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 or durability of the motorcycle.*
     c. *Addition of components or accessories that result in the vehicle exceeding the standards.*
     d. *Permanently removing, disconnecting, or rendering inoperative any component or element of design of the emission control systems.*

**WE RECOMMEND THAT ALL DEALERS OBSERVE THESE PROVISIONS OF FEDERAL LAW, THE VIOLATION OF WHICH IS PUNISHABLE BY CIVIL PENALTIES NOT EXCEEDING $10,000 PER VIOLATION.**

## TAMPERING WITH NOISE CONTROL SYSTEM PROHIBITED

Federal law prohibits the following acts or the causing thereof: (1) The removal or rendering inoperative by any person other than for purposes of maintenance, repair, or replacement, of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use, or (2) the use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

Among those acts presumed to constitute tampering are the acts listed below:

- Replacement of the original exhaust system or muffler with a component not in compliance with Federal regulations.
- Removal of the muffler(s) or any internal portion of the muffler(s).
- Removal of the air box or air box cover.
- Modifications to the muffler(s) or air intake system by cutting, drilling, or other means if such modifications result in increased noise levels.




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 scheduled maintenance be performed in accordance with this service manual. Any owner maintenance or repair procedure not performed in accordance with this manual may void the warranty.

To get the longest life out of your Motorcycle:

- Follow the Periodic Maintenance Chart in the Service Manual.
- Be alert for problems and non-scheduled maintenance.
- Use proper tools and genuine Kawasaki Motorcycle parts. Special tools, gauges, and testers that are necessary when servicing Kawasaki motorcycles are introduced by the Special Tool Manual. Genuine parts provided as spare parts are listed in the Parts Catalog.
- 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 CAUTION symbols, heed their instructions! Always follow safe operating and maintenance practices.

WARNING

**○This warning symbol identifies special instructions or procedures which, if not correctly followed, could result in personal injury, or loss of life.**

CAUTION

**○This caution symbol identifies special instructions or procedures which, if not strictly observed, could result in damage to or destruction of equipment.**

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 you will find the instructions indicating which parts require specified tightening torque, oil, grease or a locking agent during assembly.

# General Information



## Table of Contents


Before Servicing ..... *
Model Identification ..... 1-2
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*Refer to Base Manual

## Model Identification

KL650-A1:




KL500-A1:



## Specifications

| Items | | KL 650-A1,A2,A3,A4,A5,A6,A7,A8,A9 | KL500-A1, A2 |
|---|---|---|---|
| **Dimensions:** | | | |
| Overall length | | 2 290 mm, ⓒⓢⓤ 2 205 mm, | |
| | | Ⓐ Ⓐu Ⓑ Ⓕ Ⓖr Ⓘ Ⓢp 2 250 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, Ⓒa 153.5 kg | * |
| Curb weight: | Front | 81 kg, Ⓒa 81.5 kg | * |
| | Rear | 97 kg | * |
| Fuel tank capacity | | 23 L | * |
| **Performance:** | | | |
| Climbing ability | | 32° | * |
| Braking distance | | 12.5 m from 50 km/h | * |
| 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 | 89.0 x 80.0 mm |
| Displacement | | 651 mL | 497 mL |
| Compression ratio | | 9.5 : 1 | * |
| Maximum horsepower | | 35.3 kW (48 PS) @6500 r/min (rpm)<br>Ⓕ 34.2 kW (46.5 PS) @6500 r/min (rpm):UTAC's norms<br>Ⓖ 19.9 kW (27 PS) @5800 r/min (rpm):DIN<br>Ⓖ -A3 19.9 kW (27 PS) @5500 r/min (rpm): DIN<br>Ⓐ -A3 32.4 kW (44 PS) @6500 r/min (rpm) | 29.4 kW (40 PS) @7 500 r/min (rpm) |
| Maximum torque | | 54.9 N-m (5.6 kg-m, 40.5 ft-lb) @5500 r/min (rpm)<br>Ⓖ 45.1 N-m (4.6 kg-m, 33.3 ft-lb) @2500 r/min (rpm): DIN<br>Ⓖ -A3 48 N-m (4.9 kg-m, 35 ft-lb) @2300 r/min (rpm): DIN<br>Ⓐ -A3 49 N-m (5.0 kg-m, 36 ft-lb) @5000 r/min (rpm) | 38.2 N-m (3.9 kg-m, 28.2 ft-lb) @6 000 r/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 @3 300 r/min (rpm) | * |
| Spark Plug | | NGK DPR8EA-9 or ND X24EPR-U9 | * |
| | | ⒶⒾⓈⓊ NGK DP8EA-9, or ND X24EP-U9 | * |

| Items | KL 650-A1,A2,A3,A4,A5,A6,A7,A8,A9 | KL500-A1, A2 |
|---|---|---|
| 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 or SF class | * |
| Viscosity | SAE10W40, 10W50, 20W40, or 20W50 | * |
| Capacity | 2.5 L | * |
| **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 | 1.529 (26/17) | * |
| 3rd | 1.181 (26/22) | * |
| 4th | 0.954 (21/22) | * |
| 5th | 0.791 (19/24) | * |
| Final drive system: | | |
| Type | Chain drive | * |
| Reduction ratio | 2.866 (43/15) | 3.133 (47/15) |
| Overall drive ratio | 5.157 @Top gear | 5.637 @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 | * |

| Items | KL 650-A1,A2,A3,A4,A5,A6,A7,A8,A9 | KL500-A1, A2 |
|---|---|---|
| Rear suspension: | | |
| Type | Swing arm (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 5/21 W, ⓒⓢⓤ 12 V 8/27 W | * |
| Alternator: | | |
| Type | Three-phase AC | * |
| Rated output | 14 A @8 000 r/min (rpm), 14 V | * |
| Voltage regulator: | | |
| Type | Short-circuit | * |

Specifications subject to change without notice, and may not apply to every country.

* : Same as KL650-A1

**Abbreviation**

Ⓐ : Australian Model
Ⓐu : Austrian Model
Ⓑ : U.K. Model
Ⓒ : Canadian Model
Ⓒa : Californian Model
Ⓕ : French Model
Ⓖ : West German Model
Ⓘ : Italian Model
Ⓢ : South African Model
Ⓢp : Spanish Model
Ⓤ : U.S. Model
Ⓖr : Greek Model

## Periodic Maintenance Chart

The scheduled maintenance must be done in accordance with this chart to keep the motorcycle in good running condition. **The initial maintenance is vitally important and must not be neglected.**

| OPERATION \ FREQUENCY | Whichever comes first ➡ / Every ⬇ | †ODOMETER READING 800 km | 5 000 km | 10 000 km | 15 000 km | 20 000 km | 25 000 km | 30 000 km | See Page |
|---|---|---|---|---|---|---|---|---|---|
| Spark plug – clean | | | • | • | • | • | • | • | (14-9) |
| Spark plug – check * | | | • | • | • | • | • | • | (14-7) |
| Valve clearance – check* | | • | | • | | • | | • | (3-11) |
| Air cleaner element – clean | | • | | • | | • | | • | (2-7) |
| Air cleaner element – replace | 5 cleanings | | | | | • | | | 2-5 |
| Throttle grip play – check * | | • | | • | | • | | • | 12-5 |
| Idle speed – check * | | • | • | • | • | • | • | • | (2-4) |
| Fuel system – check * | | | | • | | • | | • | (2-8) |
| Coolant – change | 2 years | | | | | | | • | (5-4) |
| Spark arrestor – clean (for Ⓤ , Ⓒ model) | | | • | • | • | • | • | • | 3-7 |
| Evaporative emission control system – check (for Ⓒa model)* | | • | • | • | • | • | • | • | (2-10) |
| Engine oil – change | Year | • | | • | | • | | • | 4-7 |
| Oil filter – replace | | • | | • | | • | | • | (4-13) |
| Radiator hoses, connections – check* | year | • | | • | | • | | • | (5-8) |
| Fuel hoses, connections – check* | | | • | • | • | • | • | • | – – – |
| Fuel hose – replace | 4 years | | | | | | | | – – – |
| Balancer chain tension – adjust | | • | • | • | • | • | • | • | (4-16) |
| Clutch – adjust | | • | • | • | • | • | • | • | (4-8) |
| Drive chain wear – check * | | | • | • | • | • | • | • | (9-4) |
| Drive chain – lubricate | 300 km | | | | | | | | (9-5) |
| Drive chain slack – check * | 800 km | | | | | | | | 9-3 |
| Brake lining wear – check * | | | • | • | • | • | • | • | (10-4) |
| Brake fluid level – check* | month | • | • | • | • | • | • | • | 10-5, 7 |
| Brake fluid – change | 2 years | | | | | • | | | (10-4) |
| Brake hoses, connections – check* | | | • | • | • | • | • | • | – – – |
| Brake hose – replace | 4 years | | | | | | | | – – – |
| Master cylinder cup and dust seal – replace | 2 years | | | | | | | | – – – |
| Caliper piston seal and dust seal – replace | 2 years | | | | | | | | – – – |
| Brake light switch – check * | | • | • | • | • | • | • | • | (10-11) |
| Steering – check * | | • | • | • | • | • | • | • | (11-6) |
| Steering stem bearing – lubricate | 2 years | | | | | • | | | (11-7) |
| Front fork oil – change | | | | | | | | • | 11-6 |
| Tire wear – check * | | | • | • | • | • | • | • | (8-5) |
| Spoke tightness and rim runout – check * | | • | • | • | • | • | • | • | (8-6) |
| Swing arm pivot, uni-trak linkage – lubricate | | | | • | | • | | • | (11-14) |
| Battery electrolyte level – check * | month | • | • | • | • | • | • | • | (14-4) |
| General lubrication – perform | | | • | • | • | • | • | • | 15-2 |
| Nut, bolt, and fastener tightness – check * | | • | | • | | • | | • | 15-2 |

† : For higher odometer readings, repeat at the frequency interval established here.
* : Replace, add, adjust, clean, or torque if necessary.
Ⓒa: Californian Model Ⓤ : U.S. Model Ⓒ : Canadian Model (Page) : See Base Manual

## 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 | | | | |
| 10 mm | 44 | 4.5 | 33 | S |
| 8 mm | 25 | 2.5 | 18.0 | S |
| Engine mounting bracket bolts and nuts | | | | |
| (8 mm) | 25 | 2.5 | 18.0 | |
| Swing arm pivot bolt and nut | | | | |
| (14 mm) | 98 | 10.0 | 72 | S |
| **Engine Bottom End/Transmission:** | | | | |
| Crankshaft bearing retainer screws | – | – | – | L |
| Shift drum pin plate bolt | 12 | 1.2 | 104 in-lb | L |
| **Wheels/Tires:** | | | | |
| Front axle nut | 78 | 8.0 | 58 | |
| Rear axle nut | 93 | 9.5 | 69 | |
| Spoke nipples | 2.0 – 3.9 | 0.2 – 0.4 | 17 – 35 in-lb | |
| **Final Drive:** | | | | |
| Engine sprocket bolts | 9.8 | 1.0 | 87 in-lb | |
| Rear sprocket studs | – | – | – | L |
| Rear sprocket nuts | 32 | 3.3 | 24 | |
| **Brakes:** | | | | |
| Front master cylinder clamp bolts | 8.8 | 0.90 | 78 in-lb | |
| Rear master cylinder mounting bolts | 23 | 2.3 | 16.5 | |
| Caliper mounting bolts | 25 | 2.5 | 18.0 | |
| Disc mounting bolts | 23 | 2.3 | 16.5 | |
| Brake hose banjo bolts | 25 | 2.5 | 18.0 | |
| Air bleed valves | 7.8 | 0.80 | 69 in-lb | |
| Brake lever pivot nut | 5.9 | 0.60 | 52 in-lb | |
| **Suspension/Steering:** | | | | |
| Front fork clamp bolts and nuts | 25 | 2.5 | 18.0 | |
| Air valves | 12 | 1.2 | 104 in-lb | L |
| Fork top bolts | 29 | 3.0 | 22 | |
| Fork bottom Allen bolts | 39 | 4.0 | 29 | L |
| Fork drain screws | – | – | – | LG |
| Rear shock absorber mounting | | | | |
| bolts and nuts: Upper (12 mm) | 59 | 6.0 | 43 | |
| Lower (14 mm) | 98 | 10.0 | 72 | |
| Swing arm pivot bolt and nut (14 mm) | 98 | 10.0 | 72 | |
| Rocker arm pivot bolt and nut (14 mm) | 98 | 10.0 | 72 | |
| Tie-rod bolts and nuts (14 mm) | 98 | 10.0 | 72 | |
| Steering stem head nut | 39 | 4.0 | 29 | |

| 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 |

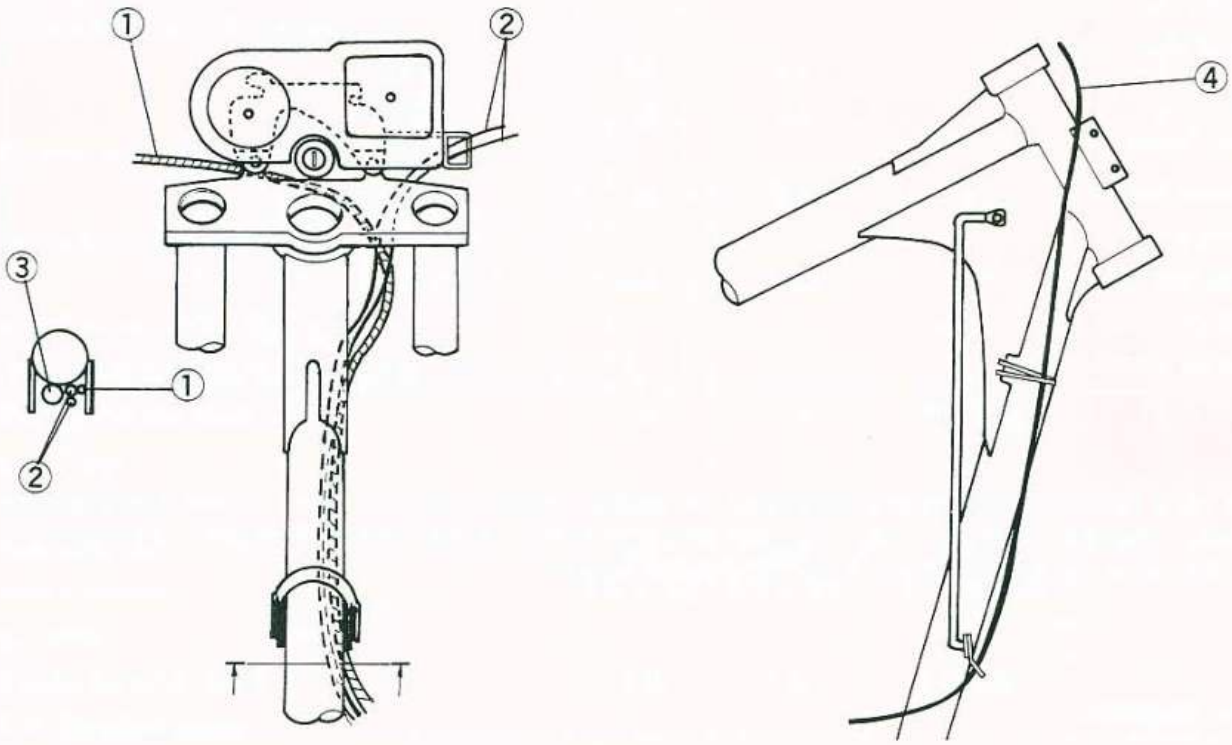
The table below, relating tightening torque to thread diameter, lists the basic torque for the bolts and nuts. Use this table for only the bolts and nuts which do not require a specific torque value. All of the values are for use with dry solvent-cleaned threads.

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 |

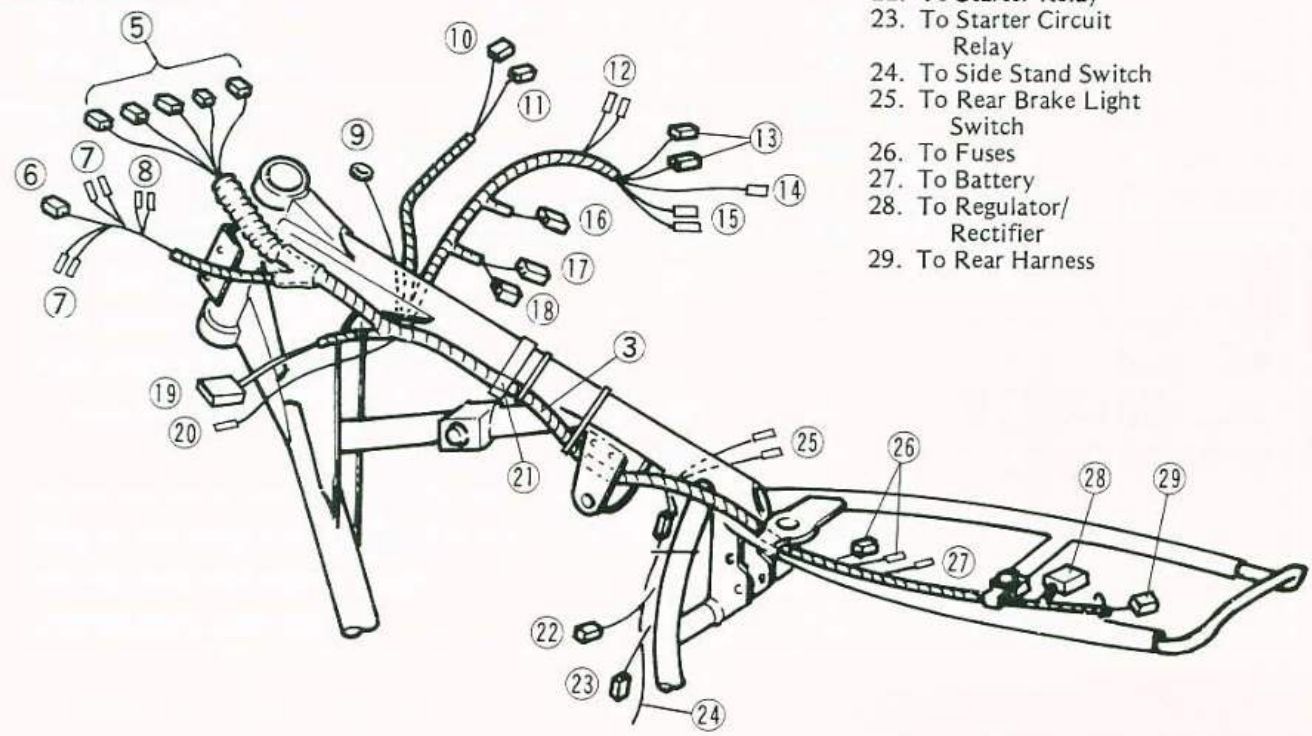
## Cable, Wire, and Hose Routing

### Control Cables

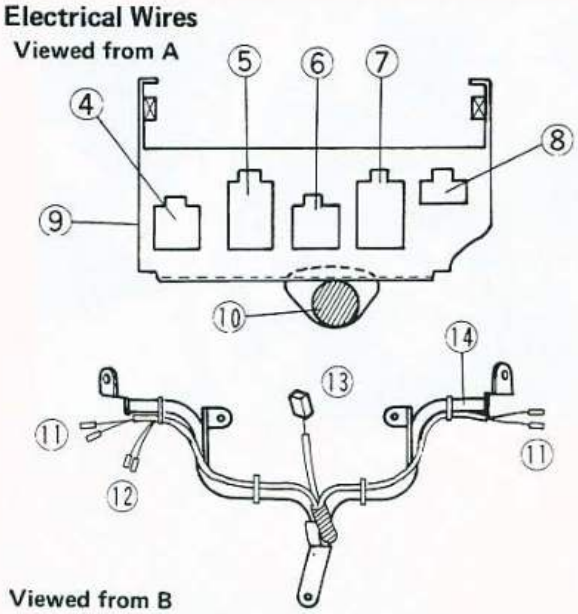


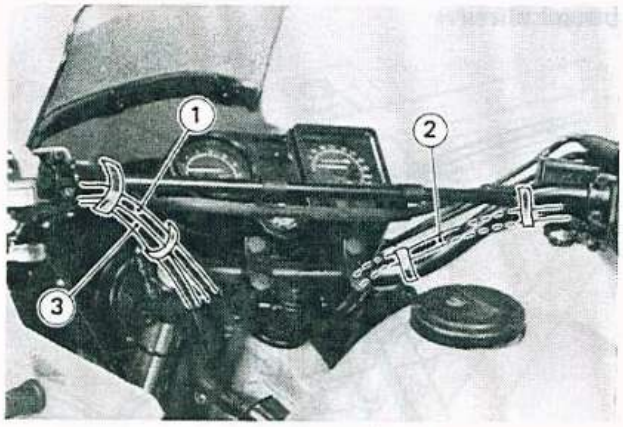
1. Choke Cable
2. Throttle Cable
3. Main Harness
4. Clutch Cable
5. To Meter Bracket
6. To Headlight
7. To Turn Signal Light
8. To City Light
9. Ground Lead
10. To Diode Assembly
11. To Turn Signal Relay
12. To Horn
13. To CDI Unit
14. To Water Temperature Sender
15. To Ignition Coil
16. To Magneto
17. To Neutral Switch and Pickup Coil
18. To Radiator Fan Relay
19. To Radiator Fan
20. To Radiator Fan Switch
21. Harness Position Mark
22. To Starter Relay
23. To Starter Circuit Relay
24. To Side Stand Switch
25. To Rear Brake Light Switch
26. To Fuses
27. To Battery
28. To Regulator/ Rectifier
29. To Rear Harness

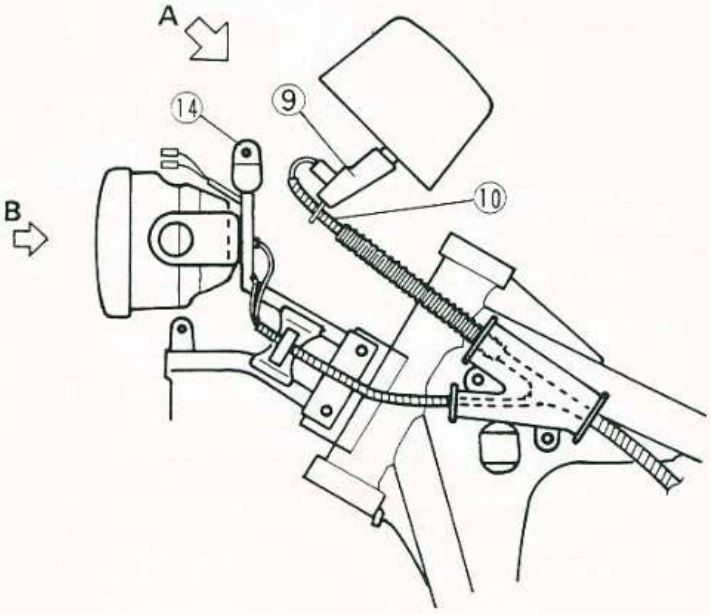
### Electrical Wires



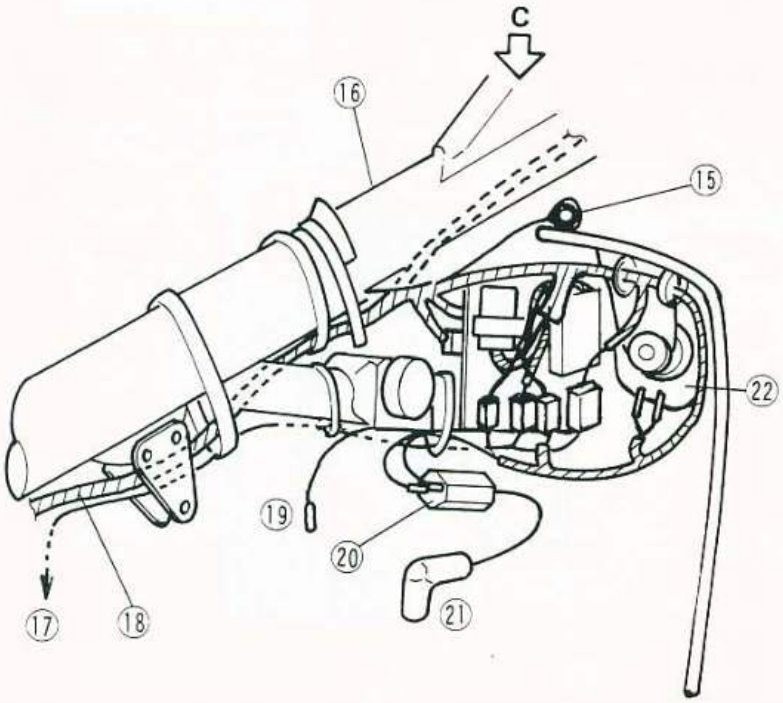
## Electrical Wires

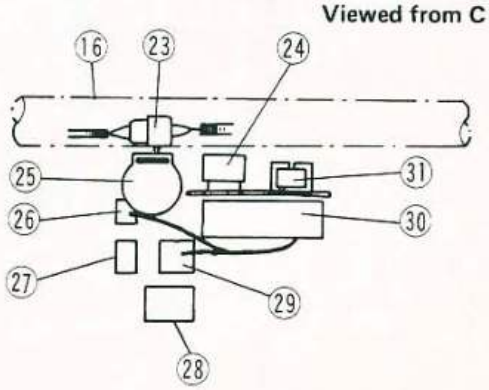


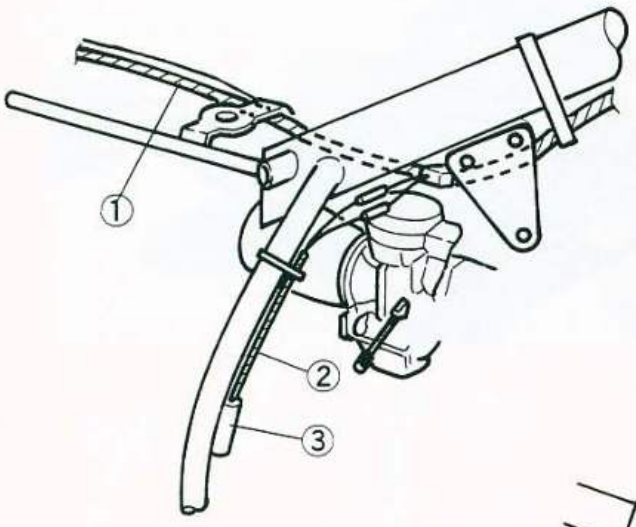


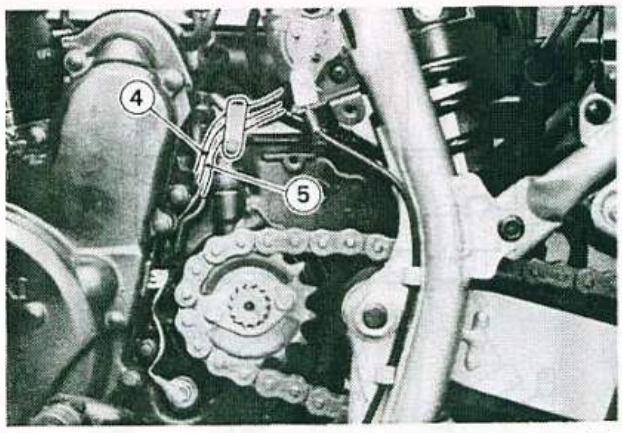

1. LH Switch Leads
2. RH Switch Leads
3. Starter Lockout Switch Leads
4. RH Switch 6P Connector (Red)
5. Meter 9P Connector
6. Ignition Switch 6P Connector (Black)
7. LH Switch 9P Connector (Red)
8. Starter Lockout Switch 3P Connector
9. Meter Bracket
10. Main Harness
11. To Turn Signal Light
12. To 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

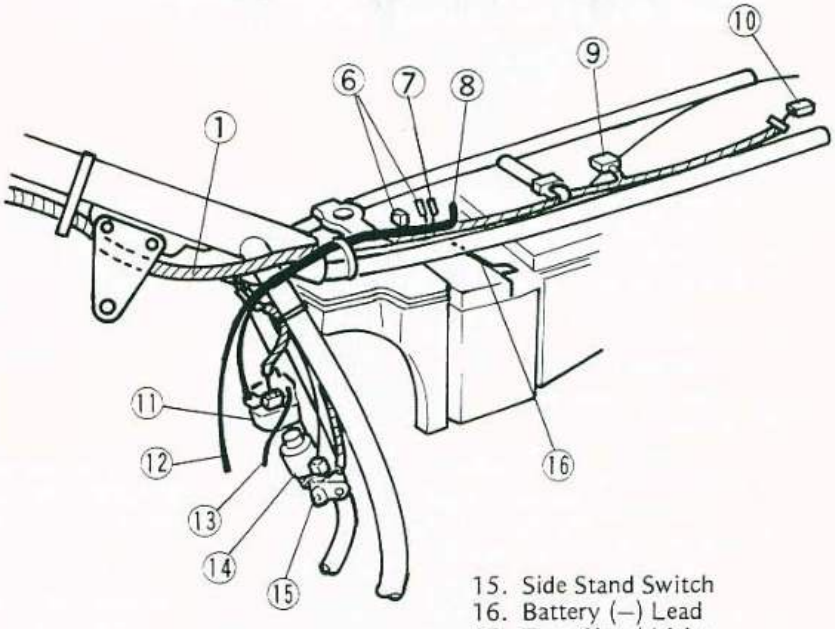


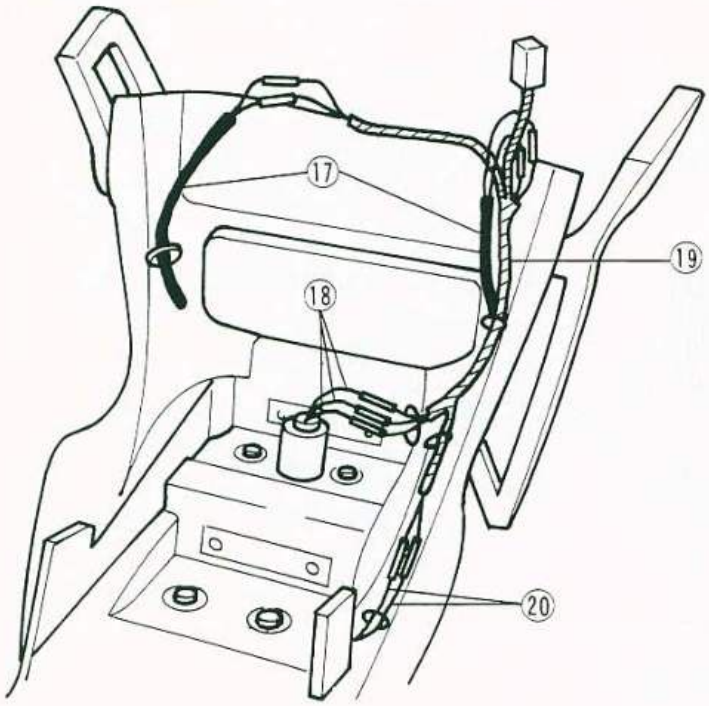
**Electrical Wires**

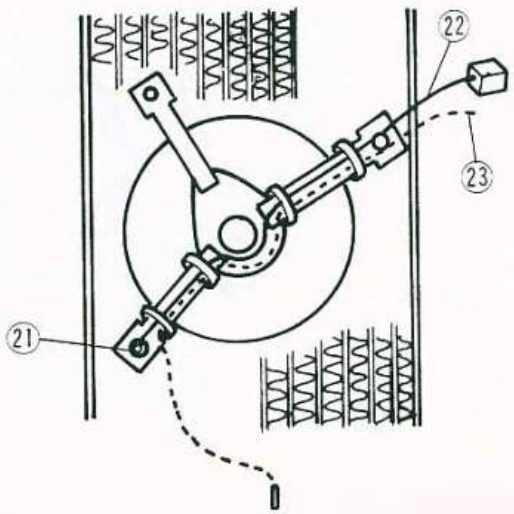


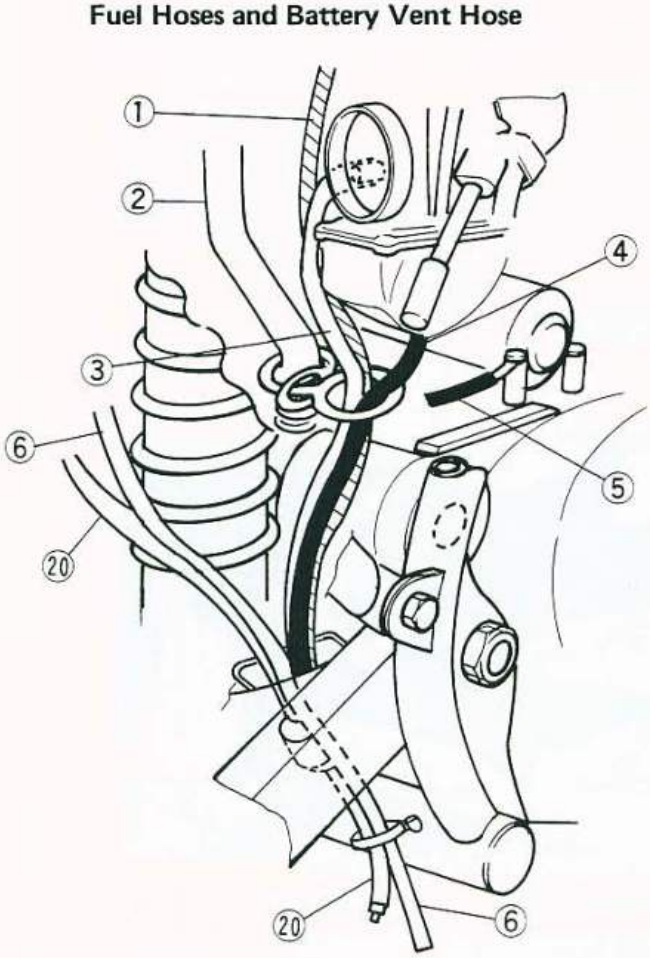



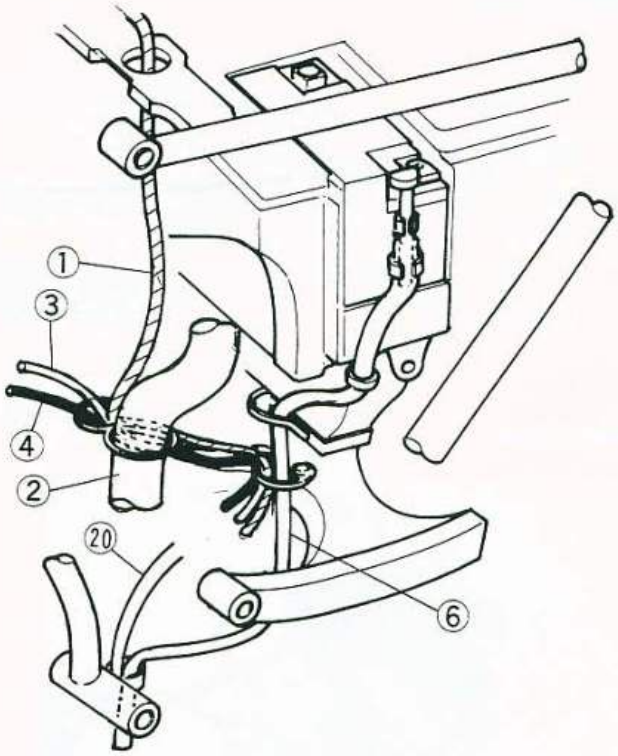

1. Main Harness
2. Rear Brake Light Switch Leads
3. Rear Brake Light Switch
4. Magneto Leads
5. Neutral Switch and Pickup Coil Leads
6. To Fuses
7. To Battery
8. Battery (+) Lead
9. To Regulator/ Rectifier
10. To Rear Harness
11. Starter Relay
12. Ground Lead
13. Starter Motor Lead
14. Starter Circuit Relay
15. Side Stand Switch
16. Battery (–) Lead
17. Turn Signal Light Leads
18. Tail/Brake Light Leads
19. Rear Harness
20. License Plate Light Leads
21. Ground Lead
22. Radiator Fan Leads
23. Radiator Fan Switch Lead



