Kawasaki

KLR650
KLR500

Motorcycle Service Manual Supplement

Quick Reference Guide

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This quick reference guide will assist you in locating a desired topic or procedure.

- Bend the pages back to match the black tab of the desired chapter number with the black tab on the edge at each table of contents page.
- Refer to the sectional table of contents for the exact pages to locate the specific topic required.

EMISSION CONTROL INFORMATION

To protect the environment in which we all live, Kawasaki has incorporated crankcase emission (1) and exhaust emission (2) control systems in compliance with applicable regulations of the United States Environmental Protection Agency and California Air Resources Board. Additionally, Kawasaki has incorporated an evaporative emission control system (3) in compliance with applicable regulations of the California Air Resources Board on vehicles sold in California only.

1. Crankcase Emission Control System
   This system eliminates the release of crankcase vapors into the atmosphere. Instead, the vapors are routed through an oil separator to the intake side of the engine. While the engine is operating, the vapors are drawn into combustion chamber, where they are burned along with the fuel and air supplied by the carburetion system.
2. Exhaust Emission Control System
   This system reduces the amount of pollutants discharged into the atmosphere by the exhaust of this motorcycle. The fuel and ignition systems of this motorcycle have been carefully designed and constructed to ensure an efficient engine with low exhaust pollutant levels.
3. Evaporative Emission Control System
   Vapors caused by fuel evaporation in the fuel system are not vented into the atmosphere. Instead, fuel vapors are routed into the running engine to be burned, or stored in a canister when the engine is stopped. Liquid fuel is caught by a vapor separator and returned to the fuel tank.

The Clean Air Act, which is the Federal law covering motor vehicle pollution, contains what is commonly referred to as the Act's "tampering provisions."

"Sec. 203(a) The following acts and the causing thereof are prohibited...

(3)(A) for any person to remove or render inoperative any device or element of design installed on or in a motor vehicle or motor vehicle engine in compliance with regulations under this title prior to its sale and delivery to the ultimate purchaser, or for any manufacturer or dealer knowingly to remove or render inoperative any such device or element of design after such sale and delivery to the ultimate purchaser.

(3)(B) for any person engaged in the business of repairing, servicing, selling, leasing, or trading motor vehicles or motor vehicle engines, or who operates a fleet of motor vehicles knowingly to remove or render inoperative any device or element of design installed on or in a motor vehicle or motor vehicle engine in compliance with regulations under this title following its sale and delivery to the ultimate purchaser..."

(Continued on next page.)

NOTE

- *The phrase "remove or render inoperative any device or element of design" has been generally interpreted as follows:*
  1. *Tampering does not include the temporary removal or rendering inoperative of devices or elements of design in order to perform maintenance.*
  2. *Tampering could include:*
     a. *Maladjustment of vehicle components such that the emission standards are exceeded.*
     b. *Use of replacement parts or accessories which adversely affect the performance*

This warning may apply to any of the following components or any assembly containing one or more of these components:—

Brake Shoes or Pads
Clutch Friction Material
Gaskets
Insulators

SAFETY INSTRUCTIONS

- Operate if possible out of doors or in a well ventilated place.
- Preferably use hand tools or low speed tools equipped, if necessary, with an appropriate dust extraction facility. If high speed tools are used, they should always be so equipped.
- If possible, dampen before cutting or drilling.
- Dampen dust and place it in properly closed receptacle and dispose of it safely.

Foreword

This KLR650/500 Service Manual Supplement is designed to be used in conjunction with the KLR600 Service Manual (P/N 99924-1050-01). The maintenance and repair procedures described in this Supplement are only those that are unique to the KLR650/500. Most service operations are identical to those for the KLR600. Complete and proper servicing of the KLR650/500 therefore requires both this Supplement and the base Service Manual.

This manual is designed primarily for use by trained mechanics in a properly equipped shop. However, it contains enough detail and basic information to make it useful to the owner who desires to perform his own basic maintenance and repair work. A basic knowledge of mechanics, the proper use of tools, and workshop procedures must be understood in order to carry out maintenance and repair satisfactorily. Whenever the owner has insufficient experience or doubts his ability to do the work, all adjustments, maintenance, and repair should be carried out only by qualified mechanics.

In order to perform the work efficiently and to avoid costly mistakes, read the text, thoroughly familiarize yourself with the procedures before starting work, and then do the work carefully in a clean area. Whenever special tools or equipment are specified, do not use makeshift tools or equipment. Precision measurements can only be made if the proper instruments are used, and the use of substitute tools may adversely affect safe operation.

For the duration of your warranty period, especially we recommend that all repairs and sch[illegible]

- Follow the procedures in this manual carefully. Don't take shortcuts.
- Remember to keep complete records of maintenance and repair with dates and any new parts installed.

How to Use this Manual

In preparing this manual, we divided the product into its major systems. These systems became the manual's chapters. All information for a particular system from adjustment through disassembly and inspection is located in a single chapter.

The Quick Reference Guide shows you all of the product's systems and assists in locating their chapters. Each chapter in turn has its own comprehensive Table of Contents.

The Periodic Maintenance Chart is located in the General Information chapter. The chart gives a time schedule for required maintenance operations.

If you want spark plug information, for example, go to the Periodic Maintenance Chart first. The chart tells you how frequently to clean and gap the plug. Next, use the Quick Reference Guide to locate the Electrical System chapter. Then, use the Table of Contents on the first page of the chapter to find the Spark Plug section.

Whenever you see these WARNING and

This manual contains five more symbols (in addition to WARNING and CAUTION) which will help you distinguish different types of information.

NOTE

○*This note symbol indicates points of particular interest for more efficient and convenient operation.*

●Indicates a procedural step or work to be done.
○Indicates a procedural sub-step or how to do the work of the procedural step it follows. It also precedes the text of a WARNING, CAUTION, or NOTE.
★Indicates a conditional step or what action to take based on the results of the test or inspection in the procedural step or sub-step it follows.
☆Indicates a conditional sub-step or what action to take based upon the results of the conditional step it follows.

In most chapters an exploded view illustration of the system components follows the Table of Contents. In these illustrations

General Information

1

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Torque and Locking Agent

The following tables list the tightening torque for the major fasteners, and the parts requiring use of a non-permanent locking agent or liquid gasket.
Letters used in the "Remarks" column mean:

L : Apply a non-permanent locking agent to the threads.
LG : Apply liquid gasket to the threads.
LS : Apply liquid gasket (silicone sealant) to the threads.
M : Apply a molybdenum disulfide lubricant (grease or oil) to the threads and seated surface, or washer.
S : Tighten the fasteners following the specified sequence.

Fastener	Torque			Remarks
	N-m	kg-m	ft-lb	
Engine Top End:				
Cylinder head cover bolts	7.8	0.80	69 in-lb	
Camshaft cap bolts	12	1.2	104 in-lb	
Camshaft sprocket bolts	49	5.0	36	L
Oil pipe banjo bolts	20	2.0	14.5	
Cylinder head bolts: 10 mm	65	6.6	48	M, S
8 mm	18	1.8	13.0	S
6 mm	9.8	1.0	87 in-lb	S
Cylinder head nuts	25	2.5	18.0	S
Cylinder bolt	9.8	1.0	87 in-lb	S
Cylinder nuts	25	2.5	18.0	S
Engine Right Side/Left Side:				
Cover damper mounting bolts	9.8	1.0	87 in-lb	L
Clutch spring bolts	9.8	1.0	87 in-lb	
Clutch hub nut	130	13.5	98	
Primary gear nut	120	12.0	87	
Oil pressure relief valve	15	1.5	11.0	L
Balancer shaft (front) right end nut	44	4.5	33	
Balancer chain guide (inner) bolts				
8 mm	25	2.5	18.0	L
6 mm	12	1.2	104 in-lb	L
Shift return spring pin	—	—	—	L
Engine drain plug	23	2.3	16.5	
Oil pipe banjo bolts	20	2.0	14.5	
Cooling System:				
Radiator fan switch	7.4	0.75	65 in-lb	
Water temperature sender	15	1.5	11.0	LS
Impeller nut	9.8	1.0	87 in-lb	

Fastener	Torque			Remarks
	N-m	kg-m	ft-lb	
Engine Removal/Installation:				
Engine mounting bolts and nuts				

Fastener	Torque			Remarks
	N-m	kg-m	ft-lb	
Controls/Instruments:				
Handlebar clamp bolts	24	2.4	17.5	
Frame:				
Rear frame mounting bolts	25	2.5	18.0	
Electrical System:				
Spark plug	14	1.4	10.0	
Magneto flywheel bolt	175	18.0	130	
Starter motor mounting bolts	9.8	1.0	87 in-lb	
Starter clutch bolts	34	3.5	25	L

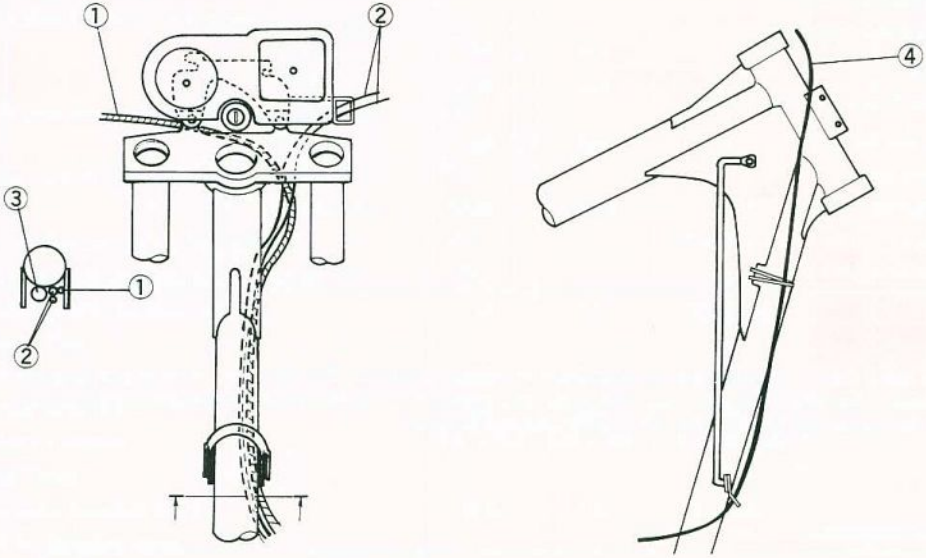
The table below, relating tightening torque to thread diameter, lists the basic torque for the bolts and nuts. Use this table for only the bolts and nuts which do not require a specific torque value. All of the values are for use with dry solvent-cleaned threads.

General Fasteners:

Threads dia. (mm)	Torque		
	N-m	kg-m	ft-lb
5	3.4 – 4.9	0.35 – 0.50	30 – 43 in-lb
6	5.9 – 7.8	0.60 – 0.80	52 – 69 in-lb
8	14 – 19	1.4 – 1.9	10.0 – 13.5
10	25 – 34	2.6 – 3.5	19.0 – 25
12	44 – 61	4.5 – 6.2	33 – 45
14	73 – 98	7.4 – 10.0	54 – 72
16	115 – 155	11.5 – 16.0	83 – 115
18	165 – 225	17.0 – 23	125 – 165
20	225 – 325	23 – 33	165 – 240

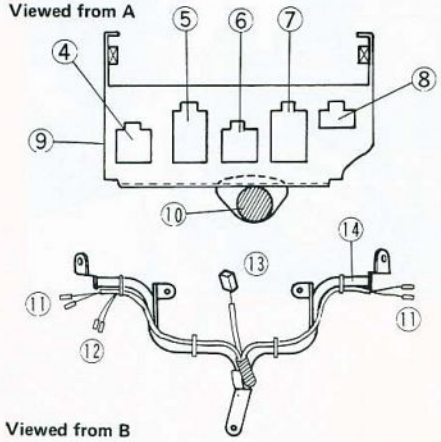
Cable, Wire, and Hose Routing

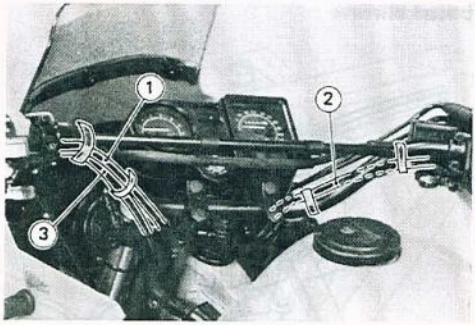
Control Cables

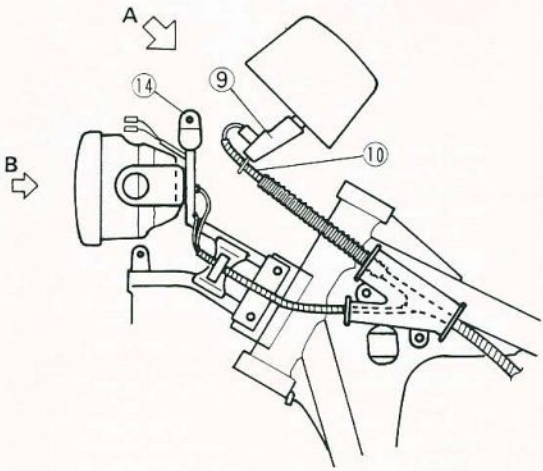


1. Choke Cable
2. Throttle Cable
3. Main Harness
4. Clutch Cable
5. To Meter Bracket
6. To Headlight
9. Ground Lead
10. To Diode Assembly
11. To Turn Signal Relay
12. To Horn
13. To C[illegible]
14. To W[illegible]
16. To Magneto
17. To Neutral Switch and Pickup Coil
18. To Radiator Fan

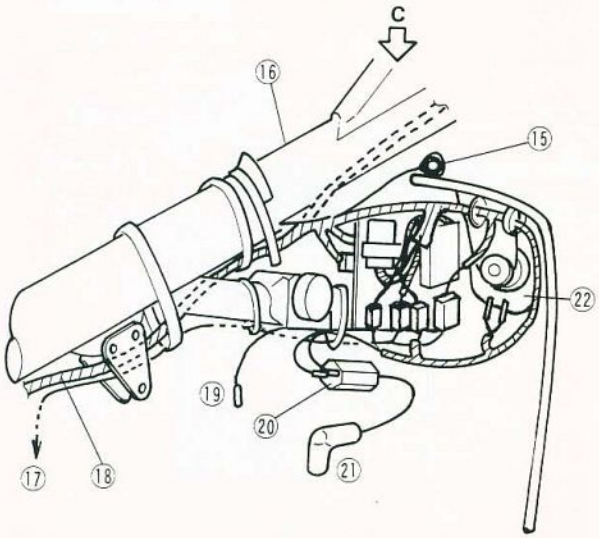
Electrical Wires

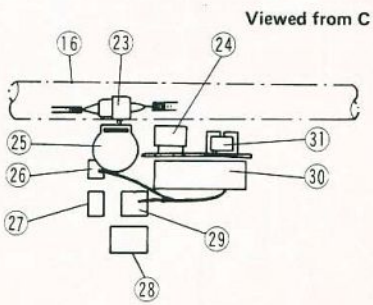




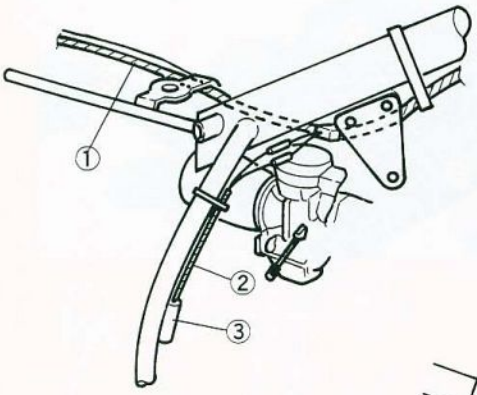


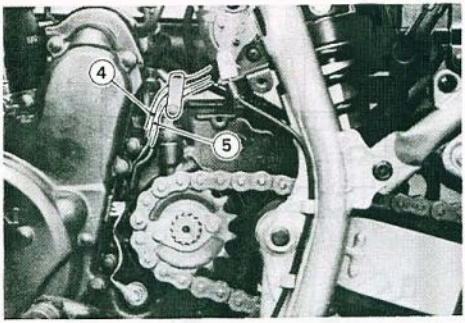
1. LH Switch Leads
2. RH Switch Leads
3. Starter Lockout Switch Leads
4. RH Switch 6P Connector (Red)
5. Meter 9P Connector
6. Ignition Switch 6P Connector (Black)
7. LH Switch 9P Connector (Red)
8. Starter Lockout Switch 3P Connector
9. Meter Bracket
10. Main Harness
11. To Turn Signal Light
12. To City Light
13. To Headlight
14. Headlight Bracket
15. Ground Lead
16. Frame Top Tube
17. To Neutral Switch and Pickup Coil
18. Main Harness
19. To Water Temperature Sender
20. Ignition Coil
21. Spark Plug Cap
22. Horn
23. Radiator Fan Connector
24. Turn Signal Relay
25. Radiator Fan Relay
26. CDI Unit 2P Connector
27. Neutral Switch and Pickup Coil 3P Connector
28. Magneto 6P Connector
29. CDI Unit 6P Connector
30. CDI Unit
31. Diode Assembly

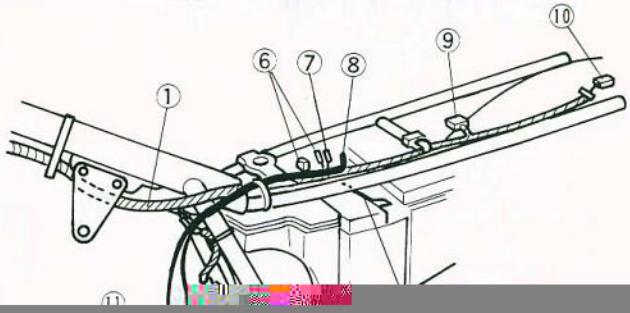




Electrical Wires







1. Main Harness
2. Rear Brake Light Switch Leads
3. Rear Brake Light Switch
4. Magneto Leads
5. Neutral Switch and

Fuel System

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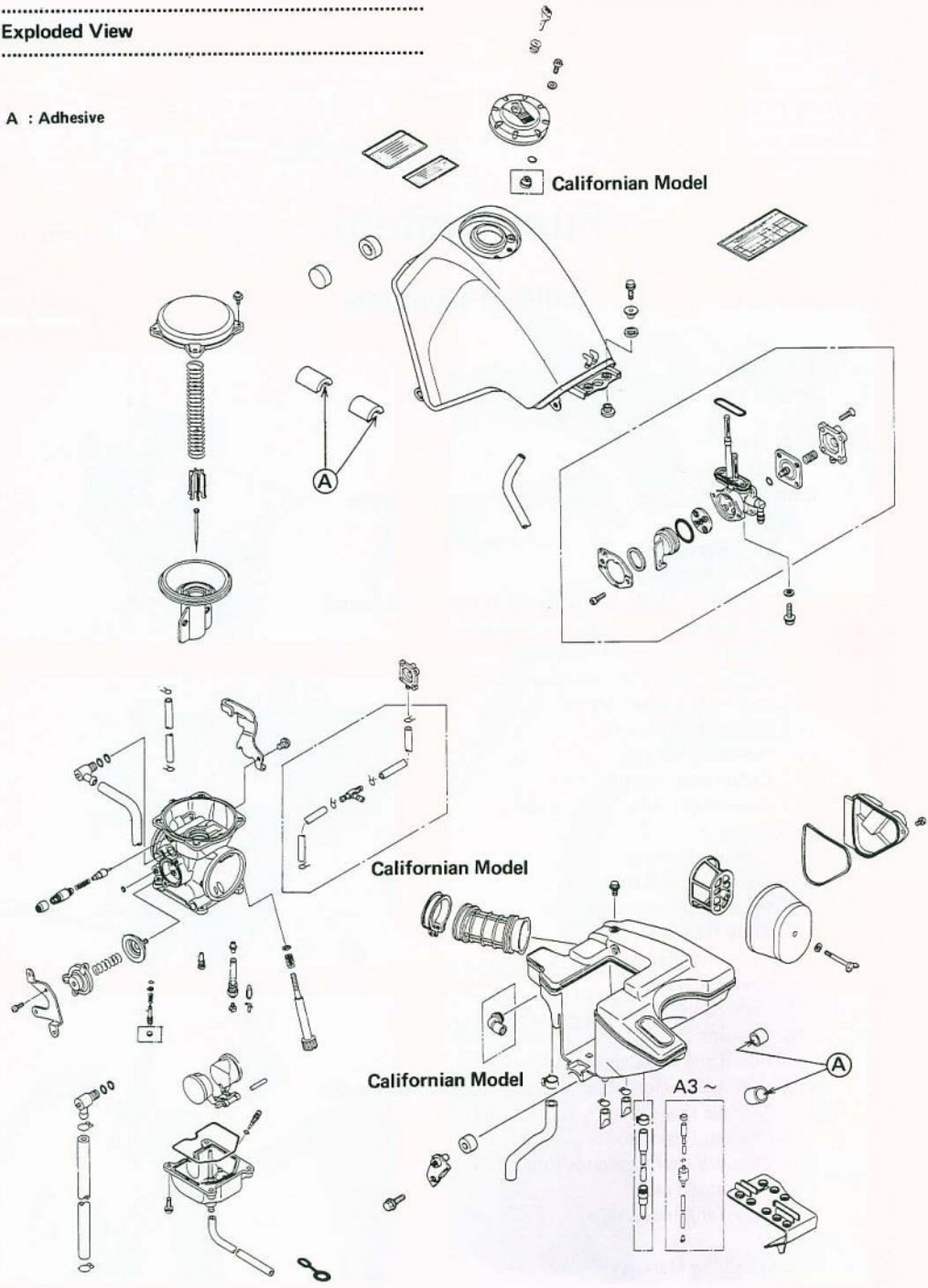
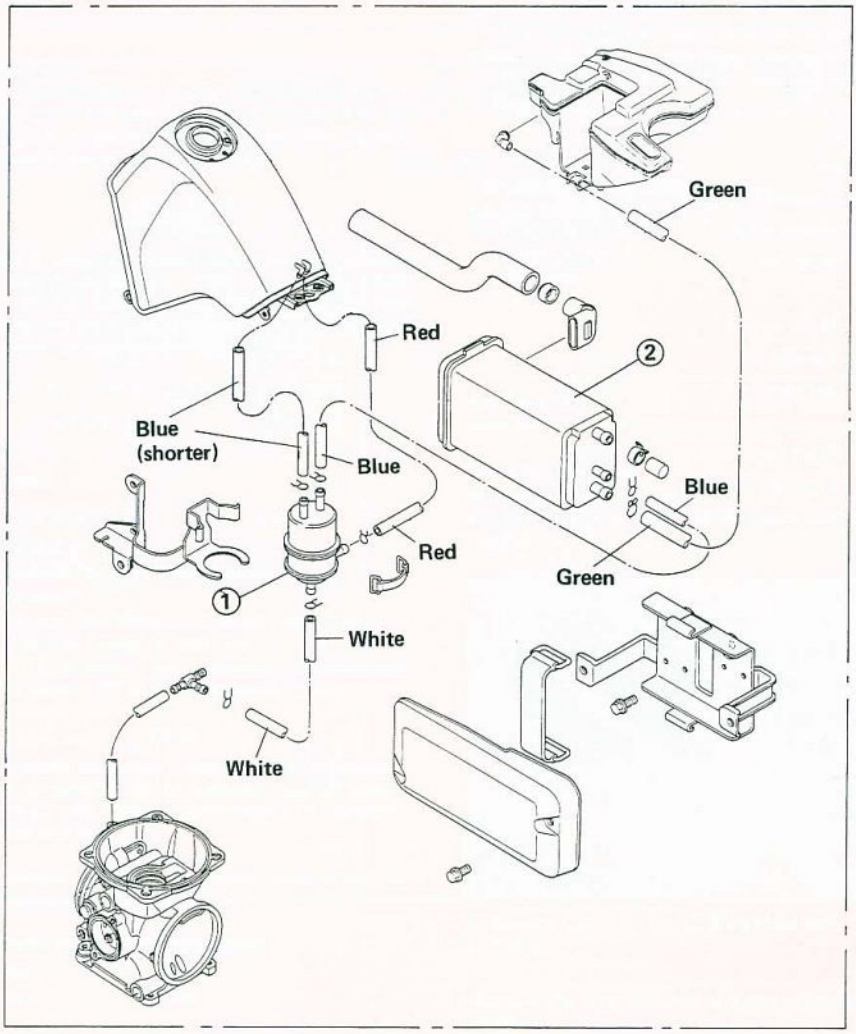
*Refer to Base Manual

Exploded View

A : Adhesive



Californian Model



1. Liquid/Vapor Separator
2. Canister

Specifications

Item	KL500-A1, A2	KL650-A1, A2	KL650-A3 ~
Carburetor:			
Idle speed	1300 ±100 r/min (rpm)	←	←
Standard specifications:			
Make, type	Keihin, CVK40	←	←
Main jet	#148	#150, Ⓤ #148, Ⓦ #155	#145, ⓊⓌ #148
Main air jet	#50	←	←
Needle jet	#6	←, Ⓦ #7	#6
Jet needle	N31W	N31T, Ⓤ N31R, Ⓦ N60B	N74C, Ⓤ N31R, Ⓦ N60N
Pilot jet	#40	←	←
Pilot air jet	#80	#70	←
Pilot screw	1 3/4 turns out	1 3/8 turns out, Ⓤ - ⒼⓌ 1 1/2	1 7/8 turns out, Ⓤ –, Ⓦ 1 3/4
Starter jet	#52	←	←
Service fuel level	–0.5 ±1 mm	←	←
Float height	17.5 mm	←	←
Height altitude adjustment (US model):			
Main jet		#145	←
Pilot jet		#38	←
Air Cleaner:			
Element oil: Grade	SE class	←	←
Viscosity	SAE30	←	←

Ⓖ : West German Model
Ⓤ : U.S. Model
Ⓦ : Swiss Model

Fuel Tank

Removal Point

Carburetor Disassembly:

Carburetor Installation

Refer to the Base Manual, noting the following.

●Refer to Cable, Wire, and Hose R[redacted]

CAUTION

Engine Top End

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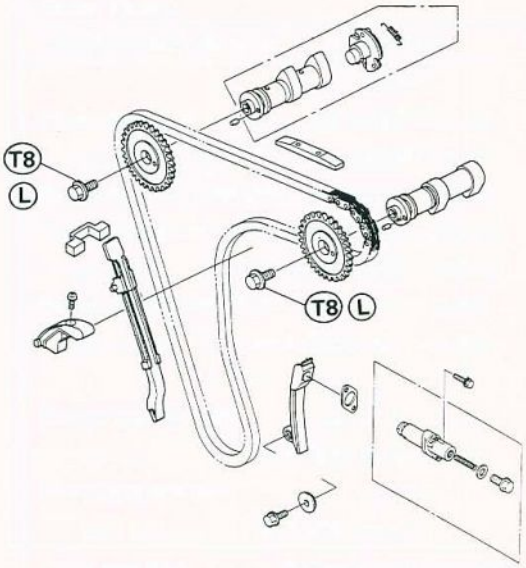
*Refer to Base Manual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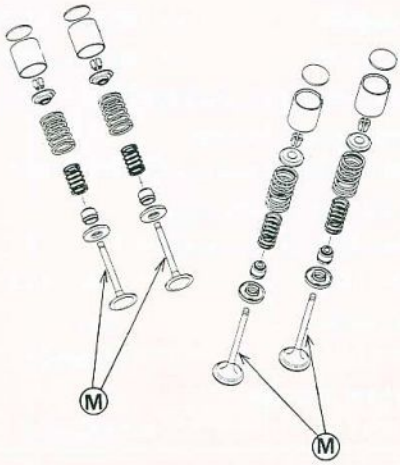
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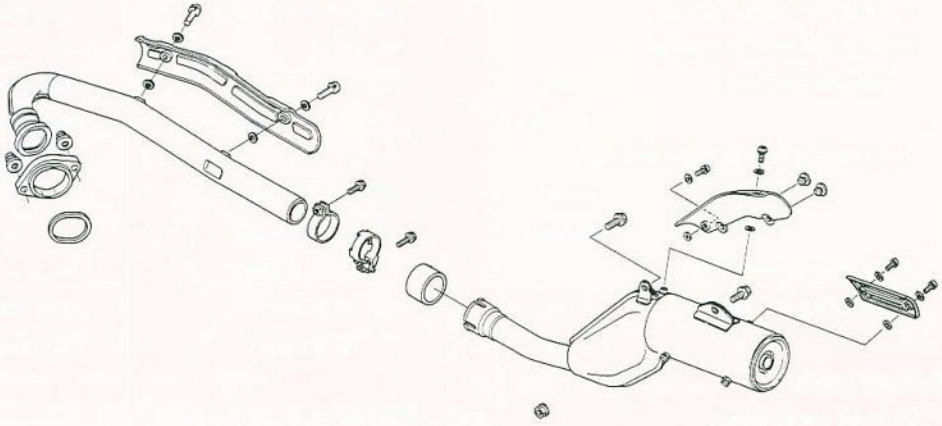


Service Data

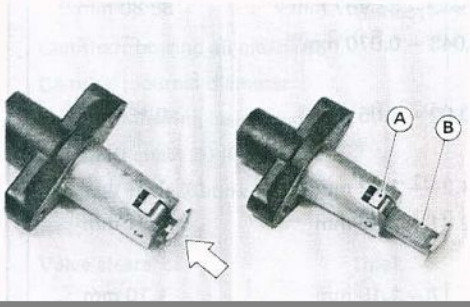
Item		Standard	Service Limit
Camshafts, Chain:			
Cam height:	Inlet	36.75 – 36.85 mm	36.65 mm
	Exhaust	36.25 – 36.35 mm	36.15 mm
Camshaft bearing oil clearance		0.030 – 0.064 mm	0.15 mm
Camshaft journal diameter		22.949 – 22.970 mm	22.92 mm
Camshaft bearing inside diameter		23.000 – 23.013 mm	23.07 mm
Camshaft chain 20-link length		127.0 – 127.4 mm	128.9 mm
Balancer chain 20-link length		190.5 – 190.9 mm	193.4 mm
Valves:			
Valve clearance:	Inlet	0.10 – 0.20 mm	– – –
	Exhaust	0.15 – 0.25 mm	– – –
Valve head thickness:	Inlet	1.0 mm	0.5 mm
	Exhaust	1.0 mm	0.7 mm
Valve stem bend		Less than 0.01 mm TIR	0.05 mm TIR
Valve stem diameter:	Inlet	6.965 – 6.980 mm	6.95 mm
	Exhaust	6.955 – 6.970 mm	6.94 mm
Valve guide inside diameter		7.000 – 7.015 mm	7.08 mm
Valve guide/valve clearance (wobble method):	Inlet	0.04 – 0.11 mm	0.24 mm
	Exhaust	0.05 – 0.12 mm	0.24 mm
Valve seating area outside diameter			
	Inlet	36.9 – 37.1 mm	– – –
	Exhaust	31.9 – 32.1 mm	– – –
Valve seating area width		0.8 – 1.2 mm	– – –
Valve spring free length:	Inner	37.6 mm	36.2 mm
	Outer	40.5 mm	39.0 mm
Cylinder Head:			
Cylinder compression		530 – 855 kPa (5.4 – 8.7 kg/cm², 77 – 124 psi)	– – –
Cylinder head warp		– – –	0.05 mm

Item		Standard	Service Limit
Cylinder, Piston:			
Cylinder inside diameter:	KL650	100.000 – 100.012 mm	100.10 mm
	KL500	89.000 – 89.012 mm	89.10 mm
Piston diameter:	KL650	99.942 – 99.957 mm	99.80 mm
	KL500	88.942 – 88.957 mm	88.80 mm
Piston/cylinder clearance		0.043 – 0.070 mm	– – –
Piston ring/groove clearance:			
Top & 2nd		0.02 – 0.05 mm	0.16 mm
Piston ring groove width:			
Top & 2nd		1.21 – 1.22 mm	1.31 mm
Oil		2.81 – 2.83 mm	2.91 mm
Piston ring thickness:			
Top & 2nd		1.17 – 1.19 mm	1.10 mm
Piston ring end gap:			
Top & 2nd		0.2 – 0.4 mm	0.7 mm

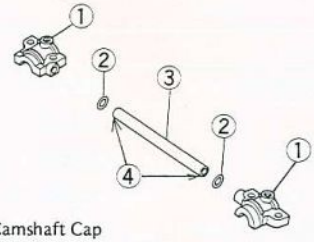
Camshaft Chain Tensioner

Installation

- Remove the cap bolt and take off the spring.
- Unlock the ratchet stopper and push the rod into the tensioner body.



