

**KLX250S**  
**KLX250SF**



# **Motorcycle**

# **Service Manual**

# Quick Reference Guide

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

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



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# **Motorcycle Service Manual**

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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.

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## 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) Celsius	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)		

## COUNTRY AND AREA CODES

AU	Australia	MY	Malaysia
CA	Canada	PH	Philippine
CAL	California	US	United States



## EMISSION CONTROL INFORMATION

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

### 1. Crankcase Emission Control System

This system eliminates the release of crankcase vapors into the atmosphere. Instead, the vapors are routed through an oil separator to the inlet side of the engine. While the engine is operating, the vapors are drawn into combustion chamber, where they are burned along with the fuel and air supplied by the fuel injection system.

### 2. Exhaust Emission Control System

This system reduces the amount of pollutants discharged into the atmosphere by the exhaust of this motorcycle. The fuel, ignition, and exhaust systems of this motorcycle have been carefully designed and constructed to ensure an efficient engine with low exhaust pollutant levels.

The exhaust system of this model motorcycle manufactured primarily for sale in California includes a catalytic converter system.

### 3. Evaporative Emission Control System

Vapors caused by fuel evaporation in the fuel system are not vented into the atmosphere. Instead, fuel vapors are routed into the running engine to be burned, or stored in a canister when the engine is stopped. Liquid fuel is caught by a vapor separator and returned to the fuel tank.

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

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

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

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

### NOTE

○The phrase "remove or render inoperative any device or element of design" has been generally interpreted as follows.

1. Tampering does not include the temporary removal or rendering inoperative of devices or elements of design in order to perform maintenance.
2. Tampering could include.
  - a. Maladjustment of vehicle components such that the emission standards are exceeded.
  - b. Use of replacement parts or accessories which adversely affect the performance or durability of the motorcycle.
  - c. Addition of components or accessories that result in the vehicle exceeding the standards.
  - d. Permanently removing, disconnecting, or rendering inoperative any component or element of design of the emission control systems.

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

**\$10,000 PER VIOLATION**

## **TAMPERING WITH NOISE CONTROL SYSTEM PROHIBITED**

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

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

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

# 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 the warranty period,** 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 vehicle:

- 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 Service 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 this manual, the product is divided into its major systems and these systems make up the manual's chapters.

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

For example, if you want ignition coil information, 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 ignition coil 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 four more symbols (in addition to WARNING and CAUTION) which will help you distinguish different types of information.

### NOTE

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

- Indicates a procedural step or work to be done.
- Indicates a procedural sub-step or how to do the work of the procedural step it follows. It also precedes the text of a 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.

In most chapters an exploded view illustration of the system components follows the Table of Contents. In these illustrations you will find the instructions indicating which parts require specified tightening torque, oil, grease or a locking agent during assembly.

# General Information

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Unit Conversion Table .....	1-15

## 1-2 GENERAL INFORMATION

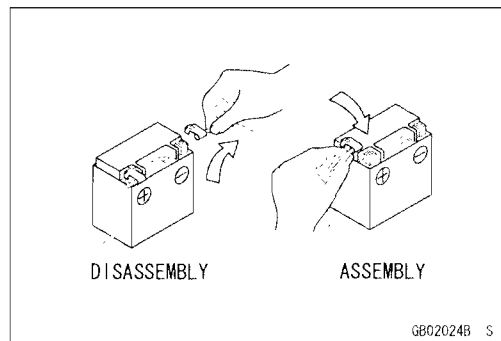
### Before Servicing

Before starting to perform an inspection service or carry out a disassembly and reassembly operation on a motorcycle, read the precautions given below. To facilitate actual operations, notes, illustrations, photographs, cautions, and detailed descriptions have been included in each chapter wherever necessary. This section explains the items that require particular attention during the removal and installation or disassembly and reassembly of general parts.

Especially note the following.

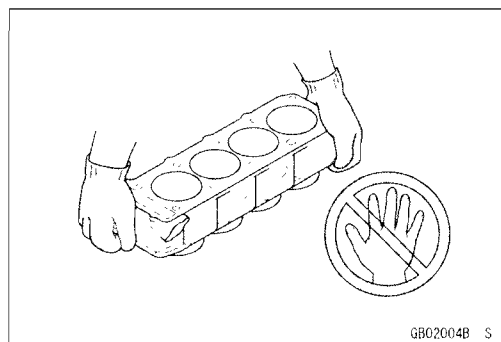
#### **Battery Ground**

Before completing any service on the motorcycle, disconnect the battery cables from the battery to prevent the engine from accidentally turning over. Disconnect the ground cable (–) first and then the positive (+). When completed with the service, first connect the positive (+) cable to the positive (+) terminal of the battery then the negative (–) cable to the negative terminal.



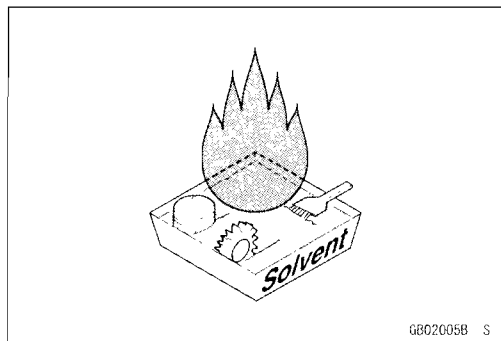
#### **Edges of Parts**

Lift large or heavy parts wearing gloves to prevent injury from possible sharp edges on the parts.



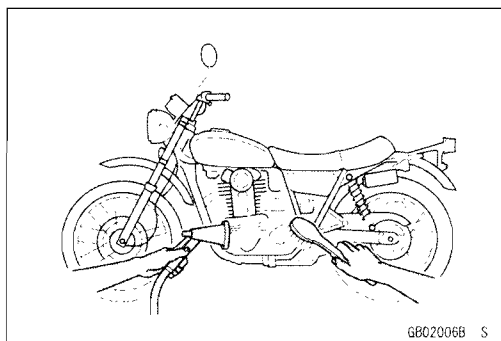
#### **Solvent**

Use a high-flash point solvent when cleaning parts. High-flash point solvent should be used according to directions of the solvent manufacturer.



#### **Cleaning vehicle before disassembly**

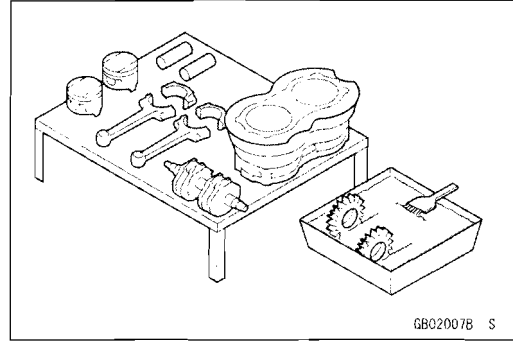
Clean the vehicle thoroughly before disassembly. Dirt or other foreign materials entering into sealed areas during vehicle disassembly can cause excessive wear and decrease performance of the vehicle.



## Before Servicing

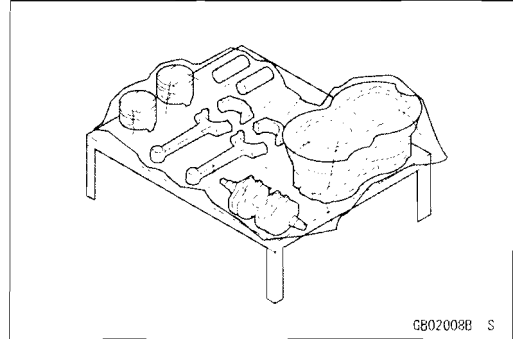
### Arrangement and Cleaning of Removed Parts

Disassembled parts are easy to confuse. Arrange the parts according to the order the parts were disassembled and clean the parts in order prior to assembly.



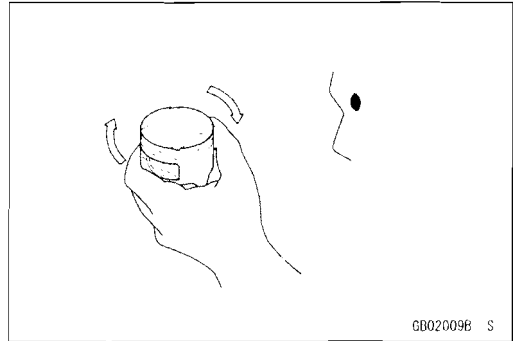
### Storage of Removed Parts

After all the parts including subassembly parts have been cleaned, store the parts in a clean area. Put a clean cloth or plastic sheet over the parts to protect from any foreign materials that may collect before re-assembly.



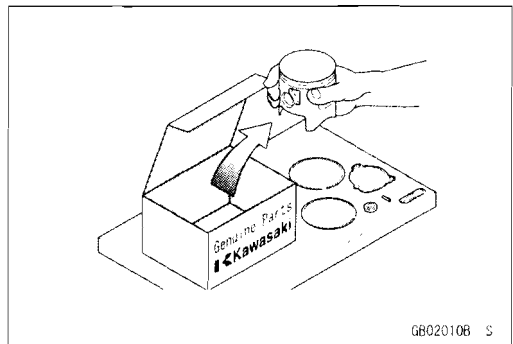
### Inspection

Reuse of worn or damaged parts may lead to serious accident. Visually inspect removed parts for corrosion, discoloration, or other damage. Refer to the appropriate sections of this manual for service limits on individual parts. Replace the parts if any damage has been found or if the part is beyond its service limit.



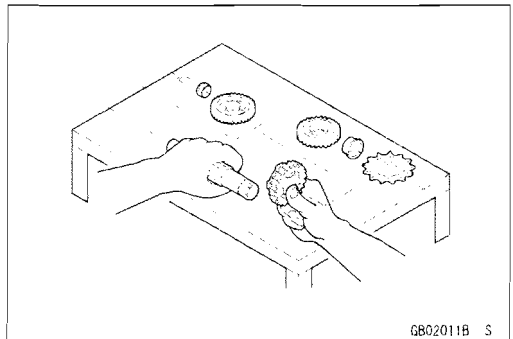
### Replacement Parts

Replacement Parts must be KAWASAKI genuine or recommended by KAWASAKI. Gaskets, O-rings, oil seals, grease seals, circlips or cotter pins must be replaced with new ones whenever disassembled.



### Assembly Order

In most cases assembly order is the reverse of disassembly, however, if assembly order is provided in this Service Manual, follow the procedures given.

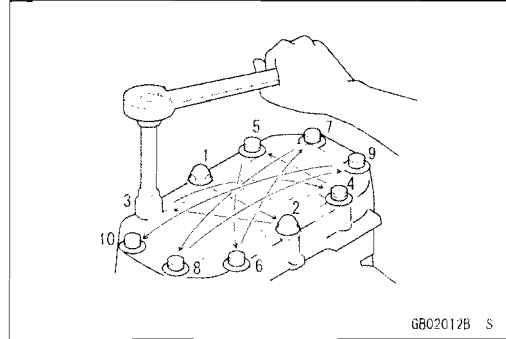


## 1-4 GENERAL INFORMATION

### Before Servicing

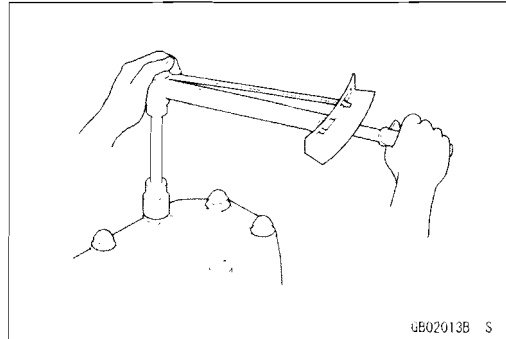
#### ***Tightening Sequence***

Generally, when installing a part with several bolts, nuts, or screws, start them all in their holes and tighten them to a snug fit. Then tighten them according to the specified sequence to prevent case warpage or deformation which can lead to malfunction. Conversely when loosening the bolts, nuts, or screws, first loosen all of them by about a quarter turn and then remove them. If the specified tightening sequence is not indicated, tighten the fasteners alternating diagonally.



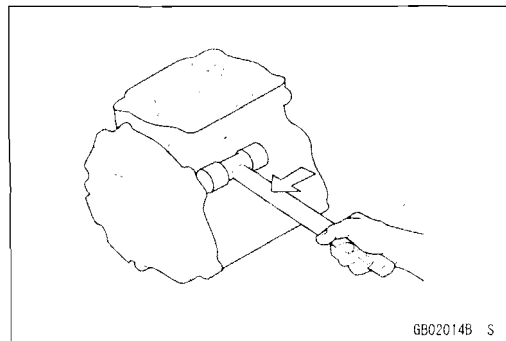
#### ***Tightening Torque***

Incorrect torque applied to a bolt, nut, or screw may lead to serious damage. Tighten fasteners to the specified torque using a good quality torque wrench.



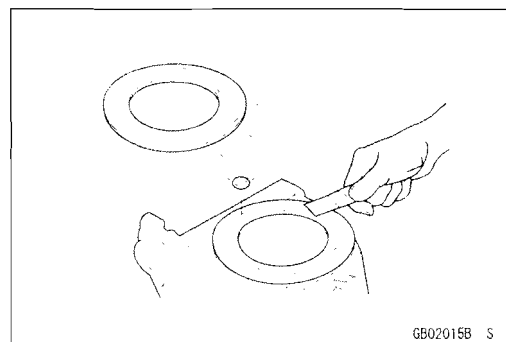
#### ***Force***

Use common sense during disassembly and assembly, excessive force can cause expensive or hard to repair damage. When necessary, remove screws that have a non-permanent locking agent applied using an impact driver. Use a plastic-faced mallet whenever tapping is necessary.



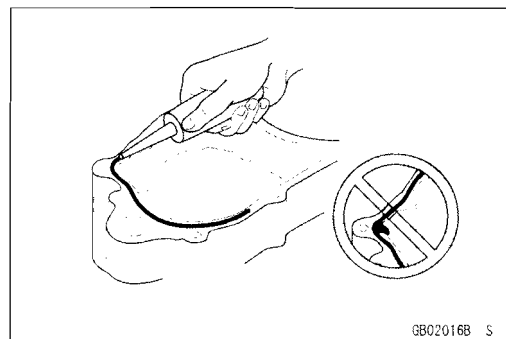
#### ***Gasket, O-ring***

Hardening, shrinkage, or damage of both gaskets and O-rings after disassembly can reduce sealing performance. Remove the old gaskets and clean the sealing surfaces thoroughly so that no gasket material or other material remains. Install the new gaskets and replace the used O-rings when re-assembling.



#### ***Liquid Gasket, Non-permanent Locking Agent***

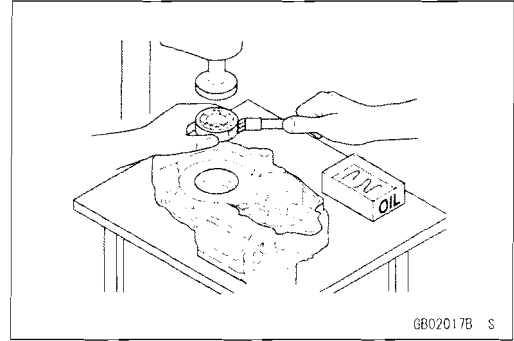
For applications that require Liquid Gasket or a Non-permanent Locking Agent, clean the surfaces so that no oil residue remains before applying liquid gasket or non-permanent locking agent. Do not apply them excessively. Excessive application can clog oil passages and cause serious damage.



## Before Servicing

### Press

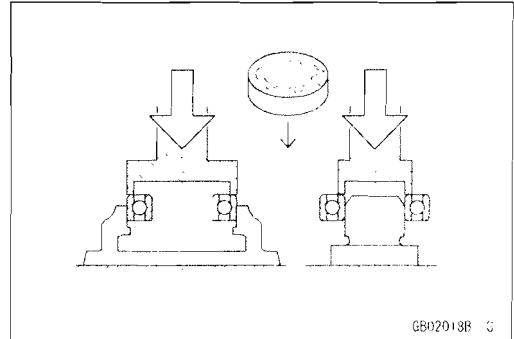
For items such as bearings or oil seals that must be pressed into place, apply small amount of oil to the contact area. Be sure to maintain proper alignment and use smooth movements when installing.



### Ball Bearing and Needle Bearing

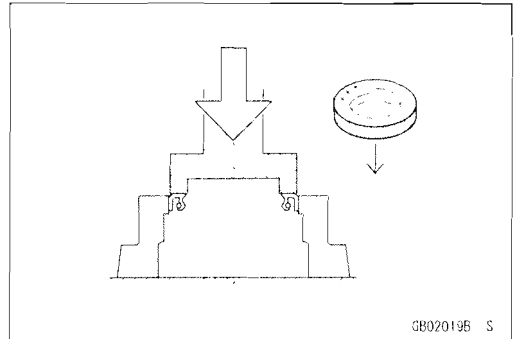
Do not remove pressed ball or needle unless removal is absolutely necessary. Replace with new ones whenever removed. Press bearings with the manufacturer and size marks facing out. Press the bearing into place by putting pressure on the correct bearing race as shown.

Pressing the incorrect race can cause pressure between the inner and outer race and result in bearing damage.

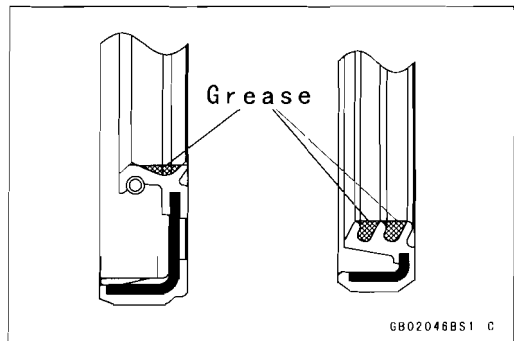


### Oil Seal, Grease Seal

Do not remove pressed oil or grease seals unless removal is necessary. Replace with new ones whenever removed. Press new oil seals with manufacture and size marks facing out. Make sure the seal is aligned properly when installing.

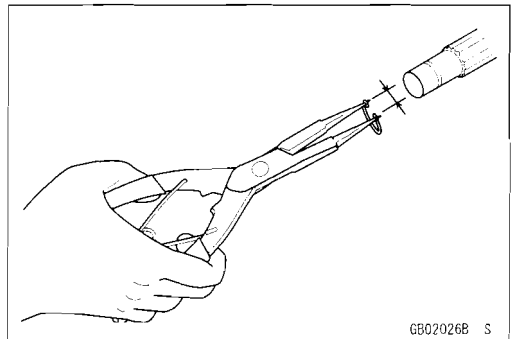


Apply specified grease to the lip of seal before installing the seal.



### Circlips, Cotter Pins

Replace the circlips or cotter pins that were removed with new ones. Take care not to open the clip excessively when installing to prevent deformation.



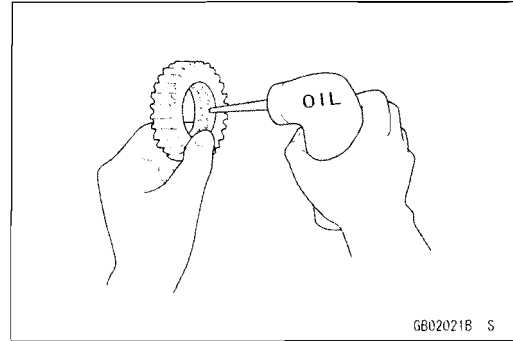


## 1-6 GENERAL INFORMATION

### Before Servicing

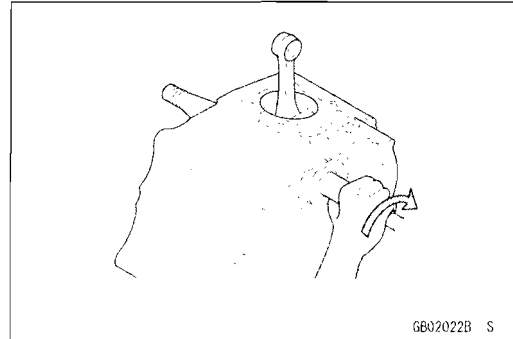
#### **Lubrication**

It is important to lubricate rotating or sliding parts during assembly to minimize wear during initial operation. Lubrication points are called out throughout this manual, apply the specific oil or grease as specified.



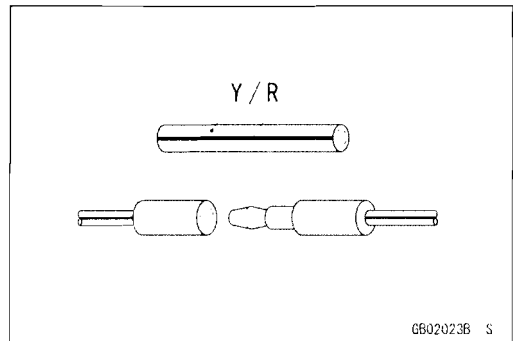
#### **Direction of Engine Rotation**

When rotating the crankshaft by hand, the free play amount of rotating direction will affect the adjustment. Rotate the crankshaft to positive direction (clockwise viewed from output side).



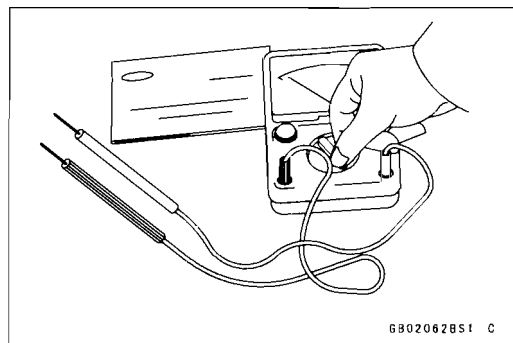
#### **Electrical Leads**

A two-color lead is identified first by the primary color and then the stripe color. Unless instructed otherwise, electrical leads must be connected to those of the same color.



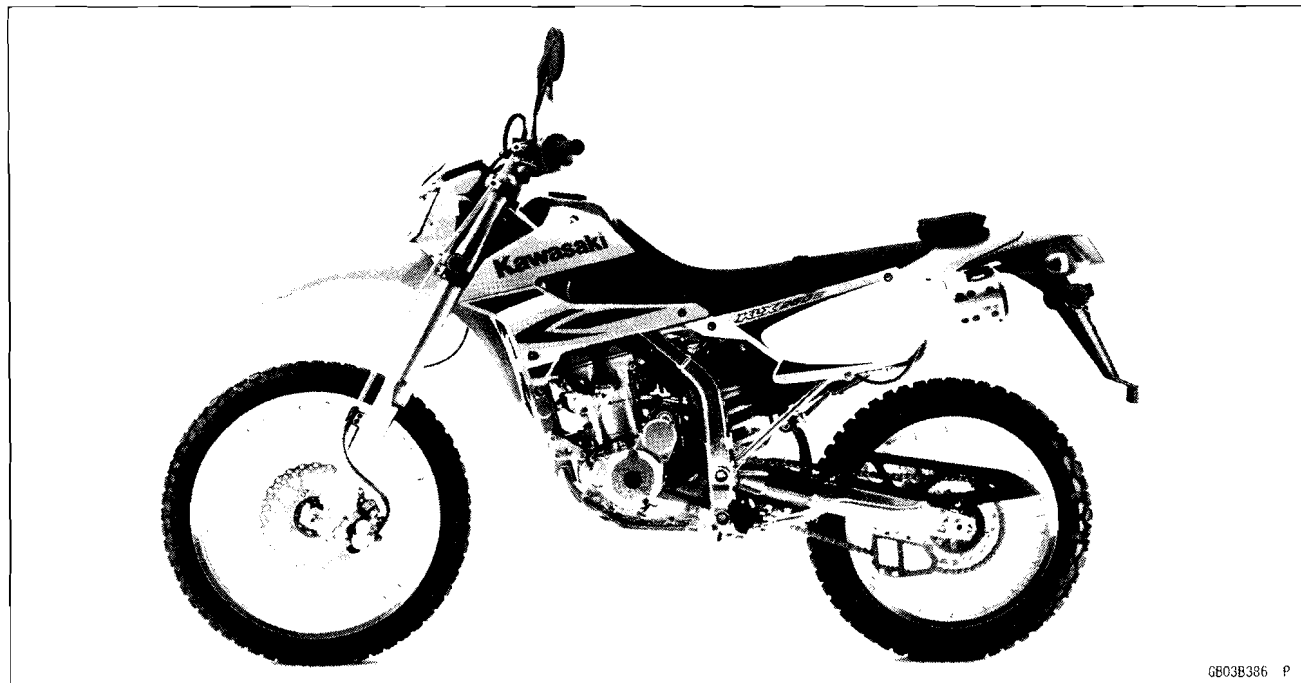
#### **Instrument**

Use a meter that has enough accuracy for an accurate measurement. Read the manufacture's instructions thoroughly before using the meter. Incorrect values may lead to improper adjustments.



## Model Identification

KLX250T9F Left Side View



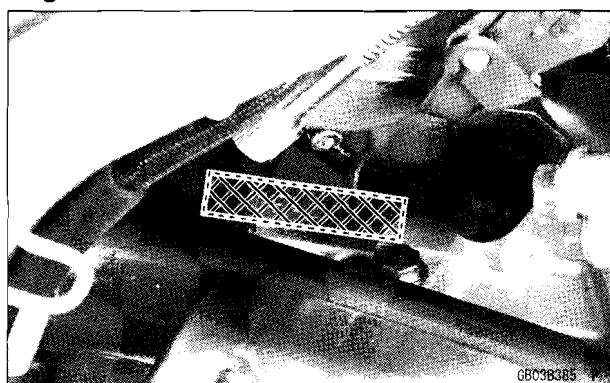
KLX250T9F Right Side View



Frame Number



Engine Number



## 1-8 GENERAL INFORMATION

### Model Identification

KLX250W9F Left Side View



KLX250W9F Right Side View



## General Specifications

Items	KLX250T9F
<b>Dimensions</b>	
Overall Length	2 200 mm (86.61 in.)
Overall Width	820 mm (32.3 in.)
Overall Height	1 205 mm (47.44 in.)
Wheelbase	1 430 mm (56.30 in.)
Road Clearance	285 mm (11.2 in.)
Seat Height	890 mm (35.0 in.)
Curb Mass:	135 kg (298 lb), (CAL) 136 kg (300 lb), (AU) 134 kg (295 lb)
Front	62 kg (137 lb) (CAL) 63 kg (139 lb)
Rear	73 kg (161 lb) (AU) 72 kg (159 lb)
Fuel Tank Capacity	7.7 L (2.0 US gal)
<b>Performance</b>	
Minimum Turning Radius	2.4 m (7.9 ft)
<b>Engine</b>	
Type	4-stroke, 1-cylinder, DOHC, 4-valve
Cooling System	Liquid-cooled
Bore and Stroke	72.0 × 61.2 mm (2.83 × 2.41 in.)
Displacement	249 cm <sup>3</sup> (15.2 cu in.)
Compression Ratio	11 : 1
Maximum Horsepower	17 kW (23 PS) @8 500 r/min (rpm) (AU) 11 kW (15 PS) @8 000 r/min (rpm) (CA), (CAL), (US) — — —
Maximum Torque	21 N·m (2.1 kgf·m, 15 ft·lb) @6 500 r/min (rpm) (AU) 17 N·m (1.7 kgf·m, 12 ft·lb) @3 000 r/min (rpm) (CA), (CAL), (US) — — —
Carburetion System	Carburetor, keihin CVK 34
Starting System	Electric starter motor
Ignition System	CDI
Timing Advance	Electronically advanced
Ignition Timing	BTDC 10° @1 300 r/min (rpm) ~ BTDC 25° @5 000 r/min (rpm) (AU) BTDC 10° @1 300 r/min (rpm) ~ BTDC 35° @5 000 r/min (rpm)
Spark Plug	NGK CR8E or ND U24ESR-N
Valve Timing:	
Inlet:	
Open	BTDC 22°
Close	ABDC 62°
Duration	264°
Exhaust:	
Open	BBDC 61°
Close	ATDC 19°
Duration	260°
Lubrication System	Forced lubrication (wet sump)

# 1-10 GENERAL INFORMATION

## General Specifications

Items	KLX250T9F
Engine Oil: Type:  Viscosity Capacity	API SE, SF or SG API SH, SJ or SL with JASO MA, MA1 or MA2 SAE10W-40 1.5 L (1.6 US qt) (when engine is completely dry)
<b>Drive Train</b> Primary Reduction System: Type Reduction Ratio Clutch Type Transmission: Type Gear Ratios: 1st 2nd 3rd 4th 5th 6th Final Drive System: Type Reduction Ratio Overall Drive Ratio	Gear drive 2.800 (84/30) Wet multi disc 6-speed, constant mesh, return shift 3.000 (30/10) 2.000 (30/15) 1.500 (27/18) 1.250 (25/20) 1.050 (21/20) 0.952 (20/21) Chain drive 3.000 (42/14) 8.000 @Top gear
<b>Frame</b> Type Caster (Rake Angle) Trail Rim Size: Front Rear Front Tire: Type Size Rear Tire: Type Size Front Suspension: Type Wheel Travel Rear Suspension: Type Wheel Travel	Tubular, semi-double cradle 26.5° 105 mm (4.13 in.) 21 × 1.60 18 × 2.15 Tube type 3.00-21 51P Tube type 4.60-18 63P Telescopic fork 255 mm (10.0 in.) Swingarm (uni-trak) 230 mm (9.06 in.)

**General Specifications**

Items	KLX250T9F
Brake Type:	
Front	Single disc brake
Rear	Single disc brake
<b>Electrical Equipment</b>	
Battery	12 V 6 Ah
Headlight:	
Type	Semi-sealed beam
Bulb:	12 V 60/55 W (quartz halogen)
Tail/Brake Light	12 V 5/21 W
Alternator:	
Type	Three-phase AC
Rated Output	16 A-14 V @5 000 r/min (rpm)

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

# 1-12 GENERAL INFORMATION

## General Specifications

Items	KLX250W9F
<b>Dimensions</b>	
Overall Length	2 130 mm (83.86 in.)
Overall Width	795 mm (31.31 in.)
Overall Height	1 140 mm (44.88 in.)
Wheelbase	1 420 mm (55.91 in.)
Road Clearance	225 mm (8.86 in.)
Seat Height	860 mm (33.9 in.)
Curb Mass:	137 kg (302 lb), (CAL) 138 kg (304 lb)
Front	63 kg (139 lb) (CAL) 64 kg (141 lb)
Rear	74 kg (163 lb)
Fuel Tank Capacity	7.7 L (2.0 US gal)
<b>Performance</b>	
Minimum Turning Radius	2.3 m (7.5 ft)
<b>Engine</b>	
Type	4-stroke, 1-cylinder, DOHC, 4-valve
Cooling System	Liquid-cooled
Bore and Stroke	72.0 × 61.2 mm (2.83 × 2.41 in.)
Displacement	249 cm <sup>3</sup> (15.2 cu in.)
Compression Ratio	11 : 1
Maximum Horsepower	(MY) 17 kW (23 PS) @8 500 r/min (rpm) (CA), (CAL), (US) — — —
Maximum Torque	(MY) 21 N·m (2.1 kgf·m, 15 ft·lb) @6 500 r/min (rpm) (CA), (CAL), (US) — — —
Carburetion System	Caburetor, keihin CVK 34
Starting System	Electric starter motor
Ignition System	CDI
Timing Advance	Electronically advanced
Ignition Timing	BTDC 10° @1 300 r/min (rpm) ~ BTDC 25° @5 000 r/min (rpm)
Spark Plug	NGK CR8E or ND U24ESR-N
Valve Timing:	
Inlet:	
Open	BTDC 22°
Close	ABDC 62°
Duration	264°
Exhaust:	
Open	BBDC 61°
Close	ATDC 19°
Duration	260°
Lubrication System	Forced lubrication (wet sump)
Engine Oil:	
Type:	API SE, SF or SG API SH, SJ or SL with JASO MA, MA1 or MA2
Viscosity	SAE10W-40

## General Specifications

Items	KLX250W9F
<b>Drive Train</b>	
Primary Reduction System:	
Type	Gear drive
Reduction Ratio	2.800 (84/30)
Clutch Type	Wet multi disc
Transmission:	
Type	6-speed, constant mesh, return shift
Gear Ratios:	
1st	3.000 (30/10)
2nd	2.000 (30/15)
3rd	1.500 (27/18)
4th	1.250 (25/20)
5th	1.050 (21/20)
6th	0.952 (20/21)
Final Drive System:	
Type	Chain drive
Reduction Ratio	2.786 (39/14)
Overall Drive Ratio	7.429 @Top gear
<b>Frame</b>	
Type	Tubular, semi-double cradle
Caster (Rake Angle)	25.5°
Trail	73 mm (2.87 in.)
Rim Size:	
Front	17 × 3.00
Rear	17 × 4.00
Front Tire:	
Type	Tube type
Size	110/70-17 M/C 54S
Rear Tire:	
Type	Tube type
Size	130/70-17 M/C 62S
Front Suspension:	
Type	Telescopic fork
Wheel Travel	230 mm (9.06 in.)
Rear Suspension:	
Type	Swingarm (uni-trak)
Wheel Travel	205 mm (8.07 in.)
Brake Type:	
Front	Single disc brake
Rear	Single disc brake
<b>Electrical Equipment</b>	
Battery	12 V 6 Ah



## 1-14 GENERAL INFORMATION

### General Specifications

Items	KLX250W9F
Headlight:	
Type	Semi-sealed beam
Bulb:	12 V 60/55 W (quartz halogen)
Tail/Brake Light	12 V 5/21 W
Alternator:	
Type	Three-phase AC
Rated Output	16 A-14 V @5 000 r/min (rpm)

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

## Unit Conversion Table

## Prefixes for Units

Prefix	Symbol	Power
mega	M	$\times 1\,000\,000$
kilo	k	$\times 1\,000$
centi	c	$\times 0.01$
milli	m	$\times 0.001$
micro	$\mu$	$\times 0.000001$

## Units of Mass

kg	$\times$	2.205	=	lb
g	$\times$	0.03527	=	oz

## Units of Volume

L	$\times$	0.2642	=	gal (US)
L	$\times$	0.2200	=	gal (imp)
L	$\times$	1.057	=	qt (US)
L	$\times$	0.8799	=	qt (imp)
L	$\times$	2.113	=	pint (US)
L	$\times$	1.816	=	pint (imp)
mL	$\times$	0.03381	=	oz (US)
mL	$\times$	0.02816	=	oz (imp)
mL	$\times$	0.06102	=	cu in

## Units of Force

N	$\times$	0.1020	=	kg
N	$\times$	0.2248	=	lb
kg	$\times$	9.807	=	N
kg	$\times$	2.205	=	lb

## Units of Length

km	$\times$	0.6214	=	mile
m	$\times$	3.281	=	ft
mm	$\times$	0.03937	=	in

## Units of Torque

N·m	$\times$	0.1020	=	kgf·m
N·m	$\times$	0.7376	=	ft·lb
N·m	$\times$	8.851	=	in·lb
kgf·m	$\times$	9.807	=	N·m
kgf·m	$\times$	7.233	=	ft·lb
kgf·m	$\times$	86.80	=	in·lb

## Units of Pressure

kPa	$\times$	0.01020	=	kgf/cm <sup>2</sup>
kPa	$\times$	0.1450	=	psi
kPa	$\times$	0.7501	=	cmHg
kgf/cm <sup>2</sup>	$\times$	98.07	=	kPa
kgf/cm <sup>2</sup>	$\times$	14.22	=	psi
cmHg	$\times$	1.333	=	kPa

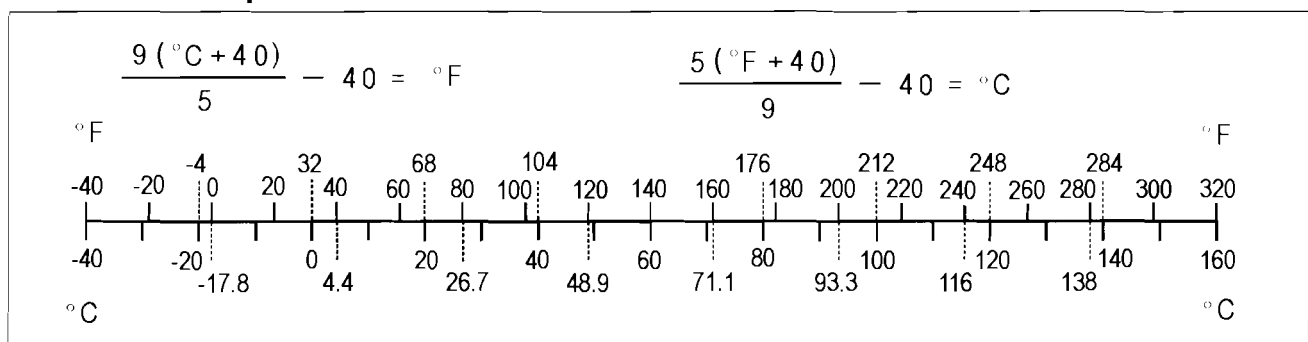
## Units of Speed

km/h	$\times$	0.6214	=	mph
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## Units of Power

kW	$\times$	1.360	=	PS
kW	$\times$	1.341	=	HP
PS	$\times$	0.7355	=	kW
PS	$\times$	0.9863	=	HP

## Units of Temperature



# Periodic Maintenance

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## 2-2 PERIODIC MAINTENANCE

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## Periodic Maintenance Chart

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

### Periodic Inspection

ITEM	FREQUENCY	* ODOMETER READING × 1 000 km (× 1 000 mile)							See Page
	Whichever comes first ↓	1 (0.6)	6 (3.75)	12 (7.5)	18 (11.25)	24 (15)	30 (18.75)	36 (22.5)	
	Every								
<b>Fuel System</b>									
Air cleaner element - clean				•		•		•	2-14
Throttle control system (play, smooth return, no drag) - inspect	year	•		•		•		•	2-15
Idle speed - inspect		•		•		•		•	2-15
Fuel leak - inspect	year	•		•		•		•	2-16
Fuel hose damage - inspect	year	•		•		•		•	2-16
Fuel hose installation condition - inspect	year	•		•		•		•	2-16
Evaporative emission control system function (CAL) - inspect		•	•	•	•	•	•	•	2-16
<b>Cooling System</b>									
Coolant level - inspect		•		•		•		•	2-17
Coolant leak (water hose and pipe) - inspect	year	•		•		•		•	2-18
Water hose damage - inspect	year	•		•		•		•	2-18
Water hose installation condition - inspect	year	•		•		•		•	2-18
<b>Engine Top End</b>									
Valve clearance - inspect				•		•		•	2-18
Spark arrester - clean (other than AU model)		Every 5 000 km (3 000 mile)							2-22
Air suction system damage - inspect (other than AU model)				•		•		•	2-22
<b>Clutch</b>									
Clutch operation (play, disengagement, engagement) - inspect		•		•		•		•	2-23
<b>Wheels and Tires</b>									
Tire air pressure - inspect	year			•		•		•	2-24
Wheel/tire damage - inspect				•		•		•	2-24
Tire tread wear, abnormal wear - inspect				•		•		•	2-25
Wheel bearings damage - inspect	year			•		•		•	2-25
Spoke tightness and rim runout		•	•	•	•	•	•	•	2-26
<b>Final Drive</b>									
Drive chain lubrication condition -		Every 600 km (400 mile)							2-27

## 2-4 PERIODIC MAINTENANCE

### Periodic Maintenance Chart

ITEM	FREQUENCY	* ODOMETER READING							See Page
	↓ Every	× 1 000 km (× 1 000 mile)							
		1 (0.6)	6 (3.75)	12 (7.5)	18 (11.25)	24 (15)	30 (18.75)	36 (22.5)	
Drive chain slack - inspect #	Every 1 000 km (600 mile)								2-28
Drive chain wear - inspect #				•		•		•	2-30
Drive chain guide wear - inspect				•		•		•	2-31
<b>Brakes</b>									
Brake fluid leak - inspect	year	•	•	•	•	•	•	•	2-32
Brake hose damage - inspect	year	•	•	•	•	•	•	•	2-33
Brake hose installation condition - inspect	year	•	•	•	•	•	•	•	2-33
Brake fluid level - inspect	6 months	•	•	•	•	•	•	•	2-33
Brake pad wear - inspect #			•	•	•	•	•	•	2-34
Brake operation (effectiveness, play, no drag) - inspect	year	•	•	•	•	•	•	•	2-33
Brake light switch operation - inspect		•	•	•	•	•	•	•	2-34
<b>Suspension</b>									
Front forks/rear shock absorber operation (damping and smooth stroke) - inspect				•		•		•	2-35
Front forks/rear shock absorber oil leak - inspect	year			•		•		•	2-35, 2-36
Rocker arm bearings - lubricate						•			2-36
Rocker arm operation - inspect				•		•		•	2-36
Tie-rods operation - inspect				•		•		•	2-36
Tie-rods bearings - lubricate						•			2-36
Swingarm pivot - lubricate						•			2-37
<b>Steering</b>									
Steering play - inspect	year	•		•		•		•	2-37
Steering stem bearings - lubricate	2 years					•			2-38
<b>Electrical System</b>									
Lights and switches operation - inspect	year			•		•		•	2-38
Headlight aiming - inspect	year			•		•		•	2-40
Sidestand switch operation - inspect	year			•		•		•	2-41
Engine stop switch operation - inspect	year			•		•		•	2-42
<b>Others</b>									
Chassis parts - lubricate	year			•		•		•	2-43
Bolts and nuts tightness - inspect		•		•		•		•	2-45

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### Periodic Maintenance Chart

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- #: Service more frequently when operating in severe conditions; dusty, wet, muddy, high speed or frequent starting/stopping.
- \*: For higher odometer readings, repeat at the frequency interval established here.

## 2-6 PERIODIC MAINTENANCE

### Periodic Maintenance Chart

#### Periodic Replacement Parts

ITEM	FREQUENCY	↓ Every	* ODOMETER READING × 1 000 km (× 1 000 mile)					See Page
			1 (0.6)	12 (7.5)	24 (15)	36 (22.5)	48 (30)	
Air cleaner element # - replace	2 years							2-46
Engine oil # - change	year	•	•	•	•	•	•	2-50
Oil filter - replace	year	•	•	•	•	•	•	2-51
Fuel hose - replace	4 years						•	2-47
Coolant - change	3 years					•		2-48
Radiator hose and O-ring - replace	3 years					•		2-50
Brake hose - replace	4 years						•	2-52
Brake fluid - change	2 years				•		•	2-53
Rubber parts of master cylinder and caliper - replace	4 years						•	2-54, 2-56
Spark plug - replace				•	•	•	•	2-59

#: Service more frequently when operating in severe conditions; dusty, wet, muddy, high speed or frequent starting/stopping.

\*: For higher odometer readings, repeat at the frequency interval established here.



## Torque and Locking Agent

The following tables list the tightening torque for the major fasteners requiring use of a non-permanent locking agent or silicone sealant etc.

Letters used in the "Remarks" column mean:

AL: Tighten the two clamp bolts alternately two times to ensure even tightening torque.

G: Apply grease.

L: Apply a non-permanent locking agent.

M: Apply molybdenum disulfide grease.

MO: Apply molybdenum disulfide grease oil solution.

(mixture of the engine oil and molybdenum disulfide grease in a weight ratio 10 : 1)

S: Follow the specified tightening sequence.

Si: Apply silicone grease (ex. PBC grease).

SS: Apply silicone sealant.

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
<b>Fuel System</b>				
Separator Bracket Bolts	9.8	1.0	87 in·lb	
Carburetor Holder Clamp Screw	1.5	0.15	13 in·lb	
<b>Cooling System</b>				
Radiator Hose Clamp Screws	1.5	0.15	13 in·lb	
Radiator Fan Bolts	7.0	0.71	62 in·lb	L
Water Temperature Warning Light Switch	7.5	0.76	66 in·lb	SS
Water Pump Impeller Nut	7.8	0.80	69 in·lb	
Thermostat Housing Bolts	9.8	1.0	87 in·lb	L
Water Pump Cover Bolts	9.8	1.0	87 in·lb	
Radiator Fan Switch	23.5	2.4	17	SS
Coolant Drain Plug	25	2.5	18	
Radiator Bolts	6.9	0.70	61 in·lb	
Water Hose Fitting Bolts	9.8	1.0	87 in·lb	
<b>Engine Top End</b>				
Cylinder Head Cover Bolts	7.8	0.80	69 in·lb	
Air Suction Valve Cover Bolts (other than AU Model)	9.8	1.0	87 in·lb	L
Camshaft Cap Bolts	12	1.2	106 in·lb	S
Carburetor Holder Bolts	12	1.2	106 in·lb	
Cylinder Head Bolts (M6)	12	1.2	106 in·lb	S
Cylinder Head Bolts (M10) (First)	15	1.5	11	S, M
Cylinder Head Bolts (M10) (Final)	46	4.7	34	S, M
Plug	20	2.0	15	L
Cylinder Head Coolant Drain Plug (other than AU Model)	25	2.5	18	
Exhaust Pipe Holder Stud Bolts	25	2.5	18	
Spark Plug	13	1.3	115 in·lb	
Timing Inspection Cap	2.3	0.23	20 in·lb	
Alternator Rotor Bolt Cap	2.3	0.23	20 in·lb	
Camshaft Sprocket Bolts	9.8	1.0	87 in·lb	L

## 2-8 PERIODIC MAINTENANCE

### Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Camshaft Chain Sub-tensioner Bolt	15	1.5	11	
Camshaft Chain Guide Bolt	25	2.5	18	
Camshaft Chain Guide Retaining Plate Bolt	9.8	1.0	87 in·lb	
Muffler Body Bolts (Front and Center)	30	3.0	22	
Muffler Body Bolt (Rear)	9.8	1.0	87 in·lb	S
Muffler Body Nut	30	3.0	22	S
<b>Clutch</b>				
Clutch Spring Bolts	7.8	0.80	69 in·lb	
Clutch Cover Damper Plate Bolts	7.8	0.80	69 in·lb	L
Clutch Cover Bolts	9.8	1.0	87 in·lb	
Clutch Cable Holder Bracket Bolts	9.8	1.0	87 in·lb	
Right Engine Cover Bolts	9.8	1.0	87 in·lb	L (1)
Oil Seal Retaining Plate Bolt	12	1.2	106 in·lb	
Clutch Hub Nut	78	8.0	58	
<b>Engine Lubrication System</b>				
Oil Pump Mounting Screws	5.2	0.53	46 in·lb	
Oil Pipe Banjo Bolts (M8)	9.8	1.0	87 in·lb	
Oil Pipe Banjo Bolt (M10)	20	2.0	15	
Oil Pump Cover Screws	10	1.0	88 in·lb	
Engine Oil Drain Plug	15	1.5	11	
Oil Pressure Relief Valve	15	1.5	11	L
<b>Engine Removal/Installation</b>				
Upper Engine Mounting Bolt and Nut	50	5.1	37	S
Upper Engine Bracket Bolts	23	2.3	17	S
Lower Engine Mounting Bolt and Nut	50	5.1	37	S
Front Engine Mounting Bolt and Nut	50	5.1	37	S
Front Engine Bracket Bolts and Nuts	50	5.1	37	S
Swingarm Pivot Shaft Nut	88	9.0	65	S
<b>Crankshaft/Transmission</b>				
Crankcase Bolts	9.8	1.0	87 in·lb	
Crankcase Allen Bolts (Front)	12	1.2	106 in·lb	
Shift Drum Bearing Retaining Bolts	9.8	1.0	87 in·lb	
Shift Shaft Return Spring Pin	37	3.8	27	L
Primary Gear Nut	98	10	72	
Torque Limiter Cover Bolts	9.8	1.0	87 in·lb	
Starter Motor Clutch Bolts	12	1.2	106 in·lb	L
External Shift Mechanism Cover Screw	5.2	0.53	46 in·lb	
External Shift Mechanism Cover Bolts	9.8	1.0	87 in·lb	
Shift Pedal Bolt	9.8	1.0	87 in·lb	
Gear Positioning Lever Nut	9.8	1.0	87 in·lb	
Drive Chain Guard Plate Bolts	9.8	1.0	87 in·lb	
External Shift Mechanism Cover Nut	9.8	1.0	87 in·lb	

**Torque and Locking Agent**

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Neutral Switch	14.7	1.5	130 in·lb	G
<b>Wheels/Tires</b>				
Spoke Nipples	4.0	0.41	35 in·lb	AL
Front Axle Clamp Bolts	20	2.0	15	
Front Axle Nut	88	9.0	65	
Rear Axle Nut	110	11.2	81.1	
<b>Final Drive</b>				
Engine Sprocket Cover Bolts	9.8	1.0	87 in·lb	L (1)
Rear Sprocket Nuts	32	3.3	24	MO
Engine Sprocket Nut	125	12.7	92.2	
<b>Brakes</b>				
Front Brake Light Switch Mounting Screw	1.2	0.12	11 in·lb	Si
Front Master Cylinder Reservoir Cap Screws	1.5	0.15	13 in·lb	
Rear Master Cylinder Reservoir Cap Screws	1.5	0.15	13 in·lb	
Brake Pad Pin Cap	2.5	0.25	22 in·lb	
Brake Lever Pivot Bolt	5.9	0.60	52 in·lb	
Brake Lever Pivot Bolt Locknut	5.9	0.60	52 in·lb	
Caliper Bleed Valves	7.8	0.80	69 in·lb	
Rear Master Cylinder Mounting Screws	7.8	0.80	69 in·lb	S
Front Master Cylinder Clamp Bolts	8.8	0.90	78 in·lb	
Front Caliper Brake Pad Pins	17	1.7	12	Si
Front Caliper Holder Shaft	17	1.7	12	
Rear Caliper Brake Pad Pin	17	1.7	12	L
Rear Master Cylinder Push Rod Locknut	17	1.7	12	
Front Brake Disc Mounting Bolts	23	2.3	17	L
Rear Brake Disc Mounting Bolts	23	2.3	17	L
Front Caliper Mounting Bolts	25	2.5	18	Si
Rear Caliper Mounting Bolt	27	2.8	20	
Brake Hose Banjo Bolts	25	2.5	18	
<b>Suspension</b>				
Front Fork Cylinder Valve Assys	55	5.6	40	L
Piston Rod Nuts	15	1.5	11	AL
Upper Front Fork Clamp Bolts	20	2.0	15	
Lower Front Fork Clamp Bolt	25	2.5	18	
Front Fork Top Plugs	30	3.0	22	
Upper Rear Shock Absorber Bolt	39	4.0	29	
Lower Rear Shock Absorber Bolt	39	4.0	29	
Tie-rod Nuts	83	8.5	61	
Swingarm Pivot Shaft Nut	88	9.0	65	
Rocker Arm Pivot Shaft Nut	98	10	72	
<b>Steering</b>				
Steering Stem Nut	4.9	0.50	43 in·lb	

## 2-10 PERIODIC MAINTENANCE

### Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Steering Stem Head Nut	44	4.5	32	AL
Upper Front Fork Clamp Bolts	20	2.0	15	
Lower Front Fork Clamp Bolt	25	2.5	18	
Left Switch Housing Screws	3.5	0.36	31 in·lb	
Right Switch Housing Screws	3.5	0.36	31 in·lb	
<b>Frame</b>				
Front Footpeg Bracket Bolt	39	4.0	29	L
Front Footpeg Bracket Nut	39	4.0	29	
Sidestand Nut	44	4.5	32	
Sidestand Switch Mounting Bolt	8.8	0.90	78 in·lb	
<b>Electrical System</b>				
Timing Inspection Cap	2.3	0.23	20 in·lb	MO
Alternator Rotor Bolt Cap	2.3	0.23	20 in·lb	
Crankshaft Sensor Screws	2.4	0.24	21 in·lb	
Starter Relay Terminal Screws	2.4	0.24	21 in·lb	
Native Brush Assy Mounting Screw	3.8	0.39	34 in·lb	
Starter Motor Through Bolts	5.0	0.51	44 in·lb	
Igniter Mounting Screws	5.2	0.53	46 in·lb	
Stator Coil Bolts	5.9	0.60	52 in·lb	
Regulator/Rectifier Bolts	9.8	1.0	87 in·lb	
Starter Motor Cable Terminal Nut	9.8	1.0	87 in·lb	
Alternator Cover Bolts	9.8	1.0	87 in·lb	
Torque Limiter Cover Bolts	9.8	1.0	87 in·lb	
Starter Motor Mounting Bolts	9.8	1.0	87 in·lb	
Ignition Coil Mounting Bolts	9.8	1.0	87 in·lb	
Starter Motor Terminal Locknut	11	1.1	97 in·lb	
Starter Motor Clutch Bolts	12	1.2	106 in·lb	
Spark Plug	13	1.3	115 in·lb	
Alternator Rotor Bolt	120	12.2	88.5	
Tail/Brake Light Lens Screws	1.0	0.10	8.8 in·lb	
Tail/Brake Light Mounting Nuts	5.9	0.60	52 in·lb	
Left Switch Housing Screws	3.5	0.36	31 in·lb	L
Right Switch Housing Screws	3.5	0.36	31 in·lb	
Sidestand Switch Mounting Bolt	8.8	0.90	78 in·lb	
Front Brake Light Switch Mounting Screw	1.2	0.12	11 in·lb	
Neutral Switch	14.7	1.5	130 in·lb	G
Radiator Fan Switch	23.5	2.4	17	SS
Water Temperature Warning Liht Switch	7.5	0.76	66 in·lb	SS

## Torque and Locking Agent

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.

### Basic Torque for General Fasteners

Threads Diameter (mm)	Torque		
	N·m	kgf·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 ~ 23.0	125 ~ 165
20	225 ~ 325	23.0 ~ 33.0	165 ~ 240

## 2-12 PERIODIC MAINTENANCE

### Specifications

Item	Standard	Service Limit
<b>Fuel System</b>		
Throttle Grip Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)	— — —
Idle Speed	1 300 ±50 r/min (rpm)	— — —
Air Cleaner Element	Polyurethane Foam	— — —
Air Cleaner Element Oil	High quality form air filter oil	
<b>Cooling System</b>		
Coolant:		
Type (Recommended)	Permanent type of antifreeze	— — —
Color	Green	— — —
Mixed Ratio	Soft water 50%, Coolant 50%	— — —
Freezing Point	−35°C (−31°F)	— — —
Total Amount	1.3 L (1.4 US qt)	— — —
<b>Engine Top End</b>		
Valve Clearance:		
Exhaust	0.15 ~ 0.24 mm (0.0059 ~ 0.0094 in.)	— — —
Inlet	0.10 ~ 0.19 mm (0.0039 ~ 0.0075 in.)	— — —
<b>Clutch</b>		
Clutch Lever Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)	— — —
<b>Engine Lubrication System</b>		
Engine Oil:		
Type	API SE, SF or SG API SH, SJ or SL with JASO MA, MA1 or MA2	— — —
Viscosity	SAE 10W-40	— — —
Capacity	1.3 L (1.4 US qt) (when filter is not removed) 1.4 L (1.5 US qt) (when filter is removed) 1.5 L (1.6 US qt) (when engine is completely dry)	— — — — — — — — —
Level	Between upper and lower level lines (Wait several minutes after idling or running)	— — —
<b>Wheels/Tires</b>		
Tread Depth:		
Front:		
KLX250T	7.8 mm (0.31 in.)	2 mm (0.08 in.)
KLX250W	4.4 mm (0.17 in.)	1 mm (0.04 in.)
Rear:		
KLX250T	11.8 mm (0.464 in.)	2 mm (0.08 in.)
KLX250W	6.5 mm (0.26 in.)	2 mm (0.08 in.) (Up to 130 km/h) 3 mm (0.12 in.) (Over 130 km/h)

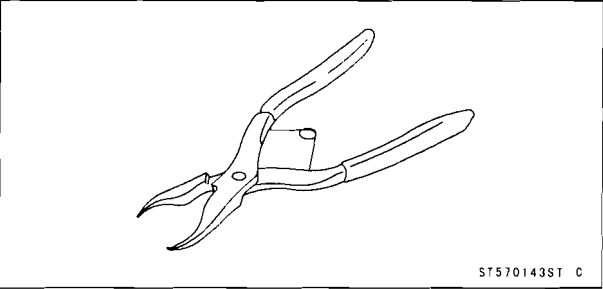
## Specifications

Item	Standard	Service Limit
<b>Air Pressure (When Cold):</b>		
Front:		
KLX250T	150 kPa (1.5 kgf/cm <sup>2</sup> , 22 psi)	— — —
KLX250W	200 kPa (2.0 kgf/cm <sup>2</sup> , 29 psi)	— — —
Rear:		
KLX250T	Up to 97.5 kg (215 lb) load: 150 kPa (1.5 kgf/cm <sup>2</sup> , 22 psi)	— — —
	97.5 ~ 181 kg (215 ~ 399 lb) load: 175 kPa (1.75 kgf/cm <sup>2</sup> , 25 psi)	— — —
KLX250W	225 kPa (2.25 kgf/cm <sup>2</sup> , 33 psi)	— — —
<b>Rim Runout:</b>		
Axial:		
KLX250T	TIR 0.7 mm (0.028 in.) or less	TIR 2.0 mm (0.08 in.)
KLX250W	TIR 0.8 mm (0.031 in.) or less	TIR 2.0 mm (0.08 in.)
Radial:		
KLX250T	TIR 1.0 mm (0.039 in.) or less	TIR 2.0 mm (0.08 in.)
KLX250W	TIR 1.2 mm (0.047 in.) or less	TIR 2.0 mm (0.08 in.)
<b>Final Drive</b>		
Drive Chain Slack	35 ~ 45 mm (1.4 ~ 1.8 in.)	— — —
Drive Chain Wear (20-link Length)	317.5 ~ 318.2 mm (12.50 ~ 12.53 in.)	323 mm (12.7 in.)
Standard Chain:		
Make	ENUMA	— — —
Type	EK525LV-O	— — —
Link:		
KLX250T	106 links	— — —
KLX250W	104 links	— — —
<b>Brakes</b>		
Brake Fluid:		
Grade	DOT3 or DOT4	— — —
Brake Pad Lining Thickness:		
Front	4.5 mm (0.18 in.)	1 mm (0.04 in.)
Rear	6.4 mm (0.25 in.)	1 mm (0.04 in.)
Brake Light Timing:		
Front	Pulled ON	— — —
Rear	ON after about 10 mm (0.39 in.) of pedal travel	— — —
<b>Electrical System</b>		
Spark Plug:		
Type	NGK CR8E or ND U24ESR-N	— — —

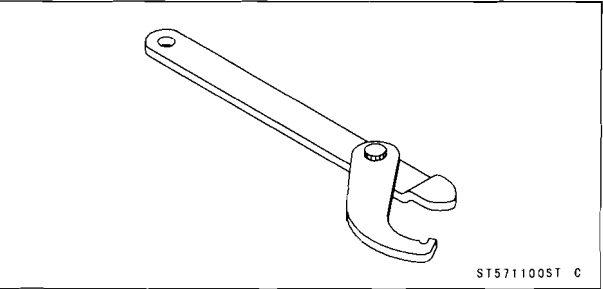
# 2-14 PERIODIC MAINTENANCE

## Special Tools

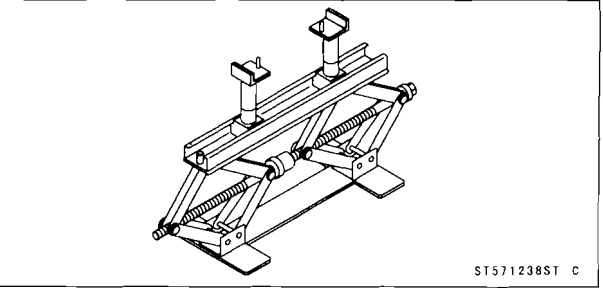
Inside Circlip Pliers:  
57001-143



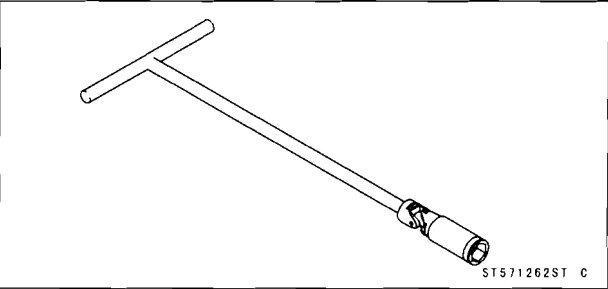
Steering Stem Nut Wrench:  
57001-1100



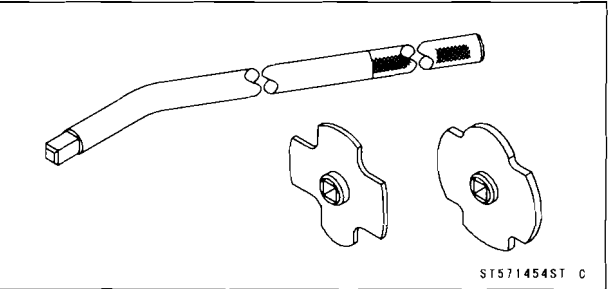
Jack:  
57001-1238



Spark Plug Wrench, Hex 16:  
57001-1262



Filler Cap Driver:  
57001-1454





## Periodic Maintenance Procedures

### Fuel System

#### Air Cleaner Element Cleaning

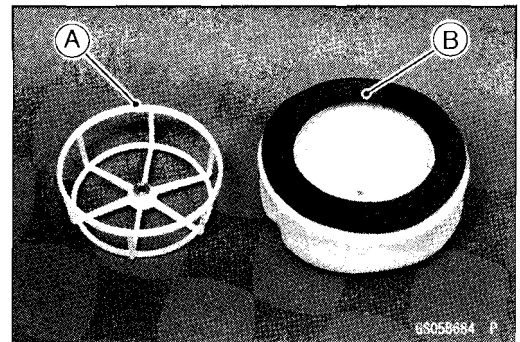
##### NOTE

- 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.

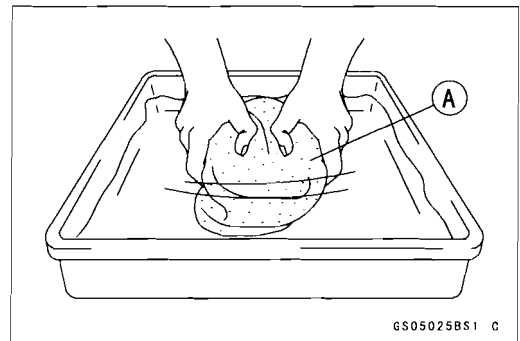
##### ⚠ WARNING

Clean the element in a well-ventilated areas, and make sure that there are 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 a low flash-point solvent to clean the element.

- Remove the air cleaner element (see Air Cleaner Element Replacement).
- Separate the frame [A] from the element [B].



- Soak the element [A] in a bath of high-flash point solvent, and clean it by using a soft bristle brush.

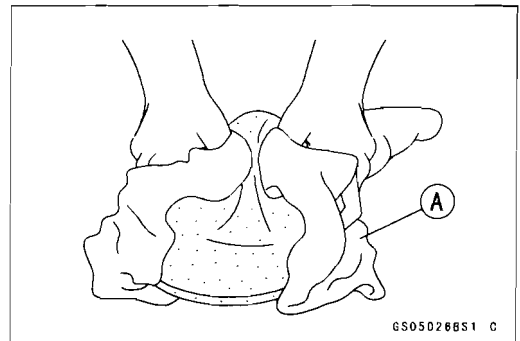


- Then squeeze it dry in a clean towel [A].

##### CAUTION

**Do not twist or blow the element. The element can be damaged.**

- Check the element and frame for visible damage.
- ★ If the element and frame are damaged, replace them.



- After cleaning, saturate the element with high quality form air filter oil, and squeeze out the excess oil.
- Then wrap the element in a clean towel and squeeze it as dry as possible.
- Install the frame into the element.

## 2-16 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

#### Throttle Control System Inspection

- Check that the throttle grip [A] moves smoothly from full open to close, and the throttle closes quickly and completely by the return spring in all steering positions.
- ★ If the throttle grip does not return properly, check the throttle cable routing, grip free play, and cable damage. Then lubricate the throttle cable.
- Check the throttle grip free play [B].

##### Throttle Grip Free Play

Standard: 2 ~ 3 mm (0.08 ~ 0.12 in.)

- ★ If the free play is incorrect, adjust the throttle cable as follows.
- Loosen the locknut [A] at the throttle cable upper ends.
- Turn the accelerator cable adjuster [B] until 2 ~ 3 mm (0.08 ~ 0.12 in.) of throttle grip play is obtained.
- Tighten the locknut.

- ★ If the free play can not be adjusted with adjusters at the upper end of the throttle cables, loosen the locknuts [A] and use the adjusters [B] at the lower end of throttle cables.
- Make the necessary free play adjustment at the adjusters, tighten the locknuts securely.
- ★ If the free play can not be adjusted with the adjusters, replace the cable.

#### ⚠ WARNING

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

#### Idle Speed Inspection

- Start the engine and warm it up thoroughly.
- With the engine idling, turn the handlebar to both sides [A].
- ★ If handlebar movement changes the idle speed, the throttle cables may be improperly adjusted or incorrectly routed or damaged. Be sure to correct any of these conditions before riding (see Throttle Control System Inspection and Cable, Wire, and Hose Routing section in the Appendix chapter).

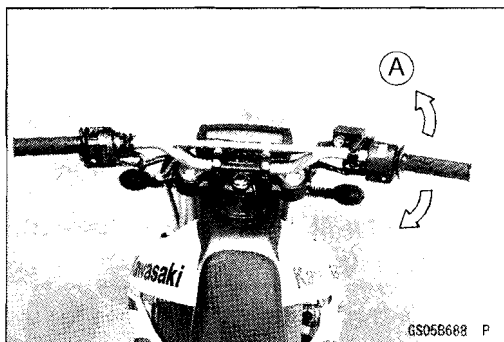
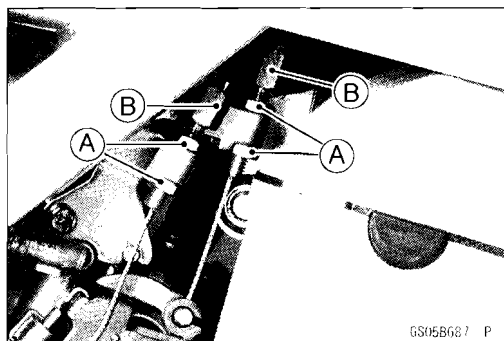
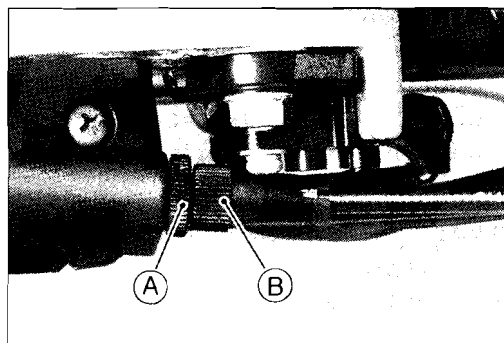
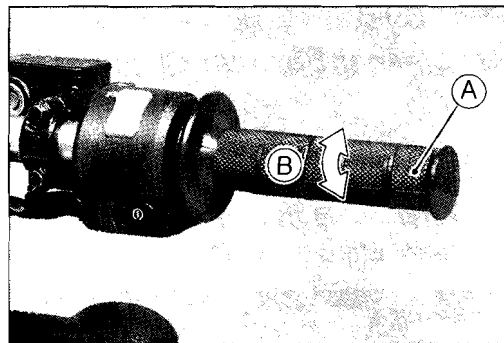
#### ⚠ WARNING

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

- Check the idle speed.

##### Idle Speed

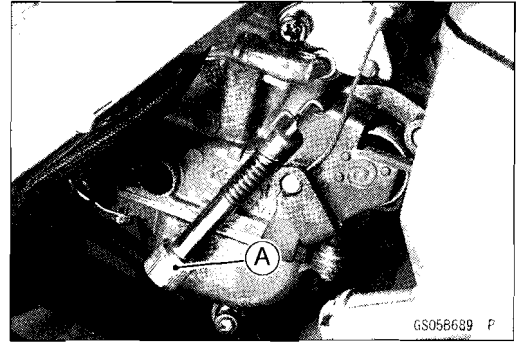
Standard: 1 300 ±50 r/min (rpm)



## Periodic Maintenance Procedures

### Idle Speed Adjustment

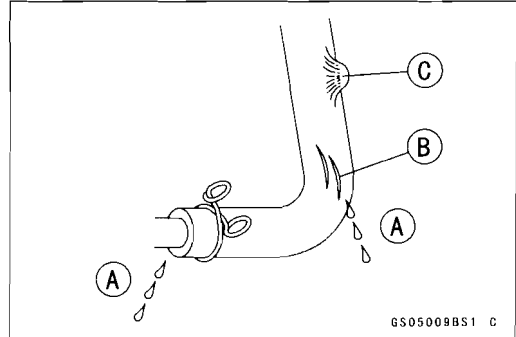
- Start the engine and warm it up thoroughly.
- Turn the adjusting screw [A] until the idle speed is correct.
- Open and close the throttle a few times to make sure that the idle speed is within the specified range. Readjust if necessary.



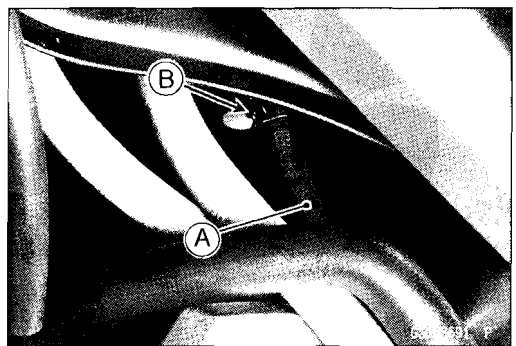
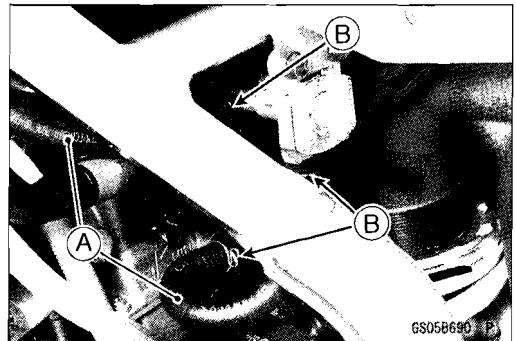
### Fuel Hose Inspection (fuel leak, damage, installation condition)

○ If the motorcycle is not properly handled, the high pressure inside the fuel line can cause fuel to leak [A] or the hose burst.

- ★ Replace the fuel hose if any fraying, cracks [B] or bulges [C] are noticed.



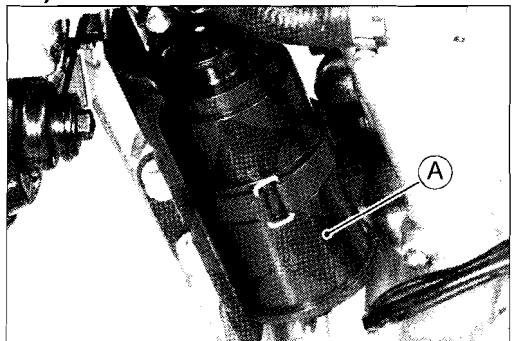
- Check that the fuel hoses [A] is securely connected and clamps [B] are tightened correctly.
- Check that the fuel hose is routed according to Cable, Wire, and Hose Routing section in the Appendix chapter.
- When installing the fuel hose, avoid sharp bending, kinking, flattening or twist, and route the fuel hose with a minimum of bending so that fuel flow will not be obstructed.
- ★ Replace the hose if it has been sharply bent or kinked.



## Evaporative Emission Control System (CAL Model)

### Evaporative Emission Control System Inspection

- Inspect the canister as follows.
- Remove the left side cover (see Side Cover Removal in the Frame chapter).
- Remove the canister [A], and disconnect the hoses from the canister.
- Visually inspect the canister for cracks or other damage.
- ★ If the canister has any cracks or bad damage, replace it with a new one.



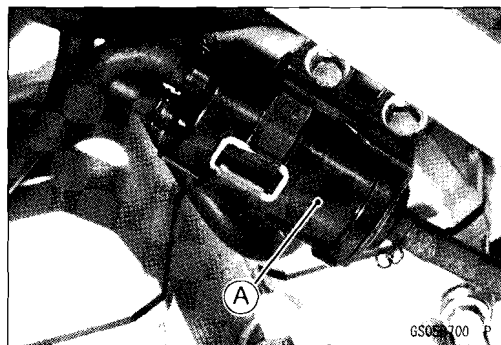
### NOTE

○ The canister is designed to work well through the motor-

## 2-18 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

- Check the liquid/vapor separator as follows.
  - Disconnect the hoses from the separator, and remove the separator [A] from the motorcycle left side.
  - Visually inspect the separator for cracks and other damage.
  - ★ If the separator has any cracks or damage, replace it with a new one.
  - To prevent the gasoline from flowing into or out of the canister, hold the separator perpendicular to the ground.
- Check the hoses of the evaporative emission control system as follows.
  - Check that the hoses are securely connected and clips are in position.
  - Replace any kinked, deteriorated or damaged hoses.
  - Route the hoses according to Cable, Wire, and Hose Routing section in the Appendix chapter.
  - When installing the hoses, avoid sharp bending, kinking, flattening or twisting, and route the hoses with a minimum of bending so that the emission flow will not be obstructed.

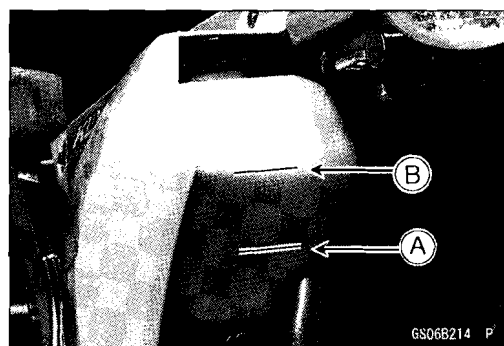


### Cooling System

#### Coolant Level Inspection

##### NOTE

- Check the level when the engine is cold (room or ambient temperature).
- Check the coolant level in the reserve tank with the motorcycle held perpendicular (Do not use the sidestand.).
- ★ If the coolant level is lower than the "LOW" level line [A], unscrew the reserve tank cap and add coolant to the "FULL" level line [B].



##### CAUTION

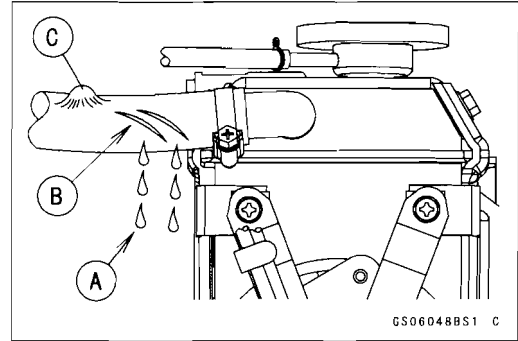
For refilling, add the specified mixture of coolant and soft water. Adding water alone dilutes the coolant and degrades its anticorrosion properties. The diluted coolant can attack the aluminum engine parts. In an emergency, soft water alone can be added. But the diluted coolant must be returned to the 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. Coolant ruins painted surfaces. Immediately wash away any coolant that spills on the frame, engine, wheels or other painted parts.



## Periodic Maintenance Procedures

### Radiator Hose Inspection (coolant leak, damage, installation condition)

- The high pressure inside the radiator hose can cause coolant to leak [A] or the hose to burst if the line is not properly maintained.
- Visually inspect the hoses for signs of deterioration. Squeeze the hoses. A hose should not be hard and brittle, nor should it be soft or swollen.
- ★ Replace the hose if any fraying, cracks [B] or bulges [C] are noticed.
- Check that the hoses are securely connected and water hose clamp screws are tightened correctly.



## Engine Top End

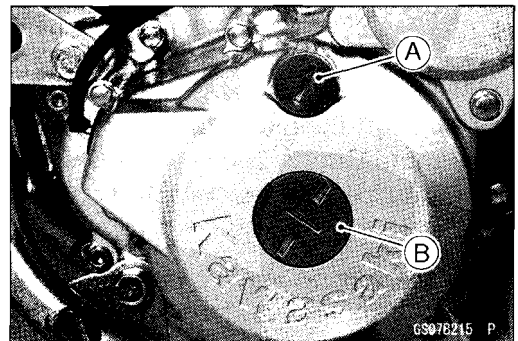
### Valve Clearance Inspection

#### NOTE

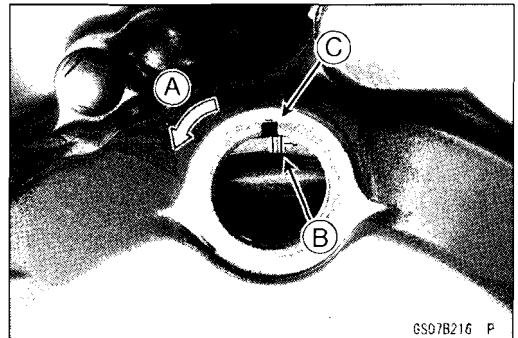
○ Valve clearance must be checked and adjusted when the engine is cold (room temperature).

- Remove the cylinder head cover (see Cylinder Head Cover Removal in the Engine Top End chapter).
- Remove the timing inspection cap [A] and alternator rotor bolt cap [B], using the filler cap driver.

**Special Tool - Filler Cap Driver: 57001-1454**



- Using a wrench on the alternator rotor bolt, turn the crankshaft counterclockwise [A] until the "T" mark [B] on the alternator rotor is aligned with notch [C] in the edge of the timing inspection hole.



- Using the thickness gauge [A], measure the valve clearance between cam and shim of all four valves.
- Measure the valve clearance of the valves for which the cam [B] are turned away from each other.

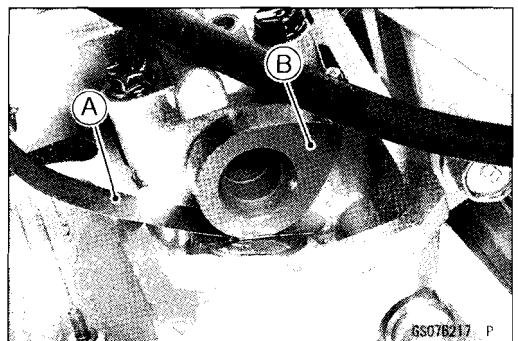
#### Valve Clearance

##### Standard:

Exhaust	0.15 ~ 0.24 mm (0.0059 ~ 0.0094 in.)
Inlet	0.10 ~ 0.19 mm (0.0039 ~ 0.0075 in.)

#### NOTE

○ Check the valve clearance using this method only. Checking the clearance at any other cam position may result in improper valve clearance.

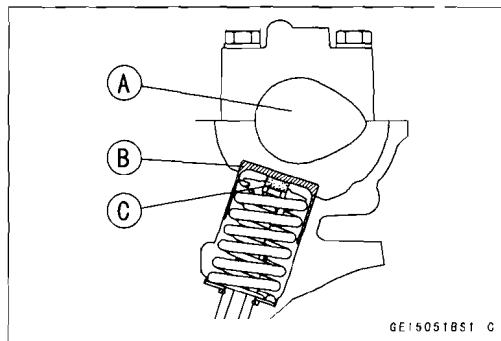


## 2-20 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

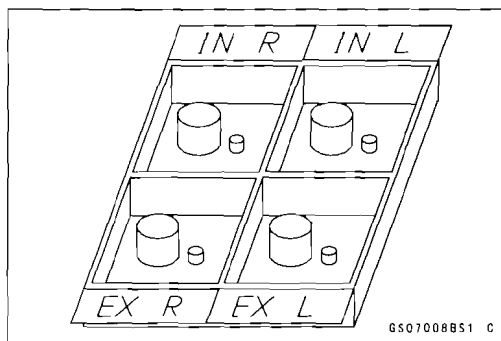
#### Valve Clearance Adjustment

- Remove the camshaft [A] (see Camshaft Removal in the Engine Top End chapter).
- Remove the valve lifter [B] of a valve that requires an adjustment.
- Remove the shim [C] on the spring retainer.



#### NOTE

○Mark the shim and valve lifter so that they can be installed in their original positions during assembly.

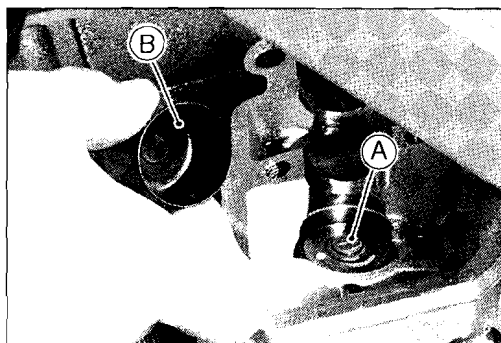


- Measure the thickness of the removed shim.
- Select an optimum shim from the Valve Clearance Adjustment Charts and replace the shim detached from the motorcycle with the selected one.

#### NOTE

○If there is no valve clearance, use a shim that is a few sizes smaller, and remeasure the valve clearance.

- Apply engine oil to the shim and install it so that the mark [A] on it faces to the valve lifter [B].



#### CAUTION

**Do not put shim stock under the shim. This may cause the shim to pop out at high rpm, causing extensive engine damage.**

**Do not grind the shim. This may cause it to fracture, causing extensive engine damage.**

- Apply oil to the valve lifter surface, and install it.
- Install the camshaft (see Camshaft Installation in the Engine Top End chapter).
- Recheck the valve clearance and readjust if necessary.
- Install the cylinder head cover, timing inspection cap and rotor bolt cap.

**Special Tool - Filler Cap Driver: 57001-1454**

**Torque - Timing Inspection Cap: 2.3 N·m (0.23 kgf·m, 20 in·lb)**

**Alternator Rotor Bolt Cap: 2.3 N·m (0.23 kgf·m, 20 in·lb)**

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## Periodic Maintenance Procedures

### Valve Clearance Adjustment Charts Inlet

		Present Shim																Example				
Part No. (92180-)		1014	1016	1018	1020	1022	1024	1026	1028	1030	1032	1034	1036	1038	1040	1042	1044	1046	1048	1050	1052	1054
Mark		50	55	60	65	70	75	80	85	90	95	00	05	10	15	20	25	30	35	40	45	50
Thickness (mm)		2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50

Valve Clearance Measurement (mm)	0.00~0.04	-	-	-	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35
	0.05~0.09	-	-	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40
Example	0.10~0.14	Specified Clearance / No Change Required																				
	0.15~0.19																					
	0.20~0.24	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	
	0.25~0.29	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50		
	0.30~0.34	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50			
	0.35~0.39	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50				
	0.40~0.44	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50					
	0.45~0.49	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50						
	0.50~0.54	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50							
	0.55~0.59	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50								
	0.60~0.64	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50									
	0.65~0.69	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50										
	0.70~0.74	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50											
	0.75~0.79	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50												
	0.80~0.84	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50													
	0.85~0.89	3.20	3.25	3.30	3.35	3.40	3.45	3.50														
	0.90~0.94	3.25	3.30	3.35	3.40	3.45	3.50															
	0.95~0.99	3.30	3.35	3.40	3.45	3.50																
	1.00~1.04	3.35	3.40	3.45	3.50																	
	1.05~1.09	3.40	3.45	3.50																		
	1.10~1.14	3.45	3.50																			
	1.15~1.19	3.50																				

Install the shim of this thickness (mm)

GE15162B S

1. Measure the valve clearance (when cold).
2. Check the present shim size.
3. Select an optimum shim based on a measured clearance value (row headings) and the thickness of the shim currently in use (column headings).
4. The cell where the row and line intersect indicates the shim thickness that provides a standard clearance.

(Example) Present Shim: 2.95 mm  
 Measured clearance: 0.36 mm  
 Exchange the shim for the 3.15 mm size shim. (intersecting point)

- Apply engine oil to the valve lifter surface and install the lifter.
- Install the camshafts.
- Recheck the valve clearance and readjust if necessary.

### NOTE

○If the valve clearance is smaller (larger) than the standard, select a thinner (thicker) shim.

## 2-22 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

#### Valve Clearance Adjustment Charts Exhaust

		Present Shim																Example				
Part No. (92180-)		1014	1016	1018	1020	1022	1024	1026	1028	1030	1032	1034	1036	1038	1040	1042	1044	1046	1048	1050	1052	1054
Mark		50	55	60	65	70	75	80	85	90	95	00	05	10	15	20	25	30	35	40	45	50
Thickness (mm)		2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50

Example

Valve Clearance Measurement (mm)		Specified Clearance / No Change Required																					
0.00~0.04	-	-	-	-	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	
0.05~0.09	-	-	-	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	
0.10~0.14	-	-	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	
0.14~0.19	Specified Clearance / No Change Required																						
0.20~0.24																							
0.25~0.29	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50			
0.30~0.34	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50				
0.35~0.39	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50					
0.40~0.44	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50						
0.45~0.49	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50							
0.50~0.54	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50								
0.55~0.59	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50									
0.60~0.64	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50										
0.65~0.69	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50											
0.70~0.74	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50												
0.75~0.79	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50													
0.80~0.84	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50														
0.85~0.89	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50															
0.90~0.94	3.20	3.25	3.30	3.35	3.40	3.45	3.50																
0.95~0.99	3.25	3.30	3.35	3.40	3.45	3.50																	
1.00~1.04	3.30	3.35	3.40	3.45	3.50																		
1.05~1.09	3.35	3.40	3.45	3.50																			
1.10~1.14	3.40	3.45	3.50																				
1.15~1.19	3.45	3.50																					
1.20~1.24	3.50																						

Install the shim of this thickness (mm)

GE15163B S

1. Measure the valve clearance (when cold).
2. Check the present shim size.
3. Select an optimum shim based on a measured clearance value (row headings) and the thickness of the shim currently in use (column headings).
4. The cell where the row and line intersect indicates the shim thickness that provides a standard clearance.

(Example) Present Shim: 3.10 mm  
 Measured clearance: 0.36 mm  
 Exchange the shim for the 3.25 mm size shim. (intersecting point)

- Apply engine oil to the valve lifter surface and install the lifter.
- Install the camshafts.
- Recheck the valve clearance and readjust if necessary.

#### NOTE

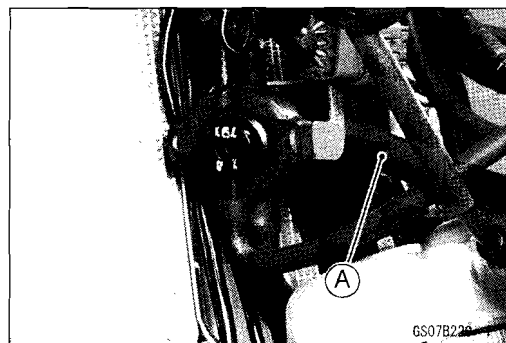
○ If the valve clearance is smaller (larger) than the standard, select a thinner (thicker) shim.



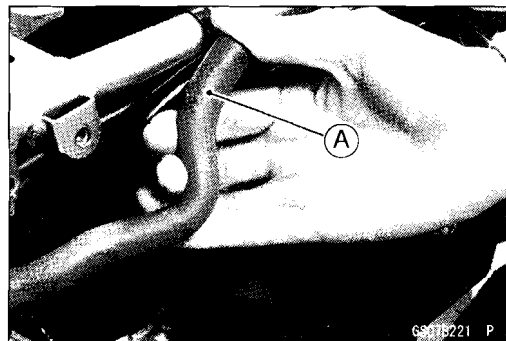
## Periodic Maintenance Procedures

### Air Suction System Damage Inspection (Other than AU model)

- Remove the fuel tank (see Fuel Tank Removal in the Fuel System chapter).
- Separate the vacuum switch valve hose [A] from the air cleaner housing.



- Install the fuel tank temporary (see Fuel Tank Installation in the Fuel System chapter).
- Start the engine and run it at idle speed.
- Plug the vacuum switch valve hose end [A] with your finger and feel vacuum pulsing in the hose.
- ★ If there is no vacuum pulsation, check the hose line for leak.
- ★ If there is no leak, check the vacuum switch valve (see Vacuum Switch Valve Test in the Engine Top End chapter).



### Spark Arrester Cleaning (Other than AU model)

#### ⚠ WARNING

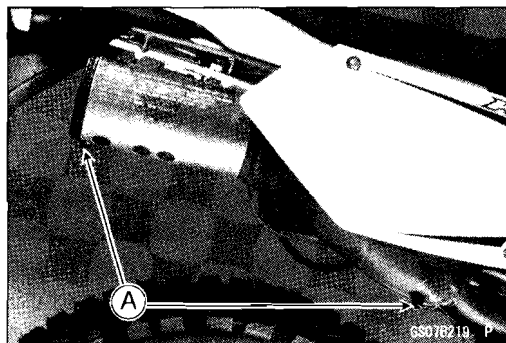
To avoid burns, wear gloves while cleaning the spark arresters. Since the engine must be run during this procedure, the muffler will become hot.

- Remove the drain plugs [A] on the muffler.
- In an open area away from combustible materials, start the engine with the transmission in neutral.
- Raise and lower engine speed while tapping on the muffler with a rubber mallet until carbon particles are purged from the muffler.

#### ⚠ WARNING

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

- Stop the engine.
- Install the drain plugs.



## 2-24 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

#### Clutch

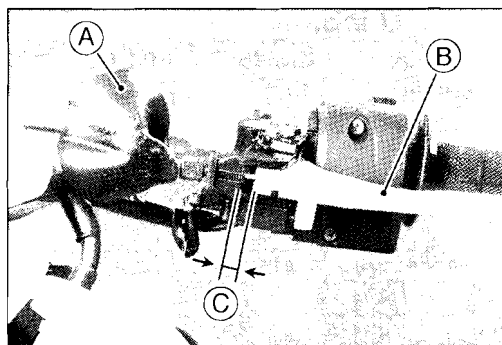
##### *Clutch Operation Inspection*

- Turn over the dust cover [A].
- Pull the clutch lever [B] lightly, and check the clutch lever free play [C].

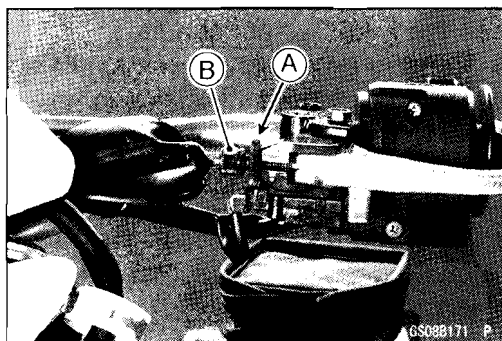
##### **Clutch Lever Free Play**

Standard: 2 ~ 3 mm (0.08 ~ 0.12 in.)

★ If the free play is incorrect, adjust it.



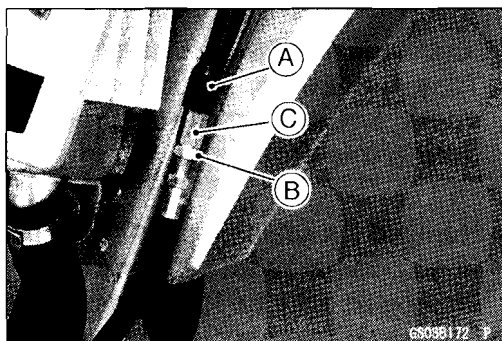
- Loosen the locknut [A].
  - Turn the adjuster [B] to adjust the free play.
  - Tighten the locknut.
  - Slide back the dust cover.
- ★ If the free play can not be adjusted with the adjuster at the clutch lever, use the adjuster at the middle of the clutch cable.



#### **⚠ WARNING**

**To avoid a serious burn, never touch the engine or exhaust pipe during clutch adjustment.**

- Slide the dust cover [A] at the clutch cable.
- Loosen the locknut [B] at the middle of the clutch cable.
- Turn the adjuster [C] at the clutch cable until the free play is correct.
- Slide back the dust cover.
- After the adjustment, start the engine and check that the clutch does not slip and that it releases properly.



#### **⚠ WARNING**

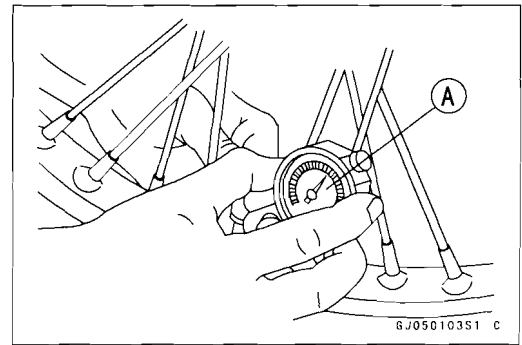
**When inspecting by running the motorcycle, note a surrounding traffic situation enough in the place of safety.**

## Periodic Maintenance Procedures

### Wheels/Tires

#### Air Pressure Inspection

- Remove the air valve cap.
- Measure the tire air pressure with an air pressure gauge [A] when the tires are cold (that is, when the motorcycle has not been ridden more than a mile during the past 3 hours).
- Install the air valve cap.
- ★ Adjust the tire air pressure according to the specifications if necessary.



#### Air Pressure (When Cold)

##### Front:

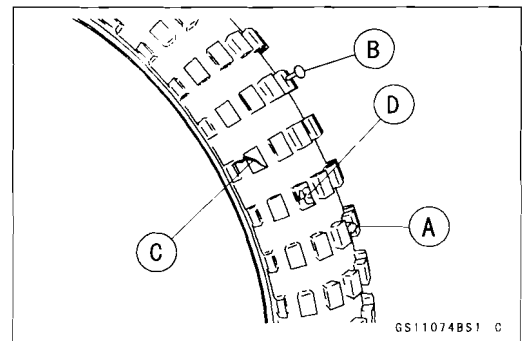
KLX250T	150 kPa (1.5 kgf/cm <sup>2</sup> , 22 psi)
KLX250W	200 kPa (2.0 kgf/cm <sup>2</sup> , 29 psi)

##### Rear:

KLX250T	Up to 97.5 kg (215 lb)
	150 kPa (1.5 kgf/cm <sup>2</sup> , 22 psi)
	97.5 ~ 181 kg (215 ~ 399 lb)
	175 kPa (1.75 kgf/cm <sup>2</sup> , 25 psi)
KLX250W	225 kPa (2.25 kgf/cm <sup>2</sup> , 33 psi)

#### Wheel/Tire Damage Inspection

- Remove any imbedded stones [A] or other foreign particles [B] from tread.
- Visually inspect the tire for cracks [C] and cuts [D], and replace the tire if necessary. Swelling or high spots indicate internal damage, requiring tire replacement.
- Visually inspect the wheel for cracks, cuts and dents damage.
- ★ If any damage is found, replace the wheel if necessary.



## 2-26 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

#### Tire Tread Wear Inspection

As the tire tread wears down, the tire becomes more susceptible to 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.

- Measure the tread depth at the center of the tread with a depth gauge [A]. Since the tire may wear unevenly, take measurement at several places.
- ★ If any measurement is less than the service limit, replace the tire (see Tire Removal/Installation in the Wheels/Tires chapter).

#### Tread Depth

##### Standard:

##### Front:

KLX250T 7.8 mm (0.31 in.)

KLX250W 4.4 mm (0.17 in.)

##### Rear:

KLX250T 11.8 mm (0.464 in.)

KLX250W 6.5 mm (0.26 in.)

##### Service Limit:

##### Front:

KLX250T 2 mm (0.08 in.)

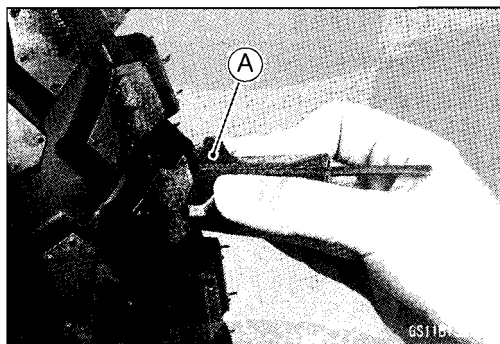
KLX250W 1 mm (0.04 in.)

##### Rear:

KLX250T 2 mm (0.08 in.)

KLX250W 2 mm (0.08 in.) (Up to 130 km/h)

3 mm (0.12 in.) (Over 130 km/h)



#### WARNING

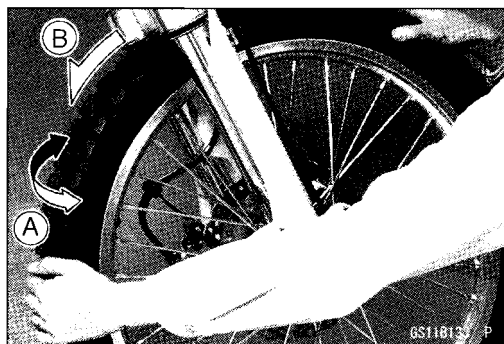
To ensure safe handling and stability, use only the recommended standard tires for replacement, inflated to the standard pressure.

#### Wheel Bearing Damage Inspection

- Raise the front wheel off the ground with jack.

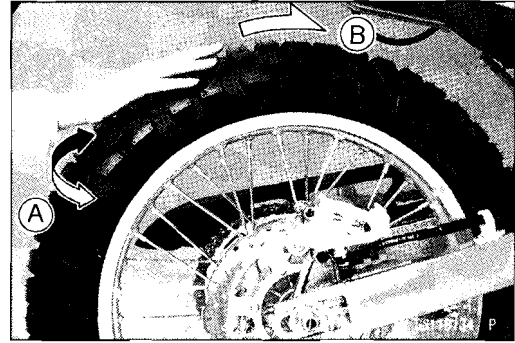
Special Tool - Jack: 57001-1238

- Turn the handlebar all the way to the right or left.
- Inspect the roughness of the front wheel bearing by moving [A] the wheel with both hands to both sides.
- Spin [B] the front wheel lightly, and check for smoothly turn, roughness, binding or noise.
- ★ If roughness, binding or noise is found, remove the front wheel and inspect the wheel bearing (see Front Wheel Removal, Hub Bearing Inspection in the Wheels/Tires chapter).



## Periodic Maintenance Procedures

- Raise the rear wheel off the ground with jack.
- Special Tool - Jack: 57001-1238**
- Inspect the roughness of the rear wheel bearing by moving [A] the wheel with both hands to both sides.
- Spin [B] the rear wheel lightly, and check for smoothly turn, roughness, binding or noise.
- ★ If roughness, binding or noise is found, remove the rear wheel and inspect the wheel bearing (see Rear Wheel Removal, Hub Bearing Inspection in the Wheels/Tires chapter).

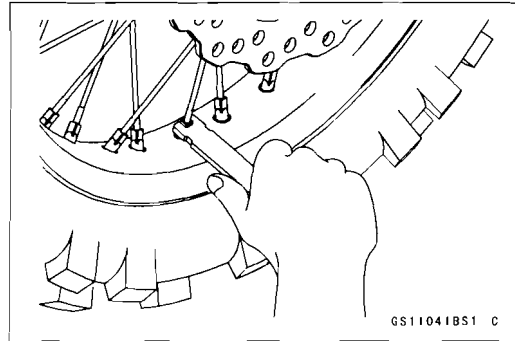


### Spoke Tightness and Rim Runout Inspection

- Check that all the spokes are tightened evenly.
- ★ If spoke tightness is uneven or loose, tighten the spoke nipples evenly.

**Torque - Spoke Nipples: 4.0 N·m (0.41 kgf·m, 35 in·lb)**

- Check the rim runout.



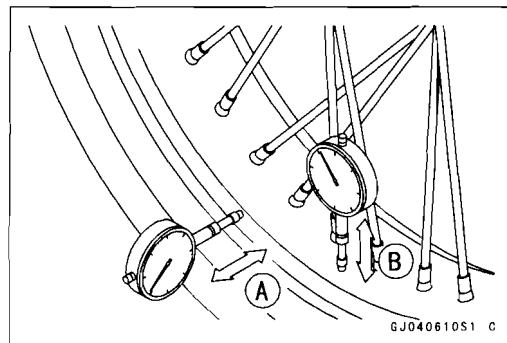
### **⚠ WARNING**

**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.**

## 2-28 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

- Raise the front/rear wheel off the ground with jack.
- Special Tool - Jack: 57001-1238**
- 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 [A]. 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 [B]. 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)

##### Standard:

##### Axial:

KLX250T TIR 0.7 mm (0.028 in.) or less

KLX250W TIR 0.8 mm (0.031 in.) or less

##### Radial:

KLX250T TIR 1.0 mm (0.039 in.) or less

KLX250W TIR 1.2 mm (0.047 in.) or less

##### Service Limit:

Axial: TIR 2.0 mm (0.08 in.)

Radial: TIR 2.0 mm (0.08 in.)

### Drive Train

#### Drive Chain Lubrication Condition Inspection

- If a special lubricant is not available, a heavy oil such as SAE 90 is preferred to a lighter oil because it will stay on the chain longer and provide better lubrication.
- If the chain appears especially dirty, clean it before lubrication.

#### CAUTION

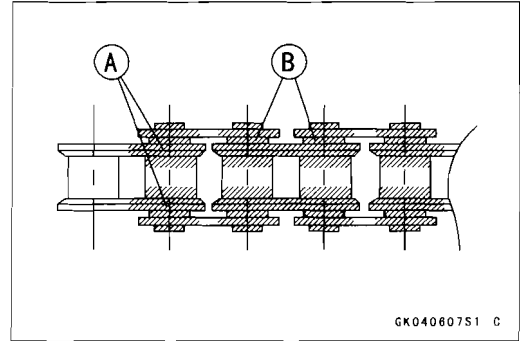
The O-rings between the side plates seal in the lubricant between the pin and the bushing. To avoid damaging the O-rings and resultant loss of lubricant, observe the following rules.

Use only kerosene or diesel oil for cleaning of the O-ring of the drive chain. Any other cleaning solution such as gasoline or trichloroethylene will cause deterioration and swelling of the O-ring. Immediately blow the chain dry with compressed air after cleaning. Complete cleaning and drying the chain within



## Periodic Maintenance Procedures

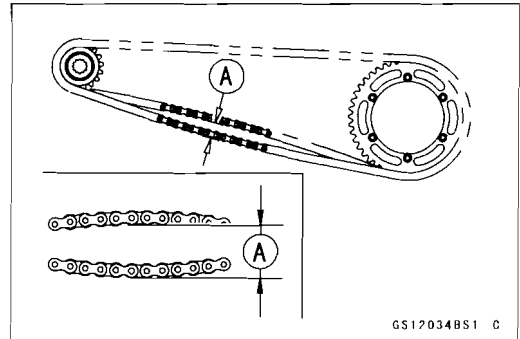
- Apply oil to the sides of the rollers so that oil will penetrate to the rollers and bushings. Apply the oil to the O-rings so that the O-rings will be coated with oil.
- Wipe off any excess oil.
  - Oil Applied Areas [A]
  - O-rings [B]



## Drive Chain Slack Inspection

### NOTE

- Check the slack with the motorcycle setting on its side-stand.
- Clean the chain if it is dirty, and lubricate it if it appears dry.
- Check the wheel alignment (see Wheel Alignment Inspection).
- Rotate the rear wheel to find the position where the chain is tightest.
- Measure the vertical movement (chain slack) [A] midway between the sprockets.
- ★ If the chain slack exceeds the standard, adjust it.

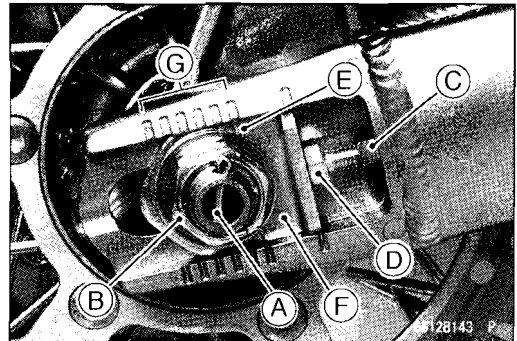


### Chain Slack

Standard: 35 ~ 45 mm (1.4 ~ 1.8 in.)

## Drive Chain Slack Adjustment

- Remove the cotter pin [A], and loosen the axle nut [B].
- Loosen the both chain adjuster locknuts [C].
- ★ If the chain is too loose, turn out the right and left chain adjusters [D] evenly.
- ★ If the chain is too tight, turn in the right and left chain adjusters evenly, and kick the wheel forward.
- Turn both chain adjusters evenly until the drive chain has the correct amount of slack. To keep the chain and wheel properly aligned, the notch [E] on the right wheel alignment indicator [F] should align with the same swingarm mark or position [G] that the left indicator notch aligns with.



### ⚠ WARNING

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

## 2-30 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

- Tighten both chain adjuster locknuts securely.
- Tighten the axle nut.

**Torque - Rear Axle Nut: 110 N·m (11.2 kgf·m, 81.1 ft·lb)**

- Turn the wheel, measure the chain slack again at the tightest position, and readjust if necessary.
- Replace the cotter pin with a new one. Insert the cotter pin to the axle shaft and spread its ends surely.

#### **⚠ WARNING**

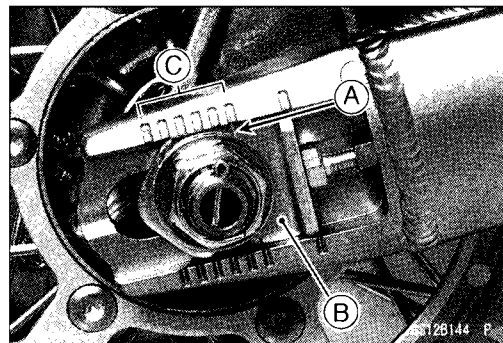
**If the rear axle nut is not securely tightened or the cotter pin is not installed, an unsafe riding condition may result.**

#### **Wheel Alignment Inspection**

- Check that the notch [A] on the right alignment indicator [B] aligns with the same swingarm mark or position [C] that the left alignment indicator notch aligns with.
- ★ If they do not, adjust the chain slack and align the wheel alignment (see Drive Chain Slack Adjustment).

#### **NOTE**

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



#### **⚠ WARNING**

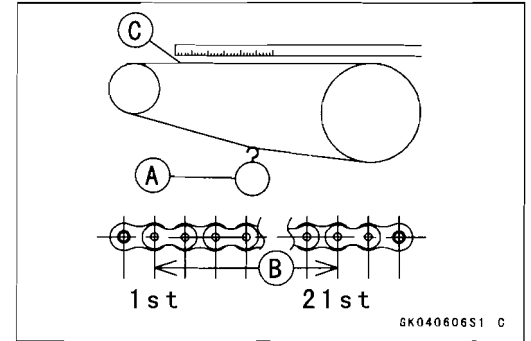
**Misalignment of the wheel will result in abnormal wear, and may result in an unsafe riding condition.**



## Periodic Maintenance Procedures

### Drive Chain Wear Inspection

- Remove the chain cover (see Drive Chain Removal in the Final Drive chapter).
- 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 [A] on the chain.
- Measure the length of 20 links [B] on the straight part [C] 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:** 317.5 ~ 318.2 mm (12.50 ~ 12.53 in.)

**Service Limit:** 323 mm (12.7 in.)

### ⚠ 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 snag on the engine sprocket or lock the rear wheel, severely damaging the motorcycle and causing it to go out of control.

For safety, use only the standard chain. It is an endless type and should not be cut for installation.

### Standard Chain

**Make:** ENUMA  
**Type:** EK525LV-O  
**Link:**  
 KLX250T 106 Links  
 KLX250W 104 Links

## 2-32 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

#### ***Chain Guide Wear Inspection***

- Visually inspect the following parts.

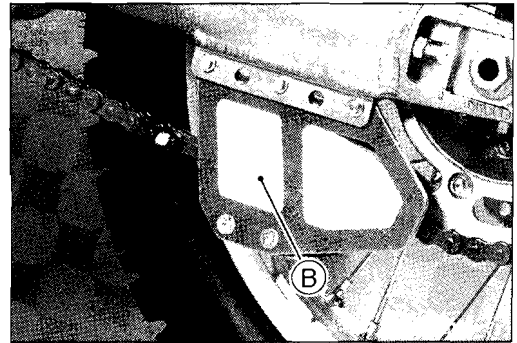
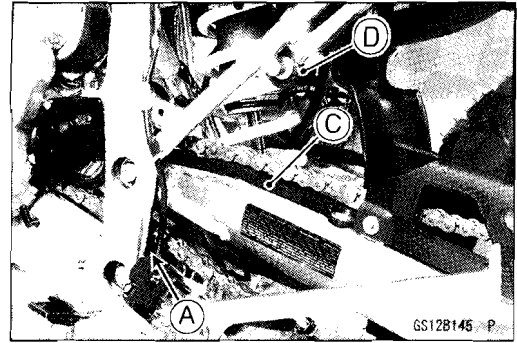
Front Chain Guide [A]

Rear Chain Guide [B]

Chain Slipper [C]

Chain Guide Roller [D]

- ★ If the chain guides, chain slipper and chain guide roller show any signs of abnormal wear or damage, replace them.

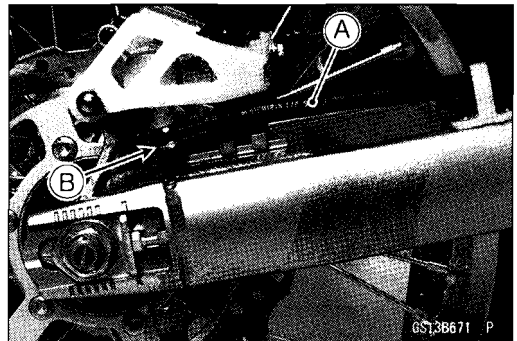
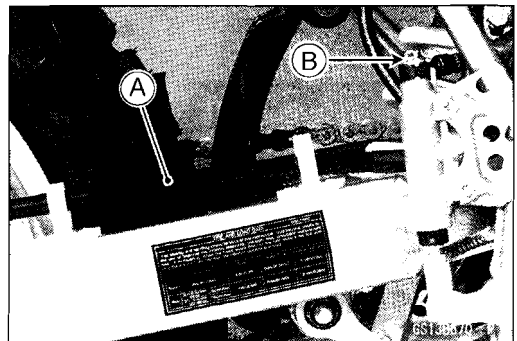
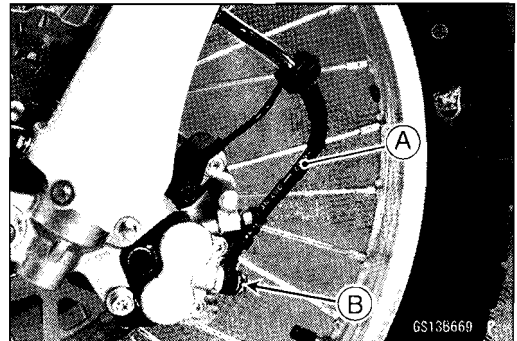
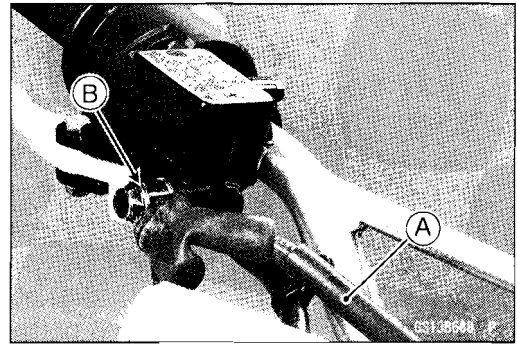


## Periodic Maintenance Procedures

### Brake System

#### *Brake Fluid Leak Inspection*

- Apply the brake lever or pedal and inspect the brake fluid leak from the brake hoses [A] and fittings [B].
- ★ If the brake fluid leaked from any position, inspect or replace the problem part.



## 2-34 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

#### **Brake Hose Damage and Installation Condition Inspection**

- Inspect the brake hoses and fittings for deterioration, cracks and signs of leakage.
- The high pressure inside the brake line can cause fluid to leak [A] or the hose to burst if the line is not properly maintained. Bend and twist the rubber hose while examining it.
- ★ Replace the hose if any crack [B], bulge [C] or leakage is noticed.
- ★ Tighten any brake hose banjo bolts and brake pipe joint nuts.

**Torque - Brake Hose Banjo Bolts:** 25 N·m (2.5 kgf·m, 18 ft·lb)

- Inspect the brake hose routing.
- ★ If any brake hose routing is incorrect, route the brake hose according to Cable, Wire, and Hose Routing section in the Appendix chapter.

#### **Brake Operation Inspection**

- Inspect the operation of the front and rear brake by running the vehicle on the dry road.
- ★ If the brake operation is insufficiency, inspect the brake system.

#### **⚠ WARNING**

When inspecting by running the vehicle, note a surrounding traffic situation enough in the place of safety.

#### **Brake Fluid Level Inspection**

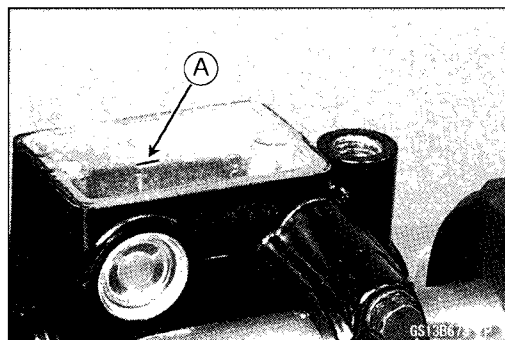
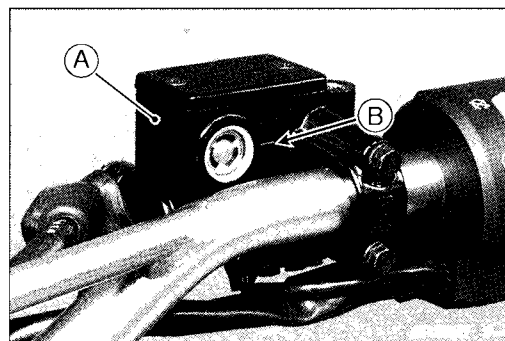
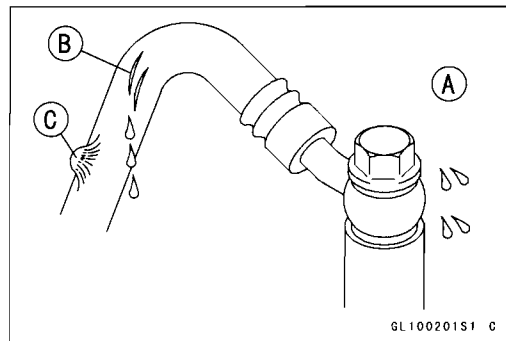
- Check that the brake fluid level in the front brake reservoir [A] is above the lower level line [B].

#### **NOTE**

○ Hold the reservoir horizontal by turning the handlebar when checking brake fluid level.

- ★ If the fluid level is lower than the lower level line, fill the reservoir to the upper level line [A] in the reservoir.
- Install the front master cylinder reservoir cap.

**Torque - Front Master Cylinder Reservoir Cap Screws:** 1.5 N·m (0.15 kgf·m, 13 in·lb)

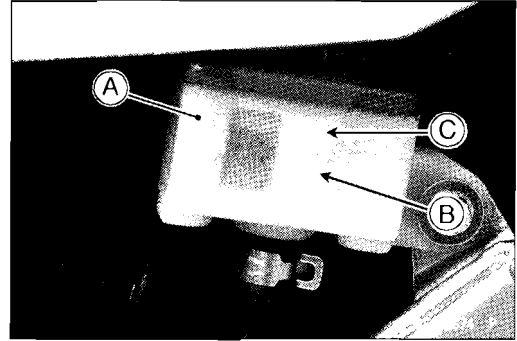


## Periodic Maintenance Procedures

- Check that the brake fluid level in the rear brake reservoir [A] is above the lower level line [B].
- ★ If the fluid level is lower than the lower level line, fill the reservoir to the upper level line [C].

### ⚠ WARNING

Change the brake fluid in the brake line completely if the brake fluid must be refilled but the type and brand of the brake fluid that is already in the reservoir are unidentified. After changing the fluid, use only the same type and brand of fluid thereafter.



### Recommended Disc Brake Fluid

Grade: DOT3 or DOT4

- Install the rear master cylinder reservoir cap.
- Torque - Rear Master Cylinder Reservoir Cap Screws: 1.5 N·m (0.15 kgf·m, 13 in·lb)**

### Brake Pad Wear Inspection

- Remove the brake pads (see Front/Rear Brake Pad Removal in the Brakes chapter).
- Check the lining thickness [A] of the pads in each caliper.
- ★ If the lining thickness of either pad is less than the service limit [B], replace both pads in the caliper as a set.

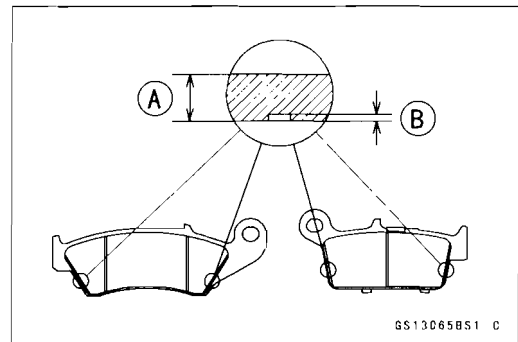
### Pad Lining Thickness

Standard:

Front 4.5 mm (0.18 in.)

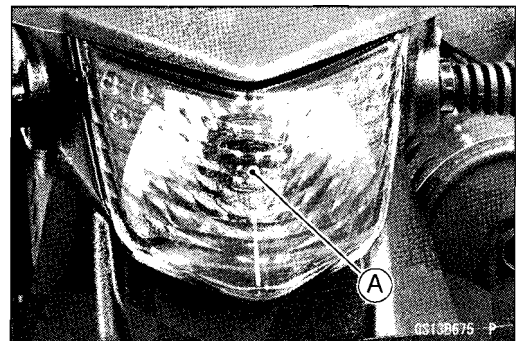
Rear 6.4 mm (0.25 in.)

Service Limit: 1 mm (0.04 in.)

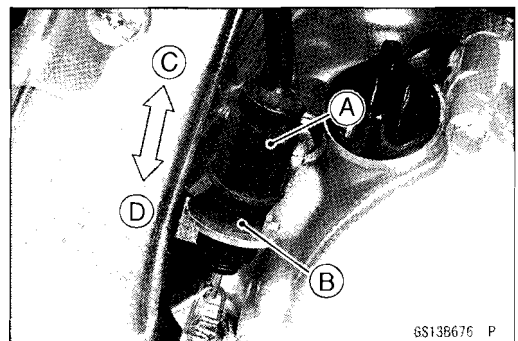


### Brake Light Switch Operation Inspection

- Turn the ignition switch ON.
- The brake light [A] should go on when the brake lever is applied or after the brake pedal is depressed about 10 mm (0.39 in.).



- ★ If it does not, adjust the brake light switch.
- While holding the switch body, turn the adjusting nut to adjust the switch.
  - Switch Body [A]
  - Adjusting Nut [B]
  - Light sooner as the body rises [C]
  - Light later as the body lowers [D]



### CAUTION

To avoid damaging the electrical connections inside the switch, be sure that the switch body does not turn during adjustment.



## 2-36 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

★ If it does not go on, inspect or replace the following items.

Battery (see Battery Condition in the Electrical System chapter)

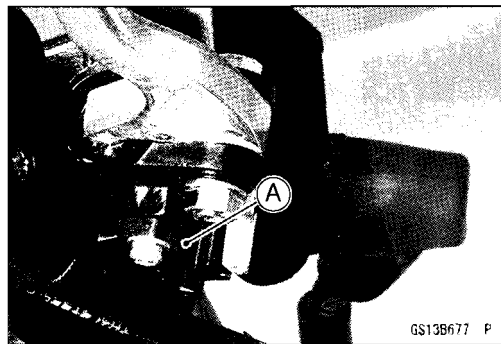
Brake Light (see Tail/Brake Light Bulb Replacement in the Electrical System chapter)

Main Fuse 20 A (see Fuse Inspection in the Electrical System chapter)

Front Brake Light Switch [A] (see Switch Inspection in the Electrical System chapter)

Rear Brake Light Switch (see Switch Inspection in the Electrical System chapter)

Harness (see Wiring Inspection in the Electrical System chapter)

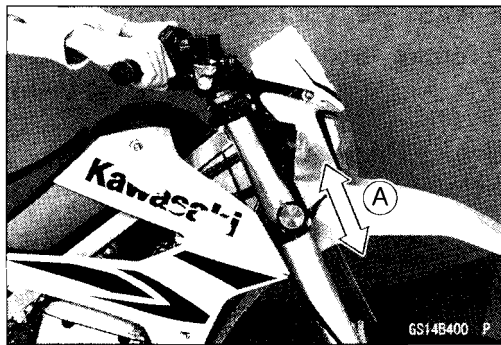


### Suspensions

#### Front Forks/Rear Shock Absorber Operation Inspection

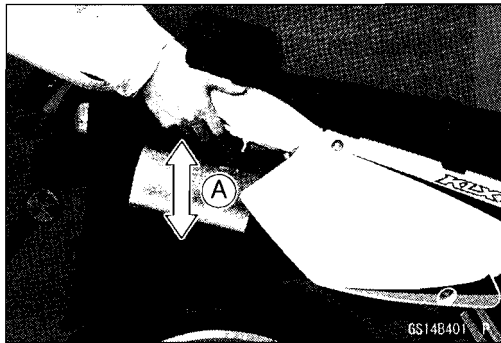
● Pump the forks down and up [A] 4 or 5 times, and inspect the smooth stroke.

★ If the forks do not smoothly or noise is found, inspect the fork oil level or fork clamps (see Front Fork Oil Change in the Suspension chapter).



● Pump the tail portion down and up [A] 4 or 5 times, and inspect the smooth stroke.

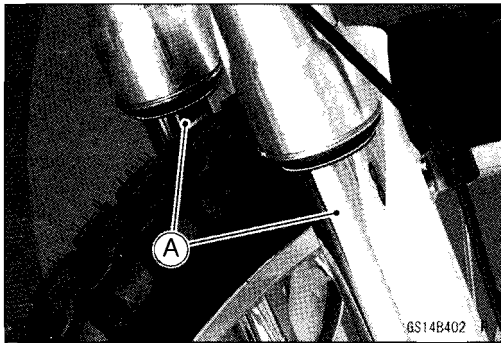
★ If the shock absorber does not smoothly stroke or noise is found, inspect the oil leak (see Rear Shock Absorber Oil Leak Inspection).



#### Front Fork Oil Leak Inspection

● Visually inspect the front forks [A] for oil leakage.

★ Replace or repair any defective parts, if necessary.



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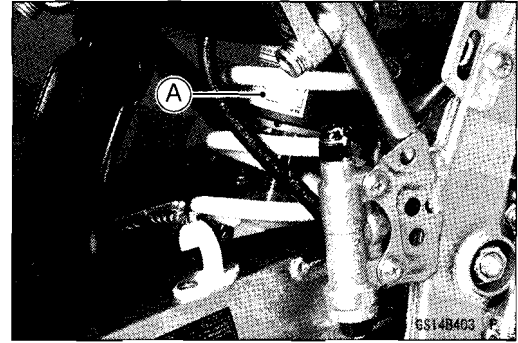
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## Periodic Maintenance Procedures

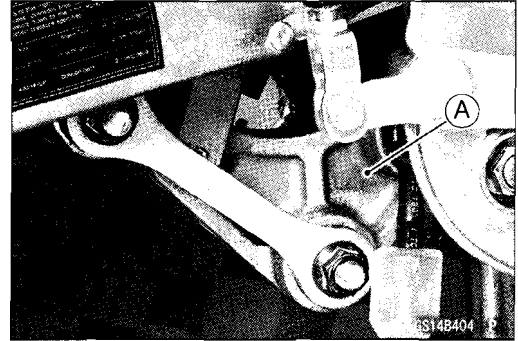
### Rear Shock Absorber Oil Leak Inspection

- Visually inspect the shock absorber [A] for oil leakage.
- ★ If the oil leakage is found on it, replace the shock absorber with a new one.



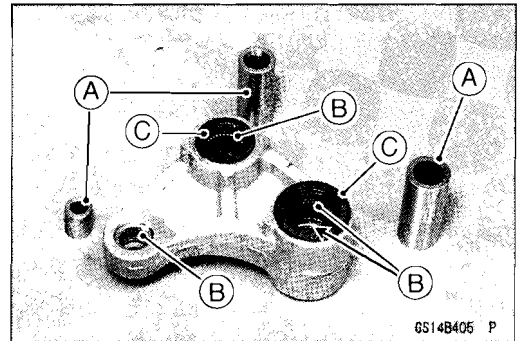
### Rocker Arm Operation Inspection

- Pump the tail portion down and up 4 or 5 times, and inspect the smooth stroke.
- ★ If the rocker arm [A] does not smoothly stroke or noise is found, inspect the fasteners and bearings (see Rocker Arm/Tie-Rod Bearing, Sleeve Inspection in the Suspension chapter).



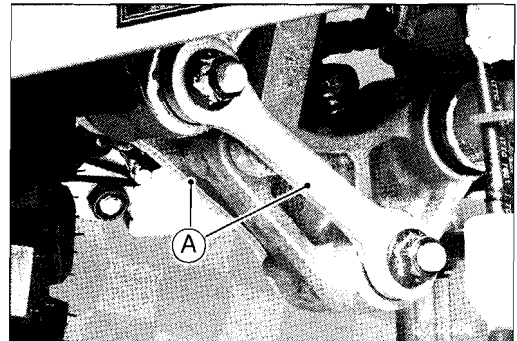
### Rocker Arm Bearing Lubrication

- Remove the rocker arm (see Rocker Arm Removal in the Suspension chapter).
- Remove the sleeves [A].
- Using a high-flash point solvent, clean the old grease out of the needle bearings [B].
- Apply plenty of grease to the inner surface of the needle bearings.
- Apply thin coat of grease to the lips of the grease seals [C].
- Install the rocker arm (see Rocker Arm Installation in the Suspension chapter).



### Tie-Rod Operation Inspection

- Pump the tail grip down and up 4 or 5 times, and inspect the smooth stroke.
- ★ If the tie-rods [A] do not smoothly stroke or noise is found, inspect the fasteners and tie-rod bearings (see Rocker Arm/Tie-Rod Bearing, Sleeve Inspection in the Suspension chapter).



### Tie-Rod Bearing Lubrication

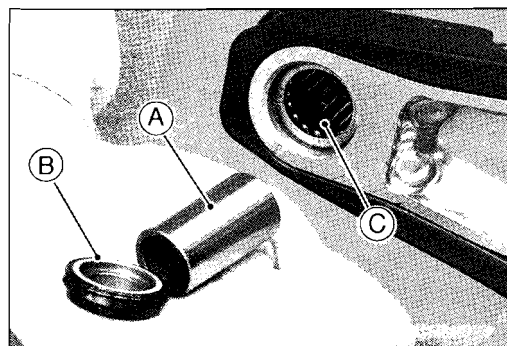
- Remove the tie-rods (see Tie-Rod Removal in the Suspension chapter).
- Lubricate the tie-rod bearings in the same way as rocker arm bearings (see Rocker Arm Bearing Lubrication).
- Install the tie-rods (see Tie-Rod Installation in the in the Suspension chapter).

## 2-38 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

#### Swingarm Pivot Lubrication

- Remove the swingarm (see Swingarm Removal in the Suspension chapter).
- Remove the sleeves [A] and grease seals [B].
- Using a high-flash point solvent, clean the old grease out of the needle bearings [C].
- Apply plenty of grease to the inner surface of the needle bearings.
- Apply thin coat of grease to the lips of the grease seals.
- Install the swingarm (see Swingarm Installation in the Suspension chapter).



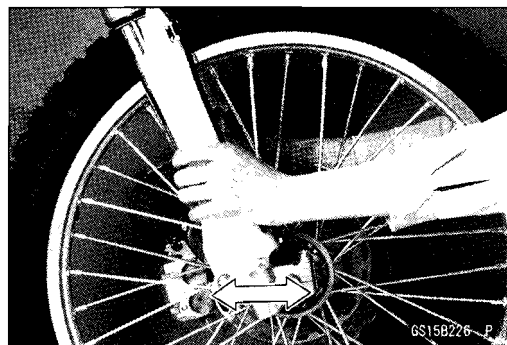
#### Steering System

##### Steering Play Inspection

- Raise the front wheel off the ground with jack.

**Special Tools - Jack: 57001-1238**

- With the front wheel pointing straight ahead, alternately tap 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 wheel binds or catches before the stop, the steering is too tight.
- Feel for steering looseness by pushing and pulling the forks.
- ★ If you feel looseness, the steering is too loose.

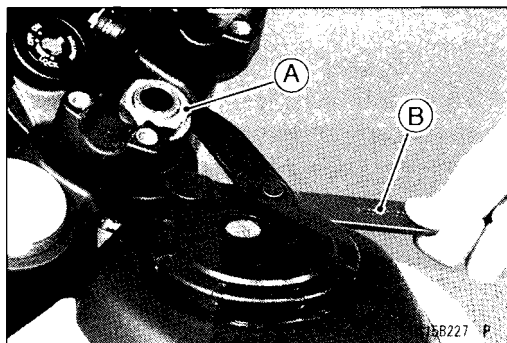


#### NOTE

- The cables and wiring will have some effect on the motion of the fork which must be taken into account.
- Be sure the leads and cables are properly routed.
- The bearings must be in good condition and properly lubricated in order for any test to be valid.

##### Steering Play Adjustment

- Remove:
  - Handlebar (see Handlebar Removal in the Steering chapter)
- Loosen:
  - Lower Fork Clamp Bolts (see Front Fork Removal in the Suspension chapter)
  - Steering Stem Head Nut [A]
- Adjust the steering, using the steering stem nut wrench [B].



**Special Tool - Steering Stem Nut Wrench: 57001-1100**

- ★ If the steering is too tight, loosen the stem nut a fraction of a turn.
- ★ If the steering is too loose, tighten the stem nut a fraction of a turn.

#### NOTE

- Turn the stem nut 1/8 turn at time maximum.

- Tighten:

**Torque - Steering Stem Head Nut: 44 N·m (4.5 kgf·m, 32 ft·lb)**

**Lower Fork Clamp Bolts: 25 N·m (2.5 kgf·m, 18**

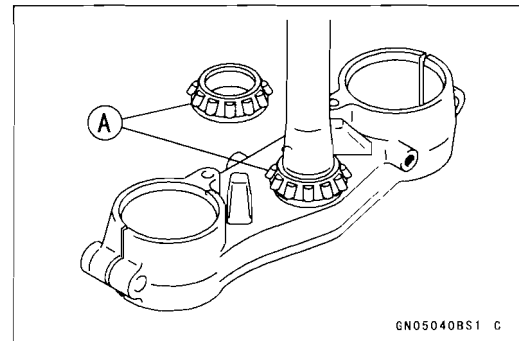


## Periodic Maintenance Procedures

- Check the steering again.
- ★ If the steering is still too tight or too loose, repeat the adjustment.

### Steering Stem Bearing Lubrication

- Remove the steering stem (see Stem, Stem Bearing Removal in the Steering chapter).
- Using a high-flash point solvent, wash the upper and lower tapered roller bearings [A] in the cages, and wipe the upper and lower outer races, which are press-fitted into the frame head pipe, clean off grease and dirt.
- Visually check the outer races and rollers.
- ★ If the rollers or races are worn, or if either race is dented, replace both races and all the bearings as a set.
- Pack the upper and lower tapered roller bearings in the cages with grease, and apply a light coat of grease to the upper and lower outer races.
- Install the steering stem (see Stem, Stem Bearing Installation in the Steering chapter).
- Adjust the steering (see Steering Play Adjustment).



## Electrical System

### Lights and Switches Operation Inspection

#### First Step

- Turn the ignition switch ON.
- The following lights should go on according to below table.

Headlight (High and/or Low) [A]	goes on
Taillight [B]	goes on
Meter Panel LCD [C]	go on
Neutral Indicator Light (LED) [D]	goes on

- ★ If the light does not go on, inspect or replace the following item.

Battery (see Battery Condition in the Electrical System chapter)

Main Fuse 20 A and Lighting Fuse 10 A (see Fuse Inspection in the Electrical System chapter)

Headlight Bulb (see Headlight Bulb Replacement in the Electrical System chapter)

Taillight Bulb (see Tail/Brake Light Bulb Replacement in the Electrical System chapter)

License Plate Light Bulb (see License Plate Light Bulb Replacement in the Electrical System chapter)

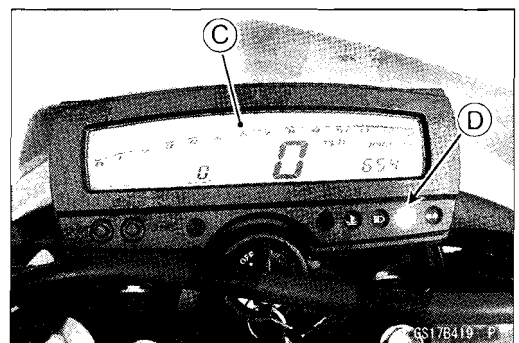
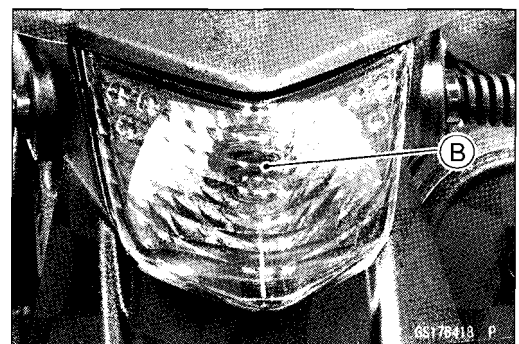
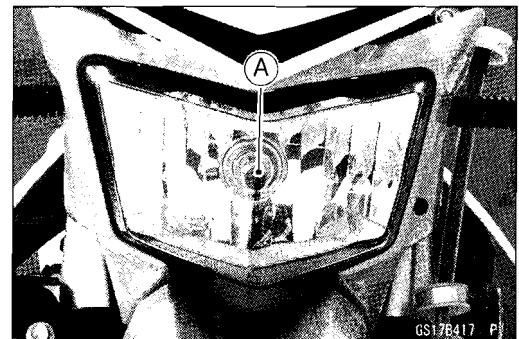
Meter Unit for Meter Panel LCD (see Meter Unit Disassembly in the Electrical System chapter)

Meter Unit for Neutral Indicator Light (LED) (see Meter Unit Disassembly in the Electrical System chapter)

Ignition Switch (see Switch Inspection in the Electrical System chapter)

Neutral Switch (see Switch Inspection in the Electrical System chapter)

Harness (see Wiring Inspection in the Electrical System chapter)



- Turn the ignition switch OFF.

★ The all lights should go off.

## 2-40 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

#### Second Step

- Turn on the turn signal switch [A] (left or right position).
- The left or right turn signal lights [B] (front and rear) according to the switch position should flash.
- The turn signal indicator light (LED) [C] in the meter unit should flash.

★ If the each light does not flash, inspect or replace the following item.

Turn Signal Light Bulb (see Turn Signal Light Bulb Replacement in the Electrical System chapter)

Meter Unit for Turn Signal Light Indicator Light (LED) (see Meter Unit Disassembly in the Electrical System chapter)

Turn Signal Switch (see Switch Inspection in the Electrical System chapter)

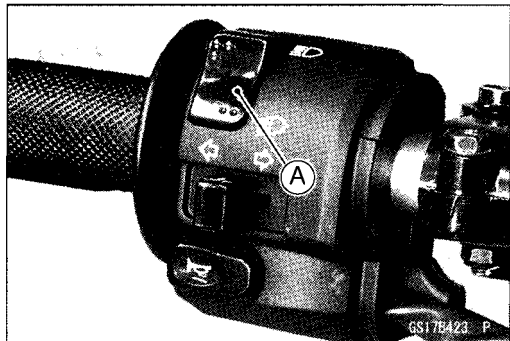
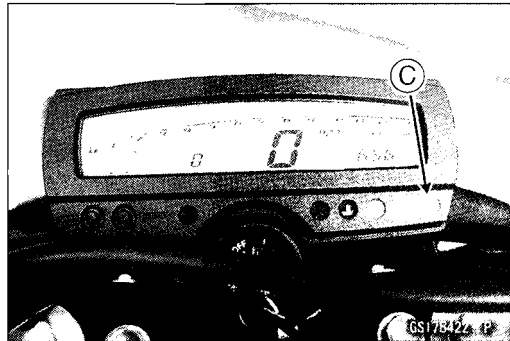
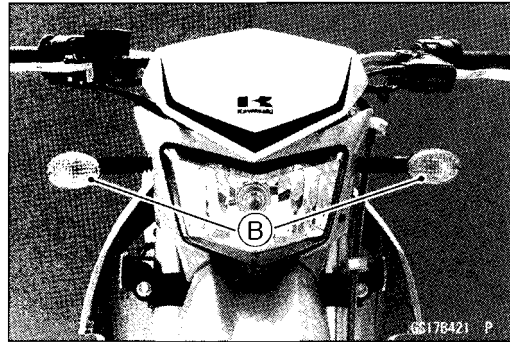
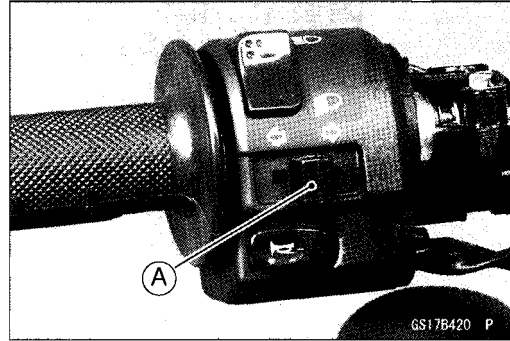
Turn Signal Relay (see Turn Signal Relay Inspection in the Electrical System chapter)

Harness (see Wiring Inspection in the Electrical System chapter)

- Push the turn signal switch.
  - The turn signal lights and indicator light should go off.
- ★ If the light does not go off, inspect or replace the following item.

Turn Signal Switch (see Switch Inspection in the Electrical System chapter)

Turn Signal Relay (see Turn Signal Relay Inspection in the Electrical System chapter)



#### Third Step

- Set the dimmer switch [A] to low beam position.
  - Turn the ignition switch ON.
  - The low beam headlight should go on.
- ★ If the low beam headlight does not go on, inspect or replace the following item.

Headlight Bulb (see Headlight Bulb Replacement in the Electrical System chapter)

Lighting System Fuse 10 A (see Fuse Inspection in the Electrical System chapter)

Dimmer Switch (see Switch Inspection in the Electrical System chapter)

Harness (see Wiring Inspection in the Electrical System chapter)

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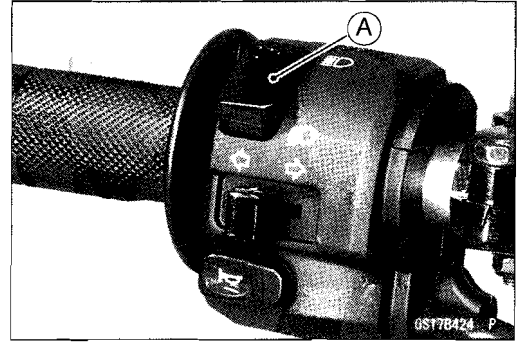
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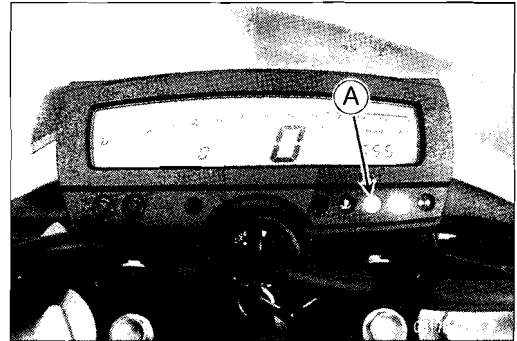
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## Periodic Maintenance Procedures

- Set the dimmer switch to high beam position [A].



- The high beam indicator light (LED) [A] should go on.
- ★ If the high beam headlight and/or high beam indicator light does not go on, inspect or replace the following item.  
Headlight Bulb (see Headlight Bulb Replacement in the Electrical System chapter)  
Dimmer Switch (see Switch Inspection in the Electrical System chapter)
- Turn the ignition switch OFF.
- The headlight and high beam indicator light (LED) should go off.

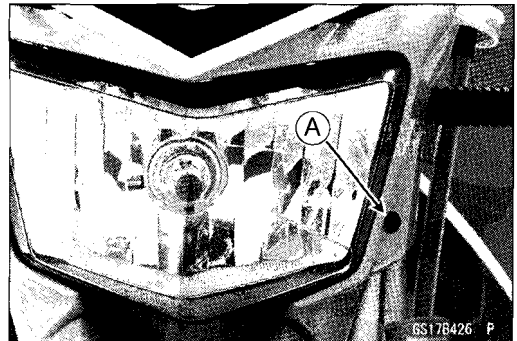


### Headlight Aiming Inspection

- Inspect the headlight beam for aiming.
- ★ If the headlight beam points to one side rather than straight ahead, adjust the horizontal beam.

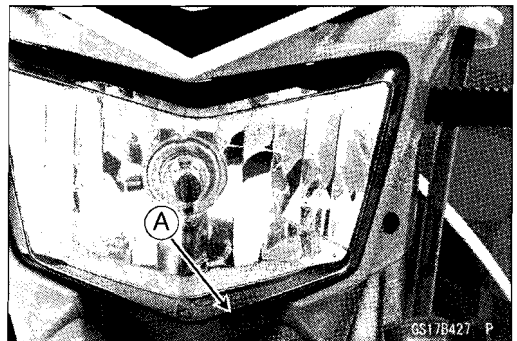
### Headlight Beam Horizontal Adjustment

- Turn the horizontal adjuster [A] on the headlight with the screwdriver in or out until the beam points straight ahead.
- ★ If the headlight beam points too low or high, adjust the vertical beam.



### Headlight Beam Vertical Adjustment

- Turn the vertical adjuster [A] on the headlight with the screwdriver in or out to adjust the headlight vertically.



### NOTE

○ ON high beam, the brightest points 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.

# 2-42 PERIODIC MAINTENANCE

## Periodic Maintenance Procedures

### NOTE

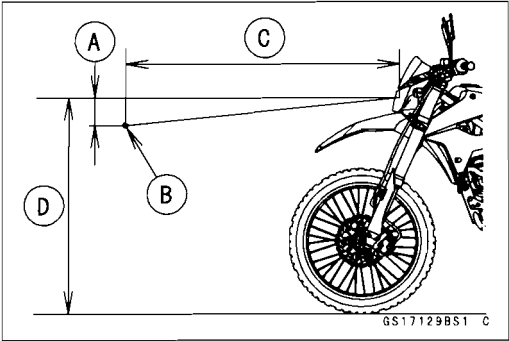
○For US model, the proper angle is 0.4 degrees below horizontal. This is 50 mm (2 in.) drop at 7.6 m (25 ft) measured from the center of the headlight with the motorcycle on its wheels and the rider seated.

50 mm (2 in.) [A]

Center of Brightest Spot [B]

7.6 m (25 ft) [C]

Height of Headlight Center [D]



### Sidestand Switch Operation Inspection

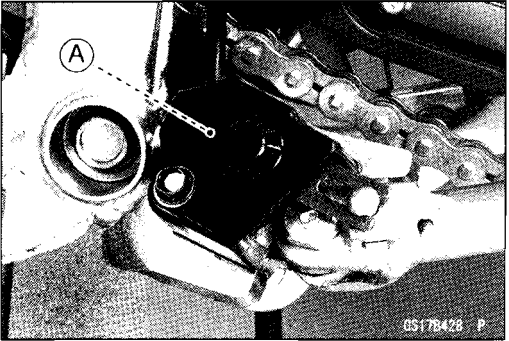
- Raise the rear wheel off the ground with jack.

Special Tool - Jack: 57001-1238

- Inspect the sidestand switch [A] operation accordance to the following table.

