JAGUAR SPORT

XJR-S

Product Support

Publication number S-80

XJR-S

Technical Introduction

JAGUAR SPORT

JaguarSport and the XJR-S

The Jaguar XJR-S will bring to the USA, for the first time the results of the creation of JaguarSport to cater for potential Jaguar buyers who want an exclusive high performance version of the XJS.

Jaguar, as a producer of specialist cars, saw the need to develop a facility, which would be an extension of its mainstream manufacturing operations and which could produce even more specialized vehicles to cater for those who wished to more fully explore the performance and handling potential of Jaguar's sedans and sporting cars.

Thus in May 1988, JaguarSport was formed as a 50/50 joint venture by Jaguar Cars Limited, and Tom Walkinshaw's TWR Group Limited, to develop and produce a range of modified Jaguars essentially for the British and European markets. TWR is the company which has run the Jaguar IMSA GT program in the USA and in the rest of the world in the World Sports Car Series.

JaguarSport engineers based at TWR's Kidlington headquarters in Oxfordshire, developed the high performance XJR-S, based on the XJS. The Jaguar XJR-S features a six liter version of the famous V12 engine which has powered Jaguar XJR race cars to many victories in both Europe and America. Production XJR-S's are built at JaguarSport's new manufacturing facility at Bloxham, near Banbury in the Cotswolds. This is also the facility where JaguarSport produces the world's fastest production car, the 200mph Jaguar XJ220.

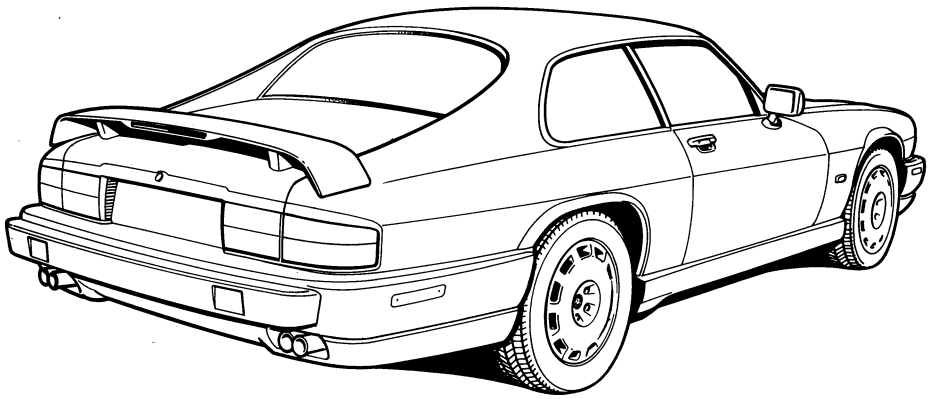
The XJR-S also offers a modified suspension package and an exclusively designed interior, featuring glove-soft Autolux fine grain leather and a hand engraved, sterling silver, numbered plaque by Asprey of London, silversmiths to Her Majesty Queen Elizabeth II.

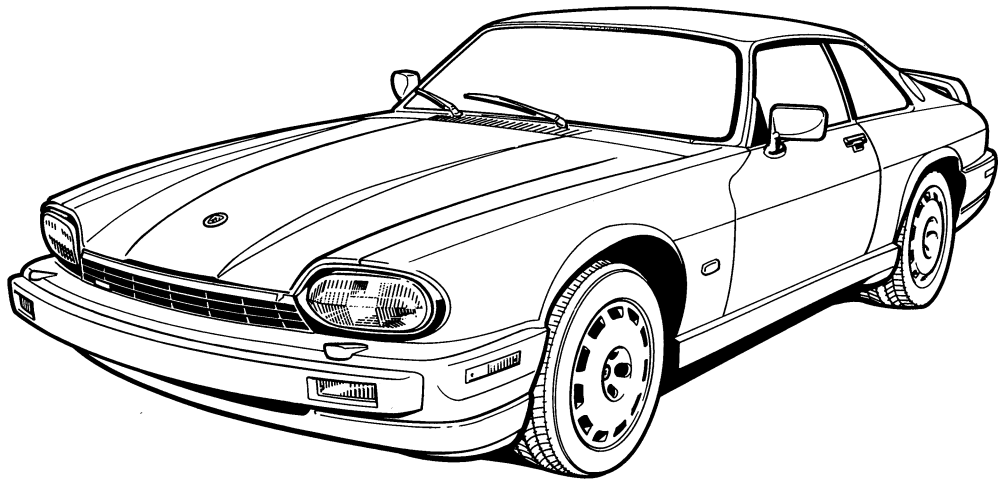
Jaguar Cars Inc. has recognized that there is a demand for more distinctly sporting variants of its range, and has therefore introduced the XJR-S to the USA in a limited edition of 100 cars - 50 coupes and 50 convertibles.

This XJR-S Product Support Manual has been designed to do the following:

- provide information on those features and systems which have been specifically modified from the regular 1993 XJS
- detail all service, parts and warranty policies which vary from existing policies
- list all XJR-S specific part numbers as they are not on the parts fiche.

All Service Managers/Advisors, Parts Managers/counterpeople, Warranty Managers and technicians should review all sections of this manual prior to receiving or servicing XJR-S vehicles.





Vehicle Identification Number (VIN)

Coupe	SAJSW534( )PC (serial number)
Convertible	SAJSW434( )PC (serial number)

NOTE: ( ) = check digit P = 1993 MY

XJR-S

The XJS 1992 Model Year Technical Introduction (publication S71) and the XJS 1993 Model Year Update (publication S79) should be reviewed for features not covered in this publication. Technical features vary from the 1993 Model Year XJS Range as follows:

Technical Features Summary	Standard
6.0 L 318 hp V12 engine	X
Zytek integrated Engine Management System	X
Dual electric fuel pumps	X
Evaporative emission control with ECM controlled purging	X
Low loss exhaust system with twin chrome tail pipes	X
High capacity auxiliary electric cooling fan	X
GM 400 automatic transmission with recalibrated valve body and rear accumulator	X
JaguarSport 8 x 16 in. forged alloy road wheels	X
Goodyear Eagle ZR unidirectional tires – Front 225 / 50 ZR 16; Rear 245 / 55 ZR 16	X
Sport road springs with Bilstein shock absorbers	X
Revised steering rack	X
Revised rear suspension bushings	X
Modified rear axle differential back cover	X
XJR-S Body panels and rear spoiler	X
Satin black grill and headlight bezels	X
XJR-S Logo identification	X
Headlight power wash	X
Front towing eye	X
Radio antenna retraction for trunk opening	X
Connoly Autolux leather interior	X
Walnut sapwood interior trim	X
XJR-S Tread plates	X
XJR-S Gear shift lever	X
Remote CD autochanger	X

NOTE: XJR-S vehicles are not equipped with front fog lights.

Color and Trim Combinations

Signal red exterior with cream Autolux interior, beige convertible top (convertible), barley dash board, coffee carpets, rattan trunk carpet and doeskin head lining.

Jet black exterior with warm charcoal Autolux interior, black convertible top (convertible), black dash board, smoke gray carpets (passenger and trunk) and savile gray head lining.

Specifications

General

Overall length	15 ft – 10 in
Turning circle	42 ft – 10 in
Kerb weight	
Coupe	4050 lbs
Convertible	4250 lbs

Engine

Displacement	5993 cc
Bore / stroke	90 mm x 78.5 mm
Compression ratio	11.0:1
Power (DIN)	318 hp @ 5200 rpm
Torque (DIN)	339 ft lbs @ 3750 rpm
Spark plugs	Champion RS6 YCC – 0.025 in gap
Fuel requirement	Unleaded gasoline – 95 RON octane rating
Idle speed	750 rpm – N or P
Engine Oil	Castrol Syntec SW50 (synthetic motor oil)

Wheels and Tires

Wheel sizes	Front: 8J x 16 in x 19 mm offset Rear: 8J x 16 in x 33 mm offset Spare: 7.5J x 15 in x 22 mm offset
Tires	Goodyear Eagle ZR Unidirectional; Unidirectional arrows must point in the direction of rotation
Tire sizes	Front: 225/50 ZR 16 Rear: 245/55 ZR 16 Spare: D7 205/70 R 15 Dunlop 95M temporary use; Maximum speed 50 mph
Snow tires (all wheels)	Pirelli M&S W210 225/55 R 16
Wheel nut tightening torque	65–70 lb ft (88–95 Nm)

Suspension

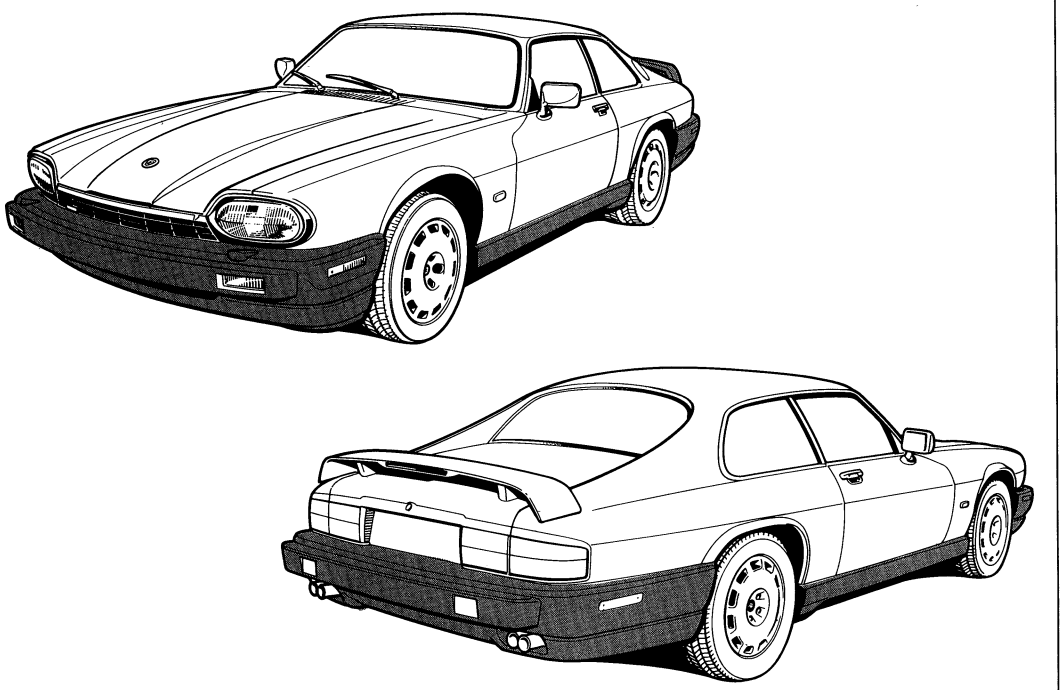
Suspension alignment	
Front	Caster: 3° 30' positive (± 15') Camber: 45' negative (± 15') Toe: 20' toe-in
Rear	Camber: 1° 20' negative Toe: parallel

NOTES: Coupe suspension alignment is set at kerb height. Do not use the XJS mid-laden tools.
Convertible suspension alignment is set with the XJS mid-laden tools in place.

Body Styling Kit

The XJR-S body styling kit is manufactured in Reinforced Resin Injection Molded (RRIM) polyurethane.

XJR-S FRONT AND REAR BODY STYLING



Front and rear aprons
Front and rear aprons mount over the existing bumper sub-structures and are attached with screws. The aprons incorporate the energy absorbing bumpers as well as side marker lights.

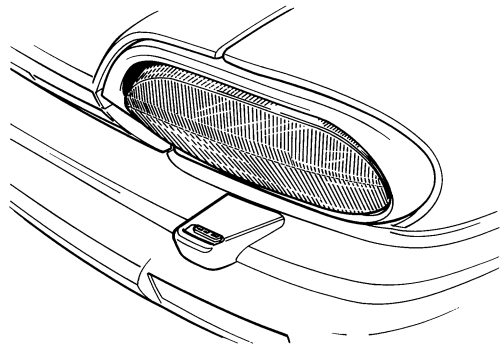
Sill covers
Flared lip-over sill covers attach with screws plus hot-melt adhesive. The rubber seals attach with adhesive only.

Rear spoiler
The rear spoiler mounts on the trunk lid and attaches by two screws on each side. The screws are accessible through the trunk lid light inner covers.

Body and Components

Headlight power wash
The standard headlight power wash system is identical to the optional system on the XJS Range vehicles. The jet finishers are color-keyed to the vehicle body.

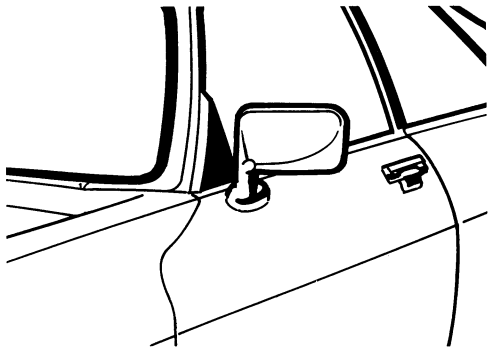
POWER WASH JET



Body and Components (continued)

Color keyed door mirrors
The door mirrors are color-keyed to the vehicle body.

DOOR MIRROR

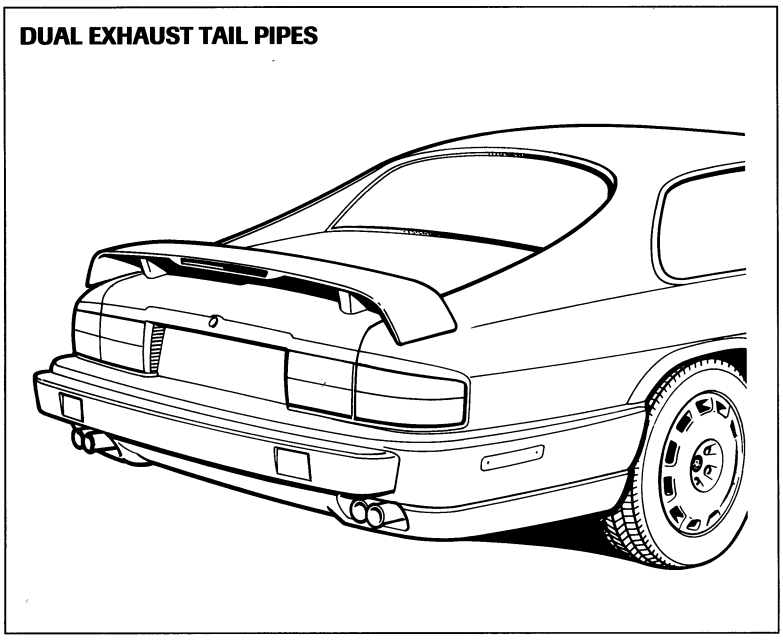


Grill and headlight bezels
A satin black finish is applied to the grill and the headlight bezels. During vehicle polishing, protect the satin black areas to prevent the surfaces from becoming glossy.

XJR-S and JAGUARSPORT emblems
XJR-S identification appears on the grill and the tread plates. The Coupe model incorporates XJR-S identification in the rear quarter glass.

Exhaust tail pipes
Dual twin exhaust tail pipes compliment the XJR-S body styling.

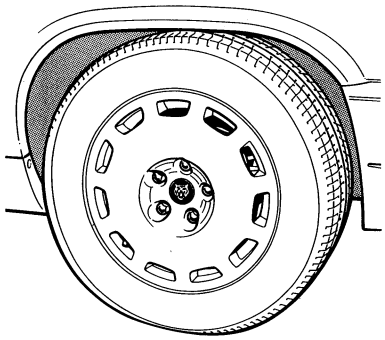
DUAL EXHAUST TAIL PIPES



Trunk lid struts
The lift struts have been upgraded to compensate for the additional weight of the trunk lid and spoiler assembly.

Road wheels and tires
High performance Goodyear Eagle ZR Unidirectional tires are mounted on XJR-S forged alloy road wheels. The unidirectional arrows must point in the direction of rotation. A temporary use spare tire having a 50 mph maximum speed is supplied.

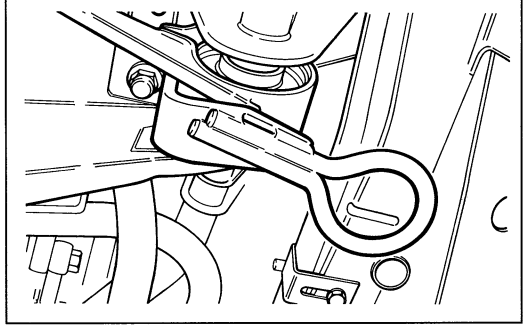
WHEEL STYLE



Vehicle Towing

Front towing eye
A front towing eye is located at the right side of the vehicle. This eye, accessible through the air intake duct, is intended only for emergency winching or short tows with the XJR-S aprons in place.

TOWING EYE



The preferred method of towing is on a flatbed transporter. If the vehicle must be towed with suspended wheels, the rear should be suspended only after protecting the body aprons.

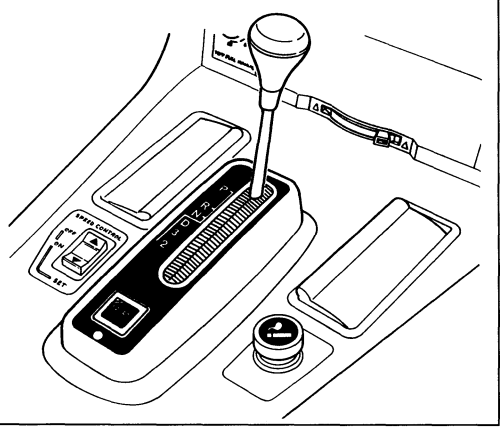
CAUTION: Do not tow with the front suspended. Do not use the towing eye for solid bar towing.

Interior Design

Gear shift lever

The XJR-S gear shift lever has sports styling with a leather covered knob.

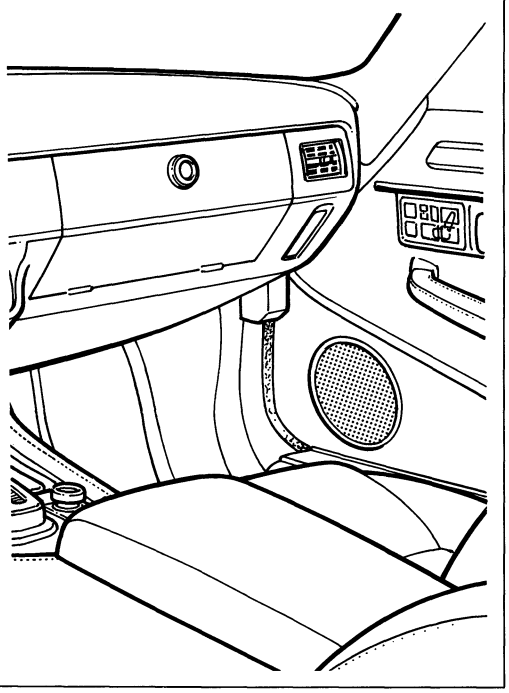
GEAR SHIFT LEVER



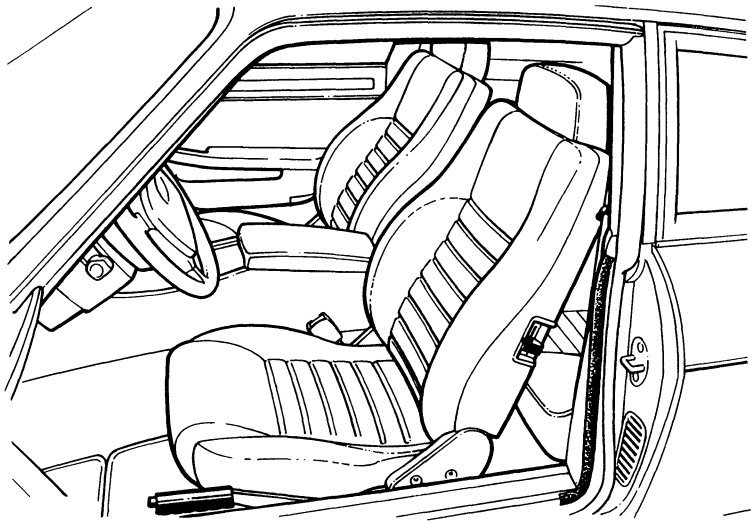
Passenger side A post trim

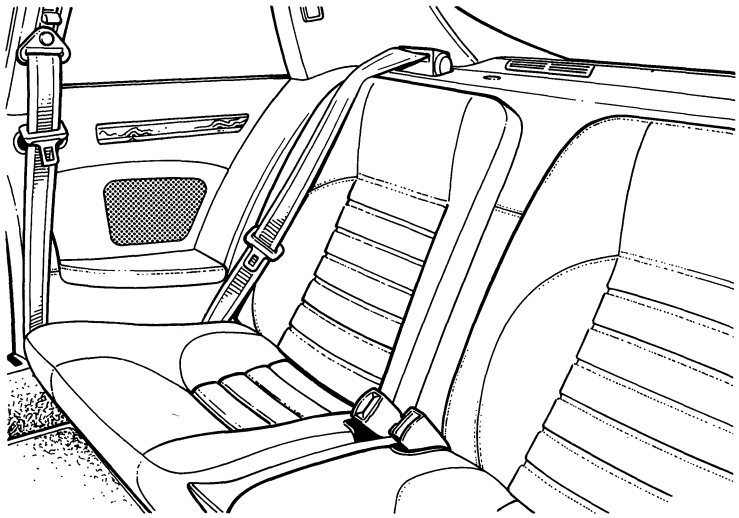
To allow installation of the Engine Management ECM, the passenger side A post trim panel has been reshaped

PASSENGER'S TRIM PANEL



FRONT AND REAR INTERIOR





Autolux leather interior

All interior leather furnishings are executed in Connoly Autolux leather with contrasting stitching.

Walnut sapwood trim

Interior wood trim panels in the dash board, center console, doors and rear quarter casings are made of unique walnut sapwood.

Engine Design / Construction

6 Litre V12 engine

The XJR-S engine is a high performance version of the standard Jaguar 5.3 litre V12 engine. Increased power and torque is achieved through cylinder displacement increase to 6 litres and compression increase to 11.0:1. The following engine modifications and additions are made:

- Forged steel crankshaft with 78.5 mm stroke (5.3 L – 70 mm stroke)
- Cylinder liners 0.135 in. shorter than standard (to clear the connecting rods)
- Forged alloy pistons with larger combustion recessed area — matched to valve configuration
- Upgraded piston pin material
- Crankshaft shield (windage tray) modified to clear crankshaft
- Crankshaft damper with ignition timing marks and pointer
- JaguarSport emblems on intake manifolds

Engine Systems

In addition to the structural changes to the engine, several other systems contribute to the XJR-S engine performance.

Engine Management System

A Zytek engine management system integrates sequential fuel injection, ignition and emission control.

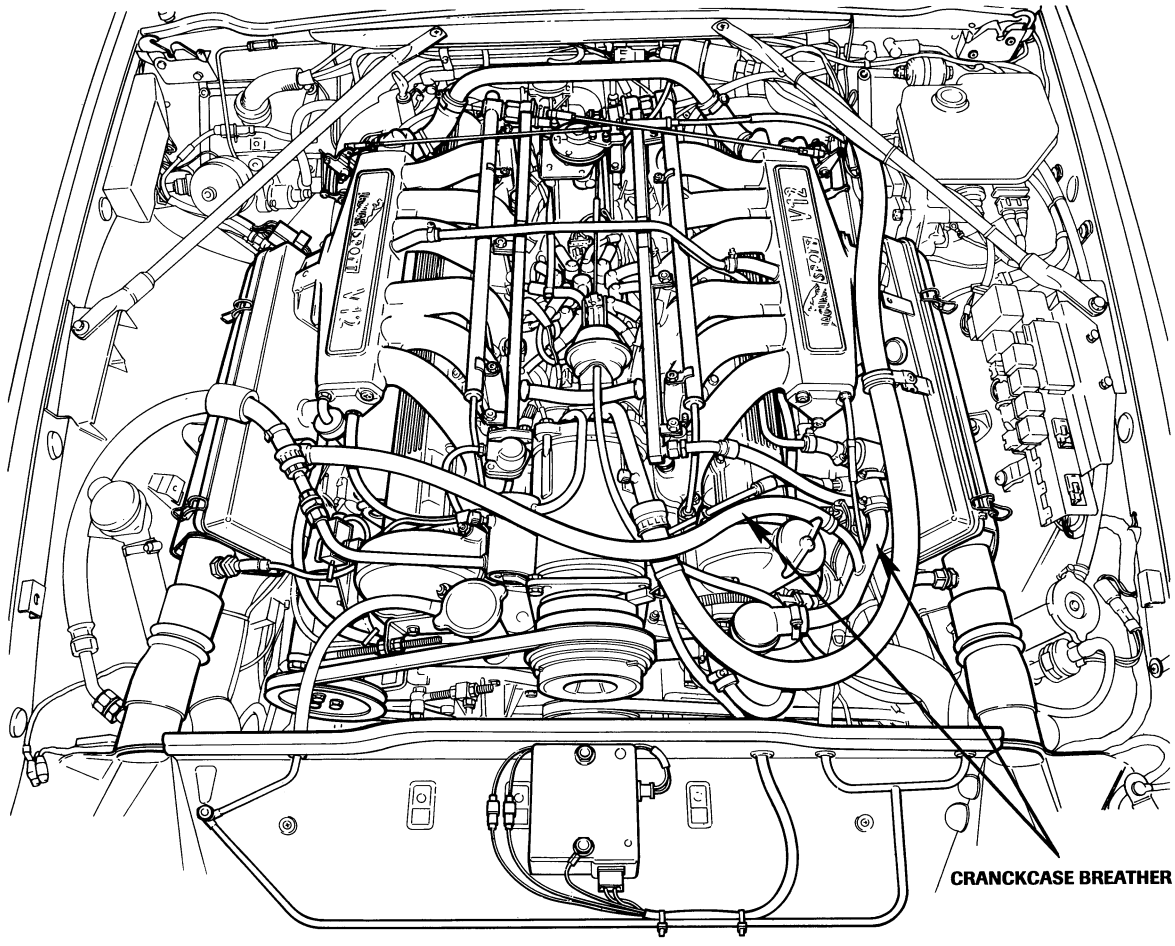
Air cleaners

The air cleaners have large diameter intake tubes that extend through a modified upper radiator support crossmember.

Crankcase breather

The crankcase breather pipe from bank B (left bank) splits and vents through both air cleaners.

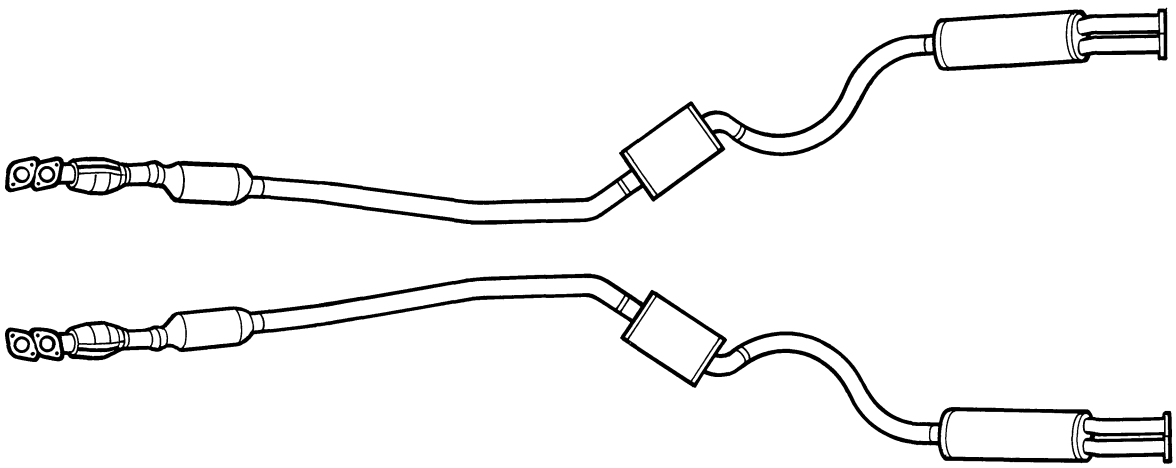
ENGINE COMPARTMENT



Exhaust system

A special low-loss dual exhaust system aids the XJR-S engine in developing additional power. Primary catalysts are located in the down pipes with secondary catalysts positioned down stream. The heated oxygen sensors are located in the down-pipes. The chrome rear outlets are part of the rear muffler assemblies.

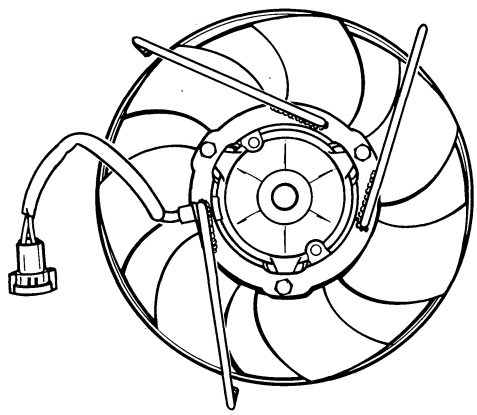
EXHAUST SYSTEM



Auxiliary cooling fan

A seven-bladed auxiliary fan is used to provide greater air flow through the radiator. The fan is switched by the same 190°F thermostatic switch used on previous V12 models.

