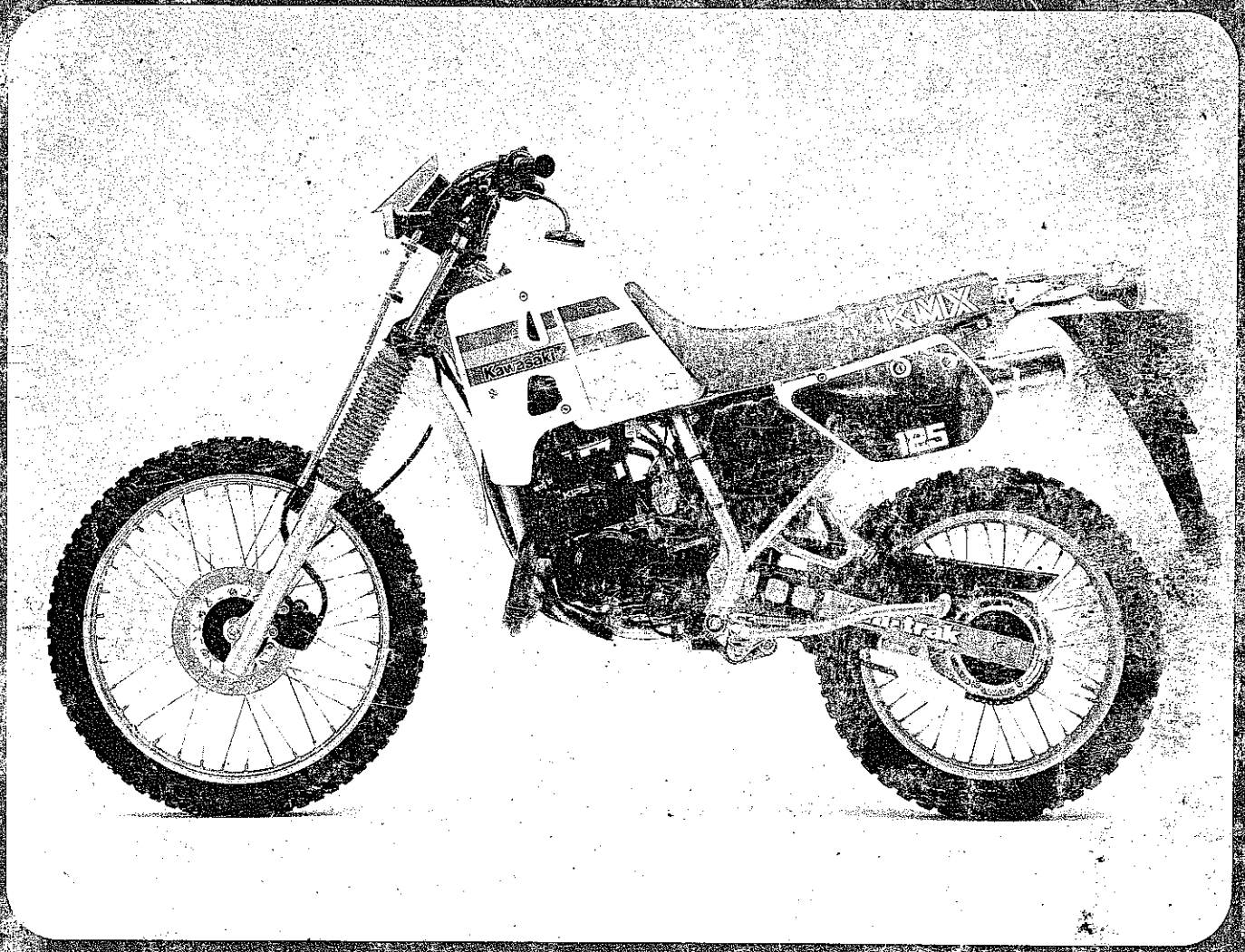
Kawasaki

KMX125

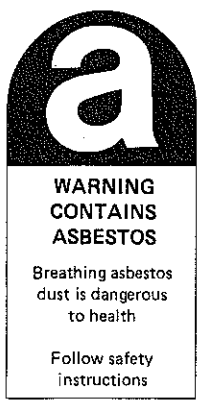


Motorcycle Service Manual

LIST OF ABBREVIATIONS

A	ampere(s)	lb	pound(s)
ABDC	after bottom dead center	m	meter(s)
AC	alternating current	min	minute(s)
ATDC	after top dead center	N	newton(s)
BBDC	before bottom dead center	Pa	pascal(s)
BDC	bottom dead center	PS	horsepower
BTDC	before top dead center	psi	pound(s) per square inch
°C	degree(s) Celcius	r	revolution
DC	direct current	rpm	revolution(s) per minute
F	farad(s)	TDC	top dead center
°F	degree(s) Fahrenheit	TIR	total indicator reading
ft	foot, feet	V	volt(s)
g	gram(s)	W	watt(s)
h	hour(s)	Ω	ohm(s)
L	liter(s)		

U.K. model



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.

Read OWNER'S MANUAL before operating.

Kawasaki

KMX125

Motorcycle
Service Manual

All rights reserved. No parts of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic mechanical photocopying, recording or otherwise, without the prior written permission of Quality Assurance Department/Consumer Products & Components Group/Kawasaki Heavy Industries, Ltd., Japan.

No liability can be accepted for any inaccuracies or omissions in this publication, although every possible care has been taken to make it as complete and accurate as possible.

The right is reserved to make changes at any time without prior notice and without incurring an obligation to make such changes to products manufactured previously. See your Motorcycle dealer for the latest information on product improvements incorporated after this publication.

All information contained in this publication is based on the latest product information available at the time of publication. Illustrations and photographs in this publication are intended for reference use only and may not depict actual model component parts.

© Kawasaki Heavy Industries, Ltd. 1986, 1988

Second Edition ① : July 9, 1988 ①

Quick Reference Guide

General Information 1
Fuel System 2
Cooling System 3
Engine Top End 4
Engine Right Side 5
Engine Lubrication System 6
Engine Removal/Installation 7
Crankshaft/Transmission 8
Wheels/Tires 9
Final Drive 10
Brakes 11
Suspension 12
Steering 13
Frame 14
Electrical System 15
Appendix 16

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.

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.

Foreword

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.

1

General Information

Table of Contents

Before Servicing 1-2
Model Identification 1-4
General Specifications 1-5
Periodic Maintenance Chart 1-7
Torque and Locking Agent 1-8
Cable Routing 1-11
Wire Routing 1-12
Hose Routing 1-14

1-2 GENERAL INFORMATION

Before Servicing

Before starting to service a motorcycle, careful reading of the applicable section is recommended to eliminate unnecessary work. Photographs, diagrams, notes, cautions, warnings, and detailed descriptions have been included wherever necessary. Nevertheless, even a detailed account has limitations, a certain amount of basic knowledge is also required for successful work.

Especially note the following:

(1) Dirt

Before removal and disassembly, clean the motorcycle. Any dirt entering the engine or other parts will work as an abrasive and shorten the life of the motorcycle. For the same reason, before installing a new part, clean off any dust or metal filings.

(2) Battery Ground

Remove the ground (—) lead from the battery before performing any disassembly operations on the motorcycle. This prevents:

(a) the possibility of accidentally turning the engine over while partially disassembled.

(b) sparks at electrical connections which will occur when they are disconnected.

(c) damage to electrical parts.

(3) Tightening Sequence

Generally, when installing a part with several bolts, nuts, or screws, they should all be started in their holes and tightened to a snug fit. Then tighten them evenly in a cross pattern. This is to avoid distortion of the part and/or causing gas or oil leakage. Conversely when loosening the bolts, nuts, or screws, first loosen all of them by about a quarter of turn and then remove them.

Where there is a tightening sequence indication in this Service Manual, the bolts, nuts, or screws must be tightened in the order and method indicated.

(4) Torque

The torque values given in this Service Manual should always be adhered to. Either too little or too much torque may lead to serious damage. Use a good quality, reliable torque wrench.

(5) Force

Common sense should dictate how much force is necessary in assembly and disassembly. If a part seems especially difficult to remove or install, stop and examine what may be causing the problem. Whenever tapping is necessary, tap lightly using a wooden or plastic faced mallet. Use an impact driver for screws (particularly for the removal of screws held by a locking agent) in order to avoid damaging the screw heads.

(6) Edges

Watch for sharp edges, especially during major engine disassembly and assembly. Protect your hands with gloves or a piece of thick cloth when lifting the engine or turning it over.

(7) High Flash-point Solvent

A high flash-point solvent is recommended to reduce fire danger. A commercial solvent commonly available in North America is Stoddard solvent (generic name). Always follow manufacturer and container directions regarding the use of any solvent.

(8) Gasket, O-ring

Do not reuse a gasket or O-ring once it has been in service. The mating surfaces around the gasket should be free of foreign matter and perfectly smooth to avoid oil or compression leaks.

(9) Liquid Gasket, Nonpermanent Locking Agent

Follow manufacturer's directions for cleaning and preparing surfaces where these compounds will be used. Apply sparingly. Excessive amounts may block engine oil passages and cause serious damage. An example of a non-permanent locking agent commonly available in North America is Loctite Lock'n Seal (Blue).

(10) Press

A part installed using a press or driver, such as a wheel bearing, should first be coated with oil on its outer or inner circumference so that it will go into place smoothly.

(11) Ball Bearing

When installing a ball bearing, the bearing race which is affected by friction should be pushed by a suitable driver. This prevents severe stress on the balls and races, and prevents races and balls from being dented. Press a ball bearing until it stops at the stop in the hole or on the shaft.

(12) Oil Seal and Grease Seal

Replace any oil or grease seals that were removed with new ones, as removal generally damages seals.

When pressing in a seal which has manufacturer's marks, press it in with the marks facing out. Seals should be pressed into place using a suitable driver, which contacts evenly with the side of seal, until the face of the seal is even with the end of the hole.

(13) Seal Guide

A seal guide is required for certain oil or grease seals during installation to avoid damage to the seal lips. Before a shaft passes through a seal, apply a little oil, preferably high temperature grease on the lips to reduce rubber to metal friction.

(14) Circlip, Retaining Ring

Replace any circlips and retaining rings that were removed with new ones, as removal weakens and deforms them. When installing circlips and retaining rings, take care to compress or expand them only enough to install them and no more.

(15) Cotter Pin

Replace any cotter pins that were removed with new ones, as removal deforms and breaks them.

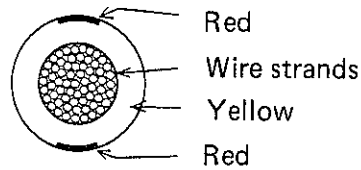
(16) Lubrication

Engine wear is generally at its maximum while the engine is warming up and before all the rubbing surfaces have an adequate lubricative film. During assembly, oil or grease (whichever is more suitable) should be applied to any rubbing surface which has lost its lubricative film. Old grease and dirty oil should be cleaned off. Deteriorated grease has lost its lubricative quality and may contain abrasive foreign particles.

Don't use just any oil or grease. Some oils and greases in particular should be used only in certain applications and may be harmful if used in an application for which they are not intended. This manual makes reference to molybdenum disulfide grease (MoS_2) in the assembly of certain engine and chassis parts. Always check manufacturer recommendations before using such special lubricants.

(17) Electrical Wires

All the electrical wires are either single-color or two-color and, with only a few exceptions, must be connected to wires of the same color. On any of the two-color wires there is a greater amount of one color and a lesser amount of a second color, so a two-color wire is identified by first the primary color and then the secondary color. For example, a yellow wire with thin red stripes is referred to as a "yellow/red" wire; it would be a "red/yellow" wire if the colors were reversed to make red the main color.

Wire (cross-section)	Name of Wire Color
	Yellow/red

(18) Replacement Parts

When there is a replacement instruction, replace these parts with new ones every time they are removed. These replacement parts will be damaged or lose their original function once removed.

(19) Inspection

When parts have been disassembled, visually inspect these parts for the following conditions or other damage. If there is any doubt as to the condition of them, replace them with new ones.

Abrasion	Crack	Hardening	Warp
Bent	Dent	Scratch	Wear
Color change	Deterioration	Seizure	

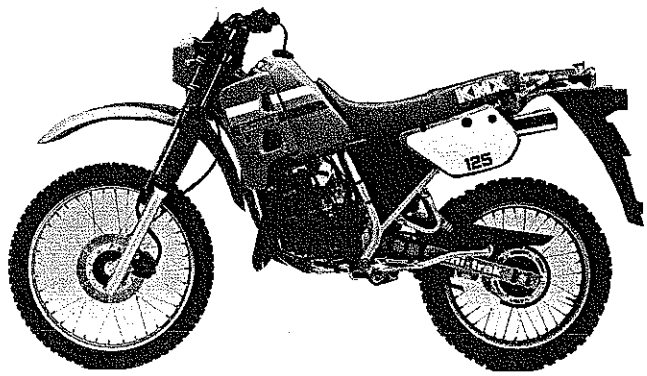
(20) Service Data

Numbers of service data in this text have following meanings:

"Standards": Show dimensions or performances which brand-new parts or systems have.
"Service limits": Indicate the usable limits. If the measurement shows excessive wear or deteriorated performance, replace the damaged parts.

Model Identification

KMX125-A1/B1 Left Side View



KMX125-A2/B2 Left Side View



KMX125-A3/B3 Left Side View



General Specifications

Items		KMX125-A1/B1/A2/B2	KMX125-A3/B3
Dimensions:			
Overall length		2 145 mm, (SA) 2 080 mm	2 100 mm, (SA) 2 080 mm
Overall width		840 mm	(WG) (GR) (N) (S) 2 145 mm
Overall height		1 175 mm	←
Wheelbase		1 375 mm	←
Road clearance		295 mm	←
Seat height		865 mm	←
Dry weight		99 kg	97 kg
Curb weight:	Front	54 kg	53 kg
	Rear	62 kg	61 kg
Fuel tank capacity		9.3 L	←
Performance:			
Climbing ability		32°	—
Braking distance		12.5 m from 50 km/h	←
Minimum turning radius		2.1 m	←
Engine:			
Type		2-stroke, single cylinder, piston reed valve	←
Cooling system		Liquid-cooled	←
Bore and stroke		54.0 x 54.4 mm	←
Displacement		124 mL	←
Maximum horsepower		17.7 kW (24 PS) @9 500 r/min (rpm)	←
		(WG) 17 PS @8 500 r/min (rpm) [DIN]	←
		(S) 12.5 kW (17 PS) @8 500 r/min (rpm)	←
		(F) 17.2 kW @9 500 r/min (rpm) [UTAC's norms]	—
		KMX125-B1/B2	KMX125-B3
		(F) 11.1 kW @8 800 r/min (rpm) [UTAC's norms]	←
		(B) 9.0 kW (12.2 PS) @8 800 r/min (rpm)	←
Maximum torque		17.7 N-m (1.8 kg-m, 13.0 ft-lb) @9 000 r/min (rpm)	←
		(WG) 1.5 kg-m @7 500 r/min (rpm) [DIN]	←
		(S) 14.7 N-m (1.5 kg-m, 10.8 ft-lb) @7 700 r/min (rpm)	←
		KMX125-B1/B2	KMX125-B3
		(B) 11.8 N-m (1.2 kg-m, 8.7 ft-lb) @6 500 r/min (rpm)	←
Carburetion system		Carburetor, Mikuni VM26SS	←
Starting system		Primary kick	←
Ignition system		CDI	←
Timing advance		Electronically advanced	←
Ignition timing		10.5° BTDC @1 300 r/min (rpm) – 26.5° BTDC @3 000 r/min (rpm)	←
Spark plug		NGK BR8ES, (I) (SA) NGK B8ES	←
Port timing:			
Inlet:	Open	Full open	←
	Close	–	←
Scavenging	Open	61° BBDC	←
	Close	61° ABDC	←
Exhaust	Open	88° BBDC	←
	Close	88° ABDC	←

(Continued on next page.)

Item	KMX125-A1/B1/A2/B2	KMX125-A3/B3
Lubrication system	Superlube (oil injection)	←
Engine oil:		
Type	2-stroke oil for air-cooled engine	←
Oil tank capacity	1.2 L	←
Drive Train:		
Primary reduction system:		
Type	Gear	←
Reduction ratio	3.272 (72/22)	←
Clutch type	Wet, multi disc	←
Transmission:		
Type	6-speed, constant mesh, return shift	←
Gear ratios: 1st	3.100 (31/10)	←
2nd	1.928 (27/14)	←
3rd	1.411 (24/17)	←
4th	1.090 (24/22)	←
5th	0.916 (22/24)	←
6th	0.807 (21/26)	←
Final drive system:		
Type	Chain drive	←
Reduction ratio	3.428 (48/18)	←
Overall drive ratio	9.062 @Top gear	←
Transmission oil:		
Grade	SE class	←
Viscosity	SAE 10W30 or 10W40	←
Capacity	0.75 L	←
Frame:		
Type	Tubular, semi-double cradle	←
Caster (rake angle)	28°	←
Trail	111 mm	←
Front tire: Type	DUNLOP K260, Tube type	←
Size	2.75–21 4PR	←
Rear tire: Type	DUNLOP K260, Tube type	←
Size	4.10–18 4PR	←
Front suspension:		
Type	Telescopic fork	←
Wheel travel	230 mm	←
Brake type:		
Front	Single disc	←
Rear	Single disc	←
Electrical Equipment:		
Battery	12 V 4 Ah	←
Headlight: Type	Semi-sealed beam	←
Bulb	12 V 60/55 W (quartz-halogen)	←
	(SA) 12 V 35/36.5 W (quartz-halogen)	←
Tail/brake light	12 V 5/21 W, (SA) 12 V 8/27 W	←
Alternator:		
Rated output	11.5 A @8 000 r/min (rpm), 14 V	←
	(SA) 9.5 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.

(B) : U.K. Model
(F) : French Model
(GR) : Greek Model
(I) : Italian Model
(N) : Norwegian Model
(S) : Swiss Model
(SA) : South African Model
(SW) : Swedish Model
(WG) : West German Model

Periodic Maintenance Chart

The 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	4,000 km	8,000 km	12,000 km	16,000 km	20,000 km	24,000 km	See Page
Spark plug -- clean		•	•	•	•	•	•	•	15-19
Spark plug -- check †		•	•	•	•	•	•	•	15-19
Air cleaner element -- clean			•		•		•		2-16
Air cleaner element -- replace	5 cleanings				•				2-16
Throttle grip play -- check †		•		•		•		•	2-5
Oil pump and carburetor synchronization --check †		•	•	•	•	•	•	•	6-3
Idle speed -- check †		•	•	•	•	•	•	•	2-8
Fuel system -- check †				•		•		•	2-10
Cylinder head bolt tightness -- check †		•		•		•		•	4-5
Coolant -- change	2 years							•	3-5
Radiator hoses, connections -- check †	year	•		•		•		•	3-13
Transmission oil -- change	year	•		•		•		•	6-7
Fuel hose -- replace	4 years								— — —
Clutch -- adjust		•	•	•	•	•	•	•	5-7
Drive chain wear -- check †			•	•	•	•	•	•	10-5
Drive chain -- lubricate	300 km								10-5
Drive chain slack -- check †	800 km								10-4
Brake lining or pad wear -- check †			•	•	•	•	•	•	11-8
Brake fluid level -- check †	month	•	•	•	•	•	•	•	11-11
Brake fluid -- change	2 years						•		11-12
Brake hose -- replace	4 years								11-14
Brake master cylinder cup and dust seal -- replace	2 years								11-10
Caliper piston seal and dust seal -- replace	2 years								11-7
Brake light switch -- check †		•	•	•	•	•	•	•	15-27
Steering -- check †		•	•	•	•	•	•	•	13-4
Steering stem bearing -- lubricate	2 years						•		13-7
Front fork oil -- change								•	12-5
Tire wear -- check †			•	•	•	•	•	•	9-8
Spoke tightness and rim runout -- check †		•	•	•	•	•	•	•	9-6
Swing arm pivot, uni-trak linkage -- lubricate				•		•		•	— — —
Battery electrolyte level -- check †	month	•	•	•	•	•	•	•	15-9
General lubrication -- perform			•	•	•	•	•	•	16-7
Nut, bolt, and fastener tightness -- check †		•		•		•		•	1-8

* : For higher odometer readings, repeat at the frequency interval established here.
† : Replace, add, adjust, clean, or torque if necessary.

Torque and Locking Agent

Tighten all bolts and nuts to the proper torque using an accurate torque wrench. If insufficiently tightened, a bolt or nut may become damaged or fall off, possibly resulting in damage to the motorcycle and injury to the rider. A bolt or nut which is overtightening may become damaged, strip an internal thread, or break and then fall out. The following table lists the tightening torque for the major bolts and nuts, and the parts requiring use of a non-permanent locking agent or liquid gasket.

When checking the tightening torque of the bolts and nuts, first loosen the bolt or nut by half a turn and then tighten to specified torque.

Letters used in the "Remarks" column mean:
L : Apply a non-permanent locking agent to the threads.
LG : Apply liquid gasket to the threads.
S : Tighten the fasteners following the specified sequence.

Fastener	Torque			Remarks
	N-m	kg-m	ft-lb	
Fuel System:				
Oil Pump Cable Locknuts	9.8	1.0	7.0	
Cooling System:				
Water Temperature Sensor	15	1.5	11.0	LG
Water Pump Impeller Nut	9.8	1.0	7.0	
Coolant Drain Plug	15	1.5	11.0	
Engine Top End:				
Cylinder Head Bolts	25	2.6	19.0	
Spark Plug	25	2.5	18.0	
Cylinder Head Bracket Nuts	25	2.5	18.0	
Shaft Lever Mounting Bolt	8.8	0.9	78 in-lb	
Cylinder Nuts	25	2.5	18.0	
Engine Right Side:				
Water Pump Impeller Nut	9.8	1.0	7.0	
Shaft Lever Mounting Bolt	8.8	0.9	78 in-lb	
Exhaust Advancer Lever Mounting Allen Bolts	3.9	0.4	35 in-lb	
Clutch Spring Bolts	9.3	0.95	82 in-lb	
Shift Drum Cam Mounting Screw	– – –	– – –	– – –	L
Gear Positioning Lever Mounting Nut	9.8	1.0	7.0	
Return Spring Pin	20	2.0	14.5	L
Primary Gear Nut	59	6.0	43	
Kick Guide Mounting Bolt	– – –	– – –	– – –	L

Fastener	Torque			Remarks
	N-m	kg-m	ft-lb	
Engine Lubrication System:				
Oil Pump Hose Banjo Bolt	4.4	0.45	39 in-lb	
Oil Pump Cable Locknuts	9.8	1.0	7.0	
Transmission Oil Drain Plug	20	2.0	14.5	
Engine Removal/Installation:				
Swing Arm Pivot Shaft Nut	98	10.0	72	
Engine Mounting Nuts	29	3.0	22.0	
Cylinder Head Bracket Nuts	29	3.0	22.0	
Crankshaft/Transmission:				
Shift Drum Cam Mounting Screw	– – –	– – –	– – –	L
Transmission Oil Drain Plug	20	2.0	14.5	
Primary Gear Nut	59	6.0	43	
Neutral Switch	15	1.5	11.0	
Flywheel Nut	59	6.0	43	
Wheels/Tires:				
Front Axle Nut	49	5.0	36	
Rear Caliper Mounting Bolts	25	2.5	18.0	
Rear Axle Nut	88	9.0	65	
Spoke Nipple	Not less than 1.5	Not less than 0.15	Not less than 13 in-lb	
Final Drive:				
Rear Axle Nut	88	9.0	65	
Engine Sprocket Bolts	12	1.2	8.5	
Rear Sprocket Nuts	27	2.8	20	
Brakes:				
Caliper Mounting Bolts (Front, Rear)	25	2.5	18.0	
Brake Hose Banjo Bolts	25	2.5	18.0	
Front Brake Hose Clamp Bolts	7.8	0.8	69 in-lb	
Front Master Cylinder Clamp Bolts	8.8	0.9	78 in-lb	S
Brake Lever Pivot Locknut	5.9	0.6	52 in-lb	
Rear Master Cylinder Mounting Bolts	25	2.5	18.0	
Reservoir Mounting Bolt (Rear)	5.9	0.6	52 in-lb	
Brake Pedal Adjuster (Adjusting Nut, Locknut)	17.2	1.75	152 in-lb	
Brake Disc Mounting Bolts (Front)	23	2.3	16.5	
Brake Disc Mounting Bolts (Rear)	15	1.5	11.0	

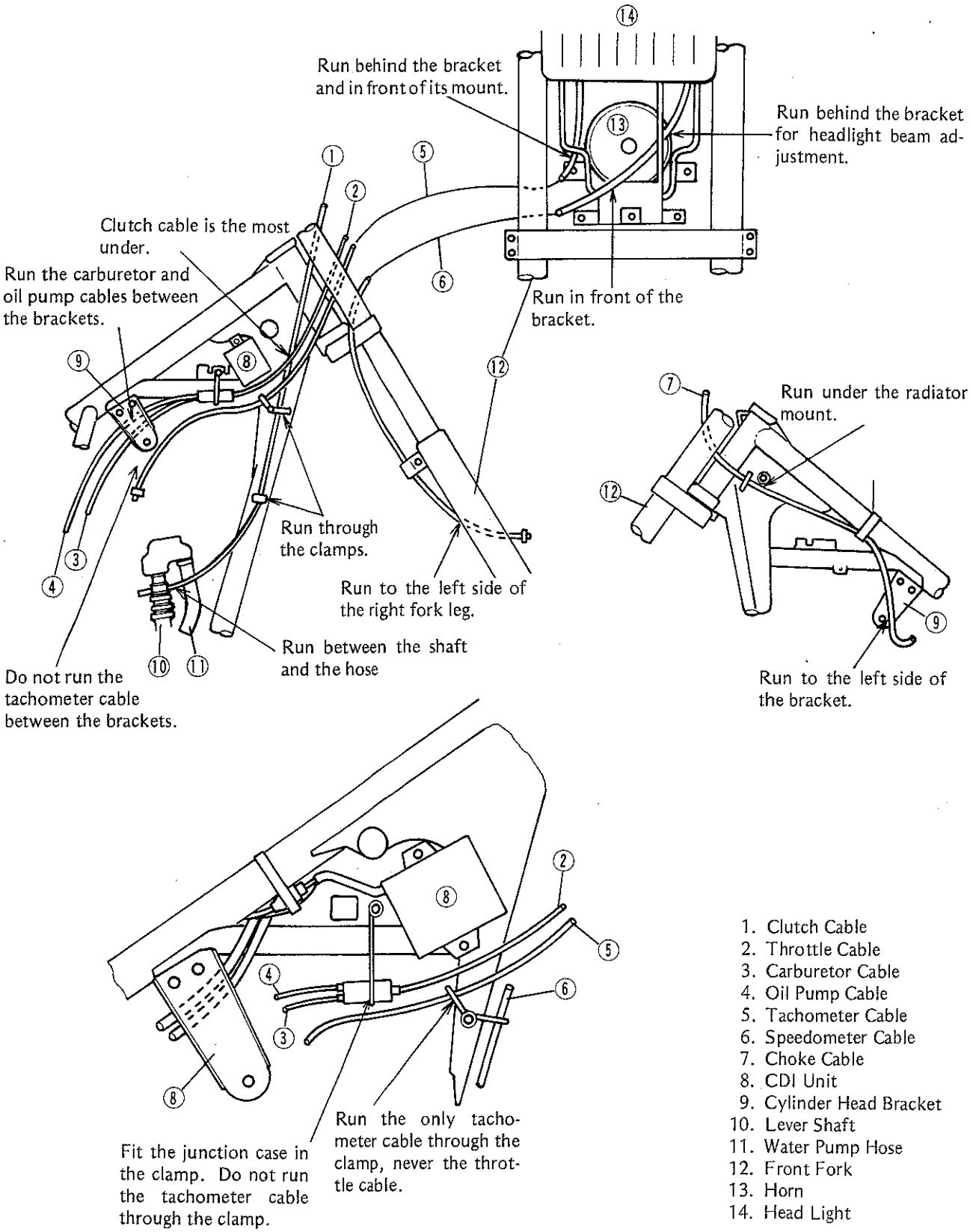
Fastener	Torque			Remarks
	N-m	kg-m	ft-lb	
Caliper Bleed Valves (Front, Rear)	7.8	0.8	69 in-lb	
Brake Pedal Mounting Bolt	9.8	1.0	7.0	L
Suspension:				
Front Fork Clamp Nuts (Upper, Lower)	20	2.0	14.5	
Front Fork Bottom Allen Bolts	20	2.0	14.5	L
Swing Arm Pivot Shaft Nut	98	10.0	72	
Rear Shock Absorber Upper Mounting Bolt	59	6.0	43	
Rear Shock Absorber Lower Mounting Nut	59	6.0	43	
Tie-Rod Front Mounting Nut	98	10.0	72	
Tie-Rod Rear Mounting Nut	59	6.0	43	
Rocker Arm Pivot Shaft Nut	98	10.0	72	
Steering:				
Steering Stem Head Nut	44	4.5	33	
Steering Stem Locknut	3.9	0.4	35 in-lb	
Handlebar Clamp Bolts	24	2.4	17.5	
Electrical System:				
Magneto Cover Damper Mounting Screws	– – –	– – –	– – –	L
Flywheel Nut	59	6.0	43	
Spark Plug	25	2.5	18.0	
Neutral Switch	15	1.5	11.0	
Water Temperature Sensor	15	1.5	11.0	LG

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

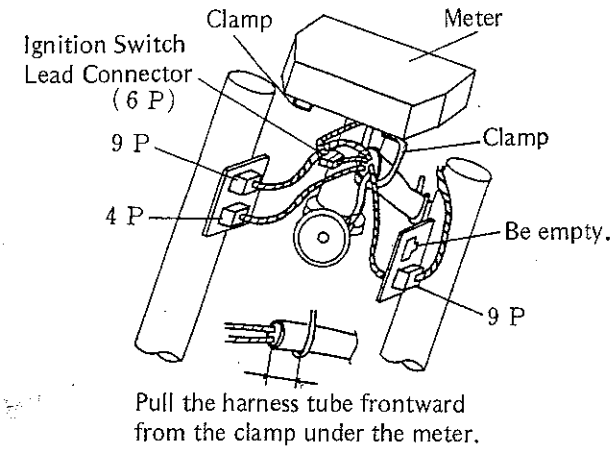
Threads dia. (mm)	Torque		
	N-m	kg-m	ft-lb
5	3.4 – 4.9	0.35 – 0.50	30 – 43 in-lb
6	5.9 – 7.8	0.60 – 0.80	52 – 69 in-lb
8	14 – 19	1.4 – 1.9	10.0 – 13.5
10	25 – 34	2.6 – 3.5	19.0 – 25
12	44 – 61	4.5 – 6.2	33 – 45
14	73 – 98	7.4 – 10.0	54 – 72
16	115 – 155	11.5 – 16.0	83 – 115
18	165 – 225	17.0 – 23	125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

Cable Routing



1. Clutch Cable
2. Throttle Cable
3. Carburetor Cable
4. Oil Pump Cable
5. Tachometer Cable
6. Speedometer Cable
7. Choke Cable
8. CDI Unit
9. Cylinder Head Bracket
10. Lever Shaft
11. Water Pump Hose
12. Front Fork
13. Horn
14. Head Light

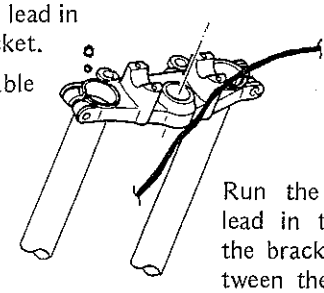
Wire Routing



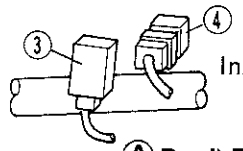
Pull the harness tube frontward from the clamp under the meter.

Run the left grip lead in front of the bracket.

Clutch Cable

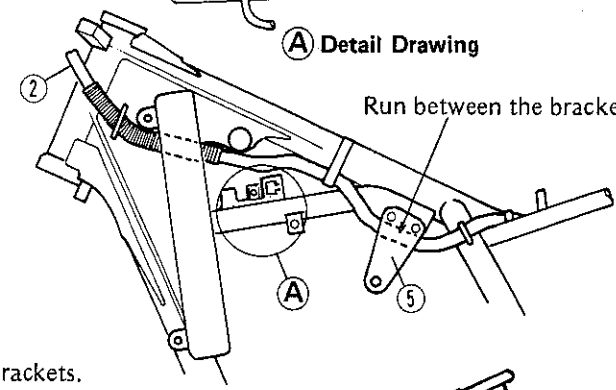


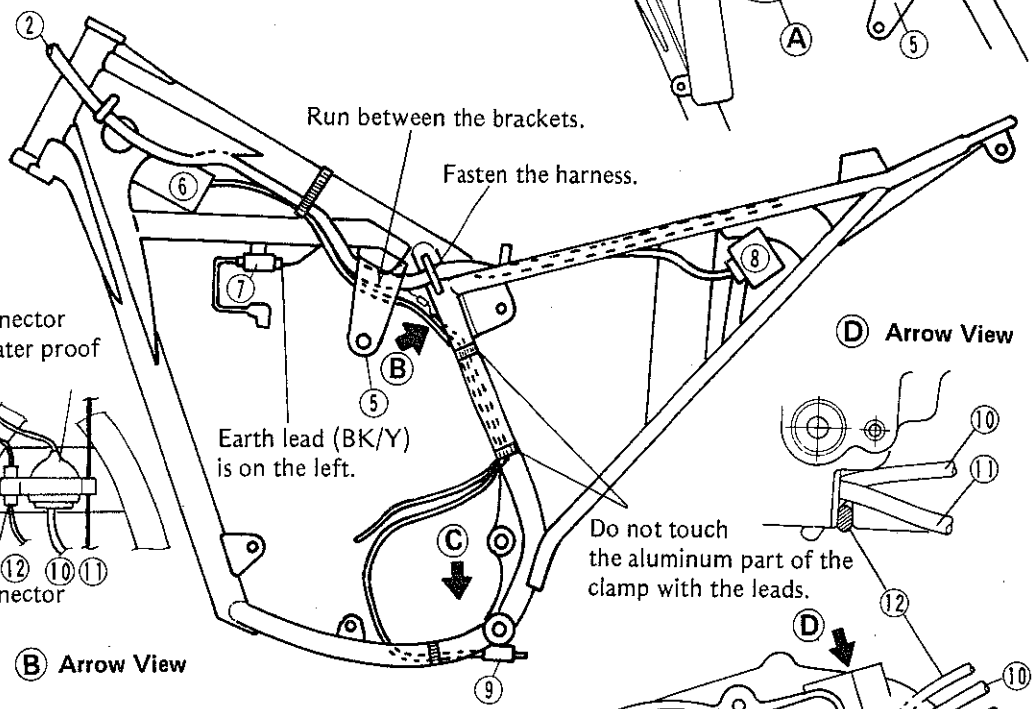
Run the right grip lead in the rear of the bracket, and between the fork legs.



Install from the right side.

Ⓐ Detail Drawing

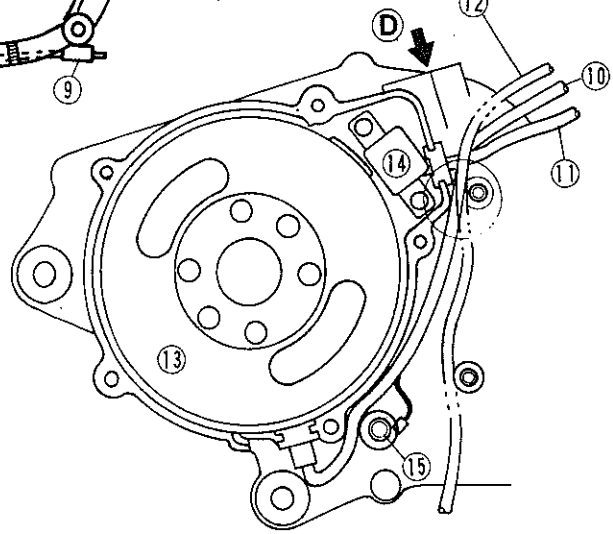




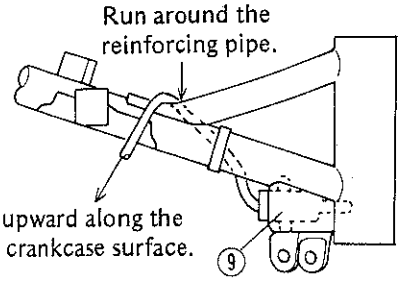
Ⓑ Arrow View

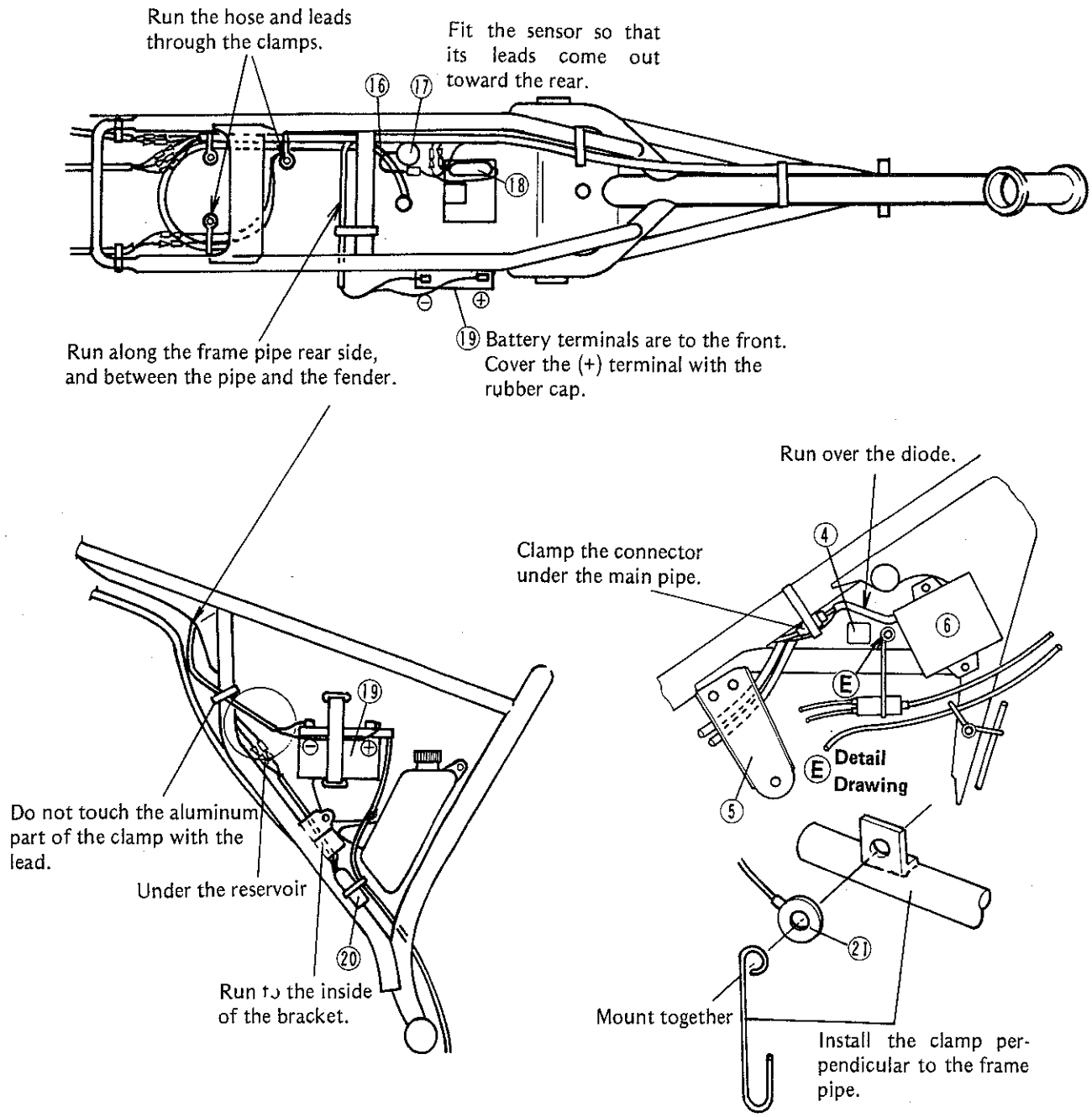
Ⓓ Arrow View

Do not touch the aluminum part of the clamp with the leads.



Ⓒ Arrow View





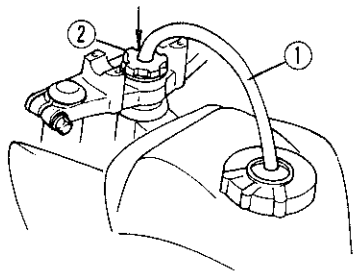
1. Horn
2. Main Harness
3. Turn Signal Relay
4. Diode
5. Cylinder Head Bracket
6. CDI Unit
7. Ignition Coil
8. Regulator/Rectifier
9. Side Stand Switch
10. Magneto Lead
11. Pickup Coil Lead
12. Side Stand Switch Lead
13. Flywheel Magneto
14. Pickup Coil
15. Neutral Switch
16. Oil Tank Breather Hose
17. Oil Level Sensor
18. Fuse
19. Battery
20. Brake Light Switch
21. Earth Terminal

Hose Routing

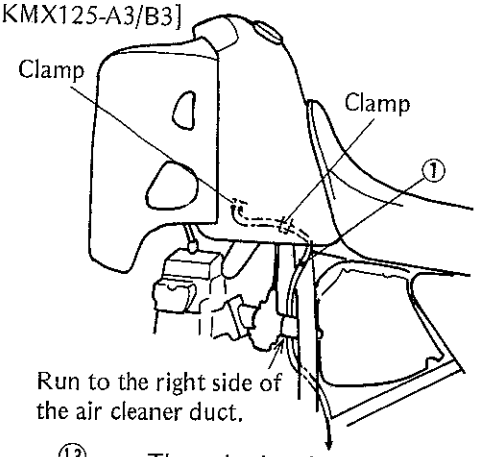
Fuel Tank Breather Hose

[KMX125-A1/A2/B1/B2]

Insert into the steering stem hole.

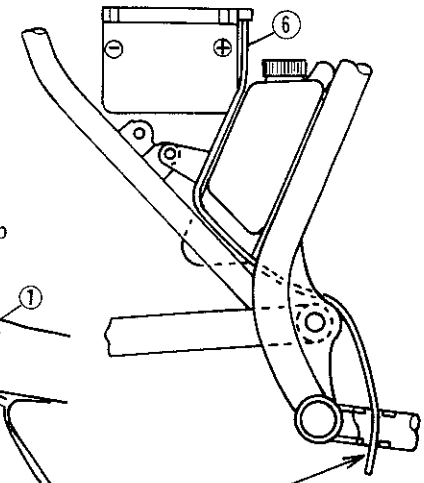


[KMX125-A3/B3]



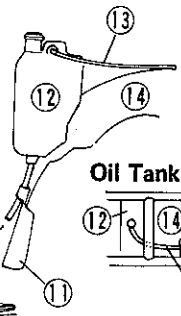
Run to the right side of the air cleaner duct.

Battery Vent Hose

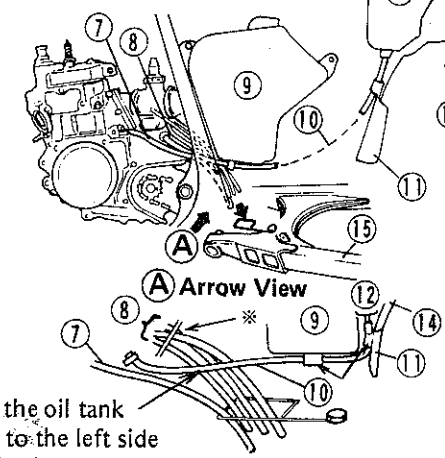


Through the footpeg bracket holes.

Engine Breather Hose
Carburetor Air Vent Tube
Carburetor Overflow Tube
Oil Tank Hose



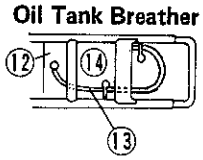
Through the clamp on the swing arm with the engine breather hose, carburetor air vent and overflow tubes.



※ Through the oil pump bracket hole.

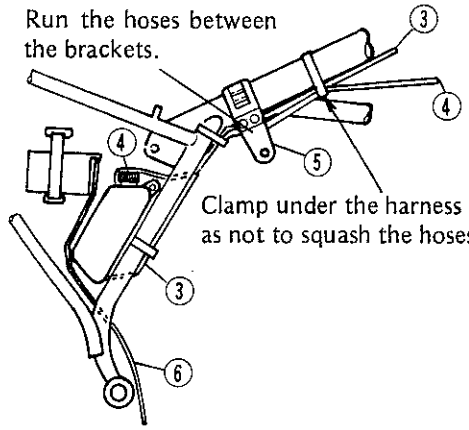
Run the oil tank hose to the left side of the air vent and overflow tubes.

Oil Tank Breather Hose



Reservoir Tank Hose
Reservoir Tank Air Vent Hose

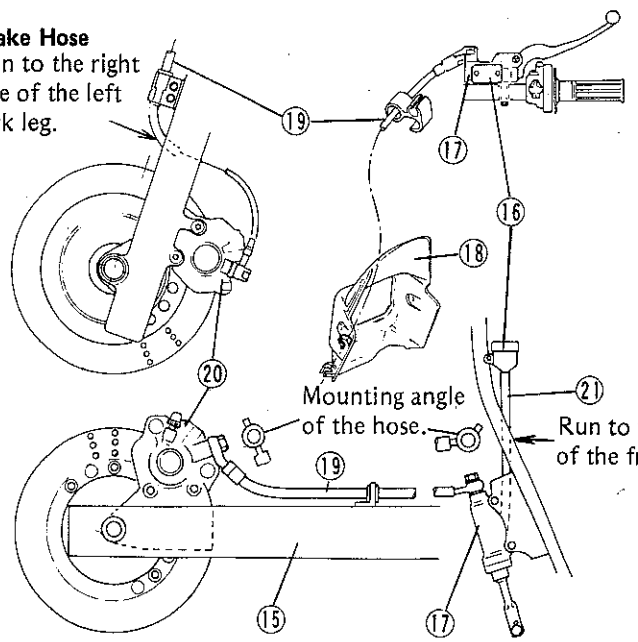
Run the hoses between the brackets.



Clamp under the harness so as not to squash the hoses.

Brake Hose

Run to the right side of the left fork leg.



Mounting angle of the hose.

Run to the left side of the frame pipe.

1. Fuel Tank Breather Hose
2. Steering Stem Head Nut
3. Reservoir Tank Hose
4. Reservoir Tank Air Vent Hose
5. Cylinder Head Bracket
6. Battery Vent Hose
7. Engine Breather Hose
8. Carburetor Air Vent and Overflow Tubes
9. Air Cleaner Housing
10. Oil Pump Hose
11. Flap
12. Oil Tank
13. Oil Tank Breather Hose
14. Rear Fender
15. Swing Arm
16. Reservoir
17. Master Cylinder
18. Head Light Cover
19. Brake Hose
20. Caliper
21. Reservoir Hose

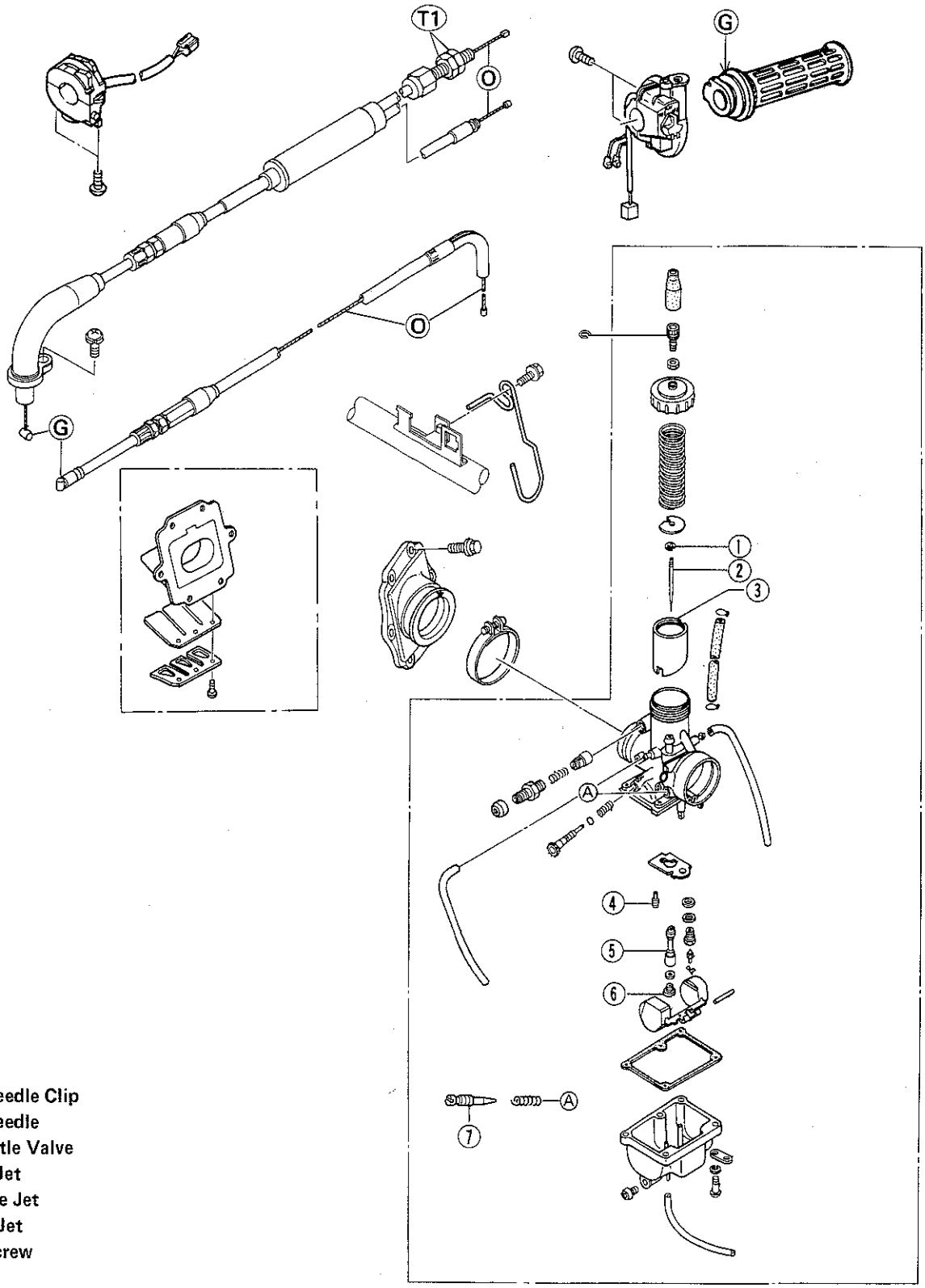
Fuel System

Table of Contents

Exploded View 2-2
Specifications 2-4
Special Tools 2-4
Throttle Control Cable 2-5
Throttle Grip Free Play Inspection 2-5
Throttle Cable Adjustment 2-5
Carburetor Cable Adjustment 2-5
Oil Pump Cable Adjustment 2-6
Throttle Control Cable Installation Notes 2-6
Throttle Control Cable Lubrication 2-6
Throttle Control Cable Inspection 2-6
Choke Cable 2-7
Choke Cable Free Play Inspection 2-7
Choke Cable Adjustment 2-7
Choke Cable Installation Notes 2-7
Choke Cable Lubrication 2-7
Choke Cable Inspection 2-8
Carburetor 2-8
Idle Speed Inspection 2-8
Idle Speed Adjustment 2-8
Service Fuel Level Inspection 2-8
Service Fuel Level Adjustment 2-9
Fuel System Cleanliness Inspection 2-10
Carburetor Removal 2-10
Carburetor Installation Notes 2-11
Carburetor Disassembly 2-12
Carburetor Assembly Notes 2-13
Carburetor Cleaning 2-13
Carburetor Inspection 2-14
Air Cleaner 2-14
Air Cleaner Housing Removal 2-14
Air Cleaner Housing Installation Notes . . 2-15
Air Cleaner Element Removal 2-16
Air Cleaner Element Installation Notes . . 2-16
Air Cleaner Element Cleaning and Inspection 2-16
Fuel Tank 2-17
Fuel Tank Removal 2-17
Fuel Tank Installation Notes 2-17
Fuel Tap Removal 2-18
Fuel Tap Installation Notes 2-18
Fuel Tap Inspection 2-18
Fuel Tank Cap Inspection 2-18
Fuel Tank and Tap Cleaning 2-18
Reed Valve 2-19
Reed Valve Removal 2-19
Reed Valve Installation 2-19
Reed Valve Inspection 2-19

2-2 FUEL SYSTEM

Exploded View

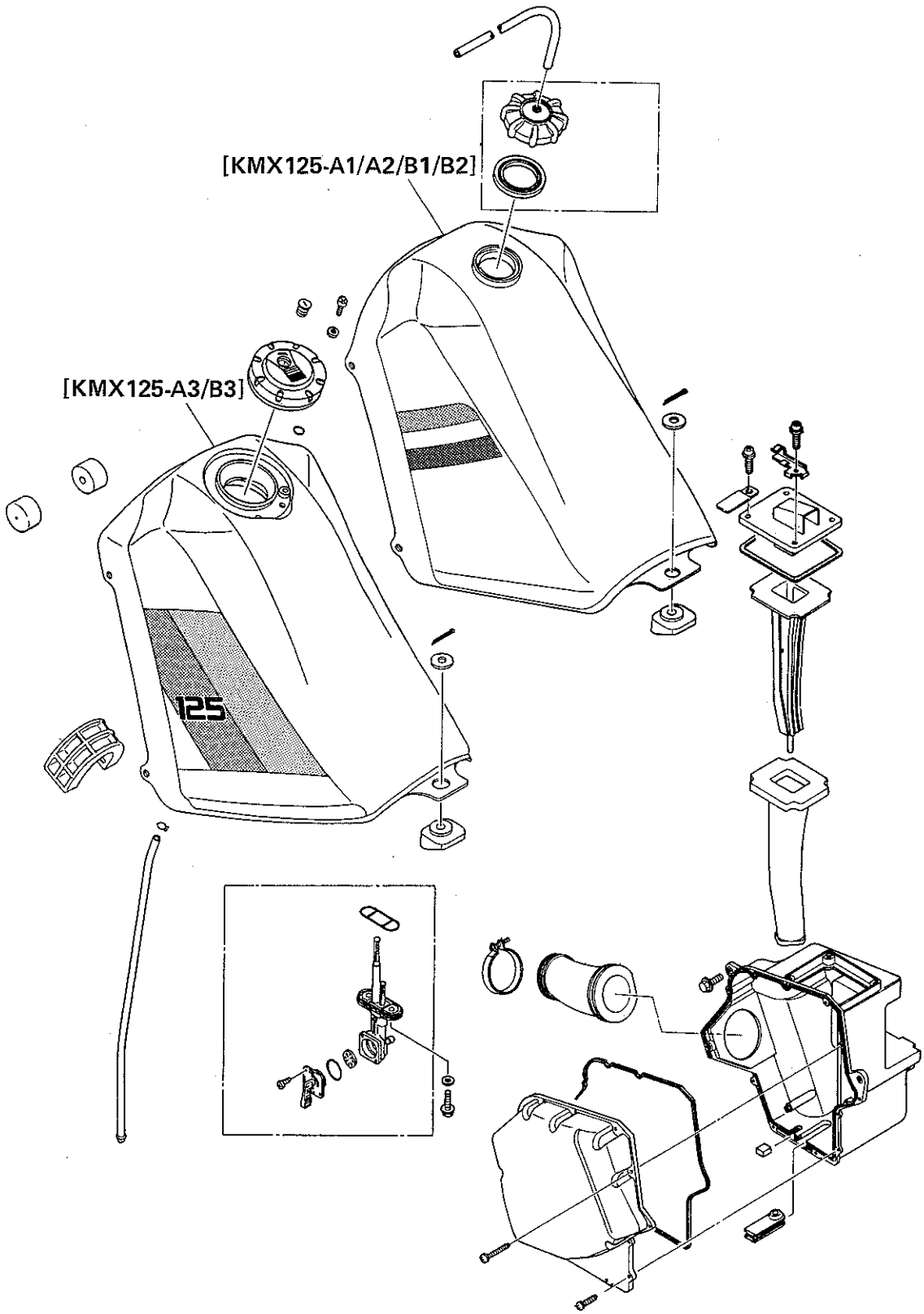


1. Jet Needle Clip
2. Jet Needle
3. Throttle Valve
4. Pilot Jet
5. Needle Jet
6. Main Jet
7. Air Screw

O : Oil

G : Grease

T1 : 9.8 N-m (1.0 kg-m, 7.0 ft-lb)


[KMX125-A1/A2/B1/B2]
[KMX125-A3/B3]
125

2-4 FUEL SYSTEM

Specifications

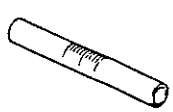
Item	Standard	Service Limit
Throttle Grip Free Play	2 – 3 mm	– – –
Choke Cable Free Play	2 – 3 mm	– – –
Idle Speed	1,200 ±100 r/min (rpm)	– – –
Carburetor Specifications:		
Make/type	Mikuni/VM26SS	– – –
Main jet	102.5	– – –
Needle jet	O-4	– – –
Throttle valve cutaway	2.0	– – –
Jet needle	4FL44-2	– – –
Jet needle clip position	2nd groove from the top	– – –
Pilot jet	25, Ⓢ 20 [KMX125-A3]	– – –
Air screw	1½ (turns out) Ⓢ 1¾ (turns out) [KMX125-A3]	– – –
Service fuel level (from the bottom edge of the carb. body)	1.5 ±1 mm under	– – –
Float height	21.1 ±2 mm	– – –
Air Cleaner Element Oil:		
Grade	SE class	– – –
Viscosity	SAE30	– – –
Reed Valve:		
Reed warp	– – –	0.2 mm

Ⓢ : Swiss Model

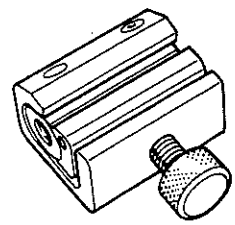
Special Tools

Along with common hand tools, the following more specialized tools are required for complete fuel system servicing.

Fuel Level Gauge: 57001-1017



Pressure Cable Luber: K56019-021



Throttle Control Cable

The throttle control cable is actually an assembly of three cables: the throttle cable, the carburetor cable, and the oil pump cable. The throttle cable runs from the throttle grip to the cable assembly junction where it connects to both the carburetor cable which leads to the carburetor, and the oil pump cable which leads to the oil pump.

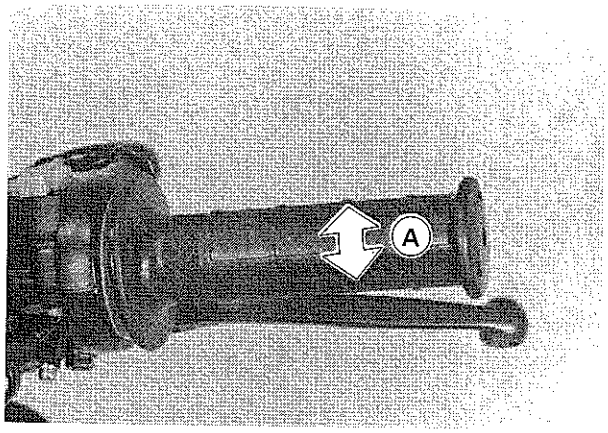
Since the throttle grip controls both the carburetor and the oil pump simultaneously, it is important that each cable be adjusted to its designed base position so that the oil and fuel/air mixture reach the engine in the correct proportion at all throttle openings. Cable stretch creates excess play at the throttle grip and alters the base positions of the cables at the carburetor and the oil pump, necessitating periodic adjustment.

NOTE

○*If one of the three cables is adjusted, be sure to check the other cables.*

Throttle Grip Free Play Inspection

●Check throttle grip free play by lightly turning the throttle grip back and forth.



A. Throttle Grip Free Play

Throttle Grip Free Play

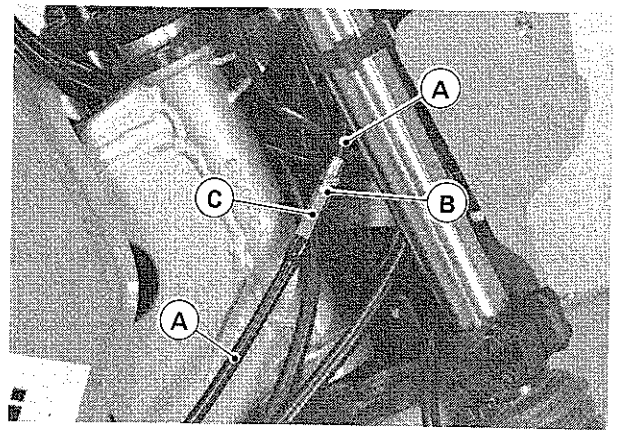
2 – 3 mm

★If the throttle grip free play is improper, adjust the throttle cable.

Throttle Cable Adjustment

●Loosen the locknut at the throttle cable elbow.

●Turn the adjusting nut until the proper amount of throttle grip free play is obtained.



A. Throttle Cable
B. Locknut
C. Adjusting Nut

●Tighten the locknut.

★If the throttle grip free play cannot be adjusted with the adjusting nut at the throttle cable, use the cable adjuster at the carburetor.

●Check the oil pump cable adjustment.

●Turn the handlebar from side to side while idling the engine. If idle speed varies, the throttle control cable assembly may be poorly routed or it may be damaged.

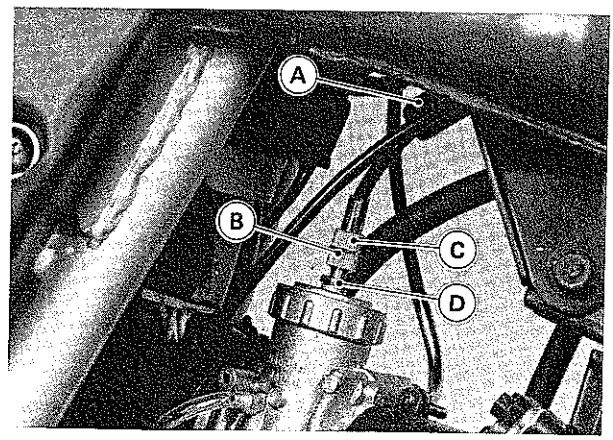
WARNING

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

Carburetor Cable Adjustment

●Check to see that the throttle cable has the proper amount of play.

●Slide the dust cover out of place.



A. Dust Cover
B. Safety Clip
C. Adjuster
D. Locknut

- Remove the safety clip from the adjuster at the lower end of the carburetor cable.
- Loosen the locknut at the lower end of the carburetor cable, and with the adjuster, eliminate the play between the cable and the throttle valve so that the slightest tug on the outer cable will affect the throttle valve. Be careful not to turn the adjuster so far that the throttle valve raises out of the zero position.
- Tighten the locknut.
- Reinstall the safety clip in the adjuster.
- Slide back the dust cover.
- Start the engine and warm it up for 5 minutes, and then adjust the idle speed.

NOTE

After this adjustment has been completed, a certain amount of play will exist between the carburetor inner cable and the throttle valve, the extent of which may be detected by taking out the adjuster safety clip and pulling on the outer cable. This play, which is the proper amount for a correct oil and fuel/air mixture ratio, must not be altered. To ensure the proper ratio, the oil pump alignment marks should be checked after carburetor cable adjustment.

Oil Pump Cable Adjustment

- See Oil Pump Synchronization Inspection and Adjustment in Engine Lubrication System chapter.

Throttle Control Cable Installation Notes

- Install the throttle control cable in accordance with the Cable Routing section in the General Information chapter.
- After the installation, adjust each cable properly.

WARNING

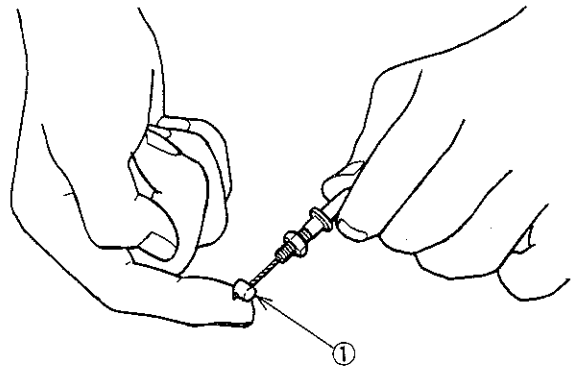
Operation with incorrectly routed or improper adjusted cables could result in an unsafe riding condition.

Throttle Control Cable Lubrication

Whenever the cable is removed, and in accordance with the Periodic Maintenance Chart (see General Information chapter), do the following.

- Apply a thin coating of grease to the cable upper end.

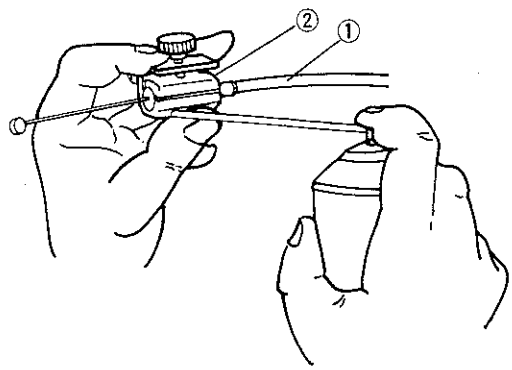
Cable Lubrication



1. Apply grease.

- Lubricate the cable with a penetrating rust inhibitor through the Pressure Cable Luber (special tool).

Cable Lubrication

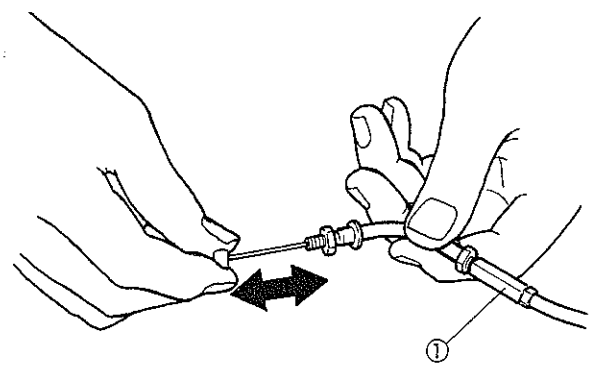


1. Cable
2. Pressure Cable Luber: K56019-021

Throttle Control Cable Inspection

- With the throttle control cable disconnected at both ends, the cable should move freely within the cable housing.

Cable Inspection



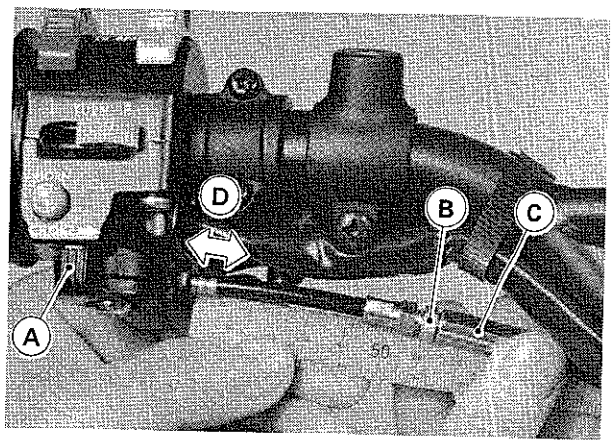
1. Cable

★If cable movement is not free after lubricating, if the cable is frayed, or if the housing is kinked, replace the cable.

Choke Cable

Choke Cable Free Play Inspection

●Check that the choke inner cable slides smoothly by moving the choke lever to the right and left.
★If there is any irregularity, check the choke cable play.
●Pull the choke lever all the way to the left.
●Determine the amount of choke cable play at the upper end of the choke cable. Pull out and push in the outer cable; the amount of cable travel is the amount of choke cable free play.



A. Choke Lever
B. Locknut
C. Adjusting Nut
D. Free Play

★If free play is not correct, adjust the choke cable.

Choke Cable Free Play

2 – 3 mm

Choke Cable Adjustment

●Loosen the locknut at the adjusting nut of the choke cable, and turn the adjusting nut until the cable has the proper amount of play.
●Tighten the locknut after adjustment.

Choke Cable Installation Notes

●Install the choke cable in accordance with the Cable Routing section in the General Information chapter.
●After installation, adjust the cable properly.

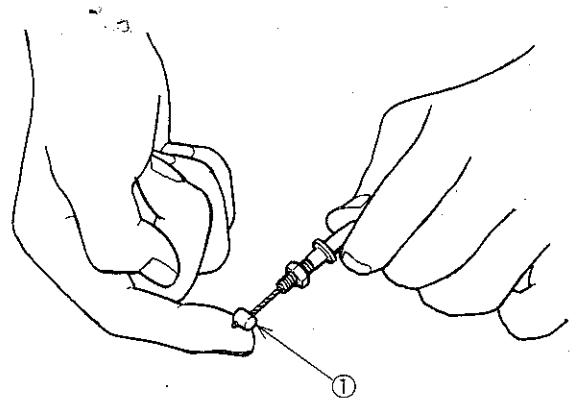
WARNING

○Operation with incorrectly routed or improperly adjusted cables could result in an unsafe riding condition.

Choke Cable Lubrication

Whenever the choke cable removed, lubricate the choke cable as follows.
●Apply a thin coating of grease to the cable upper end.

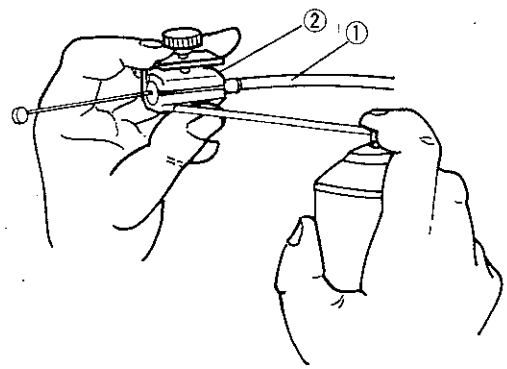
Cable Lubrication



1. Apply grease.

●Lubricate the cable with a penetrating rust inhibitor through the Pressure Cable Luber (special tool).

Cable Lubrication

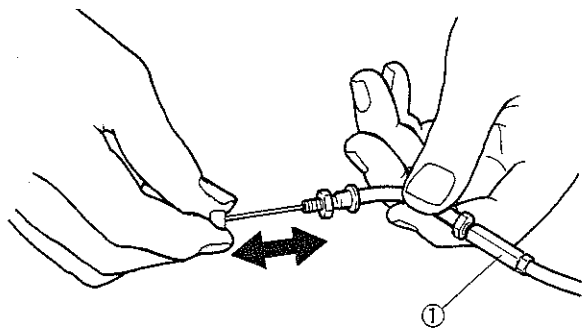


1. Cable
2. Pressure Cable Luber: K56019-021

Choke Cable Inspection

•With the choke cable disconnected at the both ends, the cable should move freely within the cable housing.

Choke Cable Inspection

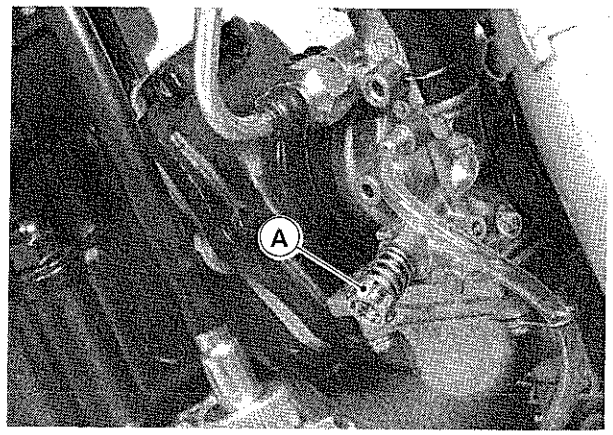


1. Choke Cable

★If cable movement is not free after lubricating, if the cable is frayed, or if the housing is kinked, replace the cable.

Idle Speed Adjustment

•Start the engine and warm it up thoroughly.
•Turn the adjusting screw until the idle speed is correct.



A. Idle Adjusting Screw

•Open and close the throttle a few times to make sure that the idle speed is within the specified range. Readjust if necessary.

Carburetor

Idle Speed Inspection

•Start the engine and warm it up thoroughly.
•With the engine idling, turn the handlebar to both sides.
★If handlebar movement changes the idle speed, the throttle cable may be improperly adjusted or incorrectly routed, or it may be damaged. Be sure to correct any of these conditions before riding (see Cable Routing in the General Information chapter).

WARNING

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

•Check idle speed.
★If the idle speed is out of the specified range, adjust it.

Idle Speed

1200 ±100 r/min (rpm)

Service Fuel Level Inspection

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.**

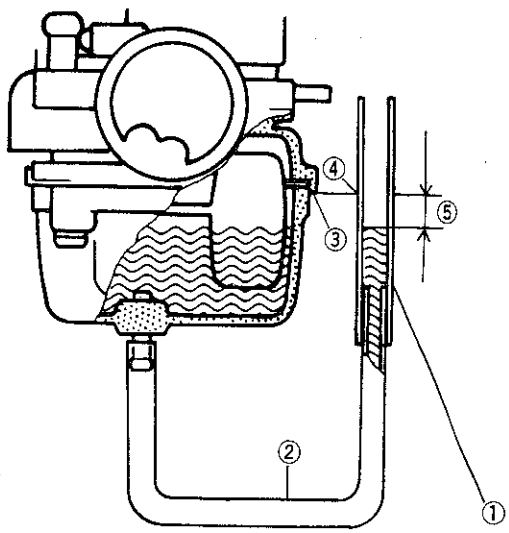
•Turn the fuel tap to the OFF position.
•Remove the fuel tank.
•Remove the carburetor, and hold it in true vertical position on a stand.
•Put the fuel tank on a bench, and connect the fuel tap to the carburetor using a suitable hose.
•Connect a fuel level gauge (special tool) to the carburetor float bowl with the overflow tube.
•Hold the gauge vertically against the side of the carburetor body so that the "zero" line is several millimeters higher than the bottom edge of the carburetor body.
•Turn the fuel tap to the ON position to feed fuel to the carburetor, then turn out the carburetor drain screw a few turns.
•Wait until the fuel level in the gauge settles.
•Keeping the gauge vertical, slowly lower the gauge until the "zero" line is even with the bottom edge of the carburetor body.

NOTE

○*Do not lower the "zero" line below the bottom edge of the carburetor body. If the gauge is lowered and then raised again, the fuel level measure shows somewhat higher than the actual fuel level. If the gauge is lowered too far, dump the fuel out of it into a suitable container and start the procedure over again.*

●Read the fuel level in the gauge and compare it to the specification.
●Screw in the carburetor drain screw.
●Turn the fuel tap to the OFF position and remove the fuel level gauge.
★If the fuel level is incorrect, adjust it.

Service Fuel Level
(from the bottom edge of the carb. body)
1.5 ±1 mm under



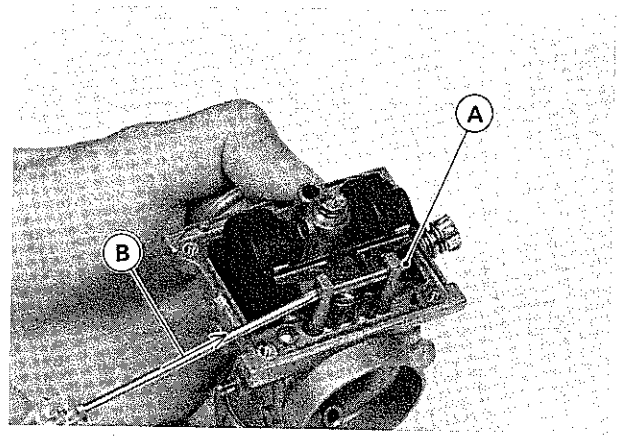
1. Fuel Level Gauge: 57001-1017
2. Overflow Tube
3. Carburetor Body Bottom Edge
4. Zero Line
5. Service Fuel Level

Service Fuel Level Adjustment

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.**

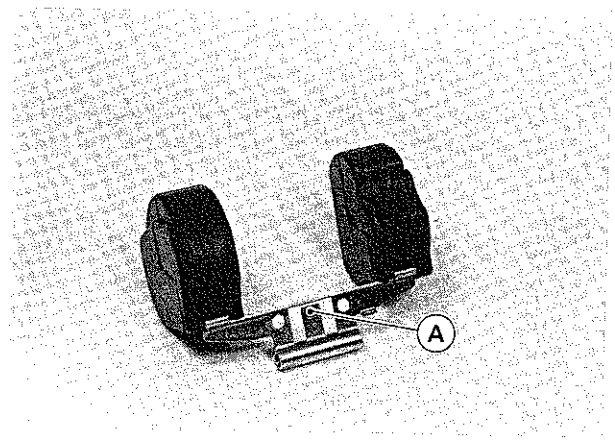
●Remove the carburetor, and drain the fuel into a suitable container.
●Remove the float bowl.
●Drive out the pivot pin and remove the float.



A. Pivot Pin B. Drive out the pin.

●Bend the tang on the float arm very slightly to change the float height. Increasing the float height lowers the fuel level and decreasing the float height raises the fuel level.

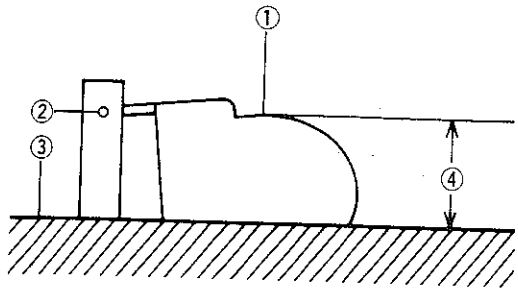
Float Height
21.1 ±2 mm



A. Tang

●Assemble the carburetor, and recheck the fuel level.
★If the fuel level cannot be adjusted by this method, the float or the float valve is damaged.

Float Height Measurement



1. Float
2. Pivot Pin
3. Float Bowl Mating Surface
4. Float Height

NOTE

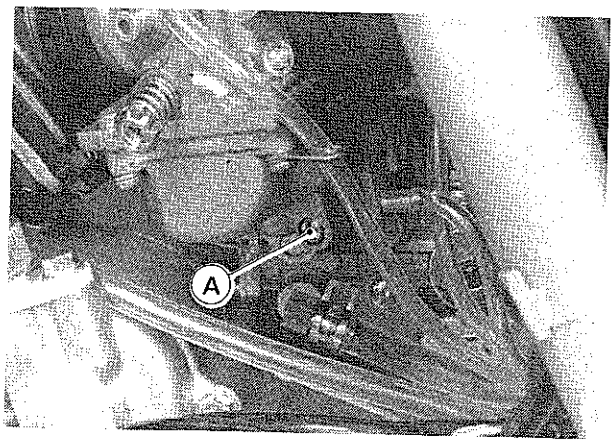
○*Float height is the distance from the float bowl mating surface of the carburetor body (with the gasket removed) to the top of the float. Measure the height with the carburetor upside down.*

Fuel System Cleanliness Inspection

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.**

●Put the lower end of the overflow tube from the float bowl into a suitable container.
●Turn the fuel tap to the RES position.
●Turn out the drain screw a few turns to drain some fuel from the carburetor, and check for water or dirt in the fuel.



A. Drain Screw

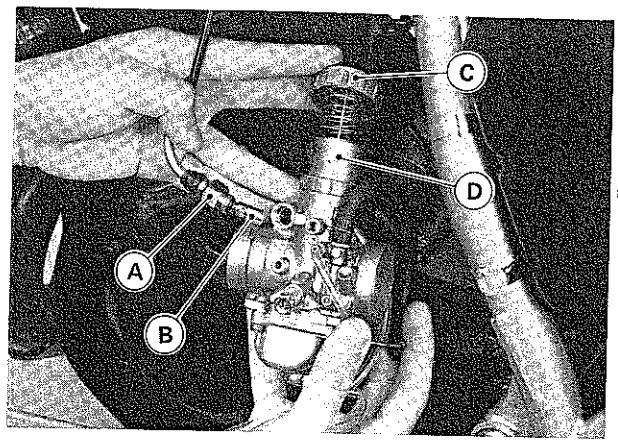
★If any water or dirt comes out, clean the carburetor, fuel tap and fuel tank (see Fuel Tank).
●Tighten the drain screw securely, and turn the fuel tap to the OFF position.

Carburetor Removal

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.**

●Turn the fuel tap to the OFF positon to stop fuel flow and pull the fuel hose off the tap.
●Run the overflow tube into a suitable container.
●Drain the fuel from the carburetor by turning out the drain screw a few turns.
●Loosen the clamps, and remove the carburetor from the end of the air cleaner duct, and then pull it out of the carburetor holder with the fuel hose, overflow tube and air vent tubes attached.
●Unscrew the guide holder at the choke cable lower end, and pull out the starter plunger assembly.
●Unscrew the carburetor cap, and pull out the throttle valve assembly.



A. Guide Holder
B. Starter Plunger
C. Carburetor Cap
D. Throttle Valve

CAUTION

○**If the starter plunger and the throttle valve are not removed from the cable, wrap them in a clean cloth to avod damage.**

•Pull the hose and tubes off the carburetor.
•After removing the carburetor, stuff pieces of lint-free, clean cloth into the carburetor holder and the air cleaner duct to keep dirt out of the engine and air cleaner.

WARNING

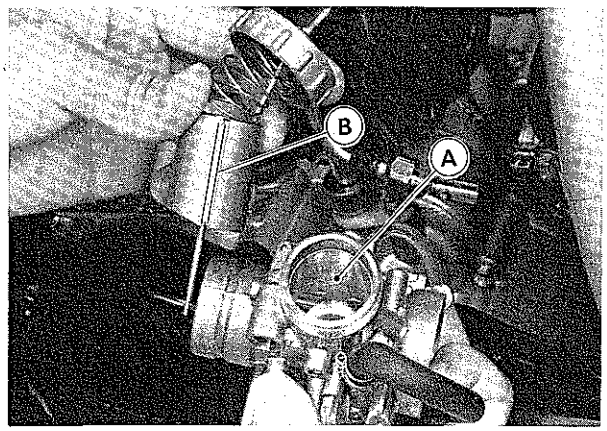
○**If dirt or dust is allowed to pass through into the carburetor, the throttle may become stuck, possibly causing an accident.**

CAUTION

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

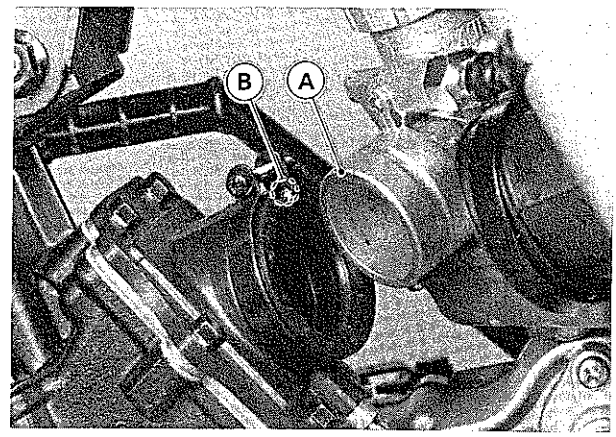
Carburetor Installation Notes

•Installation is the reverse of removal.
•Being careful not to bend or otherwise damage the jet needle, align the groove on the side of the throttle valve with the guide pin in the carburetor body. Check to see that the throttle valve goes all the way down into the carburetor body, and slides smoothly.



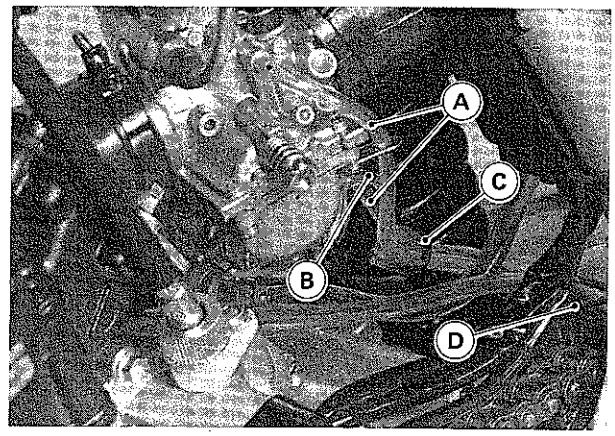
A. Guide Pin B. Groove

•When installing the carburetor into the carburetor holder, align the top center of the carburetor with the positioning mark on the holder.



A. Top Center B. Positioning Mark

•Route the air vent tubes and overflow tube through the oil pump bracket to the clamp on the swing arm (see Hose Routing in the General Information chapter).



A. Air Vent Tubes C. Oil Pump Bracket
B. Overflow Tube D. Clamp

CAUTION

○**Always keep the tubes free of obstruction, and make sure they do not get pinched by the chain or shock absorber.**

•After installing the carburetor, perform the following.
○Turn the fuel tap to the ON or RES position, and check for fuel leakage from the carburetor.

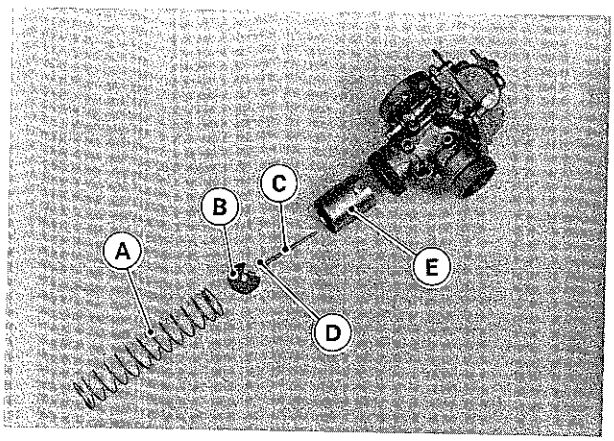
WARNING

○**Fuel spilled from the carburetor is hazardous.**

○Adjust the following items if necessary.
Throttle Control Cable
Choke Cable
Idle Speed

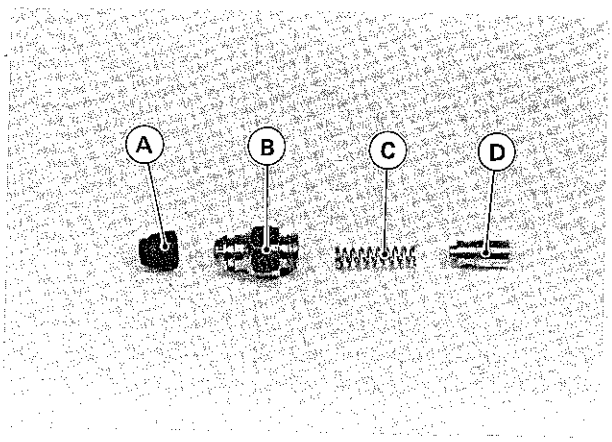
Carburetor Disassembly

- Remove the carburetor.
- Remove the throttle valve assembly and carburetor cap from the carburetor cable lower end.
- Disassemble the throttle valve assembly; spring, plate, jet needle, clip and throttle valve.