### Sidestand Switch Operation

Sidestand	Gear Position	Clutch Lever	Engine Start	Engine Run
Up	Neutral	Released	Starts	Continue running
Up	Neutral	Pulled in	Starts	Continue running
Up	In Gear	Released	Doesn't start	Continue running
Up	In Gear	Pulled in	Starts	Continue running
Down	Neutral	Released	Starts	Continue running
Down	Neutral	Pulled in	Starts	Continue running
Down	In Gear	Released	Doesn't start	Stops
Down	In Gear	Pulled in	Doesn't start	Stops





## Periodic Maintenance Procedures

★ If the sidestand switch operation does not work, inspect or replace the following item.

Battery (see Battery Condition in the Electrical System chapter)

Main Fuse 20 A (see Fuse Inspection in the Electrical System chapter)

Ignition Switch (see Switch Inspection in the Electrical System chapter)

Sidestand Switch (see Switch Inspection in the Electrical System chapter)

Engine Stop Switch (see Switch Inspection in the Electrical System chapter)

Starter Button (see Switch Inspection in the Electrical System chapter)

Neutral Switch (see Switch Inspection in the Electrical System chapter)

Starter Relay (see Starter Relay Inspection in the Electrical System chapter)

Interlock Diode Unit (see Interlock Diode Unit Inspection in the Electrical System chapter)

Starter Circuit Relay (see Starter Circuit Relay Inspection in the Electrical System chapter)

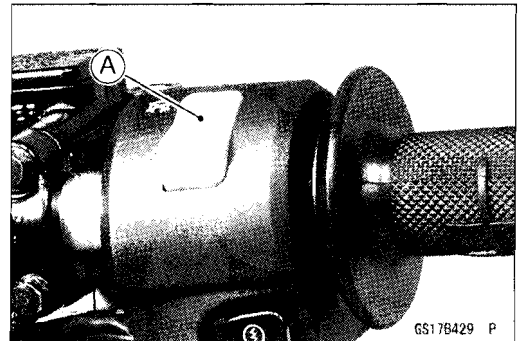
Harness (see Wiring Inspection in the Electrical System chapter)

★ If the all parts are good condition, replace the Igniter (see Igniter Removal in the Electrical System chapter).

### Engine Stop Switch Operation Inspection

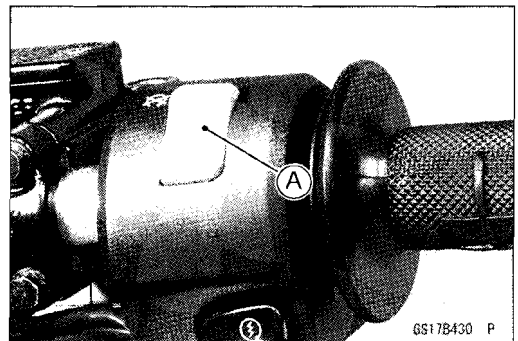
#### First Step

- Turn the ignition switch ON.
  - Set the neutral position.
  - Turn the engine stop switch to stop position [A].
  - Push the starter button.
  - The engine does not start.
- ★ If the engine starts, inspect or replace the following item.
- Engine Stop Switch (see Switch Inspection in the Electrical System chapter)



#### Second Step

- Turn the ignition switch ON.
  - Set the neutral position.
  - Turn the engine stop switch to run position [A].
  - Push the starter button and run the engine.
  - Turn the engine stop switch to stop position.
  - Immediately the engine should be stop.
- ★ If the engine does not stop, inspect or replace the following item.
- Engine Stop Switch (see Switch Inspection in the Electrical System chapter)



## 2-44 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

#### Others

##### Chassis Parts 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

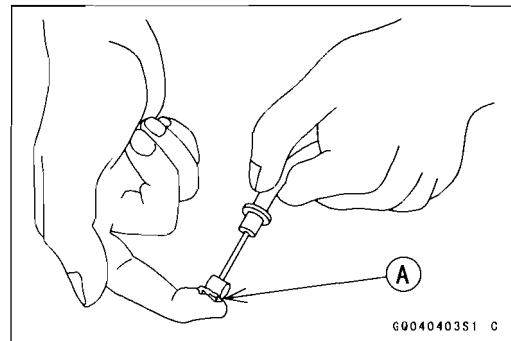
○Whenever the vehicle has been operated under wet or rainy conditions, or especially after using a high-pressure water spray, perform the general lubrication.

##### Pivots: Lubricate with Grease.

Brake Lever (Apply silicone grease.)  
Clutch Lever (Apply silicone grease.)  
Brake Pedal  
Sidestand

##### Points: Lubricate with Grease.

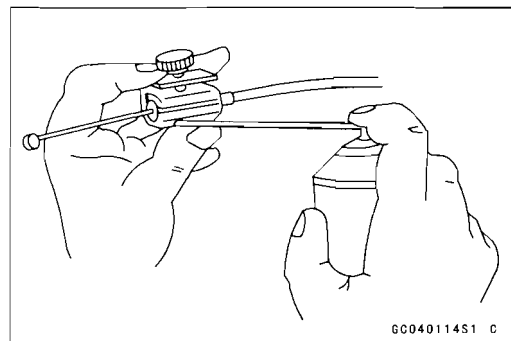
Clutch Inner Cable Upper and Lower Ends [A]  
Throttle Inner Cable Upper and Lower Ends



##### Cables: Lubricate with Rust Inhibitor.

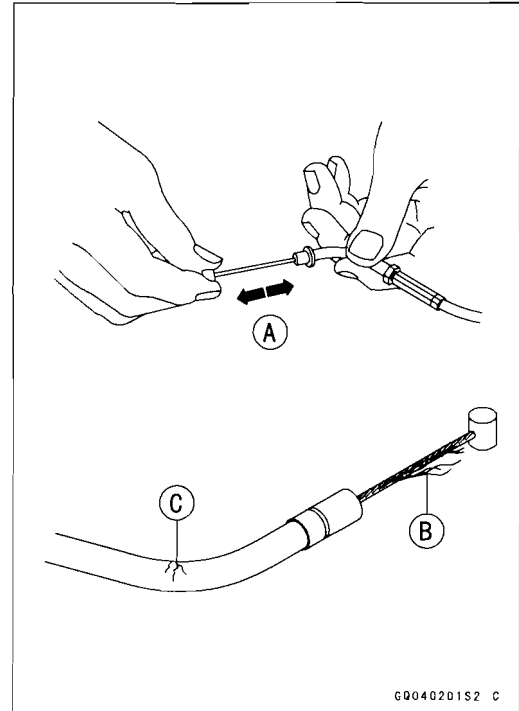
Clutch Cable  
Throttle Cables

- Lubricate the cables by seeping the oil between the cable and housing.
- The cable may be lubricated by using a commercially available pressure cable lubricator with an aerosol cable lubricant.



## Periodic Maintenance Procedures

- With the cable disconnected at both ends, the cable should move freely [A] within the cable housing.
- ★ If cable movement is not free after lubricating, if the cable is frayed [B], or if the cable housing is kinked [C], replace the cable.



## 2-46 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

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#### ***Bolts, Nuts and Fasteners Tightness Inspection***

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

#### **NOTE**

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

- ★ If there are loose fasteners, retighten them to the specified torque following the specified tightening sequence. Refer to the appropriate chapter for torque specifications. If torque specifications are not in the appropriate chapter, see the Standard Torque Table. For each fastener, first loosen it by 1/2 turn, then tighten it.
- ★ If cotter pins are damaged, replace them with new ones.

#### **Bolt, Nut and Fastener to be checked**

##### Engine:

- Clutch Lever Pivot Bolt Locknut
- Engine Bracket Nuts
- Engine Mounting Bolt and Nuts
- Exhaust Pipe Holder Nuts
- Exhaust Pipe Holder Clamp Bolt
- Muffler Body Bolts
- Radiator Bolts

##### Wheels:

- Front Axle
- Front Axle Clamp Bolts
- Rear Axle Nut
- Rear Axle Nut Cotter Pin

##### Brakes:

- Brake Lever Pivot Bolt and Locknut
- Brake Rod Joint Cotter Pin
- Caliper Mounting Bolts
- Front Master Cylinder Clamp Bolts
- Brake Pad Pins
- Rear Master Cylinder Mounting Bolts

##### Suspension:

- Front Fork Clamp Bolts
- Rear Shock Absorber Bolts
- Swingarm Pivot Shaft Nut
- Tie-Rod Nuts
- Rocker Arm Pivot Shaft Nut

##### Steering:

- Handlebar Holder Bolts
- Steering Stem Head Nut

##### Others:

- Footpeg Bracket Bolts
- Front Fender Bolts
- Sidestand Bolt and Nut



## Periodic Maintenance Procedures

### Replacement Parts

#### Air Cleaner Element Replacement

##### NOTE

- In dusty areas, the element should be replaced more frequently than the recommended interval.
- After riding through rain or on muddy roads, the element should be replaced immediately.

##### ⚠ WARNING

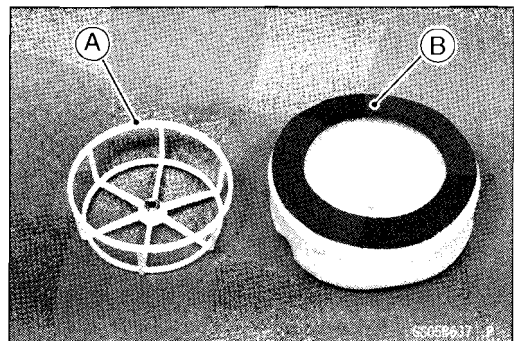
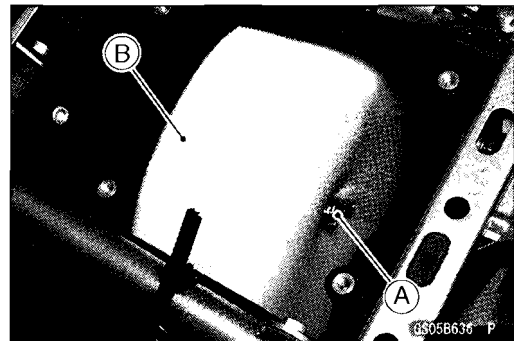
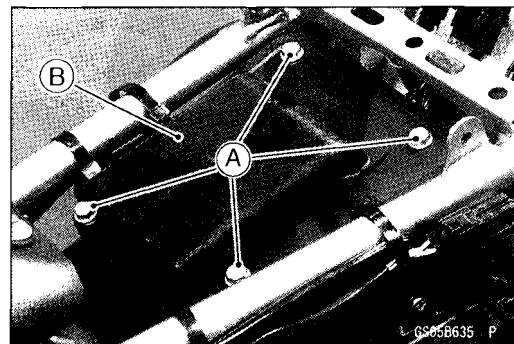
If dirt or dust is allowed to pass through into the carburetor, the throttle may become stuck, possibly causing accident.

- Remove:
  - Seat (see Seat Removal in the Frame chapter)
  - Bolts [A]
  - Air Cleaner Cap [B]
- Remove:
  - Wing Bolt [A] and Washer
  - Air Cleaner Element [B]
- Stuff pieces of lint-free, clean cloth into the air cleaner housing to keep dirt out of the carburetor and engine.

##### CAUTION

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

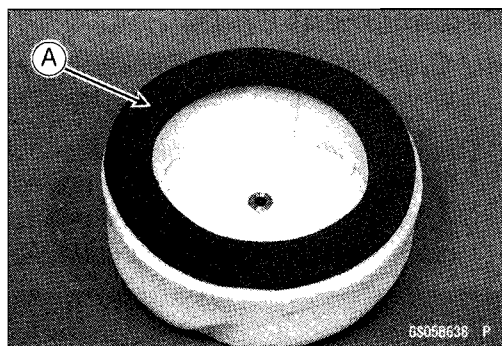
- Separate the frame [A] from the element [B].
- Discard the air cleaner element.



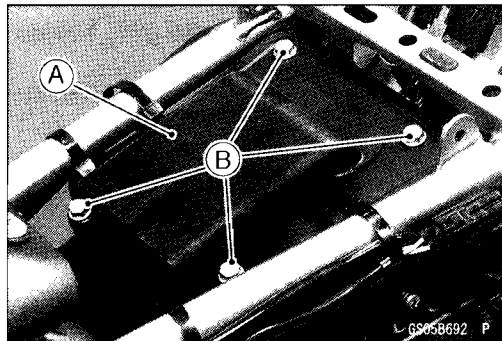
## 2-48 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

- Install the frame into the new element.
- Coat the lip of the element with a thick layer of all purpose grease [A] to assure a complete seal against the air cleaner element base. Also, coat the base where the lip of the element fits.



- Install the element, and tighten the wing bolt securely.
- Install the air cleaner cap [A], and tighten the bolts [B].

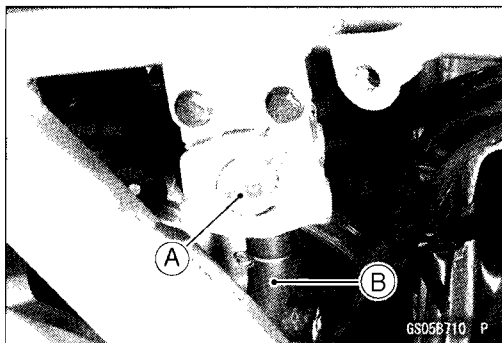


### Fuel Hose Replacement

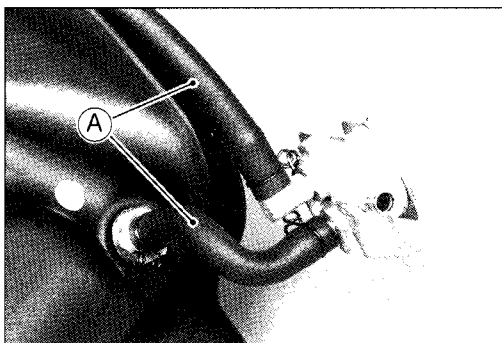
#### **⚠ WARNING**

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 lever [A] to the OFF position.
- Remove:
  - Fuel Hose [B]



- Remove:
  - Fuel Tank (see Fuel Tank Removal)
  - Fuel Hoses [A]
- Replace the fuel hoses with new ones.
- Fix the both ends of the fuel hoses with the clamps securely.
- Install the removed parts (see appropriate chapters).
- Start the engine and check the fuel hoses for leaks.



## Periodic Maintenance Procedures

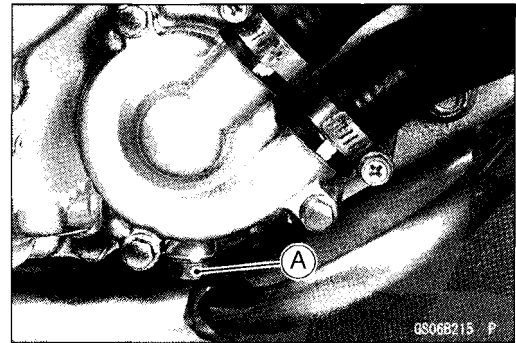
### Coolant Change

#### **⚠ WARNING**

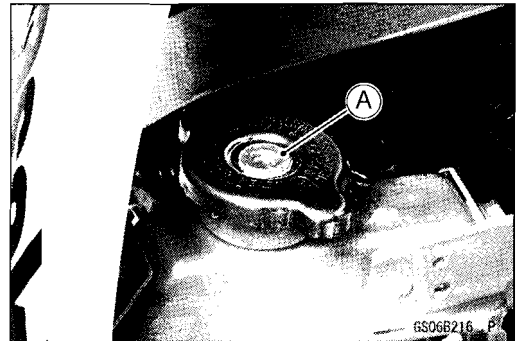
To avoid burns, do not remove the radiator cap or try to change the coolant when the engine is still hot. Wait until it cools down. Coolant on tires will make them slippery and can cause an accident and injury. Immediately wipe up or wash away any coolant that spills on the frame, engine, or other painted parts.

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

- Remove:  
Side Cover (see Side Cover Removal in the Frame chapter)
- Place a container under the coolant drain plug [A], then remove the drain plug.

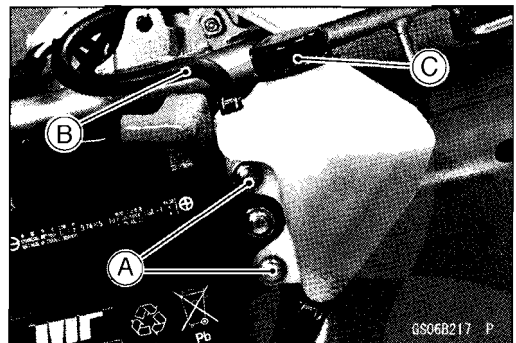


- Remove the radiator cap [A] in two steps. First turn the cap counterclockwise to the first stop. Then push and turn it further in the same direction and remove the cap.
- The coolant will drain from the radiator and engine.



- Remove:  
Bolts [A]  
Reserve Tank Overflow Hose [B]
- Remove the cap [C], and pour the coolant into a container.
- Install the reserve tank.
- Replace the drain plug gasket with a new one.
- Tighten the drain plug with the gasket.

**Torque - Coolant Drain Plug: 25 N·m (2.5 kgf·m, 18 ft·lb)**



## 2-50 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

- When filling the coolant, choose a suitable mixture ratio by referring to the coolant manufacturer's directions.

#### CAUTION

Soft or distilled water must be used with the 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.

#### Water and Coolant Mixture Ratio (Recommended)

Soft Water: 50%

Coolant: 50%

Freezing Point:  $-35^{\circ}\text{C}$  ( $-31^{\circ}\text{F}$ )

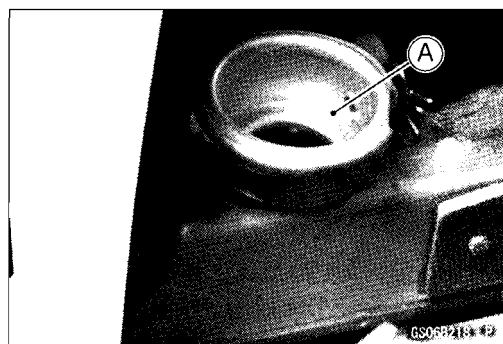
Total Amount: 1.3 L (1.4 US qt)

- Fill the radiator up to the filler neck [A] with coolant.

#### NOTE

○ Pour in the coolant slowly so that it can expel the air from the engine and radiator.

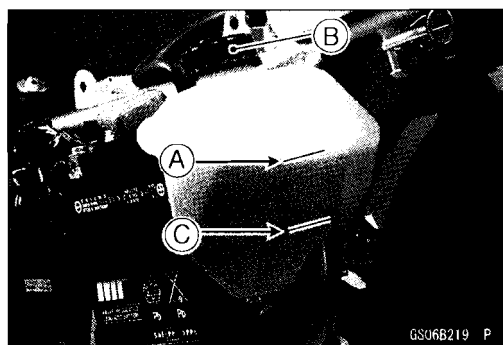
- Check the cooling system for leaks.
- Tap the radiator hoses to force any air bubbles caught inside.
- Fill the radiator up to the filler neck with coolant.



- Fill the reserve tank up to the upper level line [A] with coolant and install the cap [B].

#### Torque - Reserve Tank Cap: Hand-tighten

- Start the engine, warm it up thoroughly until the radiator fan turns on and then stop the engine.
- Check the coolant level in the reserve tank after the engine cools down.
- ★ If the coolant level is lower than the lower level line [C], add coolant to the upper level line.



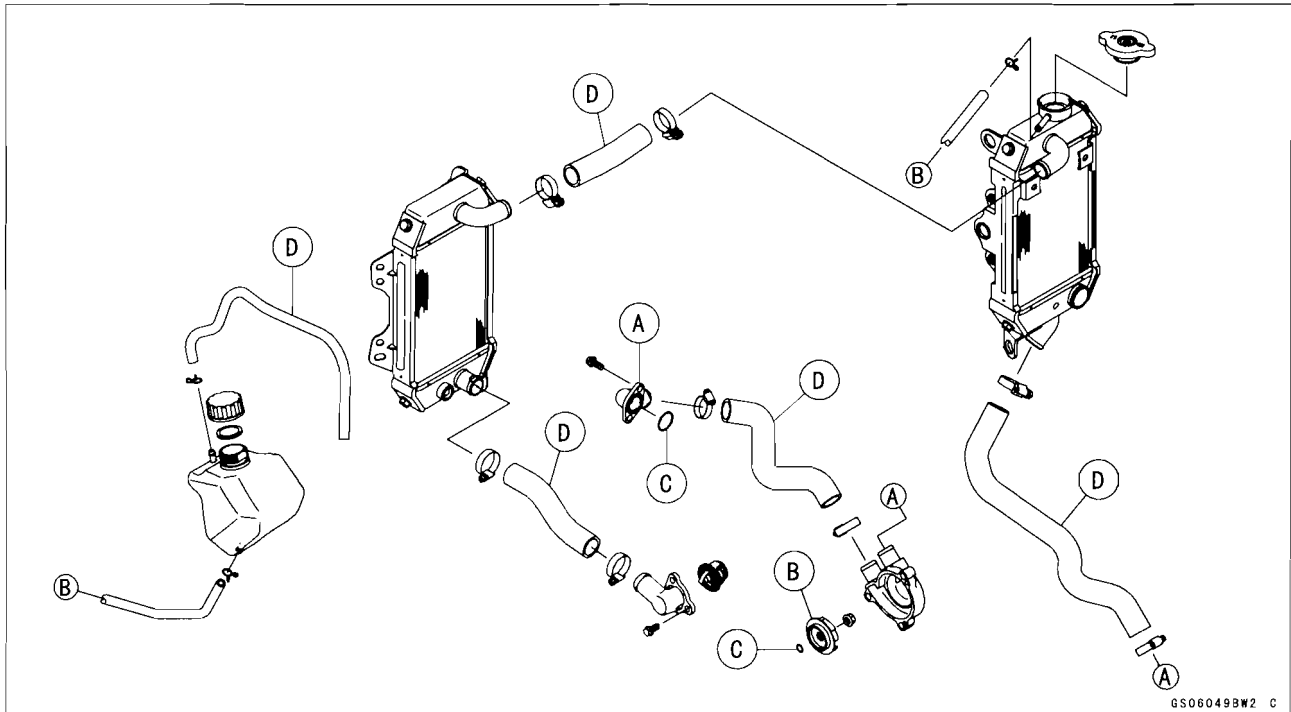
#### CAUTION

Do not add more coolant above the "F" level line.

## Periodic Maintenance Procedures

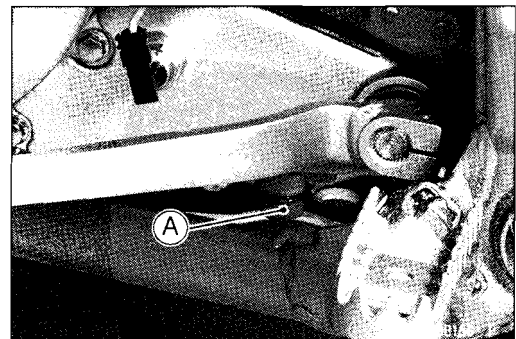
### Radiator Hose and O-ring Replacement

- Drain the coolant (see Coolant Change).
- Remove:
  - Water Hose Fitting [A]
  - Water Pump Impeller [B] (see Water Pump Removal in the Cooling System chapter)
  - O-rings [C]
  - Hoses [D]
- Apply grease to the new O-rings and install them.
- Tighten:
  - Torque - Water Hose Fitting Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)**
- Install the new hoses and tighten the hose clamp screws.
  - Torque - Radiator Hose Clamp Screws: 1.5 N·m (0.15 kgf·m, 13 in·lb)**
- Fill the coolant (see Coolant Change).
- Check the cooling system for leaks.



### Engine Oil Change

- Situate the motorcycle so that it is vertical after warming up the engine.
- Remove the engine oil drain plug [A] to drain the oil.
- Replace the drain plug gasket with a new one.
- Tighten the drain plug.
  - Torque - Engine Oil Drain Plug: 15 N·m (1.5 kgf·m, 11 ft·lb)**
- Pour in the specified type and amount of oil.



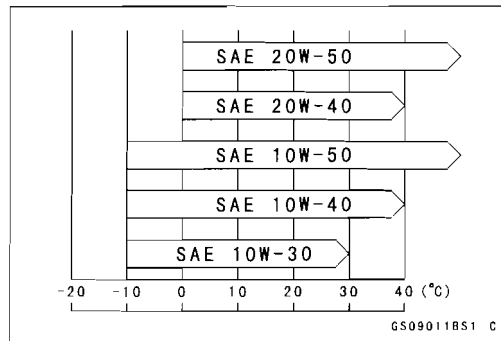


## 2-52 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

#### Recommended Engine Oil

- Type: API SE, SF or SG  
API SH, SJ or SL with JASO MA, MA1 or MA2
- Viscosity: SAE 10W-40
- Capacity: 1.3 L (1.4 US qt) (when filter is not removed)  
1.4 L (1.5 US qt) (when filter is removed)  
1.5 L (1.6 US qt) (when engine is completely dry)



#### NOTE

- Do not add any chemical additive to the oil. Oils fulfilling the above requirements are fully formulated and provide adequate lubrication for both the engine and the clutch.
- Although 10W-40 engine oil is the recommended oil for most conditions, the oil viscosity may need to be changed to accommodate atmospheric conditions in your riding area.

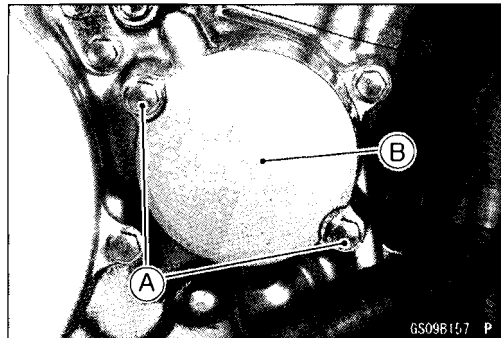
#### • Tighten:

**Torque - Oil Filler Cap: Hand-tighten**

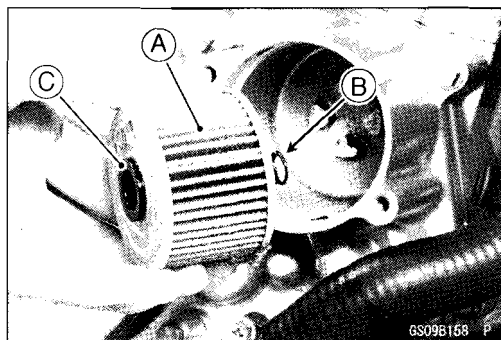
- Check the oil level (see Oil Level Inspection in the Engine Lubrication System chapter).

#### Oil Filter Replacement

- Drain the engine oil (see Engine Oil Change).
- Remove:
  - Bolts [A]
  - Oil Filter Cap [B]



- Replace the oil filter [A] with a new one.
  - Apply grease to the spring [B] so that it may stay in place without falling off from the oil filter.
  - Apply engine oil to the grommet [C].
- Install the oil filter with the grommet side facing out.

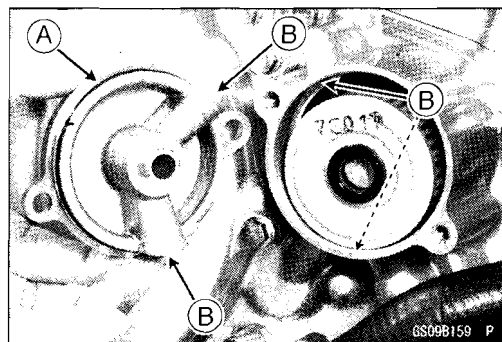


#### CAUTION

If the filter is put in the wrong direction, it blocks oil from flowing to the engine and causes an engine seizure.

## Periodic Maintenance Procedures

- Replace the O-ring [A] of the filter cap with a new one.
- Apply engine oil to the O-ring.
- Install the oil filter cap so that the align the oil passage holes [B] of the oil filter cap and right engine cover.
- Pour in the specified type and amount of oil (see Engine Oil Change).



## Brake Hose Replacement

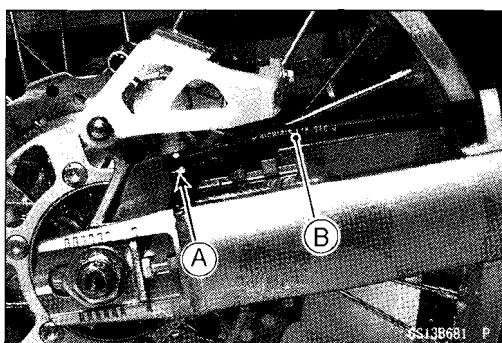
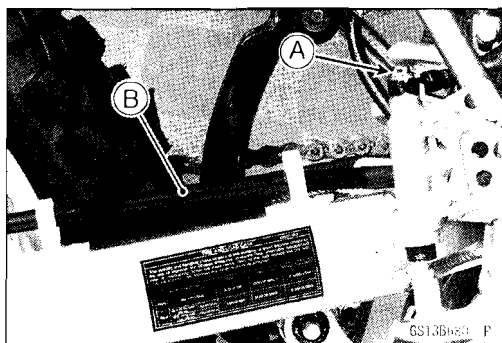
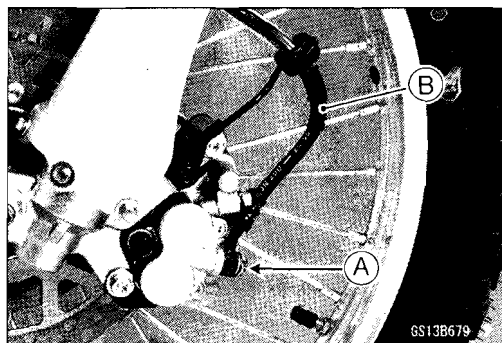
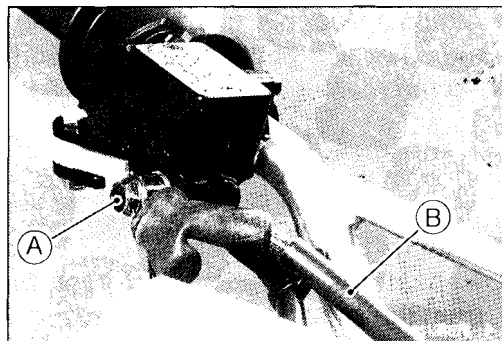
### CAUTION

**Brake fluid quickly ruins painted plastic surfaces; any spilled fluid should be completely washed away immediately.**

- Remove the brake hose banjo bolts [A].
- When removing the brake hose, take care not to spill the brake fluid on the painted or plastic parts.
- When removing the brake hoses [B], temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.
- Immediately wash away any brake fluid that spills.
- There are washers on each side of the brake hose fitting. Replace them with new ones when installing.
- Tighten:

**Torque - Brake Hose Banjo Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)**

- When installing the hoses, avoid sharp bending, kinking, flattening or twisting, and route the hoses according to Cable, Wire, and Hose Routing section in the Appendix chapter.
- Fill the brake line after installing the brake hose (see Brake Fluid Change).





## 2-54 PERIODIC MAINTENANCE

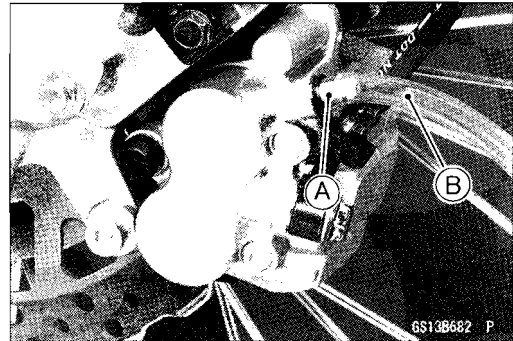
### Periodic Maintenance Procedures

#### Brake Fluid Change

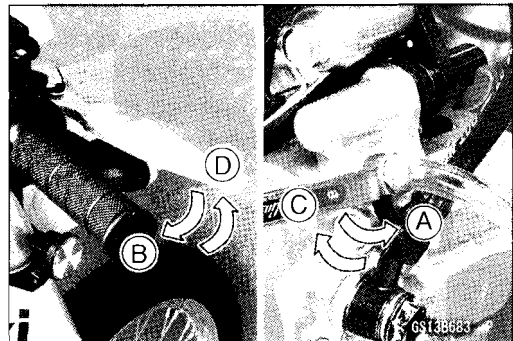
##### NOTE

○ 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 brake fluid reservoir.
- Remove the reservoir cap and diaphragm.
- Remove the rubber cap from the bleed valve [A] on the caliper.
- Attach a clear plastic hose [B] to the bleed valve, and run the other end of the hose into a container.
- Fill the reservoir with fresh specified brake fluid.



- Change the brake fluid.
- Repeat this operation until fresh brake fluid comes out from the plastic hose or the color of the fluid changes.
  1. Open the bleed valve [A].
  2. Apply the brake and hold it [B].
  3. Close the bleed valve [C].
  4. Release the brake [D].



##### 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.
- Install the diaphragm and reservoir cap.
- Tighten:

**Torque - Master Cylinder Reservoir Cap Screws: 1.5 N·m  
(0.15 kgf·m, 13 in·lb)**

**Caliper Bleed Valves: 7.8 N·m (0.80 kgf·m, 69 in·lb)**

- Install the rubber cap on the bleed valve.
- After changing the fluid, check the brake for good braking power, no brake drag, and no fluid leakage.
- ★ If necessary, bleed the air from the lines.

## Periodic Maintenance Procedures

### Master Cylinder Rubber Parts Replacement Front Master Cylinder Disassembly

- Remove the front master cylinder (see Front Master Cylinder Removal in the Brakes chapter).
- Remove the reservoir cap [A] and diaphragm [B], and pour the brake fluid into a container.
- Unscrew the locknut [C] and pivot bolt [D], and remove the brake lever.
- Pull the dust cover [E] out of place, and remove the circlip [F].

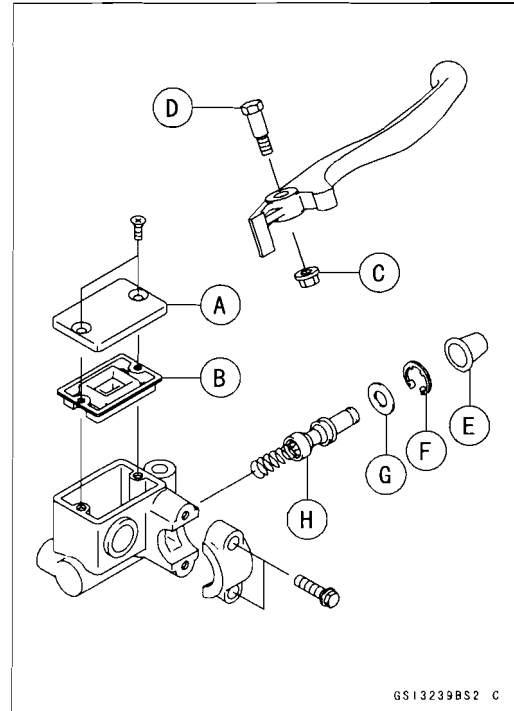
**Special Tool - Inside Circlip Pliers: 57001-143**

- Remove the washer [G].
- Pull out the piston assy [H].

#### CAUTION

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

- Replace:
  - Diaphragm [B]
  - Dust Cover [E]
  - Circlip [F]
  - Piston Assy [G]



GS13239BS2 C

### Rear Master Cylinder Disassembly

- Remove the rear master cylinder (see Rear Master Cylinder Removal in the Brakes chapter).
- Remove the reservoir cap [A] and diaphragm [B], and pour the brake fluid into a container.
- Remove the circlip [C], fitting [D] and O-ring [E].

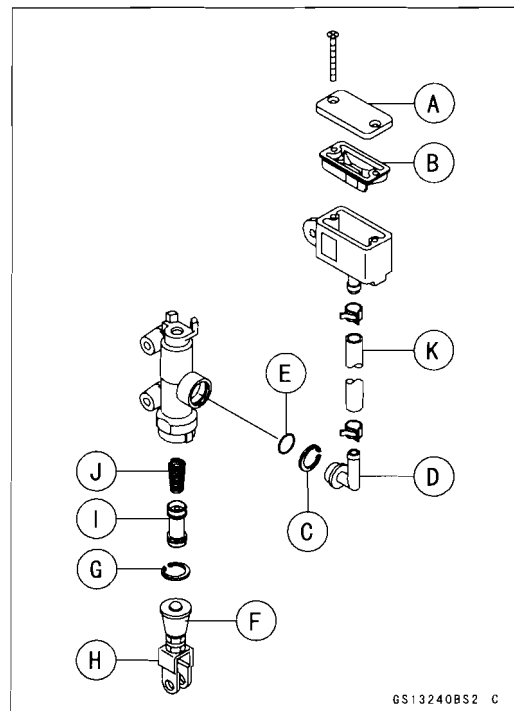
**Special Tool - Inside Circlip Pliers: 57001-143**

- Slide the dust cover [F] out of place, and remove the circlip [G].
- Pull out the push rod assy [H].
- Take off the piston assy [I] and return spring [J].

#### CAUTION

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

- Replace:
  - Diaphragm [B]
  - Circlip [C]
  - O-ring [E]
  - Circlip [G]
  - Push Rod Assy [H]
  - Piston Assy [I]
  - Hose [K]



GS13240BS2 C

## 2-56 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

#### Master Cylinder Assembly

- Before assembly, clean all parts including the master cylinder with brake fluid or alcohol.

#### CAUTION

Except for the disc pads and disc, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol for cleaning brake parts. Do not use any other fluid for cleaning these parts. Gasoline, engine oil, or any other petroleum distillate will cause deterioration of the rubber parts. Oil spilled on any part will be difficult to wash off completely, and will eventually deteriorate the rubber used in the disc brake.

- Apply brake fluid to the new parts and to the inner wall of the cylinder.
- Take care not to scratch the piston or the inner wall of the cylinder.
- Apply silicone grease to the brake lever pivot bolt [A].
- Apply silicone grease to the contact surface [B] of the brake lever and piston.
- Tighten:

**Torque - Brake Lever Pivot Bolt:** 5.9 N·m (0.60 kgf·m, 52 in·lb)

**Brake Lever Pivot Bolt Locknut [C]:** 5.9 N·m (0.60 kgf·m, 52 in·lb)

**Master Cylinder Reservoir Cap Screws [D]:** 1.5 N·m (0.15 kgf·m, 13 in·lb)

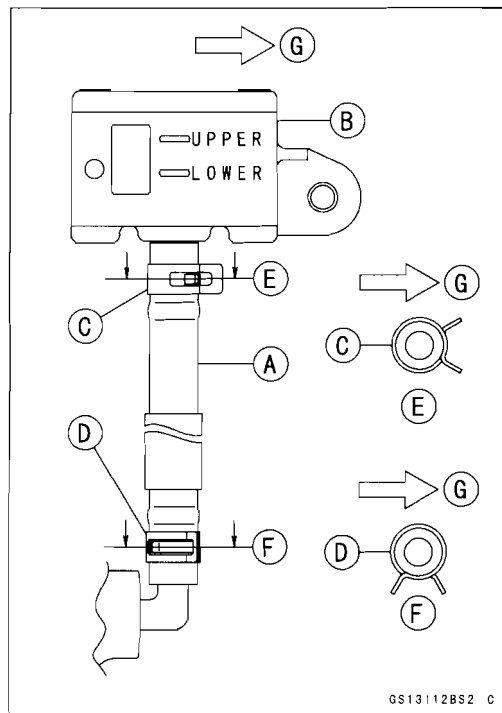
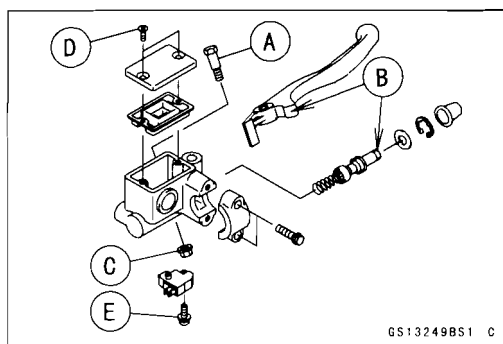
**Front Brake Light Switch Screw [E]:** 1.2 N·m (0.12 kgf·m, 11 in·lb)

- Attach the brake hose [A] and the rear brake reservoir [B] to the rear master cylinder and set the upper hose clamp [C] and the lower hose clamp [D] as shown in the figure.

Section [E]

Section [F]

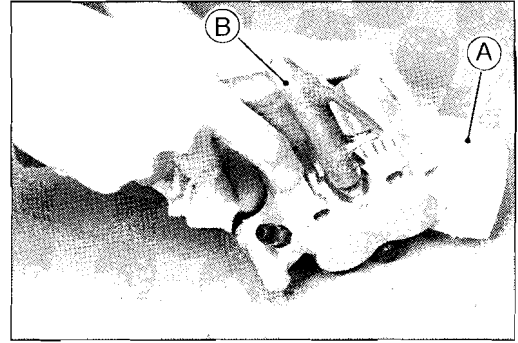
Front [G]



## Periodic Maintenance Procedures

### Caliper Rubber Parts Replacement Front Caliper Disassembly

- Remove:
  - Front Caliper (see Front Caliper Removal in the Brakes chapter)
  - Brake Pads (see Front Brake Pad Removal in the Brakes chapter)
- Using compressed air, remove the pistons.
  - Cover the piston area with a clean, thick cloth [A].
  - Blow compressed air [B] into the hole for the banjo bolt to remove the piston.



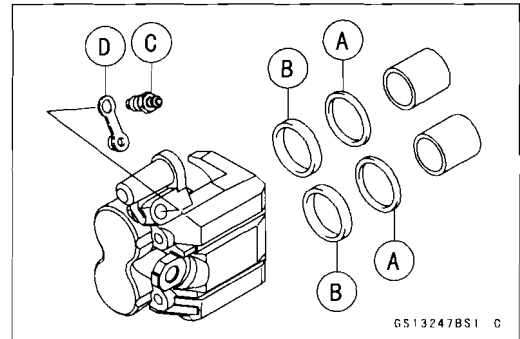
### **⚠ WARNING**

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

- Pull out the pistons by hand.
- Remove the dust seals [A] and fluid seals [B].
- Remove the bleed valve [C] and rubber cap [D].

### **NOTE**

○ If compressed air is not available, with the brake hose still attached, apply the brake lever to remove the piston. The remaining process is as described above.



### Front Caliper Assembly

- Clean the caliper parts except for the pads.

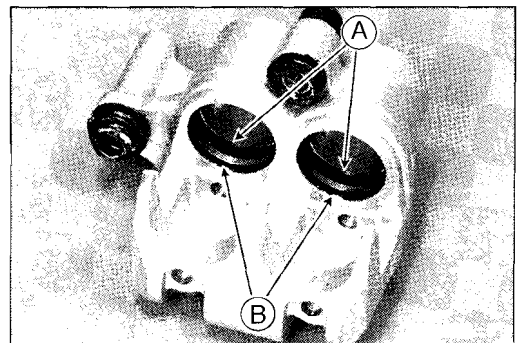
### **CAUTION**

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

- Install the bleed valve and rubber cap.
 

**Torque - Caliper Bleed Valve: 7.8 N·m (0.80 kgf·m, 69 in·lb)**

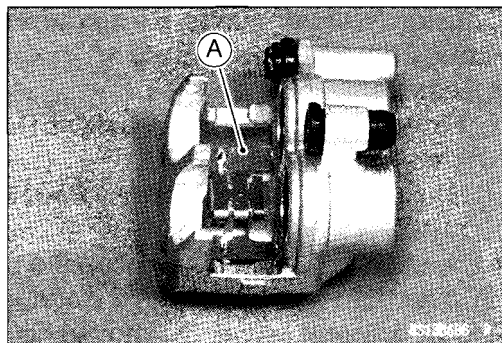
- Replace the fluid seals [A] with new ones.
  - Apply a thin coat of PBC (Poly Butyl Cuprysil) grease to the fluid seals, and install them into the cylinders by hand (PBC is a special high-temperature, water-resistance grease).
- Replace the dust seals [B] with new ones if they are damaged.
  - Apply brake fluid to the dust seals, and install them into the cylinders by hand.



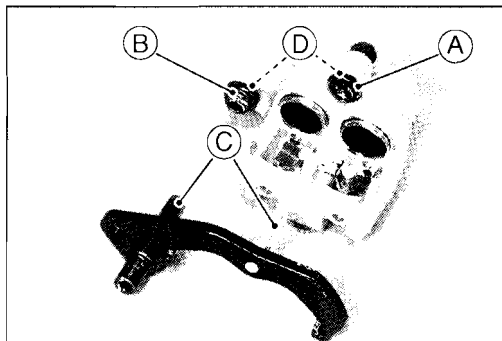
## 2-58 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

- Install the anti-rattle spring [A] as shown.

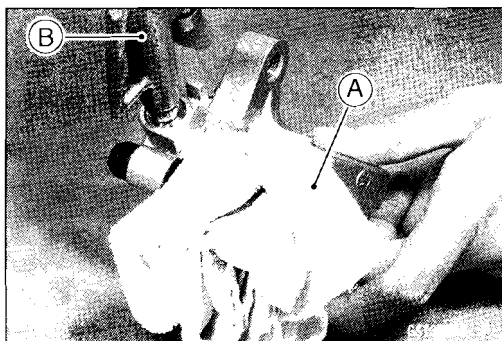


- Apply brake fluid to the outside of the pistons, and push them into each cylinder by hand.
- Check the shaft rubber friction boot [A] and the dust boot [B] replace them with new ones if they are damaged.
- Apply a thin coat of PBC (Poly Butyl Cuprysil) grease to the caliper holder shafts [C] and holder holes [D] (PBC is a special high-temperature, water-resistance grease).
- Install the pads (see Front Brake Pad Installation in the Brakes chapter).
- Wipe up any spilled brake fluid on the caliper with wet cloth.



#### Rear Caliper Disassembly

- Remove:
  - Rear Caliper (see Rear Caliper Removal in the Brakes chapter)
  - Brake Pads (see Rear Brake Pad Removal in the Brakes chapter)
- Using compressed air, remove the pistons.
  - Cover the piston area with a clean, thick cloth [A].
  - Blow compressed air [B] into the hole for the banjo bolt to remove the piston.



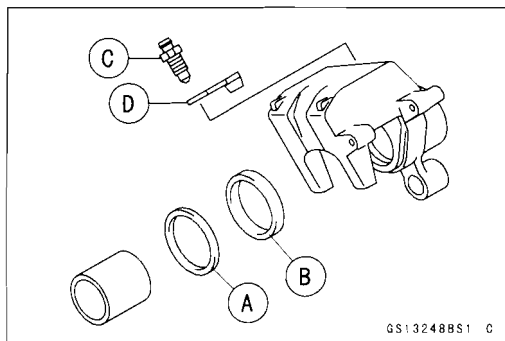
#### **⚠ WARNING**

**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.**

- Remove the dust seal [A] and fluid seal [B].
- Remove the bleed valve [C] and rubber cap [D].

#### **NOTE**

○ If compressed air is not available, with the brake hose still attached, apply the brake pedal to remove the piston. The remaining process is as described above.





## Periodic Maintenance Procedures

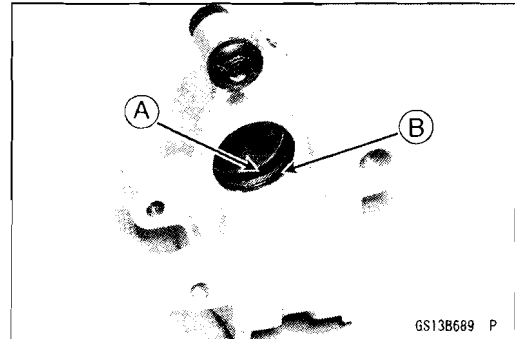
### Rear Caliper Assembly

- Clean the caliper parts except for the pads.

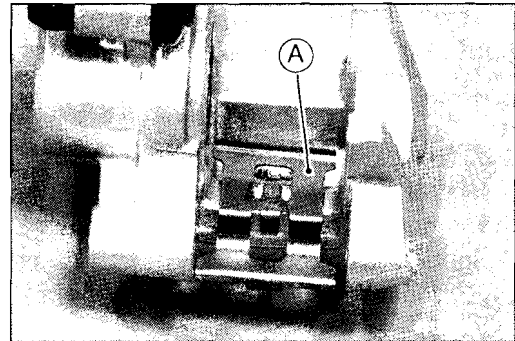
#### CAUTION

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

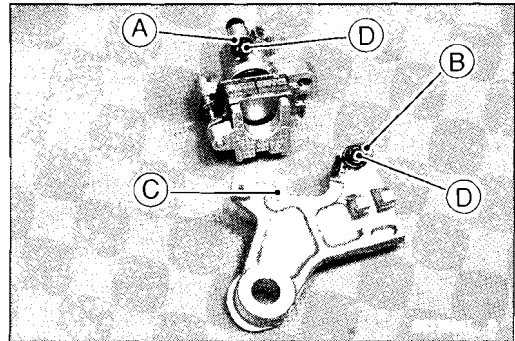
- Install the bleed valve and rubber cap.
- Torque - Bleed Valve: 7.8 N·m (0.80 kgf·m, 69 in·lb)**
- Replace the fluid seal [A] with a new one.
  - Apply a thin coat of PBC (Poly Butyl Cuprysil) grease to the fluid seal, and install it into the cylinder by hand (PBC is a special high-temperature, water-resistance grease).
  - Replace the dust seal [B] with a new one.
  - Apply brake fluid to the dust seal, and install it into the cylinder by hand.



- Install the anti-rattle spring [A] in the caliper as shown.



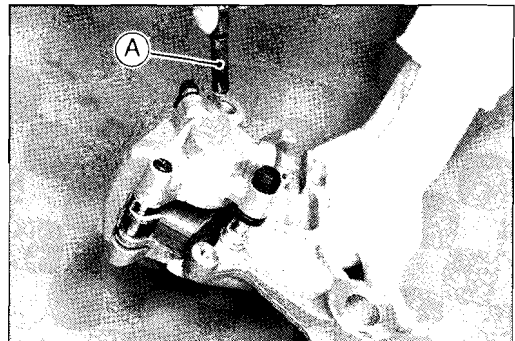
- Apply brake fluid to the outside of the piston, and push it into the cylinder by hand.
- Replace the shaft rubber friction boot [A] and dust boot [B] if they are damaged.
- Apply a thin coat of PBC (Poly Butyl Cuprysil) grease to the caliper holder shaft [C] and holder holes [D] (PBC is a special high-temperature, water-resistance grease).
- Install the pads (see Rear Brake Pad Installation in the Brakes chapter).



- Apply a thin coat of PBC (Poly Butyl Cuprysil) grease to the rear caliper mounting bolt [A] and tighten it.

**Torque - Rear Caliper Mounting Bolt: 27 N·m (2.8 kgf·m, 20 ft·lb)**

- Wipe up any spilled brake fluid on the caliper with wet cloth.



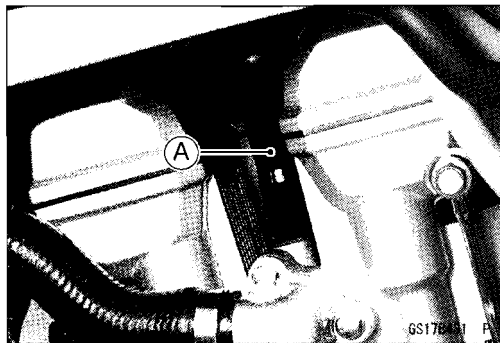
## 2-60 PERIODIC MAINTENANCE

### Periodic Maintenance Procedures

#### Spark Plug Replacement

- Remove the left radiator shroud (see Radiator Shroud Removal in the Frame System chapter).
- Remove the spark plug cap [A] from the spark plug.
- Remove the spark plug using the plug wrench vertically.

**Special Tool - Spark Plug Wrench, Hex 16: 57001-1262**



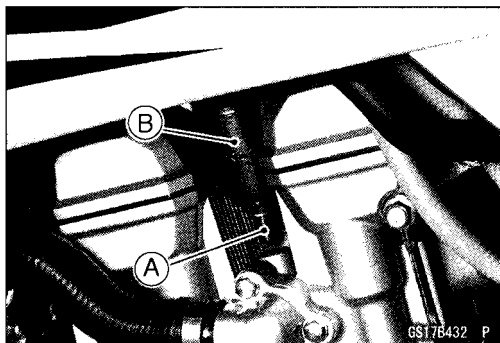
- Replace the spark plug with a new one.

#### Standard Spark Plug

**Type: NGK CR8E or ND U24ESR-N**

- Insert the spark plug [A] vertically into the plug hole with the spark plug installed in the plug wrench [B].

**Special Tool - Spark Plug Wrench, Hex 16: 57001-1262**



#### CAUTION

**The insulator of the spark plug may break if when the wrench is inclined during tightening.**

- Tighten:  
**Torque - Spark Plug: 13 N·m (1.3 kgf·m, 115 in·lb)**
- Install the spark plug cap securely.
- Be sure the spark plug cap is installed by pulling up it lightly.

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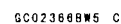


# Fuel System

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## Exploded View



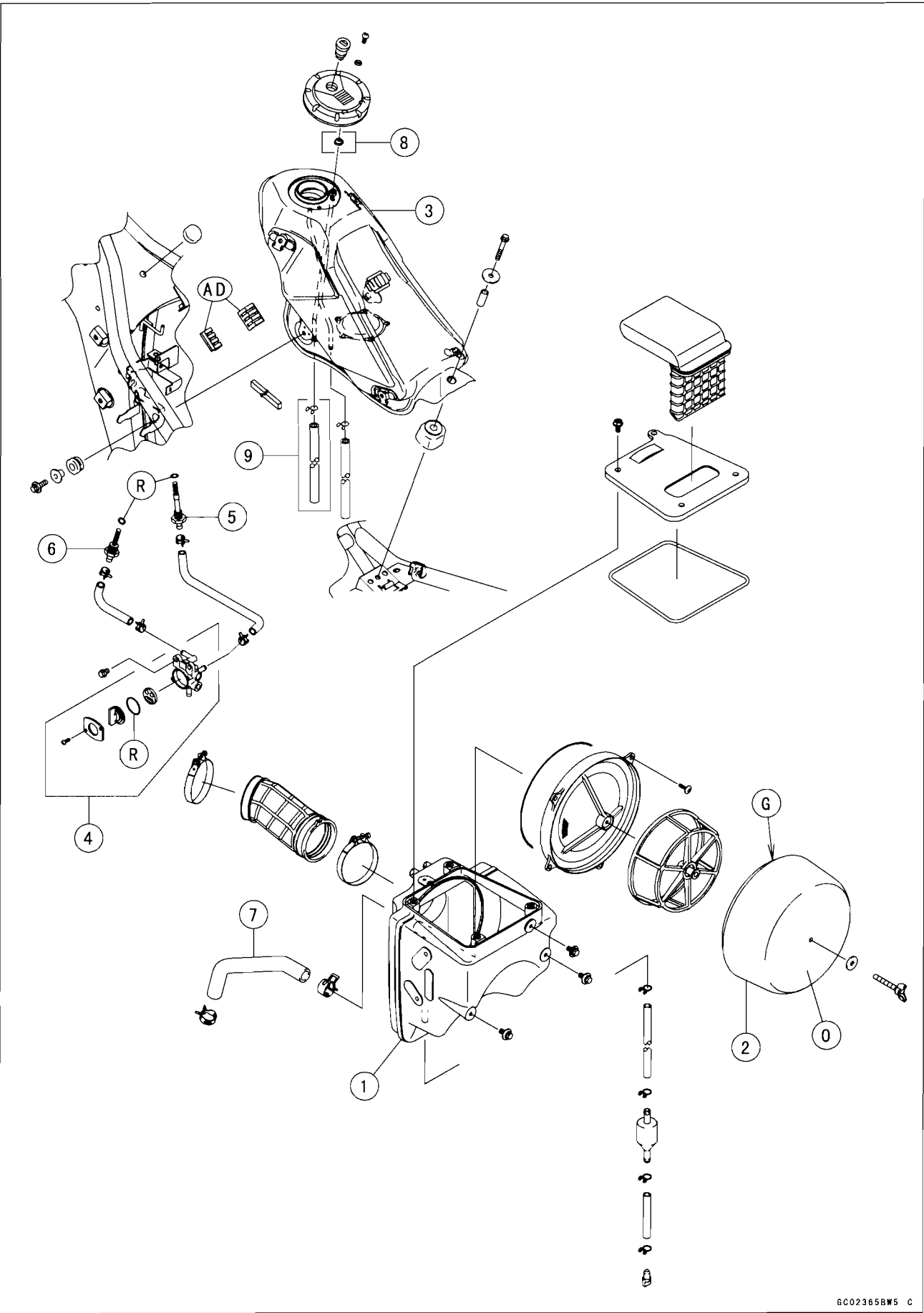
# Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Carburetor Holder Clamp Screw	1.5	0.15	13 in·lb	

- 2. Throttle Cables
- 3. Pilot Screw
- 4. Pilot Jet
- 5. Float Valve
- 6. Jet Needle
- 7. Needle Jet
- 8. Needle Jet Holder
- 9. Main Jet
- 10. Float
- 11. Plug (other than AU Model)
- 12. Choke Knob
- 13. CAL Model
- 14. AU Model
- CL: Apply cable lubricant.
- G: Apply grease.
- R: Replacement Parts

3-4 FUEL SYSTEM

Exploded View



### Exploded View

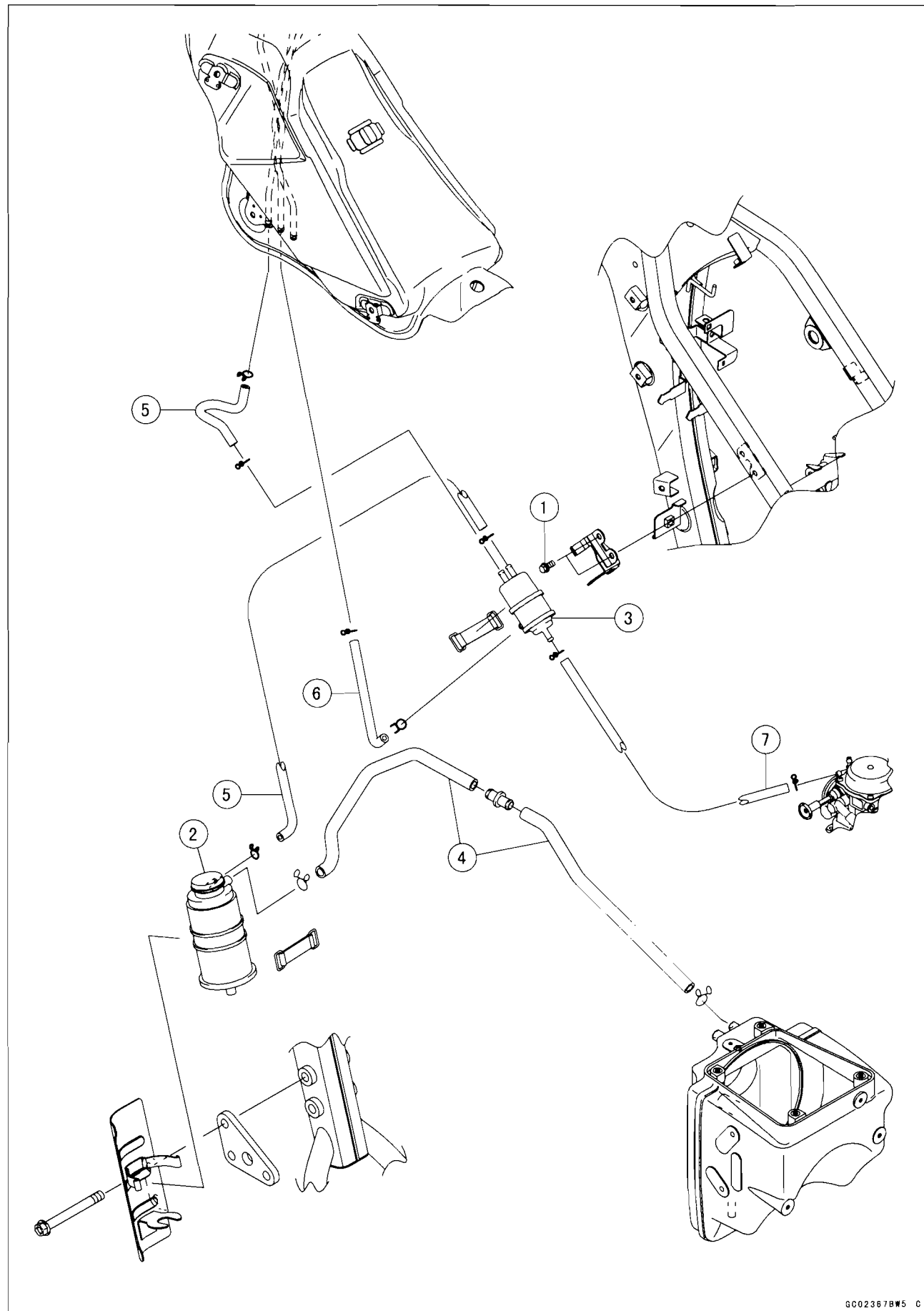
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1. Air Cleaner Housing
  2. Air Cleaner Element
  3. Fuel Tank
  4. Fuel Tap
  5. Fuel Filter (Primary)
  6. Fuel Filter (Reserve)
  7. Breather Hose
  8. CAL Model
  9. Other than AU Model
- AD: Apply adhesive.  
G: Apply grease.  
O: Apply high-quality foam air filter oil.  
R: Replacement Parts

## 3-6 FUEL SYSTEM

### Exploded View

#### CAL Model



**Exploded View**

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Separator Bracket Bolts	9.8	1.0	87 in·lb	

- 2. Canister
- 3. Separator
- 4. Green/White Hose
- 5. Blue Hose
- 6. Red Hose
- 7. White Hose



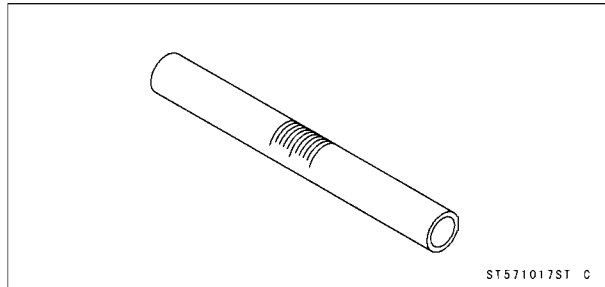
## 3-8 FUEL SYSTEM

### Specifications

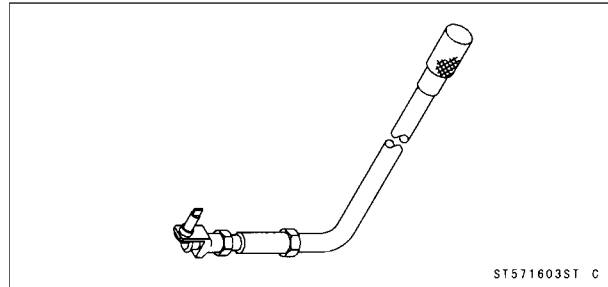
Fastener	Standard
<b>Throttle Grip and Cable</b>	
Throttle Grip Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)
<b>Carburetor</b>	
Make, type	KEIHIN, CVK 34
Idle Speed	1 300 ±50 r/min (rpm)
Pilot Screw Turns Out	1 5/8 turn (AU) 2 3/8 turn
Float Height	17 ±2 mm (0.67 ±0.08 in.)
Service Fuel Level (above the bottom edge of the carburetor body)	0.5 ±1 mm (0.02 ±0.04 in.)
Main Jet	#118, (AU) #132
Main Air Jet	#50
Needle Jet	#6
Jet Needle	NNLA, (AU) N1RX
Pilot Jet (Slow Jet)	#35
Pilot Air Jet (Slow Air Jet)	#145
Starter Jet	#48, (AU) #40
<b>Air Cleaner</b>	
Air Cleaner Element	Polyurethane Form
Air Cleaner Element Oil	High-quality form air filter oil

### Special Tools

**Fuel Level Gauge:**  
**57001-1017**



**Pilot Screw Adjuster, E:**  
**57001-1603**



## 3-10 FUEL SYSTEM

### Throttle Grip and Cables

#### **Throttle Grip Free Play Inspection**

- Refer to the Throttle Control System Inspection in the Periodic Maintenance chapter.

#### **Throttle Grip Free Play Adjustment**

- Refer to the Throttle Control System Inspection in the Periodic Maintenance chapter.

#### **Choke Knob Operation**

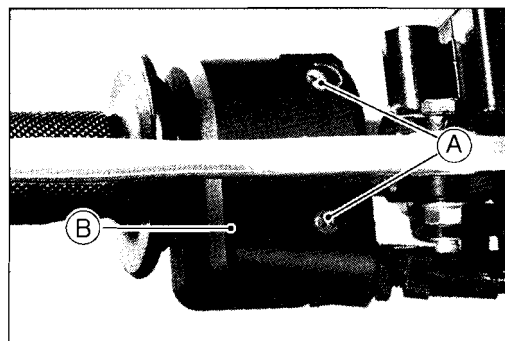
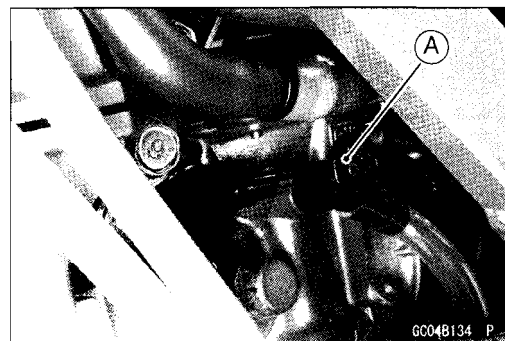
- Check that the choke knob [A] moves smoothly by pushing and pulling it lightly.
- ★ If you find any abnormality or if the choke does not work correctly when you pull the choke knob fully, replace the choke knob assembly or clean the carburetor.

#### **NOTE**

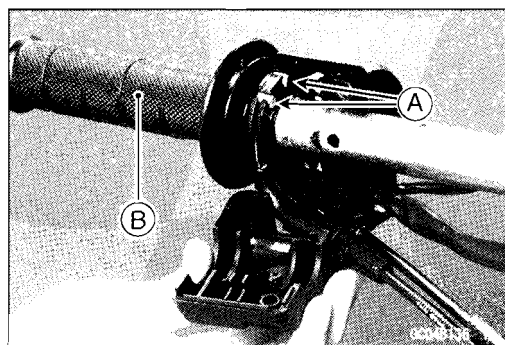
- When you use the choke knob, be sure to pull it fully. Even if you pull it, but not to the stroke end, the choke will not work.
- Normally, you are not required to operate the choke knob. You must only pull the choke knob to cold start the engine.
- Once the engine warms up, push the choke knob back to the stroke end.

#### **Throttle Cable Removal**

- Remove the screws [A].
- Disassemble the throttle case [B].

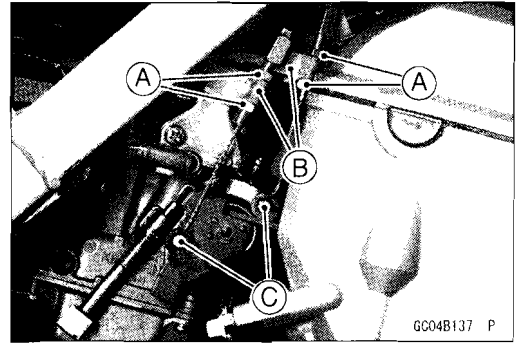


- Take off the throttle cable tips [A] from the throttle grip [B].



## Throttle Grip and Cables

- Loosen the locknuts [A].
- Remove the throttle cables from the cable holder cable [B].
- Take off the throttle cable tips [C] from the carburetor pulley.
- Pull out the throttle cables out of the frame.



### Throttle Cable Installation

- Lubricate the throttle cables.
- Grease the tips of the cable upper end.
- Install the cable lower ends (see Carburetor Installation).
- Install the cable upper ends in the throttle grip. (see Handlebar Installation in the Steering chapter).
- Install the throttle case.
- Install the cable correctly according to Cable, Wire, and Hose Routing in the Appendix chapter.
- After installation, adjust each cable properly (see Throttle Control System Cable Inspection in the Periodic Maintenance chapter).

### **⚠ WARNING**

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

### Throttle Cable Lubrication

- Refer to the Chassis Parts Lubrication in the Periodic Maintenance chapter.

## 3-12 FUEL SYSTEM

### Carburetor

#### Idle Speed Inspection

- Refer to the Idle Speed Inspection in the Periodic Maintenance chapter.

#### Idle Speed Adjustment

- Refer to the Idle Speed Adjustment in the Periodic Maintenance chapter.

#### Pilot Screw Adjustment (AU Model)

##### NOTE

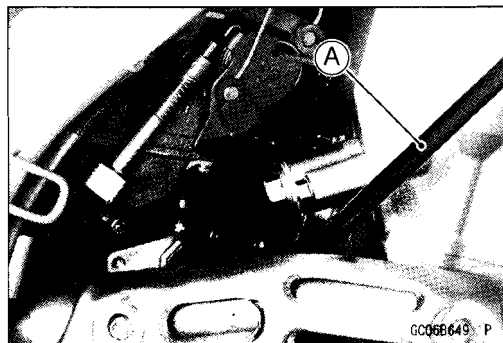
○ For the other than Australia model, there is plug on the pilot screw.

- ★ If the engine idle is still not stable, adjust the pilot screw to obtain the proper idle speed using the pilot screw adjuster [A].

**Special Tool - Pilot Screw Adjuster, E: 57001-1603**

- Turn in the pilot screw fully but not tightly, and then back it out the specified turns. To set the screw to its original position.

**Pilot Screw Setting: 1 5/8 turns out**



##### CAUTION

**Does not over-tighten the pilot screw. It could be damaged, requiring replacement.**

##### NOTE

○ The standard number of turns the pilot screw must be backed out varies by carburetor. The values given in the specifications should be used only when the number of the original back out turns is unavailable.

#### 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.**

## Carburetor

- Turn the fuel tap to the OFF position.
- Remove the carburetor, and hold it in true vertical position on a stand.
- Connect the fuel tank to the carburetor assy using a suitable hose.
- Connect the fuel level gauge [A] to the carburetor overflow hose [F].

### Special Tool - Fuel Level Gauge: 57001-1017

- Hold the gauge so that the “zero” line [B] is several millimeters higher than the bottom edge [D] of the carburetor body.
- Turn the fuel tap to the ON position, and unscrew the drain screw [C] at the carburetor.
- 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 mating surface of the carburetor body and float chamber.

### NOTE

○Do not lower the “zero” line below the mating surface of the carburetor body and float chamber. If the gauge is lowered below the mating surface and then raised again, the fuel level measure shows somewhat higher than the actual fuel level, and it must be measured again.

- Read the fuel level [E].

### Service Fuel Level

Standard:  $0.5 \pm 1 \text{ mm}$  ( $0.02 \pm 0.04 \text{ in.}$ ) above the bottom edge of the carburetor body

- ★ If the reading is out of the range, adjust the float height (see Float Height Adjustment).
- Tighten the drain screw.
- Turn the fuel tap to the OFF position and remove the gauge.

## Float Height Adjustment

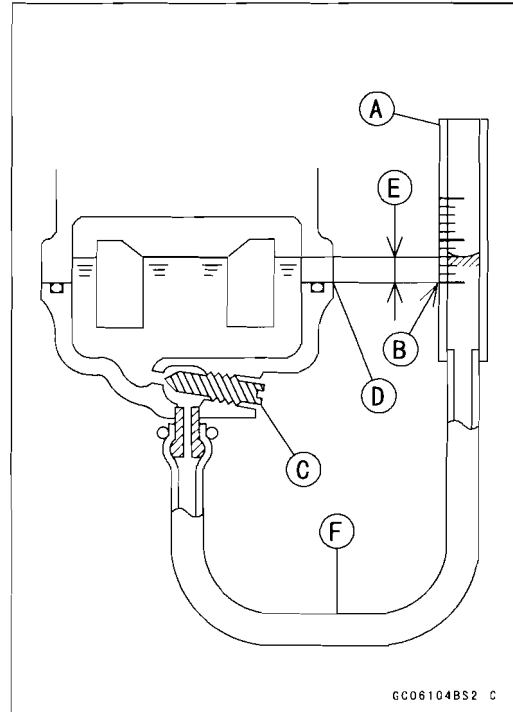
### ⚠ WARNING

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.

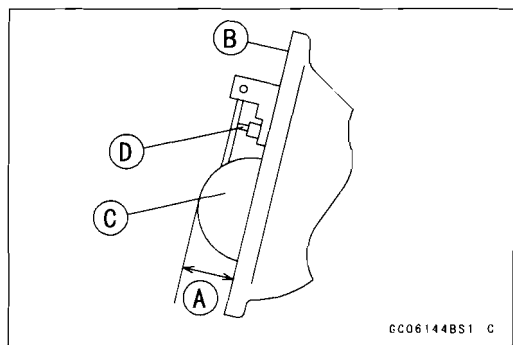
- Remove the float bowl (see Carburetor Disassembly).
- Measure the float height [A] from the mating surface [B] of carburetor body to the top of the float by tilting the carburetor so that the tang of the float [C] just touches the needle rod [D] of the float valve.
- When measuring the float height, the needle rod must not be depressed.

### Float height

Standard:  $17.12 \text{ mm}$  ( $0.67 \pm 0.08 \text{ in.}$ )



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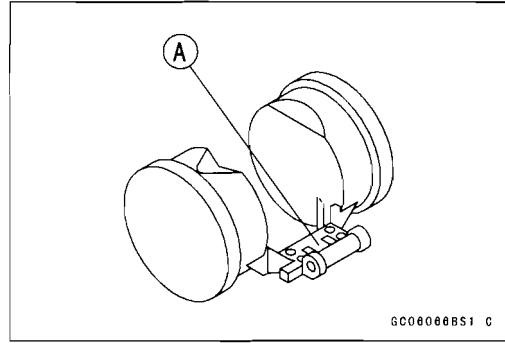


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## 3-14 FUEL SYSTEM

### Carburetor

- ★ If the float height is out of the standard range, adjust the float height according to the following procedure.
- Bend the tang [A] 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.

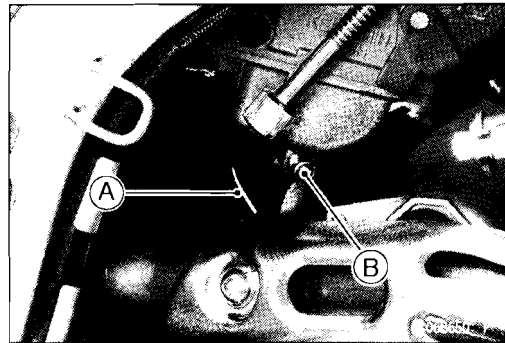


- Assemble the carburetor, and recheck the fuel level.
- ★ If the fuel level can not be adjusted by this method, the float or the float valve is damaged.

### 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.



- the float bowl.
- Place the suitable container under the lower end of the carburetor drain hose [A].
- Turn out the carburetor drain plug [B] a few turns and drain the float bowl.
- Check to see if water or dirt comes out.
- Tighten the drain plug.
- ★ If any water or dirt appears during the above inspection, clean the carburetor and the fuel tank (see Carburetor Cleaning and Fuel Tank Cleaning).

### 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.

- Remove the throttle cable ends from the throttle cable holder (see Throttle Cable Removal).

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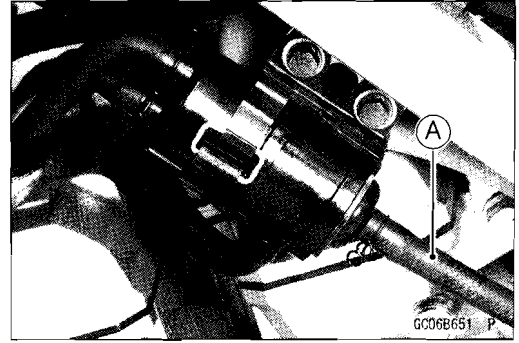
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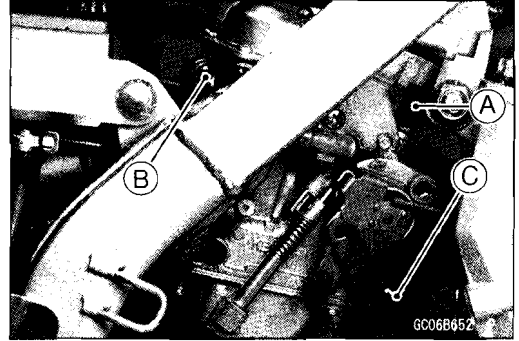


## Carburetor

- For the Australia model, drain the coolant and remove the water hoses from the fitting on the carburetor.
- For the California model, remove the vacuum hose [A] of the separator from the fitting.



- Remove:
  - Fuel Tank (see Fuel Tank Removal)
- For the other than Australia model, remove the vacuum switch valve hose [A] from the fitting on the carburetor.
- Loosen:
  - Air Cleaner Duct Clamp Screw [B]
  - Carburetor Holder Clamp Screw [C]
- Remove the air cleaner duct clamp and carburetor holder clamp to make easy to remove carburetor.
- Pull the carburetor out of the air cleaner duct, and then pull it out of the carburetor holder.
- Take out the carburetor from the up side of the motorcycle.
- Stuff pieces of lint-free, clean clothe into the carburetor holder and the air cleaner duct to keep dirt out of the engine and air cleaner.

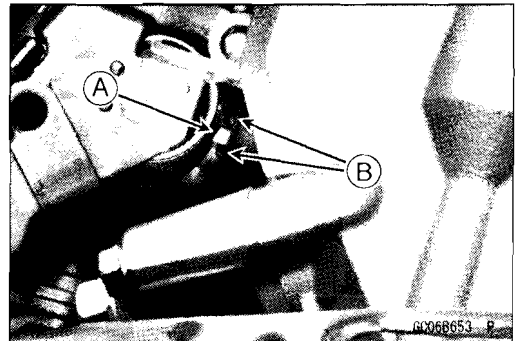


### CAUTION

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

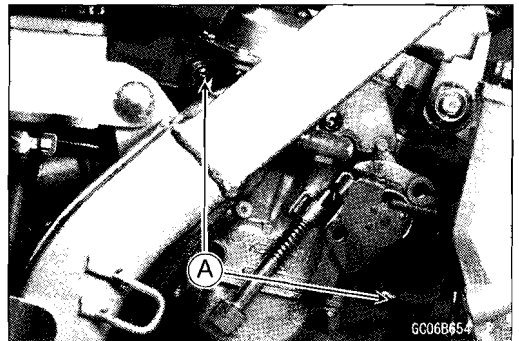
### Carburetor Installation

- Fit the projection [A] of the carburetor into the stopper [B] of the carburetor holder.



- Install the holder clamp screws [A] in the direction as shown and tighten them.

**Torque - Carburetor Holder Clamp Screw: 1.5 N·m (0.15 kgf·m, 13 in·lb)**



## 3-16 FUEL SYSTEM

### Carburetor

- Check the fuel leakage from the carburetor.

#### **⚠ WARNING**

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

- Run the hoses correctly (see Cable, Wire, and Hose Routing section in the Appendix chapter).
- Adjust:
  - Throttle Grip Free Play (see Throttle Control System Inspection in the Periodic Maintenance chapter)
  - Idle Speed (see Idle Speed Adjustment in the Periodic Maintenance chapter)

### *Carburetor Disassembly*

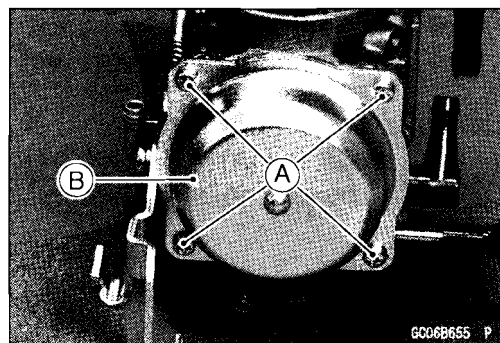
#### **⚠ WARNING**

**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.**

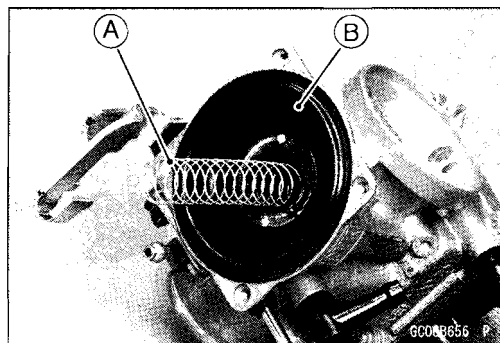
#### **CAUTION**

**During carburetor disassembly, be careful not to damage the diaphragm. Never use a sharp edge to remove the diaphragm.**

- Remove:
  - Carburetor (see Carburetor Removal)
  - Screws [A]
  - Upper Chamber Cover [B]

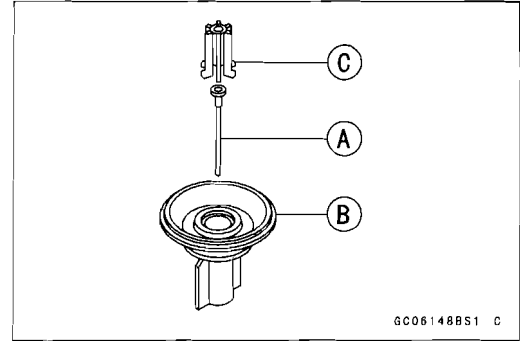


- Remove:
  - Spring [A]
  - Diaphragm [B]

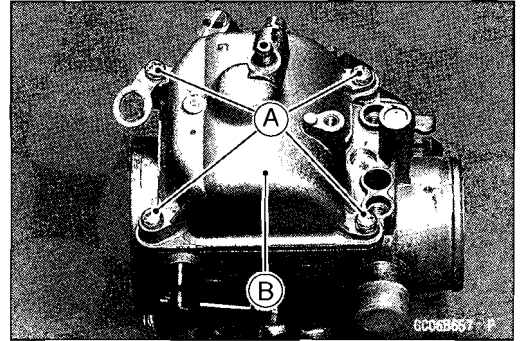


## Carburetor

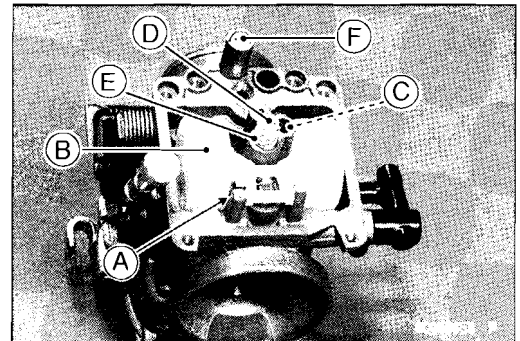
- Separate the jet needle [A] and spring seat [C] from the vacuum piston [B].



- Remove:  
Screws [A]  
Float Bowl [B]



- Remove:  
Pivot Pin [A]  
Float [B] and Float Valve  
Pilot Jet [C]  
Main Jet [D]  
Needle Jet Holder [E] and Needle Jet
- For the other than Australia model, remove the plug [F] on the pilot screw as follows.  
○ Punch a hole in the plug and pry it out with an awl or other suitable tool.
- Turn in the pilot screw and count the number of turns until it seats fully but not tightly, and record the number of turns.  
○ This is to set the pilot screw to its original position when assembling.
- Remove the pilot screw.



### CAUTION

Does not over-tighten the pilot screw. It could be damaged, requiring replacement.

## Carburetor Assembly

### ⚠ 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.

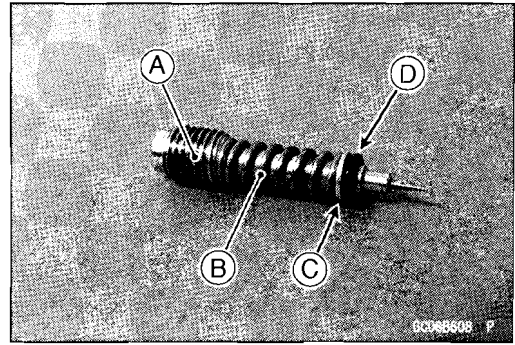
### CAUTION

Do not apply force to the jet or overtighten it, as this could damage the jet or the carburetor body, requiring replacement.

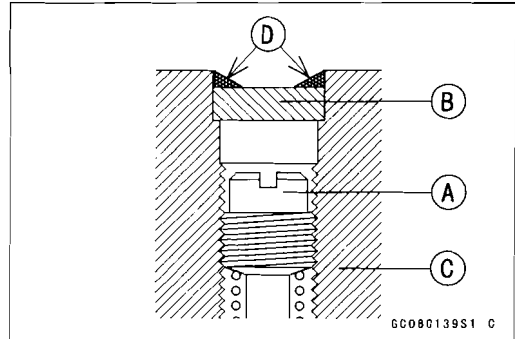
## 3-18 FUEL SYSTEM

### Carburetor

- Install the following on the pilot screw [A].
  - Spring [B]
  - Spring Seat [C]
  - O-ring [D]



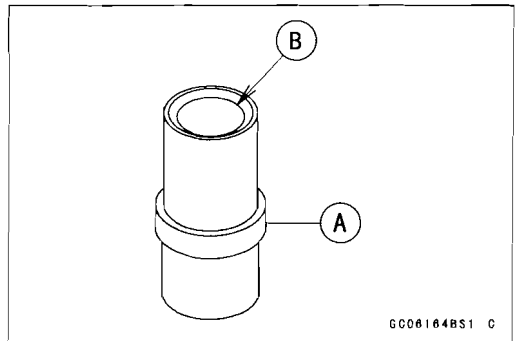
- Turn in the pilot screw [A] fully but not tightly, and then back it same number of turns counted during disassembly.
  - For the other than Australia model, install the plug [B] on the pilot screw as follows.
- Install a new plug in the pilot screw hole of the carburetor body [C], and then apply a small amount of a bonding agent [D] to the circumference of the plug to fix the plug.



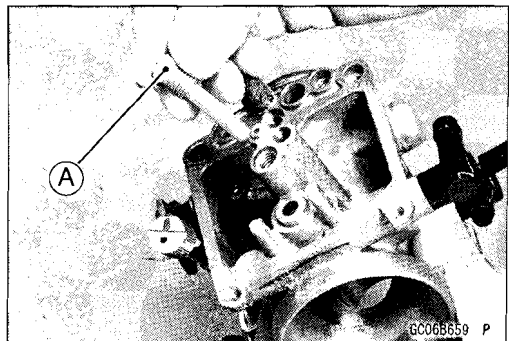
#### CAUTION

**Do not apply too much bonding agent to the plug or the pilot screw itself may become fixed.**

- To install the needle jet [A], turn the carburetor upside down, and drop the needle jet into place so that the larger hole side [B] of the jet goes first.



- Carefully screw in the needle jet holder [A]. It will seat against the needle jet, pushing the end of the jet into the carburetor bore.

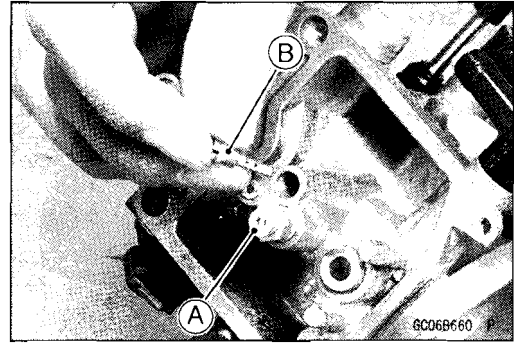


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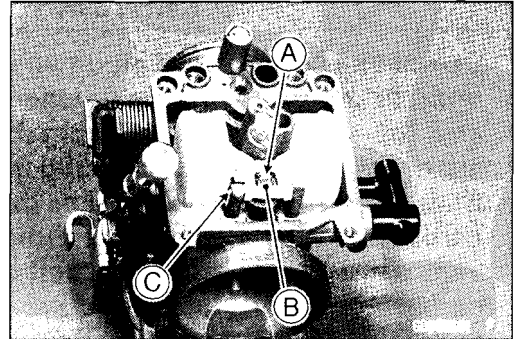


## Carburetor

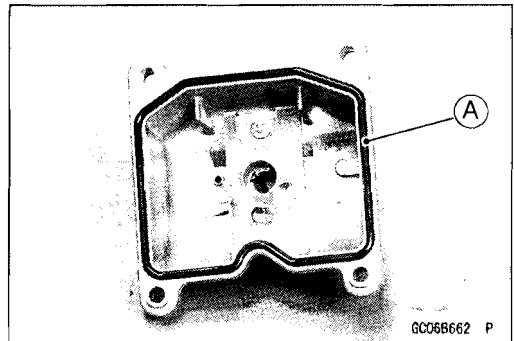
- Carefully screw in the main jet [A] on the needle jet holder.
- Carefully screw in the pilot jet [B] on the carburetor.



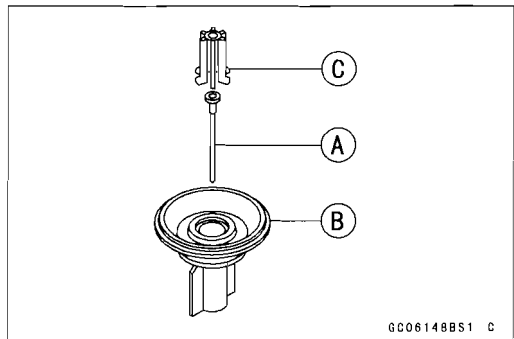
- Hook the needle hanger [A] onto the float tang [B] and install the float valve needle in the valve seat.
- Insert the float pivot pin [C].
- After installation, check the float height (see Float Height Adjustment).



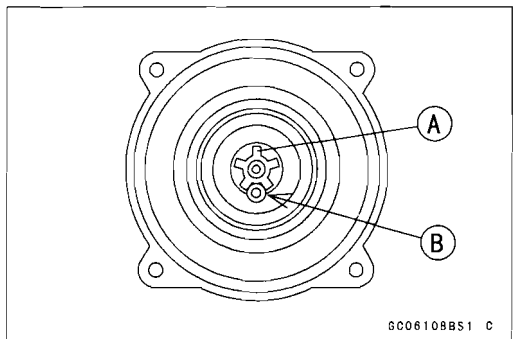
- Replace the O-ring [A] with a new one.
- Install the float bowl.



- Insert the jet needle [A] into the hole in the center of the vacuum piston [B], and put the spring seat [C] on the jet needle.



- Turn the spring seat [A] so that it does not block the hole [B] at the bottom of the vacuum piston.
- Install the spring and upper chamber cover.
- After installation, check that the vacuum piston slides up and down smoothly without binding in the carburetor bore.



## 3-20 FUEL SYSTEM

### Carburetor

#### 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-flash point solvent to clean the carburetor.

##### CAUTION

Do not use compressed air on an assembled carburetor, or the floats may be crushed by the pressure, and the vacuum piston diaphragm may be damaged. Remove as many rubber or plastic parts from the carburetor as possible before cleaning the carburetor with a cleaning solution. This will prevent damage to or deterioration of the parts. The carburetor body has plastic parts that cannot be removed. Do not use a strong carburetor cleaning solution which could attack these 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.

- Disassemble the carburetor (see Carburetor Disassembly).
- Clean all the metal parts in a carburetor cleaning solution.
- Rinse the parts in water.
- Dry them with compressed air.
- Blow through the air and fuel passages with compressed air.
- Assemble the carburetor (see Carburetor Assembly).

#### Carburetor Inspection

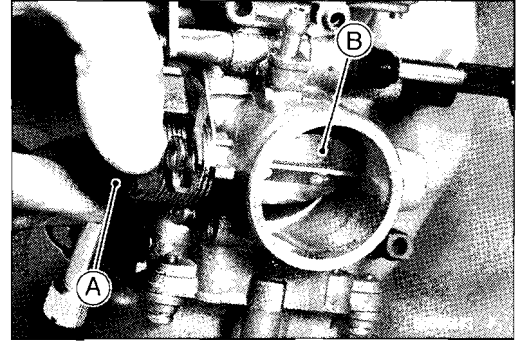
##### WARNING

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.

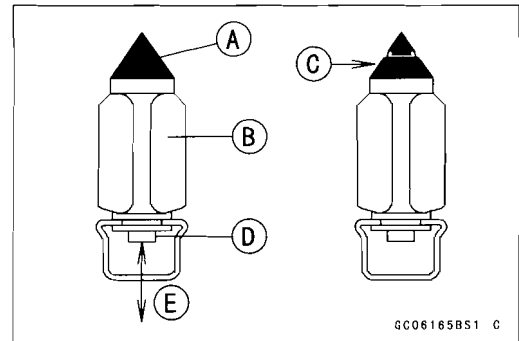
- Remove the carburetor (see Carburetor Removal).
- Before disassembling the carburetor body, check the service fuel level (see Service Fuel Level Inspection).
- ★ If the fuel level is incorrect, inspect of the carburetor before correct it.

## Carburetor

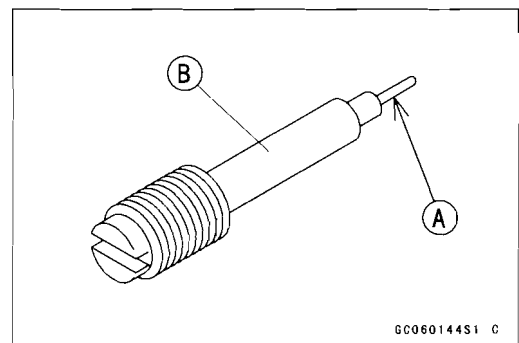
- Turn the throttle cable pulley [A] to check that the throttle valve [B] moves smoothly and returns by spring force.
- ★ If the throttle valve does not move smoothly, replace the carburetor.



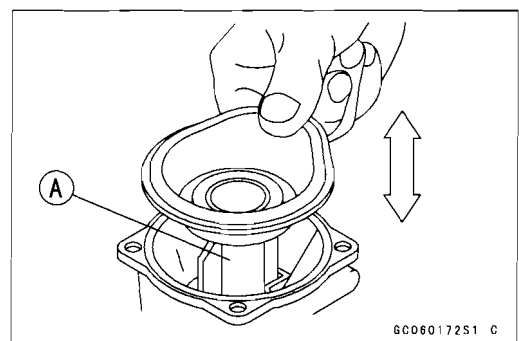
- Disassemble the carburetor (see Carburetor Disassembly).
- Clean the carburetor (see Carburetor Cleaning).
- Check that all O-rings and diaphragms of the carburetor are in good condition.
- ★ If the O-ring or the diaphragm is not in good condition, replace it.
- Check the plastic tip [A] of the float valve needle [B]. It should be smooth, without any grooves, scratches, or tears.
- ★ If the plastic tip is damaged [C], replace the needle.
- Push the rod [D] into the valve needle with your finger, and then release it [E].
- ★ If the rod does not spring out, replace the float valve needle.



- Check the tapered portion [A] of the pilot screw [B] for wear or damage.
- ★ Replace the pilot screw if it is worn or damaged on the tapered portion, or it will prevent the engine from idling smoothly.



- Check that the vacuum piston [A] operates smoothly in the carburetor body.
- ★ If the vacuum piston does not operate smoothly, or if loosened in the carburetor body, replace the piston or the carburetor.





## 3-22 FUEL SYSTEM

### Air Cleaner

#### **Air Cleaner Element Removal/Installation**

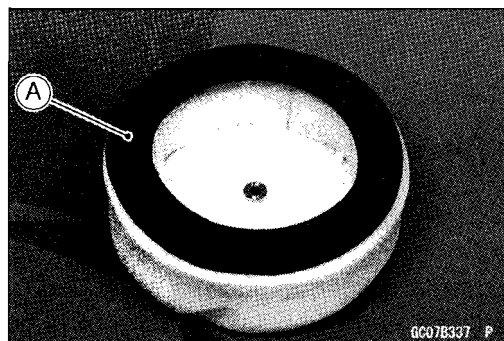
- Refer to the Air Cleaner Element Replacement in the Periodic Maintenance chapter.

#### **Air Cleaner Element Cleaning**

- Refer to the Air Cleaner Element Cleaning in the Periodic Maintenance chapter.

#### **Air Cleaner Element Inspection**

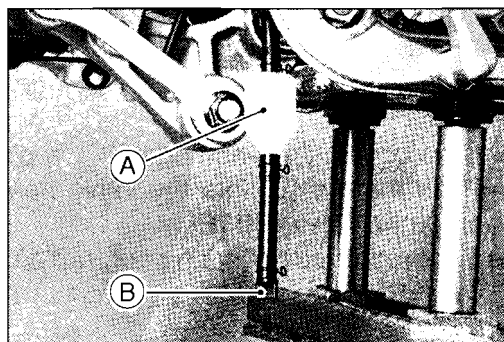
- Remove the air cleaner element (see Air Cleaner Element Replacement in the Periodic Maintenance chapter).
- Visually check the element [A] for tears or breaks.
- ★ If the element has any tears or breaks, replace the element.



#### **Air Cleaner Oil Draining**

A drain hose is connected to the bottom of the air cleaner to drain water or oil accumulated in the cleaner part.

- Visually check the catch tank [A] of the drain hose, if the water or oil accumulates.
- ★ If any water or oil accumulates in the tank, remove the plug [B] from the drain hose and drain it.

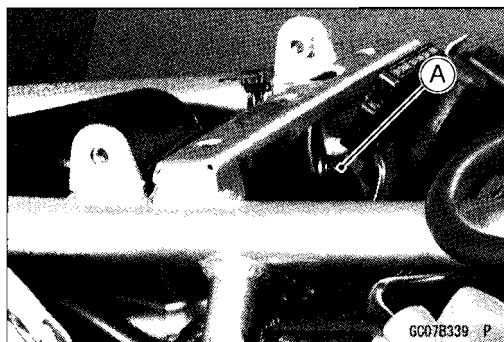


#### **⚠ WARNING**

Be sure to reinstall the plug in the drain hose after draining. Oil on tires will make them slippery and can cause an accident and injury.

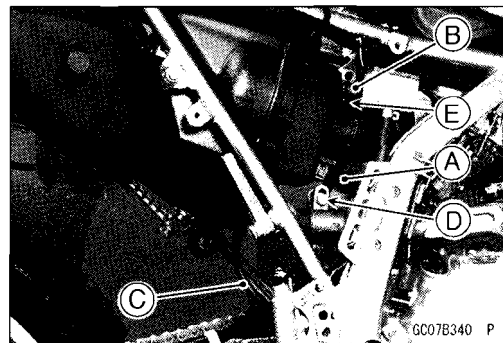
#### **Air Cleaner Housing Removal**

- Remove:
  - Right and Left Side Covers (see Side Cover Removal in the Frame chapter)
  - Rear Shock Absorber (see Rear Shock Absorber Removal in the Suspension chapter)
  - Rear Fender Front (see Rear Fender Removal in the Frame chapter)
  - Rear Fender Flap Front (see Rear Fender Flap Front Removal in the Frame chapter)
  - Igniter (see Igniter Removal in the Electrical System chapter)
  - Bolt [A]

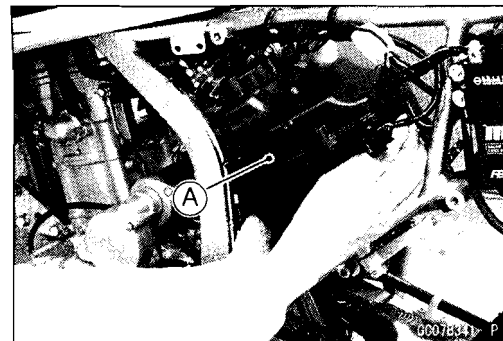


## Air Cleaner

- Remove:
  - Breather Hose [A]
  - Vacuum Switch Valve Hose (other than AU Models) [B]
  - Drain Hose [C]
- Loosen the muffler clamp bolt [D], and move the clamp forward.
- Loosen the air cleaner duct clamp screw [E].

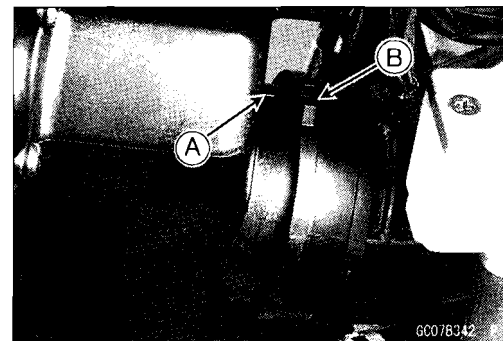


- Remove the air cleaner housing [A] from the left side of the motorcycle.



### **Air Cleaner Housing Installation**

- Fit the projection [A] of the air cleaner housing into the groove [B] of the air cleaner holder.
- Tighten the clamp screw.
- Run the removed hoses properly (see Cable, Wire and Hose Routing in the Appendix chapter).



## 3-24 FUEL SYSTEM

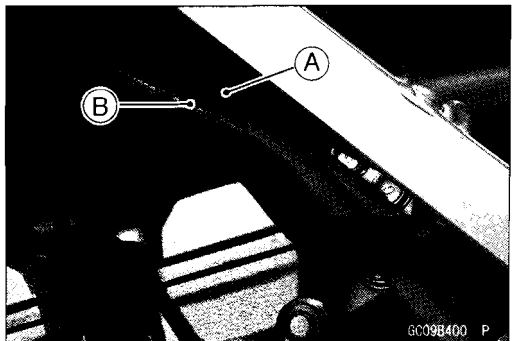
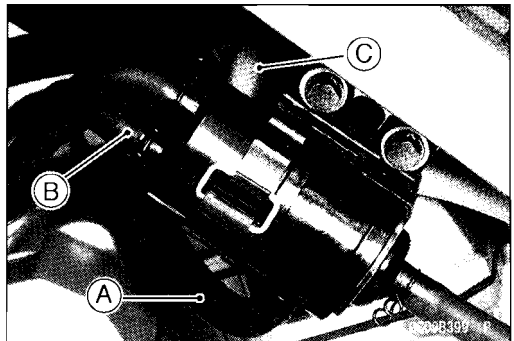
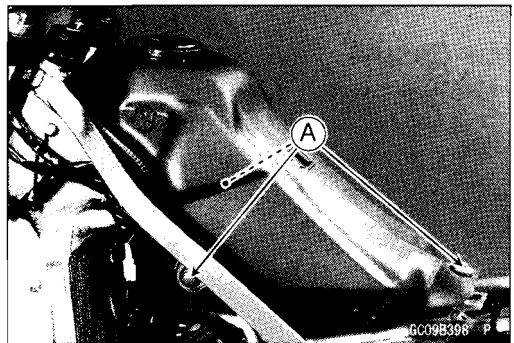
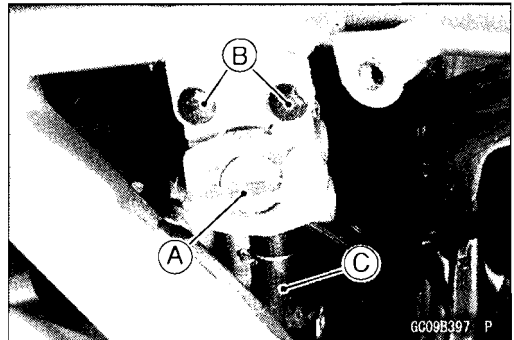
### Fuel Tank

#### Fuel Tank 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.

- Remove:
  - Seat (see Seat Removal in the Frame chapter)
  - Radiator Shroud (see Radiator Shroud Removal in the Frame chapter)
- Turn the fuel tap lever [A] to the OFF position.
- Remove:
  - Fuel Tap Bolts [B]
  - Fuel Hose (Fuel Tap to Carburetor) [C]
- Remove:
  - Fuel Tank Bolts [A]
- For the California model, remove the following.
  - Fuel Return Hose (rear side, red) [A]
  - Fuel Tank Breather Hose (front side, blue) [B]
  - Drain Hose [C]
- For the other than California model, remove the drain hose [A] and breather hose [B] from the fitting on the fuel tank.
- Remove the fuel tank together with the fuel tap connected.

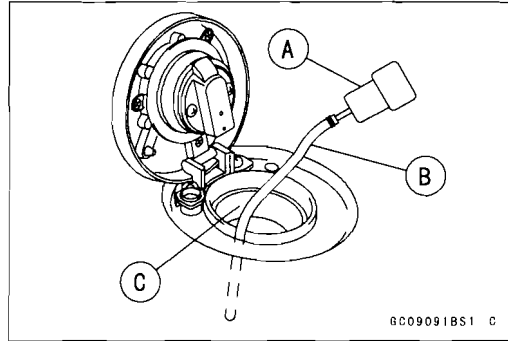


## Fuel Tank

- Draw the fuel out from the fuel tank with a commercially available pump [A].
- Use a soft plastic hose [B] as a pump inlet hose in order to insert the hose smoothly.
- Put the hose through the fill opening [C] into the tank and draw the fuel out.

### ⚠ WARNING

The fuel could not be removed completely from the fuel tank. Be careful for remained fuel spillage.



- For the California model, note the following.

### CAUTION

For the California model, if gasoline, solvent, water or any other liquid enters the canister, the canister's vapor absorbing capacity is greatly reduced. If the canister does become contaminated, replace it with a new one.

- Be sure to plug the evaporative fuel return hose to prevent fuel spilling before fuel tank removal.

### ⚠ WARNING

For the California model, be careful not to spill the gasoline through the return hose. Spilled fuel is hazardous.

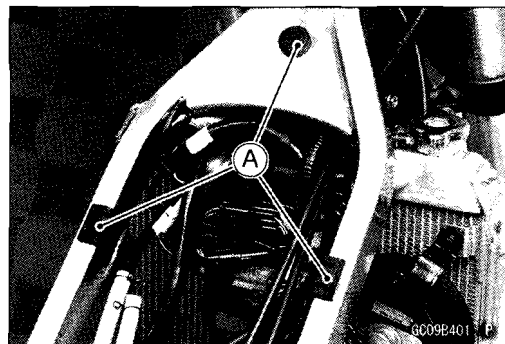
- ★ If liquid or gasoline flows into the breather hose, remove the hose and blow it clean with compressed air.
- Be careful of fuel spillage from the fuel tank since fuel still remains in the fuel tank and fuel pump.

### ⚠ WARNING

Store the fuel tank in an area which is well-ventilated and free from any source of flame or sparks. Do not smoke in this area. Place the fuel tank on a flat surface and plug the fuel pipes to prevent fuel leakage.

## Fuel Tank Installation

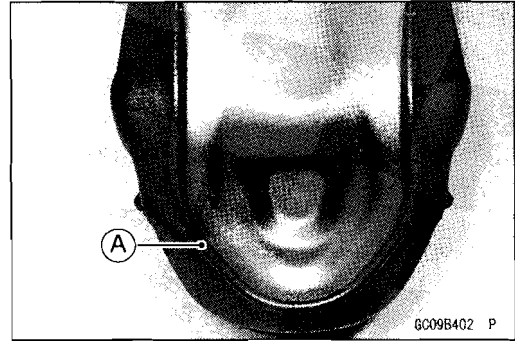
- Note the above WARNING (see Fuel Tank Removal).
- Route the hoses correctly (see Cable, Wire, and Hose Routing in the Appendix chapter).
- Check that the dampers [A] are in place on the frame and the fuel tank.
- ★ If the dampers are damaged or deteriorated, replace them.
- For the California model, note the following.
- To prevent the gasoline from flowing into or out of the canister, hold the separator perpendicular to the ground.
- Connect the hoses according to the Cable, Wire, and Hose Routing in the Appendix chapter. Make sure they do not get pinched or kinked.
- Route hoses with a minimum of bending so that the air or vapor will not be obstructed.



## 3-26 FUEL SYSTEM

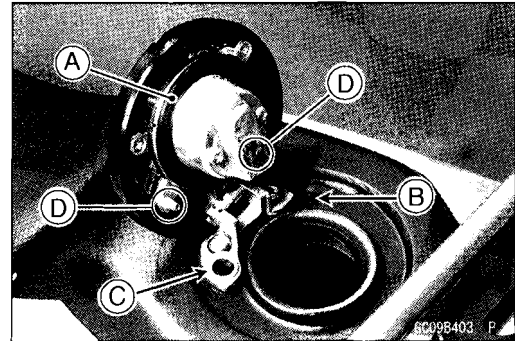
### Fuel Tank

- Be sure that the trim [A] is on the fuel tank as shown.
- Install the fuel tank.
- Be sure the hoses are clamped securely.
- Install the fuel tap.



### Fuel Tank Inspection

- Visually inspect the gasket [A] on the tank cap for any damage.
- ★ Replace the tank cap if gasket is damaged.
- Check to see if the water drain pipe [B] and fuel breather pipe [C] in the tank are not clogged. Check the tank cap breather also.
- ★ If they are clogged, remove the tank and drain it, and then blow the breather free with compressed air.



### CAUTION

Do not apply compressed air to the air vent holes [D] in the tank cap. This could cause damage and clogging of the labyrinth in the cap.

### Fuel Tank Cleaning

#### ⚠ WARNING

Clean the tank in a well-ventilated area, and take 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 low flash-point solvents to clean the tank.

- Remove the fuel tank and drain it (see Fuel Tank Removal).
- Pour some high-flash point solvent into the fuel tank and shake the tank to remove dirt and fuel deposits.
- Pour the solvent out of the tank.
- Remove the fuel tap (see Fuel Tap Removal).
- Clean the fuel tap filter screens in a high-flash point solvent.
- Dry the tank and the fuel tap with compressed air.
- Install the fuel tap (see Fuel Tap Installation).

### Fuel Tap Removal

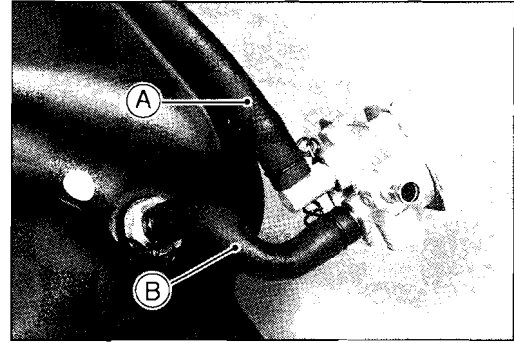
#### ⚠ WARNING

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.



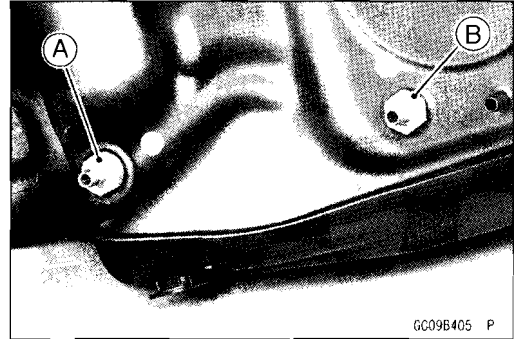
## Fuel Tank

- Remove the fuel tank and drain it (see Fuel Tank Removal).
- Disconnect:
  - Fuel Hose (primary) [A]
  - Fuel Hose (reserve) [B]

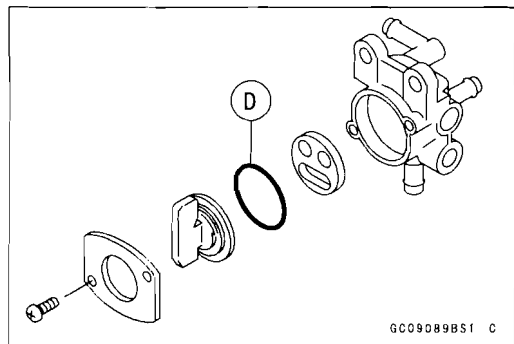
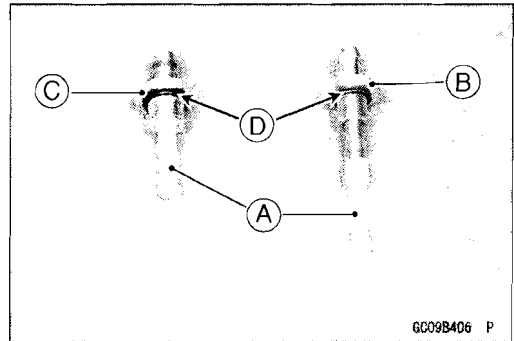


### Fuel Tap and Fuel Filter Inspection

- Remove the fuel tank, and drain the gasoline into a suitable container.
- Remove the fuel filters for reserve [A] and primary [B] from the fuel tank.



- Visually inspect the fuel screens [A] on the fuel filter.
  - [B] for Primary
  - [C] for reserve
- ★ If the fillers are damaged or deteriorated, replace them.
- Inspect fuel taps at the respective switch positions.
- ★ If the fuel tap leaks, or allows fuel to flow when it is at OFF position, replace the O-rings [D] with a new one.



## 3-28 FUEL SYSTEM

### Evaporative Emission Control System (CAL Model)

The Evaporative Emission Control System routes fuel vapors from the fuel system into the running engine or stores the vapors in a canister when the engine is stopped. Although no adjustments are required, a thorough visual inspection must be made at the intervals specified by the Periodic Maintenance Chart.

#### **Parts Removal/Installation**

#### **⚠ WARNING**

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

#### **CAUTION**

If gasoline, solvent, water or any other liquid enters the canister, the canister's vapor absorbing capacity is greatly reduced. If the canister does become contaminated, replace it with a new one.

- To prevent the gasoline from flowing into or out of the canister, hold the separator perpendicular to the ground.
- Connect the hoses according to the see Cable, Wire, and Hose Routing section in the Appendix chapter. Make sure they do not get pinched or kinked.

#### **Hose Inspection**

- Refer to the Evaporative Emission Control System Inspection in the Periodic Maintenance chapter.

#### **Separator Inspection**

- Refer to the Evaporative Emission Control System Inspection in the Periodic Maintenance chapter.



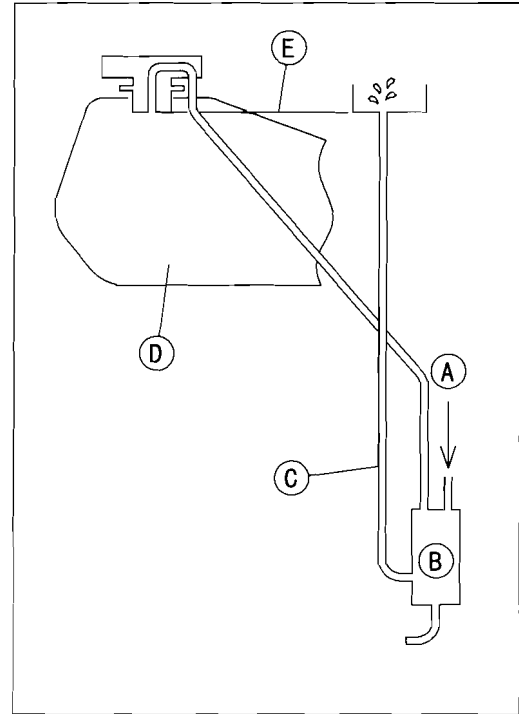
## Evaporative Emission Control System (CAL Model)

### Separator Operation Test

#### **⚠ WARNING**

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

- Connect the hoses to the separator, and install the separator on the motorcycle.
- Disconnect the breather hose from the separator, and inject about 20 mL (0.68 US oz.) of gasoline [A] into the separator [B] through the hose fitting.
- Disconnect the fuel return hose [C] from the fuel tank [D].
- Run the open end of the return hose into the container and hold it level with the tank top [E].
- Start the engine, and let it idle.
- ★ If the gasoline in the separator comes out of the hose, the separator works well. If it does not, replace the separator with a new one.



### Canister Inspection

- Refer to the Evaporative Emission Control System Inspection in the Periodic Maintenance chapter.

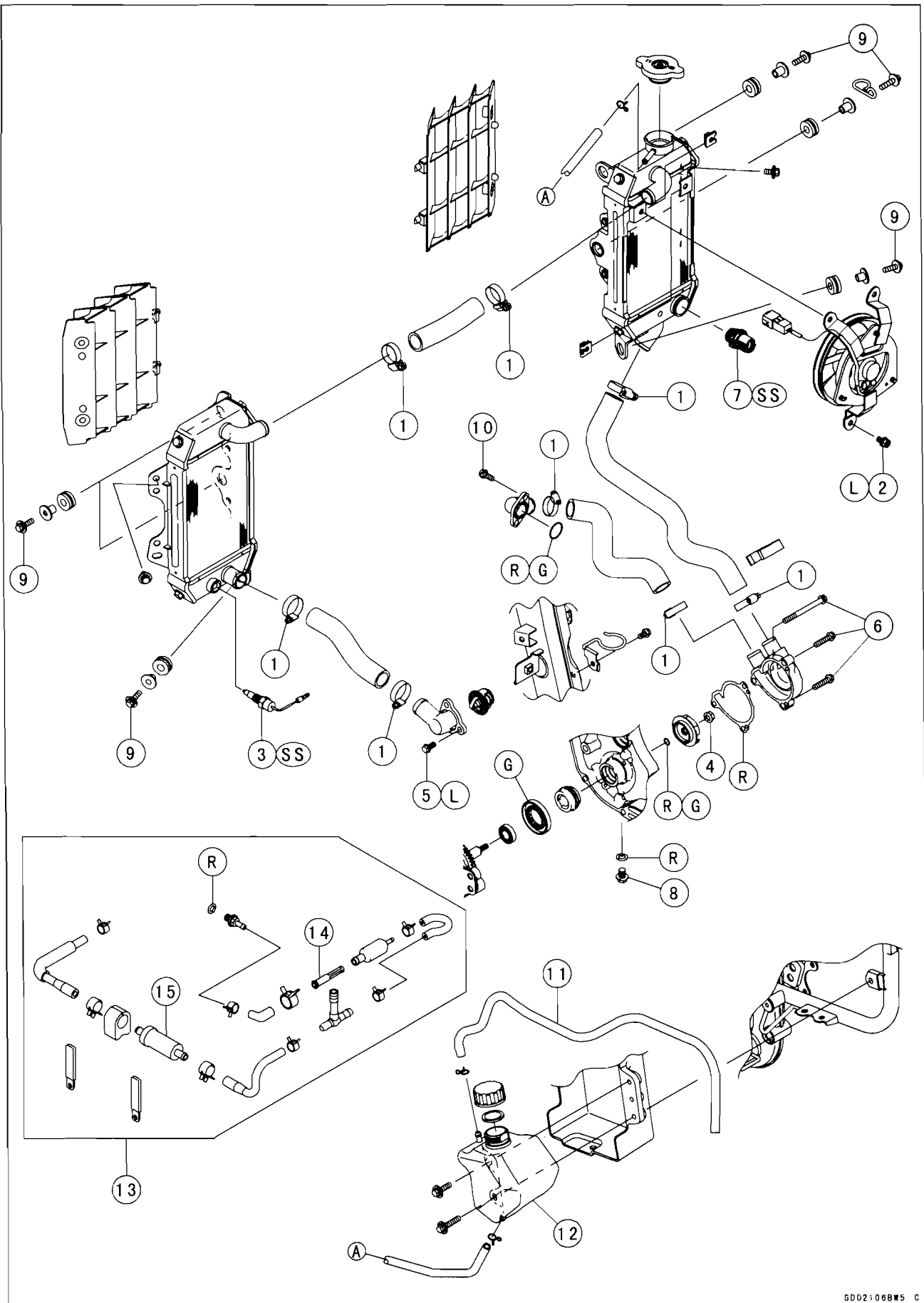
# Cooling System

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## 4-2 COOLING SYSTEM

### Exploded View



## Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Radiator Hose Clamp Screws	1.5	0.15	13 in·lb	
2	Radiator Fan Bolts	7.0	0.71	62 in·lb	L
3	Water Temperature Warning Light Switch	7.5	0.76	66 in·lb	SS
4	Water Pump Impeller Nut	7.8	0.80	69 in·lb	
5	Thermostat Housing Bolts	9.8	1.0	87 in·lb	L
6	Water Pump Cover Bolts	9.8	1.0	87 in·lb	
7	Radiator Fan Switch	23.5	2.4	17	SS
8	Coolant Drain Plug	25	2.5	18	
9	Radiator Bolts	6.9	0.70	61 in·lb	
10	Water Hose Fitting Bolts	9.8	1.0	87 in·lb	

11. Coolant Overflow Hose

12. Reserve Tank

13. AU Model

14. Coolant Filter

15. Coolant Valve

G: Apply grease.

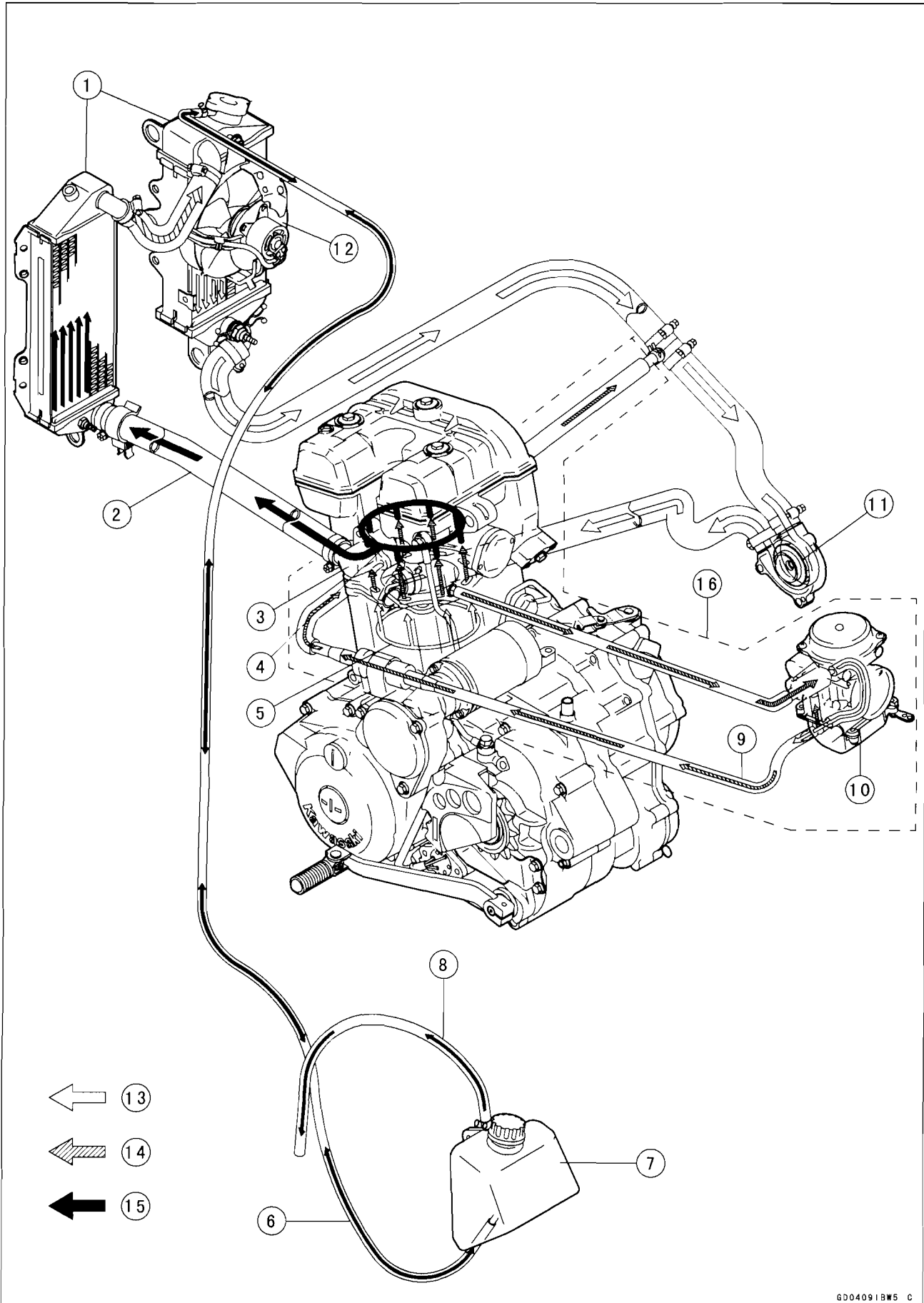
L: Apply a non-permanent locking agent.

R: Replacement Parts

SS: Apply Silicone Sealant (Kawasaki Bond: 56019-120).

## 4-4 COOLING SYSTEM

### Coolant Flow Chart



## Coolant Flow Chart

1. Radiators
2. Radiator Hose
3. Thermostat
4. Cylinder Head Jacket
5. Cylinder Jacket
6. Reserve Tank Hose
7. Reserve Tank
8. Reserve Tank Over Flow Hose
9. Water Hose
10. Carburetor
11. Water Pump
12. Radiator Fans
13. Cold Coolant
14. Warm Coolant
15. Hot Coolant
16. AU Model

Permanent type antifreeze (for aluminum radiators) is used as a coolant to protect the cooling system from rust and corrosion. When the engine starts, the water pump (coupled with the oil pump) turns and the coolant circulates.

The thermostat is a wax pellet type which opens or closes as coolant temperature changes. The thermostat continuously changes its valve opening to keep the coolant temperature at the proper level. When coolant temperature is below 69.5 ~ 72.5°C (157 ~ 163°F), the thermostat closes so that the coolant flow is restricted through the air bleeder hole, causing the engine to warm up more quickly. When coolant temperature is more than 69.5 ~ 72.5 °C (157 ~ 163°F), the thermostat opens and the coolant flows.

When the coolant temperature goes up beyond 95 ~ 101 °C (203 ~ 214°F), the radiator fan switch conducts to operate the radiator fan. The radiator fan draws air through the radiator core when there is not sufficient air flow such as at low speeds. This increases up the cooling action of the radiator. When the temperature is below 87°C (189°F), the fan switch opens and the radiator fan stops.

In this way, this system controls the engine temperature within narrow limits where the engine operates most efficiently even if the engine load varies.

The system is pressurized by the radiator cap to suppress boiling and the resultant air bubbles which can cause engine overheating. As the engine warms up, the coolant in the radiator and the water jacket expands. The excess coolant flows through the radiator cap and hose to the reserve tank to be stored there temporarily. Conversely, as the engine cools down, the coolant in the radiator and the water jacket contracts, and the stored coolant flows back to the radiator from the reserve tank.

The radiator cap has two functions: One is a pressure valve which holds the pressure in the system when the engine is running. When the pressure exceeds 93 ~ 123 kPa (0.95 ~ 1.25 kgf/cm<sup>2</sup>, 13 ~ 18 psi), the pressure valve opens and releases the pressure to the reserve tank. As soon as pressure escapes, the valve closes, and keeps the pressure at 93 ~ 123 kPa (0.95 ~ 1.25 kgf/cm<sup>2</sup>, 13 ~ 18 psi). When the engine cools down, another small valve (vacuum valve) in the cap opens. As the coolant cools, the coolant contracts to form a vacuum in the system. The vacuum valve opens and allows the coolant from the reserve tank to enter the radiator.

## 4-6 COOLING SYSTEM

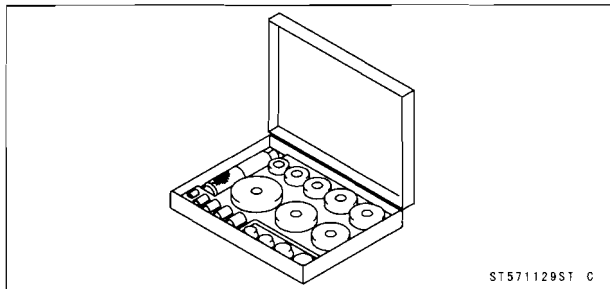
### Specifications

Fastener	Standard
<b>Coolant</b>	
Type (Recommended)	Permanent Type of Antifreeze (Ethylene glycol plus corrosion and rust inhibitor chemicals for aluminum engines and radiators)
Color	Green
Mixed Ratio	Soft water 50% and coolant 50%
Freezing Point	-35°C (-31°F)
Total Amount	1.3 L (1.4 US qt) (reserve tank full level including radiator and engine)
<b>Radiator Cap</b>	
Relief Pressure	93 ~ 123 kPa (0.95 ~ 1.25 kgf/cm <sup>2</sup> , 13.5 ~ 17.8 psi)
<b>Thermostat</b>	
Valve Opening Temperature	69.5 ~ 72.5 °C (157 ~ 163 °F)
Valve Full Opening Lift	3 mm (0.12 in) or more at 85 °C (185 °F)

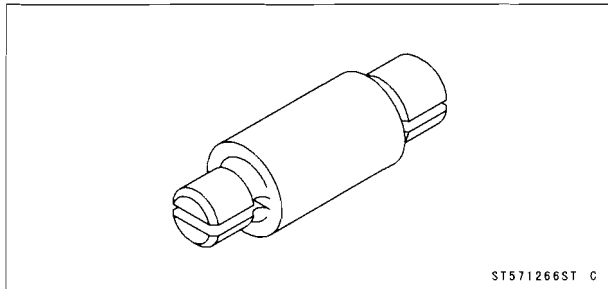


### Special Tools and Sealant

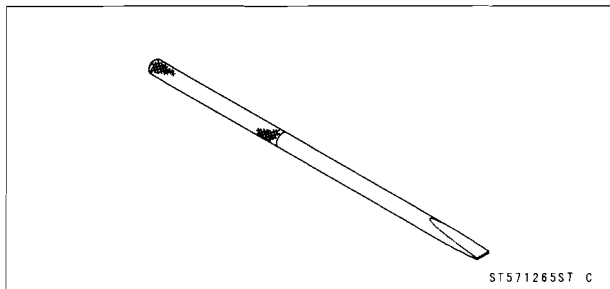
**Bearing Driver Set:**  
**57001-1129**



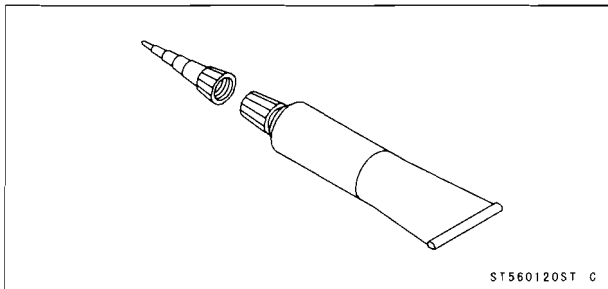
**Bearing Remover Head  $\phi 10 \times \phi 12$ :**  
**57001-1266**



**Bearing Remover Shaft:**  
**57001-1265**



**Kawasaki Bond (Silicone Sealant):**  
**56019-120**

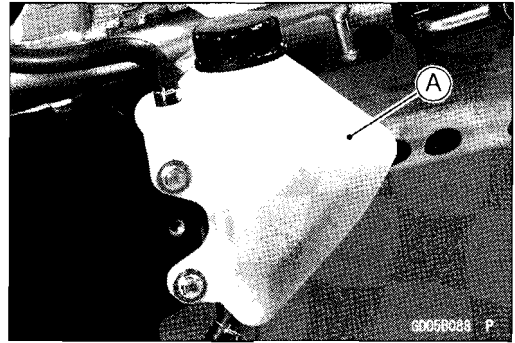


## 4-8 COOLING SYSTEM

### Coolant

#### Coolant Deterioration Inspection

- Remove the left side cover (see Side Cover Removal in the Frame chapter).
- Visually inspect the coolant in the reserve tank [A].
- ★ If whitish cotton-like wafts are observed, aluminum parts in the cooling system are corroded. If the coolant is brown, iron 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 Level Inspection

- Refer to the Coolant Level Inspection in the Periodic Maintenance chapter.

#### Coolant Draining

- Refer to the Coolant Change in the Periodic Maintenance chapter.

#### Coolant Filling

- Refer to the Coolant Change in the Periodic Maintenance chapter.

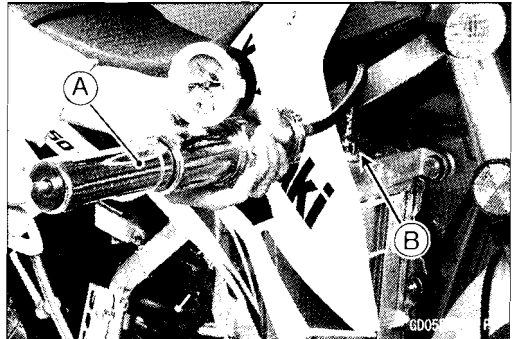
#### Pressure Testing

- Remove the radiator cap (see Coolant Change in the Periodic Maintenance chapter), and install a cooling system pressure tester [A] on the filler neck [B].

#### NOTE

○Wet the 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 kgf/cm<sup>2</sup>, 18 psi).



#### CAUTION

**During pressure testing, do not exceed the pressure for which the system is designed. The maximum pressure is 123 kPa (1.25 kgf/cm<sup>2</sup>, 18 psi).**

- Watch the gauge for at least 6 seconds.
- ★ If the pressure holds steady, the system is all right.
- ★ If the pressure drops and no external source is found, check for internal leaks. Droplets in the engine oil indicate internal leakage. Check the cylinder head gasket and the water pump.
- Remove the pressure tester, replenish the coolant, and install the radiator cap.

## Coolant

### 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 coolant (see Coolant Change in the Periodic Maintenance chapter).
- Fill the cooling system with fresh water mixed with a flushing compound.

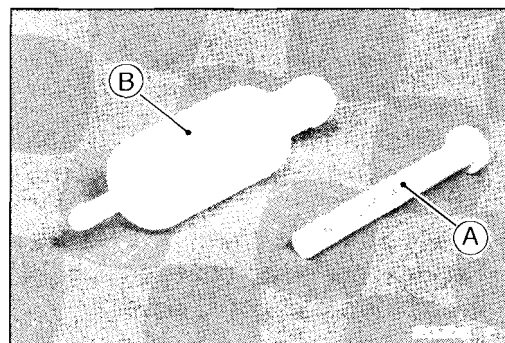
#### CAUTION

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

- Warm up the engine, and run it at normal operating temperature for about 10 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 Coolant Change in the Periodic Maintenance chapter).

### Coolant Filter Cleaning (AU Model)

- Before winter season starts, clean the coolant filter [A] in the carburetor system.
- Drain the coolant (see Coolant Change in the Periodic Maintenance chapter).
- Remove the coolant filter case [B] and filter from the water hoses in the carburetor system.
- Blow dirt and sediment off the filter with compressed air.



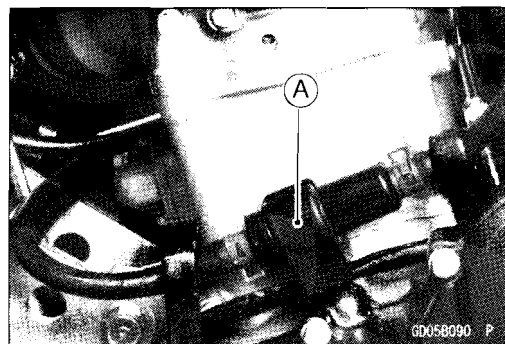
### Coolant Valve Inspection (AU Model)

- Drain the coolant (see Coolant Change in the Periodic Maintenance chapter).
- Remove the coolant valve [A].
- Visually inspect the valve.
- ★ If the valve is closed, replace the valve with a new one.
- To check valve opening, just blow through the valve.

#### Valve Closing Temperature (Reference)

**Standard: 68 ~ 72°C (154° ~ 162°F) @Water pressure 24.5 kpa (0.25 kgf/cm², 3.6 psi)**

- Install the valve (see Cable, Wire and Hose Routing in the Appendix chapter).

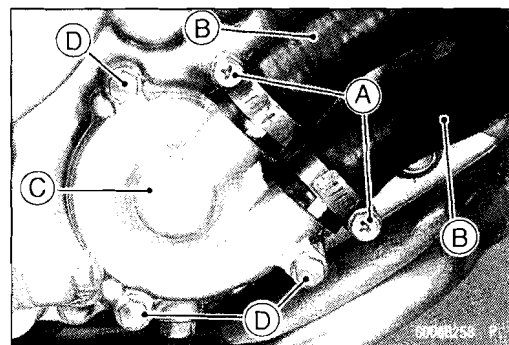


## 4-10 COOLING SYSTEM

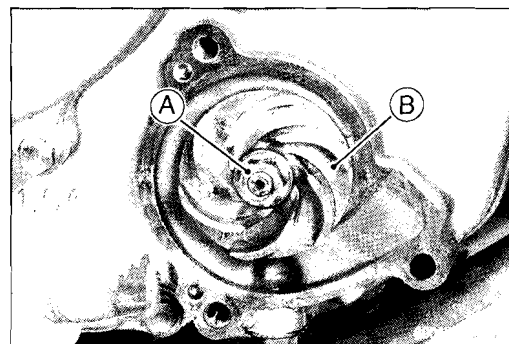
### Water Pump

#### Water Pump Removal

- Drain the coolant (see Coolant Change in the Periodic Maintenance chapter).
- Loosen the clamp screws [A] fully.
- Disconnect the radiator hose [B] from the water pump cover [C].
- Remove:
  - Water Pump Cover Bolts [D]
  - Water Pump Cover



- Remove:
  - Impeller Nut [A]
  - Impeller [B]



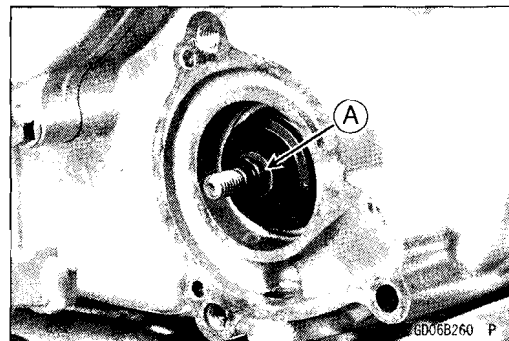
#### Water Pump Installation

- Install the new O-ring [A] on the water pump shaft.
- Install the impeller on the water pump shaft, and tighten the impeller nut.

**Torque - Water Pump Impeller Nut: 7.8 N·m (0.80 kgf·m, 69 in·lb)**

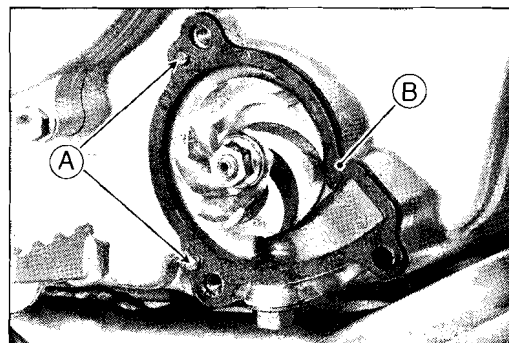
#### CAUTION

**In installing the impeller, take care so as not to damage the O-ring with threads of the water pump shaft.**



- Be sure that the dowel pins [A] are in position.
- Replace the pump cover gasket [B] with a new one, and install the water pump cover.

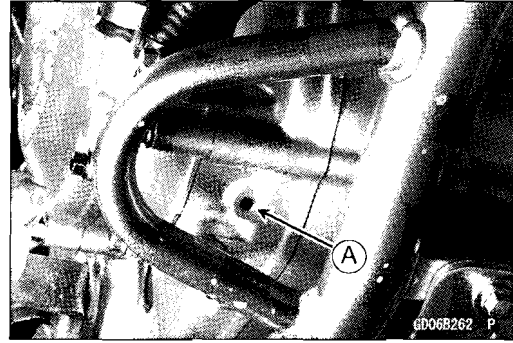
**Torque - Water Pump Cover Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)**



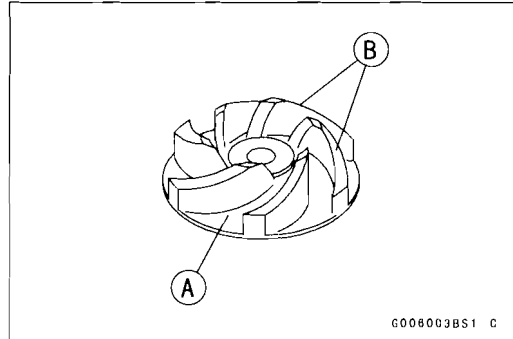
## Water Pump

### Water Pump Inspection

- Check the drainage outlet passage [A] at the bottom of the right engine cover for coolant leakage.
- ★ If the mechanical seal is damaged, the coolant leaks through the seal and drains through the passage. Replace the mechanical seal with a new one.

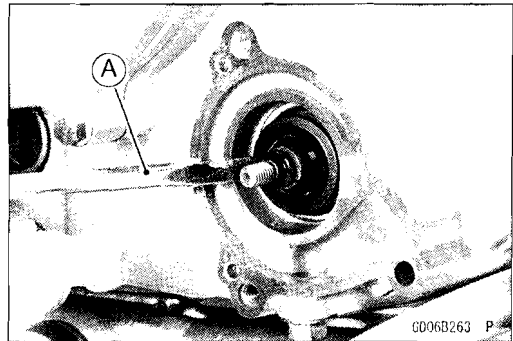


- Visually check the impeller [A].
- ★ If the surface is corroded, or if the blades [B] are damaged, replace the impeller.



### Mechanical Seal Replacement

- Remove the water pump impeller (see Water Pump Removal).
- Pry the mechanical seal flange off with a thin blade screw driver [A].
- Pull the mechanical seal out of the right crankcase with needle nose pliers, and replace it with a new one.



### CAUTION

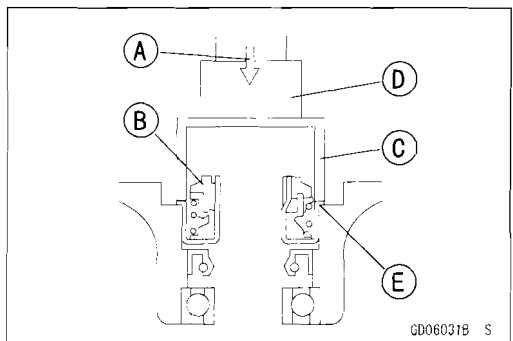
Take care so as not to damage inner seal surfaces of the water pump shaft and the right engine cover.

### NOTE

○ Since the mechanical seal replaced has an adhesive coated body, do not apply a liquid gasket to the exterior surface of the body.

- Press [A] the mechanical seal [B] by using a suitable tool [C] (inside diameter: 28 mm, outside diameter: 32 mm) and a bearing driver [D] until its flange touches the step [E] as shown in the figure.

**Special Tool - Bearing Driver Set: 57001-1129**





## 4-12 COOLING SYSTEM

### Water Pump

#### Ball Bearing, Oil Seal Replacement

★ Although a small quantity of coolant may leak from the mechanical seal until its sealing surface settles, if the leakage still continue, the damages on the seal and the ball bearing are considered. Replace the mechanical seal, ball bearing and oil seal.

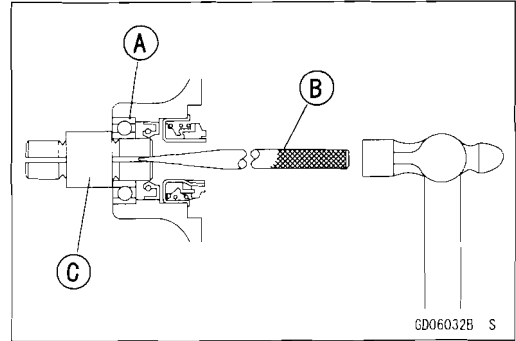
- Remove the right engine cover (see Right Engine Cover Removal in the Clutch chapter).
- Take the bearing [A] out of the right engine cover, using the bearing remover.

**Special Tools - Bearing Remover Shaft: 57001-1265 [B]**

**Bearing Remover Head,  $\phi 10 \times \phi 12$ : 57001-1266 [C]**

- Press out the mechanical seal [A] and oil seal [B] from the inside of the right engine cover with the bearing driver set [C].

**Special Tool - Bearing Driver Set: 57001-1129**



○ Be sure to replace the mechanical seal, oil seal, O-ring, and ball bearings with new ones because these parts will be damaged by removal.