AUXILIARY COOLING FAN



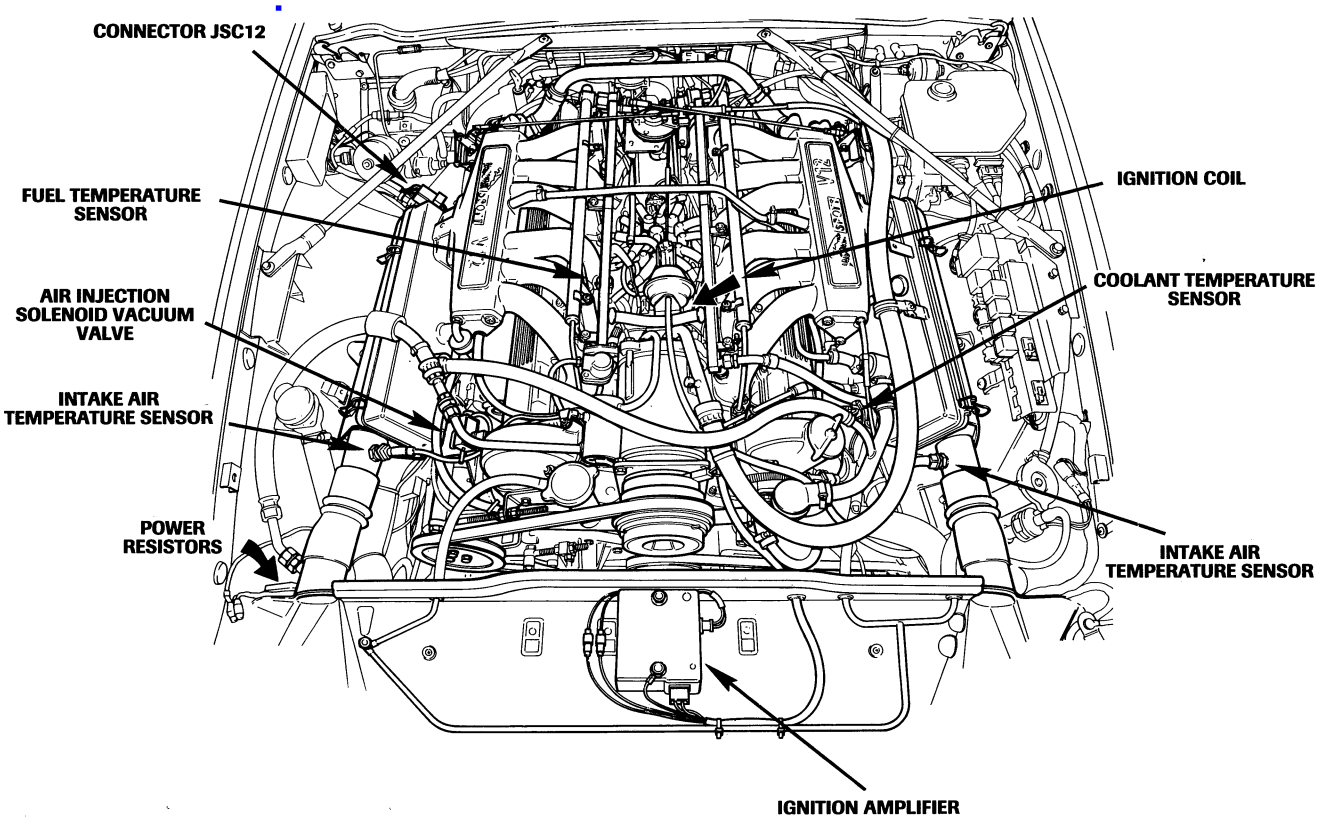
Engine Management System Overview

The Zytek engine management system is a microprocessor based system with control over fuel delivery, evaporative emission purging, sequential fuel injection, exhaust emission, ignition timing and air injection. A single engine control module incorporating a manifold absolute pressure (MAP) sensor drives the various functions by applying inputs received from engine sensors with the strategies stored in memory. The ECM contains an on-board diagnostic capability that can be accessed via serial communication through a lap top computer using special software.

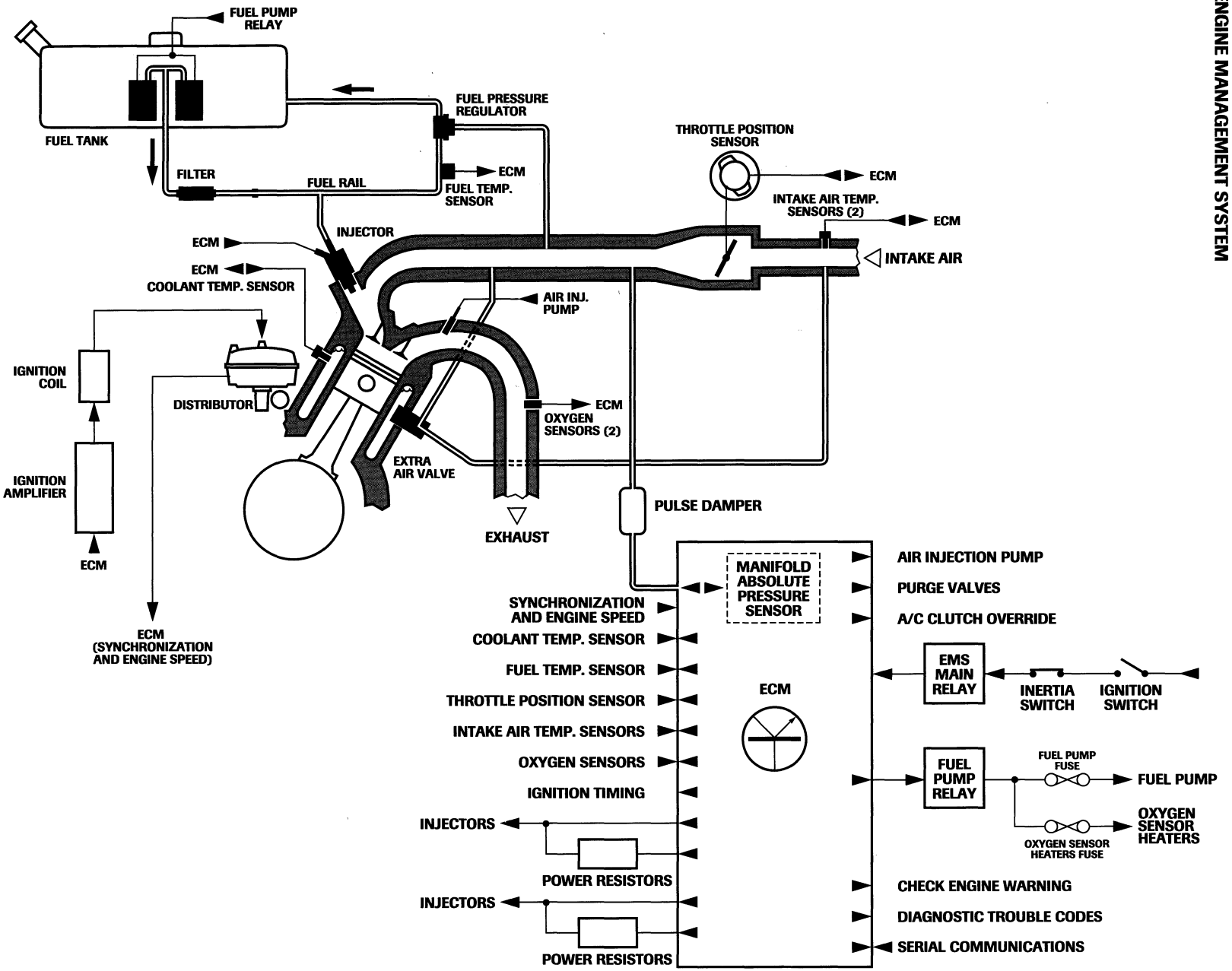
The complete list of engine management ECM functions is as follows:

- Fuel delivery
- Evaporative emission canister purging
- Sequential fuel injection – idle, acceleration, cruise, deceleration
- Cold start
- Warm-up
- Closed loop exhaust emission control
- Air injection control
- Wide open throttle injector disable on cranking
- Overrun fuel cut-off
- Engine speed limitation
- Ignition timing
- Air conditioning compressor override (high engine temperature)
- Engine speed output signal (tachometer)
- Fuel monitoring (trip computer)
- On-board diagnostics (OBD)
- CHECK ENGINE warning and diagnostic trouble codes
- Limp home capability
- Serial communication

ENGINE COMPARTMENT



ENGINE MANAGEMENT SYSTEM



Fuel Delivery and Evaporative Emission Control

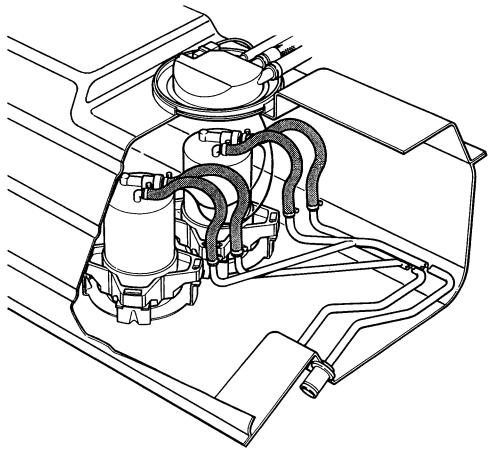
Fuel delivery

The basic fuel delivery system is unchanged from the 1992 model year V12 vehicles. In order to meet the demands of the 6 litre engine, two downrated versions of the standard fuel pump modules are used. These must be replaced as a matched pair. The fuel pumps are activated by the ECM (electronic control module) only when engine cranking or engine speed signals are received. Two vertical black stripes identify the twin fuel pump tank.

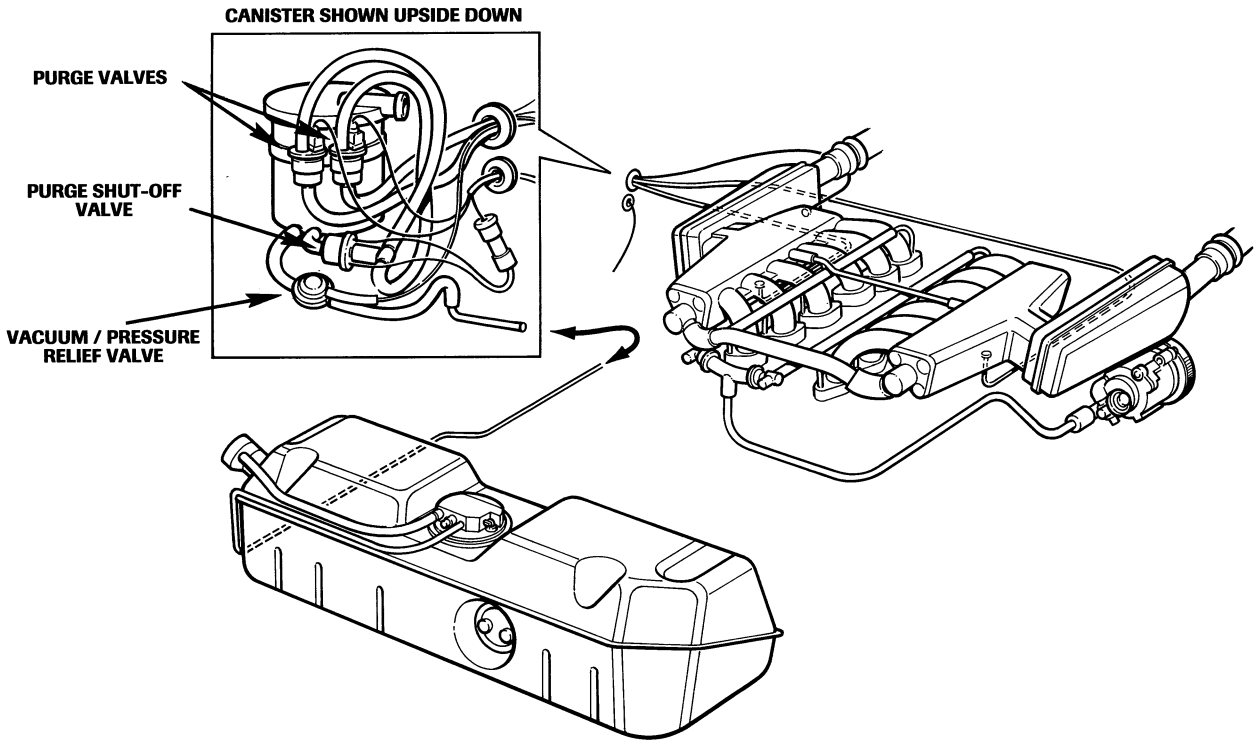
Evaporative emission control

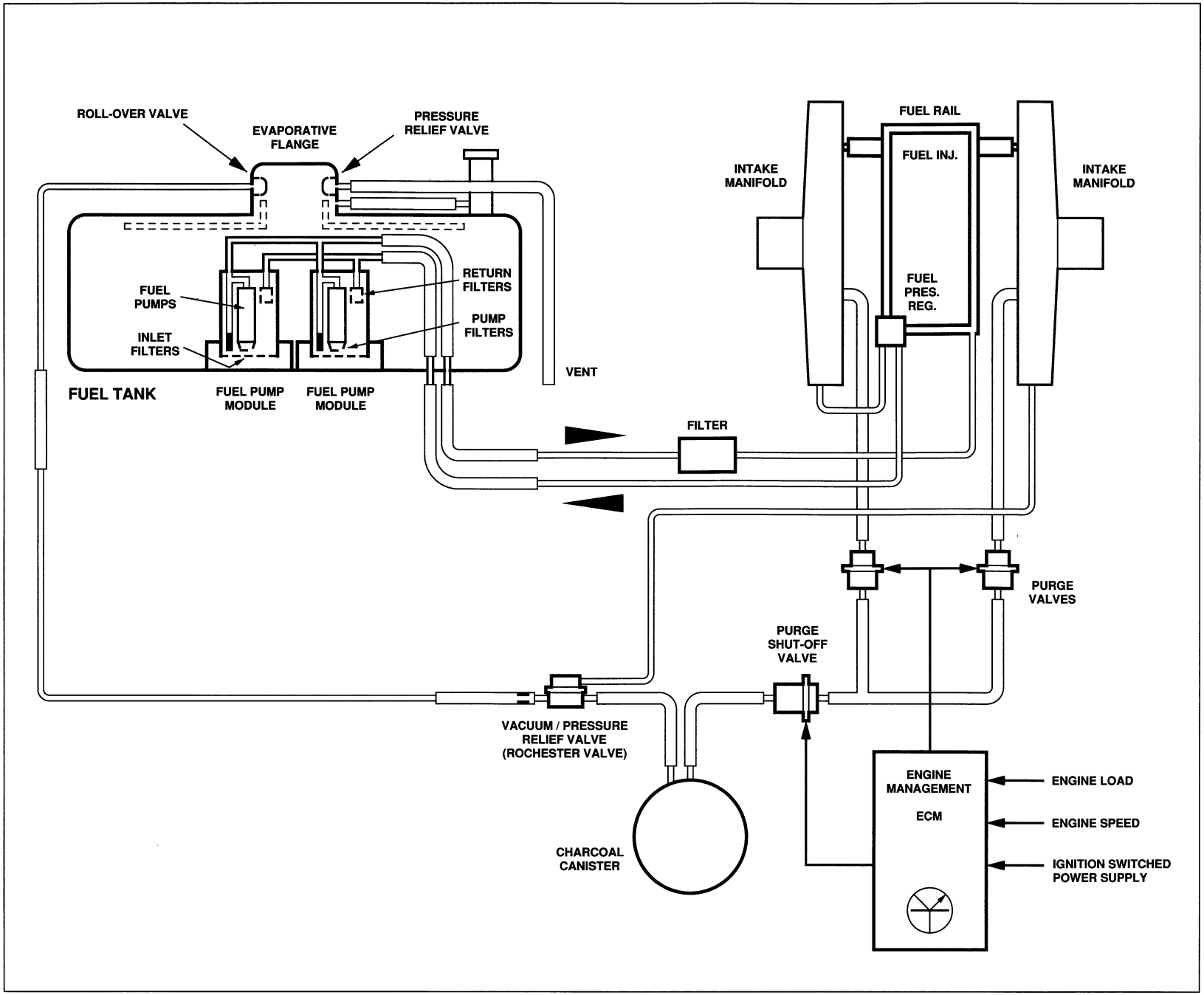
The evaporative emission control system uses the same canister and vacuum / pressure relief valve as the 1992 model year V12 vehicle, however, the canister is inverted. Engine run-on is prevented by a normally closed purge shut-off valve. The valve opens when the ignition is switch ON. Canister purging is controlled by the ECM via two purge control valves in the purge lines to the left and right intake manifolds. The ECM opens the valves simultaneously according to an engine load and speed strategy. Correct functioning of the purge shut-off valve and the purge control valves is monitored by the on-board diagnostic system in the ECM.

FUEL PUMPS



EVAPORATIVE EMISSION CONTROL SYSTEM




ROLL-OVER VALVE
EVAPORATIVE FLANGE
PRESSURE RELIEF VALVE
FUEL RAIL
FUEL INJ.
INTAKE MANIFOLD
INTAKE MANIFOLD
FUEL PUMPS
RETURN FILTERS
PUMP FILTERS
INLET FILTERS
FUEL PRES. REG.
VENT
FUEL TANK
FUEL PUMP MODULE
FUEL PUMP MODULE
FILTER
PURGE VALVES
PURGE SHUT-OFF VALVE
VACUUM / PRESSURE RELIEF VALVE (ROCHESTER VALVE)
CHARCOAL CANISTER
ENGINE MANAGEMENT
ECM
ENGINE LOAD
ENGINE SPEED
IGNITION SWITCHED POWER SUPPLY

Fuel Injection

Fuel metering control

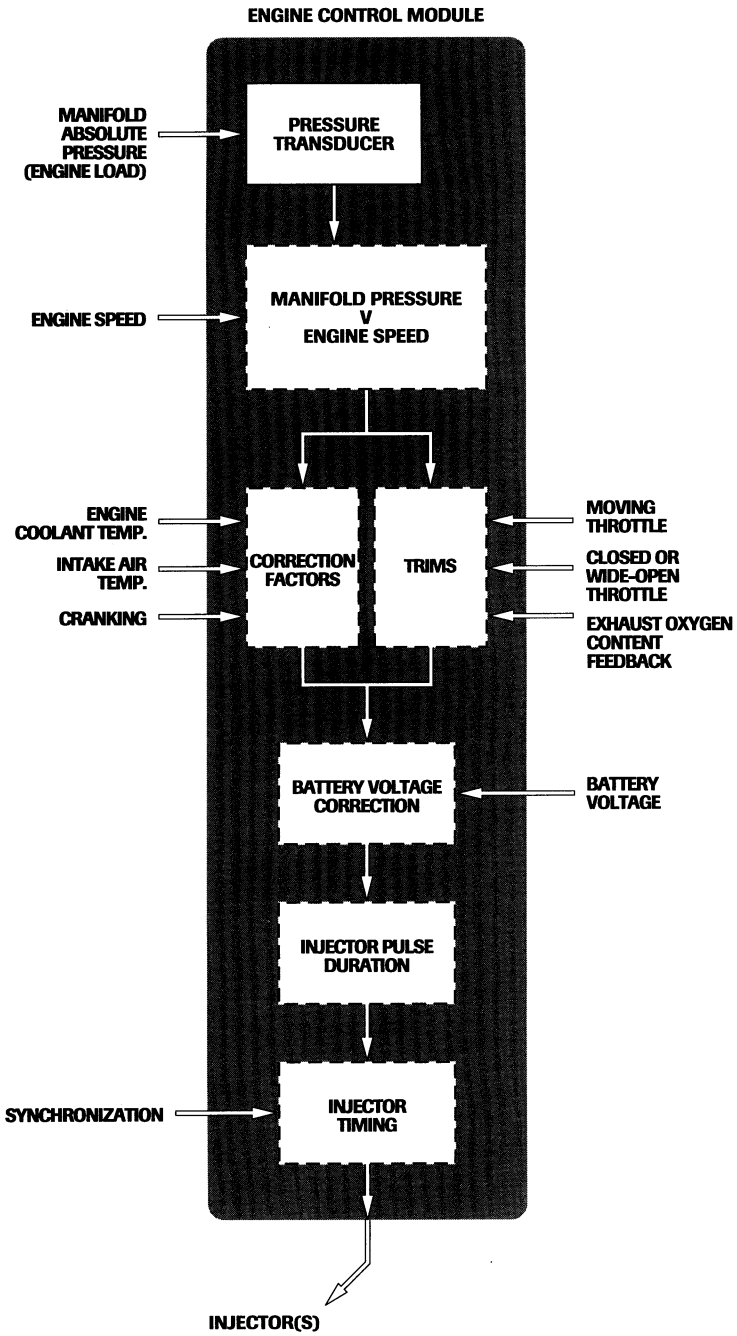
Fuel metering is obtained by controlling the injector pulse duration (on-time) during each engine cycle (two crankshaft rotations). The pulse duration is varied by the engine control module (ECM) according to several sensor inputs. The sensed control inputs form two groups – primary and secondary. Primary control inputs are intake manifold absolute pressure (MAP) and engine speed; secondary control inputs consist of engine coolant temperature, intake air temperature, throttle movement and position, exhaust oxygen content, crankshaft position, cranking signal, fuel temperature and battery voltage. The injectors are pulsed sequentially, once per engine cycle in the engine firing order.

Primary control

Fuel metering is controlled primarily as a function of intake manifold absolute pressure (MAP) and engine speed. Manifold pressure is sensed by a pressure transducer located in the engine control module and connected to the A bank manifold by a vacuum line. Engine speed is sensed by a reluctor mounted in the ignition distributor. In addition to engine speed, the Hall effect reluctor supplies a synchronization input to the ECM for fuel injection timing.

Fueling strategies are held in memory (EPROM) in the ECM and form a manifold pressure v engine speed matrix. Injector pulse duration is then calculated according to secondary correction factors and trims. The resulting injector pulse duration is further modified to account for battery voltage.

FUEL INJECTION CONTROL



Secondary control
Secondary fueling enrichment is provided for engine starting, warm-up and throttle response at all temperatures within the engine's operating range.

Coolant temperature The coolant temperature sensor provides an electrical input to the ECM. During engine starting and warm-up, enrichment is provided by increasing the injector pulse duration when coolant temperature is below normal operating temperature. Enrichment is reduced with increasing engine speed and load.

Engine starting When the engine starts at low temperatures, the ECM pulses all injectors together, six injections per engine cycle (2 crankshaft revolutions). Normal sequential timing of the injectors is resumed after a preset number of injections.

After start enrichment After engine start-up, the ECM increases the injector pulse duration above the normal running requirement and then decreases the pulse duration at a fixed rate over a preset number of engine revolutions.

Throttle movement and position The throttle position sensor provides electrical signals to the ECM for opened and closed throttle operation as well as throttle movement during acceleration and deceleration.

Intake air temperature Fuel metering is adjusted to vary approximately with the density of the engine intake air. Intake air density is sensed by measuring the air temperature at both the left and right air intakes. Independent correction is provided for each cylinder bank.

Full load Full load fuel metering varies with throttle position and engine speed. Under full load conditions, exhaust oxygen sensor closed loop control is disabled.

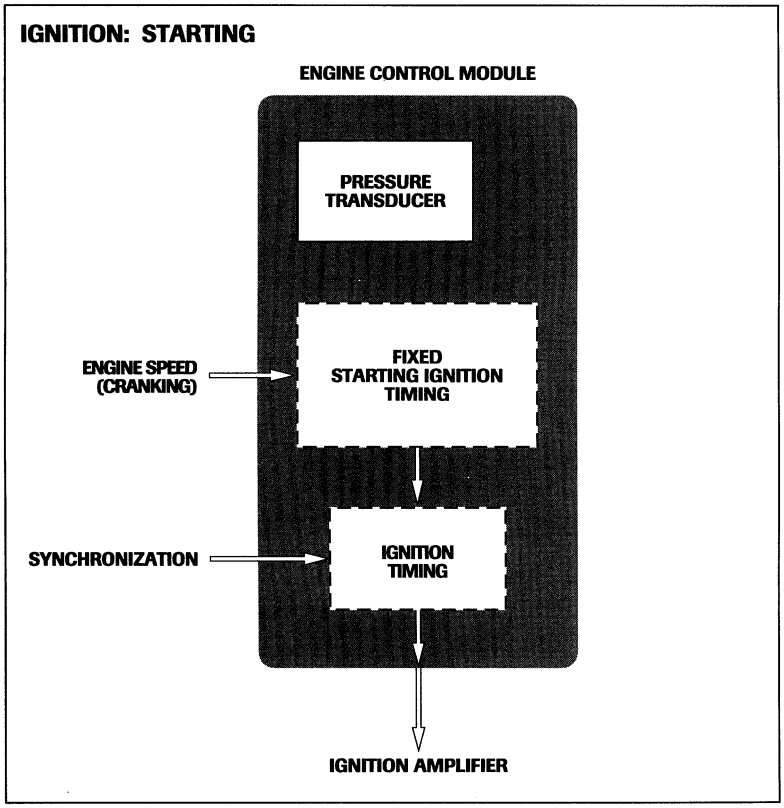
Idle fuel To compensate for variable injector flow at short pulse durations, the ECM has an adjustable idle trim function to optimize the idle fuel metering for each cylinder bank. Adjustments are made using a lap-top computer with special software.

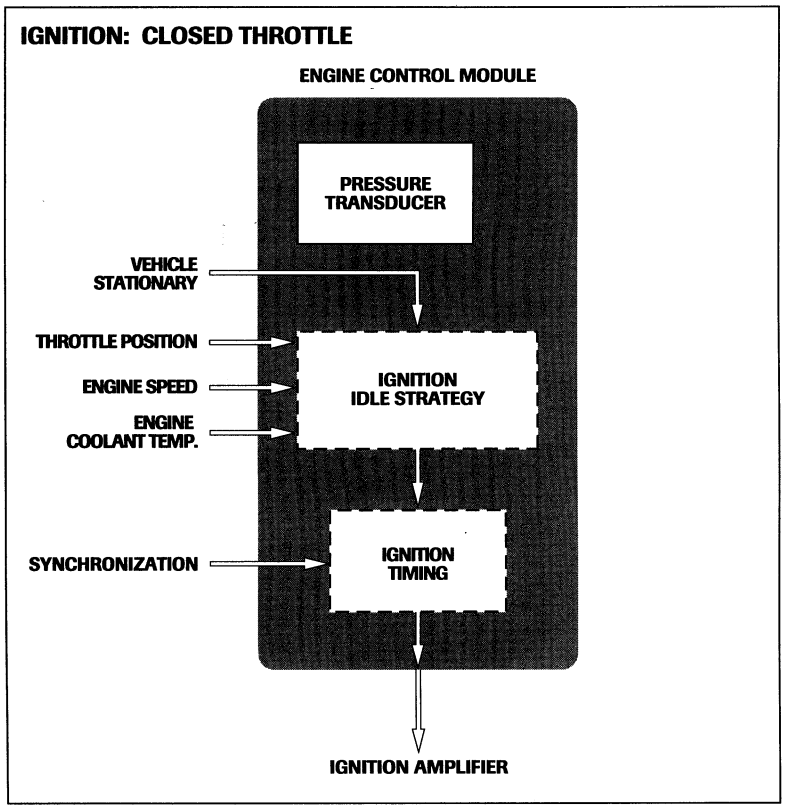
Fuel temperature To improve hot starting and running at high ambient temperature, additional fuel is supplied as a function of fuel temperature. A fuel temperature sensor on the fuel rail provides an input to the ECM.

Air / fuel ratio (closed loop control) In order to achieve optimum performance from the exhaust three-way catalyst system, the exhaust oxygen content is monitored and controlled by trimming the fuel metering. Two oxygen sensors are used–one in each exhaust down pipe, after the primary catalyst. Closed loop control is disabled under these conditions:

- during engine warm-up when the air injection is operating
- following hot starts until the oxygen sensors reach operating temperature
- during full load operation
- during deceleration fuel cut-off (engine overrun).

Battery voltage The time necessary for full injector open and close to occur varies with battery voltage. For example, with low battery voltage, the time necessary for full injector open to occur is long; therefore, less fuel is delivered for a given pulse duration. The opposite is true for high battery voltage. The ECM corrects the injector pulse duration to achieve the fuel delivery that would be obtained at a nominal reference voltage.