Head Oil Pipe



1. Camshaft Cap
2. O-ring
3. Oil Pipe
4. Apply engine oil.

Cylinder Head

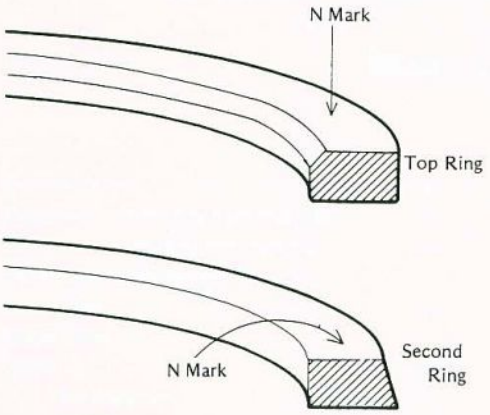
Installation Points of Cylinder Head

Cylinder, Piston

Installation Points of Piston Rings

Refer to the Base Manual, noting the following.

Cross Section of Piston Rings (Top and Second)



○Do not mix up the top and second rings. The top and second rings are not symmetrical and must be installed with the marked side facing up.

Muffler

Spark Arrester Cleaning (U.S. model)

This motorcycle is equipped with a spark arrester approved for off-road use by the U.S. Forest Service. It must be properly maintained to ensure its efficiency. In accordance with the Periodic Maintenance Chart, clean the spark arrester.

WARNING

○**To avoid burns, wear gloves while cleaning the spark arrester. Since the engine must be run during this procedure, the muffler will become hot.**

●Remove the drain plugs on the muffler.

A. Drain Plugs

●In an open area away from combustible materials, start the engine with the transmission in neutral.

●Raise and lower engine speed while tapping on the muffler with a rubber mallet until carbon particles are purged form the muffler.

WARNING

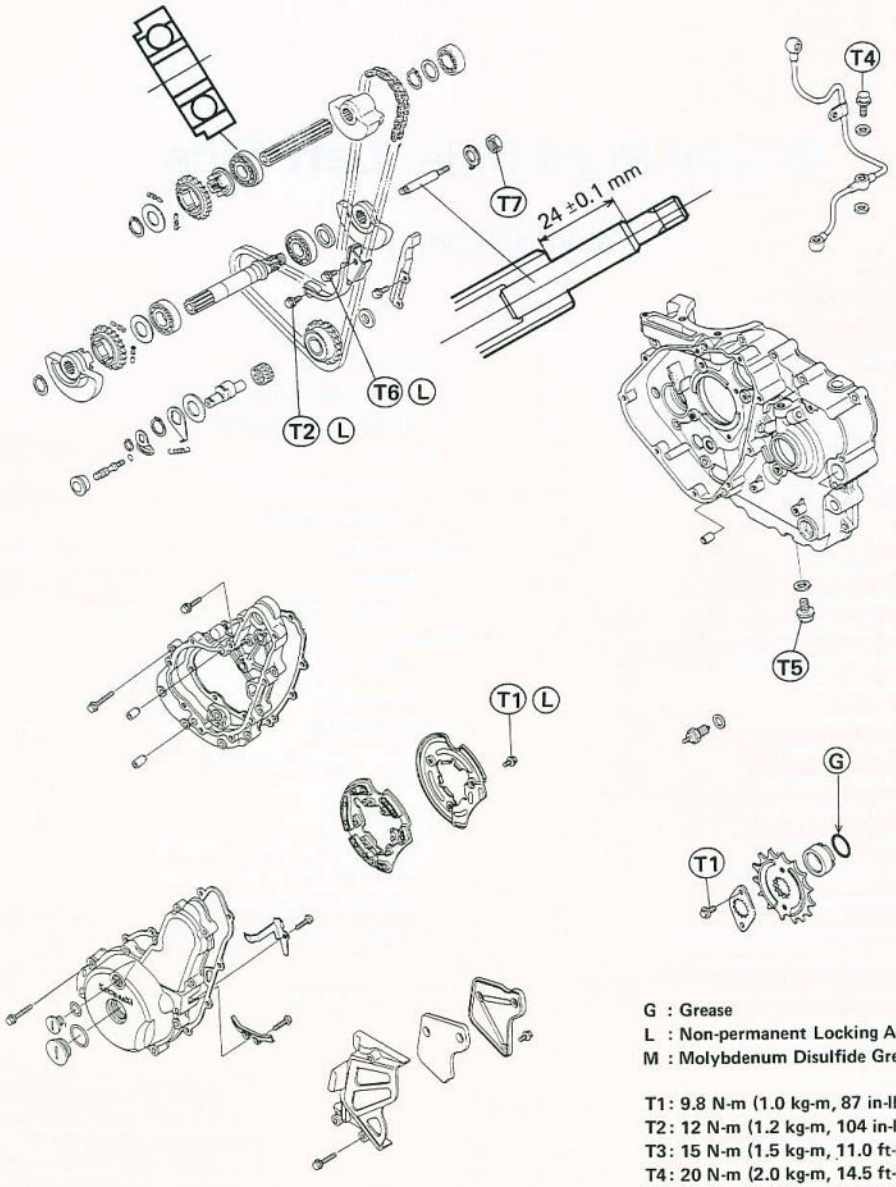
○**Do not run the engine in a closed area. Exhaust gases contain carbon monoxide, a colorless, odorless, poisonous gas. Breathing exhaust gas leads to carbon monoxide poisoning, asphyxiation, and death.**

●Stop the engine.

●Install the drain plugs.

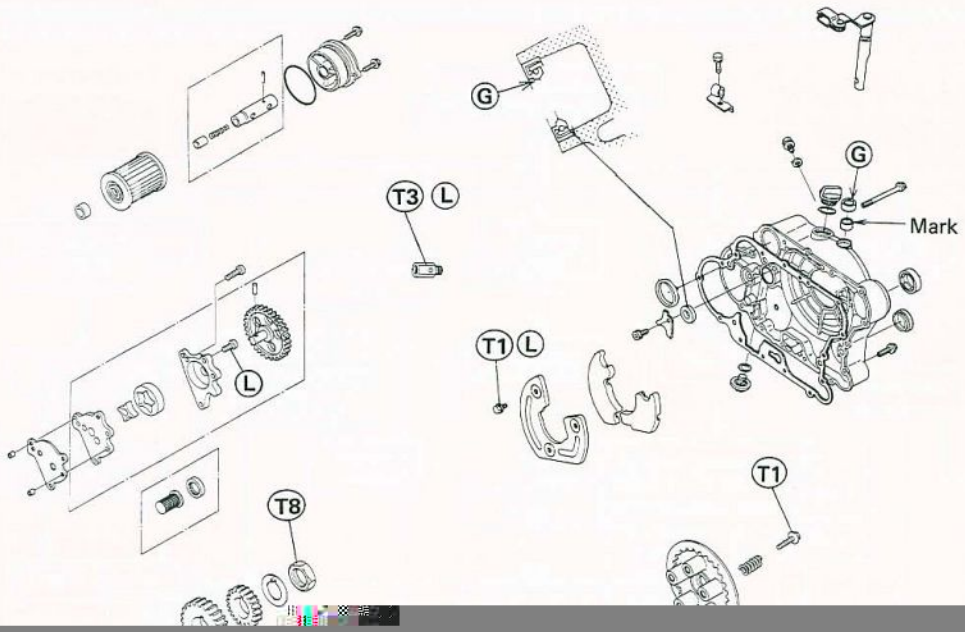
Engine Right Side/Left Side

Exploded View



G : Grease
L : Non-permanent Locking Agent
M : Molybdenum Disulfide Grease

T1: 9.8 N-m (1.0 kg-m, 87 in-lb)
T2: 12 N-m (1.2 kg-m, 104 in-lb)
T3: 15 N-m (1.5 kg-m, 11.0 ft-lb)
T4: 20 N-m (2.0 kg-m, 14.5 ft-lb)
T5: 23 N-m (2.3 kg-m, 16.5 ft-lb)
T6: 25 N-m (2.5 kg-m, 18.0 ft-lb)
T7: 44 N-m (4.5 kg-m, 33 ft-lb)
T8: 120 N-m (12.0 kg-m, 87 ft-lb)
T9: 130 N-m (13.5 kg-m, 98 ft-lb)


G
T3
L
G
Mark
T1
L
L
T1
T8

Service Data

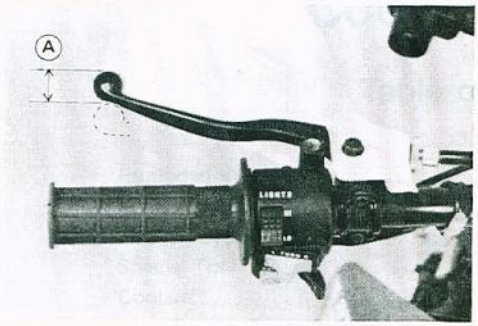
Item	Standard	Service Limit
Clutch:		
Clutch lever play	2 – 3 mm 10 – 15 mm (at lever end)	– – –
Friction plate thickness	2.9 – 3.1 mm	2.75 mm
Friction, steel plate warp	Less than 0.2 mm	0.3 mm
Clutch spring free length	34.2 mm	33.1 mm
Engine Lubrication System:		
Engine oil: Grade	SE or SF class	– – –
Viscosity	SAE 10W40, 10W50, 20W40, or 20W50	– – –
Amount	2.2 L (filter is not removed)	– – –
	2.5 L (filter is removed)	– – –
Level	Between upper and lower level lines	– – –
Relief valve opening pressure	430 – 590 kPa (4.4 – 6.0 kg/cm^2, 63 – 85 psi)	– – –
Oil pressure @4 000 rpm (r/min), 90°C (194°F)	78 – 147 kPa (0.8 – 1.5 kg/cm^2, 11 – 21 psi)	– – –

Clutch

Play Inspection

Refer to the Base Manual, noting the following.

●When checking the clutch lever play without the hand cover removal, check the lever play at the lever end.

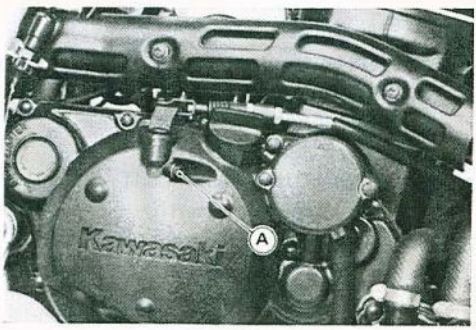


A. Clutch Lever Play (at lever end): 10 – 15 mm

Clutch Release Removal

Refer to the Base Manual, noting the following.

●Before pulling out the clutch release lever and shaft assembly, take out the shaft positioning bolt.



A. Positioning Bolt

CAUTION

○**Do not remove the clutch release lever and shaft assembly unless it is absolutely necessary. If removed, the oil seal replacement may be required.**

Clutch Release Installation

Refer to the Base Manual, noting the following.

●Before installing the lever and shaft assembly, check the oil seal and replace it if necessary.

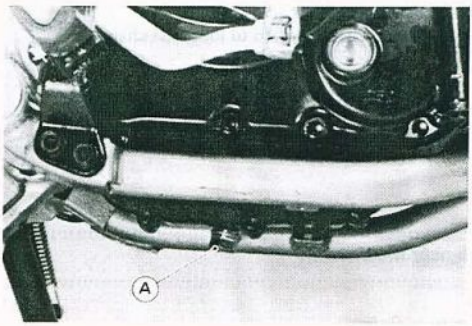
Engine Lubrication System

Engine Oil and Filter:

Oil Change

Refer to the Base Manual, noting the following.

●The engine drain plug is installed at the bottom of the crankcase.



A. Drain Plug

Engine Oil

Grade: SE or SF class
Viscosity: SAE 10W40, 10W50 20W40, or 20W50
Amount: 2.2 L (oil filter is not removed)
2.5 L (oil filter is removed)

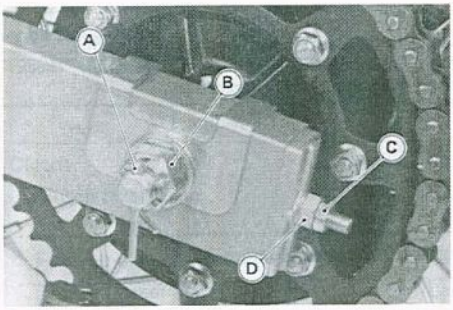
Engine Sprocket

Removal

Refer to the Base Manual, noting the following.

●Loosen the drive chain to remove it from the rear sprocket.

○Remo[illegible]



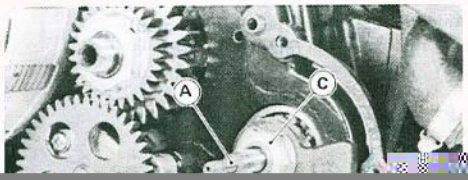
A. Cotter Pin
B. Rear Axle Nut
C. Locknut
D. Chain Adjusting Nut

○Loosen the locknuts and back out both left and right chain adjusting nuts evenly.
○Push the rear wheel forward to loose the chain.

Balancer Mechanism

Removal Point

Refer to the Base Manual, noting the following.
●Using the magneto holder (special tool: P/N 57001-1184) to keep the crankshaft and balancer shafts from turning, loosen or tighten the nut of the front right balancer weight.



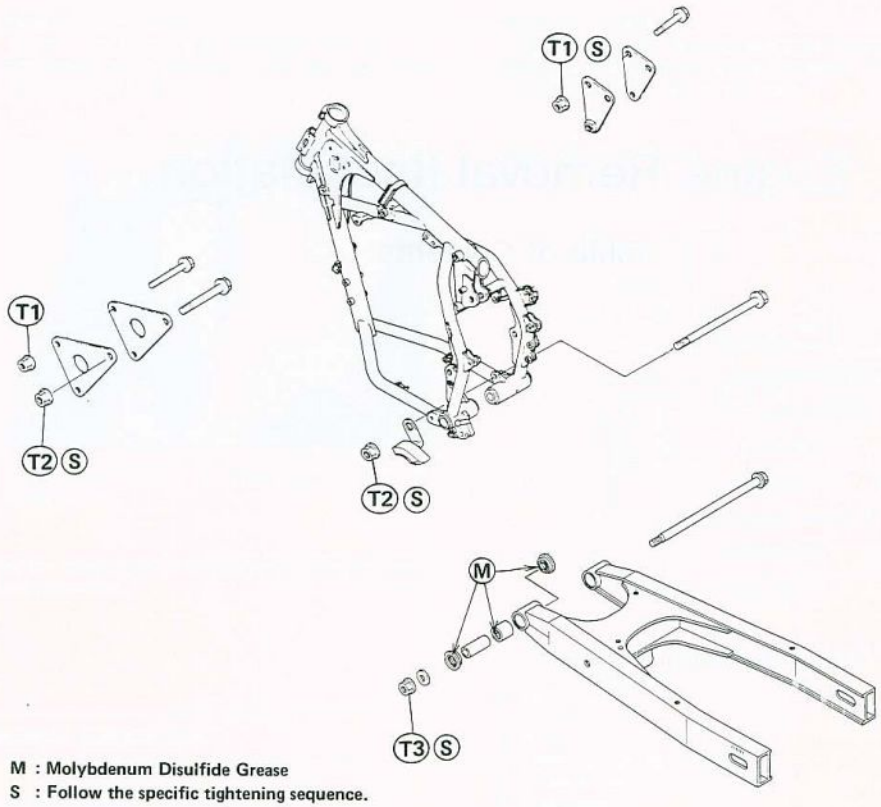
Assembly Points

Refer to the Base Manual, noting the following.
●Tighten the front right balancer weight nut to the specified torque and bend the toothed lockwasher over the nut.

Tightening Torque

Balancer Weight Nut: 44 N-m (4.5 kg-m, 33 ft-lb)

Exploded View



M : Molybdenum Disulfide Grease
S : Follow the specific tightening sequence.

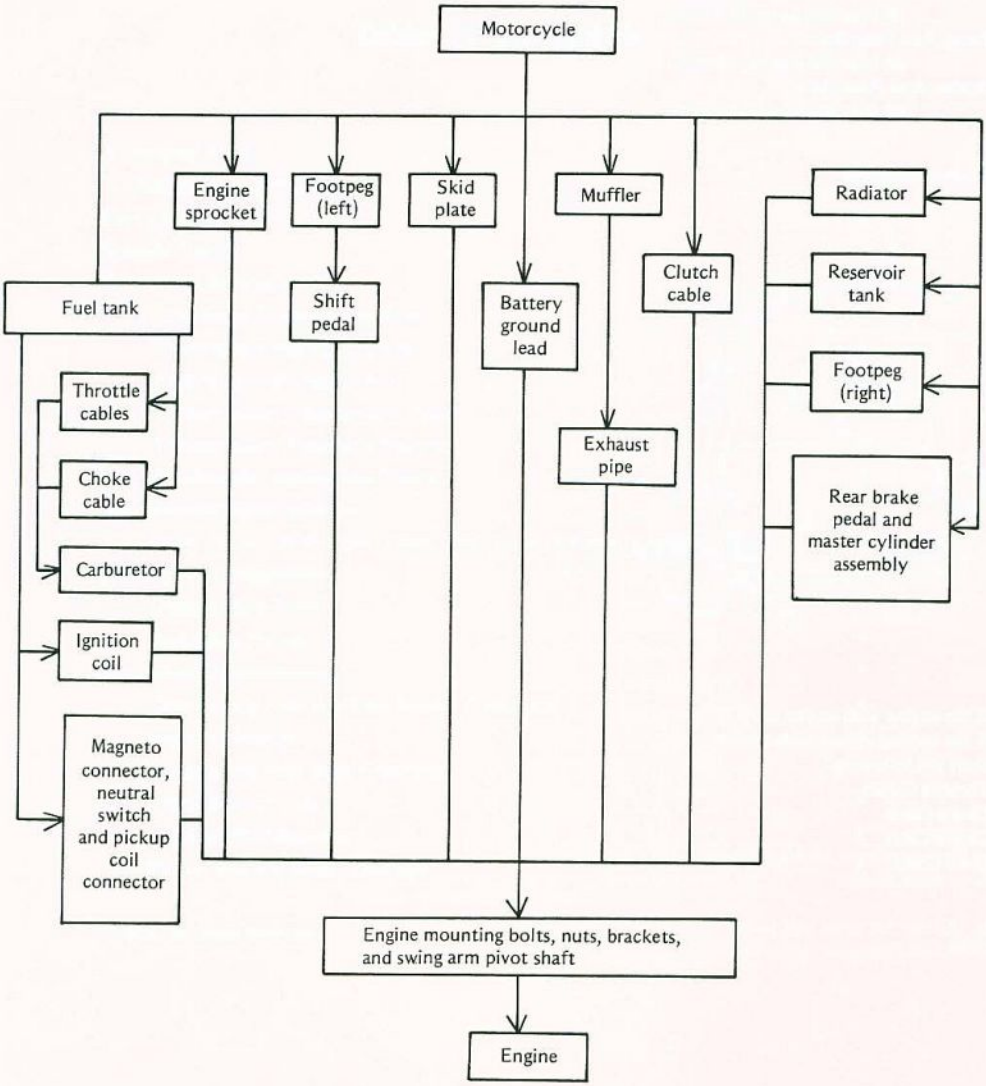
T1 : 25 N-m (2.5 kg-m, 18.0 ft-lb)
T2 : 44 N-m (4.5 kg-m, 33 ft-lb)
T3 : 98 N-m (10.0 kg-m, 72 ft-lb)

Engine Unit

Removal

- For later installation convenience, note and record how and where cables, wires, and hoses are routed. They should not be bent sharply, kinked, or twisted.
- Drain the engine oil (chapter 4) and coolant (chapter 5).
- Remove the parts and free the cables and wiring shown in the chart.
- Place a stand or block under the engine and remove the engine mounting bolts, nuts, and brackets.

○This chart is designed to aid in determining proper removal sequence. Select the component you wish to remove and follow the arrows to that point on the chart.



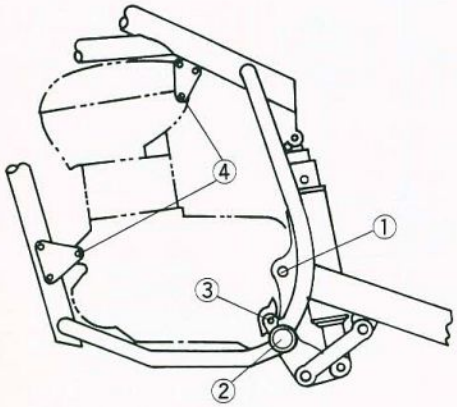
Installation

- Engine unit installation is the reverse of removal. Note the following.
- Tighten the engine mounting bolts, bracket bolts, and swing arm pivot bolt to the specified torque.

Tightening Torque

Engine Mounting Bolts (10 mm):
44 N-m (4.5 kg-m, 33 ft-lb)
Engine Mounting Bolts (8 mm):
23 N-m (2.3 kg-m, 16.5 ft-lb)
Engine Mounting Bracket Bolts (8 mm):
23 N-m (2.3 kg-m, 16.5 ft-lb)
Swing Arm Pivot Bolt:
98 N-m (10.0 kg-m, 72 ft-lb)
Rocker Arm Pivot Bolt:
98 N-m (10.0 kg-m, 72 ft-lb)

Tightening Sequence



- Fill the engine with engine oil.
- Fill the cooling system with coolant.
- Adjust the following.
  Throttle Cables
  Choke Cable
  Clutch Cable
  Drive Chain

Engine Bottom End/Transmission

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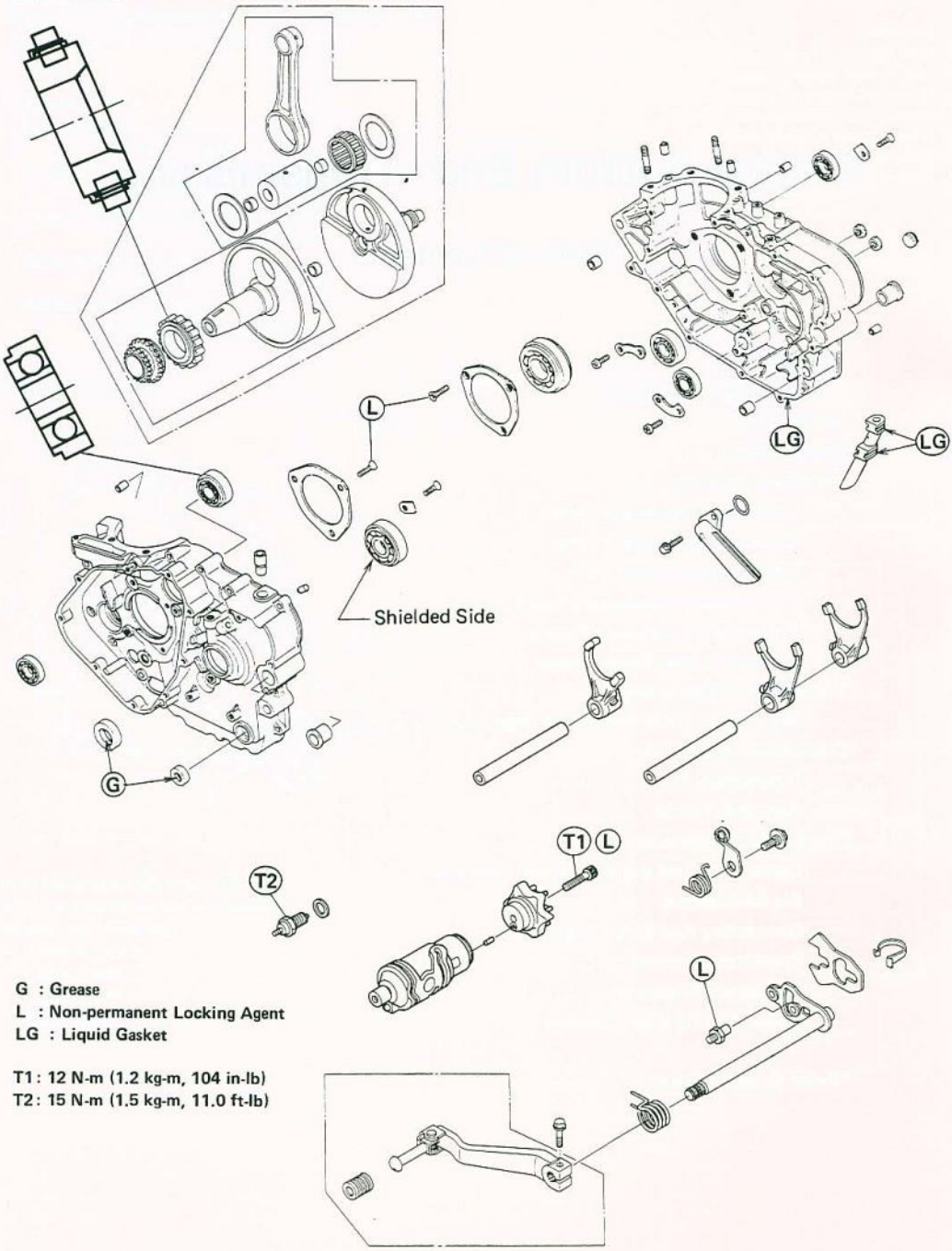
Transmission Assembly Points	*
Crankshaft Installation Points	*
Transmission Maintenance	*
Shift Drum, Shift Fork, Shift Rod, Gear Groove Inspection	*
Crankshaft Disassembly	*
Disassembly Point	*
Assembly Points	*
Crankshaft Maintenance	*
Connecting Rod Big End Radial Clearance	*
Big End Seizure	*
Connecting Rod Side Clearance	*
Crankshaft Runout	*
Crankshaft Alignment	*
Roller Bearing Wear, Damage	*

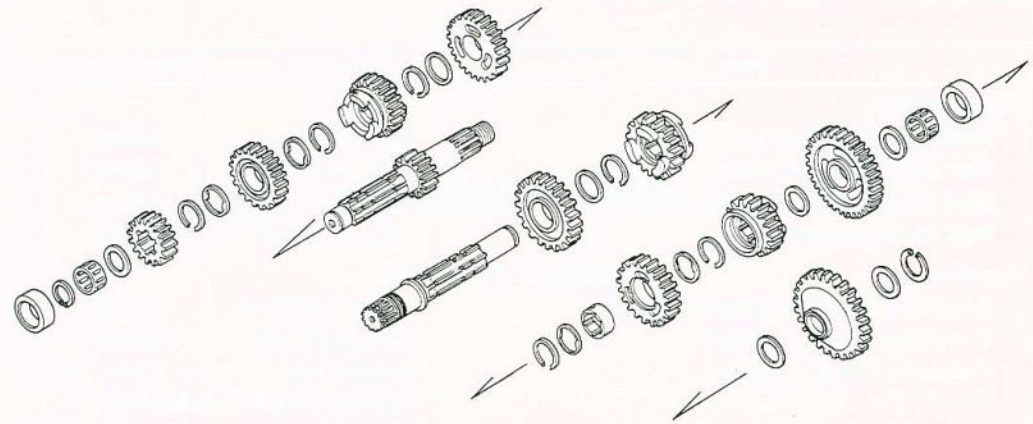
*Refer to Base Manual

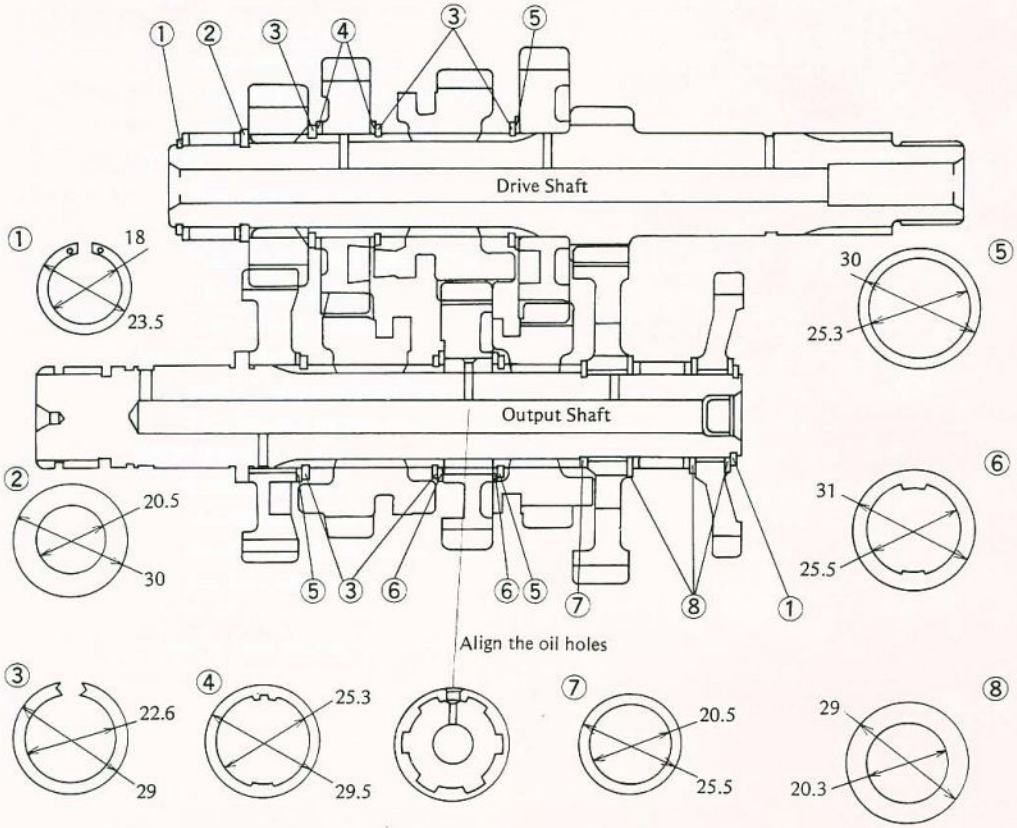
Exploded View



G : Grease
L : Non-permanent Locking Agent
LG : Liquid Gasket

T1 : 12 N-m (1.2 kg-m, 104 in-lb)
T2 : 15 N-m (1.5 kg-m, 11.0 ft-lb)




