



**KX85**  
**KX100**



# **Motorcycle Service Manual**



# Quick Reference Guide

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

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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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.

## 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)		

**Read OWNER'S MANUAL before operating**

# 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 as to 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.

To get the longest life out of your motorcycle:

- Follow the Periodic Maintenance Chart in the Service Manual.
- Be alert for problems and non-scheduled maintenance.
- Use proper tools and genuine Kawasaki motorcycle parts. Special tools, gauges, and testers that are necessary when servicing Kawasaki Motorcycles are introduced by the 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.

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## How to Use this Manual

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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

1

## Table of Contents

Before Servicing .....	1-2
Model Identification.....	1-5
General Specifications.....	1-7
Periodic Maintenance Chart .....	1-13
Torque and Locking Agent.....	1-15
Special Tools and Sealants .....	1-19
Cable, Wire and Hose Routing .....	1-23

## 1-2 GENERAL INFORMATION

### Before Servicing

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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 reinstallation or disassembly and reassembly of general parts.

#### **Especially note the following:**

(1) Dirt

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

(2) Battery Ground

Disconnect the ground (–) cable from the battery before performing any disassembly operations on the motorcycle. This prevents the engine from accidentally turning over while work is being carried out, sparks from being generated while disconnecting the cables from electrical parts, as well as damage to the electrical parts themselves. For reinstallation, first connect the positive cable to the positive (+) terminal of the battery

(3) Installation, Assembly

Generally, installation or assembly is the reverse of removal or disassembly. However, if installation or assembly sequence is given in this Service Manual, follow it. Note parts locations and cable, wire, and hose routing during removal or disassembly so they can be installed or assembled in the same way. It is preferable to mark and record the locations and routing whenever possible.

(4) Tightening Sequence

When installing bolts, nuts, or screws for which a tightening sequence is given in this Service Manual, make sure to follow the sequence. When installing a part with several bolts, nuts, or screws, start them all in their holes and tighten them to a snug fit, thus ensuring that the part has been installed in its proper location. Then, tighten them to the specified torque in the tightening sequence and method indicated. If tightening sequence instructions are not given, tighten them evenly in a cross pattern. Conversely, to remove a part, first loosen all the bolts, nuts, or screws that are retaining the part a 1/4-turn before removing them.

(5) Torque

When torque values are given in this Service Manual, use them. Either too little or too much torque may lead to serious damage. Use a good quality, reliable torque wrench.

(6) Force

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

(7) Edges

Watch for sharp edges, as they could cause injury through careless handling, especially during major engine disassembly and assembly. Use a clean piece of thick cloth when lifting the engine or turning it over.

(8) High-Flash Point Solvent

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

(9) Gasket, O-ring

Replace a gasket or an O-ring with a new part when disassembling. Remove any foreign matter from the mating surface of the gasket or O-ring to ensure a perfectly smooth surface to prevent oil or compression leaks.

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**Before Servicing**

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**(10)Liquid Gasket, Locking Agent**

Clean and prepare surfaces where liquid gasket or non-permanent locking agent will be used. Apply them sparingly. Excessive amount may block engine oil passages and cause serious damage.

**(11)Press**

When using a press or driver to install a part such as a wheel bearing, apply a small amount of oil to the area where the two parts come in contact to ensure a smooth fit.

**(12)Ball Bearing and Needle Bearing**

Do not remove a ball bearing or a needle bearing unless it is absolutely necessary. Replace any ball or needle bearings that were removed with new ones. Install bearings with the manufacturer and size marks facing out, applying pressure evenly with a suitable driver. Apply force only to the end of the race that contacts the press fit portion, and press it evenly over the base component.

**(13)Oil Seal and Grease Seal**

Replace any oil or grease seals that were removed with new ones, as removal generally damages seals. Oil or grease seals should be pressed into place using a suitable driver, applying a force uniformly to the end of seal until the face of the seal is even with the end of the hole, unless instructed otherwise. When pressing in an oil or grease seal which has manufacturer's marks, press it in with the marks facing out.

**(14)Circlip, Retaining Ring, and Cotter Pin**

When installing circlips and retaining rings, take care to compress or expand them only enough to install them and no more. Install the circlip with its chamfered side facing load side as well.

Replace any circlips, retaining rings, and cotter pins that were removed with new ones, as removal weakens and deforms them. If old ones are reused, they could become detached while the motorcycle is driven, leading to a major problem.

**(15)Lubrication**

Engine wear is generally at its maximum while the engine is warming up and before all the sliding surfaces have an adequate lubricative film. During assembly, make sure to apply oil to any sliding surface or bearing that has been cleaned. Old grease or dirty oil could have lost its lubricative quality and may contain foreign particles that act as abrasives; therefore, make sure to wipe it off and apply fresh grease or oil. Some oils and greases in particular should be used only in certain applications and may be harmful if used in an application for which they are not intended.

**(16)Direction of Engine Rotation**

To rotate the crankshaft manually, make sure to do so in the direction of positive rotation. Positive rotation is counterclockwise as viewed from the left side of the engine. To carry out proper adjustment, it is furthermore necessary to rotate the engine in the direction of positive rotation as well.

**(17)Replacement Parts**

When there is a replacement instruction, replace these parts with new ones every time they are removed.

Replacement parts will be damaged or lose their original function once they are removed. Therefore, always replace these parts with new ones every time they are removed. Although the previously mentioned gasket, O-ring, ball bearing, needle bearing, grease seal, oil seal, circlip, and cotter pin have not been so designated in their respective text, they are replacement parts.

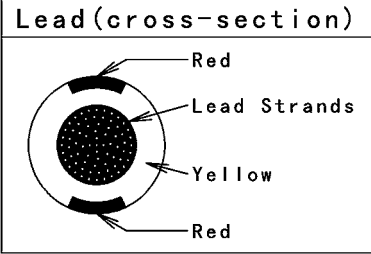

**(18)Electrical Leads**

All the electrical leads are either one-color or two-color. A two-color lead is identified first by the primary color and then the stripe color. For example, a yellow lead with thin red stripes is referred to as a "yellow/red" lead; it would be a "red/yellow" lead if the colors were reversed. Unless instructed otherwise, electrical leads must be connected to leads of the same color.

# 1-4 GENERAL INFORMATION

## Before Servicing

### Two-Color Electrical

Lead (cross-section)	Color Indicated on the Lead	Color Indicated on the Wiring Diagram
	Yellow/Red	

GB020698WI C

#### (19)Inspection

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

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

#### (20)Specifications

Specification terms are defined as follows:  
"Standards" show dimensions or performances which brand-new parts or systems have.  
"Service Limits" indicate the usable limits. If the measurement shows excessive wear or deteriorated performance, replace the damaged parts.

**Model Identification**

**KX85-A1 Left Side View**



**KX85-B1 Right Side View**



## 1-6 GENERAL INFORMATION

### Model Identification

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#### KX100-D1 Left Side View



#### KX100-D1 Right Side View



## General Specifications

Items	KX85-A1 ~ A5, A6F ~	KX85-B1 ~ B5, B6F ~
<b>Dimensions</b>		
Overall Length	1 820 mm (71.7 in.)	1 910 mm (75.2 in.)
Overall Width	735 mm (28.9 in.)	←
Overall Height	1 055 mm (41.5 in.)	1 105 mm (43.5 in.)
Wheelbase	1 255 mm (49.4 in.)	1 290 mm (50.8 in.)
Road Clearance	340 mm (13.4 in.)	380 mm (15.0 in.)
Seat Height	840 mm (33.1 in.)	870 mm (34.3 in.)
Dry Weight	65 kg (143 lb)	68 kg (150 lb)
Curb Weight:		
Front	34 kg (75 lb)	35 kg (77 lb)
Rear	35 kg (77 lb)	36 kg (79 lb)
Fuel Tank Capacity	5.5 L (5.8 US qt)	←
<b>Engine</b>		
Type	2-stroke, single cylinder, piston reed valve	←
Cooling System	Liquid-cooled	←
Bore and Stroke	48.5 × 45.8 mm (1.91 × 1.80 in.)	←
Displacement	84 cm <sup>3</sup> (5.1 Cu in.)	←
Compression Ratio	10.0 (Low speed)	←
	9.2 (High speed)	←
Carburetion System	Carburetor, KEIHIN PWK28	←
Starting System	Primary kick	←
Ignition System	CDI (Digital)	←
Ignition Timing	12° BTDC @12 000 r/min (rpm) (KX85-A1 ~ A5)	←(KX85-B1 ~ B5)
	12° BTDC @12 040 r/min (rpm) (KX85A6F ~ )	←(KX85B6F ~ )
Spark Plug (Terminal profile)	NGK R6252K-105	←
Port Timing		
Inlet:		
Open	Full open	←
Close	—	—
Scavenging:		
Open	62.5° BBDC	←
Close	62.5° ABDC	←
Duration	125°	←
Exhaust:		
Open	87° (Low speed)	←
	93.5° (High speed)	←
Close	87° (Low speed)	←
	93.5° (High speed)	←
Duration	174° (Low speed)	←
	187° (High speed)	←

## 1-8 GENERAL INFORMATION

### General Specifications

Items	KX85-A1 ~ A5, A6F ~	KX85-B1 ~ B5, B6F ~
Lubrication System	Petrol mix (32 : 1)	←
<b>Drive Train</b>		
Primary Reduction System:		
Type	Gear	←
Reduction Ratio	3.400 (68/20)	←
Clutch Type	Wet, multi disc	←
Transmission:		
Type	6-speed, constant mesh, return shift	←
Gear Ratios:		
1st	2.538 (33/13)	←
2nd	1.875 (30/16)	←
3rd	1.500 (27/18)	←
4th	1.250 (25/20)	←
5th	1.090 (24/22)	←
6th	0.956 (22/23)	←
Final Drive System:		
Type	Chain drive	←
Reduction Ratio	3.571 (50/14)	3.923 (51/13)
Overall Drive Ratio	11.607 @Top gear	12.758 @Top gear
Transmission Oil:		
Engine Oil:		
Grade	API SE, SF or SG API SH, SJ or SL with JASO MA	←
Viscosity	SAE 10W-40	←
Capacity	KX85-A1 ~ A3: 0.65 L (0.69 US qt)  KX85-A4 ~: 0.70 L (0.74 US qt)	KX85-B1 ~ B3: 0.65 L (0.69 US qt)  KX85-B4 ~: 0.70 L (0.74 US qt)
<b>Frame</b>		
Type	Tubular, semi-double cradle	←
Steering Angle	45° to either side	←
Caster (rake angle)	27°	←
Trail	89 mm (3.5 in.)	103 mm (4.1 in.)
Front Tire:		
Size	70/100-17 40M	70/100-19, 70/100-19 42M (EU) 70/100-19 42M (KX85-B5 ~)
Type	Tube	←
Rear Tire:		
Size	90/100-14 49M	90/100-16, 90/100-16 52M (EU) 90/100-16 52M (KX85-B5 ~)
Type	Tube	←



## General Specifications

Items	KX85-A1 ~ A5, A6F ~	KX85-B1 ~ B5, B6F ~
Rim Size:		
Front	17 × 1.40	19 × 1.40
Rear	14 × 1.60	16 × 1.85
Front Suspension:		
Type	Telescopic fork	←
Wheel Travel	275 mm (10.8 in.)	←
Rear Suspension:		
Type	Swing arm (Uni-trak)	←
Wheel Travel	275 mm (10.8 in.)	←
Brake Type:		
Front and Rear	Single disc	←
Effective Disc Diameter:		
Front	202 mm (8.0 in.)	←
Rear	150 mm (5.9 in.)	←

Specifications are subject to change without notice, and may not apply to every country.  
 (EU): Europe Model

# 1-10 GENERAL INFORMATION

## General Specifications

Items	KX100-D1 ~ D5, D6F ~
<b>Dimmensions</b>	
Overall Length	1 910 mm (75.2 in.)
Overall Width	735 mm (28.9 in.)
Overall Height	1 105 mm (43.5 in.)
Wheelbase	1 290 mm (50.8 in.)
Road Clearance	380 mm (15.0 in.)
Seat Height	870 mm (34.3 in.)
Dry Weight	68 kg (150 lb)
Curb Mass:	
Front	35 kg (77 lb)
Rear	36 kg (79 lb)
Fuel Tank Capacity	5.5 L (1.5 US gal)
<b>Engine</b>	
Type	2-stroke, single cylinder, piston reed valve
Cooling System	Liquid-cooled
Bore and Stroke	52.5 × 45.8 mm (2.1 × 1.8 in.)
Displacement	99 cm <sup>3</sup> (6.0 Cu in.)
Compression Ratio	9.6 (Low speed) 8.8 (High speed)
Carburetion System	Carburetor, Keihin PWK28
Starting System	Primary kick
Ignition System	CDI (Digital)
Ignition Timing	15° BTDC @12 500 r/min (rpm) (KX100-D1 ~ D5) 21.2° BTDC @10 000 r/min (rpm) (KX100D6F ~ )
Spark Plug	NGK R6252K-105
Port Timing	
Inlet:	
Open	Full open
Close	—
Scavenging:	
Open	62° BBDC
Close	62° ABDC
Duration	124°
Exhaust:	
Open	87° (Low speed), 93.5° (High speed)
Close	87° (Low speed), 93.5° (High speed)
Duration	174° (Low speed), 187° (High speed)
Lubrication System	Pertrol mix (32:1)

## General Specifications

Items	KX100-D1 ~ D5, D6F ~
<b>Drive Train</b>	
Primary Reduction System:	
Type	Gear
Reduction Ratio	3.400 (68/20)
Clutch Type	Wet, multi disc
Transmission:	
Type	6-speed, constant mesh, return shift
Gear Ratios	
1st	2.538 (33/13)
2nd	1.875 (30/16)
3rd	1.500 (27/18)
4th	1.250 (25/20)
5th	1.090 (24/22)
6th	0.956 (22/23)
Final Drive System:	
Type	Chain drive
Reduction Ratio	3.923 (51/13)
Overall Drive Ratio	12.758 @Top gear
Transmission Oil:	
Engine Oil:	
Grade	API SE, SF or SG API SH, SJ or SL with JASO MA
Viscosity	SAE 10W-40
Capacity	KX100-D1 ~ D3: 0.65 L (0.69 US qt) KX100-D4 ~: 0.70 L (0.74 US qt)
<b>Frame</b>	
Type	Tubular, single cradle
Steering Angle	45° to either side
Caster (rake angle)	27°
Trail	103 mm (4.1 in.)
Front Tire:	
Size	70/100-19, 70/100-19 42M (EU) 70/100-19 42M (KX100-D5 ~)
Type	Tube
Rear Tire:	
Size	90/100-16, 90/100-16 52M (EU) 90/100-16 52M (KX100-D5 ~)
Type	Tube
Rim Size:	
Front	19 × 1.40
Rear	16 × 1.85
Front Suspension:	
Type	Telescopic fork
Wheel Travel	275 mm (10.8 in.)

## 1-12 GENERAL INFORMATION

### General Specifications

Items	KX100-D1 ~ D5, D6F ~
Rear Suspension:	
Type	Swingarm (Uni-trak)
Wheel Travel	275 mm (10.8 in.)
Brake Type:	
Front and Rear	Single disc
Effective Disc Diameter:	
Front	202 mm (8.0 in.)
Rear	150 mm (5.9 in.)

Specifications are subject to change without notice, and may not apply to every country.  
(EU): Europe Model

## Periodic Maintenance Chart

The maintenance must be done in accordance with this chart to keep the motorcycle in good running condition.

OPERATION	FREQUENCY	Each race (2.5 hr)	Every 3 races (7.5 hr)	Every 5 races (12.5 hr)	Every 10 races (25 hr)	As required
<b>ENGINE</b>						
Clutch - adjust		•				
Clutch plates - inspect †			•	R		
Throttle cable - adjust		•				
Spark plug - clean, regap †		•	R			
Air cleaner element - clean		•				
Air cleaner element - replace		When damaged				
Carburetor - inspect/adjust		•				
Transmission oil - change			•			
Piston and piston ring - clean/ inspect †			•	R		
Cylinder head, cylinder - inspect			•			
Exhaust valves - clean/inspect		•				
Silencer - clean/inspect †		•				
Silencer packing - change			•			
Small end bearing - inspect †			•		R	
Kick pedal and shift pedal - clean		•				
Exhaust pipe O-ring - replace			•			
Engine sprocket - inspect †		•				
Coolant - inspect †		•				R
Water hoses, connections - inspect †		•				
Reed valve - inspect †		•				
<b>CHASSIS</b>						
Brake adjustment - inspect †		•				
Brake pad wear - inspect †				•		
Brake fluid level - inspect †			•			
Brake fluid - change		Every 2 years				
Brake master cylinder cup and dust seal - replace		Every 2 years				
Brake caliper fluid seal and dust seal - replace		Every 2 years				
Brake hoses, connections - inspect †		•				
Brake hose - replace		Every 4 years				
Spoke tightness and rim runout - inspect †		•				
Drive chain - adjust		•				
Drive chain - lubricate		•				
Drive chain wear - inspect †				•		
Chain slipper and guide - replace		When damaged				
Front fork - inspect/clean		•				

## 1-14 GENERAL INFORMATION

### Periodic Maintenance Chart

OPERATION	FREQUENCY	Each race (2.5 hr)	Every 3 races (7.5 hr)	Every 5 races (12.5 hr)	Every 10 races (25 hr)	As required
Front fork oil - change	1st time after 2 races, then every 5 races					
Nuts, bolts, fasteners - inspect †	•					
Fuel system - clean	•					
Fuel hoses, connections - inspect †	•					
Fuel hose - replace	Every 4 years					
Steering play - inspect †	•					
Steering stem bearing - grease			•			
Rear sprocket - inspect †			•			
General lubrication - perform	•					
Wheel bearing - inspect †				•		
Swingarm and Uni-Trak linkage pivots - grease			•			
Swingarm and Uni-Trak linkage pivots - inspect †			•			
Rear shock oil - replace	1st time after 2 races, then every 5 races					

†: Replace, add, adjust, clean or torque if necessary.

R: Replace

## Torque and Locking Agent

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

Letters used in the "Remarks" column mean:

L: Apply a non-permanent locking agent to the threads.

Lh: Left-hand threads

M: Apply molybdenum disulfide grease.

S: Tighten the fasteners following the specified sequence.

St: Stake the fasteners to prevent loosening

The table on the right 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 dia. (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 ~ 33	165 ~ 240

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
<b>Fuel System</b>				
Air Cleaner Housing Mounting Bolts	8.8	0.90	78 in·lb	
Air Cleaner Holder Nuts	3.0	0.31	27 in·lb	
Fuel Tap Plate Screws	0.8	0.08	7 in·lb	
Reed Mounting Screws	1.0	0.10	9 in·lb	
Carburetor Holder Mounting Bolts	8.8	0.90	78 in·lb	
Carburetor Mounting Clamp Screw	1.5	0.15	13 in·lb	
Rear Frame Pipe Bolts	34	3.5	25	
<b>Cooling System</b>				
Water Hose Clamp Screws	1.5	0.15	13 in·lb	
Radiator Stay Mounting Bolts	8.8	0.90	78 in·lb	
Radiator Shroud Mounting Bolts	8.8	0.90	78 in·lb	
Radiator Screen Mounting Bolts	8.8	0.90	78 in·lb	
Radiator Mounting Bolts	8.8	0.90	78 in·lb	
Coolant Drain Plug (cylinder)	8.8	0.90	78 in·lb	
Coolant Drain Plug (water pump)	5.4	0.55	48 in·lb	
Water Pump Impeller Bolt	7.0	0.70	61 in·lb	
Water Pump Cover Bolts	8.8	0.90	78 in·lb	
<b>Engine Top End</b>				
Muffler Mounting Bolts	8.8	0.90	78 in·lb	

## 1-16 GENERAL INFORMATION

### Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Exhaust Pipe Mounting Bolts	8.8	0.90	78 in·lb	S S        L
Air Bleeder Bolt	8.8	0.90	78 in·lb	
Spark Plug	26	2.7	20	
Water Hose Clamp Screws	1.5	0.15	13 in·lb	
Engine Mounting Nuts	29	3.0	22	
Engine Bracket Nuts	29	3.0	22	
Cylinder Head Nuts	25	2.5	18	
Cylinder Nuts	25	2.5	18	
Coolant Drain Plug (cylinder)	8.8	0.90	78 in·lb	
Exhaust Valve Cover Mounting Bolts	5.2	0.53	46 in·lb	
Exhaust valve lever mounting bolt	3.9	0.40	35 in·lb	
KIPS Cover Mounting Bolts	5.2	0.53	46 in·lb	
Engine Right Side				
Water Pump Impeller Bolt	7.0	0.70	61 in·lb	Lh St                L
Clutch Spring Bolts	9.3	0.95	82 in·lb	
Clutch Hub Nut	88	9.0	65	
Primary Gear Nut	49	5.0	36	
Kick Lever Plug Screw	—	—	—	
Kick Lever Boss Mounting Bolt	12	1.2	104 in·lb	
Shift Shaft Return Spring Pin	22	2.2	16	
Right Engine Cover Bolts	8.8	0.90	78 in·lb	
Clutch Cover Bolts	8.8	0.90	78 in·lb	
Gear Set Lever Mounting Bolts	8.8	0.90	78 in·lb	
Ratchet Guide Mounting Bolt	8.8	0.90	78 in·lb	
Ratchet Guide Mounting Screw	5.2	0.53	46 in·lb	
Oil Filler Cap	1.5	0.15	13 in·lb	
Lever Shaft Retaining Bolt	5.4	0.55	48 in·lb	
Lever Assembly Mounting Screw (KX85-A4 ~/B4 ~)	6.4	0.65	56 in·lb	
Engine Removal/Installation				
Engine Mounting Nuts	29	3.0	22	
Engine Mounting Bracket Nuts	29	3.0	22	
Swing Arm Pivot Shaft Nut	69	7.0	51	
Engine Bottom End/Transmission				
Engine Oil Drain Plug	15	1.5	11	L     Lh
Flywheel Nut	29	3.0	22	
Shift Drum Cam Bolt	23	2.3	16.5	
Return Spring Pin	22	2.2	16	
Crankcase Bolts	8.8	0.90	78 in·lb	
Primary Gear Nut	49	5.0	36	
Output Shaft Bearing Retaining Screws	5.4	0.55	48 in·lb	
Drive Shaft Bearing Retaining Bolts	8.8	0.90	78 in·lb	
Shift Drum Plate Bolts	9.8	1.0	87 in·lb	



## Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
<b>Wheels/Tires</b>				
Front Axle Nut	79	8.1	58	
Rear Axle Nut	79	8.1	58	
Spoke Nipple	1.5 ~ 3.0	0.15 ~ 0.31	13 ~ 27 in·lb	
Caliper Mounting Bolts (rear)	25	2.5	18	
<b>Final Drive</b>				
Rear Axle Nut	79	8.1	58	
Rear Sprocket Nuts	32	3.3	24	
Rear Sprocket Studs	—	—	—	L
Magneto Cover Bolts	9.8	1.0	87 in·lb	
<b>Brakes</b>				
Bleed Valve	7.8	0.80	69 in·lb	
Brake Hose Banjo Bolts	25	2.5	18	
Front Brake Reservoir Cap Screws	1.5	0.15	13 in·lb	
Rear Brake Reservoir Bolt	5.9	0.60	52 in·lb	
Brake Lever Pivot Bolt Locknut	5.9	0.60	52 in·lb	
Brake Lever Pivot Bolt	5.9	0.60	52 in·lb	
Brake Lever Adjust Locknut	4.9	0.50	43 in·lb	
Front Master Cylinder Clamp Bolts	8.8	0.90	78 in·lb	S
Caliper Mounting Bolts (front, rear)	25	2.5	18	
Disc Bolts (front, rear)	9.8	1.0	87 in·lb	L
Rear Master Cylinder Mounting Bolts	9.8	1.0	87 in·lb	
Rear Master Cylinder Push Rod Locknut	18	1.8	13	
Rear Caliper Pad Mounting Bolts	18	1.8	13	
Brake Pedal Bolt	25	2.5	18	
<b>Suspension</b>				
Front Fork Clamp Bolts (Upper, Lower)	20	2.0	15	
Front Fork Top Plug	27	2.8	20	
Front Fork Push Rod Nut	15	1.5	11	
Compression Valve Assembly	54	5.5	40	L
Front Caliper Mounting Bolts	25	2.5	18	
Rear Frame Pipe Bolts	34	3.5	25	
Rear Shock Absorber Mounting Bolts	39	4.0	29	
Swingarm Pivot Shaft Nut	69	7.0	51	
Uni-trak:				
Rocker Arm Pivot Shaft Nuts	83	8.5	61	
Rocker Arm Bracket Bolts	83	8.5	61	M
Tie-rod Nuts	59	6.0	44	
<b>Steering</b>				
Steering Stem Head Nut	64	6.5	47	
Steering Stem Nut	Hand-Tight or 4.9	← or 0.49	← or 43 in·lb	
Handlebar Holder Bolts	25	2.5	18	S

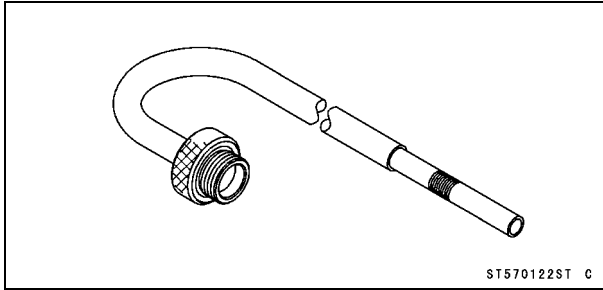
## 1-18 GENERAL INFORMATION

### Torque and Locking Agent

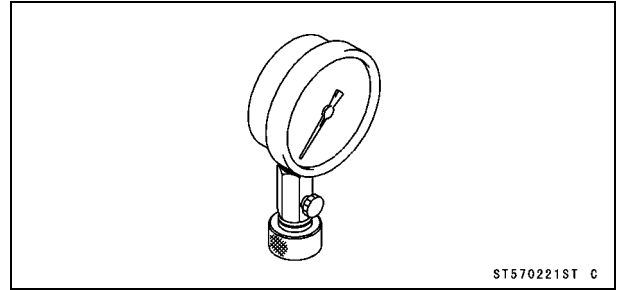
Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Front Master Cylinder Clamp Bolt	8.8	0.90	78 in·lb	
Clutch Lever Clamp Bolts	8.8	0.90	78 in·lb	
<b>Frame</b>				
Rear Frame Pipe Bolts	34	3.5	25	
Rear Fender Flap Bolts	5.9	0.60	52 in·lb	
<b>Electrical System</b>				
Spark Plug	26	2.7	20	
Magneto Cover Bolts	9.8	1.0	87 in·lb	
Flywheel Nut	29	3.0	22	
Stator Mounting Screws	5.2	0.53	43 in·lb	
Ignition Coil Mounting Bolts	8.8	0.90	78 in·lb	
CDI Unit Mounting Bolts	8.8	0.90	78 in·lb	

## Special Tools and Sealants

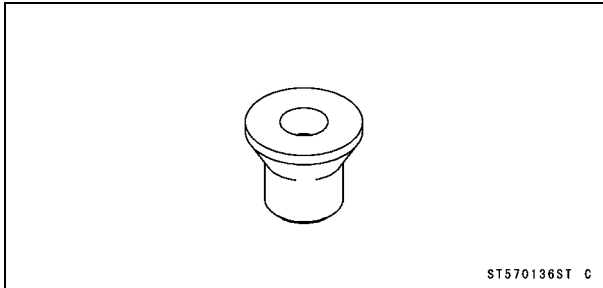
**Fuel Level Gauge, M18 × 1.0:**  
**57001-122**



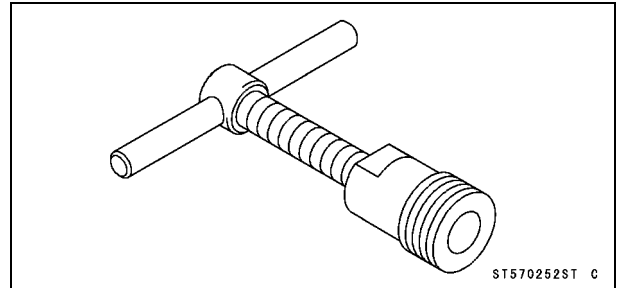
**Compression Gauge, 20 kgf/cm<sup>2</sup>:**  
**57001-221**



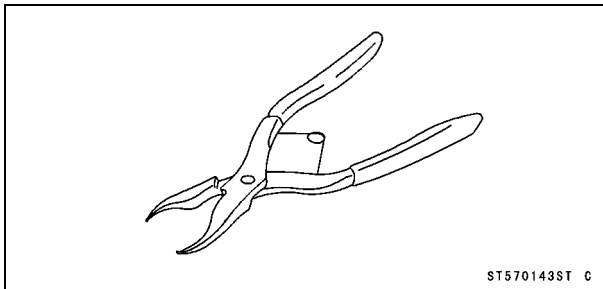
**Bearing Puller Adapter:**  
**57001-136**



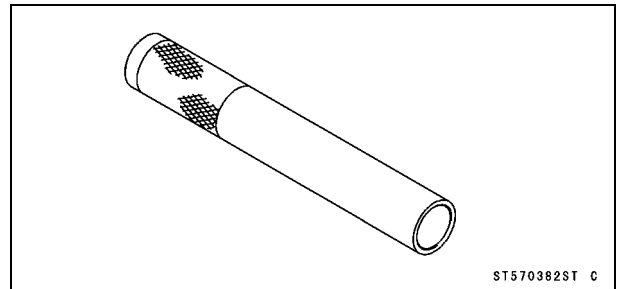
**Flywheel Puller, M12 × 1.75:**  
**57001-252**



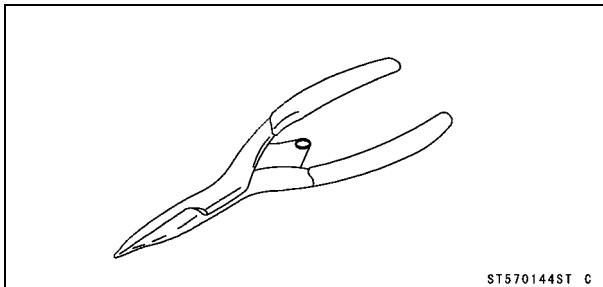
**Inside Circlip Pliers:**  
**57001-143**



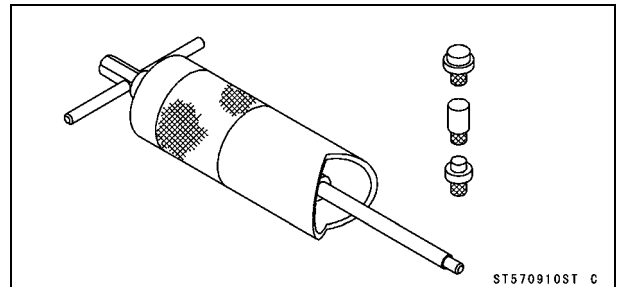
**Bearing Driver, φ32:**  
**57001-382**



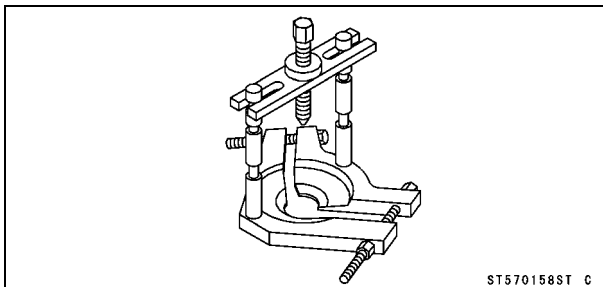
**Outside Circlip Pliers:**  
**57001-144**



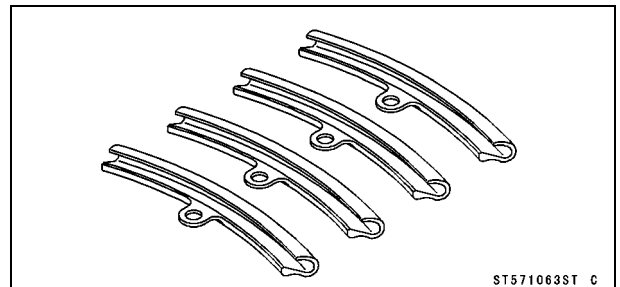
**Piston Pin Puller Assembly:**  
**57001-910**



**Bearing Puller:**  
**57001-158**



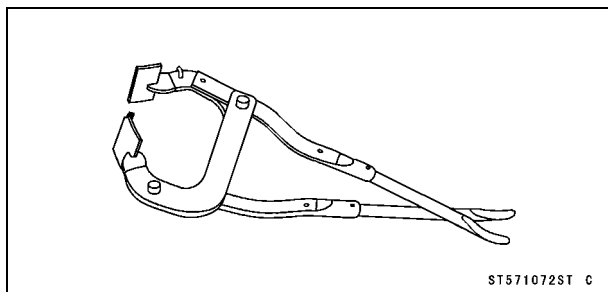
**Rim Protector:**  
**57001-1063**



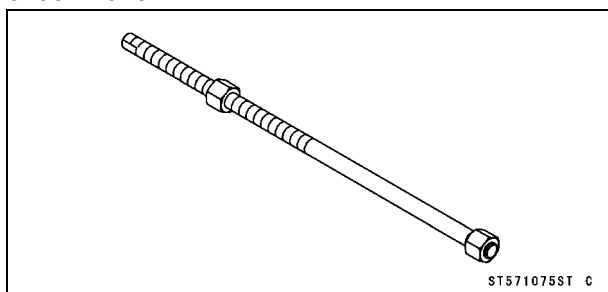
## 1-20 GENERAL INFORMATION

### Special Tools and Sealants

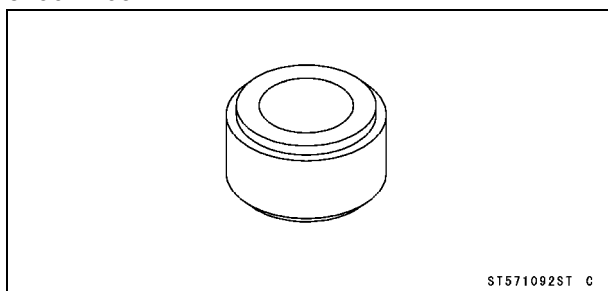
**Bead Breaker Assembly:**  
**57001-1072**



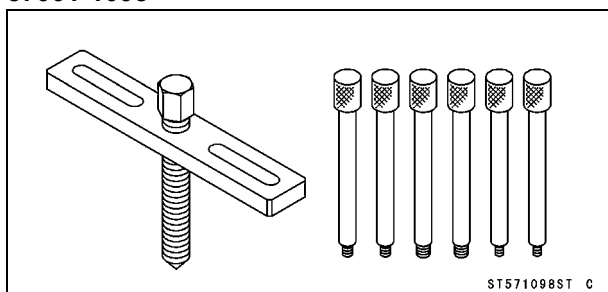
**Head Pipe Outer Race Press Shaft:**  
**57001-1075**



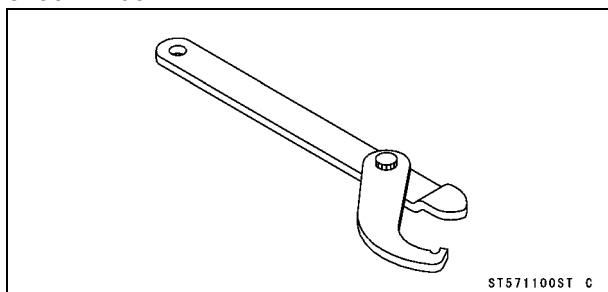
**Steering Stem Bearing Driver Adapter,  $\phi 29.7$ :**  
**57001-1092**



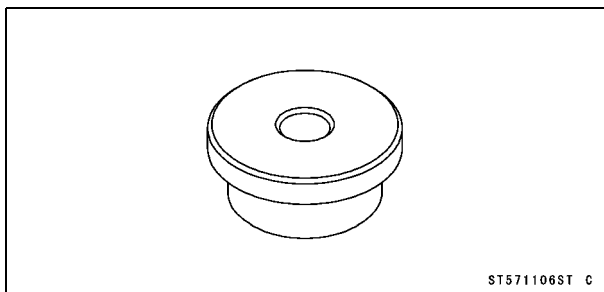
**Crankcase Splitting Tool Assembly:**  
**57001-1098**



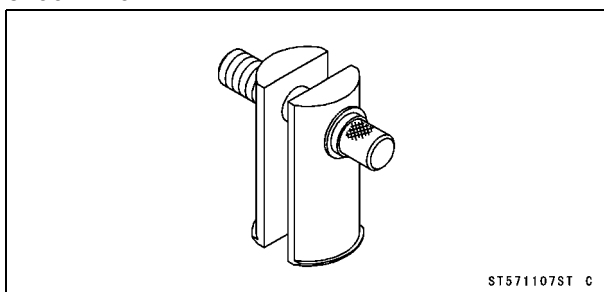
**Steering Stem Nut Wrench:**  
**57001-1100**



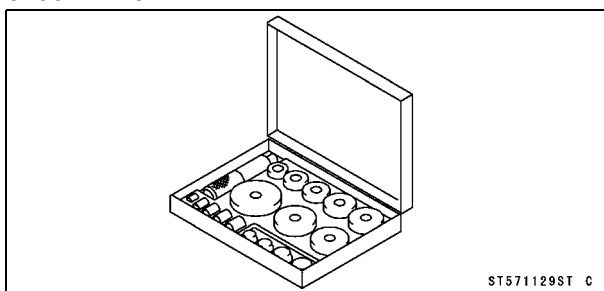
**Head Pipe Outer Race Driver,  $\phi 46.5$ :**  
**57001-1106**



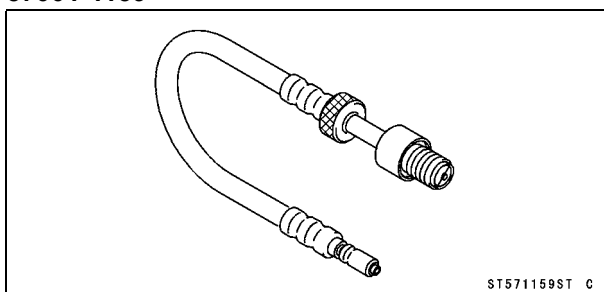
**Head Pipe Outer Race Remover ID > 37 mm:**  
**57001-1107**



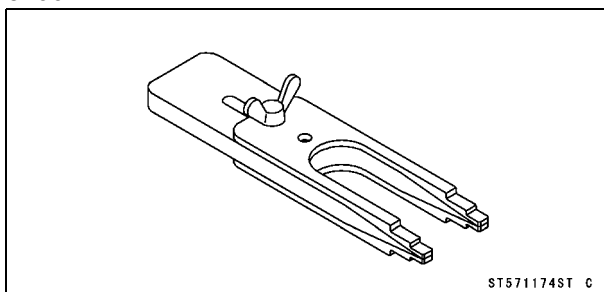
**Bearing Driver Set:**  
**57001-1129**



**Compression Gauge Adapter, M14  $\times$  1.25:**  
**57001-1159**



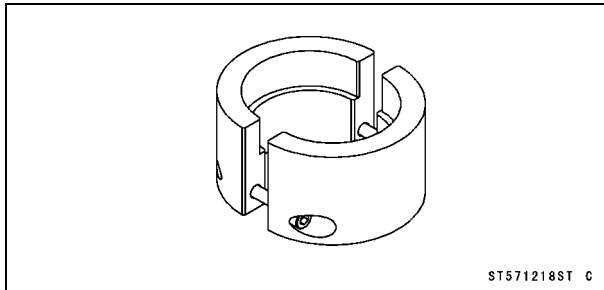
**Crankshaft Jig:**  
**57001-1174**



## Special Tools and Sealants

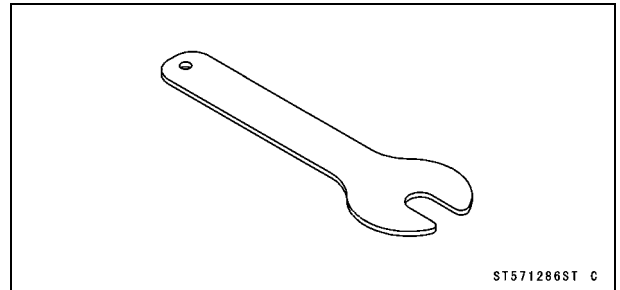
**Fork Outer Tube Weight:**

**57001-1218**



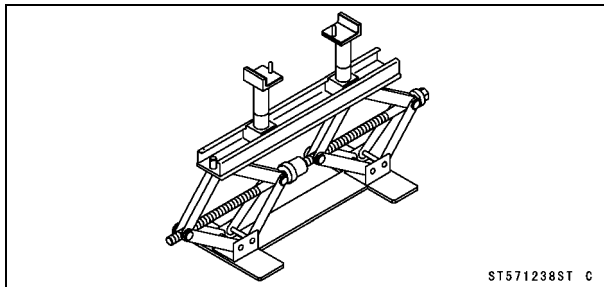
**Fork Spring Holder:**

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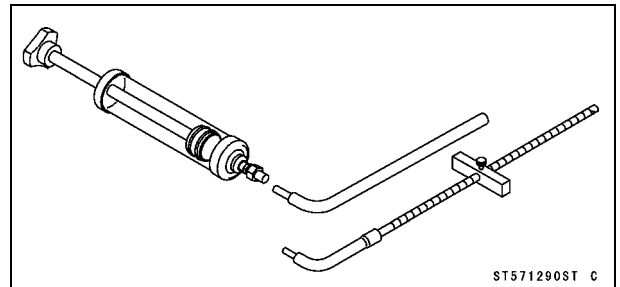
**Jack:**

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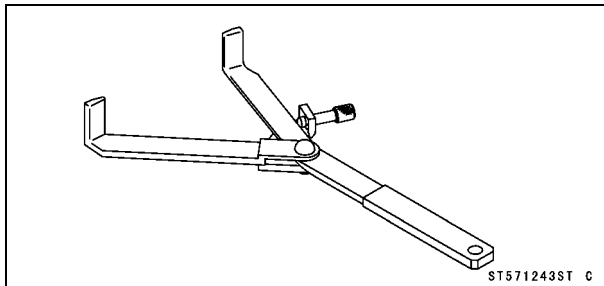
**Fork Oil Level Gauge:**

**57001-1290**



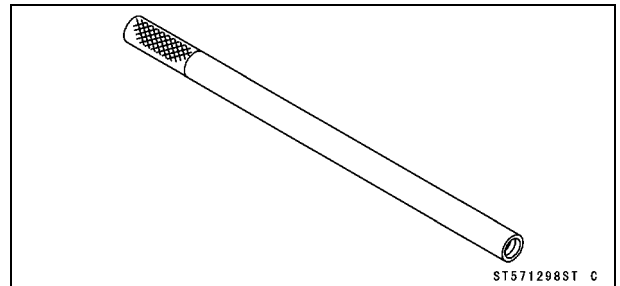
**Clutch Holder:**

**57001-1243**



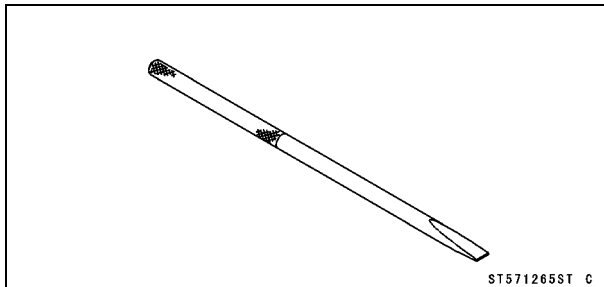
**Fork Piston Rod Puller, M10 × 1.0:**

**57001-1298**



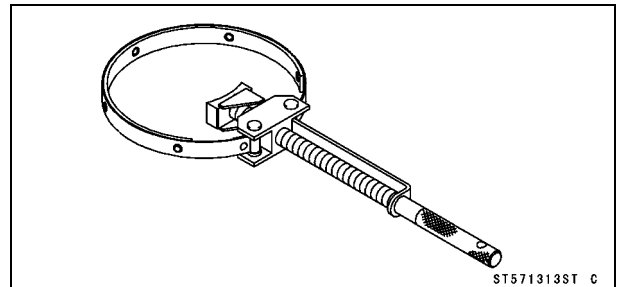
**Bearing Remover Shaft,  $\phi 9$ :**

**57001-1265**



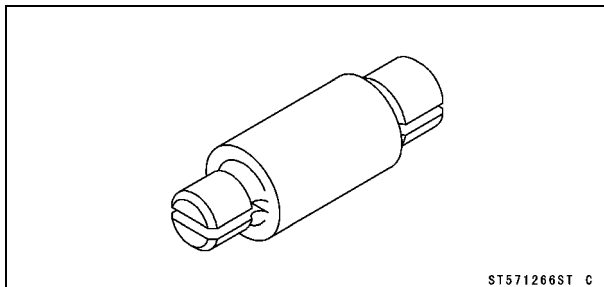
**Flywheel Holder:**

**57001-1313**



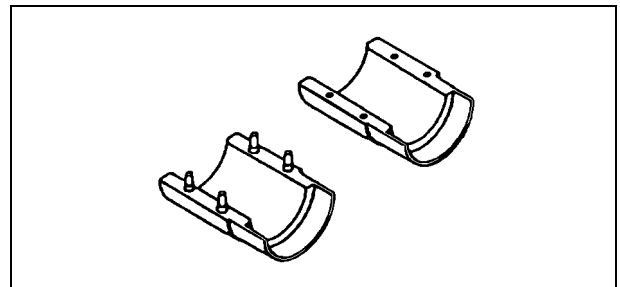
**Bearing Remover Head,  $\phi 10 \times \phi 12$ :**

**57001-1266**



**Fork Oil Seal Driver,  $\phi 36$ :**

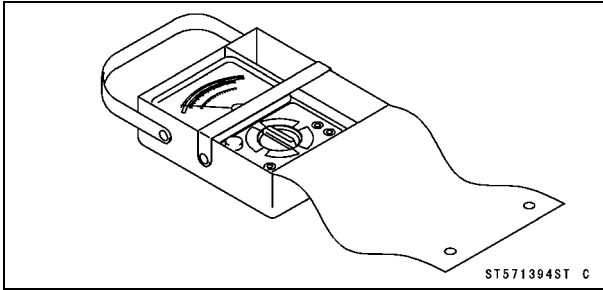
**57001-1352**



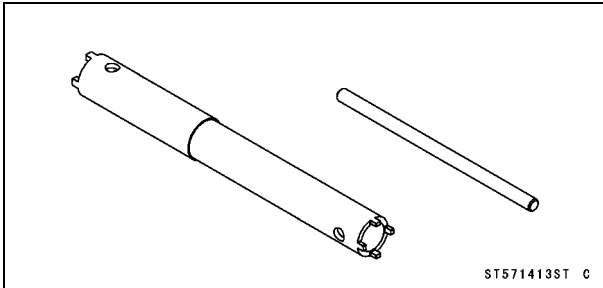
## 1-22 GENERAL INFORMATION

### Special Tools and Sealants

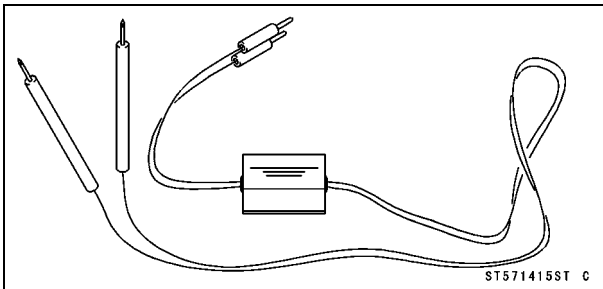
**Hand Tester:**  
**57001-1394**



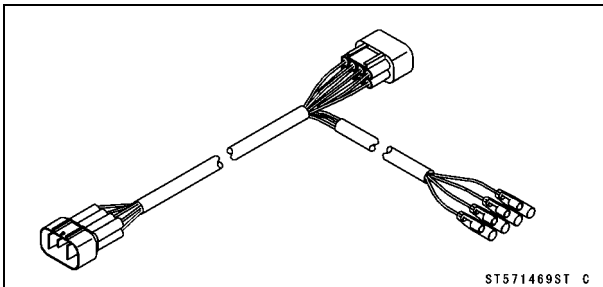
**Fork Cylinder Holder:**  
**57001-1413**



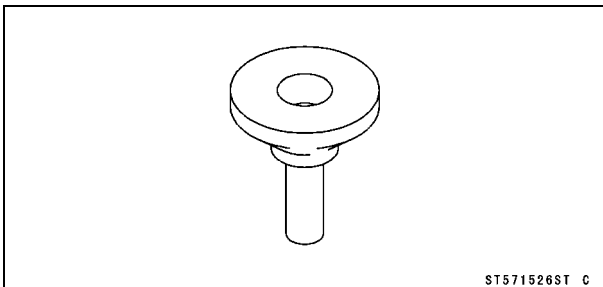
**Peak Voltage Adapter:**  
**57001-1415**



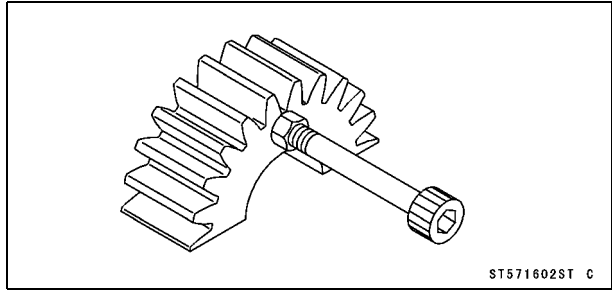
**Lead Wire - Magneto Lead Adapter:**  
**57001-1469**



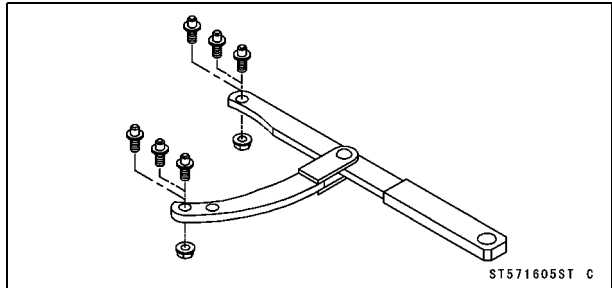
**Bearing Puller Adapter:**  
**57001-1526**



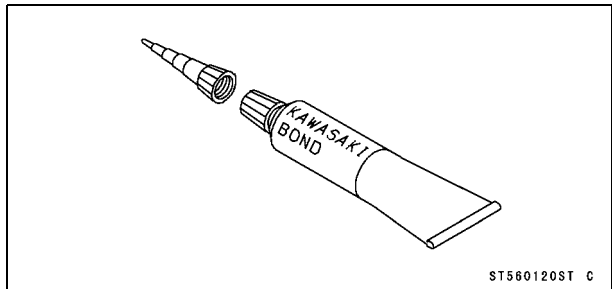
**Gear Holder:**  
**57001-1602**



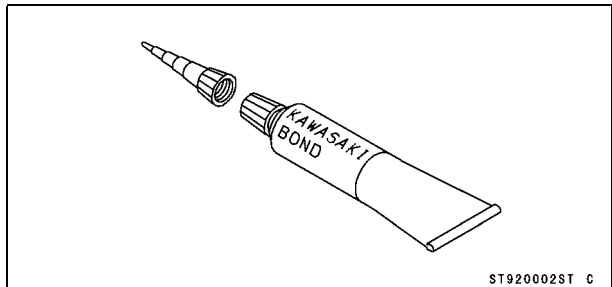
**Flywheel & Pulley Holder:**  
**57001-1605**



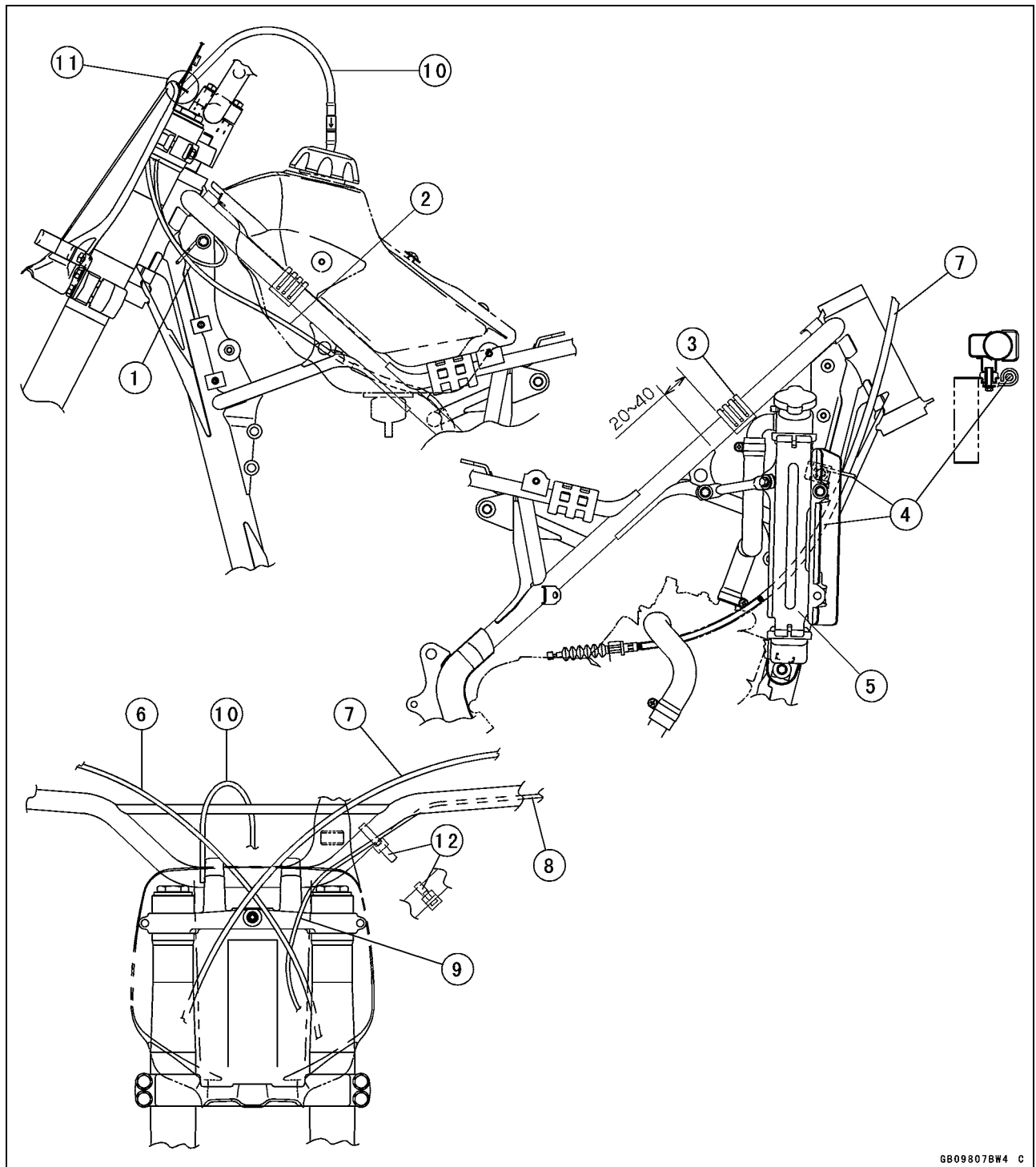
**Kawasaki Bond (Silicone Sealant):**  
**56019-120**



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



## Cable, Wire and Hose Routing

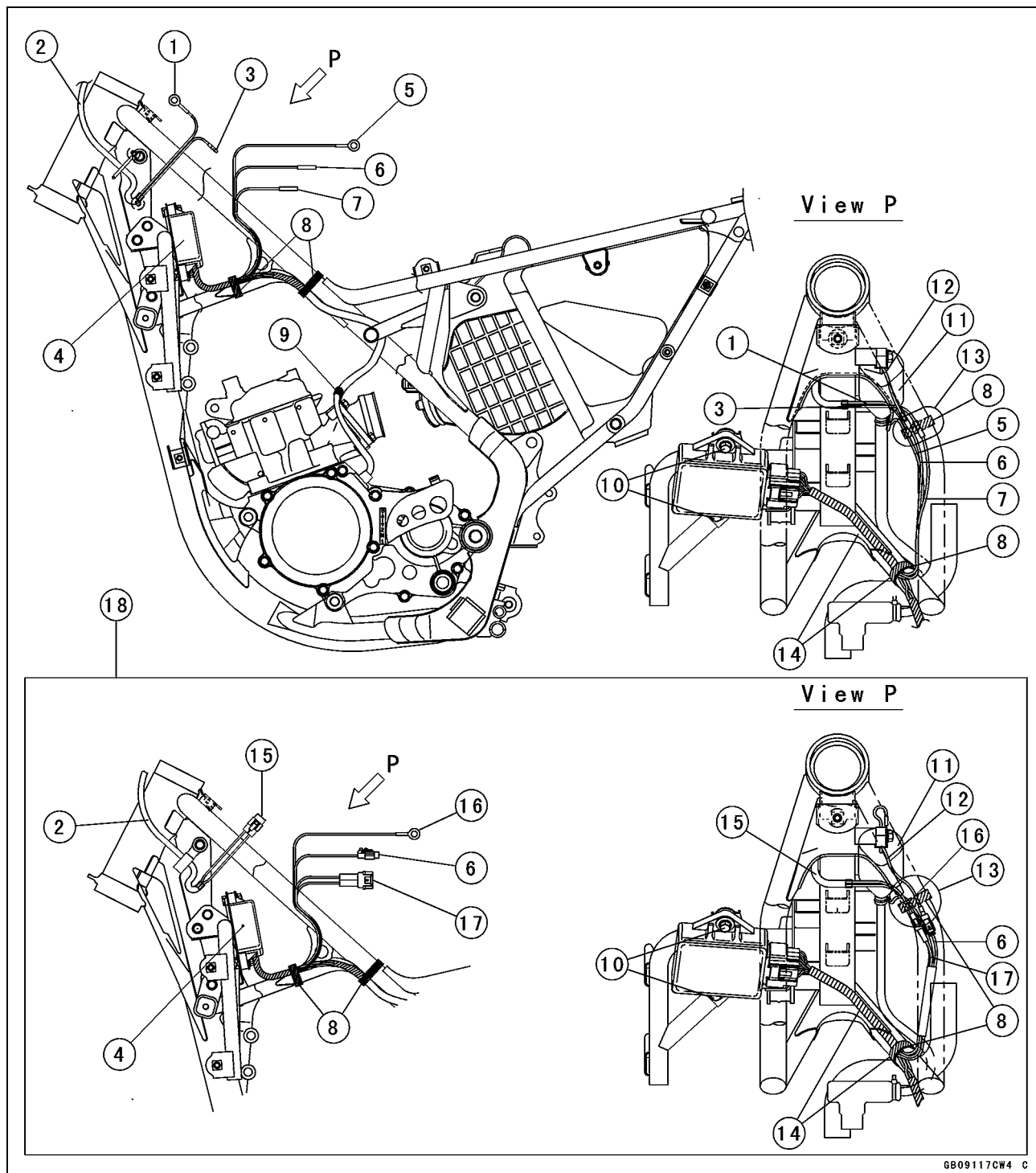


GB09807BW4 C

1. Run the throttle cable and engine stop button lead through the clamp.
2. Do not pinch the throttle cable between the fuel tank and frame.
3. Adheve the damper on the frame pipe.
4. Run the clutch cable between the clamp and upper and lower radiator installation bolts.
5. Radiator
6. Throttle Cable
7. Clutch Cable
8. Engine Stop Button Lead
9. Run the engine stop button lead in front of the bracket.
10. Fuel Tank Breather Hose Assy and install the check valve of arrow mark direction to fuel tank cap side
11. Insert the fuel tank breather hose outlet end into the number Plate hole.
12. Band (KX85A6F ~ , B6F ~ /KX100D6F ~ )