Ignition

Ignition timing control

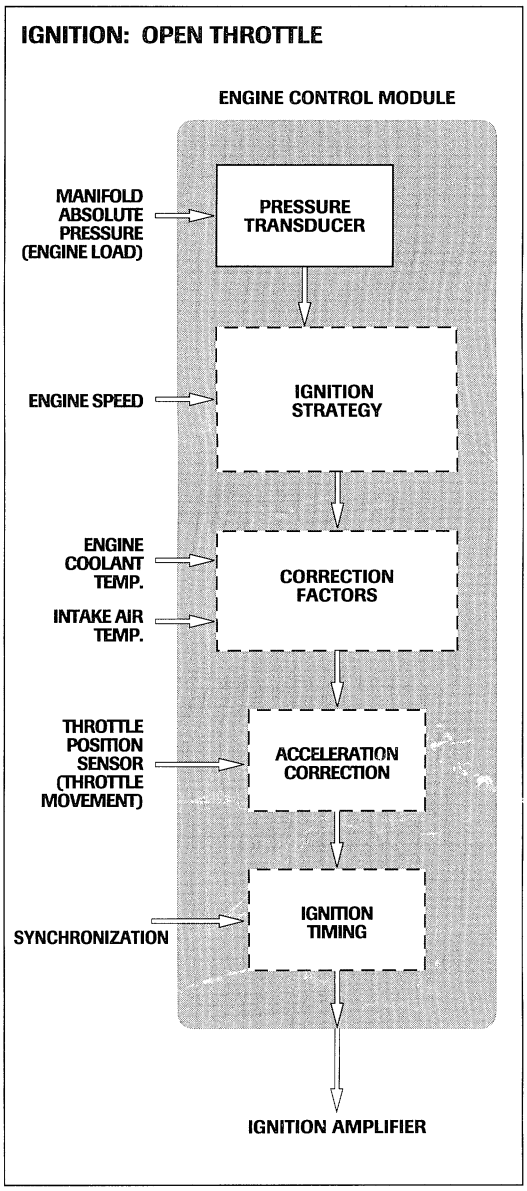
The ignition timing is varied by the ECM according to several sensor inputs. The sensed control inputs form two groups – primary and secondary. Primary control inputs are intake manifold absolute pressure and engine speed; secondary control inputs consist of engine coolant temperature, intake air temperature and throttle position. Crankshaft position is determined by the Hall effect reluctor (synchronization sensor) in the distributor.

Ignition timing strategies are held in memory (EPROM) in the ECM. The ECM uses secondary sensor inputs to determine the engine operating condition – starting, closed throttle operation or open throttle operation – and then applies the correct ignition timing.

Engine starting During engine cranking, the ignition timing is fixed by the ECM. After starting, the ignition timing is varied as determined by an idle strategy.

Idle A separate "short" idle strategy that ensures steady idle is employed when the vehicle is stationary and the throttle closed. The input from the road speed sensor is used to determine whether the vehicle is in motion or stationary. Closed throttle operation is sensed from the throttle position sensor. The engine speed change-over points between starting and idle are written in the ECM memory.

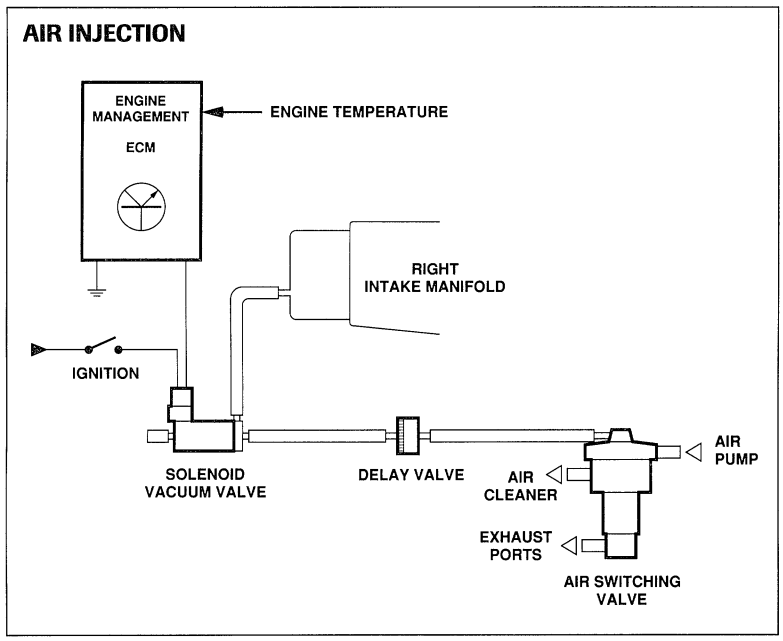
Open throttle operation For any given manifold absolute pressure (MAP) and engine speed, the ECM will determine the required ignition timing from the "look-up" table. The timing is then corrected for engine temperature, intake air temperature and for acceleration.



Other ECM functions

Other ECM functions include air injection control, fuel cut-off and air conditioning compressor clutch override.

Air injection Air injection is enabled by the ECM during engine warm-up. The ECM activates the solenoid vacuum valve to apply intake manifold vacuum to the air switching valve to switch air delivery to the exhaust ports. When the coolant temperature reaches 125°F, the ECM switches off the vacuum valve causing the air delivery to be switched from the exhaust ports back to the right air cleaner. The air switching valve, solenoid vacuum valve and delay valve are carry-over components from the 1992 model year XJS V12.



Other ECM Functions (continued)

Fuel cut-off Fuel cut-off is used during engine overrun conditions, for engine overspeed protection, and for flooding protection during wide-open-throttle start. The following table lists the fuel cut-off conditions and control specifications:

Controlled parameter	Fuel cut-off (engine speed)	Reinstate
Engine overrun (deceleration)	1395 plus rpm (engine temp. above 60°C, throttle position below threshold level, vehicle in motion)	930 rpm
Engine overspeed	6498 rpm	6494 rpm
Wide-open-throttle start	Engine cranking	Throttle closed

NOTE: The ECM uses the road speed input to determine "vehicle in motion" when applying deceleration fuel cut-off.

Air conditioner compressor clutch override The ECM switches the compressor clutch relay coil ground circuit to override the compressor operation if the engine coolant temperature reaches 257°F (125°C) or higher. Compressor operation is reinstated when the temperature drops to 253°F (123°C).

Idle speed control

Idle speed control is maintained solely by the adjustable idle air bleed at the extra air valve. No supplementary air valve or electronic idle speed control is provided.

On-Board Diagnostics System (OBD)

The ECM includes a fault diagnosis facility that continuously monitors the operation of the engine management sensors and components. If a fault is detected, the OBD system will activate the CHECK ENGINE warning in the instrument pack and on the trip computer display. In addition, it will flag a diagnostic trouble code (DTC) in the ECM memory. The ECM can, at any time, be interrogated through the trip computer display by switching off the ignition then switching on the ignition. The CHECK ENGINE warning will display and the DTC will appear 5 seconds later. If two or more DTCs are flagged in memory, only the highest priority code will be displayed. The remaining codes will be displayed, in turn, as the faults are corrected and erased from memory.

NOTE: Fueling diagnostics are disabled when the fuel tank level falls below approximately 6.5 gallons (25 litres).

Serial communications

Serial communications between the engine management system and a lap top diagnostic computer are available via the EMS data link connector (PM 4) located in the passenger's footwell. Serial communication is used for engine set-up, fault diagnosis and erasing diagnostic trouble codes. Refer to the Service Information section of this manual for detailed information.

Limp home mode

In order to allow vehicle operation if a malfunction occurs, "limp home" default strategies are incorporated as an ECM facility. The ECM will substitute a nominal value for missing inputs from various sensors and components.

Open loop default

Certain malfunctions have "open loop" default when in limp home mode. If a malfunction has open loop default, oxygen sensor inputs are ignored. If a malfunction does not have open loop default, oxygen sensor inputs are used.

Diagnostic trouble codes

The available DTCs are listed in order of priority on the following table. Limp home and/or open loop default are available as indicated.

DTC	Limp Home Default	Open Loop Default	Input or Component Checked
29			ECM Self-test
55	X	X	Engine ground sensing circuit
44	X	X	Oxygen sensor circuit – bank A
45	X	X	Oxygen sensor circuit – bank B
18			Fuel metering above idle – bank A
19			Fuel metering above idle – bank B
12			Engine speed and synchronization sensors circuit
24			Ignition drive circuit
36	X	X	Injector electrical circuit – Injector 1A
56	X	X	Injector electrical circuit – Injector 2A
46	X	X	Injector electrical circuit – Injector 3A
58	X	X	Injector electrical circuit – Injector 4A
38	X	X	Injector electrical circuit – Injector 5A
48	X	X	Injector electrical circuit – Injector 6A
49	X	X	Injector electrical circuit – Injector 1B
39	X	X	Injector electrical circuit – Injector 2B
59	X	X	Injector electrical circuit – Injector 3B
47	X	X	Injector electrical circuit – Injector 4B
57	X	X	Injector electrical circuit – Injector 5B
37	X	X	Injector electrical circuit – Injector 6B
34	X	X	Injector drive circuit
33	X	X	Fuel metering at idle – bank A
35	X	X	Fuel metering at idle – bank B
23			Fuel metering at idle – banks A and B combined
13	X		Pressure transducer and sensing hose
17	X		Throttle position sensor circuit
11	X		Pressure transducer / throttle position sensor circuit
27	X		Sensor ground circuit (coolant, intake air, fuel temp.)
14	X		Coolant temperature sensor circuit
15	X		Intake air temperature sensor circuit – bank A
16	X		Intake air temperature sensor circuit – bank B
26	X		Intake air temperature sensor circuits – excessive difference, bank A to bank B
25	X		Fuel temperature sensor circuit
22			Fuel pump relay control circuit
88			Purge valves circuit
79			Purge shut-off valve circuit
66	X	X	Air injection solenoid vacuum valve circuit
68	X		Road speed sensor circuit

NOTE: The Service Information section of this manual contains expanded OBD information and EMS diagnostic and service procedures.

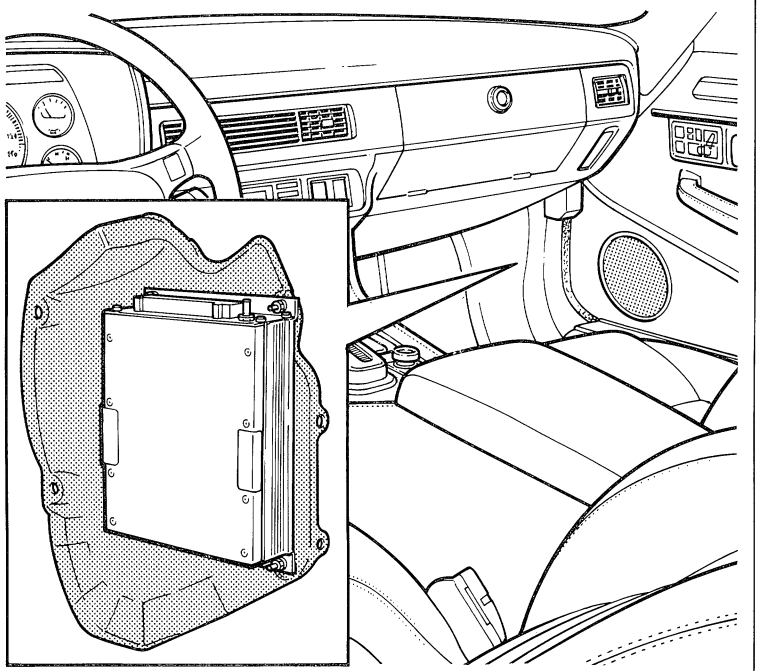
Engine Management Components

Engine control module

Location Passenger's side A post

Description The ECM is a microprocessor based unit with control over fuel injection, emission control and ignition The ECM contains an integral pressure transducer for sensing engine manifold absolute pressure. A vacuum line runs from the right intake manifold to the ECM through a damper. The vacuum line is routed behind the passenger's A post trim. The damper is located above the passenger footwell.

ECM LOCATION



Fuel injectors

Location Fuel rail / intake manifolds

Description The fuel injectors are carry-over components from the 1992 model year XJS V12.

Power resistors

Location Engine compartment, right front

Description Twin power resistor packs contain a resistor for each injector.

Throttle position sensor

Location Under the throttle turntable

Description The throttle position sensor is a carry-over component from the 1992 model year XJS V12.

Coolant temperature sensor

Location Left thermostat housing

Description The coolant temperature sensor is a carry-over component from the 1992 model year XJS V12.

Intake air temperature sensors

Location Right and left air cleaner intakes

Description Two intake air temperature sensors are used. The sensors are carry-over components from the 1992 model year XJS V12.

Fuel temperature sensor

Location Fuel rail, right

Description The fuel temperature sensor is a temperature sensitive resistor (thermistor). As the fuel temperature rises, the electrical resistance decreases providing a fuel temperature input to the ECM.

Oxygen sensors

Location Exhaust down pipes

Description The oxygen sensors are carry-over components from the 1992 model year XJS V12.

Extra air valve

Location Left cylinder head, rear

Description The extra air valve is carry-over component from the 1992 model year XJS V12.

Inertia switch

Location Passenger's side A post

Description The inertia switch is carry-over component from the 1992 model year XJS V12.

Air injection solenoid vacuum valve

Location Right cylinder head, front

Description The solenoid vacuum valve is carry-over component from the 1992 model year XJS V12.

Air switching valve

Location Engine, right front

Description The air switching valve is carry-over component from the 1992 model year XJS V12.

Purge valves

Location Charcoal canister

Description The purge valves are solenoid-operated vacuum switching valves identical to the purge valve used in the AJ6 4.0L engine installation.

Purge shut-off valve

Location Charcoal canister

Description The purge shut-off valve is a solenoid-operated vacuum switching valve identical to the supplementary air valve used in the 1992 model year XJS V12.

Ignition amplifier

Location Radiator support, top

Description The electronic ignition amplifier performs primary circuit switching as signaled by the ECM.

Ignition coil

Location Engine vee

Description The ignition coil generates high voltage current for distribution to the spark plugs.

Ignition distributor

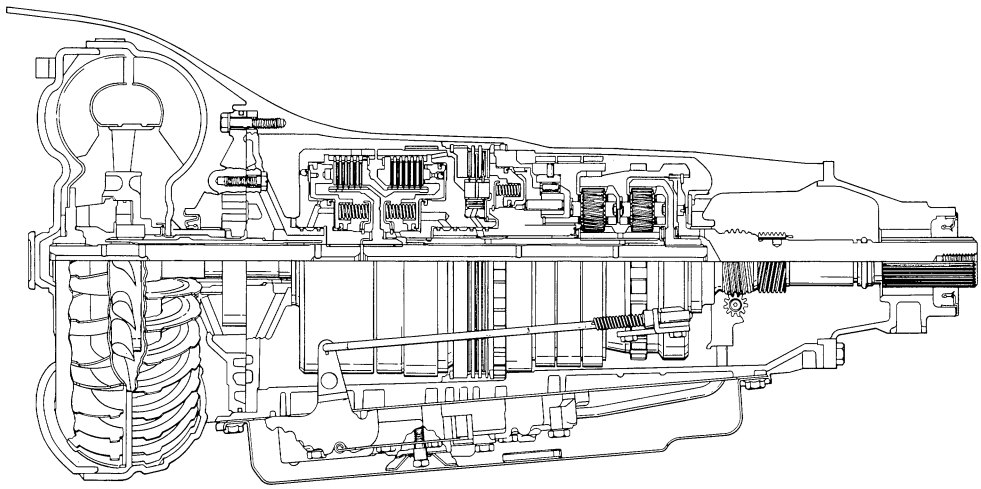
Location Engine vee

Description The distributor is a single deck design incorporating sensors for engine speed and crankshaft position. Engine speed output is derived from a Hall effect twelve segment reluctor. The reluctor has an integral inner one segment rotor that generates a crankshaft position output for synchronization of the sequential fuel injection.

GM400 Transmission

An upgraded model OZRA GM400 transmission with a recalibrated control valve assembly (valve body) and rear accumulator spring is designed to take full advantage of the XJR-S power and torque increase. The bell housing cover is changed due to the deletion of the Marelli engine speed sensor.

GM400 TRANSMISSION



Shift speeds

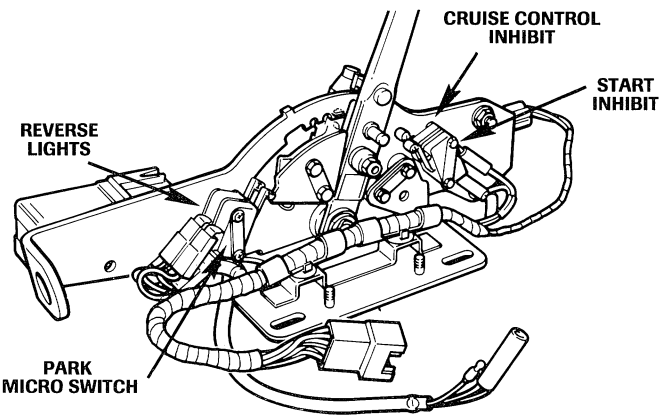
The revised shift speeds are as follows:

Full throttle up-shift	1–2	56 mph @ 5450 rpm
Full throttle up-shift	2–3	100 mph @ 5500 rpm
Kickdown	3–2	86 mph max.
Kickdown	3–1	41 mph max.
Kickdown	2–1	38 mph max.
Part throttle downshift	3–2	58 mph max.

Gear selector switches

The gear selector mechanism incorporates 4 micro switches: reverse light switch, park micro switch, start inhibit switch and cruise control inhibit switch.

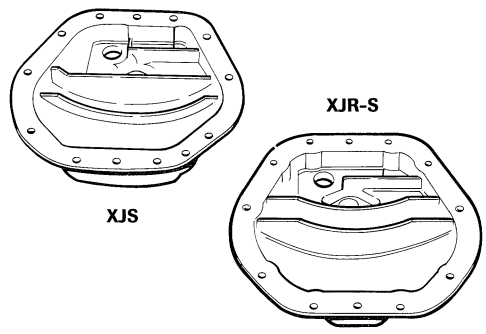
GEAR SELECTOR SWITCHES



Final Drive

A standard XJS limited slip final drive unit having a ratio of 2.88:1 carries the XJR-S power and torque. The differential rear cover is redesigned to improve breathing a high road speeds. The altered baffle plates direct the oil flow so that turbulence is kept away from the oil breather.

DIFFERENTIAL COVERS



Suspension

The front and rear suspension is upgraded to suit the characteristics of the XJR-S.

Road springs (coupe only)

The front and rear road springs are shorter and stiffer than standard XJS springs. Ride height packers are used to trim the ride height. The springs are rated as follows:

Front springs:	96.5 N mm vs. a standard rating of 74 N mm
Rear springs:	41 N mm vs. a standard rating of 30 N mm

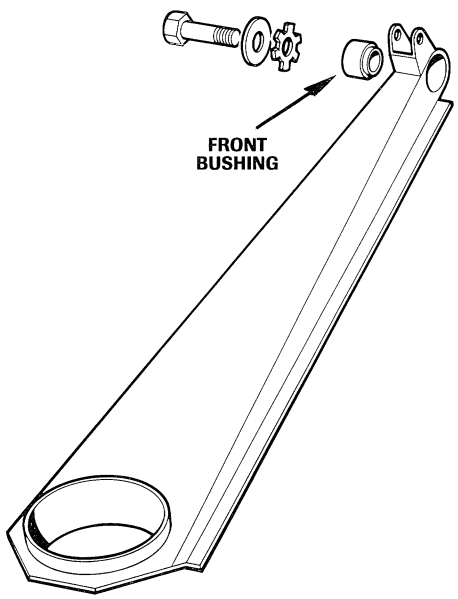
Shock absorbers

Front and rear Bilstein shock absorbers are specially tuned for the XJR-S.

Rear radius arm

The front bushings in the rear radius arms are upgraded to accept the XJR-S power and torque.

REAR RADIUS ARM



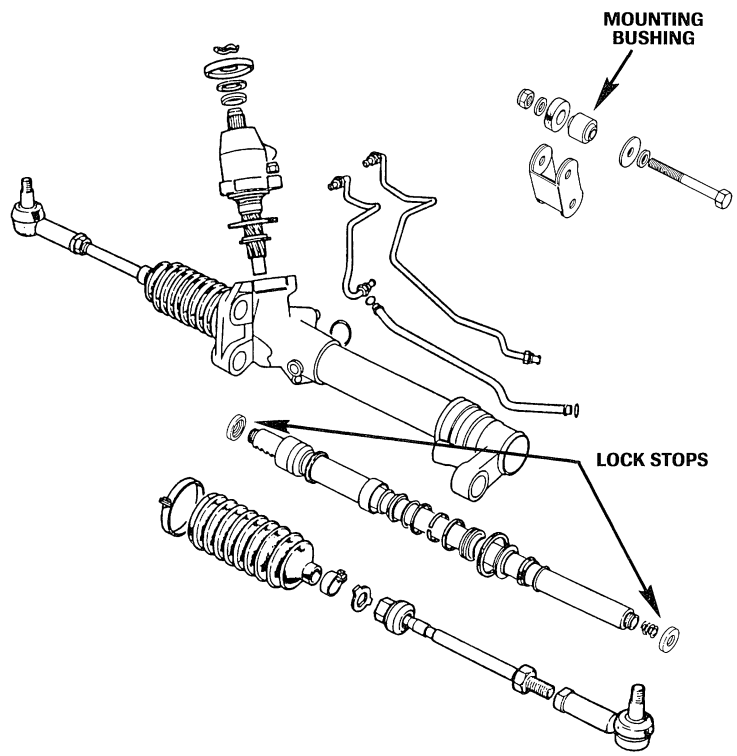
Steering

The steering is revised to suit the characteristics of the XJR-S.

Steering rack

The steering rack mounting bushings are upgraded to reduce side float and a revised spool valve decreases power assistance to permit greater "road feel". Additionally, 8 mm lock stops are installed to prevent the wheel from rubbing the inner fender at full turning lock. The steering wheel turns 2.5 turns lock-to-lock.

STEERING RACK



XJR-S Separate Wiring Harnesses

Additional or substitute wiring harnesses are used with the base XJS V12 wiring harnesses.

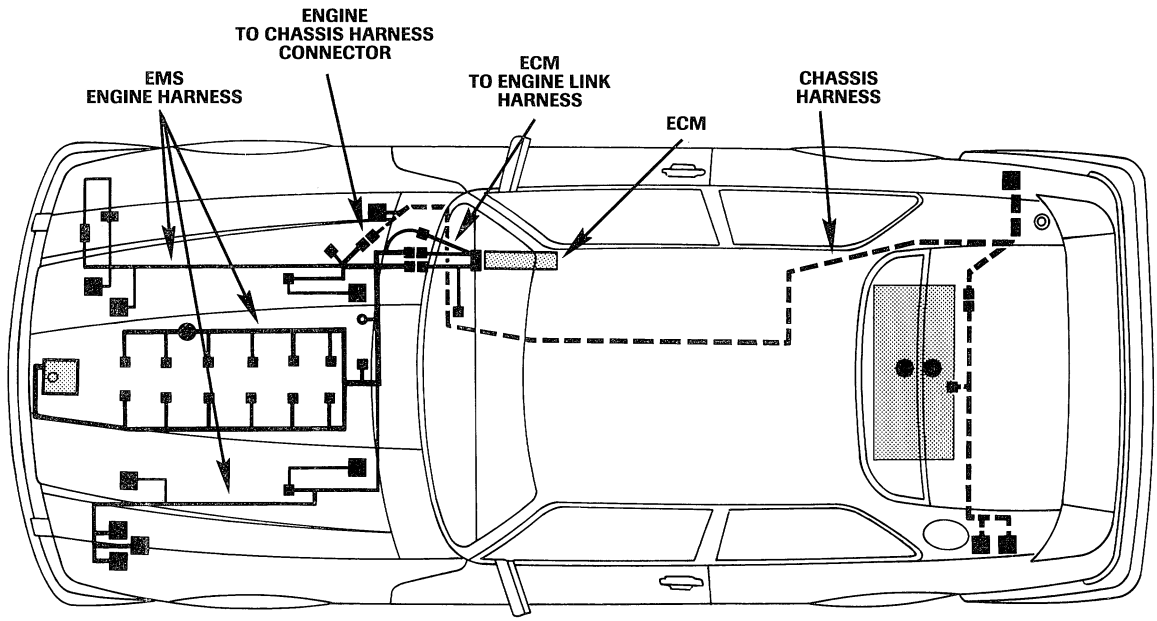
EMS engine harness
The EMS engine harness serves the engine management system and makes connection to the chassis harness at the Sumitomo 090 Sealed connector located at the right rear of the engine compartment.

ECM to engine link harness
This link harness connects the ECM to the engine harness via two Sumitomo 090 Block and one 250 blade wire-to-wire connectors located in the passenger's footwell.

Chassis harness
The chassis harness interfaces with the engine harness in the engine compartment and runs rearward to the fuel level sender, speed interface, fuel pumps, antenna retraction override relay and EMS main and fuel pump relays.

Lighting link harnesses
Link harnesses make connection to the side lights.

HARNESS LAYOUT



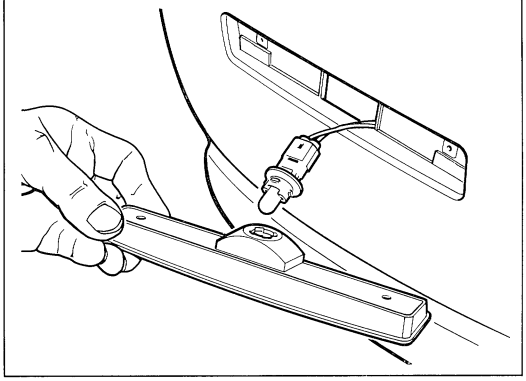
Lighting

The XJR-S body panels incorporate new side lights and require a revised procedure for servicing the front turn signal bulbs. Front fog lights cannot be installed because of the front body apron styling.

Side lights

The side light assemblies are installed with two face mounting screws. These must be withdrawn to allow bulb replacement.

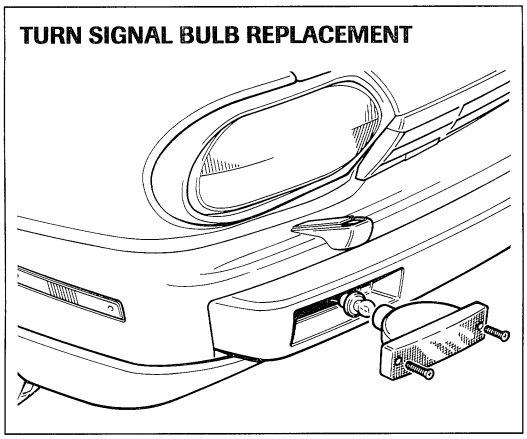
SIDE LIGHT BULB REPLACEMENT



Front turn signals

The front turn signal assemblies are installed with two face mounting screws. These must be withdrawn to allow bulb replacement.

TURN SIGNAL BULB REPLACEMENT



Antenna Retraction

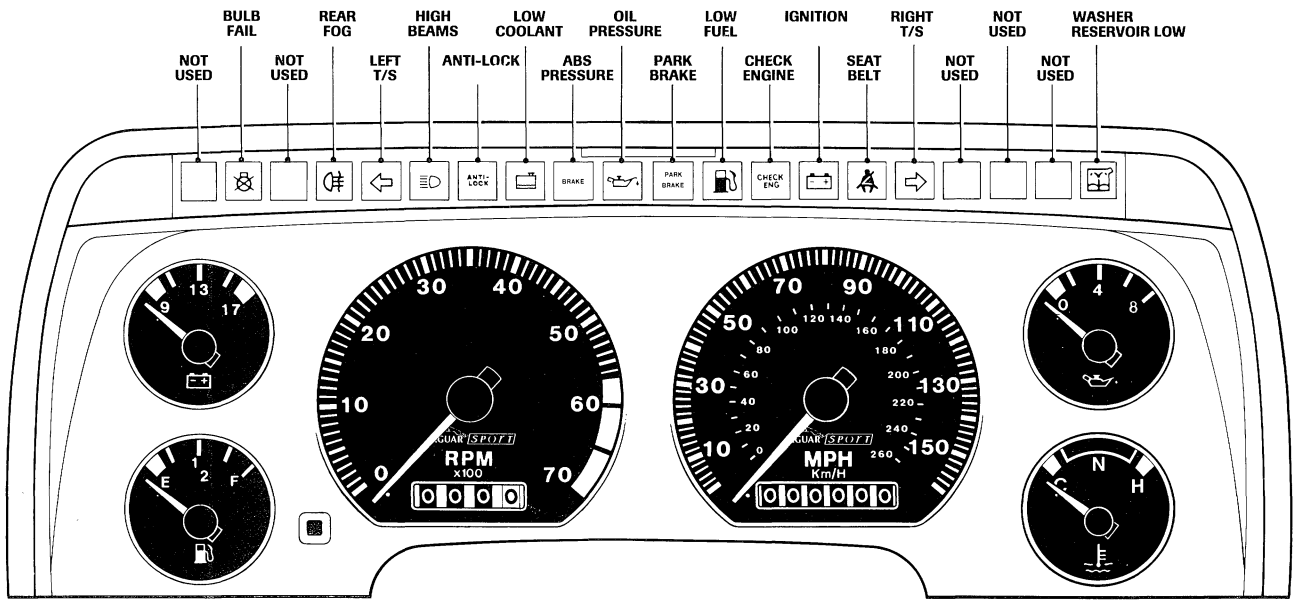
In order to prevent interference between the rear spoiler and the extended radio antenna as the trunk lid is opened (if the radio is switched on), an antenna retraction circuit has been added. An antenna retraction override relay is activated by the trunk light switch as the trunk lid is opened and drives the antenna down. When opening the trunk with the antenna extended, the operator must raise the lid slightly and then wait for the antenna to retract completely before continuing to open the trunk.