Drive Shaft
Output Shaft
Align the oil holes
18
23.5
30
25.3
20.5
30
31
25.5
22.6
29
25.3
29.5
20.5
25.5
29
20.3

Service Data

Item	Standard	Service Limit
Transmission:		
Shift fork finger thickness	4.4 – 4.5 mm	4.3 mm
Gear shift fork groove width	4.55 – 4.65 mm	4.8 mm
Shift fork guide pin diameter	5.9 – 6.0 mm	5.8 mm
Shift drum groove width	6.05 – 6.20 mm	6.3 mm
Crankshaft:		
Connecting rod big end radial clearance	0.008 – 0.020 mm	0.07 mm
Connecting rod side clearance	0.25 – 0.35 mm	0.60 mm
Crankshaft runout: Left half	0.03 mm TIR	0.10 mm TIR
Right half	0.04 mm TIR	0.10 mm TIR
Cold-fitting tolerance between crankpin and flywheel	0.093 – 0.122 mm	– – –

Wheels/Tires

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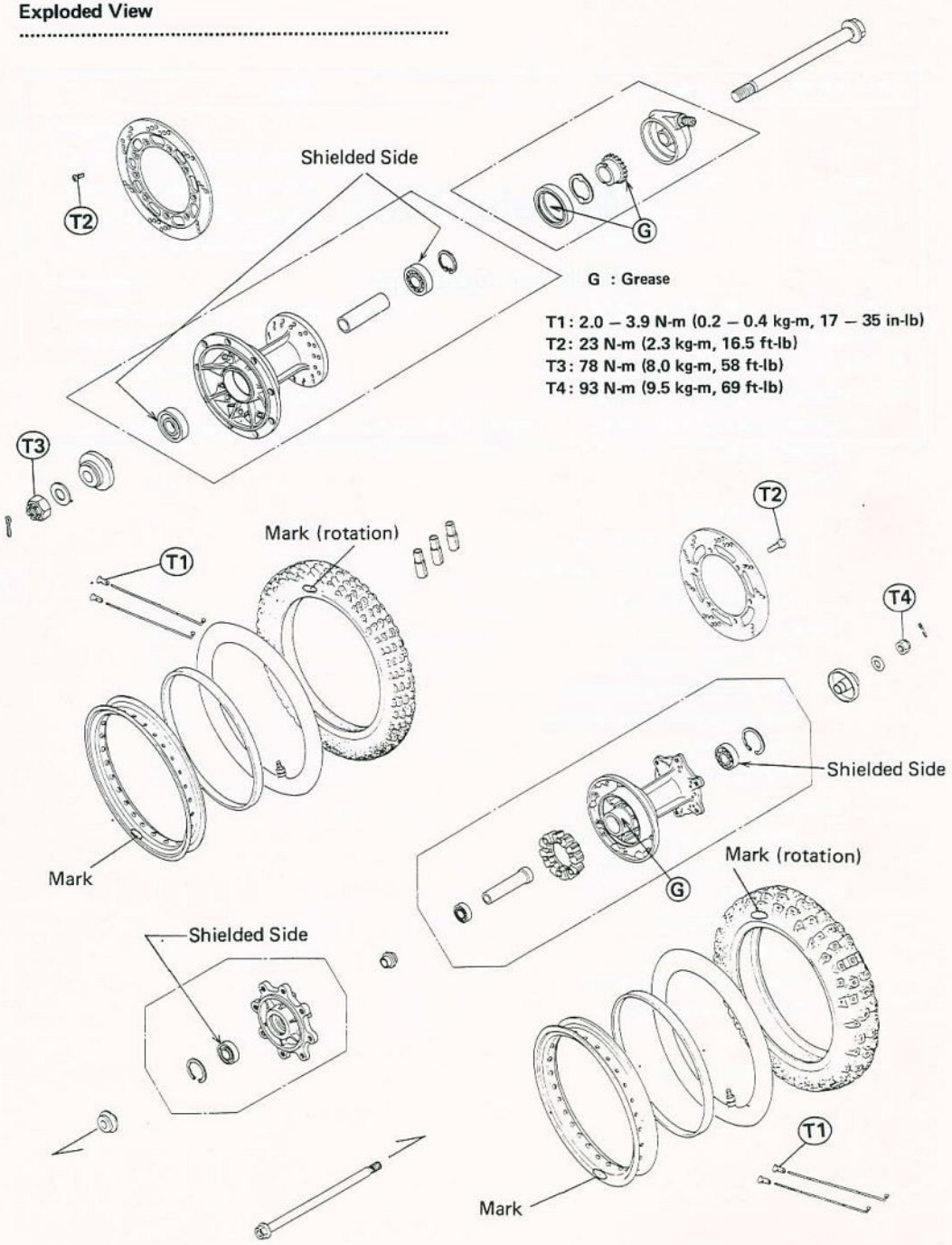
Bearing Lubrication	*

*Refer to Base Manual

Exploded View



Service Data

Item		Standard	Service Limit
Tires:			
Standard tire:	Front	90/90-21 54S DUNLOP K750 Ⓐ -A3 ~: DUNLOP TRAIL MAX	– – –
	Rear	130/80-17 65S DUNLOP K750 Ⓐ -A3 ~: DUNLOP TRAIL MAX	– – –
Tire tread depth:	Front	6.4 mm	2 mm
	Rear	8.8 mm	2 mm
Tire air pressure:			
Front		150 kPa (1.5 kg/cm², 21 psi)	
Rear	Up to 97.5 kg (215 lb) load	150 kPa (1.5 kg/cm², 21 psi)	
	97.5 – 182 kg (215 – 401 lb) load	200 kPa (2.0 kg/cm², 28 psi)	
Wheels:			
Wheel balance		Less than 10 g	– – –
Balance weights		10 g, 20 g, 30 g	– – –
Spokes and Rims:			
Rim runout: Radial & Axial		– – –	2 mm

Ⓐ : Australian Model

Tires

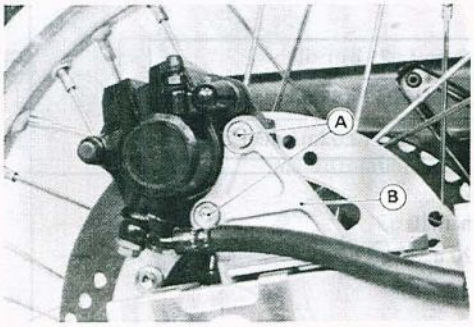
Adjustment after Tire Installation

- Check and adjust the following.
  Tire Air Pressure
  Wheel Balance (front wheel only)

Wheels

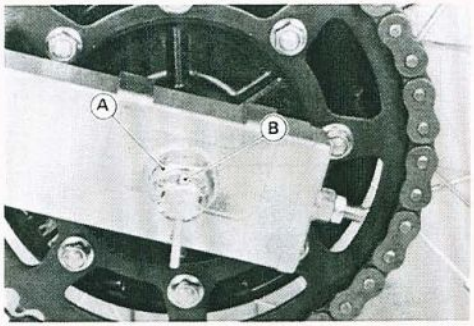
Rear Wheel Removal

- Remove the rear caliper from the caliper holder with the brake hose connected.



A. Caliper Mounting Bolts B. Caliper Holder

- Remove the cotter pin and take off the rear axle nut.



A. Rear Axle Nut B. Cotter Pin

- Place a stand or block under the motorcycle so that the rear wheel is raised off the ground.
- Pull the rear axle off the wheel and free the drive chain from the rear sprocket.

Rear Wheel Installation Points

- Adjust the drive chain slack after installing the rear wheel.
- Tighten the rear caliper mounting bolts to the specified torque.

Tightening Torque

Rear Caliper Mounting Bolts:
25 N-m (2.5 kg-m, 18.0 ft-lb)

- Check the rear brake effectiveness.

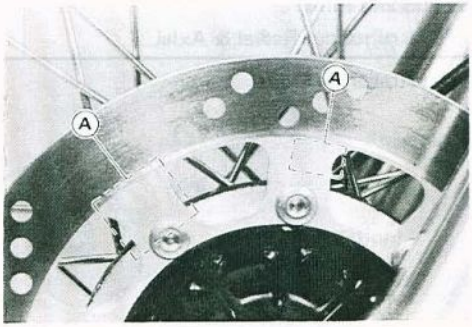
Disc Installation Points

- Clean the disc and wheel hub mating surfaces of any dirt and foreign particles.
- Mount the brake disc on the wheel so that the marked side faces out.
- Tighten the disc mounting bolts to the specified torque.

Tightening Torque

Disc Mounting Bolts: 23 N-m (2.3 kg-m, 16.5 ft-lb)

- After installing the disc, check the disc runout (see chapter 10).



A. Mark

Front Wheel Balance

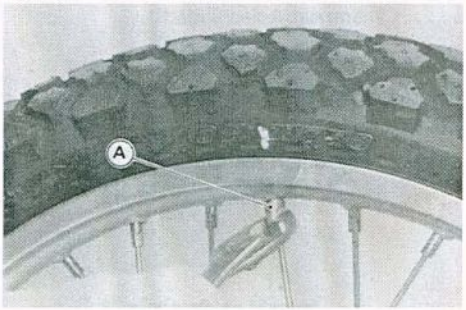
To improve stability and decrease vibration at high speed, the front wheel must be kept balanced.

Check and balance the front wheel when required, or when a tire and/or rim is replaced with a new one.

- Raise the front wheel so that it can be spun freely.
- Check that all the spokes are tightened evenly and the rim runout is within the service limit.
- Spin the wheel lightly, and mark the wheel at the top when the wheel stops.

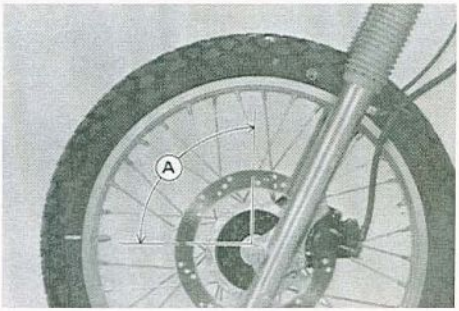
A. Mark at the top.

- ●Repeat this procedure several times.
- ★If the wheel stops of its own accord in various positions, it is well balanced.
- ★If the wheel always stops in one position, balance the wheel.
- ●Temporarily attach a balance weight on the wheel.
- ○Attach a balance weight loosely to the spoke under the marking.



A. Balance Weight

- ●Rotate the wheel ¼ turn, and see whether or not the wheel stays in this position.
- ★If it does, the correct balance weight is being used.



A. ¼ turn.

- ★If the wheel rotates and the weight goes up, replace the weight with the next heavier size.
- ★If the wheel rotates and the weight goes down, replace the weight with the next lighter size.
- ●Repeat these step until the wheel remains at rest after being rotated ¼ turn.
- ●Rotate the wheel another ¼ turn and then another ¼ turn to see if the wheel is correctly balanced.
- ●Repeat the entire procedure as many times as necessary to achieve correct wheel balance.
- ●Install the balance weight firmly on the wheel.
- ○Clamp on the balance weight firmly using pliers.

NOTE

- ○*Balance weights are available from Kawasaki Dealers in 10, 20, and 30 gram sizes. An imbalance of less than 10 grams will not usually after running stability.*
- ○*Do not use four or more balance weight (more than 90 g). If the wheel requires an excess balance weight, remove and disassemble the wheel to find the cause.*

Final Drive

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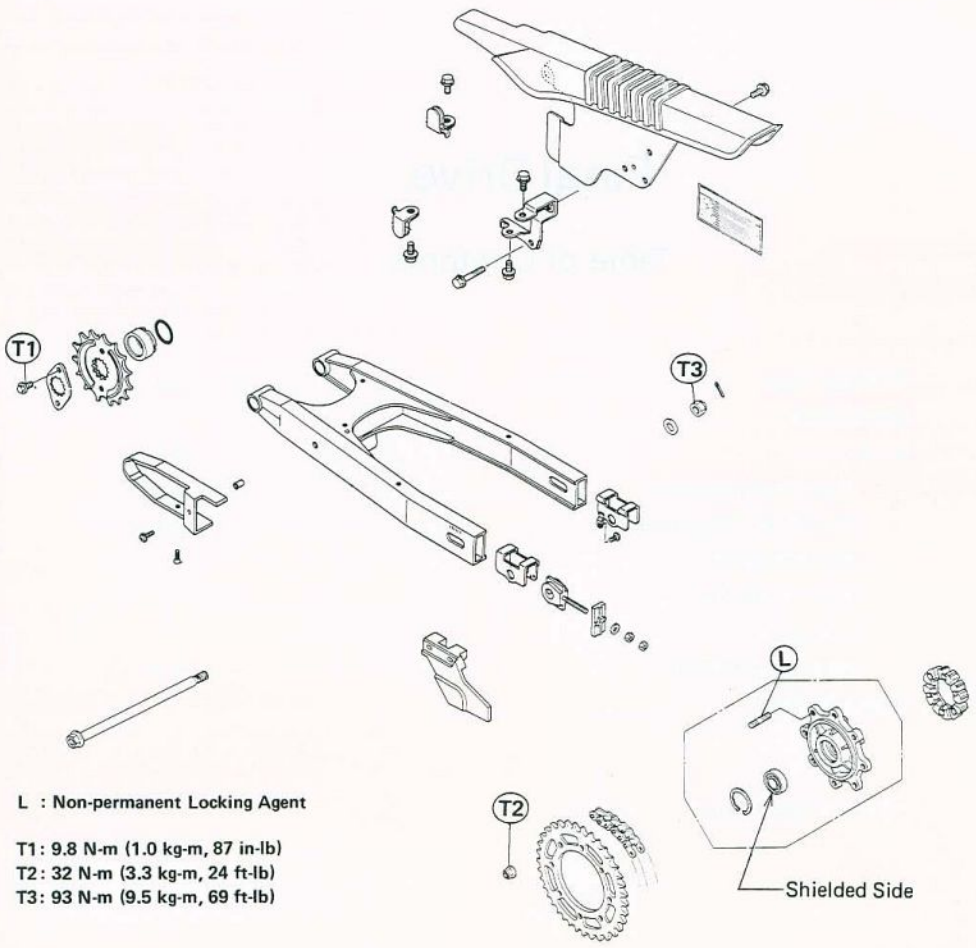
Engine Sprocket	*

*Refer to Base Manual

Exploded View



L : Non-permanent Locking Agent

T1: 9.8 N-m (1.0 kg-m, 87 in-lb)
T2: 32 N-m (3.3 kg-m, 24 ft-lb)
T3: 93 N-m (9.5 kg-m, 69 ft-lb)

Service Data

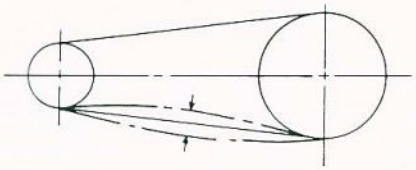
Item		Standard	Service Limit
Drive Chain:			
Standard chain:	KL650-A1,A2,A3	EK520LD-O 106 L	– – –
	KL650-A4~	DID. JAPAN. 520V2 106 L	– – –
	KL500	EK520LD-O 108 L	– – –
Chain slack		50 – 55 mm	50 – 60 mm
Chain 20-link length		317.5 – 318.4 mm	323 mm

Drive Chain

Chain Slack Inspection

- Stand the motorcycle on its side stand.
- If the drive chain appears dry, lubricate it.
- Rotate the rear wheel to find the place where the chain is tightest because the chain wears unevenly.
- Measure the vertical movement midway between the sprockets.
- ★If the drive chain is too tight or too loose, adjust it so that the chain slack is within the standard value.

Drive Chain Slack

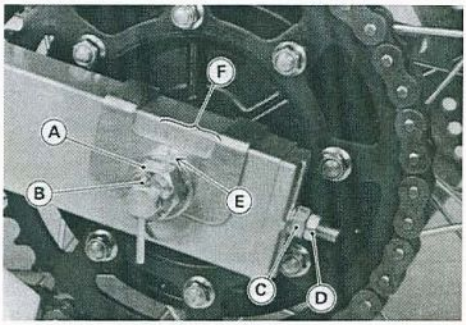


Drive Chain Slack

Standard:	**50 – 55 mm**
Too tight:	**less than 50 mm**
Too loose:	**more than 60 mm**

Chain Slack Adjustment

- Remove the cotter pin and loosen the rear axle nut.



A. Axle Nut
B. Cotter Pin
C. Chain Adjusting Nut
D. Locknut
E. Notch
F. Marks

- Loosen the left and right chain adjusting nut locknuts.
- ★If the chain is too tight, back out the left and right chain adjusting nuts evenly, and kick the wheel forward until the chain is too loose.
- Turn both chain adjusting nuts evenly until the chain has the correct amount of slack. To keep the chain and wheel properly aligned, the notch on the left chain adjuster should align with the same swing arm mark that the right chain adjuster notch aligns with.

NOTE

○*Wheel alignment can also be checked using the straight-edge or string method.*

WARNING

○**Misalignment of the wheel will result in abnormal wear, and may result in an unsafe riding condition.**

- Tighten the axle nut loosely, and tighten both chain adjusting nuts, but not enough to change the adjustment, and then tighten both locknuts securely.
- Tighten the axle nut to the specified torque.

Tightening Torque

Rear Axle Nut: 93 N-m (9.5 kg-m, 69 ft-lb)

- Rotate the wheel, measure the chain slack again at the tightest position, and readjust if necessary.
- Insert the new cotter pin through the axle nut and axle, and spread its ends.

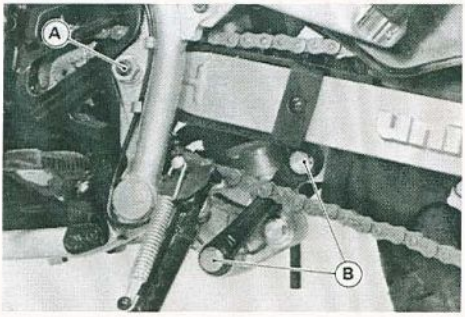
WARNING

○**If the axle nut is not securely tightened and the cotter pin is not installed, an unshaft riding condition may result.**

- Check the rear brake effectiveness.

Drive Chain Removal

- Place a stand or block under the motorcycle to raise the rear wheel off the ground.
- After removing the engine sprocket and drive chain from the rear sprocket, remove the swing arm pivot shaft and tie-rod bolt (upper or lower)



A. Swing Arm Pivot Shaft
B Tie-rod Bolts

- Pulling back the swing arm, remove the drive chain from the motorcycle.

Brakes

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*Refer to Base Manual

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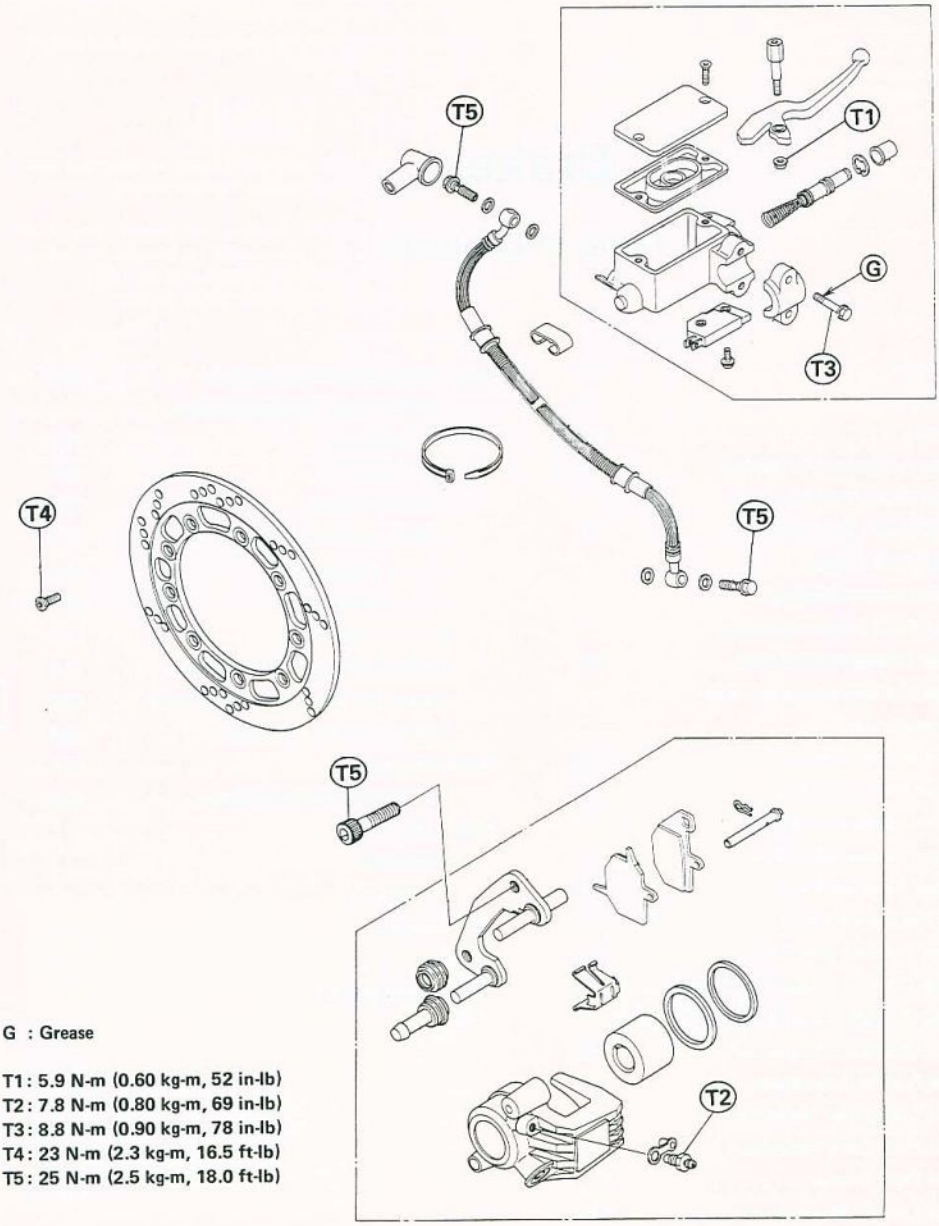
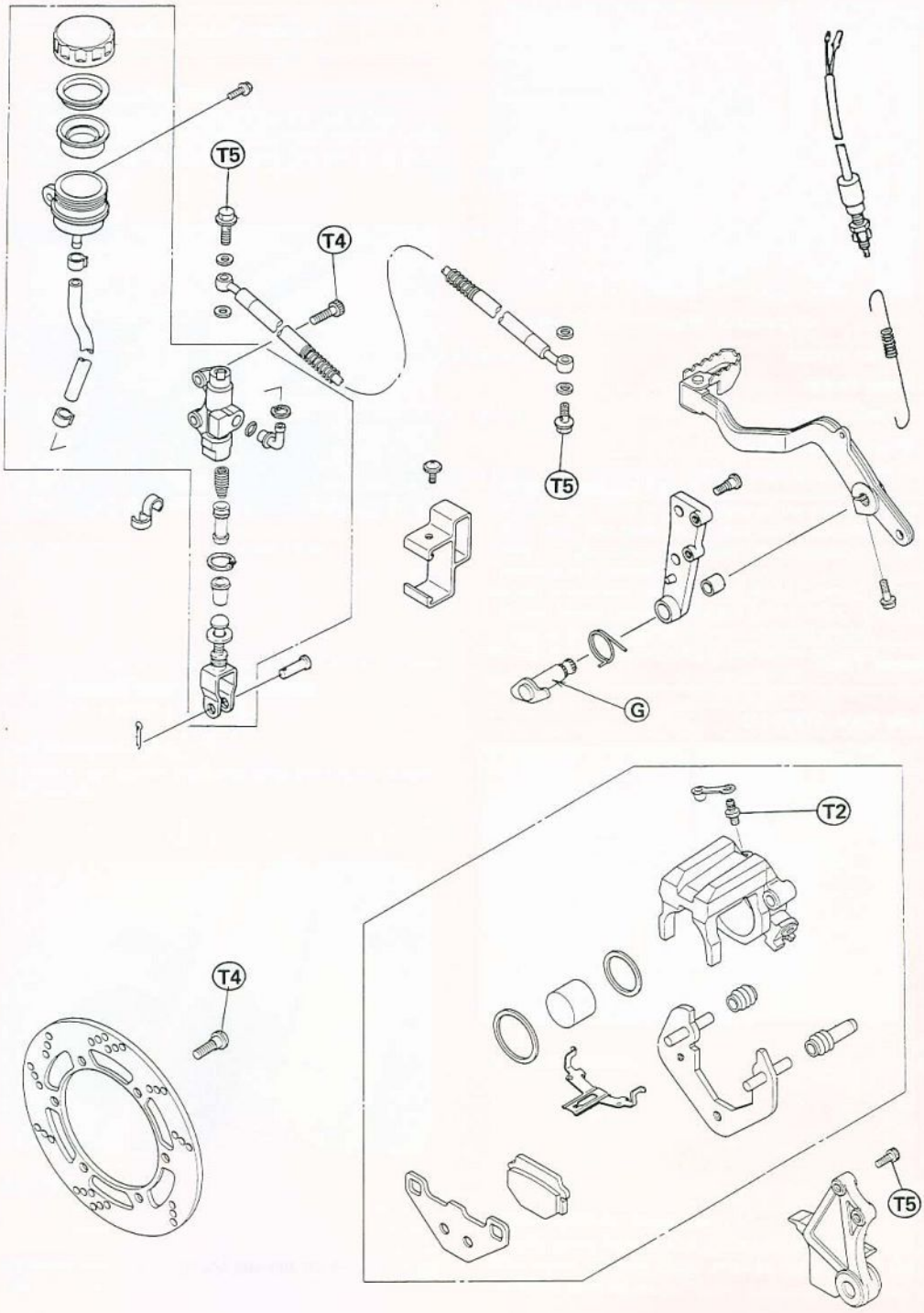


G : Grease

T1 : 5.9 N-m (0.60 kg-m, 52 in-lb)
T2 : 7.8 N-m (0.80 kg-m, 69 in-lb)
T3 : 8.8 N-m (0.90 kg-m, 78 in-lb)
T4 : 23 N-m (2.3 kg-m, 16.5 ft-lb)
T5 : 25 N-m (2.5 kg-m, 18.0 ft-lb)

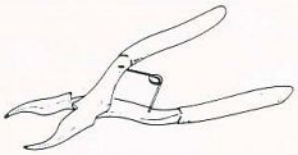

T5
T4
T5
G
T2
T4
T5

Service Data

Item		Standard	Service Limit
Brake Fluid:			
Grade		D.O.T.3 or 4	– – –
Brake Pads:			
Pad lining thickness		4.5 mm	1 mm
Brake Discs:			
Disc thickness:	Front	3.8 – 4.1 mm	3.5 mm
	Rear	4.8 – 5.1 mm	4.5 mm
Disc runout		Less than 0.2 mm	0.3 mm
Brake Pedal:			
Pedal position		Level with footpeg top	– – –
Brake Light Switch:			
Rear brake light switch operation		ON after about 15 mm pedal travel	– – –

Special Tool

Circlip Pliers: 57001-143

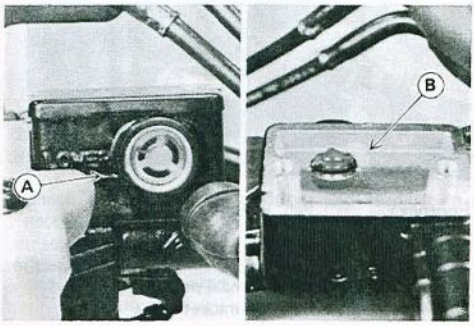


Front Brake Adjustment/Inspection

Brake Fluid Level Inspection

Refer to the Base Manual, noting the following.

- Holding the reservoir horizontally, check that the brake fluid level in the reservoir is higher than the lower level.

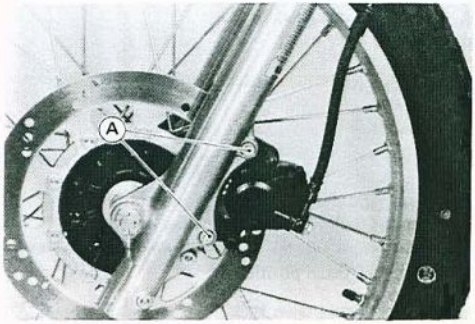


A. Lower Level B. Upper Level

Front Brake Disassembly/Assembly

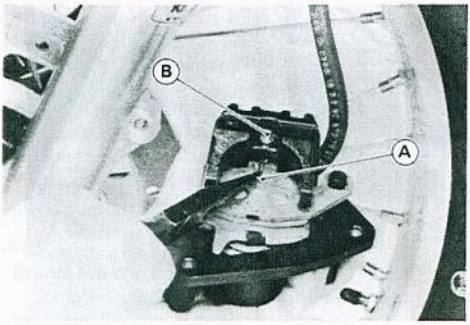
Pad Removal Points

- Remove the caliper mounting bolts and lift the caliper off the disc.



A. Caliper Mounting Bolts

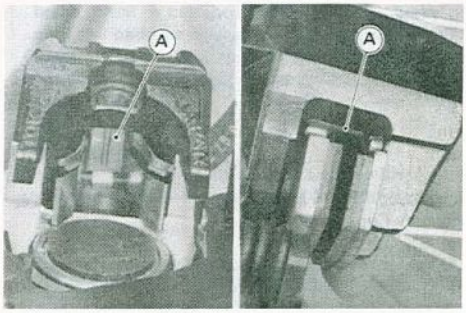
- Remove the safety clip and pull out the pad retaining pin.



