEAL AND SPRING LOCK INSPECTION

Condition	Code	Procedure
Leaking	A	(1) Require repair or replacement.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary.

O2 SENSORS

O2 SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of

hardware.

Attaching hardware threads damaged ..... A ... Require repair or replacement of hardware.

Attaching hardware threads stripped (threads missing) ..... A .. Require repair or replacement of hardware.

Connector broken ..... A .. Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.

Connector melted ..... A ..... (1) Require repair or replacement.

Connector missing ..... C ..... Require replacement.

Contaminated ..... A ..... (2) Require repair or replacement.

Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.

Leaking ..... A .. Require repair or replacement.

Missing ..... C ..... Require replacement.

Resistance out of specification ..... B .. Require repair or replacement.

Restricted, affecting performance ..... A .. Require repair or replacement.

Terminal broken ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal corroded, affecting performance .. A .. Require repair or replacement.

Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.

Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

Threads damaged ..... A .. Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.

Wire lead conductors exposed ..... B .. Require repair or replacement.

Wire lead corroded ..... A .. Require repair or replacement.

Wire lead open ..... A .. Require repair or replacement.

Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

OIL PRESSURE SENDING UNITS

OIL PRESSURE SENDING UNIT INSPECTION

Condition Code Procedure

Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require repair or replacement.
Leaking ..... A ..... Require replacement.
Output signal incorrect . B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

OIL PUMP PICK-UP SCREENS

OIL PUMP PICK-UP SCREEN INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bypass stuck	A	Require repair or replacement.
Cracked	A	Require repair or replacement.
Loose	A	Require repair or replacement.
Missing	C	Require replacement.
Positioned incorrectly	A	Require repair or replacement.
Restricted	A	Require repair or replacement.
Screen torn	A	Require replacement.

OIL PUMPS

OIL PUMP INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.

Housing cracked ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Pressure relief valve
stuck ..... A .. Require repair or replacement.
Seized ..... A .. Require repair or replacement.
Worn beyond
specifications ..... B .. Require repair or replacement.

PARK NEUTRAL POSITION SWITCHES

PARK NEUTRAL POSITION SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.

Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

PCV BREATHER ELEMENTS

PCV BREATHER ELEMENT INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Leaking	A	Require replacement.
Maintenance intervals	3	Suggest replacement to comply with vehicle's OEM recommended service intervals.

Melted ..... A ..... Required replacement.
Missing ..... C ..... Require replacement.
Restricted, affecting
performance ..... A ..... Require replacement.
Restricted, not affecting
performance ..... 1 ..... Suggest replacement.
Water-contaminated ..... A ..... Require replacement.

PCV ORIFICES

PCV ORIFICE INSPECTION

Condition Code Procedure

Leaking ..... A ..... Require replacement.
Maintenance interval .... 3 ... Suggest repair or replacement
to comply with OEM recommended
service intervals.
Missing ..... C ..... Require replacement.
Restricted ..... A .. Require repair or replacement.

PCV VALVES

PCV VALVE INSPECTION

Condition Code Procedure

Application incorrect ... B ..... Require replacement.
Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement
of hardware.
Grommet broken ..... A ... Require repair or replacement
of grommet.
Grommet missing ..... C . Require replacement of grommet.
Grommet not
functioning ..... A ... Require repair or replacement
of grommet.
Inoperative ..... A ..... (1) Require replacement

Leaking ..... A ..... Require replacement.
Maintenance interval .... 3 ... Suggest replacement to comply with vehicle's OEM recommended service intervals.
Missing ..... C ..... Require replacement.
Restricted ..... A ..... Require replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

PICK-UP ASSEMBLIES (INCLUDES MAGNETIC, HALL EFFECT AND OPTICAL)

PICK-UP ASSEMBLY (MAGNETIC, HALL EFFECT AND OPTICAL) INSPECTION

Condition Code Procedure

Adjustment incorrect .... B ..... Require repair.
Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... B ..... (2) Require replacement.
Oil-soaked ..... A ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification. Refer to OEM recommended service' procedures.

POWER STEERING PRESSURE SENSORS

POWER STEERING PRESSURE SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.

Resistance out of
specification ..... B .. Require repair or replacement.
Restricted, affecting
performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

POWERTRAIN CONTROL MODULES (PCM) AND PROM

POWERTRAIN CONTROL MODULE (PCM) AND PROM INSPECTION

Condition	Code	Procedure
Application incorrect ...	B	Require replacement.
Attaching hardware missing	C	Require replacement of

hardware.

Attaching hardware threads damaged ..... A ... Require repair or replacement of hardware.

Attaching hardware threads stripped (threads missing) ..... A ... Require repair or replacement of hardware.

Code set (if applicable) ..... A ..... (1) Further inspection required.

Connector broken ..... A .. Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.

Connector melted ..... A ..... (2) Require repair or replacement.

Connector missing ..... A ..... Require repair.

Contaminated ..... A ..... (3) Require repair or replacement.

Leaking ..... A .. Require repair or replacement.

Malfunctioning ..... A ..... (4) Require repair or replacement.

Missing ..... C ..... Require replacement.

Terminal broken ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (2) Require repair or replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal corroded, affecting performance .. A .. Require repair or replacement.

Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.

Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

Threads damaged ..... A .. Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.

Wire lead conductors exposed ..... B .. Require repair or replacement.

Wire lead corroded ..... A .. Require repair or replacement.

Wire lead open ..... A .. Require repair or replacement.

Wire lead shorted ..... A .. Require repair or replacement.

(1) - Refer to manufacturer's diagnostic trouble code procedure and require repair or replacement of affected component(s).
(2) - Determine cause and correct prior to repair or replacement of part.
(3) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(4) - Includes inoperative, intermittent operation, failure to perform all functions, or out of OEM specification.

POWERTRAIN CONTROL PROM

See POWERTRAIN CONTROL MODULES (PCM) AND PROM.

PRESSURIZED EXPANSION TANK CAPS

See RADIATOR CAPS AND PRESSURIZED EXPANSION TANK CAPS.

RADIATOR CAPS AND PRESSURIZED EXPANSION TANK CAPS

RADIATOR CAP AND PRESSURIZED EXPANSION TANK CAP INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Coolant recovery check valve inoperative	A	(1) Require replacement.
Fails to maintain proper pressure	B	Require replacement.
Gasket missing	C	Require replacement of gasket.
Missing	C	Require replacement.
Seal missing	C	Require replacement of seal.

(1) - Inoperative includes intermittent operation or out of OEM specification.

RADIATOR FAN BLADES

RADIATOR FAN BLADE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.

Attaching hardware
broken ..... A .. Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A .. Require repair or replacement of hardware.
Bent ..... A ..... Require replacement.
Broken ..... A ..... Require replacement.
Cracked ..... A ..... Require replacement.
Loose ..... A . Require repair or replacement.
Missing ..... C ..... Require replacement.

RADIATOR FAN CLUTCHES

NOTE: Some lateral movement, measured at the fan blade tip, may be normal.

RADIATOR FAN CLUTCH INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bearing noisy	A	Require replacement.
Bearing worn	A	Require replacement.
Fastener loose	A	Require repair or replacement of fastener.
Inoperative	A	(1) Require replacement.
Leaking	1	Suggest replacement.
Seized	A	Require replacement.
Slips (insufficient fan speed)	A	Require replacement.
Thermal control incorrect	B	Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

RADIATORS

RADIATOR INSPECTION

Condition	Code	Procedure
Air flow restriction	A	Require repair.
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connection leaking	A	Require repair or replacement.
Corroded	1	Suggest repair or replacement.
Fins damaged, affecting performance	A	Require repair or replacement.
Fins damaged, not affecting performance	2	Suggest repair or replacement.
Internal oil cooler leaking	A	Require repair or replacement.
Internal restrictions, affecting performance	B	Require repair or replacement.
Internal restrictions, not affecting performance	2	Suggest repair or replacement.
Leaking	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require repair or replacement.
Tubes damaged, affecting performance	A	Require repair or replacement.
Tubes damaged, not affecting performance		No service suggested or required.

ROLL OVER VALVES

ROLL OVER VALVE INSPECTION

Condition	Code	Procedure
Inoperative	A	(1) Require replacement.
Leaking	A	Require replacement.
Missing	C	Require replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

SEALING COMPOUNDS

SEALING COMPOUND INSPECTION

Condition	Code	Procedure
Leaking	A	(1) Require repair or replacement.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary.

SEALS

SEAL INSPECTION

Condition	Code	Procedure
Leaking	A	(1) Require repair or replacement.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary.

SECONDARY AIR INJECTION SYSTEM MANAGEMENT DEVICES

SECONDARY AIR INJECTION SYSTEM MANAGEMENT DEVICE INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of

hardware.

Attaching hardware threads damaged ..... A ... Require repair or replacement of hardware.

Attaching hardware threads stripped (threads missing) ..... A .. Require repair or replacement of hardware.

Connector broken ..... A .. Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.

Connector melted ..... A ..... (1) Require repair or replacement.

Connector missing ..... C ..... Require replacement.

Contaminated ..... A ..... (2) Require repair or replacement.

Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.

Leaking ..... A .. Require repair or replacement.

Missing ..... C ..... Require replacement.

Resistance out of specification ..... B .. Require repair or replacement.

Restricted, affecting performance ..... A .. Require repair or replacement.

Terminal broken ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal corroded, affecting performance .. A .. Require repair or replacement.

Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.

Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

Threads damaged ..... A .. Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.

Wire lead conductors exposed ..... B .. Require repair or replacement.

Wire lead corroded ..... A .. Require repair or replacement.

Wire lead open ..... A .. Require repair or replacement.

Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

SENSORS AND ACTUATORS

NOTE: Conditions pertaining to the sensors and actuators listed in this section may be found under the name of the sensor or actuator.

SENSOR ABBREVIATION TABLE

Sensor	Abbreviation
Accelerator Pedal Position Sensor	APP
Air Conditioning Cycling Switch	AC
Air Conditioning Pressure Sensor	..
Air Fuel Ratio Sensor	..
Barometric Pressure Sensor	BARO
Camshaft Position Sensor	CMP
Clutch Pedal Position Switch	CPP
Cooling Fan Motor Sensors and Switches	..
Crankshaft Position Sensor	CKP
Electronic Transmission Feedback Devices	..
Engine Coolant Temperature Sensor	ECT
Evaporative Emission feedback devices	..
Exhaust Gas Recirculation feedback devices	..
Fan Control Sensor	FC
Intake Air Temperature Sensor	IAT
Knock Sensor	KS
Manifold Absolute Pressure Sensor	MAP
Mass Air Flow Sensor	MAF
O2 Sensor	O2S
Park Neutral Position Switch	PNP
Power Steering Pressure Sensor	PSP
Thermal Vacuum Valve	TVV
Throttle Position Sensor	TP Sensor
Throttle Position Switch	..

*** ENGINE SYSTEMS UNIFORM INSPECT**

Transmission Range Switch ..... TR Switch
Vehicle Speed Sensor ..... VSS
Volume Air Flow Sensor ..... VAF

ACTUATOR ABBREVIATION TABLE

Actuator	Abbreviation
Air Injection Control Solenoid	..
Electronic Transmission control devices	..
Evaporative Emission Canister	EVAP
Purge Device	..
Exhaust Gas Recirculation Device	EGR
Fuel Injector	..
Idle Air Control	IAC
Idle Speed Control Actuator	ISC
Mix Control Solenoid	MC Solenoid
Secondary Air Injection System Management Device	AIR, PAIR
Vacuum Regulator Solenoid	..
Waste Gate Control Solenoid	..

SHROUDS, BAFFLES AND DEFLECTORS

SHROUD, BAFFLE AND DEFLECTOR INSPECTION

Condition	Code	Procedure
Application incorrect, affecting cooling system performance	A	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bent, affecting cooling system performance	A	Require repair or replacement.
Blocked, affecting cooling system performance	A	Require repair or replacement.
Broken, affecting cooling		

system performance ..... A . Require repair or replacement.
Cracked, affecting cooling
system performance ..... A . Require repair or replacement.
Loose, affecting cooling
system performance ..... A ..... Require repair.
Loose, not affecting
cooling system
performance ..... 2 ..... Suggest repair.
Missing, affecting cooling
system performance ..... C ..... Require replacement.

SPARK PLUGS

NOTE: You are not required to replace spark plugs in sets.
However, you may suggest replacement of the other plugs
for preventive maintenance.

SPARK PLUG INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Electrode eroded	1	Suggest replacement.
Fouled	A	(1) Require repair or replacement.
Gap incorrect	B	Require repair or replacement.
Insulation broken	A	Require replacement
Insulator cracked	A	Require replacement.
Leaking compression	A	Require repair or replacement.
Maintenance interval	3	Suggest replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Determine cause of fouling and suggest repair.

SPRING LOCKS

SPRING LOCK INSPECTION

Condition	Code	Procedure
Leaking	A	(1) Require repair or

(1) - Require inspection of mating and sealing surface and repair or replace as necessary.

SUPER CHARGERS

SUPER CHARGER INSPECTION

Condition	Code	Procedure
Attaching hardware damaged, affecting operation or performance	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Bearing noisy	A	Require replacement.
Bearing worn	A	Require replacement.
Boost pressure incorrect	A	(1) Require repair or replacement.
Clearance out of specification	B	Require repair or replacement.
Leaking	A	Require repair or replacement.
Noisy	2	Suggest repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require repair or replacement.

(1) - Boost pressure problems may be caused by other systems or components.

SWITCHES

SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware		

missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Binding, affecting performance ..... A .. Require repair or replacement.
Binding, not affecting performance ..... 2 .. Suggest repair or replacement.
Broken ..... A .. Require repair or replacement.
Burned, affecting performance ..... A ..... (1) Require repair or replacement.
Burned, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.
Cracked, affecting performance ..... A .. Require repair or replacement.
Cracked, not affecting performance ..... 1 .. Suggest repair or replacement.
Leaking ..... A .. Require repair or replacement.
Malfunctioning ..... A ..... (2) Require repair or replacement.
Melted, affecting performance ..... A ..... (1) Require repair or replacement.
Melted, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Out of adjustment ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Won't return ..... A .. Require repair or replacement.

Worn ..... 1 ..... Suggest replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Includes inoperative, intermittent operation, or failure to perform all functions.

THERMAL VACUUM VALVES

THERMAL VACUUM VALVE INSPECTION

Condition	Code	Procedure
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.
Threads damaged	A	Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

THERMOSTATIC AIR DOOR ASSEMBLIES

THERMOSTATIC AIR DOOR ASSEMBLY INSPECTION

Condition	Code	Procedure
Attaching hardware damaged, affecting operation or performance	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Binding	A	Require repair or replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Seized	A	Require repair or replacement.

THERMOSTATS AND HOUSINGS

THERMOSTAT AND HOUSING INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware		

broken ..... A ... Require repair or replacement of hardware.
Attaching hardware corroded ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Housing corroded ..... 1 .. Suggest replacement of housing.
Inoperative ..... A ..... (1) Require replacement.
Installation incorrect .. B .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Thermostat missing ..... C ..... Require replacement of thermostat.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A .. Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

THROTTLE BODIES

THROTTLE BODY INSPECTION

Condition Code Procedure

Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Restricted ..... A ..... (3) Require repair.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not

affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A .. Require repair or replacement.
Throttle shaft binding,
affecting performance .. A .. Require repair or replacement.
Throttle shaft worn,
affecting performance .. A .. Require repair or replacement.
Throttle shaft worn, not
affecting performance .. 1 .. Suggest repair or replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Some components may be serviceable; check for accepted cleaning procedure.

THROTTLE CABLES

See THROTTLE LINKAGES AND CABLES.

THROTTLE LINKAGES AND CABLES

THROTTLE LINKAGE AND CABLE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ...	Require repair or replacement

Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A .. Require repair or replacement of hardware.
Bent ..... A .. Require repair or replacement.
Binding ..... A .. Require repair or replacement.
Bracket bent, affecting performance ..... A .. Require repair or replacement.
Bracket bent, not affecting performance .. .. No service suggested or required.
Bracket broken, affecting performance ..... A Require replacement.
Bracket broken, not affecting performance .. .. No service suggested or required.
Bracket corroded, affecting performance .. A .. Require repair or replacement.
Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Bracket cracked, affecting performance ..... A .. Require repair or replacement.
Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket loose, affecting performance ..... A .. Require repair or replacement.
Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Broken ..... A ..... Require replacement.
Cracked ..... A .. Require repair or replacement.
Disconnected ..... A .. Require repair or replacement.
Kinked ..... A .. Require repair or replacement.
Melted ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B ..... (1) Require repair or replacement.
Routed incorrectly ..... 2 ..... Suggest repair.
Seized ..... A .. Require repair or replacement.

(1) - Follow OEM recommended adjustment procedures. Require repair or replacement if out of specification.

THROTTLE POSITION SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads		

missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

THROTTLE POSITION SWITCHES

THROTTLE POSITION SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Inoperative	B	(2) Require repair or replacement. Further inspection required.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

TIMING BELT SPROCKETS

TIMING BELT SPROCKET INSPECTION

Condition Code Procedure

Alignment incorrect ..... B ..... Require repair.
Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Bent ..... A ..... Require replacement.

Cracked ..... A ..... Require replacement.
Key damaged ..... A ..... Require replacement.
Loose ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Pulley damaged, affecting
belt life ..... A ..... Require replacement.
Sprocket damaged,
affecting belt life .... A .. Require repair or replacement.
Sprocket loose ..... B .. Require repair or replacement.
Sprocket-to-shaft
alignment incorrect ..... B .. Require repair or replacement.

TIMING BELTS

TIMING BELT INSPECTION

Condition Code Procedure

Adjustment incorrect .... 2 ..... (1) Suggest adjustment.
Alignment incorrect ..... B ..... (2) Further inspection required.
Broken ..... A ..... Require replacement.
Cam timing out of
specification ..... B ..... Require repair.
Cracked ..... 1 ..... Suggest replacement.
Fluid-soaked ..... 1 ... Suggest replacement. Further inspection required.
Frayed ..... 1 ..... Suggest replacement.
Maintenance intervals ... 3 ... Suggest replacement to comply with vehicle OEM recommended service intervals.
Missing ..... C ..... (3) Require replacement.
Noisy ..... 2 ..... (4) Further inspection required.
See note below.
Plies separated ..... A ..... Require replacement.
Tension out of
specification ..... B ..... Require adjustment or replacement.
Teeth missing ..... A ..... Require replacement.

(1) - Inspect belt tensioners, pulleys, and cover.
(2) - Determine cause of incorrect alignment and require repair.
(3) - CAUTION: Internal engine damage may result from timing belt damage/failure.

(4) - Determine cause of noise and suggest repair.

TORQUE STRUTS

TORQUE STRUT INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Binding	A	Require replacement.
Body dented	A	(1) Further inspection required.
Body punctured	A	Require replacement.
Bushing deteriorated, affecting performance	A	Require replacement.
Bushing deteriorated, not affecting performance	.. ..	No service suggested or required.
Bushings missing	C	Require replacement.
Bushings separated from mounting eye	1	Suggest replacement.
Damping (none)	A	Require replacement.
Leaking oil, enough for fluid to be running down the body	A	Require replacement.
Missing	C	Require replacement.
Noisy	2	(2) Further inspection required.
Piston rod bent	A	Require replacement.
Piston rod broken	A	Require replacement.
Seized	A	Require replacement.
Threads damaged	A ..	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Require replacement of units where dents restrict strut piston rod movement. Dents not restricting movement, use

service is suggested or required.
(2) - If noise is isolated to shock or strut, suggest replacement.

TRANSMISSION RANGE SWITCHES

TRANSMISSION RANGE SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting		

performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

TUBE CLAMPS

See HOSE AND TUBE COUPLERS, CONNECTORS AND CLAMPS.

TUBE CONNECTORS

See HOSE AND TUBE COUPLERS, CONNECTORS AND CLAMPS.

TUBE COUPLERS

See HOSE AND TUBE COUPLERS, CONNECTORS AND CLAMPS.

TUBES

See HOSES AND TUBES (FUEL LINES, RADIATOR, BY PASS, HEATER, RECOVERY TANK AND OIL COOLERS).

TURBO CHARGERS

TURBO CHARGER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ...	Require repair or replacement

of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Boost pressure
incorrect ..... A ..... (1) Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Oil seal (internal)
leaking ..... A .. Require repair or replacement.
Vibrates ..... A .. Require repair or replacement.

(1) - Boost pressure problems may be caused by other systems or components.

VACUUM CONNECTIONS

See VACUUM HOSES, TUBES AND CONNECTIONS (NON-METALLIC).

VACUUM HOSES, TUBES AND CONNECTIONS (NON-METALLIC)

VACUUM HOSE, TUBE AND CONNECTION (NON-METALLIC) INSPECTION

Condition	Code	Procedure
Leaking	A	Require repair or replacement.
Melted	A	Require replacement.
Missing	C	Require replacement.
Oil-soaked (spongy)	1	Suggest replacement.
Restricted	A	Require repair or replacement.
Surface cracks (dry-rotted)	1	Suggest replacement.

VACUUM REGULATOR SOLENOIDS

VACUUM REGULATOR SOLENOID INSPECTION

Condition	Code	Procedure
Attaching hardware		

missing ..... C ..... Require replacement of hardware.
Attaching hardware threads damaged ..... A ... Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing) ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Resistance out of specification ..... B .. Require repair or replacement.
Restricted, affecting performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.

Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

VACUUM TUBES

See VACUUM HOSES, TUBES AND CONNECTIONS (NON-METALLIC).

VEHICLE SPEED SENSORS

VEHICLE SPEED SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.

Resistance out of specification ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

VOLUME AIR FLOW SENSORS

VOLUME AIR FLOW SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A ...	Require repair or replacement

of hardware.
Attaching hardware threads stripped (threads missing) ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Resistance out of specification ..... B .. Require repair or replacement.
Restricted, affecting performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or

replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

WASTE GATE CONTROL SOLENOIDS

WASTE GATE CONTROL SOLENOID INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.

Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

WASTE GATES AND BOOST CONTROL MECHANISMS

WASTE GATE AND BOOST CONTROL MECHANISM INSPECTION

Condition	Code	Procedure
Boost pressure incorrect	A	(1) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.

(1) - Incorrect boost pressure includes intermittent operation or out of OEM specification.

WATER PUMP (ELECTRIC) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Inoperative	A	(2) Require replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Noisy	2	Suggest replacement.
Rotation incorrect for application	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.
Vibration	1	Suggest replacement.
Wire lead conductors exposed	B	Require repair or replacement.
Wire lead corroded	A	Require repair or replacement.
Wire lead open	A	Require repair or replacement.
Wire lead shorted	A	Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Check fan motor/controls. Inoperative includes intermittent operation or out of OEM specification.

WATER PUMPS (NON-ELECTRIC)

WATER PUMP (NON-ELECTRIC) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware corroded	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Corrosion (internal) is excessive, affecting performance	A	Require replacement.
Corrosion (internal) is excessive, not affecting performance	2	Suggest cooling system service.
Inoperative	A	(1) Require replacement.
Leaking	A	Require replacement.
Noisy	A	Require replacement.
Rotation incorrect for application	B	Require repair or replacement.
Shaft bent	A	Require replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

WIRING HARNESSES AND CONNECTORS

WIRING HARNESS AND CONNECTOR INSPECTION *** ENGINE SYSTEMS UNIFORM INSPECT**

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Insulation damaged, conductors exposed	A	Require repair or replacement.
Insulation damaged, conductors not exposed	1	Suggest replacement.
Open	A	Require repair or replacement.
Protective shield (conduit) melted	2	(1) Suggest repair or replacement.
Protective shield (conduit) missing	2	Suggest repair or replacement.
Resistance (voltage drop) out of specification	A	Require repair or replacement.
Routed incorrectly	B	Require repair.
Secured incorrectly	B	Require repair.
Shorted	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.

Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Voltage drop out of
specification ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or
replacement of part.

END OF ARTICLE

* ENGINE SYSTEMS UNIFORM INSPECTION GUIDELINES *
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ARTICLE BEGINNING

GENERAL INFORMATION
Engine Performance and Maintenance January 2000 Motorist Assurance Program
Standards For Automotive Repair

All Makes and Models

INTRODUCTION TO MOTORIST ASSURANCE PROGRAM (MAP)

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*** ENGINE SYSTEMS UNIFORM INSPECTION**

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POWERTRAIN CONTROL PROM
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*** ENGINE SYSTEMS UNI**

SECONDARY AIR INJECTION SYSTEM MANAGEMENT DEVICES
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INTRODUCTION TO MOTORIST ASSURANCE PROGRAM (MAP)

OVERVIEW OF MOTORIST ASSURANCE PROGRAM (MAP)

Automotive industry professionals and interested readers:
The Motorist Assurance Program (MAP) is the consumer outreach effort of the Automotive Maintenance and Repair Association, Inc. (AMRA). Participation in the Motorist Assurance Program is drawn from auto repair companies and independents, parts and equipment manufacturers and suppliers, vehicle manufacturers and industry associations.

Our organization's mission is to strengthen the relationship between the consumer and the auto repair industry. We encourage motorists to take greater responsibility for their vehicles-through proper, manufacturer-recommended, maintenance, and endorse participating service and repair shops (including franchisees and dealers) who adopt (1) the MAP Pledge of Assurance to their Customers and (2) the Motorist Assurance Program Standards of Service. All participating service providers have agreed to subscribe to this Pledge and to adhere to the promulgated Standards of Service demonstrating to their customers that they are serious about customer satisfaction.

These Standards of Service require an inspection of the vehicle's (problem) system and that the results be communicated to the customer according to industry standards. Since the industry did not have such standards, the Motorist Assurance Program successfully promulgated industry inspection communication standards in 1994-95 for the following systems: Exhaust, Brakes, ABS, Steering and Suspension, Engine Maintenance and Performance, HVAC, and Electrical Systems.

Further, revisions to all of these inspection communication standards are re-published periodically. In addition to the above, standards for Drive Train and Transmissions were promulgated and published in 1998. Participating shops utilize these Uniform Inspection & Communication Standards (UI&CS) as part of the inspection process and for communicating their findings to their customers.

The Motorist Assurance Program continues to work cooperatively and proactively with government agencies and consumer groups toward solutions that both benefit the customer and are mutually acceptable to both regulators and industry. We maintain the belief that industry must retain control over how we conduct our business, and we must be viewed as part of the solution and not part of the problem. Meetings with state and other government officials (and their representatives), concerned with auto repair and/or consumer protection, are conducted. Feedback from these sessions is brought back to the association governing body, and the program adjusted as needed.

To assure recourse for auto repair customers if they are not satisfied with a repair transaction, the Motorist Assurance Program offers mediation and arbitration through the BBB and other similar non-profit organizations. MAP conducted pilot programs in twelve states before announcing the program nationally in October 1998. During the pilots, participating repair shops demonstrated their adherence to the Pledge and Standards and agreed to follow the UI&CS in communicating the results of their inspection to their customers. Complaints and "come-backs" dropped significantly.

To put some "teeth" in the program, an accreditation requirement for shops was initiated. The requirements are stringent.

and a self-policing technique has been incorporated which includes the "mystery shopping" of outlets. By year-end 1999, over 4,000 auto repair facilities had been accredited by the Motorist Assurance Program.

We welcome you to join us as we continue our outreach. With your support, both the automotive repair industry and your customers will reap the benefits. Please visit MAP at our Internet site www.motorist.org or contact us at:

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OVERVIEW OF SERVICE REQUIREMENTS AND SUGGESTIONS

It is MAP policy that all exhaust, brake, steering, suspension, wheel alignment, drive-line, engine performance and maintenance, and heating, ventilation and air conditioning, and electrical services be offered and performed under the standards and procedures specified in these sections.

Before any service is performed on a vehicle, an inspection of the appropriate system must be performed. The results of this inspection must be explained to the customer and documented on an inspection form. The condition of the vehicle and its components will indicate what services/part replacements may be "Required" or "Suggested." In addition, suggestions may be made to satisfy the requests expressed by the customer.

When a component is suggested or required to be repaired or replaced, the decision to repair or replace must be made in the customer's best interest, and at his or her choice given the options available.

This section lists the various parts and the conditions that indicate a required or suggested service or part replacement. Although this list is extensive, it is not fully inclusive. In addition to this list, a technician may make a suggestion. However, any suggestions must be based on substantial and informed experience, or the vehicle manufacturer's recommended service interval and must be documented.

Some conditions indicate that service or part replacement is required because the part in question is no longer providing the function for which it is intended, does not meet a vehicle manufacturer's design specification or is missing.

* Example: An exhaust pipe has corroded severely and has a hole in it through which exhaust gases are leaking.

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Replacement of the exhaust pipe in this case is required due to functional failure.

* Example: A brake rotor has been worn to the point where it measures less than the vehicle manufacturer's discard specifications. Replacement of the rotor is required because it does not meet design specifications.

Some conditions indicate that a service or part replacement is suggested because the part is close to the end of its useful life or addresses a customer's need, convenience or request. If a customer's vehicle has one of these conditions, the procedure may be only to suggest service.

* Example: An exhaust pipe is rusted, corroded or weak, but no leaks are present. In this case, the exhaust pipe has not failed. However, there is evidence that the pipe may need replacement in the near future. Replacement of the pipe may be suggested for the customer's convenience in avoiding a future problem.
* Example: The customer desires improved ride and/or handling, but the vehicle's shocks or struts have not failed. In this case, replacement may be suggested to satisfy the customer's wishes. In this case, replacement of the shocks or struts may not be sold as a requirement.

A customer, of course, has the choice of whether or not a shop will service his or her vehicle. He or she may decide not to follow some of your suggestions. When a repair is required, a MAP shop must refuse partial service on that system if, in the judgment of the service provider, proceeding with the work could create or continue an unsafe condition.

When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

The following reasons may be used for required and suggested services. These codes are shown in the "Code" column of the MAP Uniform Inspection & Communications Standards that follow:

Reasons to Require Repair or Replacement

A - Part no longer performs intended purpose
B - Part does not meet a design specification (regardless of performance)
C - Part is missing

NOTE: When a repair is required, the shop must refuse partial

service to the system in question, if the repair creates or continues an unsafe condition.

Reasons to Suggest Repair or Replacement

1 - Part is close to the end of its useful life (just above discard specifications, or weak; failure likely to occur soon, etc.)
2 - To address a customer need, convenience, or request (to stiffen ride, enhance performance, eliminate noise, etc.)
3 - To comply with maintenance recommended by the vehicle's Original Equipment Manufacturer (OEM)
4 - Technician's recommendation based on substantial and informed experience

NOTE: Suggested services are always optional. When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

ENGINE ASSEMBLIES

SERVICE PROCEDURES REQUIRED AND SUGGESTED FOR PROPER VEHICLE OPERATION

CYLINDER HEAD ASSEMBLIES

NOTE: A Cylinder Head Assembly is a cylinder head fitted with valves, associated springs, retainers, and on overhead camshaft cylinder heads (OHC), camshaft, camshaft bearings, lash adjusters, tappets and rockers.

CYLINDER HEAD ASSEMBLY INSPECTION

Condition	Code	Procedure
Adjustable valve lash is out of specification	B	Require repair.
Internal component failure (any component)	A	(1) Require repair or replacement of cylinder head assembly.

(1) - It is Required that all other failure related components be inspected for cause and condition. Additional components or assemblies may be Suggested for repair or replacement, *** ENGINE SYSTEMS UNIFORM INSPE**

such as a water pump on a short block (reason code 4, technician's recommendation based on substantial and informed experience).

Example:
If there is a failed head gasket with an external coolant leak, in addition to Requiring replacement of the head gasket, inspection of the following for cause and condition is Required: Block, Cooling System, Cylinder Head. It may be Suggested that additional inspections be performed, such as the other head gasket on a V-type engine.

LONG BLOCK ASSEMBLIES

NOTE: A Long Block Assembly is a short block assembly together with a cylinder head assembly and all those components fitted within the rocker or cam cover, and timing cover (the whole presented as an assembly). A rebuilt or new oil pump, or kit shall be supplied or fitted as appropriate.

LONG BLOCK ASSEMBLY INSPECTION

Condition	Code	Procedure
Internal component failure (any component)	A	(1) Require repair or replacement of the long block assembly.

(1) - It is Required that all other failure related components be inspected for cause and condition. Additional components or assemblies may be Suggested for repair or replacement such as a water pump on a short block (reason code 4, technician's recommendation based on substantial and informed experience).

Example:
If there is a failed head gasket with an external coolant leak, in addition to Requiring replacement of the head gasket, inspection of the following for cause and condition is Required: Block, Cooling System, Cylinder Head. It may be Suggested that additional inspections be performed, such as the other head gasket on a V-type engine.

SHORT BLOCK ASSEMBLIES

NOTE: A Short Block Assembly is a cylinder block and all those components contained within the limits of the block deck or decks, the pan rail, the block rear face and the timing cover (where fitted), including the crankshaft.

SHORT BLOCK ASSEMBLY INSPECTION

Condition	Code	Procedure
Any internal component failure	A	(1) Require repair or replacement of the short block assembly.

(1) - It is Required that all other failure related components be inspected for cause and condition. Additional components or assemblies may be Suggested for repair or replacement, such as a water pump on a short block (reason code 4, technician's recommendation based on substantial and informed experience).

Example:
If there is a failed head gasket with an external coolant leak, in addition to Requiring replacement of the head gasket, inspection of the following for cause and condition is Required: Block, Cooling System, Cylinder Head. It may be Suggested that additional inspections be performed, such as the other head gasket on a V-type engine.

ENGINE COMPONENTS

ACCELERATOR PEDAL POSITION SENSORS

ACCELERATOR PEDAL POSITION SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware		

threads damaged ..... A ... Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing) ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... B ..... (2) Require repair or replacement. Further inspection required.
Missing ..... C ..... Require replacement.
Resistance out of specification ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

ACCESSORY BELTS

ACCESSORY BELT INSPECTION

Condition	Code	Procedure
Alignment incorrect	B	(1) Further inspection required.
Cracked	1	Suggest replacement.
Frayed	1	Suggest replacement.
Missing	C	Require replacement.
Noisy	2	(2) Further inspection required.
Plies separated	A	Require replacement.
Tension out of specification	B	Require adjustment or replacement.
Worn beyond adjustment range	B	Require replacement.
Worn so it contacts bottom of pulley	A	Require replacement.

(1) - Determine cause of incorrect alignment and require repair.
(2) - Determine cause of noise and suggest repair.

ACCESSORY PULLEYS

ACCESSORY PULLEY INSPECTION

Condition	Code	Procedure
Alignment incorrect	B	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bent	A	Require replacement.
Cracked	A	Require replacement.
Loose	A	Require repair or replacement.

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Missing ..... C ..... Require replacement.
Pulley damaged, affecting
belt life ..... A ..... Require replacement.

ACTUATORS

See SENSORS AND ACTUATORS.

AIR CONDITIONING CYCLING SWITCHES

AIR CONDITIONING CYCLING SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.

Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

AIR CONDITIONING PRESSURE SENSORS

AIR CONDITIONING PRESSURE SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.

Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack
type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Resistance out of
specification ..... B .. Require repair or replacement.
Restricted, affecting
performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of

OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

AIR DUCTS AND TUBES

AIR DUCT AND TUBE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Restricted, affecting performance	A	Require repair or replacement.

AIR FILTER ELEMENTS

AIR FILTER ELEMENT INSPECTION

Condition	Code	Procedure
Leaking	A	Require replacement.
Paper filter element oil-soaked	A	(1) Require replacement.
Maintenance intervals	3	Suggest replacement to comply with vehicle's OEM recommended service intervals.
Melted	A	Required replacement.
Missing	C	Require replacement.
Restricted, affecting performance	A	Require replacement.
Water-contaminated	A	(1) Require replacement.

(1) - Further inspection required to determine cause.

AIR FILTER GASKETS

See AIR FILTER HOUSINGS AND GASKETS.

AIR FILTER HOUSINGS AND GASKETS

AIR FILTER HOUSING AND GASKET INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.

AIR FUEL RATIO SENSORS

AIR FUEL RATIO SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contains cracks	A	(2) Require repair or

		replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A ..	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B ..	Require repair or replacement.
Restricted, affecting performance	A ..	Require repair or replacement.
Terminal broken	A ..	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance ..	2 ..	Suggest repair or replacement.
Terminal corroded, affecting performance ..	A ..	Require repair or replacement.
Terminal corroded, not affecting performance ..	2 ..	Suggest repair or replacement.
Terminal loose, affecting performance	B ..	Require repair or replacement.
Terminal loose, not affecting performance ..	1 ..	Suggest repair or replacement.
Threads damaged	A ..	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Wire lead conductors exposed	B ..	Require repair or replacement.
Wire lead corroded	A ..	Require repair or replacement.
Wire lead open	A ..	Require repair or replacement.
Wire lead shorted	A ..	Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

AIR INJECTION CONTROL SOLENOIDS

AIR INJECTION CONTROL SOLENOID INSPECTION *** ENGINE SYSTEMS UNIFORM INSPECTION (**

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Inoperative	B	(2) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Wire lead conductors		

exposed ..... B . Require repair or replacement.
Wire lead corroded ..... A . Require repair or replacement.
Wire lead open ..... A . Require repair or replacement.
Wire lead shorted ..... A . Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

AIR PLENUMS

AIR PLENUM INSPECTION

Condition	Code	Procedure
Integrated air or fuel control components inoperative	A	(1) Require repair or replacement.
Internal air or fuel components damaged, affecting performance	A	Require repair or replacement of component.
Internal air or fuel components damaged, not affecting performance		No service suggested or required.
Internal air or fuel components missing	C	Require replacement of component.
Leaking	A	Require repair or replacement.
Restricted	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

AIR PUMP BELTS

AIR PUMP BELT INSPECTION

Condition	Code	Procedure
Alignment incorrect	B	(1) Further inspection required.
Cracked	1	Suggest replacement.
Frayed	1	Suggest replacement.
Maintenance intervals	3	Suggest replacement to comply with vehicle OEM recommended service intervals.
Missing	C	Require replacement.
Noisy	2	(2) Further inspection required.
Plies separated	A	Require replacement.
Tension out of specification	B	Require adjustment or replacement.
Worn beyond adjustment range	B	Require replacement.
Worn so it contacts bottom of pulley	A	Require replacement.

(1) - Determine cause of incorrect alignment and require repair.
(2) - Determine cause of noise and suggest repair.

AIR PUMPS (ELECTRIC-DRIVEN)

AIR PUMP (ELECTRIC-DRIVEN) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.

Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require replacement.
Leaking ..... A ..... Require replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 ..... Suggest replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

AIR TUBES

See AIR DUCTS AND TUBES.

ASPIRATOR, CHECK AND DECEL VALVES

ASPIRATOR, CHECK AND DECEL VALVE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ...	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not		

functioning	A	...	Require repair or replacement of hardware.
Inoperative	A	.....	(1) Require repair or replacement.
Leaking	A	.....	Require replacement.
Melted, affecting performance	A	.....	Require replacement.
Melted, not affecting performance	..	.....	No service suggested or required.
Missing	C	.....	Require replacement.
Threads damaged	A	..	Require repair or replacement.
Threads stripped (threads missing)	A	..	Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

BAFFLES

See SHROUDS, BAFFLES AND DEFLECTORS.

BALLAST PRIMARY SUPPLY RESISTOR WIRES

See BALLAST RESISTORS AND PRIMARY SUPPLY RESISTOR WIRES.

BALLAST RESISTORS AND PRIMARY SUPPLY RESISTOR WIRES

BALLAST RESISTOR AND PRIMARY SUPPLY RESISTOR WIRE INSPECTION

Condition	Code		Procedure
Attaching hardware broken	A	...	Require repair or replacement of hardware.
Attaching hardware missing	C	.....	Require replacement of hardware.
Attaching hardware not functioning	A	...	Require repair or replacement of hardware.
Conductor exposed	A	.....	Require replacement.
Connector broken	A	..	Require repair or replacement.
Connector melted	A	.....	(1) Require repair or replacement.

Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require replacement.
Insulation overheated ... A ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

BAROMETRIC PRESSURE SENSORS

BAROMETRIC PRESSURE SENSOR INSPECTION

Condition Code Procedure

Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware
threads damaged ..... A ... Require repair or replacement
of hardware.
Attaching hardware
threads stripped
(threads missing) ..... A ... Require repair or replacement
of hardware.
Connector broken ..... A ... Require repair or replacement.
Connector (Weatherpack
type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or
replacement.
Connector missing ..... C ..... Require replacement.

Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Resistance out of specification ..... B .. Require repair or replacement.
Restricted, affecting performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

Proper operation of any electrical system or component can be affected by battery condition. The battery(ies) must meet or exceed minimum specification for vehicle as equipped and test to that specific battery's CCA.

Definition of Terms

* Battery Performance Testing
  Testing that determines whether or not a battery meets both vehicle OEM and battery manufacturer's specifications.

* Cold Cranking Amp (CCA) Rating
  The number of amperes a new, fully charged battery at 0° F (-17.8° C) can deliver for 30 seconds and maintain at least a voltage of 1.2 volts per cell (7.2 volts for a 12-volt battery).

* Cranking Amps (CA)
  The number of amperes a new, fully charged battery, typically at 32° F (0° C) can deliver for 30 seconds and maintain at least a voltage of 1.2 volts per cell (7.2 volts for a 12-volt battery).

* OEM Cranking Amps
  The minimum CCA required by the original vehicle manufacturer for a specific vehicle.

BATTERY INSPECTION

Condition	Code	Procedure
Battery frozen	..	(1) Further inspection required.
Case leaking	A	Require replacement.
Casing swollen	A	(2) Further inspection required.
Circuit open internally	A	Require replacement.
Electrolyte contamination	A	(2) Further inspection required.
Electrolyte discoloration	A	(2) Further inspection required.
Fails to accept and hold charge	A	(3) Require replacement.
Fluid level low	B	(4) Further inspection

required.

Out of performance specification for battery ..... B ..... (5) Require replacement.

Out of specification for application ..... B ..... (5) Require replacement.

Post (top or side) burned, affecting performance .. A ..... (6) Require repair or replacement.

Post (top or side) burned, not affecting performance ..... 2 ..... (6) Suggest repair or replacement.

Post (top or side) corroded, affecting performance ..... A ..... Require repair.

Post (top or side) corroded, not affecting performance ..... 2 ..... Suggest repair.

Post (top or side) loose ..... A ..... Require replacement.

Post (top or side) melted, affecting performance ..... A ..... (6) Require repair or replacement.

Post (top or side) melted, not affecting performance ..... 2 ..... (6) Suggest repair or replacement.

Specific gravity low .... B ..... (7) Further inspection required.

State of charge low ..... A ..... (7) Further inspection required.

Top dirty ..... 2 ..... Suggest cleaning battery.

Top wet ..... A ... (8) Require cleaning battery. Further inspection required.

Vent cap loose ..... A ... Require repair or replacement of vent cap.

Vent cap missing ..... C ..... Require replacement of vent cap.

(1) - DO NOT attempt to charge a frozen battery. Allow battery to warm thoroughly and then performance-test. If battery fails performance test, require replacement.

(2) - No service suggested or required unless the battery fails performance test, in which case, require

replacement.
(3) - This phrase refers to a battery that fails to either accept and/or retain a charge using appropriate times listed in the Battery Charging Guide of the BCI Service Manual, battery charger operating manual, or battery manufacturer's specifications.
(4) - Determine cause of low fluid level. Refill to proper level(s) with water (distilled water preferred). Recharge battery and performance-test.
(5) - The battery may meet battery manufacturer's specifications but test below the minimum specification defined by the vehicle's OEM for that vehicle.
(6) - Determine cause and correct prior to repair or replacement of part.
(7) - Recharge and test to manufacturer's specifications. If battery fails performance test, require replacement.
(8) - Check fluid level and adjust to manufacturer's specification. Suggest checking charging system for proper operation.

BATTERY CABLES, WIRES AND CONNECTORS

BATTERY CABLE, WIRE AND CONNECTOR INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Insulation damaged, conductors exposed	A	(2) Require repair or replacement.
Insulation damaged,		

conductors not exposed . 1 ..... Suggest replacement.
Open ..... A .. Require repair or replacement.
Protective shield
(conduit) melted ..... 2 ..... (1) Suggest repair or replacement.
Protective shield
(conduit) missing ..... 2 .. Suggest repair or replacement.
Resistance (voltage drop)
out of specification ... A .. Require repair or replacement.
Routed incorrectly ..... B ..... Require repair.
Secured incorrectly ..... B ..... Require repair.
Shorted ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Voltage drop out of
specification ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Exposed conductor at replacement (aftermarket) terminal end does not require repair or replacement.

BATTERY CONNECTORS

See BATTERY CABLES, WIRES AND CONNECTORS.

BATTERY TRAYS AND HOLD DOWN HARDWARE

BATTERY TRAY AND HOLD DOWN HARDWARE INSPECTION

Condition	Code	Procedure
Battery improperly		

secured ..... 2 ..... Suggest repair.
Bent, affecting
performance ..... A .. Require repair or replacement.
Bent, not affecting
performance .... No service suggested or required.
Broken, affecting
performance ..... A .. Require repair or replacement.
Broken, not affecting
performance .... No service suggested or required.
Corroded, affecting
performance ..... A .. Require repair or replacement.
Corroded, not affecting
performance ..... 2 .. Suggest repair or replacement.
Cracked, affecting
performance ..... A .. Require repair or replacement.
Cracked, not affecting
performance ..... 1 .. Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Water drain clogged ..... A ..... Require repair.

BATTERY WIRES

See BATTERY CABLES, WIRES AND CONNECTORS.

BELT-DRIVEN AIR PUMPS

BELT-DRIVEN AIR PUMP INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Inoperative	C	Require replacement.

Leaking ..... A ..... Require replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 ..... Suggest replacement.
Pulley alignment
incorrect ..... B .. Require repair or replacement.
Pulley bent ..... A ..... Require replacement.
Pulley cracked ..... A ..... Require replacement.
Pulley loose ..... A .. Require repair or replacement.
Pulley missing ..... C ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A .. Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

BELT IDLER ASSEMBLIES (ACCESSORY AND CAM BELTS)

BELT IDLER ASSEMBLY (ACCESSORY AND CAM BELT) INSPECTION

Condition Code Procedure

Alignment incorrect ..... B .. Require repair or replacement.
Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Bearings worn ..... 1 ..... Suggest replacement.
Cracked ..... 2 ..... Suggest replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 ..... Suggest replacement.
Seized ..... A .. Require repair or replacement.

BELT TENSIONERS (ACCESSORY AND CAM BELTS)

BELT TENSIONER (ACCESSORY AND CAM BELT) INSPECTION

Condition Code Procedure

Alignment incorrect ..... B .. Require repair or replacement.
Attaching hardware
broken ..... A .. Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Bearings worn ..... 1 ..... Suggest replacement.
Belt tension incorrect .. B ... Require adjustment or repair.
Cracked ..... 2 ..... Suggest replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 ..... Suggest replacement.
Pulley damaged, affecting
belt life ..... A ..... Require replacement.
Seized ..... A .. Require repair or replacement.

BOOST CONTROL MECHANISMS

See WASTE GATES AND BOOST CONTROL MECHANISMS.

CAMSHAFT POSITION SENSORS

CAMSHAFT POSITION SENSOR INSPECTION

Condition Code Procedure

Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware threads
damaged ..... A ... Require repair or replacement of hardware.
Attaching hardware
threads stripped
(threads missing) ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack
type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.

Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

CARBURETORS AND CHOKES

NOTE: Proper operation of a carburetor includes the ability to control air/fuel mixtures during all phases or driving operation to comply with all federal and local emissions standards. Adjustments are to be considered repairs.

CARBURETOR AND CHOKE INSPECTION

Condition	Code	Procedure
Air/fuel control incorrect	B	Require repair or replacement.
Application incorrect	B	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Components binding	A	Require repair or replacement.
Components damaged, affecting operation or performance	A	Require repair or replacement.
Components missing	C	Require replacement of components.
Contaminated	A	(1) Require repair or replacement. Further inspection required.
Controlling linkages binding	A	Require repair or replacement of linkage.
Leaking	A	Require repair or replacement.
Mechanical operation incorrect	B	Require repair or replacement.
Operating incorrectly	B	Require repair or replacement.

(1) - Some components may be serviceable; check for accepted cleaning procedure. Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.

CASTING CORE PLUGS AND EXPANSION PLUGS

CASTING CORE PLUG AND EXPANSION PLUG INSPECTION

Condition	Code	Procedure
Leaking	A	Require replacement.
Material type incorrect	2	Suggest replacement.

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CHARGE AIR COOLERS "INTERCOOLERS" (CAC)

CHARGE AIR COOLER "INTERCOOLER" (CAC) INSPECTION

Condition	Code	Procedure
Air-to-air intercooler leaking, affecting boost performance	A	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Leaking coolant	A	Require repair or replacement.
Missing	C	Require replacement.
Restricted, affecting performance	A	Require repair or replacement.

CHECK VALVES

See ASPIRATOR, CHECK AND DECEL VALVES.

CHOKES

See CARBURETORS AND CHOKES.

CLUTCH PEDAL POSITION SWITCHES

CLUTCH PEDAL POSITION SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.

Attaching hardware
threads stripped
(threads missing) ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... B ..... (2) Require repair or replacement. Further inspection required.
Missing ..... C ..... Require replacement.
Resistance out of
specification ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

See FUEL AND COLD START INJECTORS.

CONNECTORS

See WIRING HARNESSES AND CONNECTORS.

COOLANT

COOLANT INSPECTION

Condition	Code	Procedure
Acidity (pH) incorrect	1	Suggest correction or replacement.
Contaminated	B	(1) Require replacement or recycling. Further inspection required.
Level low	B	(2) Require filling to proper level.
Maintenance intervals	3	(3) Suggest replacement.
Mixture incorrect	B	Require correction or replacement.
Type incorrect	B	Require replacement.

(1) - Determine source of contamination and require correction prior to coolant replacement.
(2) - Determine source of incorrect level and suggest repair.
(3) - The system should be drained and/or flushed and refilled with correct coolant according to OEM recommended service interval and procedures.

COOLANT RECOVERY TANKS

COOLANT RECOVERY TANK INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement

of hardware.
Leaking ..... A . Require repair or replacement.
Missing (if original
equipment) ..... C ..... Require replacement.

COOLING FAN MOTOR MODULES

See COOLING FAN MOTOR RELAYS AND MODULES.

COOLING FAN MOTOR RELAYS AND MODULES

COOLING FAN MOTOR RELAY AND MODULE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Housing cracked	2	Suggest repair or replacement.
Malfunctioning	A	(2) Require repair or replacement.
Missing	C	Require replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting		

performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Includes inoperative, intermittent operation, failure to perform all functions, or out of OEM specification.

COOLING FAN MOTOR RESISTORS

COOLING FAN MOTOR RESISTOR INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Missing	C	Require replacement.
Open	A	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Shorted	A	Require replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.

Terminal burned, not
affecting performance ... 2 . Suggest repair or replacement.
Terminal corroded,
affecting performance ... A . Require repair or replacement.
Terminal corroded, not
affecting performance ... 2 . Suggest repair or replacement.
Terminal loose, affecting
performance ..... B . Require repair or replacement.
Terminal loose, not
affecting performance ... 1 . Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

COOLING FAN MOTOR SENSORS AND SWITCHES

COOLING FAN MOTOR SENSOR AND SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting		

performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

COOLING FAN MOTOR SWITCHES

See COOLING FAN MOTOR SENSORS AND SWITCHES.

COOLING FAN MOTORS

COOLING FAN MOTOR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ..	Require repair or replacement of hardware.
Attaching hardware missing	C	Replace as required.

hardware.

Attaching hardware not functioning ..... A .. Require repair or replacement of hardware.
Connector broken ..... A . Require repair or replacement.
Connector (Weatherpack type) leaking ..... A . Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Hydraulic fan motor leaking ..... A . Require repair or replacement.
Inoperative ..... A ..... (2) Require replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 ..... Suggest replacement.
Rotation incorrect for application ..... B . Require repair or replacement.
Terminal broken ..... A . Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 . Suggest repair or replacement.
Terminal corroded, affecting performance .. A . Require repair or replacement.
Terminal corroded, not affecting performance .. 2 . Suggest repair or replacement.
Terminal loose, affecting performance ..... B . Require repair or replacement.
Terminal loose, not affecting performance .. 1 . Suggest repair or replacement.
Vibration ..... 1 ..... Suggest replacement.
Wire lead conductors exposed ..... B . Require repair or replacement.
Wire lead corroded ..... A . Require repair or replacement.
Wire lead open ..... A . Require repair or replacement.
Wire lead shorted ..... A . Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Check fan motor/controls. Inoperative includes intermittent operation or out of OEM specification.

CRANKSHAFT POSITION SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	Require repair or replacement.
Inoperative	B	Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Wire lead conductors exposed	B	Require repair or replacement.

Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

DECEL VALVES

See ASPIRATOR, CHECK AND DECEL VALVES.

DEFLECTORS

See SHROUDS, BAFFLES AND DEFLECTORS.

DIP STICKS AND TUBES

DIP STICK AND TUBE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Bent	2	Suggest repair or replacement.
Broken, affecting performance (for example, fuel mixture)	A	Require repair or replacement.
Broken, not affecting performance	2	Suggest repair or replacement.
Leaking, affecting performance (for example, fuel mixture)	A	Require repair or replacement.
Leaking, not affecting performance	2	Suggest repair or replacement.
Missing	C	Require replacement.

DIP STICK TUBES

See DIP STICKS AND TUBES.

DISTRIBUTOR ADVANCES AND RETARDERS (MECHANICAL AND VACUUM)

DISTRIBUTOR ADVANCE AND RETARDER (MECHANICAL AND VACUUM) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Binding	A	Require repair or replacement.
Inoperative	A	(1) Require repair or replacement.
Leaking	A	Require replacement.
Out of specification	B	Require repair or replacement.

(1) - Inoperative includes intermittent operation.

DISTRIBUTOR BOOTS AND SHIELDS

DISTRIBUTOR BOOT AND SHIELD INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Deteriorated	A	Require replacement.
Leaking	A	Require replacement.
Missing	A	Require replacement.
Torn	A	Require replacement.

DISTRIBUTOR CAPS

DISTRIBUTOR CAP INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Arcing	A	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Burned	A	Require replacement.
Carbon button missing	A	Require replacement.
Carbon button worn, affecting performance	A	Require replacement.
Carbon button worn, not affecting performance	1	Suggest replacement.
Carbon-tracked	A	Require replacement.
Cracked	A	Require replacement.
Loose	2	Suggest repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal eroded, affecting performance	A	Require repair or replacement.
Terminal eroded, not affecting performance		No service suggested or required.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

DISTRIBUTOR RETARDERS (MECHANICAL AND VACUUM)

See DISTRIBUTOR ADVANCES AND RETARDERS (MECHANICAL AND VACUUM).

DISTRIBUTOR ROTORS

DISTRIBUTOR ROTOR INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Carbon-tracked	A	Require replacement.
Contact burned	A	Require replacement.
Corroded	1	Suggest replacement.
Eroded	1	Suggest replacement.
Loose	A	Require repair or replacement.
Out of specification	B	Require replacement.

DISTRIBUTOR SHIELDS

See DISTRIBUTOR BOOTS AND SHIELDS.

DISTRIBUTORS

DISTRIBUTOR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.

Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Bushings worn, affecting performance ..... A .. Require repair or replacement.
Bushings worn, not affecting performance .. 1 .. Suggest repair or replacement.
Cam lobes worn, affecting performance ..... A .. Require repair or replacement.
Cam lobes worn, not affecting performance .. 1 .. Suggest repair or replacement.
Gear broken ..... A .. Require repair or replacement.
Gear worn, affecting performance ..... A ..... Require replacement.
Gear worn, not affecting performance .... No service suggested or required.
Integrated pickup triggering device loose ..... A .. Require repair or replacement.
Integrated pickup triggering device magnetism incorrect .... A .. Require repair or replacement.
Leaking oil internally .. A .. Require repair or replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Pickup triggering device (reluctor) broken ..... A .. Require repair or replacement.
Pickup triggering device (reluctor) loose ..... A .. Require repair or replacement.
Pickup triggering device (reluctor) weak ..... A .. Require repair or replacement.
Reluctor (pickup triggering device) broken ..... A .. Require repair or replacement.
Reluctor (pickup triggering device) loose ..... A .. Require repair or replacement.
Reluctor (pickup triggering device) weak ..... A .. Require repair or replacement.
Shaft bent ..... A ..... Require replacement.
Thrust washer broken .... A .. Require repair or replacement.
Thrust washer missing ... C .. Require repair or replacement.

Thrust washer worn,
affecting performance .. A .. Require repair or replacement.
Thrust washer worn, not
affecting performance .. 1 .. Suggest repair or replacement.

EARLY FUEL EVAPORATION VALVES (HEAT RISER ASSEMBLIES)

EARLY FUEL EVAPORATION VALVE (HEAT RISER ASSEMBLY) INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement of affected parts.
Diaphragm inoperative	A	(1) Further inspection required.
Leaking	A	Require repair or replacement.
Noisy	2	Suggest repair or replacement.
Seized	A	Require replacement of affected parts.
Spring broken	B	Require replacement of spring(s).
Spring inoperative	A	(2) Require replacement of spring(s).

(1) - Inoperative includes intermittent operation or out of OEM specification. If the inoperative diaphragm is separate from the heat riser, then require replacement of the inoperative diaphragm. If the inoperative diaphragm is part of the heat riser, then replace the heat riser.
(2) - Inoperative includes intermittent operation or out of OEM specification.

EGR COOLERS

See EGR PLATES AND COOLERS.

EGR EXHAUST MANIFOLD PASSAGES

See EGR INTAKE AND EXHAUST MANIFOLD PASSAGES.

EGR INTAKE AND EXHAUST MANIFOLD PASSAGES

EGR INTAKE AND EXHAUST MANIFOLD PASSAGE INSPECTION

Condition	Code	Procedure
Leaking	A	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.

EGR PLATES AND COOLERS

EGR PLATE AND COOLER INSPECTION

Condition	Code	Procedure
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Restricted, affecting performance	A	Require repair or replacement.

ELECTRONIC SPARK CONTROL MODULES

ELECTRONIC SPARK CONTROL MODULE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	A	Require repair.
Contaminated	A	(2) Require repair or replacement.
Leaking	A	Require repair or replacement.

*** ENGINE SYSTEMS UNIFORM IN**

Malfunctioning ..... A ..... (3) Require repair or replacement.
Missing ..... C ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement of source.
(3) - Includes inoperative, intermittent operation, failure to perform all functions, or out of OEM specification.

ELECTRONIC TRANSMISSION CONTROL DEVICES

ELECTRONIC TRANSMISSION CONTROL DEVICE INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A ...	Require repair or replacement

of hardware.

Attaching hardware threads stripped (threads missing) ..... A ... Require repair or replacement of hardware.

Connector broken ..... A .. Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.

Connector melted ..... A ..... (1) Require repair or replacement.

Connector missing ..... C ..... Require replacement.

Contaminated ..... A ..... (2) Require repair or replacement.

Leaking ..... A .. Require repair or replacement.

Malfunctioning ..... A ..... (3) Require repair or replacement.

Missing ..... C ..... Require replacement.

Resistance out of specification ..... B .. Require repair or replacement.

Restricted, affecting performance ..... A .. Require repair or replacement.

Terminal broken ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal corroded, affecting performance .. A .. Require repair or replacement.

Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.

Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

Threads damaged ..... A .. Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.

Wire lead conductors exposed ..... B .. Require repair or replacement.

Wire lead corroded ..... A .. Require repair or replacement.

Wire lead open ..... A .. Require repair or replacement.

Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Includes inoperative, intermittent operation, failure to perform all functions, or out of OEM specification.

ELECTRONIC TRANSMISSION FEEDBACK DEVICES

ELECTRONIC TRANSMISSION FEEDBACK DEVICE INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	*	Require repair or replacement.

Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

ENGINE COOLANT TEMPERATURE SENSORS

ENGINE COOLANT TEMPERATURE SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.

Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Resistance out of specification ..... B .. Require repair or replacement.
Restricted, affecting performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

ENGINE COOLING SYSTEMS

NOTE: Overheating, poor engine performance, and insufficient cabin heat can be affected by, but are not limited to, all of the components in the engine cooling system.

ENGINE COVERS (OIL PAN, VALVE COVER, TIMING COVER)

ENGINE COVER (OIL PAN, VALVE COVER, TIMING COVER) INSPECTION

Condition	Code	Procedure
Attaching hardware incorrect	B	Require replacement.
Attaching hardware loose	A	Require repair or replacement.
Attaching hardware missing	C	Require replacement.
Baffle loose	2	Suggest repair or replacement.
Baffle missing	C	Require replacement.
Bent, affecting performance	A	Require repair or replacement.
Bent, not affecting performance		No service suggested or required.
Cracked (not leaking)	2	Suggest repair or replacement.
Leaking externally	A	Require repair or replacement.
Leaking internally, causing fluid contamination	A	Require repair or replacement.
Missing	C	Require replacement.
Restricted passage	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.

ENGINE OIL

ENGINE OIL INSPECTION

Condition	Code	Procedure
Contaminated	A	(1) Require replacement of oil and filter.
Level high	B	Determine source of incorrect level and require repair.

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Level low ..... B ... Determine source of incorrect level and require repair.
Maintenance intervals ... 3 ... Suggest replacement to comply with vehicle's OEM recommended service intervals.

(1) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water when changing oil. Require repair or replacement.

ENGINE OIL CANISTERS

See ENGINE OIL FILTERS AND CANISTERS.

ENGINE OIL COOLERS (EXTERNAL)

ENGINE OIL COOLER (EXTERNAL) INSPECTION

Condition	Code	Procedure
Air flow restriction	A	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bypassed	A	Require repair or replacement.
Connection leaking	A	Require repair or replacement.
Corroded	1	Suggest repair or replacement.
Fins damaged, affecting performance	A	Require repair or replacement.
Fins damaged, not affecting performance	2	Suggest repair or replacement.
Fluid flow restrictions	A	Require repair or replacement.
Internal restrictions, affecting performance	A	Require repair or replacement.
Leaking	A	Require repair or replacement.
Missing	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

ENGINE OIL DRAIN PLUGS AND GASKETS

ENGINE OIL DRAIN PLUG AND GASKET INSPECTION

Condition	Code	Procedure
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Threads damaged	A	(1) Require repair or replacement.

(1) - Some OEMs require replacement of drain plug gasket when removing drain plug. Inspect threads in oil pan for damage.

ENGINE OIL FILTERS AND CANISTERS

ENGINE OIL FILTER AND CANISTER INSPECTION

Condition	Code	Procedure
Bulged	A	(1) Require replacement. Further inspection required.
Canister attaching hardware broken	A	Require repair or replacement of hardware.
Canister attaching hardware loose	A	Require repair.
Canister attaching hardware missing	C	Require replacement.
Canister attaching hardware not functioning	A	Require repair or replacement of hardware.
Center tube collapsed	A	(2) Require replacement. Further inspection required.
Contaminated	A	(3) Require replacement of oil and filter.
Dented	2	(4) Suggest replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Maintenance intervals	3	Suggest replacement to comply with vehicle's OEM recommended service intervals.

(1) - Inspect pressure relief valve.
(2) - Inspect bypass.
(3) - Determine cause of contamination, such as engine coolant, fuel, metal particles, or water when changing oil. Require repair or replacement.
(4) - Determine cause, such as broken motor mount.

ENGINE OIL GASKETS

See ENGINE OIL DRAIN PLUGS AND GASKETS.

ENGINE OIL PRESSURE GAUGES (MECHANICAL)

ENGINE OIL PRESSURE GAUGE (MECHANICAL) INSPECTION

Condition	Code	Procedure
Indicates out of range	B	(1) Further inspection required.
Inoperative	A	(2) Further inspection required.
Leaking	A	Require repair or replacement.
Reads inaccurately	2	Suggest repair or replacement.

(1) - Gauge may indicate problem with contaminated oil, level, pressure, or temperature, or problem with gauge.
(2) - Gauge may indicate problem with contaminated oil, level, pressure, or temperature, or problem with gauge. Inoperative includes intermittent operation, out of OEM specification, or out of range. Further inspection required to determine cause.

EVAPORATIVE EMISSION (EVAP) CANISTER FILTERS

EVAPORATIVE EMISSION (EVAP) CANISTER FILTER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of

hardware.

Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.

Maintenance interval .... 3 ... Suggest replacement to comply with OEM recommended service interval.

Missing ..... C ..... Require replacement.

Restricted, affecting performance ..... A ..... Require replacement.

Restricted, not affecting performance ..... 1 ..... Suggest replacement.

Water-contaminated ..... A ..... Require replacement.

EVAPORATIVE EMISSION (EVAP) CANISTER PURGE DEVICES

EVAPORATIVE EMISSION (EVAP) CANISTER PURGE DEVICE INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.

Restricted, affecting performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

EVAPORATIVE EMISSION (EVAP) CANISTERS

EVAPORATIVE EMISSION (EVAP) CANISTER INSPECTION

Condition	Code	Procedure
Inoperative	A	(1) Require repair or replacement.
Leaking	A	Require replacement.
Missing	C	Require replacement.
Saturated	A	Require replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

EVAPORATIVE EMISSION (EVAP) FEEDBACK DEVICES

EVAPORATIVE EMISSION (EVAP) FEEDBACK DEVICE INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.

Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

EXHAUST GAS RECIRCULATION DEVICES

EXHAUST GAS RECIRCULATION DEVICE INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.

Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Resistance out of specification ..... B .. Require repair or replacement.
Restricted, affecting performance ..... A .. Require repair or replacement.
Restricted, not affecting performance ..... 1 .. Suggest repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

EXHAUST GAS RECIRCULATION FEEDBACK DEVICE INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.
Restricted, not affecting performance	1	Suggest repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.

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Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

EXPANSION PLUGS

See CASTING CORE PLUGS AND EXPANSION PLUGS.

FAN CONTROL SENSORS

FAN CONTROL SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.

Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Resistance out of specification ..... B .. Require repair or replacement.
Restricted, affecting performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

FUEL

FUEL INSPECTION

Condition	Code	Procedure
Contaminated	B	(1) Require repair or replacement.
Fuel incorrect	B	(2) Require flushing of system.

(1) - Determine of source of contamination. Require repair or replacement.
(2) - If a fuel other than specification fuel is present in the system, the required service is to flush and fill with the correct fuel.

FUEL ACCUMULATORS AND DAMPERS

FUEL ACCUMULATOR AND DAMPER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connections leaking	A	Require repair or replacement.
Inoperative	A	(1) Require replacement.
Leaking	A	Require replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

FUEL AND COLD START INJECTORS

NOTE: You are not required to replace injectors in sets. However, you may suggest replacement of all injectors for

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preventive maintenance.

FUEL AND COLD START INJECTOR INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Flow restricted	B	Require repair or replacement.
Inoperative	B	(2) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Resistance out of specification	B	Require replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation, out of OEM specification. Some components may be serviceable.

FUEL DAMPERS

See FUEL ACCUMULATORS AND DAMPERS.

FUEL DELIVERY CHECK VALVES

FUEL DELIVERY CHECK VALVE INSPECTION

Condition	Code	Procedure
Inoperative	A	(1) Require replacement.
Leaking externally	A	Require repair or replacement.
Missing	C	Require replacement.
Pressure leaking (bleeds down)	A	Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

FUEL DISTRIBUTORS (BOSCH CIS)

FUEL DISTRIBUTOR (BOSCH CIS) INSPECTION

Condition	Code	Procedure
Inoperative	A	(1) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	(2) Require repair or replacement. Further inspection required.

(1) - Inoperative includes intermittent operation.
(2) - Some components may be serviceable; check for accepted cleaning procedure.

FUEL FILLER NECKS AND RESTRICTORS

FUEL FILLER NECK AND RESTRICTOR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Restricted	2	Suggest repair or replacement.

FUEL FILTERS

FUEL FILTER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Leaking	A	Require repair or replacement.
Maintenance interval	3	Suggest replacement to comply with OEM recommended service interval.
Missing	C	Require replacement.
Restricted, affecting performance	A	Require replacement.
Restricted, not affecting performance	1	Suggest replacement.

Water-contaminated ..... 2 ..... Suggest replacement.

FUEL INJECTORS

FUEL INJECTOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.
Restricted, not affecting performance	2	Suggest repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded,		

affecting performance .. A . Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 . Suggest repair or replacement.
Terminal loose, affecting
performance ..... B . Require repair or replacement.
Terminal loose, not
affecting performance .. 1 . Suggest repair or replacement.
Threads damaged ..... A . Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B . Require repair or replacement.
Wire lead corroded ..... A . Require repair or replacement.
Wire lead open ..... A . Require repair or replacement.
Wire lead shorted ..... A . Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

FUEL LEVEL SENDERS

FUEL LEVEL SENDER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Inoperative	A	(1) Require repair or replacement.
Leaking	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting		

performance	A		(2) Require repair or replacement.
Terminal burned, not affecting performance	2		Suggest repair or replacement.
Terminal corroded, affecting performance	A		Require repair or replacement.
Terminal corroded, not affecting performance	2		Suggest repair or replacement.
Terminal loose, affecting performance	B		Require repair or replacement.
Terminal loose, not affecting performance	1		Suggest repair or replacement.
Wire lead conductors exposed	B		Require repair or replacement.
Wire lead corroded	A		Require repair or replacement.
Wire lead open	A		Require repair or replacement.
Wire lead shorted	A		Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.
(2) - Determine cause and correct prior to repair or replacement of part.

FUEL PRESSURE REGULATORS

FUEL PRESSURE REGULATOR INSPECTION

Condition	Code	Procedure
Contaminated	2	(1) Suggest repair or replacement. Further inspection required.
Inoperative	B	(2) Require repair or replacement.
Leaking (internally or externally)	A	Require repair or replacement.
Pressure out of specification	B	Require repair or replacement.
Vapor bypass restricted	A	Require repair or replacement.

(1) - Some components may be serviceable; check for accepted cleaning procedure. Determine source of contamination. Require repair or replacement.
(2) - Inoperative includes intermittent operation or out of OEM specification.

FUEL PUMPS (IN-TANK AND EXTERNAL, ELECTRICAL OR MECHANICAL)

FUEL PUMP (IN-TANK AND EXTERNAL, ELECTRICAL OR MECHANICAL) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require replacement.
Inoperative	A	(3) Require repair or replacement.
Leaking externally (includes pulsator)	A	Require repair or replacement.
Leaking internally (includes pulsator)	A	Require repair or replacement.
Noisy	2	Suggest repair or replacement.
Out of specification	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	2	Suggest repair or replacement.

Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination. Require repair or replacement.
(3) - Inoperative includes intermittent operation.

FUEL RAILS

FUEL RAIL INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Contaminated	A	(1) Require replacement.
Leaking	A	Require repair or replacement.
Restricted	A	Require repair or replacement.
Rust-pitted	1	Suggest replacement.

(1) - Determine source of contamination. Require repair or replacement.