CAUTION: Damage will result if the antenna is not fully retracted when the trunk is opened or closed.

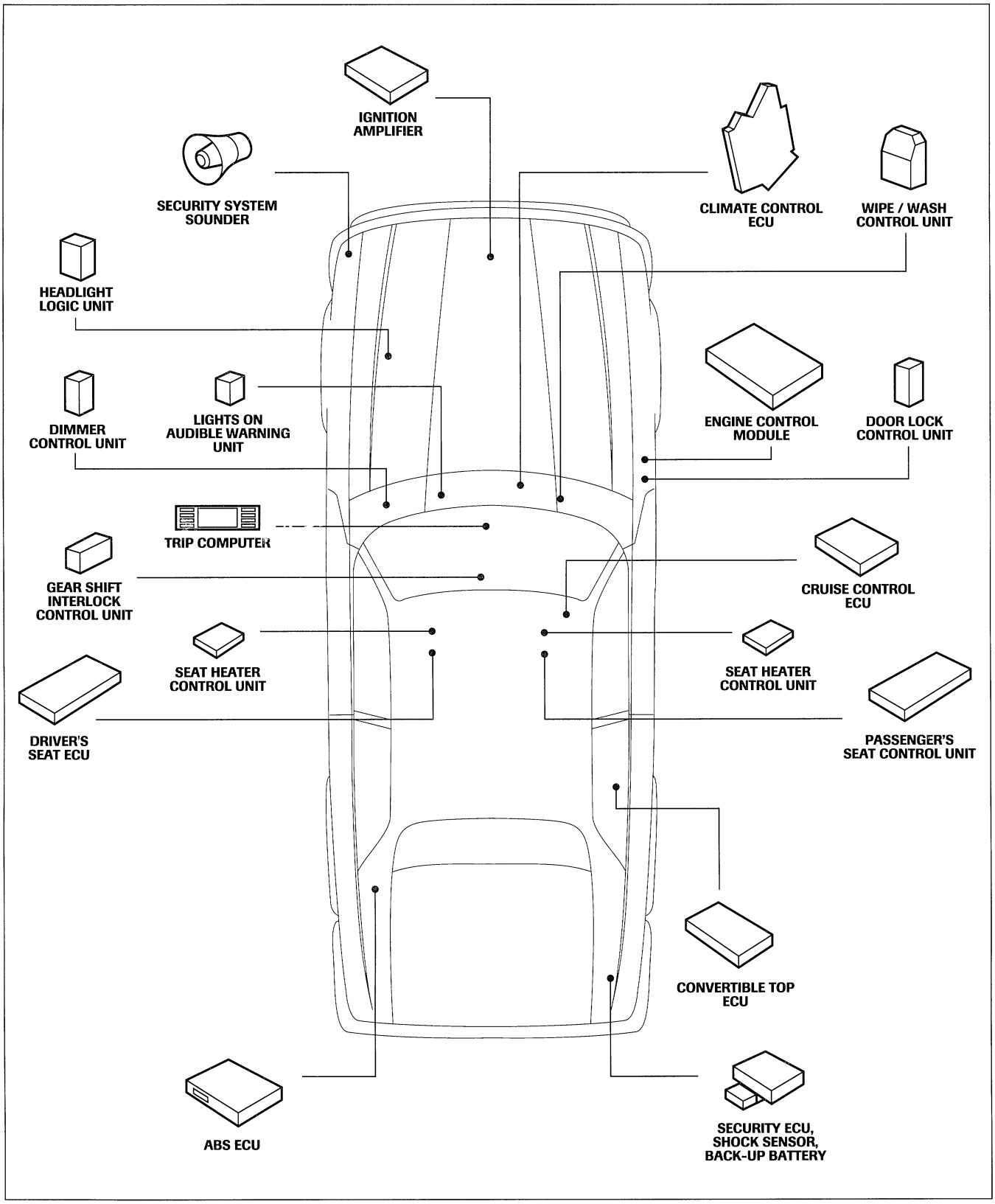
Instrument Pack

The instrument pack speedometer has been recalibrated to reflect the larger diameter XJR-S wheel size. XJR-S logos appear on the speedometer and the tachometer.

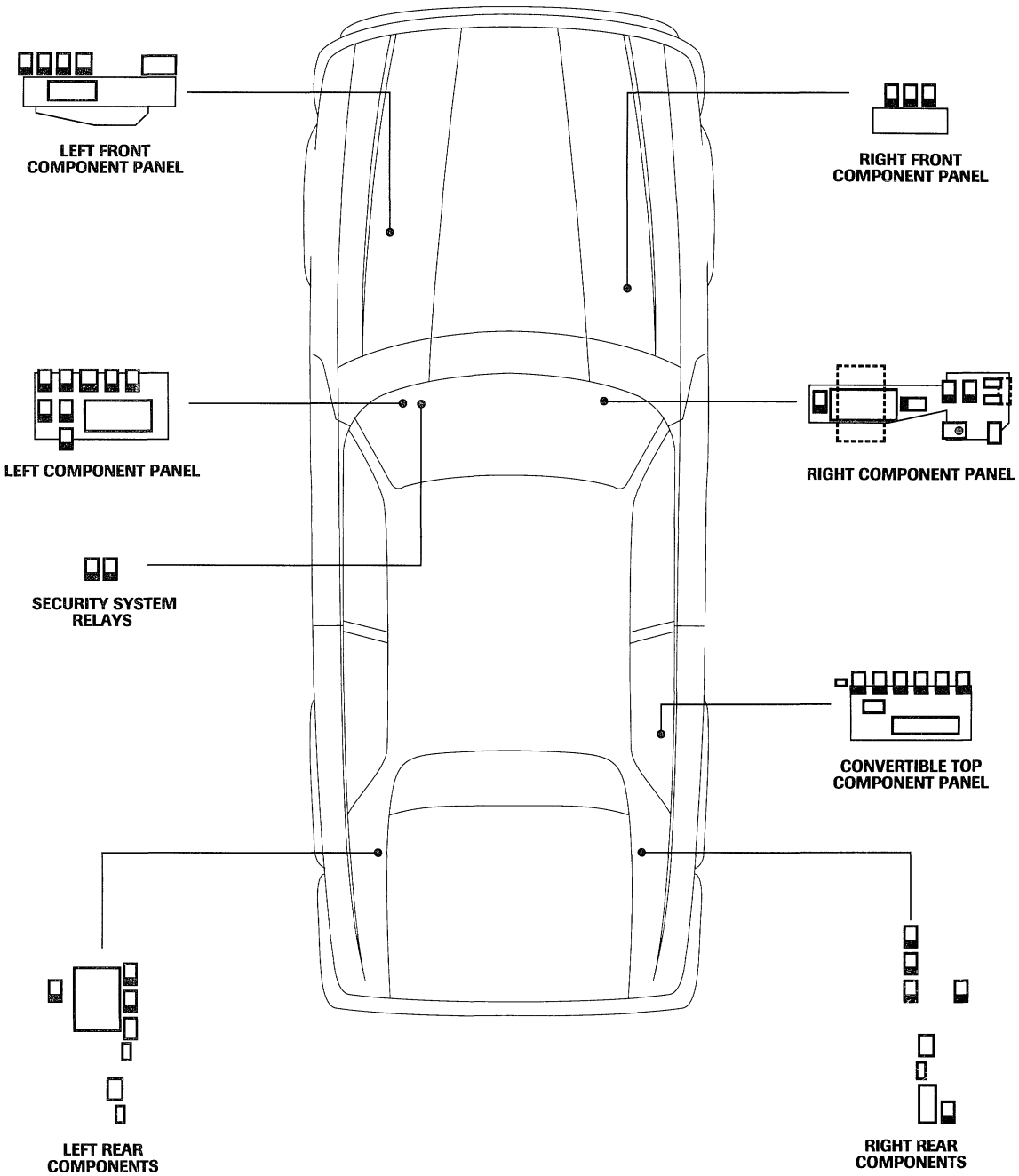
INSTRUMENT PACK



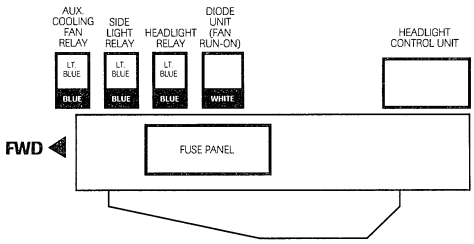
Electrical / Electronic Component Identification and Location



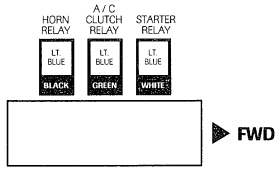
Component Panel Location



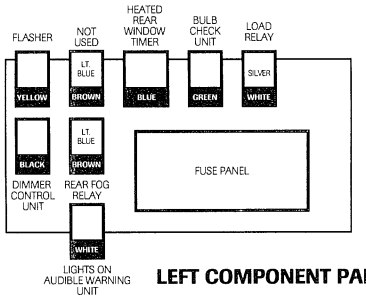
Relay Identification and Location



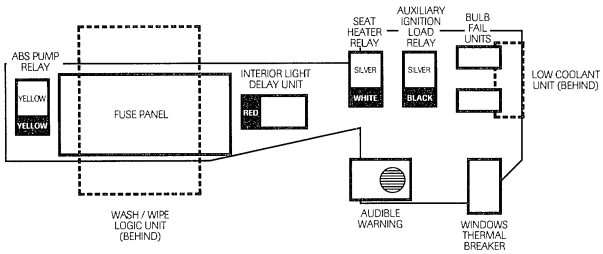
LEFT FRONT COMPONENT PANEL



RIGHT FRONT COMPONENT PANEL

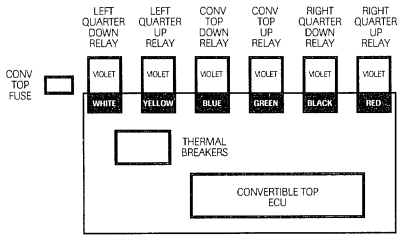


LEFT COMPONENT PANEL

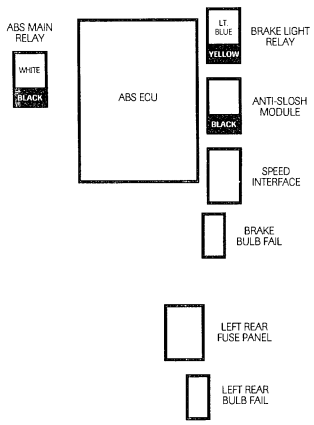


RIGHT COMPONENT PANEL

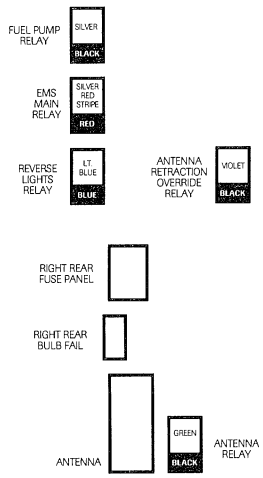
SECURITY SYSTEM RELAYS



CONVERTIBLE TOP COMPONENT PANEL



LEFT REAR COMPONENTS



RIGHT REAR COMPONENTS

Fuse Panels and Identifications

Left fuse panel

Number	Color	Value	Circuit
1	Lt. Blue	15A	Driver's seat movement – fore, aft, lumbar
2	Violet	3A	Kick down
3	Yellow	20A	Left blower
4	Pink	4A	Telephone ignition power (optional)
5	Tan	5A	Telephone battery power (optional)
6	Tan	5A	Radio memory
7	Red	10A	Radio power
8	Red	10A	Windshield washer pump
9	Red	10A	Driver's seat heater
10	Gray	1A	Not used
11	Red	10A	Trunk lighting
12	Yellow	20A	Driver's seat movement – recline
13	Violet	3A	Trip computer memory
14	Violet	3A	Power mirrors; door switch packs; seat memory
15	Pink	4A	Heated washer jets
16	Tan	5A	Trip computer; gear shift interlock
17	Tan	5A	Rear fog lights
18	Orange	7.5A	Locate lighting; instrument pack lighting
19	Orange	7.5A	Hazard warning; seat belt warning logic
20	Lt. Blue	15A	Not used
21	–	–	Not used
22	Lt. Blue	15A	Heated rear window; heated door mirrors

Right fuse panel

Number	Color	Value	Circuit
1	Lt. Blue	15A	Passenger's seat movement – fore, aft, lumbar
2	Violet	3A	Cruise control
3	Yellow	20A	Right blower
4	Tan	5A	Interior lighting
5	Brown	7.5A	Turn signals
6	Red	10A	Central door locking
7	Red	10A	Cigar lighter
8	Lt. Blue	15A	Windshield wipers
9	Lt. Green	30A	Headlight power wash
10	Violet	3A	Not used
11	Lt. Green	30A	ABS main
12	Yellow	20A	Passenger's seat movement – recline
13	Violet	3A	Left front side lights
14	Violet	3A	Right front side lights
15	Violet	3A	Climate control (ECU and control circuit); cooling fan run-on
16	Tan	5A	Air conditioning compressor clutch relay
17	Red	10A	Passenger's seat heater
18	Lt. Blue	15A	Horns
19	Lt. Blue	15A	Stop lights
20	Lt. Blue	15A	Not used
21	–	–	Not used
22	Lt. Green	30A	ABS pump

Left front fuse panel

Number	Color	Value	Circuit
1	–	–	Not used
2	–	–	Not used
3	–	–	Not used
4	Lt. Green	30A	Auxiliary cooling fan
5	Red	10A	Left headlight high beam
6	Red	10A	Right headlight high beam
7	–	–	Not used
8	Lt. Blue	15A	Not used
9	Brown	7.5A	Left headlight low beam
10	Brown	7.5A	Right headlight low beam
11	–	–	Not used
12	Violet	3A	Not used

Left rear fuse panel

Number	Color	Value	Circuit
1	Violet	3A	Right tail, left license plate lighting
2	Violet	3A	Not used
3	Violet	3A	Not used

Right rear fuse panel

Number	Color	Value	Circuit
1	Violet	3A	Left tail, right license plate lighting
2	Red	10A	Antenna
3	Tan	5A	Reverse lights

Convertible top fuse

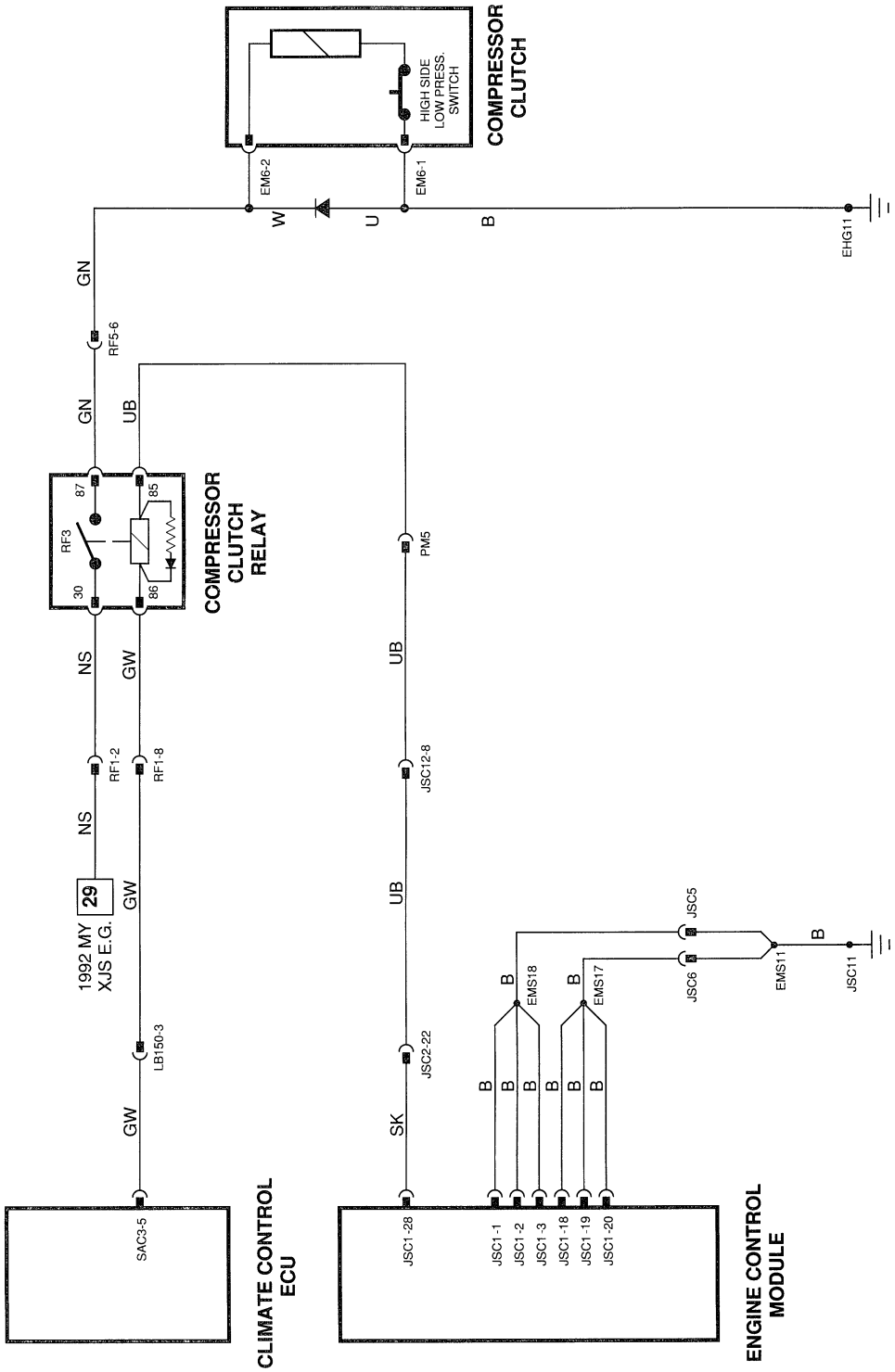
Number	Color	Value	Circuit
1	Lt. Green	30A	Convertible top

In-line fuses

Color	Value	Circuit	Location
Violet	3A	Driver's lumbar motor	Driver's seat back
Violet	3A	Passenger's lumbar motor	Passenger's seat back
Tan	5A	EMS Serial communications data link	Passenger's footwell
Brown	7.5A	Security system	Trunk, right rear
Tan	5A	Right rear side lights	Trunk, right rear
Tan	5A	Left rear side lights	Trunk, left rear
Brown	7.5A	Oxygen sensor heaters	Trunk, right
Lt. Blue	15A	Twin fuel pumps	Trunk, right

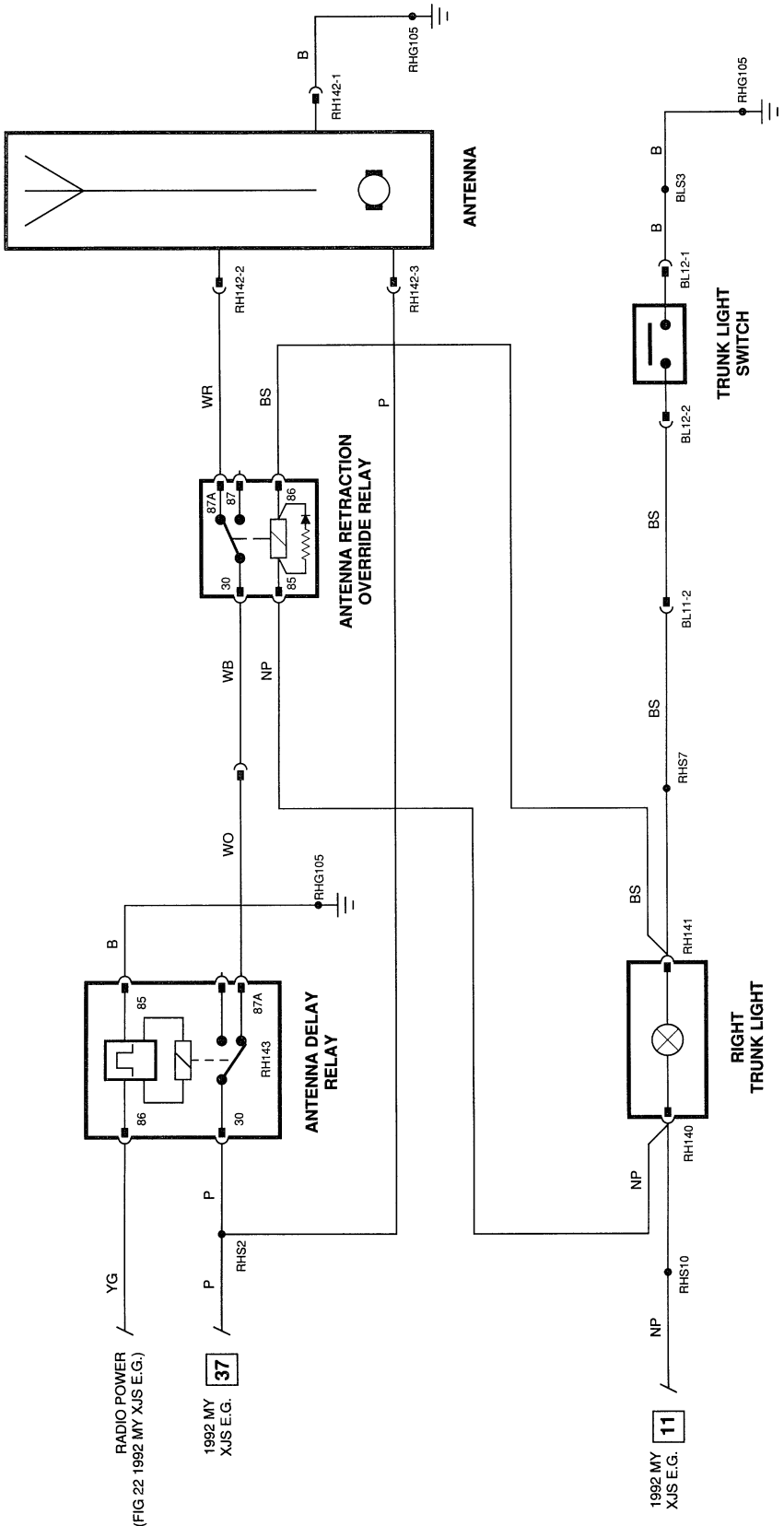
Air Conditioning Compressor Clutch Control

Refer to page 32 of this publication for Wiring Color Codes.



Antenna Retraction Override

Refer to page 32 of this publication for Wiring Color Codes.

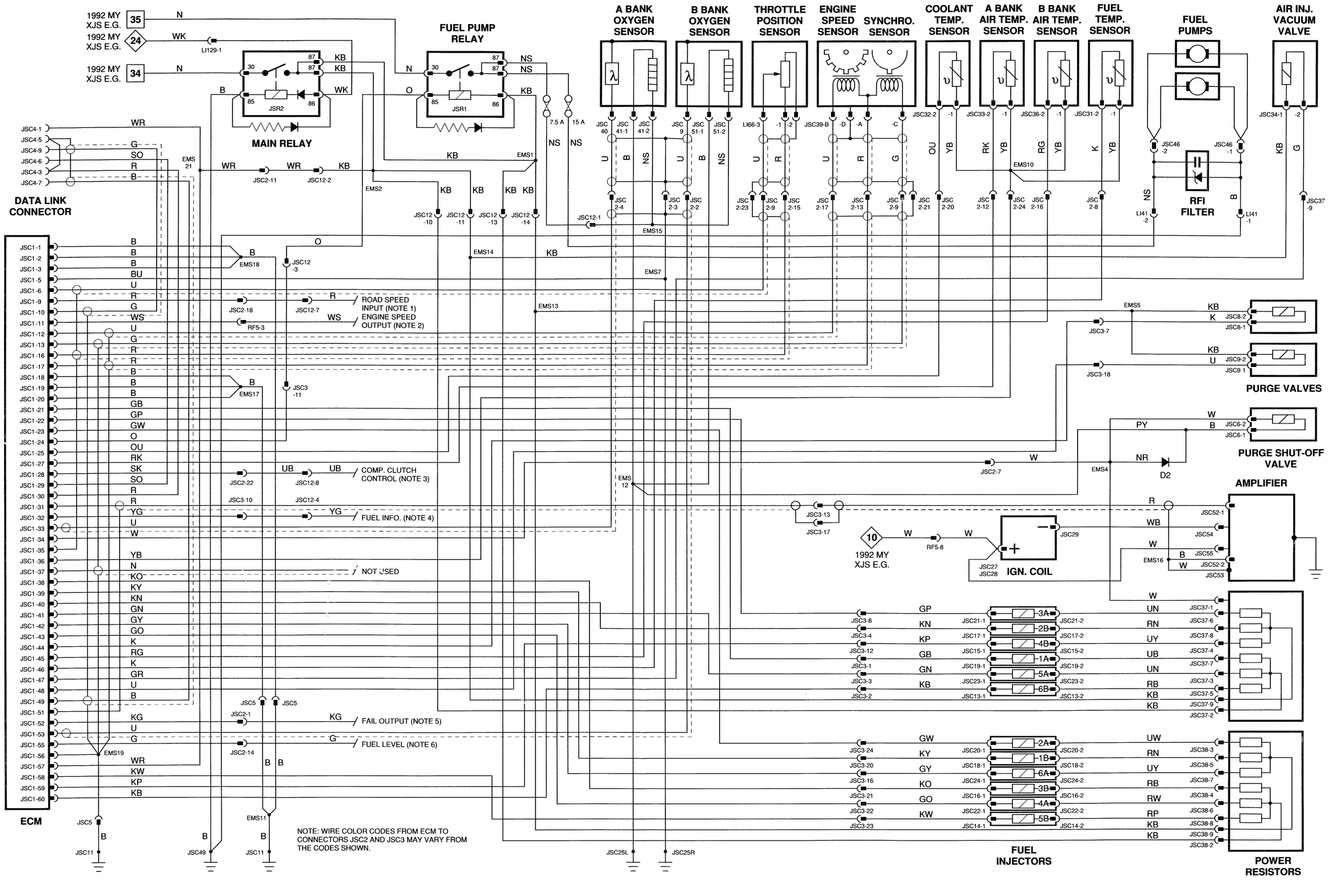


Engine Management System (FOLD OUT)

Wiring Color Codes

N	Brown	Y	Yellow
B	Black	O	Orange
W	White	S	Slate
K	Pink	L	Light
G	Green	U	Blue
R	Red	P	Purple

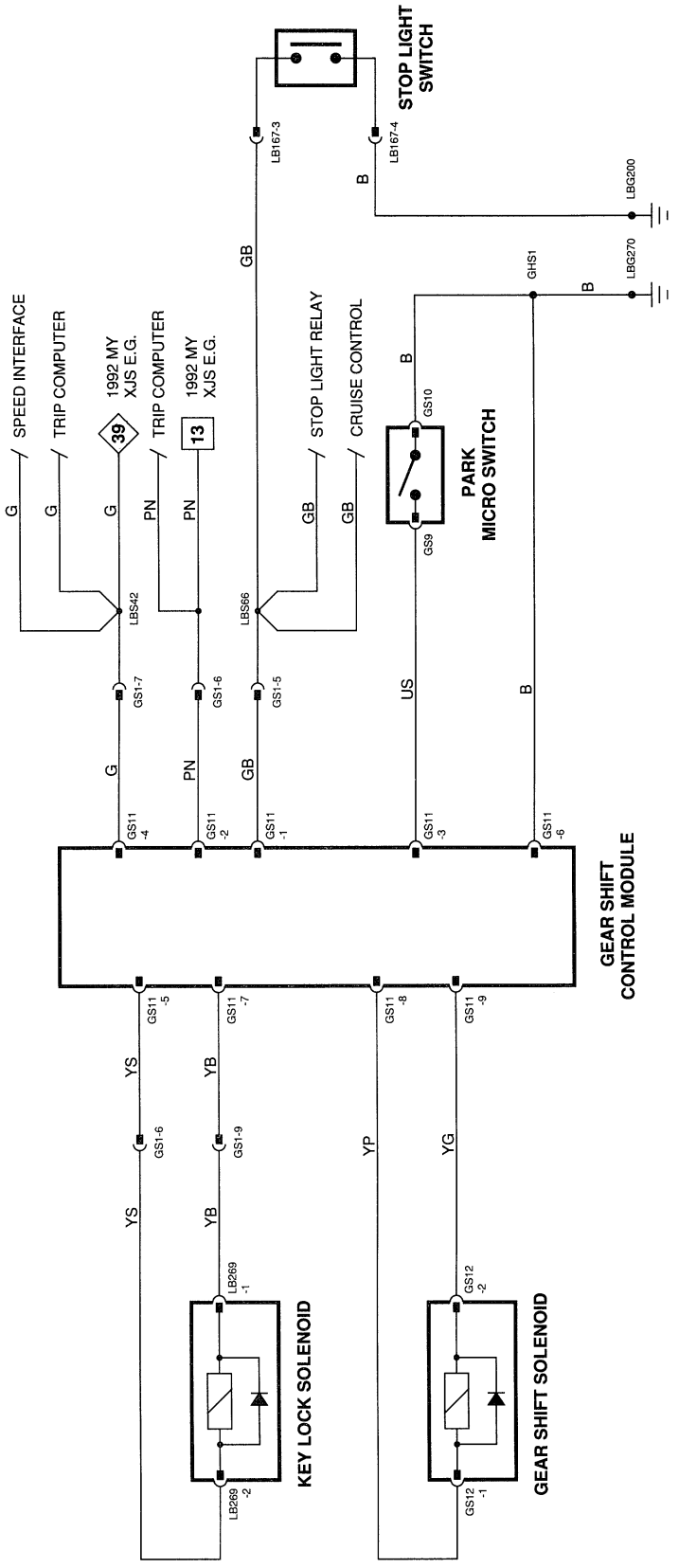
Refer to the XJS Range 1992 Electrical Guide for keys to symbols and Codes.