A. Safety Clip B. Retaining Pin

Caliper Assembly Points

- Apply brake fluid to the outside of the piston and the fluid seal, and push the piston into the cylinder by hand. Take care that neither the cylinder nor the piston skirt scratched.
- Apply a thin coat of PBC (Poly Butyl Cuprysil) grease to the caliper holder shafts and holder holes. (PBC is a special high temperature, water-resistant grease).
- Install the anti-rattle spring in the caliper as shown.

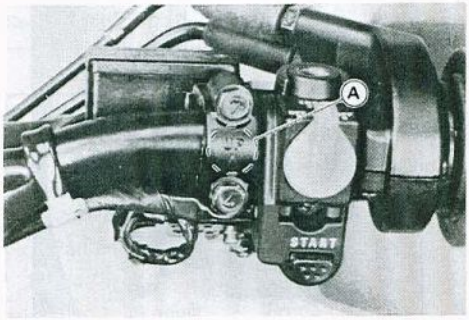


A. Anti-rattle Spring

Master Cylinder Installation

Refer to the Base Manual, noting the following.

- The master cylinder clamp must be installed with the UP mark pointing up.

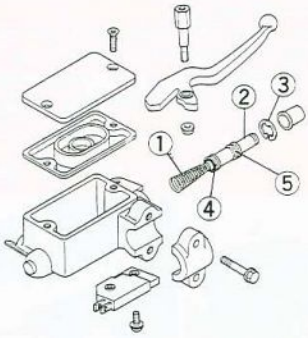


A. UP Mark

Master Cylinder Disassembly Points

- Using the circlip pliers (special tool: P/N 57001-143), remove the circlip and pull the piston and spring out of the cylinder.

Front Master Cylinder



1. Spring
2. Piston
3. Circlip
4. Primary Cup
5. Secondary Cup

CAUTION

- **Do not remove the primary and secondary cups from the piston since removal will damaged them.**

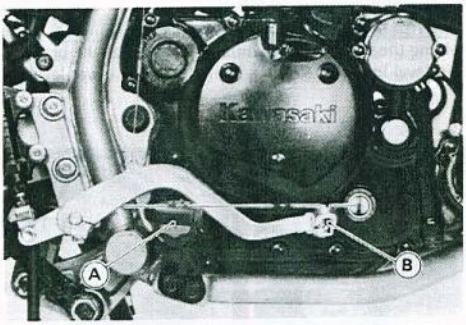
Rear Brake Adjustment/Inspection

Pedal Position Adjustment

- When the brake pedal is in its rest position, it should be at the position specified.

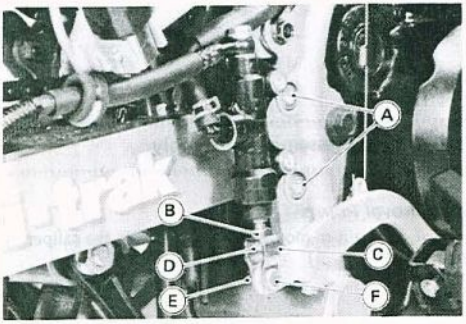
Brake Pedal Position

Standard: **Level with footpeg top**



A. Footpeg B. Brake Pedal

- If it is not, adjust the brake pedal position as follows.
- Remove the master cylinder bracket bolts.



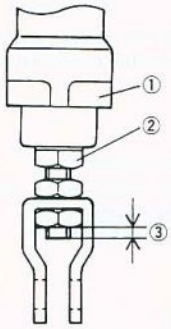
A. Master Cylinder Bracket Bolts
B. Locknut
C. Clevis
D. Adjusting Nut
E. Cotter Pin
F. Clevis Pin

- Pull out the cotter pin and the clevis pin.
- Loosen the locknut of the rod with the clevis held.
- Up or down the adjusting nut by turning the clevis to adjust the brake pedal position.

NOTE

- *If the pedal position cannot be adjusted by turning the clevis, the brake pedal may be deformed or incorrectly installed.*
- *If the brake rod protrusion is 3.0 – 3.5 mm below the nut, the pedal will be at the position specified.*

Brake Rod Protrusion



1. Master Cylinder
2. Adjusting Nut
3. Rod Protrusion

- Check the brake pedal position, and readjust it if necessary.
- Install the removed parts and tighten the locknut.
- Check the brake light switch and adjust if necessary.

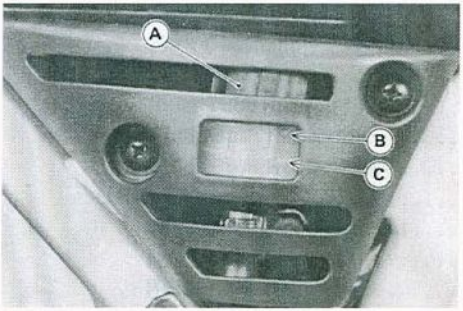
Brake Lining Wear Inspection

Refer to the Front Brake Adjustment/Inspection section in the Base Manual.

Brake Fluid Level Inspection

Refer to the Front Brake Adjustment/Inspection section in the Base Manual, noting the following.

- Holding the reservoir horizontally, check that the brake fluid level in the reservoir is between the upper and lower lines.



A. Reservoir
B. Upper Level
C. Lower Level

Brake Fluid Change

Refer to the Front Brake Adjustment/Inspection section in the Base Manual, noting the following.

- Press down the brake pedal instand of squeezing the brake lever to apply the rear brake.

Brake Line Air Bleeding

Refer to the Front Brake Adjustment/Inspection section in the Base Manual, noting the following.

- Press down the brake pedal instead of squeezing the brake lever to apply the brake.

Brake Fluid Recommendation

Refer to the Front Brake Adjustment/Inspection section in the Base Manual.

Rear Brake Disassembly/Assembly

- Observe the WARNING and CAUTION in the Brake Fluid Recommendation.

Inspection and Adjustment after Installation

Refer to the Front Brake Disassembly/Assembly section in the Base Manual, noting the following.

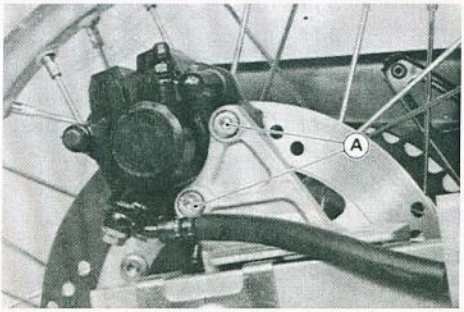
- Check the rear brake for good braking power, no brake drag, and no fluid leakage.

WARNING

- **Do not attempt to drive the motorcycle until a full brake pedal is obtained by pumping the brake pedal until the pads are against the disc. The brake will not function on the first application of the pedal if this is not done.**

Pad Removal

Refer to the Front Brake Disassembly/Assembly section in the Base Manual, noting the following.



A. Rear Caliper Mounting Bolts

Caliper Removal

Refer to the Front Brake Disassembly/Assembly section in the Base Manual, noting the following.

●Use the brake pedal instead of using the brake lever to remove the caliper piston.

Caliper Installation

Refer to the Front Brake Disassembly/Assembly section in the Base Manual.

Caliper Disassembly

Refer to the Front Brake Disassembly/Assembly section in the Base Manual.

Caliper Assembly.

Refer to the Front Brake Disassembly/Assembly section in the Base Manual.

Disc Installation

Refer to the Front Brake Disassembly/Assembly section in the Base Manual.

Master Cylinder Installation Points

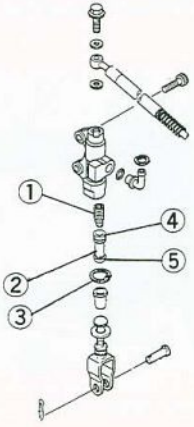
●Discard the used flat washers, and install a new washer on each side of the brake hose fittings.

●Check and adjust the brake pedal position.

Master Cylinder Disassembly Points

●Using the circlip pliers (special tool: P/N 57001-143), remove the circlip and pull the piston and spring out of the cylinder.

Rear Master Cylinder



1. Spring
2. Piston
3. Circlip
4. Primary Cup
5. Secondary Cup

CAUTION

○**Do not remove the primary and secondary cups from the piston since removal will damage them.**

Master Cylinder Assembly

Refer to the Front Brake Disassembly/Assembly section in the Base Manual.

Brake Maintenance

Brake Disc Runout Inspection

A warped disc will cause the brake pads to drag on the disc and will wear down both the pads and disc quickly. Dragging will also cause overheating and poor braking efficiency.

●Raise the wheel off the ground.

○Turn the handlebar fully to one side if it is the front wheel.

●Set up a dial gauge against the brake disc and rotate the wheel to measure the runout. The difference between the highest and lowest dial reading is the amount of runout.

★If runout is beyond the service limit, replace the brake disc.

Suspension / Steering

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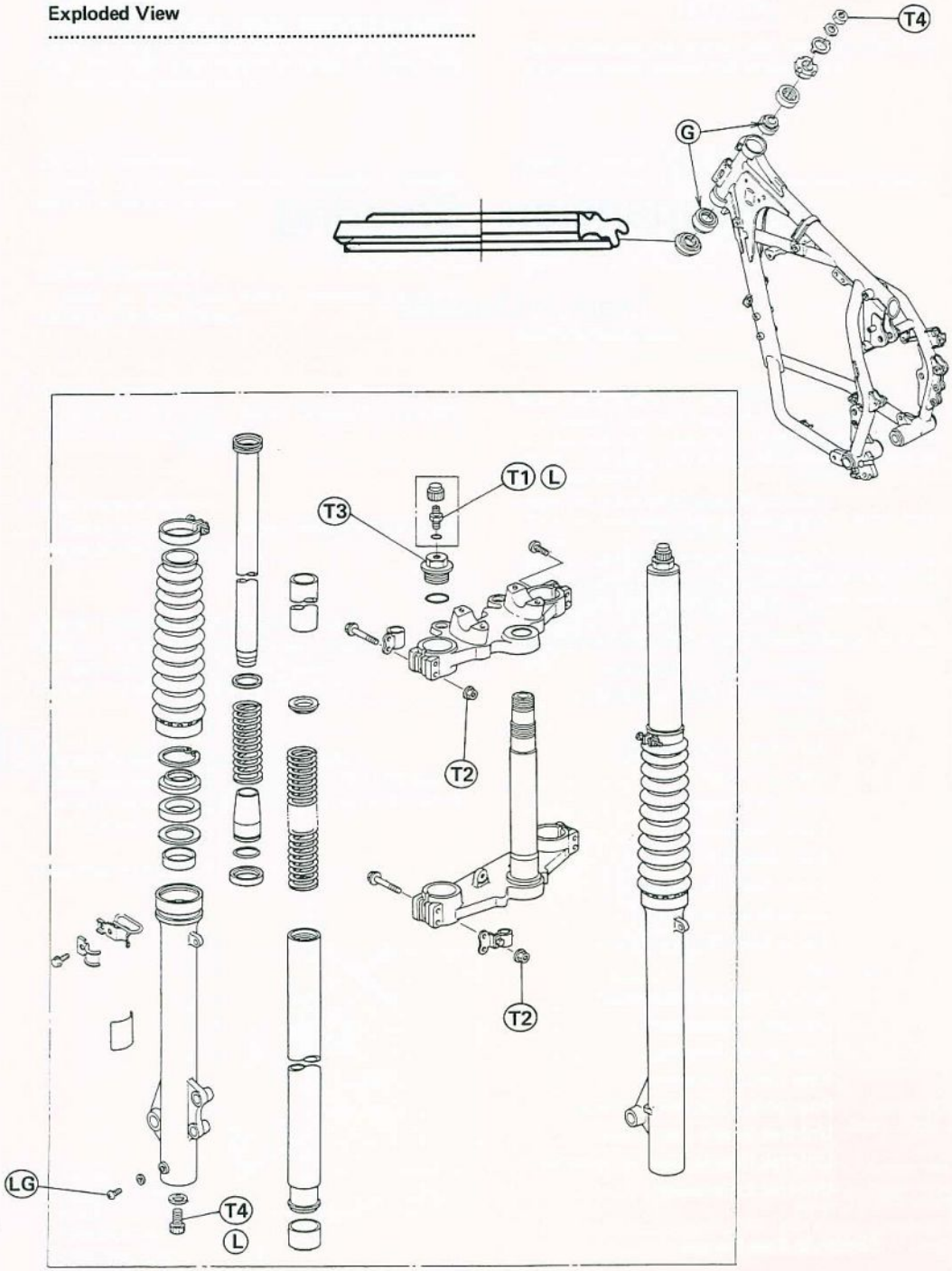
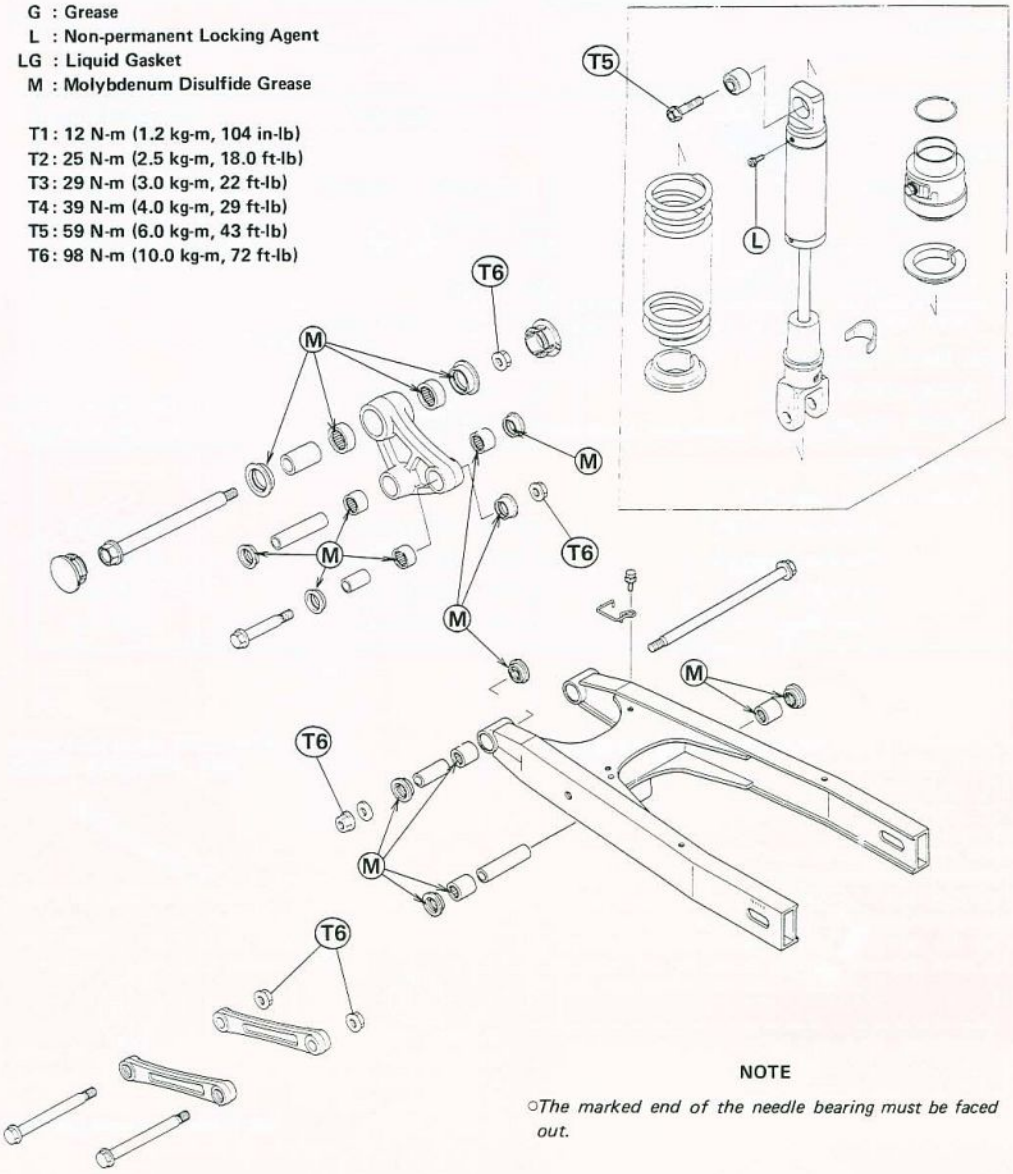
*Refer to Base Manual

Exploded View



G : Grease
L : Non-permanent Locking Agent
LG : Liquid Gasket
M : Molybdenum Disulfide Grease

T1 : 12 N-m (1.2 kg-m, 104 in-lb)
T2 : 25 N-m (2.5 kg-m, 18.0 ft-lb)
T3 : 29 N-m (3.0 kg-m, 22 ft-lb)
T4 : 39 N-m (4.0 kg-m, 29 ft-lb)
T5 : 59 N-m (6.0 kg-m, 43 ft-lb)
T6 : 98 N-m (10.0 kg-m, 72 ft-lb)



NOTE

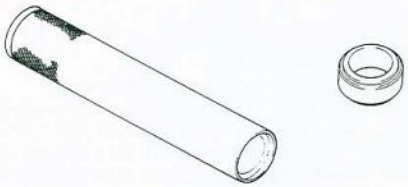
○*The marked end of the needle bearing must be faced out.*

Service Data

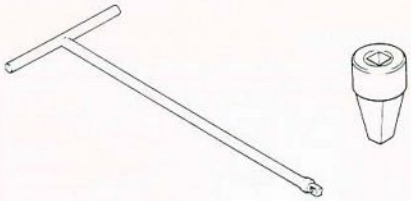
Item	Standard	Service Limit
Front Fork:		
Air pressure	0 (atmospheric pressure)	– – –
Oil viscosity	SAE 10W20	– – –
Oil amount (par side)	420 ±4 mL	– – –
Oil level (fully compressed)	190 ±2 mm (from top of inner tube)	– – –
Rear Shock Absorber:		
Spring preload adjuster	No. 1 of 5 positions	– – –
Damper adjuster	No. 1 of 4 positions	– – –
Uni-trak Sleeves:		
Sleeve outside diameter:		
Swing arm pivot	19.979 – 20.000 mm	19.95 mm
Rocker arm pivot	27.979 – 28.000 mm	27.95 mm
Tie-rod ends	19.979 – 20.000 mm	19.95 mm
Rear Shock lower end	19.979 – 20.000 mm	19.95 mm

Special Tools

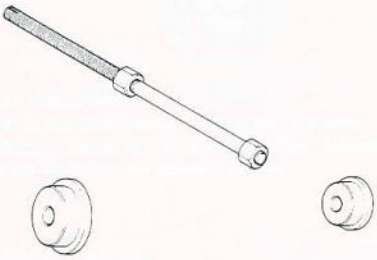
Stem Bearing Driver: 57001-137
Adapter: 57001-1074



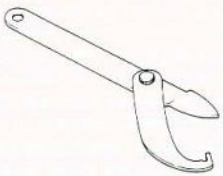
Handle: 57001-183
Adapter: 57001-1057



Driver Press Shaft: 57001-1075
Drivers: 57001-1076, 1106



Stem Nut Wrench: 57001-1100



Oil Seal Driver: 57001-1104

NOTE

○*Following tools can be used for front fork servicing instead of using the oil seal driver (P/N 57001-1104).*

Fork Outer Tube Weight: 57001-1218

Fork Oil Seal Driver: 57001-1219

Stem Bearing Remover: 57001-1107

Front Fork

Fork Oil Level

Refer to the Base Manual, noting the following.

Front Fork Oil Level

190 ±2 mm below the top end of the inner tube

Fork Oil Changing

Refer to the Base Manual, noting the following.

Front Fork Oil

Rating: Kayaba G-10
Viscosity: SAE 10W20
Amount per side:
When changing oil: 355 mL
After disassembly and completely dry: 420 ±4 mL

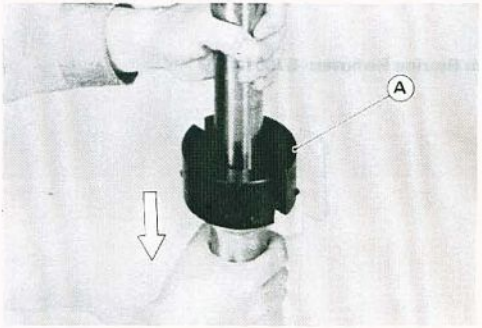
Fork Disassembly

Refer to the Base Manual, noting the following.

●When separating the inner tube from the outer tube, the fork outer tube weight (special tool: P/N 57001-1218) can be used to separate them instead of using the driver (special tool: P/N 57001-1104). Perform the following.

○Mount the weight (special tool) on the top of the outer tube, by fitting the step of the weight to the top corner of the outer tube.

○Holding the inner tube by hand in a vertical position, stroke the outer tube several times and pull it down.



A. Fork Outer Tube Weight: 57001-1218

Fork Assembly

Refer to the Base Manual, noting the following.

●When installing the guide bush and oil seal at the outer tube top, the fork oil seal driver (special tool: P/N 57001-1219) can be used to install them instead of using the driver (special tool: P/N 57001-1104). See Guide Bush Replacement.

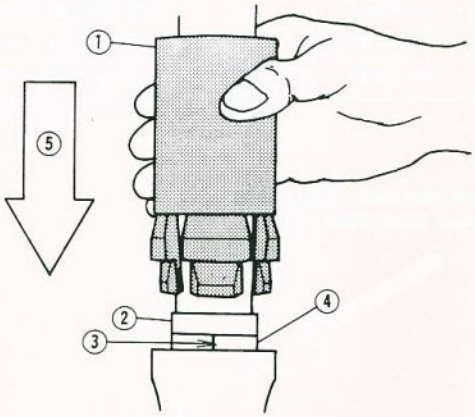
Guide Bush Replacement

Refer to the Base Manual, noting the following.

●When installing the guide bush and oil seal at the outer tube top, the fork oil seal driver (special tool: P/N 57001-1219) can be used to install them instead of using the driver (special tool: 57001-1104). Perform the following.

○Install the guide bush (with a used guide bush or washer on it) by tapping the used guide bush or washer with the driver until it stops. The slit of the bush must be faced toward the left or right.

Guide Bush Installation



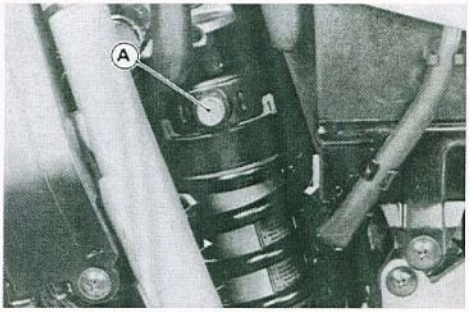
1. Driver: 57001-1219
2. Used Guide Bush.
3. Slit (toward the left or right)
4. New Guide Bush
5. Tap

Uni-trak

Spring Preload Adjustment

The spring preload adjuster on the rear shock absorber has 5 positions so that the spring force can be adjusted for different riding conditions.

●Using a socket wrench, turn the spring preload adjuster as required.
○For californian vehicles, remove the liquid/vapor separator from its bracket.



A. Spring Preload Adjuster

Setting Table for Spring Preload and Damper Adjusters

Riding Condition / Adjuster	An average-build rider or a rider with load	A rider and a passenger	A rider and a passenger with load
Spring preload	① or 2	② or 3	③, 4, or 5
Damper	Ⅰ or Ⅱ	Ⅱ or Ⅲ	Ⅲ or Ⅳ

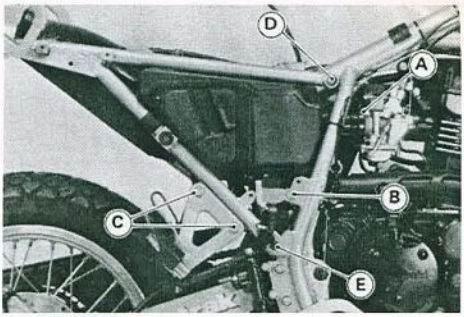
○: Standard setting (number) is identified with a circle marking.

Damper Adjustment

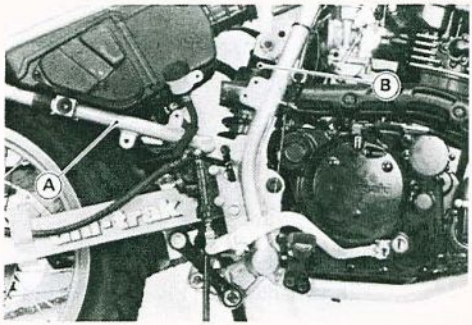
Refer to the Base Manual, noting the following.
●See Setting Table in the Spring Preload Adjustment paragraph to adjust the damper adjuster.

Rear Shock Removal

●Remove the following.
Side Covers
Seat
Fuel Tank
Battery
Muffler
●Remove the mounting bolt of the rear brake master cylinder reservoir.
●Remove the rear right footpeg bracket bolts.
●Loosen the clamp of the carburetor air duct.
●Disconnect the main harness connectors, and remove the clamps to free rear frame from the harness.
●Loosen the rear frame lower bolts and remove the upper bolts.
●Tilt the rear frame backwards.



A. Carburetor Air Duct Clamp
B. Reservoir Mounting Bolt
C. Footpeg Bracket Bolts
D. Rear Frame Upper Bolt (remove)
E. Rear Frame Lower Bolt (loosen)



A. Rear Frame B. Rear Shock Absorber

●Loosen the upper and lower shock absorber mounting nuts. Do not remove them yet.
●Place a stand or block under the motorcycle so that the rear wheel off the ground.
●Remove the rear shock absorber mounting bolts and nuts, take out the rear shock absorber.

Rear Shock Installation Point

●Tighten the following bolts to the specified torque.

Tightening Torque

Rear Shock Mounting:
Upper: 59 N-m (6.0 kg-m, 43 ft-lb)
Lower: 98 N-m (10.0 kg-m, 72 ft-lb)
Rear Frame Mounting Bolts:
25 N-m (2.5 kg-m, 18.0 ft-lb)

Controls / Instruments

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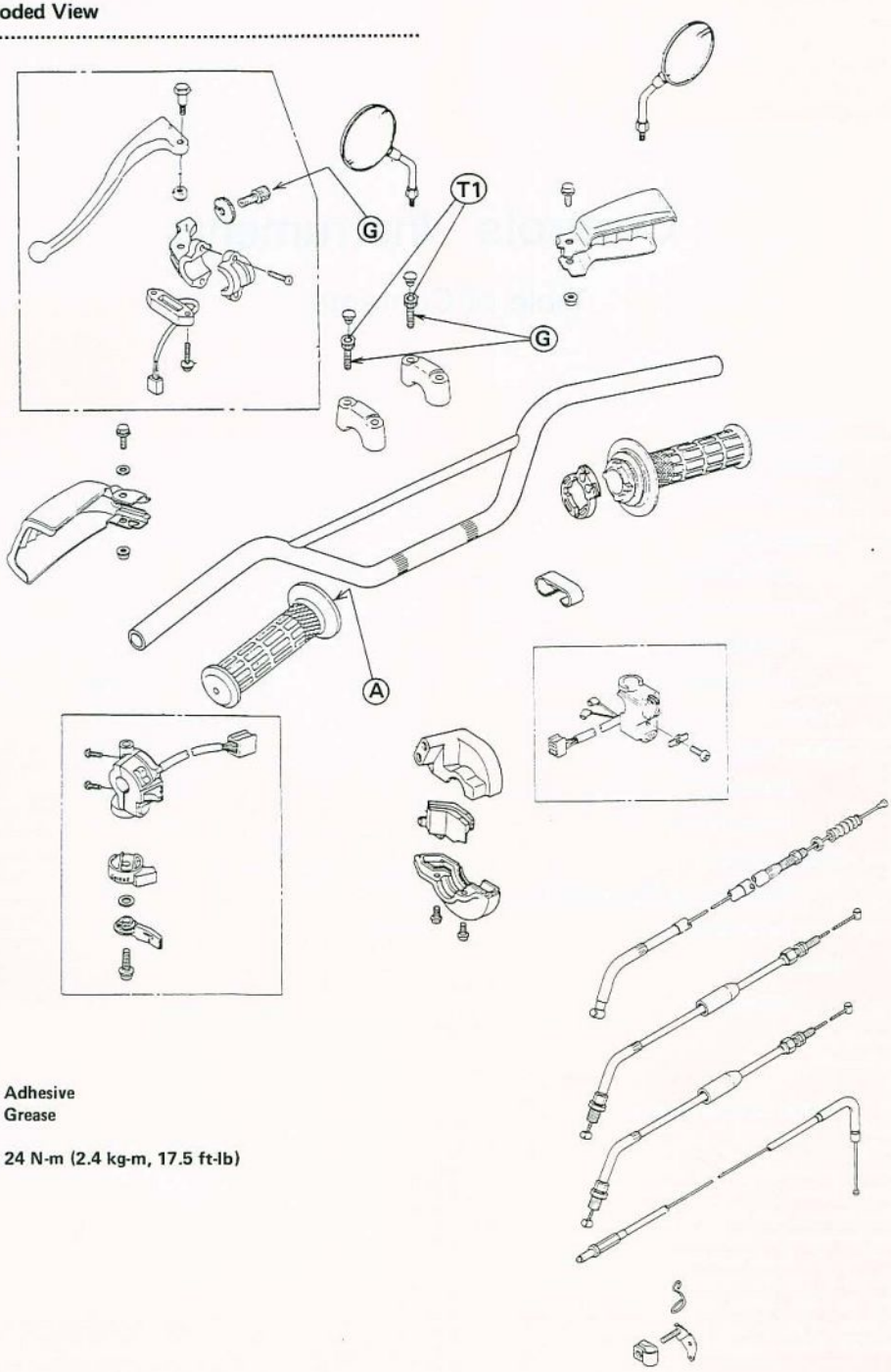
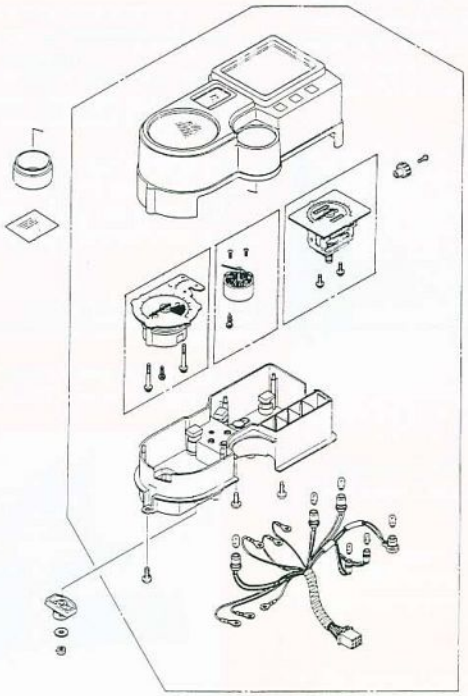
*Refer to Base Manual

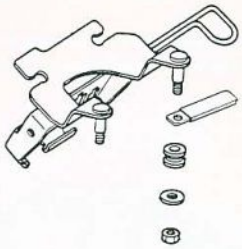
Exploded View



A : Adhesive
G : Grease

T1 : 24 N-m (2.4 kg-m, 17.5 ft-lb)





Service Data

Item	Standard
Choke Lever:	
Choke cable free play	2 – 3 mm
Throttle Grip:	
Throttle grip free play	2 – 3 mm
Clutch:	
Clutch lever free play	2 – 3 mm 10 – 15 mm (at lever end)

Throttle Grip

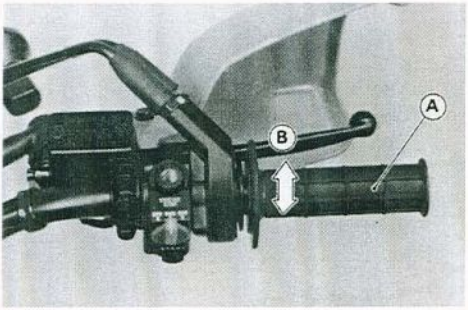
There are two throttle cables: an accelerator cable for opening the throttle valve, and a decelerator cable for closing it.