FUEL RESTRICTORS

See FUEL FILLER NECKS AND RESTRICTORS.

FUEL TANKS

FUEL TANK INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Baffles loose	A	Require repair or replacement.
Contaminated	A	(1) Require repair.
Corroded internally	A	Require repair or replacement.
Distorted, affecting performance	B	Require replacement.
Distorted, not affecting performance		No service suggested or required.
Leaking	A	Require repair or replacement.

(1) - Determine source of contamination. Require repair or replacement.

GAS CAPS

GAS CAP INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Fails to maintain proper pressure	A	Require replacement.
Gaskets missing	C	Require replacement.
Leaking	A	Require replacement.
Missing	C	Require replacement.
Plugged (vacuum and pressure relief)	A	Require replacement.
Seals missing	C	Require replacement.

GASKETS

GASKET INSPECTION

Condition	Code	Procedure
Leaking	A	(1) Require repair or replacement.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary.

GROMMETS (VALVE COVER)

GROMMET (VALVE COVER) INSPECTION

Condition	Code	Procedure
Leaking	2	(1) Suggest repair or replacement.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary.

HARMONIC DAMPERS

HARMONIC DAMPER INSPECTION

Condition	Code	Procedure
Application incorrect ...	B	Require replacement.
Attaching hardware broken	A ..	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A ..	Require repair or replacement of hardware.
Cracked	A	Require replacement.
Dented (fluid type only)	A	Require replacement.
Keyway distorted	A .	Require repair or replacement.
Leaking (Fluid damper only)	A	Require replacement.

Loose ..... A ..... Require replacement.
Noisy ..... A ..... Require replacement.
Outer ring slipped out of
position ..... A ..... Require replacement.
Positioned incorrectly .. A . Require repair or replacement.
Rubber damping material
deteriorated ..... 1 ..... Suggest replacement.
Seal surface worn, causing
a leak ..... A . Require repair or replacement.
Threads damaged ..... A . Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

HEATER CONTROL VALVES

HEATER CONTROL VALVE INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement
of hardware.
Bypassed ..... A ..... Require replacement.
Coolant leak ..... A .. Require repair or replacement.
Malfunctioning ..... A ..... (1) Require repair or
replacement.
Missing ..... C ..... Require replacement.
Restricted ..... A .. Require repair or replacement.
Vacuum leak ..... A .. Require repair or replacement.

(1) - Includes inoperative, intermittent operation, or
failure to perform all functions.

HEATER CORES

HEATER CORE INSPECTION

Condition Code Procedure

Air flow restriction .... A .. Require repair or replacement.
Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Bypassed ..... A .. Require repair or replacement.
Connection leaking ..... A .. Require repair or replacement.
Corroded ..... 1 .. Suggest repair or replacement.
Fins damaged, affecting
performance ..... A .. Require repair or replacement.
Fins damaged, not
affecting performance .. 2 .. Suggest repair or replacement.
Internal restrictions,
affecting performance .. A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.

HOSE AND TUBE COUPLERS, CONNECTORS AND CLAMPS

NOTE: When replacing fuel lines and hoses, replace with product that meets or exceeds OEM design specifications.

HOSE AND TUBE COUPLER, CONNECTOR AND CLAMP INSPECTION

Condition Code Procedure

Application incorrect ... B ..... Require replacement.
Connected incorrectly ... A ..... Require repair.
Corroded, not reusable .. 1 ..... Suggest replacement.
Cracked ..... A ..... Require replacement.
Insufficient clamping
force, allowing hose to
leak ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Safety clip missing (not
leaking) ..... C ... Require replacement of safety clip.
Stripped ..... A ..... Require replacement.

HOSE CLAMPS

See HOSE AND TUBE COUPLERS, CONNECTORS AND CLAMPS.

HOSE CONNECTORS

See HOSE AND TUBE COUPLERS, CONNECTORS AND CLAMPS.

HOSE COUPLERS

See HOSE AND TUBE COUPLERS, CONNECTORS AND CLAMPS.

HOSES AND TUBES (FUEL LINES, RADIATOR, VACUUM, BY PASS, HEATER, RECOVERY TANK AND OIL COOLERS)

HOSE AND TUBE (FUEL LINE, RADIATOR, VACUUM, BY PASS, HEATER, RECOVERY TANK AND OIL COOLER) INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Connected incorrectly	A	Require repair.
Corroded, not reusable	1	Suggest replacement.
Cracked	A	Require replacement.
Dry-rotted	1	Suggest repair or replacement.
Hard	1	Suggest repair or replacement.
Inner fabric (webbing) damaged	A	Require replacement.
Insufficient clamping force, allowing hose to leak	A	Require repair or replacement.
Leaking	A	Require repair or replacement.
Maintenance intervals	3	Suggest replacement.
Melted	1	Suggest repair or replacement.
Missing	C	Require replacement.
Outer covering damaged	1	Suggest replacement.
Outer covering damaged to the extent that the inner fabric is visible	A	Require replacement.
Protective sleeves damaged	2	Suggest replacement of sleeves.
Protective sleeves missing	2	Suggest replacement of sleeves.
Restricted, affecting		

performance ..... A .. Require repair or replacement.
Restricted, not affecting
performance ..... 2 .. Suggest repair or replacement.
Routed incorrectly ..... 2 .. Suggest repair or replacement.
Safety clip missing ..... C ..... Require replacement.
Spongy ..... 1 .. Suggest repair or replacement.
Stripped ..... A ..... Require replacement.
Swollen ..... B ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Type incorrect ..... 1 .. Suggest repair or replacement.

HOUSINGS

See THERMOSTATS AND HOUSINGS.

IDLE AIR CONTROLS

IDLE AIR CONTROL INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.

Missing ..... C ..... Require replacement.
Resistance out of
specification ..... B .. Require repair or replacement.
Restricted, affecting
performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

IDLE SPEED CONTROL ACTUATORS

IDLE SPEED CONTROL ACTUATOR INSPECTION

Condition Code Procedure

Attaching hardware
missing ..... C ..... Require replacement of

hardware.

Attaching hardware threads damaged ..... A ... Require repair or replacement of hardware.

Attaching hardware threads stripped (threads missing) ..... A ... Require repair or replacement of hardware.

Connector broken ..... A .. Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.

Connector melted ..... A ..... (1) Require repair or replacement.

Connector missing ..... C ..... Require replacement.

Contaminated ..... A ..... (2) Require repair or replacement.

Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.

Leaking ..... A .. Require repair or replacement.

Missing ..... C ..... Require replacement.

Resistance out of specification ..... B .. Require repair or replacement.

Terminal broken ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal corroded, affecting performance .. A .. Require repair or replacement.

Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.

Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

Threads damaged ..... A .. Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.

Wire lead conductors exposed ..... B .. Require repair or replacement.

Wire lead corroded ..... A .. Require repair or replacement.

Wire lead open ..... A .. Require repair or replacement.

Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

IGNITION BOOTS

See IGNITION WIRES, BOOTS, COIL TOWERS AND TERMINALS (SECONDARY).

IGNITION COIL TOWERS

See IGNITION WIRES, BOOTS, COIL TOWERS AND TERMINALS (SECONDARY).

IGNITION COILS

IGNITION COIL INSPECTION

Condition	Code	Procedure
Arcing	A	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Corroded, affecting performance	A	Require replacement.
Corroded, not affecting performance	2	Suggest replacement.

Distorted .... (2) No service suggested or required.
Inoperative ..... A ..... (3) Require replacement.
Oil leaking ..... A ..... Require replacement.
Out of specification .... B ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Distortion may be the result of overheating; coil should be tested.
(3) - Inoperative includes intermittent operation.

IGNITION CONTROL MODULES (ICM)

IGNITION CONTROL MODULE (ICM) INSPECTION

Condition Code Procedure

Application incorrect ... B ..... Require replacement.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware threads damaged ..... A ... Require repair or replacement of hardware.
Attaching hardware

threads stripped
(threads missing) ..... A ... Require repair or replacement of hardware.
Code set
(if applicable) ..... A ..... (1) Further inspection required.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack
type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (2) Require repair or replacement.
Connector missing ..... A ..... Require repair.
Contaminated ..... A ..... (3) Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Malfunctioning ..... A ..... (4) Require repair or replacement.
Missing ..... C ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (2) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Refer to manufacturer's diagnostic trouble code procedure and require repair or replacement of affected component(s).
(2) - Determine cause and correct prior to repair or replacement of part.
(3) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require

repair or replacement.
(4) - Includes inoperative, intermittent operation, or failure to perform all functions.

IGNITION SWITCHES

See SWITCHES.

IGNITION TERMINALS

See IGNITION WIRES, BOOTS, COIL TOWERS AND TERMINALS (SECONDARY).

IGNITION WIRES, BOOTS, COIL TOWERS AND TERMINALS (SECONDARY)

NOTE: You are not required to replace ignition wires in sets. However, you may suggest replacement of the entire secondary wire set for preventive maintenance.

IGNITION WIRE, BOOT, COIL TOWER AND TERMINAL (SECONDARY) INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Carbon-tracked	A	Require replacement.
Corroded	1	Suggest repair or replacement.
Insulation leaking (shorted)	A	Require repair or replacement.
Metal heat shield bent	2	Suggest repair or replacement.
Missing	C	Require replacement.
Oil-soaked (spongy)	1	Suggest replacement.
Resistance incorrect	B	Require replacement.
Routed incorrectly	2	(1) Suggest repair.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(2) Require repair or

replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - If improper routing affects the performance of other systems, require repair. Proper routing, hardware, heatshields, etc., are intended to prevent premature failure of secondary ignition components.
(2) - Determine cause and correct prior to repair or replacement of part.

IN-TANK FUEL STRAINERS

IN-TANK FUEL STRAINER INSPECTION

Condition	Code	Procedure
Missing	C	Require replacement.
Restricted	A	Require repair or replacement.
Torn	A	Require replacement.

INERTIA FUEL SHUT-OFF SWITCHES

INERTIA FUEL SHUT-OFF SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.

Connector broken ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require replacement.
Inoperative ..... A ..... (3) Require repair or replacement.
Missing ..... C ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification.

INTAKE AIR TEMPERATURE SENSORS

INTAKE AIR TEMPERATURE SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.

Attaching hardware
threads damaged ..... A ... Require repair or replacement of hardware.
Attaching hardware
threads stripped
(threads missing) ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack
type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Resistance out of
specification ..... B .. Require repair or replacement.
Restricted, affecting
performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

INTAKE MANIFOLDS

INTAKE MANIFOLD INSPECTION

Condition	Code	Procedure
Corroded, affecting sealability	A	Require repair or replacement.
Integrated air or fuel control components inoperative	A	(1) Require repair or replacement.
Internal air or fuel components damaged, affecting performance	A	Require repair or replacement of component.
Internal air or fuel components damaged, not affecting performance		No service suggested or required.
Internal air or fuel components missing	C	Require replacement of component.
Leaking	A	Require repair or replacement.
Out of specification	B	Require replacement.
Restricted	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require repair or replacement.
Warped	B	Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

INTERCOOLERS

See CHARGE AIR COOLERS "INTERCOOLERS" (CAC).

KNOCK SENSORS

KNOCK SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Inoperative	B	(2) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.

affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

LIQUID VAPOR SEPARATORS

LIQUID VAPOR SEPARATOR INSPECTION

Condition Code Procedure

Inoperative ..... A ..... (1) Require repair or replacement.
Leaking ..... A ..... Require replacement.
Missing ..... C ..... Require replacement.
Restricted ..... A .. Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSORS

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION

Condition Code Procedure

Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware
threads damaged ..... A ... Require repair or replacement of hardware.
Attaching hardware

threads stripped
(threads missing) ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Resistance out of specification ..... B .. Require repair or replacement.
Restricted, affecting performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant,

fuel, metal particles, or water. Require repair or replacement.

(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

MASS AIR FLOW (MAF) SENSORS

MASS AIR FLOW (MAF) SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.

Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

METAL AIR MANIFOLDS AND PIPES

METAL AIR MANIFOLD AND PIPE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Broken	A	Require repair of injection tube or replacement of manifold.
Corroded, affecting		

structural integrity ...	1	Suggest replacement of injection tube or manifold.
Leaking	A	Require repair of injection tube or replacement of manifold.
Loose	A	Require repair.
Missing	C	Require replacement.
Restricted	A	Require replacement of injection tube or manifold.
Threads damaged	A	Require repair.
Threads stripped (threads missing)	A	Require replacement.

METAL AIR PIPES

See METAL AIR MANIFOLDS AND PIPES.

MIX CONTROL SOLENOIDS

MIX CONTROL SOLENOID INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A ...	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A ...	Require repair or replacement of hardware.
Connector broken	A ..	Require repair or replacement.
Connector (Weatherpack type) leaking	A ..	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.

Missing ..... C ..... Require replacement.
Resistance out of
specification ..... B .. Require repair or replacement.
Restricted, affecting
performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

MOTOR MOUNTS

MOTOR MOUNT INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement

of hardware.

Attaching hardware missing ..... C ..... Require replacement of hardware.

Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.

Broken ..... A ..... Require replacement.

Leaking (hydraulic mount) ..... A ..... Require replacement.

Mounting hole worn, affecting performance .. A ..... Require replacement.

Mounting hole worn, not affecting performance .. .. No service suggested or required.

Rubber deteriorated, affecting performance .. A ..... Require replacement.

Rubber deteriorated, not affecting performance .. .. No service suggested or required.

Threads damaged ..... A .. Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.

O-RINGS, GASKETS, SEALS AND SPRING LOCKS

O-RING, GASKET, SEAL AND SPRING LOCK INSPECTION

Condition	Code	Procedure
Leaking	A	(1) Require repair or replacement.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary.

O2 SENSORS

O2 SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of

hardware.

Attaching hardware threads damaged ..... A ... Require repair or replacement of hardware.

Attaching hardware threads stripped (threads missing) ..... A .. Require repair or replacement of hardware.

Connector broken ..... A .. Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.

Connector melted ..... A ..... (1) Require repair or replacement.

Connector missing ..... C ..... Require replacement.

Contaminated ..... A ..... (2) Require repair or replacement.

Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.

Leaking ..... A .. Require repair or replacement.

Missing ..... C ..... Require replacement.

Resistance out of specification ..... B .. Require repair or replacement.

Restricted, affecting performance ..... A .. Require repair or replacement.

Terminal broken ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal corroded, affecting performance .. A .. Require repair or replacement.

Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.

Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

Threads damaged ..... A .. Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.

Wire lead conductors exposed ..... B .. Require repair or replacement.

Wire lead corroded ..... A .. Require repair or replacement.

Wire lead open ..... A .. Require repair or replacement.

Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

OIL PRESSURE SENDING UNITS

OIL PRESSURE SENDING UNIT INSPECTION

Condition Code Procedure

Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require repair or replacement.
Leaking ..... A ..... Require replacement.
Output signal incorrect . B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

OIL PUMP PICK-UP SCREENS

OIL PUMP PICK-UP SCREEN INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bypass stuck	A	Require repair or replacement.
Cracked	A	Require repair or replacement.
Loose	A	Require repair or replacement.
Missing	C	Require replacement.
Positioned incorrectly	A	Require repair or replacement.
Restricted	A	Require repair or replacement.
Screen torn	A	Require replacement.

OIL PUMPS

OIL PUMP INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.

Housing cracked ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Pressure relief valve
stuck ..... A .. Require repair or replacement.
Seized ..... A .. Require repair or replacement.
Worn beyond
specifications ..... B .. Require repair or replacement.

PARK NEUTRAL POSITION SWITCHES

PARK NEUTRAL POSITION SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.

Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

PCV BREATHER ELEMENTS

PCV BREATHER ELEMENT INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Leaking	A	Require replacement.
Maintenance intervals	3	Suggest replacement to comply with vehicle's OEM recommended service intervals.

Melted ..... A ..... Required replacement.
Missing ..... C ..... Require replacement.
Restricted, affecting
performance ..... A ..... Require replacement.
Restricted, not affecting
performance ..... 1 ..... Suggest replacement.
Water-contaminated ..... A ..... Require replacement.

PCV ORIFICES

PCV ORIFICE INSPECTION

Condition Code Procedure

Leaking ..... A ..... Require replacement.
Maintenance interval .... 3 ... Suggest repair or replacement
to comply with OEM recommended
service intervals.
Missing ..... C ..... Require replacement.
Restricted ..... A .. Require repair or replacement.

PCV VALVES

PCV VALVE INSPECTION

Condition Code Procedure

Application incorrect ... B ..... Require replacement.
Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement
of hardware.
Grommet broken ..... A ... Require repair or replacement
of grommet.
Grommet missing ..... C . Require replacement of grommet.
Grommet not
functioning ..... A ... Require repair or replacement
of grommet.
Inoperative ..... A ..... (1) Require replacement

Leaking ..... A ..... Require replacement.
Maintenance interval .... 3 ... Suggest replacement to comply with vehicle's OEM recommended service intervals.
Missing ..... C ..... Require replacement.
Restricted ..... A ..... Require replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

PICK-UP ASSEMBLIES (INCLUDES MAGNETIC, HALL EFFECT AND OPTICAL)

PICK-UP ASSEMBLY (MAGNETIC, HALL EFFECT AND OPTICAL) INSPECTION

Condition Code Procedure

Adjustment incorrect .... B ..... Require repair.
Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... B ..... (2) Require replacement.
Oil-soaked ..... A ..... Require replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification. Refer to OEM recommended service' procedures.

POWER STEERING PRESSURE SENSORS

POWER STEERING PRESSURE SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.

Resistance out of
specification ..... B .. Require repair or replacement.
Restricted, affecting
performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

POWERTRAIN CONTROL MODULES (PCM) AND PROM

POWERTRAIN CONTROL MODULE (PCM) AND PROM INSPECTION

Condition	Code	Procedure
Application incorrect ...	B	Require replacement.
Attaching hardware missing	C	Require replacement of

hardware.

Attaching hardware threads damaged ..... A ... Require repair or replacement of hardware.

Attaching hardware threads stripped (threads missing) ..... A ... Require repair or replacement of hardware.

Code set (if applicable) ..... A ..... (1) Further inspection required.

Connector broken ..... A .. Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.

Connector melted ..... A ..... (2) Require repair or replacement.

Connector missing ..... A ..... Require repair.

Contaminated ..... A ..... (3) Require repair or replacement.

Leaking ..... A .. Require repair or replacement.

Malfunctioning ..... A ..... (4) Require repair or replacement.

Missing ..... C ..... Require replacement.

Terminal broken ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (2) Require repair or replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal corroded, affecting performance .. A .. Require repair or replacement.

Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.

Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

Threads damaged ..... A .. Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.

Wire lead conductors exposed ..... B .. Require repair or replacement.

Wire lead corroded ..... A .. Require repair or replacement.

Wire lead open ..... A .. Require repair or replacement.

Wire lead shorted ..... A .. Require repair or replacement.

(1) - Refer to manufacturer's diagnostic trouble code procedure and require repair or replacement of affected component(s).
(2) - Determine cause and correct prior to repair or replacement of part.
(3) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(4) - Includes inoperative, intermittent operation, failure to perform all functions, or out of OEM specification.

POWERTRAIN CONTROL PROM

See POWERTRAIN CONTROL MODULES (PCM) AND PROM.

PRESSURIZED EXPANSION TANK CAPS

See RADIATOR CAPS AND PRESSURIZED EXPANSION TANK CAPS.

RADIATOR CAPS AND PRESSURIZED EXPANSION TANK CAPS

RADIATOR CAP AND PRESSURIZED EXPANSION TANK CAP INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Coolant recovery check valve inoperative	A	(1) Require replacement.
Fails to maintain proper pressure	B	Require replacement.
Gasket missing	C	Require replacement of gasket.
Missing	C	Require replacement.
Seal missing	C	Require replacement of seal.

(1) - Inoperative includes intermittent operation or out of OEM specification.

RADIATOR FAN BLADES

RADIATOR FAN BLADE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.

Attaching hardware
broken ..... A .. Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A .. Require repair or replacement of hardware.
Bent ..... A ..... Require replacement.
Broken ..... A ..... Require replacement.
Cracked ..... A ..... Require replacement.
Loose ..... A . Require repair or replacement.
Missing ..... C ..... Require replacement.

RADIATOR FAN CLUTCHES

NOTE: Some lateral movement, measured at the fan blade tip, may be normal.

RADIATOR FAN CLUTCH INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bearing noisy	A	Require replacement.
Bearing worn	A	Require replacement.
Fastener loose	A	Require repair or replacement of fastener.
Inoperative	A	(1) Require replacement.
Leaking	1	Suggest replacement.
Seized	A	Require replacement.
Slips (insufficient fan speed)	A	Require replacement.
Thermal control incorrect	B	Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

RADIATORS

RADIATOR INSPECTION

Condition	Code	Procedure
Air flow restriction	A	Require repair.
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connection leaking	A	Require repair or replacement.
Corroded	1	Suggest repair or replacement.
Fins damaged, affecting performance	A	Require repair or replacement.
Fins damaged, not affecting performance	2	Suggest repair or replacement.
Internal oil cooler leaking	A	Require repair or replacement.
Internal restrictions, affecting performance	B	Require repair or replacement.
Internal restrictions, not affecting performance	2	Suggest repair or replacement.
Leaking	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require repair or replacement.
Tubes damaged, affecting performance	A	Require repair or replacement.
Tubes damaged, not affecting performance		No service suggested or required.

ROLL OVER VALVES

ROLL OVER VALVE INSPECTION

Condition	Code	Procedure
Inoperative	A	(1) Require replacement.
Leaking	A	Require replacement.
Missing	C	Require replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

SEALING COMPOUNDS

SEALING COMPOUND INSPECTION

Condition	Code	Procedure
Leaking	A	(1) Require repair or replacement.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary.

SEALS

SEAL INSPECTION

Condition	Code	Procedure
Leaking	A	(1) Require repair or replacement.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary.

SECONDARY AIR INJECTION SYSTEM MANAGEMENT DEVICES

SECONDARY AIR INJECTION SYSTEM MANAGEMENT DEVICE INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of

hardware.

Attaching hardware threads damaged ..... A ... Require repair or replacement of hardware.

Attaching hardware threads stripped (threads missing) ..... A .. Require repair or replacement of hardware.

Connector broken ..... A .. Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.

Connector melted ..... A ..... (1) Require repair or replacement.

Connector missing ..... C ..... Require replacement.

Contaminated ..... A ..... (2) Require repair or replacement.

Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.

Leaking ..... A .. Require repair or replacement.

Missing ..... C ..... Require replacement.

Resistance out of specification ..... B .. Require repair or replacement.

Restricted, affecting performance ..... A .. Require repair or replacement.

Terminal broken ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal corroded, affecting performance .. A .. Require repair or replacement.

Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Terminal loose, affecting performance ..... B .. Require repair or replacement.

Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

Threads damaged ..... A .. Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.

Wire lead conductors exposed ..... B .. Require repair or replacement.

Wire lead corroded ..... A .. Require repair or replacement.

Wire lead open ..... A .. Require repair or replacement.

Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

SENSORS AND ACTUATORS

NOTE: Conditions pertaining to the sensors and actuators listed in this section may be found under the name of the sensor or actuator.

SENSOR ABBREVIATION TABLE

Sensor	Abbreviation
Accelerator Pedal Position Sensor	APP
Air Conditioning Cycling Switch	AC
Air Conditioning Pressure Sensor	..
Air Fuel Ratio Sensor	..
Barometric Pressure Sensor	BARO
Camshaft Position Sensor	CMP
Clutch Pedal Position Switch	CPP
Cooling Fan Motor Sensors and Switches	..
Crankshaft Position Sensor	CKP
Electronic Transmission Feedback Devices	..
Engine Coolant Temperature Sensor	ECT
Evaporative Emission feedback devices	..
Exhaust Gas Recirculation feedback devices	..
Fan Control Sensor	FC
Intake Air Temperature Sensor	IAT
Knock Sensor	KS
Manifold Absolute Pressure Sensor	MAP
Mass Air Flow Sensor	MAF
O2 Sensor	O2S
Park Neutral Position Switch	PNP
Power Steering Pressure Sensor	PSP
Thermal Vacuum Valve	TVV
Throttle Position Sensor	TP Sensor
Throttle Position Switch	..

*** ENGINE SYSTEMS UNIFORM INSPECT**

Transmission Range Switch ..... TR Switch
Vehicle Speed Sensor ..... VSS
Volume Air Flow Sensor ..... VAF

ACTUATOR ABBREVIATION TABLE

Actuator	Abbreviation
Air Injection Control Solenoid	..
Electronic Transmission control devices	..
Evaporative Emission Canister	EVAP
Purge Device	..
Exhaust Gas Recirculation Device	EGR
Fuel Injector	..
Idle Air Control	IAC
Idle Speed Control Actuator	ISC
Mix Control Solenoid	MC Solenoid
Secondary Air Injection System Management Device	AIR, PAIR
Vacuum Regulator Solenoid	..
Waste Gate Control Solenoid	..

SHROUDS, BAFFLES AND DEFLECTORS

SHROUD, BAFFLE AND DEFLECTOR INSPECTION

Condition	Code	Procedure
Application incorrect, affecting cooling system performance	A	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bent, affecting cooling system performance	A	Require repair or replacement.
Blocked, affecting cooling system performance	A	Require repair or replacement.
Broken, affecting cooling		

system performance ..... A . Require repair or replacement.
Cracked, affecting cooling
system performance ..... A . Require repair or replacement.
Loose, affecting cooling
system performance ..... A ..... Require repair.
Loose, not affecting
cooling system
performance ..... 2 ..... Suggest repair.
Missing, affecting cooling
system performance ..... C ..... Require replacement.

SPARK PLUGS

NOTE: You are not required to replace spark plugs in sets.
However, you may suggest replacement of the other plugs
for preventive maintenance.

SPARK PLUG INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Electrode eroded	1	Suggest replacement.
Fouled	A	(1) Require repair or replacement.
Gap incorrect	B	Require repair or replacement.
Insulation broken	A	Require replacement
Insulator cracked	A	Require replacement.
Leaking compression	A	Require repair or replacement.
Maintenance interval	3	Suggest replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Determine cause of fouling and suggest repair.

SPRING LOCKS

SPRING LOCK INSPECTION

Condition	Code	Procedure
Leaking	A	(1) Require repair or

(1) - Require inspection of mating and sealing surface and repair or replace as necessary.

SUPER CHARGERS

SUPER CHARGER INSPECTION

Condition	Code	Procedure
Attaching hardware damaged, affecting operation or performance	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Bearing noisy	A	Require replacement.
Bearing worn	A	Require replacement.
Boost pressure incorrect	A	(1) Require repair or replacement.
Clearance out of specification	B	Require repair or replacement.
Leaking	A	Require repair or replacement.
Noisy	2	Suggest repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require repair or replacement.

(1) - Boost pressure problems may be caused by other systems or components.

SWITCHES

SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware		

missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Binding, affecting performance ..... A .. Require repair or replacement.
Binding, not affecting performance ..... 2 .. Suggest repair or replacement.
Broken ..... A .. Require repair or replacement.
Burned, affecting performance ..... A ..... (1) Require repair or replacement.
Burned, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.
Cracked, affecting performance ..... A .. Require repair or replacement.
Cracked, not affecting performance ..... 1 .. Suggest repair or replacement.
Leaking ..... A .. Require repair or replacement.
Malfunctioning ..... A ..... (2) Require repair or replacement.
Melted, affecting performance ..... A ..... (1) Require repair or replacement.
Melted, not affecting performance ..... 2 ..... (1) Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Out of adjustment ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Won't return ..... A .. Require repair or replacement.

Worn ..... 1 ..... Suggest replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Includes inoperative, intermittent operation, or failure to perform all functions.

THERMAL VACUUM VALVES

THERMAL VACUUM VALVE INSPECTION

Condition	Code	Procedure
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.
Threads damaged	A	Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

THERMOSTATIC AIR DOOR ASSEMBLIES

THERMOSTATIC AIR DOOR ASSEMBLY INSPECTION

Condition	Code	Procedure
Attaching hardware damaged, affecting operation or performance	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Binding	A	Require repair or replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Seized	A	Require repair or replacement.

THERMOSTATS AND HOUSINGS

THERMOSTAT AND HOUSING INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware		

broken ..... A ... Require repair or replacement of hardware.
Attaching hardware corroded ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Housing corroded ..... 1 .. Suggest replacement of housing.
Inoperative ..... A ..... (1) Require replacement.
Installation incorrect .. B .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Thermostat missing ..... C ..... Require replacement of thermostat.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A .. Require repair or replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

THROTTLE BODIES

THROTTLE BODY INSPECTION

Condition Code Procedure

Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Restricted ..... A ..... (3) Require repair.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not

affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A .. Require repair or replacement.
Throttle shaft binding,
affecting performance .. A .. Require repair or replacement.
Throttle shaft worn,
affecting performance .. A .. Require repair or replacement.
Throttle shaft worn, not
affecting performance .. 1 .. Suggest repair or replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Some components may be serviceable; check for accepted cleaning procedure.

THROTTLE CABLES

See THROTTLE LINKAGES AND CABLES.

THROTTLE LINKAGES AND CABLES

THROTTLE LINKAGE AND CABLE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ...	Require repair or replacement

Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A .. Require repair or replacement of hardware.
Bent ..... A .. Require repair or replacement.
Binding ..... A .. Require repair or replacement.
Bracket bent, affecting performance ..... A .. Require repair or replacement.
Bracket bent, not affecting performance .. .. No service suggested or required.
Bracket broken, affecting performance ..... A Require replacement.
Bracket broken, not affecting performance .. .. No service suggested or required.
Bracket corroded, affecting performance .. A .. Require repair or replacement.
Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Bracket cracked, affecting performance ..... A .. Require repair or replacement.
Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket loose, affecting performance ..... A .. Require repair or replacement.
Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Broken ..... A ..... Require replacement.
Cracked ..... A .. Require repair or replacement.
Disconnected ..... A .. Require repair or replacement.
Kinked ..... A .. Require repair or replacement.
Melted ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B ..... (1) Require repair or replacement.
Routed incorrectly ..... 2 ..... Suggest repair.
Seized ..... A .. Require repair or replacement.

(1) - Follow OEM recommended adjustment procedures. Require repair or replacement if out of specification.

THROTTLE POSITION SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads		

missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

THROTTLE POSITION SWITCHES

THROTTLE POSITION SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Inoperative	B	(2) Require repair or replacement. Further inspection required.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

TIMING BELT SPROCKETS

TIMING BELT SPROCKET INSPECTION

Condition Code Procedure

Alignment incorrect ..... B ..... Require repair.
Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Bent ..... A ..... Require replacement.

Cracked ..... A ..... Require replacement.
Key damaged ..... A ..... Require replacement.
Loose ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Pulley damaged, affecting
belt life ..... A ..... Require replacement.
Sprocket damaged,
affecting belt life .... A .. Require repair or replacement.
Sprocket loose ..... B .. Require repair or replacement.
Sprocket-to-shaft
alignment incorrect ..... B .. Require repair or replacement.

TIMING BELTS

TIMING BELT INSPECTION

Condition Code Procedure

Adjustment incorrect .... 2 ..... (1) Suggest adjustment.
Alignment incorrect ..... B ..... (2) Further inspection required.
Broken ..... A ..... Require replacement.
Cam timing out of
specification ..... B ..... Require repair.
Cracked ..... 1 ..... Suggest replacement.
Fluid-soaked ..... 1 ... Suggest replacement. Further inspection required.
Frayed ..... 1 ..... Suggest replacement.
Maintenance intervals ... 3 ... Suggest replacement to comply with vehicle OEM recommended service intervals.
Missing ..... C ..... (3) Require replacement.
Noisy ..... 2 ..... (4) Further inspection required.
See note below.
Plies separated ..... A ..... Require replacement.
Tension out of
specification ..... B ..... Require adjustment or replacement.
Teeth missing ..... A ..... Require replacement.

(1) - Inspect belt tensioners, pulleys, and cover.
(2) - Determine cause of incorrect alignment and require repair.
(3) - CAUTION: Internal engine damage may result from timing belt damage/failure.

(4) - Determine cause of noise and suggest repair.

TORQUE STRUTS

TORQUE STRUT INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Binding	A	Require replacement.
Body dented	A	(1) Further inspection required.
Body punctured	A	Require replacement.
Bushing deteriorated, affecting performance	A	Require replacement.
Bushing deteriorated, not affecting performance	.. ..	No service suggested or required.
Bushings missing	C	Require replacement.
Bushings separated from mounting eye	1	Suggest replacement.
Damping (none)	A	Require replacement.
Leaking oil, enough for fluid to be running down the body	A	Require replacement.
Missing	C	Require replacement.
Noisy	2	(2) Further inspection required.
Piston rod bent	A	Require replacement.
Piston rod broken	A	Require replacement.
Seized	A	Require replacement.
Threads damaged	A ..	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Require replacement of units where dents restrict strut piston rod movement. Dents not restricting movement, use

service is suggested or required.
(2) - If noise is isolated to shock or strut, suggest replacement.

TRANSMISSION RANGE SWITCHES

TRANSMISSION RANGE SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting		

performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

TUBE CLAMPS

See HOSE AND TUBE COUPLERS, CONNECTORS AND CLAMPS.

TUBE CONNECTORS

See HOSE AND TUBE COUPLERS, CONNECTORS AND CLAMPS.

TUBE COUPLERS

See HOSE AND TUBE COUPLERS, CONNECTORS AND CLAMPS.

TUBES

See HOSES AND TUBES (FUEL LINES, RADIATOR, BY PASS, HEATER, RECOVERY TANK AND OIL COOLERS).

TURBO CHARGERS

TURBO CHARGER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A ...	Require repair or replacement

of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Boost pressure
incorrect ..... A ..... (1) Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Oil seal (internal)
leaking ..... A .. Require repair or replacement.
Vibrates ..... A .. Require repair or replacement.

(1) - Boost pressure problems may be caused by other systems or components.

VACUUM CONNECTIONS

See VACUUM HOSES, TUBES AND CONNECTIONS (NON-METALLIC).

VACUUM HOSES, TUBES AND CONNECTIONS (NON-METALLIC)

VACUUM HOSE, TUBE AND CONNECTION (NON-METALLIC) INSPECTION

Condition	Code	Procedure
Leaking	A	Require repair or replacement.
Melted	A	Require replacement.
Missing	C	Require replacement.
Oil-soaked (spongy)	1	Suggest replacement.
Restricted	A	Require repair or replacement.
Surface cracks (dry-rotted)	1	Suggest replacement.

VACUUM REGULATOR SOLENOIDS

VACUUM REGULATOR SOLENOID INSPECTION

Condition	Code	Procedure
Attaching hardware		

missing ..... C ..... Require replacement of hardware.
Attaching hardware threads damaged ..... A ... Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing) ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Resistance out of specification ..... B .. Require repair or replacement.
Restricted, affecting performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.

Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

VACUUM TUBES

See VACUUM HOSES, TUBES AND CONNECTIONS (NON-METALLIC).

VEHICLE SPEED SENSORS

VEHICLE SPEED SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.

Resistance out of specification ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

VOLUME AIR FLOW SENSORS

VOLUME AIR FLOW SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A ...	Require repair or replacement

of hardware.
Attaching hardware threads stripped (threads missing) ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Contaminated ..... A ..... (2) Require repair or replacement.
Inoperative ..... B ..... (3) Require repair or replacement. Further inspection required.
Leaking ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Resistance out of specification ..... B .. Require repair or replacement.
Restricted, affecting performance ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Wire lead conductors exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or

replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

WASTE GATE CONTROL SOLENOIDS

WASTE GATE CONTROL SOLENOID INSPECTION

Condition	Code	Procedure
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(2) Require repair or replacement.
Inoperative	B	(3) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Resistance out of specification	B	Require repair or replacement.
Restricted, affecting performance	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.

Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Determine source of contamination, such as engine coolant, fuel, metal particles, or water. Require repair or replacement.
(3) - Inoperative includes intermittent operation or out of OEM specification. Some components may be serviceable; check for accepted cleaning procedure.

WASTE GATES AND BOOST CONTROL MECHANISMS

WASTE GATE AND BOOST CONTROL MECHANISM INSPECTION

Condition	Code	Procedure
Boost pressure incorrect	A	(1) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.

(1) - Incorrect boost pressure includes intermittent operation or out of OEM specification.

WATER PUMP (ELECTRIC) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Inoperative	A	(2) Require replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Noisy	2	Suggest replacement.
Rotation incorrect for application	B	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.
Terminal loose, not affecting performance	1	Suggest repair or replacement.
Vibration	1	Suggest replacement.
Wire lead conductors exposed	B	Require repair or replacement.
Wire lead corroded	A	Require repair or replacement.
Wire lead open	A	Require repair or replacement.
Wire lead shorted	A	Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Check fan motor/controls. Inoperative includes intermittent operation or out of OEM specification.

WATER PUMPS (NON-ELECTRIC)

WATER PUMP (NON-ELECTRIC) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware corroded	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Corrosion (internal) is excessive, affecting performance	A	Require replacement.
Corrosion (internal) is excessive, not affecting performance	2	Suggest cooling system service.
Inoperative	A	(1) Require replacement.
Leaking	A	Require replacement.
Noisy	A	Require replacement.
Rotation incorrect for application	B	Require repair or replacement.
Shaft bent	A	Require replacement.

(1) - Inoperative includes intermittent operation or out of OEM specification.

WIRING HARNESSES AND CONNECTORS

WIRING HARNESS AND CONNECTOR INSPECTION *** ENGINE SYSTEMS UNIFORM INSPECT**

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Insulation damaged, conductors exposed	A	Require repair or replacement.
Insulation damaged, conductors not exposed	1	Suggest replacement.
Open	A	Require repair or replacement.
Protective shield (conduit) melted	2	(1) Suggest repair or replacement.
Protective shield (conduit) missing	2	Suggest repair or replacement.
Resistance (voltage drop) out of specification	A	Require repair or replacement.
Routed incorrectly	B	Require repair.
Secured incorrectly	B	Require repair.
Shorted	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.
Terminal corroded, not affecting performance	2	Suggest repair or replacement.
Terminal loose, affecting performance	B	Require repair or replacement.

Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Voltage drop out of
specification ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or
replacement of part.

END OF ARTICLE

TROUBLE SHOOTING - BASIC PROCEDURES
Article Text
1996 Kia Sephia
For 1 1 1 1 1

Saturday, April 18, 2009 10:07PM

ARTICLE BEGINNING

GENERAL TROUBLE SHOOTING

*** PLEASE READ THIS FIRST ***

NOTE: This is GENERAL information. This article is not intended to be specific to any unique situation or individual vehicle configuration. The purpose of this Trouble Shooting information is to provide a list of common causes to problem symptoms. For model-specific Trouble Shooting, refer to SUBJECT, DIAGNOSTIC, or TESTING articles available in the section(s) you are accessing.

ACCESSORIES & ELECTRICAL

CHARGING SYSTEM TROUBLE SHOOTING

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BASIC CHARGING SYSTEM TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
Vehicle Will Not Start	Dead battery	Check battery cells, alternator belt tension and alternator output
	Loose or corroded battery connections	Check all charging system connections
	Ignition circuit or switch malfunction	Check and replace as necessary
Alternator Light Stays On With Engine Running	Loose or worn alternator drive belt	Check alternator drive tension and condition, See Belt Adjustment in TUNE-UP

		article in the TUNE-UP section
	Loose alternator wiring connections	Check all charging system connections
	Short in alternator light wiring	See Indicator Warning Lights in STANDARD INSTRUMENTS in the ACCESSORIES & EQUIPMENT section
	Defective alternator stator or diodes	See Bench Tests in ALTERNATOR article
	Defective regulator	See Regulator Check in ALTERNATOR article
Alternator Light Stays Off With Ignition Switch ON	Blown fuse	See WIRING DIAGRAMS
	Defective alternator	See Testing in ALTERNATOR article
	Defective indicator light bulb or socket	See Indicator Warning Lights in STANDARD INSTRUMENTS in the ACCESSORIES & EQUIPMENT section
Alternator Light Stays OFF With Ignition Switch ON	Short in alternator wiring	See On-Vehicle Tests in ALTERNATOR article
	Defective rectifier bridge	See Bench Tests in ALTERNATOR article
Lights or Fuses Burn Out Frequently	Defective alternator wiring	See On-Vehicle Tests in ALTERNATOR article
	Defective regulator	See Regulator Check in ALTERNATOR article

	Defective battery	Check and replace as necessary
Ammeter Gauge Shows Discharge	Loose or worn drive belt	Check alternator drive belt tension and condition. See Belt Adjustment in TUNE-UP article in the TUNE-UP section
	Defective wiring	Check all wires and wire connections
	Defective alternator or regulator	See Bench Tests and On-Vehicle Tests in ALTERNATOR article
	Defective ammeter, or improper ammeter wiring connection	See Testing in STANDARD INSTRUMENTS in the ACCESSORIES & EQUIPMENT section
Noisy Alternator	Loose drive pulley	Tighten drive pulley attaching nut
	Loose mounting bolts	Tighten all alternator mounting bolts
	Worn or dirty bearings	See Bearing Replacement ALTERNATOR article
	Defective diodes or stator	See Bench Test in ALTERNATOR article
Battery Does Stay Charged	Loose or worn drive belt	Check alternator drive belt tension and condition. See Belt Adjustment in appropriate TUNE-UP article in the TUNE-UP section
	Loose or corroded battery connections	Check all charging system connections

	Loose alternator connections	Check all charging system connections
	Defective alternator or battery	See On-Vehicle Tests and Bench Tests in ALTERNATOR article
	Add-on electrical accessories exceeding alternator capacity	Install larger alternator
Battery Overcharged-Uses Too Much Water	Defective battery	Check alternator output and repair as necessary
	Defective alternator	See On-Vehicle Test and Bench Tests in ALTERNATOR article
	Excessive alternator voltage	Check alternator output and repair as necessary

IGNITION SYSTEM TROUBLE SHOOTING

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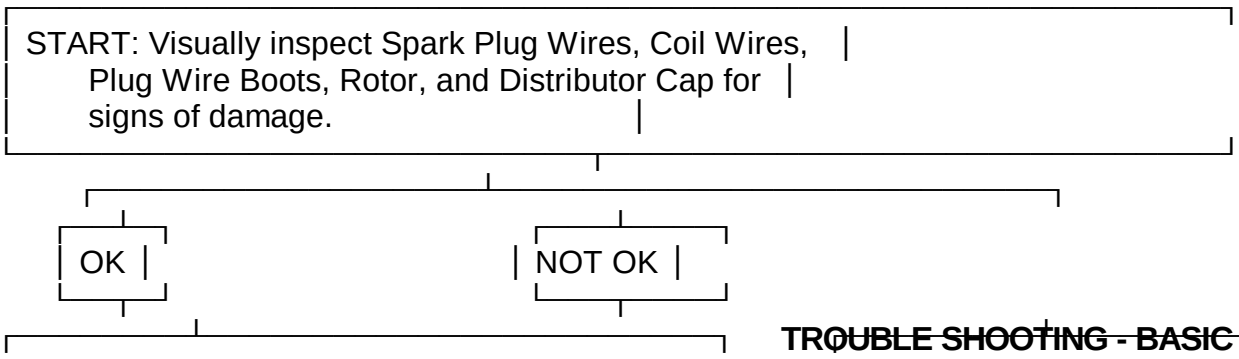
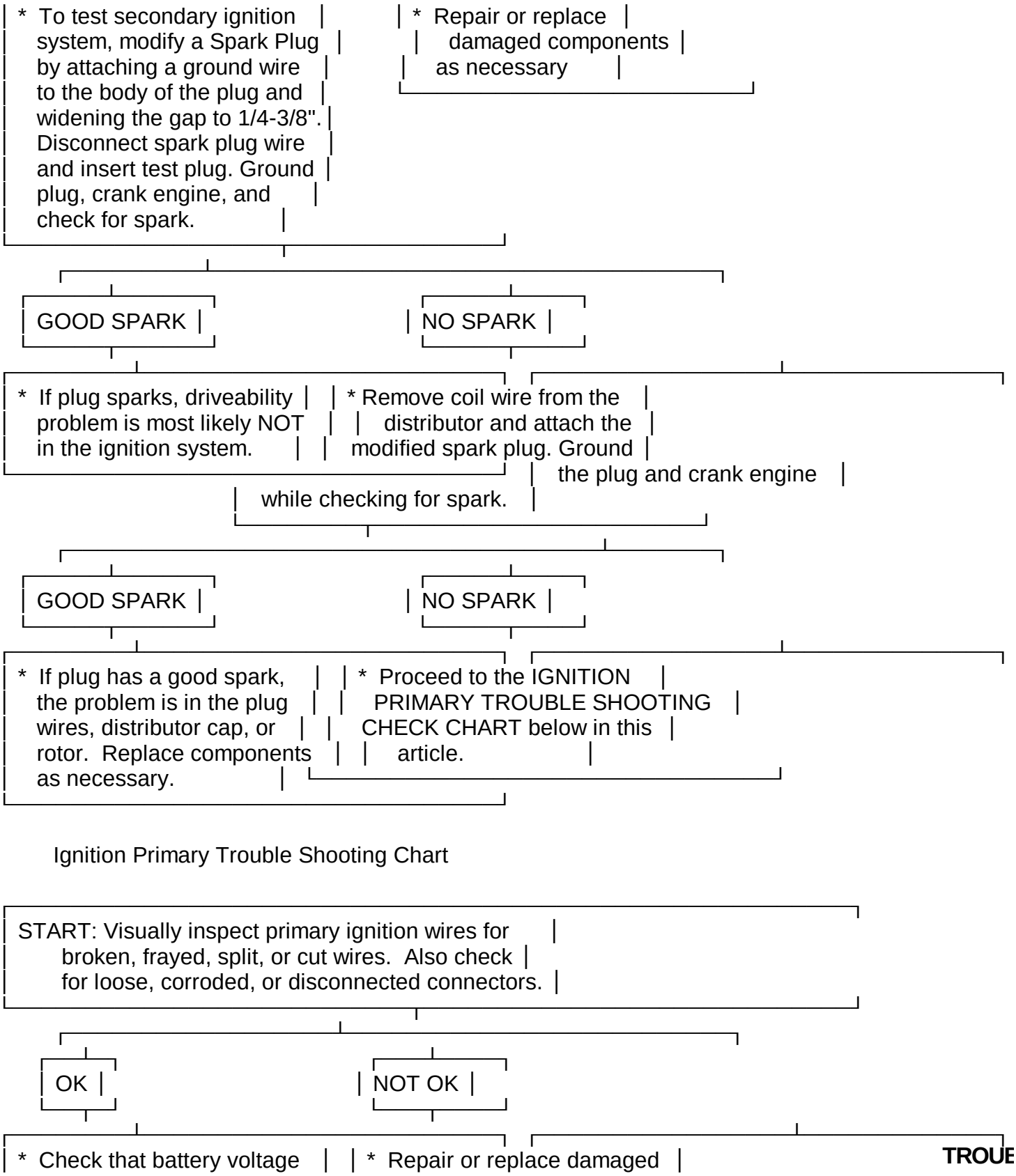
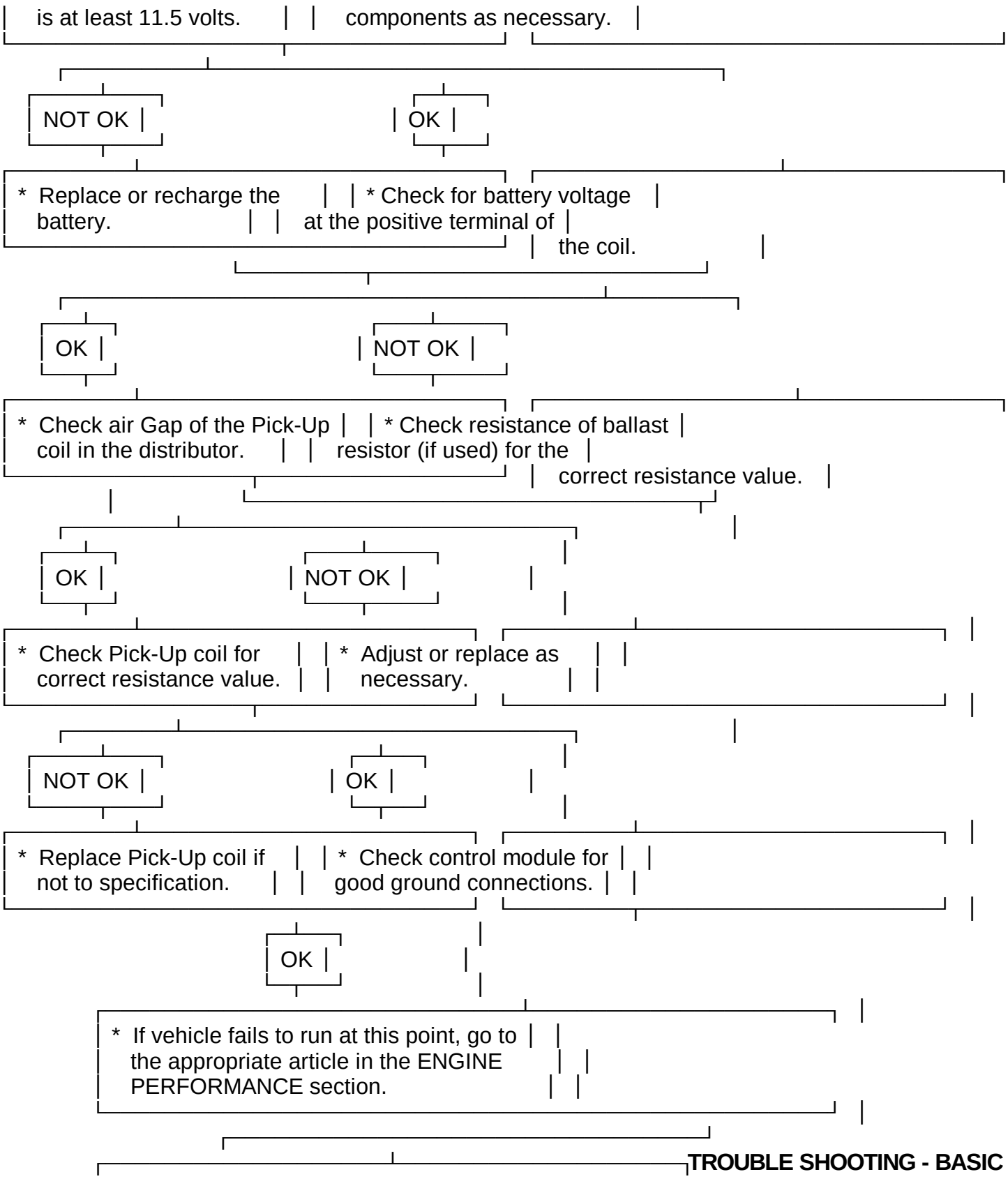
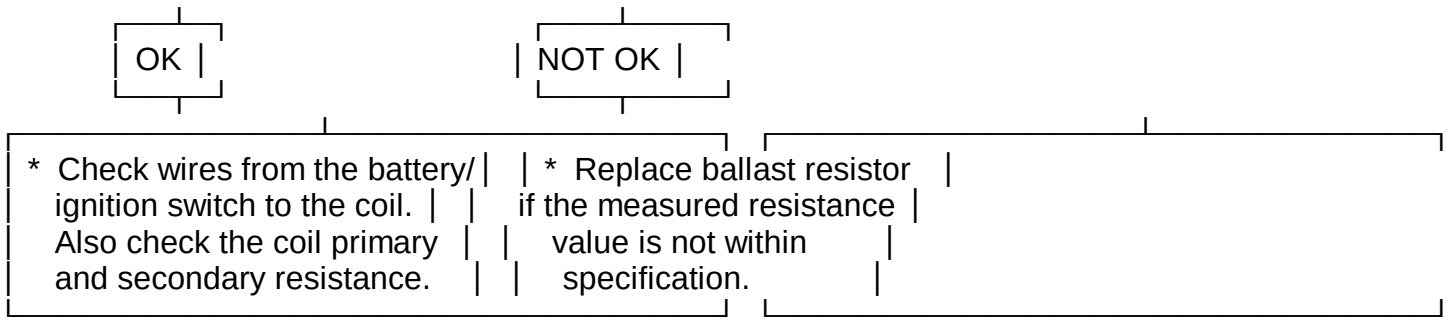
Ignition Secondary Trouble Shooting Chart





Ignition Primary Trouble Shooting Chart





STARTER TROUBLE SHOOTING

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BASIC STARTER TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
Starter Fails to Operate	Dead battery or bad connections between starter and battery	Check battery charge and all wires and connections to starter
	Ignition switch faulty or misadjusted	Adjust or replace ignition switch
	Open circuit between starter switch ignition terminal on starter relay	Check and repair wires and connections as necessary
	Starter relay or starter defective	See Testing in STARTER article
	Open solenoid pull-in wire	See Testing in STARTER article
Starter Does Not Operate and Headlights Dim	Weak battery or dead cell	Charge or replace battery as necessary
	Loose or corroded battery connections	Check that battery connections are clean

		and tight
	Internal ground in starter windings	See Testing in STARTER article
	Grounded starter fields	See Testing in STARTERS
	Armature rubbing on pole shoes	See STARTER article
Starter Turns but Engine Does Not Rotate	Starter clutch slipping	See STARTER article
	Broken clutch housing	See STARTER article
	Pinion shaft rusted or dry	See STARTER article
	Engine basic timing incorrect	See Ignition Timing in TUNE-UP article
	Broken teeth on engine flywheel	Replace flywheel and check for starter pinion gear damage
Starter Will Not Crank Engine	Faulty overrunning clutch	See STARTER article
	Broken clutch housing	See STARTER article
	Broken flywheel teeth	Replace flywheel and check for starter pinion gear damage
	Armature shaft sheared or reduction gear teeth stripped	See STARTER article
	Weak battery	Charge or replace battery as necessary
	Faulty solenoid	See On-Vehicle Tests in STARTER article
	Poor grounds	Check all ground connections for

		tight and clean connections
	Ignition switch faulty or misadjusted	Adjust or replace ignition switch as necessary
Starter Cranks Engine Slowly	Battery weak or defective	Charge or replace battery as necessary
	Engine overheated	See ENGINE COOLING SYSTEM article
	Engine oil too heavy	Check that proper viscosity oil is used
	Poor battery-to-starter connections	Check that all between battery and starter are clean and tight
	Current draw too low or too high	See Bench Tests in STARTER article
	Bent armature, loose pole shoes screws or worn bearings	See STARTER article
	Burned solenoid contacts	Replace solenoid
	Faulty starter	Replace starter
Starter Engages Engine Only Momentarily	Engine timing too far advanced	See Ignition Timing in TUNE-UP article
	Overrunning clutch not engaging properly	Replace overrunning clutch. See STARTER article
	Broken starter clutch	See STARTER article
	Broken teeth on engine flywheel	Replace flywheel and check starter pinion gear for damage

	Weak drive assembly thrust spring	See STARTER article
	Weak hold-in coil	See Bench Tests in STARTER article
Starter Drive Will Not Engage	Defective point assembly	See Testing in STARTER article
	Poor point assembly ground	See Testing in STARTER article
	Defective pull-in coil	Replace starter solenoid
Starter Relay Does Not Close	Dead battery	Charge or replace battery as necessary
	Faulty wiring	Check all wiring and connections leading to relay
	Neutral safety switch faulty	Replace neutral safety switch
	Starter relay faulty	Replace starter relay
Starter Drive Will Not Disengage	Starter motor loose on mountings	Tighten starter attach bolts
	Worn drive end bushing	See STARTER article
	Damaged engine flywheel teeth	Replace flywheel and starter pinion gear for damage
	Drive yolk return spring broken or missing	Replace return spring
	Faulty ignition switch	Replace ignition switch
	Insufficient clearance between winding leads to solenoid terminal and main contact in solenoid	Replace starter solenoid

	Starter clutch not disengaging	Replace starter clutch
	Ignition starter switch contacts sticking	Replace ignition switch
Starter Relay Operates but Solenoid Does Not	Faulty solenoid switch, switch connections or	Check all wiring between relay and solenoid or replace relay or solenoid as necessary
	Broken lead or loose soldered connections	Repair wire or wire connections as necessary
Solenoid Plunger Vibrates When Switch is Engaged	Weak battery	Charge or replace battery as necessary
	Solenoid contacts corroded	Clean contacts or replace solenoid
	Faulty wiring	Check all wiring leading to solenoid
	Broken connections inside switch cover	Repair connections or replace solenoid
	Open hold-in wire	Replace solenoid
Low Current Draw	Worn brushes or weak	Replace brushes or brush springs as necessary
High Pitched Whine During Cranking Before Engine Fires but Engine Fires and Cranks Normally	Distance too great between starter pinion and flywheel	Align starter or check that correct starter and flywheel are being used
High Pitched Whine After Engine Fires With Key released. Engine Fires and Cranks	Distance too small between starter pinion and flywheel Flywheel runout contributes to the intermittent nature	

Normally

AIR CONDITIONING & HEAT

AIR CONDITIONING TROUBLE SHOOTING

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BASIC AIR CONDITIONING TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE
Compressor Not Working	• Compressor clutch circuit open. • Compressor clutch coil inoperative. • Poor clutch ground connection. • Fan belts loose. • Thermostatic switch inoperative. • Thermostatic switch not adjusted. • Ambient temperature switch open. • Superheat fuse blown.
Excessive Noise or Vibration	• Missing or loose mounting bolts. • Bad idler pulley bearings. • Fan belts not tightened correctly. • Compressor clutch contacting body. • Excessive system pressure. • Compressor oil level low. • Damaged clutch bearings. • Damaged reed valves. • Damaged compressor.
Insufficient or No Cooling; Compressor Working	• Expansion valve inoperative. • Heater control valve stuck open. • Low system pressure. • Blocked condenser fins. • Blocked evaporator fins. • Vacuum system leak. • Vacuum motors inoperative.

- Control cables improperly adjusted.
- Restricted air inlet.
- Mode doors binding.
- Blower motor inoperative.
- Temperature above system capacity.

HEATER SYSTEM TROUBLE SHOOTING

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BASIC HEATER SYSTEM TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE
Insufficient, Erratic, or No Heat	• Low Coolant Level • Incorrect thermostat. • Restricted coolant flow through heater core. • Heater hoses plugged. • Misadjusted control cable. • Sticking heater control valve. • Vacuum hose leaking. • Vacuum hose blocked. • Vacuum motors inoperative. • Blocked air inlet. • Inoperative heater blower motor. • Oil residue on heater core fins. • Dirt on heater core fins.
Too Much Heat	• Improperly adjusted cables. • Sticking heater control valve. • No vacuum to heater control valve. • Temperature door stuck open.
Air Flow Changes During Acceleration	• Vacuum system leak. • Bad check valve or reservoir.

Air From Defroster At All Times	• Vacuum system leak. • Improperly adjusted control cables. • Inoperative vacuum motor.
Blower Does Not Operate Correctly	• Blown fuse. • Blower motor windings open. • Resistors burned out. • Motor ground connection loose. • Wiring harness connections loose. • Blower motor switch inoperative. • Blower relay inoperative. • Fan binding or foreign object in housing. • Fan blades broken or bent.

BRAKES

BRAKE SYSTEM TROUBLE SHOOTING

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BRAKE SYSTEM TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
Brakes Pull Left or Right	Incorrect tire pressure	Inflate tires to proper pressure
	Front end out of alignment	See WHEEL ALIGNMENT
	Mismatched tires	Check tires sizes
	Restricted brake lines or hoses	Check hose routing
	Loose or malfunctioning	

	caliper	See DISC BRAKES or BRAKE SYSTEM
	Bent shoe or oily linings	See DRUM BRAKES or BRAKE SYSTEM
	Malfunctioning rear brakes	See DRUM, DISC BRAKES or BRAKE SYSTEM
	Loose suspension parts	See SUSPENSION
Noises Without Brakes Applied	Front linings worn out	Replace linings
	Dust or oil on drums or rotors	See DRUM, DISC BRAKES or BRAKE SYSTEM
Noises With Brakes Applied	Insulator on outboard shoe damaged	See DISC BRAKES or BRAKE SYSTEM
	Incorrect pads or linings	Replace pads or linings
Brake Rough, Chatters or Pulsates	Excessive lateral runout	Check rotor runout
	Parallelism not to specifications	Reface or replace rotor
	Wheel bearings not adjusted	See SUSPENSION
	Rear drums out-of-round	Reface or replace drums
	Disc pad reversed, steel against rotor	Remove and reinstall pad
Excessive Pedal Effort	Malfunctioning power unit	See POWER BRAKES or BRAKE SYSTEM
	Partial system failure	Check fluid and pipes
	Worn disc pad or lining	Replace pad or lining
	Caliper piston stuck or	

	sluggish	See DISC BRAKES or BRAKE SYSTEM
	Master cylinder piston stuck	See MASTER CYLINDERS or BRAKE SYSTEM
	Brake fade due to incorrect pads for linings	Replace pads or linings
	Linings or pads glazed	Replace pads or linings
	Worn drums	Reface or replace drums
Excessive Pedal Travel	Partial brake system failure	Check fluid and pipes
	Insufficient fluid in master cylinder	See MASTER CYLINDERS or BRAKE SYSTEM
	Air trapped in system	See BRAKE BLEEDING or BRAKE SYSTEM
	Rear brakes not adjusted	See Adjustments in DRUM BRAKES or BRAKE SYSTEM
	Bent shoe or lining	See DRUM BRAKES or BRAKE SYSTEM
	Plugged master cylinder cap	See MASTER CYLINDERS or BRAKE SYSTEM
	Improper brake fluid	Replace brake fluid
Pedal Travel Decreasing	Compensating port plugged	See MASTER CYLINDERS or BRAKE SYSTEM
	Swollen cup in master cylinder	See MASTER CYLINDERS or BRAKE SYSTEM
	Master cylinder piston not returning	See MASTER CYLINDERS or BRAKE SYSTEM
	Weak shoe retracting springs	See DRUM BRAKES

		BRAKE SYSTEM
	Wheel cylinder piston sticking	See DRUM BRAKES or BRAKE SYSTEM
Dragging Brakes	Master cylinder pistons not returning	See MASTER CYLINDERS BRAKE SYSTEM
	Restricted brake lines or hoses	Check line routing
	Incorrect parking brake adjustment	See DRUM BRAKES BRAKE SYSTEM
	Parking Brake cables frozen	See DRUM BRAKES BRAKE SYSTEM
	Incorrect installation of inboard disc pad	Remove and replace correctly
	Power booster output rod too long	See POWER BRAKE UNITS BRAKE SYSTEM
	Brake pedal not returning freely	See DISC, DRUM BRAKES BRAKE SYSTEM
Brakes Grab or Uneven Braking Action	Malfunction of combination valve	See CONTROL VALVE or BRAKE SYSTEM
	Malfunction of power brake unit	See POWER BRAKE UNITS or BRAKE SYSTEM
	Binding brake pedal	See DISC, DRUM BRAKES or BRAKE SYSTEM
Pulsation or Roughness	Uneven pad wear caused by caliper	See DISC BRAKES or BRAKE SYSTEM
	Uneven rotor wear	See DISC BRAKES or **TROUBLE SHOOTING - BASIC PROCE**

BRAKE SYSTEM

Drums out-of-round	Reface or replace drums

ENGINE MECHANICAL

COOLING SYSTEM TROUBLE SHOOTING

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COOLING SYSTEM TROUBLE SHOOTING

CONDITION	POSSIBLE CAUSE	CORRECTION
Overheating	Coolant Leak	Fill/Pressure Test System
	A/C Condenser Fins Clogged	Remove/Clean Condenser
	Radiator Fins Clogged	Remove/Clean Radiator
	Thermostat Stuck Closed	Replace Thermostat
	Clogged Cooling System Passages	Clean/Flush Cooling System
	Water Pump Malfunction	Replace Water Pump
	Fan Clutch Malfunction	Replace Fan Clutch
	Retarded Ignition Timing	Reset Ignition Timing
	Cooling Fan Malfunction	Test Cooling Fan/ Circuit
	Cooling Fan Motor Malfunction	Test Fan Motor
	Cooling Fan Relay	

	Malfunction	Test Fan Relay
	Faulty Radiator Cap	Replace Radiator Cap
	Broken/Slipping Fan Belt	Replace Fan Belt
	Restricted Exhaust	Repair Exhaust System
Corrosion	Impurities In Coolant	Clean/Flush System
Coolant Leakage	Damaged hose	Replace Hose
	Leaky Water Pump	Replace Water Pump
	Damaged Radiator Seam	Replace/Repair Radiator
	Leaky Thermostat Cover	Replace Thermostat Cover
	Cylinder Head Problem	Check Head/Head Gasket
	Leaky Freeze Plugs	Replace Freeze Plugs
Recovery System Inoperative		
	Loose and/or Defective Radiator Cap	Replace Radiator Cap
	Overflow Tube Clogged and/or Leaking	Repair Tube
	Recovery Bottle Vent Restricted	Clean Vent
No Heater Core Flow		
	Collapsed Heater Hose	Replace Heater Hose
	Plugged Heater Core	Clean/Replace Heater Core
	Faulty Heater Valve	Replace Heater Valve

GASOLINE ENGINE - MECHANICAL TROUBLE SHOOTING

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BASIC GASOLINE ENGINE - MECHANICAL TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
Engine Lopes At Idle	Intake manifold-to-head leaks	Replace manifold gasket, See ENGINES
	Blown head gasket	Replace head gasket, See ENGINES
	Worn timing gears, chain or sprocket	Replace gears, chain or sprocket
	Worn camshaft lobes	Replace camshaft, See ENGINES
	Overheated engine	Check cooling system, See COOLING
	Blocked crankcase vent valve	Remove restriction
	Leaking EGR valve	Repair leak and/or replace valve
	Faulty fuel pump	Replace fuel pump
Engine Has Low Power	Leaking fuel pump	Repair leak and/or replace fuel pump
	Excessive piston-to-bore clearance	Install larger pistons, See ENGINES
	Sticking valves or weak valve springs	Check valve train components, See ENGINES
	Incorrect valve timing	Reset valve timing, See ENGINES
	Worn camshaft lobes	Replace camshaft, See ENGINES
	Blown head gasket	Replace head gasket. See ENGINES.
	Clutch slipping	Adjust pedal and/or replace components, See ENGINES
	Engine overheating	Check cooling system, See COOLING
	Auto. Trans. pressure regulator valve faulty	Replace pressure regulator valve

	Auto. Trans. fluid level too low	Add fluid as necessary
	Improper vacuum diverter valve operation	Replace vacuum diverter valve
	Vacuum leaks	Inspect vacuum system and repair as required
	Leaking piston rings	Replace piston rings, See ENGINES
Faulty High Speed Operation	Low fuel pump volume	Replace fuel pump
	Leaking valves or worn	Replace valves and/or springs, See ENGINES
	Incorrect valve timing	Reset valve timing,See ENGINES
	Intake manifold restricted	Remove restriction
	Worn distributor shaft	Replace distributor
Faulty Acceleration	Improper fuel pump stroke	Remove pump and reset pump stroke
	Incorrect ignition timing	Reset ignition timing, See TUNE-UP
	Leaking valves	Replace valves, See ENGINES
	Worn fuel pump diaphragm or piston	Replace diaphragm or piston
Intake Backfire	Improper ignition timing	Reset ignition timing, See TUNE-UP
	Faulty accelerator pump discharge	Replace accelerator pump
	Improper choke operation	Check choke and adjust as required
	Defective EGR valve	Replace EGR valve
	Fuel mixture too lean	Reset air/fuel mixture, See TUNE-UP
	Choke valve initial clearance too large	Reset choke valve initial clearance
Exhaust Backfire	Vacuum leak	Inspect and repair vacuum system
	Faulty vacuum diverter valve	Replace vacuum diverter valve
	Faulty choke operation	Check choke and adjust as required

	Exhaust system leak	repair exhaust system leak
Engine Detonation	Ignition timing too far advanced	Reset ignition timing, See TUNE-UP
	Faulty ignition system	Check ignition timing, See TUNE-UP
	Spark plugs loose or faulty	Retighten or replace plugs
	Fuel delivery system clogged	Inspect lines, pump and filter for clog
	EGR valve inoperative	Replace EGR valve
	PCV system inoperative	Inspect and/or replace hoses or valve
	Vacuum leaks	Check vacuum system and repair leaks
	Excessive combustion chamber deposits	Remove built-up deposits
	Leaking, sticking or broken valves	Inspect and/or replace valves
External Oil Leakage	Fuel pump improperly seated or worn gasket	Remove pump, replace gasket and seat properly
	Oil pan gasket broken or pan bent	Straighten pan and replace gasket
	Timing chain cover gasket broken	Replace timing chain cover gasket
	Rear main oil seal worn	Replace rear main oil seal
	Oil pan drain plug not seated properly	Remove and reinstall drain plug
	Camshaft bearing drain hole blocked	Remove restriction
	Oil pressure sending switch leaking	Remove and reinstall sending switch
Excessive Oil Consumption	Worn valve stems or guides	Replace stems or guides, See ENGINES
	Valve "O" ring seals damaged	Replace "O" ring seals, See ENGINES
	Plugged oil drain back holes	Remove restrictions
	Improper PCV valve operation	Replace PCV valve
	Engine oil level too high	Remove excess oil

	Engine oil too thin	Replace thicker oil
	Valve stem oil deflectors damaged	Replace oil deflectors
	Incorrect piston rings	Replace piston rings, See ENGINES
	Piston ring gaps not staggered	Reinstall piston rings, See ENGINES
	Insufficient piston ring tension	Replace rings, See ENGINES
	Piston ring grooves or oil return slots clogged	Replace piston rings, See ENGINES
	Piston rings sticking in grooves	Replace piston rings, See ENGINES
	Piston ring grooves excessively worn	Replace piston and rings, See ENGINES
	Compression rings installed upside down	Replace compression rings correctly, See ENGINES
	Worn or scored cylinder walls	Rebore cylinders or replace block
	Mismatched oil ring expander and rail	Replace oil ring expander and rail, See ENGINES
	Intake gasket dowels too long	Replace intake gasket dowels
	Excessive main or connecting rod bearing clearance	Replace main or connecting rod bearings, See ENGINES
No Oil Pressure	Low oil level	Add oil to proper level
	Oil pressure sender or gauge broken	Replace sender or gauge
	Oil pump malfunction	Remove and overhaul oil pump, See ENGINES
	Oil pressure relief valve sticking	Remove and reinstall valve
	Oil pump passages blocked	Overhaul oil pump, See ENGINES
	Oil pickup screen or tube blocked	remove restriction
	Loose oil inlet tube	Tighten oil inlet tube
	Loose camshaft bearings	Replace camshaft bearings, See ENGINES
	Internal leakage at oil passages	Replace block or cylinder head

Low Oil Pressure	Low engine oil level	Add oil to proper level
	Engine oil too thin	Remove and replace with thicker oil
	Excessive oil pump clearance	Reduce oil pump clearance, See ENGINES
	Oil pickup tube or screen blocked	Remove restrictions
	Main, rod or cam bearing clearance excessive	Replace bearing to reduce clearance, See ENGINES
High Oil Pressure	Improper grade of oil	Replace with proper oil
	Oil pressure relief valve stuck closed	Eliminate binding
	Oil pressure sender or gauge faulty	Replace sender or gauge
Noisy Main Bearings	Inadequate oil supply	Check oil delivery to main bearings
	Excessive main bearing clearance	Replace main bearings, See ENGINES
	Excessive crankshaft end play	Replace crankshaft, See ENGINES
	Loose flywheel or torque converter	Tighten attaching bolts
	Loose or damaged vibration damper	Tighten or replace vibration damper
	Crankshaft journals out-of-round	Re-grind crankshaft journals
	Excessive belt tension	Loosen belt tension
Noisy Connecting Rods	Excessive bearing clearance or missing bearing	Replace bearing, See ENGINES
	Crankshaft rod journal out-of-round	Re-grind crankshaft journal
	Misaligned connecting rod or cap	Remove rod or cap and realign
	Incorrectly tightened rod bolts	Remove and re-tighten rod bolts
Noisy Pistons and Rings	Excessive piston-to-bore clearance	Install larger pistons, See ENGINES
	Bore tapered or out-of-round	Rebore block
	Piston ring broken	Replace piston rings, See ENGINES
	Piston pin loose or seized	Replace piston pin, See

		ENGINES
	Connecting rods misaligned	Realign connecting rods
	Ring side clearance too loose or tight	Replace with larger or smaller rings
	Carbon build-up on piston	Remove carbon
Noisy Valve Train	Worn or bent push rods	Replace push rods, See ENGINES
	Worn rocker arms or bridged pivots	Replace push rods, See ENGINES
	Dirt or chips in valve lifters	Remove lifters and remove dirt/chips
	Excessive valve lifter leak-down	Replace valve lifters, See ENGINES
	Valve lifter face worn	Replace valve lifters, See ENGINES
	Broken or cocked valve springs	replace or reposition springs
	Too much valve stem-to-guide clearance	Replace valve guides, See ENGINES
	Valve bent	Replace valve, See ENGINES
	Loose rocker arms	Retighten rocker arms, See ENGINES
	Excessive valve seat run-out	Reface valve seats, See ENGINES
	Missing valve lock	Install new valve lock
	Excessively worn camshaft lobes	Replace camshaft, See ENGINES
	Plugged valve lifter oil holes	Eliminate restriction or replace lifter
	Faulty valve lifter check ball	Replace lifter check ball, See ENGINES
	Rocker arm nut installed upside down	Remove and reinstall correctly
	Valve lifter incorrect for engine	Remove and replace valve lifters
	Faulty push rod seat or lifter plunger	Replace plunger or push rod
Noisy Valves	Improper valve lash	Re-adjust valve lash, See ENGINES
	Worn or dirty valve lifters	Clean and/or replace lifters
	Worn valve guides	Replace valve guides, See ENGINES

	Excessive valve seat or face run-out	Reface seats or valve face
	Worn camshaft lobes	Replace camshaft, See ENGINES
	Loose rocker arm studs	Re-tighten rocker arm studs, See ENGINES
	Bent push rods	Replace push rods, See ENGINES
	Broken valve springs	Replace valve springs, See ENGINES
Burned,Sticking or Broken Valves	Weak valve springs or warped valves	Replace valves and/or springs, See ENGINES
	Improper lifter clearance	Re-adjust clearance or replace lifters
	Worn guides or improper guide clearance	Replace valve guides, See ENGINES
	Out-of-round valve seats or improper seat width	Re-grind valve seats
	Gum deposits on valve stems, seats or guides	Remove deposits
	Improper spark timing	Re-adjust spark timing
Broken Pistons/Rings	Undersize pistons	Replace with larger pistons, See ENGINES
	Wrong piston rings	Replace with correct rings, See ENGINES
	Out-of-round cylinder bore	Re-bore cylinder bore
	Improper connecting rod alignment	Remove and realign connecting rods
	Excessively worn ring grooves	Replace pistons, See ENGINES
	Improperly assembled piston pins	Re-assemble pin-to -piston, See ENGINES
	Insufficient ring gap clearance	Install new rings, See ENGINES
	Engine overheating	Check cooling system
	Incorrect ignition timing	Re-adjust ignition timing, See TUNE-UP
Excessive Exhaust Noise	Leaks at manifold to head, or to pipe	Replace manifold or pipe gasket
	Exhaust manifold cracked or broken	Replace exhaust manifold, See ENGINES

ENGINE PERFORMANCE

CARBURETOR TROUBLE SHOOTING:

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BASIC COLD START SYMPTOMS TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
Engine Won't Start	Choke not closing	Check choke operation, see FUEL SYSTEMS
	Choke linkage bent	Check linkage, see FUEL SYSTEM
Engine Starts, Then Dies	Choke vacuum kick setting too wide	Check setting and adjust see, FUEL SYSTEMS
	Fast idle RPM too low	Reset RPM to specification, see TUNE-UP
	Fast idle cam index incorrect	Reset fast idle cam index, see FUEL SYSTEMS
	Vacuum leak	Inspect vacuum system for leaks
	Low fuel pump outlet	Repair or replace pump, see FUEL SYSTEMS
	Low carburetor fuel level	Check float setting see FUEL SYSTEM
Engine Quits Under Load	Choke vacuum kick setting Incorrect	Reset vacuum kick setting,see FUEL

		SYSTEMS
	Fast idle cam index incorrect	Reset fast idle cam index, see FUEL SYSTEM
	Incorrect hot fast idle speed RPM	Reset fast idle RPM, see TUNE-UP
Engine Starts, Runs Up,Then Idles, Slowly With Black Smoke	Choke vacuum kick set too narrow	Reset vacuum kick, see FUEL SYSTEMS
	Fast idle cam index incorrect	Reset fast idle cam index, see FUEL SYSTEMS
	Hot fast idle RPM too low	Reset fast idle RPM, see TUNE-UP

BASIC HOT START SYMPTOMS TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
Engine Won't Start	Engine flooded	Allow fuel to evaporate

BASIC COLD ENGINE DRIVEABILITY SYMPTOMS TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
Engine Stalls in Gear	Choke vacuum kick setting incorrect	Reset choke vacuum kick, see FUEL SYSTEMS
	Fast idle RPM incorrect	Reset fast idle RPM, see TUNE-UP
	Fast idle cam index incorrect	Reset fast idle cam see FUEL SYSTEMS
Acceleration Sag or Stall	Defective choke control switch	Replace choke control switch
	Choke vacuum kick setting	Reset choke vacuum

	incorrect	kick see, FUEL SYSTEMS
	Float level incorrect (too low)	Adjust float level, FUEL SYSTEMS
	Accelerator pump defective	Repair or replace pump see FUEL SYSTEMS
	Secondary throttles not closed	Inspect lockout adjustment,see FUEL SYSTEMS
Sag or Stall After Warmup	Defective choke control switch	Replace choke control switch, see FUEL SYSTEMS
	Defective accelerator pump	Replace pump, see FUEL SYSTEMS
	Float level incorrect (too low)	Adjust float level, see FUEL SYSTEMS
Backfiring & Black Smoke	Plugged heat crossover system	Remove restriction

BASIC WARM ENGINE DRIVEABILITY SYMPTOMS TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
Hesitation With Small Amount of Gas Pedal Movement	Vacuum leak	Inspect vacuum lines
	Accelerator pump weak or inoperable	Replace pump, see FUEL SYSTEMS
	Float level setting too low	Reset float level, see,FUEL SYSTEMS
	Metering rods sticking or binding	Inspect and/or replace rods, see FUEL SYSTEMS
	Carburetor idle or transfer	Inspect system and **TROUBLE SHOOTING - BASIC PROC**

	system plugged	remove restriction
	Frozen or binding heated air inlet	Inspect heated air door for binding
Hesitation With Heavy Gas Pedal Movement	Defective accelerator pump	Replace pump, see FUEL SYSTEMS
	Metering rod carrier sticking or binding	Remove restriction
	Large vacuum leak	Inspect vacuum system and repair leak
	Float level setting too low	Reset float level, see FUEL SYSTEMS
	Defective fuel pump, lines or filter	Inspect pump, lines and filter
	Air door setting incorrect	Adjust air door setting, see FUEL

DIESEL ENGINE TROUBLE SHOOTING

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NOTE: Diesel engines mechanical diagnosis is the same as gasoline engines for items such as noisy valves, bearings, pistons, etc. The following trouble shooting covers only items pertaining to diesel engines.