1992 MY XJS E.G. 35
1992 MY XJS E.G. 24
1992 MY XJS E.G. 34
N
WK
LI129-1
B
JSR2
MAIN RELAY
FUEL PUMP RELAY
JSR1
7.5 A
15 A
A BANK OXYGEN SENSOR
B BANK OXYGEN SENSOR
THROTTLE POSITION SENSOR
ENGINE SPEED SENSOR
SYNCHRO. SENSOR
COOLANT TEMP. SENSOR
A BANK AIR TEMP. SENSOR
B BANK AIR TEMP. SENSOR
FUEL TEMP. SENSOR
FUEL PUMPS
AIR INJ. VACUUM VALVE
RFI FILTER
DATA LINK CONNECTOR
EMS1
EMS2
EMS5
EMS7
EMS10
EMS12
EMS13
EMS14
EMS15
EMS16
EMS17
EMS18
EMS19
ROAD SPEED INPUT (NOTE 1)
ENGINE SPEED OUTPUT (NOTE 2)
COMP. CLUTCH CONTROL (NOTE 3)
FUEL INFO. (NOTE 4)
NOT USED
FAIL OUTPUT (NOTE 5)
FUEL LEVEL (NOTE 6)
PURGE VALVES
PURGE SHUT-OFF VALVE
AMPLIFIER
IGN. COIL
1992 MY XJS E.G. 10
D2
FUEL INJECTORS
POWER RESISTORS
ECM
NOTE: WIRE COLOR CODES FROM ECM TO CONNECTORS JSC2 AND JSC3 MAY VARY FROM THE CODES SHOWN.

Data for Engine Management System Wiring Diagram (FOLD OUT)

Gear Shift Interlock

Refer to page 32 of this publication for Wiring Color Codes.



COMPONENTS

DESCRIPTION	LOCATION	ACCESS
AIR INJECTION VACUUM VALVE	ENGINE, RIGHT FRONT	ENGINE COMPARTMENT
AIR TEMPERATURE SENSOR – BANK A	RIGHT AIR CLEANER	ENGINE COMPARTMENT
AIR TEMPERATURE SENSOR – BANK B	LEFT AIR CLEANER	ENGINE COMPARTMENT
AMPLIFIER	RADIATOR SUPPORT	ENGINE COMPARTMENT
COOLANT TEMPERATURE SENSOR	ENGINE, LEFT FRONT	ENGINE COMPARTMENT
DATA LINK CONNECTOR	PASSENGER FOOTWELL, TOP FRONT	PASSENGER FOOTWELL
DIODE – D2	ADJACENT TO PURGE CANISTER	RIGHT FRONT WHEEL HOUSING PANEL
ENGINE CONTROL MODULE	RIGHT A POST	PASSENGER FOOTWELL TRIM PANEL
ENGINE SPEED SENSOR	DISTRIBUTOR	ENGINE COMPARTMENT
FUEL INJECTORS	ENGINE, TOP	ENGINE COMPARTMENT
FUEL PUMPS	FUEL TANK	LUGGAGE COMPARTMENT
FUEL TEMPERATURE SENSOR	FUEL RAIL, A BANK	ENGINE COMPARTMENT
IGNITION COIL	ENGINE VEE	ENGINE COMPARTMENT
OXYGEN SENSOR – BANK A	RIGHT DOWN-PIPE	UNDER BODY
OXYGEN SENSOR – BANK B	LEFT DOWN-PIPE	UNDER BODY
POWER RESISTORS	RIGHT FRONT INNER FENDER	ENGINE COMPARTMENT
PURGE SHUT-OFF VALVE	ADJACENT TO PURGE CANISTER	RIGHT FRONT WHEEL HOUSING PANEL
PURGE VALVES	ADJACENT TO PURGE CANISTER	RIGHT FRONT WHEEL HOUSING PANEL
RELAY – FUEL PUMP (JSR1)	RIGHT REAR "HOCKEY STICK" BRACE	LUGGAGE COMPARTMENT, RIGHT TRIM
RELAY – MAIN (JSR2)	RIGHT REAR "HOCKEY STICK" BRACE	LUGGAGE COMPARTMENT, RIGHT TRIM
RFI FILTER	FUEL TANK, TOP	LUGGAGE COMPARTMENT
SYNCHRO. SENSOR	DISTRIBUTOR	ENGINE COMPARTMENT
THROTTLE POSITION SENSOR	ENGINE VEE, REAR	ENGINE COMPARTMENT

CONNECTORS

CODE	DESCRIPTION	LOCATION / INTERFACE
JSC1	60 WAY MODU WIRE-TO-BOARD	PASSENGER'S FOOTWELL / ECM
JSC2	22 WAY SUMITOMO 090 SEALED (YELLOW)	PASSENGER'S FOOTWELL / ECM
JSC3	22 WAY SUMITOMO 090 SEALED (WHITE)	PASSENGER'S FOOTWELL / ECM
JSC4	9 WAY PM4 (BLACK)	PASSENGER'S FOOTWELL / DATA LINK CONNECTOR
JSC5	4 WAY 250 BLADE (WHITE)	PASSENGER'S FOOTWELL / ECM
JSC6	3 WAY PM5 (BLACK)	LEFT FRONT FENDER / PURGE SHUT-OFF VALVE
JSC8	2 WAY AMP (BLACK)	LEFT FRONT FENDER / PURGE VALVE
JSC9	2 WAY AMP (BLACK)	LEFT FRONT FENDER / PURGE VALVE
JSC12	14 WAY SUMITOMO 090 SEALED (WHITE)	ENGINE COMPARTMENT, RIGHT REAR / ENGINE TO CHASSIS HARNESS
JSC13	2 WAY AMP (GRAY)	INJECTOR 6B
JSC14	2 WAY AMP (GRAY)	INJECTOR 5B
JSC15	2 WAY AMP (GRAY)	INJECTOR 4B
JSC16	2 WAY AMP (GRAY)	INJECTOR 3B
JSC17	2 WAY AMP (GRAY)	INJECTOR 2B
JSC18	2 WAY AMP (GRAY)	INJECTOR 1B
JSC19	2 WAY AMP (GRAY)	INJECTOR 1A
JSC20	2 WAY AMP (GRAY)	INJECTOR 2A
JSC21	2 WAY AMP (GRAY)	INJECTOR 3A
JSC22	2 WAY AMP (GRAY)	INJECTOR 4A
JSC23	2 WAY AMP (GRAY)	INJECTOR 5A
JSC24	2 WAY AMP (GRAY)	INJECTOR 6A
JSC27	250 BLADE	ENGINE VEE / IGNITION COIL
JSC28	250 BLADE	ENGINE VEE / IGNITION COIL
JSC29	250 BLADE	ENGINE VEE / IGNITION COIL
JSC31	2 WAY AMP (BLACK)	FUEL RAIL / FUEL TEMPERATURE SENSOR
JSC32	2 WAY AMP (GRAY)	ENGINE, LEFT FRONT / COOLANT TEMPERATURE SENSOR
JSC33	2 WAY AMP (BLACK)	RIGHT AIR CLEANER / A BANK AIR TEMP. SENSOR
JSC34	2 WAY AMP (BLUE)	ENGINE, RIGHT FRONT / AIR INJECTION VACUUM VALVE
JSC36	2 WAY AMP (BLACK)	LEFT AIR CLEANER / B BANK AIR TEMP. SENSOR
JSC37	10 WAY MODULE WIRE-TO-BOARD (WHITE)	ENGINE COMPARTMENT, RIGHT FRONT / POWER RESISTORS
JSC38	10 WAY MODULE WIRE-TO-BOARD (WHITE)	ENGINE COMPARTMENT, RIGHT FRONT / POWER RESISTORS
JSC39	4 WAY WIRE-TO-WIRE SEALED (BLACK)	ENGINE VEE / DISTRIBUTOR
JSC40	250 BLADE	ENGINE COMPARTMENT, RIGHT SIDE / A BANK OXYGEN SENSOR
JSC41	2 WAY AMP (BLACK)	ENGINE COMPARTMENT, RIGHT SIDE / A BANK OXYGEN SENSOR
JSC46	2 WAY ECONOSEAL III LC (WHITE)	FUEL TANK EVAPORATIVE FLANGE / FUEL PUMPS
JSC50	250 BLADE	ENGINE COMPARTMENT, RIGHT SIDE / B BANK OXYGEN SENSOR
JSC51	2 WAY AMP (BLACK)	ENGINE COMPARTMENT, LEFT SIDE / B BANK OXYGEN SENSOR
JSC52	250 BLADE WIRE-TO-BOARD (BLACK)	RADIATOR SUPPORT / AMPLIFIER
JSC53	EYELET	RADIATOR SUPPORT / AMPLIFIER
JSC54	250 BLADE WIRE-TO-BOARD (WHITE)	RADIATOR SUPPORT / AMPLIFIER
JSC55	250 BLADE WIRE-TO-BOARD (BLACK)	RADIATOR SUPPORT / AMPLIFIER
JSR1	RELAY BASE (BLACK)	RIGHT REAR WHEEL ARCH / FUEL PUMP RELAY
JSR2	RELAY BASE (RED)	RIGHT REAR WHEEL ARCH / EMS MAIN RELAY
LI41	2 WAY ECONOSEAL III HC (BLACK)	TRUNK, RIGHT FRONT / CHASSIS HARNESS
LI66	6 WAY SUMITOMO 090 SEALED (GREEN)	ENGINE VEE, REAR / THROTTLE POSITION SENSOR
LI129	6 WAY SUMITOMO BLOCK (BLUE)	BELOW A/C OUTLET / TRIP COMPUTER; INSTRUMENT PACK
RF5	9 WAY PM4 (BLACK)	ENGINE COMPARTMENT, RIGHT REAR / ENGINE HARNESS

GROUNDS

CODE	DESCRIPTION	LOCATION / INTERFACE
JSC11	EYELET	ENGINE COMPARTMENT BULKHEAD, RIGHT REAR / EMS GROUNDS
JSC25L	EYELET	ENGINE CYLINDER HEAD, B BANK, NO. 5 INTAKE MANIFOLD STUD / OXYGEN SENSOR AND PURGE SHUT-OFF VALVE GROUNDS
JSC25R	EYELET	ENGINE CYLINDER HEAD, A BANK, NO. 5 INTAKE MANIFOLD STUD / ECM SHIELDS
JSC49	EYELET	BETWEEN BATTERY AND INNER WHEEL ARCH / POWER GROUND

INPUTS / OUTPUTS

ENGINE CONTROL MODULE

CODE	IN / OUT	CIRCUIT	ACTIVE	INACTIVE
JSC1-1	GROUND	INJECTORS – A BANK	0V	0V
JSC1-2	GROUND	INJECTORS – A BANK	0V	0V
JSC1-3	GROUND	INJECTORS – A BANK	0V	0V
JSC1-4	INPUT	ENGINE GROUND SENSING CIRCUIT	0.4 – 0.55V	0.4 – 0.55V
JSC1-6	INPUT	THROTTLE WIPER INPUT	IDLE ≥ .235 – .355V; FULL THROTTLE < 4.9V	
JSC1-9	INPUT	ROAD SPEED SENSOR	0 MPH = 0V AC; 20 MPH = 2V AC; 50 MPH = 3.4V AC	12V DC
JSC1-10	OUTPUT	DIAGNOSTIC CONNECTOR	.670V	.670V
JSC1-11	OUTPUT	TACHOMETER DRIVE	700 RPM = 6V AC	0 RPM = 0V AC
JSC1-12	INPUT	ENGINE SPEED SENSOR	700 RPM = 6V AC	0 RPM = 0V AC
JSC1-13	INPUT	SYNCHRONIZATION SENSOR	700 RPM = 1.5V AC	0 RPM = 0V AC
JSC1-16	OUTPUT	THROTTLE POSITION SENSOR SUPPLY	~5V	~5V
JSC1-17	OUTPUT	ENGINE SPEED SENSOR SUPPLY	12V	12V
JSC1-18	GROUND	INJECTORS – BANK B	0V	0V
JSC1-19	GROUND	INJECTORS – BANK B	0V	0V
JSC1-20	GROUND	INJECTORS – BANK B	0V	0V
JSC1-21	OUTPUT	INJECTOR 1A TRIGGER	PULSED SIGNAL	12V
JSC1-22	OUTPUT	INJECTOR 3A TRIGGER	PULSED SIGNAL	12V
JSC1-23	OUTPUT	INJECTOR 2A TRIGGER	PULSED SIGNAL	12V
JSC1-24	OUTPUT	FUEL PUMP RELAY	RELAY ENERGIZED: <1V; RELAY OFF: = 12V	
JSC1-25	INPUT	COOLANT TEMPERATURE SENSOR	@20°C = 3.4V; @90°C = .8V	
JSC1-27	INPUT	AIR TEMPERATURE SENSOR – A BANK	@20°C = 3.2V	
JSC1-28	OUTPUT	A/C COMPRESSOR RELAY	A/C ON AND COOLANT TEMP. <120°C: <.2V; >120°C: >9V	
JSC1-29	INPUT	DIAGNOSTIC CONNECTOR	5V	5V
JSC1-30	INPUT	DIAGNOSTIC CONNECTOR	5V	5V
JSC1-31	OUTPUT	IGNITION DRIVE	IDLE = 4V DC	0V
JSC1-32	OUTPUT	TRIP COMPUTER: FUEL USED	PULSED SIGNAL	12V
JSC1-33	INPUT	OXYGEN SENSOR – A BANK	.1 – .8V DC	4 – 5V
JSC1-34	OUTPUT	PURGE SHUT-OFF VALVE	9V	9V
JSC1-35	GROUND	THROTTLE POSITION SENSOR GROUND	0V	0V
JSC1-36	GROUND	COOLANT, AIR AND FUEL TEMP. SENSORS	0V	0V
JSC1-37	NOT USED			
JSC1-38	OUTPUT	INJECTOR 3B TRIGGER	PULSED SIGNAL	12V
JSC1-39	OUTPUT	INJECTOR 1B TRIGGER	PULSED SIGNAL	12V
JSC1-40	OUTPUT	INJECTOR 2B TRIGGER	PULSED SIGNAL	12V
JSC1-41	OUTPUT	INJECTOR 5A TRIGGER	PULSED SIGNAL	12V
JSC1-42	OUTPUT	INJECTOR 6A TRIGGER	PULSED SIGNAL	12V
JSC1-43	OUTPUT	INJECTOR 4A TRIGGER	PULSED SIGNAL	12V
JSC1-44	OUTPUT	PURGE VALVE 1 – DRIVE	PULSED SIGNAL	.1V
JSC1-45	INPUT	AIR TEMPERATURE SENSOR – B BANK	@20°C = 3.2V	
JSC1-46	INPUT	FUEL RAIL TEMPERATURE SENSOR	@20°C = 3.2V	
JSC1-47	OUTPUT	AIR INJECTION SOLENOID VALVE	AIR INJECTION ON: < 1V; AIR INJECTION OFF: = 12V	
JSC1-48	OUTPUT	PURGE VALVE 2 – DRIVE	PULSED SIGNAL	.1V
JSC1-49	INPUT	DIAGNOSTIC CONNECTOR	.2V	.2V
JSC1-51	GROUND	IGNITION SYSTEM GROUND	0V	0V
JSC1-52	OUTPUT	CHECK ENGINE WARNING	WARNING ON = 0V; WARNING OFF = 12V	
JSC1-53	INPUT	OXYGEN SENSOR – B BANK	.1 – .8V DC	4 – 5V
JSC1-55	INPUT	FUEL LEVEL SENSOR	FUEL TANK FULL = 2.5V; FUEL TANK EMPTY = 11V	
JSC1-56	GROUND	IGNITION SENSOR SHIELDS	0V	0V
JSC1-57	INPUT	IGNITION SWITCHED POWER	12V	12V
JSC1-58	OUTPUT	INJECTOR 5B TRIGGER	PULSED SIGNAL	12V
JSC1-59	OUTPUT	INJECTOR 4B TRIGGER	PULSED SIGNAL	12V
JSC1-60	OUTPUT	INJECTOR 6B TRIGGER	PULSED SIGNAL	12V

NOTES FROM WIRING DIAGRAM

NOTE 1: ROAD SPEED INPUT FROM SPEED INTERFACE UNIT VIA RH114-4 AND BLACK PM5; REFER TO XJS 1992 ELECTRICAL GUIDE: FIG 10
NOTE 2: ENGINE SPEED OUTPUT TO TACHOMETER VIA RF5-3; REFER TO XJS 1992 ELECTRICAL GUIDE: FIG 9
NOTE 3: COMPRESSOR CLUTCH CONTROL – WIRING DIAGRAM
NOTE 4: FUEL INFORMATION OUTPUT TO TRIP COMPUTER VIA LI129-3; REFER TO XJS 1992 ELECTRICAL GUIDE: FIG 10
NOTE 5: FAIL OUTPUT; CHECK ENGINE TO INSTRUMENT PACK AND MESSAGE DISPLAY; DTC TO MESSAGE DISPLAY VIA LI129-2; REFER TO XJS 1992 ELECTRICAL GUIDE: FIG 10
NOTE 6: FUEL LEVEL INPUT FROM ANTI-SLOSH MODULE VIA RH169-4 AND BLACK PM5; REFER TO XJS 1992 ELECTRICAL GUIDE: FIG 9

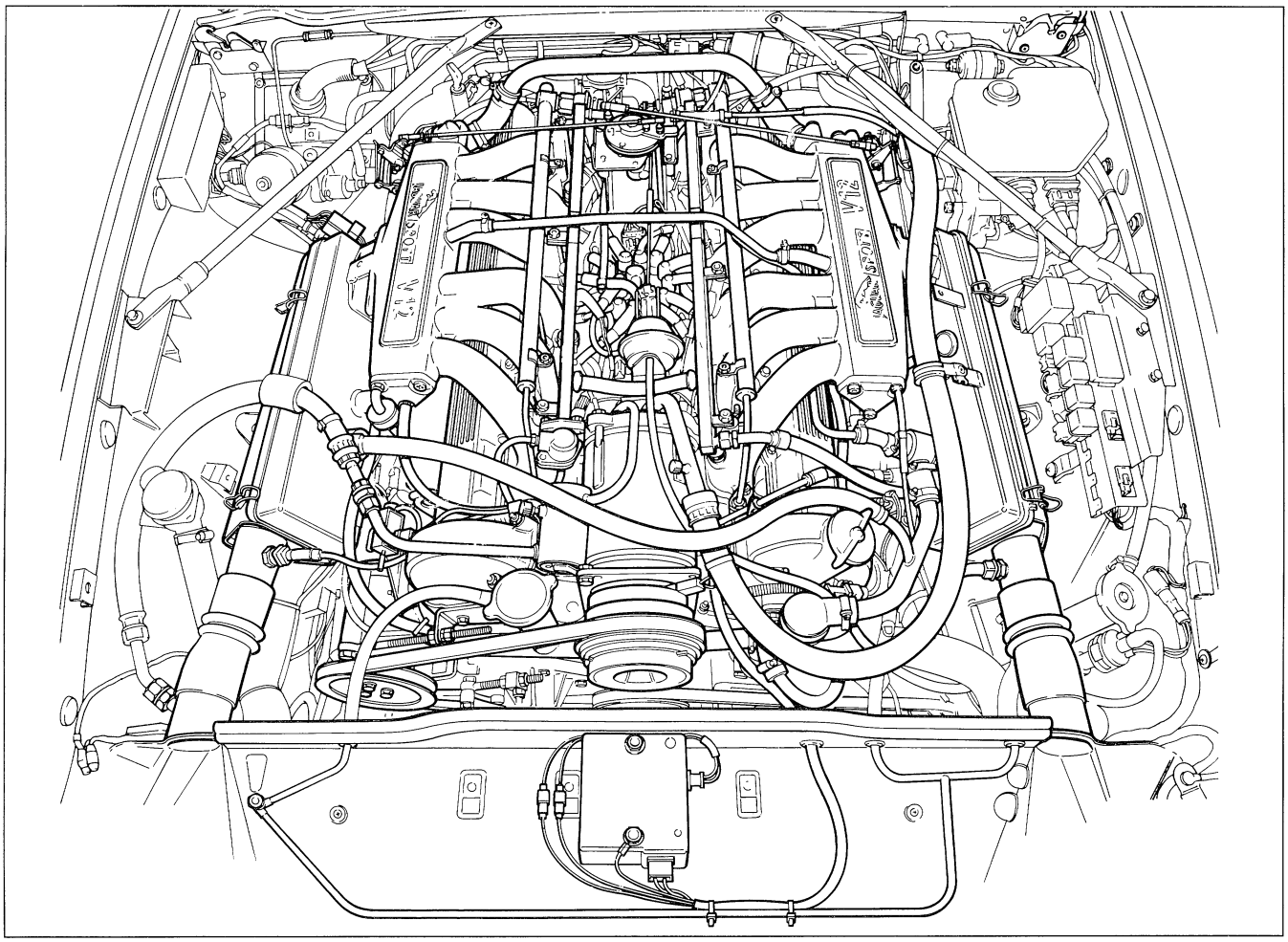
XJR-S

Service Information

JAGUAR SPORT

Engine Management System Service

The service information included in this section covers the Engine Management System. The information is provided in addition to the system description, wiring diagram and wiring diagram data contained in the Technical Introduction. The information is arranged as follows: ENGINE MANAGEMENT SYSTEM SERVICE AID explains the basic operation of this computerized engine management monitoring system; System monitoring and engine set up details system inputs monitored by the ECM, ECM outputs, and engine set up adjustments using the computer and software; Fault diagnosis presents each Diagnostic Trouble Code with a fault description and additional diagnostic information where applicable.



Engine Management System Service Aid

Zytek Systems, the supplier of the XJR-S engine management system have developed a computerized engine management service aid consisting of special software run on a standard portable lap-top computer with custom connection to the engine management system. The Zytek service aid allows monitoring of the system under both static and dynamic conditions.

Computer equipment and connection

When required for service, Jaguar dealers will be supplied with the computer, software (installed in computer drive), interface unit and cables. Refer to the Service Policies section of this manual. The interface unit and cables are connected between the computer and the engine management system. Connect the 9-way connector to the computer serial port. Connect the PM 4 connector to the data link connector in the passenger's footwell. Connect the computer power cable to a 120 V standard wall outlet. Unless it is necessary, do not operate the computer on the internal battery.

Start up

Open and turn on the computer with the power switch located on the left side, toward the front. The computer will load the software and display the Zytek logo screen. Press any key to continue to the next screen showing the title of the software in use.

TITLE SCREEN

```
ZYTEK ENGINE MANAGEMENT SYSTEM SERVICE AID

Copyright (c) 1991 Zytek Systems Ltd

Configured for use on: -

ZYTEK SEQUENTIAL INJECTION SYSTEM - OBD1




Press any key to continue
```

Main menu

Press any key to continue to the next screen – MAIN MENU. Use the directional keys to select the required option and press <ENTER>.

MAIN MENU

```
Zytek Systems Ltd.        Engine management system service aid        Version 4.0.
─────────────────────────────────────────────────────────────────────────────
Dynamic display of system parameters monitored by the ECU

Display of Oxygen Sensor Feedback Data/Throttle Position

Display program & data identification details

Set up Engine

Quit program and return to DOS

─────────────────────────────────────────────────────────────────────────────
─────────────────────────────────────────────────────────────────────────────
MAIN MENU                 Select function using ↑ & ↓ keys - then press <Enter>
```

Dynamic display of system parameters

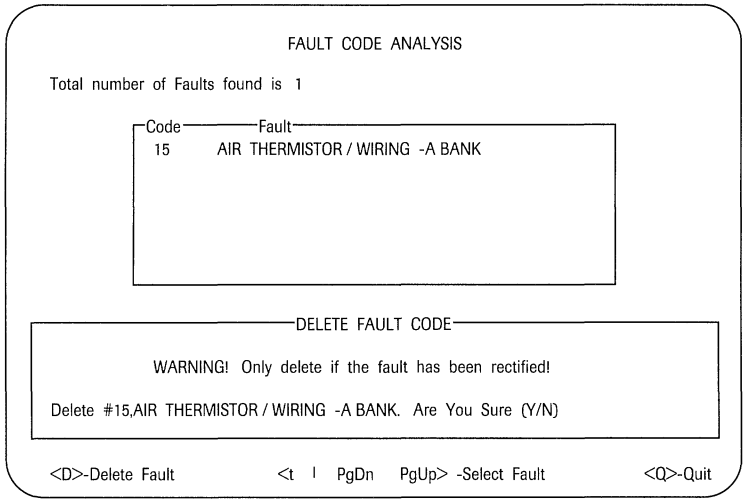
This option presents a visual display of the engine inputs monitored by the ECM, and the outputs for engine operation from the ECM. The values will be generated with the engine off or running; however, the ignition must be ON for the computer to assemble the information. An expanded explanation of the values and their interpretation is given in System Monitoring. Press <Q> to return to the main menu.

DYNAMIC DISPLAY OF SYSTEM PARAMETERS

```
┌──────────────────────────────────────────────────────────────────────────┐
│ COOLANT TEMPERATURE : 193 Deg. F      AIR TEMPERATURE-BANK A : 123 Deg. F│
│ FUEL TEMPERATURE    : 119 Deg. F      AIR TEMPERATURE-BANK B : 143 Deg. F│
└──────────────────────────────────────────────────────────────────────────┘
   ┌──────────────────────────────────────────────────────────────────┐
   │ ENGINE SPEED    : 780 RPM      THROTTLE POSITION    : 323  mV    │
   │ ROAD SPEED      :   0 MPH      MANIFOLD DEPRESSION  :  13.1 InHg │
   └──────────────────────────────────────────────────────────────────┘
┌──────────────────────────────────────────────────────────────────────────┐
│ BATTERY VOLTAGE  : 13.9 V  PURGE VALVE VOLTAGE: 11.1 V  AIR PUMP: DISABLED│
│ FUEL TANK VOLTAGE: 11.0 V  AIR COND : ENABLED           PURGE FLOW  :  2 %│
└──────────────────────────────────────────────────────────────────────────┘
┌──────────────────────────────────────────────┐ ┌──────────────────────────┐
│ LAMBDA A VOLTS: 0.75 V  LAMBDA B VOLTS: 0.39 V│ │ INJECTOR OPEN TIME : 4.47 mS│
│          LAMBDA GROUND VOLTS: 0.45 V          │ │ IGNITION ADVANCE   : 3.4 Deg│
└──────────────────────────────────────────────┘ └──────────────────────────┘
▲
DYNAMIC DISPLAY OF SYSTEM PARAMETERS        Press <Q> to return to main menu
```

Engine Management System Service Aid (continued)

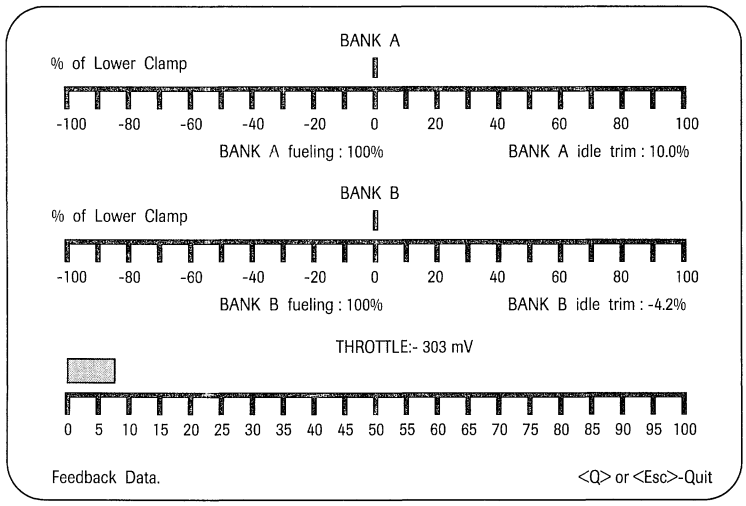
DIAGNOSTICS



Diagnostics

This option is used only to access and erase Diagnostic Trouble Codes flagged in the ECM memory. No computerized diagnostic routines are provided. Press <Q> to return to the main menu.