- Apply plenty of high temperature grease to the oil seal lips.
- Apply oil to the outer circumference of the oil seal.
- Press the oil seal [A] into the hole from the outside of the right engine cover with the bearing driver set so that the spring side of the seal lips is toward the inside of the right engine cover.

**Special Tool - Bearing Driver Set: 57001-1129**

- Press in the oil seal so that the seal end is flush with the step [B] of the hole as shown.

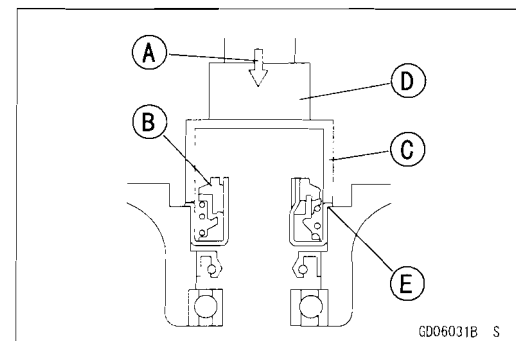
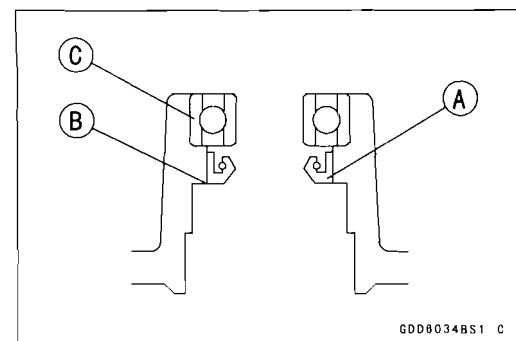
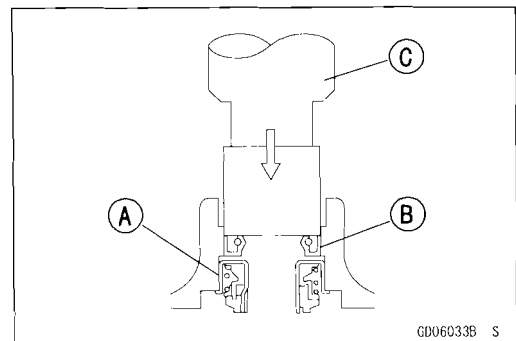
○ Use the bearing driver which has a larger diameter than the oil seal.

- Press in the ball bearing [C] with its manufacturer's mark facing out until it bottoms out.

- Press [A] the mechanical seal [B] by using a suitable tool [C] (inside diameter: 28 mm, outside diameter: 32 mm) and a bearing driver [D] until its flange touches the step [E] as shown in the figure.

- Install the water pump shaft from the inside of the right engine cover.

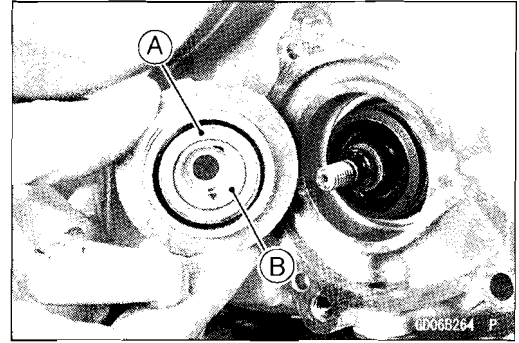
**Special Tool - Bearing Driver Set: 57001-1129**



## Water Pump

- Clean both sliding surfaces of a new mechanical seal with a high-flash point solvent (e.g. ethyl alcohol), 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 [A] and sealing seat [B], and press the rubber seal and sealing seat into the impeller by hand until the seat bottoms out.
- Install the new O-ring on the water pump shaft.
- Tighten:

**Torque - Water Pump Impeller Nut: 7.8 N·m (0.80 kgf·m, 69 in·lb)**



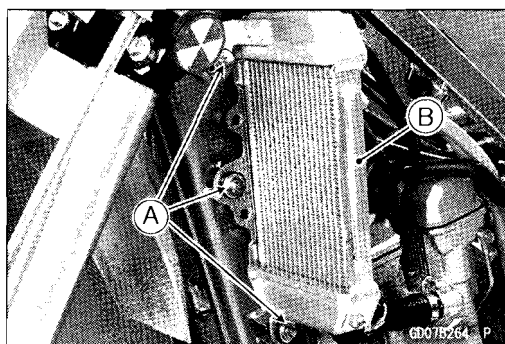
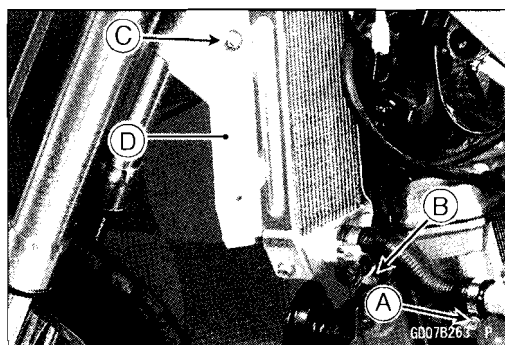
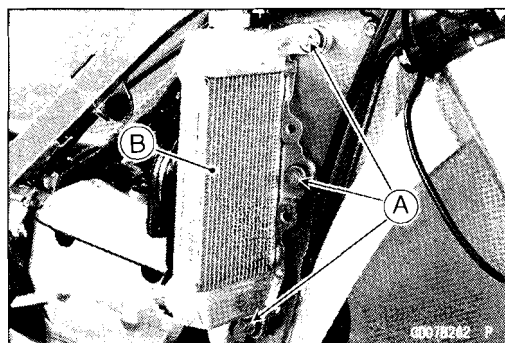
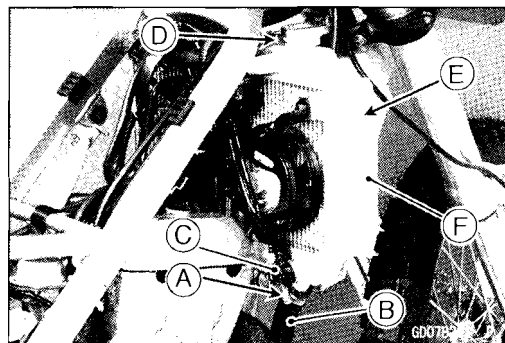
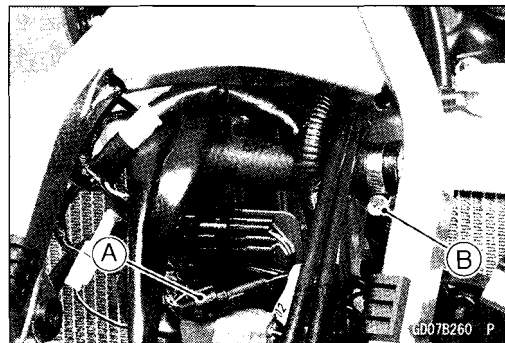


## 4-14 COOLING SYSTEM

### Radiators

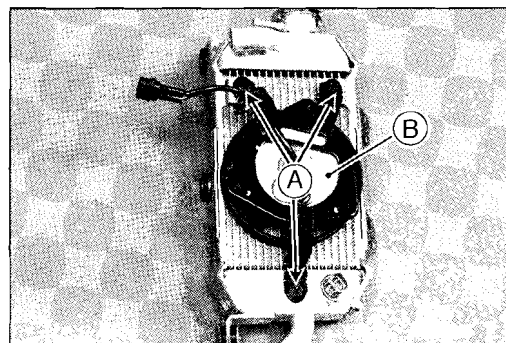
#### **Radiator Removal**

- Drain the coolant (see Coolant Change in the Periodic Maintenance chapter).
- Remove:
  - Radiator Shrouds (see Radiator Shroud Removal in the Frame chapter)
  - Fuel Tank (see Fuel Tank Removal in the Fuel System chapter)
  - Radiator Fan Connectors [A] (disconnect)
- Loosen the radiator hose clamp screw [B] fully.
- Loosen the radiator hose clamp screw [A] fully.
- Disconnect:
  - Radiator Hose [B]
  - Radiator Fan Switch Connector [C]
  - Reserve Tank Hose [D]
- Remove:
  - Right Screen Mounting Bolt [E]
  - Right Screen [F]
- Remove:
  - Radiator Mounting Bolts [A]
  - Right Radiator [B]
- Loosen the radiator hose clamp screw [A] fully.
- Remove:
  - Water Temperature Warning Light Switch Lead Connector [B] (disconnect)
  - Left Screen Mounting Bolt [C]
  - Left Screen [D]
- Remove:
  - Radiator Mounting Bolts [A]
  - Left Radiator [B]



## Radiators

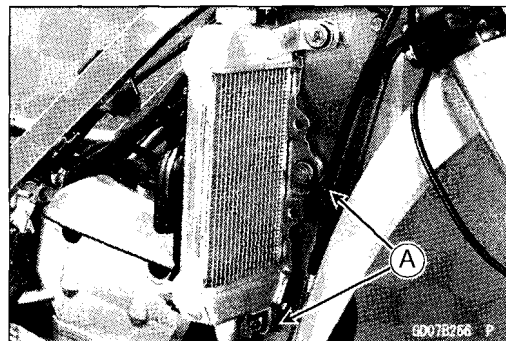
- Remove:
  - Radiator Fan Bolts [A]
  - Radiator Fan [B]



### Radiator Installation

- Hold the clutch cable with the clamps [A].
- Run the radiator hose and reserve tank hose correctly (see Cable, Wire and Hose Routing in the Appendix chapter).

**Torque - Radiator Bolts:** 6.9 N·m (0.70 kgf·m, 61 in·lb)



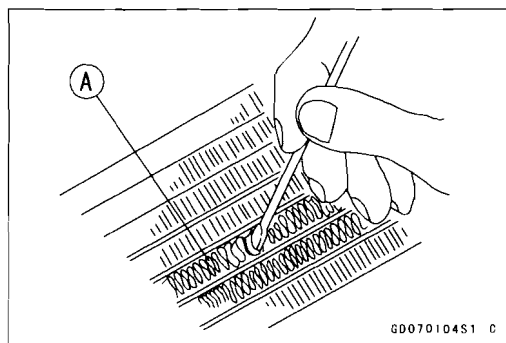
### Radiator Inspection

- Check for radiator core clogging and bent fins [A].
- ★ Correct bent fins, if any, with a flat blade screw driver.

#### CAUTION

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

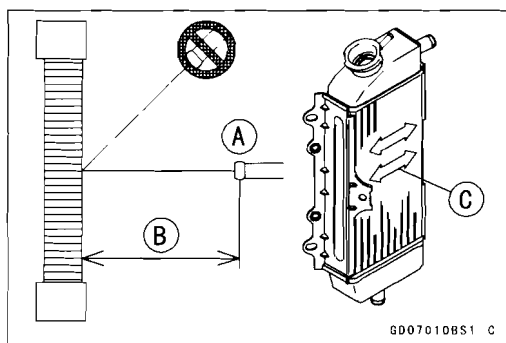
- ★ If the radiator core are blocked more than 20% by unremovable obstructions or irreparably deformed fins, replace the radiator with a new one.



#### CAUTION

**When cleaning the radiator with a steam cleaner, be careful of the followings:**

- Keep the steam gun [A] away more than 50 cm [B] from the radiator core.
- Hold the steam gun perpendicular to the core surface.
- When you move the nozzle in cleaning, move it parallel to the fins [C]. (never move it at right angles to the fins)

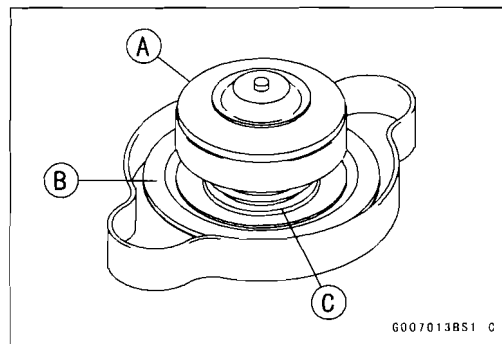


## 4-16 COOLING SYSTEM

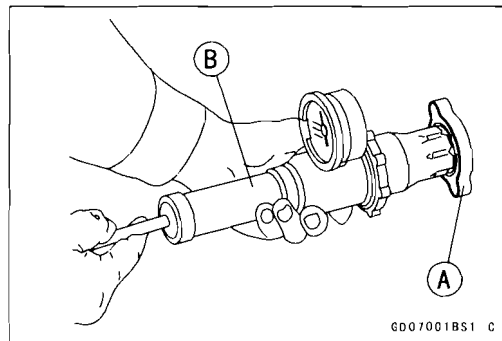
### Radiators

#### **Radiator Cap Inspection**

- Remove the radiator cap.
- Visually inspect the condition of the bottom [A] and top [B] of the valve seals and valve spring [C].
- ★ If they show any damage, replace the cap with a new one.



- Install the cap [A] on a pressure tester [B], and check the relief pressure.
- Apply water or coolant to both seal surfaces of the cap so that pressure is not released.
- Watching the pressure gauge, pump the pressure tester to build up the pressure. The relief valve must open within the specified range and the gauge hand must remain within the same range at least 6 seconds.



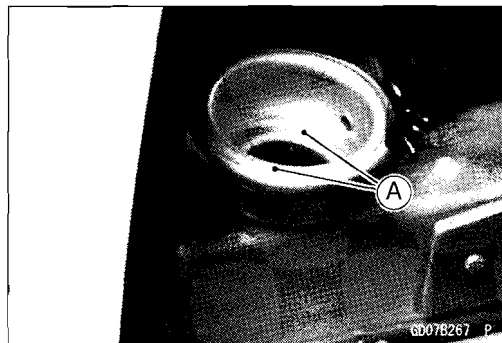
#### **Relief Pressure**

Standard: 93 ~ 123 kPa (0.95 ~ 1.25 kgf/cm<sup>2</sup>, 13.5 ~ 17.8 psi)

- ★ If the cap cannot hold the pressure within the specified range for 6 seconds, or if the relief pressure is too high or too low, replace the cap with a new one.

#### **Radiator Filler Neck Inspection**

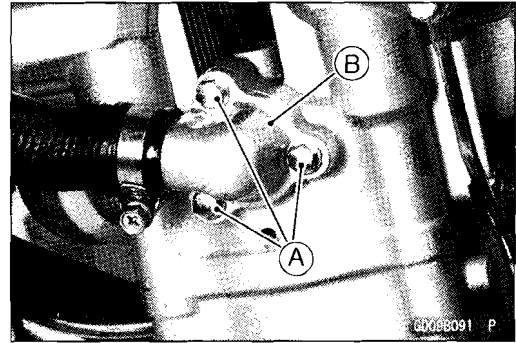
- Remove the radiator cap.
- Visually inspect the radiator filler neck for signs of damage.
- Check the condition of the top and bottom seal surfaces [A] in the filler neck. They must be smooth and clean for the radiator cap to function properly.



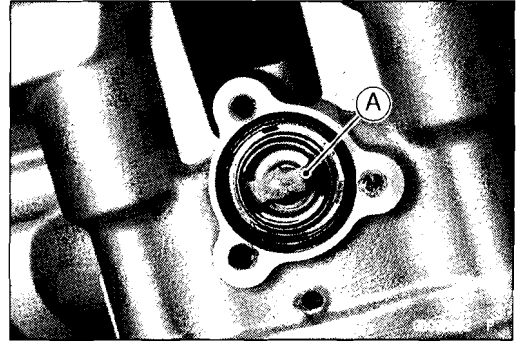
## Thermostat

### Thermostat Removal

- Drain the coolant (see Coolant Change in the Periodic Maintenance chapter).
- Remove:
  - Thermostat Housing Bolts [A]
  - Thermostat Housing [B]



- Take off the thermostat [A] from the cylinder head.

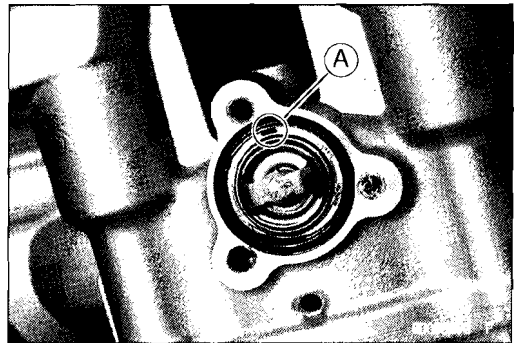


### Thermostat Installation

- Install the thermostat in the cylinder head so that the air bleeder hole [A] is on top.
- Apply a non-permanent locking agent to the threads of the thermostat housing bolts.
- Tighten:

**Torque - Thermostat Housing Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)**

- Fill the coolant (see Coolant Change in the Periodic Maintenance chapter).



### 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 [A] and an thermometer [B] in a container of water with the heat-sensitive portions [C] in almost the same depth.

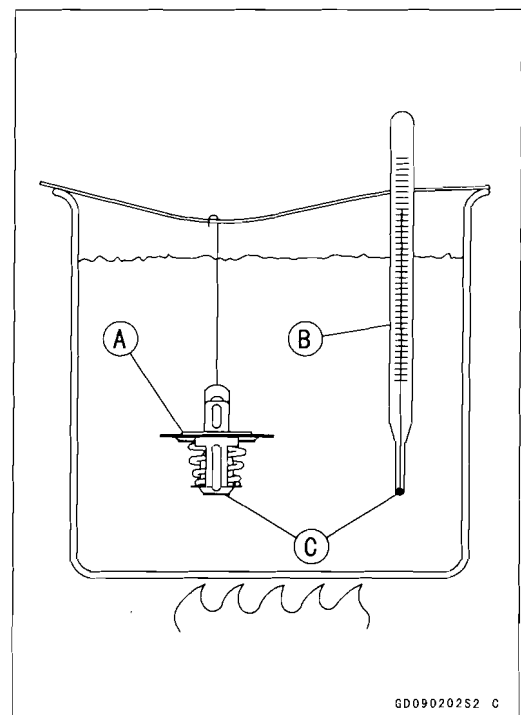
#### NOTE

○ The thermostat must be completely submerged and must not touch the container sides or bottom.

- Gradually raise the temperature of the water while stirring the water gently for even temperature.

**Thermostat Valve Opening Temperature**  
69.5 °C ~ 72.5 °C (157 ~ 163°F)

- ★ If the measurement is out of the range, replace the thermostat.



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## 4-18 COOLING SYSTEM

### Hose and Pipes

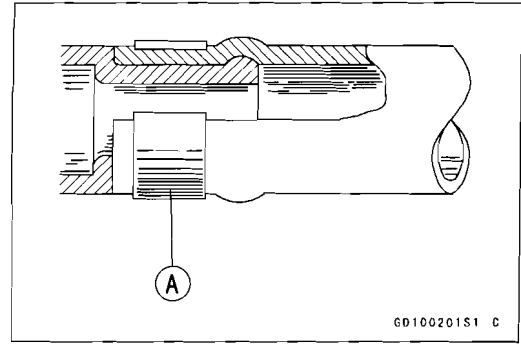
#### **Hose Installation**

- Install the hoses, being careful to follow bending direction. Avoid sharp bending, kinking, flattening or twisting.
- Run the hoses (see Cable, Wire, and Hose Routing section in the Appendix chapter).
- Install the clamp [A] as near as possible to the hose end to clear the raised rib of the fitting. This will prevent the hoses from working loose.
- The clamp screws should be positioned correctly to prevent the clamps from contacting the other parts.
- Tighten:

**Torque - Radiator Hose Clamp Screws: 1.5 N·m (0.15 kgf·m, 13 in·lb)**

#### **Hose Inspection**

- Refer to the Radiator Hose Damage and Installation Condition Inspection in the Periodic Maintenance chapter.

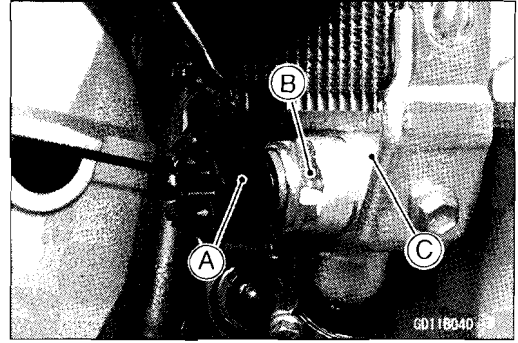




## Radiator Fan Switch/Water Temperature Warning Light Switch

### Radiator Fan Switch/Water Temperature Warning Light Switch Removal

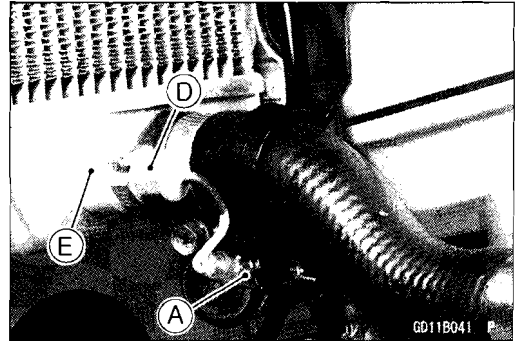
- Drain the coolant (see Coolant Change in the Periodic Maintenance chapter).
- Disconnect the connector [A] from the switch.
- Remove the radiator fan switch [B] from the right radiator [C].



- Remove the water temperature warning light switch [D] from the left radiator [E].

### CAUTION

Never drop the radiator fan switch and water temperature warning light switch, especially on a hard surface. Such a shock to the parts can damage them.



### Radiator Fan Switch/Water Temperature Warning Light Switch Installation

- Apply silicone sealant to the threads of the switches, and install the radiator fan switch on the right radiator and the water temperature warning light switch on the left radiator respectively.

Sealant - Kawasaki Bond (Silicone Sealant): 56019-120

Torque - Radiator Fan Switch : 23.5 N·m (2.4 kgf·m, 17 ft·lb)  
 Water Temperature Warning Light Switch: 7.5 N·m  
 (0.75 kgf·m, 66 in·lb)

- Fill the coolant (see Coolant Change in the Periodic Maintenance chapter).

### Radiator Fan Switch Inspection

- Refer to the Radiator Fan Switch Inspection in the Electrical System chapter.

### Water Temperature Warning Light Switch Inspection

- Refer to the Water Temperature Warning Light Switch Inspection in the Electrical System chapter.

# Engine Top End

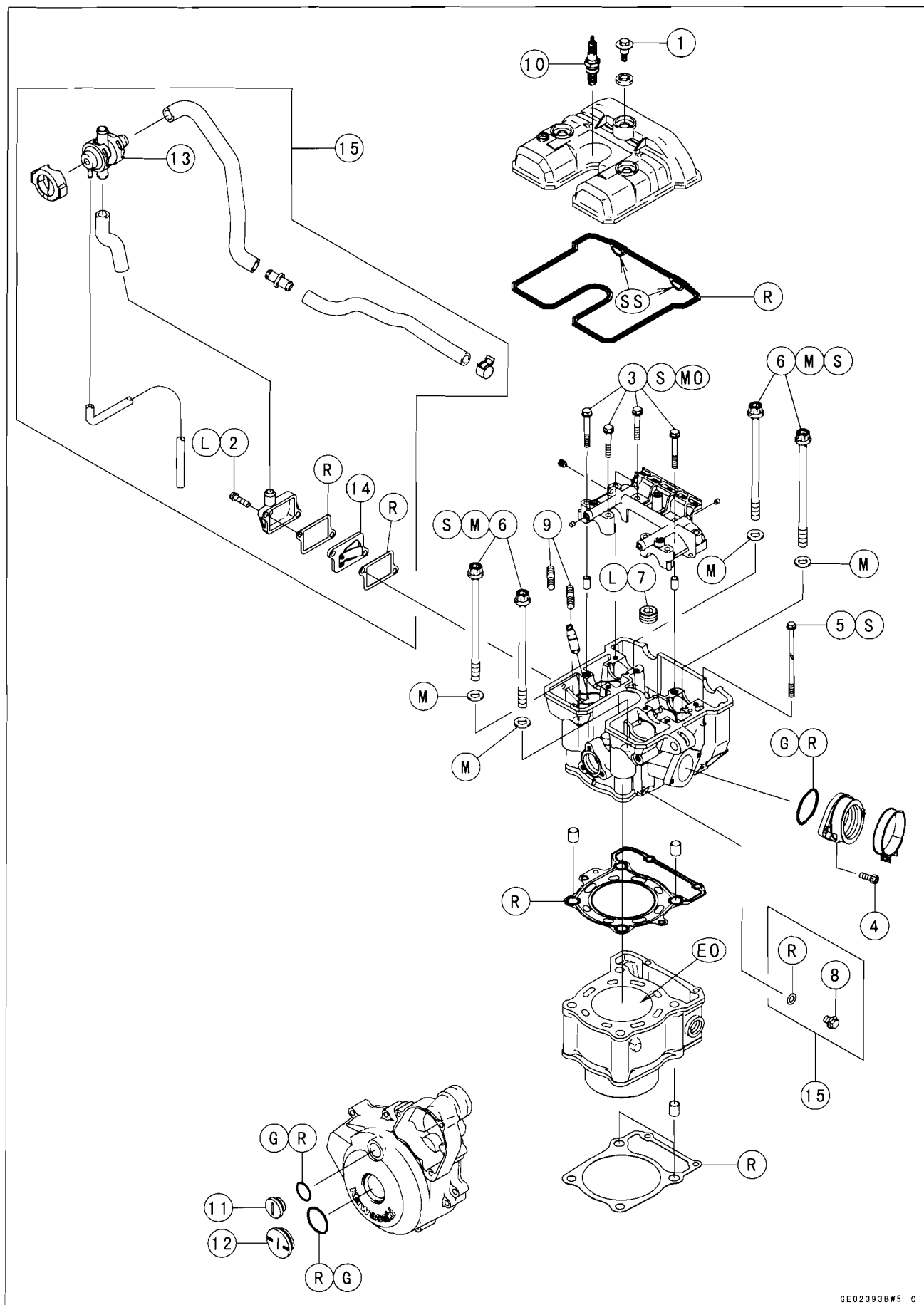
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## 5-2 ENGINE TOP END

### Exploded View



GE02393BW5 C

**Exploded View**

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Cylinder Head Cover Bolts	7.8	0.80	69 in·lb	
2	Air Suction Valve Cover Bolts	9.8	1.0	87 in·lb	L
3	Camshaft Cap Bolts	12	1.2	106 in·lb	S
4	Carburetor Holder Bolts	12	1.2	106 in·lb	
5	Cylinder Head Bolts (M6)	12	1.2	106 in·lb	S
6	Cylinder Head Bolts (M10) (First)	15	1.5	11	M, S
	Cylinder Head Bolts (M10) (Final)	46	4.7	34	M, S
7	Plug	20	2.0	15	L
8	Cylinder Head Coolant Drain Plug	25	2.5	18	
9	Exhaust Pipe Holder Stud Bolts	25	2.5	18	
10	Spark Plug	13	1.3	115 in·lb	
11	Timing Inspection Cap	2.3	0.23	20 in·lb	
12	Alternator Rotor Bolt Cap	2.3	0.23	20 in·lb	

13. Vacuum Switch Valve

14. Air Suction Valve

15. Other than AU Model

EO: Apply engine oil.

G: Apply grease.

L: Apply a non-permanent locking agent.

M: Apply molybdenum disulfide grease.

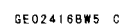
MO: Apply molybdenum disulfide oil. (mixture of engine oil and molybdenum disulfide grease in a weight ration is 10 : 1)

R: Replacement Parts

S: Follow the specified tightening sequence.

SS: Apply silicone sealant.

### Exploded View



**Exploded View**

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Camshaft Sprocket Bolts	9.8	1.0	87 in·lb	L
2	Camshaft Chain Tensioner Bolts	9.8	1.0	87 in·lb	
3	Camshaft Chain Sub-tensioner Bolt	15	1.5	11	
4	Camshaft Chain Guide Bolt	25	2.5	18	
5	Camshaft Chain Guide Retaining Plate Bolt	9.8	1.0	87 in·lb	
6	Muffler Body Bolts (Front and Center)	30	3.0	22	
7	Muffler Body Bolt (Rear)	9.8	1.0	87 in·lb	S
8	Muffler Body Nut	30	3.0	22	S

9. Other than AU Model

EO: Apply engine oil.

L: Apply a non-permanent locking agent.

M: Apply molybdenum disulfide grease.

R: Replacement Parts

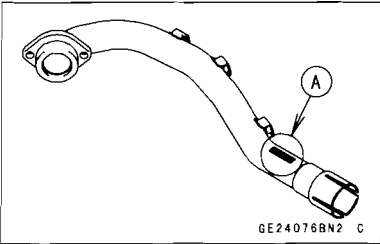
5-6 ENGINE TOP END

Exhaust System Identification

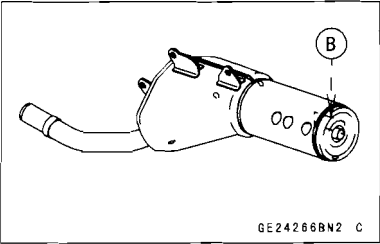
Exhaust Pipe	Muffler Body	SPECIFICATION	MARKETING CODE
<div>Non-Catalyst</div> <div>P/No. 18088-0415</div> <div>Mark : KHI E053</div>	<div>Pipe Type Catalyst</div> <div>P/No. 18091-0534</div> <div>Mark : —</div> <div>EPA Noise Emission Control Information</div>	US CAL CA PH MY	KLX250T9F Early Model KLX250T9FL Early Model KLX250T9F Early Model KLX250T9F Early Model KLX250T9F Early Model
<div>Non-Catalyst</div> <div>P/No. 18088-0512</div> <div>Mark : KHI E053</div>	<div>Pipe Type Catalyst</div> <div>P/No. 18091-0581</div> <div>Mark : —</div> <div>EPA Noise Emission Control Information</div>	US CAL CA PH MY  US CAL CA MY	KLX250T9F Late Model KLX250T9FL Late Model KLX250T9F Late Model KLX250T9F Late Model KLX250T9F Late Model  KLX250W9F KLX250W9FL KLX250W9F KLX250W9F
<div>Non-Catalyst</div> <div>P/No. 18088-0034</div> <div>Mark : KHI E033</div>	<div>Non-Catalyst</div> <div>P/No. 18091-0533</div> <div>Mark : KHI K 539</div>	AU	KLX250T9F

GE24317B F

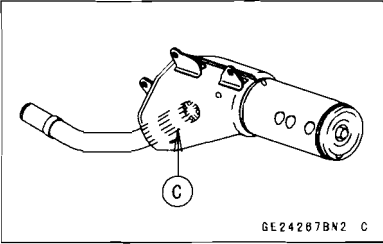
Exhaust Pipe Mark Position [A]



Muffler Body Mark Position [B]



Pipe Type Catalyst [C]



## Specifications

Fastener	Standard	Service Limit
<b>Clean Air system</b>		
Vacuum Switch Valve Closing Pressure	Open → Close 41.3 ~ 49.3 kPa (310 ~ 370 mmHg)	— — — — — —
<b>Camshaft</b>		
Cam Height:		
Exhaust	36.246 ~ 36.354 mm (1.4270 ~ 1.4312 in.)	36.15 mm (1.423 in.)
Inlet	36.246 ~ 36.354 mm (1.4270 ~ 1.4312 in.)	36.15 mm (1.423 in.)
Camshaft/Cap Clearance	0.020 ~ 0.062 mm (0.00079 ~ 0.0024 in.)	0.15 mm (0.0059 in.)
Camshaft Journal Diameter	22.959 ~ 22.980 mm (0.90390 ~ 0.90472 in.)	22.93 mm (0.9028 in.)
Camshaft Bearing Inside Diameter	23.000 ~ 23.021 mm (0.90551 ~ 0.90633 in.)	23.08 mm (0.9086 in.)
Camshaft Runout	TIR 0.03 mm (0.001 in.) or less	TIR 0.1 mm (0.004 in.)
<b>Cylinder Head</b>		
Cylinder Compression:		
Usable Range	660 ~ 1 030 kPa (6.7 ~ 10.5 kgf/cm <sup>2</sup> , 96 ~ 149 psi) @300 rpm	— — —
Cylinder Head Warp		0.05 mm (0.002 in.)
<b>Valve</b>		
Valve Clearance:		
Exhaust	0.15 ~ 0.24 mm (0.0059 ~ 0.0094 in.)	— — —
Inlet	0.10 ~ 0.19 mm (0.0039 ~ 0.0075 in.)	— — —
Valve Head Thickness:		
Exhaust	0.8 mm (0.03 in.)	0.5 mm (0.02 in.)
Inlet	0.5 mm (0.02 in.)	0.2 mm (0.008 in.)
Valve Stem Bend	TIR 0.01 mm (0.0004 in.) or less	TIR 0.05 mm (0.002 in.)
Valve Stem Diameter:		
Exhaust	4.455 ~ 4.470 mm (0.1754 ~ 0.1760 in.)	4.44 mm (0.175 in.)
Inlet	4.475 ~ 4.490 mm (0.1762 ~ 0.1768 in.)	4.46 mm (0.176 in.)
Valve Guide Inside Diameter:		
Exhaust	4.500 ~ 4.512 mm (0.1772 ~ 0.1776 in.)	4.58 mm (0.180 in.)
Inlet	4.500 ~ 4.512 mm (0.1772 ~ 0.1776 in.)	4.58 mm (0.180 in.)
Valve/Valve Guide Clearance (Wobble Method):		
Exhaust	0.08 ~ 0.15 mm (0.0031 ~ 0.0059 in.)	0.33 mm (0.013 in.)
Inlet	0.03 ~ 0.10 mm (0.0012 ~ 0.0039 in.)	0.28 mm (0.011 in.)
Valve Seat Cutting Angle	32°, 45°, 60°	— — —
Valve Seat Surface Outside Diameter:		
Exhaust	24.4 ~ 24.6 mm (0.961 ~ 0.968 in.)	— — —
Inlet	28.4 ~ 28.6 mm (1.118 ~ 1.126 in.)	— — —

## 5-8 ENGINE TOP END

### Specifications

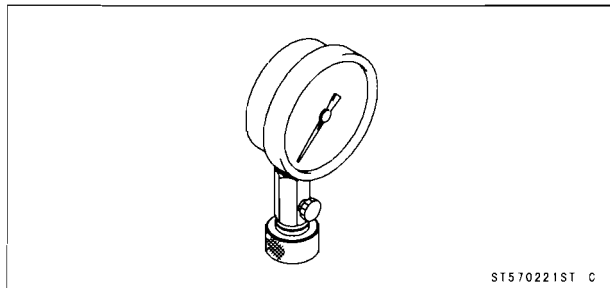
Fastener	Standard	Service Limit
Valve Seat Surface Width:		
Exhaust	0.5 ~ 1.0 mm (0.02 ~ 0.04 in.)	— — —
Inlet	0.5 ~ 1.0 mm (0.02 ~ 0.04 in.)	— — —
Valve Spring Free Length:		
Outer (EX, IN)	41.4 mm (1.63 in.)	39.6 mm (1.56 in.)
Inner (EX, IN)	36.5 mm (1.44 in.)	34.8 mm (1.37 in.)
<b>Cylinder, Piston</b>		
Cylinder Inside Diameter	72.000 ~ 72.012 mm (2.8346 ~ 2.8351 in.)	72.07 mm (2.837 in.)
Piston Outside Diameter	71.950 ~ 71.965 mm (2.8327 ~ 2.8333 in.)	71.80 mm (2.827 in.)
Piston/Cylinder Clearance	0.035 ~ 0.062 mm (0.0014 ~ 0.0024 in.)	— — —
Piston Ring/Groove Clearance:		
Top	0.03 ~ 0.07 mm (0.001 ~ 0.003 in.)	0.17 mm (0.0067 in.)
Second	0.03 ~ 0.07 mm (0.001 ~ 0.003 in.)	0.17 mm (0.0067 in.)
Piston Ring Groove Width:		
Top	1.02 ~ 1.04 mm (0.0402 ~ 0.0409 in.)	1.12 mm (0.0441 in.)
Second	1.02 ~ 1.04 mm (0.0402 ~ 0.0409 in.)	1.12 mm (0.0441 in.)
Oil	2.01 ~ 2.03 mm (0.0791 ~ 0.0799 in.)	2.11 mm (0.0831 in.)
Piston Ring Thickness:		
Top	0.97 ~ 0.99 mm (0.038 ~ 0.039 in.)	0.90 mm (0.035 in.)
Second	0.97 ~ 0.99 mm (0.038 ~ 0.039 in.)	0.90 mm (0.035 in.)
Piston Ring End Gap:		
Top	0.20 ~ 0.35 mm (0.0079 ~ 0.014 in.)	0.6 mm (0.02 in.)
Second	0.20 ~ 0.35 mm (0.0079 ~ 0.014 in.)	0.6 mm (0.02 in.)
Oil	0.20 ~ 0.70 mm (0.0079 ~ 0.028 in.)	1.0 mm (0.039 in.)

TIR: Total Indicator Reading of a Dial Gauge

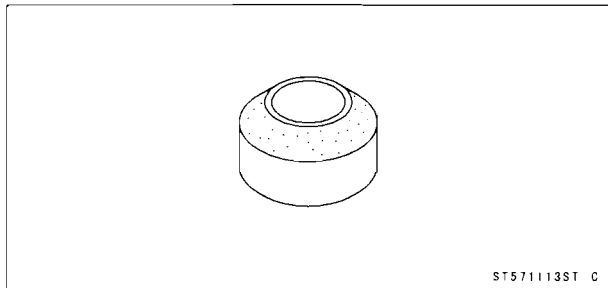


## Special Tools and Sealants

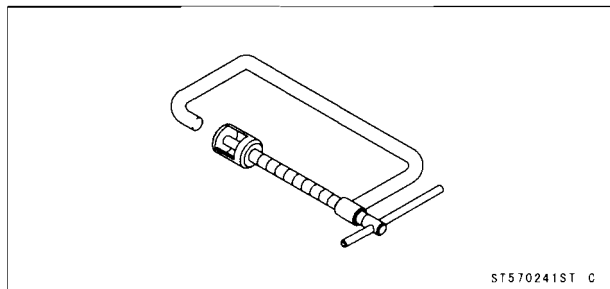
**Compression Gauge 20 kgf/cm<sup>2</sup>:  
57001-221**



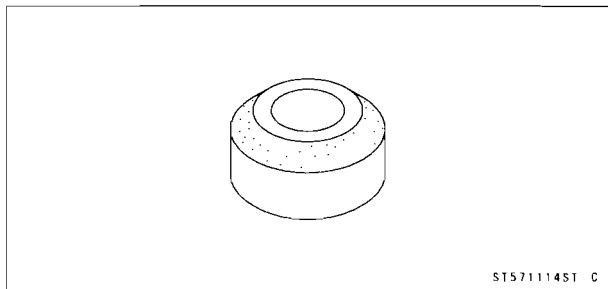
**Valve Seat Cutter 45° -  $\phi$ 24.5:  
57001-1113**



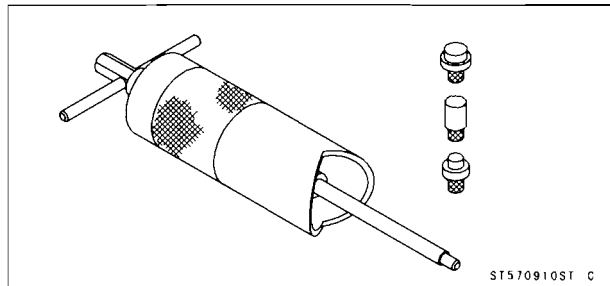
**Valve Spring Compressor Assembly:  
57001-241**



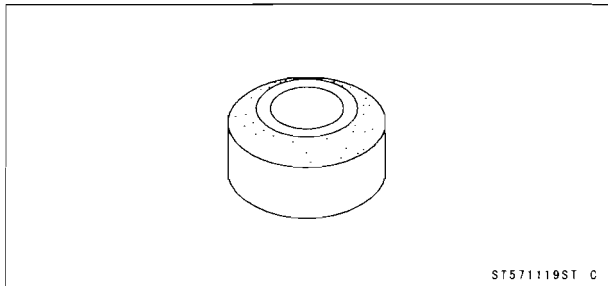
**Valve Seat Cutter 45° -  $\phi$ 27.5:  
57001-1114**



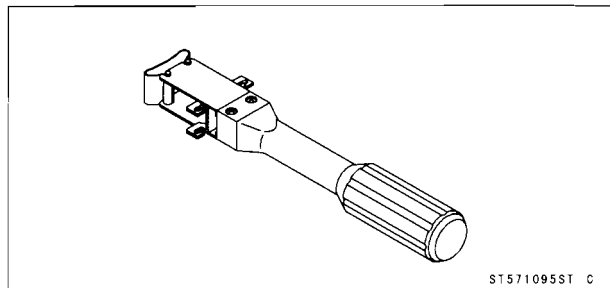
**Piston Pin Puller Assembly:  
57001-910**



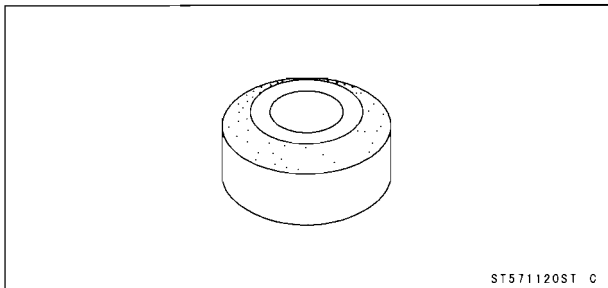
**Valve Seat Cutter 32° -  $\phi$ 28:  
57001-1119**



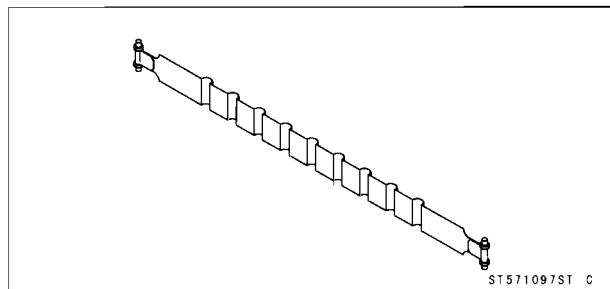
**Piston Ring Compressor Grip :  
57001-1095**



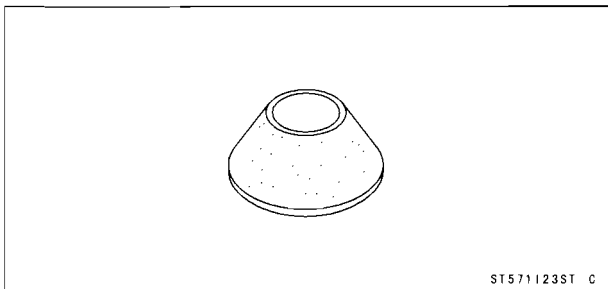
**Valve Seat Cutter 30° -  $\phi$ 30:  
57001-1120**



**Piston Ring Compressor Belt,  $\phi$ 67 ~  $\phi$ 79:  
57001-1097**



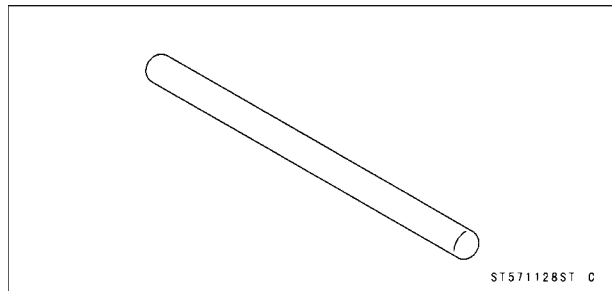
**Valve Seat Cutter 60° -  $\phi$ 30:  
57001-1123**



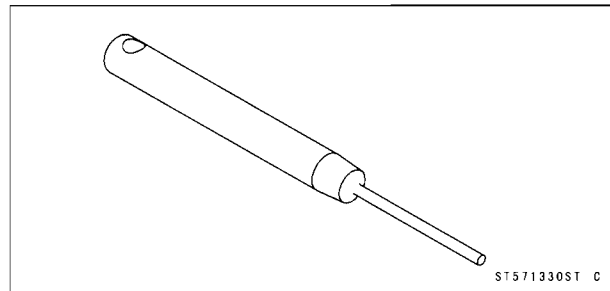
## 5-10 ENGINE TOP END

### Special Tools and Sealants

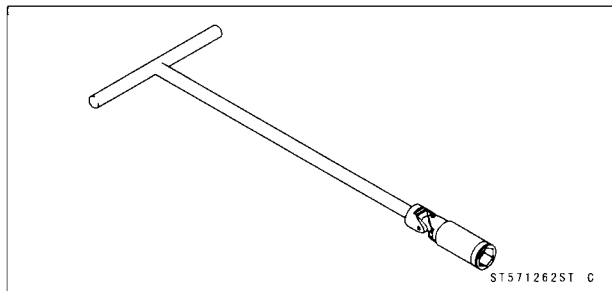
Valve Seat Cutter Holder Bar:  
57001-1128



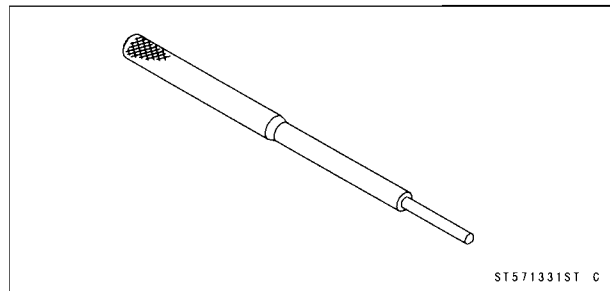
Valve Seat Cutter Holder  $\phi 4.5$ :  
57001-1330



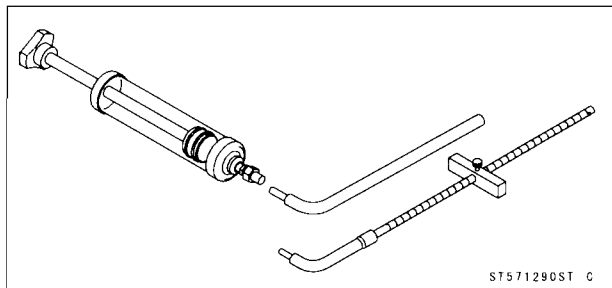
Spark Plug Wrench Hex 16:  
57001-1262



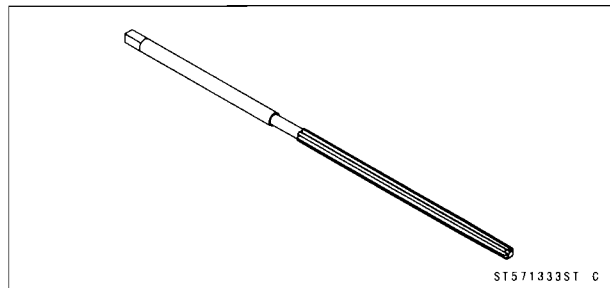
Valve Guide Arbor  $\phi 4.5$ :  
57001-1331



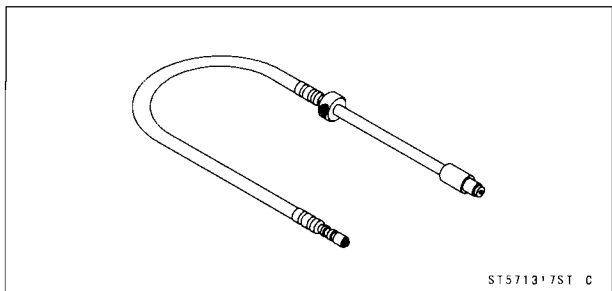
Fork Oil Level Gauge:  
57001-1290



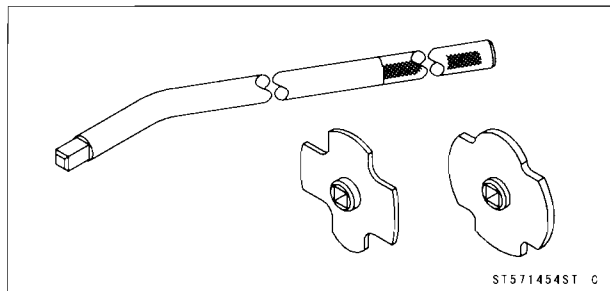
Valve Guide Reamer  $\phi 4.5$ :  
57001-1333



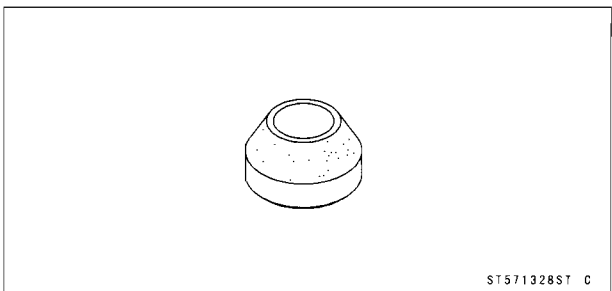
Compression Gauge Adapter M10  $\times$  1.0:  
57001-1317



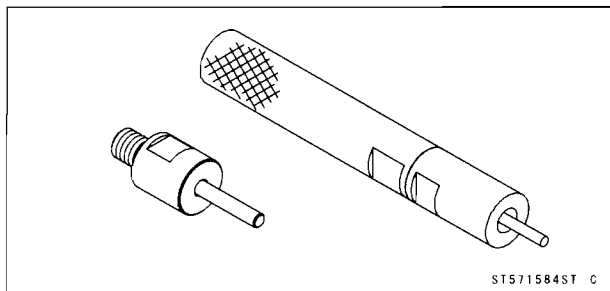
Filler Cap Driver:  
57001-1454



Valve Seat Cutter 60° -  $\phi 25$ :  
57001-1328

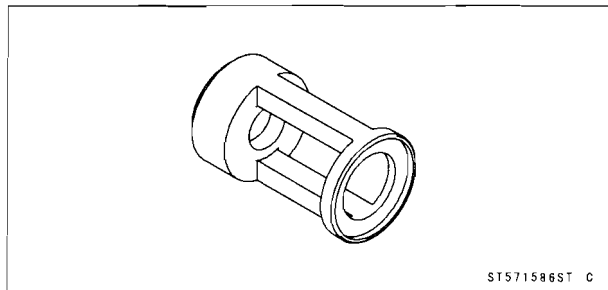


Valve Guide Driver:  
57001-1564

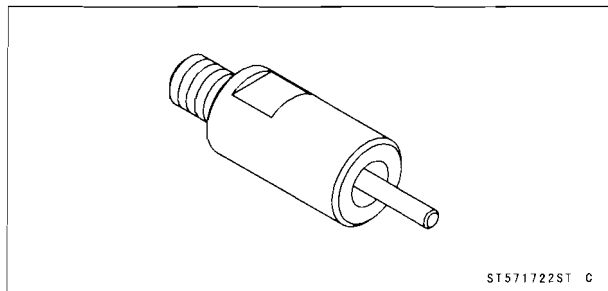


## Special Tools and Sealants

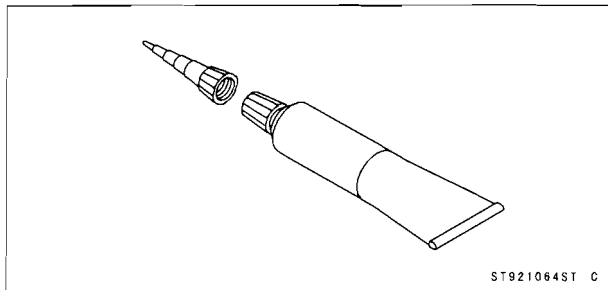
**Valve Spring Compressor Adapter,  $\phi 24$ :**  
**57001-1586**



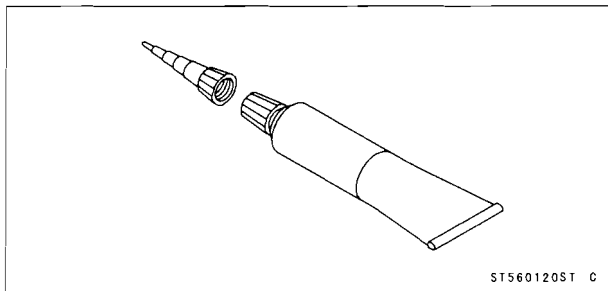
**Valve Guide Driver Attachment F:**  
**57001-1722**



**Kawasaki Bond (Liquid Gasket - Black):**  
**92104-1064**



**Kawasaki Bond (Silicone Sealant):**  
**56019-120**

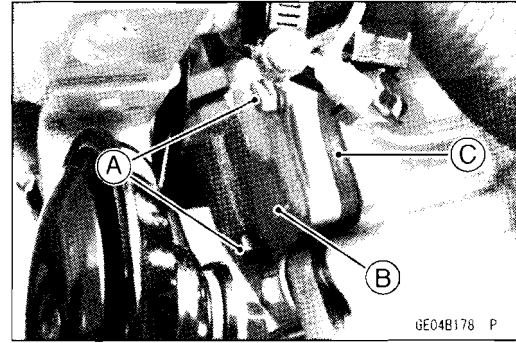


## 5-12 ENGINE TOP END

### Clean Air system

#### **Air Suction Valve Removal (Other than AU model)**

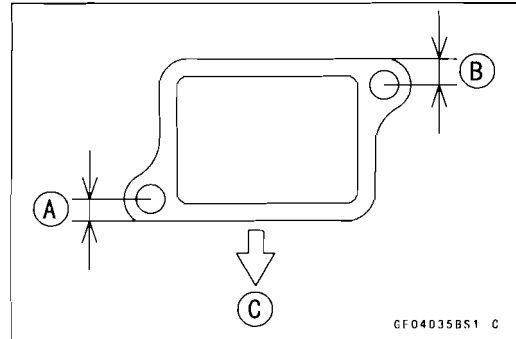
- Remove:
  - Air Suction Valve Cover Bolts [A]
  - Air Suction Valve Cover [B]
  - Air Suction Valve [C]



#### **Air Suction Valve Installation (Other than AU model)**

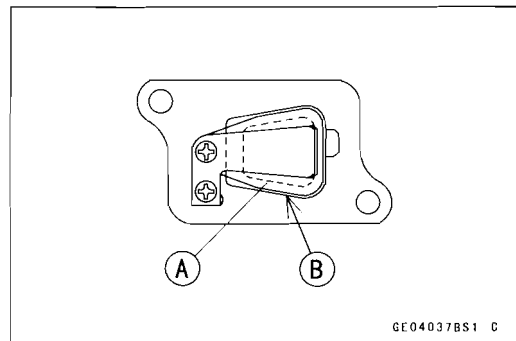
- Replace the gaskets with new ones.
- Install a gasket in such a manner that the 5 mm (0.20 in.) side [A] faces downward [C].
- Apply a non-permanent locking agent to the thread of the air suction valve cover bolts, and tighten them.

**Torque - Air Suction Valve Cover Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)**



#### **Air Suction Valve Inspection (Other than AU model)**

- Remove the air suction valve (see Air Suction Valve Removal).
- Visually inspect the reed [A] for cracks, folds, warps, heat damage, or other damage.
- ★ If there is any doubt as to the condition of the reed, replace the air suction valve as an assembly.
- Check the reed contact area [B] of the valve holder for grooves, scratches, any signs of separation from the holder, or heat damage.
- ★ If there is any doubt as to the condition of the reed contact areas, replace the air suction valve as an assembly.
- If any carbon or other foreign particles have accumulated between the reed and the reed contact area, wash the valve assembly with a high flash-point solvent.

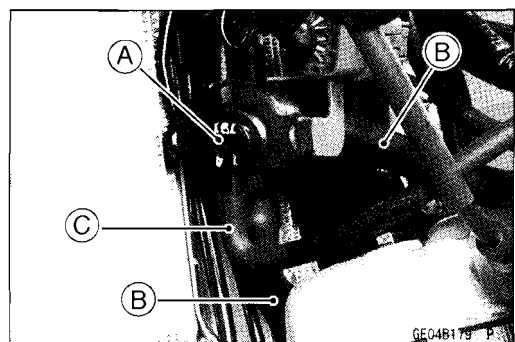


#### **CAUTION**

**Do not scrape off the deposits with a scraper as this could damage the rubber, requiring replacement of the suction valve assembly.**

#### **Vacuum Switch Valve Removal**

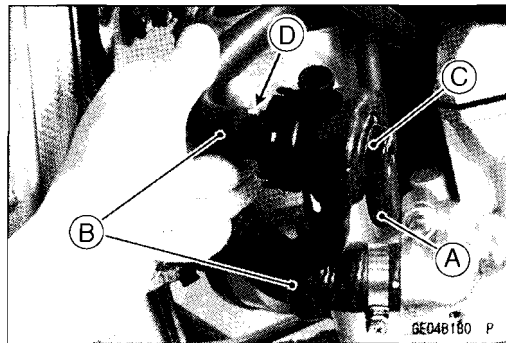
- Remove:
  - Fuel Tank (see Fuel Tank Removal in the Fuel System chapter)
- Remove the vacuum switch valve [A] from the frame bracket.
- Pull off the vacuum switch valve hoses [B] and vacuum hose [C], and remove the vacuum switch valve.



## Clean Air system

### Vacuum Switch Valve Installation

- Install the vacuum hose [A] and vacuum switch valve hoses [B] onto the vacuum switch valve [C].
- Install it so that the positioning mark [D] faces upward.
- Route the hose correctly (see Cable, Wire, and Hose Routing in the Appendix chapter).



### Vacuum Switch Valve Operation Inspection

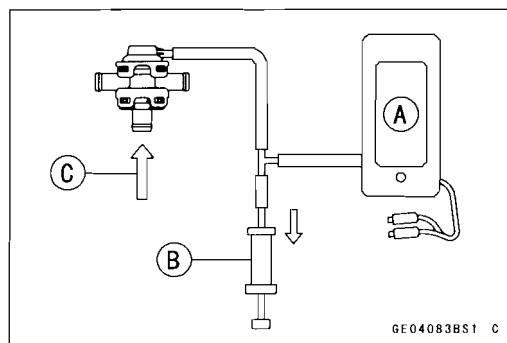
- Refer to the Air Suction System Damage Inspection in the Periodic Maintenance chapter.

### Vacuum Switch Valve Inspection

- Remove the vacuum switch valve (see Vacuum Switch Valve Removal).
- Connect a commercially available vacuum gauge [A] and syringe [B] or the fork oil level gauge to the vacuum hose as shown.

**Special Tool - Fork Oil Level Gauge: 57001-1290**

Air Flow [C]



- Gradually raise the vacuum (lower the pressure) applied to the vacuum switch valve, and check the valve operation. When the vacuum is low, the vacuum switch valve should permit air to flow. When the vacuum is raised to valve the closing pressure, the valve should stop air flow.

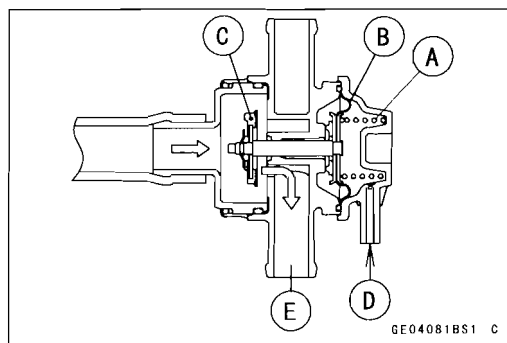
Spring [A]

Diaphragm [B]

Valve [C]

Low Vacuum [D]

Secondary Air Flow [E]



- ★ If the vacuum switch valve does not operate as described, replace it with a new one.

### NOTE

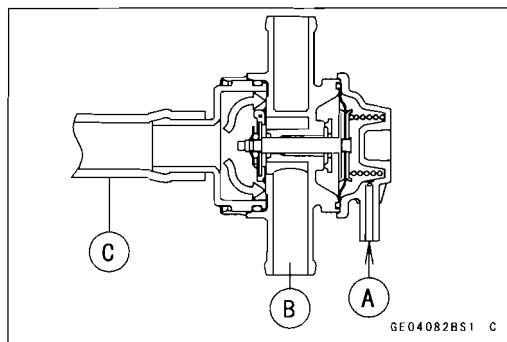
- To check air flow through the vacuum switch valve, just blow through the air cleaner hose [C].

### Vacuum Switch Valve Closing Pressure (Open → Close)

**Standard: 41.3 ~ 49.3 kPa (310 ~ 370 mmHg)**

High Vacuum [A]

Secondary Air Cannot Flow [B]



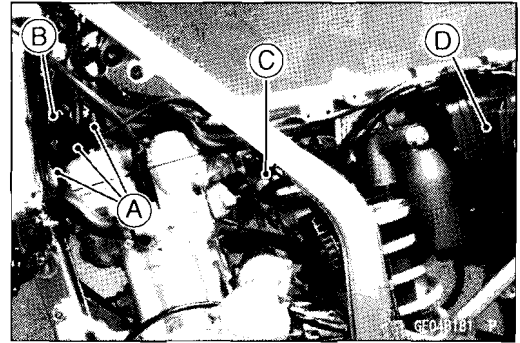
## 5-14 ENGINE TOP END

### Clean Air system

#### ***Clean Air system Hoses Inspection***

Visually inspect the hoses [A] for damage or connection.

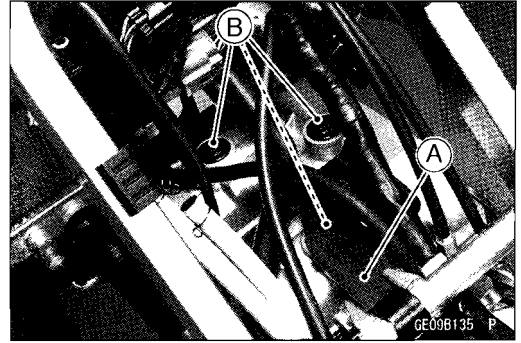
- Be certain that all the hoses are routed without being flattened or kinked, and are connected correctly to the vacuum switch valve [B], carburetor [C], air cleaner housing [D] and air suction valve cover.
- ★ If they are not connected correctly, remove the fuel tank (see Fuel Tank Removal in the Fuel System chapter), and run the hoses correctly. Replace any damaged hoses.



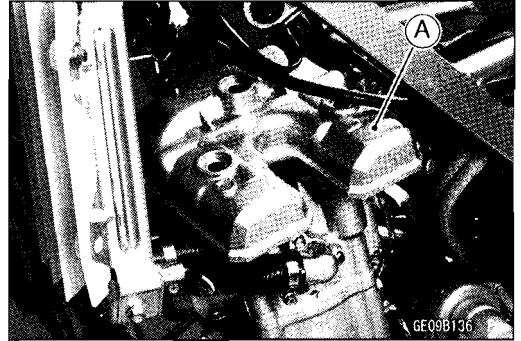
## Cylinder Head Cover

### Cylinder Head Cover Removal

- Remove:
  - Fuel Tank (see Fuel Tank Removal in the Fuel System chapter)
  - Vacuum Switch Valve (see Vacuum Switch Valve Removal)
  - Heat Guard [A]
  - Cylinder Head Cover Bolts [B]



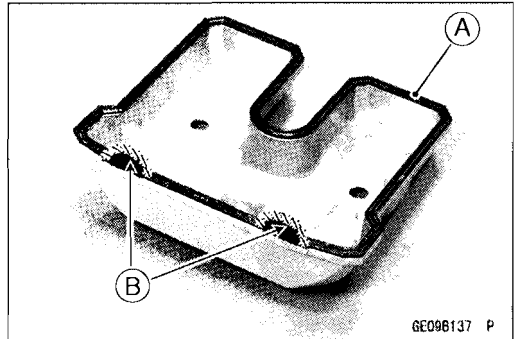
- Remove the cylinder head cover [A] from the left side.



### Cylinder Head Cover Installation

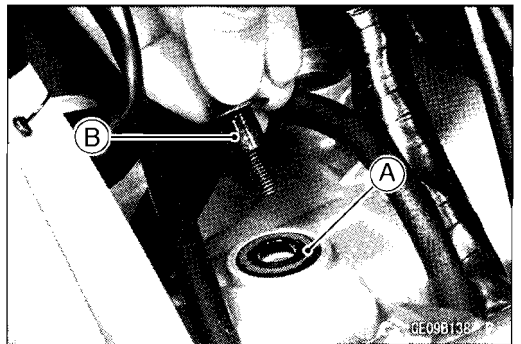
- Replace the cylinder head cover gasket [A] with a new one.
- Insert the protrusion of a gasket into the groove of the cylinder head cover securely.
- Apply silicone sealant [B] to the cylinder head cover gasket as shown.

Sealant - **Kawasaki Bond (Silicone Sealant): 56019-120**



- Install the cylinder head cover together with the gasket.
- Install the head cover bolt washers [A] with the metal side upwards.
- Tighten:

Torque - Cylinder Head Cover Bolts [B]: 7.8 N·m (0.80 kgf·m, 69 in·lb)





## 5-16 ENGINE TOP END

### Camshaft Chain Tensioner

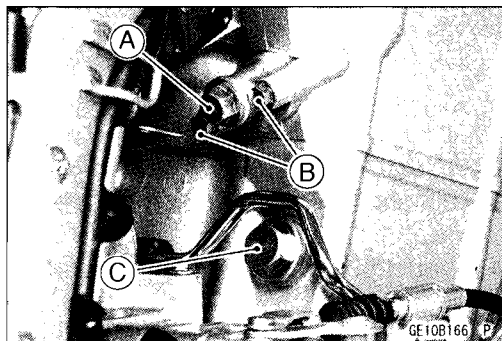
#### Camshaft Chain Tensioner Removal

##### CAUTION

This is a non-return type camshaft chain tensioner. The push rod does not return to its original position once it moves out to take up camshaft chain slack. When removing the tensioner, do not take out the mounting bolts only halfway. Retightening the mounting bolts from this position could damage the tensioner and the camshaft chain. Once the bolts are loosened, the tensioner must be removed and reset as described in "Camshaft Chain Tensioner Installation".

Do not turn over the crankshaft while the tensioner is removed. This could upset the cam chain timing, and damage the valves.

- Remove the exhaust pipe (see Exhaust Pipe Removal)
- Remove the tensioner cap bolt [A] before loosening the chain tensioner bolts [B].
- Remove:
  - Chain Tensioner Bolts
  - Chain Tensioner
  - Sub Chain Tensioner [C]



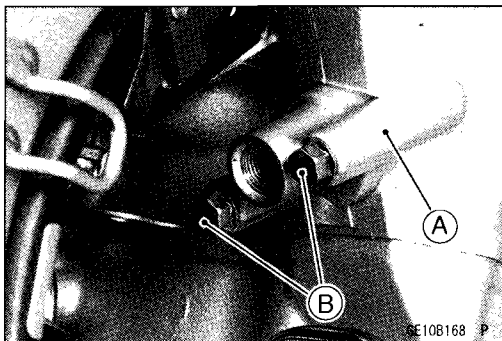
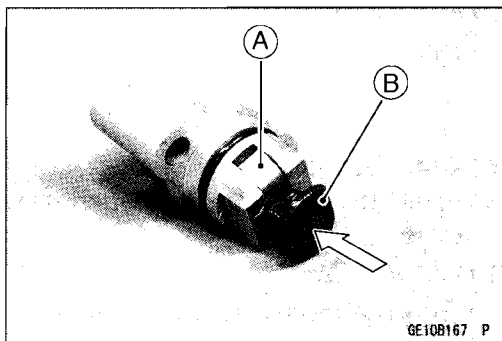
#### Camshaft Chain Tensioner Installation

##### CAUTION

Always install the camshaft chain tensioner after timing the cam shaft chain.

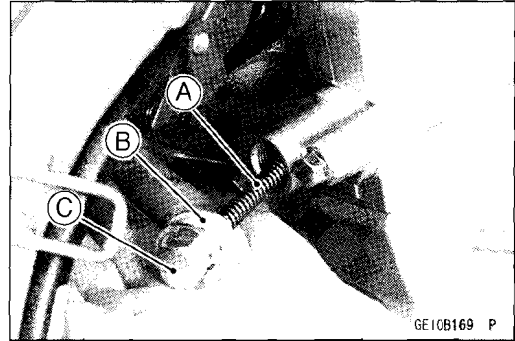
- Push the stopper [A] to release the ratchet and push the push rod [B] into the tensioner body.
- Install the tensioner body [A], and tighten the mounting bolts [B].

**Torque - Camshaft Chain Tensioner Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)**



## Camshaft Chain Tensioner

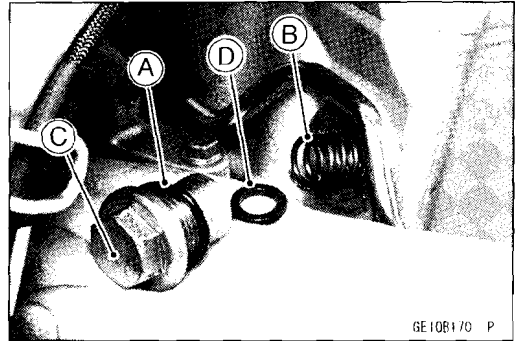
- Install the spring [A], washer [B].
- Tighten the tensioner cap bolt [C] securely.



- Replace the O-ring [A] with a new one.
- Install the spring [B].
- Tighten:

**Torque - Camshaft Chain Sub-tensioner Bolt [C]: 15 N·m  
(1.5 kgf·m, 11 ft·lb)**

○The washer [D] is placed between the sub-tensioner bolt and the spring.



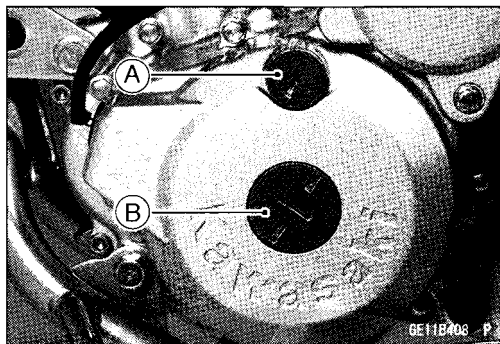
## 5-18 ENGINE TOP END

### Camshaft

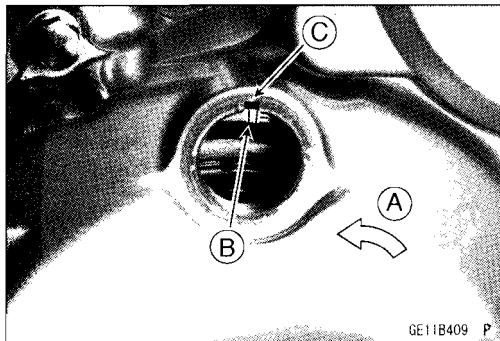
#### Camshaft Removal

- Remove the timing inspection cap [A] and rotor bolt cap [B].

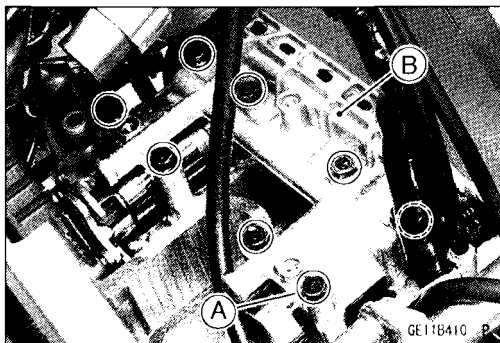
Special Tool - Filler Cap Driver: 57001-1454



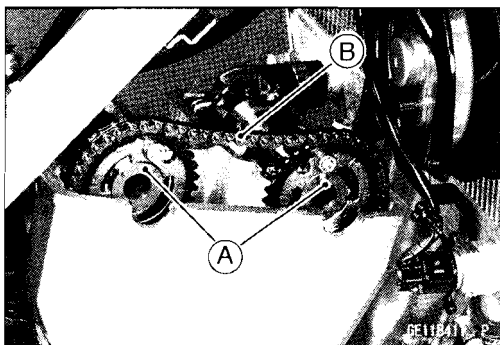
- Turn the crankshaft counterclockwise [A] and align the "T" mark line [B] of the rotor with the notch [C] of the alternator cover.
- Remove:
  - Cylinder Head Cover (see Cylinder Head Cover Removal)
  - Camshaft Chain Tensioner (Camshaft Chain Tensioner Removal)
  - Sub-tensioner (Camshaft Chain Tensioner Removal)



- Remove:
  - Camshaft Cap Bolts [A]
  - Camshaft Cap [B]



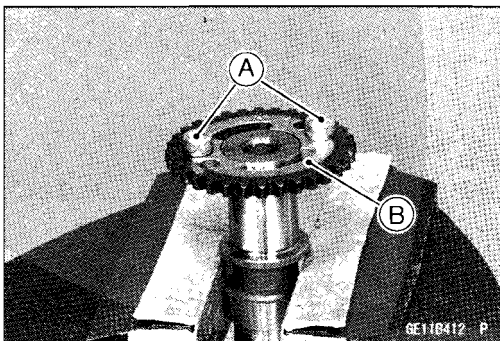
- Remove the camshaft [A] from the camshaft chain [B].
- Stuff a clean cloth into the chain tunnel to keep any parts from dropping into the crankcase.



#### CAUTION

The crankshaft may be turned while the camshafts are removed. Always pull the chain taut while turning the crankshaft. This avoids kinking the chain on the lower (crankshaft) sprocket. A kinked chain could damage the crankcase.

- Remove:
  - Camshaft Chain Sprocket Bolts [A]
  - Camshaft Chain Sprocket [B]



## Camshaft

### Camshaft Installation

Sprockets are the same for both inlet and exhaust sides.

- Install the sprocket on the camshaft so that the marked side faces out.

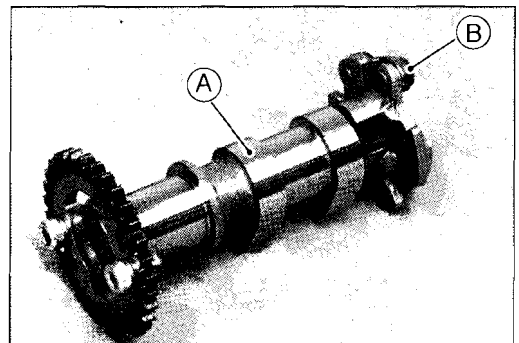
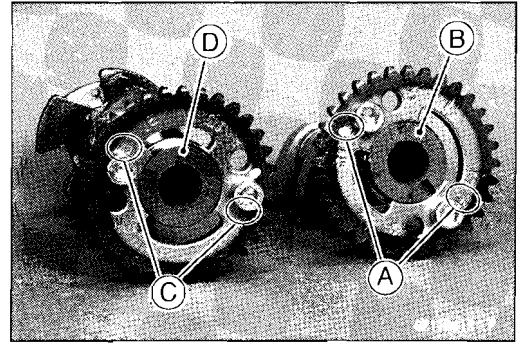
#### NOTE

○ Install sprockets to the camshafts with a sprocket aligned with the IN mark [A] for the inlet side camshaft [B] and the other, with the EX mark [C] for the exhaust side camshaft [D].

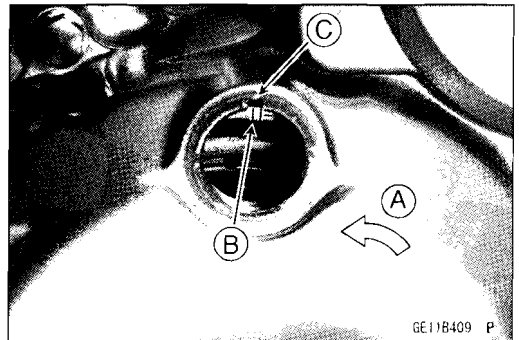
- Apply a non-permanent locking agent to the threads of the camshaft sprocket bolts, and tighten them.

**Torque - Camshaft Sprocket Bolts:** 9.8 N·m (1.0 kgf·m, 87 in·lb)

- Apply engine oil to the entire circumference of the cam.
- When either camshaft or cylinder head was replaced with a new one, apply molybdenum disulfide oil to the entire circumference of the cam.
- Install the camshafts.
- The exhaust side camshaft [A] is equipped with a compression release mechanism [B].



- Position the piston at TDC.
- Turn the crankshaft counterclockwise [A] and align the "T" mark line [B] of the rotor with the [C] of the alternator cover.



- Engage the camshaft chain with the camshaft sprocket.

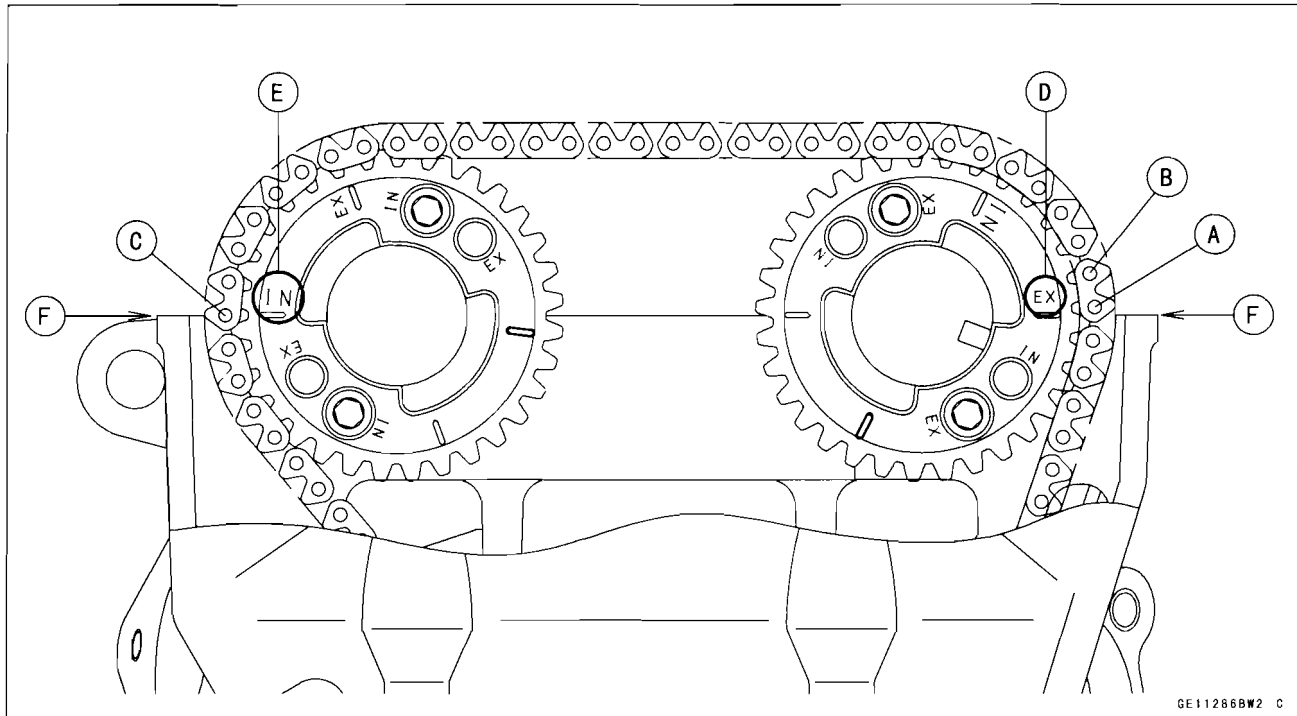
#### NOTE

○ Always pull the tension side (exhaust side) of the chain taut.

- Pull the tension side (exhaust side) of the chain taut to install the chain.
- The timing marks on the sprocket must be aligned with the cylinder head upper surface.
- Pull the chain taut and fit it onto the camshaft sprocket.
- Starting with the timing mark on the front of the exhaust sprocket, count to the 1st pin. Feed the exhaust camshaft through the chain and align the 32th pin with the cylinder head upper surface.

## 5-20 ENGINE TOP END

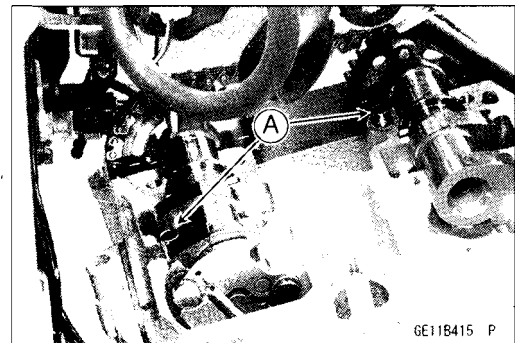
### Camshaft



1st Pin [A]  
2nd Pin [B]  
32th Pin [C]

EX Mark [D]  
IN Mark [E]  
Cylinder Head Upper Surface [F]

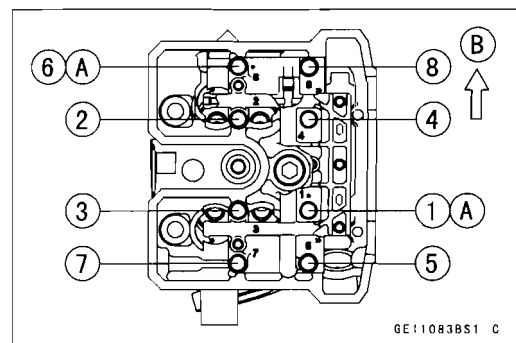
- Be sure to install the dowel pins [A].



- Install the camshaft cap.
- Apply molybdenum disulfide oil to the threads and seating surface of the camshaft cap bolt.
- Tighten the camshaft cap bolts.  
Longer Bolts [A]  
Front [B]

#### NOTE

○First gradually tighten the bolt (1) and (2) evenly to seat the camshaft in place, then tighten all bolts following the specified tightening sequence.



**Torque - Camshaft Cap Bolts: 12 N·m (1.2 kgf·m, 106 in·lb)**

#### CAUTION

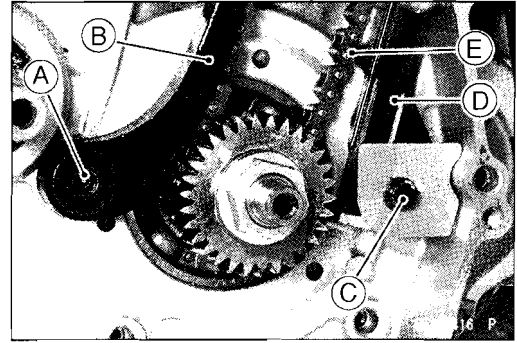
After assembling the camshaft and the chain, turn the crankshaft counterclockwise for two rotations and check if the "T" mark of the rotor, the exhaust side sprocket timing mark (EX mark) and the inlet side sprocket timing mark (IN mark) align with each



## Camshaft

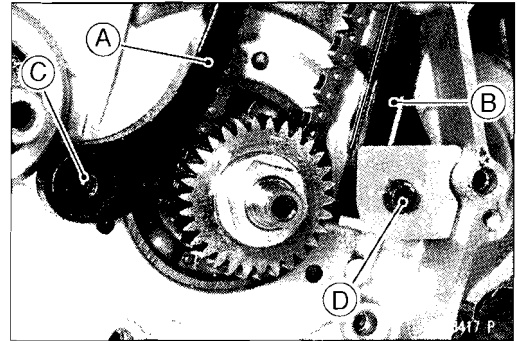
### Camshaft Chain Removal

- Remove:
  - Clutch (see Clutch Removal in the Clutch chapter)
  - Oil Pump (see Oil Pump Removal in the Engine Lubrication System chapter)
  - Camshafts (see Camshaft Removal)
  - Camshaft Chain Guide Bolt [A]
  - Rear Camshaft Chain Guide [B]
  - Camshaft Chain Guide Retaining Plate Bolt [C]
  - Front Camshaft Chain Guide [D]
  - Camshaft Chain [E]



### Camshaft Chain Installation

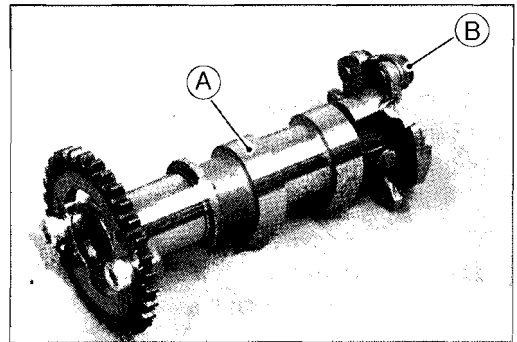
- Hang the camshaft chain to the crankshaft sprocket.
- Install:
  - Front Camshaft Chain Guide [A]
  - Rear Camshaft Chain Guide [B]
- Tighten:
  - Torque - Camshaft Chain Guide Bolt [C]: 25 N·m (2.5 kgf·m, 18 ft·lb)
  - Camshaft Chain Guide Retaining Plate Bolt [D]: 9.8 N·m (1.0 kgf·m, 87 in·lb)



### KACR (Kawasaki Automatic Compression Release) Inspection

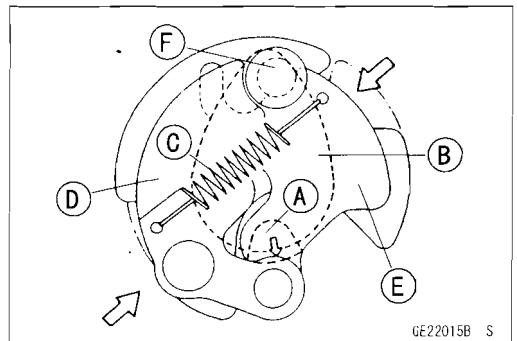
KACR [B] is installed on the left end of the exhaust camshaft [A]. Do not remove or disassemble KACR alone.

○ Since KACR is the simple construction, it does not require periodic maintenance. The KACR mechanism may develop two types of failures. They are failing to release compression pressure in starting the engine and releasing compression pressure while the engine is running.



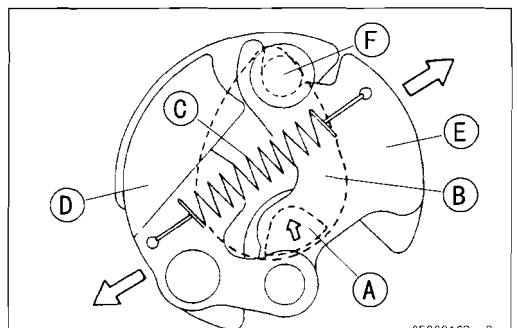
○ When compression pressure in the cylinder is not released in starting the engine (an error event), the pin [A] remains in the cam [B], so that the exhaust valve is not pushed down, which results in hard starting due to difficulty to increase the crank shaft rotation speed.

- Visually inspect the spring [C].
- ★ If the spring is damaged, deformed or lost, replace it.
- Remove the spring, and move the weights [D] and [E] back and forth.
- ★ If the weights do not move freely, replace the exhaust camshaft and KACR as a set.
- Stopper [F]



○ When compression pressure in the cylinder is released while the engine is rotating (an error event), the pin [A] remains in the cam [B], so that the exhaust valve is pushed down, which results in engine stalling due to poor ignition, because a fuel-air mixture is not properly compressed.

- Move the weights [D] and [E] back and forth.
- ★ If you cannot move the weights from their retracted positions, replace the exhaust camshaft and KACR as a set.



Spring [C]

Stopper [F]

## 5-22 ENGINE TOP END

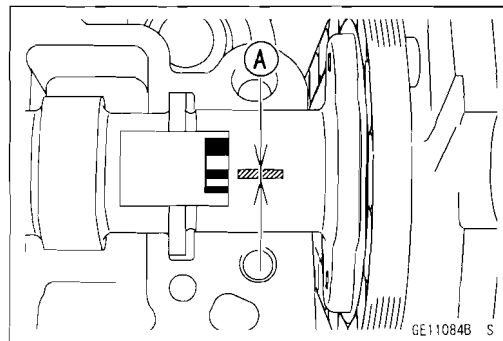
### Camshaft

#### Camshaft/Camshaft Cap Wear

- Cut the strips of plastigage to journal width. Place a strip on each journal parallel to the camshaft installed in the correct position.
- Measure each clearance between the camshaft and the camshaft cap using plastigage [A].
- Install the camshaft cap (see Camshaft Installation).

#### NOTE

○ Do not turn the camshaft when the plastigage is between the journal and camshaft cap.



#### Camshaft/Camshaft Cap Clearance

**Standard:** 0.020 ~ 0.062 mm (0.00079 ~ 0.0024 in.)

**Service Limit:** 0.15 mm (0.0059 in.)

- ★ If any clearance exceeds the service limit, measure the diameter of each camshaft journal with a micrometer.

#### Camshaft Journal Diameter

**Standard:** 22.959 ~ 22.980 mm (0.90390 ~ 0.90472 in.)

**Service Limit:** 22.93 mm (0.9028 in.)

- ★ If the camshaft journal diameter is less than the service limit, replace the camshaft with a new one and measure the clearance again.
- ★ If the clearance still remains out of the limit, replace the cylinder head and camshaft cap.

#### CAUTION

The camshaft cap and cylinder head are machined at the factory in the assembled state, so they must be replaced as a set.

#### Camshaft Runout

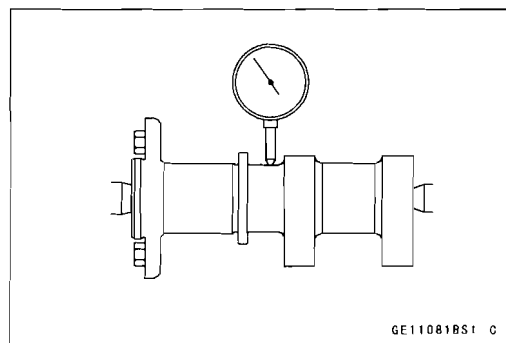
- Remove the camshaft (see Camshaft Removal).
- Set the camshaft in a camshaft alignment jig or on V blocks.
- Measure the runout with a dial gauge at the specified place as shown.

#### Camshaft Runout

**Standard:** TIR 0.03 mm (0.001 in.) or less

**Service Limit:** TIR 0.1 mm (0.004 in.)

- ★ If the runout exceeds the service limit, replace the camshaft.





## Camshaft

### Cam Wear

- Remove the camshaft (see Camshaft Removal).
- Measure the height [A] of each cam with a micrometer.
- ★ If the cams are worn down past the service limit, replace the camshaft.

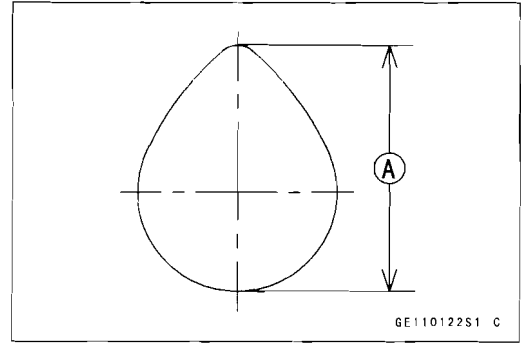
### Cam Height

#### Standard:

Inlet	36.246 ~ 36.354 mm (1.4270 ~ 1.4312 in.)
Exhaust	36.246 ~ 36.354 mm (1.4270 ~ 1.4312 in.)

#### Service Limit:

Inlet	36.15 mm (1.423 in.)
Exhaust	36.15 mm (1.423 in.)



## 5-24 ENGINE TOP END

### Cylinder Head

#### Cylinder Compression Measurement

##### NOTE

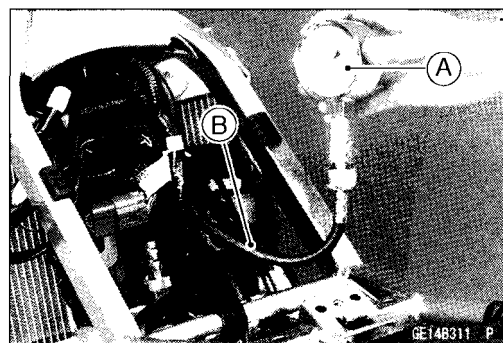
○ Use the battery which is fully charged.

- Warm up the engine thoroughly.
- Stop the engine.
- Remove:
  - Right and Left Radiator Shrouds
  - Fuel Tank (see Fuel Tank Removal in the Fuel System chapter)
- Remove the spark plug, using the spark plug wrench.

**Special Tool - Spark Plug Wrench, M16: 57001-1262**

- Install a compression gauge [A] and adapter [B] onto the plug hole in such a manner that no compression pressure is released.
- Measure the compression.
- Obtain the maximum gauge reading by turning the crank shaft with the starter motor with the throttle grip kept in the full open position.

**Special Tools - Compression Gauge 20 kgf/cm<sup>2</sup>: 57001-221**  
**Compression Gauge Adapter M10 × 1.0: 57001-1317**



##### Cylinder Compression (Usable Range)

660 ~ 1 030 kPa (6.7 ~ 10.5 kgf/cm<sup>2</sup>, 96 ~ 149 psi) @300 r/min (rpm)

- Install the spark plug.

**Torque - Spark Plug: 13 N·m (1.3 kgf·m, 115 in·lb)**

## Cylinder Head

★The following table should be consulted if the obtainable compression reading is not within the usable range.

Problems	Diagnosis	Required Action
Cylinder compression is higher than usable range	Carbon buildup on piston or in combustion chamber possibly due to damaged valve stem, valve guide stem oil seal and/or damaged piston oil rings.	Remove the carbon deposits. If necessary, replace damaged parts.
	Incorrect cylinder head gasket thickness	Replace the gasket with a standard part.
	The KACR cam spring is damaged or missing.	Replace the exhaust camshaft.
	The KACR weight does not move smoothly.	Replace the exhaust camshaft.
Cylinder compression is lower than usable range	Gas leakage around the cylinder head	Replace damaged gasket and check cylinder head warp.
	Bad condition of valve seats, valves, and valve springs	Repair them if possible.
	The valve clearance is small.	Adjust the valve clearance.
	Incorrect piston/cylinder clearance	Replace the piston or the cylinder.
	Piston seizure	Inspect the cylinder and replace/repair the cylinder and/or piston as necessary.
	Bad condition of piston ring and/or piston ring grooves.	Replace the piston and/or the piston rings.
	The KACR weight does not move smoothly.	Replace the exhaust camshaft.

### Cylinder Head Removal

- Drain the coolant (see Coolant Change in the Periodic Maintenance chapter).

- Remove:

Thermostat (see Thermostat Removal in the Cooling System chapter)

Fuel Tank (see Fuel Tank Removal in the Fuel System chapter)

Exhaust Pipe (see Exhaust Pipe Removal)

Carburetor (see Carburetor Removal in the Fuel System chapter)

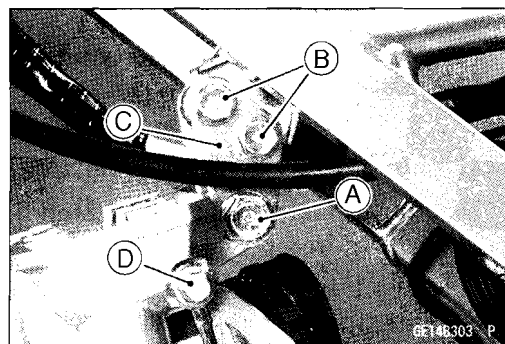
Camshaft (see Camshaft Removal)

Upper Engine Mounting Bolt [A] and Nut

Upper Engine Bracket Bolts [B]

Upper Engine Brackets [C]

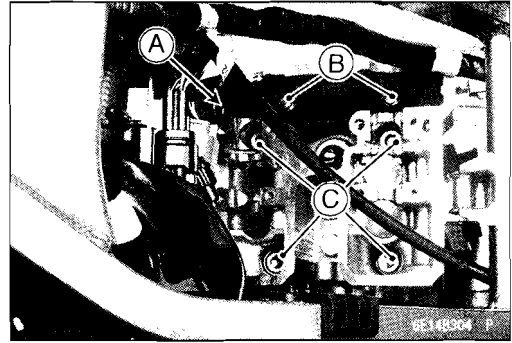
Oil Pipe Banjo Bolt [D]



## 5-26 ENGINE TOP END

### Cylinder Head

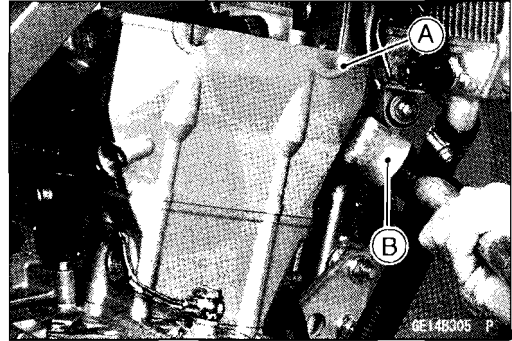
- Remove the front chain guide [A].
- Remove the cylinder head bolts in the following sequence:
  - (1) M6 Bolts [B]
  - (2) M10 Allen Bolts [C]



- Remove the cylinder head [A].

#### NOTE

○If it is hard to remove it, tap lightly using a plastic-faced mallet [B].

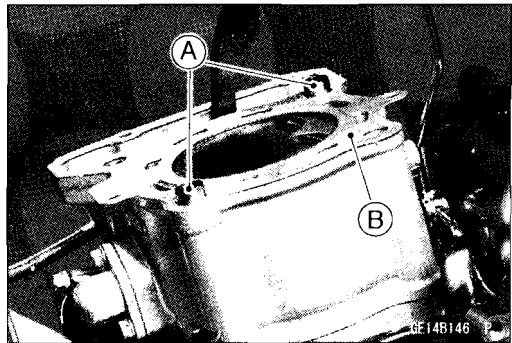


### Cylinder Head Installation

- Install the dowel pins [A] and new cylinder gasket [B].
- Install the cylinder head.

#### NOTE

○The camshaft cap is machined with the cylinder head, so if a new cylinder head is installed, use the cap that is supplied with the new head.



- Apply a molybdenum disulfide grease to both surfaces and threads of the cylinder head bolts (M10) washers.
- Temporarily tighten the cylinder head bolts (M10) and tighten them with specified torque in accordance with the sequence numbers [1 to 4].

#### Torque - Cylinder Head Allen Bolts (M10):

(First) 15 N·m (1.5 kgf·m, 11 ft·lb)

(Final) 46 N·m (4.7 kgf·m, 34 ft·lb)

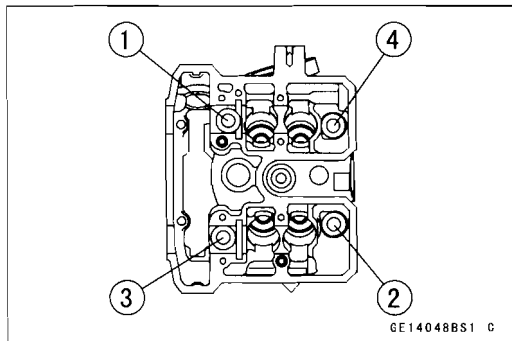
- Tighten the cylinder head bolts (M6).

**Torque - Cylinder Head Bolts (M6): 12 N·m (1.2 kgf·m, 106 in·lb)**

- Remove the front chain guide.
- Replace the oil pipe banjo bolt washers with new ones, and tighten the oil pipe banjo bolts.

**Torque - Oil Pipe Banjo Bolt (M8): 9.8 N·m (1.0 kgf·m, 87 in·lb)**

- Install removed parts (see appropriate chapters).



## Cylinder Head

### Cylinder Head Warp

- Lay a straightedge across the lower surface of the cylinder head at several positions.
- Measure the gap between the straightedge [B] and the head with a thickness gauge [A].

#### Cylinder Head Warp

Standard: — — —

Service Limit: 0.05 mm (0.002 in.)

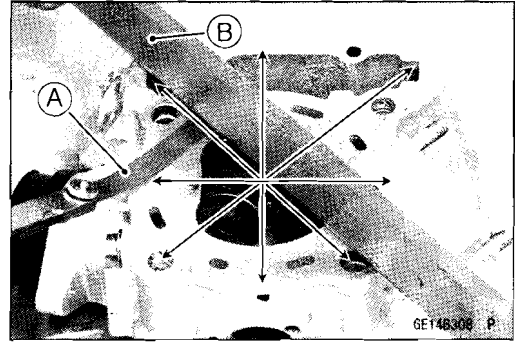
- ★ If the cylinder head is warped more than the service limit, replace it.
- ★ If the cylinder head is warped less than the service limit, repair the head by rubbing the lower surface on emery paper secured to a surface plate (first No.200, then No.400).

### Valve Clearance Inspection

- Refer to the Valve Clearance Inspection in the Periodic Maintenance chapter.

### Valve Clearance Adjustment

- Refer to the Valve Clearance Adjustment in the Periodic Maintenance chapter.



## 5-28 ENGINE TOP END

### Valve

#### Valve Removal

- Remove the cylinder head.
- Remove the valve lifter and shim from the valve.
- Record the positions of the shims so they can be installed in their original positions.
- Compress the valve spring, and remove the split keeper.

**Special Tools - Valve Spring Compressor Assembly: 57001-241 [A]**

**Valve Spring Compressor Adapter  $\phi 24$ : 57001-1586 [B]**

- Remove:
  - Spring Retainer
  - Outer Valve Spring
  - Inner Valve Spring
- Remove the valve.

#### Valve Installation

- Replace the stem oil seal [C] with a new one.
- Apply molybdenum disulfide grease to the valve stem [A], and install it.
- Check the valve moves up and down smoothly.
- The inner valve spring [D] and the outer valve spring [E] should be installed with their tightly wound ends placed near the spring seats [B].
- Compress the valve springs and engage the split keeper [G] to fasten the spring retainer [F].

**Special Tools - Valve Spring Compressor Assembly: 57001-241**

**Valve Spring Compressor Adapter  $\phi 24$ : 57001-1586**

- Put on the shim [H] with a thickness indication facing the retainer.
- Replace the shim back to the position noted earlier and install it as it was.

#### NOTE

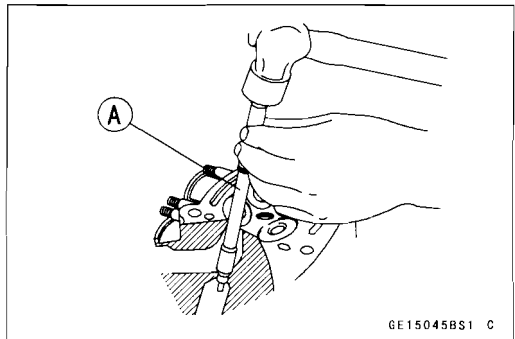
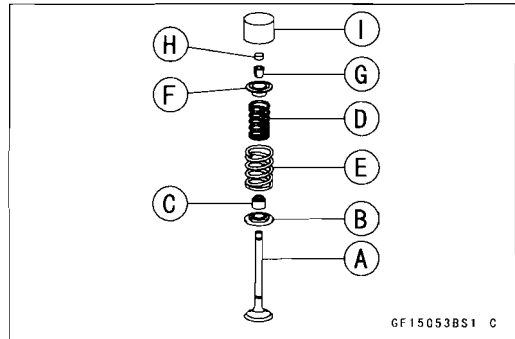
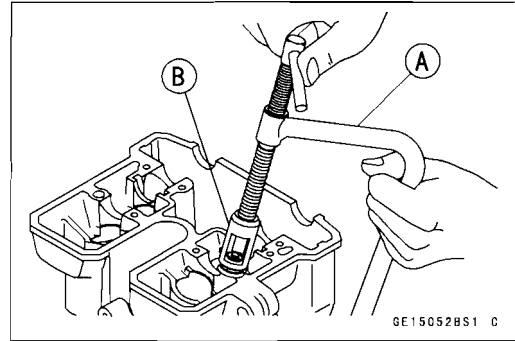
○ Apply grease to the shim or the retainer to prevent the shim from falling off while installing the camshaft.

- Apply engine oil to the valve lifter [I] surface and install the lifter.

#### Valve Guide Removal

- Remove:
  - Valve
  - Stem Oil Seal
  - Spring Seats
- Heat the area around the valve guide to 120 ~ 150 °C, and hammer lightly on the valve guide arbor [A] to remove the guide from the top of the head.

**Special Tool - Valve Guide Arbor,  $\phi 4.5$ : 57001-1331**



#### CAUTION

**Do not heat the cylinder head with a torch. This will warp the cylinder head. Soak the cylinder head in engine oil and heat the oil.**

## Valve

### Valve Guide Installation

- Apply a thin coat of oil to the outer surface of the valve guide.
- Heat the area around the valve guide up to 120 ~ 150°C (248 ~ 302°F).

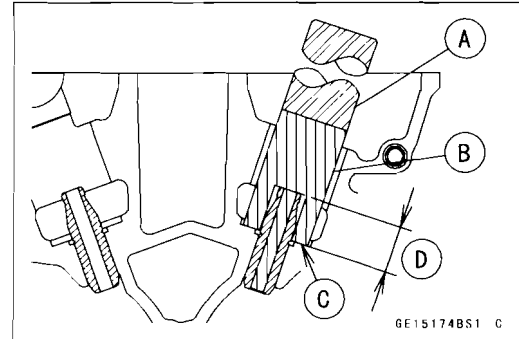
#### CAUTION

**Do not heat the cylinder head with a torch. This will warp the cylinder head. Soak the cylinder head and heat the oil.**

- Using the valve guide driver [A] and attachment [B], press and insert the valve guide in until the attachment bottom surface touches the head surface [C].  
15.3 ~ 15.5 mm (0.602 ~ 0.610 in.) [D]

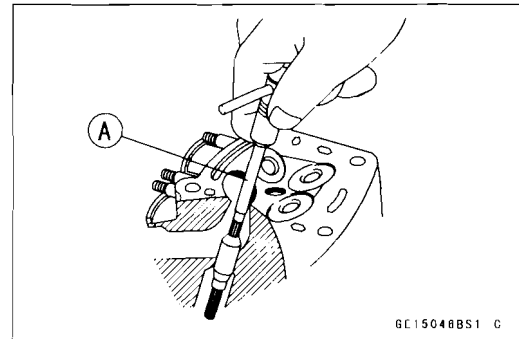
**Special Tools - Valve Guide Driver: 57001-1564**

**Valve Guide Driver Attachment F: 57001-1722**



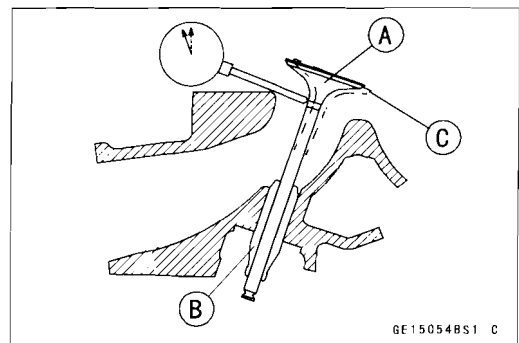
- Wait until the cylinder head cools down and then ream the valve guide with the valve guide reamer [A] even if the old guide is reused.
- Turn the reamer in a clockwise direction until the reamer turns freely in the guide. Never turn the reamer counter-clockwise or it will be dulled.
- Wash the guide thoroughly when its finish grinding is completed.

**Special Tool - Valve Guide Reamer,  $\phi 4.5$ : 57001-1333**



### Valve Guide Wear (Wobble Method)

- If a small bore gauge is not available, inspect the valve guide wear by measuring the valve-to-guide clearance with the wobble method as indicated below. The reading is not actual valve-to-guide clearance because the measuring point is above the guide.
- Insert a new valve [A] into the guide [B] and set a dial gauge against the stem perpendicular to it as close as possible to the cylinder head gasket surface.
- Move the stem back and forth [C] to measure valve-to-guide clearance.
- Repeat the measurement in a direction at a right angle (90°) to the first.
- ★ If the reading exceeds the service limit, replace the guide.



#### Valve/Valve Guide Clearance (Wobble Method)

##### Standard:

Exhaust	0.08 ~ 0.15 mm (0.0031 ~ 0.0059 in.)
Inlet	0.03 ~ 0.10 mm (0.0012 ~ 0.0039 in.)

##### Service Limit:

Exhaust	0.33 mm (0.013 in.)
Inlet	0.28 mm (0.011 in.)



## 5-30 ENGINE TOP END

### Valve

#### Valve Seat Inspection

- Remove the valve.
- Check the valve seat surface [A] between the valve [B] and valve seat [C].
- Measure the outside diameter [D] of the seating pattern on the valve seat with a pair of vernier caliper.
- ★ If the outside diameter is too large or too small, repair the seat.

#### Valve Seat Surface Outside Diameter (Seat O.D.)

Standard:

Exhaust 24.4 ~ 24.6 mm (0.961 ~ 0.968 in.)

Inlet 28.4 ~ 28.6 mm (1.118 ~ 1.126 in.)

- Measure the seat width [E] of the portion where there is no build-up carbon (white portion) of the valve seat with vernier calipers.

Good [F]

- ★ If the width is too wide [G], too narrow [H] or uneven [J], repair the seat.

#### Valve Seat Surface Width (or Seat Width)

Standard:

Exhaust 0.5 ~ 1.0 mm (0.02 ~ 0.04 in.)

Inlet 0.5 ~ 1.0 mm (0.02 ~ 0.04 in.)

#### Valve Seat Repair

- Repair the valve seat with the valve seat cutters [A].

Special Tools - Valve Seat Cutter Holder Bar: 57001-1128 [C]

Valve Seat Cutter Holder,  $\phi 4.5$ : 57001-1330 [B]

#### Exhaust Valve Seat

Valve Seat Cutter, 45° -  $\phi 24.5$ : 57001-1113

Valve Seat Cutter, 32° -  $\phi 28$ : 57001-1119

Valve Seat Cutter, 60° -  $\phi 25$ : 57001-1328

#### Inlet Valve Seat

Valve Seat Cutter, 45° -  $\phi 27.5$ : 57001-1114

Valve Seat Cutter, 30° -  $\phi 30$ : 57001-1120

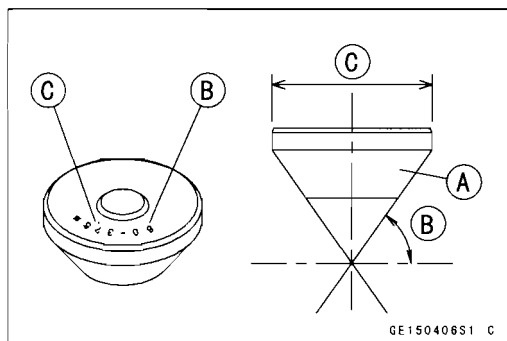
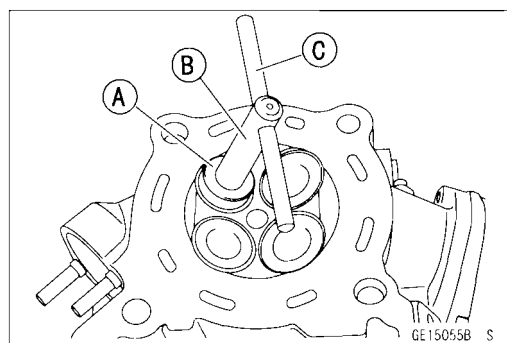
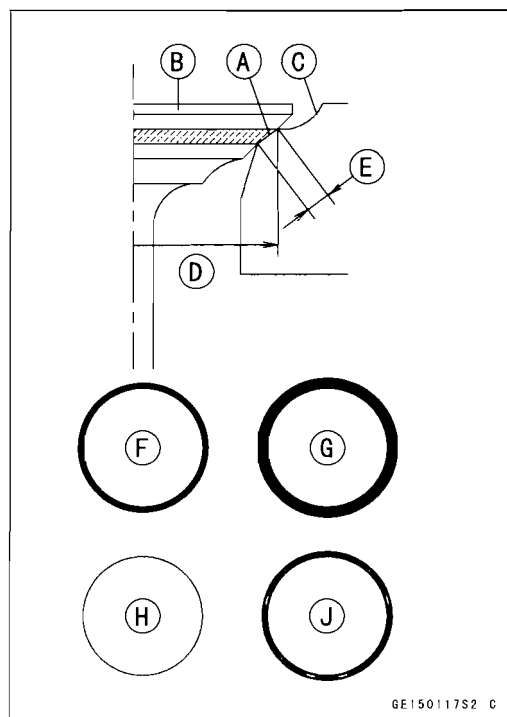
Valve Seat Cutter, 60° -  $\phi 30$ : 57001-1123

○ The marks stamped on the back of the cutter [A] represent the following.

60° ..... Cutter Angle [B]

37.5 $\phi$  ..... Outer Diameter of Cutter [C]

- ★ If the manufacturer's instructions are not available, use the following procedure.



## Valve

### Seat Cutter Operating Cares

1. This valve seat cutter is designed only for valve seat repair. Therefore the cutter must not be used for other purposes.
2. Do not drop or hit the valve seat cutter, or the diamond particles may fall off.
3. Do not fail to apply engine oil to the valve seat cutter before grinding the seat surface. Also wash off ground particles sticking to the cutter with washing oil.

### CAUTION

**Do not use a wire brush to remove the metal particles from the cutter. It will take off the diamond particles.**

4. Setting the valve seat cutter holder into the valve guide, operate the cutter in one hand. Do not apply too much force to the diamond portion.

### NOTE

○Prior to grinding, apply engine oil to the cutter. During operation, wash off any ground particles sticking to the cutter with washing oil.

5. After use wash the cutter with washing oil and apply a thin layer of engine oil before storing.

### Operating Procedures

- Clean the seat area carefully.
- Coat the seat with machinist's dye.
- Fit a 45° cutter [A] into the holder [B] and slide it into the valve guide.
- Press down lightly on the handle and turn it right or left [C]. Grind the seat surface only until it is smooth.

### CAUTION

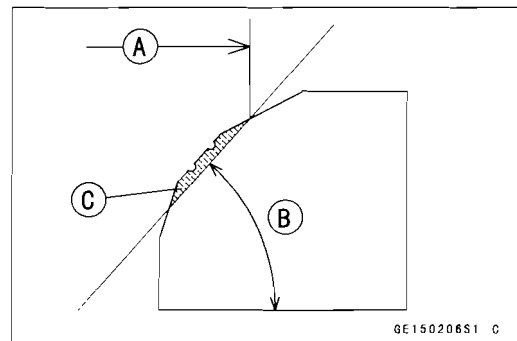
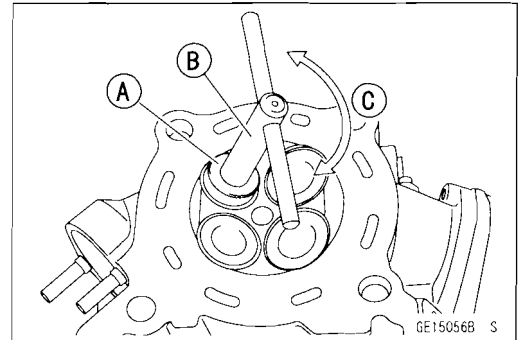
**Do not ground the seat longer than necessary. Excessive grinding will cause the valve to sink deeper in the head and necessitate a larger adjustment in valve clearance.**

- Measure the outside diameter (O.D.) [A] of the seat surface (seat outer diameter) with vernier calipers.
- ★ If the seat O.D. is too small, repeat the 45° grind [B] until the diameter is within the specified range.  
Ground Voluum [C]

### NOTE

- Remove all pittings or flaws from the ground surface.
- After grinding with a cutter, apply thin coat of machinist's dye to seating surface. This makes seat surface distinct and 32° and 60° grinding operation easier.
- When the valve guide is replaced, be sure to grind with 45° cutter for centering and good contact.

- ★ If the O.D. of the seating surface is too large, make the 32° grind described below.



## 5-32 ENGINE TOP END

### Valve

- To make the 32° grind, fit a 32° cutter into the holder, and slide it into the valve guide.
- Turn the holder one turn at a time while pressing down very lightly. Check the seat after each turn.

#### CAUTION

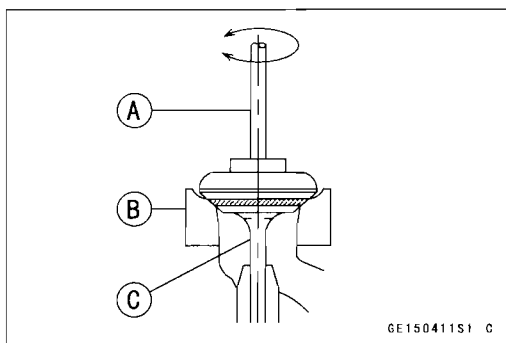
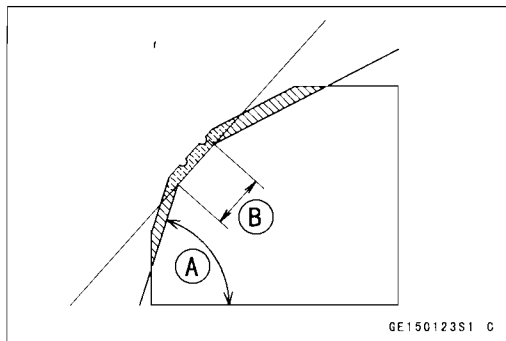
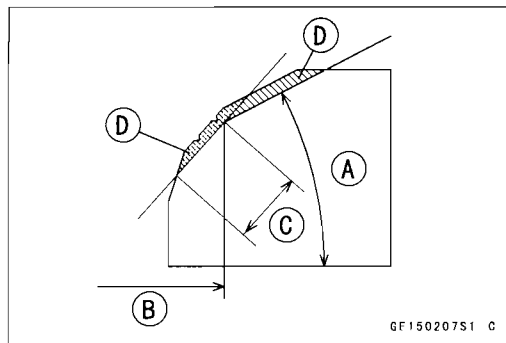
**The 32° cutter removes material very quickly. Check the seat outside diameter frequently to prevent overgrinding.**

- Grind the seat at a 32° angle [A] until the seat O.D. [B] is within the specified range.
- ★ If the O.D. of the seating surface is within the specified range, measure the seat width as described below.
- To measure the seat width, use vernier calipers to measure the width [C] of the 45° angle portion of the seat at several places around the seat.  
Ground Voluum [D]
- ★ If the seat width is too narrow, repeat the 45° grind until the seat is slightly too wide, and then measure the seat O.D..
- ★ If the seat width is too wide, make the 60° grind described below.
- To make the 60° grind, fit a 60° cutter into the holder, and slide it into the valve guide.
- Turn the holder, while pressing down lightly.
- Grind the seat at a 60° angle [A] until the seat width [B] is within the specified range.

- Lap the valve to the seat, once the seat width and outside diameter are within the ranges specified above.
- Put a little coarse grinding compound on the face of the valve in a number of places around the valve head.
- Spin the valve against the seat until the grinding compound produces a smooth, matched surface on both the seat and the valve.
- Repeat the process with a fine grinding compound.

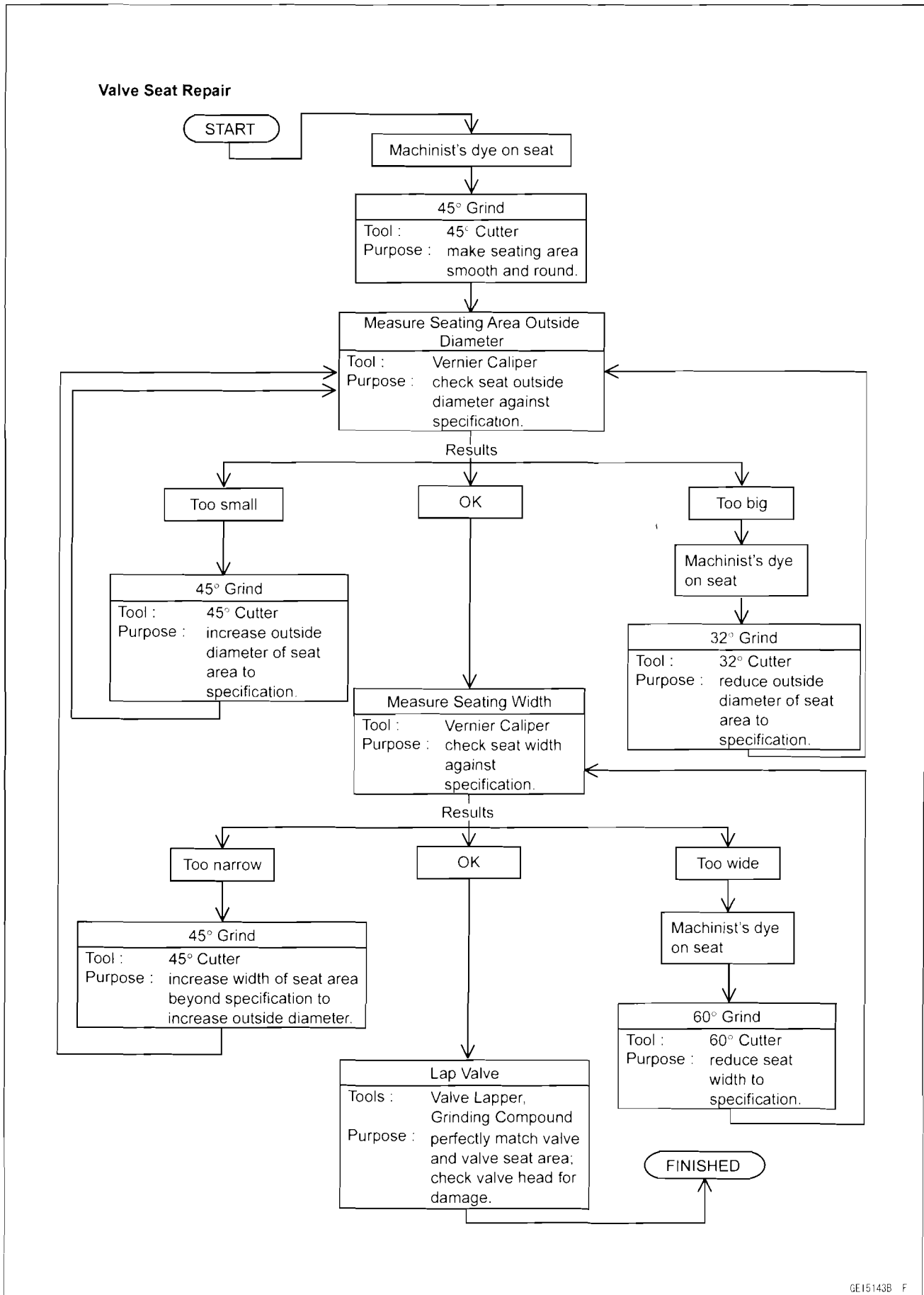
Lapper [A]  
Valve Seat [B]  
Valve [C]

- The seat area should be marked about in the middle of the valve face.
- ★ If the seat area is not in the right place on the valve, check to be sure the valve is the correct part. If it is, it may have been refused too much; replace it.
- Be sure to remove all grinding compound before assembly.



## Valve

## Valve Seat Repair

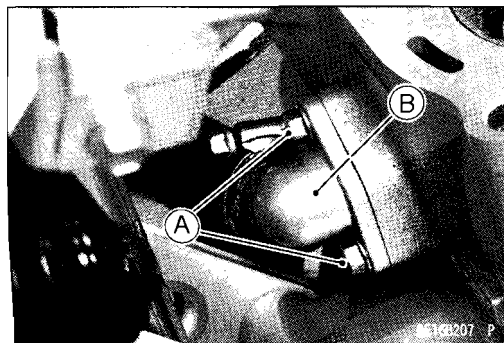


## 5-34 ENGINE TOP END

### Cylinder, Piston

#### Cylinder Removal

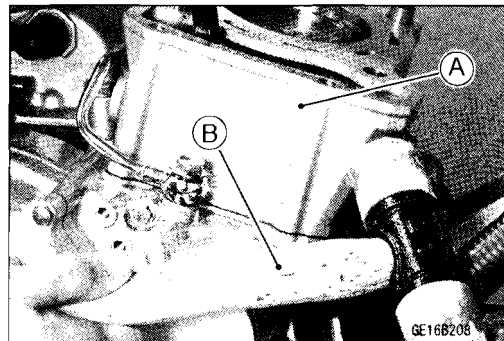
- Remove:
  - Cylinder Head (see Cylinder Head Removal)
  - Radiator Hose Fitting Bolts [A]
  - Radiator Hose Fitting [B]



- Remove the cylinder [A] and cylinder base gasket.

#### NOTE

○If it is hard to remove it, tap lightly using a plastic-faced mallet [B].



#### Piston Removal

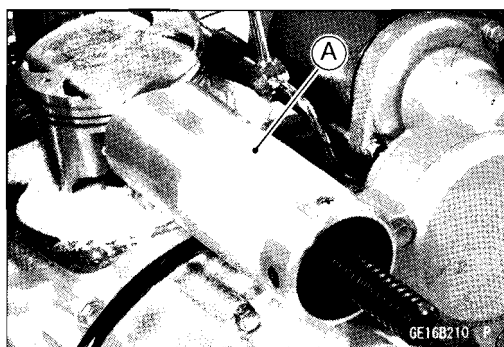
- Remove the cylinder (see Cylinder Removal).
- Remove the piston snap ring [A].

#### NOTE

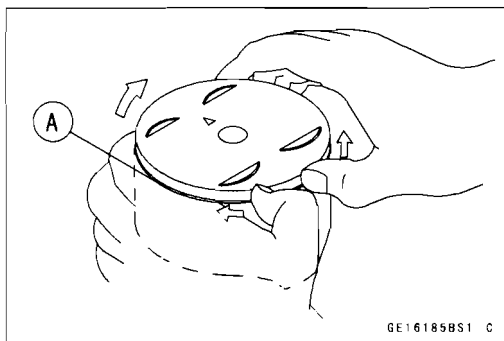
○Stuff a clean cloth [B] into the crankcase opening to keep any parts from dropping into the crankcase.



- Using the piston pin puller assy, remove the piston pin.  
**Special Tool - Piston Pin Puller Assembly [A]: 57001-910**
- Remove the piston.



- Carefully spread the ring [A] opening with your fingers and then push up on the opposite side of the ring to remove it.
- Similarly, disengage a set of three oil rings.

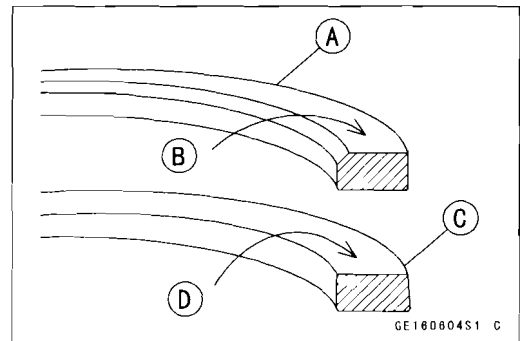
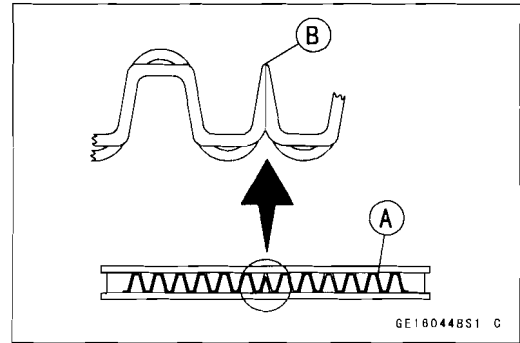


## Cylinder, Piston

### Cylinder, Piston Installation

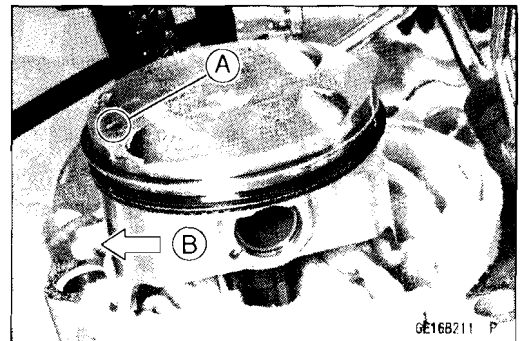
#### NOTE

- The oil ring rails have no "top" or "bottom".
- Install the oil ring expander [A] in the bottom piston ring groove so the ends [B] butt together.
- Install the oil ring steel rails, one above the expander and one below it.
- Spread the rail with your thumbs, but only enough to fit the rail over the piston.
- Release the rail into the bottom piston ring groove.
- Do not mix up the top and second rings.
- The top ring has a whitish finished surface, while the second ring has a blackish finished surface.
- Install the top ring [A] so that the "R" mark [B] faces up.
- Install the second ring [C] so that the "R" mark [D] face up.



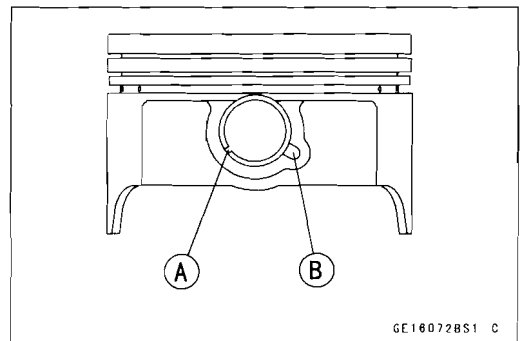
#### NOTE

- The piston-to-cylinder clearance is measured whenever a piston or cylinder is replaced with a new one. Also use new piston rings.
- Apply engine oil to the inside of the connecting rod small end.
- Install the piston with the  $\Delta$  mark [A] provided on the head facing forward [B].
- Install the piston pin and piston ring.



#### CAUTION

**Always replace the piston pin snap ring with a new one.**  
**When installing a snap ring, compress it only enough to install it and no more.**  
**Fit a new piston pin snap ring into the side of the piston so that the ring opening [A] does not coincide with the notch [B] in the edge of the piston pin hole.**



- The piston ring openings must be positioned as shown in the figure. The openings of the oil ring steel rails must be about 30 ~ 45° [F] of angle from the opening of the top ring.

Top Ring [A]

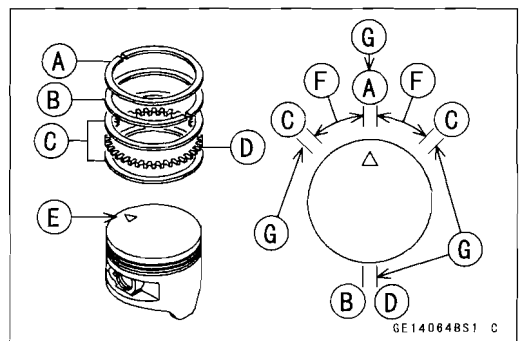
Second Ring [B]

Oil Ring Steel Rails [C]

Oil Ring Expander [D]

The  $\Delta$  mark [E] should face the front side of the engine.

The end-gap positions [G] of the rings are shown.



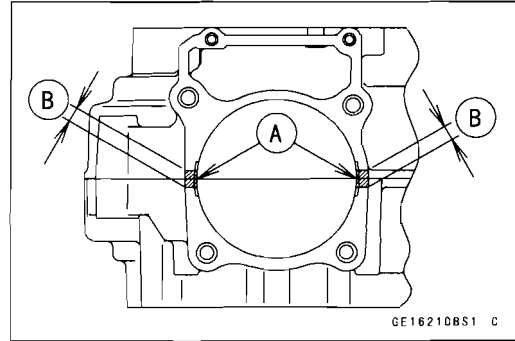


## 5-36 ENGINE TOP END

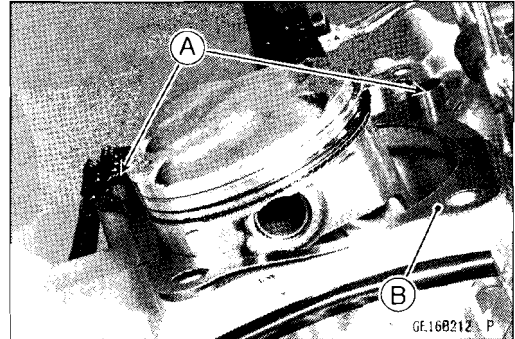
### Cylinder, Piston

- Apply liquid gasket to the upper surface [A] of the crankcase mating surface.  
[B] about 10 mm (0.39 in.)

**Sealant - Kawasaki Bond (Liquid-Black): 92104-1064**



- Install the dowel pins [A].
- Replace the cylinder base gasket [B] with a new one.

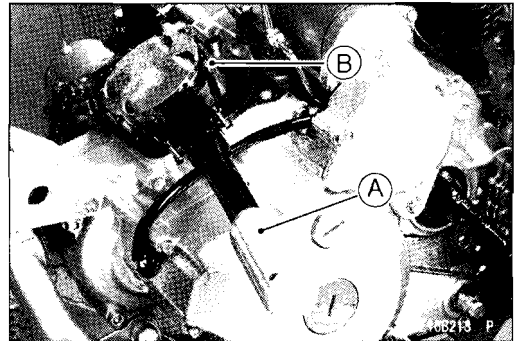


- Compress the piston ring with fingers or a tool to fit the piston into the cylinder.

**Special Tools - Piston Ring Compressor Grip: 57001-1095**  
[A]

**Piston Ring Compressor Belt,  $\phi 67 \sim \phi 79$ : 57001-1097 [B]**

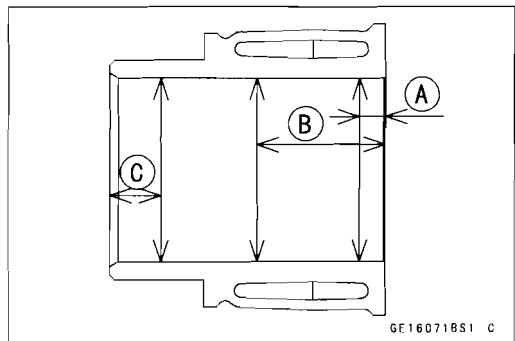
- Make chamfer side of the compressor belt faces upwards.
- Install removed parts (see appropriate chapters).



### Cylinder Wear

- 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 three locations (total of six measurements) shown in the figure.

10 mm (0.4 in.) [A]  
50 mm (2.0 in.) [B]  
20 mm (0.8 in.) [C]



### Cylinder Inside Diameter

**Standard:** 72.000 ~ 72.012 mm (2.8346 ~ 2.8351 in.), while differences in measurements should be within 0.01 mm (0.0004 in.).

**Service Limit:** 72.07 mm (2.837 in.), or differences in measurements should be within 0.05 mm (0.0020 in.).

- ★ If any of the cylinder inside diameter measurements exceeds the service limit, replace the cylinder.



## Cylinder, Piston

### Piston Wear

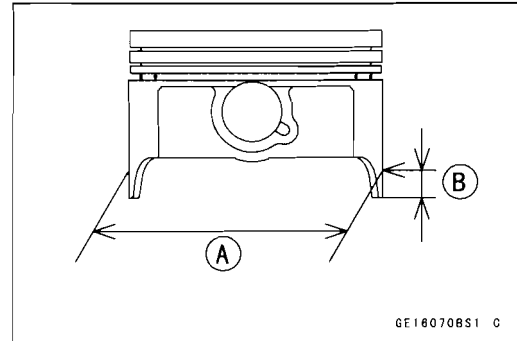
- Measure the outside diameter [A] of each piston 5 mm [B] up from the bottom of the piston at a right angle to the direction of the piston pin.

#### Piston Diameter

**Standard:** 71.950 ~ 71.965 mm (2.8327 ~ 2.8333 in.)

**Service Limit:** 71.80 mm (2.827 in.)

- ★ If the measurement is under the service limit, replace the piston.



### Piston/Cylinder Clearance

- Subtract the piston diameter from the cylinder inside diameter to get the piston/cylinder clearance.

#### Piston/Cylinder Clearance

**Standard:** 0.035 ~ 0.062 mm (0.0014 ~ 0.0024 in.)

- ★ If the piston/cylinder clearance is less than the specified range, use a smaller piston made within the standard diameter or increase the cylinder inside diameter within the standard diameter by honing.
- ★ If the piston/cylinder clearance is greater than the specified range, use a larger piston made within the standard diameter.
- ★ 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.

### Piston Ring, Piston Ring Groove Wear

- Visually inspect the piston rings and the ring grooves.
- ★ If the piston ring or the ring groove is distorted, unevenly worn or damaged, change pistons and piston rings.
- With the piston ring in its groove, make several measurements with a thickness gauge [A] to determine piston ring/groove clearance.

#### Piston Ring/groove Clearance:

##### Standard:

**Top** 0.03 ~ 0.07 mm (0.001 ~ 0.003 in.)

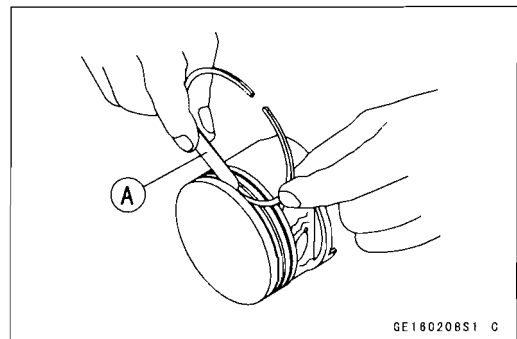
**Second** 0.03 ~ 0.07 mm (0.001 ~ 0.003 in.)

##### Service Limit:

**Top** 0.17 mm (0.0067 in.)

**Second** 0.17 mm (0.0067 in.)

- ★ If the piston ring groove clearance is greater than the service limit, measure the ring thickness and groove width to decide whether to replace the rings, the piston or both.



## 5-38 ENGINE TOP END

### Cylinder, Piston

#### Piston Ring Groove Width

- Measure the width of the top ring [A], second ring [B] and oil ring [C] grooves.
- Use vernier calipers at several points around the piston.

##### Piston Ring Groove Width

###### Standard:

Top	1.02 ~ 1.04 mm (0.0402 ~ 0.0409 in.)
Second	1.02 ~ 1.04 mm (0.0402 ~ 0.0409 in.)
Oil	2.01 ~ 2.03 mm (0.0791 ~ 0.0799 in.)

###### Service Limit:

Top	1.12 mm (0.0441 in.)
Second	1.12 mm (0.0441 in.)
Oil	2.11 mm (0.0831 in.)

- ★ If the groove width exceeds the service limit, replace the piston.

#### Piston Ring Thickness

- Measure the thickness of the top [A] and second [B] rings.
- Use a micrometer to measure at several points around the rings.

##### Piston Ring Groove Thickness

###### Standard:

Top	0.97 ~ 0.99 mm (0.038 ~ 0.039 in.)
Second	0.97 ~ 0.99 mm (0.038 ~ 0.039 in.)

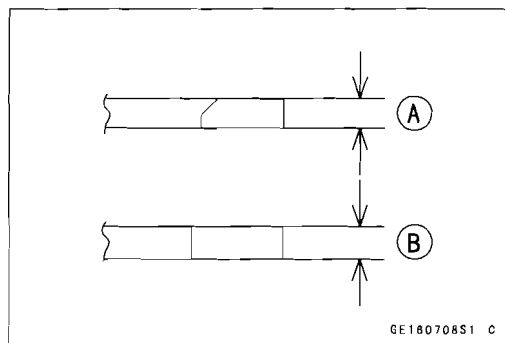
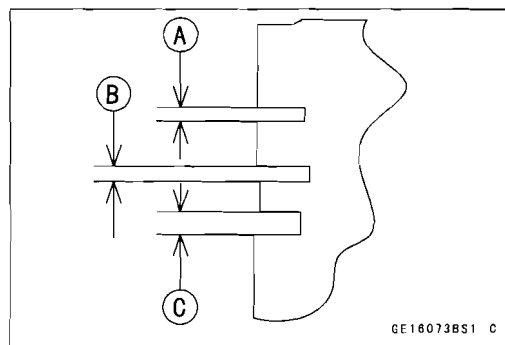
###### Service Limit:

Top	0.90 mm (0.035 in.)
Second	0.90 mm (0.035 in.)

- ★ If any of the measurements is less than the service limit on either of the rings, replace all the rings.

#### NOTE

- When using new rings in a used piston, check for uneven groove wear. A ring must fit tightly along the top and bottom edges of the groove. If not, replace the piston.



## Cylinder, Piston

### Piston Ring End Gap

- Place the piston ring [A] 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 [B] between the ends of the ring with a thickness gauge.

#### Piston Ring End Gap

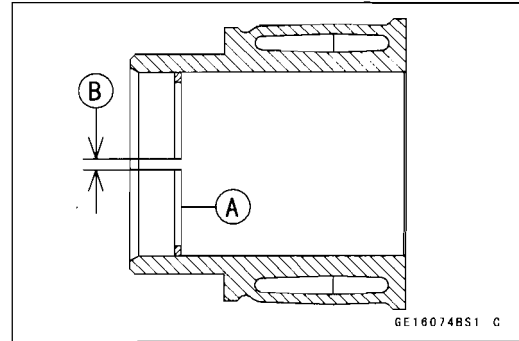
##### Standard:

Top	0.20 ~ 0.35 mm (0.0079 ~ 0.014 in.)
Second	0.20 ~ 0.35 mm (0.0079 ~ 0.014 in.)
Oil	0.20 ~ 0.70 mm (0.0079 ~ 0.028 in.)

##### Service Limit:

Top	0.6 mm (0.02 in.)
Second	0.6 mm (0.02 in.)
Oil	1.0 mm (0.039 in.)

- ★ If the end gap of any ring is greater than the service limit, replace the ring.

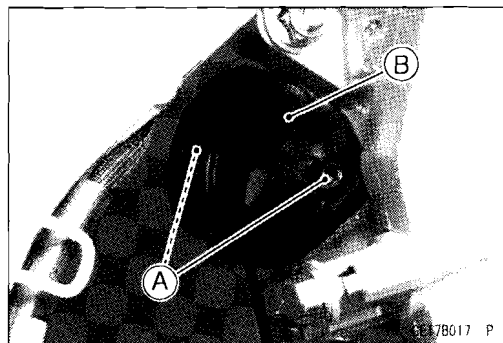


## 5-40 ENGINE TOP END

### Carburetor Holder

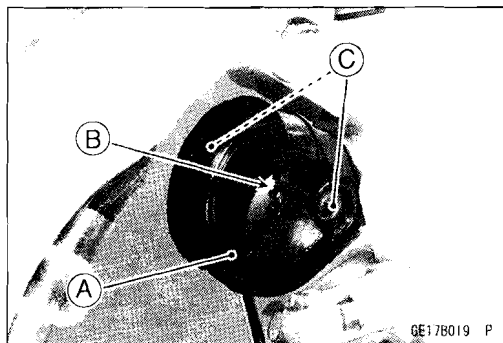
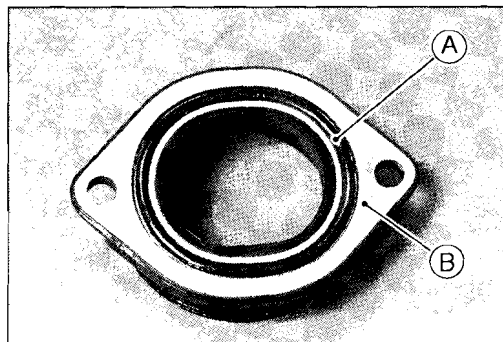
#### Carburetor Holder Removal

- Remove:
  - Carburetor (see Carburetor Removal in the Fuel System chapter)
  - Carburetor Holder Bolts [A]
  - Carburetor Holder [B]



#### Carburetor Holder Installation

- Replace the O-ring [A] with a new one.
  - Apply grease to the O-ring.
  - Install the O-ring to the carburetor holder [B].
- 
- Install the carburetor holder [A] so that the groove [B] faces right side.
  - Tighten:
    - Torque - Carburetor Holder Bolts [C]: 12 N·m (1.2 kgf·m, 106 in·lb)



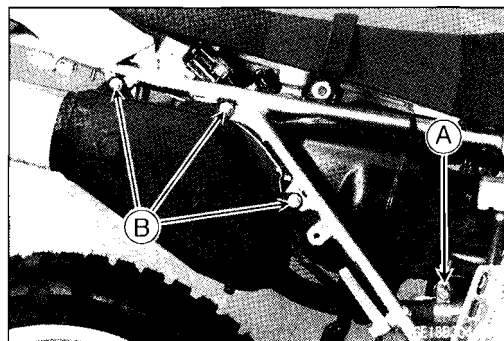
## Mufflers

### Muffler Body Removal

#### ⚠ WARNING

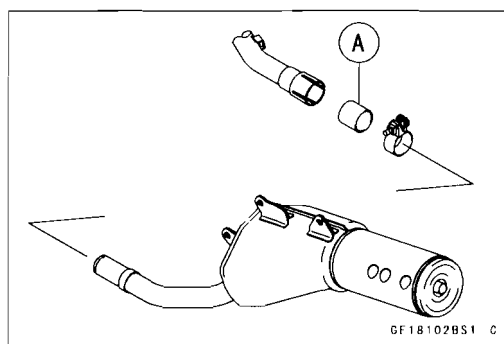
To avoid a serious burn, do not remove the exhaust pipe or muffler body when the engine is still hot.