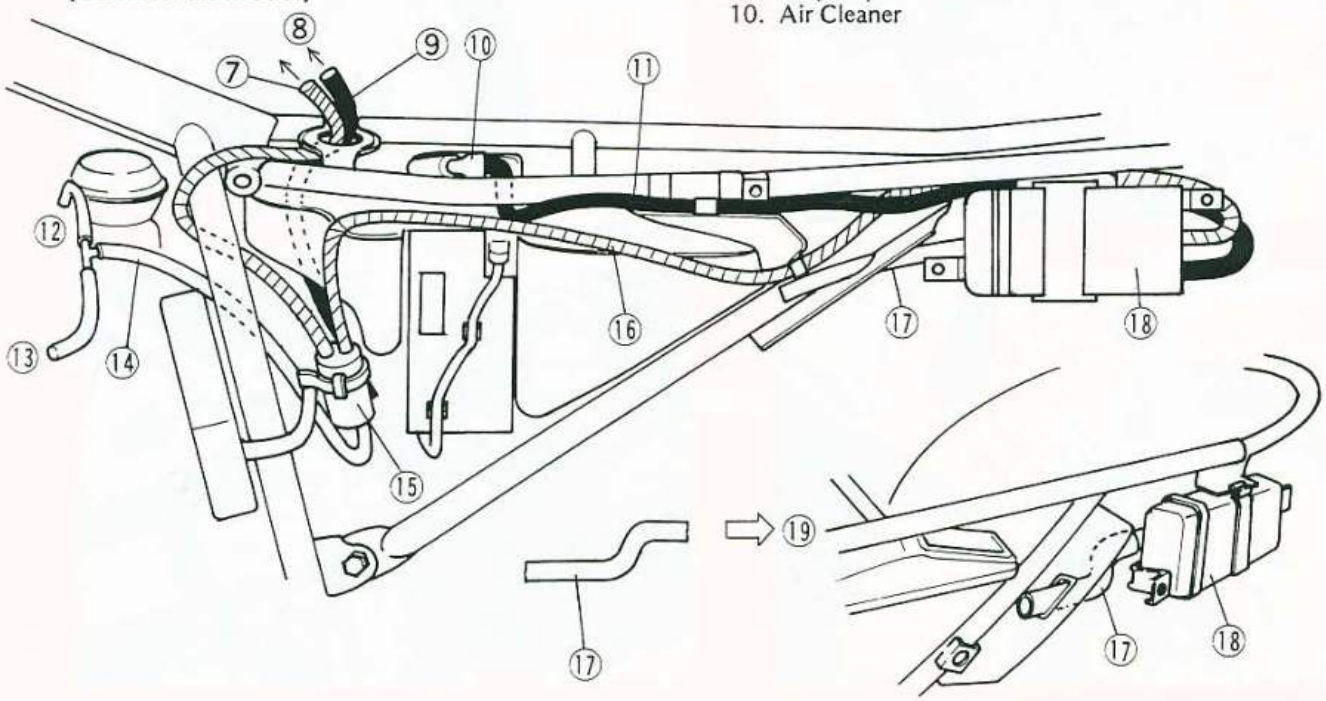
**Fuel Hoses and Battery Vent Hose**




1. Fuel Tank Breather Hose
2. Crankcase Breather Hose
3. Carburetor Air Vent Hose
4. Carburetor Overflow Hose
5. Ground Lead
6. Battery Vent Hose
7. Breather Hose (Blue)
8. To Fuel Tank
9. Fuel Return Hose (Red)
10. Air Cleaner
11. Purge Hose (Green)
12. To Carburetor
13. To Fuel Tap
14. Vacuum Hose (White)
15. Liquid/Vapor Separator
16. Breather Hose (Blue)
17. Hose
18. Canister
19. To Canister
20. Air Cleaner Drain Hose (A3 ~)

**Vacuum Hoses and Breather Hoses (Californian Model)**



# Fuel System

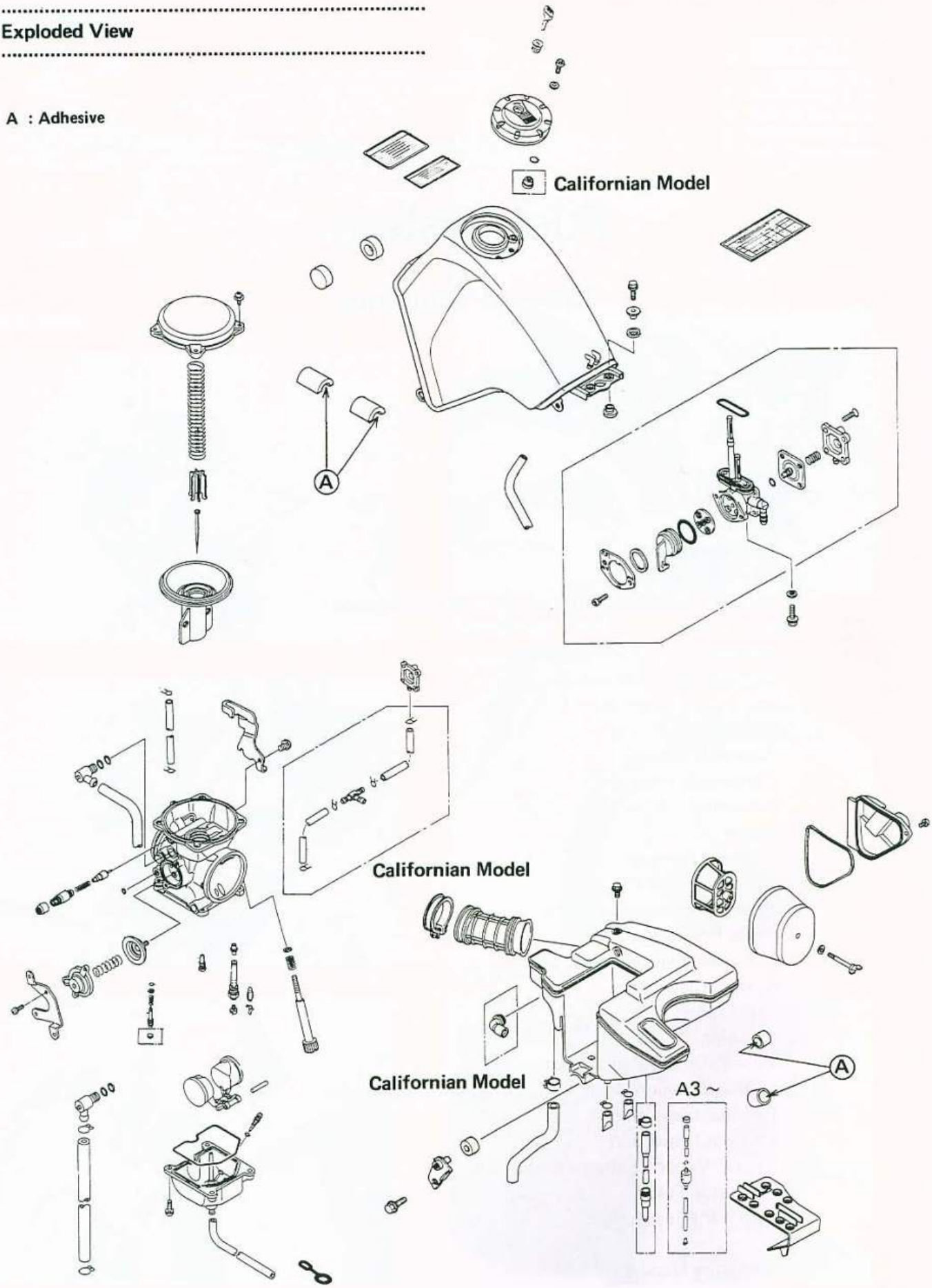
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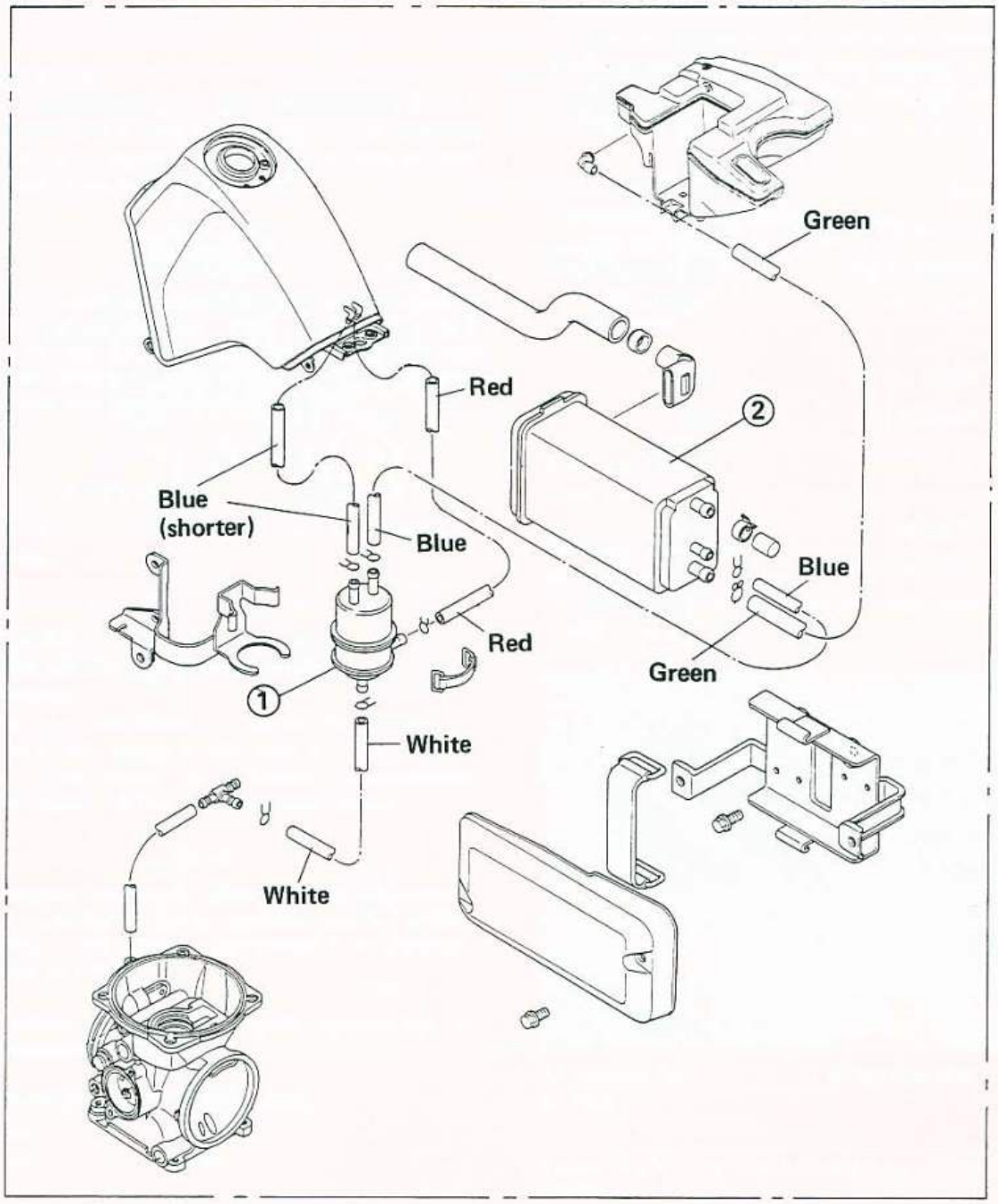

*Refer to Base Manual

## 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 | $1\frac{3}{4}$ turns out | $1\frac{3}{8}$ turns out, Ⓤ - ⒼⓌ $1\frac{1}{2}$ | $1\frac{7}{8}$ turns out, Ⓤ –, Ⓦ $1\frac{3}{4}$ |
| 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*

- Before removing the fuel tank or disconnecting the fuel hose from the fuel tap, turn the fuel tap lever to the OFF position to prevent fuel leaking out while the tank is removed or the hose is disconnected.

**WARNING**

- **Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch OFF. Do not smoke. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.**

## Carburetor

### Adjustment:

*High Altitude Performance Adjustment (US model)*

To improve the Emission Control Performance of vehicle operated above **4 000 feet (1 219 meters)**, Kawasaki recommends the following Environmental protection Agency (EPA) approved modification.

**NOTE**

- *When properly performed, these specified adjustments are not considered to be emission control system "tampering" and vehicle performance is generally unchanged as a result.*

- High altitude adjustments require replacement of certain carburetor jets.

**High Altitude Carburetor Specifications**

| | |
|---|---|
| **Main Jet:** | **#145** |
| **Pilot Jet:** | **#38** |

- After high altitude adjustments are performed, provide the customer with the Vehicle Emission Control Information Update Label and label installation instructions (P/N 99969-0614).
- Advise the customer that by law, the Vehicle Emission Control Information Update Label must be affixed to any vehicle modified with the high altitude adjustments.

**NOTE**

- *If a vehicle with the high altitude adjustments is used below 4 000 feet (1 219 meters), the update label must be removed and the original carburetor parts must be reinstalled.*

### Carburetor Disassembly:

*Carburetor Installation*

Refer to the Base Manual, noting the following.

- Refer to Cable, Wire, and Hose Routing in the chapter 1 for the carburetor overflow tube and air vent tube routing.

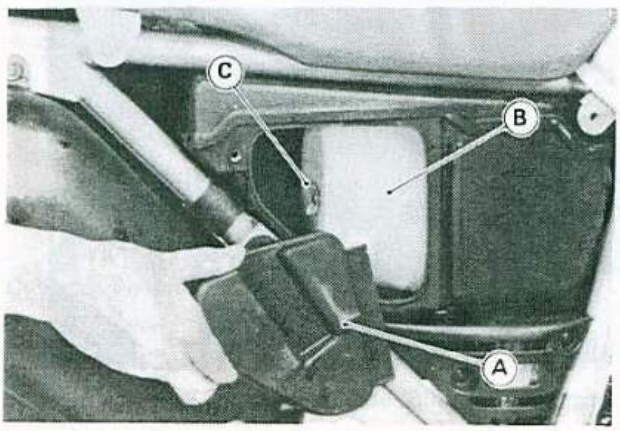
*Adjustment after Installation*

- Adjust the following.
  Throttle Grip
  Choke Lever
  Idle Speed

## Air Cleaner

*Element Removal*

- Remove the right side cover.
- Remove the screws and take off the air cleaner element cap.




A. Element Cap
B. Element
C. Wing Head Bolt

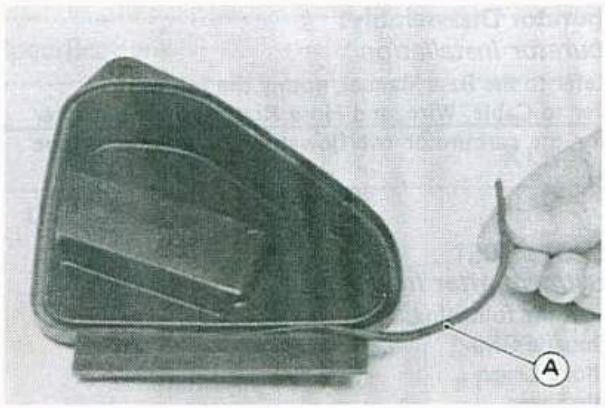
- Remove the wing head bolt and take off the air cleaner element.
- Push a clean, lint-free towel into the air cleaner housing to keep dirt or other foreign material from entering.

**CAUTION**

- **If dirt gets through into the engine, excessive engine wear and possibly engine damage will occur.**

*Element Installation Points*

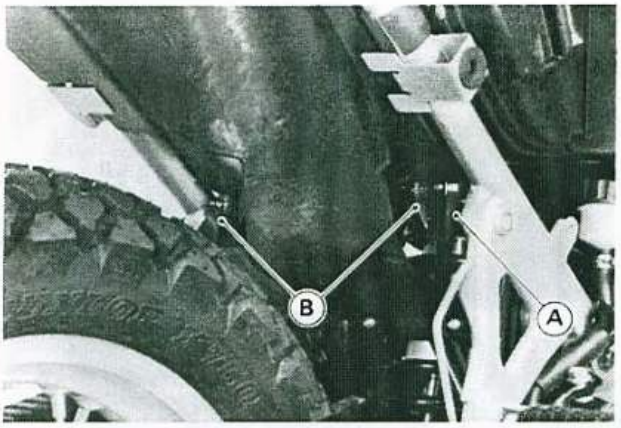
- Coat the element lip with a layer of all purpose grease to assure a complete seal against the cleaner case.
- Be sure the foam gasket is in place in the groove in the element cap.




A. Foam Gasket

*Body Installation Point*

●If the air cleaner body drain tubes were removed, install them in place on the bottom of the housing. The longer drain tube including the air filter must be installed the rear side fitting (dirty side fitting).




A. Long Drain Tube B. Short Drain Tubes

## Fuel System Cleanliness

*Fuel Tank and Cap Inspection*

●Visually inspect the gasket on the tank cap for any damage.

★Replace the gasket if it is damaged.

●Remove the hose(s) from the fuel tank, and open the tank cap.

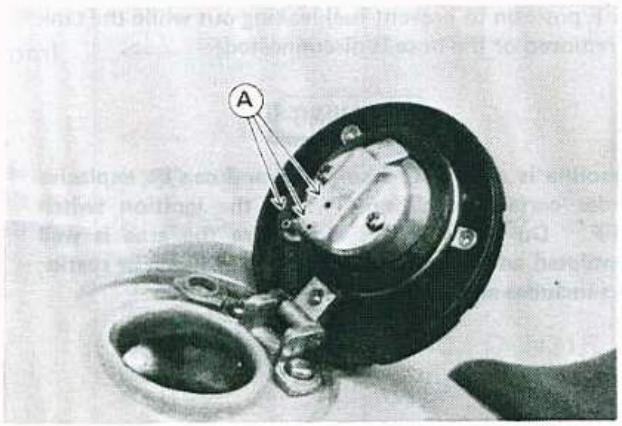
●Check to see if the breather and water drain pipes (also the fuel return pipe for the US California vehicle) in the tank are not clogged. Check the tank cap breather too.

★If the tank pipes are clogged, remove the tank and drain it and then blow the pipes free with compressed air.

★If the tank cap breather is clogged, replace it.

**CAUTION**

**○Do not apply compressed air to the air vent holes on the tank cap. This could cause damage and clogging of the labyrinth in the cap.**




A. Air Vent Holes

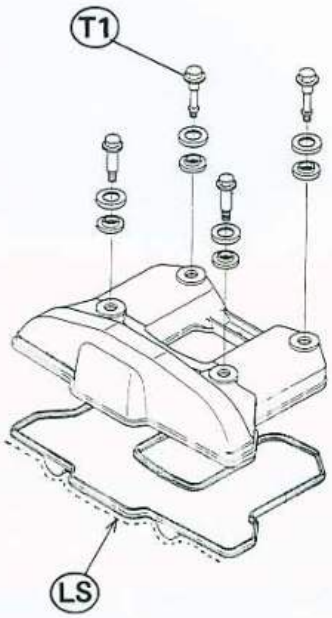
# Engine Top End

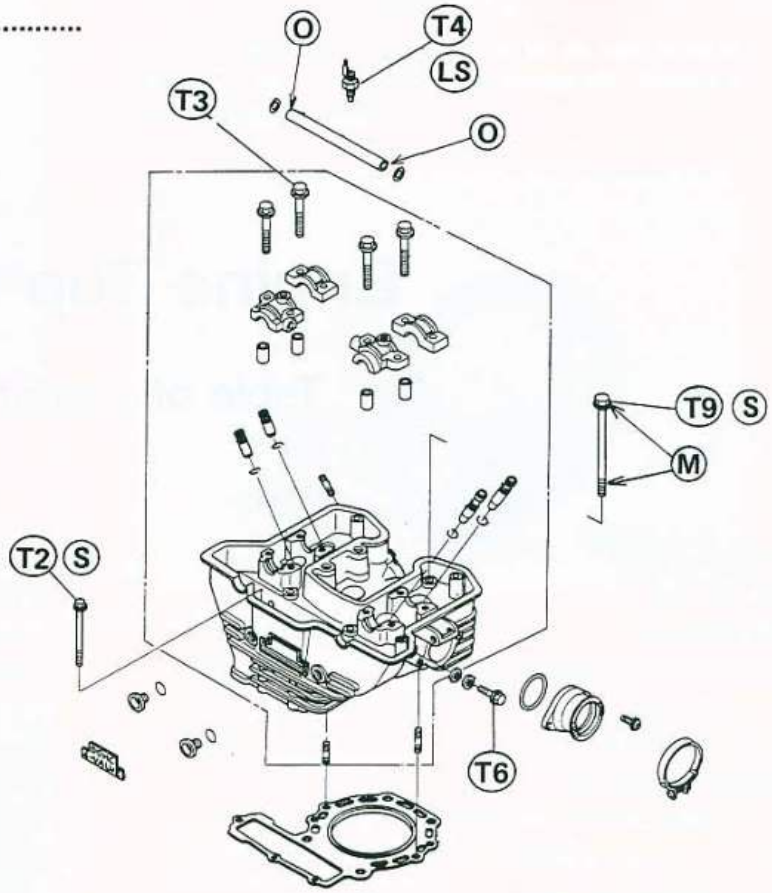
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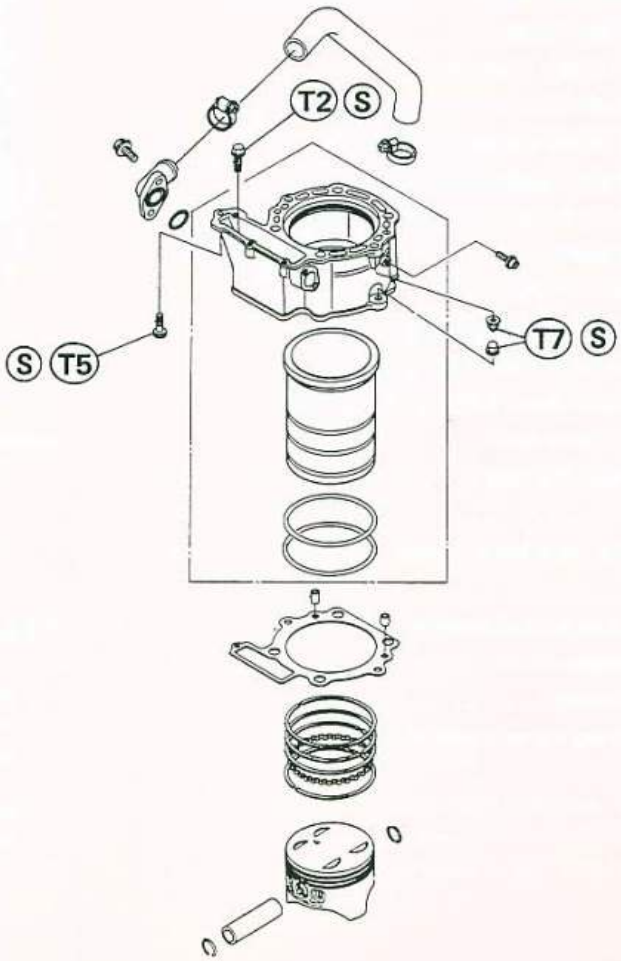

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*Refer to Base Manual

## Exploded View

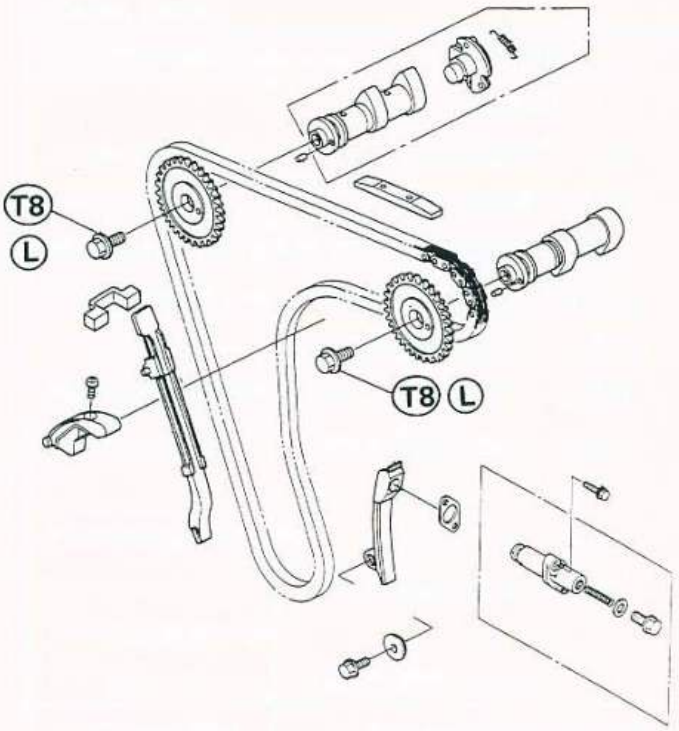


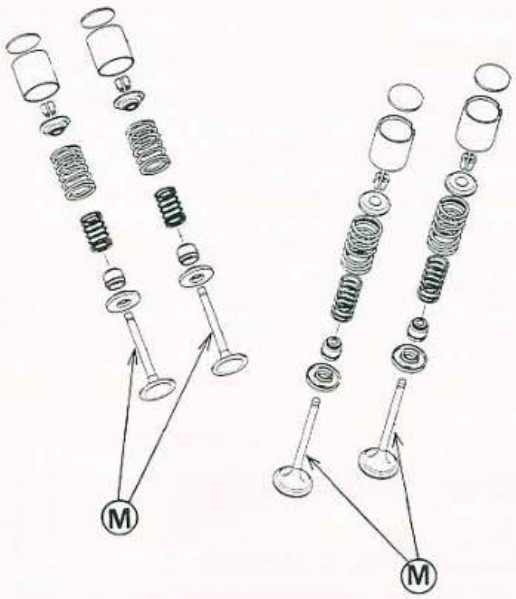



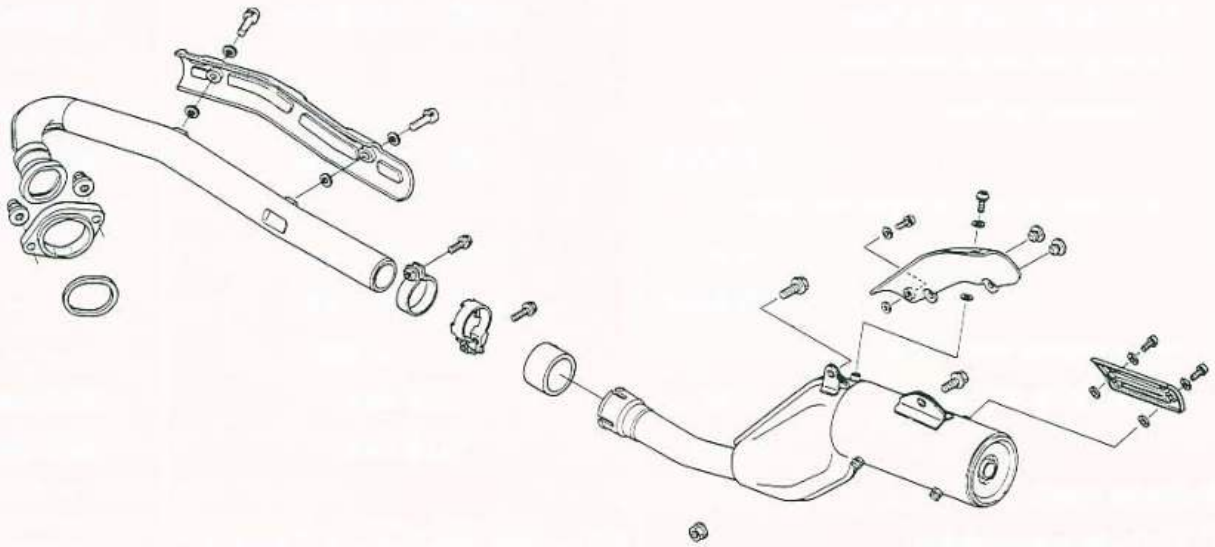




L : Non-permanent Locking Agent
LS: Liquid Gasket (Silicone Sealant)
M : Molybdenum Disulfide Grease
O : Engine Oil
S : Follow the specific tightening sequence.

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


T8
L
T8
L


M
M



## Service Data

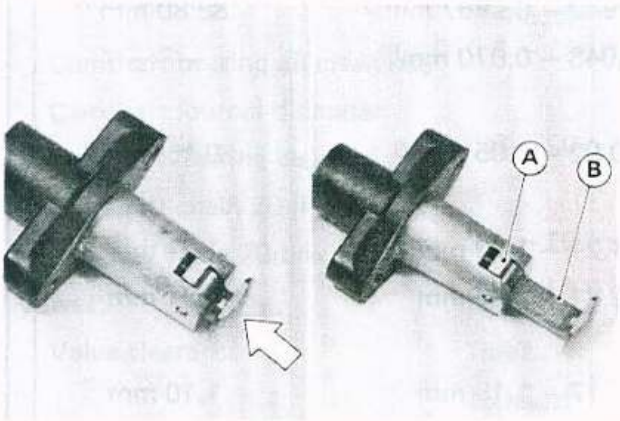
| Item | | Standard | Service Limit |
|---|---|---|---|
| **Camshafts, Chain:** | | | |
| Cam height: | Inlet | 36.75 – 36.85 mm | 36.65 mm |
| | Exhaust | 36.25 – 36.35 mm | 36.15 mm |
| Camshaft bearing oil clearance | | 0.030 – 0.064 mm | 0.15 mm |
| Camshaft journal diameter | | 22.949 – 22.970 mm | 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/cm$^2$, 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

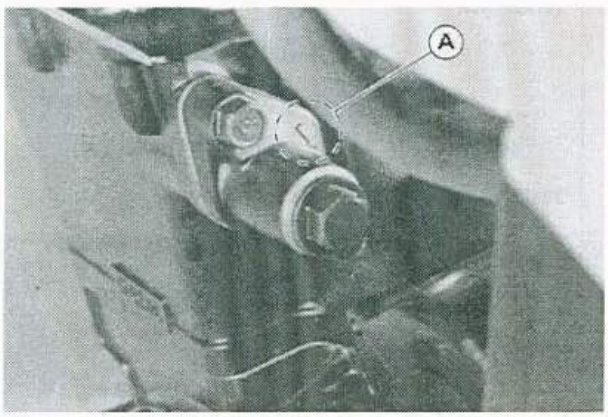
*Installation*

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




A. Ratchet Stopper B. Push Rod

- Install the chain tensioner with the gasket so that the arrow on it points downwards.




A. Arrow

- Install the spring and tighten the cap bolt with the gasket.

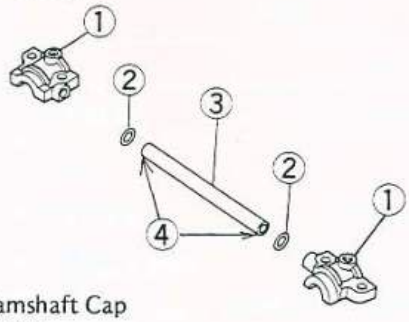
## Oil Pipes

*Oil Pipe Installation Points*

Refer to the Base Manual, noting the following.

- Apply engine oil to both ends of the head oil pipe to prevent damage to the O-rings in the camshaft caps.

**Head Oil Pipe**



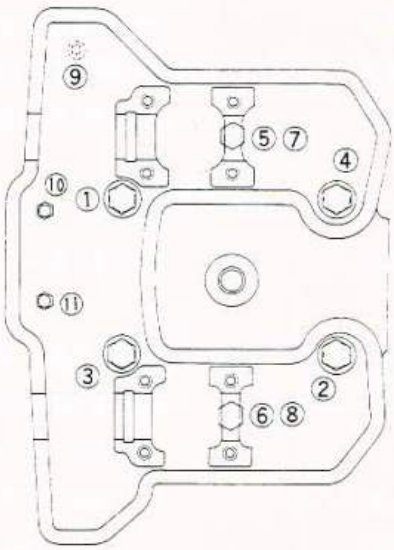

1. Camshaft Cap
2. O-ring
3. Oil Pipe
4. Apply engine oil.

## Cylinder Head

*Installation Points of Cylinder Head*

Refer to the Base Manual, noting the following.

**Cylinder Head Bolts and Nuts Tightening Torque and Sequence**




① – ④ : Cylinder Head Bolts (10 mm)
Torque them first to 20 N-m (2.0 kg-m, 14.5 ft-lb) and then to 65 N-m (6.6 kg-m, 48 ft-lb) following the tightening sequence.