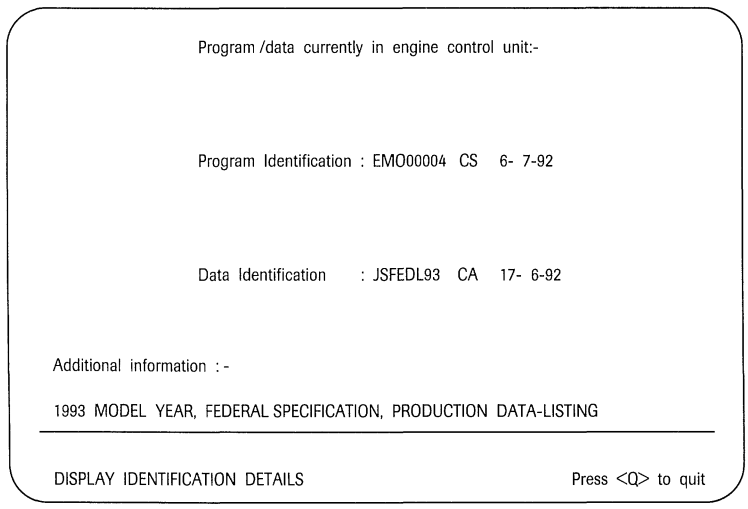
CLOSED LOOP CONTROL



Closed loop control data

This option displays the ECM closed loop fuel metering control in the form of bar graphs for A and B banks. In addition, the throttle opening is represented as a percent (0 = closed; 100 = wide open). An expanded explanation of the values and their interpretation is given in System Monitoring. Press <Q> to return to the main menu.

DISPLAY PROGRAM AND DATA IDENTIFICATION DETAILS



Display program and data identification details

This option provides the identification of the software program within the ECM. Switch the ignition ON (do not start the engine) and press <ENTER>. The computer will display the program data. Press <Q> to return to the main menu.

Set up engine

This option provides a step-by-step procedure for engine set up using the computer screen displays. It is not necessary to complete the procedures in sequence as each procedure can be accessed independently. Press <SPACE> to cycle to the next procedure. An expanded explanation of the procedures is given in Engine Set up. Press <Q> or <ESCAPE> to return to the main menu.

IMPORTANT: Under normal circumstances, the engine set up procedures should only be carried out after component replacement or engine disassembly and reassembly.

Quit program and return to DOS

Selecting this option and pressing <ENTER> quits the program and parks the disc to allow computer shut down.

SET UP ENGINE

Before proceeding with the engine set-up function, ensure that the following conditions have been met.

1). Turn the engine OFF.

2). Set the gear selector to PARK or NEUTRAL.

3). Turn the air conditioning unit OFF.

4). Ensure Ignition is off, connect to timing light, then turn ignition on.

5). Be sure that there are no diagnostic faults outstanding.

1). Set up engine. <Q> or <Esc> quits, <SPACE> cycles to next page

MAIN MENU

Zytek Systems Ltd. Engine management system service aid Version 4.0.

Dynamic display of system parameters monitored by the ECU

Display of Oxygen Sensor Feedback Data/Throttle Position

Display program & data identification details

Set up Engine

Quit program and return to DOS

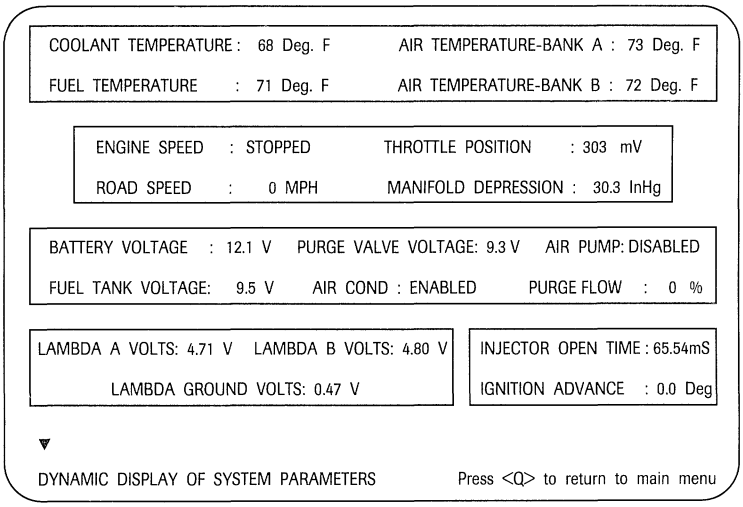
MAIN MENU Select function using ↑ & ↓ keys - then press <Enter>

Dynamic Display of System Parameters

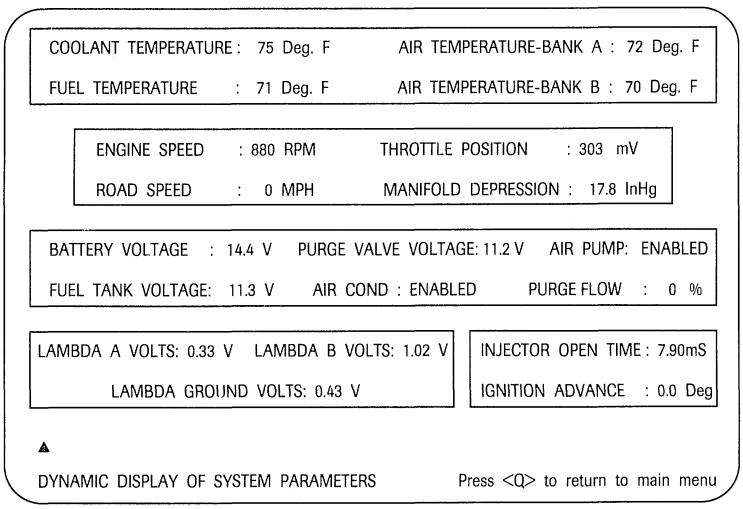
By selecting this option from the main menu, the engine inputs monitored by the ECM, and the outputs for engine operation from the ECM will be displayed. The values will be generated with the engine off or running; however, the ignition must be ON for the computer to assemble the information. The information provided in this sub section explains each value and adds additional detail as necessary to the understanding of the value displayed.

If a fault condition exists as indicated by the displayed value or warning, a corresponding diagnostic trouble code should be flagged by the ECM. Refer to the DTC chart and diagnostic process – Fault diagnosis sub section.

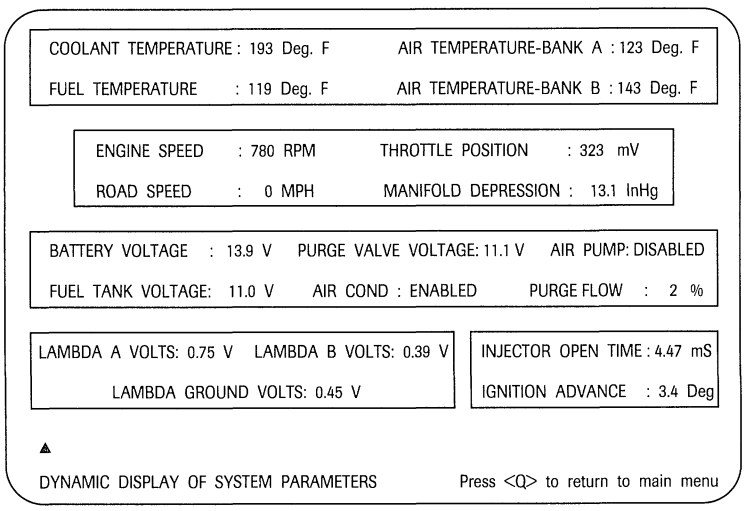
IGNITION ON; ENGINE STOPPED / COLD (AMBIENT)



ENGINE AFTER-START WARM UP



ENGINE AT IDLE / NORMAL OPERATING TEMPERATURE



Coolant, air and fuel temperatures

The upper box displays coolant temperature, bank A air temperature, bank B air temperature and fuel temperature as input to the ECM from the respective sensors. Sensor temperature is expressed in degrees Fahrenheit. The sensor temperatures will be displayed in one of three possible ways:

- Actual temperature in degrees Fahrenheit
- "Short circuit" indicating a short circuit within the sensor or the sensor circuit.
- "Open circuit" indicating an open circuit within the sensor or the sensor circuit

Engine speed

Engine speed is expressed in rpm (revolutions per minute). The screen displayed value represents the actual engine speed sensed by the ECM from the engine speed sensor.

If "stopped" is displayed during cranking, the ECM is not receiving an engine speed input from the speed sensor.

Throttle position

Throttle opening is expressed as a voltage on a scale of 0 to 5000 mVolts. The throttle position sensor input to the ECM can be observed with the engine stopped and the ignition on. Closed throttle (idle) should indicate very low voltage. As the throttle is opened, the voltage should rise smoothly. When held full open, the voltage should be high and steady.

Road speed
Road speed is expressed in mph. The screen displayed value represents the actual road speed sensed by the ECM from the road speed sensor via the speed interface unit.

Manifold absolute pressure (manifold depression)
Manifold absolute pressure (MAP) is identified as manifold depression on the display. Do not confuse this value with manifold vacuum. Manifold absolute pressure is expressed in inches of mercury (in. hg). When the ignition is switched on (engine stopped) the display should indicate ambient atmospheric pressure (29.92 in. hg at sea level). After starting the engine, the MAP should vary from approximately 13 in. hg at idle to slightly less than ambient atmospheric pressure at full throttle.

Any faults indicated by this display can be detected by static values as the engine modes vary (level surface v climbing grade; idle v acceleration) or by fluctuating values as the engine mode remain steady (idle; cruise on level surface).

Manifold Absolute Pressure (MAP) v Gauge Vacuum (approximate)

MAP	VACUUM
30 in hg	0
29 in hg	1 in hg
28 in hg	2 in hg
27 in hg	3 in hg
26 in hg	4 in hg
25 in hg	5 in hg
44 in hg	6 in hg
23 in hg	7 in hg
22 in hg	8 in hg
21 in hg	9 in hg
20 in hg	10 in hg
19 in hg	11 in hg
18 in hg	12 in hg
17 in hg	13 in hg
16 in hg	14 in hg
15 in hg	15 in hg
14 in hg	16 in hg
13 in hg	17 in hg
12 in hg	18 in hg
11 in hg	19 in hg
10 in hg	20 in hg

Battery voltage
Battery voltage as measured by the ECM is displayed.

Purge valve voltage
In order to open the purge shut off valve, the ECM applies voltage to the valve when the ignition is switched on. This voltage is less than battery voltage (approximately 9 - 11.5 V). The displayed value will indicate if the valve is open.

Air injection pump
ENABLED indicates that the air pump flow is being directed to the exhaust ports. DISABLED indicates that the air pump flow is being diverted to the right air cleaner.

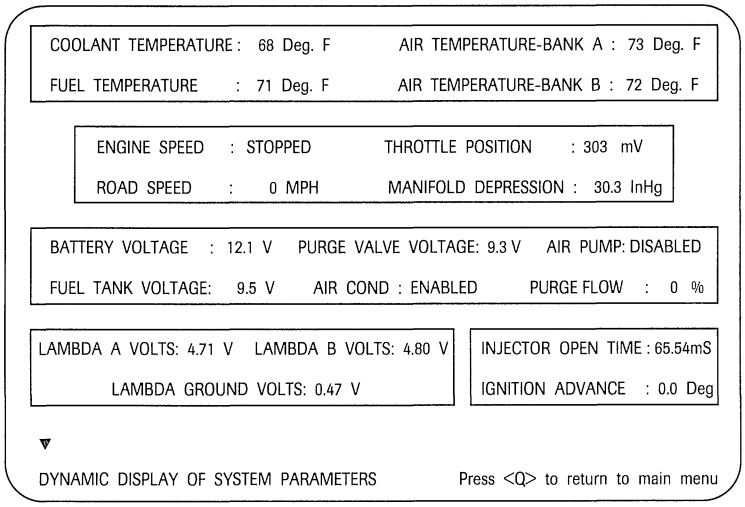
Fuel tank level (voltage)
The fuel tank level is expressed as a voltage measured directly from the fuel tank level sender and ranges from 2 to 10 volts (full to empty). Diagnostic trouble codes related to engine fueling are disabled when the fuel level is below 6.5 gallons.

Air conditioning compressor
ENABLED indicates that the compressor clutch override circuit is not activated thus allowing compressor operation. DISABLED indicates that the override circuit is activated thus preventing compressor operation.

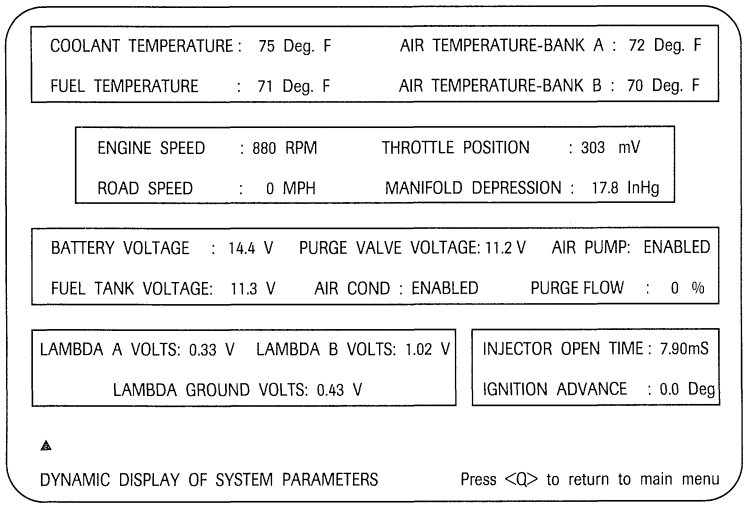
Purge flow
The % value indicates if the purge valves are open allowing canister purging. 0% indicates that the valves are closed. The value at idle (engine at normal operating temperature) will be approximately 2%. Above idle, the % value will vary above 2% depending on engine operating conditions.

Oxygen sensor (Lambda) voltages
The oxygen sensor output voltage as measured by the ECM is displayed for A and B bank oxygen sensors. The possible range of voltage is 0 to 5 volts. When the ignition is switched on (engine stopped) with the engine cold (ambient temperature) the voltage should read 4 - 5 V. After starting the engine, the voltages should fall rapidly as the sensors are warmed by the heaters. When the engine is fully warmed, at idle speed, the sensor voltages should range between 0.1 - 0.8 V. If the engine is stopped and restarted while hot, the initial voltages may vary between 0.2 - 5 V.

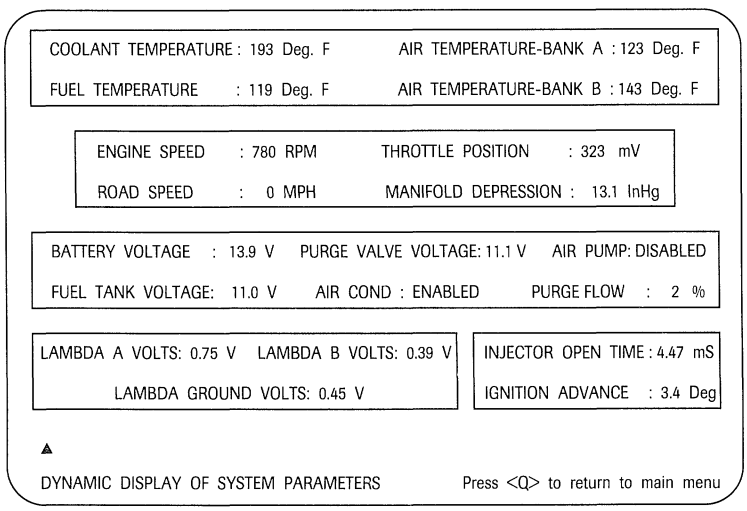
IGNITION ON; ENGINE STOPPED / COLD (AMBIENT)



ENGINE AFTER-START WARM UP



ENGINE AT IDLE / NORMAL OPERATING TEMPERATURE



Dynamic Display of System Parameters (continued)

Oxygen sensor (Lambda) ground voltage

The voltage of the ground sensing circuit between the ECM, the A bank intake manifold stud and the engine ground is displayed. With the ignition switched on (engine stopped) the ground signal voltage should read 0.4 - 0.55 V.

Injector open time (pulse duration)

Injector pulse duration is expressed in milliseconds. The screen displayed value represents the actual pulse duration output from the ECM for the prevailing engine operating condition. The pulse duration should increase and decrease as engine speed and load (MAP) varies.

Ignition advance

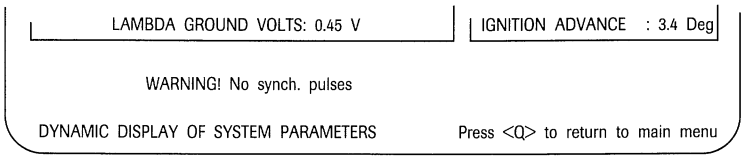
The actual ignition timing as referenced from the synchronization sensor is displayed. It is possible for this timing to be incorrect if the distributor is not referenced to the crankshaft as described in Engine Set up.

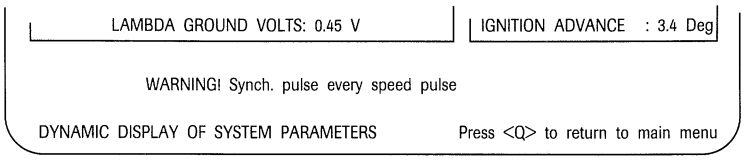
Synchronization sensor

There is no value display for the synchronization sensor output. Two possible warnings may be displayed at the bottom of the screen:

The No synch. pulses warning indicates that the ECM is not receiving the synchronization pulse to identify cylinder A 1 at T.D.C. The Synch. pulse every speed pulse warning indicates that the ECM is receiving 12 synchronization pulses each engine cycle instead of just one. Either warning identifies a fault in the synchronization sensor or engine speed sensor and/or circuits.

SYNCHRONIZATION WARNINGS





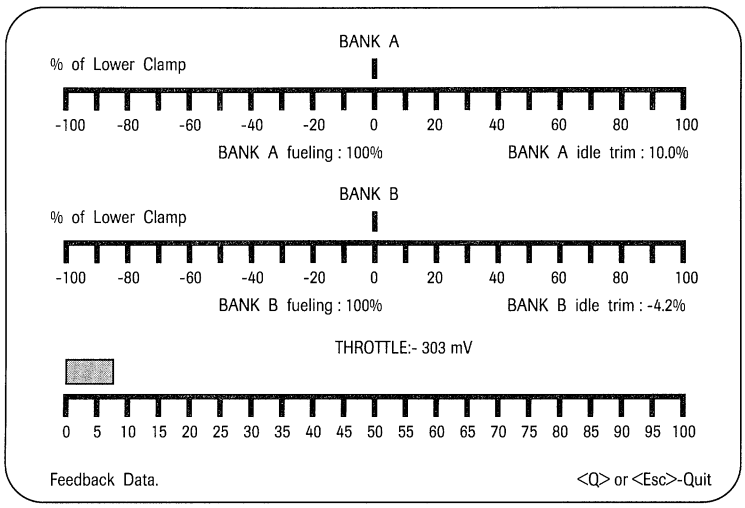
Oxygen Sensor Feedback Data / Throttle Position (Closed Loop Control Data)

By selecting this option from the main menu, the operation of the closed loop fuel metering control will be displayed. Values will be displayed only when the engine is running in closed loop control mode (the oxygen sensors are controlling fuel metering).

The display includes two bar graphs indicating the idle fuel metering trim for each bank and a bar graph indicating throttle opening as a percent (0 = closed; 100 = wide open). After starting the engine and bringing it to normal operating temperature, the ECM outputs will control the idle fuel metering trim. As the ECM attempts to maintain the optimum air/fuel ratio, the bars on the graphs should "hunt" to either side of the zero position. The graph scales represent how close to the optimum idle fuel metering strategy the system is operating. The center of the scales (100%) is optimum. Idle trim is adjustable as described in Engine Set Up.

NOTE: A slight deviation between A and B bank fueling is acceptable.

CLOSED LOOP CONTROL DATA

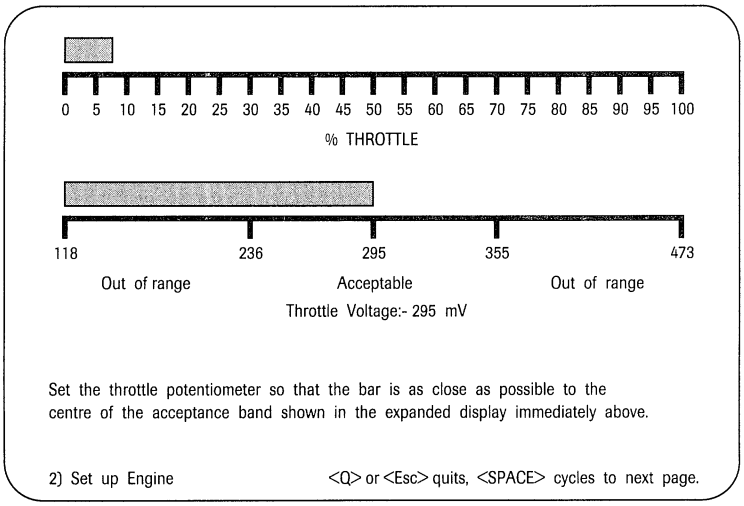


Engine Set Up

The Zytek Engine Management Service Aid provides an Engine Set Up option in a step-by-step procedure. Many of the displays for the procedures can be used for system operating analysis as an aid to fault diagnosis. It is not necessary to run the procedures in sequence as each item can be accessed independently as long as the engine is running.

IMPORTANT: Under normal circumstances, the engine set up procedures should only be carried out after component replacement or engine disassembly and reassembly.

THROTTLE POSITION SENSOR



Throttle position sensor

Two bar graphs are displayed for the throttle position sensor check. The upper graph indicates throttle opening as a percent (0 = closed; 100 = wide open). The lower graph displays the output voltage from the throttle position sensor as measured by the ECM. With the throttle closed (idle), the voltage should be within the acceptable range: 236-355 mV. If adjustment is necessary, attempt to center the bar at 295 mV. Adjust only if the voltage is outside the acceptable range.

Throttle linkage adjustment

Three screens cover a verbal description of a complete throttle linkage adjustment. This procedure should not be necessary during normal service or fault diagnosis.

Ignition advance

After starting the engine and ensuring that the displayed conditions are met, the actual ignition timing advance as referenced from the synchronization sensor will be fixed at 10 Deg. It is possible for this timing to be incorrect if the distributor is not correctly referenced to the crankshaft. The reference to the crankshaft can be checked by using a timing strobe light to check the engine timing marks on the front pulley. If necessary, adjust the distributor to 10 Deg. B.T.D.C. when observed at the crankshaft pulley. Exiting this screen will cause the ignition timing to revert to control by the ECM strategy.

IGNITION ADVANCE

If the following conditions have been met, the ignition will be fixed to a constant advance angle of 10 Deg. Exiting this page will cause the ignition to revert to the normal settings. Parameters shown in highlights are those which are out of limits. The advance will not be fixed until these parameters are brought within the limits stated.

ENSURE THAT;

Water temperature is greater than 165 F	Current value is: 188 F
Engine speed is between 100 and 1000 RPM	Current value is: 831 RPM
Throttle is set between 276 and 335mV	Current value is: 308mV
Road speed is zero	Current value is: 0 MPH
No faults are present	System is currently: OK

Ignition fixed at 10 Deg.

Adjust distributor if required to give 10 Deg when measured at the crank pulley.

7) Set up engine. <Q> or <Esc> quits, <SPACE> cycles to next page

Idle speed

Idle speed is adjusted at the extra air valve idle bleed screw. If necessary, adjust the speed to 750 rpm.

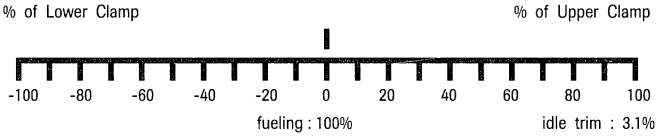
ECM idle fuel trim

The closed loop control system automatically adjusts the idle fuel metering, however; to correctly position the idle fueling on the ECM strategy, the ECM idle fuel trim can be adjusted. Before adjustment, stop the engine and disconnect the purge line at the B bank intake manifold. Block off the intake manifold port.

The displayed bar graph is for B bank; therefore, keep in mind that the adjustment will affect both banks as observed in the Oxygen Sensor Feedback Data / Throttle Position option. Start the engine and allow to idle for at least one minute. Use the left and right arrow keys on the computer to adjust the trim so that the bar "hunts" to either side of the zero position. Before exiting this screen, press <S> to save the trim adjustment.

IDLE FUEL TRIM

<T> - show trim relevant parameters, <S> - save trim in ECU
← decrease trim ( ) → increase trim



fueling : 100% idle trim : 3.1%

Set the idle fuel trim potentiometer to cause the feedback bar shown above to oscillate equally about the zero position

10) Set up Engine <Q> or <Esc> quits, <SPACE> cycles to next page.

Fault Diagnosis

The diagnostic information contained in this section is arranged by Diagnostic Trouble Code (DTC). For each code, the following is provided: a summary of how the particular code is flagged, a list of possible faults, and additional diagnostic information where applicable.

Diagnostic trouble code summary

The available DTCs are listed in order of priority on the following table. Limp home and/or open loop default are available as indicated. When multiple faults occur, only the highest priority code will be displayed.

DTC	Limp Home Default	Open Loop Default	Input or Component Checked
29			ECM Self-test
55	X	X	Engine ground sensing circuit
44	X	X	Oxygen sensor circuit – bank A
45	X	X	Oxygen sensor circuit – bank B
18			Fuel metering above idle – bank A
19			Fuel metering above idle – bank B
12			Engine speed and synchronization sensors circuit
24			Ignition drive circuit
36	X	X	Injector electrical circuit – Injector 1A
56	X	X	Injector electrical circuit – Injector 2A
46	X	X	Injector electrical circuit – Injector 3A
58	X	X	Injector electrical circuit – Injector 4A
38	X	X	Injector electrical circuit – Injector 5A
48	X	X	Injector electrical circuit – Injector 6A
49	X	X	Injector electrical circuit – Injector 1B
39	X	X	Injector electrical circuit – Injector 2B
59	X	X	Injector electrical circuit – Injector 3B
47	X	X	Injector electrical circuit – Injector 4B
57	X	X	Injector electrical circuit – Injector 5B
37	X	X	Injector electrical circuit – Injector 6B
34	X	X	Injector drive circuit
33	X	X	Fuel metering at idle – bank A
35	X	X	Fuel metering at idle – bank B
23			Fuel metering at idle – banks A and B combined
13	X		Pressure transducer and sensing hose
17	X		Throttle position sensor circuit
11	X		Pressure transducer / throttle position sensor circuit
27	X		Sensor ground circuit (coolant, intake air, fuel temp.)
14	X		Coolant temperature sensor circuit
15	X		Intake air temperature sensor circuit – bank A
16	X		Intake air temperature sensor circuit – bank B
26	X		Intake air temperature sensor circuits – excessive difference, bank A to bank B
25	X		Fuel temperature sensor circuit
22			Fuel pump relay control circuit
88			Purge valves circuit
79			Purge shut-off valve circuit
66	X	X	Air injection solenoid vacuum valve circuit
68	X		Road speed sensor circuit

Clearing diagnostic trouble codes

If a fault is detected and flagged by the ECM, the DTC(s) can be cleared by using the lap-top computer and the Zytek engine management service aid as explained on page 2. The DTC(s) will automatically clear if the fault does not reoccur within 50 engine starts. The interruption of the battery power supply to the ECM will not erase the DTC(s).

General repair procedure

1 **Before performing a repair, contact the Jaguar Cars Inc. Technical Hotline.**

2 **Record and clear Diagnostic Trouble Codes**
Use the computer and Service Aid software. Select DIAGNOSTICS from the main menu. Note and record all listed DTCs. Delete the codes.

3 **Operate the vehicle and determine if the condition still exists.**
Refer to the applicable DTC fault diagnosis page. Note the "Conditions required for OBD flagging". Operate the vehicle and try to reproduce the conditions.

EXAMPLE: DTC 11 condition 1 – Engine speed 500-900 rpm, MAP less than 18.4 in. hg and throttle position more than 2 volts to be maintained for 4 seconds. These conditions may be reproduced at idle if a throttle position sensor fault exists.

4 **Test systems and circuits listed as possible faults**
If the DTC is reflagged in step 3, the fault still exists and probably can be identified by observing the sensor inputs.

EXAMPLE: DTC 11 – Check the throttle position sensor and MAP sensor values during operation.