BASIC DIESEL ENGINE TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
Engine Won't	Bad battery connections	Check connections

Crank	or dead batteries	and/or replace batteries
	Bad starter connections	Check connections
	or bad starter	and/or replace batteries

Engine Cranks Slowly, Won't Start	Bad battery connections or dead batteries	Check connections and/or replace batteries
	Engine oil too heavy	Replace engine oil

Engine Cranks Normally, But Will Not Start	Glow plugs not functioning	Check glow plug system, see FUEL SYSTEMS
	Glow plug control not functioning	Check controller, see FUEL SYSTEMS
	Fuel not injected into cylinders	Check fuel injectors, see FUEL SYSTEMS
	No fuel to injection pump	Check fuel delivery system
	Fuel filter blocked	Replace fuel filter
	Fuel tank filter blocked	Replace fuel tank filter
	Fuel pump not operating	Check pump operation and/or replace pump
	Fuel return system blocked	Inspect system and remove restriction
	No voltage to fuel solenoid	Check solenoid and connections
	Incorrect or contaminated fuel	Replace fuel
	Incorrect injection pump timing	Re-adjust pump timing, see FUEL SYSTEMS
	Low compression	Check valves, pistons, rings, see ENGINES
	Injection pump malfunction	Inspect and/or replace injection pump

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Engine Starts, Won't Idle	Incorrect slow idle adjustment	Reset idle adjustment, see TUNE-UP
	Fast idle solenoid malfunctioning	Check solenoid and connections
	Fuel return system blocked	Check system and remove restrictions
	Glow plugs go off too soon	See glow plug diagnosis in FUEL SYSTEMS
	Injection pump timing	Reset pump timing, see

	incorrect	FUEL SYSTEMS
	No fuel to injection pump	Check fuel delivery system
	Incorrect or contaminated fuel	Replace fuel
	Low compression	Check valves, piston, rings, see ENGINES
	Injection pump malfunction	Replace injection pump, see FUEL SYSTEMS
	Fuel solenoid closes in RUN position	Check solenoid and connections
Engines Starts/ Idles Rough W/out Smoke or Noise	Incorrect slow idle adjustment	Reset slow idle, see TUNE-UP
	Injection line fuel leaks	Check lines and connections
	Fuel return system blocked	Check lines and connections
	Air in fuel system	Bleed air from system
	Incorrect or contaminated fuel	Replace fuel
	Injector nozzle malfunction	Check nozzles, see FUEL SYSTEMS
Engines Starts and Idles Rough W/out Smoke or Noise, But Clears After Warm-Up	Injection pump timing incorrect	Reset pump timing, see FUEL SYSTEMS
	Engine not fully broken in	Put more miles on engine
	Air in system	Bleed air from system
	Injector nozzle malfunction	Check nozzles, see FUEL SYSTEMS
Engine Idles Correctly, Misfires Above Idle	Blocked fuel filter	Replace fuel filter
	Injection pump timing incorrect	Reset pump timing, see FUEL SYSTEMS
	Incorrect or contaminated fuel	Replace fuel
Engine Won't Return To Idle	Fast idle adjustment incorrect	Reset fast idle, see TUNE-UP
	Internal injection pump malfunction	Replace injection pump, see FUEL SYSTEMS
	External linkage binding	Check linkage and remove binding
Fuel Leaks On	Loose or broken fuel line	Check lines and

	Ground		connections
		Internal injection pump seal leak	Replace injection pump, see FUEL SYSTEMS
Cylinder Knocking Noise	Injector nozzles sticking open		Test injectors, see FUEL SYSTEMS
		Very low nozzle opening pressure	Test injectors and/or replace
Loss of Engine Power	Restricted air intake		Remove restriction
	EGR valve malfunction		Replace EGR valve
	Blocked or damaged exhaust system		Remove restriction and/or replace components
	Blocked fuel tank filter		Replace filter
	Restricted fuel filter		Remove restriction and/or replace filter
	Block vent in gas cap		Remove restriction and/or replace cap
	Tank-to-injection pump fuel supply blocked		Check fuel lines and connections
	Blocked fuel return system		Remove restriction
	Incorrect or contaminated fuel		Replace fuel
	Blocked injector nozzles		Check nozzle for blockage, see FUEL SYSTEMS
	Low compression		Check valves, rings, pistons, see ENGINES
Loud Engine Noise With Black Smoke	Basic timing incorrect		Reset timing, see FUEL SYSTEMS
	EGR valve malfunction		Replace EGR valve
	Internal injection pump malfunction		Replace injection pump, see FUEL SYSTEMS
	Incorrect injector pump housing pressure		Check pressure, see FUEL SYSTEMS
Engine Overheating	Cooling system leaks		Check cooling system and repair leaks
	Belt slipping or damaged		Check tension and/or replace belt
	Thermostat stuck closed		Remove and replace thermostat, see ENGINE COOLING
	Head gasket leaking		Replace head gasket

Oil Light on at Idle	Low oil pump pressure	Check oil pump operation, see ENGINES
	Oil cooler or line restricted	Remove restriction and/or replace cooler

Engine Won't Shut Off	Injector pump fuel solenoid does not return fuel valve to OFF position	Remove and check solenoid and replace if needed

VACUUM PUMP DIAGNOSIS

Excessive Noise	Loose pump-to-drive assembly screws	Tighten screws
	Loose tube on pump assembly	Tighten tube
	Valves not functioning properly	Replace valves
Oil Leakage	Loose end plug	Tighten end plug
	Bad seal crimp	Remove and re-crimp seal

FUEL INJECTION TROUBLE SHOOTING

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BASIC FUEL INJECTION TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
Engine Won't Start (Cranks Normally)	Cold start valve inoperative	Test valve and circuit
	Poor connection;vacuum or wiring	Check vacuum and electrical connections
	Contaminated fuel	Test fuel for water or alcohol

	Defective fuel pump relay or circuit	Test relay and wiring
	Battery too low	Charge and test battery
	Low fuel pressure	Test pressure regulator and fuel pump, check for restricted lines and filters
	No distributor reference pulses	Repair ignition system as necessary
	Open coolant temperature sensor circuit	Test sensor and wiring
	Shorted W.O.T. switch in T.P.S.	Disconnect W.O.T. switch, engine should start
	Defective ECM	Replace ECM
	Fuel tank residual pressure valve leaks	Test for fuel pressure drop after shut down
Hard Starting	Disconnected hot air tube to air cleaner	Reconnect tube and test control valve
	Defective Idle Air Control (IAC) valve	Test valve operation and circuit
	Shorted, open or misadjusted T.P.S.	Test and adjust or replace T.P.S.
	EGR valve open	Test EGR valve and control circuit
	Poor Oxygen sensor signal	Test for shorted or circuit
	Incorrect mixture from PCV system	Test PCV for flow, check sealing of oil filter cap

Poor High Speed Operation	Low fuel pump volume	Faulty pump or restricted fuel lines or filters
	Poor MAP sensor signal	Test MAP sensor, vacuum hose and wiring
	Poor Oxygen sensor signal	Test for shorted or open sensor or circuit
	Open coolant temperature sensor circuit	Test sensor and wiring
	Faulty ignition operation	Check wires for cracks or poor connections, test secondary voltage with oscilloscope
	Contaminated fuel	Test fuel for water or alcohol
	Intermittent ECM ground	Test ECM ground connection for resistance
	Restricted air cleaner	Replace air cleaner
	Restricted exhaust system	Test for exhaust manifold back pressure
	Poor MAF sensor signal	Check leakage between sensor and manifold
	Poor VSS signal	If tester for ALCL hook-up is available check that VSS reading matches speedometer
Ping or Knock on	Poor Knock sensor signal	Test for shorted or

Acceleration		open sensor or circuit
	Poor Baro sensor signal	Test for shorted or open sensor or circuit
	Improper ignition timing	See VEHICLE EMISSION CONTROL LABEL (where applicable)
	Check for engine overheating problems	Low coolant, loose belts or electric cooling fan inoperative

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NOTE: For additional electronic fuel injection trouble shooting information, see the appropriate article in the ENGINE PERFORMANCE section (not all vehicles have Computer Engine Control articles). Information is provided there for diagnosing fuel system problems on vehicles with electronic fuel injection.

IGNITION SYSTEM TROUBLE SHOOTING

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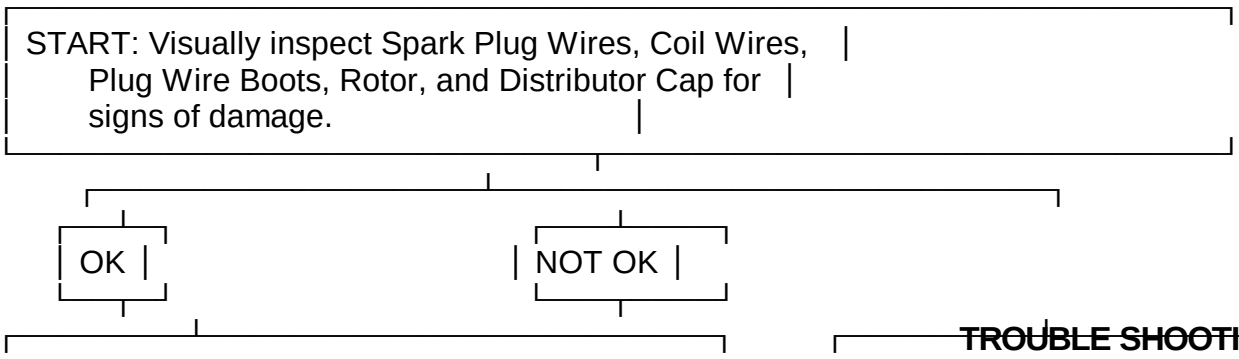
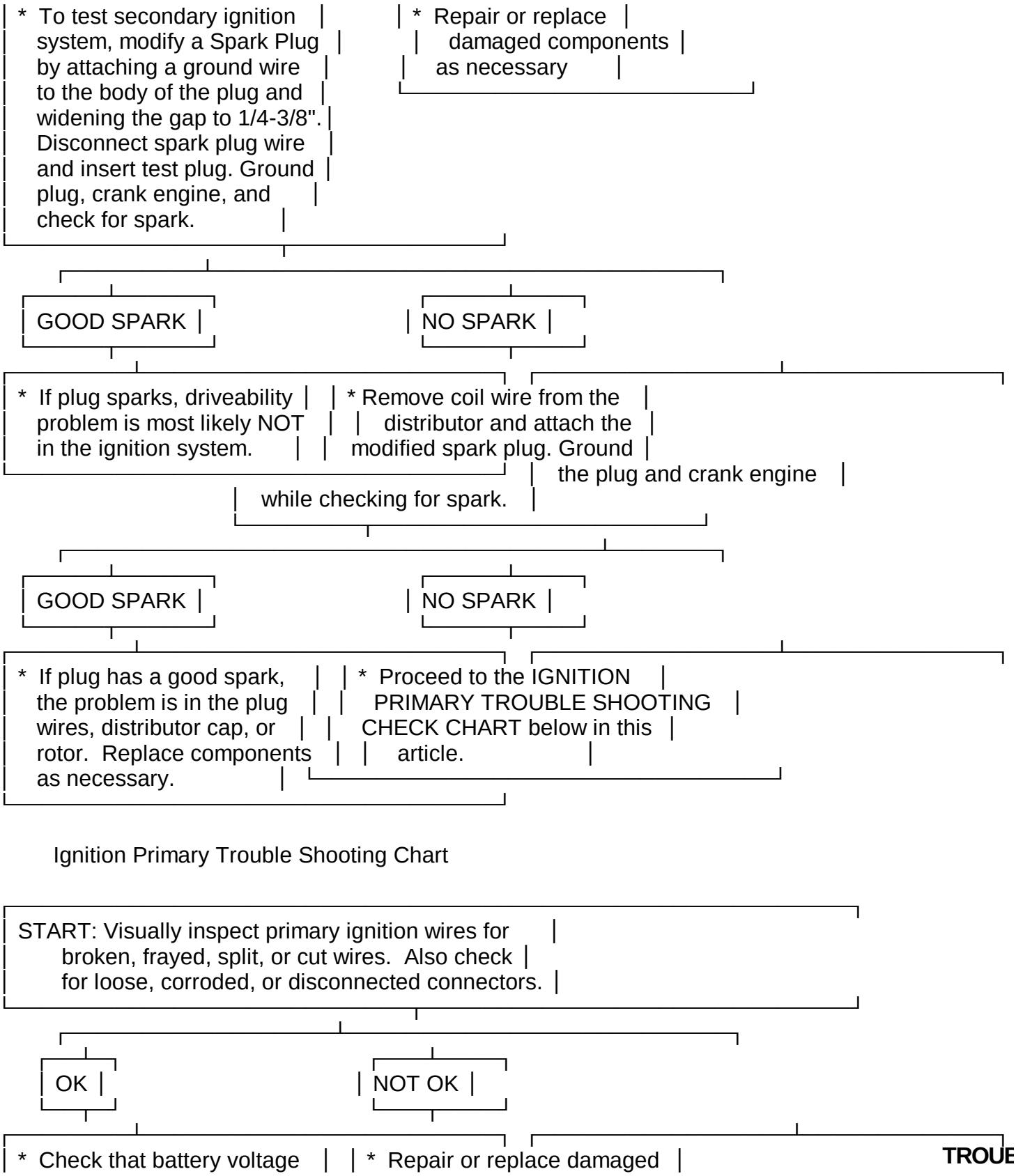
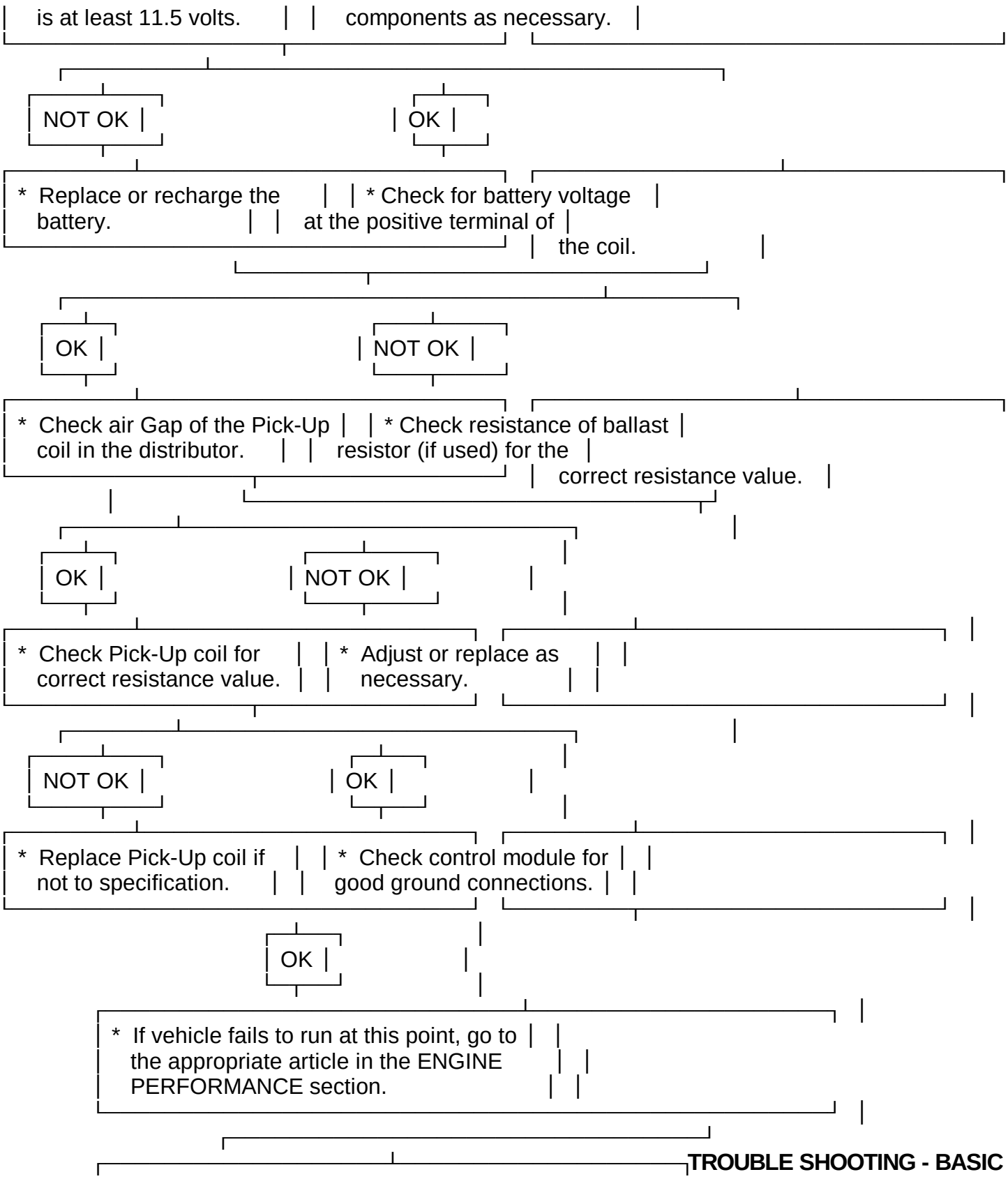
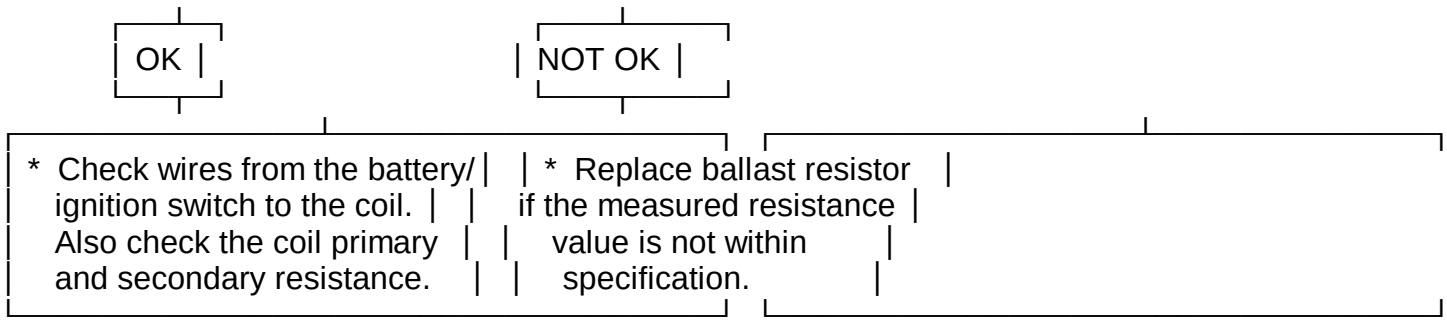
Ignition Secondary Trouble Shooting Chart





Ignition Primary Trouble Shooting Chart





STARTER TROUBLE SHOOTING

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BASIC STARTER TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
Starter Fails to Operate	Dead battery or bad connections between starter and battery	Check battery charge and all wires and connections to starter
	Ignition switch faulty or misadjusted	Adjust or replace ignition switch
	Open circuit between starter switch ignition terminal on starter relay	Check and repair wires and connections as necessary
	Starter relay or starter defective	See Testing in STARTER article
	Open solenoid pull-in wire	See Testing in STARTER article
Starter Does Not Operate and Headlights Dim	Weak battery or dead cell	Charge or replace battery as necessary
	Loose or corroded battery connections	Check that battery connections are clean

		and tight
	Internal ground in starter windings	See Testing in STARTER article
	Grounded starter fields	See Testing in STARTERS
	Armature rubbing on pole shoes	See STARTER article
Starter Turns but Engine Does Not Rotate	Starter clutch slipping	See STARTER article
	Broken clutch housing	See STARTER article
	Pinion shaft rusted or dry	See STARTER article
	Engine basic timing incorrect	See Ignition Timing in TUNE-UP article
	Broken teeth on engine flywheel	Replace flywheel and check for starter pinion gear damage
Starter Will Not Crank Engine	Faulty overrunning clutch	See STARTER article
	Broken clutch housing	See STARTER article
	Broken flywheel teeth	Replace flywheel and check for starter pinion gear damage
	Armature shaft sheared or reduction gear teeth stripped	See STARTER article
	Weak battery	Charge or replace battery as necessary
	Faulty solenoid	See On-Vehicle Tests in STARTER article
	Poor grounds	Check all ground connections for

		tight and clean connections
	Ignition switch faulty or misadjusted	Adjust or replace ignition switch as necessary
Starter Cranks Engine Slowly	Battery weak or defective	Charge or replace battery as necessary
	Engine overheated	See ENGINE COOLING SYSTEM article
	Engine oil too heavy	Check that proper viscosity oil is used
	Poor battery-to-starter connections	Check that all between battery and starter are clean and tight
	Current draw too low or too high	See Bench Tests in STARTER article
	Bent armature, loose pole shoes screws or worn bearings	See STARTER article
	Burned solenoid contacts	Replace solenoid
	Faulty starter	Replace starter
Starter Engages Engine Only Momentarily	Engine timing too far advanced	See Ignition Timing in TUNE-UP article
	Overrunning clutch not engaging properly	Replace overrunning clutch. See STARTER article
	Broken starter clutch	See STARTER article
	Broken teeth on engine flywheel	Replace flywheel and check starter pinion gear for damage

		Weak drive assembly thrust spring	See STARTER article
		Weak hold-in coil	See Bench Tests in STARTER article
Starter Drive Will Not Engage	Defective point assembly		See Testing in STARTER article
		Poor point assembly ground	See Testing in STARTER article
		Defective pull-in coil	Replace starter solenoid
Starter Relay Does Not Close	Dead battery		Charge or replace battery as necessary
		Faulty wiring	Check all wiring and connections leading to relay
		Neutral safety switch faulty	Replace neutral safety switch
		Starter relay faulty	Replace starter relay
Starter Drive Will Not Disengage	Starter motor loose on mountings		Tighten starter attach bolts
		Worn drive end bushing	See STARTER article
		Damaged engine flywheel teeth	Replace flywheel and starter pinion gear for damage
		Drive yolk return spring broken or missing	Replace return spring
		Faulty ignition switch	Replace ignition switch
		Insufficient clearance between winding leads to solenoid terminal and main contact in solenoid	Replace starter solenoid

	Starter clutch not disengaging	Replace starter clutch
	Ignition starter switch contacts sticking	Replace ignition switch
Starter Relay Operates but Solenoid Does Not	Faulty solenoid switch, switch connections or	Check all wiring between relay and solenoid or replace relay or solenoid as necessary
	Broken lead or loose soldered connections	Repair wire or wire connections as necessary
Solenoid Plunger Vibrates When Switch is Engaged	Weak battery	Charge or replace battery as necessary
	Solenoid contacts corroded	Clean contacts or replace solenoid
	Faulty wiring	Check all wiring leading to solenoid
	Broken connections inside switch cover	Repair connections or replace solenoid
	Open hold-in wire	Replace solenoid
Low Current Draw	Worn brushes or weak	Replace brushes or brush springs as necessary
High Pitched Whine During Cranking Before Engine Fires but Engine Fires and Cranks Normally	Distance too great between starter pinion and flywheel	Align starter or check that correct starter and flywheel are being used
High Pitched Whine After Engine Fires With Key released. Engine Fires and Cranks	Distance too small between starter pinion and flywheel Flywheel runout contributes to the intermittent nature	

Normally

TUNE-UP TROUBLE SHOOTING - GAS ENGINE VEHICLES

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BASIC SPARK PLUG TROUBLE SHOOTING CHARTS

CONDITION	POSSIBLE CAUSE	CORRECTION
Normal Spark Plug Condition	Light Tan or Gray deposits	No Action
	Electrode not burned or fouled	No Action
	Gap tolerance not changed	No Action
Cold Fouling or Carbon Deposits	Overrich air/fuel mixture	Adjust air/fuel mixture, see ENGINE PERFORMANCE section
	Faulty choke	Replace choke assembly, see ENGINE PERFORMANCE section
	Clogged air filter	Clean and/or replace air filter
	Incorrect idle speed or dirty carburetor	Reset idle speed and/or clean carburetor
	Faulty ignition wires	Replace ignition wiring
	Prolonged operation at idle	Shut engine off during long idle
	Sticking valves or worn valve guides	Check valve train

Wet Fouling or Oil Deposits	Worn rings and pistons	Install new rings and pistons
	Excessive cylinder wear	Rebore or replace block
	Excessive valve guide clearance	Worn or loose bearing
Gap Bridged	Deposits in combustion chamber becoming fused to electrode	Clean combustion chamber of deposits
Blistered Electrode	Engine overheating	Check cooling system
	Wrong type of fuel	Replace with correct fuel
	Loose spark plugs	Retighten spark plugs
	Over-advanced ignition timing	Reset ignition timing see ENGINE PERFORMANCE
Pre-Ignition or Melted Electrodes	Incorrect type of fuel	Replace with correct fuel
	Incorrect ignition timing	Reset ignition timing see ENGINE PERFORMANCE
	Burned valves	Replace valves
	Engine Overheating	Check cooling system
	Wrong type of spark plug, too hot	Replace with correct spark plug, see ENGINE PERFORMANCE
Chipped Insulators	Severe detonation	Check for over-advanced timing or combustion
	Improper gapping procedure	Re-gap spark plugs
Rust Colored	Additives in unleaded	Try different fuel

Deposits	fuel	brand
Water In Combustion Chamber	Blown head gasket or cracked head	Repair or replace head or head gasket

NOTE: Before diagnosing an electronic ignition system, ensure that all wiring is connected properly between distributor, wiring connector and spark plugs. Ignition problem will show up either as: Engine Will Not Start or Engine Runs Rough.

BASIC ELECTRONIC IGNITION TROUBLE SHOOTING CHARTS

CONDITION	POSSIBLE CAUSE	CORRECTION
Engine Won't Start	Open circuit between distributor and bulkhead connector	Repair circuit
	Open circuit between bulkhead connector and ignition switch	Repair circuit
	Open circuit between ignition switch and starter solenoid	Repair circuit
Engine Runs Rough	Fuel lines leaking or clogged	Tighten fitting, remove restriction
	Initial timing incorrect	Reset ignition timing see ENGINE PERFORMANCE
	Centrifugal advance malfunction	Repair distributor advance
	Defective spark plugs or wiring	Replace plugs or plug wiring
Component Failure	Spark arc-over on cap, rotor or coil	Replace cap, rotor or coil
	Defective pick-up coil	Replace pick-up coil
	Defective ignition coil	Replace ignition coil

	Defective vacuum unit	Replace vacuum unit
	Defective control module	Replace control module

BASIC ELECTRONIC IGNITION TROUBLE SHOOTING CHARTS - USING OSCILLOSCOPE PATTERNS

CONDITION	POSSIBLE CAUSE	CORRECTION
Firing Voltage Lines are the Same, but Abnormally High	Retarded ignition timing	Reset ignition timing, see ENGINE PERFORMANCE section
	Fuel mixture too lean	Readjust carburetor, see ENGINE PERFORMANCE
	High resistance in coil wire	Replace coil wire
	Corrosion in coil tower terminal	Clean and/or replace coil
	Corrosion in distributor coil terminal	Clean and/or replace distributor cap
Firing Voltage Lines are the Same but Abnormally Low	Fuel mixture too rich	Readjust carburetor, see ENGINE PERFORMANCE
	Breaks in coil wire causing arcing	Replace coil wire
	Cracked coil tower causing arcing	Replace coil
	Low coil output	Replace coil
	Low engine compression	Determine cause and repair
One or More, But Not All Firing Voltage Lines are Higher Than Others	Carburetor idle mixture not balanced	Readjust carburetor, see ENGINE PERFORMANCE
	EGR valve stuck open	Clean and/or replace valve

	High resistance in spark plug wires	Replace spark plug wires
	Cracked or broken spark plug insulator	Replace spark plugs
	Intake vacuum leak	Repair leak
	Defective spark plugs	Replace spark plugs
	Corroded spark plug terminals	Replace spark plugs
One or More, But Not All Firing	Curb idle mixture not balanced	Readjust carburetor, see ENGINE PERFORMANCE
Voltage Lines Are Lower Than Others	Breaks in plug wires causing arcing	Replace plug wires
	Cracked coil tower causing arcing	Replace coil
	Low compression	Determine cause and repair
	Defective spark plugs	Replace spark plugs
	Corroded spark plugs	Replace spark plugs
Cylinders Not Firing	Cracked distributor cap terminals	Replace distributor cap
	Shorted spark plug wire	Determine cause and repair
	Mechanical problem in engine	Determine cause and repair
	Defective spark plugs	Replace spark plugs
	Spark plugs fouled	Replace spark plugs

BASIC DRIVEABILITY PROBLEMS TROUBLE SHOOTING TABLE

Hard Starting	Binding carburetor linkage	Eliminate binding
	Binding choke linkage	Eliminate binding
	Binding choke piston	Eliminate binding
	Restricted choke vacuum	Check vacuum lines for blockage
	Worn or dirty needle valve and seat	Clean carburetor, see ENGINE PERFORMANCE
	Float sticking	Readjust or replace float see the ENGINE PERFORMANCE section
	Incorrect choke adjustment	Reset choke adjustment see ENGINE PERFORMANCE
	Defective coil	Replace coil
	Improper spark plug gap	Regap spark plugs
	Incorrect ignition timing	Reset ignition timing see ENGINE PERFORMANCE
Detonation	Over-advanced ignition timing	Reset ignition timing see ENGINE PERFORMANCE
	Defective spark plugs	Replace spark plugs
	Fuel lines clogged	Clean fuel lines
	EGR system malfunction	Check and repair EGR system
	PCV system malfunction	Repair PCV system
	Vacuum leaks	Check and repair vacuum system
	Loose fan belts	Tighten or replace fan belts, see ENGINE PERFORMANCE

	Restricted airflow	Remove restriction
	Vacuum advance malfunction	Check distributor operation
Dieseling	Binding carburetor linkage	Eliminate binding
	Binding throttle linkage	Eliminate blinding
	Binding choke linkage or fast idle cam	Eliminate binding
	Defective idle solenoid	Replace idle solenoid see ENGINE PERFORMANCE
	Improper base idle speed	Reset idle speed, see see ENGINE PERFORMANCE
	Incorrect ignition timing	Reset ignition timing see ENGINE PERFORMANCE
	Incorrect idle mixture setting	Reset idle mixture, see ENGINE PERFORMANCE
Faulty Acceleration	Incorrect ignition timing	Reset ignition timing see ENGINE PERFORMANCE
	Engine cold and choke too lean	Adjust choke and allow engine to warm-up
	Defective spark plugs	Replace spark plugs
	Defective coil	Replace coil
Faulty Low Speed Operation	Clogged idle transfer slots	Clean idle transfer slots, see FUEL
	Restricted idle air bleeds and passages	Disassemble and clean carburetor, see FUEL
	Clogged air cleaner	Replace air filter
	Defective spark plugs	Replace spark plugs
	Defective ignition wires	Replace ignition wires

		see ENGINE PERFORMANCE
	Defective distributor cap	Replace distributor cap
Faulty High Speed Operation	Incorrect ignition timing	Reset ignition timing see ENGINE PERFORMANCE
	Defective distributor centrifugal advance	Replace advance mechanism
	Defective distributor vacuum advance	Replace advance unit
	Incorrect spark plugs or plug gap	Check gap and/or replace spark plugs
	Faulty choke operation	Check choke and repair as required
	Clogged vacuum passages	Remove restrictions
	Improper size or clogged main jet	Check jet size and clean, see FUEL
	Restricted air cleaner	Check filter and replace as necessary
	Defective distributor cap, rotor or coil	Replace cap, rotor or coil
Misfire at All Speeds	Defective spark plugs	Replace spark plugs
	Defective spark plug wires	Replace spark plug wires
	Defective distributor cap, rotor, or coil	Replace cap, rotor, or coil
	Cracked or broken vacuum hoses	Replace vacuum hoses
	Vacuum leaks	Repair vacuum leaks
	Fuel lines clogged	Remove restriction

Hesitation	Cracked or broken vacuum hoses	Replace vacuum hoses
	Vacuum leaks	Repair Vacuum leaks
	Binding carburetor linkage	Eliminate binding
	Binding throttle linkage	Eliminate binding
	Binding choke linkage or fast idle cam	Eliminate binding
	Improper float setting	Readjust float setting, see FUEL
	Cracked or broken ignition wires	Replace ignition wires
Rough idle, Missing or Stalling	Incorrect curb idle or fast idle speed	Reset idle speed, see see ENGINE PERFORMANCE
	Incorrect basic timing	Reset ignition timing see ENGINE PERFORMANCE
	Improper idle mixture adjustment	Reset idle mixture, see ENGINE PERFORMANCE
	Improper feedback system operation	Check feedback system see ENGINE PERFORMANCE
	Incorrect spark plug gap	Reset spark plug gap, see ENGINE PERFORMANCE
	Moisture in ignition components	Dry components
	Loose or broken ignition wires	Replace ignition wires
	Damaged distributor cap or or rotor	Replace distributor cap or rotor
	Faulty ignition coil	Replace ignition coil
	Fuel filter clogged or worn	Replace fuel filte

Damaged idle mixture screw	Replace idle mixture screw, see FUEL
Improper fast idle cam adjustment	Reset fast idle cam adjustment, see TUNE-see ENGINE PERFORMANCE
Improper EGR valve operation	Replace EGR valve
Faulty PCV valve air flow	Replace PCV valve
Choke binding or improper choke setting	Reset choke or eliminate binding
Vacuum leak	Repair vacuum leak
Improper float bowl fuel level	Reset float adjustment, see FUEL
Clogged air bleed or idle passages	Clean carburetor passages, see FUEL
Clogged or worn air cleaner filter	Replace air filter
Faulty choke vacuum diaphragm	Replace diaphragm, see ENGINE PERFORMANCE
Exhaust manifold heat valve inoperative	Replace heat valve
Improper distributor spark advance	Check distributor operation
Leaking valves or valve components	Check and repair valvetrain
Improper carburetor mounting	Remove and remount carburetor
Excessive play in distributor shaft	Replace distributor
Loose or corroded wiring connections	Repair or replace as required

Engine Surges	Improper PCV valve airflow	Replace PCV valve
	Vacuum leaks	Repair vacuum leaks
	Clogged air bleeds	Remove restriction
	EGR valve malfunction	Replace EGR valve
	Restricted air cleaner filter	Replace air filter
	Cracked or broken vacuum hoses	Replace vacuum hoses
	Cracked or broken ignition wires	Replace ignition wires
	Vacuum advance malfunction	Check unit and replace as necessary
	Defective or fouled spark plugs	Replace spark plugs
Ping or Spark Knock	Incorrect ignition timing	Reset ignition timing see ENGINE PERFORMANCE
	Distributor centrifugal or vacuum advance malfunction	Check operation and replace as necessary
	Carburetor setting too lean	Readjust mixture setting, see ENGINE PERFORMANCE
	Vacuum leak	Eliminate vacuum leak
	EGR valve malfunction	Replace EGR valve
Poor Gasoline Mileage	Cracked or broken vacuum hoses	Replace vacuum hoses
	Vacuum leaks	Repair vacuum leaks
	Defective ignition wires	Replace wires
	Incorrect choke setting	Readjust setting, see

ENGINE PERFORMANCE

	Defective vacuum advance	Replace vacuum advance
	Defective spark plugs	Replace spark plugs
	Binding carburetor power piston	Eliminate binding
	Dirt in carburetor jets	Clean and/or replace jets
	Incorrect float adjustment	Readjust float setting, see FUEL
	Defective power valve	Replace power valve, see ENGINE PERFORMANCE
	Incorrect idle speed	Readjust idle speed
Engine Stalls	Improper float level	Readjust float level
	Leaking needle valve and seat	Replace needle valve and seat
	Vacuum leaks	Eliminate vacuum leaks

VACUUM PUMP - DIESEL TROUBLE SHOOTING

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NOTE: Diesel engines mechanical diagnosis is the same as gasoline engines for items such as noisy valves, bearings, pistons, etc. The following trouble shooting covers only items pertaining to diesel engines.

VACUUM PUMP (DIESEL) TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
Excessive Noise	Loose pump-to-drive assembly screws	Tighten screws
	Loose tube on pump assembly	Tighten tube
	Valves not functioning properly	Replace valves
Oil Leakage	Loose end plug	Tighten end plug
	Bad seal crimp	Remove and re-crimp seal

MANUAL TRANSMISSION

MANUAL TRANSMISSION TROUBLE SHOOTING

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MANUAL TRANSMISSION/TRANSAXLE TROUBLE SHOOTING

Condition	Possible Cause
Noisy In Forward Gears	.Low gear oil level, .Loose bell housing bolts, .Worn bearings or gears
Clunk On Deceleration (FWD Only)	.Loose engine mounts, .Worn inboard CV joints, .Worn differential pinion shaft, .Side gear hub counterbore in case worn oversize
Gear Clash When Shifting Forward Gears	.Clutch Out Of Adjustment, .Shift linkage damaged or out of adjustment, .Gears or synchronizers damaged, .Low gear oil level

Transmission Noisy When Moving (RWD Only) Quiet In Neutral With Clutch Engaged	.Worn rear outputshaft bearing
Gear Rattle	.Worn bearings, .Wrong gear oil, .Low gear oil, .Worn gears
Steady Ticking At Idle (Increases With RPM)	.Broken tooth on gear
Gear Clash When Shifting Forward Gears	.Worn or broken synchronizers
Loud Whine In Reverse	.Normal condition (1)
Noise When Stepping On Clutch	.Bad release bearing, .Worn pilot bearing
Ticking Or Screeching As Clutch Is Engaged	.Faulty release bearing, .Uneven pressure plate fingers
Click Or Snap When Clutch Is Engaged	.Worn clutch fork, .Worn or broken front bearing retainer
Transmission Shifts Hard	.Clutch not releasing, .Shift mechanism binding, .Clutch installed backwards
Will Not Shift Into One Gear, Shifts Into All Others	.Bent shift fork, .Worn detent balls
Locked Into Gear, Cannot Shift	.Clutch adjustment, .Worn detent balls
Transmission Jumps Out Of Gear	.Pilot bearing worn, .Bent shift fork,

	.Worn gear teeth or face .Excessive gear train end play .Worn synchronizers .Missing detent ball spring .Shift mechanism worn or out of adjustment .Engine or transmission mount bolts loose or out of adjustment .Transmission not aligned	
Shift Lever Rattle	.Worn shift lever or detents .Worn shift forks .Worn synchronizers sleeve	
Shift Lever Hops Under Acceleration	.Worn engine or transmission mounts	

(1) - Most units use spur cut gears in reverse and are noisy

POWERTRAIN

CLUTCH TROUBLE SHOOTING

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BASIC CLUTCH TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
Chattering or Grabbing	Incorrect clutch adjustment	Adjust clutch
	Oil, grease or glaze on facings	Disassemble and clean or replace
	Loose "U" joint flange	See DRIVE AXLES article
	Worn input shaft spline	Replace input shaft

	Binding pressure plate	Replace pressure plate
	Binding release lever	See CLUTCH article
	Binding clutch disc hub	Replace clutch disc
	Unequal pressure plate contact	Replace worn/misaligned components
	Loose/bent clutch disc	Replace clutch disc
	Incorrect transmission alignment	Realign transmission
	Worn pressure plate, disc or flywheel	Replace damaged components
	Broken or weak pressure springs	Replace pressure plate
	Sticking clutch pedal	Lubricate clutch pedal & linkage
	Incorrect clutch disc facing	Replace clutch disc
	Engine loose in chassis	Tighten all mounting bolts
Failure to Release	Oil or grease on clutch facings	Clean or replace clutch disc
	Incorrect release lever or pedal adjustment	See CLUTCH article
	Worn or broken clutch facings	Replace clutch disc
	Bent clutch disc or pressure plate	Replace damaged components
	Clutch disc hub binding on input shaft	Clean or replace clutch disc and/or input shaft
	Binding pilot bearing	Replace pilot bearing

	Sticking release bearing sleeve	Replace release bearing and/or sleeve
	Binding clutch cable	See CLUTCH article
	Defective clutch master	Replace master cylinder
	Defective clutch slave	Replace slave cylinder
	Air in hydraulic system	Bleed hydraulic system
Rattling	Weak or broken release lever spring	Replace spring and check alignment
	Damaged pressure plate	Replace pressure plate
	Broken clutch return spring	Replace return spring
	Worn splines on clutch disc or input shaft	Replace clutch disc and/or input shaft
	Worn clutch release bearing	Replace release bearing
	Dry or worn pilot bearing	Lubricate or replace pilot bearing
	Unequal release lever contact	Align or replace release lever
	Incorrect pedal free play	Adjust free play
	Warped or damaged clutch disc	Replace damaged components
Slipping	Pressure springs worn or	Release pressure plate
	Oily, greasy or worn facings	Clean or replace clutch disc
	Incorrect clutch alignment	Realign clutch assembly
	Warped clutch disc or pressure plate	Replace damaged components
	Binding release levers or	Lubricate and/or **TROUBLE SHOOTING - BASIC PROCEDUR**

	clutch pedal	replace release components
Squeaking	Worn or damaged release	Replace release bearing
	Dry or worn pilot or release bearing	Lubricate or replace assembly
	Pilot bearing turning in crankshaft	Replace pilot bearing and/or crankshaft
	Worn input shaft bearing	Replace bearing and seal
	Incorrect transmission alignment	Realign transmission
	Dry release fork between pivot	Lubricate release fork and pivot
Heavy and/or Stiff Pedal	Sticking release bearing sleeve	Replace release bearing and/or sleeve
	Dry or binding clutch pedal hub	Lubricate and align components
	Floor mat interference with pedal	Lay mat flat in proper area
	Dry or binding ball/fork pivots	Lubricate and align components
	Faulty clutch cable	Replace clutch cable
Noisy Clutch Pedal	Faulty interlock switch	Replace interlock switch
	Self-adjuster ratchet noise	Lubricate or replace self-adjuster
	Speed control interlock switch	Lubricate or replace interlock switch
Clutch Pedal Sticks Down	Binding clutch cable	See CLUTCH article

	Springs weak in pressure plate	Replace pressure plate
	Binding in clutch linkage	Lubricate and free linkage
Noisy	Dry release bearing	Lubricate or replace release bearing
	Dry or worn pilot bearing	Lubricate or replace bearing
	Worn input shaft bearing	Replace bearing
Transmission Click	Weak springs in pressure plate	Replace pressure plate
	Release fork loose on ball stud	Replace release fork and/or ball stud
	Oil on clutch disc damper	Replace clutch disc
	Broken spring in slave cylinder	Replace slave cylinder

DRIVE AXLE - NOISE DIAGNOSIS

Unrelated Noises

Some driveline trouble symptoms are also common to the engine, transmission, wheel bearings, tires, and other parts of the vehicle. Ensure cause of trouble actually is in the drive axle before adjusting, repairing, or replacing any of its parts.

Non-Drive Axle Noises

A few conditions can sound just like drive axle noise and have to be considered in pre-diagnosis. The 4 most common noises are exhaust, tires, CV/universal joints and wheel trim rings.

In certain conditions, the pitch of the exhaust gases may sound like gear whine. At other times, it may be mistaken for a wheel bearing rumble.

Tires, especially radial and snow, can have a high-pitched tread whine or roar, similar to gear noise. Also, some non-standard tires with an unusual tread construction may emit a roar or whine.

Defective CV/universal joints produce clicking noises or

excessive driveline play that can be improperly diagnosed as drive axle problems.

Trim and moldings also can cause a whistling or whining noise. Ensure none of these components are causing the noise before disassembling the drive axle.

Gear Noise

A "howling" or "whining" noise from the ring and pinion gear can be caused by an improper gear pattern, gear damage, or improper bearing preload. It can occur at various speeds and driving conditions, or it can be continuous.

Before disassembling axle to diagnose and correct gear noise, make sure that tires, exhaust, and vehicle trim have been checked as possible causes.

Chuckle

This is a particular rattling noise that sounds like a stick against the spokes of a spinning bicycle wheel. It occurs while decelerating from 40 MPH and usually can be heard until vehicle comes to a complete stop. The frequency varies with the speed of the vehicle.

A chuckle that occurs on the driving phase is usually caused by excessive clearance due to differential gear wear, or by a damaged tooth on the coast side of the pinion or ring gear. Even a very small tooth nick or a ridge on the edge of a gear tooth is enough the cause the noise.

This condition can be corrected simply by cleaning the gear tooth nick or ridge with a small grinding wheel. If either gear is damaged or scored badly, the gear set must be replaced. If metal has broken loose, the carrier and housing must be cleaned to remove particles that could cause damage.

Knock

This is very similar to a chuckle, though it may be louder, and occur on acceleration or deceleration. Knock can be caused by a gear tooth that is damaged on the drive side of the ring and pinion gears. Ring gear bolts that are hitting the carrier casting can cause knock. Knock can also be due to excessive end play in the axle shafts.

Clunk

Clunk is a metallic noise heard when an automatic transmission is engaged in Reverse or Drive, or when throttle is applied or released. It is caused by backlash somewhere in the driveline, but not necessarily in the axle. To determine whether driveline clunk is caused by the axle, check the total axle backlash as follows:

1) Raise vehicle on a frame or twinpost hoist so that drive wheels are free. Clamp a bar between axle companion flange and a part of the frame or body so that flange cannot move.

2) On conventional drive axles, lock the left wheel to keep it from turning. On all models, turn the right wheel slowly until it is felt to be in Drive condition. Hold a chalk marker on side of tire about 12" from center of wheel. Turn wheel in the opposite direction until it is again felt to be in Drive condition.

3) Measure the length of the chalk mark, which is the total axle backlash. If backlash is one inch or less, drive axle is not the source of clunk noise.

Bearing Whine

Bearing whine is a high-pitched sound similar to a whistle. It is usually caused by malfunctioning pinion bearings. Pinion bearings operate at drive shaft speed. Roller wheel bearings may whine in a similar manner if they run completely dry of lubricant. Bearing noise will occur at all driving speeds. This distinguishes it from gear whine, which usually comes and goes as speed changes.

Bearing Rumble

Bearing rumble sounds like marbles being tumbled. It is usually caused by a malfunctioning wheel bearing. The lower pitch is because the wheel bearing turns at only about 1/3 of drive shaft speed.

Chatter On Turns

This is a condition where the entire front or rear of vehicle vibrates when vehicle is moving. The vibration is plainly felt as well as heard. Extra differential thrust washers installed during axle repair can cause a condition of partial lock-up that creates this chatter.

Axle Shaft Noise

Axle shaft noise is similar to gear noise and pinion bearing whine. Axle shaft bearing noise will normally distinguish itself from gear noise by occurring in all driving modes (Drive, cruise, coast and float), and will persist with transmission in Neutral while vehicle is moving at problem speed.

If vehicle displays this noise condition, remove suspect axle shafts, replace wheel seals and install a new set of bearings. Re-evaluate vehicle for noise before removing any internal components.

Vibration

Vibration is a high-frequency trembling, shaking or grinding

condition (felt or heard) that may be constant or variable in level and can occur during the total operating speed range of the vehicle.

The types of vibrations that can be felt in the vehicle can be divided into 3 main groups:

* Vibrations of various unbalanced rotating parts of the vehicle.
* Resonance vibrations of the body and frame structures caused by rotating of unbalanced parts.
* Tip-in moans of resonance vibrations from stressed engine or exhaust system mounts or driveline flexing modes.

DRIVE AXLE - RWD TROUBLE SHOOTING

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DRIVE AXLE (RWD) TROUBLE SHOOTING

CONDITION	POSSIBLE CAUSE	CORRECTION
Knocking or Clunking		
	Differential Side Gear Clearance	Check Clearance
	Worn Pinion Shaft	Replace Pinion Shaft
	Axle Shaft End Play	Check End Play
	Missing Gear Teeth	Check Differential/ Replace Gear
	Wrong Axle Backlash	Check Backlash
	Misaligned Driveline	Realign Driveline
Clinking During Engagement		
	Side Gear Clearance	Check Clearance

	Ring and Pinion Backlash	Check Backlash
	Worn/Loose Pinion Shaft	Replace Shaft/Bearing
	Bad "U" Joint	Replace "U" Joint
	Sticking Slip Yoke	Lube Slip Yoke
	Broken Rear Axle Mount	Replace Mount
	Loose Drive Shaft Flange	Check Flange
Click/Chatter On Turns	Differential Side Gear Clearance	Check Clearance
	Wrong Turn On Plates (1)	Replace Clutch Plates
	Wrong Differential Lubricant (1)	Change Lubricant
Knock Or Click	Flat Spot on Rear Wheel Bearing	Replace Wheel Bearing
Low Vibration At All Speeds	Faulty Wheel Bearing	Replace Wheel Bearing
	Faulty "U" Joint	Replace "U" Joint
	Faulty Drive Shaft	Balance Drive Shaft
	Faulty Companion Flange	Replace Flange
	Faulty Slip Yoke Flange	Replace Flange

(1) - Limited slip differential only.

FWD AXLE SHAFTS & CV JOINTS TROUBLE SHOOTING

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in the section(s) you are accessing.

BASIC FWD AXLE SHAFTS & CV JOINTS TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE
Grease Leaks	CV boot torn or cracked
Clicking Noise on Cornering	Damaged outer CV
Clunk Noise on Acceleration	Damaged inner CV
Vibration or Shudder on Acceleration	Sticking, damaged or worn CV Misalignment or spring height

STEERING & SUSPENSION

MANUAL STEERING GEAR TROUBLE SHOOTING

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BASIC MANUAL STEERING GEAR TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
Rattle or Chucking Noise in Rack and Pinion	Rack and pinion mounting bracket loose	Tighten all mounting bolts
	Lack of/or incorrect lubricant	Correct as necessary
	Steering gear mounting bolts loose	Tighten all mounting bolts
Excessive Play	Front wheel bearing improperly adjusted	See FRONT SUSPENSION article
	Loose or worn steering linkage	See STEERING LINKAGE article

	Loose or worn steering gear shift	See MANUAL STEERING GEAR article
	Steering arm loose on gear shaft	See MANUAL STEERING GEAR article
	Steering gear housing bolts loose	Tighten all mounting bolts
	Steering gear adjustment too loose	See MANUAL STEERING GEAR article
	Steering arms loose on knuckles	Tighten and check steering linkage
	Rack and pinion mounting loose	Tighten all mounting bolts
	Rack and pinion out of adjustment	See adjustment in STEERING article
	Tie rod end loose	Tighten and check steering linkage
	Excessive Pitman shaft-to-ball nut lash	Repair as necessary
Poor Returnability	Lack of lubricant in ball joint or linkage	Lubricate and service systems
	Binding in linkage or ball joints	See STEERING LINKAGE and SUSPENSION article
	Improper front end alignment	See WHEEL ALIGNMENT article
	Improper tire pressure	Inflate to proper pressure
	Tie rod binding	Inflate to proper pressure
	Shaft seal rubbing shaft	See STEERING COLUMN article

Excessive Vertical Motion	Improper tire pressure	Inflate to proper pressure
	Tires, wheels or rotors out of balance	Balance tires then check wheels and rotors
	Worn or faulty shock absorbers	Check and replace if necessary
	Loose tie rod ends or steering	Tighten or replace if necessary
	Loose or worn wheel bearings	See SUSPENSION article
Steering Pulls to One Side	Improper tire pressure	Inflate to proper pressure
	Front tires are different sizes	Rotate or replace if necessary
	Wheel bearings not adjusted properly	See FRONT SUSPENSION article
	Bent or broken suspension components	See FRONT SUSPENSION article
	Improper wheel alignment	See WHEEL ALIGNMENT article
	Brakes dragging	See BRAKES article
Instability	Low or uneven tire pressure	Inflate to proper pressure
	Loose or worn wheel bearings	See FRONT SUSPENSION article
	Loose or worn idler arm bushing	See FRONT SUSPENSION article
	Loose or worn strut bushings	See FRONT SUSPENSION article

Incorrect front wheel alignment	See WHEEL ALIGNMENT article	
Steering gear not centered	See MANUAL STEERING GEARS article	
Springs or shock	Check and replace if necessary	
Improper cross shaft	See MANUAL STEERING GEARS article	

POWER STEERING TROUBLE SHOOTING

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BASIC POWER STEERING TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
Rattle or Chucking Noise	Pressure hoses touching engine parts	Adjust to proper clearance
	Loose Pitman shaft	Adjust or replace if necessary
	Tie rods ends or Pitman arm loose	Tighten and check system
	Rack and pinion mounts loose	Tighten all mounting bolts
	Free play in worm and	See POWER STEERING GEAR article
	Loose sector shaft or thrust bearing adjustment	See POWER STEERING GEAR
	Steering pump coupling	See STEERING COLUMN

		article
	Worn shaft serrations	See STEERING COLUMN article
Growl in Steering Pump	Excessive pressure in hoses	Restricted hoses, see POWER STEERING GEAR article
	Scored pressure plates	See POWER STEERING GEAR article
	Scored thrust plates or rotor	See POWER STEERING GEAR article
	Extreme wear of cam ring	See POWER STEERING GEAR article
Rattle in Steering Pump	Vanes not installed	See POWER STEERING PUMP article
	Vanes sticking in rotor	See POWER STEERING PUMP article
Swish noise in Pump	Defective flow control valve	See POWER STEERING PUMP article
Groan in Steering Pump	Air in fluid	See POWER STEERING PUMP article
	Poor pressure hose connection	Tighten and check, replace if necessary
Squawk When Turning	Damper "O" ring on valve spool cut	See POWER STEERING PUMP article
Moan or Whine in Pump	Pump shaft bearing scored	Replace bearing and fluid
	Air in fluid or fluid level low	See POWER STEERING PUMP article
	Hose or column grounded	Check and replace if necessary
	Cover "O" ring missing	See POWER STEERING PUMP

	or damaged	article
	Valve cover baffle missing or damaged	See POWER STEERING PUMP article
	Interference of components in pump	See POWER STEERING PUMP article
	Loose or poor bracket alignment	Correct or replace if necessary
Hissing When Parking	Internal leakage in steering gear	Check valved assembly first
Chirp in Steering Pump	Loose or worn power steering belt	Adjust or replace if necessary
Buzzing When Not Steering	Noisy pump	See POWER STEERING PUMP article
	Free play in steering shaft bearing	See STEERING COLUMN article
	Bearing loose on shaft serrations	See STEERING COLUMN article
Clicking Noise in Pump	Pump slippers too long	See POWER STEERING PUMP article
	Broken slipper springs	See POWER STEERING PUMP article
	Excessive wear or nicked rotors	See POWER STEERING PUMP article
	Damaged cam contour	See POWER STEERING PUMP article
Poor Return of Wheel	Wheel rubbing against turn signal	See STEERING COLUMN SWITCHES article
	Flange rubbing steering gear adjuster	See STEERING COLUMN article
	Tight or frozen steering shaft bearing	See STEERING COLUMN article

Steering gear out of adjustment	See POWER STEERING GEAR article
Sticking or plugged spool valve	See POWER STEERING PUMP article
Improper front end alignment	See WHEEL ALIGNMENT article
Wheel bearings worn or loose	See FRONT SUSPENSION article
Ties rods or ball joints binding	Check and replace if necessary
Intermediate shaft joints binding	See STEERING COLUMN article
Kinked pressure hoses	Correct or replace if necessary
Loose housing head spanner nut	See POWER STEERING GEAR article
Damaged valve lever	See POWER STEERING GEAR article
Sector shaft adjusted too tight	See ADJUSTMENTS in POWER STEERING GEAR article
Worm thrust bearing adjusted too tight	See ADJUSTMENTS in POWER STEERING GEAR article
Reaction ring sticking in cylinder	See POWER STEERING GEAR article
Reaction ring sticking in housing head	See POWER STEERING GEAR article
Steering pump internal leakage	See POWER STEERING PUMP article
Steering gear-to-column misalignment	See STEERING COLUMN article

	Lack of lubrication in linkage	Service front suspension
	Lack of lubrication in ball joints	Service front suspension
Increased Effort When Turning Wheel Fast Foaming, Milky Power Steering Fluid, Low Fluid Level or Low Pressure	High internal pump leakage	See POWER STEERING PUMP article
	Power steering pump belt slipping	Adjust or replace if necessary
	Low fluid level	Check and fill to proper level
	Engine idle speed to low	Adjust to correct setting
	Air in pump fluid system	See POWER STEERING PUMP article
	Pump output low	See POWER STEERING PUMP article
	Steering gear malfunctioning	See POWER STEERING GEAR article
Wheel Surges or Jerks	Low fluid level	Check and fill to proper level
	Loose fan belt	Adjust or replace if necessary
	Insufficient pump pressure	See POWER STEERING PUMP article
	Sticky flow control valve	See POWER STEERING PUMP article
	Linkage hitting oil pan at full turn	Replace bent components
Kick Back or Free Play	Air in pump fluid system	See POWER STEERING PUMP article
	Worn poppet valve in steering gear	See POWER STEERING PUMP article

	Excessive over center lash	See POWER STEERING GEAR article
	Thrust bearing out of adjustment	See POWER STEERING GEAR article
	Free play in pot coupling	See POWER STEERING PUMP article
	Steering gear coupling loose on shaft	See POWER STEERING PUMP article
	Steering disc mounting bolts loose	Tighten or replace if necessary
	Coupling loose on worm shaft	Tighten or replace if necessary
	Improper sector shaft adjustment	See POWER STEERING GEAR article
	Excessive worm piston side play	See POWER STEERING GEAR article
	Damaged valve lever	See POWER STEERING GEAR article
	Universal joint loose	Tighten or replace if necessary
	Defective rotary valve	See POWER STEERING GEAR article
No Power When Parking	Sticking flow control valve	See POWER STEERING PUMP article
	Insufficient pump pressure output	See POWER STEERING PUMP article
	Excessive internal pump leakage	See POWER STEERING PUMP article
	Excessive internal gear leakage	See POWER STEERING PUMP article

	Flange rubs against gear adjust plug	See STEERING COLUMN article	
	Loose pump belt	Adjust or replace if necessary	
	Low fluid level	Check and add proper amount of fluid	
	Engine idle too low	Adjust to correct setting	
	Steering gear-to-column misaligned	See STEERING COLUMN article	
No Power, Left Turn	Left turn reaction seal "O" ring worn	See POWER STEERING GEAR article	
	Left turn reaction seal damaged/missing	See POWER STEERING GEAR article	
	Cylinder head "O" ring damaged	See POWER STEERING PUMP article	
No Power, Right Turns	Column pot coupling bottomed	See STEERING COLUMN article	
	Right turn reaction seal "O" ring worn	See POWER STEERING GEAR article	
	Right turn reaction seal damaged	See POWER STEERING GEAR article	
	Internal leakage through piston end plug	See POWER STEERING GEAR article	
	Internal leakage through side plugs	See POWER STEERING GEAR article	
Lack of Effort in Turning	Left and/or right reaction seal sticking in cylinder head	Replace, see POWER STEERING GEAR article	
Wanders to One Side	Front end alignment incorrect	See WHEEL ALIGNMENT article	

	Unbalanced steering gear valve	See POWER STEERING GEAR article
Low Pressure Due to Steering Pump	Flow control valve stuck or inoperative	See POWER STEERING PUMP article
	Pressure plate not flat against cam ring	See POWER STEERING PUMP article
	Extreme wear of cam ring	Replace and check adjustments
	Scored plate, thrust plate or rotor	See POWER STEERING PUMP article
	Vanes not installed properly	See POWER STEERING PUMP article
	Vanes sticking in rotor slots	See POWER STEERING PUMP article
	Cracked/broken thrust or pressure plate	See POWER STEERING PUMP article

STEERING COLUMN TROUBLE SHOOTING

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BASIC STEERING COLUMN TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
Noise in Steering	Coupling pulled apart	See STEERING COLUMNS article
	Column not correctly aligned	See STEERING COLUMNS article
	Broken lower joint	Replace joint

	Horn contact ring not	See STEERING COLUMN article
	Bearing not lubricated	See STEERING COLUMN article
	Shaft snap ring not properly seated	Reseat or replace snap ring
	Plastic spherical joint not lubricated	See STEERING COLUMN article
	Shroud or housing loose	Tighten holding screws
	Lock plate retaining ring not seated	See STEERING COLUMN article
	Loose sight shield	Tighten holding screws
High Steering Shaft Effort	Column assembly misaligned	See STEERING COLUMN article
	Improperly installed dust shield	Adjust or replace
	Tight steering universal joint	See STEERING COLUMN article
High Shift Effort	Column is out of alignment	See STEERING COLUMN article
	Improperly installed dust shield	Adjust or replace
	Seals or bearings not lubricated	See STEERING COLUMNS article
	Mounting bracket screws too long	Replace with new shorter screws
	Burrs on shift tube	Remove burrs or replace tube
	Lower bowl bearing assembled wrong	See STEERING COLUMN article

	Shift tube bent or broken	Replace as necessary
	Improper adjustment of shift levers	See STEERING COLUMN article
Improper Trans. Shifting	Sheared shift tube joint	Replace as necessary
	Sheared lower shaft lever	Replace as necessary
	Improper shift lever adjustment	See STEERING COLUMN article
	Improper gate plate adjustment	See STEERING COLUMN article
Excess Play in Column	Instrument panel bracket bolts loose	Tighten bolts and check bracket
	Broken weld nut on jacket	See STEERING COLUMN article
	Instrument bracket capsule sheared	See STEERING COLUMN article
	Column bracket/jacket bolts loose	Tighten bolts and check bracket
Steering Locks in Gear	Release lever mechanism	See STEERING COLUMN article

SUSPENSION TROUBLE SHOOTING

NOTE: This is GENERAL information. This article is not intended to be specific to any unique situation or individual vehicle configuration. The purpose of this Trouble Shooting information is to provide a list of common causes to problem symptoms. For model-specific Trouble Shooting, refer to SUBJECT, DIAGNOSTIC, or TESTING articles available in the section(s) you are accessing.