⑤ – ⑥ : Cylinder Head Nuts
25 N-m (2.5 kg-m, 18.0 ft-lb)

⑦ – ⑧ : Cylinder Nuts (Retighten)
25 N-m (2.5 kg-m, 18.0 ft-lb)

⑨ : Cylinder Head Bolt (8 mm)
18 N-m (1.8 kg-m, 13.0 ft-lb)

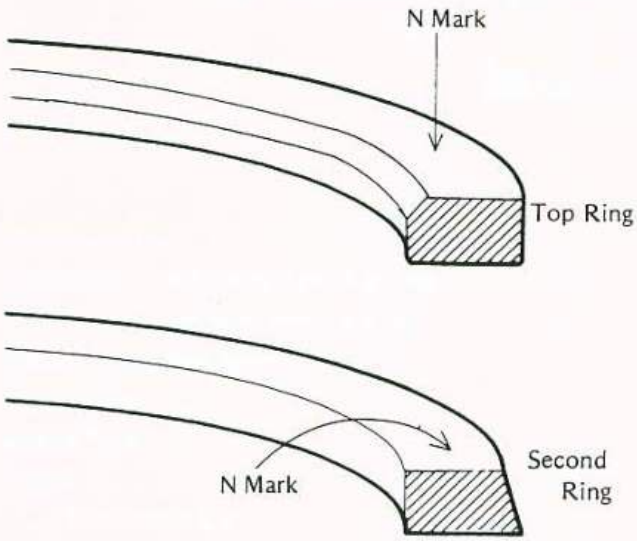
⑩ – ⑪ : Cylinder Head Bolts (6 mm)
9.8 N-m (1.0 kg-m, 87 in-lb)

## 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

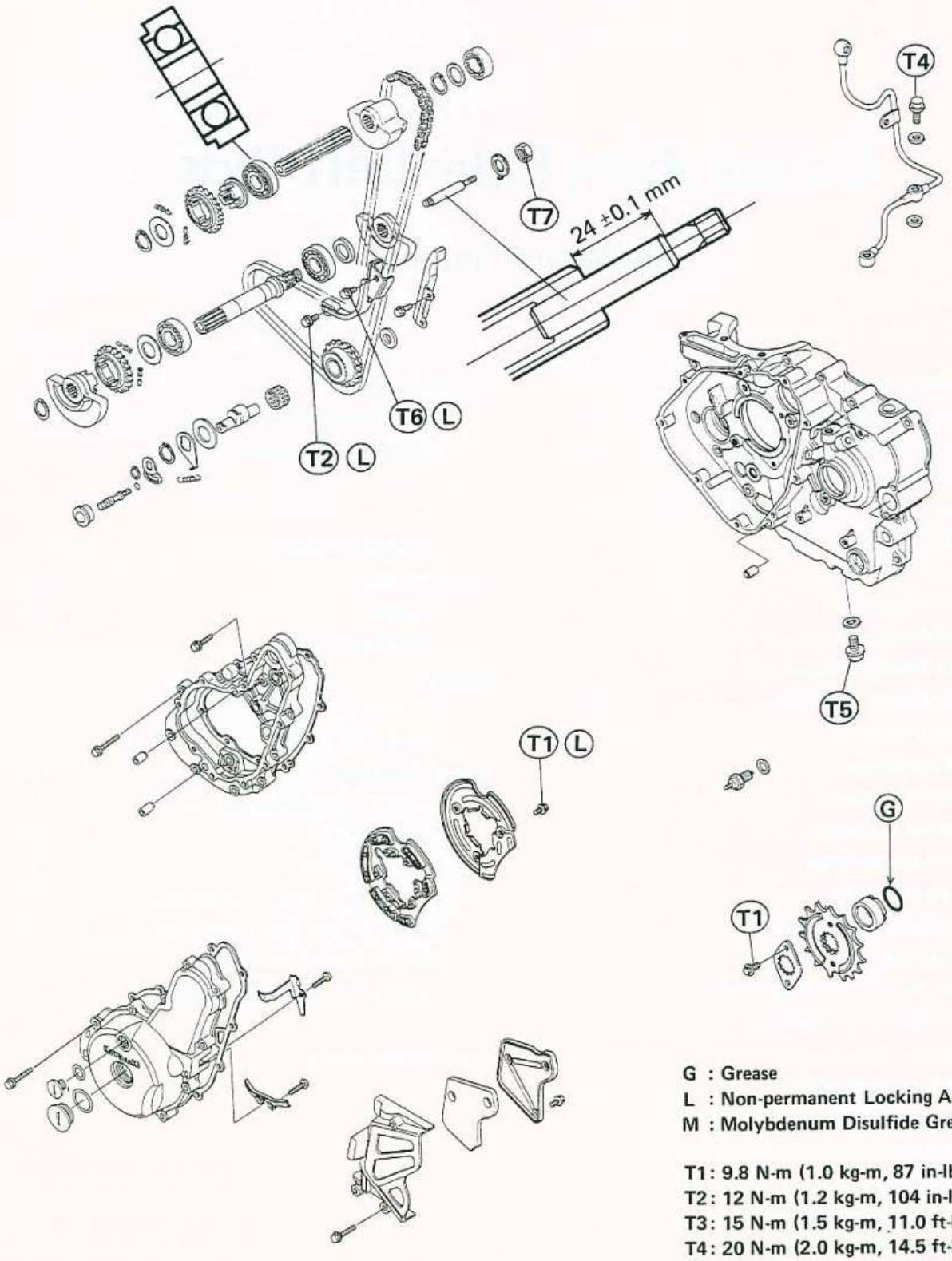
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*Refer to Base Manual

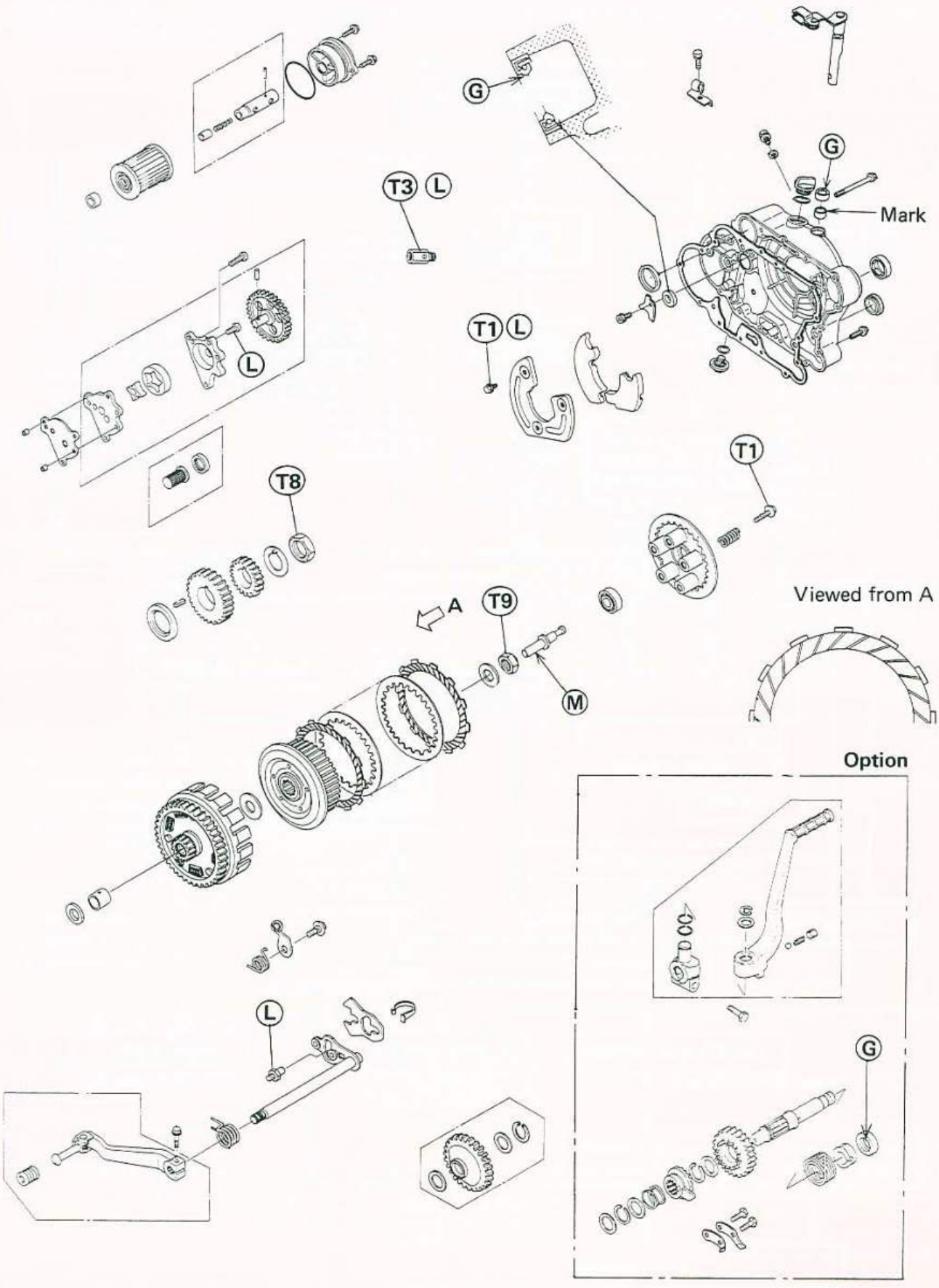
4

## Exploded View



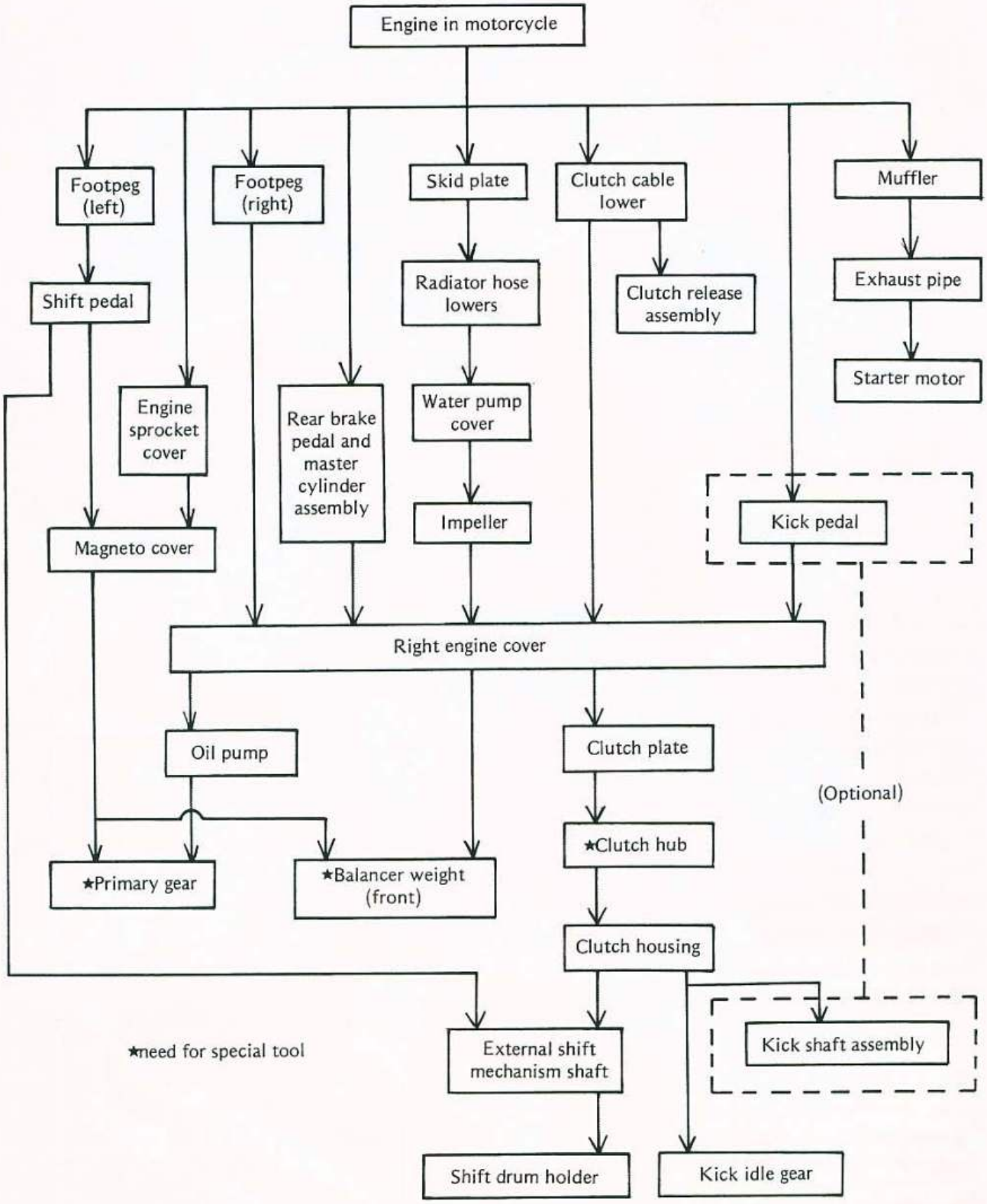

G : Grease
L : Non-permanent Locking Agent
M : Molybdenum Disulfide Grease

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
T8
T1
A
T9
M
Viewed from A
Option
L
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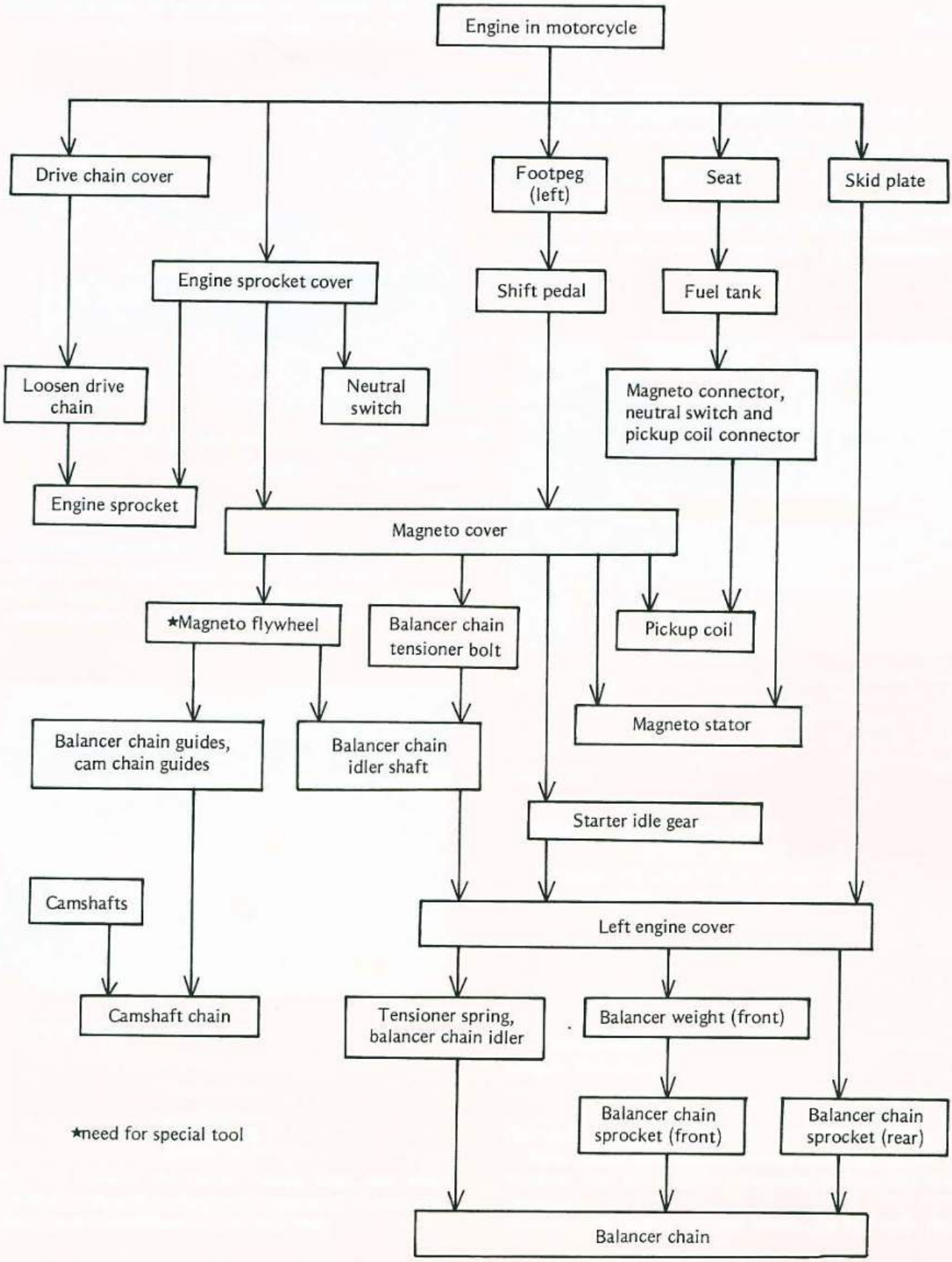
## Flow Chart — Right Side Parts Removals

○The following chart is intended to be an aid to proper removal. Select the component you wish to remove and follow the arrows to that point on the chart.



## Flow Chart — Left Side Parts Removals

○The following chart is intended to be an aid to proper removal. Select the component you wish to remove and follow the arrows to that point on the chart.



## 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 | 78 – 147 kPa | – – – |
| @4 000 rpm (r/min), 90°C (194°F) | (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.

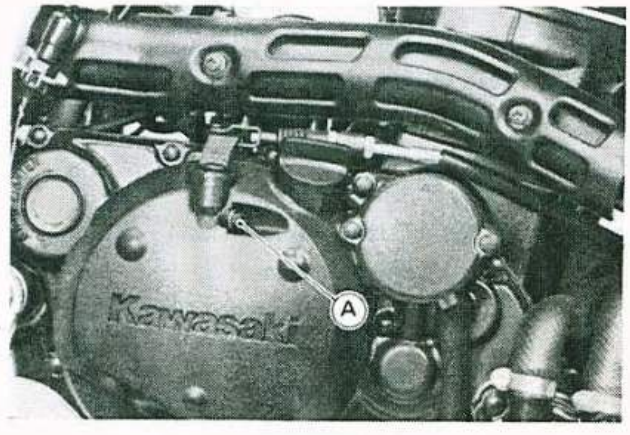



A. Clutch Lever Play (at lever end): 10 – 15 mm

### *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.

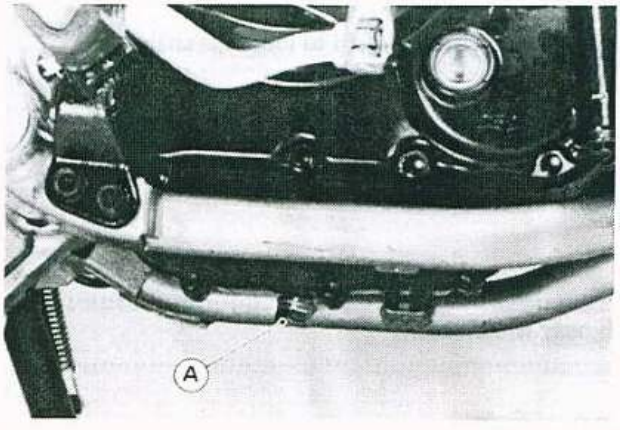
## Engine Lubrication System

### 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**

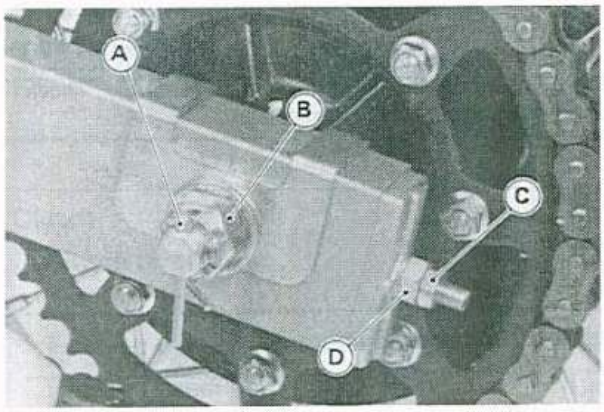
**Grade:** SE or SF class
**Viscosity:** SAE 10W40, 10W50
20W40, or 20W50
**Amount:** 2.2 L (oil filter is not removed)
2.5 L (oil filter is removed)

## Engine Sprocket

### *Removal*

Refer to the Base Manual, noting the following.

- Loosen the drive chain to remove it from the rear sprocket.
- Remove the cotter pin and loosen the rear axle nut.




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

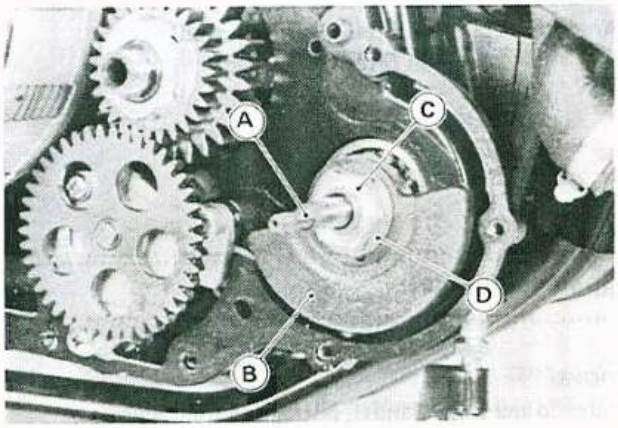
○Loosen the locknuts and back out both left and right chain adjusting nuts evenly.
○Push the rear wheel forward to loose the chain.

## 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.




A. Water Pump Shaft
B. Right Weight
C. Nut
D. Toothed Lockwasher

*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)**

# Cooling System

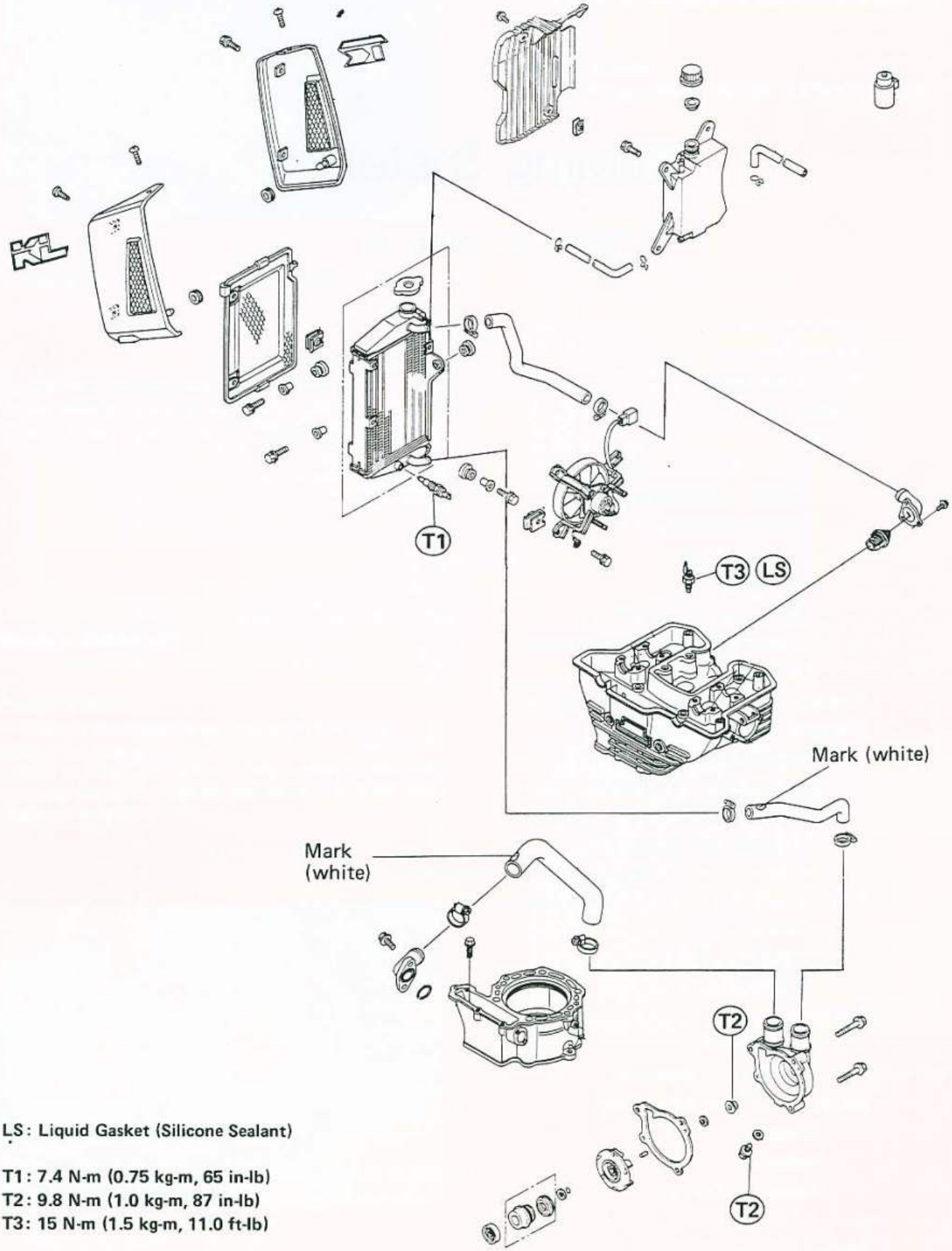
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*Refer to Base Manual

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## Exploded View



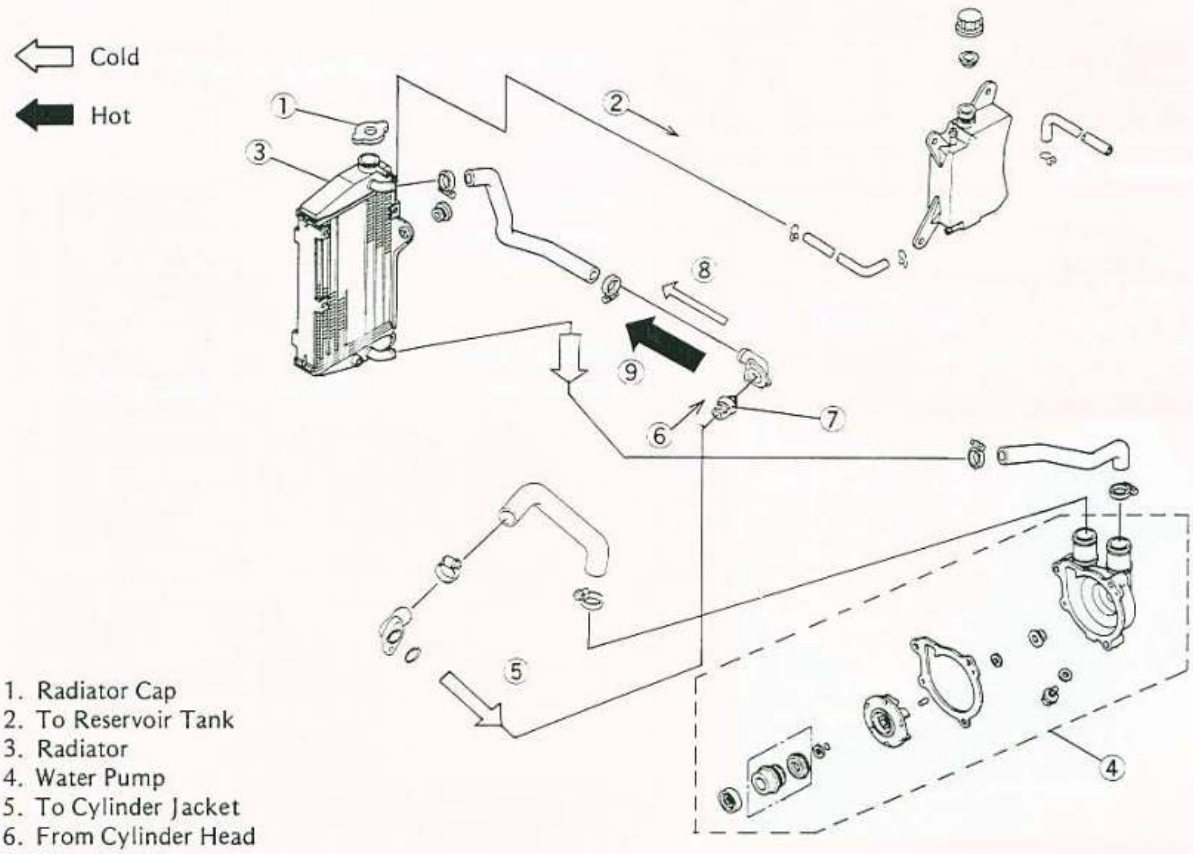

LS: Liquid Gasket (Silicone Sealant)

T1: 7.4 N-m (0.75 kg-m, 65 in-lb)
T2: 9.8 N-m (1.0 kg-m, 87 in-lb)
T3: 15 N-m (1.5 kg-m, 11.0 ft-lb)

## Service Data

| Item | | Standard |
|---|---|---|
| **Coolant:** | | |
| Type (recommended) | | Permanent type of antifreeze (soft water and ethylene glycol plus corrosion and rust inhibitor chemicals for aluminum engines and radiators) |
| Mixed ratio (provided coolant when shipping) | | Soft water 50%, coolant 50% |
| Freezing point (provided coolant when shipping) | | –35°C (–31°F) |
| Total amount | | 1.3 L |
| **Radiator Cap:** | Relief pressure | 93 – 123 kPa (0.95 – 1.25 kg/cm², 14 – 18 psi) |
| **Thermostat:** | Valve opening temperature | 69.5 – 72.5°C (157 – 162°F) |
| | Valve full opening lift | Not less than 3 mm @85°C (185°F) |

## Coolant Flow Chart



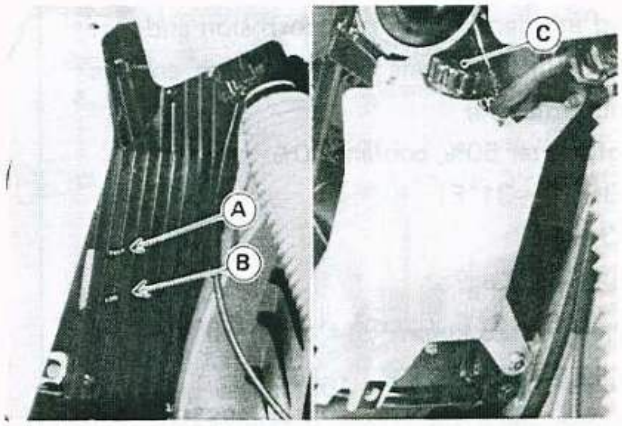

1. Radiator Cap
2. To Reservoir Tank
3. Radiator
4. Water Pump
5. To Cylinder Jacket
6. From Cylinder Head
7. Thermostat
8. Through Thermostat Air Bleeder Hole
9. Through Thermostat Valve

## Coolant

### *Coolant Level Inspection*

Refer to the Base Manual, noting the following.

●The reserve tank is mounted to the right lower side of the frame head pipe.




A. FULL Mark
B. LOW Mark
C. Tank Cap

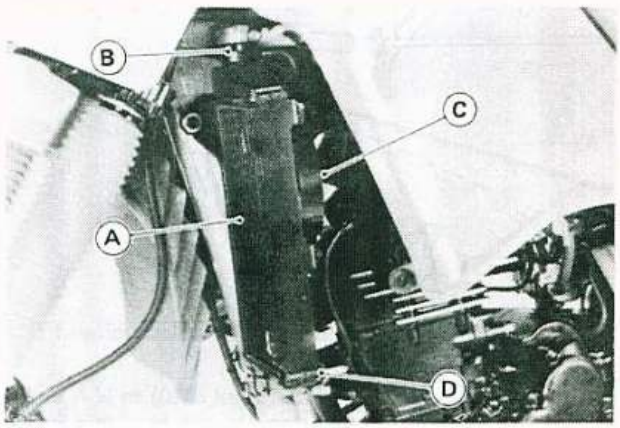
○Set the motorcycle on its side stand during the coolant level inspection.

## Radiator, Radiator Fan

### *Removal Points*

Refer to the Base Manual, noting the following.

●The radiator is one-piece type and is mounted to the left lower side of the frame head pipe.




A. Radiator
B. Radiator Cap
C. Radiator Fan
D. Radiator Fan Switch

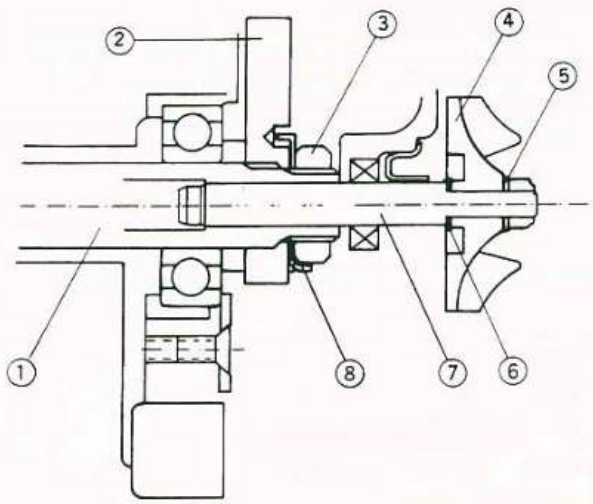
## Water Pump, Mechanical Seal

### *Assembly Points*

Refer to the Base Manual, noting the following.

●Impeller shim selection is not necessary. Install only the shim which is 0.8 mm thickness.