If the DTC is not reflagged in step 3, the fault is intermittent. Visually inspect the systems and/or circuits that are listed as possible faults.

5 **Retest system after repair**
Upon completion of repairs, delete any codes that may have been flagged as a result of testing (see below). Retest the system for DTC flagging as described in step 3.

General diagnostic notes

Refer to the engine management system wiring diagram and data page in the Technical Introduction section of this manual.

Use the computer and Service Aid software, when available, to monitor the engine management system.

Primary suspect areas are connectors and wiring harness faults. To test for faults caused by road vibration, manually shake wires, connectors and components while performing diagnostic tests.

DTCs can be created when checking circuits by disconnecting sensors, injectors and other components when the ignition is switched ON.

Diagnostic Trouble Code
11

DTC 11: PRESSURE TRANSDUCER / THROTTLE POSITION SENSOR CIRCUIT

OBD System Monitoring

The OBD system monitors for a discrepancy between engine speed, manifold absolute pressure and throttle position. Two possible sets of conditions can cause this code to be flagged.

Conditions required for OBD flagging

Condition 1

Engine Speed	500 – 900 rpm
Manifold absolute pressure	18.4 in. hg or less
Throttle position input voltage to ECM	2 V or greater
Conditions monitored for (time)	4 seconds or longer

Condition 2

Engine Speed	3000 – 6000 rpm
Manifold absolute pressure	25.4 in. hg or greater
Throttle position input voltage to ECM	2 V or less
Conditions monitored for (time)	4 seconds or longer

IMPORTANT: Values shown indicate manifold absolute pressure. Do not confuse manifold absolute pressure with manifold vacuum.

DTC 11 Possible faults

1. Manifold absolute pressure sensing hose, pulse damper and connections
2. Intake manifold leak
3. Throttle position sensor harness and connector condition
4. Throttle position sensor setting
5. Throttle position sensor setting
6. ECM,pressure transducer
7. ECM internal throttle position circuit

Diagnostic notes

- Disconnecting the throttle position sensor connector, with the ignition ON, will cause DTC 17 to be flagged.
- Check "Display of System Parameters"

  The manifold pressure (depression) reading at idle should be approximately 13 in. hg. Pressure should quickly increase on acceleration and decrease on deceleration.

  The throttle position voltage should rise smoothly from idle to slightly less than 5 volts at full throttle (can be checked with the ignition ON and engine stopped)

Diagnostic Trouble Code 12	ENGINE SPEED AND SYNCHRONIZATION SENSORS CIRCUIT

OBD system monitoring

The OBD system monitors the engine speed and synchronization inputs to the ECM for the correct ratio of speed pulses to synchronization pulse. There should be 12 engine speed pulses for every synchronization pulse.

Conditions required for OBD flagging

Engine speed	500 or greater rpm
Pulse comparison	Less or more than 12 engine speed pulses every synchronization pulse
Frequency of monitoring	Every engine cycle (2 crankshaft revolutions)
Conditions monitored for (time)	240 milliseconds @ 500 rpm

DTC 12 Possible faults

1. Engine speed sensor harness and connector condition
2. Engine speed sensor condition
3. Synchronization sensor harness and connector condition
4. Synchronization sensor condition
5. ECM internal engine speed and synchronization circuit

Diagnostic notes

- If the synchronization pulse is lost, the engine will continue to run. The "Display of System Parameters" message will read "Warning! No synch. pulses".
- If the engine speed pulse is lost, the engine will not run. The "Display of System Parameters" message will read "Warning! Synch. pulse every speed pulse".
- To test the ECM and wiring, electrically connect the spare distributor (synch. and engine speed connector only) and rapidly spin the drive gear with the ignition ON. An engine speed should momentarily be displayed.

Diagnostic Trouble Code
13

PRESSURE TRANSDUCER AND SENSING HOSE

OBD system monitoring

The OBD system monitors for a manifold absolute pressure change immediately after each engine start and for nominal manifold absolute pressure values at given engine speeds. Two possible sets of conditions can cause this code to be flagged.

Conditions required for OBD flagging

Condition 1

Engine speed	After start increase in rpm
Manifold absolute pressure	No change in manifold pressure during first 5 seconds after start
Frequency of monitoring	Once per engine start
Conditions monitored for (time)	5 seconds

Condition 2

Engine speed	500 – 900 rpm
Manifold absolute pressure	Less than 5.4 in. hg or greater than 24 in. hg
Conditions monitored for (time)	3 seconds

IMPORTANT: Values shown indicate manifold absolute pressure. Do not confuse manifold absolute pressure with manifold vacuum.

DTC 13 Possible faults

1. Manifold absolute pressure sensing hose, pulse damper and connections
2. Intake manifold leak
3. ECM pressure transducer

Diagnostic notes

- If "Display of System Parameters" shows an incorrect manifold pressure (depression) reading, test the vacuum signal at the ECM with a mechanical vacuum gauge.

  Normal displayed manifold pressure is approximately 13 in. hg (idle, normal operating temperature).

  Normal mechanical gauge vacuum is approximately 17 in. hg (idle, normal operating temperature).

- The ECM pressure transducer can be checked by using a hand vacuum pump connected to the ECM port. At 17 in hg vacuum, the displayed manifold pressure (depression) should read approximately 13 in hg. Refer to the chart on page 5.

Diagnostic Trouble Code
14

COOLANT TEMPERATURE SENSOR CIRCUIT

OBD system monitoring

The OBD system monitors the coolant temperature sensor input voltage to the ECM to determine if it is within the normal operating range. In addition the coolant temperature sensor input to the ECM is monitored for a change in voltage (temperature rise) during the first 4 minutes of engine operation.

Conditions required for OBD flagging

NORMAL	
Ignition	ON
Coolant temp. input voltage to ECM	Less than 0.23 V or greater than 4.92 V (outside normal range)
Conditions monitored for (time)	120 milliseconds
START	
Engine speed	500 or greater rpm
Input voltage	Less than 0.3 V (300 mV) change during first 4 minutes
Conditions monitored for (time)	First 4 minutes after engine start

DTC 14 Possible faults

1. Coolant temperature sensor harness and condition
2. Coolant temperature sensor
3. ECM internal coolant temperature sensor circuit

Diagnostic notes

- Disconnecting the sensor connector, with the ignition ON, will cause DTC 14 to be flagged.
- "Display of System Parameters" will indicate coolant temperature sensor "open" or "short" circuit.
- Supply voltage to the sensor at connector JSC32 pin 2, OU wire (sensor disconnected) should be 5 volts.
- The sensor can be checked by using the following temperature v resistance table:

Coolant temperature °F	°C	Resistance kilo Ohm
14	-10	9.2
32	0	5.9
50	10	3.7
78	20	2.5
86	30	1.7
104	40	1.18
122	50	0.84
140	60	0.60
158	70	0.435
176	80	0.325
193	90	0.25
212	100	0.19

- If DTC 27 is also flagged, suspect a sensor ground circuit fault. Refer to DTC 27 fault diagnosis.

Diagnostic Trouble Code 15, 16	INTAKE AIR TEMPERATURE SENSOR CIRCUIT DTC 15: BANK A DTC 16: BANK B

OBD system monitoring

The OBD system monitors both intake air temperature sensor input voltages to the ECM to determine if they are within the normal operating range.

Conditions required for OBD flagging

Ignition	ON
Intake air temp. sensor input voltage to ECM	Less than 0.23 V or greater than 4.92 V (outside normal range)
Conditions monitored for (time)	120 milliseconds

DTC 15 and 16 Possible faults

1. Air temperature sensor harness and condition
2. Air temperature sensor
3. ECM internal air temperature sensor circuit

Diagnostic notes

- Disconnecting the sensor connector, with the ignition ON, will cause DTC 15 or 16 to be flagged.
- "Display of System Parameters" will indicate air temperature sensor "open" or "short" circuit.
- Supply voltage to the sensor at connector JSC33 pin 2, RK wire (A bank), JSC36 pin 2, RG wire (B bank) (sensor disconnected) should be 5 volts.
- The sensor can be checked by using the following temperature v resistance table.

Air temperature °F	°C	Resistance kilo Ohm
14	-10	9.2
32	0	5.9
50	10	3.7
78	20	2.5
86	30	1.7
104	40	1.18
122	50	0.84
140	60	0.60
158	70	0.435
176	80	0.325
193	90	0.25
212	100	0.19

- If DTC 27 is also flagged, suspect a sensor ground circuit fault. Refer to DTC 27 fault diagnosis.

Diagnostic Trouble Code
17

THROTTLE POSITION SENSOR CIRCUIT

OBD system monitoring

The OBD system monitors the throttle position sensor wiper input voltage to the ECM to determine if it is within the normal operating range.

Conditions required for OBD flagging

Ignition	ON
Throttle pos. sensor input voltage to ECM	Less than 0.1 V or greater than 4.9 V (outside normal range)
Conditions monitored for (time)	120 milliseconds

DTC 17 Possible faults

1. Throttle position sensor harness and connector condition
2. Throttle position sensor condition
3. ECM internal throttle position circuit

Diagnostic notes

- Disconnecting the throttle position sensor connector, with the ignition ON, will cause DTC 17 to be flagged.
- The throttle position sensor adjustment has no influence on this DTC. Do not attempt adjustment as part of the fault diagnostic procedure.
- The throttle position voltage should rise smoothly from idle to slightly less than 5 volts at full throttle (can be checked with the ignition ON and engine stopped).
- Supply voltage to the throttle position sensor at connector LI66 pin 1, R wire (sensor disconnected) should be 5 volts.
- Ground from the throttle position sensor LI66 pin 2, W wire is through the harness shield.

Diagnostic Trouble Code 18, 19	FUEL METERING ABOVE IDLE DTC 18: BANK A DTC 19: BANK B

OBD system monitoring

The OBD system monitors closed loop control above idle conditions to determine if fuel metering correction is within an acceptable range.

Conditions required for OBD flagging

Engine operating conditions	Above idle; closed loop control enabled*
Fuel metering trim	Less than -37% or greater than 43% (outside limits of normal trim)
Conditions monitored for (time)	6 seconds

* ECM inputs from throttle position, engine speed, manifold absolute pressure, road speed, and coolant temperature are such that closed loop control is enabled.

DTC 18 and 19 Possible faults

1. Intake manifold leak
2. Purge valve mechanical fault (stuck open)
3. Injector mechanical fault (leaking, clogged, etc.)
4. Oxygen sensor and heater harness and condition
5. Oxygen sensor and heater condition
6. ECM internal oxygen sensor circuit

Diagnostic notes

- Check "Display of System Parameters"

  If oxygen sensor voltage does not continuously switch between 0.1 – 0.8 volts, check the oxygen sensor heater circuit and sensor heater resistance. Heater resistance should be 3.7 – 4.4 Ω.

- Check the sensor heater ground circuit to the B bank intake manifold stud.
- Check for 12 supply to the sensor heater circuit with the fuel pump operating. If there is no voltage, check the heater fuse (7.5 amp) in the trunk, right side.
- Check "Oxygen Sensor Feedback Data"

  Fueling above 100% indicates excess air; fueling less than 100% indicates excess fuel. Incorrect fueling can be caused by a mechanical fault.

Diagnostic Trouble Code 22	FUEL PUMP RELAY CONTROL CIRCUIT

OBD system monitoring

The OBD system monitors the fuel pump relay coil circuit to determine if the relay is energized (switch closed; pumps activated) as intended by the ECM strategy.

Conditions required for OBD flagging

ECM strategy fuel pump control	Pumps activated or off as intended by ECM
Fuel pump relay coil circuit load	Measured internally in ECM circuit
Conditions monitored for (time)	3 seconds

DTC 22 Possible faults

1. Fuel pump relay harness and condition
2. Fuel pump relay
3. ECM internal fuel pump circuit

Diagnostic notes

- The actual fuel pump operation has no influence on this DTC. Diagnose only the relay coil circuit.
- Disconnecting the fuel pump relay, with the ignition ON, will cause DTC 22 to be flagged.
- Check for 12 volt supply to fuel pump relay pin 86, KB wire during engine cranking.
- Check for grounding of fuel pump relay pin 85, O wire during engine cranking.

Diagnostic Trouble Code
23

FUEL METERING AT IDLE – BANKS A AND B COMBINED

OBD system monitoring

The OBD system monitors closed loop control at idle conditions to determine if fuel metering correction is within an acceptable range.

Conditions required for OBD flagging

Engine operating conditions	Idle; closed loop control enabled*
Fuel metering trim	Less than -37% or greater than 43% (outside limits of normal trim)
Conditions monitored for (time)	12 seconds

* ECM inputs from throttle position, engine speed, manifold absolute pressure, road speed, and coolant temperature are such that the engine is at idle and closed loop control is enabled.

DTC 23 Possible faults

1. Intake manifold leak
2. Purge valve mechanical fault (stuck open)
3. Injector mechanical fault (leaking, clogged, etc.)
4. Oxygen sensor and heater harness and condition
5. Oxygen sensor and heater condition
6. Air injection operation and condition
7. Fuel pressure low or high
8. ECM internal oxygen sensor circuit

Diagnostic notes

- Air injection operation:

Engine coolant temperature less than 125° F	Air injection enabled (air injection flow to exhaust ports)
Engine coolant temperature 125° F or higher	Air injection disabled (air injection flow to the right air cleaner)

- Fuel pressure specification:

Idle, vacuum connected	28 psi nominal
Idle, vacuum disconnected	36.5 psi nominal

- Check "Oxygen Sensor Feedback Data"

  Fueling above 100% indicates excess air; fueling less than 100% indicates excess fuel. Incorrect fueling can be caused by a mechanical fault.

- Check "Display of System Parameters"

  If oxygen sensor voltage does not continuously switch between 0.1 – 0.8 volts, check the oxygen sensor heater circuit and sensor heater resistance. Heater resistance should be 3.7 – 4.4 Ω.

- Check the sensor heater ground circuit to the B bank intake manifold stud.
- Check for 12 supply to the sensor heater circuit with the fuel pump operating. If there is no voltage, check the heater fuse (7.5 amp) in the trunk, right side.
- If DTC 55 is also flagged, suspect an engine ground fault. Refer to DTC 55 fault diagnosis.

Diagnostic Trouble Code 24	IGNITION DRIVE CIRCUIT

OBD system monitoring

The OBD system monitors the ECM ignition output signals to determine if there are 12 signals for every synchronization pulse.

Conditions required for OBD flagging

Engine speed	500 or greater rpm
ECM ignition output	Less or more than 12 ignition signals every synchronization pulse
Frequency of monitoring	Every engine cycle (2 crankshaft revolutions)
Conditions monitored for (time)	240 milliseconds @ 500 rpm

DTC 24 Possible faults

1 Ignition drive circuit (ECM to amplifier) harness and condition

2 ECM internal ignition circuit

Diagnostic notes

- Test for an open or short circuit in the ignition drive circuit between the ECM and the amplifier.

  With the ignition OFF, test for a short circuit to ground at the amplifier connector JSC52 pin 1, R wire. If there is a short circuit to ground, first disconnect the ECM and then the amplifier and trace the wires to locate the short circuit. Refer to the wiring diagram.

  Test the circuit for an open circuit. Refer to the wiring diagram.

Diagnostic Trouble Code 25	FUEL TEMPERATURE SENSOR CIRCUIT

OBD system monitoring

The OBD system monitors fuel temperature sensor input voltage to the ECM to determine if it is within the normal operating range.

Conditions required for OBD flagging

Ignition	ON
Fuel temp. sensor input voltage to ECM	Less than 0.23 V or greater than 4.92 V (outside normal range)
Conditions monitored for (time)	120 milliseconds

DTC 25 Possible faults

1. Fuel temperature sensor harness and condition
2. Fuel temperature sensor
3. ECM internal fuel temperature sensor circuit

Diagnostic notes

- Disconnecting the sensor connector, with the ignition ON, will cause DTC 25 to be flagged.
- "Display of System Parameters" will indicate fuel temperature sensor "open" or "short" circuit.
- Supply voltage to the sensor at connector JSC31 pin 2, K wire (sensor disconnected) should be 5 volts.
- The sensor can be checked by using the following temperature v resistance table:

Air temperature °F	°C	Resistance kilo Ohm
14	-10	9.2
32	0	5.9
50	10	3.7
78	20	2.5
86	30	1.7
104	40	1.18
122	50	0.84
140	60	0.60
158	70	0.435
176	80	0.325
193	90	0.25
212	100	0.19

- If DTC 27 is also flagged, suspect a sensor ground circuit fault. Refer to DTC 27 fault diagnosis.

Diagnostic Trouble Code 26	INTAKE AIR TEMP. SENSOR CIRCUITS – EXCESSIVE DIFFERENCE, BANK A TO BANK B

OBD system monitoring

The OBD system monitors both intake air temperature sensor input voltages to the ECM to determine if they are within the normal operating range. In addition, the ECM monitors for a difference in input voltages equal to a temperature difference no greater than 72 F degrees (40 C degrees) between each bank.

Conditions required for OBD flagging

Ignition	ON
Road speed	30 mph or higher
Intake air temp. sensor input voltages to ECM	Greater than 72° F (40° C) difference between A and B banks
Conditions monitored for (time)	1 second

DTC 26 Possible faults

1. Blocked air intake
2. Air temperature sensors harness and condition
3. Air temperature sensor(s)
4. ECM internal air temperature sensor circuit

Diagnostic notes

- Disconnecting the sensor connector, with the ignition ON, will cause DTC 15 or 16 to be flagged.
- "Display of System Parameters" will indicate intake air temperature sensor "open" or "short" circuit.
- Supply voltage to the sensor at connector JSC33 pin 2, RK wire (A bank), JSC36 pin 2, RG wire (B bank) (sensor disconnected) should be 5 volts.
- The sensors can be checked by using the following temperature v resistance table:

Intake air temperature °F	°C	Resistance kilo Ohm
14	-10	9.2
32	0	5.9
50	10	3.7
78	20	2.5
86	30	1.7
104	40	1.18
122	50	0.84
140	60	0.60
158	70	0.435
176	80	0.325
193	90	0.25
212	100	0.19

- If DTC 27 is also flagged, suspect a sensor ground circuit fault. Refer to DTC 27 fault diagnosis.

Diagnostic Trouble Code 27	SENSOR GROUND CIRCUIT (COOLANT, INTAKE AIR, FUEL TEMP.)

OBD system monitoring

The OBD system monitors the four temperature sensor input voltages to the ECM to determine if all are within the normal operating range. If all are simultaneously outside the normal operating range, the OBD system interprets the fault as a ground circuit failure.

Conditions required for OBD flagging

Ignition	ON
Coolant temp. sensor input voltage to ECM	Less than 0.23 V or greater than 4.92 V (outside normal range)
A bank air temp. sensor input voltage to ECM	Less than 0.23 V or greater than 4.92 V (outside normal range)
B bank air temp. sensor input voltage to ECM	Less than 0.23 V or greater than 4.92 V (outside normal range)
Fuel temp. sensor input voltage to ECM	Less than 0.23 V or greater than 4.92 V (outside normal range)
Conditions monitored for (time)	120 milliseconds

DTC 27 Possible faults

1. Temperature sensors (ground circuit) harness and condition
2. ECM internal temperature sensors ground circuit

Diagnostic notes

- Disconnecting all of the temperature sensor connectors at the same time, with the ignition ON, will cause DTC 27 to be flagged.
- Refer to the wiring diagram.

  Check the sensor ground circuit from the sensors to the ECM, pin 36.

  Check the ground circuits from ECM pins 1, 2, 3, 18, 19 and 20 to the engine compartment bulkhead ground stud.

Diagnostic Trouble Code 29	ECM SELF TEST

OBD system monitoring

The ECM runs a "self check" every time the ignition is switched ON. If the self check reveals a problem with the ECM memory, the DTC is flagged.

Conditions required for OBD flagging

Ignition	ON
ECM memory	One or more memory areas incorrect
Frequency of monitoring	Every time the ignition is switched ON
Conditions monitored for (time)	10 milliseconds

DTC 29 Possible faults

1. Low battery voltage
2. ECM

Diagnostic notes

- Check the battery voltage and correct if necessary. Clear the DTC and check for reflagging of the code.

Diagnostic Trouble Code 33, 35	FUEL METERING AT IDLE DTC 33: BANK A DTC 35: BANK B

OBD system monitoring

The OBD system monitors closed loop control at idle conditions to determine if fuel metering correction is within an acceptable range.

Conditions required for OBD flagging

Engine operating conditions	Idle; closed loop control enabled*
Fuel metering trim	Less than -37% or greater than 43% (outside limits of normal trim)
Conditions monitored for (time)	12 seconds

* ECM inputs from throttle position, engine speed, manifold absolute pressure, road speed, and coolant temperature are such that the engine is at idle and closed loop control is enabled.

DTC 33, 35 Possible faults

1. Intake manifold leak
2. Purge valve mechanical fault (stuck open)
3. Injector mechanical fault (leaking, clogged, etc.)
4. Oxygen sensor and heater harness and condition
5. Oxygen sensor and heater condition
6. ECM internal oxygen sensor circuit

Diagnostic notes

- Check "Display of System Parameters"

  If oxygen sensor voltage does not continuously switch between 0.1 – 0.8 volts, check the oxygen sensor heater circuit and sensor heater resistance. Heater resistance should be 3.7 – 4.4 Ω.

- Check the sensor heater ground circuit to the B bank intake manifold stud.
- Check for 12 supply to the sensor heater circuit with the fuel pump operating. If there is no voltage, check the heater fuse (7.5 amp) in the trunk, right side.
- Check "Oxygen Sensor Feedback Data"

  Fueling above 100% indicates excess air; fueling less than 100% indicates excess fuel. Incorrect fueling can be caused by a mechanical fault.

Diagnostic Trouble Code 34	INJECTOR DRIVE CIRCUIT – NON SPECIFIC

OBD system monitoring

The OBD system monitors the ECM fuel injection output signals to determine if there are 12 signals for every synchronization pulse. In addition the drive voltage to each injector is monitored to determine if it is within the normal range.

Conditions required for OBD flagging

Engine speed	500 or higher rpm
ECM injector output	Less or more than 12 fuel injection signals every synchronization pulse
ECM injector drive voltages	One or more injector circuits open circuit, short circuit, low or high voltage.
Frequency of monitoring	Every engine cycle (2 crankshaft revolutions)
Conditions monitored for (time)	4.8 seconds @ 500 rpm

DTC 34 Possible faults

1. Fuel injector(s)
2. Injector drive circuit(s) (ECM to injectors) harness and condition
3. Power resistor(s)
4. ECM internal fuel injector drive circuit

Diagnostic notes

- Disconnecting one or more injectors with the engine speed 500 or higher rpm will cause DTC 34 to be flagged.
- If an individual injector DTC is also flagged, suspect an individual injector circuit fault. Refer to DTCs 36, 37, 38, 39, 46, 47, 48, 49, 56, 57, 58 and 59.
- If an individual injector DTC is not flagged, suspect an intermittent harness fault.

Diagnostic Trouble Code	INJECTOR ELECTRICAL CIRCUIT		
36, 37, 38, 39 46, 47, 48, 49 56, 57, 58, 59	**DTC 36: INJECTOR 1A**	**DTC 46: INJECTOR 3A**	**DTC 56: INJECTOR 2A**
	DTC 37: INJECTOR 6B	**DTC 47: INJECTOR 4B**	**DTC 57: INJECTOR 5B**
	DTC 38: INJECTOR 5A	**DTC 48: INJECTOR 6A**	**DTC 58: INJECTOR 4A**
	DTC 39: INJECTOR 2B	**DTC 49: INJECTOR 1B**	**DTC 59: INJECTOR 3B**

OBD system monitoring

After flagging DTC 34, the OBD system monitors the drive voltage to each injector to determine if it is within the normal range. An out of range voltage(s) will identify a specific injector or group of injectors.

Conditions required for OBD flagging

Engine speed	600 – 1200 rpm
Manifold absolute pressure	9.6 – 15 in. hg
ECM injector output	Less or more than 12 fuel injection signals every synchronization pulse
ECM injector drive voltages	One or more injector circuits open circuit, short circuit, low or high voltage.
Frequency of monitoring	Every engine cycle (2 crankshaft revolutions)
Conditions monitored for (time)	4.2 seconds @ 600 rpm

IMPORTANT: Values shown indicate manifold absolute pressure. Do not confuse manifold absolute pressure with manifold vacuum.

DTC 36, 37, 38, 39, 46, 47, 48, 49, 56, 57, 58, 59 Possible faults

1. Fuel injector(s)
2. Injector drive circuit(s) (ECM to injectors) harness and condition
3. Power resistor(s)
4. ECM internal fuel injector drive circuit

Diagnostic notes

- Disconnecting one or more injectors with the engine speed 600 – 1200 rpm will cause the applicable DTC to be flagged.
- Check the fuel injector

  Switch off the ignition. Disconnect the injector indicated by the DTC and measure the resistance across the two terminals. The injector resistance should be 2.2 to 2.8 Ω.
- Refer to the wiring diagram and check the fuel injector circuit

  Connect the injector and switch on the ignition. The supply voltage to the injector pin 1 should be 12 volts.

  Check the injector circuit for an open circuit or short circuit to ground.

Diagnostic Trouble Code	OXYGEN SENSOR CIRCUIT
44, 45	DTC 44: BANK A DTC 45: BANK B

OBD system monitoring

The OBD system monitors oxygen sensor input voltages to the ECM during closed loop control to determine if the voltages (A and B banks) are within the normal range. DTC 44 and 45 indicate that the oxygen sensor(s) are not responding to fuel metering changes. Two possible sets of conditions can cause this code to be flagged.

Conditions required for OBD flagging

Condition 1

Engine operating conditions	Idle; closed loop control enabled*
Oxygen sensor input voltage to ECM	Greater than 1.5 V (outside normal range)
Conditions monitored for (time)	12 seconds

Condition 2

Engine operating conditions	Idle; closed loop control enabled*
Fuel metering trim	Much less than -37% or much greater than 43% (far outside limits of normal trim)
Conditions monitored for (time)	12 seconds

* ECM inputs from throttle position, engine speed, manifold absolute pressure, road speed, and coolant temperature are such that closed loop control is enabled.

DTC 44, 45 Possible faults

1. Oxygen sensor and heater harness and condition
2. Oxygen sensor and heater condition
3. Fuel pressure low or high
4. Air injection system operation and condition
5. ECM internal oxygen sensor circuit

Diagnostic notes

- Air injection operation:

Engine coolant temperature less than 125° F	Air injection enabled (air injection flow to exhaust ports)
Engine coolant temperature 125° F or higher	Air injection disabled (air injection flow to the right air cleaner)

- Fuel pressure specification:

Idle, vacuum connected	28 psi nominal
Idle, vacuum disconnected	36.5 psi nominal

- Check "Display of System Parameters"

  If the oxygen sensor voltage is 0 volts, suspect a short circuit to ground in the circuit between the ECM and the oxygen sensor.

  If the oxygen sensor voltage is 5 volts, suspect an open circuit in the circuit between the ECM and the oxygen sensor.

- If DTC 55 is also flagged, suspect an engine ground fault. Refer to DTC 55.

Diagnostic Trouble Code
55

ENGINE GROUND SENSING CIRCUIT

OBD system monitoring

The OBD system monitors the engine ground condition by sensing a difference in voltage to ground from the ECM (pin 5) via the BLACK/BLUE wire, splice EMS7 and ground JSC25R.

Conditions required for OBD flagging

Ignition	ON
Ground sensing voltage	Greater than 4.5 V
Conditions monitored for (time)	120 milliseconds

DTC 55 Possible faults

1. Ground sensing circuit (ECM pin 5, BU wire) harness and condition
2. Engine ground strap condition
3. ECM internal ground sensing circuit

Diagnostic notes

- Check the ground circuit condition.

  Check the eyelet connection at the A bank intake manifold stud.

  Check the security of the engine ground strap.
- If DTC 27 is also flagged, suspect an ECM ground circuit fault. Refer to DTC 27 fault diagnosis.

Diagnostic Trouble Code 66	AIR INJECTION SOLENOID VACUUM VALVE CIRCUIT

OBD system monitoring

The OBD system monitors the solenoid vacuum valve circuit to determine if the solenoid is energized (air injection enabled) as intended by the ECM strategy.

Conditions required for OBD flagging

Ignition	ON
ECM air injection control	Air injection enabled – engine running, coolant temperature less than 125° F
	Air injection disabled – engine stopped or running, coolant temperature 125° F or higher
Air inj. solenoid vac. valve circuit load	Measured internally in ECM circuit
Conditions monitored for (time)	3 seconds

DTC 66 Possible faults

1 Air injection solenoid vacuum valve circuit harness and condition
2 Air injection solenoid vacuum valve
3 ECM internal air injection solenoid vacuum valve circuit

Diagnostic notes

- Disconnecting the air injection solenoid vacuum valve connector when the ignition is ON will cause DTC 66 to be flagged.