## 1-24 GENERAL INFORMATION

### Cable, Wire and Hose Routing



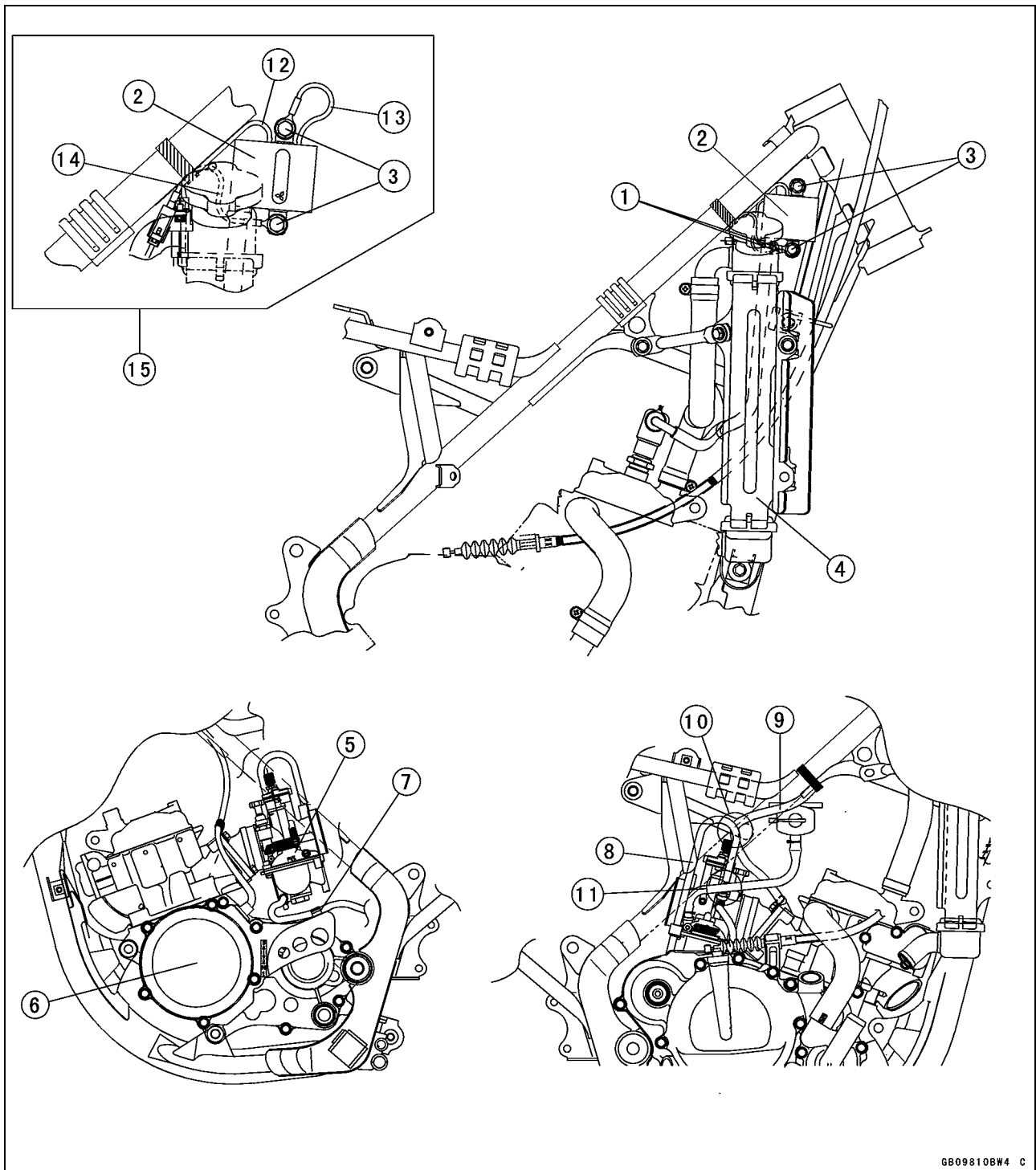
1. Engine Stop Button Ground Lead (B)
2. Run the engine stop button lead through the clamp for throttle cable.
3. Engine Stop Button Lead [BK/W]
4. CDI Unit
5. CDI Unit Ground Lead [BK/Y]
6. CDI Unit Primary Lead [O]
7. CDI Unit Lead to Engine Stop Button [BK]
8. Bands
9. Clamp
10. CDI unit Installation Bolts

11. Ignition Coil
12. Ignition Coil Primary Lead
13. Bundle the harness under the frame pipe.
14. Fit the taping part of harness with band so that there is not a loose or tension of harness between the connector and band.
15. Engine Stop Button Lead (BK/W, BK)
16. CDI Unit Ground Lead (BK/O)
17. CDI Unit Lead to Engine Stop Button (BK, BK/Y)
18. KX85A6F ~ , B6F ~ /KX100D6F ~

GB09117CW4 C



# Cable, Wire and Hose Routing



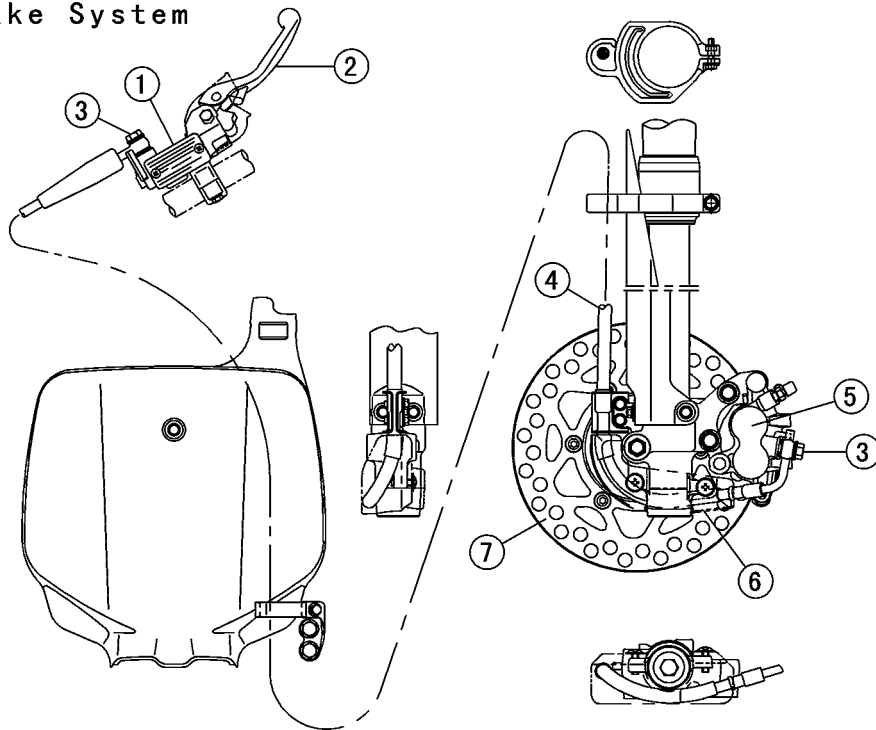
GB09810BW4 C

1. Tighten the CDI unit and engine stop button ground terminals together with lower ignition coil installation bolt.
2. Install the ignition coil so that the ignition secondary coil come to backward.
3. Ignition Coil Installation Bolts
4. Radiator
5. Carburetor
6. Magneto Cover
7. Run the carburetor over flow tube through the clamp installed on the magneto cover.
8. Carburetor Air Vent Tube
9. Magneto Lead
10. Do not cross the carburetor air vent tube and magneto lead.
11. Run the fuel hose toward the outside of the carburetor air vent tube.
12. Ignition Coil Primary Lead (O)
13. Ignition Coil Ground Lead (BK)
14. CDI Unit Ground Lead (BK/O)
15. KX85A6F ~ , B6F ~ /KX100D6F ~

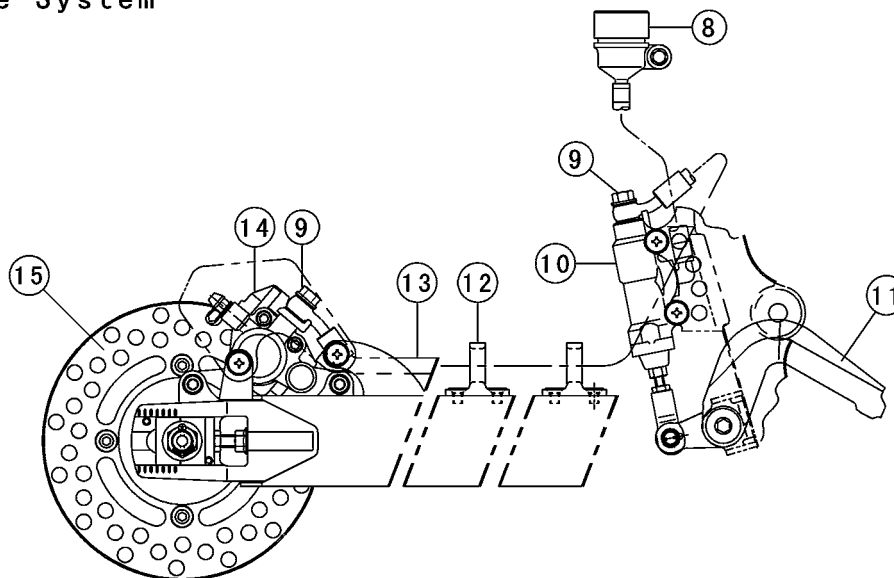
## 1-26 GENERAL INFORMATION

### Cable, Wire and Hose Routing

#### Front Brake System



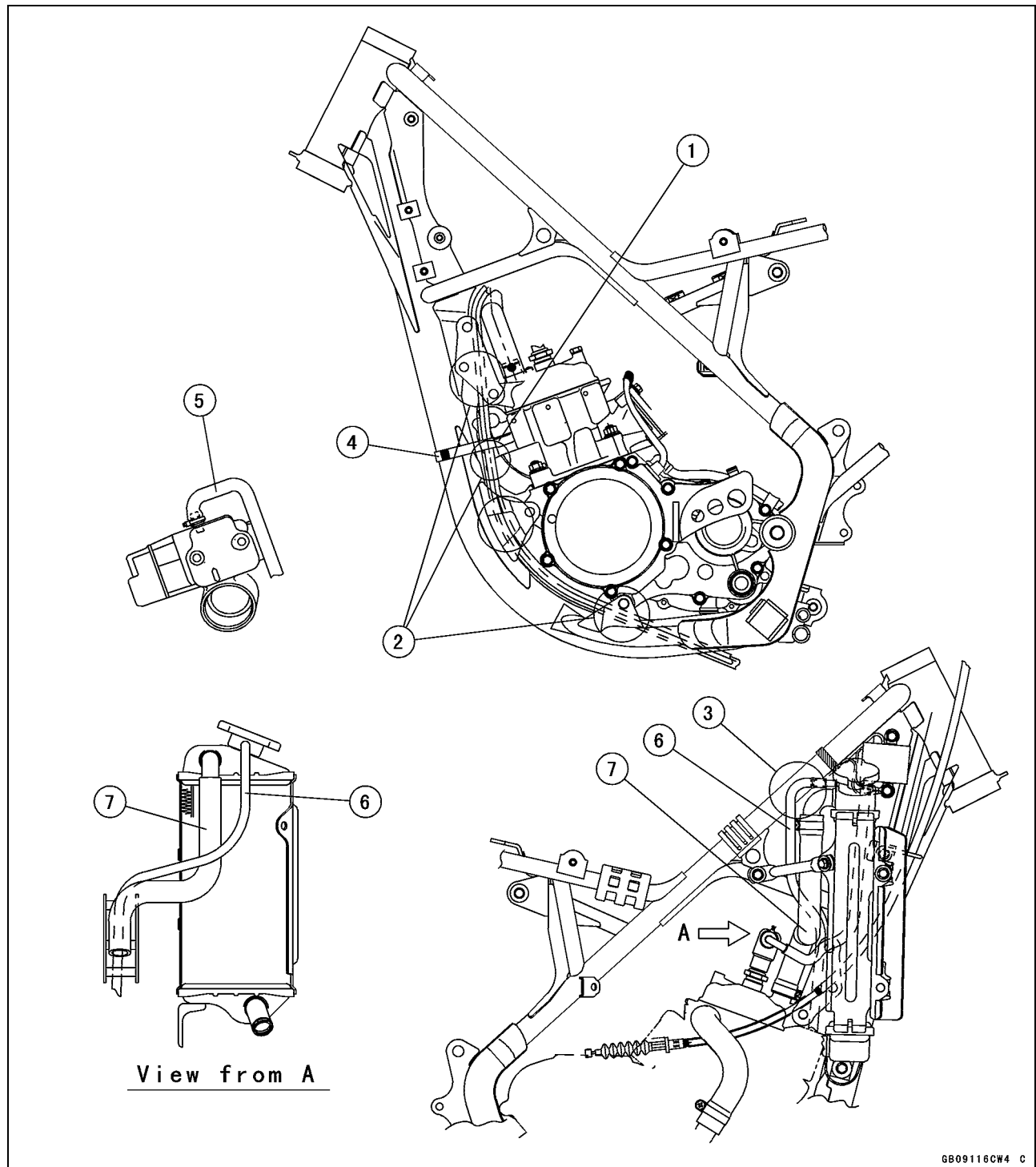
#### Rear Brake System



GB090646W4 C

- |                                |                                |
|--------------------------------|--------------------------------|
| 1. Front Brake Master Cylinder | 9. Banjo Bolt                  |
| 2. Brake Lever                 | 10. Rear Brake Master Cylinder |
| 3. Banjo Bolt                  | 11. Brake Pedal                |
| 4. Front Brake Hose            | 12. Brake Hose Guide           |
| 5. Front Brake Caliper         | 13. Rear Brake Hose            |
| 6. Brake Hose Cover            | 14. Rear Brake Caliper         |
| 7. Front Brake Disc            | 15. Rear Brake Disc            |
| 8. Rear Brake Fluid Reservoir  |                                |

## Cable, Wire and Hose Routing



1. Route the water hose so that it does not touch the exhaust pipe.
2. Route the water hose between 3 engine mounting brackets.
3. Route the water hose noting the bend of it.
4. Band (Radiator Hose and KIPS Chamber Vent Tube)
5. KIPS Chamber Vent Tube
6. Breather Hose
7. Water Hose (Upper)

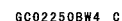


# Fuel System

## Table of Contents

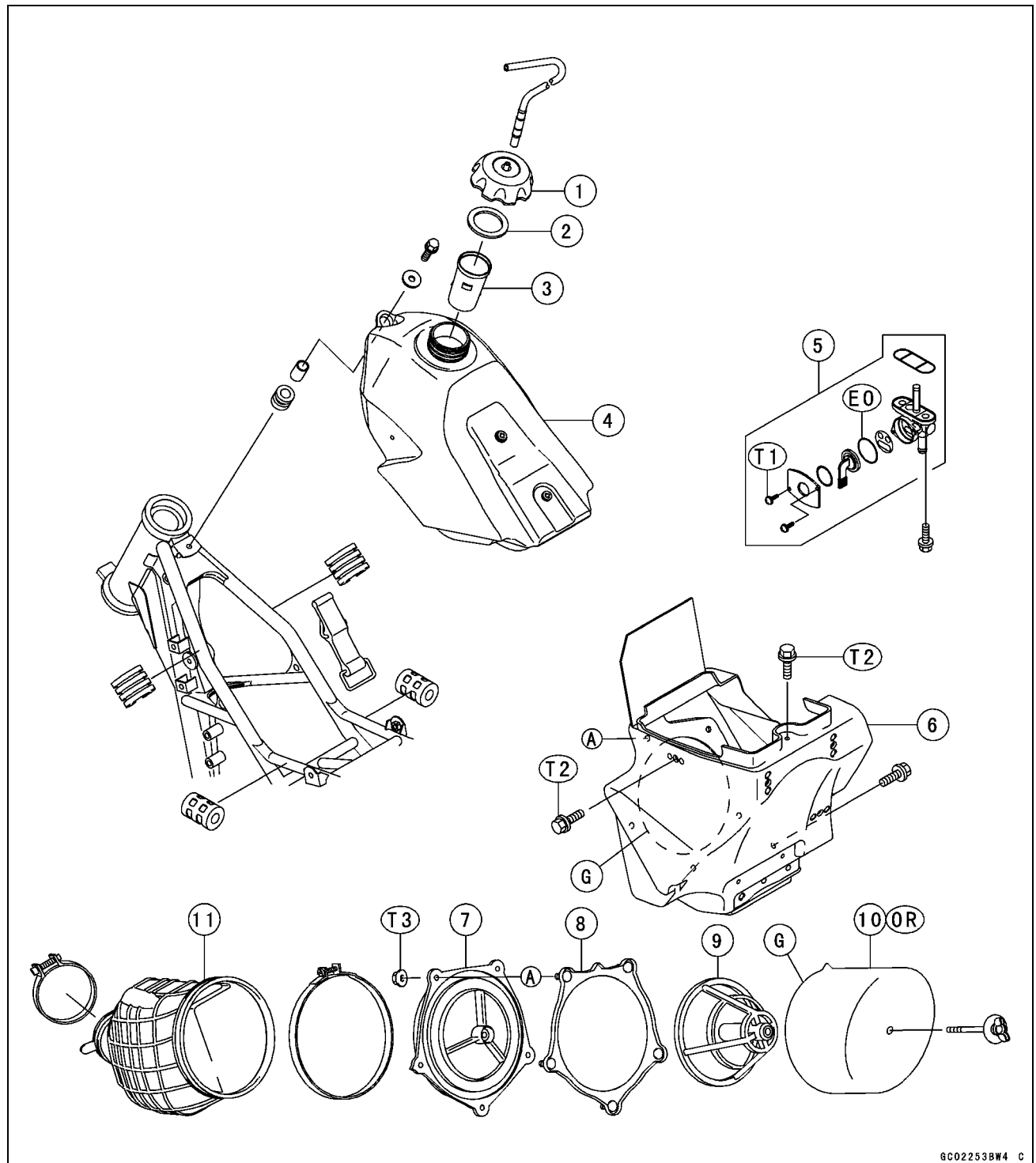
Exploded View .....	2-2
Specifications .....	2-4
Throttle Grip and Cable .....	2-5
Free Play Inspection .....	2-5
Free Play Adjustment .....	2-5
Installation Notes .....	2-6
Cable Lubrication .....	2-6
Cable Inspection .....	2-6
Carburetor .....	2-7
Idle Speed Inspection .....	2-7
Idle Speed Adjustment .....	2-7
Main Jet Replacement Notes .....	2-7
Service Fuel Level Inspection .....	2-8
Service Fuel Level Adjustment .....	2-9
Fuel System Clean .....	2-9
Removal .....	2-10
Installation .....	2-11
Disassembly .....	2-12
Assembly .....	2-12
Cleaning .....	2-13
Inspection .....	2-13
Air Cleaner .....	2-15
Air Cleaner Element Removal .....	2-15
Air Cleaner Element Installation .....	2-15
Air Cleaner Element Cleaning and Inspection .....	2-15
Air Cleaner Housing Removal .....	2-16
Air Cleaner Housing Installation .....	2-16
Air Cleaner Housing Assembly .....	2-16
Fuel Tank .....	2-17
Fuel Tank Removal .....	2-17
Fuel Tank Installation .....	2-17
Fuel Tap Removal .....	2-17
Fuel Tap Installation .....	2-17
Fuel Tap Inspection .....	2-18
Fuel Tank Cap Inspection .....	2-18
Fuel Tank and Tap Cleaning .....	2-18
Reed Valve .....	2-19
Removal .....	2-19
Installation Note .....	2-19
Inspection .....	2-19
Fuel Hose .....	2-20
Fuel Hoses and Connections Inspection .....	2-20

## Exploded View



- T1: 1.0 N·m (0.10 kgf·m, 9 in·lb)  
T2: 8.8 N·m (0.90 kgf·m, 78 in·lb)  
T3: 1.5 N·m (0.15 kgf·m, 13 in·lb)  
CL: Apply cable lubricant  
G: Apply grease  
O: Apply oil

## Exploded View



GC02253BW4 C

1. Fuel Tank Cap
2. Gasket
3. Fuel Filler
4. Fuel Tank
5. Fuel Tap
6. Air Cleaner Housing
7. Holder
8. Air Filter Plate
9. Air Cleaner Element Holder

10. Air Cleaner Element
11. Air Duct
- T1: 0.8 N·m (0.08 kgf·m, 7 in·lb)
- T2: 8.8 N·m (0.90 kgf·m, 78 in·lb)
- T3: 3.0 N·m (0.31 kgf·m, 27 in·lb)
- EO: Apply engine oil.
- G: Apply Grease.
- OR: Apply 2-stroke racing oil or high quality foam air filter oil.

## 2-4 FUEL SYSTEM

### Specifications

Item	Standard	Service Limit
<b>Throttle grip free play and Cable</b>	2 ~ 3 mm (0.08 ~ 0.12 in.)	— — —
<b>Carburetor</b>		
Make/type	KEIHIN PWK28	— — —
Main Jet:		
KX85A/B	#140	— — —
KX100D	#138	— — —
Main air jet	#60	— — —
Throttle Valve Cutaway	#3.5	— — —
Jet Needle:		
KX85A/B	NAPE	— — —
KX100D	NAPF	— — —
Jet Needle Clip Position:		
KX85A/B	3rd groove from the top	— — —
KX100D	4th groove from the top	— — —
Pilot Jet (Slow jet)	#45	— — —
Air Screw	1 3/8 (turns out)	— — —
Starter Jet	#62	— — —
Service Fuel Level (below the float bowl mating surface)	1.0 ±1 mm (0.04 ±0.04 in.)	— — —
Float height	19 ±1 mm (0.75 ±0.04 in.)	— — —
<b>Air Cleaner</b>		
Element Oil	High quality foam air filter oil	— — —
<b>Reed Valve</b>		
Reed Warp	— — —	0.2 mm (0.008 in.)

**Special Tools - Fuel Level Gauge, M18 × 1.0 : 57001-122**



## Throttle Grip and Cable

If the throttle grip has excessive free play due to cable stretch or misjudgments, there will be a delay in throttle response. Also, the throttle valve may not open fully at full throttle. On the other hand, if the throttle grip has no play, the throttle will be hard to control, and the idle speed will be erratic. Check the throttle grip play periodically in accordance with the Periodic Maintenance Chart, and adjust the play if necessary.

The throttle cable routing is shown in Cable, Wire and Hose Routing in the General Information chapter.

### Free Play Inspection

- Check the throttle grip free play [B] by lightly turning the throttle grip [A] back and forth.
- ★ If the free play is improper, adjust the throttle cable.

#### Throttle Grip Free Play

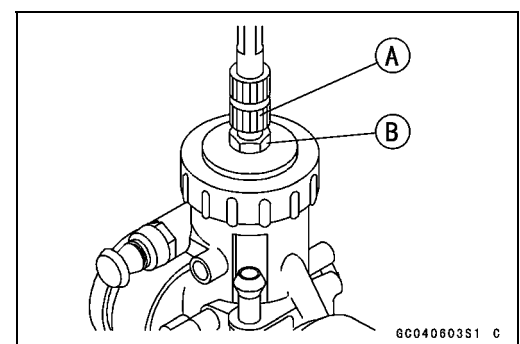
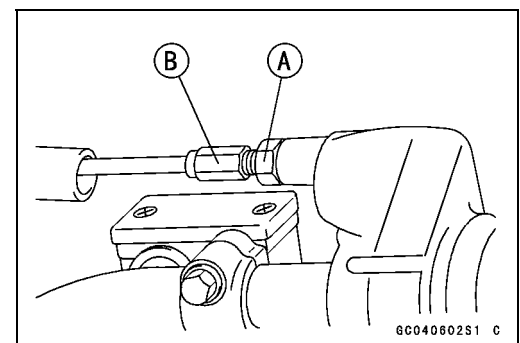
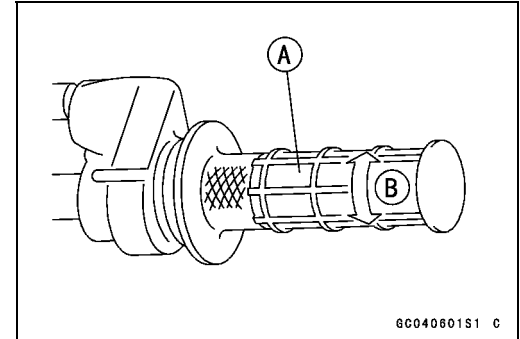
Standard: 2 ~ 3 mm

- Check that the throttle grip moves smoothly from full open to close, and the throttle closes quickly and completely in all steering positions by the return spring.
- ★ If the throttle grip does not return properly, check the throttle cable routing, grip free play, and cable damage. Then lubricate the throttle cable.
- Run the engine at the idle speed, and turn the handlebar all the way to the right and left to ensure that the idle speed does not change.
- ★ If the idle speed increase, check the throttle cable free play and the cable routing.

### Free Play Adjustment

- Loosen the locknut [A] at the upper end of the throttle cable.
- Turn the adjuster [B] until the proper amount of throttle grip free play is obtained.
- Tighten the locknut.

- ★ If the throttle grip free play cannot be adjusted with the adjuster at the upper end of the throttle cable, use the cable adjuster [A] at the carburetor.
- Pull the boot off of the carburetor top.
- Loosen the locknut and turn the adjuster until the proper amount of throttle grip play is obtained.
- Tighten the locknut [B].
- Slide back the dust cover.
- Turn the handlebar from side to side while idling the engine. If idle speed varies, the throttle cable may be poorly routed or it may be damaged.



### ⚠ WARNING

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

## 2-6 FUEL SYSTEM

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### Throttle Grip and Cable

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#### *Installation Notes*

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

#### *Cable Lubrication*

- Refer to the General Lubrication in the Appendix chapter.

#### *Cable Inspection*

- Refer to the General Lubrication in the Appendix chapter.

## Carburetor

Since the carburetor regulates and mixes the fuel and air going to the engine, there are two general types of carburetor trouble: too rich a mixture (too much fuel), and too lean a mixture (too little fuel). Such trouble can be caused by dirt, wear, maladjustment, or improper fuel level in the float chamber. A dirty or damaged air cleaner can also alter the fuel to air ratio.

### *Idle Speed Inspection*

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

### **⚠ WARNING**

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

- Check the idle speed.
- ★ Adjust it as needed.

### *Idle Speed Adjustment*

- Start the engine and warm it up thoroughly.
- First turn in the air screw [A] until it seats lightly, and back it out the specified number of turns.

#### **Air Screw (turns out)**

**Standard: 1 3/8**

- Turn the idle adjusting screw [B] to obtain desired idle speed. If no idle is preferred, turn out the screw until the engine stops.
- Open and close the throttle a few times to make sure that the idle speed is as desired. Readjust if necessary.

### *Main Jet Replacement Notes*

### **⚠ WARNING**

**Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and 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.**

**Make sure the engine is cold before working. Wipe any fuel off the engine before starting it.**



## 2-8 FUEL SYSTEM

### Carburetor

- Turn the fuel tap to the OFF position.
- Remove the fuel tank.
- Place a suitable container beneath the carburetor drain plug.
- Remove the carburetor (see Carburetor Removal).
- Remove the drain plug to drain the carburetor.
- Replace the main jet [A] with the desired one
- Tighten the drain plug securely.
- Install the carburetor (see Carburetor Installation).



### Service Fuel Level Inspection

#### ⚠ WARNING

**Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and do not smoke. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.**

- Turn the fuel tap to the OFF position.
- Remove the fuel tank
- Remove the carburetor, and hold it in true vertical position on a stand.
- Put the fuel tank on a bench, and connect the fuel tap to the carburetor using a suitable hose.
- Remove the drain plug from the bottom of the float bowl, and screw a fuel level gauge [A] into the plug hole.

#### **Special Tool - Fuel Level Gauge, M18 × 1.0: 57001-122**

- Hold the gauge vertically against the side of the carburetor body so that the middle line [C] is several millimeters higher than the float bowl mating surface [B].
- Turn the fuel tap to the ON position to feed fuel to the carburetor.
- Wait until the fuel level in the gauge settles.
- Keeping the gauge vertical, slowly lower the gauge until the middle line is even with the float bowl mating surface.

#### **NOTE**

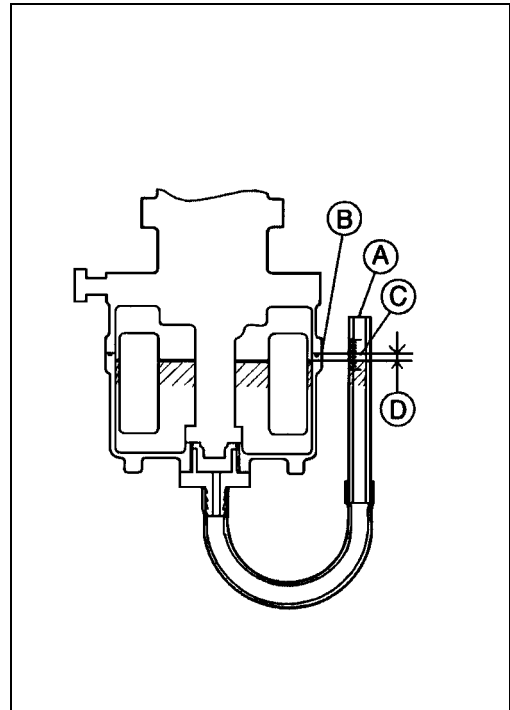
*○Do not lower the "zero" line below the bottom edge of the carburetor body. If the gauge is lowered and then raised again, the fuel level measure shows somewhat higher than the actual fuel level. If the gauge is lowered too far, dump the fuel out of it into a suitable container and start the procedure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

- Read the fuel level [D] in the gauge and compare it to the specification.

#### **Service Fuel Level (below the float bowl mating surface)**

**Standard: 1.0 ±1 mm (0.04 ±0.04 in.)**

- Turn the fuel tap to the OFF position and remove the fuel level gauge.
- ★ If the fuel level is incorrect, adjust the float height.



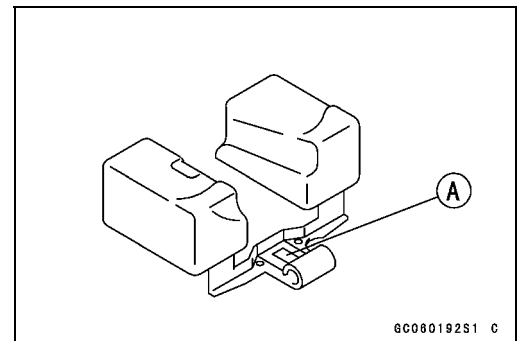
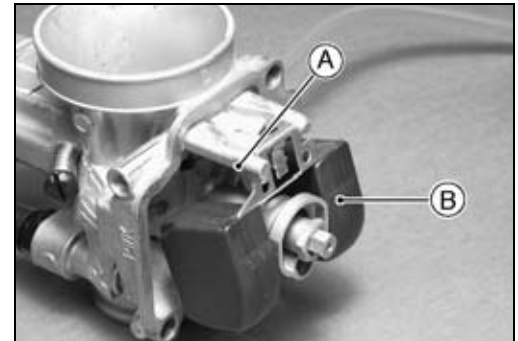
# Carburetor

## Service Fuel Level Adjustment

### WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and 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).
- Remove the float bowl.
- Drive out the pivot pin [A] and remove the float [B].
- 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.
- Install the float.



- Measure the float height tilting the carburetor so that the tang on the float just touches the needle rod in the float valve.

[A] Float Bowl Mating Surface

[B] Needle Rod

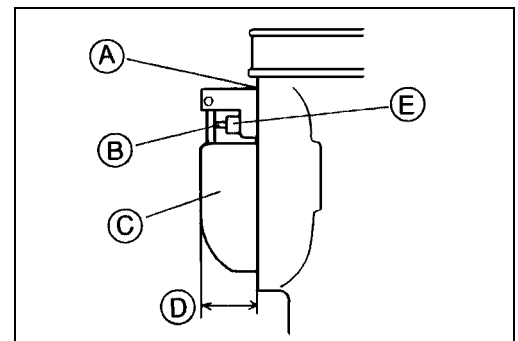
[C] Float

[D] Float Height

[E] Float Valve

### Float Height

Standard: 19 ±1 mm (0.75 ±0.04 in.)



### NOTE

○Do not push the needle rod in during the float height measurement.

- Assemble the carburetor, and recheck the fuel level.

## Fuel System Clean

### WARNING

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

## 2-10 FUEL SYSTEM

### Carburetor

- Place a suitable container beneath the carburetor.
- Turn the fuel tap to the OFF position.
- Remove the drain plug [A] from the bottom of the float bowl and check for water or dirt in the fuel.
- ★ If any water or dirt comes out, clean the carburetor (see Carburetor Cleaning), fuel tap and fuel tank (see Fuel Tap, Fuel Tank Cleaning).
- Install the drain plug securely.



#### Removal

#### **⚠ WARNING**

**Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and do not smoke. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.**

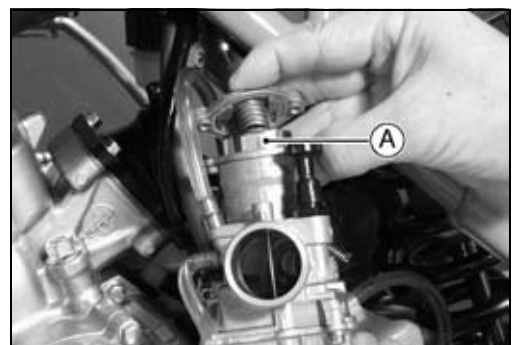
- Turn the fuel tap to the OFF position and pull the fuel hose off.
- Screw in the upper and lower throttle cable adjusters to give the cable plenty of play (see Throttle Cable Adjustment).
- Loosen the clamps and remove the carburetor from the end of the air cleaner duct, and then pull it out of the carburetor holder to the vehicle left side.
- Remove the throttle grip to make a play on the throttle cable enoughly.
- Remove the carburetor cap screws, and pull out the throttle valve assembly [A].



#### **CAUTION**

**If the throttle valve is not removed from the cable, wrap it in a clean cloth to avoid damage.**

- After removing the carburetor, push a clean, lint-free towel into the carburetor holder and the air cleaner duct to keep dirt or other foreign material from entering.



#### **⚠ WARNING**

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

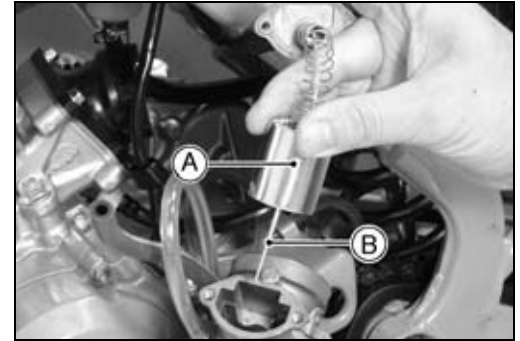
#### **CAUTION**

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

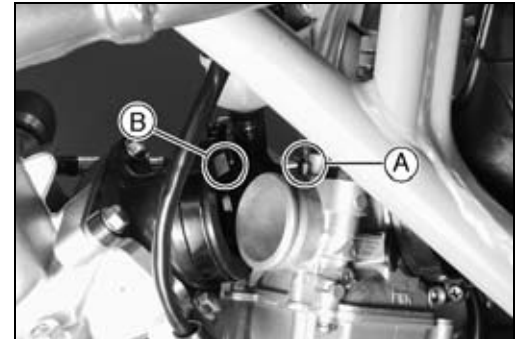
## Carburetor

### Installation

- Being careful not to bend or otherwise damage the jet needle [B], insert the throttle valve assembly [A] into the carburetor body.
- Check to see that the throttle valve goes all the way down into the carburetor body, and slides smoothly.



- Fit the ridge [A] into the notch [B] on the carburetor holder.



- Tighten the clamps [A] securely.  
Torque - Carburetor Clamp Screws: 1.5 N·m (0.15 kgf·m, 13 in·lb)



- Route the air vent and overflow hose through the clamp on the crankcase (see Cable, Wire and Hose Routing Section in the Appendix chapter).

### CAUTION

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

- Turn the fuel tap to the ON position, and check for fuel leakage from the carburetor.

### ⚠ WARNING

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

- Adjust the following items if necessary:  
Throttle Cable (see Throttle Grip Free Play Adjustment)  
Idle Speed (see Idle Speed Adjustment)

## 2-12 FUEL SYSTEM

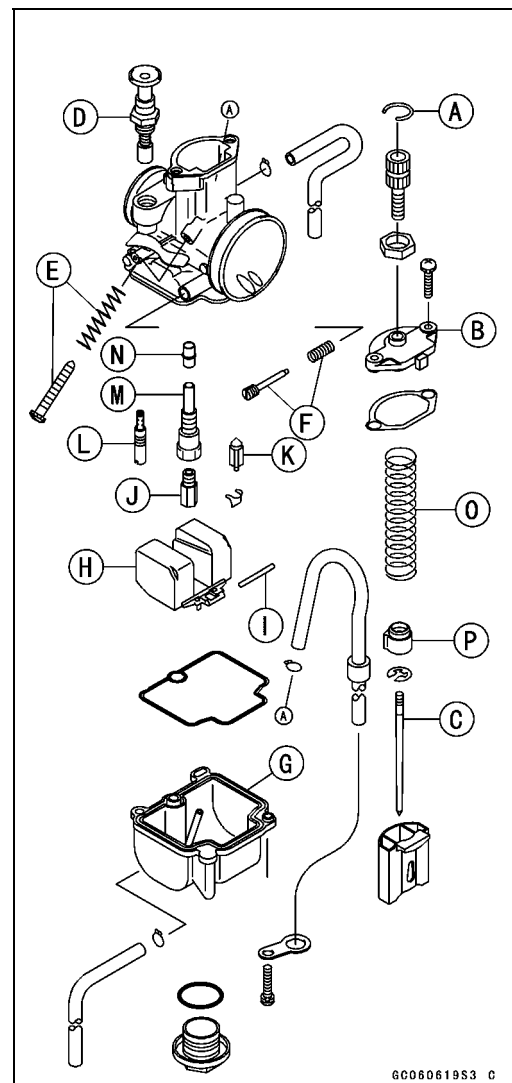
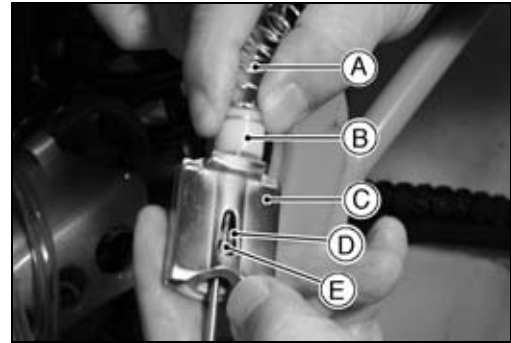
### Carburetor

#### Disassembly

#### **⚠ WARNING**

**Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and 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).
- Disassemble the throttle valve assembly as follows.
  - Hold the throttle valve return spring [A] compressed together with the spring seat [B], undo the end [E] of the throttle cable from the hook [D] of the throttle valve, and free the spring and spring seat from the throttle valve [C].
  - Slide the jet needle [C] out of the throttle valve.
  - Pull out the snap ring [A], and remove the throttle cable from the carburetor cap [B].
- Disassemble the carburetor body.
  - Starter Plunger Assembly [D] (unscrew)
  - Idle Adjusting Screw and Spring [E] (unscrew)
  - Air Screw and Spring [F] (unscrew)
- Disassemble the carburetor body bottom end.
  - Float Bowl [G]
  - Float [H]
  - Pivot Pin [I] (drive out)
  - Main Jet [J]
  - Float Valve [K]
  - Pilot Jet [L]
  - Main Jet Holder [M]
  - Needle Jet [N]
  - Spring [O]
  - Spring Seat [P]



#### Assembly

- Clean the disassembly parts.

#### **CAUTION**

**Do not overtighten the jets. They could be damaged requiring replacement.**

- Replace the float bowl O-ring with a new one if it is deteriorated or damaged.



## 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.

- Disassemble the carburetor (see Disassembly).

#### **CAUTION**

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

- Immerse all the metal parts into a carburetor cleaning solution.
- Rinse the parts in water.
- After the parts are cleaned, dry them with compressed air.
- Blow through the air and fuel passages with compressed air.
- Assemble the carburetor, and install it on the motorcycle.

### *Inspection*

#### **WARNING**

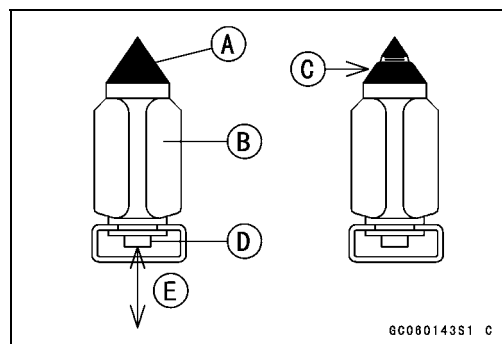
Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

- Remove the carburetor (see Carburetor Removal).
- Before disassembling the carburetor, check the fuel level (see Fuel Level Inspection).
- ★ If the fuel level is incorrect, inspect the rest of the carburetor before correcting it.
- Pull the carburetor cable to check that the throttle valve moves smoothly and returns by spring pressure.
- ★ If the throttle valve does not move smoothly, replace the carburetor body so that it returns by spring force.

## 2-14 FUEL SYSTEM

### Carburetor

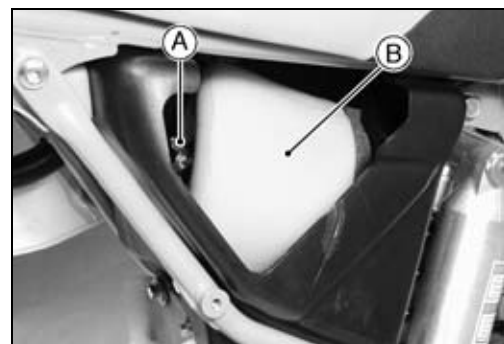
- Clean the carburetor (see cleaning).
- Check the plastic tip [A] of the float valve needle [B]. It should be smooth without any grooves, scratches, or tears.
- ★ If the plastic tip is damaged [C], replace the needle.
- Push the rod [D] in the valve, then release [E] it.
- ★ If the rod does not spring out, replace the valve.
- Check the jet needle and needle jet for damage.
- ★ The damaged jet needle should be replaced.
- ★ If the needle jet is damaged, replace the carburetor body.
- Check the starter jet in the float bowl for damage.
- ★ If the starter jet is damaged, replace the float bowl.



## Air Cleaner

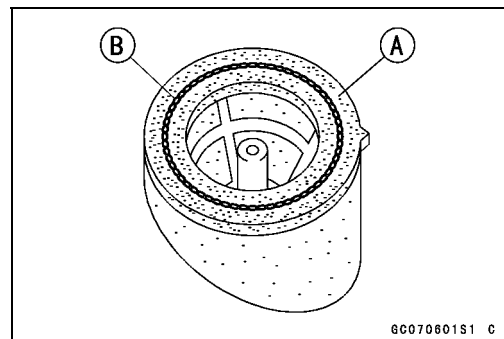
### Air Cleaner Element Removal

- Remove the side cover.
- Remove the wing bolt [A] and pull out the element [B].

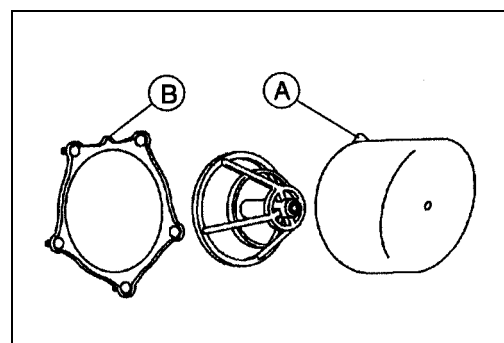


### Air Cleaner Element Installation

- Coat the lip of the element [A] with a thick layer of all purpose grease [B] to assure a complete seal. Also, coat the air cleaner housing where the lip of the element fits.



- Align the element tab [A] with the projection [B] on the air cleaner plate and install the element.



### Air Cleaner Element Cleaning and Inspection

#### NOTE

- In dusty areas, the element should be cleaned more frequently than recommended interval.
- After riding through rain or on muddy roads, the element should be cleaned immediately.
- If there is a break in the element material or any other damage to the element, replace the element with a new one.

#### **⚠ WARNING**

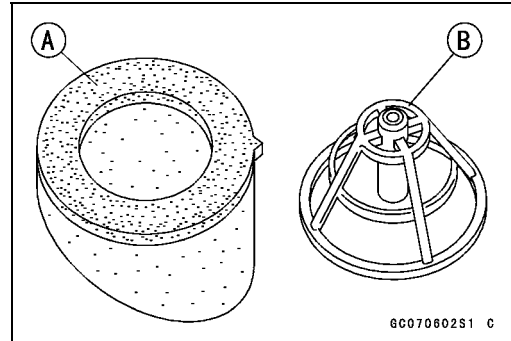
Clean the element in a well-ventilated area, and take care that there are no sparks or flame anywhere near the working area; this includes any appliance with a pilot light.

Because of the danger of highly flammable liquids, do not use gasoline or a low flash-point solvent to clean the element.

## 2-16 FUEL SYSTEM

### Air Cleaner

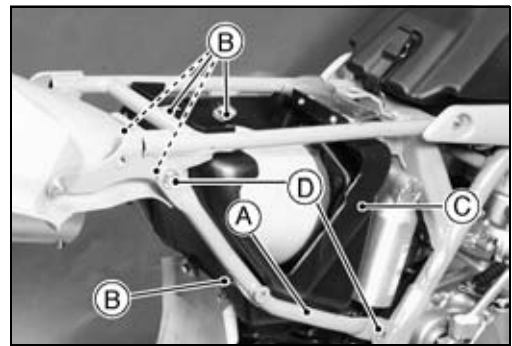
- Remove the air cleaner element, and separate the element [A] from the frame [B].



- Clean the element in a bath of a high flash-point solvent, and squeeze the element dry.
- Check all the parts of the element for visible damage.
- ★ If any part of the element is damaged, replace it.
- After cleaning, saturate the element with a high-quality foam-air-filter oil, squeeze out the excess, then wrap it in a clean rag and squeeze it as dry as possible. Be careful not to tear the sponge filter.
- Assemble the element.

#### Air Cleaner Housing Removal

- Remove:
  - Seat
  - Side Cover
  - Air Cleaner Duct Clamp (loosen)
  - Rear Frame Pipe [A]
  - Air Cleaner Housing Bolts [B]
- Remove the air cleaner housing [C] to the right side.

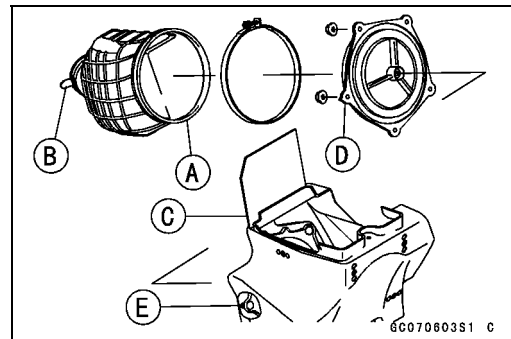


#### Air Cleaner Housing Installation

- Installation is the reverse of the removal.
- Torque:
  - Torque - Rear Frame Pipe Bolts [D]: 34 N·m (3.5 kgf·m, 25 ft·lb)**
  - Air Cleaner Housing Mounting Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)**

#### Air Cleaner Housing Assembly

- Install the air cleaner duct [A] so that the lobe [B] of it faces to the left side and aligns with the left bolt of the housing.
  - Air Cleaner Duct [A]
  - Lobe of the duct [B]
  - Air Cleaner Housing [C]
  - Projection (show the hole which is assembled to the left bolt) [D]
  - Left Bolt [E]



## Fuel Tank

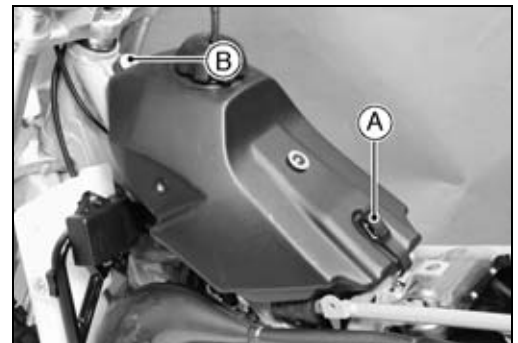
### Fuel Tank Removal

- Remove:
  - Seat (see Frame chapter)
  - Air Scoop [A]
- Turn the fuel tap to the OFF position.
- Pull the fuel hose off the fuel tap.

### **⚠ WARNING**

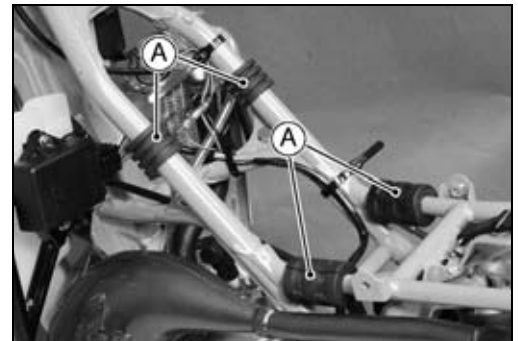
**Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.**

- Remove the fuel tank band [A] and the fuel tank mounting bolt [B].
- Remove the fuel tank.
- Drain the fuel tank.



### Fuel Tank Installation

- Check the rubber dampers [A].
- ★ If the dampers are damaged or deteriorated, replace them.
- Be sure the fuel hose is clamped to the fuel tap to prevent leaks.



- Insert the fuel tank breather hose outlet end into the number plate hole (see Cable, Wire and Hose Routing Section in the General Information chapter).

### Fuel Tap Removal

- Remove the fuel tank and drain it.
- Remove the mounting bolts and take out the fuel tap.

### Fuel Tap Installation

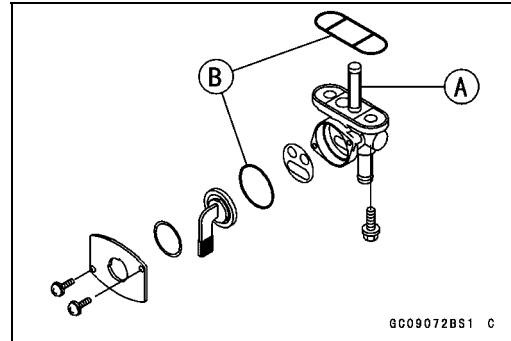
- Be sure the O-ring is in good condition to prevent leaks.
- Be sure to clamp the fuel hose to the tap to prevent leaks.

## 2-18 FUEL SYSTEM

### Fuel Tank

#### *Fuel Tap Inspection*

- Remove the fuel tap.
- Check the fuel tap filter screen for any breaks or deterioration.
- ★ If the fuel tap screen has any breaks or is deteriorated, it may allow dirt to reach the carburetor, causing poor running. Replace the fuel tap.
- ★ If the fuel tap leaks, or allows fuel to flow when it is at OFF position, replace the damaged O-ring.
  - Filter Screen [A]
  - O-ring [B]



#### *Fuel Tank Cap Inspection*

- Remove the fuel tank cap.
- Inspect the gasket on the tank cap for visible damage.
- ★ Replace the gasket if it is damaged.
- Remove the breather hose and check to see that the hose is not clogged.
- ★ If it is clogged, blow out the breather hose with compressed air.
- Apply engine oil to the O-ring when installing it on the fuel tap.

#### *Fuel Tank and Tap Cleaning*

#### **⚠ WARNING**

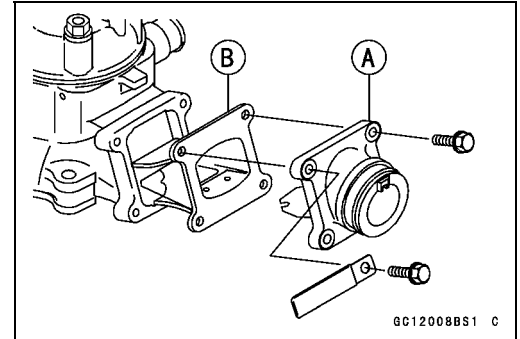
**Clean the tank in a well-ventilated area, and take care that there is no sparks or flame anywhere near the working area. Because of the danger of highly flammable liquids, do not use gasoline or low flash-point solvent to clean the tank.**

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

## Reed Valve

### Removal

- Remove the carburetor (see Carburetor Removal).
- Remove the carburetor holder [A] mounting Bolts, and move the rearward.
- Take the reed valve assembly [B] out of the cylinder.

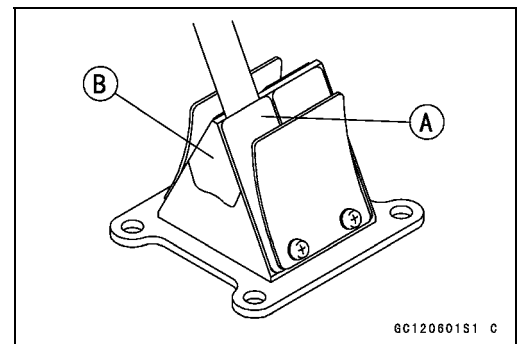


### Installation Note

**Torque - Carburetor Holder Mounting Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)**

### Inspection

- Inspect the reeds for cracks, folds, or other visible damage.
- ★ If there is any doubt as to the condition of a reed, replace the reed valve part with a new one.
- ★ If a reed becomes wavy, replace the valve part with a new one even if its warp is less than the service limit.
- Measure the clearance between the reed [A] and holder [B], and check the reed warp as shown.
- ★ If any one of the clearance measurements exceeds the service limit, replace the valve part with a new one.



### Reed Warp

**Service Limit: 0.2 mm**

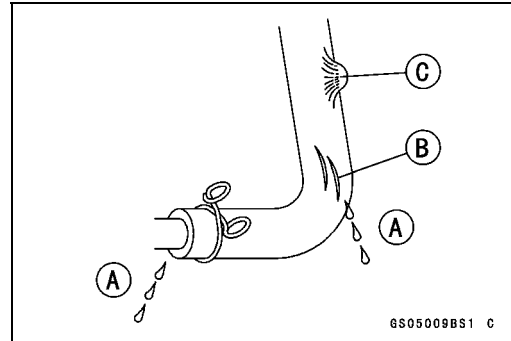
**Torque - Reed Mountings screws: 1.0 N·m (0.1 kgf·m, 9 in·lb)**

## 2-20 FUEL SYSTEM

### Fuel Hose

#### *Fuel Hoses and Connections Inspection*

- Check the fuel hose periodically in accordance with the Periodic Maintenance Chart, and if the motorcycle is not properly handled, the inside the fuel line can cause fuel to leak [A] or the hose to burst. Remove the fuel tank and check the fuel hose.
- ★ Replace the fuel hose if any fraying, cracks [B] or bulges [C] are noticed.
- Check that the hoses are securely connected and clamps are tightened correctly.
- When installing, route the hoses according to Cable, Wire and Hose Routing section in the General Information chapter.
- When installing the fuel hoses, avoid sharp bending, kinking, flattening or twisting, and route the fuel hoses with a minimum of bending so that the fuel flow will not be obstructed.
- ★ Replace the hose if it has been sharply bent or kinked.