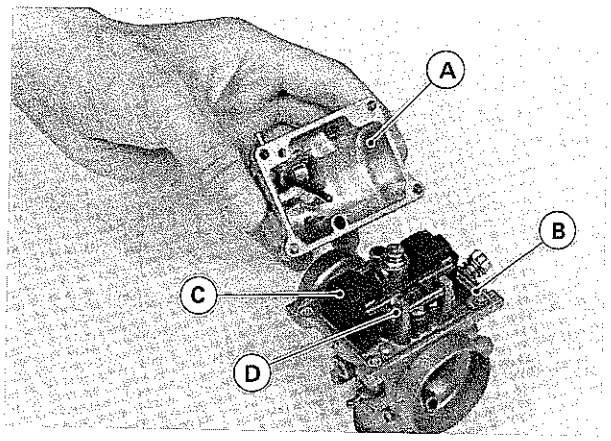
A. Spring
B. Plate
C. Jet Needle
D. Clip
E. Throttle Valve

- Remove the starter plunger assembly from the choke cable lower end.
- Disassemble the starter plunger assembly; rubber cap, guide holder, spring and starter plunger.

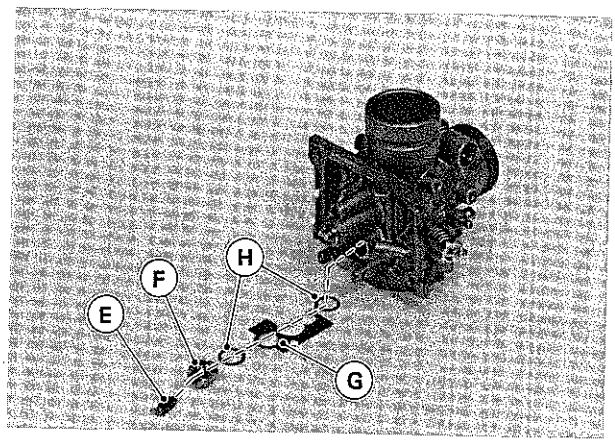


A. Rubber Cap
B. Guide Holder
C. Spring
D. Starter Plunger

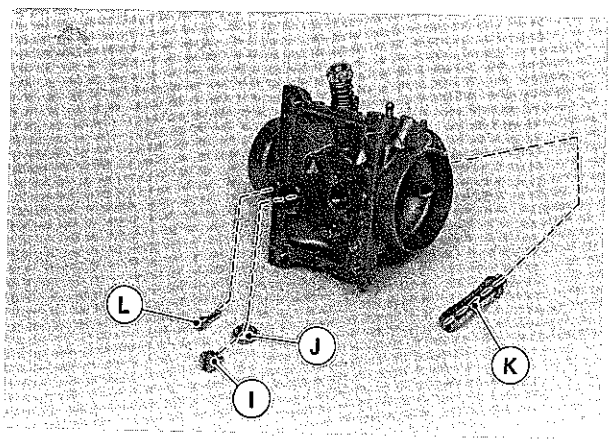
- Remove the following parts from the carburetor body.



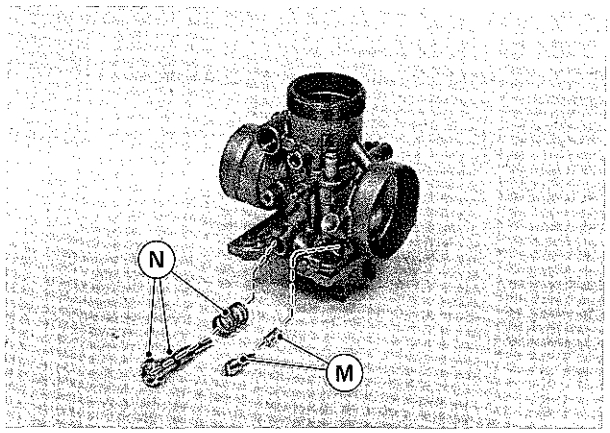
A. Float Bowl
B. Gasket
C. Float
D. Pin



E. Float Valve
F. Valve Seat
G. Plate
H. Gaskets



I. Main Jet
J. Washer
K. Needle Jet
L. Pilot Jet



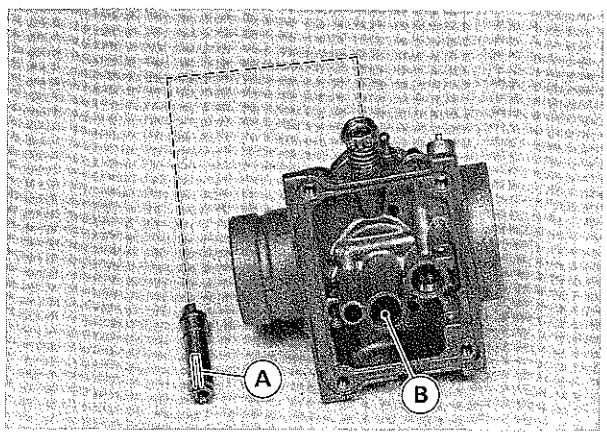
M. Air Screw and Spring
N. Idle Adjusting Screw, Spring and O-Ring

NOTE

○*When removing the air screw, turn in the screw and count the number of turns until it seats fully but not tightly in order to set the screw to its original position when assembling.*

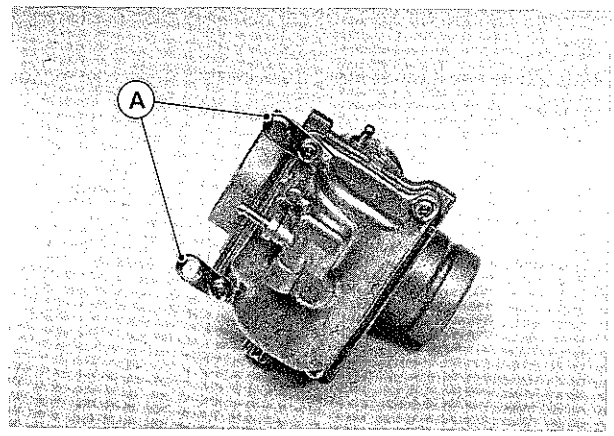
Carburetor Assembly Notes

- Assembly is the reverse of disassembly.
- Clean the disassembled parts before assembling.
- The needle jet is replaced through the top of the needle jet bore. Align the groove on the bottom of the needle jet with the guide pin.



A. Groove B. Guide Pin

- Replace the float bowl gasket with a new one if it is deteriorated or damaged.
- Turn in the air screw fully but not tightly, and then back it out the same number of turns counted during disassembly.
- Install the tube guide plates as shown.



A. Tube Guide Plates

Carburetor Cleaning

WARNING

○**Clean the carburetor in a well-ventilated area, and take care that there is no spark or flame anywhere near the working area; this includes any appliance with a pilot light. Because of the danger of highly flammable liquids, do not use gasoline or low flashpoint solvents to clean the carburetor.**

- Make sure the fuel tap is in the OFF position.
- Remove the carburetor and drain it.
- Disassemble the carburetor.

CAUTION

○**Do not use compressed air on an assembled carburetor, the float may be deformed by the pressure.**
○**Remove as many rubber or plastic parts from the carburetor as possible before cleaning the carburetor with a cleaning solution. This will prevent damage or deterioration of the parts.**
○**Do not use a strong carburetor cleaning solution which could attack the plastic parts; instead, use a mild high flash point cleaning solution safe for plastic parts.**
○**Do not use wire or any other hard instrument to clean carburetor parts, especially jets, as they may be damaged.**

- Immerse all the metal parts in a carburetor cleaning solution.
- Rinse the parts in water.
- When the parts are clean, dry them with compressed air.

•Blow through the air and fuel passages with compressed air.
•Assemble the carburetor, and install it on the motorcycle.

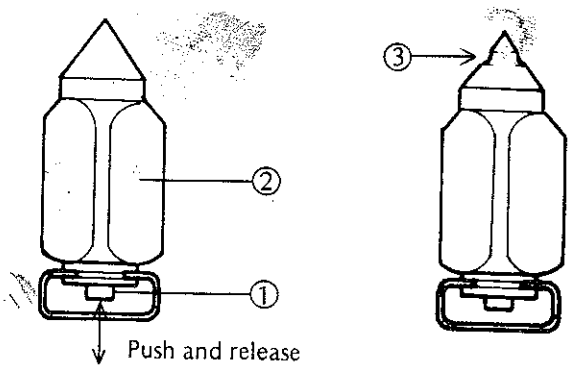
Carburetor Inspection

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.**

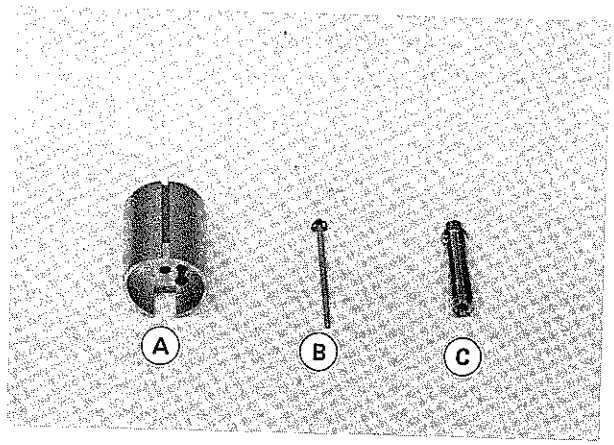
•Remove the carburetor.
•Before disassembling the carburetor, check the fuel level (see Fuel Level Inspection).
★If the fuel level is incorrect, inspect the rest of the carburetor before correcting it.
•Pull the carburetor cable to check that the throttle valve moves smoothly and returns by spring pressure.
★If the throttle valve does not move smoothly. Replace the carburetor.
•Slide the choke lever right to left it to check that the starter plunger moves smoothly and returns by spring pressure.
★If the starter plunger do not work properly, replace the carburetor.
•Clean the carburetor.
•Remove the float valve needle and valve seat.
•Check the float valve needle and valve seat for wear.
★If the needle is worn as shown in the figure or the seat is worn, replace the valve needle and valve seat as a set.
•Push the rod in the valve needle, then release it.
★If the rod does not come out fully by spring tension, replace the valve needle and valve seat as a set.

Float Valve Wear



1. Rod
2. Valve Needle
3. Valve Needle Wear

•Check the gaskets on both sides of the plate at the valve seat for damage.
★If the gaskets are damaged, replace them.
•Remove the idle adjusting screw.
•Check the idle adjusting screw O-ring for damage.
★If the O-ring is damaged, replace it.
•Remove the pilot jet.
•Check the pilot jet for any damage.
★If the pilot jet is damaged, replace it with a new one.
•Remove the throttle valve, jet needle, and needle jet.
•Inspect the outside of the throttle valve for scratches and abnormal wear.
★If it is badly scratched or worn, replace the throttle valve.
•Inspect the inside of the carburetor body for these same faults.
★If it is badly scratched or worn, replace the entire carburetor.
•Check the jet needle and needle jet for wear.
★A worn needle jet or jet needle should be replaced.



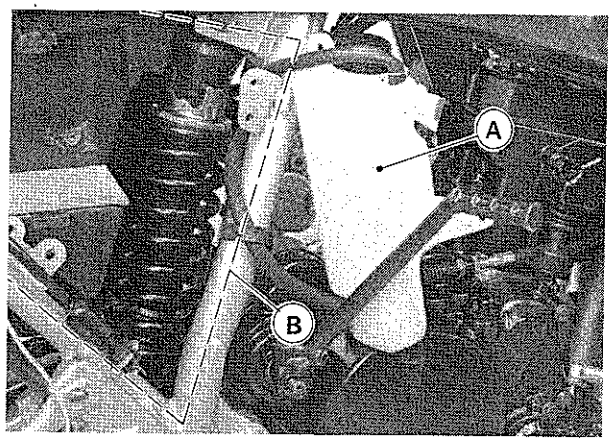
A. Throttle Valve
B. Jet Needle
C. Needle Jet

•Disassemble the carburetor, and clean the fuel and air passages with a high flash point solvent and compressed air.

Air Cleaner

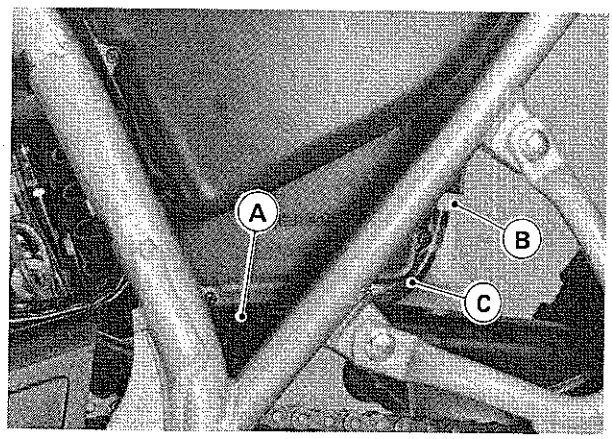
Air Cleaner Housing Removal

•Remove the following parts.
Seat
Side Covers
Battery Cover
Silencer
•Remove the mounting bolts, and pull the reservoir tank out of the enclosed frame pipe.



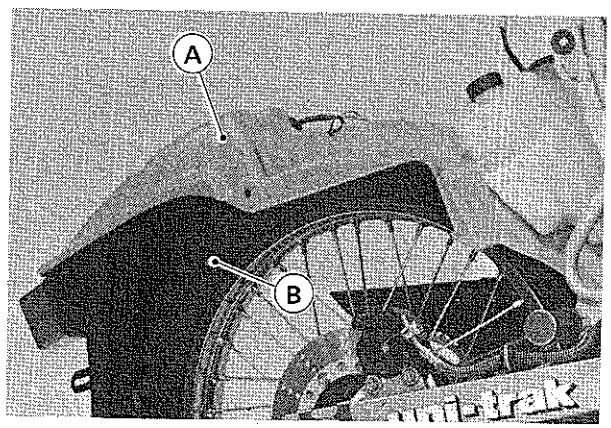
A. Reservoir Tank B. Enclosed Frame Pipe

•Free the oil tank hose from the clamp at the air cleaner housing bottom and the rear fender flap.



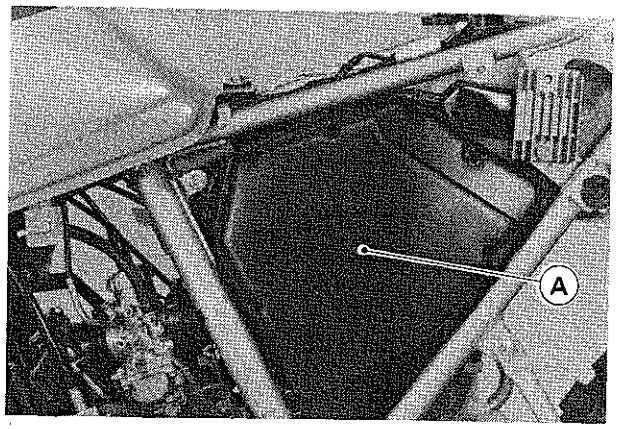
A. Clamp
B. Flap
C. Oil Tank Hose

•Remove the rear fender, and put it on the rear wheel (see Rear Fender Removal in the Frame chapter).



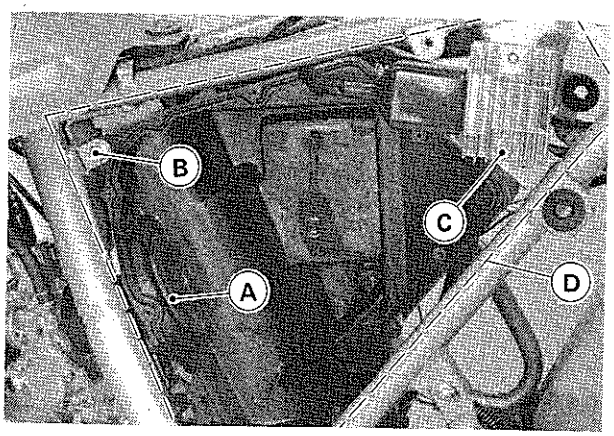
A. Rear Fender B. Rear Wheel

•Remove the left side of the air cleaner housing.



A. Left Side of Air Cleaner Housing

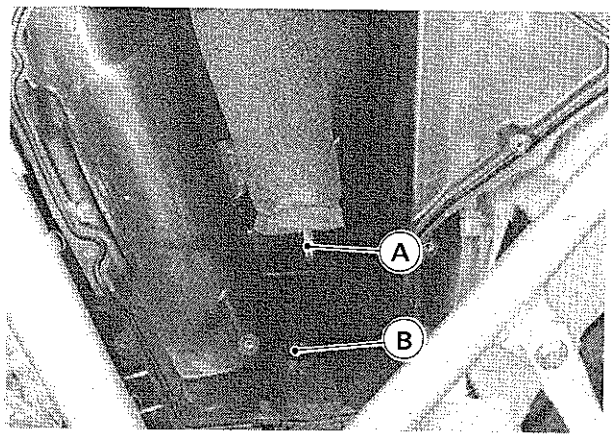
•Remove the air cleaner cap, and take the element out of the housing.
•Remove the duct from the housing.
•Remove the air cleaner mounting bolt and regulator/rectifier mounting bolt.
•Take the housing out of the enclosed frame pipe.



A. Duct
B. Air Cleaner Mounting Bolt
C. Regulator/Rectifier Mounting Bolt
D. Enclosed Frame Pipe

Air Cleaner Housing Installation Notes

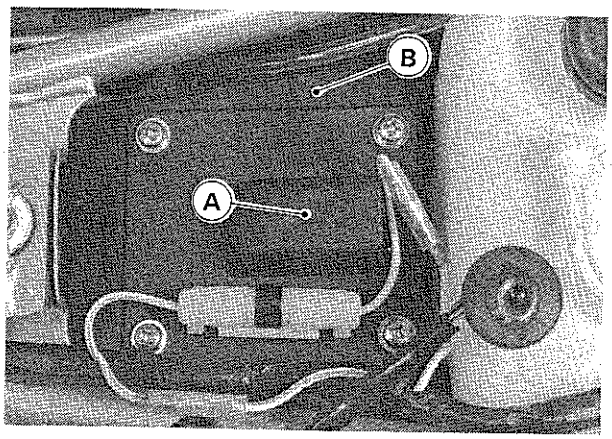
•Installation is the reverse of removal (see Rear Fender Installation Notes in the Frame chapter).
•Insert the frame boss on the lower end of the element into the hole in the holder on the bottom of the housing.



A. Frame Boss B. Hole in Holder

Air Cleaner Element Removal

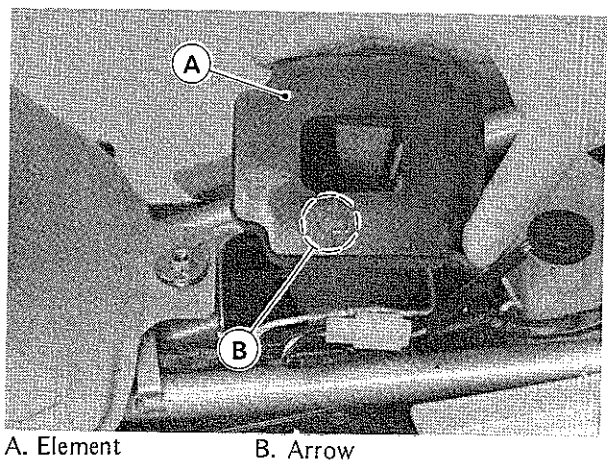
- Remove the seat.
- Take off the air cleaner cap.
- Take the element out of the housing.



A. Air Cleaner Cap B. Air Cleaner Housing

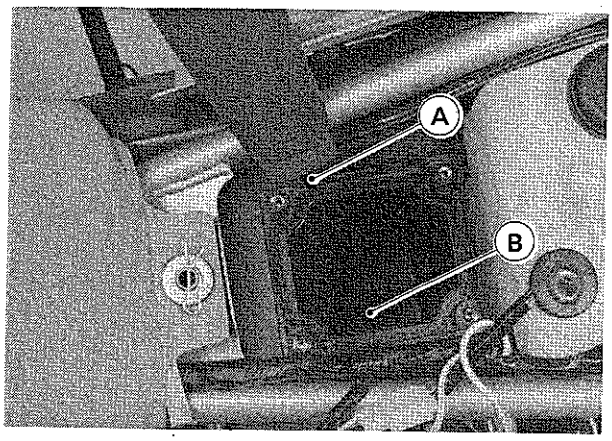
Air Cleaner Element Installation Notes

- Installation is the reverse of removal.
- The arrow on the top of the element must point toward the front.



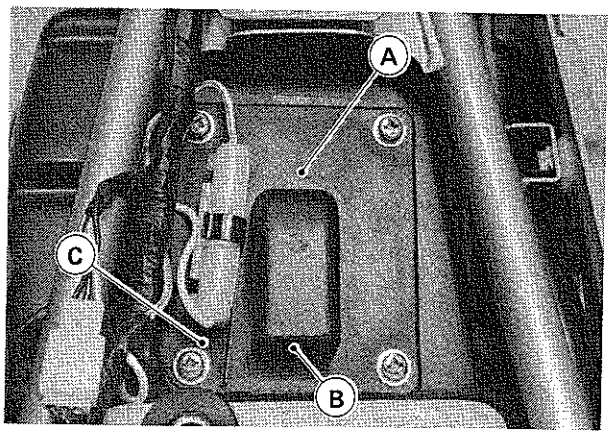
A. Element B. Arrow

- Insert the frame boss on the lower end of the element into the hole in the holder on the bottom of the housing.



A. Frame Boss B. Hole in Holder

- Turn the cap intake port to the rear.
- Position the fuse bracket at the left rear on the cap.



A. Air Cleaner Cap C. Fuse Bracket
B. Intake Port

Air Cleaner Element Cleaning and Inspection

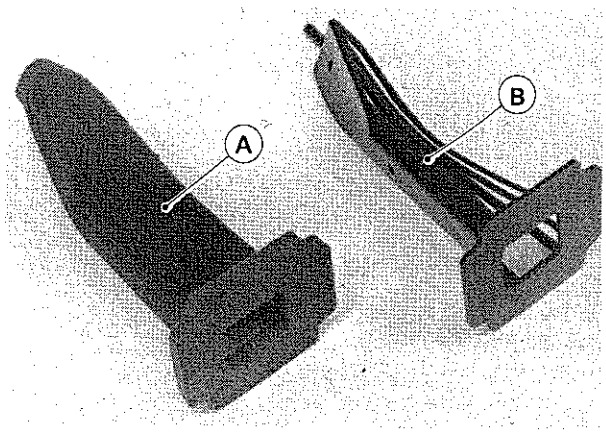
NOTE

- *In dusty areas, the element should be cleaned more frequently than the recommended interval.*
- *After riding through rain or on muddy roads, the element should be cleaned immediately.*
- *Since repeated cleaning opens the pores of the element, replace it with a new one in accordance with the Periodic Maintenance Chart. Also, if there is a break in the element material or any other damage to the element, replace the element with a new one.*

WARNING

○Clean the element in a well-ventilated area, and take ample care that there are no sparks or flame anywhere near the working area.
○Because of the danger of highly flammable liquids, do not use gasoline or a low flash point solvent to clean the element.

●Remove the air cleaner element, and separate the element from the element frame.



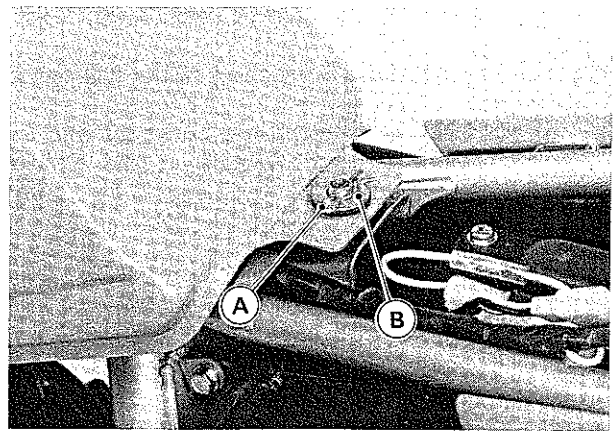
A. Filter B. Frame

●Clean the element in a bath of a high flash-point solvent, and then dry it with compressed air or by shaking it.
●Check all the parts of the element for visible damage.
★If any of the parts of the element are damaged, replace them.
●After cleaning, saturate the sponge filter with SE class SAE 30 oil, squeeze out the excess, then wrap it in a clean rag and squeeze it dry as possible. Be careful not to tear the sponge filter.
●Assemble the element.
●Install the element.

Fuel Tank

Fuel Tank Removal

●Remove the seat.
●Pull off the snap pin, and remove the washer from the rear end of the fuel tank.



A. Snap Pin B. Washer

●Turn the fuel tap to the OFF position to stop the fuel flow.
●Pull the fuel hose off the fuel tap.

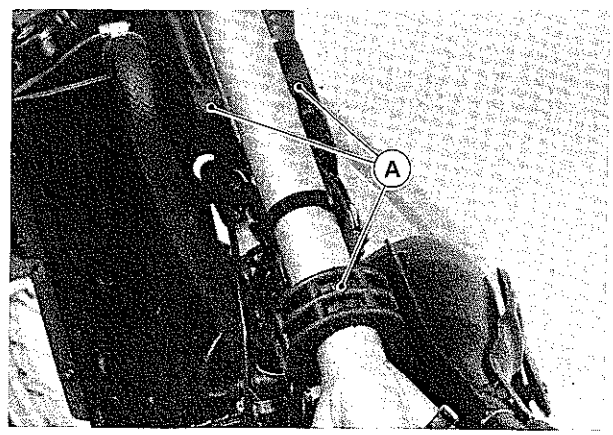
WARNING

○Gasoline is extremely flammable and can be explosive under certain conditions. Turn the engine stop 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.

●Tilt the tank out the rear of the frame.
●Drain the fuel tank.
○Arrange a suitable container under the fuel tank.
○Turn the fuel tap to RES to drain the fuel into the container.

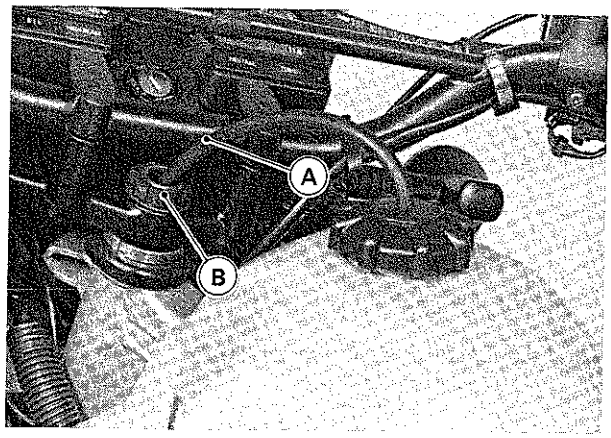
Fuel Tank Installation Notes

●Installation is the reverse of removal.
●Check the rubber dampers on the frame top-pipe.



A. Dampers

★If the dampers are damaged or deteriorated, replace them.
●Be sure the fuel hose is clamped to the fuel tap to prevent leak.
●Insert the fuel tank breather hose outlet end into the steering stem (see Hose Routing in the General information chapter).



A. Fuel Tank Breather Hose
B. Steering Stem Head Nut

Fuel Tap Removal

●Remove the fuel tank and drain it.
●Remove the bolts with nylon flat whashers and take out the fuel tap.

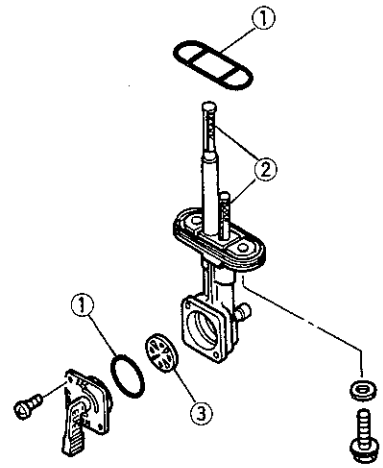
Fuel Tap Installation Notes

●Installation is the reverse of removal.
●Be sure the O-ring is in good condition to prevent leaks.
●Be sure to clamp the fuel hose to the tap to prevent leaks.
●Be sure the nylon washers are in good condition to prevent leaks.
○Do not use steel washers in place of the nylon washers, because they will not seal the bolts properly and fuel will leak.

Fuel Tap Inspection

●Remove the fuel tap.
●Check the fuel tap filter screens for any breaks or deterioration.

Fuel Tap



1. O-ring
2. Filter Screens
3. Gasket

★If the fuel tap screens have any breaks or are deteriorated, it may allow dirt to reach the carburetor, causing poor running. Replace the fuel tap.
★If the fuel tap leaks, or allows fuel to flow when it is at OFF position, replace the damaged gasket or O-ring.

Fuel Tank Cap Inspection

●Remove the fuel tank cap.
●Inspect the gasket on the tank cap for visible damage.
★Replace the gasket if it is damaged.
●Remove the breather hose and check to see that the hose is not clogged.
★If it is clogged, blow the breather hose with compressed air.

Fuel Tank and Tap Cleaning

●Remove the fuel tank and drain it.
●Pour some high flashpoint solvent into the fuel tank and shake the tank to remove dirt and fuel deposits.

WARNING

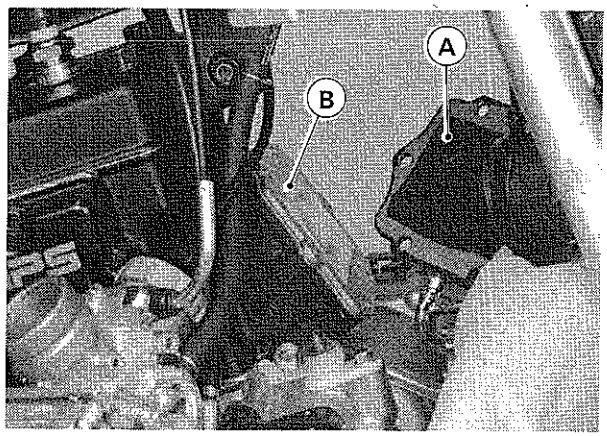
○**Clean the tank in a well-ventilated area, and take care that there is no spark or flame anywhere near the working area. Because of the danger of highly flammable liquids, do not use gasoline or low flashpoint solvents to clean the tank.**

- Pour the solvent out of the tank.
- Remove the fuel tap from the tank by taking out the bolts with nylon washers.
- Clean the fuel tap filter screens in a high flash point solvent.
- Pour high flash point solvent through the tap in all lever positions.
- Dry the tank and tap with compressed air.
- Install the tap in the tank.
- Install the fuel tank.

Reed Valve

Reed Valve Removal

- Remove the carburetor from the carburetor holder and air cleaner duct, and move it to the left of the cylinder.
- Remove the tachometer cable lower end.
- Remove the carburetor holder mounting bolts, and move the holder rearward.
- Take the reed valve out of the cylinder.



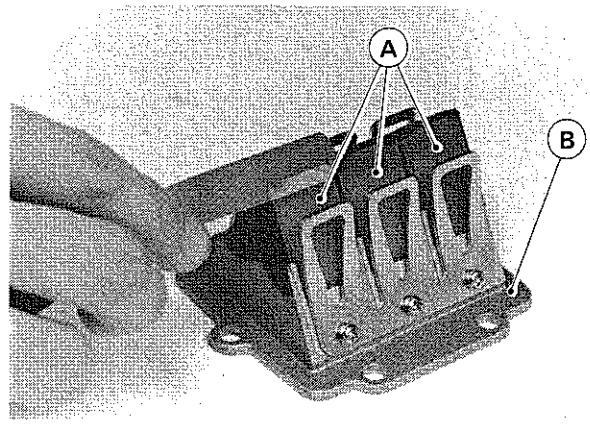
A. Carburetor Holder B. Reed Valve

Reed Valve Installation

- Installation is the reverse of removal (see Carburetor Installation Notes).

Reed Valve Inspection

- Inspect the reeds for cracks, folds, or other visible damage.
- ★If there is any doubt as to the condition of a reed, replace the reed valve assembly.
- ★If a reed becomes wavy, replace the valve assembly even if its warp is less than the service limit.
- Measure the clearance between the reed and holder, and check the read warp as shown.



A. Reed B. Reed Valve Holder

★If any one of the clearance measurements exceeds the service limit, replace the valve assembly.

Reed Warp

Service Limit: 0.2 mm

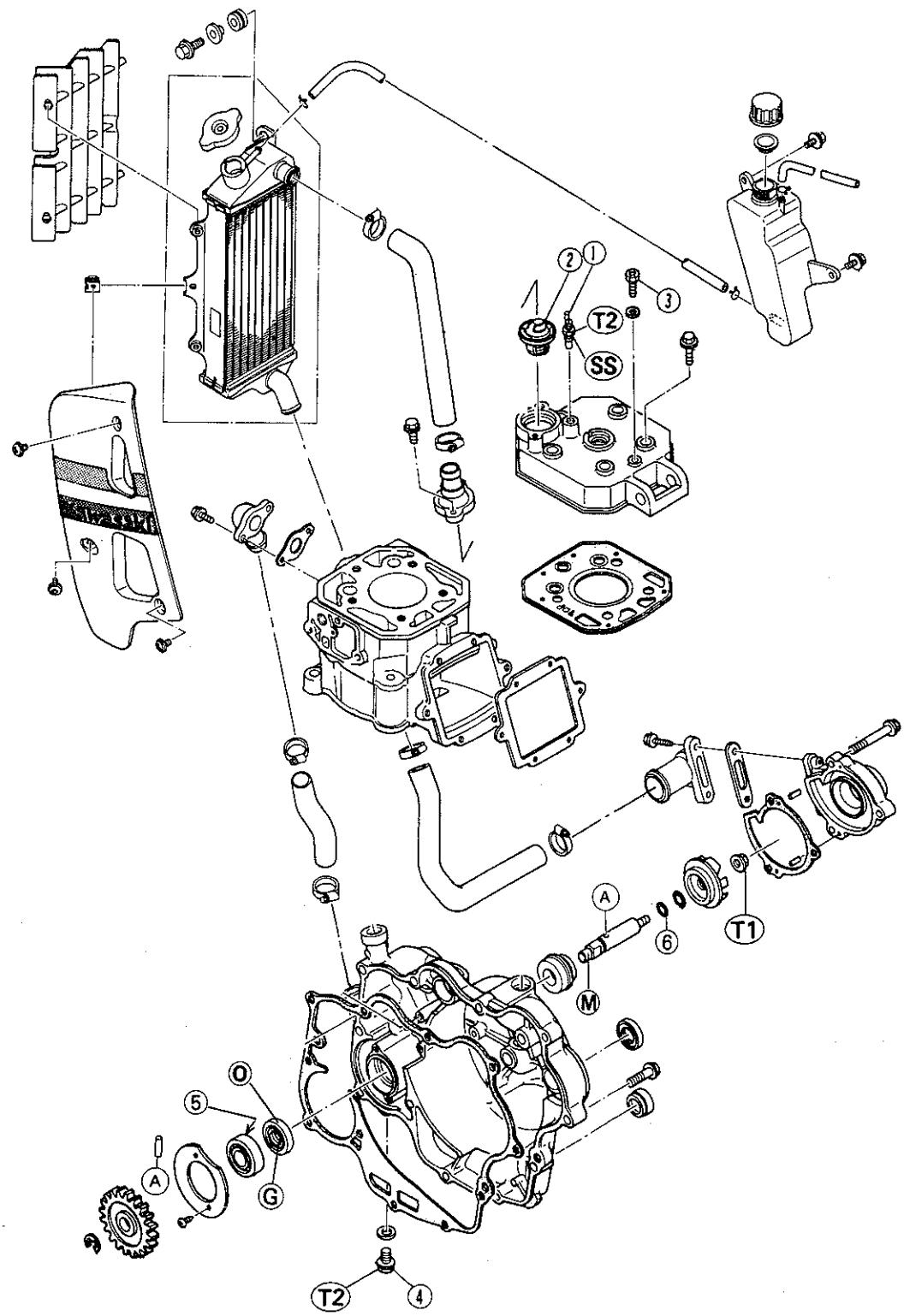
Cooling System

Table of Contents

Exploded View 3-2
Specifications 3-3
Special Tool 3-3
Sealant 3-3
Cooling System 3-4
Coolant 3-5
Coolant Inspection 3-5
Coolant Change 3-5
Air Bleeding 3-7
Coolant Leak Inspection 3-7
Cooling System Pressure Testing 3-7
Cooling System Flushing 3-8
Disassembly and Assembly Precautions 3-8
Water Pump 3-8
Water Pump Cover Removal 3-8
Water Pump Cover Installation Notes . . . 3-8
Impeller Removal 3-8
Impeller Installation 3-8
Impeller Assembly Notes 3-9
Impeller Inspection 3-9
Water Pump Shaft Removal 3-9
Water Pump Shaft Installation Notes 3-9
Mechanical Seal, Oil Seal Removal 3-10
Mechanical Seal, Oil Seal Installation 3-10
Mechanical Seal Inspection 3-11
Water Pump Hose Inspection 3-12
Radiator 3-12
Radiator Removal 3-12
Radiator Installation 3-12
Radiator Inspection 3-12
Radiator Cap Inspection 3-12
Filler Neck Inspection 3-13
Radiator Hose, Water Hose,
Reservoir Tank Hose,
Air Vent Hose Inspection 3-13
Radiator Hose, Water Hose,
Reservoir Tank Hose,
Air Vent Hose Installation Notes . . 3-13
Thermostat 3-14
Thermostat Removal 3-14
Thermostat Installation Notes 3-14
Thermostat Inspection 3-14
Water Temperature Sensor 3-15
Water Temperature Sensor Removal 3-15
Water Temperature Sensor
Installation Notes 3-15
Water Temperature Sensor Inspection . . . 3-15

3-2 COOLING SYSTEM

Exploded View



1. Water Temperature Sensor
2. Thermostat
3. Air Bleeder Bolt
4. Drain Plug
5. Sealed Side
6. O-ring

T1 : 9.8 N-m (1.0 kg-m, 7.0 ft-lb)
T2 : 15 N-m (1.5 kg-m, 11.0 ft-lb)
SS : Apply silicone sealant (Kawasaki Bond: 56019-120) to the threads.
G : Apply high temperature grease.
M : Apply molybdenum disulfide grease.

Specifications

Items		Standard
Coolant Provided when Shipping:		
	Type	Permanent type of antifreeze for aluminum engines and radiators
	Color	Green
	Mixed ratio	Soft water 50%, coolant 50%
	Freezing point	−35°C (−31°F)
	Total amount	1.1 L (reservoir tank full level)
Radiator:		
	Cap relief pressure	93 – 123 kPa (0.95 – 1.25 kg/cm², 14 – 18 psi)
Thermostat:		
	Valve opening temperature	58.5 – 61.5°C (137.3 – 142.7°F)
	Valve full opening lift	not less than 3 mm @75°C (167°F)

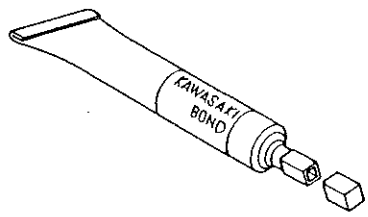
Special Tool

Bearing Driver Set: 57001-1129



Sealant

Kawasaki Bond (Silicone Sealant): 56019-120

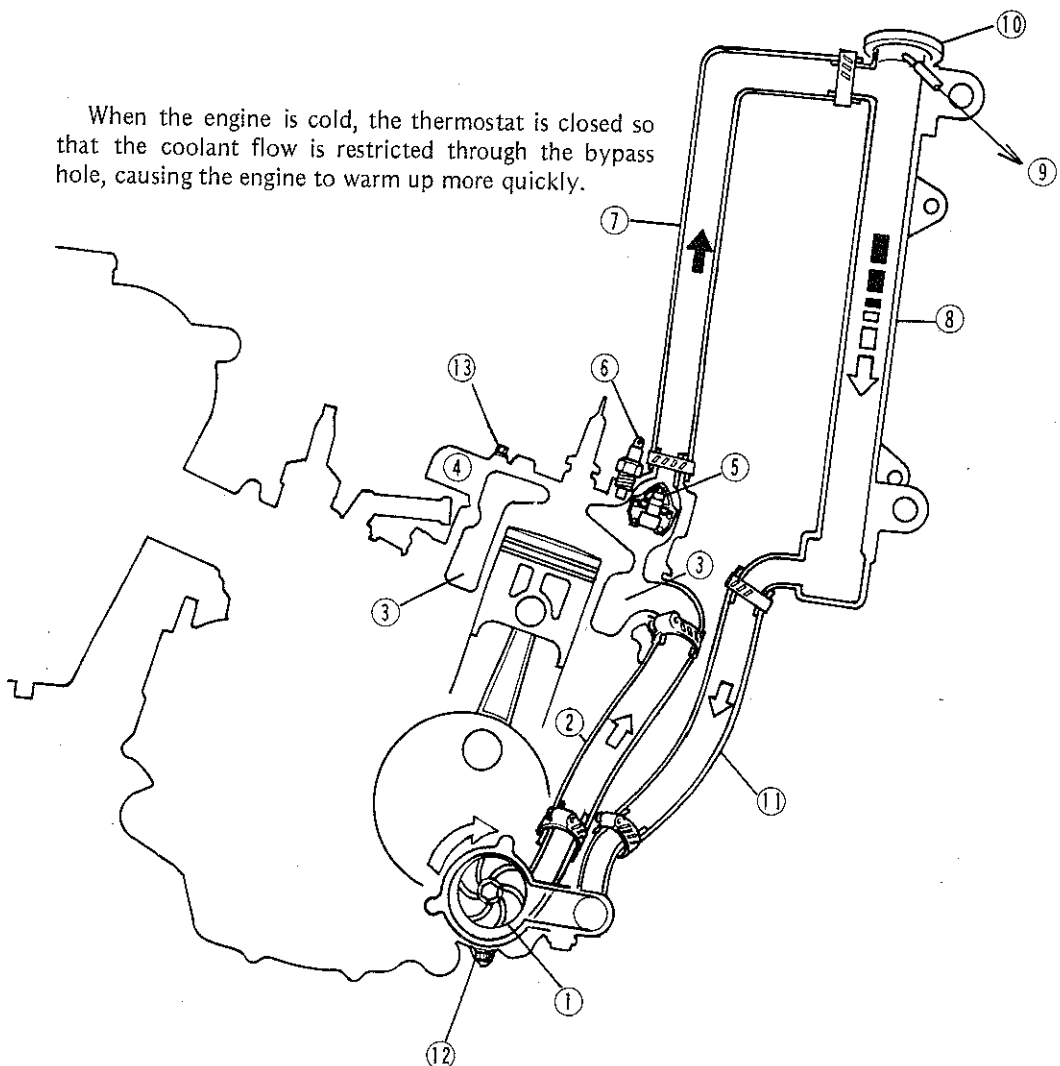


3-4 COOLING SYSTEM

Cooling System

The water cooling system is a pressurized forced circulation type. When the engine load varies, this system controls the engine temperature within narrow limits where the engine operates most efficiently. In this way the engine performs stably in various riding conditions, and possesses high durability.

When the engine is cold, the thermostat is closed so that the coolant flow is restricted through the bypass hole, causing the engine to warm up more quickly.



1. Water Pump
2. Water Pump Hose
3. Cylinder Jacket
4. Cylinder Head
5. Thermostat
6. Water Temperature Sensor
7. Water Hose
8. Radiator
9. To Reservoir Tank
10. Radiator Cap
11. Radiator Hose
12. Drain Plug
13. Air Bleeder Bolt

Coolant

Check the coolant level each day before riding the motorcycle, and replenish coolant if the level is low. Change the coolant in accordance with the Periodic Maintenance Chart (see the General Information chapter).

Coolant Inspection

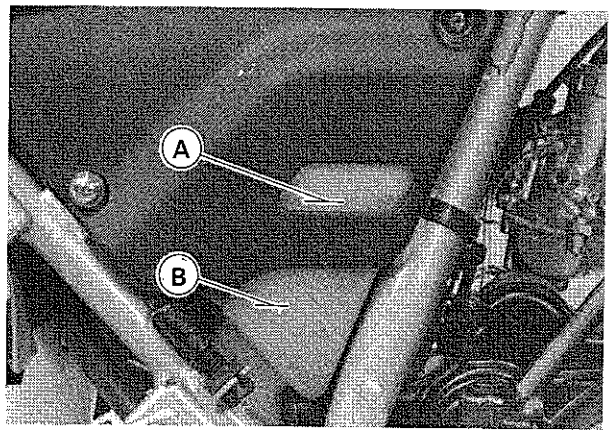
Coolant Level:

- Situate the motorcycle so that it is perpendicular to the ground.
- Check the level through the coolant level gauge on the reservoir tank. The coolant level should be between the FULL and LOW marks.

NOTE

○*Check the level when the engine is cold (room or ambient temperature).*

○*Do not check the level through the radiator filler by removing the cap. If the cap is removed, air may get into the coolant, and lower the cooling efficiency.*



A. "FULL" Mark B. "LOW" Mark

★If the amount of coolant is insufficient, add coolant through the filler opening to the FULL mark.

CAUTION

○**For refilling, add the specified mixture of coolant and soft water. Adding water alone dilutes the coolant and degrades its anticorrosion properties. The diluted coolant can attack the aluminum engine parts. In an emergency, soft water can be added. But the diluted coolant must be returned to the correct mixture ratio within a few days.**

○**If coolant must be added often, or the reservoir tank has run completely dry, there is probably leakage in the cooling system. Check the system for leaks (see Visual Leak Inspection, and Cooling System Pressure Testing).**

Coolant Deterioration:

- Remove the battery cover.
- Remove the reservoir tank cap.
- Visually inspect the coolant in the reservoir tank.

NOTE

○*Be sure to inspect the coolant at the reservoir tank. If the coolant is checked at the radiator by removing the radiator cap, the air must be bled from the cooling system.*

○If whitish cotton-like wafts are observed, aluminum parts in the cooling system are corroded. If the coolant is brown, iron or steel parts are rusting. In either case, flush the cooling system.

○If the coolant gives off an abnormal smell, check for a cooling system leak. It may be caused by exhaust gas leaking into the cooling system.

Coolant Change

The coolant should be changed periodically to ensure long engine life.

Coolant Draining:

WARNING

○**To avoid burns do not remove the radiator cap or try to change the coolant when the engine is still hot. Wait until it cools down.**

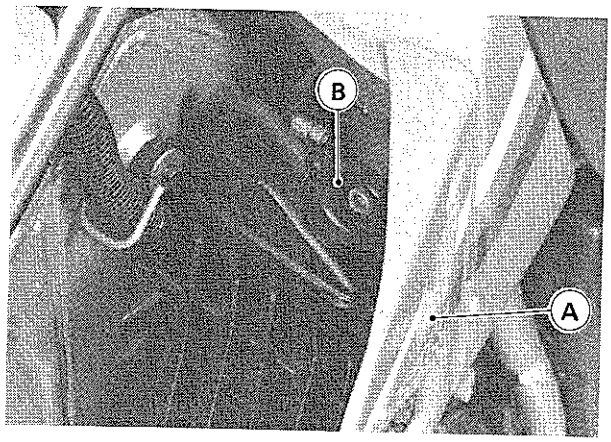
○**Coolant on tires will make them slippery and can cause an accident and injury. Immediately wipe up or wash away any coolant that spills on the frame, engine or other painted parts.**

○**Since coolant is harmful to the human body, do not use for drinking.**

- Remove the radiator shroud, and turn the handlebar to the right.
- Remove the radiator cap.

NOTE

○*Remove the radiator cap in two steps. First turn the cap counterclockwise to the first stop and wait there for a few seconds. Then push and turn it further in the same direction and remove the cap.*

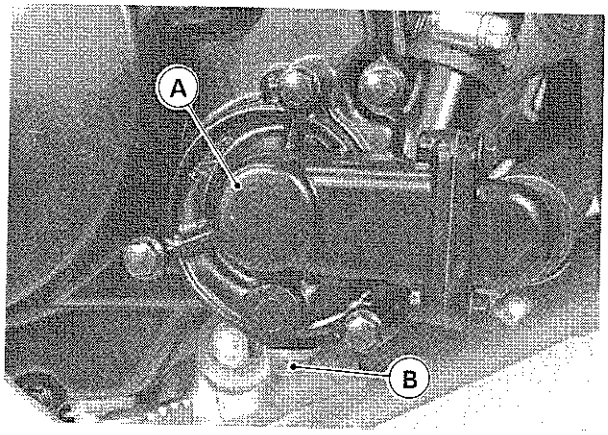


A. Radiator Shroud B. Radiator Cap

- Remove the engine guard.
- Place a container under the water pump.
- Drain the coolant from the radiator and engine by removing the drain plug at the bottom of the water pump.

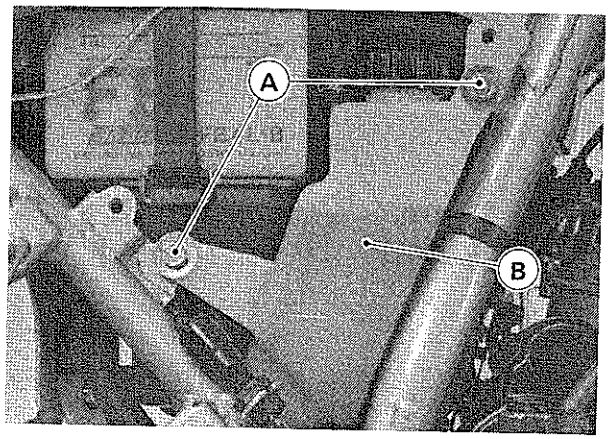
NOTE

○*Position the motorcycle upright so that the coolant may be drained easily.*



A. Water Pump B. Drain Plug

- Remove the battery cover.
- Pull off the air vent hose and remove the mounting bolts from the reservoir tank, and take out the tank with the reservoir tank hose attached.



A. Mounting Bolts B. Reservoir Tank

- Unscrew the cap and pour the coolant into a container.
- Inspect the old coolant for visual evidence of corrosion and abnormal smell (see Coolant Deterioration).

Coolant Filling:

CAUTION

○**Use coolant containing corrosion inhibitors made specifically for aluminum engines and radiators in accordance with the manufacturer's instructions.**
○**Soft or distilled water must be used with the antifreeze (see below for antifreeze) in the cooling system.**
☆**If hard water is used in the system, it causes scales accumulation in the water passages, and considerably reduces the efficiency of the cooling system.**

NOTE

○*Choose a suitable mixture ratio by referring to the coolant manufacturer's directions.*

The coolant provided when shipping

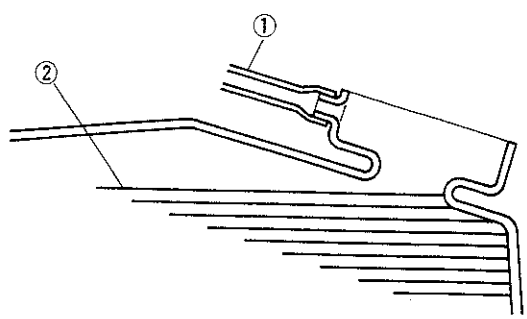
Type	:	**Permanent type antifreeze for aluminum engines and radiators**
Color	:	**Green**
Mixed ratio	:	**Soft water 50%, coolant 50%**
Freezing point	:	**–35°C (–31°F)**
Total amount	:	**1.1 L (reservoir tank full level)**

- Install the drain plug. Always replace the gasket with a new one, if it is damaged.
- Tighten the drain plug to the specified torque (see Exploded View).
- Install the engine guard.
- Fill the radiator up to the bottom of the radiator filler neck with coolant, and install the cap turning it clockwise about ¼ turn.

NOTE

○*Pour in the coolant slowly so that it can expel the air from the engine and radiator.*
○*The radiator cap must be installed in two steps. First turn the cap clockwise to the first stop. Then push down on it and turn it the rest of the way.*

Radiator Filler Neck



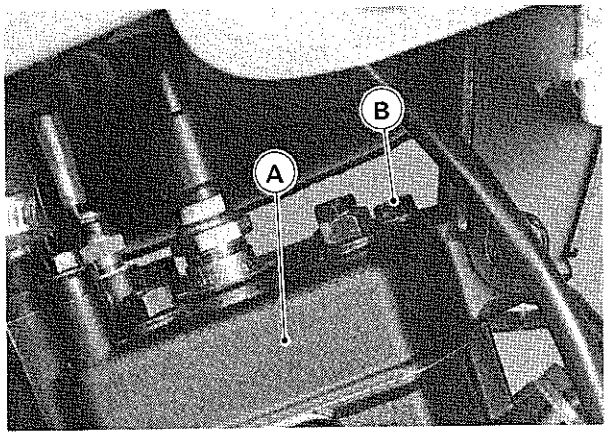
1. Reservoir Tank Hose
2. Coolant Level

- Install the radiator shroud.
- Fill the reservoir tank up to the FULL mark with coolant, and install the cap.
- Install the battery cover.

Air Bleeding

Before putting the motorcycle into operation, any air trapped in the cooling system must be removed as follows.

- Remove the radiator shroud, and turn the handlebar to the right.
- Remove the radiator cap.
- Loosen the air bleeder bolt on the rear of the cylinder head.



A. Cylinder Head B. Air Bleeder Bolt

- Pour coolant into the radiator until the coolant begins to flow out the air bleeder bolt hole (that is, after all the remaining air has been forced out).
- Tighten the air bleeder bolt.
- Fill the radiator up to the radiator filler neck with coolant, and install the radiator cap.
- Install the radiator shroud.
- Check the cooling system for leaks.
- Start the engine, warm it up thoroughly, and then stop it.
- Check the coolant level in the reservoir tank after the engine cools down.

★If the coolant level is low, add coolant up to the Full mark through the reservoir tank opening.

Coolant Leak Inspection

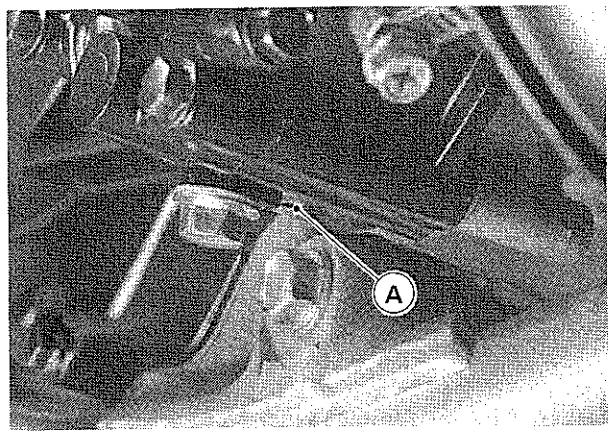
Any time the system slowly loses coolant, inspect for leaks.

- Visually check the water pump drainage outlet passage for coolant leaks.

★If the mechanical seal is damaged, the coolant leaks through the seal and drains through the passage. Replace the mechanical seal as a unit with a new one.

CAUTION

○**Whenever the mechanical seal is replaced, the oil seal and the ball bearing must be replaced with new ones too.**



A. Drainage Outlet Passage
: at the bottom of water pump

★If there are no apparent leaks, pressure test the cooling system.

Cooling System Pressure Testing

CAUTION

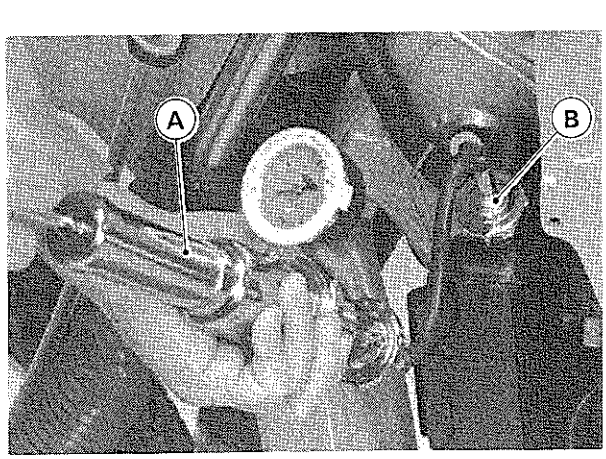
○**During pressure testing, do not exceed the pressure for which the system is designed. The maximum pressure is 123 kPa (1.25 kg/cm^2, 18 psi).**

- Remove the radiator shroud, and turn the handlebar to the right.
- Remove the radiator cap, and install a cooling system pressure tester on the radiator filler neck.

NOTE

○*Wet the adapter cap sealing surfaces with water or coolant to prevent pressure leaks.*

- Build up pressure in the system carefully until the pressure reaches 123 kPa (1.25 kg/cm^2, 18 psi).
- Watch the gauge for at least 6 seconds. If the pressure holds steady, the cooling system is all right.



A. Pressure Tester B. Adapter

•Remove the pressure tester, replenish the coolant, and install the radiator cap.
★If the pressure drops and no external source is found, check for internal leaks. Check the cylinder head gasket for leaks.

Cooling System Flushing

Over a period of time, the cooling system accumulates rust, scale, and lime in the water jacket and radiator. When this accumulation is suspected or observed, flush the cooling system. If this accumulation is not removed, it will clog up the water passage and considerably reduce the efficiency of the cooling system.
•Drain the cooling system.
•Fill the cooling system with fresh water mixed with a flushing compound.

CAUTION

○**Avoid the use of a flushing compound which is harmful to the aluminum engine and radiator. Carefully follow the instructions supplied by the manufacturer of the cleaning product.**

•Warm up the engine, and run it at normal operating temperature for about ten minutes.
•Stop the engine, and drain the cooling system.
•Fill the system with fresh water.
•Warm up the engine and drain the system.
•Repeat the previous two steps once more.
•Fill the system with a permanent type coolant, and bleed the air from the system (see Air Bleeding).

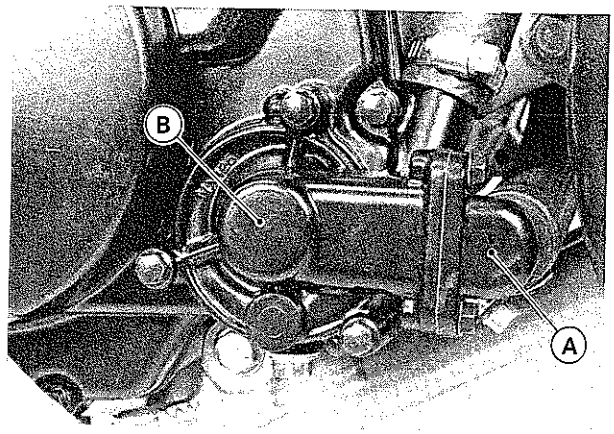
Disassembly and Assembly Precautions

•Prior to disassembly of cooling system parts (radiator, pump, sensors, etc), wait until the coolant cools down, and then drain the coolant.
•After assembling and filling the system with coolant, bleed any air from the system.

Water Pump

Water Pump Cover Removal

•Drain the coolant (see Coolant Draining).
•Remove the elbow mounting bolts at the radiator hose lower end.
•Remove the cover bolts and remove the water pump cover.



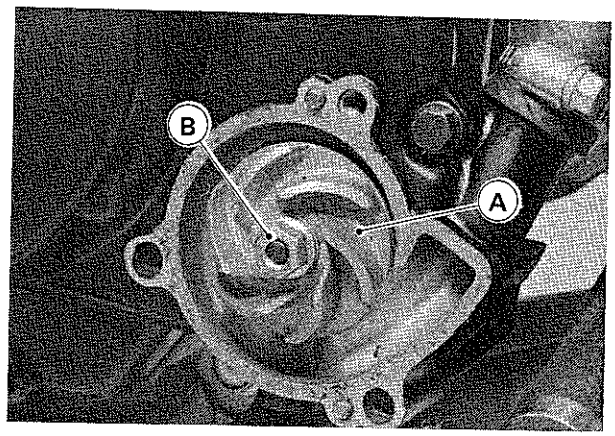
A. Elbow B. Water Pump Cover

Water Pump Cover Installation Notes

•Installation is the reverse of removal.
•Replace the pump cover and elbow gaskets with new ones.
•Fill the cooling system (see Coolant Filling).

Impeller Removal

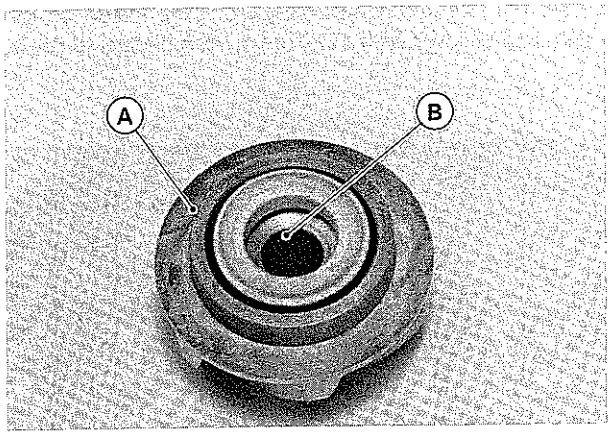
•Drain the coolant (see Coolant Draining).
•Remove the cover bolts and pull down the water pump cover with the radiator hose attached.
•Remove the impeller nut, and pull out the impeller and the O-ring.



A. Impeller B. Impeller Nut

Impeller Installation

•Before installing the impeller, fit the O-ring in the impeller.
○Check that the O-ring is in good condition.
☆If it is damaged, replace it with a new one.



A. Impeller B. O-Ring

●Install the impeller onto the water pump shaft, and tighten the impeller nut to the specified torque (see Exploded View).

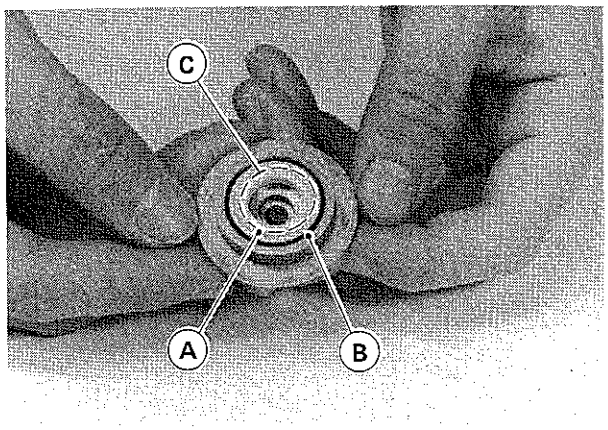
CAUTION

○**Turn the impeller clockwise at installation, and turn it counterclockwise at removal. This is to prevent impeller O-ring damage by the shaft screw threads.**

Impeller Assembly Notes

●Clean the sliding surface of the mechanical seal with a high flash point solvent, and apply a little coolant to the sliding surface to give the mechanical seal initial lubrication.

●Apply coolant to the surfaces of the rubber seal and sealing seat, and install the rubber seal and sealing seat into the impeller by pressing them by hand until the seat stops at the bottom of the hole.

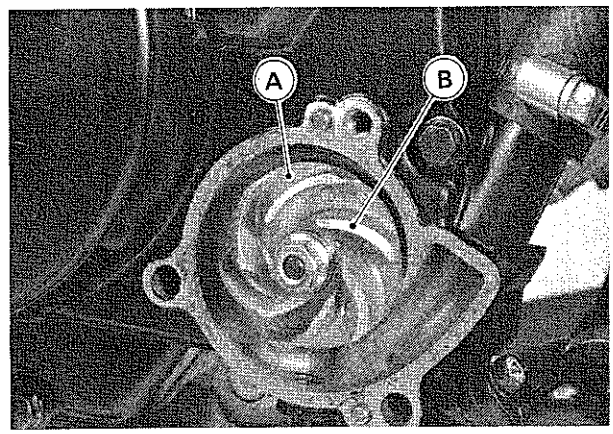


A. Sealing Seat C. Apply coolant to the surfaces.
B. Rubber Seal

Impeller Inspection

●Visually check the impeller.

★If the surface is corroded, or if the blades are damaged, replace the impeller.



A. Impeller B. Blades

Water Pump Shaft Removal

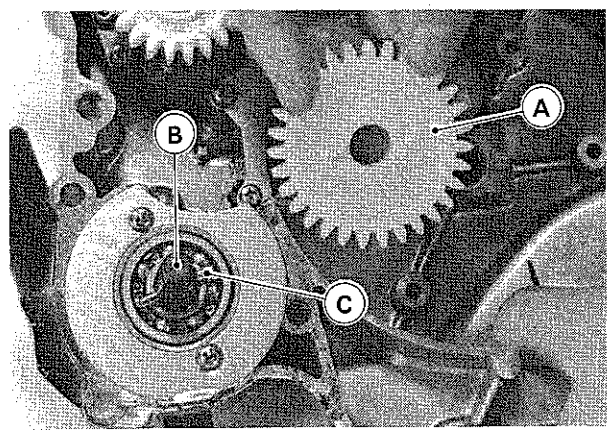
●Remove the following parts.
Impeller
Right Engine Cover (see Right Engine Cover in the Engine Right Side chapter)

●Remove the circlip, and take off the water pump gear.

●Pull out the water pump shaft toward inside of the right engine cover, and remove the gear drive pin.

CAUTION

○**Be sure to pull out the shaft toward the inside of the cover to prevent the oil seal lips from peeling.**



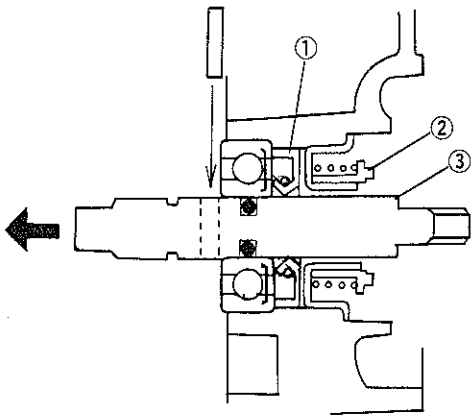
A. Water Pump Gear C. Gear Drive Pin
B. Water Pump Shaft

Water Pump Shaft Installation Notes

●Installation is the reverse of removal.

●To prevent the oil seal lips from peeling, apply a molybdenum disulfide grease to the water pump shaft and insert it into the hole from the mechanical seal side.

Water Pump Shaft Installation



1. Oil Seal
2. Mechanical Seal
3. Water Pump Shaft

CAUTION

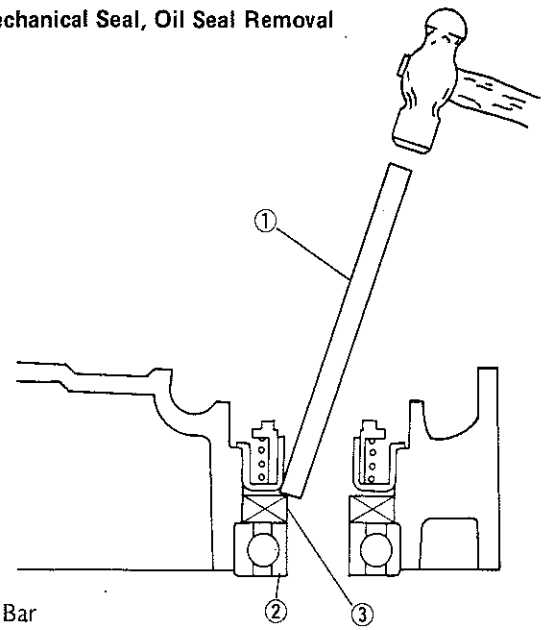
○**Be sure to apply a molybednum disulfide grease to the water pump shaft when installing. If it is installed clog, the seals may wear excessively.**

Mechanical Seal, Oil Seal Removal

●Remove the following parts.
Impeller
Right Engine Cover (see Right Engine Cover in the Engine Right Side chapter)
Water Pump Shaft

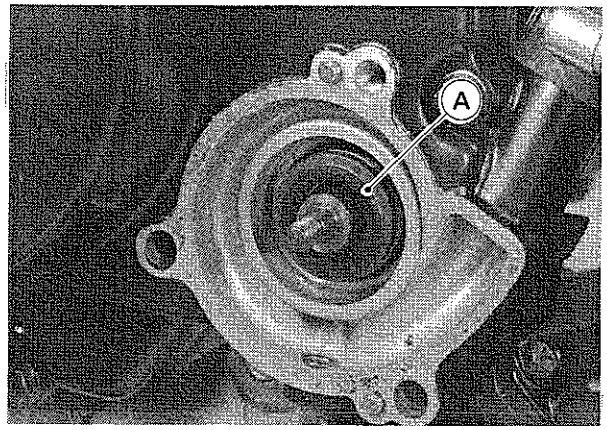
●Insert a bar into the water pump shaft hole from the outside of the right engine cover, and remove the ball bearing and the oil seal by tapping evenly around the bearing inner race and seal lips.

Mechanical Seal, Oil Seal Removal



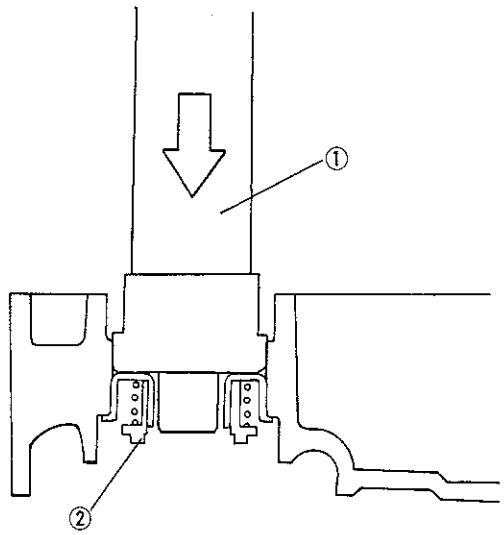
1. Bar
2. Ball Bearing
3. Oil Seal

●Press out the mechanical seal from the inside of the right engine cover with a bearing driver set (special tool).



A. Mechanical Seal

Mechanical Seal Removal



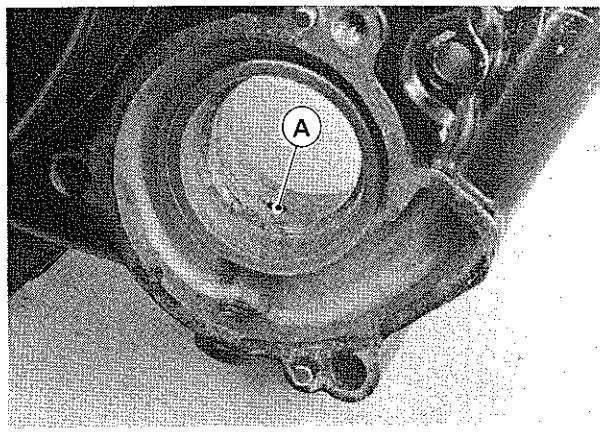
1. Bearing Driver Set: 57001-1129
2. Mechanical Seal

Mechanical Seal, Oil Seal Installation

CAUTION

○**If the mechanical seal, oil seal or ball bearing is removed, replace all of them with new ones at the same time.**

○**Do not obstruct the drainage outlet passage with liquid gasket or the oil seal. If it is obstructed, the coolant may be forced through the oil seal and mix with the transmission oil.**



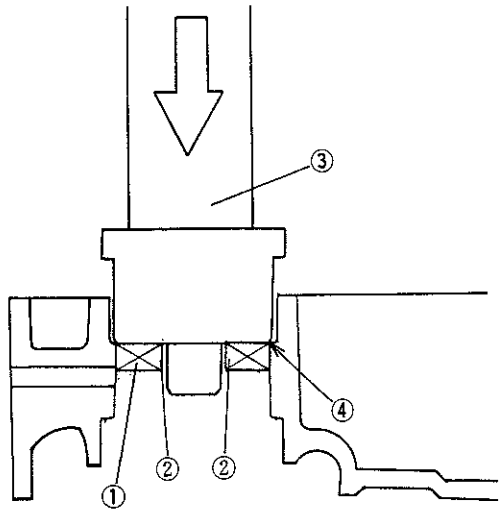
A. Drainage Outlet Passage

●Apply plenty of high temperature grease to the oil seal lips, and oil to the oil seal outside circular surface.
●Press the oil seal into the hole from the inside of the right engine cover with a bearing driver set (special tool) so that the spring side of the seal lips are toward the inside of the cover.

CAUTION

○**Use a bearing driver larger in diameter than the oil seal, and press the oil seal into the hole until the edge of the oil seal is flush with the step for the ball bearing. After installing the mechanical seal, there should be about 0.8 mm clearance between the seals for the drainage passage.**

Oil Seal Installation



1. Oil Seal
2. Apply High Temperature Grease
3. Bearing Driver Set: 57001-1129
4. Step

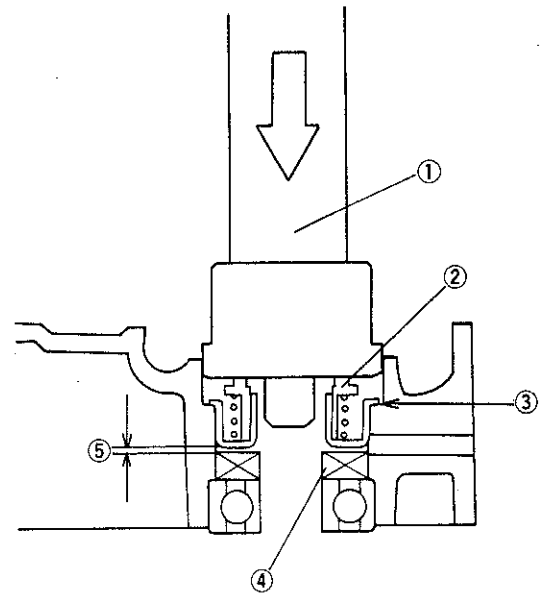
●Press the ball bearing into the hole with a bearing driver set (special tool: 57001-1129) until the bearing is bottomed against the step.
○Press the ball bearing with facing its sealed side to the oil seal.

●Press the mechanical seal into the hole with a bearing driver (special tool) until its flange touches the step.

CAUTION

○**Never tap on the mechanical seal, use a press only.**
○**Be careful not to damage the sealing surface of the mechanical seal.**

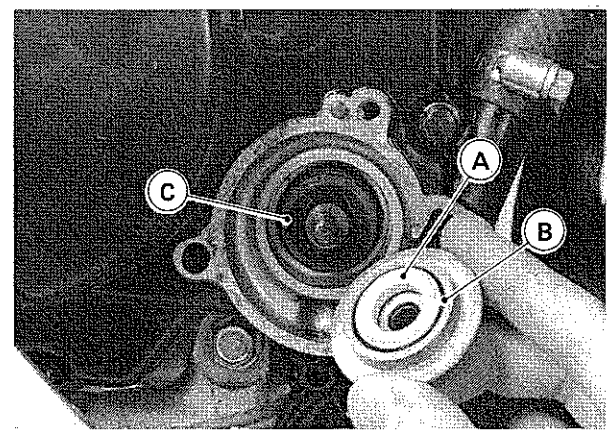
Mechanical Seal Installation



1. Bearing Driver Set: 57001-1129
2. Mechanical Seal
3. Touch the Step
4. Oil Seal
5. Clearance (about 0.8 mm)

Mechanical Seal Inspection

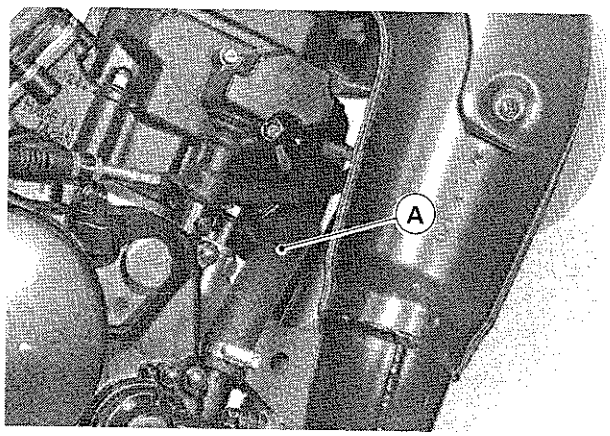
●Visually inspect the mechanical seal.
★If any one of the parts is damaged, replace the mechanical seal as a unit.



A. Impeller Sealing Seat Surface
B. Rubber Seal
C. Mechanical Seal Diaphragm

Water Pump Hose Inspection

- In accordance with the Periodic Maintenance Chart, Visually inspect the hoses for signs of deterioration. Squeeze the hose. A hose should not be hard and brittle, nor should it be soft or swollen.
- Replace any damaged hose.



A. Water Pump Hose

Radiator

Radiator Removal

- Drain the coolant (see Coolant Draining).
- Loosen the hose clamps, and pull off the radiator and reservoir tank hoses.
- Remove the mounting bolts, and take out the radiator with the radiator louver.

Radiator Installation

- Installation is the reverse of removal (see Coolant Filling).

Radiator Inspection

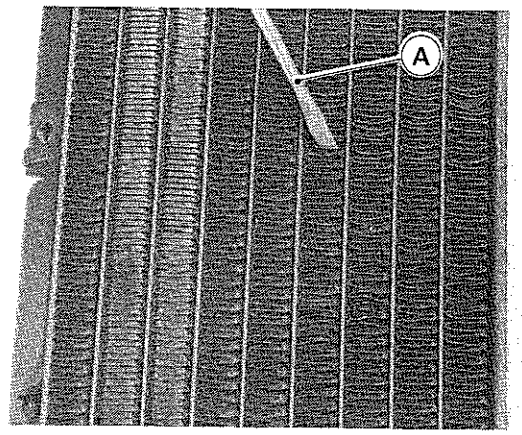
- Check the radiator core.

★If there are obstructions to air flow, remove them.

★If the corrugated fins are deformed, carefully straighten them with the blade of a thin screw driver.

CAUTION

○Do not tear the radiator tubes while straightening the fins.



A. Thin Screwdriver

★If the air passages of the radiator core are blocked more than 20% by unremovable obstructions or irreparably deformed fins, replace the radiator with a new one.

CAUTION

○When cleaning the radiator with compressed air, be careful of the following to avoid damage to the fins.

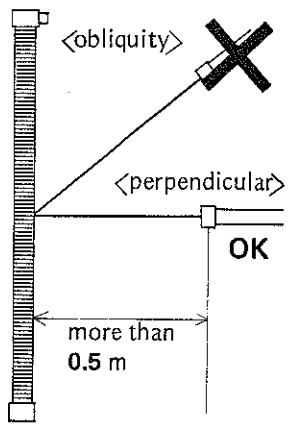
○Keep the air nozzle over 0.5 m (20 in.) away from the radiator.

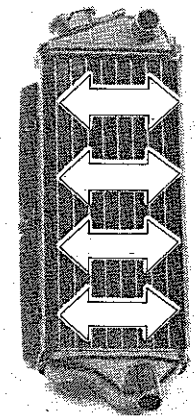
○Blow air perpendicularly to the radiator core.

○Never blow air at an angle against the fins but straight through them in the direction of natural air flow.

○Never shake the air nozzle at a right angle against the fins, be sure to move it at a level with the fins.

Radiator Cleaning

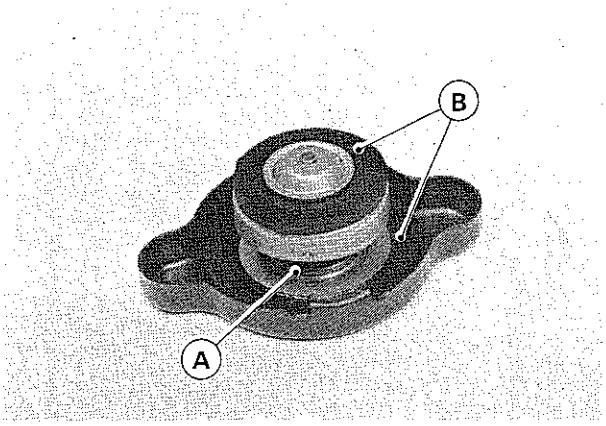




Radiator Cap Inspection

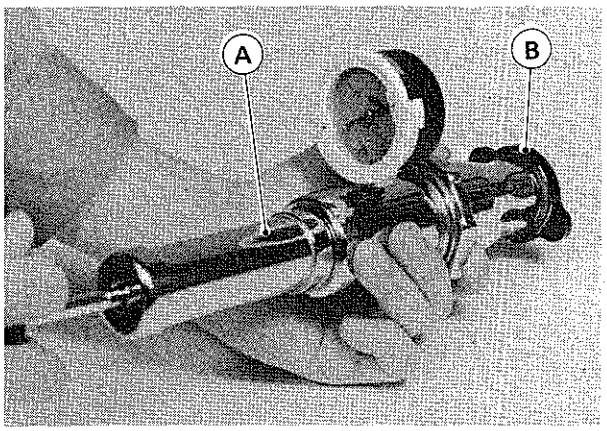
- Check the condition of the valve spring, and the top and bottom valve seals of the radiator cap.

★If any one of them shows visible damage, replace the cap.



A. Valve Spring B. Top and Bottom Valve Seals

•Wet the cap sealing surfaces with water or coolant to prevent pressure leaks.
•Install the cap on a cooling system pressure tester.
•Watching the pressure gauge, pump the tester to build up the test pressure. The cap must open at the specified relief pressure (the gauge hand flicks down).



A. Pressure Tester B. Radiator Cap

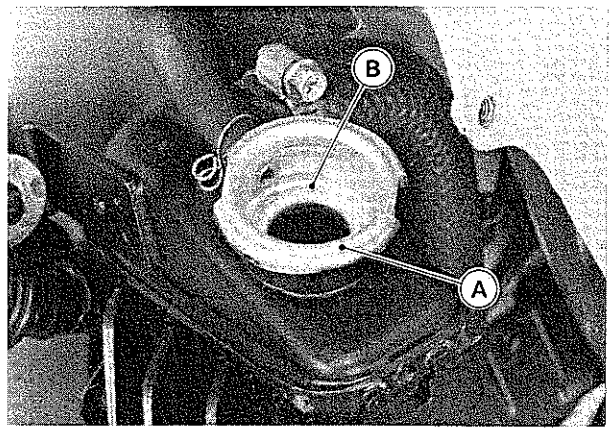
Radiator Cap Relief Pressure

93 – 123 kPa (0.95 – 1.25 kg/cm^2, 14 – 18 psi)

○Also, the cap must hold any pressure less than the relief pressure for at least 6 seconds.
★If the cap cannot hold the pressure, or if the relief pressure is too high or too low, replace the cap with a new one.

Filler Neck Inspection

•Check the radiator filler neck for signs of damage.
•Check the condition of the top and bottom sealing seats in the filler neck. They must be smooth and clean for the radiator cap to function properly.



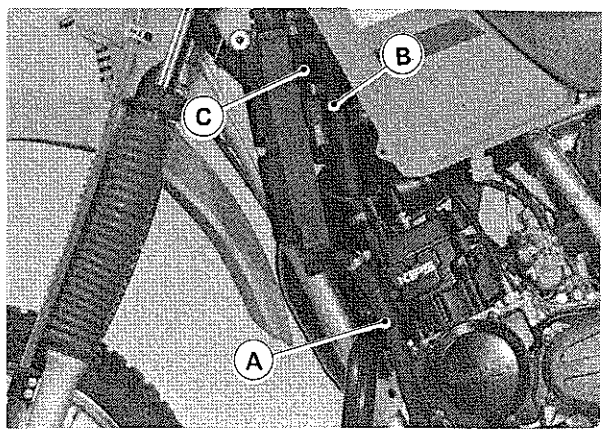
A. Top Sealing Seat B. Bottom Sealing Seat

Radiator Hose, Water Hose, Reservoir Tank Hose, Air Vent Hose Inspection

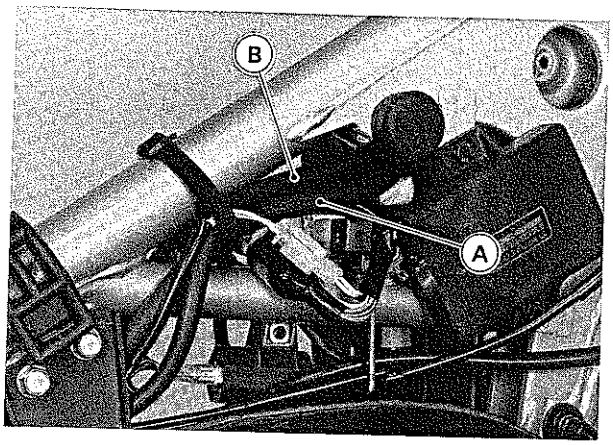
•In accordance with the Periodic Maintenance Chart, visually inspect the hoses for signs of deterioration. Squeeze the hose. A hose should not be hard and brittle, nor should it be soft or swollen.
•Replace any damaged hose.

Radiator Hose, Water Hose, Reservoir Tank Hose, Air Vent Hose Installation Notes

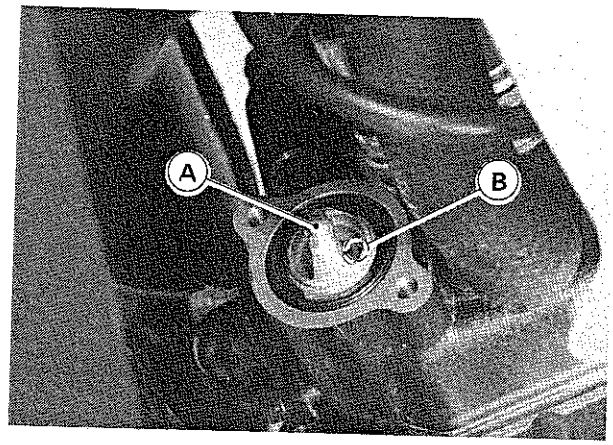
•Install the radiator hose, water hose, reservoir tank hose or air vent hose being careful to follow the performed bends (see Exploded View, Hose Routing in the General Information chapter). Avoid sharp bending, kinking, flattening, or twisting.
•Tighten the hose clamps securely.