  Air injection operation:

Engine coolant temperature less than 125° F	Air injection enabled (air injection flow to exhaust ports)
Engine coolant temperature 125° F or higher	Air injection disabled (air injection flow to the right air cleaner)

- Check the signal voltage to the air injection solenoid vacuum valve JSC34 pin 2, G wire.

  When the air injection is disabled, the signal voltage should be approximately 12 volts.

  When the air injection is enabled, the signal voltage should be less than 5 volts.

- Check the power supply to the air injection solenoid vacuum valve JSC34 pin 1, KB wire.

  With the ignition ON, the supply voltage should be 12 volts.

- Refer to the wiring diagram

  Check the air injection solenoid vacuum valve wiring for open or short circuits.

Diagnostic Trouble Code 68	ROAD SPEED SENSOR CIRCUIT

OBD system monitoring

The OBD system monitors the road speed input falls within a range that can be expected from the engine speed and manifold absolute pressure.

Conditions required for OBD flagging

Engine speed	1200 – 3250 rpm
Manifold absolute pressure	13 – 21 in. hg
Road speed input	0 mph; higher than 180 mph
Conditions monitored for (time)	5 seconds

IMPORTANT: Values shown indicate manifold absolute pressure. Do not confuse manifold absolute pressure with manifold vacuum.

DTC 68 Possible faults

1. Road speed sensor circuit harness and condition (between speed interface unit and ECM)
2. Road speed sensor
3. Speed interface unit
4. ECM internal road speed sensing circuit

Diagnostic notes

- The road speed input is derived from a splice at the speed interface unit. Therefore, if the speedometer is operating normally, the harness between the speed interface unit and the ECM is the most likely open circuit.
- Check the road speed circuit voltage at ECM pin 9

  With the ignition ON and the vehicle stationary, the voltage at pin 9 should be approximately 12 volts DC.

  Raise the vehicle on a "wheels free" lift. Start the engine and select DRIVE. Allow the drive wheels to turn at 20 mph. The voltage at ECM pin 9 should be approximately 2 volts AC.

Diagnostic Trouble Code 79	PURGE SHUT-OFF VALVE CIRCUIT

OBD system monitoring

The OBD system monitors the purge shut-off valve circuit to determine if the drive signal is within the normal range.

Conditions required for OBD flagging

Ignition	ON
Purge shut-off valve drive voltage	1.9 V or less; greater than 90% of battery V
Conditions monitored for (time)	120 milliseconds

DTC 79 Possible faults

1. Purge shut-off valve circuit harness and condition
2. Purge shut-off valve
3. ECM internal purge shut-off valve circuit

Diagnostic notes

- Disconnecting the purge shut-off valve connector when the ignition is ON will cause DTC 79 to be flagged.
- Check "Display of System Parameters"

  If the purge shut-off valve voltage is 12 volts, suspect an open circuit in the solenoid or in the ground circuit between the solenoid JSC6 pin 1, B wire and the B bank intake manifold stud.

  If the purge shut-off valve voltage is less than 2 volts, suspect a loss of supply power to the solenoid JSC6 pin 2, W wire or a short circuit to ground (possibly through diode D2).

Diagnostic Trouble Code 88	PURGE VALVES CIRCUIT

OBD system monitoring

The OBD system monitors the purge valve circuits to determine if the solenoids are energized (canister purge enabled) as intended by the ECM strategy.

Conditions required for OBD flagging

Engine operating conditions	Engine operating
ECM strategy purge control	Canister purge enabled or disabled*
Purge valve circuit load	Measured internally in ECM circuit
Conditions monitored for (time)	3 seconds

* ECM inputs from throttle position, engine speed and manifold absolute pressure are such that canister purge is either enabled or disabled.

DTC 88 Possible faults

1. Purge valves circuit harness and condition
2. Purge valves
3. ECM internal purge valve circuit

Diagnostic notes

- Disconnecting one or both purge valve connectors when the ignition is ON will cause DTC 88 to be flagged.
- Check the purge valves operation

  Operate engine at normal temperature and hold the purge valves in the palm of the hand. The purge valve should be felt pulsating.
- Check power supply to each purge valve

  With the ignition ON, the supply voltage JSC8, JSC9 pin 2, KB wire should be 12 volts.
- Check purge valves resistance

  Switch off the ignition. Disconnect the purge valves and measure the resistance across the two terminals. The purge valve resistance should be approximately 45Ω.
- Check the purge valves circuit

  Refer to the wiring diagram and check the circuit between the ECM and the purge valves.

XJR-S

Service Policies

JAGUAR SPORT

General

For the most part these will not vary from existing policies. However some new policies have been developed due to the following:

- A very limited volume of 100 cars
- A different Engine Management System and transmission from the regular XJS
- The need for a laptop computer and Zytek software to service the EMS
- Low volume parts needs.

Objective

The overall objective is to ensure that the highest standards of customer service are maintained without excessive expense being incurred by your dealership for parts and equipment.

Regular Servicing and Repair

For regular servicing and repairs to the body, the interior, chassis, electrical systems and engine mechanical items please refer to the regular XJS Workshop Manual JJM 100406/20.

XJR-S Specific Repairs

Special policies and procedures have been put in place where repairs to one or both of the following is necessary:

- The Engine Management System (EMS): fuel delivery, fuel injection, ignition and emission control
- The automatic transmission

Procedures for EMS Repair

When there is a customer problem with the EMS, for example, the Malfunction Indicator Lamp (MIL) (Check Engine Warning) comes on, the service appointment should be made ahead of time if possible. This gives JCI time to ship two kit part numbers to your dealership overnight after approval from the Technical Representative on the hotline. These part numbers and contents are as follows:

JS 1 Diagnostic Kit

Contents:

- Toshiba laptop computer
- Zytek software discs
- Zytek interface unit and cables
- Instructions for operation of computer only
- Cordless phone (in case your dealership does not have one)
- XJR-S Product Support Manual

JS 2 Parts Kit

Contents:

- Parts list
- Complete set of engine management parts

All of these components have been tested and sealed. This process will ensure immediate availability of parts where necessary and avoid the need for dealer stocking of slow-moving parts.

Steps for EMS Repairs

Please follow these steps for EMS repairs.

1 Determination is made that there is a problem in one of the areas noted – preferably before the car is brought in.

2 The Jaguar Technical Hotline is contacted and precise symptoms and description of problem given.
NOTE: If the MIL has been triggered it is essential that the dealer gives a clear description of:

- The symptoms
- The Diagnostic Trouble Code (DTC) displayed
- The vehicle VIN number
- The vehicle mileage

The MIL light can *only* be canceled using the computer and Zytek software in JS 1 even if the ECM (Engine Control Module) has been disconnected.

3 The Technical Representative will determine if the JS 1 and JS 2 Kits are required. If so, they will be shipped overnight to the dealer.
NOTE: Freight both ways will be paid by JCI (Details are in the Parts Listing and Procedures section of this manual).

4 Next day at the scheduled appointment time the Technical Representative will contact the dealer and will direct the EMS repair over the telephone as the technician is using the diagnostic laptop computer.

5 At the direction of the Technical Representative, the repair is completed and authorization given to replace one or more parts if necessary. Parts from the JS 2 kit can only be used at the direction of the Technical Representative. The return of warranty parts is detailed in the Warranty Policy and Procedure section. Due to the above policy, No Fault Found parts will NOT be charged back to the dealer.

6 Technician completes the repair, fills out the parts form in the JS 2 Kit indicating what was used in the repair.

7 The JS 1 and JS 2 kits are given to the Parts Manager for immediate overnight return to JCI in Mahwah and for dealer internal parts billing purposes (Details in Parts Listing and Procedures section).

Steps for Transmission Repairs

Please follow these steps for transmissions repairs.

1 Where a customer complains of a transmission problem the technician should contact The Technical Hotline with the following information:

- The symptoms
- The vehicle VIN number
- The vehicle mileage

2 Transmission repairs are by unit replacement only as JaguarSport has modified the basic GM 400 box. Therefore JCI may require a road test by a DSM or Technical Representative, before a replacement transmission is released. The part number will be "frozen". Ordering the unit is detailed in the Parts Listing and Procedures section of this manual.

3 The displaced unit is then returned via the regular warranty system.

4 Due to this policy No Fault Found units will NOT be charged back to the dealers.

IMPORTANT: By following the EMS and transmission steps regarding the scheduling of service appointments and ordering of JS 1 and JS 2 Kits and of transmissions, most repairs will be completed in one day and the maximum should not be more than two days.

XJR-S

Parts Listing and Procedures

JAGUAR SPORT

General

The majority of parts on the XJR-S are identical to those on the regular XJS Coupe or Convertible. However there are a number of areas where there are new part numbers. These include but are not limited to the following areas:

- Engine Management System: fuel delivery, fuel injection, ignition and emission control systems
- Exterior: mirrors, grille, rear quarter glass, wheels, headlamp surrounds
- Mechanical: steering rack, shock absorbers, pistons, liners, oil pan, mufflers, catalysts, automatic transmission, short engine, crankshaft.
- Interior: Autolux leather, sapwood dash, round gear shift knob, headrests
- JaguarSport Kit: rocker panel sills, front and rear aprons, trunk spoiler

A complete parts listing (except trim) is shown on pages 4 – 6.

Due to the small volume of cars coming in (50 coupes and 50 convertibles) it is unlikely that you will stock JaguarSport specific part numbers. A possible exception would be spark plugs which are specific to the 6.0 litre engine.

Objective

The objective of JCI is to ensure that we can provide the XJR-S owner with the parts required to service and repair his/her car within a 24 to 48 hour time period.

Stocking Policies

JCI will stock most of the parts shown on the XJR-S parts list although in limited quantities due to the expected low demand. When required we will "J" order parts from the UK.

Steps for Parts Ordering

A If the part is a regular XJS part, order as normal.

B If the part:

- is a JaguarSport number (prefix begins with "SP")
- is not "frozen" – as noted on the parts list in this section,

order as normal.

C If the part:

- is a JaguarSport number
- is "frozen", according to the parts list in this section

do not order the part as it will backorder. The part is a JaguarSport specific number that may be in the JS 2 Kit and is part of one of the following: fuel delivery, fuel injection, ignition or emission control system.

As shown in the Repair Policies section of this guide these are covered by parts in the JS 2 Kit and require JCI Technical Representative approval before any of the parts in the kit are used. See section on the JS 2 Kit following.

D Automatic Transmission and Short Engine Unit

The transmission is a modified GM 400 unit, specific to the XJR-S and is replaced as a unit providing the technician receives authorization from the Jaguar Hotline Technical Representative. The dealer should not order either of these parts. After authorization is given:

- The Technical Representative will instruct the PDC to ship the transmission or engine to the dealer
- The dealer Parts Manager should put up an on order for the part in his system.

E Trim Parts

To order trim parts you will need to provide JCI with the following information:

- The complete VIN
- The Jaguar part number from the fiche

From this information JCI will:

- apply the correct JaguarSport color code
- load part number to the file if required
- create "J" order on the UK
- create back order for the dealer

F Wood

To order wood you will need to supply JCI with the complete VIN number. From this information JCI will:

- load part number to the file if required
- create "J" order on the UK
- create back order for the dealer

JS 1 and JS 2 Kits

In order to ensure that:

- The owner is serviced as quickly as possible
- The correct tools and equipment are available to the technician
- The dealers do not have to stock a laptop computer, the software and a wide range of JaguarSport specific parts,

JCI has created two kits as follows:

JS 1 Equipment Kit Core Charge $500

Contents:

- Toshiba laptop computer
- Zytek software discs
- Zytek interface unit and cables
- Instructions for operation of computer only
- Cordless phone (in case your dealership does not have one)
- XJR-S Product Support Manual

JS 2 XJR-S Parts Kit Core Charge $500

Contents:

- Parts list
- XJR-S Product Support Manual
- Complete set of engine management parts:

Qty.	Part Description	Part No.	Qty.	Part Description	Part No.
1	Distributor Assy	SPD 1065	2	Air Temp Sensor	EAC 2863
1	Distributor Cap	DAC 4168	2	Oxygen Sensor	DBC 10744
1	High Tension Lead Kit	JLM 726	1	Throttle Potentiometer	DAC 7427
1	Amplifier	DAC 4104	1	Twin Fuel Pump Assy	SPC 1312
12	Spark Plugs	SPE 1007	12	Fuel Injector	EBC 2409
1	Ignition Coil	SPD 1159	1	Fuel Pressure Regulator	EBC 3387
1	Engine Control Module	SPD 1162	1	ECM Pulse Damper	CAC 4968
2	Power Resistor	SPD 1013	1	Purge Valve	DBC 4301
1	Fuel Temp Sensor	SPD 1130	1	Purge Shut Off Valve	EAC 4161
1	Fuel Temp Sensor Adaptor	SPE 1175	1	Air Injection Solenoid	EAC 7905
1	Coolant Temp Sensor	DBC 3728	1	Air Switching Valve	EAC 3827
1	Regulator "O" Ring	EBC 2207	1	Package fuel rail seals	CBC 9113

Steps for Ordering JS 1 and JS 2 Kits

The steps for ordering, using and returning these kits are as follows:

1 Customer communicates with the dealer regarding a problem in the EMS - fuel injection/ignition or fuel delivery system.

2 JCI Technical Hotline is contacted preferably at least one day before the XJR-S car comes in for service.

3 JCI Tech Rep determines that the JS 1 and JS 2 Kits are required. He authorizes overnight shipment to dealer. JCI pays freight. Dealer is charged a $500 core charge for each part number.

4 Via the hotline, the technician repairs the car and uses one or more parts from the JS 2 Kit.

5 Technician notes on parts list in the JS 2 Kit which parts he has used under authorization of the Tech Rep.

6 Technician returns JS 1 and JS 2 Kits to Parts Manager.

7 Parts Manager verifies contents of JS 1 Kit and checks for parts used from JS 2 Kit.

8 Parts Manager bills his Service Department for part(s) used plus handling allowance assuming it is a warranty repair (see Warranty Policy and Procedures section of this manual for allowance information).

9 Using the return labels and seals to be found in each box, the Parts Manager fastens each box with the seal, packages them in an outer carton (to conceal the contents) and with the return labels provided, ships them overnight back to the Mahwah or Brisbane PDC.

10 Upon receipt, JCI will:

- verify contents of each box
- credit dealer for core charges
- debit dealer for parts used
- refill parts kit and seal it ready for the next shipment

11 To receive return freight costs, the dealer uses the claim procedures for return of warranty parts as noted in the Jaguar Warranty Manual Section I: 4.

XJR-S Parts Listing

This Parts Listing is divided into two Sections. Section A lists all the mechanical and electrical parts and certain exterior elements. Section B lists the body panels and fitting kits – front apron kit, sill kit, rear apron kit and trunk spoiler kits.

All wood veneer and interior trim must be special ordered quoting the complete VIN number and in the case of trim, the color. Each piece will be made to order.

NOTE: ** Indicates these parts are frozen and cannot be ordered. They are part of kit JS 2. Any requirement for these parts or the kit must go through the Technical Hotline.

*** Indicates part is frozen – call Technical Hotline

SECTION A

Part No.	Description
CAC 4968	Vacuum Pressure Damper
CBC 9113	Fuel Rail Seal
DAC 4104	Amplifier
DAC 4168	Distributor Cap
DAC 7427	Throttle Position Sensor
DBC 3728	Coolant Temp Sensor
DBC 4301	Purge Valve
DBC 10744	Oxygen Sensor
EAC 2863	Air Temp Sensor
EAC 3827	Air Switching Valve
EAC 4161	Purge Shut-off Valve
EAC 7905	Air Injection Solenoid
EBC 2207	Regulator 'O' Ring
EBC 2409	Fuel Injector
EBC 3387	Fuel Pressure Regulator
EBC 4553	Radiator cooling fan
EBC 4558	Downpipe, Catalyst RH
EBC 4559	Downpipe, Catalyst LH
JLM 726	High Tension Lead Kit
** JS 1	Diagnostic Equipment – Call Technical Hotline
** JS 2	Engine Management Parts Kit – Call Technical Hotline
SPB 1142	"Sport" Badge
SPB 1156	"Sport" Badge Mounting Bracket
SPB 1168	Nut Insert
SPB 1358	Tape, Chip Protection RHF
SPB 1359	Tape, Chip Protection LHF
SPB 1360	Tape, Chip Protection RHR
SPB 1361	Tape, Chip Protection LHR
SPB 1428	Upper Cross Member Assy.
SPB 1482/PDH	Jetwash Cover RH, Black
SPB 1482/CFC	Jetwash Cover RH, Red
SPB 1482/MDK	Jetwash Cover RH, Silver
SPB 1483/PDH	Jetwash Cover LH, Black
SPB 1483/CFC	Jetwash Cover LH, Red
SPB 1483/MDK	Jetwash Cover LH, Silver
SPB 1490	Rear Quarter Glass RH
SPB 1491	Rear Quarter Glass LH
SPB 1511	Front Grille, Black
SPB 1532/PDH	Door Mirror RH, Black
SPB 1532/CFC	Door Mirror RH, Red
SPB 1532/MDK	Door Mirror RH, Silver
SPB 1533/PDH	Door Mirror LH, Black
SPB 1533/CFC	Door Mirror LH, Red
SPB 1533/MDK	Door Mirror LH, Silver
SPB 1536	Treadplate Assy, Coupe RH
SPB 1537	Treadplate Assy, Coupe LH
SPB 1538	Treadplate Assy, Convertible RH
SPB 1539	Treadplate Assy, Convertible LH
SPB 1584	Mirror Cap Screw
SPB 1590	RH Footwell ECM Panel
SPB 1606	Tape Chip Protection, Rocker
SPB 1607	Tape Chip Protection, Rocker
SPC 1001	Spare Wheel
SPC 1009	Front Shock Absorber, Coupe
SPC 1010	Rear Shock Absorber, Coupe & Convertible
SPC 1021	Gear Lever, Auto
SPC 1023/LEG	Gearknob
SPC 1026	Gearknob Washer
SPC 1031	Spare Wheel Warning Label
SPC 1073	Front Road Spring
SPC 1115	Spare Tire, Dunlop 205/70 x 15
SPC 1165	Wheel Nut
SPC 1198	Road Wheel, Rear

SECTION A (continued)

Part No.	Description
SPC 1204	Road Wheel, Front
SPC 1240	Front Tire, Goodyear Eagle XR50 225/50/ZR16
SPC 1241	Rear Tire, Goodyear Eagle XR55 245/55/ZR16
SPC 1244	Differential Cover
SPC 1250	Tire Label, Coupe
SPC 1251	Tire Label, Convertible
SPC 1252	Label E
SPC 1254	Hose Connector, Vacuum Routing Pipe, ECM to Engine
SPC 1258	8mm Bore Connector (for above)
SPC 1259	Fuel pump module
SPC 1260	Wheel Badge & Retainer Assy.
SPC 1274	Fuel Tank, Coupe
SPC 1286	Steering Rack and Pinion Assy. SPC 1158 Pinion Valve Assy., Special Order all other parts as CCC 5663/N Strg Rack
SPC 1300	Label, Fuel Tank, Coupe
SPC 1301	Label, Fuel Tank, Convertible
SPC 1302	Fuel Tank, Convertible
SPC 1304	Front Shock Absorber, Convertible
** SPC 1312	Twin Fuel Pump Assy.
** SPD 1013	Power Resistor
SPD 1030	Power Resistor Bracket
** SPD 1065	Distributor Assy.
SPD 1106	Black Headlamp Surround, RH
SPD 1107	Black Headlamp Surround, LH
SPD 1123	Chassis Harness
SPD 1124	Ignition Harness
** SPD 1130	Fuel Temp Sensor
SPD 1139	Link Lead, Fuel Pump to Flange
** SPD 1159	Ignition Coil
** SPD 1162	Engine Control Module (ECM)
SPD 1167	Fuel Pump Bracket
SPD 1168	Fuel Pump Fuse Label
SPD 1177	Label, Power Resistor
SPD 1208	Footwell Cover, Footwell Cover
SPE 1001	Crankshaft
SPE 1002	Piston Assy.(unit of issue is 12)
JLM 1789	Piston Ring Set (one piston)
SPE 1003	Cylinder Liner
SPE 1004	Undershield, Crankshaft
** SPE 1007	Spark Plug, Champion RS6YCC
SPE 1019	Boss, Thermal Air Intake
***SPE 1027	Automatic Transmission Assy. — Call Technical Hotline
SPE 1030	Wrist Pin, Piston
SPE 1031	Label, Oil Approval
SPE 1032	"JaguarSport V12" Engine Badge
SPE 1039/2	Breather Hose
SPE 1059	Air Cleaner Hose
SPE 1060	Air Cleaner Complete Assy, RH (EBC 1084 element)
SPE 1061	Air Cleaner Complete Assy, LH (EBC 1084 element)
SPE 1094	Oil Pan
SPE 1096	Over Axle Exhaust Pipe, RH
SPE 1097	Over Axle Exhaust Pipe, LH
SPE 1101	Ferrule for Muffler
SPE 1102	Tailpipe
SPE 1112	Catalyst, RH
SPE 1113	Catalyst, LH
SPE 1118	Rear Muffler, RH
SPE 1119	Rear Muffler, LH
SPE 1122	Breather Pipe Assy
SPE 1128	Intermediate Muffler, RH
SPE 1129	Intermediate Muffler, LH
SPE 1174/1	Band Clamp, Exhaust
SPE 1174/2	Band Clamp, Exhaust
** SPE 1175	Adaptor, Fuel Temp Sensor
SPE 1179	Hose
SPE 1187	Breather Pipe
SPE 1190	Pipe Hose Worm
***SPM 6000	6.0L Short Engine Unit
SPM 9001	Security Wheel Nut Set
SPM 9076	JaguarSport Key Fob

SECTION B

COUPE AND CONVERTIBLE: FRONT APRON KIT

Part No.	Description	Qty.
SPM 6025	Front Apron Kit	1
KIT CONTAINS:		
SPB 1394	Front Apron	1
SPM 6026	Front Apron Fitting Kit	1
FITTING KIT CONTAINS:		
AB 606088	Screw – M6	5 *
AGU 2555	Screw – sheet metal	13 *
BBC 8184	Captive nut	5 *
BD 542/8	Washer – plain	4
C 8016	Grommet	3 *
DAC 6632	Sidemarker lamp, RH	1
DAC 6633	Sidemarker lamp, LH	1
DAC 7929	Jet wash cover, LH (heater	1
DAC 7930	Jet wash cover, RH (heater)	1
JLM 9675	Bolt – 1/4 UNF x 1	4
MM 108151	Blind rivet nut	5 *
NY 604041	Self-locking nut	4
SH 108161	Hex head screw – M8 x 16	5 *
SH 608121	Screw	2
SPB 1039	Nut insert	13 *
SPB 1153	Adhesive – Loctite 409	1
SPB 1176	Towing eye	1
SPB 1228	Kaynar nut (for towing eye)	2
SPB 1370	Adhesive – 1k	1
SPB 1384	Front edge finisher, RH	1
SPB 1385	Front edge finisher, LH	1
SPB 1395	Attachment angle / bracket	2
SPB 1396	Attachment bracket, RH	1
SPB 1396	Bracket, RH	1
SPB 1397	Attachment bracket, LH	1
SPB 1397	Bracket, LH	1
SPB 1477	Finisher / "U" section rubber trim	2
SPB 1482	Jet wash cover, RH	1
SPB 1483	Jet wash cover, LH	1
SPB 1514	Bracket, RH	1
SPB 1515	Bracket, LH	1
SPB 1580	Baffle, RH	1
SPB 1581	Baffle, LH	1
SPB 1609	Rivet – 4mm x 12m	18
SPB 1628/3	Foam strip – 4mm x 15mm x 15m	1
SPB 1678	Stiffener bracket, RH rear	1
SPB 1679	Stiffener bracket, LH rear	1
SPB 1680	Stiffener bracket, RH side	1
SPB 1681	Stiffener bracket, LH side	1
SPB 1682	Stiffener bracket, front	1
SPB 1700	Reinforcement tube	1
SPD 1225	Rivet	5 *
WJ 600041	Flat washer – 1/4"	4
WL 108001	Washer spring – M8	5 *

COUPE AND CONVERTIBLE: SILL KIT

Part No.	Description	Qty.
SPM 6027	Sill (rocker panel) kit, RH & LH	1
KIT CONTAINS:		
SPB 1392	Sill, RH	1
SPB 1393	Sill, LH	1
SPM 6028	Sill fitting kit	1
FITTING KIT CONTAINS (for two sills):		
AGU 2555	Screw & washer	17 *
SPB 1009	Spacer – jacking point	6
SPB 1037	Trim edge finisher – EPDM	2
SPB 1039	Nut insert	17 *
SPB 1153	Adhesive – Loctite 409	1
SPB 1307	Screw – jacking point spacer	7 *
SPB 1370	Adhesive – 1k	1
SPB 1522	Finisher, RH	1
SPB 1523	Finisher, LH	1

*** 1 spare supplied**

SECTION B (continued)

COUPE AND CONVERTIBLE: REAR APRON KIT

Part No.	Description	Qty.
SPM 6029	Rear apron kit	1
KIT CONTAINS:		
SPB 1399	Rear apron	1
SPM 6030	Rear apron fitting kit	1
FITTING KIT CONTAINS:		
AB 606088	Screw	5 *
AGU 2555	Screw & washer	5 *
BBC 8184	Captive nut	5 *
DAC 6634	Sidemarker lamp, RH	1
DAC 6635	Sidemarker lamp, LH	1
JLM 9566	Screw	4 *
NY 106041	Nyloc nut – M6	3 *
SPB 1018	Plug – blanking	6
SPB 1039	Nut insert	5 *
SPB 1153	Adhesive	1
SPB 1366	Bolt for SPB 1677 bracket	4 *
SPB 1370	Adhesive – 1k	1
SPB 1372	Washer – black	4 *
SPB 1400	Bracket, lower	2
SPB 1401	Bracket, upper	2
SPB 1402	Edge finisher	1
SPB 1430	Edge clip	5 *
SPB 1513	Bracket – mtg. sidemarker	2
SPB 1677	Bracket attachment – ft.	3
SPB 1701	Reinforcement tube	1
WA 106041	Plain washer	4 *
WL 600041	Spring washer	4 *

COUPE ONLY: TRUNK SPOILER KIT

Part No.	Description	Qty.
SPM 6001	Trunk (boot) spoiler kit	1
KIT CONTAINS:		
SPB 1709	Trunk spoiler	1
SPM 6002	Trunk spoiler fitting kit	
FITTING KIT CONTAINS:		
DAC 7687	Relay	1
NY 604041	Nyloc nut – M6	5
SPB 1628/1	Seal	2
SPB 1775	Gas strut	2
SPD 1138	Aerial retraction harness	1
SPM 4003	Adhesive – 1k	1
WA 106041	Washer – M6	5

CONVERTIBLE ONLY: TRUNK SPOILER KIT

Part No.	Description	Qty.
SPM 6037	Trunk (boot) spoiler kit	1
KIT CONTAINS:		
SPB 1709	Trunk spoiler	1
SPM 6043	Trunk spoiler fitting kit	1
FITTING KIT CONTAINS:		
DAC 7687	Relay	1
NH 105041	Nut – M5	1
NY 106041	Nyloc nut – M6	6
NY 1005001	Shakeproof washer	1
SP 105121	Screw – M5 x 12	1
SPD 1138	Aerial retraction harness	1
SPB 1153	Adhesive – Loctite 409	1
SPB 1238	Plinth seal	1
SPB 1370	Adhesive – 1k	1
SPB 1628/1	Seal	2
SPB 1697	Plinth – center hi-mount stop light	1
SPB 1775	Gas strut	2
WA 106041	Washer – M6	6
WA 1005001	Washer	1

*** 1 spare supplied**

XJR-S

Warranty Policy and Procedures

JAGUAR SPORT

Warranty

The JaguarSport XJR-S is covered by the same 4-year 50,000 mile New Car Warranty, Emission Warranties, and Corrosion Warranty as all other 1993 Jaguar vehicles. A detailed description of these warranties can be found in the Passport to Service and Jaguar Warranty Manual.

Claim Submission

Warranty claims can be submitted electronically via DCS, or manually by completing the W-1 claim form for non-DCS dealers. When filing a manual warranty claim use the following model codes:

- Coupe – 4060
- Convertible – 2100

NOTE: Model Codes are assigned automatically for DCS dealers using the 17 digit VIN.

All service repair operation numbers and repair times are listed under these model codes in the XJS Warranty Codes and Repair Times Manual (PN S 76), and in the Automated Labor Time Guide for DCS dealers. Normal warranty parts handling allowances apply.

Warranty Parts Handling

Certain engine management parts unique to the XJR-S must be authorized through the Technical Service Hotline and shipped individually through normal parts channels or in the JS 2 Parts Kit. A list of part numbers can be found in the Parts Listing and Procedure section of this manual.

All warranty parts are to be handled as outlined in the Jaguar Warranty Manual. However, if a part is used from the JS 2 Parts Kit it must be retained at the dealership. Do not return the part with the kit. After claim submission, a part return edit will be generated automatically requesting return of the part.