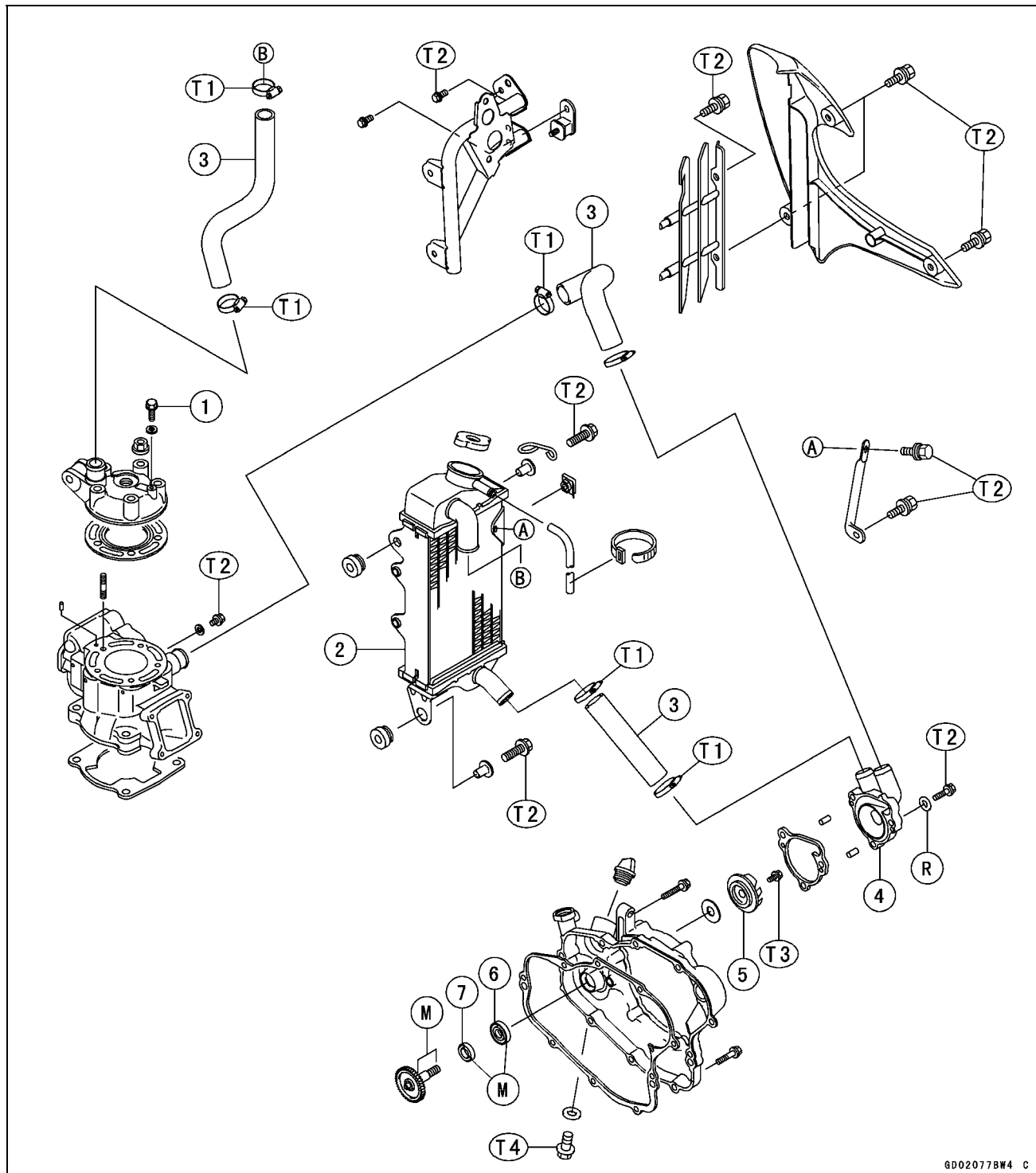
# Cooling System

## Table of Contents

Exploded View .....	3-2
Cooling System .....	3-3
Specifications .....	3-4
Coolant .....	3-5
Coolant Level Inspection.....	3-5
Coolant Deterioration Inspection.....	3-5
Coolant Draining .....	3-6
Coolant Filling .....	3-6
Cooling System Pressure Testing .....	3-8
Cooling System Flushing .....	3-8
Water Pump.....	3-9
Water Pump Cover Removal .....	3-9
Water Pump Cover Installation .....	3-9
Impeller Removal .....	3-9
Impeller Installation .....	3-9
Impeller Inspection.....	3-9
Water Pump Shaft Removal .....	3-10
Water Pump Seal Removal.....	3-10
Water Pump Seal Installation.....	3-10
Radiator .....	3-11
Radiator Removal .....	3-11
Radiator Installation .....	3-11
Radiator Inspection .....	3-11
Cleaning.....	3-11
Radiator Cap Inspection .....	3-12
Filler Neck Inspection.....	3-12
Water Hoses, Connections Inspection .....	3-12
Water Hoses, Breather Hose Installation .....	3-12

## 3-2 COOLING SYSTEM

### Exploded View



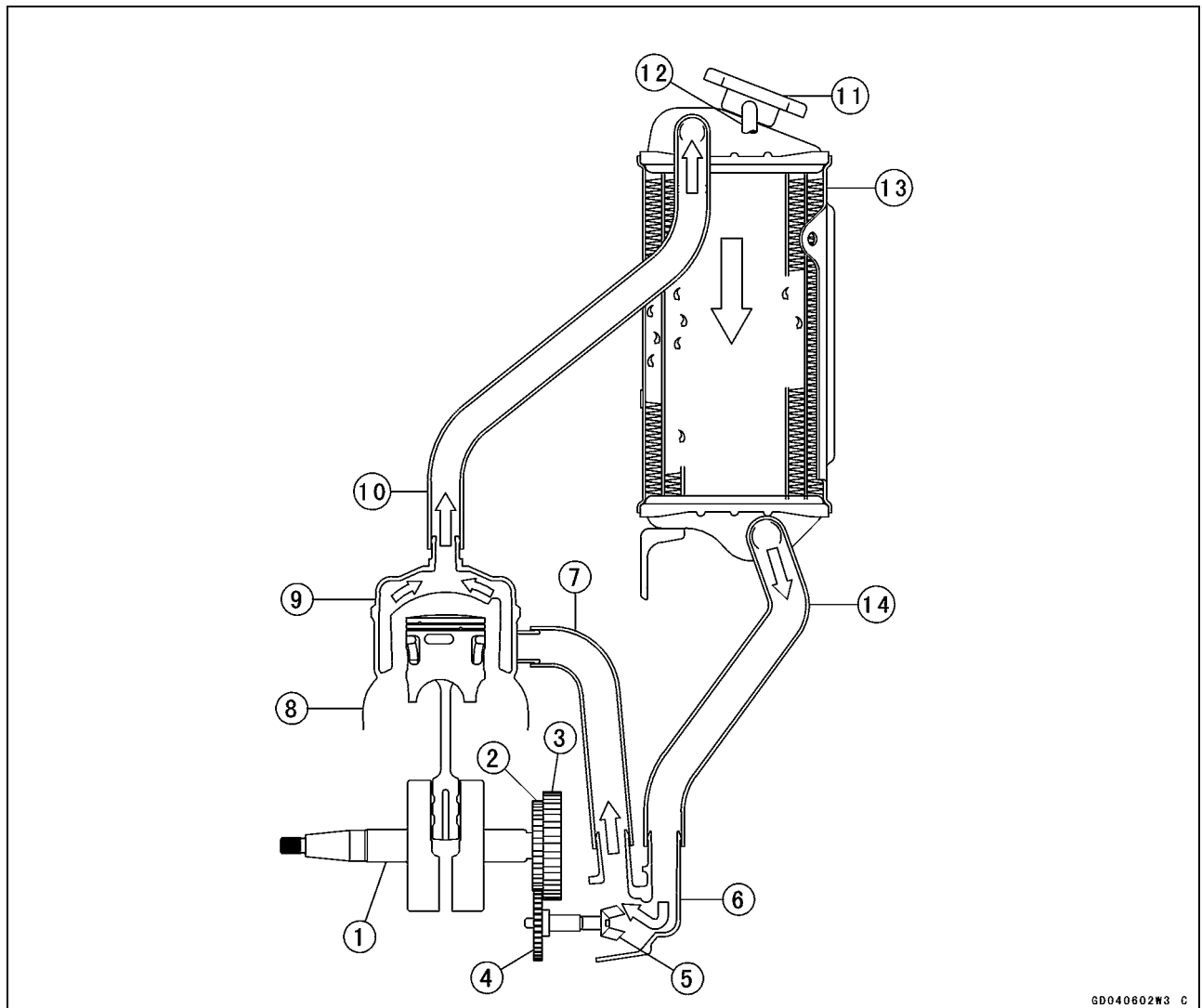
6D02077BW4 C

1. Air Bleeder Bolt
2. Radiator
3. Water Hoses
4. Water Pump Cover
5. Impeller
6. Water Pump Bearing
7. Water Pump Seal

- T1: 1.5 N·m (0.15 kgf·m, 13 in·lb)  
 T2: 8.8 N·m (0.90 kgf·m, 78 in·lb)  
 T3: 7.0 N·m (0.70 kgf·m, 61 in·lb)  
 T4: 5.4 N·m (0.55 kgf·m, 48 in·lb)  
 M: Apply molybdenum disulfide grease.  
 R: Replacement Parts

## Cooling System

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



GD040602W3 C

1. Crankshaft
2. Water Pump Drive Gear
3. Primary Gear
4. Water Pump Shaft Gear
5. Impeller
6. Water Pump Cover
7. Joint Water Hose
8. Cylinder
9. Cylinder Head
10. Upper Water Hose
11. Radiator Cap
12. Breather Hose
13. Radiator
14. Lower Water Hose

### 3-4 COOLING SYSTEM

#### Specifications

Item	Standard
<b>Coolant</b>	
Type	Permanent type antifreeze (soft water and ethylene glycol plus corrosion and rust inhibitor chemicals for aluminum engines and radiators)
Color	Green
Mixed Ratio	Soft water 50%, coolant 50%
Freezing Point	- 35°C (- 31°F)
Total Capacity	0.67 L (0.71 US qt)
<b>Radiator</b>	
Cap Relief Pressure	93 ~ 123 kPa (0.95 ~ 1.25 kgf/cm <sup>2</sup> , 14 ~ 18 psi)

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

## Coolant

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

### **⚠ WARNING**

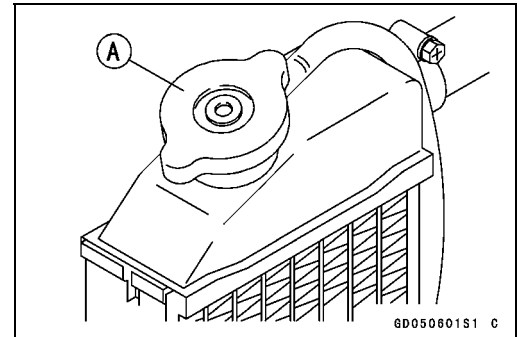
**To avoid burns, do not remove the radiator cap or try to inspect the coolant level or change the coolant when the engine is still hot. Wait until it cools down.**

### Coolant Level Inspection

- Situate the motorcycle so that it is perpendicular to the ground.

### **NOTE**

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



- The coolant level [B] should be at the bottom of the filler neck.

### **NOTE**

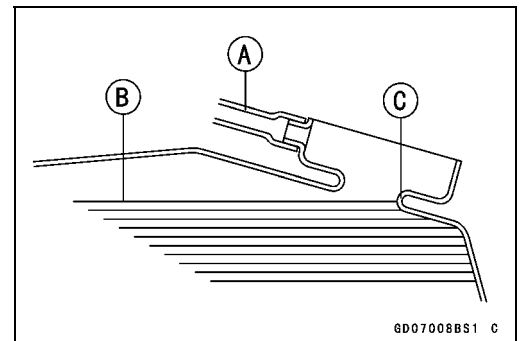
○ Check the level when the engine is cold (room or ambient temperature).

- ★ If the coolant level is low, add the correct amount of coolant through the filler opening (see Coolant Filling).

Breather Hose [A]

Coolant Level [B]

Filler Neck [C]



### **Recommended coolant:**

**Permanent type of antifreeze (soft water and ethylene glycol plus corrosion and rust inhibitor chemicals for aluminum engines and radiators)**

### **Coolant mixture ratio:**

**1 : 1 (Soft water 50%, Coolant 50%)**

### **Total amount:**

**0.67 L (0.71 US qt)**

### Coolant Deterioration Inspection

- Visually inspect the coolant.
- ★ If whitish cotton-like wafts are observed, aluminum parts in the cooling system are corroded. If the coolant is brown, iron or steel parts are rusting. In either case, flush the cooling system.
- ★ If the coolant gives off an abnormal smell, check for a cooling system leak. It may be caused by exhaust gas leaking into the cooling system.

## 3-6 COOLING SYSTEM

### Coolant

#### Coolant Draining

#### ⚠ WARNING

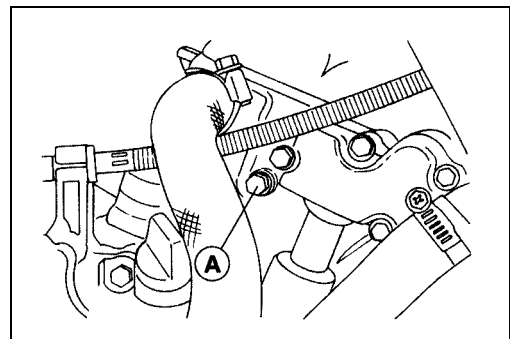
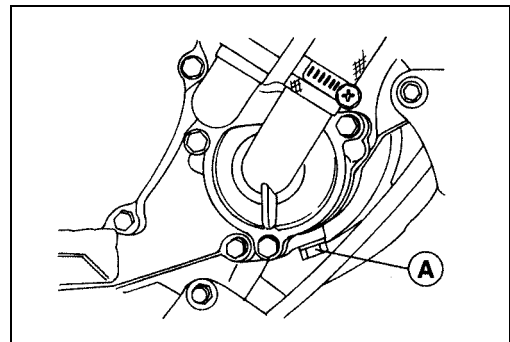
To avoid burns, do not remove the radiator cap or try to change the coolant when the engine is still hot. Wait until it cools down.

Coolant on tires will make them slippery and can cause an accident and injury. Immediately wipe up or wash away any coolant that spills on the frame, engine or other painted parts. Since coolant is harmful to the human body, do not use for drinking.

#### NOTE

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

- Place a container under the coolant drain plug (Water Pump) [A].
- Drain the coolant from the radiator and engine by removing the drain plug at the bottom of the water pump.
- Remove the radiator cap in two steps. First turn the cap counterclockwise to the first stop and wait there for a few seconds. Then push down and turn it further in the same direction and remove the cap.
- The coolant will drain from the radiator and engine.
- Place a container under the drain plug on the right side of the cylinder and drain the coolant by removing the drain plug (Cylinder) [A].
- Inspect the oil coolant for visual evidence of corrosion and abnormal smell (see Coolant Deterioration Inspection).



#### Coolant Filling

#### CAUTION

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

## Coolant

### Recommended Coolant

Type:	Permanent type antifreeze (soft water and ethylene glycol plus corrosion and rust inhibitor chemicals for aluminum engines and radiators)
Color:	Green
Mixed ratio:	Soft water 50%, Coolant 50%
Freezing point:	- 35°C (- 31°F)
Total amount:	0.67 L (0.71 US qt)

### NOTE

○Choose a suitable mixture ratio by referring to the coolant manufactures directions.

- Install the drain plug.
- Replace the gasket with a new one.

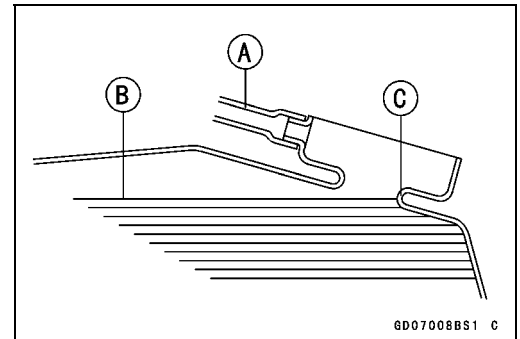
**Torque - Coolant Drain Plug (Water Pump): 5.4 N·m (0.55 kgf·m, 48 in·lb)**

**Coolant Drain Plug (Cylinder): 8.8 N·m (0.90 kgf·m, 78 in·lb)**

- Fill the radiator up to the filler neck with coolant.
  - Breather Hose [A]
  - Coolant Level [B]
  - Filler Neck [C]

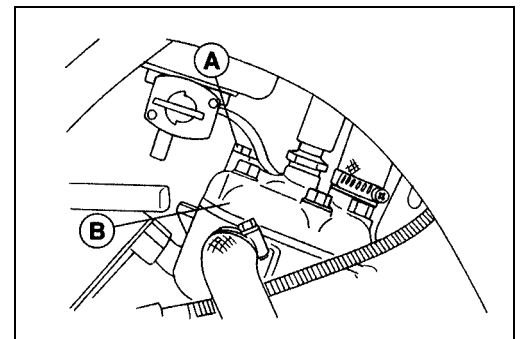
### NOTE

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

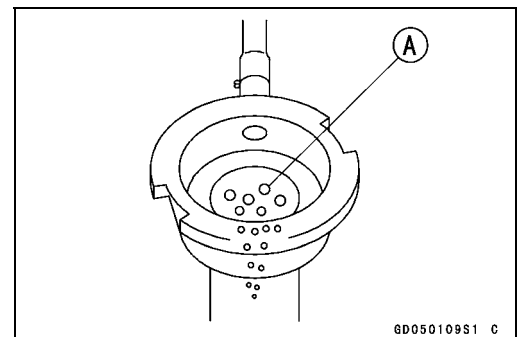


6D07008BS1 C

- Bleed the air from the cooling system as follows.
  - Loosen the air bleeder bolt [A] on the cylinder head [B] until the coolant begins to flow out the air bleeder bolt hole (that is, until all the remaining air has been forced out).
  - Tighten the air bleeder bolt.



- Start the engine with the radiator cap removed and run it until no more air bubbles [A] can be seen in the coolant.
- Tap the cooling hoses to force any air bubbles caught inside.
- Stop the engine and add coolant up to the filler neck.
- Check the cooling system for leaks.
- Install the radiator cap.
- The radiator cap must be installed in two steps. First turn the cap clockwise to the first stop. Then push down on it and turn it the rest of the way.



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## 3-8 COOLING SYSTEM

### Coolant

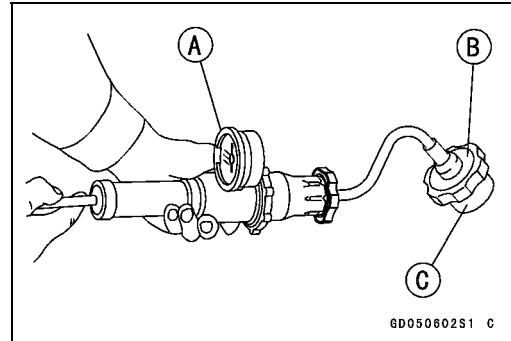
#### Cooling System Pressure Testing

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

#### CAUTION

**During pressure testing, do not exceed the pressure for which the system is designed to work. The maximum pressure is 125 kPa (1.25 kgf/cm<sup>2</sup>, 18 psi).**

- Remove the radiator cap, and install a cooling system pressure tester [A] and adapter [B] on the radiator filler neck [C].



#### NOTE

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

- Build up pressure in the system carefully until the pressure reaches 125 kPa (1.25 kgf/cm<sup>2</sup>, 18 psi).
- Watch the gauge for at least 6 seconds. If the pressure holds steady, the cooling system is all right.
- Remove the pressure tester, replenish the coolant, and install the radiator cap.
- ★ If the pressure drops and no external source is found, check for internal leaks. Check the cylinder head gasket for leaks.

#### Cooling System Flushing

Over a period of time, the cooling system accumulates rust, scale, and lime in the water jacket and radiator. When this accumulation is suspected or observed, flush the cooling system. If this accumulation is not removed, it will clog up the water passages and considerably reduce the efficiency of the cooling system.

- Drain the cooling system (see Coolant Draining).
- Fill the cooling system with fresh water mixed with a flushing compound.

#### CAUTION

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

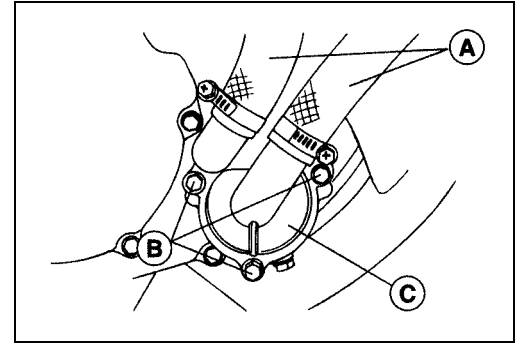
- Warm up the engine, and run it at normal operating temperature for about ten minutes.
- Stop the engine, and drain the cooling system after the coolant cools down.
- Fill the system with fresh water.
- Warm up the engine and drain the system after the coolant cools down.
- Repeat the previous two steps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



## Water Pump

### Water Pump Cover Removal

- Drain the coolant (see Coolant Draining).
- Loosen the cooling hose clamps, and disconnect the cooling hoses [A] on the water pump cover.
- Remove the water pump cover bolts [B], and remove the water pump cover [C].

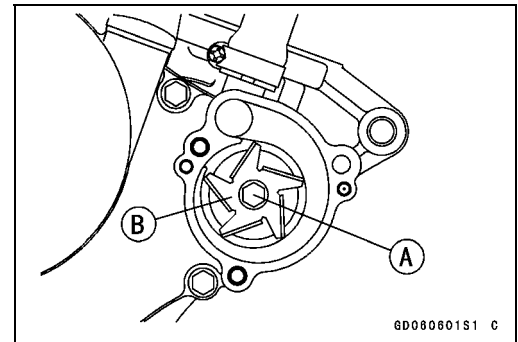


### Water Pump Cover Installation

- Fill the cooling system (see Coolant Filling).

### Impeller Removal

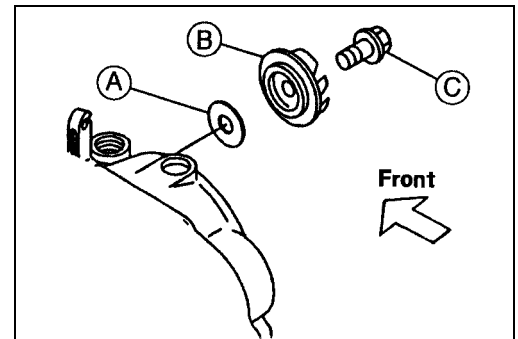
- Drain the coolant (see Coolant Draining).
- Remove the cover bolts and take out the water pump cover from the right engine cover with the cooling hoses attached.
- Remove the impeller bolt [A], and pull out the impeller [B].



### Impeller Installation

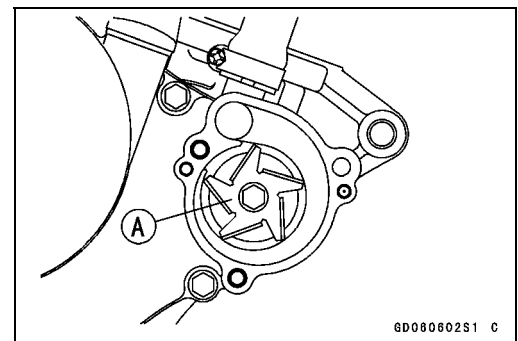
- Install the following.
  - Washer [A]
  - Impeller [B]
  - Impeller Bolt [C]
- Torque the impeller bolt.
 

**Torque - Water Pump Impeller Bolt: 7.0 N·m (0.70 kgf·m, 61 in·lb)**



### Impeller Inspection

- Check the impeller [A] visually.
- ★ If the corrosion or damage on the impeller, replace it.

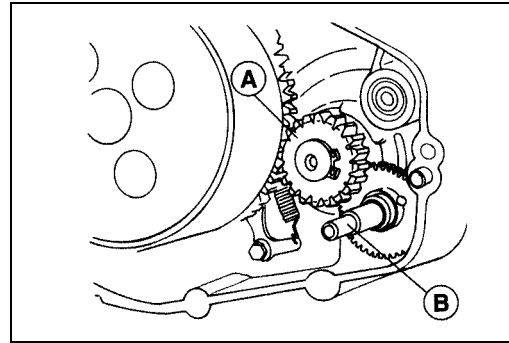


## 3-10 COOLING SYSTEM

### Water Pump

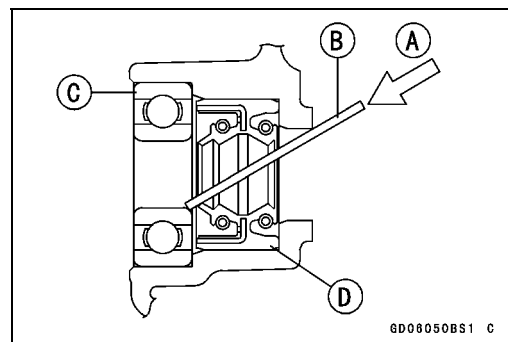
#### Water Pump Shaft Removal

- Remove:
  - Right Engine Cover (see Engine Right Side chapter)
  - Primary Gear [A] (see Engine Right Side chapter)
- Pull out the water pump shaft [B].



#### Water Pump Seal Removal

- Remove:
  - Impeller (see Impeller Removal)
  - Right Engine Cover (see Engine Right Side chapter)
- To remove the water pump seal, remove the ball bearing firstly.
  - Insert a metal rod [B] into the right engine cover from the impeller side, and remove the ball bearing tapping [A] around the inner race of the bearing [C].
  - Remove the water pump seal [D] tapping around the bottom of the seal as same as bearing installation.



#### Water Pump Seal Installation

##### CAUTION

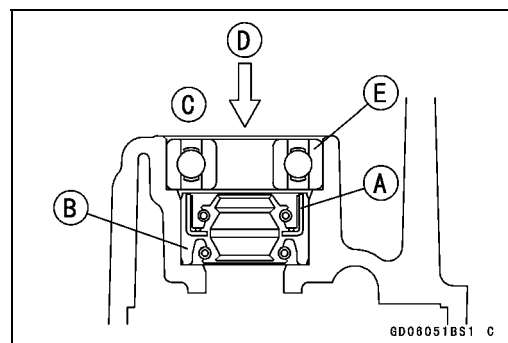
**If the water pump seal is removed, replace the water pump bearing also.**

- Apply plenty of high temperature grease to the water pump seal.
- Go first the soft side [B] of the water pump seal [A] and insert the seal into the right engine cover from the opposite side [C] of the impeller.
- Press [D] the water pump seal until it bottoms to the right engine cover using the bearing driver set.

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

- Install the water pump bearing [E] until it bottoms to the cover using the bearing driver set. The marked side of the bearing faces outward.

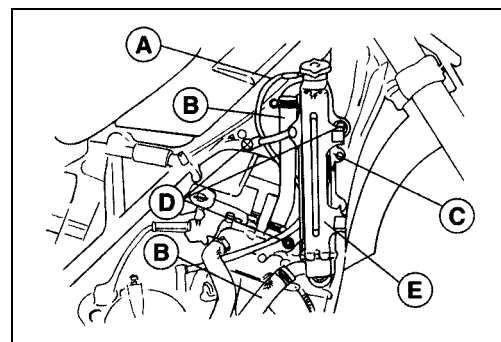
**Special Tool - Bearing Driver Set: 57001-1129**



## Radiator

### Radiator Removal

- Drain the coolant by removing the coolant drain plug (Water Pump)
- Remove:
  - Air Scoop
  - Fuel Tank (Move back)
  - Hose Clamps (Loosen)
  - Breather Hose Upper End [A]
  - Water Hose Ends [B]
  - Radiator Screen [C]
  - Radiator Mounting Bolts/Screw [D]
  - Radiator [E]



### Radiator Installation

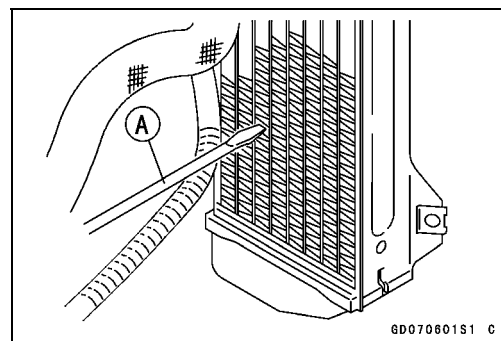
- Install the water hoses (see Water Hoses, Breather Hose Installation).
- Fill the coolant (see Coolant Filling).

**Torque - Radiator Mounting Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)**

**Coolant Drain Plug (Water Pump): 8.8 N·m (0.90 kgf·m, 78 in·lb)**

### Radiator Inspection

- Check the radiator core.
- ★ If there are obstructions to air flow, remove them.
- ★ If the corrugated fins are deformed, carefully straighten them with the thin blade of a screwdriver [A].



### CAUTION

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

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

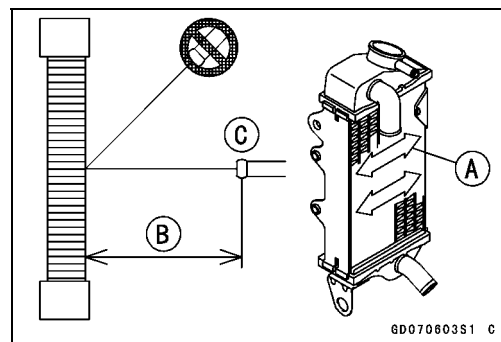
### Cleaning

- Remove the radiator (see Radiator Removal).

### CAUTION

**When cleaning the radiator with steam cleaner, be careful of the following to avoid damage to the fins. Keep the steam gun [C] over 0.5 m (20 in.) [B] away from the radiator.**

**Blow steam perpendicularly to the radiator face. Never blow steam at angle against the fins but straight through fins in the direction of natural air flow.**



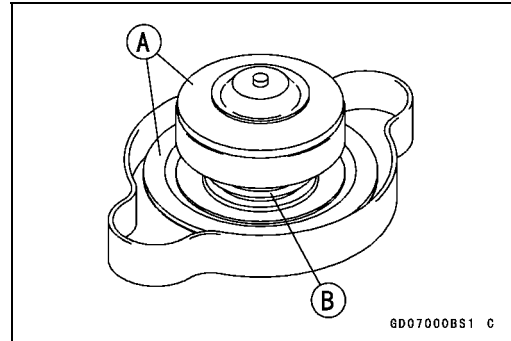
[A] Cleaner Running Direction

## 3-12 COOLING SYSTEM

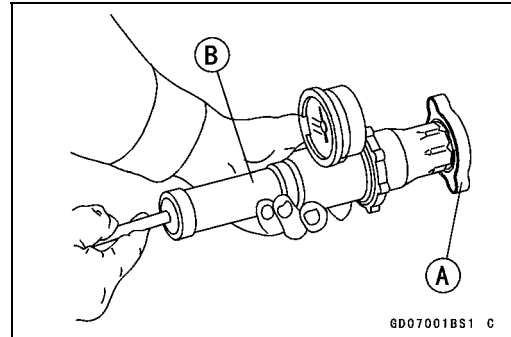
### Radiator

#### *Radiator Cap Inspection*

- Check the condition of the valve spring [B], and the top and bottom valve seals [A] of the radiator cap.
- ★ If any one of them shows visible damage, replace the cap.



- Wet the top and bottom valve seals with water or coolant to prevent pressure leaks.
- Install the cap [A] on a cooling system pressure tester [B].
- Watching the pressure gauge, pump the pressure tester slowly to build up the pressure. The gauge pointer must remain within the relief pressure range in the table below at least 6 seconds. Also, when the pressure tester is pumped further, the pointer must flick down (the cap opens) at a relief pressure in the table.



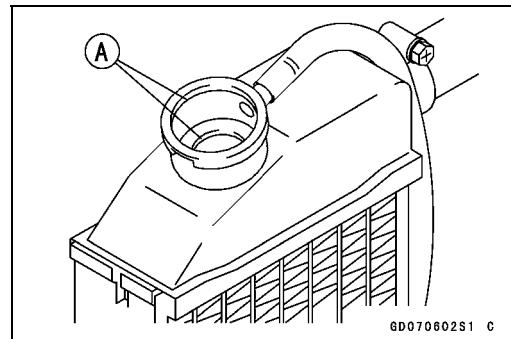
#### **Radiator Cap Relief Pressure**

**Standard: 93 ~ 123 kPa (0.95 ~ 1.25 kgf/cm<sup>2</sup>, 14 ~ 18 psi)**

- ★ If the cap cannot hold the pressure, or if the relief pressure is too high or too low, replace the cap with a new one.

#### *Filler Neck Inspection*

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



#### *Water Hoses, Connections Inspection*

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

#### *Water Hoses, Breather Hose Installation*

- Install the water hoses or breather hose being careful to follow the performed bends (see Exploded View and Cable, Wire and Hose Routing in the General Information chapter). Avoid sharp bending, kinking, flattening, or twisting.
- Note the water hose clamp screw position and tighten the water hose clamps securely.

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

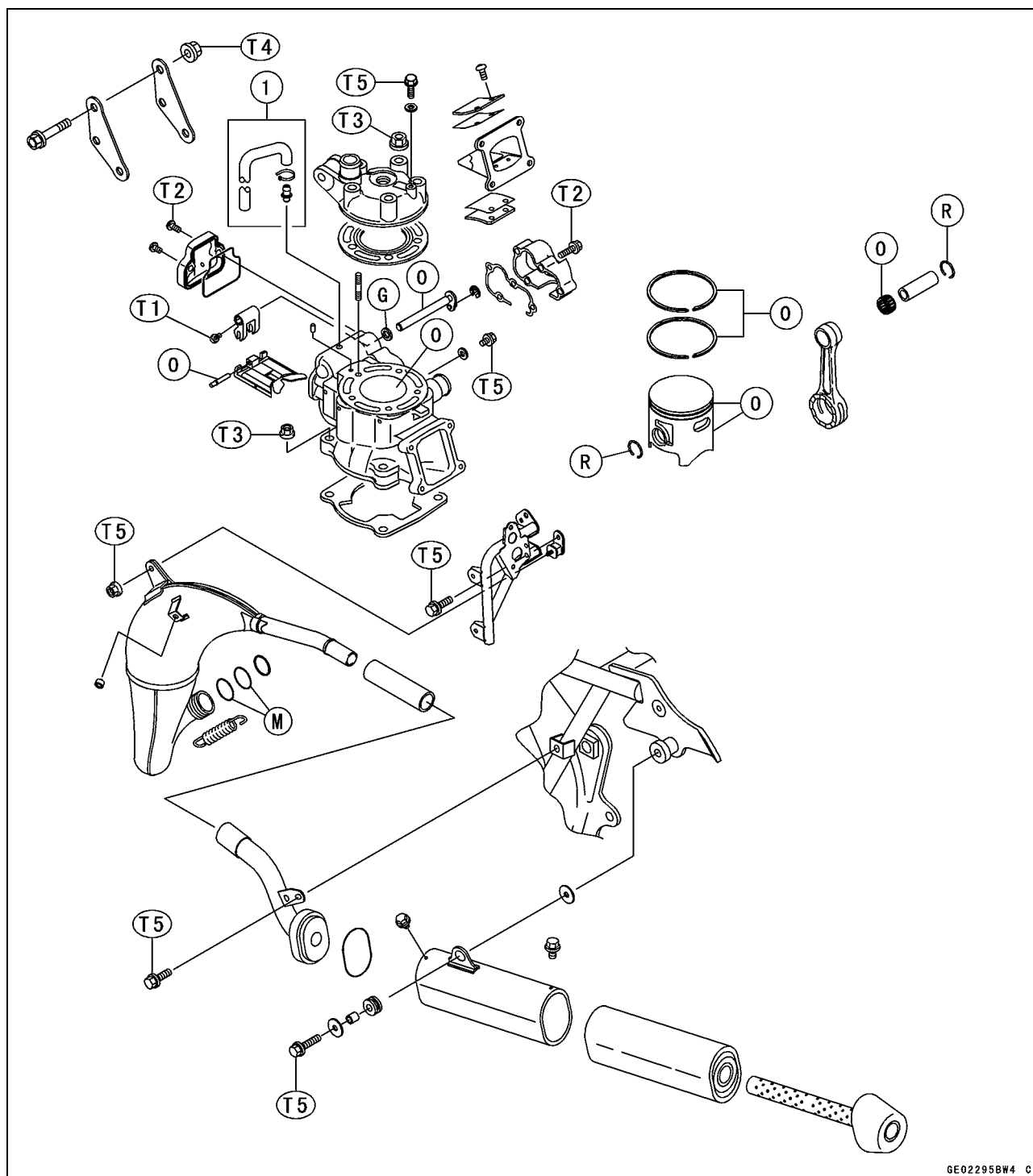
# Engine Top End

## Table of Contents

Exploded View .....	4-2
Specifications .....	4-3
Cylinder Head .....	4-4
Compression Pressure Measurement .....	4-4
Removal .....	4-4
Installation .....	4-5
Warp Inspection .....	4-5
Cylinder .....	4-6
Cylinder Removal .....	4-6
Cylinder Installation .....	4-6
Piston Removal .....	4-7
Piston Installation .....	4-7
Cylinder Wear Inspection .....	4-8
Piston Diameter Measurement .....	4-9
Piston/Cylinder Clearance Inspection .....	4-9
Piston Ring, Piston Ring Groove Inspection .....	4-10
Piston Ring End Gap Inspection .....	4-11
Piston, Piston Pin, and Connecting Rod Wear Inspection .....	4-11
Exhaust Valve (KIPS) .....	4-13
Removal .....	4-13
Installation .....	4-13
Muffler .....	4-15
Removal .....	4-15
Installation .....	4-15
Muffler Baffle Change .....	4-15

## 4-2 ENGINE TOP END

### Exploded View



GE022958W4 C

1: KIPS Chamber Vent Tube (KX85A6F ~, B6F ~ / KX100D6F ~ )

T1: 3.9 N·m (0.40 kgf·m, 35 in·lb)

T2: 5.2 N·m (0.53 kgf·m, 46 in·lb)

T3: 25 N·m (2.5 kgf·m, 18 ft·lb)

T4: 29 N·m (3.0 kgf·m, 22 ft·lb)

T5: 8.8 N·m (0.90 kgf·m, 78 in·lb)

O: Apply 2 stroke-racing oil.

R: Replacement parts

## Specifications

Item	Standard	Service Limit
<b>Cylinder Head</b>		
Cylinder Compression	(Usable range) 825 ~ 1 280 kPa (8.4 ~ 13.0 kgf/cm <sup>2</sup> , 119 ~ 185 psi)	— — —
Cylinder Head Warp	— — —	0.03 mm (0.0012 in.)
<b>Cylinder, Piston</b>		
Cylinder Inside Diameter		
KX85A/B	48.505 ~ 48.520 mm* (1.9096 ~ 1.9102 in.)	48.60 mm** (1.91 in.)
KX100D	52.505 ~ 52.520 mm* (2.0671 ~ 2.0677 in.)	52.60 mm** (2.07 in.)
Piston Diameter		
KX85A/B	48.439 ~ 48.454 mm (1.9070 ~ 1.9076 in.) 48.444 ~ 48.459 mm (1.9072 ~ 1.9078 in.) (KX85-A4 ~/B4 ~)	48.29 mm (1.90 in.) 48.29 mm (1.90 in.)
KX100D	52.435 ~ 52.450 mm (2.0644 ~ 2.0650 in.)	52.29 mm (2.06 in.)
Piston/cylinder Clearance		
KX85A/B	0.061 ~ 0.071 mm (0.0024 ~ 0.0028 in.) 0.056 ~ 0.066 mm (0.0022 ~ 0.0026 in.) (KX85-A4 ~/B4 ~)	— — — — — —
KX100D	0.065 ~ 0.075 mm (0.0026 ~ 0.0030 in.)	— — —
Piston Ring/groove Clearance:		
Top		
KX85A/B	0.020 ~ 0.060 mm (0.0008 ~ 0.0024 in.)	0.16 mm (0.0063 in.)
KX100D	0.040 ~ 0.080 mm (0.0016 ~ 0.0031 in.)	0.18 mm (0.0071 in.)
Second	0.020 ~ 0.060 mm (0.0008 ~ 0.0024 in.)	0.16 mm (0.0063 in.)
Piston Ring Groove Width		
Top		
KX85A/B	1.01 ~ 1.03 mm (0.0398 ~ 0.0406 in.)	1.11 mm (0.0437 in.)
KX100D	1.03 ~ 1.05 mm (0.0406 ~ 0.0413 in.)	1.13 mm (0.0445 in.)
Second	1.01 ~ 1.03 mm (0.0398 ~ 0.0406 in.)	1.11 mm (0.0437 in.)
Piston Ring Thickness		
Top, second	0.97 ~ 0.99 mm (0.0382 ~ 0.0390 in.)	0.90 mm (0.0354 in.)
Piston Ring End Gap		
Top, Second	0.30 ~ 0.50 mm (0.0118 ~ 0.0197 in.)	0.80 mm (0.0315 in.)

(\*): And less than 0.01 mm difference between any two measurements

(\*\*): Or more than 0.05 mm difference between any two measurements

**Special Tools - Compression Gauge: 57001-221**

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

**Compression Gauge Adapter, M14 × 1.25: 57001-1159**

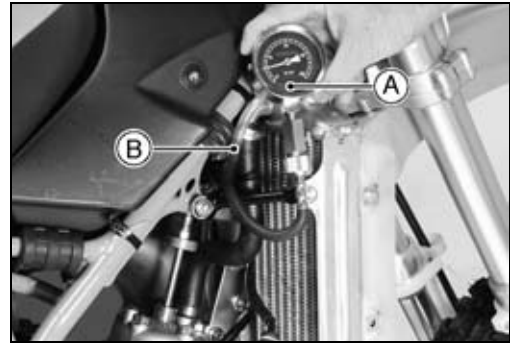
## 4-4 ENGINE TOP END

### Cylinder Head

#### Compression Pressure Measurement

- Start the engine.
- Thoroughly warm up the engine so that the engine oil between the piston and cylinder wall will help seal compression as it does during normal running.
- Stop the engine.
- Move the fuel tank backward with the hose left installed (see Fuel System chapter).
- Remove the spark plug, and screw a compression gauge firmly into the spark plug hole.

**Special Tools - Compression Gauge: 57001-221 [A]  
Compression Gauge Adapter, M14 × 1.25:  
57001-1159 [B]**



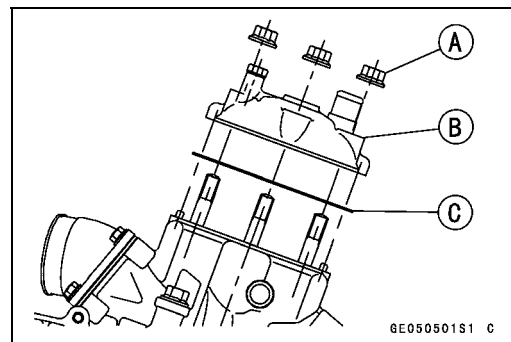
- With the throttle fully open, turn the engine over sharply with the kickstarter several times until the compression gauge stops riding; the compression is the highest reading obtainable.

**Compression Pressure (Usable Range)**  
**825 ~ 1 280 kPa (8.4 ~ 13.0 kgf/cm<sup>2</sup>, 119 ~ 185 psi)**

- ★ If compression pressure is higher than the usable range, check the following:
  - Carbon build up on the piston head and cylinder head - clean off any carbon on the piston head and cylinder head.
  - Cylinder head gasket, cylinder base gasket - use only the proper gaskets for the cylinder head and base.
  - The use of gasket of the incorrect thickness will change the pressure.
- If compression pressure is lower than the usable range, check the following:
  - Piston/cylinder clearance, piston seizure.
  - Gas leakage around the cylinder head - replace the damaged gasket and check the cylinder head for warp.
  - Piston ring, piston ring groove clearance.

#### Removal

- Remove the following.
  - Radiators (see Cooling System chapter)
  - Muffler (see Muffler Removal)
  - Spark Plug
  - Cooling Hose Lower End
  - Engine Bracket Bolts and Nuts
- Remove the cylinder head nuts [A], and take off the cylinder head [B] and gasket [C].





## Cylinder Head

### Installation

- Replace the head gasket with a new one.
- Scrape out any carbon and clean the head with a high flash-point solvent.
- Check the head water jacket for a crust of minerals and rust and remove them if necessary.
- Install a new cylinder head gasket with the side marked UP [A] facing up.
- Torque:

**Torque - Engine Bracket Nuts: 29 N·m (3.0 kgf·m, 22 ft·lb)**

**Cylinder Head Nuts: 25 N·m (2.5 kgf·m, 18 ft·lb)**

**Spark Plug: 26 N·m (2.7 kgf·m, 20 ft·lb)**

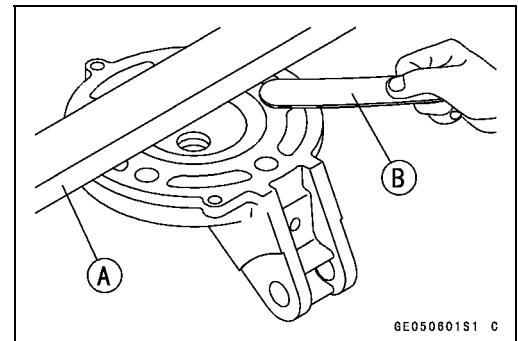
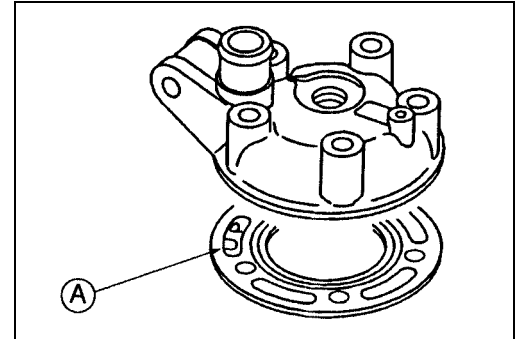
- Install the following.
  - Muffler (see Muffler Installation)
  - Radiator (see Cooling System chapter)

### Warp Inspection

- Lay a straightedge [A] across the lower surface of the head at several different points, and measure warp by inserting a thickness gauge [B] between the straightedge and the head.
- ★ If warp exceeds the service limit, repair the mating surface. Replace the cylinder head if the mating surface is badly damaged.

### Cylinder Head Warp

**Service Limit: 0.03 mm (0.0012 in.)**



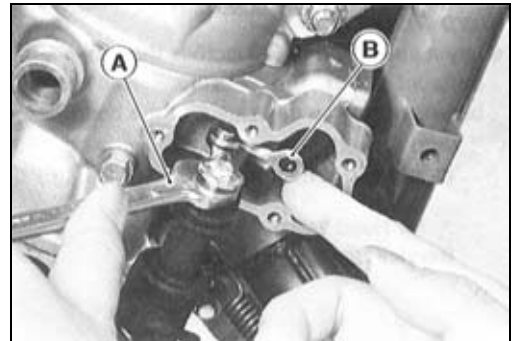
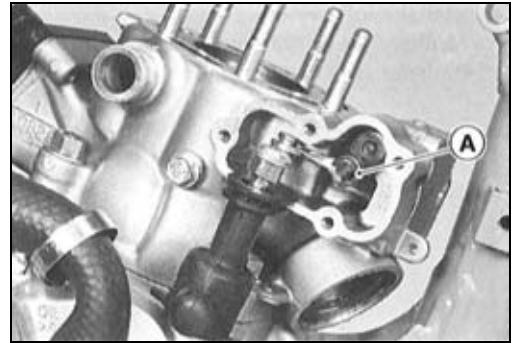
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## 4-6 ENGINE TOP END

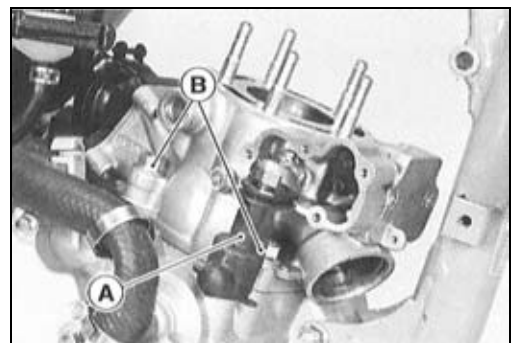
### Cylinder

#### Cylinder Removal

- Drain the coolant (see Cooling System chapter). Be sure to remove the cylinder drain plug.
- Remove the following.
  - Cylinder Head (see Cylinder Head Removal)
  - Carburetor (see Fuel System chapter)
  - Radiator Hose Upper End
  - KIPS Cover
  - Muffler Holding Springs
  - E-clip [A]
- Put a spanner wrench [A] on the shaft lever upper end.
- Turn the shaft lever clockwise with the wrench, and separate the link lever [B] from the link pin.



- Pull the boot [A] down.
- Remove the cylinder nuts [B].
- Lift off the cylinder, and remove the cylinder base gasket. If necessary, tap lightly around the base of the cylinder with a plastic mallet, taking care not to damage the cylinder.

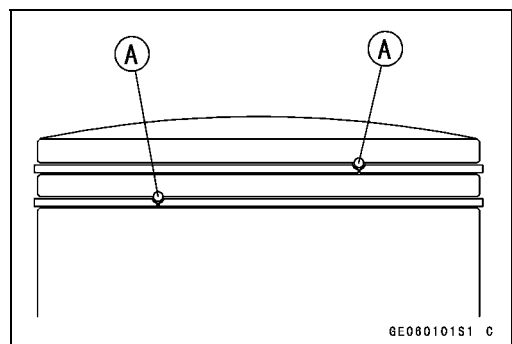


#### Cylinder Installation

- Scrape any carbon out of the exhaust port.
- Check on a crust of minerals and rust in the cylinder water jacket, and remove them if necessary.
- Replace the cylinder base gasket with a new one.
- Apply engine oil to the piston surface, piston rings and cylinder bore.
- Check to see that the pin [A] in each piston ring groove is between the ends of the piston ring, and fit the base of the cylinder over each ring, pressing in on opposite sides of the ring as necessary. Be certain that the rings do not slip out of position.
- Torque:

**Torque - Cylinder Nuts: 25 N·m (2.5 kgf·m, 18 ft·lb)**

- Install the following.
  - Carburetor (see Fuel System chapter)
  - Cylinder Head (see Cylinder Head Installation)



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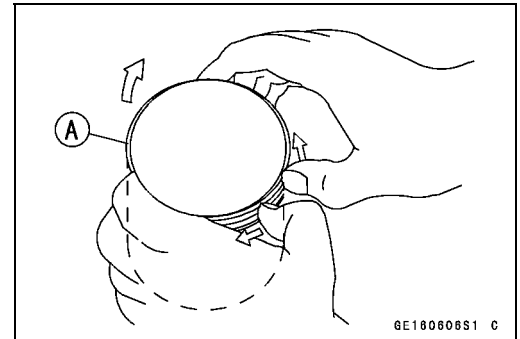
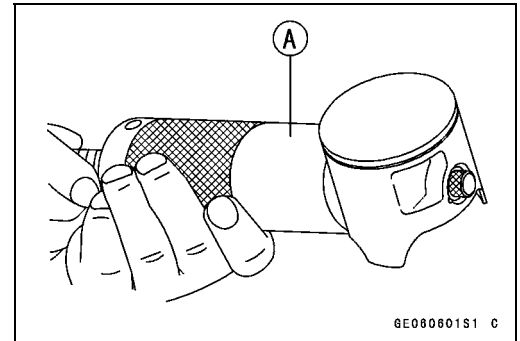
## Cylinder

### Piston Removal

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

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

- Carefully spread the ring [A] opening with your thumbs and then push up on the opposite side of the ring to remove it.

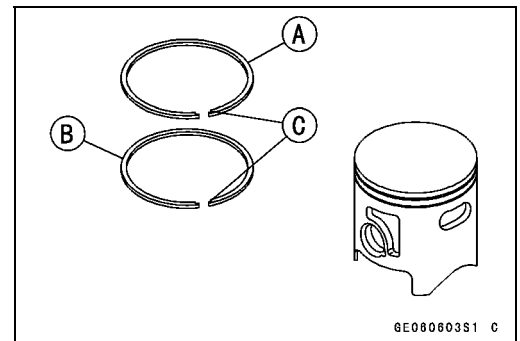


### Piston Installation

- Stuff a clean cloth into the crankcase opening around the connecting rod so that no parts will fall into the crankcase.
- Scrape off any carbon of the piston, then lightly polish the piston with fine emery cloth.
- Clean carbon and dirt out of the piston ring groove using a suitable tool.

#### CAUTION

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



- The top [A] and second [B] rings are identical in KX100 model, But they are different in KX85 model.

○The mark on the ring are as follows;

**KX85A/B- Top: 1N**

**Second: 2N**

**KX100D- Top and Second: N**

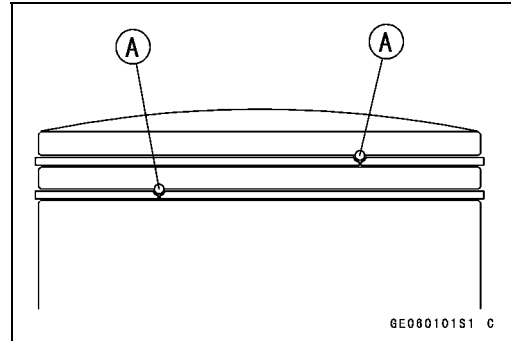
- First fit one end of the piston ring against the pin in the ring groove, spread the ring opening with the other hand and then slip the ring into the groove.

○Install each ring so that the marked [C] side faces upward.

## 4-8 ENGINE TOP END

### Cylinder

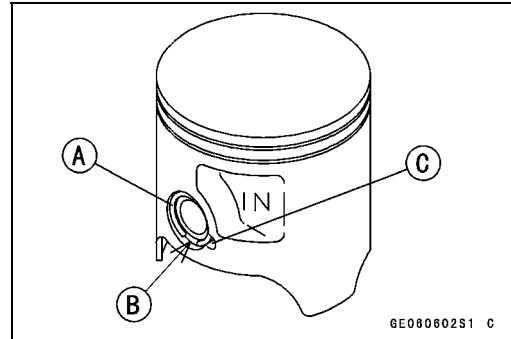
- Install the ring so that the pin [A] in the piston ring groove is between the ends of the piston ring.



- Apply 2-stroke engine oil to the connecting rod needle bearing and the piston pin.
- Install the piston so that the “IN” marked on the piston side wall comes to the back side of the engine.
- When installing a piston pin snap ring, compress it only enough to install it and no more.

#### CAUTION

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



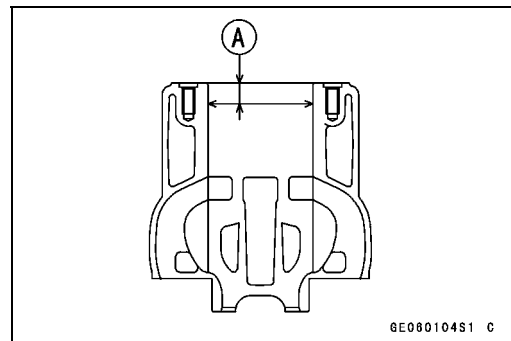
- Fit a new piston pin snap ring [A] into the side of the piston so that the ring opening [B] does not coincide with the notch [C] in the edge of the piston pin hole.

### Cylinder Wear Inspection

#### NOTE

○ Measure the cylinder inside diameter when the cylinder is cold (room or ambient temperature).

- Inspect the inside of the cylinder for scratches and abnormal wear.
- ★ If the cylinder is damaged or badly worn, replace it with a new one.
- Since there is a difference in cylinder wear in different directions, take a side-to-side and a front-to back measurement shown in the figure.
- ★ If any of the cylinder inside diameter measurements exceeds the service limit, the cylinder must be replaced with a new one since the ELECTOR FUSION cylinder cannot be bored or honed.  
15 mm [A]



## Cylinder

### Cylinder Inside Diameter

#### Standard:

**KX85A/B** 48.505 ~ 48.520 mm (1.9096 ~ 1.9102 in.), and less than 0.01 mm (0.0004 in.) difference between any two measurements.

**KX100D** 52.505 ~ 52.520 mm (2.0671 ~ 2.0677 in.), and less than 0.01 mm (0.0004 in.) difference between any two measurements.

#### Service Limit:

**KX85A/B** 48.60 mm (1.9134 in.) or more than 0.05 mm (0.0020 in.) difference between any two measurements.

**KX100D** 52.60 mm (2.0709 in.), or more than 0.05 mm (0.0020 in.) difference between any two measurements.

### Piston Diameter Measurement

- Measure the outside diameter of the piston 17 mm [A] up from the bottom of the piston at a right angle to the direction of the piston pin.
- ★ If the measurement is under the service limit, replace the piston.

#### Piston Diameter

##### Standard:

**KX85-A1 ~ A3/B1 ~ B3** 48.439 ~ 48.454 mm (1.9070 ~ 1.9076 in.)

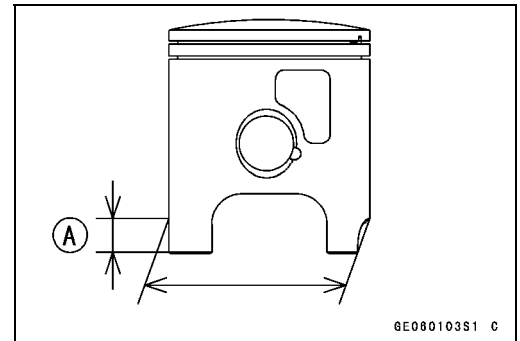
**KX85-A4 ~/B4 ~** 48.444 ~ 48.459 mm (1.9072 ~ 1.9078 in.)

**KX100D** 52.435 ~ 52.450 mm (2.0644 ~ 2.0650 in.)

##### Service Limit:

**KX85A/B** 48.29 mm (1.9012 in.)

**KX100D** 52.29 mm (2.0587 in.)



### Piston/Cylinder Clearance Inspection

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

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

## 4-10 ENGINE TOP END

### Cylinder

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

#### Piston/Cylinder Clearance

**KX85-A1 ~ A3/B1 ~ B3:**

**0.061 ~ 0.071 mm (0.0024 ~ 0.0028 in.)**

**KX85-A4 ~/B4 ~:**

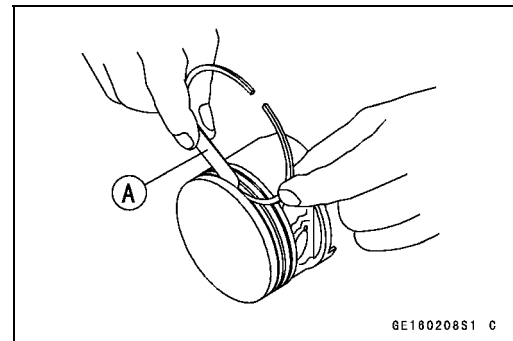
**0.056 ~ 0.066 mm (0.0022 ~ 0.0026 in.)**

**KX100D:**

**0.065 ~ 0.075 mm (0.0026 ~ 0.0030 in.)**

#### *Piston Ring, Piston Ring Groove Inspection*

- Visually inspect the piston rings and the piston ring grooves.
  - ★ If the rings are worn unevenly or damaged, they must be replaced.
  - ★ If the piston ring grooves are worn unevenly or damaged, the piston must be replaced and fitted with new rings.
  - Check for uneven groove wear by inspecting the ring seating.
  - ★ The rings should fit perfectly parallel to the groove surfaces. If not, the piston must be replaced.
  - ★ With the piston ring in its groove, make several measurements with a thickness gauge [A] to determine piston ring/groove clearance.
- 
- ★ If the clearance exceeds the service limit, measure the thickness of the piston ring
  - ★ If the ring has worn down to less than the service limit, replace the ring; if the groove width exceeds the service limit, replace the piston.



#### Piston Ring/Groove Clearance

**Standard:**

**Top:**

**KX85A/B      0.020 ~ 0.060 mm (0.0008 ~ 0.0024 in.)**

**KX100D      0.040 ~ 0.080 mm (0.0016 ~ 0.0032 in.)**

**Second:      0.020 ~ 0.060 mm (0.0008 ~ 0.0039 in.)**

**Service Limit:**

**Top:**

**KX85A/B      0.16 mm (0.0063 in.)**

**KX100D      0.18 mm (0.0071 in.)**

**Second:      0.16 mm (0.0063 in.)**

#### Piston Ring Thickness (Top and Second)

**Standard:      0.97 ~ 0.99 mm (0.0382 ~ 0.0390 in.)**

**Service Limit:      0.90 mm (0.0354 in.)**

## Cylinder

### Piston Ring Groove Width

#### Standard:

##### Top:

KX85A/B 1.01 ~ 1.03 mm (0.0398 ~ 0.0406 in.)

KX100D 1.03 ~ 1.05 mm (0.0406 ~ 0.0413 in.)

Second: 1.01 ~ 1.03 mm (0.0398 ~ 0.0406 in.)

#### Service Limit:

##### Top:

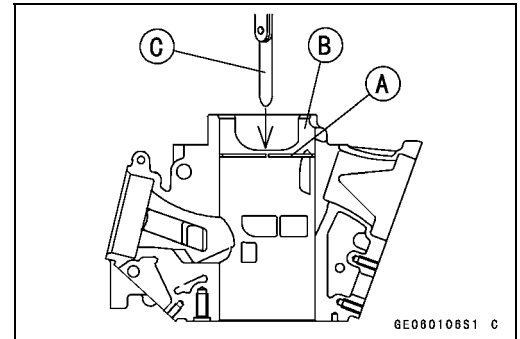
KX85A/B 1.11 mm (0.0437 in.)

KX100D 1.13 mm (0.0445 in.)

Second: 1.11 mm (0.0437 in.)

### Piston Ring End Gap Inspection

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



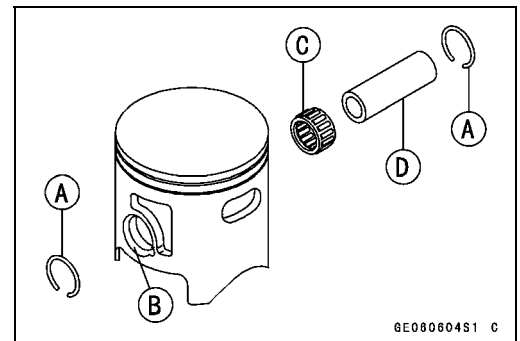
### Piston Ring End Gap (Top and Second)

Standard: 0.30 ~ 0.50 mm (0.0118 ~ 0.0197 in.)

Service Limit: 0.80 mm (0.0315 in.)

### Piston, Piston Pin, and Connecting Rod Wear Inspection

- Visually inspect the snap ring [A] still fitted in place.
- ★ If the ring shows weakness or deformation, replace the ring. Also if the pin hole groove shows excessive wear, replace the piston.
- Measure the diameter of the piston pin [D] with a micrometer.
- ★ If the piston pin diameter is less than the service limit at any point, replace the piston pin.
- Using a cylinder gauge, measure the diameter of both piston pin holes [B] in the piston and the inside diameter of the connecting rod small end.
- ★ If either piston pin hole diameter exceeds the service limit, replace the piston.
- ★ If the inside diameter of the connecting rod small end exceeds the service limit, replace the crankshaft assembly.
- Check the needle bearing [C].
- The rollers in a needle bearing normally wear very little, and wear is difficult to measure. Instead of measuring, inspect the bearing for abrasion, color change, other damage.