A. Radiator Hose C. Reservoir Tank Hose
B. Water Hose



A. Reservoir Tank Hose B. Air Vent Hose

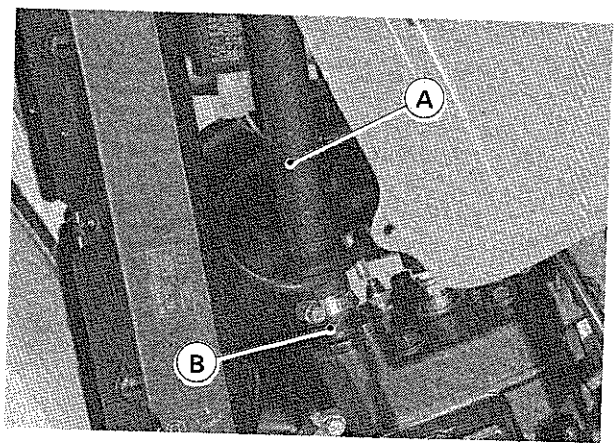


A. Thermostat B. Air Bleeder Hole

Thermostat

Thermostat Removal

- Remove the radiator shroud.
- Drain the coolant (see Coolant Draining).
- Pull off the water hose lower end.
- Remove the thermostat housing cap, and take out the thermostat.



A. Water Hose B. Thermostat Housing Cap

Thermostat Installation Notes

- Installation is the reverse of removal (see Coolant Filling).
- Put the thermostat into the housing so that the air bleeder hole is positioned toward the rear of the engine.

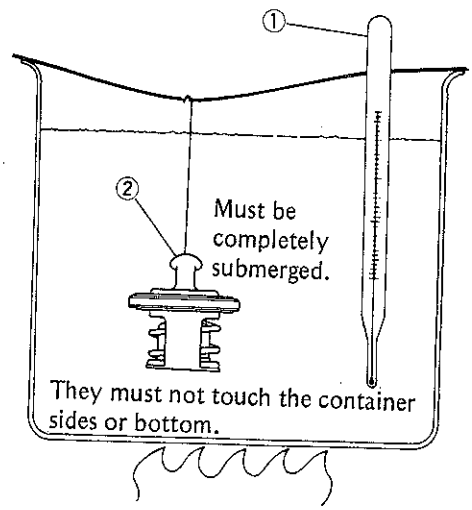
Thermostat Inspection

- Remove the thermostat, and inspect the thermostat valve at room temperature.

★If the valve is open, replace the valve with a new one.

- To check valve opening temperature, suspend the thermostat and an accurate thermometer in a container of water.
- Place the container over a source of heat and gradually raise the temperature of the water while stirring the water gently.

Valve Opening Temperature Measurement



1. Thermometer
2. Thermostat

•Watch the valve. As soon as the valve starts to open, note the temperature.
★If it is out of the specified range, replace the thermostat.

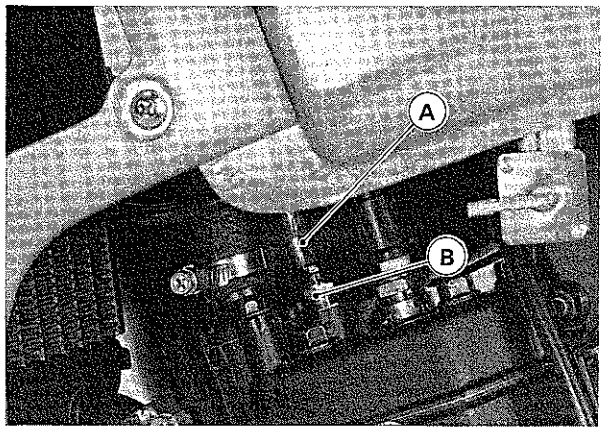
Thermostat Valve Opening Temperature

58.5 – 61.5°C (137.3 – 142.7°F)

Water Temperature Sensor

Water Temperature Sensor Removal

•Disconnect the water temperature sensor connector.
•Unscrew the sensor and remove it.



A. Connector B. Water Temperature Sensor

Water Temperature Sensor Installation Notes

•Apply a liquid gasket compound to the threads before installing the water temperature sensor.
•Tighten the water temperature sensor to the specified torque (see Exploded View).
•After installing, be sure to bleed the cooling system (see Air Bleeding).

Water Temperature Sensor Inspection

•Refer to the Electrical System chapter.

Engine Top End

Table of Contents

Exploded View 4-2
Specifications 4-4
Special Tools 4-4
Cylinder Head 4-5
- Cylinder Compression Measurement 4-5
- Cylinder Head Removal 4-5
- Cylinder Head Installation Notes 4-5
- Cylinder Head Warp Inspection 4-6

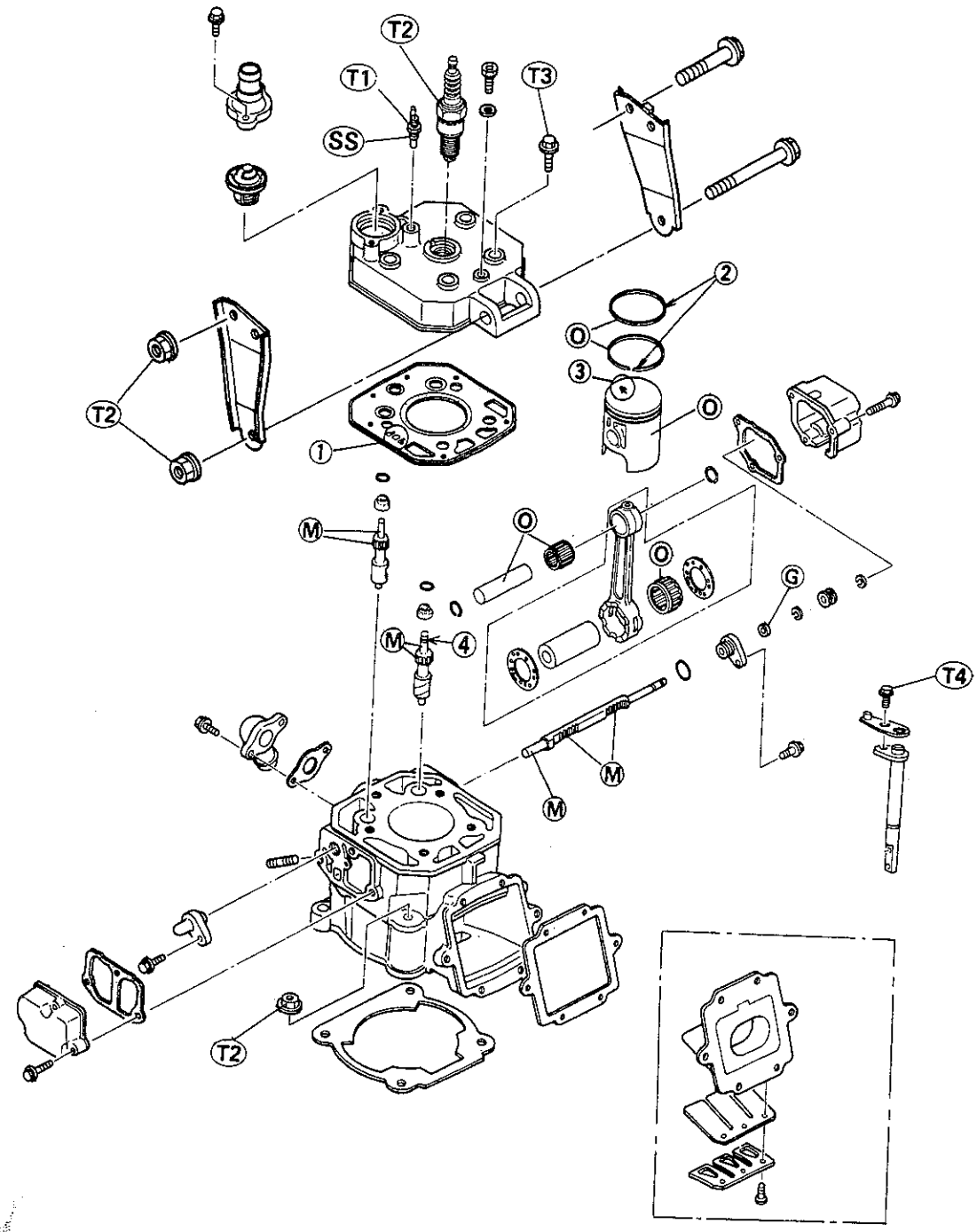
Exhaust Valve (KIPS) 4-6
- Exhaust Valve Removal 4-6
- Exhaust Valve Installation Notes 4-6
- Exhaust Valve Operation Inspection 4-7

Cylinder, Piston 4-8
- Cylinder Removal 4-8
- Cylinder Installation Notes 4-8
- Piston Removal 4-8
- Piston Installation Notes 4-9
- Cylinder Wear Inspection 4-10
- Piston Diameter Measurement 4-10
- Piston/Cylinder Clearance 4-10
- Piston Ring, Piston Ring Groove Inspection 4-11
- Piston Ring End Gap Inspection 4-11
- Piston, Piston Pin, Connecting Rod Wear Inspection 4-11

Muffler (Expansion Chamber, Silencer) 4-12
- Expansion Chamber Removal 4-12
- Expansion Chamber Installation Notes 4-12
- Silencer Removal 4-12
- Silencer Installation Notes 4-13
- Silencer Wool Change 4-13

4-2 ENGINE TOP END

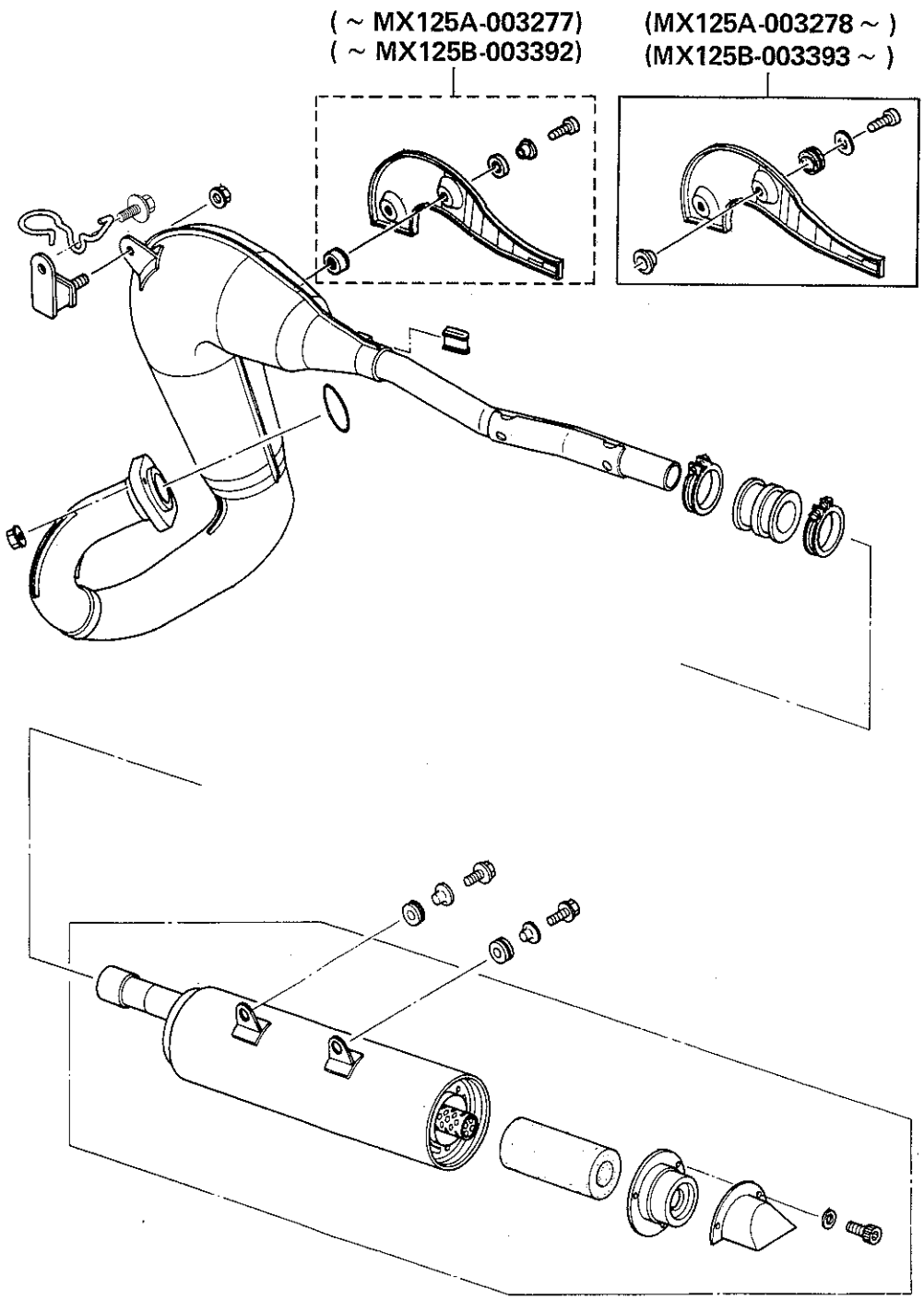
Exploded View



1. TOP Punched Mark
2. N Mark
3. Arrow mark is must point toward the front.
4. Discriminative Groove

SS : Apply silicone sealant (Kawasaki Bond: 56019-120) to the threads.
O : Apply engine oil to the surface.
M : Apply a molybdenum disulfide grease.
G : Apply a high temperature grease.

T1 : 15 N-m (1.5 kg-m, 11.0 ft-lb)
T2 : 25 N-m (2.5 kg-m, 18.0 ft-lb)
T3 : 25 N-m (2.6 kg-m, 19.0 ft-lb)
T4 : 8.8 N-m (0.9 kg-m, 78 in-lb)


(~ MX125A-003277)
(~ MX125B-003392)
(MX125A-003278 ~)
(MX125B-003393 ~)

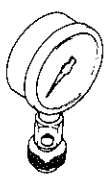
4-4 ENGINE TOP END

Specifications

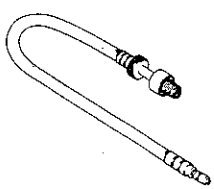
Item		Standard	Service Limit
Cylinder Head:			
Cylinder compression		(usable range) 795 – 1 230 kPa (8.1 – 12.5 kg/cm², 115 – 178 psi)	– – –
Cylinder head warp		– – –	0.03 mm
Cylinder, Piston:			
Cylinder inside diameter		54.000 – 54.015 mm	54.09 mm
Piston diameter		53.935 – 53.970 mm	53.82 mm
Piston/cylinder clearance		0.050 – 0.060 mm	– – –
Piston ring/groove clearance:			
	Top (keystone)	– – –	– – –
	Second	0.03 – 0.07 mm	0.17 mm
Piston ring groove width:			
	Top (keystone)	– – –	– – –
	Second	1.22 – 1.24 mm	1.33 mm
Piston ring thickness:	Top (keystone)	– – –	– – –
	Second	1.17 – 1.19 mm	1.10 mm
Piston ring end gap:	Top	0.15 – 0.35 mm	0.65 mm
	Second	0.15 – 0.35 mm	0.65 mm

Special Tools

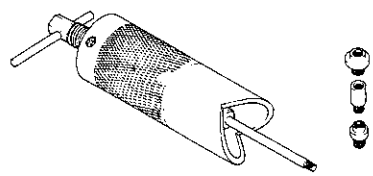
Compression Gauge: 57001-221



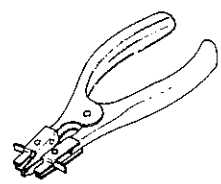
Adapter: 57001-1159



Piston Pin Puller Assembly: 57001-910



Piston Ring Pliers: 57001-115



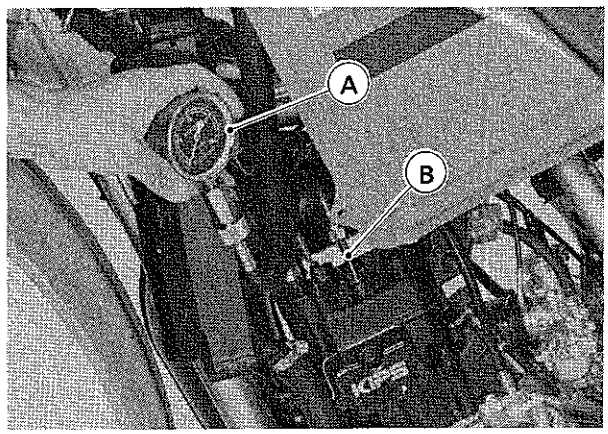
Cylinder Head

Cylinder Compression Measurement

- Start the engine.
- Thoroughly warm up the engine so that the engine oil between the piston and cylinder wall will help seal compression as it does during normal running.
- Stop the engine.
- Remove the radiator shroud and the ignition coil.
- Remove the spark plug, and screw a compression gauge (special tool) firmly into the spark plug hole.
- With the throttle fully open, turn the engine over sharply with the kickstarter several times until the compression gauge stops rising; the compression is the highest reading obtainable.

Cylinder Compression (Usable Range)

795 – 1 230 kPa (8.1 – 12.5 kg/cm^2, 115 – 178 psi)



A. Compression Gauge: 57001-221
B. Adapter: 57001-1159

★If cylinder compression is higher than the standard value, check the following:

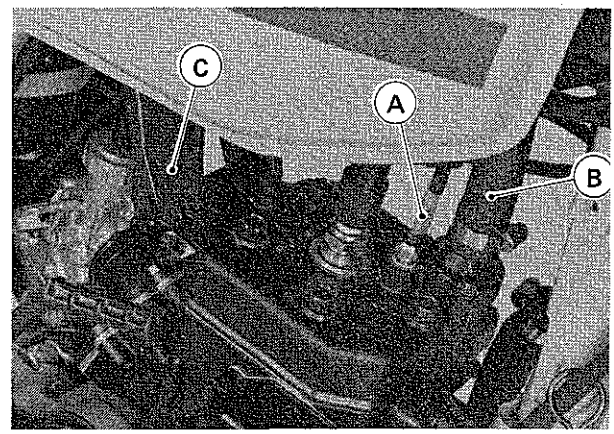
1. Carbon build-up on the piston head and cylinder head.
   – clean off any carbon on the piston head and cylinder head.
2. Cylinder head gasket, cylinder base gasket – use only the proper gaskets for the cylinder head and base. The use of gaskets of the incorrect thickness will change the compression.

★If cylinder compression is lower than the service limit, check the following:

1. Piston/cylinder clearance, piston seizure.
2. Gas leakage around the cylinder head – replace the damaged gasket and check the cylinder head for warping.
3. Piston ring, piston ring groove.

Cylinder Head Removal

- Drain the coolant (see Coolant Change in the Cooling System chapter).
- Remove the following parts:
  Right Side Cover
  Expansion Chamber
  Water Temperature Sensor Connector (disconnect)
  Spark Plug
  Water Hose Lower End (Thermostat Cap)
  Cylinder Head Bracket Bolt (Lower)

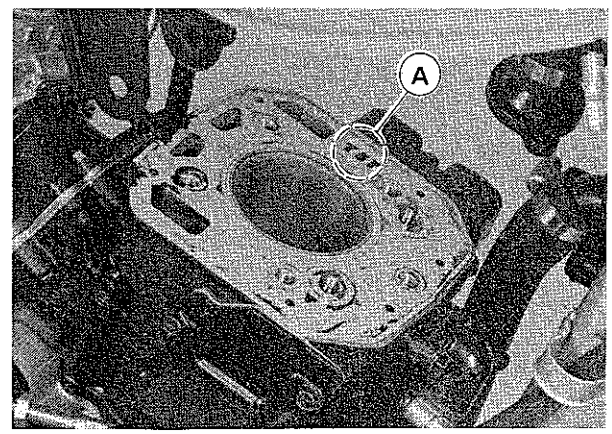


A. Water Temperature Sensor Connector
B. Water Hose
C. Cylinder Head Bracket

- Remove the cylinder head bolts, and take off the cylinder head and gasket.

Cylinder Head Installation Notes

- Installation is the reverse of removal.
- Replace the head gasket with a new one.
- The head gasket has a punched TOP mark. Install the gasket with the TOP mark up and to the left.



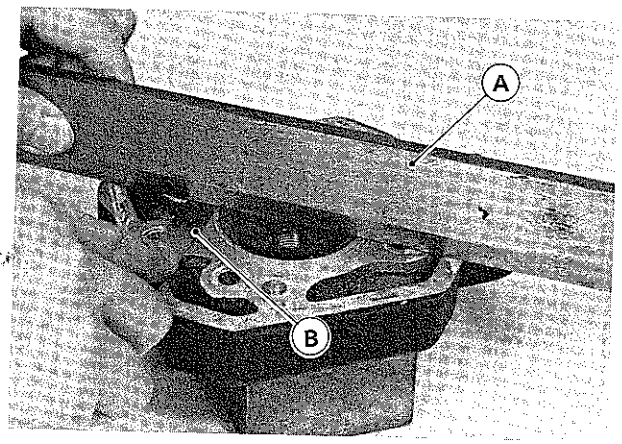
A. TOP Punched Mark

- Scrape out any carbon and clean the head with a high flash-point solvent.
- Check for a crust of minerals and rust in the head water jacket, and remove them if necessary.
- Tighten the cylinder head bolts to the specified torque (see Exploded View).
- Tighten the cylinder head bracket nut to the specified torque (see Exploded View).
- Tighten the spark plug to the specified torque (see Exploded View).

Cylinder Head Warp Inspection

- Lay a straightedge across the lower surface of the head at several different points, and measure warp by inserting a thickness gauge between the straightedge and the head.

*If warp exceeds the service limit, repair the mating surface. Replace the cylinder head if the mating surface is badly damaged.



A. Straightedge B. Thickness Gauge

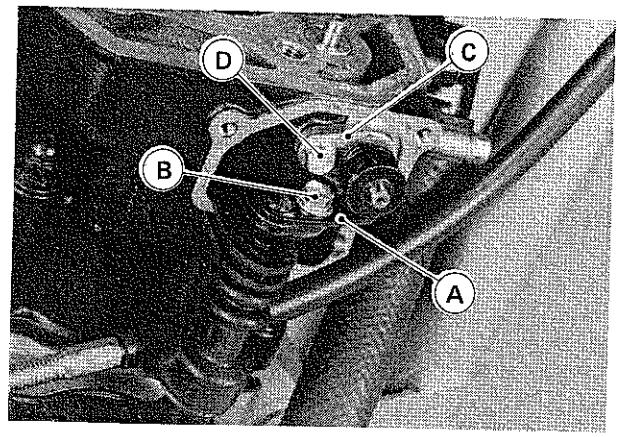
Cylinder Head Warp

Service Limit: **0.03 mm**

Exhaust Valve (KIPS)

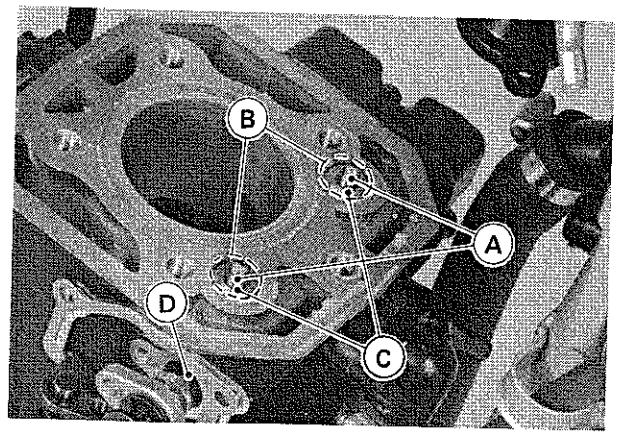
Exhaust Valve Removal

- Remove the cylinder head (see Cylinder Head Removal).
- Remove the right cover at the cylinder.
- Remove the shaft lever mounting bolt, and take off the shaft lever.
- Remove the rod seal plug mounting bolt, and pull the plug out of the cylinder.



A. Shaft Lever
B. Shaft Lever Mounting Bolt
C. Rod Seal Plug
D. Rod Seal Plug Mounting Bolt

- Lift up the exhaust valves, and remove the O-rings and valve guides.



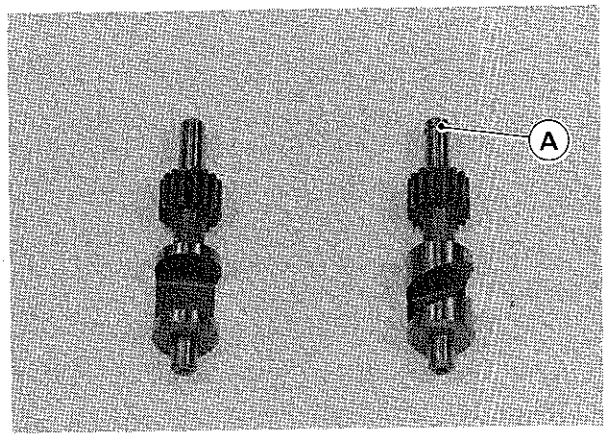
A. Exhaust Valves
B. O-Rings (nothing in above fig.)
C. Valve Guides
D. Valve Operating Rod

- Lift up the exhaust valves, and pull out the valve operating rod.
- Take out the exhaust valves.

Exhaust Valve Installation Notes

- Installation is the reverse of removal.
- Scrape out any carbon and clean the valves with a high flash-point solvent.
- Check the exhuast valves and valve operating rod for signs of damage. If necessary, replace them with new ones.

- Check the gasket and oil seal on the rod seal plug for signs of damage. If necessary, replace them with new ones.
- Check the O-rings on the valve guides for signs of damage. If necessary, replace them with new ones.
- Be careful not to mix up the right and left exhaust valves. The right valve has a identifying groove.



A. Groove

- Apply a molybdenum disulfide grease to the following:
  Exhaust Valve Upper and Lower Journals
  Exhaust Valve Pinions
  Valve Guides (inside)
  Valve Operating Rod Journals
  Rod Seal Plugs (inside)
  Valve Operating Rod Rack
- Apply a high temperature grease to the oil seal on the right rod seal plug.
- Adjust the exhaust valve position in accordance with the following procedure.

○After installing the rod seal plug in the cylinder with the valve operating rod, pull the rod to the right side as far as it will go.

○Engage the valve pinions with the rod rack so that the punch marks on the pinions are positioned toward the front of the engine. The punch marks on the valve pinions should align with the grooves on the rod.

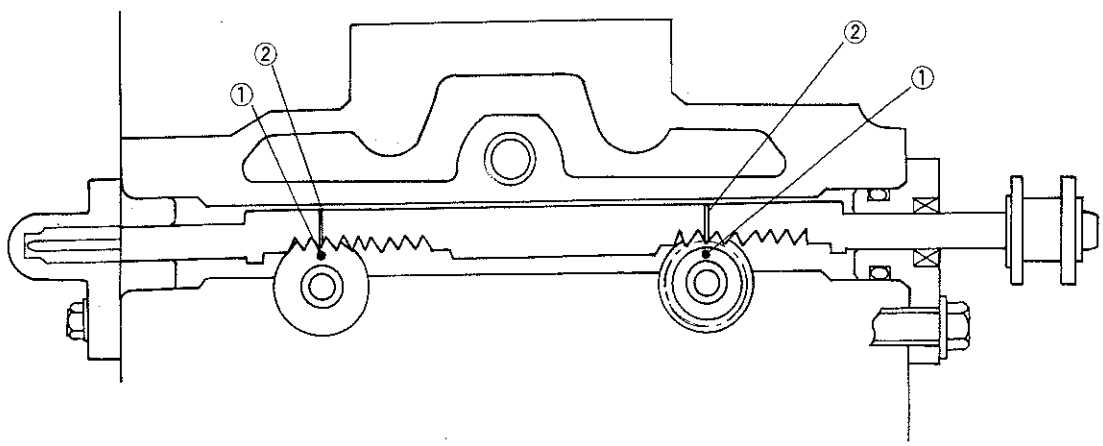
- After installing the valve guides with the O-rings, check that the valve operating rod and exhaust valves work smoothly by pushing and pulling the rod.
- When installing the shaft lever, tighten the shaft lever mounting bolt to the specified torque (see Exploded View) while pushing the valve operating rod as far as it will go.

Exhaust Valve Operation Inspection

- Remove the right cover at the cylinder.
- Start the engine.
- Visually check that the valve operating rod moves as the engine speed is raised. The rod should begin to move at about 6,500 rpm.

★If the valve operating rod does not move as the engine speed is raised, the exhaust valves may be sticking due to carbon accumulation. Clean off the carbon on the exhaust valves and in the valve holes in the cylinder.

Exhaust Valve Position

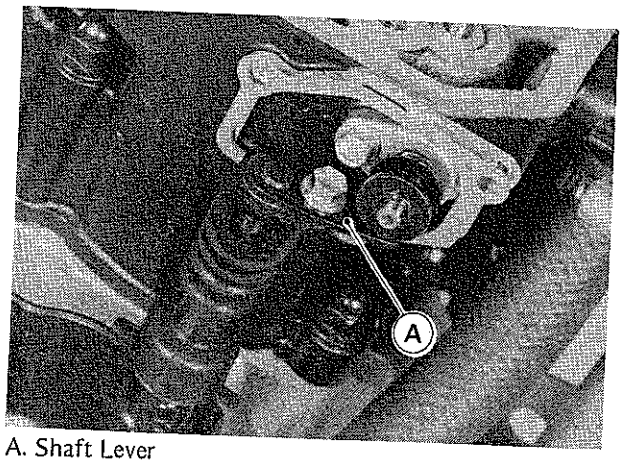


1. Punch Mark
2. Groove

Cylinder, Piston

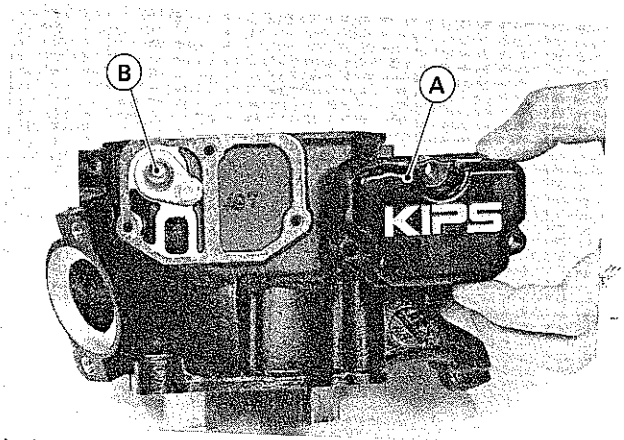
Cylinder Removal

- Remove the following parts:
  - Cylinder Head
  - Seat
  - Fuel Tank
  - Cylinder Head Bracket
  - Tachometer Cable Lower End
  - Clutch Cable Lower End
- Loosen the clamps, and pull the carburetor out of the holder and the air cleaner duct.
- Remove the carburetor holder mounting bolts, and pull the holder out to the rear.
- Remove the right cover at the cylinder.
- Remove the shaft lever mounting bolt, and take off the shaft lever.



A. Shaft Lever

- Remove the elbow at the water pump hose upper end.
- Remove the cylinder nuts.
- Lift off the cylinder, and remove the cylinder base gasket. If necessary, tap lightly around the base of the cylinder with a plastic mallet, taking care not to damage the cylinder.
- Remove the exhaust valves (see Exhaust Valve Removal).
- Remove the resonator at the cylinder left side.
- Remove the rod seal plug mounting bolt, and pull the plug out of the cylinder.



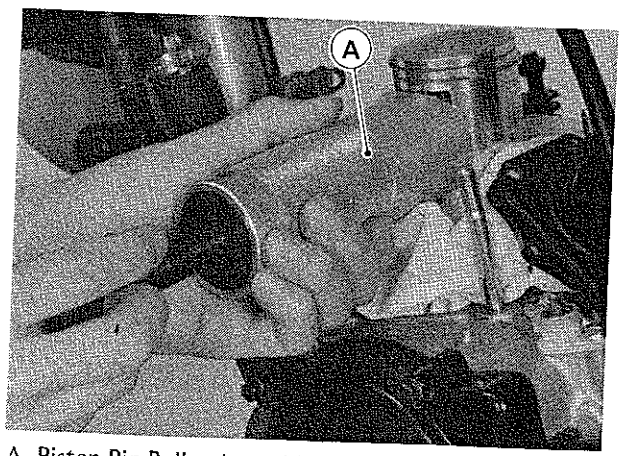
A. Resonator B. Rod Seal Plug

Cylinder Installation Notes

- Installation is the reverse of removal.
- Clean any carbon out of the inside of the resonator.
- Scrape any carbon out of the exhaust port, sub-ports and resonator port.
- Check for a crust of minerals and rust in the cylinder water jacket, and remove them if necessary.
- Check the gasket on the rod seal plug for signs of damage. If necessary, replace it with a new one.
- Apply a molybdenum disulfide grease to the inside of the rod seal plug.
- Replace the resonator gasket with a new one.
- Refer to Exhaust Valve Installation Notes to install the exhaust valves.
- The stud in the right crankcase half for mounting the cylinder have knock pins. Check to see that they are in place.
- Replace the cylinder base gasket with a new one.
- Apply engine oil to the piston surface, piston rings and cylinder bore.
- Check to see that the pin in each piston ring groove is between the ends of the piston ring, and fit the base of the cylinder over each ring, pressing in on opposite sides of the ring as necessary. Be certain that the rings do not slip out of position.
- Tighten the cylinder nuts to the specified torque (see Exploded View).
- Replace the elbow gasket with a new one.
- When installing the shaft lever, tighten the shaft lever mounting bolt to the specified torque (see Exploded View) while pushing the valve operating rod all the way in.
- Refer to 'Carburetor Installation Notes in the Fuel System chapter for carburetor installation.

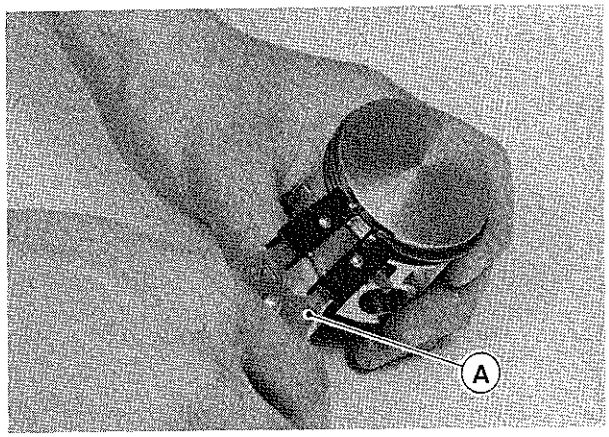
Piston Removal

- Remove the cylinder.
- Stuff a clean cloth into the crankcase opening around the connecting rod so that no parts will fall into the crankcase.
- Remove one of the piston pin snap rings with needle nose pliers.
- Remove the piston by pushing the piston pin out the side from which the snap ring was removed. Use a piston pin puller assembly (special tool), if the pin is tight.



A. Piston Pin Puller Assembly: 57001-910

●Remove the top and second rings with piston ring pliers (special tool). If the special tool is not available, carefully spread the ring opening with your thumbs and then push up on the opposite side of the ring to remove it.



A. Piston Ring Pliers: 57001-115

Piston Installation Notes

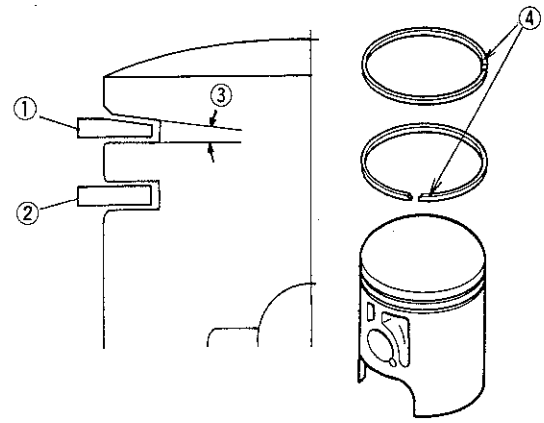
●Installation is the reverse of removal.
●Scrape any carbon off of the piston, and then lightly polish the piston with fine emery cloth.
●Clean carbon and dirt out of the piston ring grooves using a suitable tool.

CAUTION

○**Carbon particles can be very abrasive to piston rings. Don't allow such particles to fall onto the cylinder walls.**

●When installing the piston rings on the piston, note the following:
○If installing the piston rings by hand, first fit one end of the piston ring against the pin in the ring groove, spread the ring opening with the other hand and then slip the ring into the groove.
○Identify the top ring and the second ring by their different cross sections.
○Both the top and the second rings have an N mark on their upper surface.

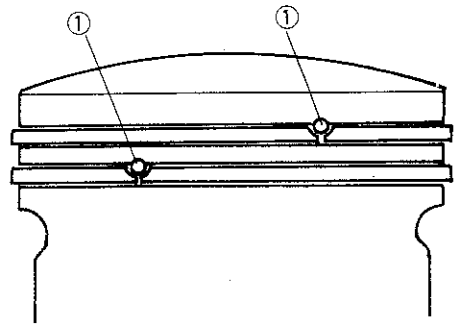
Piston Rings



1. Top Ring (keystone)
2. Second Ring
3. 7°
4. **N** Mark (upward).

○Install the rings so that the pin in each piston ring groove is between the ends of the piston ring.

Piston Ring Position



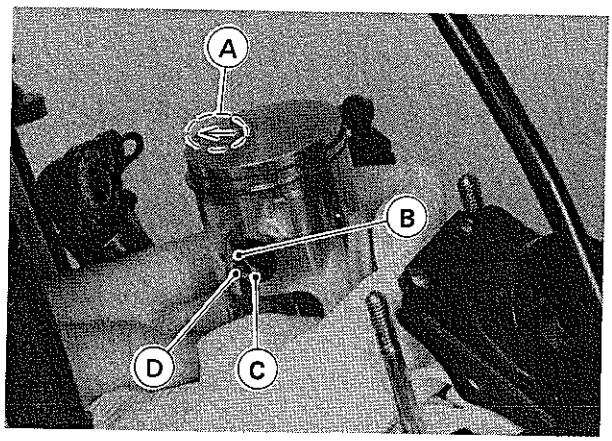
1. Pin

●Apply engine oil to the connecting rod needle bearing and the piston pin.
●The arrow on the top of the piston must point toward the front.
●When installing a piston pin snap ring, compress it only enough to install it and no more.

CAUTION

○**Do not reuse snap rings, as removal weakens and deforms them. They could fall out and score the cylinder wall.**

•Fit a new piston pin snap ring into the side of the piston so that the ring opening does not coincide with the notch in the edge of the piston pin hole.

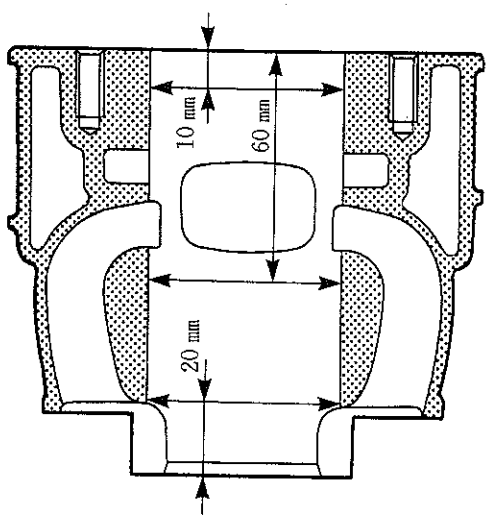


A. Arrow
B. Snap Ring
C. Ring Opening
D. Notch

Cylinder Wear Inspection

•Inspect the inside of the cylinder for scratches and abnormal wear.
★If the cylinder is damaged or badly worn, replace it with a new one.
•Since there is a difference in cylinder wear in different directions, take a side-to-side and a front-to-back measurement at each of the 3 locations (total of 6 measurements) shown in the figure.
★If any of the cylinder inside diameter measurements exceeds the service limit, the cylinder must be replaced with a new one since the ELECTROFUSION cylinder cannot be bored or honed.

Cylinder Inside Diameter Measurement



Cylinder Inside Diameter

Standard:	**54.000 – 54.015 mm and less than 0.01 mm difference between any two measurements**
Service Limit:	**54.09 mm,or more than 0.05 mm difference between any two measurements**

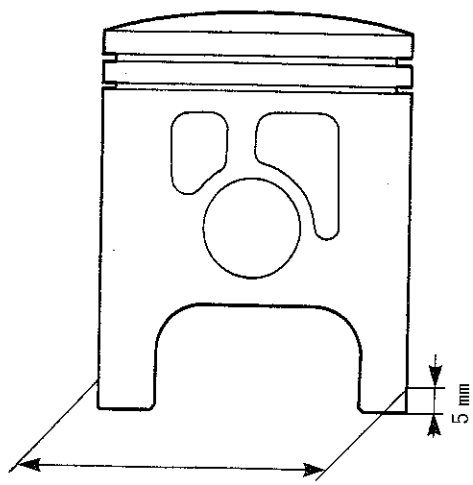
Piston Diameter Measurement

•Measure the outside diameter of the piston **5 mm** up from the bottom of the piston at a right angle to the direction of the piston pin.
★If the measurement is under the service limit, replace the piston.

Piston Diameter

Standard:	**53.935 – 53.970 mm**
Service Limit:	**53.82 mm**

Piston Diameter Measurement



Piston/Cylinder Clearance

The piston-to-cylinder clearance is measured whenever a piston or cylinder is replaced with a new one. The standard piston-to-cylinder clearance must be adhered to whenever the cylinder is replaced.

If only a piston is replaced, the clearance may exceed the standard slightly. But it must not be less than the minimum, in order to avoid piston seizure.

The most accurate way to find the piston clearance is by making separate piston and cylinder diameter measurements and then computing the difference between the two values. Measure the piston diameter as just described, and measure the cylinder diameter at the very bottom of the cylinder.

Piston/Cylinder Clearance

0.050 – 0.060 mm

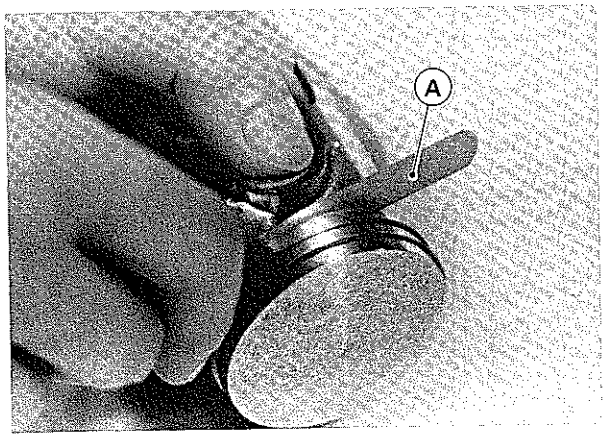
Piston Ring, Piston Ring Groove Inspection

- Visually inspect the piston rings and the piston ring grooves.
- ★If the rings are worn unevenly or damaged, they must be replaced.
- ★If the piston ring grooves are worn unevenly or damaged, the piston must be replaced and fitted with new rings.
- Check for uneven groove wear by inspecting the ring seating.
- ★The rings should fit perfectly parallel to the groove surfaces. If not, the piston must be replaced.
- With the second ring in its groove, make several measurements with a thickness gauge to determine piston ring/groove clearance.

Piston Ring/Groove Clearance

Second Ring

Standard:	**0.03 – 0.07 mm**
Service Limit:	**0.17 mm**



A. Thickness Gauge

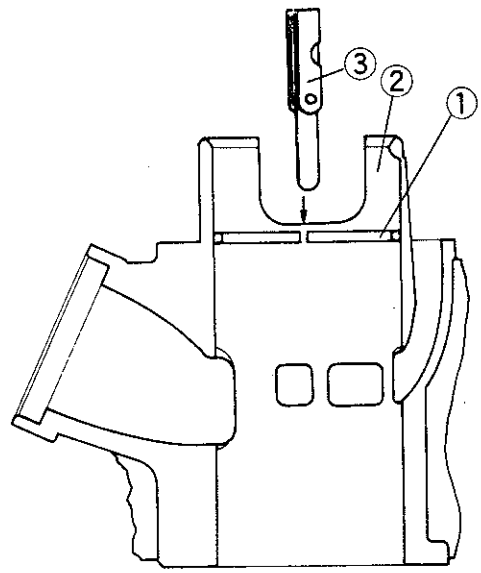
Piston Ring End Gap Inspection

- Place the piston ring inside the cylinder, using the piston to locate the ring squarely in place.
- Set it close to the bottom of the cylinder, where cylinder wear is low.
- Measure the gap between the ends of the ring with a thickness gauge.
- If the gap is wider than the service limit, the ring is overworn and must be replaced.

Piston Ring End Gap

	Standard	Service Limit
Top	**0.15 – 0.35 mm**	**0.65 mm**
Second	**0.15 – 0.35 mm**	**0.65 mm**

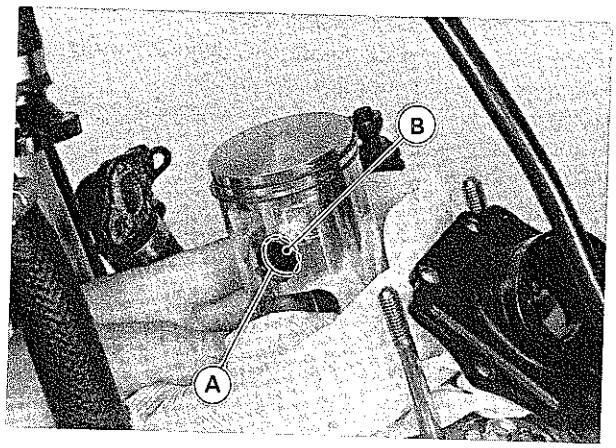
Ring End Gap Measurement



1. Piston Ring
2. Cylinder Block
3. Thickness Gauge

Piston, Piston Pin, Connecting Rod Wear Inspection

- Visually inspect the snap ring still fitted in place.
- ★If the ring shows weakness or deformation, replace the ring. Also if the pin hole groove shows excessive wear, replace the piston.
- Visually inspect the piston pin hole and connecting rod small end hole.
- ★If the piston pin hole shows uneven wear, replace the piston.
- ★If the rod small end hole shows uneven wear, replace the rod, or crankshaft assembly.
- Visually inspect the outer surface of the piston pin.
- ★If the pin shows color change or stepped wear, replace the pin and needle bearing.

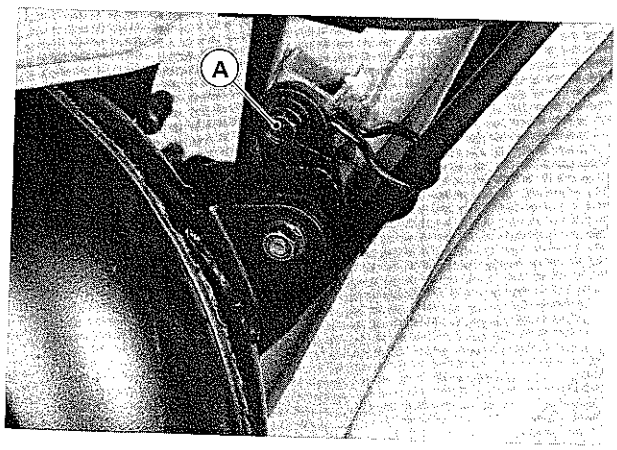


A. Snap Ring B. Piston Pin

Muffler (Expansion Chamber, Silencer)

Expansion Chamber Removal

- Remove the right side cover and the battery cover.
- Loosen the clamps for the connecting rubber seal between the expansion chamber and the silencer.
- Remove the exhaust pipe holder nuts.
- Remove the muffler damper mounting bolt, and pull off the expansion chamber to the frontward.

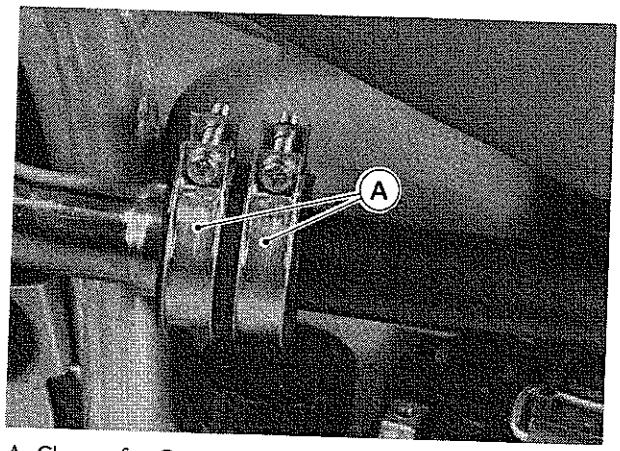


A. Muffler Damper Mounting Bolt

- Remove the exhaust gasket.

Expansion Chamber Installation Notes

- Installation is the reverse of removal.
- Scrape any carbon out of the expansion chamber.
- Check the exhaust gasket for signs of damage. If necessary, replace it with a new one.
- Check the connecting rubber seal between the expansion chamber and the silencer for signs of damage. If necessary, replace it with a new one.
- Install the muffler damper with the clamp for the clutch and tachometer cables by its mounting bolt (see Exploded View).
- Clamp the connecting rubber seal so that the screws are on top.



A. Clamps for Connecting Rubber Seal

- After installing, thoroughly warm up the engine, wait until the engine cools down, and then retighten the exhaust pipe holder nuts.

Silencer Removal

- Remove the right side cover.
- Loosen the clamps for the connecting rubber seal between the expansion chamber and the silencer.
- Remove the silencer mounting bolts, and pull off the silencer to the rear.



A. Clamps for Connecting Rubber Seal
B. Mounting Bolts

Silencer Installation Notes

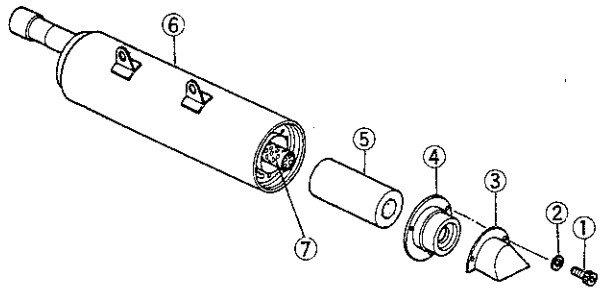
- Installation is the reverse of removal.
- Check the connecting rubber seal between the expansion chamber and the silencer for signs of damage. If necessary, replace it with a new one.
- Clamp the connecting rubber seal so that the screws are on top.

Silencer Wool Change

Replace the silencer wool if exhaust noise becomes too loud or engine performance drops.

- Remove the Allen bolts, and take off the silencer cover and cap.
- Pull the silencer wool out of the silencer body, and insert the new wool into the body wrapped around the baffle tube.
- Install the cap and cover.

Silencer



1. Allen Bolt
2. Spring Washer
3. Cover
4. Cap
5. Wool
6. Silencer Body
7. Baffle Tube

Engine Right Side

Table of Contents

Exploded View 5-2
Specifications 5-4
Special Tools 5-4
Right Engine Cover 5-5
- Right Engine Cover Removal 5-5
- Right Engine Cover Installation Notes 5-5
- Right Engine Cover Disassembly 5-6
- Exhaust Advancer Assembly Disassembly/Assembly Notes 5-6
- Right Engine Cover Assembly Notes 5-7

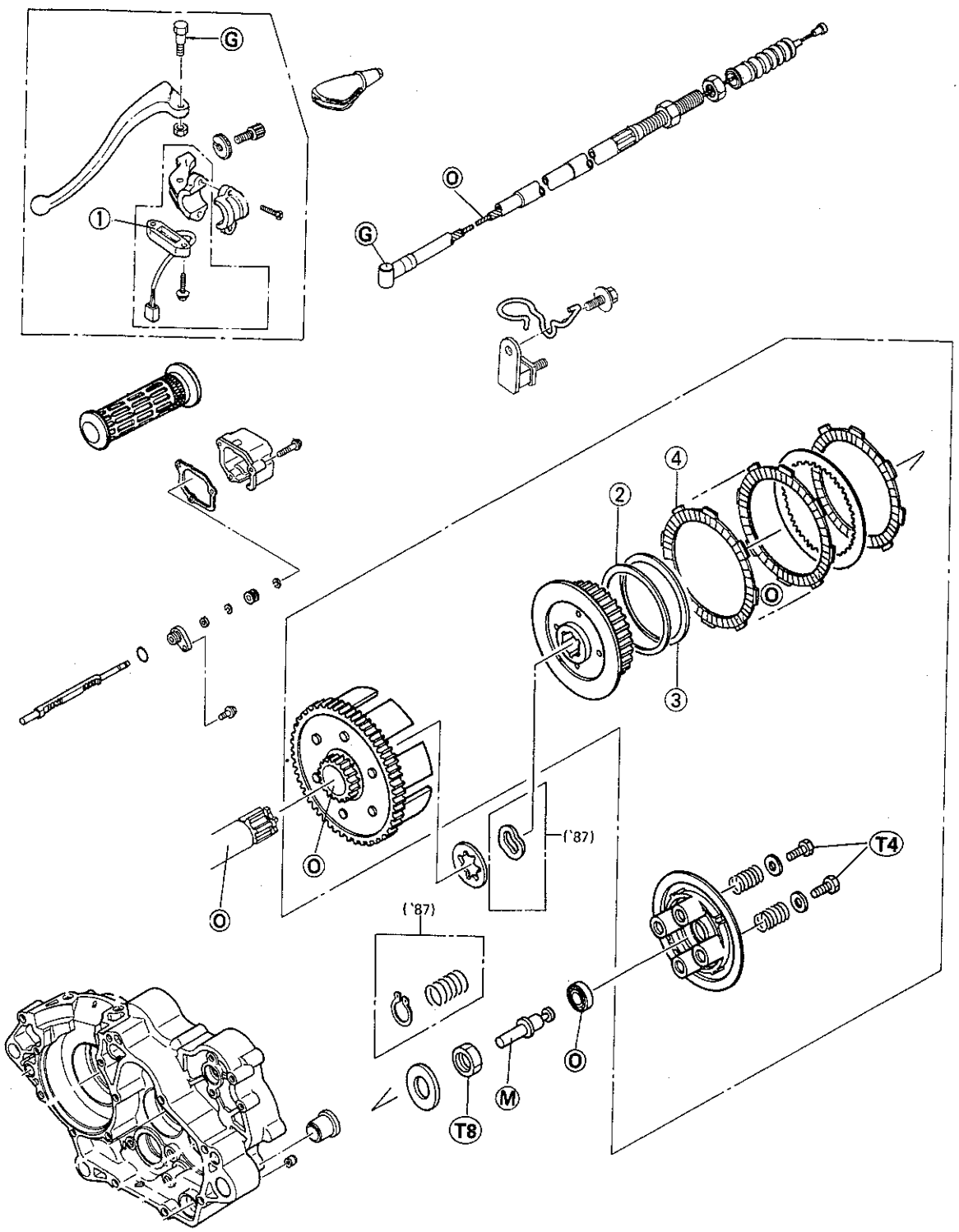
Clutch 5-7
- Clutch Adjustment Check 5-7
- Clutch Adjustment 5-8
- Clutch Removal 5-9
- Clutch Installation Notes 5-9
- Friction Plate Wear, Damage Inspection 5-10
- Friction and Steel Plate Warp Inspection 5-10
- Clutch Spring Free Length Measurement 5-10
- Clutch Housing Finger Inspection 5-11
- Clutch Hub Spline Inspection 5-11

External Shift Mechanism 5-11
- External Shift Mechanism Removal 5-11
- External Shift Mechanism Installation Notes 5-11
- External Shift Mechanism Inspection 5-12

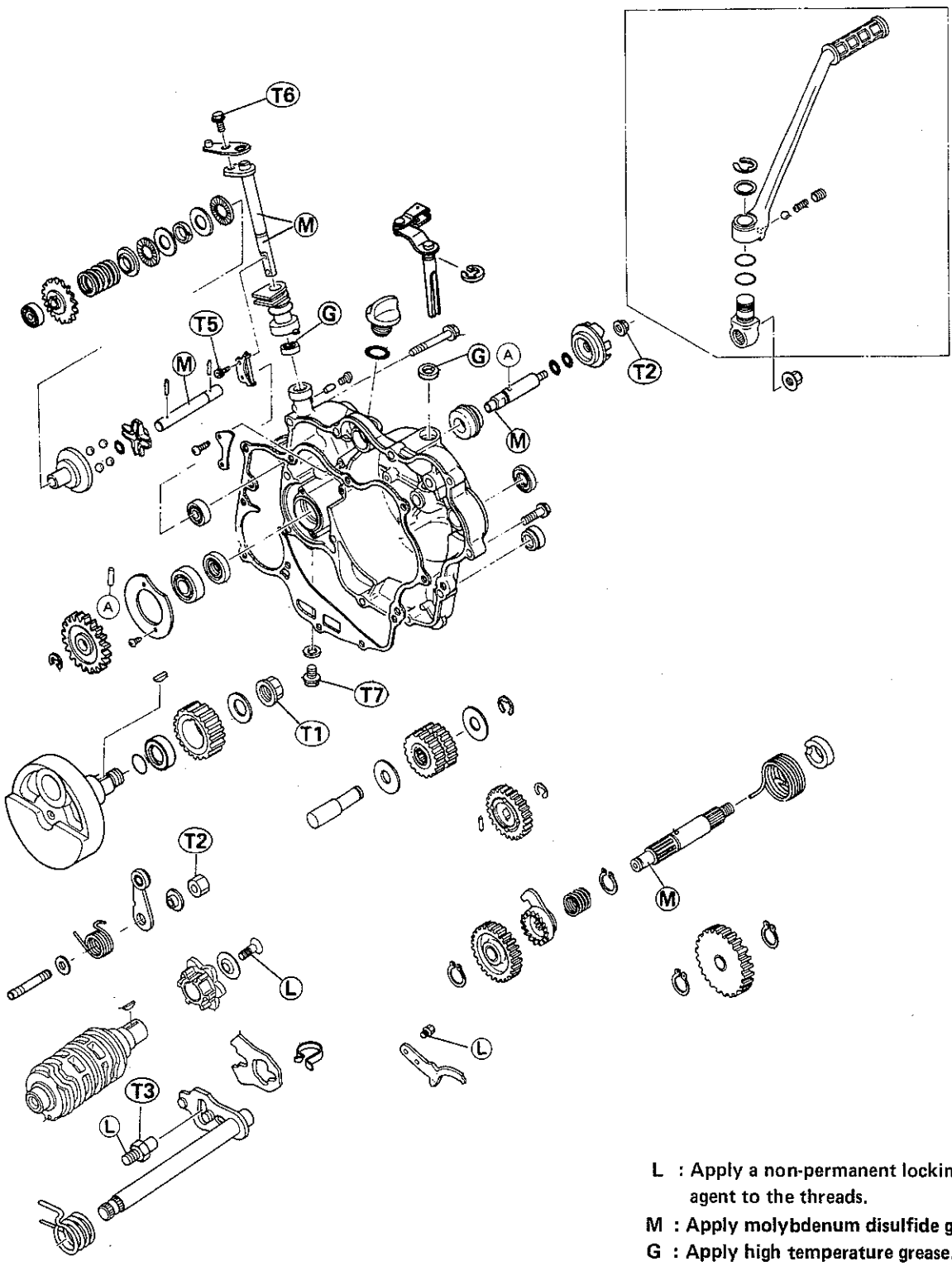
Primary Gear 5-12
- Primary Gear Removal 5-12
- Primary Gear Installation Notes 5-12

Kick Starter 5-13
- Kick Shaft Assembly Removal 5-13
- Kick Shaft Assembly Installation Notes 5-13
- Kick Shaft Assembly Disassembly/Assembly Notes 5-14
- Kick Starter Idle Gear Removal Note 5-14
- Kick Starter Idle Gear Installation Notes 5-14

Exploded View



1. Clutch Switch
2. Spring Seat
3. Spring
4. Friction Plate whose inside diameter is larger than the others.



L : Apply a non-permanent locking agent to the threads.
M : Apply molybdenum disulfide grease.
G : Apply high temperature grease.
O : Apply transmission oil.
T1 : 59 N-m (6.0 kg-m, 43 ft-lb)
T2 : 9.8 N-m (1.0 kg-m, 7.0 ft-lb)
T3 : 20 N-m (2.0 kg-m, 14.5 ft-lb)
T4 : 9.3 N-m (0.95 kg-m, 82 in-lb)
T5 : 3.9 N-m (0.40 kg-m, 35 in-lb)
T6 : 8.8 N-m (0.90 kg-m, 78 in-lb)
T7 : 15 N-m (1.5 kg-m, 11.0 ft-lb)

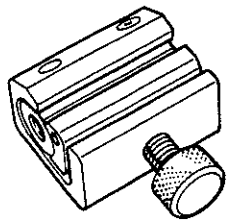
5-4 ENGINE RIGHT SIDE

Specifications

Item	Standard	Service Limit
Clutch:		
Clutch lever free play	2 – 3 mm	– – –
Clutch spring free length	33.2 mm	31.5 mm
Friction plate thickness	2.9 – 3.1 mm	2.8 mm
Friction and steel plate warp	not more than 0.15 mm	0.3 mm

Special Tools

Pressure Cable Luber: K56019-021



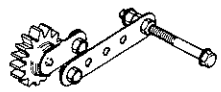
Oil Seal Guide: 57001-263



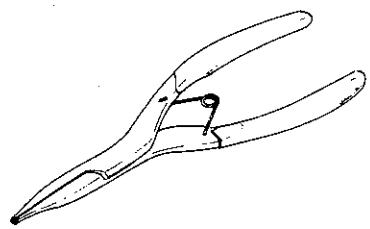
Oil Seal Guide: 57001-264



Gear Holder: 57001-1015



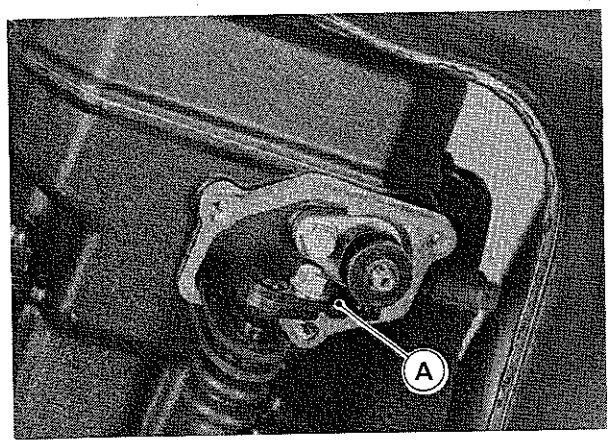
Outside Circlip Pliers: 57001-144



Right Engine Cover

Right Engine Cover Removal

- Drian the transmission oil (see Transmission Oil Change in the Engine Lubrication System chapter).
System chapter).
- Drain the coolant (see Coolant Change in the Cooling System chapter).
- Remove the following parts.
  Kick Pedal
  Clutch Cable Lower End
  Brake Pedal and Brake Light Switch
  Spring Lower End
  Water Pump Cover
- Pull off the water pump hose lower end.
- Remove the right cover side KIPS cover from the cylinder.
- Remove the shaft lever mounting bolt, and take off the shaft lever.



A. Shaft Lever

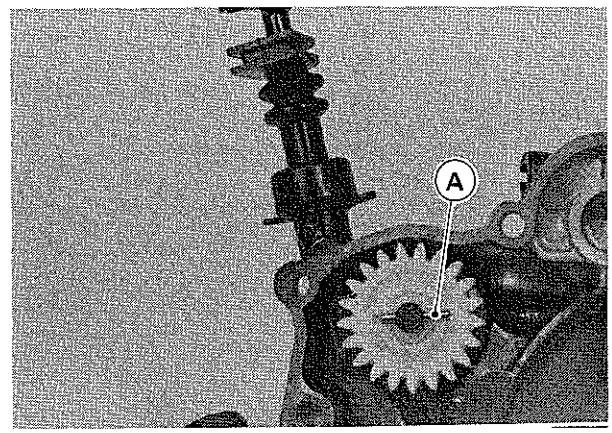
- Turn the clutch release lever toward the rear and free the release shaft from the clutch spring plate pusher.
- Take off the oil filler cap and remove the right engine cover.

Right Engine Cover Installation Notes

- Installation is the reverse of removal. Note the following.
- There are two knock pins on the mating surfaces of the crankcase and right engine cover.
- In case the exhaust advancer assembly has been removed, install it and turn the gear so as to level the gear drive pin.

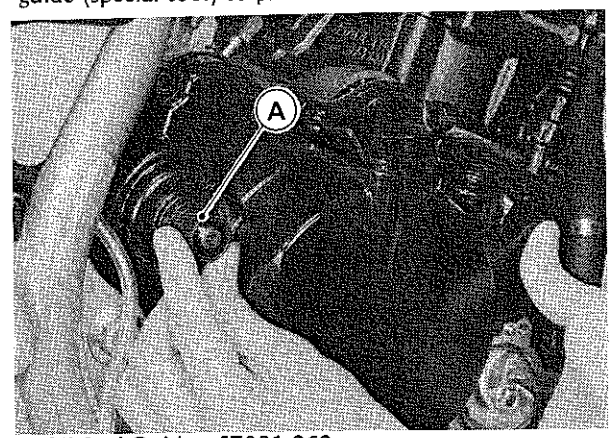
CAUTION

○If the gear drive pin is not positioned level, it may fall out when installing the right engine cover.



A. Gear Drive Pin (level position)

- Apply molybdenum disulfide grease to the water pump shaft journal inserted into the crankcase.
- Turn the clutch release lever toward the rear.
- After engaging the water pump gear with the primary gear, install the right engine cover using the oil seal guide (special tool) to protect the cover oil seal.

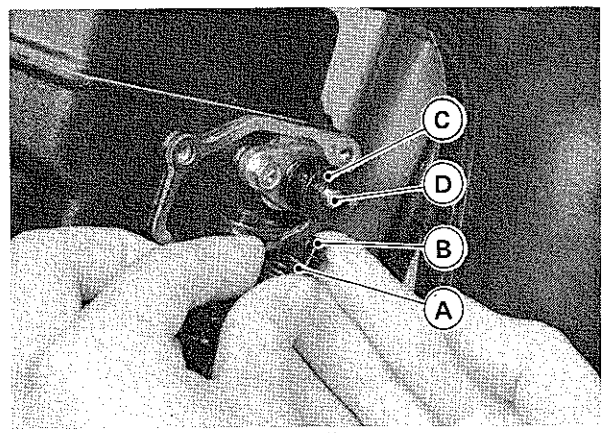


A. Oil Seal Guide: 57001-263

- Fit the shaft lever boss in the groove of the valve operating rod collar, and install the shaft lever on the lever shaft. Tighten the shaft lever mounting bolt to the specified torque (see Exploded View).

NOTE

○*Tighten the shaft lever mounting bolt while holding the valve operating rod all the way in.*

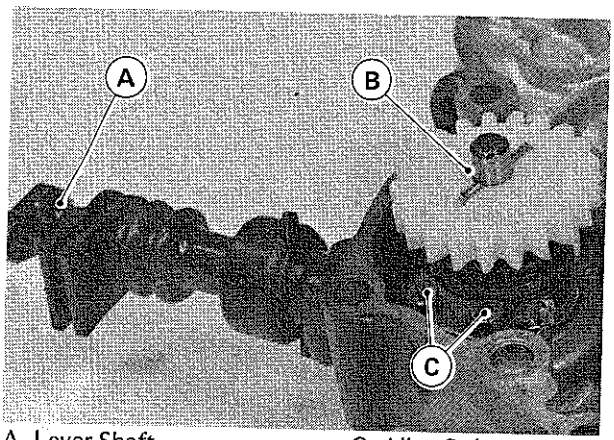


A. Shaft Lever
B. Boss
C. Collar
D. Valve Operating Rod

•Apply a non-permanent locking agent to the threads of the brake pedal mounting bolt, and tighten it to the specified torque (see Exploded View in the Brakes chapter).
•Fill the cooling system (see Coolant Filling in the Cooling System chapter).
•Fill the transmission with oil (see Transmission Oil Change in the Engine Lubrication System chapter).
•Adjust the following parts.
Clutch Cable
Rear Brake

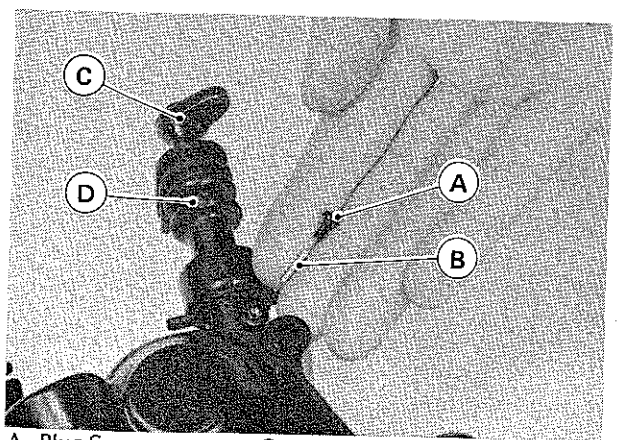
Right Engine Cover Disassembly

•Remove the right engine cover.
•Turn the lever shaft to the right, and remove the exhaust advancer assembly.
•Remove the Allen bolts, and take off the advancer lever.



A. Lever Shaft
B. Exhaust Advancer Assembly
C. Allen Bolts

•Remove the plug screw and take out the positioning pin.
•Pull the lever shaft out of the right engine cover and remove the rubber boot.

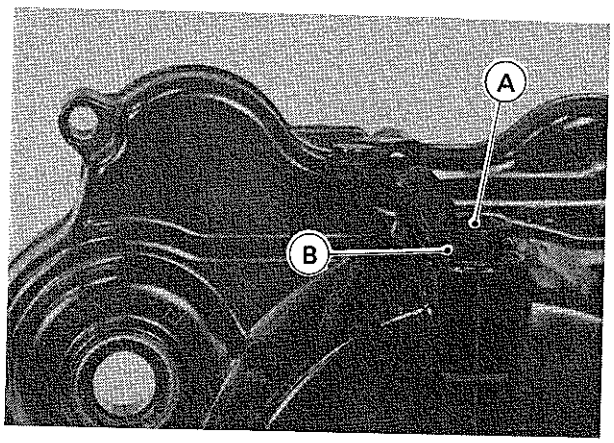


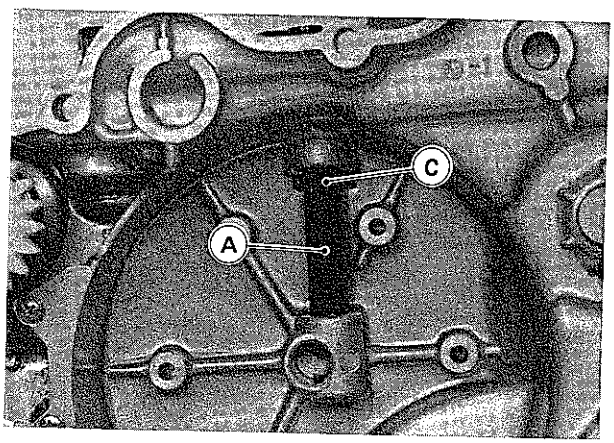
A. Plug Screw
B. Positioning Pin
C. Lever Shaft
D. Rubber Boot

•Remove the water pump impeller.
•Pull off the water pump shaft (see Water Pump Shaft Removal in the Cooling System chapter).
•Remove the mechanical seal and oil seal (see Mechanical Seal, Oil Seal Removal in the Cooling System chapter).

CAUTION

○Do not remove the clutch release shaft unless it is absolutely necessary. If removed, you must replace the oil seal and circlip with new ones.



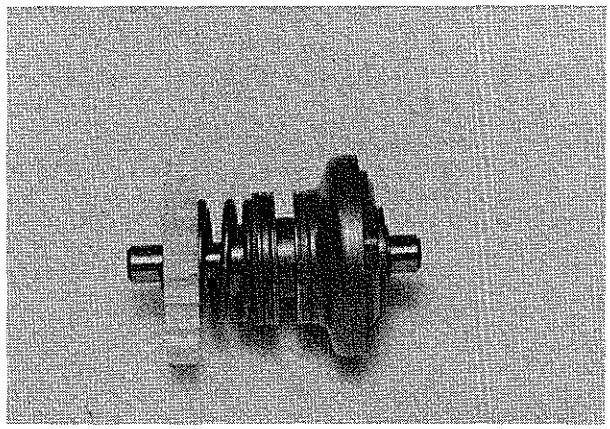


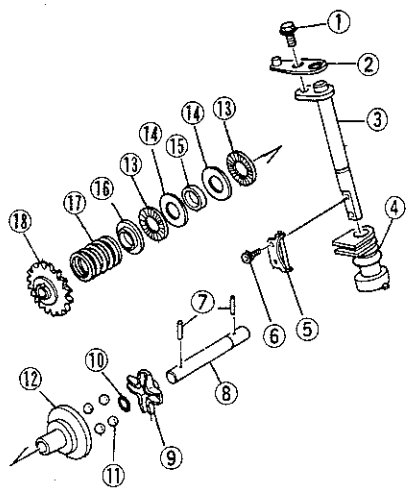
A. Clutch Release Shaft
B. Oil Seal
C. Circlip

Exhaust Advancer Assembly Disassembly/Assembly Notes

•The exhaust advancer assembly consists of the following parts.

Exhaust Advancer Assembly



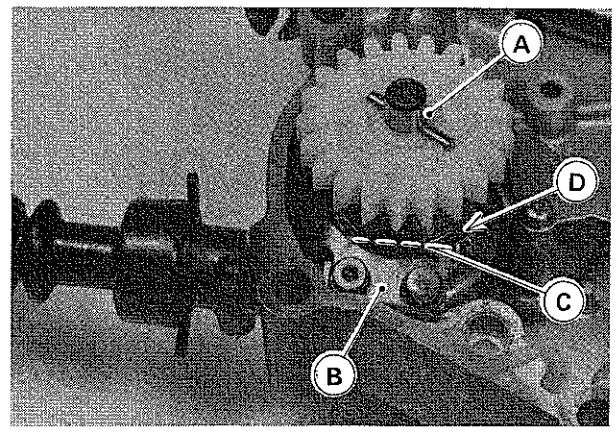


1. Mounting Bolt
2. Shaft Lever
3. Lever Shaft
4. Rubber Boot
5. Advancer Lever
6. Allen Bolt
7. Pins
8. Rod
9. Guide
10. O-ring
11. Steel Balls
12. Holder
13. Needle Bearing
14. Spacer
15. Collar
16. Collar
17. Spring
18. Gear

- Check the exhaust advancer assembly parts for damage. Any damaged parts should be replaced with new ones.
- When assembling, apply molybdenum disulfide grease between the rod and holder.

Right Engine Cover Assembly Notes

- Assembly is the reverse of disassembly.
- In case of the clutch release shaft has been removed, be sure to replace the circlip and oil seal with new ones and apply high temperature grease liberally to the oil seal lip.
- Refer to the appropriate items in the Cooling System chapter for installation of the mechanical seal, oil seal and water pump shaft.
- Apply high temperature grease to the oil seal lips before inserting the lever shaft.
- Apply molybdenum disulfide grease to the surface of the lever shaft, and insert the lever shaft into the right engine cover hole.
- Tighten the advancer lever mounting Allen bolts to the specified torque (see Exploded View).
- Fit the advancer lever pin into the groove on the exhaust advancer assembly, and install the assembly in the engine cover while turning the lever shaft to the left.



A. Exhaust Advancer Assembly
B. Advancer Lever
C. Pin
D. Groove

Clutch

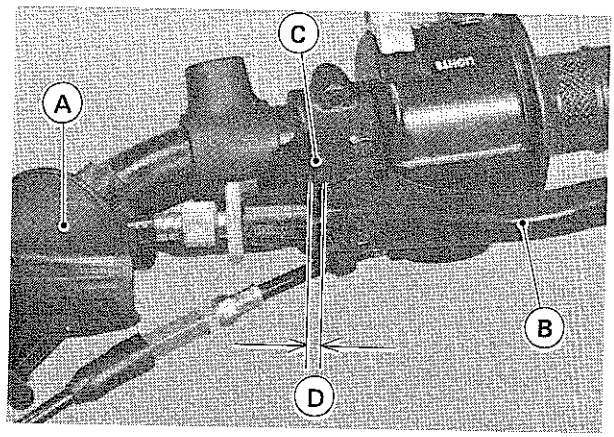
Due to friction plate wear and clutch cable stretch over a long period of use, the clutch must be adjusted in accordance with the Periodic Maintenance Chart.

WARNING

○To avoid a serious burn, never touch the hot engine or exhaust chamber during clutch adjustment.

Clutch Adjustment Check

- Slide the dust cover at the clutch cable upper end out of place.
- Check that the clutch cable upper end in fully seated in the adjuster.
- Pull the clutch lever just enough to take up the free play.
- Measure the gap between the lever and the lever bracket.

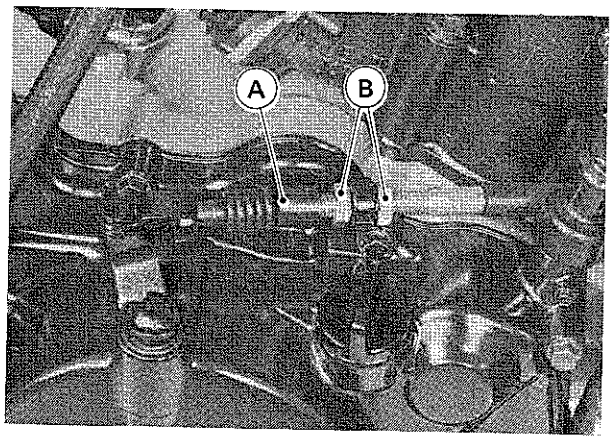


A. Dust Cover
B. Clutch Lever
C. Lever Bracket
D. Clutch Lever Free Play
2 – 3 mm

★If the gap is too wide, the clutch may not release fully. If the gap is too narrow, the clutch may not engage fully. In either case, adjust the clutch.

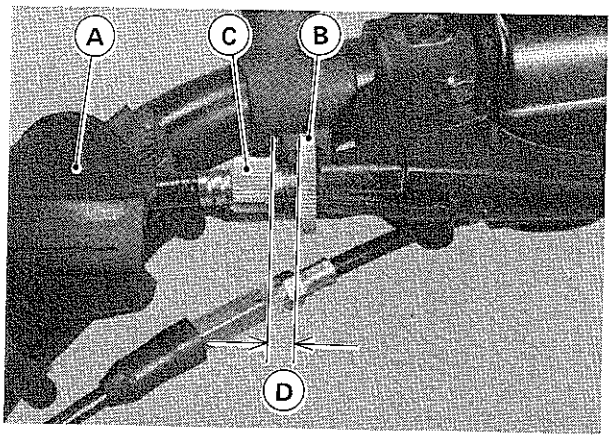
Clutch Adjustment

- Slide back the dust cover at the clutch cable lower end.
- Loosen both adjusting nuts at the right engine cover as far as they will go.



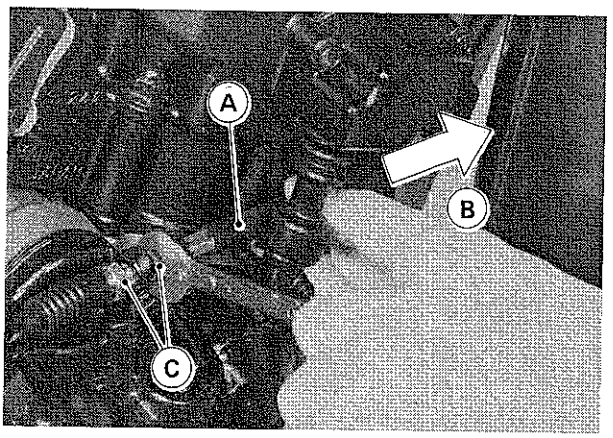
A. Dust Cover
B. Adjusting Nuts

- Slide the dust cover at the clutch cable upper end out of place.
- Loosen the knurled locknut at the clutch lever.
- Turn the adjuster so that 5 – 6 mm of threads are visible.



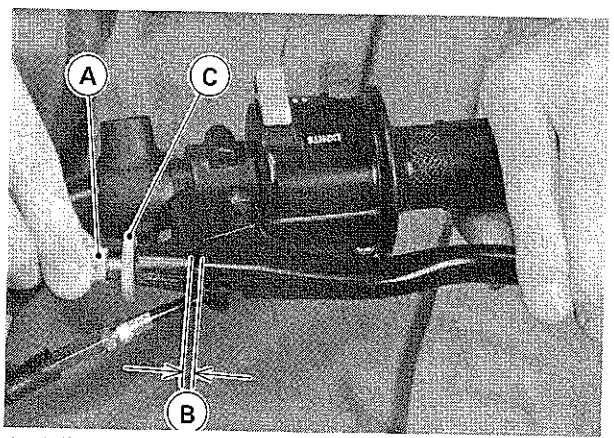
A. Dust Cover
B. Knurled Locknut
C. Adjuster
D. 5 – 6 mm

- Pull the clutch cable tight and tighten the adjusting nuts against the bracket.



A. Clutch Cable
B. Pull Tight
C. Adjusting Nuts

- Slip the rubber dust cover back into place.
- Turn the adjuster at the clutch lever until the free play is correct (2 – 3 mm).



A. Adjuster
B. 2 – 3 mm
C. Locknut

- Tighten the knurled locknut at the clutch lever.

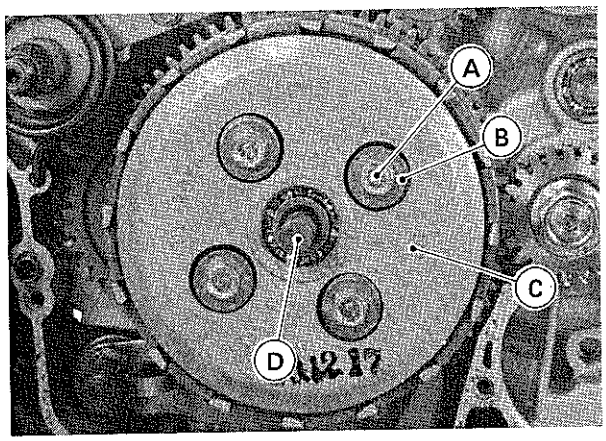
WARNING

○**Be sure that the outer cable end at the clutch lever is fully seated in the adjuster at the clutch lever, or it could slip into the place later, creating enough cable play to prevent clutch disengagement.**

●After the adjustment is made, start the engine and check that the clutch does not slip and that it releases properly.

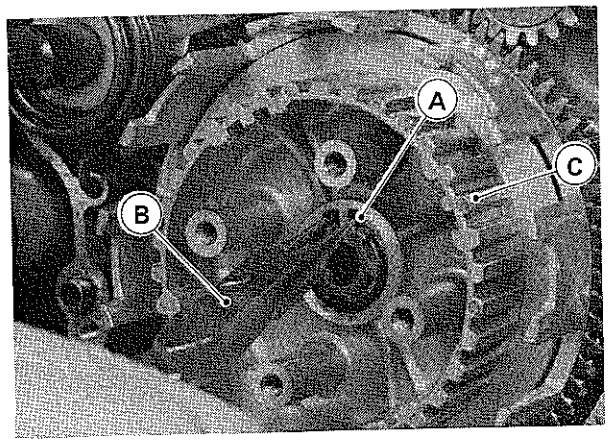
Clutch Removal

●Remove the right engine cover (see Right Engine Cover Removal).
●Remove the clutch spring bolts, washers and springs.



A. Clutch Spring Bolt
B. Washer
C. Clutch Spring Plate
D. Clutch Spring Plate Pusher

●Remove the clutch spring plate with the thrust ball bearing, the clutch spring plate pusher and the spring.
●Remove the friction plates and steel plates.
●Remove the spring and the spring seat (Engine No. MX125 AE013437/MX125 AG000802 ~).
●Using the outside circlip pliers (special tool) to remove the circlip, pull out the clutch hub.

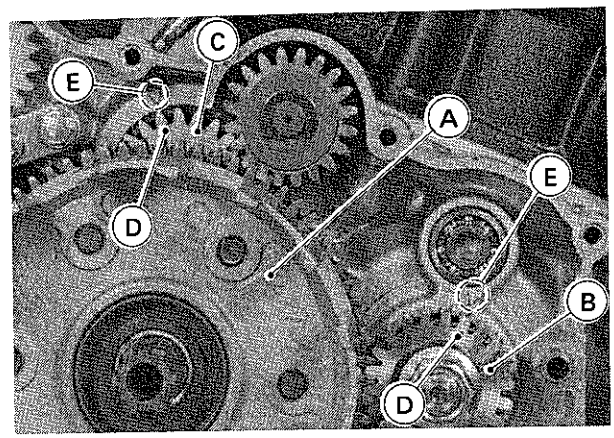


A. Circlip
B. Outside Circlip Pliers: 57001-144
C. Clutch Hub

●Remove the spring washer and thrust washer, and take out the clutch housing.

Clutch Installation Notes

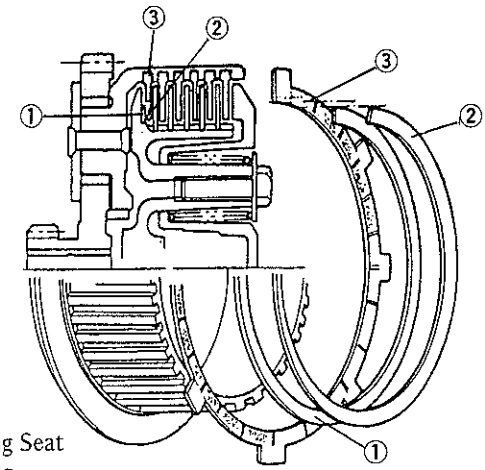
●Installation is the reverse of removal.
●Apply transmission oil to the inside of the clutch housing gear and kick starter driven gear.
●When installing the clutch housing, first align the punch mark on the primary gear with the notched mark on the right crankcase half, next align the punch mark on the balancer gear with the notched mark on the right crankcase half, and finally engage the clutch housing gear with those gears in their aligned positions.