- Remove the right side cover (see Side Cover Removal in the Frame chapter).
- Loosen the muffler clamp bolt [A].
- Remove the mounting bolts [B], and pull the muffler body backward.

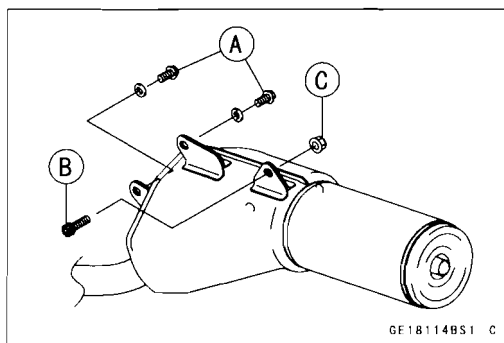


### Muffler Body Installation

- Replace the muffler gasket [A] with a new one, and install it.
- Install the muffler body.

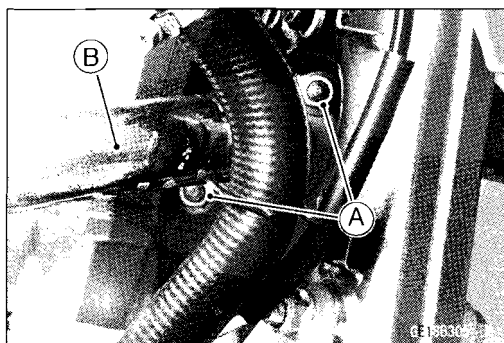


- Tighten:
  - Torque - Muffler Body Bolts (Front and Center) [A]:** 30 N·m (3.0 kgf·m, 22 ft·lb)
- First, tighten the muffler body bolt (rear) [B], and next tighten the muffler body nut [C].
  - Torque - Muffler Body Bolt (Rear):** 9.8 N·m (1.0 kgf·m, 87 in·lb)
  - Muffler Body Nut:** 30 N·m (3.0 kgf·m, 22 ft·lb)



### Exhaust Pipe Removal

- Remove:
  - Muffler Body (see Muffler Body Removal)
  - Exhaust Pipe Holder Nuts [A]
  - Exhaust Pipe [B]

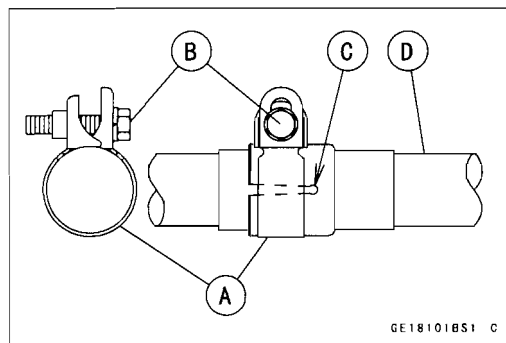


## 5-42 ENGINE TOP END

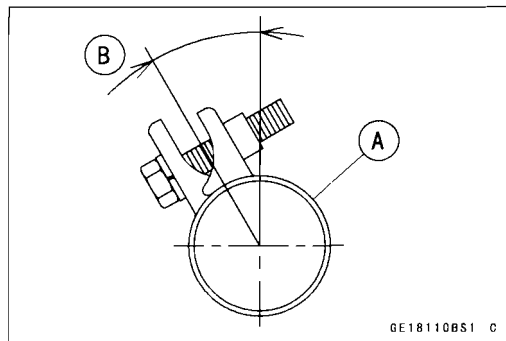
### Mufflers

#### **Muffler/Exhaust Pipe Installation**

- Replace the muffler and exhaust pipe gaskets with a new one.
- Install the muffler clamp [A] so that the clamp bolt [B] faces upward and position the clamp between slit [C] of the exhaust pipe [D].



- Install the muffler clamp [A] as shown, and tighten the clamp bolt securely.  
20 ~ 40° [B]



- Tighten the exhaust pipe holder nuts and muffler clamp bolt.
- Install the muffler body (see Muffler Body Installation).
- Thoroughly warm up the engine, wait until the engine cools down, and retighten the muffler clamp bolt and exhaust pipe holder nuts.

# Clutch

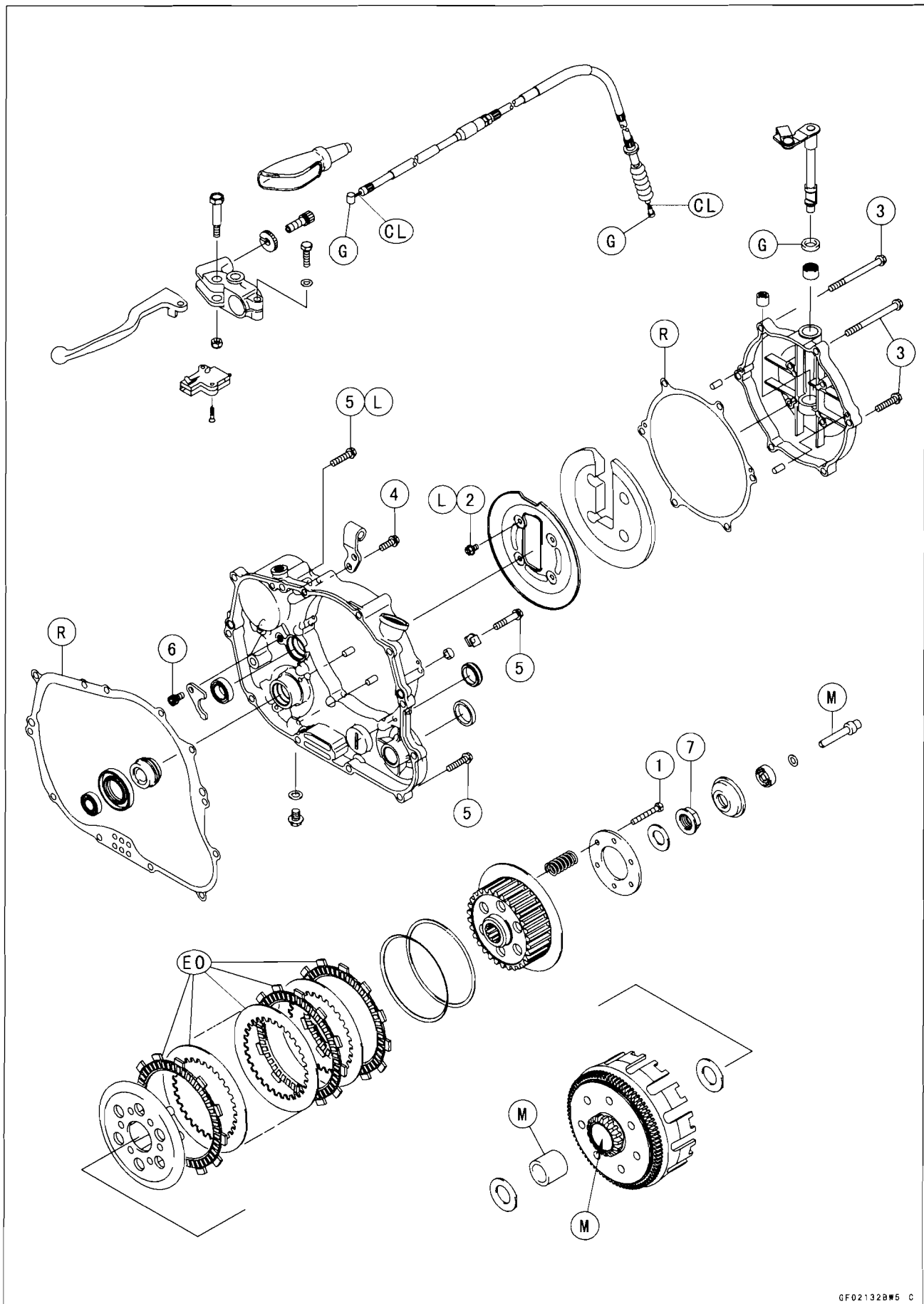
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## 6-2 CLUTCH

### Exploded View



GF02132BW5 C

**Exploded View**

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Clutch Spring Bolts	7.8	0.80	69 in·lb	
2	Clutch Cover Damper Plate Bolts	7.8	0.80	69 in·lb	L
3	Clutch Cover Bolts	9.8	1.0	87 in·lb	
4	Clutch Cable Holder Bracket Bolts	9.8	1.0	87 in·lb	
5	Right Engine Cover Bolts	9.8	1.0	87 in·lb	L (1)
6	Oil Seal Retaining Plate Bolt	12	1.2	106 in·lb	
7	Clutch Hub Nut	78	8.0	58	

CL: Apply cable lubricant.

EO: Apply engine oil.

G: Apply grease.

L: Apply a non-permanent locking agent.

M: Apply molybdenum disulfide grease.

R: Replacement Parts

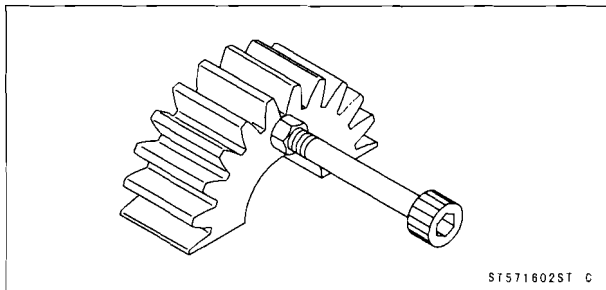
## 6-4 CLUTCH

### Specifications

Item	Standard	Service Limit
<b>Clutch Lever</b>		
Clutch Lever Play	2 ~ 3 mm (0.08 ~ 0.12 in.)	— — —
<b>Clutch</b>		
Plate Assy Thickness	30.3 ~ 30.9 mm (1.19 ~ 1.22 in.)	— — —
Clutch Spring Free Length	35.4 mm (1.39 in.)	33.9 mm (1.33 in.)
Friction Plate Thickness	2.92 ~ 3.08 mm (0.115 ~ 0.121 in.)	2.7 mm (0.11 in.)
Friction Plate/Clutch Housing Clearance	0.09 ~ 0.70 mm (0.0035 ~ 0.028 in.)	0.95 mm (0.037 in.)
Friction Plate Warp	0.15 mm (0.0060 in.) or less	0.3 mm (0.01 in.)
Steel Plate Warp	0.20 mm (0.0079 in.) or less	0.3 mm (0.01 in.)

## Special Tool

**Gear Holder:**  
**57001-1602**



## 6-6 CLUTCH

### Clutch Lever and Cable

#### **Clutch Lever Free Play Inspection**

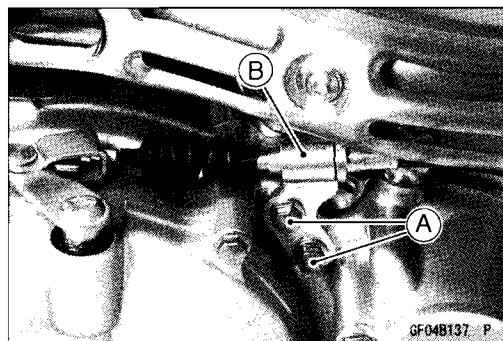
- Refer to the Clutch Operation Inspection in the Periodic Maintenance chapter.

#### **Clutch Lever Free Play Adjustment**

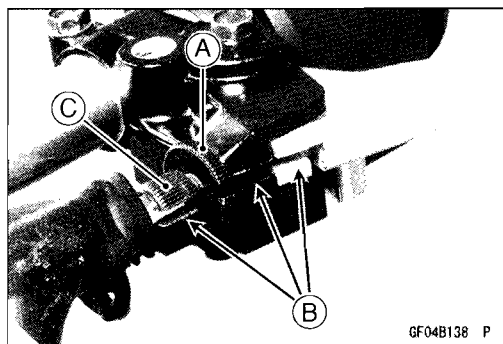
- Refer to the Clutch Operation Inspection in the Periodic Maintenance chapter.

#### **Clutch Cable Removal**

- Remove:
  - Bolts [A]
  - Clutch Cable Holder Bracket [B] (with the clutch cable installed)



- Loosen the locknut [A].
- Line up the slots [B] in the clutch lever and adjuster [C], and then free the cable from the lever.
- Free the clutch inner cable tip from the clutch release lever.
- Push the release lever toward the front of the motorcycle and tape the release lever to the clutch cover to prevent the release shaft from falling out.
- Pull the clutch cable out of the frame.



#### **Clutch Cable Installation**

- Run the clutch cable correctly (see Cable, Wire, and Hose Routing section in the Appendix chapter).

**Torque - Clutch Cable Holder Bracket Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)**

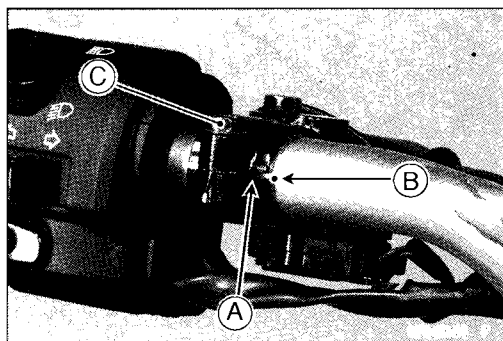
- Adjust the clutch cable (see Clutch Operation Inspection in the Periodic Maintenance chapter).

#### **Clutch Cable Lubrication**

- Refer to the Chassis Parts Lubrication in the Periodic Maintenance chapter.

#### **Clutch Lever Installation**

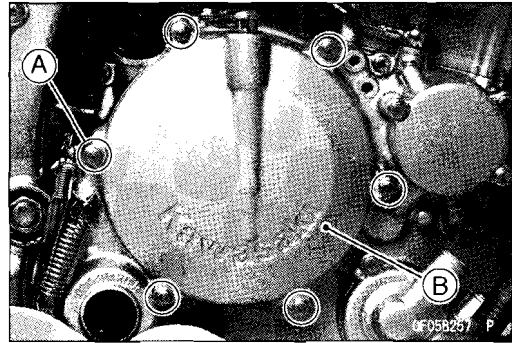
- Install the clutch lever so that the slit [A] of the clutch lever clamp is aligned with the punch mark [B].
- Tighten the clutch lever clamp bolt [C] securely.



## Clutch Lever and Cable

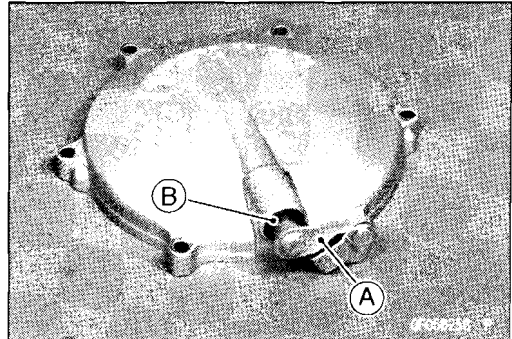
### Clutch Cover Removal

- Drain the engine oil (see Engine Oil Change in the Periodic Maintenance chapter).
- Remove:
  - Clutch Cable Lower End (see Clutch Cable Removal)
  - Clutch Cover Bolts [A]
  - Clutch Cover [B]



### CAUTION

Do not remove the clutch release shaft [A] unless it is absolutely necessary. If removed, the oil seal [B] replacement may be required.



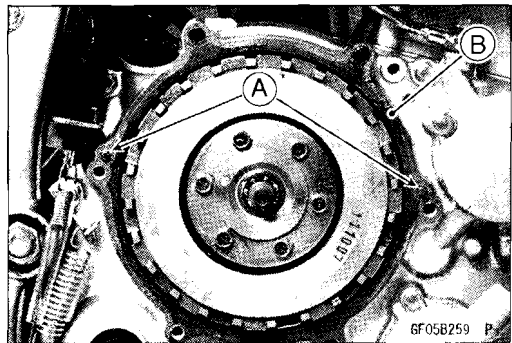
### Clutch Cover Installation

- Make sure the two dowel pins [A] are in position.
- Turn the clutch release lever toward the rear.
- Replace the clutch cover gasket [B] with a new one.
- Install the clutch cover.

**Torque - Clutch Cover Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)**

**Clutch Cable Holder Bracket Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)**

- After installing the clutch cable, adjust its free play (see Clutch Operation Inspection in the Periodic Maintenance chapter).



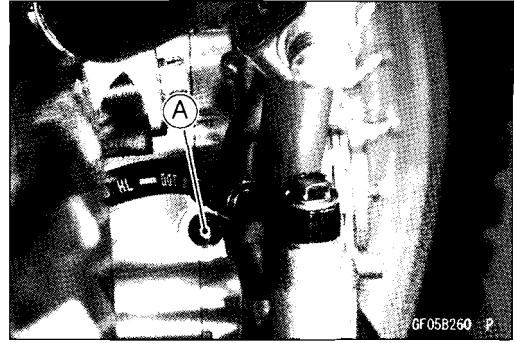
### Right Engine Cover Removal

- Drain the engine oil (see Engine Oil Change in the Periodic Maintenance chapter).
- Drain the coolant (see Coolant Change in the Periodic Maintenance chapter).
- Remove:
  - Water Pump (see Water Pump Removal in the Cooling System chapter)
  - Clutch Cable Lower End (see Clutch Cable Removal)
  - Brake Pedal (see Brake Pedal Removal in the Brake chapter)

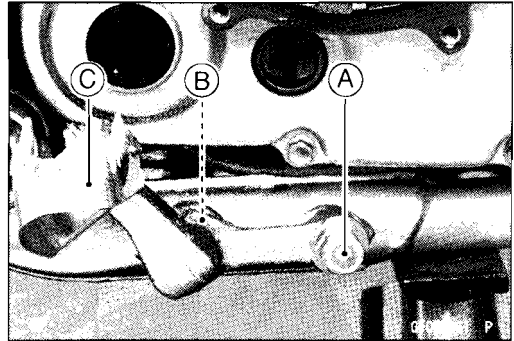
## 6-8 CLUTCH

### Clutch Lever and Cable

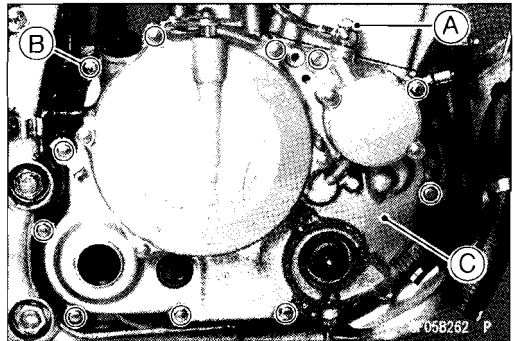
- Remove the rear brake light switch bracket bolt [A] to free the brake light switch.



- Remove:
  - Right Front Footpeg Bolt [A]
  - Right Front Footpeg Nut [B]
  - Right Front Footpeg [C]

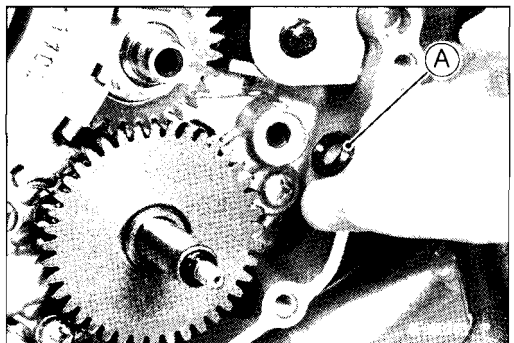


- Remove:
  - Oil Pipe Banjo Bolt [A]
- Remove the right engine cover bolt [B] and take off the right engine cover [C] with the clutch cover installed.

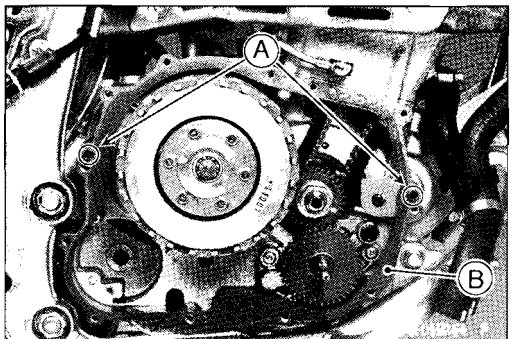


### Right Engine Cover Installation

- Make sure the O-ring [A] is chamfered side facing outward.



- Make sure the two dowel pins [A] are in position.
- Turn the clutch release lever toward the rear.
- Replace the right engine cover gasket [B] with a new one.





## Clutch Lever and Cable

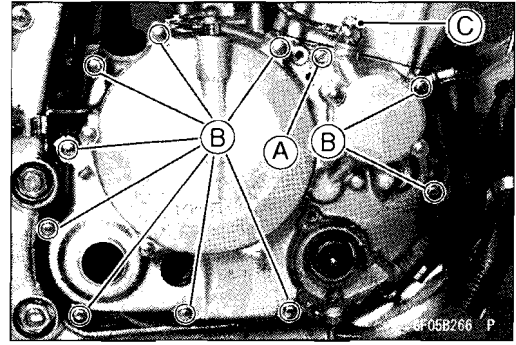
- Apply a non permanent locking agent to the thread of the right engine cover bolt [A].
- Install the right engine cover.

**Torque - Right Engine Cover Bolts [A] [B]: 9.8 N·m (1.0 kgf·m, 87 in·lb)**

- Install the water pump (see Water Pump Installation in the Cooling System chapter).
- Replace the oil pipe banjo bolt washers with new ones, and tighten the oil pipe banjo bolt [C].

**Torque - Oil Pipe Banjo Bolt (M10): 20 N·m (2.0 kgf·m, 15 ft·lb)**

- Install:
  - Brake Pedal (see Brake Pedal Installation in the Brakes chapter)
  - Right Front Footpeg
- Fill the coolant (see Coolant Change in the Periodic Maintenance chapter).
- Fill the engine oil (see Engine Oil Change in the Periodic Maintenance chapter).
- Adjust the clutch lever free play (see Clutch Operation Inspection in the Periodic Maintenance chapter).
- Check the rear brake (see Brake Operation Inspection in the Periodic Maintenance chapter).

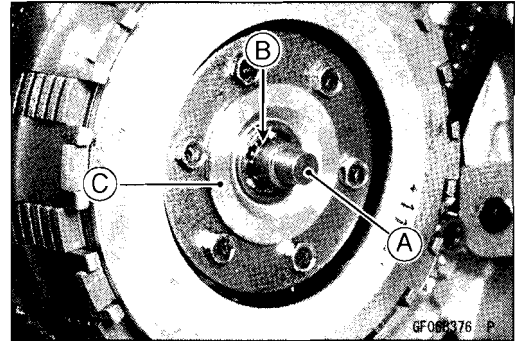


## 6-10 CLUTCH

### Clutch

#### Clutch Removal

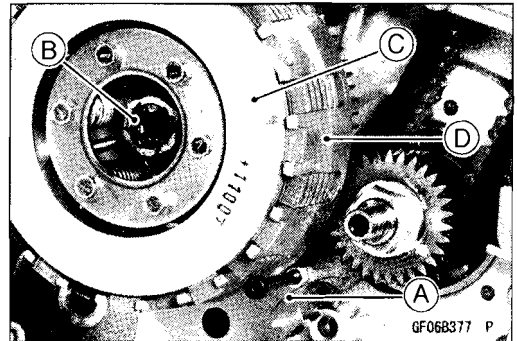
- Drain the engine oil (see Engine Oil Change in the Periodic Maintenance chapter).
- Remove:
  - Right Engine Cover (see Right Engine Cover Removal).
  - Oil Pump (see Oil Pump Removal in the Engine Lubrication System chapter).
- Remove:
  - Clutch Pusher [A]
  - Washer [B]
  - Holder [C]



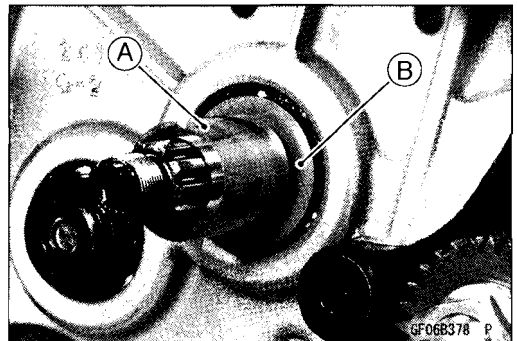
- Using the gear holder [A] to prevent the clutch from rotating.

**Special Tool - Gear Holder: 57001-1602**

- Remove:
  - Clutch Hub Nut [B] and Washer
  - Clutch Plate Assy [C] and Washer
  - Clutch Housing [D]

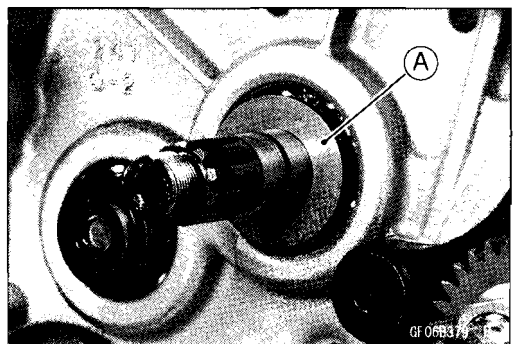


- Remove:
  - Sleeve [A]
  - Washer [B]



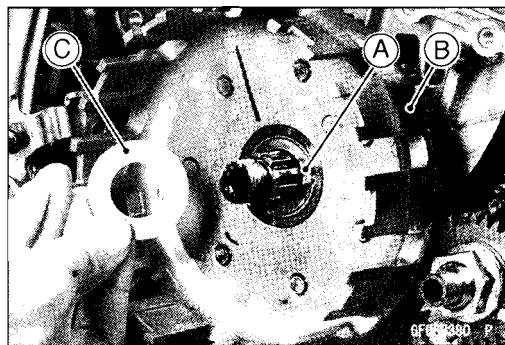
#### Clutch Installation

- Install:
  - Washer [A]



## Clutch

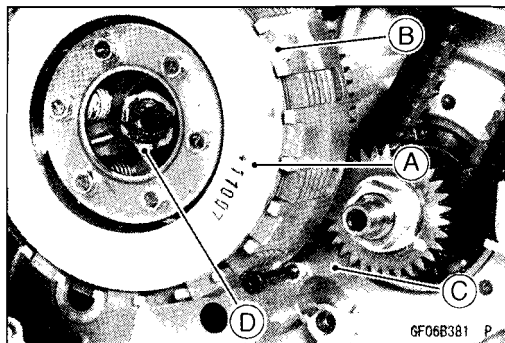
- Apply molybdenum disulfide grease to the sleeve and inside of the clutch housing boss.
- Install the sleeve [A] into the clutch housing [B].
- Install:  
Clutch Housing with the sleeve installed  
Washer [C]



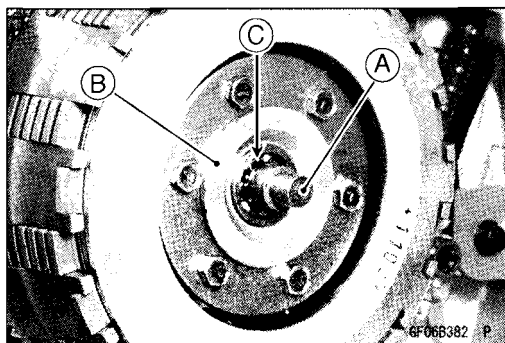
- Install the clutch plate assy [A].
- Install the last friction plate [B] in the shallower groove in the clutch housing.
- Using the gear holder [C] to prevent the clutch from rotating.

**Special Tool - Gear Holder: 57001-1602**

- Tighten:  
**Torque - Clutch Hub Nut [D]: 78 N·m (8.0 kgf·m, 58 ft·lb)**

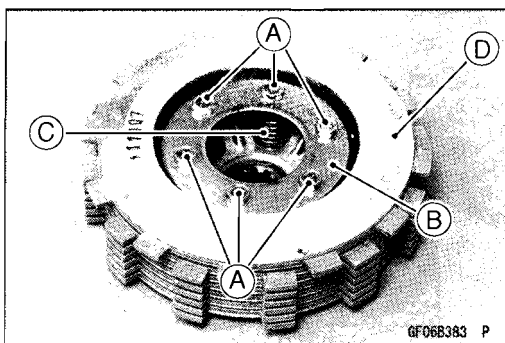


- Apply molybdenum disulfide grease to the clutch pusher [A].
- Install:  
Holder [B]  
Washer [C]  
Clutch Pusher
- Install removed parts (see appropriate chapters).



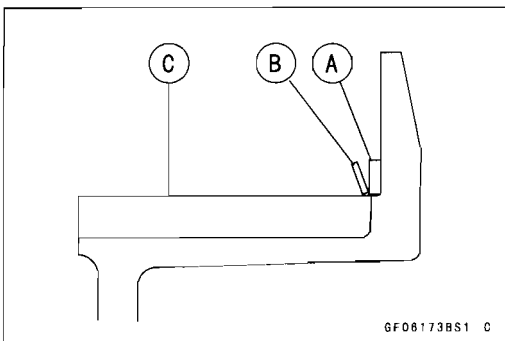
### Clutch Plate Assy Disassembly

- Remove:  
Spring Bolts [A]  
Spring Plate [B]  
Springs [C]  
Clutch Wheel [D]  
Judder Spring Seat  
Judder Spring  
Friction Plate  
Steel Plates



### Clutch Plate Assy Assembly

- Install the judder spring seat [A] and judder spring [B] to the clutch hub [C] as shown.
- Apply engine oil to the friction and steel plates.



## 6-12 CLUTCH

### Clutch

- Assemble the friction plate and the clutch plate to the clutch hub.
- First, install the friction plate [A] and steel plate (without knurling) [B].
- Then install the friction plates [C] and steel plates [D] (with knurling), starting with a friction plate and alternating them.
- Turn the outside friction plate to shift its phase by 15°.
- Install the clutch wheel [E].

#### CAUTION

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

- Install:
  - Springs [A]
  - Spring Plate [B]
  - Spring Bolts [C]
- Torque - Clutch Spring Bolts: 7.8 N·m (0.80 kgf·m, 69 in·lb )**
- Check the plate assy thickness (see Plate Assy Thickness Inspection and Adjustment).

#### Clutch Plate Assy Inspection and Adjustment

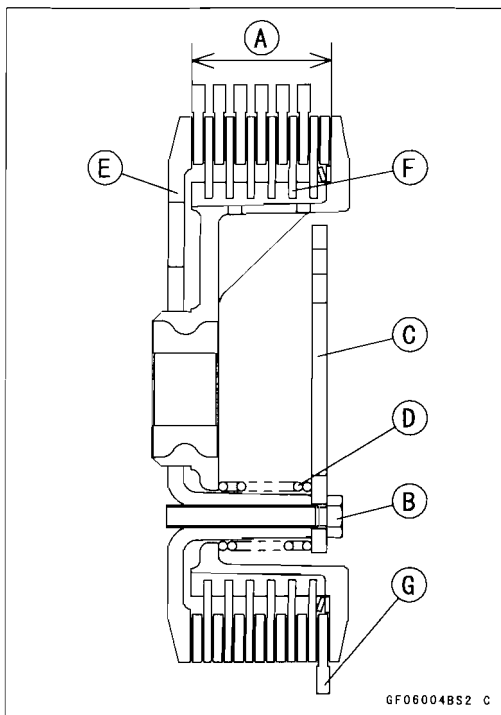
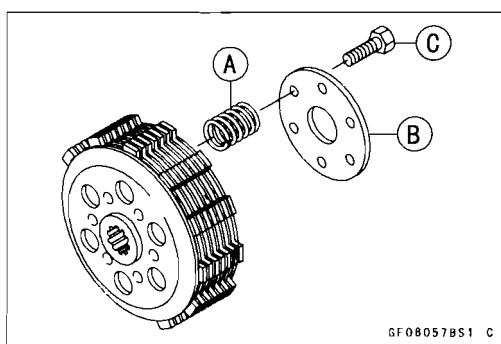
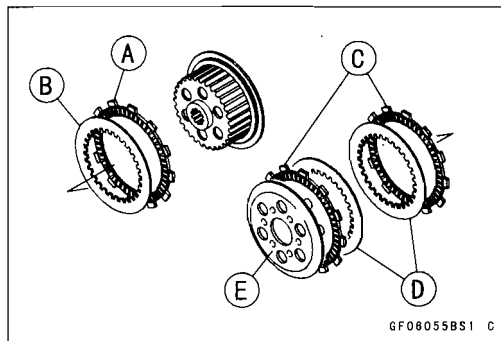
- Measure the thickness [A] of the clutch plate assy.
- Clutch Plate Assy Thickness**
  - Standard: 30.3 ~ 30.9 mm (1.19 ~ 1.22 in.)**
- ★ If the thickness is not in the standard range, change steel plates to adjust thickness.
- Remove:
  - Spring Bolt [B]
  - Spring Plate [C]
  - Springs [D]
  - Clutch Wheel [E]
- Replace the following steel plates [F].

Parts No.	Thickness
13089-1117	1.2 mm (0.05 in.)
13089-1094	1.6 mm (STD) (0.06 in.)
13089-1116	2.0 mm (0.08 in.)

#### NOTE

○ Do not use the steel plate of 1.2 mm (0.05 in.) and 2.0 mm (0.08 in.) thickness at the same time.

- Install the removed parts, and inspect the clutch plate assy thickness.
- Turn the friction plate [G] to shift its phase by 15°.
- Torque - Clutch Spring Bolt: 7.8 N·m (0.80 kgf·m, 69 in·lb)**



## Clutch

### Friction and Steel Plates Wear, Damage Inspection

#### CAUTION

If new friction plates are installed, apply engine oil to the surfaces of each plate to avoid seizure.

- Visually inspect the friction or steel plates for signs of seizure, overheating (discoloration) or uneven wear.
- ★ Replace any damaged plates.
- Measure the thickness of the friction plate [A] at several points.

#### Friction Plate Thickness

**Standard:** 2.92 ~ 3.08 mm (0.115 ~ 0.121 in.)

**Service Limit:** 2.7 mm (0.11 in.)

- ★ If the measurement is under the service limit, replace the friction plates.
- When you have changed friction plates or steel plates, measure the thickness of the clutch plate assy and make an adjustment, if necessary.

### Friction and Steel Plates Warp

- Place each friction plate or steel plate on a surface plate [A], and measure the gap between the surface plate and each friction plate or steel plate [B] with a thickness gauge [C]. The gap is the amount of friction or steel plate warp.

#### Plate Warp

##### Friction Plate:

**Standard:** 0.15 mm (0.0060 in.) or less

**Service Limit:** 0.3 mm (0.01 in.)

##### Steel Plates:

**Standard:** 0.20 mm (0.0079 in.) or less

**Service Limit:** 0.3 mm (0.01 in.)

- ★ If the friction plate is warped more than the service limit, replace it with a new one.
- ★ If the steel plate is warped more than the service limit, replace it with a new one of the same thickness.

### Clutch Spring Free Length Inspection

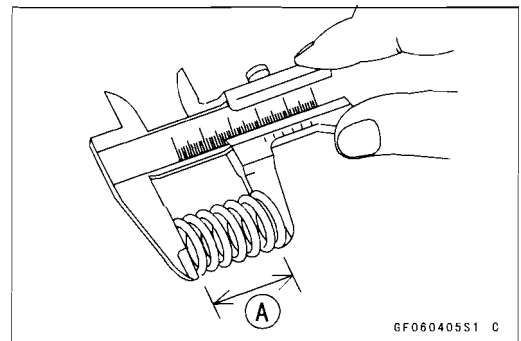
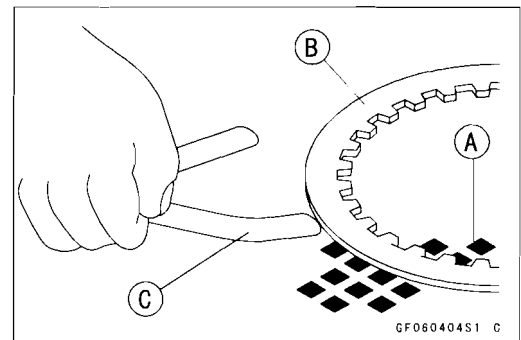
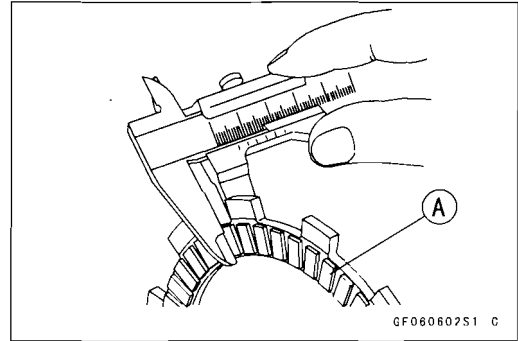
- Measure the free length [A] of the spring.

#### Clutch Spring Free Length

**Standard:** 35.4 mm (1.39 in.)

**Service Limit:** 33.9 mm (1.33 in.)

- ★ If the measurement is smaller than the service limit, replace the clutch spring.

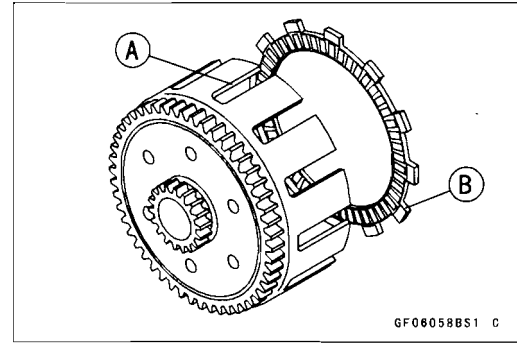


## 6-14 CLUTCH

### Clutch

#### **Clutch Housing Groove Inspection**

- Visually inspect the grooves [A] of the clutch housing where the tangs [B] of the friction plates hit them.
- ★ If they are badly worn or if there are groove cuts where the tangs hit, replace the housing. Also, replace the friction plates if their tangs are damaged.



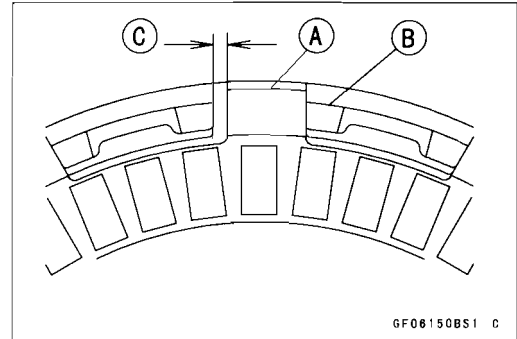
- Measure the clearance [C] between the tangs [A] on the friction plate and the fingers [B] of the clutch housing.

#### **Friction Plate/Clutch Housing Clearance**

**Standard:** 0.09 ~ 0.70 mm (0.0035 ~ 0.028 in.)

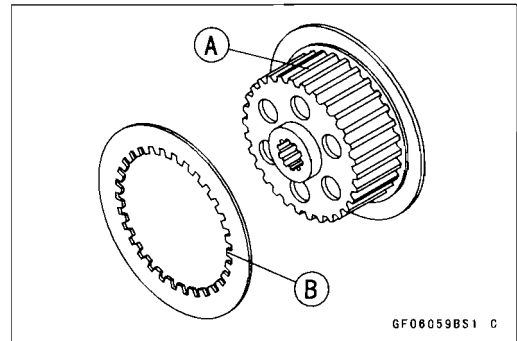
**Service Limit:** 0.95 mm (0.037 in.)

- ★ If this clearance is excessive, the clutch will be noisy.
- ★ If the clearance exceeds the service limit, replace the friction plates.



#### **Clutch Hub Spline Inspection**

- Visually inspect where the teeth [B] on the steel plates wear against the splines [A] of the clutch hub.
- ★ If there are notches worn into the splines, replace the steel plates.





# Engine Lubrication System

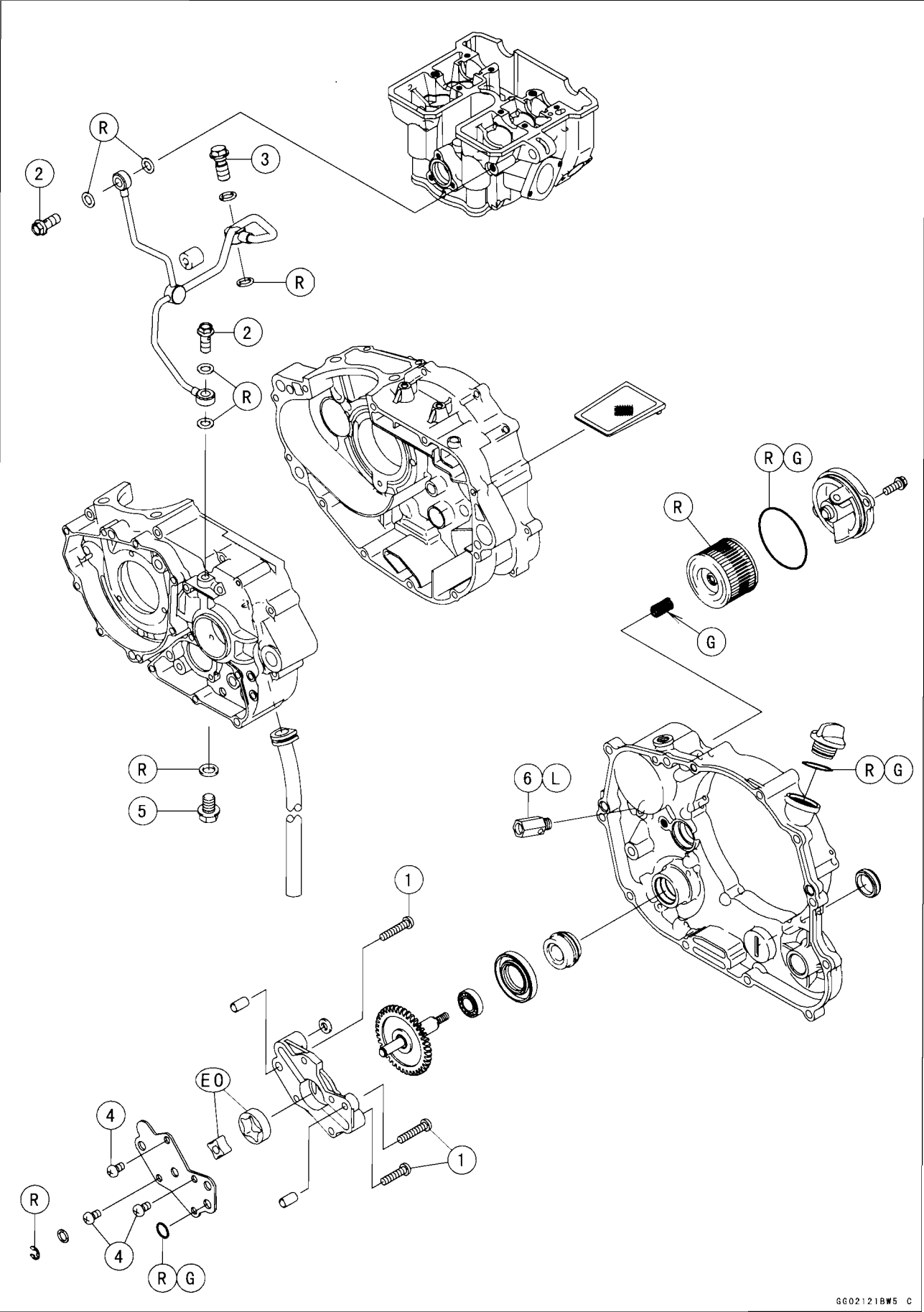
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7-2 ENGINE LUBRICATION SYSTEM

Exploded View



## ENGINE LUBRICATION SYSTEM 7-3

### Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Oil Pump Mounting Screws	5.2	0.53	46 in·lb	
2	Oil Pipe Banjo Bolts (M8)	9.8	1.0	87 in·lb	
3	Oil Pipe Banjo Bolt (M10)	20	2.0	15	
4	Oil Pump Cover Screws	10	1.0	88 in·lb	
5	Engine Oil Drain Plug	15	1.5	11	
6	Oil Pressure Relief Valve	15	1.5	11	L

EO: Apply engine oil.

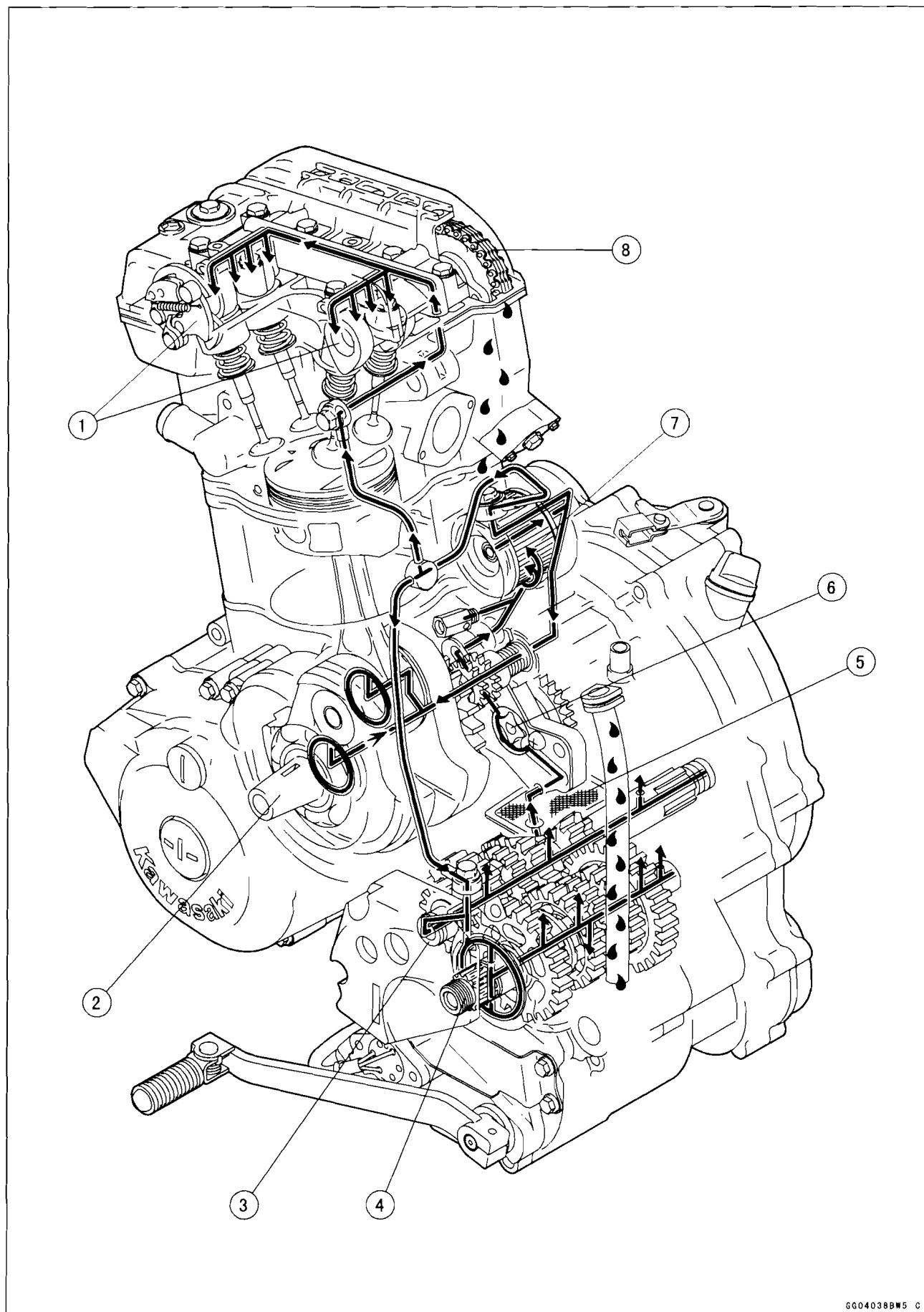
G: Apply grease.

L: Apply a non-permanent locking agent.

R: Replacement Parts

## 7-4 ENGINE LUBRICATION SYSTEM

### Engine Oil Flow Chart



GG04038BW5 C

### Engine Oil Flow Chart

→: Oil Flow

1. Camshaft
2. Crankshaft
3. Driveshaft
4. Output shaft
5. Oil Screens
6. Oil Pump
7. Oil filter
8. Camshaft Chain

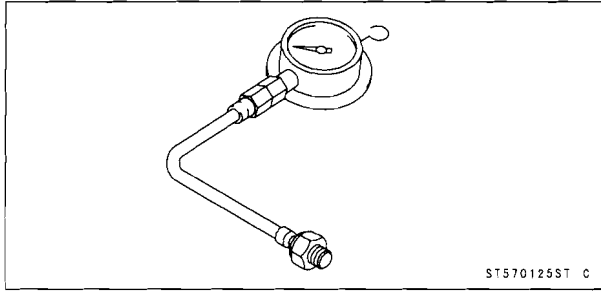
## 7-6 ENGINE LUBRICATION SYSTEM

### Specifications

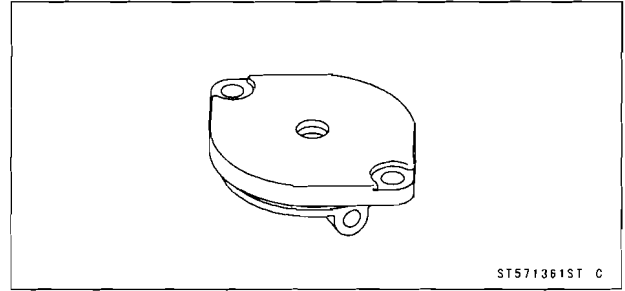
Item	Standard
<b>Engine Oil</b>	
Grade	API SE, SF or SG API SH, SJ or SL with JASO MA, MA1 or MA2
Viscosity	SAE 10W-40
Capacity	1.3 L (1.4 US qt) (when filter is not removed) 1.4 L (1.5 US qt) (when filter is removed) 1.5 L (1.6 US qt) (when engine is completely disassembled and dry)
Level	Between upper and lower level lines (Wait several minutes after the idling or running.)
Oil Pressure (engine speed 4 000 rpm, oil temperature 90 °C (194 °F))	78 ~ 147 kPa (0.8 ~ 1.5 kgf/cm <sup>2</sup> , 11 ~ 21 psi)

## Special Tools

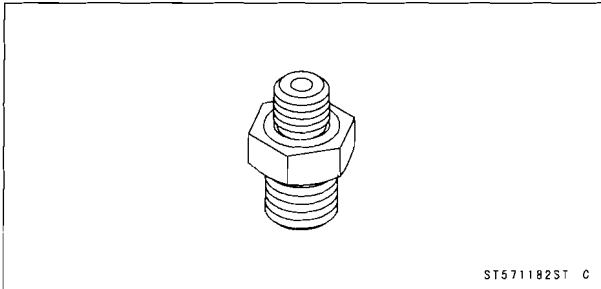
**Oil Pressure Gauge 5 kgf/cm<sup>2</sup>:**  
**57001-125**



**Oil Pressure Cap M10 × 1.25:**  
**57001-1361**



**Oil Pressure Gauge Adapter M10 × 1.25:**  
**57001-1182**



## 7-8 ENGINE LUBRICATION SYSTEM

### Engine Oil and Oil Filter

#### **⚠ WARNING**

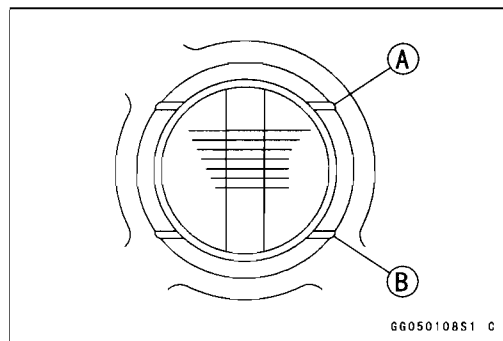
Motorcycle operation with insufficient, deteriorated or contaminated engine oil will cause accelerated wear and may result in engine or transmission seizure, accident, and injury.

#### **Oil Level Inspection**

- Check that the engine oil level is between the upper [A] and lower [B] levels in the gauge.

#### **NOTE**

- Situate the motorcycle so that it is perpendicular to the ground.
- If the motorcycle has just been used, wait several minutes for all the oil to drain down.
- If the oil has just been changed, start the engine and run it for several minutes at idle speed. This fills the oil filter with oil. Stop the engine, then wait several minutes until the oil settles.



#### **CAUTION**

Racing the engine before the oil reaches every part can cause engine seizure.

- ★ 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 filter opening. Use the same type and make of oil that is already in the engine.

#### **NOTE**

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

#### **Change Engine Oil**

- Refer to the Engine Oil Change in the Periodic Maintenance chapter.

#### **Oil Filter Replacement**

- Refer to the Oil Filter Replacement in the Periodic Maintenance chapter.



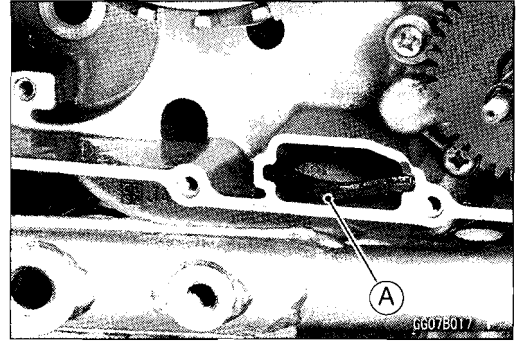
## Engine Oil and Oil Filter

### Oil Screen Removal

- Remove the right engine cover (see Right Engine Cover Removal in the Clutch chapter).
- Pull the oil screen [A] out of the crankcase.
- Wash the oil screen with a high-flash point solvent.

### ⚠ WARNING

Clean the oil screen 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 flash-point solvent to clean the oil screen.



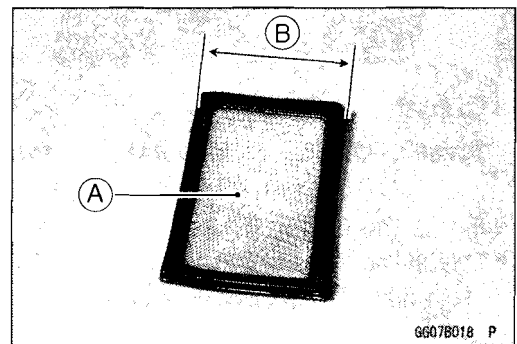
### NOTE

○ While cleaning the oil screens, check for any metal particles that might indicate internal engine damage.

- Inspect the oil screen for damage.
- ★ If it shows any signs of damage, replace it with a new one.

### Oil Screen Installation

- The oil screen [A] should be installed in the crankcase in such a manner that its narrower side [B] shall be inserted into the crankcase first.
- Install the right engine cover (see Right Engine Cover Installation in the Clutch chapter).

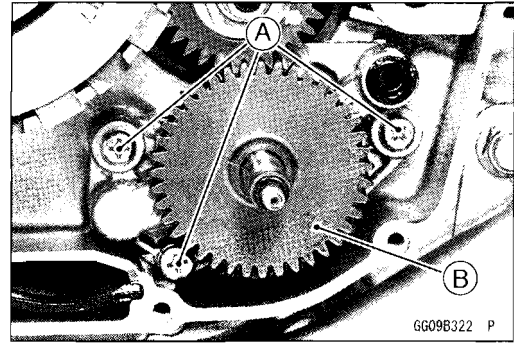


## 7-10 ENGINE LUBRICATION SYSTEM

### Oil Pump

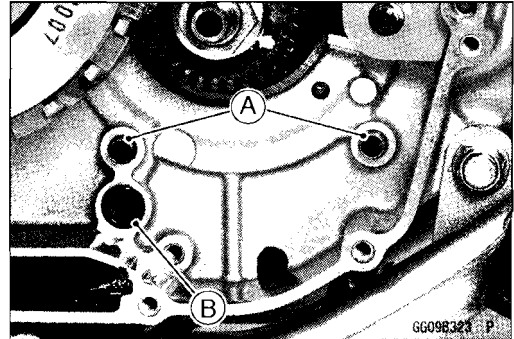
#### Oil Pump Removal

- Remove:
  - Right Engine Cover (see Right Engine Cover Removal in the Clutch chapter)
  - Screws [A]
  - Oil Pump [B]

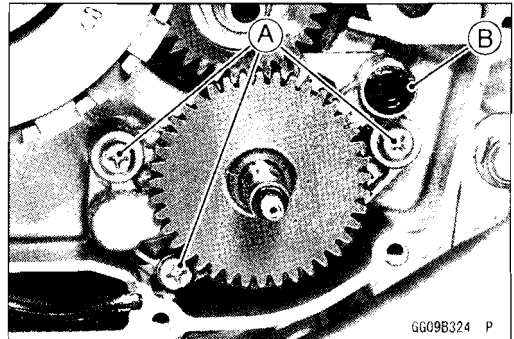


#### Oil Pump Installation

- Install the dowel pins [A] and O-ring [B] into the crankcase.
- Install the oil pump.

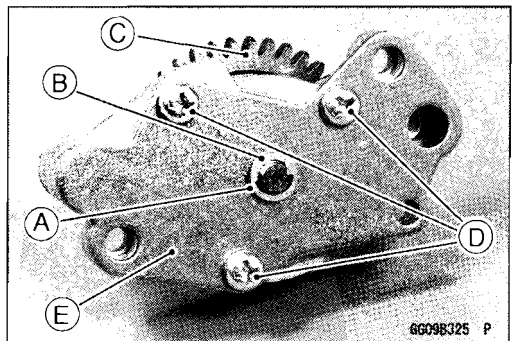


- Tighten:
  - Torque - Oil Pump Mounting Screws [A]: 5.2 N·m (0.53 kgf-m, 46 in·lb)
- Install the O-ring [B] so that swelled side facing outward.
- Install the right engine cover (see Right Engine Cover Installation in the Clutch chapter).

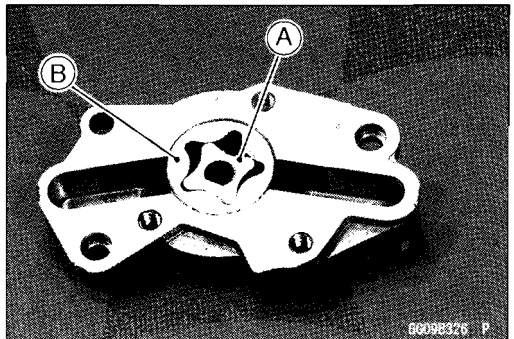


#### Oil Pump Disassembly

- Remove:
  - Oil Pump (see Oil Pump Removal)
  - Circlip [A]
  - Washer [B]
  - Oil Pump Gear [C]
  - Screws [D]
  - Oil Pump Cover [E]



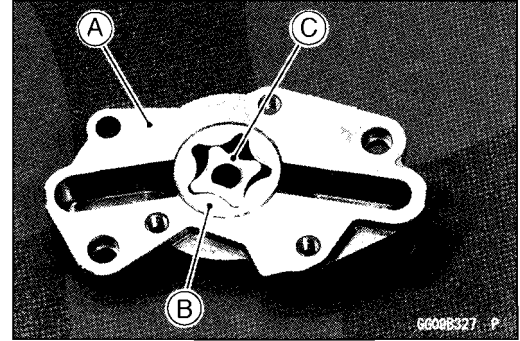
- Remove:
  - Inner Rotor [A]
  - Outer Rotor [B]



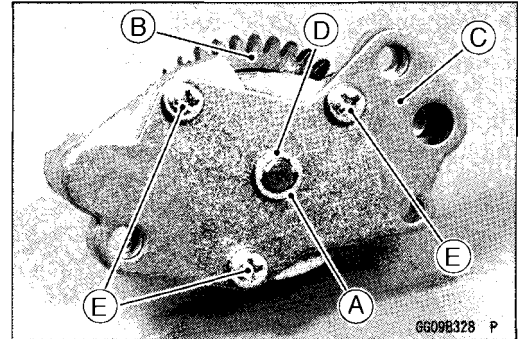
## Oil Pump

### Oil Pump Assembly

- Apply engine oil to the inner and outer rotors.
- Install the following parts to the oil pump body [A].  
Outer Rotor [B]  
Inner Rotor [C]



- Replace the circlip [A] with a new one.
- Install:  
Oil Pump Gear [B]  
Oil Pump Cover [C]  
Washer [D]  
Circlip
- Tighten:  
**Torque - Oil Pump Cover Screws [E] : 10 N·m (1.0 kgf·m, 88 in·lb)**



### Oil Pump Inspection

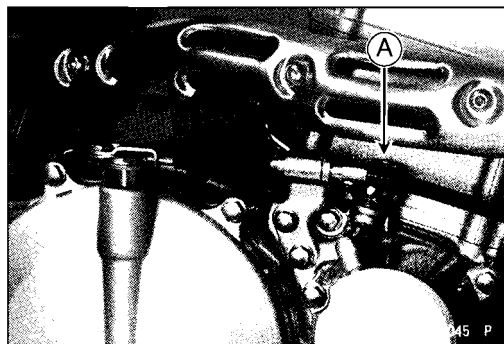
- Disassemble the oil pump (see Oil Pump Disassembly).
- Visually inspect the oil pump body, outer rotors and the inner rotors.
- ★ If the oil pump is any damaged or unevenly worn, replace the rotors, cover, or oil pump body.

## 7-12 ENGINE LUBRICATION SYSTEM

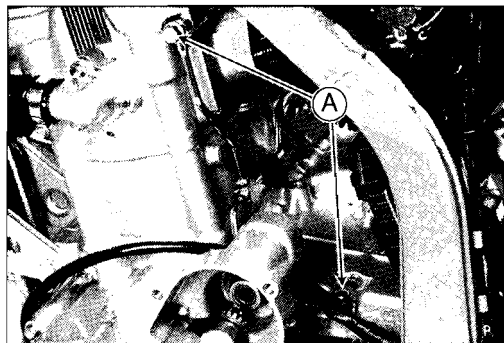
### Oil Pipe

#### **Oil Pipe Removal**

- Remove the starter motor (see Starter Motor Removal in the Electrical System chapter).
- Remove the oil pipe banjo bolt [A] provided on the right engine cover side.



- Remove the banjo bolts [A] on the cylinder head and crankcase sides and take out the oil pipe.



#### **Oil Pipe Installation**

- Replace the washers on both sides of the oil pipe with new ones.
- Tighten:

##### **Torque - Oil Pipe Banjo Bolts:**

(M8) 9.8 N·m (1.0 kgf·m, 87 in·lb)

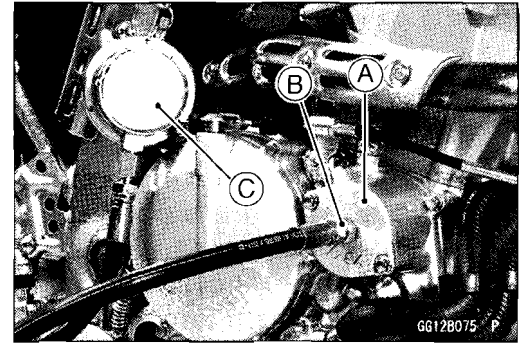
(M10) 20 N·m (2.0 kgf·m, 15 ft·lb)

## Oil Pressure

### Oil Pressure Measurement

- Remove the oil filter cap.
- Install the O-ring to the oil pressure cap.
- Install the oil pressure cap [A].
- Align the oil passage holes of the oil pressure cap and right engine cover.
- Install the oil pressure gauge adapter [B] and oil pressure gauge [C].

**Special Tools - Oil Pressure Gauge 5 kgf/cm<sup>2</sup>: 57001-125**  
**Oil Pressure Gauge Adapter M10 × 1.25: 57001-1182**  
**Oil Pressure Cap M10 × 1.25: 57001-1361**



### **⚠ WARNING**

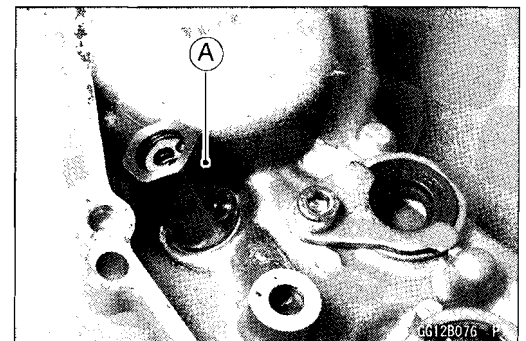
Take care against burns from hot engine oil that will drain through the oil filter when the plug is removed.

### **NOTE**

- Measure the oil pressure after the engine is thoroughly warmed up.
- Start up the engine and measure an oil pressure value at 4 000 rpm.
- Oil Pressure (engine speed 4 000 rpm, oil temperature 90 °C (194°F))**  
**Standard: 78 ~ 147 kPa (0.8 ~ 1.5 kgf/cm<sup>2</sup>, 11 ~ 21 psi)**
- ★ If the reading is less than the specified value, inspect the oil pump and relief valve.
- ★ If the oil pump and relief valve are not at fault, inspect the rest of the lubrication system.
- Stop the engine, remove the gauge and oil pressure cap.
- Install the oil filter cap (see Oil Filter Replacement in the Periodic Maintenance chapter).

### Relief Valve Inspection

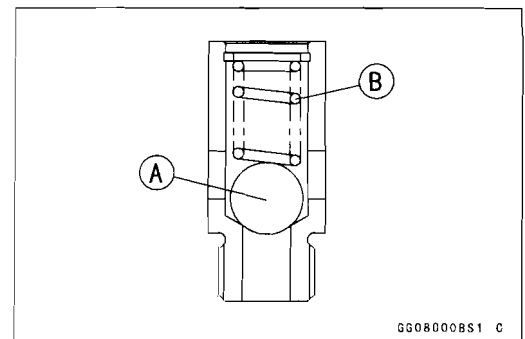
- Remove the right engine cover (see Right Engine Cover Removal in the Clutch chapter).
- Remove the oil pressure relief valve [A].



- Check to see if the steel ball [A] inside the valve slides smoothly when pushing it in with a wooden or other soft rod, and see if it comes back to original position by valve spring pressure [B].

### **NOTE**

- Since the relief valve cannot be disassembled, inspect it as an assy.
- ★ If the steel ball does not move smoothly, wash the relief valve with a high-flash point solvent and blow dirt out with





## Oil Pressure

## WARNING

**Torque - Oil Pressure Relief Valve: 15 N·m (1.5 kgf·m, 11 ft·lb)**

# Engine Removal/Installation

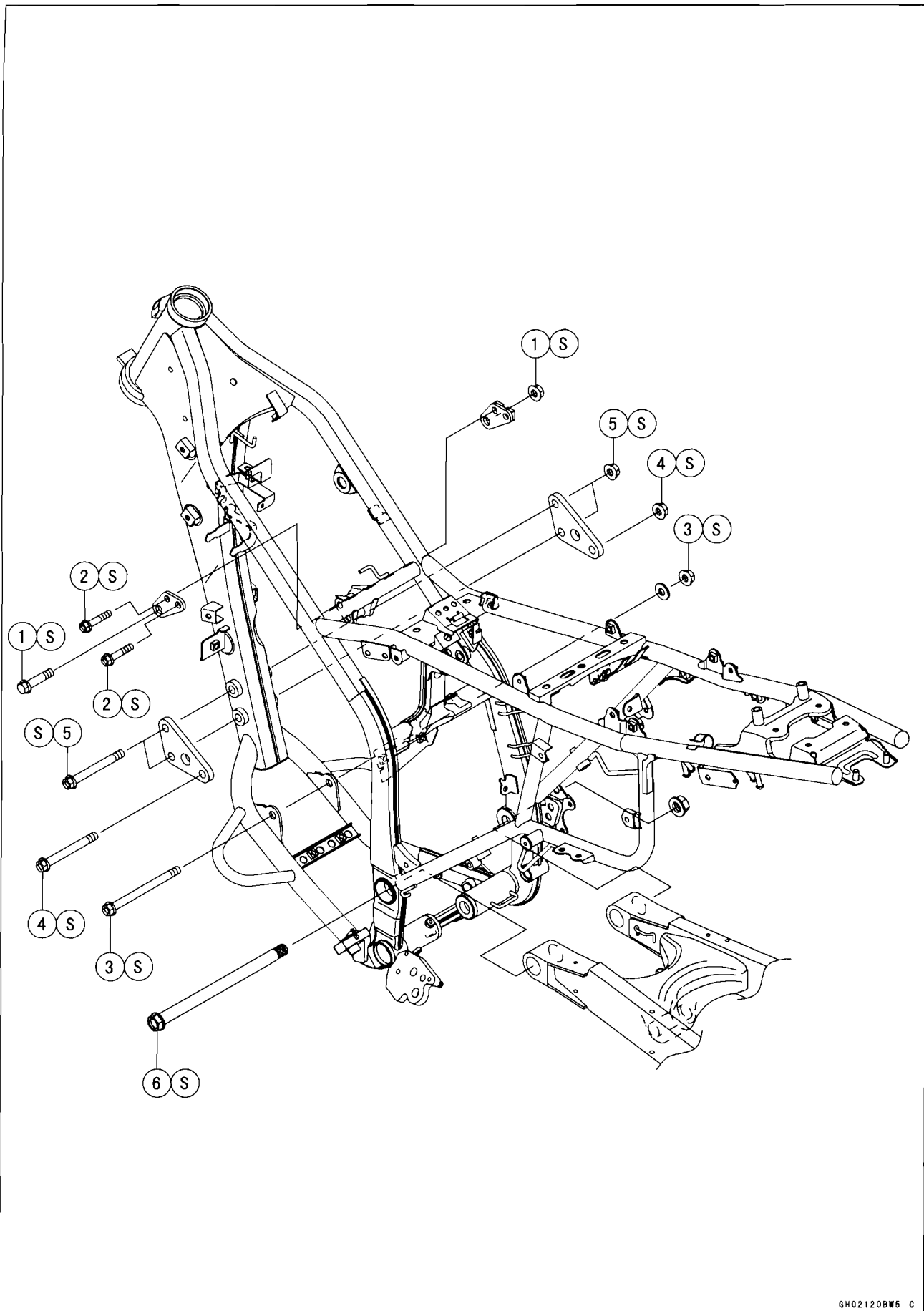
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## 8-2 ENGINE REMOVAL/INSTALLATION

### Exploded View



## ENGINE REMOVAL/INSTALLATION 8-3

### Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Upper Engine Mounting Bolt and Nut	50	5.1	37	S
2	Upper Engine Bracket Bolts	23	2.3	17	S
3	Lower Engine Mounting Bolt and Nut	50	5.1	37	S
4	Front Engine Mounting Bolt and Nut	50	5.1	37	S
5	Front Engine Bracket Bolts and Nuts	50	5.1	37	S
6	Swingarm Pivot Shaft Nut	88	9.0	65	S

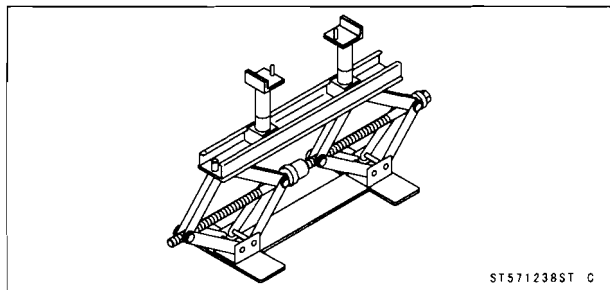
S: Follow the specified tightening sequence.

## 8-4 ENGINE REMOVAL/INSTALLATION

### Special Tool

Jack:

57001-1238



## Engine Removal/Installation

### Engine Removal

- Place a jack [A] under the frame to raise the rear wheel off the ground.

Special Tool - Jack: 57001-1238

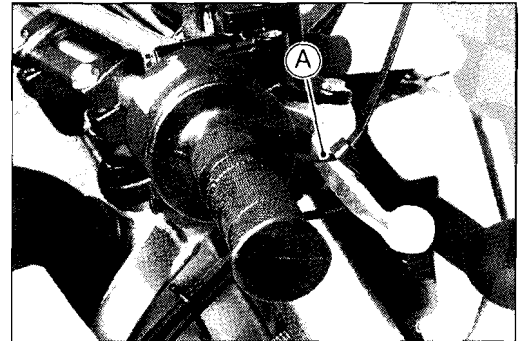
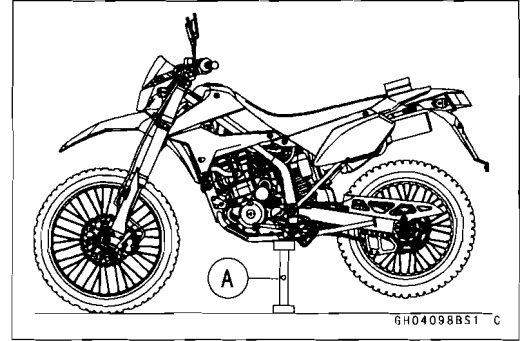
### **⚠ WARNING**

The swingarm pivot shaft also serves as the engine mounting bolt. The reason for jacking up the motorcycle body is to prevent a fall, because the swingarm may come off upon pulling the pivot shaft out.

- Squeeze the front brake lever, and hold it with a band [A] to prevent the motorcycle from running forward.

### **⚠ WARNING**

Be sure to hold the front brake when removing the engine, or the motorcycle may fall over. It could cause an accident and injury.

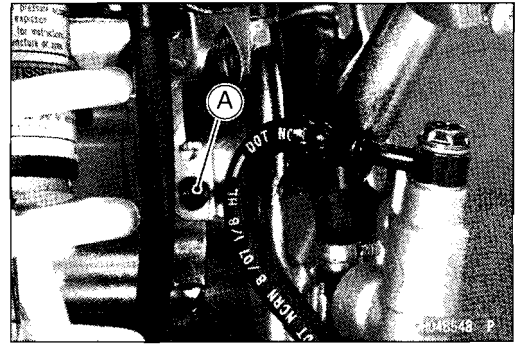


- Drain:
  - Coolant (see Coolant Change in the Periodic Maintenance chapter)
  - Engine Oil (see Engine Oil Change in the Periodic Maintenance chapter)
- Remove:
  - Fuel Tank (see Fuel Tank Removal in the Fuel System chapter)
  - Carburetor (see Carburetor Removal in the Fuel System chapter)
  - Radiator (see Radiator Removal in the Cooling System chapter)
  - Alternator and Crankshaft Sensor Leads Connectors (Alternator Cover Removal in the Electrical System chapter)
  - Neutral Switch Connector (see External Shift Mechanism Removal in the Crankshaft/Transmission chapter)
  - Exhaust Pipe (see Exhaust Pipe Removal in the Engine Top End chapter)
  - Clutch Cable Lower End (see Clutch Cable Removal in the Clutch chapter)
  - Brake Pedal (see Brake Pedal Removal in the Brakes chapter)
  - Front Right Footpeg
  - Engine Sprocket (see Engine Sprocket Removal in the Final Drive chapter)

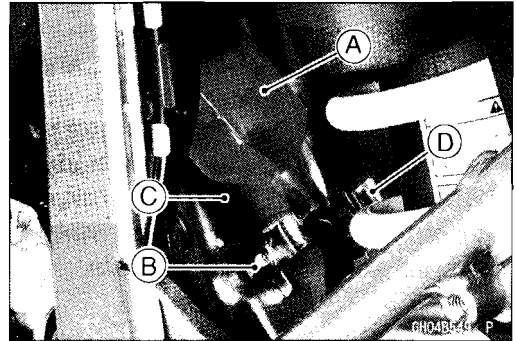
## 8-6 ENGINE REMOVAL/INSTALLATION

### Engine Removal/Installation

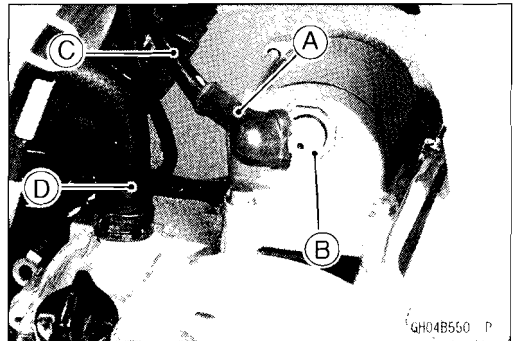
- Remove:
  - Bolt [A]
- Take out the rear brake light switch from the frame.



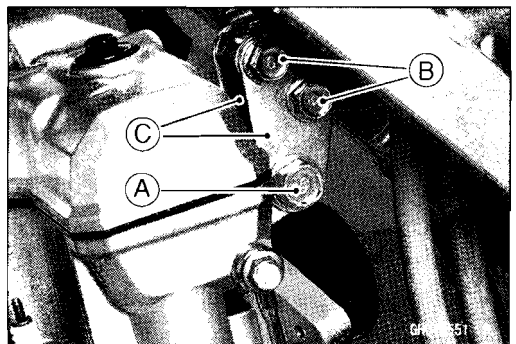
- Remove:
  - Regulator/Rectifier Connector [A]
  - Bolt [B]
  - Engine Ground Lead [C]
  - Clamp [D]



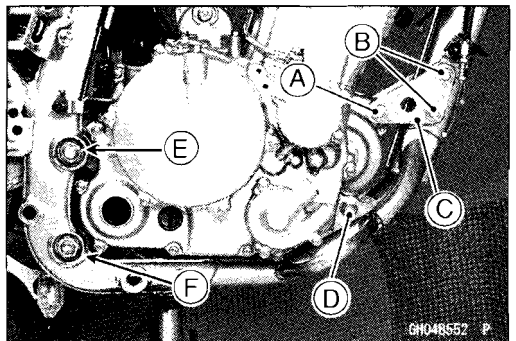
- Slide back the rubber boots [A].
- Remove the terminal nut [B] to free the starter motor cable [C].
- Disconnect the breather hose [D] from the right crankcase.



- Remove:
  - Upper Engine Mounting Bolt [A] and Nut
  - Upper Engine Bracket Bolts [B]
  - Upper Engine Bracket [C]



- Remove:
  - Front Engine Mounting Bolt and Nut [A]
  - Front Engine Bracket Bolts and Nuts [B]
  - Front Engine Brackets [C]
  - Lower Engine Mounting Bolt and Nut [D]
- Remove the swingarm pivot shaft nut [E], and pull out the swingarm pivot shaft.
- Loosen the rocker arm pivot shaft nut [F], if the swingarm pivot shaft does not pull out.
- Lift the engine a little and lean it to the right.
- Take out the engine to the right.



## Engine Removal/Installation

### Engine Installation

- Support the engine with a commercially available stand and place it into the frame in reverse order of dismantling.
- Insert the swingarm pivot shaft from the left side, and put the engine in its original position.
- Tighten the mounting bolts and nuts following the specified tightening sequence [1 to 8] as shown.

**Torque - Swingarm Pivot Shaft Nut:** 88 N·m (9.0 kgf·m, 65 ft·lb)

**Lower Engine Mounting Bolt and Nut:** 50 N·m (5.1 kgf·m, 37 ft·lb)

**Front Engine Bracket Bolts and Nuts:** 50 N·m (5.1 kgf·m, 37 ft·lb)

**Front Engine Mounting Bolt and Nut:** 50 N·m (5.1 kgf·m, 37 ft·lb)

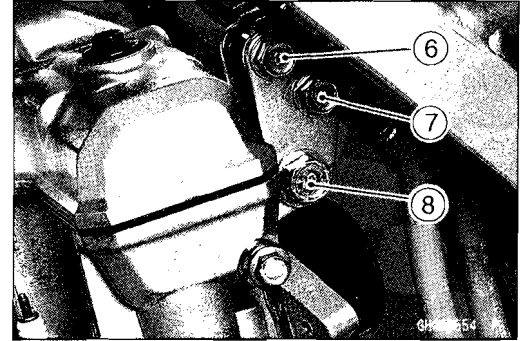
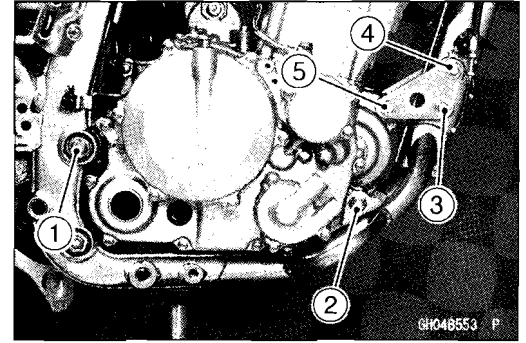
**Upper Engine Bracket Bolts:** 23 N·m (2.3 kgf·m, 17 ft·lb)

**Upper Engine Mounting Bolt and Nut:** 50 N·m (5.1 kgf·m, 37 ft·lb)

○ Tighten the rocker arm pivot shaft nut, if loosen it.

**Torque - Rocker Arm Pivot Shaft Nut:** 98 N·m (10 kgf·m, 72 ft·lb)

- Instal the removed parts (see appropriate chapters).
- Run the leads, cables and hoses correctly (see Cable, Wire, and Hose Routing in the Appendix chapter).
- Adjust:
  - Throttle Cables (see Throttle Control System Inspection in the Periodic Maintenance chapter)
  - Clutch Cable (see Clutch Operation Inspection in Periodic Maintenance chapter)
  - Drive Chain (see Drive Chain Slack Adjustment in the Periodic Maintenance chapter)
- Fill the engine with engine oil (see Engine Oil Change in the Periodic Maintenance chapter).
- Fill the engine with coolant and bleed the air from the cooling system (see Coolant Change in the Periodic Maintenance chapter).



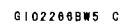
# Crankshaft/Transmission

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## Exploded View



## Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Crankcase Bolts	9.8	1.0	87 in·lb	
2	Crankcase Allen Bolts (Front)	12	1.2	106 in·lb	
3	Shift Drum Bearing Retaining Bolts	9.8	1.0	87 in·lb	
4	Shift Shaft Return Spring Pin	37	3.8	27	L
5	Primary Gear Nut	98	10	72	
6	Torque Limiter Cover Bolts	9.8	1.0	87 in·lb	
7	Starter Motor Clutch Bolts	12	1.2	106 in·lb	L

G: Apply grease.

L: Apply a non-permanent locking agent.

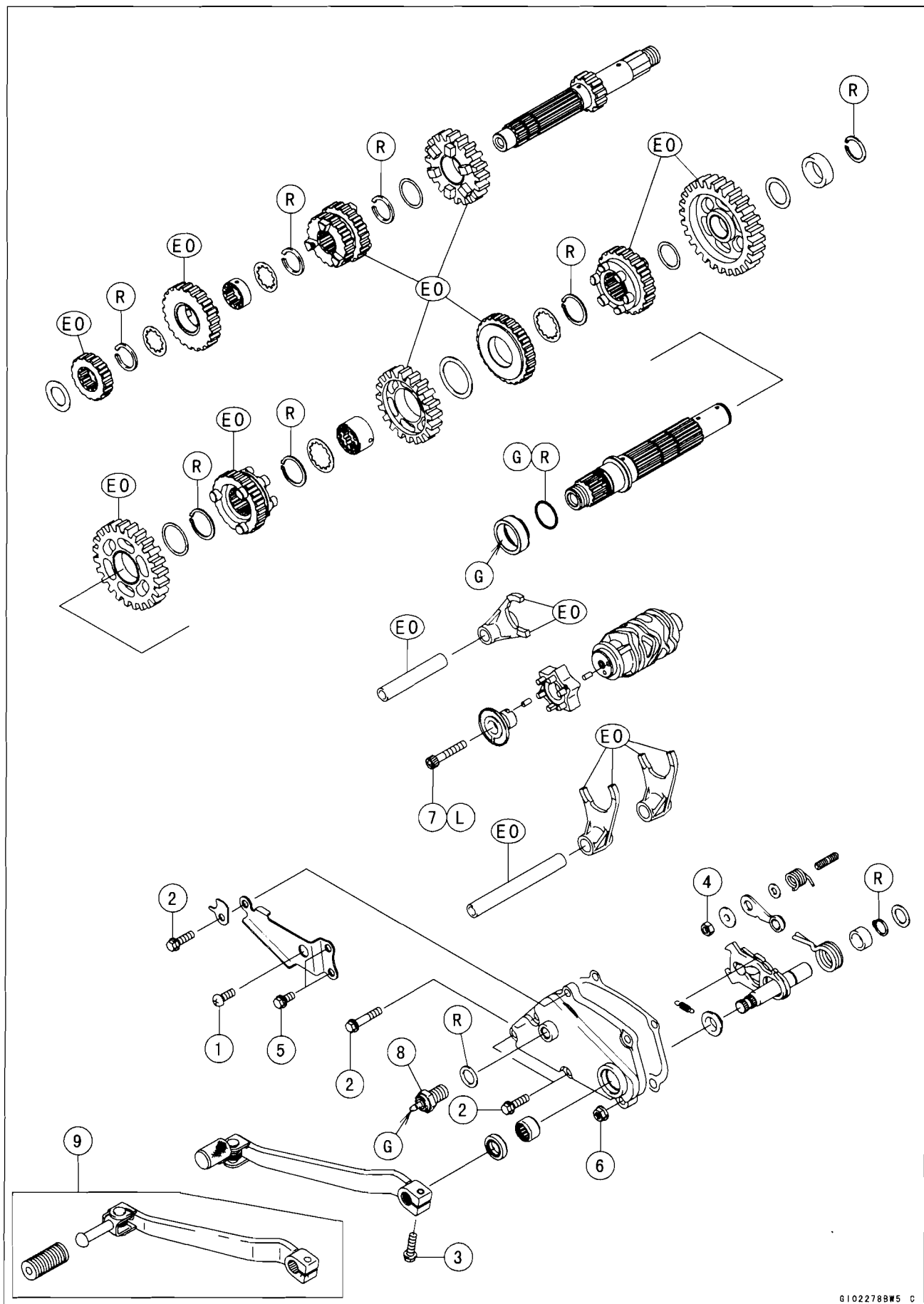
LG: Apply liquid gasket (Kawasaki Bond: (Liquid Gasket-Black): 92104-1064).

M: Apply molybdenum disulfide grease.

R: Replacement Parts

## 9-4 CRANKSHAFT/TRANSMISSION

### Exploded View



G1022789W5 C

## Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	External Shift Mechanism Cover Screw	5.2	0.53	46 in·lb	
2	External Shift Mechanism Cover Bolts	9.8	1.0	87 in·lb	
3	Shift Pedal Bolt	9.8	1.0	87 in·lb	
4	Gear Positioning Lever Nut	9.8	1.0	87 in·lb	
5	Drive Chain Guard Plate Bolts	9.8	1.0	87 in·lb	
6	External Shift Mechanism Cover Nut	9.8	1.0	87 in·lb	
7	Shift Drum Cam Holder Bolt	12	1.2	106 in·lb	L
8	Neutral Switch	14.7	1.5	130 in·lb	G

9. KLX250W

EO: Apply engine oil.

G: Apply grease.

L: Apply a non-permanent locking agent.

R: Replacement Parts

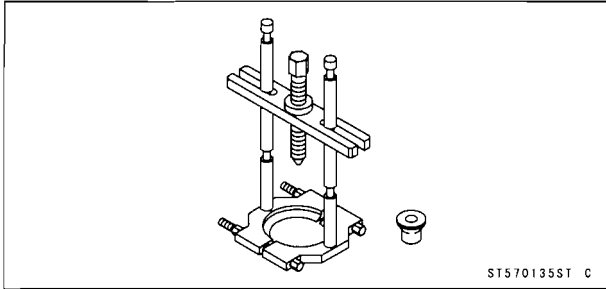
## 9-6 CRANKSHAFT/TRANSMISSION

### Specifications

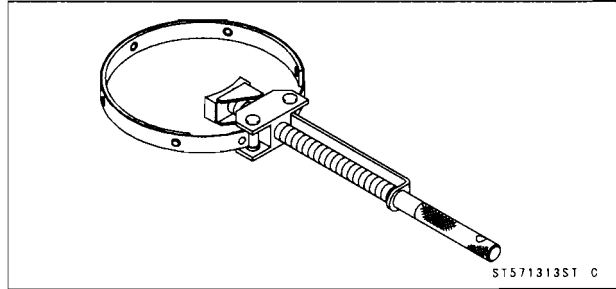
Item	Standard	Service Limit
<b>Crankshaft, Connecting Rod</b>		
Connecting Rod Bend	— — —	0.2 mm (0.008 in.)
Connecting Rod Twist	— — —	0.2 mm (0.008 in.)
Connecting Rod Big End Radial Clearance	0.008 ~ 0.02 mm (0.0003 ~ 0.0008 in.)	0.07 mm (0.003 in.)
Connecting Rod Big End Side Clearance	0.25 ~ 0.35 mm (0.0098 ~ 0.014 in.)	0.55 mm (0.022 in.)
Crankshaft Runout	TIR 0.03 mm (0.001 in.) or less	TIR 0.08 mm (0.003 in.)
<b>Transmission</b>		
Shift Fork Ear Thickness	4.9 ~ 5.0 mm (0.19 ~ 0.20 in.)	4.8 mm (0.19 in.)
Gear Shift Fork Groove Width	5.05 ~ 5.15 mm (0.199 ~ 0.203 in.)	5.2 mm (0.20 in.)
Shift Fork Guide Pin Diameter	5.9 ~ 6.0 mm (0.23 ~ 0.24 in.)	5.8 mm (0.23 in.)
Shift Drum Groove Width	6.05 ~ 6.20 mm (0.238 ~ 0.244 in.)	6.3 mm (0.25 in.)

## Special Tools and Sealant

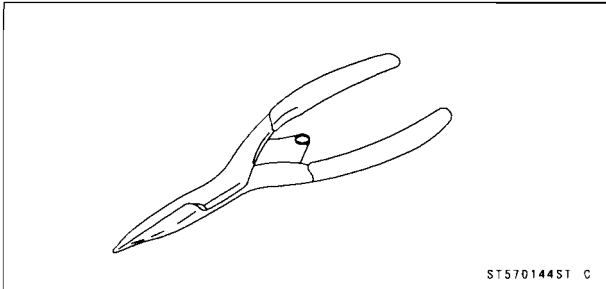
**Bearing Puller:**  
57001-135



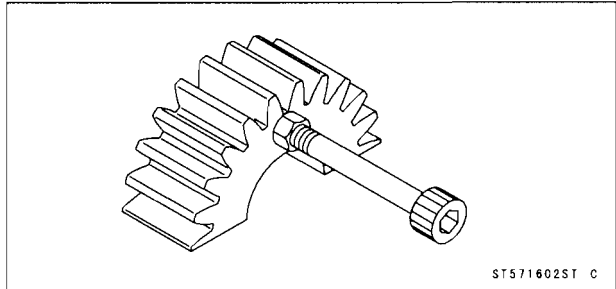
**Flywheel Holder:**  
57001-1313



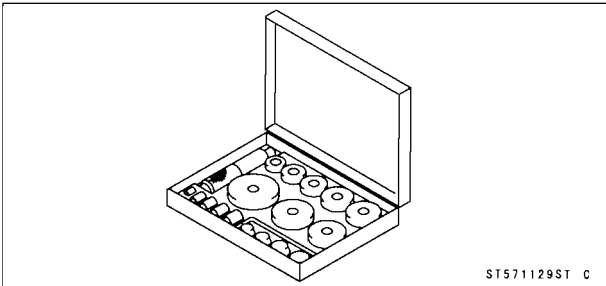
**Outside Circlip Pliers:**  
57001-144



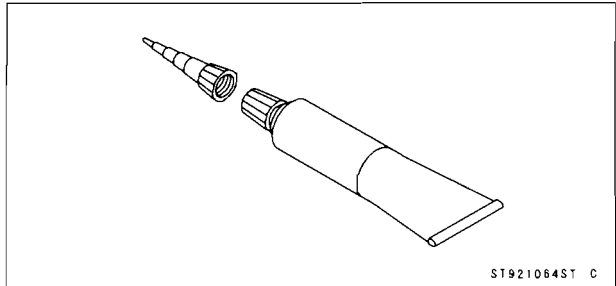
**Gear Holder:**  
57001-1602



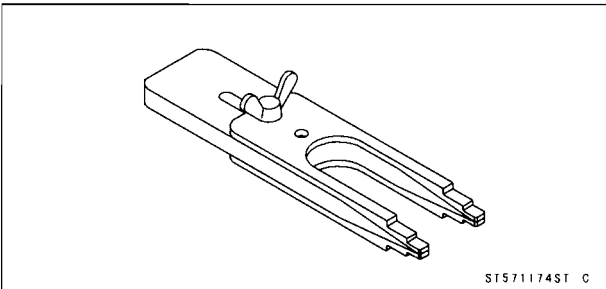
**Bearing Driver Set:**  
57001-1129



**Kawasaki Bond (Liquid Gasket - Black):**  
92104-1064



**Crankshaft Jig:**  
57001-1174

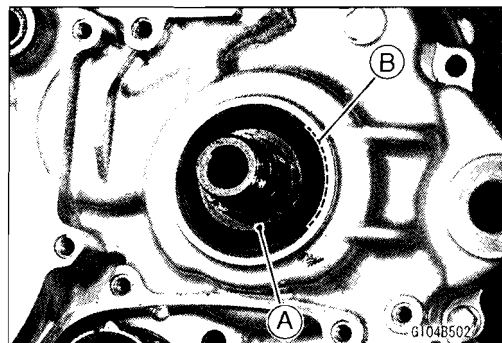


## 9-8 CRANKSHAFT/TRANSMISSION

### Crankcase

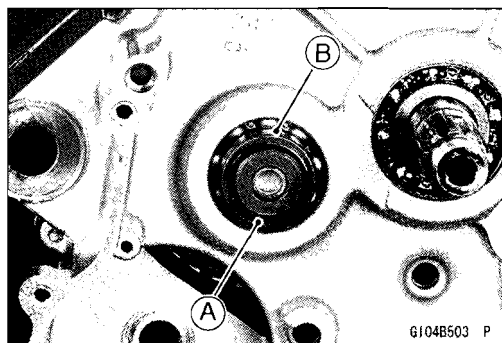
#### ***Crankcase Disassembly***

- Remove the engine from the frame (see Engine Removal in the Engine Removal/Installation chapter).
- Remove:
  - Torque Limiter (see Torque Limiter Removal)
  - Starter Motor (see Starter Motor Removal in the Electrical System chapter)
  - Oil Pipe (see Oil Pipe Removal in the Engine Lubrication System chapter)
  - Cylinder and Piston (see Cylinder Removal, Piston Removal in the Engine Top End chapter)
  - Water Pump Cover and Impeller (see Water Pump Removal in the Cooling System chapter)
  - Right Engine Cover (see Right Engine Cover Removal in the Clutch chapter)
  - Clutch (see Clutch Removal in the Clutch chapter)
  - Oil Pump (see Oil Pump Removal in the Engine Lubrication System chapter)
  - Primary Gear (see Primary Gear Removal)
  - Camshaft Chain (see Camshaft Chain Removal in the Engine Top End chapter)
  - Alternator Cover (see Alternator Cover Removal in the Electrical System chapter)
  - Alternator Rotor and Starter Motor Idle Gear (see Alternator Rotor Removal in the Electrical System chapter)
  - Shift Shaft Assembly (see External Shift Mechanism Removal)
- Remove the output shaft sleeve [A] and O-ring [B].



- Remove the circlip [A], and remove the collar [B] from the output shaft.

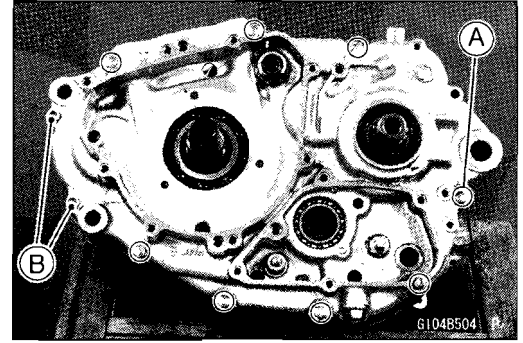
**Special Tool - Outside Circlip Pliers: 57001-144**



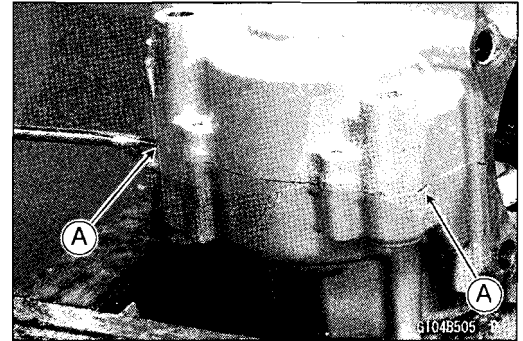


## Crankcase

- Remove:  
Crankcase Bolts [A]  
Allen Bolts [B]



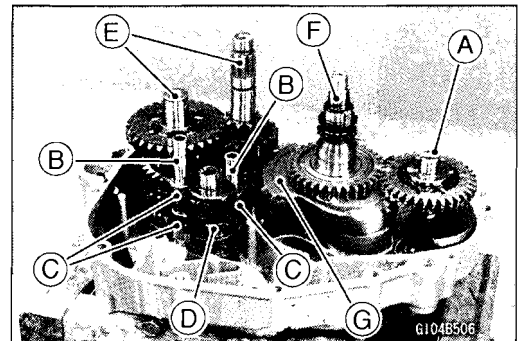
- Place it with the left crankcase facing downward.
- Pry the points [A] to split the crankcase halves apart, and remove the right crankcase half.



- Remove:  
Balancer [A]  
Shift Rods [B]  
Shift Forks [C]  
Shift Drum [D]  
Transmission [E]

### NOTE

○ Turn the crankshaft [F] to the position where the crank web [G] does not get in the way in removing the transmission.



- Pull the crankshaft out of the left crankcase (see Crankshaft Removal).

### CAUTION

Do not remove the bearing and oil seal in the crankcase unless it is absolutely necessary. Any removed parts should be replaced with new ones.

## 9-10 CRANKSHAFT/TRANSMISSION

### Crankcase

#### Crankcase Assembly

##### CAUTION

The right and left crankcase halves are machined at the factory in the assembled state, so they must be replaced as a set.

- Remove the old gasket from the mating surfaces of the crankcase halves, and clean off the crankcase with a high flash-point solvent.
- Using compressed air, blow out the oil passage.

##### ⚠ WARNING

Clean it in a well-ventilated area, and make sure that there are no sparks or flames 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-flash point solvent.

- If removed, the oil seal replacement may be required. Press in the new oil seal using a press and suitable tools so that the seal surface [B] is flush with the surface of the crankcase [A].
- Apply grease to the oil seal lips [C].

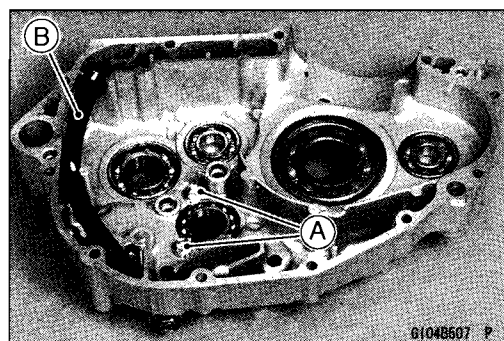
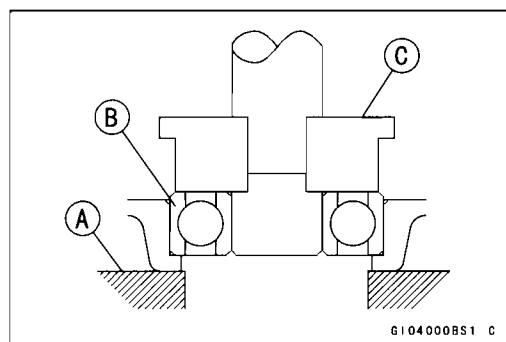
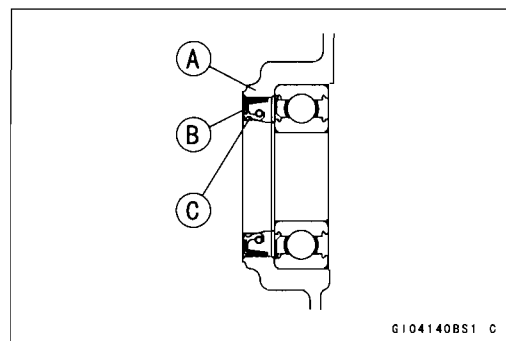
- Using a suitable jig [A], support the crankcase bearing boss.
- Using a press or the bearing driver set [C], install the ball bearing [B] until it bottoms out.

##### CAUTION

Support the crankcase bearing boss when pushing the bearing, otherwise the crankcase could be damaged.

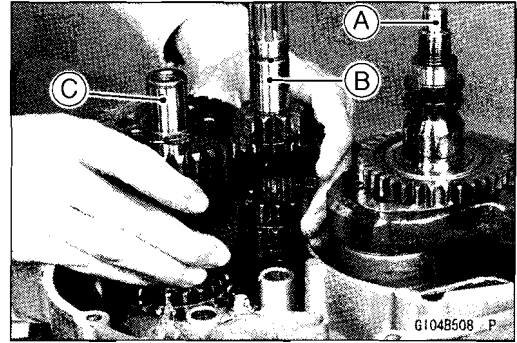
**Special Tool - Bearing Driver Set: 57001-1129**

- A bearing sealed on one end should be installed with the sealed end facing the outside of the engine.
- Tighten the retaining bolts [A].
- Torque - Shift Drum Bearing Retaining Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)**
- Install the oil return pipe [B].
- Install the crankshaft (see Crankshaft Installation).

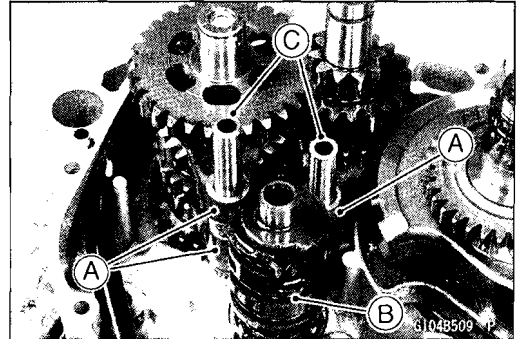


## Crankcase

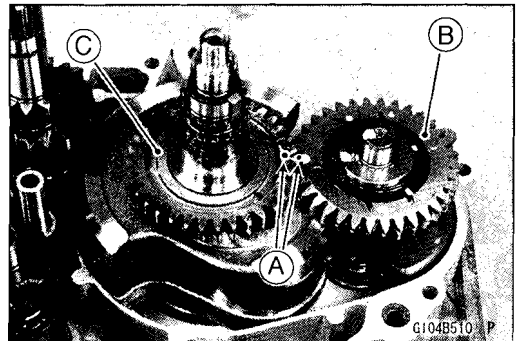
- Apply engine oil to the crankcase bearing, transmission gears and bearings, shift drum, shift forks and shift shaft.
- Turn the crankshaft [A] to the position where the crankshaft web does not get in the way of the drive shaft [B], and insert the drive shaft and the output shaft [C] together as a set into the crankcase.



- Install:
  - Shift Forks [A] (see Transmission Installation)
  - Shift Drum [B] (see Transmission Installation)
  - Shift Rods [C] (see Transmission Installation)

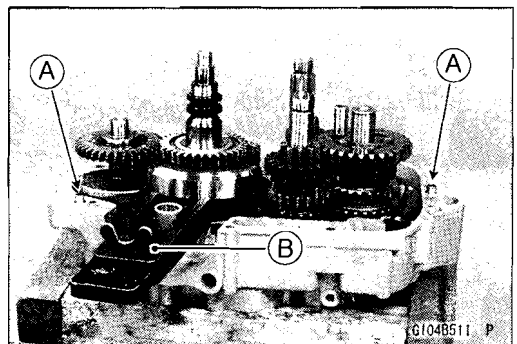


- Assemble the balancer to the crankcase with the punch marks [A] provided on the balancer gear [B] and the driven gear [C] of the crankshaft aligned with each other.



- Install the dowel pins [A].
- Turn the crankshaft to BDC, and install the crankshaft jig [B] 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 between the crankshaft flywheels before pressing the crankshaft into the left crankcase half.

**Special Tool - Crankshaft Jig: 57001-1174**

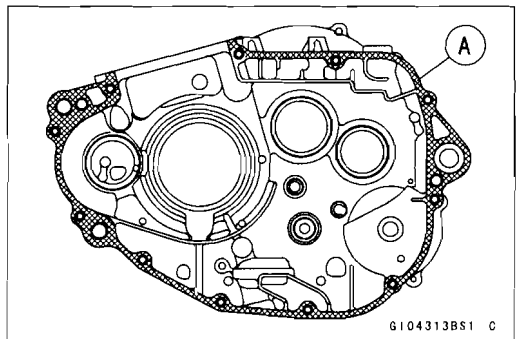


- Apply silicone sealant [A] to the mating surfaces of the right crankcase half.

**Sealant - Kawasaki Bond (Liquid Gasket - Black): 92104-1064**

### NOTE

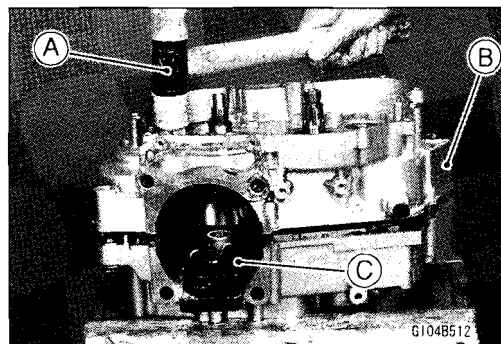
- Make the application finish within 20 minutes when the liquid gasket to the mating surface of the crankcase half is applied.
- Moreover fit the case and tighten the case bolts just after finishing the application of the liquid gasket.



## 9-12 CRANKSHAFT/TRANSMISSION

### Crankcase

- Tap lightly with a plastic hammer [A] the perimeter of the crankshaft and assemble the right crankcase [B].
- Assemble them with care to keep the right and left crankcase halves in parallel all the time.
- Remove the crankcase jig [C].



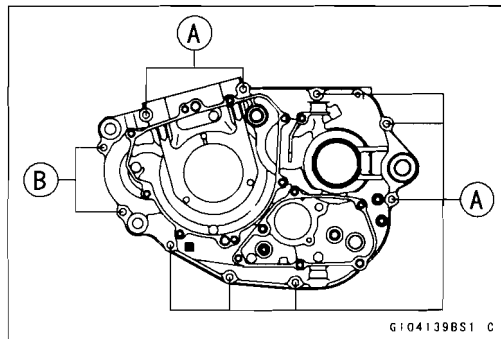
- Tighten the crankcase mounting bolts starting with the ones around the crankshaft, and then the farther ones.

**Torque - Crankcase Bolts [A]: 9.8 N·m (1.0 kgf·m, 87 in·lb)**

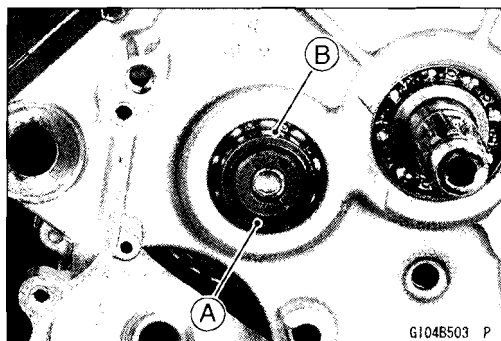
**Crankcase Allen Bolts (Front) [B]: 12 N·m (1.2 kgf·m, 106 in·lb)**

#### NOTE

○ After tightening the crankcase bolts, wipe up the liquid gasket seeping out around the mating surface.

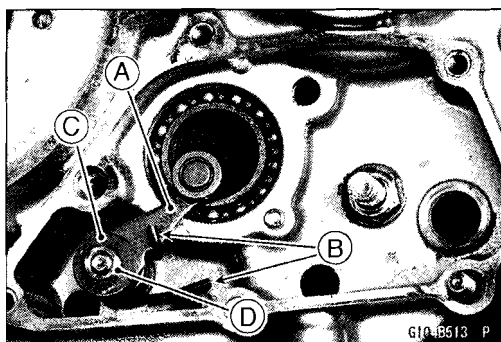


- Check to see that the crankshaft, drive shaft, and output shaft all turn smoothly.
  - ★ If the crankshaft will not turn, probably the crankshaft is not centered; tap the end of the crankshaft with a mallet to reposition it.
  - Replace the circlip [A] with a new one.
  - Install the collar [B] and circlip on the output shaft.
- Special Tool - Outside Circlip Pliers: 57001-144**



- Install the gear positioning lever [A].
- Fit the each ends [B] of the spring as shown.
- Do not forget to install the washer and spacer [C].
- Tighten:

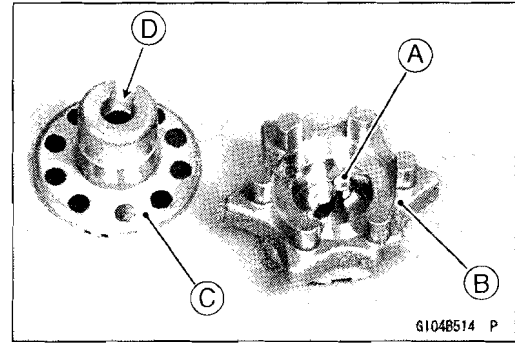
**Torque - Gear Positioning Lever Nut [D]: 9.8 N·m (1.0 kgf·m, 87 in·lb)**



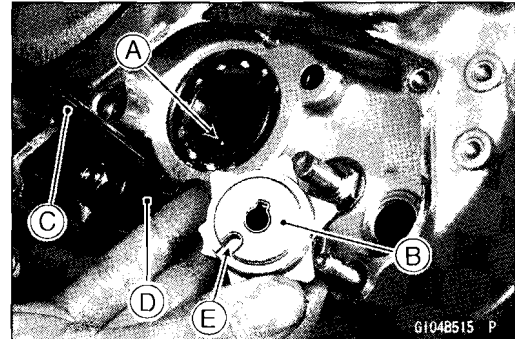


## Crankcase

- Install the pin [A] to the shift drum cam [B].
- Install the shift drum cam holder [C] so that the groove [D] fit the pin.



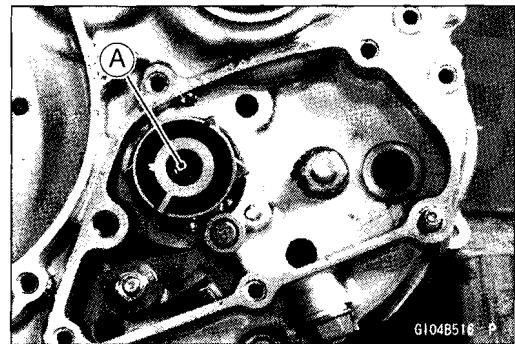
- Install the pin [A] to the shift drum.
- To install the shift drum cam [B], using a screw driver [C] to push down the gear positioning lever [D] toward the bottom of the crankcase.
- Fit the hollow [E] of the shift drum cam on the shift drum pin.



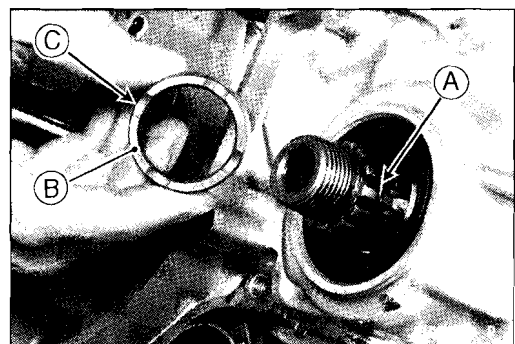
- Apply a non-permanent locking agent to the threads of the shift drum cam holder bolt [A].
- Tighten:

**Torque - Shift Drum Cam Holder Bolt: 12 N·m (1.2 kgf·m, 106 in·lb)**

- Check to see that gears shift smoothly from 1st to 6th gear, and 6th to 1st while spinning the output shaft.
- Set the shift drum in the neutral position.
- Install the shift shaft assembly (see External Shift Mechanism Installation).



- Replace the O-ring [A] with a new one.
- Apply grease to the inner surface of the output shaft collar [B].
- Insert the collar with notched side [C] facing toward the engine.
- Install the removed parts (see appropriate chapters).

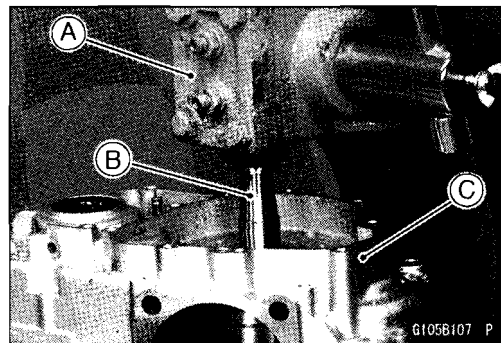


## 9-14 CRANKSHAFT/TRANSMISSION

### Crankshaft/Connecting Rods

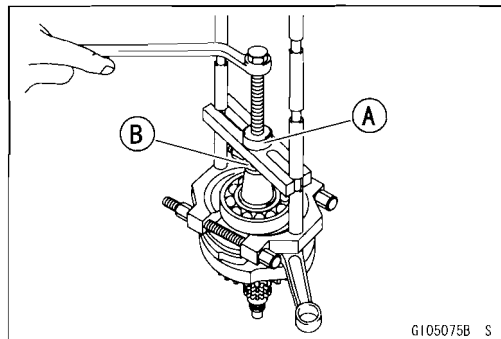
#### **Crankshaft Removal**

- Split the crankcase, and remove the right crankcase half (see Crankcase Splitting).
- Pull out the shift rod, and take off the shift forks.
- Remove the shift drum.
- Remove the drive shaft and output shaft.
- Remove the balancer.
- Using a press [A], remove the crankshaft [B] from the left crankcase [C].



- ★ If the bearings stay on the crankshaft when splitting the crankcase or removing the crankshaft from the left crankcase, remove the bearings from the crankshaft with a bearing puller [A] and adapter [B].

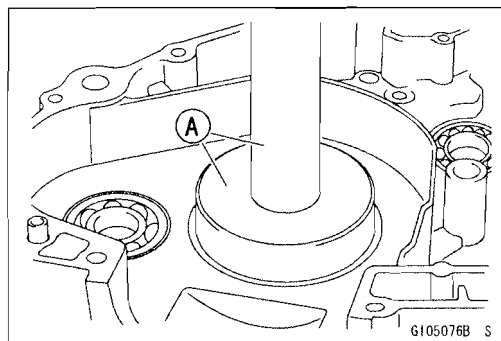
**Special Tool - Bearing Puller: 57001-135**



#### **Crankshaft Installation**

- If the crankshaft bearings were removed, press them into the crankcase using a bearing driver [A] and press until the bearing bottoms out.

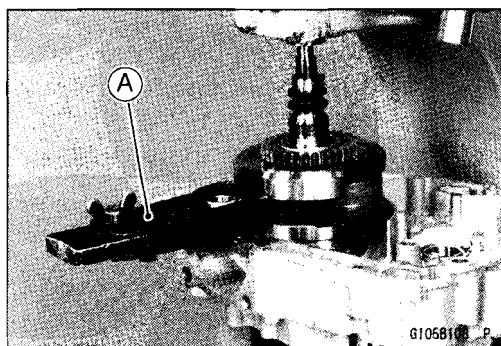
**Special Tool - Bearing Driver Set: 57001-1129**



- Set the crankshaft jig [A] onto the crankshaft and press fit it into the crankshaft bearing hole of the left crankcase.
- In doing so, lay the crankshaft jig in the direction of the cylinder so that it does not hit the crankcase.

**Special Tool - Crankshaft Jig: 57001-1174**

- Apply engine oil to the connecting rod big end bearing.



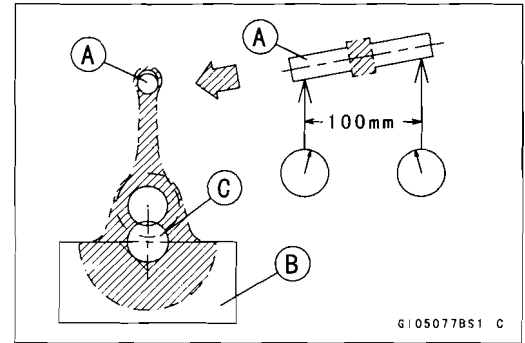
#### **Crankshaft/Connecting Rod Cleaning**

- Blow the crankshaft oil holes with compressed air to remove any foreign particles or residue that may have accumulated in the holes.

## Crankshaft/Connecting Rods

### Connecting Rod Bend Inspection

- Select an arbor of the same diameter as the piston pin and more than 100 mm long, and insert the arbor [A] through the connecting rod small end.
- Set the journal portions [C] of the crankshaft on V blocks [B].
- With the connecting rod held vertically, use a height gauge to measure the difference in the height of the small end arbor above the surface plate over a 100 mm length to determine the amount of connecting rod bend.



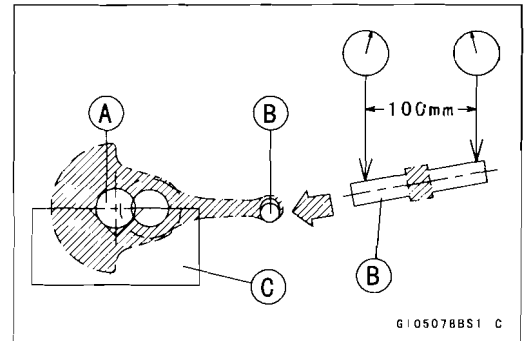
#### Connecting Rod Bend

**Service Limit:** 0.2 mm (0.008 in.)

- ★ If connecting rod bend exceeds the service limit, replace the crankshaft assembly with a new one.

### Connecting Rod Twist Inspection

- With the journal portions of the crankshaft [A] still on V block [C], hold the connecting rod horizontally and measure the amount that the arbor [B] varies from being paralleled with the surface plate over a 100 mm length of the arbor to determine the amount of connecting rod twist.



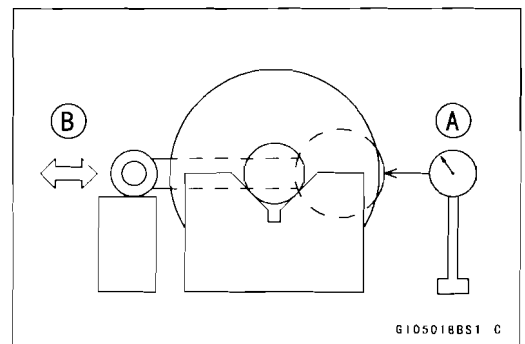
#### Connecting Rod Twist

**Service Limit:** 0.2 mm (0.008 in.)

- ★ If connecting rod twist exceeds the service limit, replace the crankshaft assembly with a new one.

### Connecting Rod Big End Radial Clearance Inspection

- Set the crankshaft on V blocks, and place a dial gauge [A] against the connecting rod big end.
- Push the connecting rod first towards the gauge and then in the opposite direction [B]. The difference between the two gauge readings is the radial clearance.



#### Connecting Rod Big End Radial Clearance

**Standard:** 0.008 ~ 0.02 mm (0.0003 ~ 0.0008 in.)

**Service Limit:** 0.07 mm (0.003 in.)

- ★ If radial clearance exceeds the service limit, replace the crankshaft assembly with a new one.

### Connecting Rod Big End Side Clearance Inspection

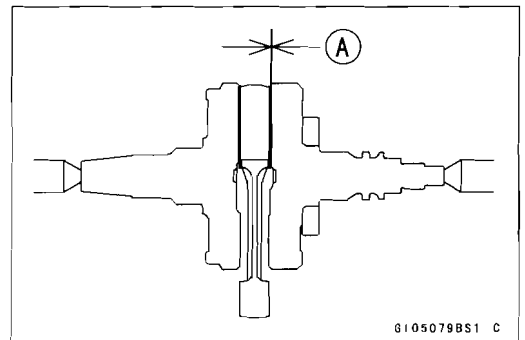
- Measure the side clearance [A] with a thickness gauge.

#### Connecting Rod Big End Side Clearance

**Standard:** 0.25 ~ 0.35 mm (0.0098 ~ 0.014 in.)

**Service Limit:** 0.55 mm (0.022 in.)

- ★ If side clearance exceeds the service limit, the crankshaft assembly must be replaced.





## 9-16 CRANKSHAFT/TRANSMISSION

### Crankshaft/Connecting Rods

#### Crankshaft Runout Inspection

- Set the crankshaft in a flywheel arrangement jig or on V blocks, and place a dial gauge as shown. Turn the crankshaft slowly. The largest difference in gauge readings (TIR) for each point is taken as crankshaft runout at that point.

10 mm (0.39 in.) [A]

15 mm (0.59 in.) [B]

#### Crankshaft Runout

**Standard:** TIR 0.03 mm (0.001 in.) or less

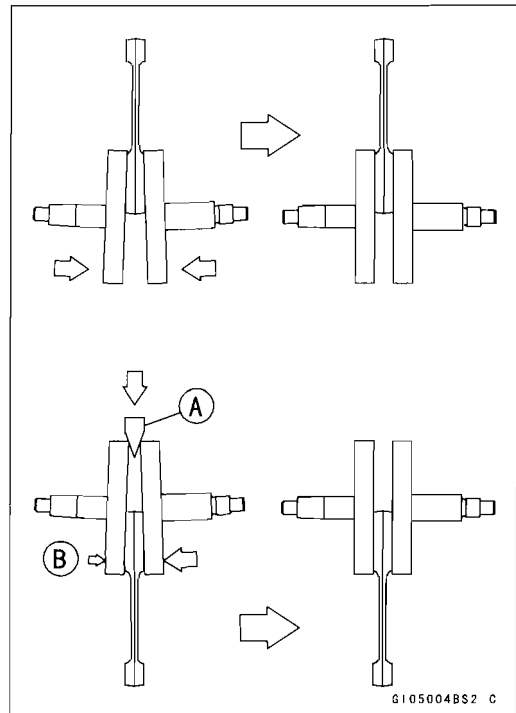
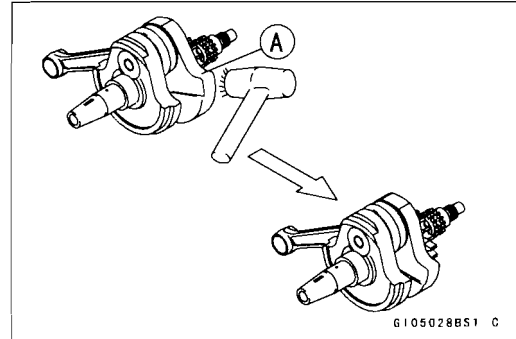
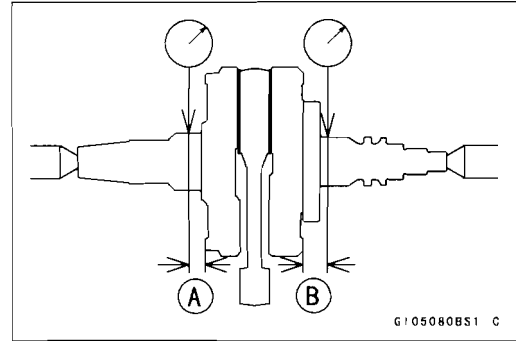
**Service Limit:** TIR 0.08 mm (0.003 in.)

- ★ When the runout at any point is in excess of the service limit, either change crankshaft assembly or straighten the crankshaft to correct runout.
- First correct runout in the horizontal direction. Tap with a copper hammer to correct the crank [A] that causes crankshaft runout.
- Correct until runout is reduced below the service limit, while checking runout from time to time.
- Next, correct the vertical misalignment by either driving a wedge [A] in between the crank halves or by squeezing them in a vice, depending on the nature of the misalignment.

#### CAUTION

**Do not hammer the crank half at the point [B].**

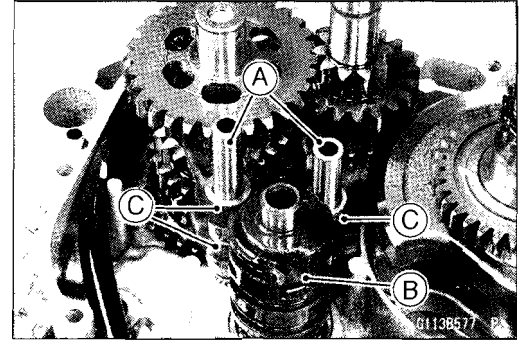
- ★ If flywheel misalignment cannot be corrected by the above method, replace the crankshaft itself.



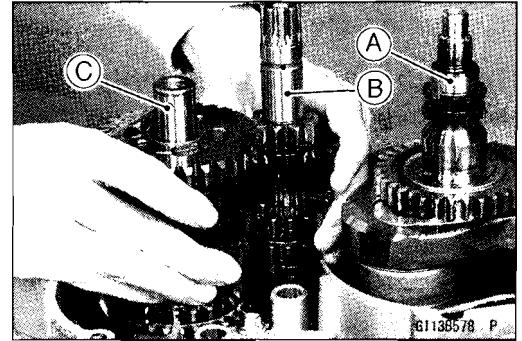
## Transmission

### Transmission Removal

- Split the crankcase (see Crankcase Splitting).
- Pull off the shift rods [A], and disengage the shift fork guide pins from the shift drum [B].
- Remove:
  - Shift Forks [C]
  - Shift Drum

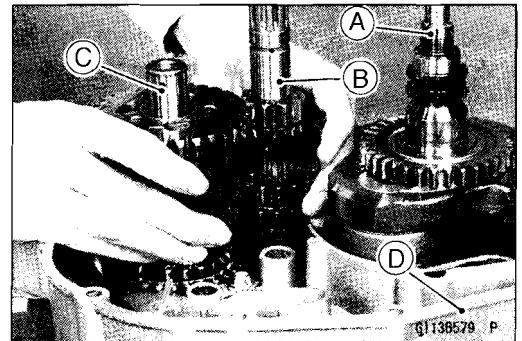


- Turn the crankshaft [A] to position where the crankshaft web does not get in the way of the drive shaft [B], and take out the drive shaft and the output shaft [C] together with their gears meshed.

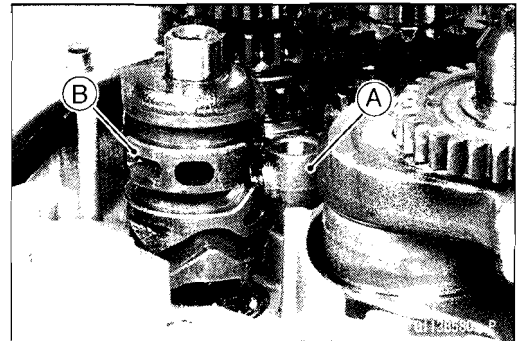


### Transmission Installation

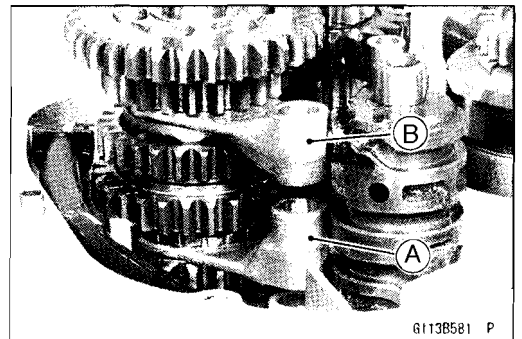
- Apply engine oil to the sliding surfaces on the transmission shafts, gears and ball bearings.
- Turn the crankshaft [A] to position where the crankshaft web does not get in the way of the drive shaft [B], engage drive shaft gears and output shaft [C] gears, and set these shafts together into the left crankcase half [D].



- Apply a little engine oil to the shift fork ears, and fit the shift forks into each gear groove.
- Install the shift fork [A] with shorter ears (3/4th).
- Install the shift drum [B].



- Set the shift fork that has a guide pin hook on the left side (for the 6th gear) [A].
- Set the shift fork that has a guide pin hook at the center (for the 5th gear) [B].
- Fit the shift fork guide pins into the shift drum grooves.
- Apply a little engine oil to the shift rod, and insert the shift forks.



## 9-18 CRANKSHAFT/TRANSMISSION

### Transmission

○ The shift forks can be identified by their shapes.

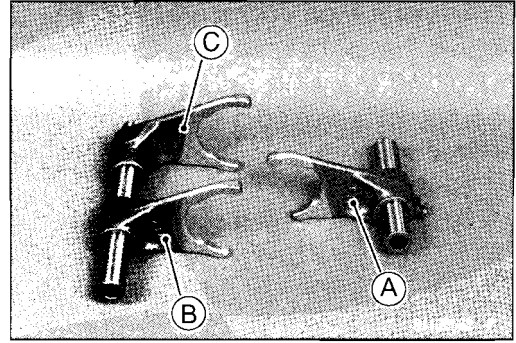
#### Driveshaft

3/4th gear shift fork [A]    ···    Shorter ears

#### Output shaft

6th gear shift fork [B]    ···    Guide pin goes to left side of the ears

5th gear shift fork [C]    ···    Guide pin goes to the center of the ears



● Assemble the crankcase (see Crankcase Assembly).

#### Transmission Disassembly

- Remove the transmission (see Transmission Removal).
- Using the circlip pliers, remove the circlips, and disassemble the transmission.

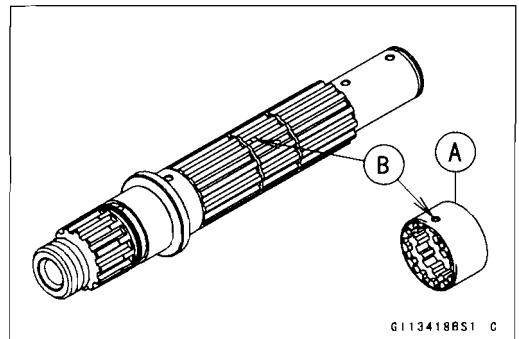
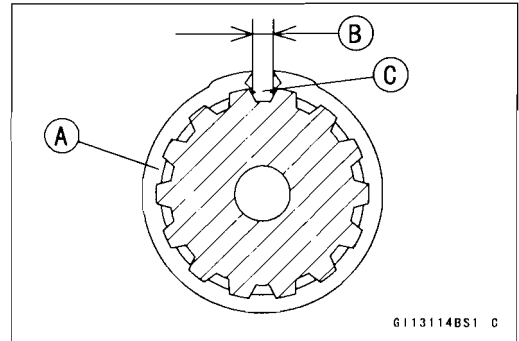
**Special Tool - Outside Circlip Pliers: 57001-144**

#### Transmission Assembly

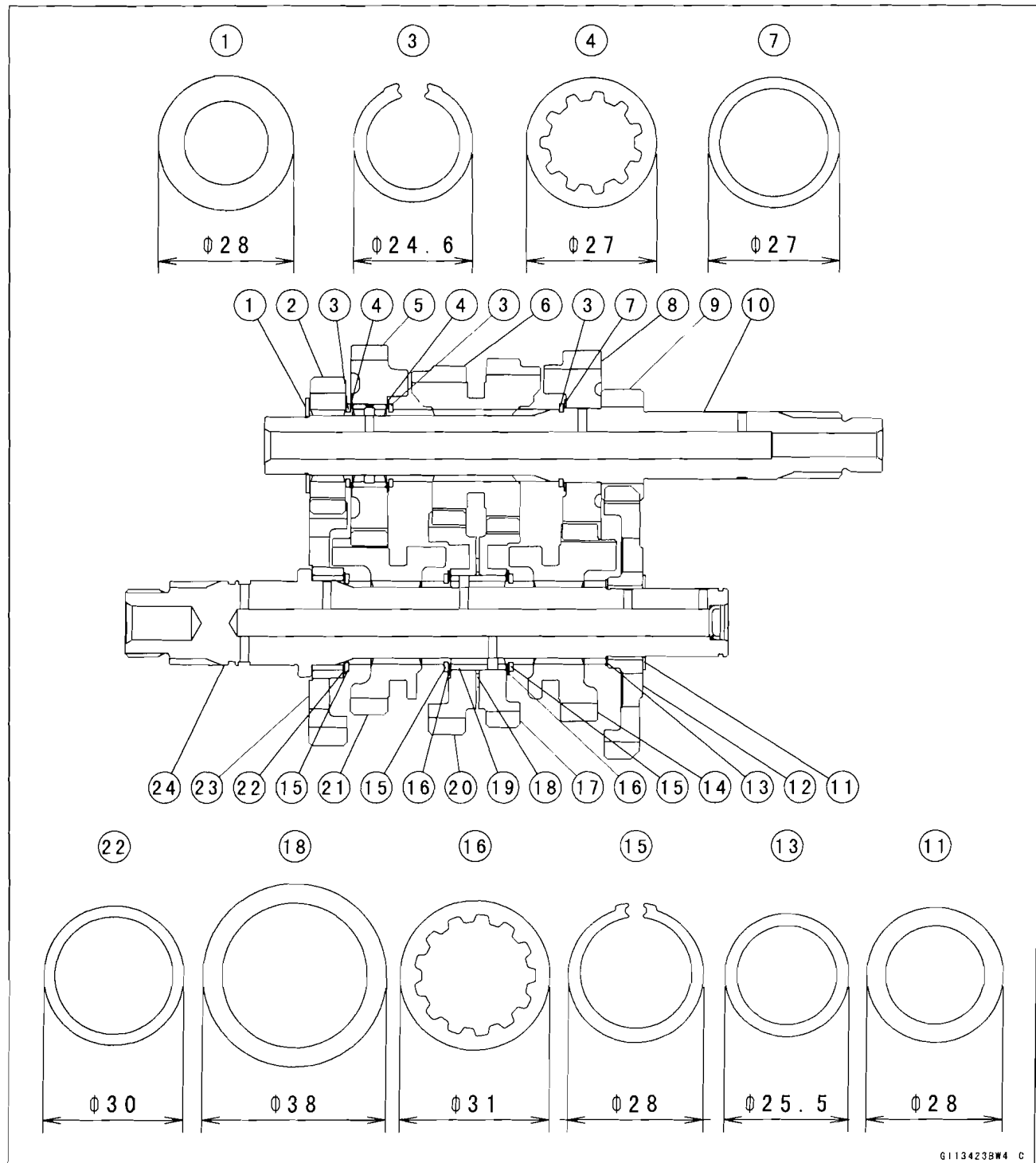
- Apply plenty of engine oil to the transmission shafts, gears and ball bearings.
- Replace any circlips that were removed with new ones.
- Install the circlips [A] so that the opening [B] of it is aligned with spline grooves [C].

**Special Tool - Outside Circlip Pliers: 57001-144**

- Drive shaft gears are for the 1st to 6th gears in order from the smallest to the largest in outer diameter. Assemble in order as illustrated in the figure below with attention paid to the direction of assembling.
- Output shaft gears are for the 1st to 6th gears in order from the largest to the smallest in outer diameter. Assemble in order as illustrated in the figure below with attention paid to the direction of assembling.
- Install the 3rd/4th gear bushings [A] onto the output shaft with their oil holes [B] aligned.



## Transmission



G113423BW4 C

- |                                 |                                  |                          |
|---------------------------------|----------------------------------|--------------------------|
| 1. Washer ( $\phi 28$ )         | 9. 1st Gear (10T)                | 17. 4th Gear (25T)       |
| 2. 2nd Gear (15T)               | 10. Drive Shaft                  | 18. Washer ( $\phi 38$ ) |
| 3. Circlip                      | 11. Washer ( $\phi 28$ )         | 19. Bushing              |
| 4. Toothed Washer ( $\phi 27$ ) | 12. 1st Gear (30T)               | 20. 3rd Gear (27T)       |
| 5. 6th Gear (21T)               | 13. Washer ( $\phi 25.5$ )       | 21. 6th Gear (20T)       |
| 6. 3rd/4th Gear (18T/20T)       | 14. 5th Gear (21T)               | 22. Washer ( $\phi 30$ ) |
| 7. Washer ( $\phi 27$ )         | 15. Circlip                      | 23. 2nd Gear (30T)       |
| 8. 5th Gear (20T)               | 16. Toothed Washer ( $\phi 31$ ) | 24. Output Shaft         |

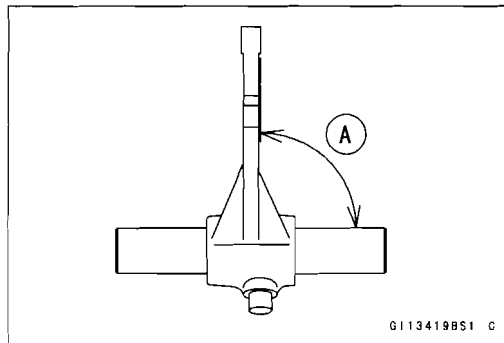
- After assembling, check that each gear spins or slides freely on the transmission shafts without binding.

## 9-20 CRANKSHAFT/TRANSMISSION

### Transmission

#### Shift Fork Bending Inspection

- 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 under power.  
90° [A]



#### Shift Fork/Gear Groove Wear Inspection

- Measure the thickness of the shift fork ears [A], and measure the width [B] of the shift fork grooves in the gears.

##### Shift Fork Ear Thickness

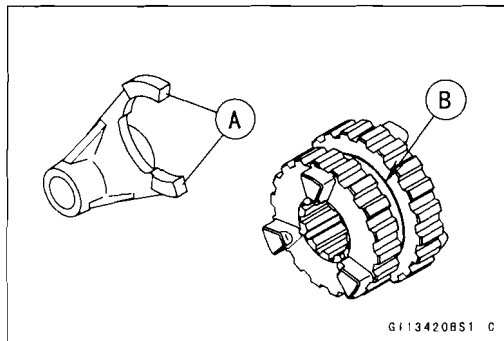
Standard: 4.9 ~ 5.0 mm (0.19 ~ 0.20 in.)

Service Limit: 4.8 mm (0.19 in.)

##### Gear Shift Fork Groove Width

Standard: 5.05 ~ 5.15 mm (0.199 ~ 0.203 in.)

Service Limit: 5.2 mm (0.20 in.)



- ★ If the thickness of a fork ear is less than the service limit, the shift fork must be replaced. If the gear groove is worn over the service limit, the gear must be replaced.

#### Shift Fork Guide Pin/Drum Groove Wear Inspection

- Measure the diameter of each shift fork guide pin [B], and measure the width [A] of each shift drum groove.

##### Shift Fork Guide Pin Diameter

Standard: 5.9 ~ 6.0 mm (0.23 ~ 0.24 in.)

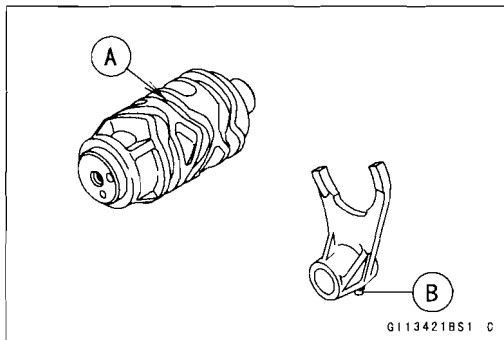
Service Limit: 5.8 mm (0.23 in.)

##### Shift Drum Groove Width

Standard: 6.05 ~ 6.20 mm (0.238 ~ 0.244 in.)

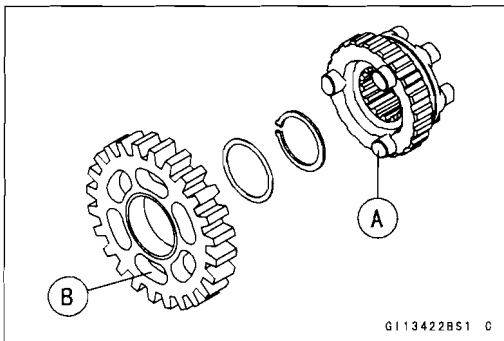
Service Limit: 6.3 mm (0.25 in.)

- ★ If the guide pin diameter is less than the service limit, replace the shift forks. If the shift drum groove is worn over the service limit, the drum must be replaced.



#### Gear Dog and Gear Dog Hole Damage Inspection

- Visually inspect the gear dogs [A] and gear dog holes [B].
- ★ Replace any damaged gears or gears with their dogs or dog holes worn excessively.





## Starter Motor Clutch/Torque Limiter

### Starter Motor Clutch Removal/Installation

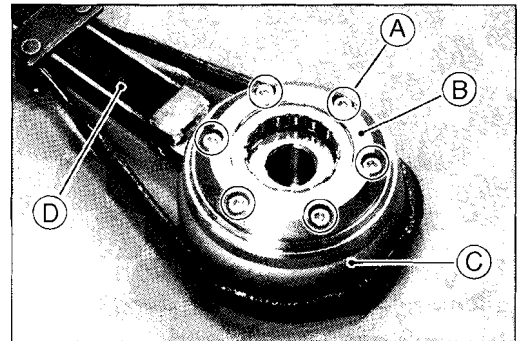
- Refer to the Alternator Rotor Removal and Installation in the Electrical System chapter.

### Starter Motor Clutch Disassembly

- Remove the alternator rotor (see Alternator Rotor Removal in the Electrical System chapter).
- Unscrew the bolts [A], and remove the one-way clutch assembly [B] from the alternator rotor [C].
- Hold firmly so that you may not damage the alternator rotor with the flywheel holder [D].

**Special Tool - Flywheel Holder: 57001-1313**

- Pull out the one-way clutch from the coupling.

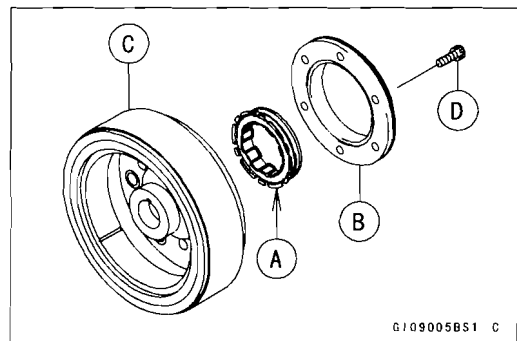


### Starter Motor Clutch Assembly

- Be sure to install the one-way clutch so that the flange [A] of it fits between the coupling [B] and alternator rotor [C].
- Apply a non-permanent locking agent to the threads of the starter motor clutch bolts [D], and tighten them.

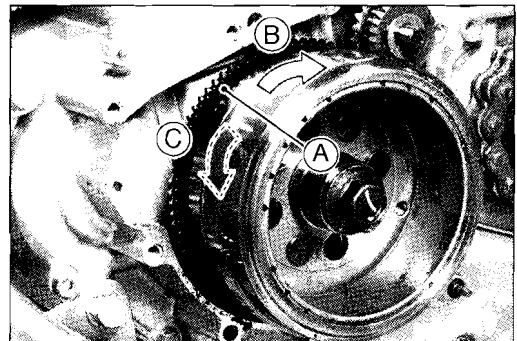
**Torque - Starter Motor Clutch Bolts: 12 N·m (1.2 kgf·m, 106 in·lb)**

**Special Tool - Flywheel Holder: 57001-1313**



### Starter Motor Clutch Inspection

- Remove the alternator cover (see Alternator Cover Removal in the Electrical System chapter).
- Turn the starter motor clutch gear [A] by hand. The starter motor clutch gear should turn clockwise [B] freely, but should not turn counterclockwise [C].
- ★ If the clutch does not operate as it should or if it makes noise, remove and disassemble the starter clutch, and visually inspect the clutch parts.
- ★ If there is any worn or damaged part, replace it.