BASIC SUSPENSION TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE	CORRECTION

Front End Noise	Loose or worn wheel bearings	See Wheel Bearing Adjustment in SUSPENSION
	Worn shocks or shock mountings	Replace struts or strut mountings
	Worn struts or strut mountings	Replace struts or strut mountings
	Loose or worn lower control arm	See SUSPENSION
	Loose steering gear-to-frame bolts	See STEERING
	Worn control arm bushings	See SUSPENSION
	Ball joints not lubricated	Lubricate ball joints & see Ball Joint Checking in SUSPENSION
Front Wheel Shake, Shimmy, or Vibration	Tires or wheels out of balance	Check tire balance
	Incorrect wheel alignment	See WHEEL ALIGNMENT
	Drive shaft unbalanced	Check drive shaft balance
	Loose or worn wheel bearings	See WHEEL ALIGNMENT
	Loose or worn tie rod ends	See SUSPENSION
	Worn upper ball joints	See Ball Joint Checking in SUSPENSION
	Worn shock absorbers	Replace shock absorbers
	Worn strut bushings	Replace strut bushings
Car Pulls to One Side	Mismatched or uneven tires	Check tire condition
	Broken or sagging springs	See SUSPENSION

	Loose or worn strut bushings	See SUSPENSION
	Improper wheel alignment	See WHEEL ALIGNMENT
	Improper rear axle alignment	Check rear axle alignment
	Power steering gear unbalanced	See STEERING
	Front brakes dragging	See BRAKES
Abnormal Tire Wear	Unbalanced tires	Check tire balance & rotation
	Sagging or broken springs	See SUSPENSION
	Incorrect front end alignment	See WHEEL ALIGNMENT
	Faulty shock absorbers	Replace chock absorbers
Scuffed Tires	Toe-In incorrect	See WHEEL ALIGNMENT
	Suspension arm bent or twisted	See appropriate SUSPENSION article
Springs Bottom or Sag	Bent or broken springs	See SUSPENSION
	Leaking or worn shock absorbers	Replace shock absorbers
	Frame misalignment	Check frame for damage
Spring Noises	Loose "U" Bolts	See SUSPENSION
	Loose or worn bushings	See SUSPENSION
	Worn or missing interliners	See SUSPENSION
Shock Absorber Noise	Loose shock mountings	Check & tighten mountings
	Worn bushings	Replace bushings

	Air in system	Bleed air from system
	Undercoating on shocks	Remove undercoating
Car Leans or Sways on Corners	Loose stabilizer bar	See SUSPENSION
	Faulty shocks or mountings	Replace shocks or mountings
	Broken or sagging springs	See SUSPENSION
Shock Absorbers Leaking	Worn seals or reservoir tube crimped	See SUSPENSION
Broken Springs	Loose "U" bolts	See SUSPENSION
	Inoperative shock absorbers	Replace shock absorbers

WHEEL ALIGNMENT TROUBLE SHOOTING

NOTE: This is GENERAL information. This article is not intended to be specific to any unique situation or individual vehicle configuration. The purpose of this Trouble Shooting information is to provide a list of common causes to problem symptoms. For model-specific Trouble Shooting, refer to SUBJECT, DIAGNOSTIC, or TESTING articles available in the section(s) you are accessing.

BASIC WHEEL ALIGNMENT TROUBLE SHOOTING CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
Premature Tire Wear	Improper tire inflation	Check tire pressure
	Front alignment out of tolerance	See ALIGNMENT SPECS in WHEEL ALIGNMENT section
	Suspension components worn	See SUSPENSION section
	Steering system components worn	See STEERING section
	Improper standing height	See WHEEL ALIGNMENT

	Uneven or sagging springs	See SUSPENSION section
	Bent wheel	See WHEEL ALIGNMENT
	Improper torsion bar adjustment	See SUSPENSION section
	Loose or worn wheel bearings	See WHEEL BEARING ADJ. in SUSPENSION section
	Worn or defective shock	Replace shock absorbers
	Tires out of balance	Check tire balance
Pulls to One Side	Improper tire inflation	Check tire pressure
	Brake dragging	See BRAKE section
	Mismatched tires	See WHEEL ALIGNMENT
	Broken or sagging spring	See SUSPENSION section
	Broken torsion bar	See SUSPENSION section
	Power steering valve not centered	See STEERING section
	Front alignment out of tolerance	See WHEEL ALIGNMENT section
	Defective wheel bearing	See WHEEL BEARINGS in SUSPENSION section
	Uneven sway bar links	See SUSPENSION section
	Frame bent	Check for frame damage
	Steering system bushing worn	See STEERING section
Hard Steering	Idler arm bushing too tight	See STEERING LINKAGE in STEERING section
	Ball joint tight or seized	See SUSPENSION section
	Steering linkage too tight	See STEERING LINKAGE in

		STEERING section
	Power steering fluid low	Add proper amount of fluid
	Power steering drive belt loose	See STEERING section
	Power steering pump defective	See STEERING section
	Steering gear out of adjustment	See STEERING section
	Incorrect wheel alignment	See WHEEL ALIGNMENT
	Damaged steering gear	See STEERING section
	Damaged suspension	See SUSPENSION section
	Bent steering knuckle or supports	See SUSPENSION section
Vehicle "Wanders"	Strut rod or control arm bushing worn	See SUSPENSION section
	Loose or worn wheel bearings	See WHEEL BEARINGS in SUSPENSION section
	Improper tire inflation	Check tire pressure
	Stabilizer bar missing or defective	See SUSPENSION section
	Wheel alignment out of tolerance	See Adjustment in WHEEL ALIGNMENT section
	Broken spring	See SUSPENSION section
	Defective shock absorbers	Replace shock absorbers
	Worn steering & suspension components	See SUSPENSION section
Front End Shimmy	Tire out of balance/round	Check tire balance

	Excessive wheel runout	See WHEEL ALIGNMENT
	Insufficient or improper caster	See WHEEL ALIGNMENT section
	Worn suspension or steering components	See SUSPENSION section
	Defective shock absorbers	Replace shock absorber
	Wheel bearings worn or loose	See WHEEL BEARING ADJ. in SUSPENSION section
	Power steering reaction Bracket loose	See STEERING section
	Steering gear box (rack) mounting loose	See STEERING section
	Steering gear adjustment loose	See STEERING section
	Worn spherical joints	See SUSPENSION section
Toe-In Not Adjustable	Lower control arm bent	See SUSPENSION section
	Frame bent	Check frame for damage
Camber Not Adjustable	Control arm bent	See SUSPENSION section
	Frame bent	Check frame for damage
	Hub & bearing not seated properly	See SUSPENSION section

END OF ARTICLE

* EXHAUST SYSTEM UNIFORM INSPECTION GUIDELINES *
Article Text
1996 Kia Sephia
For 1 1 1 1 1

Saturday, April 18, 2009 10:08PM

ARTICLE BEGINNING

GENERAL INFORMATION
Exhaust Systems January 2000 Motorist Assurance Program
Standards For Automotive Repair

All Makes and Models

CONTENTS

INTRODUCTION TO MOTORIST ASSURANCE PROGRAM (MAP)

OVERVIEW OF MOTORIST ASSURANCE PROGRAM (MAP)

Automotive industry professionals and interested readers:
The Motorist Assurance Program (MAP) is the consumer outreach effort of the Automotive Maintenance and Repair Association, Inc. (AMRA). Participation in the Motorist Assurance Program is drawn from auto repair companies and independents, parts and equipment manufacturers and suppliers, vehicle manufacturers and industry associations.

Our organization's mission is to strengthen the relationship between the consumer and the auto repair industry. We encourage motorists to take greater responsibility for their vehicles-through proper, manufacturer-recommended, maintenance, and endorse participating service and repair shops (including franchisees and dealers) who adopt (1) the MAP Pledge of Assurance to their Customers and (2) the Motorist Assurance Program Standards of Service. All participating service providers have agreed to subscribe to this

Pledge and to adhere to the promulgated Standards of Service demonstrating to their customers that they are serious about customer satisfaction.

These Standards of Service require an inspection of the vehicle's (problem) system and that the results be communicated to the customer according to industry standards. Since the industry did not have such standards, the Motorist Assurance Program successfully promulgated industry inspection communication standards in 1994-95 for the following systems: Exhaust, Brakes, ABS, Steering and Suspension, Engine Maintenance and Performance, HVAC, and Electrical Systems.

Further, revisions to all of these inspection communication standards are re-published periodically. In addition to the above, standards for Drive Train and Transmissions were promulgated and published in 1998. Participating shops utilize these Uniform Inspection & Communication Standards (UI&CS) as part of the inspection process and for communicating their findings to their customers.

The Motorist Assurance Program continues to work cooperatively and proactively with government agencies and consumer groups toward solutions that both benefit the customer and are mutually acceptable to both regulators and industry. We maintain the belief that industry must retain control over how we conduct our business, and we must be viewed as part of the solution and not part of the problem. Meetings with state and other government officials (and their representatives), concerned with auto repair and/or consumer protection, are conducted. Feedback from these sessions is brought back to the association governing body, and the program adjusted as needed.

To assure recourse for auto repair customers if they are not satisfied with a repair transaction, the Motorist Assurance Program offers mediation and arbitration through the BBB and other similar non-profit organizations. MAP conducted pilot programs in twelve states before announcing the program nationally in October 1998. During the pilots, participating repair shops demonstrated their adherence to the Pledge and Standards and agreed to follow the UI&CS in communicating the results of their inspection to their customers. Complaints and "come-backs" dropped significantly.

To put some "teeth" in the program, an accreditation requirement for shops was initiated. The requirements are stringent, and a self-policing technique has been incorporated which includes the "mystery shopping" of outlets. By year-end 1999, over 4,000 auto repair facilities had been accredited by the Motorist Assurance Program.

We welcome you to join us as we continue our outreach. With your support, both the automotive repair industry and your customers will reap the benefits. Please visit MAP at our Internet site www.motorist.org or contact us at:

*** EXHAUST SYSTEM UNIFORM INSPE**

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OVERVIEW OF SERVICE REQUIREMENTS AND SUGGESTIONS

It is MAP policy that all exhaust, brake, steering, suspension, wheel alignment, drive-line, engine performance and maintenance, and heating, ventilation and air conditioning, and electrical services be offered and performed under the standards and procedures specified in these sections.

Before any service is performed on a vehicle, an inspection of the appropriate system must be performed. The results of this inspection must be explained to the customer and documented on an inspection form. The condition of the vehicle and its components will indicate what services/part replacements may be "Required" or "Suggested." In addition, suggestions may be made to satisfy the requests expressed by the customer.

When a component is suggested or required to be repaired or replaced, the decision to repair or replace must be made in the customer's best interest, and at his or her choice given the options available.

This section lists the various parts and the conditions that indicate a required or suggested service or part replacement. Although this list is extensive, it is not fully inclusive. In addition to this list, a technician may make a suggestion. However, any suggestions must be based on substantial and informed experience, or the vehicle manufacturer's recommended service interval and must be documented.

Some conditions indicate that service or part replacement is required because the part in question is no longer providing the function for which it is intended, does not meet a vehicle manufacturer's design specification or is missing.

* Example: An exhaust pipe has corroded severely and has a hole in it through which exhaust gases are leaking. Replacement of the exhaust pipe in this case is required due to functional failure.
* Example: A brake rotor has been worn to the point where it measures less than the vehicle manufacturer's discard specifications. Replacement of the rotor is required because it does not meet design specifications.

Some conditions indicate that service or part replacement

is suggested because the part is close to the end of its useful life or addresses a customer's need, convenience or request. If a customer's vehicle has one of these conditions, the procedure may be only to suggest service.

* Example: An exhaust pipe is rusted, corroded or weak, but no leaks are present. In this case, the exhaust pipe has not failed. However, there is evidence that the pipe may need replacement in the near future. Replacement of the pipe may be suggested for the customer's convenience in avoiding a future problem.
* Example: The customer desires improved ride and/or handling, but the vehicle's shocks or struts have not failed. In this case, replacement may be suggested to satisfy the customer's wishes. In this case, replacement of the shocks or struts may not be sold as a requirement.

A customer, of course, has the choice of whether or not a shop will service his or her vehicle. He or she may decide not to follow some of your suggestions. When a repair is required, a MAP shop must refuse partial service on that system if, in the judgment of the service provider, proceeding with the work could create or continue an unsafe condition.

When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

The following reasons may be used for required and suggested services. These codes are shown in the "Code" column of the MAP Uniform Inspection & Communications Standards that follow:

Reasons to Require Repair or Replacement

A - Part no longer performs intended purpose
B - Part does not meet a design specification (regardless of performance)
C - Part is missing

NOTE: When a repair is required, the shop must refuse partial service to the system in question, if the repair creates or continues an unsafe condition.

Reasons to Suggest Repair or Replacement

1 - Part is close to the end of its useful life (just above discard specifications, or weak; failure likely to occur soon, etc.)

2 - To address a customer need, convenience, or request (to stiffen ride, enhance performance, eliminate noise, etc.)
3 - To comply with maintenance recommended by the vehicle's Original Equipment Manufacturer (OEM)
4 - Technician's recommendation based on substantial and informed experience

NOTE: Suggested services are always optional. When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

EXHAUST

SERVICE PROCEDURES REQUIRED AND SUGGESTED FOR PROPER VEHICLE OPERATION

WARNING: Federal EPA rules prohibit altering an exhaust system in any way that defeats the emission reduction components of a vehicle. Be sure to review and adhere to EPA policy on removing and replacing catalytic converters. Where state or local laws are stricter, they take precedence over these guidelines.

NOTE: Some exhaust systems are of a welded design. It is not required that the entire system be replaced. Determine the need to replace individual components based on conditions of component.

CATALYTIC CONVERTERS

CAUTION: Before working on an exhaust system, review EPA regulations on removing and replacing catalytic converters.

NOTE: Any time a converter has failed, further diagnosis is required to determine the reason(s) for converter failure.

CATALYTIC CONVERTER INSPECTION

Condition	Code	Procedure
Air injection tube broken	A	Require repair or replacement of injection tube or replacement of catalytic converter.

Air injection tube burnt	A	...	Require repair or replacement of injection tube or replacement of catalytic converter.
Air injection tube leaking	A	...	Require repair or replacement of injection tube or replacement of catalytic converter.
Air injection tube loose	A	...	Require repair or replacement of injection tube or replacement of catalytic converter.
Air injection tube restricted	A	...	Require repair or replacement of injection tube or replacement of catalytic converter.
Air injection tube threads damaged	A	...	Require repair or replacement of injection tube or replacement of catalytic converter.
Air injection tube threads stripped (threads missing)	A	...	Require repair or replacement of injection tube or replacement of catalytic converter.
Body cracked	B	..	Require repair or replacement.
Converter empty	A	..	Require repair or replacement.
Converter fill plug missing	C	..	Require repair or replacement.
Converter missing	C	.....	Require replacement.
Exhaust gases leaking	A	..	Require repair or replacement.
Flanges leaking	A	...	Require repair or replacement of flanges.
Inlet pipes cracked	B	..	Require repair or replacement.
Internal rattle (except pellet-type)	2	.....	(1) Further inspection required.
Mounting brackets that are part of converter broken	A	..	Require repair or replacement.

Obvious overheating .... (2) Require testing of converter.
Outlet pipes cracked .... B .. Require repair or replacement.
Pieces of catalyst material found downstream ..... 1 ..... Suggest replacement.
Plugged ..... A ..... (3) Require replacement.
Testing has determined that existing converter has been lead-poisoned, contaminated, or failed testing ..... A .. Require repair or replacement.

(1) - If the converter is breaking up, suggest converter replacement. If an object has fallen into the converter, remove the object.
(2) - Overheating is caused by something other than the converter. Further diagnosis is required to determine the cause of the overheating.
(3) - Determine cause and correct to ensure that new converter will not become plugged.

EXHAUST AND TAIL PIPES

NOTE: For pipes with resonators, also see MUFFLERS AND RESONATORS.

EXHAUST AND TAIL PIPE INSPECTION

Condition Code Procedure

Bracket broken ..... A .. Require repair or replacement.
Pipe bent out of position ..... B .. Require repair or replacement.
Pipe broken ..... A .. Require repair or replacement.
Pipe cracked ..... B .. Require repair or replacement.
Pipe leaking ..... A ..... Require replacement.
Pipe missing ..... C ..... Require replacement.
Pipe plugged ..... A ..... Require replacement.
Pipe weak due to corrosion, but no leaks present ..... 1 ..... Suggest replacement.
Weld broken ..... A .. Require repair or replacement.

EXHAUST CONNECTIONS

*** EXHAUST SYSTEM UNIFORM INSPECTION**

EXHAUST CONNECTION INSPECTION

Condition	Code	Procedure
Attaching hardware incorrect	B	Require replacement of hardware.
Clamp broken	A	Require replacement.
Clamp loose	A	Require repair or replacement.
Clamp missing	C	Require replacement.
Corroded, affecting structural integrity	1	Suggest replacement.
Incorrect type (i.e. flange, ball & socket etc.)	B	Require replacement.
Leaking	A	Require repair.
Loose	A	Require repair.

HANGERS

HANGER INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Corroded, affecting structural integrity	1	Suggest replacement.
Incorrect type	B	Require replacement.
Loose	A	Require repair or replacement.
Missing	C	Require replacement.
Out of position	B	Require repair or replacement.
Rubber deteriorated	1	Suggest replacement.

HEAT RISERS (MECHANICAL EFE DEVICES)

HEAT RISER (MECHANICAL EFE DEVICE) INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement of affected parts.
Diaphragm inoperative	A	(1) Require replacement.
Leaking	A	Require repair or replacement.

Noisy ..... 2 ... Suggest repair or replacement of affected parts.
Seized ..... A ... Require repair or replacement of affected parts.
Spring broken ..... B ..... Require replacement of spring(s).
Spring inoperative ..... A ..... Require replacement of spring(s).

(1) - If the inoperative diaphragm is separate from the heat riser, then require replacement of the inoperative diaphragm. If the inoperative diaphragm is part of the heat riser, then replace the heat riser.

HEAT SHIELDS

HEAT SHIELD INSPECTION

Condition	Code	Procedure
Bent	B ..	Require repair or replacement.
Broken	A	Require replacement.
Corroded, affecting structural integrity ...	1	Suggest replacement.
Loose	A ..	Require repair or replacement.
Missing	C	Require replacement.

MANIFOLDS (CAST AND TUBE TYPE)

MANIFOLD (CAST AND TUBE TYPE) INSPECTION

Condition	Code	Procedure
Air injection tube in manifold broken	A ...	Require repair or replacement of injection tube or replacement of manifold.
Air injection tube in manifold corroded, affecting structural integrity	1	Suggest replacement of injection tube or manifold.
Air injection tube in manifold leaking	A ...	Require repair or replacement.

of injection tube or replacement of manifold.

Air injection tube in manifold loose ..... A ..... Require repair.

Air injection tube in manifold restricted .... A ..... Require replacement of injection tube or manifold.

Air injection tube in manifold threads damaged ..... A ..... Require repair of injection tube or manifold.

Air injection tube in manifold threads stripped (threads missing) ..... A ..... Require replacement of injection tube or manifold.

Bolt broken ..... A ... Require replacement of bolts.

Bolt loose ..... A ..... Require tightening or replacement of bolts.

Bolt missing ..... C ... Require replacement of bolts.

Corroded, affecting sealability ..... A .. Require repair or replacement.

Cylinder head threads stripped ..... A ... Require repair or replacement of cylinder head.

Gasket leaking ..... A ..... Require tightening or replacement of gasket.

Heat stove bent ..... B ..... (1) Require repair or replacement of stove.

Heat stove broken ..... A ..... (1) Require replacement of stove.

Heat stove corroded, affecting structural integrity ..... 1 ..... (1) Suggest replacement of stove.

Heat stove missing ..... C ..... (1) Require replacement of stove.

Manifold broken ..... A .. Require repair or replacement.

Manifold cracked ..... B .. Require repair or replacement.

Manifold warped ..... A .. Require repair or replacement.

Out of specification .... B .. Require repair or replacement.

Stud broken ..... A .... Require replacement of stud.

Stud missing ..... C .... Require replacement of stud.

Stud threads damaged .... A ... Require repair or replacement of stud.

Stud threads stripped (threads missing) ..... A .... Require replacement of stud.

*** EXHAUST SYSTEM UNIFORM INSPECT**

(1) - Stove may not be available separately; this may require replacement of manifold.

MECHANICAL EFE DEVICES

See HEAT RISERS (MECHANICAL EFE DEVICES).

MUFFLERS AND RESONATORS

MUFFLER AND RESONATOR INSPECTION

Condition	Code	Procedure
Body shell distorted, affecting performance or structural integrity	A	Require replacement.
Corrosion hole	A	Require replacement.
Missing	C	Require replacement.
Mounting bracket broken	A	Require repair or replacement.
Mounting bracket cracked	B	Require repair or replacement.
Nipple cracked	A	Require repair or replacement.
Nipple loose	B	Require replacement.
Outer wrap peeling (exhaust not leaking)	1	Suggest replacement.
Plugged	A	Require replacement.
Puncture (other than a drain hole)	A	Require replacement.
Rattling or knocking noise from inside muffler	B	Require replacement.
Seam open (exhaust leaking)	A	Require replacement.
Sound quality unsatisfactory	2	Suggest replacement to address customer need and/or request.
Split (exhaust leaking)	A	Require replacement.
Weak due to corrosion, but no leaks present	1	Suggest replacement.

END OF ARTICLE

*** EXHAUST SYSTEM UNIFORM INSPECT**

INTERFERENCE VERIFICATION CHECK FOR OHC ENGINE

Article Text

1996 Kia Sephia
For 1 1 1 1 1

Saturday, April 18, 2009 10:08PM

ARTICLE BEGINNING

Maintenance & Service Information
1994-96 Kia - Timing Belt Information

Sephia, Sportage

TIMING BELT INTERFERENCE VERIFICATION INFORMATION

TIMING BELT INTERFERENCE CAUTION

NOTE: CAMSHAFT DRIVE BELTS OR TIMING BELTS - The condition of camshaft drive belts should always be checked on vehicles which have more than 50,000 miles. Although some manufacturers do not recommend replacement at a specified mileage, others require it at 60,000-100,000 miles. A camshaft drive belt failure may cause extensive damage to internal engine components on most engines, although some designs do not allow piston-to-valve contact. These designs are often called "Free Wheeling". Many manufacturers changed their maintenance and warranty schedules in the mid-1980's to reflect timing belt inspection and/or replacement at 50,000-60,000 miles. Most service interval schedules shown in this section reflect these changes. Belts or components should be inspected and replaced if any of the following conditions exist:

* Crack Or Tears In Belt Surface
* Missing, Damaged, Cracked Or Rounded Teeth
* Oil Contamination
* Damaged Or Faulty Tensioners
* Incorrect Tension Adjustment

TIMING BELT INTERFERENCE CHECK MENU

TIMING BELT INTERFERENCE VERIFICATION TABLE (1)

Application	Engine	Replacement Interval (Miles)
Passenger Cars		
Sephia		
1994-95	1.6L 4-Cyl. (Calif.)	105,000
	1.6L 4-Cyl. (Exc. Calif.)	60,000
1996	1.8L 4-Cyl. (Calif.)	105,000
	1.8L 4-Cyl. (Exc. Calif.)	60,000

Light Trucks
Sportage
1995-96 ..... (2) 2.0L 4-Cyl. DOHC
(Calif.) 105,000
(2) 2.0L 4-Cyl. DOHC
(Exc. Calif.) 60,000
(2) 2.0L 4-Cyl. (SOHC) 60,000

(1) - Other interference engine applications may exist which are not indicated here.
(2) - Interference engine. Check for possible damage to piston(s) or valve(s) if there has been a timing belt failure.

END OF ARTICLE

* DRIVETRAIN SYSTEMS UNIFORM INSPECTION GUIDELINES *

Article Text

1996 Kia Sephia

For 1 1 1 1 1

Saturday, April 18, 2009 10:08PM

ARTICLE BEGINNING

GENERAL INFORMATION
Drivetrain/Transmission Motorist Assurance Program
Standards For Automotive Repair

All Makes and Models

INTRODUCTION TO MOTORIST ASSURANCE PROGRAM (MAP)

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COMPANION FLANGES
CONNECTORS
COOLER BYPASS VALVES
COOLER LINES
COOLERS
CV JOINTS
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DIP STICKS (FLUID LEVEL INDICATORS)
DOWEL PINS, GUIDES AND PILOT HOLES
DRIVE SHAFT FLANGES
DRIVE SHAFTS AND HALF SHAFTS
DUST BOOTS
ENGINE MOUNTS
EXCITER RINGS
FILLER TUBES
FILTERS AND SCREENS
FLANGES
FLEX PLATES
FLUID LEVEL INDICATORS
FLUIDS AND LUBRICANTS
FLYWHEELS
FORCE MOTORS
GUIDES
HALF SHAFTS
HOSES, LINES AND TUBES
HOUSINGS (BELL, CASE, TAIL (EXTENSION) AND AUXILIARY)
INTERMEDIATE SHAFT SUPPORT BEARINGS
KEY INTERLOCK SYSTEMS
LIMITED SLIPS
LINES
LINKAGES (EXTERNAL)
LOCKING HUB ASSEMBLIES
LOCKING HUB CONTROL KNOBS
LUBRICANTS
METAL-CLAD SEALS
METALASTIC JOINTS
MODULATOR PINS
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MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION)
ODOMETER DRIVES (MECHANICAL)
ODOMETER HEADS (MECHANICAL)
OIL PANS
PANS
PILOT HOLES
PRESSURE PLATES
PRESSURE SWITCHES

*** DRIVETRAIN SYSTEMS UNI**

RACES
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TRANSMISSION COOLERS
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VACUUM CONTROLS
VACUUM HOSES
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VENTS
VIBRATION DAMPERS
WHEEL ATTACHMENT HARDWARE
WHEEL SPEED SENSORS
WIRING HARNESSES AND CONNECTORS
YOKES AND SLIP YOKES

INTRODUCTION TO MOTORIST ASSURANCE PROGRAM (MAP)

OVERVIEW OF MOTORIST ASSURANCE PROGRAM

The Motorist Assurance Program is the consumer outreach

effort of the Automotive Maintenance and Repair Association, Inc. (AMRA). Participation in the Motorist Assurance Program is drawn from retailers, suppliers, independent repair facilities, vehicle manufacturers and industry associations.

Our organization's mission is to strengthen the relationship between the consumer and the auto repair industry. We produce materials that give motorists the information and encouragement to take greater responsibility for their vehicles-through proper, manufacturer-recommended, maintenance. We encourage participating service and repair shops (including franchisees and dealers) to adopt (1) a Pledge of Assurance to their Customers and (2) the Motorist Assurance Program Standards of Service. All participating service providers have agreed to subscribe to this Pledge and to adhere to the promulgated Standards of Service demonstrating to their customers that they are serious about customer satisfaction.

These Standards of Service require that an inspection of the vehicle's (problem) system be made and the results communicated to the customer according to industry standards. Given that the industry did not have such standards, the Motorist Assurance Program successfully promulgated industry inspection communication standards in 1994-95 for the following systems: Exhaust, Brakes, ABS, Steering and Suspension, Engine Maintenance and Performance, HVAC, and Electrical Systems. Further, revisions to all of these inspection were recently published. Further, revisions to all of these inspection communication standards are continually republished. In addition to these, standards for Drive Train and Transmissions have recently been promulgated. Participating shops utilize these Uniform Inspection & Communication Standards as part of the inspection process and for communicating their findings to their customers.

The Motorist Assurance Program continues to work cooperatively and proactively with government agencies and consumer groups toward solutions that both benefit the customer and are mutually acceptable to both regulators and industry. We maintain the belief that industry must retain control over how we conduct our business, and we must be viewed as part of the solution and not part of the problem. Meetings with state and other government officials (and their representatives), concerned with auto repair and/or consumer protection, are conducted. Feedback from these sessions is brought back to the association, and the program adjusted as needed.

To assure auto repair customers recourse if they were not satisfied with a repair transaction, the Motorist Assurance Program offers mediation and arbitration through MAP/BBB-CARE and other non-profit organizations. MAP conducted pilot programs in twelve states before announcing the program nationally in October, 1998. During the pilots, participating repair shops demonstrated their adherence to the Pledge and Standards and agreed to follow the UICS in communicating

the results of their inspection to their customers. To put some "teeth" in the program, an accreditation requirement for shops was initiated. The requirements are stringent, and a self-policing method has been incorporated which includes the "mystery shopping" of outlets.

We welcome you to join us as we continue our outreach... with your support, both the automotive repair industry and your customers will reap the benefits. Please visit MAP at our Internet site www.motorist.org or contact us at:

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Washington, DC 20005
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January 1999

MAP UNIFORM INSPECTION GENERAL GUIDELINES

OVERVIEW OF SERVICE REQUIREMENTS & SUGGESTIONS

It is MAP policy that all exhaust, brake, steering, suspension, wheel alignment, drive-line, engine performance and maintenance, and heating, ventilation and air conditioning, and electrical services be offered and performed under the standards and procedures specified in these sections.

Before any service is performed on a vehicle, an inspection of the appropriate system must be performed. The results of this inspection must be explained to the customer and documented on an inspection form. The condition of the vehicle and its components will indicate what services/part replacements may be "Required" or "Suggested". In addition, suggestions may be made to satisfy the requests expressed by the customer.

When a component is suggested or required to be repaired or replaced, the decision to repair or replace must be made in the customer's best interest, and at his or her choice given the options available.

This section lists the various parts and conditions that indicate a required or suggested service or part replacement. Although this list is extensive, it is not fully inclusive. In addition to this list, a technician may make a suggestion. However, any suggestions must be based on substantial and informed experience, or the vehicle manufacturer's recommended service interval and must be documented.

Some conditions indicate that service or part replacement is required because the part in question is no longer providing the function for which it is intended, does not meet a vehicle manufacturer's design specification or is missing.

*** DRIVETRAIN SYSTEMS UNIF**

Example:
An exhaust pipe has corroded severely and has a hole in it through which exhaust gases are leaking. Replacement of the exhaust pipe in this case is required due to functional failure.

Example:
A brake rotor has been worn to the point where it measures less than the vehicle manufacturer's discard specifications. Replacement of the rotor is required because it does not meet design specifications.

Some conditions indicate that a service or part replacement is suggested because the part is close to the end of its useful life or addresses a customer's need, convenience or request. If a customer's vehicle has one of these conditions, the procedure may be only to suggest service.

Example:
An exhaust pipe is rusted, corroded or weak, but no leaks are present. In this case, the exhaust pipe has not failed. However, there is evidence that the pipe may need replacement in the near future. Replacement of the pipe may be suggested for the customer's convenience in avoiding a future problem.

Example:
The customer desires improved ride and/or handling, but the vehicle's shocks or struts have not failed. In this case, replacement may be suggested to satisfy the customer's wishes. In this case, replacement of the shocks or struts may not be sold as a requirement.

A customer, of course, has the choice of whether or not a shop will service his or her vehicle. He or she may decide not to follow some of your suggestions. When a repair is required, a MAP shop must refuse partial service on that system if, in the judgment of the service provider, proceeding with the work could create or continue an unsafe condition. When a procedure states that required or suggested repair or replacement is recommended, the customer must be informed of the generally acceptable repair/replacement options whether or not performed by the shop.

When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

The following reasons may be used for requiring inspection:

services. These codes are shown in the "Code" column of the MAP Uniform Inspection & Communications Standards that follow:

Reasons to Require Repair or Replacement

A - Part no longer performs intended purpose
B - Part does not meet a design specification (regardless of performance)
C - Part is missing

NOTE: When a repair is required, the shop must refuse partial service to the system in question, if the repair creates or continues an unsafe condition.

Reasons to Suggest Repair or Replacement

1 - Part is close to the end of its useful life (just above discard specifications, or weak; failure likely to occur soon, etc.)
2 - To address a customer need, convenience, or request (to stiffen ride, enhance performance, eliminate noise, etc.)
3 - To comply with maintenance recommended by the vehicle's Original Equipment Manufacturer (OEM)
4 - Technician's recommendation based on substantial and informed experience

NOTE: Suggested services are always optional. When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

DRIVE/POWER TRAIN ASSEMBLIES

SERVICE PROCEDURES REQUIRED AND SUGGESTED FOR PROPER VEHICLE OPERATION

NOTE: Whenever transmission or drivetrain service is performed that affects the suspension alignment, for example, removing the engine cradle, it is required that the alignment be checked and corrected if necessary.

AUTOMATIC TRANSMISSION/TRANSAXLE ASSEMBLIES

AUTOMATIC TRANSMISSION/TRANSAXLE ASSEMBLY INSPECTION

Any internal component failure that requires removal of the assembly from the vehicle for service. (1) ..... A ..... (2) Require repair or replacement of the automatic transmission/transaxle assembly.

(1) - It is Required that the torque converter and all other failure related components be inspected for cause and condition.
(2) - For components not requiring removal of the assembly, refer to the component listing in this document.

DIFFERENTIAL AND FINAL DRIVE ASSEMBLIES

NOTE: Does not include half shafts.

DIFFERENTIAL AND FINAL DRIVE ASSEMBLY INSPECTION

Condition	Code	Procedure
Any internal component failure that requires removal of the assembly from the vehicle for service. (1)	A ...	Require repair or replacement of the differential assembly.

(1) - For components not requiring removal of the assembly, refer to the component listing in this document.

MANUAL TRANSMISSION/TRANSAXLE ASSEMBLIES

MANUAL TRANSMISSION/TRANSAXLE ASSEMBLY INSPECTION

Condition	Code	Procedure
Any internal component failure that requires removal of the assembly from the vehicle for		

service. (1)	A	...	Require repair or replacement of the manual transmission/transaxle assembly.

(1) - For components not requiring removal of the assembly, refer to the component listing in this document.

TRANSFER CASE ASSEMBLIES

TRANSFER CASE ASSEMBLY INSPECTION

Condition	Code		Procedure
Any internal component failure that requires removal of the assembly from the vehicle for service. (1)	A	...	Require repair or replacement of the transfer case differential assembly.

(1) - For components not requiring removal of the assembly, refer to the component listing in this document.

DRIVE TRAIN/COMPONENTS

The conditions listed for the components included in this section assume that the problem has been isolated to the specific component through proper testing.

ACTUATORS (ELECTRICAL)

ACTUATOR (ELECTRICAL) INSPECTION

Condition	Code		Procedure
Attaching hardware broken	A	...	Require repair or replacement of hardware.
Attaching hardware missing	C	.....	Require replacement of hardware.
Attaching hardware not			

functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted, affecting performance .. A ..... (1) Require repair or replacement.
Connector melted, not affecting performance .. 2 ..... (1) Suggest repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 1 ..... (1) Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 1 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

ACTUATORS (VACUUM)

ACTUATOR (VACUUM) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement.

of hardware.

Attaching hardware missing ..... C ..... Require replacement of hardware.

Attaching hardware not functioning ..... A .. Require repair or replacement of hardware.

Connector broken ..... A .. Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.

Connector melted, affecting performance .. A ..... (1) Require repair or replacement.

Connector melted, not affecting performance .. 2 ..... (1) Suggest repair or replacement.

Connector missing ..... C ..... Require replacement.

Inoperative ..... A ..... (2) Require replacement.

Leaking (vacuum) ..... A .. Require repair or replacement.

Linkage bent, affecting performance ..... A ... Require repair or replacement of linkage.

Linkage bent, not affecting performance .. 2 ... Suggest repair or replacement of linkage.

Linkage binding, affecting performance ..... A ... Require repair or replacement of linkage.

Linkage binding, not affecting performance .. 1 ... Suggest repair or replacement of linkage.

Linkage broken A Require repair or replacement of linkage.

Linkage loose, affecting performance ..... A ... Require repair or replacement of linkage.

Linkage loose, not affecting performance .. 1 ... Suggest repair or replacement of linkage.

Linkage missing ..... C ..... Require replacement.

Linkage noisy ..... 2 .. Suggest repair or replacement.

Missing ..... C ..... Require replacement.

Noisy ..... 2 .. Suggest repair or replacement.

Out of adjustment ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or

replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

AXLES

AXLE INSPECTION

Condition	Code	Procedure
Bent	A	Require replacement.
Broken	A	Require replacement.
End play exceeds specifications	B	Require repair or replacement.
Flange bent	A	Require replacement.
Flange threads stripped	A	Require repair or replacement.
Twisted	A	Require replacement.
Worn, affecting performance	A	Require replacement.

BEARINGS AND RACES

NOTE: When replacing or repacking bearings, grease seal replacement is required. You are not required to replace these components in axle sets. Determine the need to replace based upon the individual component conditions that follow.

BEARING AND RACE INSPECTION

Condition	Code	Procedure

Bearing end-play exceeds specifications ..... B .. Require adjustment of bearing, if possible. If proper adjustment cannot be obtained, require replacement of bearing assembly.

Bearing rollers, balls or races are worn, pitted, or feel rough when rotated as an assembly ..... B .. Require replacement of bearing assembly.

BELL CRANKS

BELL CRANK INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bent	A	Require repair or replacement.
Broken	A	Require repair or replacement.
Cracked	A	Require repair or replacement.
Missing	C	Require replacement.
Worn, affecting performance	A	Require repair or replacement.

BELL HOUSINGS

See HOUSINGS (BELL, CASE, TAIL (EXTENSION) AND AUXILIARY).

BUSHINGS (EXTERNAL)

BUSHING (EXTERNAL) INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part if available; otherwise, replace bushing.
Attaching hardware broken	A	Require replacement of broken part if available; otherwise, replace bushing.
Attaching hardware corroded, affecting structural integrity	A	Require replacement of corroded part if available; otherwise, replace bushing.
Attaching hardware incorrect	A	Require replacement of incorrect part if available; otherwise, replace bushing.
Attaching hardware loose	A	Require repair or replacement of loose part if available; otherwise, replace bushing.
Attaching hardware missing	C	Require replacement of missing part if available; otherwise, replace bushing.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads if available; otherwise, replace bushing.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads if available; otherwise, replace bushing.
Binding	A	Require repair or replacement.
Contaminated	1	Suggest replacement.
Deteriorated, affecting performance	A	Require repair or replacement.
Distorted, affecting performance	A	Require repair or replacement.
Missing	A	Require replacement.

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Noisy ..... 2 ..... (1) Further inspection required.
Rubber separating from internal metal sleeve on bonded bushing ..... A ..... Require replacement.
Seized ..... A ..... Require replacement.
Shifted (out of position) ..... B .. Require repair or replacement.
Split ..... A ..... Require replacement.
Surface cracking (weather-checked) .... No service suggested or required.
Worn, affecting performance ..... A .. Require repair or replacement.
Worn close to the end of its useful life ..... 1 ..... Suggest replacement.

(1) - If noise isolated to bushing, suggest repair or replacement.
CAUTION: Use only approved lubricant on rubber bushings. Petroleum-based lubricants may damage rubber bushings.

CABLES (SPEEDOMETER)

CABLE (SPEEDOMETER) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bent	A	Require repair or replacement.
Binding	A	Require repair or replacement.
Bracket bent, affecting performance	A	Require repair or replacement.
Bracket bent, not affecting performance	.. ..	No service suggested or required.
Bracket broken, affecting		

performance ..... A ..... Require replacement.
Bracket broken, not
affecting performance .. .. No service suggested or required.
Bracket corroded,
affecting performance .. A .. Require repair or replacement.
Bracket corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Bracket cracked, affecting
performance ..... A .. Require repair or replacement.
Bracket cracked, not
affecting performance .. 1 .. Suggest repair or replacement.
Bracket loose, affecting
performance ..... A .. Require repair or replacement.
Bracket loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Broken ..... A ..... Require replacement.
Cracked ..... A .. Require repair or replacement.
Disconnected ..... A .. Require repair or replacement.
Kinked ..... A .. Require repair or replacement.
Melted ..... A ..... (1) Require repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Routed incorrectly ..... 2 ..... Suggest repair.
Seized ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

CABLES (TV, DETENT AND SHIFT)

CABLE (TV, DETENT AND SHIFT) INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement

of hardware.

Bent ..... A .. Require repair or replacement.
Binding ..... A .. Require repair or replacement.
Bracket bent, affecting performance ..... A .. Require repair or replacement.
Bracket bent, not affecting performance .. .. No service suggested or required.
Bracket broken, affecting performance ..... A ..... Require replacement.
Bracket broken, not affecting performance .. .. No service suggested or required.
Bracket corroded, affecting performance .. A .. Require repair or replacement.
Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Bracket cracked, affecting performance ..... A .. Require repair or replacement.
Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket loose, affecting performance ..... A .. Require repair or replacement.
Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Broken ..... A ..... Require replacement.
Cracked ..... A .. Require repair or replacement.
Disconnected ..... A .. Require repair or replacement.
Frayed ..... A ..... Require replacement.
Kinked ..... A .. Require repair or replacement.
Melted ..... A ..... (1) Require repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B ..... (2) Require repair or replacement.
Routed incorrectly ..... 2 ..... Suggest repair.
Seized ..... A .. Require repair or replacement.
Self-adjuster inoperative ..... A .. Require repair or replacement of self-adjuster.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

*** DRIVETRAIN SYSTEMS UNIFORM INSPEC**

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Cable replacement is required if it cannot be adjusted within specifications.

CARRIER BEARINGS

See INTERMEDIATE SHAFT SUPPORT BEARINGS.

CLUTCH CABLES AND CABLE HOUSINGS

CLUTCH CABLE AND CABLE HOUSING INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Cable bent	A	Require replacement.
Cable binding	A	Require repair or replacement.
Cable mounting loose	B	Require repair or replacement.
Cable out of adjustment	B	Require repair or replacement.
Frayed	B	Require replacement.
Housing heat-damaged	1	Suggest replacement.
Missing	C	Require replacement.
Noisy	2	Suggest repair or replacement.
Seized	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn, affecting performance	A	Require replacement.

CLUTCH DISCS (MANUAL TRANSMISSION)

CLUTCH DISC (MANUAL TRANSMISSION) INSPECTION

Condition	Code	Procedure
Backing plate cracked	A	Require replacement.
Broken	A	Require replacement.
Contaminated with oil	A	Require replacement.
Damper cushion broken	A	Require replacement.
Damper cushion collapsed	A	Require replacement.
Damper spring collapsed	A	Require replacement.

Damper spring missing .. C ..... (1) Require replacement.
Friction material cracked through ..... B ..... Require replacement.
Friction material flaking or chunking ..... B ..... Require replacement.
Friction material surface cracking ..... B ..... No service suggested or required.
Grooved ..... B ..... No service suggested or required unless the pressure plate or flywheel is being resurfaced or replaced. In this case, replacement of clutch disc is required.
Ridged ..... B ..... No service suggested or required unless the pressure plate or flywheel is being resurfaced or replaced. In this case, replacement of clutch disc is required.
Splines worn, affecting performance ..... A ..... Require replacement.
Warped ..... A ..... Require replacement.
Wear exceeds specifications (where applicable) ..... B ..... Require replacement.
Worn close to the end of its useful life ..... 1 ..... Suggest replacement.
Worn, affecting performance ..... A ..... Require replacement.

(1) - Not all clutch discs have springs in all spring chambers on the disc.

CLUTCH FORKS

CLUTCH FORK INSPECTION

Condition Code Procedure

Bent ..... B ..... Require replacement.
Broken ..... A .. Require repair or replacement.
Cracked ..... B .. Require repair or replacement.
Worn close to the end of its useful life ..... 1 ..... Suggest replacement.

*** DRIVETRAIN SYSTEMS UNIFORM INS**

Worn, affecting
performance ..... A ..... Require replacement.

CLUTCH LINKAGES (MECHANICAL)

See LINKAGES (EXTERNAL).

CLUTCH MASTER CYLINDERS

CLUTCH MASTER CYLINDER INSPECTION

Condition	Code	Procedure
Cover gasket distorted	A	Require replacement of cover gasket.
Cover gasket gummy	A	Require replacement of cover gasket.
Cylinder leaking fluid from rear of bore	A	Require repair or replacement.
Cylinder leaking fluid internally	A	Require replacement.
Dust boot missing	C	Require replacement of dust boot.
Dust boot punctured	A	Require replacement of dust boot.
Dust boot torn	A	Require replacement of dust boot.
Fluid level incorrect	B	Require fluid level adjustment.
Housing damaged, affecting performance	A	Require repair or replacement.
Master cylinder has residue in reservoir (make parallel w/brakes when they are done)	2	(1) Further inspection required.
Threads damaged	A	Require repair replacement
Threads stripped (threads missing)	A	Require replacement.

(1) - DO NOT replace master cylinder unless it exhibits conditions listed for replacement. You may suggest fluid change according to OEM service intervals.

CLUTCH PEDALS

CLUTCH PEDAL INSPECTION

Condition	Code	Procedure
Bent, affecting performance	A	Require repair or replacement.
Broken	A	Require repair or replacement.
Pedal pad missing	C	Require replacement of pedal pad.
Pivot bushings worn, affecting performance	A	Require replacement of pivot bushings.

CLUTCH PIVOTS

CLUTCH PIVOT INSPECTION

Condition	Code	Procedure
Bent	A	Require replacement.
Broken	A	Require repair or replacement.
Cracked	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn close to the end of its useful life	1	Suggest replacement.
Worn, affecting performance	A	Require replacement.

CLUTCH PRESSURE PLATES

See PRESSURE PLATES.

CLUTCH RELEASE BEARINGS

CLUTCH RELEASE BEARING INSPECTION

Condition	Code	Procedure
Collar broken	A	Require replacement.
Cracked	A	Require replacement.
Rough when rotated as		

assembly ..... B ..... Require replacement.
Seized ..... A ..... Require replacement.
Wear exceeds
specifications ..... B ..... Require replacement.
Worn close to the end of
its useful life ..... 1 ..... Suggest replacement.
Worn, affecting
performance ..... A ..... Require replacement.

CLUTCH SLAVE CYLINDERS (CONCENTRIC)

CLUTCH SLAVE CYLINDER (CONCENTRIC) INSPECTION

Condition Code Procedure

Bearing rough when rotated
as an assembly ..... B ..... Require replacement.
Bearing seized ..... A ..... Require replacement.
Bleeder pipe leaks ..... A .. Require repair or replacement.
Carrier assembly worn,
affecting performance .. A ..... Require replacement.
Collar broken ..... A ..... Require replacement.
Cracked ..... A ..... Require replacement.
Housing leaks ..... A ..... Require replacement.
Inoperative ..... A ..... Require replacement.
Release binding ..... A ..... Require replacement.
Spring broken ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Worn, affecting
performance ..... A ..... Require replacement.

CLUTCH SLAVE CYLINDERS (CONVENTIONAL OR EXTERNAL)

CLUTCH SLAVE CYLINDER (CONVENTIONAL OR EXTERNAL) INSPECTION

Condition Code Procedure

Binding ..... A .. Require repair or replacement.
Bleeder port damaged (not
repairable) ..... A ..... (1) Require replacement.
Bleeder port damaged
(repairable) ..... A ..... (1) Require repair.

Bleeder screw broken off
in slave cylinder ..... A ..... (1) Require replacement.
Bleeder screw seized .... A ..... (2) Require replacement.
Bore corroded (pitted) .. B ..... Require replacement.
Bore grooved ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - Only required if the hydraulic system must be opened.
(2) - Seized is defined as a bleeder screw that cannot be removed after a practical attempt at removing it has been made.

COMPANION FLANGES

See YOKES AND SLIP YOKES.

CONNECTORS

See WIRING HARNESSES AND CONNECTORS.

COOLER BYPASS VALVES

COOLER BYPASS VALVE INSPECTION

Condition Code Procedure

Inoperative ..... A ..... Require replacement.
Installed incorrectly ... A ..... Require repair.
Leaking ..... A .. Require repair or replacement.
Restricted ..... A .. Require repair or replacement.

COOLER LINES

COOLER LINE INSPECTION

Condition Code Procedure

Abrasion damage, affecting
structural integrity ... A .. Require repair or replacement.
Abrasion damage, not
affecting structural
integrity .... No service suggested o

required.
Application incorrect ... B ..... Require replacement.
Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement
of hardware.
Clamp corroded, not
reusable ..... 1 ..... Suggest replacement.
Connected incorrectly ... A ..... Require repair.
Corroded, affecting
structural integrity ... A ..... Require replacement.
Corroded, not affecting
structural integrity ... . No service suggested or
required.
Cracked ..... A .. Require repair or replacement.
Fitting type incorrect
(such as compression
fitting) ..... B ..... Require replacement.
Flange leaking ..... A .. Require repair or replacement.
Insufficient clamping
force, allowing hose to
leak ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Melted ..... 1 .. Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Outer covering damaged to
the extent that the inner
fabric is visible ..... A ..... Require replacement.
Protective sleeves
damaged ..... 2 . Suggest replacement of sleeves.
Protective sleeves
missing ..... C . Require replacement of sleeves.
Restricted, affecting
performance ..... A .. Require repair or replacement.
Routed incorrectly ..... 2 ..... Require repair.
Swollen ..... 1 ..... Suggest replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Type incorrect ..... 1 .. Suggest repair or replacement.

COOLERS

See TRANSMISSION COOLERS.

CV JOINTS

CV JOINT INSPECTION

Condition	Code	Procedure
Bearing, bushing or seal surface worn, affecting performance	A	Require repair or replacement.
Boot clamp broken	A	Require repair or replacement of clamp.
Boot clamp loose	A	Require repair or replacement of clamp.
Boot clamp missing	C	Require repair or replacement of clamp.
Boot leaking	A	Require replacement of CV boot.
Boot surface cracked, not leaking	2	Suggest replacement of CV boot.
Cage broken	A	Require repair or replacement of CV joint.
Housing damaged to the extent that it no longer performs its intended function	A	(1) Require repair or replacement of CV joint.
Housing worn to the extent that it no longer performs its intended function	A	(1) Require repair or replacement of CV joint.
Holes elongated	A	Require replacement.
Internal parts binding	A	Require repair or replacement.
Internal parts worn	A	Require repair or replacement.
Lubricant missing	C	Require cleaning, inspection, and repacking of CV joint.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Housing assembly may appear blue in color from normal manufacturing process of heat-treating the housing.

DIP STICK TUBES

DIP STICK TUBE INSPECTION

Condition	Code	Procedure
Broken	A	Require repair or replacement.
Checkball missing	C	Suggest repair or replacement.
Cracked	A	Require repair or replacement.
Hold down bracket broken	A	Require repair or replacement.
Hold down bracket missing	C	Require replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

DIP STICKS (FLUID LEVEL INDICATORS)

DIP STICK (FLUID LEVEL INDICATOR) INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Broken	A	Require replacement.
Compressed	A	Require repair or replacement.
Missing	C	Require replacement.
Modified	A	Require replacement.
Stretched	A	Require repair or replacement.

DOWEL PINS, GUIDES AND PILOT HOLES

DOWEL PIN, GUIDE AND PILOT HOLE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement.
Cracked	A	Require repair or replacement.
Distorted	A	Require repair or replacement.
Missing	C	Require replacement.
Positioned incorrectly	B	Require repair or replacement.

*** DRI**

Stepped ..... A .. Require repair or replacement.
Worn to the extent that it
no longer performs its
intended function ..... A .. Require repair or replacement.

DRIVE SHAFT FLANGES

See COMPANION FLANGES.

DRIVE SHAFTS AND HALF SHAFTS

DRIVE SHAFT AND HALF SHAFT INSPECTION

Condition Code Procedure

Balance weight missing .. C .. Require repair or replacement.
Bearing cap bore
distorted ..... A .. Require repair or replacement.
Bent ..... A ..... Require replacement.
Bolt holes elongated .... A .. Require repair or replacement.
Bushing or seal surface
worn, affecting
performance ..... A .. Require repair or replacement.
Leaking through soft yoke
plug ..... A ... Require repair or replacement
of soft yoke plug.
Out of balance ..... A .. Require repair or replacement.
Retainer strap bent ..... A ..... Require replacement of
retainer strap.
Slip yoke broken ..... A ..... Require replacement.
Splines worn, affecting
performance ..... A ..... Require replacement.
Splines worn close to
the end of their
useful life ..... 1 ..... Suggest replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
U-bolt damaged, affecting
performance ..... A . Require replacement of U-bolts.
Yoke damaged, affecting
performance ..... A .. Require repair or replacement.

DUST BOOTS

NOTE: Does not include CV boots.

DUST BOOT INSPECTION

Condition	Code	Procedure
Cracked, not leaking	1	Suggest replacement.
Missing	C	Require replacement.
Leaking	A	Require repair or replacement.
Torn	A	Require replacement.

ENGINE MOUNTS

See MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION).

EXCITER RINGS

See TOOTHED RINGS (TONE WHEELS).

FILLER TUBES

See DIP STICK TUBES.

FILTERS AND SCREENS

FILTER AND SCREEN INSPECTION

Condition	Code	Procedure
At service interval	3	Suggest replacement.
Bent	A	Require repair or replacement.
Exceeding service interval	3	Suggest replacement.
Missing	C	Require replacement.
Near service interval	3	Suggest replacement.
Restricted	A	(1) Require repair or replacement.
Torn	A	Require replacement.
Worn, affecting performance (metal or nylon screen type)	A	Require repair or replacement.

(1) - Further inspection may be required to determine the source of restriction or contamination.

FLANGES

See COMPANION FLANGES.

FLEX PLATES

FLEX PLATE INSPECTION

Condition	Code	Procedure
Bent, affecting performance	A	Require replacement.
Bent, not affecting performance	..	No service suggested or required.
Bolt or stud holes elongated	B	Require replacement.
Broken	A	Require replacement.
Cracked	A	Require replacement.
Ring gear worn close to the end of its useful life	1	Suggest replacement.
Ring gear worn to the extent that it no longer performs its intended function	A	Require replacement.
Weights missing	A	Require replacement.

FLUID LEVEL INDICATORS

See DIP STICKS (FLUID LEVEL INDICATORS).

FLUIDS AND LUBRICANTS

FLUID AND LUBRICANT INSPECTION

Condition	Code	Procedure
Application incorrect	B	(1) Require replacement.
At service interval	3	Suggest replacement.
Beyond service interval	3	Suggest replacement.
Burned	..	(2) Further inspection required.

Contaminated, for example,
fluid other than hydraulic
fluid present ..... A or B .... (3)(4) Require service.
Exceeding service
interval ..... 3 ..... Suggest replacement.
Hydraulic fluid
incorrect ..... B ..... (5) Require service.
Level incorrect ..... B ..... Require correction of fluid level.
Near service interval ... 3 ..... Suggest replacement.
Rubber master cylinder
cover gasket distorted
and gummy ..... A ..... (3) Require service.
Varnished .... (6) Further inspection required.

(1) - Determine and correct cause.
(2) - Fluid that is burned indicates a serious problem. Determine and correct the cause.
(3) - If a fluid other than hydraulic fluid is present in the hydraulic system which DOES affect the rubber parts, the required service is to: 1) remove all components having rubber parts from the system, 2) flush lines with denatured alcohol or hydraulic cleaner, 3) repair or replace all components having rubber parts, and 4) bleed and flush with correct hydraulic fluid. (Code A)
(4) - If a fluid other than hydraulic fluid is present in the hydraulic system which DOES NOT affect the rubber parts, the required service is to flush and fill with the correct hydraulic fluid. (Code B)
(5) - If a fluid other than specification hydraulic fluid is present in the hydraulic system, the required service is to flush and fill with the correct hydraulic fluid.
(6) - Fluid that is varnished may indicate a serious problem. Determine and correct the cause.

FLYWHEELS

NOTE: Clutch disc replacement does not necessitate flywheel reconditioning, unless other conditions justify the reason to do so.

FLYWHEEL INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Cracked (other than
mounting area) ..... A ..... (1) Require resurfacing or replacement.
Cracks in mounting area . B ..... Require replacement.
Hard spots ..... B .. Require repair or replacement.
Ring gear broken ..... A ..... Require replacement of ring gear.
Ring gear teeth worn,
affecting performance .. A ..... Require replacement of ring gear.
Runout exceeds
specifications ..... B .. Require repair or replacement.
Scored ..... B .. Require repair or replacement.
Surface cracks after
resurfacing to
manufacturer's minimum
specifications ..... B ..... Require replacement.
Wear exceeds
specifications ..... B ..... Require replacement.
Worn close to the end of
its useful life ..... 1 ..... Suggest replacement.
Worn, affecting
performance ..... A .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - Some manufacturers allow slight surface cracking in the friction surface.

FORCE MOTORS

See ACTUATORS (ELECTRICAL).

See DOWEL PINS, GUIDES AND PILOT HOLES.

HALF SHAFTS

See DRIVE SHAFTS AND HALF SHAFTS.

HOSES, LINES AND TUBES

HOSE, LINE AND TUBE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Connected incorrectly	A	Require repair.
Corroded, not reusable	1	Suggest replacement.
Cracked	A	Require replacement.
Dry-rotted	1	Suggest repair or replacement.
Hard	1	Suggest repair or replacement.
Inner fabric (webbing) damaged	A	Require replacement.
Insufficient clamping force, allowing hose to leak	A	Require repair or replacement.
Leaking	A	Require repair or replacement.
Maintenance intervals	3	Suggest replacement.
Melted	1	Suggest repair or replacement.
Missing	C	Require replacement.
Outer covering damaged	1	Suggest replacement.
Outer covering damaged to the extent that the inner fabric is visible	A	Require replacement.
Protective sleeves damaged	2	Suggest replacement of sleeves.
Protective sleeves missing	2	Suggest replacement of sleeves.
Restricted, affecting performance	A	Require repair or replacement.
Restricted, not affecting performance	2	Suggest repair or replacement.
Routed incorrectly	2	Suggest replacement.
Safety clip missing	C	Require replacement.
Spongy	1	Suggest repair or replacement.
Stripped	A	Require replacement.
Swollen	B	Require replacement.
Threads damaged	A	Require replacement.

Threads stripped (threads
missing) ..... A ..... Require replacement.
Type incorrect ..... 1 .. Suggest repair or replacement.

HOUSINGS (BELL, CASE, TAIL (EXTENSION) AND AUXILIARY)

HOUSING (BELL, CASE, TAIL (EXTENSION) AND AUXILIARY) INSPECTION

Condition Code Procedure

Bearing race loose
in bore ..... A .. Require repair or replacement.
Broken, affecting
performance ..... A .. Require repair or replacement.
Cracked ..... A .. Require repair or replacement.
Dowel pin holes worn,
affecting performance .. A ..... (1) Require repair or
replacement.
Machined surfaces damaged,
affecting performance .. A .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Worn, affecting
performance ..... A .. Require repair or replacement.

(1) - See DOWEL PINS, GUIDES AND PILOT HOLES.

INTERMEDIATE SHAFT SUPPORT BEARINGS

INTERMEDIATE SHAFT SUPPORT BEARING INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement
of hardware.
Bearing rollers, balls or

races are worn, pitted, noisy, or feel rough when rotated as an assembly . A .. Require replacement of bearing assembly.

Bracket bent, affecting performance ..... A .. Require repair or replacement.

Bracket bent, not affecting performance .. .. No service suggested or required.

Bracket broken, affecting performance ..... A ..... Require replacement.

Bracket broken, not affecting performance .. .. No service suggested or required.

Bracket corroded, affecting performance .. A .. Require repair or replacement.

Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Bracket cracked, affecting performance ..... A .. Require repair or replacement.

Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket holes elongated, affecting performance .. A .. Require repair or replacement.

Bracket holes elongated, not affecting performances) .... No service suggested or required.

Bracket loose, affecting performance ..... A .. Require repair or replacement.

Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket missing ..... C ..... Require replacement.

Cracked .... Require replacement.

Rough (brinelling, spalling) ..... A ..... Require replacement.

Rubber deteriorated, affecting performance .. A ..... Require replacement.

Seized ..... A ..... Require replacement.

KEY INTERLOCK SYSTEMS

See SHIFT INTERLOCK SYSTEMS (SELECTOR AND KEY INTERLOCK SYSTEMS).

LIMITED SLIPS

See DIFFERENTIAL AND FINAL DRIVE ASSEMBLIES.

LINES

See HOSES, LINES AND TUBES.

LINKAGES (EXTERNAL)

LINKAGE (EXTERNAL) INSPECTION

Condition	Code	Procedure
Components missing	C	Require replacement of missing components.
Linkage bent, affecting performance	A	Require repair or replacement of linkage.
Linkage bent, not affecting performance	2	Suggest repair or replacement of linkage.
Linkage binding, affecting performance	A	Require repair or replacement of linkage.
Linkage binding, not affecting performance	1	Suggest repair or replacement of linkage.
Linkage broken	A	Require repair or replacement of linkage.
Linkage loose, affecting performance	A	Require repair or replacement of linkage.
Linkage loose, not affecting performance	1	Suggest repair or replacement of linkage.
Linkage missing	C	Require replacement.
Linkage noisy	2	Suggest repair or replacement.
Out of adjustment	B	Require repair or replacement.
Worn to the extent that it no longer performs its intended function	A	Require repair or replacement.

LOCKING HUB ASSEMBLIES

LOCKING HUB ASSEMBLY INSPECTION

Condition	Code	Procedure
Inoperative	A	(1) Require repair or replacement.
Loose	A	Require repair or replacement.
Seized in any position	A	Require repair or replacement.

(1) - Inoperative includes intermittent operation.

LOCKING HUB CONTROL KNOBS

LOCKING HUB CONTROL KNOB INSPECTION

Condition	Code	Procedure
Damaged, affecting performance	A	Require replacement.
Missing	C	Require replacement.
Worn, affecting performance	A	Require replacement.

LUBRICANTS

See FLUIDS AND LUBRICANTS.

METAL-CLAD SEALS

See SEALS.

METALASTIC JOINTS

See RUBBER JOINTS (METALASTIC).

MODULATOR PINS

MODULATOR PIN INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Missing	C	Require replacement.

MODULATORS

MODULATOR INSPECTION

Condition	Code	Procedure
Bent, affecting performance	A	Require replacement.
Contaminated (water, fuel, etc.)	A	(1) Require replacement.
Housing cracked	A	Require replacement.
Inoperative	A	(2) Require replacement.
Leaking fluid externally	A	Require repair or replacement.
Leaking fluid internally	A	Require replacement.
Leaking vacuum	A	Require replacement.
Nipple broken	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Further inspection is required to determine the cause of the contamination.
(2) - Inoperative includes intermittent operation or out of OEM specification.

MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION)

MOUNT (ENGINE, TRANSAXLE AND TRANSMISSION) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Broken	A	Require replacement.
Leaking (hydraulic mount)	A	Require replacement.

Mounting hole worn, affecting performance	A	Require replacement.
Mounting hole worn, not affecting performance		No service suggested or required.
Rubber deteriorated, affecting performance	A	Require replacement.
Rubber deteriorated, not affecting performance		No service suggested or required.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

ODOMETER DRIVES (MECHANICAL)

See SPEEDOMETER/ODOMETER DRIVES (MECHANICAL).

ODOMETER HEADS (MECHANICAL)

See SPEEDOMETER/ODOMETER HEADS (MECHANICAL).

OIL PANS

See TRANSMISSION PANS.

PANS

See TRANSMISSION PANS.

PILOT HOLES

See DOWEL PINS, GUIDES AND PILOT HOLES.

PRESSURE PLATES

PRESSURE PLATE INSPECTION

Condition	Code	Procedure
Balance weight missing	C	Require replacement.
Broken	A	Require replacement.
Contact surface distorted	B	Require replacement.
Cracks	B	Require replacement.
Fingers bent	A	Require replacement.

Hard spots	B	Require replacement.
Scored	B	Require replacement.
Spring rate less than specifications	B	Require replacement.
Worn, affecting performance	A	Require replacement.
Worn beyond specifications	B	Require replacement.
Worn close to the end of its useful life	1	Suggest replacement.

PRESSURE SWITCHES

See SWITCHES.

RACES

See BEARINGS AND RACES.

RUBBER JOINTS (METALASTIC)

These joints may be found on half and/or drive shafts. They are usually found on European vehicles featuring a three-lug drive flange. They may be equipped with a centering ball or pin.

RUBBER JOINT (METALASTIC) INSPECTION

Condition	Code	Procedure
Drive flange bent	A	Require repair or replacement.
Drive flange damaged, affecting performance	A	Require replacement.
Rubber drive joint cracked	2	Suggest replacement.
Rubber drive joint damaged, affecting performance	A	Require replacement.
Rubber drive joint split between mounting holes	A	Require replacement.
Rubber drive joint torn at mounting holes	A	Require replacement.
Rubber drive joint weather-cracked		No service suggested or required.

SCREENS

See FILTERS AND SCREENS.

SEALS

SEAL INSPECTION

Condition	Code	Procedure
Leaking	A	(1) Require repair or replacement.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary. Check vent. A plugged vent may force fluid past the seal.

SEALS (METAL-CLAD)

See SEALS.

SELECTOR INTERLOCK SYSTEMS

See SHIFT INTERLOCK SYSTEMS (SELECTOR AND KEY INTERLOCK SYSTEMS).

SERVOS

See ACTUATORS (VACUUM).

SHIFT INTERLOCK SYSTEMS (SELECTOR AND KEY INTERLOCK SYSTEMS)

See:
ACTUATORS (ELECTRICAL)
CABLES
LINKAGES (EXTERNAL)
SWITCHES

SENSORS

SENSOR INSPECTION

Condition	Code	Procedure

Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require repair or replacement.
Leaking (vacuum/fluid/air) ..... A ..... Require replacement.
Out of adjustment ..... B ..... (3) Further inspection required.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of specification.
(3) - Follow OEM recommended adjustment procedures. Repair or replace if out of specification.

SIDE COVERS

See TRANSMISSION PANS.

SLIP YOKES

See YOKES AND SLIP YOKES.

SOLENOIDS

See:
ACTUATORS (ELECTRICAL)
ACTUATORS (VACUUM)

SPEED SENSORS (ELECTRONIC WHEEL AND VEHICLE)

SPEED SENSOR (ELECTRONIC WHEEL AND VEHICLE) INSPECTION

Condition	Code	Procedure
Air gap incorrect	B	(1) Require adjustment or replacement.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(2) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(3) Require repair or replacement.
Inoperative	B	(4) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Loose	A	Require repair or replacement.

Missing ..... C ..... Require replacement.
Resistance out of
specification ..... B .. Require repair or replacement.
Sensor housing cracked .. 2 ..... Suggest replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (2) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead misrouted ..... B .... Require re-routing according
to vehicle manufacturer's
specifications.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - If a sensor is not adjustable, further inspection is
required to identify and correct cause.
(2) - Determine cause and correct prior to repair or
replacement of part.
(3) - Determine source of contamination, such as metal particles
or water. Require repair or replacement.
(4) - Inoperative includes intermittent operation or out of OEM
specification. Some components may be serviceable;
check for accepted cleaning procedure.

SPEEDOMETER-DRIVEN GEAR HOUSINGS

See SPEEDOMETER/ODOMETER DRIVES (MECHANICAL).

SPEEDOMETER/ODOMETER DRIVES (MECHANICAL) *** DRIVETRAIN SYSTEMS UNIFORM INSPEC**

SPEEDOMETER/ODOMETER DRIVE (MECHANICAL) INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Inoperative	A	(1) Require replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Teeth broken	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn close to the end of its useful life	1	Suggest replacement.
Worn, affecting performance	A	Require replacement.

(1) - Inoperative includes intermittent operation.

SPEEDOMETER/ODOMETER HEADS (MECHANICAL)

SPEEDOMETER/ODOMETER HEAD (MECHANICAL) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Lens broken	A	(1) Require repair or

replacement.
Lens cloudy ..... 2 ..... (1) Suggest repair or replacement.
Lens missing ..... C ..... (1) Require repair or replacement.
Malfunctioning ..... A ..... (2) Require repair or replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

(1) - If lens is available as a separate part, require replacement of lens only.
(2) - Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.

SPEEDOMETERS AND ODOMETERS (ELECTRONIC)

SPEEDOMETER AND ODOMETER (ELECTRONIC) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Leaking	A	Require replacement.
Lens broken	A	(2) Require repair or replacement.
Lens cloudy	2	(2) Suggest repair or replacement.
Lens missing	C	(2) Require repair or

replacement.
Malfunctioning ..... A ..... (3) Require repair or replacement.
Mechanical head noisy ... 2 .. Suggest repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - If lens is available as a separate part, require replacement of lens only.
(3) - Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.

SWITCHES

SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Binding, affecting performance	A	Require repair or replacement.
Binding, not affecting		

performance ..... 2 .. Suggest repair or replacement.
Broken ..... A .. Require repair or replacement.
Burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Burned, not affecting
performance ..... 2 ..... (1) Suggest repair or replacement.
Cracked, affecting
performance ..... A .. Require repair or replacement.
Cracked, not affecting
performance ..... 1 .. Suggest repair or replacement.
Leaking ..... A .. Require repair or replacement.
Malfunctioning ..... A ..... (2) Require repair or replacement.
Melted, affecting
performance ..... A ..... (1) Require repair or replacement.
Melted, not affecting
performance ..... 2 ..... (1) Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Out of adjustment ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Won't return ..... A .. Require repair or replacement.
Worn ..... 1 ..... Suggest replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Includes inoperative, intermittent operation, or failure to perform all functions.

TONE WHEELS

See TOOTHED RINGS (TONE WHEELS).

TOOTHED RINGS (TONE WHEELS)

If the toothed ring requires replacement and cannot be replaced as a separate component, replace the assembly of which the ring is a part.

TOOTHED RING (TONE WHEEL) INSPECTION

Condition	Code	Procedure
Alignment incorrect	B	Require repair or replacement.
Bent	B	Require replacement.
Contaminated, affecting performance	A	Require repair. Identify and correct cause.
Cracked	B	Require replacement.
Loose	A	Require replacement of worn parts.
Missing	C	Require replacement.
Number of teeth incorrect	B	Require replacement.
Teeth broken	A	Require replacement.
Teeth damaged, affecting performance	A	Require replacement.

TORQUE CONVERTERS

TORQUE CONVERTER INSPECTION

Condition	Code	Procedure
Converter clutch lock-up operation is faulty	A	Require replacement.
Cover shell damaged, affecting performance	A	Require replacement.
Does not meet stall speed specification	B	Require replacement.
End play exceeds specifications	B	Require replacement.
Hub broken	A	Require replacement.
Hub cracked	A	Require replacement.

Internal component
failure ..... A ..... Require replacement.
Leaking ..... A .. Require repair or replacement.
Pilot broken ..... A ..... Require replacement.
Pilot worn, affecting
performance ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Weights missing ..... C ..... Require replacement.

TRANSAXLE MOUNTS

See MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION).

TRANSDUCERS (TRANSMISSION)

See SENSORS.

TRANSMISSION COOLERS

TRANSMISSION COOLER INSPECTION

Condition Code Procedure

Air flow obstruction .... A ..... Require repair.
Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A .. Require repair or replacement
of hardware.
Connection leaking ..... A .. Require repair or replacement.
Contaminated ..... A .. Require repair or replacement.
Corroded ..... 1 .. Suggest repair or replacement.
Fins damaged, affecting
performance ..... A .. Require repair or replacement.
Fins damaged, not
affecting performance .. .. No service suggested or
required.
Internal restrictions ... B .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement

Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A .. Require repair or replacement.
Tubes damaged, affecting performance ..... A .. Require repair or replacement.
Tubes damaged, not affecting performance .. .. No service suggested or required.

TRANSMISSION MOUNTS

See MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION).

TRANSMISSION PANS

TRANSMISSION PAN INSPECTION

Condition Code Procedure

Bent, interfering with filter or other internal components ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.

TRANSMISSION RANGE INDICATORS (PRNDL)

TRANSMISSION RANGE INDICATOR (PRNDL) INSPECTION

Condition Code Procedure

Binding ..... A .. Require repair or replacement.
Broken ..... A .. Require repair or replacement.
Components missing ..... C .. Require replacement of missing components.
Loose, affecting performance ..... A .. Require repair or replacement.
Out of adjustment ..... A ..... Require repair.
Worn, affecting performance ..... A .. Require repair or replacement.