## 4-12 ENGINE TOP END

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### Cylinder

---

★ If there is any doubt as to the condition of a needle bearing, replace the bearing and piston pin.

#### Piston Pin Diameter

##### Standard:

KX85, KX100 14.000 ~ 13.995 mm (0.5512 ~ 0.5510 in.)

##### Service Limit:

KX85, KX100 13.965 mm (0.5498 in.)

#### Piston Pin Hole Diameter

##### Standard:

KX85, KX100 14.040 ~ 14.034 mm (0.5528 ~ 0.5525 in.)

##### Service Limit:

KX85, KX100 14.116 mm (0.5557 in.)

#### Connecting Rod small End Inside Diameter

##### Standard:

KX85, KX100 18.013 ~ 18.002 mm (0.7092 ~ 0.7087 in.)

##### Service Limit:

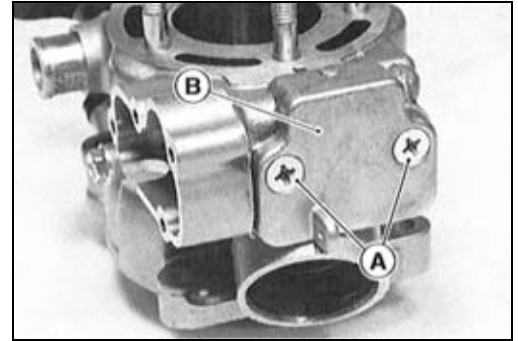
KX85, KX100 18.060 mm (0.7110 in.)



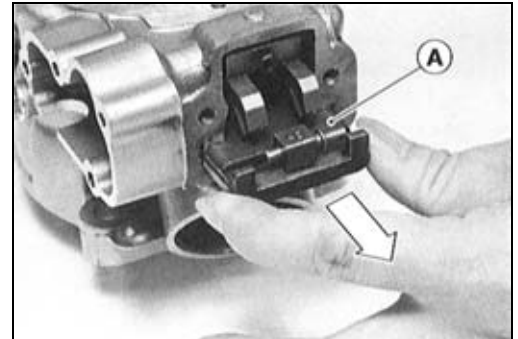
## Exhaust Valve (KIPS)

### Removal

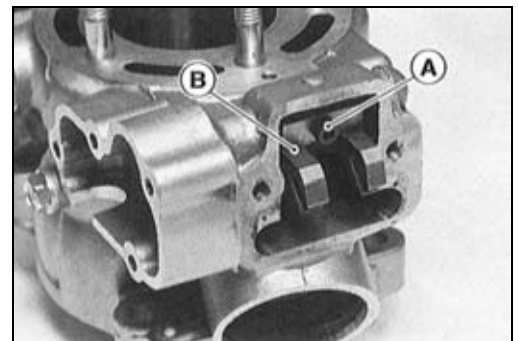
- Remove:
  - Carburetor
  - Cylinder Head
  - Cylinder
- Take out the screws [A] and remove the cover [B].



- Pull the valve assembly [A] out.



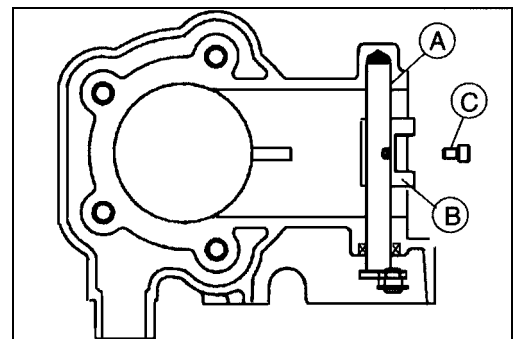
- Unscrew the bolt [A] and remove the operating rod and the lever [B].



### Installation

- Scrape out any carbon and clean the valves with a high flash-point solvent.
- Check the following for signs of damage:
  - Exhaust Valve Assembly
  - Oil Seal
  - O-rings
- ★ If necessary, replace them with new ones.
- Apply a 2-stroke engine oil to the following.
  - Valve Operating Rod Journal.
  - Main Exhaust Valve Parts
- Apply a high temperature grease to the oil seal lip on the operating rod.
- Install the operating rod [A] with the lever [B].
- Apply a non-permanent locking agent to the thread of exhaust valve lever mounting bolt.
- Torque:

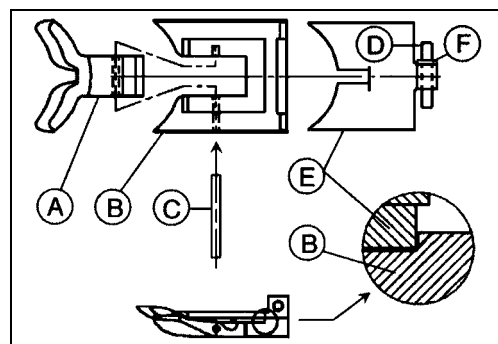
**Torque - Exhaust Valve Lever Mounting Bolt [C]: 3.9 N·m  
(0.40 kgf·m, 35 in·lb)**



## 4-14 ENGINE TOP END

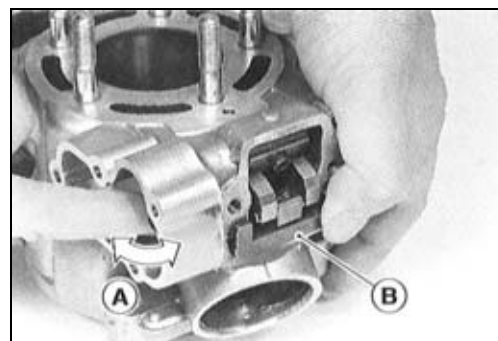
### Exhaust Valve (KIPS)

- Install the butterfly valve [A] on the holder [B], with a pin [C].
- Install the pin [D] in the slide valve [E], carefully the direction of the brim [F].
- Place the slide valve on the holder as shown.



- Install the valve assembly at fully opened condition into the cylinder.
- Turn the operating rod [A], holding the holder [B] by hand to check that the slide and butterfly valve move smoothly.
- Install the Exhaust Valve cover.
- Torque:

**Torque - Exhaust Valve Cover Mounting Bolts: 5.2 N·m  
(0.53 kgf·m, 46 in·lb)**



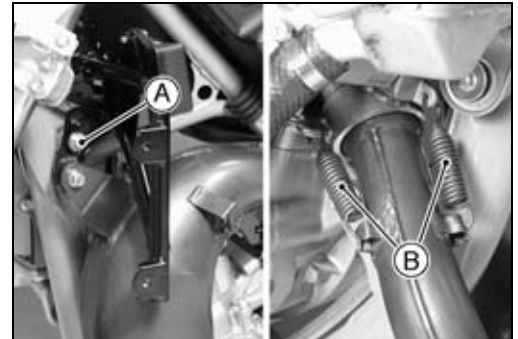
## Muffler

### Removal

- Remove the left side cover and scoop.
- Remove the muffler mounting bolts [A]
- Pull the muffler body to backward.



- Remove:
  - Louver
  - Exhaust Pipe Mounting Bolt [A]
  - Exhaust Pipe Mounting Springs [B]
- Pull the muffler body out of the cylinder.

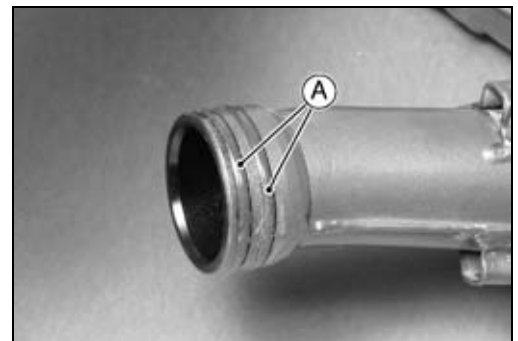


### Installation

- Scrape any carbon out of the muffler.
- Check the exhaust O-rings [A] for signs of damage. If necessary, replace them with new ones.
- ★ Replace the exhaust gasket with new one.
- ★ Apply molybdenum disulfide grease around the exhaust O-rings.

**Torque - Muffler Mounting Bolts:** 8.8 N·m (0.90 kgf·m, 78 in·lb)

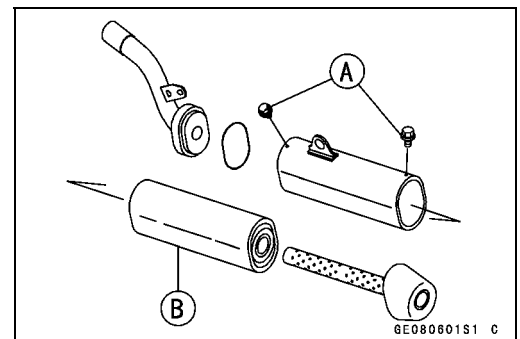
**Exhaust Pipe Mounting Bolts:** 8.8 N·m (0.90 kgf·m, 78 in·lb)



### Muffler Baffle Change

Replace the muffler baffle if exhaust noise becomes too loud or the engine performance drops.

- Remove the muffler pipe and inner pipe mounting bolts [A], and pull the inner pipe out toward the rear.
- Pull off the old muffler baffle [B], and wrap new muffler baffle around the inner pipe.
- Install inner pipe into the muffler body.





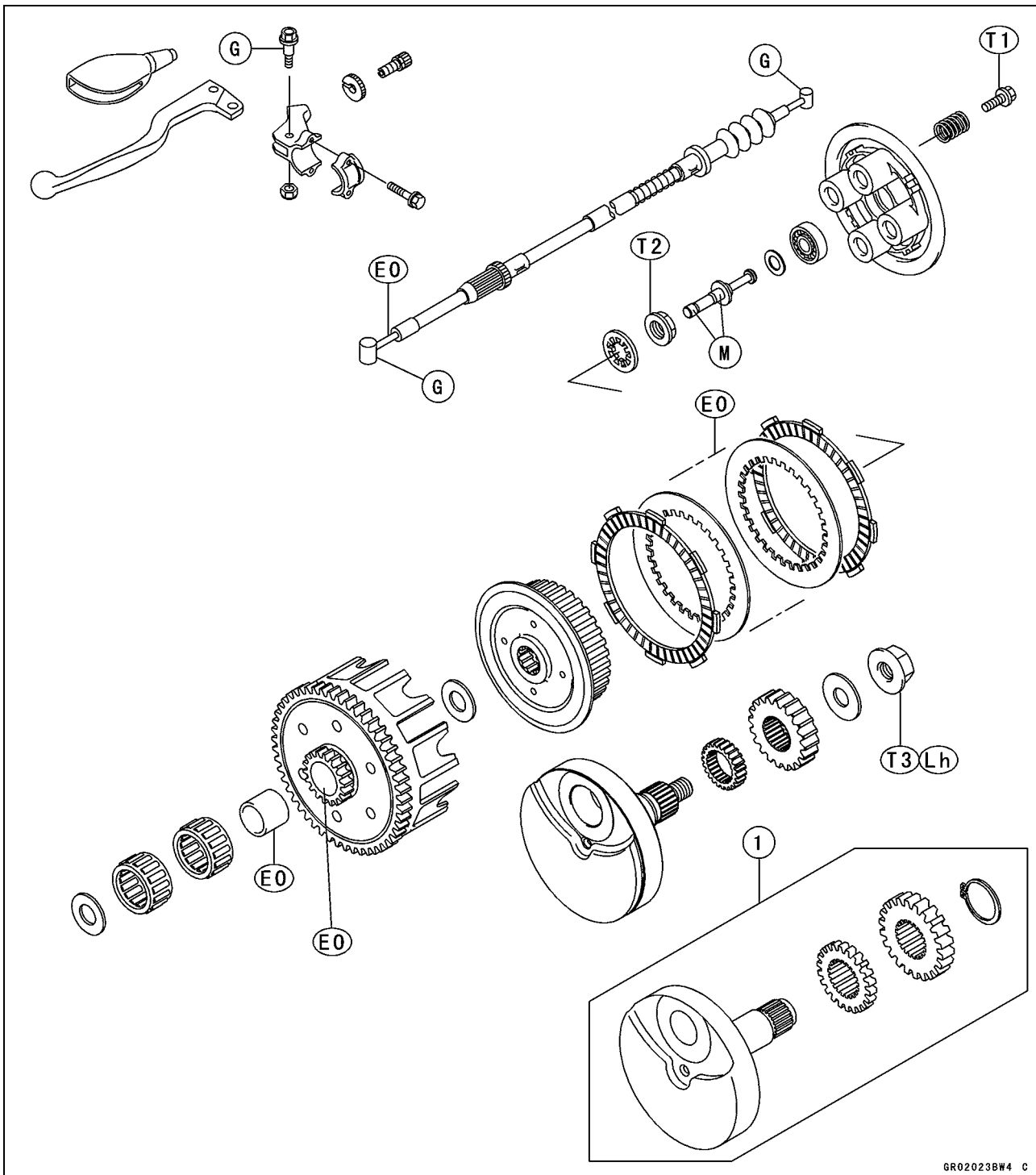
# Engine Right Side

## Table of Contents

Exploded View .....	5-2
Specifications .....	5-4
Clutch Cable .....	5-5
Clutch Cable Free Play Inspection .....	5-5
Clutch Cable Free Play Adjustment .....	5-5
Clutch Release Lever Angle Inspection and Adjustment .....	5-5
Removal .....	5-6
Installation .....	5-6
Lubrication and Inspection .....	5-7
Clutch Cover .....	5-8
Clutch Cover Removal .....	5-8
Clutch Cover Installation Notes .....	5-8
Right Engine Cover .....	5-9
Right Engine Cover Removal .....	5-9
Cover Installation .....	5-10
Right Engine Cover Disassembly .....	5-11
Advancer Disassembly .....	5-11
Advancer Assembly .....	5-12
Right Engine Cover Assembly .....	5-12
Clutch .....	5-13
Removal .....	5-13
Installation Notes .....	5-14
Friction and Steel Plates Wear, Damage Inspection .....	5-14
Friction and Steel Plate Warp Inspection .....	5-15
Spring Free Length Measurement .....	5-15
Clutch Housing Finger Inspection .....	5-15
Clutch Hub Spline Inspection .....	5-15
Primary Gear .....	5-16
Removal (KX85-A1 ~ A5, B1 ~ B5/KX100-D1 ~ D5) .....	5-16
Installation (KX85-A1 ~ A5, B1 ~ B5/KX100-D1 ~ D5) .....	5-16
Primary Gear Removal (KX85A6F ~, B6F ~/KX100D6F ~ ) .....	5-16
Primary Gear Installation (KX85A6F ~, B6F ~/KX100D6F ~ ) .....	5-16
External Shift Mechanism .....	5-18
Removal .....	5-18
Installation .....	5-18
Inspection .....	5-18
Kickstarter .....	5-19
Removal .....	5-19
Installation .....	5-19
Assembly .....	5-19

## 5-2 ENGINE RIGHT SIDE

### Exploded View



GR02023BW4 C

1: KX85-A1 ~ A5, B1 ~ B5/KX100-D1 ~ D5

T1: 9.3 N·m (0.95 kgf·m, 82 in·lb)

T2: 88 N·m (9.0 kgf·m, 65 ft·lb)

T3: 49 N·m (5.0 kgf·m, 36 ft·lb)

CL: Apply Cable lubricant.

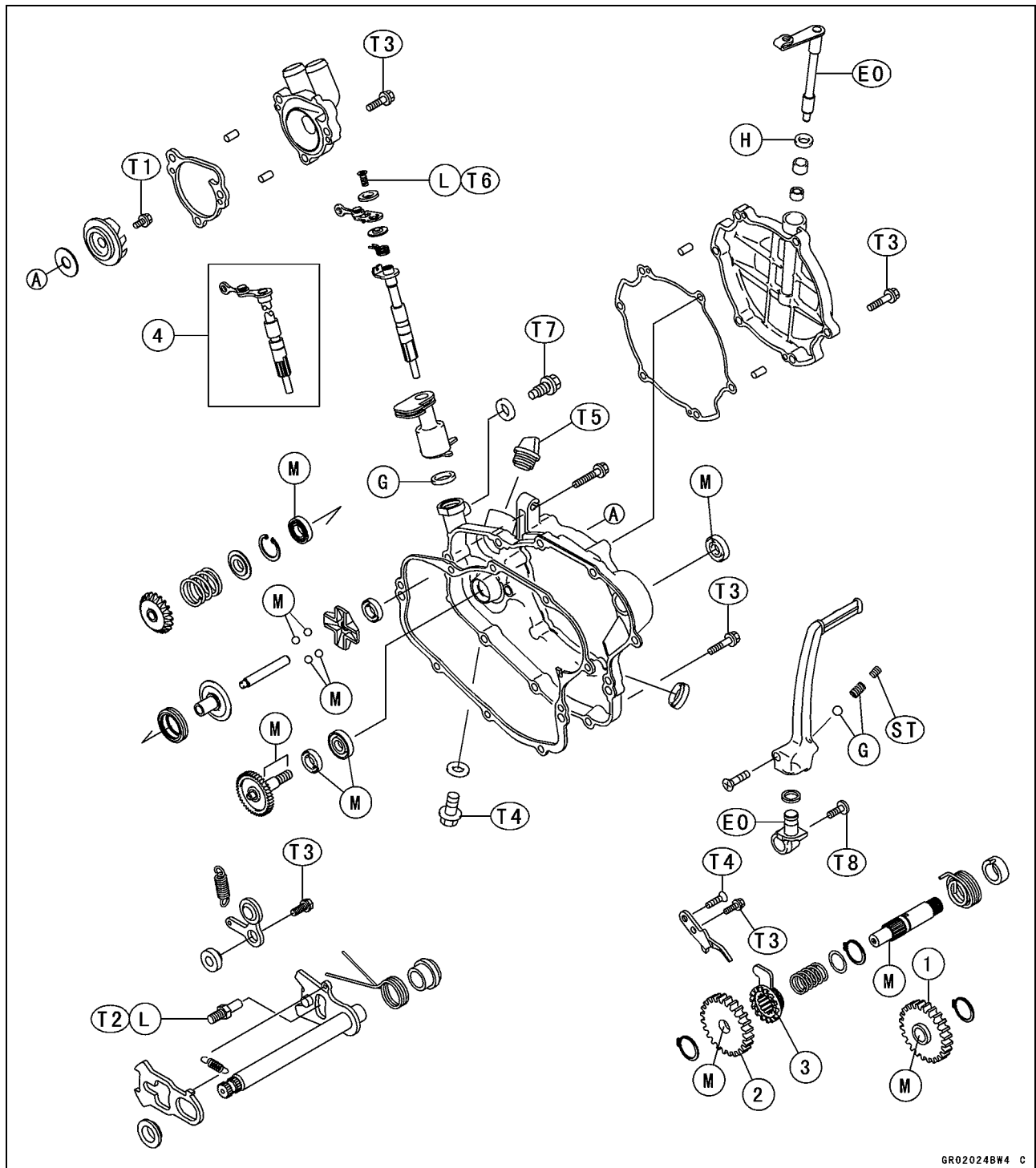
G: Apply grease.

Lh: Left-hand threads

M: Apply molybdenum disulfide grease.

E0: Apply engine oil.

## Exploded View



GR02024BW4 C

- |   |   |
|---|---|
| 1. Idle Gear  | T6: 6.4 N·m (0.65 kgf·m, 56 in·lb)      |
| 2. Kick Gear  | T7: 5.4 N·m (0.55 kgf·m, 48 in·lb)      |
| 3. Ratchet  | T8: 12 N·m (1.2 kgf·m, 104 in·lb)       |
| 4. Lever Shaft (KX85-A1 ~ A3/B1 ~ B3,<br>KX100-D1 ~ D3) | G: Apply grease.                        |
| T1: 7.0 N·m (0.70 kgf·m, 61 in·lb)                      | H: Apply high temperature grease.       |
| T2: 22 N·m (2.2 kgf·m, 16 ft·lb)                        | L: Apply a non-permanent locking agent. |
| T3: 8.8 N·m (0.90 kgf·m, 78 in·lb)                      | M: Apply molybdenum disulfide grease.   |
| T4: 5.2 N·m (0.53 kgf·m, 46 in·lb)                      | ST: Staking                             |
| T5: 1.5 N·m (0.15 kgf·m, 13 in·lb)                      | E0: Apply engine oil.                   |

## 5-4 ENGINE RIGHT SIDE

### Specifications

Item	Standard	Service Limit
<b>Clutch Lever Free Play</b>	2 ~ 3 mm	— — —
<b>Clutch</b>		
Friction Plate Thickness	2.8 ~ 2.9 mm	2.7 mm
Friction and Steel Plate Warp	0.15 mm or less	0.3 mm
Clutch Spring Free Length	35.0 mm	34.0 mm

**Special Tools - Outside Circlip Pliers: 57001-144**

**Bearing Puller: 57001-158**

**Clutch Holder: 57001-1243**

**Flywheel Holder: 57001- 1313**

**Bearing Puller Adapter: 57001-1526**

**Gear Holder: 57001-1602**



## Clutch Cable

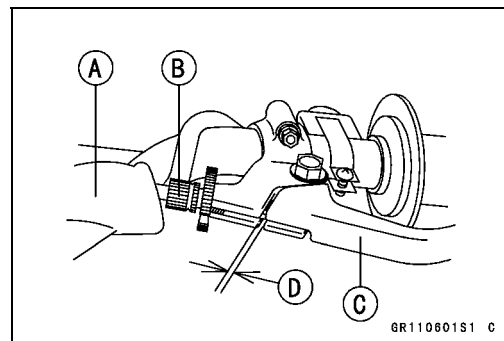
Due to friction plate wear and clutch cable stretch over a long period of use, the clutch must be adjusted in accordance with the Periodic Maintenance Chart.

### **⚠ WARNING**

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

### *Clutch Cable Free Play Inspection*

- Slide the clutch lever dust cover [A] out of place.
- Check that the clutch cable upper end is fully seated in the adjuster [B].
- Check that the clutch lever [C] has 2 ~ 3 mm of play [D].
- ★ If the free play is improper, adjust the lever play.

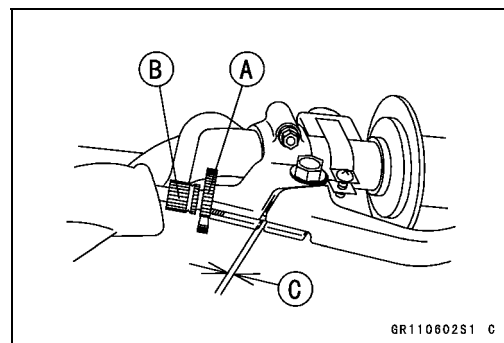


### *Clutch Cable Free Play Adjustment*

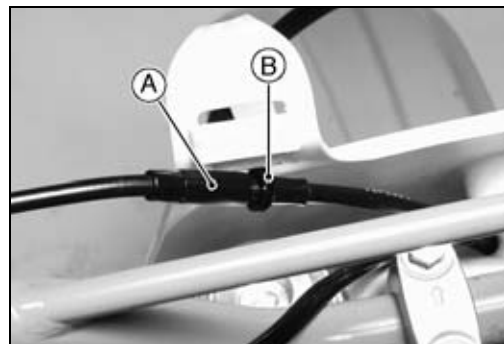
- Slide the clutch lever dust cover out of place.
- Loosen the knurled locknut [A].
- Turn the adjuster [B] so that the clutch lever will have 2 ~ 3 mm (0.08 ~ 0.12 in.) of play [C].

### **NOTE**

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



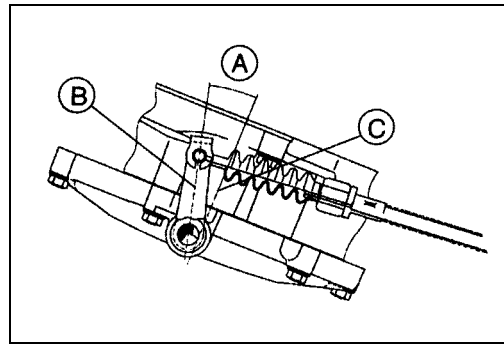
- Tighten the locknut.
- If it cannot be done, loosen the locknut [B] at the middle of the clutch cable, and turn the adjusting nut [A] so that clutch lever has 2 ~ 3 mm (0.08 ~ 0.12 in.) of play.
- After the adjustment is made, tighten the locknut, and start the engine and check that the clutch does not slip and that it release properly.



### *Clutch Release Lever Angle Inspection and Adjustment*

If the clutch slips or the action at the lever feels heavy despite proper clutch lever free play adjustment, inspect and adjust the clutch release lever angle.

- Turn the clutch release lever toward the front until it becomes hard to turn, this is the point where the clutch is just starting to release. At this time, check that the included angle [A] between the clutch release lever [B] and the line [C] at right angle to the right engine cover.



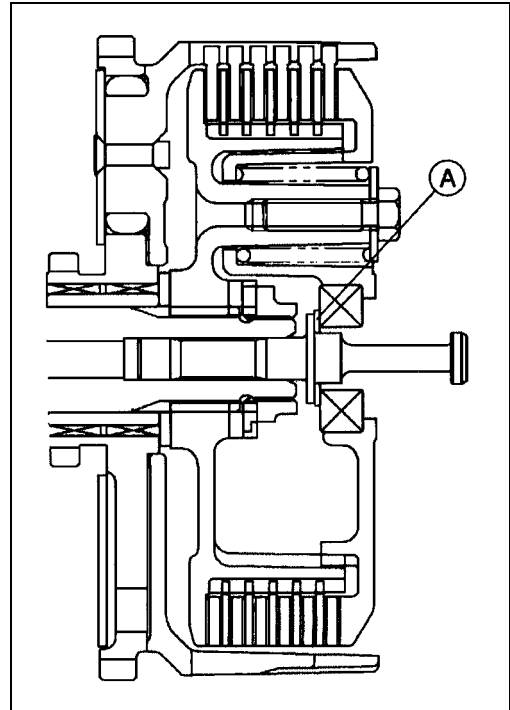
### **Clutch Release Lever Angle**

**Standard:** approx. 14° [A]

## 5-6 ENGINE RIGHT SIDE

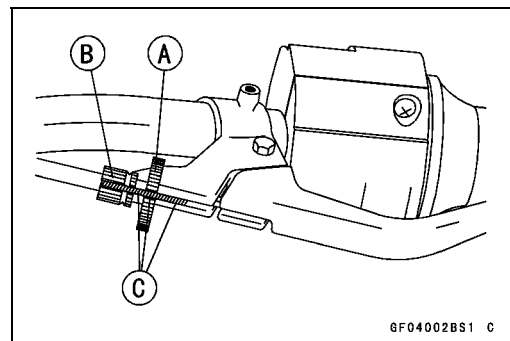
### Clutch Cable

- ★ If it is not, adjust the clutch lever angle by increasing or decreasing the number of shims [A].



#### Removal

- Slide the dust cover out of place.
- Loosen the locknut at the upper of the cable, and turn the adjusting nut to give the cable plenty of play.
- Loosen the knurled locknut [A] at the clutch lever, and screw in the adjuster [B].
- Line up the slots [C] in the clutch lever, knurled locknut, and adjuster, and then free the cable from the clutch lever.



- Free the clutch inner cable tip from the clutch release lever.

#### CAUTION

**Do not remove the clutch release shaft unless it is absolutely necessary. If removed, release shaft oil seal must be replaced with a new one.**

- Pull the clutch cable out of the frame.

#### Installation

- Run the clutch cable according to the Cable, Wire and Hose Routing section in the General Information chapter.
- Adjust the clutch cable (see Free Play Adjustment).

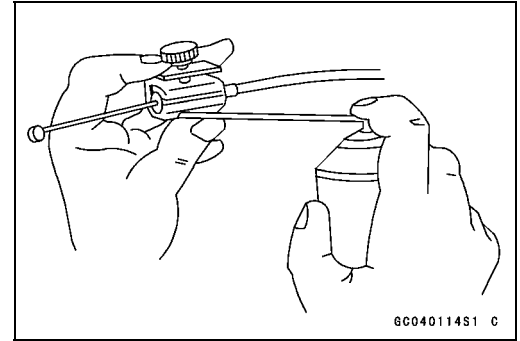
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## Clutch Cable

---

### *Lubrication and Inspection*

- Lubricate the clutch cable using the pressure cable luber in accordance with the Periodic Maintenance Chart.
- With the cable disconnected at both ends, the cable should move freely within the cable housing (see General Lubrication in the Appendix chapter).

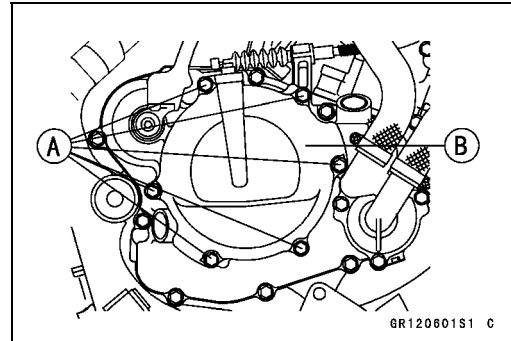


## 5-8 ENGINE RIGHT SIDE

### Clutch Cover

#### *Clutch Cover Removal*

- Drain the engine oil (see Transmission Oil Change in the Engine Bottom End/Transmission chapter).
- Remove the brake pedal (see Brake Pedal Removal in the Brake chapter).
- Free the clutch inner cable at clutch lever side (see Clutch Cable Removal).
- Unbolt the clutch cover bolts [A], and take off the clutch cover [B].



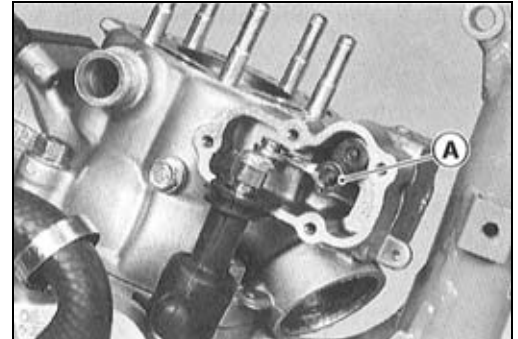
#### *Clutch Cover Installation Notes*

- There are two knock pins on the mating surfaces of right engine cover and clutch cover.
- Replace the clutch cover gasket with a new one.
- Torque:  
**Torque - Clutch Cover Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)**

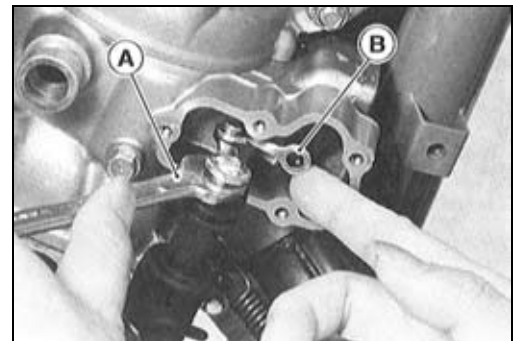
## Right Engine Cover

### Right Engine Cover Removal

- Remove:
  - Engine Oil (drain)
  - Coolant (drain)
  - Cooling Hose Lower End
  - Kick Pedal
  - Brake Pedal
  - Water Pump Cover
  - Impeller
  - Clutch Cable
- Remove the KIPS cover from the right side of the cylinder.
- Remove the E-clip [A].

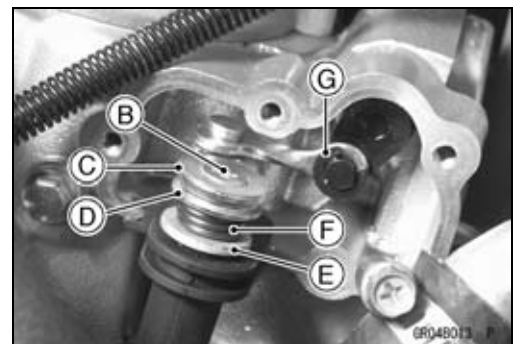


- Put a spanner wrench [A] on the shaft lever upper end.
- Turn the shaft lever counterclockwise with the wrench, and separate the link lever [B] from the lever pin.

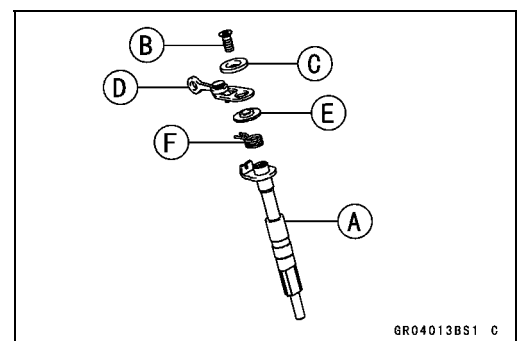


### KX85-A4 ~ /B4 ~, KX100-D4 ~

- Remove the KIPS cover from the cylinder right side.
- Remove the E ring [G].



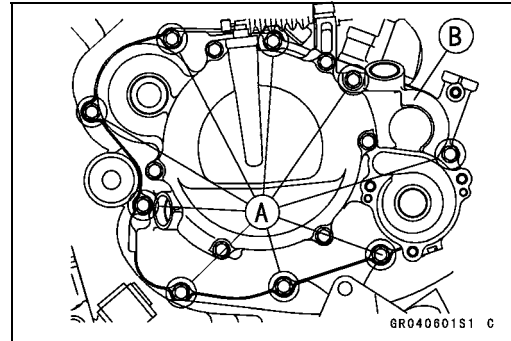
- Remove the lever assy mounting screw [B], washer [C], lever assy [D], collar [E], and spring [F] from the lever shaft [A].



## 5-10 ENGINE RIGHT SIDE

### Right Engine Cover

- Remove the right engine cover bolts [A] and take off the right engine cover [B] and gasket.

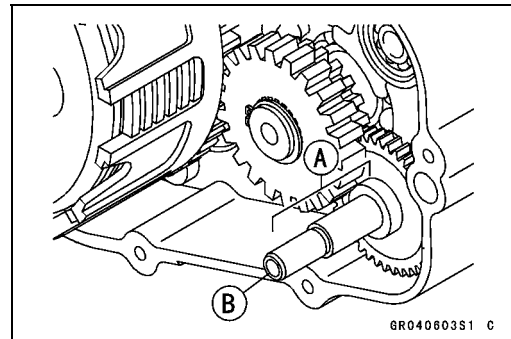


#### Cover Installation

- There are two knock pins of the mating surfaces of the crankcase and right engine cover.
- Apply molybdenum disulfide grease [A] to the water pump shaft [B] to prevent water pump seal damage.

#### CAUTION

**If the right engine cover is installed without greasing the pump shaft, the pump seal could damage.**



- Turn the clutch release lever toward the rear.
- Stick the new right engine cover gasket in position with a thin layer of grease.
- Torque:

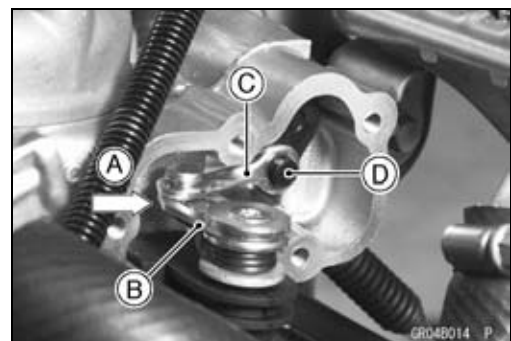
**Torque - Right Engine Cover Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)**

#### KX85-A4 ~/B4 ~, KX100-D4 ~

- Apply a non-permanent locking agent to the thread of lever assy mounting screw.
- Install the spring to the lever shaft, put the one end of spring into the notch of the lever shaft, and install the collar, lever assy and washer with the specified torque.

**Torque - Lever Assy Mounting Screw: 6.4 N·m (0.65 kgf·m, 56 in·lb)**

- Push [A] the shaft lever [B], and install the link lever [C] to the valve shaft [D].

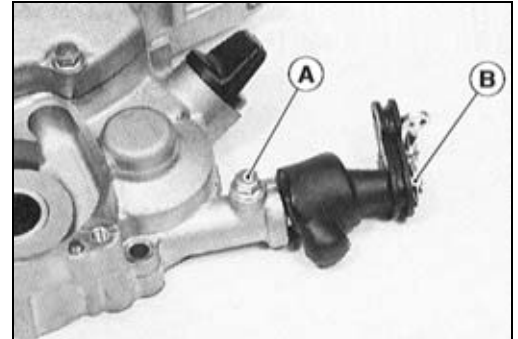


## Right Engine Cover

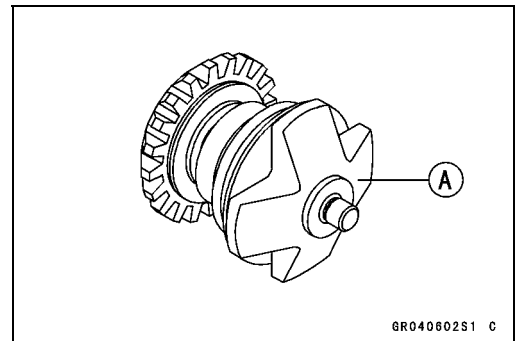
- Run the clutch cable and the water hoses according to the Cable, Wire, and Hose Routing section in the General Information chapter.
- Adjust the clutch cable (see Clutch Cable Free Play Adjustment).
- Check the clutch release lever angle (see Clutch Release Lever Angle Inspection and Adjustment).
- Fill the crankcase with engine oil (see Engine Bottom End/Transmission chapter).
- Fill the engine with coolant (see Cooling System chapter).

### Right Engine Cover Disassembly

- Remove the right engine cover.
- Unscrew the lever shaft retaining bolt [A].
- Turn the lever shaft [B] and pull out it.



- Take off the advancer assembly [A].



### Advancer Disassembly

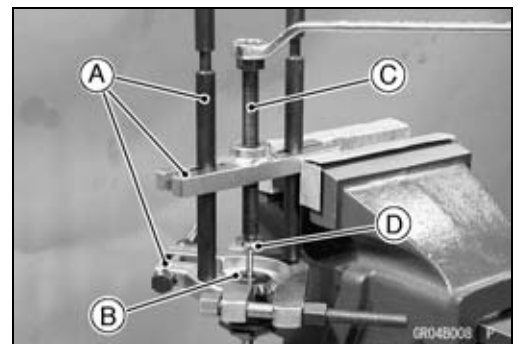
#### KX85-A3 ~/B3 ~, KX100-D3 ~

The advancer assembly of the KX85-A3 ~/B3 ~ and KX100-D3 ~ can be disassembled.

- Hold the bearing puller [A] in a vise, and set the advancer assembly [B] with the gear upward on the bearing puller.
- Screw the rod [C] in and pull out the gear on the shaft. Do not drop the assembly parts on the floor.

**Special Tools - Bearing Puller: 57001-158**

**Bearing Puller Adapter: 57001-1526 [D]**



## 5-12 ENGINE RIGHT SIDE

### Right Engine Cover

The advancer assembly consists of the following parts.

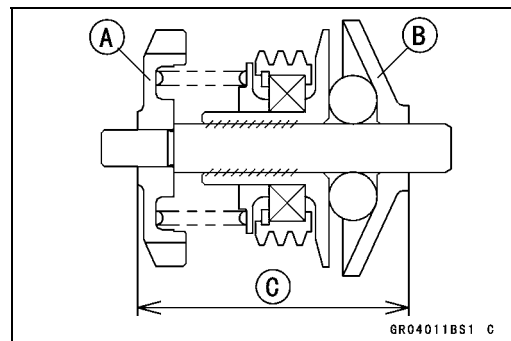
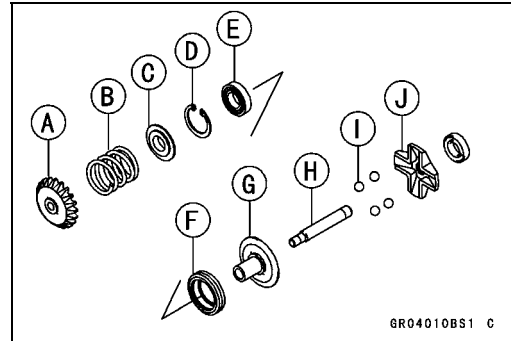
- [A] Gear
- [B] Spring
- [C] Collar
- [D] Circlip
- [E] Ball bearing
- [F] Collar
- [G] Holder
- [H] Shaft
- [I] Ball
- [J] Guide

- Check the advancer assembly parts for damage.
- ★ Any damaged parts should be replaced with new ones.
- When assembling, apply molybdenum disulfide grease between the shaft and inside/outside diameter parts of the holder, ball bearing and collars.

#### Advancer Assembly

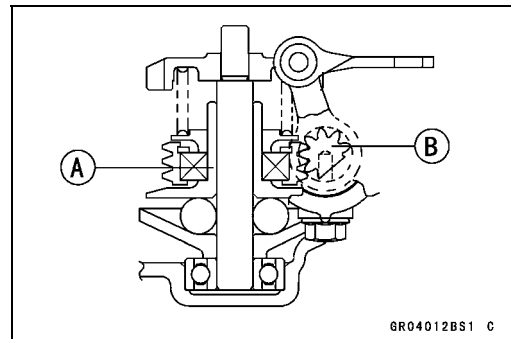
**KX85-A3 ~ /B3 ~, KX100-D3 ~**

- Press the gear [A] on the shaft so that the gear contacts the step on the shaft.
- Install the parts in due order and press fit the guide to set the distance [C] of 44.65 ~ 44.75 mm (1.7579 ~ 1.7618 in.).



#### Right Engine Cover Assembly

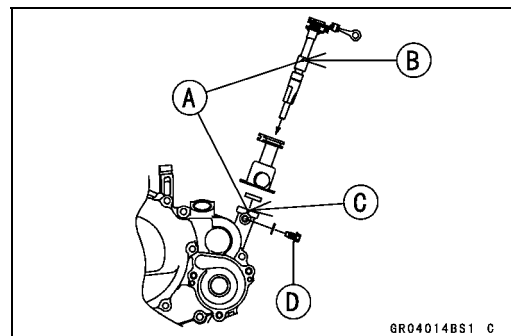
- Fit the advancer [A] to the lever shaft [B], as shown.



- Apply grease to the oil seal lips before inserting the lever shaft.
- Align [A] the mark [B] on the lever shaft with the mark [C] on the right engine cover and insert the shaft into the cover.
- Tighten:

**Torque - Lever Shaft Retaining Bolt [D]: 5.4 N·m (0.55 kgf·m, 48 in·lb)**

- Install the advancer in the right engine cover.





## Clutch

### Removal

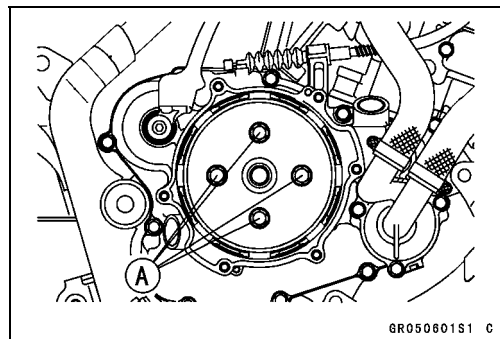
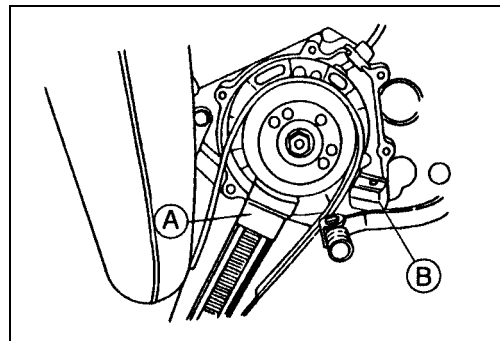
- Remove the clutch cover.
- Remove the magneto cover.
- Unscrew the crankshaft sensor mounting screws and remove the crankshaft sensor [B] from the stator.
- Install the flywheel holder [A] on the magneto flywheel.

### NOTE

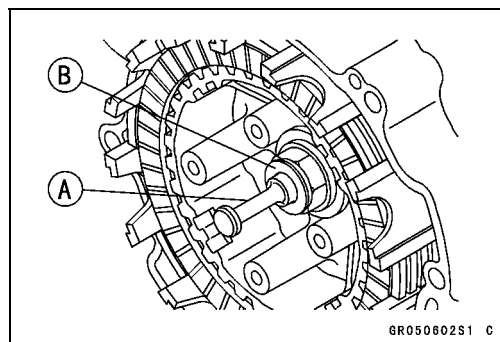
○Use the flywheel holder to prevent the clutch from rotating.

### Special Tool - Flywheel Holder: 57001-1313

- Remove the clutch spring bolts [A], spring, and clutch pressure plate.



- Remove the ball bearing push rod [A], shim [B] (if provided), friction plates, and steel plates.

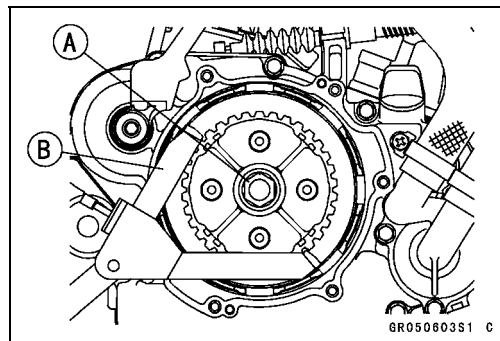


- Remove the clutch hub nut [A] and washer.

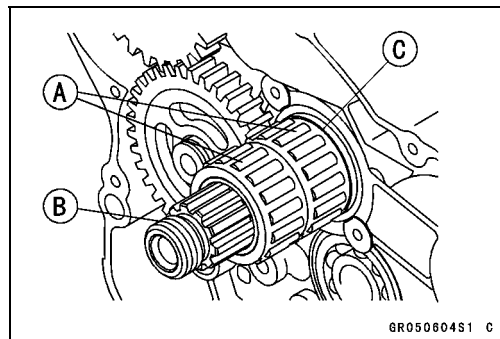
### NOTE

○Use the clutch holder [B] to prevent the clutch hub from rotating.

### Special Tool - Clutch Holder: 57001-1243



- Remove the clutch assembly, needle bearings [A], sleeve [B], and thrust washer [C].



## 5-14 ENGINE RIGHT SIDE

### Clutch

#### Installation Notes

- Apply molybdenum disulfide grease to the outside of the sleeve.
- Apply transmission oil to the inside of the clutch housing gear and Kickstarter driven gear.
- Install the friction plates and steel plates, starting with a friction plate and alternating them. Finish with a friction plate.

#### CAUTION

**Do not install dry steel plates and friction plates; apply transmission oil to the surfaces of each plate to avoid clutch plate seizure.**

- Torque the clutch hub nut.  
**Torque - Clutch Hub Nut: 88 N·m (9.0 kgf·m, 65 ft·lb)**

#### NOTE

○ Use the clutch holder to prevent the clutch hub from rotating.

**Special Tool - Clutch Holder: 57001-1243**

- Apply molybdenum disulfide grease to the rubbing portion of the push rod.
- Torque the clutch spring bolts.  
**Torque - Clutch Spring Bolts: 9.3 N·m (0.95 kgf·m, 82 in·lb)**

#### NOTE

○ Use the flywheel holder to prevent the clutch front rotating.

**Special Tool - Flywheel Holder: 57001-1313**

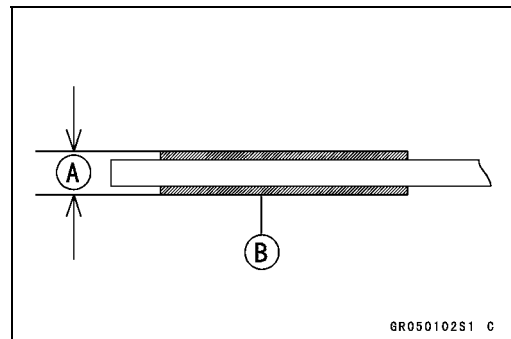
#### Friction and Steel Plates Wear, Damage Inspection

- Visually inspect the friction and steel plates to see if they show any signs of seizure, or uneven wear.
- ★ If any plates show signs of damage, replace the friction plates and steel plates as a set.
- Measure the thickness [A] of the friction plates [B] with vernier calipers.
- ★ If they have worn past the service limit, replace them with new ones.

#### Friction Plate Thickness

**Standard: 2.8 ~ 2.9 mm (0.110 ~ 0.114 in.)**

**Service Limit: 2.7 mm (0.106 in.)**



## Clutch

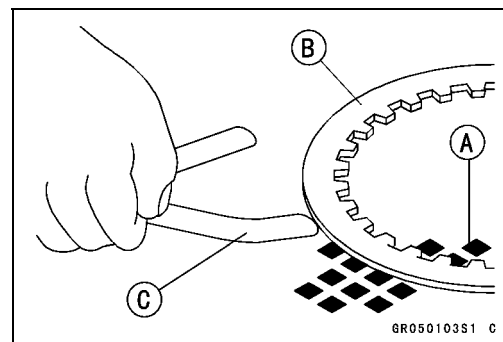
### Friction and Steel Plate Warp Inspection

- Place each friction plate or steel plate on a surface plate, and measure the gap between the surface plate [A] and each friction plate or steel plate [B] with a thickness gauge [C]. The gap is the amount of friction or steel plate warp.
- ★ If any plate is warped over the service limit, replace it with a new one.

#### Friction and Steel Plates Warp

**Standard:** 0.15 mm (0.006 in.) or less

**Service Limit:** 0.3 mm (0.012 in.)



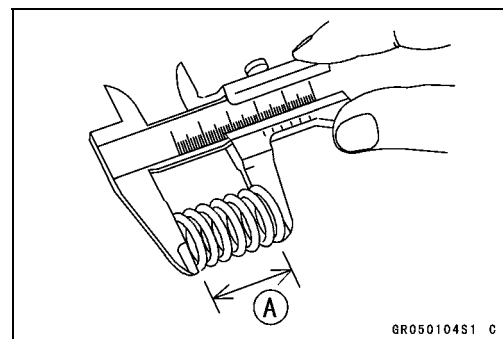
### Spring Free Length Measurement

- Since the spring [A] becomes shorter as it weakens, check its free length to determine its condition.
- ★ If any of the springs is shorter than the service limit, it must be replaced.

#### Clutch Spring Free Length

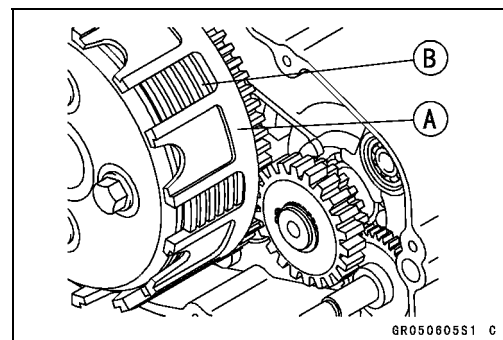
**Standard:** 35.0 mm (1.378 in.)

**Service Limit:** 34.0 mm (1.339 in.)



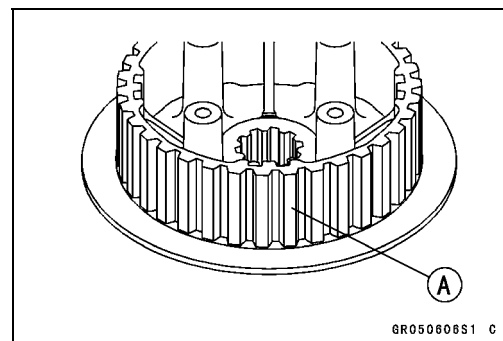
### Clutch Housing Finger Inspection

- Visually inspect the fingers [A] of the clutch housing where the tangs [B] of the friction plate hit them.
- ★ If they are worn or if there are groove cut where the tangs hit, replace the housing. Also replace the friction plates if their tangs are damaged.



### Clutch Hub Spline Inspection

- Visually inspect where the teeth on the steel plates wear against splines [A] of the clutch hub.
- ★ If there are notches worn into the splines, replace the clutch hub. Also, replace the clutch plates if their tooth are damaged.



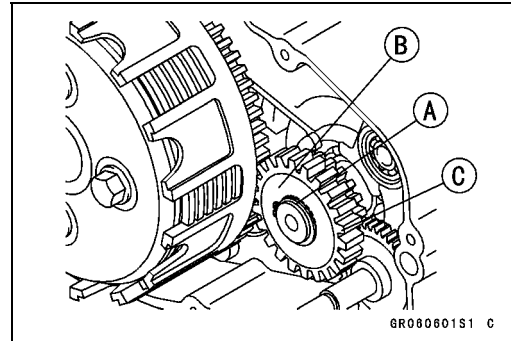
## 5-16 ENGINE RIGHT SIDE

### Primary Gear

#### Removal (KX85-A1 ~ A5, B1 ~ B5/KX100-D1 ~ D5)

- Remove the right engine cover (see Right Engine Cover Removal).
- Remove the circlip [A], then pull out the primary gear [B].

**Special Tool - Outside Circlip Pliers: 57001-144**



#### Installation (KX85-A1 ~ A5, B1 ~ B5/KX100-D1 ~ D5)

- Install the primary gear with the chamfer side [C] facing out (see above photo).
- Install the right engine cover (see Right Engine Cover Installation).

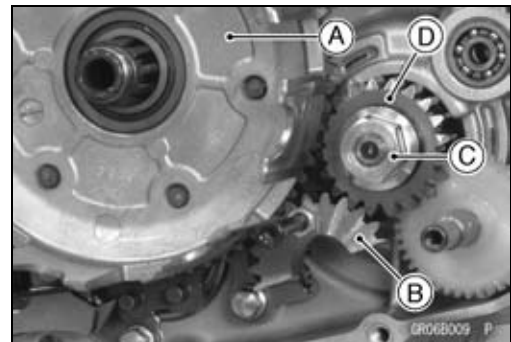
#### Primary Gear Removal (KX85A6F ~, B6F ~/KX100D6F ~)

- Remove the right engine cover (see Right Engine Cover).
- Remove the clutch (see Clutch Removal).
- Temporarily install the clutch housing [A].
- Using the gear holder [B], secure the primary gear.

**Special Tool - Gear Holder: 57001-1602**

- Remove the clutch housing.
- Remove the primary gear nut [C], washer, and the primary gear [D].

○Primary gear nut is left-hand threads.

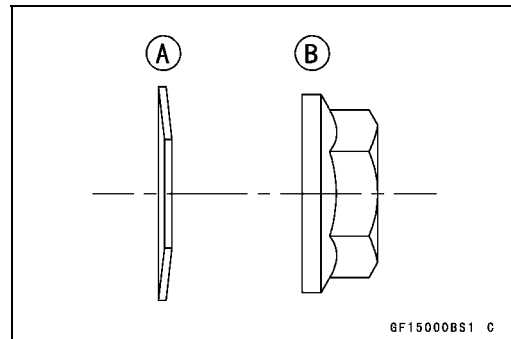


#### Primary Gear Installation (KX85A6F ~, B6F ~/KX100D6F ~)

- Apply high-temperature grease to the kick pedal shaft oil seal lip.
- Insert the primary gear [A] to the crankshaft.
- Install:
  - Washer [B]
  - Primary Gear Nut [C]



- Install the spring washer [A] with the concave side facing to the inward.
- Temporarily tighten the primary gear nut [B].



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## Primary Gear

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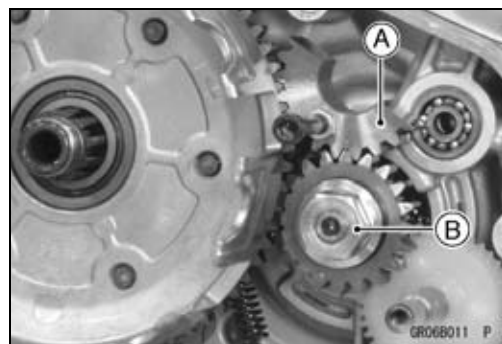
- Using the gear holder [A], secure the clutch gear and the bottom of the primary gear; then, tighten the primary gear nut [B].

○Primary gear nut is left-hand threads.

**Torque - Primary Gear Nut: 49 N·m (5.0 kgf·m, 36 ft·lb)**

**Special Tool - Gear Holder: 57001-1602**

- Install:  
Clutch (see Clutch Installation)

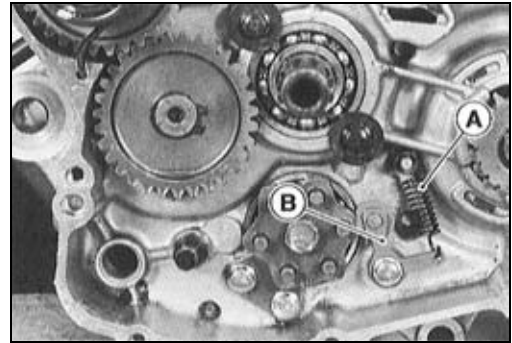


## 5-18 ENGINE RIGHT SIDE

### External Shift Mechanism

#### Removal

- Remove the following.
  - Brake Pedal (see Brakes chapter)
  - Magneto Cover
  - Shift Pedal
  - Clutch (see Clutch Removal)
- Pull out the shift shaft with the shift mechanism arm and arm spring.
- Remove the gear set lever spring [A].
- Remove the bolt, and take off the gear set lever [B].



#### Installation

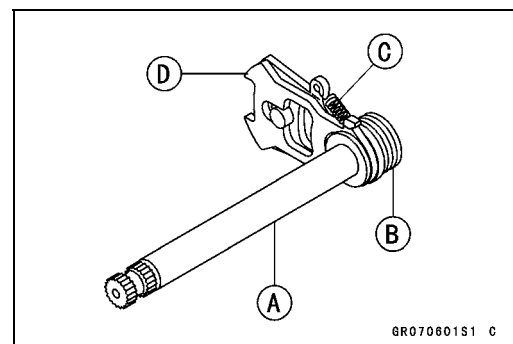
- Before installing the shift shaft, apply high temperature grease to the oil seal lips.
- Install the following.
  - Clutch (see Clutch Installation)
  - Brake Pedal (see Brakes chapter)
- Torque:
  - Torque - Gear Set Lever Mounting Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)**

#### Inspection

- Check the shift shaft [A] for bending or damage to the splines.
- ★ If the shaft is bent, straighten or replace it. If the splines are damaged, replace the external shift mechanism.
- Check the return spring [B] and arm spring [C] for cracks or distortion.
- ★ If the springs are damaged in any way, replace them.
- Check the shift mechanism arm [D] for distortion.
- ★ If the shift mechanism arm is damaged in any way, replace the shift mechanism.
- Check that the return spring pin is not loose.
- ★ If it is loose, unscrew it, apply a non-permanent locking agent to the threads, and tighten it to the specified torque.

**Torque - Shift Shaft Return Spring Pin: 22 N·m (2.2 kgf·m, 16 ft·lb)**

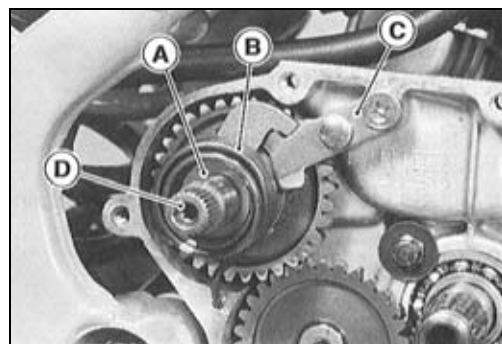
- Check the gear set lever, and the spring for cracks or distortion.
- ★ If the lever or spring is damaged in any way, replace them.