**Water Pump Installation**




1. Balancer Shaft
2. Right Weight
3. Nut
4. Impeller
5. Washer
6. Shim (0.8 mm thickness)
7. Impeller Shaft
8. Lockwasher

**Tightening Torque**

| | |
|---|---|
| **Impeller Nut:** | **9.8 N-m (1.0 kg-m, 87 in-lb)** |

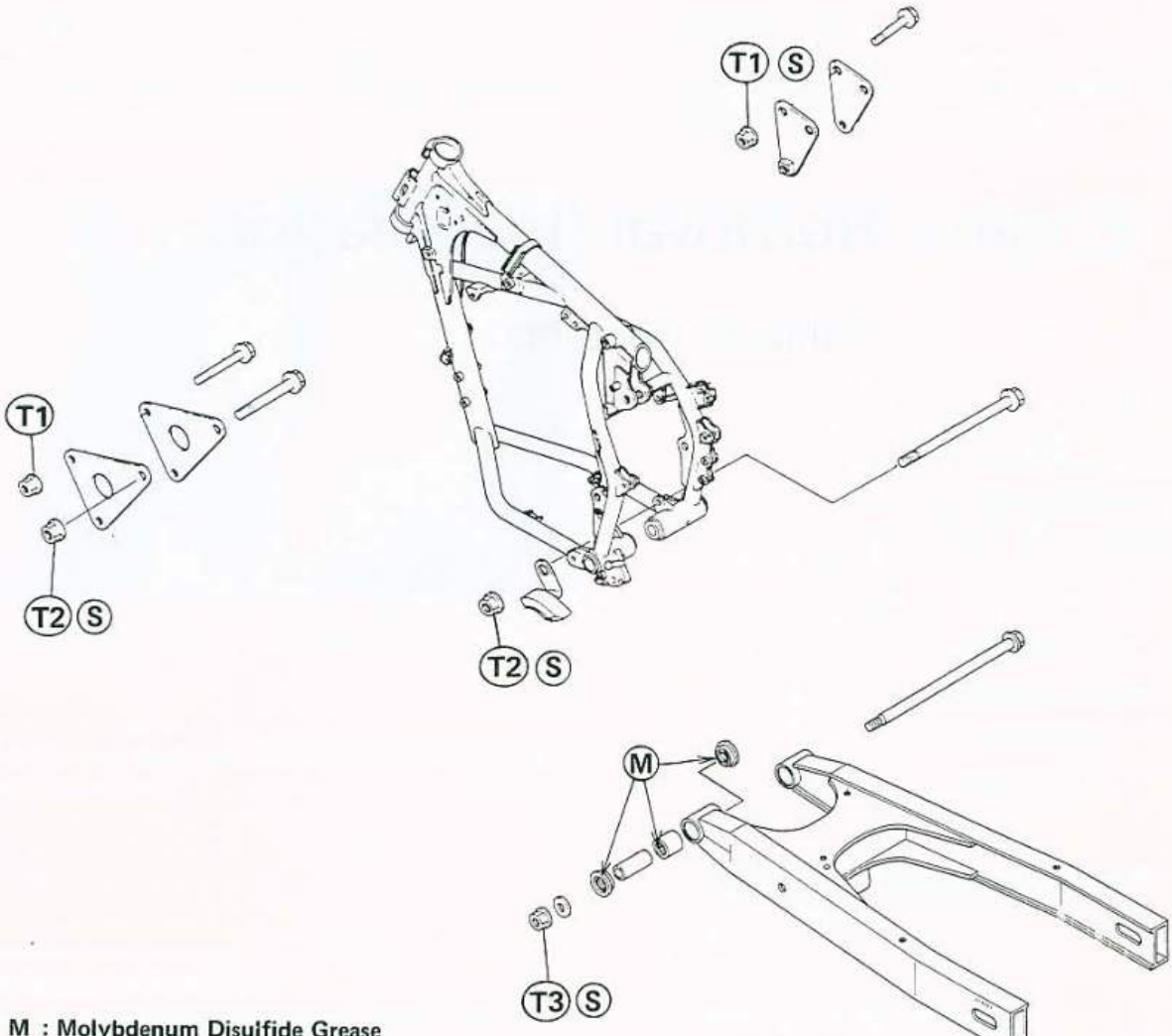
# Engine Removal/Installation

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*Refer to Base Manual

## Exploded View




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

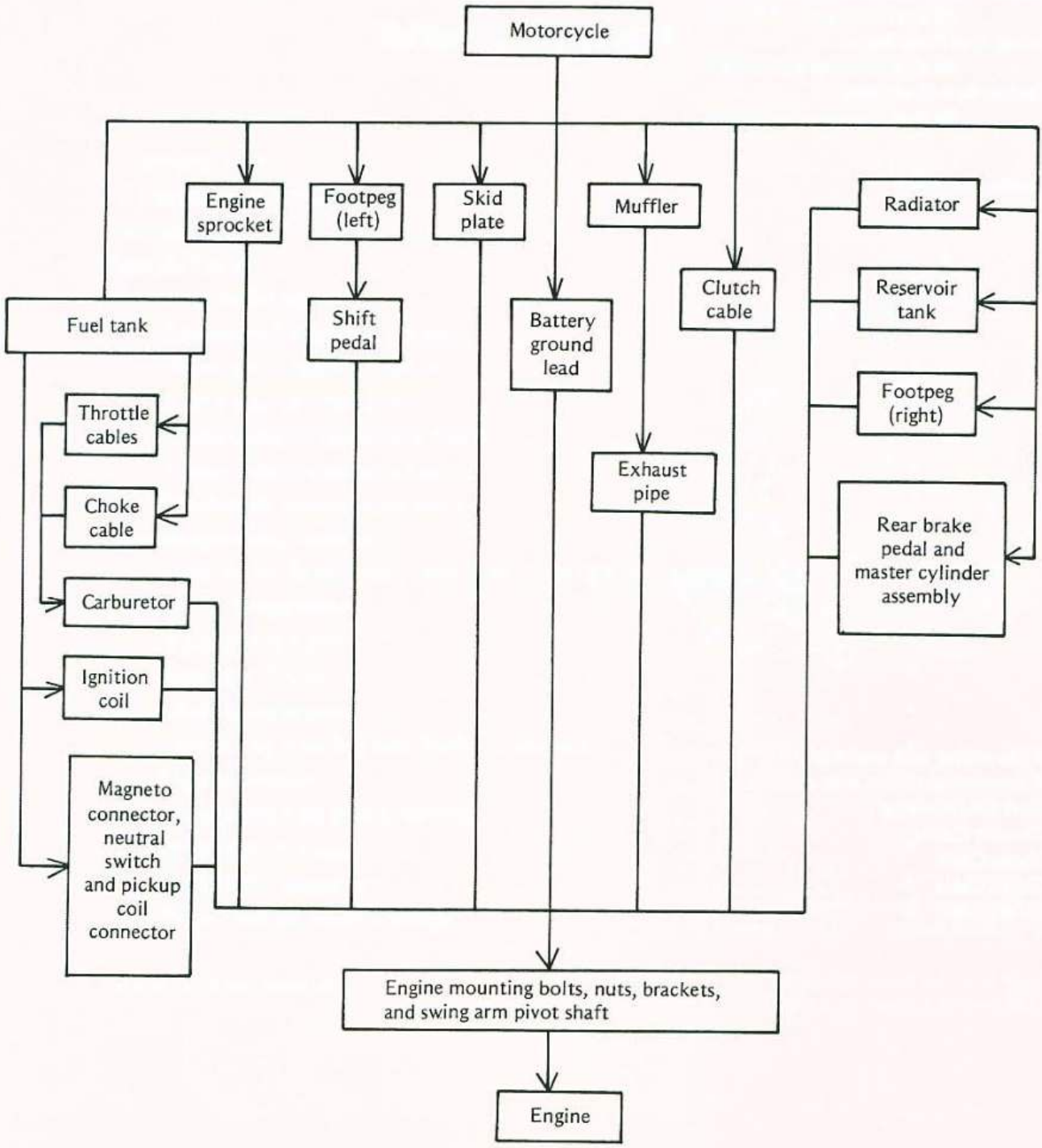
T1 : 25 N-m (2.5 kg-m, 18.0 ft-lb)
T2 : 44 N-m (4.5 kg-m, 33 ft-lb)
T3 : 98 N-m (10.0 kg-m, 72 ft-lb)

## 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.



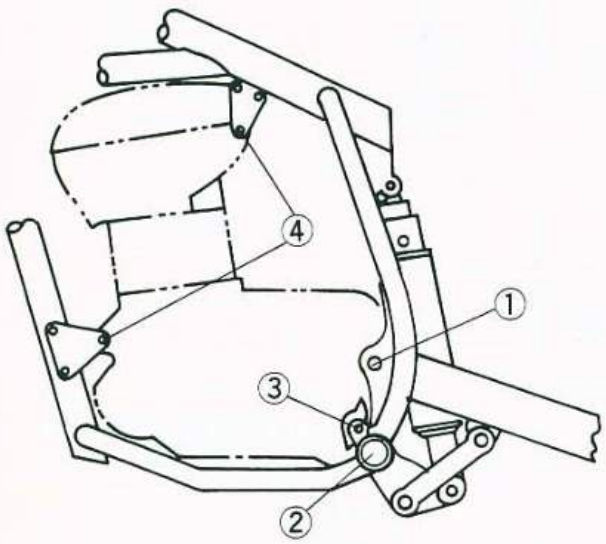
*Installation*

- 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

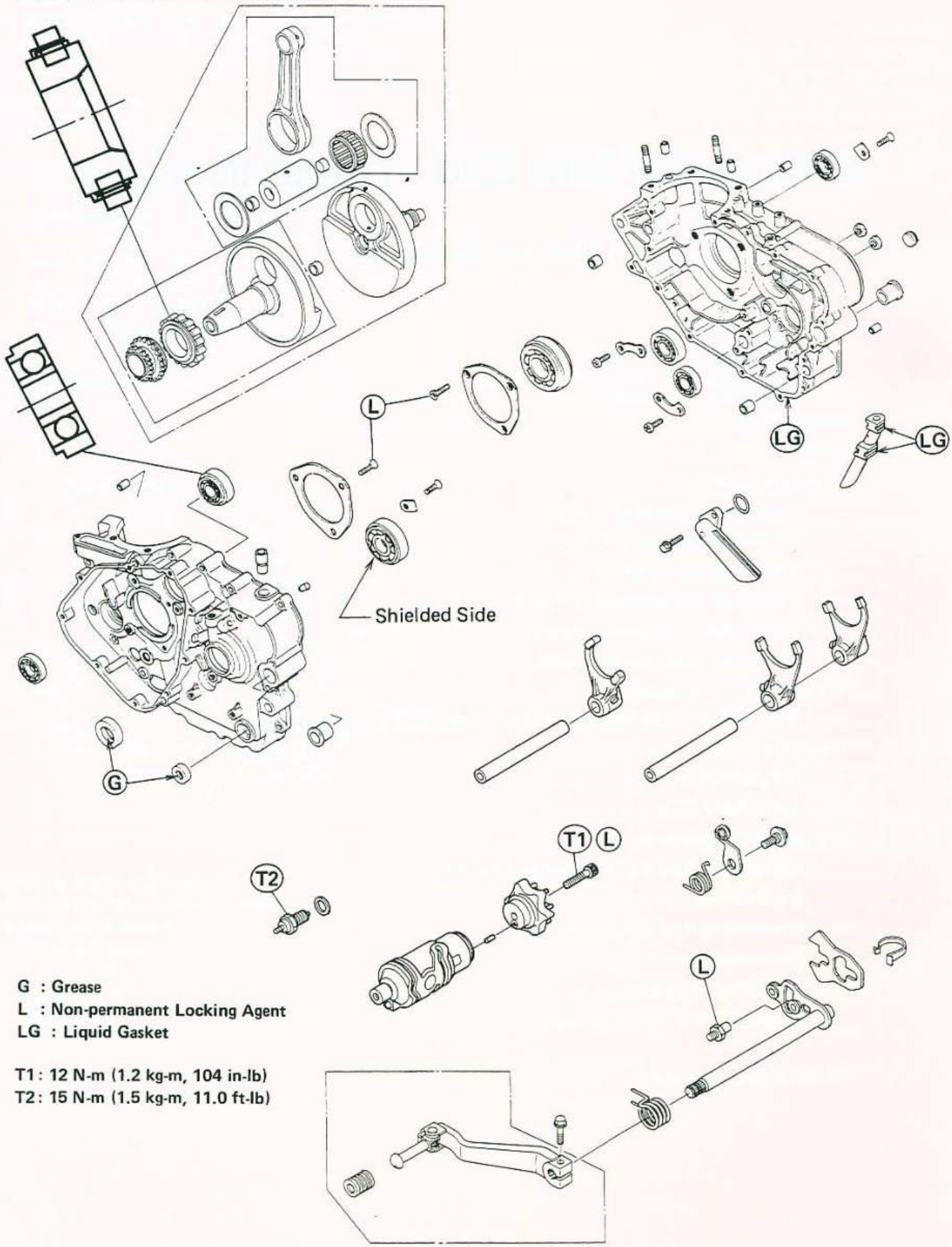
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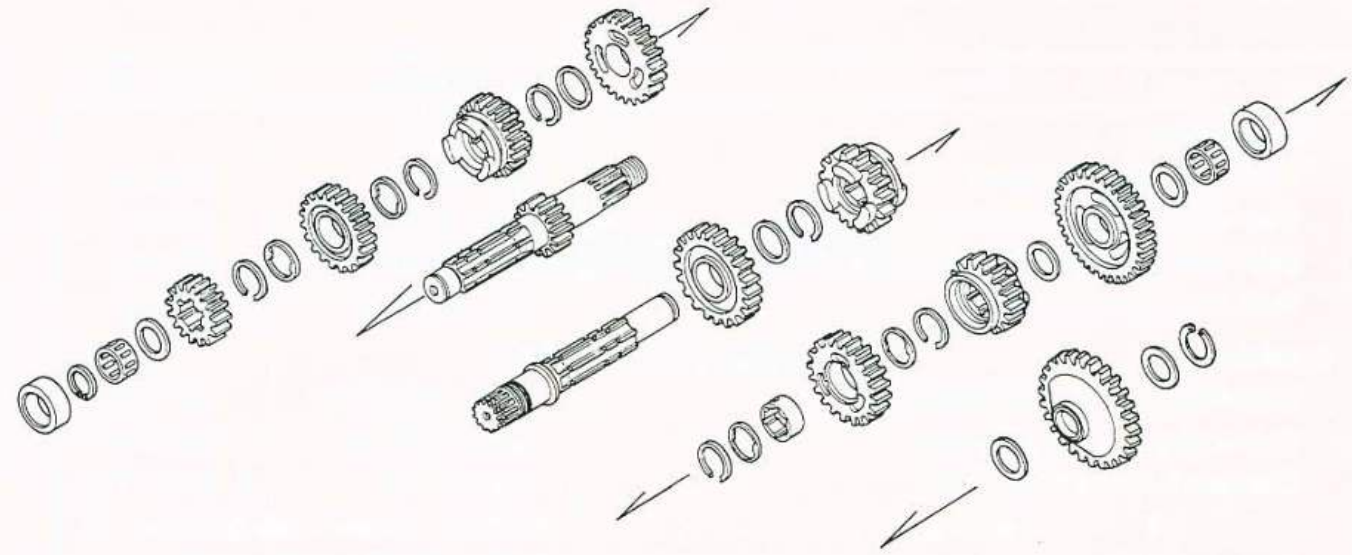

*Refer to Base Manual

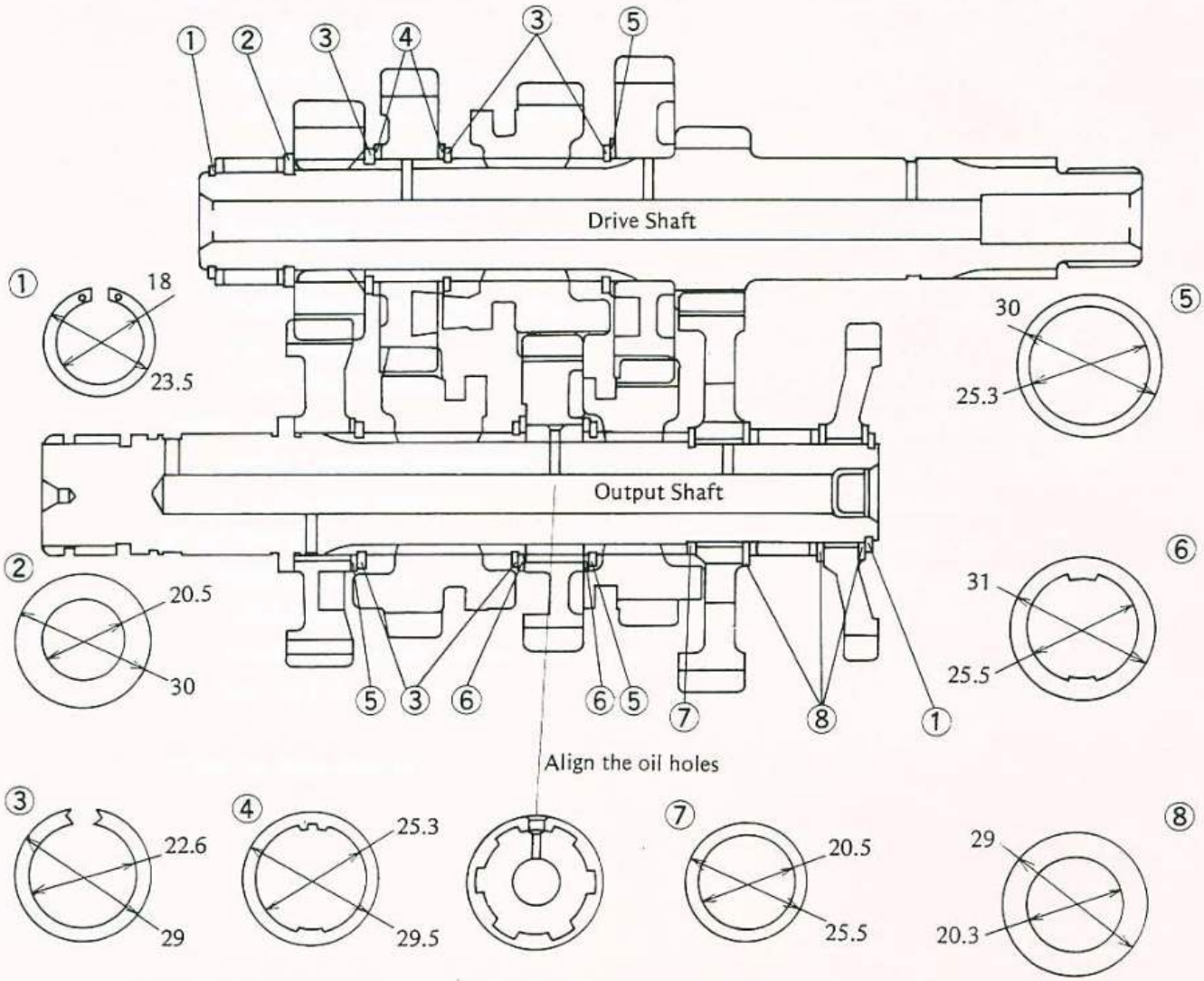
## Exploded View




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 | – – – |

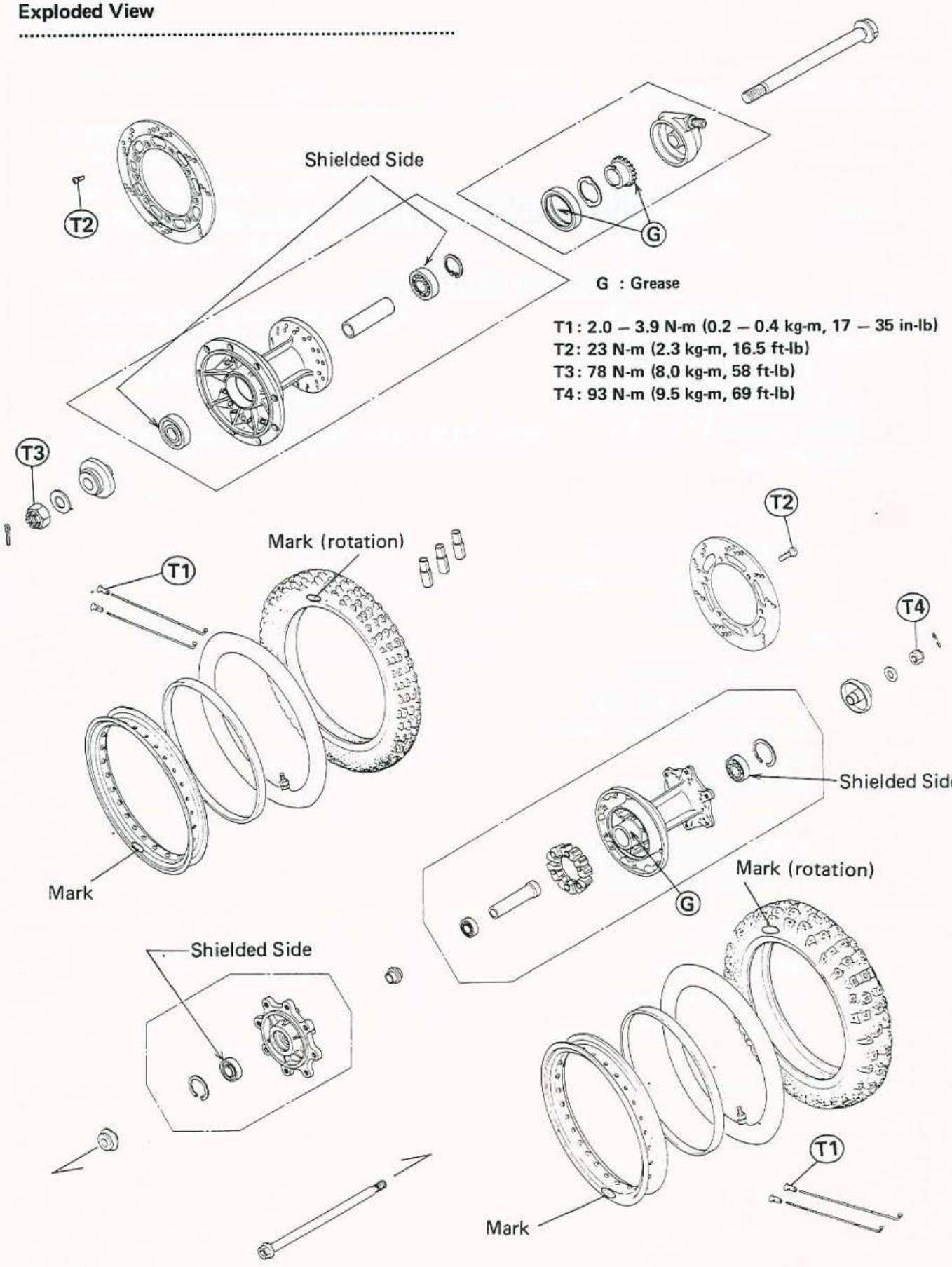
# Wheels/Tires

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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<br>DUNLOP K750<br>Ⓐ -A3 ~: DUNLOP TRAIL MAX | – – – |
| | Rear | 130/80-17 65S<br>DUNLOP K750<br>Ⓐ -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

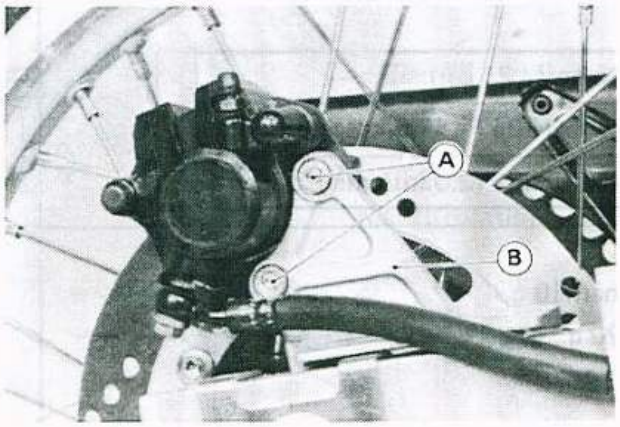
### *Adjustment after Tire Installation*

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

## Wheels

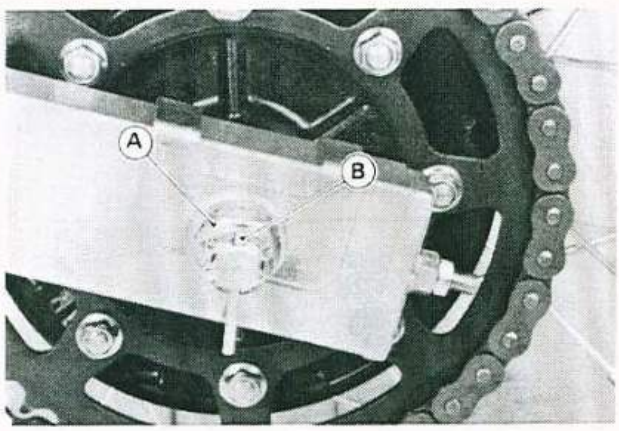
### *Rear Wheel Removal*

- 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.

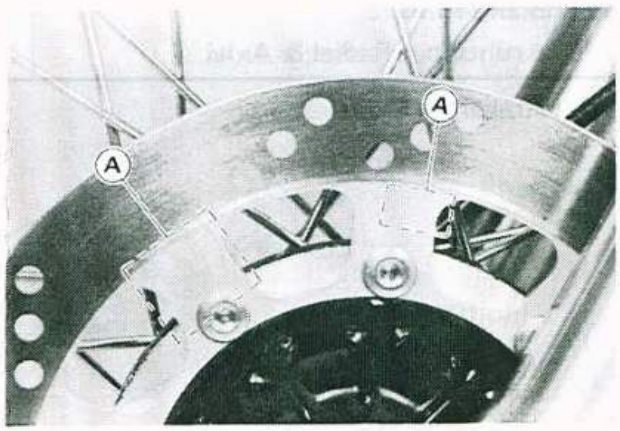
### *Disc Installation Points*

- 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.

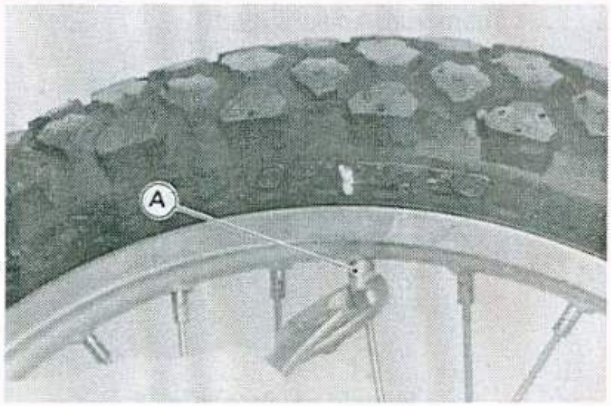
Check and balance the front wheel when required, or when a tire and/or rim is replaced with a new one.

- 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.



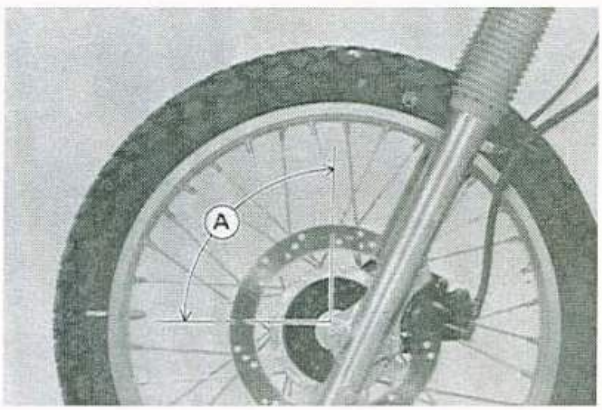

A. Mark at the top.

- 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.*

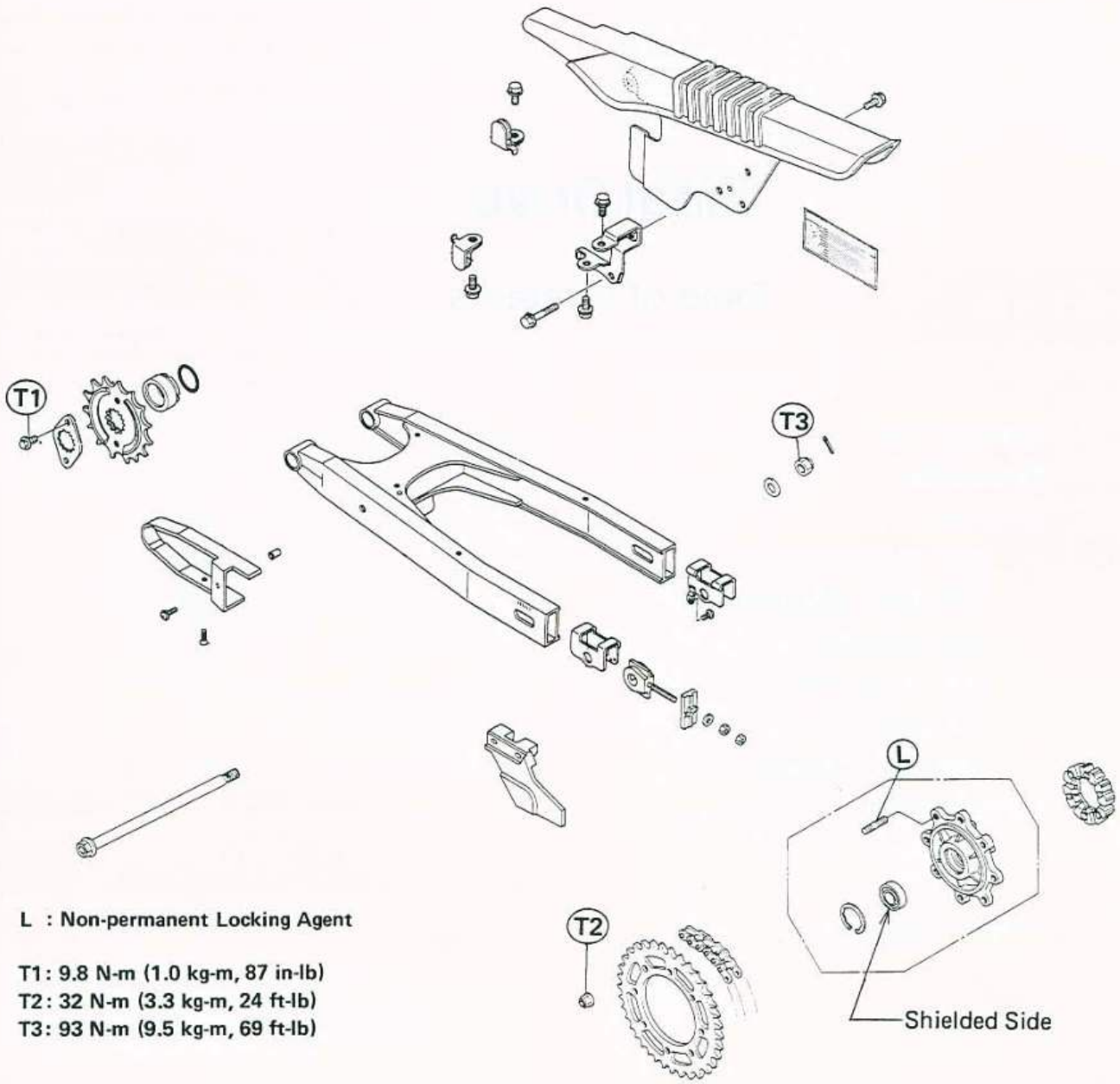
# Final Drive

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*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 |

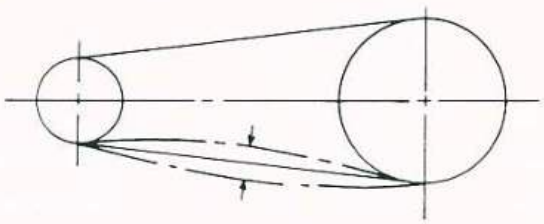
## Drive Chain

### *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**

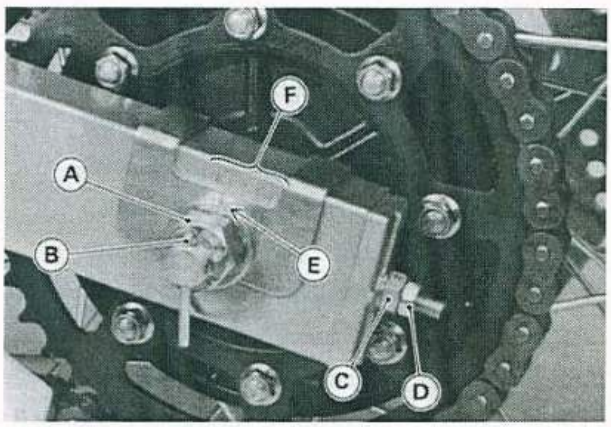


**Drive Chain Slack**

| | |
|---|---|
| **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.

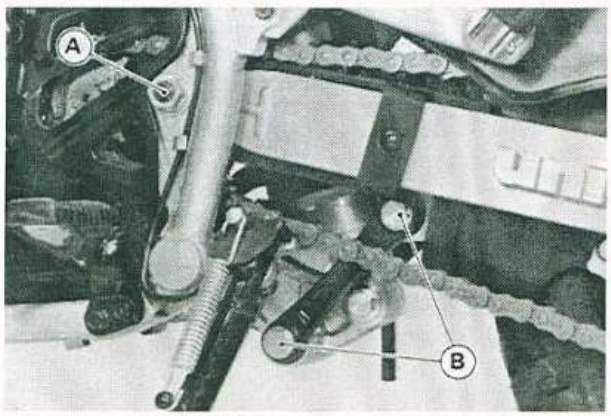
**WARNING**

○**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.

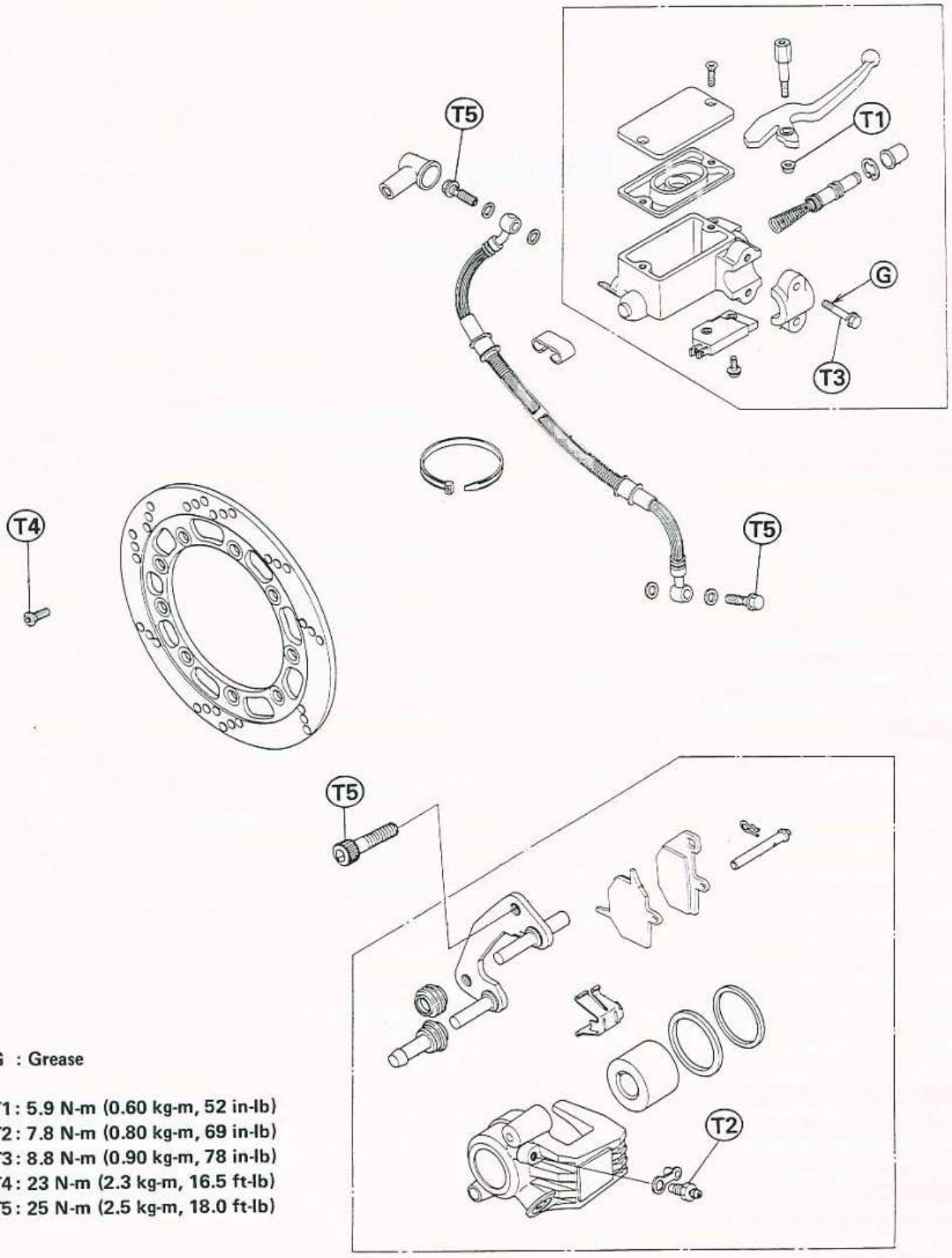
# Brakes

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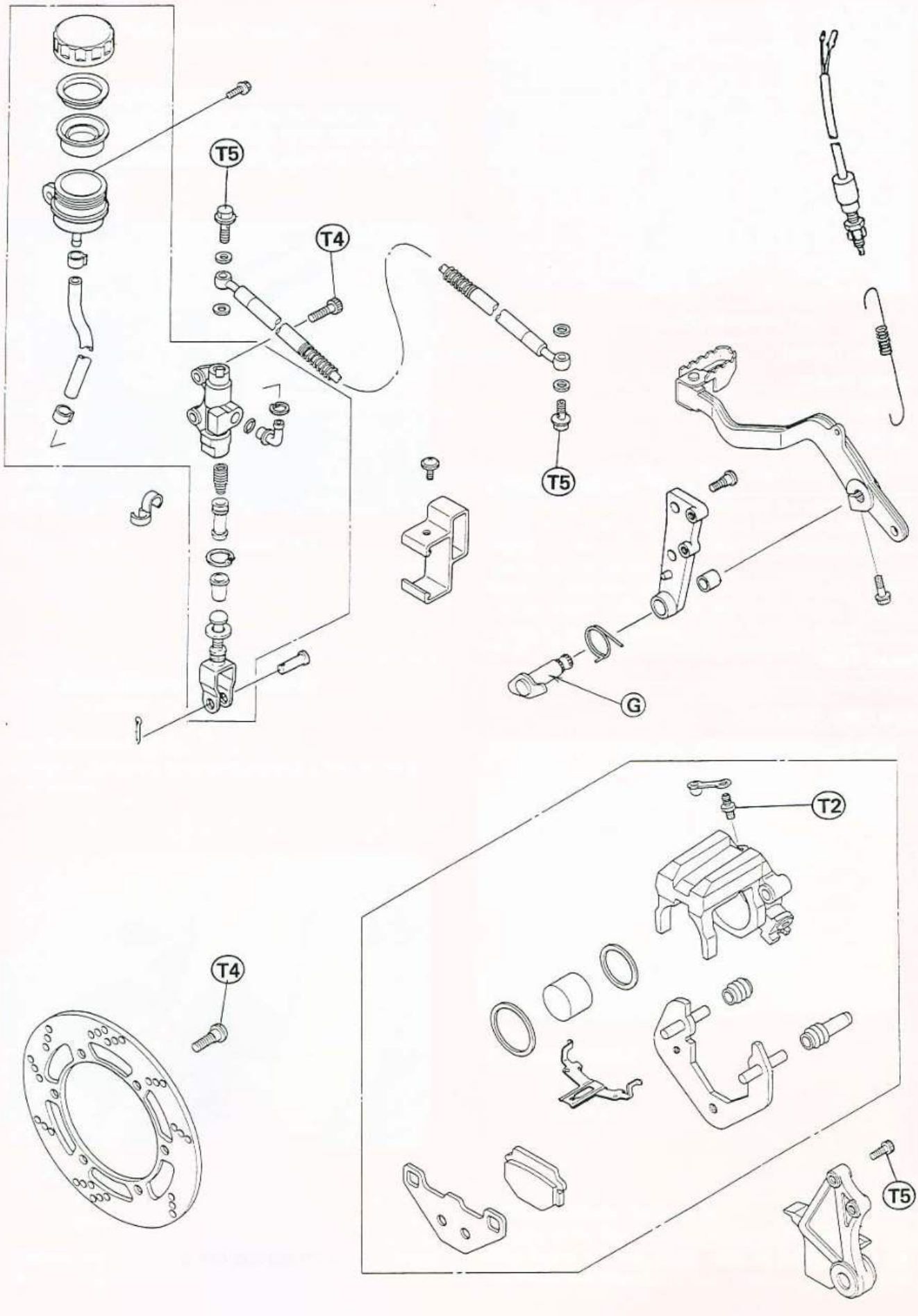

*Refer to Base Manual

## Exploded View




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)

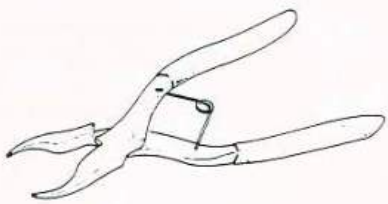

T5
T4
T5
G
T4
T2
T5

## 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**

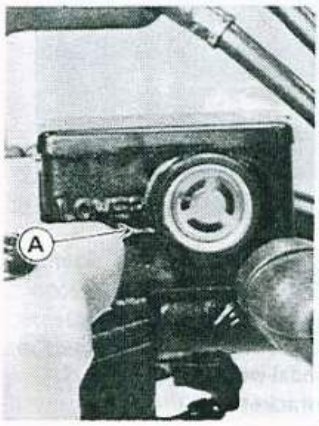


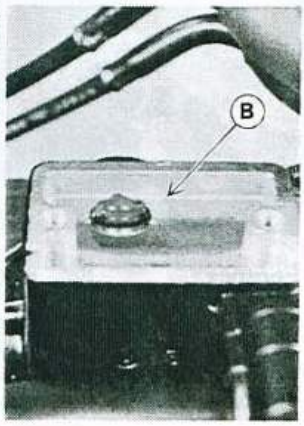
## Front Brake Adjustment/Inspection

### *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.



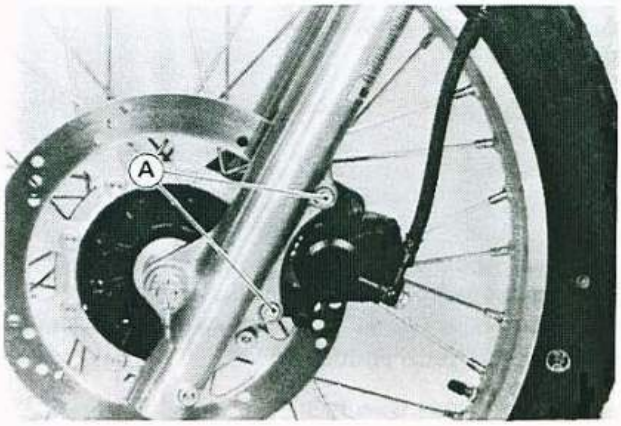




A. Lower Level B. Upper Level

## Front Brake Disassembly/Assembly

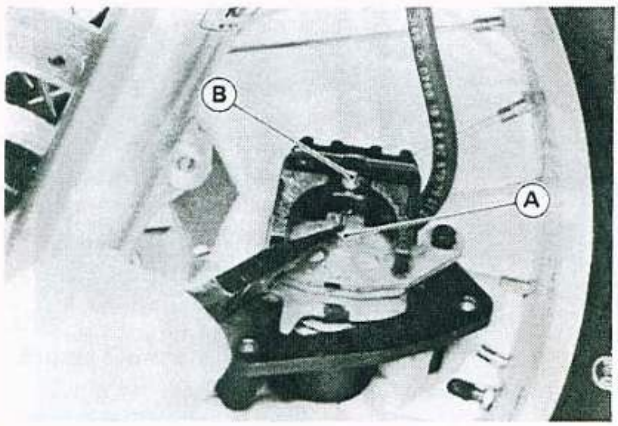
### *Pad Removal Points*

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




A. Caliper Mounting Bolts

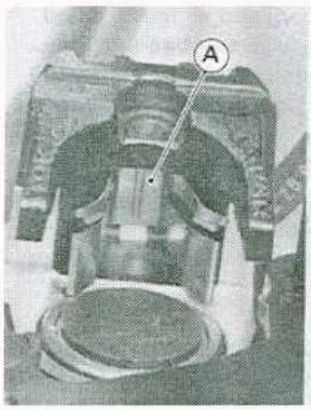
- Remove the safety clip and pull out the pad retaining pin.