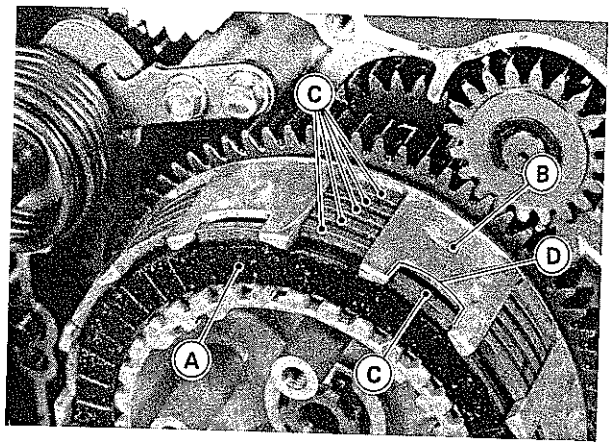
A. Clutch Housing
B. Primary Gear
C. Balancer Gear
D. Punch Mark
E. Notched Mark

●After installing the clutch housing, first install the thrust washer, and then the spring washer.
●After installing the clutch hub, first install the spring seat, and then the spring with facing the concave side to the right engine cover (Engine No. MX125 AE013437/MX125AG000802 ~).
●When installing the friction plates and steel plates, first install the friction plate whose inside diameter is larger than the others and then start with a steel plate and alternating them. Be careful to install only the last friction plate so that its tangs are engaged with the indentations in the tops of the clutch housing fingers.

Spring Seat, Spring, Friction Plate Installation



1. Spring Seat
2. Spring
3. Friction plate whose inside diameter is larger than the others.



A. Friction Plate
B. Clutch Housing Finger
C. Friction Plate Tangs
D. Clutch Housing Finger Top Indentations

CAUTION

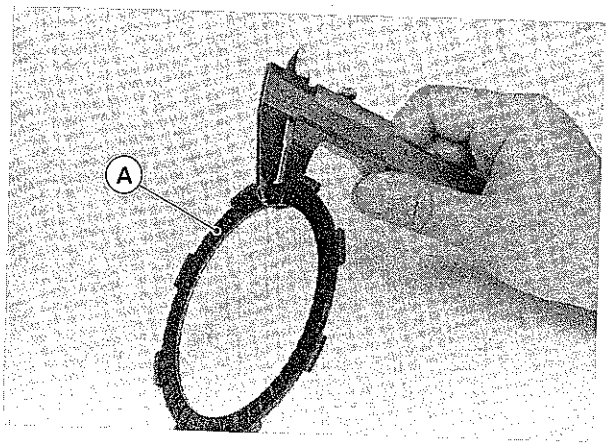
○If new dry steel plates and friction plates are installed, apply engine oil to the surfaces of each plate to avoid clutch plate seizure.

●Apply transmission oil to the thrust ball bearing.
●Apply molybdenum disulfide grease to the rubbing portion of the clutch spring plate pusher.
●Tighten the clutch spring bolts to the specified torque (see Exploded View).

Friction Plate Wear, Damage Inspection

●Visually inspect the friction plates to see if they show any signs of seizure, overheating, or uneven wear.
★If any plates show signs of damage, replace the friction plates and steel plates as a set.

Friction Plate Thickness Measurement



A. Friction Plate

Friction Plate Thickness

Standard:	**2.9 – 3.1 mm**
Service Limit:	**2.8 mm**

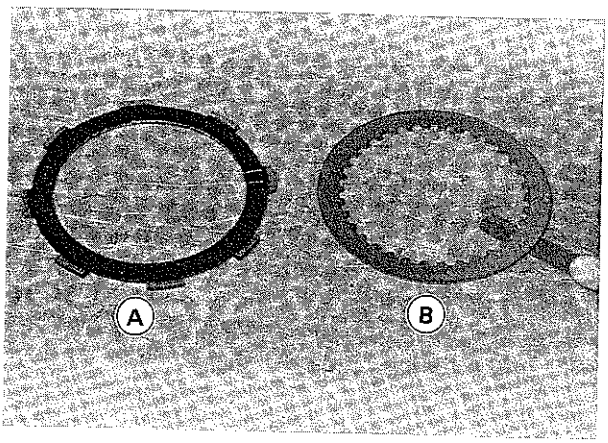
Friction and Steel Plate Warp Inspection

●Place each friction plate or steel plate on a surface plate, and measure the gap between the surface plate and each friction plate or steel plate. The gap is the amount of friction or steel plate warp.
★If any plate is warped over the service limit, replace it with a new one.

Friction and Steel Plate Warp

Standard:	**not more than 0.15 mm**
Service Limit:	**0.3 mm**

Friction and Steel Plate Warp Measurement

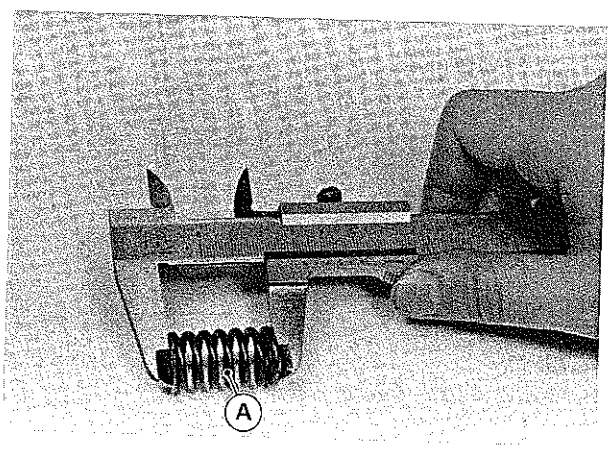


A. Friction Plate B. Steel Plate

Clutch Spring Free Length Measurement

Clutch Spring Free Length

Standard:	**33.2 mm**
Service Limit:	**31.5 mm**

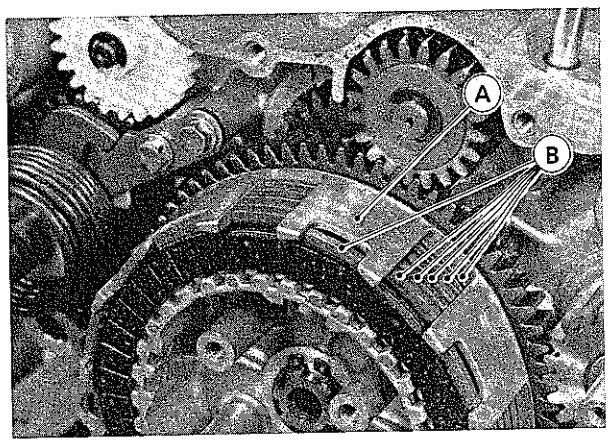


A. Clutch Spring

Clutch Housing Finger Inspection

●Visually inspect the fingers of the clutch housing where the tangs of the friction plates hit them.

★If they are badly worn or if there are grooves cut where the tangs hit, replace the housing. Also, replace the friction plates if their tangs are damaged.

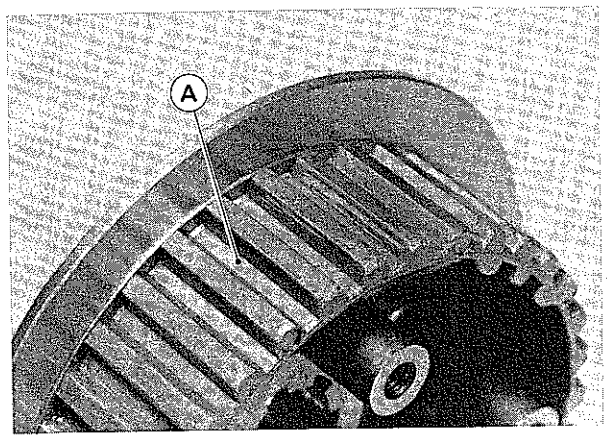


A. Clutch Housing Finger B. Friction Plate Tangs

Clutch Hub Spline Inspection

●Visually inspect where the teeth on the steel plates wear against the splines of the clutch hub.

★If there are notches worn into the splines, replace the clutch hub. Also, replace the steel plates if their teeth are damaged.



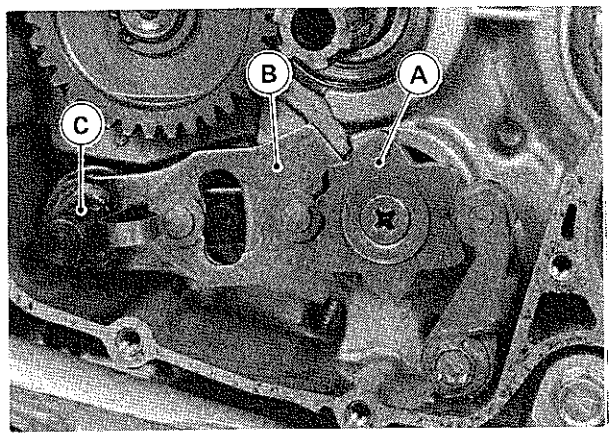
A. Clutch Hub Spline

External Shift Mechanism

External Shift Mechanism Removal

●Remove the following parts.
Engine Sprocket Cover
Shift Pedal
Right Engine Cover
Clutch Housing

●Turn the shift drum cam to the position where the shift mechanism arm is not obstructed by the drum cam.



A. Shift Drum Cam C. Shift Shaft
B. Shift Mechanism Arm

●Pull out the shift shaft with the shift mechanism arm, arm spring and shaft return spring.

●Remove the gear positioning lever mounting nut, and take off the collar, lever, spring and washer.

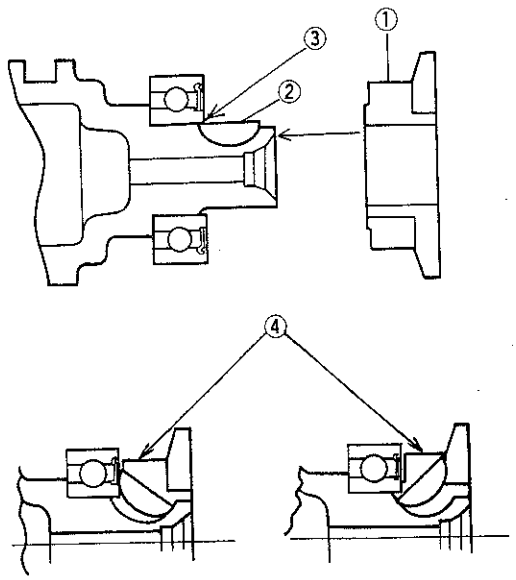
●Remove the screw in the shift drum cam, and take off the drum cam. There is a woodruff key in the shift drum shaft.

External Shift Mechanism Installation Notes

●Installation is the reverse of removal.

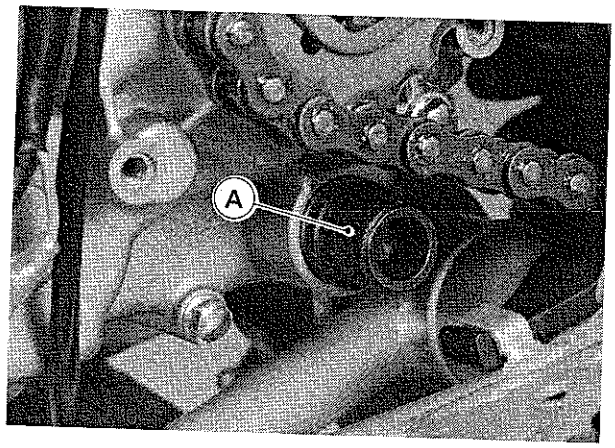
●When installing the shift drum cam, rotate the woodruff key into place in the drum shaft slot so that the upper side of the key touches the inside of the ball bearing.

Shift Drum Cam Installation



1. Shift Drum Cam
2. Woodruff Key
3. Touch the Bearing
4. Incorrect Installation

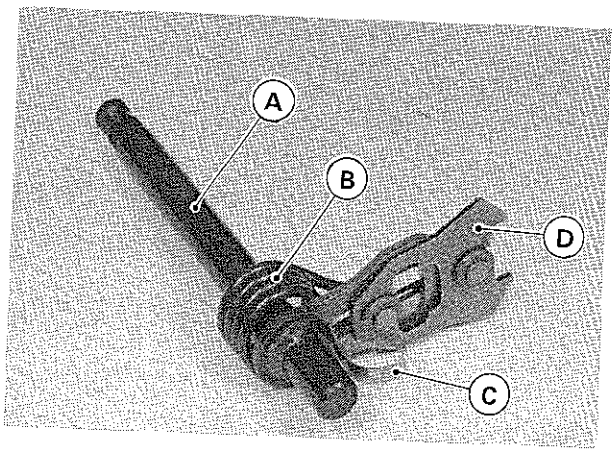
•Apply a non-permanent locking agent to the threads of the shift drum cam screw.
•The small diameter side of the collar in the gear positioning lever must face toward the crankcase.
•Insert the shift shaft into the crank case using the oil seal guide (special tool) on the oil seal in the left crank case half to protect the seal.
○Before installing the shift shaft, apply high temperature grease to the oil seal lips.



A. Oil Seal Guide: 57001-264

External Shift Mechanism Inspection

•Examine the shift shaft for any damage.
○Check the shift shaft for bending or damage to the splines.
☆If the shaft is bent, straighten or replace it. If the splines are damaged, replace the shaft.
○Check the return spring and arm spring for cracks or distortion.
☆If the springs are damaged in any way, replace them.
○Check the shift mechanism arm for distortion.
☆If the shift mechanism arm is damaged in any way, replace the arm.



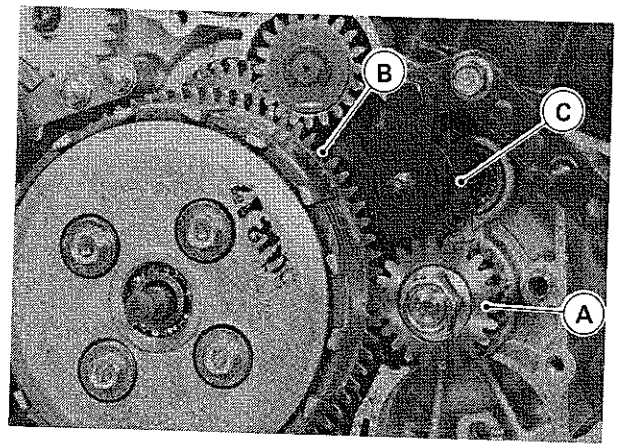
A. Shift Shaft
B. Return Spring
C. Arm Spring
D. Shift Mechanism Arm

•Check that the return spring pin is not loose.
★If it is loose, unscrew it, apply a non-permanent locking agent to the threads, and tighten it to the specified torque (see Exploded View).
•Check the gear positioning lever, and its spring for cracks or distortion.
★If the lever or spring is damaged in any way, replace them.
•Visually inspect the shift drum cam.
★If it is badly worn or if it shows any damage, replace it.

Primary Gear

Primary Gear Removal

•Remove the right engine cover (see Right Engine Cover Removal).
•Using the gear holder (special tool) to prevent the clutch housing and primary gears from rotating, loosen the primary gear nut.

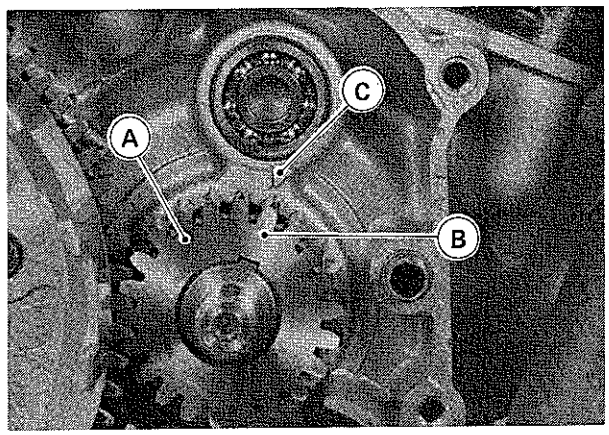


A. Primary Gear
B. Clutch Housing Gear
C. Gear Holder: 57001-1015

•Remove the clutch housing, and primary gear. There is a woodruff key between the primary gear and the crankshaft.

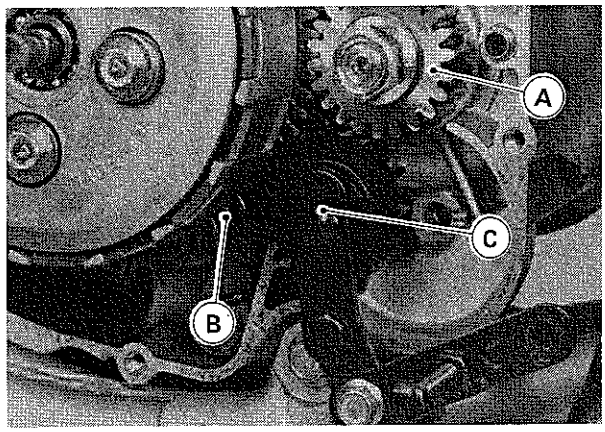
Primary Gear Installation Notes

•Installation is the reverse of removal.
•Fit the woodruff key on the primary gear groove securely in the crankshaft.
•Do not tap the primary gear onto the crankshaft with a hammer.
•When installing the clutch housing, align the punch mark on the primary gear with the notched mark on the right crankcase half (see Clutch Installation Notes).



A. Primary Gear
B. Punch Mark
C. Notched Mark

•Install the conical spring washer so that the concave surface faces toward the gear.
•Using the gear holder (special tool) to prevent the clutch housing and primary gears from rotating, tighten the primary gear nut to the specified torque (see Exploded View).

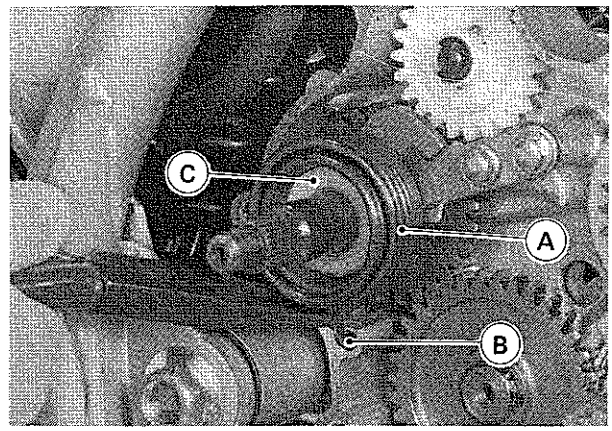


A. Primary Gear
B. Clutch Housing Gear
C. Gear Holder: 57001-1015

Kick Starter

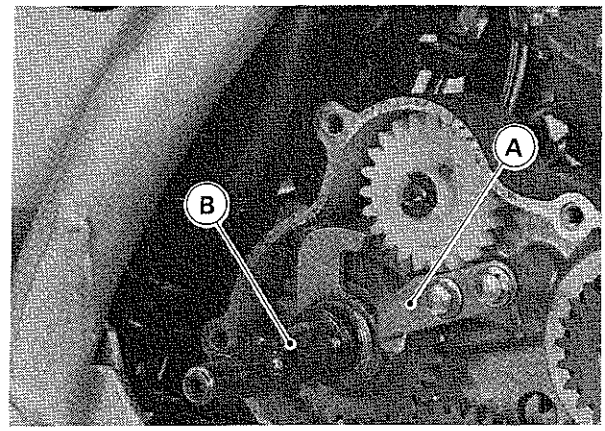
Kick Shaft Assembly Removal

•Remove the following parts.
Right Engine Cover
Clutch Housing
•Pull the end of the return spring out of the hole in the crankcase.



A. Return Spring
B. Hole
C. Return Spring Guide

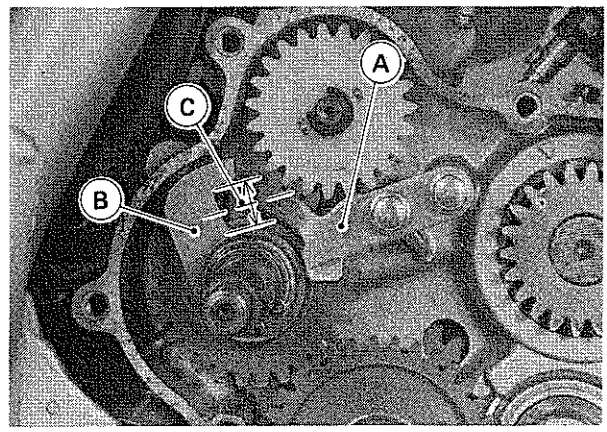
•Remove the return spring guide and spring.
•Remove the kick guide, and pull off the kick shaft assembly.



A. Kick Guide
B. Kick Shaft Assembly

Kick Shaft Assembly Installation Notes

•Installation is the reverse of removal.
•Apply a non-permanent locking agent to the threads of the kick guide mounting bolts, and insall the guide so that its top end is positioned at the center of the ratchet gear hook.



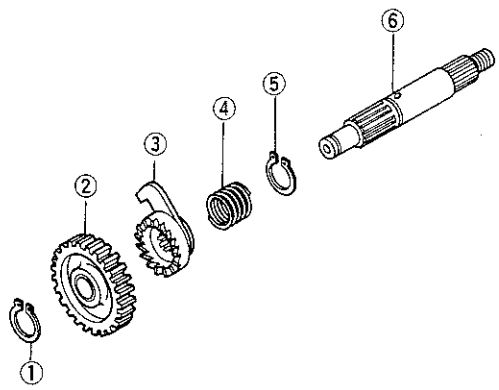
A. Kick Guide
B. Ratchet Gear Hook
C. Center

•When installing the clutch housing, be careful of primary gear and balancer gear alignment (see Clutch Installation Notes).

Kick Shaft Assembly Disassembly/Assembly Notes

•The kick shaft assembly consists of the following parts.

Kick Shaft Assembly

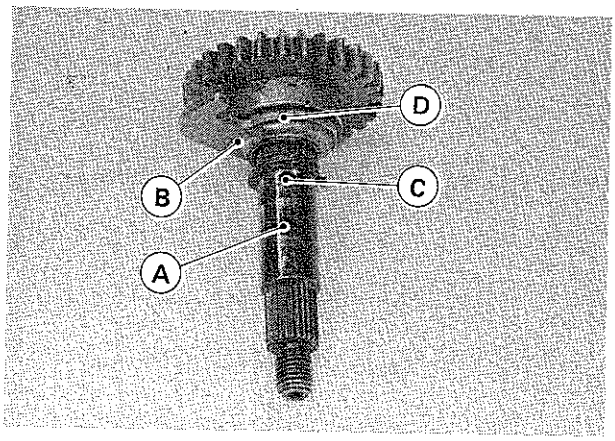


1. Circlip
2. Kick Gear
3. Ratchet Gear
4. Spring
5. Circlip
6. Kick Shaft

•Check the kick shaft assembly parts for damage. Any damaged parts should be replaced with new ones.

CAUTION

○When assembling the ratchet gear onto the kick shaft, align the notch on the gear with the hole on the shaft.



A. Kick Shaft
B. Ratchet Gear
C. Hole
D. Notch

•Apply molybdenum disulfide grease to the inside of the kick gear.
•Replace the circlips that were removed with new ones.

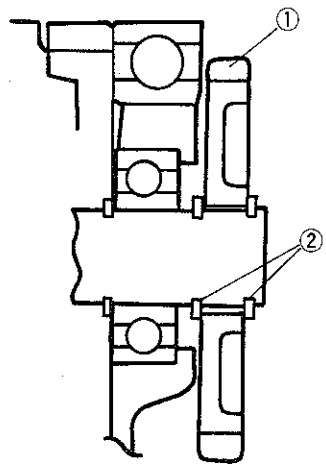
Kick Starter Idle Gear Removal Note

•Remove the right engine cover and clutch housing before idle gear removal (see Right Engine Cover Removal and Clutch Removal).

Kick Starter Idle Gear Installation Notes

•Installation is the reverse of removal (see Right Engine Cover Installation Notes and Clutch Installation Notes).
•There are circlips on both sides of the idle gear, replace them with new ones.
•Install the idle gear with the flat side toward the crankcase.

Idle Gear Installation



1. Idle Gear
2. Circlips

Engine Lubrication System

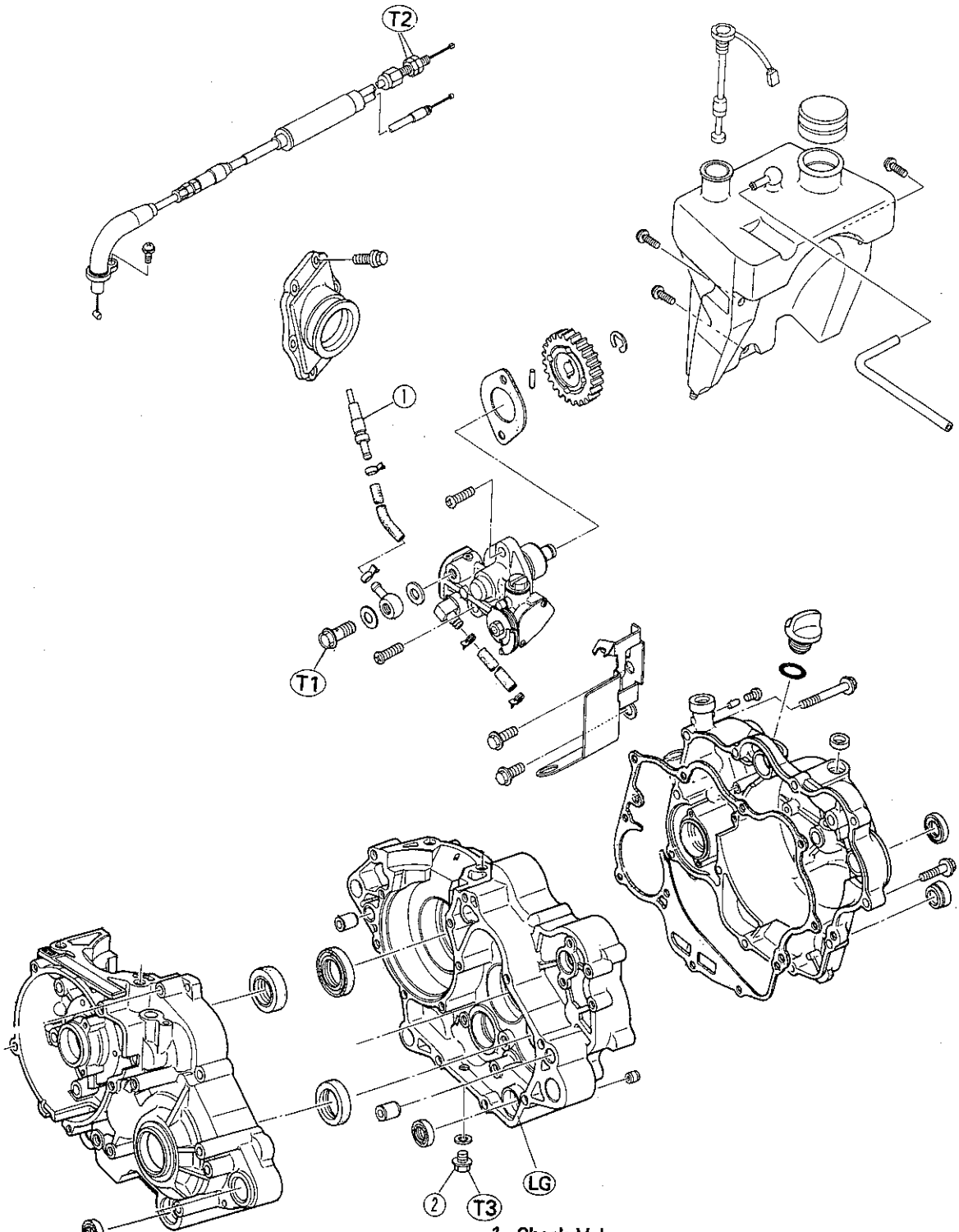
Table of Contents

Exploded View 6-2
Specifications 6-3
Engine Oil Pump 6-3
- Oil Pump Synchronization Inspection 6-3
- Oil Pump Synchronization Adjustment 6-3
- Oil Pump Removal 6-3
- Oil Pump Installation Notes 6-4
- Oil Pump Disassembly/Assembly Notes 6-5
- Oil Pump Air Bleeding 6-5
- Oil Pump Performance Test 6-5
- Check Valve Inspection 6-6

Engine Oil Tank 6-6
- Oil Tank Removal 6-6
- Oil Tank Installation Notes 6-7

Transmission Oil 6-7
- Oil Level Inspection 6-7
- Transmission Oil Change 6-7

Exploded View



1. Check Valve
2. Transmission Oil Drain Plug

LG : Apply liquid gasket – silver (Kawasaki Bond: 92104-002) to the mating surface of the right and left crankcase halves.

T1: 4.4 N-m (0.45 kg-m, 39 in-lb)
T2: 9.8 N-m (1.0 kg-m, 7.0 ft-lb)
T3: 20 N-m (2.0 kg-m, 14.5 ft-lb)

Specifications

Item		Standard	Service Limit
Engine Oil Pump:	Oil pump output @2 000 r/min (rpm), 3 min.	3.6 – 4.2 mL	– – –
Transmission Oil:	Grade	SE class	– – –
	Viscosity	SAE 10W30 or 10W40	– – –
	Amount	0.75 L	– – –

Engine Oil Pump

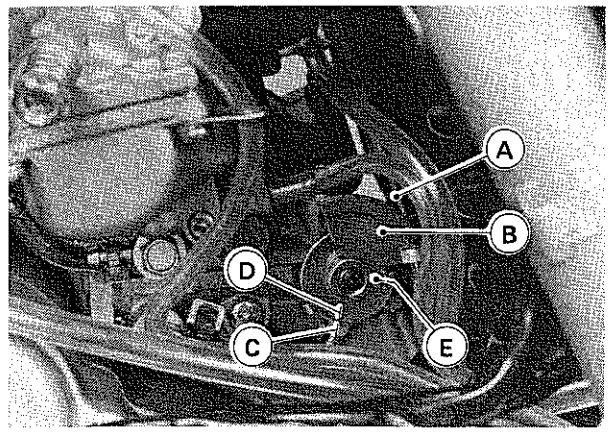
Oil Pump Synchronization Inspection

- Check the throttle grip free play (see Throttle Grip Free Play Inspection in the Fuel System chapter).
- Check to see that the end of the oil pump outer cable is fully seated in the cable adjuster.
- Make sure the tab on the oil pump lever is bent to hold the oil pump inner cable securely.
- Turn the throttle grip fully, and check to see if the synchronization mark on the pump lever aligns with the mark on the lever stop.

NOTE

○*The pump lever has two marks on it. One is the synchronization mark which is used to check the oil pump synchronization, and the other is the idle mark which is not used during oil pump synchronization.*

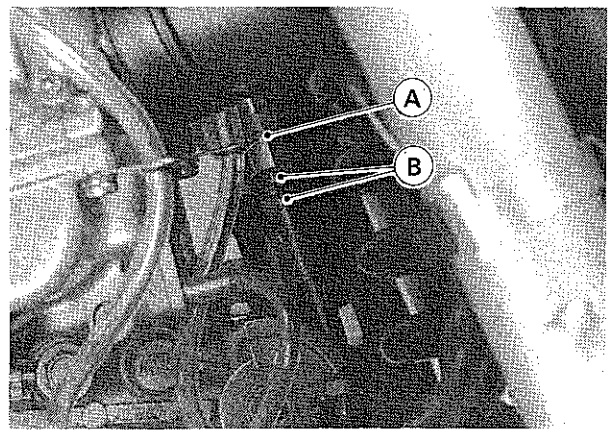
★If they do not line up, adjust the oil pump cable.



A. Oil Pump Inner Cable
B. Oil Pump Lever
C. Mark on Lever Stop
D. Synchronization Mark
E. Idle Mark

Oil Pump Synchronization Adjustment

- Loosen the oil pump cable adjuster locknut, and adjust the synchronization with the oil pump and carburetor by turning the adjuster so as to align the synchronization mark with the lever stop mark.
- Tighten the locknut to the specified torque (see Exploded View).

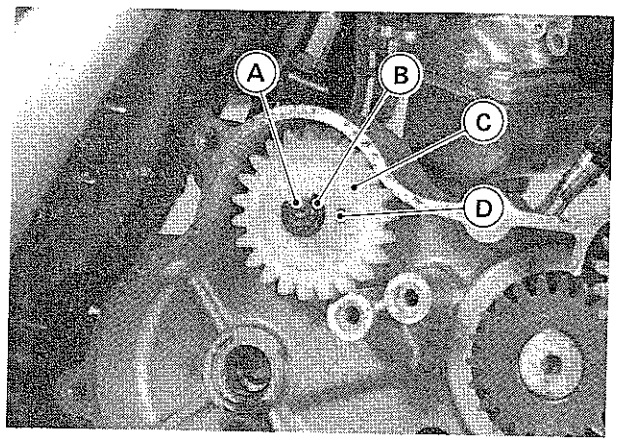


A. Oil Pump Cable Adjuster
B. Locknut

- Check the pump synchronization. Re-adjust if necessary.
- Check the throttle grip free play.

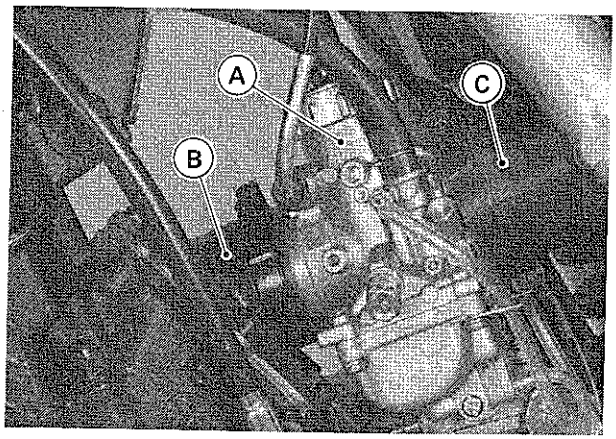
Oil Pump Removal

- Remove the following parts (see the Engine Right Side chapter).
  - Right Engine Cover
  - Clutch Housing
  - Kick Shaft Assy
- Remove the circlip, oil pump gear and gear drive pin out of the oil pump shaft.



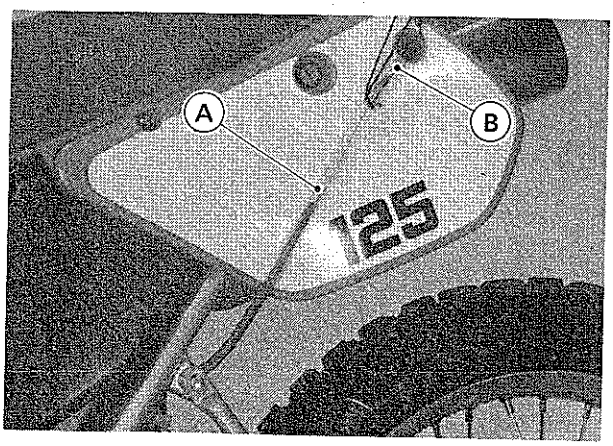
A. Oil Pump Shaft
B. Circlip
C. Oil Pump Gear
D. Gear Drive Pin

- Turn the fuel tap to the OFF position.
- Remove the carburetor from the carburetor holder and air cleaner duct, and move it to the left of the cylinder.



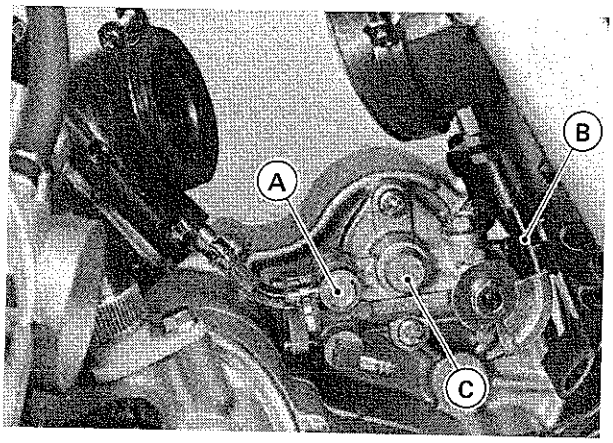
A. Carburetor
B. Carburetor Holder
C. Air Cleaner Duct

- Pull off the oil tank hose lower end from the oil pump, screw a suitable screw into the end to keep the engine oil from flowing out.



A. Oil Tank Hose
B. Suitable Screw

- Remove the oil pump hose banjo bolt.
- Remove the oil pump cable from the oil pump lever.
- Remove the oil pump mounting screws, and take off the oil pump.



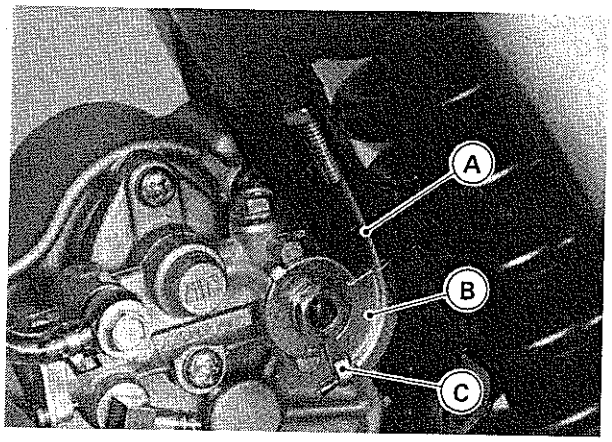
A. Banjo Bolt
B. Oil Pump Cable
C. Oil Pump

Oil Pump Installation Notes

- Installation is the reverse of removal (see the Engine Right Side chapter).
- Replace the gasket with a new one.
- Fit the oil pump inner cable on the oil pump lever, and bend the tab back onto the end of the cable.

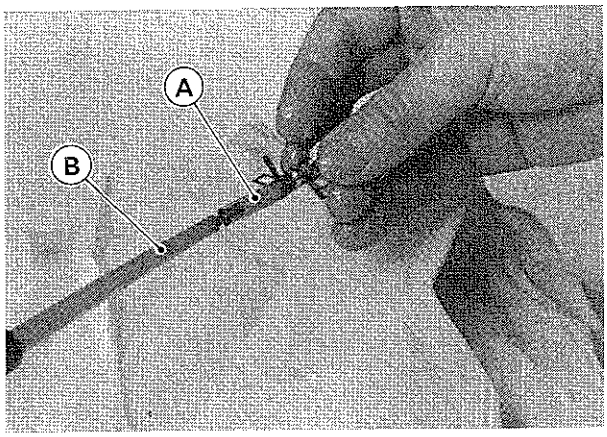
CAUTION

Make sure the tab on the oil pump lever is bent to hold the cable nipple securely. If loose, the cable may slip out, resulting in piston seizure.



A. Oil Pump Cable
B. Oil Pump Lever
C. Tab

- Before installing the banjo bolt, fill the oil pump hose with 2-stroke oil.



A. Oil Pump Hose B. Inject 2-stroke Oil

•Be sure to install a new washer on each side of the connector, and tighten the banjo bolt to the specified torque (see Exploded View).
•Clamping the oil tank hose at the bottom of the air cleaner housing and the rear fender flap, route the hose according to the Hose Routing section in the General Information chapter).
•Adjust the oil pump synchronization.
•Bleed the air from the oil tank hose, oil pump body and oil pump hose.

Oil Pump Disassembly/Assembly Notes

•Do not disassemble the oil pump.

CAUTION

○**If the trouble is with internal parts of the oil pump, replace the pump as an assembly. The pump is precision made with no allowance for replacement of individual parts.**

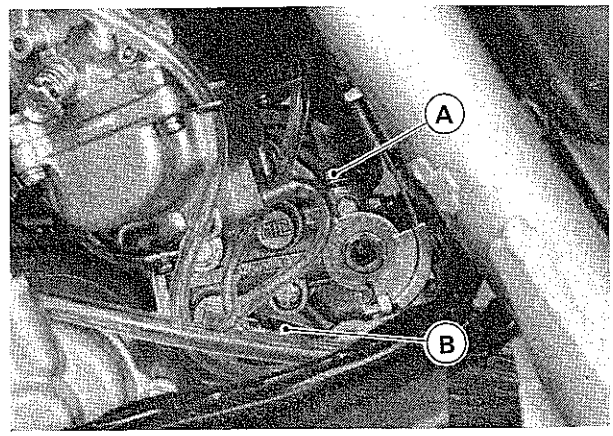
Oil Pump Air Bleeding

When either of the oil pump hoses has been removed, air may become trapped inside, which will obstruct oil flow.

CAUTION

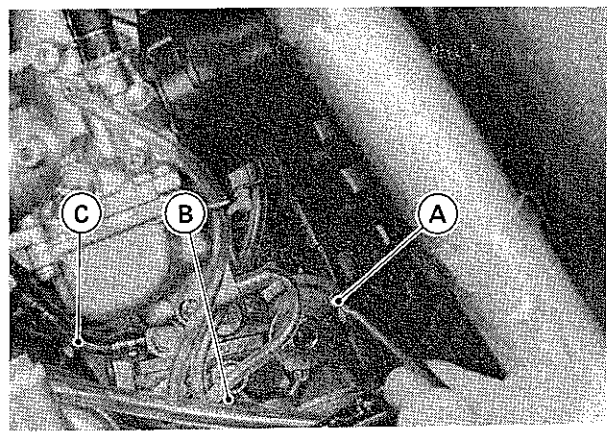
○**Be sure to bleed the lubrication system whenever either of the oil pump hoses has been removed.**

•First check that there is plenty of engine oil in the oil tank.
•Bleed the air from the oil tank hose and oil pump body by backing out the bleed valve on the oil pump body a couple of turns. Leave it loose until the oil flows out of the bleed valve, and then tighten the valve securely.



A. Bleed Valve B. Oil Tank Hose

•Bleed the air from the oil pump hose with the engine idling (below 2 000 rpm), and with the oil pump lever opened fully to maximize the pump output, as shown in the figure.
○Keep the engine idling until the air is completely pumped out.
☆If air bubbles continue to appear in the oil pump hose, check the oil hose connections at the pump and tank.



A. Oil Pump Lever C. Oil Pump Hose
B. Oil Tank Hose

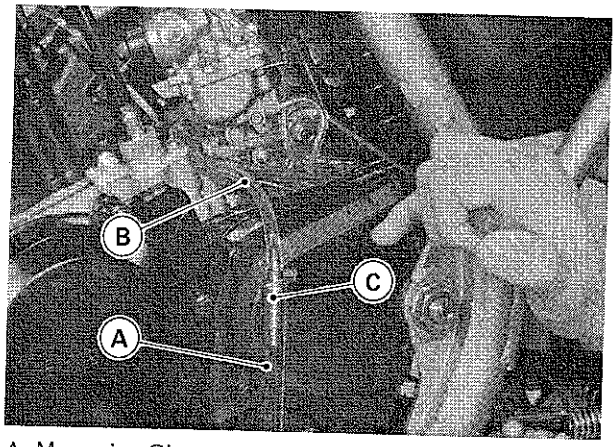
Oil Pump Performance Test

CAUTION

○**Use a 20:1 mixture of gasoline to oil in the fuel tank in place of the gasoline normally used.**
○**Make sure the work area is well ventilated.**

If a drop in oil pump performance is suspected, check the rate that the oil is being pumped.

- Prepare a measuring glass.
- Remove the banjo bolt, and pull the oil pump hose off the check valve.
- Pull the check valve out of the carburetor holder, and fit the hole with a suitable plug (ϕ6 mm x L25 mm bolt) instead of the check valve.
- Prepare a hose with an inside diameter the same as the existing oil pump hose and about 200 mm long.
- Replace the existing hose with the prepared hose.
- Fill the hose with 2-stroke oil, and attach it to the oil pump.
- Attach the check valve to the end of the hose, and bleed the system.
- Hang the hose into the measuring glass as shown.



A. Measuring Glass
B. Hose (about 200 mm)
C. Check Valve

- Start the engine, and keep it at 2,000 rpm.
- Opening the oil pump lever fully, collect the oil that is pumped in 3 minutes. If the quantity of oil collected is within the specified range, the oil pump is operating properly.

Oil Pump Output

@2,000 r/min (rpm), 3 min.
Standard: 3.6 – 4.2 mL

★If the oil pump output is below normal, inspect the pump and hose for oil leaks and the check valve for proper operation.
☆If there are no oil leaks and the check valve works properly, replace the oil pump as an assembly.

Check Valve Inspection

The check valve allows oil flow in the direction of the arrow. When the engine is stopped – and therefore the oil pump is also stopped – the check valve stops oil flow, and any oil that has passed the check valve is prevented from returning.

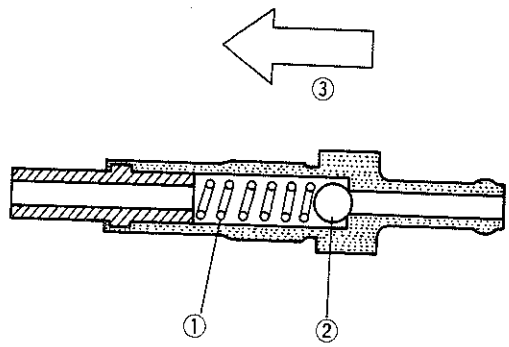
- Inspect the check valve by doing the oil pump performance test twice, first with the check valve mounted normally, then with it turned around backward.

★If oil will not pass through the check valve in the normal direction, clean the valve out by using a high flash point solvent in a squirt can or syringe.
☆If the check valve does not work properly after being cleaned out, whether allowing oil to pass in both directions or not allowing oil to pass at all, replace the check valve.

CAUTION

○**Do not use compressed air on the valve since doing so would damage the valve spring.**

Check Valve

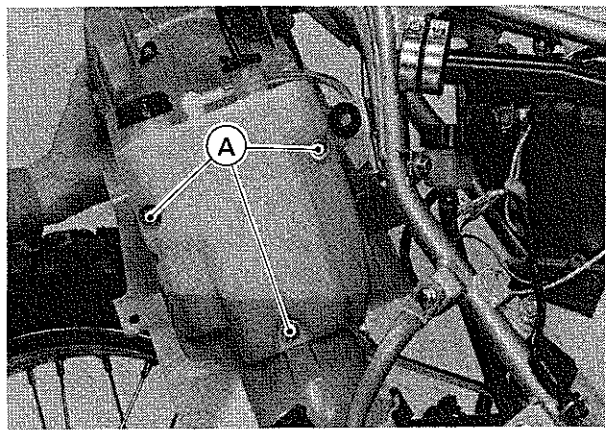


1. Spring
2. Steel Ball
3. Oil Flow

Engine Oil Tank

Oil Tank Removal

- Remove the following parts.
  Seat
  Right Side Cover
  Silencer
- Remove the rear fender, and unscrew the mounting screws (see Oil Tank Removal in the Frame chapter).



A. Oil Tank Mounting Screws

●Remove the cap, and pour the engine oil into a container.
●Pull off the oil tank hose, and take off the oil tank with the oil tank bleeder hose.

Oil Tank Installation Notes

●Installation is the reverse of removal (see Oil Tank Installation Notes in the Frame chapter).
●Install the oil tank hose in accordance with the following procedures:
○Loosen the bleeder bolt on the oil pump body, and inject 2-stroke oil into the oil tank hose.
○After checking that the oil flows out of the bleeder bolt, tighten the bolt securely.
○Fit a suitable plug into the end of the pump hose.
○Attach the hose to the oil tank without getting any air in it, and then fill the tank with engine oil.

Transmission Oil

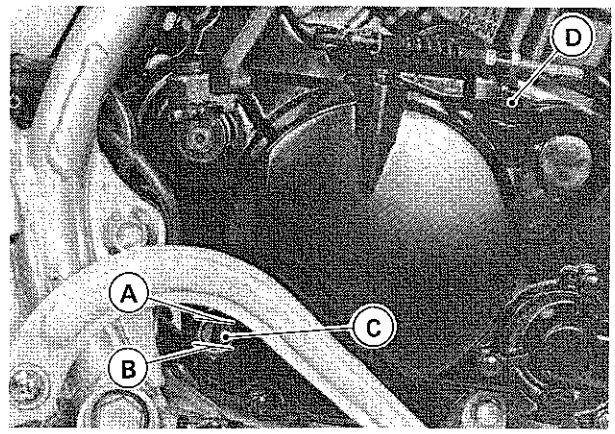
In order for the transmission and clutch to function properly, always maintain the transmission oil at the proper lever and change the oil periodically.

WARNING

○**Motorcycle operation with insufficient, deteriorated, or contaminated transmission oil will cause accelerated, wear and may result in transmission seizure, accident, and injury.**

Oil Level Inspection

●If the motorcycle has just been used, wait several minutes until the oil settles.
●Check that the oil level comes up between the upper and lower levels through the oil level gauge on the right engine cover.



A. Upper Level
B. Lower Level
C. Oil Level Gauge
D. Oil Filler Cap

★If the oil level is too high, remove the excess oil, using a syringe or some other suitable device.
★If the oil level is too low, add the correct amount of oil through the oil filler opening. Use the same type and make of oil that is already in the engine.

NOTE

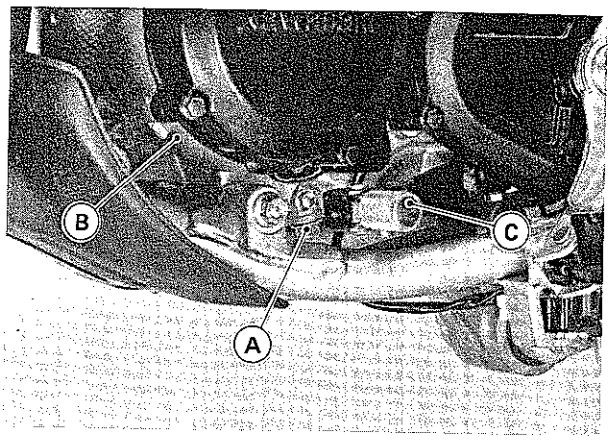
○*If the transmission oil type and make are unknown, use any brand of the specified oil to top up the level in preference to running the engine with the oil level low. Then at your earliest convenience, change the oil completely.*

Transmission Oil Change

●Warm up the engine thoroughly so that the oil will pick up any sediment and drain easily. Then stop the engine.
●Place an oil pan beneath the engine.
●Remove the transmission oil drain plug on the bottom of the engine, and let the oil drain completely.

NOTE

○*Hold the motorcycle upright so that the oil may drain completely.*



A. Transmission Oil Drain Plug
B. Engine
C. Shaft Pedal

●Check the gasket at the drain plug for damage.
★Replace the gasket with a new one if it is damaged.
●After the oil has completely drained out, install the drain plug with the gasket, and tighten it to the specified torque (see Exploded View).
●Fill the engine with a good quality transmission oil specified in the table.
●Check the oil level.

Transmission Oil

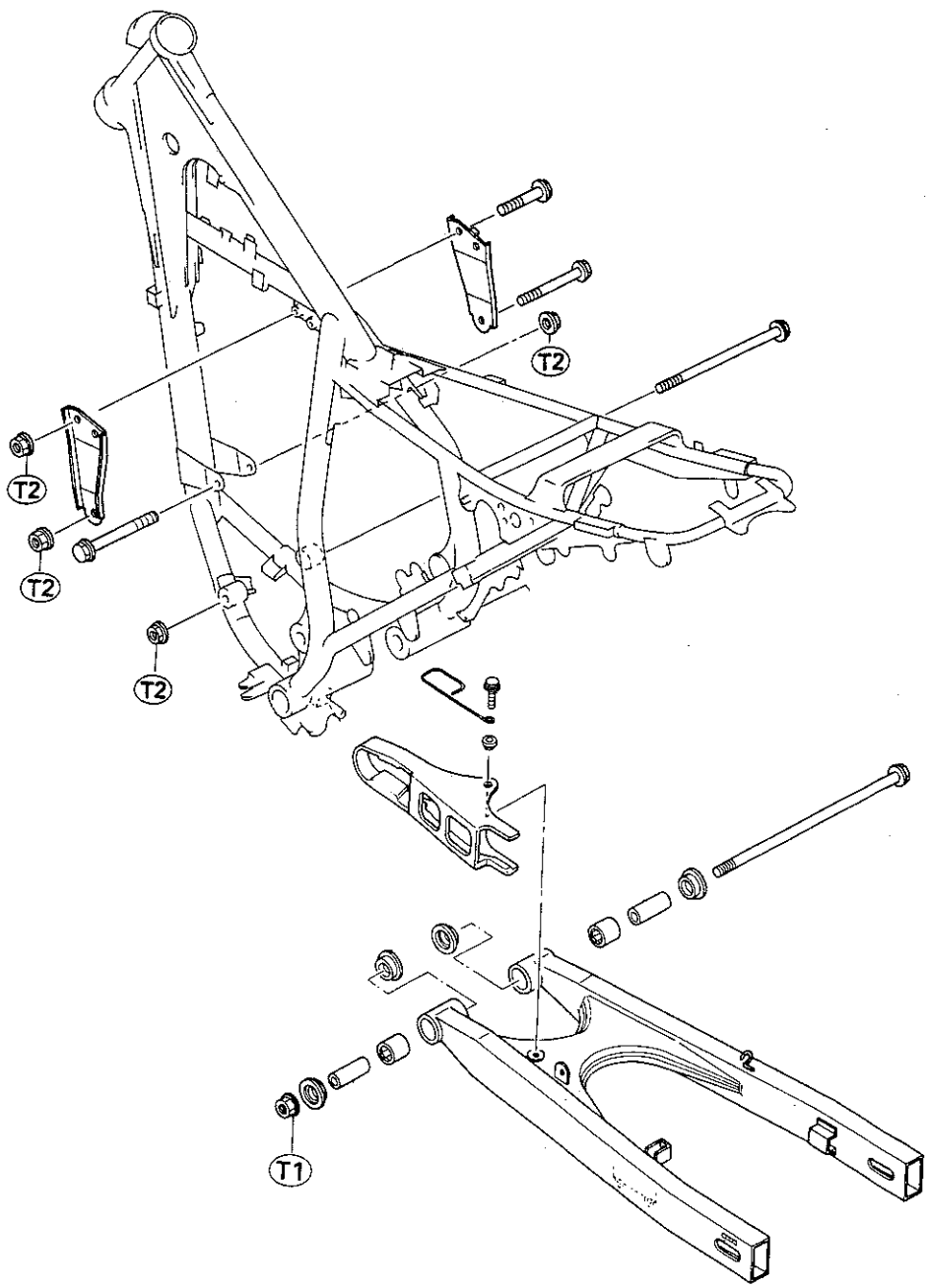
Grade	:	**SE class**
Viscosity	:	**SAE 10W30 or 10W40**
Amount	:	**0.75 L**

Engine Removal/Installation

Table of Contents

Exploded View 7-2
Engine Removal/Installation 7-3
Engine Removal 7-3
Engine Installation Notes 7-3

Exploded View

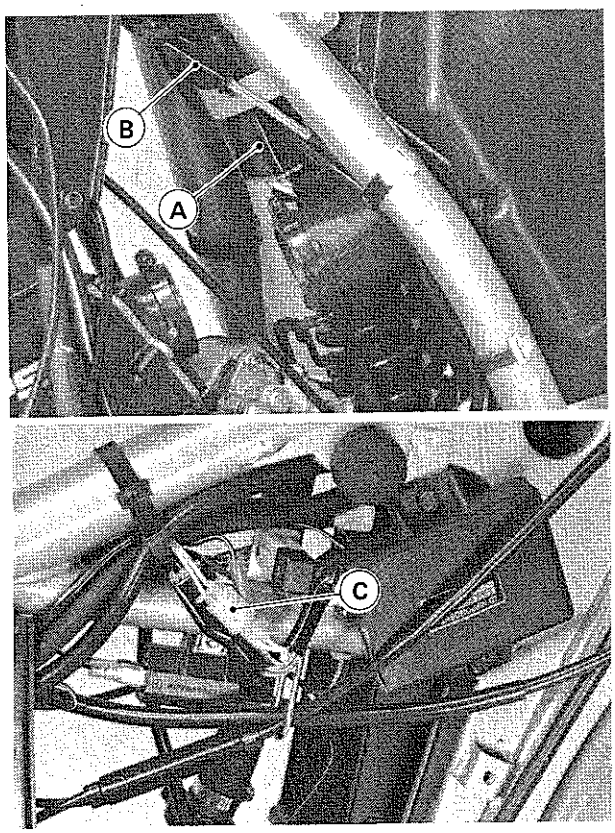


T1: 98 N-m (10.0 kg-m, 72 ft-lb)
T2: 29 N-m (3.0 kg-m, 22 ft-lb)

Engine Removal/Installation

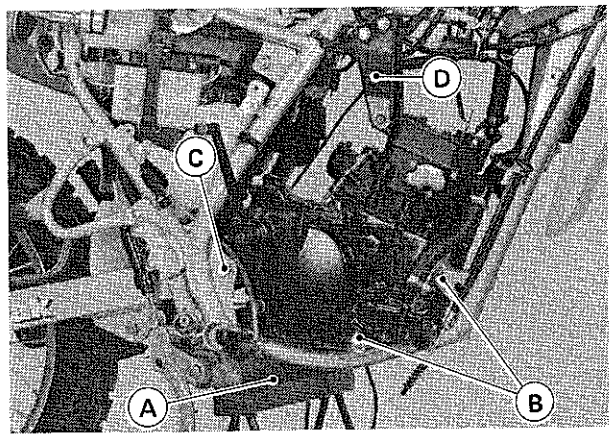
Engine Removal

- Drain the transmission oil (see Transmission Oil Change in the Engine Lubrication System chapter).
- Drain the coolant (see Coolant Change in the Cooling System chapter).
- Remove the following parts.
  - Right Side Cover
  - Battery Cover
  - Seat
  - Fuel Tank
  - Expansion Chamber
  - Spark Plug
  - Water Hose Lower End (Thermostat Cap)
  - Tachometer Cable Lower End
  - Carburetor (with Cables and Hoses)
  - Oil Pump Cable Lower End
  - Oil Tank Hose Lower End (Pump Side)
  - Clutch Cable Lower End
  - Radiator Hose
  - Brake Pedal and Brake Light Switch Spring Lower End
  - Drive Chain and Engine Sprocket
  - Shift Pedal
- Disconnect the following connectors and their lead clamps.
  - Magneto Lead Connector
  - Side Stand Switch Lead Connector
  - Pickup Coil Lead Connector
  - Water Temperature Sensor Connector



A. Magneto Lead Connector
B. Side Stand Switch Lead Connector
C. Pickup Coil Lead Connector

- Place a stand under the frame to lift the motorcycle off the ground, and put blocks under the front and rear tires to steady the motorcycle.
- Remove the engine mounting bolts.
- Pull out the swing arm pivot shaft halfway to avoid the swing arm falling down but to disengage it from the engine assembly.
- Remove the cylinder head bracket bolts, and take off the brackets.
- Lift the engine out to the right.



A. Stand
B. Engine Mounting Bolts
C. Swing Arm Pivot Shaft
D. Cylinder Head Bracket

Engine Installation Notes

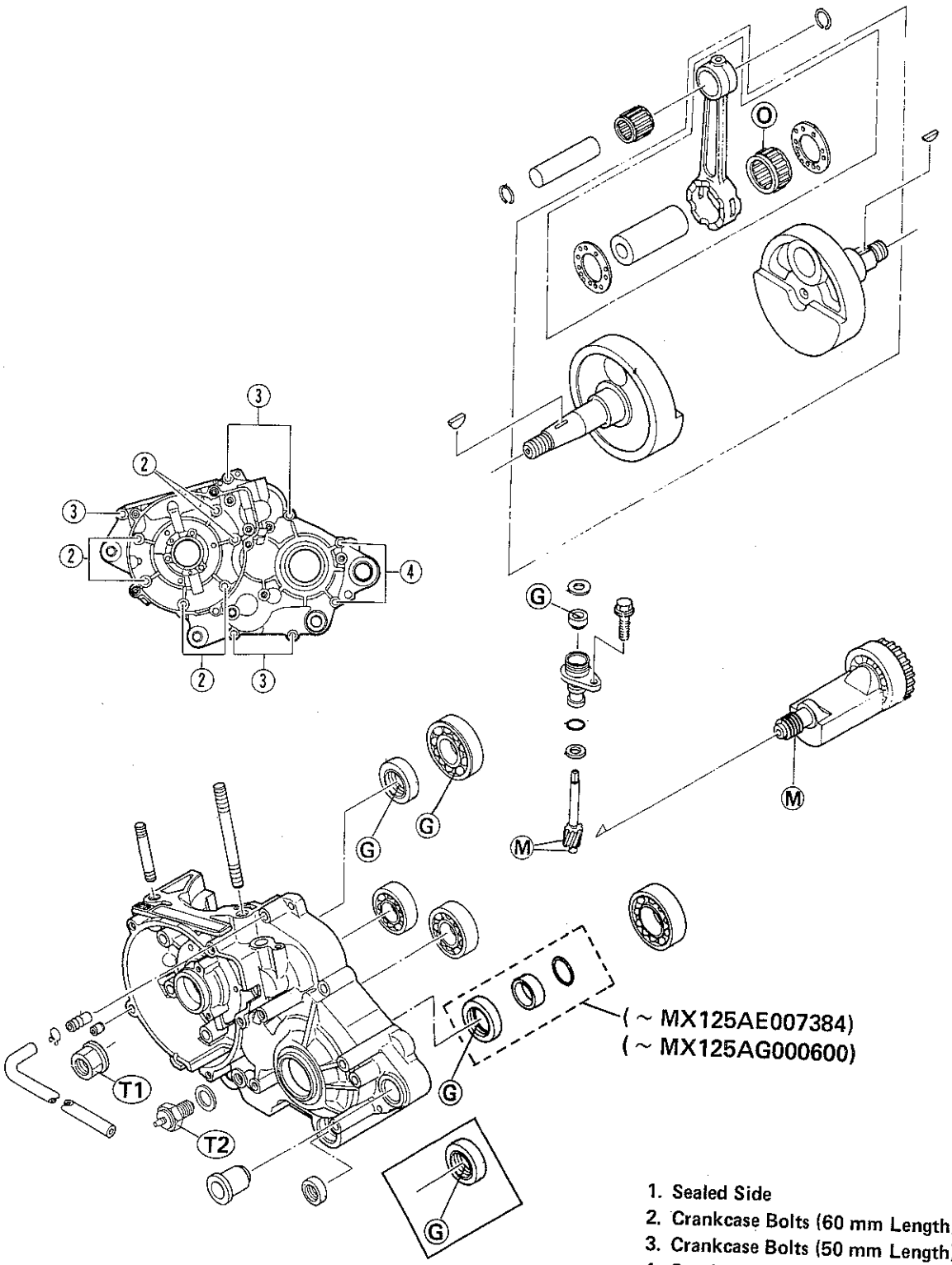
- Engine installation is the reverse of removal.
- Install the front engine mounting bolt from the engine left side.
- Tighten the nuts to the specified torque (see Exploded View) in the following order: swing arm pivot shaft, engine mounting bolts, and then cylinder head bracket bolts.
- To route the leads, cables and hoses, refer to the General Information chapter.
- Apply a non-permanent locking agent to the threads of the brake pedal mounting bolt, and tighten it to the specified torque (see Exploded View in the Brakes chapter).
- To install parts removed, refer to the appropriate chapters.
- Fill the engine with coolant (see Coolant Change in the Cooling System chapter).
- Fill the engine with transmission oil (see Transmission Oil change in the Engine Lubrication System chapter).
- Adjust the following parts:
  - Throttle Cable
  - Carburetor Cable
  - Oil Pump Cable
  - Clutch Cable
  - Choke Cable
  - Drive Chain
  - Rear Brake

Crankshaft/Transmission

Table of Contents

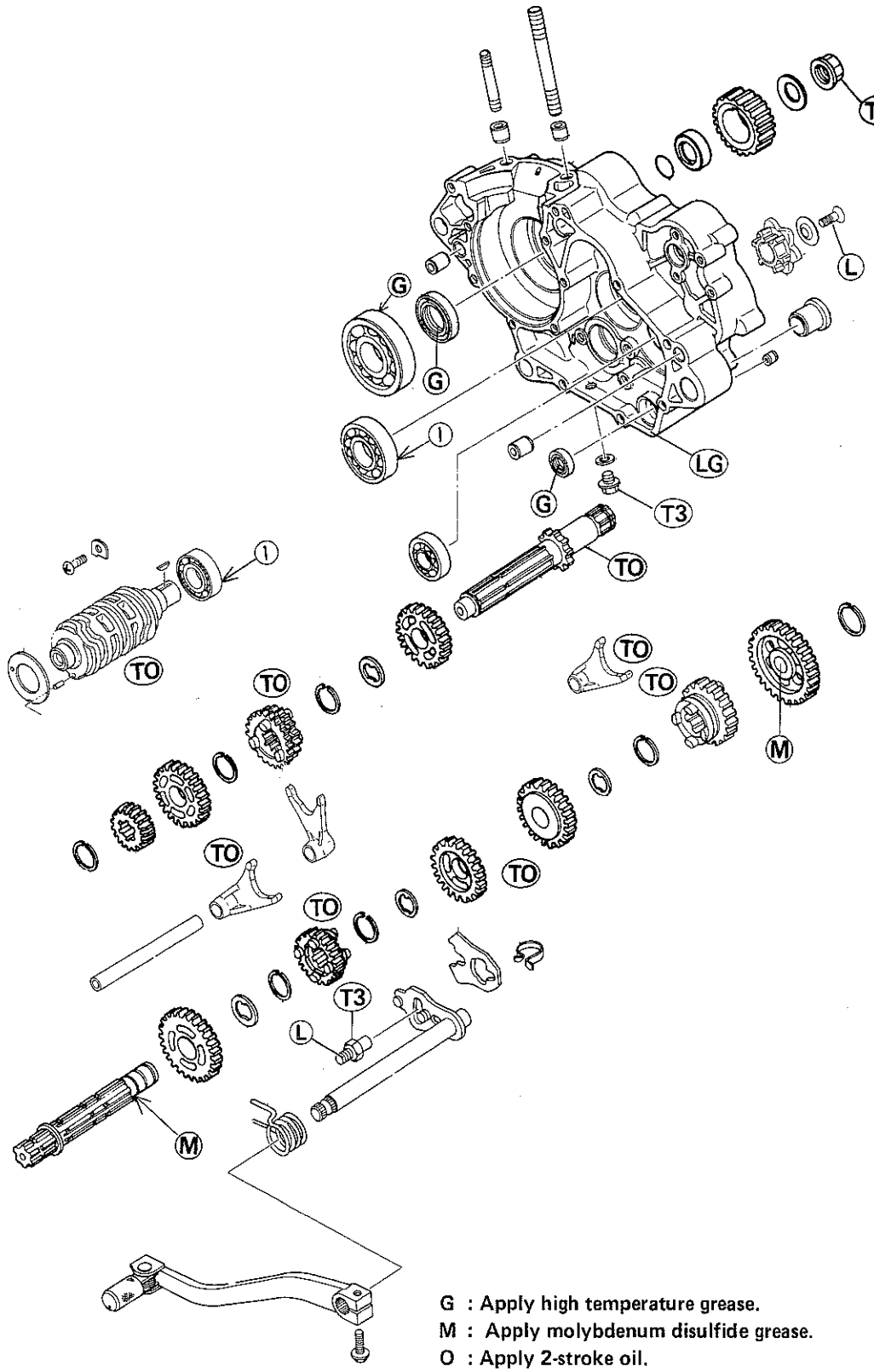
Exploded View 8-2
Specifications 8-4
Special Tools 8-5
Sealant 8-5
Crankcase Splitting 8-6
  Crankcase Splitting 8-6
  Crankcase Assembly 8-6
Crankshaft, Connecting Rod 8-8
  Crankshaft Removal 8-8
  Crankshaft Installation Notes 8-8
  Crankshaft Disassembly Note 8-9
  Crankshaft Assembly Notes 8-9
  Connecting Rod Big End Radial Clearance 8-9
  Big End Seizure 8-9
  Connecting Rod Side Clearance 8-9
  Crankshaft Runout 8-9
  Crankshaft Alignment 8-10
Balancer 8-10
  Balancer Removal 8-10
  Balancer Installation Notes 8-11
Transmission 8-11
  Transmission Shaft Removal 8-11
  Transmission Shaft Installation Notes 8-12
  Transmission Shaft Disassembly Notes 8-12
  Transmission Shaft Assembly Notes 8-12
  Shift Drum and Fork Installation Notes 8-13
  Shift Fork Bending 8-14
  Shift Fork/Gear Groove Wear 8-14
  Shift Fork Guide Pin/Shift Drum Groove Wear 8-14
  Gear Dog/Gear Dog Hole Damage 8-14
  Ball Bearing Wear 8-15

Exploded View



1. Sealed Side
2. Crankcase Bolts (60 mm Length)
3. Crankcase Bolts (50 mm Length)
4. Crankcase Bolts (75 mm Length)

T1 : 59 N-m (6.0 kg-m, 43 ft-lb)
T2 : 15 N-m (1.5 kg-m, 11.0 ft-lb)
T3 : 20 N-m (2.0 kg-m, 14.5 ft-lb)



G : Apply high temperature grease.
M : Apply molybdenum disulfide grease.
O : Apply 2-stroke oil.
TO: Apply transmission oil to the transmission and shift forks, etc.
LG: Apply liquid gasket—silver (Kawasaki Bond: 92104-002) to the mating surface of the right and left crankcase halves.
L : Apply a non-permanent locking agent to the threads.

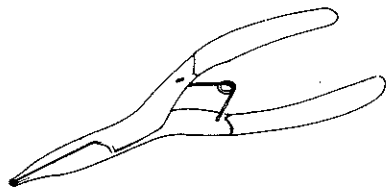
Specifications

Item	Standard	Service Limit
Crankshaft, Connecting Rod:		
Connecting rod:		
Big end radial clearance	0.020 – 0.035 mm	0.08 mm
Big end side clearance	0.4 – 0.5 mm	0.7 mm
Crankshaft runout	not more than 0.03 mm	0.08 mm
Transmission:		
Gear backlash	0.02 – 0.19 mm	0.26 mm
Shift fork ear thickness	4.9 – 5.0 mm	4.8 mm
Gear shift fork groove width	5.05 – 5.15 mm	5.3 mm
Shift fork guide pin diameter	5.9 – 6.0 mm	5.80 mm
Shift drum groove width	6.05 – 6.20 mm	6.30 mm

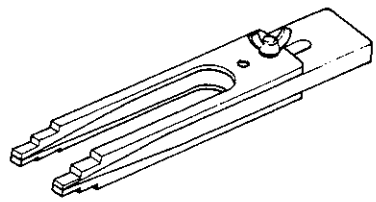
Special Tools

Along with common hand tools and precision instruments specialized tools are required for complete crankshaft/transmission servicing.

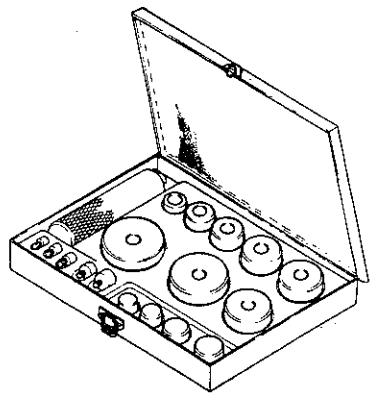
Outside Circlip Pliers: 57001-144



Crankshaft Jig: 57001-1174



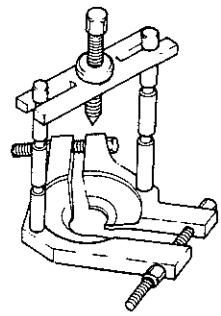
Bearing Driver Set: 57001-1129



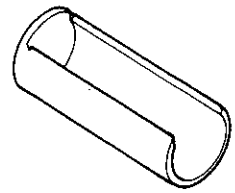
Oil Seal Guide: 57001-264



Bearing Puller: 57001-158

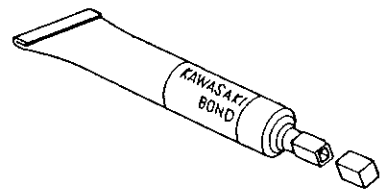


Bearing Driver: 57001-1227



Sealant

Kawasaki Bond (Liquid Gasket – Silver): 92104-002

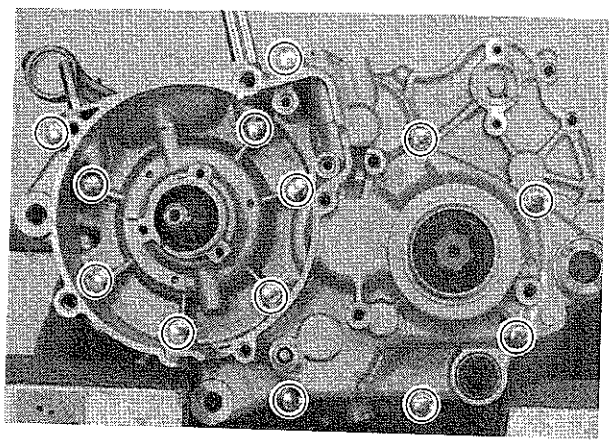


Crankcase Splitting

Crankcase Splitting

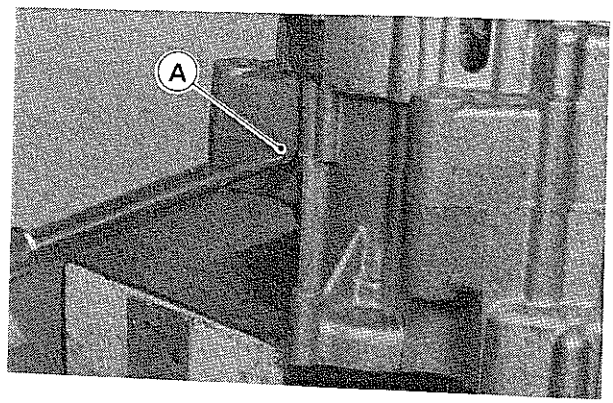
- Remove the engine (see the Engine Removal/Installation chapter).
- Set the engine on a clean surface while parts are being removed.
- Remove the following parts from the engine:
  - Magneto Cover
  - Neutral Switch Connector
  - Output Shaft Sleeve and O-ring (Engine No. ~MX125 AE007384/~MX125 AG000600)
  - Tachometer Cable Lower End Gear
  - Cylinder Head
  - Cylinder
  - Piston
  - Pickup Coil
  - Flywheel Magneto
  - Right Engine Cover, Exhaust Advancer Assy and Water Pump
  - Clutch
  - Primary Gear
  - Crankshaft Collar and O-ring
  - Balancer Idle Gear
  - Kick Shaft Assembly
  - Shift Shaft
  - Oil Pump
  - Kick Starter Idle Gear
  - Gear Positioning Lever
  - Shift Drum Cam
  - Breather Hose

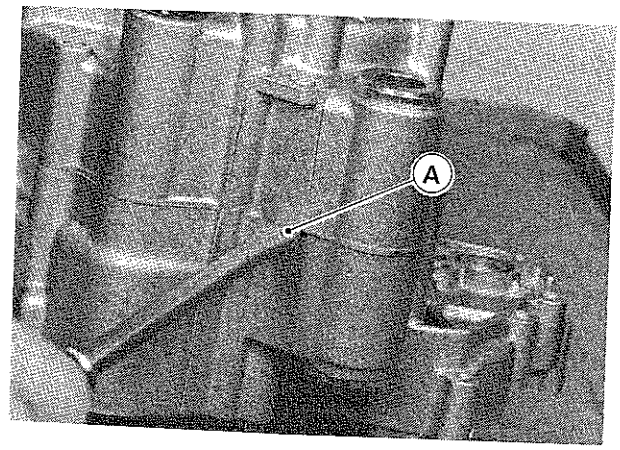
- Remove the crankcase bolts.



A. Crankcase Bolts

- Pry the points in the figures with a screwdriver to split the crankcase halves apart evenly. There are two knock pins on the crankcase mating surface. Pull off the left crankcase half.





A. Pry Point

Crankcase Assembly

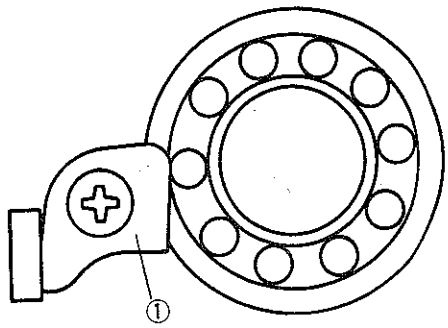
- Before fitting the left case on the right case, note the following.
  - Chip off the old gasket from the mating surfaces of the crankshaft halves, and clean off the crankcase, transmission and crankshaft with a high flash point solvent. After cleaning, apply transmission oil to the transmission gears, shift drum, shift forks and so on.
  - Be sure to replace any oil seal removed with a new one. Press in the new oil seal using a press and suitable tools so that the seal surface is flush with the surface of the crankcase. But press in 1.5 mm the new oil seal for the output shaft from the surface of the crankcase.
  - Apply high temperature grease to the oil seal lips.
  - Press in the ball bearings using the bearing driver set (special tool: 57001-1129) until the bearing is bottomed.

NOTE

- *Do not remove the bearings unless it is necessary. Removal may damage them.*
- *After applying high temperature grease liberally to the oil seal sides of the crankshaft bearings, install them.*
- *Install the bearings for the drive shaft and the shift drum in the right crankcase so that their sealed sides face toward the right engine cover. Install the oil seal for the shift shaft in the right crankcase so that its lip spring side faces toward the right engine cover.*

☆Install the holding plate for the bearing on the shift drum in the right crankcase as shown.

Bearing Holding Plate Installation

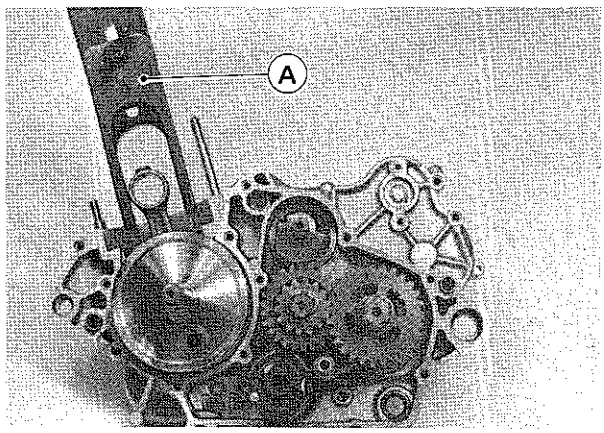


1. Bearing Holding Plate

☆If the crankshaft bearings stay on the crankshaft when splitting the crankcase, remove the bearings from the shaft and reinstall them in the crankcase, and then assemble the crankcase (see Crankshaft Removal and Installation Notes).

●Turn the crankshaft to BDC, and install the crankshaft jig (special tool) between the flywheels opposite the connecting rod big end to protect flywheel alignment as shown.

○If the crankshaft has been removed from the crankcase, install the jig (special tool) between the crankshaft flywheels before pressing the crankshaft into the right crankcase half.



A. Crankshaft Jig: 57001-1174

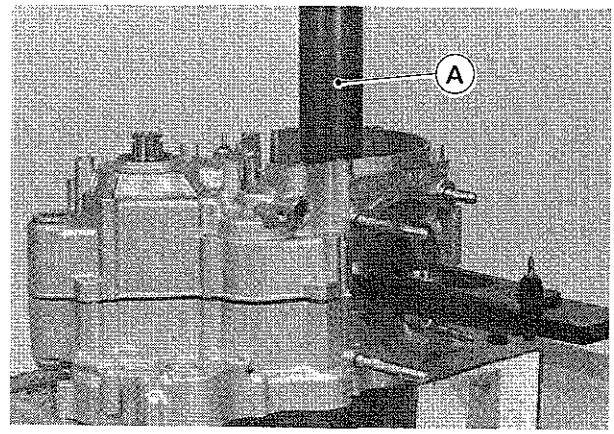
●Check to see that the crankcase knock pins are in place on the right crankcase half. If any of them has been removed, replace it with a new one.

●Apply liquid gasket – silver (Kawasaki Bond: 92104-002) to the mating surface of the left crankcase half.

●Using a suitable tool on the left crankcase to press around the hole for the crankshaft, fit the crankcase halves together with a press on the tool.

NOTE

○*Constantly check the alignment of the two crankcase halves, and the position of the transmission shafts, and shift drum. The front and rear of the crankcase must be pushed together evenly.*

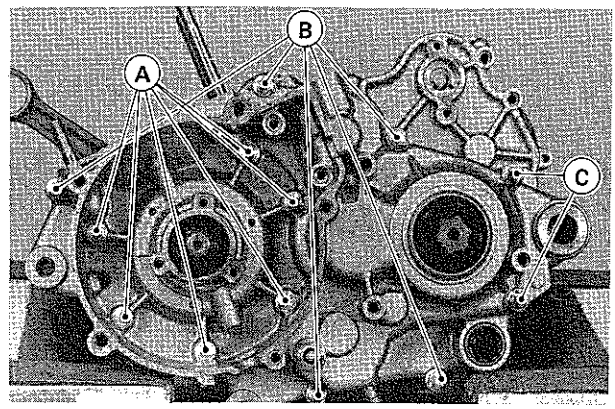


A. Press

●Remove the crankshaft jig (special tool) from the flywheels.

●Tighten the crankcase bolts starting with the ones around the crankshaft, and then the farther ones. The tightening order is as follows.

1. 60 mm length bolts
2. 50 mm length bolts
3. 75 mm length bolts

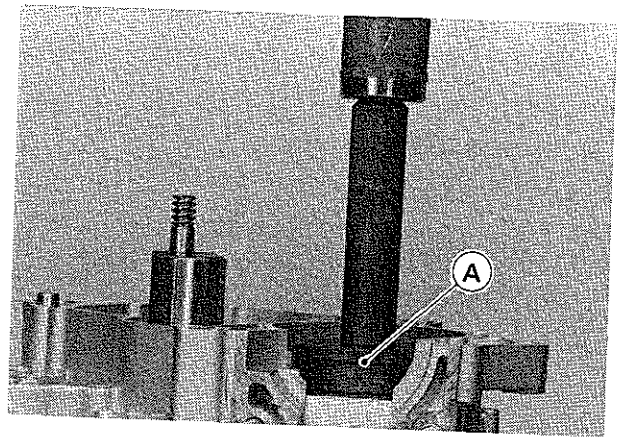


A. 60 mm Length Bolts
B. 50 mm Length Bolts
C. 75 mm Length Bolts

●Check to see that the crankshaft, drive shaft, and output shaft all turn freely (in the neutral position).

★If the crankshaft will not turn, probably the crankshaft is not centered; tap the appropriate end of the crankshaft with a mallet to reposition it.

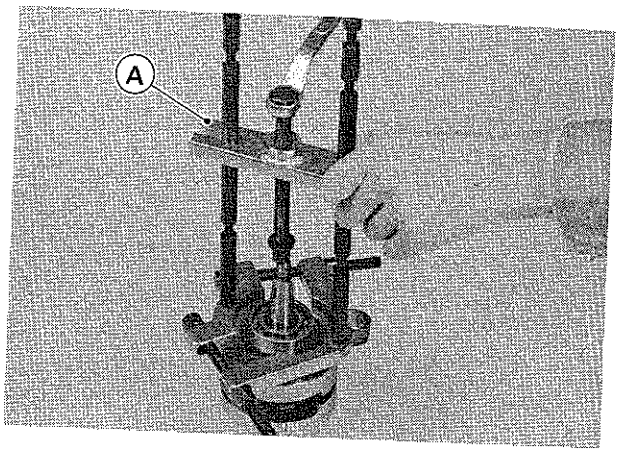
•Spinning the output shaft, shift the transmission through all the gears to make certain there is no binding and that all the gears shift properly.
•Install the parts removed in the reverse order of removal, and refer to the appropriate chapters.
○Replace the O-rings on the output shaft with new ones.



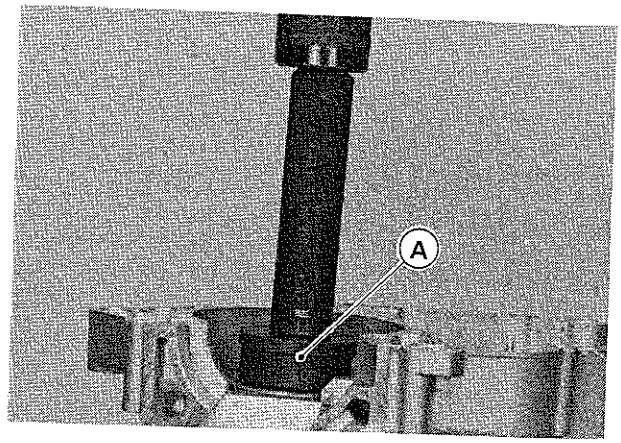
Crankshaft, Connecting Rod

Crankshaft Removal

•Split the crankcase (see Crankcase Splitting).
•Remove the transmission shaft (see Transmission Shaft Removal).
•Using a press remove the crankshaft from the right crankcase.
★If the bearings stay on the crankshaft when splitting the crankcase or removing the crankshaft from the right crankcase, remove the bearings from the crankshaft with a hearing puller (special tool).

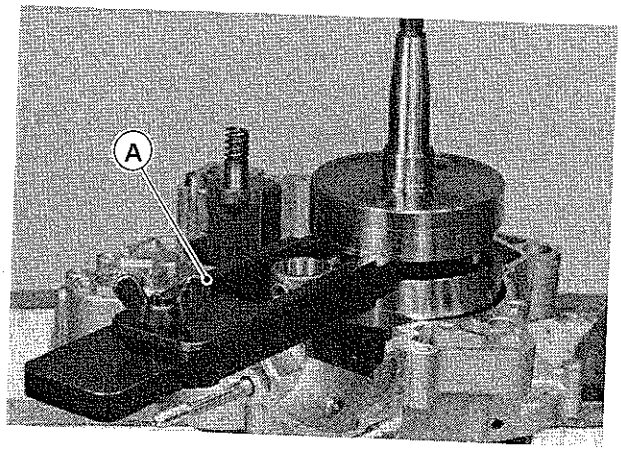


A. Bearing Puller: 57001-158



A. Bearing Driver Set: 57001-1129

•Insert the crankshaft jig (special tool) between the crankshaft flywheels opposite the connecting rod big end to protect flywheel alignment as shown, and press the crankshaft into the right crankcase.
○When pressing, position the jig in the crankcase opening so the jig will not hit the crankcase.



A. Crankshaft Jig: 57001-1174

Crankshaft Installation Notes

•Installation is the reverse of removal (see Transmission Shaft Installation Notes and Crankcase Assembly).
•When installing the crankshaft bearings, apply high temperature grease to the outer sides of the bearings, and then press them into the crankcase using the bearing driver set (special tool) until the bearing bottoms against the step.

•Apply 2-stroke oil to the connecting rod big end bearing.

Crankshaft Disassembly Note

Since assembly of the crankshaft demands exacting tolerances, the disassembly and reassembly of the crankshaft can only be done by a shop having the necessary tools and equipment.