TUBES

See HOSES, LINES AND TUBES.

UNIVERSAL JOINTS (CARDON OR CROSS TYPE)

UNIVERSAL JOINT (CARDON OR CROSS TYPE) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bearing cap distorted	B	Require replacement.
Binding	A	Require replacement.
Cross (trunion) worn, affecting performance	A	Require replacement.
Double cardon centering ball damaged	A	Require replacement.
Double cardon centering ball worn, affecting performance	A	Require replacement.
Double cardon centering spring broken	A	Require replacement.
Double cardon centering spring missing	C	Require replacement.
Double cardon centering spring weak	A	Require replacement.
End cap seal cracked	2	Suggest replacement.
End cap seal missing	C	Require replacement of seal.
Grease fitting broken	A	(1) Require replacement of grease fitting.
Grease fitting missing	C	(2) Require replacement of grease fitting.
Rust-colored powder around end cap seals	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn, affecting performance	A	Require replacement.

(1) - A broken grease fitting does not require replacement

of the U-Joint.
(2) - A missing grease fitting does not require replacement of the U-Joint.

VACUUM CONTROLS

See ACTUATORS (VACUUM).

VACUUM HOSES

See HOSES, LINES AND TUBES.

VACUUM MOTORS

See ACTUATORS (VACUUM).

VACUUM-OPERATED SWITCHES

See SWITCHES.

VEHICLE SPEED SENSORS

See SPEED SENSORS (ELECTRONIC WHEEL AND VEHICLE).

VENTS

VENT INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Missing	C	Require replacement.
Plugged	A	(1) Require repair or replacement.

(1) - A plugged vent may force fluid past the seal.

VIBRATION DAMPERS

VIBRATION DAMPER INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Missing	C	Require replacement.

Out of position ..... B .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

WHEEL ATTACHMENT HARDWARE

NOTE: For conditions noted below, also check conditions of wheel stud holes.

CAUTION: Proper lug nut torque is essential. Follow recommended torque specifications and tightening sequence. DO NOT lubricate threads unless specified by the vehicle manufacturer.

WHEEL ATTACHMENT HARDWARE INSPECTION

Condition Code Procedure

Bent ..... A ..... Require replacement.
Broken ..... A ..... (1) Require replacement.
Loose ..... B ... Require repair or replacement of affected component.
Lug nut installed
backward ..... B .. Require repair or replacement.
Lug nut mating surface
dished ..... A ..... Require replacement of nut.
Lug nut mating type
incorrect ..... B ..... Require replacement of nut.
Lug nut rounded ..... A . (2) Require replacement of nut.
Lug nut seized ..... A . (2) Require replacement of nut.
Stud incorrect ..... B .... Require replacement of stud.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - Some manufacturers require replacement of all studs on that wheel if two or more studs or nuts on the same wheel are broken or missing.
(2) - Only required if removing wheel.

WHEEL SPEED SENSORS

See SPEED SENSORS (ELECTRONIC WHEEL AND VEHICLE).

WIRING HARNESS AND CONNECTOR INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Insulation damaged, conductors exposed	A	Require repair or replacement.
Insulation damaged, conductors not exposed	1	Suggest replacement.
Open	A	Require repair or replacement.
Protective shield (conduit) melted	2	(1) Suggest repair or replacement.
Protective shield (conduit) missing	2	Suggest repair or replacement.
Resistance (voltage drop) out of specification	A	Require repair or replacement.
Routed incorrectly	B	Require repair.
Secured incorrectly	B	Require repair.
Shorted	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.

Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Transmission connector
leaking .... See TRANSMISSION ASSEMBLY.
Voltage drop out of
specification ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

YOKES AND SLIP YOKES

YOKE AND SLIP YOKE INSPECTION

Condition Code Procedure

Bearing cap bore
distorted ..... A .. Require repair or replacement.
Bent ..... A ..... Require replacement.
Bolt holes elongated .... A .. Require repair or replacement.
Bushing or seal surface
worn, affecting
performance ..... A .. Require repair or replacement.
Leaking through soft yoke
plug ..... A ... Require repair or replacement of soft yoke plug.
Retainer strap bent ..... A ..... Require replacement of retainer strap.
Slip yoke broken ..... A ..... Require replacement.
Splines worn, affecting
performance ..... A ..... Require replacement.
Splines worn close
to the end of their
useful life ..... 1 ..... Suggest replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
U-bolt damaged, affecting
performance ..... A ..... Require replacement of U-bolts.
Yoke damaged, affecting

performance ..... A .. Require repair or replacement.

END OF ARTICLE

* DRIVETRAIN SYSTEMS UNIFORM INSPECTION GUIDELINES *

Article Text

1996 Kia Sephia

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Saturday, April 18, 2009 10:09PM

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All Makes and Models

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INTRODUCTION TO MOTORIST ASSURANCE PROGRAM (MAP)

OVERVIEW OF MOTORIST ASSURANCE PROGRAM

The Motorist Assurance Program is the consumer outreach

effort of the Automotive Maintenance and Repair Association, Inc. (AMRA). Participation in the Motorist Assurance Program is drawn from retailers, suppliers, independent repair facilities, vehicle manufacturers and industry associations.

Our organization's mission is to strengthen the relationship between the consumer and the auto repair industry. We produce materials that give motorists the information and encouragement to take greater responsibility for their vehicles-through proper, manufacturer-recommended, maintenance. We encourage participating service and repair shops (including franchisees and dealers) to adopt (1) a Pledge of Assurance to their Customers and (2) the Motorist Assurance Program Standards of Service. All participating service providers have agreed to subscribe to this Pledge and to adhere to the promulgated Standards of Service demonstrating to their customers that they are serious about customer satisfaction.

These Standards of Service require that an inspection of the vehicle's (problem) system be made and the results communicated to the customer according to industry standards. Given that the industry did not have such standards, the Motorist Assurance Program successfully promulgated industry inspection communication standards in 1994-95 for the following systems: Exhaust, Brakes, ABS, Steering and Suspension, Engine Maintenance and Performance, HVAC, and Electrical Systems. Further, revisions to all of these inspection were recently published. Further, revisions to all of these inspection communication standards are continually republished. In addition to these, standards for Drive Train and Transmissions have recently been promulgated. Participating shops utilize these Uniform Inspection & Communication Standards as part of the inspection process and for communicating their findings to their customers.

The Motorist Assurance Program continues to work cooperatively and proactively with government agencies and consumer groups toward solutions that both benefit the customer and are mutually acceptable to both regulators and industry. We maintain the belief that industry must retain control over how we conduct our business, and we must be viewed as part of the solution and not part of the problem. Meetings with state and other government officials (and their representatives), concerned with auto repair and/or consumer protection, are conducted. Feedback from these sessions is brought back to the association, and the program adjusted as needed.

To assure auto repair customers recourse if they were not satisfied with a repair transaction, the Motorist Assurance Program offers mediation and arbitration through MAP/BBB-CARE and other non-profit organizations. MAP conducted pilot programs in twelve states before announcing the program nationally in October, 1998. During the pilots, participating repair shops demonstrated their adherence to the Pledge and Standards and agreed to follow the UICS in communicating

the results of their inspection to their customers. To put some "teeth" in the program, an accreditation requirement for shops was initiated. The requirements are stringent, and a self-policing method has been incorporated which includes the "mystery shopping" of outlets.

We welcome you to join us as we continue our outreach... with your support, both the automotive repair industry and your customers will reap the benefits. Please visit MAP at our Internet site www.motorist.org or contact us at:

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January 1999

MAP UNIFORM INSPECTION GENERAL GUIDELINES

OVERVIEW OF SERVICE REQUIREMENTS & SUGGESTIONS

It is MAP policy that all exhaust, brake, steering, suspension, wheel alignment, drive-line, engine performance and maintenance, and heating, ventilation and air conditioning, and electrical services be offered and performed under the standards and procedures specified in these sections.

Before any service is performed on a vehicle, an inspection of the appropriate system must be performed. The results of this inspection must be explained to the customer and documented on an inspection form. The condition of the vehicle and its components will indicate what services/part replacements may be "Required" or "Suggested". In addition, suggestions may be made to satisfy the requests expressed by the customer.

When a component is suggested or required to be repaired or replaced, the decision to repair or replace must be made in the customer's best interest, and at his or her choice given the options available.

This section lists the various parts and conditions that indicate a required or suggested service or part replacement. Although this list is extensive, it is not fully inclusive. In addition to this list, a technician may make a suggestion. However, any suggestions must be based on substantial and informed experience, or the vehicle manufacturer's recommended service interval and must be documented.

Some conditions indicate that service or part replacement is required because the part in question is no longer providing the function for which it is intended, does not meet a vehicle manufacturer's design specification or is missing.

*** DRIVETRAIN SYSTEMS UNIF**

Example:
An exhaust pipe has corroded severely and has a hole in it through which exhaust gases are leaking. Replacement of the exhaust pipe in this case is required due to functional failure.

Example:
A brake rotor has been worn to the point where it measures less than the vehicle manufacturer's discard specifications. Replacement of the rotor is required because it does not meet design specifications.

Some conditions indicate that a service or part replacement is suggested because the part is close to the end of its useful life or addresses a customer's need, convenience or request. If a customer's vehicle has one of these conditions, the procedure may be only to suggest service.

Example:
An exhaust pipe is rusted, corroded or weak, but no leaks are present. In this case, the exhaust pipe has not failed. However, there is evidence that the pipe may need replacement in the near future. Replacement of the pipe may be suggested for the customer's convenience in avoiding a future problem.

Example:
The customer desires improved ride and/or handling, but the vehicle's shocks or struts have not failed. In this case, replacement may be suggested to satisfy the customer's wishes. In this case, replacement of the shocks or struts may not be sold as a requirement.

A customer, of course, has the choice of whether or not a shop will service his or her vehicle. He or she may decide not to follow some of your suggestions. When a repair is required, a MAP shop must refuse partial service on that system if, in the judgment of the service provider, proceeding with the work could create or continue an unsafe condition. When a procedure states that required or suggested repair or replacement is recommended, the customer must be informed of the generally acceptable repair/replacement options whether or not performed by the shop.

When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

The following reasons may be used for requiring inspection:

services. These codes are shown in the "Code" column of the MAP Uniform Inspection & Communications Standards that follow:

Reasons to Require Repair or Replacement

A - Part no longer performs intended purpose
B - Part does not meet a design specification (regardless of performance)
C - Part is missing

NOTE: When a repair is required, the shop must refuse partial service to the system in question, if the repair creates or continues an unsafe condition.

Reasons to Suggest Repair or Replacement

1 - Part is close to the end of its useful life (just above discard specifications, or weak; failure likely to occur soon, etc.)
2 - To address a customer need, convenience, or request (to stiffen ride, enhance performance, eliminate noise, etc.)
3 - To comply with maintenance recommended by the vehicle's Original Equipment Manufacturer (OEM)
4 - Technician's recommendation based on substantial and informed experience

NOTE: Suggested services are always optional. When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

DRIVE/POWER TRAIN ASSEMBLIES

SERVICE PROCEDURES REQUIRED AND SUGGESTED FOR PROPER VEHICLE OPERATION

NOTE: Whenever transmission or drivetrain service is performed that affects the suspension alignment, for example, removing the engine cradle, it is required that the alignment be checked and corrected if necessary.

AUTOMATIC TRANSMISSION/TRANSAXLE ASSEMBLIES

AUTOMATIC TRANSMISSION/TRANSAXLE ASSEMBLY INSPECTION

Any internal component failure that requires removal of the assembly from the vehicle for service. (1) ..... A ..... (2) Require repair or replacement of the automatic transmission/transaxle assembly.

(1) - It is Required that the torque converter and all other failure related components be inspected for cause and condition.
(2) - For components not requiring removal of the assembly, refer to the component listing in this document.

DIFFERENTIAL AND FINAL DRIVE ASSEMBLIES

NOTE: Does not include half shafts.

DIFFERENTIAL AND FINAL DRIVE ASSEMBLY INSPECTION

Condition	Code	Procedure
Any internal component failure that requires removal of the assembly from the vehicle for service. (1)	A ...	Require repair or replacement of the differential assembly.

(1) - For components not requiring removal of the assembly, refer to the component listing in this document.

MANUAL TRANSMISSION/TRANSAXLE ASSEMBLIES

MANUAL TRANSMISSION/TRANSAXLE ASSEMBLY INSPECTION

Condition	Code	Procedure
Any internal component failure that requires removal of the assembly from the vehicle for		

service. (1)	A	...	Require repair or replacement of the manual transmission/transaxle assembly.

(1) - For components not requiring removal of the assembly, refer to the component listing in this document.

TRANSFER CASE ASSEMBLIES

TRANSFER CASE ASSEMBLY INSPECTION

Condition	Code		Procedure
Any internal component failure that requires removal of the assembly from the vehicle for service. (1)	A	...	Require repair or replacement of the transfer case differential assembly.

(1) - For components not requiring removal of the assembly, refer to the component listing in this document.

DRIVE TRAIN/COMPONENTS

The conditions listed for the components included in this section assume that the problem has been isolated to the specific component through proper testing.

ACTUATORS (ELECTRICAL)

ACTUATOR (ELECTRICAL) INSPECTION

Condition	Code		Procedure
Attaching hardware broken	A	...	Require repair or replacement of hardware.
Attaching hardware missing	C	.....	Require replacement of hardware.
Attaching hardware not			

functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted, affecting performance .. A ..... (1) Require repair or replacement.
Connector melted, not affecting performance .. 2 ..... (1) Suggest repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 1 ..... (1) Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 1 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

ACTUATORS (VACUUM)

ACTUATOR (VACUUM) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement.

of hardware.

Attaching hardware missing ..... C ..... Require replacement of hardware.

Attaching hardware not functioning ..... A .. Require repair or replacement of hardware.

Connector broken ..... A .. Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.

Connector melted, affecting performance .. A ..... (1) Require repair or replacement.

Connector melted, not affecting performance .. 2 ..... (1) Suggest repair or replacement.

Connector missing ..... C ..... Require replacement.

Inoperative ..... A ..... (2) Require replacement.

Leaking (vacuum) ..... A .. Require repair or replacement.

Linkage bent, affecting performance ..... A ... Require repair or replacement of linkage.

Linkage bent, not affecting performance .. 2 ... Suggest repair or replacement of linkage.

Linkage binding, affecting performance ..... A ... Require repair or replacement of linkage.

Linkage binding, not affecting performance .. 1 ... Suggest repair or replacement of linkage.

Linkage broken A Require repair or replacement of linkage.

Linkage loose, affecting performance ..... A ... Require repair or replacement of linkage.

Linkage loose, not affecting performance .. 1 ... Suggest repair or replacement of linkage.

Linkage missing ..... C ..... Require replacement.

Linkage noisy ..... 2 .. Suggest repair or replacement.

Missing ..... C ..... Require replacement.

Noisy ..... 2 .. Suggest repair or replacement.

Out of adjustment ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or

replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

AXLES

AXLE INSPECTION

Condition	Code	Procedure
Bent	A	Require replacement.
Broken	A	Require replacement.
End play exceeds specifications	B	Require repair or replacement.
Flange bent	A	Require replacement.
Flange threads stripped	A	Require repair or replacement.
Twisted	A	Require replacement.
Worn, affecting performance	A	Require replacement.

BEARINGS AND RACES

NOTE: When replacing or repacking bearings, grease seal replacement is required. You are not required to replace these components in axle sets. Determine the need to replace based upon the individual component conditions that follow.

BEARING AND RACE INSPECTION

Condition	Code	Procedure

Bearing end-play exceeds specifications ..... B .. Require adjustment of bearing, if possible. If proper adjustment cannot be obtained, require replacement of bearing assembly.

Bearing rollers, balls or races are worn, pitted, or feel rough when rotated as an assembly ..... B .. Require replacement of bearing assembly.

BELL CRANKS

BELL CRANK INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bent	A	Require repair or replacement.
Broken	A	Require repair or replacement.
Cracked	A	Require repair or replacement.
Missing	C	Require replacement.
Worn, affecting performance	A	Require repair or replacement.

BELL HOUSINGS

See HOUSINGS (BELL, CASE, TAIL (EXTENSION) AND AUXILIARY).

BUSHINGS (EXTERNAL)

BUSHING (EXTERNAL) INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part if available; otherwise, replace bushing.
Attaching hardware broken	A	Require replacement of broken part if available; otherwise, replace bushing.
Attaching hardware corroded, affecting structural integrity	A	Require replacement of corroded part if available; otherwise, replace bushing.
Attaching hardware incorrect	A	Require replacement of incorrect part if available; otherwise, replace bushing.
Attaching hardware loose	A	Require repair or replacement of loose part if available; otherwise, replace bushing.
Attaching hardware missing	C	Require replacement of missing part if available; otherwise, replace bushing.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads if available; otherwise, replace bushing.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads if available; otherwise, replace bushing.
Binding	A	Require repair or replacement.
Contaminated	1	Suggest replacement.
Deteriorated, affecting performance	A	Require repair or replacement.
Distorted, affecting performance	A	Require repair or replacement.
Missing	A	Require replacement.

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Noisy ..... 2 ..... (1) Further inspection required.
Rubber separating from internal metal sleeve on bonded bushing ..... A ..... Require replacement.
Seized ..... A ..... Require replacement.
Shifted (out of position) ..... B .. Require repair or replacement.
Split ..... A ..... Require replacement.
Surface cracking (weather-checked) .... No service suggested or required.
Worn, affecting performance ..... A .. Require repair or replacement.
Worn close to the end of its useful life ..... 1 ..... Suggest replacement.

(1) - If noise isolated to bushing, suggest repair or replacement.
CAUTION: Use only approved lubricant on rubber bushings. Petroleum-based lubricants may damage rubber bushings.

CABLES (SPEEDOMETER)

CABLE (SPEEDOMETER) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bent	A	Require repair or replacement.
Binding	A	Require repair or replacement.
Bracket bent, affecting performance	A	Require repair or replacement.
Bracket bent, not affecting performance	.. ..	No service suggested or required.
Bracket broken, affecting		

performance ..... A ..... Require replacement.
Bracket broken, not
affecting performance .. .. No service suggested or required.
Bracket corroded,
affecting performance .. A .. Require repair or replacement.
Bracket corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Bracket cracked, affecting
performance ..... A .. Require repair or replacement.
Bracket cracked, not
affecting performance .. 1 .. Suggest repair or replacement.
Bracket loose, affecting
performance ..... A .. Require repair or replacement.
Bracket loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Broken ..... A ..... Require replacement.
Cracked ..... A .. Require repair or replacement.
Disconnected ..... A .. Require repair or replacement.
Kinked ..... A .. Require repair or replacement.
Melted ..... A ..... (1) Require repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Routed incorrectly ..... 2 ..... Suggest repair.
Seized ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

CABLES (TV, DETENT AND SHIFT)

CABLE (TV, DETENT AND SHIFT) INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement

of hardware.

Bent ..... A .. Require repair or replacement.
Binding ..... A .. Require repair or replacement.
Bracket bent, affecting performance ..... A .. Require repair or replacement.
Bracket bent, not affecting performance .. .. No service suggested or required.
Bracket broken, affecting performance ..... A ..... Require replacement.
Bracket broken, not affecting performance .. .. No service suggested or required.
Bracket corroded, affecting performance .. A .. Require repair or replacement.
Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Bracket cracked, affecting performance ..... A .. Require repair or replacement.
Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket loose, affecting performance ..... A .. Require repair or replacement.
Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Broken ..... A ..... Require replacement.
Cracked ..... A .. Require repair or replacement.
Disconnected ..... A .. Require repair or replacement.
Frayed ..... A ..... Require replacement.
Kinked ..... A .. Require repair or replacement.
Melted ..... A ..... (1) Require repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B ..... (2) Require repair or replacement.
Routed incorrectly ..... 2 ..... Suggest repair.
Seized ..... A .. Require repair or replacement.
Self-adjuster inoperative ..... A .. Require repair or replacement of self-adjuster.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

*** DRIVETRAIN SYSTEMS UNIFORM INSPEC**

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Cable replacement is required if it cannot be adjusted within specifications.

CARRIER BEARINGS

See INTERMEDIATE SHAFT SUPPORT BEARINGS.

CLUTCH CABLES AND CABLE HOUSINGS

CLUTCH CABLE AND CABLE HOUSING INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Cable bent	A	Require replacement.
Cable binding	A	Require repair or replacement.
Cable mounting loose	B	Require repair or replacement.
Cable out of adjustment	B	Require repair or replacement.
Frayed	B	Require replacement.
Housing heat-damaged	1	Suggest replacement.
Missing	C	Require replacement.
Noisy	2	Suggest repair or replacement.
Seized	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn, affecting performance	A	Require replacement.

CLUTCH DISCS (MANUAL TRANSMISSION)

CLUTCH DISC (MANUAL TRANSMISSION) INSPECTION

Condition	Code	Procedure
Backing plate cracked	A	Require replacement.
Broken	A	Require replacement.
Contaminated with oil	A	Require replacement.
Damper cushion broken	A	Require replacement.
Damper cushion collapsed	A	Require replacement.
Damper spring collapsed	A	Require replacement.

Damper spring missing .. C ..... (1) Require replacement.
Friction material cracked through ..... B ..... Require replacement.
Friction material flaking or chunking ..... B ..... Require replacement.
Friction material surface cracking ..... B ..... No service suggested or required.
Grooved ..... B ..... No service suggested or required unless the pressure plate or flywheel is being resurfaced or replaced. In this case, replacement of clutch disc is required.
Ridged ..... B ..... No service suggested or required unless the pressure plate or flywheel is being resurfaced or replaced. In this case, replacement of clutch disc is required.
Splines worn, affecting performance ..... A ..... Require replacement.
Warped ..... A ..... Require replacement.
Wear exceeds specifications (where applicable) ..... B ..... Require replacement.
Worn close to the end of its useful life ..... 1 ..... Suggest replacement.
Worn, affecting performance ..... A ..... Require replacement.

(1) - Not all clutch discs have springs in all spring chambers on the disc.

CLUTCH FORKS

CLUTCH FORK INSPECTION

Condition Code Procedure

Bent ..... B ..... Require replacement.
Broken ..... A .. Require repair or replacement.
Cracked ..... B .. Require repair or replacement.
Worn close to the end of its useful life ..... 1 ..... Suggest replacement.

*** DRIVETRAIN SYSTEMS UNIFORM INS**

Worn, affecting
performance ..... A ..... Require replacement.

CLUTCH LINKAGES (MECHANICAL)

See LINKAGES (EXTERNAL).

CLUTCH MASTER CYLINDERS

CLUTCH MASTER CYLINDER INSPECTION

Condition	Code	Procedure
Cover gasket distorted	A	Require replacement of cover gasket.
Cover gasket gummy	A	Require replacement of cover gasket.
Cylinder leaking fluid from rear of bore	A	Require repair or replacement.
Cylinder leaking fluid internally	A	Require replacement.
Dust boot missing	C	Require replacement of dust boot.
Dust boot punctured	A	Require replacement of dust boot.
Dust boot torn	A	Require replacement of dust boot.
Fluid level incorrect	B	Require fluid level adjustment.
Housing damaged, affecting performance	A	Require repair or replacement.
Master cylinder has residue in reservoir (make parallel w/brakes when they are done)	2	(1) Further inspection required.
Threads damaged	A	Require repair replacement
Threads stripped (threads missing)	A	Require replacement.

(1) - DO NOT replace master cylinder unless it exhibits conditions listed for replacement. You may suggest fluid change according to OEM service intervals.

CLUTCH PEDALS

CLUTCH PEDAL INSPECTION

Condition	Code	Procedure
Bent, affecting performance	A	Require repair or replacement.
Broken	A	Require repair or replacement.
Pedal pad missing	C	Require replacement of pedal pad.
Pivot bushings worn, affecting performance	A	Require replacement of pivot bushings.

CLUTCH PIVOTS

CLUTCH PIVOT INSPECTION

Condition	Code	Procedure
Bent	A	Require replacement.
Broken	A	Require repair or replacement.
Cracked	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn close to the end of its useful life	1	Suggest replacement.
Worn, affecting performance	A	Require replacement.

CLUTCH PRESSURE PLATES

See PRESSURE PLATES.

CLUTCH RELEASE BEARINGS

CLUTCH RELEASE BEARING INSPECTION

Condition	Code	Procedure
Collar broken	A	Require replacement.
Cracked	A	Require replacement.
Rough when rotated as		

assembly ..... B ..... Require replacement.
Seized ..... A ..... Require replacement.
Wear exceeds
specifications ..... B ..... Require replacement.
Worn close to the end of
its useful life ..... 1 ..... Suggest replacement.
Worn, affecting
performance ..... A ..... Require replacement.

CLUTCH SLAVE CYLINDERS (CONCENTRIC)

CLUTCH SLAVE CYLINDER (CONCENTRIC) INSPECTION

Condition Code Procedure

Bearing rough when rotated
as an assembly ..... B ..... Require replacement.
Bearing seized ..... A ..... Require replacement.
Bleeder pipe leaks ..... A .. Require repair or replacement.
Carrier assembly worn,
affecting performance .. A ..... Require replacement.
Collar broken ..... A ..... Require replacement.
Cracked ..... A ..... Require replacement.
Housing leaks ..... A ..... Require replacement.
Inoperative ..... A ..... Require replacement.
Release binding ..... A ..... Require replacement.
Spring broken ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Worn, affecting
performance ..... A ..... Require replacement.

CLUTCH SLAVE CYLINDERS (CONVENTIONAL OR EXTERNAL)

CLUTCH SLAVE CYLINDER (CONVENTIONAL OR EXTERNAL) INSPECTION

Condition Code Procedure

Binding ..... A .. Require repair or replacement.
Bleeder port damaged (not
repairable) ..... A ..... (1) Require replacement.
Bleeder port damaged
(repairable) ..... A ..... (1) Require repair.

Bleeder screw broken off
in slave cylinder ..... A ..... (1) Require replacement.
Bleeder screw seized .... A ..... (2) Require replacement.
Bore corroded (pitted) .. B ..... Require replacement.
Bore grooved ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - Only required if the hydraulic system must be opened.
(2) - Seized is defined as a bleeder screw that cannot be removed after a practical attempt at removing it has been made.

COMPANION FLANGES

See YOKES AND SLIP YOKES.

CONNECTORS

See WIRING HARNESSES AND CONNECTORS.

COOLER BYPASS VALVES

COOLER BYPASS VALVE INSPECTION

Condition Code Procedure

Inoperative ..... A ..... Require replacement.
Installed incorrectly ... A ..... Require repair.
Leaking ..... A .. Require repair or replacement.
Restricted ..... A .. Require repair or replacement.

COOLER LINES

COOLER LINE INSPECTION

Condition Code Procedure

Abrasion damage, affecting
structural integrity ... A .. Require repair or replacement.
Abrasion damage, not
affecting structural
integrity .... No service suggested o

required.
Application incorrect ... B ..... Require replacement.
Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement
of hardware.
Clamp corroded, not
reusable ..... 1 ..... Suggest replacement.
Connected incorrectly ... A ..... Require repair.
Corroded, affecting
structural integrity ... A ..... Require replacement.
Corroded, not affecting
structural integrity ... . No service suggested or
required.
Cracked ..... A .. Require repair or replacement.
Fitting type incorrect
(such as compression
fitting) ..... B ..... Require replacement.
Flange leaking ..... A .. Require repair or replacement.
Insufficient clamping
force, allowing hose to
leak ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Melted ..... 1 .. Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Outer covering damaged to
the extent that the inner
fabric is visible ..... A ..... Require replacement.
Protective sleeves
damaged ..... 2 . Suggest replacement of sleeves.
Protective sleeves
missing ..... C . Require replacement of sleeves.
Restricted, affecting
performance ..... A .. Require repair or replacement.
Routed incorrectly ..... 2 ..... Require repair.
Swollen ..... 1 ..... Suggest replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Type incorrect ..... 1 .. Suggest repair or replacement.

COOLERS

See TRANSMISSION COOLERS.

CV JOINTS

CV JOINT INSPECTION

Condition	Code	Procedure
Bearing, bushing or seal surface worn, affecting performance	A	Require repair or replacement.
Boot clamp broken	A	Require repair or replacement of clamp.
Boot clamp loose	A	Require repair or replacement of clamp.
Boot clamp missing	C	Require repair or replacement of clamp.
Boot leaking	A	Require replacement of CV boot.
Boot surface cracked, not leaking	2	Suggest replacement of CV boot.
Cage broken	A	Require repair or replacement of CV joint.
Housing damaged to the extent that it no longer performs its intended function	A	(1) Require repair or replacement of CV joint.
Housing worn to the extent that it no longer performs its intended function	A	(1) Require repair or replacement of CV joint.
Holes elongated	A	Require replacement.
Internal parts binding	A	Require repair or replacement.
Internal parts worn	A	Require repair or replacement.
Lubricant missing	C	Require cleaning, inspection, and repacking of CV joint.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Housing assembly may appear blue in color from normal manufacturing process of heat-treating the housing.

DIP STICK TUBES

DIP STICK TUBE INSPECTION

Condition	Code	Procedure
Broken	A	Require repair or replacement.
Checkball missing	C	Suggest repair or replacement.
Cracked	A	Require repair or replacement.
Hold down bracket broken	A	Require repair or replacement.
Hold down bracket missing	C	Require replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

DIP STICKS (FLUID LEVEL INDICATORS)

DIP STICK (FLUID LEVEL INDICATOR) INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Broken	A	Require replacement.
Compressed	A	Require repair or replacement.
Missing	C	Require replacement.
Modified	A	Require replacement.
Stretched	A	Require repair or replacement.

DOWEL PINS, GUIDES AND PILOT HOLES

DOWEL PIN, GUIDE AND PILOT HOLE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement.
Cracked	A	Require repair or replacement.
Distorted	A	Require repair or replacement.
Missing	C	Require replacement.
Positioned incorrectly	B	Require repair or replacement.

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Stepped ..... A .. Require repair or replacement.
Worn to the extent that it
no longer performs its
intended function ..... A .. Require repair or replacement.

DRIVE SHAFT FLANGES

See COMPANION FLANGES.

DRIVE SHAFTS AND HALF SHAFTS

DRIVE SHAFT AND HALF SHAFT INSPECTION

Condition Code Procedure

Balance weight missing .. C .. Require repair or replacement.
Bearing cap bore
distorted ..... A .. Require repair or replacement.
Bent ..... A ..... Require replacement.
Bolt holes elongated .... A .. Require repair or replacement.
Bushing or seal surface
worn, affecting
performance ..... A .. Require repair or replacement.
Leaking through soft yoke
plug ..... A ... Require repair or replacement
of soft yoke plug.
Out of balance ..... A .. Require repair or replacement.
Retainer strap bent ..... A ..... Require replacement of
retainer strap.
Slip yoke broken ..... A ..... Require replacement.
Splines worn, affecting
performance ..... A ..... Require replacement.
Splines worn close to
the end of their
useful life ..... 1 ..... Suggest replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
U-bolt damaged, affecting
performance ..... A . Require replacement of U-bolts.
Yoke damaged, affecting
performance ..... A .. Require repair or replacement.

DUST BOOTS

NOTE: Does not include CV boots.

DUST BOOT INSPECTION

Condition	Code	Procedure
Cracked, not leaking	1	Suggest replacement.
Missing	C	Require replacement.
Leaking	A	Require repair or replacement.
Torn	A	Require replacement.

ENGINE MOUNTS

See MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION).

EXCITER RINGS

See TOOTHED RINGS (TONE WHEELS).

FILLER TUBES

See DIP STICK TUBES.

FILTERS AND SCREENS

FILTER AND SCREEN INSPECTION

Condition	Code	Procedure
At service interval	3	Suggest replacement.
Bent	A	Require repair or replacement.
Exceeding service interval	3	Suggest replacement.
Missing	C	Require replacement.
Near service interval	3	Suggest replacement.
Restricted	A	(1) Require repair or replacement.
Torn	A	Require replacement.
Worn, affecting performance (metal or nylon screen type)	A	Require repair or replacement.

(1) - Further inspection may be required to determine the source of restriction or contamination.

FLANGES

See COMPANION FLANGES.

FLEX PLATES

FLEX PLATE INSPECTION

Condition	Code	Procedure
Bent, affecting performance	A	Require replacement.
Bent, not affecting performance	..	No service suggested or required.
Bolt or stud holes elongated	B	Require replacement.
Broken	A	Require replacement.
Cracked	A	Require replacement.
Ring gear worn close to the end of its useful life	1	Suggest replacement.
Ring gear worn to the extent that it no longer performs its intended function	A	Require replacement.
Weights missing	A	Require replacement.

FLUID LEVEL INDICATORS

See DIP STICKS (FLUID LEVEL INDICATORS).

FLUIDS AND LUBRICANTS

FLUID AND LUBRICANT INSPECTION

Condition	Code	Procedure
Application incorrect	B	(1) Require replacement.
At service interval	3	Suggest replacement.
Beyond service interval	3	Suggest replacement.
Burned	..	(2) Further inspection required.

Contaminated, for example,
fluid other than hydraulic
fluid present ..... A or B .... (3)(4) Require service.
Exceeding service
interval ..... 3 ..... Suggest replacement.
Hydraulic fluid
incorrect ..... B ..... (5) Require service.
Level incorrect ..... B ..... Require correction of fluid level.
Near service interval ... 3 ..... Suggest replacement.
Rubber master cylinder
cover gasket distorted
and gummy ..... A ..... (3) Require service.
Varnished .... (6) Further inspection required.

(1) - Determine and correct cause.
(2) - Fluid that is burned indicates a serious problem. Determine and correct the cause.
(3) - If a fluid other than hydraulic fluid is present in the hydraulic system which DOES affect the rubber parts, the required service is to: 1) remove all components having rubber parts from the system, 2) flush lines with denatured alcohol or hydraulic cleaner, 3) repair or replace all components having rubber parts, and 4) bleed and flush with correct hydraulic fluid. (Code A)
(4) - If a fluid other than hydraulic fluid is present in the hydraulic system which DOES NOT affect the rubber parts, the required service is to flush and fill with the correct hydraulic fluid. (Code B)
(5) - If a fluid other than specification hydraulic fluid is present in the hydraulic system, the required service is to flush and fill with the correct hydraulic fluid.
(6) - Fluid that is varnished may indicate a serious problem. Determine and correct the cause.

FLYWHEELS

NOTE: Clutch disc replacement does not necessitate flywheel reconditioning, unless other conditions justify the reason to do so.

FLYWHEEL INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Cracked (other than
mounting area) ..... A ..... (1) Require resurfacing or replacement.
Cracks in mounting area . B ..... Require replacement.
Hard spots ..... B .. Require repair or replacement.
Ring gear broken ..... A ..... Require replacement of ring gear.
Ring gear teeth worn,
affecting performance .. A ..... Require replacement of ring gear.
Runout exceeds
specifications ..... B .. Require repair or replacement.
Scored ..... B .. Require repair or replacement.
Surface cracks after
resurfacing to
manufacturer's minimum
specifications ..... B ..... Require replacement.
Wear exceeds
specifications ..... B ..... Require replacement.
Worn close to the end of
its useful life ..... 1 ..... Suggest replacement.
Worn, affecting
performance ..... A .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - Some manufacturers allow slight surface cracking in the friction surface.

FORCE MOTORS

See ACTUATORS (ELECTRICAL).

See DOWEL PINS, GUIDES AND PILOT HOLES.

HALF SHAFTS

See DRIVE SHAFTS AND HALF SHAFTS.

HOSES, LINES AND TUBES

HOSE, LINE AND TUBE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Connected incorrectly	A	Require repair.
Corroded, not reusable	1	Suggest replacement.
Cracked	A	Require replacement.
Dry-rotted	1	Suggest repair or replacement.
Hard	1	Suggest repair or replacement.
Inner fabric (webbing) damaged	A	Require replacement.
Insufficient clamping force, allowing hose to leak	A	Require repair or replacement.
Leaking	A	Require repair or replacement.
Maintenance intervals	3	Suggest replacement.
Melted	1	Suggest repair or replacement.
Missing	C	Require replacement.
Outer covering damaged	1	Suggest replacement.
Outer covering damaged to the extent that the inner fabric is visible	A	Require replacement.
Protective sleeves damaged	2	Suggest replacement of sleeves.
Protective sleeves missing	2	Suggest replacement of sleeves.
Restricted, affecting performance	A	Require repair or replacement.
Restricted, not affecting performance	2	Suggest repair or replacement.
Routed incorrectly	2	Suggest replacement.
Safety clip missing	C	Require replacement.
Spongy	1	Suggest repair or replacement.
Stripped	A	Require replacement.
Swollen	B	Require replacement.
Threads damaged	A	Require replacement.

Threads stripped (threads
missing) ..... A ..... Require replacement.
Type incorrect ..... 1 .. Suggest repair or replacement.

HOUSINGS (BELL, CASE, TAIL (EXTENSION) AND AUXILIARY)

HOUSING (BELL, CASE, TAIL (EXTENSION) AND AUXILIARY) INSPECTION

Condition Code Procedure

Bearing race loose
in bore ..... A .. Require repair or replacement.
Broken, affecting
performance ..... A .. Require repair or replacement.
Cracked ..... A .. Require repair or replacement.
Dowel pin holes worn,
affecting performance .. A ..... (1) Require repair or
replacement.
Machined surfaces damaged,
affecting performance .. A .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Worn, affecting
performance ..... A .. Require repair or replacement.

(1) - See DOWEL PINS, GUIDES AND PILOT HOLES.

INTERMEDIATE SHAFT SUPPORT BEARINGS

INTERMEDIATE SHAFT SUPPORT BEARING INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement
of hardware.
Bearing rollers, balls or

races are worn, pitted, noisy, or feel rough when rotated as an assembly . A .. Require replacement of bearing assembly.

Bracket bent, affecting performance ..... A .. Require repair or replacement.

Bracket bent, not affecting performance .. .. No service suggested or required.

Bracket broken, affecting performance ..... A ..... Require replacement.

Bracket broken, not affecting performance .. .. No service suggested or required.

Bracket corroded, affecting performance .. A .. Require repair or replacement.

Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Bracket cracked, affecting performance ..... A .. Require repair or replacement.

Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket holes elongated, affecting performance .. A .. Require repair or replacement.

Bracket holes elongated, not affecting performances) .... No service suggested or required.

Bracket loose, affecting performance ..... A .. Require repair or replacement.

Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket missing ..... C ..... Require replacement.

Cracked .... Require replacement.

Rough (brinelling, spalling) ..... A ..... Require replacement.

Rubber deteriorated, affecting performance .. A ..... Require replacement.

Seized ..... A ..... Require replacement.

KEY INTERLOCK SYSTEMS

See SHIFT INTERLOCK SYSTEMS (SELECTOR AND KEY INTERLOCK SYSTEMS).

LIMITED SLIPS

See DIFFERENTIAL AND FINAL DRIVE ASSEMBLIES.

LINES

See HOSES, LINES AND TUBES.

LINKAGES (EXTERNAL)

LINKAGE (EXTERNAL) INSPECTION

Condition	Code	Procedure
Components missing	C	Require replacement of missing components.
Linkage bent, affecting performance	A	Require repair or replacement of linkage.
Linkage bent, not affecting performance	2	Suggest repair or replacement of linkage.
Linkage binding, affecting performance	A	Require repair or replacement of linkage.
Linkage binding, not affecting performance	1	Suggest repair or replacement of linkage.
Linkage broken	A	Require repair or replacement of linkage.
Linkage loose, affecting performance	A	Require repair or replacement of linkage.
Linkage loose, not affecting performance	1	Suggest repair or replacement of linkage.
Linkage missing	C	Require replacement.
Linkage noisy	2	Suggest repair or replacement.
Out of adjustment	B	Require repair or replacement.
Worn to the extent that it no longer performs its intended function	A	Require repair or replacement.

LOCKING HUB ASSEMBLIES

LOCKING HUB ASSEMBLY INSPECTION

Condition	Code	Procedure
Inoperative	A	(1) Require repair or replacement.
Loose	A	Require repair or replacement.
Seized in any position	A	Require repair or replacement.

(1) - Inoperative includes intermittent operation.

LOCKING HUB CONTROL KNOBS

LOCKING HUB CONTROL KNOB INSPECTION

Condition	Code	Procedure
Damaged, affecting performance	A	Require replacement.
Missing	C	Require replacement.
Worn, affecting performance	A	Require replacement.

LUBRICANTS

See FLUIDS AND LUBRICANTS.

METAL-CLAD SEALS

See SEALS.

METALASTIC JOINTS

See RUBBER JOINTS (METALASTIC).

MODULATOR PINS

MODULATOR PIN INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Missing	C	Require replacement.

MODULATORS

MODULATOR INSPECTION

Condition	Code	Procedure
Bent, affecting performance	A	Require replacement.
Contaminated (water, fuel, etc.)	A	(1) Require replacement.
Housing cracked	A	Require replacement.
Inoperative	A	(2) Require replacement.
Leaking fluid externally	A	Require repair or replacement.
Leaking fluid internally	A	Require replacement.
Leaking vacuum	A	Require replacement.
Nipple broken	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Further inspection is required to determine the cause of the contamination.
(2) - Inoperative includes intermittent operation or out of OEM specification.

MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION)

MOUNT (ENGINE, TRANSAXLE AND TRANSMISSION) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Broken	A	Require replacement.
Leaking (hydraulic mount)	A	Require replacement.

Mounting hole worn, affecting performance	A	Require replacement.
Mounting hole worn, not affecting performance		No service suggested or required.
Rubber deteriorated, affecting performance	A	Require replacement.
Rubber deteriorated, not affecting performance		No service suggested or required.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

ODOMETER DRIVES (MECHANICAL)

See SPEEDOMETER/ODOMETER DRIVES (MECHANICAL).

ODOMETER HEADS (MECHANICAL)

See SPEEDOMETER/ODOMETER HEADS (MECHANICAL).

OIL PANS

See TRANSMISSION PANS.

PANS

See TRANSMISSION PANS.

PILOT HOLES

See DOWEL PINS, GUIDES AND PILOT HOLES.

PRESSURE PLATES

PRESSURE PLATE INSPECTION

Condition	Code	Procedure
Balance weight missing	C	Require replacement.
Broken	A	Require replacement.
Contact surface distorted	B	Require replacement.
Cracks	B	Require replacement.
Fingers bent	A	Require replacement.

Hard spots	B	Require replacement.
Scored	B	Require replacement.
Spring rate less than specifications	B	Require replacement.
Worn, affecting performance	A	Require replacement.
Worn beyond specifications	B	Require replacement.
Worn close to the end of its useful life	1	Suggest replacement.

PRESSURE SWITCHES

See SWITCHES.

RACES

See BEARINGS AND RACES.

RUBBER JOINTS (METALASTIC)

These joints may be found on half and/or drive shafts. They are usually found on European vehicles featuring a three-lug drive flange. They may be equipped with a centering ball or pin.

RUBBER JOINT (METALASTIC) INSPECTION

Condition	Code	Procedure
Drive flange bent	A	Require repair or replacement.
Drive flange damaged, affecting performance	A	Require replacement.
Rubber drive joint cracked	2	Suggest replacement.
Rubber drive joint damaged, affecting performance	A	Require replacement.
Rubber drive joint split between mounting holes	A	Require replacement.
Rubber drive joint torn at mounting holes	A	Require replacement.
Rubber drive joint weather-cracked		No service suggested or required.

SCREENS

See FILTERS AND SCREENS.

SEALS

SEAL INSPECTION

Condition	Code	Procedure
Leaking	A	(1) Require repair or replacement.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary. Check vent. A plugged vent may force fluid past the seal.

SEALS (METAL-CLAD)

See SEALS.

SELECTOR INTERLOCK SYSTEMS

See SHIFT INTERLOCK SYSTEMS (SELECTOR AND KEY INTERLOCK SYSTEMS).

SERVOS

See ACTUATORS (VACUUM).

SHIFT INTERLOCK SYSTEMS (SELECTOR AND KEY INTERLOCK SYSTEMS)

See:
ACTUATORS (ELECTRICAL)
CABLES
LINKAGES (EXTERNAL)
SWITCHES

SENSORS

SENSOR INSPECTION

Condition	Code	Procedure

Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require repair or replacement.
Leaking (vacuum/fluid/air) ..... A ..... Require replacement.
Out of adjustment ..... B ..... (3) Further inspection required.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of specification.
(3) - Follow OEM recommended adjustment procedures. Repair or replace if out of specification.

SIDE COVERS

See TRANSMISSION PANS.

SLIP YOKES

See YOKES AND SLIP YOKES.

SOLENOIDS

See:
ACTUATORS (ELECTRICAL)
ACTUATORS (VACUUM)

SPEED SENSORS (ELECTRONIC WHEEL AND VEHICLE)

SPEED SENSOR (ELECTRONIC WHEEL AND VEHICLE) INSPECTION

Condition	Code	Procedure
Air gap incorrect	B	(1) Require adjustment or replacement.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(2) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(3) Require repair or replacement.
Inoperative	B	(4) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Loose	A	Require repair or replacement.

Missing ..... C ..... Require replacement.
Resistance out of
specification ..... B .. Require repair or replacement.
Sensor housing cracked .. 2 ..... Suggest replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (2) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead misrouted ..... B .... Require re-routing according
to vehicle manufacturer's
specifications.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - If a sensor is not adjustable, further inspection is
required to identify and correct cause.
(2) - Determine cause and correct prior to repair or
replacement of part.
(3) - Determine source of contamination, such as metal particles
or water. Require repair or replacement.
(4) - Inoperative includes intermittent operation or out of OEM
specification. Some components may be serviceable;
check for accepted cleaning procedure.

SPEEDOMETER-DRIVEN GEAR HOUSINGS

See SPEEDOMETER/ODOMETER DRIVES (MECHANICAL).

SPEEDOMETER/ODOMETER DRIVES (MECHANICAL) *** DRIVETRAIN SYSTEMS UNIFORM INSPEC**

SPEEDOMETER/ODOMETER DRIVE (MECHANICAL) INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Inoperative	A	(1) Require replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Teeth broken	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn close to the end of its useful life	1	Suggest replacement.
Worn, affecting performance	A	Require replacement.

(1) - Inoperative includes intermittent operation.

SPEEDOMETER/ODOMETER HEADS (MECHANICAL)

SPEEDOMETER/ODOMETER HEAD (MECHANICAL) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Lens broken	A	(1) Require repair or

replacement.
Lens cloudy ..... 2 ..... (1) Suggest repair or replacement.
Lens missing ..... C ..... (1) Require repair or replacement.
Malfunctioning ..... A ..... (2) Require repair or replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

(1) - If lens is available as a separate part, require replacement of lens only.
(2) - Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.

SPEEDOMETERS AND ODOMETERS (ELECTRONIC)

SPEEDOMETER AND ODOMETER (ELECTRONIC) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Leaking	A	Require replacement.
Lens broken	A	(2) Require repair or replacement.
Lens cloudy	2	(2) Suggest repair or replacement.
Lens missing	C	(2) Require repair or

replacement.
Malfunctioning ..... A ..... (3) Require repair or replacement.
Mechanical head noisy ... 2 .. Suggest repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - If lens is available as a separate part, require replacement of lens only.
(3) - Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.

SWITCHES

SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Binding, affecting performance	A	Require repair or replacement.
Binding, not affecting		

performance ..... 2 .. Suggest repair or replacement.
Broken ..... A .. Require repair or replacement.
Burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Burned, not affecting
performance ..... 2 ..... (1) Suggest repair or replacement.
Cracked, affecting
performance ..... A .. Require repair or replacement.
Cracked, not affecting
performance ..... 1 .. Suggest repair or replacement.
Leaking ..... A .. Require repair or replacement.
Malfunctioning ..... A ..... (2) Require repair or replacement.
Melted, affecting
performance ..... A ..... (1) Require repair or replacement.
Melted, not affecting
performance ..... 2 ..... (1) Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Out of adjustment ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Won't return ..... A .. Require repair or replacement.
Worn ..... 1 ..... Suggest replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Includes inoperative, intermittent operation, or failure to perform all functions.

TONE WHEELS

See TOOTHED RINGS (TONE WHEELS).

TOOTHED RINGS (TONE WHEELS)

If the toothed ring requires replacement and cannot be replaced as a separate component, replace the assembly of which the ring is a part.

TOOTHED RING (TONE WHEEL) INSPECTION

Condition	Code	Procedure
Alignment incorrect	B	Require repair or replacement.
Bent	B	Require replacement.
Contaminated, affecting performance	A	Require repair. Identify and correct cause.
Cracked	B	Require replacement.
Loose	A	Require replacement of worn parts.
Missing	C	Require replacement.
Number of teeth incorrect	B	Require replacement.
Teeth broken	A	Require replacement.
Teeth damaged, affecting performance	A	Require replacement.

TORQUE CONVERTERS

TORQUE CONVERTER INSPECTION

Condition	Code	Procedure
Converter clutch lock-up operation is faulty	A	Require replacement.
Cover shell damaged, affecting performance	A	Require replacement.
Does not meet stall speed specification	B	Require replacement.
End play exceeds specifications	B	Require replacement.
Hub broken	A	Require replacement.
Hub cracked	A	Require replacement.

Internal component
failure ..... A ..... Require replacement.
Leaking ..... A .. Require repair or replacement.
Pilot broken ..... A ..... Require replacement.
Pilot worn, affecting
performance ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Weights missing ..... C ..... Require replacement.

TRANSAXLE MOUNTS

See MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION).

TRANSDUCERS (TRANSMISSION)

See SENSORS.

TRANSMISSION COOLERS

TRANSMISSION COOLER INSPECTION

Condition Code Procedure

Air flow obstruction .... A ..... Require repair.
Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A .. Require repair or replacement
of hardware.
Connection leaking ..... A .. Require repair or replacement.
Contaminated ..... A .. Require repair or replacement.
Corroded ..... 1 .. Suggest repair or replacement.
Fins damaged, affecting
performance ..... A .. Require repair or replacement.
Fins damaged, not
affecting performance .. .. No service suggested or
required.
Internal restrictions ... B .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement

Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A .. Require repair or replacement.
Tubes damaged, affecting performance ..... A .. Require repair or replacement.
Tubes damaged, not affecting performance .. .. No service suggested or required.

TRANSMISSION MOUNTS

See MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION).

TRANSMISSION PANS

TRANSMISSION PAN INSPECTION

Condition Code Procedure

Bent, interfering with filter or other internal components ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.

TRANSMISSION RANGE INDICATORS (PRNDL)

TRANSMISSION RANGE INDICATOR (PRNDL) INSPECTION

Condition Code Procedure

Binding ..... A .. Require repair or replacement.
Broken ..... A .. Require repair or replacement.
Components missing ..... C .. Require replacement of missing components.
Loose, affecting performance ..... A .. Require repair or replacement.
Out of adjustment ..... A ..... Require repair.
Worn, affecting performance ..... A .. Require repair or replacement.

TUBES

See HOSES, LINES AND TUBES.

UNIVERSAL JOINTS (CARDON OR CROSS TYPE)

UNIVERSAL JOINT (CARDON OR CROSS TYPE) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bearing cap distorted	B	Require replacement.
Binding	A	Require replacement.
Cross (trunion) worn, affecting performance	A	Require replacement.
Double cardon centering ball damaged	A	Require replacement.
Double cardon centering ball worn, affecting performance	A	Require replacement.
Double cardon centering spring broken	A	Require replacement.
Double cardon centering spring missing	C	Require replacement.
Double cardon centering spring weak	A	Require replacement.
End cap seal cracked	2	Suggest replacement.
End cap seal missing	C	Require replacement of seal.
Grease fitting broken	A	(1) Require replacement of grease fitting.
Grease fitting missing	C	(2) Require replacement of grease fitting.
Rust-colored powder around end cap seals	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn, affecting performance	A	Require replacement.

(1) - A broken grease fitting does not require replacement

of the U-Joint.
(2) - A missing grease fitting does not require replacement of the U-Joint.

VACUUM CONTROLS

See ACTUATORS (VACUUM).

VACUUM HOSES

See HOSES, LINES AND TUBES.

VACUUM MOTORS

See ACTUATORS (VACUUM).

VACUUM-OPERATED SWITCHES

See SWITCHES.

VEHICLE SPEED SENSORS

See SPEED SENSORS (ELECTRONIC WHEEL AND VEHICLE).

VENTS

VENT INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Missing	C	Require replacement.
Plugged	A	(1) Require repair or replacement.

(1) - A plugged vent may force fluid past the seal.

VIBRATION DAMPERS

VIBRATION DAMPER INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Missing	C	Require replacement.

Out of position ..... B .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

WHEEL ATTACHMENT HARDWARE

NOTE: For conditions noted below, also check conditions of wheel stud holes.

CAUTION: Proper lug nut torque is essential. Follow recommended torque specifications and tightening sequence. DO NOT lubricate threads unless specified by the vehicle manufacturer.

WHEEL ATTACHMENT HARDWARE INSPECTION

Condition Code Procedure

Bent ..... A ..... Require replacement.
Broken ..... A ..... (1) Require replacement.
Loose ..... B ... Require repair or replacement of affected component.
Lug nut installed
backward ..... B .. Require repair or replacement.
Lug nut mating surface
dished ..... A ..... Require replacement of nut.
Lug nut mating type
incorrect ..... B ..... Require replacement of nut.
Lug nut rounded ..... A . (2) Require replacement of nut.
Lug nut seized ..... A . (2) Require replacement of nut.
Stud incorrect ..... B .... Require replacement of stud.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - Some manufacturers require replacement of all studs on that wheel if two or more studs or nuts on the same wheel are broken or missing.
(2) - Only required if removing wheel.

WHEEL SPEED SENSORS

See SPEED SENSORS (ELECTRONIC WHEEL AND VEHICLE).

WIRING HARNESS AND CONNECTOR INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Insulation damaged, conductors exposed	A	Require repair or replacement.
Insulation damaged, conductors not exposed	1	Suggest replacement.
Open	A	Require repair or replacement.
Protective shield (conduit) melted	2	(1) Suggest repair or replacement.
Protective shield (conduit) missing	2	Suggest repair or replacement.
Resistance (voltage drop) out of specification	A	Require repair or replacement.
Routed incorrectly	B	Require repair.
Secured incorrectly	B	Require repair.
Shorted	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.

Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Transmission connector
leaking .... See TRANSMISSION ASSEMBLY.
Voltage drop out of
specification ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

YOKES AND SLIP YOKES

YOKE AND SLIP YOKE INSPECTION

Condition Code Procedure

Bearing cap bore
distorted ..... A .. Require repair or replacement.
Bent ..... A ..... Require replacement.
Bolt holes elongated .... A .. Require repair or replacement.
Bushing or seal surface
worn, affecting
performance ..... A .. Require repair or replacement.
Leaking through soft yoke
plug ..... A ... Require repair or replacement of soft yoke plug.
Retainer strap bent ..... A ..... Require replacement of retainer strap.
Slip yoke broken ..... A ..... Require replacement.
Splines worn, affecting
performance ..... A ..... Require replacement.
Splines worn close
to the end of their
useful life ..... 1 ..... Suggest replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
U-bolt damaged, affecting
performance ..... A ..... Require replacement of U-bolts.
Yoke damaged, affecting

performance ..... A .. Require repair or replacement.

END OF ARTICLE

* DRIVETRAIN SYSTEMS UNIFORM INSPECTION GUIDELINES *

Article Text

1996 Kia Sephia

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Saturday, April 18, 2009 10:09PM

ARTICLE BEGINNING

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Drivetrain/Transmission Motorist Assurance Program
Standards For Automotive Repair

All Makes and Models

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INTRODUCTION TO MOTORIST ASSURANCE PROGRAM (MAP)

OVERVIEW OF MOTORIST ASSURANCE PROGRAM

The Motorist Assurance Program is the consumer outreach

effort of the Automotive Maintenance and Repair Association, Inc. (AMRA). Participation in the Motorist Assurance Program is drawn from retailers, suppliers, independent repair facilities, vehicle manufacturers and industry associations.

Our organization's mission is to strengthen the relationship between the consumer and the auto repair industry. We produce materials that give motorists the information and encouragement to take greater responsibility for their vehicles-through proper, manufacturer-recommended, maintenance. We encourage participating service and repair shops (including franchisees and dealers) to adopt (1) a Pledge of Assurance to their Customers and (2) the Motorist Assurance Program Standards of Service. All participating service providers have agreed to subscribe to this Pledge and to adhere to the promulgated Standards of Service demonstrating to their customers that they are serious about customer satisfaction.

These Standards of Service require that an inspection of the vehicle's (problem) system be made and the results communicated to the customer according to industry standards. Given that the industry did not have such standards, the Motorist Assurance Program successfully promulgated industry inspection communication standards in 1994-95 for the following systems: Exhaust, Brakes, ABS, Steering and Suspension, Engine Maintenance and Performance, HVAC, and Electrical Systems. Further, revisions to all of these inspection were recently published. Further, revisions to all of these inspection communication standards are continually republished. In addition to these, standards for Drive Train and Transmissions have recently been promulgated. Participating shops utilize these Uniform Inspection & Communication Standards as part of the inspection process and for communicating their findings to their customers.

The Motorist Assurance Program continues to work cooperatively and proactively with government agencies and consumer groups toward solutions that both benefit the customer and are mutually acceptable to both regulators and industry. We maintain the belief that industry must retain control over how we conduct our business, and we must be viewed as part of the solution and not part of the problem. Meetings with state and other government officials (and their representatives), concerned with auto repair and/or consumer protection, are conducted. Feedback from these sessions is brought back to the association, and the program adjusted as needed.

To assure auto repair customers recourse if they were not satisfied with a repair transaction, the Motorist Assurance Program offers mediation and arbitration through MAP/BBB-CARE and other non-profit organizations. MAP conducted pilot programs in twelve states before announcing the program nationally in October, 1998. During the pilots, participating repair shops demonstrated their adherence to the Pledge and Standards and agreed to follow the UICS in communicating

the results of their inspection to their customers. To put some "teeth" in the program, an accreditation requirement for shops was initiated. The requirements are stringent, and a self-policing method has been incorporated which includes the "mystery shopping" of outlets.

We welcome you to join us as we continue our outreach... with your support, both the automotive repair industry and your customers will reap the benefits. Please visit MAP at our Internet site www.motorist.org or contact us at:

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January 1999

MAP UNIFORM INSPECTION GENERAL GUIDELINES

OVERVIEW OF SERVICE REQUIREMENTS & SUGGESTIONS

It is MAP policy that all exhaust, brake, steering, suspension, wheel alignment, drive-line, engine performance and maintenance, and heating, ventilation and air conditioning, and electrical services be offered and performed under the standards and procedures specified in these sections.

Before any service is performed on a vehicle, an inspection of the appropriate system must be performed. The results of this inspection must be explained to the customer and documented on an inspection form. The condition of the vehicle and its components will indicate what services/part replacements may be "Required" or "Suggested". In addition, suggestions may be made to satisfy the requests expressed by the customer.

When a component is suggested or required to be repaired or replaced, the decision to repair or replace must be made in the customer's best interest, and at his or her choice given the options available.

This section lists the various parts and conditions that indicate a required or suggested service or part replacement. Although this list is extensive, it is not fully inclusive. In addition to this list, a technician may make a suggestion. However, any suggestions must be based on substantial and informed experience, or the vehicle manufacturer's recommended service interval and must be documented.

Some conditions indicate that service or part replacement is required because the part in question is no longer providing the function for which it is intended, does not meet a vehicle manufacturer's design specification or is missing.

*** DRIVETRAIN SYSTEMS UNIF**

Example:
An exhaust pipe has corroded severely and has a hole in it through which exhaust gases are leaking. Replacement of the exhaust pipe in this case is required due to functional failure.

Example:
A brake rotor has been worn to the point where it measures less than the vehicle manufacturer's discard specifications. Replacement of the rotor is required because it does not meet design specifications.

Some conditions indicate that a service or part replacement is suggested because the part is close to the end of its useful life or addresses a customer's need, convenience or request. If a customer's vehicle has one of these conditions, the procedure may be only to suggest service.

Example:
An exhaust pipe is rusted, corroded or weak, but no leaks are present. In this case, the exhaust pipe has not failed. However, there is evidence that the pipe may need replacement in the near future. Replacement of the pipe may be suggested for the customer's convenience in avoiding a future problem.

Example:
The customer desires improved ride and/or handling, but the vehicle's shocks or struts have not failed. In this case, replacement may be suggested to satisfy the customer's wishes. In this case, replacement of the shocks or struts may not be sold as a requirement.

A customer, of course, has the choice of whether or not a shop will service his or her vehicle. He or she may decide not to follow some of your suggestions. When a repair is required, a MAP shop must refuse partial service on that system if, in the judgment of the service provider, proceeding with the work could create or continue an unsafe condition. When a procedure states that required or suggested repair or replacement is recommended, the customer must be informed of the generally acceptable repair/replacement options whether or not performed by the shop.

When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

The following reasons may be used for requiring inspection:

services. These codes are shown in the "Code" column of the MAP Uniform Inspection & Communications Standards that follow:

Reasons to Require Repair or Replacement

A - Part no longer performs intended purpose
B - Part does not meet a design specification (regardless of performance)
C - Part is missing

NOTE: When a repair is required, the shop must refuse partial service to the system in question, if the repair creates or continues an unsafe condition.

Reasons to Suggest Repair or Replacement

1 - Part is close to the end of its useful life (just above discard specifications, or weak; failure likely to occur soon, etc.)
2 - To address a customer need, convenience, or request (to stiffen ride, enhance performance, eliminate noise, etc.)
3 - To comply with maintenance recommended by the vehicle's Original Equipment Manufacturer (OEM)
4 - Technician's recommendation based on substantial and informed experience

NOTE: Suggested services are always optional. When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

DRIVE/POWER TRAIN ASSEMBLIES

SERVICE PROCEDURES REQUIRED AND SUGGESTED FOR PROPER VEHICLE OPERATION

NOTE: Whenever transmission or drivetrain service is performed that affects the suspension alignment, for example, removing the engine cradle, it is required that the alignment be checked and corrected if necessary.

AUTOMATIC TRANSMISSION/TRANSAXLE ASSEMBLIES

AUTOMATIC TRANSMISSION/TRANSAXLE ASSEMBLY INSPECTION

Any internal component failure that requires removal of the assembly from the vehicle for service. (1) ..... A ..... (2) Require repair or replacement of the automatic transmission/transaxle assembly.

(1) - It is Required that the torque converter and all other failure related components be inspected for cause and condition.
(2) - For components not requiring removal of the assembly, refer to the component listing in this document.

DIFFERENTIAL AND FINAL DRIVE ASSEMBLIES

NOTE: Does not include half shafts.

DIFFERENTIAL AND FINAL DRIVE ASSEMBLY INSPECTION

Condition	Code	Procedure
Any internal component failure that requires removal of the assembly from the vehicle for service. (1)	A ...	Require repair or replacement of the differential assembly.

(1) - For components not requiring removal of the assembly, refer to the component listing in this document.

MANUAL TRANSMISSION/TRANSAXLE ASSEMBLIES

MANUAL TRANSMISSION/TRANSAXLE ASSEMBLY INSPECTION

Condition	Code	Procedure
Any internal component failure that requires removal of the assembly from the vehicle for		

service. (1)	A	...	Require repair or replacement of the manual transmission/transaxle assembly.

(1) - For components not requiring removal of the assembly, refer to the component listing in this document.

TRANSFER CASE ASSEMBLIES

TRANSFER CASE ASSEMBLY INSPECTION

Condition	Code		Procedure
Any internal component failure that requires removal of the assembly from the vehicle for service. (1)	A	...	Require repair or replacement of the transfer case differential assembly.

(1) - For components not requiring removal of the assembly, refer to the component listing in this document.

DRIVE TRAIN/COMPONENTS

The conditions listed for the components included in this section assume that the problem has been isolated to the specific component through proper testing.

ACTUATORS (ELECTRICAL)

ACTUATOR (ELECTRICAL) INSPECTION

Condition	Code		Procedure
Attaching hardware broken	A	...	Require repair or replacement of hardware.
Attaching hardware missing	C	.....	Require replacement of hardware.
Attaching hardware not			

functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted, affecting performance .. A ..... (1) Require repair or replacement.
Connector melted, not affecting performance .. 2 ..... (1) Suggest repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 1 ..... (1) Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 1 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

ACTUATORS (VACUUM)

ACTUATOR (VACUUM) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement.

of hardware.

Attaching hardware missing ..... C ..... Require replacement of hardware.

Attaching hardware not functioning ..... A .. Require repair or replacement of hardware.

Connector broken ..... A .. Require repair or replacement.

Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.

Connector melted, affecting performance .. A ..... (1) Require repair or replacement.

Connector melted, not affecting performance .. 2 ..... (1) Suggest repair or replacement.

Connector missing ..... C ..... Require replacement.

Inoperative ..... A ..... (2) Require replacement.

Leaking (vacuum) ..... A .. Require repair or replacement.

Linkage bent, affecting performance ..... A ... Require repair or replacement of linkage.

Linkage bent, not affecting performance .. 2 ... Suggest repair or replacement of linkage.

Linkage binding, affecting performance ..... A ... Require repair or replacement of linkage.

Linkage binding, not affecting performance .. 1 ... Suggest repair or replacement of linkage.

Linkage broken A Require repair or replacement of linkage.

Linkage loose, affecting performance ..... A ... Require repair or replacement of linkage.

Linkage loose, not affecting performance .. 1 ... Suggest repair or replacement of linkage.

Linkage missing ..... C ..... Require replacement.

Linkage noisy ..... 2 .. Suggest repair or replacement.

Missing ..... C ..... Require replacement.

Noisy ..... 2 .. Suggest repair or replacement.

Out of adjustment ..... A .. Require repair or replacement.

Terminal burned, affecting performance ..... A ..... (1) Require repair or

replacement.

Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of OEM specification.

AXLES

AXLE INSPECTION

Condition	Code	Procedure
Bent	A	Require replacement.
Broken	A	Require replacement.
End play exceeds specifications	B	Require repair or replacement.
Flange bent	A	Require replacement.
Flange threads stripped	A	Require repair or replacement.
Twisted	A	Require replacement.
Worn, affecting performance	A	Require replacement.

BEARINGS AND RACES

NOTE: When replacing or repacking bearings, grease seal replacement is required. You are not required to replace these components in axle sets. Determine the need to replace based upon the individual component conditions that follow.

BEARING AND RACE INSPECTION

Condition	Code	Procedure

Bearing end-play exceeds specifications ..... B .. Require adjustment of bearing, if possible. If proper adjustment cannot be obtained, require replacement of bearing assembly.

Bearing rollers, balls or races are worn, pitted, or feel rough when rotated as an assembly ..... B .. Require replacement of bearing assembly.

BELL CRANKS

BELL CRANK INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bent	A	Require repair or replacement.
Broken	A	Require repair or replacement.
Cracked	A	Require repair or replacement.
Missing	C	Require replacement.
Worn, affecting performance	A	Require repair or replacement.

BELL HOUSINGS

See HOUSINGS (BELL, CASE, TAIL (EXTENSION) AND AUXILIARY).

BUSHINGS (EXTERNAL)

BUSHING (EXTERNAL) INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part if available; otherwise, replace bushing.
Attaching hardware broken	A	Require replacement of broken part if available; otherwise, replace bushing.
Attaching hardware corroded, affecting structural integrity	A	Require replacement of corroded part if available; otherwise, replace bushing.
Attaching hardware incorrect	A	Require replacement of incorrect part if available; otherwise, replace bushing.
Attaching hardware loose	A	Require repair or replacement of loose part if available; otherwise, replace bushing.
Attaching hardware missing	C	Require replacement of missing part if available; otherwise, replace bushing.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads if available; otherwise, replace bushing.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads if available; otherwise, replace bushing.
Binding	A	Require repair or replacement.
Contaminated	1	Suggest replacement.
Deteriorated, affecting performance	A	Require repair or replacement.
Distorted, affecting performance	A	Require repair or replacement.
Missing	A	Require replacement.

*** DRI**

Noisy ..... 2 ..... (1) Further inspection required.
Rubber separating from internal metal sleeve on bonded bushing ..... A ..... Require replacement.
Seized ..... A ..... Require replacement.
Shifted (out of position) ..... B .. Require repair or replacement.
Split ..... A ..... Require replacement.
Surface cracking (weather-checked) .... No service suggested or required.
Worn, affecting performance ..... A .. Require repair or replacement.
Worn close to the end of its useful life ..... 1 ..... Suggest replacement.

(1) - If noise isolated to bushing, suggest repair or replacement.
CAUTION: Use only approved lubricant on rubber bushings. Petroleum-based lubricants may damage rubber bushings.

CABLES (SPEEDOMETER)

CABLE (SPEEDOMETER) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bent	A	Require repair or replacement.
Binding	A	Require repair or replacement.
Bracket bent, affecting performance	A	Require repair or replacement.
Bracket bent, not affecting performance	.. ..	No service suggested or required.
Bracket broken, affecting		

performance ..... A ..... Require replacement.
Bracket broken, not
affecting performance .. .. No service suggested or required.
Bracket corroded,
affecting performance .. A .. Require repair or replacement.
Bracket corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Bracket cracked, affecting
performance ..... A .. Require repair or replacement.
Bracket cracked, not
affecting performance .. 1 .. Suggest repair or replacement.
Bracket loose, affecting
performance ..... A .. Require repair or replacement.
Bracket loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Broken ..... A ..... Require replacement.
Cracked ..... A .. Require repair or replacement.
Disconnected ..... A .. Require repair or replacement.
Kinked ..... A .. Require repair or replacement.
Melted ..... A ..... (1) Require repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Routed incorrectly ..... 2 ..... Suggest repair.
Seized ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

CABLES (TV, DETENT AND SHIFT)

CABLE (TV, DETENT AND SHIFT) INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement

of hardware.

Bent ..... A .. Require repair or replacement.
Binding ..... A .. Require repair or replacement.
Bracket bent, affecting performance ..... A .. Require repair or replacement.
Bracket bent, not affecting performance .. .. No service suggested or required.
Bracket broken, affecting performance ..... A ..... Require replacement.
Bracket broken, not affecting performance .. .. No service suggested or required.
Bracket corroded, affecting performance .. A .. Require repair or replacement.
Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Bracket cracked, affecting performance ..... A .. Require repair or replacement.
Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket loose, affecting performance ..... A .. Require repair or replacement.
Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.
Bracket missing ..... C ..... Require replacement.
Broken ..... A ..... Require replacement.
Cracked ..... A .. Require repair or replacement.
Disconnected ..... A .. Require repair or replacement.
Frayed ..... A ..... Require replacement.
Kinked ..... A .. Require repair or replacement.
Melted ..... A ..... (1) Require repair or replacement.
Missing ..... C ..... Require replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Out of adjustment ..... B ..... (2) Require repair or replacement.
Routed incorrectly ..... 2 ..... Suggest repair.
Seized ..... A .. Require repair or replacement.
Self-adjuster inoperative ..... A .. Require repair or replacement of self-adjuster.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

*** DRIVETRAIN SYSTEMS UNIFORM INSPEC**

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Cable replacement is required if it cannot be adjusted within specifications.