If the throttle grip has excessive free play due to cable stretch or misadjustment, there will be a delay in throttle response. Also, the throttle valve may not open fully at full throttle.

On the other hand, if the grip has no play, the throttle will be hard to control, and the idle speed will be erratic. Check the throttle grip play periodically in accordance with the Periodic Maintenance Chart, and adjust the play if necessary.

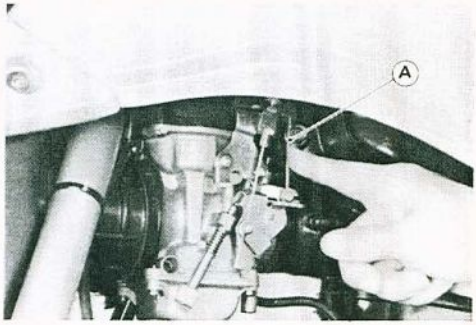
Inspection

●Check that there is 2 – 3 mm throttle grip free play when lightly turning the throttle grip back and forth.



A. Throttle Grip B. 2 – 3 mm

●With the throttle grip closed, check that the decelerator inner cable is tight by touching it at the lower end.



A. Decelerator Inner Cable

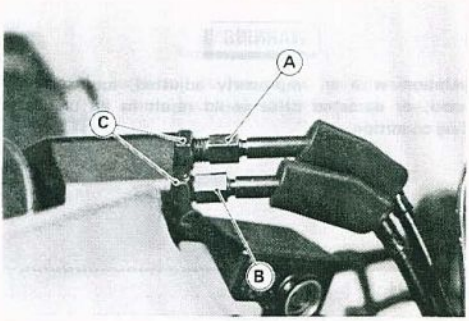
★If the throttle grip free play is incorrect or the decelerator inner cable is loose with the throttle closed, adjust the throttle grip.

Adjustment

●Loosen the locknuts, and screw both throttle cable adjusting nuts in fully at the upper ends of the throttle cables to give the throttle grip plenty of play.

●With the throttle grip completely closed, turn out the decelerator cable adjusting nut until the inner cable just becomes tight.

●Tighten the locknut.



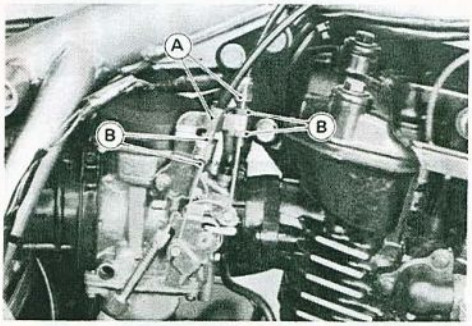
A. Accelerator Cable Adjusting Nut C. Locknuts
B. Decelerator Cable Adjusting Nut

●Turn the accelerator cable adjusting nut until the correct throttle grip free play is obtained.

●Tighten the locknut.

NOTE

○*If the throttle cables cannot be adjusted by using the cable adjuster nuts at the upper ends of of the throttle cables, use the cable adjusters at the lower ends of the throttle cables. Do not forget to securely tighten the adjuster locknuts after adjustment.*



A. Cable Adjusters B. Locknuts

WARNING

○**Be sure the upper ends of the outer cables are fully seated in their adjusting nuts, or they could slip into place later, creating enough grip play to prevent**

throttle operation, resulting in a hazardous riding conditions.

- Start the engine.
- Turn the handlebar from side to side while idling the engine.
- ★If idle speed varies, the throttle cables may be poorly routed or they may be damaged.
- Correct any problem before operating the motorcycle.

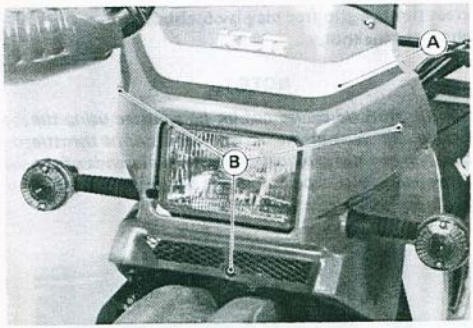
WARNING

- ○**Operation with an improperly adjusted, incorrectly routed, or damaged cable could result in an unsafe riding condition.**

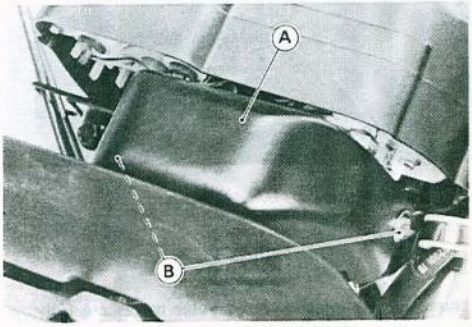
Meter Unit

Removal

- Remove the headlight cover and connector cover.

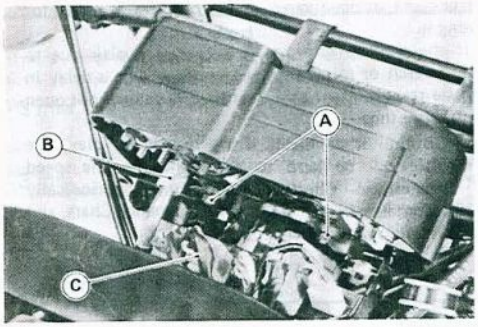


A. Headlight Cover B. Screws



A. Connector Cover B. Screws

- Disconnect the 9-pin meter connector.
- Remove the meter mounting nuts and the speedometer cable nut, and take off the meter unit.



A. Meter Mounting Nuts C. Meter 9-pin Connector
B. Speedometer Cable Nut (White)

Frame

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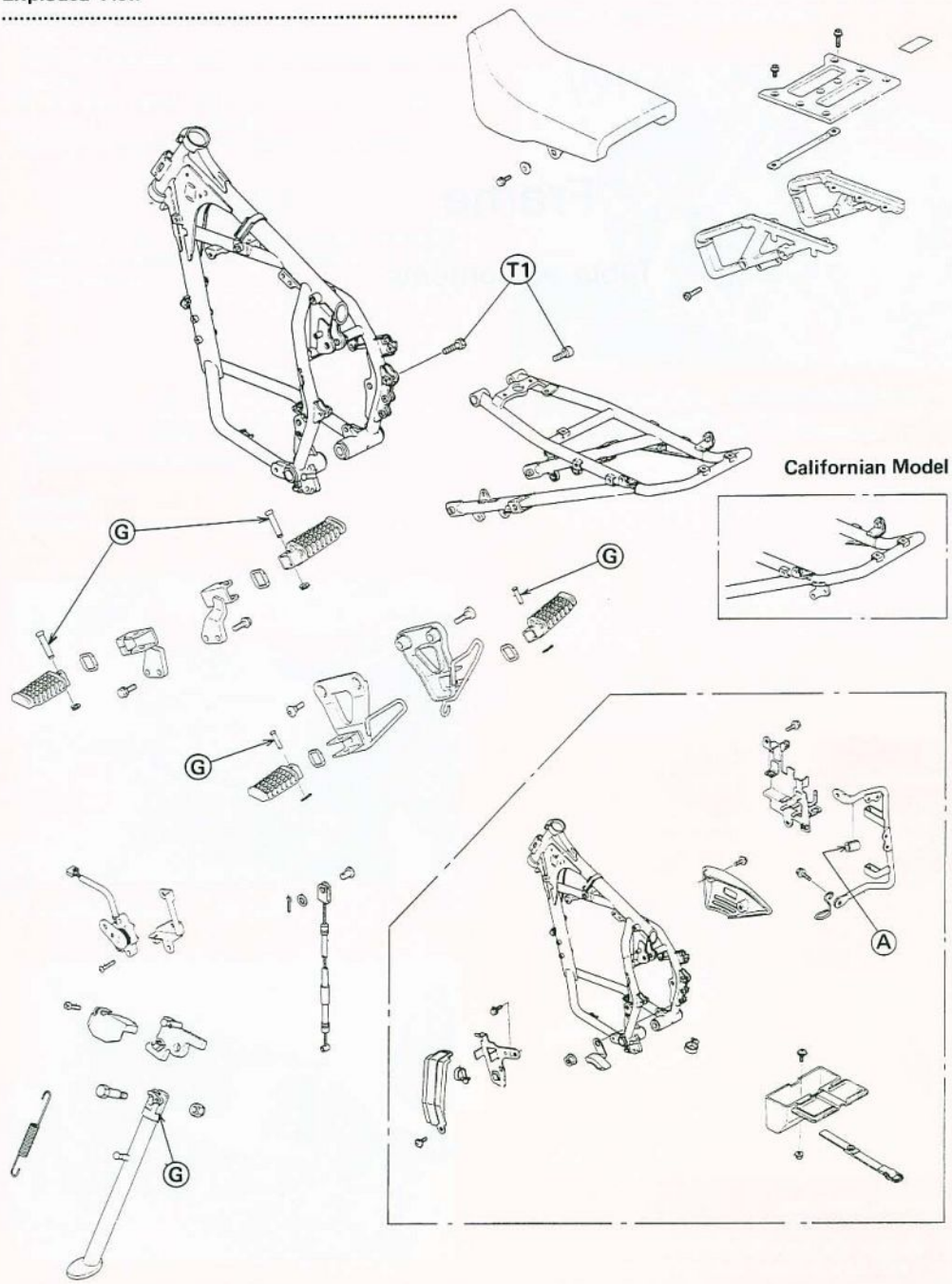
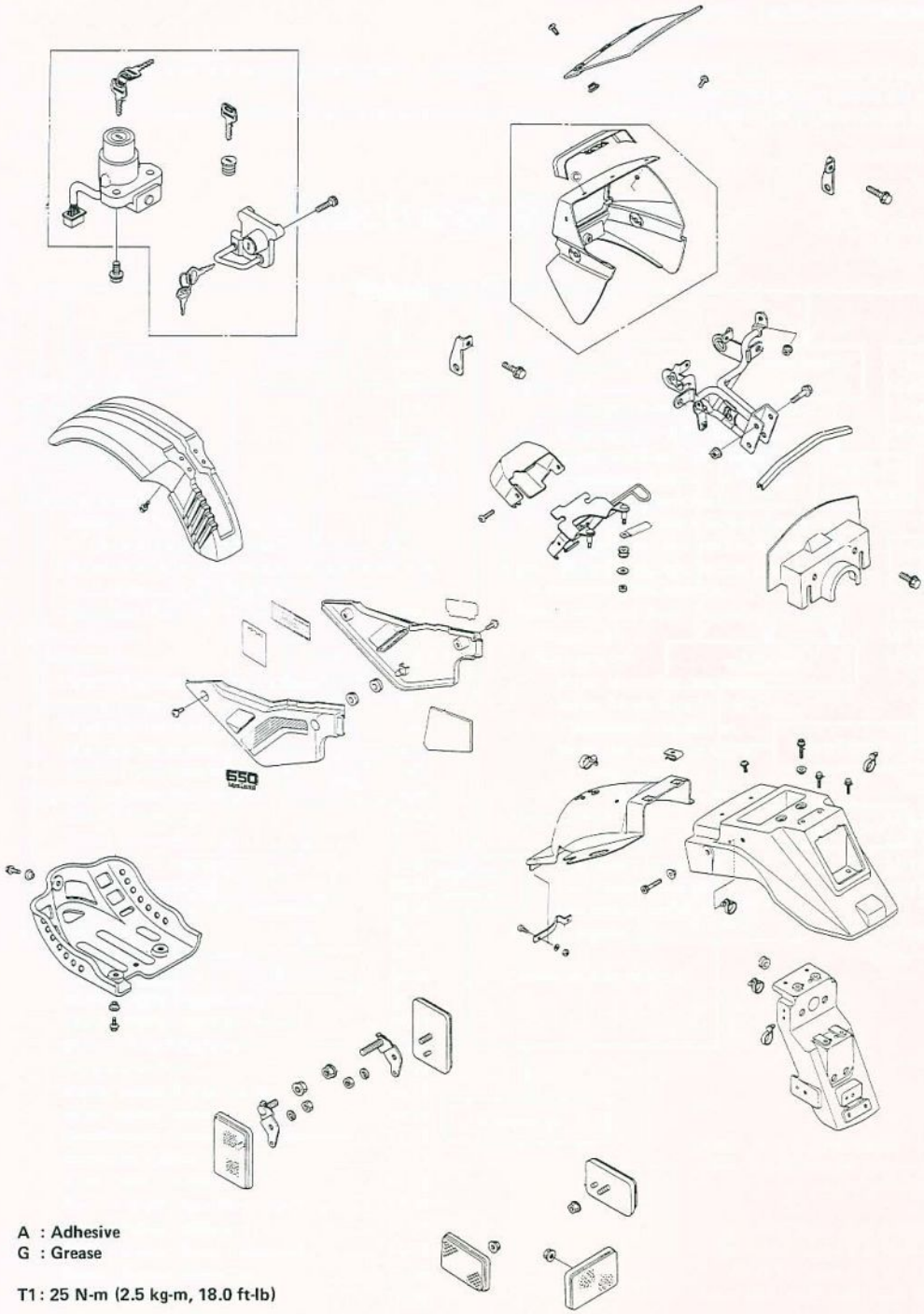
Exploded View



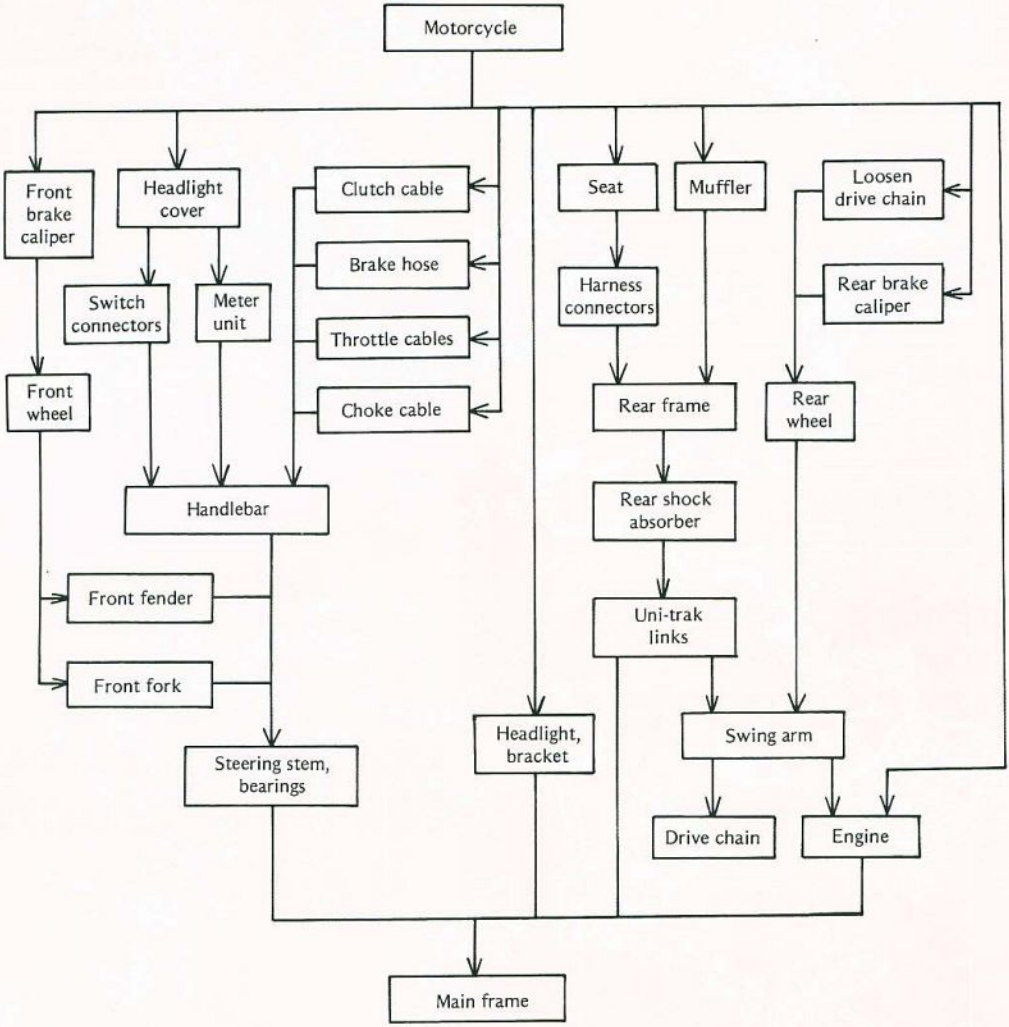


A : Adhesive
G : Grease

T1 : 25 N-m (2.5 kg-m, 18.0 ft-lb)

Disassembly Flow Chart – Chassis

○This chart is designed to aid in determining proper removal sequence. Select the component you wish to remove and follow the arrows to that point on the chart.
●Set the motorcycle up on a stand or jacks so that it is stable during the removal and installation operations.



Electrical System

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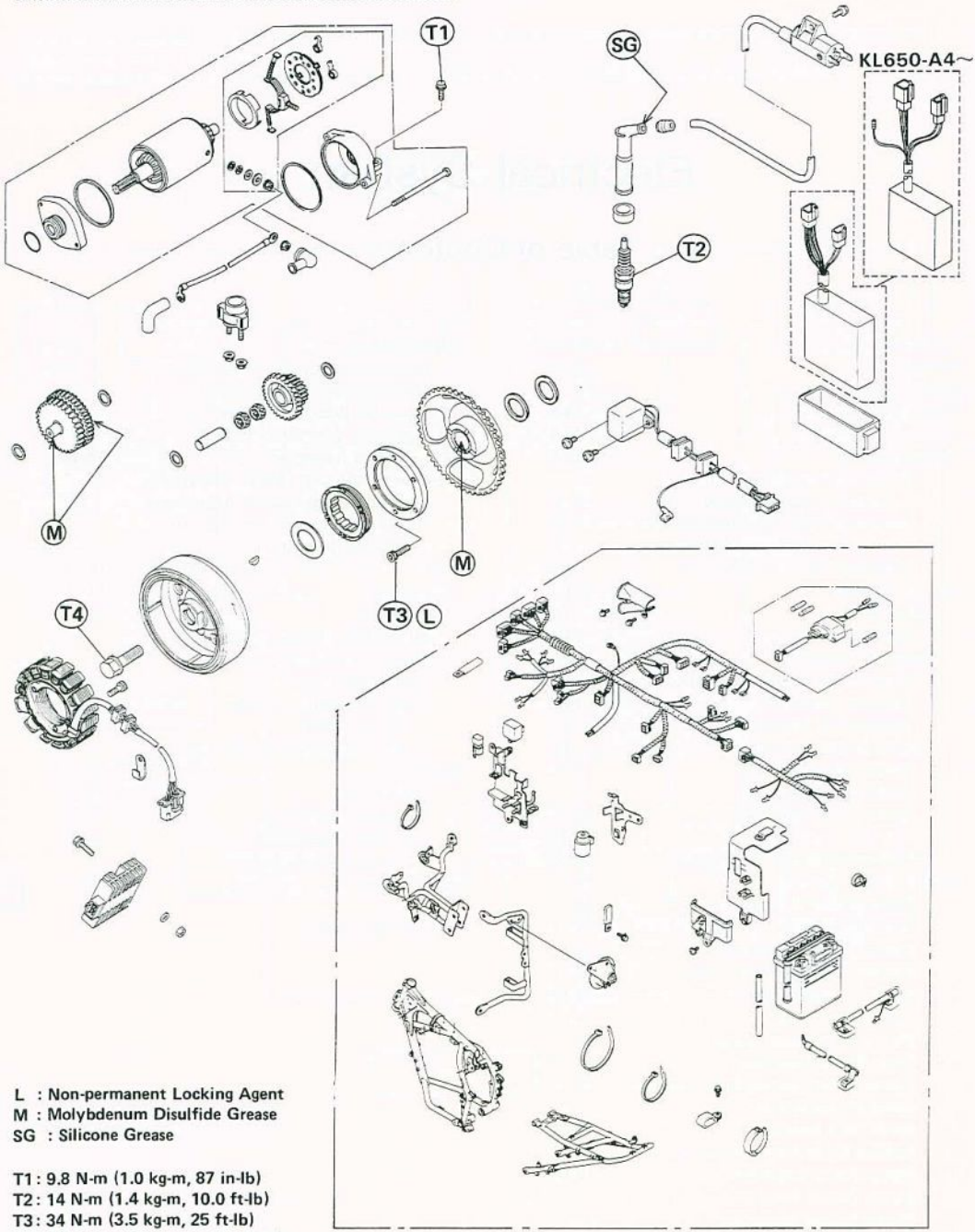
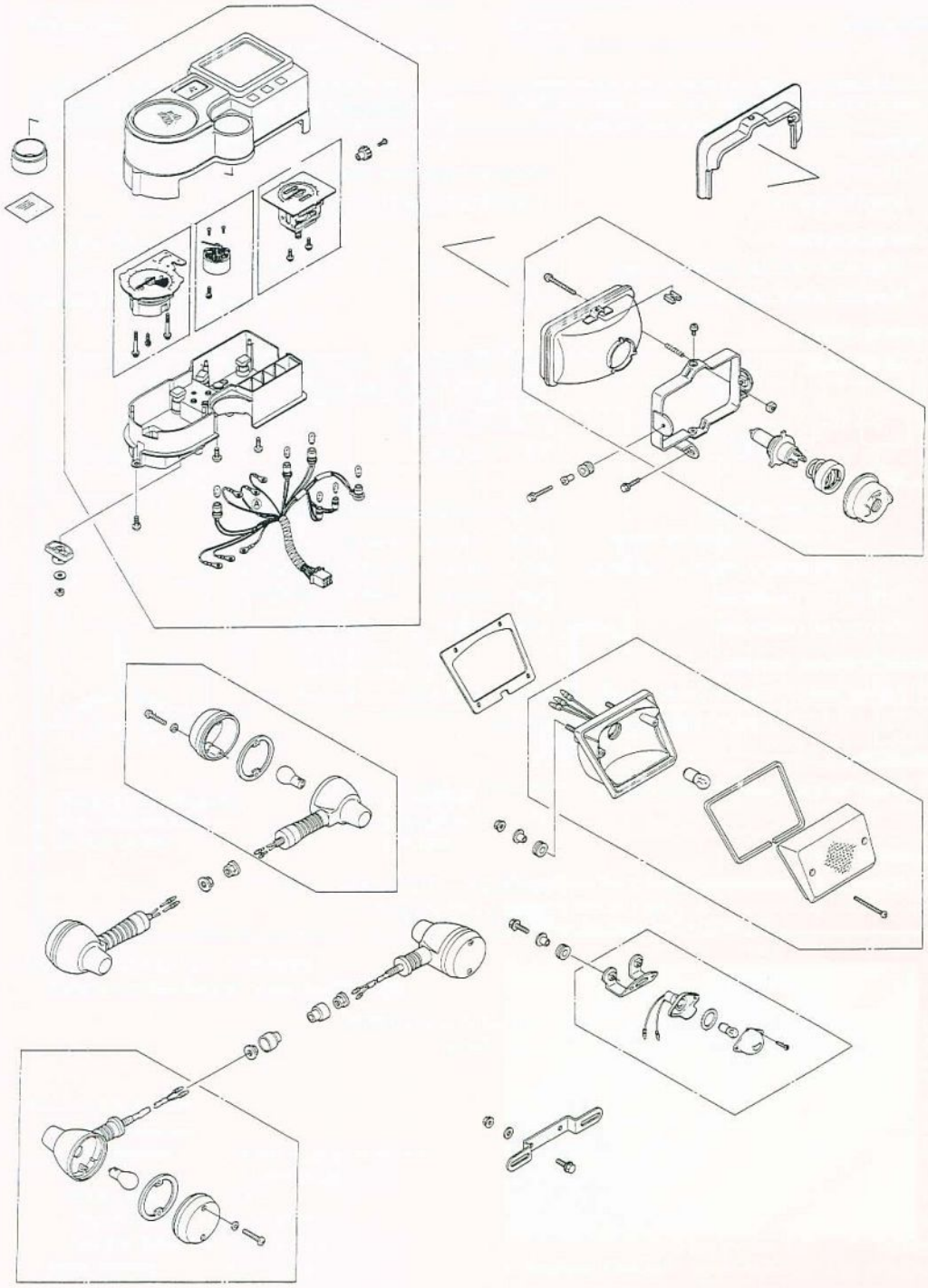
*Refer to Base Manual

Exploded View



L : Non-permanent Locking Agent
M : Molybdenum Disulfide Grease
SG : Silicone Grease

T1 : 9.8 N-m (1.0 kg-m, 87 in-lb)
T2 : 14 N-m (1.4 kg-m, 10.0 ft-lb)
T3 : 34 N-m (3.5 kg-m, 25 ft-lb)
T4 : 175 N-m (18.0 kg-m, 130 ft-lb)



Service Data

Item	Standard	Service Limit
Battery:		
Electrolyte level	Between upper and lower levels	– – –
Specific gravity	1.280 @20°C (68°F)	– – –
Charging System:		
Regulator/rectifier output voltage	Battery – 15 V	– – –
Magneto stator coil resistance	0.3 – 1.0 Ω	– – –
Ignition System:		
Spark plug: Type	NGK DPR8EA-9 or ND X24EPR-U9	– – –
	Ⓐ Ⓘ Ⓢ Ⓤ NGK DP8EA-9 or ND X24EP-U9	– – –
Gap	0.8 – 0.9 mm	– – –
Ignition coil:		
Arcing distance	7 mm or more (3-needle method)	– – –
Primary winding resistance	0.15 – 0.21 Ω	– – –
Secondary winding resistance	3.8 – 5.8 kΩ	– – –
Exciter coil resistance	100 – 200 Ω	– – –
Pickup coil resistance	100 – 150 Ω	– – –
Electric Starter System:		
Starter motor: Carbon brush length	12.0 – 12.5 mm	6 mm
Commutator diamater	28 mm	27 mm
Meter Unit:		
Water temperature sender resistance	47 – 57 Ω @80°C (176°F)	– – –
	26 – 30 Ω @100°C (212°F)	– – –
Radiator Fan:		
Radiator fan switch: ON	Above 94 – 100°C (201 – 212°F)	– – –
OFF	Below 91°C (196°F)	– – –

Ⓐ : Australian Model
Ⓘ : Italian Model
Ⓢ : South African Model
Ⓤ : US Model

Precautions

Refer to the Base Manual, noting the following.

○Because of the large amount of current, never keep the starter button pushed when the starter motor will not turn over, or the current may burn out the starter motor windings.

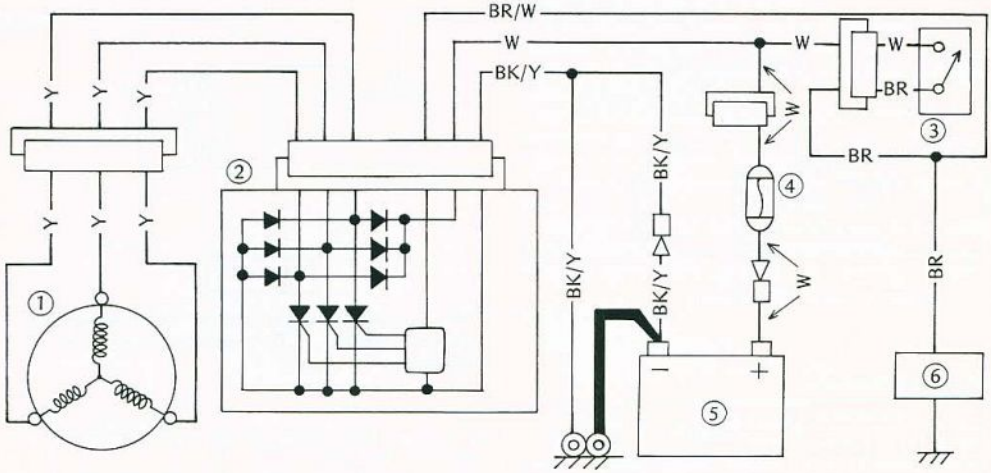
Battery

Refer to the Base Manual, noting the following.

●Refer to Cable, Wire, and Hose Routing in the chapter 1 for the battery vent hose routing.

Charging System

Charging System Wiring Diagram



1. Charging Coils (Magneto)
2. Regulator/Rectifier
3. Ignition Switch
4. Fuse 20A
5. Battery
6. Loads

Measuring Stator Coil Resistance

Refer to the Base Manual, noting the following.

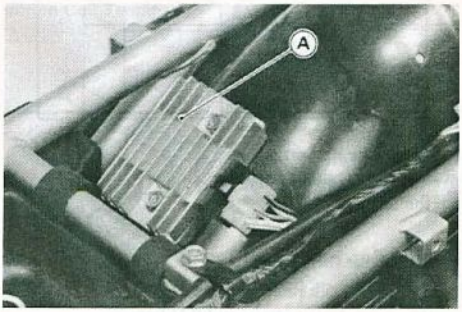
Stator Coil Resistance

Meter Connections:	
Lead location	**Female magneto connector (disconnected)**
Meter range	**x 1 Ω**
One meter load	**One yellow lead**
Another meter lead	**Other yellow lead**
Meter Reading	**0.3 – 1.0 Ω**

Regulator/Rectifier Inspection

Rectifier Circuit Test:

●Remove the regulator/rectifier.