- If it should be necessary to disassemble the crankshaft, use a press to remove the crankpin.

Crankshaft Assembly Notes

Since assembly of the crankshaft demands exacting tolerances, the disassembly and reassembly of the crankshaft can only be done by a shop having the necessary tools and equipment.

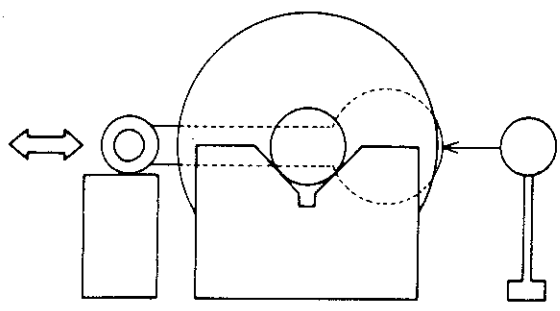
- Reassemble the crankshaft according to the standard tolerances in Specifications.
  - Connecting rod big end radial clearance.
  - Cold-fitting tolerance between crankpin and flywheels.
  - Side clearance between the connecting rod and one of the flywheels.
  - Crankshaft runout.

Connecting Rod Big End Radial Clearance

- Set the crankshaft in flywheel alignment jig or on V blocks, and place a dial gauge against the big end of the connecting rod.
- Push the connecting rod first towards the gauge and then in the opposite direction. The difference between the two gauge readings is the radial clearance.
- ★If the radial clearance exceeds the service limit, the crankshaft should be either replaced or disassembled and the crankpin, needle bearing, and connecting rod big end examined for wear.

Connecting Rod Big End Radial Clearance

Standard:	**0.020 – 0.035 mm**
Service Limit:	**0.08 mm**



Big End Seizure

- ★In case of serious seizure with damaged flywheels, the crankshaft must be replaced.
- ★In case of less serious damage, disassemble the crankshaft and replace the crankpin, needle bearing, side washers, and connecting rod.

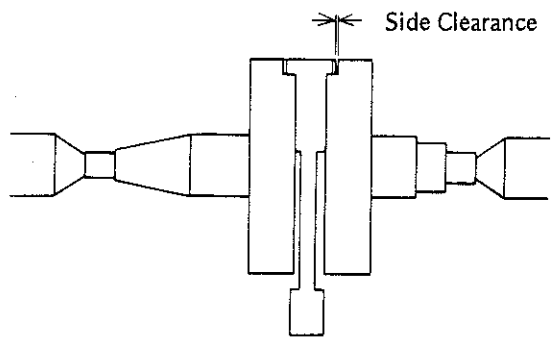
Connecting Rod Side Clearance

- Measure the side clearance of the connecting rod with a thickness gauge.
- ★If the clearance exceeds the service limit, replace the crankshaft.

Connecting Rod Side Clearance

Standard:	**0.4 – 0.5 mm**
Service Limit:	**0.7 mm**

Side Clearance



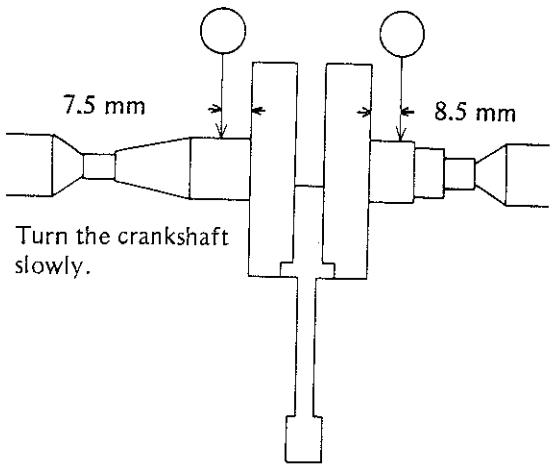
Crankshaft Runout

- Set the crankshaft in a flywheel alignment jig or on V blocks, and place a dial gauge against the points indicated.
- Turn the crankshaft slowly. The maximum difference in gauge readings is the crankshaft runout.

Crankshaft Runout

Standard:	**Not more than 0.03 mm**
Service Limit:	**0.08 mm**

Crankshaft Runout



Crankshaft Alignment

★If the runout at either point exceeds the service limit, align the flywheels so that the runout falls within the service limit.

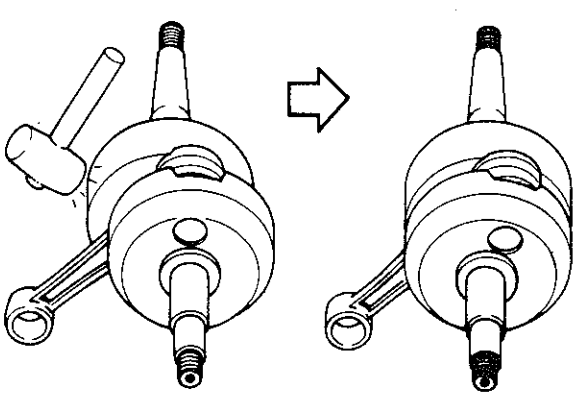
●In the case of horizontal misalignment, which is the most common, strike the projecting rim of the flywheel with a plastic, soft lead, or brass hammer as indicated in the figure.

●Recheck the runout with a dial gauge, repeating the process until the runout falls within the service limit.

○Vertical misalignment is corrected either by driving a wedge in between the flywheels or by squeezing the flywheel rims in a vise, depending on the nature of the misalignment. In both cases of horizontal and vertical misalignment, correct the horizontal misalignment first.

★If flywheel misalignment cannot be corrected by the above method, replace the crankpin or the crankshaft itself.

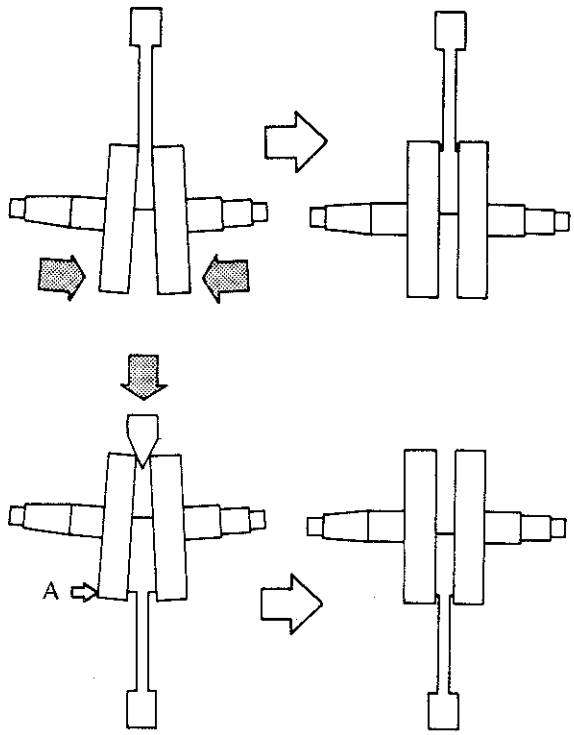
Horizontal Misalignment



CAUTION

○Don't hammer the flywheel at point "A".

Vertial Misalignment



Balancer

Balancer Removal

CAUTION

○Do not remove the balancer unless it is necessary. Removal will cause bearing damage.

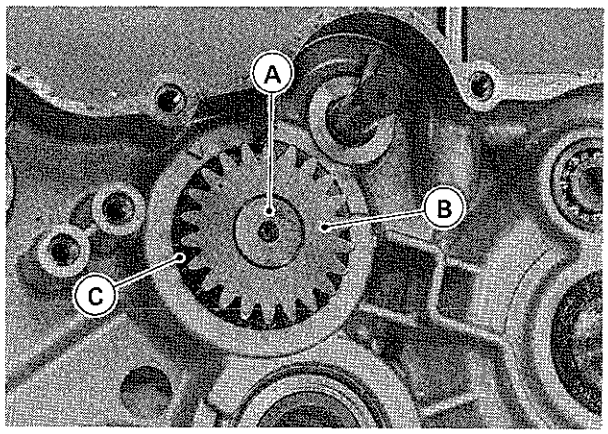
●Split the crankcase (see Crankcase Splitting).

●Remove the transmission shafts (see Transmission Shaft Removal).

●Remove the balancer weight, balancer gear and bearing as an assembly by pressing the balancer shaft out of the case.

NOTE

○*Do not disassemble the balancer assembly. If balancer replacement is necessary, replace the balancer as an assembly.*



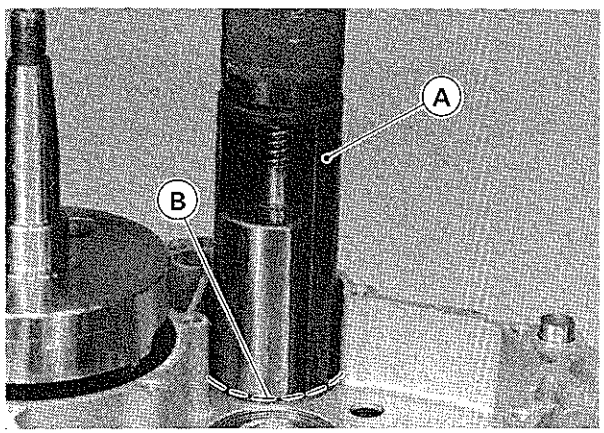
A. Balancer Shaft
B. Balancer Gear
C. Bearing

Balancer Installation Notes

- Installation is the reverse of removal.
- Apply molybdenum disulfide grease to the tachometer gear on the end of the balancer shaft.
- Press the balancer assembly into the right crankcase by pressing the balancer bearing outer race. Use the bearing driver (special tool).

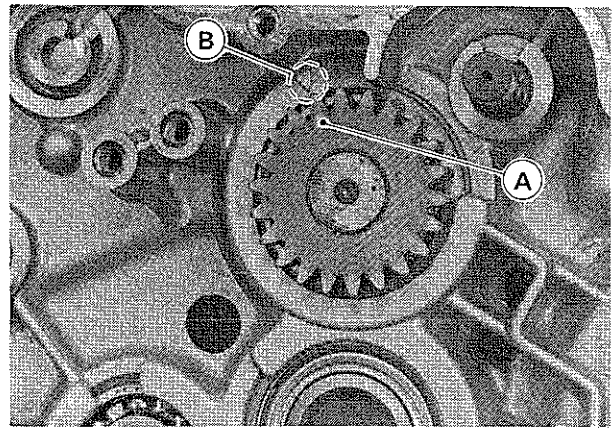
CAUTION

○**Do not press the top end of the balancer shaft.**



A. Bearing Driver: 57001-1227
B. Balancer Bearing Outer Race

- When installing the clutch housing, align the punch mark on the balancer gear with the notched mark on the right crankcase half (see Clutch Installation Notes in the Engine Right Side chapter).

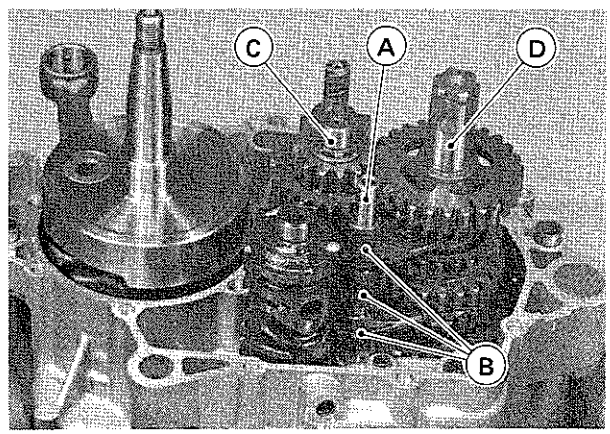


A. Punch Mark
B. Notched Mark

Transmission

Transmission Shaft Removal

- Split the crankcase (see Crankcase Splitting).
- Pull off the shift rod, and disengage the shift fork guide pins from the shift drum grooves.
- Take off the shift drum.
- Remove the shift forks from the transmission gears.
- Take out the drive shaft and output shaft together, with their gears meshed.

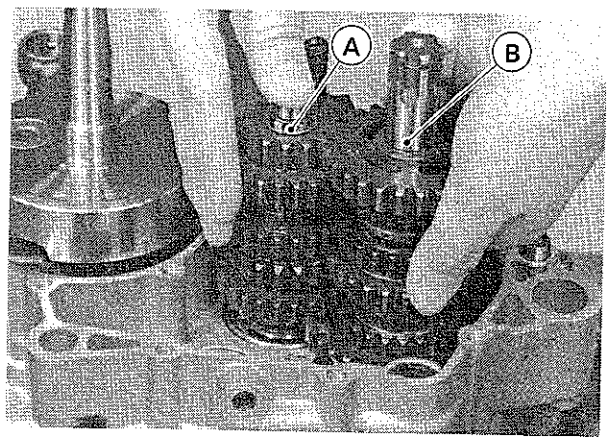


A. Shift Rod
B. Shift Forks
C. Drive Shaft
D. Output Shaft

Transmission Shaft Installation Notes

●Installation is the reverse of removal.

●Hold the drive shaft and output shaft together, with their gears meshed, and fit them into the right crankcase half.



A. Drive Shaft B. Output Shaft

●To install the shift forks and shift drum, see the Shift Drum and Fork Installation Notes.

Transmission Shaft Disassembly Notes

●Using circlip pliers (special tool: 57001-144) to remove the circlips, disassemble the transmission shaft.

Transmission Shaft Assembly Notes

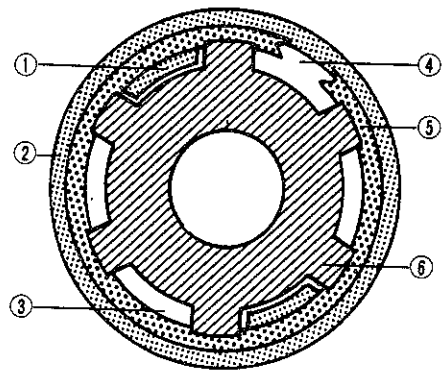
●Assembly is the reverse of removal.

●Apply transmission oil liberally to the transmission shaft, gears and bearings.

●Replace any circlips that were removed with new ones.

○Always install circlips so that the opening is aligned with a spline groove, and install toothed washers so that the teeth are not aligned with the circlip opening. To install a circlip without damage, first fit the circlip onto the shaft expanding it just enough to install it, and then use a suitable gear to push the circlip into place.

Circlip and toothed Washer Installation

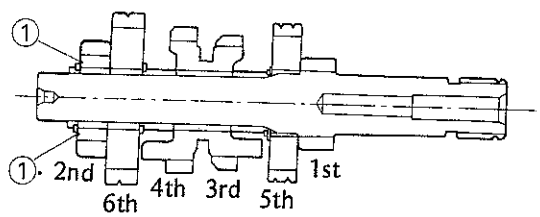


1. Teeth of Toothed Washer
2. Toothed Washer
3. Groove of Shaft
4. Opening of Circlip
5. Circlip
6. Shaft

●The drive shaft gears can be identified by size; the smallest diameter gear is 1st gear, and the largest is 6th. Be sure that all parts are put back in the correct sequence, facing the proper direction, and that all circlips and the washer are properly in place.

1. 1st gear (10T; part of drive shaft)
2. 5th gear (24T; has two identifying grooves)
3. 3rd/4th gear (17T/22T)
4. 6th gear (26T; has an identifying groove)
5. 2nd gear (14T; has an identifying groove)

Drive Shaft Gears



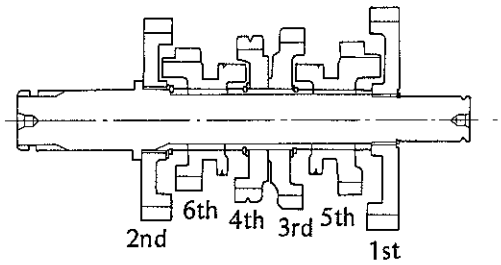
1. Identifying groove is face to the outside.

●The proper sequence starting with 1st gear (which is a part of the drive shaft) is 1st gear, 5th gear (face the dog hole side of the gear to the left), toothed washer, circlip, 3rd/4th gear (face 3rd gear side to the right), circlip, 6th gear (face the dog hole side of the gear to the right), 2nd gear (face the identifying groove side of the gear to the left), and circlip.

•The output shaft gears can be identified by size; the largest diameter gear is 1st gear, and the smallest is 6th. Be sure that all parts are put back in the correct sequence and facing the proper direction, and that all circlips and washers are properly in place.

1. 2nd gear (27T)
2. 6th gear (21T; has an identifying groove)
3. 4th gear (24T; has an identifying groove)
4. 3rd gear (24T)
5. 5th gear (22T; has an identifying groove)
6. 1st gear (31T)

Output Shaft Gears



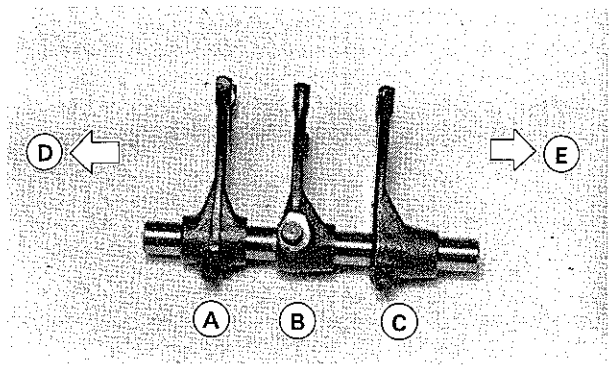
•Proper sequence starting with 2nd gear is 2nd gear (face the flat side of the gear to the left), toothed washer, circlip, 6th gear (face the fork groove side to the right), circlip, toothed washer, 4th gear (face the side with the dog recesses to the left), 3rd gear (face the side with the dog recesses to the right), toothed washer, circlip, 5th gear (face the fork groove side to the left), 1st gear (face the flat side of the gear to the right), and circlip.
•Check that each gear spins or slides freely on the transmission shaft without binding after assembly.

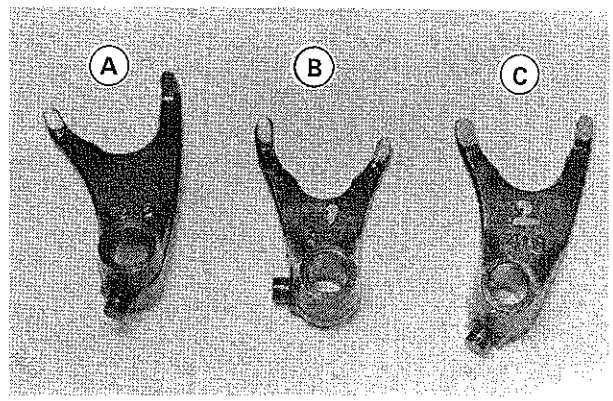
Shift Drum and Fork Installation Notes

•Apply a little transmission oil to the shift fork ears, and fit the shift forks into the gear grooves.

Shift Fork Identification

Output shaft 5th gear shift fork	ears are centered on guide
Drive shaft 3rd/4th gear shift fork	ears are shorter than those of the other two shift forks
Output shaft 6th gear shift fork	ears are on end of guide

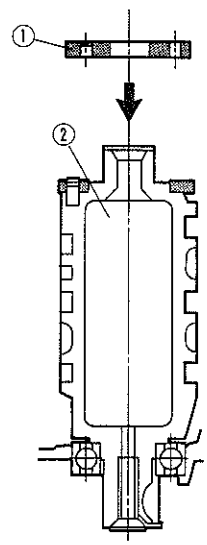




A. Output Shaft 5th Gear Shift Fork
B. Drive Shaft 3rd/4th Gear Shift Fork
C. Output Shaft 6th Gear Shift Fork
D. Right Crankcase Half Side
E. Left Crankcase Half Side

•Fit the shift fork guide pins into the corresponding shift drum grooves.
•Apply a little transmission oil to the shift rod, and slide it into the shift forks.
•If the neutral holder has been removed from the shift drum, fit the holder onto the shift drum with the blind-end bore in the holder facing the shift drum.

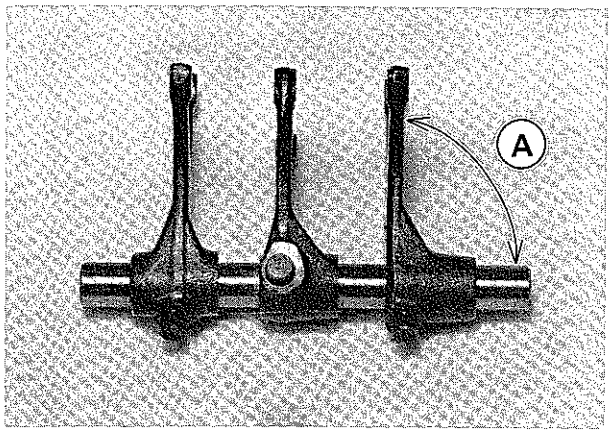
Neutral Holder Installation



1. Neutral Holder
2. Shift Drum

Shift Fork Bending

●Visually inspect the shift forks, and replace any fork that is bent. A bent fork could cause difficulty in shifting, or allow the transmission to jump out of gear when under power.



A. 90°

Shift Fork/Gear Groove Wear

●Measure the thickness of the shift fork ears, and measure the width of the shift fork grooves in the transmission gears.

★If the thickness of a shift fork ear is less than the service limit, the shift fork must be replaced.

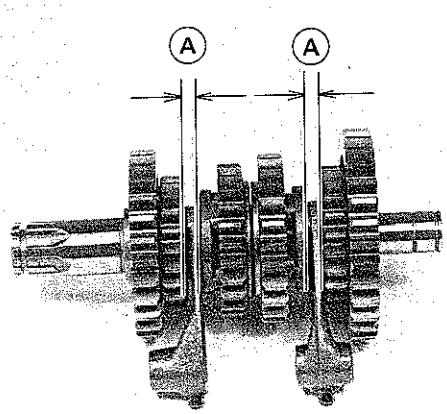
Shift Fork Ear Thickness

Standard:	**4.9 – 5.0 mm**
Service Limit:	**4.8 mm**

★If a gear shift fork groove is worn over the service limit, the gear must be replaced.

Gear Shift Fork Groove Width

Standard:	**5.05 – 5.15 mm**
Service Limit:	**5.3 mm**



A. Gear Shift Fork Groove

Shift Fork Guide Pin/Shift Drum Groove Wear

●Measure the diameter of each shift fork guide pin, and measure the width of each shift drum groove.

★If the guide pin on any shift fork is less than the service limit, the fork must be replaced.

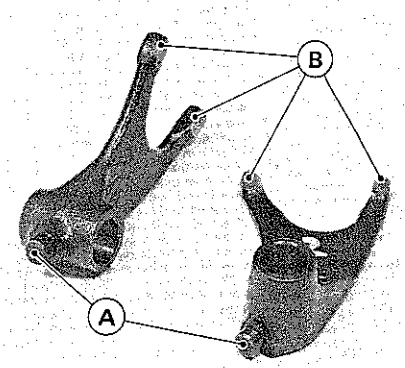
Shift Fork Guide Pin Diameter

Standard:	**5.9 – 6.0 mm**
Service Limit:	**5.80 mm**

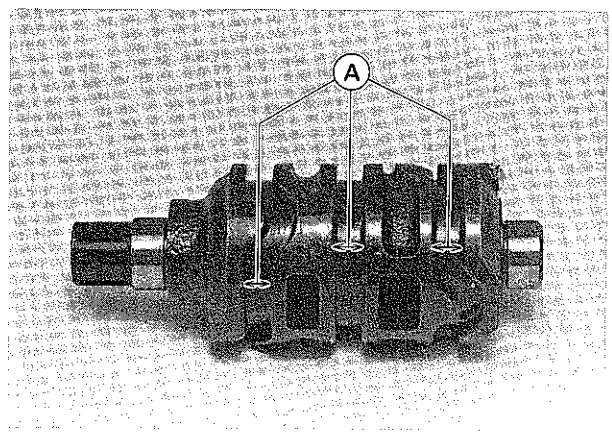
★If any shift drum groove is worn over the service limit, the drum must be replaced.

Shift Drum Groove Width

Standard:	**6.05 – 6.20 mm**
Service Limit:	**6.30 mm**



A. Shift Fork Guide Pin B. Shift Fork Ears

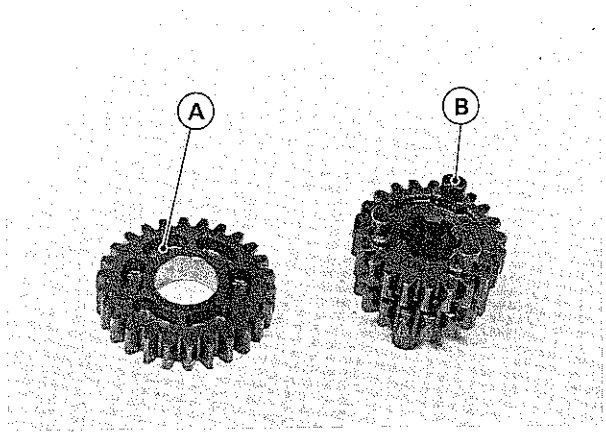


A. Shift Drum Grooves

Gear Dog/Gear Dog Hole Damage

●Visually inspect the gear dogs and gear dog holes.

★Replace any damaged gears or gears with excessively worn dogs or dog holes.



A. Dog Hole B. Dog

Ball Bearing Wear

●Check the ball bearing on both sides of the shift drum, drive shaft and output shaft.

○Since the ball bearings are made to extremely close tolerances, the wear must be judged by feel rather than measurement. Clean each bearing in a high flash point solvent, dry it (do not spin the bearing while it is dry), and oil it with transmission oil.

○Spin the bearing by hand to check its condition.

★If the bearing is noisy, does not spin smoothly, or has any rough spots, replace it.

Wheels/Tires

Table of Contents

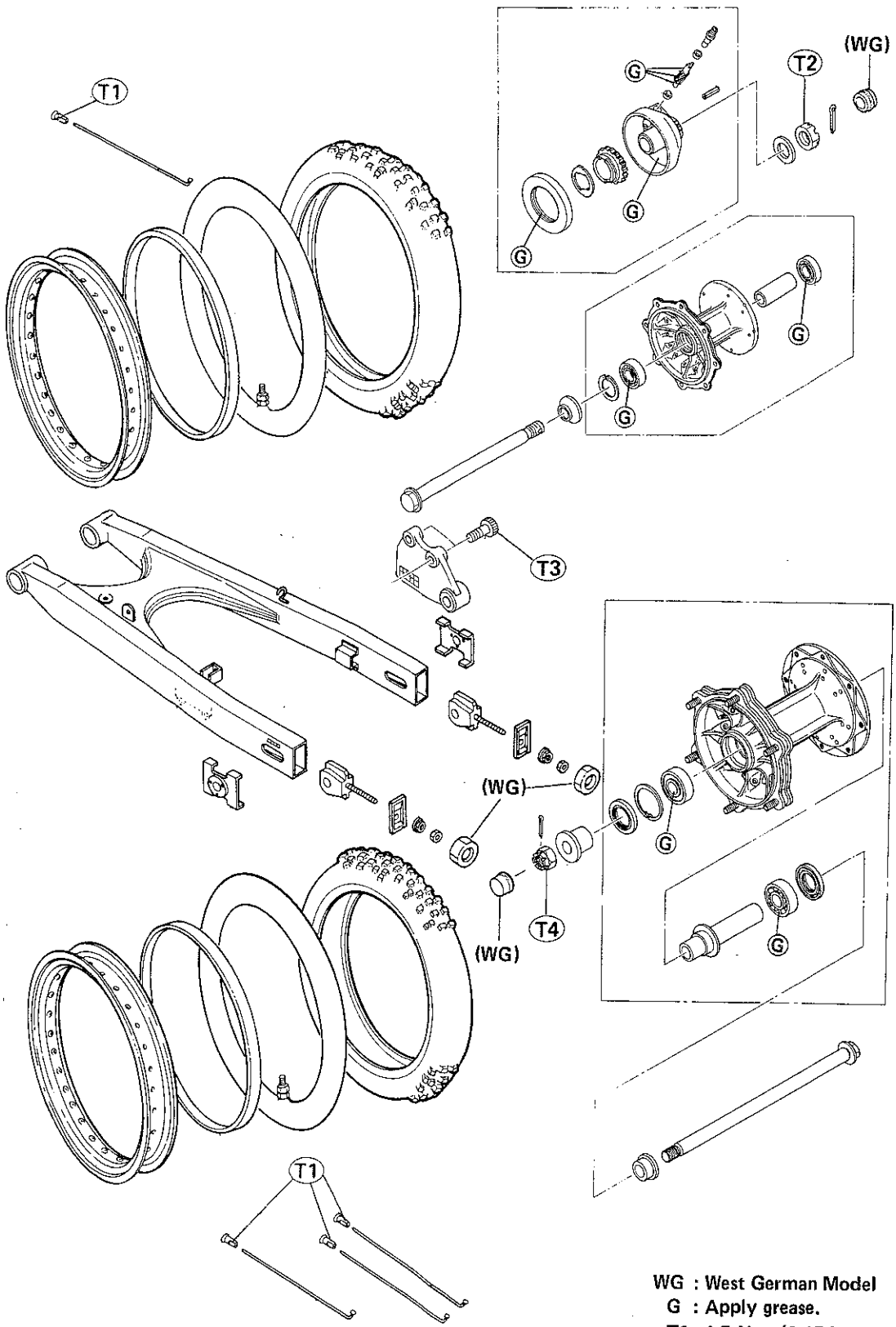
Exploded View 9-2
Specifications 9-3
Special Tools 9-4
Wheels 9-5
- Front Wheel Removal 9-5
- Front Wheel Installation Notes 9-5
- Rear Wheel Removal 9-5
- Rear Wheel Installation Notes 9-5
- Wheel Alignment Inspection 9-6
- Wheel Alignment Adjustment 9-6
- Wheel Inspection 9-6
- Spoke Inspection 9-6
- Rim Inspection 9-6
- Axle Inspection 9-6

Tires 9-7
- Tire Removal 9-7
- Tire Installation Notes 9-7
- Tire Pressure Inspection/Adjustment 9-8
- Tire Inspection 9-8

Hub Bearings 9-9
- Hub Bearing Removal Notes 9-9
- Hub Bearing Installation Notes 9-9
- Hub Bearing Inspection and Lubrication 9-9
- Grease Seal Inspection and Lubrication 9-10

Speedometer Gear Housing 9-10
- Speedometer Gear Housing Disassembly 9-10
- Speedometer Gear Housing Assembly Notes 9-10
- Speedometer Gear Housing Lubrication 9-11

Exploded View



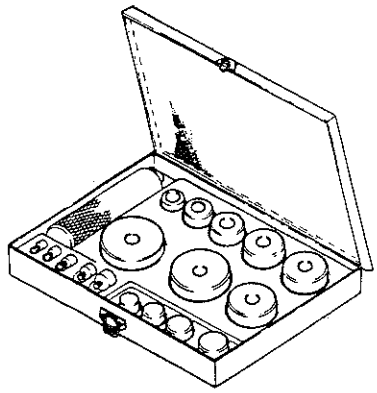
WG : West German Model
G : Apply grease.
T1 : 1.5 N-m (0.15 kg-m, 13 in-lb)
T2 : 49 N-m (5.0 kg-m, 36 ft-lb)
T3 : 25 N-m (2.5 kg-m, 18.0 ft-lb)
T4 : 88 N-m (9.0 kg-m, 65 ft-lb)

Specifications

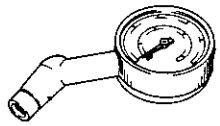
Item		Standard	Service Limit
Wheels:			
Rim runout:	Radial	– – –	2 mm
	Axial	– – –	2 mm
Axle runout/100 mm		Under 0.05 mm	0.2 mm (0.7 mm:RL)
Tires:			
Front tire:	Make & type	DUNLOP K260	– – –
	Tire size	2.75–21 4PR	– – –
	Air pressure	150 kPa (1.5 kg/cm², 21 psi)	– – –
	Tread depth	6.9 mm	2 mm
Rear tire:	Make & type	DUNLOP K260	– – –
	Tire size	4.10–18 4PR	– – –
	Air pressure	Up to 97.5 kg (215 lb) load: 150 kPa (1.5 kg/cm², 21 psi) 97.5 – 186 kg (215 – 410 lb) load: 175 kPa (1.75 kg/cm², 25 psi)	– – –
	Tread depth	9.3 mm	2 mm

Special Tools

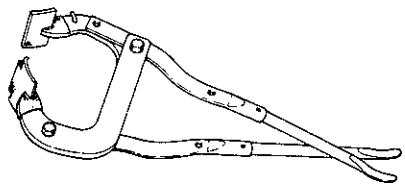
Bearing Driver Set: 57001-1129



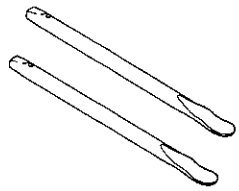
Air Pressure Gauge: 52005-1003



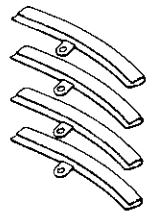
Bead Breaker Ass'y: 57001-1072



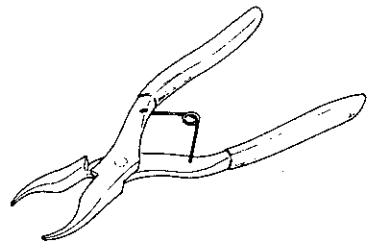
Tire Iron: 57001-1073



Rim Protector: 57001-1063



Inside Circlip Pliers: 57001-143



Wheels

Front Wheel Removal

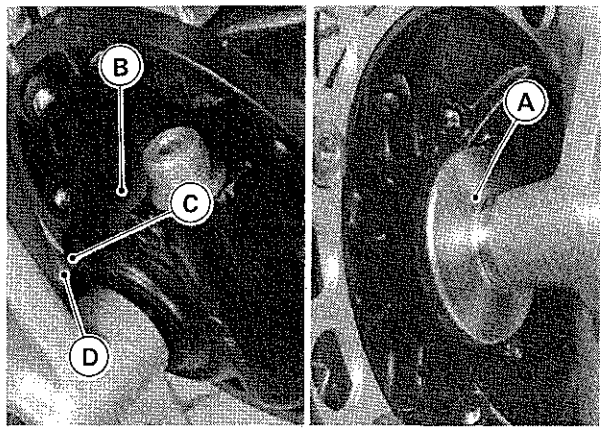
- Remove the speedometer cable lower end.
- Remove the cotter pin, and remove the axle nut and washer.
- Place a stand or block under the motorcycle so that the front wheel is raised off the ground.
- Pull out the axle, and remove the wheel.

CAUTION

Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.

Front Wheel Installation Notes

- Installation is the reverse of removal.
- Install the collar on the left side of the hub.
- Install the speedometer gear housing so that it fits in the speedometer gear drive notches.
- Fit the speedometer gear housing stop to the fork leg stop.



A. Collar
B. Speedometer Gear Housing
C. Housing Stop
D. Fork Leg Stop

- Tighten the axle nut to the specified torque (see Exploded View).
- Install a new cotter pin.
- Check the front brake for weak braking power and brake drag.

WARNING

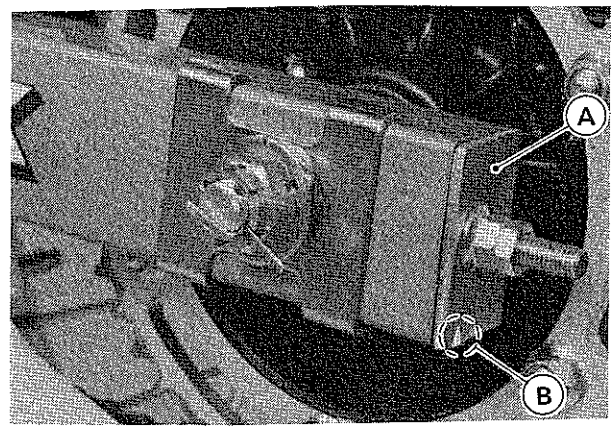
Do not attempt to drive the motorcycle until a full brake lever is obtained by pumping the brake lever until the pads are against the disc. The brake will not function on the first application of the lever if this is not done.

Rear Wheel Removal

- Place a stand or block under the motorcycle so that the rear wheel is raised off the ground.
- Unscrew the caliper mounting bolts, and remove the caliper from the disc.
- Remove the clip from the master link using pliers, and free the drive chain from the rear sprocket.
- Remove the cotter pin, and axle nut.
- Pull out the axle, and remove the chain adjuster, brake holder, and rear wheel.

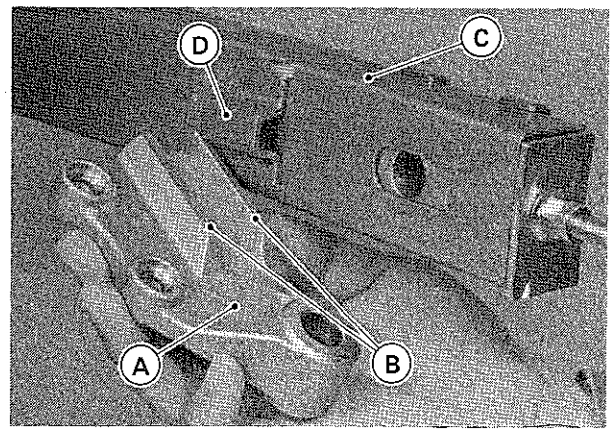
Rear Wheel Installation Notes

- Installation is the reverse of removal.
- Install the chain adjuster caps with the boss down.



A. Cap
B. Boss

- Fit the brake holder stop against the swing arm stop.



A. Brake Holder
B. Stop
C. Swing Arm
D. Stop

- Adjust the drive chain slack (see Drive Chain Slack Inspection in the Final Drive chapter).
- Tighten the axle nut to the specified torque (see Exploded View).
- Install a new cotter pin.
- Tighten the caliper mounting bolts to the specified torque (see Exploded View in the Brake chapter).
- Check the rear brake for weak braking power and brake drag.

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.**

Wheel Alignment Inspection

- Refer to Wheel Alignment Inspection in the Final Drive chapter.

Wheel Alignment Adjustment

- Refer to Wheel Alignment Adjustment in the Final Drive chapter.

Wheel Inspection

- Place a stand or block under the motorcycle so that the front/rear wheel is raised off the ground.
- Spin the wheel lightly, and check for roughness of binding.

★If roughness or binding is found, replace or lubricate the hub bearings.

- Visually inspect the front and rear axles for damages.

★If axle is damaged or bent, replace it.

Spoke Inspection

- Check that all the spokes are tightened evenly.

★If spoke tightness is uneven or loose, tighten the spoke nipples to the specified torque evenly (see Exploded View).

- Check the rim runout.

WARNING

○**If any spoke breaks, it should be replaced immediately. A missing spoke places an additional load on the other spokes, which will eventually cause other spokes to break.**

Rim Inspection

- Inspect the rim for small cracks, dents, bending, or warping.

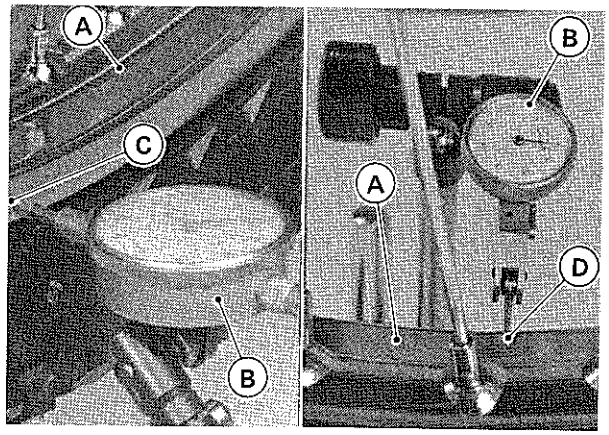
★If there is any damage to the rim, it must be replaced.

- Set a dial gauge against the side of the rim, and rotate the rim to measure the axial runout. The difference between the highest and lowest dial readings is the amount of runout.
- Set a dial gauge against the outer circumference of the rim, and rotate the rim to measure radial runout. The difference between the highest and lowest dial readings is the amount of runout.

★If rim runout exceeds the service limit, check the wheel bearings first. Replace them if they are damaged. If the problem is not due to the bearings, correct the rim warp (runout). A certain amount of rim warp can be corrected by recentering the rim. Loosen some spokes and tighten others within the standard torque to change the position of different parts of the rim. If the rim is badly bent, however, it must be replaced.

Rim Runout (with tire installed)

	Service Limit
Axial	2 mm
Radial	2 mm



A. Rim
B. Dial Gauge
C. Axial Rim Runout
D. Raidal Rim Runout

Axle Inspection

- Place the axle in V blocks that are 100 mm apart, and set a dial gauge on the axle at a point halfway between the blocks. Turn the axle to measure the runout. The difference between the highest and lowest dial readings is the amount of runout.

★If runout exceeds the replace limit, replace it.

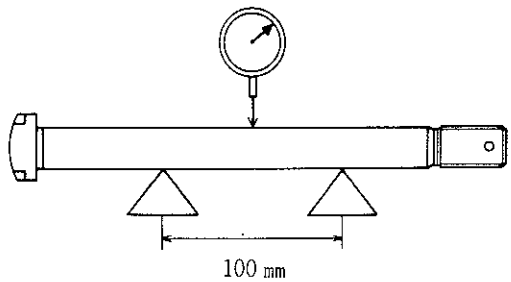
★If runout only exceeds the service limit, straighten the axle.

★If the axle cannot be straightened to within service limit, replace the axle.

Axle Runout/100 mm

Service Limit:	**0.2 mm**
Replace Limit:	**0.7 mm**

Axle Runout



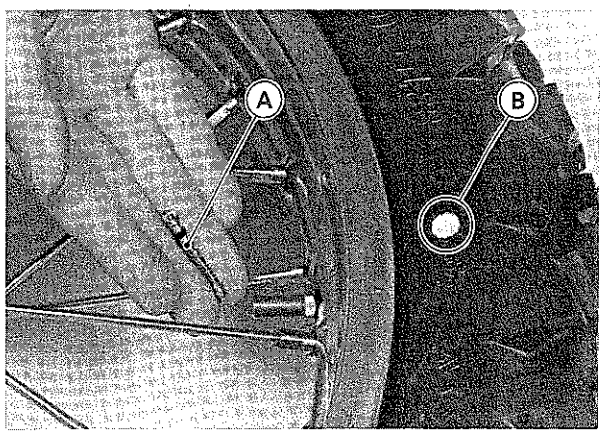
Tires

Tire Removal

CAUTION

○**Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so the disc does not touch the ground.**

●Remove the wheel from the motorcycle (see Wheels).
●To maintain wheel balance, mark the valve stem position on the tire with chalk so that the tire can be reinstalled in the same position.
●Take out the valve core to let out the air.



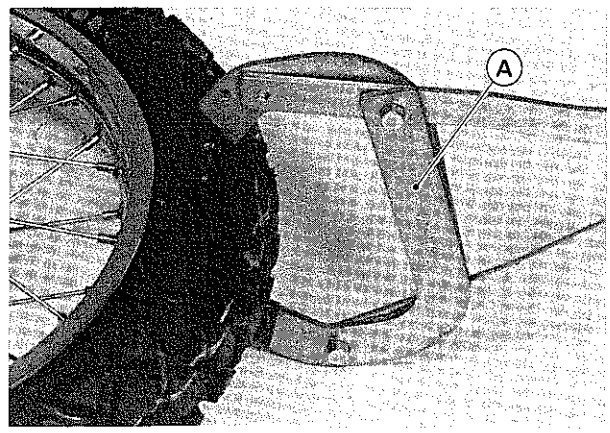
A. Unscrew valve core. B. Mark valve stem position.

○When handling the rims, be careful not to damage the aluminum rim flanges.
●Lubricate the tire beads and rim flanges on both sides with a soap and water solution or rubber lubricant. This helps the tire beads slip off the rim flanges.

CAUTION

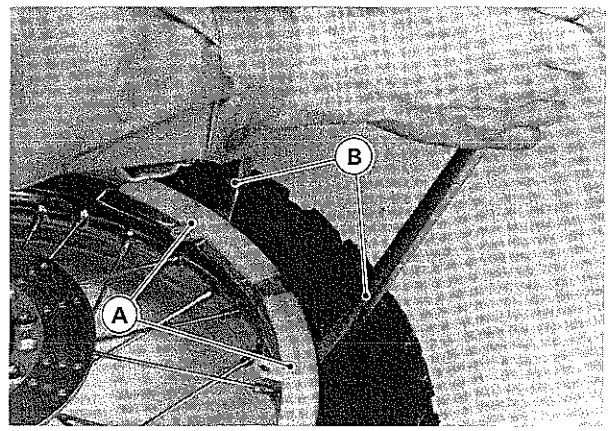
○**Never lubricate with mineral oil (engine oil) or gasoline because they will cause deterioration of the tire.**

●Break the beads away from both sides of the rim with the bead breaker (special tool).



A. Bead Breaker: 57001-1072

●Pry the tire off the rim with tire irons (special tool) protecting the rim with rim protectors (special tool).



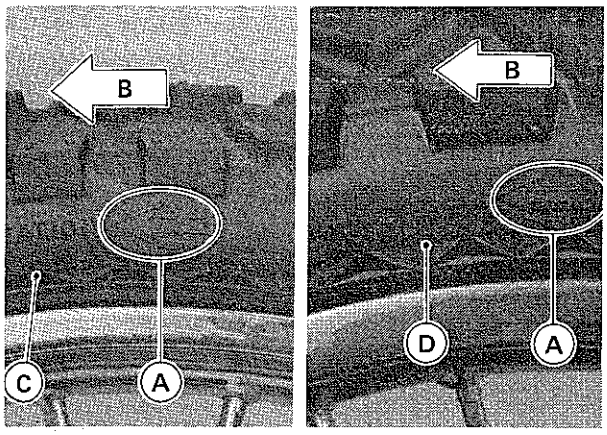
A. Rim Protectors: 57001-1063
B. Tire Irons: 57001-1073

Tire Installation Notes

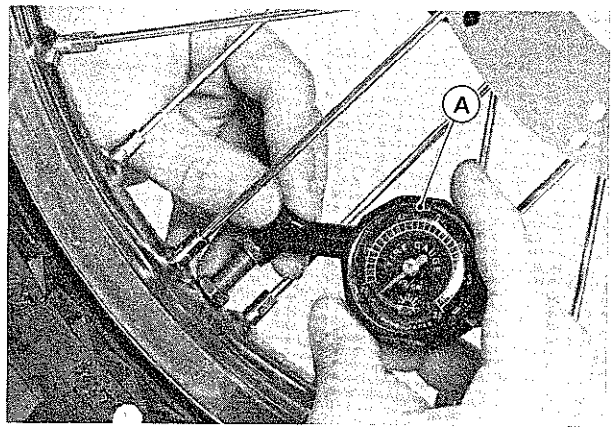
●Installation is the reverse of removal (see Wheels).
●Check the tire rotation mark on the front/rear tire and install it on the rim accordingly.

NOTE

○*The direction of the tire rotation is shown by an arrow on the tire sidewall.*

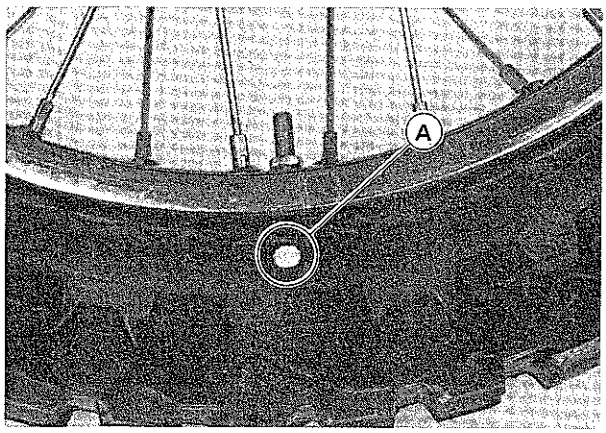


A. Arrow Mark (Rotation Mark)
B. Rotating Direction
C. Front Tire
D. Rear Tire



A. Air Pressure Gauge: 52005-1003

●Position the tire on the rim so that the valve is at the tire balance mark (the chalk mark made during removal or the yellow paint mark on a new tire).



A. Balance Mark

●Check and adjust the air pressure after installing.

Tire Pressure Inspection/Adjustment

●Using tire pressure gauge (special tool), measure the tire pressure when the tires are cold.
★Adjust the tire pressure according to the following specifications, if necessary.

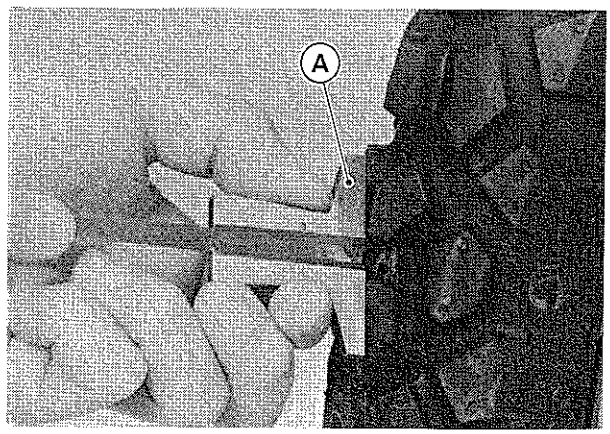
Tire Air Pressure (when cold)

Front tire:	**150 kPa (1.5 kg/cm^2, 21 psi)**
Rear tire:	**Up to 97.5 kg (215 lb) load:**
	150 kPa (1.5 kg/cm^2, 21 psi)
	97.5 – 186 kg (215 – 410 lb) load:
	175 kPa (1.75 kg/cm^2, 25 psi)

Tire Inspection

As the tire tread wears down, the tire becomes more susceptible the puncture and failure. An accepted estimate is that 90% of all tire failures occur during the last 10% of tread life (90% worn). So it is false economy and unsafe to use the tires until they are bald.

●Remove any imbedded stones or other foreign particles from the tread.
●Visually inspect the tire for cracks and cuts, replacing the tire in case of bad damage. Swelling or high spots indicate internal damage, requiring tire replacement.
●Measure the tread depth at the center of the tread with a depth gauge. Since the tire may wear unevenly, take measurements at several places.
★If any measurement is less than the service limit, replace the tire.



A. Tire Depth Gauge

Tire Tread Depth

Front	
Standard:	**6.9 mm**
Service Limit:	**2 mm**
Rear	
Standard:	**9.3 mm**
Service Limit:	**2 mm**

WARNING

○To ensure safe handling and stability, use only the recommended standard tires for replacement, inflated to the standard pressure.

NOTE

○Check and balance the wheel when a tire is replaced with a new one.

Standard Tire

Front	
Size:	2.75-21 4PR
Make, Type:	DUNLOP K260
Rear	
Size:	4.10-18 4PR
Make, Type:	DUNLOP K260

Hub Bearings

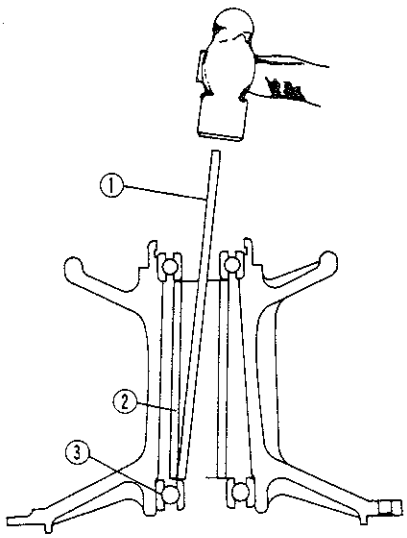
CAUTION

○Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so the disc does not touch the ground.

Hub Bearing Removal Notes

●Remove the hub bearing by tapping evenly around the bearing inner race as shown.

Bearing Removal



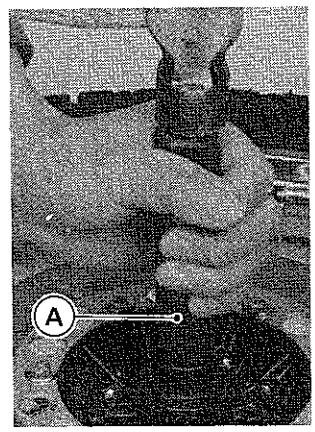
1. Bar
2. Distance Collar
3. Hub Bearing

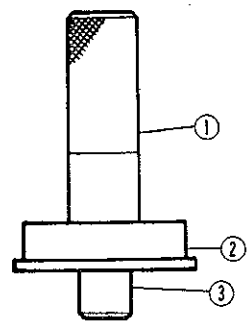
Hub Bearing Installation Notes

●Before installing the wheel bearings, blow any dirt or foreign particles out of the hub with compressed air to prevent contamination of the bearings.

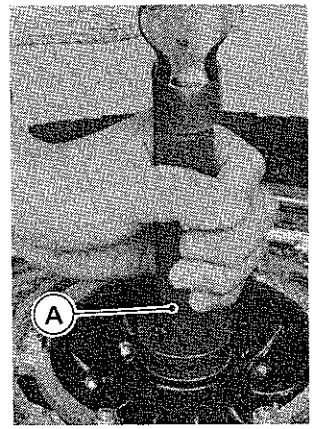
●Inspect the bearings and replace them if necessary. Lubricate them and install them using the bearing driver set (special tool) so that the marked or shielded sides face out.

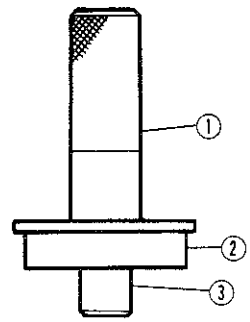
Front Hub Bearing





Rear Hub Bearing





A. Bearing Driver Set: 57001-1129
1. Bearing Driver Holder
2. Bearing Driver
3. Bearing Driver

●Inspect the grease seal and replace if necessary. Press it in until it stops at the circlip in the hole using the same special tools used for bearing installation.

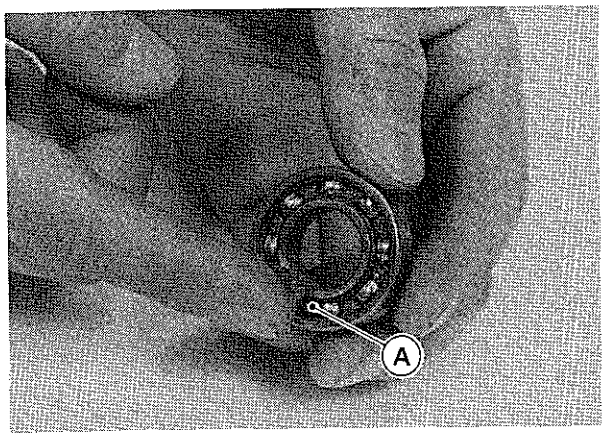
Hub Bearing Inspection and Lubrication

Since the wheel bearings are made to extremely close tolerances, the clearance cannot normally be measured.

- Wash the bearing with a high flash point solvent, dry it (do not spin it while it is dry), and oil it. Spin it by hand to check its condition.

★If it is noisy, does not spin smoothly, or has any rough spots, it must be replaced.

★If the bearing is to be used again, rewash it with a quality flash point solvent, dry it and pack it with good bearing by hand a few times to make sure the grease is distributed uniformly inside the bearing, and wipe the old grease out of the hub before bearing installation.



A. Grease.

- Examine the bearing seal for tears or leakage.

★If the seal is torn or is leaking, replace the bearing.

Grease Seal Inspection and Lubrication

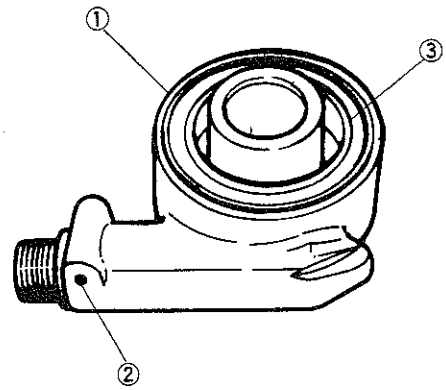
If the grease seals are examined without removing the seals themselves, look for discoloration (indicating the rubber has deteriorated), hardening, damage to the internal ribbing, or other damage. If the seal or internal ribbing has hardened, the clearance between the seal and the axle sleeve will not be taken up, which will allow dirt and moisture to enter and reach the bearing. If in doubt as to its condition and whenever a seal is removed for greasing the bearing, the seal should be replaced. The seals are generally damaged upon removal.

Speedometer Gear Housing

Speedometer Gear Housing Disassembly

- Pull the speedometer gear housing and collar off the front wheel.
- Pull out the grease seal using a hook.

Speedometer Gear Housing



1. Speedometer Gear Housing
2. Pin
3. Grease Seal

- Pull out the speedometer gear.
- If the speedometer cable bushing or speedometer pinion needs to be removed, first drill the housing through the pin using a 1.0 to 1.5 mm drill bit. Drill the housing from the under side using a 3.0 to 3.5 mm drill bit. Using a suitable tool, tap out the pin, and then pull out the speedometer cable bushing, pinion, and washers.

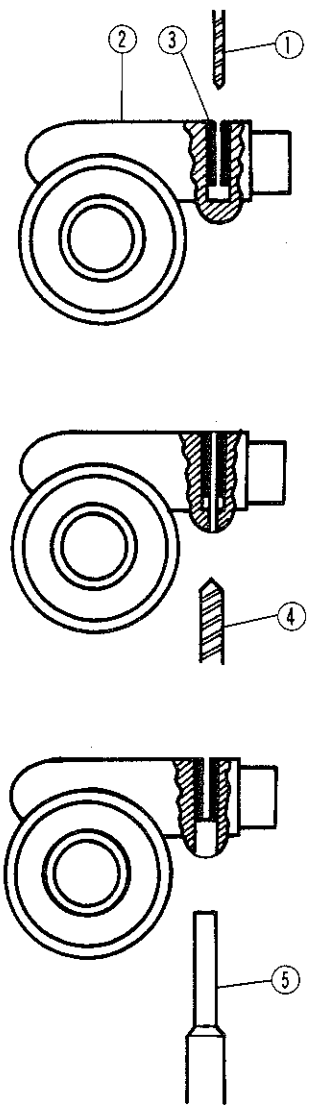
NOTE

○*It is recommended that the assembly be replaced rather than attempting to repair the components.*

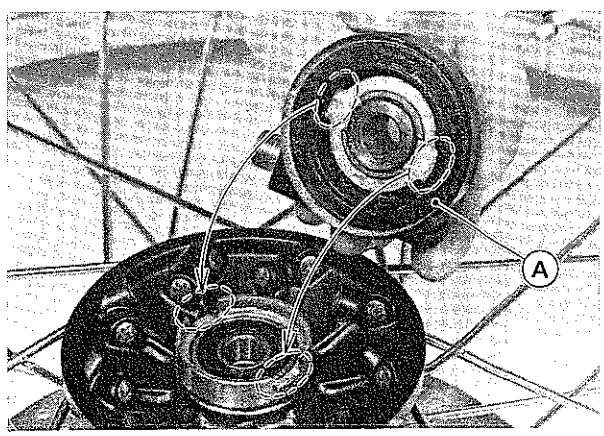
Speedometer Gear Housing Assembly Notes

- Assembly is the reverse of disassembly.
- After inserting a new pin, stake the housing hole to secure the pin in place.
- Replace the grease seal with a new one. Apply a little grease to the seal. Install it using a press or a suitable driver so that the face of the seal is level with the surface of the housing.
- Regrease the speedometer gear.
- Install the speedometer gear housing so that it fits in the speedometer gear drive notches.

Speedometer Gear Housing Pin Removal



1. 1 – 1.5 mm Bit
2. Housing
3. Pin
4. 3 – 3.5 mm Bit
5. 3 mm Rod

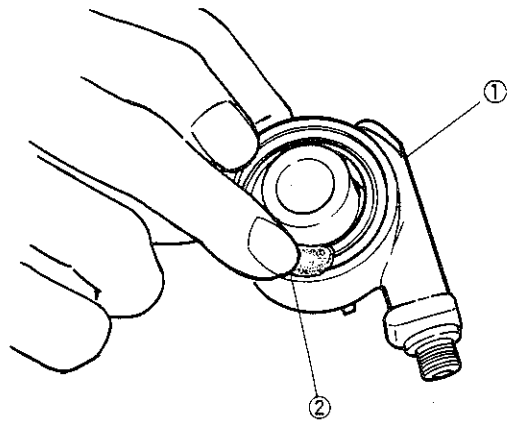


A. Speedometer Gear Housing
B. Fit in the gear drive notches.

Speedometer Gear Housing Lubrication

- Clean and grease the speedometer gear housing.

Speedometer Gear Housing Lubrication



1. Speedometer Gear Housing
2. Grease.

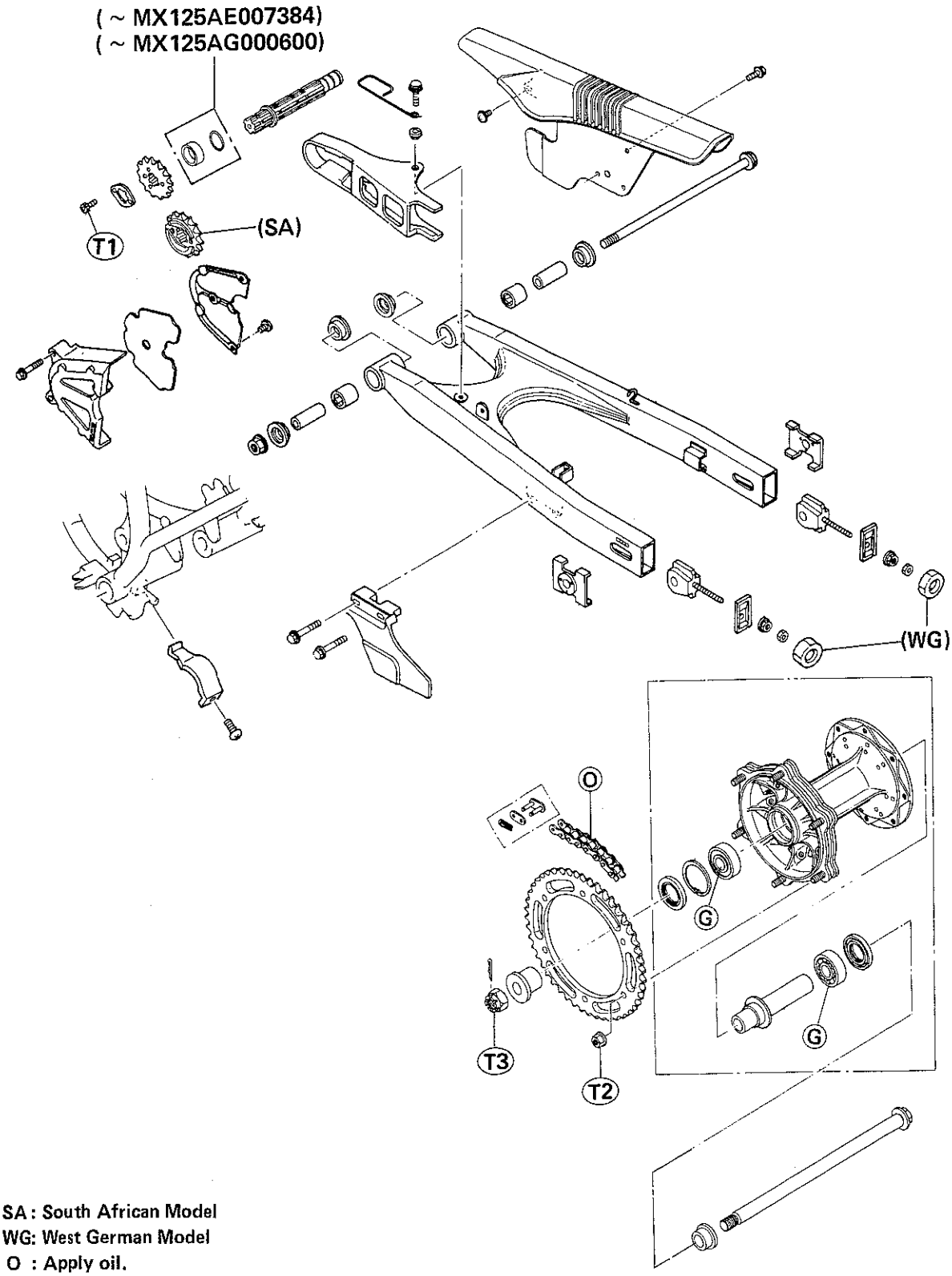
Final Drive

Table of Contents

Exploded View 10-2
Specifications 10-3
Special Tools 10-3
Drive Chain 10-4
- Drive Chain Slack Inspection 10-4
- Drive Chain Slack Adjustment 10-4
- Wheel Alignment Inspection 10-4
- Wheel Alignment Adjustment 10-5
- Drive Chain Wear Inspection 10-5
- Drive Chain Lubrication 10-5
- Drive Chain Removal 10-5
- Drive Chain Installation Notes 10-5

Sprocket 10-6
- Engine Sprocket Removal 10-6
- Engine Sprocket Installation Notes 10-6
- Rear Sprocket Removal 10-6
- Rear Sprocket Installation Notes 10-6
- Sprocket Wear Inspection 10-7
- Sprocket Warp Inspection 10-7

Exploded View



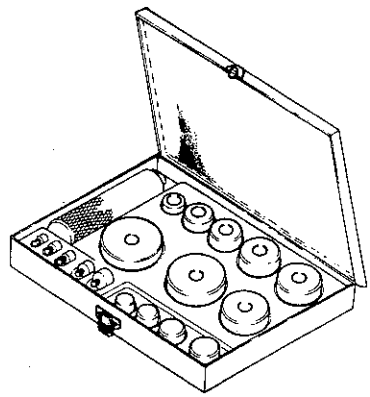
SA : South African Model
WG: West German Model
O : Apply oil.
G : Apply grease.
T1: 12 N-m (1.2 kg-m, 8.5 ft-lb)
T2: 27 N-m (2.8 kg-m, 20 ft-lb)
T3: 88 N-m (9.0 kg-m, 65 ft-lb)

Specifications

Item		Standard	Service Limit
Drive Chain:			
	Make and type	Enuma	– – –
		EK428SH-R 124 Link	– – –
	Chain slack	40 – 50 mm	Less than 40 mm, or more than 55 mm
	20-link length	254.0 – 254.6 mm	260 mm
Sprockets:			
	Engine sprocket diameter	48.37 – 48.57 mm/14 T	47.7 mm
	Rear sprocket diameter	185.73 – 186.23 mm/48 T	185.43 mm
	Rear sprocket warp	Under 0.4 mm	0.5 mm

Special Tools

Bearing Driver Set: 57001-1129



Drive Chain

Drive Chain Slack Inspection

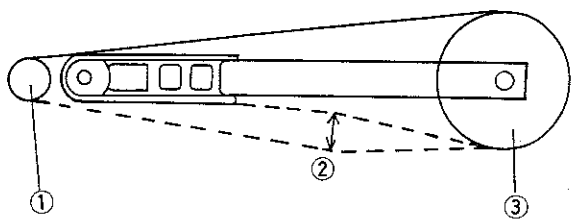
•Stand the motorcycle with its side stand.
•Check the wheel alignment (see Wheel Alignment Inspection), and adjust it if necessary (see Wheel Alignment Adjustment).

NOTE

○*Clean the drive chain if it is dirty, and lubricate it if it appears dry.*

•Rotate the rear wheel to find the position where the chain is tightest.
•Measure the vertical movement as shown.
★If the drive chain slack exceeds the standard, adjust it.

Drive Chain Slack Inspection



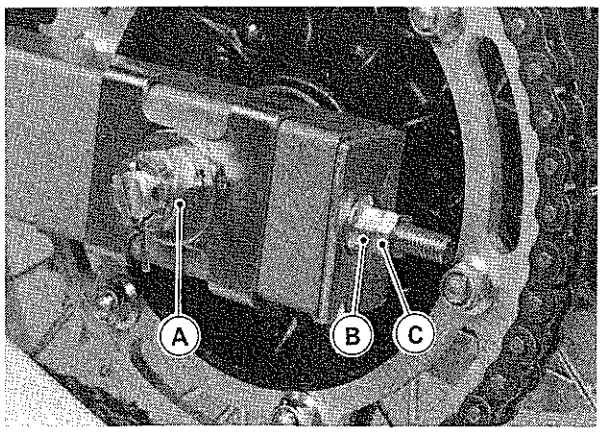
1. Engine Sprocket
2. Chain Vertical Movement (Slack)
3. Rear Sprocket

Drive Chain Slack

Standard: 40 – 50 mm

Drive Chain Slack Adjustment

•Loosen the left and right chain adjuster locknuts.
•Pull out the cotter pin, and loosen the axle nut.



A. Axle Nut
B. Adjusting Nut
C. Locknut

•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.
•If the chain is too loose, turn both chain adjusting nuts evenly until the drive 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 as the right chain adjuster notch.
•Tighten the axle nut loosely, and tighten the left and right adjusting nuts slightly. Take care not to change the adjustment during the adjusting nut tighening.
•Tighten both chain adjuster locknuts securely.
•Tighten the axle nut to the specified torque (see Exploded View).
•Rotate the wheel, measure the chain slack again at the tightest position, and readjust if necessary.
•Insert a new cotter pin through the axle nut and axle, and spread its ends.

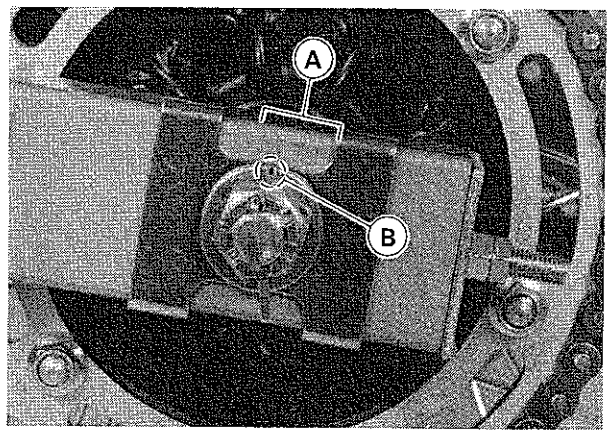
WARNING

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

•Check the rear brake for weak braking power, and brake drag (see the Brakes chapter).

Wheel Alignment Inspection

•Check that the notch on the left chain adjuster alignes with the same swing arm mark as the right chain adjuster.



A. Mark B. Notch

NOTE

○*Wheel alignment can also be checked using the straightedge or string method.*

WARNING

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

Wheel Alignment Adjustment

This procedure is the same as Drive Chain Slack Adjustment.

Drive Chain Wear Inspection

- Remove the chain cover, and chain guard.
- Rotate the rear wheel to inspect the drive chain for damaged rollers, and loose pins and links.
- ★If there is any irregularity, replace the drive chain.
- ★Lubricate the drive chain if it appears dry.
- Stretch the chain taut by hanging a 98 N (10 kg, 20 lb) weight on the chain.
- Measure the length of 20 links on the straight part of the chain from the pin center of the 1st pin to the pin center of the 21st pin. Since the chain may wear unevenly, take measurements at several places.
- ★If any measurements exceed the service limit, replace the chain. Also, replace the front and rear sprockets when the drive chain is replaced.

Drive Chain 20-Link Length

Standard:	**254.0 – 254.6 mm**
Service Limit:	**260 mm**

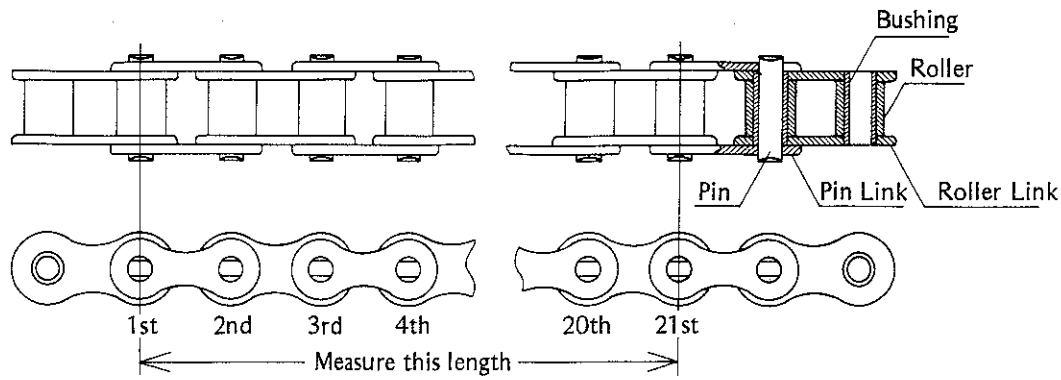
WARNING

○**If the drive chain wear exceeds the service limit, replace the chain or an unsafe riding condition may result. A chain that breaks or jumps off the sprockets could sag on the engine sprocket or lock the rear wheel, severely damaging the motorcycle and causing it to go out of control.**

Drive Chain

Make	Enuma
Type	EK428SH-R
Link	124

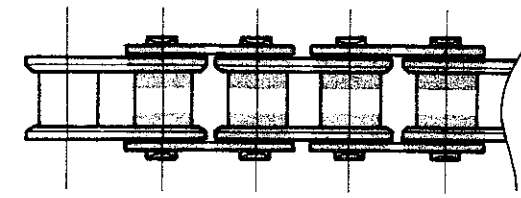
Drive Chain Wear Inspection



Drive Chain Lubrication

- If the chain appears especially dirty, it should be cleaned before lubrication with high flash point solvent.
- Apply oil to the sides of the rollers so that oil will penetrate to the rollers and bushings.
- Wipe off any excess oil.

Drive Chain Lubrication



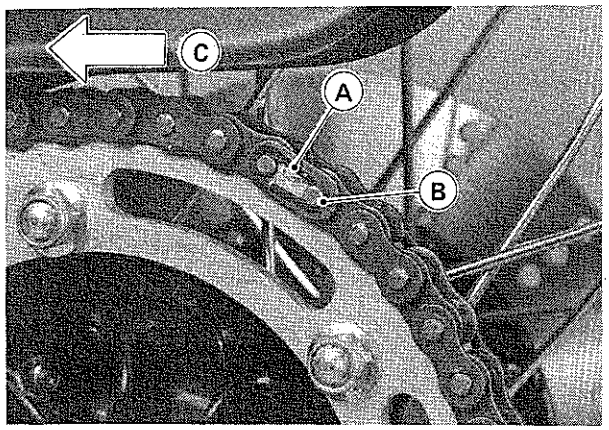
: Apply oil.

Drive Chain Removal

- Remove the engine sprocket cover.
- Remove the clip from the master link using pliers, and free the drive chain from the rear sprocket.
- Remove the drive chain from the chassis.

Drive Chain Installation Notes

- Installation is the reverse of removal.
- Fit the drive chain back onto the sprockets with the ends at the rear sprocket.
- Install the master link from the frame side.
- Install the clip so that the open end faces away from the direction of chain rotation.



A. Clip
B. Open End
C. Direction of Open End Drive Chain Rotation.

•Adjust the drive chain slack (see Drive Chain Slack Adjustment).
•Check the brake for weak braking power, and brake drag (see the Brakes chapter).

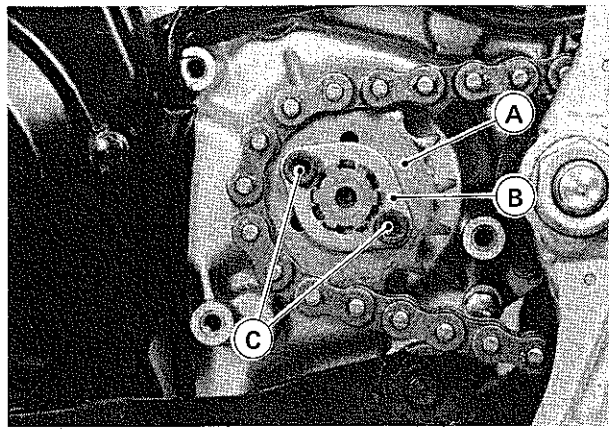
Sprocket

Engine Sprocket Removal

•Remove the following parts.
Engine Sprocket Cover
Engine Sprocket Bolts
Holding Plate
Drive Chain (free)
•Remove the engine sprocket.

Engine Sprocket Installation Notes

•Installation is the reverse of removal.
•Tighten the engine sprocket bolts to the specified torque (see Exploded View).



A. Engine Sprocket
B. Holding Plate
C. Sprocket Bolts

Rear Sprocket Removal

•Remove the rear wheel (see Rear Wheel Removal in the Wheels/Tires chapter).

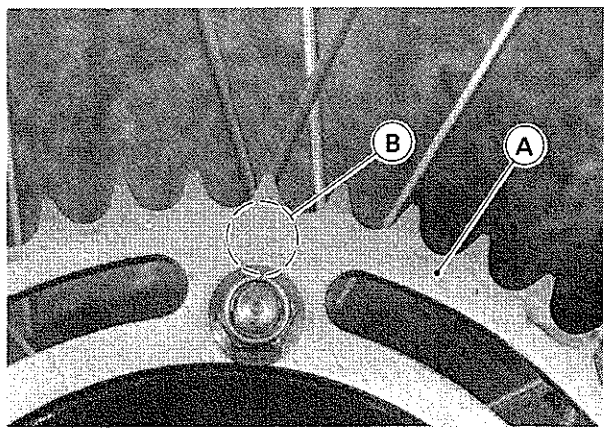
CAUTION

○**Do not lay the wheel on the ground with the disc facing down. This can damage of warp the disc. Place blocks under the wheel so that the disc does not touch the ground.**

•Unscrew the rear sprocket nuts, and remove the rear sprocket.

Rear Sprocket Installation Notes

•Installation is the reverse of removal.
•Install the rear sprocket so that the marked side faces out.
•Tighten the rear sprocket nuts to the specified torque (see Exploded View).



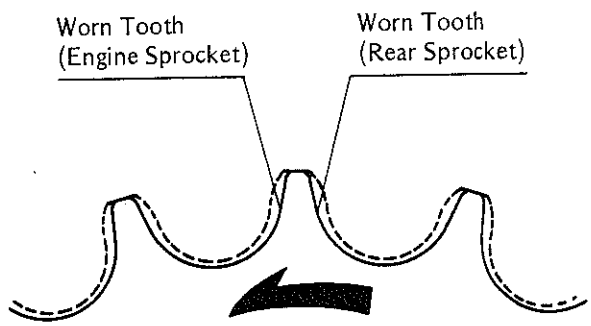
A. Rear Sprocket
B. Mark

Sprocket Wear Inspection

●Visually inspect the front and rear sprocket teeth for wear and damage.

★If they are worn as illustrated or damaged, replace the sprocket.

Sprocket Wear Inspection



●Measure the diameter of the sprocket at the base of the teeth.

★If the sprocket is worn down to less than the service limit, replace the sprocket.

Sprocket Diameter

Engine Sprocket	
Standard:	**48.37 – 48.57 mm**
Service Limit:	**47.7 mm**
Rear Sprocket	
Standard:	**185.73 – 186.23 mm**
Service Limit:	**185.43 mm**

NOTE

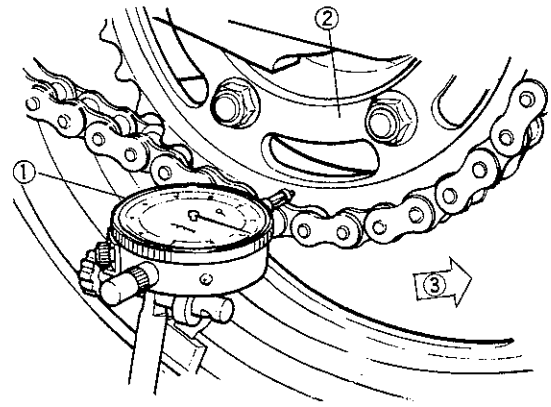
○*If a sprocket requires replacement, the chain is probably worn also. When replacing a sprocket, inspect the chain.*

Sprocket Warp Inspection

●Elevate the rear wheel so that it will turn freely, and set a dial gauge against the rear sprocket near the teeth as shown. Rotate the rear wheel. The difference between the highest and lowest dial gauge readings is the amount of runout (warp).

★If the runout exceeds the service limit, replace the rear sprocket.