CARRIER BEARINGS

See INTERMEDIATE SHAFT SUPPORT BEARINGS.

CLUTCH CABLES AND CABLE HOUSINGS

CLUTCH CABLE AND CABLE HOUSING INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Cable bent	A	Require replacement.
Cable binding	A	Require repair or replacement.
Cable mounting loose	B	Require repair or replacement.
Cable out of adjustment	B	Require repair or replacement.
Frayed	B	Require replacement.
Housing heat-damaged	1	Suggest replacement.
Missing	C	Require replacement.
Noisy	2	Suggest repair or replacement.
Seized	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn, affecting performance	A	Require replacement.

CLUTCH DISCS (MANUAL TRANSMISSION)

CLUTCH DISC (MANUAL TRANSMISSION) INSPECTION

Condition	Code	Procedure
Backing plate cracked	A	Require replacement.
Broken	A	Require replacement.
Contaminated with oil	A	Require replacement.
Damper cushion broken	A	Require replacement.
Damper cushion collapsed	A	Require replacement.
Damper spring collapsed	A	Require replacement.

Damper spring missing .. C ..... (1) Require replacement.
Friction material cracked through ..... B ..... Require replacement.
Friction material flaking or chunking ..... B ..... Require replacement.
Friction material surface cracking ..... B ..... No service suggested or required.
Grooved ..... B ..... No service suggested or required unless the pressure plate or flywheel is being resurfaced or replaced. In this case, replacement of clutch disc is required.
Ridged ..... B ..... No service suggested or required unless the pressure plate or flywheel is being resurfaced or replaced. In this case, replacement of clutch disc is required.
Splines worn, affecting performance ..... A ..... Require replacement.
Warped ..... A ..... Require replacement.
Wear exceeds specifications (where applicable) ..... B ..... Require replacement.
Worn close to the end of its useful life ..... 1 ..... Suggest replacement.
Worn, affecting performance ..... A ..... Require replacement.

(1) - Not all clutch discs have springs in all spring chambers on the disc.

CLUTCH FORKS

CLUTCH FORK INSPECTION

Condition Code Procedure

Bent ..... B ..... Require replacement.
Broken ..... A .. Require repair or replacement.
Cracked ..... B .. Require repair or replacement.
Worn close to the end of its useful life ..... 1 ..... Suggest replacement.

*** DRIVETRAIN SYSTEMS UNIFORM INS**

Worn, affecting
performance ..... A ..... Require replacement.

CLUTCH LINKAGES (MECHANICAL)

See LINKAGES (EXTERNAL).

CLUTCH MASTER CYLINDERS

CLUTCH MASTER CYLINDER INSPECTION

Condition	Code	Procedure
Cover gasket distorted	A	Require replacement of cover gasket.
Cover gasket gummy	A	Require replacement of cover gasket.
Cylinder leaking fluid from rear of bore	A	Require repair or replacement.
Cylinder leaking fluid internally	A	Require replacement.
Dust boot missing	C	Require replacement of dust boot.
Dust boot punctured	A	Require replacement of dust boot.
Dust boot torn	A	Require replacement of dust boot.
Fluid level incorrect	B	Require fluid level adjustment.
Housing damaged, affecting performance	A	Require repair or replacement.
Master cylinder has residue in reservoir (make parallel w/brakes when they are done)	2	(1) Further inspection required.
Threads damaged	A	Require repair replacement
Threads stripped (threads missing)	A	Require replacement.

(1) - DO NOT replace master cylinder unless it exhibits conditions listed for replacement. You may suggest fluid change according to OEM service intervals.

CLUTCH PEDALS

CLUTCH PEDAL INSPECTION

Condition	Code	Procedure
Bent, affecting performance	A	Require repair or replacement.
Broken	A	Require repair or replacement.
Pedal pad missing	C	Require replacement of pedal pad.
Pivot bushings worn, affecting performance	A	Require replacement of pivot bushings.

CLUTCH PIVOTS

CLUTCH PIVOT INSPECTION

Condition	Code	Procedure
Bent	A	Require replacement.
Broken	A	Require repair or replacement.
Cracked	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn close to the end of its useful life	1	Suggest replacement.
Worn, affecting performance	A	Require replacement.

CLUTCH PRESSURE PLATES

See PRESSURE PLATES.

CLUTCH RELEASE BEARINGS

CLUTCH RELEASE BEARING INSPECTION

Condition	Code	Procedure
Collar broken	A	Require replacement.
Cracked	A	Require replacement.
Rough when rotated as		

assembly ..... B ..... Require replacement.
Seized ..... A ..... Require replacement.
Wear exceeds
specifications ..... B ..... Require replacement.
Worn close to the end of
its useful life ..... 1 ..... Suggest replacement.
Worn, affecting
performance ..... A ..... Require replacement.

CLUTCH SLAVE CYLINDERS (CONCENTRIC)

CLUTCH SLAVE CYLINDER (CONCENTRIC) INSPECTION

Condition Code Procedure

Bearing rough when rotated
as an assembly ..... B ..... Require replacement.
Bearing seized ..... A ..... Require replacement.
Bleeder pipe leaks ..... A .. Require repair or replacement.
Carrier assembly worn,
affecting performance .. A ..... Require replacement.
Collar broken ..... A ..... Require replacement.
Cracked ..... A ..... Require replacement.
Housing leaks ..... A ..... Require replacement.
Inoperative ..... A ..... Require replacement.
Release binding ..... A ..... Require replacement.
Spring broken ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Worn, affecting
performance ..... A ..... Require replacement.

CLUTCH SLAVE CYLINDERS (CONVENTIONAL OR EXTERNAL)

CLUTCH SLAVE CYLINDER (CONVENTIONAL OR EXTERNAL) INSPECTION

Condition Code Procedure

Binding ..... A .. Require repair or replacement.
Bleeder port damaged (not
repairable) ..... A ..... (1) Require replacement.
Bleeder port damaged
(repairable) ..... A ..... (1) Require repair.

Bleeder screw broken off
in slave cylinder ..... A ..... (1) Require replacement.
Bleeder screw seized .... A ..... (2) Require replacement.
Bore corroded (pitted) .. B ..... Require replacement.
Bore grooved ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - Only required if the hydraulic system must be opened.
(2) - Seized is defined as a bleeder screw that cannot be removed after a practical attempt at removing it has been made.

COMPANION FLANGES

See YOKES AND SLIP YOKES.

CONNECTORS

See WIRING HARNESSES AND CONNECTORS.

COOLER BYPASS VALVES

COOLER BYPASS VALVE INSPECTION

Condition Code Procedure

Inoperative ..... A ..... Require replacement.
Installed incorrectly ... A ..... Require repair.
Leaking ..... A .. Require repair or replacement.
Restricted ..... A .. Require repair or replacement.

COOLER LINES

COOLER LINE INSPECTION

Condition Code Procedure

Abrasion damage, affecting
structural integrity ... A .. Require repair or replacement.
Abrasion damage, not
affecting structural
integrity .... No service suggested o

required.
Application incorrect ... B ..... Require replacement.
Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement
of hardware.
Clamp corroded, not
reusable ..... 1 ..... Suggest replacement.
Connected incorrectly ... A ..... Require repair.
Corroded, affecting
structural integrity ... A ..... Require replacement.
Corroded, not affecting
structural integrity ... . No service suggested or
required.
Cracked ..... A .. Require repair or replacement.
Fitting type incorrect
(such as compression
fitting) ..... B ..... Require replacement.
Flange leaking ..... A .. Require repair or replacement.
Insufficient clamping
force, allowing hose to
leak ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Melted ..... 1 .. Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Outer covering damaged to
the extent that the inner
fabric is visible ..... A ..... Require replacement.
Protective sleeves
damaged ..... 2 . Suggest replacement of sleeves.
Protective sleeves
missing ..... C . Require replacement of sleeves.
Restricted, affecting
performance ..... A .. Require repair or replacement.
Routed incorrectly ..... 2 ..... Require repair.
Swollen ..... 1 ..... Suggest replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Type incorrect ..... 1 .. Suggest repair or replacement.

COOLERS

See TRANSMISSION COOLERS.

CV JOINTS

CV JOINT INSPECTION

Condition	Code	Procedure
Bearing, bushing or seal surface worn, affecting performance	A	Require repair or replacement.
Boot clamp broken	A	Require repair or replacement of clamp.
Boot clamp loose	A	Require repair or replacement of clamp.
Boot clamp missing	C	Require repair or replacement of clamp.
Boot leaking	A	Require replacement of CV boot.
Boot surface cracked, not leaking	2	Suggest replacement of CV boot.
Cage broken	A	Require repair or replacement of CV joint.
Housing damaged to the extent that it no longer performs its intended function	A	(1) Require repair or replacement of CV joint.
Housing worn to the extent that it no longer performs its intended function	A	(1) Require repair or replacement of CV joint.
Holes elongated	A	Require replacement.
Internal parts binding	A	Require repair or replacement.
Internal parts worn	A	Require repair or replacement.
Lubricant missing	C	Require cleaning, inspection, and repacking of CV joint.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Housing assembly may appear blue in color from normal manufacturing process of heat-treating the housing.

DIP STICK TUBES

DIP STICK TUBE INSPECTION

Condition	Code	Procedure
Broken	A	Require repair or replacement.
Checkball missing	C	Suggest repair or replacement.
Cracked	A	Require repair or replacement.
Hold down bracket broken	A	Require repair or replacement.
Hold down bracket missing	C	Require replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

DIP STICKS (FLUID LEVEL INDICATORS)

DIP STICK (FLUID LEVEL INDICATOR) INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Broken	A	Require replacement.
Compressed	A	Require repair or replacement.
Missing	C	Require replacement.
Modified	A	Require replacement.
Stretched	A	Require repair or replacement.

DOWEL PINS, GUIDES AND PILOT HOLES

DOWEL PIN, GUIDE AND PILOT HOLE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement.
Cracked	A	Require repair or replacement.
Distorted	A	Require repair or replacement.
Missing	C	Require replacement.
Positioned incorrectly	B	Require repair or replacement.

*** DRI**

Stepped ..... A .. Require repair or replacement.
Worn to the extent that it
no longer performs its
intended function ..... A .. Require repair or replacement.

DRIVE SHAFT FLANGES

See COMPANION FLANGES.

DRIVE SHAFTS AND HALF SHAFTS

DRIVE SHAFT AND HALF SHAFT INSPECTION

Condition Code Procedure

Balance weight missing .. C .. Require repair or replacement.
Bearing cap bore
distorted ..... A .. Require repair or replacement.
Bent ..... A ..... Require replacement.
Bolt holes elongated .... A .. Require repair or replacement.
Bushing or seal surface
worn, affecting
performance ..... A .. Require repair or replacement.
Leaking through soft yoke
plug ..... A ... Require repair or replacement
of soft yoke plug.
Out of balance ..... A .. Require repair or replacement.
Retainer strap bent ..... A ..... Require replacement of
retainer strap.
Slip yoke broken ..... A ..... Require replacement.
Splines worn, affecting
performance ..... A ..... Require replacement.
Splines worn close to
the end of their
useful life ..... 1 ..... Suggest replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
U-bolt damaged, affecting
performance ..... A . Require replacement of U-bolts.
Yoke damaged, affecting
performance ..... A .. Require repair or replacement.

DUST BOOTS

NOTE: Does not include CV boots.

DUST BOOT INSPECTION

Condition	Code	Procedure
Cracked, not leaking	1	Suggest replacement.
Missing	C	Require replacement.
Leaking	A	Require repair or replacement.
Torn	A	Require replacement.

ENGINE MOUNTS

See MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION).

EXCITER RINGS

See TOOTHED RINGS (TONE WHEELS).

FILLER TUBES

See DIP STICK TUBES.

FILTERS AND SCREENS

FILTER AND SCREEN INSPECTION

Condition	Code	Procedure
At service interval	3	Suggest replacement.
Bent	A	Require repair or replacement.
Exceeding service interval	3	Suggest replacement.
Missing	C	Require replacement.
Near service interval	3	Suggest replacement.
Restricted	A	(1) Require repair or replacement.
Torn	A	Require replacement.
Worn, affecting performance (metal or nylon screen type)	A	Require repair or replacement.

(1) - Further inspection may be required to determine the source of restriction or contamination.

FLANGES

See COMPANION FLANGES.

FLEX PLATES

FLEX PLATE INSPECTION

Condition	Code	Procedure
Bent, affecting performance	A	Require replacement.
Bent, not affecting performance	..	No service suggested or required.
Bolt or stud holes elongated	B	Require replacement.
Broken	A	Require replacement.
Cracked	A	Require replacement.
Ring gear worn close to the end of its useful life	1	Suggest replacement.
Ring gear worn to the extent that it no longer performs its intended function	A	Require replacement.
Weights missing	A	Require replacement.

FLUID LEVEL INDICATORS

See DIP STICKS (FLUID LEVEL INDICATORS).

FLUIDS AND LUBRICANTS

FLUID AND LUBRICANT INSPECTION

Condition	Code	Procedure
Application incorrect	B	(1) Require replacement.
At service interval	3	Suggest replacement.
Beyond service interval	3	Suggest replacement.
Burned	..	(2) Further inspection required.

Contaminated, for example,
fluid other than hydraulic
fluid present ..... A or B .... (3)(4) Require service.
Exceeding service
interval ..... 3 ..... Suggest replacement.
Hydraulic fluid
incorrect ..... B ..... (5) Require service.
Level incorrect ..... B ..... Require correction of fluid level.
Near service interval ... 3 ..... Suggest replacement.
Rubber master cylinder
cover gasket distorted
and gummy ..... A ..... (3) Require service.
Varnished .... (6) Further inspection required.

(1) - Determine and correct cause.
(2) - Fluid that is burned indicates a serious problem. Determine and correct the cause.
(3) - If a fluid other than hydraulic fluid is present in the hydraulic system which DOES affect the rubber parts, the required service is to: 1) remove all components having rubber parts from the system, 2) flush lines with denatured alcohol or hydraulic cleaner, 3) repair or replace all components having rubber parts, and 4) bleed and flush with correct hydraulic fluid. (Code A)
(4) - If a fluid other than hydraulic fluid is present in the hydraulic system which DOES NOT affect the rubber parts, the required service is to flush and fill with the correct hydraulic fluid. (Code B)
(5) - If a fluid other than specification hydraulic fluid is present in the hydraulic system, the required service is to flush and fill with the correct hydraulic fluid.
(6) - Fluid that is varnished may indicate a serious problem. Determine and correct the cause.

FLYWHEELS

NOTE: Clutch disc replacement does not necessitate flywheel reconditioning, unless other conditions justify the reason to do so.

FLYWHEEL INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement of hardware.
Attaching hardware
missing ..... C ..... Require replacement of hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement of hardware.
Cracked (other than
mounting area) ..... A ..... (1) Require resurfacing or replacement.
Cracks in mounting area . B ..... Require replacement.
Hard spots ..... B .. Require repair or replacement.
Ring gear broken ..... A ..... Require replacement of ring gear.
Ring gear teeth worn,
affecting performance .. A ..... Require replacement of ring gear.
Runout exceeds
specifications ..... B .. Require repair or replacement.
Scored ..... B .. Require repair or replacement.
Surface cracks after
resurfacing to
manufacturer's minimum
specifications ..... B ..... Require replacement.
Wear exceeds
specifications ..... B ..... Require replacement.
Worn close to the end of
its useful life ..... 1 ..... Suggest replacement.
Worn, affecting
performance ..... A .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - Some manufacturers allow slight surface cracking in the friction surface.

FORCE MOTORS

See ACTUATORS (ELECTRICAL).

See DOWEL PINS, GUIDES AND PILOT HOLES.

HALF SHAFTS

See DRIVE SHAFTS AND HALF SHAFTS.

HOSES, LINES AND TUBES

HOSE, LINE AND TUBE INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Connected incorrectly	A	Require repair.
Corroded, not reusable	1	Suggest replacement.
Cracked	A	Require replacement.
Dry-rotted	1	Suggest repair or replacement.
Hard	1	Suggest repair or replacement.
Inner fabric (webbing) damaged	A	Require replacement.
Insufficient clamping force, allowing hose to leak	A	Require repair or replacement.
Leaking	A	Require repair or replacement.
Maintenance intervals	3	Suggest replacement.
Melted	1	Suggest repair or replacement.
Missing	C	Require replacement.
Outer covering damaged	1	Suggest replacement.
Outer covering damaged to the extent that the inner fabric is visible	A	Require replacement.
Protective sleeves damaged	2	Suggest replacement of sleeves.
Protective sleeves missing	2	Suggest replacement of sleeves.
Restricted, affecting performance	A	Require repair or replacement.
Restricted, not affecting performance	2	Suggest repair or replacement.
Routed incorrectly	2	Suggest replacement.
Safety clip missing	C	Require replacement.
Spongy	1	Suggest repair or replacement.
Stripped	A	Require replacement.
Swollen	B	Require replacement.
Threads damaged	A	Require replacement.

Threads stripped (threads
missing) ..... A ..... Require replacement.
Type incorrect ..... 1 .. Suggest repair or replacement.

HOUSINGS (BELL, CASE, TAIL (EXTENSION) AND AUXILIARY)

HOUSING (BELL, CASE, TAIL (EXTENSION) AND AUXILIARY) INSPECTION

Condition Code Procedure

Bearing race loose
in bore ..... A .. Require repair or replacement.
Broken, affecting
performance ..... A .. Require repair or replacement.
Cracked ..... A .. Require repair or replacement.
Dowel pin holes worn,
affecting performance .. A ..... (1) Require repair or
replacement.
Machined surfaces damaged,
affecting performance .. A .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Worn, affecting
performance ..... A .. Require repair or replacement.

(1) - See DOWEL PINS, GUIDES AND PILOT HOLES.

INTERMEDIATE SHAFT SUPPORT BEARINGS

INTERMEDIATE SHAFT SUPPORT BEARING INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A ... Require repair or replacement
of hardware.
Bearing rollers, balls or

races are worn, pitted, noisy, or feel rough when rotated as an assembly . A .. Require replacement of bearing assembly.

Bracket bent, affecting performance ..... A .. Require repair or replacement.

Bracket bent, not affecting performance .. .. No service suggested or required.

Bracket broken, affecting performance ..... A ..... Require replacement.

Bracket broken, not affecting performance .. .. No service suggested or required.

Bracket corroded, affecting performance .. A .. Require repair or replacement.

Bracket corroded, not affecting performance .. 2 .. Suggest repair or replacement.

Bracket cracked, affecting performance ..... A .. Require repair or replacement.

Bracket cracked, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket holes elongated, affecting performance .. A .. Require repair or replacement.

Bracket holes elongated, not affecting performances) .... No service suggested or required.

Bracket loose, affecting performance ..... A .. Require repair or replacement.

Bracket loose, not affecting performance .. 1 .. Suggest repair or replacement.

Bracket missing ..... C ..... Require replacement.

Cracked .... Require replacement.

Rough (brinelling, spalling) ..... A ..... Require replacement.

Rubber deteriorated, affecting performance .. A ..... Require replacement.

Seized ..... A ..... Require replacement.

KEY INTERLOCK SYSTEMS

See SHIFT INTERLOCK SYSTEMS (SELECTOR AND KEY INTERLOCK SYSTEMS).

LIMITED SLIPS

See DIFFERENTIAL AND FINAL DRIVE ASSEMBLIES.

LINES

See HOSES, LINES AND TUBES.

LINKAGES (EXTERNAL)

LINKAGE (EXTERNAL) INSPECTION

Condition	Code	Procedure
Components missing	C	Require replacement of missing components.
Linkage bent, affecting performance	A	Require repair or replacement of linkage.
Linkage bent, not affecting performance	2	Suggest repair or replacement of linkage.
Linkage binding, affecting performance	A	Require repair or replacement of linkage.
Linkage binding, not affecting performance	1	Suggest repair or replacement of linkage.
Linkage broken	A	Require repair or replacement of linkage.
Linkage loose, affecting performance	A	Require repair or replacement of linkage.
Linkage loose, not affecting performance	1	Suggest repair or replacement of linkage.
Linkage missing	C	Require replacement.
Linkage noisy	2	Suggest repair or replacement.
Out of adjustment	B	Require repair or replacement.
Worn to the extent that it no longer performs its intended function	A	Require repair or replacement.

LOCKING HUB ASSEMBLIES

LOCKING HUB ASSEMBLY INSPECTION

Condition	Code	Procedure
Inoperative	A	(1) Require repair or replacement.
Loose	A	Require repair or replacement.
Seized in any position	A	Require repair or replacement.

(1) - Inoperative includes intermittent operation.

LOCKING HUB CONTROL KNOBS

LOCKING HUB CONTROL KNOB INSPECTION

Condition	Code	Procedure
Damaged, affecting performance	A	Require replacement.
Missing	C	Require replacement.
Worn, affecting performance	A	Require replacement.

LUBRICANTS

See FLUIDS AND LUBRICANTS.

METAL-CLAD SEALS

See SEALS.

METALASTIC JOINTS

See RUBBER JOINTS (METALASTIC).

MODULATOR PINS

MODULATOR PIN INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Missing	C	Require replacement.

MODULATORS

MODULATOR INSPECTION

Condition	Code	Procedure
Bent, affecting performance	A	Require replacement.
Contaminated (water, fuel, etc.)	A	(1) Require replacement.
Housing cracked	A	Require replacement.
Inoperative	A	(2) Require replacement.
Leaking fluid externally	A	Require repair or replacement.
Leaking fluid internally	A	Require replacement.
Leaking vacuum	A	Require replacement.
Nipple broken	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Further inspection is required to determine the cause of the contamination.
(2) - Inoperative includes intermittent operation or out of OEM specification.

MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION)

MOUNT (ENGINE, TRANSAXLE AND TRANSMISSION) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Broken	A	Require replacement.
Leaking (hydraulic mount)	A	Require replacement.

Mounting hole worn, affecting performance	A	Require replacement.
Mounting hole worn, not affecting performance		No service suggested or required.
Rubber deteriorated, affecting performance	A	Require replacement.
Rubber deteriorated, not affecting performance		No service suggested or required.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

ODOMETER DRIVES (MECHANICAL)

See SPEEDOMETER/ODOMETER DRIVES (MECHANICAL).

ODOMETER HEADS (MECHANICAL)

See SPEEDOMETER/ODOMETER HEADS (MECHANICAL).

OIL PANS

See TRANSMISSION PANS.

PANS

See TRANSMISSION PANS.

PILOT HOLES

See DOWEL PINS, GUIDES AND PILOT HOLES.

PRESSURE PLATES

PRESSURE PLATE INSPECTION

Condition	Code	Procedure
Balance weight missing	C	Require replacement.
Broken	A	Require replacement.
Contact surface distorted	B	Require replacement.
Cracks	B	Require replacement.
Fingers bent	A	Require replacement.

Hard spots	B	Require replacement.
Scored	B	Require replacement.
Spring rate less than specifications	B	Require replacement.
Worn, affecting performance	A	Require replacement.
Worn beyond specifications	B	Require replacement.
Worn close to the end of its useful life	1	Suggest replacement.

PRESSURE SWITCHES

See SWITCHES.

RACES

See BEARINGS AND RACES.

RUBBER JOINTS (METALASTIC)

These joints may be found on half and/or drive shafts. They are usually found on European vehicles featuring a three-lug drive flange. They may be equipped with a centering ball or pin.

RUBBER JOINT (METALASTIC) INSPECTION

Condition	Code	Procedure
Drive flange bent	A	Require repair or replacement.
Drive flange damaged, affecting performance	A	Require replacement.
Rubber drive joint cracked	2	Suggest replacement.
Rubber drive joint damaged, affecting performance	A	Require replacement.
Rubber drive joint split between mounting holes	A	Require replacement.
Rubber drive joint torn at mounting holes	A	Require replacement.
Rubber drive joint weather-cracked		No service suggested or required.

SCREENS

See FILTERS AND SCREENS.

SEALS

SEAL INSPECTION

Condition	Code	Procedure
Leaking	A	(1) Require repair or replacement.

(1) - Require inspection of mating and sealing surface and repair or replace as necessary. Check vent. A plugged vent may force fluid past the seal.

SEALS (METAL-CLAD)

See SEALS.

SELECTOR INTERLOCK SYSTEMS

See SHIFT INTERLOCK SYSTEMS (SELECTOR AND KEY INTERLOCK SYSTEMS).

SERVOS

See ACTUATORS (VACUUM).

SHIFT INTERLOCK SYSTEMS (SELECTOR AND KEY INTERLOCK SYSTEMS)

See:
ACTUATORS (ELECTRICAL)
CABLES
LINKAGES (EXTERNAL)
SWITCHES

SENSORS

SENSOR INSPECTION

Condition	Code	Procedure

Attaching hardware broken ..... A ... Require repair or replacement of hardware.
Attaching hardware missing ..... C ..... Require replacement of hardware.
Attaching hardware not functioning ..... A ... Require repair or replacement of hardware.
Connector broken ..... A .. Require repair or replacement.
Connector (Weatherpack type) leaking ..... A .. Require repair or replacement.
Connector melted ..... A ..... (1) Require repair or replacement.
Connector missing ..... C ..... Require replacement.
Inoperative ..... A ..... (2) Require repair or replacement.
Leaking (vacuum/fluid/air) ..... A ..... Require replacement.
Out of adjustment ..... B ..... (3) Further inspection required.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Inoperative includes intermittent operation or out of specification.
(3) - Follow OEM recommended adjustment procedures. Repair or replace if out of specification.

SIDE COVERS

See TRANSMISSION PANS.

SLIP YOKES

See YOKES AND SLIP YOKES.

SOLENOIDS

See:
ACTUATORS (ELECTRICAL)
ACTUATORS (VACUUM)

SPEED SENSORS (ELECTRONIC WHEEL AND VEHICLE)

SPEED SENSOR (ELECTRONIC WHEEL AND VEHICLE) INSPECTION

Condition	Code	Procedure
Air gap incorrect	B	(1) Require adjustment or replacement.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware threads damaged	A	Require repair or replacement of hardware.
Attaching hardware threads stripped (threads missing)	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(2) Require repair or replacement.
Connector missing	C	Require replacement.
Contaminated	A	(3) Require repair or replacement.
Inoperative	B	(4) Require repair or replacement. Further inspection required.
Leaking	A	Require repair or replacement.
Loose	A	Require repair or replacement.

Missing ..... C ..... Require replacement.
Resistance out of
specification ..... B .. Require repair or replacement.
Sensor housing cracked .. 2 ..... Suggest replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (2) Require repair or
replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Wire lead conductors
exposed ..... B .. Require repair or replacement.
Wire lead corroded ..... A .. Require repair or replacement.
Wire lead misrouted ..... B .... Require re-routing according
to vehicle manufacturer's
specifications.
Wire lead open ..... A .. Require repair or replacement.
Wire lead shorted ..... A .. Require repair or replacement.

(1) - If a sensor is not adjustable, further inspection is
required to identify and correct cause.
(2) - Determine cause and correct prior to repair or
replacement of part.
(3) - Determine source of contamination, such as metal particles
or water. Require repair or replacement.
(4) - Inoperative includes intermittent operation or out of OEM
specification. Some components may be serviceable;
check for accepted cleaning procedure.

SPEEDOMETER-DRIVEN GEAR HOUSINGS

See SPEEDOMETER/ODOMETER DRIVES (MECHANICAL).

SPEEDOMETER/ODOMETER DRIVES (MECHANICAL) *** DRIVETRAIN SYSTEMS UNIFORM INSPEC**

SPEEDOMETER/ODOMETER DRIVE (MECHANICAL) INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Inoperative	A	(1) Require replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Teeth broken	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn close to the end of its useful life	1	Suggest replacement.
Worn, affecting performance	A	Require replacement.

(1) - Inoperative includes intermittent operation.

SPEEDOMETER/ODOMETER HEADS (MECHANICAL)

SPEEDOMETER/ODOMETER HEAD (MECHANICAL) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Lens broken	A	(1) Require repair or

replacement.
Lens cloudy ..... 2 ..... (1) Suggest repair or replacement.
Lens missing ..... C ..... (1) Require repair or replacement.
Malfunctioning ..... A ..... (2) Require repair or replacement.
Noisy ..... 2 .. Suggest repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.

(1) - If lens is available as a separate part, require replacement of lens only.
(2) - Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.

SPEEDOMETERS AND ODOMETERS (ELECTRONIC)

SPEEDOMETER AND ODOMETER (ELECTRONIC) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Leaking	A	Require replacement.
Lens broken	A	(2) Require repair or replacement.
Lens cloudy	2	(2) Suggest repair or replacement.
Lens missing	C	(2) Require repair or

replacement.
Malfunctioning ..... A ..... (3) Require repair or replacement.
Mechanical head noisy ... 2 .. Suggest repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded, affecting performance .. A .. Require repair or replacement.
Terminal corroded, not affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting performance ..... B .. Require repair or replacement.
Terminal loose, not affecting performance .. 1 .. Suggest repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - If lens is available as a separate part, require replacement of lens only.
(3) - Includes inoperative, intermittent operation, failure to perform all functions, out of OEM specification, or out of range.

SWITCHES

SWITCH INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Binding, affecting performance	A	Require repair or replacement.
Binding, not affecting		

performance ..... 2 .. Suggest repair or replacement.
Broken ..... A .. Require repair or replacement.
Burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Burned, not affecting
performance ..... 2 ..... (1) Suggest repair or replacement.
Cracked, affecting
performance ..... A .. Require repair or replacement.
Cracked, not affecting
performance ..... 1 .. Suggest repair or replacement.
Leaking ..... A .. Require repair or replacement.
Malfunctioning ..... A ..... (2) Require repair or replacement.
Melted, affecting
performance ..... A ..... (1) Require repair or replacement.
Melted, not affecting
performance ..... 2 ..... (1) Suggest repair or replacement.
Missing ..... C ..... Require replacement.
Out of adjustment ..... B .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal burned, affecting
performance ..... A ..... (1) Require repair or replacement.
Terminal burned, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal corroded,
affecting performance .. A .. Require repair or replacement.
Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Won't return ..... A .. Require repair or replacement.
Worn ..... 1 ..... Suggest replacement.

(1) - Determine cause and correct prior to repair or replacement of part.
(2) - Includes inoperative, intermittent operation, or failure to perform all functions.

TONE WHEELS

See TOOTHED RINGS (TONE WHEELS).

TOOTHED RINGS (TONE WHEELS)

If the toothed ring requires replacement and cannot be replaced as a separate component, replace the assembly of which the ring is a part.

TOOTHED RING (TONE WHEEL) INSPECTION

Condition	Code	Procedure
Alignment incorrect	B	Require repair or replacement.
Bent	B	Require replacement.
Contaminated, affecting performance	A	Require repair. Identify and correct cause.
Cracked	B	Require replacement.
Loose	A	Require replacement of worn parts.
Missing	C	Require replacement.
Number of teeth incorrect	B	Require replacement.
Teeth broken	A	Require replacement.
Teeth damaged, affecting performance	A	Require replacement.

TORQUE CONVERTERS

TORQUE CONVERTER INSPECTION

Condition	Code	Procedure
Converter clutch lock-up operation is faulty	A	Require replacement.
Cover shell damaged, affecting performance	A	Require replacement.
Does not meet stall speed specification	B	Require replacement.
End play exceeds specifications	B	Require replacement.
Hub broken	A	Require replacement.
Hub cracked	A	Require replacement.

Internal component
failure ..... A ..... Require replacement.
Leaking ..... A .. Require repair or replacement.
Pilot broken ..... A ..... Require replacement.
Pilot worn, affecting
performance ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
Weights missing ..... C ..... Require replacement.

TRANSAXLE MOUNTS

See MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION).

TRANSDUCERS (TRANSMISSION)

See SENSORS.

TRANSMISSION COOLERS

TRANSMISSION COOLER INSPECTION

Condition Code Procedure

Air flow obstruction .... A ..... Require repair.
Attaching hardware
broken ..... A ... Require repair or replacement
of hardware.
Attaching hardware
missing ..... C ..... Require replacement of
hardware.
Attaching hardware not
functioning ..... A .. Require repair or replacement
of hardware.
Connection leaking ..... A .. Require repair or replacement.
Contaminated ..... A .. Require repair or replacement.
Corroded ..... 1 .. Suggest repair or replacement.
Fins damaged, affecting
performance ..... A .. Require repair or replacement.
Fins damaged, not
affecting performance .. .. No service suggested or
required.
Internal restrictions ... B .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement

Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A .. Require repair or replacement.
Tubes damaged, affecting performance ..... A .. Require repair or replacement.
Tubes damaged, not affecting performance .. .. No service suggested or required.

TRANSMISSION MOUNTS

See MOUNTS (ENGINE, TRANSAXLE AND TRANSMISSION).

TRANSMISSION PANS

TRANSMISSION PAN INSPECTION

Condition Code Procedure

Bent, interfering with filter or other internal components ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.

TRANSMISSION RANGE INDICATORS (PRNDL)

TRANSMISSION RANGE INDICATOR (PRNDL) INSPECTION

Condition Code Procedure

Binding ..... A .. Require repair or replacement.
Broken ..... A .. Require repair or replacement.
Components missing ..... C .. Require replacement of missing components.
Loose, affecting performance ..... A .. Require repair or replacement.
Out of adjustment ..... A ..... Require repair.
Worn, affecting performance ..... A .. Require repair or replacement.

TUBES

See HOSES, LINES AND TUBES.

UNIVERSAL JOINTS (CARDON OR CROSS TYPE)

UNIVERSAL JOINT (CARDON OR CROSS TYPE) INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Bearing cap distorted	B	Require replacement.
Binding	A	Require replacement.
Cross (trunion) worn, affecting performance	A	Require replacement.
Double cardon centering ball damaged	A	Require replacement.
Double cardon centering ball worn, affecting performance	A	Require replacement.
Double cardon centering spring broken	A	Require replacement.
Double cardon centering spring missing	C	Require replacement.
Double cardon centering spring weak	A	Require replacement.
End cap seal cracked	2	Suggest replacement.
End cap seal missing	C	Require replacement of seal.
Grease fitting broken	A	(1) Require replacement of grease fitting.
Grease fitting missing	C	(2) Require replacement of grease fitting.
Rust-colored powder around end cap seals	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.
Worn, affecting performance	A	Require replacement.

(1) - A broken grease fitting does not require replacement

of the U-Joint.
(2) - A missing grease fitting does not require replacement of the U-Joint.

VACUUM CONTROLS

See ACTUATORS (VACUUM).

VACUUM HOSES

See HOSES, LINES AND TUBES.

VACUUM MOTORS

See ACTUATORS (VACUUM).

VACUUM-OPERATED SWITCHES

See SWITCHES.

VEHICLE SPEED SENSORS

See SPEED SENSORS (ELECTRONIC WHEEL AND VEHICLE).

VENTS

VENT INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Missing	C	Require replacement.
Plugged	A	(1) Require repair or replacement.

(1) - A plugged vent may force fluid past the seal.

VIBRATION DAMPERS

VIBRATION DAMPER INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Missing	C	Require replacement.

Out of position ..... B .. Require repair or replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

WHEEL ATTACHMENT HARDWARE

NOTE: For conditions noted below, also check conditions of wheel stud holes.

CAUTION: Proper lug nut torque is essential. Follow recommended torque specifications and tightening sequence. DO NOT lubricate threads unless specified by the vehicle manufacturer.

WHEEL ATTACHMENT HARDWARE INSPECTION

Condition Code Procedure

Bent ..... A ..... Require replacement.
Broken ..... A ..... (1) Require replacement.
Loose ..... B ... Require repair or replacement of affected component.
Lug nut installed
backward ..... B .. Require repair or replacement.
Lug nut mating surface
dished ..... A ..... Require replacement of nut.
Lug nut mating type
incorrect ..... B ..... Require replacement of nut.
Lug nut rounded ..... A . (2) Require replacement of nut.
Lug nut seized ..... A . (2) Require replacement of nut.
Stud incorrect ..... B .... Require replacement of stud.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - Some manufacturers require replacement of all studs on that wheel if two or more studs or nuts on the same wheel are broken or missing.
(2) - Only required if removing wheel.

WHEEL SPEED SENSORS

See SPEED SENSORS (ELECTRONIC WHEEL AND VEHICLE).

WIRING HARNESS AND CONNECTOR INSPECTION

Condition	Code	Procedure
Application incorrect	B	Require repair or replacement.
Attaching hardware broken	A	Require repair or replacement of hardware.
Attaching hardware missing	C	Require replacement of hardware.
Attaching hardware not functioning	A	Require repair or replacement of hardware.
Connector broken	A	Require repair or replacement.
Connector (Weatherpack type) leaking	A	Require repair or replacement.
Connector melted	A	(1) Require repair or replacement.
Connector missing	C	Require replacement.
Insulation damaged, conductors exposed	A	Require repair or replacement.
Insulation damaged, conductors not exposed	1	Suggest replacement.
Open	A	Require repair or replacement.
Protective shield (conduit) melted	2	(1) Suggest repair or replacement.
Protective shield (conduit) missing	2	Suggest repair or replacement.
Resistance (voltage drop) out of specification	A	Require repair or replacement.
Routed incorrectly	B	Require repair.
Secured incorrectly	B	Require repair.
Shorted	A	Require repair or replacement.
Terminal broken	A	Require repair or replacement.
Terminal burned, affecting performance	A	(1) Require repair or replacement.
Terminal burned, not affecting performance	2	Suggest repair or replacement.
Terminal corroded, affecting performance	A	Require repair or replacement.

Terminal corroded, not
affecting performance .. 2 .. Suggest repair or replacement.
Terminal loose, affecting
performance ..... B .. Require repair or replacement.
Terminal loose, not
affecting performance .. 1 .. Suggest repair or replacement.
Transmission connector
leaking .... See TRANSMISSION ASSEMBLY.
Voltage drop out of
specification ..... A .. Require repair or replacement.

(1) - Determine cause and correct prior to repair or replacement of part.

YOKES AND SLIP YOKES

YOKE AND SLIP YOKE INSPECTION

Condition Code Procedure

Bearing cap bore
distorted ..... A .. Require repair or replacement.
Bent ..... A ..... Require replacement.
Bolt holes elongated .... A .. Require repair or replacement.
Bushing or seal surface
worn, affecting
performance ..... A .. Require repair or replacement.
Leaking through soft yoke
plug ..... A ... Require repair or replacement of soft yoke plug.
Retainer strap bent ..... A ..... Require replacement of retainer strap.
Slip yoke broken ..... A ..... Require replacement.
Splines worn, affecting
performance ..... A ..... Require replacement.
Splines worn close
to the end of their
useful life ..... 1 ..... Suggest replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.
U-bolt damaged, affecting
performance ..... A ..... Require replacement of U-bolts.
Yoke damaged, affecting

performance ..... A .. Require repair or replacement.

END OF ARTICLE

* STEERING UNIFORM INSPECTION GUIDELINES *
Article Text
1996 Kia Sephia
For 1 1 1 1 1

Saturday, April 18, 2009 10:09PM

ARTICLE BEGINNING

GENERAL INFORMATION
Steering, Suspension, Wheel Alignment, Wheels and Tires
January 2000 Motorist Assurance Program
Standards For Automotive Repair

All Makes and Models

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SHOCK ABSORBERS, STRUT CARTRIDGES AND STRUT ASSEMBLIES
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Wheel Alignment

WHEEL ALIGNMENT

Wheels and Tires

TIRES
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WHEEL ATTACHMENT HARDWARE
WHEELS (RIMS)

MOTORIST ASSURANCE PROGRAM (MAP)

OVERVIEW OF MOTORIST ASSURANCE PROGRAM (MAP)

Automotive industry professionals and interested readers:
The Motorist Assurance Program (MAP) is the consumer outreach effort of the Automotive Maintenance and Repair Association, Inc. (AMRA). Participation in the Motorist Assurance Program is drawn from auto repair companies and independents, parts and equipment manufacturers and suppliers, vehicle manufacturers and industry associations.

Our organization's mission is to strengthen the relationship between the consumer and the auto repair industry. We encourage motorists to take greater responsibility for their vehicles-through proper, manufacturer-recommended, maintenance, and endorse participating service and repair shops (including franchisees and dealers) who adopt (1) the MAP Pledge of Assurance to their Customers

and (2) the Motorist Assurance Program Standards of Service. All participating service providers have agreed to subscribe to this Pledge and to adhere to the promulgated Standards of Service demonstrating to their customers that they are serious about customer satisfaction.

These Standards of Service require an inspection of the vehicle's (problem) system and that the results be communicated to the customer according to industry standards. Since the industry did not have such standards, the Motorist Assurance Program successfully promulgated industry inspection communication standards in 1994-95 for the following systems: Exhaust, Brakes, ABS, Steering and Suspension, Engine Maintenance and Performance, HVAC, and Electrical Systems.

Further, revisions to all of these inspection communication standards are re-published periodically. In addition to the above, standards for Drive Train and Transmissions were promulgated and published in 1998. Participating shops utilize these Uniform Inspection & Communication Standards (UI&CS) as part of the inspection process and for communicating their findings to their customers.

The Motorist Assurance Program continues to work cooperatively and proactively with government agencies and consumer groups toward solutions that both benefit the customer and are mutually acceptable to both regulators and industry. We maintain the belief that industry must retain control over how we conduct our business, and we must be viewed as part of the solution and not part of the problem. Meetings with state and other government officials (and their representatives), concerned with auto repair and/or consumer protection, are conducted. Feedback from these sessions is brought back to the association governing body, and the program adjusted as needed.

To assure recourse for auto repair customers if they are not satisfied with a repair transaction, the Motorist Assurance Program offers mediation and arbitration through the BBB and other similar non-profit organizations. MAP conducted pilot programs in twelve states before announcing the program nationally in October 1998. During the pilots, participating repair shops demonstrated their adherence to the Pledge and Standards and agreed to follow the UI&CS in communicating the results of their inspection to their customers. Complaints and "come-backs" dropped significantly.

To put some "teeth" in the program, an accreditation requirement for shops was initiated. The requirements are stringent, and a self-policing technique has been incorporated which includes the "mystery shopping" of outlets. By year-end 1999, over 4,000 auto repair facilities had been accredited by the Motorist Assurance Program.

We welcome you to join us as we continue our outreach. With your support, both the automotive repair industry and your customers

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will reap the benefits. Please visit MAP at our Internet site www.motorist.org or contact us at:

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OVERVIEW OF SERVICE REQUIREMENTS & SUGGESTIONS

It is MAP policy that all exhaust, brake, steering, suspension, wheel alignment, drive-line, engine performance and maintenance, and heating, ventilation and air conditioning, and electrical services be offered and performed under the standards and procedures specified in these sections.

Before any service is performed on a vehicle, an inspection of the appropriate system must be performed. The results of this inspection must be explained to the customer and documented on an inspection form. The condition of the vehicle and its components will indicate what services/part replacements may be "Required" or "Suggested." In addition, suggestions may be made to satisfy the requests expressed by the customer.

When a component is suggested or required to be repaired or replaced, the decision to repair or replace must be made in the customer's best interest, and at his or her choice given the options available.

This section lists the various parts and the conditions that indicate a required or suggested service or part replacement. Although this list is extensive, it is not fully inclusive. In addition to this list, a technician may make a suggestion. However, any suggestions must be based on substantial and informed experience, or the vehicle manufacturer's recommended service interval and must be documented.

Some conditions indicate that service or part replacement is required because the part in question is no longer providing the function for which it is intended, does not meet a vehicle manufacturer's design specification or is missing.

* Example: An exhaust pipe has corroded severely and has a hole in it through which exhaust gases are leaking. Replacement of the exhaust pipe in this case is required due to functional failure.
* Example: A brake rotor has been worn to the point where it measures less than the vehicle manufacturer's discard specifications. Replacement of the rotor is required because it does not meet design specifications.

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Some conditions indicate that a service or part replacement is suggested because the part is close to the end of its useful life or addresses a customer's need, convenience or request. If a customer's vehicle has one of these conditions, the procedure may be only to suggest service.

* Example: An exhaust pipe is rusted, corroded or weak, but no leaks are present. In this case, the exhaust pipe has not failed. However, there is evidence that the pipe may need replacement in the near future. Replacement of the pipe may be suggested for the customer's convenience in avoiding a future problem.
* Example: The customer desires improved ride and/or handling, but the vehicle's shocks or struts have not failed. In this case, replacement may be suggested to satisfy the customer's wishes. In this case, replacement of the shocks or struts may not be sold as a requirement.

A customer, of course, has the choice of whether or not a shop will service his or her vehicle. He or she may decide not to follow some of your suggestions. When a repair is required, a MAP shop must refuse partial service on that system if, in the judgment of the service provider, proceeding with the work could create or continue an unsafe condition.

When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

The following reasons may be used for required and suggested services. These codes are shown in the "Code" column of the MAP Uniform Inspection & Communications Standards that follow:

Reasons to Require Repair or Replacement

A - Part no longer performs intended purpose
B - Part does not meet a design specification (regardless of performance)
C - Part is missing

NOTE: When a repair is required, the shop must refuse partial service to the system in question, if the repair creates or continues an unsafe condition.

Reasons to Suggest Repair or Replacement

1 - Part is close to the end of its useful life (just above

discard specifications, or weak; failure likely to occur soon, etc.)

2 - To address a customer need, convenience, or request (to stiffen ride, enhance performance, eliminate noise, etc.)

3 - To comply with maintenance recommended by the vehicle's Original Equipment Manufacturer (OEM)

4 - Technician's recommendation based on substantial and informed experience

NOTE: Suggested services are always optional. When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

STEERING AND SUSPENSION

SERVICE PROCEDURES REQUIRED AND SUGGESTED FOR PROPER VEHICLE OPERATION

Steering and suspension are complex systems made up of a variety of interdependent components. For proper vehicle handling, ride, and tire wear, a thorough inspection is required whenever suspension work is being performed.

Conditions listed assume that the problem has been isolated to the specific component by proper testing procedures.

NOTE: When replacing steering and/or suspension components which may affect an alignment angle, you are required to check and adjust alignment as needed. Refer to the OEM specifications.

CAUTION: DO NOT use ride height altering or load compensating components, such as variable rate springs and coil over shocks, on vehicles with height or load sensing proportioning valve-equipped braking systems, unless these components are original equipment.

AIR RIDE SUSPENSION

NOTE: Depending on the air suspension design, there are some aftermarket products available to eliminate the air ride suspension on certain vehicles. If the system has been eliminated with one of these products, then no service is suggested or required.

AIR RIDE SUSPENSION - AIR SHOCKS AND AIR STRUTS *** STEERING UNIFORM INSPECTION GUID**

NOTE: This section covers the air spring portion of the air shock or strut. For damping portion of shock or strut conditions and procedures, refer to the SHOCK ABSORBERS, STRUT CARTRIDGES AND STRUT ASSEMBLIES section.

AIR RIDE SUSPENSION - AIR SHOCK AND AIR STRUT INSPECTION

Condition	Code	Procedure
Inner fabric of air bag damaged	A	Require replacement.
Leaking	A	Require repair or replacement.
Outer covering of air bag is cracked to the extent that inner fabric of air bag is visible	1	Suggest replacement.

AIR RIDE SUSPENSION - AIR SPRING VALVES

AIR RIDE SUSPENSION - AIR SPRING VALVE INSPECTION

Condition	Code	Procedure
Attaching hardware incorrect	A	Require replacement of incorrect part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Blocked	A	Require repair or replacement.
Connector bent	A	Require repair or replacement.
Connector broken	A	Require replacement.
Connector loose	A	Require repair or replacement.

Inoperative ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Restricted ..... A .. Require repair or replacement.

AIR RIDE SUSPENSION - AIR SPRINGS

AIR RIDE SUSPENSION - AIR SPRING INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require replacement of broken part.
Attaching hardware incorrect	A	Require replacement of incorrect part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Collar cracked	A	Require replacement.
End cap cracked	A	Require replacement.
Inner fabric of bag damaged	A	Require replacement.
Leaking	A	Require repair or replacement.
Outer covering of air bag is cracked to the extent that inner fabric of air bag is visible	1	Suggest replacement.
Piston cracked	A	Require replacement.

AIR RIDE SUSPENSION - COMPRESSORS

AIR RIDE SUSPENSION - COMPRESSOR INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part.
Attaching hardware broken	A	Require replacement of broken part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Connector bent	A	Require repair or replacement.
Connector broken	A	Require replacement.
Connector loose	A	Require repair or replacement.
Does not build pressure	A	(1) Further inspection required.
Excessive run time	B	(2) Further inspection required.
Inoperative	A	Require replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.

(1) - If failure to build pressure is traced to the compressor, require replacement.
(2) - If excessive run time is traced to the compressor, require replacement.

AIR RIDE SUSPENSION - HEIGHT SENSORS

AIR RIDE SUSPENSION - HEIGHT SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part.
Attaching hardware		

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broken ..... A ... Require replacement of broken part.
Attaching hardware corroded, affecting structural integrity .... A ..... Require replacement of corroded part.
Attaching hardware loose ..... A ... Require repair or replacement of loose part.
Attaching hardware missing ..... C .. Require replacement of missing part.
Attaching hardware threads damaged ..... A ... Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads.
Dust boot missing ..... 2 ..... (1) Suggest replacement.
Dust boot split ..... 2 ..... (1) Suggest replacement.
Dust boot torn ..... 2 ..... (1) Suggest replacement.
Housing cracked ..... A ..... Require replacement.
Lead routing incorrect .. B .. Require rerouting according to vehicle manufacturer's specifications.
Loose ..... B ... Require adjustment to vehicle manufacturer's specifications.
Missing ..... C ..... Require replacement.
Output signal incorrect . A .. Require repair or replacement.
Wire lead damaged ..... A .. Require repair or replacement.

(1) - This condition can lead to damage of the sliding magnet, which, in turn, causes premature sensor failure.

AIR RIDE SUSPENSION - MODULES

AIR RIDE SUSPENSION - MODULE INSPECTION

Condition Code Procedure

Attaching hardware loose ..... A ... Require repair or replacement of loose part.

missing ..... C .. Require replacement of missing part.
Attaching hardware threads damaged ..... A ... Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads.
Housing cracked ..... 2 .. Suggest repair or replacement.
Inoperative ..... A ..... Require replacement.
Missing ..... C ..... Require replacement.

AIR RIDE SUSPENSION - RELAYS (COMPRESSOR)

AIR RIDE SUSPENSION - RELAY (COMPRESSOR) INSPECTION

Condition	Code	Procedure
Housing cracked	2	(1) Suggest replacement.
Intermittent	A	Require replacement.
Missing	C	Require replacement.
Output signal incorrect .	A	Require replacement.

(1) - If moisture enters the relay, it can reduce life expectancy or impair function.

AIR RIDE SUSPENSION - SWITCHES (ON/OFF)

AIR RIDE SUSPENSION - SWITCH (ON/OFF) INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Missing	C	Require replacement.
Output signal incorrect .	A	Require replacement.

AIR RIDE SUSPENSION - TORSION SPRINGS (COUNTER BALANCING)

AIR RIDE SUSPENSION - TORSION SPRING (COUNTER BALANCING) INSPECTION

Condition	Code	Procedure

Attaching hardware bent . B ... Require repair or replacement of bent part.
Attaching hardware broken ..... A ... Require replacement of broken part.
Attaching hardware incorrect ..... A ..... Require replacement of incorrect part.
Attaching hardware loose ..... A ... Require repair or replacement of loose part.
Attaching hardware missing ..... C .. Require replacement of missing part.
Attaching hardware threads damaged ..... A ... Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads.
Broken ..... A ..... Require replacement.
Missing ..... C ..... Require replacement.

AIR RIDE SUSPENSION - TUBING

AIR RIDE SUSPENSION - TUBING INSPECTION

Condition Code Procedure

Attaching hardware incorrect ..... A ..... Require replacement of incorrect part.
Attaching hardware loose ..... A ... Require repair or replacement of loose part.
Attaching hardware missing ..... C .. Require replacement of missing part.
Blocked ..... A .. Require repair or replacement.
Fitting incorrect ..... B ..... Require replacement.
Leaking ..... A .. Require repair or replacement.
Line type incorrect ..... B ..... Require replacement.
Missing ..... C ..... Require replacement.
Restricted ..... A .. Require repair or replacement.

Routed incorrectly ..... B ..... Require routing correction.

AIR RIDE SUSPENSION - WARNING LAMPS

AIR RIDE SUSPENSION - WARNING LAMP INSPECTION

Condition	Code	Procedure
Bulb burned out	A	Require replacement.
Warning light does not come on during bulb check	.	Further inspection required to determine cause.
Warning light flashes	.	Further inspection required to determine cause.
Warning light is intermittent	.	Further inspection required to determine cause.
Warning light stays on after initial bulb check	.	Further inspection required to determine cause.

AIR RIDE SUSPENSION - WIRING HARNESSES

AIR RIDE SUSPENSION - WIRING HARNESS INSPECTION

Condition	Code	Procedure
Connector bent	A	Require repair or replacement.
Connector broken	A	Require repair or replacement.
Connector loose	A	Require repair or replacement.
Damaged (cut, burned, or chafed)	A	Require repair or replacement.
Excessive resistance	B	Require repair or replacement.
Fuse blown	A	Require replacement.
Fusible link blown	A	Require replacement.
Open	A	Require repair or replacement.
Poor ground	A	Require repair or replacement.
Routed incorrectly	B	Require rerouting according to vehicle manufacturer's specifications.
Shorted	A	Require repair or replacement.
Terminal bent	A	Require repair or replacement.

Terminal broken ..... A .. Require repair or replacement.
Terminal corroded ..... A .. Require repair or replacement.
Terminal loose ..... A .. Require repair or replacement.

BALL JOINTS

Before requiring or suggesting ball joint replacement, the approved OEM procedure must be used to measure ball joint wear. The measurement(s) obtained, along with the vehicle manufacturer's specifications, must be noted on the inspection report. Some states require that these measurements also appear on the invoice.

NOTE: The term "perceptible movement," defined as any visible movement in any direction, has been the industry standard for determining the need for replacement of follower ball joints. Some vehicle manufacturers are now publishing specifications for follower ball joints that were previously diagnosed by the "perceptible movement" standard. Before requiring or suggesting any parts be replaced based on "perceptible movement," consult your repair manual to determine if OEM specifications exist.

You are not required to replace ball joints in axle sets. However, when replacing a ball joint due to wear exceeding manufacturer's specification, you may suggest replacement of the other ball joint if its measurement shows it is close to the end of its useful life, for preventive maintenance.

BALL JOINT INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part if available; otherwise, replace ball joint.
Attaching hardware broken	A	Require replacement of broken part if available; otherwise, replace ball joint.
Attaching hardware corroded, affecting structural integrity	A	Require replacement of corroded part if available; otherwise, replace ball joint.
Attaching hardware		

incorrect ..... A ..... Require replacement of incorrect part if available; otherwise, replace ball joint.

Attaching hardware loose ..... A ... Require repair or replacement of loose part if available; otherwise, replace ball joint.

Attaching hardware missing ..... C .. Require replacement of missing part if available; otherwise, replace ball joint.

Attaching hardware threads damaged ..... A ... Require repair or replacement of part with damaged threads if available; otherwise, replace ball joint.

Attaching hardware threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads if available; otherwise, replace ball joint.

Binding ..... A ..... (1) Further inspection required.

Grease boot cracked ..... 2 ..... (2) Suggest replacement.

Grease boot missing ..... 2 ..... (3) Suggest replacement.

Grease boot torn ..... 2 ..... (4) Suggest replacement.

Grease fitting broken ... A ... Require replacement of grease fitting.

Grease fitting missing .. C ... Require replacement of grease fitting.

Grease fitting won't seal ..... A ... Require replacement of grease fitting.

Greaseable ball joint will not take grease ..... 2 ..... (5) Suggest replacement of grease fitting.

Nut on ball joint loose . A ..... (6) Require repair or replacement.

Pre-load adjustment incorrect ..... B .. Require repair or replacement.

Seized ..... A ..... Require replacement.

Stud bent ..... B ..... (7) Require replacement.

Stud broken ..... A ..... (7) Require replacement.

Threads damaged ..... A .. Require repair or replacement.

Threads stripped (threads

missing) ..... A ..... (7) Require replacement.
Wear exceeds
manufacturer's
specifications ..... B ..... Require replacement.

(1) - If greaseable, grease ball joint. If problem persists or joint is non-greaseable, require replacement.
(2) - Cracked grease boot will allow contaminants to enter the ball joint and will accelerate wear.
(3) - Lack of grease boot will allow contaminants to enter the ball joint and will accelerate wear.
(4) - Torn grease boot will allow contaminants to enter the ball joint and will accelerate wear.
(5) - If the greaseable ball joint still will not take grease after replacing the grease fitting, suggest replacement of ball joint.
(6) - Check for bent stud or damaged taper hole.
(7) - Check for damaged taper hole.

BUSHINGS

BUSHING INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part if available; otherwise, replace bushing.
Attaching hardware broken	A	Require replacement of broken part if available; otherwise, replace bushing.
Attaching hardware corroded, affecting structural integrity	A	Require replacement of corroded part if available; otherwise, replace bushing.
Attaching hardware incorrect	A	Require replacement of incorrect part if available; otherwise, replace bushing.
Attaching hardware loose	A	Require repair or replacement of loose part if available; otherwise, replace bushing.

Attaching hardware missing ..... C .. Require replacement of missing part if available; otherwise, replace bushing.

Attaching hardware threads damaged ..... A ... Require repair or replacement of part with damaged threads if available; otherwise, replace bushing.

Attaching hardware threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads if available; otherwise, replace bushing.

Binding ..... A .. Require repair or replacement.

Deteriorated, affecting performance ..... A .. Require repair or replacement.

Distorted, affecting performance ..... A .. Require repair or replacement.

Leaking (fluid-filled type) ..... A ..... Require replacement.

Missing ..... C ..... Require replacement.

Noisy ..... 2 ..... (1) Further inspection required.

Rubber separating from internal metal sleeve on bonded bushing ..... A ..... Require replacement.

Seized ..... A ..... Require replacement.

Shifted (out of position) ..... B .. Require repair or replacement.

Split ..... A ..... Require replacement.

Surface cracking (weather-checked) .... No service suggested or required.

(1) - If noise isolated to bushing, suggest repair or replacement.

CAUTION: Use only approved lubricant on rubber bushings. Petroleum-based lubricants may damage rubber bushings.

CENTER LINKS

CENTER LINK INSPECTION

Condition	Code	Procedure
Attaching hardware incorrect	A	Require replacement of incorrect part, if available; otherwise, replace center link.
Attaching hardware loose	A	Require repair or replacement of loose part, if available; otherwise, replace center link.
Attaching hardware missing	C	Require replacement of missing part, if available; otherwise, replace center link.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads, if available; otherwise, replace center link.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads, if available; otherwise, replace center link.
Bent	B	Require replacement.
Binding	A	(1) Further inspection required.
Grease boot cracked	2	(2) Suggest replacement.
Grease boot missing	2	(3) Suggest replacement.
Grease boot torn	2	(4) Suggest replacement.
Grease fitting broken	A	Require replacement of grease fitting.
Grease fitting missing	C	Require replacement of grease fitting.
Grease fitting won't seal	A	Require replacement of grease fitting.
Grease seal missing	2	(3) Suggest replacement.
Grease seal torn	2	(4) Suggest replacement.
Looseness (perceptible horizontal movement)	1	(5) Suggest replacement.
Looseness that is excessive	B	(5)(6) Require replacement.
Seized	A	Require replacement.
Stud bent	B	(7) Require replacement.

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Stud broken ..... A ..... (7) Require replacement.
Stud loose in
taper hole ..... A ..... (7) Require repair or
replacement.
Taper hole elongated .... A ..... (8) Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped
(threads missing) ..... A ..... (7) Require replacement.
Wear exceeds
manufacturer's
specifications ..... B ..... Require replacement.

(1) - If greaseable, grease joint. If problem persists or joint is non-greaseable, require replacement.
(2) - Cracked grease boot will allow contaminants to enter the joint and will accelerate wear.
(3) - Lack of grease boot will allow contaminants to enter the joint and will accelerate wear.
(4) - Torn grease boot will allow contaminants to enter the joint and will accelerate wear.
(5) - If manufacturer's procedures for inspection exist, use those procedures; otherwise, use an approved inspection method such as the dry park check.
CAUTION: DO NOT use pliers or pry bar to check ball and socket movement. Use only moderate hand pressure.
(6) - Excessive looseness is defined as being significant enough to affect vehicle handling or structural integrity.
(7) - Check for damaged taper hole.
(8) - Check for damaged stud.

CONTROL ARM SHAFTS

CONTROL ARM SHAFT INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require replacement of broken part, if available; otherwise, replace shaft.
Attaching hardware
loose ..... A ... Require repair or replacement of loose part, if available; otherwise, replace shaft.

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Attaching hardware
missing ..... C .. Require replacement of missing
part, if available; otherwise,
replace shaft.
Attaching hardware
threads damaged ..... A ... Require repair or replacement
of part with damaged threads,
if available; otherwise,
replace shaft.
Attaching hardware
threads stripped
(threads missing) ..... A ..... Require replacement of part
with stripped threads, if
available; otherwise, replace
shaft.
Bent ..... B ..... Require replacement.
Shaft bushing surface
undersized (worn) ..... B ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

CONTROL ARMS

CONTROL ARM INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part, if available; otherwise, replace control arm.
Attaching hardware broken	A	Require replacement of broken part, if available; otherwise, replace control arm.
Attaching hardware corroded, affecting structural integrity	A	Require replacement of corroded part, if available; otherwise, replace control arm.
Attaching hardware incorrect	A	Require replacement of incorrect part, if available; otherwise, replace control arm.

Attaching hardware
loose ..... A ... Require repair or replacement
of loose part, if available;
otherwise, replace control arm.
Attaching hardware
missing ..... C .. Require replacement of missing
part, if available; otherwise,
replace control arm.
Attaching hardware
threads damaged ..... A ... Require repair or replacement
of part with damaged threads,
if available; otherwise,
replace control arm.
Attaching hardware
threads stripped
(threads missing) ..... A ..... Require replacement of part
with stripped threads, if
available; otherwise, replace
control arm.
Bent ..... B ..... Require replacement.
Bushing hole oversized .. B ..... Require replacement.
Ball joint hole oversized
(loose interference or
press fit) ..... B ..... (1) Further inspection
required.
Corroded, affecting
structural integrity ... A ..... Require replacement.
Holes distorted ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - If oversized ball joint is available, require
replacement of ball joint. If oversized ball joint
is not available, require replacement of control arm.

DRAG LINKS

DRAG LINK INSPECTION

Condition Code Procedure

Attaching hardware
incorrect ..... A ..... Require replacement of
incorrect part, if available; *** STEERING UNIFORM INSPECTION GUIDELINE**

otherwise, replace drag link.

Attaching hardware loose ..... A ... Require repair or replacement of loose part, if available; otherwise, replace drag link.

Attaching hardware missing ..... C .. Require replacement of missing part, if available; otherwise, replace drag link.

Attaching hardware threads damaged ..... A ... Require repair or replacement of part with damaged threads, if available; otherwise, replace drag link.

Attaching hardware threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads, if available; otherwise, replace drag link.

Bent ..... B ..... Require replacement.

Binding ..... A ..... (1) Further inspection required.

Grease boot cracked ..... 2 ..... (2) Suggest replacement.

Grease boot missing ..... 2 ..... (3) Suggest replacement.

Grease boot torn ..... 2 ..... (4) Suggest replacement.

Grease fitting broken ... A ... Require replacement of grease fitting.

Grease fitting missing .. C ... Require replacement of grease fitting.

Grease fitting won't seal ..... A ... Require replacement of grease fitting.

Grease seal missing ..... 2 ..... (5) Suggest replacement.

Grease seal torn ..... 2 ..... (4) Suggest replacement.

Looseness (perceptible horizontal movement) ... 1 ..... (6) Suggest replacement.

Looseness that is excessive ..... B ..... (6)(7) Require replacement.

Seized ..... A ..... Require replacement.

Stud bent ..... B ..... (8) Require replacement.

Stud broken ..... A ..... (8) Require replacement.

Stud loose in taper hole ..... A ..... (8) Require repair or replacement.

Taper hole elongated .... A ..... (9) Require replacement.

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Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... (8) Require replacement.
Wear exceeds
manufacturer's
specifications ..... B ..... Require replacement.

(1) - If greaseable, grease joint. If problem persists or joint is non-greaseable, require replacement.
(2) - Cracked grease boot will allow contaminants to enter the joint and will accelerate wear.
(3) - Lack of grease boot will allow contaminants to enter the joint and will accelerate wear.
(4) - Torn grease boot will allow contaminants to enter the joint and will accelerate wear.
(5) - Missing grease seal will allow contaminants to enter the joint and will accelerate wear.
(6) - If manufacturer's procedures for inspection exist, use those procedures; otherwise, use an approved inspection method such as the dry park check.
CAUTION: DO NOT use pliers or pry bar to check ball and socket movement. Use only moderate hand pressure.
(7) - Excessive looseness is defined as being significant enough to affect vehicle handling or structural integrity.
(8) - Check for damaged taper hole.
(9) - Check for damaged stud.

ELECTRONIC RIDE CONTROL SHOCKS AND STRUTS

NOTE: This section covers the electronic damping control portion of the electronic shock or strut. For dampening portion of shock or strut conditions and procedures, refer to the SHOCK ABSORBERS, STRUT CARTRIDGES AND STRUT ASSEMBLIES section.

ELECTRONIC RIDE CONTROL SHOCK AND STRUT INSPECTION

Condition Code Procedure

Connector bent ..... A .. Require repair or replacement.
Connector broken ..... A .. Require repair or replacement.
Connector loose ..... A .. Require repair or replacement.
Electronic valve control
inoperative ..... 2 ..... (1) Suggest replacement.

Terminal bent ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal corroded ..... A .. Require repair or replacement.
Terminal loose ..... A .. Require repair or replacement.

(1) - It is acceptable to replace with a non-electronically controlled unit, where available.

IDLER ARMS

IDLER ARM INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require replacement of broken part, if available; otherwise, replace idler arm.
Attaching hardware incorrect	A	Require replacement of incorrect part, if available; otherwise, replace idler arm.
Attaching hardware loose	A	Require repair or replacement of loose part, if available; otherwise, replace idler arm.
Attaching hardware missing	C	Require replacement of missing part, if available; otherwise, replace idler arm.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads, if available; otherwise, replace idler arm.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads, if available; otherwise, replace idler arm.
Binding	A	(1) Further inspection required.
Grease boot cracked	2	(2) Suggest replacement.
Grease boot missing	2	(3) Suggest replacement.

Grease boot torn ..... 2 ..... (4) Suggest replacement.
Grease fitting broken ... A ... Require replacement of grease fitting.
Grease fitting missing .. C ... Require replacement of grease fitting.
Grease fitting won't seal ..... A ... Require replacement of grease fitting.
Grease seal missing ..... 2 ..... (5) Suggest replacement.
Grease seal torn ..... 2 ..... (4) Suggest replacement.
Greaseable joint will not take grease ..... 2 ..... (1) Suggest replacement of grease fitting.
Looseness at frame bracket end ..... B ..... (6)(7) Require repair or replacement.
Looseness at link end (perceptible horizontal movement) ..... 1 ..... (8) Suggest replacement.
Looseness at link end that is excessive ..... B ..... (8)(9) Require replacement.
Mounted out of position (center link not parallel) ..... B ..... Require repositioning.
Nut on stud loose ..... A ..... (10) Require repair or replacement.
Seized ..... A ..... Require replacement.
Stud bent ..... B ..... (11) Require replacement.
Stud broken ..... A ..... (11) Require replacement.
Taper hole elongated .... A ..... (12) Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... (11) Require replacement.
Wear exceeds manufacturer's specifications ..... B ..... Require replacement.

(1) - If greaseable, grease joint. If problem persists or joint is non-greaseable, require replacement.
(2) - Cracked grease boot will allow contaminants to enter joint and will accelerate wear.
(3) - Lack of grease boot will allow contaminants to enter joint and will accelerate wear.
(4) - Torn grease boot will allow contaminants to enter joint and will accelerate wear.
(5) - Missing grease seal will allow contaminants to enter

joint and will accelerate wear.
(6) - If manufacturer's procedures and specifications exist, use those procedures and specifications; otherwise, use an approved inspection method such as the dry park check.
(7) - Looseness is defined as movement that creates excessive toe change.
(8) - If manufacturer's procedures for inspection exist, use those procedures; otherwise, use an approved inspection method such as the dry park check.
CAUTION: DO NOT use pliers or pry bar to check ball and socket movement. Use only moderate hand pressure.
(9) - Excessive looseness is defined as significant enough to affect vehicle handling or structural integrity.
(10) - Check for bent stud or damaged taper hole.
(11) - Check for damaged taper hole.
(12) - Check for damaged stud.

KING PINS

You are not required to replace king pins in axle sets. However, when replacing a king pin due to wear exceeding manufacturer's specifications, you may suggest replacement of the other king pin on the axle if its measurement shows it is close to the end of its useful life.

KING PIN INSPECTION

Condition	Code	Procedure
Bearing balls pitted	A	Require replacement.
Bearing balls worn	A	Require replacement.
Bearing races pitted	A	Require replacement.
Bearing races worn	A	Require replacement.
Bearing rollers pitted	A	Require replacement.
Bearing rollers worn	A	Require replacement.
Bearing seal bent	2	Suggest replacement of seal or bearing.
Bearing seal missing	2	Suggest replacement of seal or bearing.
Bearing seal torn	2	Suggest replacement of seal or bearing.
Binding	A	Require repair or replacement of affected parts.
End caps missing	C	Require replacement of missing part, if available; otherwise,

replace king pin.
End play exceeds specifications ..... B ..... Require repair.
Grease fitting broken ... A .. Require replacement of grease fitting.
Grease fitting missing .. C .. Require replacement of grease fitting.
Grease fitting won't seal ..... A .. Require replacement of grease fitting.
Locating pins missing ... C . Require replacement of missing part, if available; otherwise, replace king pin.
Looseness exceeds manufacturer's specifications ..... B .... Require replacement of worn parts.
Seized ..... A ..... Require replacement.
Threads damaged ..... A . Require repair or replacement.
Threads stripped (threads missing) ..... A ..... Require replacement.
Will not take grease .... 2 ..... (1) Suggest replacement of grease fitting.

(1) - If king pin will not take grease after replacement of grease fitting, suggest replacement of king pin.

PITMAN ARMS

PITMAN ARM INSPECTION

Condition	Code	Procedure
Attaching hardware incorrect	A	Require replacement of incorrect part, if available; otherwise, replace pitman arm.
Attaching hardware loose	A	Require repair or replacement of loose part, if available; otherwise, replace pitman arm.
Attaching hardware missing	C	Require replacement of missing part, if available; otherwise, replace pitman arm.