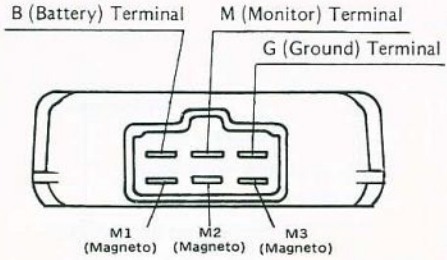
A. Regulator/Rectifier

●Zero the ohmmeter, and connect it to the regulator/rectifier terminals.
●Check the resistance between the terminals following the table.
★The resistance should be low in one direction and more than ten times as much in the other direction. If any two leads are low or high in both directions, the rectifier is defective and must be replaced.

NOTE

○*The actual meter reading varies with the meter used and the individual rectifier, but, generally speaking the lower reading should be from zero to the first ½ of the scale.*

Regulator/Rectifier Terminal



Rectifier Circuit Inspection

No.	Connections		Reading	Meter Range
	Meter (+) to	Meter (–) to		
1	M1	B	∞	x 10 Ω or x 100 Ω
2	M2			
3	M3			
4	M1	G	0 – ½ scale	
5	M2			
6	M3			
7	B	M1		
8		M2		
9		M3		
10	G	M1	∞	
11		M2		
12		M3		

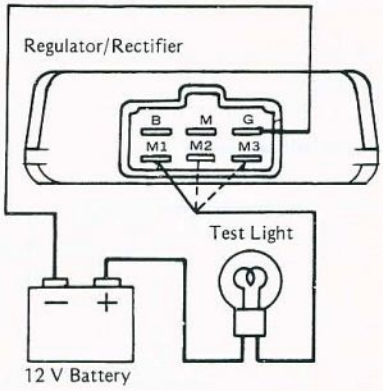
Regulator Circuit Test:
●Remove the regulator/rectifier.
●Prepare the test tools shown.

Tools for Regulator Circuit Test

Test light → Bulb rated 12 V and 3 – 6 W
Batteries → 12 V battery and 6 V battery
Test wires → 5 auxiliary wires

●Connect the test light and the 12 V battery to the regulator/rectifier as shown.
●Check M1, M2, and M3 terminals respectively.

Regulator Circuit Test-1st Step

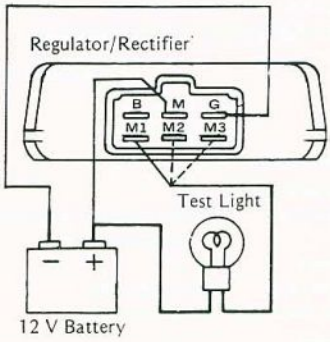


CAUTION

○**The test light limits the current flow through the regulator/ rectifier. Do not use an ammeter or multimeter in its place.**

★If the test light turns on, the regulator/rectifier is defective. Replace it.
★If the test light does not turn on, continue the test.
●Momentarily apply 12 V to the voltage monitoring terminal.
●Check M1, M2, and M3 terminals respectively.

Regulator Circuit Test-2nd Step

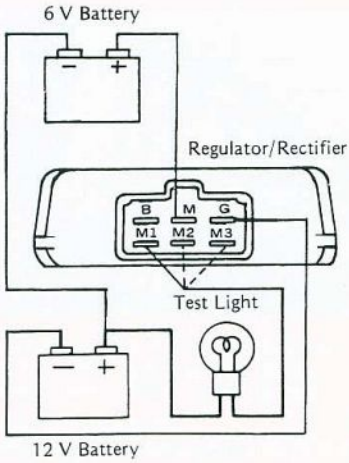


★If the test light turns on, the regulator/rectifier is defective. Replace it.
★If the test light does not turn on, continue the test.
●Momentarily apply 18 V to the voltage monitoring terminal by adding a 6 V battery.
●Check M1, M2, and M3 terminals respectively.

CAUTION

○**Do not apply more than 18 V to the regulator/rectifier and do not leave the 18 V applied for more than a few seconds, or the unit will be damaged.**

Regulator Circuit Test-3rd Step



★If the test light did not light when the 18 V was applied momentarily to the voltage monitoring terminal, the regulator/rectifier is defective. Replace it.
★If the regulator/rectifier passes all of the tests described, it may still be defective. If the charging system still does not work properly after checking all of the components and the battery, test the regulator/rectifier by replacing it with a known good unit.

Ignition System

Adjustment:

Spark Plug Cleaning and Gapping

Refer to the Base Manual, noting the following.

Standard Spark Plug

Plug Type: NGK DPR8EA-9 or ND X24EPR-U9
Ⓐ Ⓘ Ⓢ Ⓤ NGK DP8EA-9 or ND X24EP-U9
Plug Gap: 0.8 – 0.9 mm
Tightening Torque: 14 N-m (1.4 kg-m, 10.0 ft-lb)

Ⓐ : Australian Model
Ⓘ : Italian Model
Ⓢ : South African Model
Ⓤ : US Model

Removal/Installation:

Magneto Removal or Installation

Refer to the Base Manual, noting the following.
●Replace the magneto flywheel bolt with a new one. This bolt is required to replace if it has been tightened once to the specified torque.
●Tightening procedure of the magneto flywheel bolt is the following.
○Tighten the magneto flywheel bolt to 120 N-m (12.0 kg-m, 87 ft-lb) of torque. Do not overtighten it now.
○Loosen the bolt and then tighten it again to the same torque (above).
○Finally, tighten the bolt to the specified torque.

Tightening Torque
Magneto Flywheel Bolt:
175 N-m (18.0 kg-m, 130 ft-lb)

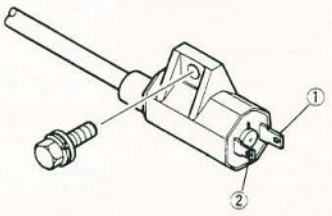
CAUTION

○**Use a 6-point socket instead of a 12-point one to tighten the flywheel bolt to the specified torque.**

Ignition Coil Installation

●Connect the primary leads to the ignition coil terminals as shown in the figure.

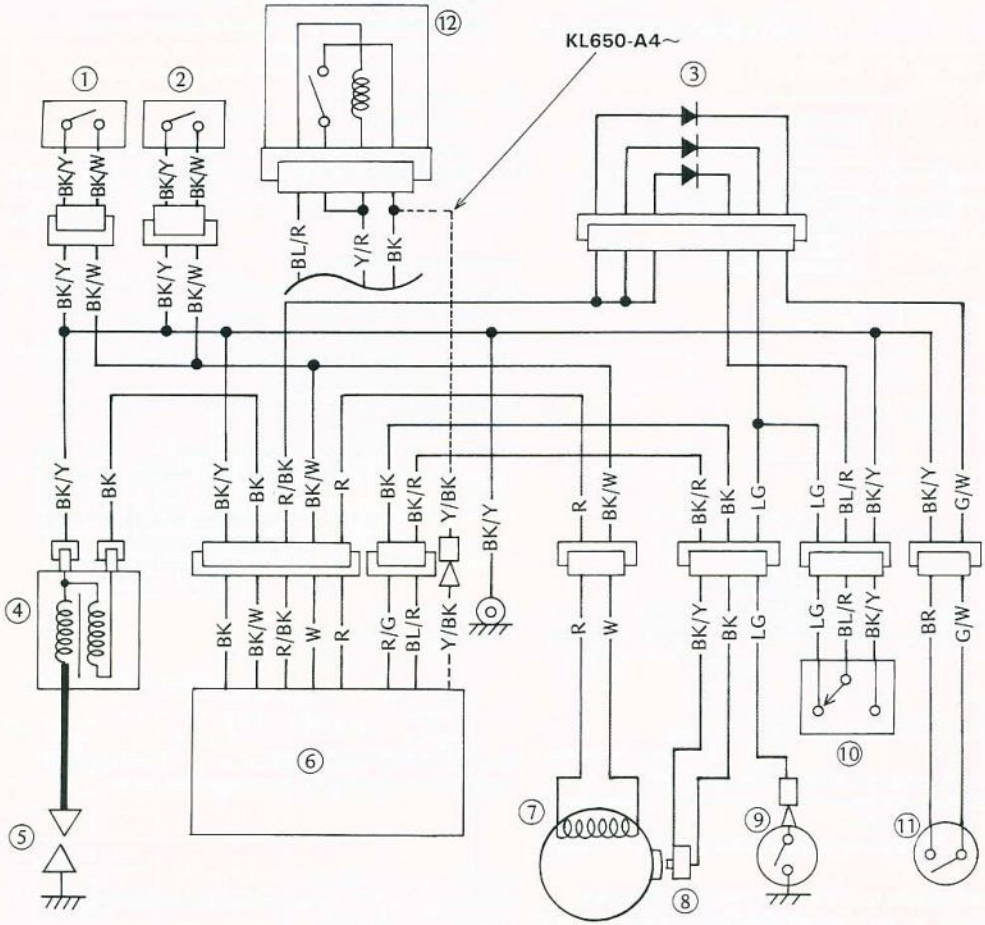
Ignition Coil Terminals



1. (+) Terminal ← BK 2. (–) Terminal ← BK/Y

Ignition System Maintenance:

Ignition System Wiring Diagram



1. Ignition Switch
2. Engine Stop Switch
3. Diodes
4. Ignition Coil
5. Spark Plug
6. CDI Unit
7. Exciter Coil (Magneto)
8. Pickup Coil
9. Neutral Switch
10. Starter Lockout Switch
11. Side Stand Switch
12. Starter Circuit Relay

Switch Inspection

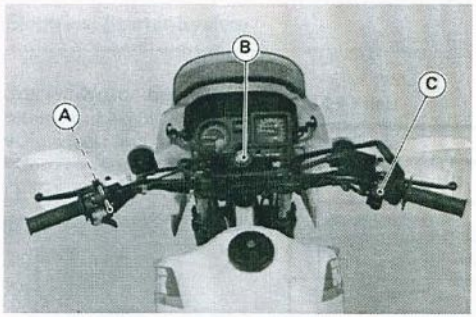
Refer to the Base Manual, noting the following.

Starter Lockout Switch Connections

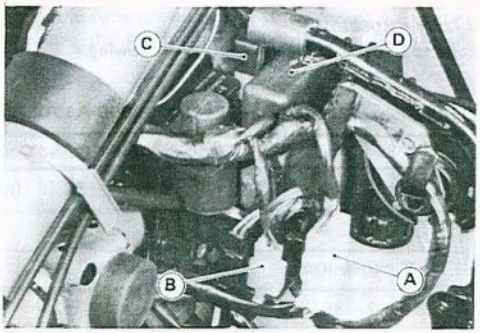
Color	BK/Y	BL/R	LG
When the clutch lever is pulled on	○——	——○	
When the clutch lever is released		○——	——○

Engine Stop Switch and Starter Button Connections

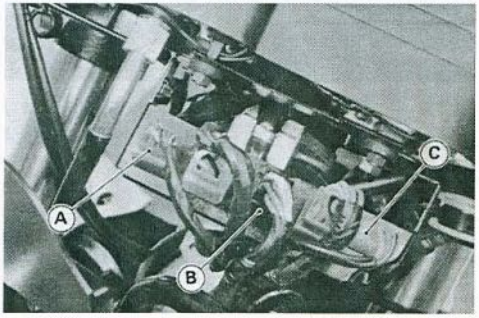
	Engine Stop Switch				Starter Button		
	BK/W	BK/Y	BR			Y/R	
OFF	○——	——○					
RUN			○——	——○	○——	——○	Pushed



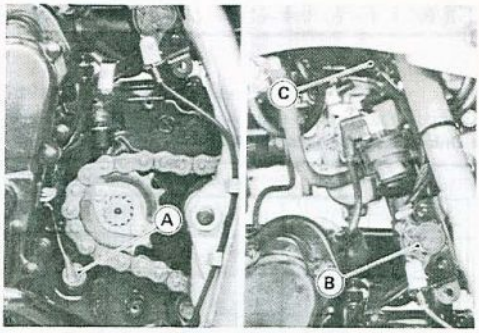
A. Starter Lockout Switch
B. Ignition Switch
C. Engine Stop Switch



A. Magneto 6-pin Connector
B. Neutral Switch and Pickup Coil 3-pin Connector
C. Diodes
D. CDI Unit



A. Engine Stop Switch 6-pin Connector (Red)
B. Ignition Switch 6-pin Connector (Black)
C. Starter Lockout Switch 3-pin Connector

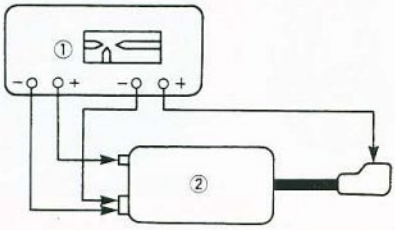


A. Neutral Switch
B. Side Stand Switch
C. Side Stand Switch 2-pin Connector

Ignition Coil Inspection

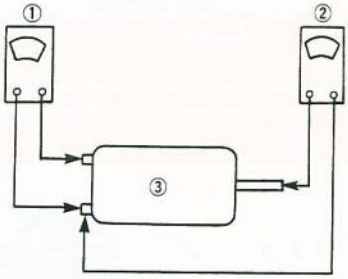
Refer to the Base Manual, noting the following.

Ignition Coil Test (Arcing Distance)



1. Electro Tester: 57001-980
2. Ignition Coil

Ignition Coil Winding Resistance



1. Measure primary winding resistance.
2. Measure secondary winding resistance.
3. Ignition Coil

Ignition Coil Resistance

Primary:	**0.15 – 0.21 Ω**
Secondary:	**3.8 – 5.8 kΩ**

CDI Unit Inspection

Refer to the Base Manual, noting the following.

CDI Unit Internal Resistance (KL500, KL650-A1,A2,A3) Unit : kΩ

		Meter Positive (+) Lead Connection						
	Lead	W	R	R/G	BL/R	BK/W	BK	R/BK
Meter (−) Lead Connection	W		∞	∞	∞	∞	∞	∞
	R	10 – 40		4 – 20	10 – 45	∞	4 – 20	3 – 15
	R/G	2 – 10	2 – 10		4 – 20	∞	0	1 – 6
	BL/R	60 – 240	60 – 240	30 – 150		∞	30 – 150	40 – 160
	BK/W	∞	∞	∞	∞		∞	∞
	BK	2 – 10	2 – 10	0	4 – 16	∞		1 – 6
	R/BK	4 – 20	4 – 20	1 – 6	5 – 25	∞	1 – 6	

CDI Unit Internal Resistance (KL650-A4~) Unit : kΩ

		Meter Positive (+) Lead Connection						
	Lead	W	R	R/G	BL/R	BK/W	BK	Y/BK
Meter (−) Lead Connection	W		∞	∞	∞	∞	∞	∞
	R	10−55		5−25	5−35	∞	5−25	20−90
	R/G	2−10	2−10		1−6	∞	0	10−50
	BL/R	4−20	4−20	1−6		∞	1−6	10−55
	BK/W	∞	∞	∞	∞		∞	∞
	BK	2−10	2−10	0	1−6	∞		10−50
	Y/BK	15−80	15−80	10−50	10−55	∞	10−50	

Exciter or Pickup Coil Inspection

Refer to the Base Manual, noting the following.

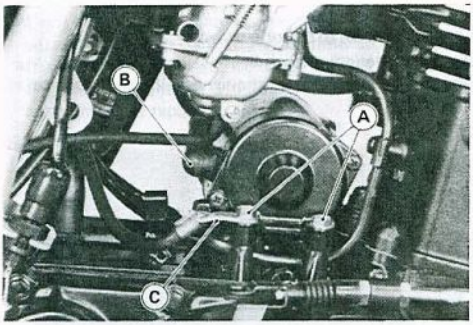
Resistance of Exciter and Pickup Coil

Meter : x 10 Ω
Connections : female connectors (disconnected)
W – R : 100 – 200 Ω (Exciter Coil)
BK/Y – BK : 100 – 150 Ω (Pickup Coil)

Electrical Starter System

Starter Motor Removal

- Remove the muffler and exhaust pipe.
- Disconnect lead from starter motor terminal.
- Unscrew starter motor mounting bolts and pull the starter motor out of its guide.



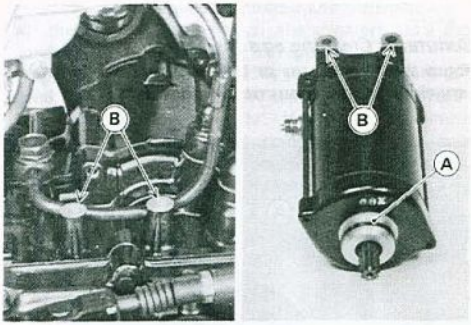
A. Mounting Bolts
B. Starter Motor Terminal
C. Ground Lead

CAUTION

○Do not tap the starter motor shaft or body. Tapping on the shaft or body could damage the motor.

Installation Points

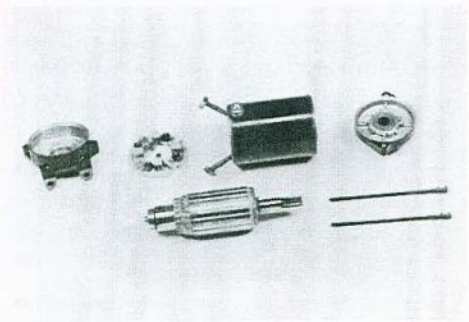
- When installing the starter motor, clean the starter motor legs and crankcase where the starter motor is grounded.
- Apply a small amount of engine oil to the O-ring.



A. O-ring
B. Clean here.

Starter Motor Disassembly

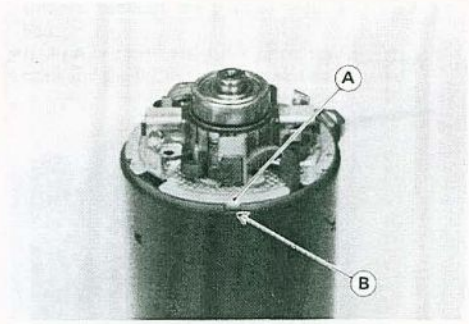
- Unscrew the retaining screws and pull off both end covers.
- Take the armature out of the yoke housing.
- Remove the brush plate assembly from the housing.



- Remove the nut and remove the terminal bolt, and then remove the positive brush assembly with the plastic holder.

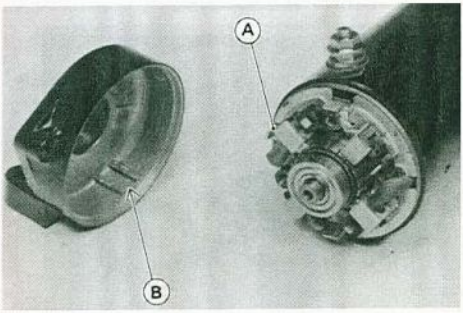
Starter Motor Assembly Points

- Push the brush plate into place with its tab fitting in the yoke housing notch.



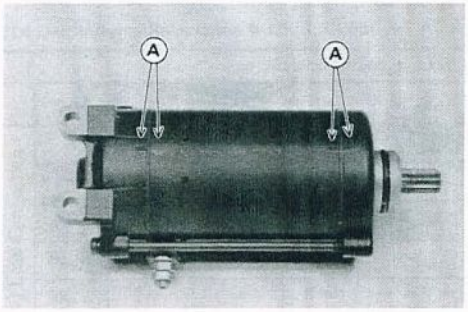
A. Tab
B. Notch

- Install the brush end cover so that the long vertical tab on the brush plate aligns with the key slot in the cover.



A. Long Tab
B. Key Slot

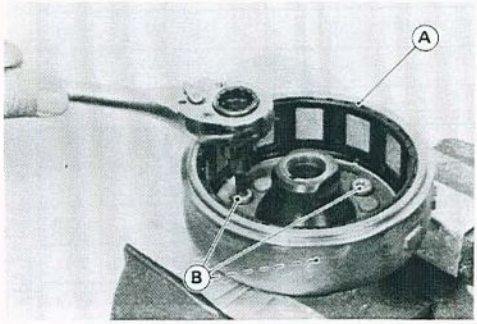
•As a further check, these marks should align on the outside of the starter.



A. Align marks.

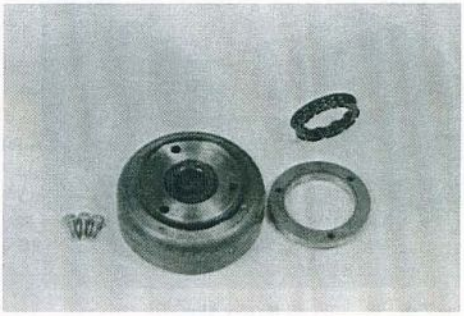
Starter Clutch Removal

•Pull off the magneto flywheel from the crankshaft.
•Holding the magneto flywheel in a vise, remove the Allen bolts.



A. Magneto Flywheel B. Starter Clutch Allen Bolts

•Separate the starter clutch assembly.



Installation Point

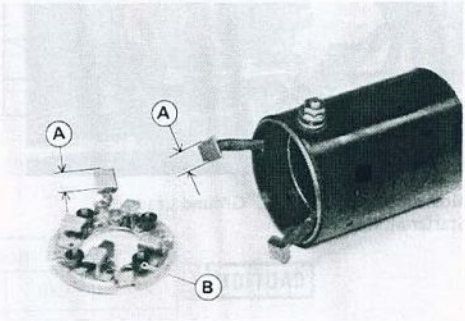
•Apply a non-permanent locking agent to the threads of the Allen bolts and tighten them to the specified torque.

Tightening Torque

Starter Clutch Bolts: 34 N·m (3.5 kg-m, 25 ft-lb)

Starter Motor Brush Length

•Measure the length of each brush.
★If any is worn down to the service limit, replace all brushes.



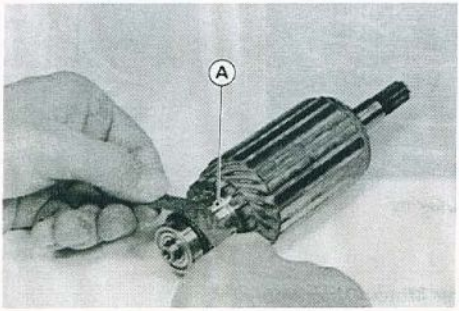
A. Measure brush length. B. Brush Spring

Brush Spring Inspection

•Check that the brush springs are in place and snap the brushes firmly into place.
★If not, reinstall or replace the spring.

Commutator Cleaning and Inspection

•Smooth the commutator surface if necessary with fine emery cloth, and clean out the grooves.

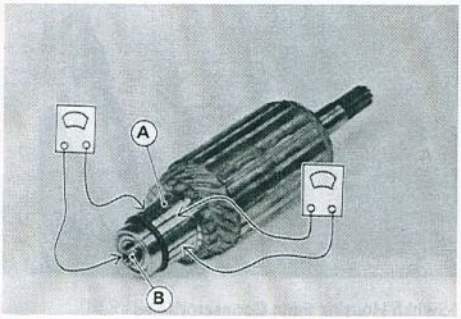


A. Commutator

•Measure the diameter of the commutator.
★Replace the starter motor with a new one if the commutator diameter is less than the service limit.

Armature Inspection

•Using the x 1 Ω ohmmeter range, measure the resistance between any two commutator segments.
★If there is a high resistance or no reading (∞) between any two segments, a winding is open and the starter motor must be replaced.



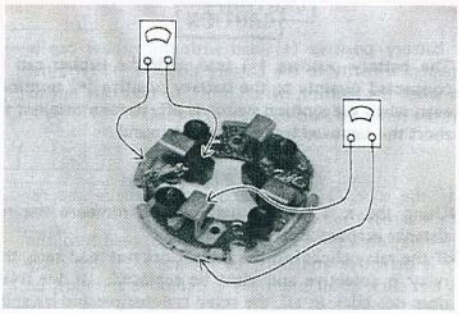
A. Segment B. Shaft

•Using the highest ohmmeter range, measure the resistance between the commutator and the shaft.
★If there is any reading at all, the armature has a short and the starter motor must be replaced.

Even if the foregoing checks show the armature to be good, it may be defective in some manner not readily detectable with an ohmmeter. If all other starter motor and starter motor circuit components check good, but the starter motor still does not turn over or only turns over weakly, replace the starter motor with a new one.

Brush Plate Inspection

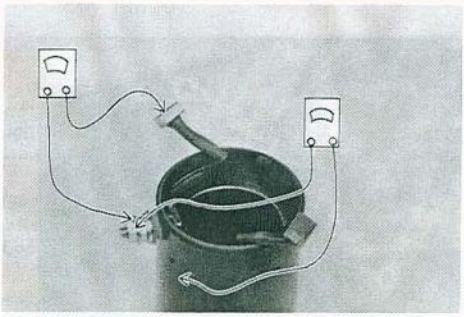
•Using the x 1 Ω ohmmeter range, measure the resistance between the negative brushes and the plate.
★If there is not close to zero ohms, the brush plate must be replaced.



•Using the highest ohmmeter range, measure the resistance between the metal plate and the positive brush holders.
★If there is any reading at all, the brush holder has a short and the brush plate must be replaced.

Positive Brush Assembly Inspection

•Using the x 1 Ω ohmmeter range, measure the resistance between the positive brush and the terminal bolt.
★If there is a high resistance or no reading (∞), a lead is open and the brush assembly must be replaced.



•Using the highest ohmmeter range, measure the resistance between the terminal bolt and the pole housing.
★If there is any reading at all, the insulation is faulty and the positive brush assembly must be replaced.

Starter Relay Inspection

•Disconnect the starter motor lead and battery positive (+) lead from the starter relay.

CAUTION

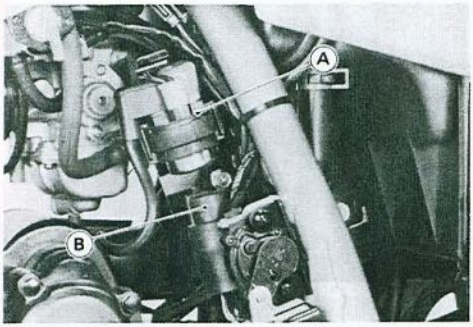
○**The battery positive (+) lead with the rubber cap is connected directly to the battery positive (+) terminal even when the ignition switch is off, so take care not to short the removed lead to chassis ground.**

●Using the x 1 Ω ohmmeter range, measure the resistance across the relay terminals.
★If the relay clicks but the meter does not read zero, the relay is defective and must be replaced. If the relay does not click at all, the relay is defective and must be replaced.
★If the relay makes a single clicking sound and the meter reads zero the relay is good. The trouble is in the starter motor or the motor power supply wires.

Switch Position:
Ignition switch ON
Engine stop switch RUN
Starter button ON
Neutral switch ON (Transmission is in Neutral)

Meter Connection:

Location	**Starter relay terminals (leads disconnected)**
Meter Range	**x 1 Ω**
Meter Reading:	**0 Ω and relay clicks when starter button is pushed.**



A. Starter Relay B. Starter Circuit Relay

Starter Circuit Relay Inspection

Starter circuit relay inspection is the same as the radiator fan relay inspection. Refer to the Fan Relay Inspection is the Base Manual.

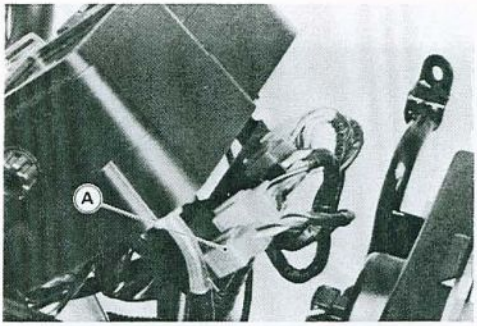
Starter Button Inspection

●Using an ohmmeter, check to see that only the connections shown in the table have continuity (about zero ohms).
★If the switch has an open or short, repair it or replace it with a new one.

Starter Button Connections*

	BR	Y/R
Push	○	○

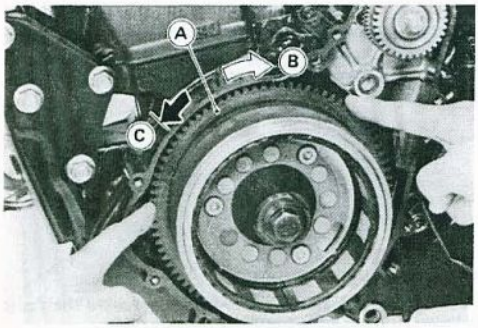
*When engine stop switch is RUN.



A. RH Switch Housing 6-pin Connector (Red)

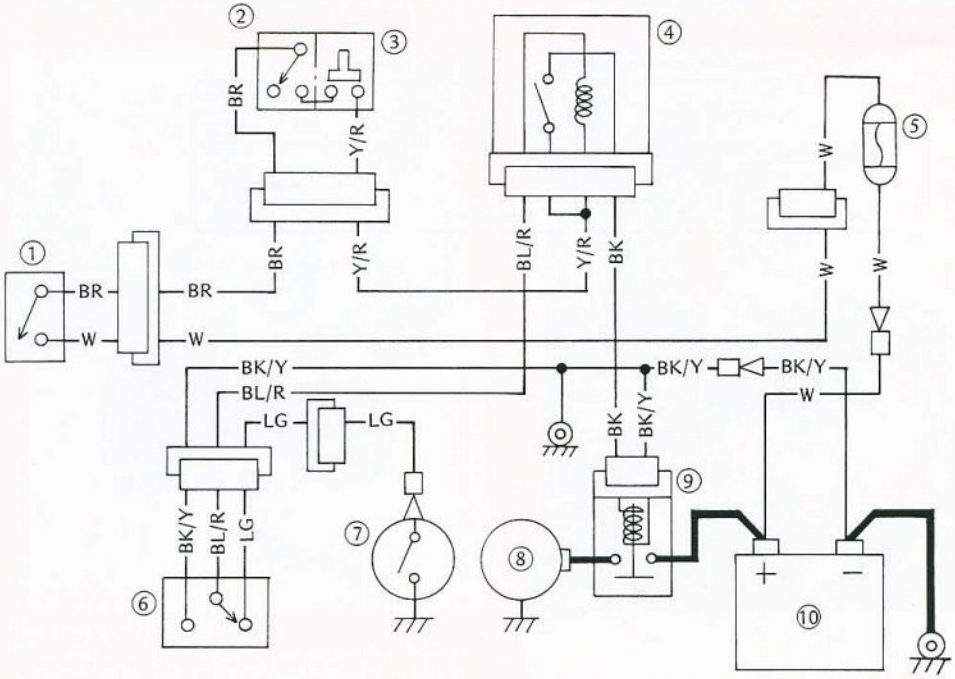
Starter Clutch Inspection

●Remove the alternator cover and starter idle gear, and turn the starter clutch gear by hand. The starter clutch gear should turn clockwise freely, but should not turn counterclockwise.
★If the clutch does not operate as it should or if it makes noise, disassemble the starter clutch, examine each part visually, and replace any worn or damaged parts.