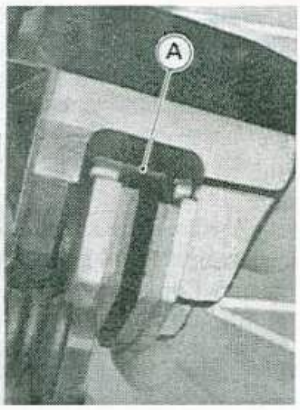



A. Safety Clip B. Retaining Pin

### *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.



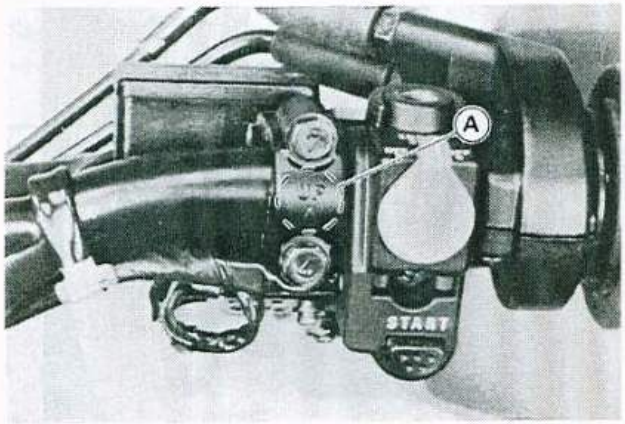




A. Anti-rattle Spring

### *Master Cylinder Installation*

Refer to the Base Manual, noting the following.

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

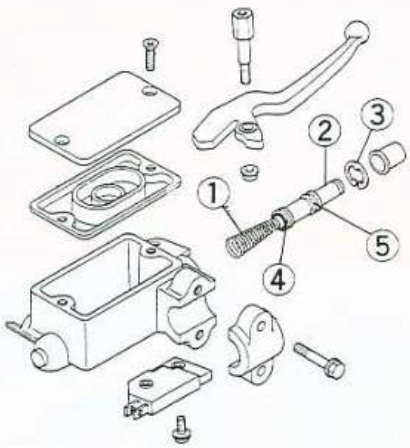



A. UP Mark

*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.**

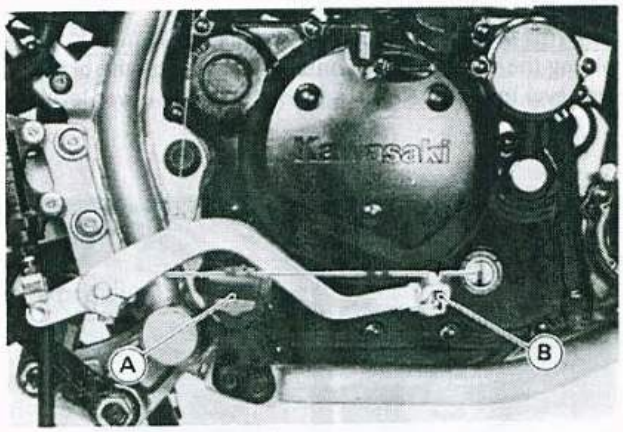
## Rear Brake Adjustment/Inspection

*Pedal Position Adjustment*

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

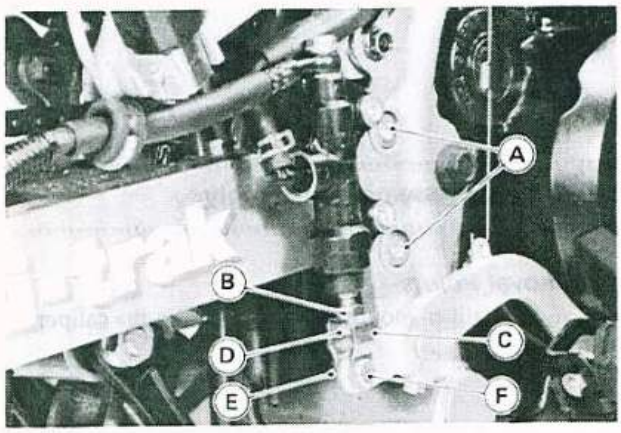
**Brake Pedal Position**

**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

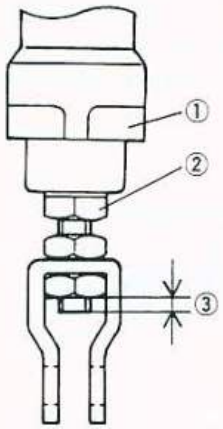
- Pull out the cotter pin and the clevis pin.
- Loosen the locknut of the rod with the clevis held.
- Up or down the adjusting nut by turning the clevis to adjust the brake pedal position.

**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.

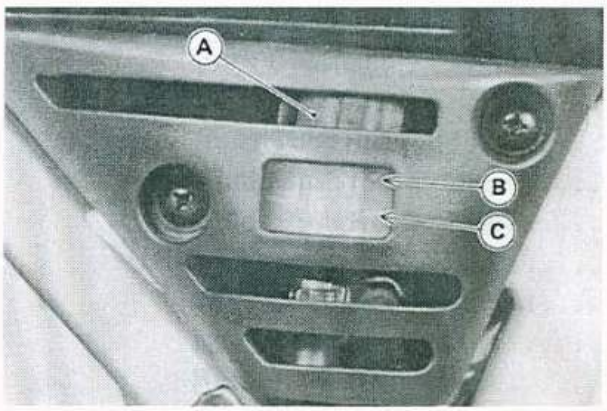
### *Brake Lining Wear Inspection*

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.

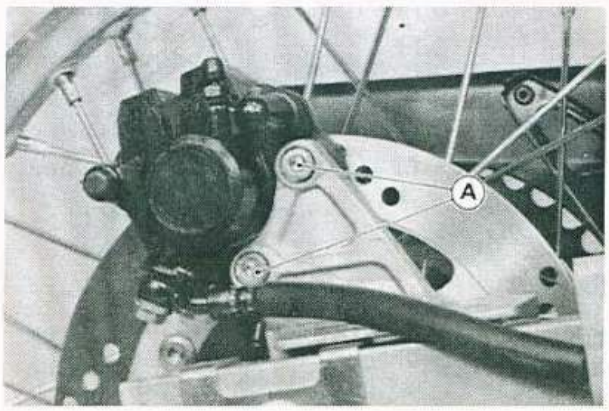
- Check the rear brake for good braking power, no brake drag, and no fluid leakage.

**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*

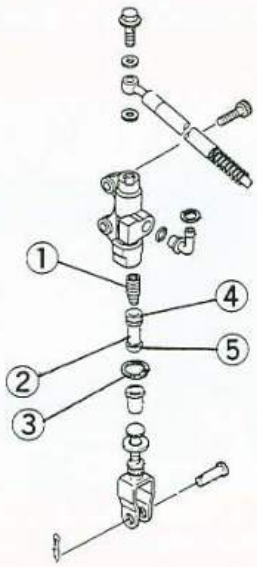
●Discard the used flat washers, and install a new washer on each side of the brake hose fittings.

●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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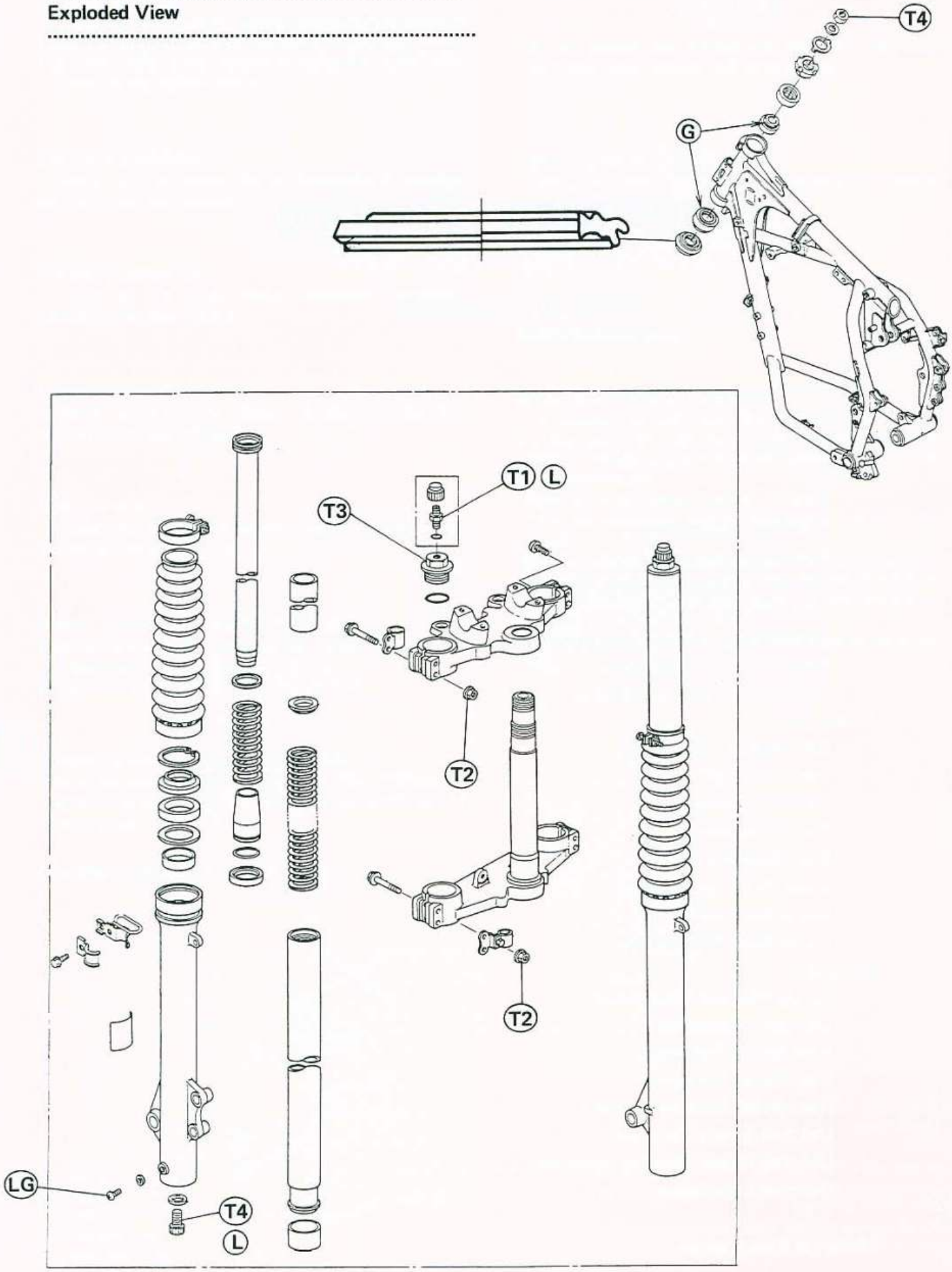

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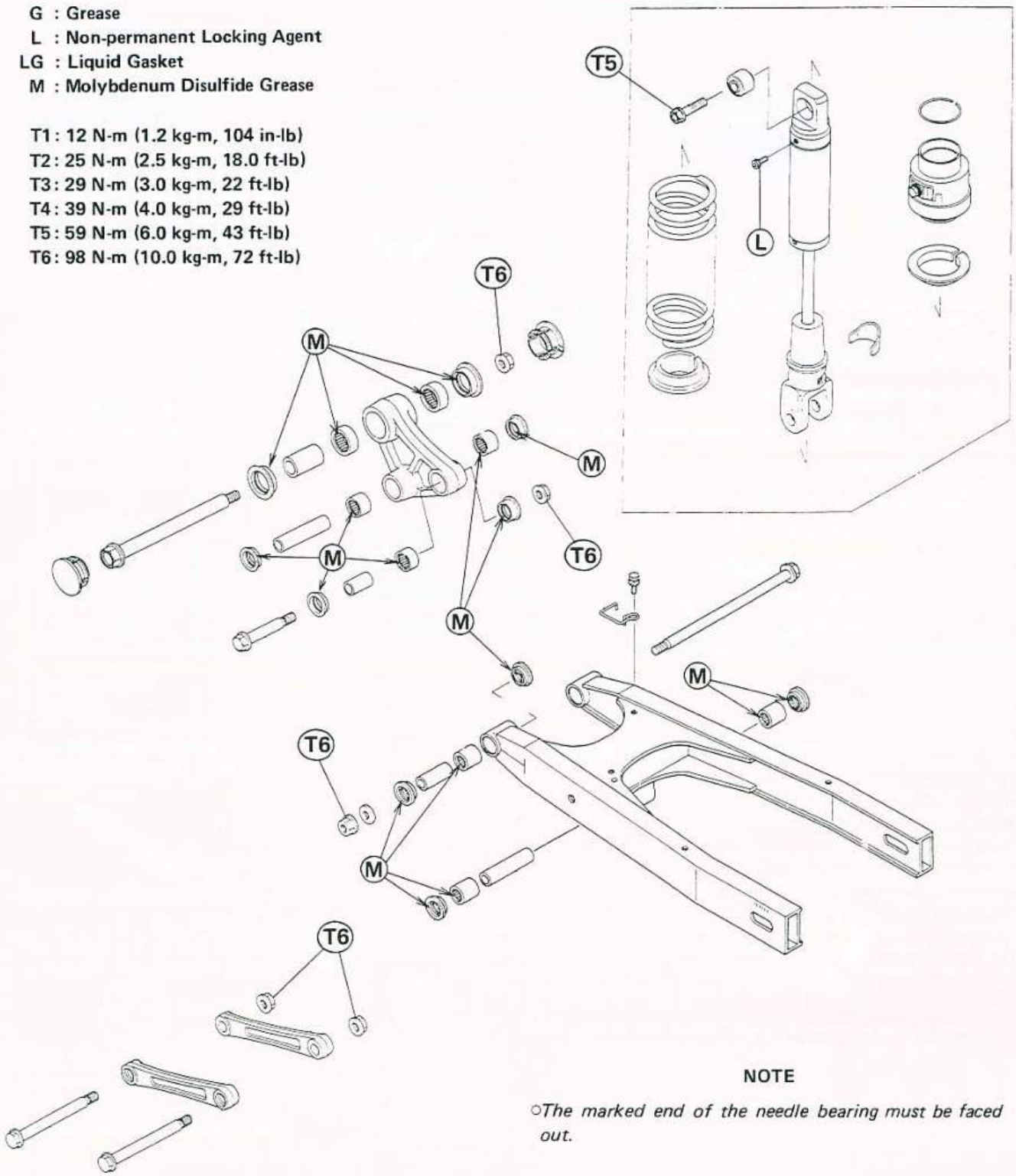

*Refer to Base Manual

## 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**

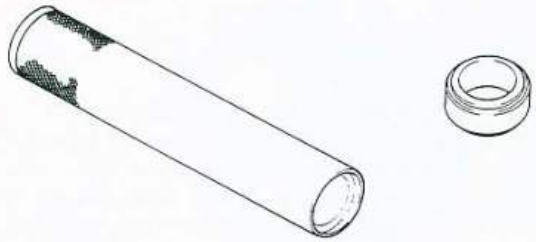
○*The marked end of the needle bearing must be faced out.*

## Service Data

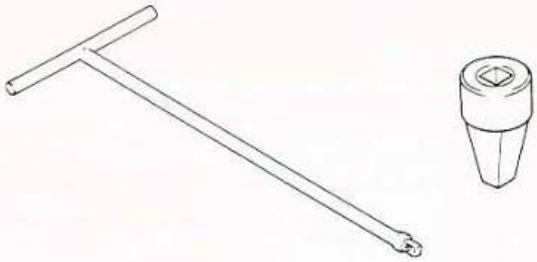
| Item | Standard | Service Limit |
|---|---|---|
| **Front Fork:** | | |
| Air pressure | 0 (atmospheric pressure) | — — — |
| Oil viscosity | SAE 10W20 | — — — |
| Oil amount (par side) | 420 ±4 mL | — — — |
| Oil level (fully compressed) | 190 ±2 mm (from top of inner tube) | — — — |
| **Rear Shock 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

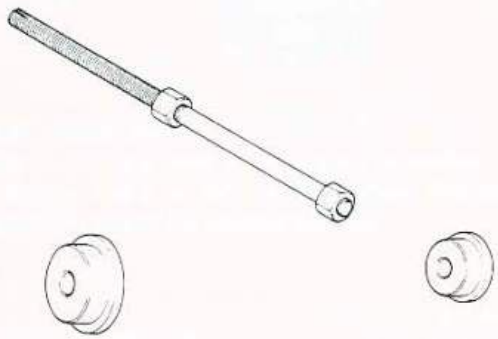
Stem Bearing Driver: 57001-137
Adapter: 57001-1074



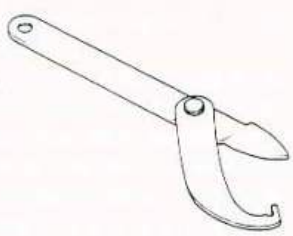
Handle: 57001-183
Adapter: 57001-1057



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



Stem Nut Wrench: 57001-1100



Oil Seal Driver: 57001-1104



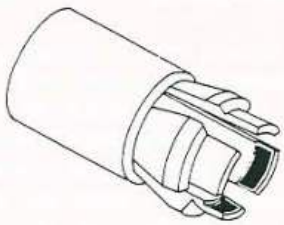
**NOTE**

○*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.

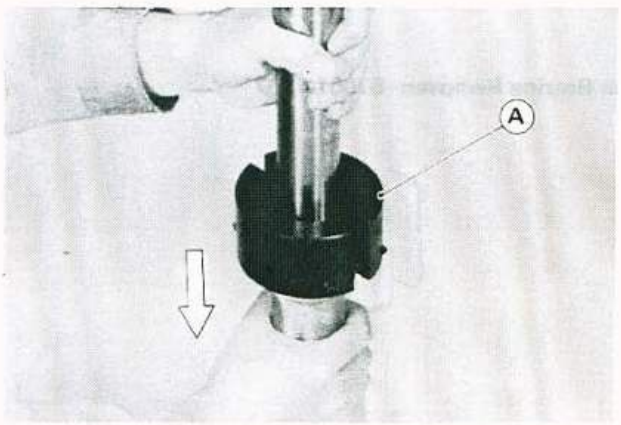
**Front Fork Oil**

**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.

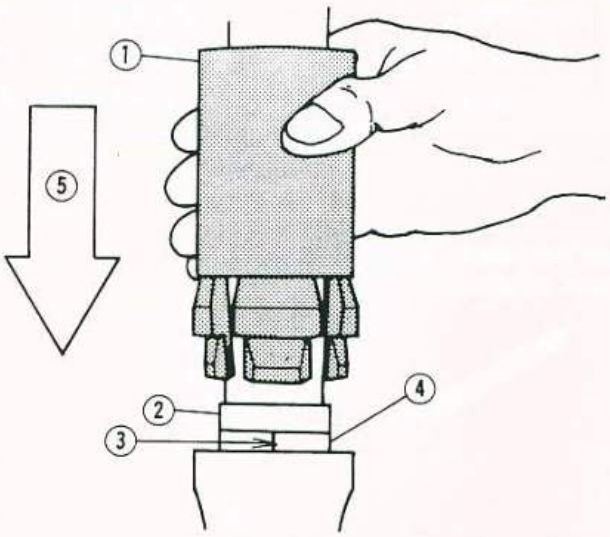
- When installing the guide bush and oil seal at the outer tube top, the fork oil seal driver (special tool: P/N 57001-1219) can be used to install them instead of using the driver (special tool: P/N 57001-1104). See Guide Bush Replacement.

### *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**



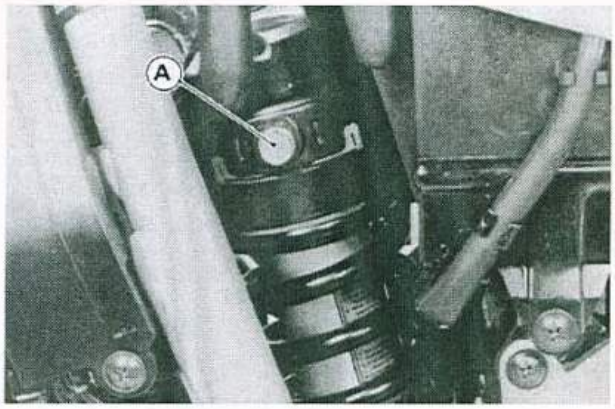

1. Driver: 57001-1219
2. Used Guide Bush.
3. Slit (toward the left or right)
4. New Guide Bush
5. Tap

## 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 ⅢⅠ |

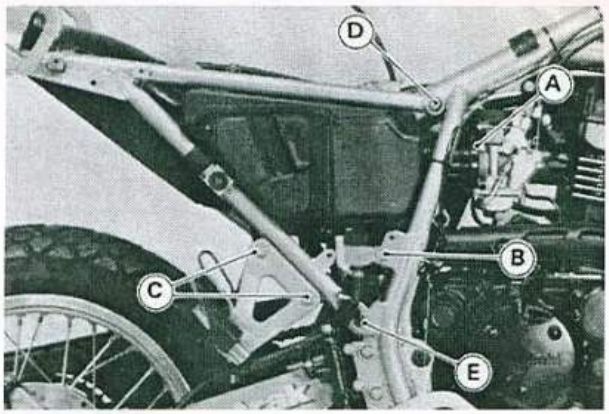
○: Standard setting (number) is identified with a circle marking.

*Damper Adjustment*

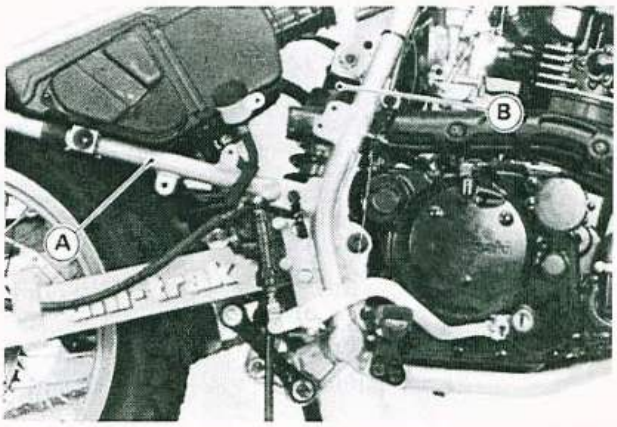
Refer to the Base Manual, noting the following.
●See Setting Table in the Spring Preload Adjustment paragraph to adjust the damper adjuster.

*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)**

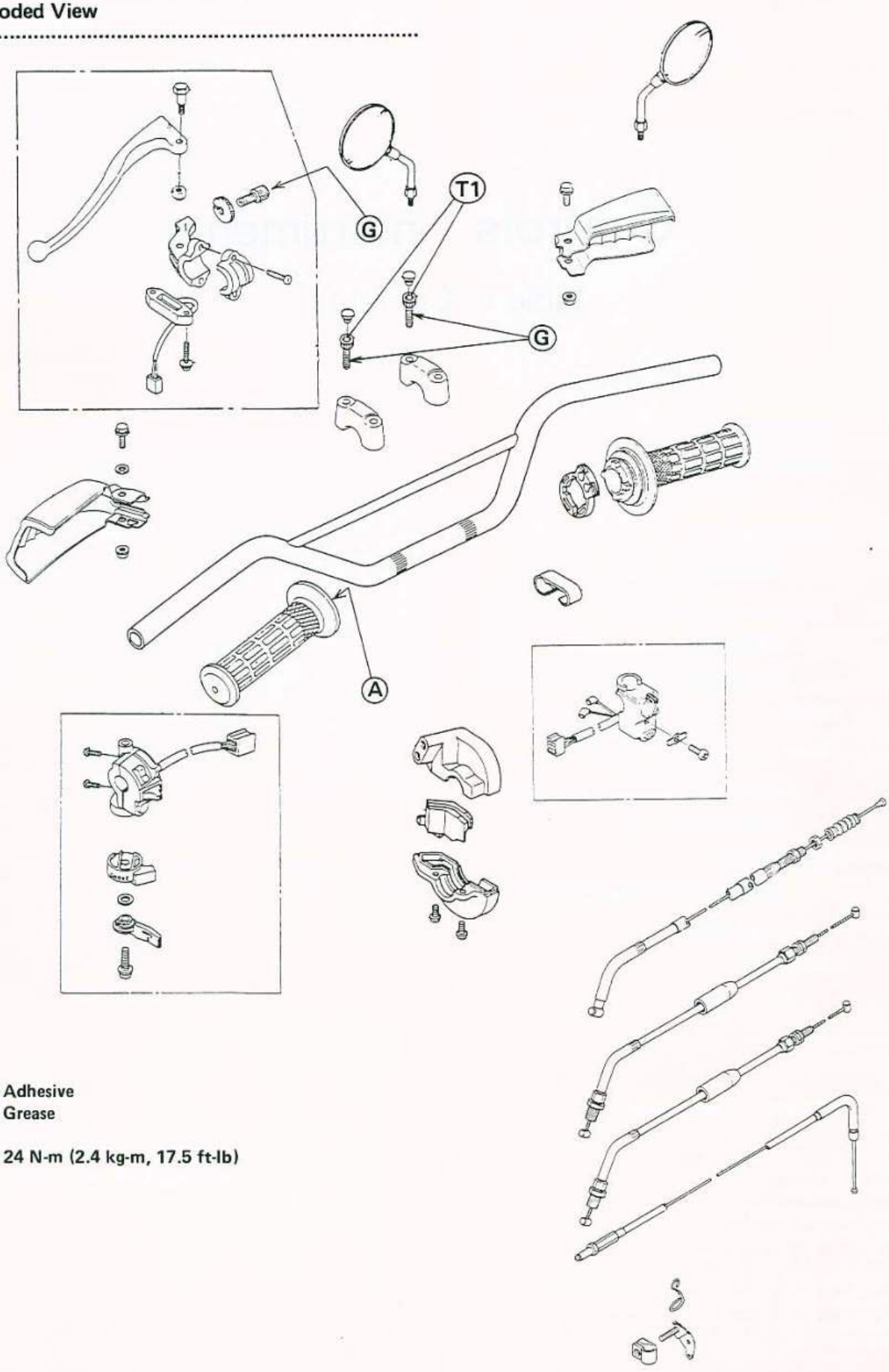
# Controls / Instruments

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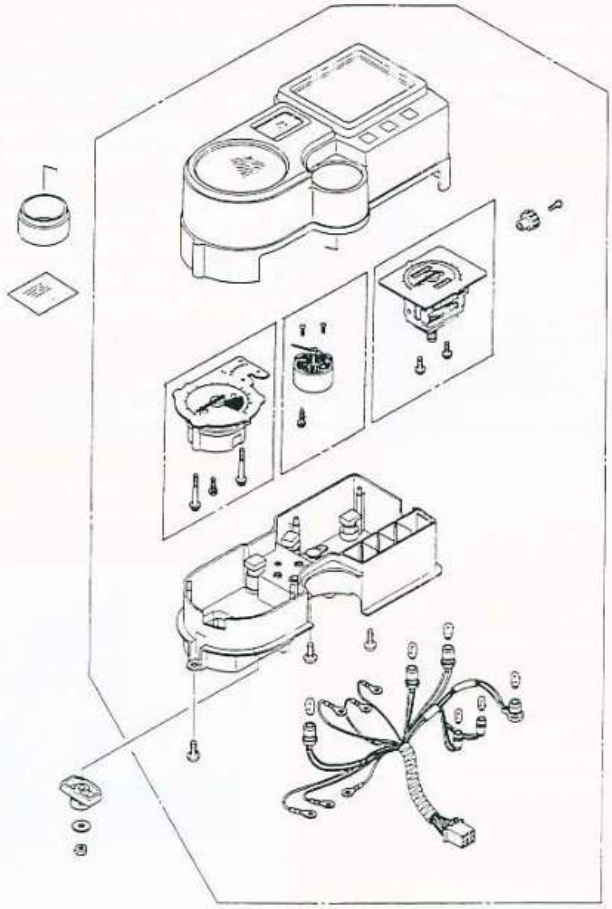

*Refer to Base Manual

## Exploded View

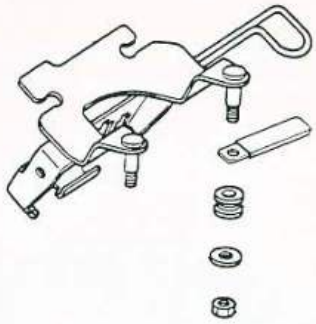



A : Adhesive
G : Grease

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<br>10 – 15 mm (at lever end) |

## Throttle Grip

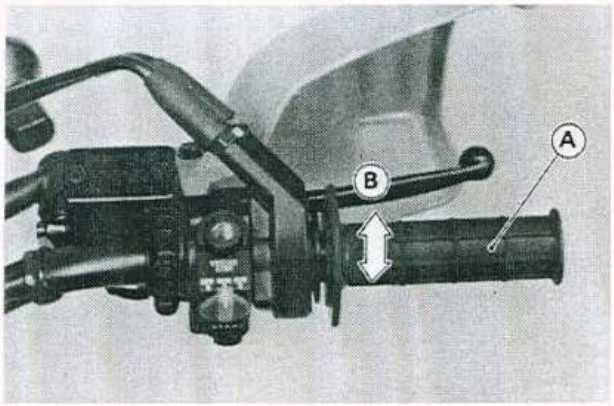
There are two throttle cables: an accelerator cable for opening the throttle valve, and a decelerator cable for closing it.

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.

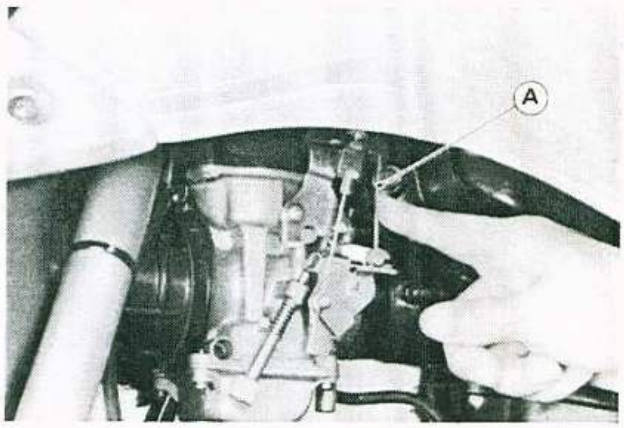
### *Inspection*

•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

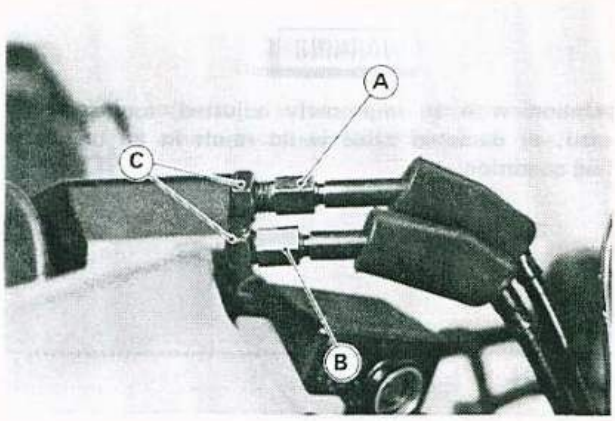
★If the throttle grip free play is incorrect or the decelerator inner cable is loose with the throttle closed, adjust the throttle grip.