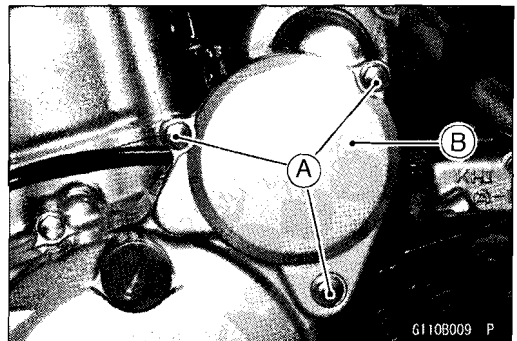


### NOTE

○ Examine the starter motor clutch gear as well. Replace it if it worn or damaged.

### Torque Limiter Removal

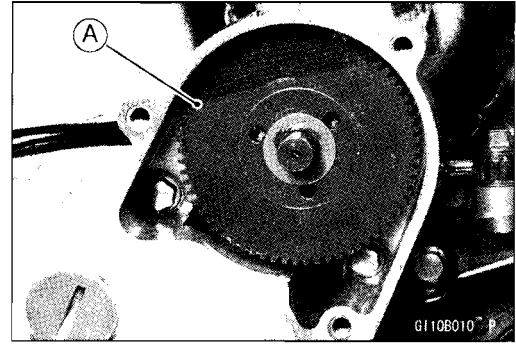
- Unscrew the bolts [A] and remove the torque limiter cover [B].



## 9-22 CRANKSHAFT/TRANSMISSION

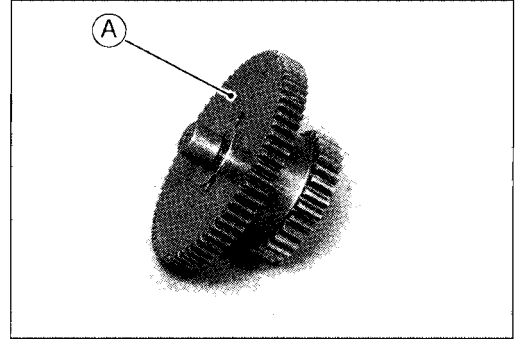
### Starter Motor Clutch/Torque Limiter

- Remove the torque limiter [A].
- There are washers set on both sides of the torque limiter.



#### ***Torque Limiter Inspection***

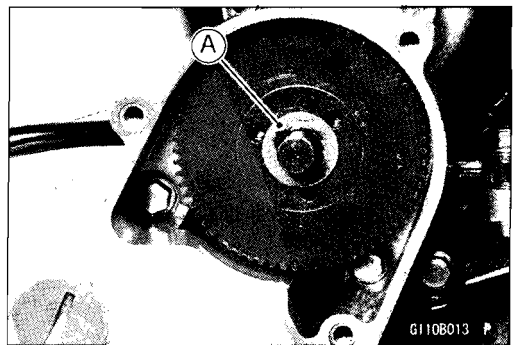
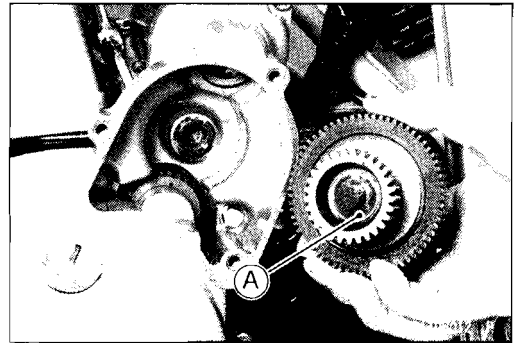
- Remove the torque limiter [A] (see Torque Limiter Removal) and visually inspect it.
- ★ If the limiter has wear, discoloration, or damage, replace it as a set.



#### ***Torque Limiter Installation***

- Apply molybdenum disulfide grease to the torque limiter and shafts and install it,
- Set washers [A] on both sides of the torque limiter.
- Install the starter motor gear cover.

**Torque - Torque Limiter Cover Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)**

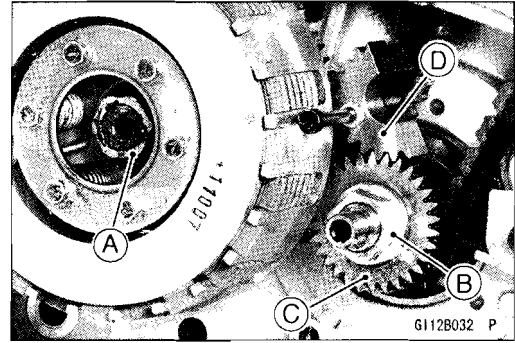




## Primary Gear

### Primary Gear Removal

- Remove:
  - Right Engine Cover (see Right Engine Cover Installation in the Clutch chapter)
  - Oil Pump (see Oil Pump Removal in the Engine Lubrication System chapter)
- Loosen the clutch hub nut [A] (see Clutch Removal in the Clutch chapter).
- Remove the primary gear nut [B].
- Remove the clutch (see Clutch Removal in the Clutch chapter).
- Remove the spring washer, primary gear [C] and woodruff key.



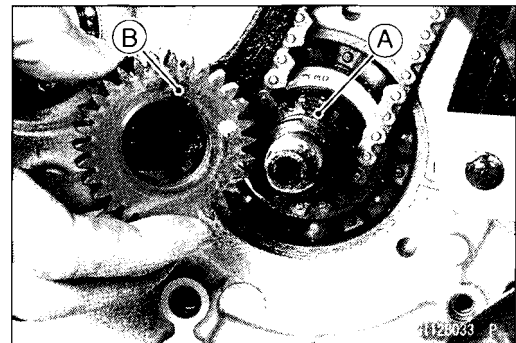
### NOTE

○ Use the gear holder [D] to prevent the crankshaft from rotating.

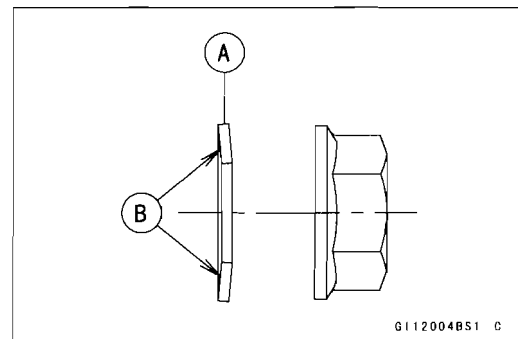
**Special Tool - Gear Holder: 57001-1602**

### Primary Gear Installation

- Set the woodruff key [A] securely between the primary gear [B] and the crankshaft.



- Set the washer [A] with its concaved side [B] facing inward.



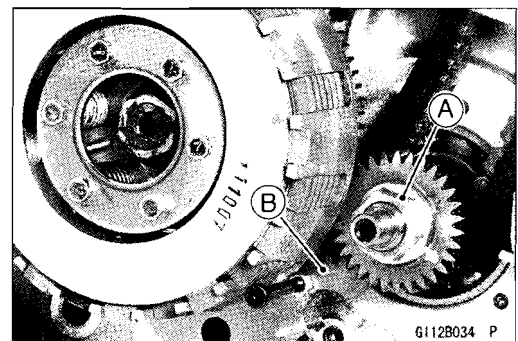
- Install the clutch (see Clutch Installation in the Clutch chapter).
- Tighten:

**Torque - Primary Gear Nut [A]: 98 N·m (10 kgf·m, 72 ft·lb)**

### NOTE

○ Use the gear holder [B] to prevent the crankshaft from rotating.

**Special Tool - Gear Holder: 57001-1602**

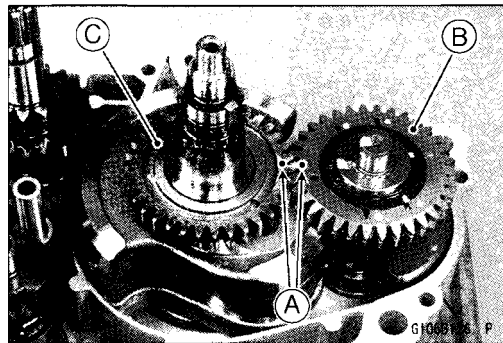


## 9-24 CRANKSHAFT/TRANSMISSION

### Balancer

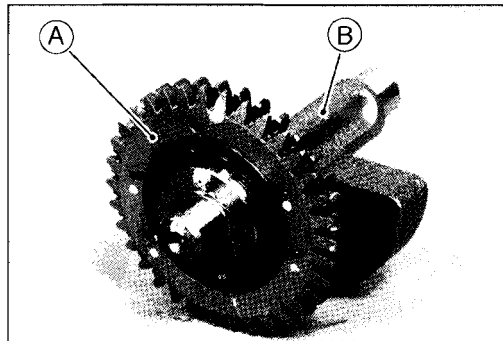
#### **Balancer Removal**

- Split the crankcase (see Crankcase Splitting).
- Remove the balancer from the left crankcase with the punch marks [A] provided on the balancer gear [B] and the driven gear [C] of the crankshaft aligned with each other.



#### **Balancer Disassembly**

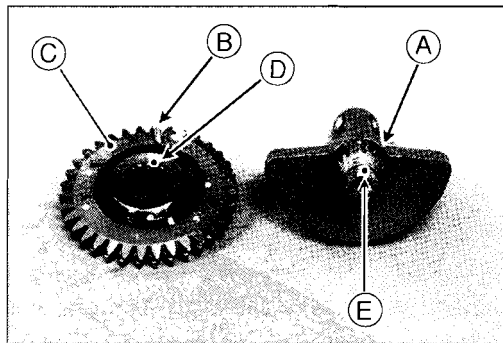
- Remove the balancer gear [A] from the balancer shaft [B].
- Tap the balancer gear side end of the shaft lightly with a plastic hammer to detach the balancer gear.



#### **Balancer Assembly**

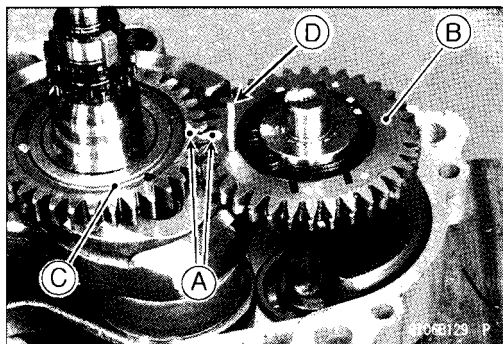
- Remove the circlip [A] with a new one, if removed.
- Put an appropriate pin [B] through the upper and lower balancer gear holes to align the upper and lower balancer gears correctly.
- Install the balancer gear [C] so that the balancer gear punch mark [D] and balancer shaft punch mark [E] align.

**Special Tool - Outside Circlip Pliers: 57001-144**



#### **Balancer Installation**

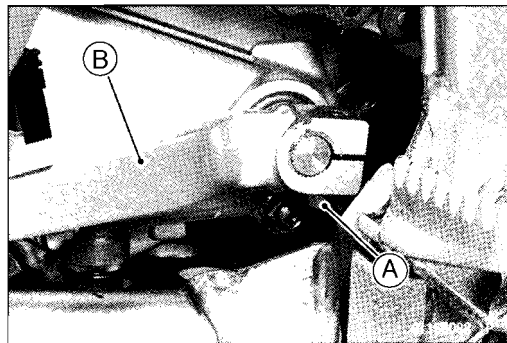
- Assemble the balancer to the crankcase with the punch marks [A] provided on the balancer gear [B] and the driven gear [C] of the crankshaft aligned with each other.
- Pull out the pin [D].



## External Shift Mechanism

### Shift Pedal Removal

- Unscrew the mounting bolts [A] and remove the shift pedal [B].

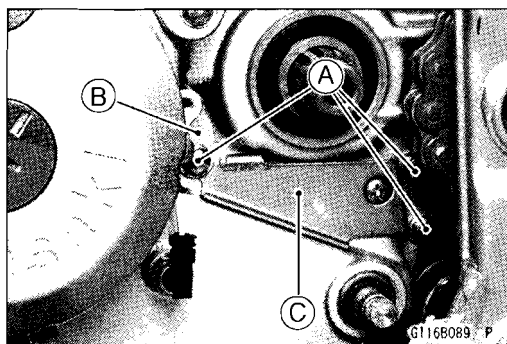


### Shift Pedal Installation

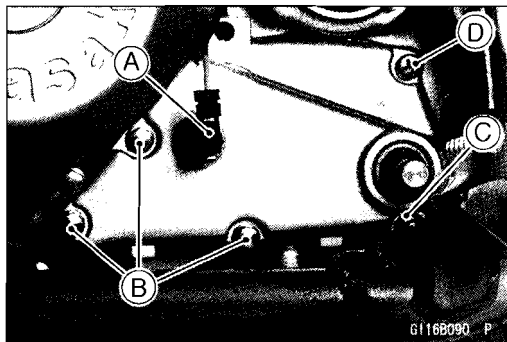
- Install the shift pedal, and tighten the mounting bolt.  
Torque - Shift Pedal Bolt: 9.8 N·m (1.0 kgf·m, 87 in·lb)

### External Shift Mechanism Removal

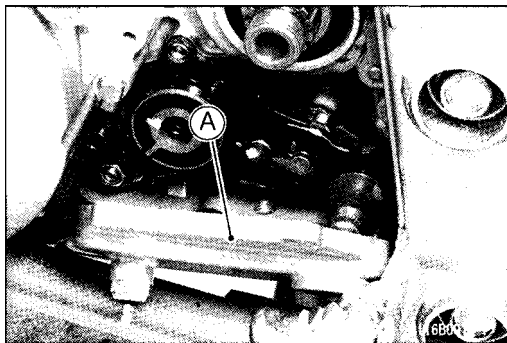
- Remove:
  - Engine Sprocket (see Engine Sprocket Removal in the Final Drive chapter)
  - Shift Pedal (see Shift Pedal Removal)
  - Bolts [A]
  - Plate [B]
  - Guard [C]



- Remove:
  - Neutral Switch Lead Connector [A]
  - Bolts [B]
  - Nut [C]
  - Screw [D]



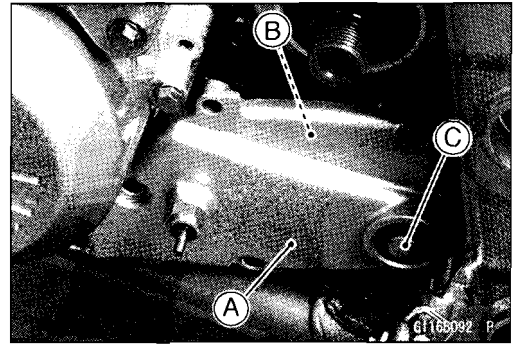
- Remove the shift mechanism cover [A] until contact it to the frame.



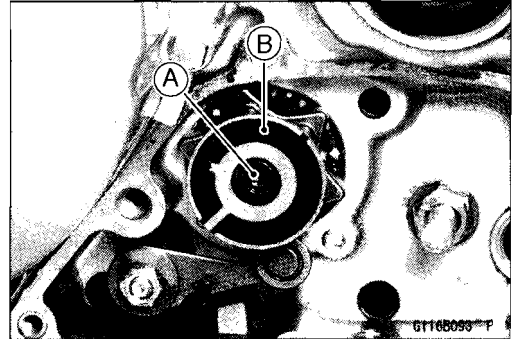
## 9-26 CRANKSHAFT/TRANSMISSION

### External Shift Mechanism

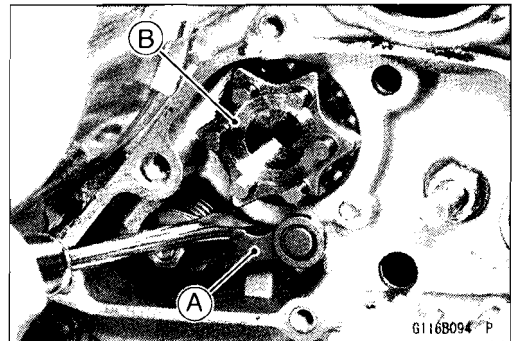
- Set the shift mechanism cover [A] to the shift shaft as shown.
- While pushing the shift mechanism lever [B] backward, pull out the shift shaft [C] to remove the shift mechanism cover together with the shift shaft assembly.



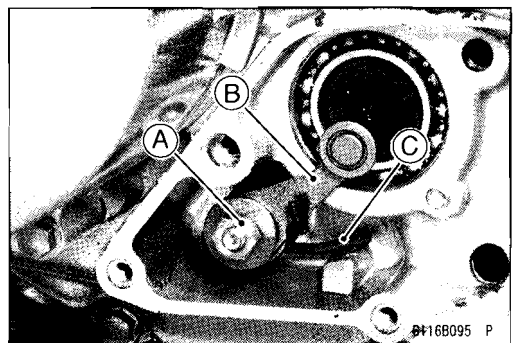
- Remove:  
Shift Drum Cam Allen Bolt [A]  
Shift Drum Cam Holder [B]



- While pushing down the gear positioning lever [A], remove the shift drum cam [B].

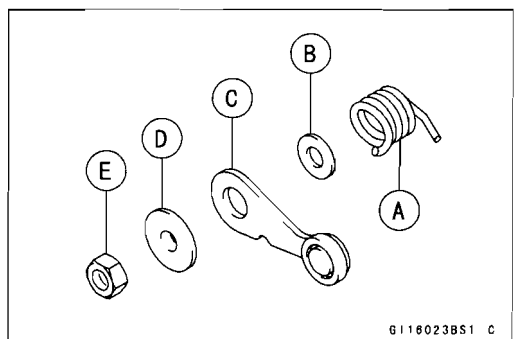


- Remove:  
Nut [A]  
Gear Positioning Lever [B]  
Spring [C]



### External Shift Mechanism Installation

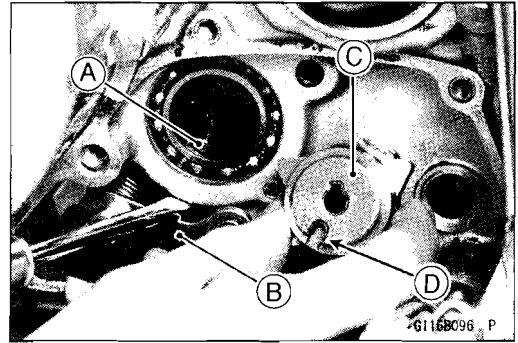
- Install:  
Spring [A]  
Washer [B]  
Gear Positioning Lever [C]  
Spacer [D]  
Nut [E]
- Tighten:  
**Torque - Gear Positioning Lever Nut [E]: 9.8 N·m (1.0 kgf·m, 87 in·lb)**



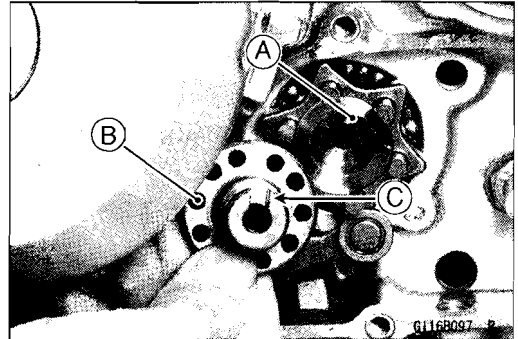


## External Shift Mechanism

- Install the pin [A].
- Use a screw driver to push down the gear positioning lever [B] and set the shift drum cam [C] so that the groove [D] of the shift drum cam fit the pin.



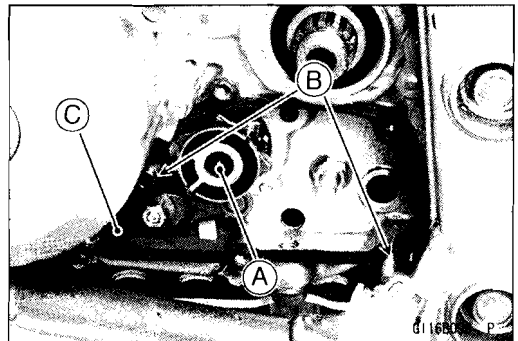
- Install the pin [A] to the shift drum cam.
- Install the shift drum cam holder [B] so that the groove [C] of the holder fit the pin.



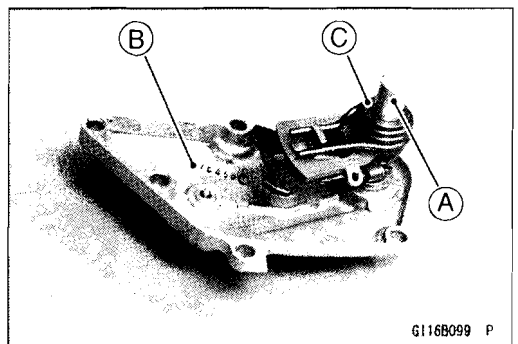
- Apply a non-permanent locking agent to the threads of the Allen bolt [A] and tighten it.

**Torque - Shift Drum Cam Holder Bolt: 12 N·m (1.2 kgf·m, 106 in·lb)**

- Install the dowel pins [B].
- Replace the gasket [C] with a new one.



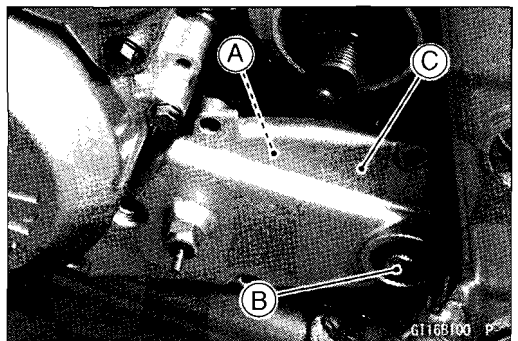
- Apply grease to the oil seal of the external shift mechanism cover.
- Insert the shift shaft assembly [A] to the external shift mechanism cover [B].
- Install the washer [C] to the shift shaft.



- While pushing the shift mechanism lever [A] backward, install the shift shaft assembly [B] together with the external shift mechanism cover [C].

**Torque - External Shift Mechanism Cover Bolts and Nut: 9.8 N·m (1.0 kgf·m, 87 in·lb)**

**External Shift Mechanism Cover Screw: 5.2 N·m (0.53 kgf·m, 46 in·lb)**

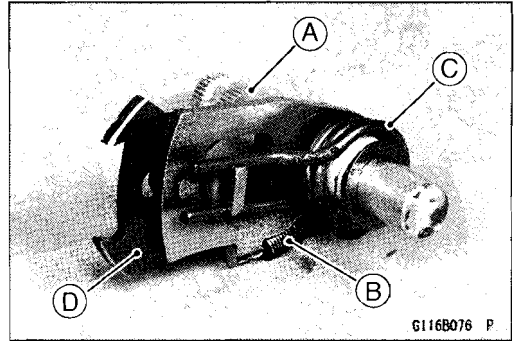


## 9-28 CRANKSHAFT/TRANSMISSION

### External Shift Mechanism

#### **External Shift Mechanism Inspection**

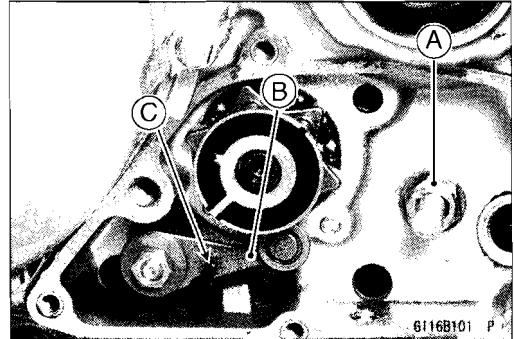
- Inspect the shift shaft [A] for any damage.
- ★ If the shaft is bent, repair or replace it.
- ★ If the spring [B] or shift pedal return spring [C] are damaged, replace the spring.
- ★ If the shift mechanism arm [D] is damaged, replace the assembly.



- Check that the return spring pin [A] is not loose.
- ★ If it is loose, unscrew it, then apply a non-permanent locking agent, and tighten it.

**Torque - Shift Shaft Return Spring Pin: 37 N·m (3.8 kgf·m, 27 ft·lb)**

- Check the gear positioning lever [B] and spring [C] for any damage.
- ★ If it shows any signs of damage, replace it with a new one.



## Bearing, Oil seal

### Bearing Replacement

#### CAUTION

**Do not remove the ball bearings unless it is necessary. Removal may damage them.**

- Using a press or puller, remove the ball bearing.

#### NOTE

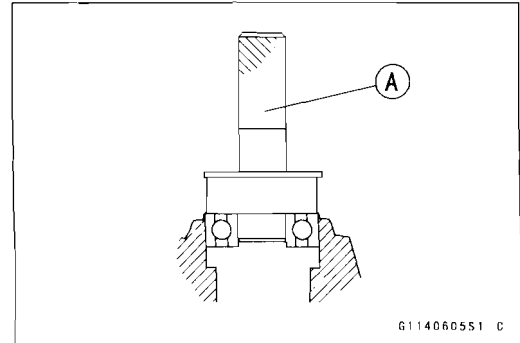
○In the absence of the above mentioned tools, satisfactory results may be obtained by heating the case to approximately 93°C (200°F) max., and tapping the bearing in or out lightly.

#### CAUTION

**Do not heat it with a torch. This will warp the case. Soak the case in engine oil and heat the oil.**

- Using a press and the bearing driver set [A], install the new bearing or outer race until it stops at the bottom of its housing.

**Special Tool - Bearing Driver Set: 57001-1129**

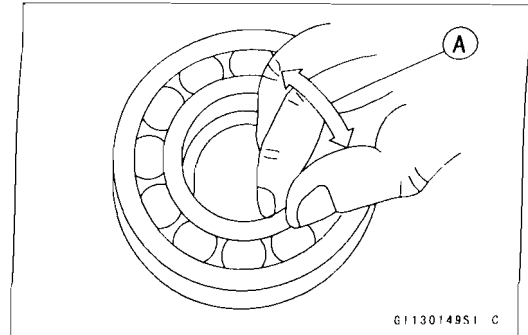


### Bearings Inspection

#### CAUTION

**Do not remove the ball bearings for inspection. Removal may damage them.**

- Check the ball bearings.
- Since the ball bearing is made to extremely close tolerances, the wear must be judged by feel rather than measurement. Wash the bearing with a high flash-point solvent, dry it (do not spin it while it is dry), and apply engine oil.
- Spin [A] the bearing to check its condition.
- ★If the bearing is noisy, does not spin smoothly, or has any damage, replace it.
- Check the needle bearings.
- The rollers in a bearing normally wear very little, and wear is difficult to measure. Instead of measuring, inspect the bearing for abrasion, color change, other damage.
- ★If any anomalies are found in the needle bearing, replace it with a new one.



### Oil Seal Inspection

- Inspect the oil seals.
- ★Replace it if the lips are misshapen, discolored (indicating that the rubber has deteriorated), hardened or otherwise damaged.

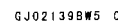


# Wheels/Tires

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### Exploded View



**Exploded View**

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Spoke Nipples	4.0	0.41	35 in·lb	
2	Front Axle Clamp Bolts	20	2.0	15	AL
3	Front Axle Nut	88	9.0	65	
4	Rear Axle Nut	110	11.2	81.1	

5. K LW250W

6. K LW250T

AL: Tighten the two clamp bolts alternately two times to ensure even tightening torque.

G: Apply grease.

R: Replacement Parts

S: Following the specified tightening sequence.

WL: Apply soap and water solution, or rubber lubricant.

## 10-4 WHEELS/TIRES

### Specifications

Item	Standard	Service Limit
<b>Wheels (Rims)</b>		
Rim Runout:		
Axial:		
KLX250T	TIR 0.7 mm (0.028 in.) or less	TIR 2.0 mm (0.08 in.)
KLX250W	TIR 0.8 mm (0.031 in.) or less	TIR 2.0 mm (0.08 in.)
Radial:		
KLX250T	TIR 1.0 mm (0.039 in.) or less	TIR 2.0 mm (0.08 in.)
KLX250W	TIR 1.2 mm (0.047 in.) or less	TIR 2.0 mm (0.08 in.)
Axle Runout/100 mm (3.94 in.)	TIR 0.03 mm (0.001 in.) or less	TIR 0.2 mm (0.008 in.)
Rim Size:		
Front:		
KLX250T	21 × 1.60	— — —
KLX250W	17 × 3.00	— — —
Rear:		
KLX250T	18 × 2.15	— — —
KLX250W	17 × 4.00	— — —
<b>Tires</b>		
Air Pressure (When Cold):		
Front:		
KLX250T	150 kPa (1.5 kgf/cm <sup>2</sup> , 22 psi)	— — —
KLX250W	200 kPa (2.0 kgf/cm <sup>2</sup> , 29 psi)	— — —
Rear:		
KLX250T	Up to 97.5 kg (215 lb) load: 150 kPa (1.5 kgf/cm <sup>2</sup> , 22 psi) 97.5 ~ 181 kg (215 ~ 399 lb) load: 175 kPa (1.75 kgf/cm <sup>2</sup> , 25 psi)	— — —
KLX250W	225 kPa (2.25 kgf/cm <sup>2</sup> , 33 psi)	— — —
Tread Depth:		
Front:		
KLX250T	7.8 mm (0.31 in.)	2 mm (0.08 in.)
KLX250W	4.4 mm (0.17 in.)	1 mm (0.04 in.)
Rear:		
KLX250T	11.8 mm (0.464 in.)	2 mm (0.08 in.)
KLX250W	6.5 mm (0.26 in.)	2 mm (0.08 in.) (Up to 130 km/h) 3 mm (0.12 in.) (Over 130 km/h)
Standard Tires:	Make, Type	Size
Front:		
KLX250T	DUNLOP D605FG	3.00-21 51P
KLX250W	IRC RX-01F	110/70-17M/C 54S
Rear:		
KLX250T	DUNLOP D605G	4.60-18 63P
KLX250W	IRC RX-01R	130/70-17M/C 62S

Specifications

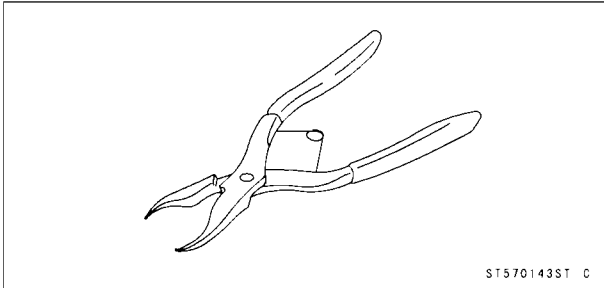
**⚠ WARNING**

Use the same manufacturer's tires on both front and rear wheels.

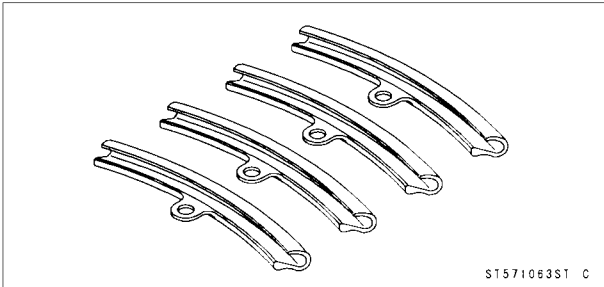
# 10-6 WHEELS/TIRES

## Special Tools

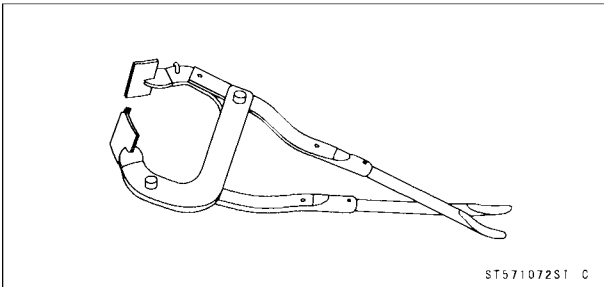
**Inside Circlip Pliers:**  
**57001-143**



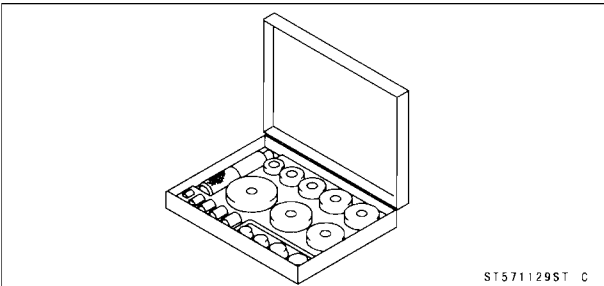
**Rim Protector:**  
**57001-1063**



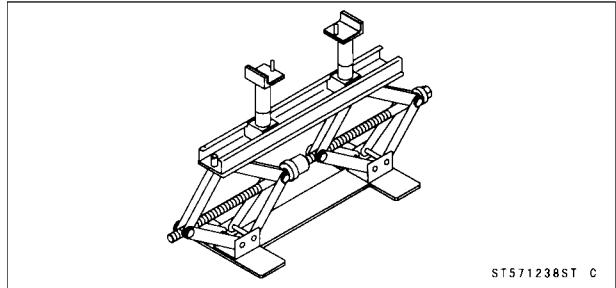
**Bead Breaker Assembly:**  
**57001-1072**



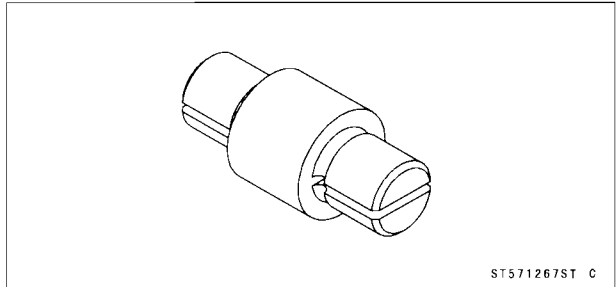
**Bearing Driver Set:**  
**57001-1129**



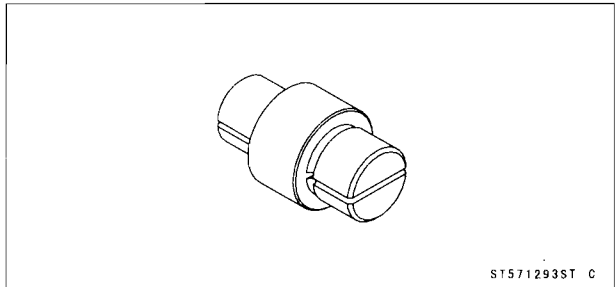
**Jack:**  
**57001-1238**



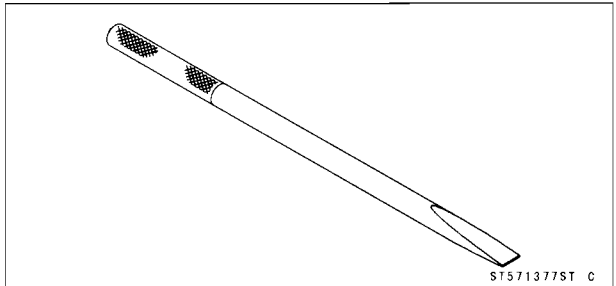
**Bearing Remover Head,  $\phi 15 \times \phi 17$ :**  
**57001-1267**



**Bearing Remover Head,  $\phi 20 \times \phi 22$ :**  
**57001-1293**



**Bearing Remover Shaft,  $\phi 13$ :**  
**57001-1377**



## Wheels (Rims)

### Front Wheel Removal

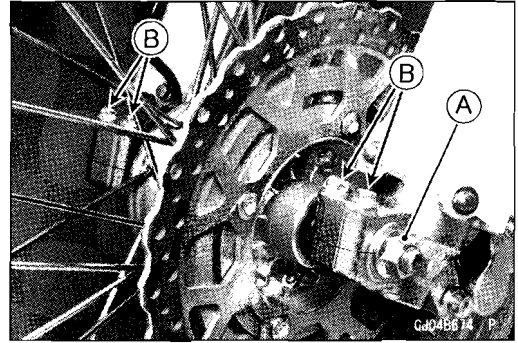
- Remove the front axle nut [A].
- Remove the front axle clamp bolts [B].
- Raise the front wheel off the ground with jack.

**Special Tool - Jack: 57001-1238**

- Pull out the axle to the right and drop the front wheel out of the forks.

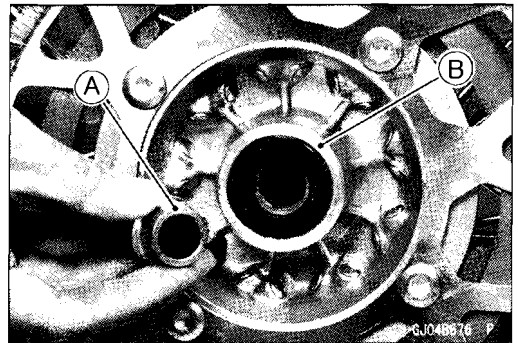
### CAUTION

Do not lay the front 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.

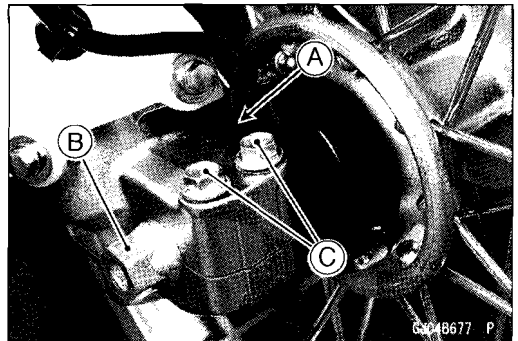


### Front Wheel Installation

- Install the speed sensor to the front hub (see Speed Sensor Installation in the Electrical System chapter).
- Apply grease to the both side seal lips.
- Fit the collar [A] on the front hub [B].



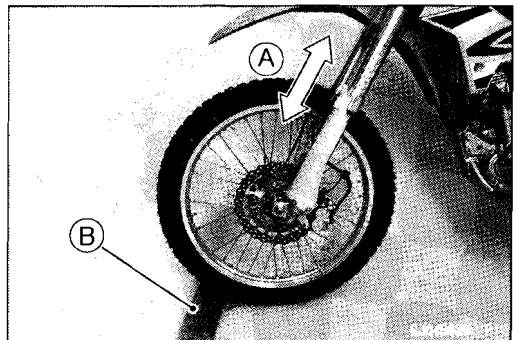
- Fit the speed sensor housing stopper [A] to the right fork leg as shown.
- Insert the front axle [B] fully.
- Temporary tighten the right front axle clamp bolts [C].



- Pump the front fork up and down [A] 4 or 5 times to all on the right front fork leg to seat on the front axle.

### NOTE

○Put a block [B] in front of the front wheel to stop moving.





## 10-8 WHEELS/TIRES

### Wheels (Rims)

- Tighten:

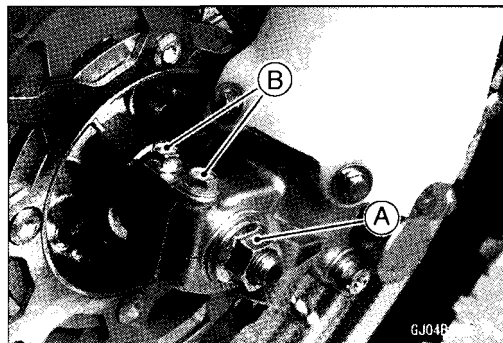
Torque - Front Axle Nut [A]: 88 N·m (9.0 kgf·m, 65 ft·lb)

- Tighten the left axle clamp bolts [B] on the left fork leg first. Next, tighten the right axle clamp bolts.

Torque - Front Axle Clamp Bolts: 20 N·m (2.0 kgf·m, 15 ft·lb)

#### NOTE

○ Tighten the two clamp bolts alternately two times to ensure even tightening torque.



- Check the front brake effectiveness (see Brake Operation Inspection in the Periodic Maintenance chapter).

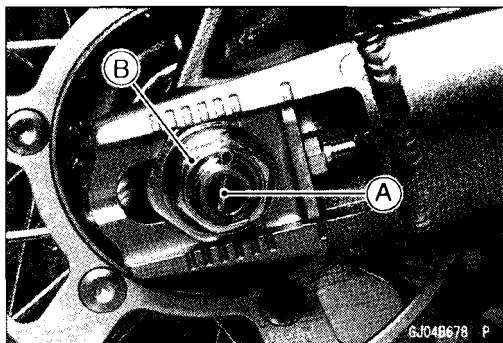
#### ⚠ WARNING

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

- Remove the cotter pin [A] and loosen the rear axle nut [B].
- Raise the rear wheel off the ground with jack.

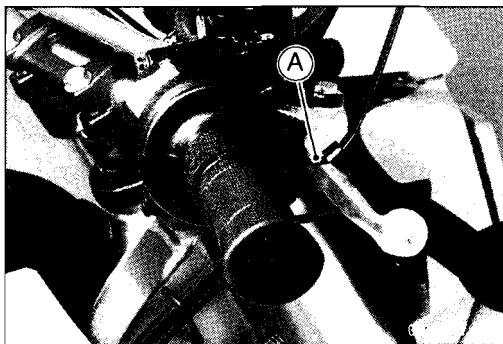
Special Tool - Jack: 57001-1238



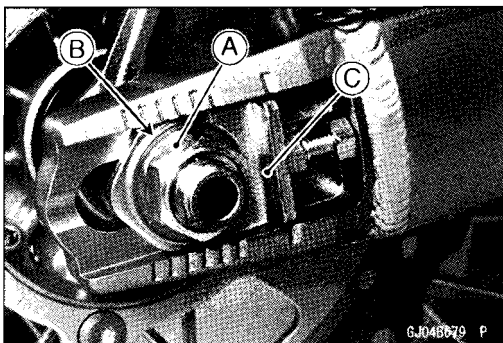
- Squeeze the front brake lever, and hold it with a band [A] to prevent the motorcycle from running forward.

#### ⚠ WARNING

Be sure to hold the front brake when removing the rear wheel, or the motorcycle may fall over. It could cause an accident and injury.



- Remove:
  - Rear Axle Nut [A]
  - Washer [B]
  - Adjuster [C]
- Pull out the rear axle to the left and drop the rear wheel.



## Wheels (Rims)

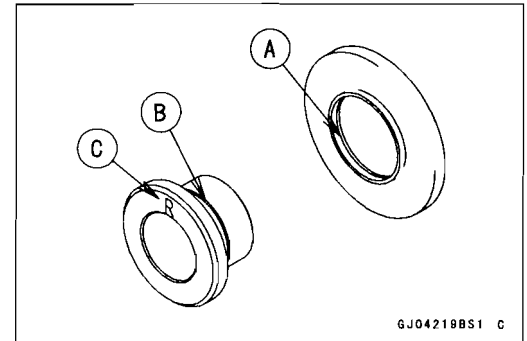
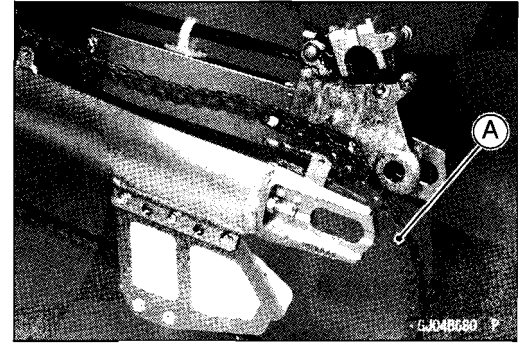
- Remove the chain cover (see Drive Chain Removal in the Final Drive chapter).
- Disengage the drive chain from the sprocket.
- Move the rear wheel back and remove it.
- Hang the drive chain [A] on the swingarm.

### CAUTION

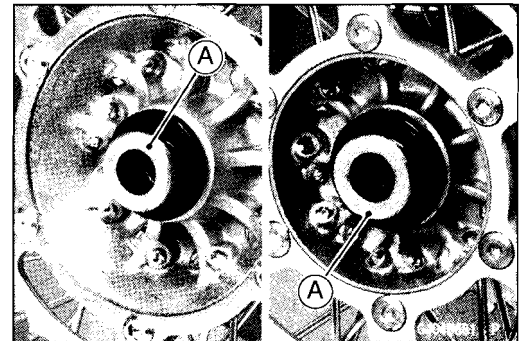
Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place wooden blocks under the wheel so that the disc does not touch the ground.

### Rear Wheel Installation

- Fit the projection [A] on the cap to the groove [B] on the collar.
- The "R" letter [C] punched on the right side collar.



- Apply grease to the both side seal lips.
- Fit the caps and collars [A] on the both sides of the hub.



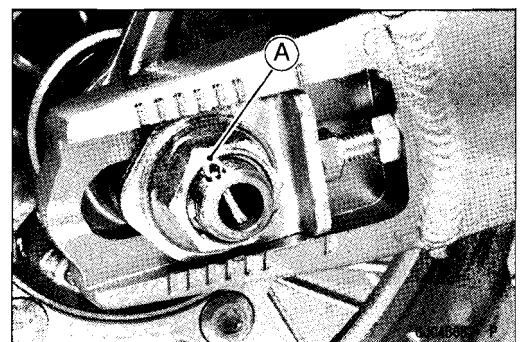
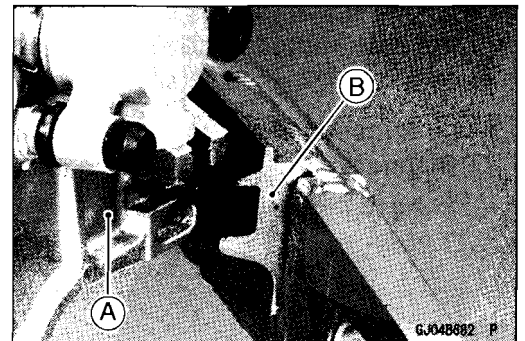
- Install the caliper bracket [A] with the caliper installed onto the stopper rail [B] of the swingarm.
- Engage the drive chain with the rear sprocket.
- Insert the axle from the left side of the wheel.
- Adjust the drive chain slack before tightening the axle nut (see Drive Chain Slack Inspection in the Periodic Maintenance chapter).
- Tighten:

**Torque - Rear Axle Nut: 110 N·m (11.2 kgf·m, 81.1 ft·lb)**

- Insert a new cotter pin [A].
- Bend the cotter pin as shown.

### ⚠ WARNING

If the rear axle nut is not securely tightened or the cotter pin is not installed, an unsafe riding condition may result.



## 10-10 WHEELS/TIRES

### Wheels (Rims)

- Check the rear brake effectiveness (see Brake Operation Inspection in the Periodic Maintenance chapter).

#### **⚠ 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 Inspection**

- Raise the front or rear wheel and turn it by hand to check that it turns smoothly without making a noise.

**Special Tool - Jack: 57001-1238**

- ★ If any abnormal condition is found, replace the hub bearing.

#### **Spoke Inspection**

- Refer to the Spoke Tightness and Rim Runout Inspection in the Periodic Maintenance chapter.

#### **Rim Inspection**

- Refer to the Spoke Tightness and Rim Runout Inspection in the Periodic Maintenance chapter.

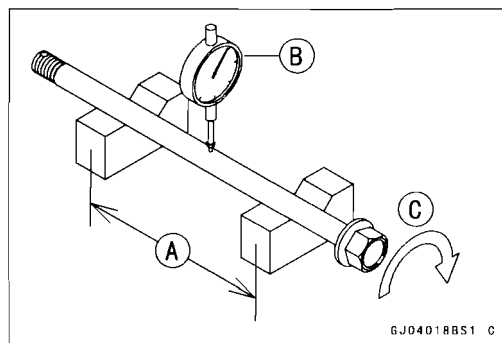
#### **Axle Inspection**

- Remove the axle (see Front/Rear Wheel Removal).
- Visually inspect the front and rear axle for damages.
- ★ If the axle is damaged or bent, replace it.
- Place the axle on the V blocks that are 100 mm (3.94 in.) [A] apart, and set a dial gauge [B] on the axle at a point halfway between the blocks. Turn [C] the axle to measure the runout. The difference between the highest and lowest dial gauge reading is the amount of runout.
- ★ If the axle runout exceeds the service limit, replace the axle.

**Axle Runout/100 mm (3.94 in.)**

**Standard: TIR 0.03 mm (0.001 in.) or less**

**Service Limit: TIR 0.2 mm (0.008 in.)**



## Tires

### Air Pressure Inspection/Adjustment

- Refer to the Air Pressure Inspection in the Periodic Maintenance chapter.

### Tire Inspection

- Refer to the Wheel/Tire Damage Inspection in the Periodic Maintenance chapter.

### Tire Removal

- Remove the wheel (see Front/Rear Wheel Removal).

#### CAUTION

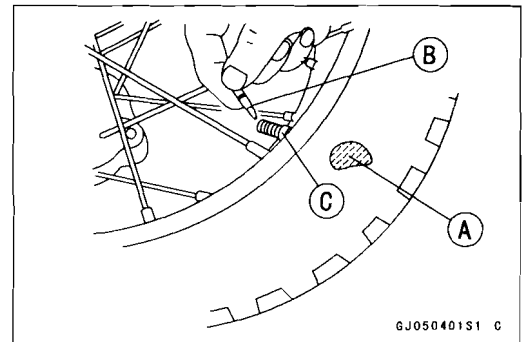
**Do not lay the front wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.**

- To maintain wheel balance, mark the air valve position on the tire with chalk so that the tire can be reinstalled in the same position.

Chalk Mark or Yellow Mark [A]

Air Valve [B]

Align [C]



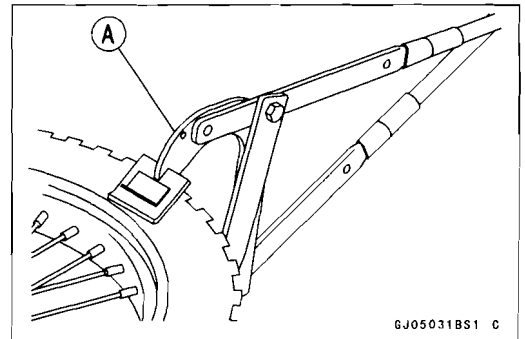
- Remove the air valve nut.
- Lubricate the tire beads and rim flanges on both sides with a soap and water solution or rubber lubricant. This helps the tire beads slip off the rim flanges.

#### CAUTION

**Never lubricate with engine oil or petroleum distillates because they will deteriorate the tire.**

- Break the beads away from both sides of the rim with the bead breaker [A].

**Special Tool - Bead Breaker Assembly: 57001-1072**



## 10-12 WHEELS/TIRES

### Tires

- Step on the side of the tire opposite air valve, and pry the tire off the rim with the tire iron [A] of the bead breaker protecting the rim with rim protectors [B].

**Special Tools - Rim Protector: 57001-1063**

**Bead Breaker Assembly: 57001-1072**

#### CAUTION

**Take care not to insert the tire irons so deeply that the tube gets damaged.**

- Remove the tube when one side of the tire is pried off.
- Pry the tire off the rim.
- Remove the rim protector.

#### Tire Installation

- Inspect the rim and the tire before installing the tire, and replace them if necessary.
- Apply a soap and water solution or rubber lubricant to both the tire bead and the rim flange.

#### KLX250W

- Check the tire rotation mark [A] on the front and rear tires and install them on the rim accordingly.

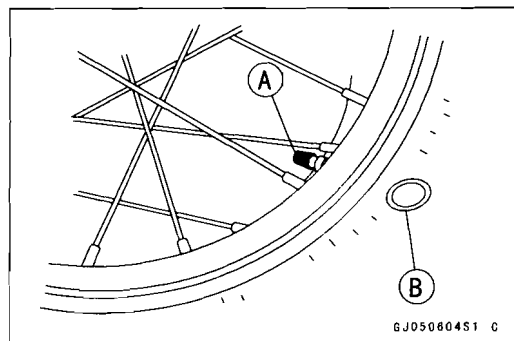
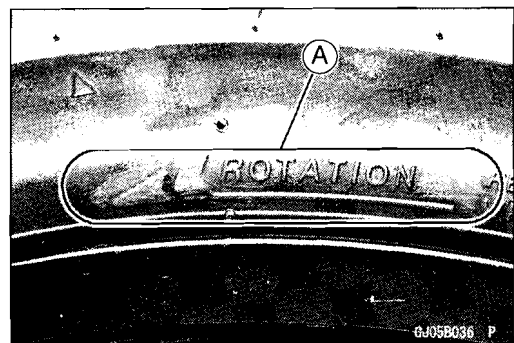
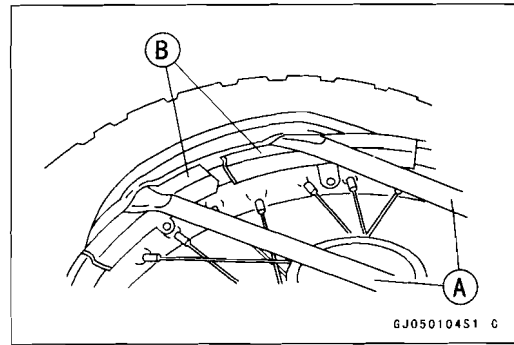
○ Position the tire on the rim so that the air valve [A] is at the tire balance mark [B] (the chalk mark made during removal, or the paint mark on a new tire).

- Insert the valve stem into the rim, and screw the nut on loosely.
- Fit the rim protectors and use tire irons to install the tire bead.

#### NOTE

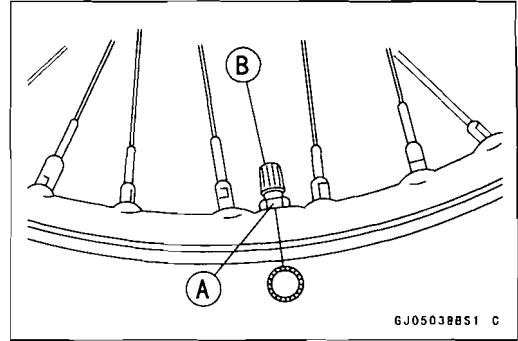
○ To prevent rim damage, be sure to place the rim protectors at any place the tire irons are applied.

- Replace the tire back on the rim from the opposite side of the valve.
- Insert the tire irons so deeply that the tube is not damaged.
- Similarly, slip the tire bead back over the rim on the other side.
- Check that the tube is not pinched between the tire and rim.



**Tires**

- Tighten the valve stem nut [A], and put on the valve cap [B].
- Adjust the tire air pressure to the specified pressure (see Air Pressure Inspection in the Periodic Maintenance chapter).





## 10-14 WHEELS/TIRES

### Hub Bearing

#### Hub Bearing Removal

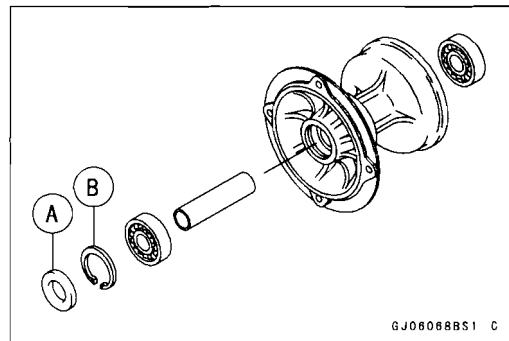
- Remove the wheel (see Front/Rear Wheel Removal), and take out the following.

#### Front

Grease Seal [A]

Circlip [B]

Special Tool - Inside Circlip Pliers: 57001-143

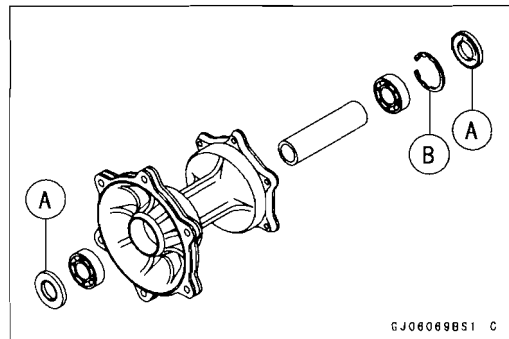


#### Rear

Grease Seals [A]

Circlip [B]

Special Tool - Inside Circlip Pliers: 57001-143



- Use the bearing remover to remove the hub bearings [A].

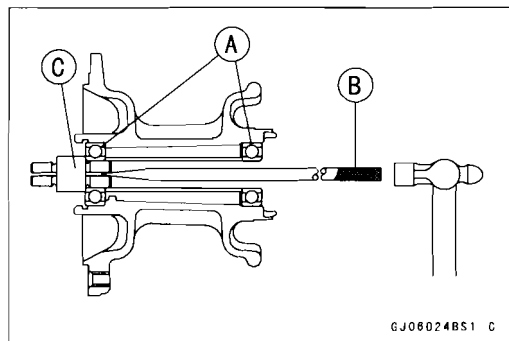
#### CAUTION

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

Special Tools - Bearing Remove Shaft: 57001-1377 [B]

Bearing Remover Head,  $\phi 15 \times \phi 17$ : 57001-1267 [C]

Bearing Remover Head,  $\phi 20 \times \phi 22$ : 57001-1293





## Hub Bearing

### Hub Bearing Installation

- Before installing the hub bearings, blow any dirt or foreign particles out of the hub with compressed air to prevent contamination of the bearings.
- Replace the bearings with new ones.
- Install the hub front bearings in the following sequence.
  - Press in the left side bearing [A] until it is bottomed.

**Special Tool - Bearing Driver Set: 57001-1129**

- Insert the collar [B] in the hub [C].
- Press in the right side bearing [D] until it is bottomed.

**Special Tool - Bearing Driver Set: 57001-1129**

- Install the rear hub bearings in the following sequence.
  - Press in the right side bearing until it is bottomed.

**Special Tool - Bearing Driver Set: 57001-1129**

- Insert the collar in the hub.
- Press in the left side bearing until it is bottomed.

**Special Tool - Bearing Driver Set: 57001-1129**

### NOTE

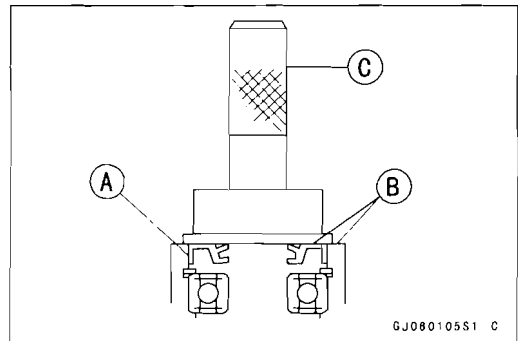
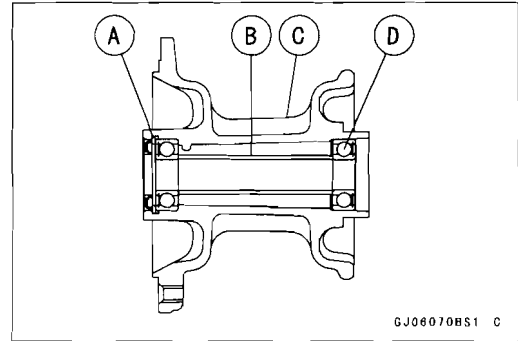
- *Install the bearings so that the marked side or sealed side faces out.*

- Replace the circlips with a new one.

**Special Tool - Inside Circlips Pliers: 57001-143**

- Replace the grease seal with a new one.
- Press in the grease seal [A] so that the seal surface is flush [B] with the end of the hole.
- Apply grease to the grease seal lip.

**Special Tool - Bearing Driver Set: 57001-1129 [C]**

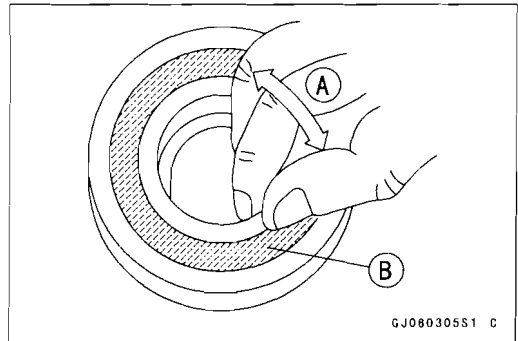


### Hub Bearing Inspection

Since the hub bearings are made to extremely close tolerances, the clearance can not normally be measured.

### NOTE

- *Do not remove any bearings for inspection. If any bearings are removed, they will need to be replaced with new ones.*
- Turn each bearing in the hub back and forth [A] while checking for plays, roughness, or binding.
- ★ If bearing play roughness, or binding is found, replace the bearing.
- Examine the bearing seal [B] for tears or leakage.
- ★ If the seal is torn or is leaking, replace the bearing.



### Hub Bearing Lubrication

### NOTE

- *Since the hub bearings are packed with grease and sealed, lubrication is not required.*

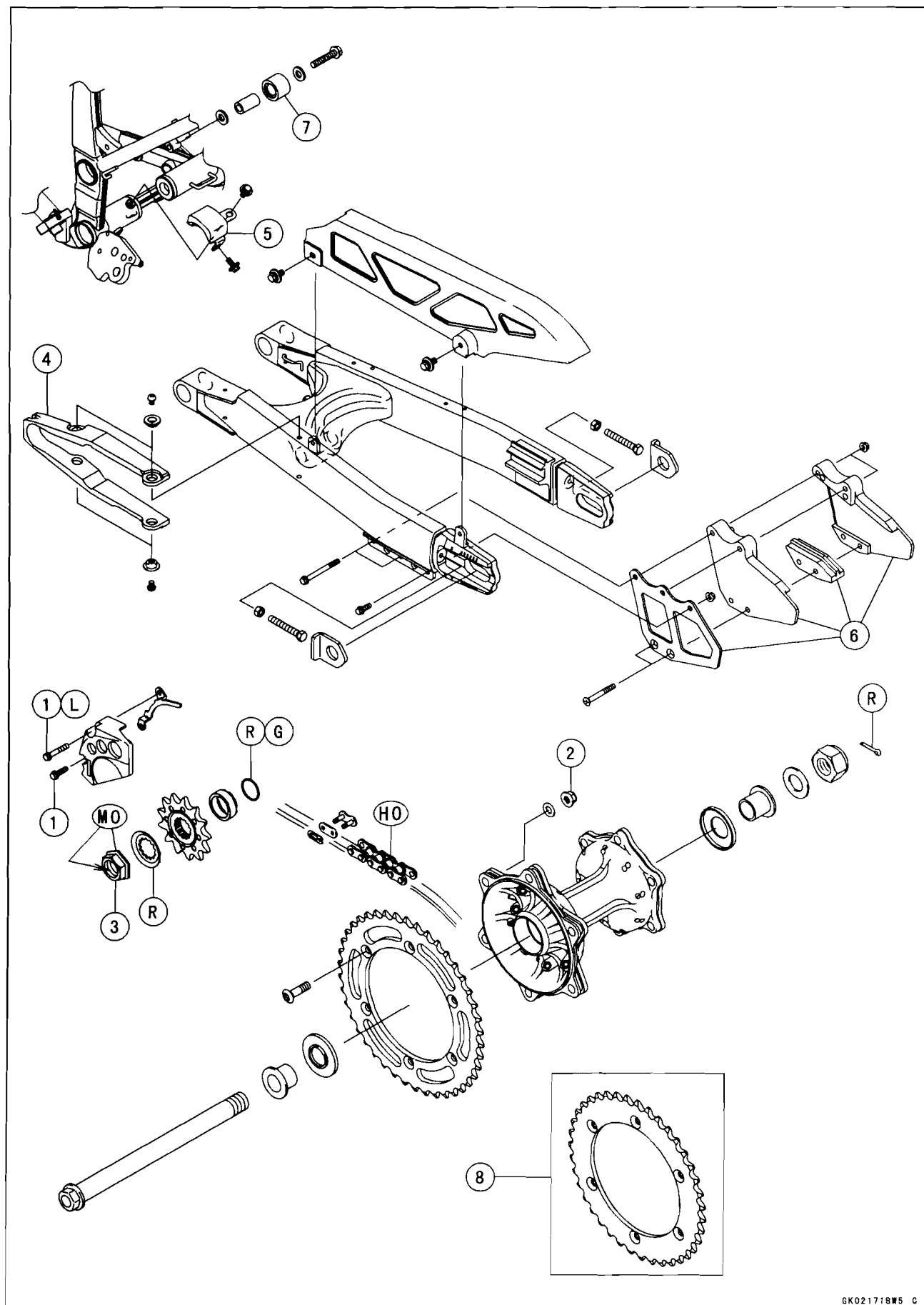
# Final Drive

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## 11-2 FINAL DRIVE

### Exploded View



GK021718W5 C

**Exploded View**

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Engine Sprocket Cover Bolts	9.8	1.0	87 in·lb	L (1)
2	Rear Sprocket Nuts	32	3.3	24	
3	Engine Sprocket Nut	125	12.7	92.2	MO

4. Chain Slipper

5. Front Chain Guide

6. Rear Chain Guide

7. Chain Guide Roller

8. KLX250W

G: Apply grease.

HO Apply heavy oil.

L: Apply a non-permanent locking agent.

MO: Apply molybdenum disulfide oil solution.

(mixture of engine oil and molybdenum disulfide grease in a weight ratio 10 : 1)

R: Replacement Parts

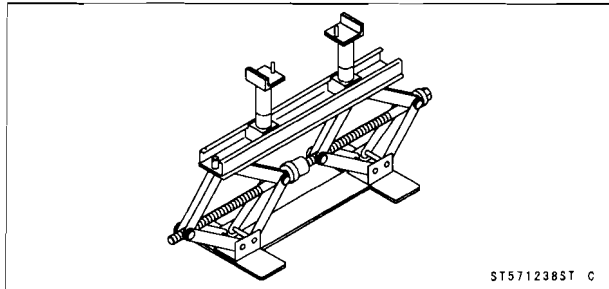
## 11-4 FINAL DRIVE

### Specifications

Item	Standard	Service Limit
<b>Drive Chain</b>		
Chain Slack	35 ~ 45 mm (1.4 ~ 1.8 in.)	— — —
20-link Length	317.5 ~ 318.2 mm (12.50 ~ 12.53 in.)	323 mm (12.7 in.)
Standard Chain		
Make	ENUMA	— — —
Type	EK520LV-O	— — —
Link:		
KLX250T	106 Links	— — —
KLX250W	104 Links	— — —
<b>Sprockets</b>		
Rear Sprocket Runout	0.4 mm (0.016 in.) or less	0.5 mm (0.02 in.)

## Special Tool

Jack:  
57001-1238



## 11-6 FINAL DRIVE

### Drive Chain

#### ***Drive Chain Slack Inspection***

- Refer to the Drive Chain Slack Inspection in the Periodic Maintenance chapter.

#### ***Drive Chain Slack Adjustment***

- Refer to the Drive Chain Slack Adjustment in the Periodic Maintenance chapter.

#### ***Wheel Alignment Inspection/Adjustment***

- Refer to the Wheel Alignment Inspection in the Periodic Maintenance chapter.

#### ***Drive Chain Wear Inspection***

- Refer to the Drive Chain Wear Inspection in the Periodic Maintenance chapter.

#### ***Drive Chain Lubrication***

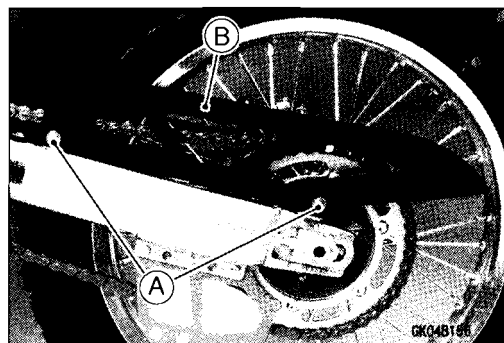
- Refer to the Drive Chain Lubrication Condition Inspection in the Periodic Maintenance chapter.

#### ***Drive Chain Guide Wear Inspection***

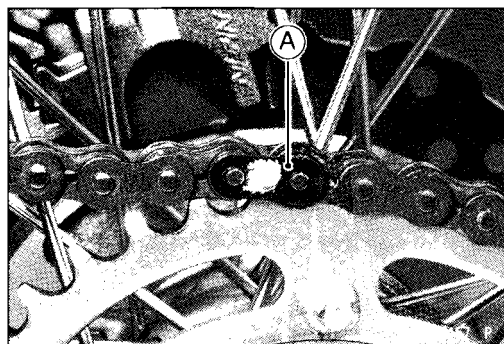
- Refer to the Drive Chain Guide Wear Inspection in the Periodic Maintenance chapter.

#### ***Drive Chain Removal***

- Remove:
  - Engine Sprocket Cover (see Engine Sprocket Removal)
  - Bolts [A]
  - Chain Cover [B]



- Remove the clip [A] from the master link to separate the drive chain.
- Remove the drive chain from the chassis.

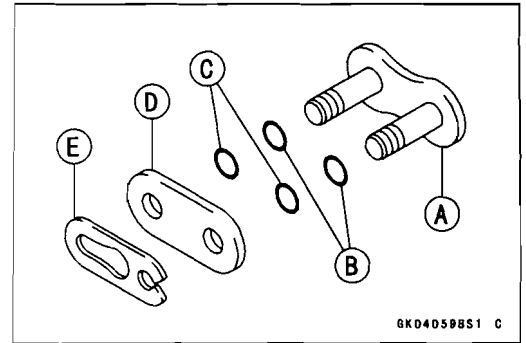




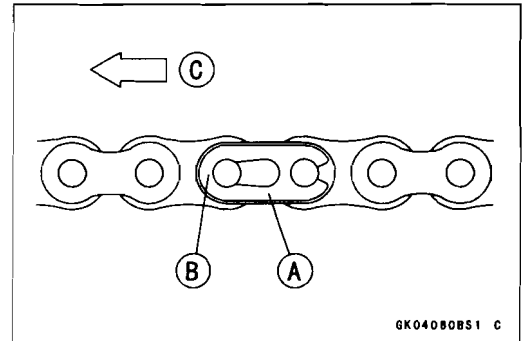
## Drive Chain

### Drive Chain Installation

- Fit the drive chain back onto the sprockets with the ends at the rear sprocket.
- Install the master link [A] and O-rings [B] from the inside.
- Install the O-rings [C], then link plate [D] with the mark facing out.
- Install the clip [E].



- Install the clip [A] so that the closed end of the "U" [B] pointed in the direction of chain rotation [C].
- Adjust the drive chain slack (see Drive Chain Slack Adjustment in the Periodic Maintenance chapter).

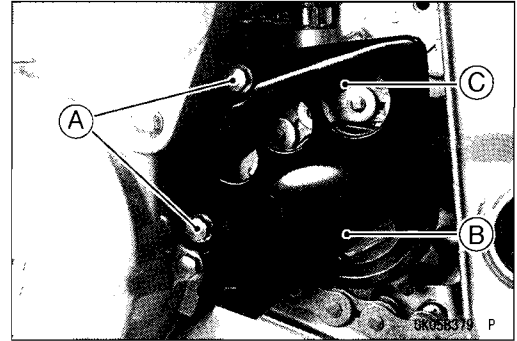


## 11-8 FINAL DRIVE

### Sprocket

#### Engine Sprocket Removal

- Remove:
  - Engine Sprocket Cover Bolts [A]
  - Engine Sprocket Cover [B]
  - Chain Guide [C]

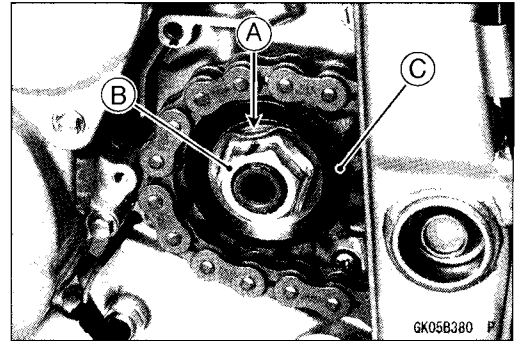


- Flatten out the bended washer [A].
- Remove:
  - Engine Sprocket Nut [B]
  - Washer

#### NOTE

○When loosening the engine sprocket nut, hold the rear brake on.

- Slack off the drive chain fully.
- Remove the engine sprocket [C].



#### Engine Sprocket Installation

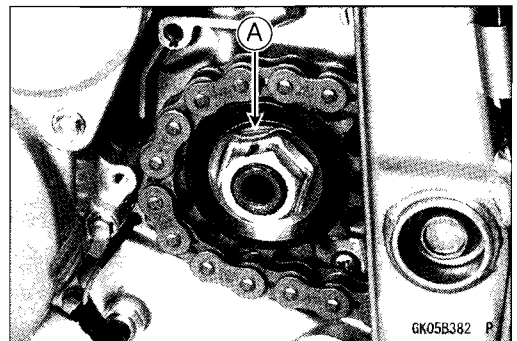
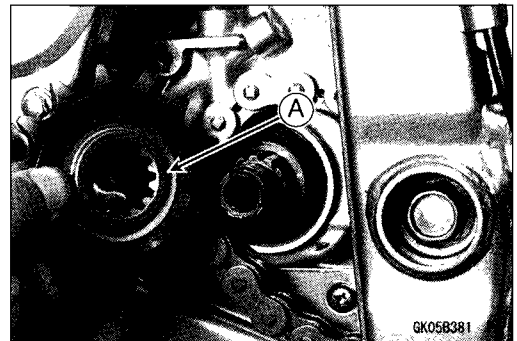
- Replace the sprocket washer with a new one.
- Install the engine sprocket so that stepped side [A] faces inside.
- Apply molybdenum disulfide oil solution to the threads of the output shaft and seating surface of the engine sprocket nut.
- Tighten:

**Torque - Engine Sprocket Nut:** 125 N·m (12.7 kgf·m, 92.2 ft·lb)

#### NOTE

○Tighten the engine sprocket nut while applying the rear brake.

- After tightening the engine sprocket nut, bend [A] the one side of the washer over the nut.

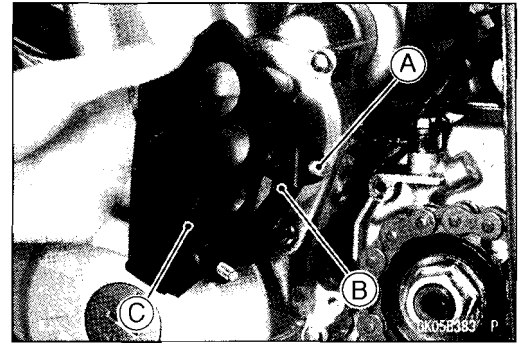


## Sprocket

- Apply a non-permanent locking agent to the threads of the engine sprocket cover mounting bolt (upper) [A].
- Install the chain guide [B] and engine sprocket cover [C].

**Torque - Engine Sprocket Cover Mounting Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)**

- Adjust the drive chain slack (see Drive Chain Slack Adjustment in the Periodic Maintenance chapter).

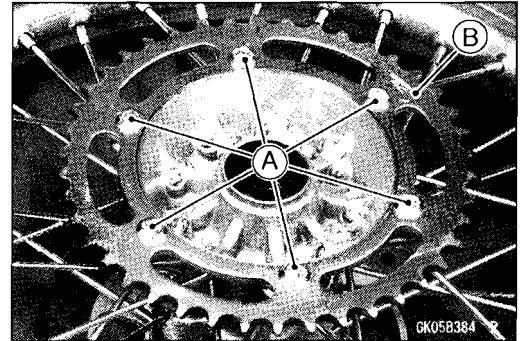


### Rear Sprocket Removal

- 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 or warp the disc. Place wooden blocks under the wheel so that the disc does not touch the ground.**



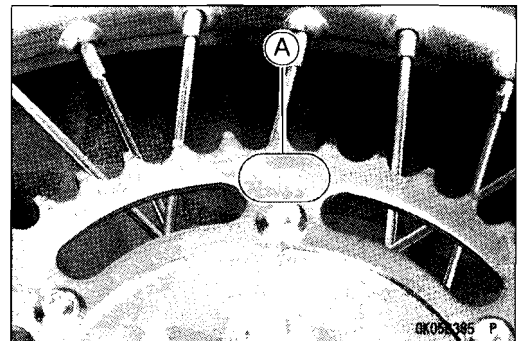
- Remove:
  - Rear Sprocket Bolts [A] and Nuts
  - Rear Sprocket [B]

### Rear Sprocket Installation

- Install the sprocket facing the tooth number marking [A] outward.
- Tighten:

**Torque - Rear Sprocket Nuts: 32 N·m (3.3 kgf·m, 24 ft·lb)**

- Install the rear wheel (see Rear Wheel Installation in the Wheels/Tires chapter).



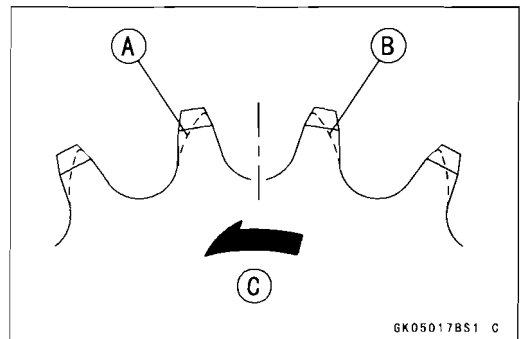
### Sprocket Wear Inspection

- Visually inspect the engine and rear sprocket teeth for wear and damage.
- ★ If the teeth are worn as illustrated, replace the sprocket, and inspect the drive chain wear (see Drive Chain Wear Inspection in the Periodic Maintenance chapter).

Worn Tooth (Engine Sprocket) [A]

Worn Tooth (Rear Sprocket) [B]

Direction of Rotation [C]



#### NOTE

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

## 11-10 FINAL DRIVE

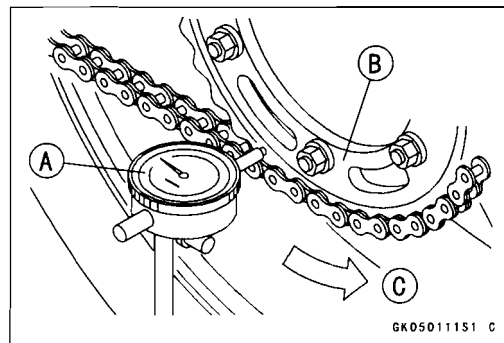
### Sprocket

#### ***Rear Sprocket Warp Inspection***

- Raise the rear wheel off the ground with jack so that it will turn freely.

**Special Tool - Jack: 57001-1238**

- Set a dial gauge [A] against the rear sprocket [B] near the teeth as shown, and rotate [C] the rear wheel to measure the sprocket runout (warp). The difference between the highest and lowest dial gauge readings is the amount of runout (warp).



#### **Rear Sprocket Warp**

**Standard: 0.4 mm (0.016 in.) or less**

**Service Limit: 0.5 mm (0.02 in.)**

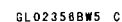
- ★ If the runout exceeds the service limit, replace the rear sprocket.

# Brakes

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## Exploded View



**Exploded View**

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Front Brake Light Switch Mounting Screw	1.2	0.12	11 in·lb	
2	Front Master Cylinder Reservoir Cap Screws	1.5	0.15	13 in·lb	
3	Brake Lever Pivot Bolt	5.9	0.60	52 in·lb	Si
4	Brake Lever Pivot Bolt Locknut	5.9	0.60	52 in·lb	
5	Caliper Bleed Valve	7.8	0.80	69 in·lb	
6	Front Master Cylinder Clamp Bolts	8.8	0.90	78 in·lb	S
7	Front Caliper Brake Pad Pins	17	1.7	12	
8	Front Caliper Holder Shaft	17	1.7	12	Si
9	Front Brake Disc Mounting Bolts	23	2.3	17	L
10	Front Caliper Mounting Bolts	25	2.5	18	
11	Brake Hose Banjo Bolts	25	2.5	18	

12. KLX250T

13. KLX250W

B: Apply brake fluid.

L: Apply a non-permanent locking agent.

R: Replacement Parts

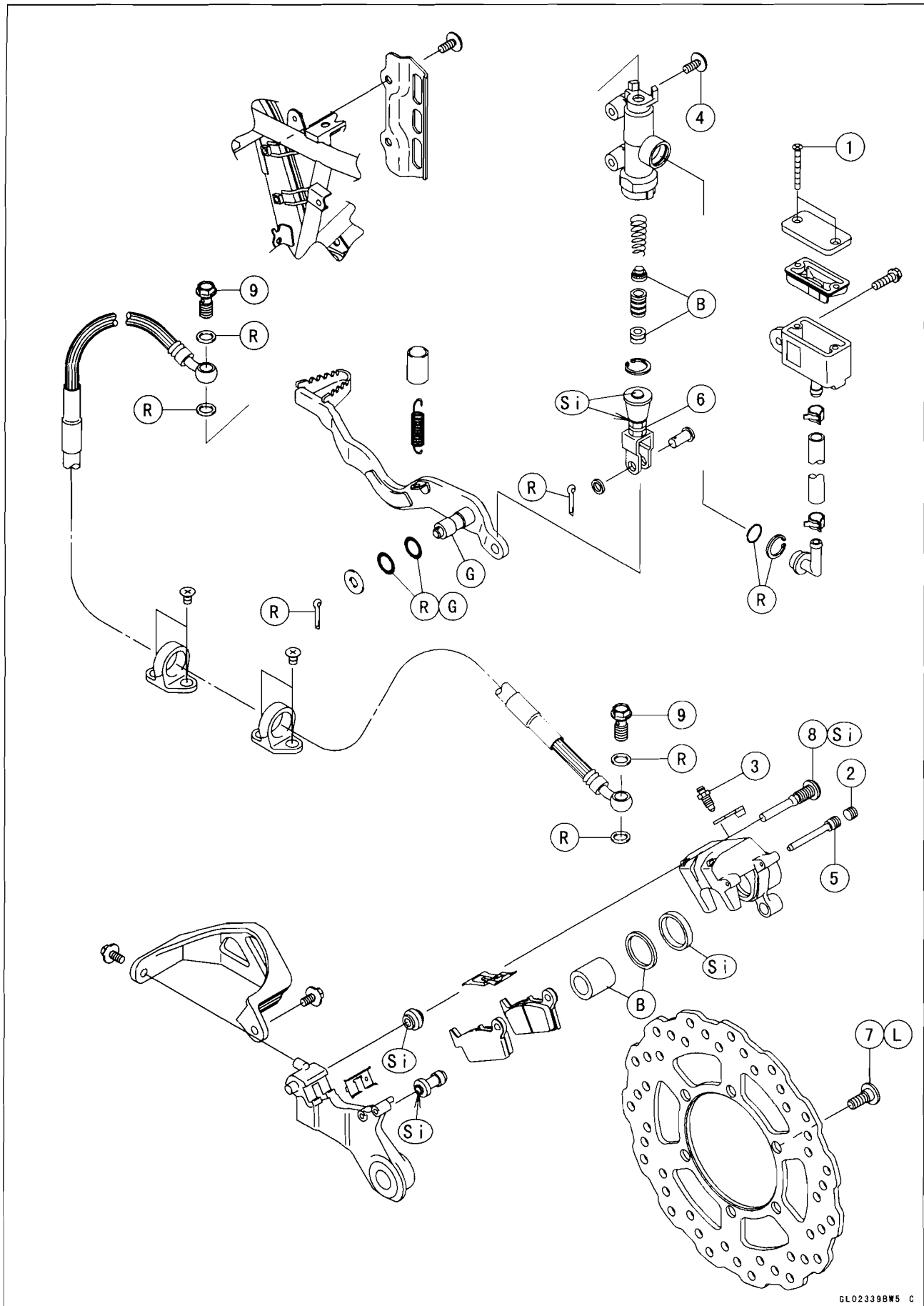
S: Follow the specified tightening sequence.

Si: Apply silicone grease (ex. PBC grease).



## 12-4 BRAKES

### Exploded View



GL02339BW5 C

**Exploded View**

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Rear Master Cylinder Reservoir Cap Screws	1.5	0.15	13 in·lb	
2	Brake Pad Pin Cap	2.5	0.25	22 in·lb	
3	Caliper Bleed Valve	7.8	0.80	69 in·lb	
4	Rear Master Cylinder Mounting Screws	7.8	0.80	69 in·lb	
5	Rear Caliper Brake Pad Pin	17	1.7	12	
6	Rear Master Cylinder Push Rod Locknut	17	1.7	12	
7	Rear Brake Disc Mounting Bolts	23	2.3	17	L
8	Rear Caliper Mounting Bolt	27	2.8	20	Si
9	Brake Hose Banjo Bolts	25	2.5	18	

B: Apply brake fluid.

G: Apply grease.

L: Apply a non-permanent locking agent.

R: Replacement Parts

Si: Apply silicone grease (ex. PBC grease).

## 12-6 BRAKES

### Specifications

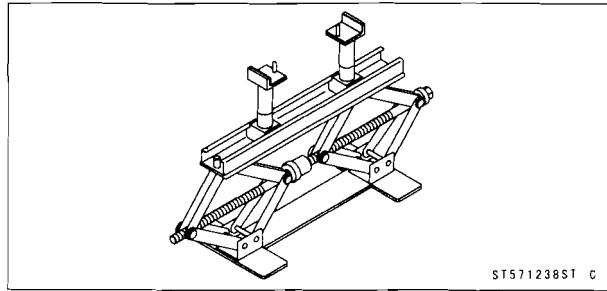
Fastener	Standard	Service Limit
<b>Brake Lever, Brake Pedal</b>		
Brake Lever Free Play	Non-adjustable	— — —
Pedal Free Play	Non-adjustable	— — —
Pedal Position	About 0.7 mm (0.03 in.) above top of footpeg	— — —
<b>Brake fluid</b>		
Grade	DOT3 or DOT4	— — —
<b>Brake Pads</b>		
Pad Lining Thickness:		— — —
Front	4.5 mm (0.18 in.)	1 mm (0.04 in.)
Rear	6.4 mm (0.25 in.)	1 mm (0.04 in.)
<b>Brake Disc</b>		
Thickness:		— — —
Front:		
KLX250T	3.35 ~ 3.65 mm (0.132 ~ 0.144 in.)	2.8 mm (0.11 in.)
KLX250W	3.8 ~ 4.2 mm (0.15 ~ 0.17 in.)	3.5 mm (0.14 in.)
Rear	4.30 ~ 4.70 mm (0.169 ~ 0.185 in.)	3.8 mm (0.15 in.)
Runout	TIR 0.12 mm (0.0047 in.) or less	TIR 0.3 mm (0.01 in.)

---

**Special Tool**

---

**Jack:**  
**57001-1238**



## 12-8 BRAKES

### Brake Pedal

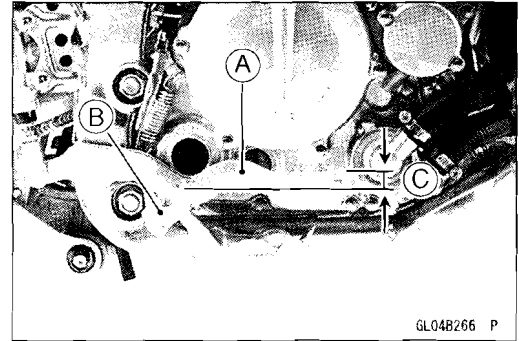
#### Brake Pedal Position Inspection

- Check that the brake pedal [A] is in the correct position.  
Footpeg [B]

##### Pedal Position

Standard: About 0.7 mm (0.03 in.) [C] above top of footpeg

- ★ If it is incorrect, adjust the brake pedal position.



#### Brake Pedal Position Adjustment

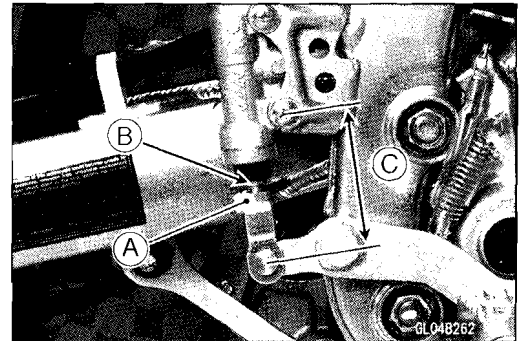
##### NOTE

○ Usually it is not necessary to adjust the pedal position, but always adjust it when the push rod locknut has been loosened.

- Loosen the locknut [A] and turn the push rod with the hex head [B] to achieve the correct pedal position.
- ★ If the length [C] shown is  $75 \pm 1$  mm ( $3.0 \pm 0.04$  in.), the pedal position will be within the standard range.
- Tighten:

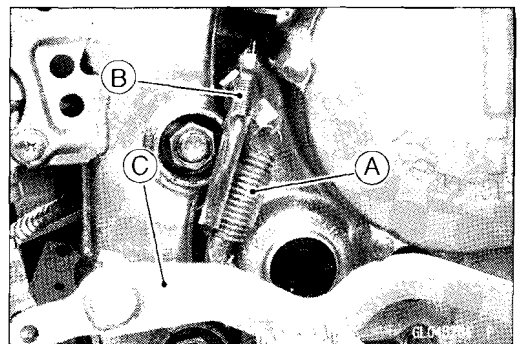
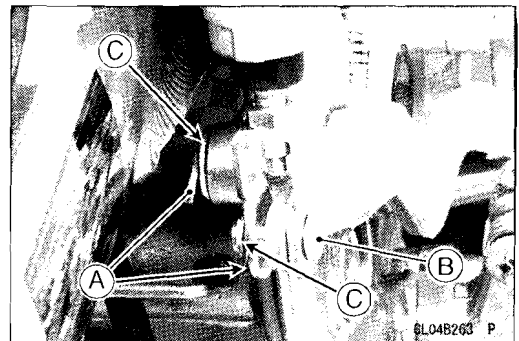
Torque - Rear Master Cylinder Push Rod Locknut: 17 N·m  
(1.7 kgf·m, 12 ft·lb)

- Check the brake light switch operation (see Brake Light Switch Operation Inspection in the Periodic Maintenance chapter).



#### Brake Pedal Removal

- Remove:
  - Cotter Pins [A]
  - Joint Pin [B]
  - Washers [C]
- Remove:
  - Brake Pedal Return Spring [A]
  - Brake Light Switch Spring [B]
  - Brake Pedal [C]



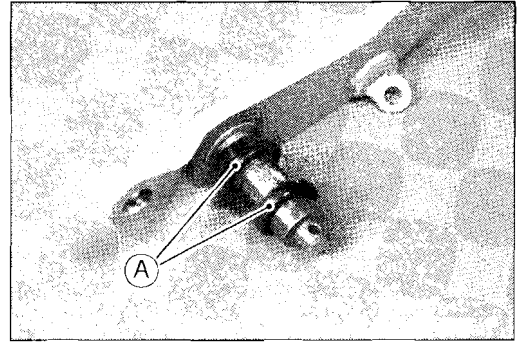
---

## Brake Pedal

---

### **Brake Pedal Installation**

- Replace O-rings [A] with new ones, and apply grease to the O-rings.
- Apply grease to the shaft portion of the brake pedal.
- Install the brake pedal onto the frame with the return spring and brake light switch spring.
- Replace the cotter pins of the brake pedal pivot and rear master cylinder joint pin with new ones.
- Insert washer and cotter pin into the shaft portion of the brake pedal, and bend cotter pin end.
- Insert a cotter pin into the joint pin, and bend its end.
- Adjust the brake pedal position (see Brake Pedal Position Adjustment).
- Check the brake light switch operation and (see Brake Light Switch Operation Inspection in the Periodic Maintenance chapter).

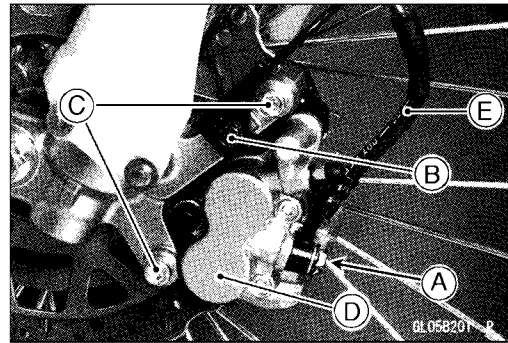


## 12-10 BRAKES

### Calipers

#### Front Caliper Removal

- Loosen the banjo bolt [A] at the brake hose lower end, and tighten it loosely.
- Unscrew the brake hose clamp bolt [B].
- Unscrew the caliper mounting bolts [C], and detach the caliper [D] from the disc.
- Unscrew the banjo bolt and remove the brake hose [E] from the caliper (see Brake Hose and Pipe Replacement in the Periodic Maintenance chapter).



#### CAUTION

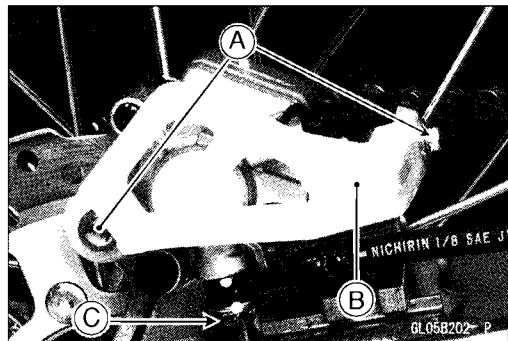
Immediately wash away any brake fluid that spills.

#### NOTE

○If the caliper is to be disassembled after removal and if compressed air is not available, disassemble the caliper before the brake hose is removed (see Caliper Rubber Parts Replacement in the Periodic Maintenance chapter).

#### Rear Caliper Removal

- Remove:
  - Rear Caliper Guard Bolts [A]
  - Rear Caliper Guard [B]
  - Rear Wheel (see Rear Wheel Removal in the Wheels/Tires chapter)
- Loosen the banjo bolt [C] at the brake hose lower end, and tighten it loosely.
- Unscrew the banjo bolt [A] and remove the brake hose [B] from the caliper.
- Remove the rear caliper [C] together with the caliper bracket [D].

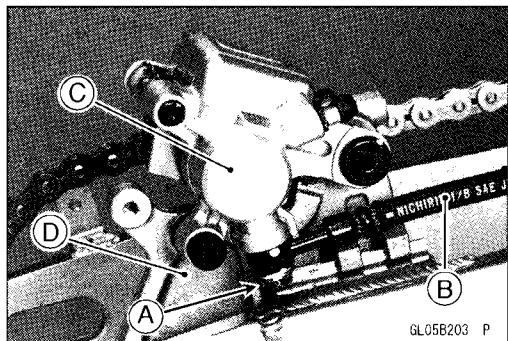


#### CAUTION

Immediately wash away any brake fluid that spills.

#### NOTE

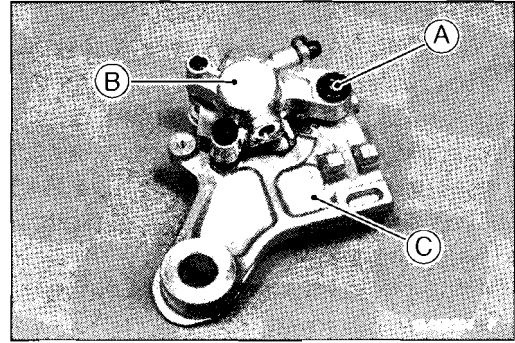
○If the caliper is to be disassembled after removal and if compressed air is not available, disassemble the caliper before the brake hose is removed (see Caliper Rubber Parts Replacement in the Periodic Maintenance chapter).





## Calipers

- Remove the caliper mounting bolt [A] to separate the caliper [B] and caliper bracket [C].



### Caliper Installation

- Install the caliper and brake hose lower end.
- Replace the washers on each side of hose fitting with new ones.
- Apply silicone grease to the rear caliper mounting bolt.
- Tighten:

#### Torque - Caliper Mounting Bolts

Front: 25 N·m (2.5 kgf·m, 18 ft·lb)

Rear: 27 N·m (2.8 kgf·m, 20 ft·lb)

Brake Hose Banjo Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)

- Install the removed parts.
- Bleed the brake line (see Brake Line Bleeding).
- Check the brake for good braking power, no brake drag, and no fluid leakage.

### **⚠ 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 brakes will not function on the first application of the lever or pedal if this is not done.

### Front Caliper Disassembly

- Refer to the Caliper Rubber Parts Replacement in the Periodic Maintenance chapter.

### Front Caliper Assembly

- Refer to the Caliper Rubber Parts Replacement in the Periodic Maintenance chapter.

### Rear Caliper Disassembly

- Refer to the Caliper Rubber Parts Replacement in the Periodic Maintenance chapter.

### Rear Caliper Assembly

- Refer to the Caliper Rubber Parts Replacement in the Periodic Maintenance chapter.

## 12-12 BRAKES

### Calipers

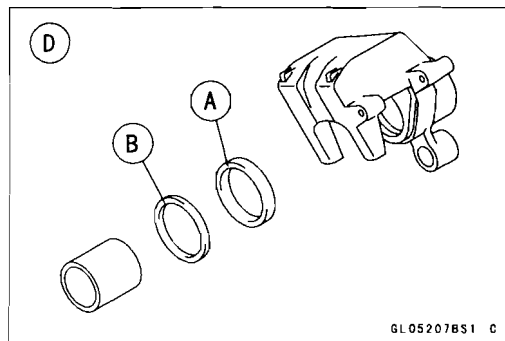
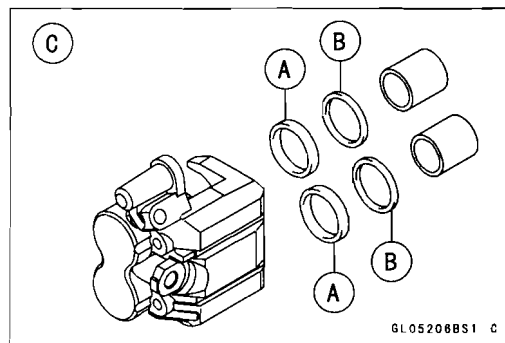
#### Caliper Fluid Seal Damage

The fluid seal (piston seal) [A] is placed around the piston to maintain clearance between the pad and the disc. If the seal is in a poor condition, it could lead the pad to wear excessively or the brake to drag, which may cause the temperature of the discs or the brake fluid to increase.

- Replace the fluid seal if it exhibits any of the conditions listed below.
  - Brake fluid leakage around the pad.
  - Brakes overheat.
  - Considerable difference in inner and outer pad wear.
  - Seal and piston are stuck together.
- ★ If the fluid seal is replaced, replace the dust seal [B] as well. Also, replace all seals every other time the pads are changed.

Front Caliper [C]

Rear Caliper [D]

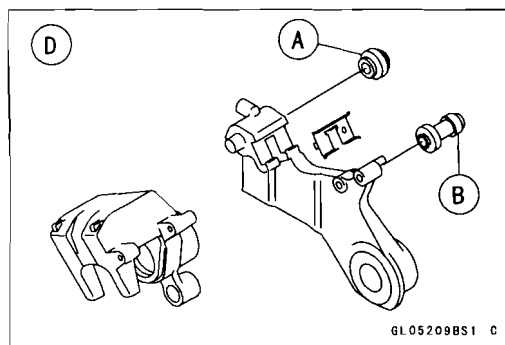
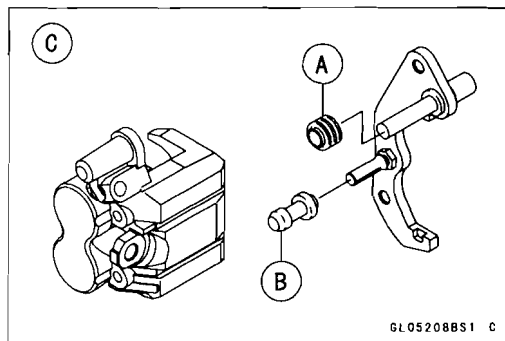


#### Caliper Dust Boot and Friction Boot Damage

- Check that the dust boot [A] and friction boot [B] are not cracked, worn, swollen, or otherwise damaged.
- ★ If they show any damage, replace it.

Front Caliper [C]

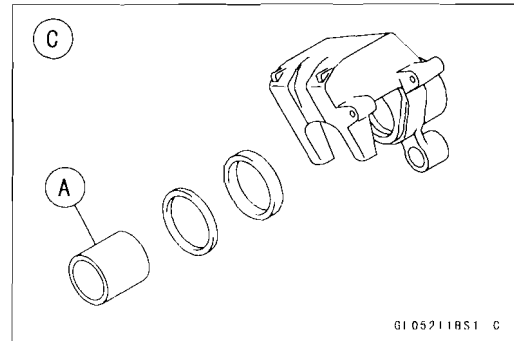
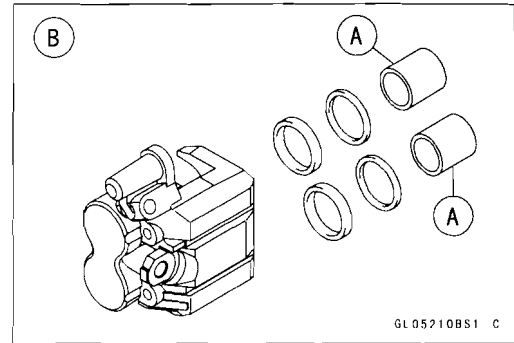
Rear Caliper [D]



## Calipers

### Caliper Piston and Cylinder Damage

- Visually inspect the pistons [A] and cylinder surfaces.
- ★ Replace the caliper if the cylinder and piston are badly scores or rusty.
  - Front Caliper [B]
  - Rear Caliper [C]



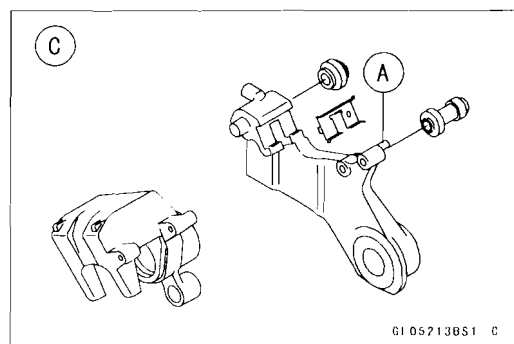
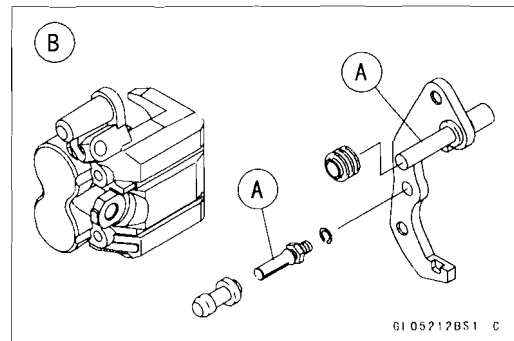
### Caliper Holder Shaft Wear

The caliper body must slide smoothly on the caliper holder shafts [A]. 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 that the caliper holder shafts are not badly worn or stepped, and that the rubber friction boots are not damaged.
- ★ If the rubber friction boot is damaged, replace the rubber friction boot. To replace the friction boot, remove the pads and the caliper bracket.
- ★ If the caliper holder shaft is damaged, replace the caliper bracket or holder shaft (front caliper).

**Torque - Front Caliper Holder Shaft: 17 N·m (1.7 kgf·m, 12 ft·lb)**

Front Caliper [B]  
Rear Caliper [C]

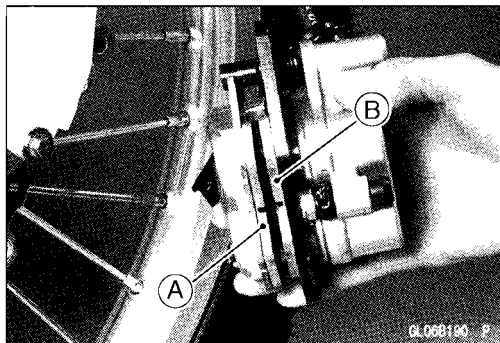
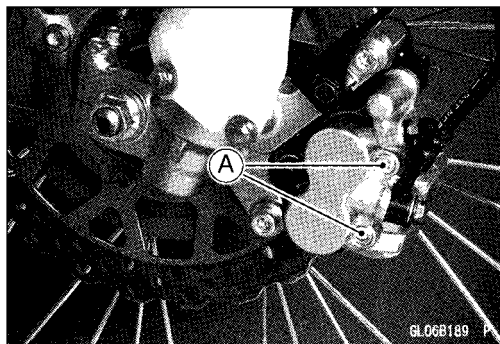


## 12-14 BRAKES

### Brake Pads

#### Front Brake Pad Removal

- Loosen the pad pins [A].
- Remove the front caliper with the brake hose installed (see Front Caliper Removal).
- Remove the pad pins.
- Remove the pad [A] of the jaw side.
- Remove the pad [B] on the piston side.



#### Front Brake Pad Installation

- Push the caliper pistons in by hand as far as they will go.
- Install the anti-rattle spring in its correct position.
- Install the pad on the piston side first, then install the other pad.
- Tighten the brake pad pins temporary.
- Install the front brake caliper (see Front Brake Caliper Installation).
- Tighten:

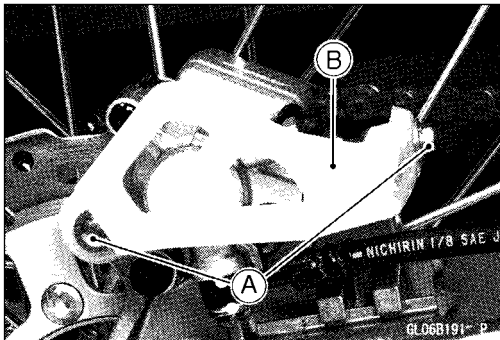
**Torque - Front Caliper Brake Pad Pins: 17 N·m (1.7 kgf·m, 12 ft·lb)**

#### **⚠ 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.**

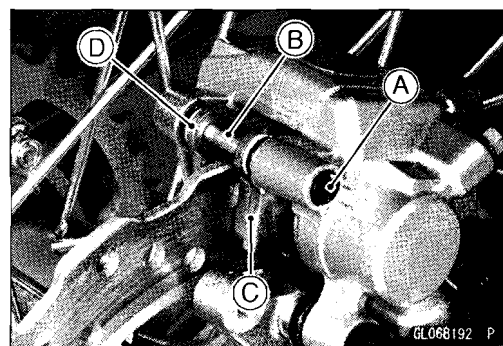
#### Rear Brake Pad Removal

- Remove:
  - Rear Caliper Guard Bolts [A]
  - Rear Caliper Guard [B]



## Brake Pads

- Remove:
  - Plug [A]
  - Pad Pin [B]
  - Piston Side Pad [C]
  - Jaw Side Pad [D]



### Rear Brake Pad Installation

- Push the caliper piston in by hand as far as it will go.
- Install the anti-rattle spring in its correct position.
- Install the pad on the piston side first, then install the other pad.
- Tighten the brake pad pins temporary.
- Install the rear brake caliper (see Rear Brake Caliper Installation).
- Tighten:

Torque - Rear Caliper Brake Pad Pins: 17 N·m (1.7 kgf·m, 12 ft·lb)

### 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.

### Brake Pad Wear Inspection

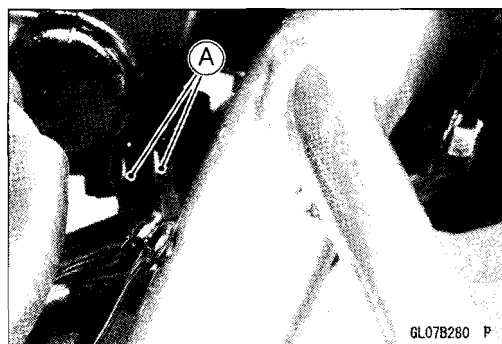
- Refer to the Brake Pad Wear Inspection in the Periodic Maintenance chapter.

## 12-16 BRAKES

### Master Cylinder

#### Front Master Cylinder Removal

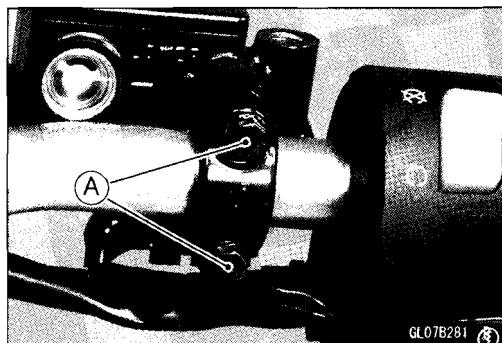
- Disconnect the brake hose from the master cylinder (see Brake Hose Replacement in the Periodic Maintenance chapter).
- Disconnect the front brake light switch connectors [A].



- Unscrew the clamp bolts [A], and take off the master cylinder as an assembly with the reservoir, brake lever and brake switch installed.

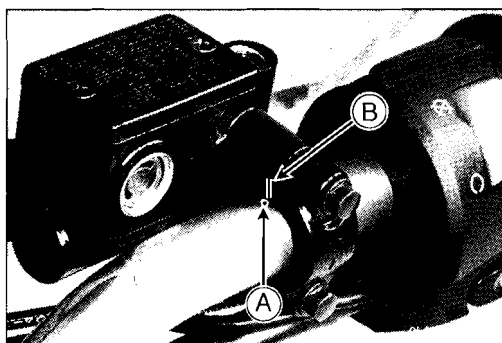
#### CAUTION

Immediately wash away any brake fluid that spills.



#### Front Master Cylinder Installation

- Install the front master cylinder so that the punch mark [A] of the handlebar is aligned with the mating surface [B] of the master cylinder clamp to level the reservoir.



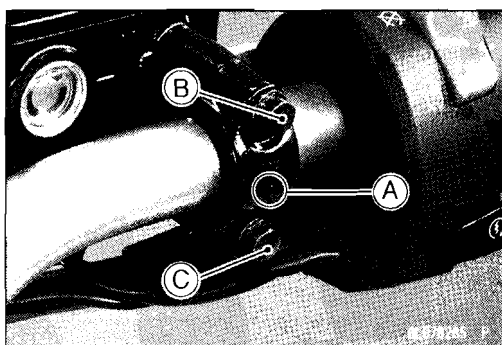
- The master cylinder clamp must be installed with the arrow mark [A] upward.
- Tighten the upper clamp bolt [B] first, and then the lower clamp bolt [C].
- There will be a gap at the lower part of the clamp after tightening.

**Torque - Front Master Cylinder Clamp Bolts:** 8.8 N·m (0.90 kgf·m, 78 in·lb)

- Replace the washers on each side of the hose fitting with new ones.
- Tighten:

**Torque - Brake Hose Banjo Bolt:** 25 N·m (2.5 kgf·m, 18 ft·lb)

- Bleed the brake line (see Brake Line Bleeding).
- Check the brake for good braking power, no brake drag, and no fluid leakage.

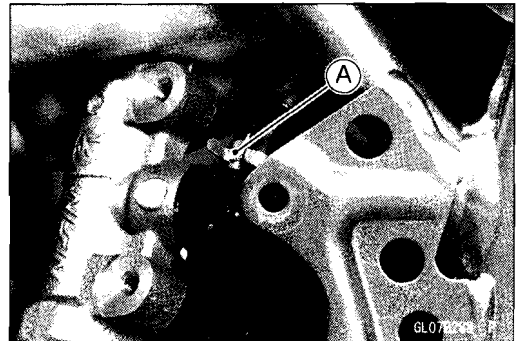
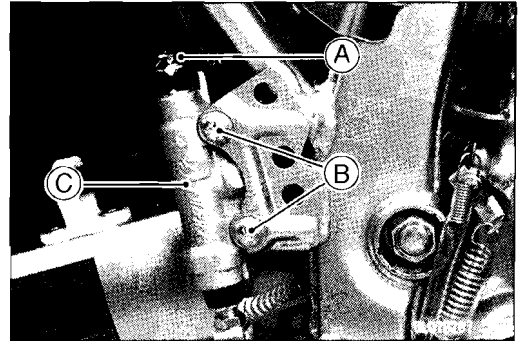
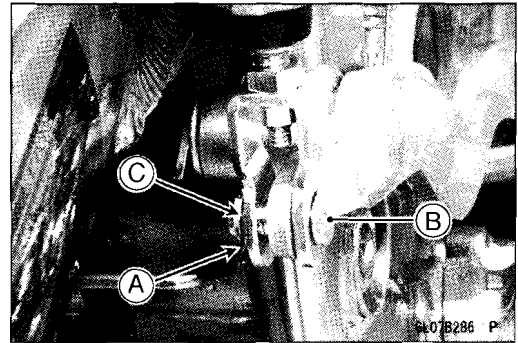




## Master Cylinder

### Rear Master Cylinder Removal

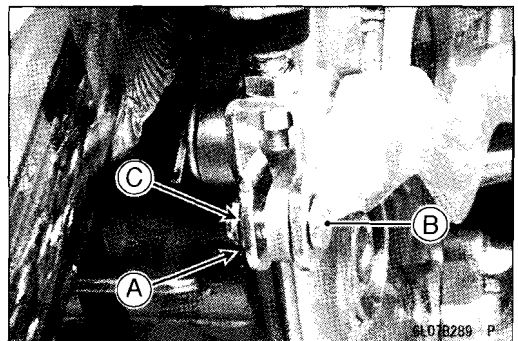
- Remove:
  - Cotter Pin [A]
  - Joint Pin [B]
  - Washer [C]
- Unscrew the brake hose banjo bolt [A] on the master cylinder (see Brake Hose and Pipe Replacement in the Periodic Maintenance chapter).
- Remove:
  - Rear Master Cylinder Mounting Screws [B]
  - Rear Master Cylinder [C]
- Slide the reservoir hose lower end clamp [A].
- Pull off the reservoir hose lower end, and drain the brake fluid into a container.



### Rear Master Cylinder Installation

- Replace the washers on each side of hose fitting with new ones.
- Tighten:
  - Torque - Rear Master Cylinder Mounting Screws: 7.8 N·m (0.80 kgf·m, 69 in·lb)**
  - Brake Hose Banjo Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)**

- Replace the cotter pin [A] with a new one.
- Install the joint pin [B] and washer [C].
- Insert the cotter pin and bend the pin ends.
- Bleed the brake line (see Brake Line Bleeding).
- Check the brake for good braking power, no brake drag, and no fluid leakage.



### Front Master Cylinder Disassembly

- Refer to the Master Cylinder Rubber Parts Replacement in the Periodic Maintenance chapter.

### Rear Master Cylinder Disassembly

- Refer to the Master Cylinder Rubber Parts Replacement



## 12-18 BRAKES

### Master Cylinder

#### Master Cylinder Assembly

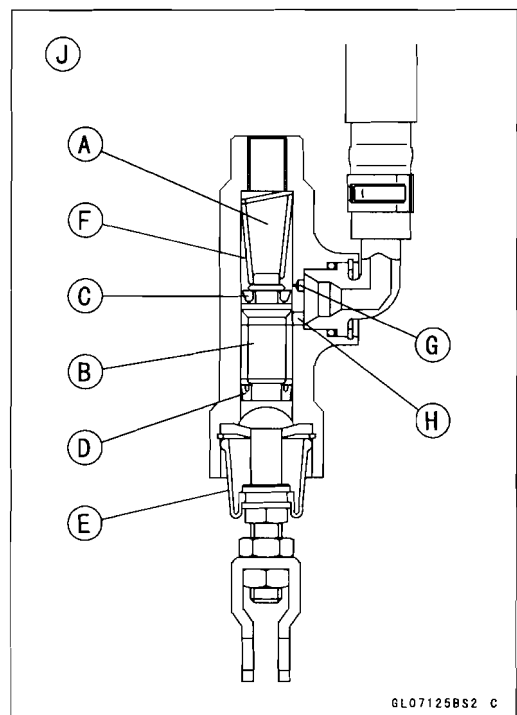
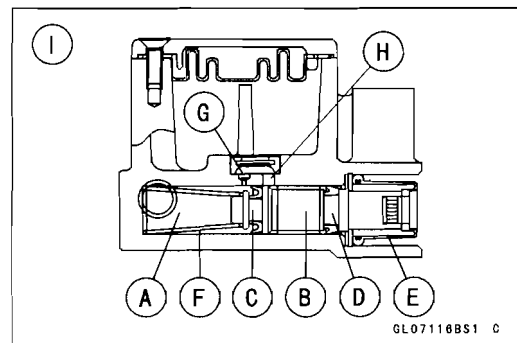
- Refer to the Master Cylinder Rubber Parts Replacement in the Periodic Maintenance chapter.

#### Master Cylinder Inspection

- Remove the master cylinders (see Front/Rear Master Cylinder Removal).
- Disassemble the front and rear master cylinders.
- Check that there are no scratches, rust or pitting on the inner wall [A] of each master cylinder and on the outside of each piston [B].
- ★ If a master cylinder or piston shows any damage, replace them.
- Inspect the primary cup [C] and secondary cup [D].
- ★ If a cup is worn, damaged softened (rotted), or swollen, the piston assembly should be replaced to renew the cups.
- ★ If fluid leakage is noted at the brake lever, the piston assembly should be replaced to renew the cups.
- Check the dust covers [E] for damage.
- ★ If they are damaged, replace them.
- Check the piston return springs [F] for any damage.
- ★ If the springs are damaged, replace them.
- Check that relief port [G] and supply port [H] are not plugged.
- ★ If the relief port becomes plugged, the brake pads will drag on the disc. Blow the ports clean with compressed air.

Front Master Cylinder [I]

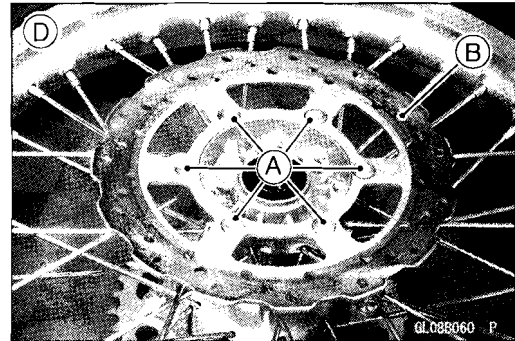
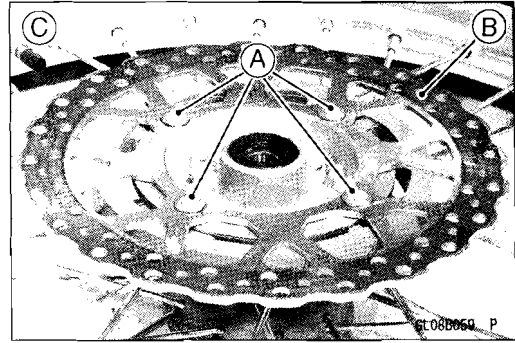
Rear Master Cylinder [J]



## Brake Disc

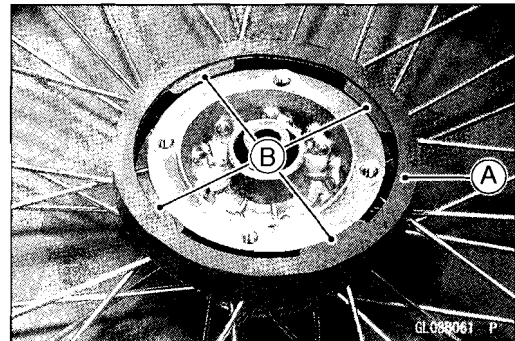
### Brake Disc Removal

- Remove the wheel (see Front/Rear Wheel Removal in the Wheels/Tires chapter).
- Unscrew the mounting bolts [A], and take off the disc [B].  
[C] Front  
[D] Rear



### Brake Disc Installation

- Before front brake disc installation, install the damper [A] to the hub so that the projections [B] contact the hub flange.



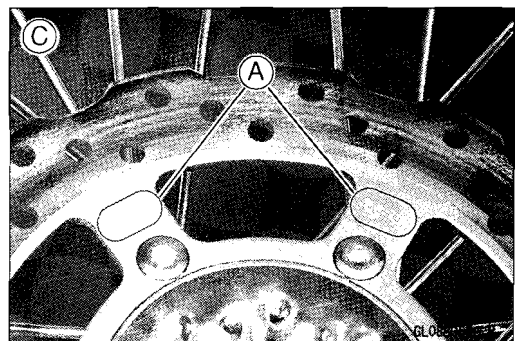
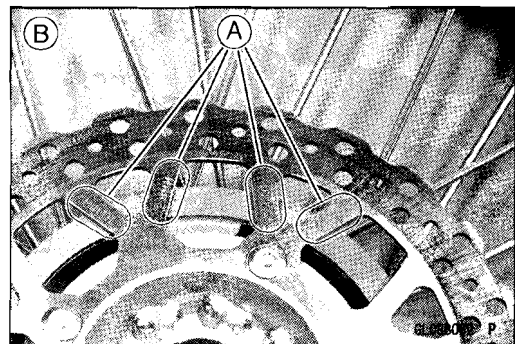
- Install the brake disc on the wheel so that the marked side [A] faces out.

[B] Front

[C] Rear

- Tighten:

**Torque - Brake Disc Mounting Bolts:** 23 N·m (2.3 kgf·m, 17 ft·lb)



## 12-20 BRAKES

### Brake Disc

#### Brake Disc Wear

- Measure the thickness of each disc [A] at the point where it has worn the most.
  - ★ If the disc has worn past the service limit, replace it.
- Measuring Area [B]

#### Brake Discs Thickness

##### Standard:

##### Front:

KLX250T 3.35 ~ 3.65 mm (0.132 ~ 0.144 in.)

KLX250W 3.8 ~ 4.2 mm (0.15 ~ 0.17 in.)

Rear 4.30 ~ 4.70 mm (0.169 ~ 0.185 in.)

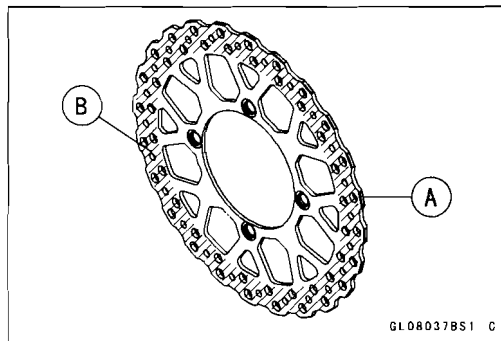
##### Service Limit:

##### Front:

KLX250T 2.8 mm (0.11 in.)

KLX250W 3.5 mm (0.14 in.)

Rear 3.8 mm (0.15 in.)

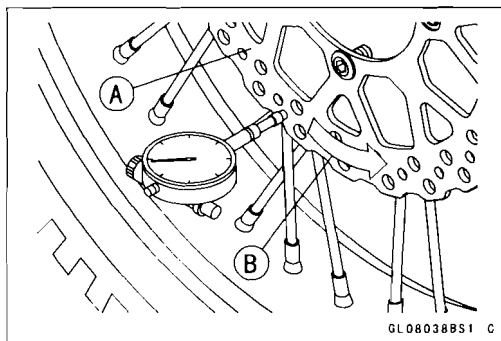


#### Brake Disc Warp

- Raise the wheel off the ground with jack (see Front/Rear Wheel Removal in the Wheels/Tires chapter).

#### Special Tools - Jack: 57001-1238

- For front disc inspection, turn the handlebar fully to one side.
- Set up a dial gauge against the disc [A] as shown and measure disc runout, while turning [B] the wheel by hand.
- ★ If runout exceeds the service limit, replace the disc.



#### Disc Runout

Standard: TIR 0.12 mm (0.0047 in.) or less

Service Limit: TIR 0.3 mm (0.01 in.)

## Brake Fluid

### Brake Fluid Level Inspection

- Refer to the Brake Fluid Level Inspection in the Periodic Maintenance chapter.

### Brake Fluid Change

- Refer to the Brake Fluid Change in the Periodic Maintenance chapter.

### Brake Line Bleeding

The brake fluid has a very low compression coefficient so that almost all the movement of the brake lever or pedal is transmitted directly to the caliper for braking action. Air, however, is easily compressed. When air enters the brake lines, brake lever or pedal movement will be partially used in compressing the air. This will make the lever or pedal feel spongy, and there will be a loss in braking power.

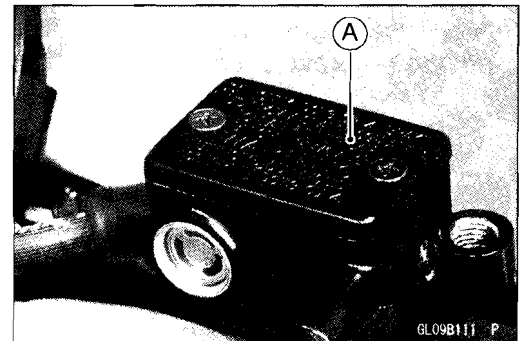
#### **⚠ WARNING**

**Be sure to bleed the air from the brake line whenever brake lever or pedal action feels soft or spongy after the brake fluid is changed, or whenever a brake line fitting has been loosened for any reason.**

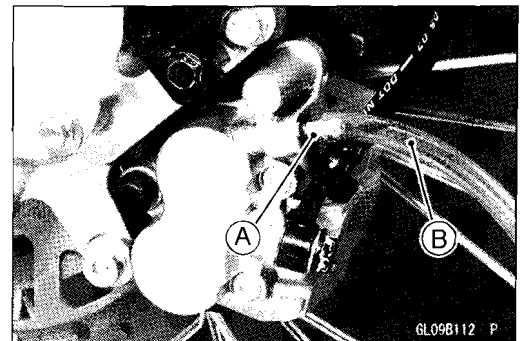
#### **NOTE**

○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 [A] and diaphragm.
- Fill the reservoir with fresh brake fluid to the upper level line in the reservoir.
- 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.



- Remove the rubber cap from the bleed valve [A] on the caliper.
- Attach a clear plastic hose [B] to the bleed valve, and run the other end of the hose into a container.



## 12-22 BRAKES

### Brake Fluid

- Bleed the brake line and the caliper.
- Repeat this operation until no more air can be seen coming out into the plastic hose.
  1. Pump the brake lever until it becomes hard, and apply the brake and hold it [A].
  2. Quickly open and close [B] the bleed valve while holding the brake applied.
  3. Release the brake [C].

#### 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 completely out any time during bleeding, the bleeding operation must be done over again from the beginning since air will have entered the line.*

○ *Tap the brake hose lightly from the caliper to the reservoir for more complete bleeding.*

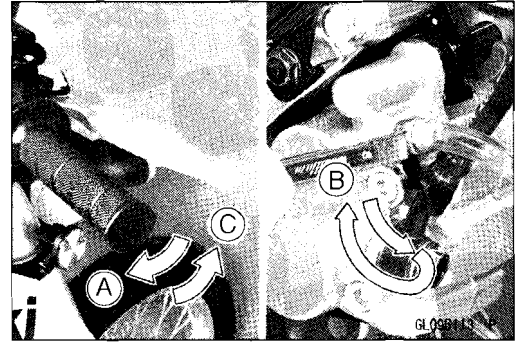
- Remove the clear plastic hose.
- Install the diaphragm and reservoir cap.
- Tighten:

**Torque - Brake Master Cylinder Reservoir Cap Screws: 1.5 N·m (0.15 kgf·m, 13 in·lb)**

- Tighten the bleed valve, and install the rubber cap.

**Torque - Caliper Bleed Valve: 7.8 N·m (0.80 kgf·m, 69 in·lb)**

- Check the fluid level (see Brake Fluid Level Inspection in the Periodic Maintenance chapter).
- After bleeding is done, check the brake for good braking power, no brake drag, and no fluid leakage.



## Brake Fluid

### WARNING

**When working with the disc brake, observe the precautions listed below.**

1. Never reuse old brake fluid.
2. Do not use fluid from a container that has been left unsealed or that has been open for a long time.
3. Do not mix two types and brands of fluid for use in the brake. This lowers the brake fluid boiling point and could cause the brake to be ineffective. It may also cause the rubber brake parts to deteriorate.
4. Don't leave the reservoir cap off for any length of time to avoid moisture contamination of the fluid.
5. Don't change the fluid in the rain or when a strong wind is blowing.
6. Except for the disc pads and disc, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol for cleaning of the brake parts. Do not use any other fluid for cleaning these parts. Gasoline, engine oil, or any other petroleum distillate will cause deterioration of the rubber parts. Oil spilled on any part will be difficult to wash off completely and will eventually deteriorate the rubber used in the disc brake.
7. When handling the disc pads or disc, be careful that no disc brake fluid or any oil gets on them. Clean off any fluid or oil that inadvertently gets on the pads or disc with a high-flash point solvent. Do not use one which will leave an oily residue. Replace the pads with new ones if they cannot be cleaned satisfactorily.
8. Brake fluid quickly ruins painted surfaces; any spilled fluid should be completely wiped up immediately.
9. If any of the brake line fittings or the bleed valve is opened at any time, the **AIR MUST BE BLED FROM THE BRAKE LINE.**

## 12-24 BRAKES

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### Brake Hose

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#### ***Brake Hose Removal/Installation***

- Refer to the Brake Hose Replacement in the Periodic Maintenance chapter.

#### ***Brake Hose Inspection***

- Refer to the Brake Hose Damage and Installation Condition Inspection in the Periodic Maintenance chapter.



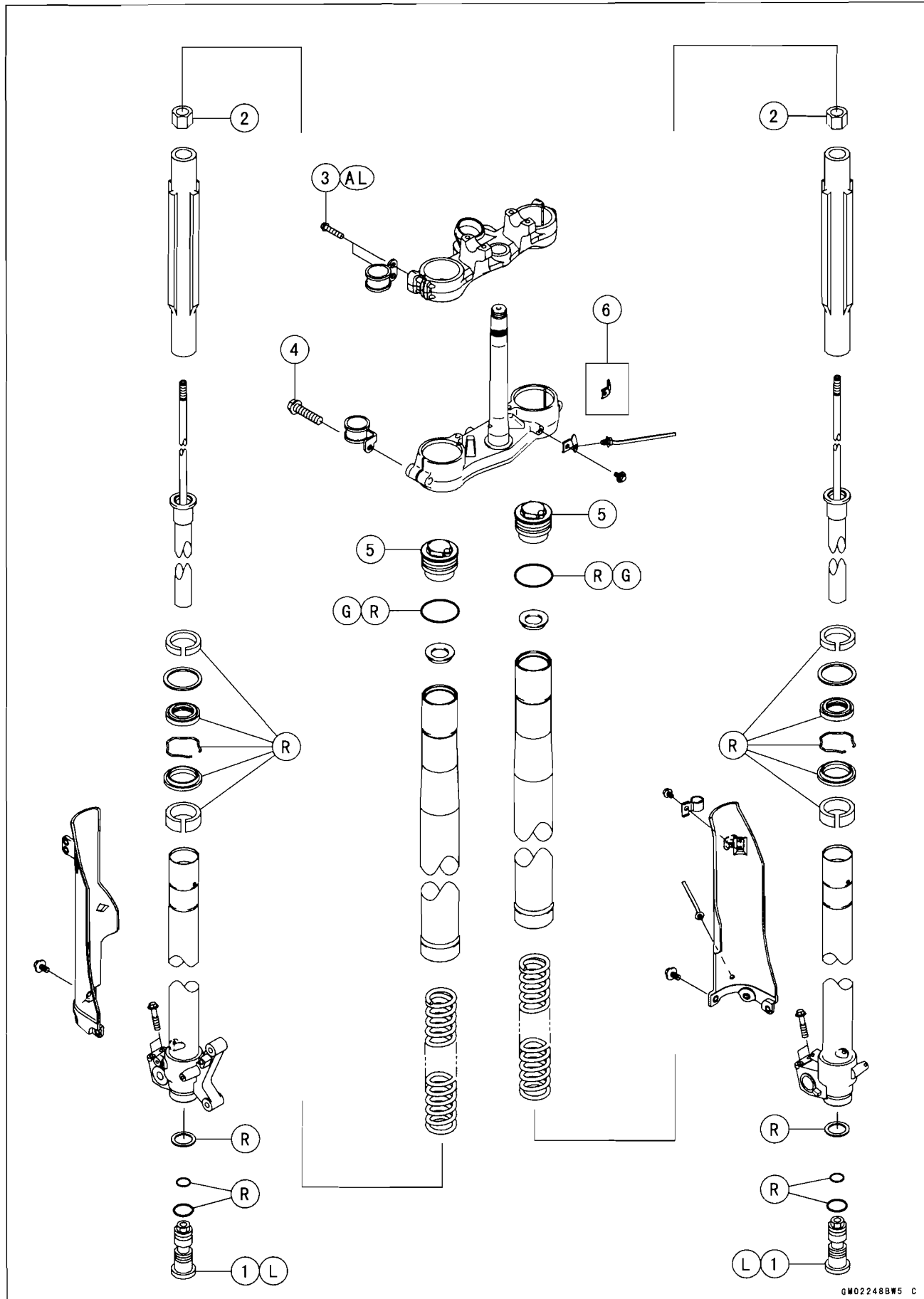
# Suspension

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## 13-2 SUSPENSION

### Exploded View



GM02248BW5 C

## Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Front Fork Cylinder Valve Assys	55	5.6	40	L
2	Piston Rod Nuts	15	1.5	11	
3	Upper Front Fork Clamp Bolts	20	2.0	15	AL
4	Lower Front Fork Clamp Bolts	25	2.5	18	
5	Front Fork Top Plugs	30	3.0	22	

6. KLX250W

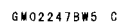
AL: Tighten the two upper front fork clamp bolts alternately two times to ensure even tightening torque.

G: Apply grease.

L: Apply a non-permanent locking agent.

R: Replacement Parts

### Exploded View



## Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Upper Rear Shock Absorber Bolt	39	4.0	29	
2	Lower Rear Shock Absorber Bolt	39	4.0	29	
3	Tie-rod Nuts	83	8.5	61	
4	Swingarm Pivot Shaft Nut	88	9.0	65	
5	Rocker Arm Pivot Shaft Nut	98	10	72	

G: Apply grease.

## 13-6 SUSPENSION

### Specifications

Fastener	Standard	Service Limit
<b>Front Fork</b>		
Air Pressure	Atmospheric Pressure (Non-adjustable)	-- --
Fork Oil:		
Viscosity:	KHL15-10 (KAYABA01) or equivalent	-- --
Amount:	Approx. 450 mL (15.2 US oz.) (when changing oil)	
KLX250T	531 ±4 mL (18.0 ±0.1 US oz.) (after disassembly and completely dry)	-- --
KLX250W	527 ±4 mL (17.8 ±0.1 US oz.) (after disassembly and completely dry)	-- --
Fork Oil Level:		
KLX250T	101 ±2 mm (3.98 ±0.08 in.) (fully compressed, without fork spring, below from the top of the inner tube)	-- --
KLX250W	104 ±2 mm (4.09 ±0.08 in.) (fully compressed, without fork spring, below from the top of the inner tube)	-- --
Compression Damper Setting (from the seated position adjuster turned fully clockwise)	12 clicks counterclockwise	(Adjustable Range) 16 clicks
Spring Free Length:		
KLX250T	412.3 mm (16.23 in.)	404 mm (15.9 in.)
KLX250W	387.3 mm (15.25 in.)	380 mm (15.0 in.)
<b>Rear Suspension (Uni-Trak):</b>		
<b>Rear Shock Absorber</b>		
Rebound Damper Setting (from the seated position adjuster turned fully clockwise):		
KLX250T	12 clicks counterclockwise	(Adjustable Range) 20 clicks
KLX250W	8 clicks counterclockwise	(Adjustable Range) 20 clicks
Spring Preload Setting (Adjusting nut position from the center of the mounting hole upper):		
KLX250T	107.5 mm (4.232 in.)	(Adjustable Range) 101 ~ 123 mm (3.98 ~ 4.84 in.)
KLX250W	119.5 mm (4.705 in.)	(Adjustable Range) 111 ~ 133 mm (4.37 ~ 4.84 in.)

**Specifications**

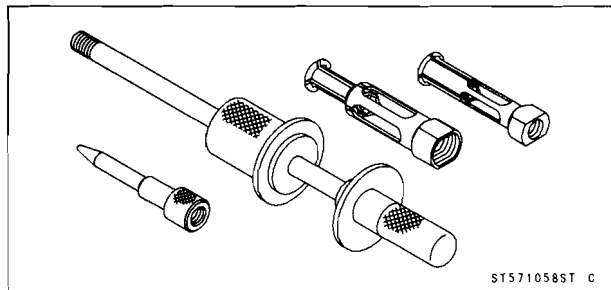
Fastener	Standard	Service Limit
<b>Gas Reservoir</b>		
Compression Damper Setting (from the seated position adjuster turned fully clockwise)	16 clicks counterclockwise	(Adjustable Range) 20 clicks
Gas Pressure	980 kPa (10 kgf/cm <sup>2</sup> , 142 psi)	— — —
<b>Tie-rod, Rocker Arm</b>		
Sleeve Outside Diameter:	24.987 ~ 25.000 mm (0.98373 ~ 0.98425 in.)	24.85 mm (0.9783 in.)
	21.987 ~ 22.000 mm (0.86563 ~ 0.86614 in.)	21.85 mm (0.8602 in.)
	15.989 ~ 16.000 mm (0.62949 ~ 0.62992 in.)	15.85 mm (0.6240 in.)
Rocker Arm Shaft Runout	TIR 0.1 mm (0.004 in.) or less	TIR 0.2 mm (0.008 in.)



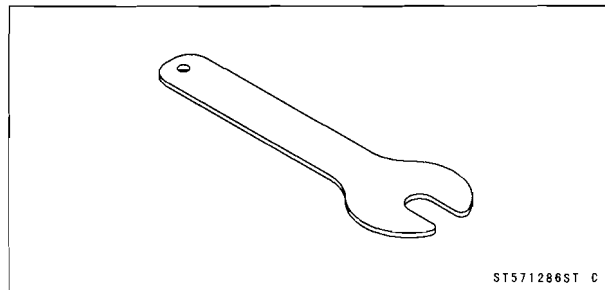
## 13-8 SUSPENSION

### Special Tools

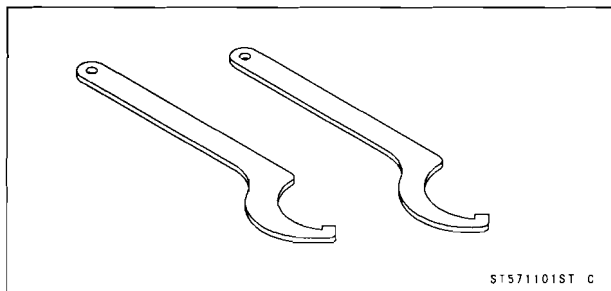
**Oil Seal & Bearing Remover:**  
57001-1058



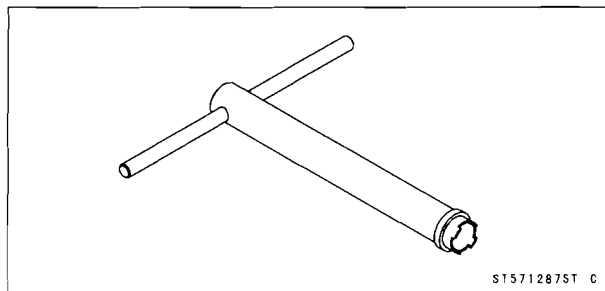
**Fork Spring Holders:**  
57001-1286



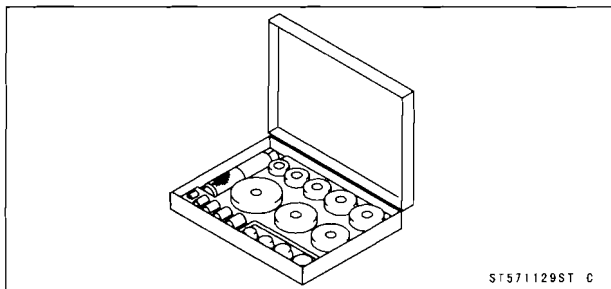
**Hook Wrench R37.5, R42:**  
57001-1101



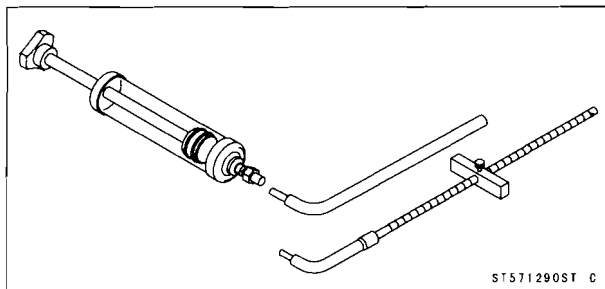
**Fork Cylinder Holder:**  
57001-1287



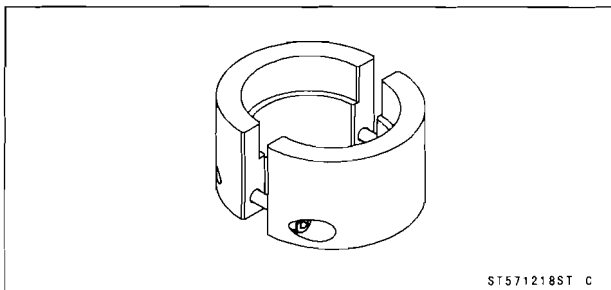
**Bearing Driver Set:**  
57001-1129



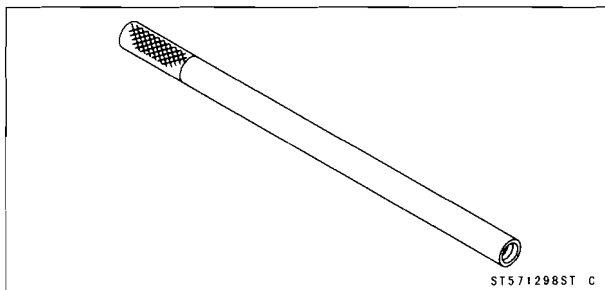
**Fork Oil Level Gauge:**  
57001-1290



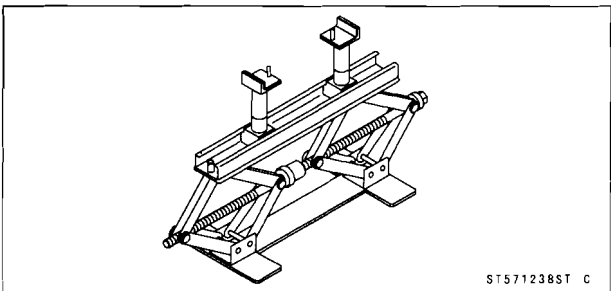
**Fork Outer Tube Weight:**  
57001-1218



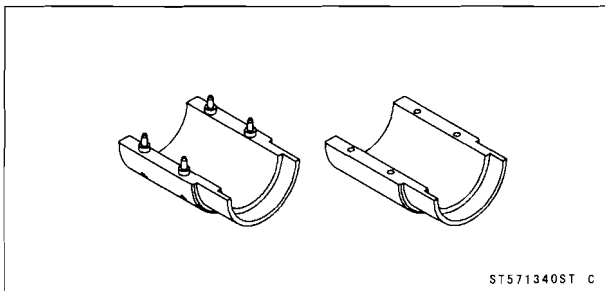
**Fork Piston Rod Puller M10 × 1.0:**  
57001-1298



**Jack:**  
57001-1238



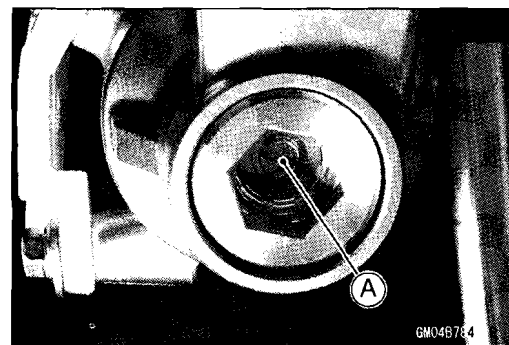
**Fork Oil Seal Driver  $\phi 43$ :**  
57001-1340



## Front Fork

### Front Fork Damping Force Adjustment

- Turn the adjuster [A] of the front fork cylinder valve with a flat head screw driver to adjust compression damping to a preference condition.



### CAUTION

The left and right fork legs must have the same shock damping.

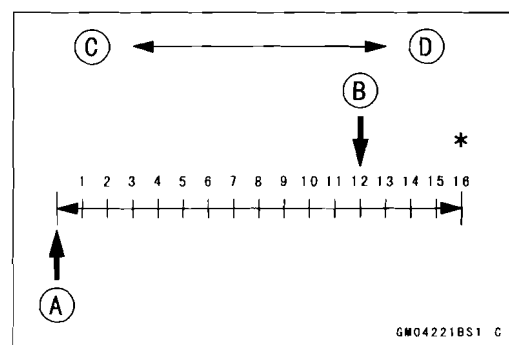
Seated positions adjuster turned fully clockwise [A].

#### Compression Damping Adjuster Setting

Standard: 12 clicks [B]

Harder [C]

Softer [D]



### NOTE

Although you can turn the adjuster beyond the adjustable range, effecting no changes to damping force, use it within the adjustable range.