A. Starter Clutch Gear C. Locked.
B. Turns freely.

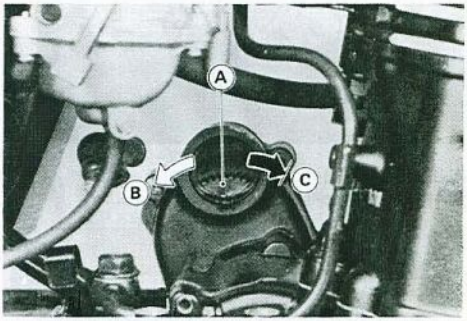
Electric Starter System Wiring Diagram



1. Ignition Switch
2. Engine Stop Switch
3. Starter Button
4. Starter Circuit Relay
5. Fuse 20A
6. Starter Lockout Switch
7. Neutral Switch
8. Starter Motor
9. Starter Relay
10. Battery

NOTE

○*Starter clutch inspection can be done by removing the starter motor.*



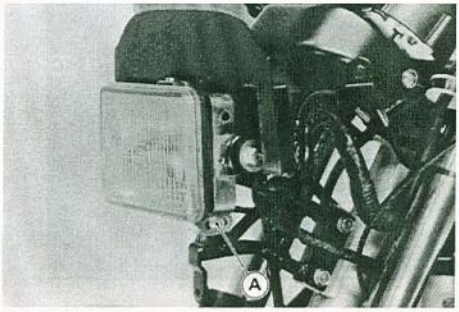
A. Starter Idle Gear
B. Turns Freely.
C. Locked.

Lighting System

Headlight Vertical Adjustment

Refer to the Base Manual, noting the following.

●Loosen the headlight lower mounting bolt.



A. Headlight Lower Mounting Bolt

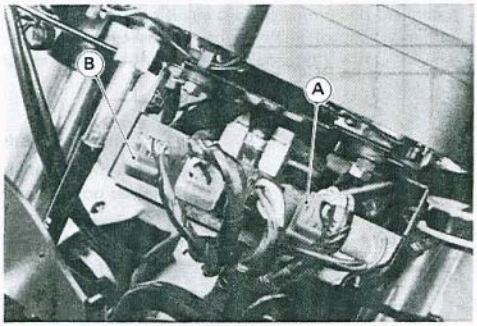
Headlight, Dimmer, or Passing Switch Inspection

Refer to the Base Manual, noting the following.

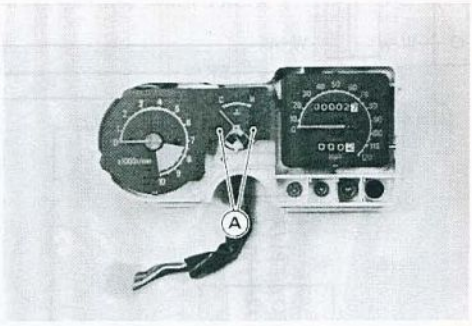
Headlight, Dimmer, or Passing Switch Connections (Other than US and Canada)

Headlight Switch				Dimmer Switch				Passing Button		
Color	BR	R/W		Color	R/BK		R/Y	Color	BR	R/BK*
ON	○	○	○	HI	○	○				
OFF								Push	○	○
PO	○	○		LO		○	○			

*R/Y for Italian Model



A. LH Switch Housing 9-pin Connector (Red)
B. RH Switch Housing 6-pin Connector (Red)



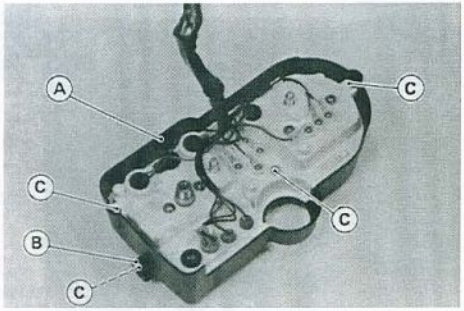
A. Screws

●Remove the tachometer or water temperature gauge.

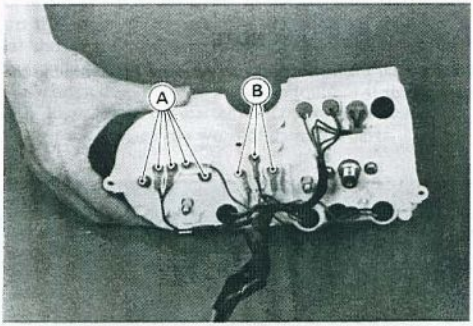
Tachometer and Water Temperature Gauge

Disassembly:

●Remove the meter cover.

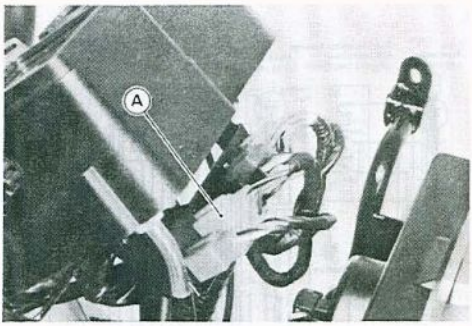


A. Meter Cover
B. Knob
C. Screw



A. Tachometer Mounting Screws
B. Water Temperature Gauge Mounting Screws

Maintenance:
Refer to the Base Manual, noting the following.



A. Meter 9-pin Connector (White)

Tachometer Inspection

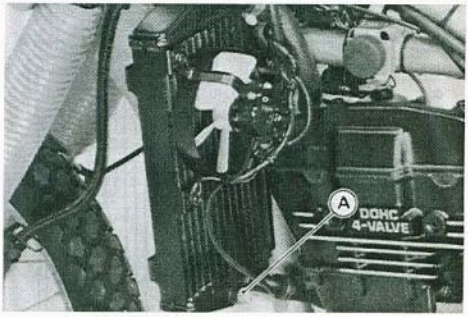
NOTE

○*The tachometer inspection is explained on the assumption that the ignition system operates normally.*

●Turn the ignition switch ON.
●With the BK/Y and the BR lead connected, open or connect the BK lead to the BR lead repeatedly using an auxiliary wire. Then the tachometer hand should flick.
★If the hand does not flick, replace the tachometer unit.

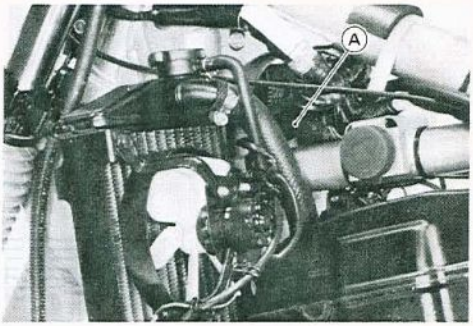
Radiator Fan

Initial Check
Refer to the Base Manual, noting the following.
●The radiator and radiator fan assembly is mounted to left lower side of the frame head pipe.



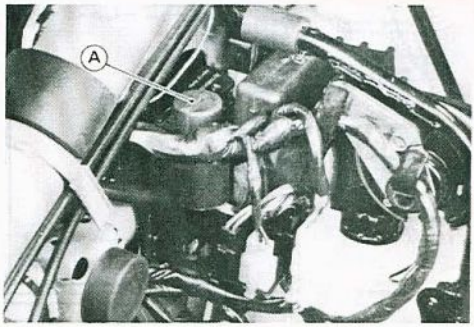
A. Radiator Fan Switch

Fan Motor Inspection
Refer to the Base Manual, noting the following.



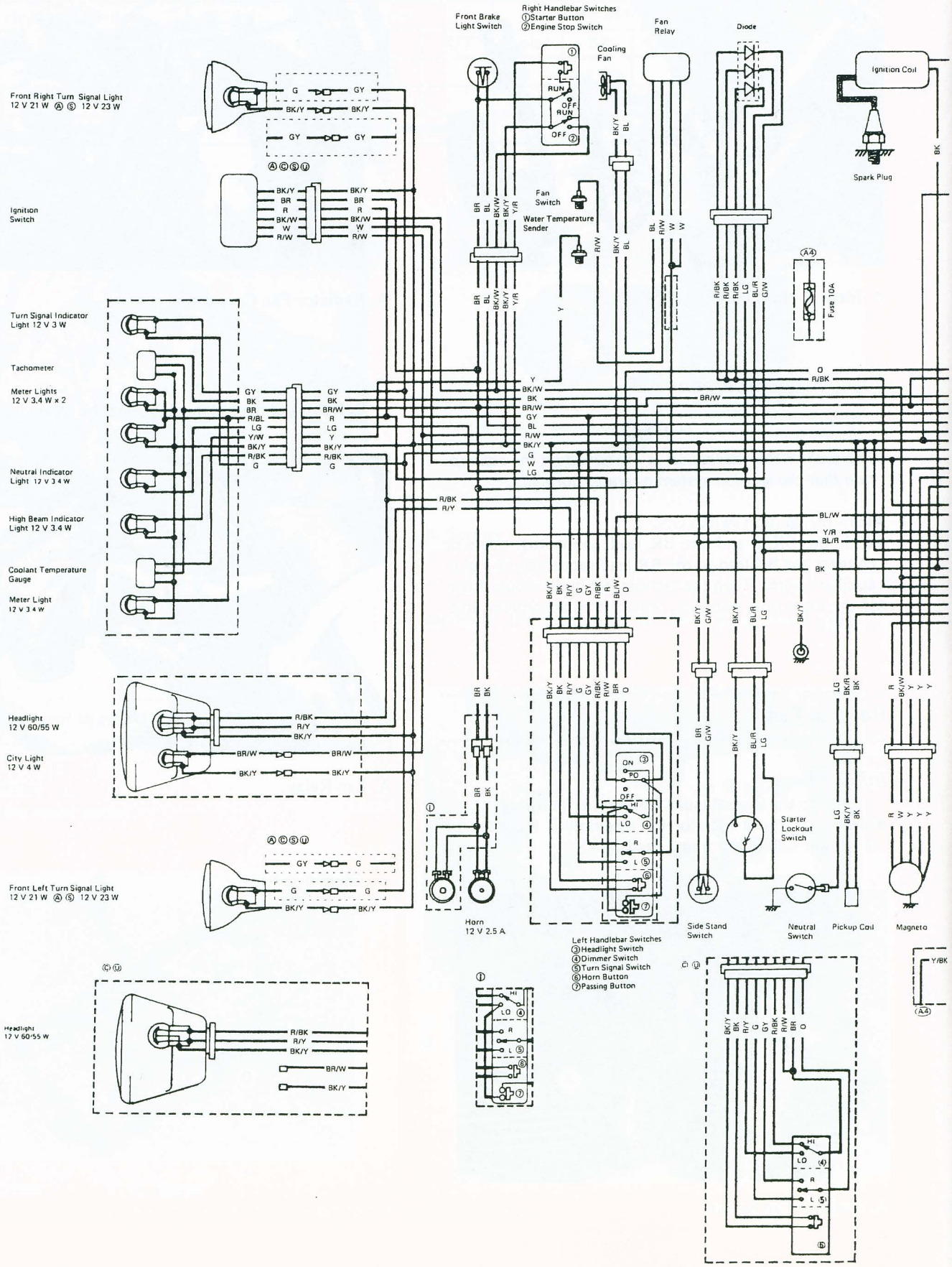
A. Radiator Fan Connector

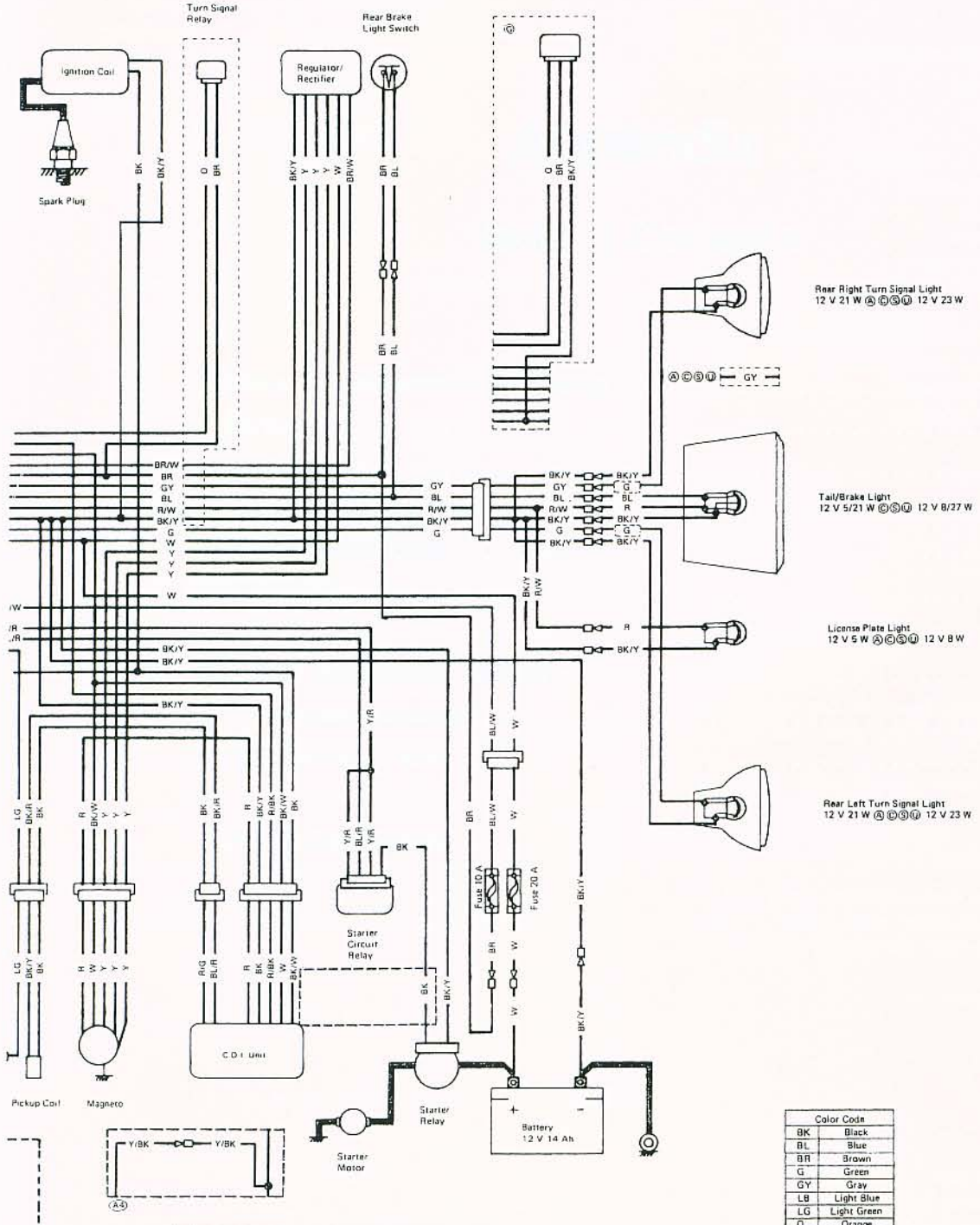
Fan Relay Inspection
Refer to the Base Manual, noting the following.



A. Fan Relay

Wiring Diagram





IGNITION SWITCH CONNECTIONS						
Color	White	Brown	BK/Y	BK/W	Red	R/W
LOCK			○	○		
OFF			○	○		
ON	○				○	
P (PARK)	○			○	○	

(1005B, 1006B, 1007B, 1008A, 1041A, 1173A)

Ⓐ : Australian model
Ⓒ : Canadian model
Ⓖ : West Germany model
Ⓘ : Italian model
Ⓢ : South African model
Ⓤ : US model
(A4) : KL650-A4~

Color Code	
BK	Black
BL	Blue
BR	Brown
G	Green
GY	Gray
LB	Light Blue
LG	Light Green
O	Orange
P	Pink
R	Red
W	White
Y	Yellow

Appendix

Table of Contents

Additional Considerations for Racing . . . . . *
Carburetor . . . . . *
Spark Plug . . . . . *
Spark Plug Inspection . . . . . *
Troubleshooting Guide 15-2
General Lubrication 15-2
Lubrication 15-2
Nut, Bolt, and Fastener Tightness 15-2
Tightness Inspection 15-2
Unit Conversion Table . . . . . *

*Refer to Base Manual

Troubleshooting Guide

Refer to the Base Manual, adding the following.

Engine Doesn't Start, Starting Difficulty:

Starter motor not rotating:
- Starter motor damaged
- Battery voltage low
- Relay not contacting or operating
- Starter button not contacting
- Wiring open or shorted
- Ignition switch damaged
- Engine stop switch damaged
- Engine stop switch off
- Fuse blown
- Starter lockout or neutral switch damaged

Starter motor rotating but engine doesn't turn over:
- Starter motor clutch damaged
- Alternator rotor bolt loosened

General Lubrication

Lubrication

- Before lubricating each part, clean off any rusty spots with rust remover and wipe off any grease, oil, dirt, or grime.
- Lubricate the points listed below with indicated lubricant.

NOTE

○*Whenever the vehicle has been operated under wet or rainy conditions, or especially after using a high-pressure spray water, perform the general lubrication.*

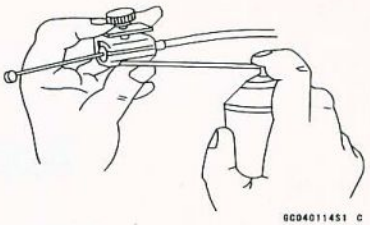
Pivots: Lubricate with Motor Oil.
- Side Stand
- Clutch Lever
- Brake Lever
- Brake Pedal
- Rear Brake Rod Joint

Points: Lubricate with Grease.
- Throttle Inner Cable Lower Ends
- Clutch Inner Cable Upper End
- Side Stand Switch Inner Cable Lower End
- Speedometer Inner Cable*

*Grease the lower part of the inner cable sparingly.

Cables: Lubricate with Rust Inhibitor.
- Choke Cable
- Throttle Cables
- Clutch Cable
- Side Stand Switch Cable

Cable Lubrication



Nut, Bolt, and Fastener Tightness

Tightness Inspection

- Check the tightness of the bolts and nuts listed here. Also, check to see that each cotter pin is in place and in good condition.

NOTE

○*For the engine fasteners, check the tightness of them when the engine is cold (at room temperature).*

★If there are loose fasteners, retorque them to the specified torque following the specified tightening sequence. Refer to the appropriate chapter for torque specifications. If torque specifications are not in the appropriate chapter, see the basic torque table (see Torque and Locking Agent in the General Information chapter).
For each fastener, first loosen it by ½ turn, then tighten it.

★If cotter pins are damaged, replace them with new ones.

Nut, Bolt, and Fastener to be checked
- Wheels:
  - Front Axle Nut
  - Front Axle Nut Cotter Pin
  - Rear Axle Nut
  - Rear Axle Nut Cotter Pin
- Brakes:
  - Front Master Cylinder Clamp Bolts
  - Front Caliper Mounting Bolts
  - Rear Master Cylinder Mounting Bolts
  - Rear Master Cylinder Bracket Bolts
  - Rear Caliper Mounting Bolts
  - Brake Lever Pivot Nut
  - Brake Pedal Bolt
  - Brake Rod Joint Cotter Pin

Suspension:
- Front Fork Clamp Bolts and Nuts
- Rear Shock Absorber Mounting Bolts and Nuts
- Swing Arm Pivot Shaft Nut
- Uni-trak Rocker Arm Pivot Nut
- Uni-trak Tie-rod Bolts and Nuts

Steering:
- Stem Head Nut
- Handlebar Clamp Bolts

Engine:
- Engine Mounting Bolts and Nuts
- Cylinder Head Bolts
- Cylinder Head Nuts
- Exhaust Pipe Holder Nuts
- Exhaust Pipe Mounting Bolt
- Muffler Mounting Bolts and Nuts
- Exhaust Pipe and Muffler Connecting Clamp Bolt
- Radiator Mounting Bolts
- Shift Pedal Bolt

Others:
- Side Stand Nut
- Rear Frame Mounting Bolts
- Clutch Lever Holder Clamp Screws
- Clutch Lever Pivot Nut
- Footpeg Bracket Mounting Bolts
- Footpeg Pivot Cotter Pins
- Rear Carrier Mounting Bolts

Supplement - 2000 - 2001 Models

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How to Use this Manual

This "Supplement - 2000 - 2001 Models" designed to be used in conjunction with the front part of this manual (up to 15-3) and /or Base Manual KLR600 Service Manual - Part No. 99924-1050-01. The specifications and maintenance procedures described in this chapter are only those that are unique to the KL650-A14/A15 model.

Complete and proper servicing of the KL650-A14/A15 model therefore requires mechanics to read both this chapter and the front of this manual.

General Information

Model Identification

KL650-A14 Left Side View

KL650-A14 Right Side View

General Specifications

Items		KL650-A14	KL650-A15
Dimensions:			
Overall length		2 205 mm	
Overall width		940 mm	
Overall height		1 345 mm	
Wheelbase		1 495 mm	
Road clearance		240 mm	
Seat height		890 mm	
Dry weight		153 kg, (CA) 153.5 kg	
Curb weight:	Front	81 kg, (CA) 81.5 kg	
	Rear	97 kg	
Fuel tank capacity		23 L	
Performance:			
Minimum turning radius		2.4 m	
Engine:			
Type		4-stroke, DOHC, 4-valve, 1-cylinder	
Cooling system		Liquid-cooled	
Bore and stroke		100.0 × 83.0 mm	
Displacement		651 mL	
Compression ratio		9.5 : 1	
Maximum horsepower		35.3 kW (48PS) @6500 r/min (rpm)	
Maximum torque		55 N·m (5.6 kg·m, 40.5 ft·lb) @5500r/min (rpm)	
Carburetion system		Carburetor, Keihin CVK40	
Starting system		Electric	
Ignition system		CDI	
Timing advance		Electronically advanced	
Ignition timing		From 10° BTDC @1 300 r/min (rpm) to 30° BTDC @3 300r/min (rpm)	
Spark plugs		NGK DPR8EA-9 or ND X 24 EPR-U9	
Valve timing:			
Inlet	Open	19° BTDC	
	Close	69° ABDC	
	Duration	268°	
Exhaust	Open	57° BBDC	
	Close	31° ATDC	
	Duration	268°	
Lubrication system		Forced lubrication (wet sump)	
Engine oil:	Grade	SE, SF or SG class	API SE, SF or SG API SH or SJ with JASO MA
	Viscosity	SAE10W40, 10W50, 20W40, or 20W50	
	Capacity	2.5 L	

Items		KL650-A14	KL650-A15
Drive Train:			
Primary reduction system:			
Type		Gear	
Reduction ratio		2.272 (75/33)	
Clutch type		Wet multi disc	
Transmission:			
Type		5-speed, constant mesh, return shift	
Gear ratios:	1st	2.266 (34/15)	
	2nd	1.444 (26/18)	
	3rd	1.136 (25/22)	
	4th	0.954 (21/22)	
	5th	0.791 (19/24)	
Final drive system:			
Type		Chain drive	
Reduction ratio		2.866 (43/15)	
Overall drive ratio		5.157 @Top gear	
Frame:			
Type		Tubular, semi-double cradle	
Caster (rake angle)		28°	
Trail		112 mm	
Front tire:	Type	Tube type	
	Size	90/90-21 54S	
Rear tire:	Type	Tube type	
	Size	130/80-17 65S	
Front suspension:	Type	Telescopic fork (pneumatic)	
	Wheel travel	230 mm	
Rear suspension:	Type	Swingarm (uni-trak)	
	Wheel travel	230 mm	
Brake Type:	Front	Single disc	
	Rear	Single disc	
Electrical Equipment:			
Battery		12 V 14 Ah	
Headlight:	Type	Semi-Sealed beam	
	Bulb	12 V 60/55 W (quartz-halogen)	
Tail/brake light		12 V 8/27 W	12 V 5/21 W
Alternator:	Type	Three-phase AC	
	Rated output	17 A @7 000 r/min (rpm),14 V	
Voltage regulator:	Type	Short-Circuit	

Specification subject to change without notice, and may not apply to every country.
(CA): California Model

Torque and Locking Agent

Fastener	Torque			Remarks
	N-m	Kg-m	ft-lb	
Engine Right Side/Left Side				
Clutch spring bolts	8.8	0.9	78 in-lb	
Final Drive				
Engine sprocket Nut	98	10	72	

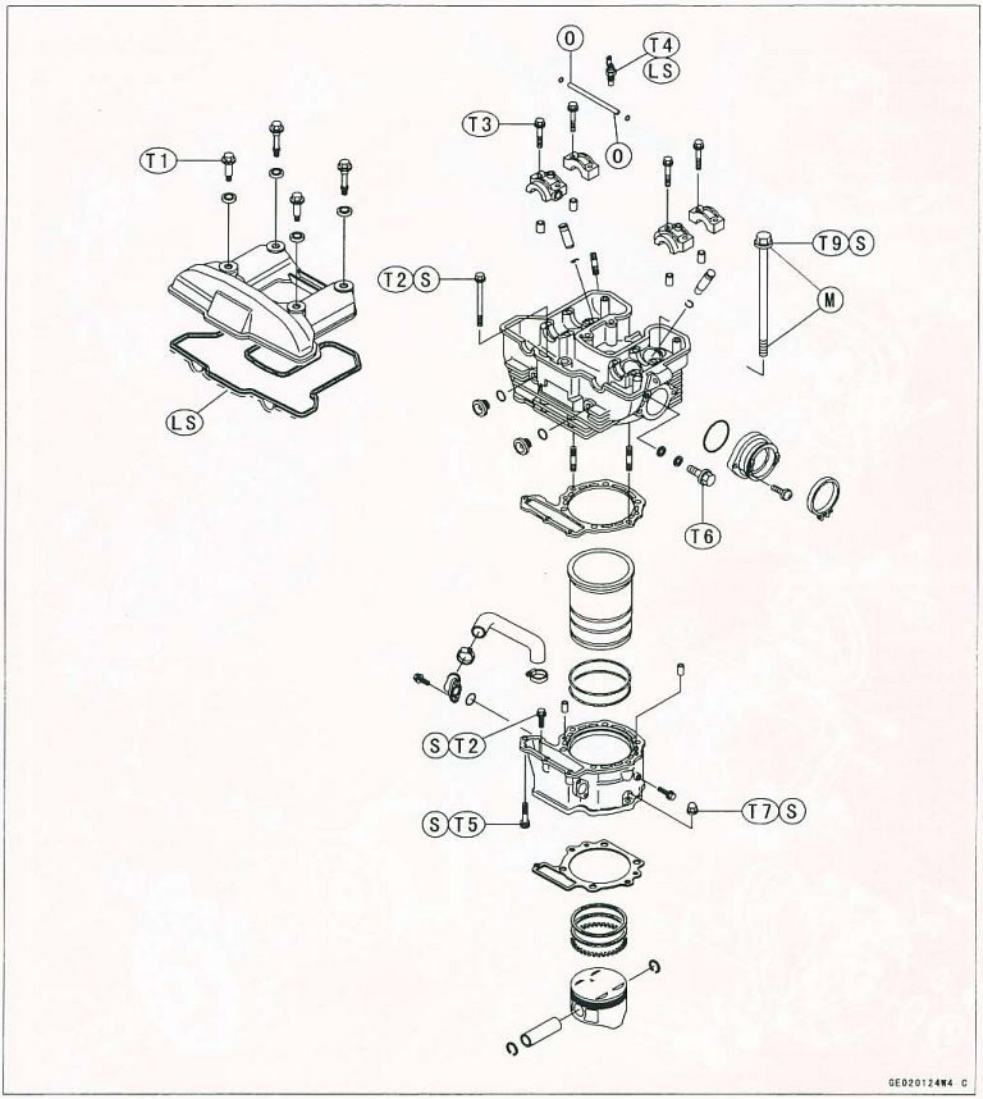
Fuel System

specifications

Item	KL650-A14/A15
Carburetor:	
Idle speed	1300± 50r/min (rpm)
Standard specifications:	
Make,type	Keihin,CVK40
Main jet	#148
Main air jet	#50
Needle jet	#6
Jet needle	N 31R
Pilot jet	#40
Pilot air jet	#70
Pilot screw	1 3/8 turns out
Starter jet	#52
Service fuel level	0.5mm above ~1.5mm below the float bowl mating surface.
Float height	17.5mm
High altitude adjustment (US model):	
Main jet	#145
Pilot jet	#38
Air Cleaner:	
Element oil: Grade	SE class
Viscosity	SAE30

Engine Top End

Exploded View

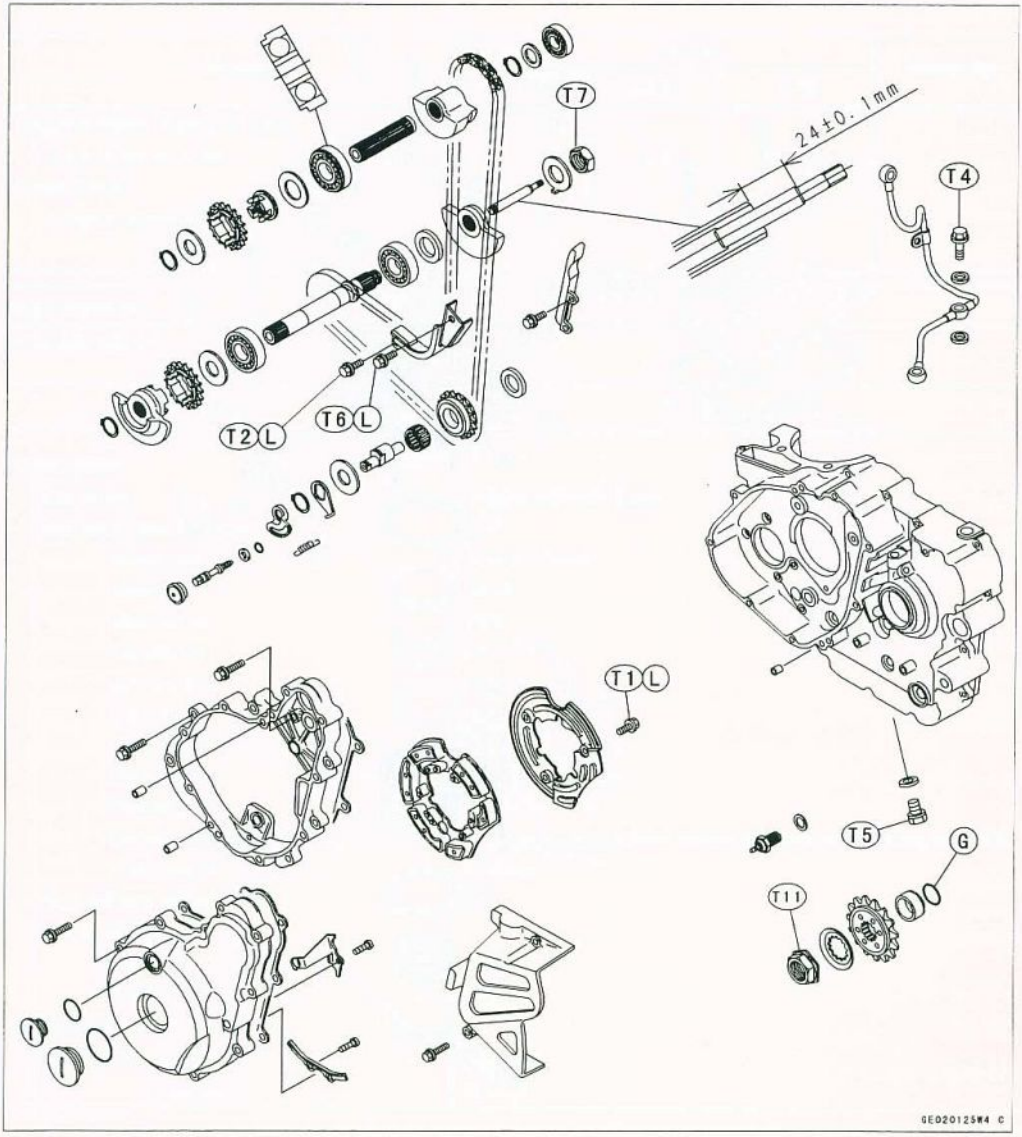


L:Non-permanent Locking Agent
LS:Liquid Gasket(Silicone Sealant)
M:Molybdenum Disulfide Grease
O:Engine Oil
S:Follow the specific tightening sequence.