### *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.



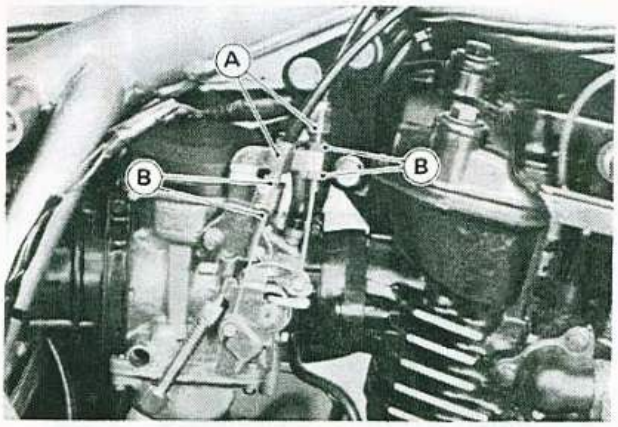

A. Accelerator Cable Adjusting Nut C. Locknuts
B. Decelerator Cable Adjusting Nut

•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.

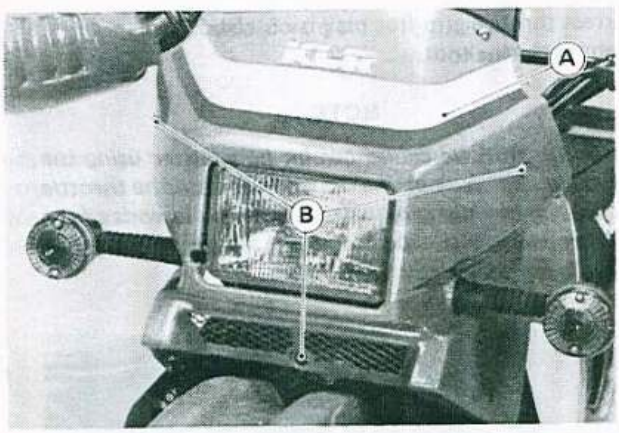
**WARNING**

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

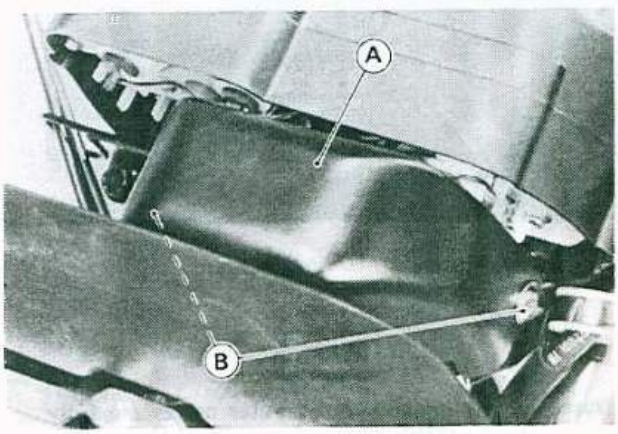
## Meter Unit

*Removal*

- Remove the headlight cover and connector cover.

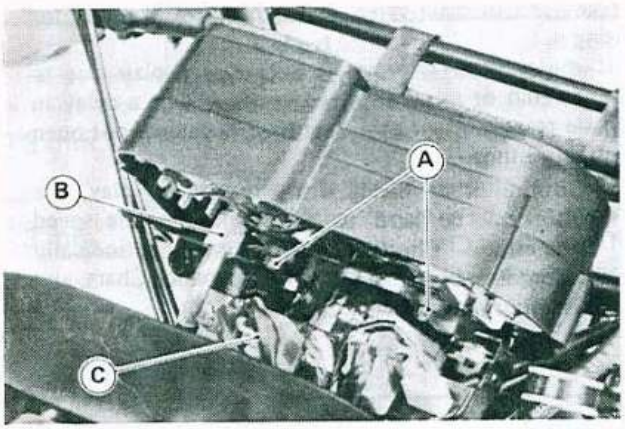



A. Headlight Cover B. Screws




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.



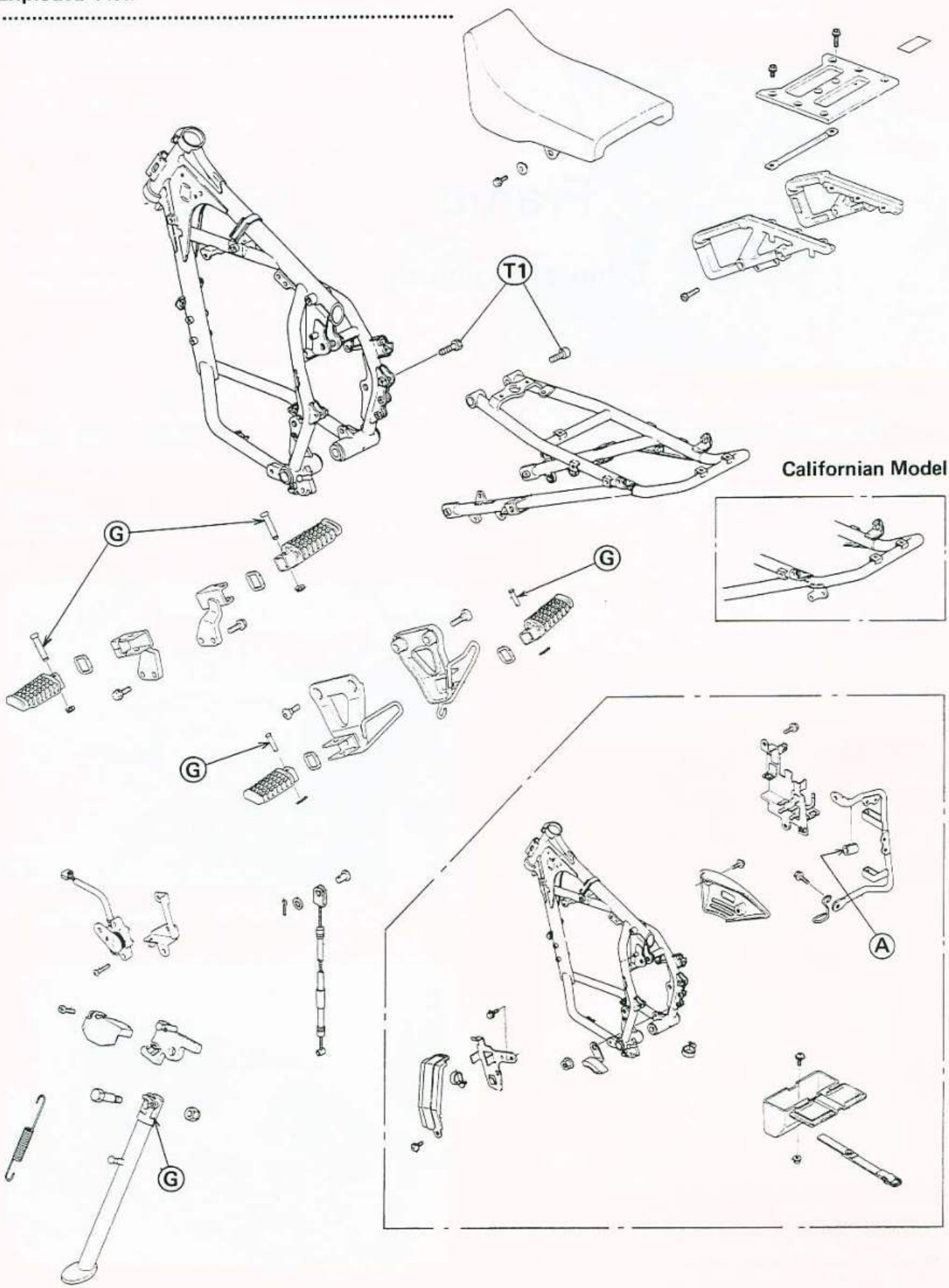

A. Meter Mounting Nuts C. Meter 9-pin Connector
B. Speedometer Cable Nut (White)

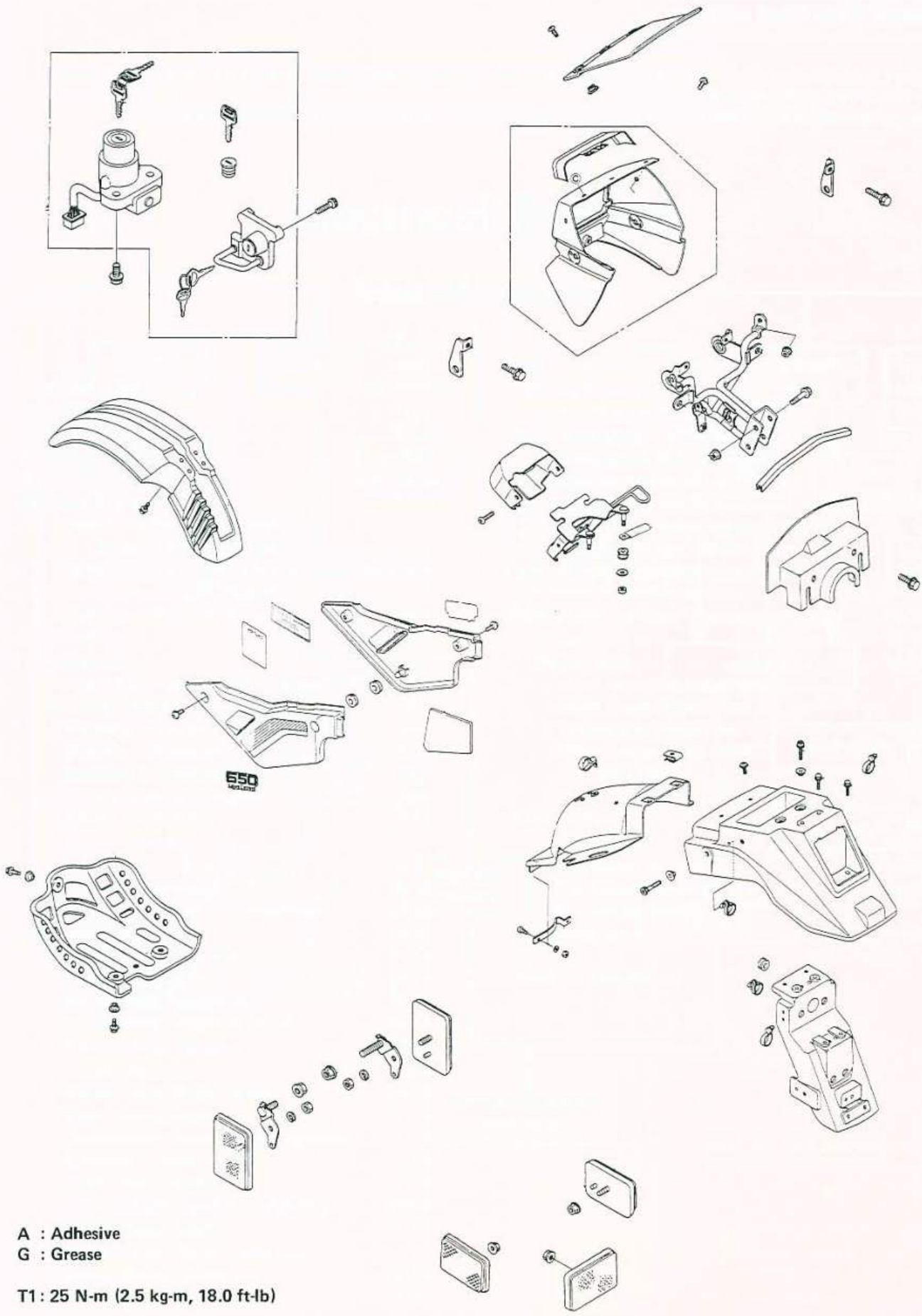
# Frame

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## Exploded View



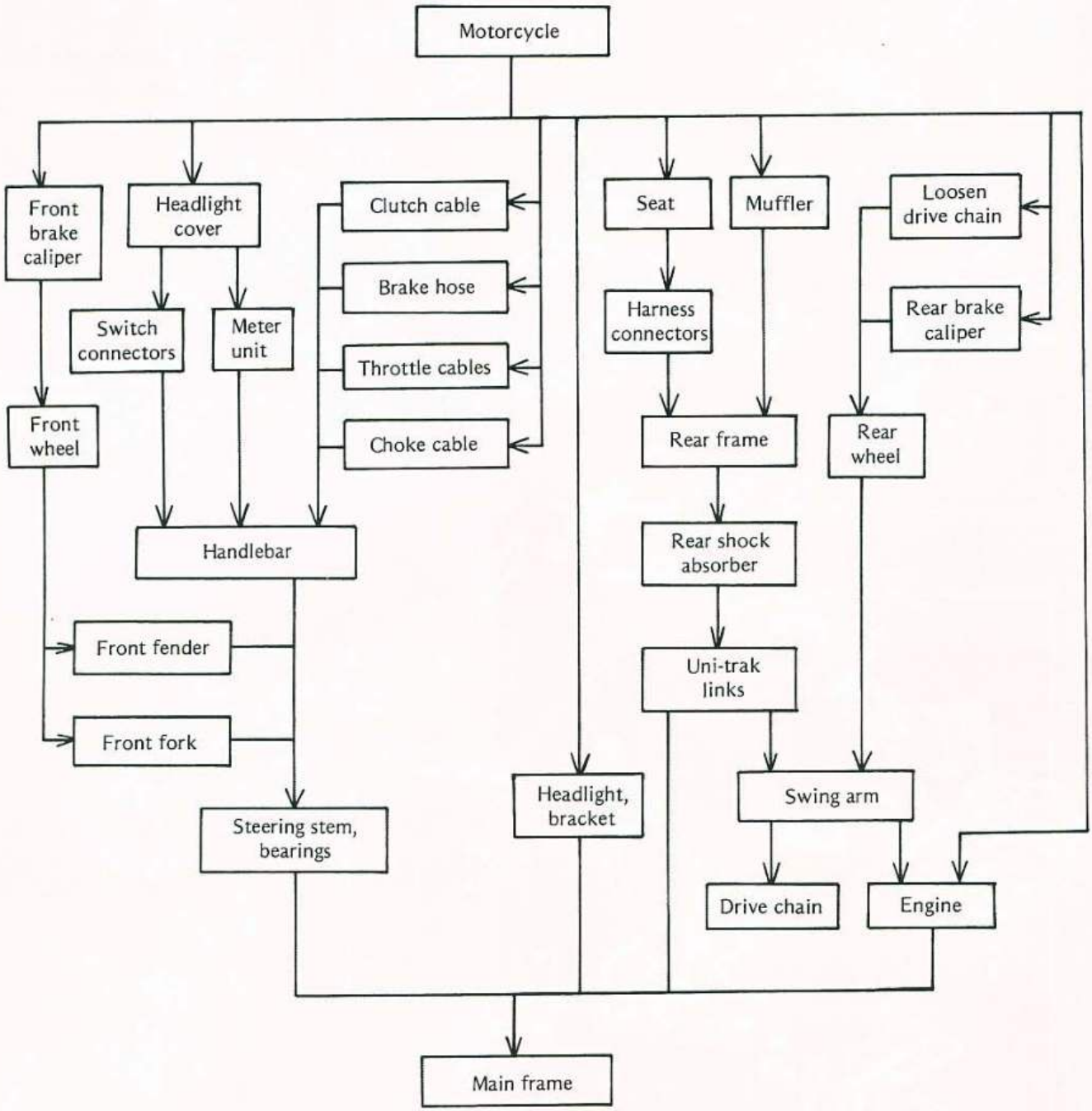



A : Adhesive
G : Grease

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.



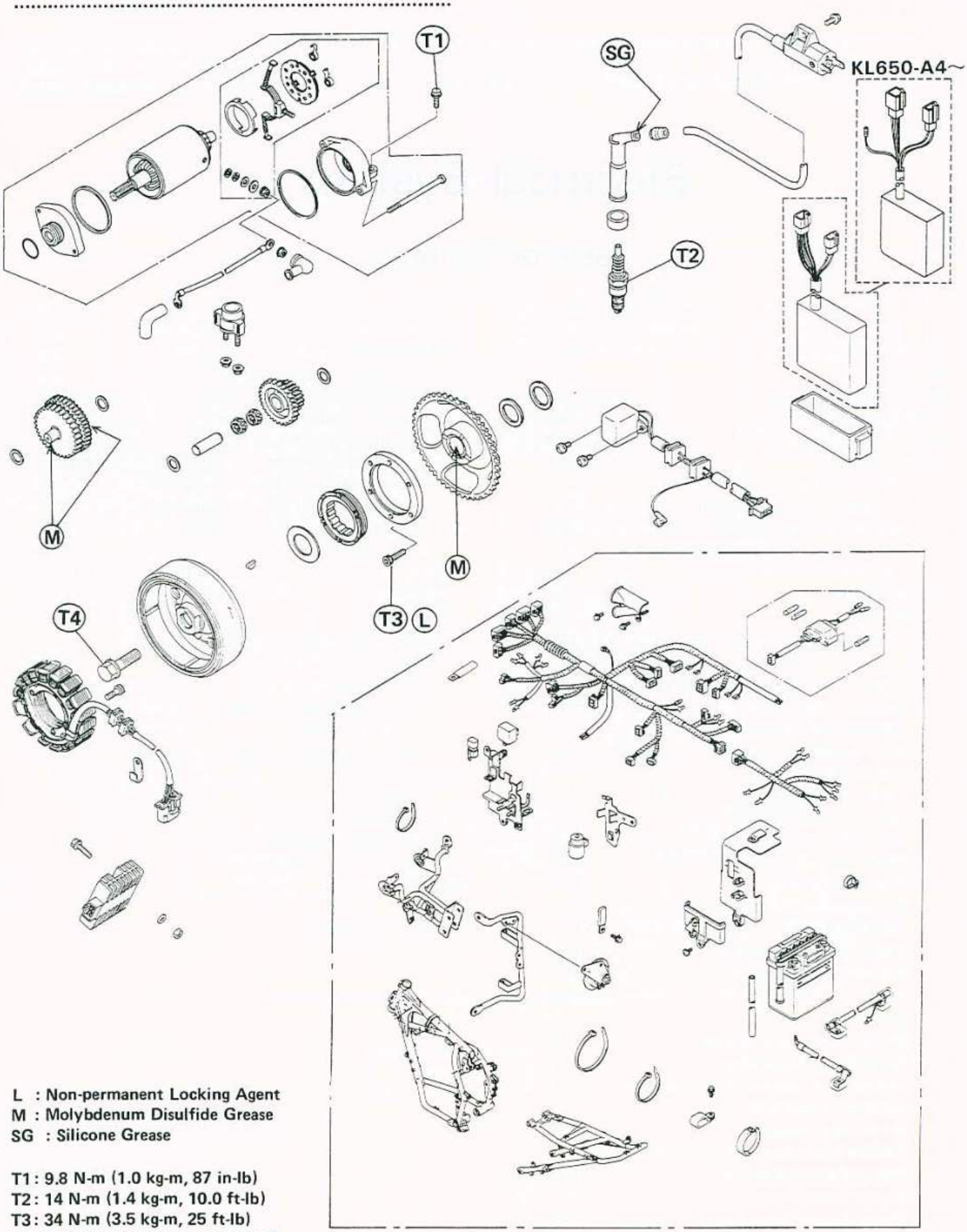
# Electrical System

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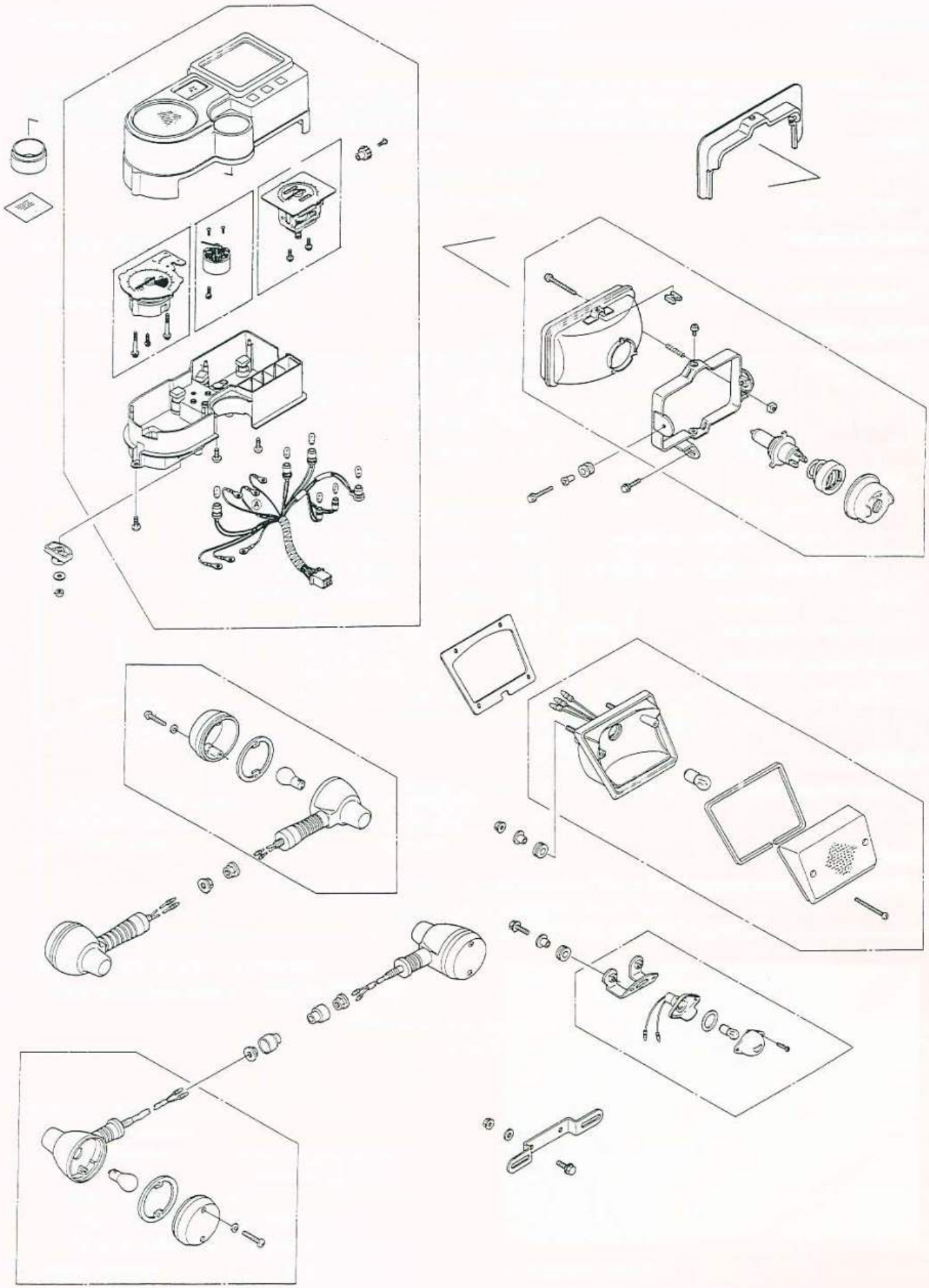

*Refer to Base Manual

## 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.

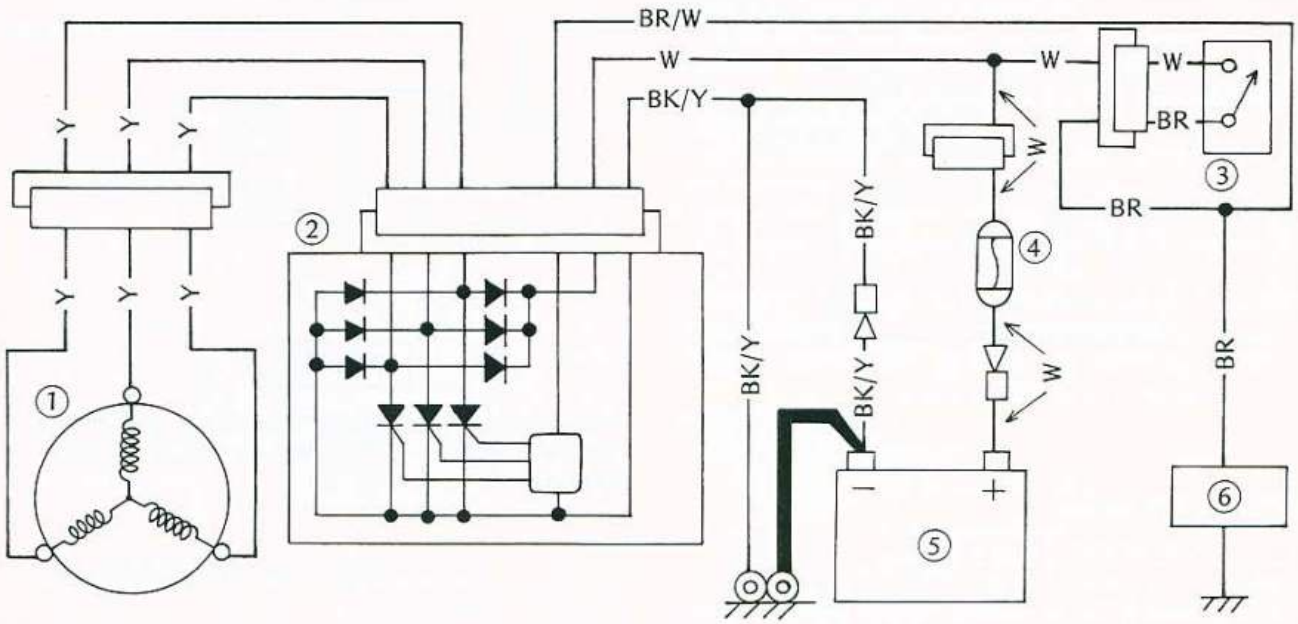
## Battery

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**

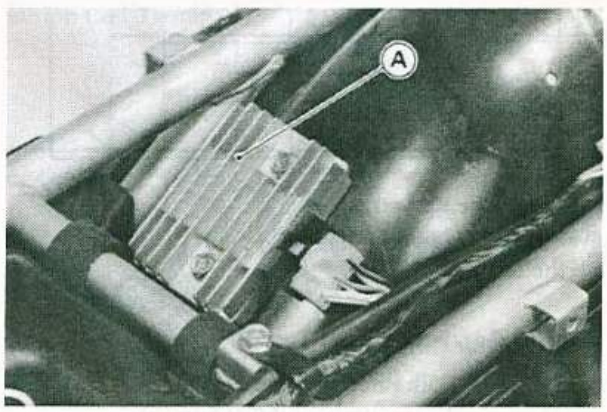
**Meter Connections:**

| | |
|---|---|
| **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.



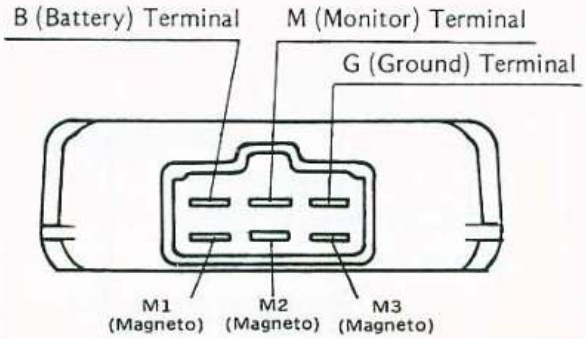

A. Regulator/Rectifier

●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 ⅓ 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 | | |

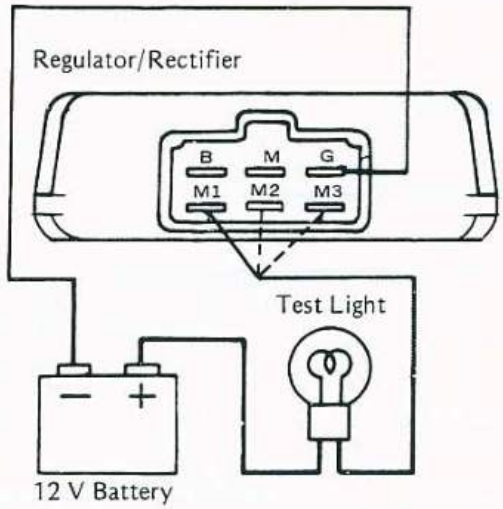
**Regulator Circuit Test:**
●Remove the regulator/rectifier.
●Prepare the test tools shown.

**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**

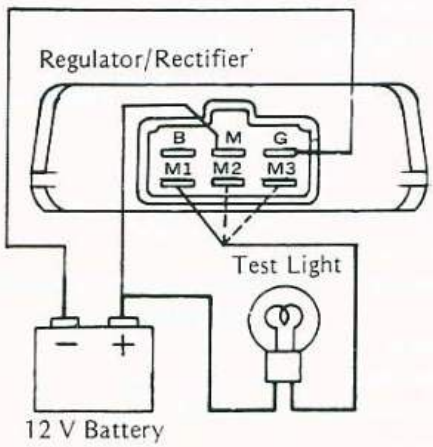



**CAUTION**

○**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**

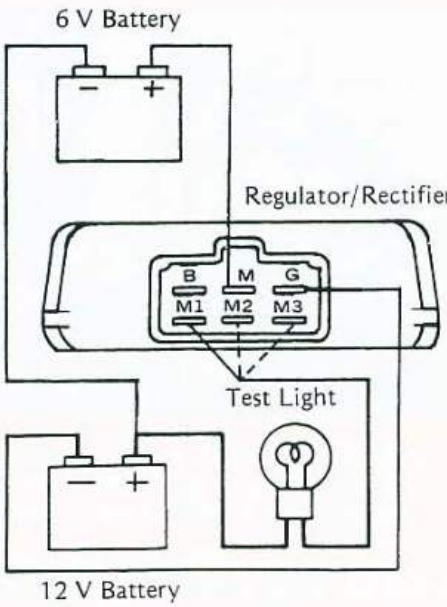


★If the test light turns on, the regulator/rectifier is defective. Replace it.
★If the test light does not turn on, continue the test.
•Momentarily apply 18 V to the voltage monitoring terminal by adding a 6 V battery.
•Check M1, M2, and M3 terminals respectively.

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)**

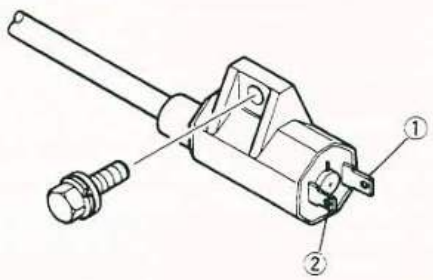
CAUTION

○**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.

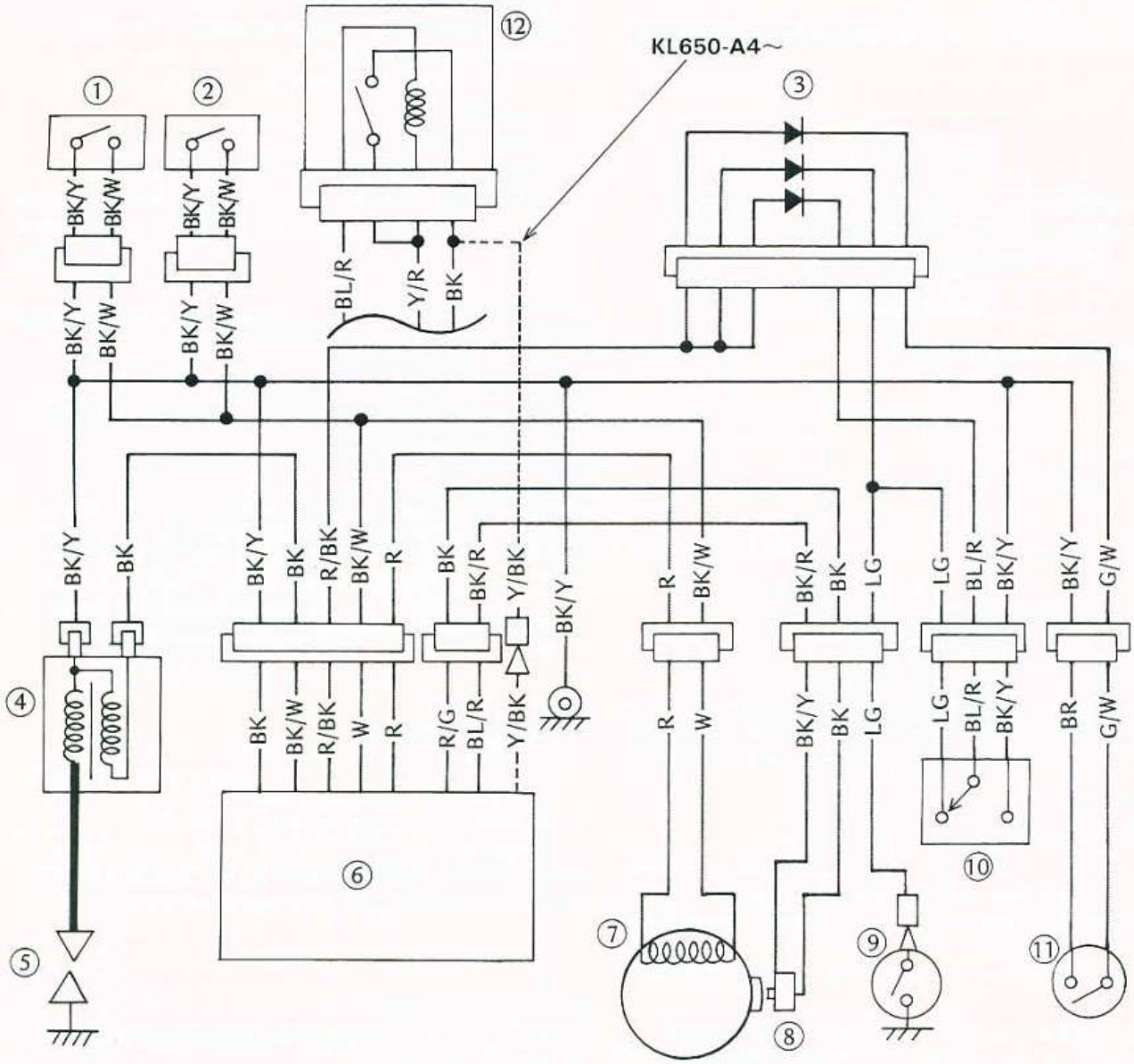
**Ignition Coil Terminals**




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*

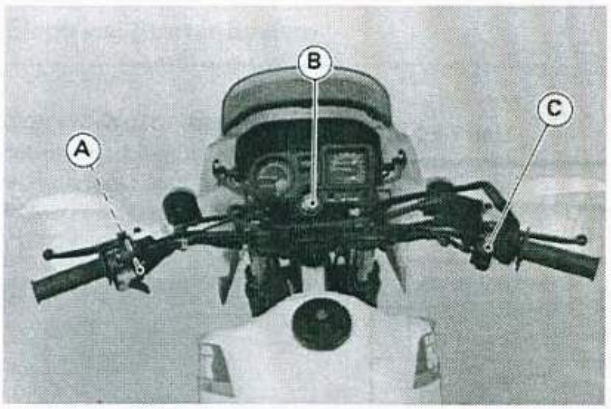
Refer to the Base Manual, noting the following.