*** STEERING UNIFORM INSPECTION GUIDELINES */**

Attaching hardware
threads damaged ..... A ... Require repair or replacement
of part with damaged threads,
if available; otherwise,
replace pitman arm.
Attaching hardware
threads stripped
(threads missing) ..... A ..... Require replacement of part
with stripped threads, if
available; otherwise, replace
pitman arm.
Bent ..... B ..... Require replacement.
Binding ..... A ..... (1) Further inspection
required.
Grease boot cracked ..... 2 ..... (2) Suggest replacement.
Grease boot missing ..... 2 ..... (3) Suggest replacement.
Grease boot torn ..... 2 ..... (4) Suggest replacement.
Grease fitting broken ... A ..... Require replacement grease
fitting.
Grease fitting missing .. C ... Require replacement of grease
fitting.
Grease fitting
won't seal ..... A ... Require replacement of grease
fitting.
Grease seal missing ..... 2 ..... (3) Suggest replacement
of seal.
Grease seal torn ..... 2 ..... (4) Suggest replacement
of seal.
Looseness (perceptible
horizontal movement) ... 1 ..... (5) Suggest replacement.
Looseness that is
excessive ..... B ..... (5)(6) Require replacement.
Nut on stud loose ..... A ..... (7) Require repair or
replacement.
Seized ..... A ..... Require replacement.
Splines damaged ..... A .. Require repair or replacement.
Splines stripped
(splines missing) ..... A ..... Require replacement.
Stud bent ..... B ..... (8) Require replacement.
Stud broken ..... A ..... (8) Require replacement.
Stud loose in
taper hole ..... A ..... (8) Require repair or
replacement.
Taper hole elongated .... A ..... (9) Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads

*** STEERING UNIFORM INSPECTION GUIDELINES */**

missing) ..... A ..... (8) Require replacement.

(1) - If greaseable, grease joint. If problem persists or joint is non-greaseable, require replacement.
(2) - Cracked grease boot will allow contaminants to enter joint and will accelerate wear.
(3) - Lack of grease boot will allow contaminants to enter joint and will accelerate wear.
(4) - Torn grease boot will allow contaminants to enter joint and will accelerate wear.
(5) - If manufacturer's procedures for inspection exist, use those procedures; otherwise, use an approved inspection method such as the dry park check.
CAUTION: DO NOT use pliers or pry bar to check ball and socket movement. Use only moderate hand pressure.
(6) - Excessive looseness is defined as being significant enough to affect vehicle handling or structural integrity.
(7) - Check for bent stud of damaged taper hole.
(8) - Check for damaged taper hole.
(9) - Check for damaged stud.

POWER STEERING HOSES

POWER STEERING HOSE INSPECTION

Condition	Code	Procedure
Blistered	B	Require replacement.
Blocked	A	Require repair or replacement.
Fitting threads damaged	A	Require repair or replacement.
Fitting threads stripped (threads missing)	A	Require replacement.
Inner fabric (webbing) cut	A	Require replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Outer covering is cracked to the extent that the inner fabric of hose is visible	B	Require replacement.
Restricted	A	Require repair or replacement.

POWER STEERING (HYDRAULIC) PUMPS

If diagnosis has determined that complete disassembly is necessary to determine the extent of the system failure, the suggestion may be made to rebuild or replace the power steering pump. Repair or replacement of the following components may be required if performed as part of a power steering pump overhaul or rebuild service to meet a minimum rebuild standard.

POWER STEERING (HYDRAULIC) PUMP INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part.
Attaching hardware broken	A	Require replacement of broken part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Belt alignment incorrect	B	(1) Further inspection required.
Belt cracked	1	Suggest replacement.
Belt frayed	1	Suggest replacement.
Belt missing	C	Require replacement.
Belt noisy	2	(2) Further inspection required.
Belt plies separated	A	Require replacement.
Belt tension out of specification	B	Require adjustment or replacement.
Belt worn beyond adjustment range	B	Require replacement.
Belt worn so it contacts bottom of pulley	A	Require replacement.
Binding	A	Require repair or replacement.

Fluid at or beyond
service interval ..... 3 ..... Suggest fluid change.
Fluid contaminated ..... B ..... (3) Require flushing and refilling of the system.
Fluid level incorrect ... B ..... Require adjustment of fluid level.
Inadequate assist ..... A ..... (4) Further inspection required.
Leaking ..... A .. Require repair or replacement.
Noise ..... 2 ..... (5) Further inspection required.
Pulley bent ..... A ... Require repair or replacement of pulley.
Pulley missing ..... C .. Require replacement of pulley.
Remote reservoir
leaking ..... A ..... Require replacement of reservoir,
Reservoir cap broken .... A ..... Require replacement of cap.
Reservoir cap missing ... C ..... Require replacement of cap.
Seized ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped
(threads missing) ..... A ..... Require replacement.

(1) - Determine cause of incorrect alignment and require repair.
(2) - Determine cause of noise and suggest repair.
(3) - Determine and correct source of contamination. OEM specifications must be followed for fluid type.
(4) - If pump is source of inadequate assist, require repair or replacement.
(5) - If noise is isolated to pump, suggest repair or replacement.

RADIUS ARMS

RADIUS ARM INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require replacement of broken part.
Attaching hardware
incorrect ..... A ..... Require replacement of incorrect part.

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Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Bent	B	Require replacement.
Corroded, affecting structural integrity	A	Require replacement.
Holes distorted	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

RELAY RODS

RELAY ROD INSPECTION

Condition	Code	Procedure
Attaching hardware incorrect	A	Require replacement of incorrect part, if available; otherwise, replace relay rod.
Attaching hardware loose	A	Require repair or replacement of loose part, if available; otherwise, replace relay rod.
Attaching hardware missing	C	Require replacement of missing part, if available; otherwise, replace relay rod.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads, if available; otherwise, replace relay rod.
Attaching hardware		*** STEERING UNIFORM INSPECTION GUIDELINES *Arti**

threads stripped (threads missing)	A	.....	Require replacement of part with stripped threads, if available; otherwise, replace relay rod.
Bent	B	.....	Require replacement.
Binding	A	.....	(1) Further inspection required.
Grease boot cracked	2	.....	(2) Suggest replacement.
Grease boot missing	2	.....	(3) Suggest replacement.
Grease boot torn	2	.....	(4) Suggest replacement.
Grease fitting broken	A	.....	Require replacement grease fitting.
Grease fitting missing	C	...	Require replacement of grease fitting.
Grease fitting won't seal	A	...	Require replacement of grease fitting.
Grease seal missing	2	.....	(3) Suggest replacement.
Grease seal torn	2	.....	(4) Suggest replacement.
Looseness (perceptible horizontal movement)	1	.....	(5) Suggest replacement.
Looseness that is excessive	B	.....	(5)(6) Require replacement.
Seized	A	.....	Require replacement.
Stud bent	B	.....	(7) Require replacement.
Stud loose in taper hole	A	.....	(7) Require repair or replacement.
Taper hole elongated	A	.....	(8) Require replacement.
Threads damaged	A	..	Require repair or replacement.
Threads stripped (threads missing)	A	.....	(7) Require replacement.
Wear exceeds manufacturer's specifications	B	.....	Require replacement.

(1) - If greaseable, grease joint. If problem persists or joint is non-greaseable, require replacement.
(2) - Cracked grease boot will allow contaminants to enter the joint and will accelerate wear.
(3) - Lack of grease boot will allow contaminants to enter the joint and will accelerate wear.
(4) - Torn grease boot will allow contaminants to enter the joint and will accelerate wear.
(5) - If manufacturer's procedures for inspection exist, use

those procedures; otherwise, use an approved inspection method such as the dry park check.

CAUTION: DO NOT use pliers or pry bar to check ball and socket movement. Use only moderate hand pressure.

(6) - Excessive looseness is defined as being significant enough to affect vehicle handling or structural integrity.

(7) - Check for damaged taper hole.

(8) - Check for damaged stud.

SHOCK ABSORBERS, STRUT CARTRIDGES AND STRUT ASSEMBLIES

You are not required to replace shocks or struts in axle sets. However, when replacing a shock or strut due to the conditions that follow, you may suggest replacement of the other shock or strut on the same axle for improved performance and preventive maintenance.

* Part is close to the end of its useful life
* To extend tire life
* To balance ride and handling
* To improve stopping distance

When replacing steering and/or suspension components which may affect an alignment angle, you are required to check and adjust alignment as needed. Refer to the OEM specifications.

Under no circumstances should a technician bend struts or strut housings.

A vehicle's load-carrying and handling abilities are limited by its suspension, tires, brakes, and driveline. Installing coil over shocks or any other load assist device does not increase the vehicle's load capacity. See the vehicle owner's manual for more details.

NOTE: If vehicle is equipped with original equipment coil over shocks, apply the conditions for coil springs from the SPRINGS - COIL, LEAF AND TORSION BAR section of the STEERING AND SUSPENSION guidelines. If the vehicle is equipped with add-on coil over shocks, you may suggest replacing the shocks with standard shocks for any spring-related condition.

SHOCK ABSORBER, STRUT CARTRIDGE AND STRUT ASSEMBLY INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement

of bent part, if available; otherwise, replace shock or strut.

Attaching hardware broken ..... A ... Require replacement of broken part, if available; otherwise, replace shock or strut.

Attaching hardware corroded, affecting structural integrity ... A . Require replacement of corroded part, if available; otherwise, replace shock or strut.

Attaching hardware incorrect ..... A ..... Require replacement of incorrect part, if available; otherwise, replace shock or strut.

Attaching hardware loose ..... A ... Require repair or replacement of loose part, if available; otherwise, replace shock or strut.

Attaching hardware missing ..... C .. Require replacement of missing part, if available; otherwise, replace shock or strut.

Attaching hardware threads damaged ..... A ... Require repair or replacement of part with damaged threads, if available; otherwise, replace shock or strut.

Attaching hardware threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads, if available; otherwise, replace shock or strut.

Binding ..... A ..... Require replacement.

Body dented ..... A ..... (1) Further inspection required.

Body punctured ..... A ..... Require replacement.

Brake hose bracket bent ..... B .. Require repair or replacement.

Brake hose bracket missing ..... C ..... Require replacement.

Brake hose bracket

*** STEERING UNIFORM INSPECTION (**

threads damaged ..... A .. Require repair or replacement.
Brake hose bracket
threads stripped
(threads missing) ..... C ..... Require replacement.
Compression bumper
missing ..... C ..... Require replacement of compression bumper.
Compression bumper
split ..... 1 ..... Suggest replacement of compression bumper.
Damping (none) ..... A ..... Require replacement.
Dust boot (bellows)
split ..... 2 ..... (2) Suggest replacement of boot.
Dust boot (bellows)
missing ..... 2 ..... (2) Suggest replacement of boot.
Dust boot (bellows)
torn ..... 2 ..... (2) Suggest replacement of boot.
Dust shield broken ..... 2 ..... (2) Suggest replacement.
Dust shield missing ..... 2 ..... (2) Suggest replacement.
Gland nut (strut housing
cap) is not removable
using appropriate tool . A .. (3) Require replacement of nut and/or housing.
Gland nut (strut housing
cap) threads damaged ... A ... Require repair or replacement of nut.
Gland nut (strut housing
cap) threads stripped
(threads missing) ..... A ..... Require replacement of nut.
Housing dented ..... A ..... (1) Further inspection required.
Housing punctured ..... A ..... Require replacement.
Jounce bumper missing ... C ... Require replacement of jounce bumper.
Jounce bumper split ..... 1 ... Suggest replacement of jounce bumper.
Leaking oil, enough for
fluid to be running down
the body ..... A ..... (4) Require replacement.
Noise ..... 2 ..... (5) Further inspection required.
Piston rod bent ..... A ..... Require replacement.
Piston rod broken ..... A ..... Require replacement.

Piston rod has surface defect ..... 2 ..... Suggest replacement.
Piston rod threads damaged ..... A .. Require repair or replacement.
Piston rod threads stripped (threads missing) ..... A ..... Require replacement.
Seized ..... A ..... Require replacement.
Shock missing ..... C ..... Require replacement.
Strut housing bent ..... A ..... Require replacement.
Strut housing cap (gland nut) is not removable using appropriate tool . A ..... (3) Require replacement of nut and/or housing.
Strut housing cap (gland nut) threads damaged ... A ... Require repair or replacement of nut.
Strut housing cap (gland nut) threads stripped (threads missing) ..... A ..... Require replacement of nut.
Strut housing severely corroded, affecting structural integrity ... A ..... Require replacement.
Strut housing threads damaged ..... A .. Require repair or replacement.
Strut housing threads stripped (threads missing) ..... A ..... Require replacement.
Tire cupping ..... A ..... (6) Further inspection required.

(1) - Require replacement of units where dents restrict shock or strut piston rod movement. If dents don't restrict movement, no service is suggested or required. Especially critical on mono-tube shocks.
(2) - This condition can lead to damage of the piston rod, which, in turn, causes premature piston rod seal wear.
(3) - Only required if replacing cartridge.
(4) - CAUTION: If the strut cartridge has been replaced previously, the oil on the strut housing may be filler oil. The technician must identify the source of the oil.
(5) - If noise is isolated to shock or strut, suggest replacement.
(6) - Although shocks or struts may have contributed to tire cupping, an inspection is needed of the entire suspension system. If the shock or strut is found to be contributing

to the tire cupping, require replacement.

SPINDLES

SPINDLE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require replacement of broken part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Bent	B	Require replacement.
Broken	A	Require replacement.
Race seat area undersized	B	Require replacement.
Scored	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

SPRINGS - COIL, LEAF AND TORSION BAR

When springs are replaced, it is suggested, but not required, that both springs on an axle be replaced to maintain equal height from side to side and to provide a balanced ride and proper handling.

When variable rate springs are installed in place of conventional coil springs, they must be installed in axle sets to ensure proper handling, uniform ride, and proper chassis height.

Erroneous height measurements may result from: improper tire inflation, non-standard tire or wheel size, and heavy load in vehicle or trunk.

SPRING (COIL, LEAF AND TORSION BAR) INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part.
Attaching hardware broken	A	Require replacement of broken part.
Attaching hardware corroded, affecting structural integrity	A	Require replacement of corroded part.
Attaching hardware incorrect	A	Require replacement of incorrect part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Broken (all springs except secondary leave(s) on multi-leaf springs)	A	Require replacement.
Coil clash		(1) Require ride height check.
Coil spring insulator deteriorated	2	Suggest replacement of insulator.
Coil spring insulator missing	2	Suggest replacement of insulator.
Coil spring insulator split	2	Suggest replacement of insulator.
Coil spring plastic		

coating deteriorated -
rust present ..... A ..... (2) Refer to manufacturer's service requirements.
Composite spring
damaged .... (3) Further inspection required.
Cracked (all springs
except composite leaf and
secondary leave(s) on
multi-leaf springs) ... A ..... Require replacement.
Installed incorrectly .. B ..... Require repair.
Leaf spring insulators
missing ..... 2 ..... Suggest replacement of insulators.
Secondary leaf on multi-
leaf spring broken .... 1 .... Suggest repair or replacement
Secondary leaf on multi-
leaf spring cracked ... 1 .... Suggest repair or replacement
Torsion bar
adjuster bent ..... A ..... (4) Require repair or replacement of adjuster.
Torsion bar adjuster
seized ..... A .... (4) Require repair or replacement of adjuster.
Torsion bar adjuster
threads damaged ..... A .... (4) Require repair or replacement of part with damaged threads.
Torsion bar adjuster
threads stripped
(threads missing) ..... A ..... Require replacement of part with stripped threads.
Vehicle suspension height
not within OEM
specifications ..... B ..... Require adjustment or replacement.

(1) - If vehicle is within manufacturer's height specifications, no service is suggested or required.
(2) - Some manufacturers require replacement under these conditions.
(3) - Check vehicle ride height. If ride height is OK, no service is suggested or required.
(4) - Only required if ride height needs to be adjusted.

CAUTION: When replacing steel power steering lines, be sure to use a replacement product that meets or exceeds OEM design specifications.

STEEL POWER STEERING LINE INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part.
Attaching hardware broken	A	Require replacement of broken part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Blocked	A	Require repair or replacement.
Fitting incorrect (such as compression fitting)	B	Require replacement.
Flare type incorrect	B	Required replacement.
Leaking	A	Require tightening or replacement.
Line type incorrect	B	Require replacement.
Restricted	A	Require replacement.
Routed incorrectly	B	Require routing correction.
Rust-pitted	1	Suggest replacement.
Rust pitted, affecting structural integrity	A	Require replacement.

STEERING ARMS

STEERING ARM INSPECTION *** STEERING UNIFORM INSPECTION GUIDELINES *Article Text (**

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part.
Attaching hardware broken	A	Require replacement of broken part.
Attaching hardware incorrect	A	Require replacement of incorrect part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Bent	B	Require replacement.
Broken	A	Require replacement.
Taper hole elongated	A	(1) Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Check for damaged stud.

STEERING DAMPERS

The following procedures are only required if the vehicle was originally equipped from the factory with a steering damper. If the steering damper is an add-on unit, then the unit may be removed instead of repairing or replacing.

STEERING DAMPER INSPECTION

Condition	Code	Procedure

Attaching hardware bent . B ... Require repair or replacement of bent part, if available; otherwise, replace steering damper.

Attaching hardware broken ..... A ... Require replacement of broken part, if available; otherwise, replace steering damper.

Attaching hardware corroded, affecting structural integrity ... A . Require replacement of corroded part, if available; otherwise, replace steering damper.

Attaching hardware incorrect ..... A ..... Require replacement of incorrect part, if available; otherwise, replace steering damper.

Attaching hardware loose ..... A ... Require repair or replacement of loose part, if available; otherwise, replace steering damper.

Attaching hardware missing ..... C .. Require replacement of missing part, if available; otherwise, replace steering damper.

Attaching hardware threads damaged ..... A ... Require repair or replacement of part with damaged threads, if available; otherwise, replace steering damper.

Attaching hardware threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads, if available; otherwise, replace steering damper.

Binding ..... A ..... Require replacement.

Damper body dented ..... A ..... (1) Further inspection required.

Damper body punctured ... A ..... Require replacement.

Damping (none) ..... A ..... Require replacement.

Dust boot (bellows) missing ..... 2 ..... (2) Suggest replacement of boot.

Dust boot (bellows)
split ..... 2 ..... (2) Suggest replacement of boot.
Dust shield broken ..... 2 ..... (2) Suggest replacement.
Dust shield missing ..... 2 ..... (2) Suggest replacement.
Leaking oil, enough for fluid to be running down the body ..... A ..... Require replacement.
Loose ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Noise ..... 2 ..... (3) Further inspection required.
Piston rod bent ..... A ..... Require replacement.
Piston rod broken ..... A ..... Require replacement.
Piston rod has surface defect ..... 2 ..... Suggest replacement.
Piston rod threads stripped (threads missing) ..... A ..... Require replacement.
Piston rod threads damaged ..... A .. Require repair or replacement.
Seized ..... A ..... Require replacement.

(1) - Require replacement of units where dents restrict damper piston rod movement. If dents don't restrict movement, no service is suggested or required. Especially critical on mono-tube dampers.
(2) - This condition can lead to damage of the piston rod, which, in turn, causes premature piston rod seal wear.
(3) - If noise is isolated to damper, suggest replacement.

STEERING GEARS (EXCEPT RACK AND PINION)

If diagnosis has determined that complete disassembly is necessary to determine the extent of the system failure, the suggestion may be made to rebuild or replace the power steering pump. Repair or replacement of the following components may be required, if performed as part of a power steering pump overhaul or rebuild service to meet a minimum rebuild standard.

STEERING GEAR (EXCEPT RACK AND PINION) INSPECTION

Condition	Code	Procedure
Attaching hardware		*** STEERING UNIFORM INSPECTION GUIDELINES *Articl**

broken ..... A .. Require replacement of broken part.
Attaching hardware loose ..... A .. Require repair or replacement of loose part.
Attaching hardware missing ..... C ..... Require replacement of missing part.
Attaching hardware threads damaged ..... A .. Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing) ..... A .... Require replacement of part with stripped threads.
Binding ..... A ... Require repair or replacement
Flex coupler binding .... A ... Require repair or replacement of coupler.
Flex coupler loose ..... A ... Require repair or replacement of coupler.
Flex coupler missing parts ..... A ... Require repair or replacement of coupler.
Flex coupler soft/spongy ..... A . Require replacement of coupler.
Flex coupler torn ..... A . Require replacement of coupler.
Fluid contaminated ..... B ..... (1) Require flushing and refilling of the system.
Gasket leaking ..... A ... Require repair or replacement of gasket.
Housing leaking ..... A ..... Require replacement.
Hydraulic fittings leaking ..... A ... Require repair or replacement of fittings.
Inadequate power assist . A ..... (2) Further inspection required. See note below.
Lash exceeds manufacturer's specifications ..... B .. Require repair or replacement.
Seal leaking ..... A ... Require repair or replacement of seal and/or mating part.
Splines damaged ..... A ... Require repair or replacement of splines.
Splines stripped ..... A . Require replacement of splines.
Steering coupler

shield cracked ..... 2 ..... Suggest replacement.
Steering coupler
shield missing ..... C ..... Require replacement.
Threads damaged ..... A ... Require repair or replacement of part with damaged threads.
Threads stripped
(threads missing) ..... A ..... Require replacement of part with stripped threads.
U-joint binding ..... A ... Require repair or replacement of joint.
U-joint loose ..... A ... Require repair or replacement of joint.
Unequal power assist .... A .. Require repair or replacement.

(1) - Determine and correct source of contamination. OEM specifications must be followed for fluid type.
(2) - If steering gear is source of inadequate assist, require repair or replacement.

STEERING GEARS - RACK AND PINION

If diagnosis has determined that complete disassembly is necessary to determine the extent of the system failure, the suggestion may be made to rebuild or replace the power steering pump. Repair or replacement of the following components may be required, if performed as part of a power steering pump overhaul or rebuild service to meet a minimum rebuild standard.

STEERING GEARS - RACK AND PINION INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require replacement of broken part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.

threads stripped
(threads missing) ..... A .... Require replacement of part with stripped threads.
Balance tube blocked .... A .. Require repair or replacement of balance tube.
Balance tube missing .... C .. Require replacement of balance tube.
Balance tube restricted . A ... Require repair or replacement of balance tube.
Bellows boot
clamp missing ..... C ... Require replacement of clamp.
Bellows boot cracked
(not through) ..... 2 .. Suggest replacement of bellows boot.
Bellows boot missing .... C .. Require replacement of bellows boot.
Bellows boot
not sealing ..... A ... Require repair or replacement of bellows boot.
Bellows boot torn ..... A .. Require replacement of bellows boot.
Bellows boot twisted
(from toe adjustment) .. B ..... Require repair.
Fitting leaking ..... A .. Require repair or replacement.
Fitting missing ..... A . Require replacement of fitting.
Fitting threads
damaged ..... A ... Require repair or replacement of part with damaged threads.
Fitting threads stripped
(threads missing) ..... A ..... Require replacement of part with stripped threads.
Flex coupler binding .... A ... Require repair or replacement of coupler.
Flex coupler loose ..... A ... Require repair or replacement of coupler.
Flex coupler
missing parts ..... A ... Require repair or replacement of coupler.
Flex coupler
soft/spongy ..... A . Require replacement of coupler.
Flex coupler torn ..... A . Require replacement of coupler.
Fluid contaminated ..... B ..... (1) Require flushing and refilling of the system.
Gasket leaking ..... A .. Require repair or replacement.
Hard steering on cold
start-up ..... 1 ..... (2) Suggest repair or

replacement.

Housing cracked, affecting structural integrity ..... B ..... Require replacement.

Housing leaking ..... A ..... Require replacement.

Inadequate power assist . A ..... (3) Further inspection required.

Lash exceeds manufacturer's specifications ..... B .. Require repair or replacement.

Seal leaking ..... A .. Require repair or replacement.

Splines damaged ..... A .. Require repair or replacement.

Splines stripped (splines missing) ..... A ..... Require replacement.

Steel line blocked ..... A ... Require repair or replacement of line.

Steel line leaking ..... A ... Require repair or replacement of line.

Steel line missing ..... C .... Require replacement of line.

Steel line restricted ... A ... Require repair or replacement of line.

Steering coupler shield cracked ..... 2 ..... Suggest replacement.

Steering coupler shield missing ..... C ..... Require replacement.

Steering coupler shield torn ..... 2 ..... Suggest replacement.

Threads damaged ..... A ... Require repair or replacement of part with damaged threads.

Threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads.

U-joint binding ..... A ... Require repair or replacement of joint.

U-joint loose ..... A ... Require repair or replacement of joint.

Unequal power assist .... A .. Require repair or replacement.

(1) - Determine and correct source of contamination. Follow OE specifications for fluid type.
(2) - Indicates internal wear.
(3) - If steering gear is source of inadequate assist, require repair or replacement.

STEERING KNUCKLE INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part.
Attaching hardware broken	A	Require replacement of broken part.
Attaching hardware incorrect	A	Require replacement of incorrect part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Bent	B	Require replacement.
Broken	A	Require replacement.
Pinch bolt incorrect	B	Require replacement with bolt that meets OE design.
Pinch bolt loose	B	Require repair.
Pinch bolt missing	B	Require replacement.
Pinch bolt tabs deformed (pinched together), .032" or more before clamping	B	(1) Require replacement.
Taper hole elongated	A	(2) Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require repair or replacement.

(1) - Steering knuckle deformation can cause pinch bolt breakage.
(2) - Check for damaged stud.

STRIKE OUT BUMPERS

STRIKE OUT BUMPER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require replacement of broken part.
Attaching hardware corroded, affecting structural integrity	A	Require replacement of corroded part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Missing	C	Require replacement.
Split	1	Suggest replacement.

STRUT RODS

STRUT ROD INSPECTION

Condition	Code	Procedure
Adjusting nut seized	A	(1) Require repair or replacement.
Attaching hardware bent	B	Require repair or replacement of bent part, if available; otherwise, replace strut rod.
Attaching hardware broken	A	Require replacement of broken

part, if available; otherwise, replace strut rod.

Attaching hardware incorrect ..... A ..... Require replacement of incorrect part, if available; otherwise, replace strut rod.

Attaching hardware loose ..... A ... Require repair or replacement of loose part, if available; otherwise, replace strut rod.

Attaching hardware missing ..... C .. Require replacement of missing part, if available; otherwise, replace strut rod.

Attaching hardware threads damaged ..... A ... Require repair or replacement of part with damaged threads, if available; otherwise, replace strut rod.

Attaching hardware threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads, if available; otherwise, replace strut rod.

Attaching (mating) hole oversized ..... A ... Require repair or replacement of frame.

Attaching point on frame corroded, affecting structural integrity ... A ..... Require repair of frame.

Bent ..... A ..... Require replacement.

Mating (attaching) hole oversized ..... A ... Require repair or replacement of frame.

Threads damaged ..... A .. Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.

(1) - Only required if an alignment is being performed.

STRUT UPPER BEARING PLATE ASSEMBLIES

NOTE: When the following guidelines indicate replacement of bearing, only the bearing should be replaced if it is

available separately; otherwise, replace the bearing plate assembly.

STRUT UPPER BEARING PLATE ASSEMBLY INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require replacement of broken part, if available; otherwise, replace bearing plate assembly.
Attaching hardware loose	A	Require repair or replacement of loose part, if available; otherwise, replace bearing plate assembly.
Attaching hardware missing	C	Require replacement of missing part, if available; otherwise, replace bearing plate assembly.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads, if available; otherwise, replace bearing plate assembly.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads, if available; otherwise, replace bearing plate assembly.
Bearing axial or radial movement exceeds vehicle manufacturer's specifications	B	Require replacement of bearing.
Bearing binding	A	Require replacement of bearing.
Bearing missing	C	Require replacement of bearing.
Bearing seized	A	Require replacement of bearing.
Bent	B	Require replacement.
Holes distorted	A	Require replacement.
Missing	C	Require replacement.
Severely corroded,		

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affecting structural
integrity ..... A ..... Require replacement.

SWAY BAR LINKS

SWAY BAR LINK INSPECTION

Condition	Code	Procedure
Attaching hardware incorrect	A	Require replacement of incorrect part, if available; otherwise, replace link.
Attaching hardware loose	A	Require repair or replacement of loose part, if available; otherwise, replace link.
Attaching hardware missing	C	Require replacement of missing part, if available; otherwise, replace link.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads, if available; otherwise, replace link.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads, if available; otherwise, replace link.
Ball and socket has looseness (perceptible vertical movement)	1	(1) Suggest replacement.
Ball and socket has looseness that is excessive	B	(1)(2) Require replacement.
Bent	B	Require replacement.
Broken	A	Require replacement.
Corroded, affecting structural integrity	A	Require replacement.
Grease boot cracked	2	(3) Suggest replacement.
Grease boot missing	2	(4) Suggest replacement.
Grease boot torn	2	(5) Suggest replacement.

Missing ..... C ..... Require replacement.
Nut on stud loose ..... A ..... (6) Require repair.
Stud bent ..... B ..... (7) Require replacement.
Stud broken ..... A ..... (7) Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... (7) Require replacement.

(1) - If manufacturer's procedures for inspection exist, use those procedures; otherwise, use an approved inspection method such as the dry park check.
CAUTION: DO NOT use pliers or pry bar to check ball and socket movement. Use only moderate hand pressure.
(2) - Excessive looseness is defined as being significant enough to affect vehicle handling or structural integrity.
(3) - Cracked grease boot will allow contaminants to enter the joint and will accelerate wear.
(4) - Lack of grease boot will allow contaminants to enter the joint and will accelerate wear.
(5) - Torn grease boot will allow contaminants to enter the joint and will accelerate wear.
(6) - Check for bent stud or damaged taper hole.
(7) - Check for damaged taper hole.

SWAY BARS

SWAY BAR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require replacement of broken part, if available; otherwise, replace sway bar.
Attaching hardware corroded, affecting structural integrity	A	Require replacement of corroded part, if available; otherwise, replace sway bar.
Attaching hardware loose	A	Require repair or replacement of loose part, if available; otherwise, replace sway bar.
Attaching hardware		

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missing ..... C .. Require replacement of missing part, if available; otherwise, replace sway bar.

Attaching hardware threads damaged ..... A ... Require repair or replacement of part with damaged threads, if available; otherwise, replace sway bar.

Attaching hardware threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads, if available; otherwise, replace sway bar.

Bent ..... B ..... Require replacement.

Broken ..... A ..... Require replacement.

Threads damaged ..... A .. Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.

TIE ROD ENDS (INNER AND OUTER)

TIE ROD END (INNER AND OUTER) INSPECTION

Condition	Code	Procedure
Attaching hardware incorrect	A	Require replacement of incorrect part, if available; otherwise, replace tie rod end.
Attaching hardware loose	A	Require repair or replacement of loose part, if available; otherwise, replace tie rod end.
Attaching hardware missing	C	Require replacement of missing part, if available; otherwise, replace tie rod end.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads, if available; otherwise, replace tie rod end.
Attaching hardware threads stripped		

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(threads missing) ..... A ..... Require replacement of part with stripped threads, if available; otherwise, replace tie rod end.

Adjusting sleeve bent ... B ... Require replacement of sleeve or tie rod end.

Adjusting sleeve clamps out of position ..... B ..... Require repair.

Adjusting sleeve corroded, affecting structural integrity ... A ... Require replacement of sleeve or tie rod end.

Adjusting sleeve missing ..... C ... Require replacement of sleeve or tie rod end.

Adjusting sleeve seized ..... A ..... (1) Require repair or replacement.

Adjusting sleeve threads damaged ..... A ... Require repair or replacement of sleeve or tie rod end.

Adjusting sleeve threads stripped (threads missing) ..... A ... Require replacement of sleeve or tie rod end.

Binding ..... A ..... (2) Further inspection required.

Grease boot cracked ..... 2 ..... (3) Suggest replacement.

Grease boot missing ..... 2 ..... (4) Suggest replacement.

Grease boot torn ..... 2 ..... (5) Suggest replacement.

Grease fitting broken ... A ... Require replacement of grease fitting.

Grease fitting missing .. C ... Require replacement of grease fitting.

Grease fitting won't seal ..... A ... Require replacement of grease fitting.

Grease seal missing ..... 2 ..... (4) Suggest replacement of seal.

Grease seal torn ..... 2 ..... (5) Suggest replacement of seal.

Greaseable tie rod end won't take grease ..... 2 ..... (6) Suggest replacement of grease fitting.

Looseness (perceptible horizontal movement) ... 1 ..... (7) Suggest replacement.

Looseness exceeds
manufacturer's
specifications ..... B ..... Require replacement.
Looseness that is
excessive ..... B ..... (7)(8) Require replacement.
Nut on stud loose ..... A ..... (9) Require repair or
replacement of nut.
Seized ..... A ..... Require replacement
Stud bent ..... B ..... (10) Require replacement.
Stud broken ..... A ..... (10) Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped
(threads missing) ..... A ..... (10) Require replacement.

(1) - Only required if toe needs to be adjusted.
(2) - If greaseable, grease joint. If problem persists or joint is non-greaseable, require replacement.
(3) - Cracked grease boot will allow contaminants to enter joint and will accelerate wear.
(4) - Lack of grease boot will allow contaminants to enter joint and will accelerate wear.
(5) - Torn grease boot will allow contaminants to enter joint and will accelerate wear.
(6) - If greaseable tie rod end will not take grease after replacing the grease fitting, suggest replacement of tie rod end.
(7) - If manufacturer's procedures for inspection exist, use those procedures; otherwise, use an approved inspection method such as the dry park check.
CAUTION: DO NOT use pliers or pry bar to check ball and socket movement. Use only moderate hand pressure.
(8) - Excessive looseness is defined as being significant enough to affect vehicle handling or structural integrity.
(9) - Check for bent stud or damaged taper hole.
(10) - Check for damaged taper hole.

TRACK BARS

TRACK BAR INSPECTION

Condition Code Procedure

Attaching hardware
incorrect ..... A ..... Require replacement of incorrect part, if available;

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			otherwise, replace track bar.
Attaching hardware loose	.....	A	... Require repair or replacement of loose part, if available; otherwise, replace track bar.
Attaching hardware missing	.....	C	.. Require replacement of missing part, if available; otherwise, replace track bar.
Attaching hardware threads damaged	.....	A	... Require repair or replacement of part with damaged threads, if available; otherwise, replace track bar.
Attaching hardware threads stripped (threads missing)	.....	A	..... Require replacement of part with stripped threads, if available; otherwise, replace track bar.
Bent	.....	B	..... Require replacement.
Corroded, affecting structural integrity	...	A	..... Require replacement.
Grease boot cracked	.....	2	..... (1) Suggest replacement.
Grease boot missing	.....	2	..... (2) Suggest replacement.
Grease boot torn	.....	2	..... (3) Suggest replacement.
Holes distorted	.....	A	..... Require replacement.
Looseness (perceptible horizontal movement)	...	1	..... (4) Suggest replacement.
Looseness that is excessive	.....	B	..... (4)(5) Require replacement.
Nut on stud loose	.....	A	..... (6) Require repair or replacement of nut.
Seized	.....	A	..... Require replacement.
Stud bent	.....	B	..... (7) Require replacement.
Stud broken	.....	A	..... (7) Require replacement.
Threads damaged	.....	A	.. Require repair or replacement.
Threads stripped (threads missing)	.....	A	..... (7) Require replacement.
Wear exceeds manufacturer's specifications	.....	B	..... Require replacement.

(1) - Cracked grease boot will allow contaminants to enter joint and will accelerate wear.
(2) - Lack of grease boot will allow contaminants to enter

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joint and will accelerate wear.
(3) - Torn grease boot will allow contaminants to enter joint and will accelerate wear.
(4) - If manufacturer's procedures for inspection exist, use those procedures; otherwise, use an approved inspection method such as the dry park check.
CAUTION: DO NOT use pliers or pry bar to check ball and socket movement. Use only moderate hand pressure.
(5) - Excessive looseness is defined as being significant enough to affect vehicle handling or structural integrity.
(6) - Check for bent stud or damaged taper hole.
(7) - Check for damaged taper hole.

TRAILING ARMS

TRAILING ARM INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require replacement of broken part, if available; otherwise, replace trailing arm.
Attaching hardware loose	A	Require repair or replacement of loose part, if available; otherwise, replace trailing arm.
Attaching hardware missing	C	Require replacement of missing part, if available; otherwise, replace trailing arm.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads, if available; otherwise, replace trailing arm.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads, if available; otherwise, replace trailing arm.
Bent	B	Require replacement.
Bushing hole oversized	B	Require replacement.

Corroded, affecting structural integrity	A	Require replacement.
Holes distorted	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

WHEEL BEARINGS, RACES AND SEALS

NOTE: When replacing or repacking wheel bearings, grease seal replacement is required. You are not required to replace these components in axle sets. Determine the need to replace based upon the individual component conditions that follow.

WHEEL BEARING, RACE AND SEAL INSPECTION

Condition	Code	Procedure
Rear axle seal on rear-wheel drive leaking	A	Require replacement of seal and inspection of axle, bearing, housing, and vent tube.
Seal bent	1	Suggest replacement.
Seal leaking	A	Require replacement of seal and inspection of bearings.
Seal missing	C	Require replacement.
Seal torn	A	Require replacement.
Wheel bearing assembly feels rough when rotated	A	Require replacement of bearing assembly.
Wheel bearing balls are pitted	A	Require replacement of bearing assembly.
Wheel bearing balls are worn	A	Require replacement of bearing assembly.
Wheel bearing end-play exceeds vehicle manufacturer's specifications	B	Require adjustment of bearing, if possible. If proper adjustment cannot be obtained,

require repair or replacement
of worn component.

Wheel bearing race is loose in the hub bore ..... A ..... Require replacement of hub assembly and wheel bearings.

Wheel bearing races are pitted ..... A .. Require replacement of bearing assembly.

Wheel bearing races are worn ..... A .. Require replacement of bearing assembly.

Wheel bearing rollers are pitted ..... A .. Require replacement of bearing assembly.

Wheel bearing rollers are worn ..... A .. Require replacement of bearing assembly.

WHEEL ALIGNMENT

WHEEL ALIGNMENT

Wheel alignment is defined as the measurement, analysis, and adjustment of steering and suspension angles to conform to OEM specifications. These angles usually include, but are not limited to: caster, camber, toe, and thrust angle. Where these angles are not adjustable and not in specification, component replacement or correction kits may be required. Errors in set-back and steering axis inclination (SAI) are often attributable to failed or damaged components and must be corrected prior to performing an alignment.

Failure to replace or correct suggested parts or service may prevent a proper alignment.

Before performing an alignment check, inspect and verify the following:

* Tire pressure and size
* Vehicle loading
* Ride height
* Steering and suspension parts

If the inspection reveals that all the above are within published specifications, a wheel alignment check and an alignment, if needed, may be performed.

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CAUTION: Under no circumstances should a technician bend or heat any steering or suspension component, unless specified by the vehicle manufacturer, for example, Ford forged twin "I" beam axles. All measurements and specifications must be noted on the inspection report.

WHEEL ALIGNMENT INSPECTION

Condition	Code	Procedure
Dog tracking, shown to be caused by faulty alignment	2	Suggest repair.
Lead, shown to be caused by faulty alignment	A	Require alignment.
Part has been changed, affecting alignment	A	Require alignment check.
Pull, shown to be caused by faulty alignment	A	Require alignment.
Steering wheel off-center	2	Suggest alignment.
Tire wear, shown to be caused by faulty alignment	A	Require alignment.
Wander, shown to be caused by faulty alignment	A	Require alignment.

WHEELS AND TIRES

TIRES

These guidelines do not apply to split rims. Some vehicle manufacturers restrict replacement of tires to specific brands, types, or sizes.

WARNING: High pressure temporary compact spare tires should not be used with any other rims or wheels, nor should standard tires, snow tires, wheel covers, or trim rings be used with high pressure compact spare rims or wheels. Attempting to mount a tire of one diameter on a wheel of a different diameter or flange type may result in serious injury or death.

WARNING: Only specially trained persons should dismount or mount tires. Explosions of tire and wheel assembly can result from improper mounting, possibly causing serious injury or death.

WARNING: Consult the vehicle owner's manual or vehicle placard for correct size, speed rating, designation, and cold inflation pressure of the original tires. DO NOT exceed the maximum load or inflation capacity of the tire specified by the Tire and Rim Association

WARNING: When replacing tires, it is suggested that the replacement tires match or exceed the OEM speed rating designation. If tires of different speed rating designations are mixed on the same vehicle, the tires may vary in handling characteristics. DO NOT mix different speed rating designations on the same axle.

WARNING: DO NOT mix radials with non-radial tires on the same axle, as this may affect vehicle handling and stability. If radial tires and bias or bias-belted ply tires are mixed on the same vehicle, the radials must be on the rear. High-pressure temporary compact spare tires are exempt from this rule.

WARNING: DO NOT mix size or type (all season, performance, mud and snow) of tires on the same axle.

TIRE INSPECTION

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Condition             Code                  Procedure