## Kickstarter

### Removal

- Remove the following parts.  
Right Engine Cover (see Right Engine Cover Removal)  
Clutch Housing  
Spring Guide [A]
- Pull the end of the kick spring [B] out of the hole in the crankcase.
- Remove the ratchet guide [C] and bolts.
- Remove the kickstarter assembly [D].



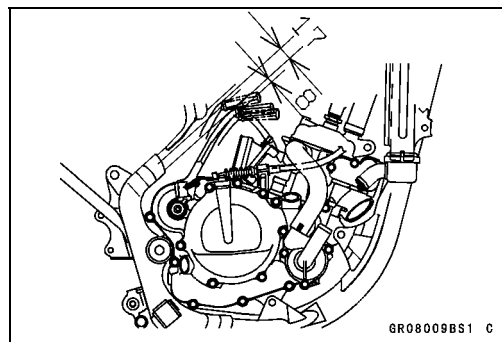
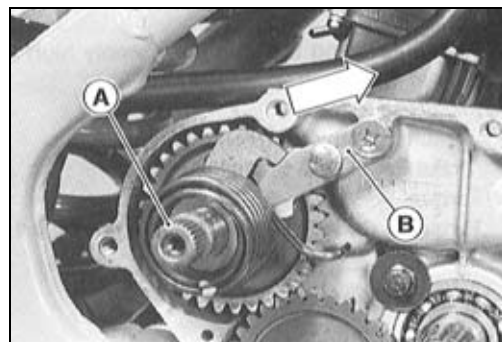
### Installation

- Apply a thin coat of molybdenum disulfide grease to the kick shaft [A] journal.
- Fit the kick shaft assembly in the right crankcase.
- Set the ratchet guide [B] as away as possible from the kick shaft and tighten the mounting bolts to the specified torque.

**Torque - Ratchet Guide Mounting Bolt: 8.8 N·m (0.90 kgf·m, 78 in·lb)**

**Ratchet Guide Mounting Screw: 5.2 N·m (0.53 kgf·m, 46 in·lb)**

- After installing the assembly, turn the kick shaft counter-clockwise and check that the shaft returns smoothly, with spring force.
- ★ If the shaft does not return smoothly, adjust the ratchet guide position.
- Install the kick shaft lever as figure.

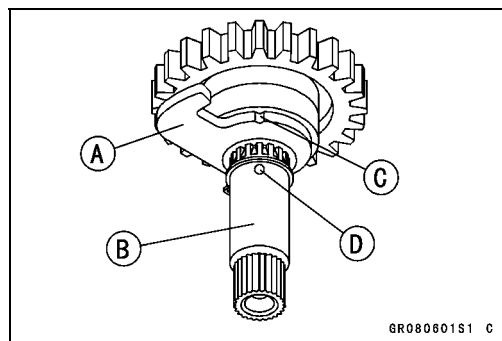


### Assembly

- Apply molybdenum disulfide grease to the inside of the kick gear and idle gear.
- Align the notch [C] on the ratchet [A] with the hole [D] on the kick shaft [B].

### CAUTION

**Misalignment of the ratchet changes the kick spring preload. Light preload could cause mechanism noise and heavy preload could weaken or break the spring.**







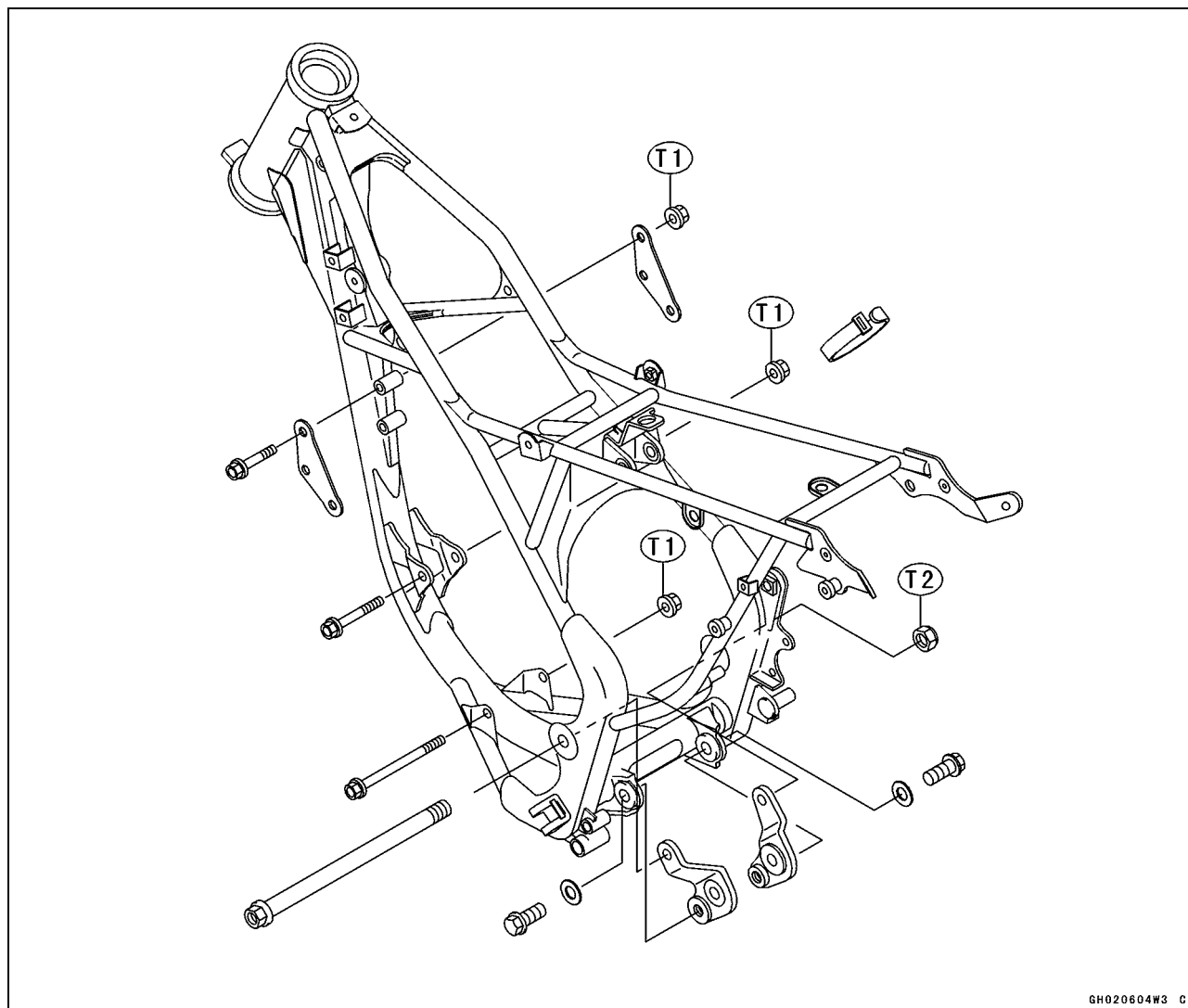
# Engine Removal/Installation

## Table of Contents

Exploded View .....	6-2
Engine Removal/Installation .....	6-3
Removal .....	6-3
Installation .....	6-4

## 6-2 ENGINE REMOVAL/INSTALLATION

### Exploded View



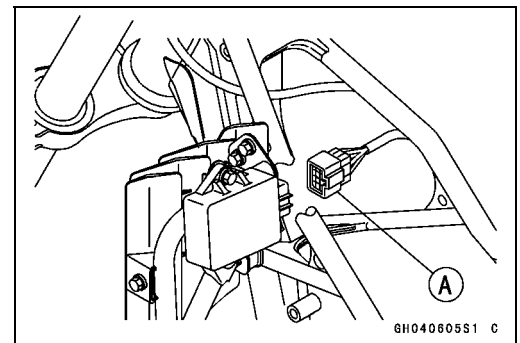
T1: 29 N·m (3.0 kgf·m, 22 ft·lb)

T2: 69 N·m (7.0 kgf·m, 51 ft·lb)

## Engine Removal/Installation

### Removal

- The following parts may be removed with the engine in the frame.
  - Clutch (see Engine Right Side chapter)
  - Flywheel Magneto (see Electrical System chapter)
- Remove the following.
  - Engine Oil (drain, see Engine Bottom End/Transmission chapter)
  - Coolant (drain, see Cooling System chapter)
  - Seat (see Frame chapter)
  - Fuel Tank (see Fuel System chapter)
  - Radiators (see Cooling System chapter)
  - Muffler (see Engine Top End chapter)
  - Carburetor (see Fuel System chapter)
  - Clutch Cable Lower End (see Engine Right Side)
  - Drive Chain (see Final Drive chapter)
  - Shift Pedal
  - Kick Pedal
  - Rear Brake Reservoir
  - Spark Plug Cap
- Disconnect the magneto leads connector [A], engine stop button lead and ignition coil lead connectors or plugs, and remove the ground lead terminal bolt.



- Place a jack under the frame to lift the rear wheel off the ground (see Wheels/Tires chapter).
- Special Tools - Jack: 57001-1238**
- Squeeze the brake lever slowly and hold it with a band.

### **⚠ WARNING**

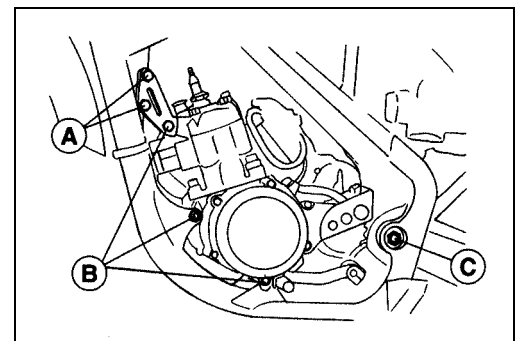
**Be sure to hold the front brake when removing the engine, or the vehicle may fall over. It could cause an accident and injury.**

- Remove the engine mounting bolts [B] and bracket bolts [A].

### **⚠ WARNING**

**The swingarm pivot shaft also serves as the engine mounting bolt. Take precautions to insure the frame is well supported, and that the motorcycle will not fall over when the pivot shaft is removed.**

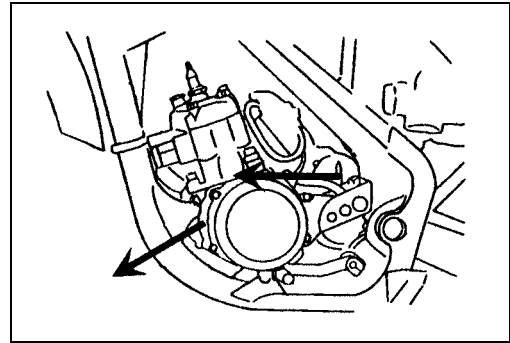
- Pull out the swingarm pivot shaft [C] halfway so that the engine is free.



## 6-4 ENGINE REMOVAL/INSTALLATION

### Engine Removal/Installation

- Move the engine forward and remove it from the vehicle right or left side.



#### *Installation*

- Engine installation is the reverse of removal.
- Torque:
  - Torque - Swingarm Pivot Shaft Nut: 69 N·m (7.0 kgf·m, 51 ft·lb)**
  - Engine Mounting Bracket Nuts: 29 N·m (3.0 kgf·m, 22 ft·lb)**
  - Engine Mounting Nuts: 29 N·m (3.0 kgf·m, 22 ft·lb)**
- To install parts removed, refer to the appropriate chapters.
- Run the wires, cables, and hoses as shown in the Cable, Wire and Hose Routing section of the General Information chapter.
- Adjust the following.
  - Clutch Cable (see Engine Right Side chapter)
  - Throttle Cable (see Fuel System chapter)
  - Drive Chain (see Final Drive chapter)
- Fill the engine with coolant (see Cooling System chapter).
- Fill the engine with engine oil (see Engine Bottom End/Transmission chapter).
- Adjust the carburetor idling.

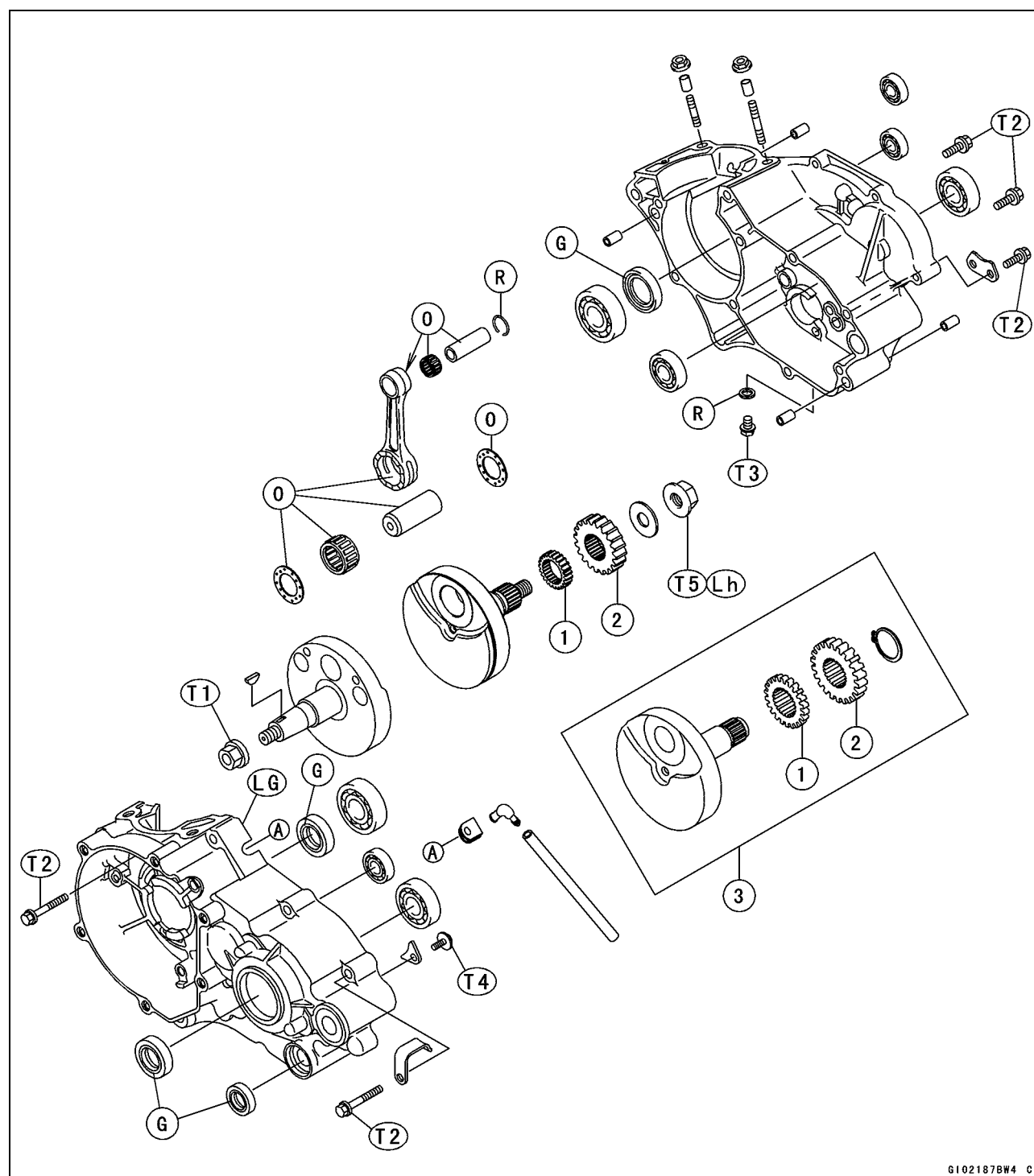
# Engine Bottom End/Transmission

## Table of Contents

Exploded View .....	7-2
Specifications .....	7-4
Transmission Oil .....	7-5
Oil Level Inspection.....	7-5
Engine Oil Change.....	7-5
Crankcase .....	7-7
Crankcase Splitting .....	7-7
Crankcase Disassembly .....	7-7
Crankcase Assembly .....	7-8
Crankshaft, Connecting Rod .....	7-10
Crankshaft Removal .....	7-10
Crankshaft Installation .....	7-10
Crankshaft Disassembly .....	7-10
Crankshaft Assembly .....	7-10
Big End Seizure Inspection.....	7-10
Crankshaft Bearing Inspection.....	7-10
Connecting Rod Big End Radial Clearance Inspection.....	7-11
Connecting Rod Big End Side Clearance Inspection.....	7-11
Crankshaft Runout Inspection.....	7-11
Crankshaft Alignment Inspection .....	7-12
Transmission .....	7-13
Transmission Shaft Removal .....	7-13
Transmission Shaft Installation .....	7-13
Transmission Shaft Disassembly .....	7-13
Transmission Shaft Assembly.....	7-13
Shift Fork Bending Inspection .....	7-14
Shift Fork/Gear Groove Wear Installation .....	7-15
Shift Fork Guide Pin/Shift Drum Groove Wear Inspection .....	7-15
Gear Dog/Gear Dog Hole Damage Inspection .....	7-15
Ball Bearing Wear Inspection.....	7-15

## 7-2 ENGINE BOTTOM END/TRANSMISSION

### Exploded View

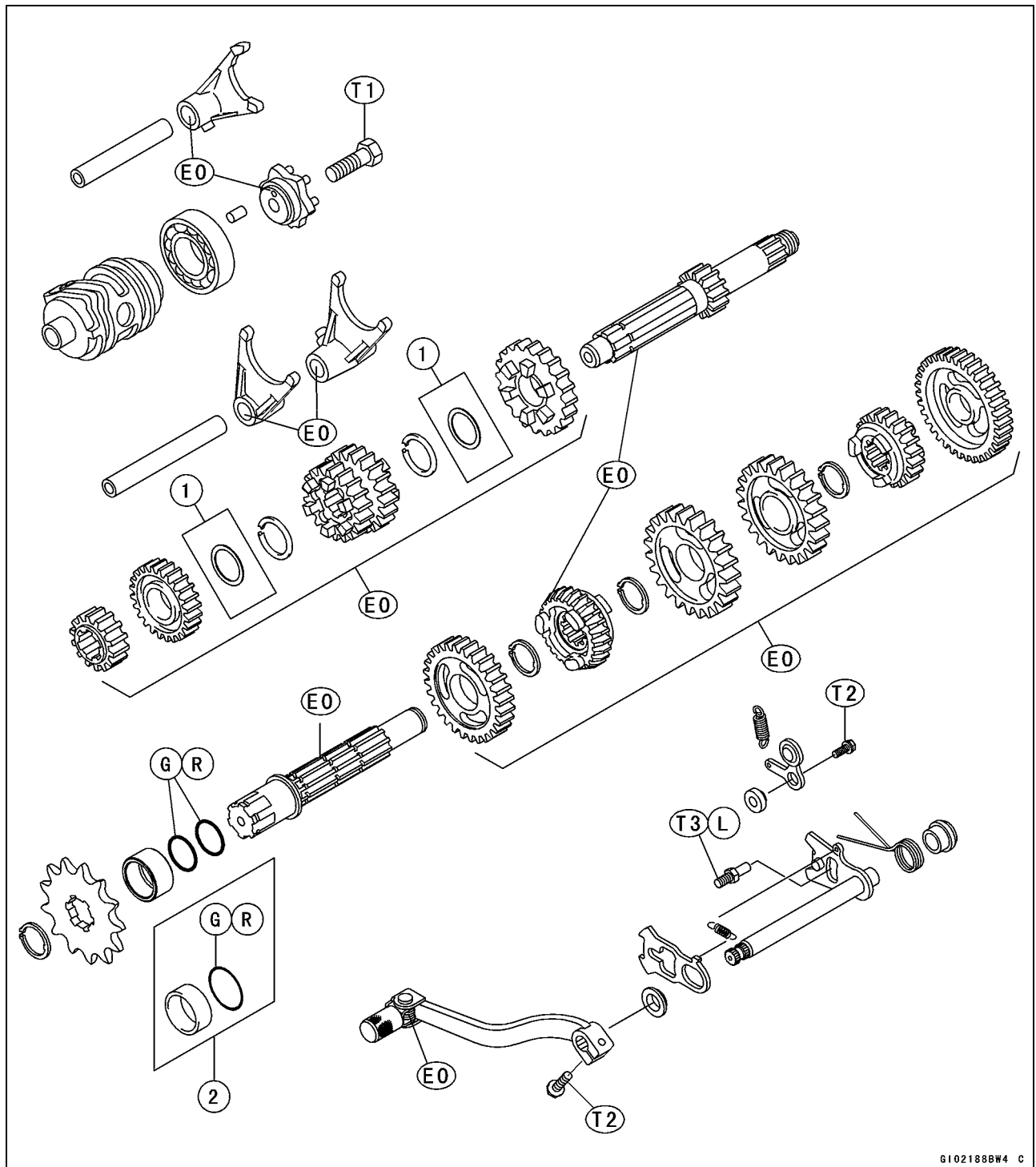


G1021878W4 C

- 1. Water Pump Gear
- 2. Primary Gear
- 3. KX85-A1 ~ A5, B1 ~ B5/KX100-D1 ~ D5
- T1: 29 N·m (3.0 kgf·m, 22 ft·lb)
- T2: 8.8 N·m (0.90 kgf·m, 78 in·lb)
- T3: 15 N·m (1.5 kgf·m, 11 in·lb)
- T4: 5.4 N·m (0.55 kgf·m, 48 in·lb)
- T5: 49 N·m (5.0 kgf·m, 36 ft·lb)

- G: Apply grease
- LG: Apply liquid gasket (Kawasaki Bond: 92104-002).
- Lh: Left-hand threads
- O: Apply 2-stroke racing oil.
- R: Replacement Parts

## Exploded View



G102188BW4 C

1: KX85-A2 ~/B2 ~, KX100-D2 ~  
2: KX85-A1 ~ A4/B1 ~ B4, KX100-D1 ~ D4

T1: 23 N·m (2.3 kgf·m, 16.5 ft·lb)  
T2: 8.8 N·m (0.90 kgf·m, 78 in·lb)  
T3: 22 N·m (2.2 kgf·m, 16 ft·lb)  
G: Apply grease.  
L: Apply a non-permanent locking agent.  
R: Replacement parts  
EO: Apply engine oil.

## 7-4 ENGINE BOTTOM END/TRANSMISSION

### Specifications

Item	Standard	Service Limit
<b>Transmission Oil</b>		
Engine Oil:		
Grade	API SE SF or SG API SH, SJ or SL with JASO MA	— — —
Viscosity	SAE10W-40	— — —
Oil Level	In middle of level gauge	— — —
Capacity	0.65 L (KX85-A1 ~ A3/B1 ~ B3, KX100-D1 ~ D3) 0.70 L (KX85-A4 ~/B4 ~, KX100-D4 ~)	— — —
<b>Crankshaft, Connecting Rod</b>		
Connecting Rod Big End Radial Clearance	0.023 ~ 0.035 mm	0.08 mm
Connecting Rod Big End Side Clearance	0.35 ~ 0.45 mm	0.7 mm
Crankshaft Runout	TIR 0.03 mm or less	TIR 0.08 mm
<b>Transmission</b>		
Shift Fork Ear Thickness	3.9 ~ 4.0 mm	3.8 mm
Gear Shift Fork Groove Width	4.05 ~ 4.15 mm	4.3 mm
Shift Fork Guide Pin Diameter	5.9 ~ 6.0 mm	5.8 mm
Shift Drum Groove Width	6.05 ~ 6.20 mm	6.3 mm

**Special Tools - Bearing Puller Adapter: 57001-136**

**Outside Circlip Pliers: 57001-144**

**Bearing Puller: 57001-158**

**Crankcase Splitting Tool Assembly: 57001-1098**

**Bearing Driver Set: 57001-1129**

**Crankshaft Jig: 57001-1174**

**Sealant - Kawasaki Bond (Liquid Gasket-Silver): 92104-002**



## Transmission Oil

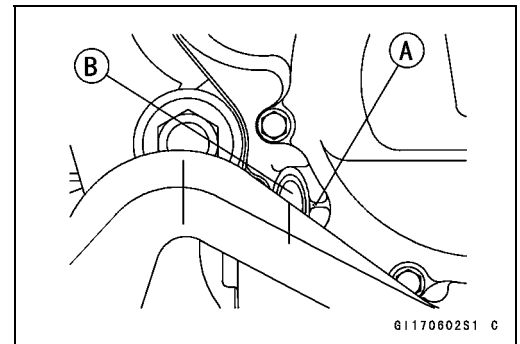
In order for the transmission and clutch to function properly, always maintain the transmission oil at the proper level and change the oil periodically.

### **⚠ WARNING**

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

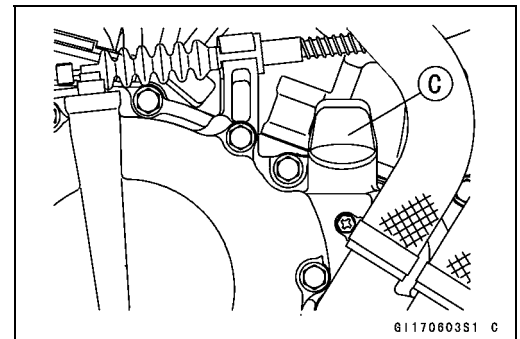
### *Oil Level Inspection*

- Situate the motorcycle so that it is perpendicular to the ground.
- If the motorcycle has just been used, wait several minutes until the oil settles.
- Check that the oil level comes up in the middle [A] of the oil level gauge [B] on the right engine cover.
- ★ If the oil level is too high, remove the excess oil through the oil filler opening [C] using a syringe or some other suitable device.
- ★ If the oil level is too low, add the correct amount of oil. 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 up the level in preference to running the engine with the oil level low. Then at your earliest convenience, change the oil completely.

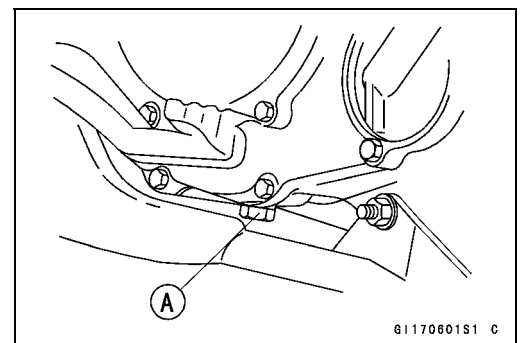


### *Engine Oil Change*

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

### **NOTE**

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



## 7-6 ENGINE BOTTOM END/TRANSMISSION

### Transmission Oil

- Check the gasket at the engine drain plug for damage.
- ★ Replace the gasket with a new one if it is damaged.
- ★ After the oil has completely drained out, install the engine drain plug with the gasket, and tighten it to the specified torque.

**Torque - Engine Oil Drain Plug: 15 N·m (1.5 kgf·m, 11 ft·lb)**

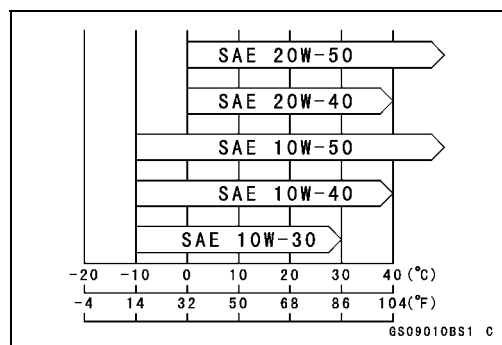
- Fill the engine with a good quality motor oil specified in the table.
- Check the oil level.

#### Recommended Engine Oil

	KX85A1 ~ A3/B1 ~ B3, KX100-D1 ~ D3	KX85-A4 ~/B4 ~ KX100-D4 ~
Engine Oil: Grade	API SE, SF or SG API SH, SJ or SL with JASO MA	←
Viscosity	SAE 10W-40	←
Capacity	0.65 L (0.69 US qt)	0.70 L (0.74 US qt)

#### NOTE

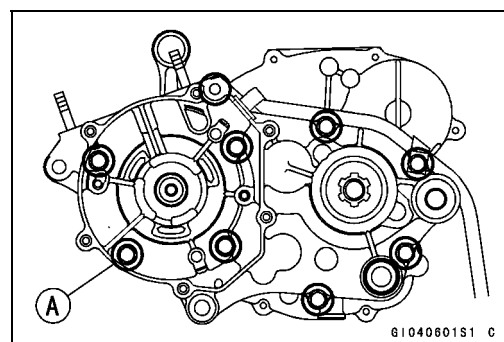
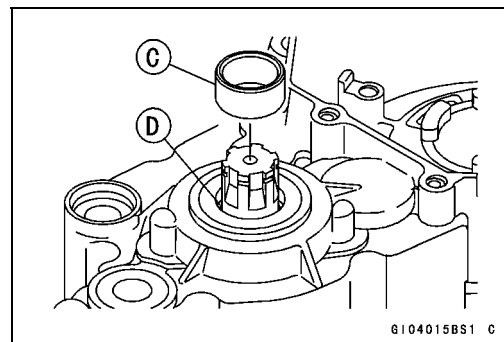
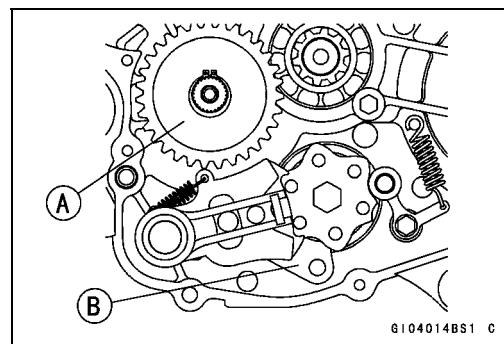
- Although 10W-40 engine oil is the recommended oil for most conditions, the oil viscosity may need to be changed to accommodate atmospheric conditions in your riding area.



## Crankcase

### Crankcase Splitting

- The following parts may be removed with the engine in the frame.  
Clutch (see Engine Right Side chapter)  
Magneto Flywheel and Stator (see Electrical System chapter))
- Remove the engine (see the Engine Removal/Installation chapter).
- Set the engine on a clean surface while parts are being removed.
- Remove the following parts from the engine:  
Cylinder Head (see Engine Top End chapter)  
Cylinder (see Engine Top End chapter)  
Piston  
Primary Gear (see Engine Right Side chapter)  
Kickstarter Assembly (see Engine Right Side chapter)  
Kickstarter Idle Gear [A]  
Gear Set Lever  
Shift Drum Plate [B]  
Output Shaft Sleeve [C] and O-ring [D]
- Replace the O-ring on the output shaft with a new one.
- Remove the crankcase bolts [A].

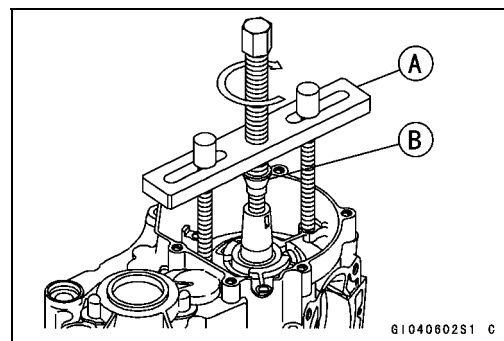


- Install the crankcase splitting tool and adapter into the left side of the crankcase. Be certain to screw the tool in all the way.

**Special Tools - Crankcase Splitting Tool Assembly: 57001-1098 [A]**

**Bearing Puller Adapter: 57001-136 [B]**

- Tighten the bolt on the crankcase splitting tool to split the crankcase halves.
- Once the crankcase is split, remove the crankcase splitting tool, and lift off the left crankcase.
- Remove the transmission shaft (see Transmission Shaft Removal).
- Remove the crankshaft from the right crankcase half using a press.



### Crankcase Disassembly

#### CAUTION

**Do not remove the bearings and the oil seals unless it is necessary.  
Removal may damage them.**

## 7-8 ENGINE BOTTOM END/TRANSMISSION

### Crankcase

#### Crankcase Assembly

##### CAUTION

**Right and left crankcase halves are machined at the factory in the assembled state, so they must be re-placed together as a set.**

- Chip off the old gasket from the mating surfaces of the crankcase halves, and clean off the crankcase with a high flash-point solvent. After cleaning, apply engine oil to the transmission gears, shift drum, shift forks and bearings.
- Be sure to replace any oil seal removed with a new one. Press in the new oil seal using a press and suitable tools so that the seal surface is flush with the surface of the crankcase.
- Apply high temperature grease to the oil seal lips.
- Press in the ball bearings using the bearing driver set until the bearing is bottomed.

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

- ★ If the crankshaft bearings stay on the crankshaft when splitting the crankcase, remove the bearings from the crankshaft and reinstall them in the crankcase as follows.
- Remove the bearings from the crankshaft with a bearing puller.

**Special Tools - Bearing Puller Adapter: 57001-136 [B]  
Bearing Puller: 57001-158 [A]**

- Discard the bearing that is removed from the crankshaft.
- Position the crankcase half so that the main bearing housing is seated on a suitable press fixture.
- Press each crankshaft bearing [B] until it bottoms out using a bearing driver [A] from the driver set which contacts the bearing outer race.

**Special Tool - Bearing Driver Set: 57001-1129 [A]**

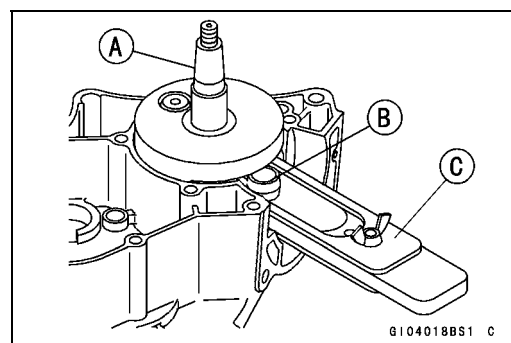
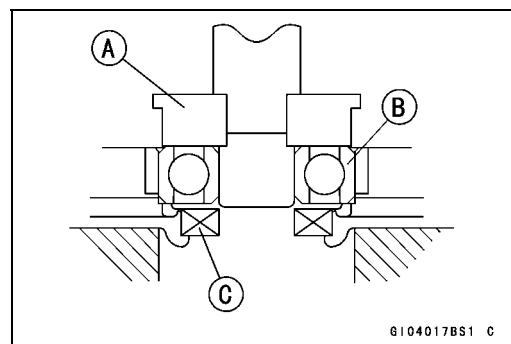
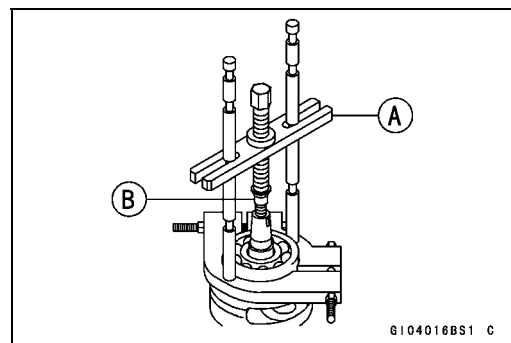
- Install the crankshaft bearing so that the ball retainer side faces in (to the oil seal [C] side).

- Turn the crankshaft to BDC, and install the crankshaft jig between the crankshaft flywheels to protect flywheel alignment and press the crankshaft into the right crankcase half.

**Special Tool - Crankshaft Jig: 57001-1174**

- Install the transmission shaft (see Transmission Shaft Installation).
- Check to see that the crankcase knock pins are in place on the right crankcase half. If any of them has been removed, replace it with a new one.
- Apply liquid gasket to the mating surface of the left crankcase half.

**Sealant - Kawasaki Bond (Liquid Gasket - Silver): 92104-002**



### Crankcase

- The crankshaft jig must be installed between the flywheel opposite the connecting rod big end with the crankshaft at BDC. This is to protect flywheel alignment
  - [A] Crankshaft
  - [B] Connecting Rod
  - [C] Crankshaft Jig: 57001-1174
- Using a suitable tool on the left crankcase to press around the hole for the crankshaft, fit the crankcase halves together with a press on the tool.
  - [A] Press
  - [B] Connecting Rod
  - [C] Crankshaft Jig

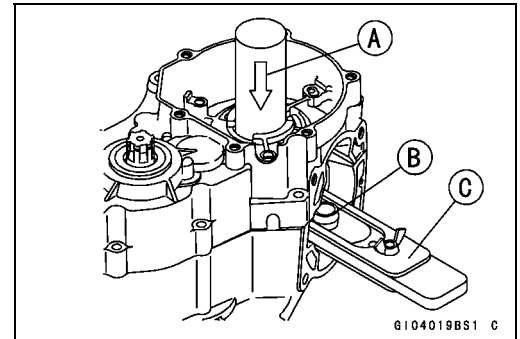
#### NOTE

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

- Remove the crankshaft jig from the flywheel.
- Tighten the crankcase bolts to the specified torque starting with the ones around the crankshaft, and then the farther ones.

**Torque - Crankcase Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)**

- Check to see that the crankshaft, drive shaft, and output shaft all turn freely (in the neutral position).
- ★ If the crankshaft will not turn, probably the crankshaft is not centered; tap the appropriate end of the crankshaft with a mallet to reposition it.
- Spinning the output shaft, shift the transmission through all the gears to make certain there is no binding and that all the gears shift properly.
- Assemble the engine.
- Install:
  - Clutch (see Engine Right Side chapter)
  - Magneto Fly Wheel and Stator (see Electrical System chapter)
  - Engine (see Engine Removal/Installation chapter)



## 7-10 ENGINE BOTTOM END/TRANSMISSION

### Crankshaft, Connecting Rod

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#### *Crankshaft Removal*

- See Crankcase Splitting.

#### *Crankshaft Installation*

- See crankcase Assembly.

#### *Crankshaft Disassembly*

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

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

#### *Crankshaft Assembly*

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

- Check that the connecting rod radial clearance is within specification (see Connecting Rod Big End Radial Clearance Inspection).
- Press the crank halves onto the crankpin until the connecting rod side clearance is within specification (see Connecting Rod Big End Side Clearance Inspection).
- Adjust crankshaft runout until it is within specification (see Crankshaft Runout Inspection).

#### *Big End Seizure Inspection*

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

#### *Crankshaft Bearing Inspection*

Since the ball bearings are made to extremely close tolerances, the wear must be judged by feel rather than measurement.

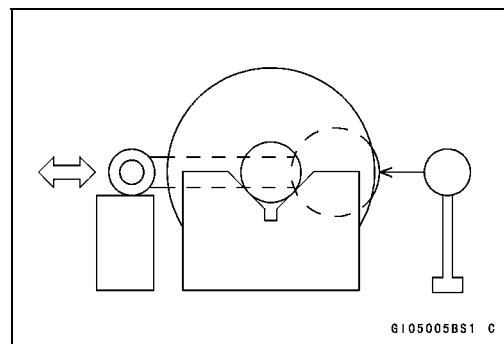
- Remove the following.
  - Piston (see Engine Top End chapter)
  - Primary Gear (see Engine Right Side chapter)
- Turn the crankshaft, using the connecting rod.
- ★ If the bearings are noisy, do not spin smoothly, or have any rough spots, replace them.

**Torque - Primary Gear Nut: 49 N·m (5.0 kgf·m, 36 ft·lb)**

## Crankshaft, Connecting Rod

### Connecting Rod Big End Radial Clearance Inspection

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



### Connecting Rod Big End Radial Clearance

**Standard:** 0.029 ~ 0.041 mm (0.0011 ~ 0.0016 in.)

**Service Limit:** 0.09 mm (0.0035 in.)

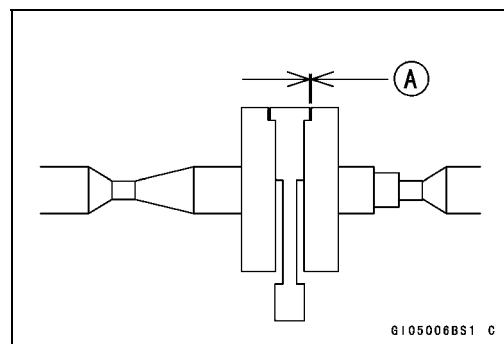
### Connecting Rod Big End Side Clearance Inspection

- Set the crankshaft on V blocks.
- Measure the side clearance [A] of the connecting rod with a thickness gauge.
- ★ If the clearance exceeds the service limit, replace the crankshaft.

### Connecting Rod Big End Side Clearance

**Standard:** 0.40 ~ 0.50 mm (0.016 ~ 0.20 in.)

**Service Limit:** 0.7 mm (0.028 in.)



### Crankshaft Runout Inspection

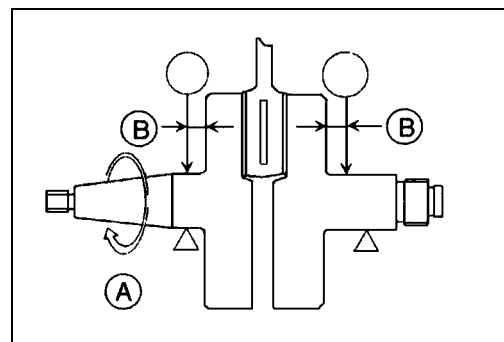
- Set the crankshaft on V blocks, and place a dial gauge against the points indicated.
- Turn the crankshaft slowly. The maximum difference in gauge readings is the crankshaft runout.

### Crankshaft Runout

**Standard:** TIR 0.03 mm (0.0012 in.) or less

**Service Limit:** TIR 0.08 mm (0.0031 in.)

**[B] 7.5 mm (0.30 in.)**



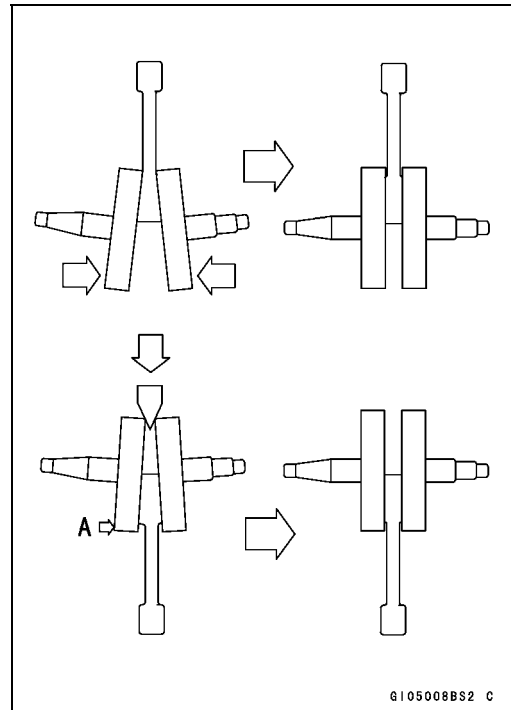
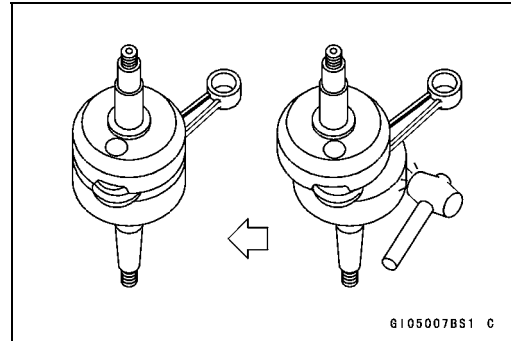
## 7-12 ENGINE BOTTOM END/TRANSMISSION

### Crankshaft, Connecting Rod

#### *Crankshaft Alignment Inspection*

- ★ If the runout at either point exceeds the service limit, align the flywheels so that the runout falls within the service limit.
- In the case of horizontal misalignment, which is the most common, strike the projecting rim of the flywheel with a plastic, soft lead, or brass hammer as indicated in the figure.
- Recheck the runout with a dial gauge, repeating the process until the runout falls within the service limit.
- Vertical misalignment is corrected either by driving a wedge in between the flywheels or by squeezing the flywheel rims in a vise, depending on the nature of the misalignment. In cases of both horizontal and vertical misalignment, correct the horizontal misalignment first.
- ★ If flywheel misalignment cannot be corrected by the above method, replace the crankpin or the crankshaft itself.

<b>CAUTION</b>
<b>Don't hammer the flywheel at point "A".</b>

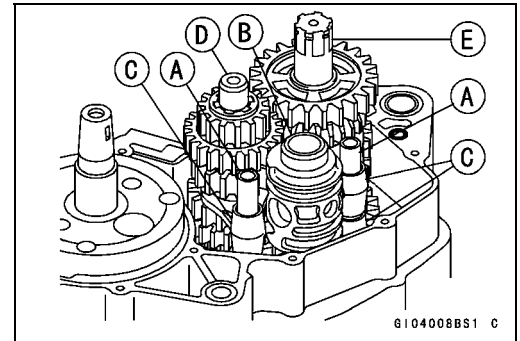




## Transmission

### Transmission Shaft Removal

- Split the crankcase (see Crankcase Splitting).
- Pull off the shift rods [A], and disengage the shift fork guide pins from the shift drum grooves.
- Remove the shift drum [B]
- Remove the shift forks [C] from the transmission gears.
- Take out the drive shaft [D] and output shaft [E] together with their gears meshed.

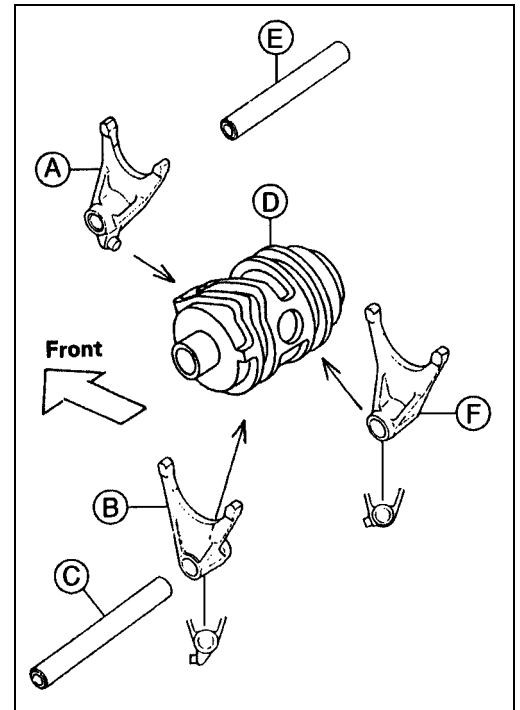


### Transmission Shaft Installation

- Set the transmission shafts, shift drum, and shift forks together, and fit them into the right crankcase half.
  - Apply transmission oil liberally to the transmission gears, bearings, shaft journals, and shift fork fingers.
  - Fit each shift fork into the groove of the proper gear so that the shift fork guide pin is in the proper groove on the shift drum.
- [A] Shorter Shift Fork (Drive Shaft)  
 [B] Left Shift Fork (Output Shaft)  
 [C] Longer Shift Rod (Output Shaft)  
 [D] Shift Drum  
 [E] Shorter Shift Rod (Drive Shaft)  
 [F] Right Shift Fork (Output Shaft)
- Apply small amount of engine oil to the shift rods, and install the rods.

**Torque - Output Shaft Bearing Retaining Screws: 5.4 N·m (0.55 kgf·m, 48 in·lb)**

**Drive Shaft Bearing Retaining Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)**



### NOTE

○ Be careful not to confuse the shift forks, or the shift rods.

- Assemble the crankcase (see Crankcase Assembly).

### Transmission Shaft Disassembly

- Remove the transmission shafts (see Transmission Shaft Removal).
- Using the outside circlip pliers, remove the circlips and disassemble the transmission shafts completely.

**Special Tools - Outside Circlip Pliers: 57001-144**

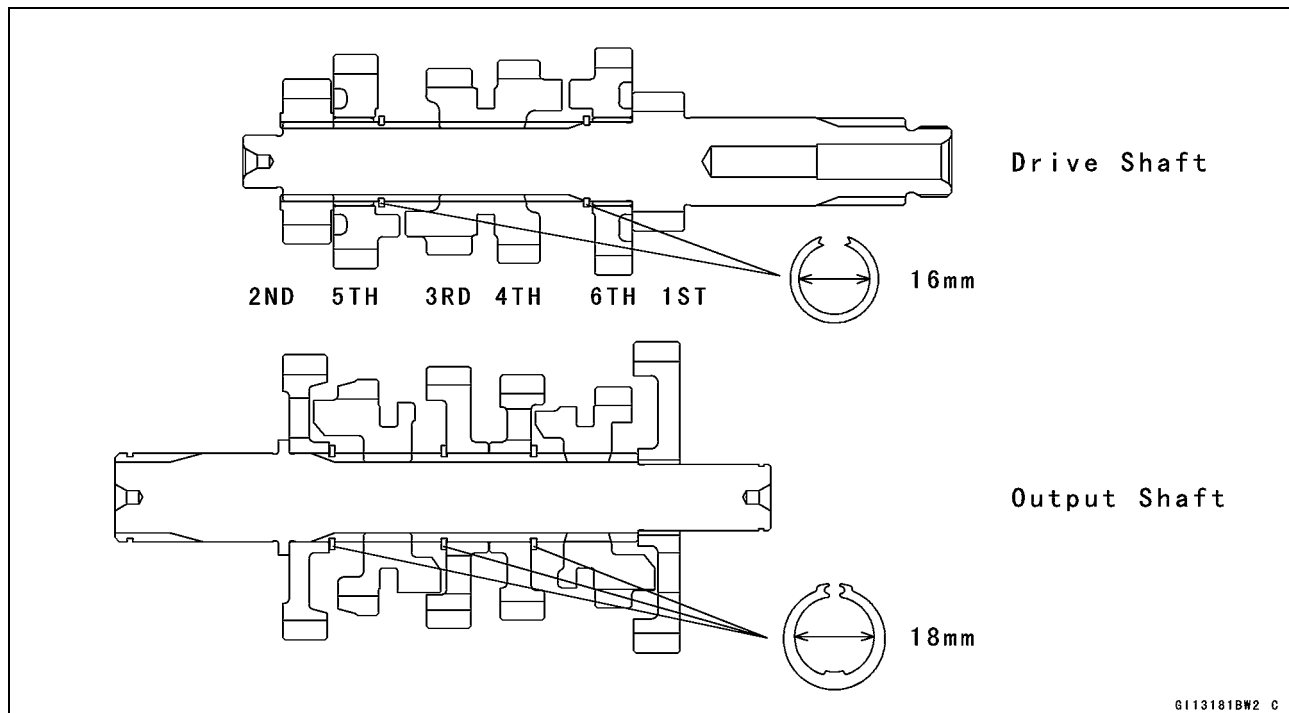
### Transmission Shaft Assembly

- Apply engine oil liberally to the transmission shaft, gears and bearings.
- Install a new circlip on the drive shaft so that opening coincides with one of the spline grooves in the shaft.
- Be careful not to install the gears backwards.
- The 2nd drive gear shall be installed so that the circle of identification groove face to outward (KX85-A1 ~ A4/B1 ~ B4, KX100-D1 ~ D4).
- ★ If the first gear on the output shaft is a new one, apply molybdenum disulfide grease to the internal diameter.

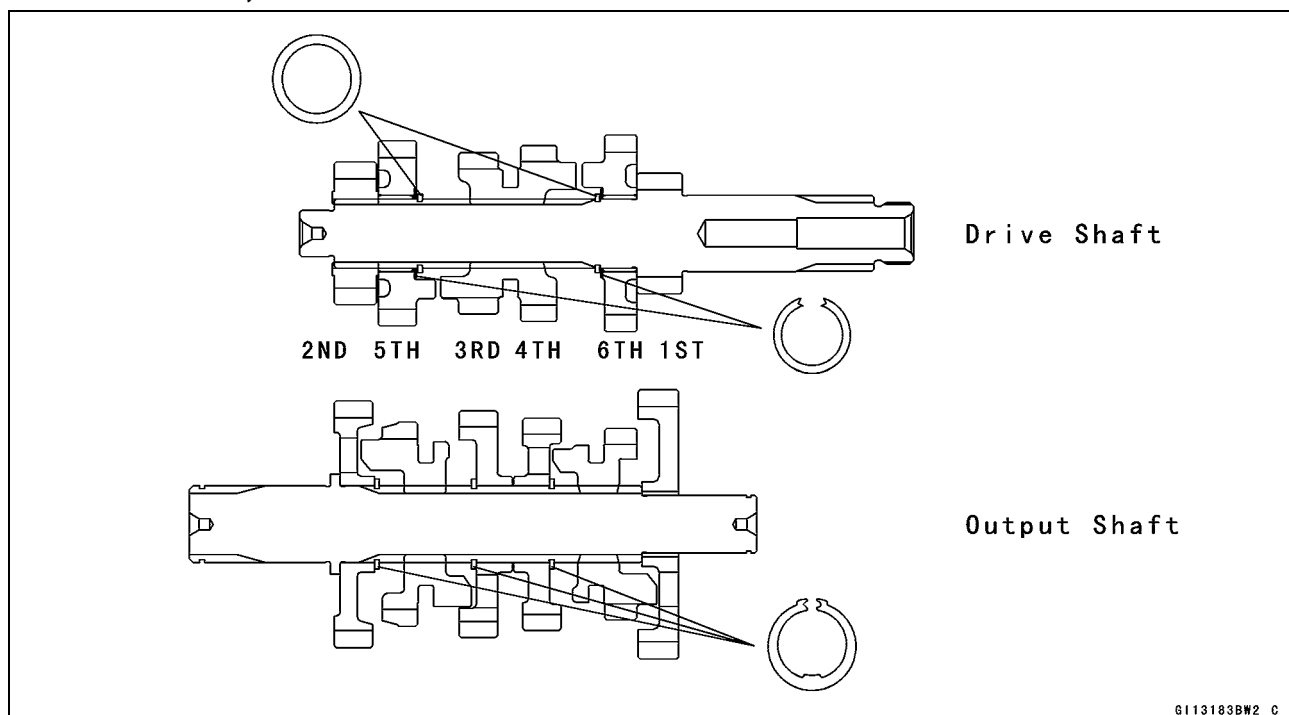
## 7-14 ENGINE BOTTOM END/TRANSMISSION

### Transmission

#### KX85-A1/B1, KX100-D1

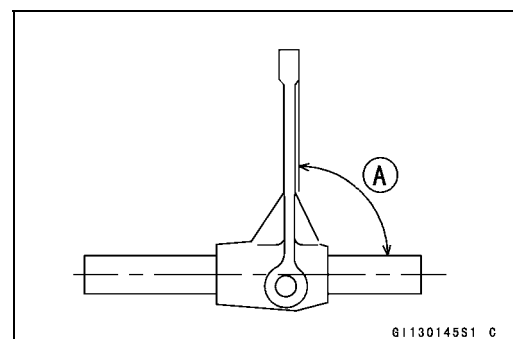


#### KX85-A2 ~/B2 ~, KX100-D2 ~



#### 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 when under power.  
[A] 90°



## Transmission

### Shift Fork/Gear Groove Wear Installation

- Measure the thickness of the shift fork ears [A], and measure the width of the shift fork grooves [B] in the transmission gears.
- ★ If the thickness of a shift fork finger is less than the service limit, the shift fork must be replaced.

#### Shift Fork Finger Thickness

**Standard:** 3.9 ~ 4.0 mm (0.154 ~ 0.157 in.)

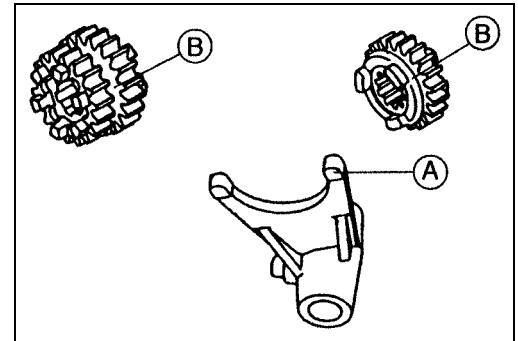
**Service Limit:** 3.8 mm (0.150 in.)

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

#### Gear Shift Fork Groove Width

**Standard:** 4.05 ~ 4.15 mm (0.159 ~ 0.163 in.)

**Service Limit:** 4.3 mm (0.169 in.)



### Shift Fork Guide Pin/Shift Drum Groove Wear Inspection

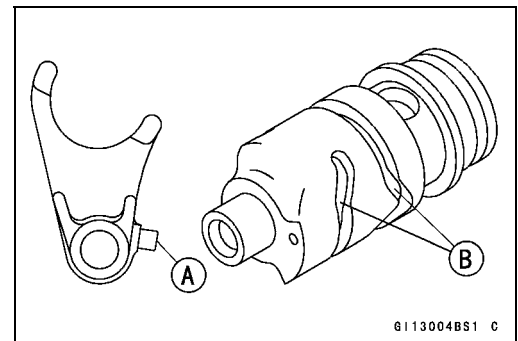
- Measure the diameter of each shift fork guide pin [A], and measure the width of each shift drum groove [B].
- ★ If the guide pin on any shift fork is less than the service limit, the fork must be replaced.

#### Shift Fork Guide Pin Diameter

**Standard:** 5.9 ~ 6.0 mm (0.232 ~ 0.236 in.)

**Service Limit:** 5.8 mm (0.228 in.)

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



6113004BS1 C

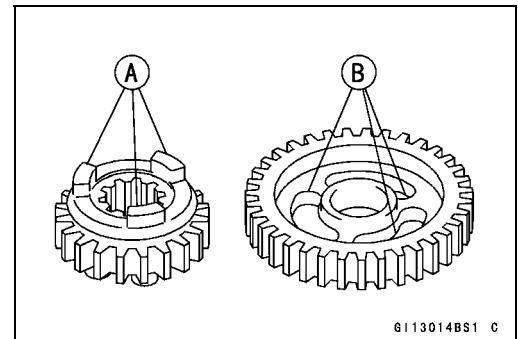
#### Shift Drum Groove Width

**Standard:** 6.05 ~ 6.20 mm (0.238 ~ 0.244 in.)

**Service Limit:** 6.3 mm (0.248 in.)

### Gear Dog/Gear Dog Hole Damage Inspection

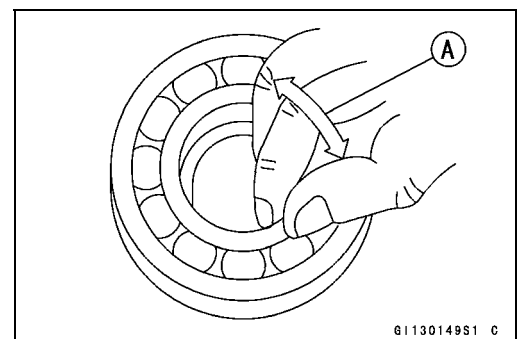
- Visually inspect the gear dogs [A] and gear dog holes [B].
- ★ Replace any damaged gears or gears with excessively worn dogs or dog holes.



6113014BS1 C

### Ball Bearing Wear Inspection

- Check the ball bearing on the crankcase.
- Since the ball bearings are made to extremely close tolerances, the wear must be judged by feel rather than measurement.
- Oil the bearing with transmission oil and spin [A] it by hand to check its condition.
- ★ If the bearing is noisy, does not spin smoothly, or has any rough spots, replace it.