Sprocket Warp Inspection



1. Dial Gauge
2. Rear Sprocket
3. Rotate

Rear Sprocket Warp

Standard:	**Under 0.4 mm**
Service Limit:	**0.5 mm**

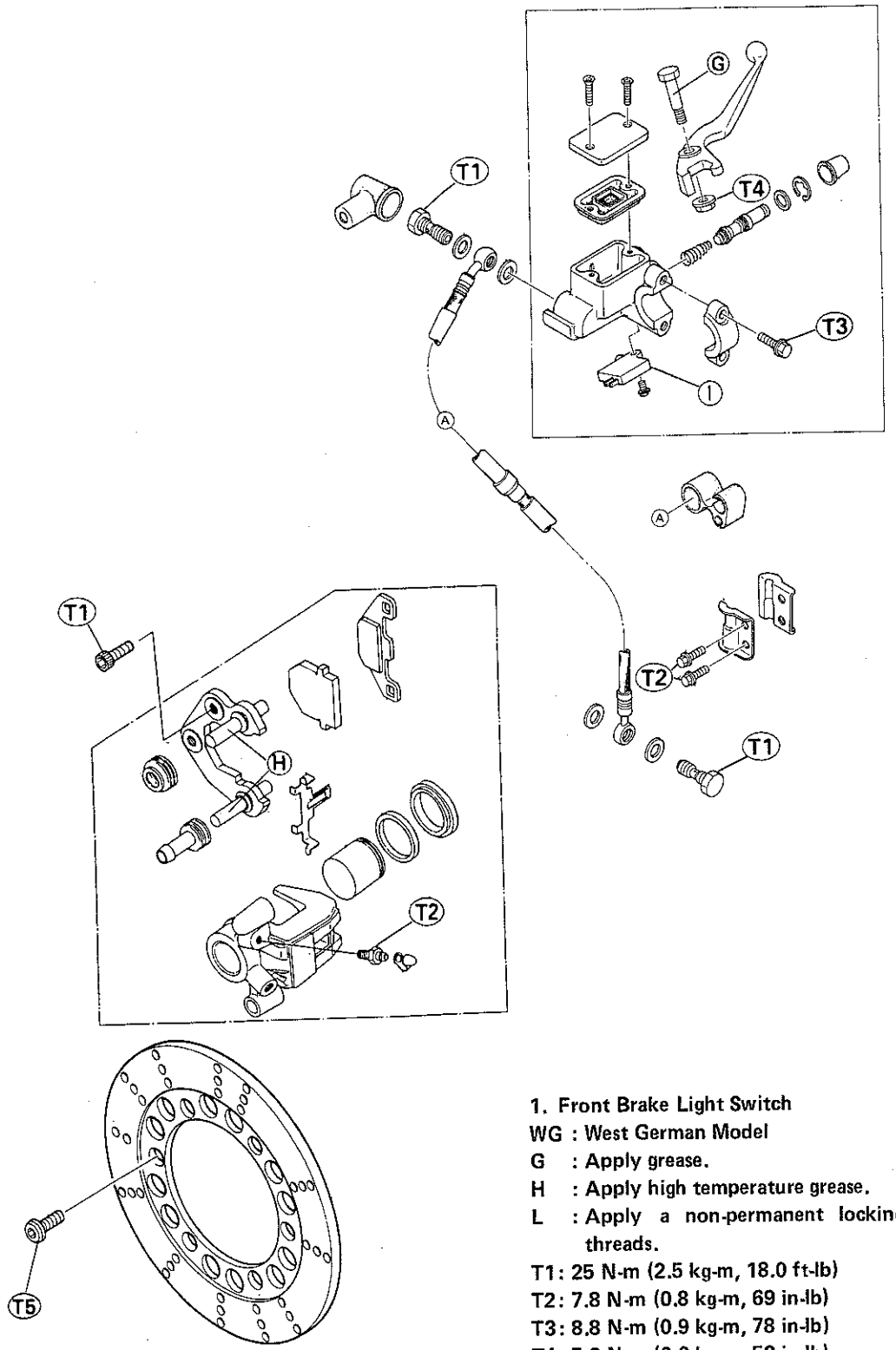
Brakes

Table of Contents

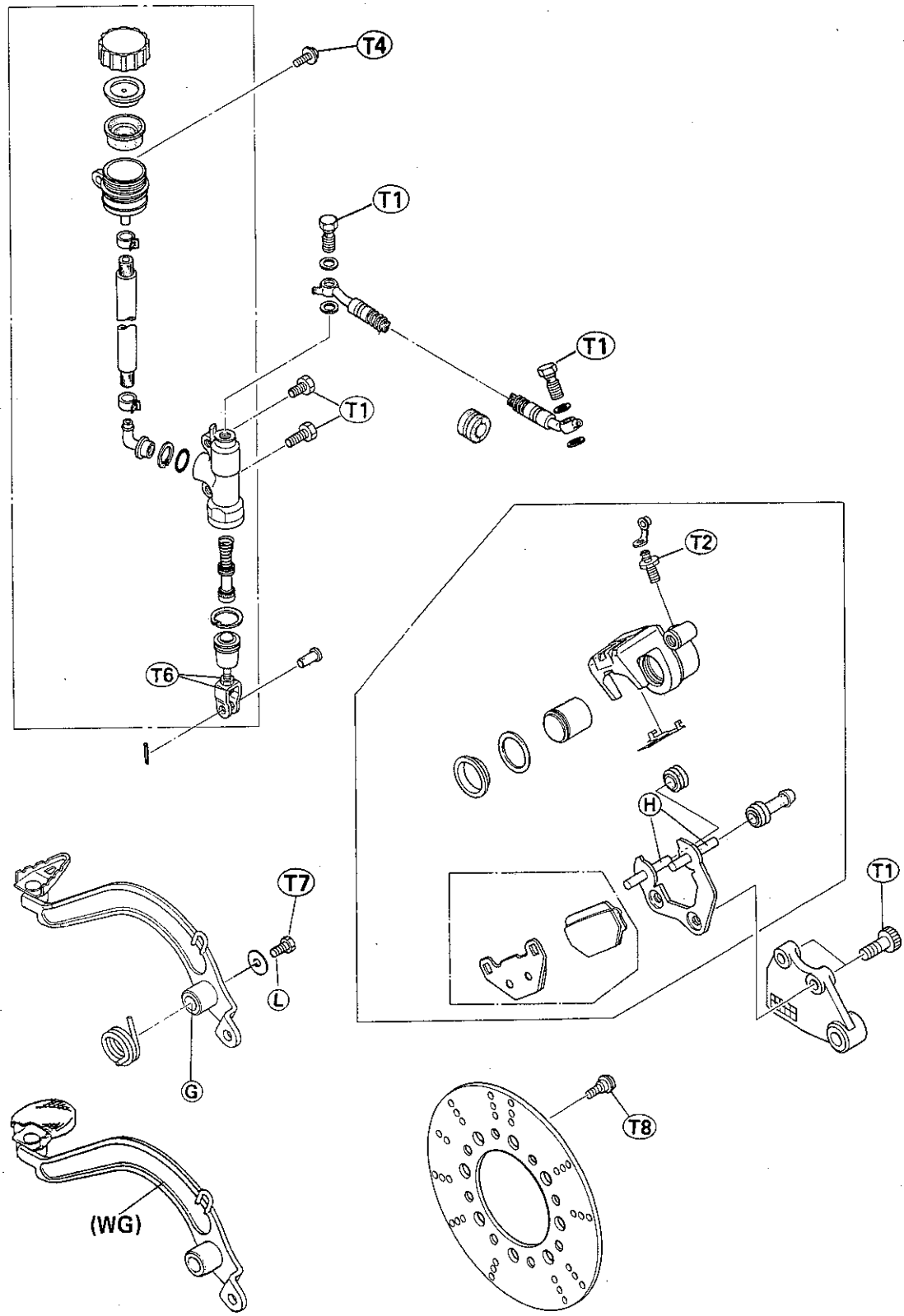
Exploded View 11-2
Specifications 11-4
Special Tool 11-4
Brake Adjustment 11-5
  Brake Lever/Pedal Free Play Inspection/Adjustment 11-5
  Brake Pedal Position Inspection 11-5
  Brake Pedal Position Adjustment 11-5
Caliper 11-5
  Caliper Removal 11-5
  Caliper Installation Notes 11-6
  Caliper Disassembly 11-6
  Caliper Assembly 11-6
  Fluid Seal Damage 11-7
  Fluid Seal Damage 11-7
  Dust Seal, Cover and Shaft Rubber Friction Boot Damage 11-8
  Piston Cylinder Damage 11-8
  Caliper Holder Shaft Wear 11-8
Brake Pads 11-8
  Pad Removal 11-8
  Pad Installation 11-8
  Pad Inspection 11-8
Master Cylinder 11-8
  Front Master Cylinder Removal 11-9
  Front Master Cylinder Installation Notes 11-9
  Rear Master Cylinder Removal 11-9
  Rear Master Cylinder Installation Notes 11-10
  Front Master Cylinder Disassembly 11-10
  Rear Master Cylinder Disassembly 11-10
  Master Cylinder Assembly Notes 11-10
  Master Cylinder Inspection (Visual Inspection) 11-10
Brake Disc 11-11
  Disc Inspection 11-11
Brake Fluid 11-12
  Brake Fluid Level Inspection 11-12
  Brake Fluid Change 11-12
    Brake Fluid Requirement 11-12
    Changing Brake Fluid 11-12
  Bleeding the Brake Line 11-13
Brake Hose 11-14
  Brake Hose Removal/ Installation Notes 11-14
  Brake Hose Inspection 11-14

11

Exploded View



1. Front Brake Light Switch
WG : West German Model
G : Apply grease.
H : Apply high temperature grease.
L : Apply a non-permanent locking agent to the threads.
T1: 25 N-m (2.5 kg-m, 18.0 ft-lb)
T2: 7.8 N-m (0.8 kg-m, 69 in-lb)
T3: 8.8 N-m (0.9 kg-m, 78 in-lb)
T4: 5.9 N-m (0.6 kg-m, 52 in-lb)
T5: 23 N-m (2.3 kg-m, 16.5 ft-lb)
T6: 17.2 N-m (1.75 kg-m, 152 in-lb)
T7: 9.8 N-m (1.0 kg-m, 7.0 ft-lb)
T8: 15 N-m (1.5 kg-m, 11.0 ft-lb)

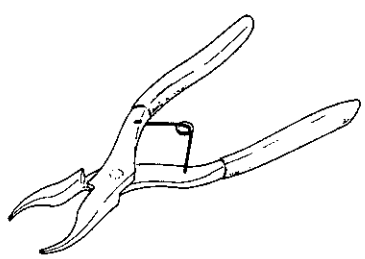

T4
T1
T1
T1
T6
T2
H
T1
T7
L
G
(WG)
T8

Specifications

Item		Standard	Service Limit
Brake Adjustment:			
Brake lever		Non-adjustable	– – –
Brake pedal position		15 – 25 mm	– – –
		(lower than the footpeg top)	
Brake light switch:	Front	Non-adjustable	– – –
	Rear	On after about 15 mm pedal travel	– – –
Brake Pads:			
Pad lining thickness:	Front	3.7 mm	1 mm
	Rear	4.5 mm	1 mm
Brake Discs:			
Disc thickness:	Front	2.8 – 3.1 mm	2.5 mm
	Rear	3.8 – 4.1 mm	3.5 mm
Disc runout		Not more than 0.20 mm	0.3 mm
Brake Fluid:			
Recommended disc brake fluid:			
	Type	D.O.T.3	– – –
	Brand	Atlas Extra Heavy Duty	– – –
		Shell Super Heavy Duty	– – –
		Texaco Super Heavy Duty	– – –
		Wagner Lockheed Heavy Duty	– – –
		Castrol Girling-Universal	– – –
		Castrol GT (LMA)	– – –
		Castrol Disc Brake Fluid	– – –

Special Tool

Inside Circlip Pliers: 57001-143



Brake Adjustment

Brake Lever/Pedal Free Play Inspection/Adjustment

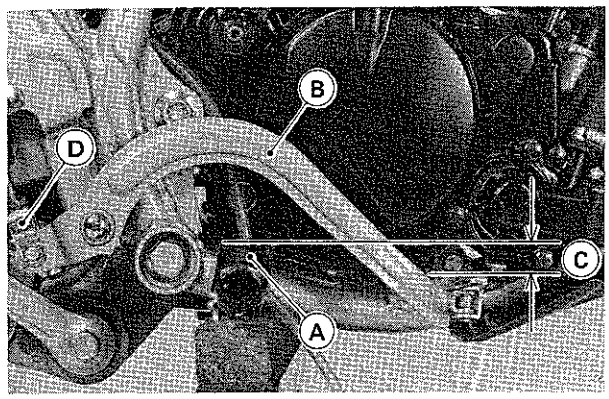
Disc and disc pad wear is automatically compensated for and has no effect on brake lever/pedal action. So brake lever/pedal free play inspection/adjustment are not needed. If the brake lever/pedal has a soft, or "spongy feeling", check the brake fluid level in the reservoir and bleed the air from the brake line (see Bleeding the Brake Line).

Brake Pedal Position Inspection

•When the brake pedal is released, it should return to the position specified.

Brake Pedal Position

Standard: 15 — 25 mm (lower than the footpeg top)

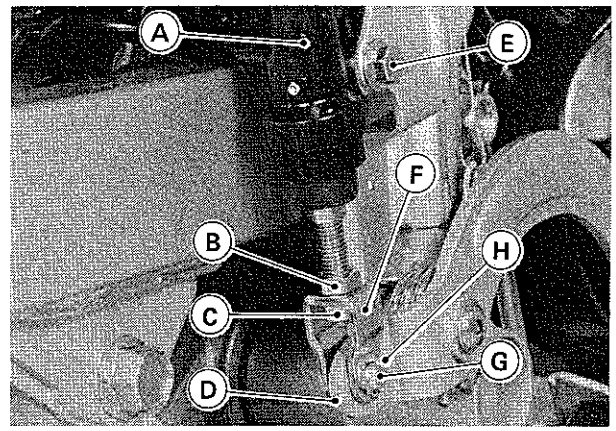


A. Footpeg
B. Brake Pedal
C. Brake Pedal Position
D. Adjuster

★If it does not, adjust the brake pedal position.

Brake Pedal Position Adjustment

•Loosen the adjuster locknut.
•Pull out the cotter pin, and remove the joint pin.
•Unscrew the mounting bolts, and remove the master cylinder.
•Move the bracket up or down by turning the adjusting nut to adjust the brake pedal position.
•After adjustment, install the master cylinder on the frame bracket, and tighten the mounting bolts to the specified torque (see Exploded View).
•Install the joint pin from the frame side, and insert a new cotter pin and spread its ends.
•Tighten the adjuster locknut against the adjusting nut to the specified torque (see Exploded View).



A. Master Cylinder
B. Locknut
C. Adjusting Nut
D. Brake Pedal Rear End
E. Master Cylinder Mounting Bolts
F. Bracket
G. Joint Pin
H. Cotter Pin

NOTE

○*If the pedal position cannot be adjusted by turning the adjuster nut, the brake pedal may be deformed or incorrectly installed.*

•Recheck the brake pedal position, and readjust it if necessary.
•Adjust the brake light switch if necessary (see Brake Light Timing Inspection in the Electrical System chapter).

Caliper

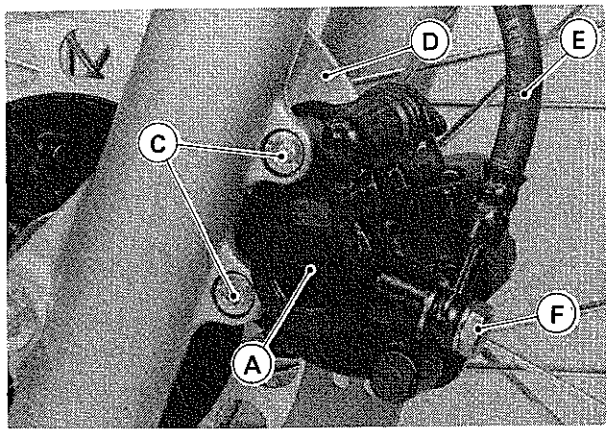
Caliper Removal

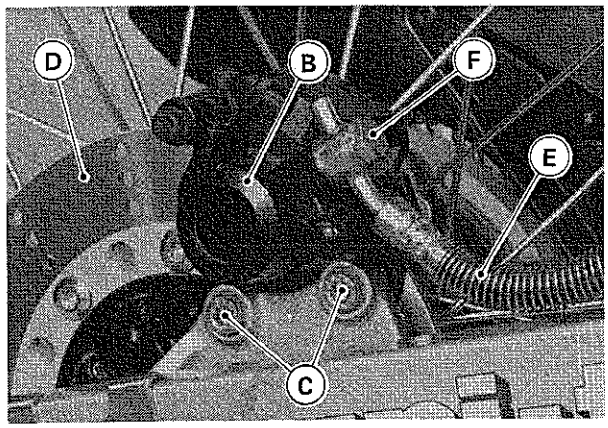
•Loosen the banjo bolt at the brake hose lower end, and tighten it loosely.
•Unscrew the mounting bolts, and remove the caliper from the disc.

NOTE

○*If the caliper is to be disassembled after removal and compressed air is not available, disassemble the caliper before brake hose removal (see Caliper Disassembly).*

•Unscrew the banjo bolt and remove the brake hose from the caliper (see Brake Hose Removal/Installation).
○There is a flat washer on each side of the hose fitting.





A. Front Caliper
B. Rear Caliper
C. Caliper Mounting Bolts
D. Brake Disc
E. Brake Hose
F. Banjo Bolt

Caliper Installation Notes

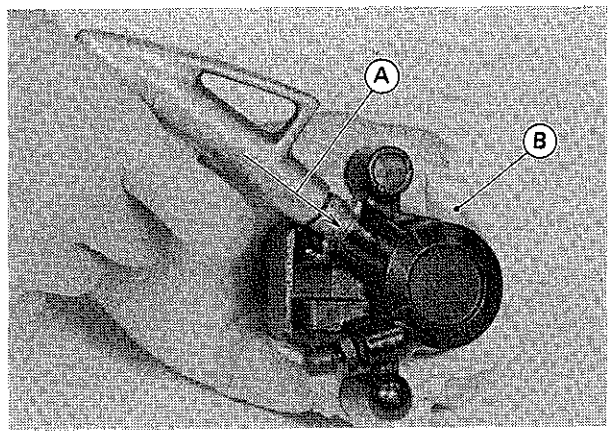
- Installation is the reverse of removal.
- Tighten the caliper mounting bolts to the specified torque (see Exploded View).
- Use a new flat washer on each side of the brake hose fitting, and tighten the banjo bolt to the specified torque (see Exploded View).
- Check the brake fluid level in the reservoir, and bleed the brake line (see Bleeding the Brake Line).
- Check the brake for weak braking power, brake drag, and fluid leakage by operating the brake lever/pedal.

Caliper Disassembly

- Remove the pads and spring (see Pad Removal).
- Remove the caliper holder, shaft rubber friction boot and dust cover.
- Using compressed air, remove the piston.
  - Cover the caliper opening with a clean, heavy cloth.
  - Remove the piston by lightly applying compressed air to where the brake line fits into the caliper.

WARNING

To avoid serious injury, never place your fingers or palm inside the caliper opening. If you apply compressed air into the caliper, the piston may crush your hand or fingers.



A. Apply compressed air. B. Cloth

NOTE

If the caliper is to be disassembled after removal and compressed air is not available, remove the piston using the following three steps before disconnecting the brake hose from the caliper.

Prepare a suitable container for brake fluid, and perform the work above it.

Remove the pads and spring (see Pad Removal).

Pump the brake lever or pedal to remove the caliper piston.

Immediately wipe up any brake fluid that spills. It may painted or plated surfaces.

- Remove the dust seal and fluid seal.
- Remove the bleed valve and rubber caps.

Caliper Assembly

- Clean the caliper parts except for the pads.

CAUTION

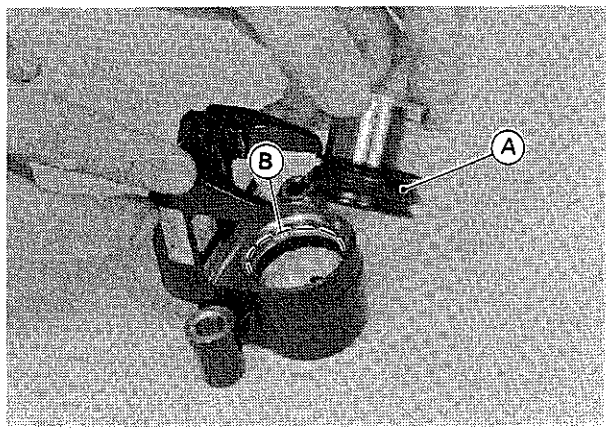
For cleaning the parts, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol.

- Tighten the bleed valve to the specified torque (see Exploded View).
- It is recommended that the fluid seal, which is removed, be replaced with a new one.
- Apply brake fluid to the fluid seal, and install it into the cylinder by hand.
- Replace the dust seal if it is damaged.
- Apply brake fluid to the outside of the piston, install the dust seal around the piston from the pad side of piston and slide down it.

●Extend the dust seal lower end, and properly fit it into the groove in the cylinder by hand.

CAUTION

○**Do not use a thin screwdriver or any other sharp instrument to fit the dust seal, or it may be damaged.**



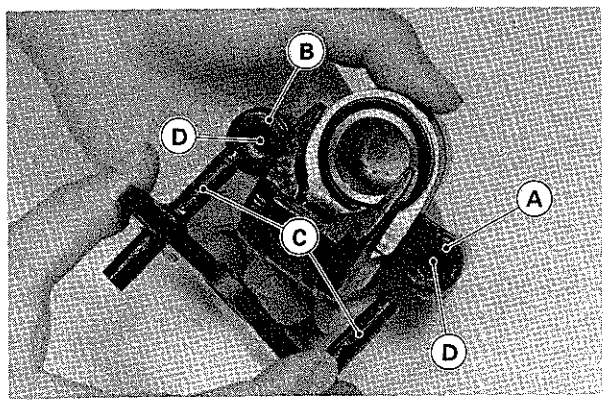
A. Dust Seal B. Groove

●Push the piston into the cylinder by hand.

CAUTION

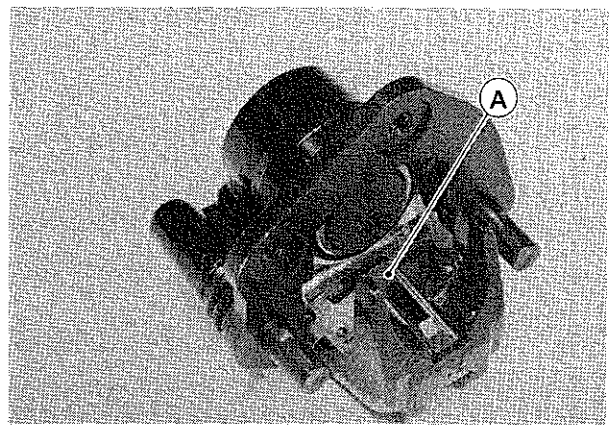
○**Do not injure the cylinder, piston and dust seal by forcing it in place.**

●Properly fit the dust seal upper end into the groove in the piston.
●Replace the shaft rubber friction boot and dust cover if they are damaged.
●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).



A. Shaft Rubber Friction Boot
B. Dust Cover
C. Caliper Holder Shafts
D. Holder Holes

●Install the anti-rattle spring in the calipers as shown.



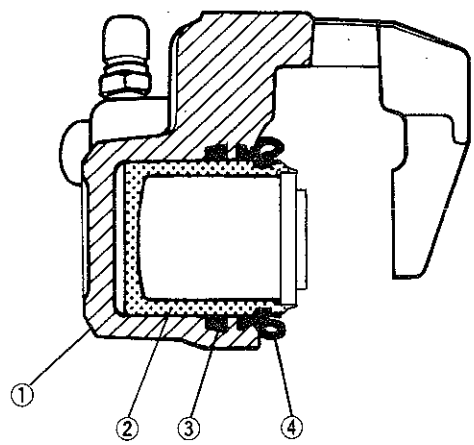
A. Anti-rattle Spring

●Install the pads (see Pad Installation).

Fluid Seal Damage

The fluid seal around the piston maintains the proper pad/disc clearance. If this seal is not in good condition, pad wear will increase, and constant pad drag on the disc will raise brake and brake fluid temperature.

Caliper



1. Caliper
2. Piston
3. Fluid Seal
4. Dust Seal

Replace the fluid seal under any of the following conditions: (a) fluid leakage around the pad; (b) brakes overheat; (c) there is a large difference in left and right pad wear; (d) the seal is stuck to the piston. If the fluid seal is replaced, replace the dust seal as well. Also, replace all seals every other time the pads are changed.

Dust Seal, Cover and Shaft Rubber Friction Boot Damage

●Check that the dust seal, cover and shaft rubber friction boot are not cracked, worn, swollen, or otherwise damaged.

★If they show any damage, replace them.

Piston Cylinder Damage

●Visually inspect the piston and cylinder surfaces.

★Replace the cylinder and piston if they are badly scored or rusty.

Caliper Holder Shaft Wear

The caliper body must slide smoothly on the caliper holder shafts. If the body does not slide smoothly, one pad will wear more than the other, pad wear will increase, and constant drag on the disc will raise brake and brake fluid temperature.

●Check to see if the caliper holder shafts are not badly worn or stepped, or rubber friction boot are not damaged.

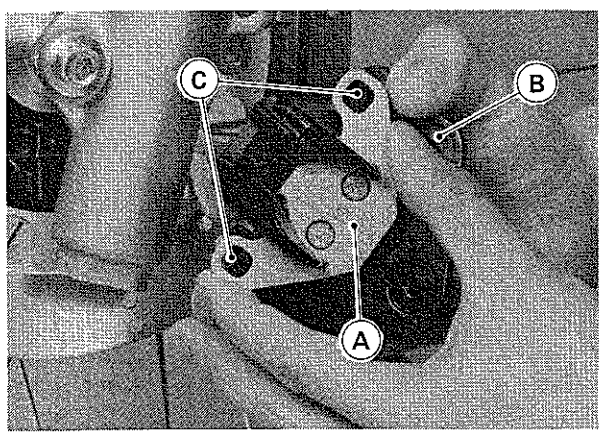
★If the rubber friction boot are damaged, replace the rubber friction boot, and the caliper holder.

Brake Pads

Pad Removal

●Remove the caliper from the disc, and take out the piston side pad from the caliper holder.

●Push the caliper holder toward the piston, and then remove the pad from the caliper holder shaft.



A. Pad
B. Caliper Holder
C. Holder Shaft

Pad Installation

●Push the caliper piston in by hand as far as it will go.

●Install the anti-rattle spring.

●Install the piston side pad first, and then install the remaining pad.

WARNING

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

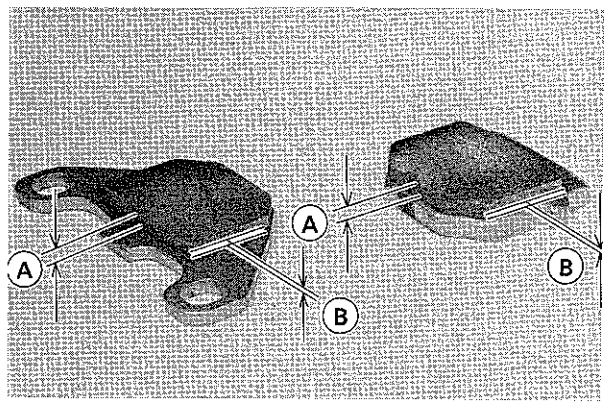
Pad Inspection

●Check the lining thickness and condition of the pads in each caliper.

★If either pad is damaged, replace both pads in the caliper as a set.

★If the lining thickness of either pad is less than the service limit, replace both pads in the caliper as a set.

Lining Thickness Measurement



A. Lining Thickness
B. Service Limit

Pad Lining Thickness (mm)

	Front	Rear
Standard	3.7	4.5
Service Limit	1	1

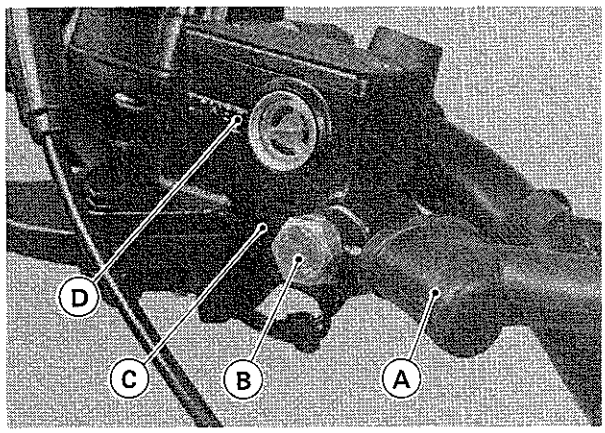
Master Cylinder

CAUTION

○Brake fluid quickly ruins painted or plated surfaces; any spilled fluid should be completely wiped up immediately.

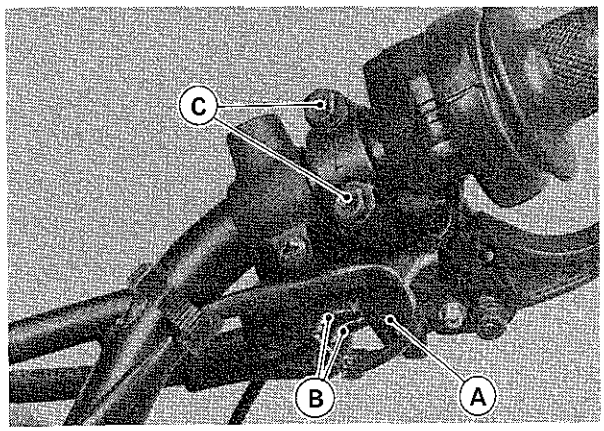
Front Master Cylinder Removal

•Pull back the dust cover, and remove the banjo bolt to disconnect the upper brake hose from the master cylinder (see Brake Hose Removal/Installation). There is a flat washer on each side of the hose fitting.



A. Dust Cover
B. Banjo Bolt
C. Master Cylinder
D. Reservoir

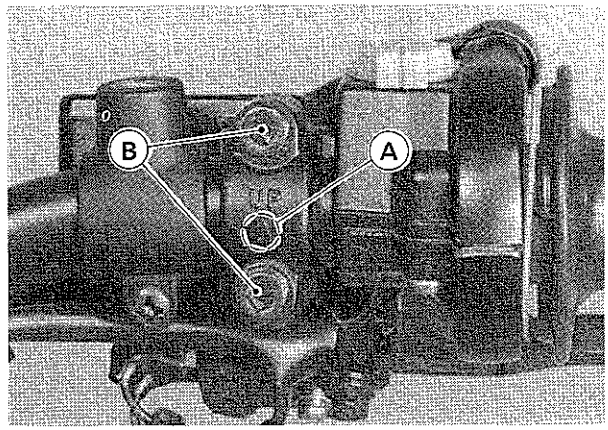
•Disconnect the front brake switch connectors.
•Unscrew the clamp bolts, and take off the master cylinder as an assembly with the reservoir, brake lever, and brake switch attached.



A. Brake Switch
B. Connectors
C. Clamp Bolts

Front Master Cylinder Installation Notes

•Installation is the reverse of removal.
•The master cylinder clamp must be installed with the arrow mark pointing upward.
•Tighten the upper clamp bolt first to the specified torque (see Exploded View), and then tighten the lower clamp bolt to the same torque. There will be a gap at the lower part of the clamp after tightening.

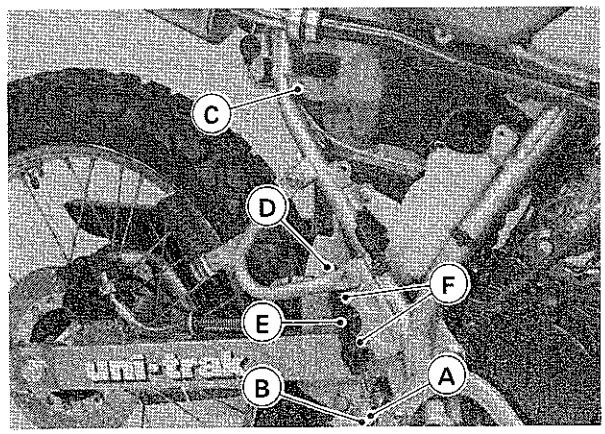


A. Arrow Mark
B. Clamp Bolt (Tighten upper clamp bolt first.)

•Use a new flat washer on each side of the brake hose fitting, and tighten the banjo bolt to he specified torque (see Exploded View).
•Bleed the brake line after master cylinder installation (see Bleeding the Brake Line).
•Check the brake for weak braking power, brake drag, and fluid leakage.

Rear Master Cylinder Removal

•Remove the right side cover, and battery cover.
•Remove the battery (see Battery Removal in the Electrical System chapter).
•Remove the reservoir mounting bolt.
•Pull out the cotter pin, and remove the joint pin.
•Unscrew the banjo bolt to disconnect the brake hose from the master cylinder (see Brake Hose Removal/Installation). There is a flat washer on each side of the hose fitting.



A. Cotter Pin
B. Joint Pin
C. Reservoir Mounting Bolt
D. Banjo Bolt
E. Master Cylinder
F. Master Cylinder Mounting Bolts

- Unscrew the master cylinder mounting bolts, and remove the master cylinder with the reservoir.
- Unscrew the reservoir cap (the diaphragm comes off with the reservoir cap) and pour the brake fluid into a container.
- Remove the reservoir and its hose from the master cylinder.

Rear Master Cylinder Installation Notes

- Installation is the reverse of removal.
- Tighten the master cylinder mounting bolts to the specified torque (see Exploded View).
- Use a new flat washer on each side of the brake hose fitting, and tighten the banjo bolts to the specified torque (see Exploded View).
- Tighten the reservoir mounting bolt to the specified torque (see Exploded View).
- Bleed the brake line after master cylinder installation (see Bleeding the Brake Line).
- Check the brake for weak braking power, brake drag, and fluid leakage.
- Check the brake pedal position, and the rear brake light switch operation (see Brake Pedal Position Inspection, and Brake Light Timing Inspection in the Electrical System chapter).

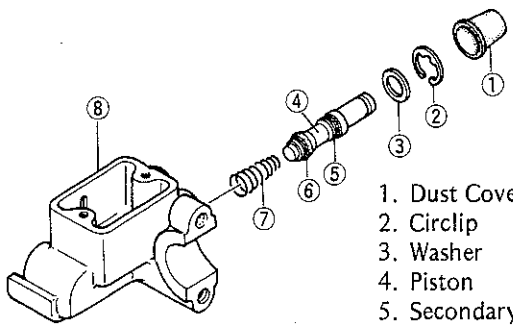
Front Master Cylinder Disassembly

- Remove the front master cylinder (see Front Master Cylinder Removal).
- Remove the reservoir cap and diaphragm, and pour the brake fluid into a container.
- Unscrew the locknut and pivot bolt, and remove the brake lever.
- Push the dust cover out of place, and using circlip pliers (special tool: 57001-143), remove the circlip.
- Remove the washer, and pull out the piston, secondary cup, primary cup, and return spring.

CAUTION

○Do not remove the secondary cup from the piston since removal will damage it.

Front Master Cylinder



1. Dust Cover
2. Circlip
3. Washer
4. Piston
5. Secondary Cup
6. Primary Cup
7. Return Spring
8. Reservoir

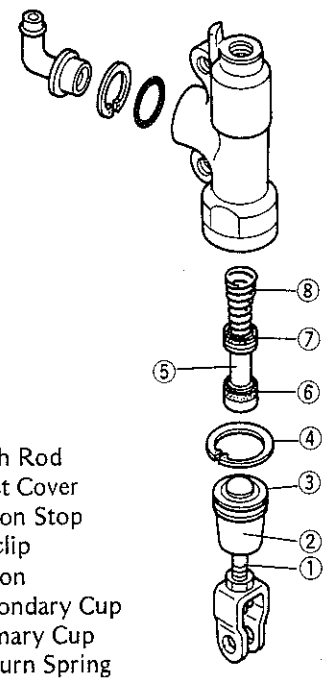
Rear Master Cylinder Disassembly

- Remove the rear master cylinder (see Rear Master Cylinder Removal).
- Slide the dust cover on the push rod out of place, and using circlip pliers (special tool: 57001-143), remove the circlip.
- Pull out the push rod with the piston stop.
- Take off the piston, secondary cup, primary cup, and return spring.

CAUTION

○Do not remove the secondary cup from the piston since removal will damage it.

Rear Master Cylinder



1. Push Rod
2. Dust Cover
3. Piston Stop
4. Circlip
5. Piston
6. Secondary Cup
7. Primary Cup
8. Return Spring

Master Cylinder Assembly Notes

- Assembly is the reverse of removal.
- Take care not to damage the inner surface of the cylinder, or the piston.
- Clean all parts with brake fluid or alcohol, and apply brake fluid to the inner surface of the cylinder before assembly.
- Tighten the brake lever pivot bolt locknut to the specified torque (see Exploded View).

Master Cylinder Inspection (Visual Inspection)

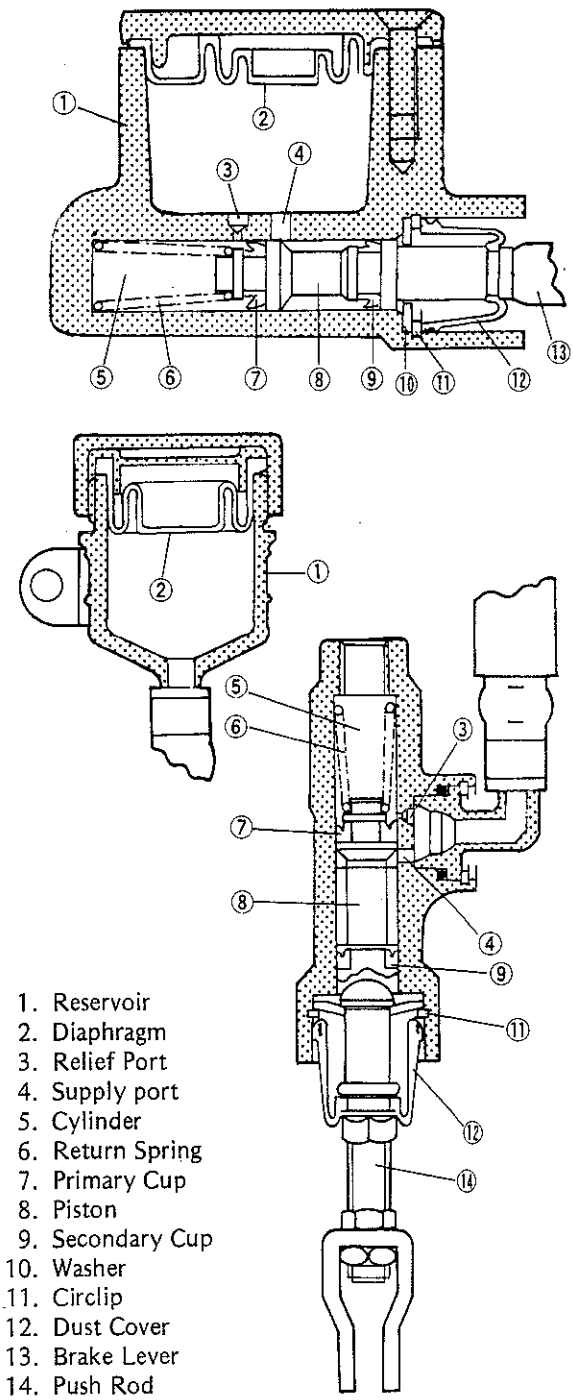
- Disassemble the front and rear master cylinders.
- Check that there are no scratches, rust or pitting on the inside of each master cylinder and on the outside of each piston.

★If a master cylinder or piston shows any damage, replace them.

- Inspect the primary cups and secondary cups.

★If a cup is worn, damaged, softened (rotted), or swollen, the piston assembly should be replace to renew the cups.
★If fluid leakage is noted at the brake lever, the piston assembly should be replaced to renew the cup.
●Check the dust covers for damage.
★If they are damaged, replace them.
●Check that the relief and supply ports are not plugged.
★If the small relief port becomes plugged, the brake pads will drag on the disc. Blow the ports clean with compressed air.
●Check the piston return springs for any damage.
★If a spring is damaged, replace it.

Front and Rear Master Cylinder



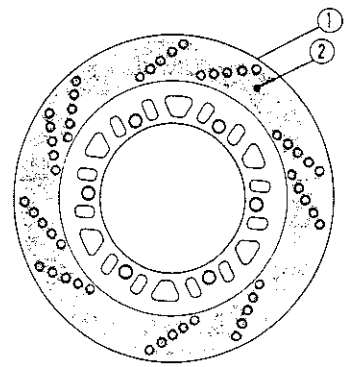
1. Reservoir
2. Diaphragm
3. Relief Port
4. Supply port
5. Cylinder
6. Return Spring
7. Primary Cup
8. Piston
9. Secondary Cup
10. Washer
11. Circlip
12. Dust Cover
13. Brake Lever
14. Push Rod

Brake Disc

Disc Inspection

●Visually inspect the disc.
★If disc is scratched or damaged replace the disc.
●Measure the thickness of each disc at the point where it has worn the most.
★Replace the disc if it has worn past the service limit.

Disc Thickness Measurement



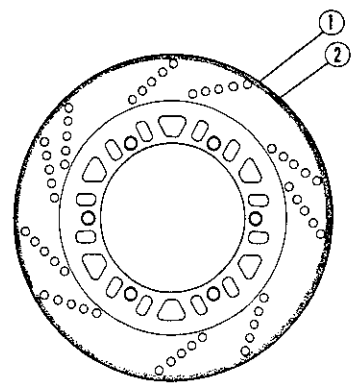
1. Disc
2. Measuring Area

Disc Thickness

	Front	Rear
Standard:	**2.8 – 3.1 mm**	**3.8 – 4.1 mm**
Service Limit:	**2.5 mm**	**3.5 mm**

●Place a stand or block under the motorcycle so that the front/rear wheel is raised off the ground.
●Set up a dial gauge against the disc as illustrated.
○For the front disc, turn the handlebar fully to one side.
●Rotate the wheel to measure disc runout. The difference between the highest and lowest dial readings is the amount of runout.
★If disc runout exceeds the service limit, replace the disc.

Disc Runout Measurement



1. Disc
2. Measuring Area

Disc Runout

Standard:	**Not more than 0.20 mm**
Service Limit:	**0.3 mm**

Brake Fluid

Brake Fluid Level Inspection

In accordance with the Periodic Maintenance Chart, inspect the brake fluid level in the front and rear brake fluid reservoirs.

●Check the brake fluid level in the reservoir.

NOTE

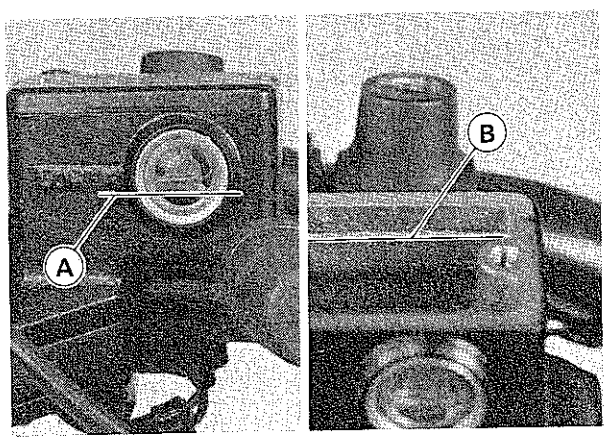
○*Hold the reservoir horizontal when checking brake fluid level.*

★The fluid level must be kept above the lower level lines. If the fluid level is lower than the lower level line, fill the reservoir to the upper level line of the reservoir

WARNING

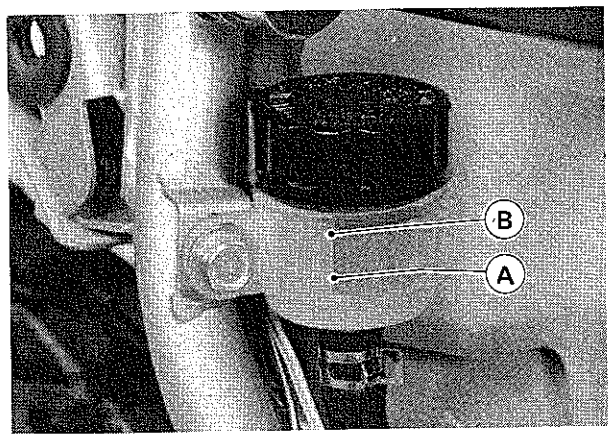
○**Change the brake fluid in the brake system completely if the brake fluid must be refilled but the type and brand of the brake fluid that already is in the reservoir are unidentified. After changing the fluid, use only the same type and brand of fluid thereafter. Mixing different types and brands of brake fluid lowers the brake fluid boiling point and could cause the brake to be ineffective. It may also cause the rubber brake parts to deteriorate.**

Front Brake Fluid Reservoir



A. Lower Level Line B. Upper Level Line

Rear Brake Fluid Reservoir



A. Lower Level Line B. Upper Level Line

Brake Fluid Change

In accordance with the Periodic Maintenance Chart, change the brake fluid. The brake fluid should also be changed if it becomes contaminated with dirt or water.

Brake Fluid Requirement:

Recommended fluids are given in table below. If none of the recommended brake fluids are available, use extra heavy-duty brake fluid only from a container marked D.O.T.3.

Recommended Disc Brake Fluid

Type:	**D.O.T.3**
Brand:	**Atlas Extra Heavy Duty**
	Shell Super Heavy Duty
	Texaco Super Heavy Duty
	Wagner Lockheed Heavy Duty
	Castrol Girling-Universal
	Castrol GT (LMA)
	Castrol Disc Brake Fluid

Changing Brake Fluid:

NOTE

○*The procedure to change the front brake fluid is as follows. Changing the rear brake fluid is the same as for the front brake.*

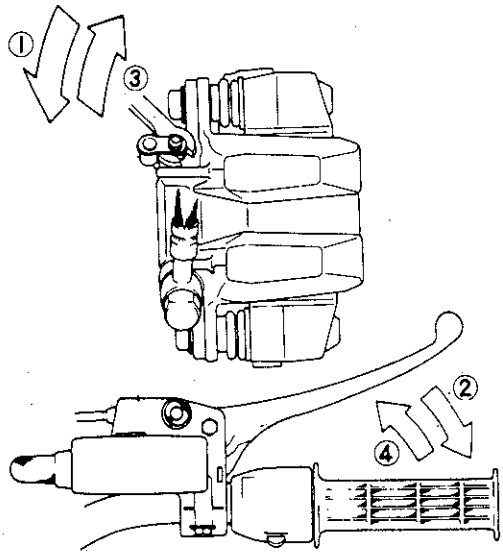
●Level the master cylinder brake fluid reservoir.

●Remove the reservoir cap, and remove the rubber cap on the bleed valve.

●Attach a clear plastic hose to the bleed valve on the caliper, and run the other end of the hose into a container.

●Change the brake fluid as follows.

Changing Brake Fluid



1. Open the bleed valve.
2. Apply the brake and hold it.
3. Close the bleed valve.
4. Release the brake.

○Repeat this operation until fresh brake fluid comes out from the plastic hose or the color of the fluid changes.

NOTE

○*The fluid level must be checked often during the changing operation and replenished with fresh brake fluid. If the fluid in the reservoir runs out any time during the changing operation, the brakes will need to be bled since air will have entered the brake line.*

●Remove the clear plastic hose.
●Tighten the bleed valve to the specified torque (see Exploded View), and install the rubber cap.
●After changing the fluid, check the brakes for weak braking power, brake drag, and fluid leakage.
★If necessary, bleed the air from the line.

Bleeding the Brake Line

The brake fluid has a very low compression coefficient so that almost all the movement of the brake lever is transmitted directly to the caliper for braking action. Air, however, is easily compressed. When air enters the brake line, brake lever movement will be partially used in compressing the air. This will make the lever feel spongy, and there will be a loss in braking power.

Bleed the air from the brake whenever brake lever action feels soft or spongy, after the brake fluid is changed, or whenever a brake line fitting has been loosened for any reason.

NOTE

○*The procedure to bleed the front brake line is as follows. Bleeding the rear brake line is the same as for the front brake.*

●Remove the reservoir cap, and fill the reservoir to the upper level line of the reservoir.

NOTE

○*The fluid level must be checked often during the bleeding operation and replenished with fresh brake fluid as necessary. If the fluid in the reservoir runs almost out any time during bleeding operation, the bleeding operation must be done over again from the beginning since air will have entered the line.*

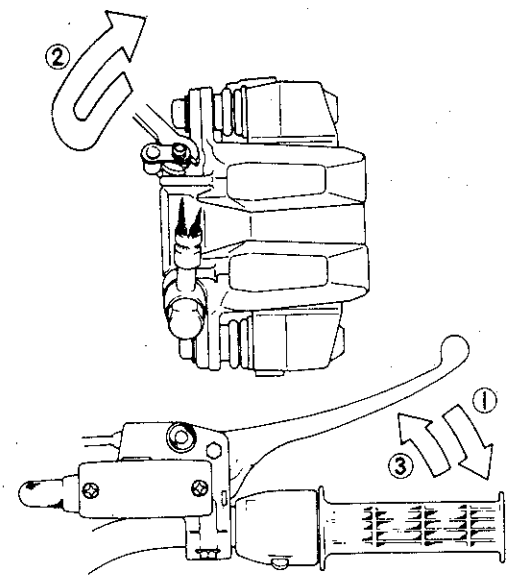
●With the reservoir cap off, slowly pump the brake lever several times until no air bubbles can be seen rising up through the fluid from the holes at the bottom of the reservoir. Bleed the air completely from the master cylinder by this operation.

NOTE

○*Tap the brake hose lightly from the caliper to the reservoir for easier bleeding.*

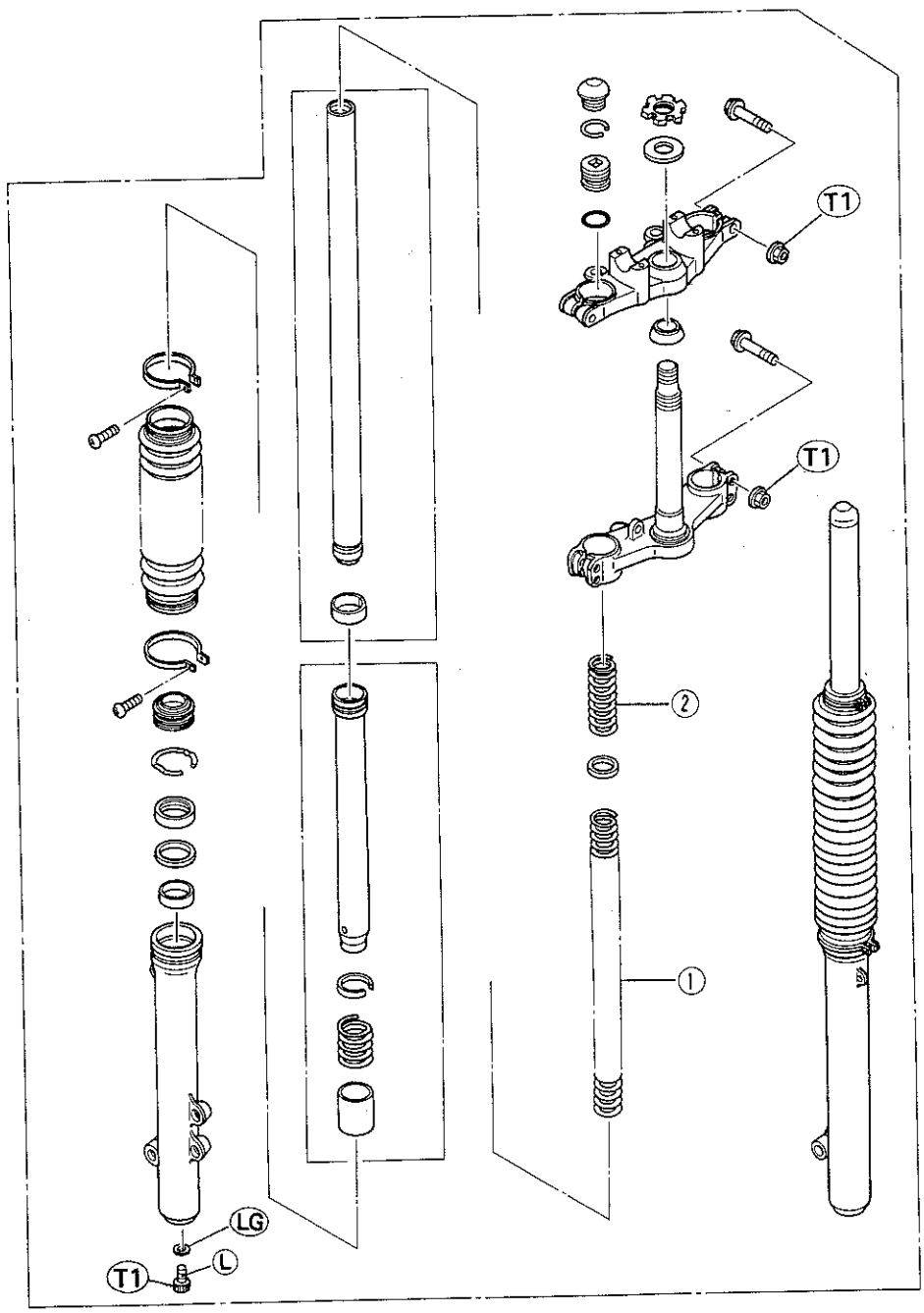
●Install the reservoir cap.
●Attach a clear plastic hose to the bleed valve on the caliper, and run the other end of the hose into a container.
●Pump the brake lever until it becomes hard and then, holding the brake applied, quickly open (turn counterclockwise) and close the bleed valve.
●Release the brake.
●Repeat this operation until no more air can be seen coming out into the plastic hose.
●Detach the clear plastic hose from the bleed valve on the caliper.
●Tighten the bleed valve to the specified torque (see Exploded View), and install the rubber cap.
●Check the fluid level.

Bleeding the Brake Line



1. Pump the brake lever until it becomes hard, and apply the brake and hold it.
2. Quickly open and close the bleed valve while holding the brake applied.
3. Release the brake.

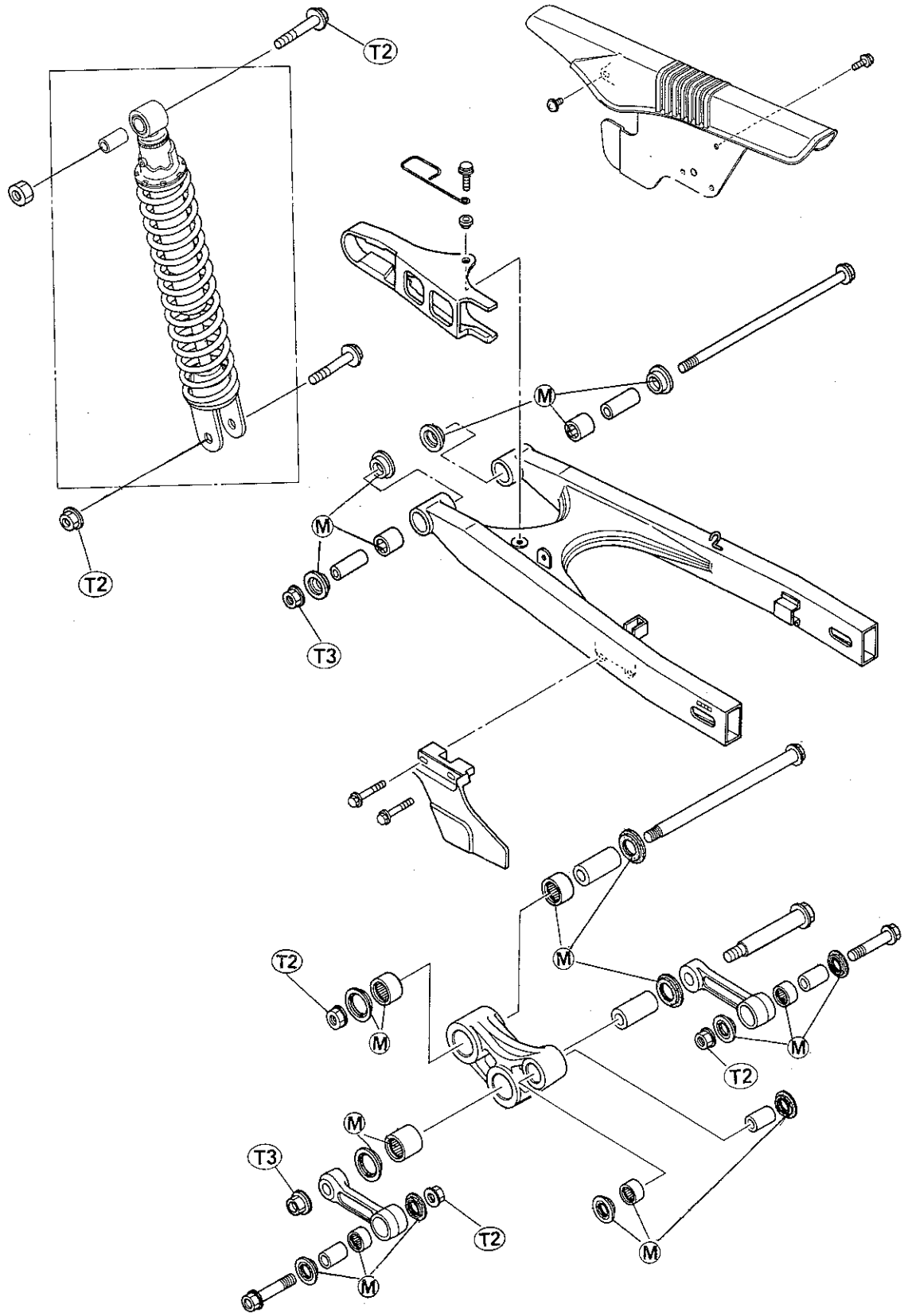
Exploded View



1. Fork Spring A
2. Fork Spring B

L : Apply a non-permanent locking agent to the threads.
LG: Apply liquid gasket to both sides of the gasket.
M : Apply plenty of molybdenum disulfide grease to the inside.

T1: 20 Nm (2.0 kg-m, 14.5 ft-lb)
T2: 59 Nm (6.0 kg-m, 43 ft-lb)
T3: 98 Nm (10.0 kg-m, 72 ft-lb)

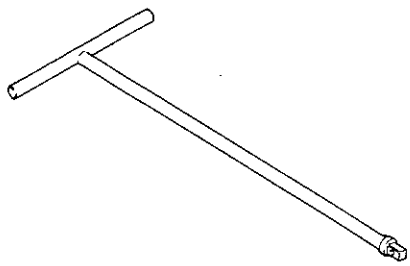

T2
T2
M
M
T3
T2
M
M
T2
M
T3
T2
M
M

Specifications

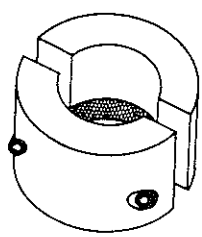
Item	Standard	Service Limit
Front Fork:		
Oil viscosity	SAE 10W20	– – –
Oil capacity	286 ±2.5 mL (when assembling) approx. 245 mL (when oil changing)	– – –
Oil level (fully compressed, without A/B springs)	200 ±2 mm (from the top of the inner tube)	– – –
Fork spring free length:		
Spring A	547.7 mm	537 mm
Spring B	55.9 mm	55 mm
Rear Suspension:		
Rear Shock Absorber:		
Recommended spring adjusting sleeve position	Position 3 (for one rider with no accessories)	(adjustable range) 1 – 5

Special Tools

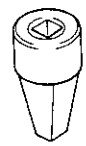
Front Fork Cylinder Holder Handle: 57001-183



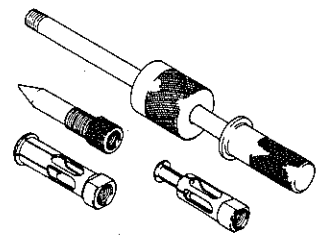
Front Fork Outer Tube Weight: 57001-1218



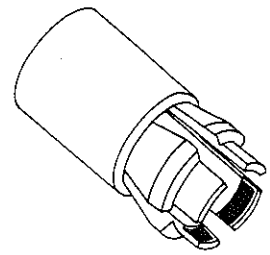
Front Fork Cylinder Holder Adapter: 57001-1057



Oil Seal and Bearing Remover: 57001-1058



Front Fork Oil Seal Driver: 57001-1219



Front Fork

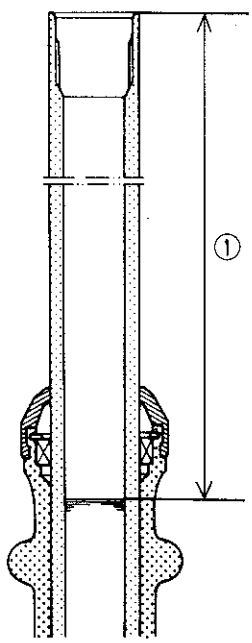
Fork Oil Change

- Place a stand or block under the motorcycle so that the front wheel is raised off the ground.
- Remove the front fork leg.
- Remove the fork cap, and retaining ring from the fork tube, and take out the top plug, O-ring, spring B (shorter), spring seat, and spring A (longer).
- Turn the front fork leg upside down, and pour the oil into a container. Pump the fork to drain the old oil completely.
- Pour in the type and amount of fork oil specified (see Specifications).
- Check the oil level.

○With the fork fully compressed, insert a tape measure or rod into the inner tube, and measure the distance from the top of the inner tube to the oil.

★If the oil is above or below the specified level, remove or add oil and recheck the oil level.

Fork Oil Level Measurement



1. Oil Level

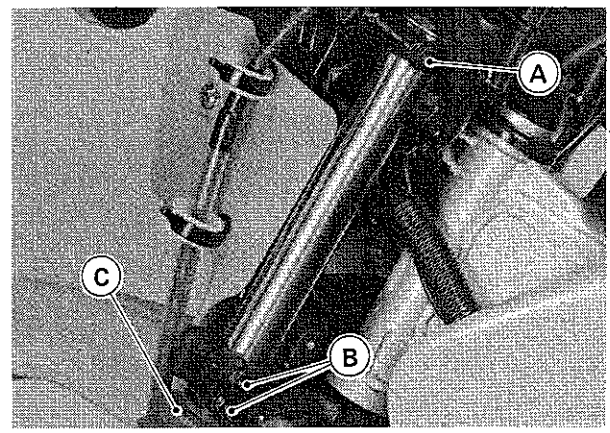
Front Fork Oil Level

Standard: 200 ±2 mm

- Install the parts removed.
- Check the O-ring at the top plug. Replace it with a new one if damaged.
- Install the front fork leg.
- Change the fork oil in the other fork leg in the same manner.

Front Fork Removal

- Remove the speedometer cable clamp, and brake hose clamp.
- Remove the speedometer cable lower end from the speedometer gear housing.
- Remove the caliper from the fork leg to be removed, and rest the caliper on some kind of stand so that it doesn't dangle.
- Remove the front wheel (see Front Wheel Removal in the Wheels/Tires chapter).
- Loosen the upper and lower fork clamp bolts.



A. Upper Fork Clamp Bolt C. Rubber Boot
B. Lower Fork Clamp Bolts

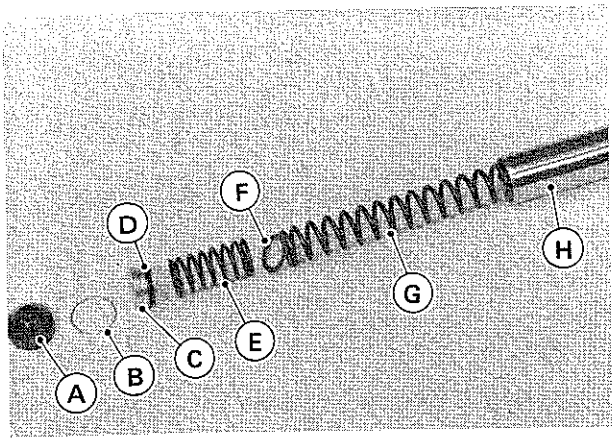
- With a twisting motion, work the fork leg down and out.

Front Fork Installation Notes

- Installation is the reverse of removal.
- If the fork leg was disassembled, check the fork oil level.
- Route the cables and hose according to the Cable and Hose Routing section in the General Information chapter.
- Tighten the lower and upper clamp nuts to the specified torque (see Exploded View).
- Tighten the caliper mounting bolts to the specified torque (see Exploded View in the Brakes chapter).
- Tighten the front axle nut to the specified torque (see Exploded View in the Wheels/Tires chapter).
- Check front brake operation after installation.

Front Fork Disassembly

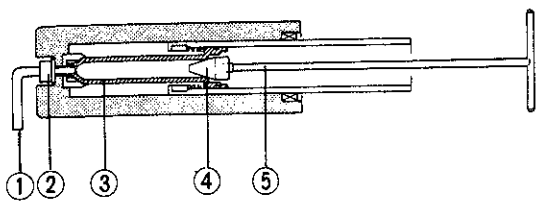
- Remove the front fork leg.
- Remove the rubber boot.
- Remove the fork cap, and retaining ring from the fork tube, and take out the top plug, O-ring, spring B (shorter), spring seat, and spring A (longer).



A. Fork Cap
B. Retaining Ring
C. Top Plug
D. O-ring
E. Spring B (shorter)
F. Spring Seat
G. Spring A (longer)
H. Fork Tube (inner)

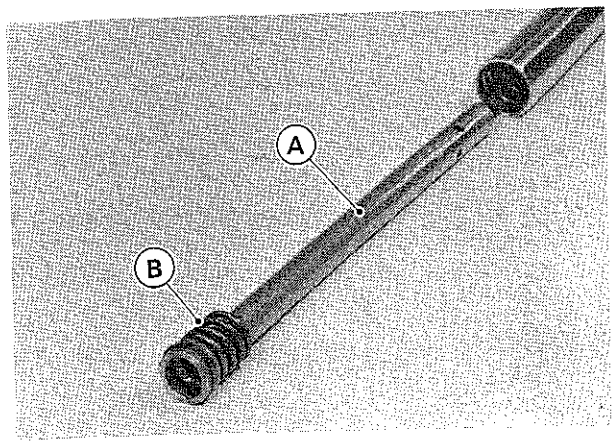
●Pour the fork oil into a container.
●Stop the cylinder from turning by using the front fork cylinder holder handle and adapter (special tools). Unscrew the Allen bolt, and take the bolt and gasket out of the bottom of the outer tube.

Allen Bolt Installation/Removal



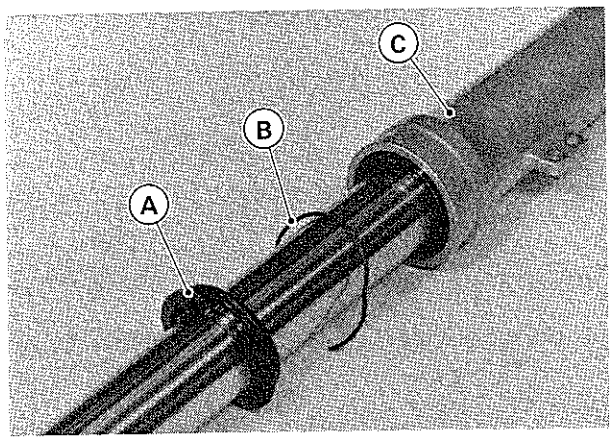
1. Allen Wrench
2. Allen Bolt
3. Piston/Cylinder Unit
4. Adapter: 57001-1057
5. Front Fork Cylinder Holder Handle: 57001-183

●Remove the piston/cylinder unit and the spring from the top of the front fork tube.



A. Piston/Cylinder Unit B. Spring

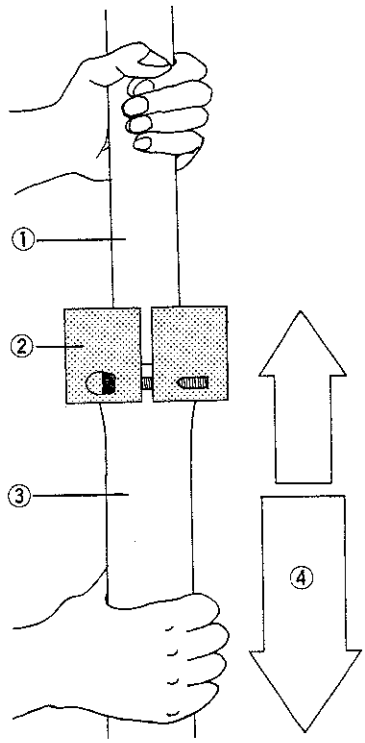
●Separate the inner tube from the outer tube as follows.
○Remove the dust seal from the outer tube.
○Remove the retaining ring from the outer tube.



A. Dust Seal C. Outer Tube
B. Retaining Ring

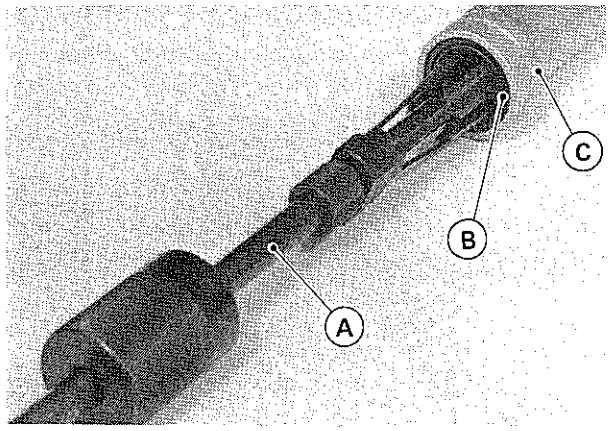
○Mount the front fork outer tube weight (special tool) on the top of the outer tube, by fitting the step of the weight (special tool) to the top corner of the outer tube.
○Holding the inner tube by hand in a vertical position, stroke the outer tube up and down several times and pull it down. This shock to the fork leg separates the outer tube from the inner tube.

Front Fork Separation



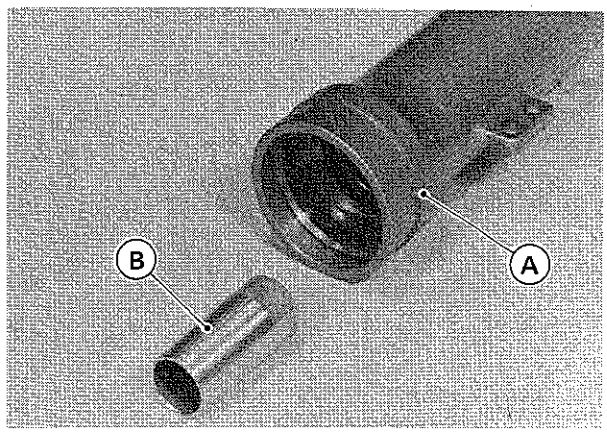
1. Inner Tube
2. Front Fork Outer Tube Weight: 57001-1218
3. Outer Tube
4. Stroke

●Using the oil seal & bearing remover (special tool), remove the oil seal from the outer tube.



A. Oil Seal & Bearing Remover: 57001-1058
B. Oil Seal
C. Outer Tube

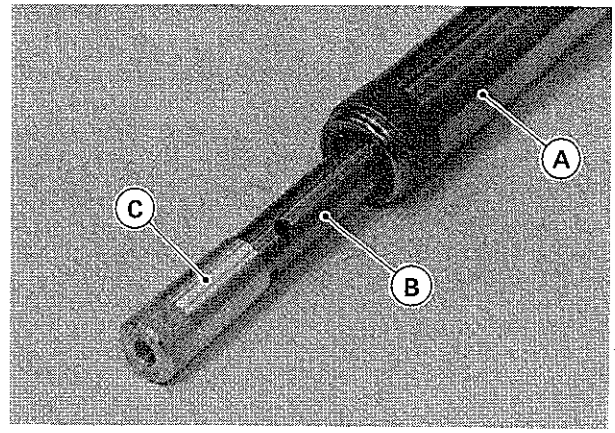
●Remove the washer and outer tube guide bush from the top of the outer tube.
●Remove the cylinder base from the bottom of the outer tube.



A. Outer Tube B. Cylinder Base

Front Fork Assembly Notes

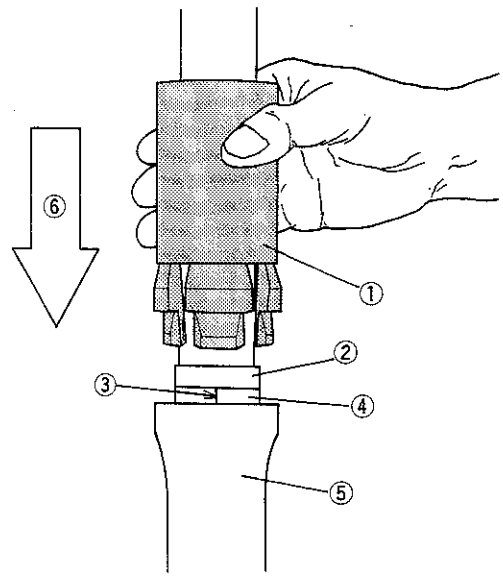
●Assembly is the reverse of disassembly.
●Check the O-ring at the top plug. Replace it with a new one if damaged.
●Replace the oil seal removed with a new one.
●Replace the guide bushes with new ones.
●Insert the piston/cylinder unit and spring in the inner tube.
●Insert the cylinder base in the piston/cylinder unit.



A. Inner Tube C. Cylinder Base
B. Piston/Cylinder Unit

●Insert the inner tube and cylinder unit as a set into the outer tube.
●Apply a liquid gasket to both sides of the gasket, and apply a non-permanent locking agent to the threads of the Allen bolt at the bottom of the outer tube.
●Stop the cylinder from turning by using the front fork cylinder holder handle (special tool: 57001-183) and holder adapter (special tool: 57001-1057), tighten the Allen bolt to the specified torque (see Exploded View).
●When replacing the outer tube guide bush with a new one, hold the used guide bush against the new one, and tap the used guide bush with the front fork oil seal driver (special tool) until it stops. The slit in the bush must face toward the wheel.

Guide Bush Installation



1. Front Fork Oil Seal Driver: 57001-1219
2. Used Guide Bush
3. Slit (face toward the wheel)
4. New Guide Bush
5. Outer Tube
6. Tap

●After installing the washer, install the oil seal by using the fork oil seal driver (special tool: 57001-1219).
●Using the fork oil seal driver (special tool: 57001-1219), install the dust seal.
●Pour in the type and amount of fork oil specified (see Specifications), and adjust the oil level (see Fork Oil Change).

Inner Tube Inspection

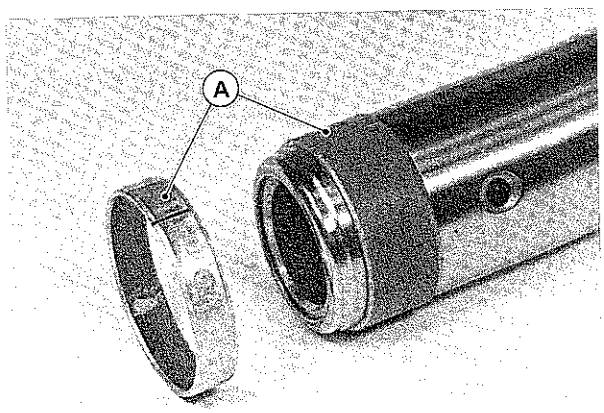
●Visually inspect the inner tube, and repair any damage.
●Nicks or rust damage can sometimes be repaired by using a wet-stone to remove sharp edges or raised areas which cause seal damage.
★If the damage is not repairable, replace the inner tube. Since damage to the inner tube damages the oil seal, replace the oil seal whenever the inner tube is repaired or replaced.
●Temporarily assemble the inner and outer tubes, and pump them back and forth manually to check for smooth operation.

CAUTION

○If the inner tube is badly bent or creased, replace it. Excessive bending, followed by subsequent straightening, can weaken the inner tube.

Guide Bush Inspection

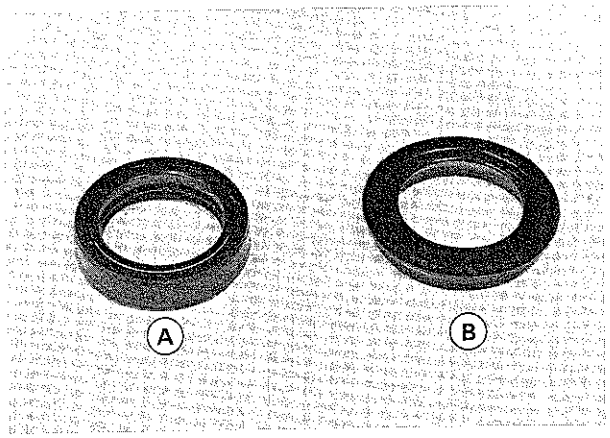
●Visually inspect the guide bushes, and replace them if necessary.



A. Guide Bushes

Oil Seal and Dust Seal Inspection

●Inspect the dust seal for any signs of deterioration or damage.
★Replace them if necessary.
●Replace the oil seal with a new one whenever it has been removed.



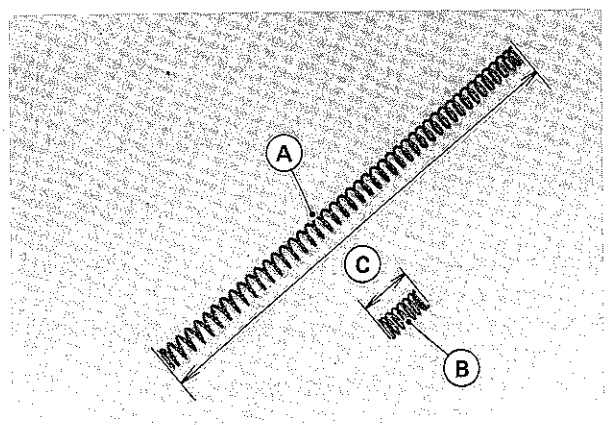
A. Oil Seal B. Dust Seal

Spring Tension

●Since a spring becomes shorter as it weakens, check its free length to determine its condition.
★If the spring of either fork leg is shorter than the service limit, it must be replaced. If the length of a replacement spring and that of the remaining spring vary greatly, the remaining spring should also be replaced in order to keep the fork legs balanced for motorcycle stability.

Fork Spring Free Length

Spring A	
Standard:	**547.7 mm**
Service Limit:	**537 mm**
Spring B	
Standard:	**55.9 mm**
Service Limit:	**55 mm**



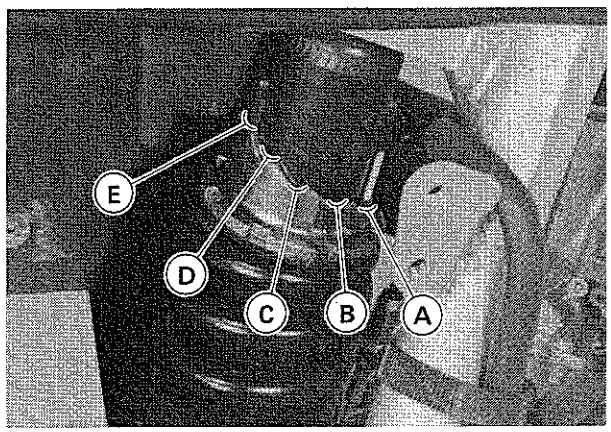
A. Fork Spring A C. Free Length
B. Fork Spring B

Rear Suspension (Uni-Trak)

Rear Shock Absorber:

Spring Preload Adjustment

The spring preload adjuster on the rear shock absorber has 5 positions so that the spring thension can be adjusted for different road and loading conditions.

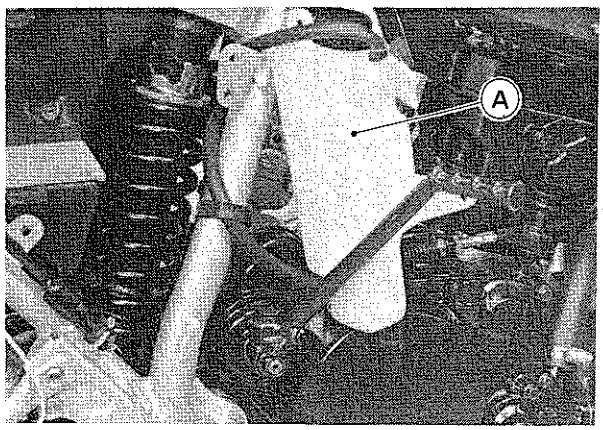


A. Position No. 1
B. Position No. 2
C. Position No. 3
D. Position No.4
E. Position No. 5

- Remove the following parts.
  Right Side Cover
  Battery Cover
  Battery
- Unscrew the reservoir tank mounting bolts, and move the tank beside the carburetor.
- Using the hook wrench (tool kit), turn the adjusting sleeve to adjust the spring tension.

○Turning the adjusting sleeve to the lower position (higher position No.) will strengthen the spring tension, for heavier loads or a harder ride.

○The standard setting position for an average-build rider of 68 kg (150 lb) with no passenger and no accessories is No. 3 (KMX125-A1/A2/B1/B2) or No. 1 (KMX125-A3/B3).



A. Adjusting Sleeve B. Hook Wench (Tool Kit)

Spring Preload Adjustment

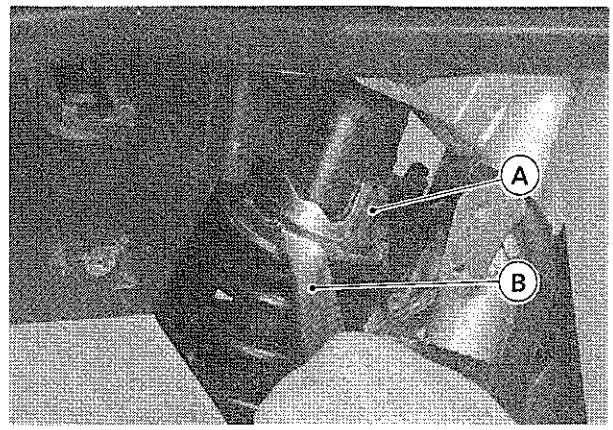
Adjuster Position	1	2	3	4	5
Spring Tension	→ Stronger				

Damping Force Adjustment (KMX125-A3/B3)

The damping force adjuster on the rear shock absorber has 4 positions so that the damping force can be adjusted for different road and loading conditions.

- Turn the adjusting dial to adjust the damping force.

○The standard setting position of the rebound damping force adjuster for an average-build rider of 68 kg (150 lb) with no passenger and no accessories it No. 2



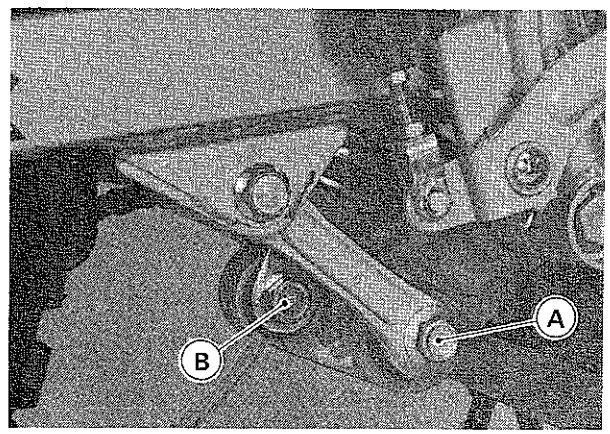
A. Adjusting Dial

Damping Force Adjustment

Adjuster Position	Damping Force	Setting	Load	Road	Speed
1	Weak	Soft	Light	Good	Low
2	↑	↑	↑	↑	↑
3	↓	↓	↓	↓	↓
4	Strong	Hard	Heavy	Bad	High

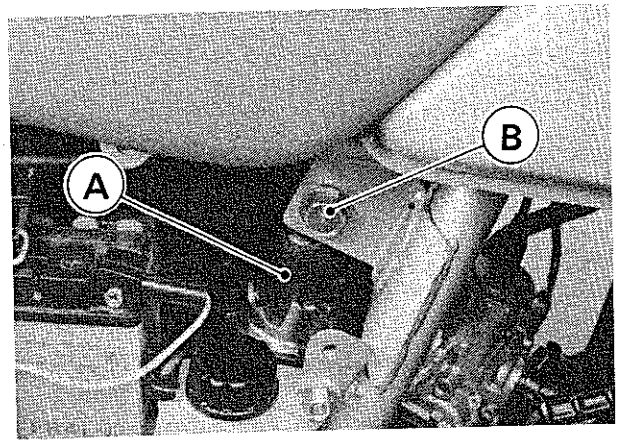
Rear Shock Absorber Removal

- Place a stand or block under the motorcycle so that the rear wheel is raised off the ground.
- Remove the expansion chamber (see Expansion Chamber Removal in the Engine Top End chapter).
- Unscrew the tie-rod front mounting nut (left side), and pull out the mounting bolt.
- Unscrew the rear shock absorber lower mounting nut (left side), and pull out the mounting bolt.



A. Tie-Rod Front Mounting Bolt
B. Rear Shock Absorber Lower Mounting Bolt

●Remove the rear shock absorber upper mounting bolt, and pull the rear shock absorber down and out.



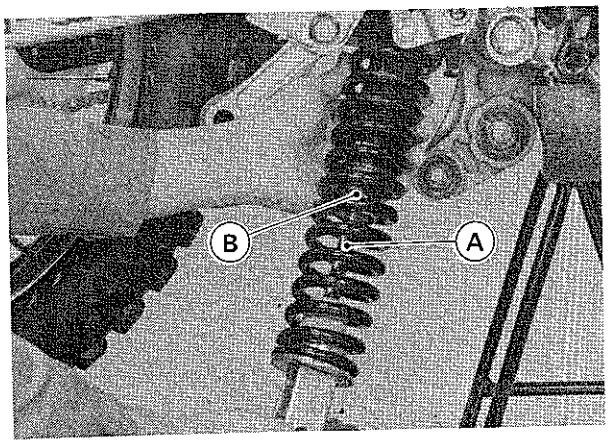
A. Rear Shock Absorber
B. Rear Shock Absorber Upper Mounting Bolt

CAUTION

○**When pulling out the mounting bolts, lift the rear wheel slightly. Forcing or tapping on a bolt could damage the bolt, sleeve, and bearing.**

Rear Shock Absorber Installation Notes

●Installation is the reverse of removal.
●Install the rear shock absorber so that the label on the shock absorber faces to the right side.
○For KMX125-A3/B3, install the rear shock absorber so that the arrow mark of damping force adjuster faces to the front.



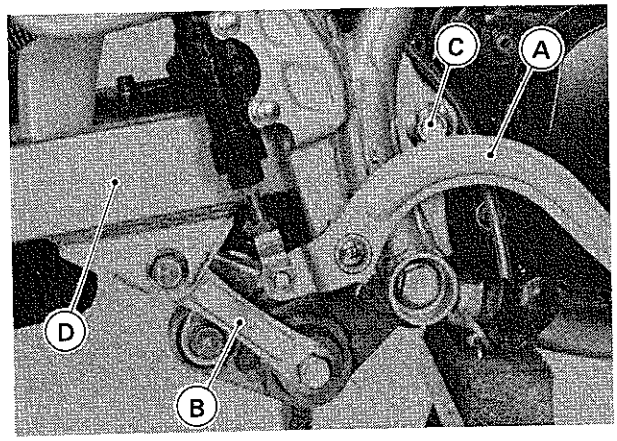
A. Shock Absorber B. Label

○Tighten the rear shock absorber upper, lower and tie-rod front mounting nuts to the specified torque (see Exploded View).

Swing Arm:

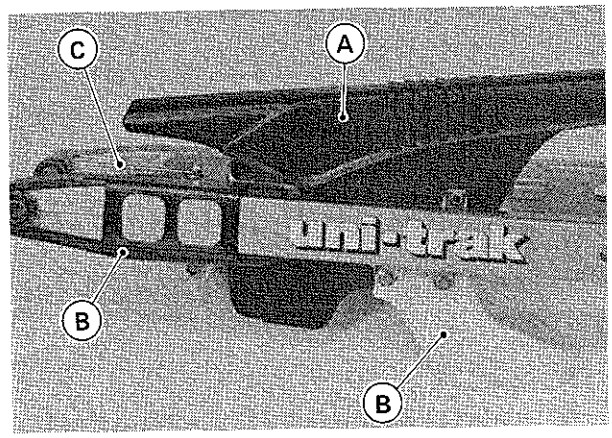
Swing Arm Removal

●Remove the rear wheel (see Rear Wheel Removal in the Wheels/Tires chapter).
●Remove the brake pedal.
●Remove the tie-rod rear mounting bolts.
●Pull out the swing arm pivot shaft, and remove the swing arm.



A. Brake Pedal C. Swing Arm Pivot Shaft
B. Tie-Rod D. Swing Arm

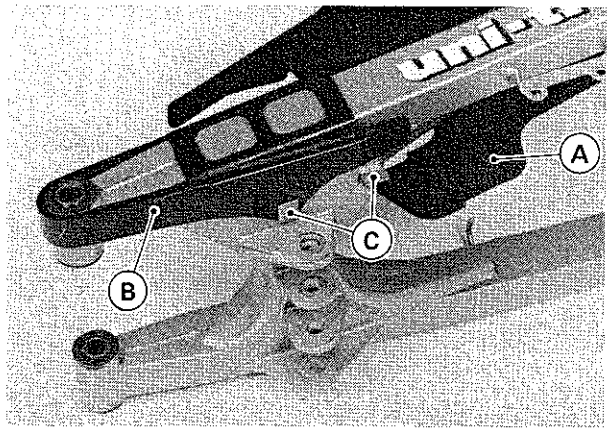
●Separate the chain cover, chain guides, and clamp from the swing arm.



A. Chain Cover C. Clamp
B. Chain Guide

Swing Arm Installation Notes

●Installation is the reverse of removal.
●Apply plenty of molybdenum disulfide grease to the inside of the needle bearings, and oil seals.
●When installing the chain cover and chain guide, insert the edges shown into each slot on the swing arm.



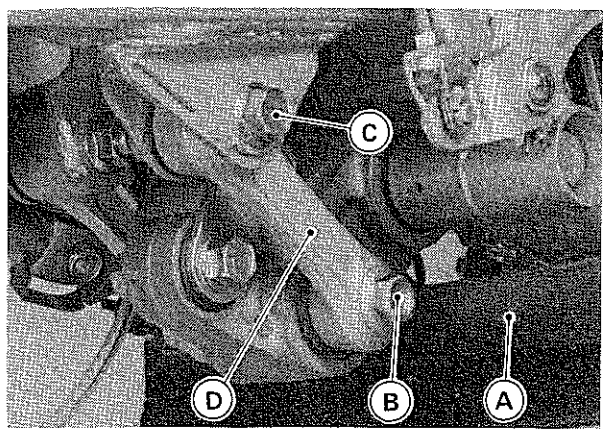
A. Chain Cover
B. Chain Guide
C. Slot

- Tighten the swing arm pivot shaft nut, and the tie-rod rear mounting nut to the specified torque (see Exploded View).
- Route the carburetor overflow tubes and engine breather hose through the clamp (see Hose Routing in the General Information chapter).
- Apply a non-permanent locking agent to the threads of the brake pedal mounting bolt, and tighten it to the specified torque (see Exploded View in the Brakes chapter).
- Refer to the Wheels/Tires, Final Drive, and Brakes chapters for wheel installation.

Tie-Rod, Rocker Arm:

Tie-Rod Removal

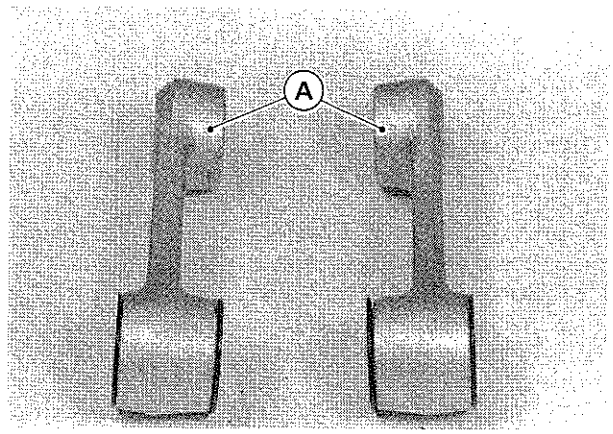
- Place a stand or block under the motorcycle so that the rear wheel is raised off the ground.
- Remove the tie-rod front mounting bolt.
- Remove the tie-rod rear mounting bolts, and then take out the tie-rods.