**Starter Lockout Switch Connections**

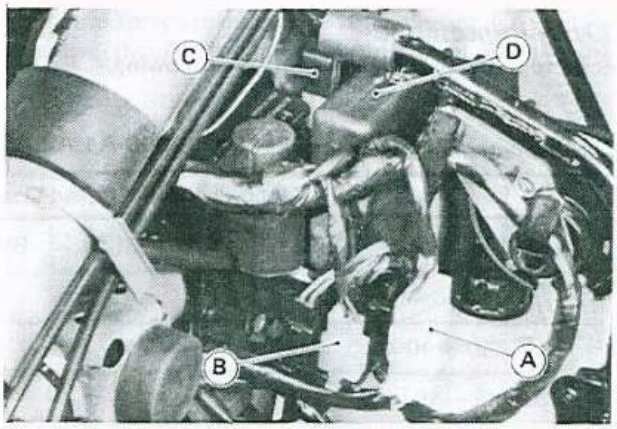
| Color | BK/Y | BL/R | LG |
|---|---|---|---|
| When the clutch lever is pulled on | ○—— | ——○ | |
| When the clutch lever is released | | ○—— | ——○ |

**Engine Stop Switch and Starter Button Connections**

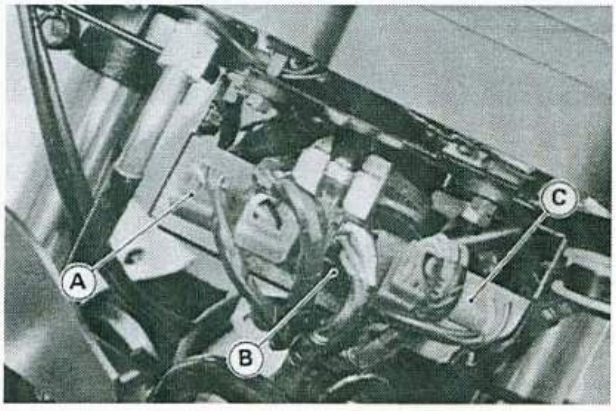
| | Engine Stop Switch | | | | Starter Button | | |
|---|---|---|---|---|---|---|---|
| | BK/W | BK/Y | BR | | | Y/R | |
| OFF | ○—— | ——○ | | | | | |
| RUN | | | ○—— | ——○ | ○—— | ——○ | Pushed |



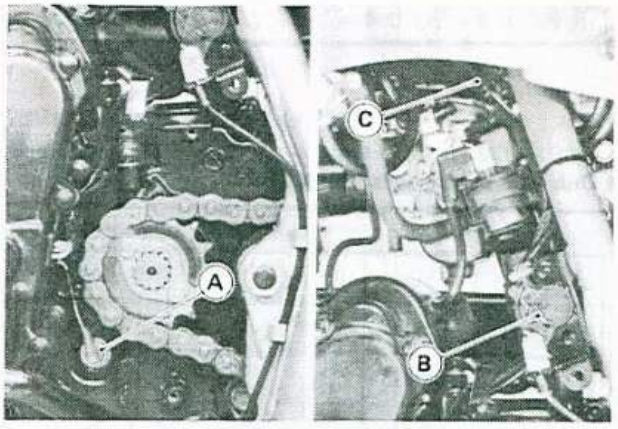

A. Starter Lockout Switch
B. Ignition Switch
C. Engine Stop Switch




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

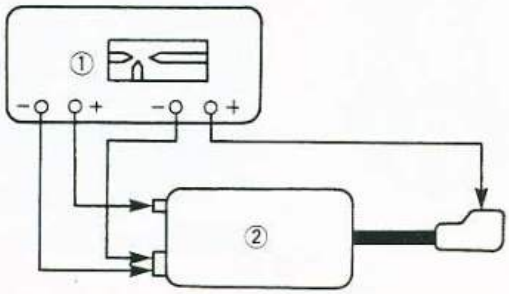



A. Neutral Switch
B. Side Stand Switch
C. Side Stand Switch 2-pin Connector

### *Ignition Coil Inspection*

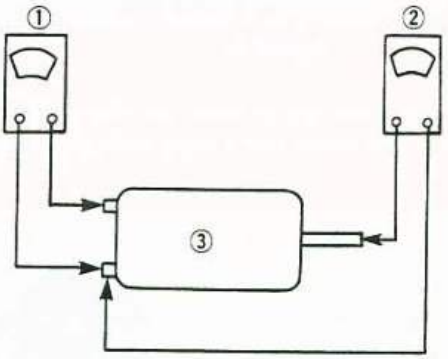
Refer to the Base Manual, noting the following.

**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.

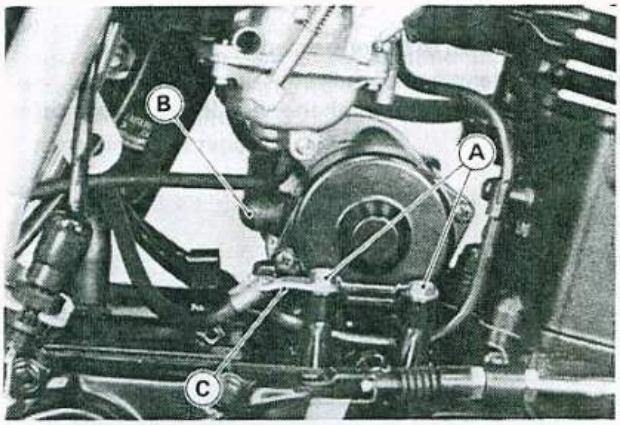
**Resistance of Exciter and Pickup Coil**

**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.



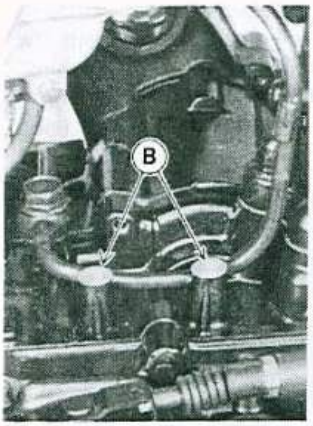

A. Mounting Bolts
B. Starter Motor Terminal
C. Ground Lead

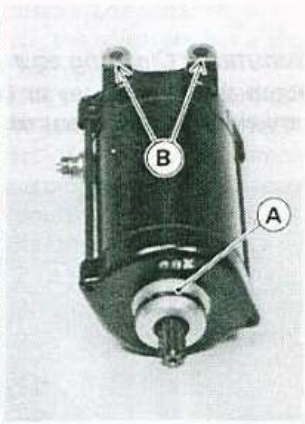
**CAUTION**

**○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.

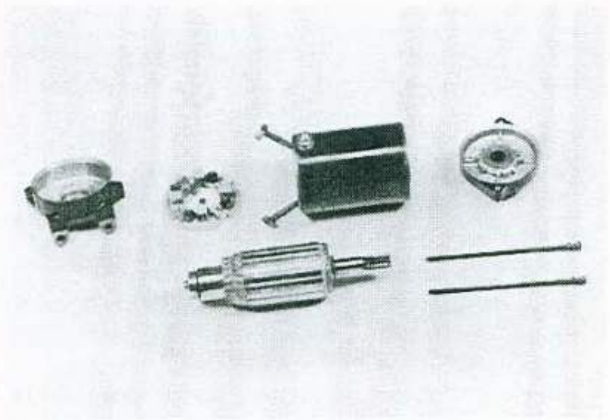



A. O-ring
B. Clean here.

### *Starter Motor Disassembly*

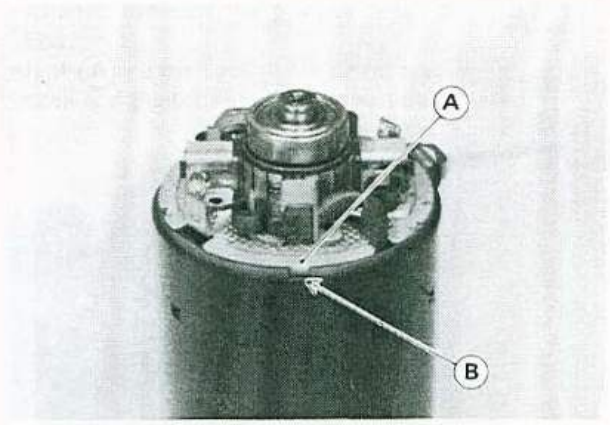
- Unscrew the retaining screws and pull off both end covers.
- Take the armature out of the yoke housing.
- Remove the brush plate assembly from the housing.



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

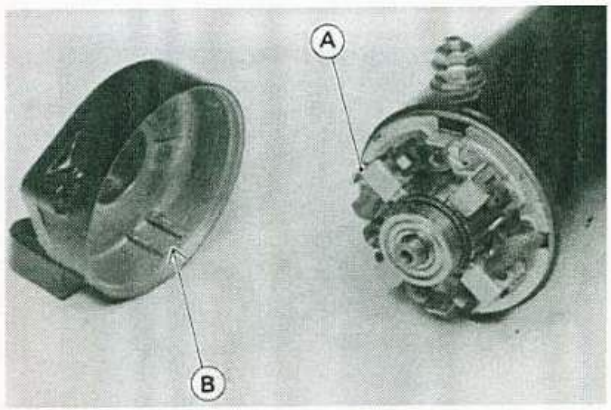
### *Starter Motor Assembly Points*

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



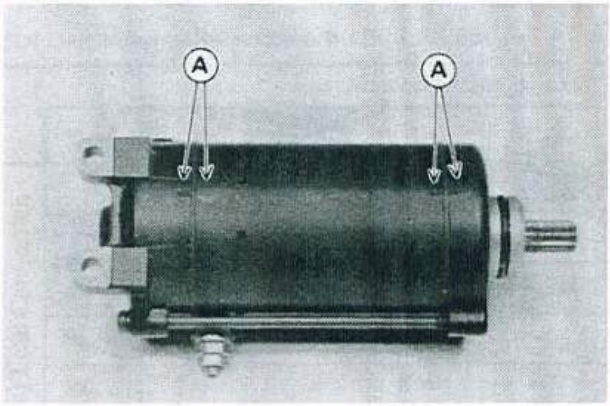

A. Tab
B. Notch

- 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.

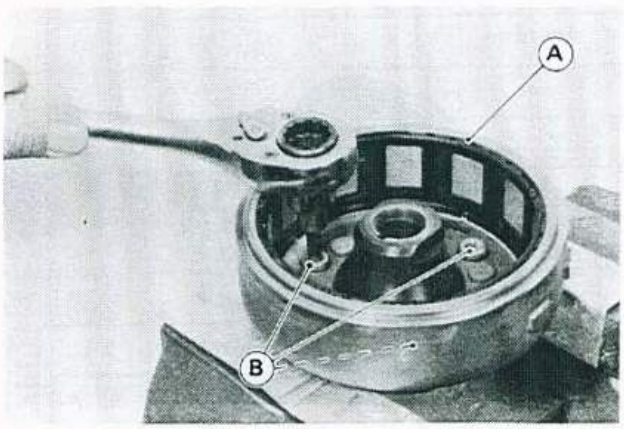



A. Align marks.

*Starter Clutch Removal*

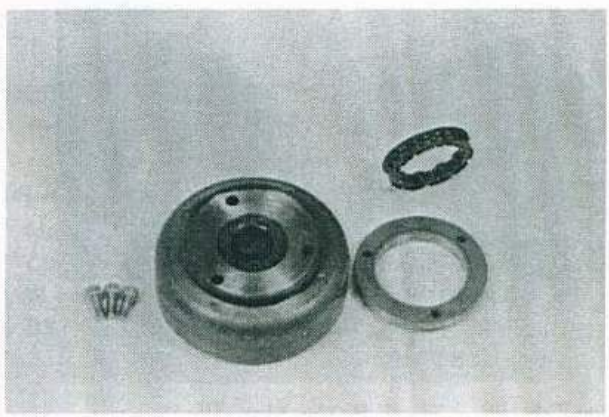
•Pull off the magneto flywheel from the crankshaft.

•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.

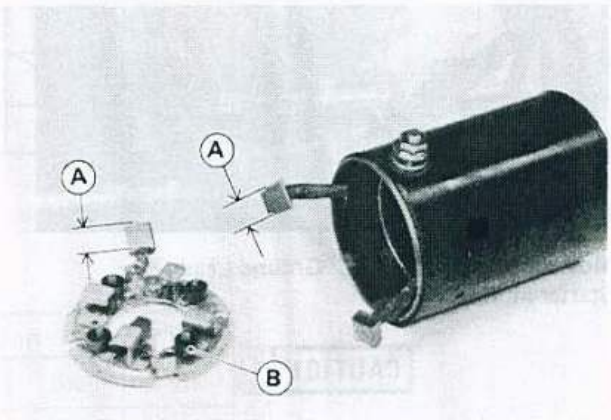
**Tightening Torque**

**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

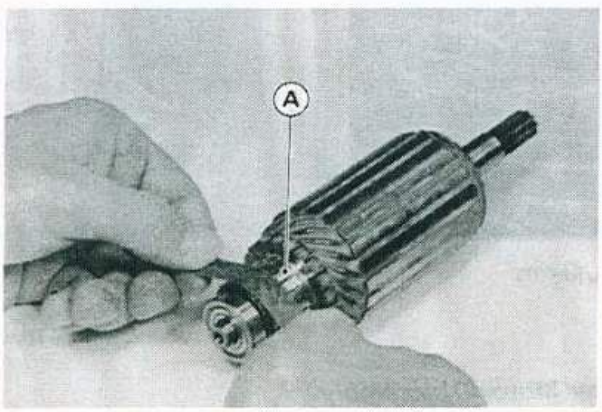
*Brush Spring Inspection*

•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.

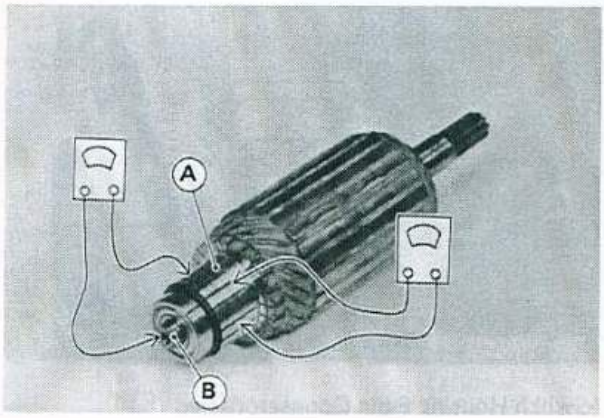



A. Commutator

•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.



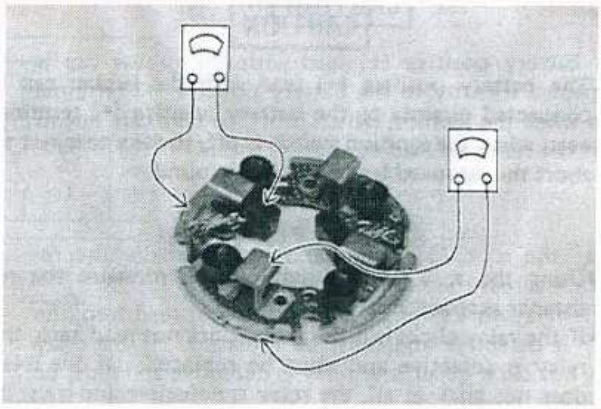

A. Segment B. Shaft

•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*

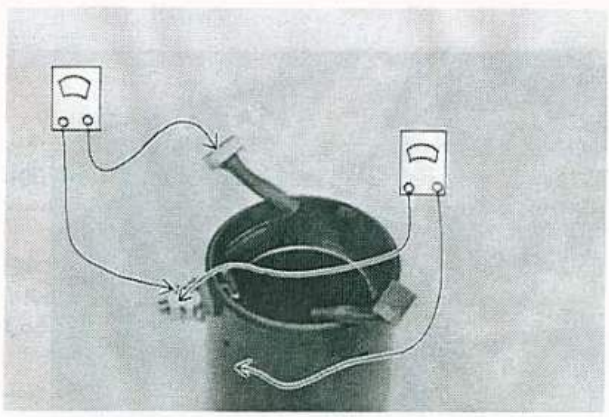
•Using the x 1 Ω ohmmeter range, measure the resistance between the negative brushes and the plate.
★If there is not close to zero ohms, the brush plate must be replaced.



•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

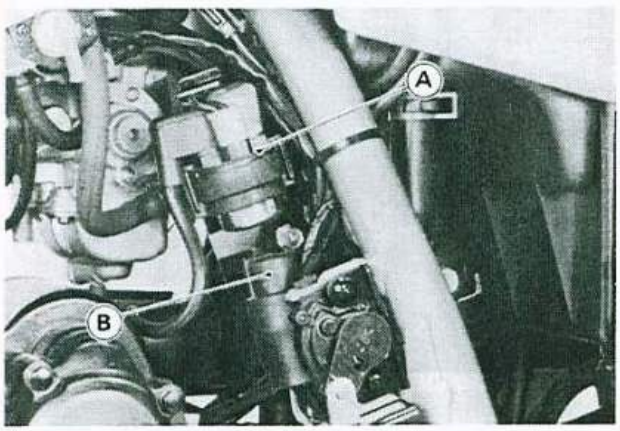
○**The battery positive (+) lead with the rubber cap is connected directly to the battery positive (+) terminal even when the ignition switch is off, so take care not to short the removed lead to chassis ground.**

●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.

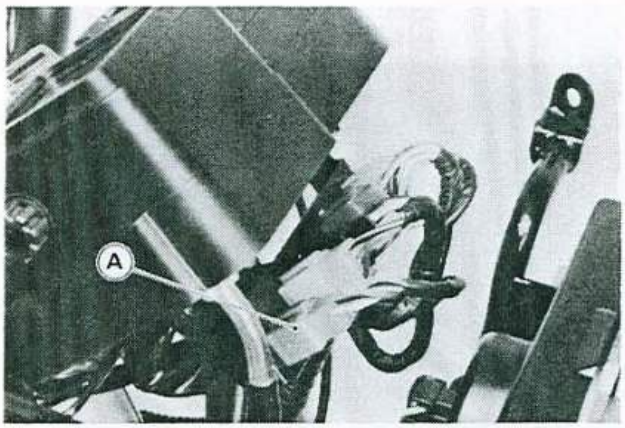
*Starter Button Inspection*

●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 | ○ | ○ |
| | | |

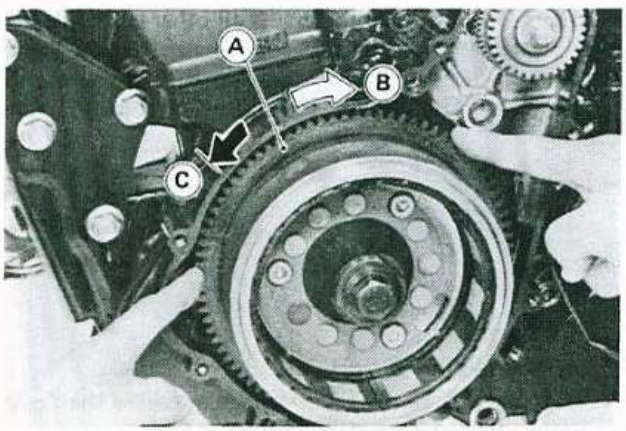
*When engine stop switch is RUN.




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

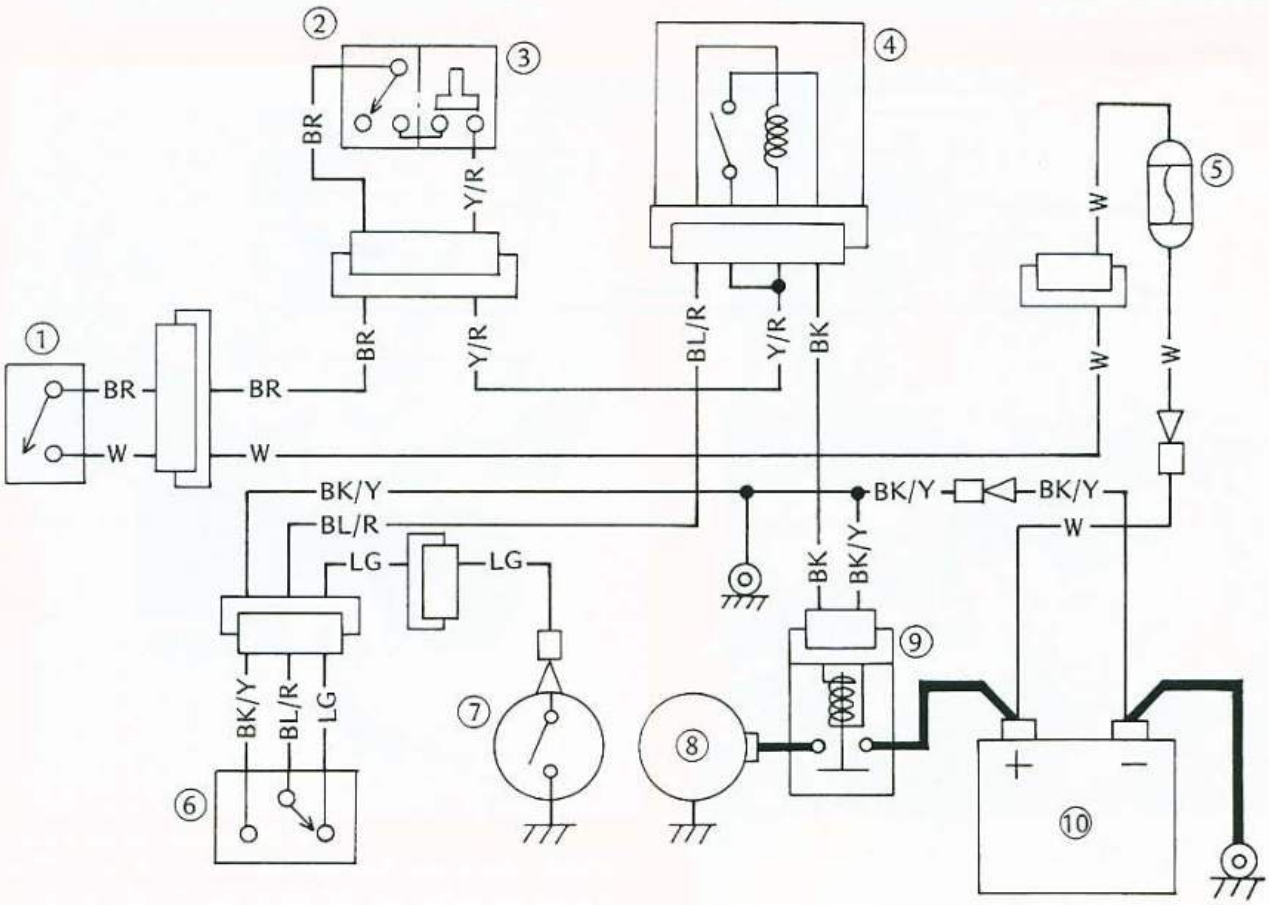
*Starter Clutch Inspection*

●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.

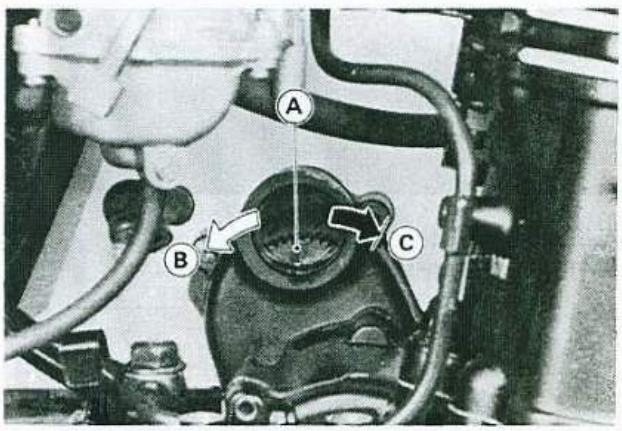
**Electric Starter System Wiring Diagram**




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.*



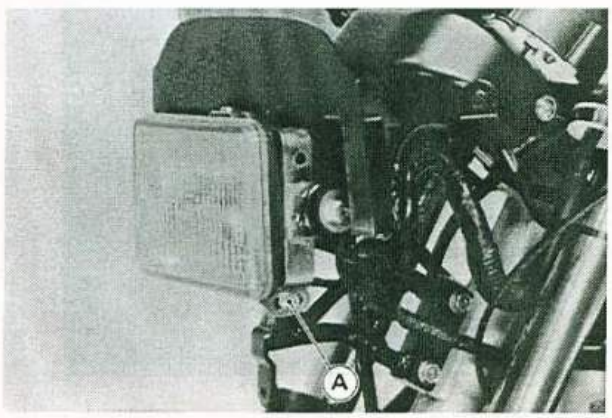

A. Starter Idle Gear
B. Turns Freely.
C. Locked.

## Lighting System

### *Headlight Vertical Adjustment*

Refer to the Base Manual, noting the following.

●Loosen the headlight lower mounting bolt.




A. Headlight Lower Mounting Bolt

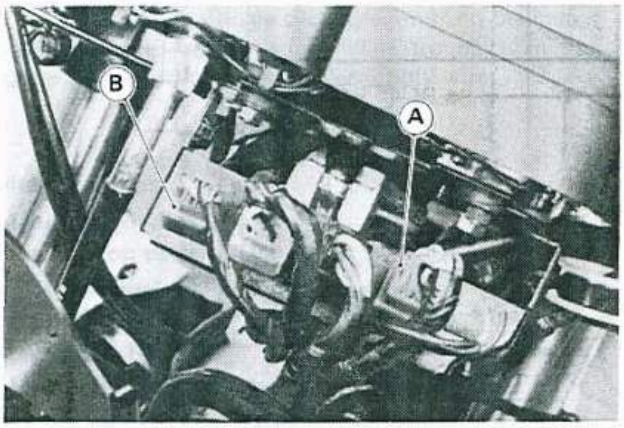
*Headlight, Dimmer, or Passing Switch Inspection*

Refer to the Base Manual, noting the following.

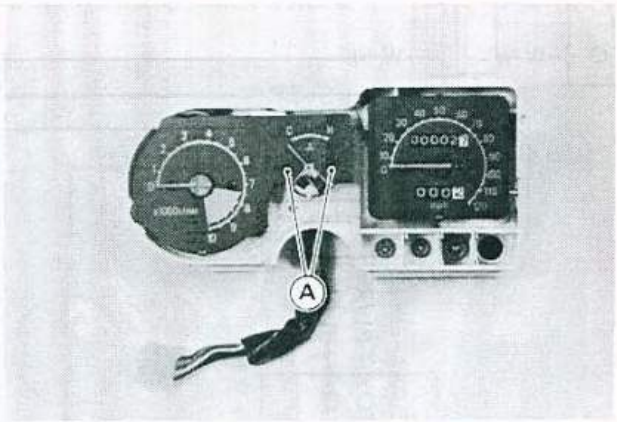
**Headlight, Dimmer, or Passing Switch Connections (Other than US and Canada)**

| 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)



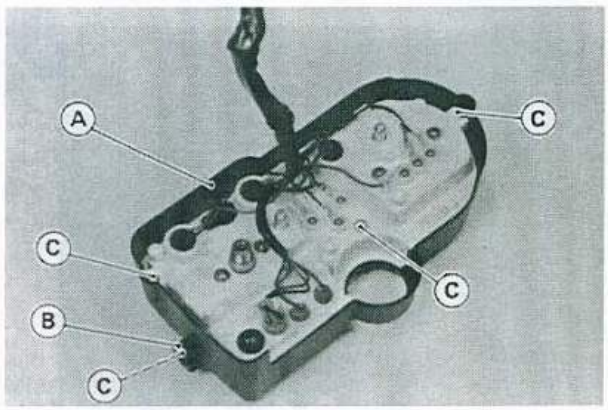

A. Screws

●Remove the tachometer or water temperature gauge.

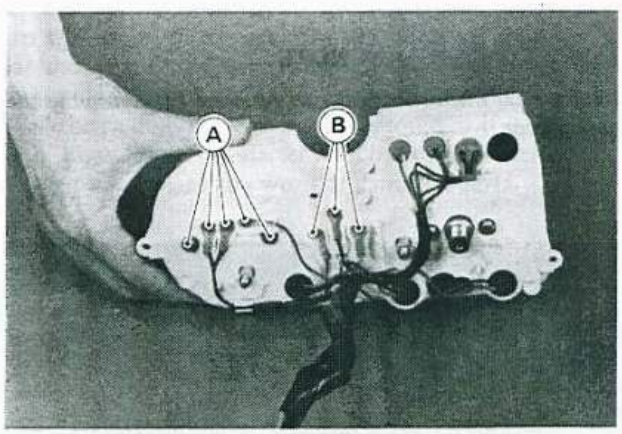
## Tachometer and Water Temperature Gauge

### Disassembly:

●Remove the meter cover.



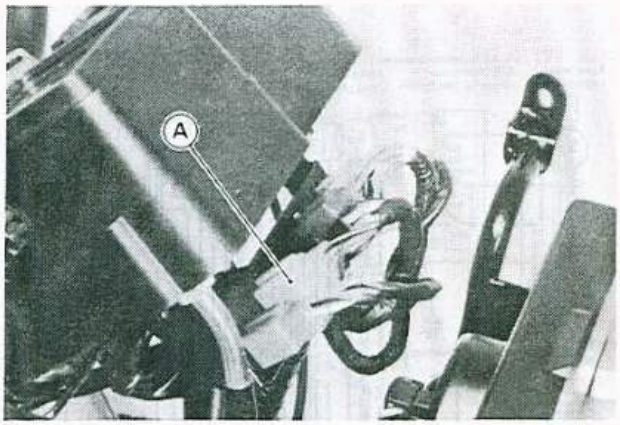

A. Meter Cover
B. Knob
C. Screw




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.

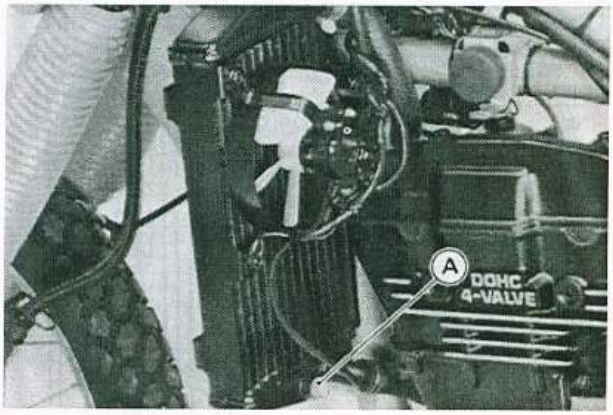
★If the hand does not flick, replace the tachometer unit.

## Radiator Fan

*Initial Check*

Refer to the Base Manual, noting the following.

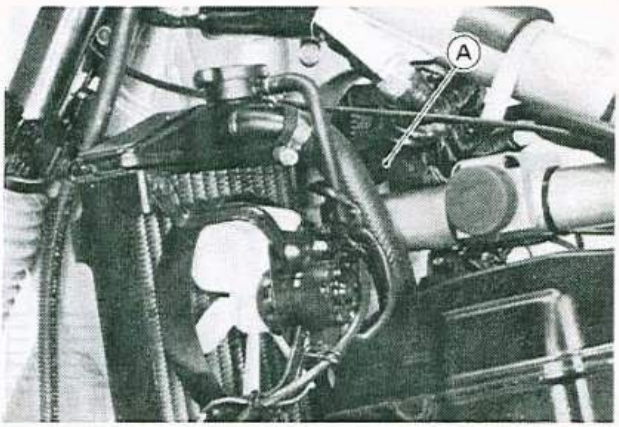
- The radiator and radiator fan assembly is mounted to left lower side of the frame head pipe.




A. Radiator Fan Switch

*Fan Motor Inspection*

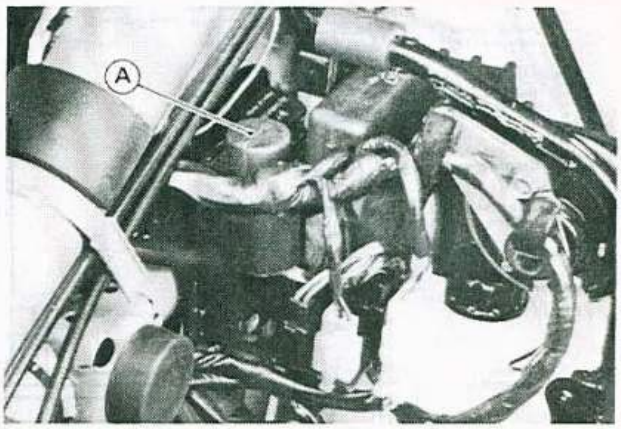
Refer to the Base Manual, noting the following.