6113014BS1 C



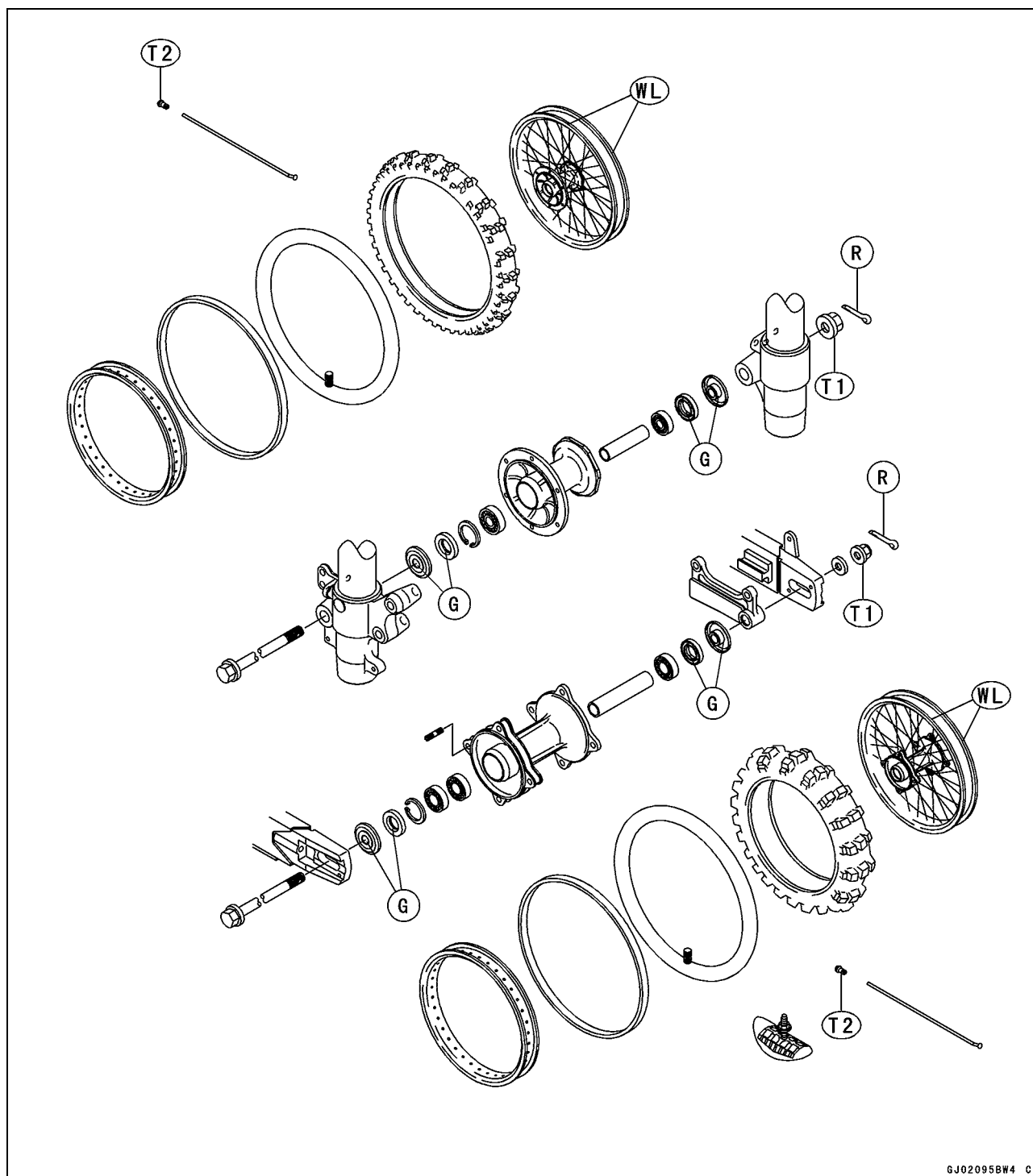
# Wheels/Tires

## Table of Contents

Exploded View .....	8-2
Specifications .....	8-3
Wheels (Rims) .....	8-5
Front Wheel Removal .....	8-5
Front Wheel Installation .....	8-5
Rear Wheel Removal .....	8-5
Rear Wheel Installation .....	8-6
Wheels Inspection .....	8-7
Spoke Inspection .....	8-7
Rim Inspection .....	8-7
Axle Inspection .....	8-7
Tires .....	8-8
Removal .....	8-8
Installation .....	8-9
Air Pressure Inspection/Adjustment .....	8-9
Inspection .....	8-10
Hub Bearing (Wheel Bearings) .....	8-11
Removal .....	8-11
Installation .....	8-11
Inspection .....	8-11
Lubrication .....	8-11

## 8-2 WHEELS/TIRES

### Exploded View



T1: 79 N·m (8.1 kgf·m, 58 ft·lb)

T2: 1.5 ~ 3.0 N·m (0.15 ~ 0.31 kgf·m, 13 ~ 27 in·lb)

G: Apply grease.

WL: Apply soap and water solution, or rubber lubricant.

**Specifications**

Item	Standard		Service Limit
<b>Wheels</b>			
Rim Runout (with tire installed):			
Axial/Radial	TIR 1.0 mm (0.04 in.) or less		TIR 2 mm (0.08 in.)
Axle Runout/100 mm (3.94 in.):	TIR 0.10 mm (0.004 in.) or less		TIR 0.2 mm (0.008 in.)
<b>Tires Air Pressure</b>			
Front and Rear	98 kPa (1.0 kgf/cm <sup>2</sup> , 14 psi)		- - -
<b>Standard Tires/Rims</b>			
<b>KX85A</b>	A1 ~ A5	A6F ~	
Front:	70/100-17 40M DUNLOP D737F DUNLOP D752F (EU)	← DUNLOP D756F	
Size			
Make, Type			
Rear:			
Size	90/100-14 49M DUNLOP D737 DUNLOP D752 (EU)	← DUNLOP D756	
Make, Type			
Rim Size:			
Front			
Rear	17 × 1.40	←	
	14 × 1.60	←	
<b>KX85B</b>	B1 ~ B4	B5	B6F ~
Front:	70/100-19 70/100-19 42M (EU) BRIDGESTONE M61 DUNLOP D752F (EU)	70/100-19 42M  BRIDGESTONE M401 ←	←  ← DUNLOP D756F (EU)
Size			
Make, Type			
Rear:			
Size	90/100-16 90/100-16 52M (EU) BRIDGESTONE M58 DUNLOP D752 (EU)	90/100-16 52M  BRIDGESTONE M402 ←	←  ← DUNLOP D756 (EU)
Make, Type			
Rim Size:			
Front			
Rear	19 × 1.40	←	←
	16 × 1.85	←	←
<b>KX100D</b>	D1 ~ D4	D5, D6F ~	
Front:	70/100-19 70/100-19 42M (EU) BRIDGESTONE M61 DUNLOP D752F (EU)	70/100-19 42M  BRIDGESTONE M401	
Size			
Make, Type			
Rear:			
Size	90/100-16 90/100-16 52M (EU) BRIDGESTONE M58 DUNLOP D752 (EU)	90/100-16 52M  BRIDGESTONE M402	
Make, Type			

## 8-4 WHEELS/TIRES

### Specifications

Item	Standard		Service Limit
Rim Size:	D1 ~ D4	D5, D6F ~	
Front	19 × 1.40	←	
Rear	16 × 1.85	←	

(EU) Europe Model

### WARNING

**Use the same manufacturer's tires on both front and rear wheels.**

**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 Shaft  $\phi 9$ : 57001-1265**

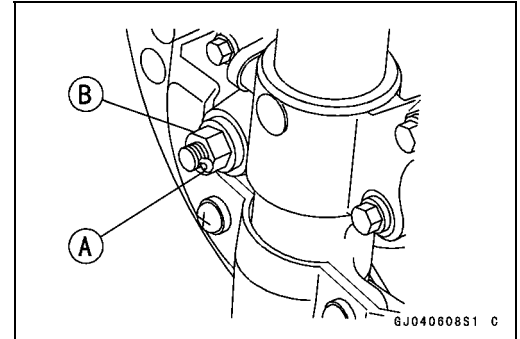
**Bearing Remover Head  $\phi 10 \times \phi 12$ : 57001-1266**



## Wheels (Rims)

### Front Wheel Removal

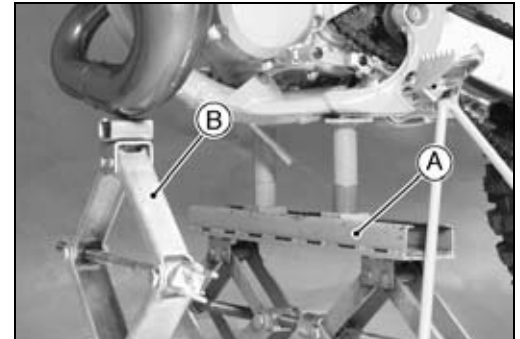
- Remove the following.  
Cotter Pin [A]  
Axle Nut [B]



- Using the jack [A] and a stand [B], raise the front wheel off the ground.

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

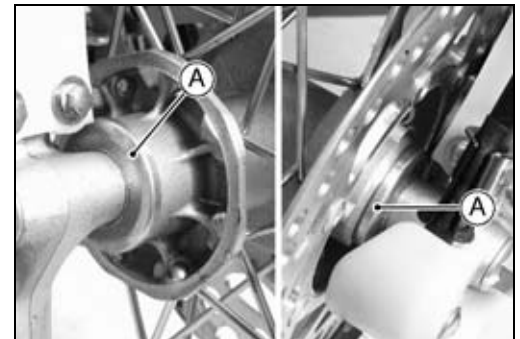
- Insert a wood wedge between the disc brake pads. This prevents them from being moved out of their proper position, should the brake lever be squeezed accidentally.

### Front Wheel Installation

- Installation is the reverse of removal. Note the following.
- Apply grease to the seals.
- Install the collars [A] on both sides of the hub.
- Tighten the front axle nut to the specified torque.

**Torque - Front Axle Nut: 79 N·m (8.1 kgf·m, 58 ft·lb)**

- Insert a new cotter pin and bend it over the axle.
- Check the front brake.

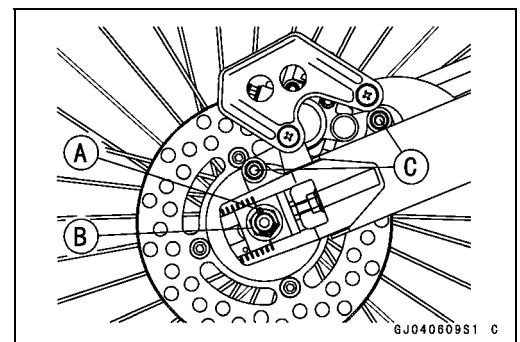


### ⚠ WARNING

**Do not attempt to drive the motorcycle until a full brake lever or pedal 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 following  
Axle Nut Cotter Pin [A]  
Rear Axle Nut [B]  
Caliper Mounting Bolts [C]

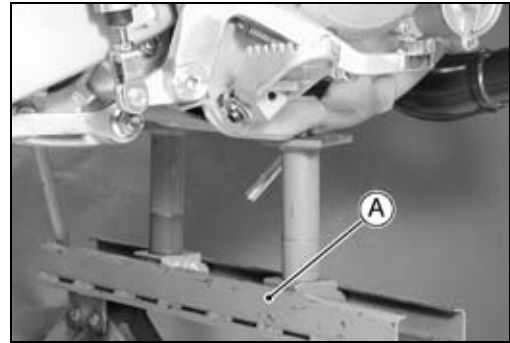


## 8-6 WHEELS/TIRES

### Wheels (Rims)

- Using the jack [A] or a stand, raise the rear wheel off the ground.

Special Tool - Jack: 57001-1238



- Hang the caliper with a brake hose on the swingarm.
- Pull out the axle.
- Move the rear wheel forward a little and free the drive chain from the rear sprocket.
- Move the rear wheel back to remove it.

#### CAUTION

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

- Insert a wood wedge between the brake pads. This prevents them from being moved out of their proper position, should the brake pedal be squeezed accidentally.

#### Rear Wheel Installation

- Installation is the reverse of removal. Note the following.
- Grease the following.
  - Grease Seals
  - Inner Circumference of Caliper Holder

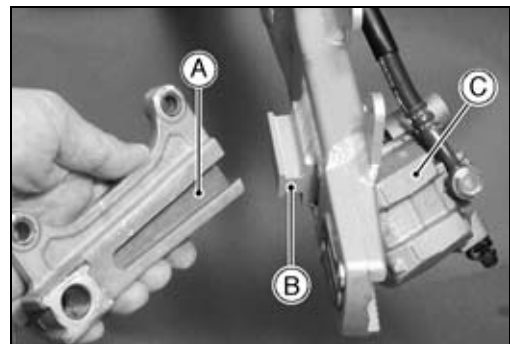
- Slide the groove of the caliper holder [A] through the stop [B] of the swingarm, and install the rear caliper [C] to the holder.

**Torque - Caliper Mounting Bolts (rear): 2.5 N·m (2.5 kgf·m, 18 ft·lb)**

- Adjust the drive chain after installation (see Final Drive chapter).
- Tighten the rear axle nut to the specified torque.

**Torque - Rear Axle Nut: 79 N·m (8.1 kgf·m, 58 ft·lb)**

- Insert a new cotter pin and bend it over the axle.
- Check the rear brake.



#### ⚠ 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.**

## Wheels (Rims)

### Wheels Inspection

- Place a stand or the jack under the frame so that the front/rear wheel is raised off the ground.

**Special Tool - Jack: 57001-1238**

- Spin the wheel lightly, and check for roughness or binding.
- ★ If roughness or binding is found, replace the hub bearings.
- Visually inspect the front and rear axles for damage.
- ★ If the axle is damaged or bent, replace it.

### Spoke Inspection

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

**Torque - Spoke Nipples: 1.5 ~ 3.0 N·m (0.15 ~ 0.31kgf·m, 13 ~ 27 in·lb)**

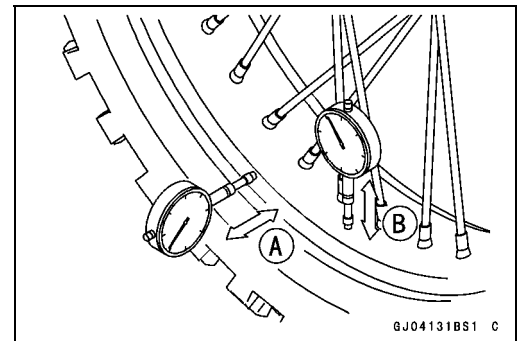
- Check the rim runout (see Rim Inspection).

### ⚠ WARNING

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

### Rim Inspection

- Remove the wheel, and support it with the tire by the axle.
- Measure the rim runout, axial [A] and radial [B], with a dial gauge.
- ★ If the rim runout exceeds the service limit, check the hub bearings. 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 parts of the rim. If the rim is badly bent, however, it must be replaced.



### Rim Runout (with tire Installed)

**Standard:**

**Axial TIR 1.0 mm (0.04 in.) or less**

**Radial TIR 1.0 mm (0.04 in.) or less**

**Service Limit:**

**Axial TIR 2.0 (0.08 in.) mm**

**Radial TIR 2.0 (0.08 in.) mm**

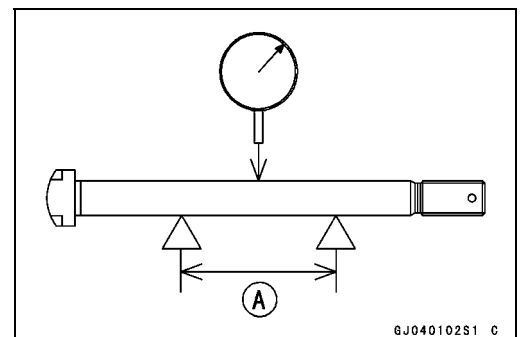
### Axle Inspection

- Place the axle in V blocks that are 100 mm (3.94 in.) [A] apart, and set a dial gauge on the axle at a point halfway between the blocks. Turn the axle to measure the runout. The difference between the highest and lowest dial readings is the amount of runout.
- ★ If the runout exceeds the service limit, replace the axle.

**Axle Runout/100 mm (3.94 in.)**

**Standard: 0.10 mm (0.004 in.) or less**

**Service Limit: 0.2 mm (0.008 in.)**



## 8-8 WHEELS/TIRES

### Tires

#### Removal

- Remove the following.
  - Wheel (see Wheel Removal)
  - Disc

#### CAUTION

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

- To maintain wheel balance, mark [A] the valve stem position on the tire with chalk so that the tire can be reinstalled in the same position.
- Take out the valve core [B] to let out the air.
- Fully loosen the valve stem nut [C] on the rear tire.
- When handling the rim, be careful not to damage the aluminum rim flanges.
- Lubricate the tire beads and rim flanges on both sides with a soap and water solution or rubber lubricant. This helps the tire beads slip off the rim flanges.

#### CAUTION

**Never lubricate with 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**

- Install the rim protectors around the valve stem. Lubricate the tire irons and rim protectors with a soap and water solution, or rubber lubricant.

**Special Tool - Rim Protector: 57001-1063 [B]**

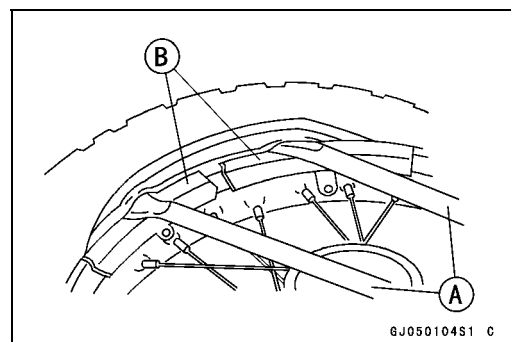
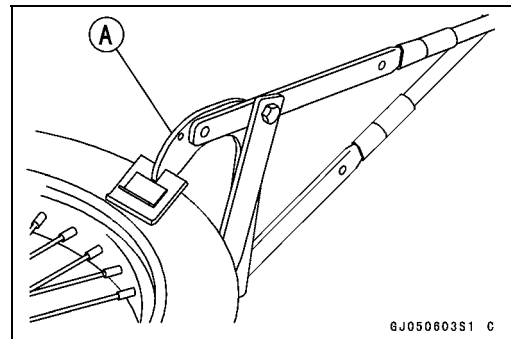
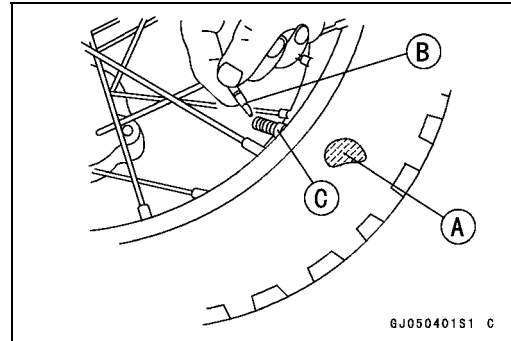
**Bead Breaker Assembly: 57001-1072 [A]**

- Step on the side of the tire opposite the valve stem, and start prying the tire off the rim near the valve stem with tire irons. Take care not to insert the tire irons so deeply that the tube gets damaged.

#### NOTE

○ For easier removal, always position the tire bead opposite the valve stem in the rim well, and pry the tire bead a little at a time.

- Remove the tube when one side of the tire is pried off.
- Pry the tire off the bead protector (rear wheel).
- Pry the other side of the tire off the rim.



## Tires

### Installation

- Inspect the rim and tire, and replace them if necessary.
- Install the tube.
- Apply a soap and water solution, or rubber lubricant to the rim flange and tire beads.
- Position the tire on the rim so that the valve [A] is at the tire balance mark [B] (the chalk mark made during removal, or the yellow paint mark on a new tire. see Removal).
- 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

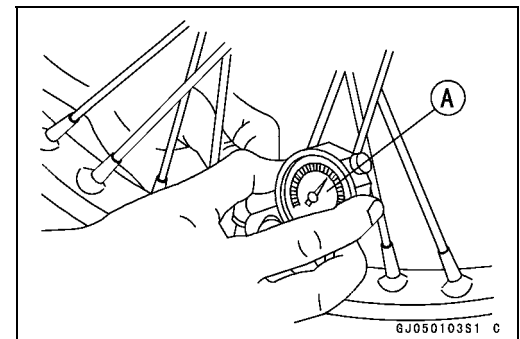
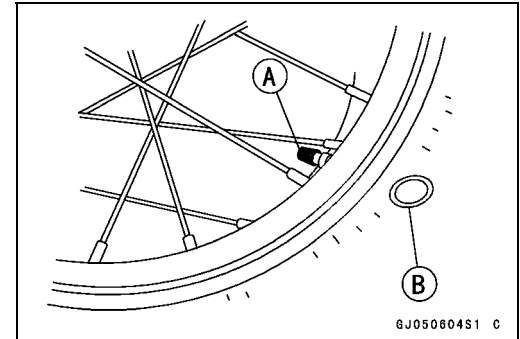
○ To prevent rim damage, be sure to place the rim protectors at any place the tire irons are applied.

- Pry one side of the tire back onto the rim. Fit the bead protector into the tire (rear tire).
- Pry the other side of the tire onto the rim, starting at the side opposite the valve.
- Take care not to insert the tire irons so deeply that the tube is damaged.
- Install the other side of the tire bead onto the rim in the same manner.
- Check that the tube is not pinched between the tire and rim.
- Tighten the bead protector nut (rear wheel) and valve stem nut, and put on the valve cap.
- Check and adjust the air pressure after installing.

### Air Pressure Inspection/Adjustment

- Using tire air pressure gauge [A], measure the tire pressure when the tires are cold.
- ★ Adjust the tire air pressure to suit track conditions and rider preference, but do not stray too far from the recommended pressure.

Track Condition	Tire Pressure
○ When the track is wet, muddy, sandy or slippery, reduce the tire pressure to increase the tire tread surface on the ground.	80 kPa (0.8 kgf/cm <sup>2</sup> , 11 psi)
○ When the track is pebbly or hard, increase the tire pressure to prevent damage or punctures, through the tires will skid more easily.	98 kPa (1.0 kgf/cm <sup>2</sup> , 14 psi)



## 8-10 WHEELS/TIRES

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### Tires

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#### *Inspection*

As the tire tread wears down, the tire becomes more susceptible the puncture and failure.

- Remove any imbedded stones or other foreign particles from the tread.
- Visually inspect the tire for cracks and cuts, replacing the tire in case of bad damage. Swelling or high spots indicate internal damage, requiring tire replacement.

#### **WARNING**

**To ensure safe handling and stability, use only the recommended standard tires (see specifications) for replacement, inflated to the standard pressure.**

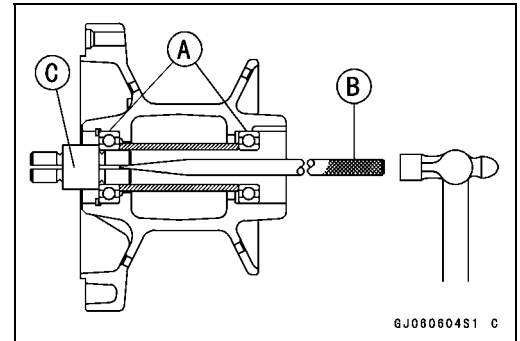
#### **NOTE**

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

# Hub Bearing (Wheel Bearings)

## Removal

- Remove the following.  
Wheel (see Wheel Removal)  
Oil Seals and Circlips
- Use the bearing remover to remove the hub bearings [A].  
**Special Tool - Bearing Remover Shaft,  $\phi 9$ : 57001-1265 [B]**  
**Bearing Remover Head,  $\phi 10 \times \phi 12$ : 57001-1266 [C]**  
**Inside Circlip Pliers: 57001-143**



## CAUTION

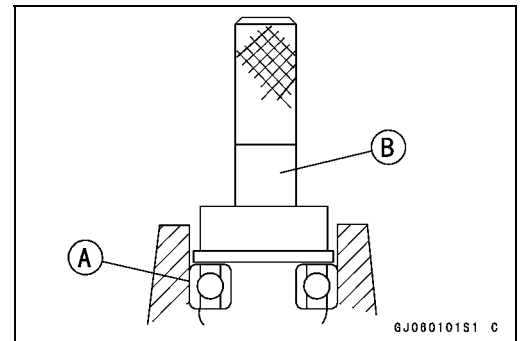
Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so the disc does not touch the ground.

## Installation

- Before installing the wheel bearings, blow any dirt or foreign particles out of the hub with compressed air to prevent contamination of the bearings.
  - Install the bearings [A] by using the bearing driver set [B] which does not contact the bearing inner race.
- Special Tool - Bearing Driver Set: 57001-1129**

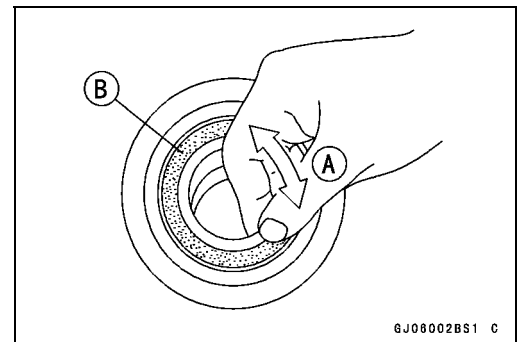
## NOTE

○Install the bearings so that the marked side, or the sealed side faces out.



## Inspection

- Since the hub bearings are made to extremely close tolerances, the clearance cannot normally be measured.
- Turn each bearing back and forth [A] while checking for roughness or binding. If roughness or binding is found, replace the bearing.
  - Examine the bearing seal [B] for damage or leakage.
- ★If the seal is damaged or is leaking, replace the bearing.



## Lubrication

## NOTE

○Since the hub bearings are packed with grease and sealed, they are not required to be removed for lubrication.





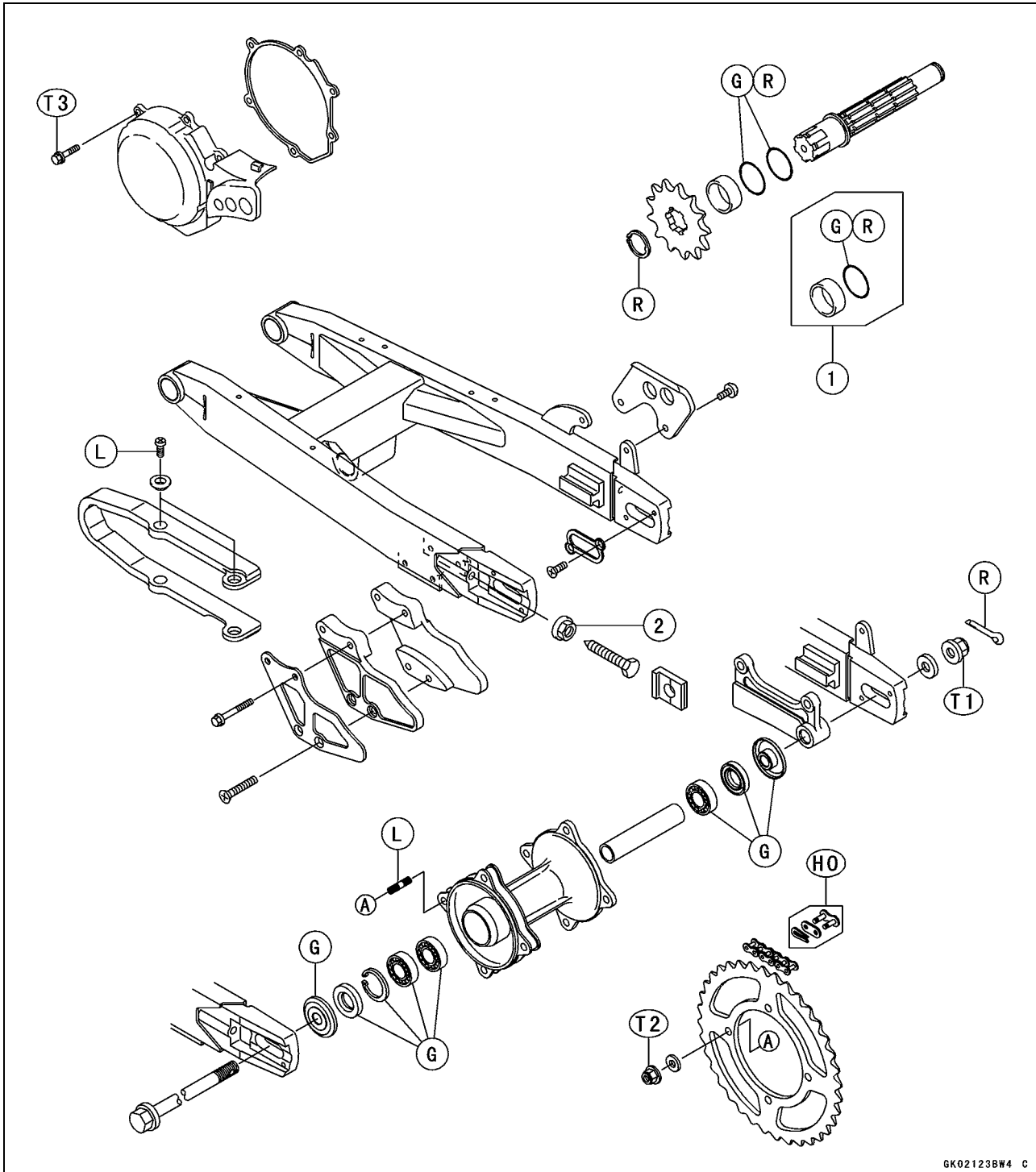
# Final Drive

## Table of Contents

Exploded View .....	9-2
Specifications .....	9-3
Drive Chain.....	9-4
Slack Adjustment .....	9-4
Wheel Alignment Adjustment.....	9-5
Wear Inspection .....	9-5
Lubrication .....	9-6
Removal.....	9-6
Installation.....	9-6
Sprockets.....	9-7
Engine Sprocket Removal .....	9-7
Engine Sprocket Installation .....	9-7
Rear Sprocket Removal.....	9-7
Rear Sprocket Installation.....	9-7
Sprocket Wear .....	9-7
Rear Sprocket Warp .....	9-8

## 9-2 FINAL DRIVE

### Exploded View



GK02123BW4 C

1. KX85-A1 ~ A4, B1 ~ B4/KX100-D1 ~ D4

2. Chain Adjuster Locknuts

T1: 79 N·m (8.0 kgf·m, 58 ft·lb)

T2: 32 N·m (3.3 kgf·m, 24 ft·lb)

T3: 9.8 N·m (1.0 kgf·m, 87 in·lb)

G: Apply grease

HO: Apply heavy oil.

L: Apply a non-permanent locking agent.

R: Replacement parts.

## Specifications

Item	Standard	Service Limit
<b>Drive Chain</b>		
Make and Type	Daido, DID 420DS2, Joint Endless	
KX85A	120 links	— — —
KX85B, KX100 D	124 links	— — —
Chain Slack	54 ~ 64 mm (2.13 ~ 2.52 in.)	— — —
20-link Length	254.0 mm (10.0 in.)	259 mm (10.2 in.)
<b>Sprockets</b>		
Rear Sprocket Warp	TIR 0.4 mm or less	TIR 0.5 mm

**Special Tools - Outside Circlip Pliers: 57001-144**

**Jack: 57001-1238**

## 9-4 FINAL DRIVE

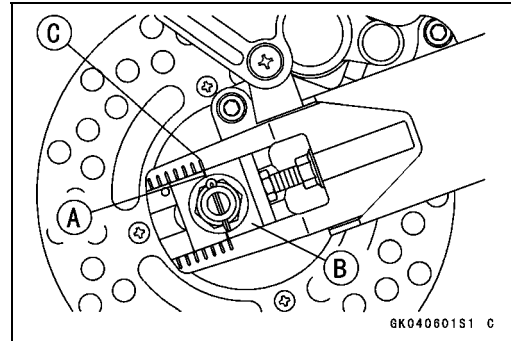
### Drive Chain

#### Slack Adjustment

- Set the motorcycle up on its side stand.
- Check to see that the notches [A] on the alignment indicators [B] on both sides are in the same relative position [C].
- ★ If they are not, adjust the chain slack and align them.

#### **⚠ WARNING**

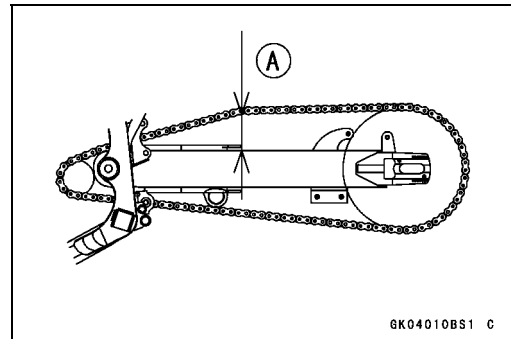
**Misalignment of the wheel will result in abnormal wear and may result in an unsafe riding condition.**



#### **NOTE**

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

- Turn the rear wheel to find the position where the chain is tightest.
- Measure the vertical movement midway between the sprockets.
- ★ If the drive chain slack [A] exceeds the standard, adjust it as follows.



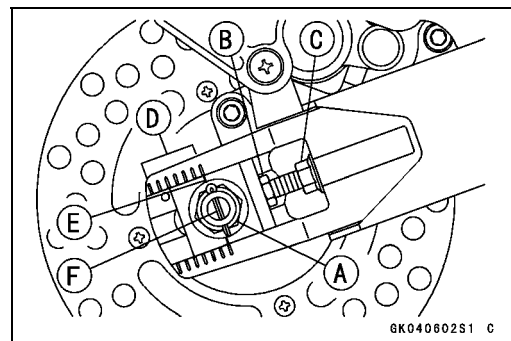
#### **Chain Slack**

**Standard: 54 ~ 64 mm (2.13 ~ 2.52 in.)**

#### **NOTE**

○ In wet or muddy conditions, mud sticks to the chain and sprockets resulting in an overly tight chain, and the chain may break.

- Loosen the left and right chain adjuster locknuts [C].
- Remove the cotter pin [F] and loosen the axle nut [A].
- ★ If the chain is too tight, back out the left and right chain adjusting bolts [B] evenly, and kick the wheel forward until the chain is too loose.
- ★ If the chain is too loose, turn both chain adjusting bolts 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 chain adjuster should align with the same swingarm mark [D] as the left chain adjuster notch aligned with.
- Check the wheel alignment.
- Tighten the axle nut.



**Torque - Rear Axle Nut: 79 N·m (8.1 kgf·m, 58 ft·lb)**

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

#### **⚠ WARNING**

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

## Drive Chain

### NOTE

○ In wet and muddy conditions, mud sticks to the chain and sprockets resulting in an overly tight chain, and the chain may break.

- Check the rear brake (see Brakes chapter).

### ⚠ WARNING

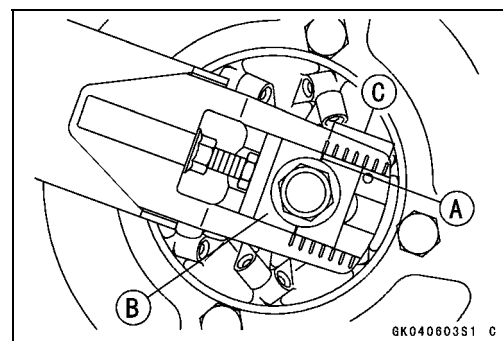
**Do not attempt to drive the motorcycle until a full brake pedal is obtained by pumping the brake pedal until the pads are against the disc. The brake will not function on the first application of the pedal if this is not done.**

### Wheel Alignment Adjustment

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

### NOTE

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



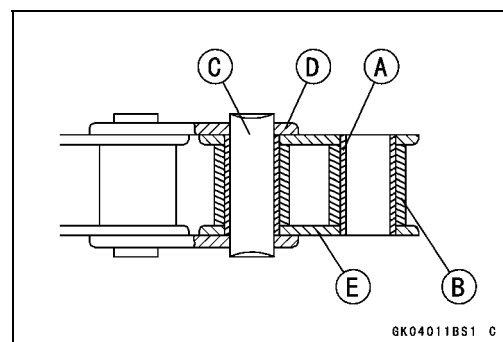
### ⚠ WARNING

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

### Wear Inspection

- 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 (see this chapter).

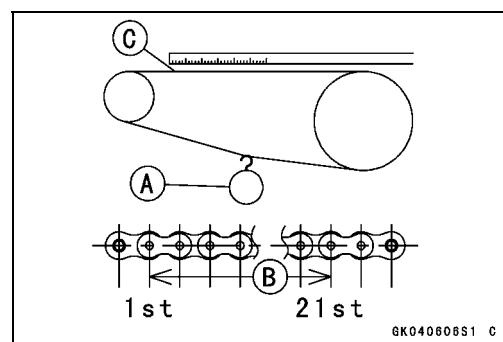
- [A] Bushing
- [B] Roller
- [C] Pin
- [D] Pin Link
- [E] Roller Link



- Stretch the chain taut by hanging a 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.

### Drive Chain 20-link Length

- Standard: 254.0 mm (10.0 in.)
- Service Limit: 259 mm (10.2 in.)



## 9-6 FINAL DRIVE

### Drive Chain

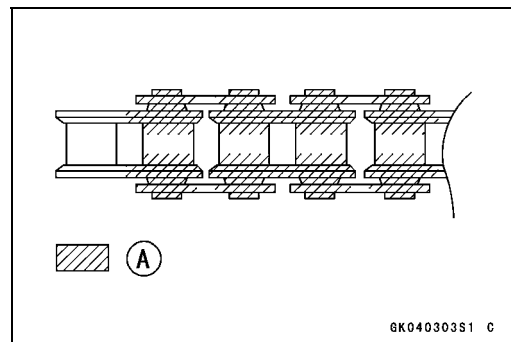
- ★ If any measurements exceed the service limit, replace the chain. Also, replace the front and rear sprockets when the drive chain is replaced.

#### 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.

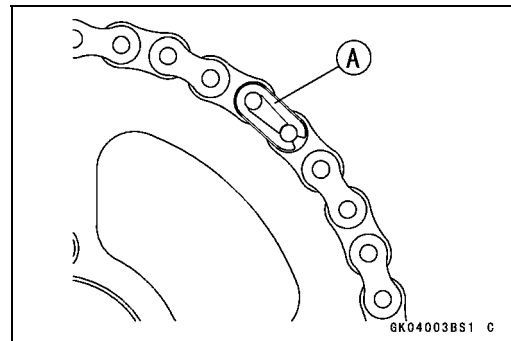
#### Lubrication

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



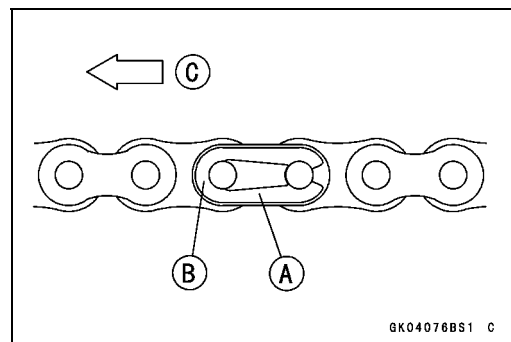
#### Removal

- Remove the clip from the master link [A] using pliers, and free the drive chain from the rear sprocket.
- Remove the drive chain from the chassis.



#### Installation

- Fit the drive chain back onto the sprockets with the ends at the rear sprocket.
- Install the master link from the frame side.
- Install the clip [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).
- Check the rear brake effectiveness.



#### WARNING

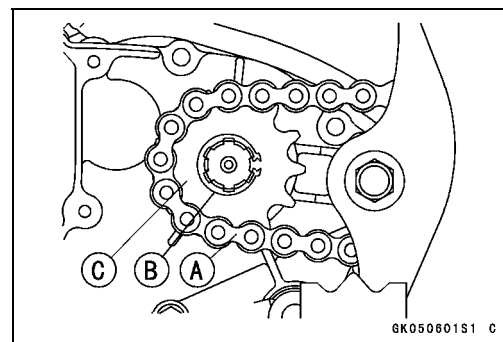
Do not attempt to drive the motorcycle until the full brake pedal is obtained by pumping the brake pedal until the pads are against the disc. The brake will not function on the first application of the pedal if this is not done.

## Sprockets

### Engine Sprocket Removal

- Remove the following parts.
  - Magneto Cover
  - Drive Chain [A] (free of engine sprocket)
- Remove the engine sprocket circlip [B], and pull off the engine sprocket [C].

**Special Tool - Outside Circlip Pliers: 57001-144**



### Engine Sprocket Installation

- Replace the engine sprocket circlip with a new one.
- Install the circlip so that the tooth is aligned with a spline groove (see above).

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

### Rear Sprocket Removal

- Loosen the rear sprocket nuts.
- Remove the rear wheel (see Wheels/Tires chapter).

#### CAUTION

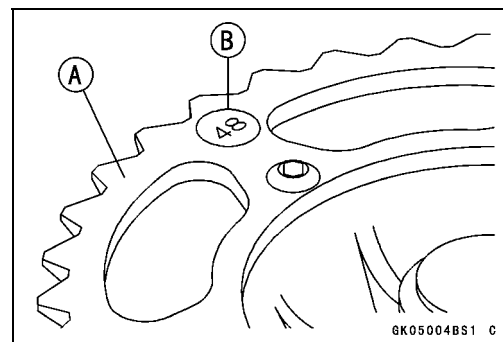
**Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.**

- Remove the rear sprocket nuts and rear sprocket.

### Rear Sprocket Installation

- Install the rear sprocket [A] so that the marked [B] side faces out.
- Tighten the rear sprocket nuts to the specified torque.

**Torque - Rear Sprocket Nuts: 32 N·m (3.3 kgf·m, 24 ft·lb)**



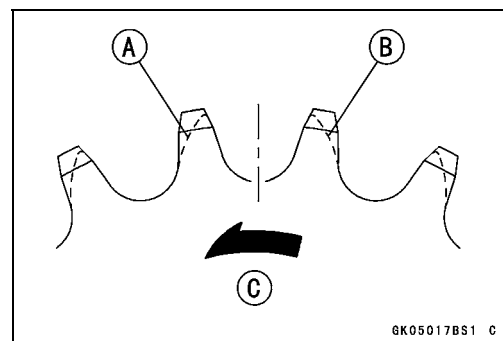
### Sprocket Wear

- Visually inspect the engine and rear sprocket teeth.
- ★ If the teeth are worn as illustrated, replace the sprocket, and inspect the drive chain and engine sprocket (see Drive Chain Wear Inspection).

Worn Tooth (Engine Sprocket) [A]

Worn Tooth (Rear Sprocket) [B]

Direction of rotation [C]



#### CAUTION

**If a sprocket requires replacement, the drive chain is probably worn also. Upon replacing the rear sprocket, inspect the chain and engine sprocket.**

#### NOTE

○ Sprocket wear is exaggerated for illustration.

## 9-8 FINAL DRIVE

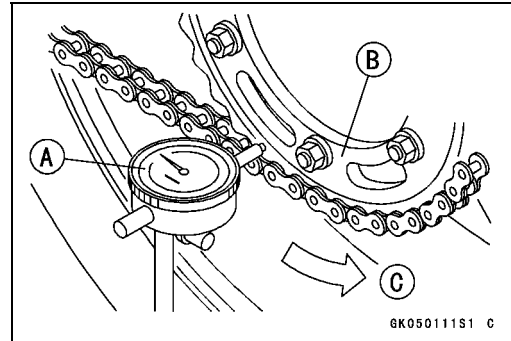
### Sprockets

#### *Rear Sprocket Warp*

- Using the jack or a stand, raise the rear wheel off the ground (see Wheels/Tires chapter).

**Special Tool - Jack: 57001-1238**

- Set a dial gauge [A] against the rear sprocket [B] near the teeth as shown. Turn [C] the rear wheel. The difference between the highest and lowest dial gauge readings is the amount of runout (warp).
- ★ If the runout exceeds the service limit, replace the rear sprocket.



#### **Rear Sprocket Warp**

**Standard:** TIR 0.4 mm (0.016 in.) or less

**Service Limit:** TIR 0.5 mm (0.020 in.)

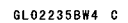


# Brakes

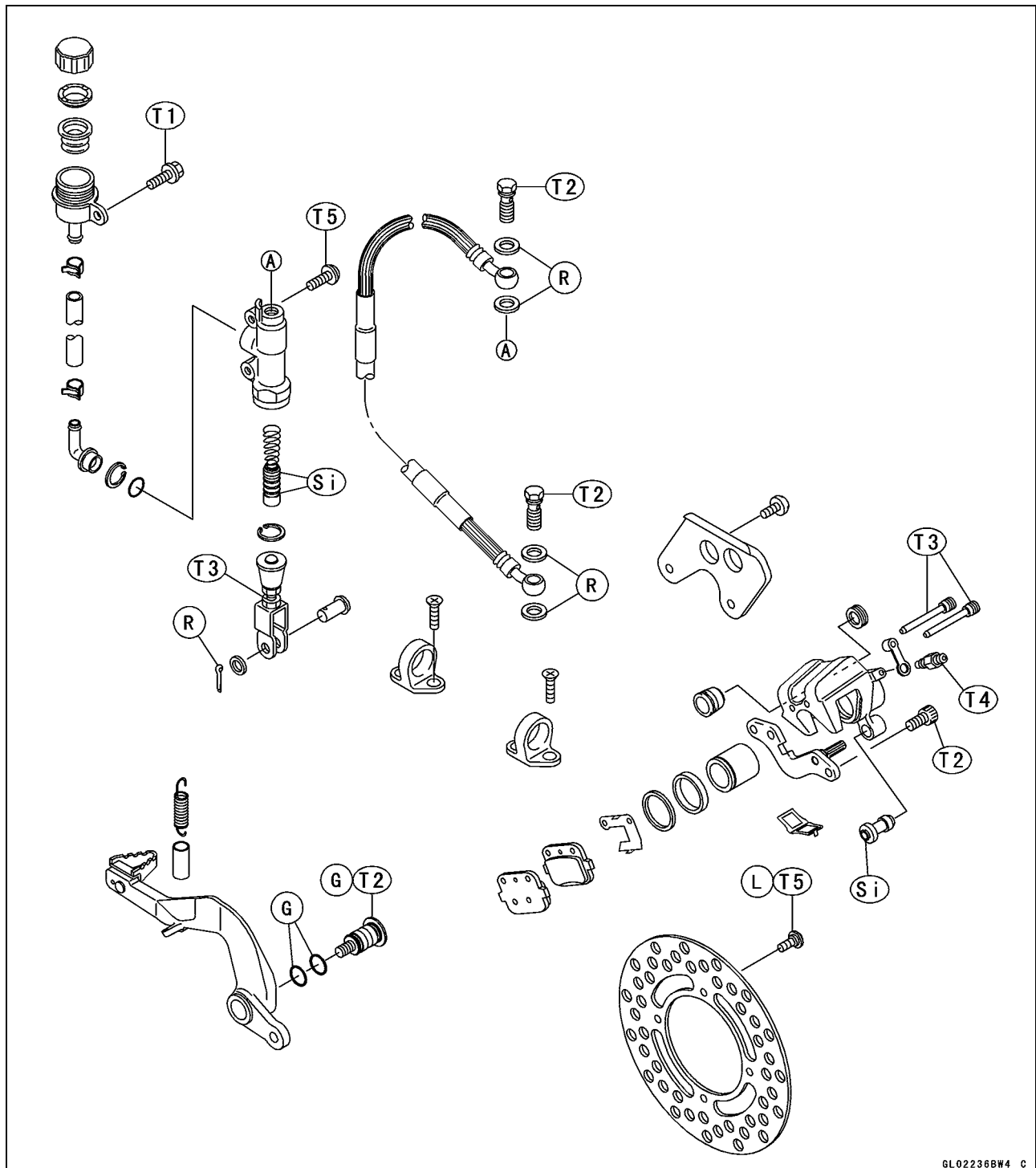
## Table of Contents

Exploded View .....	10-2
Specifications .....	10-4
Disc Brake Information .....	10-5
Brake Lever and Pedal .....	10-6
Brake Lever Play Adjustment.....	10-6
Pedal Position Adjustment .....	10-6
Pedal Removal.....	10-7
Pedal Installation Notes .....	10-7
Calipers .....	10-8
Caliper Removal .....	10-8
Caliper Installation .....	10-8
Caliper Disassembly .....	10-8
Assembly Notes .....	10-9
Fluid Seal Damage Inspection .....	10-9
Dust Seal and Cover Damage Inspection.....	10-9
Piston Cylinder Damage Inspection.....	10-9
Caliper Holder Shaft Wear Inspection.....	10-10
Brake Pads .....	10-11
Removal.....	10-11
Installation Notes .....	10-11
Brake Pad Wear Inspection .....	10-12
Master Cylinder .....	10-13
Front Master Cylinder Removal .....	10-13
Front Master Cylinder Installation .....	10-13
Rear Master Cylinder Removal.....	10-13
Rear Master Cylinder Installation Notes .....	10-13
Inspection and Adjustment after Installation .....	10-14
Front Master Cylinder Disassembly.....	10-14
Rear Master Cylinder Disassembly.....	10-15
Assembly .....	10-15
Inspection (Visually).....	10-16
Brake Disk .....	10-17
Brake Disc Removal .....	10-17
Brake Disc Installation .....	10-17
Wear Inspection .....	10-17
Warp Inspection .....	10-17
Brake Fluid .....	10-18
Fluid Level Inspection .....	10-18
Brake Fluid Change .....	10-18
Bleeding the Brake Line.....	10-19
Brake Hose.....	10-21
Removal/Installation.....	10-21
Inspection.....	10-21

## Exploded View



Si: Apply silicone grease.

**Exploded View**


GL02236BW4 C

T1: 5.9 N·m (0.60 kgf·m, 52 in·lb)

T2: 25 N·m (2.5 kgf·m, 18 ft·lb)

T3: 18 N·m (1.8 kgf·m, 13 ft·lb)

T4: 7.8 N·m (0.8 kgf·m, 69 in·lb)

T5: 9.8 N·m (1.0 kgf·m, 87 in·lb)

G: Apply grease.

L: Apply a non-permanent locking agent.

R: Replacement parts

Si: Apply silicone grease.

## 10-4 BRAKES

### Specifications

Item	Standard	Service Limit
<b>Brake Adjustment</b> Brake Lever Free Play	Adjustable (to suit rider)	— — —
<b>Brake Pads</b> Pad Lining Thickness: Front Rear	4.0 mm (0.16 in.) 4.0 mm (0.16 in.)	1 mm (0.04 in.) 1 mm (0.04 in.)
<b>Brake Disc</b> Disc Thickness: Front Rear Disc Runout Front Rear	2.85 ~ 3.15 mm (0.112 ~ 0.124 in.) 2.85 ~ 3.15 mm (0.112 ~ 0.124 in.) TIR 0.12 mm (0.0047 in.) or less TIR 0.12 mm (0.0047 in.) or less	2.5 mm (0.098 in.) 2.5 mm (0.098 in.) TIR 0.3 mm (0.012 in.) TIR 0.3 mm (0.012 in.)
<b>Brake Fluid</b> Recommended Disc Brake Fluid: Type	DOT 4	— — —

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

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**Disc Brake Information**

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**⚠ 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 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.**

## 10-6 BRAKES

### Brake Lever and Pedal

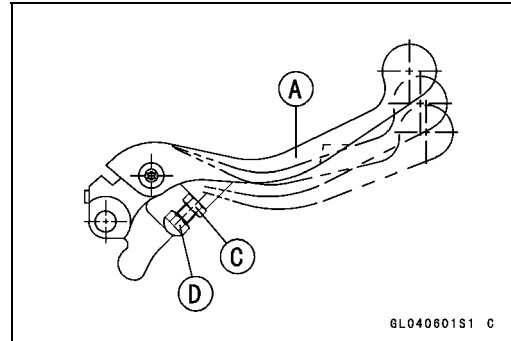
#### Brake Lever Play Adjustment

- Adjust the front brake lever [A] to suit you.
- Loosen the adjuster locknut [C] and turn the adjuster [D] to either side.
- After adjustment, tighten the locknut to the specified torque.

**Torque - Brake Lever Adjuster Locknut : 4.9 N·m (0.50 kgf·m, 43 in·lb)**

#### ⚠ WARNING

**Always maintain proper brake adjustment. If adjustment is improper, the brake could drag and overheat. This could damage the brake assembly and possibly lock the wheel resulting in loss of control.**



#### Pedal Position Adjustment

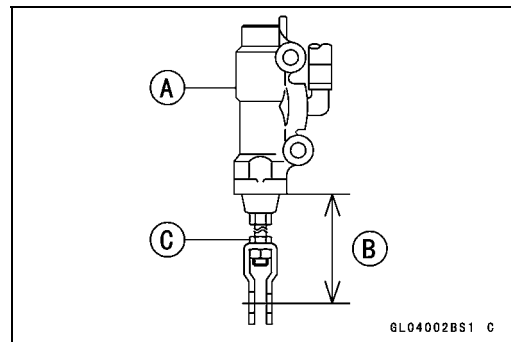
The brake pedal position and pedal play should not be adjusted. There is no pedal position adjustment device as such. The only adjustment is master cylinder push rod length.

#### NOTE

- Usually it is not necessary to adjust the push rod length, but always adjust it when the rear master cylinder [A] is disassembled.
- When the brake pedal is in its rest position, measure the length [B] indicated in the figure.

**B: 57.5 mm (2.26 in.)**

**C: Push Rod Locknut**



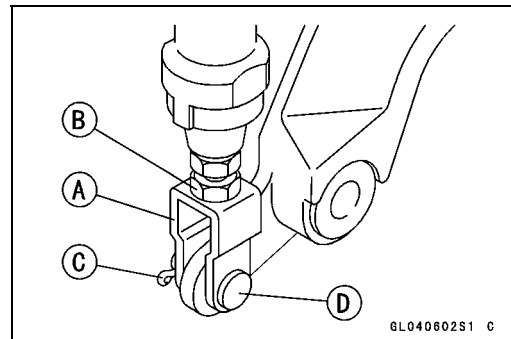
- ★ If the length is not within the specified length, adjust the clevis [A] as follows.
- Loosen the push rod locknut [B].
- Pull out the cotter pin [C] and the joint pin [D].
- Turn the clevis to obtain the specified length.
- Tighten the locknut.

**Torque - Rear Master Cylinder Push Rod Locknut : 18 N·m (1.8 kgf·m, 13 ft·lb)**

- Install the joint pin and new cotter pin.

#### NOTE

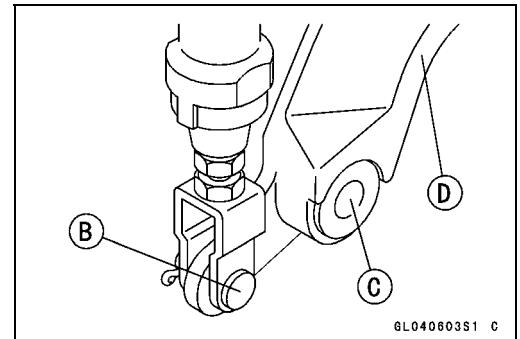
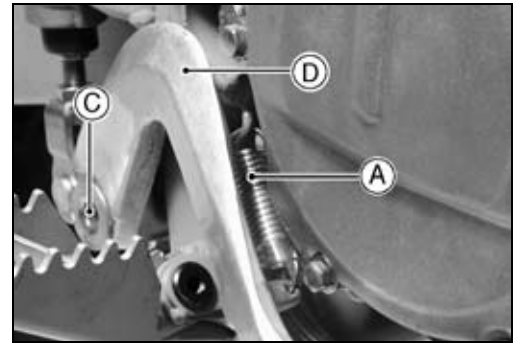
- If the pedal position is incorrect after adjusting the master cylinder push rod, the brake pedal may be deformed or incorrectly installed.



## Brake Lever and Pedal

### *Pedal Removal*

- Remove the following.
  - Brake Pedal Return Spring [A]
  - Cotter Pin
  - Joint Pin [B]
- Remove the brake pedal bolt [C] and remove the brake pedal [D].



### *Pedal Installation Notes*

- Grease the brake pedal hole.
- Check the pedal O-ring for signs of damage. If necessary, replace them with new ones.
- Install the brake pedal to the frame, and tighten the brake pedal bolt with the specified torque.

**Torque - Brake Pedal Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)**

- Check the brake pedal position.
- Install the joint pin and a new cotter pin (see Pedal Position Adjustment).

## 10-8 BRAKES

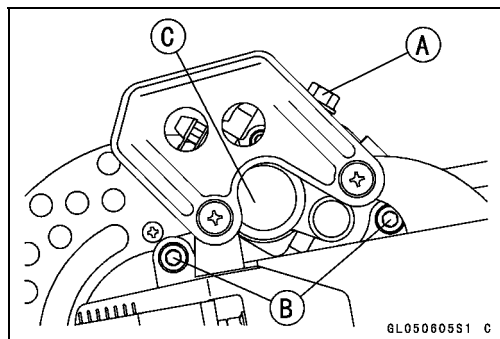
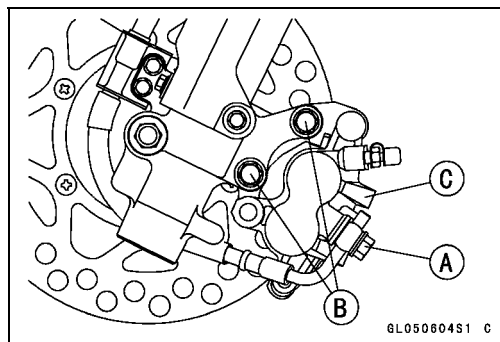
### Calipers

#### Caliper Removal

- Loosen the banjo bolt [A] so as not to spill brake fluid.
  - Remove the caliper mounting bolts [B].
  - Remove the caliper [C].
  - Remove the banjo bolt and take off the brake hose from the caliper (see Brake Hose Removal/Installation).
  - If the caliper is to be disassembled after removal and if compressed air is not available, remove the piston using the following steps before disconnecting the brake hose from the caliper.
- Remove the pads.
  - Pump the brake lever or pedal to remove the piston.

#### CAUTION

Immediately wash away any brake fluid that spills.



#### Caliper Installation

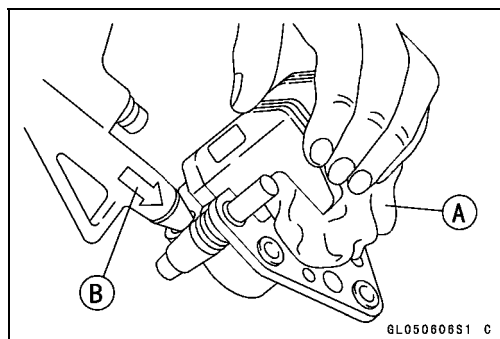
- Tighten the caliper mounting bolts to the specified torque.
- Torque - Caliper Mounting Bolts (Front, Rear): 25 N·m (2.5 kgf·m, 18 ft·lb)**
- Connect the brake hose to the caliper putting a new flat washer on each side of the brake hose fitting.
  - Tighten the banjo bolt to the specified torque.
- Torque - Brake Hose Banjo Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)**
- Check the fluid level in the reservoir, and bleed the brake line (see Bleeding the Brake).
  - 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.

#### Caliper Disassembly

- Remove the caliper (see Caliper Removal).
  - Remove the pads and spring (see Pad Removal).
  - Pull off the dust seal lip from the caliper body (Front Caliper).
  - Remove the caliper holder, shaft rubber boot and dust cover.
  - Using compressed air, remove the piston.
- Cover the caliper opening with a clean, heavy cloth [A].
  - Remove the piston by lightly applying compressed air [B] to the hose joint opening.