A. Stand
B. Tie-Rod Front Mounting Bolt
C. Tie-Rod Rear Mounting Bolt
D. Tie-Rod

Tie-Rod Installation Notes

- Installation is the reverse of removal.
- Apply plenty of molybdenum disulfide grease to the inside of the needle bearings, and oil seals.
- Install the large eyelet with bearings on the swing arm so that the protruding side of the small eyelet faces inward.

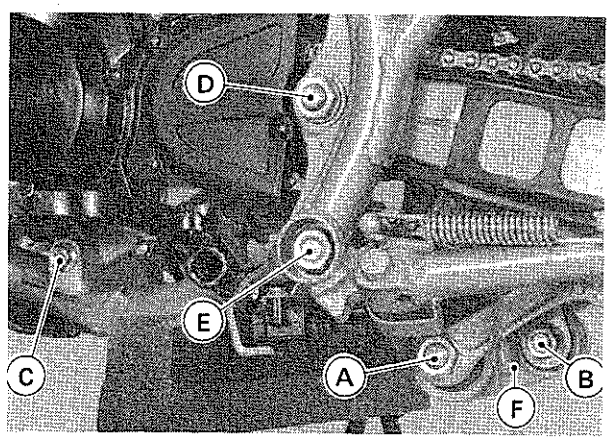


A. Protruding Side

- Tighten the tie-rod front and rear mounting nuts to the specified torque (see Exploded View).

Rocker Arm Removal

- Place a stand or block under the motorcycle so that the rear wheel is raized off the ground.
- Remove the tie-rod front mounting bolt.
- Remove the rear shock absorber lower mounting bolt.



A. Tie-Rod Front Mounting Bolt
B. Rear Shock Absorber Lower Mounting Bolt
C. Engine Mounting Bolt
D. Swing Arm Pivot Shaft
E. Rocker Arm Pivot Shaft
F. Rocker Arm

- Loosen the engine mounting bolt.
- Loosen the swing arm pivot shaft.
- Pull out the rocker arm pivot shaft, and remove the rocker arm.

Rocker Arm Installation Notes

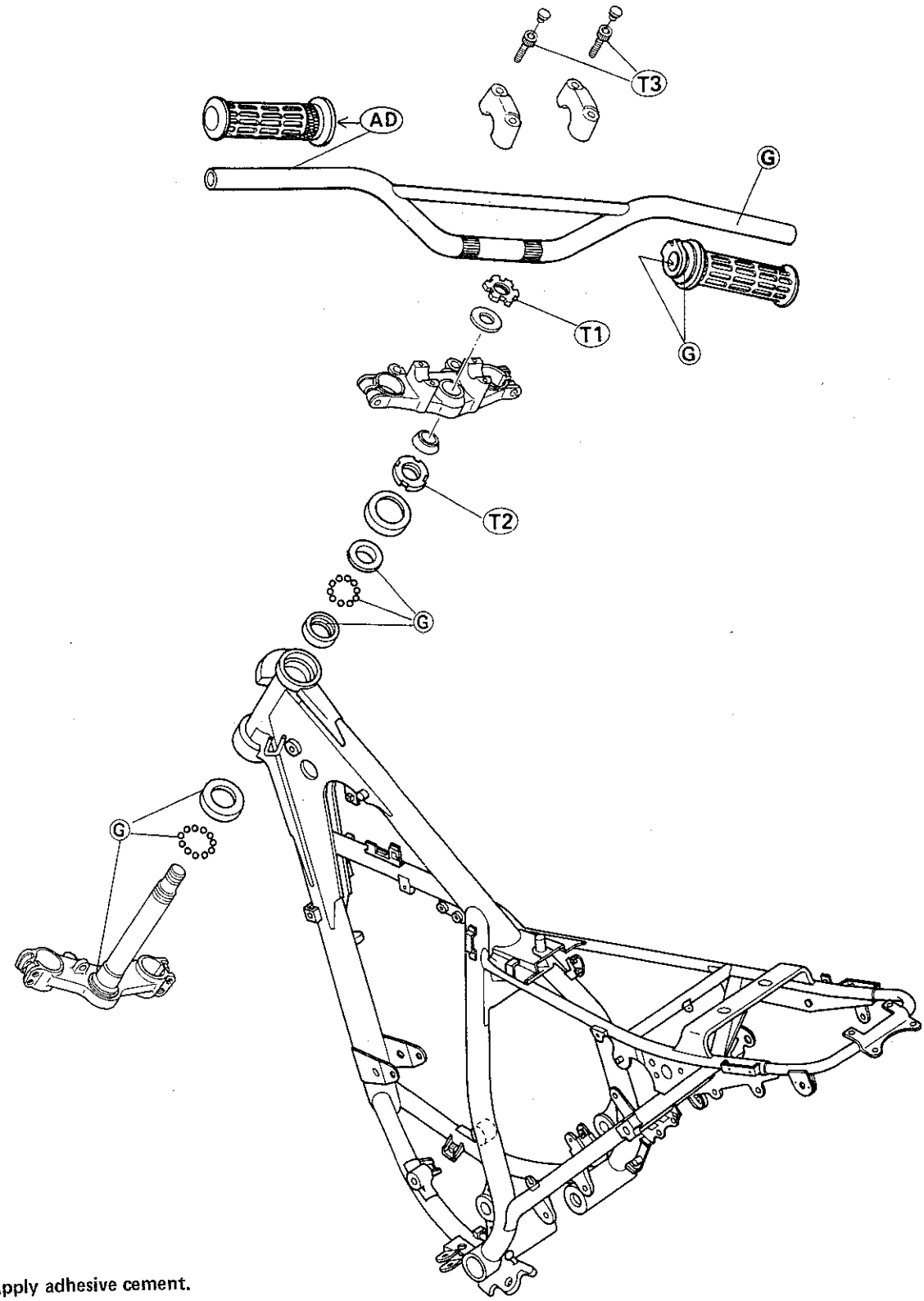
- Installation is the reverse of removal.
- Apply plenty of molybdenum disulfide grease to the inside of the needle bearings, and oil seal, and between them.
- Tighten the following parts to the specified torque in the following order (see Exploded View).
  1. Swing Arm Pivot Shaft Nut
  2. Rocker Arm Pivot Shaft Nut
  3. Engine Mounting Nut
- Tighten the rear shock absorber lower mounting nut and the tie-rod front mounting nuts to the specified torque (see Exploded View).

Steering

Table of Contents

Exploded View 13-2
Special Tools 13-3
Steering Adjustment 13-4
    Steering Inspection 13-4
    Steering Adjustment 13-4
Steering Removal/Installation 13-5
    Steering Stem Removal 13-5
    Steering Stem Installation Notes 13-5
    Steering Stem Bearing Removal 13-6
    Steering Stem Bearing Installation Notes 13-6
Steering Lubrication 13-7
    Steering Stem Bearing Lubrication 13-7

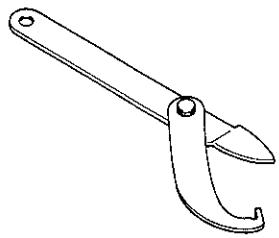
Exploded View



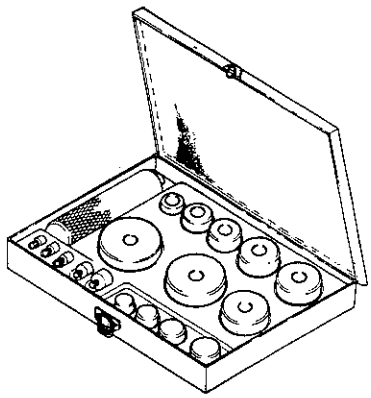
AD: Apply adhesive cement.
G : Apply grease liberally.
T1: 44 N-m (4.5 kg-m, 33 ft-lb)
T2: Tighten all snugly, then loosen.
Retighten to 3.9 N-m (0.4 kg-m, 35 in-lb).
T3: 24 N-m (2.4 kg-m, 17.5 ft-lb)

Special Tools

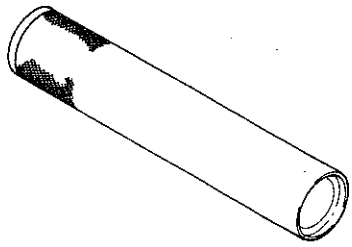
Steering Stem Nut Wrench: 57001-1100



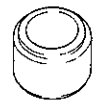
Bearing Driver Set: 57001-1129



Stem Bearing Driver: 57001-137



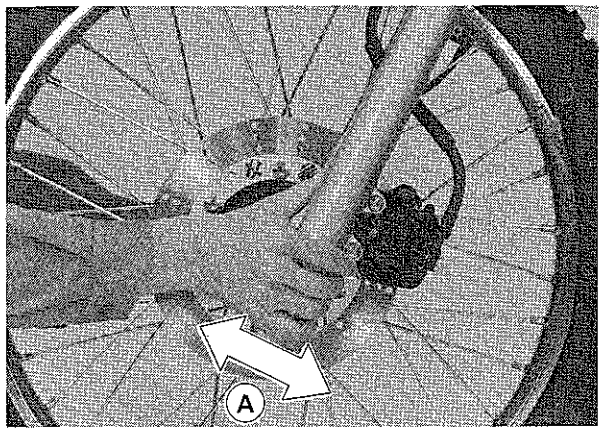
Stem Bearing Driver Adapter: 57001-292



Steering Adjustment

Steering Inspection

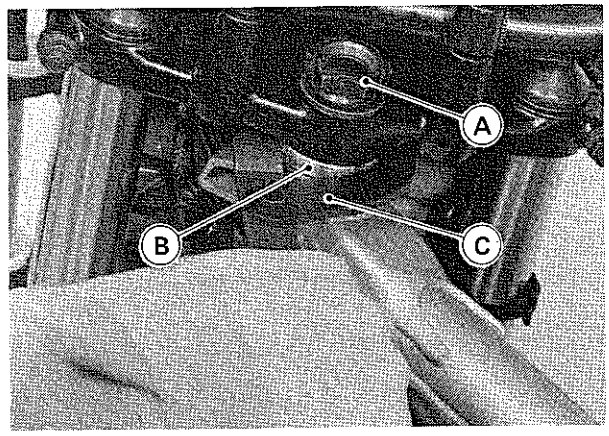
- Place a stand or block under the motorcycle so that the front wheel is raised off the ground.
- With the front wheel pointing straight ahead, alternately nudge each end of the handlebar. The front wheel should swing fully left and right from the force of gravity until the fork hits the stop.
- ★If the steering binds or catches before the stop, check the routing of the cables, hoses, and harnesses.
- ★If the steering feels tight, adjust or lubricate the steering.
- Feel for steering looseness by pushing and pulling the forks.
- ★If you feel looseness, adjust the steering.



A. Push and Pull

Steering Adjustment

- Remove the fuel tank.
- Loosen the front fork lower clamp bolts and stem head nut.
- Place a stand or block under the motorcycle so that the front wheel is raised off the ground.
- Using the steering stem nut wrench (special tool), adjust the steering.
- ★If the steering is too tight, loosen the stem locknut a fraction of a turn; if the steering is too loose, tighten the locknut a fraction of a turn. Turn the locknut 1/8 turn at a time maximum.



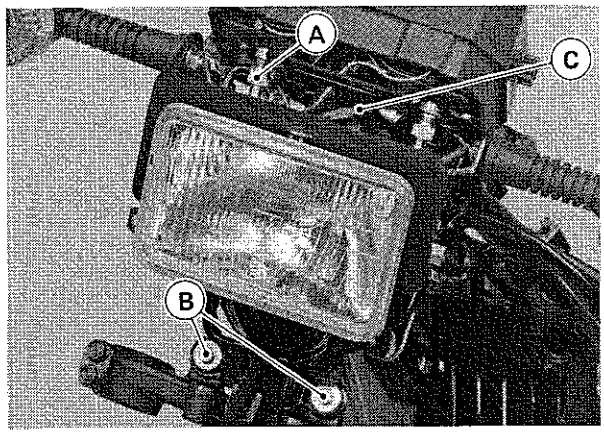
A. Steering Stem Head Nut
B. Steering Stem Locknut
C. Steering Stem Nut Wrench: 57001-1100

- Tighten the steering stem head nut to the specified torque (see Exploded View).
- Tighten the front fork lower clamp bolts to the specified torque (see Exploded View).
- Check the steering again.
- ★If the steering is still to tight or too loose in spite of correct adjustment, inspect the steering stem parts.
- Install the fuel tank.

Steering Removal/Installation

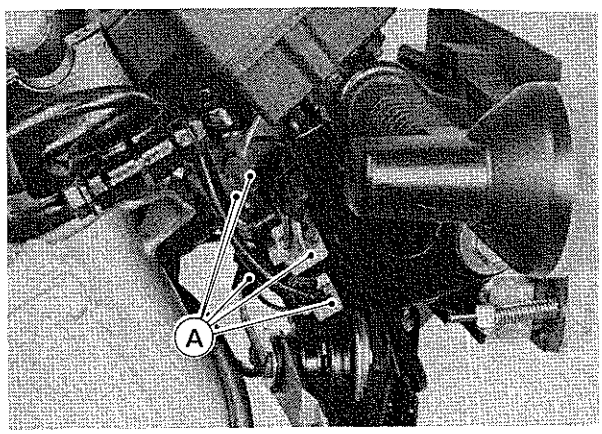
Steering Stem Removal

- Remove the following parts.
  - Seat
  - Fuel Tank
  - Front Wheel
  - Speedometer Cable Clamp
  - Brake Hose Clamp
  - Caliper Mounting Bolts
  - Master Cylinder Clamp
  - Front Fender
  - Handlebar
  - Headlight Cover
  - Front Fork
- Remove the steering stem head nut and washer.
- Remove the tachometer cable upper end.
- Unscrew the lower meter bracket bolts.



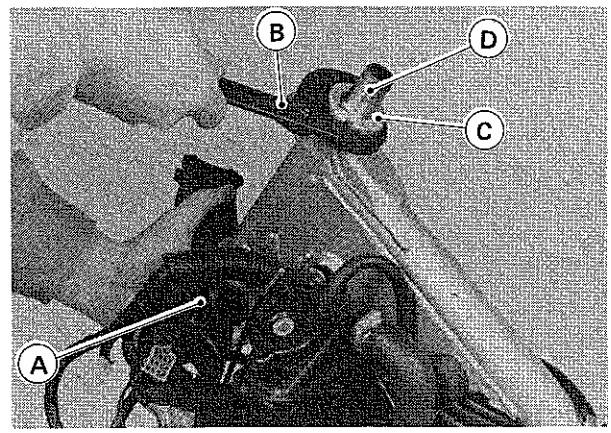
A. Tachometer Cable Upper End
B. Lower Meter Bracket Bolts
C. Clamp

- Disconnect the three connectors in the meter bracket and the lead connectors, and remove the lead clamps.



A. Connectors

- Remove the steering stem head and meter bracket assembly.
- Push up on the stem base, and remove the steering stem locknut with the steering stem nut wrench (special tool), then remove the steering stem and stem base. As the stem is removed, some of the steel balls will drop out of the lower outer race.

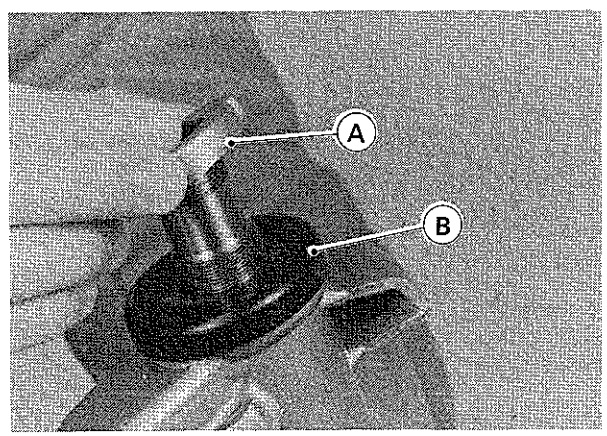


A. Stem Base
B. Steering Stem Nut Wrench: 57001-1100
C. Steering Stem Locknut
D. Steering Stem

- Remove the remaining ball bearings from the lower bearing outer race. There are 19 steel balls installed in the lower outer race.
- Remove the remaining stell balls from the lower bearing outer race. There are 19 steel balls installed in the lower outer race.

Steering Stem Installation Notes

- Installation is the reverse of removal.
- Apply grease liberally to the upper and lower outer races in the head pipe so that the steel balls will stick in place during stem insertion, and install 23 upper steel balls, and 19 lower steel balls.
- Install the stem locknut so that the notched side faces down.



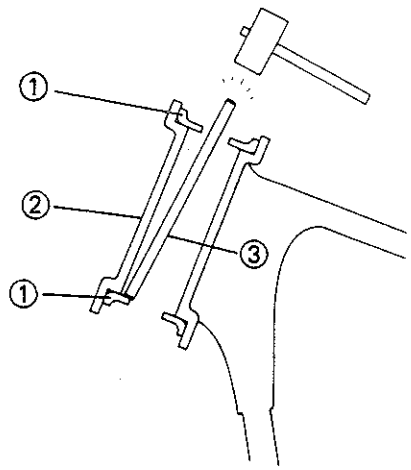
A. Notched Side
B. Cap

- Using the steering stem nut wrench (special tool), temporarily tighten the stem locknut to press the steel balls against the outer race.
- Back out the stem locknut a fraction of a turn until it turns lightly and then tighten the stem locknut to 3.9 N-m (0.40 kg-m, 35 in-lb) of torque again.
- Connect the connectors, and route them according to the Cable and Wire Routing section in the General information chapter.
- Tighten the stem head nut to the specified torque (see Exploded View).
- Install the parts removed (see appropriate chapters).
- Route the cables, hoses, and harnesses according to the Cable, Hose and Wire Routing section in the General Information chapter. The cables, hose, and wiring harnesses must not hinder handlebar movement.
- Check and adjust the following items.

Steering
Front Brake
Clutch Cable
Throttle Cable
Choke Cable
Headlight
Rear View Mirror(s)

Steering Stem Bearing Removal

- Remove the steering stem, and take out the upper inner race and the steel balls.
- To remove the outer races pressed into the head pipe, insert a bar into the head pipe, and hammer evenly around the circumference of the opposite race to drive it out.

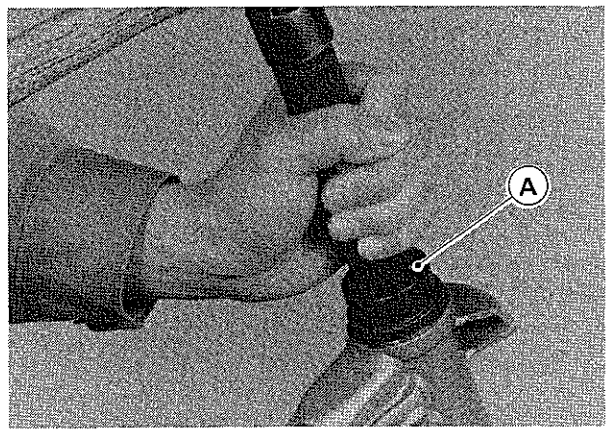


1. Outer Race
2. Head Pipe
3. Bar

- Pry the lower inner race off the steering stem, with suitable levers.

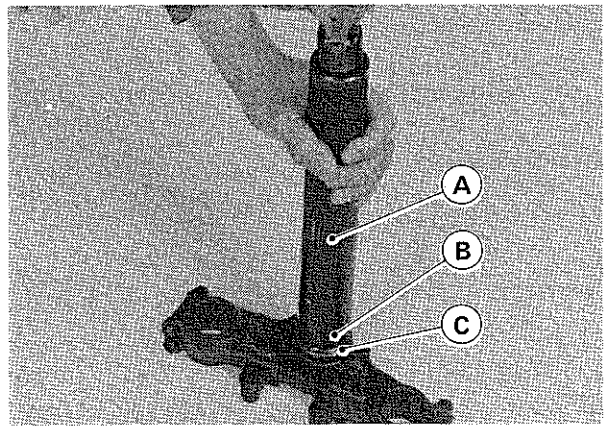
Steering Stem Bearing Installation Notes

- Installation is the reverse of removal.
- Apply engine oil to the outer races, and then drive them into the head pipe using the bearing driver set (special tool).



A. Bearing Driver Set: 57001-1129

- Drive the lower inner race onto the steering stem using the stem bearing driver and adapter (special tools).



A. Stem Bearing Driver: 57001-137
B. Adapter: 57001-292
C. Inner Race

- Refer to Steering Stem Installation Notes.

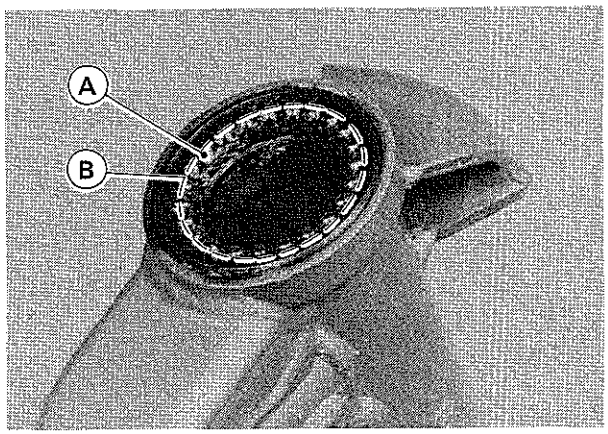
Steering Lubrication

Steering Stem Bearing Lubrication

- Remove the steering stem (see Steering Stem Removal).
- Wipe the old grease off from upper and lower bearing races and steel balls, washing them in a high flash point solvent if necessary.
- Inspect the bearing races and the steel balls.

★Replace the worn or damaged parts if necessary.

- Apply grease liberally to the upper and lower outer races in the head pipe and steel balls.



A. Steel Balls B. Grease.

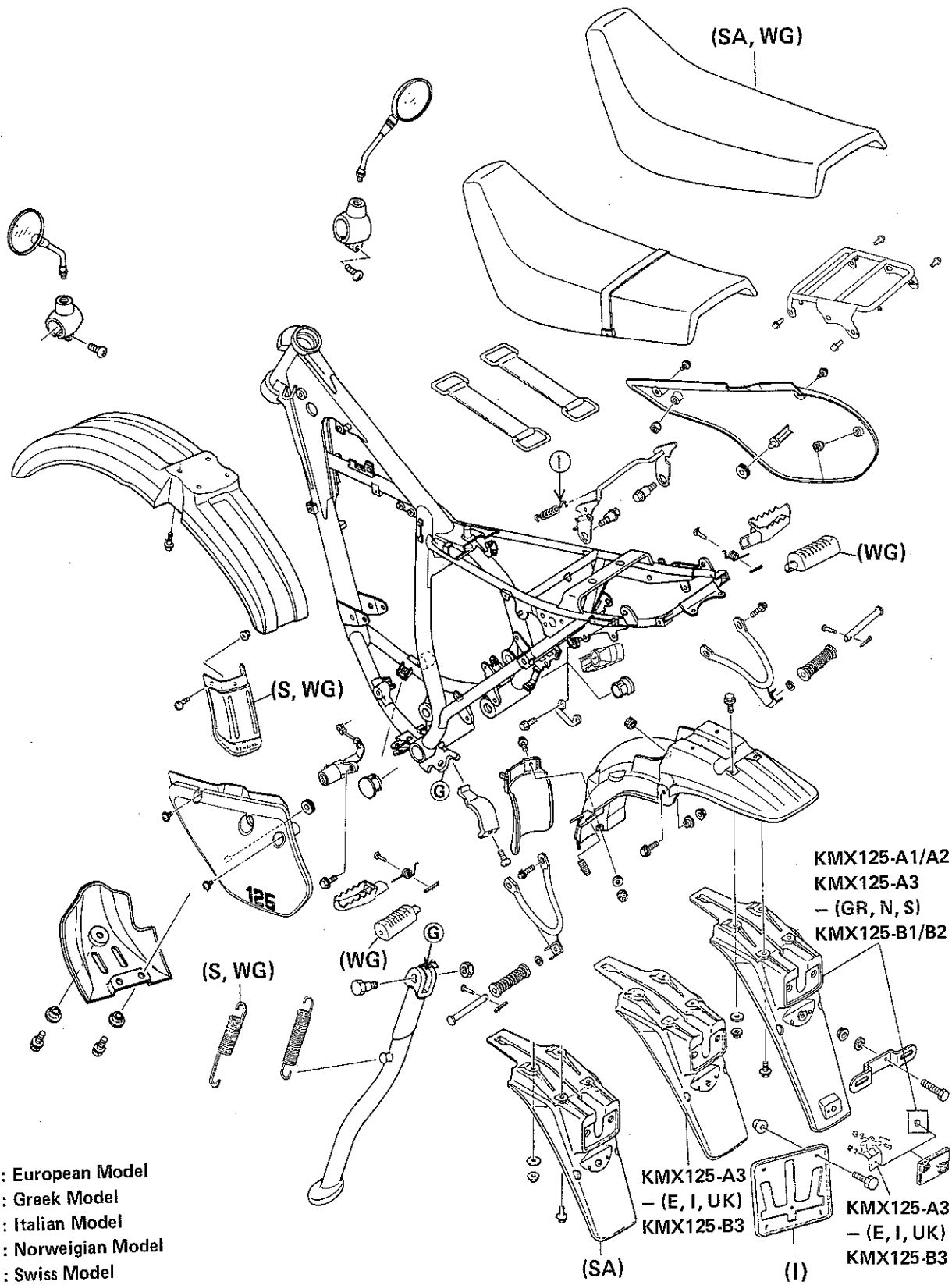
- Install the steering stem, and adjust the steering (see Steering Stem Installation, Steering Adjustment).

Frame

Table of Contents

Exploded View 14-2
Fender 14-3
Front Fender Removal 14-3
Front Fender Installation Note 14-3
Rear Fender Removal 14-3
Rear Fender Installation Notes 14-3
Footpeg 14-4
Rear Footpeg Installation Note 14-4
Seat Lock 14-4
Seat Lock Installation Note 14-4

Exploded View



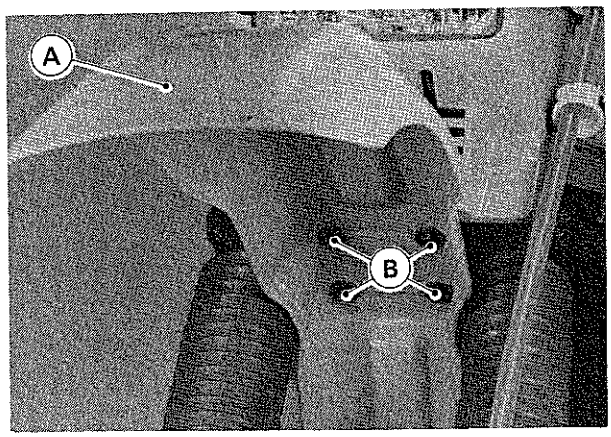
E : European Model
GR : Greek Model
I : Italian Model
N : Norweigian Model
S : Swiss Model
SA : South African Model
UK : U.K. Model
WG : West German Model

1. Hook the long end of the spring on the seat lock rod.
G : Apply grease.

Fender

Front Fender Removal

●Unscrew the mounting bolts, and remove the front fender.



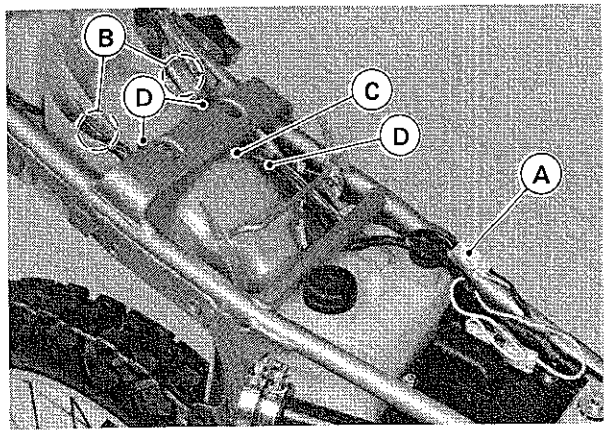
A. Front Fender B. Mounting Bolts

Front Fender Installation Note

●Installation is the reverse of removal.

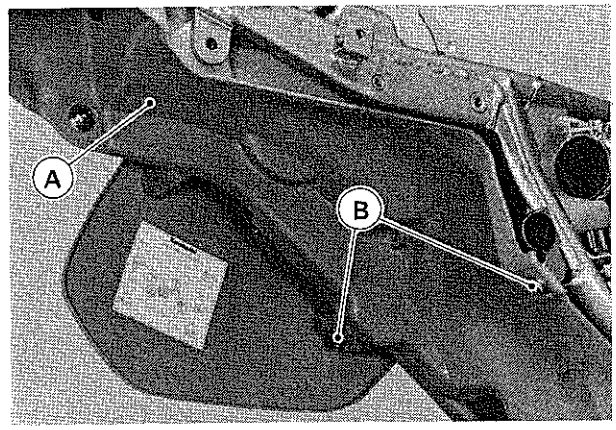
Rear Fender Removal

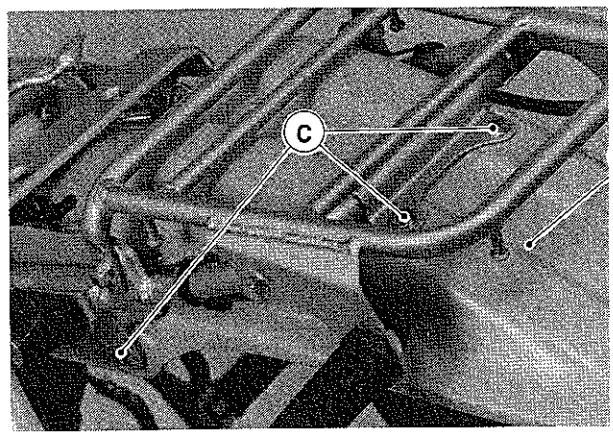
●Remove the following parts.
Seat
Right Side Cover
Silencer
●Disconnect the oil level sensor connector.
●Disconnect the lead connectors, and free the leads and oil tank breather hose from the clamp on the rear fender.



A. Oil Level Sensor Connector
B. Lead Connectors
C. Oil Tank Breather Hose
D. Clamps

●Unscrew the rear fender mounting bolts, nuts and screws.



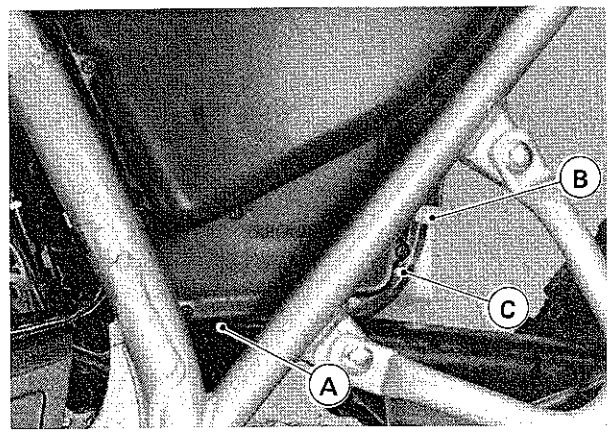


A. Rear Fender C. Mounting Bolts and Nuts
B. Mounting Screws

●Remove the oil tank from the rear fender.

Rear Fender Installation Notes

●Installation is the reverse of removal.
●Route the oil tank hose according to the Hose Routing section in the General Information chapter. Clamp it at the air cleaner housing bottom and the rear fender flap.



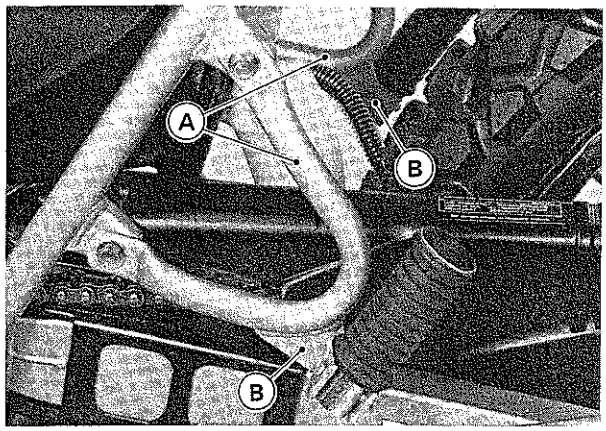
A. Clamp C. Oil Tank Hose
B. Flap

●Route the leads and oil tank breather hose according to the Hose Routing and Wire Routing in the General Information chapter and clamp them securely on the rear fender.

Footpeg

Rear Footpeg Installation Note

●Install the rear footpeg bracket so that the actual footpeg mount is at the bottom. The brackets are marked "L" and "R", do not mix them up.

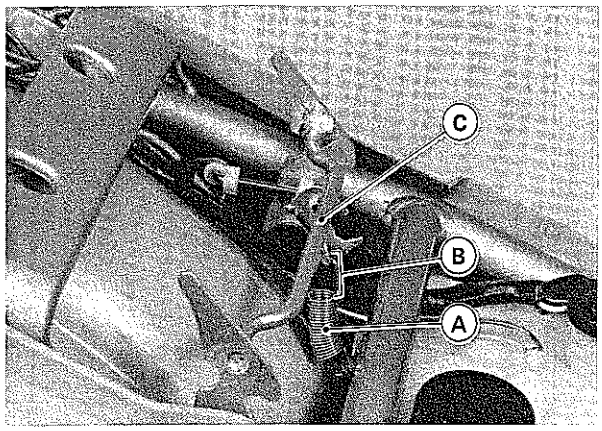


A. Rear Footpeg Brackets B. Footpeg Mount

Seat Lock

Seat Lock Installation Note

●Install the return spring so that the long end of the spring is hooked on the seat lock rod.



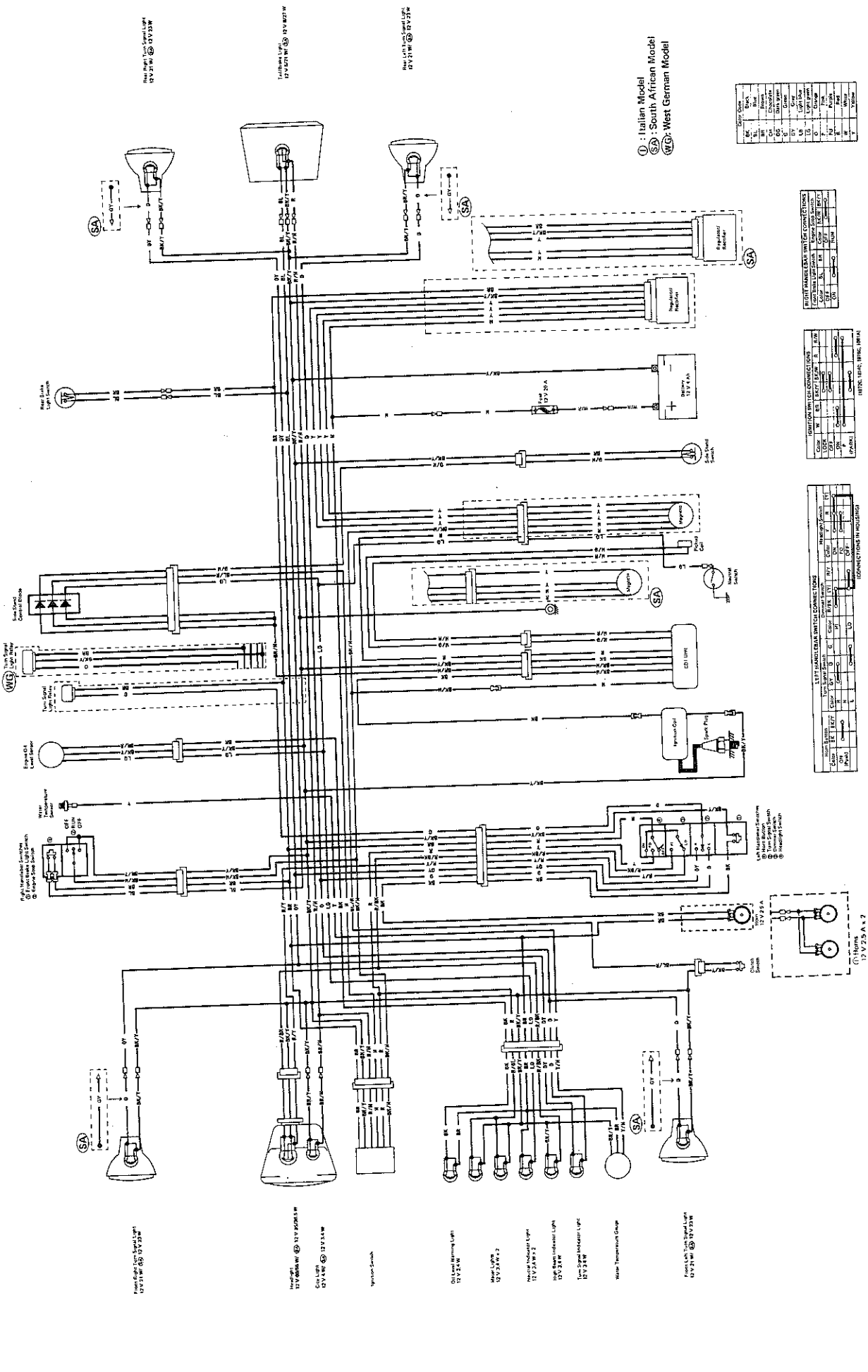
A. Return Spring C. Seat Lock Rod
B. Long End

Electrical System

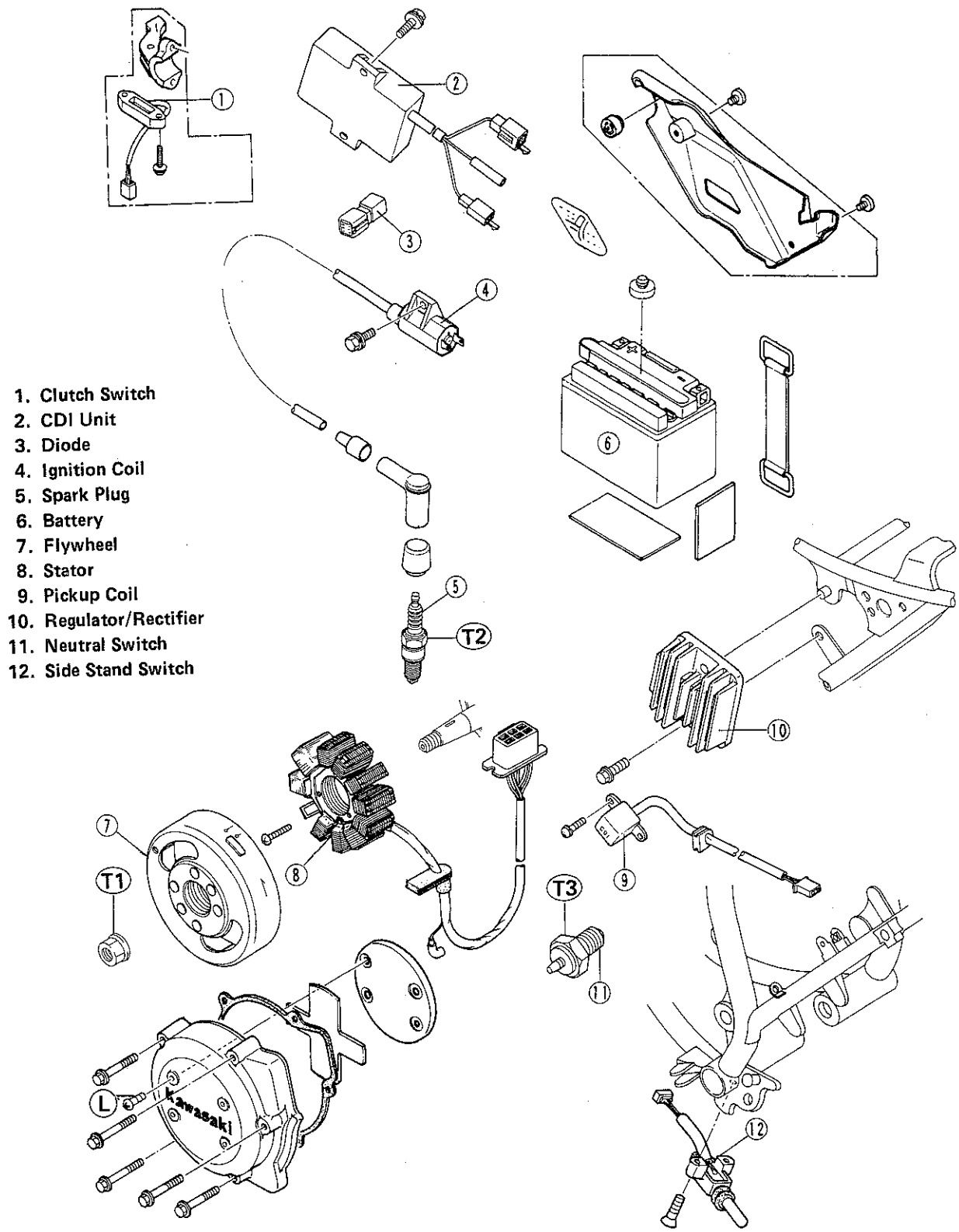
Table of Contents

Wiring Diagram 15-2
Exploded View 15-3
Specifications 15-6
Special Tools 15-7
Sealant 15-7
Precautions 15-8
Electrical Wiring 15-8
Wiring Inspection 15-8
Battery 15-8
Precautions 15-8
Battery Removal 15-9
Battery Installation 15-9
Electrolyte 15-9
Electrolyte Level Inspection 15-9
Battery Charging 15-9
Battery Condition 15-9
Battery Initial Charging 15-10
Battery Ordinary Charging 15-11
Battery Test Charging 15-12
Flywheel Magneto 15-12
Flywheel Magneto Removal 15-12
Flywheel Magneto Installation 15-13
Flywheel Magneto Inspection 15-13
Charging System 15-14
Magneto Output Voltage Inspection 15-14
Charging Coil Inspection 15-14
Charging Voltage (Regulator/Rectifier Output Voltage) Inspection 15-14
Regulator/Rectifier Inspection 15-16
Ignition System 15-17
Safety Instructions 15-17
Ignition Coil Removal 15-18
Ignition Coil Installation 15-18
Ignition Coil Inspection 15-18
Spark Plug Cleaning and Inspection 15-19
Spark Plug Gap Inspection 15-19
CDI Unit Inspection 15-20
Pickup Coil Removal 15-20
Pickup Coil Installation 15-21
Pickup Coil Inspection 15-21
Exciter Coil Inspection 15-21
Diode Inspection 15-21
Lighting System 15-23
Headlight Beam Horizontal Adjustment . . 15-23
Headlight Beam Vertical Adjustment . . . 15-23
Headlight Bulb Replacement Notes 15-24
Headlight Unit Removal/ Installation Note 15-24
Tail/Brake Light Bulb Replacement Notes 15-24
Tail/Brake Light Lens Removal/ Installation Note 15-25
Turn Signal Light Bulb Replacement Note 15-25
Turn Signal Relay Inspection 15-25
Meter and Gauges 15-25
Meter and Gauges Removal/ Installation Note 15-25
Meter Mounting Inspection 15-25
Bulb Replacement Notes 15-26
Water Temperature Gauge Operation Inspection 15-26
Switches and Sensors 15-27
Brake Light Timing Inspection 15-27
Brake Light Timing Adjustment 15-27
Water Temperature Sensor Inspection . . . 15-27
Switch Inspection 15-28
Engine Oil Level Warning System 15-29
Engine Oil Level Warning Circuit Inspection 15-29
Oil Level Sensor Inspection 15-30
Fuse 15-30
20 Ampere Fuse Removal 15-30
20 Ampere Fuse Installation 15-31

KMX125-A1/A2/A3/B1/B2/B3 Wiring Diagram

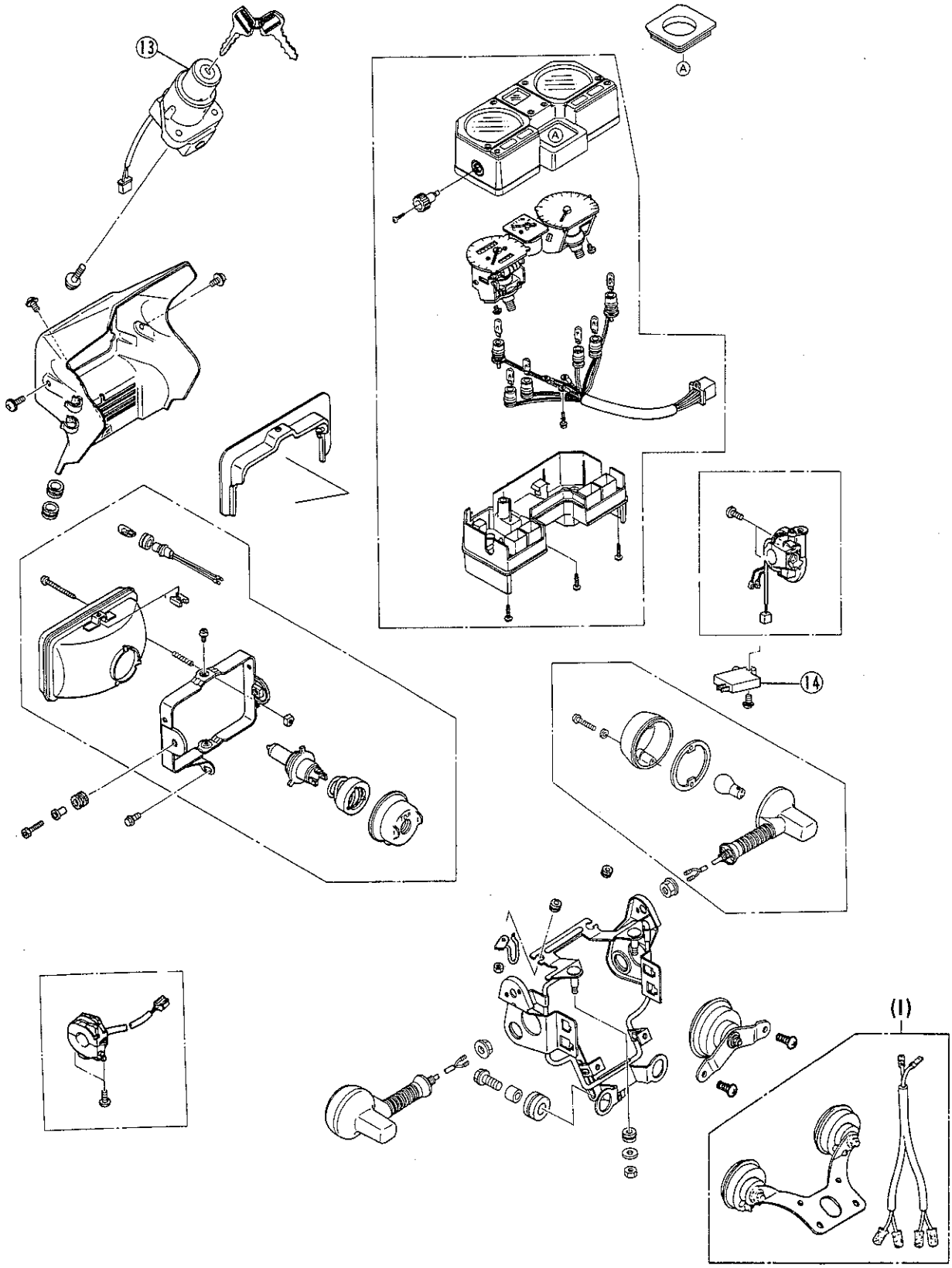


Exploded View

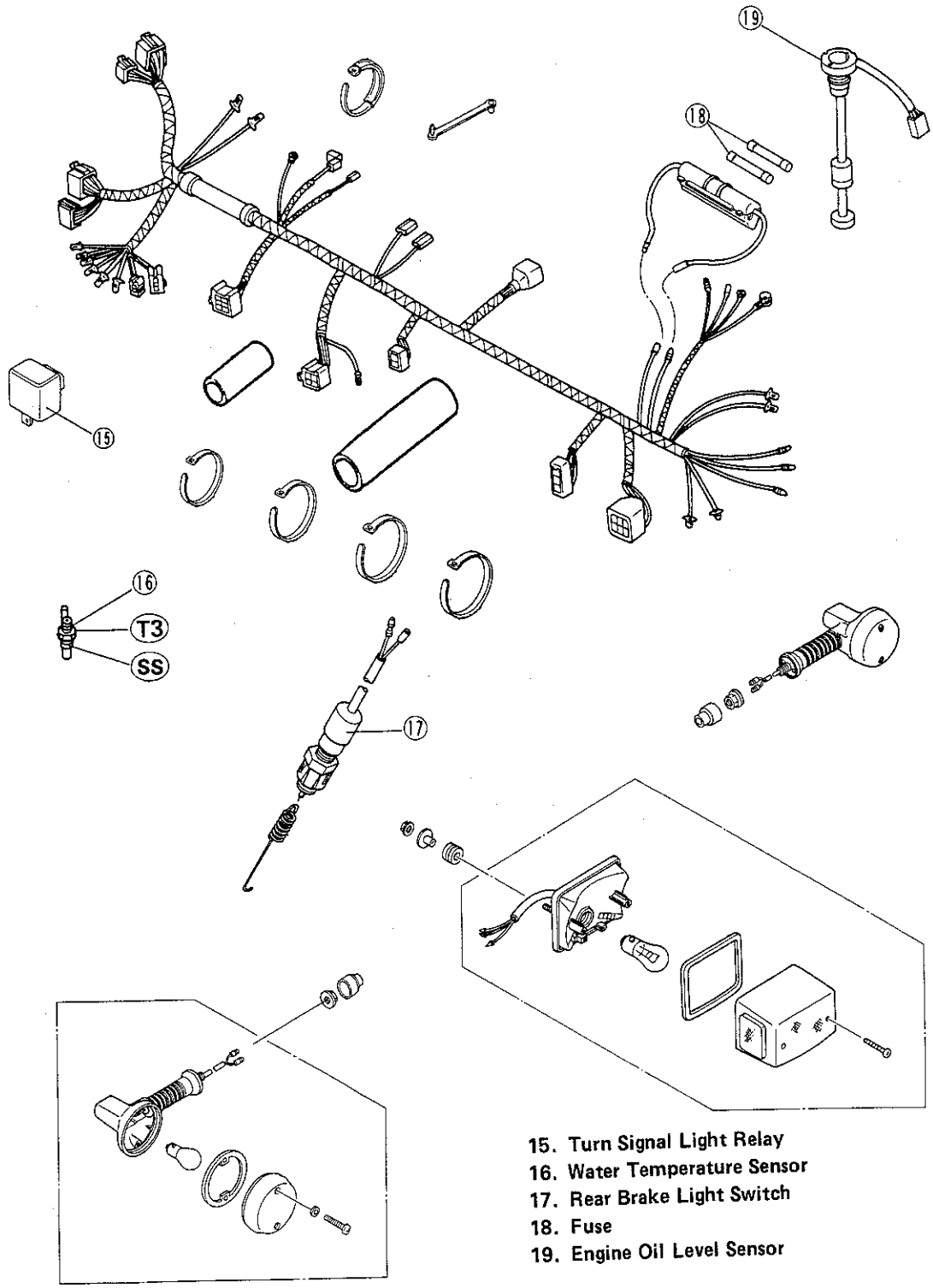


1. Clutch Switch
2. CDI Unit
3. Diode
4. Ignition Coil
5. Spark Plug
6. Battery
7. Flywheel
8. Stator
9. Pickup Coil
10. Regulator/Rectifier
11. Neutral Switch
12. Side Stand Switch

L : Apply a non-permanent locking agent to the threads.
T1 : 59 N-m (6.0 kg-m, 43 ft-lb)
T2 : 25 N-m (2.5 kg-m, 18.0 ft-lb)
T3 : 15 N-m (1.5 kg-m, 11.0 ft-lb)



I : Italian Model
13. Ignition Switch
14. Front Brake Light Switch



15. Turn Signal Light Relay
16. Water Temperature Sensor
17. Rear Brake Light Switch
18. Fuse
19. Engine Oil Level Sensor

SS: Apply silicone sealant (Kawasaki Bond: 56019-120) to the threads.
T3: 15 N-m (1.5 kg-m, 11.0 ft-lb)

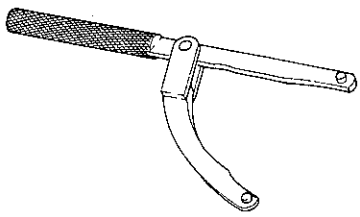
Specifications

Item	Standard
Battery:	
Type	12 V 4 Ah
Electrolyte level	Between upper and lower levels
Electrolyte amount	270 mL; 45 mL per one cell
Specific gravity of electrolyte	1.280 @20°C (68°F)
Charging System:	
Type	Three-phase AC
Magneto output voltage	Not less than 27 V @4 000 r/min (rpm) (SA) Not less than 31 V @4 000 r/min (rpm)
Charging coil resistance	0.3 – 1.0 Ω (Y – Y), (SA) 0.2 – 0.8 Ω (Y – Y)
Charging voltage (Regulator/rectifier output voltage)	14.5 ±0.5 V @4,000 r/min (rpm) (with Headlight switch ON if applicable)
Ignition System:	
Ignition timing	10.5° BTDC @1 300 r/min (rpm) – 26.5° BTDC @3 000 r/min (rpm)
Ignition Coil:	
3 needle arcing distance	7 mm or more
Primary winding resistance	0.153 – 0.207 Ω
Secondary winding resistance	3.84 – 5.76 kΩ
Exciter coil resistance	90 – 170 Ω (R – W)
Pickup coil resistance	100 – 150 Ω
Pickup coil air gap	0.7 mm
CDI unit internal resistance	refer to p. 20
Spark plug: Type; Standard	NGK BR8ES, (I) (SA) NGK B8ES
Low speed riding	NGK BR7ES, (I) (SA) NGK B7ES
High speed riding	NGK BR9ES, (I) (SA) NGK B9ES
Spark plug gap	0.7 – 0.8 mm
Switches and Sensors:	
Brake light timing	On after about 15 mm pedal travel
Water temperature sensor internal resistance	about 130 Ω @80°C (176°F) about 70Ω @100°C (212°F)

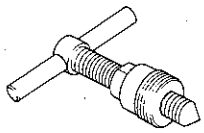
Special Tools

Along with common hand tools, the following more specialized tools are required for complete electrical system servicing.

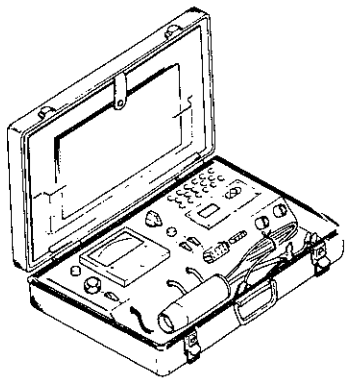
Flywheel Holder: 57001-306



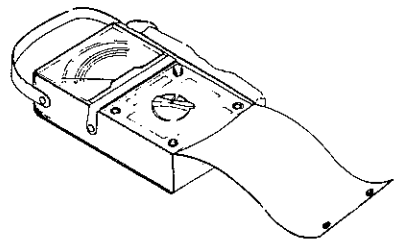
Flywheel Puller: 57001-252



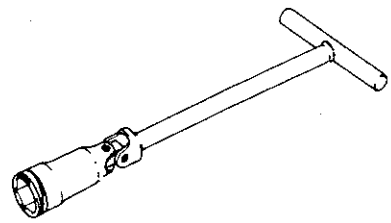
Electro Tester: 57001-980



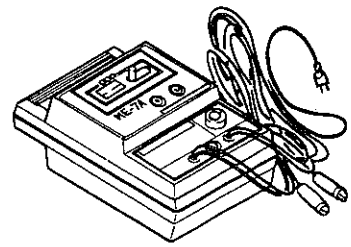
Hand Tester: 57001-983



Spark Plug Wrench, Hex 18: 57001-1024

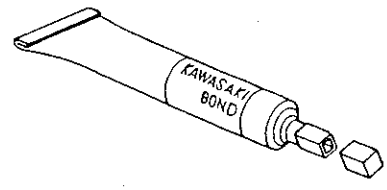


Coil Tester: 57001-1242



Sealant

Kawasaki Bond (Silicone Sealant): 56019-120

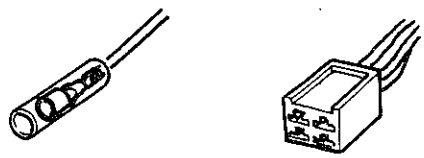


Precautions

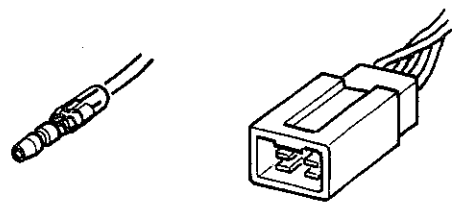
There are numbers of important precautions that are musts when servicing electrical system. Learn and observe all the rules below.

- ○Do not reverse the battery lead connections. This will burn out the diodes in the electrical parts.
- ○Always check battery condition before condemning other parts of an electrical system. A fully charged battery is a must for conducting accurate electrical system tests.
- ○The electrical parts should never be struck sharply, as with a hammer, or allowed to fall on a hard surface. Such a shock to the parts can damage them.
- ○To prevent damage to electrical parts, do not disconnect the battery leads or any other electrical connections when the ignition switch is on, or the engine is running.
- ○Do not use a meter illumination bulb rated for other than the voltage or wattage specified in the wiring diagram, as the meter or gauge panel could be warped by excessive heat radiated from the bulb.
- ○Take care not to short the leads that are directly connected to the battery positive (+) terminal to the chassis ground.
- ○Troubles may involve one or in some cases all items. Never replace a defective part without determining what CAUSED the failure. If the failure was caused by some other item or items, they too must be repaired or replaced, or the new replacement will soon fail again.
- ○Make sure all connectors in the circuit are clean and tight, and examine wires for signs of burning, fraying, etc. Poor wires and bad connections will affect electrical system operation.
- ○Measure coil and winding resistance when the part is cold (at room temperature).
- ○Electrical Connectors

Female Connectors



Male Connectors



- ○Color Codes:

BK	Black
BL	Blue
BR	Brown
CH	Chocolate
DG	Dark green
G	Green
GY	Gray
LB	Light blue
LG	Light green
O	Orange
P	Pink
PU	Purple
R	Red
W	White
Y	Yellow

Electrical Wiring

Wiring Inspection

- ●Visually inspect the wiring for signs of burning, fraying, etc.
- ★If any wiring is poor, replace the damaged wiring.
- ●Pull each connector apart and insect it for corrosion, dirt, and damage.
- ★If the connector is corroded or dirty, clean it carefully. If it is damaged, replace it.
- ●Check the wiring for continuity.
- ○Use the wiring diagram to find the ends of the lead which is suspected of being a problem.
- ○Connect an ohmmeter between the ends of the leads.
- ○Set the meter to the x 1 Ω range, and read the meter.
- ★If the meter does not read 0 Ω, the lead is defective. Replace the lead or the wiring harness if necessary.

Battery

Precautions:

Following a few simple rules will greatly extend the life of the battery.

- ○When the level of the electrolyte in the battery is low, add only distilled water to each cell, until the level is at the upper level line marked on the outside of the battery. Ordinary tap water is not a substitute for distilled water and will shorten the life of the battery.
- ○Never add sulphuric acid solution to the battery. This will make the electrolyte solution too strong and will ruin the battery within a very short time.
- ○Avoid quick-charging the battery. A quick-charge will damage the battery plates.

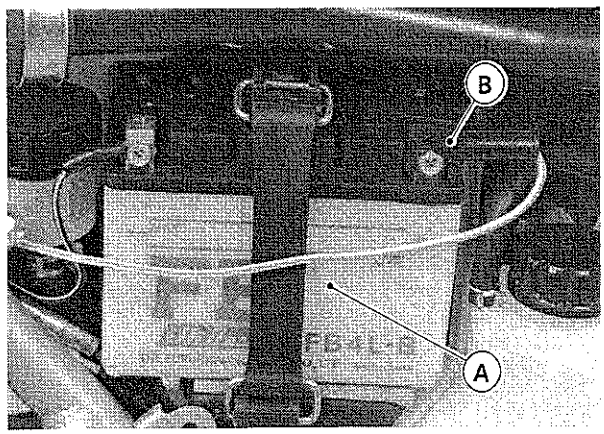
○Never let a good battery stand for more than 30 days without giving it a supplemental charge, and never let a discharged battery stand without charging it. If a battery stands for any length of time, it slowly self-discharges. Once it is discharged, the plates sulphate (turn white), and the battery will no longer take a charge.
○Keep the battery well-charged during cold weather so that the electrolyte does not freeze and crack open the battery. The more discharged the battery becomes, the more easily it freezes.
○Always keep the battery vent hose free of obstruction, and make sure it does not get pinched, crimped, or melted shut by contact with the hot muffler. If battery gases cannot escape through this hose, they will explode the battery.
○DON'T INSTALL THE BATTERY BACKWARDS. The negative side is grounded.

Battery Removal

●Remove the following parts:
Right Side Cover
Battery Cover
●Remove the bolts from the (+) and (–) terminals, and disconnect the battery leads.
●Remove the band.
●Remove the battery with vent hose.

Battery Installation

●Installation is the reverse of removal. Note the following:
○Install the battery so that the terminals are to the front. Be sure to cover the (+) terminal with the rubber cap.



A. Frontal Side B. Rubber Cap

○For battery vent hose routing information, see the label on the back side of the battery cover or Hose Routing in the General Information chapter.

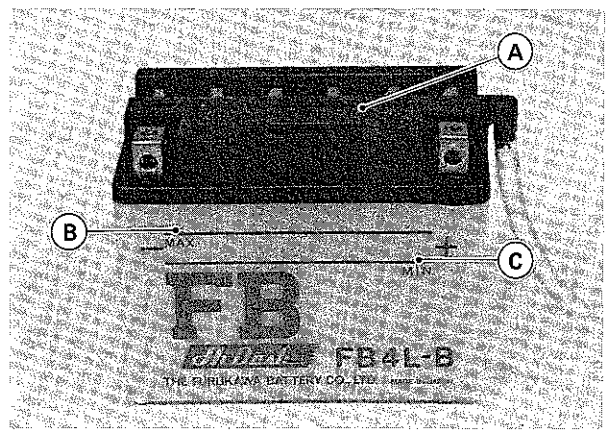
CAUTION

○Make sure the battery vent hose kept away from the drive chain. Battery electrolyte can corrode and dangerously weaken the chain.
○Always keep the battery vent hose free of obstruction, and make sure it does not get pinched, crimped, or melted shut by contact with the hot muffler. If battery gases cannot escape through this hose, they can explode the battery.

Electrolyte:

Electrolyte Level Inspection

●Remove the battery.
●Visually check the electrolyte level in the battery.



A. Battery C. Lower Level
B. Upper Level

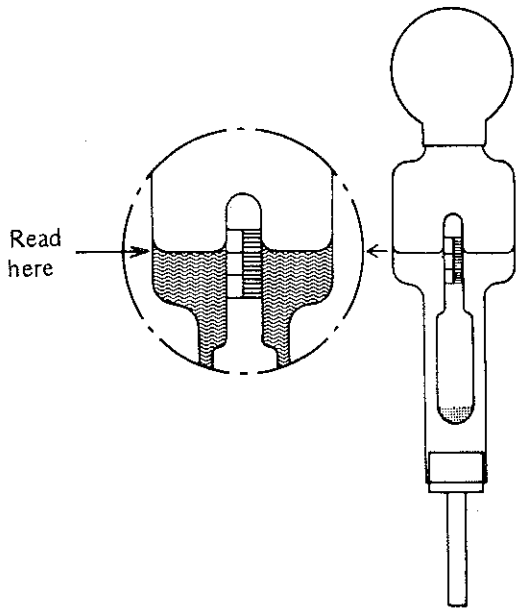
★If the level line of electrolyte in any cell is below the lower level line on the battery case, add distilled water only to that cell.
●Install the battery.

Battery Charging:

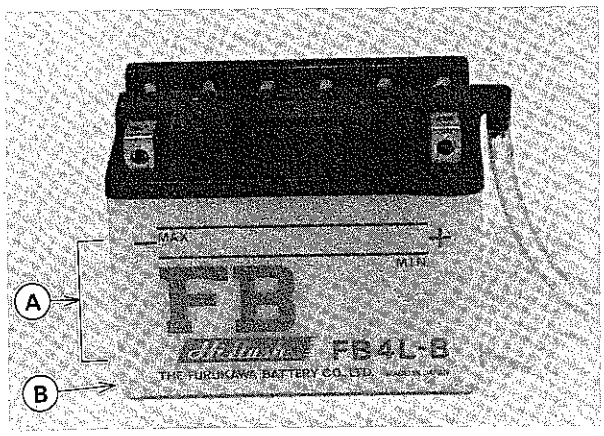
Battery Condition

●Before charging, check battery condition by testing the specific gravity of the electrolyte in each cell.
○Draw a little fluid from the cell with a hydrometer.
○Read the level of the electrolyte on the floating scale. This is the specific gravity of the electrolyte.

Hydrometer



●Look for sediment and white sulfation inside the cells on the bottom of the plates.



A. Sulfation here B. Sediment here

●See the Battery Troubleshooting Guide in Battery Test Charging.

★If the specific gravity is below 1.200 the battery needs to be charged.

NOTE

○*The specific gravity of the electrolyte varies with changes in temperature, so the specific gravity reading must be corrected for the temperature of the electrolyte.*

○*Celsius: Add 0.007 points to reading for each 10°C above 20°C or subtract 0.007 points for each 10°C below 20°C.*

○*Fahrenheit: Add 0.004 points to reading for each 10°F above 68°F or subtract 0.004 points for each 10°F below 68°F.*

★If the specific gravity of any of the cells is more than 0.050 away from any other reading, the battery will probably not accept a charge. If it generally best to replace a battery in this condition.

★If the specific gravity of all the cells is 1.280 or more the battery is fully charged.

Battery Initial Charging

Before being placed in service, **a new battery must be given an initial charging.**

●Cut off the sealed end of the battery vent hose and remove the filler caps.

●Fill each cell to the upper level line on the battery case with fresh electrolyte at a temperature of 30°C (86°F) or less. Let the battery stand for about 30 minutes before charging.

NOTE

○*If the electrolyte level drops, add electrolyte to the upper level line before charging.*

●Leaving the caps off the cells, connect the battery to a charger, set the charging rate at 1/10 the battery capacity, and **charge it for 10 hours.** For example, if the battery is rated at 12 Ah, the charging rate would be 1.2 A.

CAUTION

○**If the battery is not given a full initial charging, it will discharge in a few weeks and will not recover fully even with supplemental charging.**

WARNING

○**Keep the battery away from sparks and open flames during charging, since the battery gives off an explosive gas mixture of hydrogen and oxygen. When using a battery charger, connect the battery to the charger before turning on the charger. This procedure prevents sparks at the battery terminals which could ignite any battery gases.**

CAUTION

○**Do not use a high rate battery charger, as is typically employed at automotive service stations, unless the charger rate can be reduced to the level required. Charging the battery at a rate higher than specified may ruin the battery. Charging at a high rate causes excess heat which can warp the plates and cause internal shorting. Higher-than-normal charging rates also cause the plates to shed active material. Deposits will accumulate, and can cause internal shorting.**

○**If the temperature of the electrolyte rises above 45°C (115°F) during charging, reduce the charging rate to lower the temperature, and increase charging time proportionately.**

•Turn the charger off, then disconnect it from the battery.
•Check battery voltage. Battery voltage should be 12 – 13 V.
•Check the specific gravity of each cell with a hydrometer (see Battery Condition).
★If the voltmeter or hydrometer readings are below those specified, additional charging is necessary before the battery can be installed.

Battery Ordinary Charging

•Remove the battery from the motorcycle.

CAUTION

○**Always remove the battery from the motorcycle for charging. If the battery is charged while still installed, battery electrolyte may spill and corrode the frame or other parts of the motorcycle.**

•Clean off the battery using a baking soda-and-water solution.
○Mix one heaping tablespoon of baking soda in one cup of water.
○Be careful not to get any of the cleaning solution in the battery.
○The terminals must be especially clean.
•If any of the cells are low, fill them to the LOWER level line with distilled water only. The electrolyte will expand during charging, and the level will rise.
•Connect a charger to the battery BEFORE plugging it in or turning it on.

WARNING

○**Keep the battery away from sparks and open flames during charging, since the battery gives off an explosive gas mixture of hydrogen and oxygen. When using a battery charger, connect the battery to the charger before turning on the charger. This procedure prevents sparks at the battery terminals which could ignite any battery gases.**

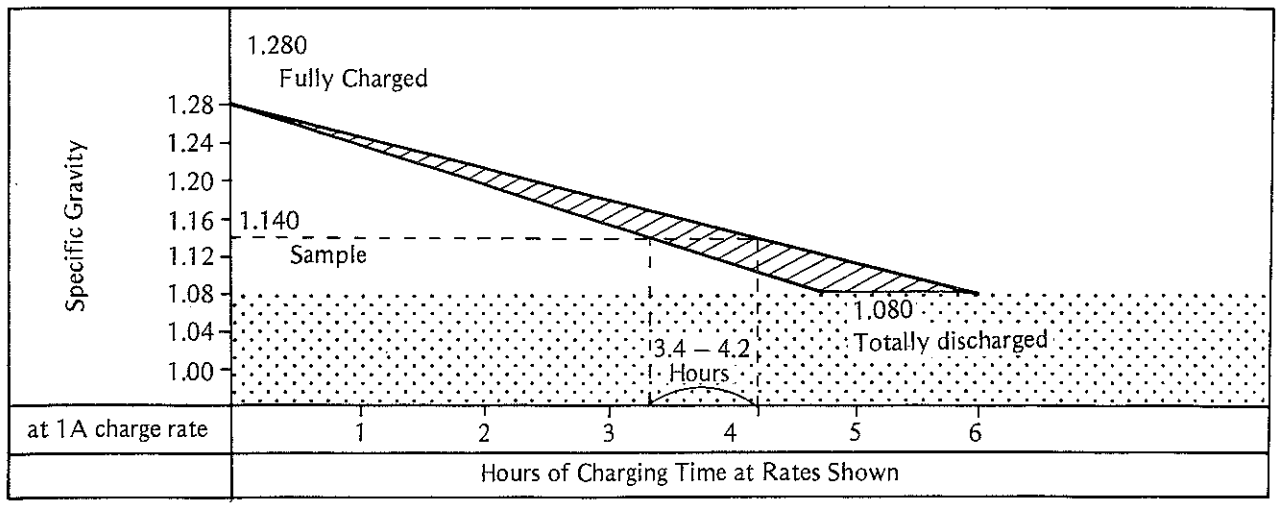
•Set the charge rate and time according to the battery condition previously determined (see Battery Condition), using the table.

CAUTION

○**Do not use a high rate battery charger, as is typically employed at automotive service stations, unless the charger rate can be reduced to the level required. Charging the battery at a rate higher than specified may ruin the battery. Charging at a high rate causes excess heat which can warp the plates and cause internal shorting. Higher-than-normal charging rates also cause the plates to shed active material. Deposits will accumulate, and can cause internal shorting.**
○**If the temperature of the electrolyte rises above 45°C (115°F) during charging, reduce the charging rate to lower the temperature, and increase charging time proportionately.**

•Turn the charger off or unplug it, then disconnect it from the battery.
•Check battery condition (See Battery Condition).
★If the battery condition indicates that it is not fully charged, additional charging time is necessary.

Battery Charging Rate/Time Table (12V 4Ah)



Battery Troubleshooting Guide

	Good Battery	Suspect Battery	Action
Plates	(+) chocolate color (–) gray	white (sulphated); + plates broken or corroded	Replace
Sediment	none, or small amount	sediment up to plates, causing short	Replace
Voltage	above 12 V	below 12 V	Test charge
Electrolyte Level	above plates	below top of plates	Fill and test charge
Specific Gravity	above 1.200 in all cells; no two cells more than 0.020 different	below 1.100, or difference of more than 0.020 between two cells	Test charge

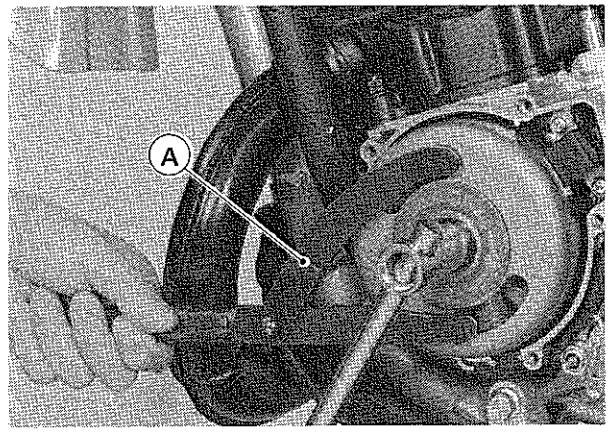
Battery Test Charging

- If the battery is suspected of being defective, sulfated, or unable to take a charge, consult the table.
- To test charge a battery, perform the ordinary charging procedure and monitor the battery voltage and other signs as mentioned below.
- ★If the battery voltage suddenly jumps to over 13 V just after the start of charging, the plates are probably sulfated. A good battery will rise to 12 V immediately and then gradually go up to 12.5 or 13 V in about 30 min to and hour after the start of charging.
- ★If one cell produces no gas bubbles or has a very low specific gravity, it is probably shorted.
- ★If there does not appear to be enough sediment in a cell to short the plates, but that cell has a very low specific gravity after the battery is fully charged, the trouble may be that there is not enough acid in that one cell. In this case only, sulfuric acid solution may be added to correct the specific gravity.
- ★If a fully charged battery not in use loses its charge after 2 to 7 days; or if the specific gravity drops markedly, the battery is defective. The self-discharge rate of a good battery is only about 1% per day.

Flywheel Magneto

Flywheel Magneto Removal

- Remove the engine sprocket cover.
- Remove the shift pedal.
- Remove the magneto lead clamps.
- Disconnect the magneto lead 6-pin connector.
- Remove the magneto cover.
- Disconnect the neutral switch connector.
- Hold the flywheel steady with the flywheel holder (special tool), and remove the flywheel nut.

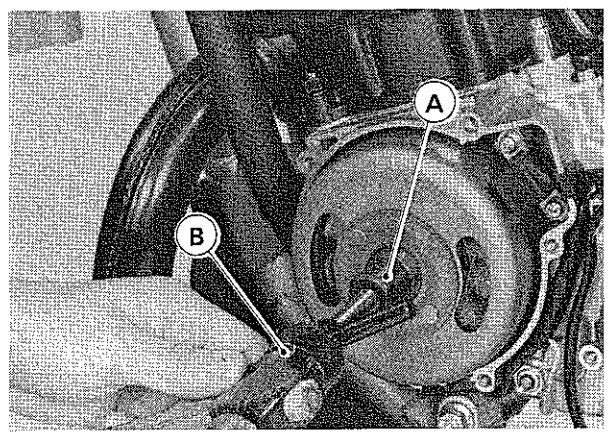


A. Flywheel Holder: 57001-306

- Screw the flywheel puller (special tool) into the flywheel by turning it counterclockwise (left-hand thread).
- Remove the flywheel from the crankshaft with turning in the puller center bolt and tapping the head of the bolt lightly with a hammer, while holding the puller body steady. There is a woodruff key in the crankshaft tapered portion.

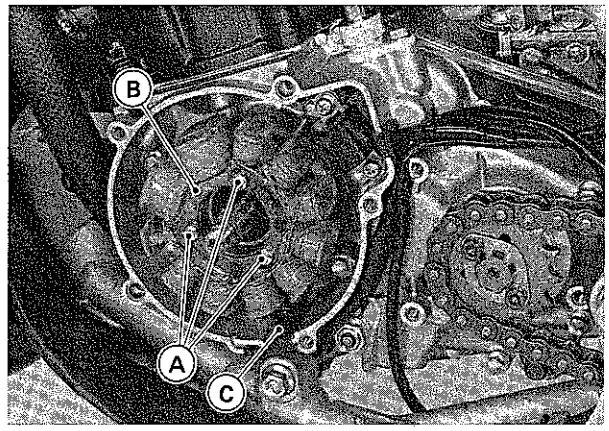
CAUTION

○**Never strike the grab bar or the flywheel itself. Striking the bar can bend it. If the flywheel is struck, the magnets may lose their magnetism.**



A. Flywheel Puller: 57001-252 B. Hammer

•Unscrew the mounting screws, and remove the stator and the lead grommet.

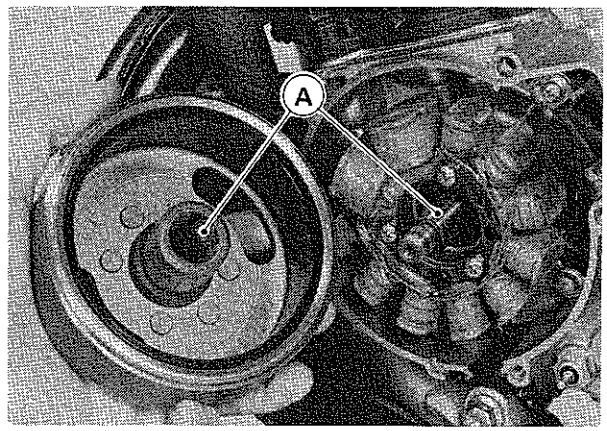


A. Mounting Screws
B. Stator
C. Lead Grommet

Flywheel Magneto Installation

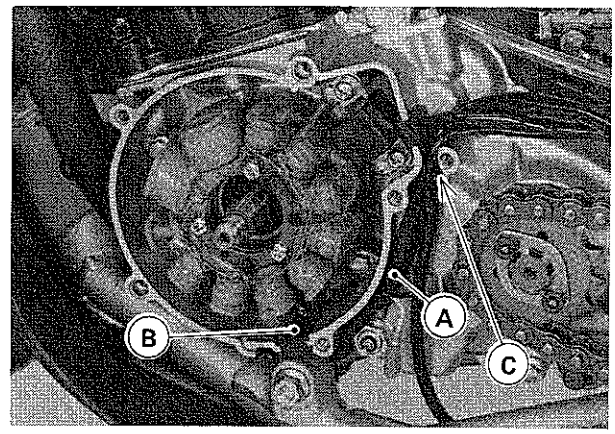
•Installation is the reverse of removal. Note the following:

○Using a high flashpoint solvent, clean off any oil or dirt that may be on the crankshaft taper or in the hole in the flywheel. Dry them with a clean cloth.



A. Clean Off

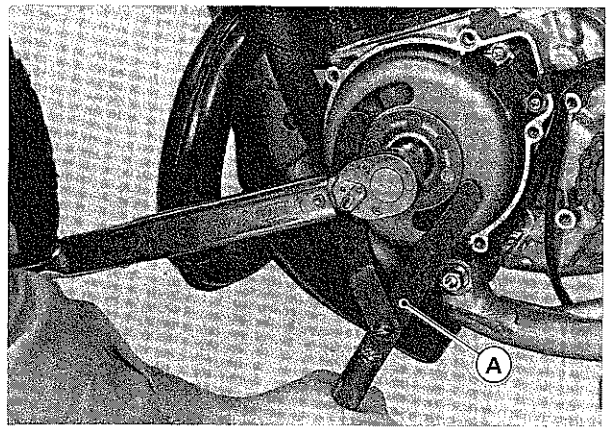
○Set the stator lead grommet securely in the notch in the left crankshaft half, and route the lead according to the Wire Routing section in the General Information chapter.



A. Stator Lead
B. Grommet
C. Insert this Part

○Fit the woodruff key securely in the slot in the crankshaft before installing the flywheel.

○Hold the flywheel steady with the flywheel holder (special tool), and tighten the flywheel nut to the specified torque (see Exploded View).



A. Flywheel Holder: 57001-306

○Check that knock pins (2) are in place in the left crankcase half.

○Replace the gasket if it is hardened or damaged.

Flywheel Magneto Inspection

There are three types of magneto problems: short, open (wire burned out), or loss in flywheel magnetism. A short or open in one of the coil wires will result in either a low output, or no output at all. A loss in flywheel magnetism, which may be caused by dropping or hitting the flywheel, or just by aging, will result in low output. Therefore, in inspecting the flywheel magneto, first measure the output, next, inspect the coils and the flywheel (see Charging System, Ignition System).

Charging System

Magneto Output Voltage Inspection

- Turn off the ignition switch.
- Remove the left side cover.
- Disconnect the regulator/rectifier connector.
- Connect the multimeter as shown in table 1.

Table 1 Magneto Output Voltage

Meter Range	Connections		Reading @4,000 rpm
	Meter (+) to	Meter (–) to	
250 V AC	One yellow lead (6 pin connector)	Another yellow lead (6 pin connector)	Not less than 27 V (SA) Not less than 31 V

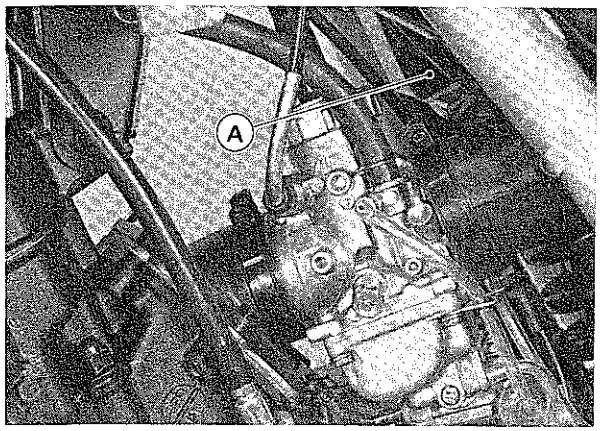
(SA) : South African Model

- Start the engine.
- Run it at the rpm given in table 1.
- Note the voltage readings (total 3 measurements).

★If the output voltage shows the value in table 1, the magneto is working properly. A much lower reading than that given in the table indicates that the magneto is defective. Check the charging coil.

Charging Coil Inspection

- Disconnect the magneto lead connector (6 pin).



A. Magneto Lead Connector

- Connect the multimeter as shown in table 2.

Table 2 Charging Coil Resistance

Meter Range	Connections		Reading
	Meter (+) to	Meter (–) to	
x 1 Ω	One yellow lead (6 pin connector)	Another yellow lead (6 pin connector)	0.3 – 1.0 Ω (SA) 0.2 – 0.8 Ω

(SA) : South African Model

- Note the resistance reading.

★If there is more resistance than shown in table 2, the stator may have an open lead, the lead between the stator and the connector may be open, or the connections may be bad. Check the stator and the leads, and fix or replace any damaged parts.

★If there is much less resistance than shown in table 2, the stator may have an internal short, or the lead between the stator and the connector may be grounded. Check the stator and the lead, and fix or replace any damaged parts.

- Using the highest resistance range of the multimeter, measure the resistance between each of the yellow leads and chassis ground.

★Any meter reading less than infinity (∞) indicates a short, necessitating stator replacement.

★If the charging coils have normal resistance, but the output voltage check showed the magneto to be defective, then the flywheel magnets have probably weakened, and the flywheel must be replaced.

Charging Voltage (Regulator/Rectifier Output Voltage) Inspection

- Remove the right side cover.
- Remove the battery cover.
- Check the battery condition (see Battery section).

NOTE

○*The battery must be fully charged.*

- Warm up the engine to obtain actual magneto and regulator/rectifier operating conditions.
- Stop the engine, and connect the multimeter as shown in table 3.

Table 3 Charging Voltage

Meter Range	Connections		Reading
	Meter (+) to	Meter (–) to	
25 V DC	Battery (+) terminal (White/Red)	Battery (–) terminal (Black/Yellow)	14.5 ±0.5 V @4,000 rpm

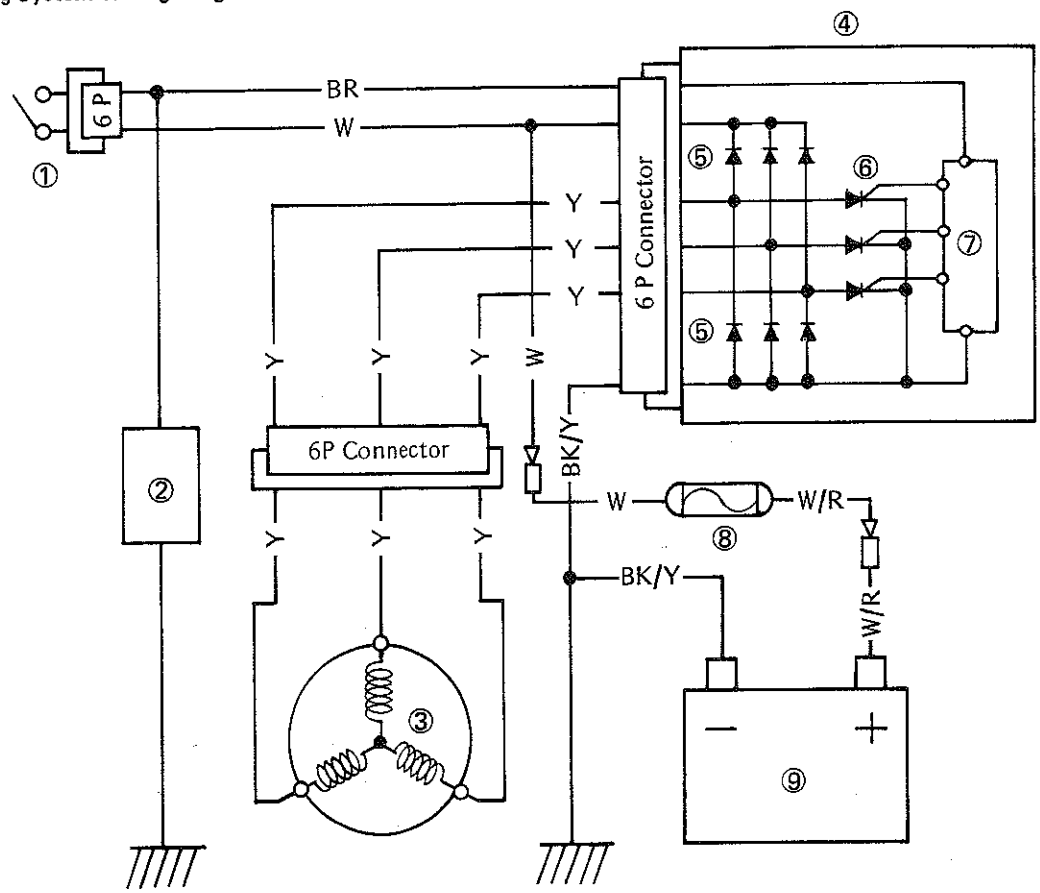
- Start the engine, and note the voltage readings at various engine speeds with the headlight turned on and then turned off. The readings should show nearly battery voltage when the engine speed is low, and, as engine speed rises, the readings should also rise. But they must stay under the specified maximum voltage.
- Turn off the ignition switch to stop the engine, and disconnect the multimeter.