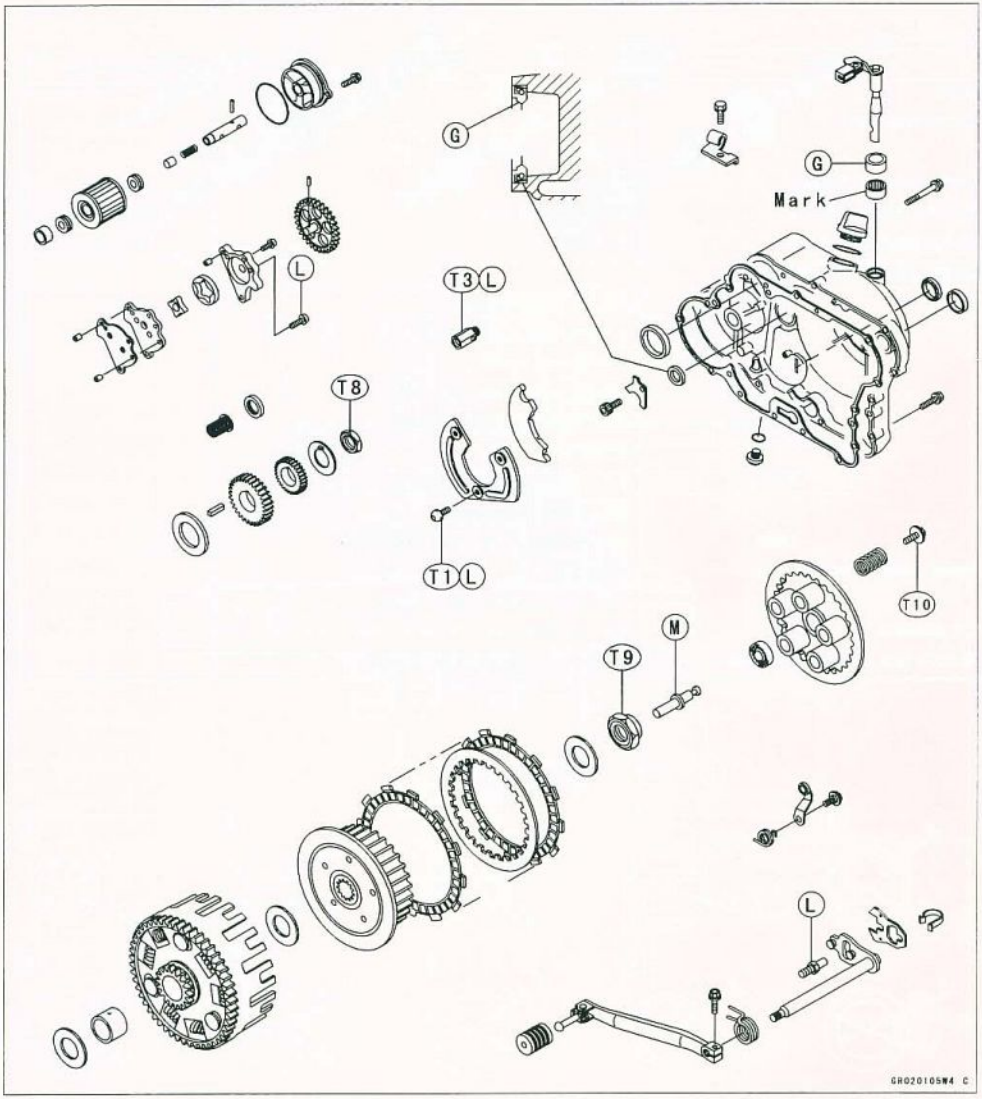
T1:7.8 N-m(0.80 kg-m,69 in-lb)
T2:9.8N-m(1.0 kg-m,87 in-lb)
T3:12N-m(1.2 kg-m,104 in-lb)
T4:15N-m(1.5 kg-m,11.0 ft-lb)
T5:18N-m(1.8 kg-m, 13.0 ft-lb)
T6:20N-m(2.0 kg-m,14.5 ft-lb)
T7:25N-m(2.5 kg-m,18.0 ft-lb)
T8:49N-m(5.0 kg-m,36 ft-lb)
T9:65N-m(6.6 kg-m,48 ft-lb)

Enginr Right Side / Left Side

Exploded View



G:Grease
L:Non-permanent Locking Agent
M:Molybdenum Disulfide Grease
T1:9.8N-m(1.0kg-m,87in-lb)
T2:12N-m(1.2kg-m,104in-lb)
T3:15N-m(1.5kg-m,11.0ft-lb)
T4:20N-m(2.0kg-m,14.5ft-lb)
T5:23N-m(2.3kg-m,16.5ft-lb)
T6:25N-m(2.5kg-m,18.0ft-lb)
T7:44N-m(4.5kg-m,33ft-lb)
T8:120N-m(12.0kg-m,87ft-lb)
T9:130N-m(13.5kg-m,98ft-lb)
T10:8.8N-m(0.9kg-m,78in-lb)
T11:98N-m(10kg-m,72ft-lb)

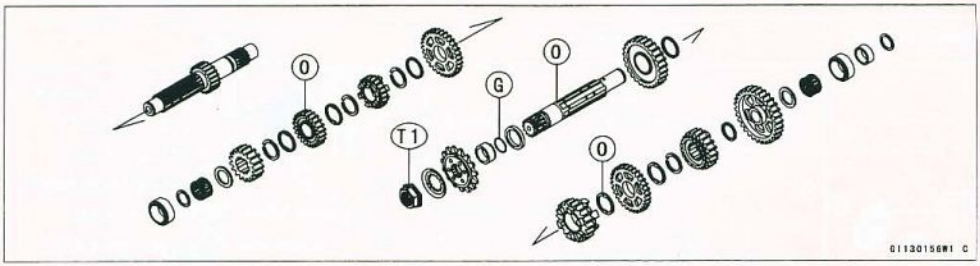

G
G
Mark
L
T3
L
T8
T1
L
T10
T9
M
L
GR02010SW4 C

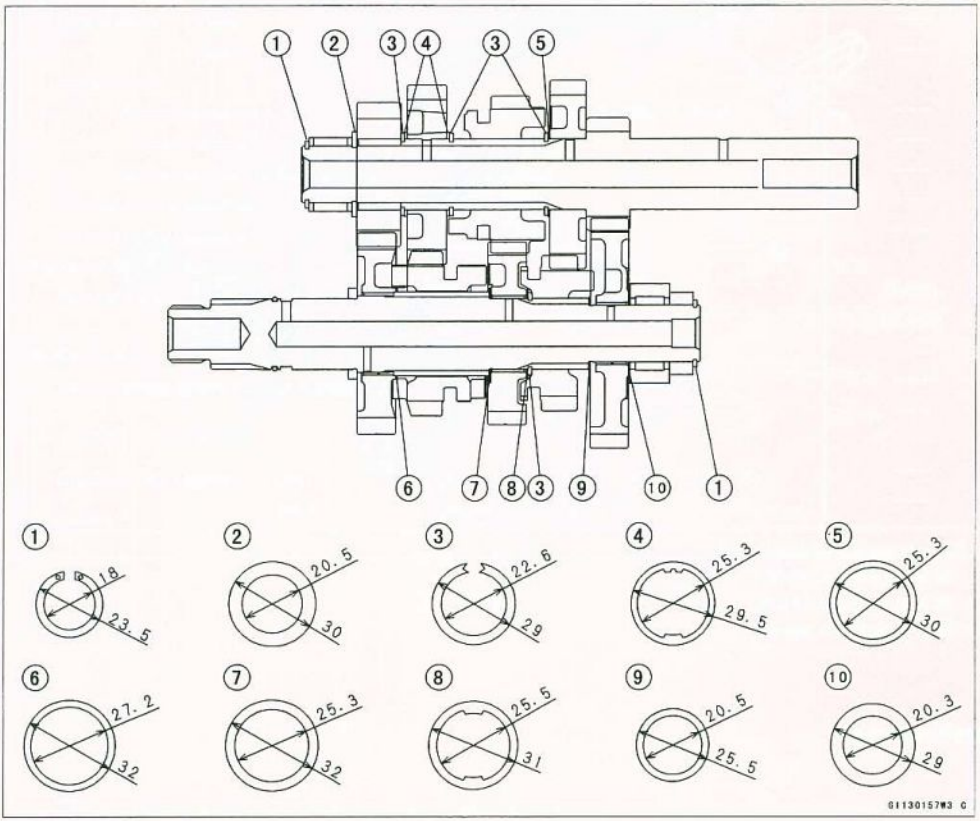
Specifications

Item	Standard	Service Limit
Clutch:		
Clutch lever play	2-3 mm	– – –
	10-15 mm (at lever end)	
Friction plate thickness	2.8-3.1 mm	2.6 mm
Friction, steel plate warp	Less than 0.2 mm	0.3 mm
Clutch spring free length	38.7 mm	36.4 mm
Engine Lubrication System:		
Engine oil: Grade	SE, SF, or SG class	– – –
	(On and After KL650-A15)	
	API SE, SF or SG	
	API SH or SJ with JASO MA	
Viscosity	SAE 10W40, 10W50,20W40,	– – –
	or 20W50	
Amount	2.2 L (filter is not removed)	– – –
	2.5 L (filter is removed)	– – –
Level	Between upper and lower level lines	– – –
Relief valve opening pressure	430 - 590 kPa	
	(4.4 - 6.0 kg/cm^2, 63 - 85 psi)	
Oil pressure	78 - 147 kPa	– – –
@4000 rpm (r/min), 90°C (194°F)	(0.8 - 1.5 kg/cm^2, 11 - 21 psi)	

Engine Bottom End/Transmission

Exploded View

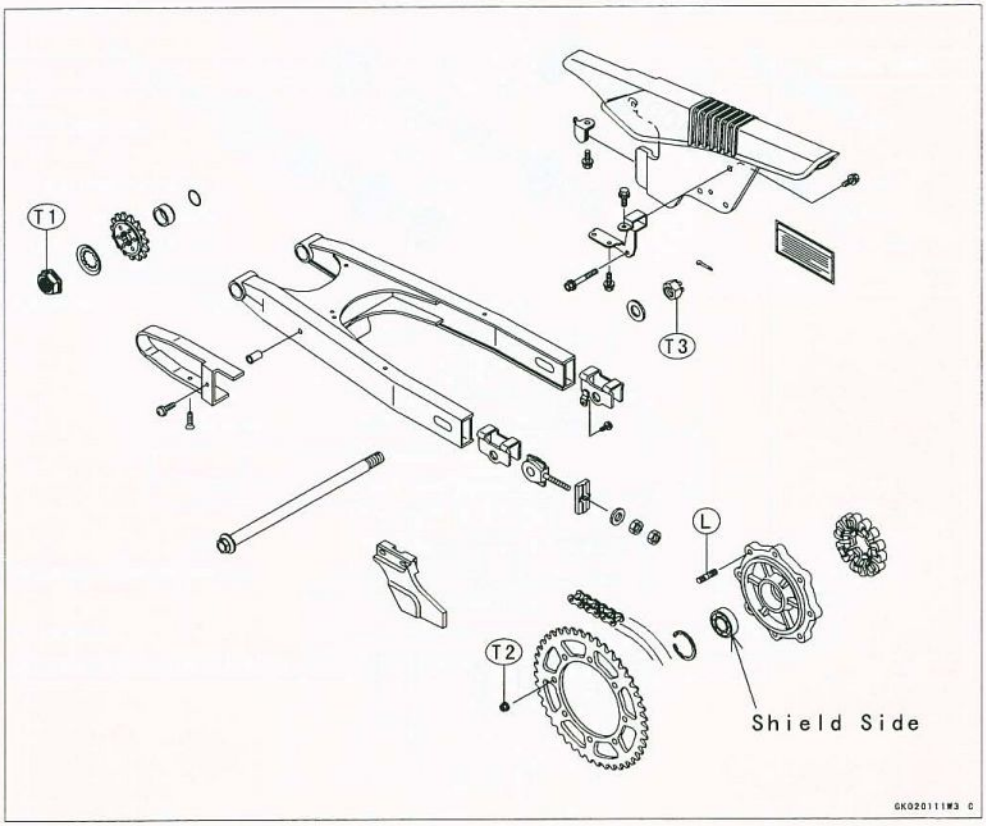




G: Grease
O: Engine Oil
T1: 9.8 N·m (10kg·m, 72 ft·lb)

Final Drive

Exploded View



L : Non-permanent Locking Agent
T1 : 98 N-m (10kg-m,72ft-lb)
T2 : 32 N-m (3.3kg-m,24 ft-lb)
T3 : 93 N-m (9.5kg-m,69ft-lb)

Specifications

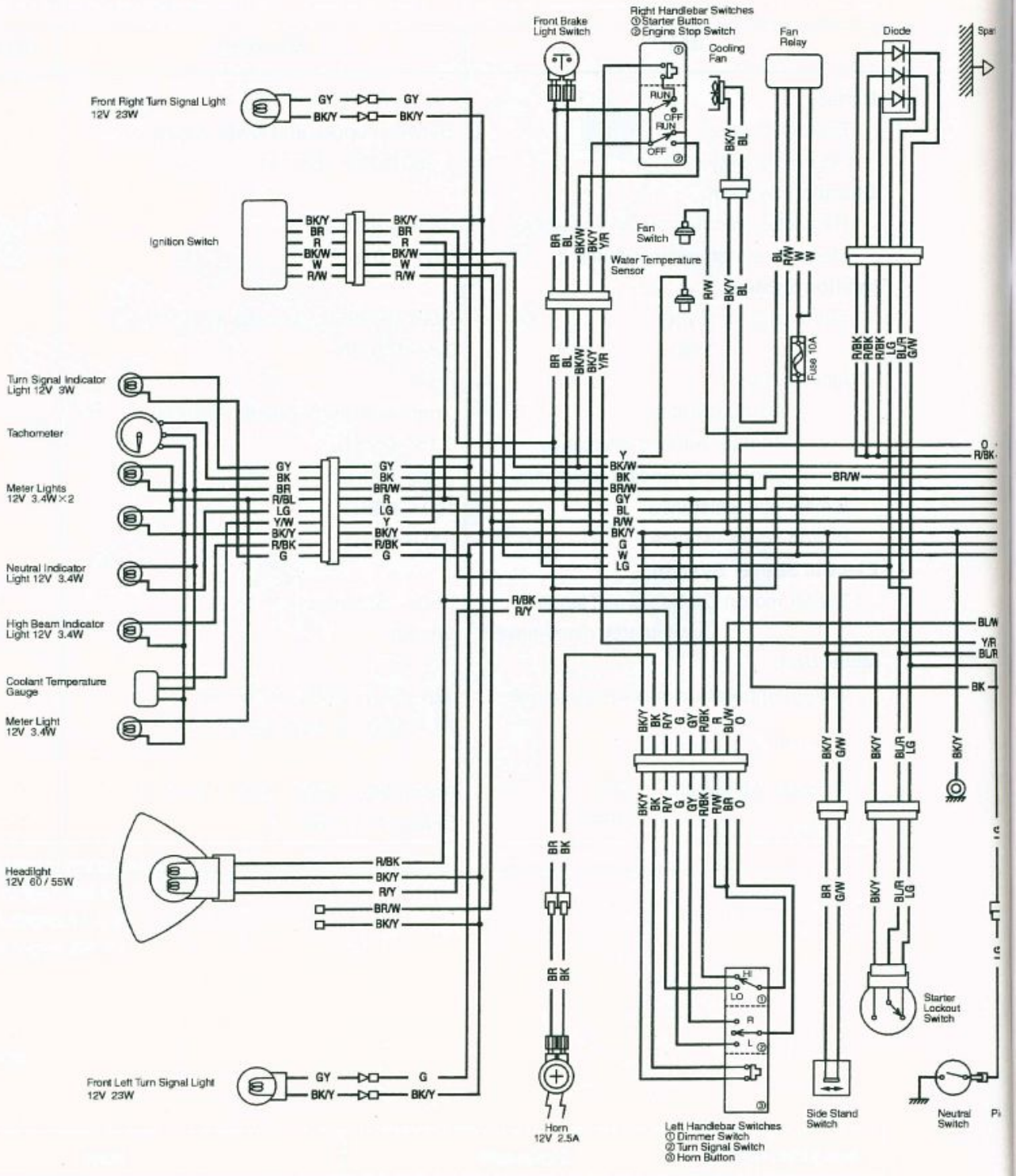
Item	Standard	Service Limit
Drive Chain:		
Standard chain : On and After KL650-A14	EK520SR-O_2 106L	---
Chain slack	50 – 55 mm	50 – 60 mm
Chain 20-link length	317.5 – 318.1mm	323mm

Electrical System

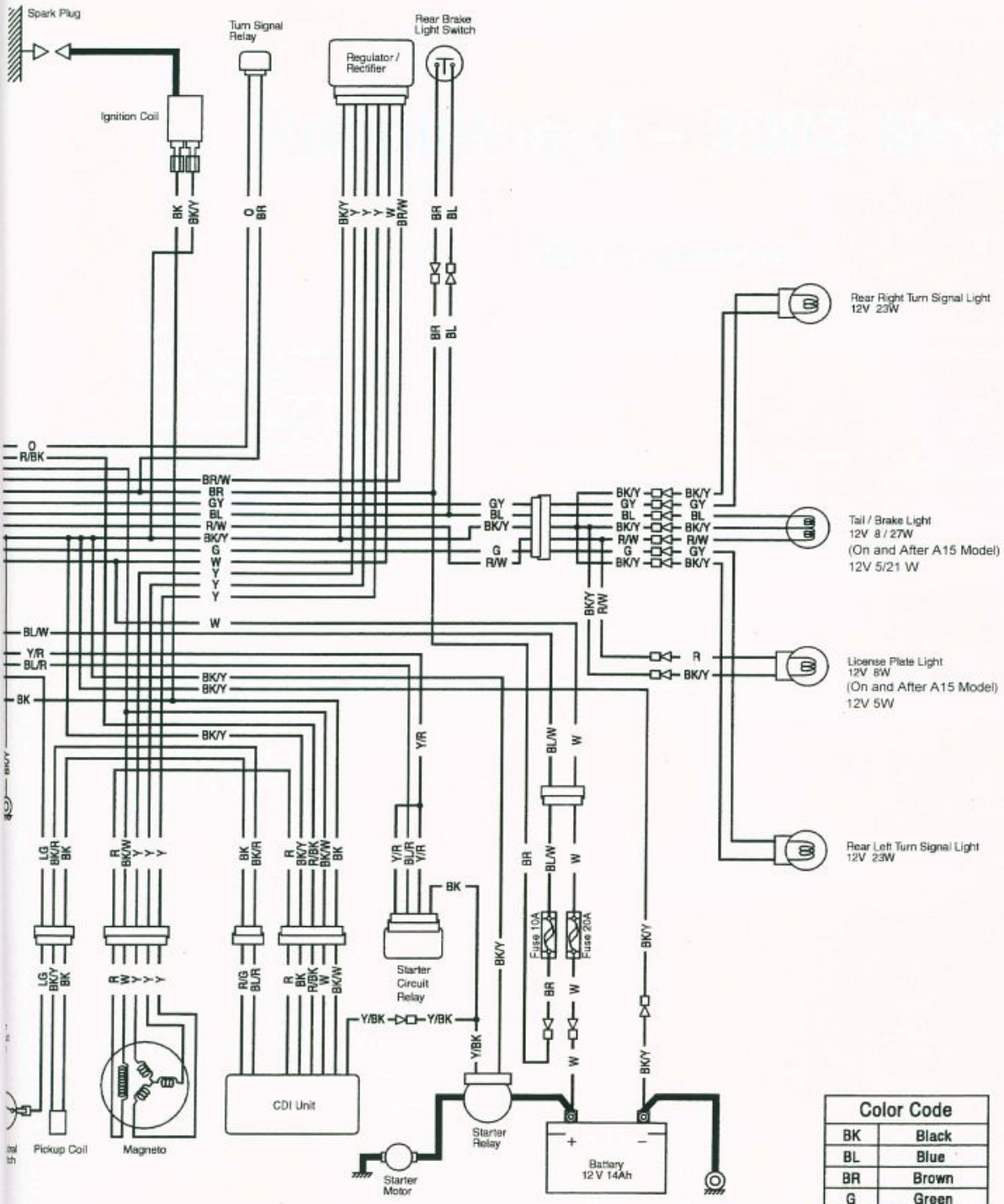
Specifications

Item	Standard	Service Limit
Battery:		
Electrolyte level	Between upper and lower levels	---
Specific gravity	1.280@20℃ (68° F)	---
Charging System:		
Regulator / rectifier output voltage	Battery – 15 V	---
Magneto stator coil resistance	0.3 – 1.0Ω	---
Ignition System:		
Spark plug: Type	NGK DPR8EA–9 or ND X24EPR-U9	---
Gap	0.8 – 0.9 mm	---
Ignition coil:		
Arcing distance	7mm or more (3-needle method)	---
Primary winding resistance	0.15 –0.21Ω	---
Secondary winding resistance	3.8 – 5.8kΩ	---
Exciter coil resistance	100 – 200Ω	---
Pickup coil resistance	100 – 150Ω	---
Electric Starter System:		
Starter motor: Carbon brush length	12.0 – 12.5 mm	6 mm
Commutatoy diameter	28 mm	27 mm
Meter Unit:		
Water temperature sender resistance	47 – 57Ω @80℃ (176° F)	---
	26 – 30Ω @100℃ (212° F)	---
Radiator fan switch: ON	Above 94 – 100℃ (201 – 212° F)	---
OFF	Below 91℃ (196° F)	---

KL650-A14/A15 Wiring Diagram



LEFT HANDLEBAR SWITC					
Horn Button			Turn Signal Switch		
Color	BK	BK/Y	Color	G	O
Push	●	●	L	●	●
Released			N		
			R		●



Color Code	
BK	Black
BL	Blue
BR	Brown
G	Green
GY	Gray
LB	Light Blue
LG	Light Green
O	Orange
P	Pink
R	Red
W	White
Y	Yellow

IGNITION SWITCH CONNECTIONS						
Color	W	BR	BK/Y	BK/W	R	R/W
LOCK			●			
OFF			●			
ON	●				●	
P(PARK)	●				●	
			●			

(98051-1173B)

WITCH CONNECTIONS					
Switch		Dimmer Switch			
O	GY	Color	R/Y	BR	R/BK
●		LO	●		
●		HI		●	

KL650A04A3

Supplement – 2002 Model

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Foreword

How to Use this Manual

This "Supplement – 2002 Model" designed to be used in conjunction with the front part of this manual (up to 16-15) and/or Base Manual KLR600 Service Manual – Part No. 99924-1050-01. The specifications and maintenance procedures described in this chapter are only those that are unique to the KL650-A16 model.

Complete and proper servicing of the KL650-A16 model therefore requires mechanics to read both this chapter and the front of this manual.

General Information

General Specifications

Items		KL650–A16
Dimensions:		
Overall length		2205 mm
Overall width		940 mm
Overall height		1 345mm
Wheelbase		1 495 mm
Road clearance		240 mm
Seat height		890 mm
Dry weight		153 kg, (CA) 153.5 kg
Curb weight:	Front	81 kg, (CA) 81.5 kg
	Rear	97 kg
Fuel tank capacity		23 L
Performance		
Minimum turning radius		2.4 m
Engine		
Type		4-stroke, DOHC, 4-valve, 1-cylinder
Cooling system		Liquid-cooled
Bore and stroke		100.0 x 83.0 mm
Displacement		651 mL
Compression ratio		9.5 : 1
Maximum horsepower		35.3 kW (48 ps) @6500 r/min (rpm)
Maximum torque		55 N·m (5.6 kgf·m, 40.5 ft·lb) @5500 r/min (rpm)
Carburetion system		Carburetor, Keihin CVK40
Starting system		Electric
Ignition system		CDI
Timing advance		Electronically advanced
Ignition timing		from 10° BTDC @1300 r/min (rpm) to 30° BTDC @3300 r/min (rpm)
Spark plugs		NGK DPR8EA-9 or ND X 24 EPR-U9
Valve timing:		
Inlet	Open	19° BTDC
	Close	69° ABDC
	Duration	268°
Exhaust	Open	57° BBDC
	Close	31° ATDC
	Duration	268°
Lubrication system		Forced lubrication (wet sump)
Engine oil:	Type	API SE, SF or SG API SH or SJ with JASO MA
	Viscosity	SAE10W40
	Capacity	2.5 L

General Information

Items		KL650–A16
Drive Train:		
Primary reduction system:		
Type		Gear
Reduction ratio		2.272 (75/33)
Clutch type		Wet multi disc
Transmission:		
Type		5-speed, constant mesh, return shift
Gear ratios:	1st	2.266 (34/15)
	2nd	1.444 (26/18)
	3rd	1.136 (25/22)
	4th	0.954 (21/22)
	5th	0.791 (19/24)
Final drive system:		
Type		Chain drive
Reduction ratio		2.866 (43/15)
Overall drive ratio		5.157 @Top gear
Frame:		
Type		Tubular, semi-double cradle
Caster (rake angle)		28°
Trail		112 mm
Front tire:	Type	Tube type
	Size	90/90-21 54S
Rear tire:	Type	Tube type
	Size	130/80-17 65S
Front suspension	Type	Telescopic fork (pneumatic)
	Wheel travel	230 mm
Rear suspension:	Type	Swingarm (uni-trak)
	Wheel travel	230 mm
Brake type:	Front	Single disc
	Rear	Single disc
Electrical Equipment:		
Battery		12 V 14 Ah
Headlight:	Type	Semi-Sealed beam
	Bulb	12 V 60/55 W (quartz-halogen)
Tail/brake light		12V 5/21 W
Alternator:	Type	Three-phase AC
	Rated output	17 A @7000 r/min (rpm), 14 V
Voltage regulator	Type	Short-Circuit

Specification subject to change without notice, and may not apply to every country.
(CA): California Model

General Information

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Fuel System:				
Fuel tap bolts	2.5	0.25	22 in·lb	
Engine Removal/Installation				
Engine mounting bolts and nuts				
10 mm	44	4.5	33	
8 mm	27	2.8	20	
Wheels/Tires:				
Front axle nut	88	9.0	65	
Rear axle nut	98	10	72	
Spoke nipples	5.1	0.52	45 in·lb	
Brakes:				
Brake pedal mounting bolt	8.8	0.9	78 in·lb	
Master cylinder mounting bolts	25	2.5	18	
Suspension/Steering:				
Steering stem nut	4.9	0.5	43 in·lb	
Swing arm pivot nut	88	9.0	65	
Front fork clamp bolts - upper	20	2.0	14	
Controls/Instruments:				
Handlebar clamp bolts	25	2.5	18	
Frame:				
Rear frame mounting bolts	27	2.8	20	
Step holder mounting bolts	32	3.3	24	
Electrical System:				
Fan switch	7.8	0.8	69 in·lb	

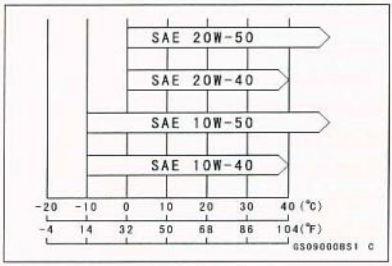
Specifications

Item		Standard	Service Limit
Engine Lubrication System:			
Engine oil:	Type	API SE, SF or SG	– – –
		API SH or SJ with JASO MA	
	Viscosity	SAE10W40	– – –
	Capacity	2.2 L (filter is not removed)	– – –
		2.5 L (filter is removed)	– – –
	Level	Between upper and lower level lines	– – –
Relief valve opening pressure		430 - 590 kPa	– – –
		(4.4 - 6.0 kgf/cm^2, 63 - 85 psi)	
Oil pressure		78 - 147 kPa	– – –
@4000 rpm (r/min), 90°C (194°F)		(0.8 - 1.5 kgf/cm^2, 11 - 21 psi)	

Engine Oil and Oil Filter

Engine Oil Change

Type: **API SE, SF or SG**
API SH or SJ with JASO MA
Viscosity: **SAE10W-40**
Capacity: **2.2 L (Oil fitler is not removed)**
2.5 L (Oil filter is removed)



NOTE

○ *Depending on the atmospheric temperature of your riding area, the engine oil viscosity should be changed accordingly to the chart.*

MODEL APPLICATION

Year	Model	Beginning Frame No.
1987	KL650-A1	JKAKLEA1□HA000001 or KL650A-000001
	KL500-A1	KL500A-000001
1988	KL650-A2	JKAKLEA1□JA008701 or KL650A-008701
	KL500-A2	KL500A-000501
1989	KL650-A3	JKAKLEA1□KA013601 or KL650A-013601
1990	KL650-A4	JKAKLEA1□LA016001
1991	KL650-A5	JKAKLEA1□MA018001
1992	KL650-A6	JKAKLEA1□NA021901
1993	KL650-A7	JKAKLEA1□PA026001
1994	KL650-A8	JKAKLEA1□RA030001
1995	KL650-A9	JKAKLEA1□SA032001
2000	KL650-A14	JKAKLEA1□YA057001
2001	KL650-A15	JKAKLEA1□1A070001
2002	KL650-A16	JKAKLEA1□2D075001

□: This digit in the frame number changes from one machine to another.

Kawasaki
KAWASAKI HEAVY INDUSTRIES, LTD.
Consumer Products & Machinery Company

Part No. 99924-1080-58

Printed in Japan