Air pressure incorrect  ..  B  ..................  Require repair
Bead broken  .............  A  ............  Require replacement.
Bead leaking, caused
 by tire  ................  A  ..  Require repair or replacement.
Bead wire/cord exposed  ..  A  ............  Require replacement.
Cord or belt material
 exposed  ................  A  ............  Require replacement.
Cord ply separations  ....  A  ............  Require replacement.
Directional/asymmetrical
 tires mounted
 incorrectly  ............  B  .......  Require remounting and/or
                                        repositioning.
Irregular tread wear,
 affecting performance ... 2 ....... (1) Suggest replacement.
```

Load ratings less
than OEM
specifications ..... B ..... Require replacement.
Mixed tread types (all
season, performance, mud
and snow) on same axle . A ..... Require replacement.
Number of punctures
exceeds manufacturer's
limit ..... B ..... Require replacement.
Out of balance ..... B . Require rebalance of tire/wheel assembly.
Ply separation ..... A ..... Require replacement.
Pull or lead, caused
by tire ..... A .. Require repair or replacement.
Radial and bias or
bias-belted ply tires
on same axle ..... B .. Require repair or replacement.
Radials are on the front
and not on the rear .... B ..... (2) Require repair or replacement.
Run flat damage ..... A ..... Require replacement.
Shoulder cut ..... A ..... Require replacement.
Shoulder puncture ..... A ..... Require replacement.
Shoulder with plug ..... A ..... Require replacement.
Sidewall bulge ..... A ..... Require replacement.
Sidewall cut ..... A ..... Require replacement.
Sidewall indentation .... No service required or suggested.
Sidewall puncture ..... A ..... Require replacement.
Sidewall with plug ..... A ..... Require replacement.
Speed rating
designations
different
on same axle ..... 2 .. Suggest repair or replacement.
Tire and wheel assembly
has excessive run-out .. B ..... (3) Require repair or replacement of appropriate part.
Tires with more than
1/4" diameter difference
on a four-wheel drive
vehicle ..... B ..... Require replacement.
Tread area puncture larger
in diameter than
manufacturer's
specifications ..... B ..... Require replacement.

*** STEERING UNIFORM INSPECTION GUI**

Tread missing pieces (chunking), exposing cord ..... A ..... Require replacement.
Tread missing pieces (chunking), not exposing cord ..... 1 ..... Suggest replacement.
Tread separations A ..... Require replacement.
Tube in tubeless tire 3 .... (4) Suggest removal of tube.
Weather-checking .... No service required or suggested.
Worn to tread wear indicators ..... B ..... Require replacement.

(1) - Determine and correct cause of irregular tire wear.
(2) - If radials and bias or bias-belted ply tires are on the same vehicle, the radials must be on the rear axle, except for high-pressure temporary spares.
(3) - Excessive is defined as enough to contribute to performance problems. Match mounting may correct run-out. If not, require replacement of appropriate part. Refer to manufacturer's specifications.
(4) - Most manufacturers do not recommend tubes in tubeless tires. Inspect tire and wheel assembly to determine the reason for a tube in tubeless tire. Recommendation for repair or replacement should be based upon condition of tires and/or wheel listed in these guidelines.

VALVE STEMS

VALVE STEM INSPECTION

Condition Code Procedure

Bent ..... 1 ..... Suggest replacement.
Broken ..... A ..... Require replacement.
Cut, but not leaking .... 1 ..... Suggest replacement.
Deteriorated (cracking, dry rot) .... 1 ..... Suggest replacement.
Leaking ..... A . Require repair or replacement.
Missing ..... C ..... Require replacement.
Threads damaged ..... A . Require repair or replacement.
Threads stripped ..... A ..... Require replacement.
Valve cap missing ..... C .... Require replacement of cap.
Weather-checking ..... 1 ..... Suggest replacement.
Won't take air ..... A . Require repair or replacement.

WHEEL ATTACHMENT HARDWARE

For conditions noted below, also check conditions of wheel stud holes.

CAUTION: Proper lug nut torque is essential. Follow recommended torque specifications and tightening sequence. DO NOT lubricate threads unless specified by the vehicle manufacturer.

WHEEL ATTACHMENT HARDWARE INSPECTION

Condition	Code	Procedure
Bent	A	Require replacement.
Broken	A	(1) Require replacement.
Loose	B	Require repair or replacement of affected component.
Lug nut installed backward	B	Require repair or replacement.
Lug nut mating type incorrect	B	Require replacement of nut.
Lug nut mating surface dished	A	Require replacement of nut.
Lug nut rounded	A	(2) Require replacement of nut.
Lug nut seized	A	(2) Require replacement of nut.
Stud incorrect	B	Require replacement of stud.
Threads damaged	A	Require repair or replacement of component with damaged threads.
Threads stripped	A	Require replacement of component with stripped threads.

(1) - Some manufacturers require replacement of all studs on that wheel if two or more studs or nuts on the same wheel are broken or missing.
(2) - Only required if removing wheel.

WHEELS (RIMS)

WARNING: Mounting a regular tire on a high-pressure compact spare wheel is not permitted. Attempting to mount a tire of one

diameter on a wheel of a different diameter or flange type may result in serious injury or death. If the wheel identification stamp is not legible, or cannot be found, do not use the wheel until the size and type have been properly identified. Wheels of different diameter, offset, or width cannot be mixed on the same axle. Bead seat tapers cannot be interchanged.

WHEEL (RIM) INSPECTION

Condition	Code	Procedure
Bead leaking, caused by wheel	A	(1) Require repair or replacement.
Bent hub mounting surface	A	Require replacement.
Bent rim, causing vibration	2	(1) Suggest replacement.
Broken	A	Require replacement.
Cast wheel porous, causing a leak	A	Require repair or replacement.
Clip-on balance weight is incorrect type for rim flange	2	Suggest replacement.
Corrosion, affecting structural integrity	A	Require replacement.
Corrosion build-up on wheel mounting surface	A	Require repair.
Cracked	A	Require replacement.
Directional/asymmetrical wheels mounted incorrectly	B	Require remounting and/or repositioning.
Load capacity less than OEM specifications	B	Require replacement.
Offset mismatched on same axle	B	Require replacement.
Rivets leaking	A	Require replacement.
Run-out beyond OEM specs	B	Require replacement.
Stud holes elongated	A	(2) Require replacement.
Welded or brazed repair	2	Suggest replacement.
Welds leaking	A	Require replacement.

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Wheel centering (pilot)
hole incorrect ..... B ..... Require replacement.

(1) - CAUTION: DO NOT attempt to correct a bent rim.
(2) - Inspect wheel attaching hardware for damage.

END OF ARTICLE

* SUSPENSION UNIFORM INSPECTION GUIDELINES *

Article Text

1996 Kia Sephia

For 1 1 1 1 1

Saturday, April 18, 2009 10:10PM

ARTICLE BEGINNING

GENERAL INFORMATION
Steering, Suspension, Wheel Alignment, Wheels and Tires
January 2000 Motorist Assurance Program
Standards For Automotive Repair

All Makes and Models

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WHEEL ALIGNMENT

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MOTORIST ASSURANCE PROGRAM (MAP)

OVERVIEW OF MOTORIST ASSURANCE PROGRAM (MAP)

Automotive industry professionals and interested readers:
The Motorist Assurance Program (MAP) is the consumer outreach effort of the Automotive Maintenance and Repair Association, Inc. (AMRA). Participation in the Motorist Assurance Program is drawn from auto repair companies and independents, parts and equipment manufacturers and suppliers, vehicle manufacturers and industry associations.

Our organization's mission is to strengthen the relationship between the consumer and the auto repair industry. We encourage motorists to take greater responsibility for their vehicles-through proper, manufacturer-recommended, maintenance, and endorse participating service and repair shops (including franchisees and dealers) who adopt (1) the MAP Pledge of Assurance to their Customers

and (2) the Motorist Assurance Program Standards of Service. All participating service providers have agreed to subscribe to this Pledge and to adhere to the promulgated Standards of Service demonstrating to their customers that they are serious about customer satisfaction.

These Standards of Service require an inspection of the vehicle's (problem) system and that the results be communicated to the customer according to industry standards. Since the industry did not have such standards, the Motorist Assurance Program successfully promulgated industry inspection communication standards in 1994-95 for the following systems: Exhaust, Brakes, ABS, Steering and Suspension, Engine Maintenance and Performance, HVAC, and Electrical Systems.

Further, revisions to all of these inspection communication standards are re-published periodically. In addition to the above, standards for Drive Train and Transmissions were promulgated and published in 1998. Participating shops utilize these Uniform Inspection & Communication Standards (UI&CS) as part of the inspection process and for communicating their findings to their customers.

The Motorist Assurance Program continues to work cooperatively and proactively with government agencies and consumer groups toward solutions that both benefit the customer and are mutually acceptable to both regulators and industry. We maintain the belief that industry must retain control over how we conduct our business, and we must be viewed as part of the solution and not part of the problem. Meetings with state and other government officials (and their representatives), concerned with auto repair and/or consumer protection, are conducted. Feedback from these sessions is brought back to the association governing body, and the program adjusted as needed.

To assure recourse for auto repair customers if they are not satisfied with a repair transaction, the Motorist Assurance Program offers mediation and arbitration through the BBB and other similar non-profit organizations. MAP conducted pilot programs in twelve states before announcing the program nationally in October 1998. During the pilots, participating repair shops demonstrated their adherence to the Pledge and Standards and agreed to follow the UI&CS in communicating the results of their inspection to their customers. Complaints and "come-backs" dropped significantly.

To put some "teeth" in the program, an accreditation requirement for shops was initiated. The requirements are stringent, and a self-policing technique has been incorporated which includes the "mystery shopping" of outlets. By year-end 1999, over 4,000 auto repair facilities had been accredited by the Motorist Assurance Program.

We welcome you to join us as we continue our outreach. With your support, both the automotive repair industry and your customers

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will reap the benefits. Please visit MAP at our Internet site www.motorist.org or contact us at:

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OVERVIEW OF SERVICE REQUIREMENTS & SUGGESTIONS

It is MAP policy that all exhaust, brake, steering, suspension, wheel alignment, drive-line, engine performance and maintenance, and heating, ventilation and air conditioning, and electrical services be offered and performed under the standards and procedures specified in these sections.

Before any service is performed on a vehicle, an inspection of the appropriate system must be performed. The results of this inspection must be explained to the customer and documented on an inspection form. The condition of the vehicle and its components will indicate what services/part replacements may be "Required" or "Suggested." In addition, suggestions may be made to satisfy the requests expressed by the customer.

When a component is suggested or required to be repaired or replaced, the decision to repair or replace must be made in the customer's best interest, and at his or her choice given the options available.

This section lists the various parts and the conditions that indicate a required or suggested service or part replacement. Although this list is extensive, it is not fully inclusive. In addition to this list, a technician may make a suggestion. However, any suggestions must be based on substantial and informed experience, or the vehicle manufacturer's recommended service interval and must be documented.

Some conditions indicate that service or part replacement is required because the part in question is no longer providing the function for which it is intended, does not meet a vehicle manufacturer's design specification or is missing.

* Example: An exhaust pipe has corroded severely and has a hole in it through which exhaust gases are leaking. Replacement of the exhaust pipe in this case is required due to functional failure.
* Example: A brake rotor has been worn to the point where it measures less than the vehicle manufacturer's discard specifications. Replacement of the rotor is required because it does not meet design specifications.

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Some conditions indicate that a service or part replacement is suggested because the part is close to the end of its useful life or addresses a customer's need, convenience or request. If a customer's vehicle has one of these conditions, the procedure may be only to suggest service.

* Example: An exhaust pipe is rusted, corroded or weak, but no leaks are present. In this case, the exhaust pipe has not failed. However, there is evidence that the pipe may need replacement in the near future. Replacement of the pipe may be suggested for the customer's convenience in avoiding a future problem.
* Example: The customer desires improved ride and/or handling, but the vehicle's shocks or struts have not failed. In this case, replacement may be suggested to satisfy the customer's wishes. In this case, replacement of the shocks or struts may not be sold as a requirement.

A customer, of course, has the choice of whether or not a shop will service his or her vehicle. He or she may decide not to follow some of your suggestions. When a repair is required, a MAP shop must refuse partial service on that system if, in the judgment of the service provider, proceeding with the work could create or continue an unsafe condition.

When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

The following reasons may be used for required and suggested services. These codes are shown in the "Code" column of the MAP Uniform Inspection & Communications Standards that follow:

Reasons to Require Repair or Replacement

A - Part no longer performs intended purpose
B - Part does not meet a design specification (regardless of performance)
C - Part is missing

NOTE: When a repair is required, the shop must refuse partial service to the system in question, if the repair creates or continues an unsafe condition.

Reasons to Suggest Repair or Replacement

1 - Part is close to the end of its useful life (just above

discard specifications, or weak; failure likely to occur soon, etc.)

2 - To address a customer need, convenience, or request (to stiffen ride, enhance performance, eliminate noise, etc.)

3 - To comply with maintenance recommended by the vehicle's Original Equipment Manufacturer (OEM)

4 - Technician's recommendation based on substantial and informed experience

NOTE: Suggested services are always optional. When presenting suggested repairs to the customer, you must present the facts, allowing the customer to draw their own conclusions and make an informed decision about how to proceed.

STEERING AND SUSPENSION

SERVICE PROCEDURES REQUIRED AND SUGGESTED FOR PROPER VEHICLE OPERATION

Steering and suspension are complex systems made up of a variety of interdependent components. For proper vehicle handling, ride, and tire wear, a thorough inspection is required whenever suspension work is being performed.

Conditions listed assume that the problem has been isolated to the specific component by proper testing procedures.

NOTE: When replacing steering and/or suspension components which may affect an alignment angle, you are required to check and adjust alignment as needed. Refer to the OEM specifications.

CAUTION: DO NOT use ride height altering or load compensating components, such as variable rate springs and coil over shocks, on vehicles with height or load sensing proportioning valve-equipped braking systems, unless these components are original equipment.

AIR RIDE SUSPENSION

NOTE: Depending on the air suspension design, there are some aftermarket products available to eliminate the air ride suspension on certain vehicles. If the system has been eliminated with one of these products, then no service is suggested or required.

AIR RIDE SUSPENSION - AIR SHOCKS AND AIR STRUTS *** SUSPENSION UNIFORM INSPECTION G**

NOTE: This section covers the air spring portion of the air shock or strut. For damping portion of shock or strut conditions and procedures, refer to the SHOCK ABSORBERS, STRUT CARTRIDGES AND STRUT ASSEMBLIES section.

AIR RIDE SUSPENSION - AIR SHOCK AND AIR STRUT INSPECTION

Condition	Code	Procedure
Inner fabric of air bag damaged	A	Require replacement.
Leaking	A	Require repair or replacement.
Outer covering of air bag is cracked to the extent that inner fabric of air bag is visible	1	Suggest replacement.

AIR RIDE SUSPENSION - AIR SPRING VALVES

AIR RIDE SUSPENSION - AIR SPRING VALVE INSPECTION

Condition	Code	Procedure
Attaching hardware incorrect	A	Require replacement of incorrect part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Blocked	A	Require repair or replacement.
Connector bent	A	Require repair or replacement.
Connector broken	A	Require replacement.
Connector loose	A	Require repair or replacement.

Inoperative ..... A .. Require repair or replacement.
Leaking ..... A .. Require repair or replacement.
Restricted ..... A .. Require repair or replacement.

AIR RIDE SUSPENSION - AIR SPRINGS

AIR RIDE SUSPENSION - AIR SPRING INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require replacement of broken part.
Attaching hardware incorrect	A	Require replacement of incorrect part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Collar cracked	A	Require replacement.
End cap cracked	A	Require replacement.
Inner fabric of bag damaged	A	Require replacement.
Leaking	A	Require repair or replacement.
Outer covering of air bag is cracked to the extent that inner fabric of air bag is visible	1	Suggest replacement.
Piston cracked	A	Require replacement.

AIR RIDE SUSPENSION - COMPRESSORS

AIR RIDE SUSPENSION - COMPRESSOR INSPECTION

*** SUSPENSION UNIFORM INSPECTION (**

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part.
Attaching hardware broken	A	Require replacement of broken part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Connector bent	A	Require repair or replacement.
Connector broken	A	Require replacement.
Connector loose	A	Require repair or replacement.
Does not build pressure	A	(1) Further inspection required.
Excessive run time	B	(2) Further inspection required.
Inoperative	A	Require replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.

(1) - If failure to build pressure is traced to the compressor, require replacement.
(2) - If excessive run time is traced to the compressor, require replacement.

AIR RIDE SUSPENSION - HEIGHT SENSORS

AIR RIDE SUSPENSION - HEIGHT SENSOR INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part.
Attaching hardware		

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broken ..... A ... Require replacement of broken part.
Attaching hardware corroded, affecting structural integrity .... A ..... Require replacement of corroded part.
Attaching hardware loose ..... A ... Require repair or replacement of loose part.
Attaching hardware missing ..... C .. Require replacement of missing part.
Attaching hardware threads damaged ..... A ... Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads.
Dust boot missing ..... 2 ..... (1) Suggest replacement.
Dust boot split ..... 2 ..... (1) Suggest replacement.
Dust boot torn ..... 2 ..... (1) Suggest replacement.
Housing cracked ..... A ..... Require replacement.
Lead routing incorrect .. B .. Require rerouting according to vehicle manufacturer's specifications.
Loose ..... B ... Require adjustment to vehicle manufacturer's specifications.
Missing ..... C ..... Require replacement.
Output signal incorrect . A .. Require repair or replacement.
Wire lead damaged ..... A .. Require repair or replacement.

(1) - This condition can lead to damage of the sliding magnet, which, in turn, causes premature sensor failure.

AIR RIDE SUSPENSION - MODULES

AIR RIDE SUSPENSION - MODULE INSPECTION

Condition Code Procedure

Attaching hardware loose ..... A ... Require repair or replacement of loose part.
Attaching hardware*** SUSPENSION UNIFORM INSPECTION GUIDELINES *Article Text (p. 10)**1996 Kia

missing ..... C .. Require replacement of missing part.
Attaching hardware threads damaged ..... A ... Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads.
Housing cracked ..... 2 .. Suggest repair or replacement.
Inoperative ..... A ..... Require replacement.
Missing ..... C ..... Require replacement.

AIR RIDE SUSPENSION - RELAYS (COMPRESSOR)

AIR RIDE SUSPENSION - RELAY (COMPRESSOR) INSPECTION

Condition	Code	Procedure
Housing cracked	2	(1) Suggest replacement.
Intermittent	A	Require replacement.
Missing	C	Require replacement.
Output signal incorrect .	A	Require replacement.

(1) - If moisture enters the relay, it can reduce life expectancy or impair function.

AIR RIDE SUSPENSION - SWITCHES (ON/OFF)

AIR RIDE SUSPENSION - SWITCH (ON/OFF) INSPECTION

Condition	Code	Procedure
Broken	A	Require replacement.
Missing	C	Require replacement.
Output signal incorrect .	A	Require replacement.

AIR RIDE SUSPENSION - TORSION SPRINGS (COUNTER BALANCING)

AIR RIDE SUSPENSION - TORSION SPRING (COUNTER BALANCING) INSPECTION

Condition	Code	Procedure

Attaching hardware bent . B ... Require repair or replacement of bent part.
Attaching hardware broken ..... A ... Require replacement of broken part.
Attaching hardware incorrect ..... A ..... Require replacement of incorrect part.
Attaching hardware loose ..... A ... Require repair or replacement of loose part.
Attaching hardware missing ..... C .. Require replacement of missing part.
Attaching hardware threads damaged ..... A ... Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads.
Broken ..... A ..... Require replacement.
Missing ..... C ..... Require replacement.

AIR RIDE SUSPENSION - TUBING

AIR RIDE SUSPENSION - TUBING INSPECTION

Condition Code Procedure

Attaching hardware incorrect ..... A ..... Require replacement of incorrect part.
Attaching hardware loose ..... A ... Require repair or replacement of loose part.
Attaching hardware missing ..... C .. Require replacement of missing part.
Blocked ..... A .. Require repair or replacement.
Fitting incorrect ..... B ..... Require replacement.
Leaking ..... A .. Require repair or replacement.
Line type incorrect ..... B ..... Require replacement.
Missing ..... C ..... Require replacement.
Restricted ..... A .. Require repair or replacement.

Routed incorrectly ..... B ..... Require routing correction.

AIR RIDE SUSPENSION - WARNING LAMPS

AIR RIDE SUSPENSION - WARNING LAMP INSPECTION

Condition	Code	Procedure
Bulb burned out	A	Require replacement.
Warning light does not come on during bulb check	.	Further inspection required to determine cause.
Warning light flashes	.	Further inspection required to determine cause.
Warning light is intermittent	.	Further inspection required to determine cause.
Warning light stays on after initial bulb check	.	Further inspection required to determine cause.

AIR RIDE SUSPENSION - WIRING HARNESSES

AIR RIDE SUSPENSION - WIRING HARNESS INSPECTION

Condition	Code	Procedure
Connector bent	A	Require repair or replacement.
Connector broken	A	Require repair or replacement.
Connector loose	A	Require repair or replacement.
Damaged (cut, burned, or chafed)	A	Require repair or replacement.
Excessive resistance	B	Require repair or replacement.
Fuse blown	A	Require replacement.
Fusible link blown	A	Require replacement.
Open	A	Require repair or replacement.
Poor ground	A	Require repair or replacement.
Routed incorrectly	B	Require rerouting according to vehicle manufacturer's specifications.
Shorted	A	Require repair or replacement.
Terminal bent	A	Require repair or replacement.

Terminal broken ..... A .. Require repair or replacement.
Terminal corroded ..... A .. Require repair or replacement.
Terminal loose ..... A .. Require repair or replacement.

BALL JOINTS

Before requiring or suggesting ball joint replacement, the approved OEM procedure must be used to measure ball joint wear. The measurement(s) obtained, along with the vehicle manufacturer's specifications, must be noted on the inspection report. Some states require that these measurements also appear on the invoice.

NOTE: The term "perceptible movement," defined as any visible movement in any direction, has been the industry standard for determining the need for replacement of follower ball joints. Some vehicle manufacturers are now publishing specifications for follower ball joints that were previously diagnosed by the "perceptible movement" standard. Before requiring or suggesting any parts be replaced based on "perceptible movement," consult your repair manual to determine if OEM specifications exist.

You are not required to replace ball joints in axle sets. However, when replacing a ball joint due to wear exceeding manufacturer's specification, you may suggest replacement of the other ball joint if its measurement shows it is close to the end of its useful life, for preventive maintenance.

BALL JOINT INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part if available; otherwise, replace ball joint.
Attaching hardware broken	A	Require replacement of broken part if available; otherwise, replace ball joint.
Attaching hardware corroded, affecting structural integrity	A	Require replacement of corroded part if available; otherwise, replace ball joint.
Attaching hardware		

*** SUSPENSION UNIFORM INSPECTION G**

incorrect ..... A ..... Require replacement of incorrect part if available; otherwise, replace ball joint.
Attaching hardware loose ..... A ... Require repair or replacement of loose part if available; otherwise, replace ball joint.
Attaching hardware missing ..... C .. Require replacement of missing part if available; otherwise, replace ball joint.
Attaching hardware threads damaged ..... A ... Require repair or replacement of part with damaged threads if available; otherwise, replace ball joint.
Attaching hardware threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads if available; otherwise, replace ball joint.
Binding ..... A ..... (1) Further inspection required.
Grease boot cracked ..... 2 ..... (2) Suggest replacement.
Grease boot missing ..... 2 ..... (3) Suggest replacement.
Grease boot torn ..... 2 ..... (4) Suggest replacement.
Grease fitting broken ... A ... Require replacement of grease fitting.
Grease fitting missing .. C ... Require replacement of grease fitting.
Grease fitting won't seal ..... A ... Require replacement of grease fitting.
Greaseable ball joint will not take grease ..... 2 ..... (5) Suggest replacement of grease fitting.
Nut on ball joint loose . A ..... (6) Require repair or replacement.
Pre-load adjustment incorrect ..... B .. Require repair or replacement.
Seized ..... A ..... Require replacement.
Stud bent ..... B ..... (7) Require replacement.
Stud broken ..... A ..... (7) Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads

missing) ..... A ..... (7) Require replacement.
Wear exceeds
manufacturer's
specifications ..... B ..... Require replacement.

(1) - If greaseable, grease ball joint. If problem persists or joint is non-greaseable, require replacement.
(2) - Cracked grease boot will allow contaminants to enter the ball joint and will accelerate wear.
(3) - Lack of grease boot will allow contaminants to enter the ball joint and will accelerate wear.
(4) - Torn grease boot will allow contaminants to enter the ball joint and will accelerate wear.
(5) - If the greaseable ball joint still will not take grease after replacing the grease fitting, suggest replacement of ball joint.
(6) - Check for bent stud or damaged taper hole.
(7) - Check for damaged taper hole.

BUSHINGS

BUSHING INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part if available; otherwise, replace bushing.
Attaching hardware broken	A	Require replacement of broken part if available; otherwise, replace bushing.
Attaching hardware corroded, affecting structural integrity	A	Require replacement of corroded part if available; otherwise, replace bushing.
Attaching hardware incorrect	A	Require replacement of incorrect part if available; otherwise, replace bushing.
Attaching hardware loose	A	Require repair or replacement of loose part if available; otherwise, replace bushing.

Attaching hardware missing	C	Require replacement of missing part if available; otherwise, replace bushing.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads if available; otherwise, replace bushing.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads if available; otherwise, replace bushing.
Binding	A	Require repair or replacement.
Deteriorated, affecting performance	A	Require repair or replacement.
Distorted, affecting performance	A	Require repair or replacement.
Leaking (fluid-filled type)	A	Require replacement.
Missing	C	Require replacement.
Noisy	2	(1) Further inspection required.
Rubber separating from internal metal sleeve on bonded bushing	A	Require replacement.
Seized	A	Require replacement.
Shifted (out of position)	B	Require repair or replacement.
Split	A	Require replacement.
Surface cracking (weather-checked)	..	No service suggested or required.

(1) - If noise isolated to bushing, suggest repair or replacement.

CAUTION: Use only approved lubricant on rubber bushings. Petroleum-based lubricants may damage rubber bushings.

CENTER LINKS

CENTER LINK INSPECTION

*** SUSPENSION UNIFORM INSPECTION GUIDELI**

Condition	Code	Procedure
Attaching hardware incorrect	A	Require replacement of incorrect part, if available; otherwise, replace center link.
Attaching hardware loose	A	Require repair or replacement of loose part, if available; otherwise, replace center link.
Attaching hardware missing	C	Require replacement of missing part, if available; otherwise, replace center link.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads, if available; otherwise, replace center link.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads, if available; otherwise, replace center link.
Bent	B	Require replacement.
Binding	A	(1) Further inspection required.
Grease boot cracked	2	(2) Suggest replacement.
Grease boot missing	2	(3) Suggest replacement.
Grease boot torn	2	(4) Suggest replacement.
Grease fitting broken	A	Require replacement of grease fitting.
Grease fitting missing	C	Require replacement of grease fitting.
Grease fitting won't seal	A	Require replacement of grease fitting.
Grease seal missing	2	(3) Suggest replacement.
Grease seal torn	2	(4) Suggest replacement.
Looseness (perceptible horizontal movement)	1	(5) Suggest replacement.
Looseness that is excessive	B	(5)(6) Require replacement.
Seized	A	Require replacement.
Stud bent	B	(7) Require replacement.

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Stud broken ..... A ..... (7) Require replacement.
Stud loose in
taper hole ..... A ..... (7) Require repair or
replacement.
Taper hole elongated .... A ..... (8) Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped
(threads missing) ..... A ..... (7) Require replacement.
Wear exceeds
manufacturer's
specifications ..... B ..... Require replacement.

(1) - If greaseable, grease joint. If problem persists or joint is non-greaseable, require replacement.
(2) - Cracked grease boot will allow contaminants to enter the joint and will accelerate wear.
(3) - Lack of grease boot will allow contaminants to enter the joint and will accelerate wear.
(4) - Torn grease boot will allow contaminants to enter the joint and will accelerate wear.
(5) - If manufacturer's procedures for inspection exist, use those procedures; otherwise, use an approved inspection method such as the dry park check.
CAUTION: DO NOT use pliers or pry bar to check ball and socket movement. Use only moderate hand pressure.
(6) - Excessive looseness is defined as being significant enough to affect vehicle handling or structural integrity.
(7) - Check for damaged taper hole.
(8) - Check for damaged stud.

CONTROL ARM SHAFTS

CONTROL ARM SHAFT INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require replacement of broken part, if available; otherwise, replace shaft.
Attaching hardware
loose ..... A ... Require repair or replacement of loose part, if available; otherwise, replace shaft.

Attaching hardware missing ..... C .. Require replacement of missing part, if available; otherwise, replace shaft.

Attaching hardware threads damaged ..... A ... Require repair or replacement of part with damaged threads, if available; otherwise, replace shaft.

Attaching hardware threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads, if available; otherwise, replace shaft.

Bent ..... B ..... Require replacement.

Shaft bushing surface undersized (worn) ..... B ..... Require replacement.

Threads damaged ..... A .. Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.

CONTROL ARMS

CONTROL ARM INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B ...	Require repair or replacement of bent part, if available; otherwise, replace control arm.
Attaching hardware broken	A ...	Require replacement of broken part, if available; otherwise, replace control arm.
Attaching hardware corroded, affecting structural integrity ...	A .	Require replacement of corroded part, if available; otherwise, replace control arm.
Attaching hardware incorrect	A	Require replacement of incorrect part, if available; otherwise, replace control arm.

Attaching hardware
loose ..... A ... Require repair or replacement
of loose part, if available;
otherwise, replace control arm.
Attaching hardware
missing ..... C .. Require replacement of missing
part, if available; otherwise,
replace control arm.
Attaching hardware
threads damaged ..... A ... Require repair or replacement
of part with damaged threads,
if available; otherwise,
replace control arm.
Attaching hardware
threads stripped
(threads missing) ..... A ..... Require replacement of part
with stripped threads, if
available; otherwise, replace
control arm.
Bent ..... B ..... Require replacement.
Bushing hole oversized .. B ..... Require replacement.
Ball joint hole oversized
(loose interference or
press fit) ..... B ..... (1) Further inspection
required.
Corroded, affecting
structural integrity ... A ..... Require replacement.
Holes distorted ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... Require replacement.

(1) - If oversized ball joint is available, require
replacement of ball joint. If oversized ball joint
is not available, require replacement of control arm.

DRAG LINKS

DRAG LINK INSPECTION

Condition Code Procedure

Attaching hardware
incorrect ..... A ..... Require replacement of
incorrect part, if available; *** SUSPENSION UNIFORM INSPECTION GUIDELI**

			otherwise, replace drag link.
Attaching hardware loose	.....	A	... Require repair or replacement of loose part, if available; otherwise, replace drag link.
Attaching hardware missing	.....	C	.. Require replacement of missing part, if available; otherwise, replace drag link.
Attaching hardware threads damaged	.....	A	... Require repair or replacement of part with damaged threads, if available; otherwise, replace drag link.
Attaching hardware threads stripped (threads missing)	.....	A	..... Require replacement of part with stripped threads, if available; otherwise, replace drag link.
Bent	.....	B	..... Require replacement.
Binding	.....	A	..... (1) Further inspection required.
Grease boot cracked	.....	2	..... (2) Suggest replacement.
Grease boot missing	.....	2	..... (3) Suggest replacement.
Grease boot torn	.....	2	..... (4) Suggest replacement.
Grease fitting broken	...	A	... Require replacement of grease fitting.
Grease fitting missing	..	C	... Require replacement of grease fitting.
Grease fitting won't seal	.....	A	... Require replacement of grease fitting.
Grease seal missing	.....	2	..... (5) Suggest replacement.
Grease seal torn	.....	2	..... (4) Suggest replacement.
Looseness (perceptible horizontal movement)	...	1	..... (6) Suggest replacement.
Looseness that is excessive	.....	B	..... (6)(7) Require replacement.
Seized	.....	A	..... Require replacement.
Stud bent	.....	B	..... (8) Require replacement.
Stud broken	.....	A	..... (8) Require replacement.
Stud loose in taper hole	.....	A	..... (8) Require repair or replacement.
Taper hole elongated	....	A	..... (9) Require replacement.

Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... (8) Require replacement.
Wear exceeds
manufacturer's
specifications ..... B ..... Require replacement.

(1) - If greaseable, grease joint. If problem persists or joint is non-greaseable, require replacement.
(2) - Cracked grease boot will allow contaminants to enter the joint and will accelerate wear.
(3) - Lack of grease boot will allow contaminants to enter the joint and will accelerate wear.
(4) - Torn grease boot will allow contaminants to enter the joint and will accelerate wear.
(5) - Missing grease seal will allow contaminants to enter the joint and will accelerate wear.
(6) - If manufacturer's procedures for inspection exist, use those procedures; otherwise, use an approved inspection method such as the dry park check.
CAUTION: DO NOT use pliers or pry bar to check ball and socket movement. Use only moderate hand pressure.
(7) - Excessive looseness is defined as being significant enough to affect vehicle handling or structural integrity.
(8) - Check for damaged taper hole.
(9) - Check for damaged stud.

ELECTRONIC RIDE CONTROL SHOCKS AND STRUTS

NOTE: This section covers the electronic damping control portion of the electronic shock or strut. For dampening portion of shock or strut conditions and procedures, refer to the SHOCK ABSORBERS, STRUT CARTRIDGES AND STRUT ASSEMBLIES section.

ELECTRONIC RIDE CONTROL SHOCK AND STRUT INSPECTION

Condition Code Procedure

Connector bent ..... A .. Require repair or replacement.
Connector broken ..... A .. Require repair or replacement.
Connector loose ..... A .. Require repair or replacement.
Electronic valve control
inoperative ..... 2 ..... (1) Suggest replacement.

*** SUSPENSION UNIFORM INSPECTION (**

Terminal bent ..... A .. Require repair or replacement.
Terminal broken ..... A .. Require repair or replacement.
Terminal corroded ..... A .. Require repair or replacement.
Terminal loose ..... A .. Require repair or replacement.

(1) - It is acceptable to replace with a non-electronically controlled unit, where available.

IDLER ARMS

IDLER ARM INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require replacement of broken part, if available; otherwise, replace idler arm.
Attaching hardware incorrect	A	Require replacement of incorrect part, if available; otherwise, replace idler arm.
Attaching hardware loose	A	Require repair or replacement of loose part, if available; otherwise, replace idler arm.
Attaching hardware missing	C	Require replacement of missing part, if available; otherwise, replace idler arm.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads, if available; otherwise, replace idler arm.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads, if available; otherwise, replace idler arm.
Binding	A	(1) Further inspection required.
Grease boot cracked	2	(2) Suggest replacement.
Grease boot missing	2	(3) Suggest replacement.

Grease boot torn ..... 2 ..... (4) Suggest replacement.
Grease fitting broken ... A ... Require replacement of grease fitting.
Grease fitting missing .. C ... Require replacement of grease fitting.
Grease fitting won't seal ..... A ... Require replacement of grease fitting.
Grease seal missing ..... 2 ..... (5) Suggest replacement.
Grease seal torn ..... 2 ..... (4) Suggest replacement.
Greaseable joint will not take grease ..... 2 ..... (1) Suggest replacement of grease fitting.
Looseness at frame bracket end ..... B ..... (6)(7) Require repair or replacement.
Looseness at link end (perceptible horizontal movement) ..... 1 ..... (8) Suggest replacement.
Looseness at link end that is excessive ..... B ..... (8)(9) Require replacement.
Mounted out of position (center link not parallel) ..... B ..... Require repositioning.
Nut on stud loose ..... A ..... (10) Require repair or replacement.
Seized ..... A ..... Require replacement.
Stud bent ..... B ..... (11) Require replacement.
Stud broken ..... A ..... (11) Require replacement.
Taper hole elongated .... A ..... (12) Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads missing) ..... A ..... (11) Require replacement.
Wear exceeds manufacturer's specifications ..... B ..... Require replacement.

(1) - If greaseable, grease joint. If problem persists or joint is non-greaseable, require replacement.
(2) - Cracked grease boot will allow contaminants to enter joint and will accelerate wear.
(3) - Lack of grease boot will allow contaminants to enter joint and will accelerate wear.
(4) - Torn grease boot will allow contaminants to enter joint and will accelerate wear.
(5) - Missing grease seal will allow contaminants to enter

*** SUSPENSION UNIFORM INSPECTION (**

joint and will accelerate wear.
(6) - If manufacturer's procedures and specifications exist, use those procedures and specifications; otherwise, use an approved inspection method such as the dry park check.
(7) - Looseness is defined as movement that creates excessive toe change.
(8) - If manufacturer's procedures for inspection exist, use those procedures; otherwise, use an approved inspection method such as the dry park check.
CAUTION: DO NOT use pliers or pry bar to check ball and socket movement. Use only moderate hand pressure.
(9) - Excessive looseness is defined as significant enough to affect vehicle handling or structural integrity.
(10) - Check for bent stud or damaged taper hole.
(11) - Check for damaged taper hole.
(12) - Check for damaged stud.

KING PINS

You are not required to replace king pins in axle sets. However, when replacing a king pin due to wear exceeding manufacturer's specifications, you may suggest replacement of the other king pin on the axle if its measurement shows it is close to the end of its useful life.

KING PIN INSPECTION

Condition	Code	Procedure
Bearing balls pitted	A	Require replacement.
Bearing balls worn	A	Require replacement.
Bearing races pitted	A	Require replacement.
Bearing races worn	A	Require replacement.
Bearing rollers pitted	A	Require replacement.
Bearing rollers worn	A	Require replacement.
Bearing seal bent	2	Suggest replacement of seal or bearing.
Bearing seal missing	2	Suggest replacement of seal or bearing.
Bearing seal torn	2	Suggest replacement of seal or bearing.
Binding	A	Require repair or replacement of affected parts.
End caps missing	C	Require replacement of missing part, if available; otherwise,

replace king pin.

End play exceeds specifications ..... B ..... Require repair.

Grease fitting broken ... A .. Require replacement of grease fitting.

Grease fitting missing .. C .. Require replacement of grease fitting.

Grease fitting won't seal ..... A .. Require replacement of grease fitting.

Locating pins missing ... C . Require replacement of missing part, if available; otherwise, replace king pin.

Looseness exceeds manufacturer's specifications ..... B .... Require replacement of worn parts.

Seized ..... A ..... Require replacement.

Threads damaged ..... A . Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.

Will not take grease .... 2 ..... (1) Suggest replacement of grease fitting.

(1) - If king pin will not take grease after replacement of grease fitting, suggest replacement of king pin.

PITMAN ARMS

PITMAN ARM INSPECTION

Condition	Code	Procedure
Attaching hardware incorrect	A	Require replacement of incorrect part, if available; otherwise, replace pitman arm.
Attaching hardware loose	A	Require repair or replacement of loose part, if available; otherwise, replace pitman arm.
Attaching hardware missing	C	Require replacement of missing part, if available; otherwise, replace pitman arm.

*** SUSPENSION UNIFORM INSPECTION GUIDELINE**

Attaching hardware
threads damaged ..... A ... Require repair or replacement
of part with damaged threads,
if available; otherwise,
replace pitman arm.
Attaching hardware
threads stripped
(threads missing) ..... A ..... Require replacement of part
with stripped threads, if
available; otherwise, replace
pitman arm.
Bent ..... B ..... Require replacement.
Binding ..... A ..... (1) Further inspection
required.
Grease boot cracked ..... 2 ..... (2) Suggest replacement.
Grease boot missing ..... 2 ..... (3) Suggest replacement.
Grease boot torn ..... 2 ..... (4) Suggest replacement.
Grease fitting broken ... A ..... Require replacement grease
fitting.
Grease fitting missing .. C ... Require replacement of grease
fitting.
Grease fitting
won't seal ..... A ... Require replacement of grease
fitting.
Grease seal missing ..... 2 ..... (3) Suggest replacement
of seal.
Grease seal torn ..... 2 ..... (4) Suggest replacement
of seal.
Looseness (perceptible
horizontal movement) ... 1 ..... (5) Suggest replacement.
Looseness that is
excessive ..... B ..... (5)(6) Require replacement.
Nut on stud loose ..... A ..... (7) Require repair or
replacement.
Seized ..... A ..... Require replacement.
Splines damaged ..... A .. Require repair or replacement.
Splines stripped
(splines missing) ..... A ..... Require replacement.
Stud bent ..... B ..... (8) Require replacement.
Stud broken ..... A ..... (8) Require replacement.
Stud loose in
taper hole ..... A ..... (8) Require repair or
replacement.
Taper hole elongated .... A ..... (9) Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads

missing) ..... A ..... (8) Require replacement.

(1) - If greaseable, grease joint. If problem persists or joint is non-greaseable, require replacement.
(2) - Cracked grease boot will allow contaminants to enter joint and will accelerate wear.
(3) - Lack of grease boot will allow contaminants to enter joint and will accelerate wear.
(4) - Torn grease boot will allow contaminants to enter joint and will accelerate wear.
(5) - If manufacturer's procedures for inspection exist, use those procedures; otherwise, use an approved inspection method such as the dry park check.
CAUTION: DO NOT use pliers or pry bar to check ball and socket movement. Use only moderate hand pressure.
(6) - Excessive looseness is defined as being significant enough to affect vehicle handling or structural integrity.
(7) - Check for bent stud of damaged taper hole.
(8) - Check for damaged taper hole.
(9) - Check for damaged stud.

POWER STEERING HOSES

POWER STEERING HOSE INSPECTION

Condition	Code	Procedure
Blistered	B	Require replacement.
Blocked	A	Require repair or replacement.
Fitting threads damaged	A	Require repair or replacement.
Fitting threads stripped (threads missing)	A	Require replacement.
Inner fabric (webbing) cut	A	Require replacement.
Leaking	A	Require repair or replacement.
Missing	C	Require replacement.
Outer covering is cracked to the extent that the inner fabric of hose is visible	B	Require replacement.
Restricted	A	Require repair or replacement.

POWER STEERING (HYDRAULIC) PUMPS

If diagnosis has determined that complete disassembly is necessary to determine the extent of the system failure, the suggestion may be made to rebuild or replace the power steering pump. Repair or replacement of the following components may be required if performed as part of a power steering pump overhaul or rebuild service to meet a minimum rebuild standard.

POWER STEERING (HYDRAULIC) PUMP INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part.
Attaching hardware broken	A	Require replacement of broken part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Belt alignment incorrect	B	(1) Further inspection required.
Belt cracked	1	Suggest replacement.
Belt frayed	1	Suggest replacement.
Belt missing	C	Require replacement.
Belt noisy	2	(2) Further inspection required.
Belt plies separated	A	Require replacement.
Belt tension out of specification	B	Require adjustment or replacement.
Belt worn beyond adjustment range	B	Require replacement.
Belt worn so it contacts bottom of pulley	A	Require replacement.
Binding	A	Require repair or replacement.

Fluid at or beyond
service interval ..... 3 ..... Suggest fluid change.
Fluid contaminated ..... B ..... (3) Require flushing and refilling of the system.
Fluid level incorrect ... B ..... Require adjustment of fluid level.
Inadequate assist ..... A ..... (4) Further inspection required.
Leaking ..... A .. Require repair or replacement.
Noise ..... 2 ..... (5) Further inspection required.
Pulley bent ..... A ... Require repair or replacement of pulley.
Pulley missing ..... C .. Require replacement of pulley.
Remote reservoir
leaking ..... A ..... Require replacement of reservoir,
Reservoir cap broken .... A ..... Require replacement of cap.
Reservoir cap missing ... C ..... Require replacement of cap.
Seized ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped
(threads missing) ..... A ..... Require replacement.

(1) - Determine cause of incorrect alignment and require repair.
(2) - Determine cause of noise and suggest repair.
(3) - Determine and correct source of contamination. OEM specifications must be followed for fluid type.
(4) - If pump is source of inadequate assist, require repair or replacement.
(5) - If noise is isolated to pump, suggest repair or replacement.

RADIUS ARMS

RADIUS ARM INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ... Require replacement of broken part.
Attaching hardware
incorrect ..... A ..... Require replacement of incorrect part.

Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Bent	B	Require replacement.
Corroded, affecting structural integrity	A	Require replacement.
Holes distorted	A	Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

RELAY RODS

RELAY ROD INSPECTION

Condition	Code	Procedure
Attaching hardware incorrect	A	Require replacement of incorrect part, if available; otherwise, replace relay rod.
Attaching hardware loose	A	Require repair or replacement of loose part, if available; otherwise, replace relay rod.
Attaching hardware missing	C	Require replacement of missing part, if available; otherwise, replace relay rod.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads, if available; otherwise, replace relay rod.
Attaching hardware		

threads stripped (threads missing)	A	Require replacement of part with stripped threads, if available; otherwise, replace relay rod.
Bent	B	Require replacement.
Binding	A	(1) Further inspection required.
Grease boot cracked	2	(2) Suggest replacement.
Grease boot missing	2	(3) Suggest replacement.
Grease boot torn	2	(4) Suggest replacement.
Grease fitting broken	A	Require replacement grease fitting.
Grease fitting missing	C	Require replacement of grease fitting.
Grease fitting won't seal	A	Require replacement of grease fitting.
Grease seal missing	2	(3) Suggest replacement.
Grease seal torn	2	(4) Suggest replacement.
Looseness (perceptible horizontal movement)	1	(5) Suggest replacement.
Looseness that is excessive	B	(5)(6) Require replacement.
Seized	A	Require replacement.
Stud bent	B	(7) Require replacement.
Stud loose in taper hole	A	(7) Require repair or replacement.
Taper hole elongated	A	(8) Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	(7) Require replacement.
Wear exceeds manufacturer's specifications	B	Require replacement.

(1) - If greaseable, grease joint. If problem persists or joint is non-greaseable, require replacement.
(2) - Cracked grease boot will allow contaminants to enter the joint and will accelerate wear.
(3) - Lack of grease boot will allow contaminants to enter the joint and will accelerate wear.
(4) - Torn grease boot will allow contaminants to enter the joint and will accelerate wear.
(5) - If manufacturer's procedures for inspection exist, use

those procedures; otherwise, use an approved inspection method such as the dry park check.

CAUTION: DO NOT use pliers or pry bar to check ball and socket movement. Use only moderate hand pressure.

(6) - Excessive looseness is defined as being significant enough to affect vehicle handling or structural integrity.

(7) - Check for damaged taper hole.

(8) - Check for damaged stud.

SHOCK ABSORBERS, STRUT CARTRIDGES AND STRUT ASSEMBLIES

You are not required to replace shocks or struts in axle sets. However, when replacing a shock or strut due to the conditions that follow, you may suggest replacement of the other shock or strut on the same axle for improved performance and preventive maintenance.

* Part is close to the end of its useful life
* To extend tire life
* To balance ride and handling
* To improve stopping distance

When replacing steering and/or suspension components which may affect an alignment angle, you are required to check and adjust alignment as needed. Refer to the OEM specifications.

Under no circumstances should a technician bend struts or strut housings.

A vehicle's load-carrying and handling abilities are limited by its suspension, tires, brakes, and driveline. Installing coil over shocks or any other load assist device does not increase the vehicle's load capacity. See the vehicle owner's manual for more details.

NOTE: If vehicle is equipped with original equipment coil over shocks, apply the conditions for coil springs from the SPRINGS - COIL, LEAF AND TORSION BAR section of the STEERING AND SUSPENSION guidelines. If the vehicle is equipped with add-on coil over shocks, you may suggest replacing the shocks with standard shocks for any spring-related condition.

SHOCK ABSORBER, STRUT CARTRIDGE AND STRUT ASSEMBLY INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	... Require repair or replacement

of bent part, if available; otherwise, replace shock or strut.

Attaching hardware broken ..... A ... Require replacement of broken part, if available; otherwise, replace shock or strut.

Attaching hardware corroded, affecting structural integrity ... A . Require replacement of corroded part, if available; otherwise, replace shock or strut.

Attaching hardware incorrect ..... A ..... Require replacement of incorrect part, if available; otherwise, replace shock or strut.

Attaching hardware loose ..... A ... Require repair or replacement of loose part, if available; otherwise, replace shock or strut.

Attaching hardware missing ..... C .. Require replacement of missing part, if available; otherwise, replace shock or strut.

Attaching hardware threads damaged ..... A ... Require repair or replacement of part with damaged threads, if available; otherwise, replace shock or strut.

Attaching hardware threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads, if available; otherwise, replace shock or strut.

Binding ..... A ..... Require replacement.

Body dented ..... A ..... (1) Further inspection required.

Body punctured ..... A ..... Require replacement.

Brake hose bracket bent ..... B .. Require repair or replacement.

Brake hose bracket missing ..... C ..... Require replacement.

Brake hose bracket

*** SUSPENSION UNIFORM INSPECTIC**

threads damaged ..... A .. Require repair or replacement.
Brake hose bracket
threads stripped
(threads missing) ..... C ..... Require replacement.
Compression bumper
missing ..... C ..... Require replacement of compression bumper.
Compression bumper
split ..... 1 ..... Suggest replacement of compression bumper.
Damping (none) ..... A ..... Require replacement.
Dust boot (bellows)
split ..... 2 ..... (2) Suggest replacement of boot.
Dust boot (bellows)
missing ..... 2 ..... (2) Suggest replacement of boot.
Dust boot (bellows)
torn ..... 2 ..... (2) Suggest replacement of boot.
Dust shield broken ..... 2 ..... (2) Suggest replacement.
Dust shield missing ..... 2 ..... (2) Suggest replacement.
Gland nut (strut housing
cap) is not removable
using appropriate tool . A .. (3) Require replacement of nut and/or housing.
Gland nut (strut housing
cap) threads damaged ... A ... Require repair or replacement of nut.
Gland nut (strut housing
cap) threads stripped
(threads missing) ..... A ..... Require replacement of nut.
Housing dented ..... A ..... (1) Further inspection required.
Housing punctured ..... A ..... Require replacement.
Jounce bumper missing ... C ... Require replacement of jounce bumper.
Jounce bumper split ..... 1 ... Suggest replacement of jounce bumper.
Leaking oil, enough for
fluid to be running down
the body ..... A ..... (4) Require replacement.
Noise ..... 2 ..... (5) Further inspection required.
Piston rod bent ..... A ..... Require replacement.
Piston rod broken ..... A ..... Require replacement.

Piston rod has surface defect ..... 2 ..... Suggest replacement.
Piston rod threads damaged ..... A .. Require repair or replacement.
Piston rod threads stripped (threads missing) ..... A ..... Require replacement.
Seized ..... A ..... Require replacement.
Shock missing ..... C ..... Require replacement.
Strut housing bent ..... A ..... Require replacement.
Strut housing cap (gland nut) is not removable using appropriate tool . A ..... (3) Require replacement of nut and/or housing.
Strut housing cap (gland nut) threads damaged ... A ... Require repair or replacement of nut.
Strut housing cap (gland nut) threads stripped (threads missing) ..... A ..... Require replacement of nut.
Strut housing severely corroded, affecting structural integrity ... A ..... Require replacement.
Strut housing threads damaged ..... A .. Require repair or replacement.
Strut housing threads stripped (threads missing) ..... A ..... Require replacement.
Tire cupping ..... A ..... (6) Further inspection required.

(1) - Require replacement of units where dents restrict shock or strut piston rod movement. If dents don't restrict movement, no service is suggested or required. Especially critical on mono-tube shocks.
(2) - This condition can lead to damage of the piston rod, which, in turn, causes premature piston rod seal wear.
(3) - Only required if replacing cartridge.
(4) - CAUTION: If the strut cartridge has been replaced previously, the oil on the strut housing may be filler oil. The technician must identify the source of the oil.
(5) - If noise is isolated to shock or strut, suggest replacement.
(6) - Although shocks or struts may have contributed to tire cupping, an inspection is needed of the entire suspension system. If the shock or strut is found to be contributing

to the tire cupping, require replacement.

SPINDLES

SPINDLE INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require replacement of broken part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Bent	B	Require replacement.
Broken	A	Require replacement.
Race seat area undersized	B	Require replacement.
Scored	A	Require repair or replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

SPRINGS - COIL, LEAF AND TORSION BAR

When springs are replaced, it is suggested, but not required, that both springs on an axle be replaced to maintain equal height from side to side and to provide a balanced ride and proper handling.

When variable rate springs are installed in place of conventional coil springs, they must be installed in axle sets to ensure proper handling, uniform ride, and proper chassis height.

Erroneous height measurements may result from: improper tire inflation, non-standard tire or wheel size, and heavy load in vehicle or trunk.

SPRING (COIL, LEAF AND TORSION BAR) INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part.
Attaching hardware broken	A	Require replacement of broken part.
Attaching hardware corroded, affecting structural integrity	A	Require replacement of corroded part.
Attaching hardware incorrect	A	Require replacement of incorrect part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Broken (all springs except secondary leave(s) on multi-leaf springs)	A	Require replacement.
Coil clash		(1) Require ride height check.
Coil spring insulator deteriorated	2	Suggest replacement of insulator.
Coil spring insulator missing	2	Suggest replacement of insulator.
Coil spring insulator split	2	Suggest replacement of insulator.
Coil spring plastic		

coating deteriorated -
rust present ..... A ..... (2) Refer to manufacturer's service requirements.
Composite spring
damaged .... (3) Further inspection required.
Cracked (all springs
except composite leaf and
secondary leave(s) on
multi-leaf springs) ... A ..... Require replacement.
Installed incorrectly .. B ..... Require repair.
Leaf spring insulators
missing ..... 2 ..... Suggest replacement of insulators.
Secondary leaf on multi-
leaf spring broken .... 1 .... Suggest repair or replacement
Secondary leaf on multi-
leaf spring cracked ... 1 .... Suggest repair or replacement
Torsion bar
adjuster bent ..... A ..... (4) Require repair or replacement of adjuster.
Torsion bar adjuster
seized ..... A .... (4) Require repair or replacement of adjuster.
Torsion bar adjuster
threads damaged ..... A .... (4) Require repair or replacement of part with damaged threads.
Torsion bar adjuster
threads stripped
(threads missing) ..... A ..... Require replacement of part with stripped threads.
Vehicle suspension height
not within OEM
specifications ..... B ..... Require adjustment or replacement.

(1) - If vehicle is within manufacturer's height specifications, no service is suggested or required.
(2) - Some manufacturers require replacement under these conditions.
(3) - Check vehicle ride height. If ride height is OK, no service is suggested or required.
(4) - Only required if ride height needs to be adjusted.

CAUTION: When replacing steel power steering lines, be sure to use a replacement product that meets or exceeds OEM design specifications.

STEEL POWER STEERING LINE INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part.
Attaching hardware broken	A	Require replacement of broken part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Blocked	A	Require repair or replacement.
Fitting incorrect (such as compression fitting)	B	Require replacement.
Flare type incorrect	B	Required replacement.
Leaking	A	Require tightening or replacement.
Line type incorrect	B	Require replacement.
Restricted	A	Require replacement.
Routed incorrectly	B	Require routing correction.
Rust-pitted	1	Suggest replacement.
Rust pitted, affecting structural integrity	A	Require replacement.

STEERING ARMS

STEERING ARM INSPECTION *** SUSPENSION UNIFORM INSPECTION GUIDELINES *Article Te**

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part.
Attaching hardware broken	A	Require replacement of broken part.
Attaching hardware incorrect	A	Require replacement of incorrect part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Bent	B	Require replacement.
Broken	A	Require replacement.
Taper hole elongated	A	(1) Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require replacement.

(1) - Check for damaged stud.

STEERING DAMPERS

The following procedures are only required if the vehicle was originally equipped from the factory with a steering damper. If the steering damper is an add-on unit, then the unit may be removed instead of repairing or replacing.

STEERING DAMPER INSPECTION

Condition	Code	Procedure

Attaching hardware bent . B ... Require repair or replacement of bent part, if available; otherwise, replace steering damper.

Attaching hardware broken ..... A ... Require replacement of broken part, if available; otherwise, replace steering damper.

Attaching hardware corroded, affecting structural integrity ... A . Require replacement of corroded part, if available; otherwise, replace steering damper.

Attaching hardware incorrect ..... A ..... Require replacement of incorrect part, if available; otherwise, replace steering damper.

Attaching hardware loose ..... A ... Require repair or replacement of loose part, if available; otherwise, replace steering damper.

Attaching hardware missing ..... C .. Require replacement of missing part, if available; otherwise, replace steering damper.

Attaching hardware threads damaged ..... A ... Require repair or replacement of part with damaged threads, if available; otherwise, replace steering damper.

Attaching hardware threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads, if available; otherwise, replace steering damper.

Binding ..... A ..... Require replacement.

Damper body dented ..... A ..... (1) Further inspection required.

Damper body punctured ... A ..... Require replacement.

Damping (none) ..... A ..... Require replacement.

Dust boot (bellows) missing ..... 2 ..... (2) Suggest replacement of boot.

Dust boot (bellows)
split ..... 2 ..... (2) Suggest replacement of boot.
Dust shield broken ..... 2 ..... (2) Suggest replacement.
Dust shield missing ..... 2 ..... (2) Suggest replacement.
Leaking oil, enough for fluid to be running down the body ..... A ..... Require replacement.
Loose ..... A .. Require repair or replacement.
Missing ..... C ..... Require replacement.
Noise ..... 2 ..... (3) Further inspection required.
Piston rod bent ..... A ..... Require replacement.
Piston rod broken ..... A ..... Require replacement.
Piston rod has surface defect ..... 2 ..... Suggest replacement.
Piston rod threads stripped (threads missing) ..... A ..... Require replacement.
Piston rod threads damaged ..... A .. Require repair or replacement.
Seized ..... A ..... Require replacement.

(1) - Require replacement of units where dents restrict damper piston rod movement. If dents don't restrict movement, no service is suggested or required. Especially critical on mono-tube dampers.
(2) - This condition can lead to damage of the piston rod, which, in turn, causes premature piston rod seal wear.
(3) - If noise is isolated to damper, suggest replacement.

STEERING GEARS (EXCEPT RACK AND PINION)

If diagnosis has determined that complete disassembly is necessary to determine the extent of the system failure, the suggestion may be made to rebuild or replace the power steering pump. Repair or replacement of the following components may be required, if performed as part of a power steering pump overhaul or rebuild service to meet a minimum rebuild standard.

STEERING GEAR (EXCEPT RACK AND PINION) INSPECTION

Condition	Code	Procedure
Attaching hardware		

broken ..... A .. Require replacement of broken part.
Attaching hardware loose ..... A .. Require repair or replacement of loose part.
Attaching hardware missing ..... C ..... Require replacement of missing part.
Attaching hardware threads damaged ..... A .. Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing) ..... A .... Require replacement of part with stripped threads.
Binding ..... A ... Require repair or replacement
Flex coupler binding .... A ... Require repair or replacement of coupler.
Flex coupler loose ..... A ... Require repair or replacement of coupler.
Flex coupler missing parts ..... A ... Require repair or replacement of coupler.
Flex coupler soft/spongy ..... A . Require replacement of coupler.
Flex coupler torn ..... A . Require replacement of coupler.
Fluid contaminated ..... B ..... (1) Require flushing and refilling of the system.
Gasket leaking ..... A ... Require repair or replacement of gasket.
Housing leaking ..... A ..... Require replacement.
Hydraulic fittings leaking ..... A ... Require repair or replacement of fittings.
Inadequate power assist . A ..... (2) Further inspection required. See note below.
Lash exceeds manufacturer's specifications ..... B .. Require repair or replacement.
Seal leaking ..... A ... Require repair or replacement of seal and/or mating part.
Splines damaged ..... A ... Require repair or replacement of splines.
Splines stripped ..... A . Require replacement of splines.
Steering coupler

shield cracked ..... 2 ..... Suggest replacement.
Steering coupler
shield missing ..... C ..... Require replacement.
Threads damaged ..... A ... Require repair or replacement of part with damaged threads.
Threads stripped
(threads missing) ..... A ..... Require replacement of part with stripped threads.
U-joint binding ..... A ... Require repair or replacement of joint.
U-joint loose ..... A ... Require repair or replacement of joint.
Unequal power assist .... A .. Require repair or replacement.

(1) - Determine and correct source of contamination. OEM specifications must be followed for fluid type.
(2) - If steering gear is source of inadequate assist, require repair or replacement.

STEERING GEARS - RACK AND PINION

If diagnosis has determined that complete disassembly is necessary to determine the extent of the system failure, the suggestion may be made to rebuild or replace the power steering pump. Repair or replacement of the following components may be required, if performed as part of a power steering pump overhaul or rebuild service to meet a minimum rebuild standard.

STEERING GEARS - RACK AND PINION INSPECTION

Condition Code Procedure

Attaching hardware
broken ..... A ..... Require replacement of broken part.
Attaching hardware
loose ..... A .. Require repair or replacement of loose part.
Attaching hardware
missing ..... C ..... Require replacement of missing part.
Attaching hardware
threads damaged ..... A .. Require repair or replacement of part with damaged threads.
Attaching hardware

threads stripped
(threads missing) ..... A .... Require replacement of part with stripped threads.
Balance tube blocked .... A .. Require repair or replacement of balance tube.
Balance tube missing .... C .. Require replacement of balance tube.
Balance tube restricted . A ... Require repair or replacement of balance tube.
Bellows boot
clamp missing ..... C ... Require replacement of clamp.
Bellows boot cracked
(not through) ..... 2 .. Suggest replacement of bellows boot.
Bellows boot missing .... C .. Require replacement of bellows boot.
Bellows boot
not sealing ..... A ... Require repair or replacement of bellows boot.
Bellows boot torn ..... A .. Require replacement of bellows boot.
Bellows boot twisted
(from toe adjustment) .. B ..... Require repair.
Fitting leaking ..... A .. Require repair or replacement.
Fitting missing ..... A . Require replacement of fitting.
Fitting threads
damaged ..... A ... Require repair or replacement of part with damaged threads.
Fitting threads stripped
(threads missing) ..... A ..... Require replacement of part with stripped threads.
Flex coupler binding .... A ... Require repair or replacement of coupler.
Flex coupler loose ..... A ... Require repair or replacement of coupler.
Flex coupler
missing parts ..... A ... Require repair or replacement of coupler.
Flex coupler
soft/spongy ..... A . Require replacement of coupler.
Flex coupler torn ..... A . Require replacement of coupler.
Fluid contaminated ..... B ..... (1) Require flushing and refilling of the system.
Gasket leaking ..... A .. Require repair or replacement.
Hard steering on cold
start-up ..... 1 ..... (2) Suggest repair or

replacement.

Housing cracked, affecting structural integrity ..... B ..... Require replacement.
Housing leaking ..... A ..... Require replacement.
Inadequate power assist . A ..... (3) Further inspection required.
Lash exceeds manufacturer's specifications ..... B .. Require repair or replacement.
Seal leaking ..... A .. Require repair or replacement.
Splines damaged ..... A .. Require repair or replacement.
Splines stripped (splines missing) ..... A ..... Require replacement.
Steel line blocked ..... A ... Require repair or replacement of line.
Steel line leaking ..... A ... Require repair or replacement of line.
Steel line missing ..... C .... Require replacement of line.
Steel line restricted ... A ... Require repair or replacement of line.
Steering coupler shield cracked ..... 2 ..... Suggest replacement.
Steering coupler shield missing ..... C ..... Require replacement.
Steering coupler shield torn ..... 2 ..... Suggest replacement.
Threads damaged ..... A ... Require repair or replacement of part with damaged threads.
Threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads.
U-joint binding ..... A ... Require repair or replacement of joint.
U-joint loose ..... A ... Require repair or replacement of joint.
Unequal power assist .... A .. Require repair or replacement.

(1) - Determine and correct source of contamination. Follow OE specifications for fluid type.
(2) - Indicates internal wear.
(3) - If steering gear is source of inadequate assist, require repair or replacement.

STEERING KNUCKLE INSPECTION

Condition	Code	Procedure
Attaching hardware bent	B	Require repair or replacement of bent part.
Attaching hardware broken	A	Require replacement of broken part.
Attaching hardware incorrect	A	Require replacement of incorrect part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Bent	B	Require replacement.
Broken	A	Require replacement.
Pinch bolt incorrect	B	Require replacement with bolt that meets OE design.
Pinch bolt loose	B	Require repair.
Pinch bolt missing	B	Require replacement.
Pinch bolt tabs deformed (pinched together), .032" or more before clamping	B	(1) Require replacement.
Taper hole elongated	A	(2) Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	Require repair or replacement.

(1) - Steering knuckle deformation can cause pinch bolt breakage.
(2) - Check for damaged stud.

STRIKE OUT BUMPERS

STRIKE OUT BUMPER INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require replacement of broken part.
Attaching hardware corroded, affecting structural integrity	A	Require replacement of corroded part.
Attaching hardware loose	A	Require repair or replacement of loose part.
Attaching hardware missing	C	Require replacement of missing part.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads.
Missing	C	Require replacement.
Split	1	Suggest replacement.

STRUT RODS

STRUT ROD INSPECTION

Condition	Code	Procedure
Adjusting nut seized	A	(1) Require repair or replacement.
Attaching hardware bent	B	Require repair or replacement of bent part, if available; otherwise, replace strut rod.
Attaching hardware broken	A	Require replacement of broken

part, if available; otherwise, replace strut rod.

Attaching hardware incorrect ..... A ..... Require replacement of incorrect part, if available; otherwise, replace strut rod.

Attaching hardware loose ..... A ... Require repair or replacement of loose part, if available; otherwise, replace strut rod.

Attaching hardware missing ..... C .. Require replacement of missing part, if available; otherwise, replace strut rod.

Attaching hardware threads damaged ..... A ... Require repair or replacement of part with damaged threads, if available; otherwise, replace strut rod.

Attaching hardware threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads, if available; otherwise, replace strut rod.

Attaching (mating) hole oversized ..... A ... Require repair or replacement of frame.

Attaching point on frame corroded, affecting structural integrity ... A ..... Require repair of frame.

Bent ..... A ..... Require replacement.

Mating (attaching) hole oversized ..... A ... Require repair or replacement of frame.

Threads damaged ..... A .. Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.

(1) - Only required if an alignment is being performed.

STRUT UPPER BEARING PLATE ASSEMBLIES

NOTE: When the following guidelines indicate replacement of bearing, only the bearing should be replaced if it is

available separately; otherwise, replace the bearing plate assembly.

STRUT UPPER BEARING PLATE ASSEMBLY INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require replacement of broken part, if available; otherwise, replace bearing plate assembly.
Attaching hardware loose	A	Require repair or replacement of loose part, if available; otherwise, replace bearing plate assembly.
Attaching hardware missing	C	Require replacement of missing part, if available; otherwise, replace bearing plate assembly.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads, if available; otherwise, replace bearing plate assembly.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads, if available; otherwise, replace bearing plate assembly.
Bearing axial or radial movement exceeds vehicle manufacturer's specifications	B	Require replacement of bearing.
Bearing binding	A	Require replacement of bearing.
Bearing missing	C	Require replacement of bearing.
Bearing seized	A	Require replacement of bearing.
Bent	B	Require replacement.
Holes distorted	A	Require replacement.
Missing	C	Require replacement.
Severely corroded,		

affecting structural
integrity ..... A ..... Require replacement.

SWAY BAR LINKS

SWAY BAR LINK INSPECTION

Condition	Code	Procedure
Attaching hardware incorrect	A	Require replacement of incorrect part, if available; otherwise, replace link.
Attaching hardware loose	A	Require repair or replacement of loose part, if available; otherwise, replace link.
Attaching hardware missing	C	Require replacement of missing part, if available; otherwise, replace link.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads, if available; otherwise, replace link.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads, if available; otherwise, replace link.
Ball and socket has looseness (perceptible vertical movement)	1	(1) Suggest replacement.
Ball and socket has looseness that is excessive	B	(1)(2) Require replacement.
Bent	B	Require replacement.
Broken	A	Require replacement.
Corroded, affecting structural integrity	A	Require replacement.
Grease boot cracked	2	(3) Suggest replacement.
Grease boot missing	2	(4) Suggest replacement.
Grease boot torn	2	(5) Suggest replacement.

Missing ..... C ..... Require replacement.
Nut on stud loose ..... A ..... (6) Require repair.
Stud bent ..... B ..... (7) Require replacement.
Stud broken ..... A ..... (7) Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped (threads
missing) ..... A ..... (7) Require replacement.

(1) - If manufacturer's procedures for inspection exist, use those procedures; otherwise, use an approved inspection method such as the dry park check.
CAUTION: DO NOT use pliers or pry bar to check ball and socket movement. Use only moderate hand pressure.
(2) - Excessive looseness is defined as being significant enough to affect vehicle handling or structural integrity.
(3) - Cracked grease boot will allow contaminants to enter the joint and will accelerate wear.
(4) - Lack of grease boot will allow contaminants to enter the joint and will accelerate wear.
(5) - Torn grease boot will allow contaminants to enter the joint and will accelerate wear.
(6) - Check for bent stud or damaged taper hole.
(7) - Check for damaged taper hole.

SWAY BARS

SWAY BAR INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require replacement of broken part, if available; otherwise, replace sway bar.
Attaching hardware corroded, affecting structural integrity	A	Require replacement of corroded part, if available; otherwise, replace sway bar.
Attaching hardware loose	A	Require repair or replacement of loose part, if available; otherwise, replace sway bar.
Attaching hardware		

missing ..... C .. Require replacement of missing part, if available; otherwise, replace sway bar.

Attaching hardware threads damaged ..... A ... Require repair or replacement of part with damaged threads, if available; otherwise, replace sway bar.

Attaching hardware threads stripped (threads missing) ..... A ..... Require replacement of part with stripped threads, if available; otherwise, replace sway bar.

Bent ..... B ..... Require replacement.

Broken ..... A ..... Require replacement.

Threads damaged ..... A .. Require repair or replacement.

Threads stripped (threads missing) ..... A ..... Require replacement.

TIE ROD ENDS (INNER AND OUTER)

TIE ROD END (INNER AND OUTER) INSPECTION

Condition	Code	Procedure
Attaching hardware incorrect	A	Require replacement of incorrect part, if available; otherwise, replace tie rod end.
Attaching hardware loose	A	Require repair or replacement of loose part, if available; otherwise, replace tie rod end.
Attaching hardware missing	C	Require replacement of missing part, if available; otherwise, replace tie rod end.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads, if available; otherwise, replace tie rod end.
Attaching hardware threads stripped		

*** SUSPENSION UNIFORM INSPECTION GUIDELINES *Article Text (p. 55)**

(threads missing) ..... A ..... Require replacement of part with stripped threads, if available; otherwise, replace tie rod end.

Adjusting sleeve bent ... B ... Require replacement of sleeve or tie rod end.

Adjusting sleeve clamps out of position ..... B ..... Require repair.

Adjusting sleeve corroded, affecting structural integrity ... A ... Require replacement of sleeve or tie rod end.

Adjusting sleeve missing ..... C ... Require replacement of sleeve or tie rod end.

Adjusting sleeve seized ..... A ..... (1) Require repair or replacement.

Adjusting sleeve threads damaged ..... A ... Require repair or replacement of sleeve or tie rod end.

Adjusting sleeve threads stripped (threads missing) ..... A ... Require replacement of sleeve or tie rod end.

Binding ..... A ..... (2) Further inspection required.

Grease boot cracked ..... 2 ..... (3) Suggest replacement.

Grease boot missing ..... 2 ..... (4) Suggest replacement.

Grease boot torn ..... 2 ..... (5) Suggest replacement.

Grease fitting broken ... A ... Require replacement of grease fitting.

Grease fitting missing .. C ... Require replacement of grease fitting.

Grease fitting won't seal ..... A ... Require replacement of grease fitting.

Grease seal missing ..... 2 ..... (4) Suggest replacement of seal.

Grease seal torn ..... 2 ..... (5) Suggest replacement of seal.

Greaseable tie rod end won't take grease ..... 2 ..... (6) Suggest replacement of grease fitting.

Looseness (perceptible horizontal movement) ... 1 ..... (7) Suggest replacement.

Looseness exceeds
manufacturer's
specifications ..... B ..... Require replacement.
Looseness that is
excessive ..... B ..... (7)(8) Require replacement.
Nut on stud loose ..... A ..... (9) Require repair or
replacement of nut.
Seized ..... A ..... Require replacement
Stud bent ..... B ..... (10) Require replacement.
Stud broken ..... A ..... (10) Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped
(threads missing) ..... A ..... (10) Require replacement.

(1) - Only required if toe needs to be adjusted.
(2) - If greaseable, grease joint. If problem persists or joint is non-greaseable, require replacement.
(3) - Cracked grease boot will allow contaminants to enter joint and will accelerate wear.
(4) - Lack of grease boot will allow contaminants to enter joint and will accelerate wear.
(5) - Torn grease boot will allow contaminants to enter joint and will accelerate wear.
(6) - If greaseable tie rod end will not take grease after replacing the grease fitting, suggest replacement of tie rod end.
(7) - If manufacturer's procedures for inspection exist, use those procedures; otherwise, use an approved inspection method such as the dry park check.
CAUTION: DO NOT use pliers or pry bar to check ball and socket movement. Use only moderate hand pressure.
(8) - Excessive looseness is defined as being significant enough to affect vehicle handling or structural integrity.
(9) - Check for bent stud or damaged taper hole.
(10) - Check for damaged taper hole.

TRACK BARS

TRACK BAR INSPECTION

Condition Code Procedure

Attaching hardware
incorrect ..... A ..... Require replacement of
incorrect part, if available;

*** SUSPENSION UNIFORM INSPECTION (**

		otherwise, replace track bar.
Attaching hardware loose	A	Require repair or replacement of loose part, if available; otherwise, replace track bar.
Attaching hardware missing	C	Require replacement of missing part, if available; otherwise, replace track bar.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads, if available; otherwise, replace track bar.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads, if available; otherwise, replace track bar.
Bent	B	Require replacement.
Corroded, affecting structural integrity	A	Require replacement.
Grease boot cracked	2	(1) Suggest replacement.
Grease boot missing	2	(2) Suggest replacement.
Grease boot torn	2	(3) Suggest replacement.
Holes distorted	A	Require replacement.
Looseness (perceptible horizontal movement)	1	(4) Suggest replacement.
Looseness that is excessive	B	(4)(5) Require replacement.
Nut on stud loose	A	(6) Require repair or replacement of nut.
Seized	A	Require replacement.
Stud bent	B	(7) Require replacement.
Stud broken	A	(7) Require replacement.
Threads damaged	A	Require repair or replacement.
Threads stripped (threads missing)	A	(7) Require replacement.
Wear exceeds manufacturer's specifications	B	Require replacement.

(1) - Cracked grease boot will allow contaminants to enter joint and will accelerate wear.

(2) - Lack of grease boot will allow contaminants to enter

joint and will accelerate wear.
(3) - Torn grease boot will allow contaminants to enter joint and will accelerate wear.
(4) - If manufacturer's procedures for inspection exist, use those procedures; otherwise, use an approved inspection method such as the dry park check.
CAUTION: DO NOT use pliers or pry bar to check ball and socket movement. Use only moderate hand pressure.
(5) - Excessive looseness is defined as being significant enough to affect vehicle handling or structural integrity.
(6) - Check for bent stud or damaged taper hole.
(7) - Check for damaged taper hole.

TRAILING ARMS

TRAILING ARM INSPECTION

Condition	Code	Procedure
Attaching hardware broken	A	Require replacement of broken part, if available; otherwise, replace trailing arm.
Attaching hardware loose	A	Require repair or replacement of loose part, if available; otherwise, replace trailing arm.
Attaching hardware missing	C	Require replacement of missing part, if available; otherwise, replace trailing arm.
Attaching hardware threads damaged	A	Require repair or replacement of part with damaged threads, if available; otherwise, replace trailing arm.
Attaching hardware threads stripped (threads missing)	A	Require replacement of part with stripped threads, if available; otherwise, replace trailing arm.
Bent	B	Require replacement.
Bushing hole oversized	B	Require replacement.

Corroded, affecting
structural integrity ... A ..... Require replacement.
Holes distorted ..... A ..... Require replacement.
Threads damaged ..... A .. Require repair or replacement.
Threads stripped
(threads missing) ..... A ..... Require replacement.

WHEEL BEARINGS, RACES AND SEALS

NOTE: When replacing or repacking wheel bearings, grease seal replacement is required. You are not required to replace these components in axle sets. Determine the need to replace based upon the individual component conditions that follow.

WHEEL BEARING, RACE AND SEAL INSPECTION

Condition Code Procedure

Rear axle seal on rear-
wheel drive leaking .... A ..... Require replacement of seal and inspection of axle, bearing, housing, and vent tube.
Seal bent ..... 1 ..... Suggest replacement.
Seal leaking ..... A . Require replacement of seal and inspection of bearings.
Seal missing ..... C ..... Require replacement.
Seal torn ..... A ..... Require replacement.
Wheel bearing
assembly feels rough
when rotated ..... A .. Require replacement of bearing assembly.
Wheel bearing balls
are pitted ..... A .. Require replacement of bearing assembly.
Wheel bearing balls
are worn ..... A .. Require replacement of bearing assembly.
Wheel bearing end-play
exceeds vehicle
manufacturer's
specifications ..... B .. Require adjustment of bearing, if possible. If proper adjustment cannot be obtained,

require repair or replacement
of worn component.

Wheel bearing race
is loose in the
hub bore ..... A ..... Require replacement of hub
assembly and wheel bearings.

Wheel bearing races
are pitted ..... A .. Require replacement of bearing
assembly.

Wheel bearing races
are worn ..... A .. Require replacement of bearing
assembly.

Wheel bearing rollers
are pitted ..... A .. Require replacement of bearing
assembly.

Wheel bearing rollers
are worn ..... A .. Require replacement of bearing
assembly.

WHEEL ALIGNMENT

WHEEL ALIGNMENT

Wheel alignment is defined as the measurement, analysis, and adjustment of steering and suspension angles to conform to OEM specifications. These angles usually include, but are not limited to: caster, camber, toe, and thrust angle. Where these angles are not adjustable and not in specification, component replacement or correction kits may be required. Errors in set-back and steering axis inclination (SAI) are often attributable to failed or damaged components and must be corrected prior to performing an alignment.

Failure to replace or correct suggested parts or service may prevent a proper alignment.

Before performing an alignment check, inspect and verify the following:

* Tire pressure and size
* Vehicle loading
* Ride height
* Steering and suspension parts

If the inspection reveals that all the above are within published specifications, a wheel alignment check and an alignment, if needed, may be performed.

*** SUSPENSION UNIFORM INSPECTION GUIDEl**

CAUTION: Under no circumstances should a technician bend or heat any steering or suspension component, unless specified by the vehicle manufacturer, for example, Ford forged twin "I" beam axles. All measurements and specifications must be noted on the inspection report.

WHEEL ALIGNMENT INSPECTION

Condition	Code	Procedure
Dog tracking, shown to be caused by faulty alignment	2	Suggest repair.
Lead, shown to be caused by faulty alignment	A	Require alignment.
Part has been changed, affecting alignment	A	Require alignment check.
Pull, shown to be caused by faulty alignment	A	Require alignment.
Steering wheel off-center	2	Suggest alignment.
Tire wear, shown to be caused by faulty alignment	A	Require alignment.
Wander, shown to be caused by faulty alignment	A	Require alignment.

WHEELS AND TIRES

TIRES

These guidelines do not apply to split rims. Some vehicle manufacturers restrict replacement of tires to specific brands, types, or sizes.

WARNING: High pressure temporary compact spare tires should not be used with any other rims or wheels, nor should standard tires, snow tires, wheel covers, or trim rings be used with high pressure compact spare rims or wheels. Attempting to mount a tire of one diameter on a wheel of a different diameter or flange type may result in serious injury or death.

WARNING: Only specially trained persons should dismount or mount tires. Explosions of tire and wheel assembly can result from improper mounting, possibly causing serious injury or death.

WARNING: Consult the vehicle owner's manual or vehicle placard for correct size, speed rating, designation, and cold inflation pressure of the original tires. DO NOT exceed the maximum load or inflation capacity of the tire specified by the Tire and Rim Association

WARNING: When replacing tires, it is suggested that the replacement tires match or exceed the OEM speed rating designation. If tires of different speed rating designations are mixed on the same vehicle, the tires may vary in handling characteristics. DO NOT mix different speed rating designations on the same axle.

WARNING: DO NOT mix radials with non-radial tires on the same axle, as this may affect vehicle handling and stability. If radial tires and bias or bias-belted ply tires are mixed on the same vehicle, the radials must be on the rear. High-pressure temporary compact spare tires are exempt from this rule.

WARNING: DO NOT mix size or type (all season, performance, mud and snow) of tires on the same axle.

TIRE INSPECTION

Condition	Code	Procedure
Air pressure incorrect	B	Require repair
Bead broken	A	Require replacement.
Bead leaking, caused by tire	A	Require repair or replacement.
Bead wire/cord exposed	A	Require replacement.
Cord or belt material exposed	A	Require replacement.
Cord ply separations	A	Require replacement.
Directional/asymmetrical tires mounted incorrectly	B	Require remounting and/or repositioning.
Irregular tread wear, affecting performance	2	(1) Suggest replacement.

Load ratings less than OEM specifications ..... B ..... Require replacement.
Mixed tread types (all season, performance, mud and snow) on same axle . A ..... Require replacement.
Number of punctures exceeds manufacturer's limit ..... B ..... Require replacement.
Out of balance ..... B . Require rebalance of tire/wheel assembly.
Ply separation ..... A ..... Require replacement.
Pull or lead, caused by tire ..... A .. Require repair or replacement.
Radial and bias or bias-belted ply tires on same axle ..... B .. Require repair or replacement.
Radials are on the front and not on the rear .... B ..... (2) Require repair or replacement.
Run flat damage ..... A ..... Require replacement.
Shoulder cut ..... A ..... Require replacement.
Shoulder puncture ..... A ..... Require replacement.
Shoulder with plug ..... A ..... Require replacement.
Sidewall bulge ..... A ..... Require replacement.
Sidewall cut ..... A ..... Require replacement.
Sidewall indentation .... No service required or suggested.
Sidewall puncture ..... A ..... Require replacement.
Sidewall with plug ..... A ..... Require replacement.
Speed rating designations different on same axle ..... 2 .. Suggest repair or replacement.
Tire and wheel assembly has excessive run-out .. B ..... (3) Require repair or replacement of appropriate part.
Tires with more than 1/4" diameter difference on a four-wheel drive vehicle ..... B ..... Require replacement.
Tread area puncture larger in diameter than manufacturer's specifications ..... B ..... Require replacement.

*** SUSPENSION UNIFORM INSPECTION C**

Tread missing pieces (chunking), exposing cord ..... A ..... Require replacement.
Tread missing pieces (chunking), not exposing cord ..... 1 ..... Suggest replacement.
Tread separations A ..... Require replacement.
Tube in tubeless tire 3 .... (4) Suggest removal of tube.
Weather-checking .... No service required or suggested.
Worn to tread wear indicators ..... B ..... Require replacement.

(1) - Determine and correct cause of irregular tire wear.
(2) - If radials and bias or bias-belted ply tires are on the same vehicle, the radials must be on the rear axle, except for high-pressure temporary spares.
(3) - Excessive is defined as enough to contribute to performance problems. Match mounting may correct run-out. If not, require replacement of appropriate part. Refer to manufacturer's specifications.
(4) - Most manufacturers do not recommend tubes in tubeless tires. Inspect tire and wheel assembly to determine the reason for a tube in tubeless tire. Recommendation for repair or replacement should be based upon condition of tires and/or wheel listed in these guidelines.

VALVE STEMS

VALVE STEM INSPECTION

Condition Code Procedure

Bent ..... 1 ..... Suggest replacement.
Broken ..... A ..... Require replacement.
Cut, but not leaking .... 1 ..... Suggest replacement.
Deteriorated (cracking, dry rot) .... 1 ..... Suggest replacement.
Leaking ..... A . Require repair or replacement.
Missing ..... C ..... Require replacement.
Threads damaged ..... A . Require repair or replacement.
Threads stripped ..... A ..... Require replacement.
Valve cap missing ..... C .... Require replacement of cap.
Weather-checking ..... 1 ..... Suggest replacement.
Won't take air ..... A . Require repair or replacement.

WHEEL ATTACHMENT HARDWARE

For conditions noted below, also check conditions of wheel stud holes.

CAUTION: Proper lug nut torque is essential. Follow recommended torque specifications and tightening sequence. DO NOT lubricate threads unless specified by the vehicle manufacturer.

WHEEL ATTACHMENT HARDWARE INSPECTION

Condition	Code	Procedure
Bent	A	Require replacement.
Broken	A	(1) Require replacement.
Loose	B	Require repair or replacement of affected component.
Lug nut installed backward	B	Require repair or replacement.
Lug nut mating type incorrect	B	Require replacement of nut.
Lug nut mating surface dished	A	Require replacement of nut.
Lug nut rounded	A	(2) Require replacement of nut.
Lug nut seized	A	(2) Require replacement of nut.
Stud incorrect	B	Require replacement of stud.
Threads damaged	A	Require repair or replacement of component with damaged threads.
Threads stripped	A	Require replacement of component with stripped threads.

(1) - Some manufacturers require replacement of all studs on that wheel if two or more studs or nuts on the same wheel are broken or missing.
(2) - Only required if removing wheel.

WHEELS (RIMS)

WARNING: Mounting a regular tire on a high-pressure compact spare wheel is not permitted. Attempting to mount a tire of one

diameter on a wheel of a different diameter or flange type may result in serious injury or death. If the wheel identification stamp is not legible, or cannot be found, do not use the wheel until the size and type have been properly identified. Wheels of different diameter, offset, or width cannot be mixed on the same axle. Bead seat tapers cannot be interchanged.

WHEEL (RIM) INSPECTION

Condition	Code	Procedure
Bead leaking, caused by wheel	A	(1) Require repair or replacement.
Bent hub mounting surface	A	Require replacement.
Bent rim, causing vibration	2	(1) Suggest replacement.
Broken	A	Require replacement.
Cast wheel porous, causing a leak	A	Require repair or replacement.
Clip-on balance weight is incorrect type for rim flange	2	Suggest replacement.
Corrosion, affecting structural integrity	A	Require replacement.
Corrosion build-up on wheel mounting surface	A	Require repair.
Cracked	A	Require replacement.
Directional/asymmetrical wheels mounted incorrectly	B	Require remounting and/or repositioning.
Load capacity less than OEM specifications	B	Require replacement.
Offset mismatched on same axle	B	Require replacement.
Rivets leaking	A	Require replacement.
Run-out beyond OEM specs	B	Require replacement.
Stud holes elongated	A	(2) Require replacement.
Welded or brazed repair	2	Suggest replacement.
Welds leaking	A	Require replacement.

*** SUSPENSION UNIFORM INSPECTION**

Wheel centering (pilot)
hole incorrect ..... B ..... Require replacement.

(1) - CAUTION: DO NOT attempt to correct a bent rim.
(2) - Inspect wheel attaching hardware for damage.

END OF ARTICLE

JACKING & HOISTING
Article Text
1996 Kia Sephia
For 1 1 1 1 1

Saturday, April 18, 2009 10:10PM

ARTICLE BEGINNING

1995-96 WHEEL ALIGNMENT
Kia - Jacking & Hoisting

Sephia

JACKING & HOISTING

* PLEASE READ THIS FIRST *

NOTE: Illustrations are not intended to represent exact structure of each vehicle's frame, underbody or body outline. They are presented only to give a point of reference.

FLOOR JACK

To raise front of vehicle, block rear wheels. Place a floor jack under center of front cross member. Raise vehicle and place safety stands at both sides of either body frame or side sills. To raise rear of vehicle, block front wheels. Place floor jack under center of crossmember. Raise vehicle and place safety stands at both sides of side sills. See Fig. 1.

LIFTING VEHICLE WITH HOIST

Position vehicle in center of hoist. Place lift chocks of hoist behind front tires and in front of rear tires. Align chocks to contact lift points specified in illustration. See Fig. 1. Raise vehicle to bring tires just off ground. Ensure vehicle is secure on hoist. Repeat as necessary.

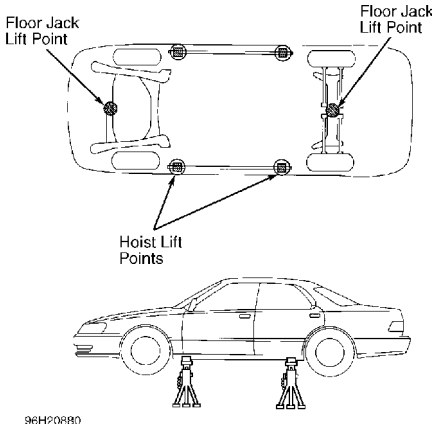

Fig. 1: Identifying Floor Jack & Hoist Lift Points
Courtesy of Kia Motors America, Inc.

END OF ARTICLE

HOW TO USE SYSTEM WIRING DIAGRAMS
Article Text

1996 Kia Sephia
For 1 1 1 1 1

Saturday, April 18, 2009 10:10PM

ARTICLE BEGINNING

GENERAL INFORMATION
Using Wiring Diagrams

All Models

INTRODUCTION

Mitchell obtains wiring diagrams and technical service bulletins, containing wiring diagram changes from the domestic and import manufacturers. These are checked for accuracy and are all redrawn into a consistent format for easy use.

In the past, when cars were simpler, diagrams were simpler. All components were connected by wires and diagrams seldom exceeded 4 pages in length. Today, some wiring diagrams require more than 16 pages. It would be impractical to expect a service technician to trace a wire from page 1 across every page to page 16.

Removing some of the wiring maze reduces eyestrain and time wasted searching across several pages. Today the majority of Mitchell diagrams follow a much improved format, which permits space for internal switch details.

Wiring diagrams are drawn in a "top-down" format. The diagrams are drawn with the power source at the top of the diagram and the ground point at the bottom of the diagram. Components locations are identified on the wiring diagrams. Any wires that don't connect directly to a component are identified on the diagram to indicate where they go.

COLOR ABBREVIATIONS

COLOR ABBREVIATIONS TABLE

Color	Normal	Optional
Black	BLK	BK
Blue	BLU	BU
Brown	BRN	BN
Clear	CLR	CR
Dark Blue	DK BLU	DK BU
Dark Green	DK GRN	DK GN
Green	GRN	GN
Gray	GRY	GY
Light Blue	LT BLU	LT BU

Light Green	LT GRN	LT GN
Orange	ORG	OG
Pink	PNK	PK
Purple	PPL	PL
Red	RED	RD
Tan	TAN	TN
Violet	VIO	VI
White	WHT	WT
Yellow	YEL	YL

IDENTIFYING WIRING DIAGRAM ABBREVIATIONS

NOTE: Abbreviations used on Mitchell diagrams are normally self-explanatory. If necessary see ABBREVIATIONS article in GENERAL INFORMATION.

IDENTIFYING WIRING DIAGRAM SYMBOLS

NOTE: Standard wiring symbol are used in Mitchell diagrams. The illustration below will help clarify any symbols that are not easily understood at a glance. Most components are labeled "Motor", "Switch" or "Relay" in addition to being drawn with the standard symbol.

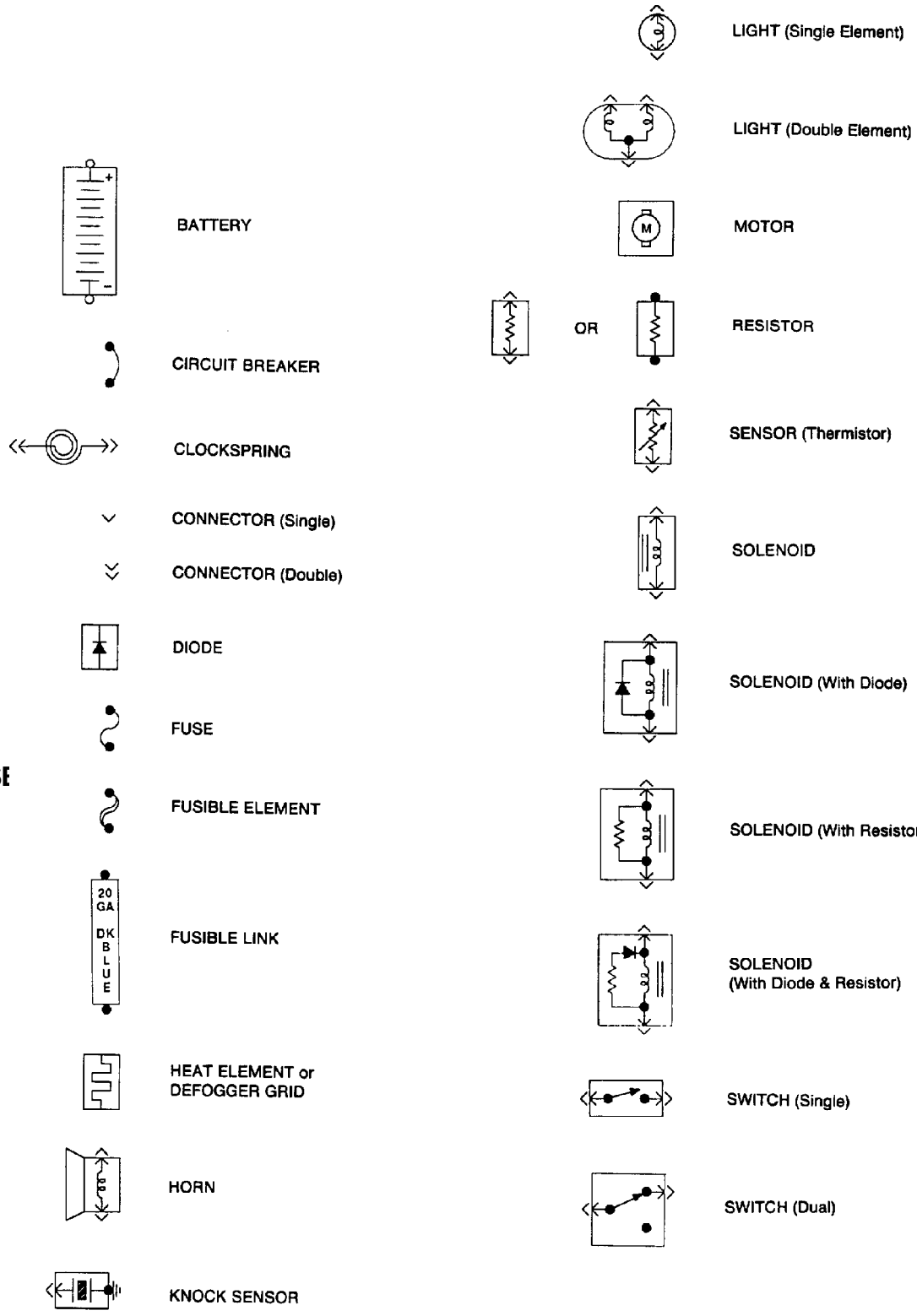

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Fig. 1: Identifying Wiring Diagram Symbols

HOW TO USE

WIRING DIAGRAM COMPONENT LOCATIONS

When trying to locate a component in a wiring diagram and you don't know the specific system where it is located, use this handy component locator to find the system wiring diagram in which the component is located. Then, go to that system and locate the component within the wiring diagram.

For example, if you don't know the specific system in which the ignition switch is located, look up ignition switch in the wiring diagram component location tables and go to the appropriate wiring diagram(s) which contain either full or partial views of the ignition switch. The full view of the ignition switch is located in Power Distribution.

The first listing for the component will be the full or most complete view of the component. Additional listings will be partial views of the component. Not all components are used on all models.

All components will have a partial view in Ground Distribution and Power Distribution. Data Link Connectors show connecting circuits between modules. Alternate names for components may be listed in wiring diagram component locations tables.

WIRING DIAGRAM COMPONENT LOCATIONS TABLE

Component	Wiring Diagram
ABS Electronic Control Unit	Anti-Lock Brakes
	Data Link Connectors
ABS Hydraulic Unit	Anti-Lock Brakes
Acceleration Sensor	Anti-Lock Brakes
Accessory Delay Relay	Power Windows
A/C Compressor Clutch Relay	Engine Performance
A/C Sensor	Engine Performance
A/C Pressure Switch	Engine Performance
Adaptive Lamp Control Module	Exterior Lights
Air Bag(s)	Air Bag Restraint System
Air Bag Module	Air Bag Restraint System
Air Bag Sensor(s)	Air Bag Restraint System
Air Injection Pump Relay	Engine Performance
Air Temperature Sensor	Overhead Console
Alternator (Generator)	Generators & Regulators
Anti-Theft Control Module	Anti-Theft System
	Starters
Autolamp Control Relay	Headlight Systems
	Daytime Running Lights
Automatic Shutdown (ASD) Relay	Engine Performance
	Generators & Regulators
Autostick Switch	Engine Performance

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Heated Oxygen Sensor(s) (HO2S) ..... Engine Performance
Heated Windshield Control Module ..... Heated Windshields
Height Sensor ..... Electronic Suspension
Horns ..... Steering Column Switches
Horn Relay ..... Steering Column Switches
Idle Air Control (IAC) Motor/Valve ..... Engine Performance
Ignition Coil(s) ..... Engine Performance
Ignition Key Lock Cylinder ..... Anti-Theft System
Ignition Module ..... Engine Performance
Ignition Switch ..... Power Distribution
Engine Performance
Generators & Regulators
Starters
Illuminated Entry Module ..... Illumination/Interior Lights
Illumination Lights ..... Illumination/Interior Lights
Impact Sensor ..... Air Bag Restraint System
Inertia Fuel Shutoff Switch ..... Engine Performance
Inhibit Relay ..... Starters
Instrument Cluster ..... Analog Instrument Panels
Intake Air Temperature (IAT) Sensor ..... Engine Performance
Interior Lights ..... Illumination/Interior Lights
Interlock Switch ..... Starters
Junction Block ..... Power Distribution
Keyless Entry Receiver ..... Remote Keyless Entry
Key Reminder Switch ..... Starters
Knock Sensor ..... Engine Performance
Lamp Control Module ..... Exterior Lights
License Plate Lamp ..... Exterior Lights
Lighting Control Module ..... Lighting Control Modules
Anti-Theft System
Daytime Running Lights
Headlight Systems
Lower Relay ..... Power Convertible Top
Malfunction Indicator Light (MIL) ..... Engine Performance
Instrument Panels
Manifold Absolute Pressure (MAP) Sensor ..... Engine Performance
Mass Airflow (MAF) Sensor ..... Engine Performance
Mega Fuse ..... Generators & Regulators
Memory Seat/Mirror Module ..... Memory Systems
Mirror Defogger ..... Rear Window Defogger
Moon Roof Motor ..... Power Moon Roof
Moon Roof Relay ..... Power Moon Roof
Multi-Function Control Module ..... Warning Systems
Neutral Safety Switch ..... Starters
Oil Level Switch ..... Engine Performance
Oil Pressure Switch/Sending Unit ..... Analog Instrument Panels

Engine Performance
Overhead Console ..... Overhead Console
Oxygen Sensor(s) (O2S) ..... Engine Performance
Parking Brake Switch ..... Analog Instrument Panels
Park Lights ..... Exterior Lights
Park/Neutral Position Switch ..... Starters
Engine Performance
Anti-Theft System
Body Control Module
Perimeter Lighting Control Relay ..... Exterior Lights
Power Amplifier ..... Power Antennas
Power Antenna Module ..... Power Antennas
Power Antenna Motor ..... Power Antennas
Power Distribution Center ..... Power Distribution
Generators & Regulators
Starters
Power Door Lock Motors ..... Power Door Locks
Power Mirror Motors ..... Power Mirrors
Memory Systems
Power Sliding Door Controller ..... Power Sliding Side Door
Power Seat Motors ..... Power Seats
Memory Systems
Power Steering Pressure Switch ..... Engine Performance
Power Top Motor ..... Power Convertible Top
Power Top Relay(s) ..... Power Convertible Top
Powertrain Control Module ..... Engine Performance
Analog Instrument Panels
Cruise Control Systems
Data Link Connectors
Generators & Regulators
Starters
Power Window Motors ..... Power Windows
Power Window Relay(s) ..... Power Windows
Radiator Fan Motor(s) ..... Electric Cooling Fans
Radiator Fan Relay(s) ..... Engine Performance
Electric Cooling Fans
Rainsense Module ..... Wiper/Washer Systems
Raise Relay ..... Power Convertible Top
Remote Anti-Theft Personality (RAP) Module ..... Anti-Theft System
Starters
Warning Systems
Seat Belt Pretensioners ..... Air Bag Restraint System
Seat Belt Retractor Solenoid ..... Passive Restraints
Seat Belt Switch ..... Air Bag Restraint System
Passive Restraints
Shift Interlock Solenoid ..... Shift Interlock Systems

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Water-In-Fuel Sensor ..... Engine Performance
Analog Instrument Panels
Wheel Speed Sensors ..... Anti-Lock Brakes
Window Timer Module ..... Power Convertible Top
Windshield Intermittent Wiper Relay ..... Wiper/Washer Systems
Windshield Washer Motor ..... Wiper/Washer Systems
Wiper Motor ..... Wiper/Washer Systems

END OF ARTICLE

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