★If the charging voltage stays between the values given in table 3, the charging system is considered to be working normally.

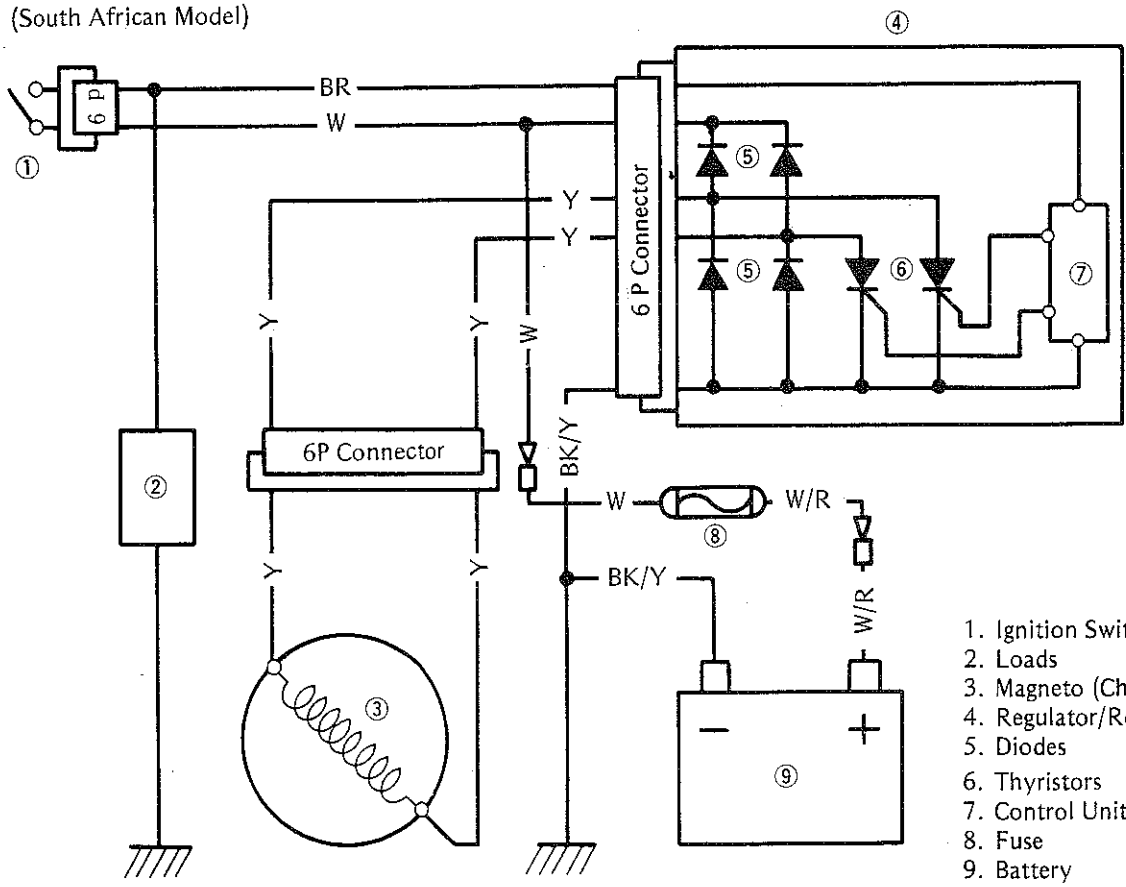
★If the charging voltage is much higher than the values specified in the table 3, the regulator/rectifier is defective. Check the regulator/rectifier.

★If the charging voltage does not rise as the engine speed increases, then the regulator/rectifier is defective or the magneto output is insufficient. Check the magneto and the regulator/rectifier.

Charging System Wiring Diagram



(South African Model)

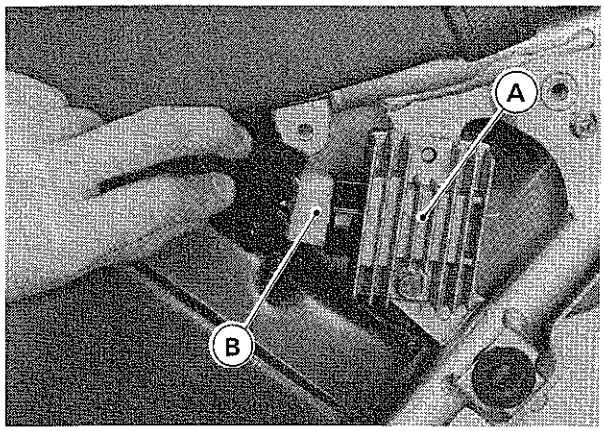


1. Ignition Switch
2. Loads
3. Magneto (Charging Coil)
4. Regulator/Rectifier
5. Diodes
6. Thyristors
7. Control Unit
8. Fuse
9. Battery

Regulator/Rectifier Inspection

Rectifier Circuit Check:

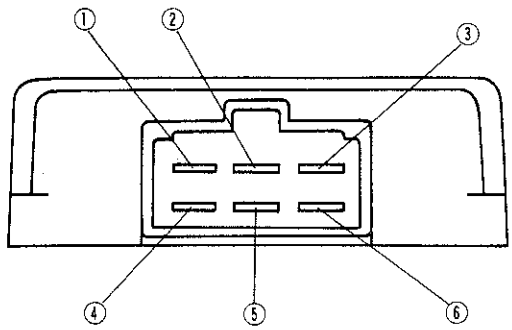
●Turn off the ignition switch.
●Remove the left side cover.
●Disconnect the regulator/rectifier connector.



A. Regulator/Rectifier B. Connector

●Connect the multimeter to the terminals in the regulator/rectifier connector, and check the resistance in both directions of each diode following the table.
○South African model has not the yellow 2 lead terminal.

Regulator/Rectifier Connector Terminals



1. White Lead Terminal
2. Brown Lead Terminal
3. Black/Yellow Lead Terminal
4. Yellow 1 Lead Terminal
5. Yellow 2 Lead Terminal
   (Other than South African Model)
6. Yellow 3 Lead Terminal

Rectifier Circuit Inspection **Unit : kΩ**

Range x 100 Ω		Meter (+) Lead Connection					
Terminal		W	BR	BK/Y	Y1	*Y2	Y3
Meter (−) Lead Connection	W		∞	∞	∞	∞	∞
	BR	1 – 50		0.3 – 1	0.5 –3	0.5 – 3	0,5 – 3
	BK/Y	0.4 – 2	0.2 – 0.8		0.2 – 0.6	0.2 – 0.6	0.2 – 0.6
	Y1	0.2 – 0.6	∞	∞		∞	∞
	*Y2	0.2 – 0.6	∞	∞	∞		∞
	Y3	0.2 – 0.6	∞	∞	∞	∞	

*South African model has not Y2 terminal.

NOTE

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

★If any two leads are low or high in both directions, the rectifier circuit is defective. The regulator/rectifier must be replaced as an assembly.

Regulator Circuit Check:

●Before checking, prepare the test circuit shown. You will need:
○Test light: Bulb rated 12 V and 3 – 6 W
○Battery: 6 V and 12 V battery
○Lead: 5 leads

CAUTION

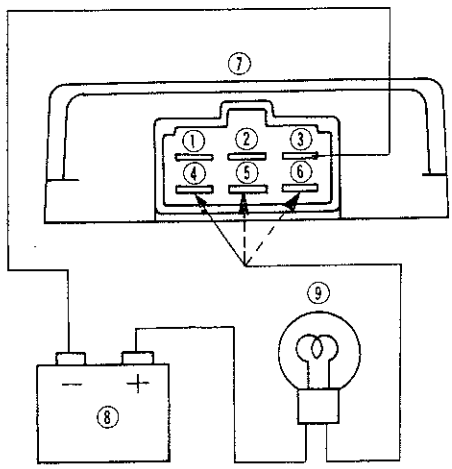
○**The test light works as an indicator and also a current limiter to protect the regulator/rectifier from excessive current. Do not use an ammeter instead of a test light.**

●Remove the left side cover.
●Disconnect the regulator/rectifier connector.
●Unscrew the mounting bolt, and remove the regulator/rectifier from the frame.
●Check to be sure the rectifier circuit is normal before continuing.

Regulator Circuit Test-1st Step:

●Connect the test light and the 12 V battery to the regulator/rectifier as shown.
●Check M1, M2, and M3 terminal respectively.
○South African model has not M2 terminal.
★The test light should not go on. If it goes on, the thyristor is shorted; replace the regulator/rectifier.

Regulator Circuit Test-1st Step



1. B (Battery Input Terminal)
2. D (Detection Terminal)
3. E (Earth Terminal)
4. M1 (Magneto Input Terminal)
5. M2 (Other than South African Model)
6. M3
7. Regulator/Rectifier
8. 12 V Battery
9. Test Light

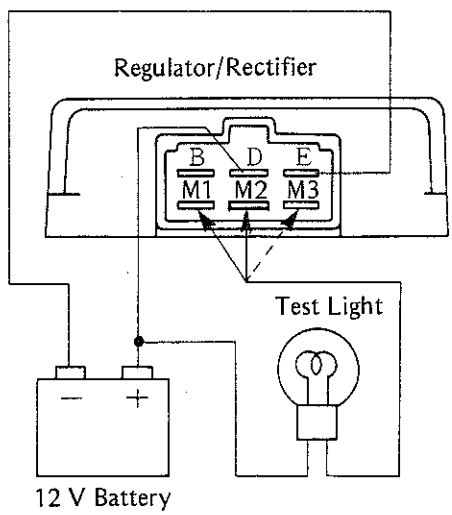
Regulator Circuit Test-2nd Step:

- Connect the test light and the 12 V battery in the manner specified in the "Regulator Circuit Test-1st step."
- Apply 12 V to the voltage detection terminal.
- Check M1, M2 and M3 terminal respectively.

○South African model has not M2 terminal.

★The test light should not go on. If it goes on, the control circuit in the regulator/rectifier is damaged; replace the regulator/rectifier.

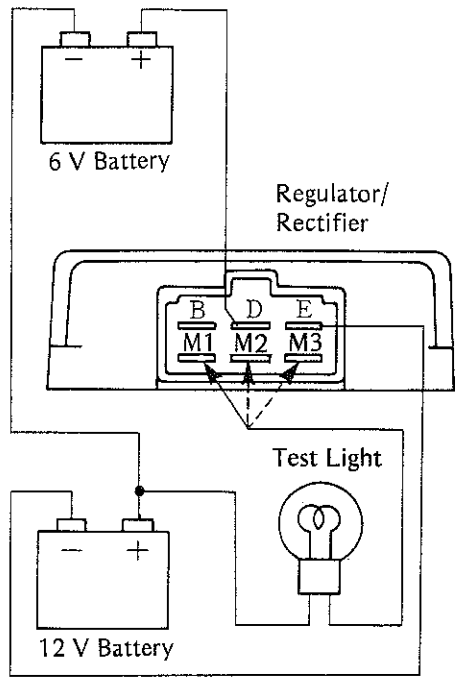
Regulator Circuit Test-2nd Step



Regulator Circuit Test-3rd Step:

- Connect the test light and the 12 V battery in the same manner as specified in the "Regulator Circuit Test-1st Step."
- Apply 18 V (6 V + 12 V) to the voltage detection terminal.

Regulator Circuit Test-3rd Step



CAUTION

○**Do not apply more than 18 V. If more than 18 V is applied, the regulator/rectifier may be damaged. Do not apply 18 V more than a few seconds. If 18 V is applied for more than a few seconds, the regulator/rectifier may be damaged.**

★The test light should go on at this time. If it does not go on, the control circuit in the regulator/rectifier is damaged; replace the regulator/rectifier.

Ignition System

Safety Instructions:

WARNING

○**The ignition system produces extremely high voltage. Do not touch the spark plug, high tension coil, or spark plug lead while the engine is running, or you could receive a severe electrical shock.**

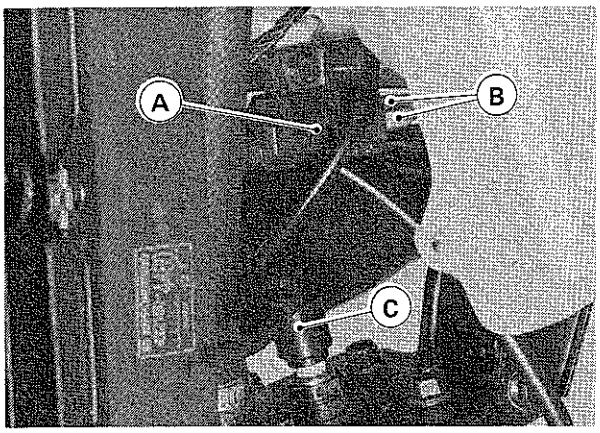
CAUTION

○**Do not disconnect the battery leads or any other electrical connections when the ignition switch on, or while the engine is running. This is to prevent CDI unit damage.**

○**Do not install the battery backwards. The negative side is grounded. This is prevent damage to the diodes and CDI unit.**

Ignition Coil Removal

- Remove the radiator shroud.
- Disconnect the ignition coil primary leads connector.
- Pull the plug cap off the spark plug.
- Unscrew the mounting bolt, and remove the ignition coil.

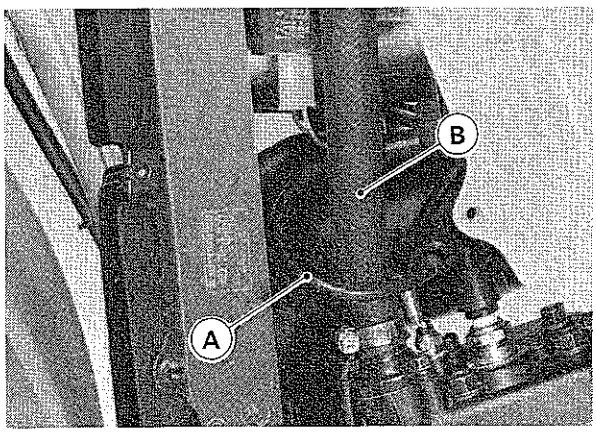


A. Ignition Coil
B. Primary Leads
C. Plug Cap

Ignition Coil Installation

- Installation is the reverse of removal. Note the following:

○Install the ignition coil so that the spark plug lead is routed around the water hose.

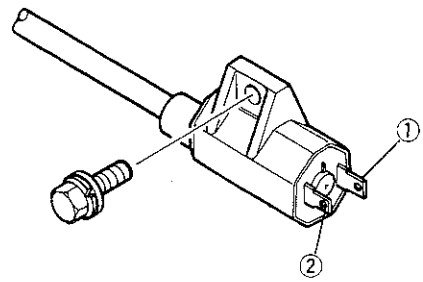


A. Spark Plug Lead
B. Water Hose

○Connect the primary leads to the ignition coil terminals as follows:

- Black Lead → (+) terminal
- Black/Yellow Lead → (–) terminal

Ignition Coil Terminals



1. (+) Terminal
2. (–) Terminal

Ignition Coil Inspection

Measuring arcing distance:

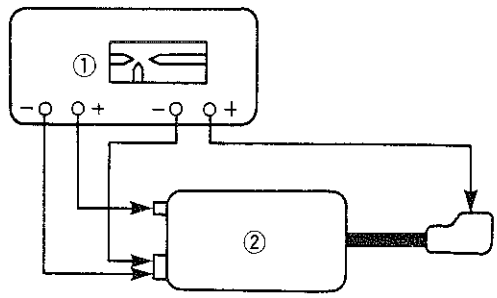
The most accurate test for determining the condition of the ignition coil is made by measuring arcing distance with a Kawasaki Electro Tester (special tool) or Coil Tester (special tool) for the 3-needle method.

NOTE

○*Since a tester other than the Kawasaki Electro Tester or Coil Tester may produce a different arcing distance, the Kawasaki Electro Tester or Coil Tester is recommended for reliable results.*

- Remove the ignition coil.
- Connect the ignition coil (with the spark plug cap left installed on the spark plug lead) to the tester, and measure the arcing distance.

Ignition Coil Test



1. Kawasaki Electro Tester: 57001-980 or Coil Tester: 57001-1242
2. Ignition Coil

WARNING

○**To avoid extremely high voltage shocks, do not touch the coil or lead.**

★If the distance reading is less than the specified value, the ignition coil or spark plug cap is defective.

Ignition Coil Arcing Distance

7 mm or more

●To determine which part is defective, measure the arcing distance again with the spark plug cap removed from the ignition coil lead.
★If the arcing distance is subnormal as before, the trouble is with the ignition coil itself. If the arcing distance is now normal, the trouble is with the spark plug cap.

Measuring coil resistance:

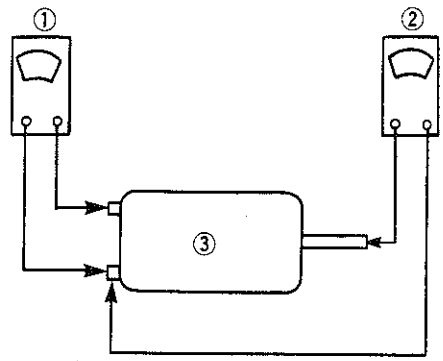
If the arcing tester is not available, the coil can be checked for a broken or badly shorted winding with an ohmmeter. However, an ohmmeter cannot detect layer shorts and shorts resulting from insulation breakdown under high voltage.

●Disconnect the primary leads from the coil terminals.
●Measure the primary winding resistance.
○Connect an ohmmeter between the coil terminals.
○Set the meter to the x 1 Ω range, and read the meter.
●Measure the secondary winding resistance.
○Pull the spark plug cap off the lead.
○Connect an ohmmeter between the spark plug lead and the black/yellow lead terminal.
○Set the meter to the x 1 kΩ range, and read the meter.
★If the meter does not read as specified, replace the coil.

Ignition Coil Winding Resistance

Primary windings:	**0.153 – 0.207 Ω**
Secondary windings:	**3.84 – 5.76 kΩ**

Ignition Coil Winding Resistance



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

★If the meter reads as specified, the ignition coil windings are probably good. However, if the ignition system still does not perform as it should after all other components have been checked, test replace the coil with one known to be good.
●Check the spark plug lead for visible damage.
★If the spark plug lead is damaged, replace the coil.

Spark Plug Cleaning and Inspection

●Remove the spark plug, and visually inspect.
●Clean the spark plug, preferably in a sandblasting device, and then clean off any abrasive particles. The plug may also be cleaned using a high flashpoint solvent and a wire brush or other suitable tool.
★If the spark plug electrodes are corroded or damaged, or if the insulator is cracked, replace the plug. Use the standard spark plug or its equivalent.

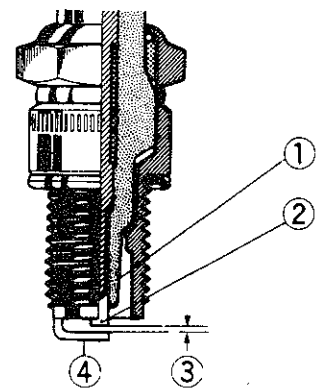
Spark Plug Gap Inspection

●Measure the gap with a wire-type thickness gauge.
★If the gap is incorrect, carefully bend the side electrode with a suitable tool to obtain the correct gap.

Spark Plug Gap

0.7 – 0.8 mm

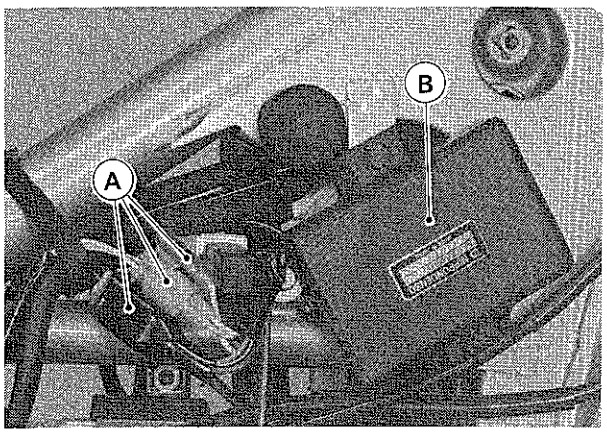
Spark Plug Gap



1. Insulator
2. Center Electrode
3. Plug Gap
4. Side Electrode

CDI Unit Inspection

- Remove the seat.
- Remove the fuel tank.
- Disconnect the CDI unit lead connectors.
- Unscrew the mounting bolts, and remove the CDI unit.



A. Connectors B. CDI Unit

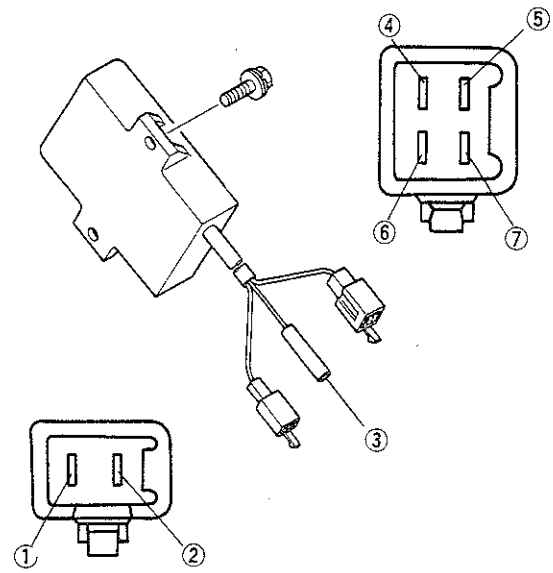
CAUTION

- **Use only Kawasaki Hand Tester 57001-983 for this test. A tester other than the Kawasaki Hand Tester may show different readings.**
- **Do not use a megger or a meter with a large-capacity battery, or the CDI unit will be damaged.**

- Set the Kawasaki Hand Tester to the x 1 kΩ range, connect the Tester to the terminals in the CDI unit lead connectors, and check the internal resistance following the table.

★If the readings do not correspond to the table, replace the CDI unit.

CDI Unit Terminals



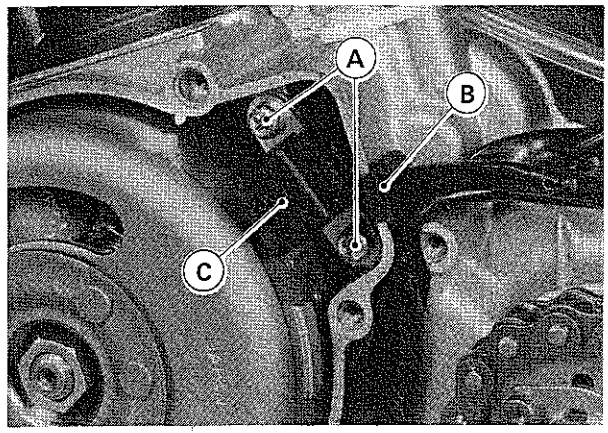
1. White/Green Lead Terminal
2. White/Red Lead Terminal
3. White Lead Terminal
4. Red Lead Terminal
5. Brown/White Lead Terminal
6. Black Lead Terminal
7. Black/White Lead Terminal

Pickup Coil Removal

- Remove the following parts.
  - Seat
  - Fuel Tank
  - Engine Sprocket Cover
  - Shift Pedal
  - Magneto Cover
- Disconnect the pickup coil lead connector.
- Remove the pickup coil lead clamps.
- Unscrew the mounting screw, and remove the pickup coil and the lead grommet.

CDI Unit Internal Resistance Unit : kΩ

Range x 1 kΩ			Meter Positive (+) Lead Connection						
			Condenser Charge		Pickup Coil		IG	Other	
		Lead	W	R	W/R	W/G	BK/W	BR/W	BK
Meter Negative (−) Lead Connection	Condenser Charge	W		∞	∞	∞	∞	∞	∞
		R	15 – 60		15 – 60	7 – 30	∞	3 – 15	7 – 30
	Pickup Coil	W/R	8 – 35	8 – 35		2 – 15	∞	6 – 25	2 – 15
		W/G	2 – 10	2 – 10	2 – 10		∞	2 – 10	0
	IG	BK/W	∞	∞	∞	∞		∞	∞
	Other	BR/W	5 – 25	5 – 25	5 – 25	2 – 10	∞		2 – 10
		BK	2 – 10	2 – 10	2 – 10	0	∞	2 – 10	



A. Mounting Screw
B. Lead Grommet
C. Pickup Coil

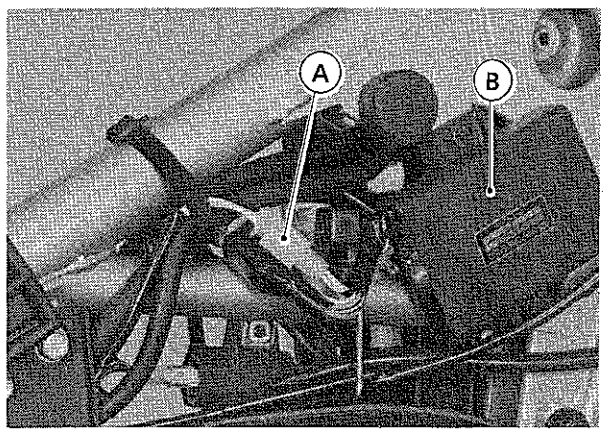
Pickup Coil Installation

●Installation is the reverse of removal. Note the following:

○Set the pickup coil lead grommet in the notch of the left crankcase half securely, and route the lead according to the Wire Routing section in the General Information chapter.

Pickup Coil Inspection

●Remove the seat.
●Remove the fuel tank.
●Disconnect the pickup coil lead connector (2 pin).



A. Pickup Coil Lead Connector
B. CDI Unit

●Zero the ohmmeter, and connect it to the pickup coil leads.
★If there is more resistance than the specified value, the coil has a broken wire and must be replaced. Much less than this resistance means the coil is shorted, and must be replaced.

Pickup Coil Resistance

100 – 150 Ω

●Using the highest resistance range of the ohmmeter, measure the resistance between the pickup coil leads and chassis ground.
★Any meter reading less than infinity (∞) indicates a short, necessitating replacement of the pickup coil assembly.

Exciter Coil Inspection

●Disconnect the magneto lead connector (6 pin).
●Zero the ohmmeter, and connect it as shown in the table.

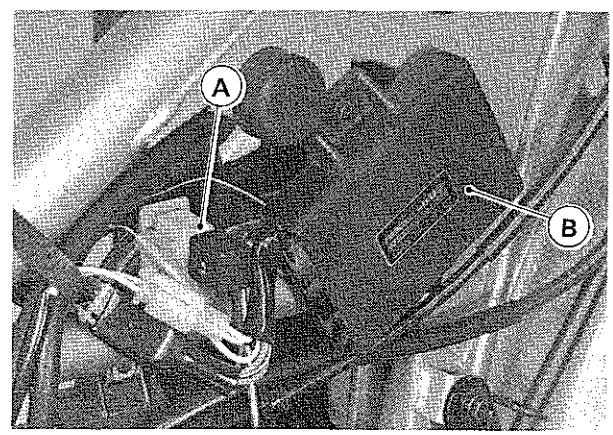
Exciter Coil Resistance

Meter Range	Connections		Reading
	Meter (+) to	Meter (–) to	
x 10 Ω	Red lead (6 pin connector)	White lead (6 pin connector)	90 – 170 Ω

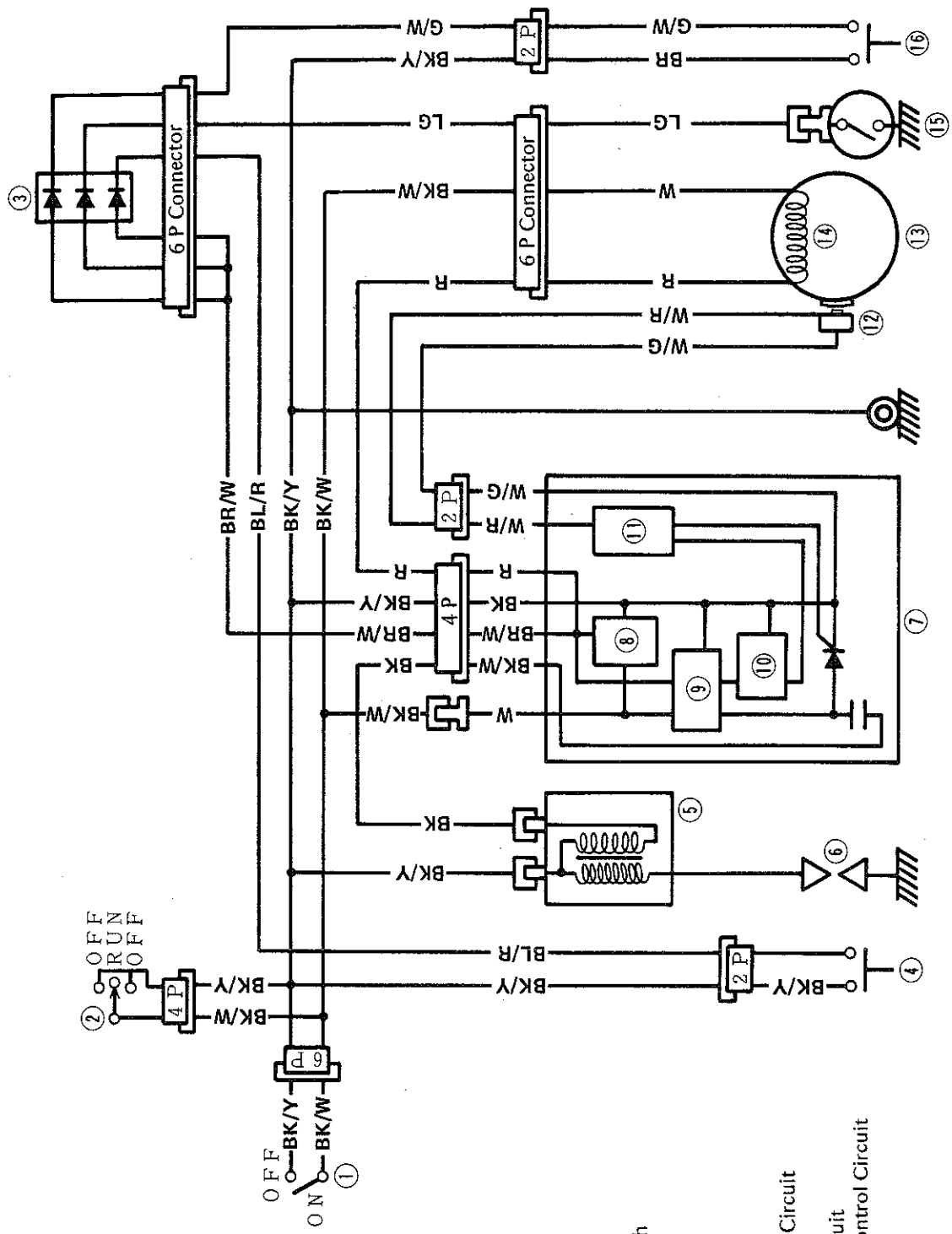
●Note the resistance reading.
★If there is more resistance than shown in the table, the stator has a broken wire, the leads between the stator and the connector are open, or the connections are bad. Check the stator and the leads, and fix or replace the damaged parts.
★If there is much less resistance than shown in the table, the stator is shorted, or the leads between the stator and the connector is grounded. Check the stator and the leads, and fix or replace the damaged parts.
●Using the highest resistance range of the ohmmeter, measure the resistance between each of the red or white leads and chassis ground.
★Any meter reading less than infinity (∞) indicates a short to ground. Replace the stator.

Diode Inspection

●Remove the seat.
●Take off the fuel tank.
●Disconnect the diode assembly.



A. Diode Assembly
B. CDI Unit



Ignition System Wiring Diagram

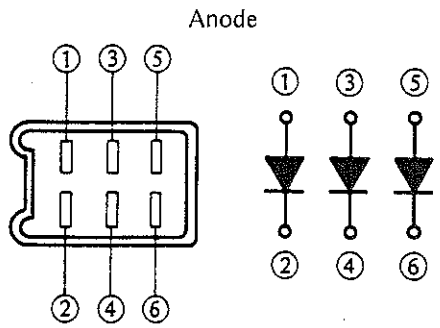
1. Ignition Switch
2. Engine Stop Switch
3. Diode
4. Clutch Switch
5. Ignition Coil
6. Spark Plug
7. CDI Unit
8. Side Stand Switch Circuit
9. Rectifier Circuit
10. Power Supply Circuit
11. Ignition Timing Control Circuit
12. Pickup Coil
13. Flywheel Magneto
14. Exciter Coil
15. Neutral Switch
16. Side Stand Switch

●Zero the ohmmeter, and connect it to each diode's terminals to check the resistance in both directions.
★The resistance should be low in one direction and more than ten times as much in the other direction. If any diode shows low or high resistance in both directions, the diode is defective and the diode assembly must be replaced.

NOTE

○*The actual meter reading varies with the meter used and the individual diode, but, generally speaking, the lower reading should be from zero to the first 1/2 of the scale.*

Polarity of Diode

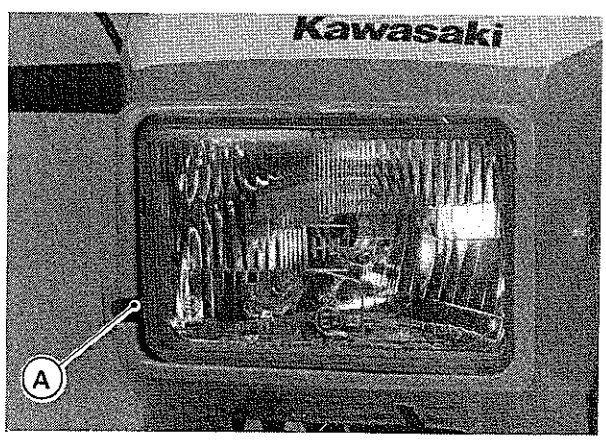


Lighting System

The headlight beam is adjustable both horizontally and vertically. Headlight aiming must be correctly adjusted both for your safety as well as that of oncoming drivers. In most areas it is illegal to ride with an improperly adjusted headlight.

Headlight Beam Horizontal Adjustment

●Turn the adjusting screw on the headlight rim in or out until the beam points straight ahead. Turning the adjusting screw clockwise makes the headlight beam point to the right.

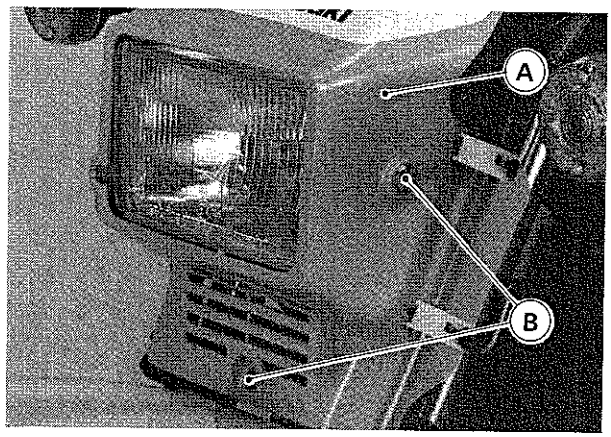


A. Adjusting Screw

Headlight Beam Vertical Adjustment

The headlight beam is adjustable vertically. If adjusted too low, neither low nor high beam will illuminate the road far enough ahead. If adjusted too high, the high beam will fail to illuminate the road close ahead, and the low beam will blind oncoming drivers.

●Unscrew the mounting screws, and take off the headlight cover.

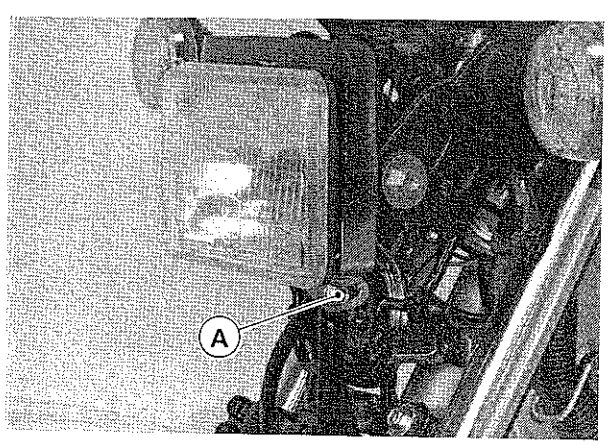


A. Headlight Cover B. Mounting Screws

●Loosen the lower headlight bolt, and adjust the headlight vertically.

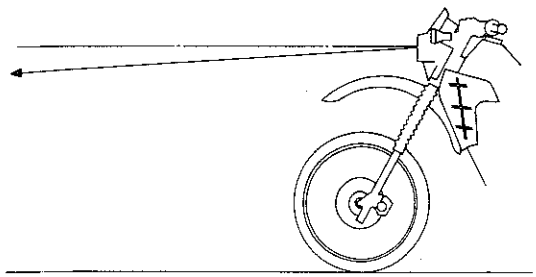
NOTE

○*On high beam, the brightest point should be slightly below horizontal with the motorcycle on its wheels and the rider seated. Adjust the headlight to the proper angle according to local regulations.*



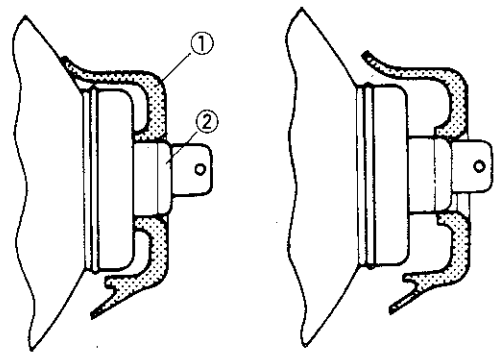
A. Lower Headlight Bolt

Vertical Adjustment



- Tighten the lower headlight bolt.
- Install the headlight cover, and tighten the mounting screws.

Dust Cover Installation



1. Dust Cover
2. Headlight Bulb

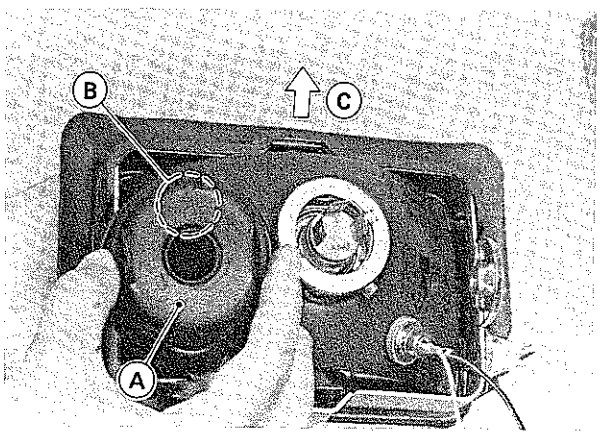
- Check the headlight aim after installation.

Headlight Bulb Replacement Notes

CAUTION

- **When handling the quartz-halogen bulbs, never touch the glass portion with bare hands. Always use a clean cloth. Oil contamination from hands or dirty rags can reduce bulb life or cause the bulb to explode.**

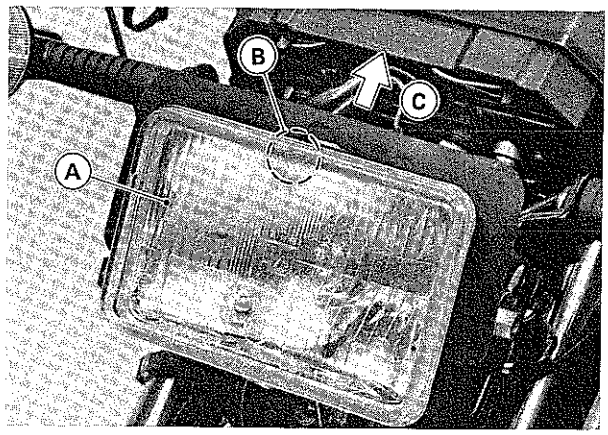
- Install the dust cover so that the "TOP" mark point up and the cover fits onto the bulb firmly as shown in the figure.



A. Dust Cover
B. Top Mark
C. Up

Headlight Unit Removal/Installation Note

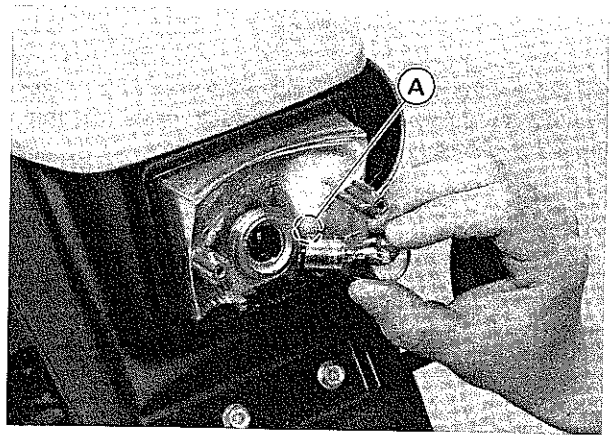
- Install the headlight unit so that the "TOP" mark on the lens points up.



A. Headlight
B. Top Mark
C. Up

Tail/Brake Light Bulb Replacement Notes

- Insert the new bulb by aligning the pins with the grooves in the walls of the socket so that the pin closest to the bulb base is to the upper right.



A. Pin Closest to Base.

Tail/Brake Light Lens Removal/Installation Note

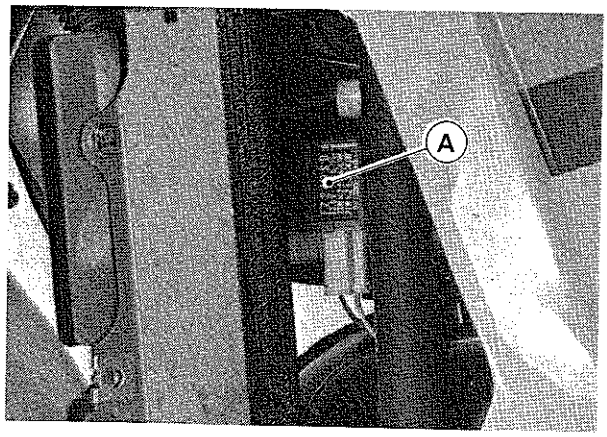
●Be careful not to overtighten the lens mounting screws.

Turn Signal Light Bulb Replacement Note

●Be careful not to overtighten the lens mounting screws.

Turn Signal Relay Inspection

●Remove the radiator shroud.



A. Turn Signal Relay

●Check the condition of the relay for the following troubles.

(1) Neither right nor left turn signals come on at all:
●Check that battery voltage is normal.
●Remove the fuel tank.
●Unplug the relay leads and use an ohmmeter to check that there is continuity (close to zero ohms) between the relay terminals.
★If there is no ohmmeter reading, or if there is several ohms resistance, replace the relay with a new one.
●Turn the meter to the 25 V DC range, connect the (+) meter lead to the brown lead that was disconnected from the relay, and connect the (–) meter lead to the orange lead.
●With the ignition switch on, first switch the turn signal switch to the R and then to the L position. The meter should register battery voltage at either position.
★If it does not, the fuse, ignition switch, or wiring is at fault.

(2) Both right or both left turn signals come on and stay on or flash too slowly:
●Check that battery voltage is normal.
●Check that all wiring connections are good.
●Check that the turn signal bulbs and indicator bulbs are of the correct wattage.
★If all of the above check good, replace the relay.

(3) A single light on one side comes on and stays on:
★Either the light that does not come one is burned out of the incorrect wattage, or the wiring is broken or improperly connected.

(4) Neither light on one side comes:
★Unless both lights for that side are burned out, the trouble is with the turn signal switch.

(5) Flashing rate is too fast:
★If this occurs on both the right and left sides, check that the battery is not being overcharged.
★If the magneto and the battery voltage are normal, replace the turn signal relay.
★If this occurs on only one side, one or both of the turn signal bulbs are of too high a wattage.

Meters and Gauges

Meter and Gauge Removal/Installation Note

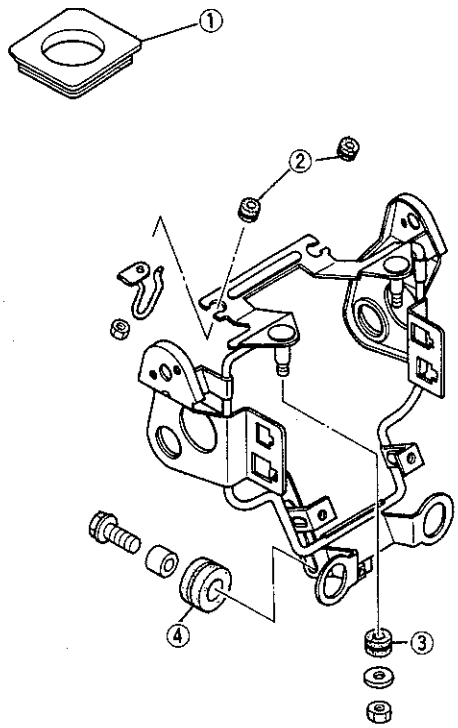
CAUTION

○**Place the meter or gauge so that the face is up. If a meter or gauge is left upside down or sideways for any length of time, it will malfunction.**

Meter Mounting Inspection

●Check to see that the rubber dampers are installed at the meter mounting bracket.
★Install a new damper where it is absent.
●Check to see that the rubber dampers in the meter mounting bracket are in good condition. They should not be hard or cracked.
★Replace any damaged rubber dampers with new ones.
●Check to see that all meter mounting nuts are tightened securely.
★Tighten any loose fasteners.

Rubber Dampers



1. One Piece
2. Two Pieces
3. Two Pieces
4. Two Pieces

Bulb Replacement Notes

- To remove the wedge-base type bulbs (indicator and illumination), pull out the bulb sockets and pull the bulbs off the sockets.

CAUTION

○Do not use bulbs rated for greater wattage than the specified value, as the meter or gauge panel could become warped by excessive heat radiated from the bulbs.

Water Temperature Gauge Operation Inspection

- Prepare an auxiliary lead, and check the operation of the gauge.

Gauge Operation Test

Ignition Switch Position: ON
Lead Location: Female, Sensor Connector (disconnected)
Results: Gauge should read C when sensor lead is opened. Gauge should read H when sensor lead is grounded briefly to engine.

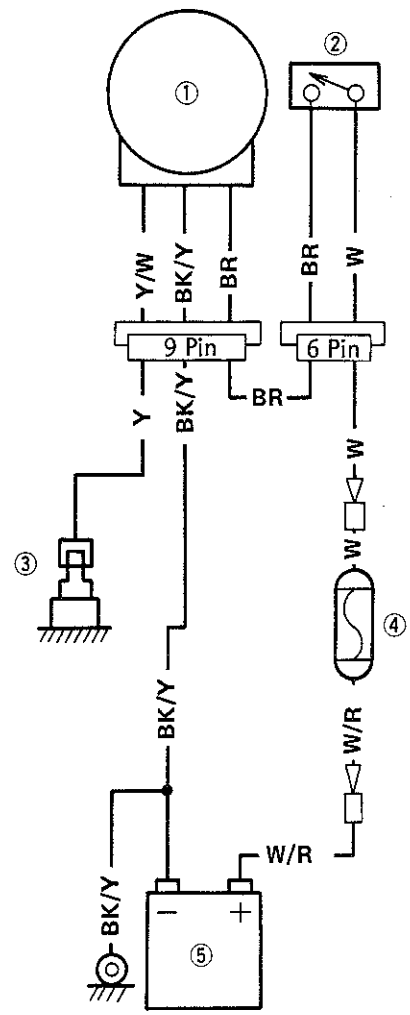
CAUTION

○Do not ground the wiring longer than necessary. After the needle swings to the H position, stop the test. Otherwise the gauge could be damaged.

★If the gauge readings are correct, the water temperature sensor is bad. If these readings are not obtained, the trouble is with the gauge and/or wiring.

- Check the water temperature gauge circuit wiring (see Wiring Inspection).
- If all wiring and components other than the water temperature gauge unit check out good, the gauge is defective.

Water Temperature Gauge Wiring Diagram

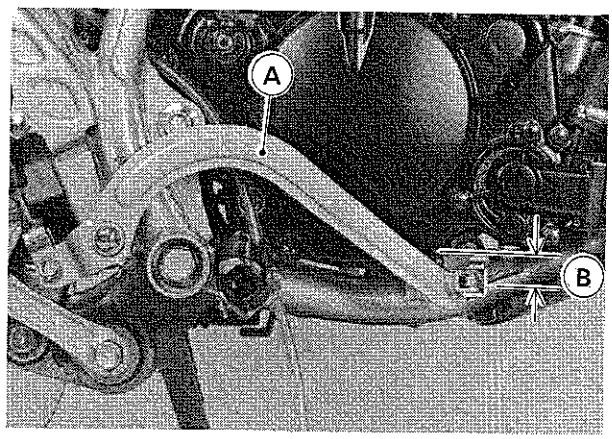


1. Water Temperature Gauge
2. Ignition Switch
3. Water Temperature Sensor
4. 20 A Fuse
5. Battery

Switches and Sensors

Brake Light Timing Inspection

- Turn on the ignition switch.
- Check the operation of the rear brake light switch by depressing the brake pedal. The brake light should go on after about 15 mm of pedal travel.



A. Brake Pedal B. About 15 mm

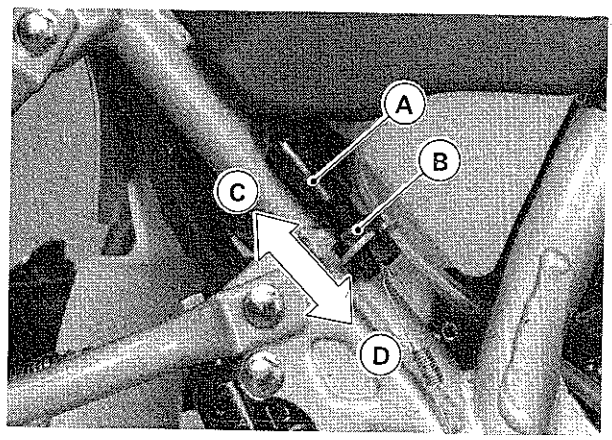
Brake Light Timing Adjustment

Brake light timing is adjusted by changing the position of the rear brake light switch.

- Adjust the position of the switch so that the brake light goes on after the specified pedal travel by turning the adjusting nut.

CAUTION

○To avoid damaging the electrical connections inside the switch, be sure that the switch body does not turn during adjustment.



A. Rear Brake Light Switch
B. Adjusting Nut
C. Light sooner.
D. Light later.

Water Temperature Sensor Inspection

- Remove the water temperature sensor.
- Suspend the sensor in a container of water so that the temperature sensing projection and threaded portion are submerged.
- Suspend an accurate thermometer in the water.
- Place the container over a source of heat and gradually raise the temperature of the water while stirring the water gently.
- Using an ohmmeter Measure the internal resistance of the sensor across the terminal and the body at the temperatures shown in the table.

★If the ohmmeter does not show the specified values, replace the sensor.

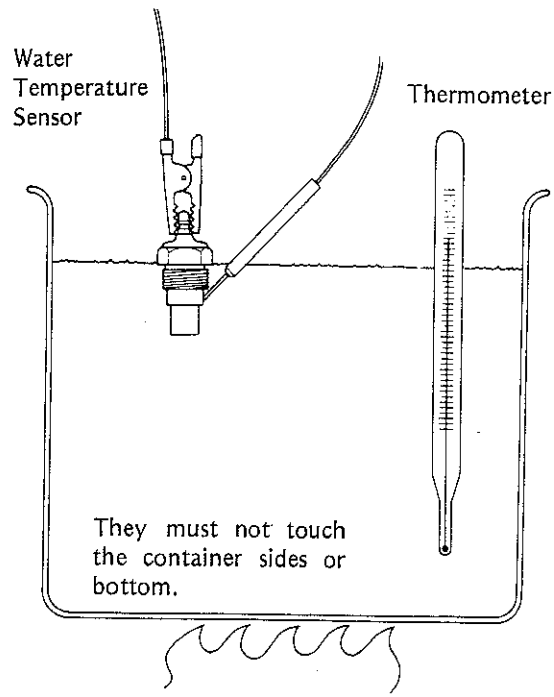
Internal Resistance of Water Temperature Sensor

80°C (176°F):	**About 130 Ω**
100°C (212°F):	**About 70 Ω**

NOTE

○*The switch and thermometer must not touch the container sides or bottom.*

Water Temperature Sensor Inspection



Switch 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.

Ignition Switch Connections						
Color	W	BR	BK/Y	BK/W	R	R/W
LOCK			○—○			
OFF			○—○			
ON	○—○				○—○	
P (PARK)	○—○		○—○		○—○	

Front Brake Light Switch Connections		
Color	BL	BR
When brake lever is pulled in	○—○	
When brake lever is released		

Dimmer Switch Connections				Headlight Switch Connections			
Color	R/BK	(Y)	R/Y	Color	Y	R	(Y)
HI	○—○			ON	○—○	○—○	○
				PO	○—○		
LO		○—○		OFF			

(CONNECTIONS IN HOUSING)

Engine Stop Switch Connections		
Color	BK/W	BK/Y
OFF	○—○	
RUN		

Turn Switch Connections			
Color	GY	O	G
R	○—○		
N			
L		○—○	

Rear Brake Light Switch Connections		
Color	BR	BL
When brake pedal is pushed down	○—○	
When brake pedal is released		

Horn Button Connections		
Color	BK	BK/Y
(Free)		
ON (Push)	○—○	

Neutral Switch Connections		
Color	LG (SW. Terminal)	⏚
When transmission is in neutral	○—○	
When transmission is not in neutral		

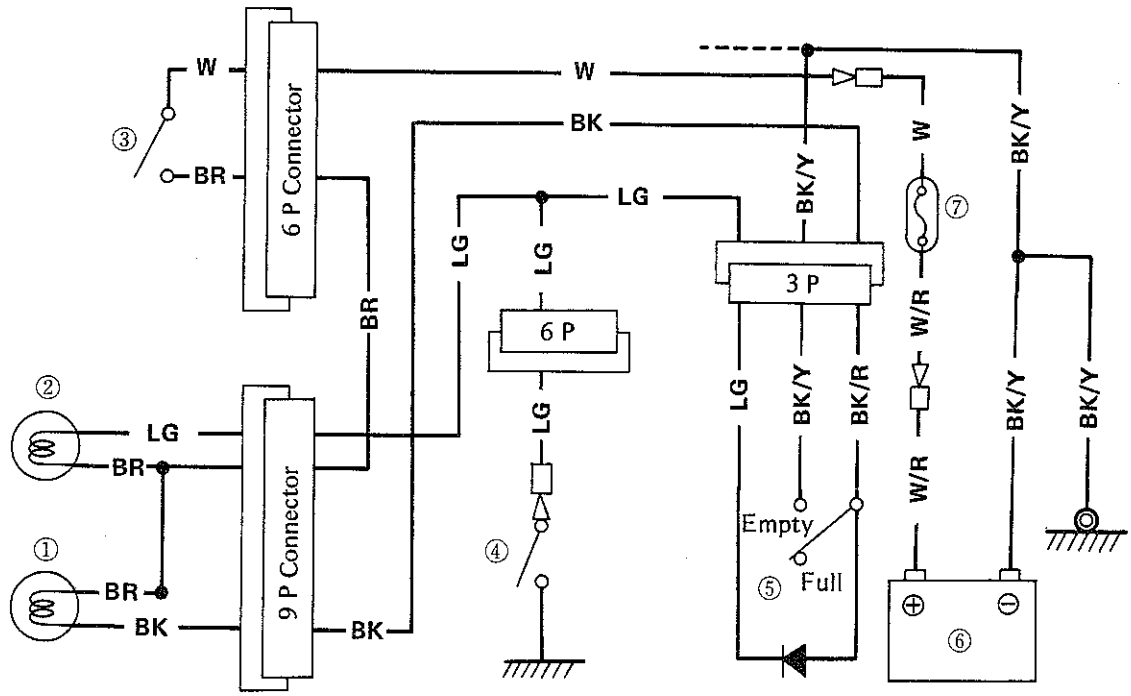
Clutch Switch Connections		
Color	BL/R	BK/Y
When clutch lever is pulled in	○—○	
When clutch lever is released		

Side Stand Switch Connections		
Color	G/W	BR
When side stand is up	○—○	
When side stand is down		

Engine Oil Level Warning System

Engine Oil Level Warning System Wiring Diagram

When the engine oil level is too low, the warning light goes on until oil is added. But if the transmission is in the neutral position, the light stays on regardless of the oil level. This is to show weather the warning light bulb has burned out.



1. Oil Level Warning Light
2. Neutral Indicator Light
3. Ignition Switch
4. Neutral Switch
5. Engine Oil Level Sensor
6. Battery
7. 20 A Fuse

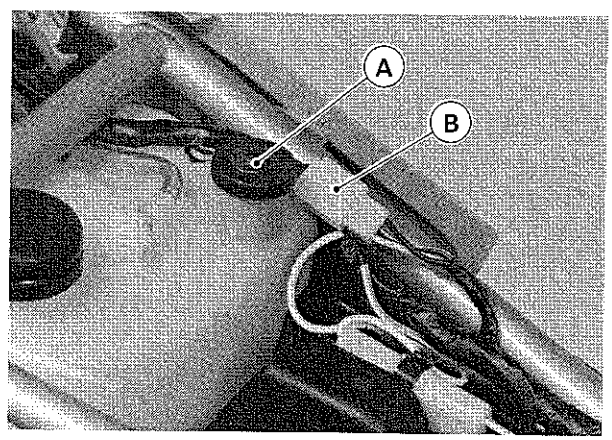
Engine Oil Level Warning Circuit Inspection

(1) The warning light does not come on with the ignition switch ON and the transmission in Neutral position.
- ●Check to see if the warning light bulb is burned out.
- ●Check the battery condition.
- ●Check the neutral indicator circuit wiring.
- ★If these components check out good, pull out the oil level sensor 3-pin connector to check the wiring.

Warning System Wiring Check

Ignition Switch Position: ON
Connection: 3-pin connector male, short together BK and BK/Y leads
Results: Oil warning light should light

★If the above check shows normal, inspect the oil level sensor.



A. Oil Level Sensor B. 3-Pin Connector

(2) Oil level is low enough but the warning light does not come on.
●Disconnect the oil level sensor 3-pin connector to check the power supply or the wiring as follows.

Power Supply Check

Ignition Switch Position: ON
Meter Range: 25 V DC
Connection: 3-pin connector male,
Meter (+) — BK
Meter (—) — Chassis ground
Result: Battery voltage

Wiring Check

Ignition Switch Position: OFF
Meter Range: x 1 Ω
Connection: 3-pin connector male,
Meter — BK/Y
Meter — Chassis ground
Result: 0 Ω

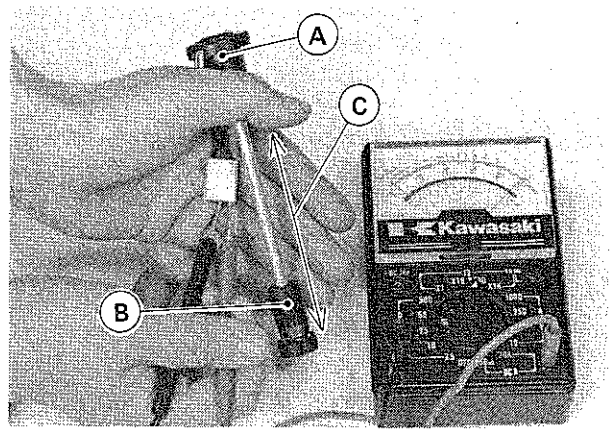
★If the above check shows normal, inspect the oil level sensor.

(3) Fuel level or oil level is not low but the warning light stays on continuously.
●Check the oil level sensor.

(4) Warning light goes on and off irregularly.
●Check that oil is well above the low level.
●Check that the wiring is not shorting out against other parts.
●Check that the battery charging voltage is normal.
●If the problem persists, recheck the wiring and check if the sensor lead is shorting intermittently.

Oil Level Sensor Inspection

●Remove the seat.
●Disconnect the oil level sensor 3-pin connector.
●Remove the engine oil level sensor from the oil tank.
●Check that the float moves up and down smoothly without binding. It should go down under its own weight.
★If the float does not move smoothly or if the sensor is visibly damaged, replace the sensor.
●Set the ohmmeter to the x 1 Ω range, and connect the ohmmeter leads to the BK/R and BK/Y leads to check the switching operation of the float.
●The ohmmeter should show continuity when the float is at the bottom.
★If it does not, replace the sensor.



A. Oil Level Sensor
B. Float
C. Up and Down Smoothly

●Connect the ohmmeter leads to the BK/R and LG leads to inspect the rectifier circuit in the sensor.
○Set the ohmmeter to the x 10 Ω or x 100 Ω range.
○Check the resistance of the diode in the sensor in both directions.

Oil Level Sensor Diode Check

Meter Range: x 10 Ω or x 100 Ω
Connection: Oil level sensor
LG — Meter — BK/R
Result: Low in one direction more than ten times as much in the other direction.

NOTE

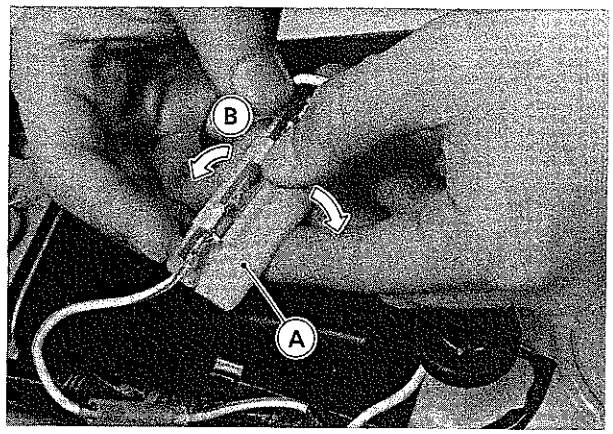
○*The actual meter reading varies with the meter used and the individual diode, but, generally speaking, the lower reading should be from zero to the first ½ of the scale.*

★If the meter reads low or high resistance in both directions the diode is defective and the sensor must be replaced.
☆If the rectifier circuit in the sensor is defective, the neutral indicator light goes on with the oil level warning light when the oil level is low, no matter what gear the transmission is in.

Fuse

20 Ampere Fuse Removal

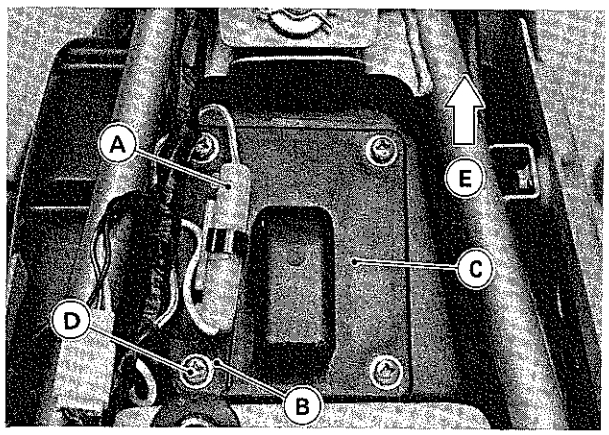
●Remove the 20 ampere fuse as follows.
○Remove the seat.
○Pull out the 20 ampere fuse case.
○Open the case.
○Remove the fuse carefully.



A. Fuse Case B. Open

20 Ampere Fuse Installation

- Installation is the reserve of removal. Note the following:
  - Install the fuse case bracket as shown with the air cleaner housing cap mounting screw.



A. Fuse Case
B. Bracket
C. Air Cleaner Housing Cap
D. Mounting Screw
E. Front

Appendix

Table of Contents

Additional Considerations for Racing 16-2
Carburetor 16-2
Spark Plug 16-2
Spark Plug Inspection 16-3
Troubleshooting Guide 16-4
General Lubrication 16-8
Lubrication 16-8
Unit Conversion Table 16-9

Additional Considerations for Racing

This motorcycle has been manufactured for use in a reasonable and prudent manner and as a vehicle only. However, some may wish to subject this motorcycle to abnormal operation, such as would be experienced under racing conditions. KAWASAKI STRONGLY RECOMMENDS THAT ALL RIDERS RIDE SAFELY AND OBEY ALL LAWS AND REGULATIONS CONCERNING THEIR MOTORCYCLE AND ITS OPERATION.

Racing should be done under supervised conditions, and recongnized sanctioning bodies should be contacted for further details. For those who desire to participate in competitive racing or related use, the following technical information may prove useful. However, please note the following important points.

- You are enteirely responsible for the use of your motorcycle under abnormal conditions such as racing, and Kawasaki shall not be liable for any damages which might arise from such use.
- US model only: Kawasaki's Limited Motorcycle Warranty and Limited Emission Control Systems Warranty specifically exclude motorcycles which are used in competitive or related uses. Please read the warranty carefully.
- Motorcycle racing is a very sophisticated sport, subject to many variables. The following information is theoretical only, and Kawasaki shall not be liable for any damages which might arise from alterations utilizing this information.
- When the motorcycle is operated on public roads, it **must** be in its original state in order to ensure safety and compliance with applicable regulations.

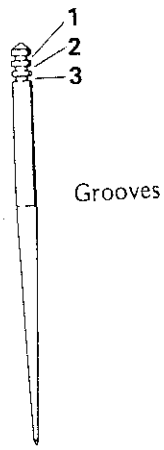
Carburetor:

Sometimes an alteration may be desirable for improved performance under special conditions when proper mixture is not obtained after the carburetor has been properly adjusted, and all parts cleaned and found to be functioning properly.

If the engine still exhibits symptoms of overly lean carburetion after all maintenance and adjustments are correctly performed, the main jet can be replaced with a smaller or larger one. A smaller numbered jet gives a leaner mixture and a larger numbered jet a richer mixture.

For the models other than the US model, a certain amount of adjustment can be made by changing the position of the needle. There are three grooves at the top of the needle. Changing the position of the clip to a groove closer to the bottom raises the needle, which makes the mixture richer at a given position of the throttle valve.

Jet Needle



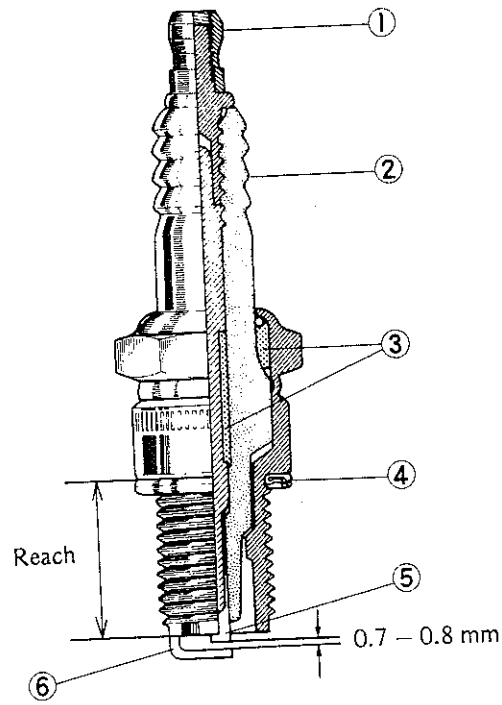
Spark Plug:

The spark plug ignites the fuel/air mixture in the combustion chamber. To do this effectively and at the proper time, the correct spark plug must be used, and the spark plug must be kept clean and adjusted.

Test have shown the plugs listed in the "Specifications" section in the "General Information" chapter to be the best plug for general use.

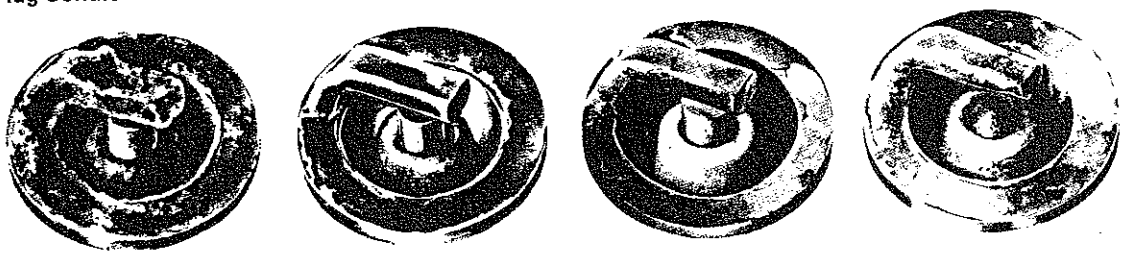
Since spark plug requirements change with the ignition and carburetion adjustments and with riding conditions, whether or not a spark plug of a correct heat range is used should be determined by removing and inspecting the plug.

Spark Plug



1. Terminal
2. Insulator
3. Cement
4. Gasket
5. Center electrode
6. Side electrode

Spark Plug Condition



Carbon Fouling | Oil Fouling | Normal Operation | Overheating

When a plug of the correct heat range is being used, the electrodes will stay hot enough to keep all the carbon burned off, but cool enough to keep from damaging the engine and the plug itself. This temperature is about 400 – 800°C (750 – 1,450°F) and can be judged by noting the condition and color of the ceramic insulator around the center electrode. If the ceramic is clean and of a light brown color, the plug is operating at the right temperature.

A spark plug for higher operating temperatures is used for racing. Such a plug is designed for better cooling efficiency so that it will not overheat and thus is often called a "colder" plug. If a spark plug with too high a heat range is used – that is, a "cold" plug that cools itself too well – the plug will stay too cool to burn off the carbon, and the carbon will collect on the electrodes and the ceramic insulator.

The carbon on the electrodes conducts electricity, and can short the center electrode to ground by either coating the ceramic insulator or bridging across the gap. Such a short will prevent an effective spark. Carbon build-up on the plug can also cause other troubles. It can heat up red-hot and cause preignition and knocking, which may eventually burn a hole in the top of the piston.

Spark Plug Inspection

- ●Remove the spark plug and inspect the ceramic insulator.
- ★Whether or not the right temperature plug is being used can be ascertained by noting the condition of the ceramic insulator around the electrode. A light brown color indicates the correct plug is being used. If the ceramic is black, it indicates that the plug is firing at too low a temperature, so the next hotter type should be used instead. If the ceramic is white, the plug is operating at too high a temperature and it should be replaced with the next colder type.

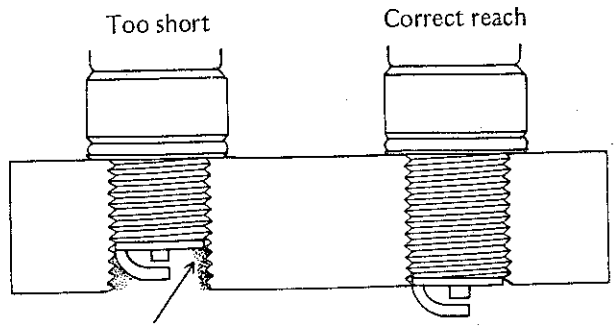
CAUTION

○If the spark plug is replaced with a type other than the standard plug listed in the "Specifications" section, make certain the replacement plug has the same thread pitch and reach (length of threaded portion) and the same insulator type (regular type or projected type) as the standard plug.

○If the plug reach is too short, carbon will build up on the plug hole threads in the cylinder head, causing overheating and making it very difficult to insert the correct spark plug later.

○If the reach is too long, carbon will build up on the exposed spark plug threads causing overheating, preignition, and possibly burning a hole in the piston top. In addition, it may be impossible to remove the plug without damaging the cylinder head.

Plug Reach



Standard Spark Plug Threads

Diameter	:	**14 mm**
Pitch	:	**1.25 mm**
Reach	:	**19.0 mm**

NOTE

○The heat range of the spark plug functions like a thermostat for the engine. Using the wrong type of spark plug can make the engine run too hot (resulting in engine damage) or too cold (with poor performance, misfiring, and stalling). The standard plug has been selected to match the normal usage of this motorcycle in combined street and highway riding. Unusual riding conditions may require a different spark plug heat range. For racing, install the colder plug.

Troubleshooting Guide

NOTE

○This is not an exhaustive list, giving every possible cause for each problem listed. It is meant simply as a rough guide to assist the troubleshooting for some of the more common difficulties.

Engine Doesn't Start; Starting Difficulty:

Engine won't turn over:
- Cylinder, piston seizure
- Crankshaft seizure
- Connecting rod small end seizure
- Connecting rod big end seizure
- Transmission gear or bearing seizure
- Balancer bearing seizure
- Kick shaft return spring broken
- Kick ratchet gear not engaging

No fuel flow:
- No fuel in tank
- Fuel tap turned off
- Tank cap air vent obstructed
- Fuel tap clogged
- Fuel line clogged
- Float valve clogged

Engine flooded:
- Float level too high
- Float valve worn or stuck open
- Starting technique faulty
  (when flooded, kick with the throttle fully open to allow more air to reach the engine.)

No spark; spark weak:
- Battery voltage low
- Ignition switch not on
- Engine stop switch turned off
- Clutch lever not pulled in or gear not in neutral
- Spark plug dirty, damaged, or maladjusted
- Spark plug cap or high tension wiring trouble
- Spark plug cap shorted or not in good contact
- Spark plug incorrect
- CDI unit trouble
- Pick-up coil trouble
- Exciter coil shorted or open
- Ignition coil trouble
- Ignition coil resistor open
- Flywheel magneto damaged
- Ignition or engine stop switch shorted
- Neutral, clutch, or side stand switch trouble
- Wiring shorted or open
- Fuse blown

Fuel/air mixture incorrect:
- Air screw and/or idle adjusting screw maladjusted
- Pilot jet or air passage clogged
- Air cleaner clogged, poorly sealed, or missing
- Starter jet clogged

Compression Low:
- Spark plug loose
- Cylinder head not sufficiently tighened down
- Cylinder, piston worn
- Piston ring bad (worn, weak, broken, or sticking)
- Piston ring/land clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Cylinder base gasket damaged
- Crankshaft oil seal deteriorated or damaged
- Reed valve damaged
- Cylinder nut loose

Poor Running at Low Speed:

Spark weak:
- Battery voltage low
- Spark plug dirty, damaged, or maladjusted
- Spark plug cap or high tension wiring trouble
- Spark plug cap shorted or not in good contact
- Spark plug incorrect
- CDI unit trouble
- Pickup coil trouble
- Exciter coil shorted or open
- Ignition coil trouble
- Flywheel magneto damaged

Fuel/air mixture incorrect:
- Air screw and/or idle adjusting screw maladjusted
- Pilot jet or air passage clogged
- Air cleaner clogged, poorly sealed, or missing
- Starter plunger stuck open
- Float level too high or too low
- Fuel tank air vent obstructed
- Carburetor holder loose
- Air cleaner duct loose

Compression low:
- Spark plug loose
- Cylinder head not sufficiently tightened down
- Cylinder, piston worn
- Piston ring bad (worn, weak, broken, or sticking)
- Piston ring/land clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Cylinder base gasket damaged
- Crankshaft oil seal deteriorated or damaged
- Reed valve damaged
- Cylinder nut loose

KIPS sub-ports stuck open:
- KIPS exhaust valve stuck open (valve seizure, or carbon accumulation)
- KIPS exhaust valves assembled incorrectly
- Exhaust advancer spring damaged
- Exhaust valve operating rod seizure
- Rod (for KIPS) seized in crankcase

Other:
- CDI unit trouble
- Transmission oil viscosity too high
- Brake dragging

Poor Running or No Power at High Speed:

Firing incorrect:
- Spark plug dirty, damaged, or maladjusted
- Spark plug cap or high tension wiring damaged
- Spark plug cap shorted or not in good contact
- Spark plug incorrect
- CDI unit trouble

Pickup coil trouble
Exciter coil shorted or open
Ignition coil trouble
Flywheel magneto damaged

Fuel/air mixture incorrect:
Main jet clogged or wrong size
Jet needle or needle jet worn
Jet needle clip in wrong position
Float level too high or too low
Air jet or air passage clogged
Air cleaner clogged, poorly sealed, or missing
Starter plunger stuck open
Fuel to carburetor insufficient
Water or foreign matter in fuel
Fuel to carburetor insufficient
Water or foreign matter in fuel
Fuel tank air vent obstructed
Carburetor holder loose
Air cleaner duct loose
Fuel tap clogged
Fuel line clogged

Compression low:
Spark plug loose
Cylinder head not sufficiently tightened down
Cylinder, piston worn
Piston ring bad (worn, weak, broken, or sticking)
Piston ring/land clearance excessive
Cylinder head gasket damaged
Cylinder head warped
Cylinder base gasket damaged
Crankshaft oil seal deteriorated or damaged
Reed valve damaged
Cylinder nut loose

Oil and fuel/air mixture incorrect:
Oil pump cable maladjusted
Throttle control cable maladjusted
No oil in oil tank
Crankshft oil seal deteriorated or damaged
Oil pump damaged
Oil line or check valve clogged
Air in oil pump or oil line

Engine rpm will not rise properly:
Starter plunger stuck open
Float level too high or too low
Main jet clogged
Throttle valve does not fully open
Air cleaner clogged
Muffler clogged
Water or foreign matter in fuel
Cylinder exhaust port clogged
Brake dragging
Clutch slipping
Overheating
Transmission oil level too high
Transmission oil viscosity too high
Crankshaft bearing worn or damaged

Knocking:
Carbon built up in combustion chamber
Fuel poor quality or incorrect
Spark plug incorrect
CDI unit trouble

KIPS sub-ports stuck closed:
KIPS sub-ports stuck closed
KIPS exhaust valves stuck closed (valve seizure, or carbon accumulation)
KIPS exhaust valves assembled incorrectly
Sub-ports clogged (carbon accumulation)
Exhaust valve operating rod seizure
Rod (for KIPS) seized in crankcase

Miscellaneous:
Throttle valve won't fully open
Muffler clogged
Cylinder exhaust port clogged
Brake dragging
Clutch slipping
Overheating
Transmission oil level too high
Transmission oil viscosity too high
Crankshaft bearing worn or damaged

Overheating:

Firing incorrect:
Spark plug dirty, broken, or maladjusted
Spark plug incorrect
CDI unit trouble

Fuel/air mixture incorrect:
Main jet clogged or wrong size
Fuel level in carburetor float bowl too low
Carburetor holder loose
Air cleaner poorly sealed, or missing
Air cleaner duct poorly sealed
Air cleaner clogged

Compression high:
Carbon built up in combustion chamber

Engine load faulty:
Brake dragging
Clutch slipping
Transmission oil level too high
Transmission oil viscosity too high

Lubrication inadequate:
Transmission oil level too low
Transmission oil poor quality or incorrect

Oil and fuel/air mixture incorrect:
Throttle control cable maladjusted
Crankshaft oil seal deteriorated or damaged
Oil pump damaged
Oil line or check valve clogged
Air in oil pump or oil line

Guage incorrect:
Water temperature gauge broken
Water temperature sensor broken

Coolant incorrect:
Coolant level too low
Coolant deteriorated

Cooling system component incorrect:
Radiator clogged
Thermostat trouble
Radiator cap trouble
Water pump not rotating
Water pump impeller damaged

Kick ratchet gear not properly disengaging from kick gear
Oil pump gear/output shaft idle gear worn or chipped

Drive chain noize:
Drive chain adjusted improperly
Chain worn
Rear and/or engine sprocket(s) worn
Chain lubrication insufficient
Rear wheel misaligned

Abnormal Frame Noise:

Front fork noise:
Oil insufficient or too thin
Spring weak or broken

Rear shock absorber noise:
Shock absorber damaged

Disc brake noise:
Pad installed incorrectly
Pad surface glazed
Disc warped
Caliper trouble
Cylinder damaged

Other noise
Bracket, nut, bolt, ect. not properly mounted or tightened

Exhaust Smoke:

Excessive white smoke:
Throttle control cable maladjusted
Engine oil poor quality or incorrect
Crankshaft oil seal damaged

Brownish smoke:
Air cleaner clogged
Main jet too large or fallen off
Starter Plunger stuck open
Float level too high

Handling and/or Stability Unsatisfactory:

Handlebar hard to turn:
Cable routing incorrect
Hose routing incorrect
Wiring routing incorrect
Steering stem locknut too tight
Bearing ball damaged
Bearing race dented or worn
Steering stem lubrication inadequate
Steering stem bent
Tire air pressure too low

Handlebar shakes or excessively vibrates:
Tire worn
Swing arm bushing or needle bearing damaged
Rim warped, or not balanced
Front, rear axle runout excessive
Wheel bearing worn
Handlebar clamp loose
Steering stem head nut loose

Handlebar pulls to one side:
Frame bent
Wheel misalignment
Swing arm bent or twisted
Swing arm pivot shaft runout excessive
Steering maladjusted
Steering stem bent
Front fork leg bent
Right/left front fork oil level uneven

Shock absorption unsatisfactory:
(Too hard)
Front fork oil excessive
Front fork oil viscosity too high
Front fork leg bent
Tire air pressure too high
Rear shock absorber maladjusted
(Too soft)
Front fork oil insufficient and/or leaking
Front fork oil viscosity too low
Front fork, rear shock absorber spring weak
Rear shock absorber gas leaking
Rear shock absorber maladjusted

Brakes Don't Hold:

Air in the brake line
Pad or disc worn
Brake fluid leak
Disc warped
Contaminated pads
Brake fluid deteriorated
Primary or secondary cup damaged
Master cylinder scratched inside

Battery Discharged:

Battery faulty (e.g., plates sulphated, shorted through sedimentation, electrolyte level too low)
Battery leads making poor contact
Load excessive (e.g., bulb of excessive wattage)
Ignition switch trouble
Flywheel magneto damaged
Wiring faulty
Regulator/rectifier trouble

Battery Overcharged:

Refulator/rectifier trouble
Battery trouble

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.

Clutch Lever
Front Brake Lever
Rear Brake Pedal
Drive Chain

Points: Lubricate with Grease.

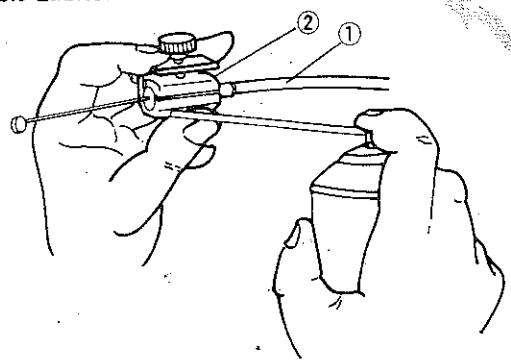
Side Stand Mounting Portion/Frame
Clutch Inner Cable Upper and Lower Ends
Choke Inner Cable Upper End
Throttle Inner Cable Upper and Lower Ends
Carburetor Inner Cable Upper End
Oil Pump Inner Cable Upper End
Speedometer Inner Cable*
Tachometer Inner Cable*
Swing Arm Pivot
Tie-Rod Pivot
Rocker Arm Pivot
Wheel Bearing
Speedometer Gear
Steering Stem Bearing

*Grease the lower part of the inner cable sparingly.

Cables: Lubricate with Motor Oil.

Clutch Cable
Choke Cable
Throttle Cable
Carburetor Cable
Oil Pump Cable

Cable Lubrication



1. Cable
2. Pressure Cable Luber: K56019-021

Unit Conversion Table

Prefixes for Units:

Prefix	Symbol	Power
mega	M	x 1,000,000
kilo	k	x 1,000
centi	c	x 0.01
milli	m	x 0.001
micro	μ	x 0.000001

Units of Mass:

kg	x	2.205	=	lb
g	x	0.03527	=	oz

Units of Volume:

L	x	0.2642	=	gal (US)
L	x	0.2200	=	gal (imp)
L	x	1.057	=	qt (US)
L	x	0.8799	=	qt (imp)
L	x	2.113	=	pint (US)
L	x	1.816	=	pint (imp)
mL	x	0.03381	=	oz (US)
mL	x	0.02816	=	oz (imp)
mL	x	0.06102	=	cu in

Units of Force:

N	x	0.1020	=	kg
N	x	0.2248	=	lb
kg	x	9.807	=	N
kg	x	2.205	=	lb

Units of Length:

km	x	0.6214	=	mile
m	x	3.281	=	ft
mm	x	0.03937	=	in

Units of Torque:

N-m	x	0.1020	=	kg-m
N-m	x	0.7376	=	ft-lb
N-m	x	8.851	=	in-lb
kg-m	x	9.807	=	N-m
kg-m	x	7.233	=	ft-lb
kg-m	x	86.80	=	in-lb

Units of Pressure:

kPa	x	0.01020	=	kg/cm^2
kPa	x	0.1450	=	psi
kPa	x	0.7501	=	cm Hg
kg/cm^2	x	98.07	=	kPa
kg/cm^2	x	14.22	=	psi
cm Hg	x	1.333	=	kPa

Units of Speed:

km/h	x	0.6214	=	mph

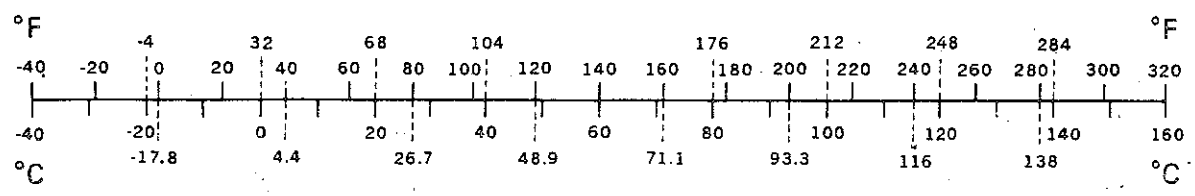
Units of Power:

kW	x	1.360	=	PS
kW	x	1.341	=	HP
PS	x	0.7355	=	kW
PS	x	0.9863	=	HP

Units of Temperature:

$$\frac{9\,(°C + 40)}{5} - 40 = °F$$

$$\frac{5\,(°F + 40)}{9} - 40 = °C$$



MODEL APPLICATION

Year	Model	Beginning Frame No.
1986	KMX125-A1	MX125A-000001
	KMX125-B1	MX125B-000001
1987	KMX125-A2	MX125A-004001
	KMX125-B2	MX125B-003801
1988	KMX125-A3	MX125A-008001
	KMX125-B3	MX125B-008001

KAWASAKI
HEAVY INDUSTRIES, LTD.
CONSUMER PRODUCTS & COMPONENTS GROUP

Part No. 99924-1072-02

Printed in Japan