## Calipers

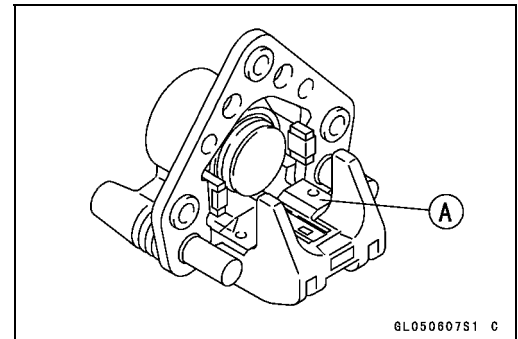
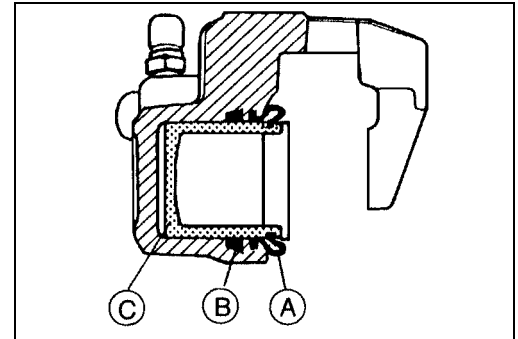
### **⚠ WARNING**

**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 and fluid seal.
- Remove the bleed valve and rubber cap.

### *Assembly Notes*

- Tighten the bleed valve to the specified torque.  
**Torque - Bleed Valve: 7.8 N·m (0.80 kgf·m, 69 in·lb)**
- It is recommended that the fluid seal [B], which is removed, be replaced with a new one.
- Replace the dust seals [A] if they are damaged.
- Apply brake fluid to the cylinders, pistons, and fluid seals (piston seals), and push the pistons [C] into the cylinders by hand. Take care that neither the cylinder nor the piston skirt get scratched.
- Install the dust seal around the piston. Check that dust seal is properly fitted into the grooves in the piston and caliper.
- Replace the caliper holder shaft rubber boot and dust cover if they are damaged.
- Apply a thin coat of silicone grease to the caliper holder shafts and holder holes (silicone grease is a special high temperature, water-resistant grease).
- Install the anti-rattle spring [A] in the caliper as shown.
- Install the pads (see Pad Installation).



### *Fluid Seal Damage Inspection*

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

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

### *Dust Seal and Cover Damage Inspection*

- Check that the dust seals and covers are not cracked, worn, swollen, or otherwise damaged.
- ★ If they show any damage, replace them.

### *Piston Cylinder Damage Inspection*

- Visually inspect the piston and cylinder surfaces.
- ★ Replace the cylinder and piston if they are badly scored or rusty.

## 10-10 BRAKES

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### Calipers

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#### *Caliper Holder Shaft Wear Inspection*

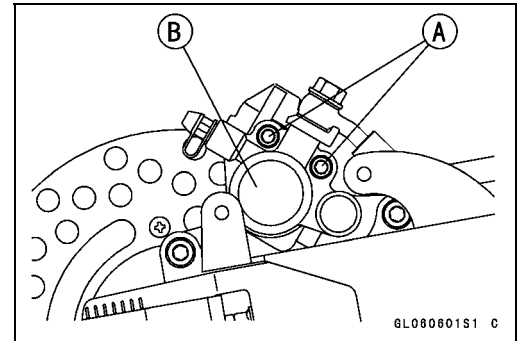
The caliper body must slide smoothly on the caliper holder shafts. If the body does not slide smoothly, one pad will wear more than the other, pad wear will increase, and constant drag on the disc will raise brake and brake fluid temperature.

- Check to see if the caliper holder shafts are not badly worn or stepped, or the rubber boot is not damaged.
- ★ If the shafts or rubber boot are damaged, replace the shafts, rubber boot, and the caliper holder.

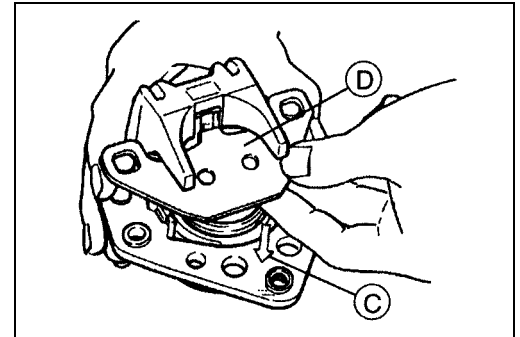
## Brake Pads

### Removal

- When removing the rear brake pads, take off the caliper guard and loosen the pad bolts [A].
- Remove the caliper [B] with the hose installed (see Caliper Removal).



- Remove the pad bolt (Rear Caliper).
- Take the piston side pad from the caliper holder.
- Push the caliper holder [C] toward the piston, and then remove the pad [D] from the caliper holder shaft.



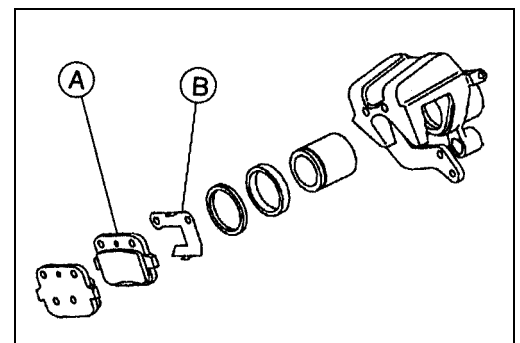
### Installation Notes

- Push the caliper piston in by hand as far as it will go.
- Install the anti-rattle spring.
- Install the piston side pad first, and then install the remaining pad.
- The piston side pad [A] of the rear caliper has a wear protecting shim [B]. Be careful not to mix it up with the other pad.
- Tighten:

**Torque - Brake Pad Bolts: 18 N·m (1.8 kgf·m, 13 ft·lb)**

**Caliper Mounting Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)**

- 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 brake will not function on the first application of the lever or pedal if this is not done.**

## 10-12 BRAKES

### Brake Pads

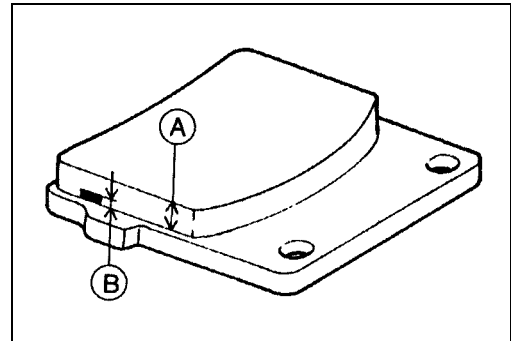
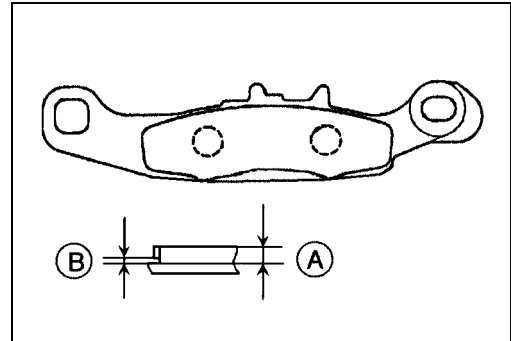
#### *Brake Pad Wear Inspection*

- 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 (front and rear)**

**Standard:** 4.0 mm (0.16 in.)

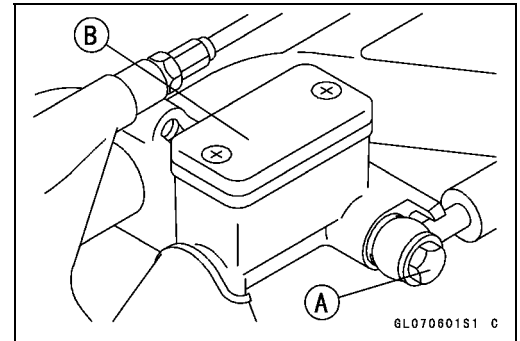
**Service Limit:** 1 mm (0.04 in.)



## Master Cylinder

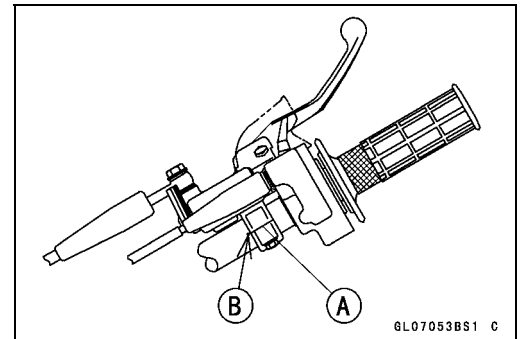
### Front Master Cylinder Removal

- Drain the front brake fluid (see Brake Fluid Change).
- Remove the following.
  - Brake Hose Banjo Bolt [A]
  - Master Cylinder Clamp Bolts
- Remove the front master cylinder [B]



### Front Master Cylinder Installation

- Position the master cylinder so that the vertical parting line [A] of the master cylinder clamps align with the punch mark [B] on the handlebar.

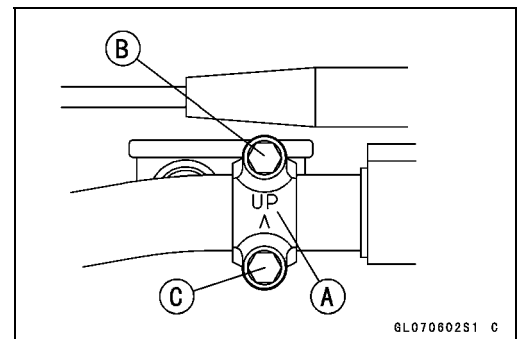


- The master cylinder clamp must be installed with the arrow mark [A] upward.
- Tighten the upper clamp bolt [B] first, and then the lower clamp bolt [C] to the specified torque. There will be a gap at the lower part of the clamp after tightening.

**Torque - Front Master Cylinder Clamp Bolts: 8.8 N·m (0.9 kgf·m, 78 in·lb)**

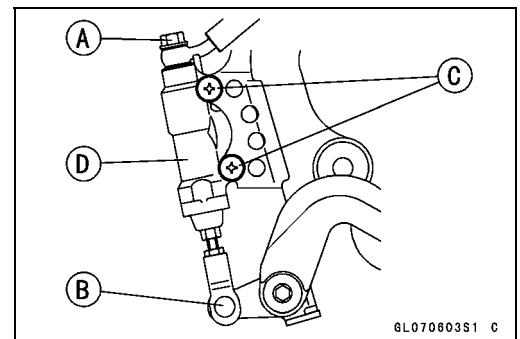
- Use a new flat washer on each side of the brake hose fitting.
- Tighten the banjo bolts to the specified torque.

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



### Rear Master Cylinder Removal

- Drain the rear brake fluid (see Brake Fluid Change).
- Loosen the banjo bolt [A]
- Remove the following.
  - Reservoir Mounting Bolt
  - Brake Pedal Joint Pin [B]
  - Upper End of Brake Hose
  - Banjo Bolt and Brake Hose
  - Rear Master Cylinder Mounting Screws [C]
- Remove the master cylinder [D].



### Rear Master Cylinder Installation Notes

- Use a new flat washer on each side of the brake hose fitting.
- Tighten the banjo bolts to the specified torque.

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

- Tighten the rear master cylinder mounting screws (2) to the specified torque.

**Torque - Rear Master Cylinder Mounting Screws: 9.8 N·m (1.0 kgf·m, 87 in·lb)**

**Rear Brake Reservoir Bolt: 5.9 N·m (0.60 kgf·m, 52 in·lb)**

## 10-14 BRAKES

### Master Cylinder

#### *Inspection and Adjustment after Installation*

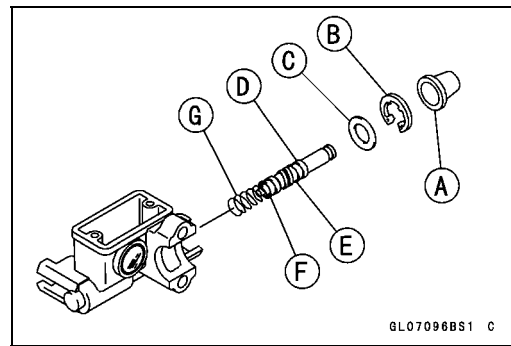
- Fill the brake line with the brake fluid (see Brake Fluid Change).
- Check and adjust the following items after installation.
  - Brake Pedal Position
  - Brake Line Air Bleed
  - Brake Drag
  - Braking Power
  - Brake Fluid Leakage

#### **⚠ 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 brake will not function on the first application of the lever or pedal if this is not done.**

#### *Front Master Cylinder Disassembly*

- Remove the following parts.
  - Front Master Cylinder (see Front Master Cylinder Removal)
  - Brake Lever Pivot Bolt and Locknut
  - Brake Lever
  - Dust Cover
  - Retainer (use the inside circlip pliers: 57001-143)
  - Piston complete with Secondary Cup, Primary Cup and Spring



#### **CAUTION**

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

- [A] Dust Cover
- [B] Retainer
- [C] Washer
- [D] Piston
- [E] Secondary Cup
- [F] Primary Cup
- [G] Return Spring

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

## Master Cylinder

### Rear Master Cylinder Disassembly

#### NOTE

○ Do not remove the push rod clevis for master cylinder disassembly since removal requires brake pedal position adjustment.

- Remove the following.  
Rear Master Cylinder (see Rear Master Cylinder Removal)  
Dust Cover on Push Rod  
Retainer (use the inside circlip pliers: 57001-143)  
Push Rod with Clevis installed  
Piston complete with Secondary Cup, Primary Cup and Spring

#### CAUTION

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

- [A] Dust Cover
- [B] Push Rod
- [C] Retainer
- [D] Piston Stop
- [E] Piston
- [F] Secondary Cup
- [G] Primary Cup
- [H] Return Spring
- [I] Circlip
- [J] Connector
- [K] O-ring

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

### Assembly

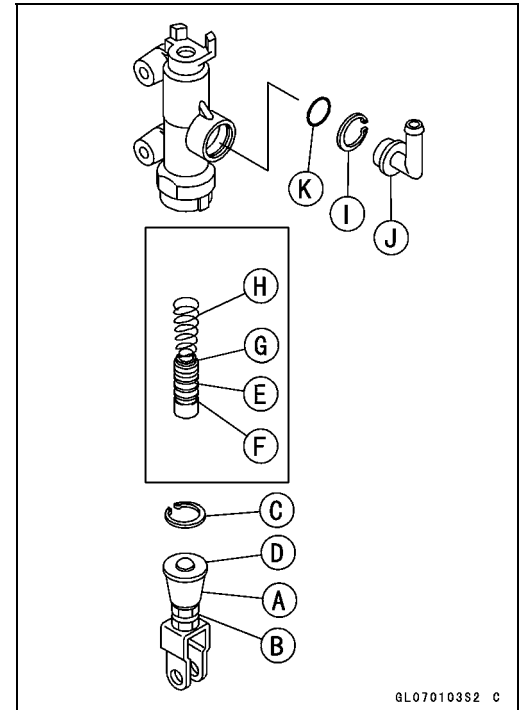
- Before assembly, clean all parts including the master cylinder with brake fluid or alcohol.

#### 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 the wash off completely, and will eventually deteriorate the rubber used in the disc brake.**

- Apply brake fluid to the removed parts and to the inner wall of the cylinder.
- Take care fluid to the removed parts and to the inner wall of the cylinder.
- Tighten the brake lever pivot bolt locknut to the specified torque.

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



## 10-16 BRAKES

### Master Cylinder

---

#### *Inspection (Visually)*

- Disassemble the front and rear master cylinder.
- Check that there are no scratches, wear, rust or pitting on the following parts.

Inside of the Master Cylinder

Outside of the Piston

Primary Cup

Secondary Cup

Dust Cover

Return Spring

Relief and Supply Port Plugged

- ★ If they are damaged, replace them.



## Brake Disk

### *Brake Disc Removal*

- Remove:
  - Front Wheel (see Wheels/Tires chapter)
  - Rear Wheel (see Wheels/Tires chapter)
- Remove the brake discs from the wheels.

### *Brake Disc Installation*

- Install the disc on the wheels so that the mark side of it faces out.
- Apply a non-permanent locking agent to the thread of disc mounting bolts.

**Torque - Disc Bolts (Front, Rear): 9.8 N·m (1.0 kgf·m, 87 in·lb)**

### *Wear Inspection*

- ★ Replace the disc if the sliding surfaces have worn past the service limit.

#### **Front and Rear Disc Thickness**

**Standard: 2.85 ~ 3.15 mm (0.112 ~ 0.124 in.)**

**Service Limit: 2.5 mm (0.098 in.)**

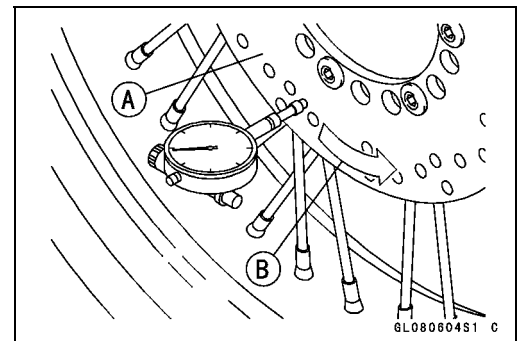
### *Warp Inspection*

- Lift the wheel off the ground using the jack (see Wheels/Tires chapter).
- 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 turning the wheel [B] slowly.
- ★ 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 (0.012 in.)**



## 10-18 BRAKES

### Brake Fluid

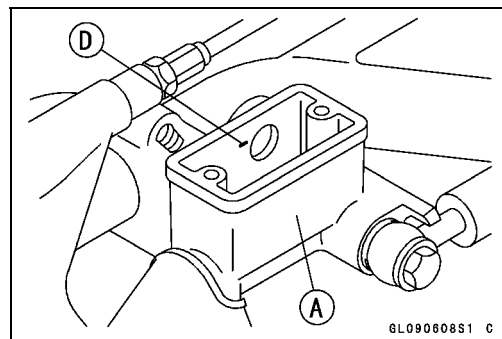
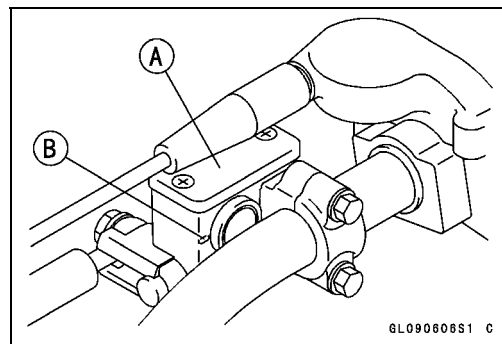
#### Fluid Level Inspection

In accordance with the Periodic Maintenance Chart, inspect the brake fluid level in the front [A] and rear [C] brake fluid reservoirs.

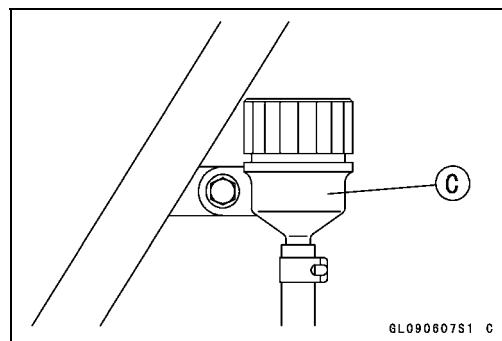
- Check the brake fluid level in the reservoir.

#### NOTE

- Hold the reservoir horizontal when checking brake fluid level.
- The front reservoir [A] must be kept above the lower level line [B]. If the fluid level in front reservoir is lower than the lower level line, fill the reservoir to the upper level line. Inside the front reservoir is stepped end showing the upper level line [D].

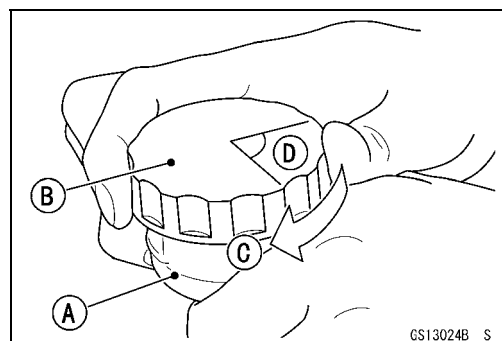


- The rear reservoir [C] must be kept more than half full with brake fluid. If the amount of brake fluid is insufficient, add brake fluid.



#### NOTE

- Follow the procedure shown below to install the rear brake fluid reservoir cap correctly. First, tighten the rear brake reservoir cap [B] clockwise [C] by hand until slight resistance is felt indicating that the cap is seated on the reservoir body, then tighten the cap an additional 1/6 turn [D] while holding the brake fluid reservoir body [A].



#### Brake Fluid Change

In accordance with the Periodic Maintenance Chart, change the brake fluid. The brake fluid should also be changed if it becomes contaminated with dirt or water.

#### ⚠ 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 already is in the reservoir are unidentified. After changing the fluid, use only the same type and brands of brake fluid lowers the brake fluid boiling point and could cause the brake to be ineffective. It may also cause the rubber brake parts to deteriorate.

## Brake Fluid

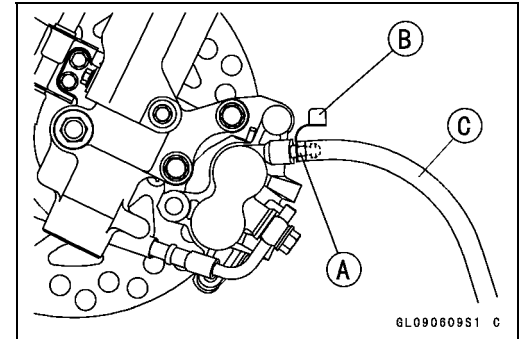
### Recommended Disc Brake Fluid

Type: DOT 4

### 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 the rubber cap [B] on the bleed valve [A].
- Attach a clear plastic hose [C] to the bleed valve on the caliper, and run the other end of the hose into a container.
- Fill the reservoir with new brake fluid.
- Change the brake fluid as follows:



- Check the fluid level in the reservoir often, replenishing it as necessary.
  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].

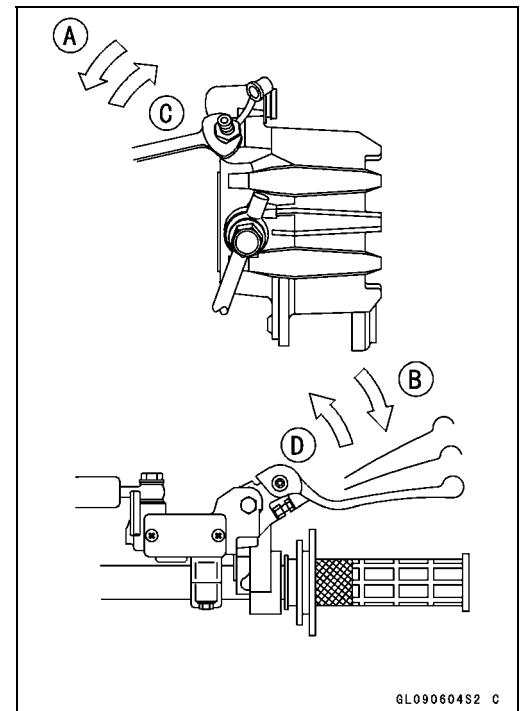
### NOTE

○If the fluid in the reservoir runs completely out any time during fluid changing, air will enter the line, and the system must be bled.

- Repeat this operation until fresh brake fluid comes out into the plastic hose or the color of the fluid changes.

### ⚠ WARNING

**Do not mix two brands of fluid. 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.**



### Bleeding the Brake Line

The brake fluid has a very low compression coefficient so that almost all 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.

Bleed the air from the brake 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.

## 10-20 BRAKES

### Brake Fluid

#### 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.*

- Bleed the air whenever brake parts are replaced or re-assembled.
- Remove the reservoir cap and fill the reservoir with fresh brake fluid.
- Slowly pump the brake lever or pedal several times until no air bubbles can be seen rising up through the fluid from the hose at the bottom of the reservoir. This bleeds the air from the master cylinder and the brake line.

#### NOTE

○ *Tap the brake hose lightly going from the caliper to the reservoir side and bleed the air off at the reservoir.*

- Attach a clear plastic hose to the bleed valve on the caliper, and run the other end of the hose into a container.
- Bleed the brake line and the caliper as follows:
- The fluid level must be checked several times during the bleeding operation and replenished as necessary.  
Hold the brake applied [A].  
Quickly open and close the valve [B].  
Release the brake [C]

#### NOTE

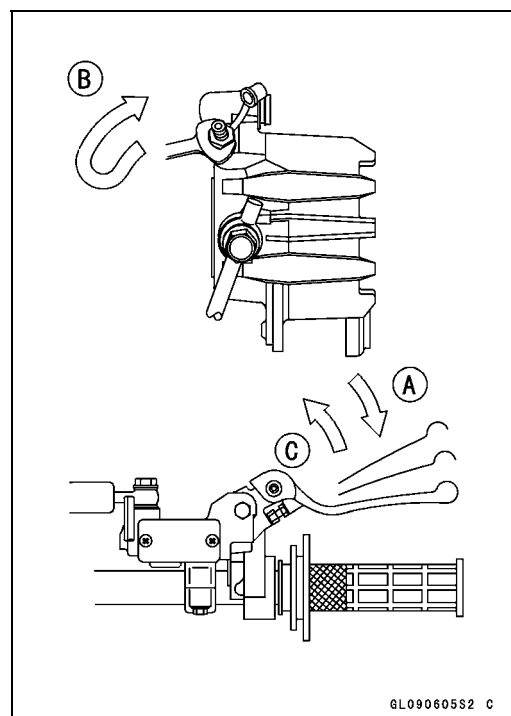
○ *If the fluid in the reservoir runs completely out any time during bleeding, the bleeding operation must be done over again from the beginning since air will have entered the line.*

○ *If the brake lever action still feels soft or spongy, tap the brake hose from bottom to top and air will rise up to the top part of the hose. Slowly pump the brake lever in the same manner as above.*

- Remove the clear plastic hose.
- Tighten the bleed valve to the specified torque, and install the rubber cap.

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

- After bleeding is done, 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 brake will not function on the first application of the lever or pedal if this is not done.**

## Brake Hose

### Removal/Installation

- When removing the brake hose, take care not to spill the brake fluid on the painted or plastic parts.
- When removing the brake hose, temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.

### CAUTION

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

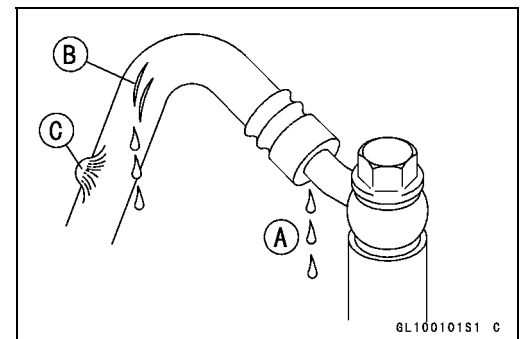
- There is a flat washer on each side of the brake hose fitting. Replace them with new ones when installing.
- When installing the hoses, avoid sharp bending, kinking, flattening or twisting, and route the hoses according to the Cable, Wire and Hose Routing section in the General Information chapter.
- Tighten the banjo bolts at the hose fittings to the specified torque.

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

- Bleed the brake line after installing the brake hose (see Bleeding the Brake Line).

### Inspection

- 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 it if any cracks [B] or bulges [C] are noticed.





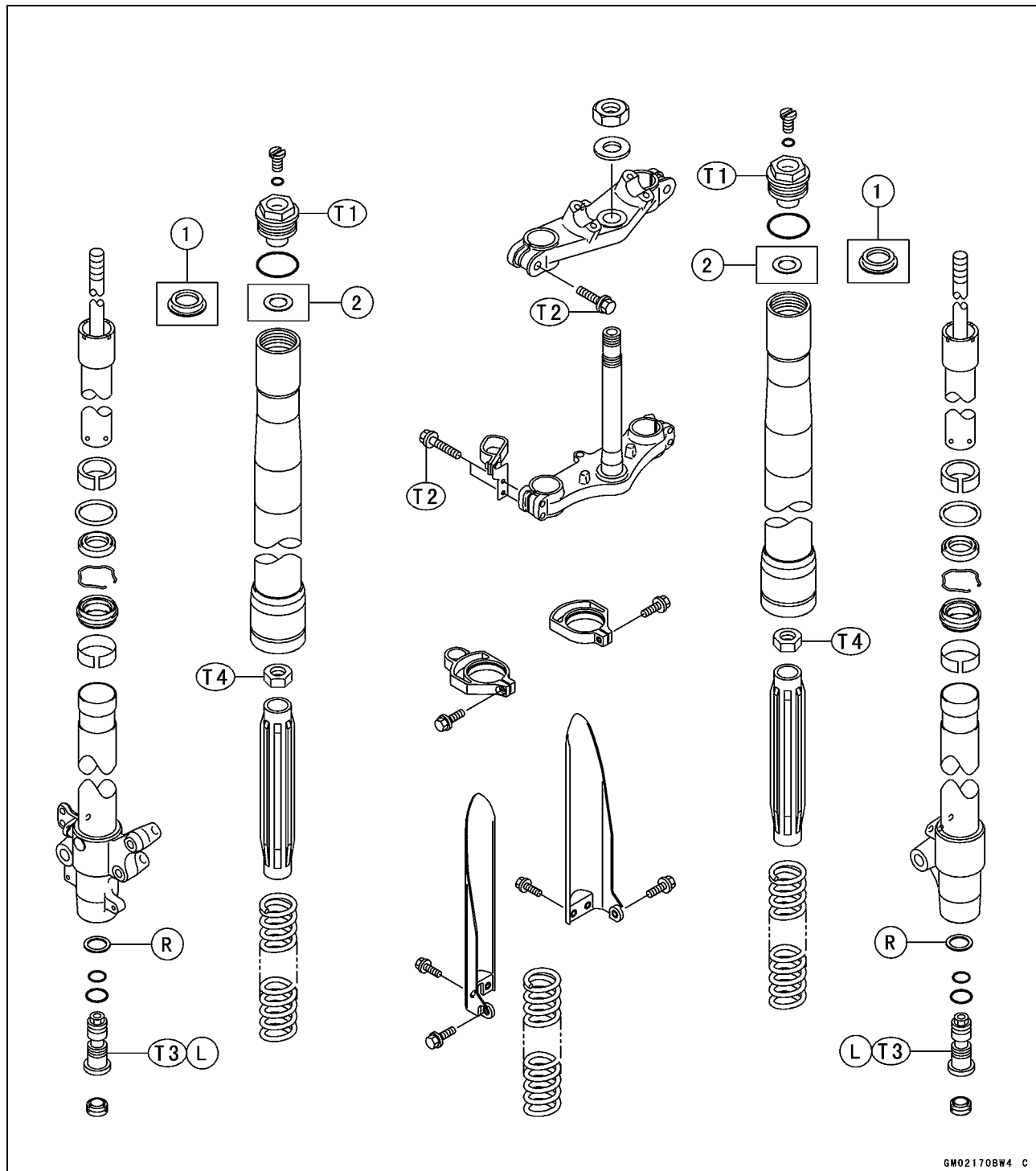
# Suspension

## Table of Contents

Exploded View .....	11-2	Disassembly.....	11-19
Specifications .....	11-4	Assembly .....	11-20
Front Fork.....	11-5	Spring Tension .....	11-21
Air Pressure Adjustment .....	11-5	Scrapping.....	11-21
Compression Damping		Swingarm.....	11-22
Adjustment .....	11-5	Removal.....	11-22
Fork Oil Level Adjustment (each		Installation.....	11-22
fork leg) .....	11-5	Swingarm Bearing Removal .....	11-22
Fork Clamp Position Adjustment..	11-8	SwingArm Bearing Installation .....	11-23
Fork Oil Change (each fork leg)...	11-8	Swingarm Pivot Inspection.....	11-23
Front Fork Removal .....	11-9	Swingarm Bearing, Sleeve	
Front Fork Installation .....	11-9	Inspection.....	11-23
Disassembly (each fork leg).....	11-10	Tie-Rod, Rocker Arm .....	11-24
Assembly (each fork leg) .....	11-11	Tie-Rod Removal .....	11-24
Spring Tension .....	11-13	Tie-Rod Installation .....	11-24
Rear Shock Absorber .....	11-14	Rocker Arm Removal.....	11-24
Compression Damping Force		Rocker Arm Installation.....	11-24
Adjustment .....	11-14	Rocker Arm/Tie-Rod Bearing	
Rebound Damping Force		Removal .....	11-25
Adjustment .....	11-14	Rocker Arm/Tie-Rod Bearing	
Preload Adjustment.....	11-14	Installation .....	11-25
Removal.....	11-15	Uni-Trak Link Pivot Inspection .....	11-25
Installation.....	11-16	Rocker Arm/Tie-Rod Bearing	
Spring Replacement .....	11-16	Inspection.....	11-25
Oil Draining .....	11-17	Rocker Arm/Tie-Rod Sleeve	
Oil Filling .....	11-18	Inspection.....	11-25

## 11-2 SUSPENSION

### Exploded View

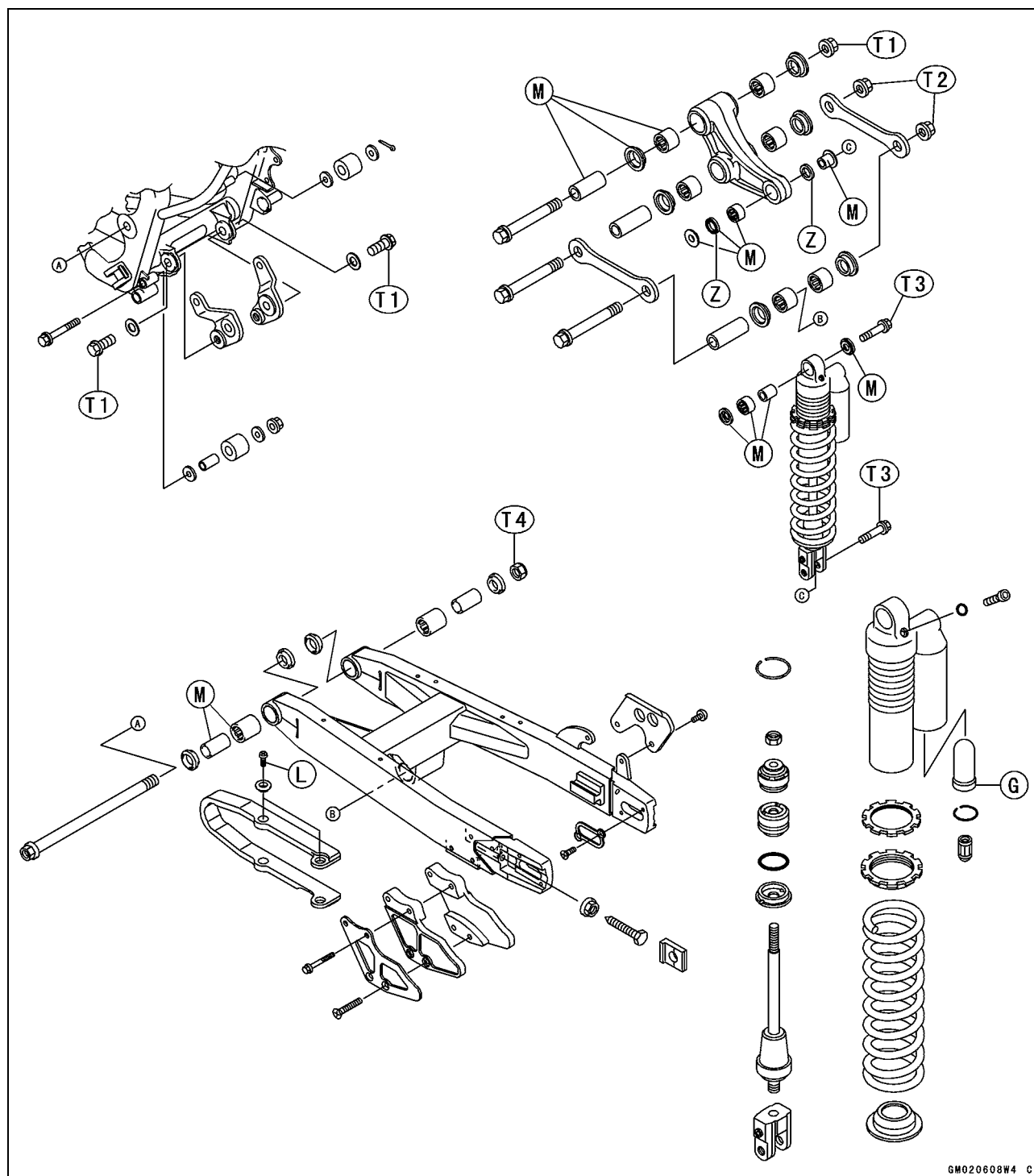


1: KX85-A1 ~ A2/B1 ~ B2, KX100-D1 ~ D2  
 2: KX85-A3 ~ B3 ~, KX100-D3 ~

T1: 27 N·m (2.8 kgf·m, 20 ft·lb)  
 T2: 20 N·m (2.0 kgf·m, 15 ft·lb)  
 T3: 54 N·m (5.5 kgf·m, 40 ft·lb)  
 T4: 15 N·m (1.5 kgf·m, 11 ft·lb)  
 L: Apply a non-permanent locking agent.  
 R: Replacement parts.



## Exploded View



GM020608W4 C

T1: 83 N·m (8.5 kgf·m, 61 ft·lb)

T2: 59 N·m (6.0 kgf·m, 44 ft·lb)

T3: 39 N·m (4.0 kgf·m, 29 ft·lb)

T4: 69 N·m (7.0 kgf·m, 51 ft·lb)

G: Apply grease.

L: Apply a non-permanent locking agent

M: Apply Molybdenum disulfide grease.

Z: The seal lips face outward.

## 11-4 SUSPENSION

### Specifications

Item	Standard	Service Limit
<b>Front Fork</b>		
Air Pressure	Atmospheric pressure	— — —
Compression Damping Adjustment	Refer to 11-5	— — —
Oil Type	KHL15-10 (KAYABA01) or equivalent	— — —
Oil Capacity:		
KX85A	315 ±4 mL (10.7 ±0.14 US oz)	— — —
KX85B, KX100D	321 ±4 mL (10.9 ±0.14 US oz)	— — —
Oil Level (fully compressed, spring removed:)		(Adjustable Range)
KX85A	100 ±2 mm (3.9 ±0.08 in.)	75 ~ 115 mm (3.0 ~ 4.5 in.)
KX85B, KX100D	90 ±2 mm (3.5 ±0.08 in.)	75 ~ 115 mm (3.0 ~ 4.5 in.)
Fork Spring Free Length	430 mm (16.9 in.)	422 mm (16.6 in.)
<b>Rear Shock Absorber</b>		
Compression Damper Setting (upper)	2nd position	(Adjustable Range) 4 clicks
Rebound Damper Setting (lower)	11th click from fully clockwise position	(Adjustable Range) 20 clicks
Spring Preload Setting		
Standard Adjusting Nut Position	73 mm (2.87 in.)	— — —
Nut Adjusting Range	63 ~ 85 mm (2.48 ~ 3.35 in.)	— — —
Standard Spring Set Length	244.5 mm (9.63 in.)	— — —
Rear Shock Absorber Oil		
Type	KHV10-K2C (KAYABA) (SAE 5W or Bel-Ray SE2 #40)	— — —
Capacity	161 ml (5.44 US oz.)	— — —
Gas Pressure	980 kPa (10 kgf/cm <sup>2</sup> , 142 psi)	— — —
Spring Free Length	256 mm (10.1 in.)	250 mm (9.8 in.)

#### Special Tools - Steering Stem Nut Wrench: 57001-1100

Bearing Driver Set: 57001-1129

Jack: 57001-1238

Fork Spring Holder: 57001-1286

Fork Oil Level Gauge: 57001-1290

Fork Piston rod Puller, M10 × 1.0: 57001-1298

Fork Cylinder Holder: 57001-1413

Fork Oil Seal Driver: 57001-1352

Fork Outer Tube Weight: 57001-1218

## Front Fork

### Air Pressure Adjustment

○The air pressure in the fork legs is atmospheric pressure. The air pressure in the fork legs increases as the fork heats up, so the fork action will get stiffer as the vehicle operation progresses.

- Lift the front wheel off the ground using the jack (special tool) and a stand (see Wheels/Tires chapter).

**Special Tool - Jack: 57001-1238**

- Remove the screws [A] on the fork top plug.

### NOTE

○Do not use the side stand when adjusting the air pressure.

○Adjust the air pressure when the front forks are cold.

- Check the O-ring of the screw. Replace the O-ring with a new one if damage.
- Install the screw.
- Remove the jack and stand.

### Compression Damping Adjustment

- Place the jack under the frame so that the front wheel off the ground.

**Special Tool - Jack: 57001-1238**

- Clean the bottom of the fork tubes.
- Remove the caps on the bottom of the fork tubes.
- To adjust compression damping, turn the adjuster [A] on the front fork cylinder valve with the blade of a screwdriver until you feel a click. Adjust the compression damping to suit your preference under special condition.

### NOTE

○The left and right fork legs must have the same shock damping.

### Compression Damping Adjuster Setting

**Standard:**

**KX85A                      8 clicks**

**KX85B, KX100D    6 clicks**

Seated positions: adjuster turned fully clockwise [A].

Harder [B]

Softer [C]

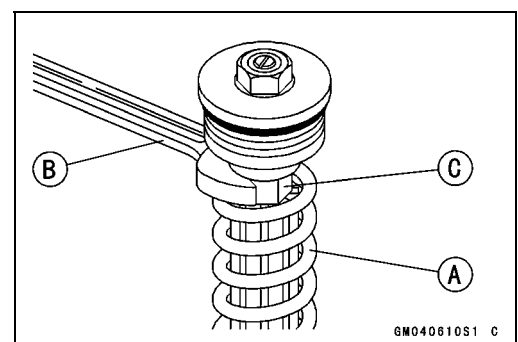
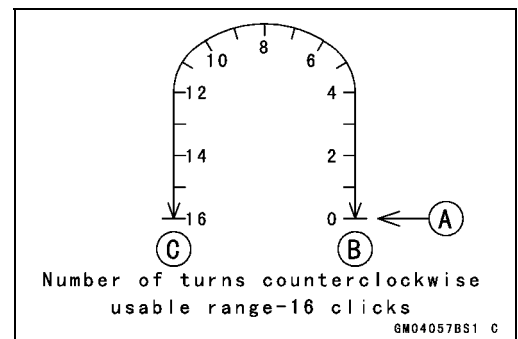
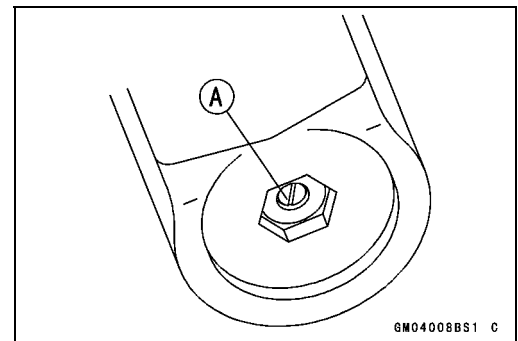
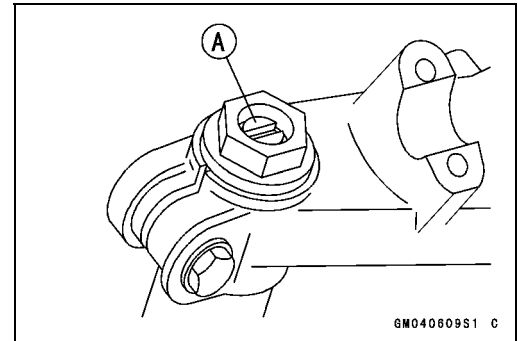
- Put the caps into the bottom of the fork tubes.

### Fork Oil Level Adjustment (each fork leg)

#### <Draining Oil>

- Loosen the fork top plug temporarily.
- Remove the front fork.
- Hold the fork leg vertically in a vise.
- Remove the fork top plug from the outer tube.
- Compress the outer tube.
- Press the fork spring [A] away from the top plug and slip the fork spring holder [B] in on top of the spring seat and under the push rod nut [C].

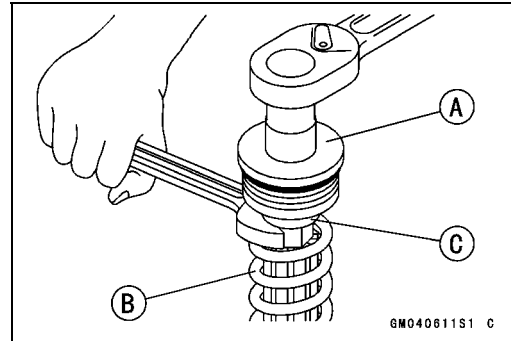
**Special Tool - Fork Spring Holder: 57001-1286**



## 11-6 SUSPENSION

### Front Fork

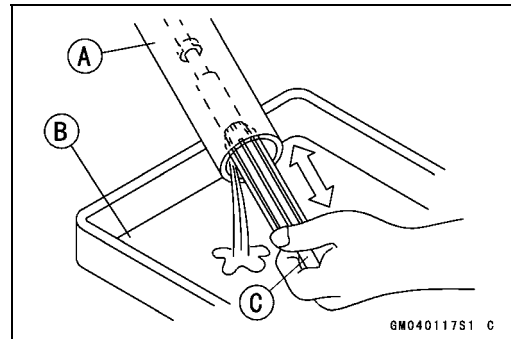
- Use wrenches on the rod nut and the top plug [A] to loosen the rod nut.
- Remove the top plug from the push rod.
- Remove the fork spring holder (special tool).
- Lift the fork spring [B] and its top spring seat [C] out of the inner tube.



- Hold the fork tube [A] upside down over a clean container [B] and pump it to drain the oil.

#### NOTE

- To discharge the fork oil, pump the push rod [C] up and down more than ten time.



#### <Filling with Oil>

- Hold the fork leg vertically in a vise, and fully compressed.

#### NOTE

- The spring should not be installed.

- Fill the front fork to the top with specified oil.

#### Recommended Fork Oil

KHL15-10 (KAYABA 01) or equivalent

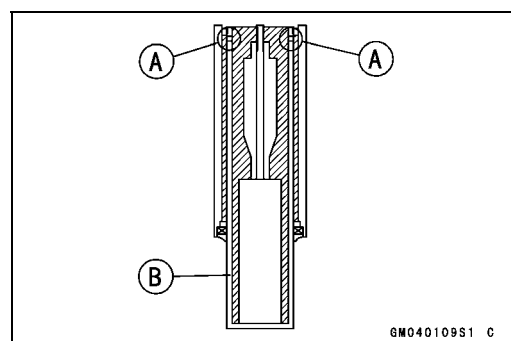
#### Fork Oil Capacity (completely dry)

KX85A: 315 ±4 mL (10.7 ±0.14 US oz)

KX85B/KX100D: 321 ±4 mL (10.9 ±0.14 US oz)

#### NOTE

- While doing this, take care to keep the oil level topped off that it stays above the two large holes [A] near the top of the inner tube [B].

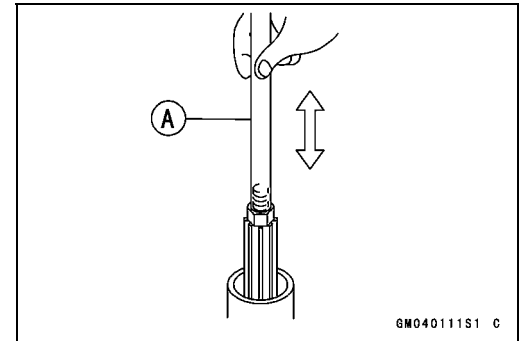


## Front Fork

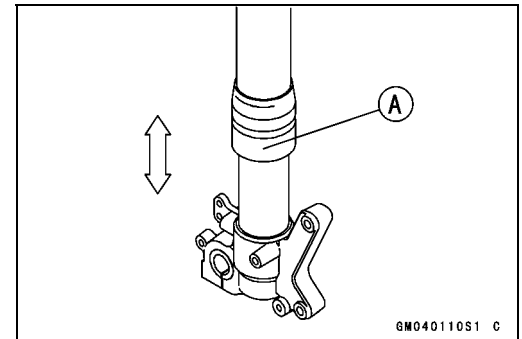
- Screw the fork piston rod puller [A] onto the end of the rod.

**Special Tool - Fork Piston Rod Puller, M10 × 1.0: 57001-1298**

- Purge the air from the fork cylinder by gently moving the rod puller [A] up and down five times.



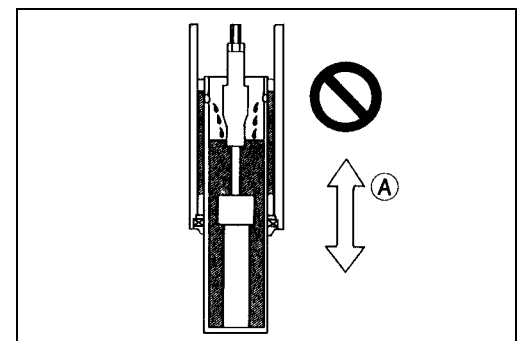
- Purge the air from between the inner and outer [A] tubes by pumping the outer tube up and down.



### CAUTION

**Never extend [A] the fork fully, oil will be forced from between the tubes into the inner tube through the holes at the top of it. This raised the oil level in the inner tube. If the fork is extended to the full length of its normal travel, the oil level will be raised about 30 mm (1.18 in.).**

- After purging the air from the assembly, let it sit for about five minutes so that any suspended air bubbles can surface.



### <Adjusting Oil Level>

- Check the oil level.
- With the fork fully compressed, put the oil level gauge [A] on the top of the tube [B], and inspect the distance from the top of the outer tube to the oil.

### NOTE

- The gauge tube is graduated in 1 cm division.
- The gauge body is graduated in 10 mL (0.134 US oz) division, excluding the gauge tube of about 5 mL (0.17 US oz) capacity.

### Oil Level (fully compressed, without spring)

#### Standard:

**KX85A: 100 ±2 mm (3.9 ±0.08 in.)**

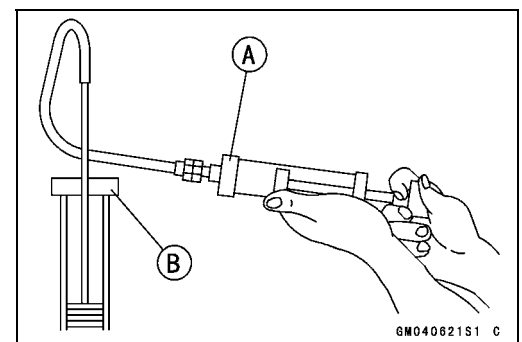
**KX85B, KX100D: 90 ±2 mm (3.5 ±0.08 in.)**

#### Adjustable Range:

**KX85A: 75 ~ 115 mm (3.0 ~ 4.5 in.)**

**KX85B, KX100D: 75 ~ 115 mm (3.0 ~ 4.5 in.)**

- ★ If no oil pumped out, there is insufficient oil in the fork tube. Pour in enough oil, then pump out the excess oil.
- Install the parts removal (see Assembly).



# 11-8 SUSPENSION

## Front Fork

### Fork Clamp Position Adjustment

Fork clamp position greatly affects steering qualities. Fork tube height is the amount of the inner tube projecting above the steering stem head. When the fork tube height is smaller, the front end becomes lighter due to change in weight bias. Also, it tends to understeer, the results are opposite.

- Be sure the front tire doesn't rub the fender when the fork tubes are compressed fully. Make the adjustment by **5 mm** increments.



### Fork Tube Height [A]

- KX85A: 20 mm (0.79 in.)
- KX85B, KX100D: 0 mm (0 in.)

### CAUTION

**Both fork tube heights should be adjusted evenly.**

### Fork Oil Change (each fork leg)

- Remove the front fork (see Front Fork Removal).
- Remove the following (see Fork Oil Level Adjustment).
  - Top Plug
  - Spring Seat
  - Main Spring

### ⚠ WARNING

**The top plugs are under extreme spring force. Use care when removing the top plugs. Wear eye and face protection.**

- Turn the front fork leg upside down, and pour the oil into a container. Pump the fork to drain the old oil completely.
- Pour in the type and amount of fork oil specified.

### Recommended Fork Oil

**KHL15-10 (KAYABA 01) or equivalent**

### Fork Oil Capacity (completely dry)

- KX85A: 315 ±4 mL (10.7 ±0.14 US oz)
- KX85B, KX100D: 321 ±4 mL (10.9 ±0.14 US oz)

- Check the oil level.

## Front Fork

○With the fork fully compressed, and held upright, measure the distance [D] from the top of the oil (see Front Oil Level Adjustment).

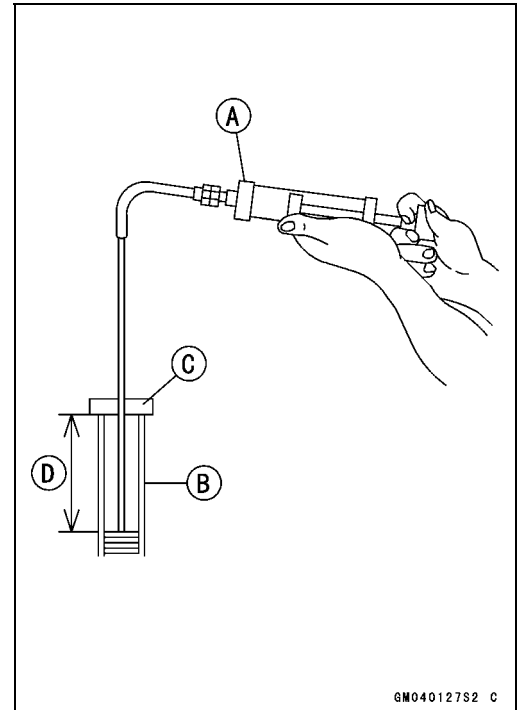
**Special Tool - Fork Oil Level Gauge: 57001-1290 [A]**

★If the oil is above or below the specified level, remove or add oil and recheck the oil level.

- Install the parts removed (see Oil Level Adjustment).
- Install the front fork leg (see Front Fork Installation).
- Change the fork oil in the other fork leg in the same manner.

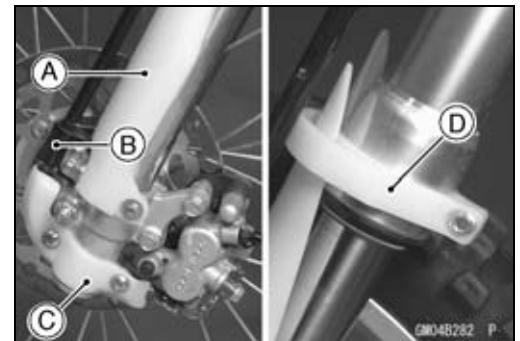
Fork Outer Tube [B]

Top of Fork Outer Tube [C]

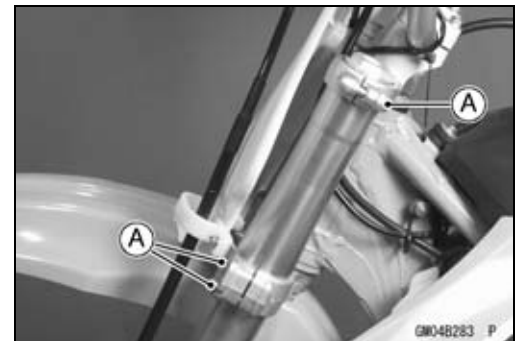


### Front Fork Removal

- Remove the left and right front fork protectors [A].
- Remove the brake hose clamp [B].
- Remove the brake hose cover [C].
- Remove the front wheel (see Wheels/Rims chapter).
- Remove the brake hose guide [D].
- Remove the front caliper from the front fork leg, and put it on the suitable stand so that it does not free in the air.



- Loosen the upper and lower front fork clamp bolts [A].
- Turning the both fork legs to the left and right, and pull them downward.



### Front Fork Installation

- When the front fork shall be disassembled, the fork oil level should be inspected.
- Install the brake cable and hose (see General Information chapter).
- Install the front wheel (see Wheels/Rims chapter).

**Torque - Front Fork Clamp Bolts (upper, lower): 20 N·m (2.0 kgf·m, 15 ft·lb)**

**Front Caliper Mounting Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)**

## 11-10 SUSPENSION

### Front Fork

#### NOTE

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

- Check the front brake for good braking power, no brake drag, and no fluid leakage after installing the front fork.

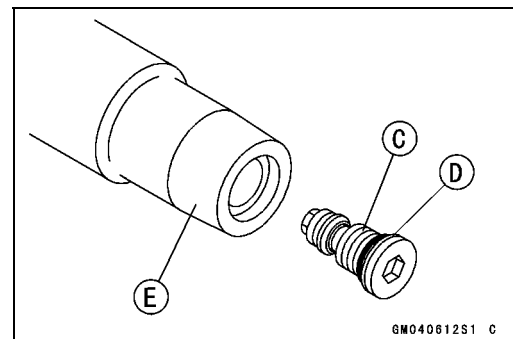
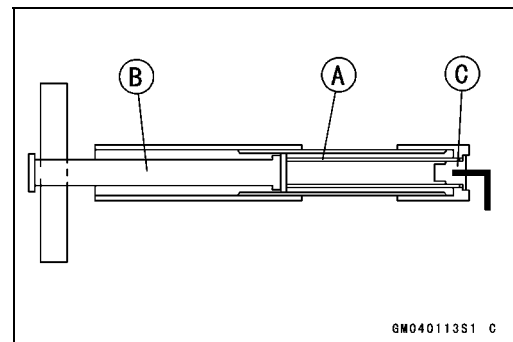
#### Disassembly (each fork leg)

- Loosen the fork top plug temporarily.
- Remove the front fork.
- Drain the fork oil (see Fork Oil Level Adjustment).
- Remove the following.
  - Push Rod Nut
  - Spring Guide

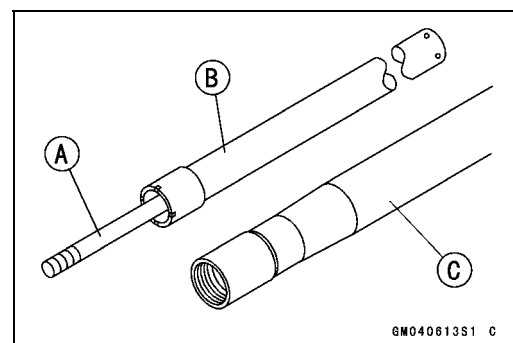
#### <Cylinder Unit Removal>

- Hold the fork leg horizontally in a vise.
- Compress the outer tube.
- Stop the cylinder unit [A] from turning by using the fork cylinder holder [B]. Unscrew the cylinder valve assembly [C], and take the cylinder valve assembly and gasket [D] out of the bottom of the inner tube [E].

**Special Tool - Fork Cylinder Holder: 57001-1413**



- Remove the push rod [A] and cylinder unit [B] from the top of the outer tube [C]

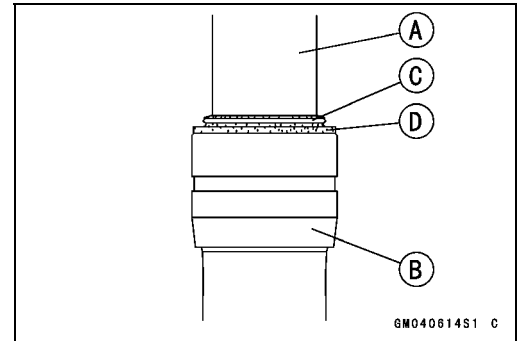




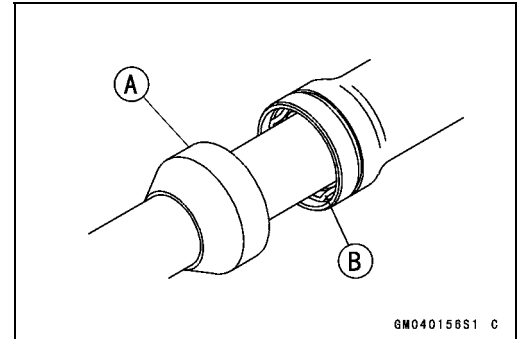
## Front Fork

### <Inner Tube Removal>

- Separate the inner tube [A] from the outer tube [B] as follows:
  - Slide up the spring band [C].
  - Slide up the dust seal [D].