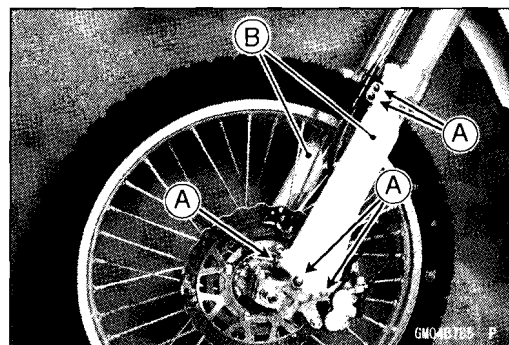
### Front Fork Removal

- Remove:
  - Bolts (Both Sides) [A]
  - Front Fork Protectors [B]
- Place the jack under the frame so that the front wheel off the ground.

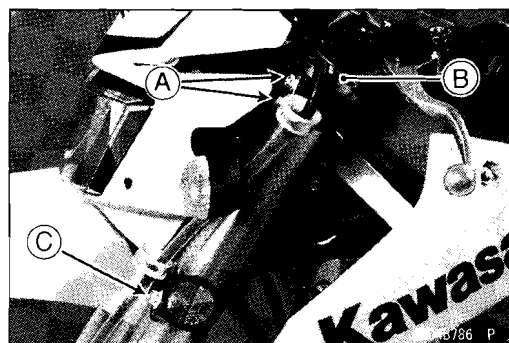
Special Tool - Jack: 57001-1238

### WARNING

Be sure to put the rear wheel on the ground when removing the front wheel, or the motorcycle may fall over. It could cause an accident and injury.



- Remove:
  - Front Wheel (see Front Wheel Removal in the Wheels/Tires chapter)
- Loosen the upper front fork clamp bolts [A].
  - If the front fork is to be disassembled, remove the handlebar to loosen the top plug [B].
- Loosen the lower front fork clamp bolt [C].
- With a twisting motion, work the fork down and out.



## 13-10 SUSPENSION

### Front Fork

#### Front Fork Installation

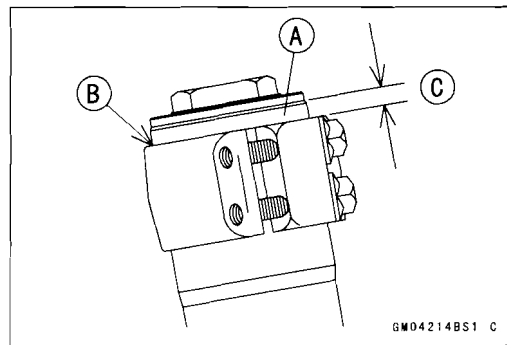
- Install the front fork so that the distance between the top end [A] of the outer tube and the upper surface [B] of the steering stem head becomes 6 mm (0.24 in.) [C].
- Tighten the lower front fork clamp bolt and top plug.

**Torque - Lower Front Fork Clamp Bolts:** 25 N·m (2.5 kgf·m, 18 ft·lb)

**Front Fork Top Plug:** 30 N·m (3.0 kgf·m, 22 ft·lb)

- Tighten:

**Torque - Upper Front Fork Clamp Bolts:** 20 N·m (2.0 kgf·m, 15 ft·lb)

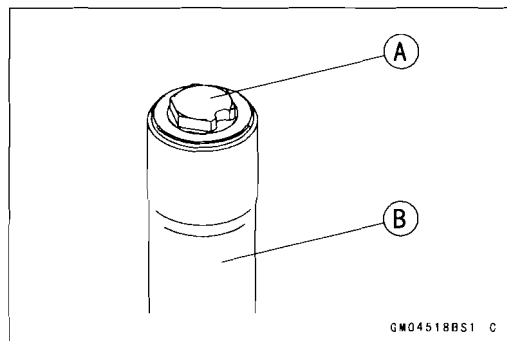


#### NOTE

- Tighten the top plug before tightening the upper front fork clamp bolts.
- Tighten the two upper front fork clamp bolts alternately two times to ensure even tightening torque.
- Install the removed parts (see appropriate chapters).

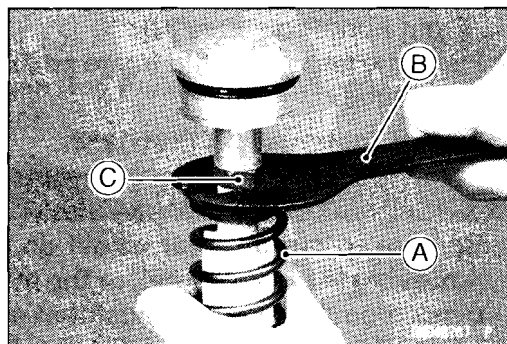
#### Front Fork Oil Change

- Remove the front fork (see Front Fork Removal).
- Hold the outer tube vertically and hold the inner tube lower end in a vice.
- Remove the top plug [A] from the outer tube [B] and slowly slide down the outer tube.

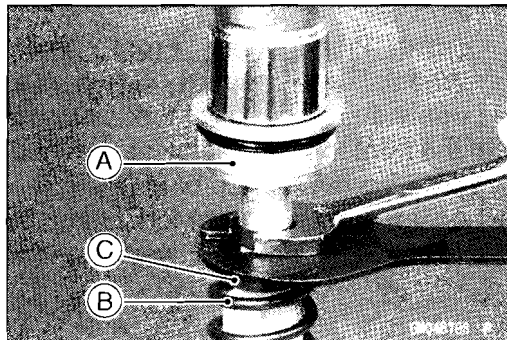


- Push down the fork spring [A] to engage the fork spring holder [B] below the piston rod nut [C].

**Special Tool - Fork Spring Holder:** 57001-1286



- Using a wrench, loosen the piston rod nut and remove the top plug [A].
- Push down the fork spring [B] to remove the fork spring holder, and then remove the fork spring and spring seat [C].

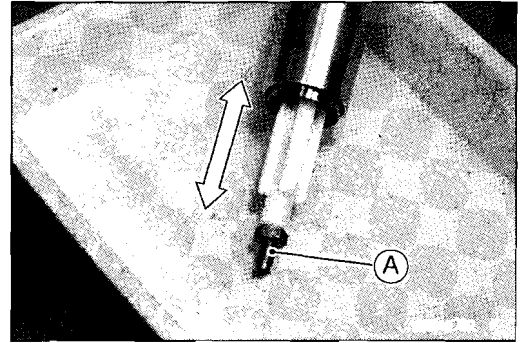


# Front Fork

- Remove the fork tube from the vise, and drain the fork oil into a suitable container.

## NOTE

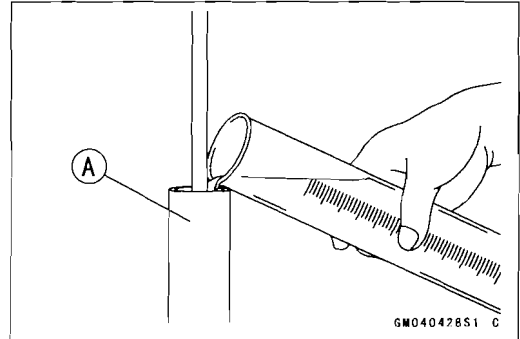
- To drain off fork oil, hold the fork tube downward and move the piston rod [A] up and down, more than ten times



- Hold the fork tube upright in a vise, press the outer tube [A] and the piston rod all the way down.
- Pour in the specified type of oil.

## Fork Oil

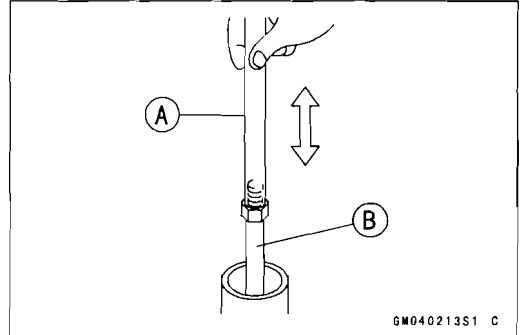
Viscosity:	KHL15-10 (KAYABA01) or equivalent
Amount (per side):	
When chaining oil	Approx. 450 mL (15.2 US oz.)
After disassembly, completely dry:	
KLX250T	531 ±4 mL (18.0 ±0.1 US oz.)
KLX250W	527 ±4 mL (17.8 ±0.1 US oz.)



- Using the fork piston rod puller [A], move the piston rod [B] up and down more than 10 times in order to discharge all the air from the fork oil.

**Special Tool - Fork Piston Rod Puller, M10 × 1.0: 57001-1298**

- Remove the fork piston rod puller.



## 13-12 SUSPENSION

### Front Fork

- Pump the outer tube up and down several times to discharge the air between the outer tube and inner tube.
- Wait until the oil level stabilizes.
- Measure the distance from the top of the inner tube to the fork oil, using the fork oil level gauge [A].

#### Special Tool - Fork Oil Level Gauge: 57001-1290

- With the front fork fully compressed and without fork spring, insert the gauge tube into the inner tube [B] and position the stopper [C] across the top end [D] of the inner tube.
- Set the gauge stopper so that its lower side shows the oil level distance specified [E].
- [F] Outer Tube

#### Oil Level (Fully compressed, without spring)

##### Standard:

KLX250T      101 ±2 mm (3.98 ±0.08 in.)

KLX250W      104 ±2 mm (4.09 ±0.08 in.)

- Pull the handle slowly to pump out the excess oil until the oil no longer comes out.
- ★ If no oil is pumped out, there is insufficient oil in the inner tube. Pour in enough oil, then pump out the excess oil.

- Install the fork piston rod puller [A] onto the push rod, and slowly pull up the fork piston rod puller.

#### Special Tool - Fork Piston Rod Puller M10 × 1.0: 57001-1298

#### NOTE

○ Be careful for fork oil spillage from the inner tube.

- Insert the fork spring into the inner tube, and set the spring guide on the spring.
- Push down the fork spring to engage the fork spring holder [B] below the piston rod nut [C].

#### Special Tool - Fork Spring Holders: 57001-1286

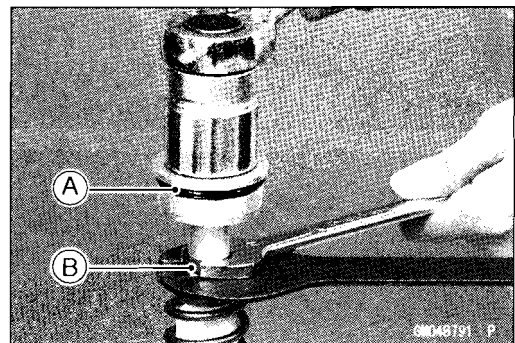
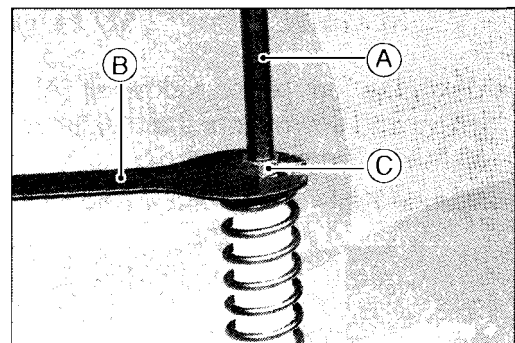
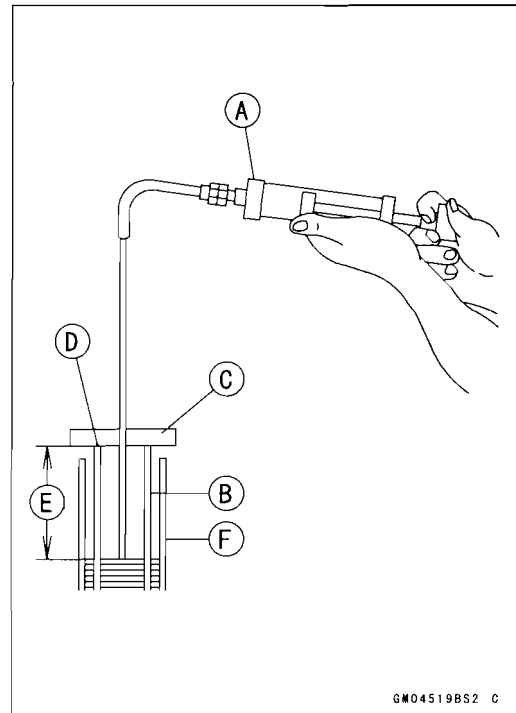
- Remove the fork piston rod puller.
- Replace the O-ring [A] on the top plug with a new one.
- Install the top plug on the piston rod.
- Holding the top plug with a wrench, tighten the piston rod nut [B] against the top plug.

#### Torque - Piston Rod Nut: 15 N·m (1.5 kgf·m, 11 ft·lb)

- Push down the fork spring to remove the fork spring holder.
- Lift up the outer tube and install the top plug.
- Tighten:

#### Torque - Front Fork Top Plug: 30 N·m (3.0 kgf·m, 22 ft·lb)

- Install the front fork (see Front Fork Installation).





## Front Fork

### Front Fork Disassembly

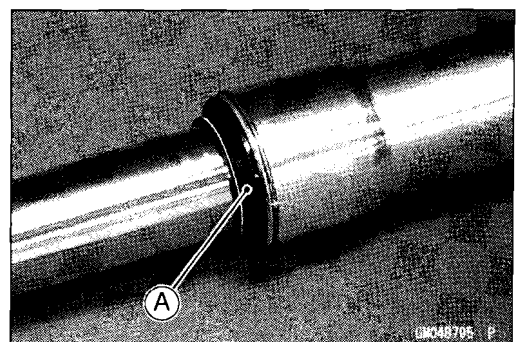
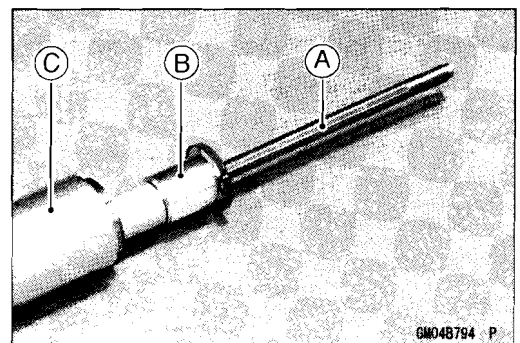
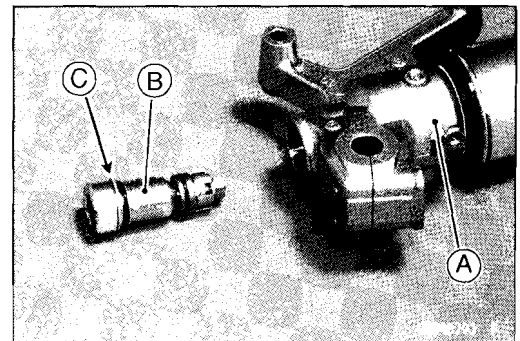
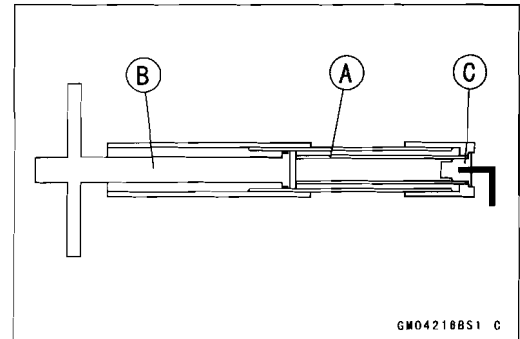
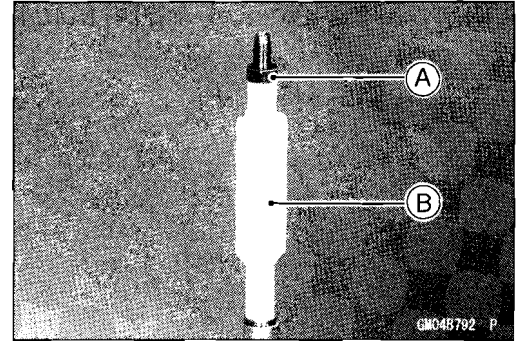
- Drain the fork oil (see Front Fork Oil Change).
- Remove:
  - Piston Rod Nut [A]
  - Spring Guide [B]
- Hold the outer tube sideways and hold the inner tube in a vice.
- Push the outer tube as far as it will go. Hold the cylinder unit [A] with the fork cylinder holder [B], and loosen the cylinder valve assy [C]. Then remove the cylinder valve assy and gasket from the inner tube.

**Special Tool - Fork Cylinder Holder: 57001-1287**

[A] Inner Tube  
[B] Cylinder Valve Assy  
[C] Gasket

- Remove the piston rod [A] and cylinder unit [B] from the inner tube [C].

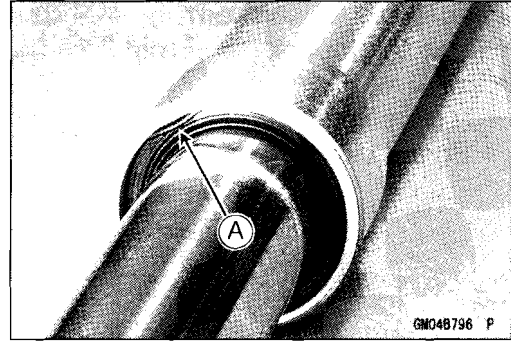
- Separate the inner tube from the outer tube as follows:
  - Pull up the dust seal [A].
  - Remove the fork tube from the vise.



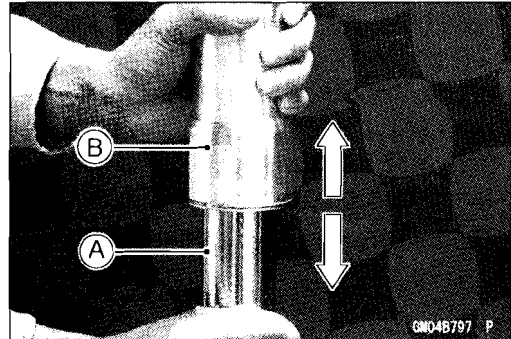
## 13-14 SUSPENSION

### Front Fork

○ Remove the retaining ring [A] from the outer tube.



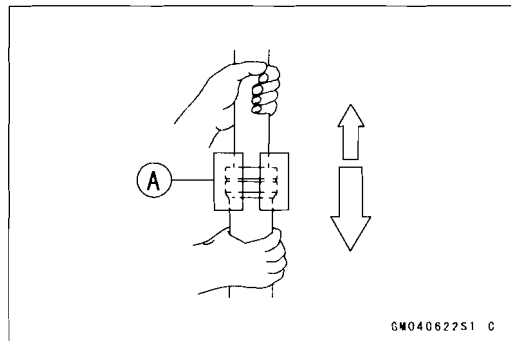
○ Holding the inner tube [A] by hand, pull the outer tube [B] several times to pull out the outer tube.



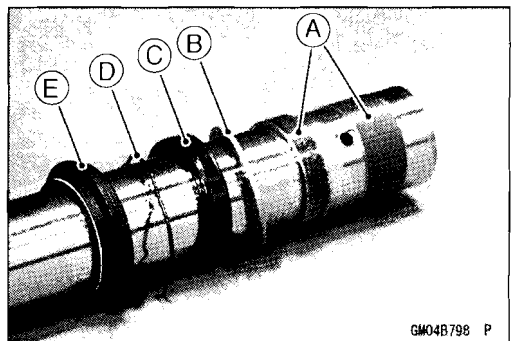
#### NOTE

○ If the outer tube does not detach easily, set the fork outer tube weight [A] onto it to separate the inner and outer tubes.

**Special Tool - Fork Outer Tube Weight: 57001-1218**



- Remove the following parts from the inner tube.
  - Guide Bushings [A]
  - Washer [B]
  - Oil Seal [C]
  - Retaining Ring [D]
  - Dust Seal [E]

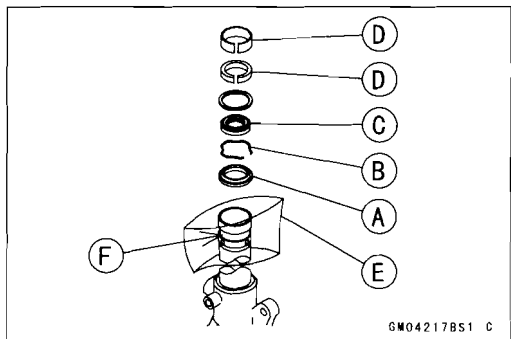


### Front Fork Assembly

- Replace the following parts with new ones.
  - Dust Seals [A]
  - Retaining Ring [B]
  - Oil Seal [C]
  - Guide Bushings [D]

#### NOTE

○ Since the inner tube guide bush groove has an edge [F], protect the oil seal lip from damages by placing a vinyl bag [E] over the inner tube in assembling an oil seal.

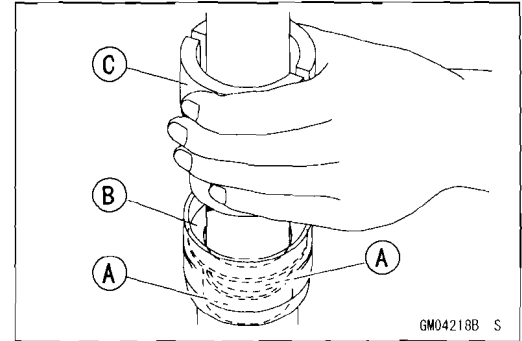




## Front Fork

- Insert the spring band of the dust seal, dust seal, oil seal, washer and guide bush to the inner tube and set the guide bushing to the inner tube.
- When assembling the outer tube guide bushings [A], hold the washer [B] against the guide bushing and tap the washer with the fork oil seal driver [C] until it stops.

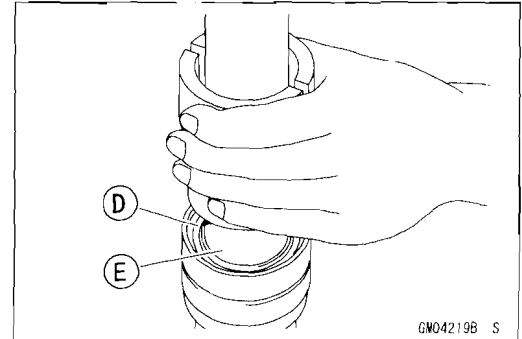
**Special Tool - Fork Oil Seal Driver  $\phi 43$ : 57001-1340**



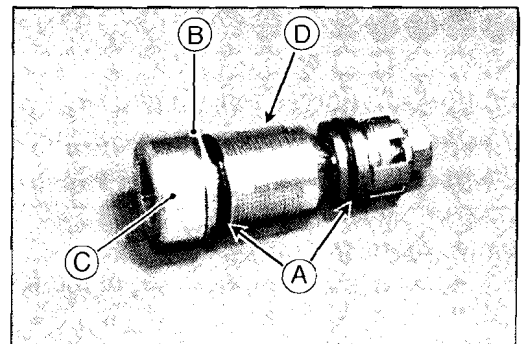
- Using the fork oil seal driver, press in the oil seal [D] until the it is bottomed.
- Make the oil seal end with the protruding lip [E] face upward.

**Special Tool - Fork Oil Seal Driver  $\phi 43$ : 57001-1340**

- Install the retaining ring.
- Push the dust seal into the outer tube.
- Set the spring band on the dust seal.



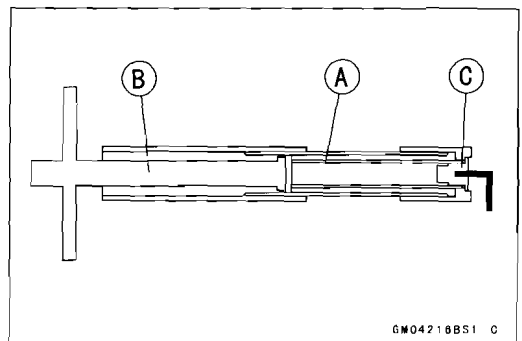
- Replace the O-rings [A] and gasket [B] on the cylinder valve assy [C] with new ones.
- Apply non-permanent locking agent to the threads [D] of the cylinder valve assy (Allen bolt).



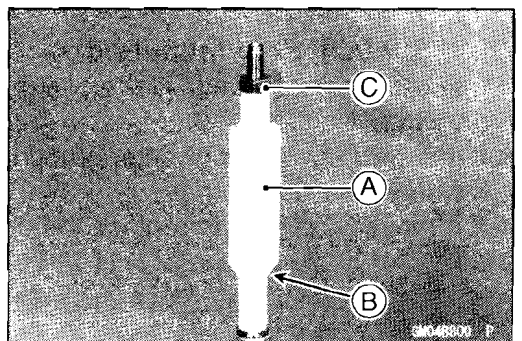
- Hold the cylinder unit [A] by using the fork cylinder holder [B], install and tighten the cylinder valve assy [C].

**Special Tool - Fork Cylinder Holder: 57001-1287**

**Torque - Front Fork Cylinder Valve Assy: 55 N·m (5.6 kgf·m, 40 ft·lb)**



- Hold the outer tube vertically and hold the inner tube lower end in a vice.
- Set the spring guide [A] onto the push rod with the tapered end [B] facing downward.
- Install the piston rod nut [C] on the spring guide.
- Pour in the specified type of oil (see Fork Oil Change).



## 13-16 SUSPENSION

### Front Fork

#### Inner Tube, Outer Tube Inspection

- Visually inspect the inner tube [A], and repair any damage.
- Nick 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.

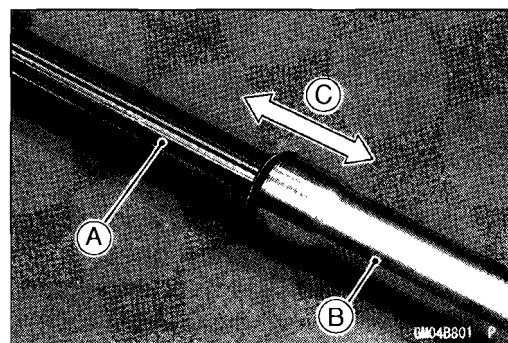
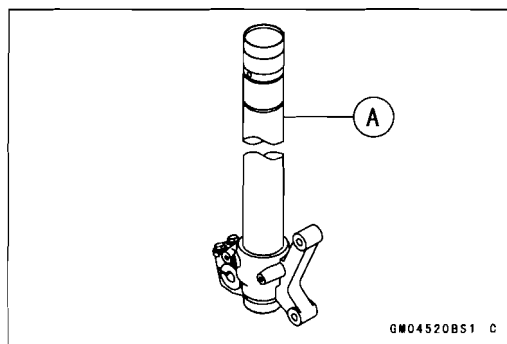
#### CAUTION

If the inner tube is badly bent or creased, replace it. Excessive bending, followed by subsequent straightening, can weaken the inner tube.

- Temporarily assemble the inner tube [A] and outer tube [B], and pump [C] them back and forth manually to check for smooth operation.
- ★ If you feel binding or catching, the inner and outer tubes must be replaced.

#### ⚠ WARNING

A straightened inner or outer fork tube may fall in use, possibly causing an accident. Replace a badly bent or damaged inner or outer tube and inspect the other tube carefully before reusing it.



#### Fork Spring Inspection

- Measure the free length [B] of the fork spring [A].
- If the measurement is less than the service limit, replace the spring. If a large difference is observed in free length due to dimensional inconsistency, change both right and left ones, as this impairs the stability of vehicle control.

#### Fork Spring Free Length

##### Standard:

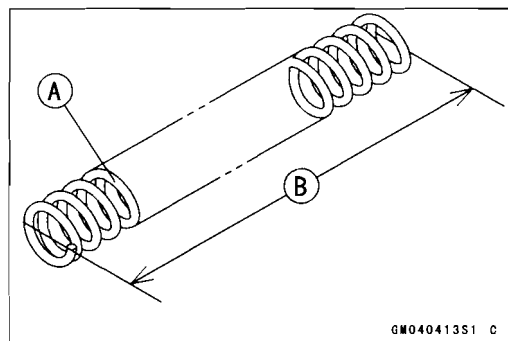
KLX250T      404 mm (15.9 in.)

KLX250W      380 mm (15.0 in.)

##### Service Limit:

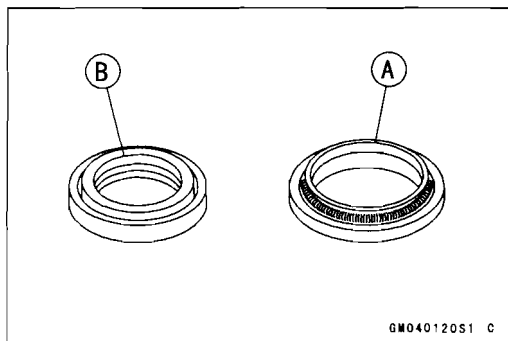
KLX250T      412.3 mm (16.23 in.)

KLX250W      387.3 mm (15.25 in.)



#### Dust Seal/Oil Seal Inspection

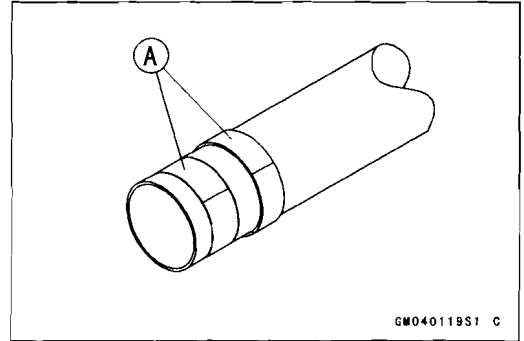
- Inspect the dust seal [A] for any signs of deterioration or damage.
- ★ If it shows any signs of deterioration or damage, replace it with a new one.
- If removed, be sure to replace the oil seal [B] with a new one.



### Front Fork

#### ***Guide Bushings Inspection***

- Visually inspect the guide bushings [A], and replace them if necessary.

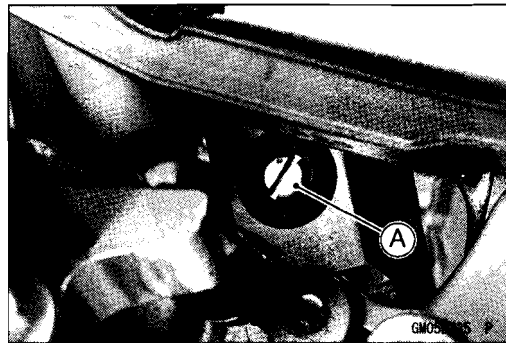


## 13-18 SUSPENSION

### Rear Shock Absorber

#### Rebound Damping Adjustment

- Turn the rebound damping adjuster [A] on the rear shock absorber lower end with a screwdriver until you feel a click.
- ★ If the damper setting feels too soft or too stiff, adjust it in accordance with the following table.



Seated position: adjuster turned fully clockwise [A].

#### Rebound Damping Adjuster Setting

Standard:

KLX250T 12 clicks [B]

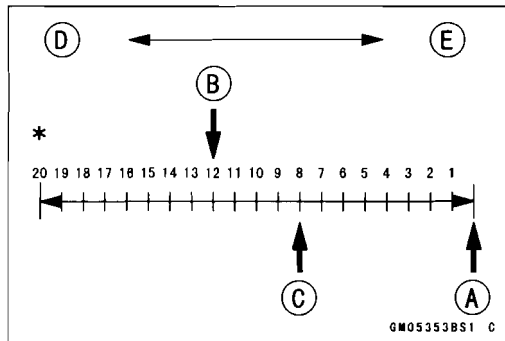
KLX250W 8 clicks [C]

Softer (Counterclockwise) [D]

Harder (Clockwise) [E]

\*: Number of turns counterclockwise usable range - 20 or more.

Counterclockwise from the fully seated position.

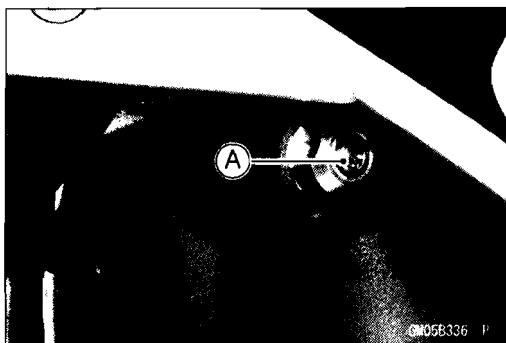


#### NOTE

- Adjustment of the rebound damping adjuster for the rear suspension will slightly affect the compression damping force. Always make any damping adjustments in small steps and test their effects before using them in competition.

#### Compression Damping Adjustment

- Adjust the compression damping, turn the compression damping adjuster [A] with a screwdriver.
- ★ If the damping feels too soft or too stiff, adjust it in accordance with the following table.



Seated position: adjuster turned fully clockwise [A]

#### Compression Damping Adjuster Setting

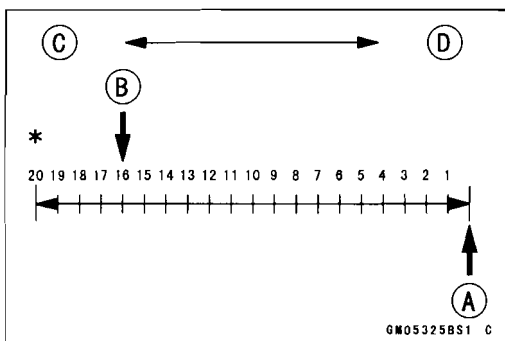
Standard: 16 clicks [B]

Softer (counterclockwise) [C]

Harder (clockwise) [D]

\*: Number of turns counterclockwise usable range - 20 clicks or more.

Counterclockwise from the fully seated position.



#### NOTE

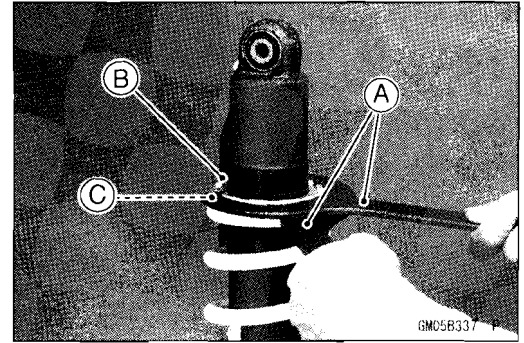
- Adjustment of the compression damping adjuster for the rear suspension will slightly affect the rebound damping force. Always make any damping adjustments in small steps and test their effects before using them in com-

## Rear Shock Absorber

### Spring Preload Adjustment

- Remove the rear shock absorber (see Rear Shock Absorber Removal).
- Hold the lower of the rear shock absorber with a vise.
- Using the hook wrenches [A], loosen the locknut [B] and turn the adjusting nut [C] as required. When you turn the adjustment nut upward, initial load will decrease; when you turn it downward, initial load will increase.

**Special Tool - Hook Wrench R37.5, R42: 57001-1101**



### Spring Preload Adjustment

(Adjusting nut position at the lower surface [A] from the center of the mounting hole)

**Standard:**

### Rebound Damping Adjuster Setting

**Standard:**

**KLX250T 107.5 mm (4.232 in.)**

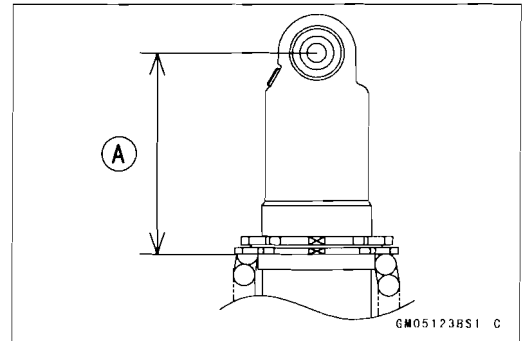
**KLX250W 119.5 mm (4.705 in.)**

**Adjustable Range**

**KLX250T 101 ~ 123 mm (3.98 ~ 4.84 in.)**

**KLX250W 111 ~ 133 mm (4.37 ~ 4.48 in.)**

- After adjusting, move the spring up and down to make sure that the spring is seated.
- Tighten the locknut securely.
- Install the rear shock absorber.



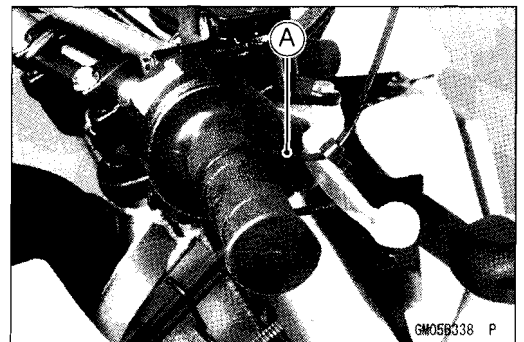
### Rear Shock Absorber Removal

- Using a jack, raise the rear wheel off the ground.
- Special Tool - Jack: 57001-1238**
- Squeeze the brake lever slowly and hold it with a band [A].

### **⚠ WARNING**

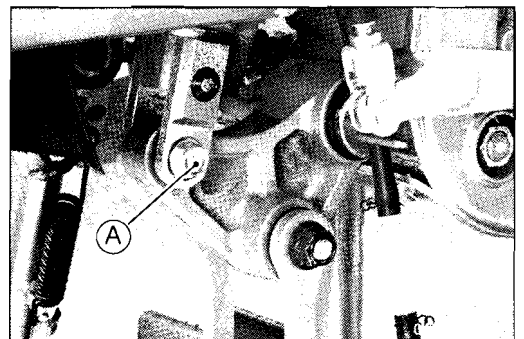
**Be sure to hold the front brake when removing the shock absorber, or the motorcycle, may fall over. It could cause an accident and injury.**

- Remove the following parts.  
Left Side Cover (see Side Cover Removal in the Frame chapter)  
Front Tie-rod Nut and Bolt (see Tie-rod Removal)  
Rear Fender Flap Front (see Rear Fender Flap Front Removal in the Frame chapter)



### **CAUTION**

**When pulling out the mounting bolt, lift the rear wheel slightly. Forcing or tapping on bolt could damage the mounting bolt, sleeve, and bearing.**



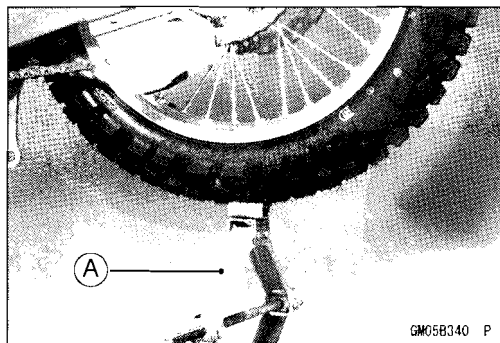
- Remove the lower rear shock absorber mounting bolt [A].



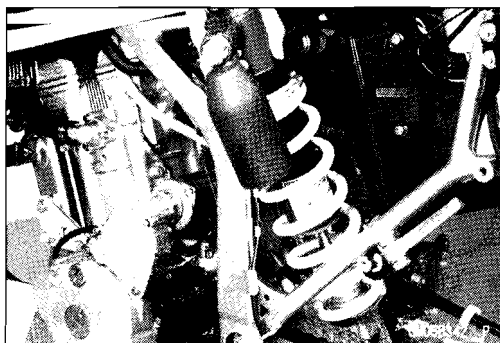
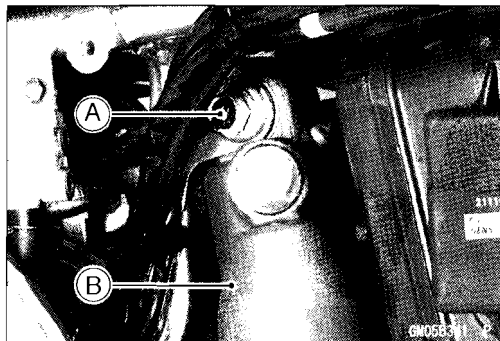
## 13-20 SUSPENSION

### Rear Shock Absorber

- Using the available jack [A], lift the rear wheel as shown.



- Remove the upper rear shock absorber bolt [A], and remove the rear shock absorber [B] to the left side.



#### Rear Shock Absorber Installation

- Apply grease to the needle bearings and inside of the oil seals.
- Tighten:

Torque - Rear Shock Absorber Bolts (Upper, Lower): 39 N·m (4.0 kgf·m, 29 ft·lb)

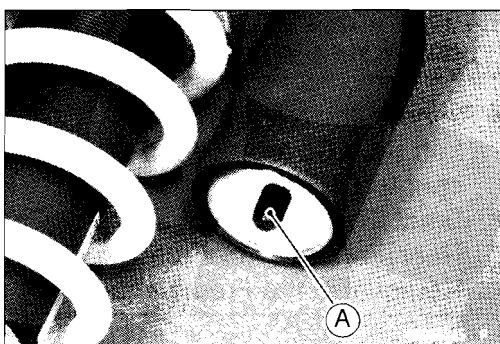
Tie-rod Nut (Rear): 83 N·m (8.5 kgf·m, 61 ft·lb)

#### Rear Shock Absorber Scrapping

##### **⚠ WARNING**

Since the reservoir tank of the rear shock absorber contains nitrogen gas, do not incinerate the reservoir tank without first releasing the gas or it may explode.

- Remove the shock absorber (see Rear Shock Absorber Removal).
- Remove the valve cap [A] and release the nitrogen gas completely from the gas reservoir.
- Remove the valve.

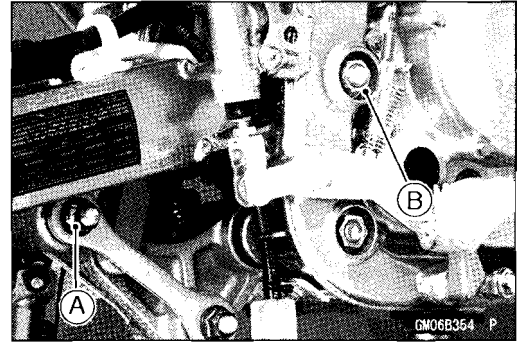


##### **⚠ WARNING**

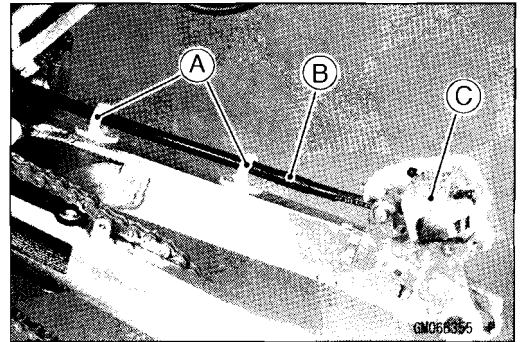
Since the high pressure gas is dangerous, do not point the valve toward your face or body.

# Swingarm

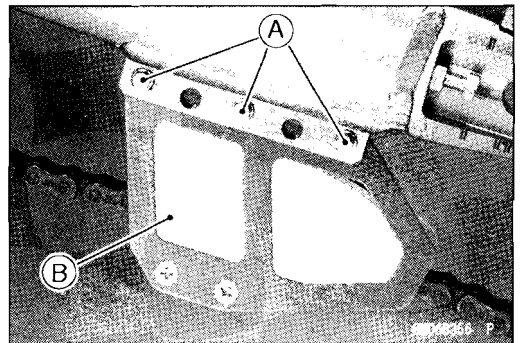
- Remove:
  - Rear Wheel (see Rear Wheel Removal in the Wheels/Tires chapter)
  - Rear Fender Flap Front (see Rear Fender Flap Front Removal in the Frame chapter)
  - Tie-rod Bolt and Nut (Rear) [A]
  - Swingarm Pivot Shaft Nut [B]



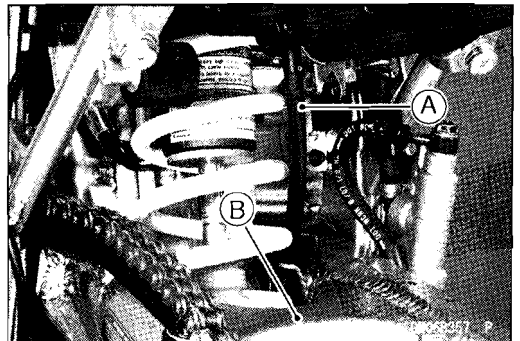
- Remove the brake hose guides [A].
- Remove the rear brake hose [B] with the caliper [C] from the swingarm.



- Remove:
  - Bolt [A] and Nuts
  - Chain Slipper [B]



- Remove the air cleaner drain hose [A].
- Pull out the swingarm pivot shaft to the left side, and remove the swingarm [B].

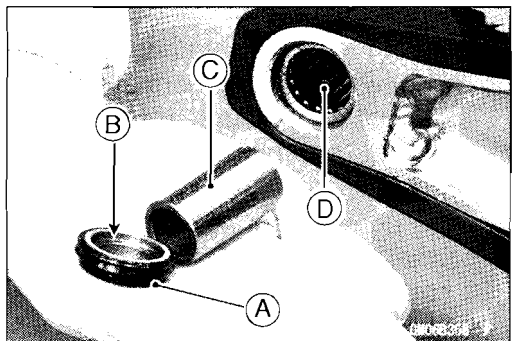


## Swingarm Installation

- Install the grease seals [A] so that the hollow side [B] face the sleeve [C] in the swingarm pivot hole.
- Apply grease to the needle bearings [D] and outside of the sleeves.
- Tighten:

**Torque - Swingarm Pivot Shaft Nut:** 88 N·m (9.0 kgf·m, 65 ft·lb)

**Tie-rod Nut (Rear):** 83 N·m (8.5 kgf·m, 61 ft·lb)

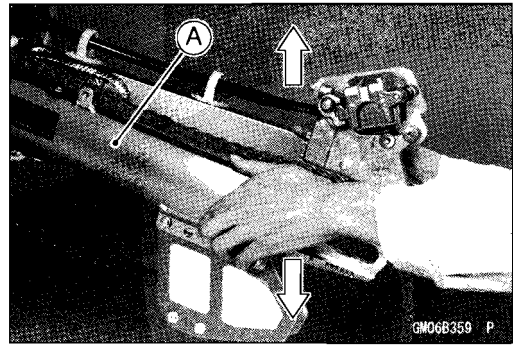




## 13-22 SUSPENSION

### Swingarm

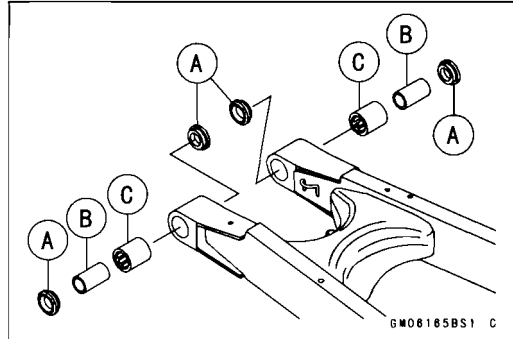
- Move the swingarm [A] up and down to check for abnormal friction.
- Install the removed parts (see appropriate chapters).



#### Swingarm Bearing Removal

- Remove:
  - Swingarm (see Swingarm Removal)
  - Grease Seal [A]
  - Sleeve [B]
- Remove the needle bearings [C] using the oil seal & bearing remover.

**Special Tool - Oil Seal & Bearing Remover: 57001-1058**



#### Swingarm Bearing Installation

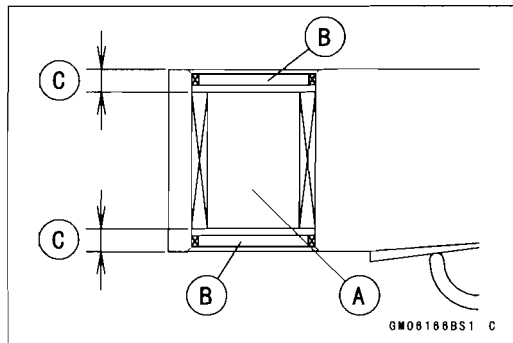
- Replace the needle bearings [A] and grease seals [B] with new ones.
- Apply plenty of grease to the sleeves, grease seals, and needle bearings.

#### NOTE

○Install the needle bearings so that the manufacturer's marks face out.

**Special Tool - Bearing Driver Set: 57001-1129**

- Install the needle bearings and grease seals position as shown.
  - [C] 5 mm (0.2 in.)
- The installation procedure is the same as the counter side.



#### Needle Bearing, Sleeve Inspection

##### CAUTION

**Do not remove the bearings for inspection. Removal may damage them.**

- Inspect the needle bearings installed in the swingarm.
  - The needle bearing normally wear very little, and wear is difficult to measure. Instead of measuring, visually inspect the bearings for abrasion, discoloration, or other damage.
  - ★If the needle bearing, and sleeve show any signs of abnormal wear, discoloration, or damage, replace them as a set.

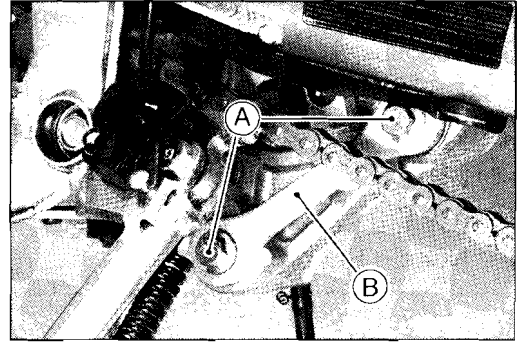
## Tie-rod, Rocker Arm

### Tie-rod Removal

- Using the jack, raise the rear wheel off the ground.

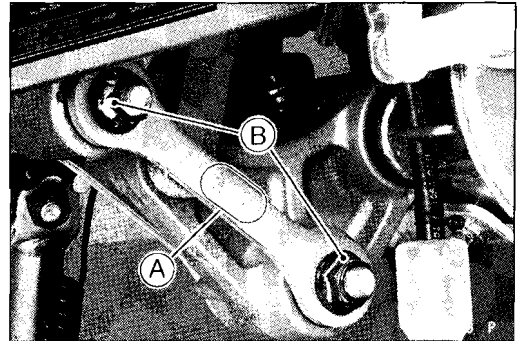
**Special Tool - Jack: 57001-1238**

- Remove:
  - Tie-rod Bolts [A] and Nuts
  - Tie-rod [B]



### Tie-rod Installation

- Install the tie-rods so that the marked side [A] faces outside.
- Tighten:
  - Torque - Tie-rod Nuts [B]: 83 N·m (8.5 kgf·m, 61 ft·lb)**

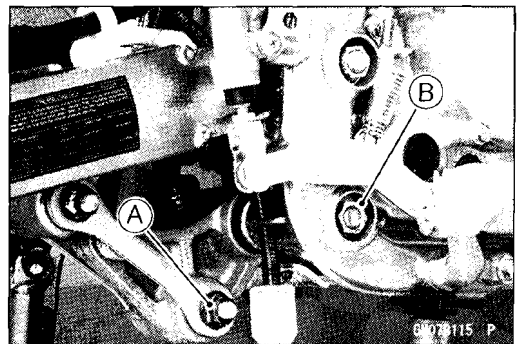


### Rocker Arm Removal

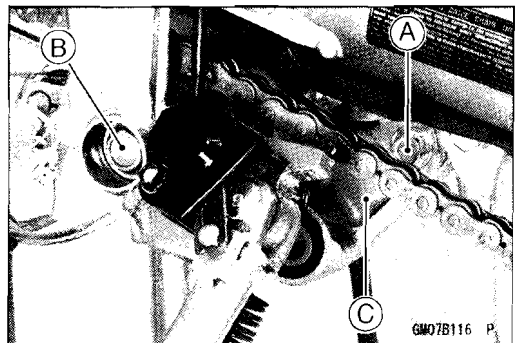
- Using the jack, raise the rear wheel off the ground.

**Special Tool - Jack: 57001-1238**

- Remove:
  - Tie-rod Bolt and Nut (Front) [A]
  - Rocker Arm Pivot Shaft Nut [B]



- Remove the lower rear shock absorber bolt [A].
- Pull out the rocker arm pivot shaft [B].
- When the rocker arm pivot shaft does not remove, loosen the swingarm pivot shaft.
- Remove the rocker arm [C].



### Rocker Arm Installation

- Apply plenty of grease to the inside of the rocker arm hole, outside of the sleeve and needle bearings.
- Tighten:
  - Torque - Rocker Arm Pivot Shaft Nut: 98 N·m (10 kgf·m, 72 ft·lb)**
  - Lower Rear Shock Absorber Bolt: 39 N·m (4.0 kgf·m, 29 ft·lb)**
  - Tie-rod Nut: 83 N·m (8.5 kgf·m, 61 ft·lb)**

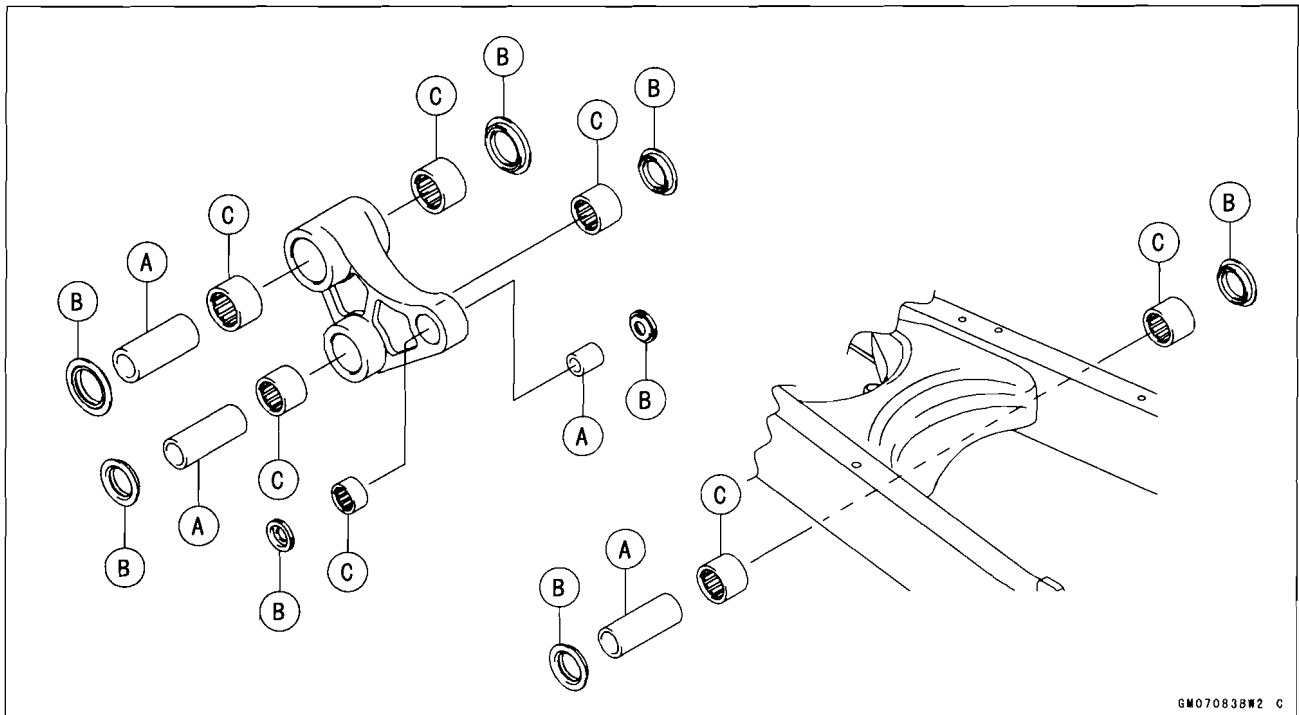
## 13-24 SUSPENSION

### Tie-rod, Rocker Arm

#### ***Tie-Rod and Rocker Arm Bearing Removal***

● Remove:

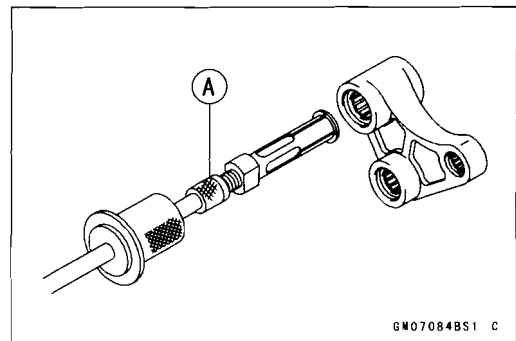
- Tie-Rods (see Tie-Rod Removal)
- Rocker Arm (see Rocker Arm Removal)
- Swingarm (see Swingarm Removal)
- Sleeves [A]
- Grease Seals [B]
- Needle Bearings [C]



- Remove the rocker arm pivot and tie-rod needle bearings, using the oil seal & bearing remover [A].

**Special Tool - Oil Seal & Bearing Remover: 57001-1058**

- Remove the lower rear shockabsorber needle bearing, using the available remover.



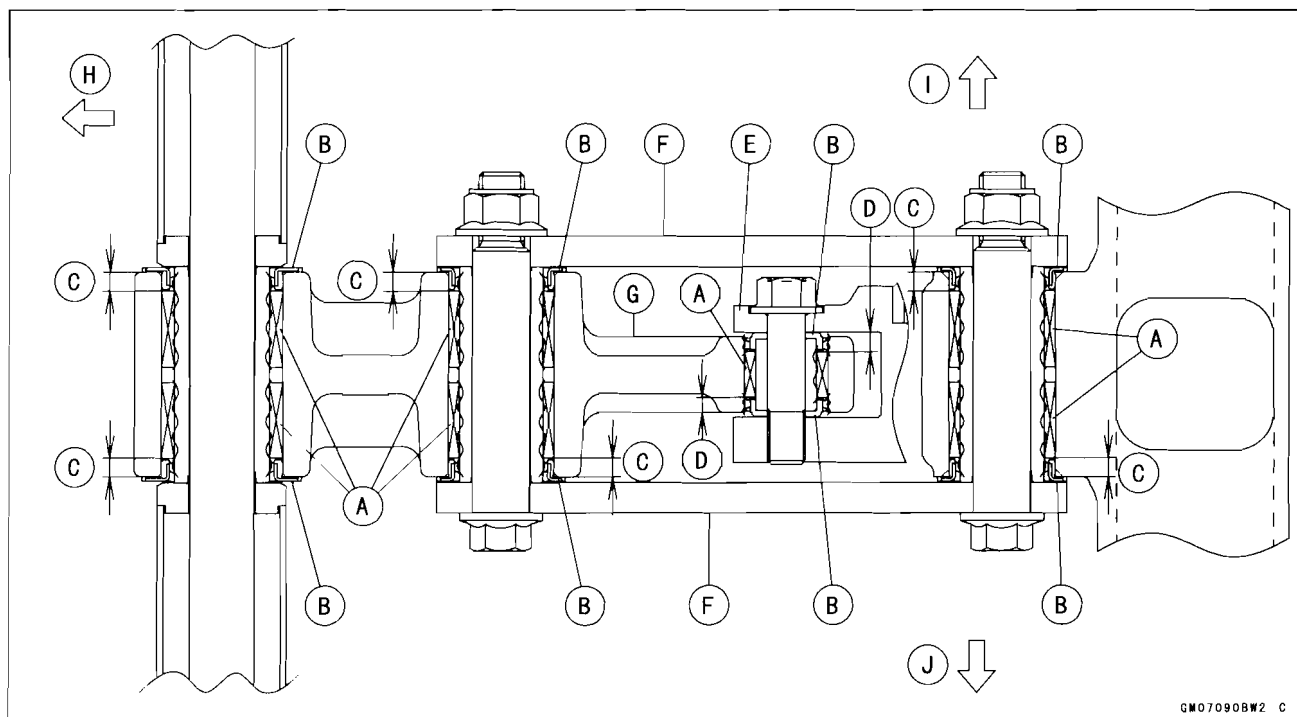
## Tie-rod, Rocker Arm

### Tie-Rod and Rocker Arm Bearing Installation

- Replace the needle bearings with new ones.
- Apply plenty of grease to the new needle bearings.
- Install the needle bearings so that the manufacturer's marks faces out.
- Install the new needle bearings [A] and grease seals [B] position as shown.
  - 5.0 mm (0.20 in.) [C]
  - 4.0 mm (0.22 in.) [D]
  - Rear Shock Absorber [E]
  - Tie-Rods [F]
  - Rocker Arm [G]
  - Front [H]
  - Right Side [I]
  - Left Side [J]

○ Using a suitable bearing driver and the bearing driver set (special tool: 57001-1129).

**Special Tool - Bearing Driver Set: 57001-1129**



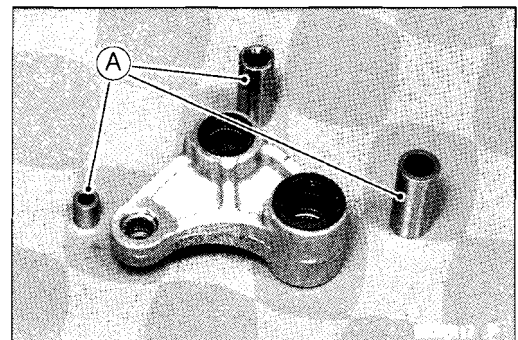
### Rocker Arm Sleeve Inspection

- Removal the rocker arm (see Rocker Arm Removal)
- Take out the sleeve [A] from the rocker arm and measure its outer diameter.

#### Sleeve Outside Diameter

**Standard:** 24.987 ~ 25.000 mm (0.98373 ~ 0.98425 in.)  
 21.987 ~ 22.000 mm (0.86563 ~ 0.86614 in.)  
 15.989 ~ 16.000 mm (0.62949 ~ 0.62992 in.)

**Service Limit:** 24.85 mm (0.9783 in.)  
 21.85 mm (0.8602 in.)  
 15.85 mm (0.6240 in.)



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

## 13-26 SUSPENSION

### Tie-rod, Rocker Arm

#### *Needle Bearing, Sleeve Inspection*

##### CAUTION

**Do not remove the bearings for inspection. Removal may damage them.**

- Inspect the needle bearings installed in the rocker arm.
- The needle bearing normally wear very little, and wear is difficult to measure. Instead of measuring, visually inspect the bearings for abrasion, discoloration, or other damage.
- ★ If the needle bearing, and sleeve show any signs of abnormal wear, discoloration, or damage, replace them as a set.

#### *Rocker Arm Pivot Shaft Bent Inspection*

A bent shaft causes vibration, poor handling, and instability.

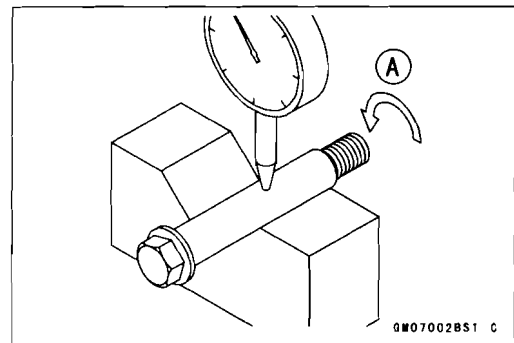
- To measure the bolt runout, remove the bolt, place it in V blocks, and set a dial gauge to the bolt at a point halfway between the blocks. Turn [A] the bolt to measure the runout. The amount of dial variation is the amount of runout.

##### **Rocker Arm Pivot Shaft Runout**

**Standard:** TIR 0.1 mm (0.004 in.) or less

**Service Limit:** TIR 0.2 mm (0.008 in.)

- ★ If any measurement exceeds the service limit, replace the shaft.

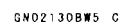


# Steering

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### Exploded View





**Exploded View**

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Steering Stem Nut	4.9	0.50	43 in·lb	
2	Handlebar Clamp Bolts	25	2.5	18	S
3	Steering Stem Head Nut	44	4.5	32	
4	Upper Front Fork Clamp Bolts	20	2.0	15	AL
5	Lower Front Fork Clamp Bolt	25	2.5	18	
6	Left Switch Housing Screws	3.5	0.36	31 in·lb	
7	Right Switch Housing Screws	3.5	0.36	31 in·lb	

8. KLX250W

AD: Apply adhesive.

AL: Tighten the clamp bolts alternately two times to ensure even tightening torque.

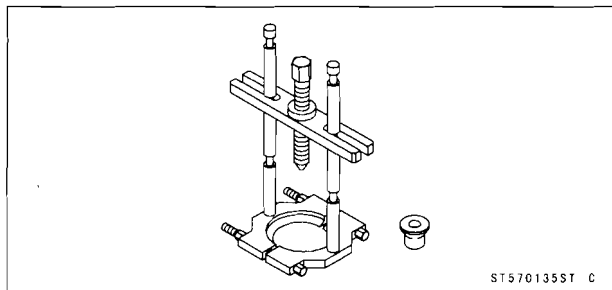
G: Apply grease.

S: Following the specified tightening sequence.

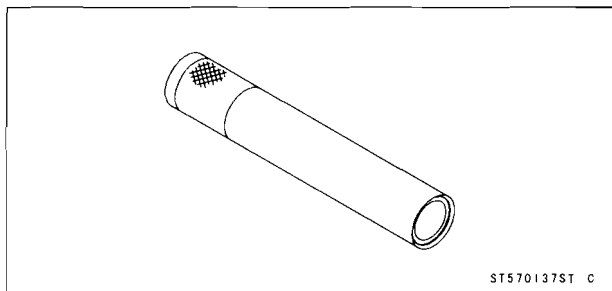
## 14-4 STEERING

### Special Tools

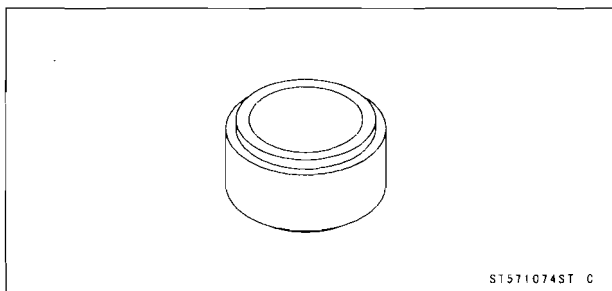
**Bearing Puller:**  
57001-135



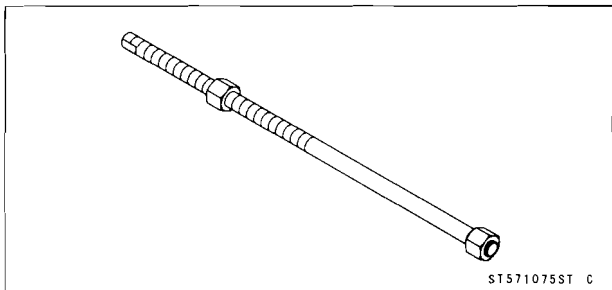
**Steering Stem Bearing Driver:**  
57001-137



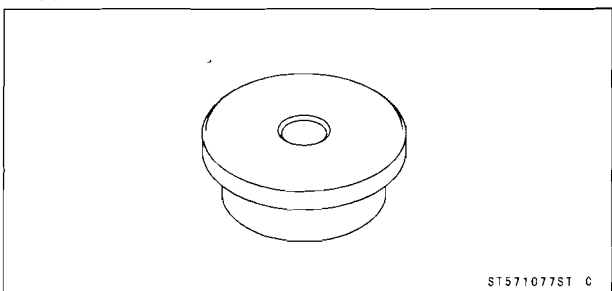
**Steering Stem Bearing Driver Adapter,  $\phi 34.5$ :**  
57001-1074



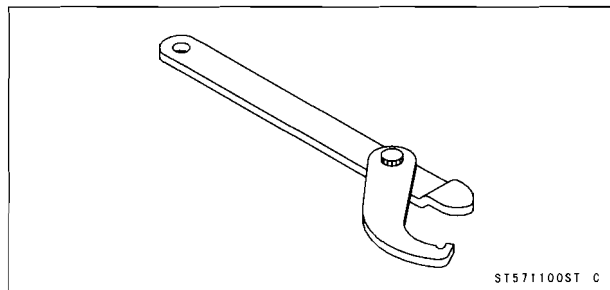
**Head Pipe Outer Race Press Shaft:**  
57001-1075



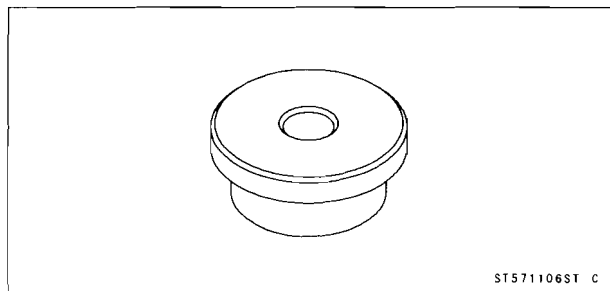
**Head Pipe Outer Race Driver,  $\phi 54.5$ :**  
57001-1077



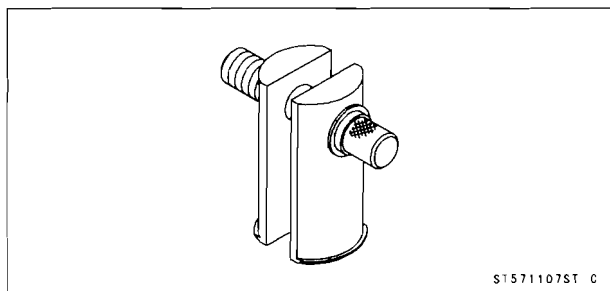
**Steering Stem Nut Wrench:**  
57001-1100



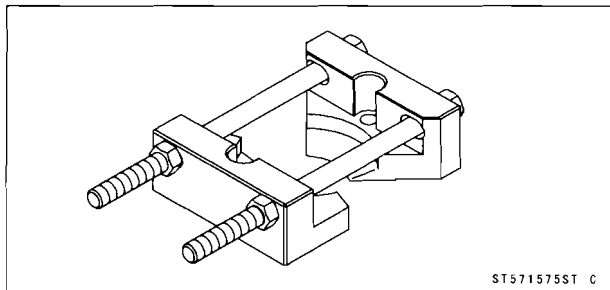
**Head Pipe Outer Race Driver,  $\phi 46.5$ :**  
57001-1106



**Head Pipe Outer Race Remover ID > 37 mm:**  
57001-1107



**Bearing Puller:**  
57001-1575



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**Steering**

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***Steering Inspection***

- Refer to the Steering Play Inspection in the Periodic Maintenance chapter.

***Steering Adjustment***

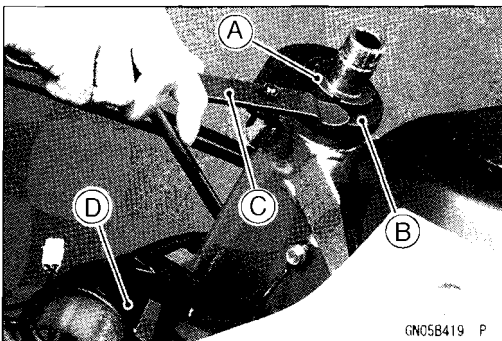
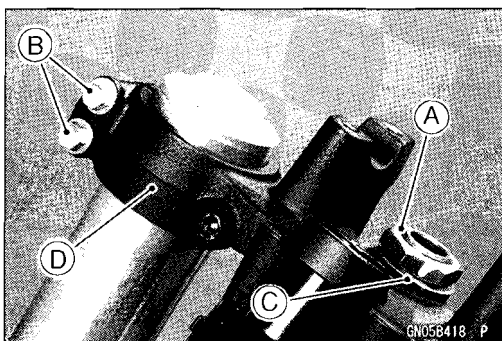
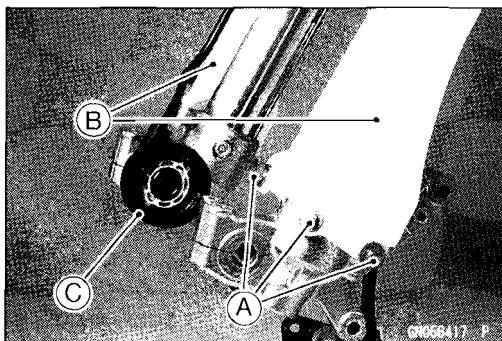
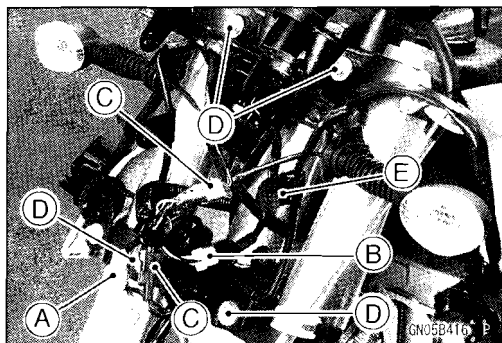
- Refer to the Steering Play Adjustment in the Periodic Maintenance chapter.

## 14-6 STEERING

### Steering Stem

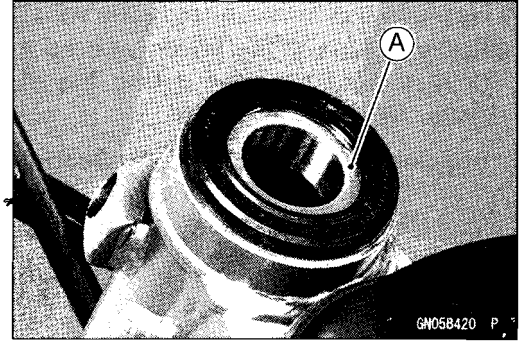
#### Stem, Stem Bearing Removal

- Remove:
  - Meter Unit (see Meter Unit Removal in the Electrical System chapter)
  - Left and Right Switch Housings
  - Throttle Cable Upper Ends
  - Clutch Cable Upper End
  - Speed Sensor Connector [A]
  - Ignition Switch Connector [B]
  - Turn Signal Light Connectors [C]
  - Bolts [D]
  - Bracket (both turn signal light installed) [E]
- Remove:
  - Front Fork Protector Bolts (both sides) [A]
  - Front Fork Protectors (both sides) [B]
- Remove the right fork protector with the speed sensor [C].
- Remove the left upper and lower fork clamp bolts to free the brake hose guide.
- Remove the handlebar clamp (see Handlebar Removal).
- Remove the following parts as a set.
  - Handlebar
  - Front Master Cylinder
  - Clutch Lever
  - Brake hose
  - Brake Caliper
  - Left Fork Protector
- Remove:
  - Steering Stem Head Nut [A]
  - Right Upper Fork Clamp Bolts [B]
  - Steering Stem Head Nut and Washer [C]
  - Steering Stem Head [D]
  - Front Forks (see Front Fork Removal in the Suspension chapter)
- Pushing up the stem base, and remove the steering stem nut [A] and stem cap [B].
- Special Tool - Steering Stem Nut Wrench [C]: 57001-1100**
- Remove the steering stem [D].



## Steering Stem

- Remove the upper stem bearing inner race (tapered roller) [A].

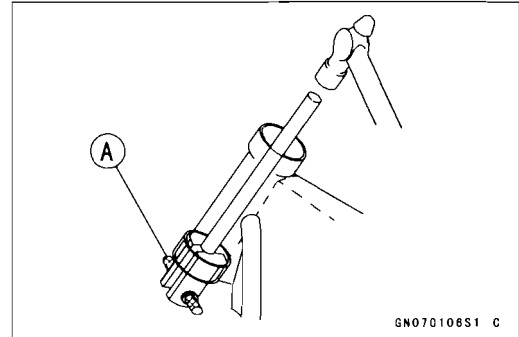


- Drive out the bearing outer races from the head pipe.
- Remove the outer races pressed into the head pipe, using the head pipe outer race remover [A], and hammer the head pipe outer race remover to drive it out.

**Special Tool - Head Pipe Outer Race Remover ID>37 mm:**  
57001-1107

### NOTE

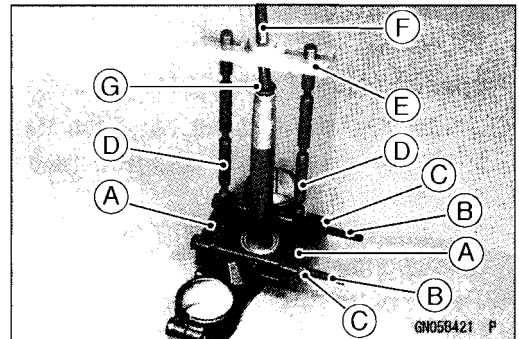
○ If either steering stem bearing is damaged, it is recommended that both the upper and lower bearing (including outer races) should be replaced with new ones.



- Remove the lower stem bearing inner race (tapered roller bearing) [A] with its grease seal from the stem using bearing pullers.

**Special Tools - Bearing Puller: 57001-135**  
**Bearing Puller: 57001-1575**

- Assemble the bearing puller (57001-1575).
- Insert the each half-split base [A] under the bottom of bearing inner race and connect the both bases by tightening the bolts [B] and nuts [C].
- Assemble the parts of the bearing puller (57001-135) as shown in the figure.
  - Stud Bolts [D]
  - Arm [E]
  - Center Bolt [F]
  - Adapter [G]
- Turn the center bolt by a wrench and pull the bearing inner race.



### NOTE

○ Tighten evenly two bases by the two bolts.

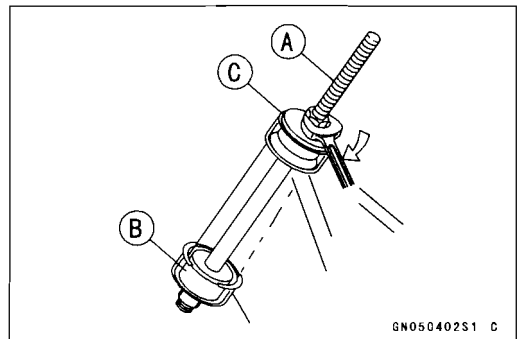
## Steering Stem, Stem Bearing Installation

- Replace the bearing outer race with new ones.
- Apply grease to the outer races, and drive them into the head pipe at the same time using the head pipe outer race press shaft [A] and the drivers.

**Special Tools - Head Pipe Outer Race Press Shaft: 57001-1075**

**Head Pipe Outer Race Driver,  $\phi 54.5$ : 57001-1077 [B]**

**Head Pipe Outer Race Driver,  $\phi 46.5$ : 57001-1106 [C]**

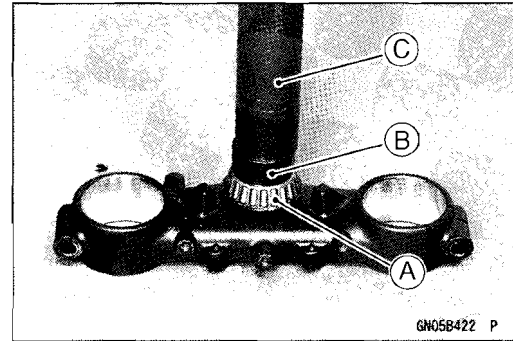


## 14-8 STEERING

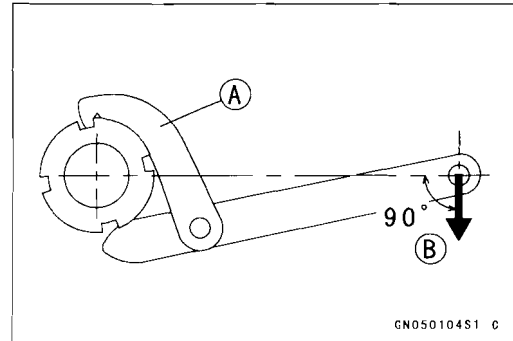
### Steering Stem

- Replace the lower inner races with new ones.
- Apply grease to the lower tapered roller bearing [A], and drive it onto the stem using the steering stem bearing driver [B] and adapter [C].

**Special Tools - Steering Stem Bearing Driver: 57001-137**  
**Steering Stem Bearing Driver Adapter,  $\phi 34.5$ : 57001-1074**



- Apply grease to the upper inner race, and install it in the head pipe.
- Install the stem through the head pipe and upper bearing, and hand-tighten the nut while pushing up on the stem base.
- Install the stem head and washer, and tighten the stem head nut lightly.
- Settle the bearing in place as follows;
- Tighten the stem nut to **39 N·m (4.0 kgf·m, 29 ft·lb)** of torque. (To tighten the steering stem nut to the specified torque, hook the wrench [A] on the stem nut, and pull the wrench at the hole by **22.2 kg** force [B] in the direction shown.)



**Special Tool - Steering Stem Nut Wrench: 57001-1100**

- Check that there is no play and the steering stem turns smoothly without rattles. If not, the steering stem bearings may be damaged.
- Again back out the stem nut a fraction of a turn until it turns lightly.
- Turn the stem nut lightly clockwise until it just becomes hard to turn. Do not overtighten, or the steering will be too tight.

**Torque - Steering Stem Nut: 4.9 N·m (0.50 kgf·m, 43 in·lb)**

## Steering Stem

- Install the stem head.
- Install the washer [A] as shown.
- Tighten the stem head nut [B] temporary.
- Install the front forks (see Front Fork Installation in the Suspension chapter).

### NOTE

- Tighten the upper fork clamp bolts first, next the stem head nut, last the lower fork clamp bolts.
- Tighten the two upper fork clamp bolts alternately two times to ensure even tightening torque.

**Torque - Upper Front Fork Clamp Bolts:** 20 N·m (2.0 kgf·m, 15 ft·lb)

**Steering Stem Head Nut:** 44 N·m (4.5 kgf·m, 32 ft·lb)

**Lower Front Fork Clamp Bolts:** 25 N·m (2.5 kgf·m, 18 ft·lb)

### ⚠ WARNING

Do not impede the handlebar turning by routing the cables, harnesses and hoses improperly (see Cable, Wire, and Hose Routing section in the Appendix chapter).

- Install the removed parts (see appropriate chapters).

### Stem Bearing Lubrication

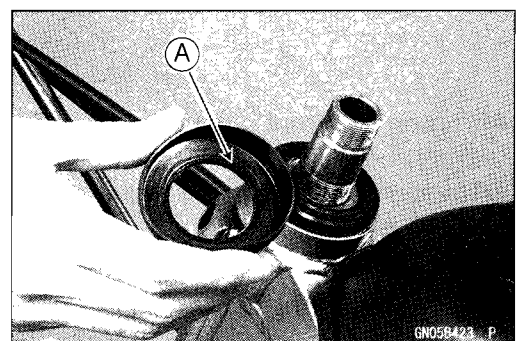
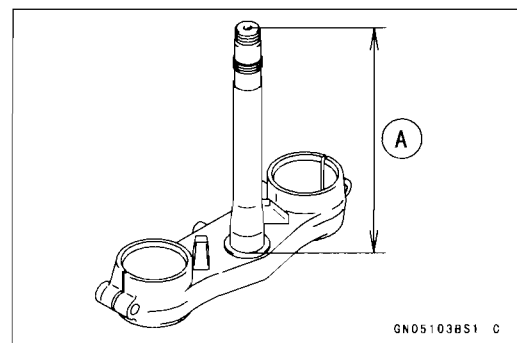
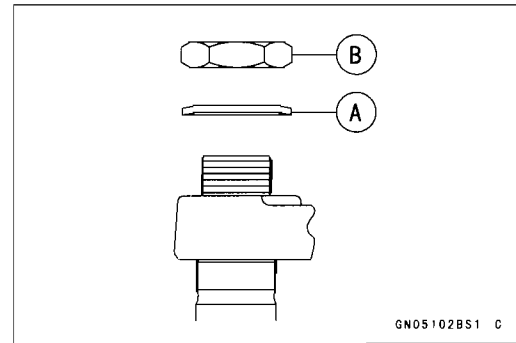
- Refer to the Steering Stem Bearing Lubrication in the Periodic Maintenance chapter.

### Steering Stem Warp

- Whenever the steering stem is removed, or if the steering cannot be adjusted for smooth action, check the steering stem for straightness.
- ★ If the steering stem [A] is bent, replace the steering stem.

### Stem Cap Deterioration, Damage

- ★ Replace the stem cap if its oil seal [A] shows damage.



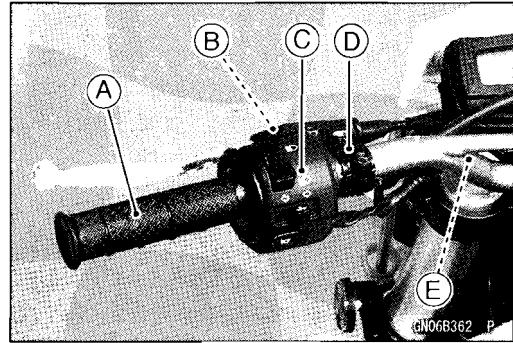


## 14-10 STEERING

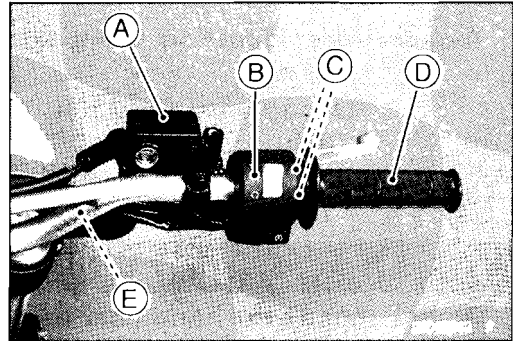
### Handlebar

#### Handlebar Removal

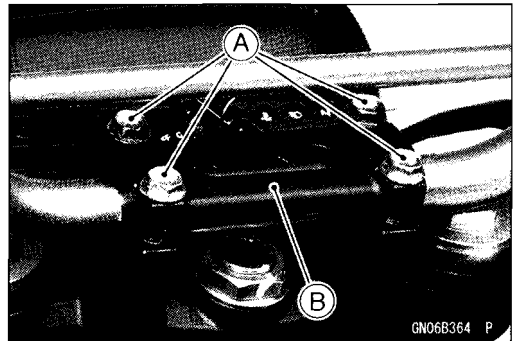
- Remove:
  - Left Handlebar Grip [A]
  - Clutch Cable Upper End [B] (see Clutch Cable Removal in the Clutch chapter)
  - Left Switch Housing [C]
  - Clutch Lever Assembly [D]
  - Clamp [E]



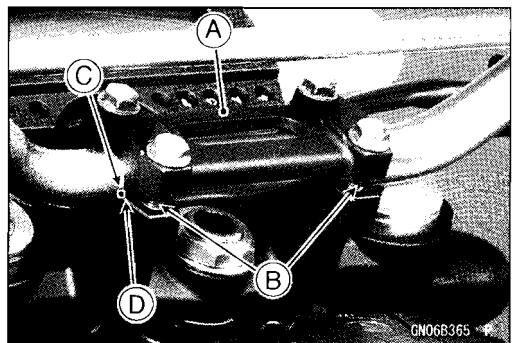
- Remove:
  - Front Brake Master Cylinder [A] (see Front Master Cylinder Removal in the Brakes chapter)
  - Right Switch Housing [B]
  - Throttle Cable Upper Ends [C] (see Throttle Cable Removal in the Fuel System chapter)
  - Throttle Grip [D]
  - Clamp [E]



- Remove:
  - Handlebar Clamp Bolts [A]
  - Handlebar Clamp [B]
  - Handlebar

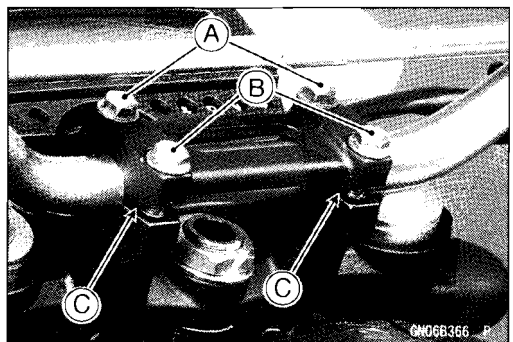


- Install the handlebar clamp [A] so that the notch side [B] faces backward.
- Align the punch mark [C] on the handlebar and corner edge [D] on the stem head.



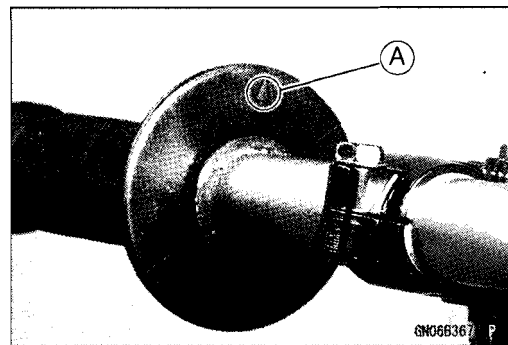
- Tighten the front clamp bolts [A] first, and then the rear clamp bolts [B].
- There will be a gap [C] at the rear part of the handlebar clamp after tightening.

**Torque - Handlebar Clamp Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)**



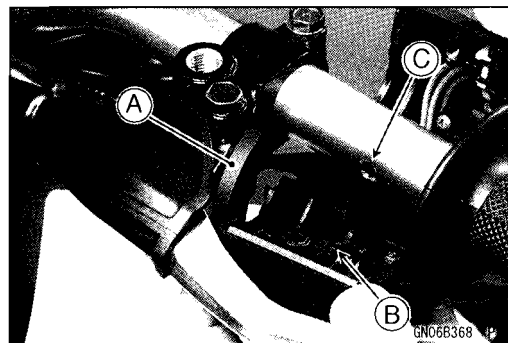
## Handlebar

- Install the clutch lever (see Clutch Lever Installation in the Clutch chapter).
- Apply adhesive to the inside of the left handlebar grip.
- Install the left handlebar grip until its end hit the handlebar end and up mark [A] faces upward.



- Install the left switch housing.
  - Fit the spacer [A] into the groove on the front half of the left switch housing.
  - Run the left switch housing lead into the clamp of the handlebar correctly (see Cable, Wire, and Hose Routing section in the Appendix chapter).
  - Fit the projection [B] into a small hole [C] in the handlebar.

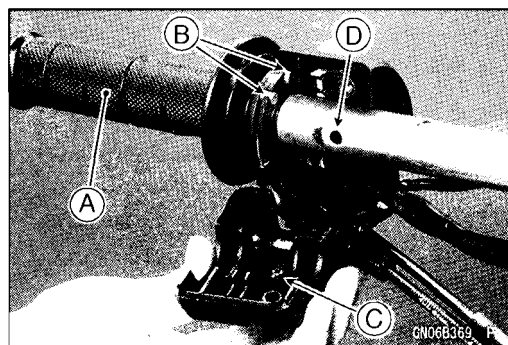
**Torque - Left Switch Housing Screws: 3.5 N·m (0.36 kgf·m, 31 in·lb)**



- Install:
  - Throttle Grip [A]
  - Throttle Cable Tips [B]
  - Right Switch Housing
- Fit the projection [C] into a small hole [D] in the handlebar.

**Torque - Right Switch Housing Screws: 3.5 N·m (0.36 kgf·m, 31 in·lb)**

- Install the front brake master cylinder (see Front Master Cylinder Installation in the Brakes chapter).



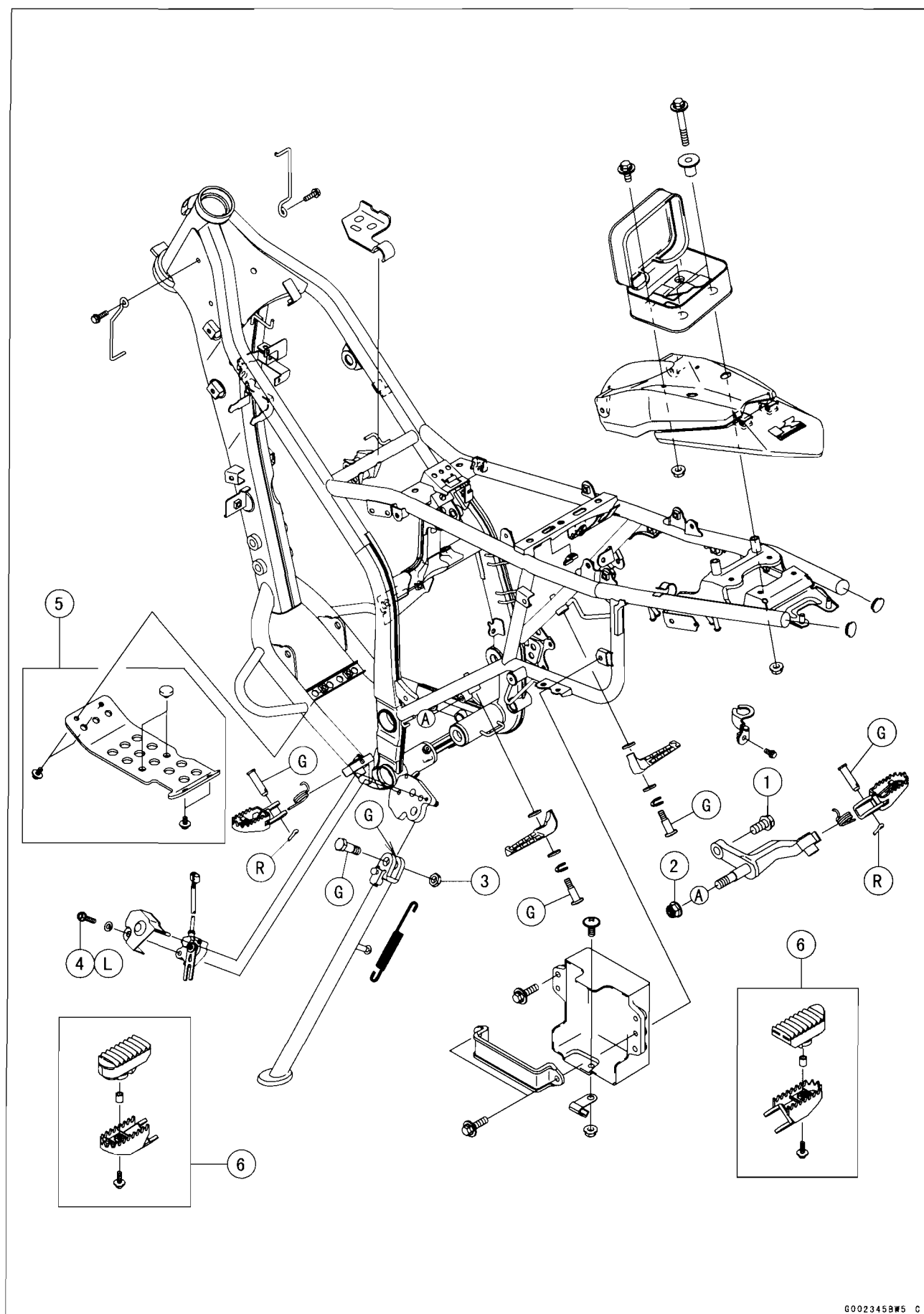
# Frame

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## 15-2 FRAME

### Exploded View



G002345BWS C

**Exploded View**

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Front Footpeg Bracket Bolt	39	4.0	29	
2	Front Footpeg Bracket Nut	39	4.0	29	
3	Sidestand Nut	44	4.5	33	
4	Sidestand Switch Mounting Bolt	8.8	0.90	78 in·lb	L

5. KLX250T

6. KLX250W

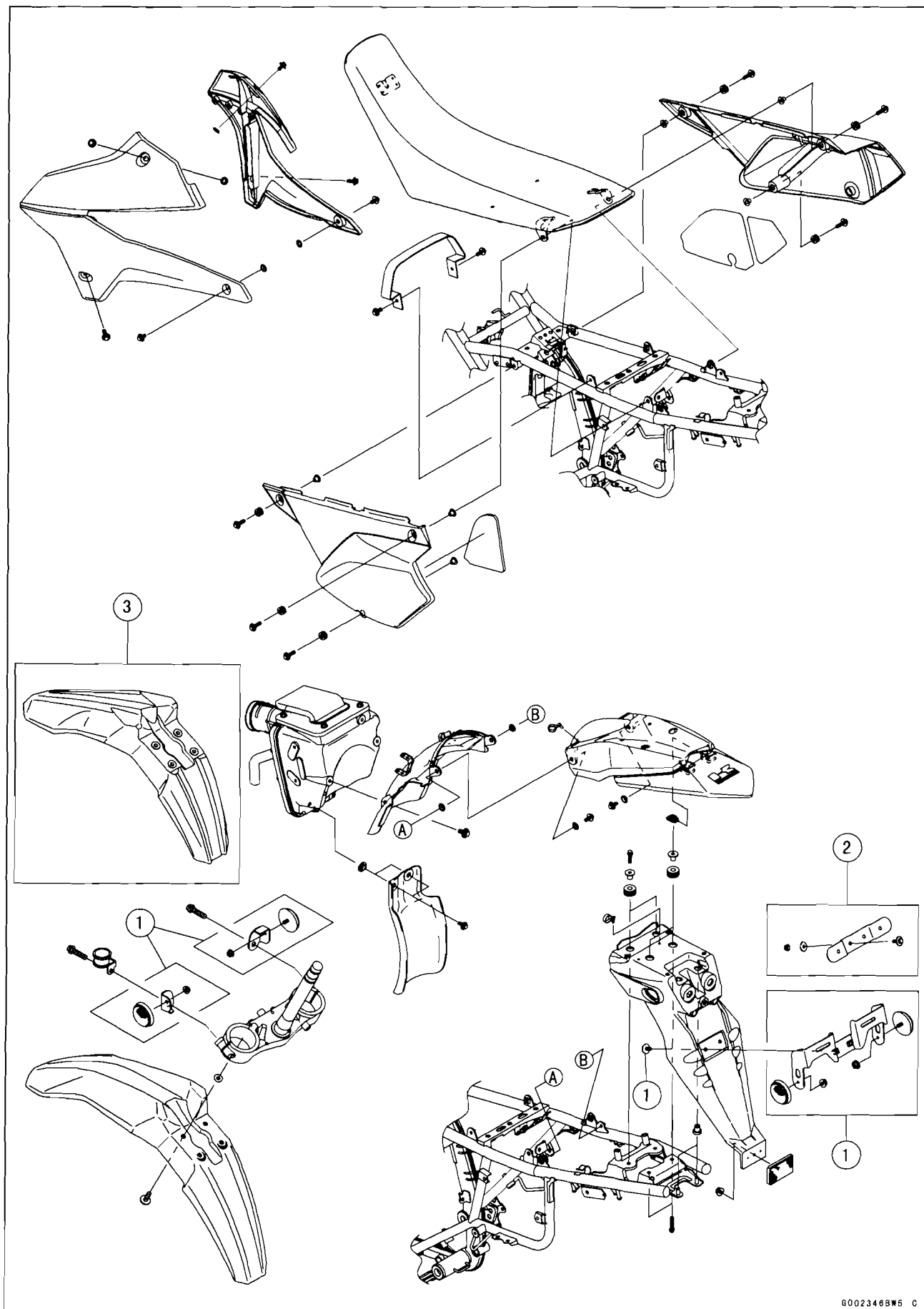
G: Apply grease.

L: Apply a non-permanent locking agent.

R: Replacement Parts

# 15-4 FRAME

## Exploded View



1. other than AU Model

3. KLX250W

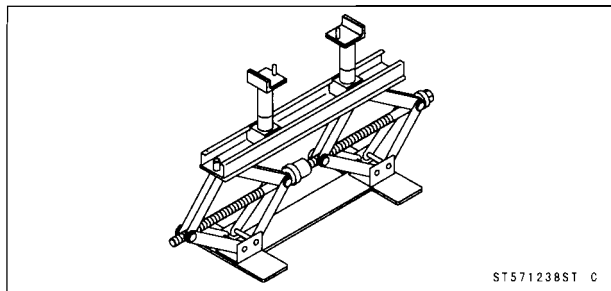
2. AU Model

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**Special Tool**

---

**Jack:**  
**57001-1238**



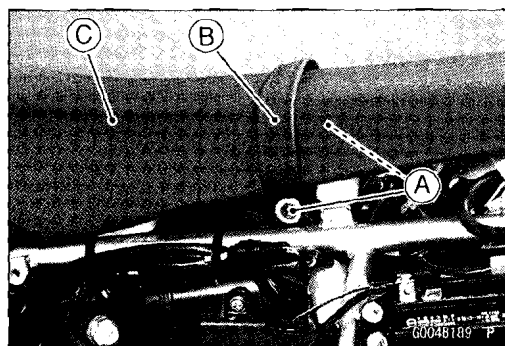


## 15-6 FRAME

### Seat

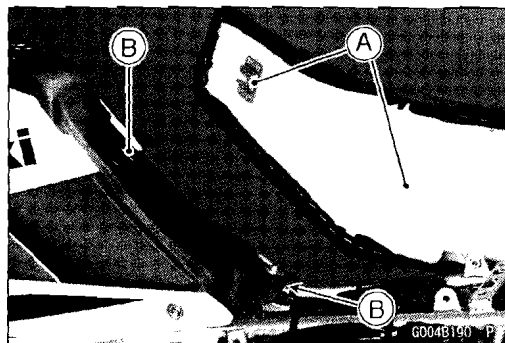
#### **Seat Removal**

- Remove:
  - Left and Right Side Covers (see Side Cover Removal)
  - Bolts [A]
  - Tandem Belt [B]
- Pull the seat [C] backward to remove the seat.



#### **Seat Installation**

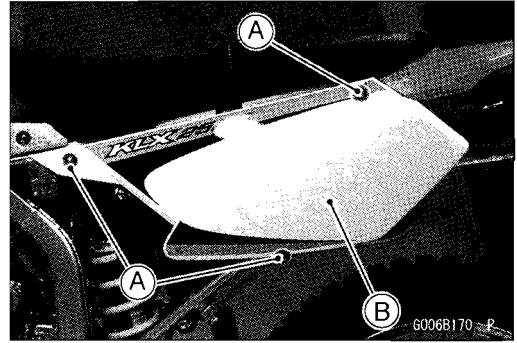
- Insert the seat hooks [A] into the stoppers [B] of the fuel tank and the frame.



## Side Cover

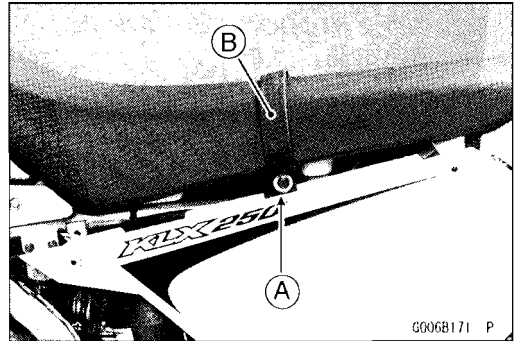
### **Side Cover Removal**

- Remove:
  - Bolts [A]
  - Side Cover [B]



### **Side Cover Installation**

- Fit the notch [A] of the side cover to the tandem belt [B] lower side, and tighten the mounting bolts.



## 15-8 FRAME

### Radiator Shroud

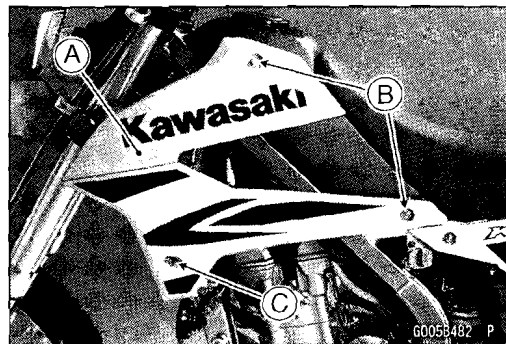
#### *Radiator Shroud Removal*

- Remove:
  - Bolts [A]
  - Radiator Shroud [B]



#### *Radiator Shroud Installation*

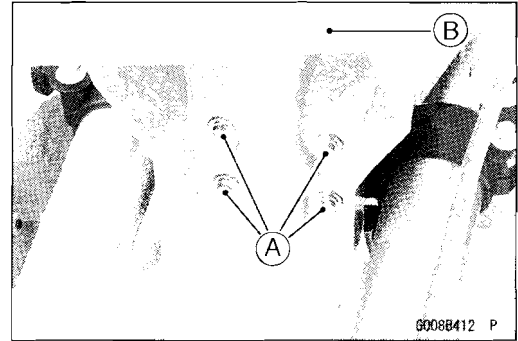
- Install:
  - Radiator Shroud [A]
  - Bolts (L = 12) [B]
  - Bolt (L = 20) [C]



## Fender

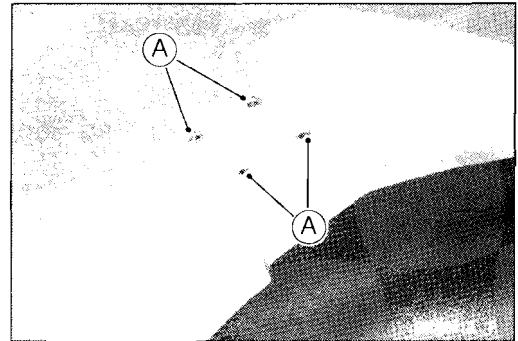
### Front Fender Removal

- Remove:
  - Bolts [A]
  - Front Fender [B]



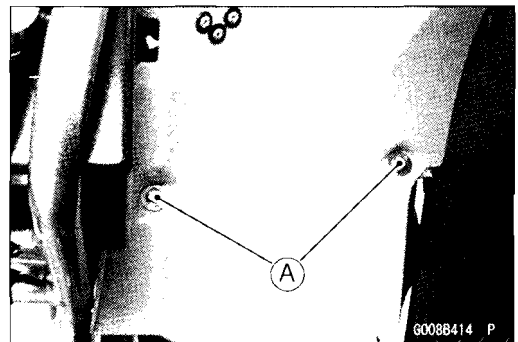
### Front Fender Installation

- Installation is the reverse of removal.
- Be sure to install the collars [A] to the front fender.

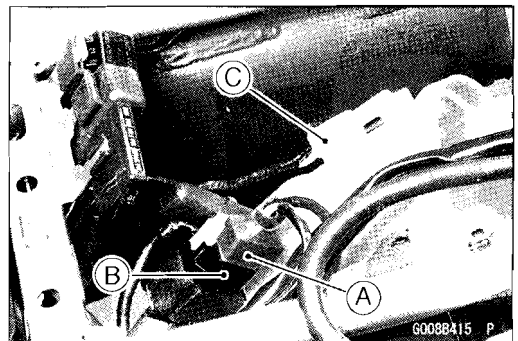


### Rear Fender Front Removal

- Remove:
  - Rear Fender Rear (see Rear Fender Rear Removal)
  - Bolts [A]
- While bending the rear fender front, push down it.



- Disconnect the starter relay connector [A].
- Remove:
  - Starter Relay [B] (see Starter Relay Removal in the Electrical System chapter)
  - Interlock Diode Unit [C]



### Rear Fender Front Installation

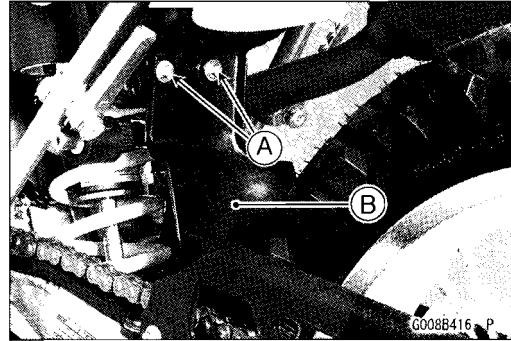
- Installation is reverse of removal.

## 15-10 FRAME

### Fender

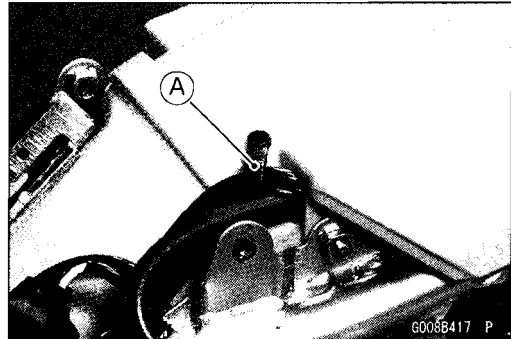
#### **Rear Fender Flap Front Removal**

- Remove:
  - Bolts [A]
- Remove the rear fender flap front [B] from the air cleaner housing.

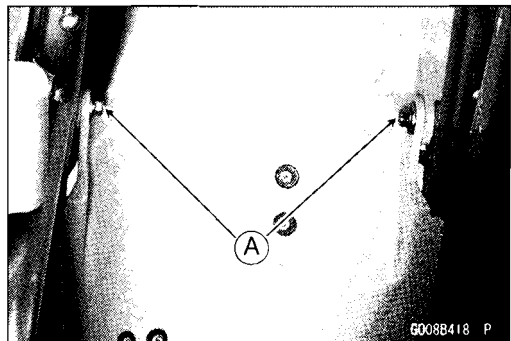


#### **Rear Fender Rear Removal**

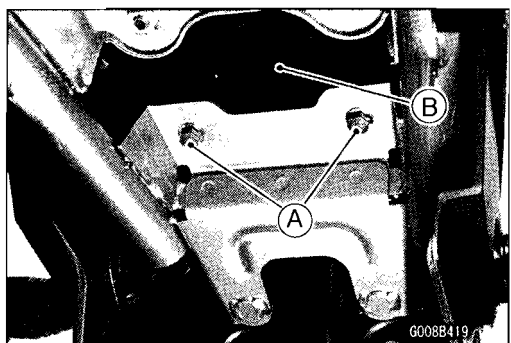
- Remove:
  - Seat (see Seat Removal)
  - Tool Kit Bag (see Tool Kit Bag Removal)
- Open the clamp [A].



- Remove:
  - Bolts [A]

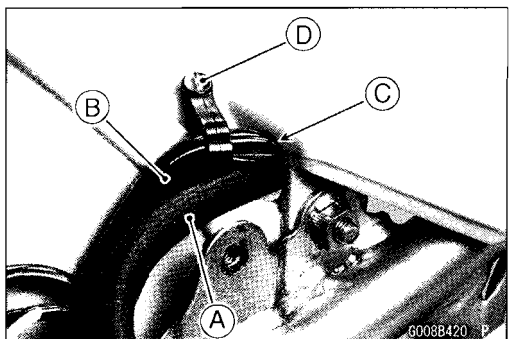


- Remove:
  - Bolts [A]
  - Rear Fender Rear [B]



#### **Rear Fender Rear Installation**

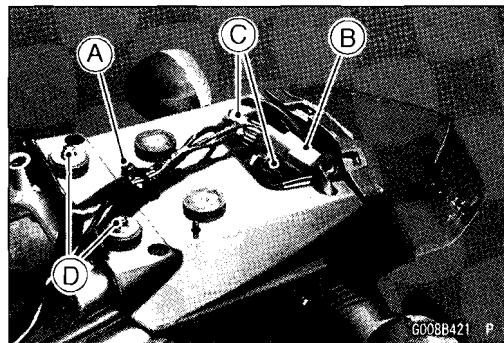
- Installation is the reverse of removal.
- Be sure to run the coolant overflow hose [A] and tail/rear brake light lead [B] to the notch [C] on the rear fender rear.
- Install the clamp [D] to hold the tail/rear brake light lead.



## Fender

### ***Rear Fender Flap Rear Removal***

- Remove:
  - Rear Fender Rear (see Rear Fender Rear Removal)
  - Clamp [A]
- Disconnect:
  - Tail/Brake Light Connector [B]
  - Turn Signal Light Connectors [C]
- Remove the mounting bolts [D], then remove the rear fender flap rear together with the tail/brake light and turn signal lights installed.



## 15-12 FRAME

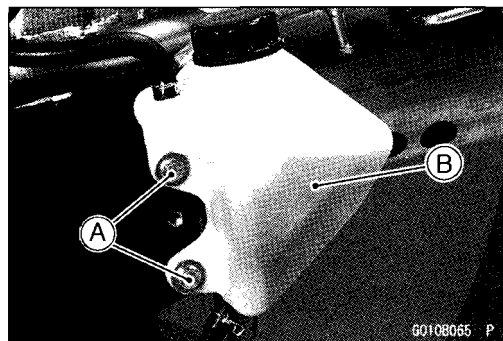
### Battery Case

#### Battery Case Removal

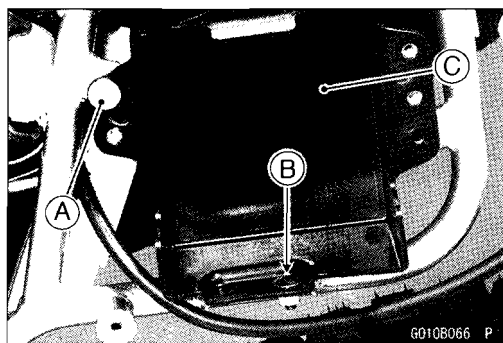
- Remove:
  - Battery (see Battery Removal in the Electrical System chapter)
  - Bolts [A]
  - Reserve Tank [B]

#### CAUTION

Make sure that the reserve tank will not be put upside down, or the coolant may leak from the overflow hose.

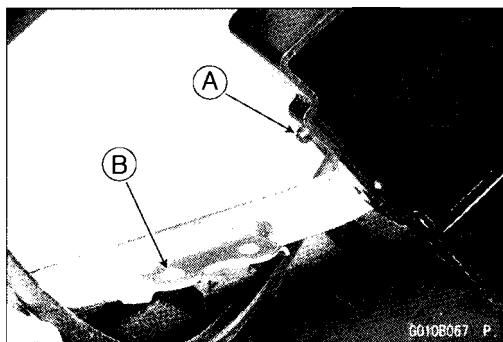


- Remove:
  - Bolt [A]
  - Screw [B]
  - Battery Case [C]



#### Battery Case Installation

- Install the battery case so that the projection [A] of the battery case bottom fit hole [B] of the frame.





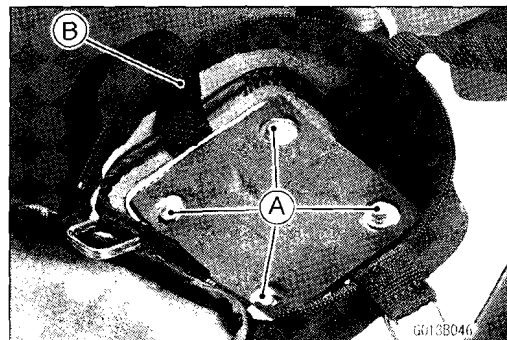
## Tool Kit Bag

### Tool Kit Bag Removal

#### NOTE

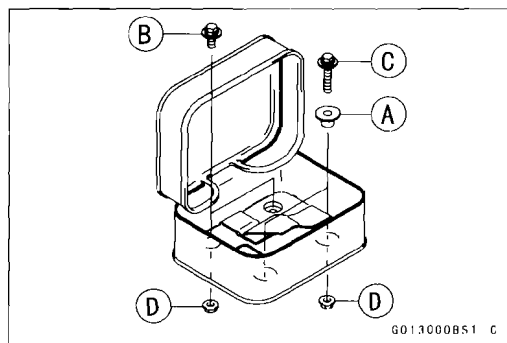
○Before washing the motorcycle, empty the tool kit bag.

- Remove:  
Bolts [A], Nuts and Collars  
Tool Kit Bag [B]



### Tool Kit Bag Installation

- Insert the collar [A] into the larger hole.
- Install the tool kit bag on the rear fender rear with the short bolts [B] in the front side, the long bolts [C] in the rear side and nuts [D].



## 15-14 FRAME

### Sidestand

#### Sidestand Removal

- Raise the rear wheel off the ground with the jack.

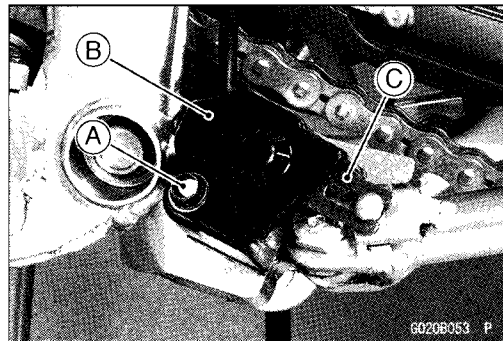
**Special Tool - Jack: 57001-1238**

- Remove:

Sidestand Switch Mounting Bolt [A]

Sidestand Switch Cover [B]

Sidestand Switch [C]



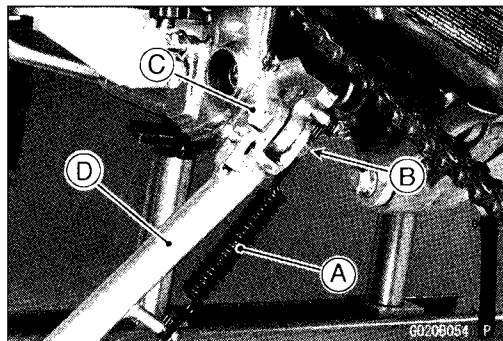
- Remove:

Spring [A]

Sidestand Nut [B]

Sidestand Bolt [C]

Sidestand [D]



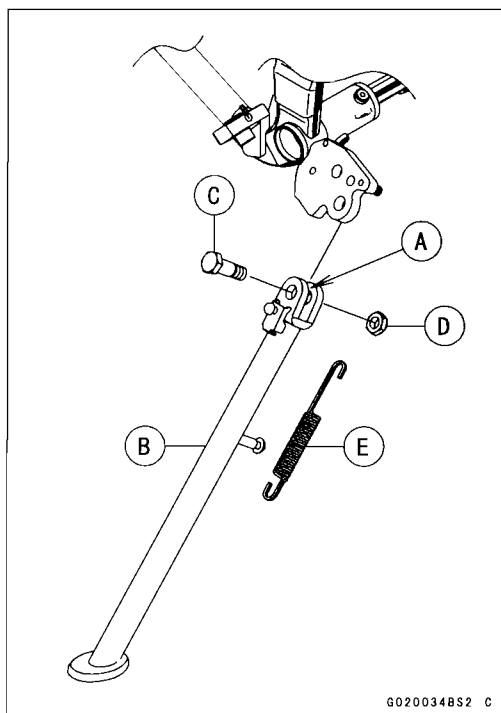
#### Sidestand Installation

- Apply grease to the sliding area [A] of the sidestand [B] and sidestand bolt [C].

- Tighten:

**Torque - Sidestand Nut [D]: 44 N·m (4.5 kgf·m, 32 ft·lb)**

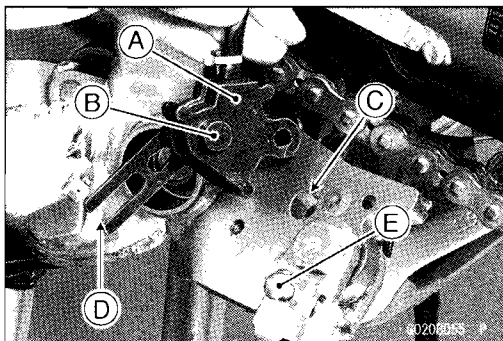
- Hook the spring [E] so that face the long spring end upward and spring ends direction as shown.



- Install the sidestand switch [A] as follows.

○ Insert the projection [B] into the hole [C].

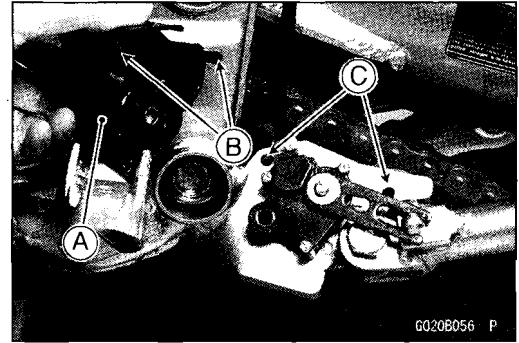
○ Fit the slit [D] to the projection [E].



## Sidestand

- Install the sidestand switch cover [A] as follows.
- Insert the projections [B] into the holes [C].
- Apply a non-permanent locking agent to the threads of the sidestand switch mounting bolt, and tighten it.

**Torque - Sidestand Switch Mounting Bolt:** 8.8 N·m (0.90 kgf·m, 78 in·lb)



## 15-16 FRAME

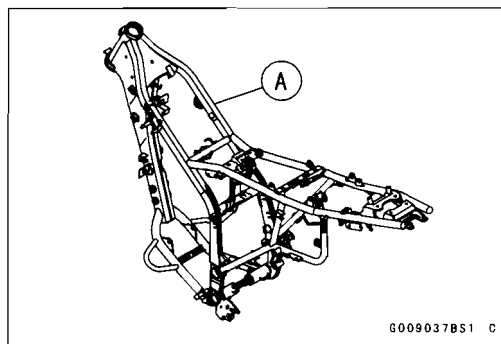
### Frame

#### **Frame Inspection**

- Visually inspect the frame [A] for cracks, dents, bending, or warping.
- ★ If there is any damage to the frame, replace it.

#### **⚠ WARNING**

A repaired frame may fail in use, possibly causing an accident. If the frame is cracked, dented, bent, or warped, replace it.



# Electrical System

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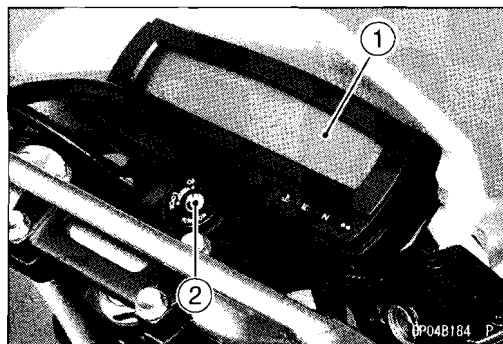
## 16-2 ELECTRICAL SYSTEM

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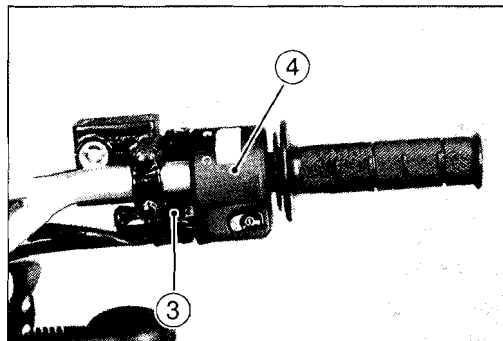
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## Parts Location

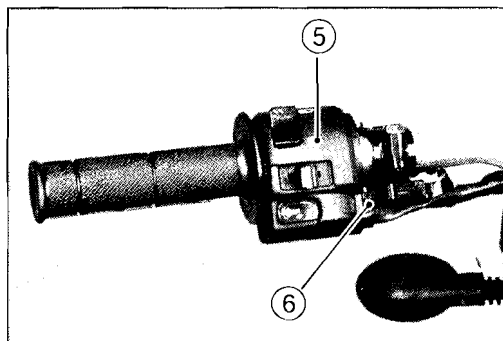
1. Meter Unit
2. Ignition Switch



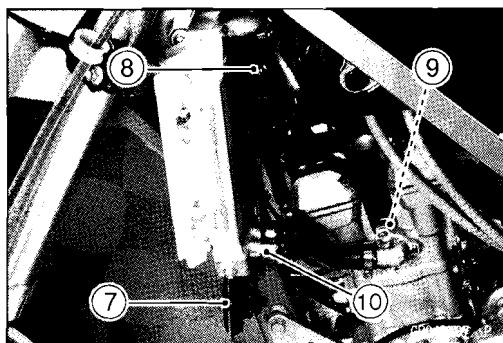
3. Front Brake Light Switch
4. Right Handlebar Switch



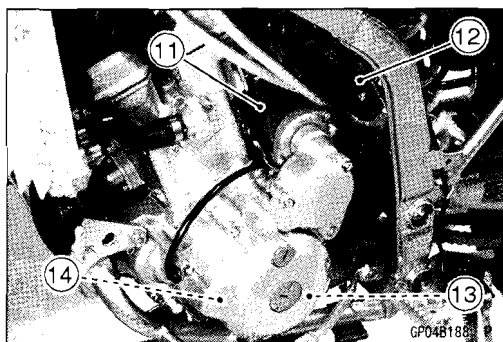
5. Left Handlebar Switch
6. Starter Lockout Switch



7. Horn
8. Ignition Coil
9. Spark Plug
10. Water Temperature Warning Light Switch



11. Starter Motor
12. Regulator/Rectifier
13. Alternator
14. Crankshaft Sensor

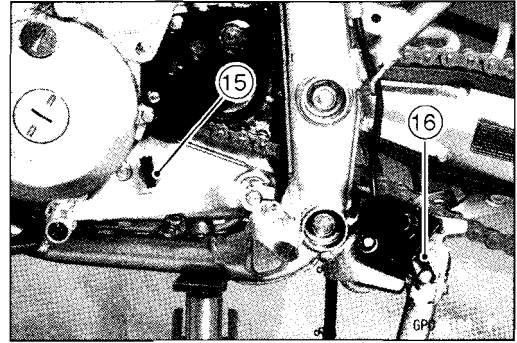




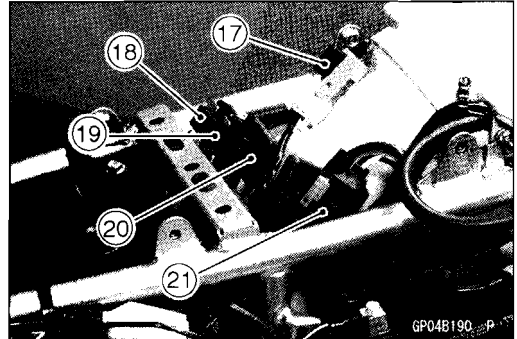
## 16-4 ELECTRICAL SYSTEM

### Parts Location

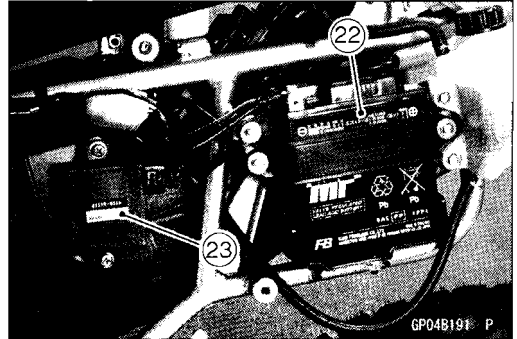
- 15. Neutral Switch
- 16. Sidestand Switch



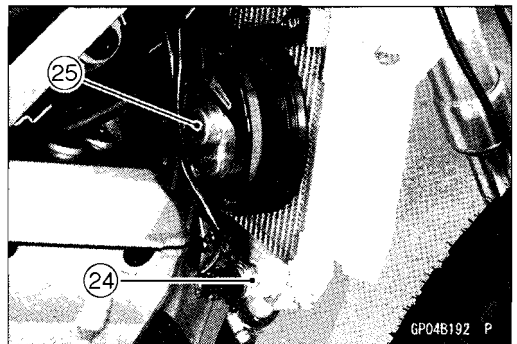
- 17. Interlock Diode Unit
- 18. Turn Signal Relay
- 19. Starter Circuit Relay
- 20. Fuse 10 A, Spare Fuse 10 A
- 21. Starter Relay, Main Fuse 20 A



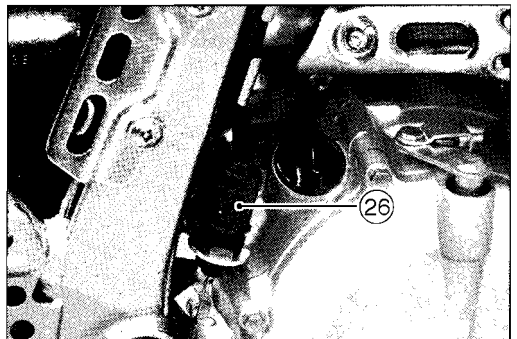
- 22. Battery 12 V 6 Ah
- 23. Igniter



- 24. Fan Switch
- 25. Fan Motor

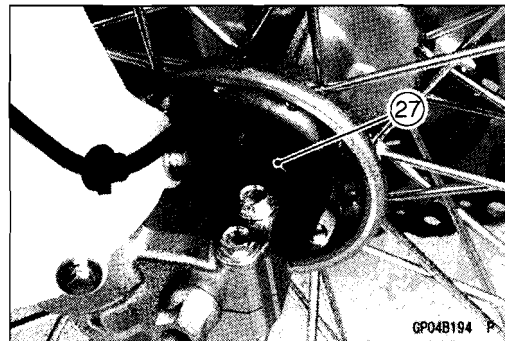


- 26. Rear Brake Light Switch



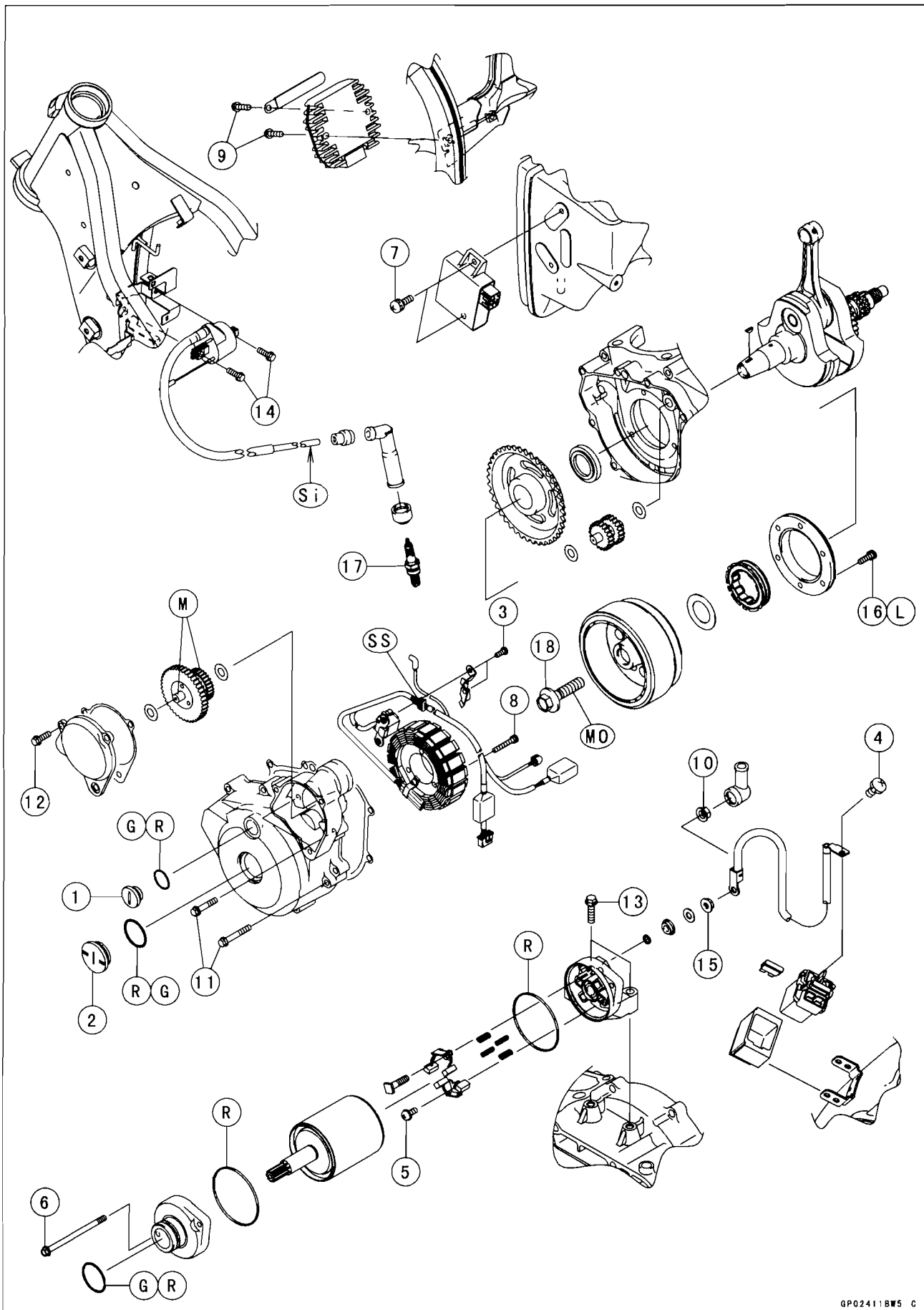
### Parts Location

27. Speed Sensor



## 16-6 ELECTRICAL SYSTEM

### Exploded View



GP02411BW5 C

**Exploded View**

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Timing Inspection Cap	2.3	0.23	20 in·lb	
2	Alternator Rotor Bolt Cap	2.3	0.23	20 in·lb	
3	Crankshaft Sensor Screws	2.4	0.24	21 in·lb	
4	Starter Relay Terminal Screws	2.4	0.24	21 in·lb	
5	Native Brush Assy Mounting Screw	3.8	0.39	34 in·lb	
6	Starter Motor Through Bolts	5.0	0.51	44 in·lb	
7	Igniter Mounting Screws	5.2	0.53	46 in·lb	
8	Stator Coil Bolts	5.9	0.60	52 in·lb	
9	Regulator/Rectifier Bolts	9.8	1.0	87 in·lb	
10	Starter Motor Cable Terminal Nut	9.8	1.0	87 in·lb	
11	Alternator Cover Bolts	9.8	1.0	87 in·lb	
12	Torque Limiter Cover Bolts	9.8	1.0	87 in·lb	
13	Starter Motor Mounting Bolts	9.8	1.0	87 in·lb	
14	Ignition Coil Mounting Bolts	9.8	1.0	87 in·lb	
15	Starter Motor Terminal Locknut	11	1.1	97 in·lb	
16	Starter Motor Clutch Bolts	12	1.2	106 in·lb	L
17	Spark Plug	13	1.3	115 in·lb	
18	Alternator Rotor Bolt	120	12.2	88.5	

G: Apply grease.

L: Apply a non-permanent locking agent.

M: Apply molybdenum disulfide grease.

MO: Apply molybdenum disulfide oil (mixture of engine oil and molybdenum disulfide grease in a weight ration is 10 : 1).

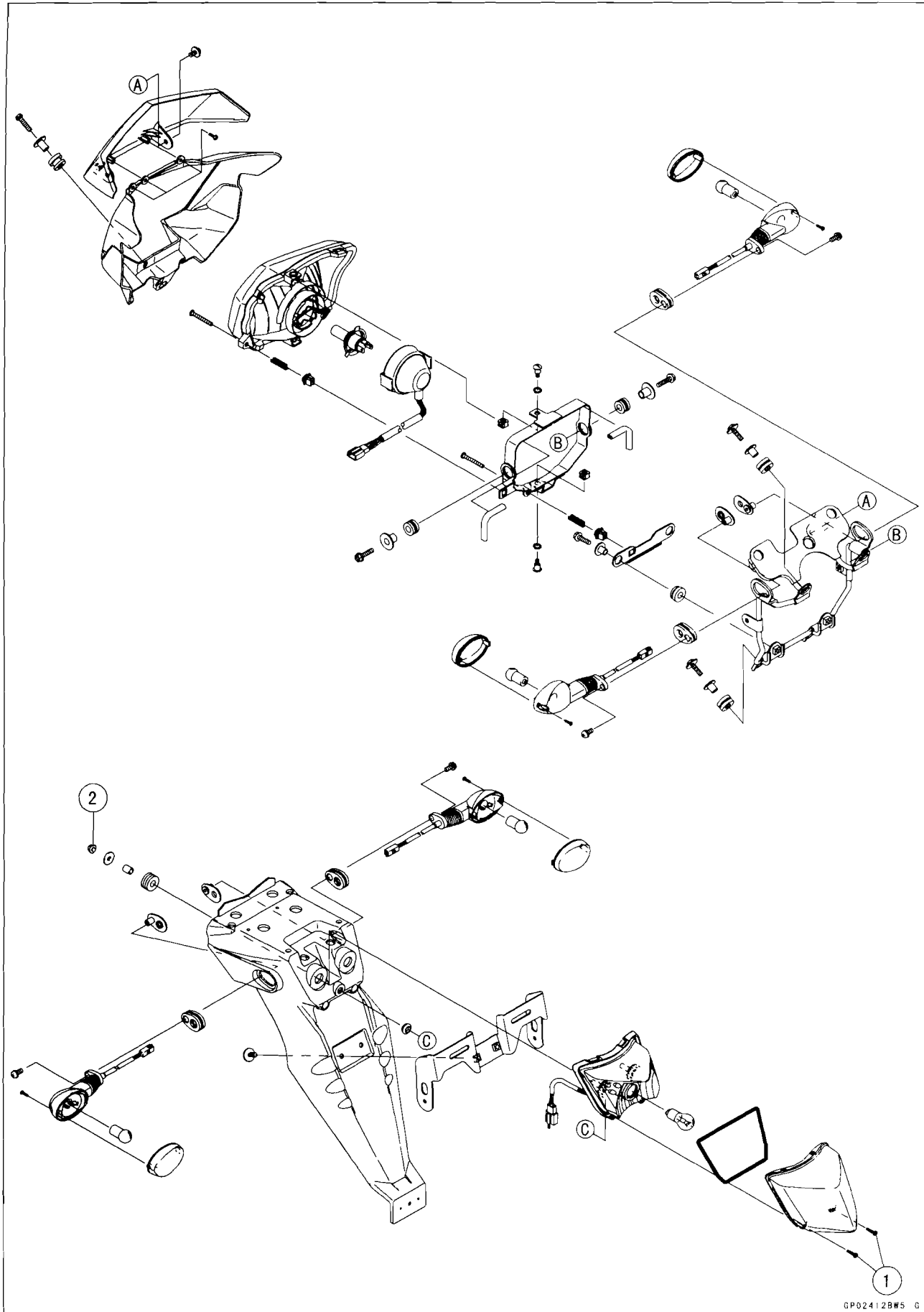
R: Replacement Parts

Si: Apply silicone grease (ex. PBC grease).

SS: Apply silicone sealant.

## 16-8 ELECTRICAL SYSTEM

### Exploded View



**Exploded View**

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Tail/Brake Light Lens Screws	1.0	0.10	8.8 in·lb	
2	Tail/Brake Light Mounting Nuts	5.9	0.60	52 in·lb	

### Exploded View





**Exploded View**

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Left Switch Housing Screws	3.5	0.36	31 in·lb	
2	Right Switch Housing Screws	3.5	0.36	31 in·lb	
3	Sidestand Switch Mounting Bolt	8.8	0.90	78 in·lb	L
4	Front Brake Light Switch Mounting Screw	1.2	0.12	11 in·lb	
5	Neutral Switch	14.7	1.5	130 in·lb	G
6	Radiator Fan Switch	23.5	2.4	17	SS
7	Water Temperature Warning Liht Switch	7.5	0.76	66 in·lb	SS

8. Starter Lockout Switch

9. Starter Circuit Relay

10. Interlock Diode Unit

11. Turn Signal Relay

G: Apply grease.

L: Apply a non-parmanent locking agent.

R: Replacement Parts

SS: Apply silicone sealant.