A. Radiator Fan Connector

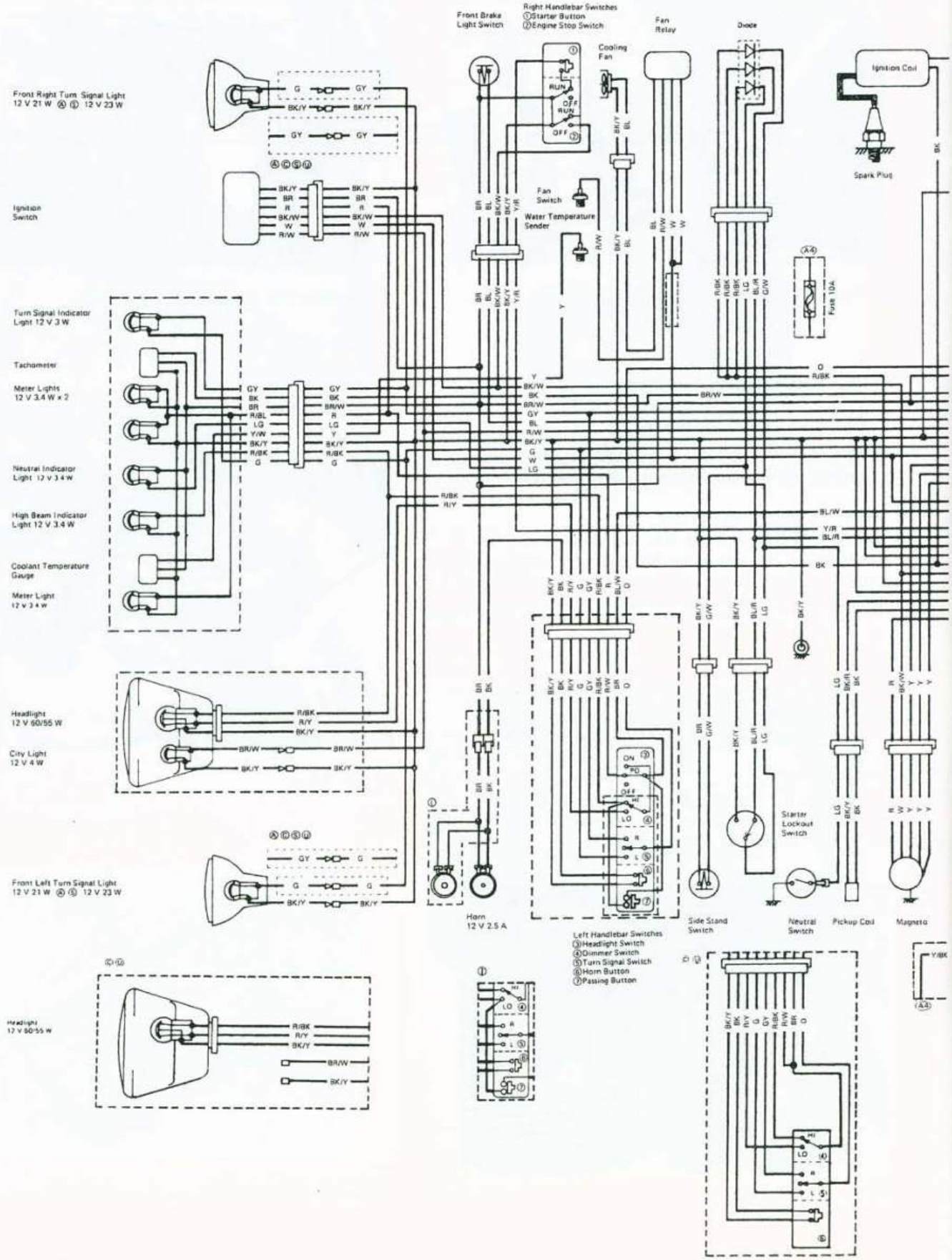
*Fan Relay Inspection*

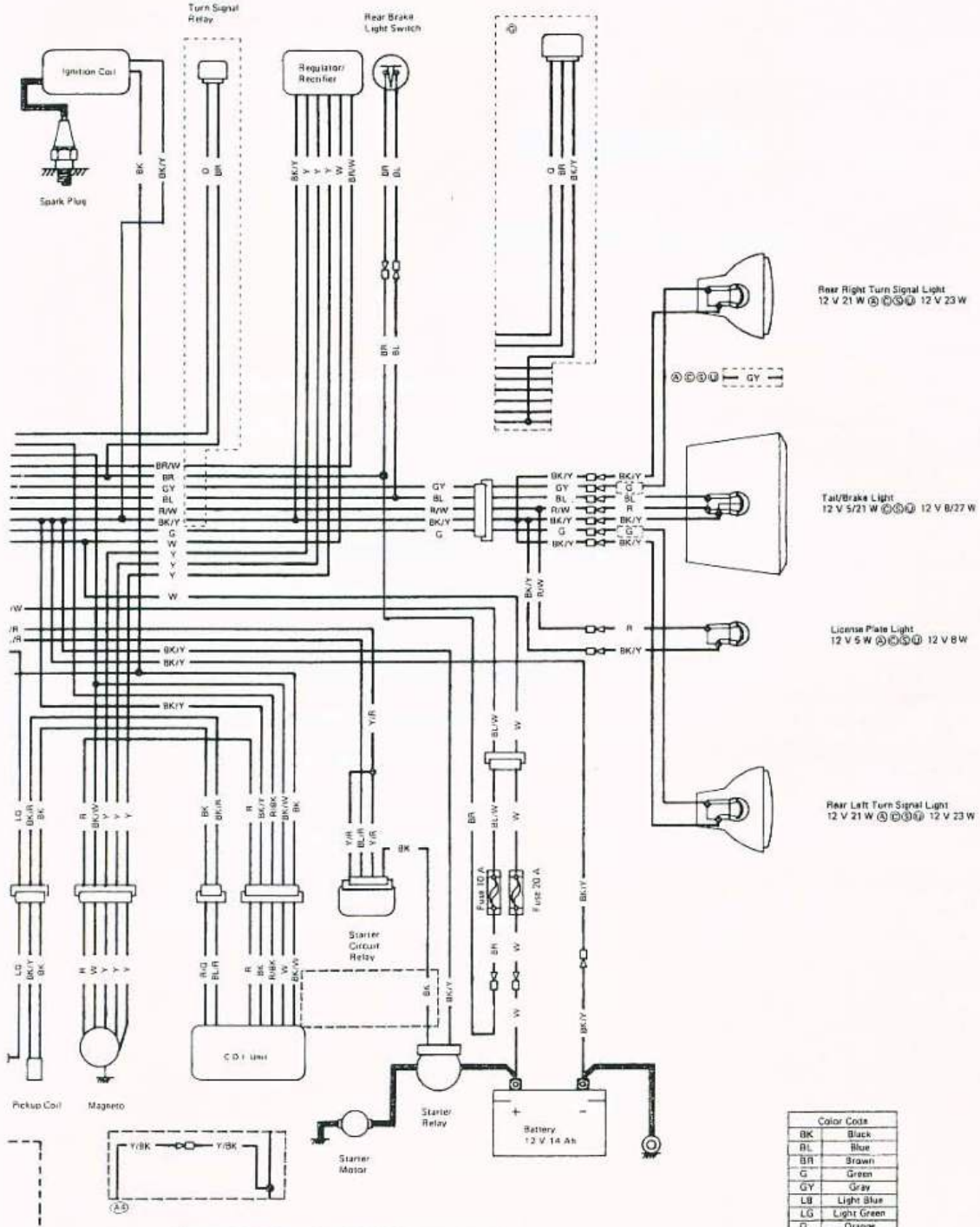
Refer to the Base Manual, noting the following.




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)

| 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 |

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

# Appendix

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| 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.*

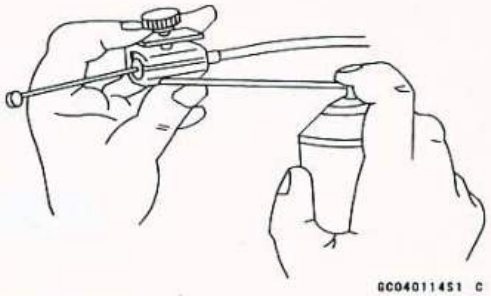
**Pivots: Lubricate with Motor Oil.**
- Side Stand
- Clutch Lever
- Brake Lever
- Brake Pedal
- Rear Brake Rod Joint

**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<br>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 requlator: | 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 | |

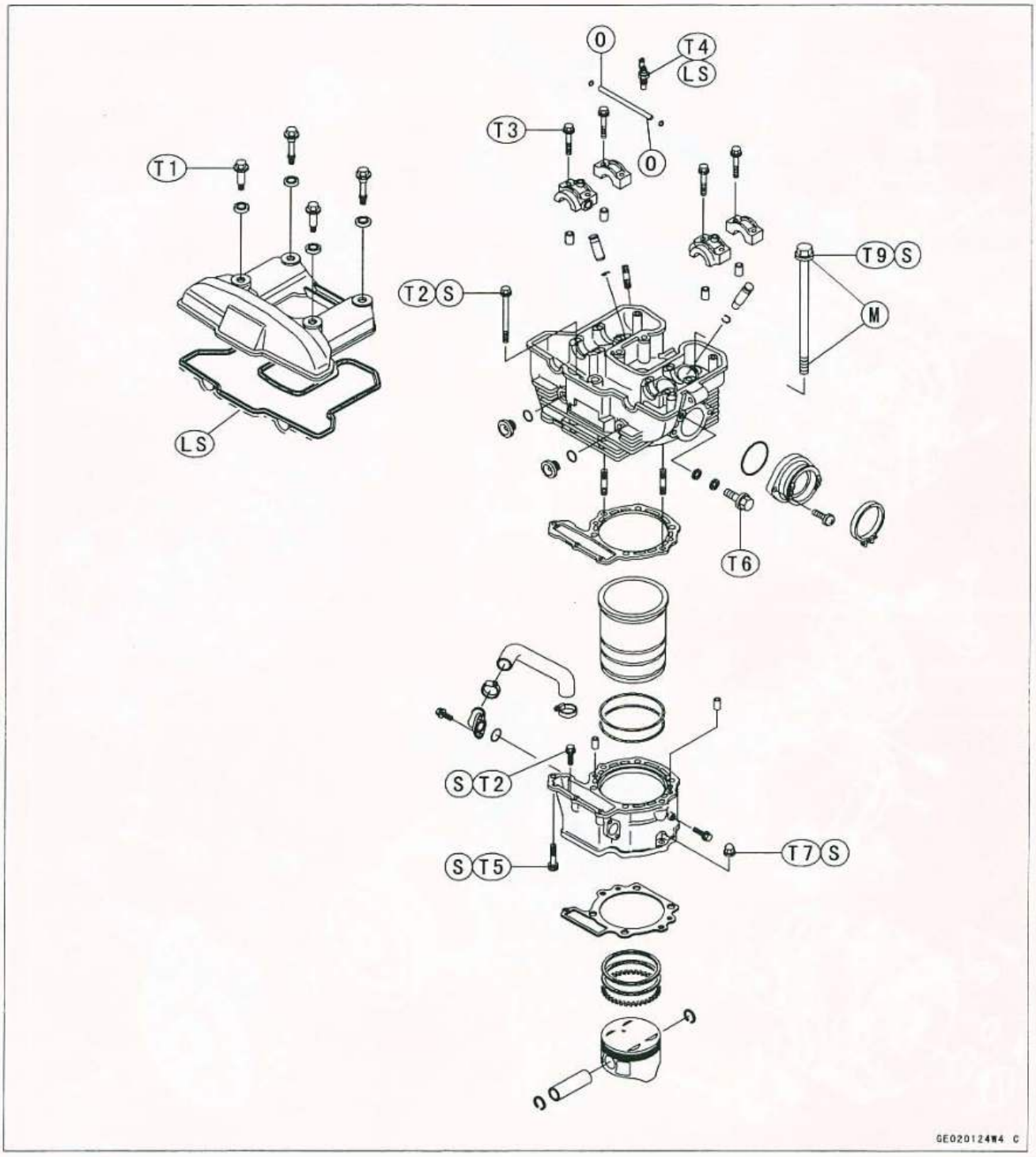
## Fuel System

### 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

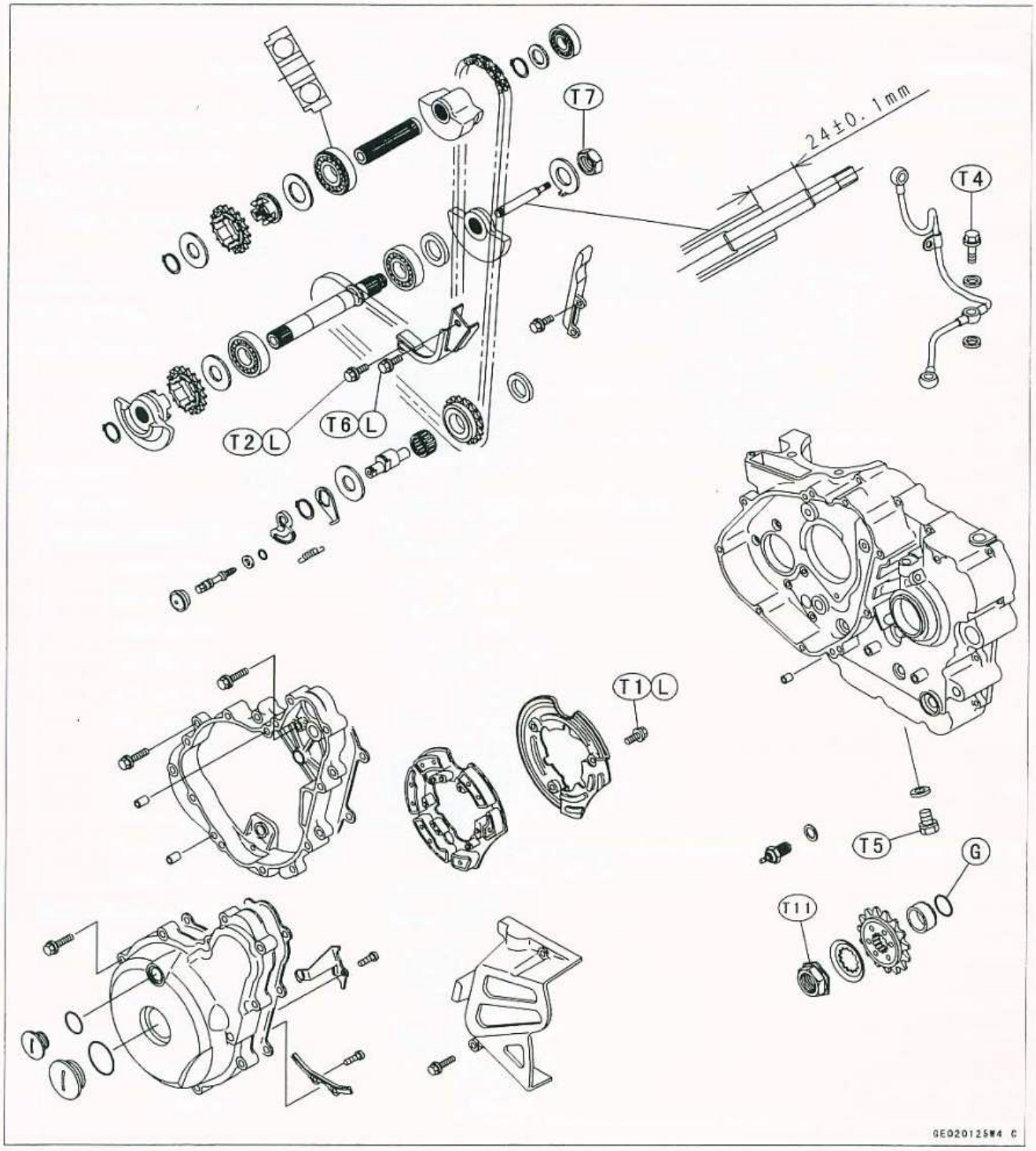



L:Non-permanent Locking Agent
LS:Liquid Gasket(Silicone Sealant)
M:Molybdenum Disulfide Grease
O:Engine Oil
S:Follow the specific tightening sequence.

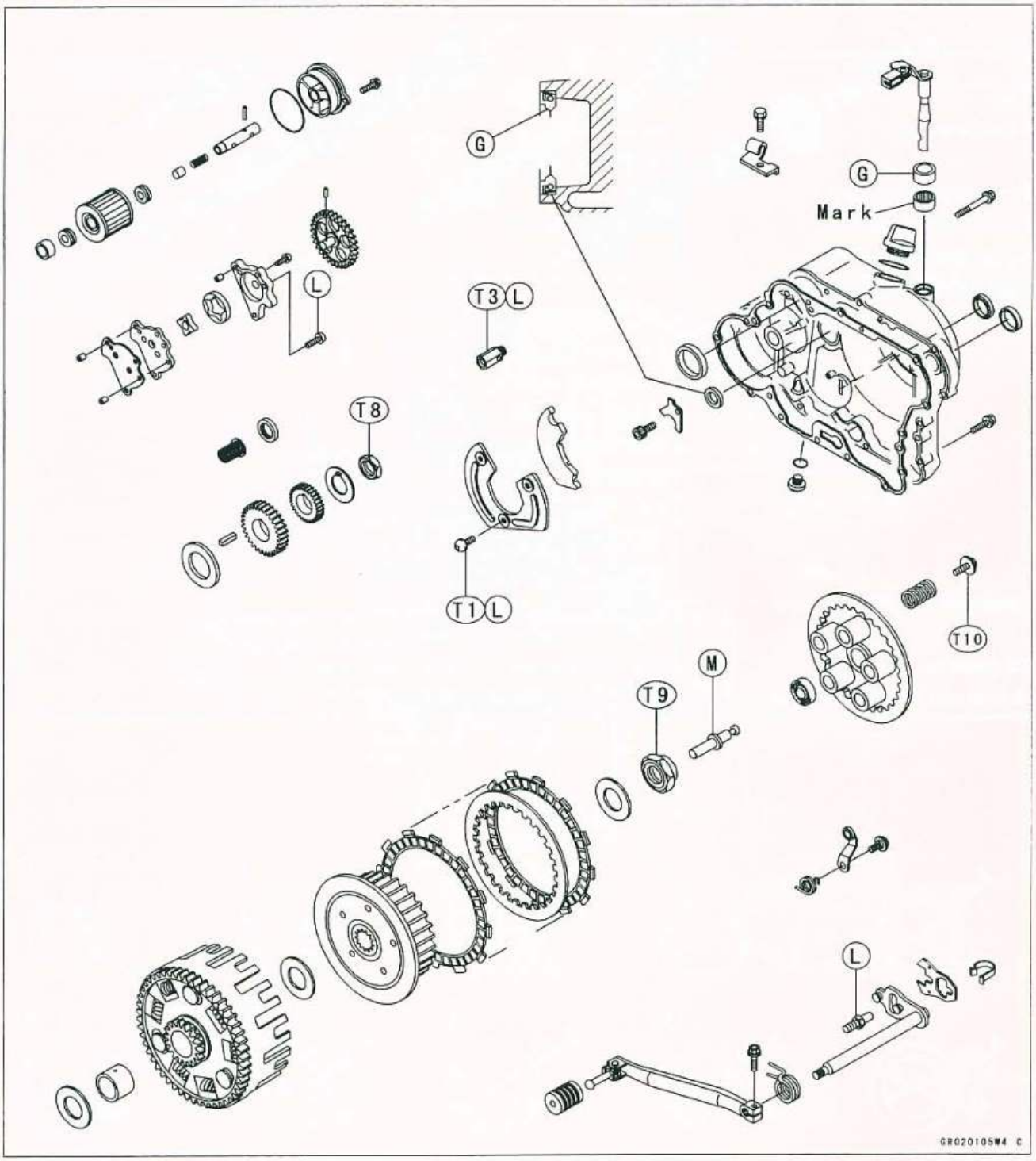
T1:7.8 N-m(0.80 kg-m,69 in-lb)
T2:9.8N-m(1.0 kg-m,87 in-lb)
T3:12N-m(1.2 kg-m,104 in-lb)
T4:15N-m(1.5 kg-m,11.0 ft-lb)
T5:18N-m(1.8 kg-m, 13.0 ft-lb)
T6:20N-m(2.0 kg-m,14.5 ft-lb)
T7:25N-m(2.5 kg-m,18.0 ft-lb)
T8:49N-m(5.0 kg-m,36 ft-lb)
T9:65N-m(6.6 kg-m,48 ft-lb)

## 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)

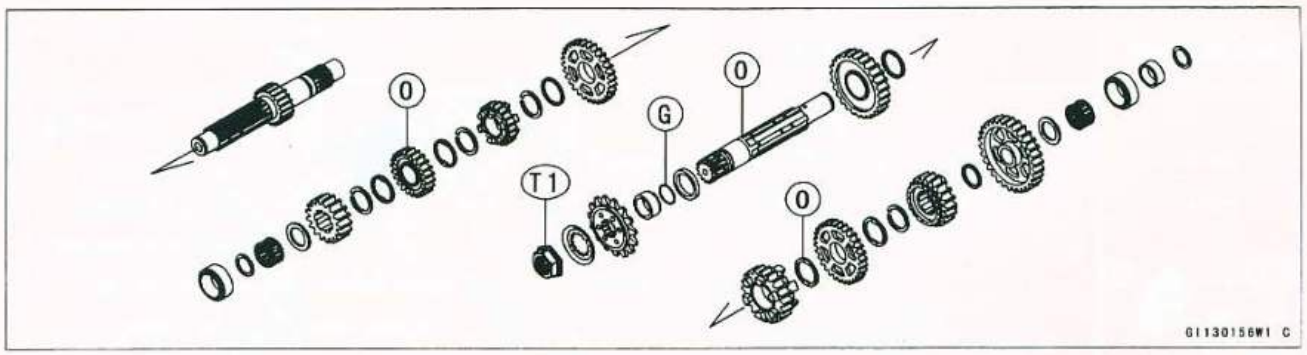

G
G
Mark
L
T3
L
T8
T1
L
T10
M
T9
L
GR02010SW4 C

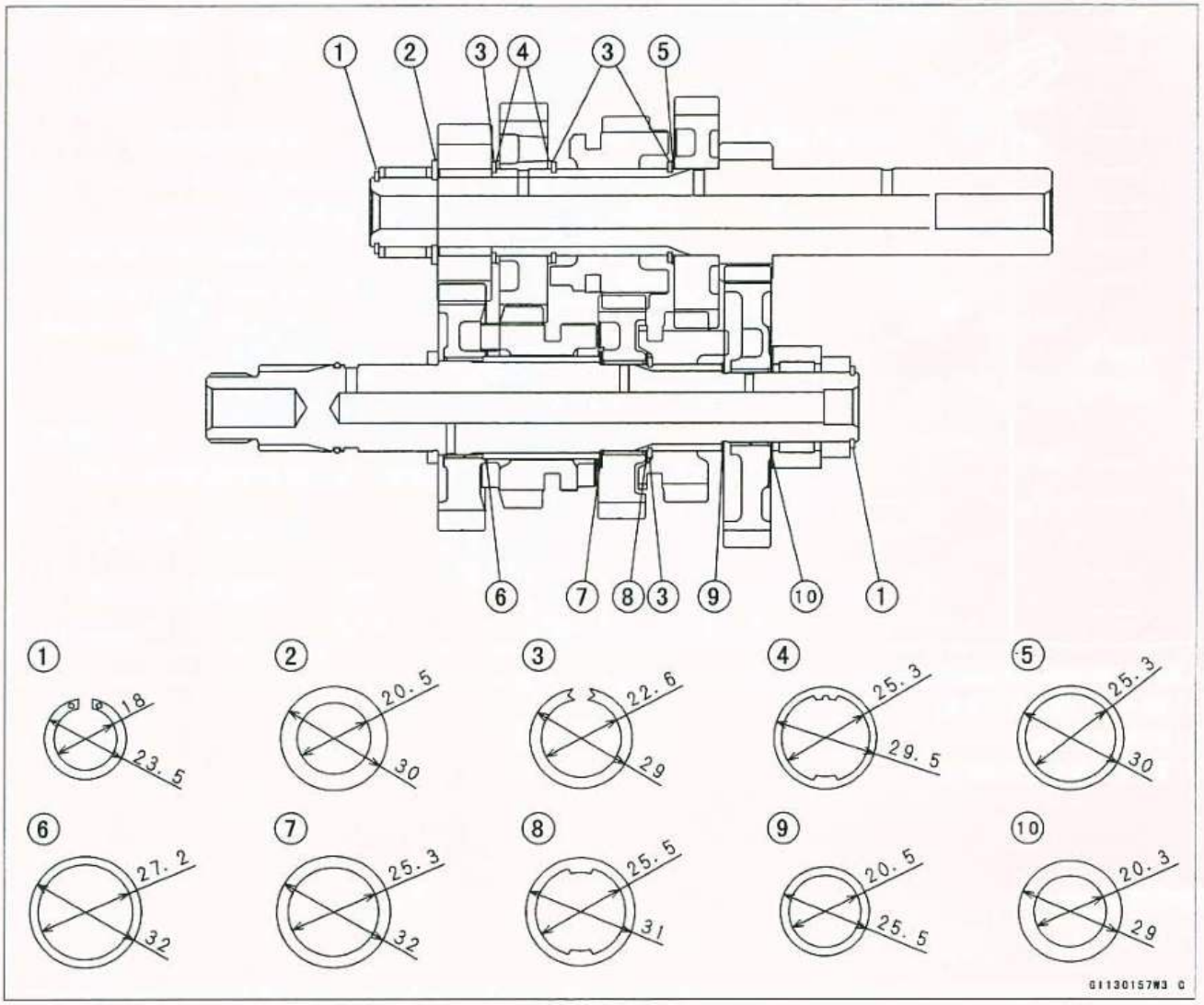
## Specifications

| 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

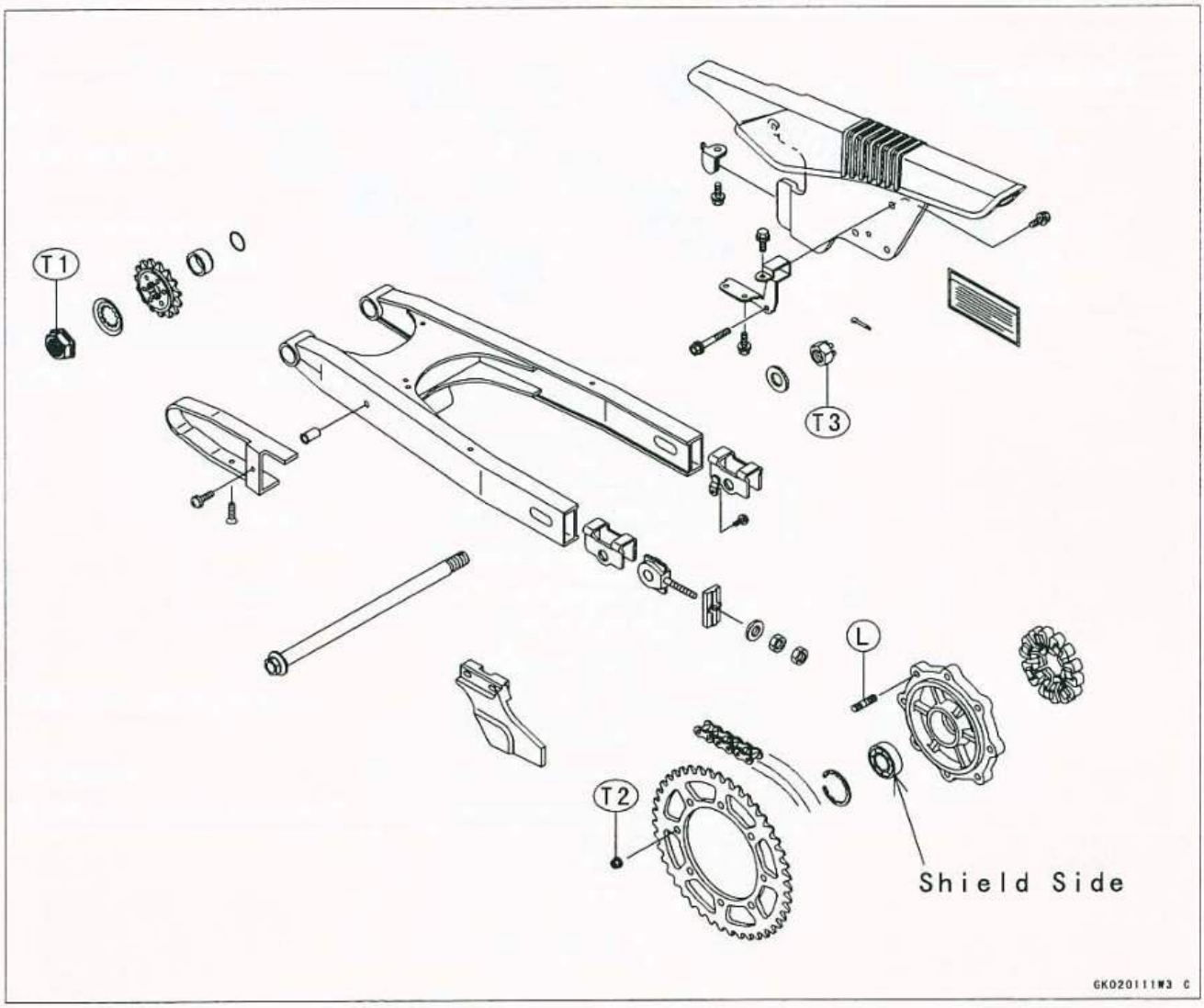



G: Grease
O: Engine Oil
T1: 9.8 N·m (10kg·m, 72 ft·lb)

## 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

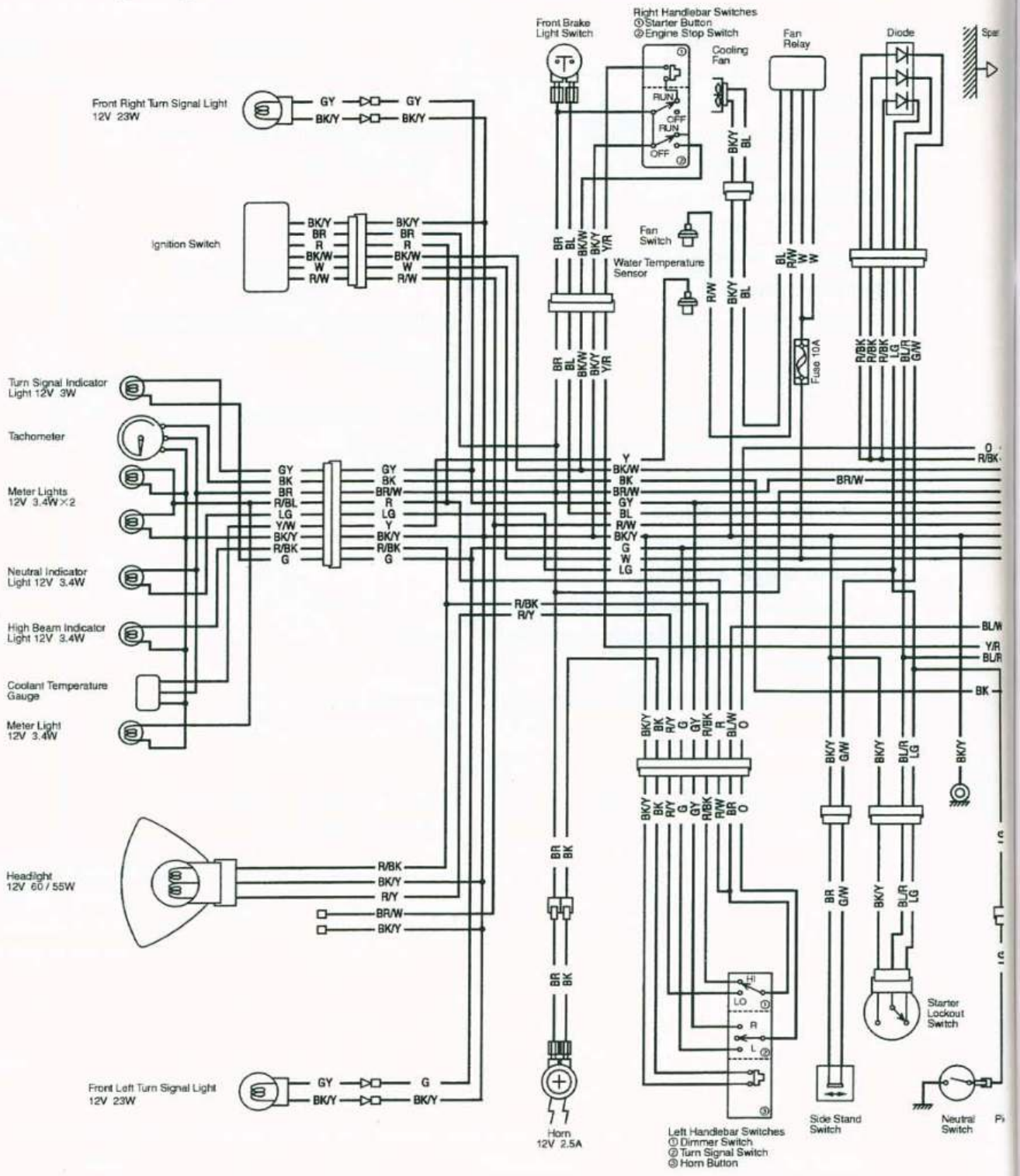
| Item | Standard | Service Limit |
|---|---|---|
| **Drive Chain:** | | |
| Standard chain : On and After KL650-A14 | EK520SR-$O_2$ 106L | --- |
| Chain slack | 50 – 55 mm | 50 – 60 mm |
| Chain 20-link length | 317.5 – 318.1mm | 323mm |

## Electrical System

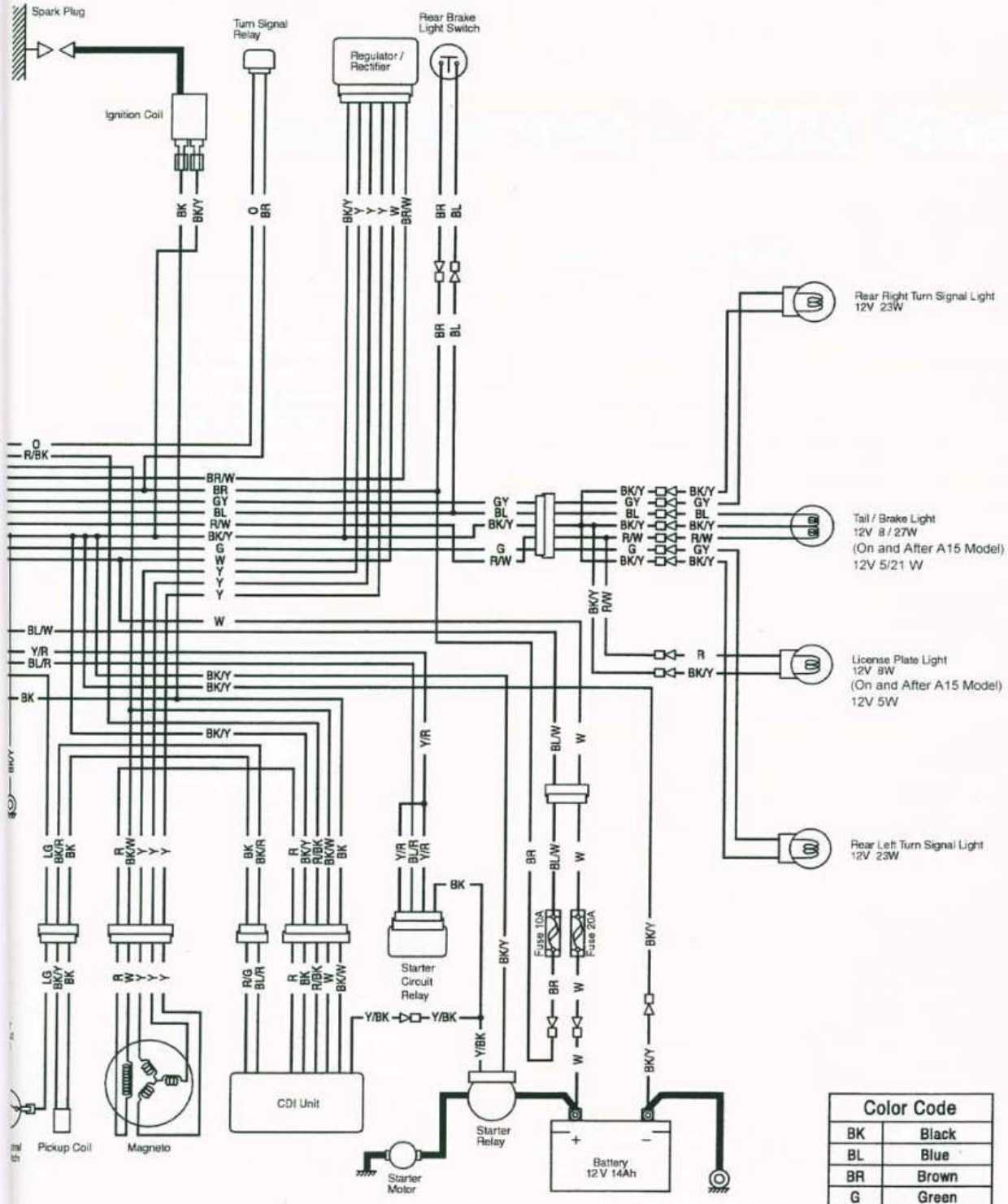
### Specifications

| 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) | ● | ● | | | ● | ● |

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

(98051-1173B)

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<br>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) | |

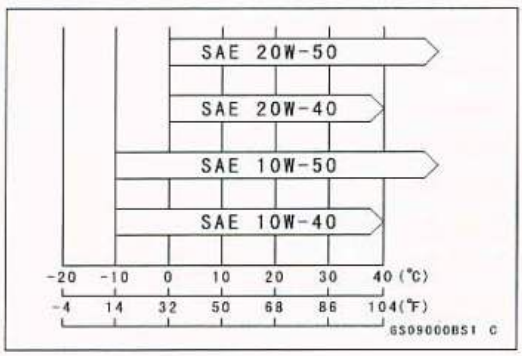
## Engine Oil and Oil Filter

*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
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