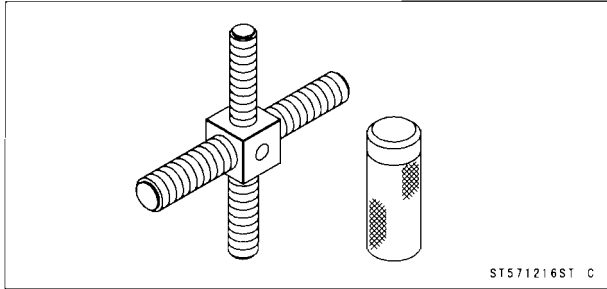
# 16-12 ELECTRICAL SYSTEM

## Specifications

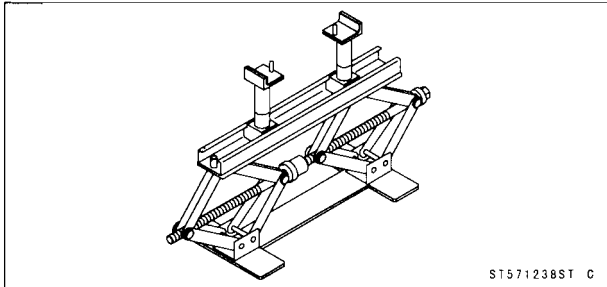
Fastener	Standard
<b>Battery</b>	
Type	Sealed battery
Model Name	FTX7L-BS
Capacity	12 V 6 Ah
Voltage	12.6 V or more
<b>Charging System</b>	
Type	Three-phase AC
Charging Voltage (Regulator/Rectifier Output Voltage)	14.2 ~ 15.2 V
Alternator output voltage (no load)	41 V or more @4 000 r/min (rpm)
Stator Coil Resistance	0.3 ~ 1.0 $\Omega$
Regulator/Rectifier Resistance:	see text
<b>Ignition System</b>	
Ignition Coil:	
3 Needle Arcing Distance	6 mm (0.24 in.) or more
Primary Winding Resistance	0.17 ~ 0.23 $\Omega$ @20°C (68°F)
Secondary Winding Resistance	5.0 ~ 7.6 k $\Omega$ @20°C (68°F)
Primary Peak Voltage	110 V or more
Spark Plug:	
Type	NGK CR8E or UD U24ESR-N
Spark Plug Gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)
Spark Plug Cap Resistance	3.75 ~ 6.25 k $\Omega$
Crankshaft Sensor:	
Crankshaft Sensor Resistance	Approx. 240 $\Omega$ @20°C (68°F)
Crankshaft Sensor Peak Voltage	1.5 V or more
<b>Electrical Starter System</b>	
Starter Motor:	
Brush Length	12 mm (0.47 in.) (Service Limit: 6.5 mm (0.26 in.))
<b>Switch and Sensor</b>	
Rear Break Light Switch Timing	On after about 10 mm (0.39 in.) pedal travel
Radiator Fan Switch Resistance:	
Rising Temperature	OFF to ON: 95 ~ 101°C (203 ~ 214°F)
Falling Temperature	ON to OFF: 87°C (189°F) or less
	In ON position: 0.5 $\Omega$ or less
	In OFF position: 1 M $\Omega$ or more
Water Temperature Warning Light Switch:	
Rising Temperature	OFF to ON: 107 ~ 113°C (225 ~ 235°F)
Falling Temperature	ON to OFF: 103°C (217°F) or less
Resistance	In ON position: 0.5 $\Omega$ or less
	In OFF position: 1 M $\Omega$ or more

## Special Tools and Sealant

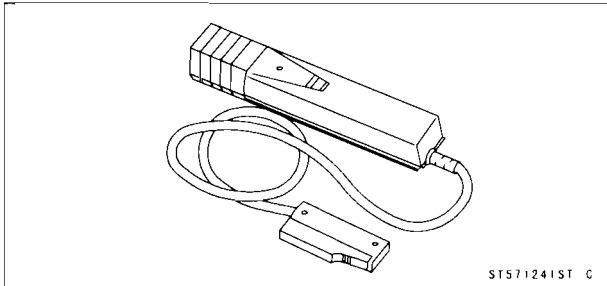
**Rotor Puller M16/M18/M20/M22 × 1.5 :**  
57001-1216



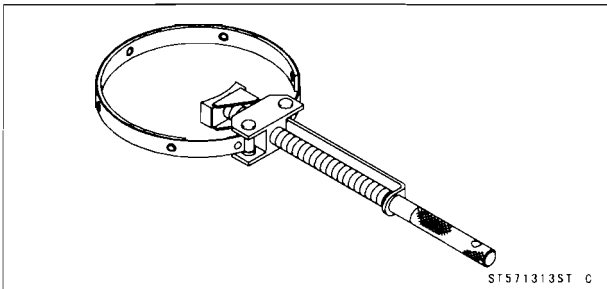
**Jack:**  
57001-1238



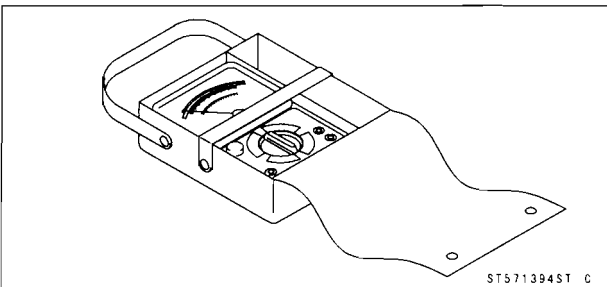
**Timing Light:**  
57001-1241



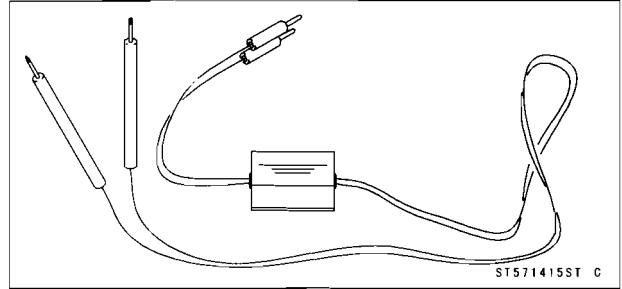
**Flywheel Holder:**  
57001-1313



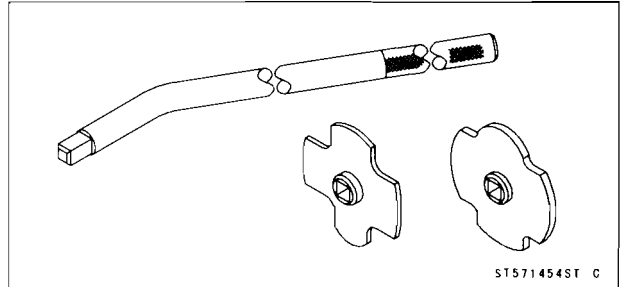
**Hand Taster:**  
57001-1394



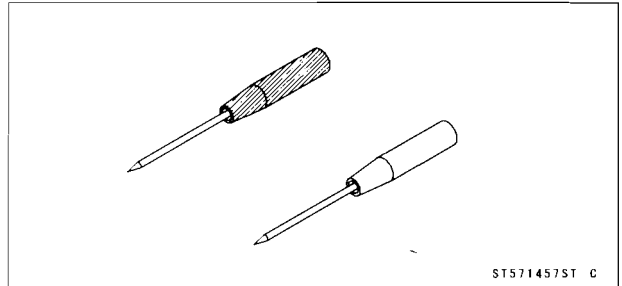
**Peak Voltage Adapter:**  
57001-1415



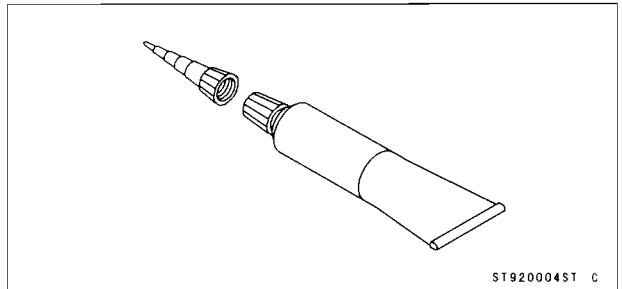
**Filler Cap Driver:**  
57001-1454



**Needle Adapter Set:**  
57001-1457

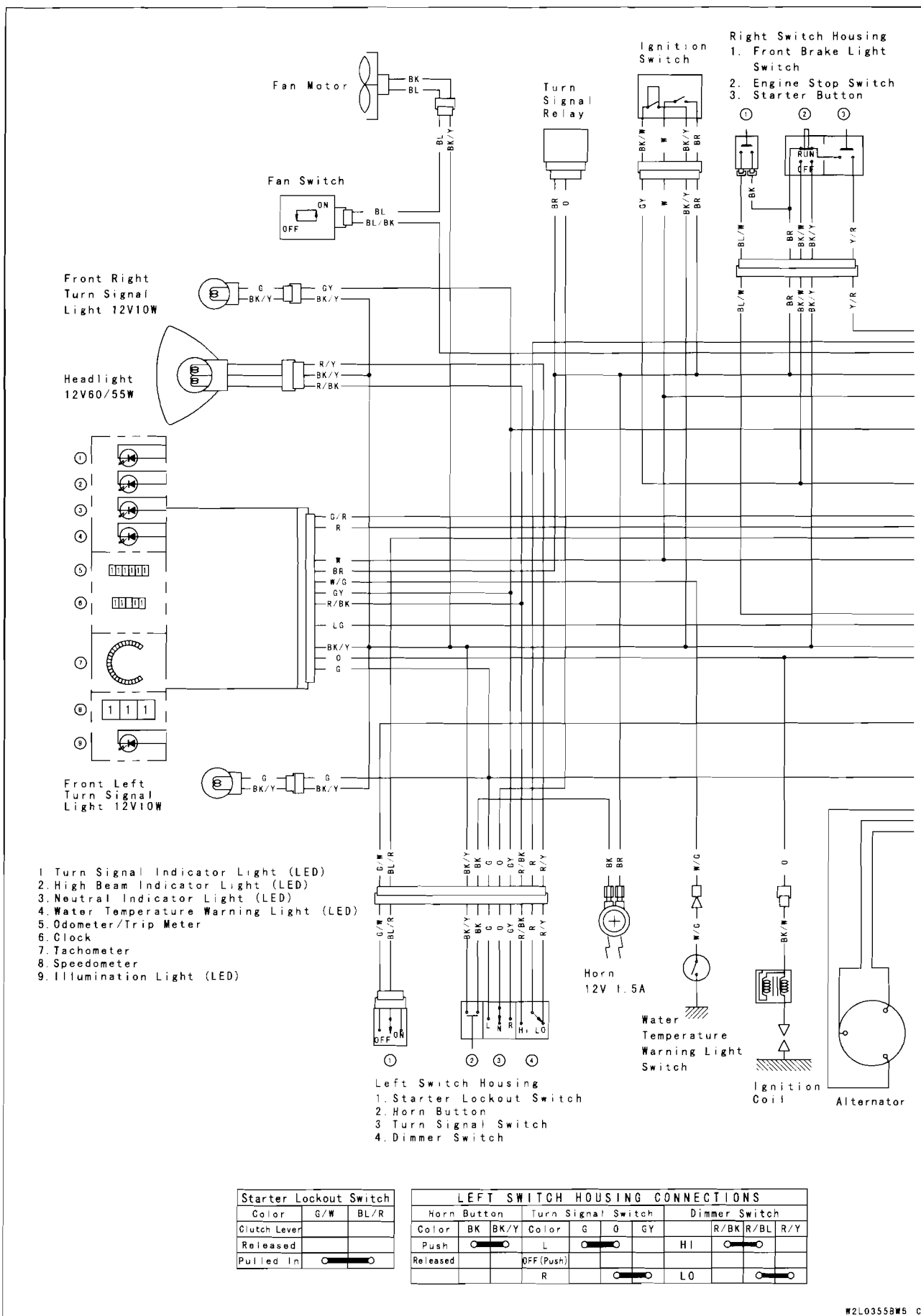


**Kawasaki Bond (Silicone Sealant):**  
92104-0004

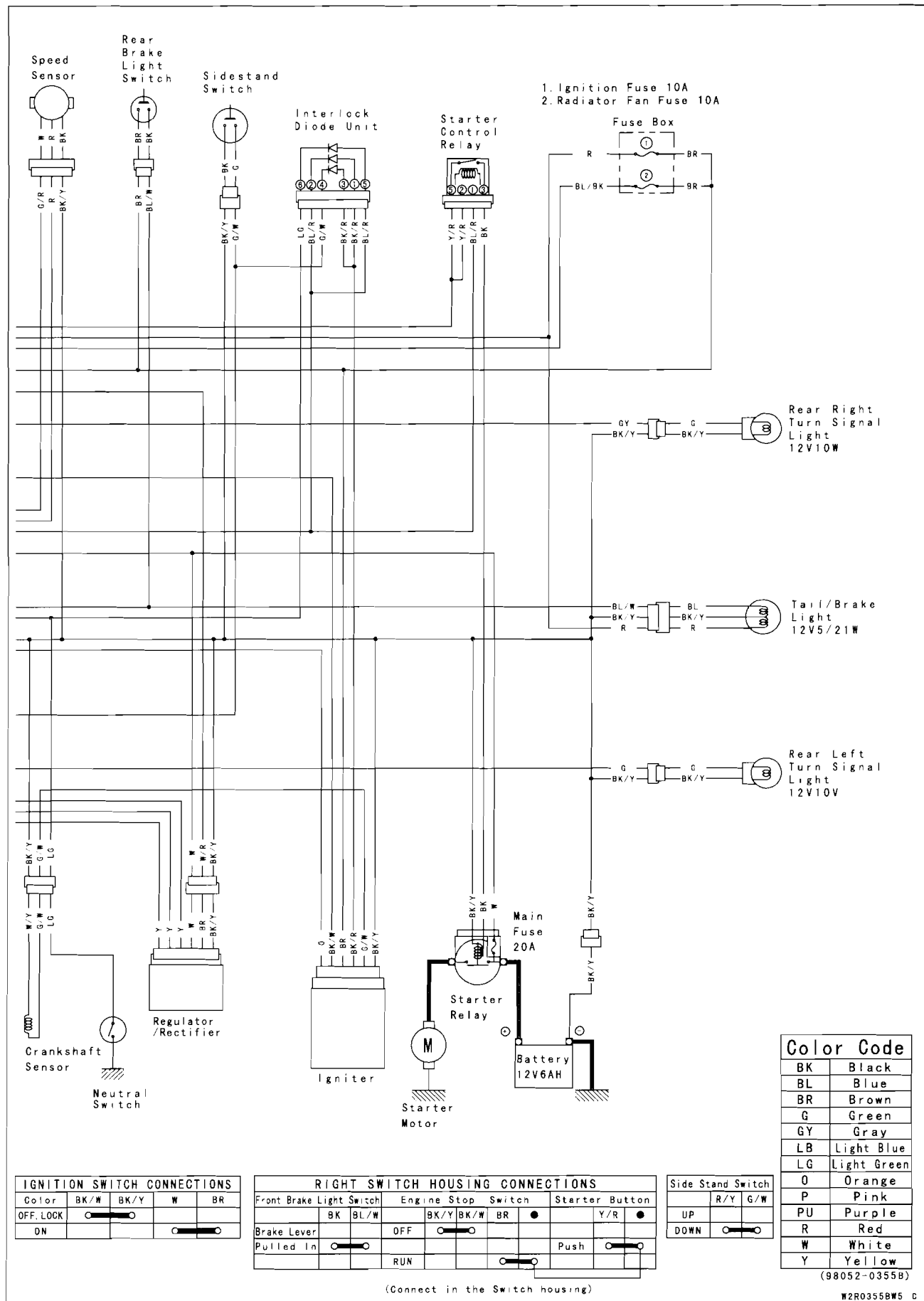


# 16-14 ELECTRICAL SYSTEM

## Wiring Diagram [KLX250T (Other than AU Model)/KLX250W]

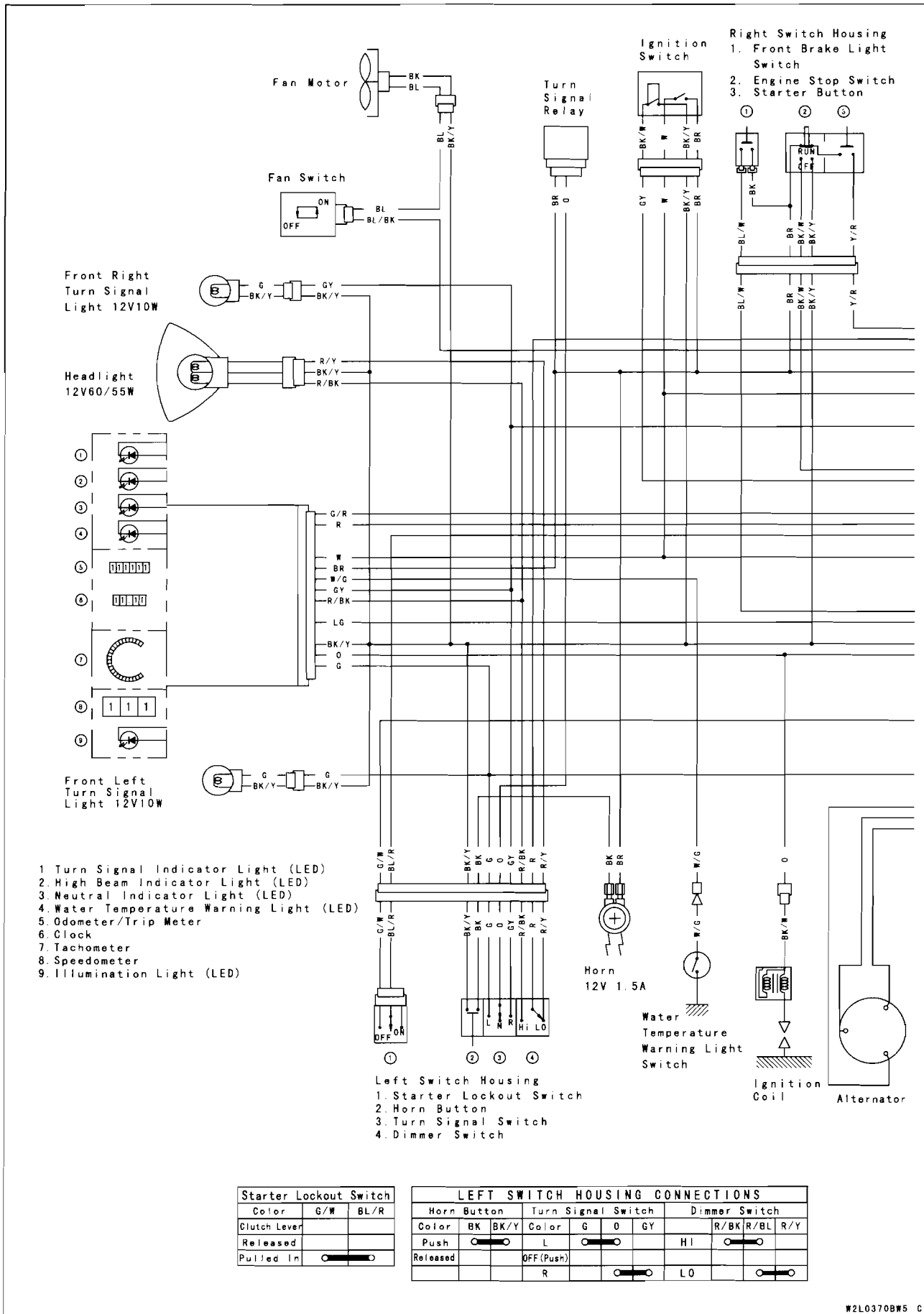


## Wiring Diagram [KLX250T (Other than AU Model)/KLX250W]

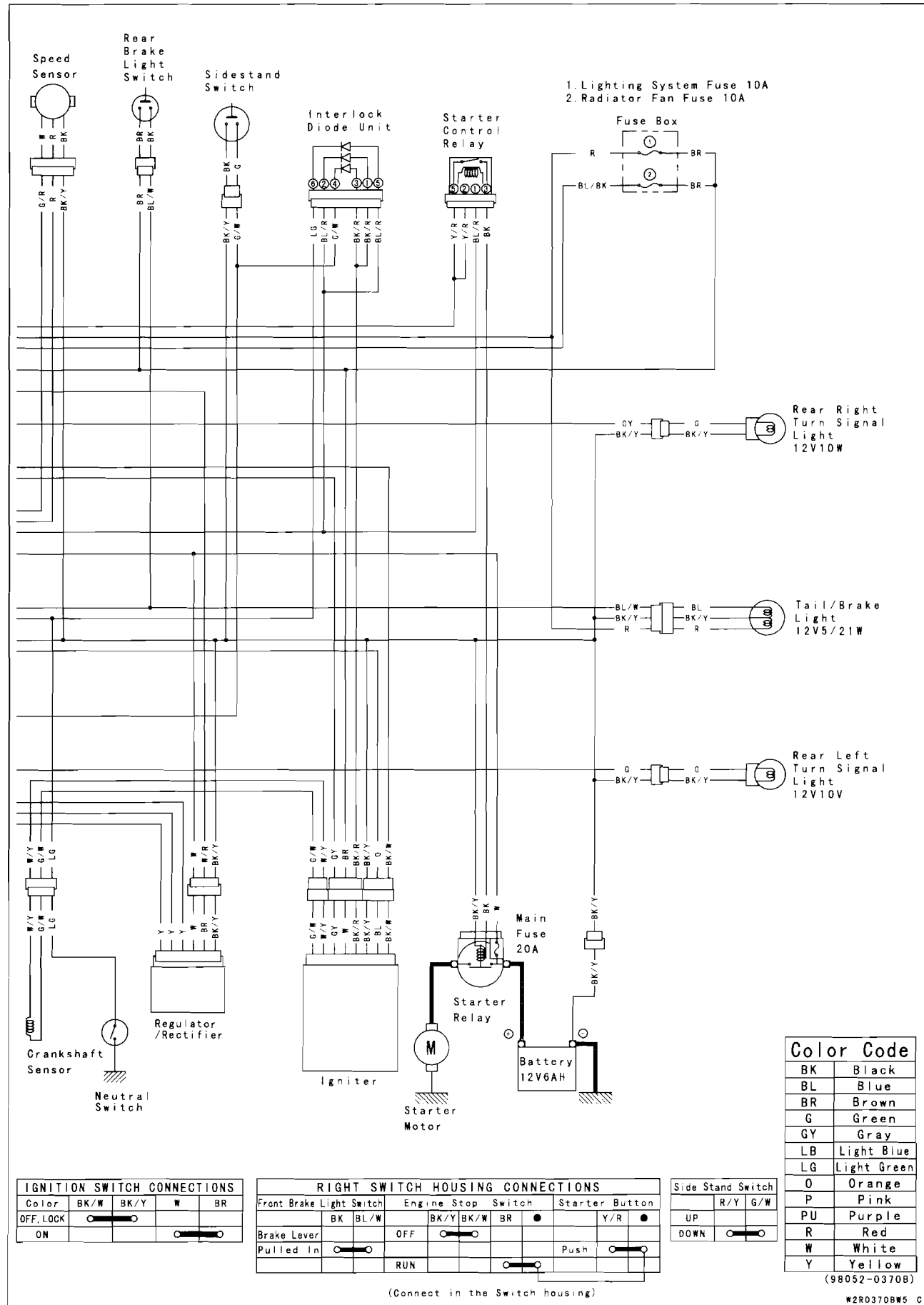


# 16-16 ELECTRICAL SYSTEM

## Wiring Diagram [KLX250T (AU Model)]



## Wiring Diagram [KLX250T (AU Model)]





## 16-18 ELECTRICAL SYSTEM

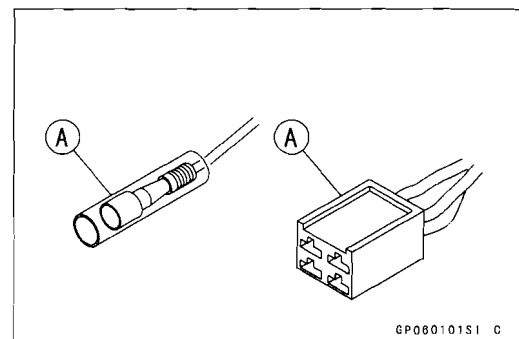
### Precautions

There are numbers of important precautions that are musts when servicing electrical systems. Learn and observe all the rules below:

- Do not reverse the battery cable 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 cables or any other electrical connections when the ignition switch is ON, or while the engine is running.
- Because of the large amount of current, never keep the starter button pushed when the starter motor will not turn over, or the current may burn out the starter motor windings.
- Take care not to short the cables 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 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 leads for signs of burning, fraying, etc. Poor leads and bad connections will affect electrical system operation.
- Measure coil and winding resistance when the part is cold (at room temperature).
- Color Code

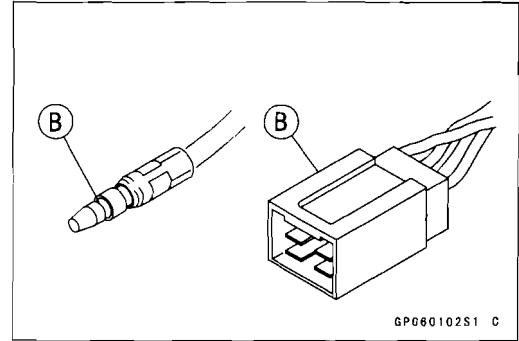
BK: Black	GY: Gray	R: Red
BL: Blue	LG: Light green	W: White
BR: Brown	O: Orange	Y: Yellow
G: Green		

- Electrical Connectors  
Connectors [A]



### Precautions

Connectors [B]



## 16-20 ELECTRICAL SYSTEM

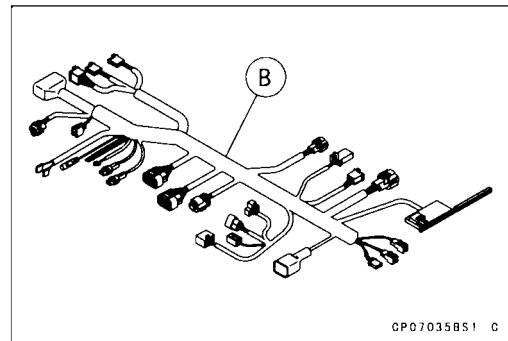
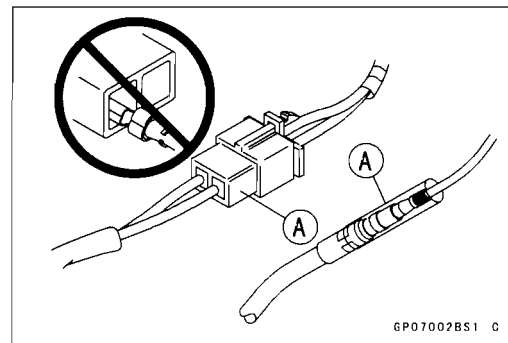
### Electrical Wiring

#### **Wiring Inspection**

- Visually inspect the wiring for signs of burning, fraying, etc.
- ★ If any wiring is poor, replace the damaged wiring.
- Pull each connector [A] apart and inspect 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 the hand tester between the ends of the leads.

#### **Special Tool - Hand Tester: 57001-1394**

- Set the tester to the  $\times 1 \Omega$  range, and read the tester.
- ★ If the tester does not read  $0 \Omega$ , the lead is defective. Replace the lead or the wiring harness [B] if necessary.



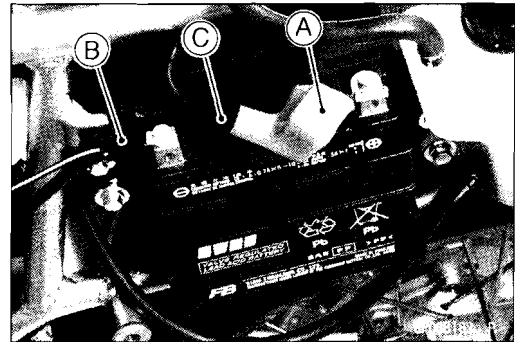
## Battery

### Battery Removal

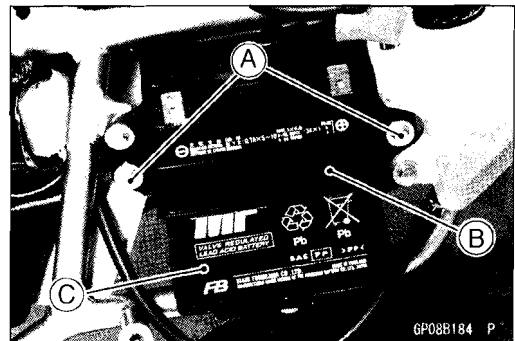
#### CAUTION

Do not disconnect the battery cables or any other electrical connections when the ignition switch is ON, as this could damage the igniter.  
Never reverse the connections of the battery, as this could damage the igniter.

- Turn the ignition switch OFF.
- Remove the left side cover (see Side Cover Removal in the Frame chapter).
- Slide the red cap [A] out.
- Disconnect the negative (–) cable [B] and then positive (+) cable [C].

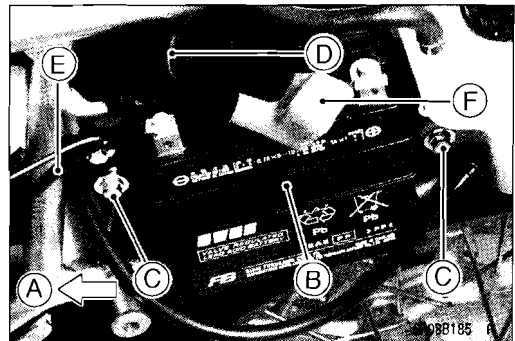


- Remove:
  - Bolts [A]
  - Battery Holder [B]
- Pull the battery [C] out of the case.
- Clean the battery using a solution of baking soda and water. Make sure that the cable connection terminals are not soiled.



### Battery Installation

- Visually inspect the surface of the battery container.
- ★ Check if there are any signs of cracking or electrolyte leakage from the sides of the battery.
- Face the (–) terminal forward [A] and put the battery into the battery case.
- Set the battery holder [B] into the battery case.
- Tighten the battery holder bolts [C] securely.



#### CAUTION

If each battery cable is not correctly disconnected or connected, sparks can arise at electrical connections, causing damage to electrical parts.

- Connect the positive (+) cable [D] (red cap) to the (+) terminal first, and then the negative (–) cable [E] to the (–) terminal.
- Apply a little grease to the terminal for rust protection.
- Cover the terminal with the red cap [F].
- Install the left side cover (see Side Cover Installation in the Frame chapter).

#### CAUTION

A failure to detach or connect the battery cables properly will cause the generation of sparks at connection terminals and resultant damages to electrical parts.

## 16-22 ELECTRICAL SYSTEM

### Battery

#### Battery Activation

##### Electrolyte Filling

- Make sure that the model name [A] of the electrolyte container matches the model name [B] of the battery. These names must be the same.

**Battery Model Name: FTX7L-BS**

#### CAUTION

Be sure to use the electrolyte container with the same model name as the battery since the electrolyte volume and specific gravity vary with the battery type. This is to prevent overfilling of the electrolyte, shorting the battery life, and deterioration of the battery performance.

#### CAUTION

Do not remove the aluminum sealing sheet [A] from the filler ports [B] until just prior to use. Be sure to use the dedicated electrolyte container for correct electrolyte volume.

- Place the battery on a level surface.
- Check to see that the sealing sheet has no peeling, tears, or holes in it.
- Remove the sealing sheet.

#### NOTE

○The battery is vacuum sealed. If the sealing sheet has leaked air into the battery, it may require a longer initial charge.

- Remove the electrolyte container from the vinyl bag.
- Detach the strip of caps [A] from the container and set aside, these will be used later to seal the battery.

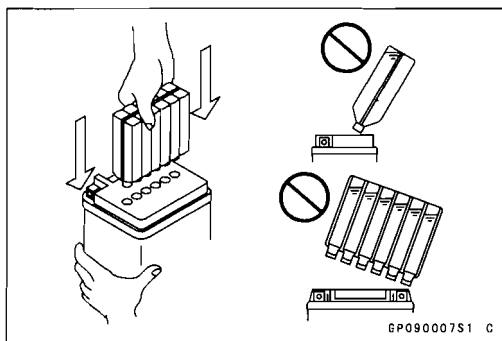
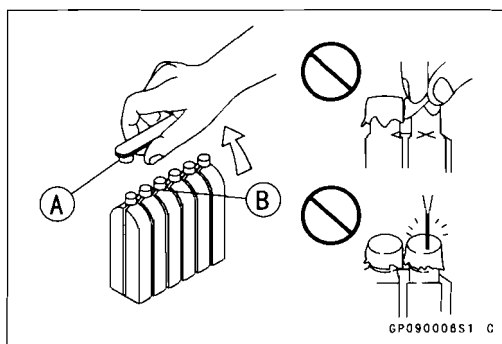
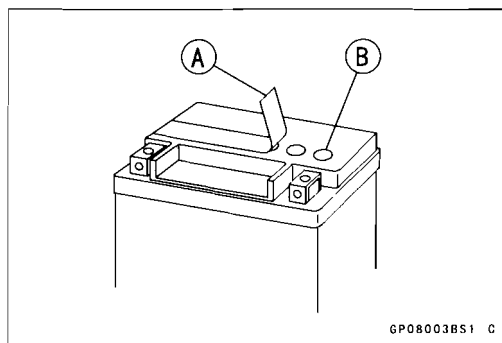
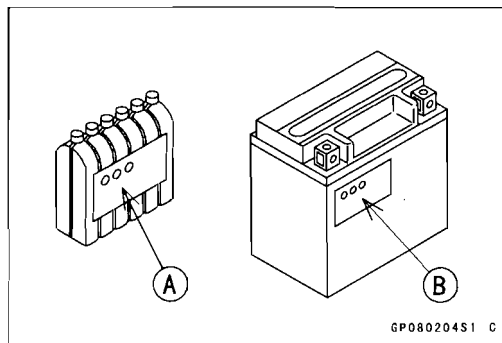
#### NOTE

○Do not pierce or otherwise open the sealed cells [B] of the electrolyte container. Do not attempt to separate individual cells.

- Place the electrolyte container upside down with the six sealed cells into the filler ports of the battery. Hold the container level, push down to break the seals of all six cells. You will see air bubbles rising into each cell as the ports fill.

#### NOTE

○Do not tilt the electrolyte container



## Battery

- Check the electrolyte flow.
- ★ If no air bubbles [A] are coming up from the filler ports, or if the container cells have not emptied completely, tap the container [B] a few times.
- Keep the container in place for **20** minutes or more. Don't remove the container from the battery until it's empty, the battery requires all the electrolyte from the container for proper operation.

### CAUTION

**Removal of the container before it is completely empty can shorten the service life of the battery. Do not remove the electrolyte container until it is completely empty and 20 minutes have elapsed.**

- Gently remove the container from the battery.
- Let the battery sit for **30** minutes prior to charging to allow the electrolyte to permeate into the plates for optimum performance.

### NOTE

○ *Charging the battery immediately after filling can shorten service life. Let the battery sit for at least **30** minutes after filling.*

### Initial Charge

- Place the strip [A] of caps loosely over the filler ports.
- Newly activated sealed batteries require an initial charge.

**Standard Charge      0.7 A × 5 ~ 10 hours**

- ★ If using a recommended battery charger, follow the charger's instructions for newly activated sealed battery.

#### Kawasaki-recommended chargers:

• **Optimate III**

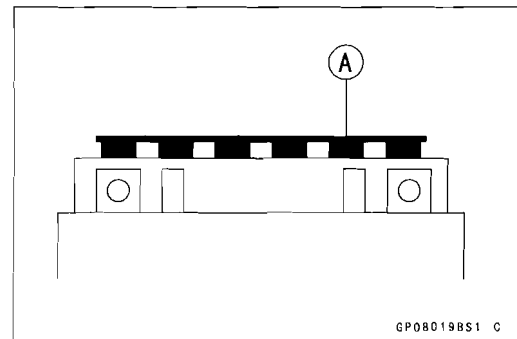
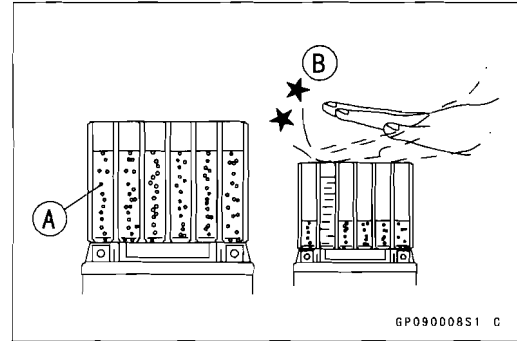
**Yuasa 1.5 Amp Automatic Charger**

**Battery Mate 150-9**

- ★ If the above chargers are not available, use equivalent one.

### NOTE

○ *Charging rates will vary depending on how long the battery has been stored, temperature, and the type of charger used. Let battery sit 30 minutes after initial charge, then check voltage using a voltmeter. If it is not at least 12.6 volts, repeat charging cycle.*



## 16-24 ELECTRICAL SYSTEM

### Battery

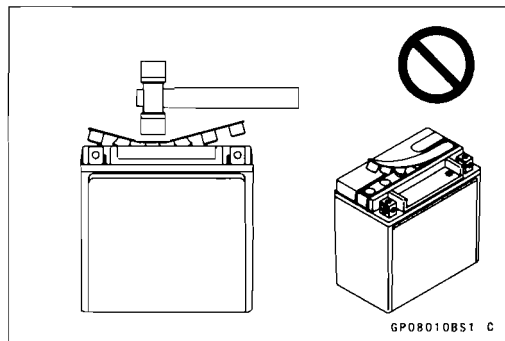
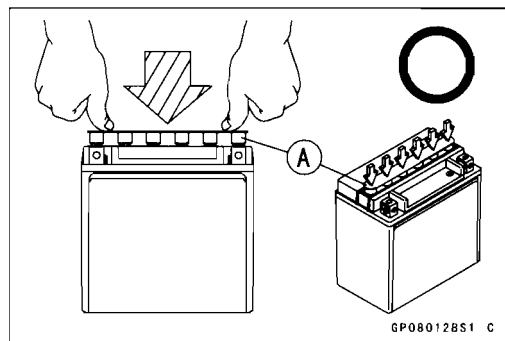
- After charging is completed, press down firmly with both hands to seat the strip of caps [A] into the battery (don't pound or hammer). When properly installed, the strip of the caps will be level with the top of the battery.

#### CAUTION

Once the strip of the caps [A] is installed onto the battery, never remove the caps, nor add water or electrolyte to the battery.

#### NOTE

- To ensure maximum battery life and customer satisfaction, it is recommended the battery be load tested at three times its amp-hour rating for 15 seconds. Re-check voltage and if less than 12.6 volts repeat the charging cycle and load test. If still below 12.6 volts the battery is defective.



### Precautions

- 1) No need of topping-up

No topping-up is necessary in this battery until it ends its life under normal use. Forcibly prying off the seal cap to add water is very dangerous. Never do that.

- 2) Refreshing charge

If an engine will not start, a horn sounds weak, or lamps are dim, it indicates the battery has been discharged. Give refresh charge for 5 to 10 hours with charge current shown in the specification (see Specifications).

When a fast charge is inevitably required, do it following precisely the maximum charge current and time conditions indicated on the battery.

#### CAUTION

**This battery is designed to sustain no unusual deterioration if refresh-charged according to the method specified above. However, the battery's performance may be reduced noticeably if charged under conditions other than given above.**

**Never remove the seal caps during refresh charge.**

**If by chance an excessive amount of gas is generated due to overcharging, the relief valve releases the gas to keep the battery normal.**

- 3) When you do not use the motorcycle for months

Give a refresh charge before you store the motorcycle and store it with the negative lead removed. Give a refresh charge once a month during storage.

- 4) Battery life

If the battery will not start the engine even after several refresh charges, the battery has exceeded its useful life. Replace it. (Provided, however, the vehicle's starting system has no problem.)

#### ⚠ 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.**

**No fire should be drawn near the battery, or no terminals should have the tightening loosened.**

**The electrolyte contains sulfuric acid. Be careful not to have it touch your skin or eyes. If**



## Battery

### Interchange

A sealed battery can fully display its performance only when combined with a proper vehicle electric system. Therefore, replace a sealed battery only on a vehicle which was originally equipped with a sealed battery.

Be careful, if a sealed battery is installed on a vehicle which had an ordinary battery as original equipment, the sealed battery's life will be shortened.

### Charging Condition Inspection

Battery charging condition can be checked by measuring battery terminal voltage with a digital voltmeter [A].

- Remove the battery (see Battery Removal).

#### CAUTION

**Be sure to disconnect the negative (-) lead first.**

- Measure the battery terminal voltage.

#### NOTE

○ Measure with a digital voltmeter which can be read to one decimal place voltage.

- ★ If the reading is 12.6 V or more, no refresh charge is required, however, if the reading is below the specified, refresh charge is required.

#### Battery Terminal Voltage

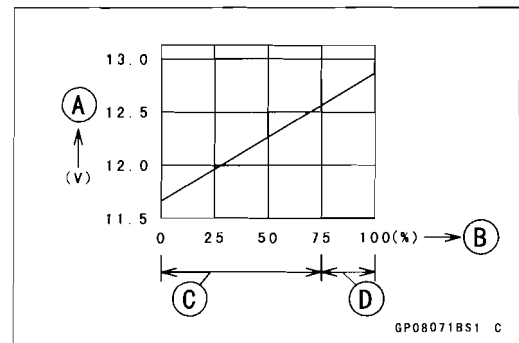
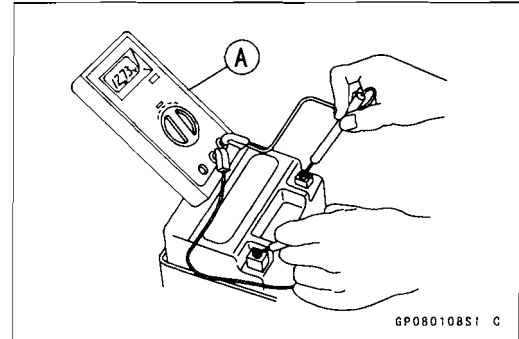
Standard: 12.6 V or more

Terminal Voltage (V) [A]

Battery Charge Rate (%) [B]

Refresh charge is required [C]

Good [D]

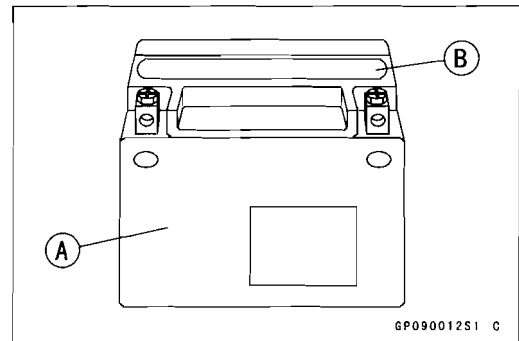


### Refreshing Charge

- Remove the battery [A] (see Battery Removal).
- Refresh-charge by following method according to the battery terminal voltage.

#### ⚠ WARNING

This battery is sealed type. Never remove seal sheet [B] even at charging. Never add water. Charge with current and time as stated below.



Terminal Voltage: 11.5 ~ less than 12.6 V

Standard Charge

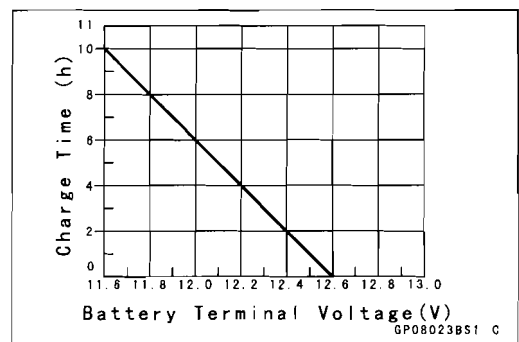
0.7 A × 5 ~ 10 h (see following chart)

Quick Charge

3.0 A × 1.0 h

#### CAUTION

If possible, do not quick charge. If the quick charge is done unavoidably, do the standard charge later on.



Terminal Voltage: less than 11.5 V

Charging Method: 0.7 A × 20 h

# 16-26 ELECTRICAL SYSTEM

## Battery

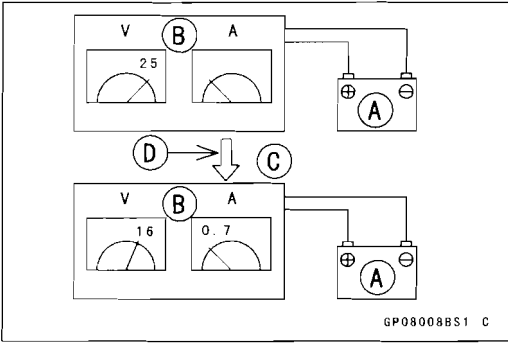
### NOTE

- Increase the charging voltage to a maximum voltage of 25 V if the battery will not accept current initially. Charge for no more than 5 minutes at the increased voltage then check if the battery is drawing current. If the battery will accept current decrease the voltage and charge by the standard charging method described on the battery case. If the battery will not accept current after 5 minutes, replace the battery.

Battery [A]  
Battery Charger [B]  
Standard Value [C]  
Current starts to flow [D]

- Determine battery condition after refreshing charge.
- Determine the condition of the battery 30 minutes after completion of the charge by measuring the terminal voltage according to the table below.

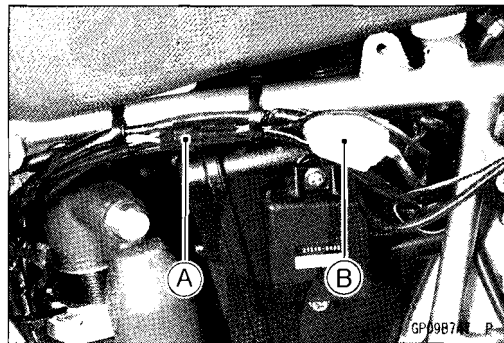
Criteria	Judgement
12.6 V or higher	Good
12.0 ~ lower than 12.6 V	Charge insufficient → Recharge
lower than 12.0 V	Unserviceable → Replace



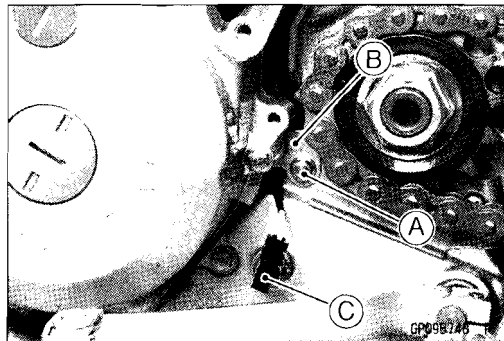
## Charging System

### Alternator Cover Removal

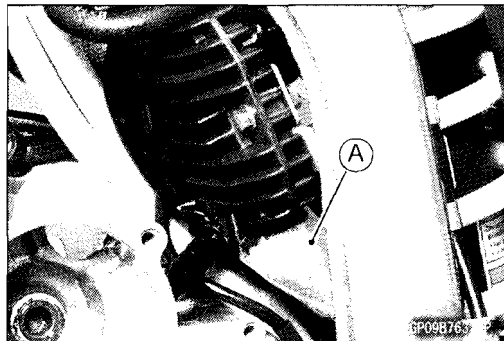
- Drain the engine oil (see Engine Oil Change in the Periodic Maintenance chapter).
- Remove:
  - Left Side Cover (see Side Cover Removal in the Frame chapter)
- Disconnect the crankshaft sensor connector [A] and alternator connector [B].



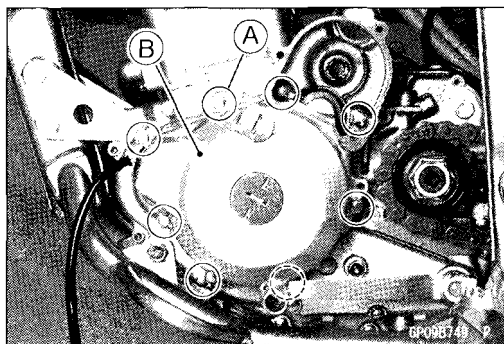
- Remove:
  - Engine Sprocket Cover (see Engine Sprocket Removal in the Final Drive chapter)
  - Starter Motor (see Starter Motor Removal in the Electrical chapter)
  - Torque Limiter (see Torque Limiter Removal in the Crankshaft/Transmission chapter)
  - Bolt [A]
  - Neutral Switch Lead Retaining Plate [B]
  - Neutral Switch Connector [C]



- Disconnect:
  - Regulator/Rectifier Connector [A]

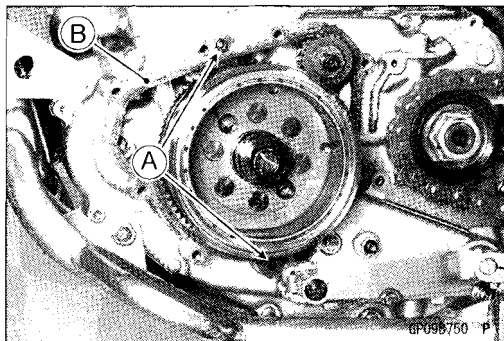


- Unscrew the bolts [A] and remove the alternator cover [B].



### Alternator Cover Installation

- Install the dowel pins [A] into the crankcase.
- Replace the gasket [B] with a new one.



## 16-28 ELECTRICAL SYSTEM

### Charging System

- Apply silicone sealant to the crankshaft sensor and stator coil leads grommet [A].

Sealant - Kawasaki Bond (Silicone Sealant): 92104-0004

- Tighten:

Torque - Alternator Cover Mounting Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)

- Apply grease to the neutral switch terminal.
- Connect the crankshaft sensor, stator coil, regulator/rectifier and neutral switch lead connector.

#### Alternator Rotor Removal

- Remove the alternator cover (see Alternator Cover Removal).
- Hold the alternator rotor [A] steady with the flywheel holder [B], and remove the rotor bolt [C].

Special Tool - Flywheel Holder: 57001-1313

- Using the rotor puller [A], remove the alternator rotor [B].

Special Tool - Rotor Puller M16/M18/M20/M22 × 1.5: 57001-1216

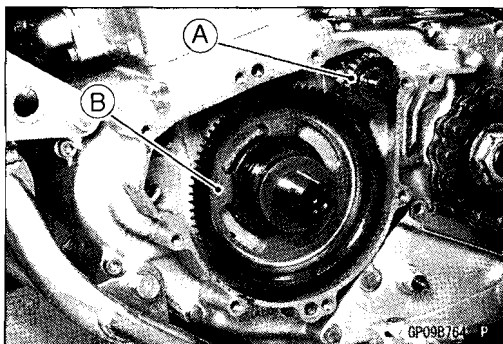
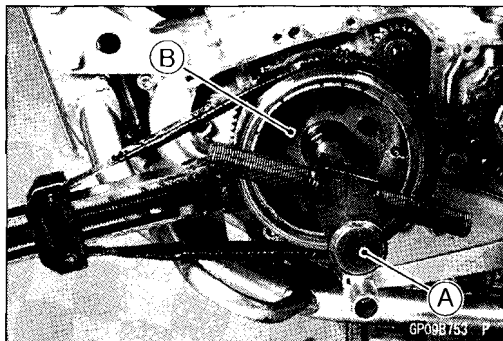
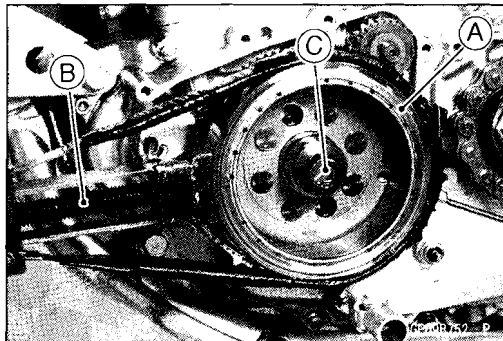
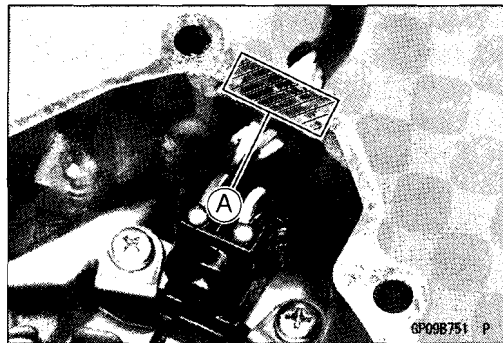
#### CAUTION

If the rotor is difficult to remove, turn the puller shaft using a wrench while tapping the head of the puller shaft with a hammer. Do not attempt to strike the grab bar or the alternator rotor itself. Striking the bar or the rotor can cause the bar to bend or the magnets to lose their magnetism.

- Remove:

Idle Gear [A]

Starter Motor Clutch Gear [B]

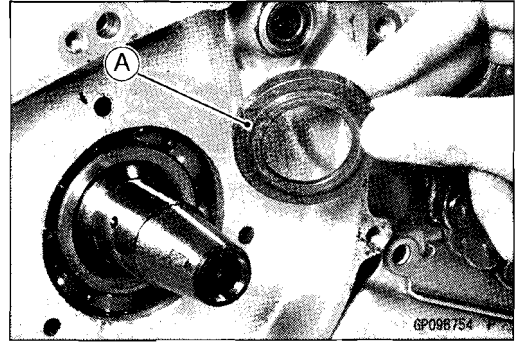




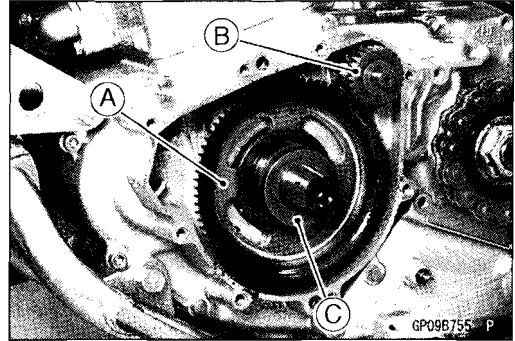
## Charging System

### Alternator Rotor Installation

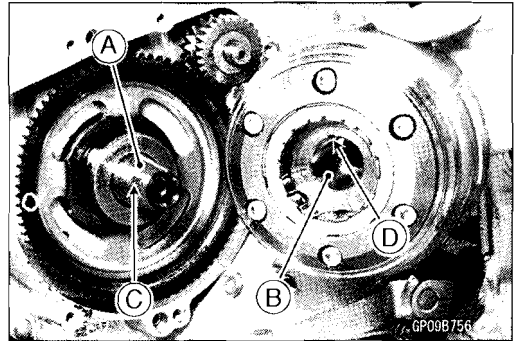
- Install the collar [A] so that the small outside diameter faces outward.



- Install:  
 Starter Motor Clutch Gear [A]  
 Idle Gear [B]  
 Spacer [C]



- Using a cleaning fluid, clean off any oil or dirt on the following portions and dry them with a clean cloth.  
 Crankshaft Tapered Portion [A]  
 Alternator Rotor Tapered Portion [B]
- Install the woodruff key [C] into the slot of the crankshaft securely.
- Fit the groove [D] on the woodruff key.

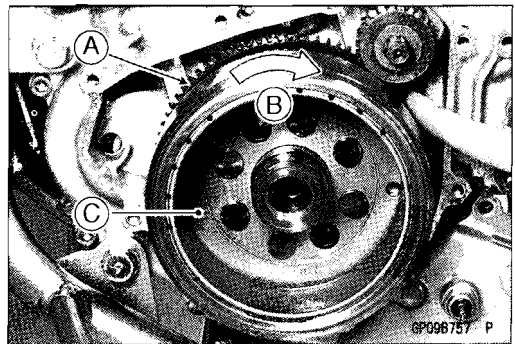


- While turning the starter motor clutch gear [A] clockwise [B], install the alternator rotor [C].
- Apply molybdenum disulfide oil to the threads of the alternator rotor bolt.
- Tighten the rotor bolt while holding the alternator rotor steady with the flywheel holder.

**Special Tool - Flywheel Holder: 57001-1313**

**Torque - Alternator Rotor Bolt: 120 N·m (12.2 kgf·m, 88.5 ft·lb)**

- Install the alternator cover (see Alternator Cover Installation).

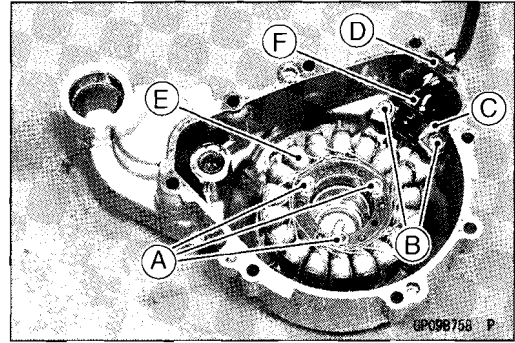


## 16-30 ELECTRICAL SYSTEM

### Charging System

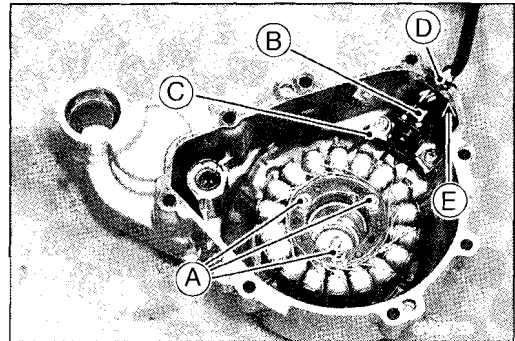
#### Stator Coil Removal

- Remove:
  - Alternator Cover (see Alternator Cover Removal)
  - Stator Coil Bolts [A]
  - Crankshaft Sensor Screws [B]
  - Stator Coil Lead Holder [C]
  - Grommet [D]
- Remove the stator coil [E] and crankshaft sensor [F] as a set.



#### Stator Coil Installation

- Install the stator coil, and tighten the bolts [A].
  - Torque - Stator Coil Bolts: 5.9 N·m (0.60 kgf·m, 52 in·lb)**
- Install the crankshaft sensor [B] and holder plate [C].
- Run the stator coil and crankshaft sensor leads under the holder plate and crankshaft sensor.
  - Torque - Crankshaft Sensor Screws: 2.4 N·m (0.24 kgf·m, 21 in·lb)**
- Apply silicone sealant to the circumference of the grommet [D].
  - Sealant - Kawasaki Bond (Silicone Sealant): 92104-0004**
- Set the grommet securely in the notch [E].
- Install the alternator cover (see Alternator Cover Installation).



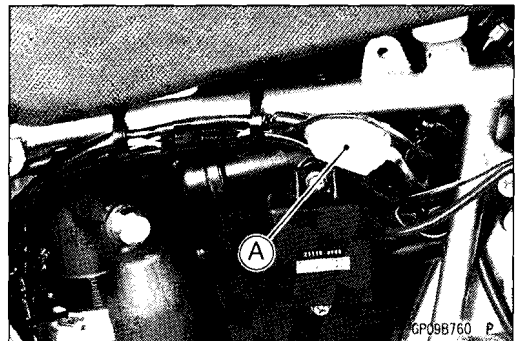
#### Alternator Inspection

There are three types of alternator failures: short, open (wire burned out), or loss in rotor magnetism. A short or open in one of the stator coil leads will result in either a low output, or no output at all. A loss in rotor magnetism, which may be caused by dropping or hitting the alternator, by leaving it near an electromagnetic field, or just by aging, will result in low output.

- To check the alternator output voltage, do the following procedures.
  - Disconnect the alternator connector [A].
  - Connect a hand tester to the alternator connector as shown.

**Special Tool - Hand Tester: 57001-1394**

- Start the engine.
- Run it at 4 000 rpm.
- Note the voltage readings.



## Charging System

### Alternator Output Voltage

Tester Range	Connections		Standard @4 000 rpm
	Tester (+) Lead Connection	Tester (-) Lead Connection	
AC 250 V	One Yellow Lead	Another Yellow Lead	41 V or more

○Repeat testing other yellow leads.

Hand Tester [A]

- ★ If the output voltage shows the value in the table, the alternator operates properly.
- ★ If the output voltage shows a much higher than the value in the table, the regulator/rectifier is damaged. A much lower reading than that given in the table indicates that the alternator is defective.

- Check the stator coil resistance as follows.

○Stop the engine.

○Connect the hand tester [A] to the connector as shown in the table.

○Note the resistance readings.

### Stator Coil Resistance

Tester Range	Connections		Standard
	Tester (+) Lead Connection	Tester (-) Lead Connection	
$\times 1 \Omega$	One Yellow Lead	Another Yellow Lead	$0.3 \sim 1.0 \Omega$

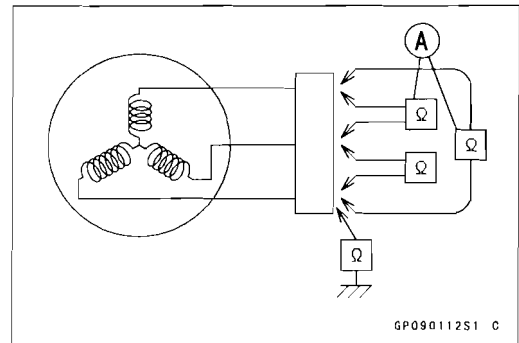
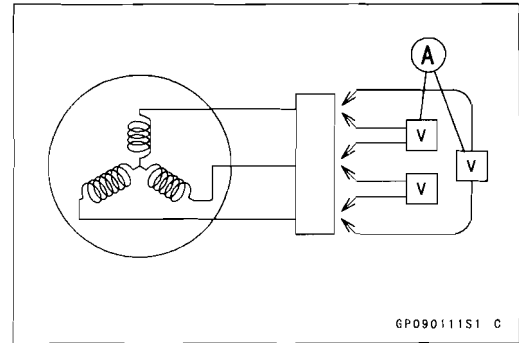
○Repeat testing other yellow leads.

- ★ If there is more resistance than shown in the table, or no hand tester reading (infinity) for any two leads, the stator coil has an open lead and must be replaced. Much less than this resistance means the stator coil is shorted, and must be replaced.

○Using the highest resistance range of the hand tester, measure the resistance between each of the Yellow leads and chassis ground.

- ★ Any hand tester reading less than infinity ( $\infty$ ) indicates a short, necessitating stator coil replacement.

- ★ If the stator coil has normal resistance, but the voltage check showed the alternator to be defective, then the rotor magnets have probably weakened, and the rotor must be replaced.



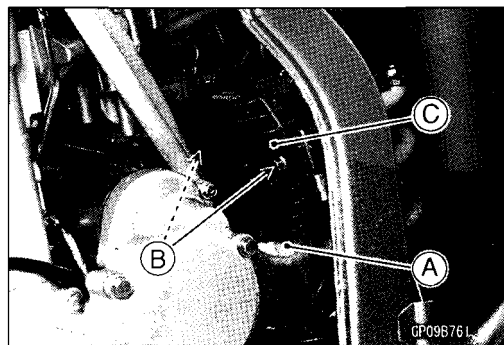


## 16-32 ELECTRICAL SYSTEM

### Charging System

#### Regulator/Rectifier Removal

- Remove the regulator/rectifier connector [A].
- Remove the bolts [B], and then remove the regulator/rectifier [C].



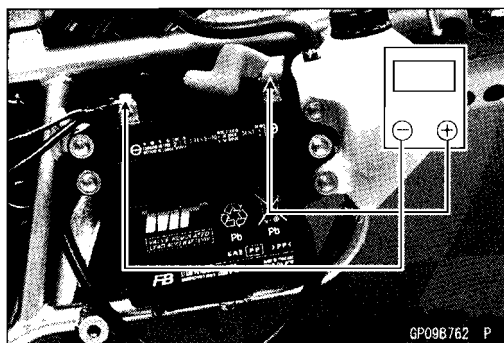
#### Regulator/Rectifier Installation

- Install:  
Regulator/Rectifier
- Tighten:  
**Torque - Regulator/Rectifier Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)**
- Connect the regulator/rectifier connector.

#### Charging Voltage Inspection

- Check the battery condition (see Charging Condition Inspection).
- Warm the engine up.
- Stop the engine, and remove the left side cover (see Side Cover Removal in the Frame chapter).
- Set the hand tester to the DC 25 V range and connect it in the table.

**Special Tool - Hand Tester: 57001-1394**



#### Charging Voltage

Tester Range	Connections		Standard @4 000 rpm
	Tester (+) Lead Connection	Tester (-) Lead Connection	
DC 25 V	Battery (+) Terminal	Battery (-) Terminal	14.2 ~ 15.2 V

- Start the engine, and note the voltage readings at various engine speeds with the headlight turned on and then turned off. While the engine speed is low, a measured value is nearly the same with the battery voltage. A greater measured value will be obtained with the increase of the engine speed. Nevertheless, no measured values will exceed the upper limit specified in the table.
- Turn off the ignition switch to stop the engine, and disconnect the hand tester.
- ★ If the reading is within range, the charging system is considered to be working normally.
- ★ If the reading shows a much higher than the upper value in the table, the regulator/rectifier is damaged, or the leads are loose or open.
- ★ If the voltage does not rise as the engine speed increases, then the regulator/rectifier is defective or the alternator output is insufficient for the loads. Check the relevant parts of the alternator and the regulator/rectifier.

## Charging System

### Regulator/Rectifier Inspection

- Remove the regulator/rectifier (see Regulator/Rectifier Removal).

### Rectifier Circuit Check

- Check conductivity of the following pair of terminals.

### Rectifier Circuit Inspection

Tester connection	W-Y1,	W-Y2,	W-Y3
	BK/Y-Y1,	BK/Y-Y2,	BK/Y-Y3,

- ★ The resistance should be low in one direction and more than ten times as much in the other direction. If any two leads are low or high in both directions, the rectifier is defective and the regulator/rectifier must be replaced.

### NOTE

- The actual meter reading varies with the meter used and the individual rectifier, but, generally speaking the lower reading should be from zero to one half the scale.

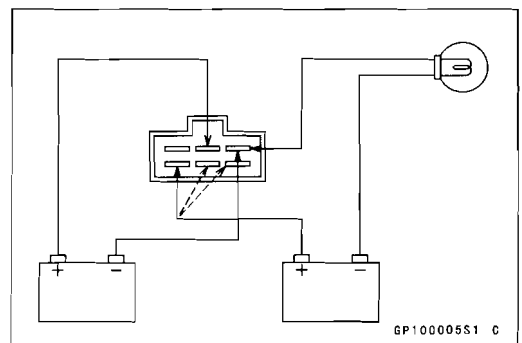
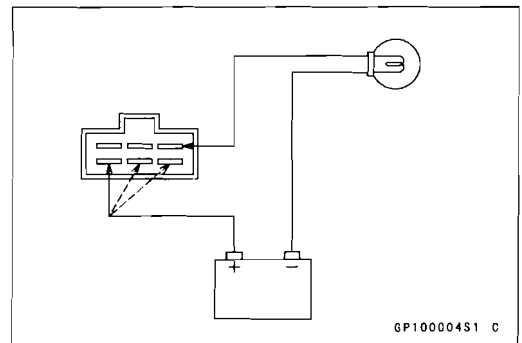
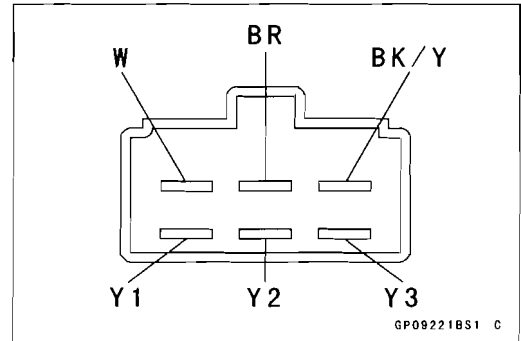
### Regulator Circuit Check

To test the regulator out of circuit, use three 12 V batteries and a test light (12 V 3 ~ 6 W bulb in a socket with 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.**

- Check to be sure the rectifier circuit is normal before continuing.
- Do the 1st step regulator circuit test.
  - Connect the test light and the 12 V battery to the regulator/rectifier as shown.
  - Check the Y1, Y2 and Y3 terminal respectively.
  - ★ If the test light turns on, the regulator/rectifier is defective. Replace it.
  - ★ If the test light does not turn on, continue the test.
- Do the 2nd step regulator circuit test.
  - Connect the test light and the 12 V battery in the same manner as specified in the "Regulator Circuit Test-1st Step".
  - Apply 12 V to the voltage BR terminal.
  - Check the Y1, Y2 and Y3 terminal respectively.
  - ★ If the test light turns on, the regulator/rectifier is defective. Replace it.
  - ★ If the test light does not turn on, continue the test.



## 16-34 ELECTRICAL SYSTEM

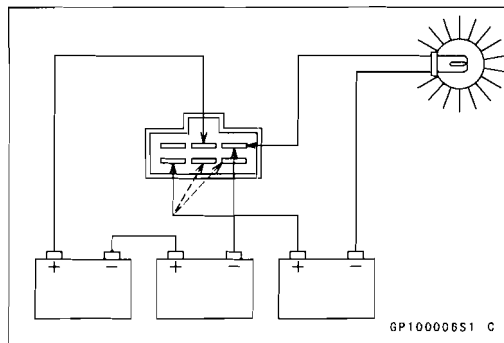
### Charging System

- Do the 3rd step regulator circuit test.
- Connect the test light and the 12 V battery in the same manner as specified in the "Regulator Circuit Test-1st Step".
- Momentarily apply 24 V to the voltage BR terminal by adding a 12 V battery.
- Check the Y1, Y2 and Y3 terminals respectively.

#### CAUTION

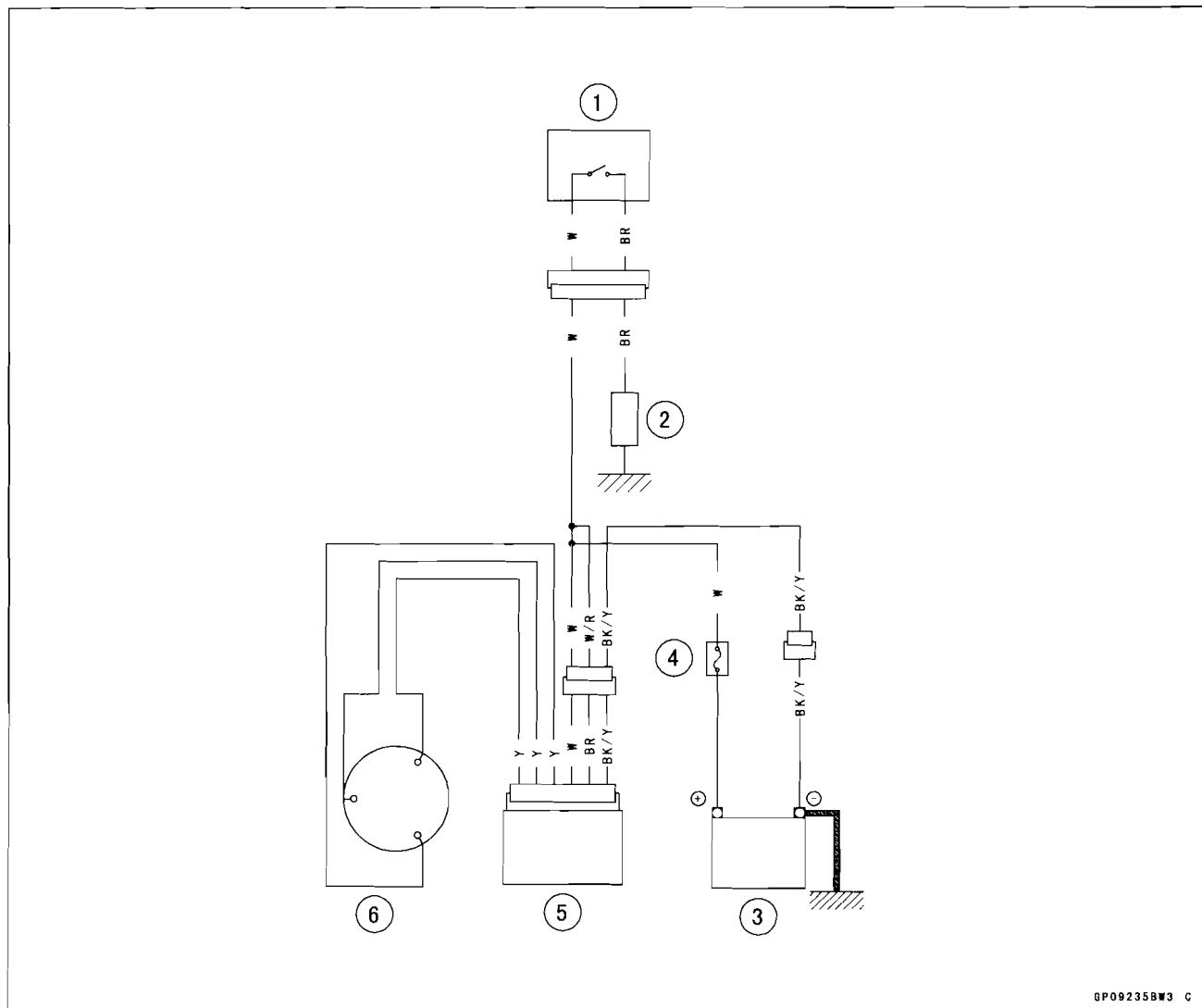
**Do not apply more than 24 V. If more than 24 V is applied, the regulator/rectifier may be damaged. Do not apply 24 V more than a few seconds. If 24 V is applied for more than a few seconds, the regulator/rectifier may be damaged.**

- ★ If the test light did not light when the 24 V was applied momentarily to the voltage monitoring terminal, the regulator/rectifier is defective. Replace it.
  - ★ If the regulator/rectifier passes all of the tests described, it may still be defective. If the charging system still does not work properly after checking all of the components and the battery, test the regulator/rectifier by replacing it with a known good unit.
- Connect the hand tester to the regulator/rectifier.



## Charging System

## Charging System Circuit



1. Ignition Switch
2. Load
3. Battery 12 V 6 Ah
4. Main Fuse 20 A
5. Regulator/Rectifier
6. Alternator

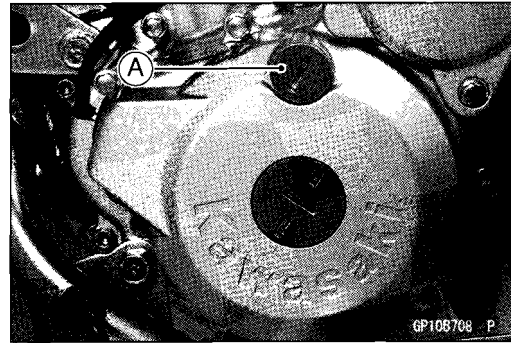
## 16-36 ELECTRICAL SYSTEM

### Ignition System

#### Ignition Timing Inspection

- Remove the timing inspection cap [A].

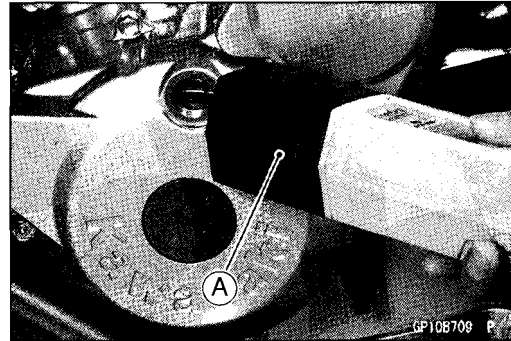
Special Tool - Filler Cap Driver: 57001-1454



- Attach the timing light [A] to the ignition coil lead in the manner prescribed by the manufacturer.

Special Tool - Timing Light: 57001-1241

- Start the engine and aim the timing light at the ignition timing mark on the alternator rotor.

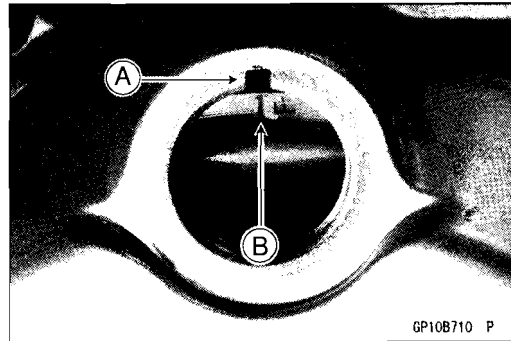


- Run the engine at the speeds specified and note the alignment of the ignition timing mark.

#### Ignition Timing

Engine speed [r/min (rpm)]	Hole groove [A] aligns with:
Idle Speed to 1 700	F mark [B] on alternator rotor

- ★ If the ignition timing is incorrect, check the crankshaft sensor (see Crankshaft Sensor Inspection).
- ★ If the crankshaft sensor are normal, check the igniter (see Igniter Inspection).
- Install the timing inspection cap.



#### ⚠ WARNING

The ignition system produces extremely high voltage. Do not touch the spark plug while the engine is running, or you could receive a severe electrical shock.

#### CAUTION

Do not disconnect the battery cables or any other electrical connections when the ignition switch is on, or while the engine is running. This is to prevent igniter damage.

Do not install the battery backwards. The negative side is grounded. This is to prevent damage to the diodes and igniter.

Use the standard regulator/rectifier, or the igniter will be damaged.

#### Crankshaft Sensor Removal

- Refer to the Stator Coil Removal.

## Ignition System

### Crankshaft Sensor Inspection

- Remove the left side cover (see Left Side Cover Removal in the Frame chapter).
- Disconnect the crankshaft sensor lead connector [A].
- Set the hand tester to the  $\times 100 \Omega$  range and connect it to the crankshaft sensor lead connector.

**Special Tool - Hand Tester: 57001-1394**

### Crankshaft Sensor Resistance

**Connections:** G/W Lead  $\longleftrightarrow$  W/Y Lead

**Standard:** Approx.  $240 \Omega$  @20°C (68°F)

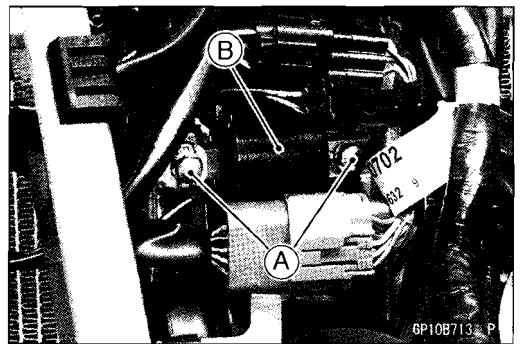
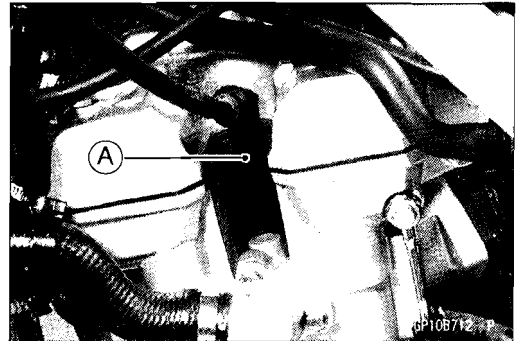
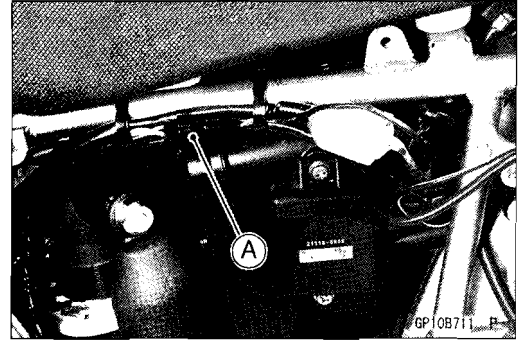
- ★ If there is more resistance than the specified value, the coil has an open lead and must be replaced. Much less than this resistance means the coil is shorted, and must be replaced.
- Using the highest resistance range of the tester, measure the resistance between the crankshaft sensor leads and chassis ground.
- ★ Any tester reading less than infinity ( $\infty$ ) indicates a short, necessitating replacement of the crankshaft sensor assembly.

### Crankshaft Sensor Peak Voltage Inspection

- Refer to the in the Igniter Inspection.

### Ignition Coil Removal

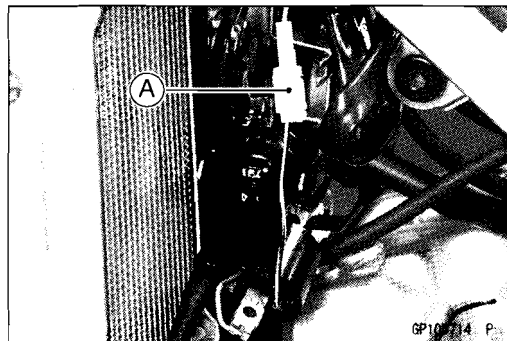
- Remove:  
Fuel Tank (see Fuel Tank Removal in the Fuel System chapter)
- Pull off the spark plug cap [A] from the spark plug.
- Remove:  
Ignition Coil Bolts [A]  
Ignition Coil [B]



## 16-38 ELECTRICAL SYSTEM

### Ignition System

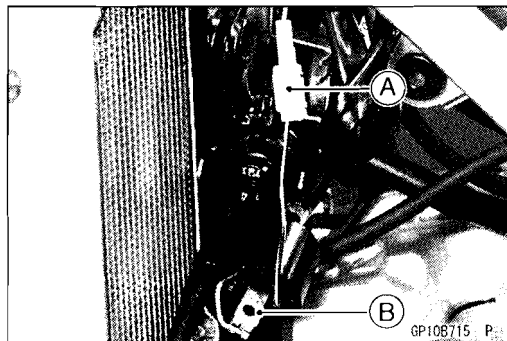
- Disconnect the ignition coil primary connector [A].



#### Ignition Coil Installation

- Connect the primary lead connector [A].
- Set the ground terminal [B] to the left bolt of the ignition coil.
- Tighten:

**Torque - Ignition Coil Mounting Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)**

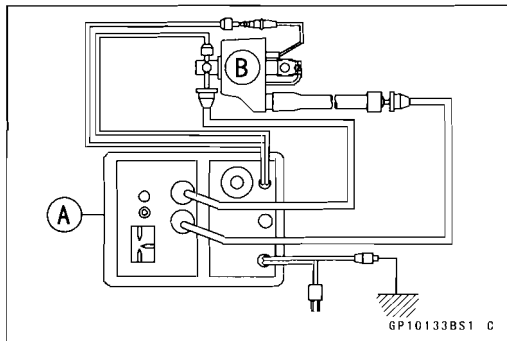


#### Ignition Coil Inspection

- Remove the ignition coil (see Ignition Coil Removal).
- Measure the arcing distance with a suitable commercially available coil tester [A] to check the condition of the ignition coil [B].
- Connect the ignition coil (with the spark plug cap left attached) to the tester in the manner prescribed by the manufacturer and measure the arcing distance.

#### Ignition Coil Arcing Distance

**6 mm (0.24 in.) or more**



### ⚠ WARNING

**To avoid extremely high voltage shocks, do not touch the coil or high tension lead.**

- ★ If the distance reading is less than the specified value, the ignition coil or spark plug cap is defective.
- To determine which part is defective, measure the arcing distance again with the spark plug cap removed from the ignition coil.
- ★ 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.
- ★ If the arcing tester is not available, the coil can be checked for a broken or badly shorted winding with the hand tester.



## Ignition System

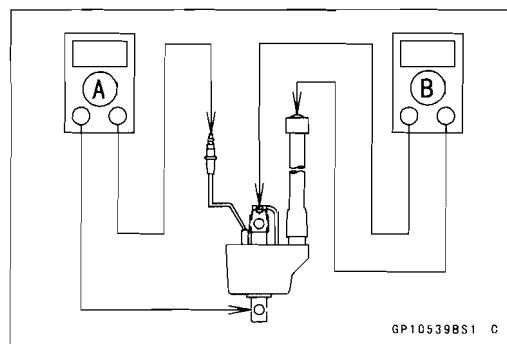
### NOTE

○ *The hand tester can not detect layer shorts and shorts resulting from insulation breakdown under high voltage.*

- Measure the primary winding resistance [A] as follows.
- Connect the hand tester between the primary terminals.

#### Special Tool - Hand Tester: 57001-1394

- Set the tester to the  $\times 1\Omega$  range, and read the tester.
- Measure the secondary winding resistance [B] as follows:
- Remove the spark plug cap by turning it counterclockwise.
- Connect the hand tester between the spark plug lead and ignition coil negative (-) terminal.
- Set the tester to the  $\times 1\text{ k}\Omega$  range, and read the tester.



#### Ignition Coil Winding Resistance

Primary windings:  $0.17 \sim 0.23 \Omega @20^{\circ}\text{C} (68^{\circ}\text{F})$

Secondary windings:  $5.0 \sim 7.6 \text{ k}\Omega @20^{\circ}\text{C} (68^{\circ}\text{F})$

- ★ If the tester does not read as specified, replace the coil.
- ★ If the tester 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, 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.
- Before installing the spark plug cap, apply a thin coat of PBC (Poly Butyl Cuprystil) grease to the end of spark plug lead (PBC is a special high-temperature, water-resistance grease).

#### Ignition Coil Primary Peak Voltage Inspection

- Refer to the igniter Inspection.

#### Spark Plug Removal

- Refer to the Spark Plug Replacement in the Periodic Maintenance chapter.

#### Spark Plug Installation

- Refer to the Spark Plug Replacement in the Periodic Maintenance chapter.

## 16-40 ELECTRICAL SYSTEM

### Ignition System

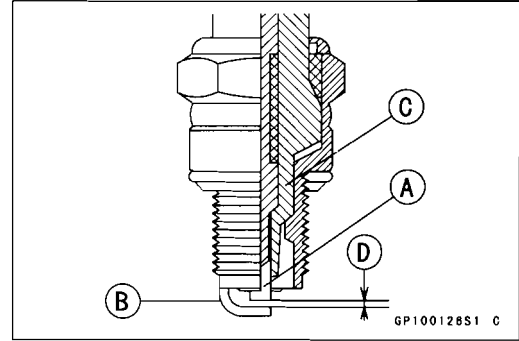
#### **Spark Plug Cleaning and Inspection**

- Remove the spark plug (see Spark Plug Replacement in the Periodic Maintenance chapter).
- 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-flash point solvent and a wire brush or other tool.
- ★ If the spark plug center electrode [A] and/or side electrode [B] are corroded or damaged, or if the insulator [C] is cracked, replace the plug.
- Use the standard spark plug or its equivalent.

**Spark Plug:**            **NGK CR8E or**  
                                 **ND U24ESR-N**

- Measure the gap [D] with a wire-type thickness gauge.
- ★ If the gap is incorrect, carefully bend the side electrode with a tool to obtain the correct gap.

**Spark Plug Gap:**    **0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)**



#### **Interlock Operation Inspection**

- Raise the rear wheel off the ground with jack.

**Special Tool - Jack: 57001-1238**

##### **1st Check**

- Start the engine to the following conditions.

##### **Condition**

**Transmission Gear → 1st Position**

**Clutch Lever → Release**

**Sidestand → Down or Up**

- Turn the ignition switch ON and push the starter button.
- Then the starter motor should not turn when the starter system circuit is normality.
- ★ If the engine is start, inspect the starter lockout switch, neutral switch, sidestand switch and interlock diode unit.
- ★ If their parts are normality replace the igniter.

##### **2nd Check**

- Start the engine to the following conditions.

##### **Condition**

**Transmission Gear → 1st Position**

**Clutch Lever → Pulled in**

**Sidestand → Up**

- Turn the ignition switch ON and push the starter button.
- Then the starter motor should turn when the starter system circuit is normality.
- ★ If the starter motor is not turn, inspect the starter lockout switch, neutral switch, sidestand switch and interlock diode unit.
- ★ If their parts are normality replace the igniter.

## Ignition System

### 3rd Check

- Inspect the engine for its secure stop after the following operations are completed.
- Run the engine to the following conditions.

#### Condition

Transmission Gear → 1st Position

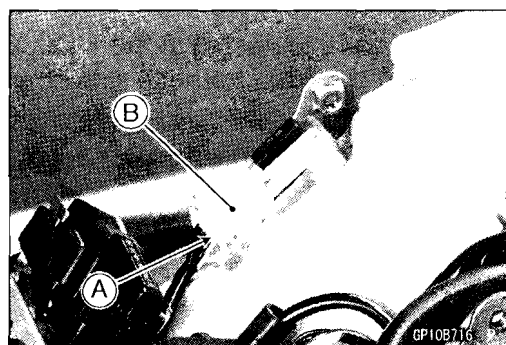
Clutch Lever → Pulled in

Sidestand → Up

- Set the sidestand on the ground, then the engine will stop.
- ★ If whichever may not be stopped, inspect the neutral switch, starter lockout switch, sidestand switch and interlock diode unit.
- ★ If their parts are normality, replace the igniter.

### Interlock Diode Unit Inspection

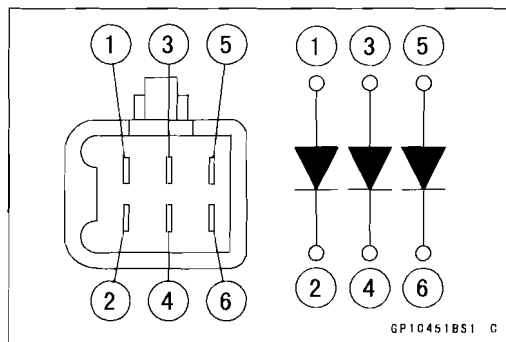
- Remove:
  - Seat (see Seat Removal in the Frame chapter)
  - Connector [A]
  - Interlock Diode Unit [B]



- Set the hand tester to the  $\times 1\Omega$  range and connect it to the diode unit terminals to check the resistance in both directions.

**Special Tool - Hand Tester: 57001-1394**

- ★ 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 in both directions, the diode is defective and the diode unit must be replaced.



#### NOTE

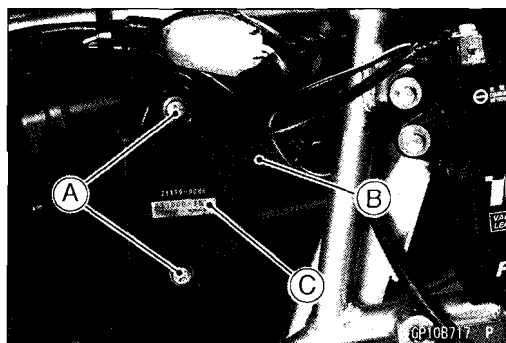
○ The actual meter reading varies with the meter used and the individual diode, but, generally speaking, the lower reading should be from the zero to one half the scale.

### Igniter Removal

#### CAUTION

**Never drop the igniter, especially on a hard surface. Such a shock to igniter can damage it.**

- Remove:
  - Left Side Cover (see Side Cover Removal in the Frame chapter)
  - Screws [A]
  - Connector [B]
  - Igniter [C]



## 16-42 ELECTRICAL SYSTEM

### Ignition System

#### Igniter Inspection

##### CAUTION

When inspecting the IC igniter, observe the following to avoid damage to the igniter. Do not disconnect the battery cables or any other electrical connections when the ignition switch on, or while the engine is running. This may damage the igniter.

#### Check1: Igniter Operation Voltage Check

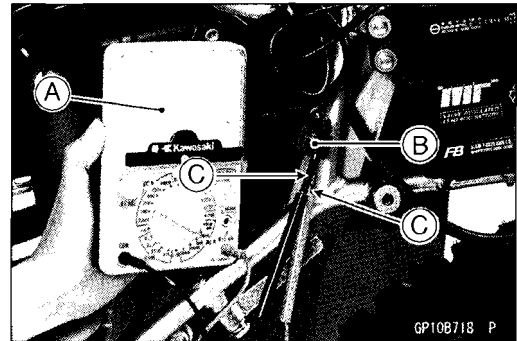
##### NOTE

○Be sure the battery is fully charged.

- Disconnect the igniter connector (see IC Igniter Removal).
- Set the hand tester [A] to the × DC 25 V range, and connect it to the main harness side connector [B].

**Special Tools - Hand Tester: 57001-1394**

**Needle Adapter Set [C]: 57001-1457**



##### Connections:

Hand Tester (+) → BR Lead  
Hand Tester (–) → BK/Y Lead

- Turn the ignition switch ON, and read the tester.

##### IC Igniter Operation Voltage

Standard: Battery Voltage

- Turn the ignition switch OFF.
- ★ If the reading is out of the specification, check the following.
  - Main Fuse 20 A (see Fuse Inspection)
  - Ignition Switch
  - Wiring (see Wiring Diagram in this section)

#### Check2: Ignition Coil Primary Peak Voltage Check

##### NOTE

○Be sure the battery is fully charged.

- Remove:
  - Left Radiator Shroud (see Radiator Shroud Removal in the Frame chapter)

## Ignition System

- Pull off the spark plug cap from the spark plug (see Ignition Coil Removal).
- Do not remove the spark plug.
- Measure the primary peak voltage as follows.
- Install the new spark plug [A] into the plug cap, and ground it onto the engine.
- Connect the peak voltage adapter [B] into the hand tester [C] which is set to the  $\times$  DC 250 V range.

**Special Tools - Hand Tester: 57001-1394**

**Peak Voltage Adapter: 57001-1415**

**Type: KEK-54-9-B**

**Needle Adapter Set [D]: 57001-1457**

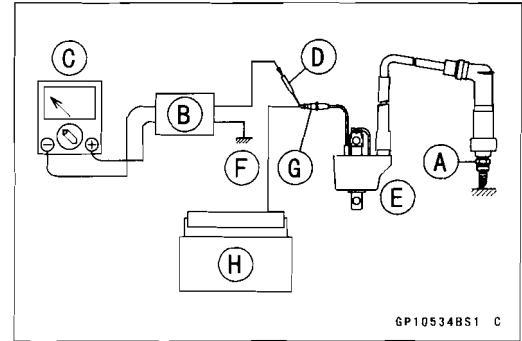
- Connect the adapter to the primary lead terminals of the ignition coil [E].
- Do not disconnect the primary leads.
- [H] Igniter

### Connections:

- |                 |   |                        |
|-----------------|---|------------------------|
| Adapter (R, +)  | → | Ground [F]             |
| Adapter (BK, -) | → | BK/W Lead Terminal [G] |

### NOTE

- Measure the voltage with each lead connected correctly. The correct value may not be obtained if disconnected.



## ⚠ WARNING

**To avoid extremely high voltage shocks, do not touch the spark plug or tester connections.**

- Turn the engine stop switch to run position.
- Turn the ignition switch ON.
- Pushing the starter button, turn the engine 4 ~ 5 seconds with the transmission in neutral to measure the primary peak voltage.
- Repeat the measurements 5 times or more times.

### Ignition Coil Primary Peak Voltage

**Standard: 110 V or more**

- ★ If the reading is less than the standard, check the ignition coil (see Ignition Coil Inspection).
- ★ If the ignition coil is good, check the other parts (see Ignition System Troubleshooting Flow Chart in this section).
- ★ If the all parts are good, replace the igniter.

## 16-44 ELECTRICAL SYSTEM

### Ignition System

#### Check3: Crankshaft Sensor Primary Peak Voltage Check

##### NOTE

- Be sure the battery is fully charged.
- Using the peak voltage adapter [A] is more reliable way to determine the condition of the crankshaft sensor than crankshaft sensor internal resistance measurements.

- Disconnect the crankshaft sensor lead connector (see Crankshaft Sensor Inspection).
- Set the hand tester [B] to the  $\times$  DC 10 V range, and connect it peak voltage adapter.

**Special Tools - Hand Tester: 57001-1394**

**Peak Voltage Adapter: 57001-1415**

**Type: KEK-54-9-B**

**Needle Adapter Set [C]: 57001-1457**

- Connect the adapter to the terminals of the crankshaft sensor lead connector [D].

##### Connections:

**Adapter (R, +)** → **G/W Lead**

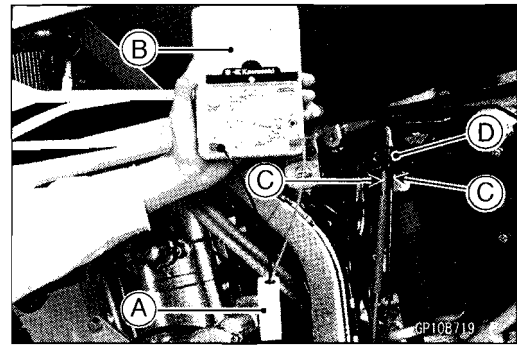
**Adapter (BK, -)** → **W/Y Lead**

- Turn the engine stop switch to run position.
- Turn the ignition switch ON.
- Pull the clutch lever and lift the sidestand.
- Pushing the starter button, turn the engine 4 ~ 5 seconds with the transmission in neutral to measure the primary peak voltage.
- Repeat the measurements 5 times or more times.

##### Crankshaft Sensor Peak Voltage

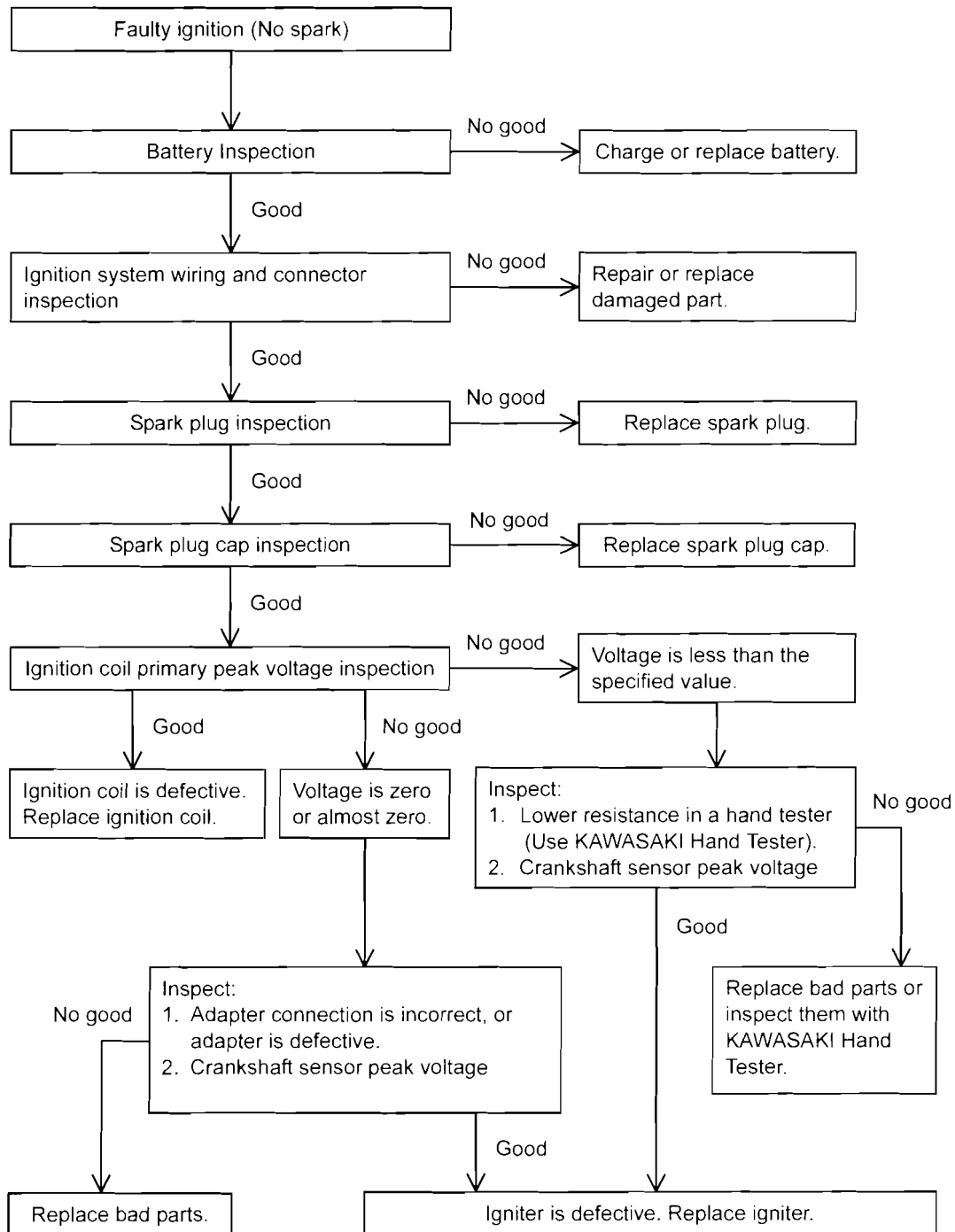
**Standard: 1.5 V or more**

- ★ If the reading is less than the standard, check the crankshaft sensor (see Crankshaft Sensor Inspection).
- ★ If the crankshaft sensor is good, check the other parts (see Ignition System Troubleshooting Flow Chart in this section).
- ★ If the all parts are good, replace the igniter.



## Ignition System

Ignition System Troubleshooting Flow Chart

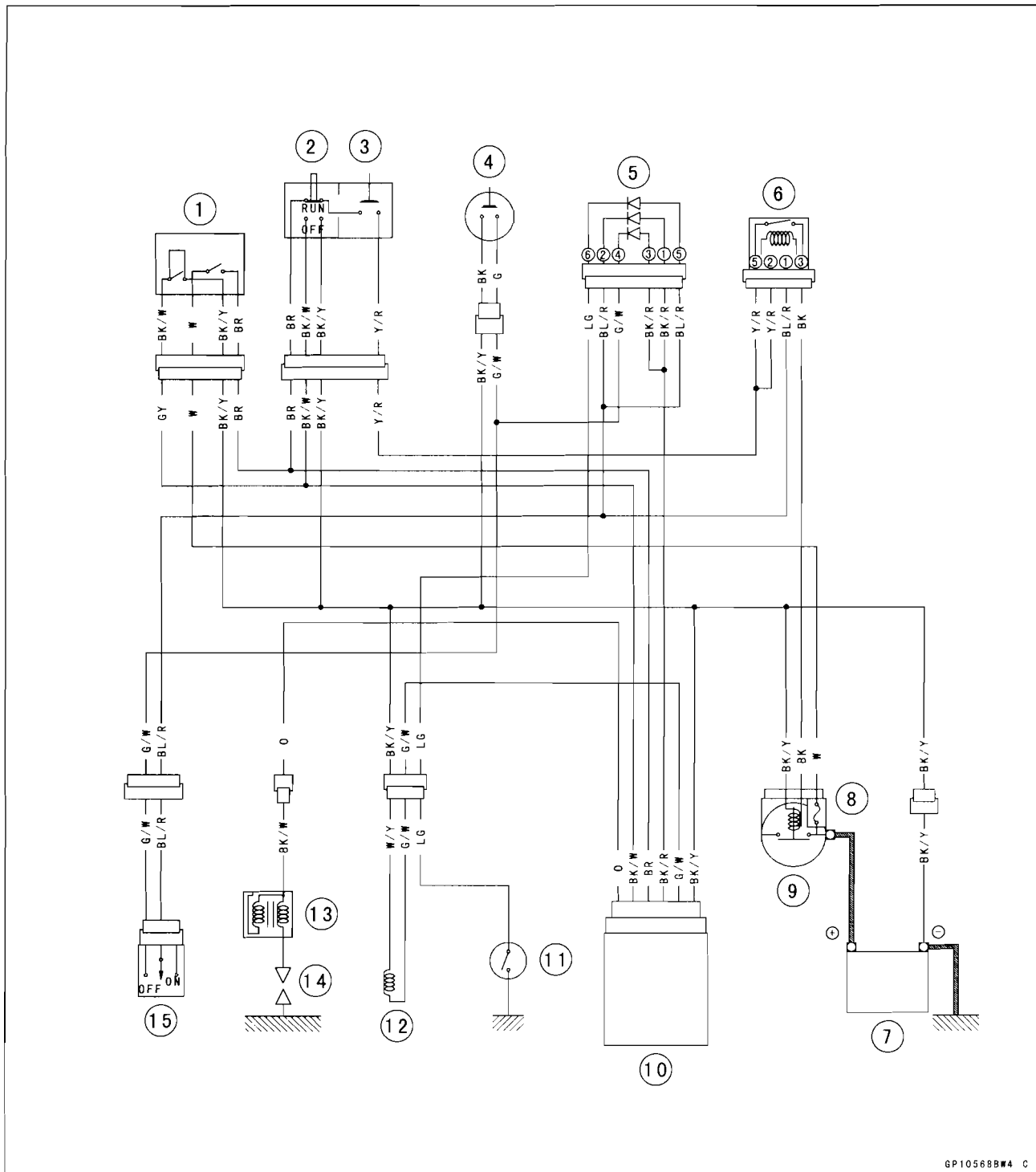




## 16-46 ELECTRICAL SYSTEM

### Ignition System

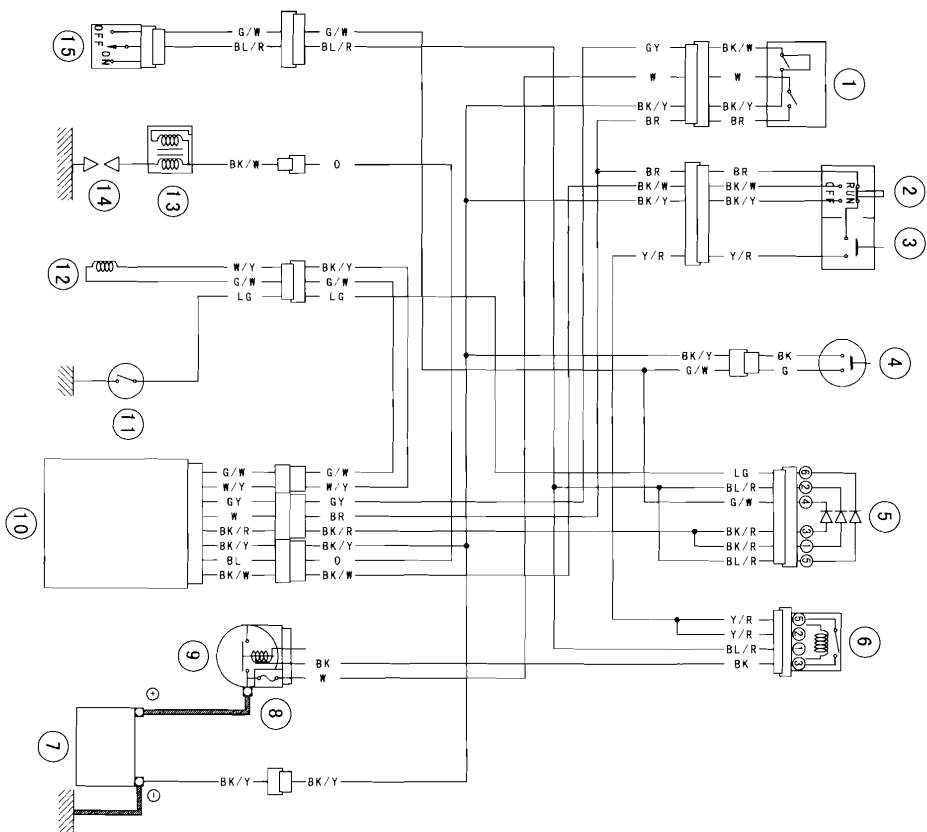
#### Ignition System Circuit [KLX250T (Other than AU Model)/KLX250W]



- |                          |                            |
|--------------------------|----------------------------|
| 1. Ignition Switch       | 9. Starter Relay           |
| 2. Engine Stop Switch    | 10. Igniter                |
| 3. Starter Button        | 11. Neutral Switch         |
| 4. Sidestand Switch      | 12. Crankshaft Sensor      |
| 5. Interlock Diode Unit  | 13. Ignition Coil          |
| 6. Starter Circuit Relay | 14. Spark Plug             |
| 7. Battery 12 V 6 Ah     | 15. Starter Lockout Switch |
| 8. Main Fuse 20 A        |                            |

## Ignition System

## Ignition System Circuit [KLX250T (AU Model)]



GP105559M4 C

1. Ignition Switch
2. Engine Stop Switch
3. Starter Button
4. Sidesand Switch
5. Interlock Diode Unit
6. Starter Circuit Relay
7. Battery 12 V 6 Ah
8. Main Fuse 20 A
9. Starter Relay
10. Igniter
11. Neutral Switch
12. Crankshaft Sensor
13. Ignition Coil
14. Spark Plug
15. Starter Lockout Switch

## 16-48 ELECTRICAL SYSTEM

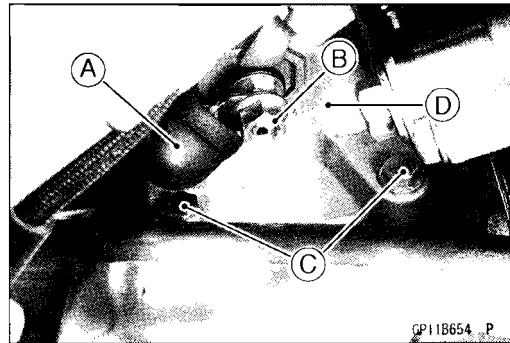
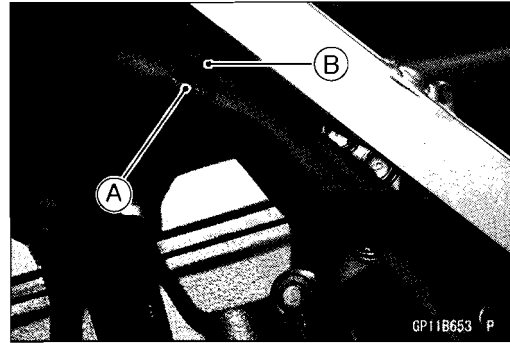
### Starter Motor

#### Starter Motor Removal

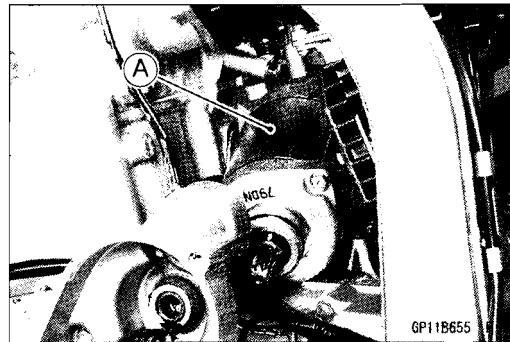
##### CAUTION

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

- Remove:
  - Left Radiator Shroud (see Radiator Shroud Removal in the Frame chapter)
  - Torque Limiter (see Torque Limiter Removal in the Crankshaft/Transmission chapter)
- Pull out the breather hose [A] and drain hose [B] from the fuel tank.
- Slide back the rubber cap [A].
- Remove:
  - Starter Motor Cable Terminal Nut [B]
  - Starter Motor Mounting Bolts [C]
- Pull out the starter motor [D] from the alternator cover.



- Turn over the starter motor [A] as shown to remove it from the engine left side.

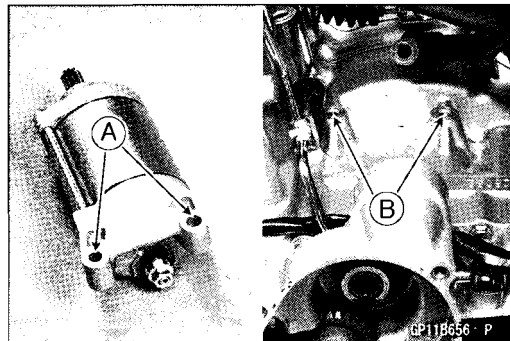


#### Starter Motor Installation

##### CAUTION

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

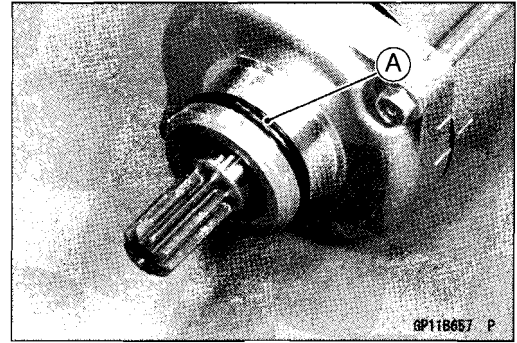
- When installing the starter motor, clean the starter motor legs [A] and crankcase [B] where the starter motor is grounded.



## Starter Motor

- Replace the O-ring [A] with a new one.
- Apply grease to the O-ring.
- Tighten:

**Torque - Starter Motor Mounting Bolts:** 9.8 N·m (1.0 kgf·m, 87 in·lb)

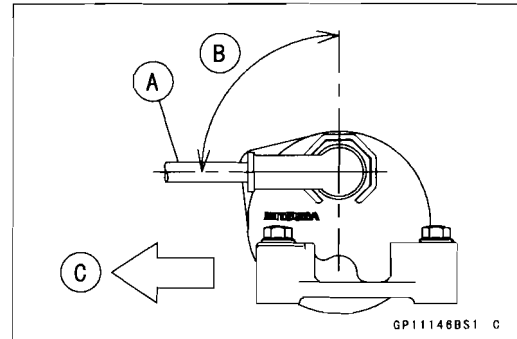


- Position the starter motor cable [A] as shown.  
90° [B]  
Front [C]

- Tighten:

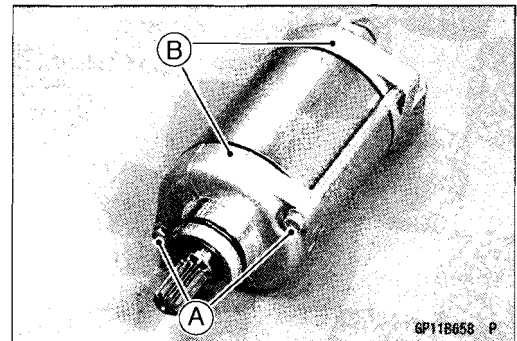
**Torque - Starter Motor Cable Terminal Nut:** 9.8 N·m (1.0 kgf·m, 87 in·lb)

- Slide back the rubber cap to the original position.



## Starter Motor Disassembly

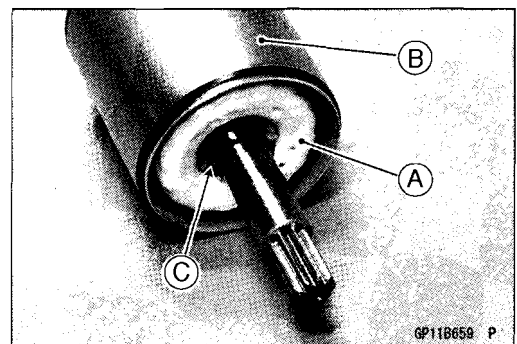
- Remove the starter motor (see Starter Motor Removal).
- Take off the starter motor through bolts [A] and remove the both end covers [B].



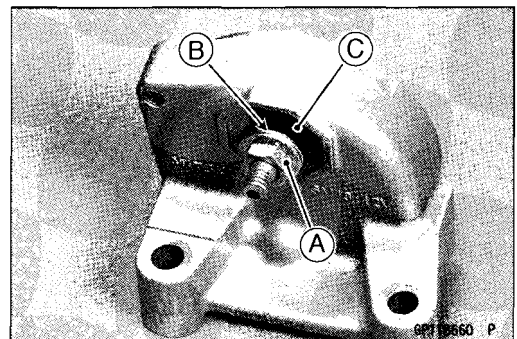
- Pull out the armature [A] out of the yoke [B].

### NOTE

○Do not remove the circlip [C] from the shaft.



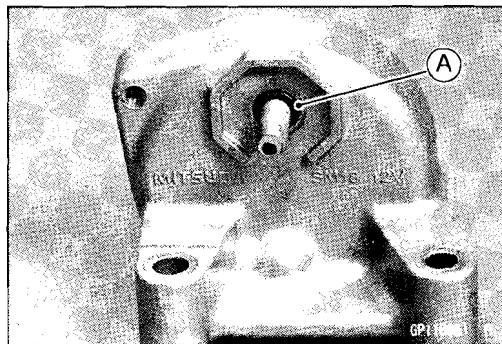
- Remove:  
Starter Motor Terminal Locknut [A]  
Washer [B]  
Collar [C]



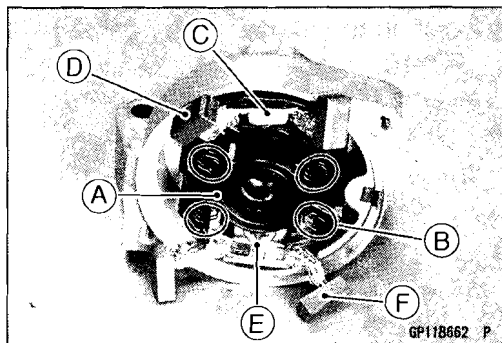
## 16-50 ELECTRICAL SYSTEM

### Starter Motor

- Remove:  
O-ring [A]

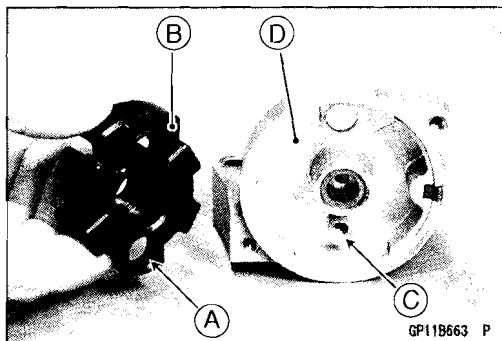


- Pull out the brushes from the brush holder [A].
- Remove:  
Brush Springs [B]  
Starter Motor Terminal [C]  
Positive Brush Assy [D]  
Screw [E]  
Negative Brush Assy [F]  
Brush Holder

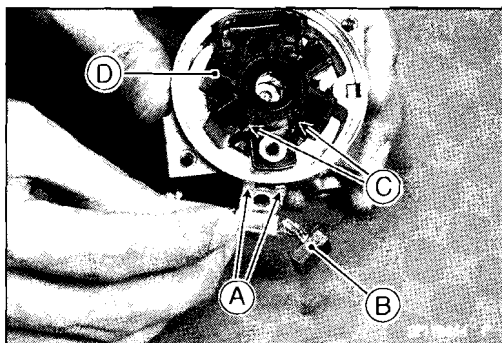


### Starter Motor Assembly

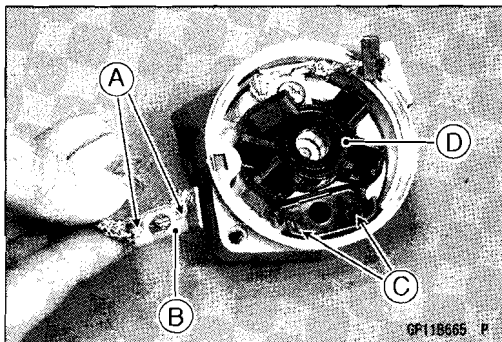
- Align the hole [A] of the brush holder [B] to the boss [C] of the right-hand end cover [D].



- Align the projections [A] of the negative brush assy [B] to the stoppers [C] of the brush holder [D].
- Tighten the screw securely.



- Align the stoppers [A] of the positive brush assy [B] to the grooves [C] of the brush holder [D].
- Install the starter motor terminal.

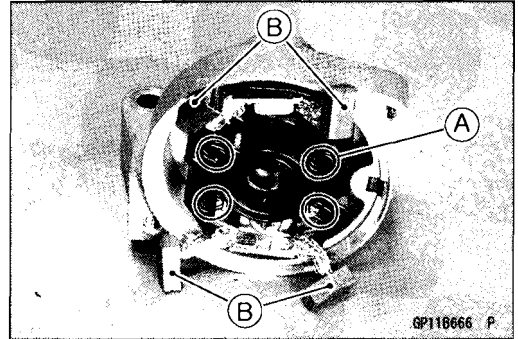
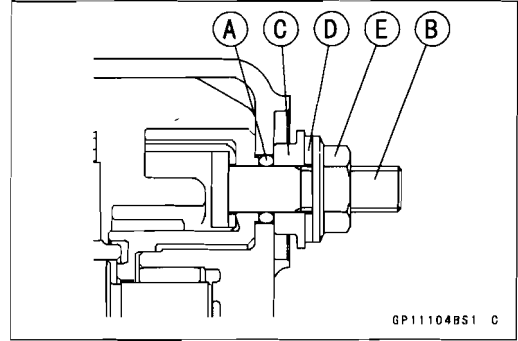




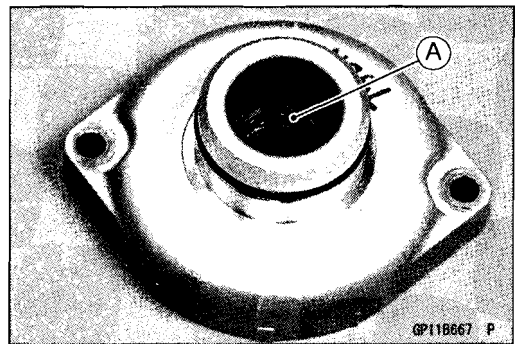
## Starter Motor

- Replace the O-ring [A] with a new one.
- Install the following parts to the starter motor terminal [B].
  - O-ring
  - Collar [C]
  - Washer [D]
  - Starter Motor Terminal Locknut [E]
- Install the collar so that stepped side faces outward.
- Tighten:
 

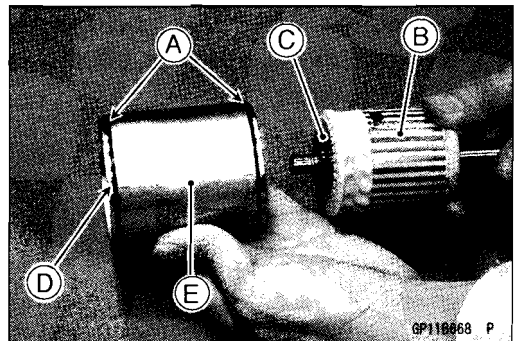
**Torque - Starter Motor Terminal Locknut: 11 N·m (1.1 kgf·m, 97 in·lb)**
- Install the brush springs [A] and insert the brushes [B].



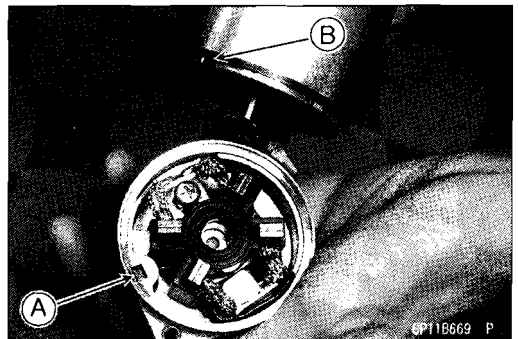
- Apply thin coat of grease to the oil seal [A].



- Replace the O-rings [A] with new ones.
- Insert the armature [B] so that commutator side [C] faces hollow side [D] of the yoke [E].



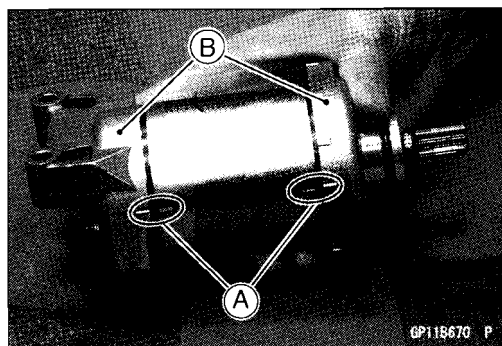
- Align the stopper [A] of the right-hand end cover to the groove [B] of the yoke.



## 16-52 ELECTRICAL SYSTEM

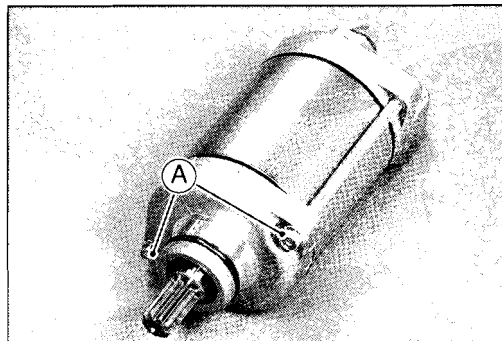
### Starter Motor

- Align the marks [A] to assembly the yoke and the end covers [B].



- Tighten:

Torque - Starter Motor Through Bolts [A]: 5.0 N·m (0.51 kgf·m, 44 in·lb)



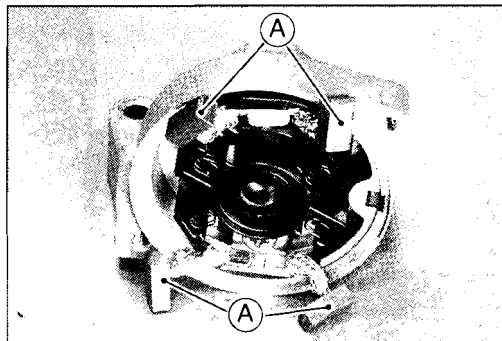
#### Brush Inspection

- Measure the length of each brush [A].
- ★ If any is worn down to the service limit, replace the brush assy.

##### Starter Motor Brush Length

Standard: 12 mm (0.47 in.)

Service Limit: 6.5 mm (0.26 in.)



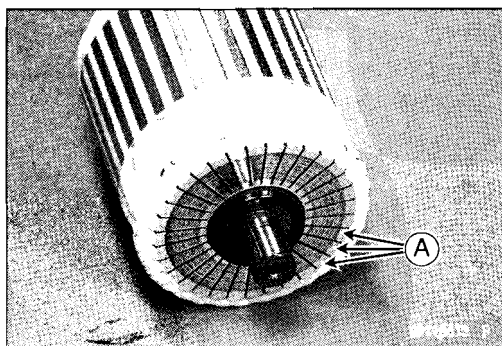
#### Commutator Cleaning and Inspection

- Clean the metallic debris off the between commutator segments [A].

##### NOTE

○ Do not use emery or sand paper on the commutator.

- Check the commutator for damage or abnormal wear.
- ★ Replace the starter motor with a new one if there is any damage or wear.
- Visually inspect the commutator segments for discoloration.
- ★ Replace the starter motor with a new one if discoloration is noticed.





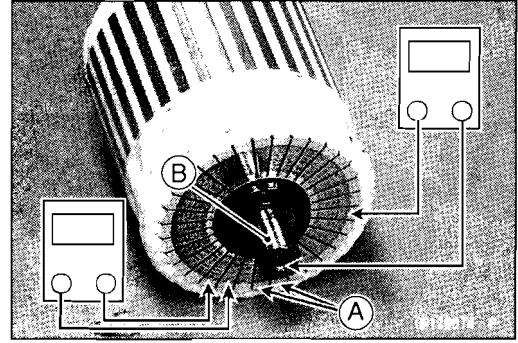
## Starter Motor

### Armature Inspection

- Using the  $\times 1 \Omega$  hand tester range, measure the resistance between any two commutator segments [A].

**Special Tool - Hand Tester: 57001-1394**

- ★ If there is a high resistance or no reading ( $\infty$ ) between any two segments, a winding is open and the starter motor must be replaced.
- Using the highest hand tester range, measure the resistance between the segments and the shaft [B].
- ★ If there is any reading at all, the armature has a short and the starter motor must be replaced.



### NOTE

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

### Brush Lead Inspection

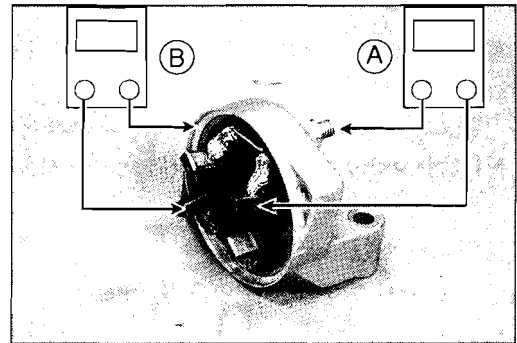
- Using the  $\times 1 \Omega$  hand tester range, measure the resistance as shown.

Terminal Bolt and Positive Brushes [A]

Right-hand End Cover and Negative Brushes [B]

**Special Tool - Hand Tester: 57001-1394**

- ★ If there is not close to zero ohms, the brush lead has an open. Replace the brush plate assy.



### Right-hand End Cover Inspection

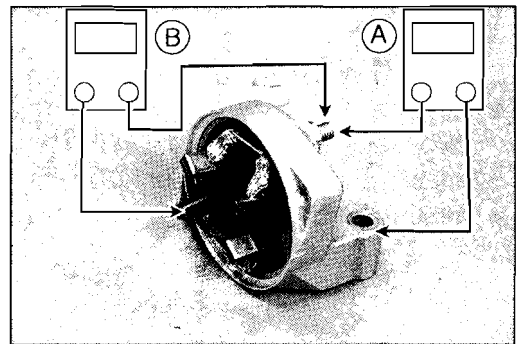
- Using the highest hand tester range, measure the resistance as shown.

Terminal Bolt and Right-hand End Cover [A]

Terminal Bolt and Negative Brushes [B]

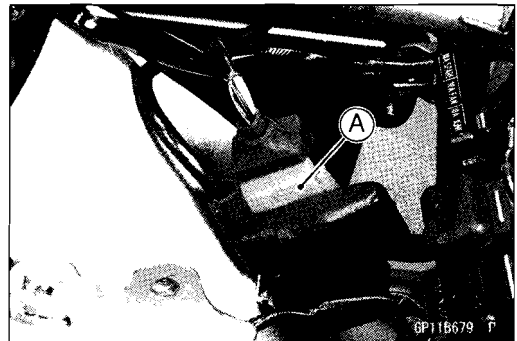
**Special Tool - Hand Tester: 57001-1394**

- ★ If there is any reading, the brush assy and/or terminal bolt assy have a short. Replace the starter motor.



### Starter Relay Removal

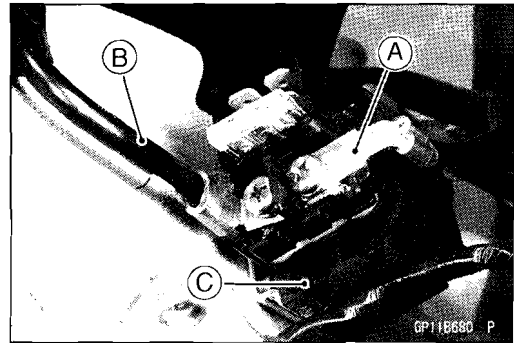
- Remove the battery negative (–) cable from the battery negative (–) terminal (see Battery Removal).
- Remove the rear fender front out of the frame (see Rear Fender Front Removal in the Frame chapter)
- Disconnect the connector [A].



## 16-54 ELECTRICAL SYSTEM

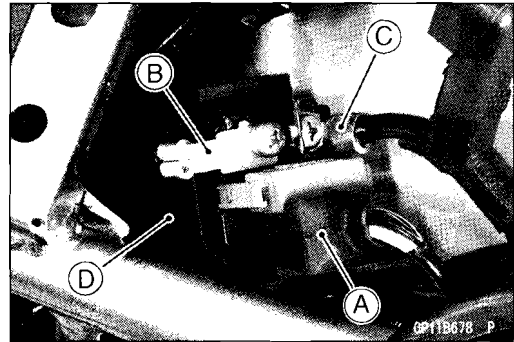
### Starter Motor

- Disconnect:
  - Starter Motor Cable [A]
  - Battery Positive (+) Cable [B]
- Remove the starter relay [C] from the rear fender front.



#### Starter Relay Inspection

- Remove the battery negative (–) cable from the battery negative (–) terminal (see Battery Removal).
- Remove the seat (see Seat Removal in the frame chapter).
- Disconnect the connector [A].
- Disconnect the starter motor cable [B] and battery positive (+) cable [C] from the starter relay [D].



- Connect the hand tester [A] and 12 V battery [B] to the starter relay [C] as shown.

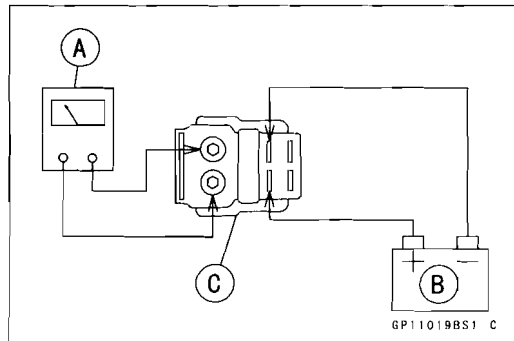
**Special Tool - Hand Tester: 57001-1394**

- ★ If the relay does not work as specified, the relay is defective. Replace the relay.

#### Testing Relay

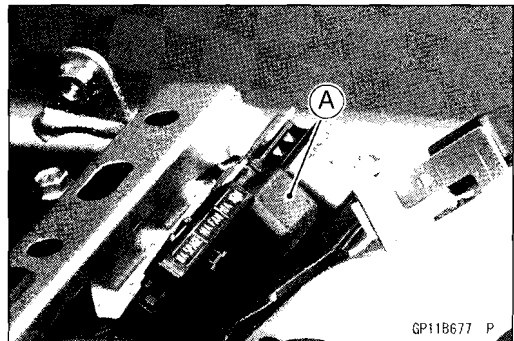
**Tester Range:**  $\times 1 \Omega$  range

**Criteria:** When battery is connected  $\rightarrow 0 \Omega$   
When battery is disconnected  $\rightarrow \infty \Omega$



#### Starter Circuit Relay Inspection

- Remove:
  - Seat (see Seat Removal in the Frame chapter)
- Pull out starter circuit relay [A] from the frame bracket.
- Disconnect the connector to remove the relay.



- Connect the hand tester [A] and a 12 V battery [B] to the starter circuit relay [C] as shown.

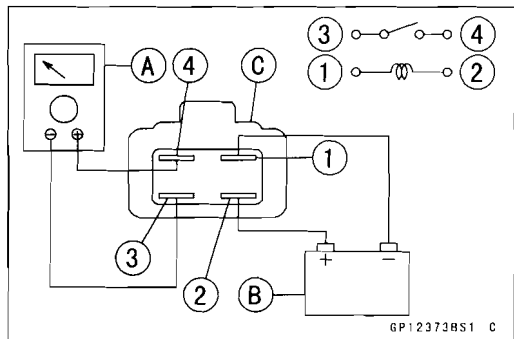
**Special Tool - Hand Tester: 57001-1394**

- ★ If the relay does not work as specified, the relay is defective. Replace the relay.

#### Testing Relay

**Hand Tester Range:**  $\times 1 \Omega$

**Criteria:** When battery is connected  $\rightarrow 0 \Omega$   
When battery is disconnected  $\rightarrow \infty \Omega$





## Starter Motor

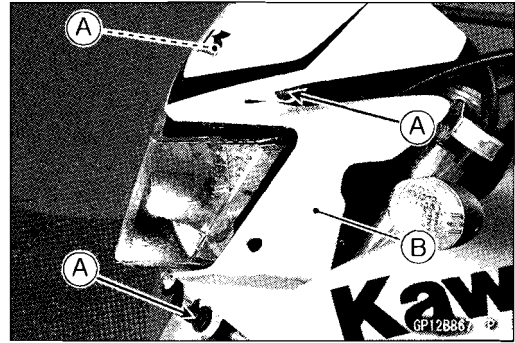
Wiring diagram for a 12V DC system. Components are numbered 1 through 13. The diagram shows a battery (11) connected to a fuse (12) and a ground. A switch (1) controls a relay (2) which is connected to a motor (10) and a solenoid (9). A fuse (4) is connected to the battery and a solenoid (6). A fuse (5) is connected to the battery and a solenoid (7). A fuse (13) is connected to the battery and a solenoid (8). The diagram includes various wire color codes such as BR, Y/R, G/W, LG, BK/Y, and BL/R.

1. Ignition Switch
2. Engine Stop Switch
3. Starter Button
4. Sidestand Switch
5. Interlock Diode Unit
6. Starter Circuit Replay
7. Battery 12 V 6 Ah
8. Main Fuse 20 A
9. Starter Relay
10. Starter Motor
11. Igniter
12. Neutral Switch
13. Starter Lockout Switch

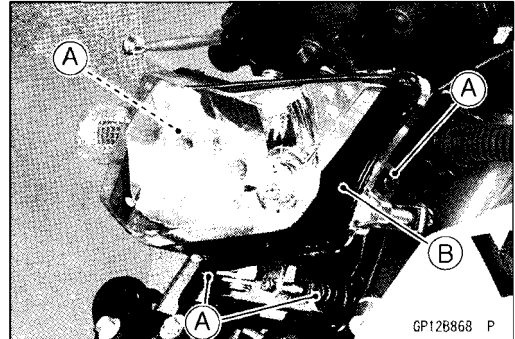
## Lighting System

### Headlight Body Removal

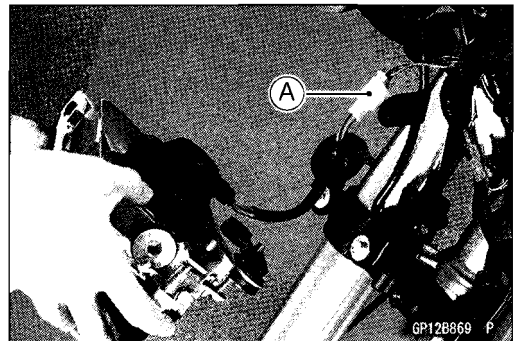
- Remove:  
Front Fender (see Front Fender Removal in the Frame chapter)  
Bolts [A]  
Headlight/Meter Cover [B]



- Remove the headlight body mounting bolts [A].
- Pull the headlight body [B] forward.



- Disconnect the headlight connector [A] to remove the headlight body.

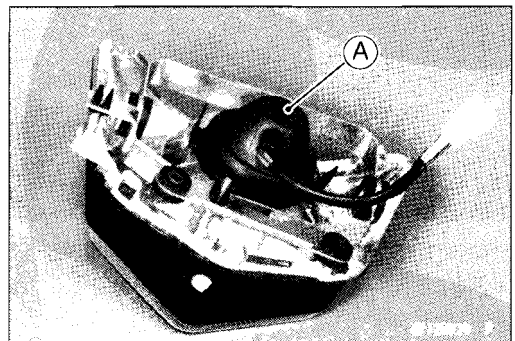


### Headlight Aiming Inspection

- Refer to the Headlight Aiming Inspection in the Periodic Maintenance chapter.

### Headlight Bulb Replacement

- Remove the headlight body from the frame (see Headlight Body Removal).
- Remove the headlight bulb dust cover [A] from the headlight body.





## 16-58 ELECTRICAL SYSTEM

### Lighting System

- Disconnect the connector [A].
- Push the hook [B] to unlock the headlight bulb.
- Remove the bulb [C].

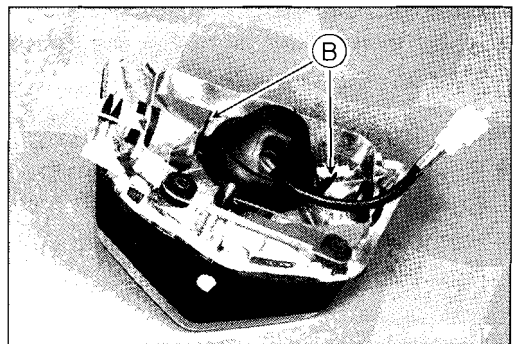
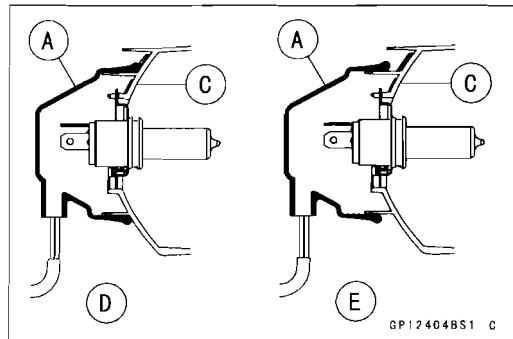
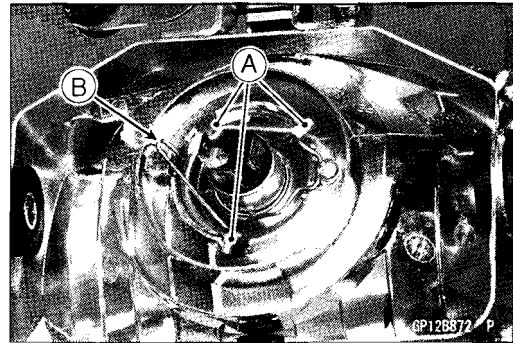
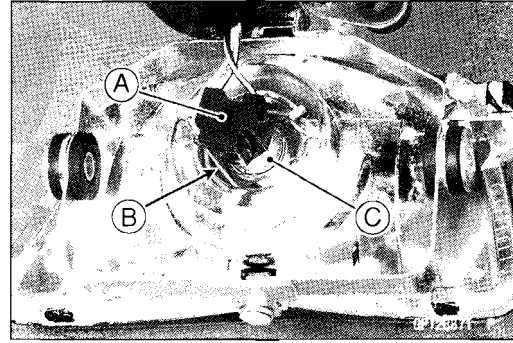
#### CAUTION

When handling the quartz-halogen bulb, 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.

#### NOTE

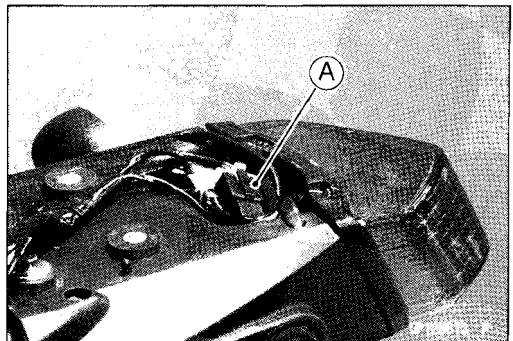
○Clean off any contamination that inadvertently gets on the bulb with alcohol or soap and water solution.

- Replace the headlight bulb.
- Fit the projections [A] of the bulb in the hollows of the headlight body.
- Install the hook [B].
- Fit the dust cover [A] with the both knobs [B] sideward onto the headlight body [C] firmly as shown.  
Good [D]  
Bad [E]
- After installation, adjust the headlight aim (see Headlight Aiming Inspection in the Periodic Maintenance chapter).



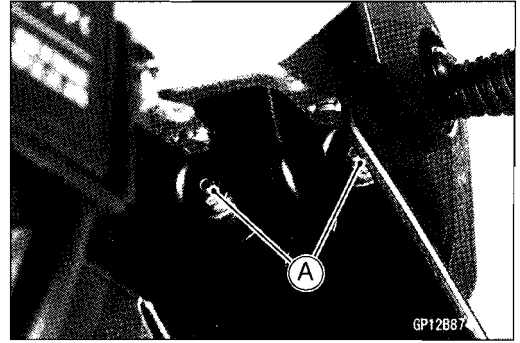
### Tail/Brake Light Removal

- Remove:  
Rear Fender Rear (see Rear Fender Rear Removal in the Frame chapter)
- Disconnect the tail/brake light lead connector [A].



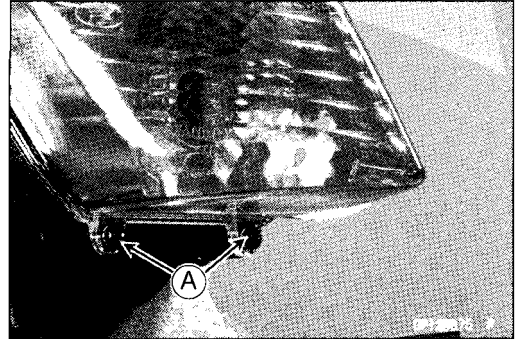
## Lighting System

- Remove:  
Nuts [A]  
Tail/Brake Light Unit

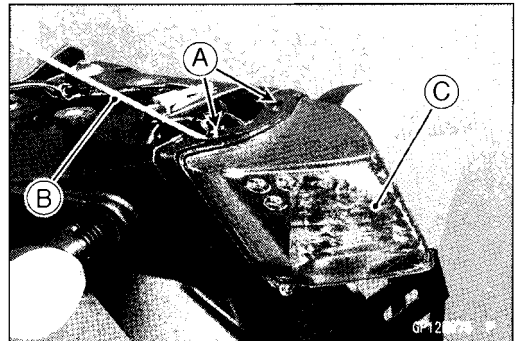


### *Tail/Brake Light Bulb Replacement*

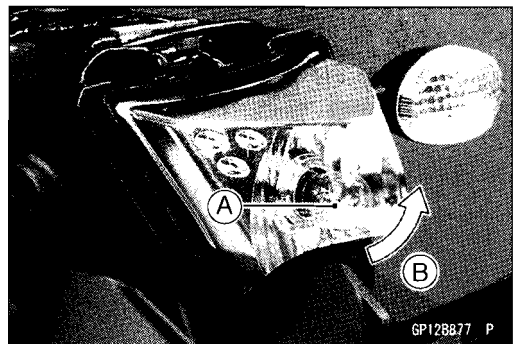
- Remove:  
Rear Fender Rear (see Rear Fender Rear Removal in the Frame chapter)  
Screws [A]



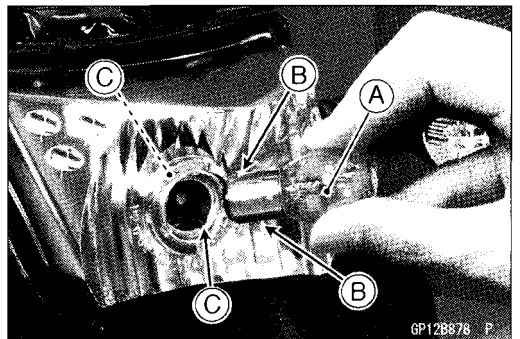
- Clear the stoppers [A] from the tail/brake light body with a screwdriver [B] to remove the lens [C].



- Push and turn the bulb [A] counterclockwise [B] and remove it.
- Replace the bulb with a new one.



- Insert the new bulb [A] by aligning its upper and lower pins [B] with the upper and lower grooves [C] in the socket.
- Push and turn the bulb clockwise.



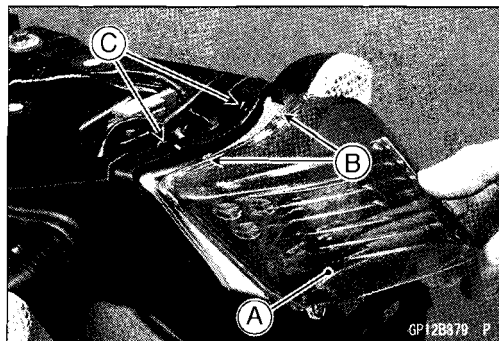


## 16-60 ELECTRICAL SYSTEM

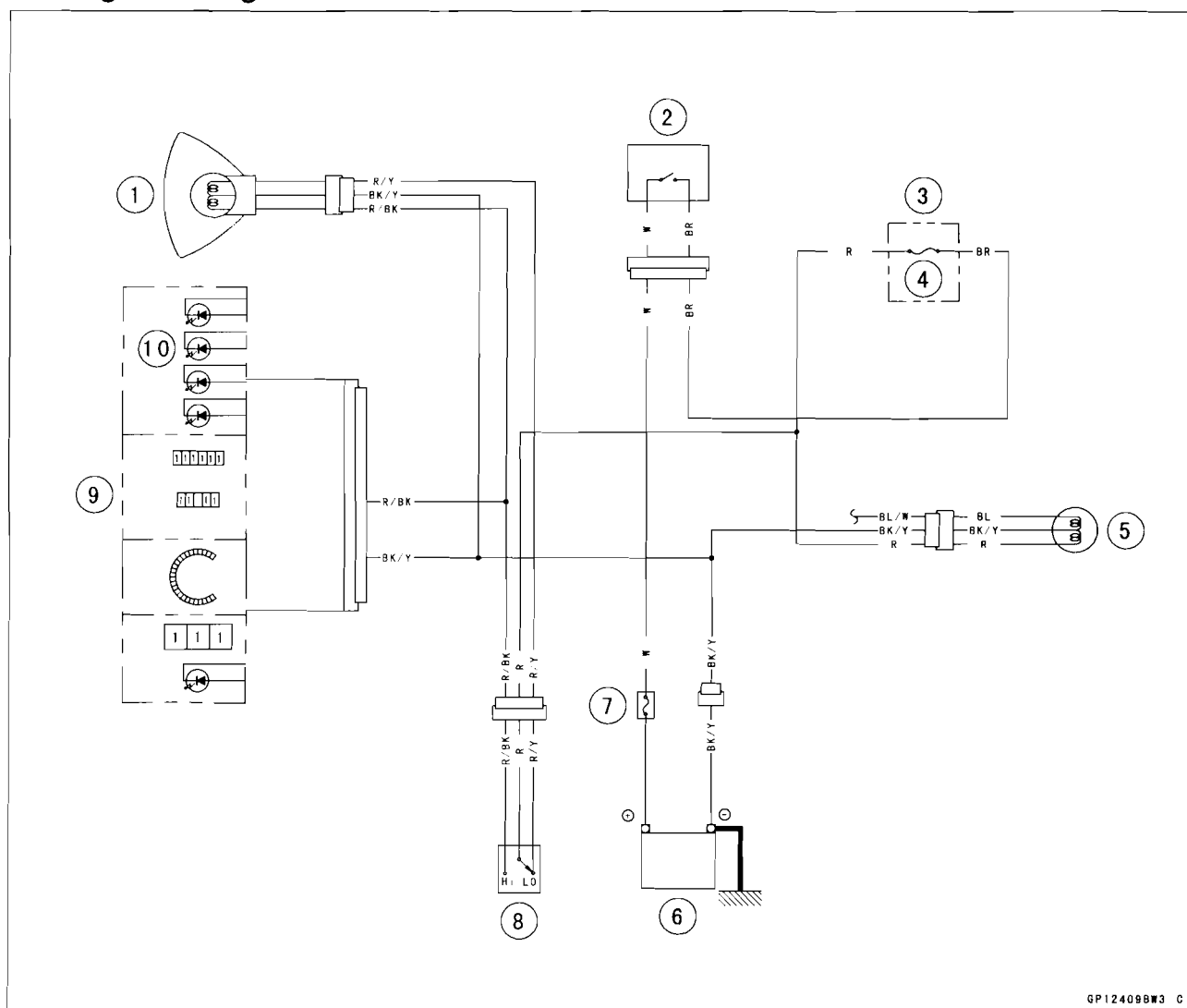
### Lighting System

- Install the taillight lens [A] so that the stopper [B] fit the slits [C].
- Tighten:

**Torque - Tail/Brake Light Lens Screws: 1.0 N·m (0.10 kgf·m, 8.8 in·lb)**



### Headlight/Tail Light Circuit



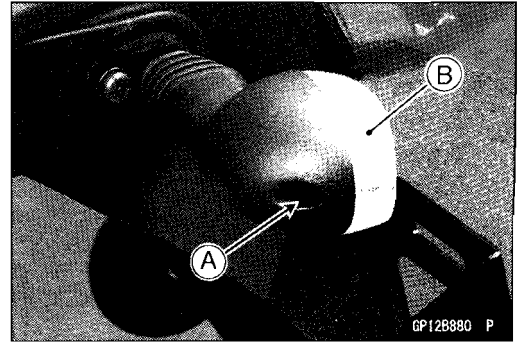
1. Headlight 12 V 60/55 W
2. Ignition Switch
3. Fuse Box
4. Lighting System Fuse 10 A
5. Tail/Brake Light 12 V 5/21 W

6. Battery 12 V 6 Ah
7. Main Fuse 20 A
8. Dimmer Switch
9. Meter Unit
10. High Beam Indicator Light (LED)

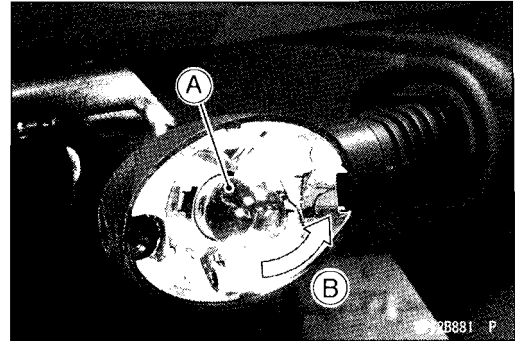
## Lighting System

### Turn Signal Light Bulb Replacement

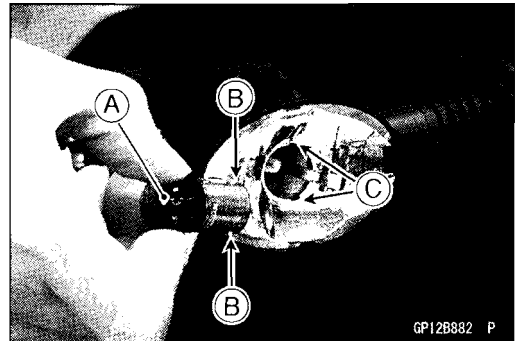
- Remove the turn signal light lens screw [A] and take off the turn signal light lens [B].



- Push and turn the bulb [A] counterclockwise [B], and remove it.
- Replace the bulb with a new one.



- Insert the new bulb [A] by aligning its upper and lower pins [B] with the upper and lower grooves [C] in the socket, and turn the bulb clockwise.
- Install the turn signal light lens.
- Tighten the turn signal light lens screw. Be careful not to overtighten it.

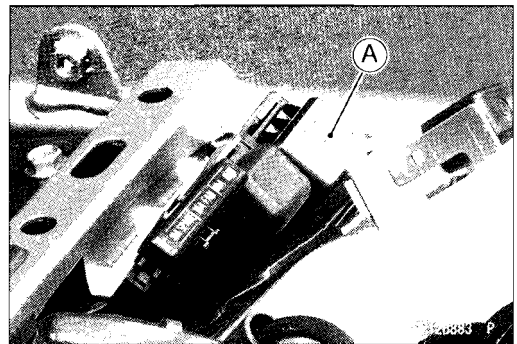


### Turn Signal Relay Inspection

#### CAUTION

**Never drop the turn signal relay, especially on a hard surface. Such a shock can damage it.**

- Remove:  
 Seat (see Seat Removal in the Frame chapter)  
 Turn Signal Relay [A]



# 16-62 ELECTRICAL SYSTEM

## Lighting System

- Connect 12 V battery and turn signal lights as indicated in the figure, and count how many times the lights flash for one minute.  
Turn Signal Relay Connector [A]  
Turn Signal Lights [B]  
12 V Battery [C]

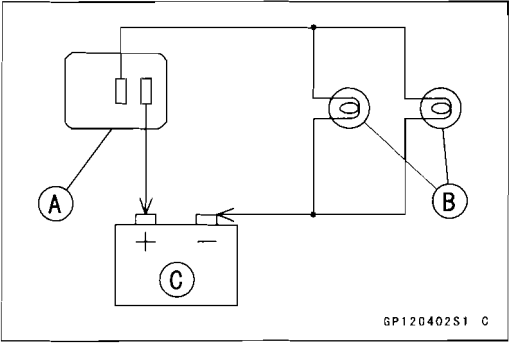
### Testing Turn Signal Relay

Load		
The Number of Turn Signal Light	Wattage (W)	Flashing times (c/m)*
1**	10	140 ~ 250
2	20	75 ~ 95

(\*): Cycle(s) per minute

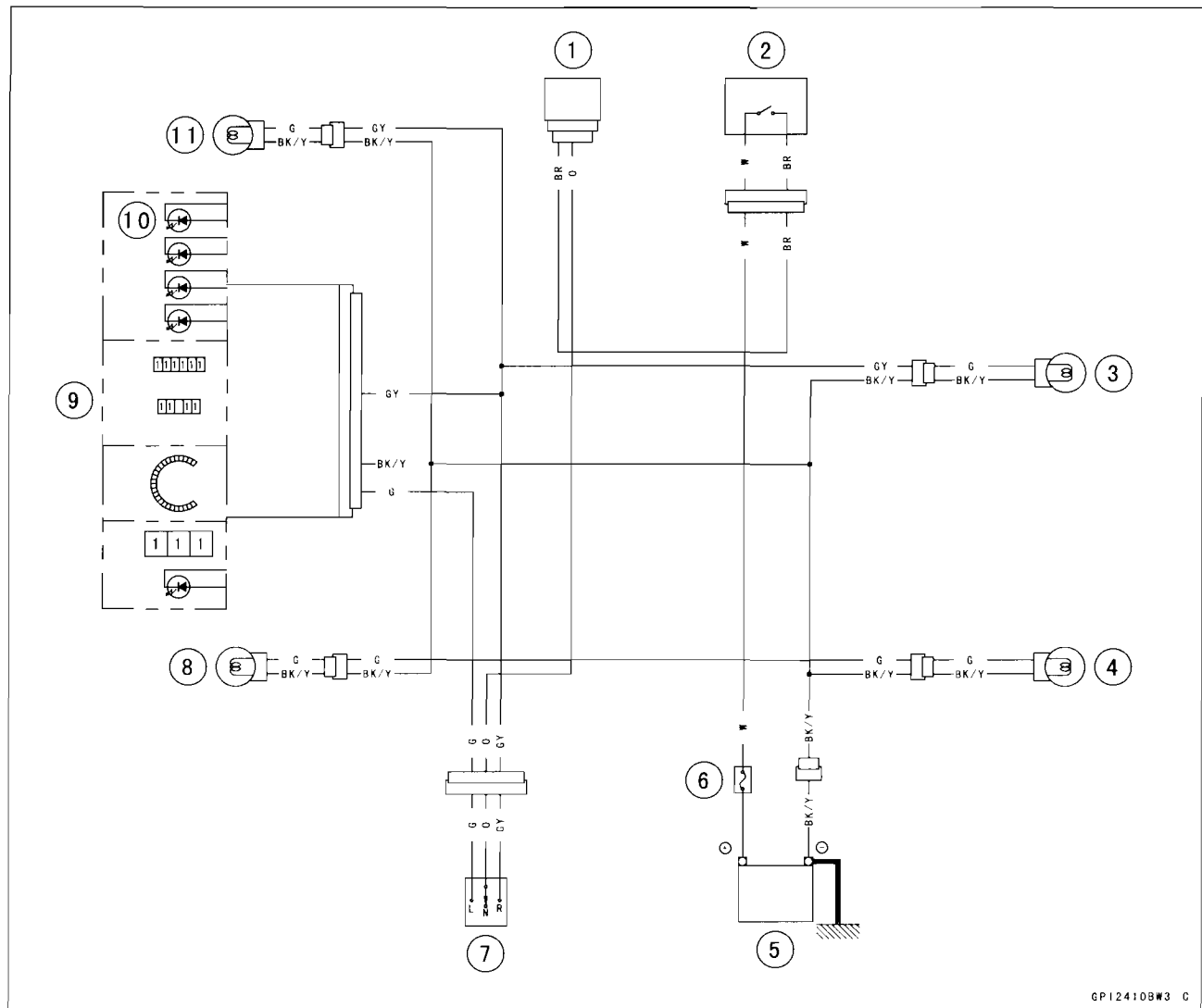
(\*\*): Corrected to "one light burned out".

★ If the lights do not flash as specified, replace the turn signal relay.



## Lighting System

## Turn Signal System Circuit



GP124109W3 C

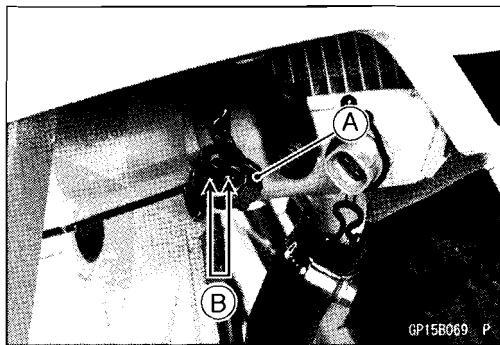
1. Turn Signal Relay
2. Ignition Switch
3. Rear Right Turn Signal Light 12 V 10 W
4. Rear Left Turn Signal Light 12 V 10 W
5. Battery 12 V 6 Ah
6. Main Fuse 20 A
7. Turn Signal Switch
8. Front Left Turn Signal Light 12 V 10 W
9. Meter Unit
10. Turn Signal Indicator Light (LED)
11. Front Right Turn Signal Light 12 V 10 W

## 16-64 ELECTRICAL SYSTEM

### Radiator Fan System

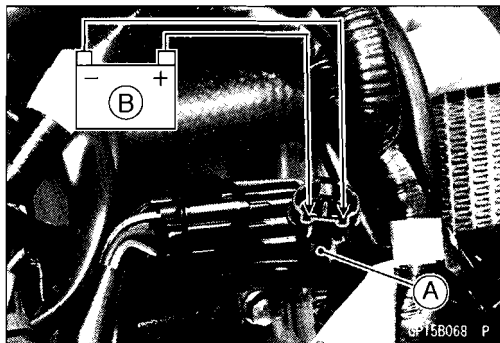
#### Fan System Circuit Inspection

- Disconnect the radiator fan switch connector [A].
- Using an auxiliary lead [B], connect the radiator fan switch leads.
- ★ If the fan rotates, inspect the fan switch (see Radiator Fan Switch Inspection).
- ★ If the fan does not rotate, inspect the following.
  - Wiring (see Wiring Diagram in this section)
  - Fan Fuse 10 A (see Fuse Inspection)
  - Fan Motor (see Fan Motor Inspection)

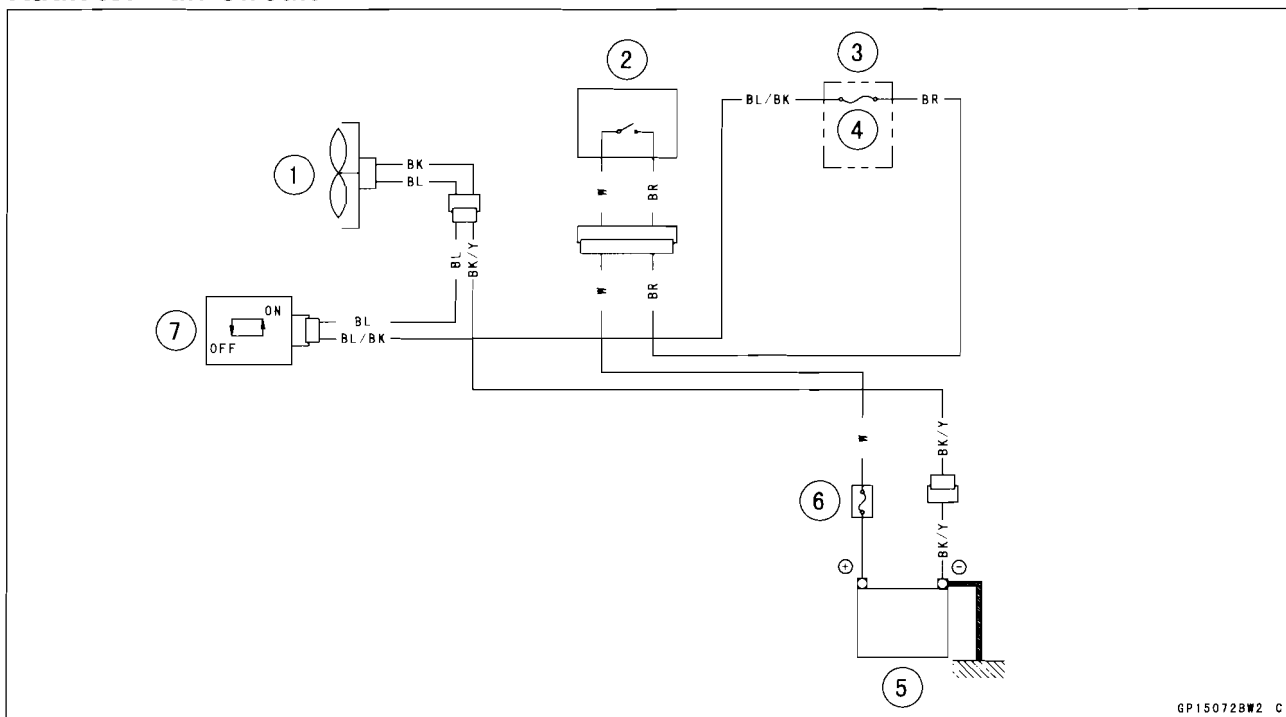


#### Fan Motor Inspection

- Remove the fuel tank (see Fuel Tank Removal in the Fuel System chapter).
- Disconnect the radiator fan lead connector [A].
- Using an auxiliary leads, supply battery [B] power to the fan motor.
- ★ If the fan does not rotate, the fan motor is defective and must be replaced.



### Radiator Fan Circuit



1. Fan Motor
2. Ignition Switch
3. Fuse Box
4. Radiator Fan Fuse 10 A
5. Battery 12 V 6 Ah
6. Main Fuse 20 A
7. Radiator Fan Switch

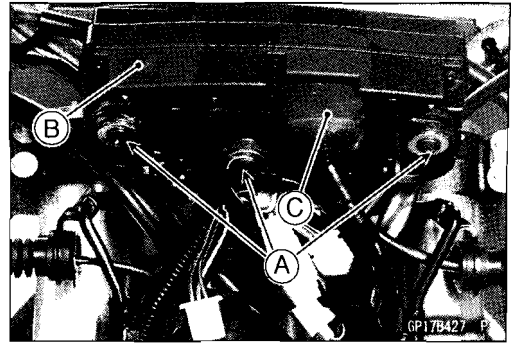
## Meter, Gauge

### Meter Unit Removal

- Remove:
  - Headlight Body (see Headlight Body Removal)
  - Screws [A]
  - Meter Unit [B]
- Disconnect the meter connector [C].

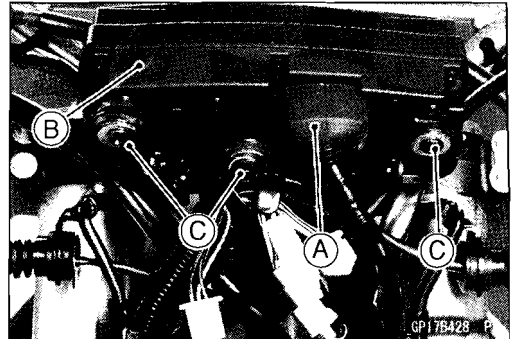
#### CAUTION

Do not drop the meter unit. Place the meter unit so that face is up. If a meter unit is left upside down or sideways for a long time or dropped, it will malfunction.



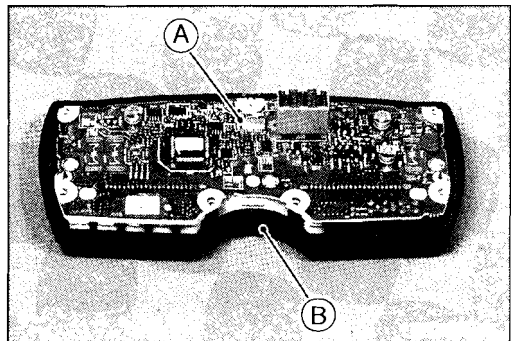
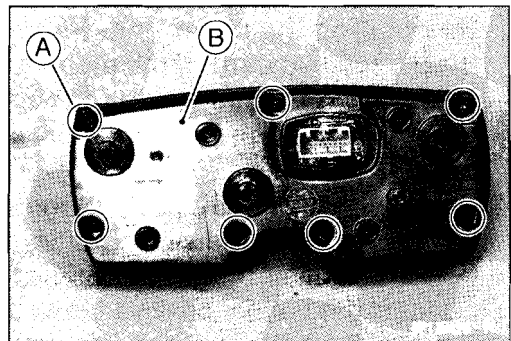
### Meter Unit Installation

- Connect the meter connector [A].
- Install the meter unit [B], and tighten the mounting screws [C] securely.



### Meter Unit Disassembly

- Remove:
  - Meter Unit (see Meter Unit Remove)
  - Screws [A]
  - Lower Meter Cover [B]
- Separate the meter assembly [A] and upper meter cover [B].

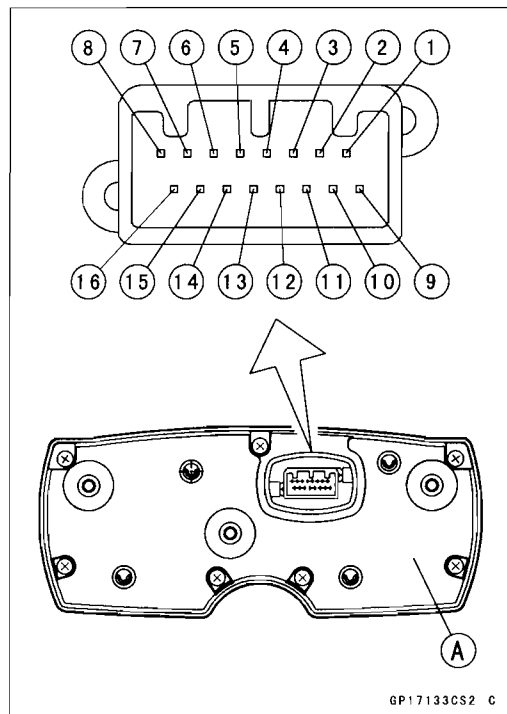


## 16-66 ELECTRICAL SYSTEM

### Meter, Gauge

#### Meter Unit Inspection

- Remove the meter unit (see Meter Unit Removal) [A].
  - [1] Tachometer Signal
  - [2] Speed Sensor Signal
  - [3] Unused
  - [4] Unused
  - [5] Speed Sensor Power Supply
  - [6] Ground (–)
  - [7] Ignition
  - [8] Battery (+)
  - [9] Neutral Indicator Light (LED) (–)
  - [10] High Beam Indicator Light (LED) (+)
  - [11] Right Turn Signal Indicator Light (LED) (+)
  - [12] Left Turn Signal Indicator Light (LED) (+)
  - [13] Water Temperature Warning Indicator Light (LED) (–)
  - [14] Unused
  - [15] Unused
  - [16] Unused

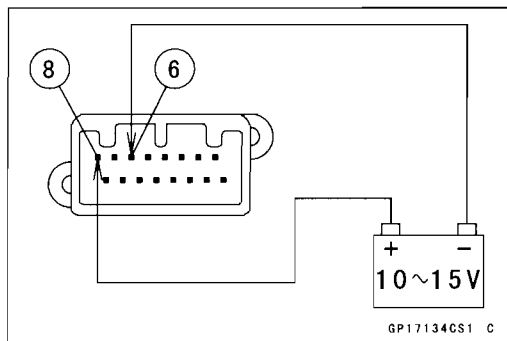


#### CAUTION

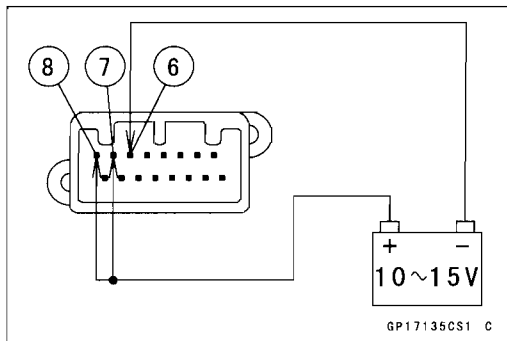
**Do not drop the meter unit. Place the meter unit so that it faces upward. If the meter assembly is left upside down or sideways for a long time or dropped, it will malfunction. Do not short each terminals.**

#### Liquid Crystal Display (LCD) Segments Check

- Using the insulated auxiliary leads, connect the 12 V battery to the meter unit connector as follows.
  - Connect the battery positive terminal to the terminal [8].
  - Connect the battery negative terminal to the terminal [6].



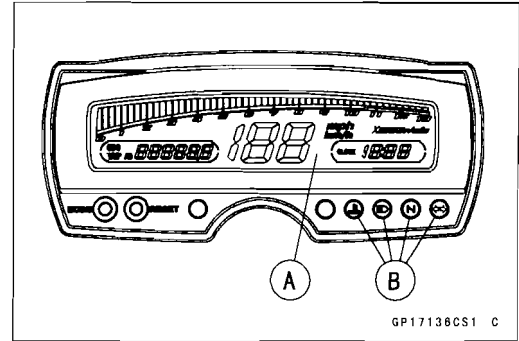
- Connect the terminal [7] to the terminal [8].





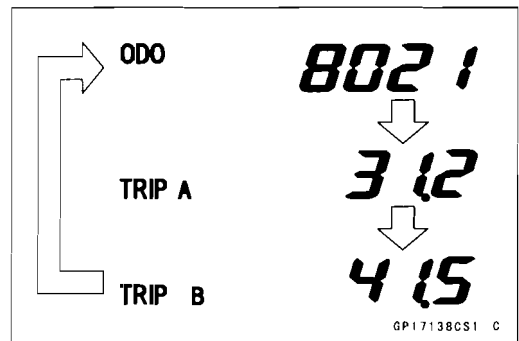
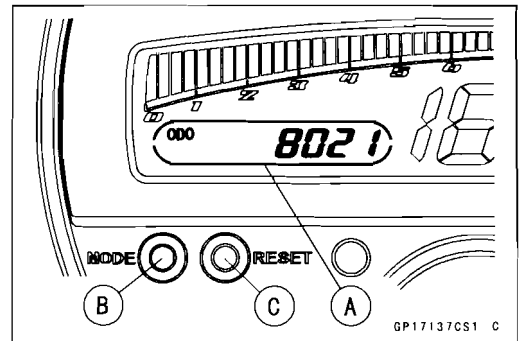
## Meter, Gauge

- When the terminals are connected, all the LCD segments [A] and all indicator lights (LED) [B] appear for three seconds.
- When the terminals are connected, tachometer momentarily goes from the minimum to the maximum, then goes back from the maximum to the minimum reading.
- ★ If the LCD segments will not appear, replace the meter assembly.
- Disconnect the terminal [7].
- All the LCD segments disappear.
- ★ If the segments do not disappear, replace the meter assembly.

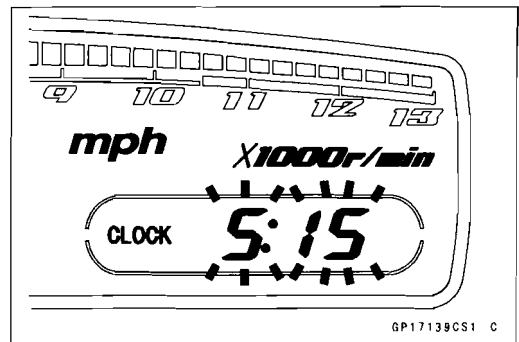


### MODE AND RESET BUTTON Operation Check

- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments Check".
  - Check that the display [A] change to the ODO, TRIP A and TRIP B displays each time the MODE button [B] is pressed.
  - ★ If the display function does not work, replace the meter assembly.
- [C] RESET button



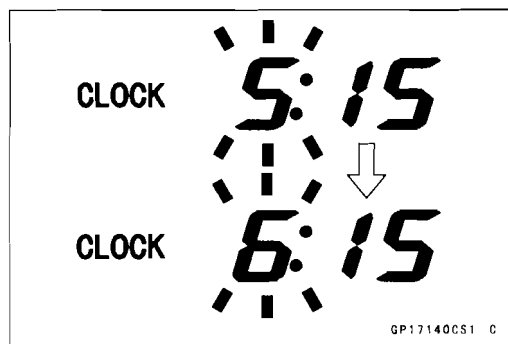
- Indicate the clock mode.
- Check that when the RESET button in CLOCK mode is pushed for more than two seconds, the meter display turns to the clock set mode.
- Both the hour and minute display start flashing.



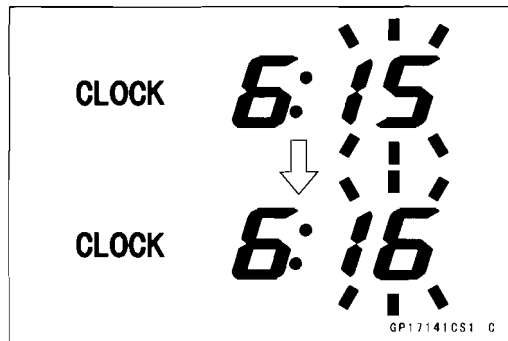
## 16-68 ELECTRICAL SYSTEM

### Meter, Gauge

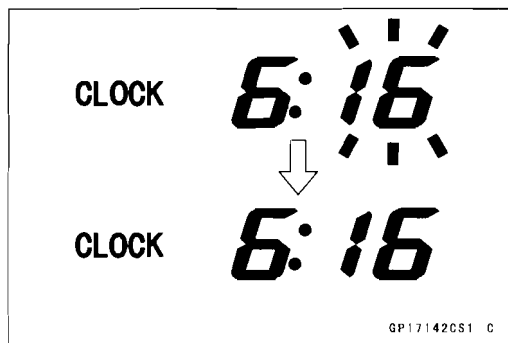
- In the HOUR/MINUTE setting mode, press the reset button [C] again to effect the HOUR setting mode.
- The hour display flashes on the display.
- Press the MODE button to set the hour.



- In the HOUR setting mode, press the RESET button to effect the MINUTE setting mode.
- The minute display flashes on the display.
- Press the MODE button to set the minute.



- In the MINUTE setting mode, press the RESET button to return to the HOUR/MINUTE setting mode.
- Press the MODE button to complete the time setting process.
- The clock starts counting the seconds as soon as the MODE button is pressed.



- Indicate the ODO mode.
- Check that the display [A] change to the mile and km display each time by pushing the RESET button while MODE button pushed in.

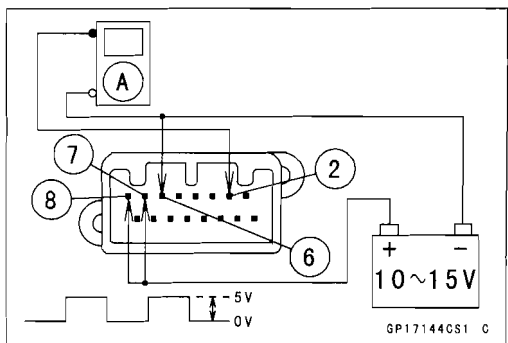
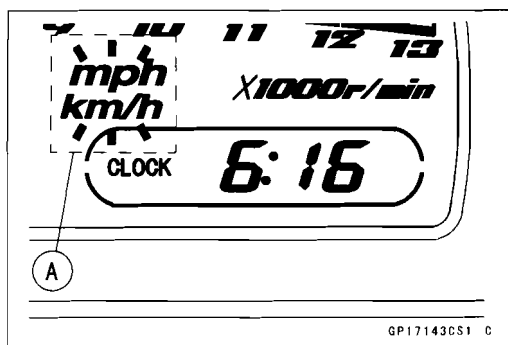
#### NOTE

○Mile/Km Display can alternate between English and metric modes (mile and km) in the digital meter. Make sure that km or mile according to local regulations is correctly displayed before riding.

- ★ If the display function does not work and adjust, replace the meter assembly.

#### Speedometer Check

- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments Check".
- The speed equivalent to the input frequency is indicated in the oscillator [A], if the square wave (illustrated as shown) would be input into the terminal [2].
- Indicates approximately 60 km/h in case the input frequency would be approximately 60 Hz.
- Indicates approximately 60 mph in case the input frequency would be approximately 96 Hz.



## Meter, Gauge

- If the oscillator is not available, the speedometer can be checked as follows.
  - Install the meter unit.
  - Raise the rear wheel off the ground, using the jack.
  - Turn on the ignition switch.
  - Rotate the rear wheel by hand.
  - Check that the speedometer shows the speed.
- ★ If the speedometer does not work, check the speed sensor and wiring (see Speed Sensor section in the Fuel System (DFI) chapter).
- ★ If the speed sensor and wiring are normal, replace the meter assembly.

### Odometer Check

- Check the odometer with the speedometer check in the same way.
- ★ If value indicated in the odometer is not added, replace the meter assembly.

#### NOTE

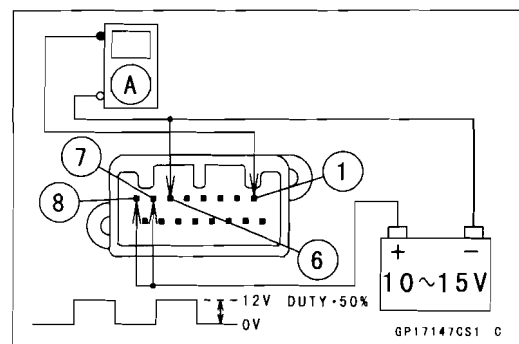
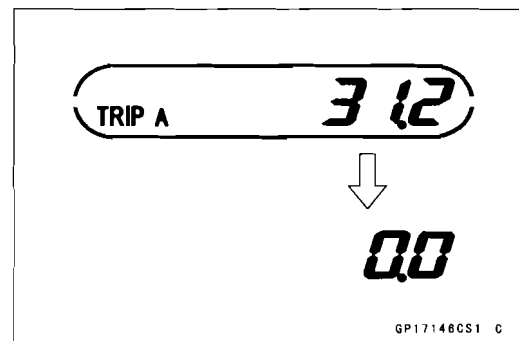
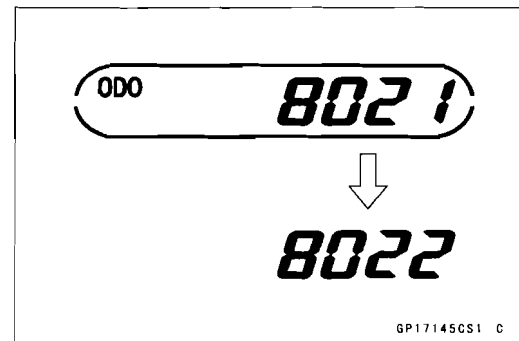
- The data is maintained even if the battery is disconnected.
- When the figures come to 999999, they are stopped and locked.

### Trip Meter Check

- Check the trip meter with the speedometer in the same way.
- ★ If value indicated in the trip meter is not added, replace the meter assembly.
- Check that when the RESET button is pushed for more than two seconds, the figure display turns to 0.0.
- ★ If the figure display does not indicate 0.0, replace the meter assembly.

### Tachometer Check

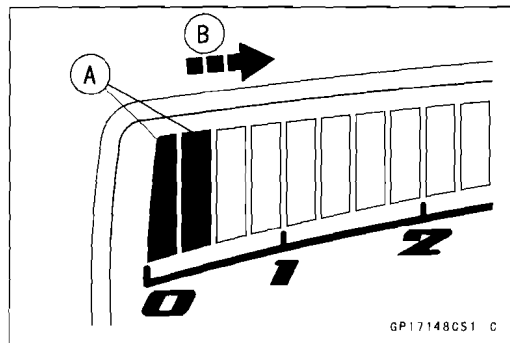
- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments Check".
- When the terminals are connected, the tachometer momentarily goes from the minimum to the maximum, then goes back from the maximum to the minimum reading.
- ★ If the tachometer segments function does not work, replace the meter assembly.
- The revolutions per minute (rpm) equivalent to the input frequency is indicated in the oscillator [A] if the square wave (illustrated as shown) would be input into the terminal [1].
- Indicates approximately 4 000 rpm in case the input frequency would be approximately 66.7 Hz.



## 16-70 ELECTRICAL SYSTEM

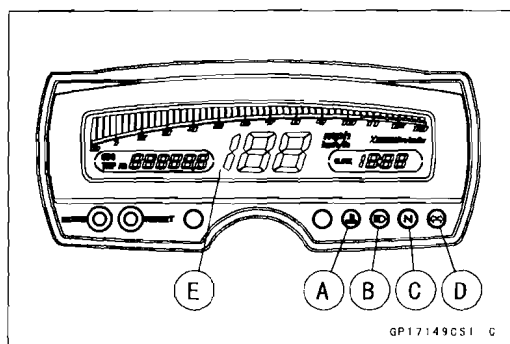
### Meter, Gauge

- If the oscillator is not available, the tachometer can be checked as follows.
- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments Check".
- When the terminals are connected, the tachometer momentary goes from minimum to the maximum, then goes back from the maximum to the minimum reading.
- ★ If the tachometer segments function does not work, replace the meter assembly.
- Using the insulated auxiliary lead, quickly open and connect the terminal [7] to the terminal [1] repeatedly.
- Then the tachometer segments [A] should flick [B].
- ★ If the hand does not flick, replace the meter assembly.



### Lights (LED) Inspection

- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments check."
- Water Temperature Warning Indicator Light (LED) [A]
- High Beam Indicator Light (LED) [B]
- Neutral Indicator Light (LED) [C]
- Turn Signal Indicator Light [D]
- Illumination Light (LED) [E]

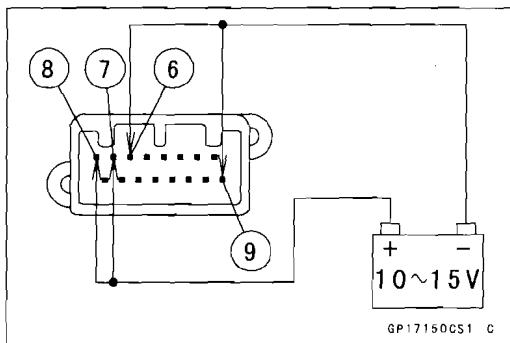


### Illumination Light (LED) Inspection

- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments check."
- When the terminals are connected, the illumination light (LED) should go on.
- ★ If the illumination light (LED) does not go on, replace the meter assembly.

### Neutral Indicator Light (LED) Inspection

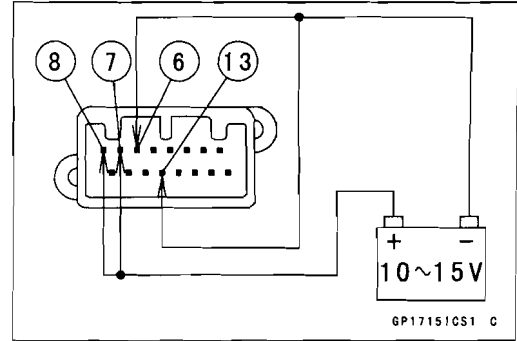
- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments check."
- Using the insulated auxiliary lead, 12 V battery to the meter unit connector as follows.
- Connect the battery negative (–) terminal to the terminal [9].
- When the terminals are connected, the neutral indicator light (LED) should go on.
- ★ If the neutral indicator light (LED) does not go on, replace the meter assembly.



## Meter, Gauge

### Water Temperature Warning Indicator Light (LED)

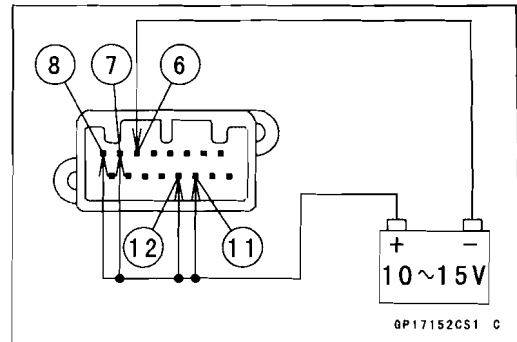
- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments check."
- Using the insulated auxiliary lead, 12 V battery to the meter unit connector as follows.
- Connect the battery negative (–) terminal to the terminal [13].



- ★ If the warning indicator light does not go on, replace the meter assembly.

### Right and Left Turn Signal Indicator Light (LED)

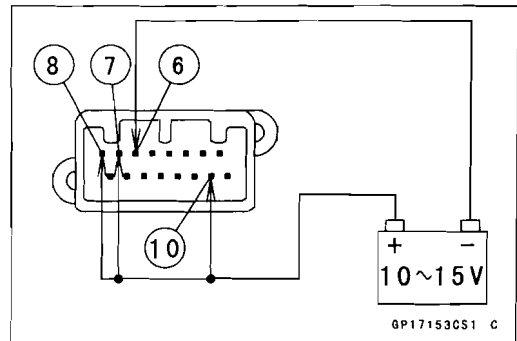
- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments check."
- Using the insulated auxiliary leads, 12 V battery to the meter unit connector as follows.
- Connect the battery positive (+) terminal to the terminal [11].
- Connect the battery negative (+) terminal to the terminal [12].



- When the terminals are connected, the turn signal indicator light (LED) should go on.
- ★ If the turn signal indicator light (LED) does not go on, replace the meter assembly.

### High Beam Indicator Light (LED)

- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments check."
- Using the insulated auxiliary lead, 12 V battery to the meter unit connector as follows.
- Connect the battery positive (+) terminal to the terminal [10].

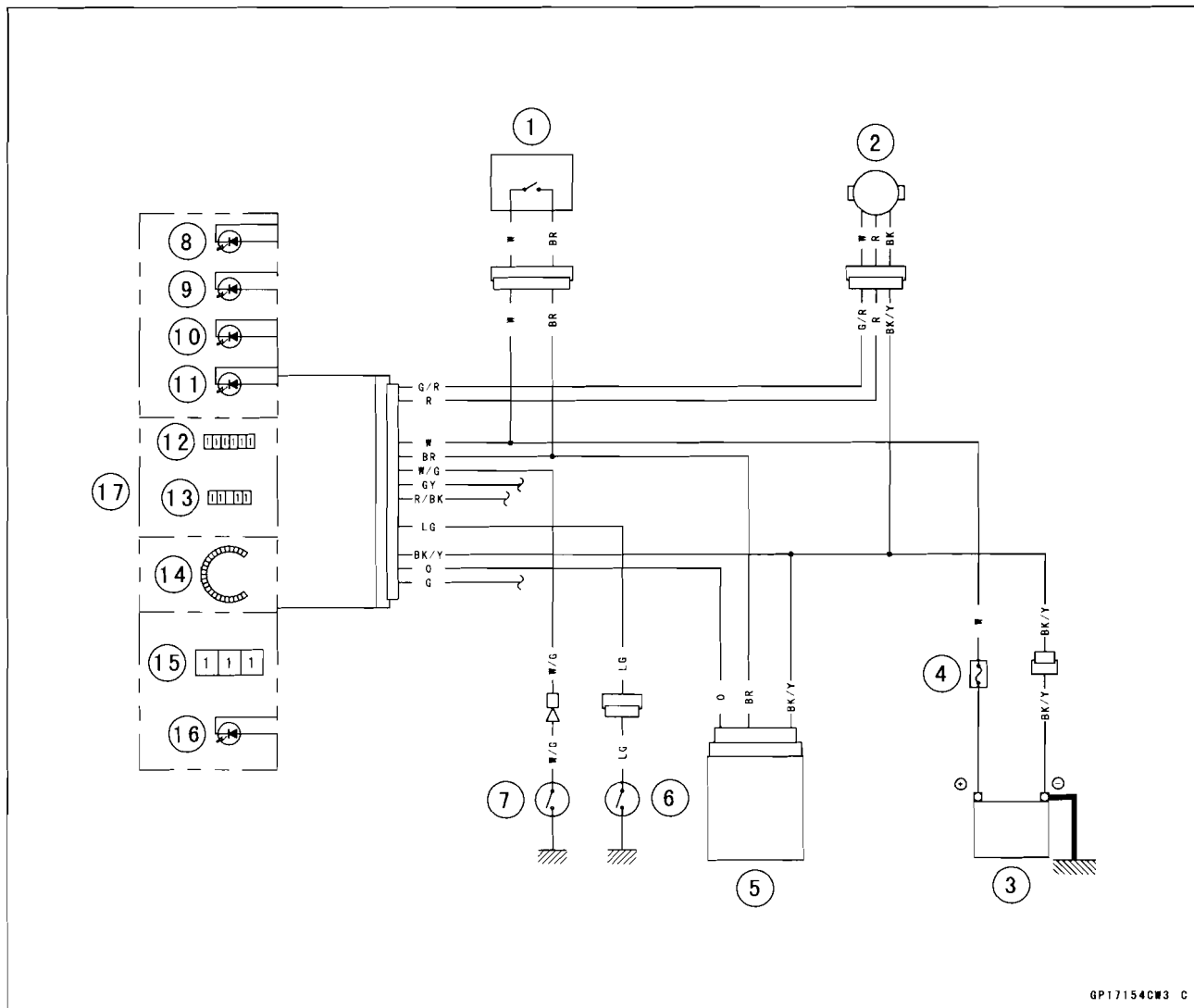


- When the terminals are connected, the high beam indicator light (LED) should go on.
- ★ If the turn signal high beam indicator light (LED) does not go on, replace the meter assembly.

# 16-72 ELECTRICAL SYSTEM

## Meter, Gauge

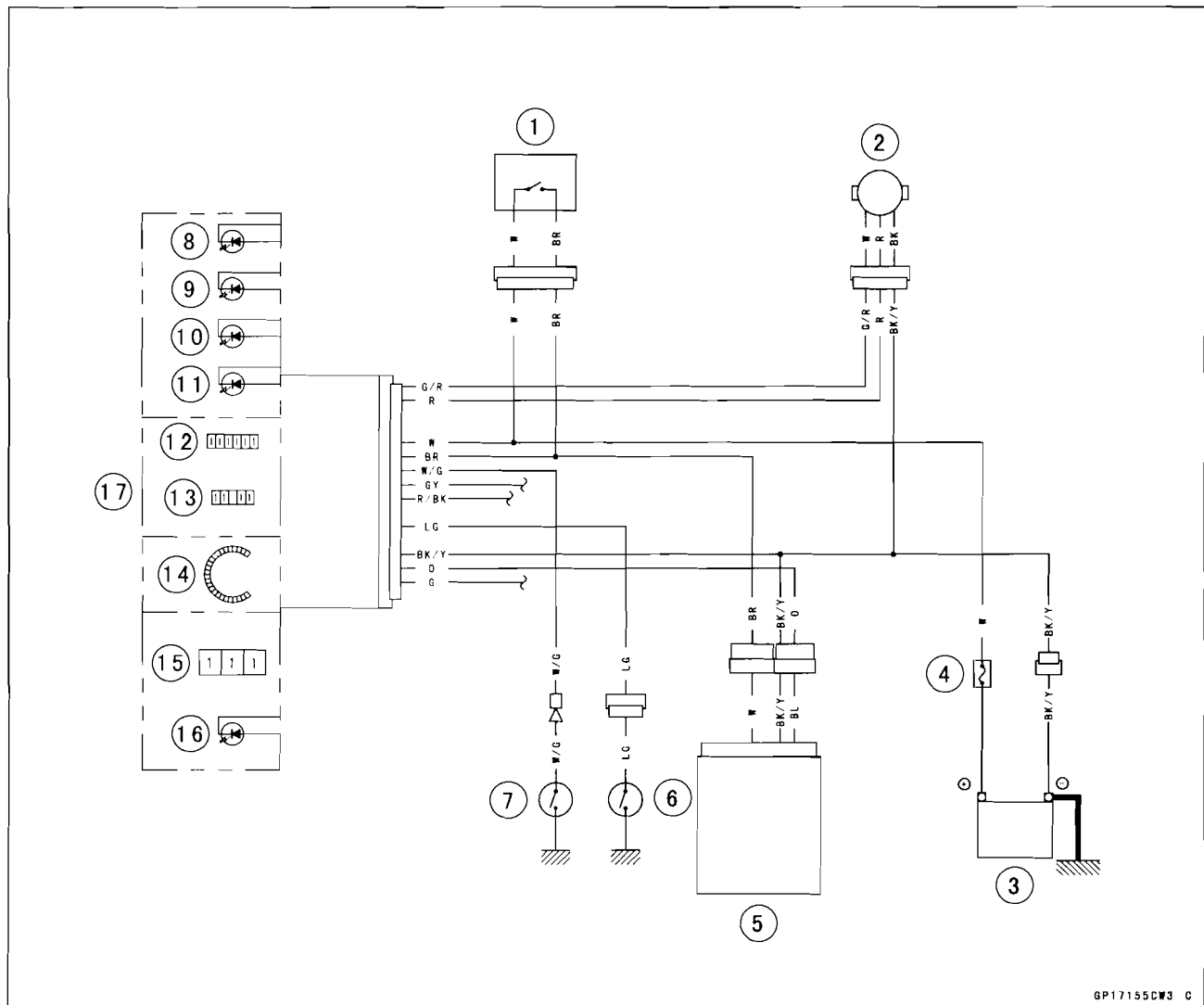
### Meter Unit Circuit (other than AU Model)



- |   |   |
|---|---|
| 1. Ignition Switch                        | 9. High Beam Indicator Light (LED)        |
| 2. Speed Sensor                           | 10. Neutral Indicator Light (LED)         |
| 3. Battery 12 V 6 Ah                      | 11. Water Temperature Warning Light (LED) |
| 4. Main Fuse 20 A                         | 12. Odometer/Trip Meter                   |
| 5. Igniter                                | 13. Clock                                 |
| 6. Neutral Switch                         | 14. Tachometer                            |
| 7. Water Temperature Warning Light Switch | 15. Speedometer                           |
| 8. Turn Signal Indicator Light (LED)      | 16. Illumination Light (LED)              |
|   | 17. Meter Unit                            |

## Meter, Gauge

## Meter Unit Circuit (AU Model)



GP17155CW3 C

- |   |   |
|---|---|
| 1. Ignition Switch                        | 9. High Beam Indicator Light (LED)        |
| 2. Speed Sensor                           | 10. Neutral Indicator Light (LED)         |
| 3. Battery 12 V 6 Ah                      | 11. Water Temperature Warning Light (LED) |
| 4. Main Fuse 20 A                         | 12. Odometer/Trip Meter                   |
| 5. Igniter                                | 13. Clock                                 |
| 6. Neutral Switch                         | 14. Tachometer                            |
| 7. Water Temperature Warning Light Switch | 15. Speedometer                           |
| 8. Turn Signal Indicator Light (LED)      | 16. Illumination Light (LED)              |
|   | 17. Meter Unit                            |

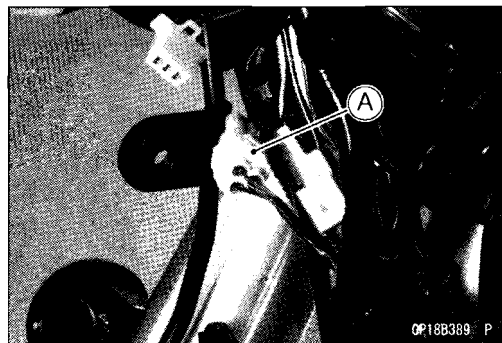


## 16-74 ELECTRICAL SYSTEM

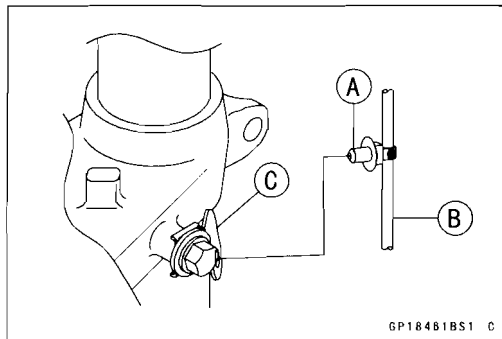
### Switches and Sensors

#### ***Speed Sensor Removal***

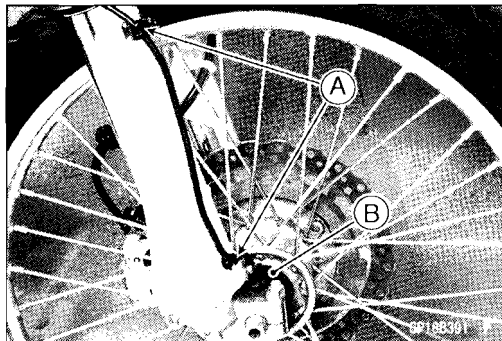
- Remove:
  - Headlight Body (see Headlight Body Removal)
- Disconnect the speed sensor connector [A].



- Pull the band [A] with speed sensor lead [B] from the bracket [C] at the steering stem base.

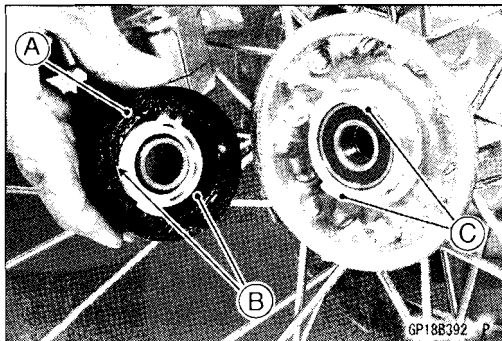


- Remove the speed sensor lead from the clamps [A] at the fork protector.
- Remove:
  - Front Wheel (see Front Wheel Removal in the Wheels/Tires chapter)
  - Speed Sensor [B]



#### ***Speed Sensor Installation***

- Apply grease to the speed sensor seal lip [A].
  - Install the speed sensor so that grooves [B] of the speed sensor fit the projections [C] of the front hub.
- After installing it, lightly turn the speed sensor housing left and right by half a turn to check if the projection of hub are engaged properly in the grooves provided on the speed sensor.



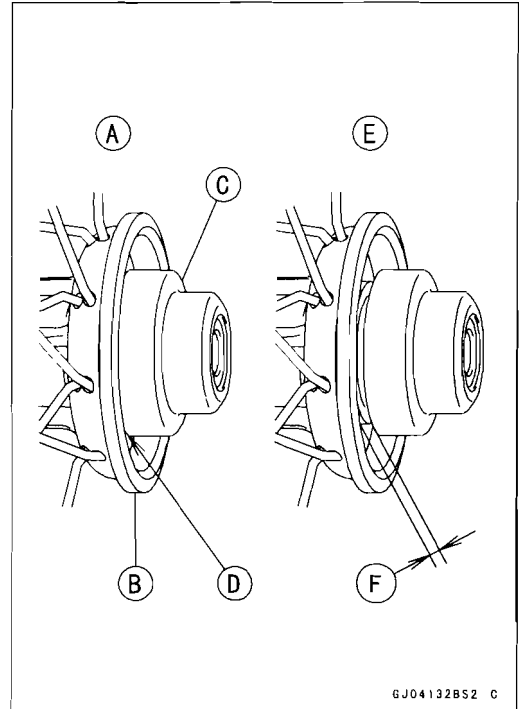
## Switches and Sensors

○When they are installed properly [A], no gaps [D] should be observed between the wheel [B] and the housing [C]. If there is a gap [F] between the wheel and the housing, then they are not engaged properly [E].

### CAUTION

**Unless the speed sensor housing is properly installed on the wheel, you will damage the speed sensor rotor in tightening the front axle.**

- Install the front wheel (see Front Wheel Installation in the Wheels/Tires chapter).
- Install the band with speed sensor lead to the bracket (see Cable, Wire, and Hose Routing section in the Appendix chapter).

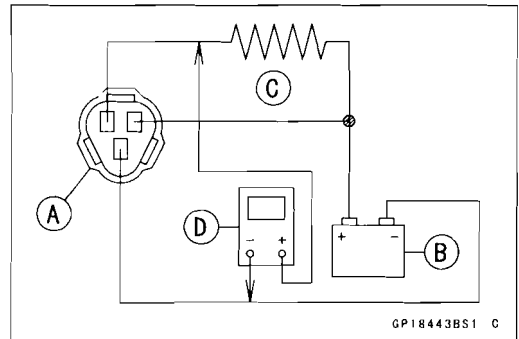


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### Speed Sensor Inspection

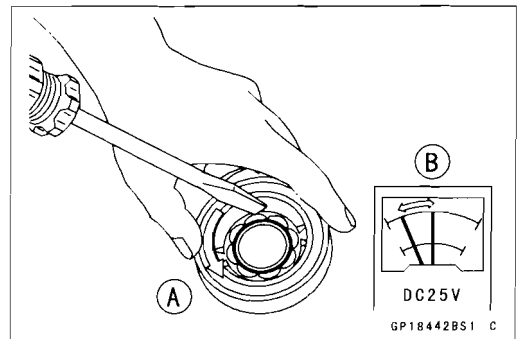
- Remove:  
Speed Sensor (see Speed Sensor Removal)
- Connect the speed sensor connector [A] with a battery [B], 10 kΩ resistor [C] and hand tester [D] as shown.
- Set the hand tester to the DC 25 V range.

**Special Tool - Hand Tester: 57001-1394**



GP18443BS1 C

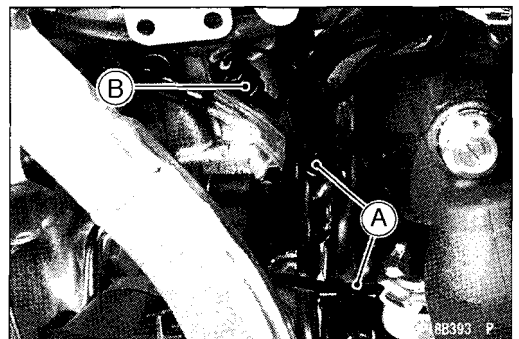
- Rotate [A] the sensor rotor of the speed sensor with a screw driver.
- Then the tester indicator should flick [B].
- ★If the tester indicator does not flick, replace the speed sensor.



GP18442BS1 C

### Sidestand Switch Removal

- Remove:  
Fuel Tank (see Fuel Tank Removal in the Fuel System chapter)  
Bands [A]  
Connector [B]

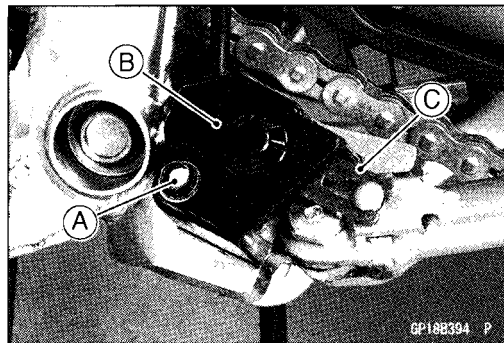


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## 16-76 ELECTRICAL SYSTEM

### Switches and Sensors

- Remove:
  - Bolt [A]
  - Sidestand Switch Cover [B]
  - Sidestand Switch [C]

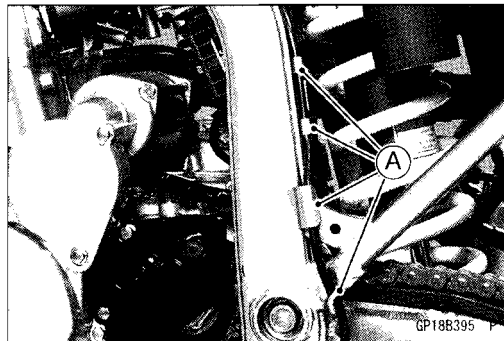


#### **Sidestand switch Installation**

- Install the sidestand switch (see Sidestand Installation in the Frame chapter).
- Apply a non-permanent locking agent to the sidestand switch mounting bolts, and tighten it.

**Torque - Sidestand Switch Mounting Bolt:** 8.8 N·m (0.90 kgf·m, 78 in·lb)

- Hold the sidestand switch lead on the frame brackets [A] (see Cable, Wire and Hose Routing in the Appendix chapter).
- Connect the sidestand switch lead connector.



#### **Brake Light Timing Inspection**

- Refer to the Brake Light Switch Operation Inspection in the Periodic Maintenance chapter.

#### **Brake Light Timing Adjustment**

- Refer to the Brake Light Switch Operation Inspection in the Periodic Maintenance chapter.

## Switches and Sensors

### Switch Inspection

- Using a hand tester, check to see that only the connections shown in the table have continuity.

**Special Tool - Hand Tester: 57001-1394**

○ For the switch housings and the ignition switch, refer to the tables in the Wiring Diagram.

- ★ If the switch has an open or short, repair it or replace it with a new one.

### Rear Brake Light Switch Connections

Rear Brake Light Switch Connections		
Color	BR	BK
When brake pedal is pushed down	○	○
When brake pedal is released		

### Sidestand Switch Connections

Sidestand Switch Connections		
Color	BK	G
When sidestand is down		
When sidestand is up	○	○

### Neutral Switch Connections

Neutral Switch Connections		
Color	SW. Terminal	Ground
When transmission is in neutral	○	○
When transmission is not in neutral		

## 16-78 ELECTRICAL SYSTEM

### Switches and Sensors

#### Radiator Fan Switch Inspection

- Remove the radiator fan switch from the radiator (see Radiator Fan Switch/Water Temperature Warning Light Switch Removal in the Cooling System chapter).
- Suspend the switch [A] in a container of coolant so that the temperature-sensing area and threaded portion are submerged.
- Suspend an accurate thermometer [B] in the coolant so that the sensitive portions [C] are located in almost the same depth.

#### NOTE

○ The switch and thermometer must not touch the container sides or bottom.

- Place the container over a source of heat and gradually raise the temperature of the oil while stirring the oil gently for even temperature.
- Using the hand tester, measure the internal resistance of the switch across the terminals in the connector at the temperatures shown below.

**Special Tool - Hand Tester: 57001-1394**

#### Radiator Fan Switch Resistance

##### Rising Temperature

OFF to ON: 95 ~ 101°C (203 ~ 214 °F)

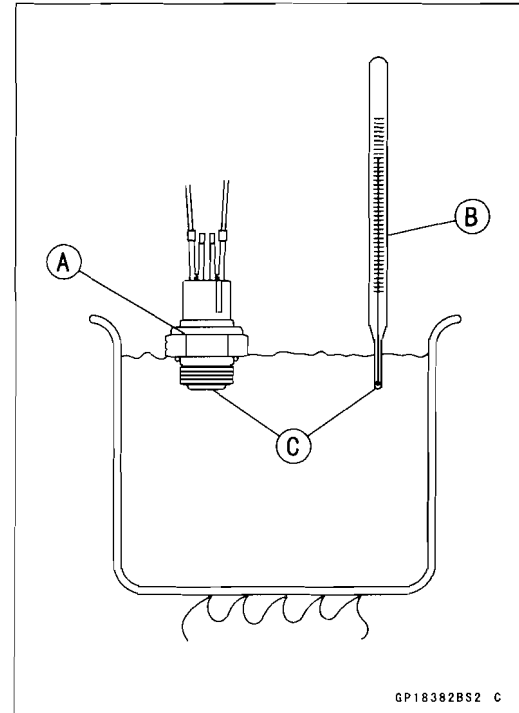
##### Falling Temperature:

ON to OFF: 87°C (189°F) or less

ON: 0.5  $\Omega$  or less

OFF: 1 M $\Omega$  or more

- ★ If the hand tester does not show the specified values, replace the switch.



## Switches and Sensors

### Water Temperature Warning Light Switch Inspection

- Remove the water temperature warning light switch (see Radiator Fan Switch/Water Temperature Warning Light Switch Removal in the Cooling System chapter).
- Suspend the switch [A] in a container of coolant so that the temperature-sensing area and threaded portion are submerged.
- Suspend an accurate thermometer [B] in the coolant so that the sensitive portions [C] are located in almost the same depth.

#### NOTE

○ The switch and thermometer must not touch the container sides or bottom.

- Place the container over a source of heat and gradually raise the temperature of the oil while stirring the oil gently for even temperature.
- Using the hand tester, measure the internal resistance of the switch across the terminal and body at the temperatures shown below.

**Special Tool - Hand Tester: 57001-1394**

### Water Temperature Warning Light Switch Resistance

#### Rising Temperature:

**OFF to ON: 107 ~ 113°C (225 ~ 235°F)**

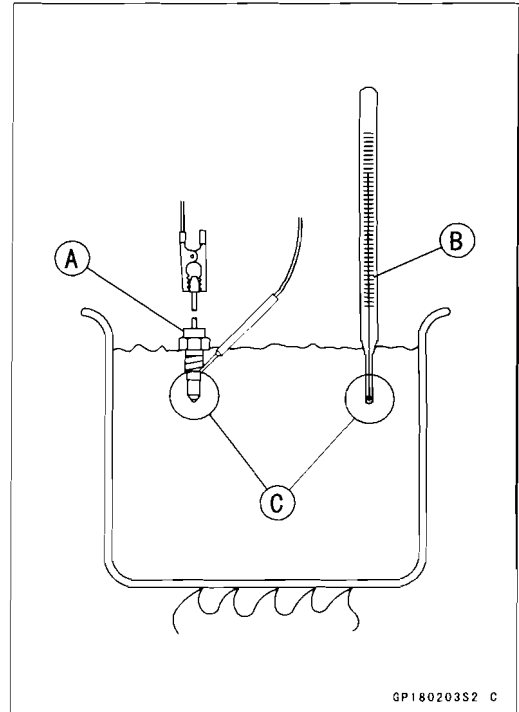
#### Falling Temperature:

**ON to OFF: 103°C (217°F) or less**

**ON: less than 0.5  $\Omega$**

**OFF: 1 M $\Omega$  or more**

- ★ If the hand tester does not show the specified values, replace the switch.

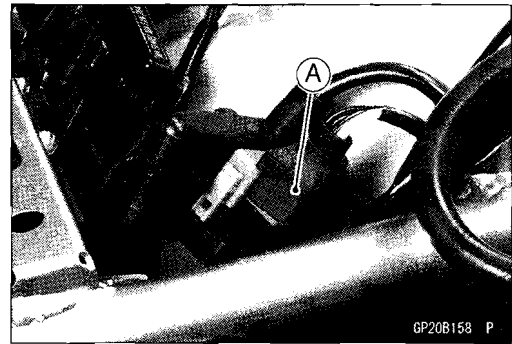


## 16-80 ELECTRICAL SYSTEM

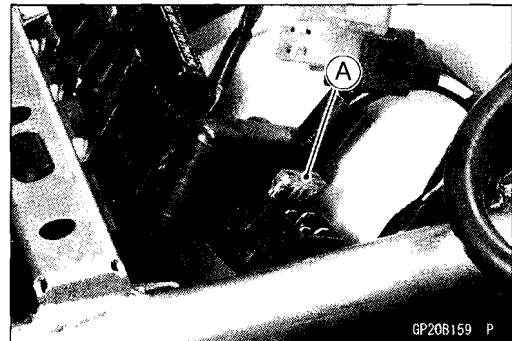
### Fuse

#### 20 A Main Fuse Removal

- Remove the seat (see Seat Removal in the Frame chapter).
- Disconnect the connector [A].

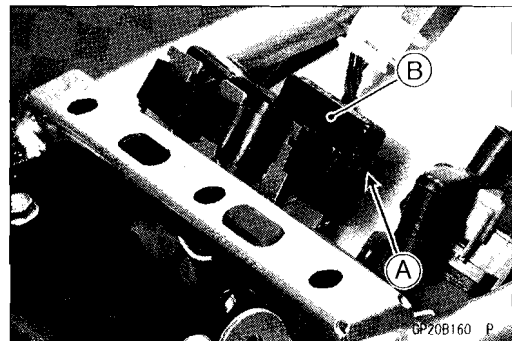


- Pull out the main fuse [A] from the starter relay with needle nose pliers.

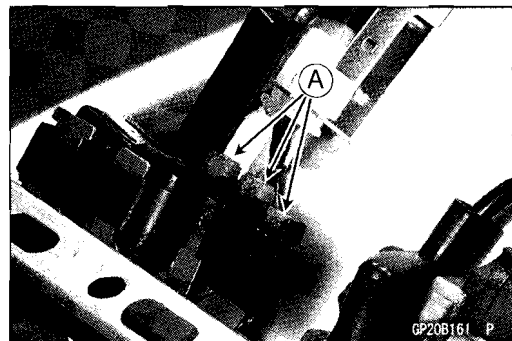


#### Fuse Box Fuse Removal

- Remove the seat (see Seat Removal in the Frame chapter).
- Unlock the hook [A] to lift up the lid [B].



- Pull the fuses [A] straight out of the fuse box with needle nose pliers.



#### Fuse Installation

- If a fuse fails during operation, inspect the electrical system to determine the cause, and then replace it with a new fuse of proper amperage.
- Install the fuse box fuses on the original position as specified on the lid.



## Fuse

### Fuse Inspection

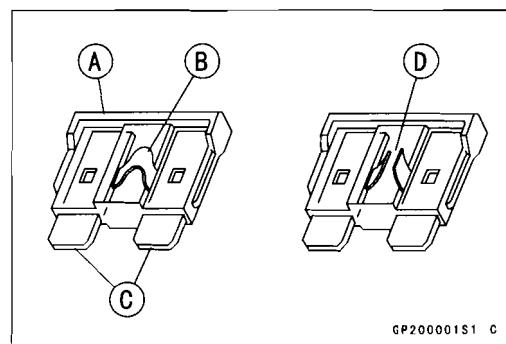
- Remove the fuse (see 20 A Main/Fuse Box Fuse Removal).
- Inspect the fuse element.
- ★ If it is blown out, replace the fuse. Before replacing a blown fuse, always check the amperage in the affected circuit. If the amperage is equal to or greater than the fuse rating, check the wiring and related components for a short circuit.

Housing [A]

Fuse Element [B]

Terminals [C]

Blown Element [D]



### CAUTION

**When replacing a fuse, be sure the new fuse matches the specified fuse rating for that circuit. Installation of a fuse with a higher rating may cause damage to wiring and components.**

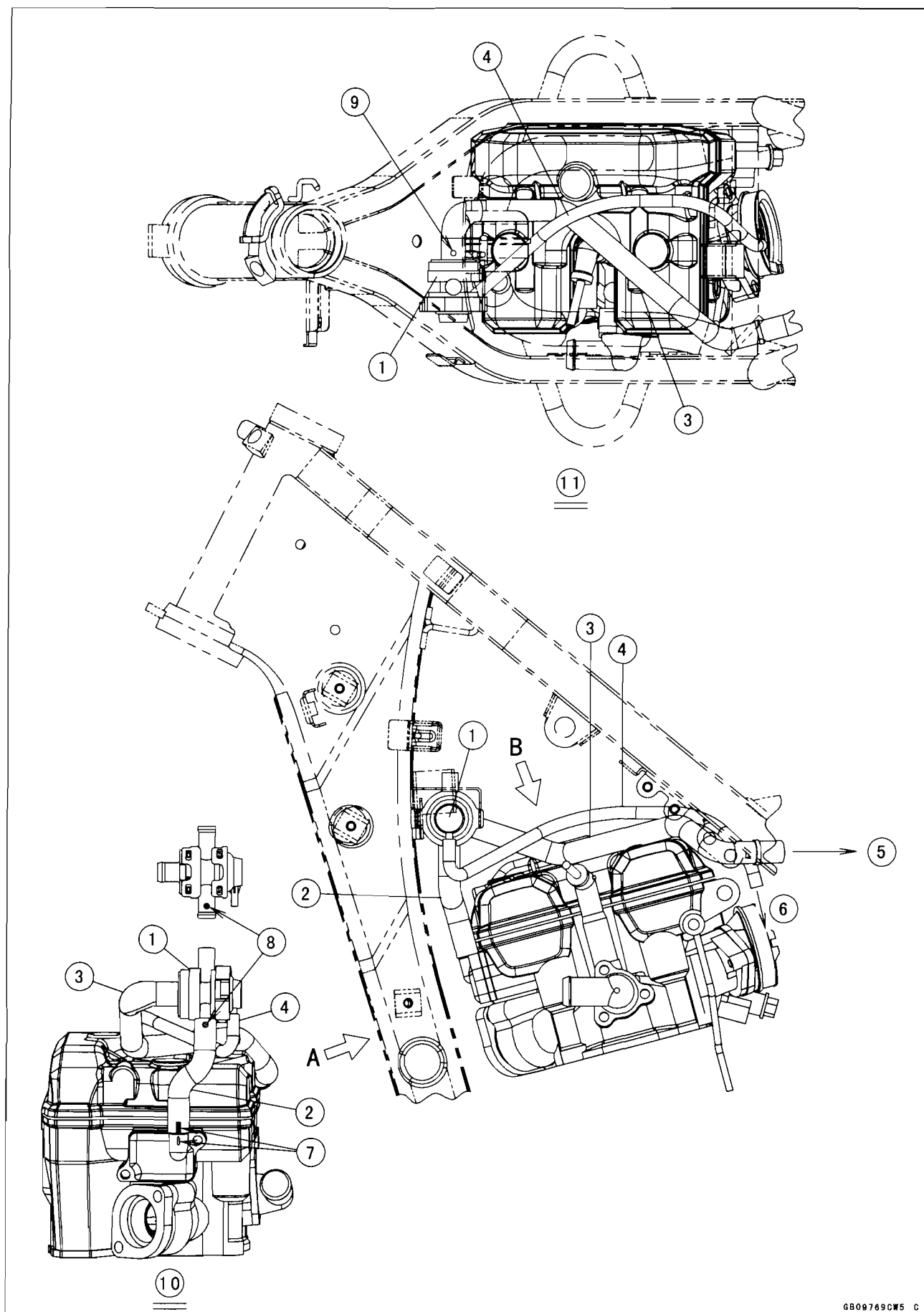
# Appendix

## Table of Contents

Cable, Wire, and Hose Routing .....	17-2
Troubleshooting Guide .....	17-28

## 17-2 APPENDIX

### Cable, Wire, and Hose Routing



GB09769CW5 C

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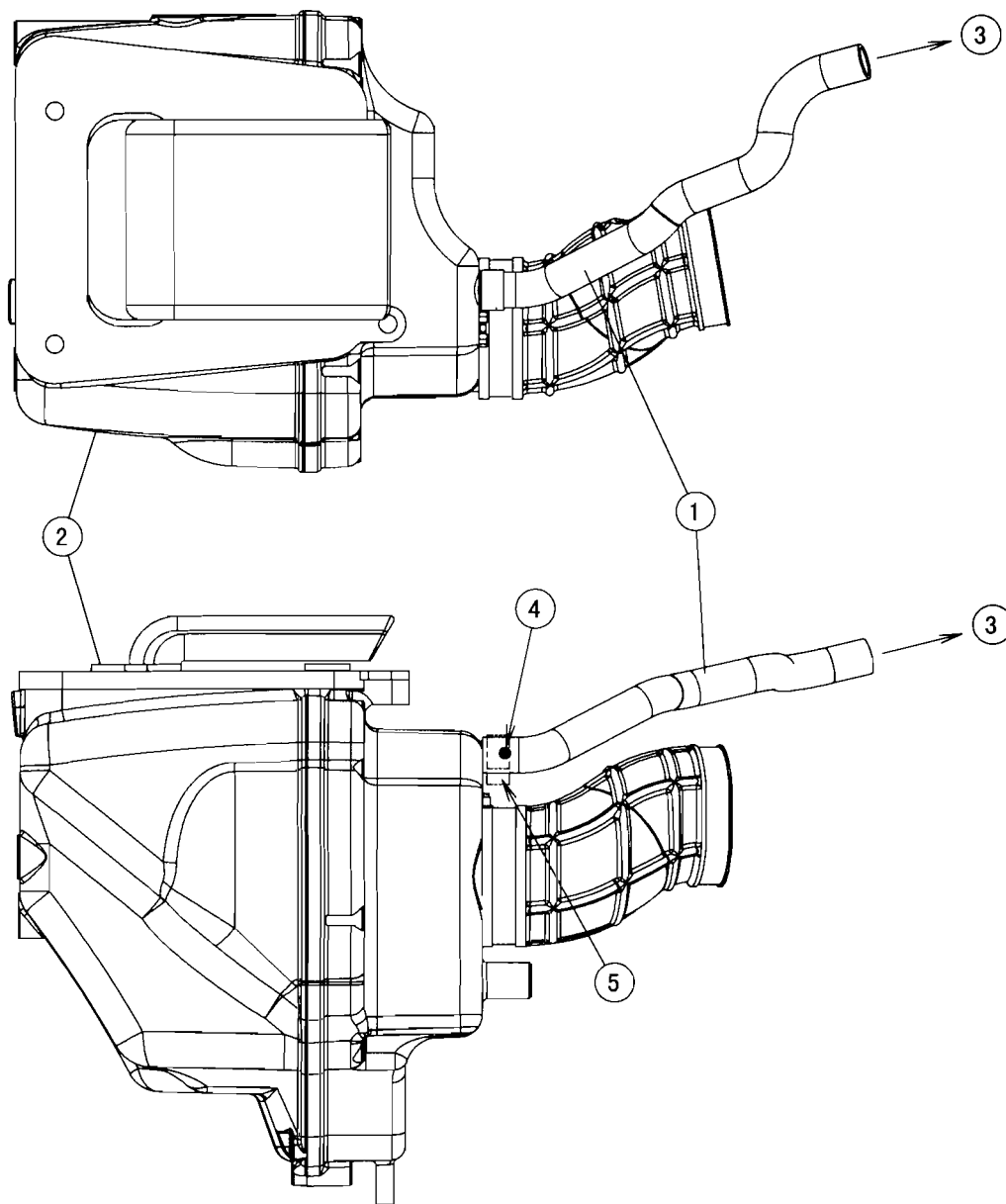
**Cable, Wire, and Hose Routing**

---

1. Vacuum Switch Valve
2. Valve Vacuum Switch Valve Hose (To Air Suction Valve)
3. Vacuum Switch Valve Hose (To Air Cleaner Housing)
4. Vacuum Switch Valve Hose (To Carburetor)
5. To Air Cleaner Housing
6. To Carburetor
7. Align the white paint and projection on the air suction valve cover.
8. Align the white paint of the vacuum switch valve hose and vacuum switch valve.
9. Face the white mark upward.
10. Viewed from A
11. Viewed from B

## 17-4 APPENDIX

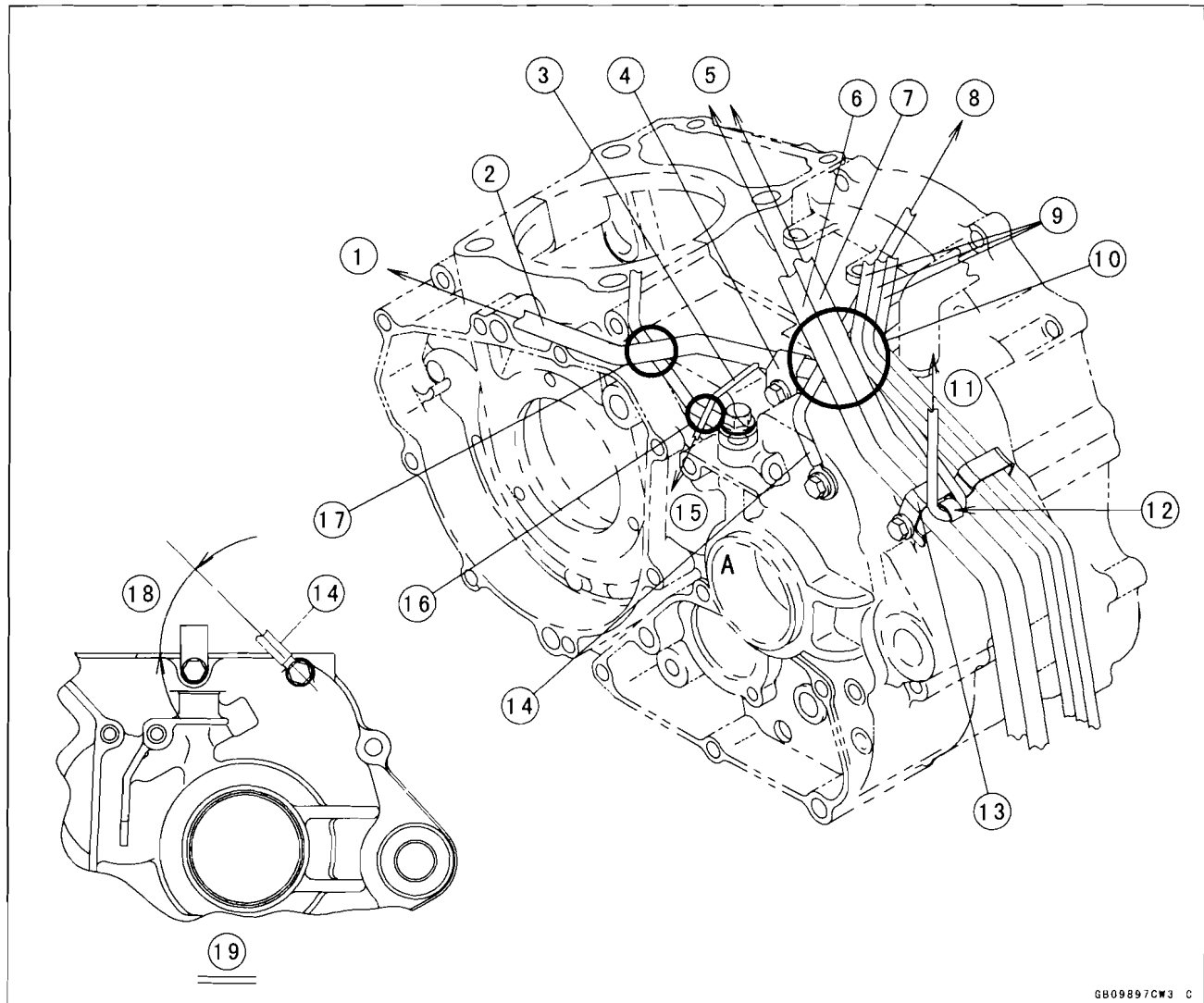
### Cable, Wire, and Hose Routing



GB09770CW4 C

1. Vacuum Switch Valve Hose
2. Air Cleaner Housing
3. To Vacuum Switch Valve
4. Face the white paint right side.
5. Position the clamp tab downward.

## Cable, Wire, and Hose Routing

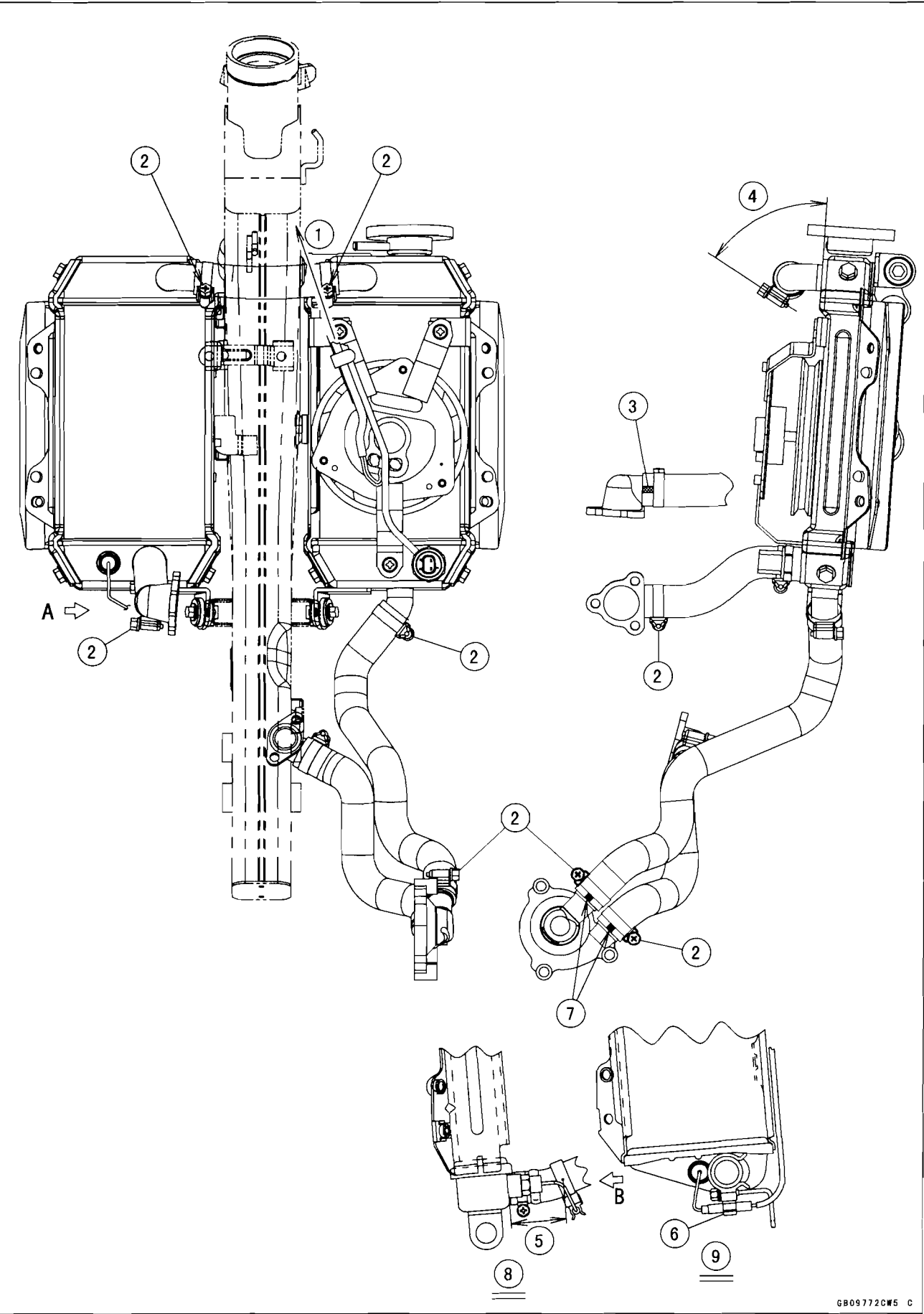


GB09897CW3 C

1. To Alternator Cover
2. Alternator/Crankshaft Sensor Lead
3. Neutral Switch Lead
4. Clamp the alternator/crankshaft sensor lead.
5. To Fuel Tank
6. Fuel Tank Breather Hose
7. Fuel Tank Drain Hose
8. To Battery Earth
9. Carburetor Air Vent and Overflow Hoses
10. Run the engine ground cable under the fuel tank breather hose and fuel tank drain hose.
11. To Regulator/Rectifier
12. Run the regulator/rectifier lead to the bracket guide.
13. Clamp the fuel tank breather hose, fuel tank drain hose, carburetor air vent hose, and overflow hose.
14. Engine Ground Cable
15. To Neutral Switch
16. Run the newtral switch lead over the oil pipe.
17. Run the alternator/crankshaft sensor lead over the oil pipe.
18. 45°
19. Viewed A

17-6 APPENDIX

Cable, Wire, and Hose Routing





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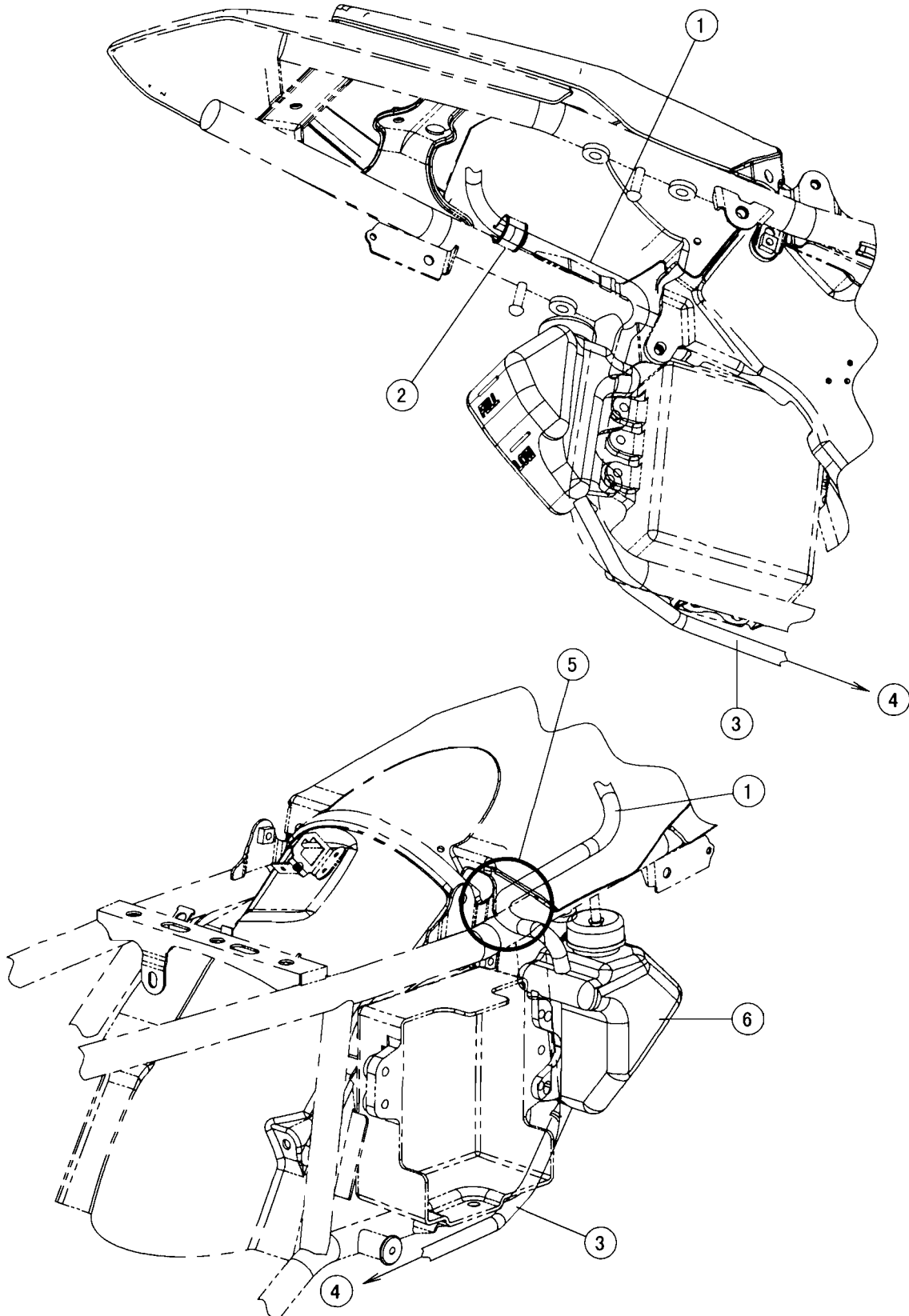
**Cable, Wire, and Hose Routing**

---

1. To Main Harness
2. Install the clamp so that the clamp bolt faces as shown in the figure.
3. White paint faces upward.
4. About 60°
5. About 45 mm (1.8 in.)
6. Face the connector holder downward.
7. White paint faces right side.
8. Viewed from A
9. Viewed from B

## 17-8 APPENDIX

### Cable, Wire, and Hose Routing



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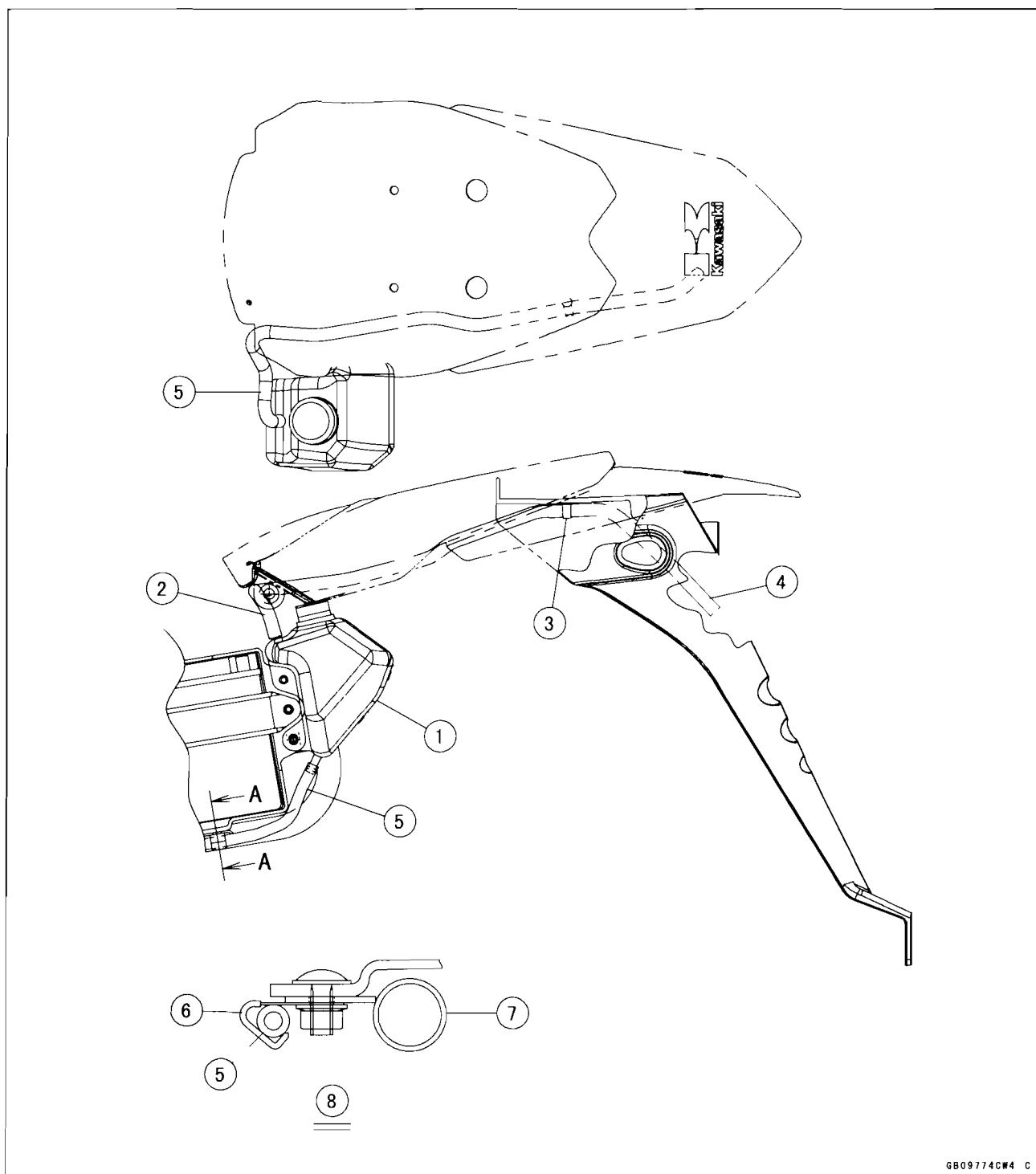
**Cable, Wire, and Hose Routing**

---

1. Reserve Tank Overflow Hose
2. Run the reservetank overflow hose into the clamp of the frame.
3. Reserve Tank Hose
4. To Radiator
5. Run the reservetank overflow hose between the rear fender rear and the frame pipe.
6. Reserve Tank

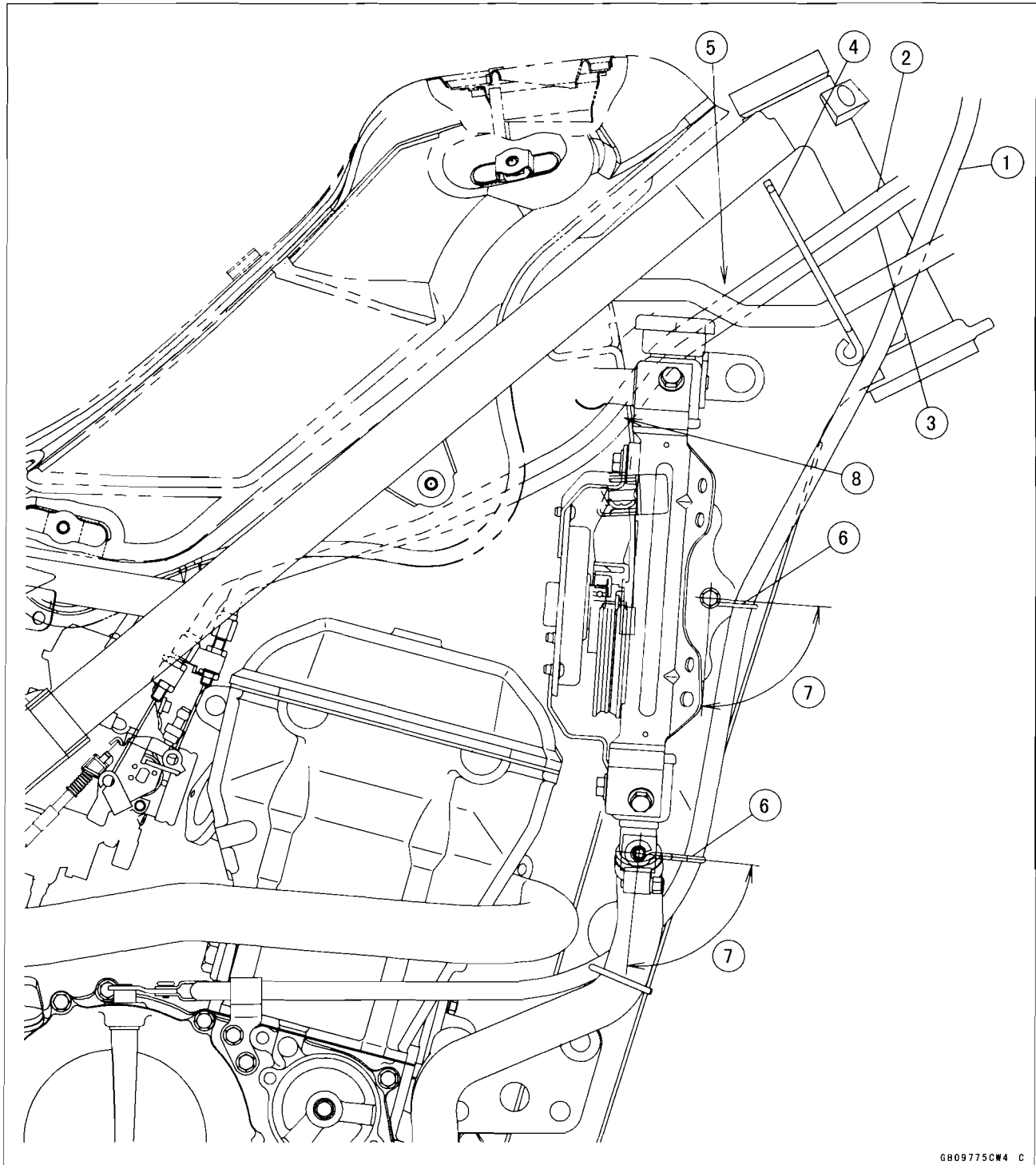
## 17-10 APPENDIX

### Cable, Wire, and Hose Routing



1. Reserve Tank
2. Reserve Tank Overflow Hose
3. Clamp
4. Install the overflow hose so that the hose end is along the inner surface of the rear flap.
5. Reserve Tank Hose
6. Clamp (Bend the clamp to hold the reserve tank hose as shown.)
7. Frame Pipe
8. Viewed from A - A

## Cable, Wire, and Hose Routing

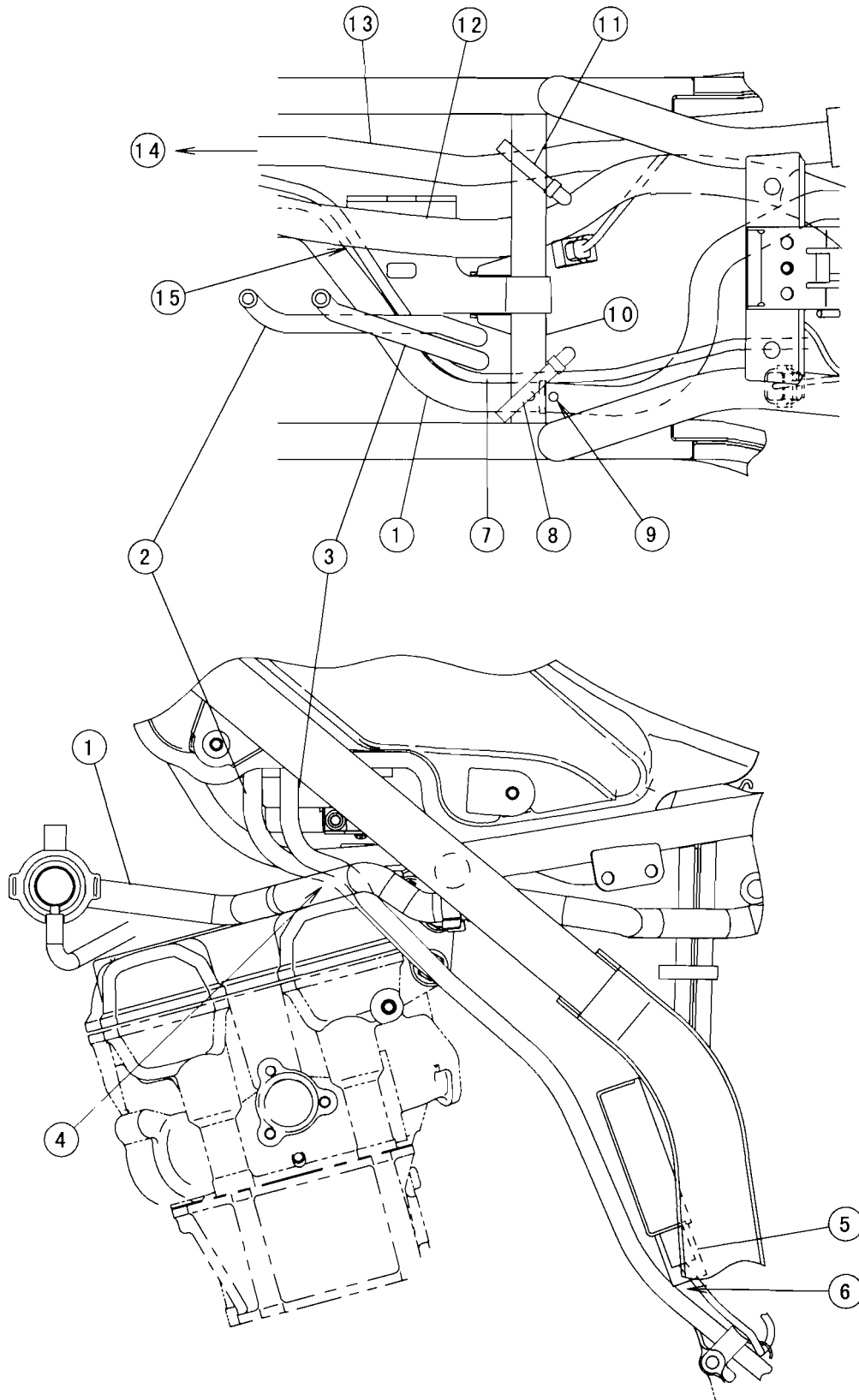


GB09775CW4 C

1. Clutch Cable
2. Throttle Cable (Decelerator)
3. Throttle Cable (Accelerator)
4. Throttle Cable Clamp
5. Be careful to throttle cables do not pinch between the fuel tank and frame.
6. Clutch Cable Guides
7. About 90°
8. Run the throttle cables under the radiator hose.

## 17-12 APPENDIX

### Cable, Wire, and Hose Routing



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**Cable, Wire, and Hose Routing**

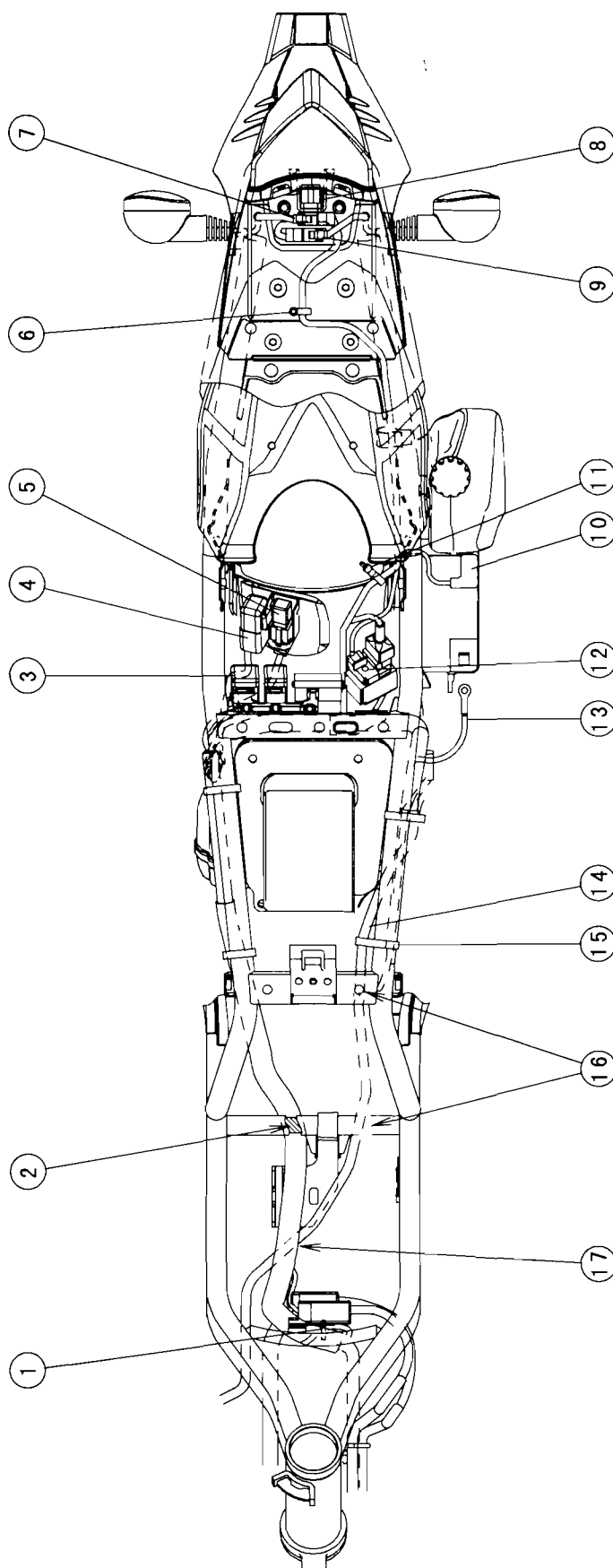
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1. Vacuum Switch Valve Hose
2. Fuel Tank Breather Hose
3. Fuel Tank Drain Hose
4. Run the fuel tank breather and drain hose inside of the vacuum switch valve hose.
5. Regulator/Rectifier Connector Cover
6. Run the fuel tank breather and drain hose so that they do not crush the cover with the hoses.
7. Reserve Tank Hose
8. Band (Clamp the vacuum switch valve hose and reserve tank hose.)
9. Joint the vacuum switch valve hoses at the backward of the frame cross pipe and white paint faces upward.
10. Frame Cross Pipe
11. Band (Clamp the evaporative hose (CAL Model))
12. Main Harness
13. Evaporative Hose (CAL Model)
14. To Canister
15. Run the vacuum switch valve hose and reserve tank hose under the main harness.



## 17-14 APPENDIX

### Cable, Wire, and Hose Routing



GB09777CW5 C

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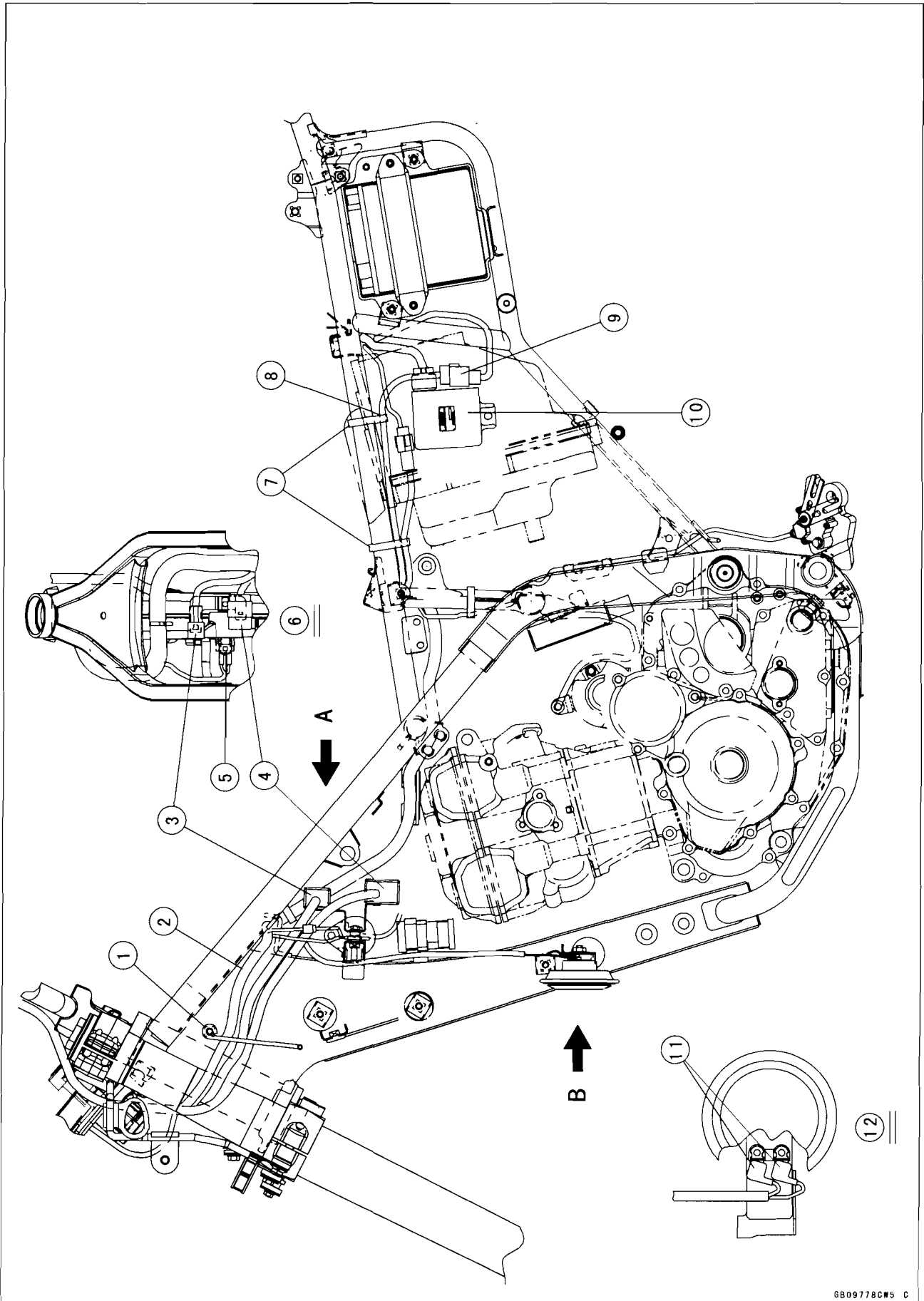
**Cable, Wire, and Hose Routing**

---

1. Align the white mark to the frame hook.
2. Run the main harness under the frame cross pipe. Align the white mark to the frame cross pipe.
3. Turn Signal Relay
4. Starter Control Relay
5. Interlock Diode Unit
6. Clamp (Clamp the main harness.)
7. Rear Right Turn Signal Light Connector
8. Tail/Brake Light Connector
9. Rear Left Turn Signal Light Connector
10. Battery Positive (+) Cable
11. Clamp (Clamp the main harness. Do not clamp the reserve tank hose.)
12. Starter Relay (Main Fuse 20 A)
13. Battery Negative (–) Cable
14. Reserve Tank Hose
15. Band (Clamp the reserve tank hose.)
16. Run the main harness under the frame cross pipe or bracket.
17. Run the reserve tank hose under the main harness.

## 17-16 APPENDIX

### Cable, Wire, and Hose Routing



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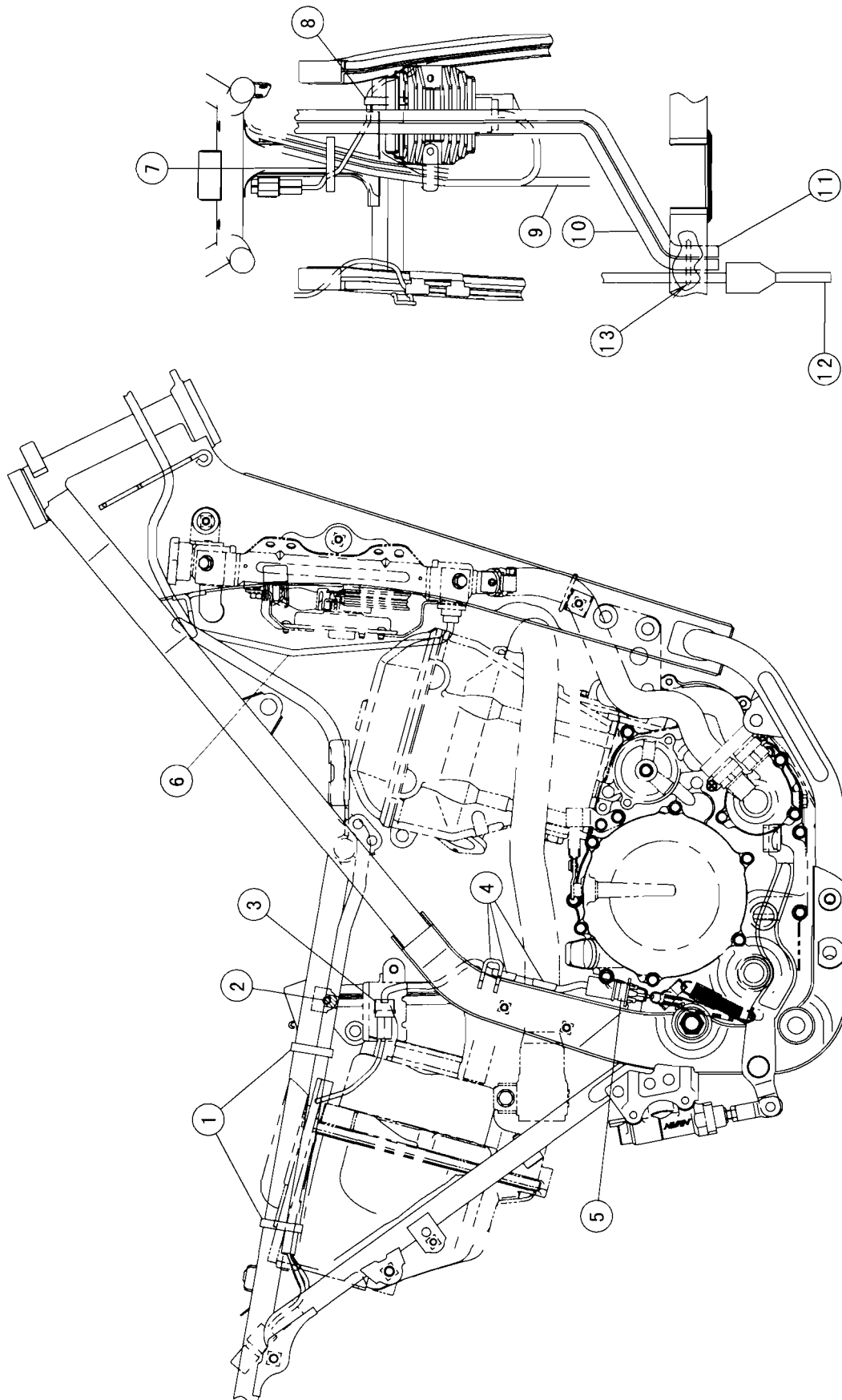
**Cable, Wire, and Hose Routing**

---

1. Guide (Run the left and right switch housing leads and reserve tank hose in to the guide)
2. Reserve Tank Hose
3. Right Switch Housing Connector
4. Left Switch Housing Connector
5. Frame Ground Terminal
6. Viewed from A
7. Band (Clamp the starter motor cable, alternator lead and reserve tank hose.)
8. Do not clamp the crankshaft sensor and neutral switch leads.
9. Alternator Lead Connector
10. Igniter
11. Horn Connectors
12. Viewed from B

## 17-18 APPENDIX

### Cable, Wire, and Hose Routing



6B09779CW5 C

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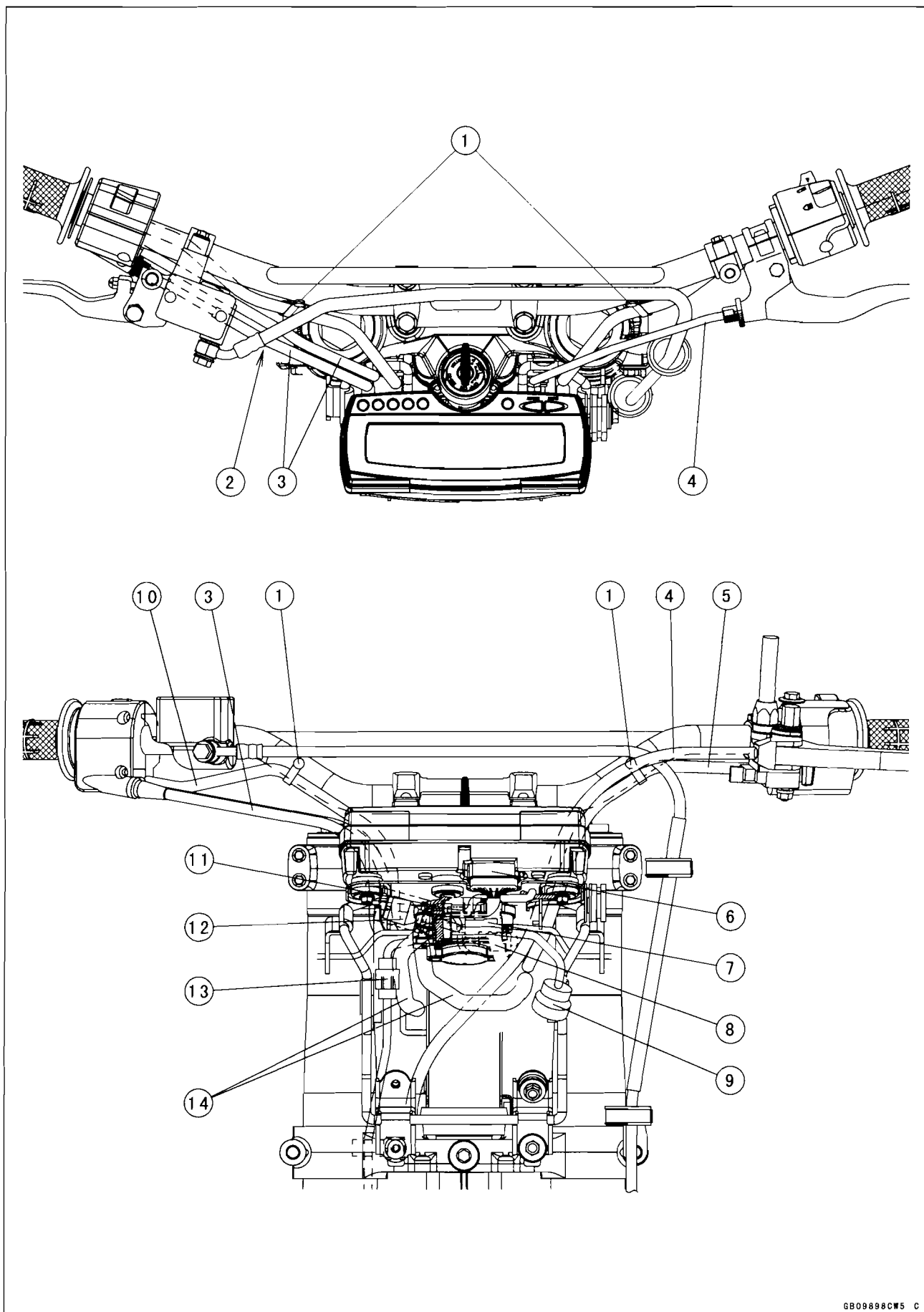
**Cable, Wire, and Hose Routing**

---

1. Band (Clamp the main harness.)
2. Align the white mark on the main harness to the frame bracket.
3. Position the rear brake right lead connector at the inside of the rear brake reservoir tank.
4. Run the rear brake light switch lead in to the frame guide.
5. Rear Brake Light Switch
6. Water Temperature Warning Light Switch Lead
7. Band (Clamp the starter motor cable, alternator lead, engine ground lead and sidestand switch lead.)
8. Band (Clamp the sidestand switch lead.)
9. Alternator Lead
10. Fuel Tank Breather Hose
11. Fuel Tank Drain Hose
12. Air Cleaner Drain Hose
13. Run the fuel tank breather and drain hose, and air cleaner drain hose into the guide of the swingarm.

## 17-20 APPENDIX

### Cable, Wire, and Hose Routing



GB09898CW5 C



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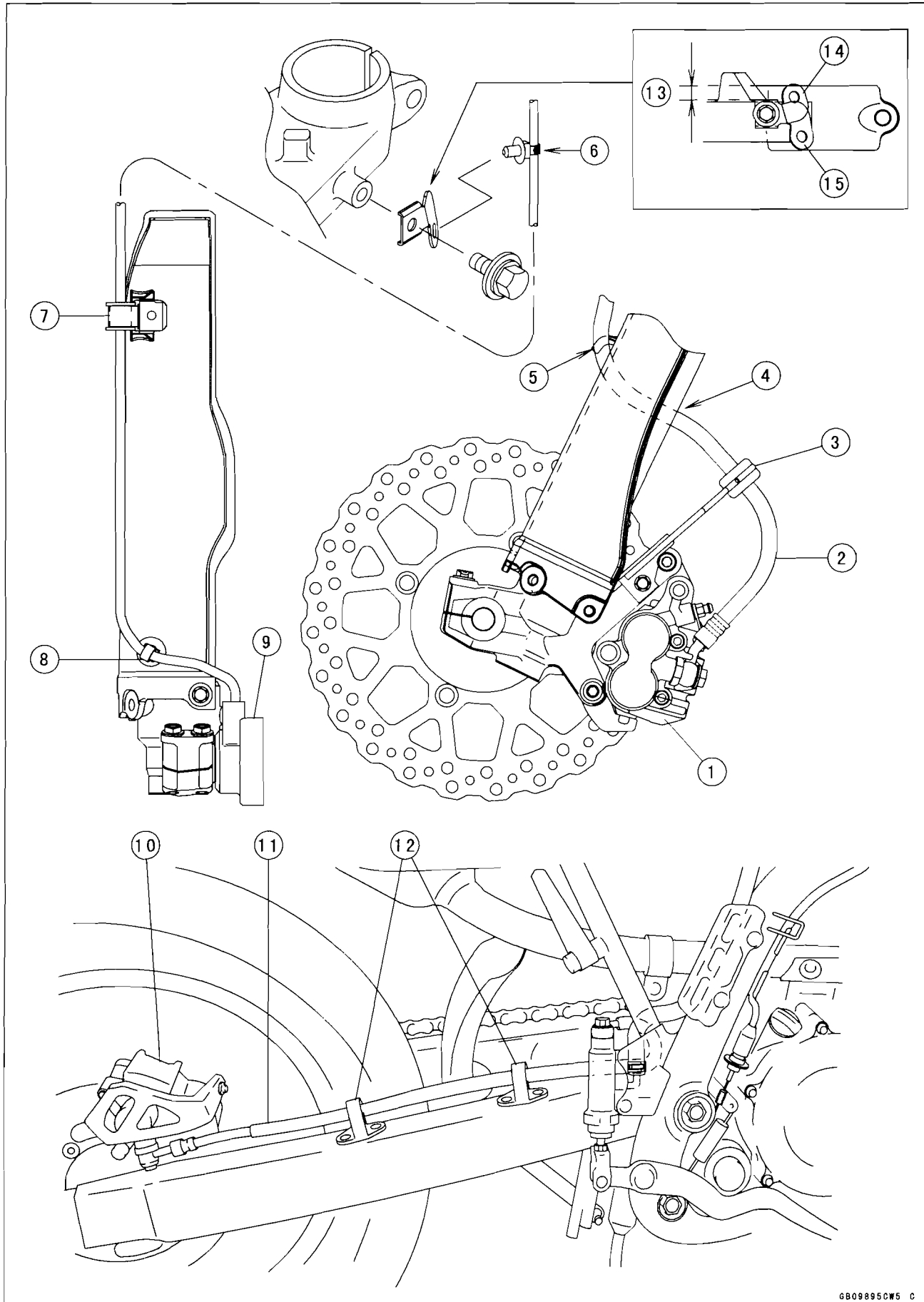
**Cable, Wire, and Hose Routing**

---

1. Clamp (Clamp the switch housing lead.)
2. Run the brake hose over the throttle cables.
3. Throttle Cables
4. Run the clutch cable forward of the front brake hose, and run it backward of the left and right switch housing leads and other lead wire. The clutch cable crosses the frame head pipe front from the left to the right.
5. Left Switch Housing Lead
6. Meter Unit Connector
7. Front Right Turn Signal Light Connector
8. Front Left Turn Signal Light Connector
9. Headlight Connector
10. Right Switch Housing Lead
11. Clamp (Clamp the main harness at the white mark.)
12. Ignition Switch Connector (Cover the dust cover to the connector.)
13. Speed Sensor Connector
14. Clamp the main harness (left and right) at the position of the white mark.

## 17-22 APPENDIX

### Cable, Wire, and Hose Routing



GB09895CW5 C

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**Cable, Wire, and Hose Routing**

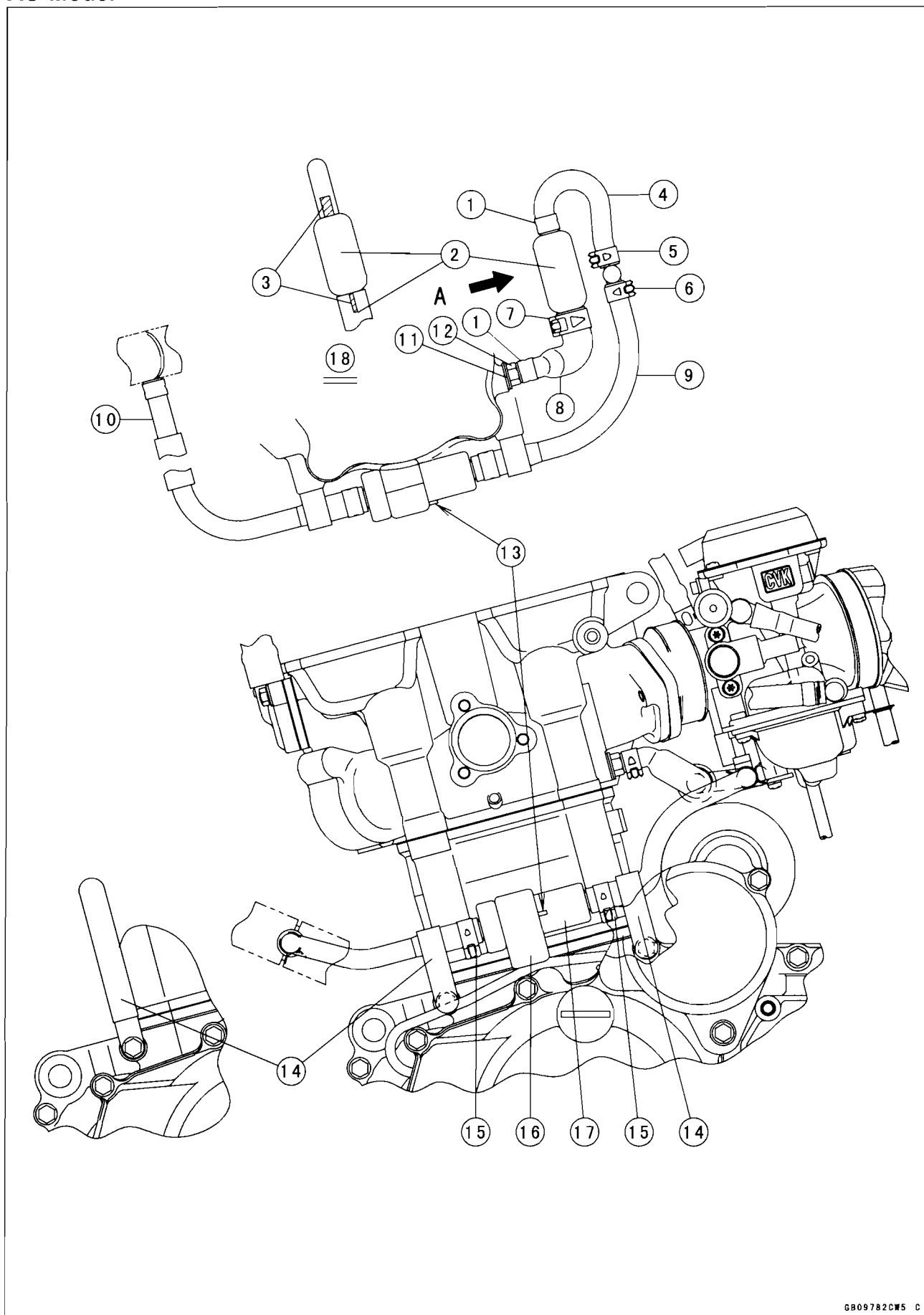
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1. Front Brake Caliper
2. Front Brake Hose
3. Clamp
4. Run the front brake hose along the guide on the fork protector.
5. Run the front brake hose inside of the front fork.
6. Align the white mark on the speed sensor lead with the clamp.
7. Clamp
8. Clamp
9. Speed Sensor
10. Rear Brake Caliper
11. Rear Brake Hose
12. Run the brake hose through the holder.
13. For KLX250W
14. Install the bracket so that its parallel to the steering stem.
15. For KLX250W
16. For KLX250T

## 17-24 APPENDIX

### Cable, Wire, and Hose Routing

#### AU Model



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**Cable, Wire, and Hose Routing**

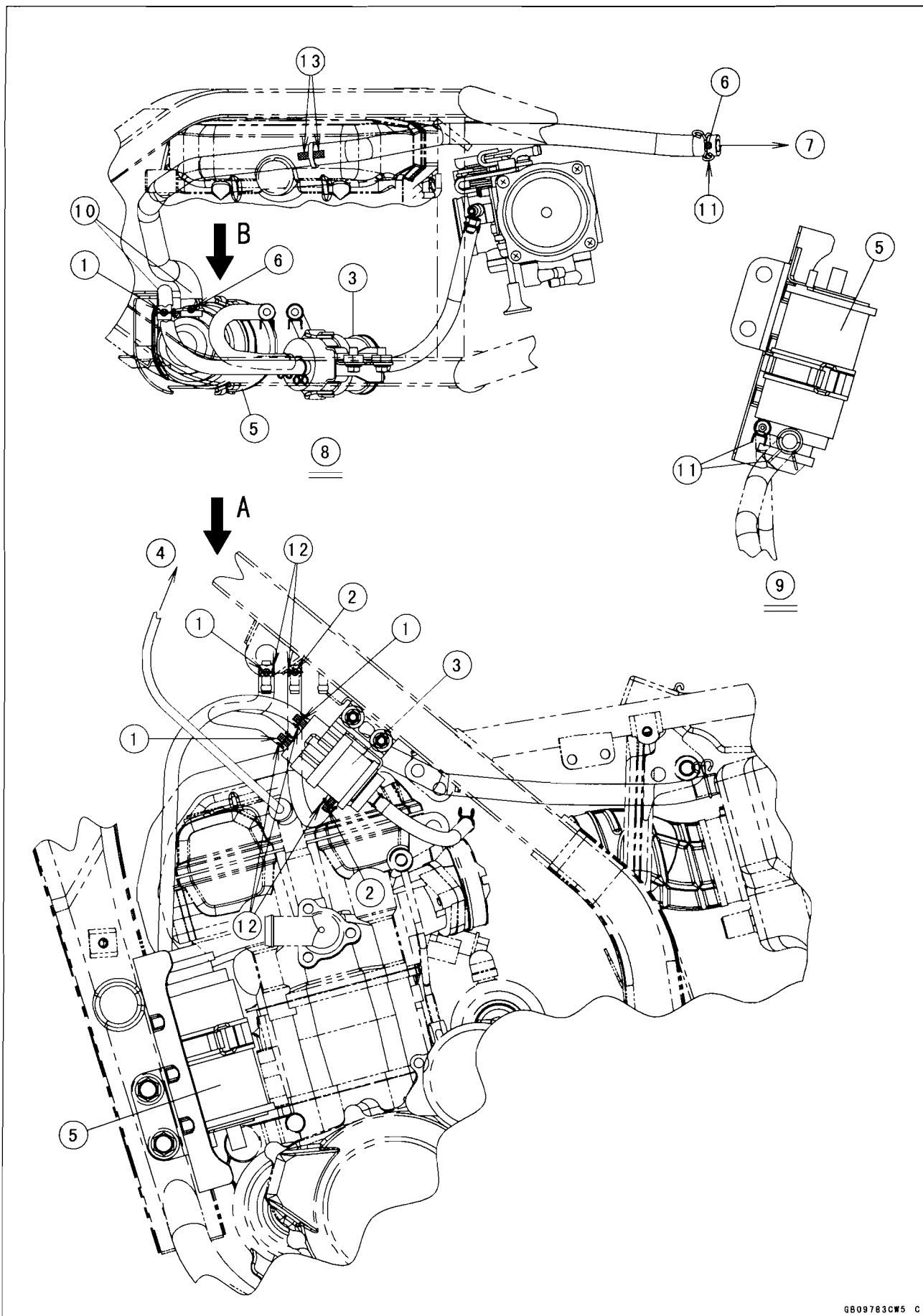
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1. Clamp (tab faces downward)
2. Coolant Filter and Filter Body
3. Insert the coolant hoses to the base of the filter body with the marks aligned with each other.
4. Water Hose
5. Clamp (tab faces forward)
6. Clamp (tab faces backward)
7. Clamp (tab faces forward)
8. Water Hose
9. Water Hose
10. Water Hose
11. Gasket
12. Fitting
13. Do not align the projection of the coolant valve with the damper slit.
14. Install the clamp so that it is right angle with the cylinder installation surface and tighten it together with the crankcase bolt.
15. Clamp (tab faces downward)
16. Damper
17. Coolant Valve
18. Viewed from A-A

## 17-26 APPENDIX

### Cable, Wire, and Hose Routing

#### CAL Model



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**Cable, Wire, and Hose Routing**

---

1. Blue Paint
2. Red Paint
3. Separattor
4. To Ignition Coil
5. Canister
6. Green Paint
7. To Air Cleaner Housing
8. Viewed from A
9. Viewed from B
10. Insert the hoses end to the fitting of the canister complately.
11. Face the clamp tab upward as shown.
12. Face the clamp tab left side as shown.
13. White Paint



### 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:

#### **Starter motor not rotating:**

- Starter lockout or neutral switch trouble
- Starter motor trouble
- Battery voltage low
- Starter relays not contacting or operating
- Starter button not contacting
- Wiring open or shorted
- Ignition switch trouble
- Engine stop switch trouble
- Main 20 A Fuse blown

#### **Starter motor rotating but engine doesn't turn over:**

- Starter motor clutch trouble

#### **Engine won't turn over:**

- Valve seizure
- Valve lifer seizure
- Cylinder, piston seizure
- Crankshaft seizure
- Connecting rod small end seizure
- Connecting rod big end seizure
- Transmission gear or bearing seizure
- Camshaft seizure
- Balancer bearing seizure
- Compression release cam (KACR) spring broken
- Compression release cam (KACR) sticks close

#### **No fuel flow:**

- No fuel in tank
- Fuel hose clogged
- Fuel tank air vent obstructed
- Fuel tap clogged
- Fuel line clogged
- Float valve clogged
- Fuel filter clogged

#### **Engine flooded:**

- Fuel level in carburetor float bowl too high
- Float valve worn or stuck open
- Starting technique faulty
- (When flooded, crank the engine with the throttle fully opened to allow more air to reach the engine.)

#### **No spark; spark weak:**

- Battery voltage low
- Spark plug dirty, broken, or maladjusted
- Spark plug cap or spark plug lead trouble
- Spark plug cap shorted or not in good con-

- Spark plug incorrect
- Igniter trouble
- Neutral, starter lockout, sidestand switch or interlock diodes trouble
- Crankshaft sensor trouble
- Ignition coil trouble
- Ignition or engine stop switch shorted
- Wiring shorted or open
- Main 20 A Fuse blown

#### **Fuel/air mixture incorrect:**

- Pilot screw and/or idle adjusting screw maladjusted
- Pilot jet, or air passage clogged
- Starter jet clogged
- Air cleaner clogged, poorly sealed, or missing

#### **Compression low:**

- Spark plug loose
- Cylinder head not sufficiently tightened down
- No valve clearance
- Cylinder, piston worn
- Piston ring bad (worn, weak, broken, or sticking)
- Piston ring/groove clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Valve spring broken or weak
- Valve not seating properly (valve bent, worn, or carbon accumulation on the seating surface)
- Compression release cam (KACR) sticks close (engine stalls when moving off)

### Poor Running at Low Speed:

#### **Spark weak:**

- Spark plug dirty, broken, or maladjusted
- Spark plug cap or spark plug lead trouble
- Spark plug cap shorted or not in good contact
- Spark plug incorrect
- Igniter trouble
- Crankshaft sensor trouble
- Ignition coil trouble

#### **Fuel/air mixture incorrect:**

- Pilot screw maladjusted
- Pilot jet, or air passage clogged
- Air bleed pipe bleed holes clogged
- Air cleaner clogged, poorly sealed, or missing
- Choke knob open
- Fuel level in carburetor float bowl too high or too low
- Fuel tank air vent obstructed
- Carburetor holder loose

## Troubleshooting Guide

### Compression low:

- Spark plug loose
- Cylinder head not sufficiently tightened down
- No valve clearance
- Cylinder, piston worn
- Piston ring bad (worn, weak, broken, or sticking)
- Piston ring/groove clearance excessive
- Cylinder head warped
- Cylinder head gasket damaged
- Valve spring broken or weak
- Valve not seating properly (valve bent, worn, or carbon accumulation on the seating surface)
- Compression release cam (KACR) sticks close (engine stalls when moving off)

### Other:

- Igniter trouble
- Carburetor vacuum piston doesn't slide smoothly
- Carburetor vacuum piston diaphragm damaged
- Engine oil viscosity too high
- Drive train trouble
- Brake dragging
- Vacuum switch valve trouble
- Clutch slipping

### Poor Running or No Power at High Speed:

#### Firing incorrect:

- Spark plug dirty, broken, or maladjusted
- Spark plug cap or high tension lead trouble
- Spark plug cap shorted or not in good contact
- Spark plug incorrect
- IC igniter trouble
- Crankshaft sensor trouble
- Ignition coil trouble

#### Fuel/air mixture incorrect:

- Choke knob open
- Main jet clogged or wrong size
- Jet needle or needle jet worn
- Fuel level in carburetor float bowl too high or too low
- Bleed holes of needle jet holder or needle jet clogged
- Air cleaner clogged, poorly sealed, or missing
- Air cleaner duct loose
- Water or foreign matter in fuel
- Carburetor holder loose
- Fuel tank air vent obstructed
- Fuel tap clogged

### Compression low:

- Spark plug loose
- Cylinder head not sufficiently tightened down
- No valve clearance
- Cylinder, piston worn
- Piston ring bad (worn, weak, broken, or sticking)
- Piston ring/groove clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Valve spring broken or weak
- Valve not seating properly (valve bent, worn, or carbon accumulation on the seating surface.)
- Compression release cam (K.A.C.R) sticks close (engine stalls when moving off)

### Knocking:

- Carbon built up in combustion chamber
- Fuel poor quality or incorrect
- Spark plug incorrect
- Igniter trouble

### Miscellaneous:

- Throttle valve won't fully open
- Carburetor vacuum piston doesn't slide smoothly
- Carburetor vacuum piston diaphragm damaged
- Brake dragging
- Clutch slipping
- Overheating
- Engine oil level too high
- Engine oil viscosity too high
- Drive train trouble
- Vacuum switch valve trouble
- Balancer mechanism malfunctioning

### Overheating:

#### Firing incorrect:

- Spark plug dirty, broken, or maladjusted
- Spark plug incorrect
- IC igniter trouble

#### Fuel/air mixture incorrect:

- Main jet clogged or wrong size
- Fuel level in carburetor float bowl too low
- Carburetor holder loose
- Air cleaner duct loose
- Air cleaner poorly sealed, or missing
- Air cleaner clogged

#### Compression high:

- Carbon built up in combustion chamber
- Compression release cam (KACR) sticks close (engine stalls when moving off)

#### Engine load faulty:

- Clutch slipping

## 17-30 APPENDIX

### Troubleshooting Guide

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Drive train trouble

Brake dragging

#### **Lubrication inadequate:**

Engine oil level too low

Engine oil poor quality or incorrect

#### **Coolant incorrect:**

Coolant level too low

Coolant deteriorated

#### **Cooling system component incorrect:**

Radiator fin damaged

Radiator clogged

Thermostat trouble

Radiator cap trouble

Radiator fan switch trouble

Fan motor broken

Fan blade damaged

Water pump not turning

Water pump impeller damaged

#### **Over Cooling:**

##### **Cooling system component incorrect:**

Radiator fan switch trouble

Thermostat trouble

#### **Clutch Operation Faulty:**

##### **Clutch slipping:**

Friction plate worn or warped

Steel plate worn or warped

Clutch spring broken or weak

Clutch hub or housing unevenly worn

No clutch lever play

Clutch inner cable trouble

Clutch release mechanism trouble

##### **Clutch not disengaging properly:**

Clutch plate warped or too rough

Clutch spring compression uneven

Engine oil deteriorated

Engine oil viscosity too high

Engine oil level too high

Clutch housing frozen on drive shaft

Clutch hub nut loose

Clutch hub spline damaged

Clutch friction plate installed wrong

Clutch lever play excessive

Clutch release mechanism trouble

#### **Gear Shifting Faulty:**

##### **Doesn't go into gear; shift pedal doesn't return:**

Clutch not disengaging

Shift fork bent or seized

Gear stuck on the shaft

Gear positioning lever binding

Shift return spring weak or broken

Shift return spring pin loose

Shift mechanism arm spring broken

Shift mechanism arm broken

##### **Jumps out of gear:**

Shift fork ear worn, bent

Gear groove worn

Gear dogs and/or dog holes worn

Shift drum groove worn

Gear positioning lever spring weak or broken

Shift fork pin worn

Drive shaft, output shaft, and/or gear splines worn

##### **Overshifts:**

Gear positioning lever spring weak or broken

Shift mechanism arm spring broken

#### **Abnormal Engine Noise:**

##### **Knocking:**

Igniter trouble

Carbon built up in combustion chamber

Fuel poor quality or incorrect

Spark plug incorrect

Overheating

##### **Piston slap:**

Cylinder/piston clearance excessive

Cylinder, piston worn

Connecting rod bent

Piston pin, piston pin hole worn

##### **Valve noise:**

Valve clearance incorrect

Valve spring broken or weak

Camshaft bearing worn

Valve lifter worn

##### **Other noise:**

Connecting rod small end clearance excessive

Connecting rod big end clearance excessive

Piston ring worn, broken, or stuck

Piston seizure, damage

Cylinder head gasket leaking

Exhaust pipe leaking at cylinder head connection

Crankshaft runout excessive

Engine mounts loose

Crankshaft bearing worn

Primary gear worn

Camshaft chain tensioner trouble

Camshaft chain, sprocket, guide worn

Vacuum switch valve damaged

Alternator rotor loose

Balancer gear worn or chipped

Balancer shaft position maladjusted

Balancer bearing worn

## Troubleshooting Guide

### Abnormal Drive Train Noise:

#### Clutch noise:

- Clutch housing/friction plate clearance excessive
- Clutch housing gear worn

#### Transmission noise:

- Bearings worn
- Transmission gears worn or chipped
- Metal chips jammed in gear teeth
- Engine oil insufficient

#### Drive line noise:

- Drive chain adjusted improperly
- Drive chain worn
- Rear and/or engine sprockets 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

#### Other noise:

- Bracket, nut, bolt, etc. not properly mounted or tightened

### Exhaust Smokes Excessively:

#### White smoke:

- Piston oil ring worn
- Cylinder worn
- Valve oil seal damaged
- Valve guide worn
- Cylinder head gasket damaged
- Engine oil level too high

#### Black smoke:

- Air cleaner clogged
- Main jet too large or fallen off
- Choke plunger stuck open
- Fuel level in carburetor float bowl too high

#### Brown smoke:

- Main jet too small
- Fuel level in carburetor float bowl too low
- Air cleaner duct loose
- Air cleaner poorly sealed or missing

### Handling and/or Stability Unsatisfactory:

#### Handlebar hard to turn:

- Cable routing incorrect

Wiring routing incorrect

Steering stem locknut too tight

Steering stem bearing damaged

Steering stem bearing lubrication inadequate

Steering stem bent

Tire air pressure too low

#### Handlebar shakes or excessively vibrates:

Tire worn

Swingarm pivot bearings worn

Rim warped, or not balanced

Wheel bearing worn

Handlebar holder loose

Steering stem head nut loose

#### Handlebar pulls to one side:

Frame bent

Wheel misalignment

Swingarm bent or twisted

Steering maladjusted

Front fork bent

Right and left front fork oil level uneven

#### Shock absorption unsatisfactory:

(Too hard)

Front fork oil excessive

Front fork oil viscosity too high

Rear shock absorber adjustment too hard

Tire air pressure too high

Front fork bent

(Too soft)

Tire air pressure too low

Front fork oil insufficient and/or leaking

Front fork oil viscosity too low

Rear shock absorber adjustment too soft

Front fork, rear shock absorber spring weak

Rear shock absorber oil leaking

### Brake Doesn't Hold:

#### Disc brake:

Air in the brake line

Pad or disc worn

Brake fluid leakage

Disc warped

Contaminated pad

Brake fluid deteriorated

Primary or secondary cup damaged in master cylinder

Master cylinder scratched inside

### Battery Trouble:

#### Battery discharged:

Battery faulty (too low terminal voltage)

Battery leads making poor contact

Load excessive (e.g., bulb of excessive wattage)

Ignition switch trouble

## 17-32 APPENDIX

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### Troubleshooting Guide

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Regulator/rectifier trouble  
**Battery overcharged:**  
Regulator/rectifier trouble

Battery faulty

## MODEL APPLICATION

Year	Model	Beginning Frame No.
2009	KLX250T9F	JKALXMT1□9DA00032 LX250T-A00032 PNKLX250TTMC00032
2009	KLX250W9F	JKALXMW1□9DA00001 PNKLX250WWMC00001

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