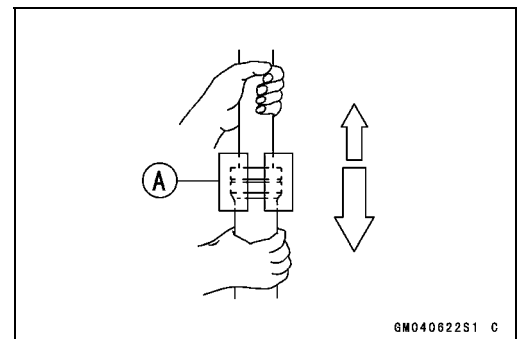
- Remove the retaining ring [B] from the outer tube [A].



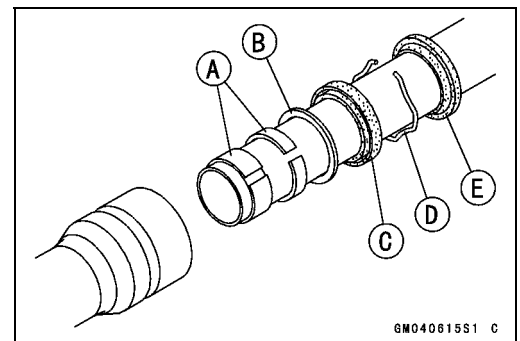
- Grasp the outer tube and stroke the inner tube up and down several times. The shock to the fork seal separates the inner tube from the outer tube.

- ★ If the tubes are tight, use the special tool [A].

**Special Tool - Fork Outer Tube Weight: 57001-1218**



- Remove the guide bushes [A], washer [B], oil seal [C], retaining ring [D], dust seal [E], from the inner tube.

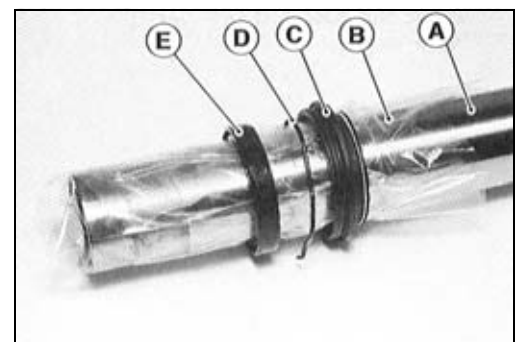


### Assembly (each fork leg)

- Assembly is the reverse of disassembly.

### <Inner Tube Assembly>

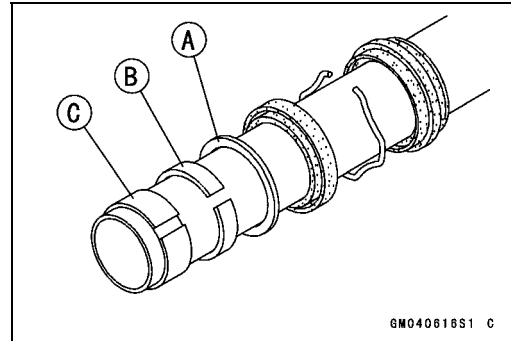
- Replace the following parts removed with a new one.
  - Guide Bushes
  - Oil Seal
  - Dust Seal
- Check the inner tube, and replace it with a new one if damaged.
- Cover the groove of the inner tube [A] guide bush with vinyl [B] for protecting the lips of dust seal and oil seal.
- Install the dust seal (Spring band side down) [C], retaining ring [D] and oil seal (marked side down) [E].
- Remove the vinyl.



## 11-12 SUSPENSION

### Front Fork

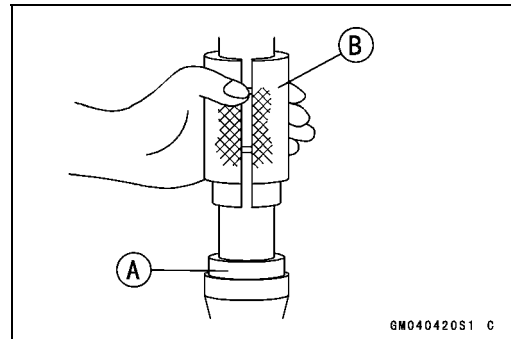
- Install the following onto the inner tube.
  - Washer [A]
  - Outer Tube Guide Bush [B]
  - Inner Tube Guide Bush [C]



- When installing the outer tube guide bush [A] into the outer tube, put the washer on the outer tube guide bush, and tap the washer with the fork oil seal driver [B] until it stops.

**Special Tool - Fork Oil Seal Driver: 57001-1352**

- Install the oil seal into the outer tube, using the oil seal driver (special tool).
- Install the following by hand.
  - Retaining Ring
  - Dust Seal

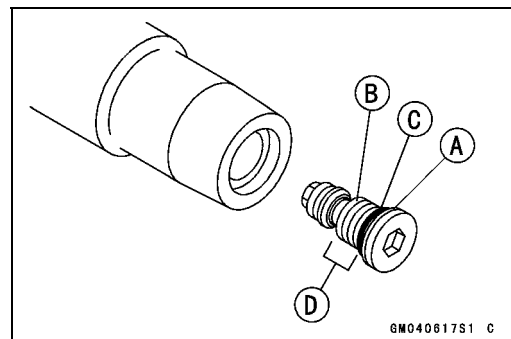


#### <Cylinder Unit Installation>

- Replace the gasket [A] of the compression valve assembly [B] with a new one.
- Hold the fork leg horizontally in a vise.
- Insert the cylinder unit in the inner tube.
- Check the O-ring [C] on the compression valve assembly, and replace it with a new one if damaged.
- Apply a non-permanent locking agent to the threads [D] of the compression valve and screw the valve assembly into the bottom of the inner tube.
- Hold the cylinder unit with the fork cylinder holder, and tighten the compression valve assembly to the specified torque.

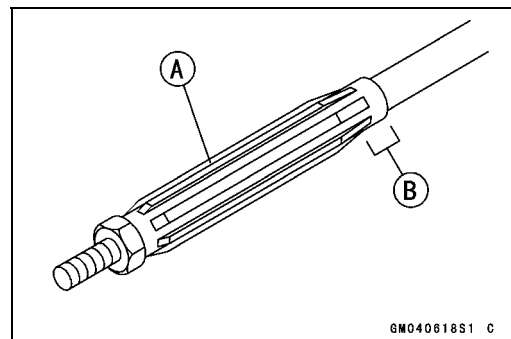
**Special Tool - Fork Cylinder Holder: 57001-1413**

**Torque - Compression Valve Assembly: 54 N·m (5.5 kgf·m, 40 ft·lb)**



#### <Top Plug Installation>

- Hold the fork leg vertically in a vice.
- Install the spring guide [A] so that the longer taper [B] is down.



## Front Fork

- Screw the push rod nut until it touched the spring guide.
- Pour in the type and amount of fork oil specified and adjust the oil level (see Fork Oil Level Adjustment).
- Screw the fork push rod puller [A] onto the end of the push rod.

**Special Tool - Fork Piston Rod Puller, M10 × 1.0: 57001-1298**

- Install the fork spring into the inner tube.
- Press the fork spring down while pulling up on the fork push rod puller (special tool).
- Insert the fork spring holder [B] in on top of the fork spring and under the push rod nut [C].

**Special Tool - Fork Spring Holder: 57001-1286**

- Remove the fork push rod puller (special tool).
- Set the spring seat [A] on the fork spring so that the convex side [B] is up.
- Check the O-ring on the top plug, and replace it with a new one if damaged.
- Tighten the top plug finger tight.
- Holding the top plug [C] with a wrench, tighten the push rod nut [D] against the top plug to the specified torque.

**Torque - Front Fork Push Rod Nut: 15 N·m (1.5 kgf·m, 11 in·lb)**

- Pull out the fork spring holder (special tool).
- Raise the outer tube, and screw the top plug into it.
- Install the front fork (see Front Fork Installation).
- Tighten the top plug to the specified torque.

**Torque - Front Fork Top Plugs: 27 N·m (2.8 kgf·m, 20 ft·lb)**

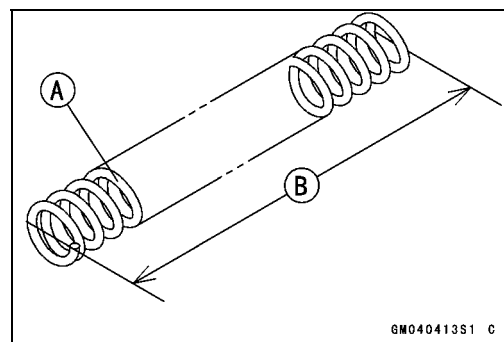
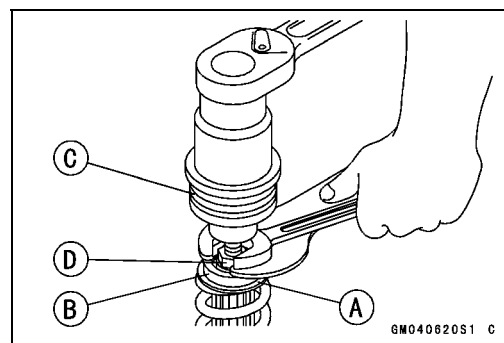
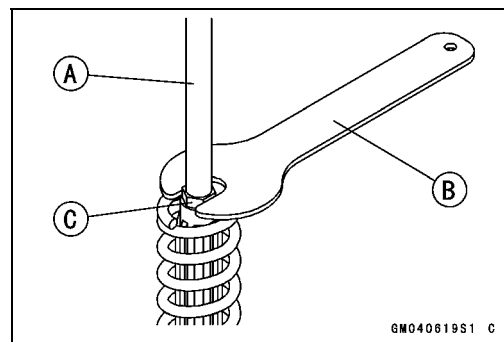
### Spring Tension

- Since a fork spring [A] becomes shorter as it weakens, check its free length [B] to determine its condition.
- ★ If the spring of either fork leg is shorter than the service limit, it must be replaced. If the length of a replacement spring and that of the remaining spring vary greatly, the remaining spring should also be replaced in order to keep the fork legs balanced for motorcycle stability.

### Main Spring Length

**Standard: 430 mm (16.9 in.)**

**Service Limit: 422 mm (16.6 in.)**



# 11-14 SUSPENSION

## Rear Shock Absorber

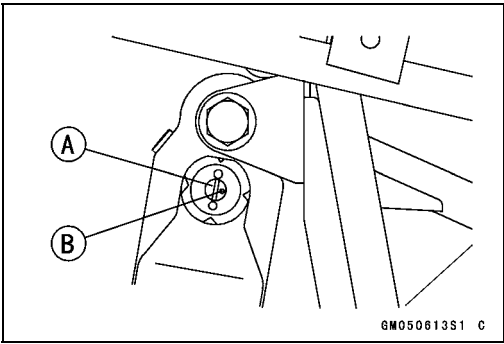
To suit to various riding conditions, the spring preload of the shock absorber can be adjusted or the spring can be replaced with an optional one. Also the damping force can be adjusted easily so changing oil viscosity unnecessary.

### Compression Damping Force Adjustment

- To adjust the compression damping force, turn the upper damping adjuster [A] to the desired position aligning the punch mark [B].
- The standard setting is number 2 position.
- ★ If the damping feels too soft or too stiff, adjust it.

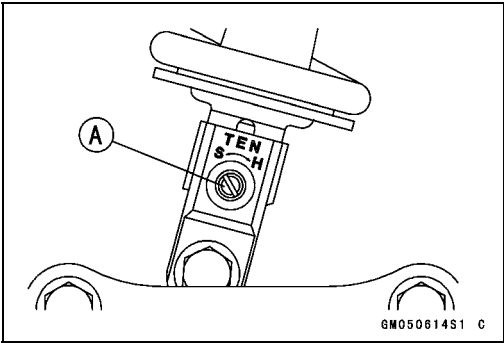
### Compression Damping Adjustment

Position	1	2	3	4
Damping Force	Minimum ← - - - - - → Maximum			



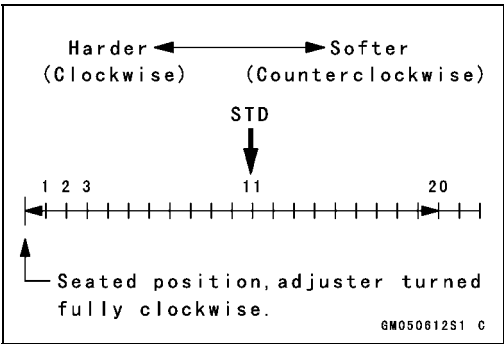
### Rebound Damping Force Adjustment

- To adjust the rebound damping force, turn the lower damping adjuster [A] to the desired position until you feel a click.
- The standard setting is the 11th click from the fully clockwise position.
- ★ If the damper setting feels too soft or too stiff, adjust it.



### 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.**



### Preload Adjustment

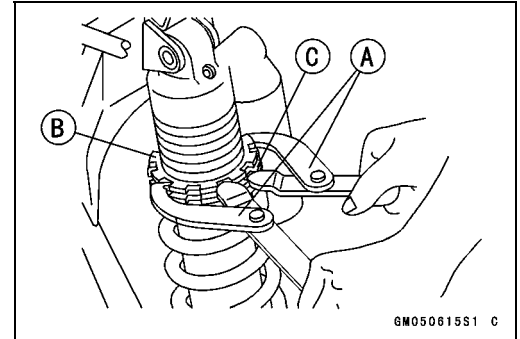
The spring adjusting nut on the rear shock absorber can be adjusted for different riding and loading conditions. If the spring action feels too soft or too stiff, adjust it in accordance with the following procedure:

- Remove the following parts.
  - Seat (see Frame chapter)
  - Side Covers (see Frame chapter)
  - Air Cleaner Duct Clamp (loosen)
  - Air Cleaner Housing (see Fuel System chapter)

## Rear Shock Absorber

- Using the steering stem nut wrenches [A], loosen the lock-nut [B] and turn the adjusting nut [C] as required.

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



- Turning the adjusting nut [A] downward makes the spring action harder and upward softer.
- Tighten the locknut.
- Measure the nut position shown, and adjust the spring as follows:

### Spring Preload Setting

**Standard adjusting nut position [B]: 73 mm (2.87 in.)**

**Nut adjusting range: 63 ~ 85 mm (2.48 ~ 3.35 in.)**

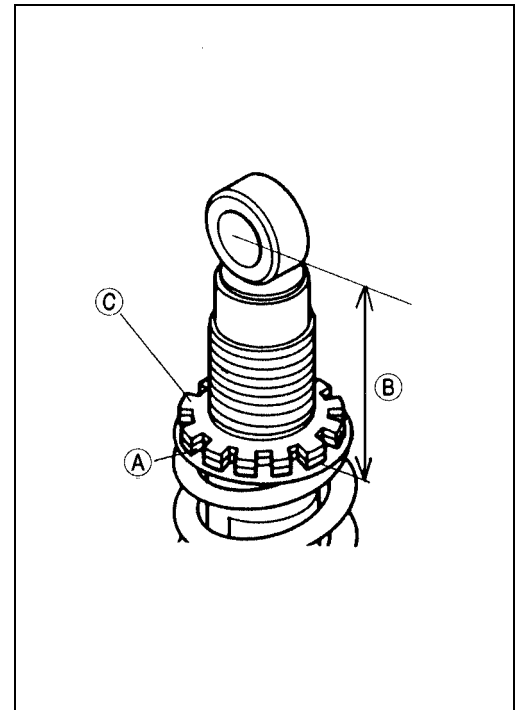
**Standard Spring Set length: 244.5 mm (9.63 in.)**

### NOTE

○Adjusting nut position and nut adjusting range applies to the optional springs.

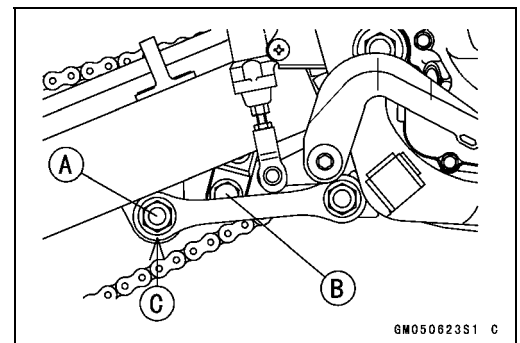
- Tighten the locknut [C] securely.
- After adjustment, move the spring up and down to make sure that the spring is seated.
- Install the parts removed.
- Torque:

**Torque - Rear Frame Pipe Bolts: 34 N·m (3.5 kgf·m, 25 ft·lb)**



### Removal

- Remove the following.
  - Air Cleaner Housing (see Preload Adjustment in this chapter)
- Raise the rear wheel off the ground (see Wheels/Tires chapter).
- Remove the following.
  - Tie- Rod Bolt and Nut [A]
  - Rear Shock Absorber Lower Bolt [B]
  - Rear Shock Absorber Upper Bolt and Nut [D]
- Support [C] rocker arm to slide out the bolts.



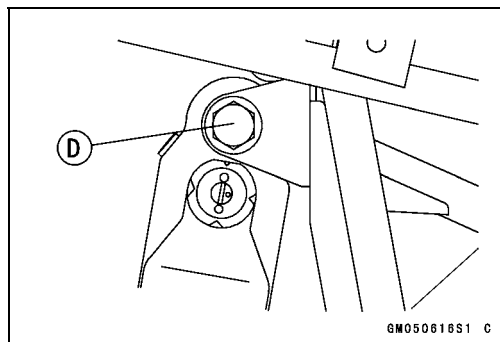
## 11-16 SUSPENSION

### Rear Shock Absorber

#### CAUTION

When pulling out the mounting bolts, lift the swingarm slightly. Forcing or tapping on a bolt could damage the bolt, sleeve, and bearing

- Remove the rear shock absorber.



#### Installation

- Installation is the reverse of removal.
- Torque:

**Torque - Rear Shock Absorber Mounting Bolts: 39 N·m (4.0 kgf·m, 29 ft·lb)**

**Tie-Rod Nut: 59 N·m (6.0 kgf·m, 44 ft·lb)**

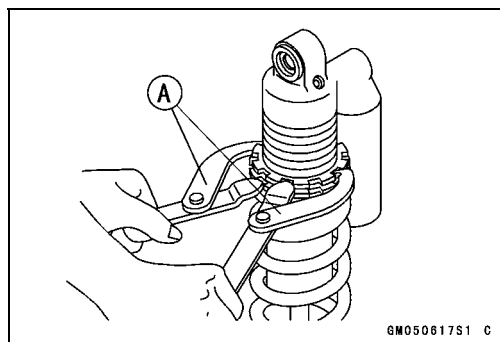
**Rear Frame Pipe Bolts: 34 N·m (3.5 kgf·m, 25 ft·lb)**

#### Spring Replacement

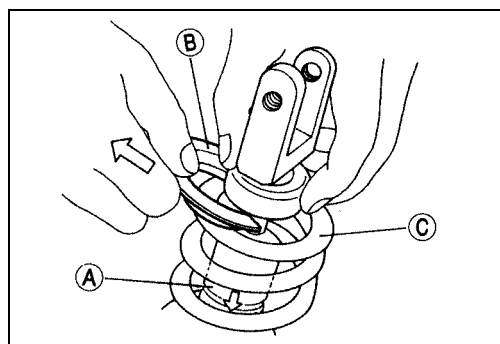
In addition to the standard spring, heavy and light springs are available. If the standard spring is improper for your purpose, select a proper one according to the rider's weight or course conditions.

- Remove the rear shock absorber (see Rear Shock Absorber Removal).
- Clean the threaded portion on the upper of the rear shock absorber.
- Hold the lower of the rear shock absorber with a vise.
- Using the stem nut wrenches [A], loosen the locknut and turn the adjusting nut all the way upward.

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



- Slide down the rubber bumper [A].
- Remove the spring retainer clip [B] from the shock absorber and lift off the spring [C].
- Exchange the spring for an optional part.
- Install the spring and retainer clip.
- Adjust the spring preload.
- Install the rear shock absorber.

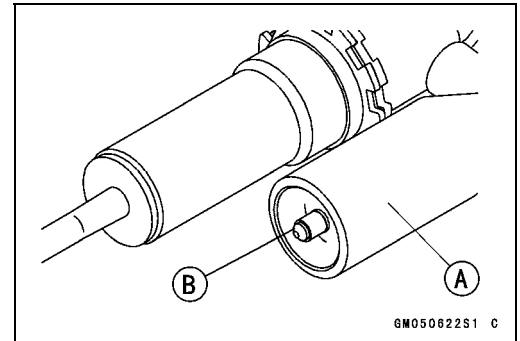


## Rear Shock Absorber

### Oil Draining

The oil should be changed in the rear shock absorber at least once per racing season. The frequency for best performance must be based upon riding conditions and rider ability.

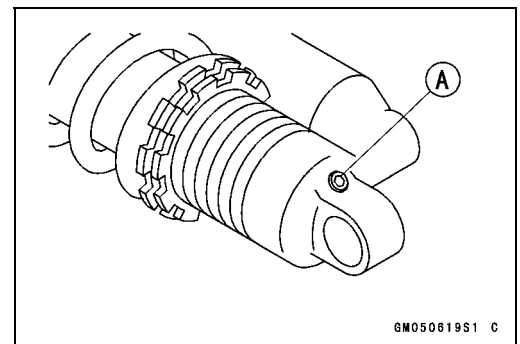
- Remove the following.
  - Rear Shock (see Rear Shock Absorber Removal)
  - Rear Shock Spring (see Spring Replacement)
- Point the reservoir valve away from you. Slowly release the nitrogen gas pressure from the gas reservoir [A] by pushing down the valve core [B] with a screwdriver.



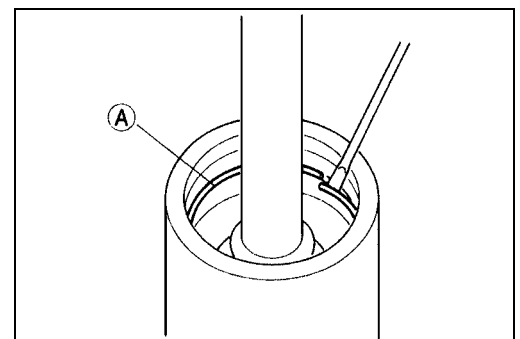
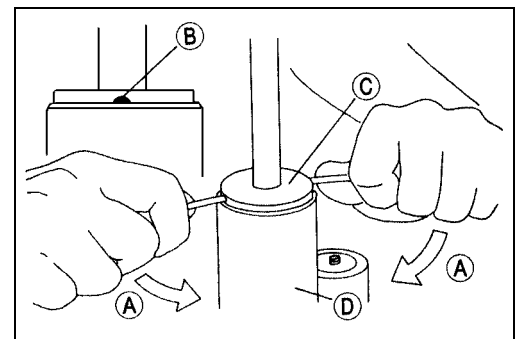
### **⚠ WARNING**

**Do not to point the reservoir valve toward your face or body when releasing nitrogen gas pressure. An oil mist is often released with the nitrogen. Always release nitrogen gas pressure before disassembling the rear shock absorber to prevent explosive separation of parts.**

- Adjust the compression damping adjuster on the gas reservoir to the softest position.
- Remove the air bleeder bolt [A] and pump the rear shock to drain the oil out of the rear shock body.
- Pry [A] at the gaps [B] in the stop [C] with suitable tools to free the stop from the rear shock body [D].



- Slide the stop up the top of the push rod then lightly tap around the seal with a suitable rod and mallet, and push the seal assembly 10 mm (0.04 in) down.
- Remove the circlip [A].
- Lightly move the push rod back and forth, and pull out the push rod assembly.
- Pour the remaining oil out of the rear shock body.



## 11-18 SUSPENSION

### Rear Shock Absorber

#### Oil Filling

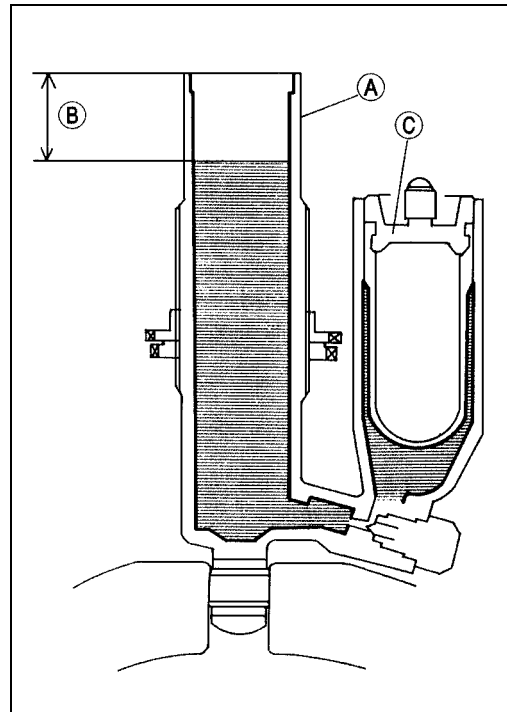
- Check the O-ring on the air bleeder bolt, and replace it if necessary.
- Install the air bleeder bolt.
- Pour **KHV10-K2C (KAYABA) (SAE 5W or Bel-Ray SE2 #40)** oil into the rear shock body to 31 ~ 35 mm (1.22 ~ 1.38 in.) (from the shock body lower end).

Rear Shock Body Lower End [A]

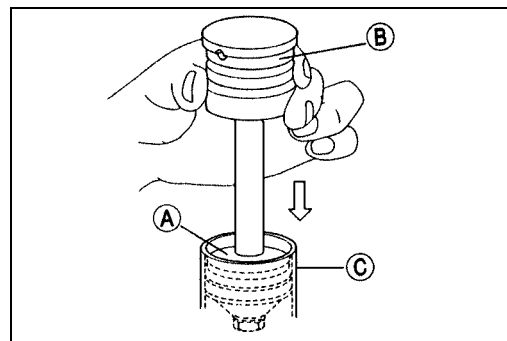
31 ~ 35 mm (1.22 ~ 1.38 in.)[B]

Gas Reservoir [C]

Oil Capacity: 161 mL (5.44 US oz)



- Insert the piston end [A] of the push rod assembly into the rear shock body slowly. Do not insert the seal assembly [B] yet. Pump the push rod until all the air is forced out of the rear shock body [C].

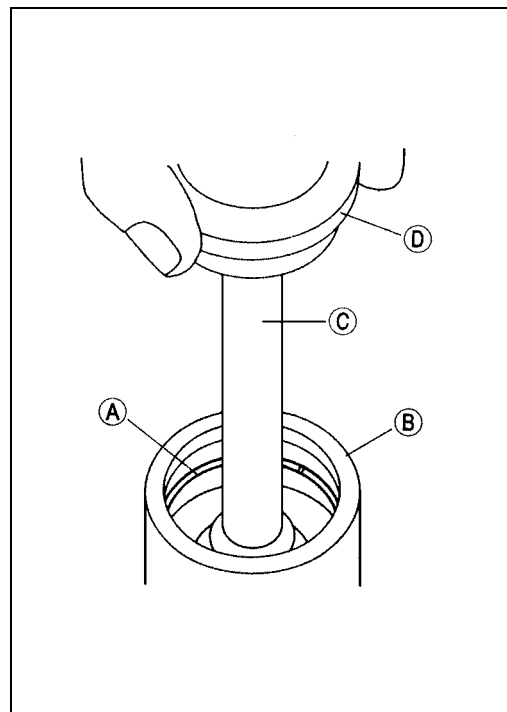


- Push the seal assembly into the rear shock body until it just clears the circlip groove.
- Check the circlip. If it is deformed or damaged, replace it with a new one.
- Fit the circlip [A] into the groove in the rear shock body [B].

#### CAUTION

**If the circlip is not a certain fit in the groove in the rear shock body, the push rod assembly may come out of the shock absorber when injecting the nitrogen gas or riding the motorcycle.**

- Pull up the push rod assembly [C] against the circlip [A].
- Force the stop [D] into the rear shock body by lightly tapping around the edge of the stop with a mallet.
- Hold the lower end of the push rod assembly with a vise.
- Pump the rear shock up and down several times, and then leave it in the fully extend position for about three minutes.
- Remove the air bleeder bolt [E] from the upper part of the rear shock body.





# Rear Shock Absorber

- ★ If oil comes out of the air bleeder bolt hole, let it overflow until it stops.
- ★ If oil does not come out of the air bleeder bolt hole, add the specified oil into the air bleeder bolt hole until it overflows (that is, until all the remaining air is forced out).
- Install the air bleeder bolt securely.
- Fully extend the push rod assembly.
- Inject nitrogen gas to a pressure of **50 kPa (0.5 kgf/cm<sup>2</sup>, 7 psi)** through the valve on the gas reservoir.
- Check the rear shock body and gas reservoir for oil and gas leaks.
- ★ If there are no leaks, inject the nitrogen gas up to **980 kPa (10 kgf/cm<sup>2</sup>, 142 psi)**.

## ⚠ WARNING

**Pressurize the gas reservoir with nitrogen gas only. Do not use air or other gases, since they may cause premature wear, rust, fire hazard or substandard performance.**  
**High pressure gas is dangerous. Have a qualified mechanic perform this procedure.**

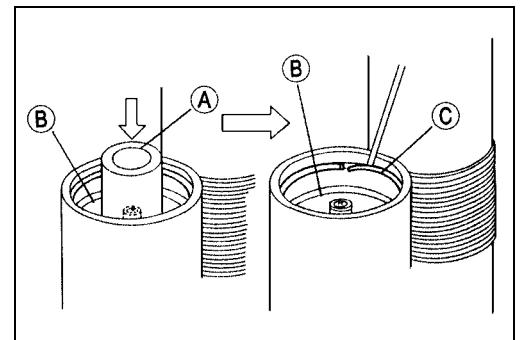
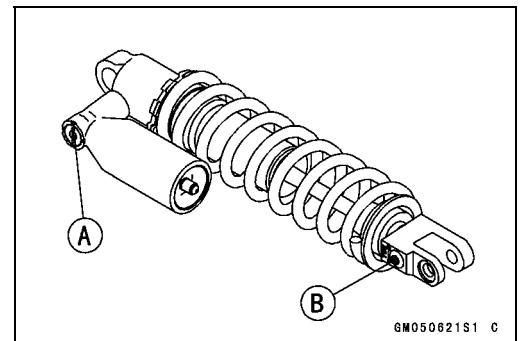
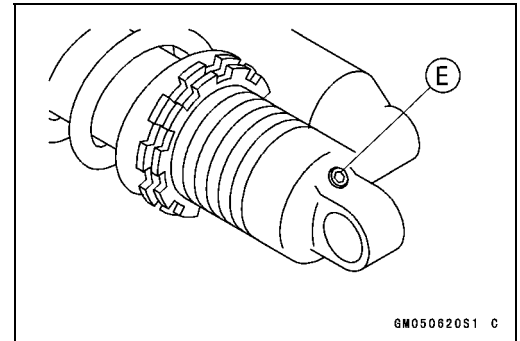
## NOTE

○ *Check and adjust the gas pressure when the gas reservoir is cold (room temperature).*

- Install the spring and retainer clip.
- Both damping adjusters must face to the same side.  
 Compression Damping Adjuster [A]  
 Rebound Damping Adjuster [B]
- Adjust the following.  
 Spring Preload  
 Compression Damping Adjuster
- Install the rear shock absorber (see Rear Shock Absorber Removal).

## Disassembly

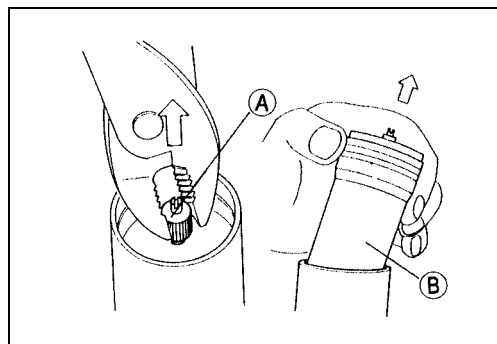
- Drain the oil and disassemble the rear shock body (see Oil Draining).
- Using a suitable tool (collar or nut) [A] and press, push the reservoir cap [B] in 10 mm (0.394 in.).
- Remove the circlip [C] from the gas reservoir.



## 11-20 SUSPENSION

### Rear Shock Absorber

- Install a steel tire valve cap [A] on the gas reservoir valve, and pull the gas reservoir cap out of the gas reservoir using pliers.
- The bladder [B] comes out with the gas reservoir cap.



#### Assembly

- Check that the bladder [A] on the gas reservoir cap is not partially collapsed.
- If it is, push down the valve core with a screwdriver.
- Check the bladder for sign of damage or crack. If necessary, replace it with a new one.

#### CAUTION

**Do not use a damaged or partially collapsed bladder, because it may burst, gently reducing rear shock performance.**

- Apply grease to the lip [B] of the bladder.
- Push the bladder and gas reservoir cap into the gas reservoir slowly until it just clears the circlip groove. Wipe out any spilled oil.

#### CAUTION

**Ensure that no air remains in the system.**

- Check the circlip for weakening, deformity and flaws. If necessary, replace it with a new one.

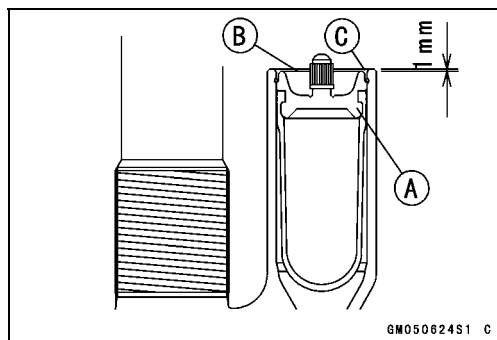
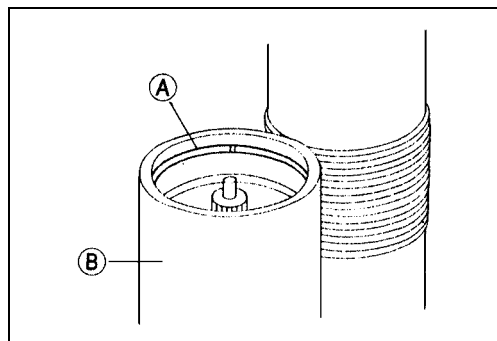
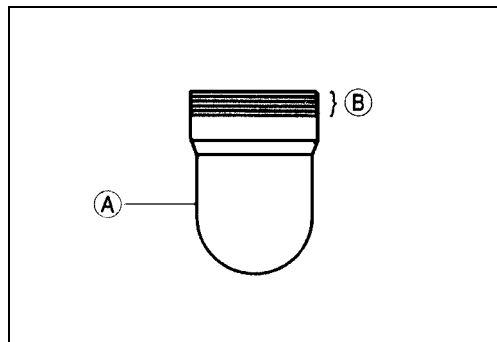
#### ⚠ WARNING

**If weakened, deformed or flawed circlip is used, the gas reservoir cap may not hold when injecting the nitrogen gas. This would allow oil and internal parts to explode out of the reservoir.**

- Fit the circlip [A] in the groove in the gas reservoir [B].
- Pull up the gas reservoir cap [A] against the circlip. The end [B] of the gas reservoir cap must be 1 mm (0.039 in.) lower than the end [C] of the gas reservoir.

#### ⚠ WARNING

**If the end of the gas reservoir cap is not 1 mm lower than the end of the gas reservoir, the circlip is not correctly fitted in the groove in the gas reservoir or is deformed. In this case, the oil and internal parts could explode out of the reservoir when injecting the nitrogen gas or while riding the motorcycle.**



GM050824S1 C

- Fill the rear shock body and gas reservoir with the specified oil, and then assemble the rear shock body (see Oil Filling).

## Rear Shock Absorber

### *Spring Tension*

Since a spring becomes shorter as it weakens, check its free length to determine the condition.

★ If the spring is shorter than the service limit, it must be replaced.

### **Rear Shock Absorber Spring Free Length**

**Standard:** 256 mm (10.1 in.)

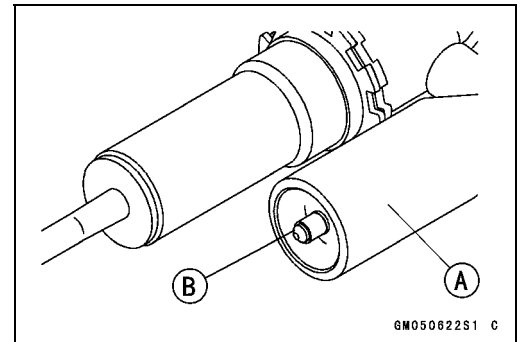
**Service Limit:** 250 mm (9.8 in.)

### *Scrapping*

- Remove the rear shock absorber (see Rear Shock Absorber Removal).
- Remove the valve cap and release the nitrogen gas completely from the gas reservoir [A] by pushing down the valve core [B] with a screwdriver.

### **⚠ WARNING**

**Since the high pressure gas is dangerous, do not point the valve toward your face or body.  
Do not incinerate a shock absorber without first removing the valve or it may exploded.**

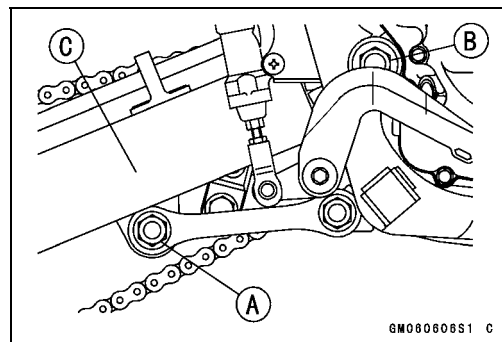


## 11-22 SUSPENSION

### Swingarm

#### Removal

- Squeeze the brake lever slowly and hold it with a band.
- Remove the following.
  - Rear Brake Hose Straps
  - Rear Brake Caliper (see Brake chapter)
  - Tie Rod Rear Bolt [A] (see Tie-Rod Removal)
  - Swingarm Pivot Shaft Nut [B]
  - Rear Wheel (see Wheels/Tires chapter)
- Pull out the swingarm pivot shaft, and remove the swingarm [C].



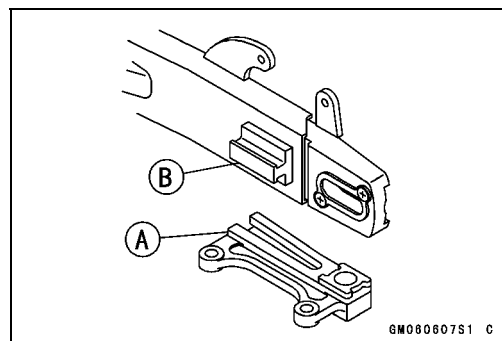
#### Installation

- Installation is the reverse of removal. Note the following.
- Apply plenty of molybdenum disulfide grease to the inside of the needle bearings and sleeves.
- Torque:

**Torque - Swingarm Pivot Shaft Nuts: 69 N·m (7.0 kgf·m, 51 ft·lb)**

**Tie-Rod Nuts: 59 N·m (6.0 kgf·m, 44 ft·lb)**

- Install the caliper holder [A] on the swingarm stop [B].
- Install the following.
  - Rear Wheel (see Wheels/Tires chapter)
  - Drive Chain (see Final Drive chapter)
- Check the brake after installation.



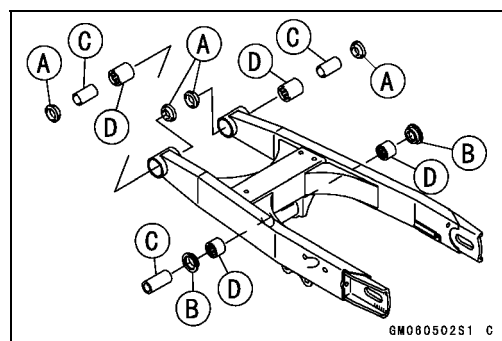
#### WARNING

**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.**

#### Swingarm Bearing Removal

- Remove:
  - Swingarm
  - Dust Seals [A]
  - Oil Seals [B]
  - Sleeves [C]
- Remove the needle bearings [D] using the bearing driver set.

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



## Swingarm

### SwingArm Bearing Installation

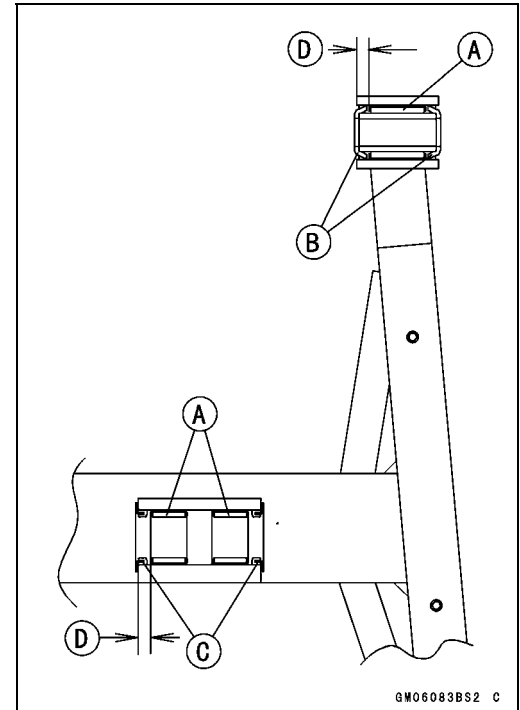
- Replace the needle bearings, dust seals and oil seals with new ones.
- Apply plenty of molybdenum disulfide grease to the dust seals, oil seals and needle bearings.

#### NOTE

○ Install the needle bearings so that the manufacturer's marks face out.

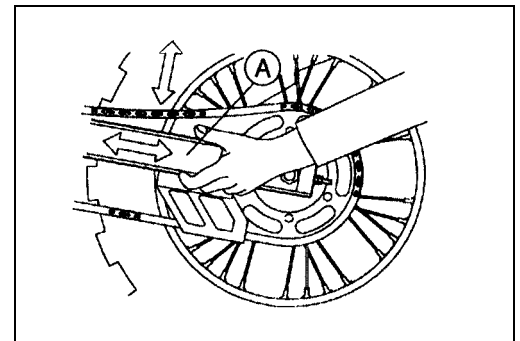
#### Special Tool - Bearing Driver Set: 57001-1129

- Install the needle bearings [A] dust seals [B] and oil seals [C] position as shown.  
5.5 mm [D]
- The installation procedure is the same as the counter side.



### Swingarm Pivot Inspection

- Check the pivot of the swingarm and uni-trak link (tie-rod and rocker arm) for wear periodically, or whenever excessive play is suspected.
- Raise the rear wheel off the ground (see Wheels/Tires chapter).
- Move the swingarm [A] up and down to check for abnormal friction, and push and pull it to check for bearing play. A small amount of play on the pivot is normal and no corrective action is needed. However, if excessive play is felt, check the swingarm and uni-trak link bearings for wear and replace them if necessary.



#### ⚠ WARNING

**Installation of new bearing(s) in the swingarm and uni-trak link may cause too stiff rear suspension. Test ride the motorcycle slowly and prudently until the suspension becomes normal.**

### Swingarm Bearing, Sleeve Inspection

- The rollers in a needle bearing normally wear very little, and wear is difficult to measure. Instead of measuring in the swingarm for abrasion, color change, or other damage.
- ★ If there is any doubt as to the condition of any of the needle bearings or sleeves, replace all the sleeves, and needle bearings as a set.

## 11-24 SUSPENSION

### Tie-Rod, Rocker Arm

#### *Tie-Rod Removal*

- Raise the rear wheel off the ground (see Wheel/Tires chapter).
- Squeeze the brake lever slowly and hold it with a band.
- Remove the following.
  - Front and Rear Tie-Rod Bolts [A]

#### **CAUTION**

**When pulling out the tie-rod bolts, lift the swingarm or the rocker arm slightly. Forcing or tapping on a bolt could damage the bolt, sleeve, and bearing.**

- Remove the tie-rods [B].

#### *Tie-Rod Installation*

- Apply plenty of molybdenum disulfide grease to the inside of the needle bearings and sleeves.
  - Rocker Arm Needle Bearings
  - Tie-Rod Needle Bearings
- Install the tie-rod bolts from the left side.
- Tighten the tie-rod front and rear nuts to the specified torque.

**Torque - Tie-Rod Nuts: 59 N·m (6.0 kgf·m, 44 ft·lb)**

#### *Rocker Arm Removal*

- Raise the rear wheel off the ground (see Wheels/Tires chapter).
- Squeeze the brake lever slowly and hold it with a band.
- Remove the following.
  - Tie-Rod (see Tie-Rod Removal)
  - Swingarm (see Swingarm Removal)

#### **NOTE**

- *The swingarm may be removed with the rear wheel left installed on it.*

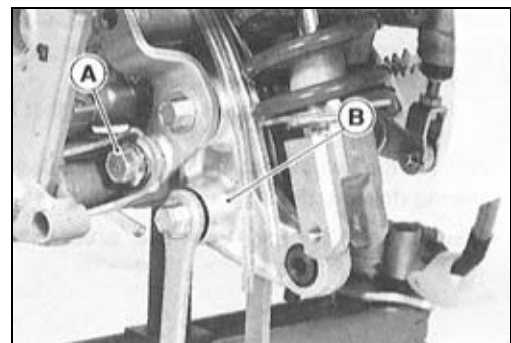
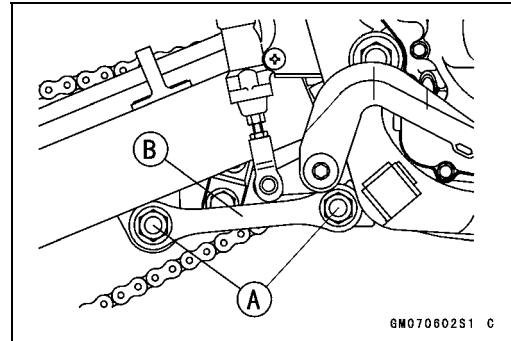
Lower Chain Guide Roller

Rocker Arm Bracket Bolts (Right and Left) [A]

- Remove the rocker arm [B].

#### *Rocker Arm Installation*

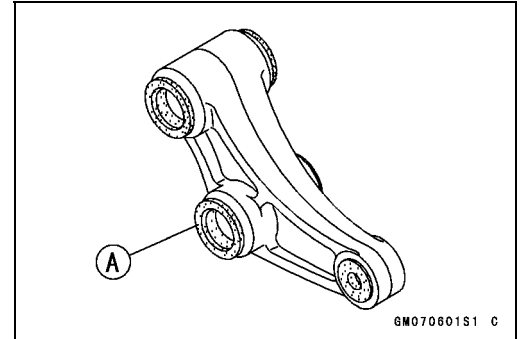
- Apply plenty of molybdenum disulfide grease to the inside of, needle bearings, and sleeves.
  - Rocker Arm Needle Bearings
  - Tie-Rod Needle Bearings
- Torque:
  - Torque - Rocker Arm Bracket Bolts: 83 N·m (8.5 kgf·m, 61 ft·lb)**
- Install the following.
  - Tie-Rod (see Tie-Rod Installation)
  - Swingarm (see Swingarm Installation)



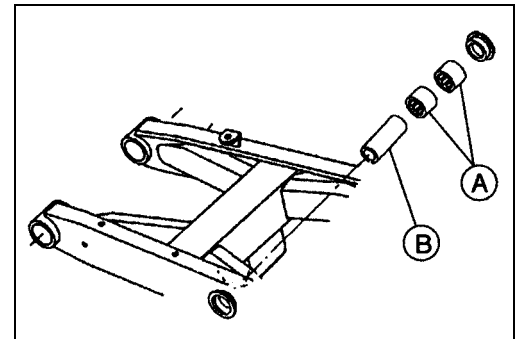
## Tie-Rod, Rocker Arm

### Rocker Arm/Tie-Rod Bearing Removal

- Remove the rocker arm for the rocker arm bearing removal (see Rocker Arm/Tie-Rod Bearing Removal).
- Remove the swingarm for the tie-rod bearing removal (see Rocker Arm/Tie-Rod Bearing Removal).
- Remove the grease seal [A].



- Remove the needle bearing.
- **Special Tool - Bearing Driver Set: 57001-1129**
- Replace the bearings [A] and sleeves [B] with new ones.



### Rocker Arm/Tie-Rod Bearing Installation

- Apply plenty of molybdenum disulfide grease to the inside of new needle bearings and sleeves.
  - Be sure to install the needle bearings so that the manufacturer's marks are faced out.
- Position the bearings as shown in the Exploded View, using a suitable bearing driver in the bearing driver set.

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

### Uni-Trak Link Pivot Inspection

- Check the pivot of the swingarm and uni-trak link (tie-rod and rocker arm) for wear periodically, or whenever excessive play is suspected (see Swingarm Pivot Inspection).
- A small amount of play on the pivot is normal and no corrective action is needed. However, if excessive play is felt, check the swingarm, and uni-trak link bearings for wear, and replace them if necessary (see Rocker Arm/Tie-Rod Bearing Inspection).

### Rocker Arm/Tie-Rod Bearing Inspection

- The rollers in a needle bearing normally wear very little, and wear is difficult to measure. Instead of measuring, inspect the bearing installed for abrasion, color change, or other damage.
- ★ If there is any doubt as to the condition of any of the needle bearings, replace all the sleeves, and needle bearings as a set.

### Rocker Arm/Tie-Rod Sleeve Inspection

- ★ If there is visible damage, replace the sleeves and all the needle bearings as a set.



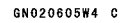


# Steering

## Table of Contents

Exploded View .....	12-2
Specifications .....	12-3
Handlebar .....	12-4
Installation .....	12-4
Clutch Lever Installation .....	12-4
Steering .....	12-5
Adjustment .....	12-5
Steering Stem .....	12-6
Removal .....	12-6
Installation .....	12-6
Bearing Seal Deterioration, Damage Inspection .....	12-6
Steering Stem Warp Inspection .....	12-7
Steering Stem Bearing .....	12-8
Removal .....	12-8
Installation .....	12-8
Lubrication .....	12-9
Wear, Damage Inspection .....	12-9

## Exploded View



O: Apply oil.

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**Specifications**

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**Special Tools - Bearing Driver,  $\phi$ 32: 57001-382**

**Head Pipe Outer Race Press Shaft: 57001-1075**

**Steering Stem Bearing Driver Adapter: 57001-1092**

**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**

**Jack: 57001-1238**

## 12-4 STEERING

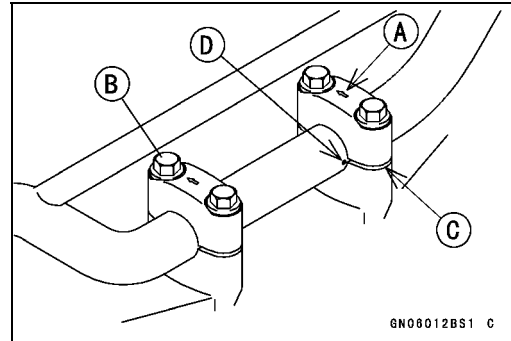
### Handlebar

#### Installation

- Install the handlebar holders so that the arrow [A] on the holder points to the front.
- Align the punch mark [D] on the handlebar to the mating surface of each clamp of handlebar, front master cylinder.
- Tighten the front holder bolts [B] first, and then the rear holder bolts to the specified torque. There will be a gap [C] at the rear part of the holder after tightening.

**Torque - Handlebar Holder Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)**

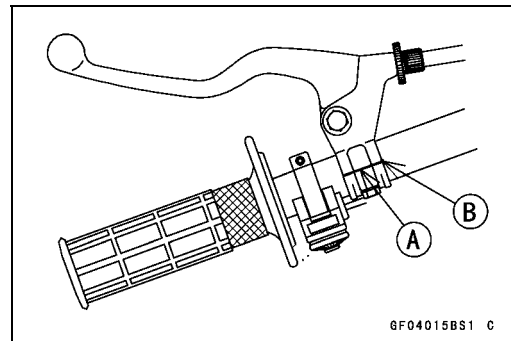
- Install the front master cylinder (see Front Master Cylinder Installation in the Brakes chapter).



#### Clutch Lever Installation

- Install the clutch lever so that the mating surface [A] of the clutch lever clamp is aligned with the punch mark [B].

**Torque - Clutch Lever Clamp Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)**



## Steering

### Adjustment

- Check the steering.
- Lift the front wheel off the ground using a stand and the jack.

#### Special Tool - 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 rib 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 legs.
- ★ If you feel looseness, the steering is too loose.

### NOTE

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

- ★ Adjust the steering if necessary.
- Remove the following parts.
  - Number Plate
  - Stem Head Nut [A] (loosen)
  - Fork Lower Clamp Bolts (both sides, loosen)
- Move back the fuel tank with the hose installed (see Fuel System chapter).
- Adjust the steering with the stem nut wrench [C].

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

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

### NOTE

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

- Tighten the following bolts and nut to the specified torque.

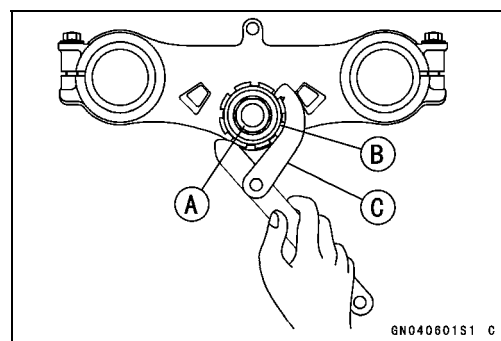
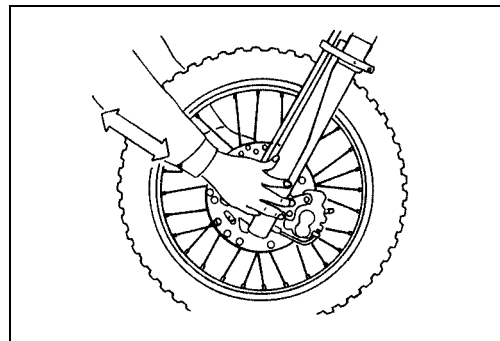
**Torque - Front Fork Clamp Bolts: 20 N·m (2.0 kgf·m, 15 ft·lb)**

**Steering Stem Head Nut: 64 N·m (6.5 kgf·m, 47 ft·lb)**

### NOTE

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

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



## 12-6 STEERING

### Steering Stem

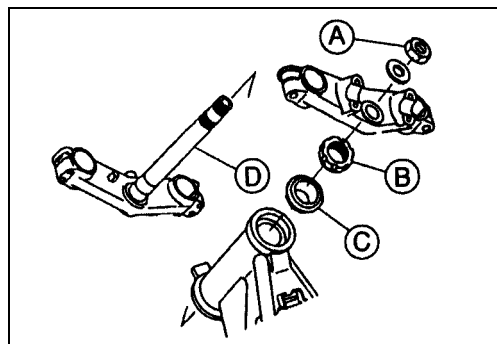
#### Removal

- Remove the following parts.
  - Steering Stem Head Nut [A]
  - Front Fender
  - Front Fork Legs (see Suspension chapter)
  - Handlebar
  - Stem Head
  - Upper Steering Stem Bearing [C]
- Push up on the steering stem [D], and remove the stem nut [B] using the stem nut wrench, then remove the steering stem base.

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

#### Installation

- Install the upper steering stem bearing (see Steering Stem Bearing Installation).
- Grease the steering stem bearing (see Steering Stem Bearing Lubrication).
- Install:
  - Stem Head
  - Handlebar (see Handlebar Installation)
  - Front Fork Legs (see Suspension chapter)
  - Front Fender Steering Stem Head Nut
- Route the cables, wire, and hose as shown in the Cable, Wire and Hose Routing section of the General Information chapter.
- Torque:
  - Torque - Handlebar Holder Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)**
  - Front Fork Clamp Bolts: 20 N·m (2.0 kgf·m, 15 ft·lb)**
  - Steering Stem Head Nut: 64 N·m (6.5 kgf·m, 47 ft·lb)**
- Check and adjust the following items after installation.
  - Steering (see Adjustment)
  - Throttle Cable (see Fuel System chapter)
  - Clutch Cable (see Clutch chapter)
  - Front Brake



#### 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 brakes will not function on the first application of the lever if this is not done.**

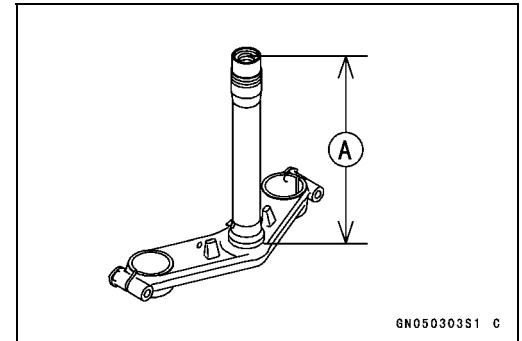
#### *Bearing Seal Deterioration, Damage Inspection*

- Inspect the grease seal of the upper and lower bearings for any signs of deterioration or damage.
- ★ Replace the bearing if necessary.

## Steering Stem

### *Steering Stem Warp Inspection*

- 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 shaft [A] is bent, replace the steering stem.



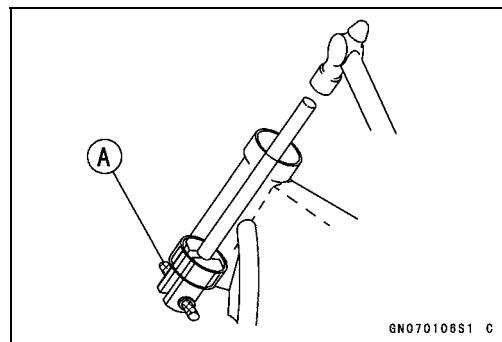
## 12-8 STEERING

### Steering Stem Bearing

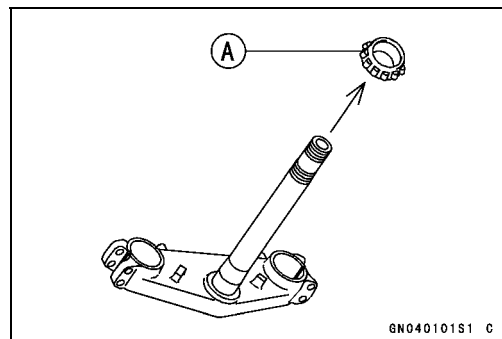
#### Removal

- Remove the steering stem (see Steering Stem Removal).
- To remove the outer races pressed into the head pipe, install the outer race remover as shown below.

**Special Tool - Head Pipe Outer Race Remover ID > 37 mm: 57001-1107 [A]**



- Remove the lower tapered roller bearing [A] which is pressed onto the steering stem with a suitable commercially available tool.

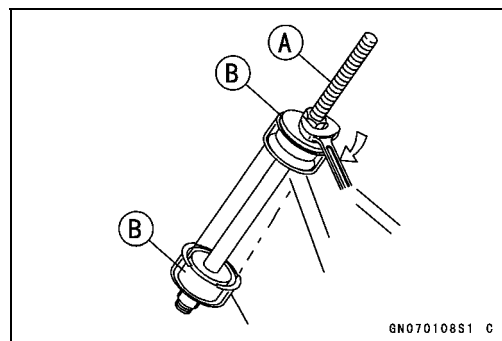


#### Installation

- Apply grease to the outer races, and then drive them into the head pipe using the drivers and the press shaft.

**Special Tool - Head Pipe Outer Race Press Shaft: 57001-1075 [A]**

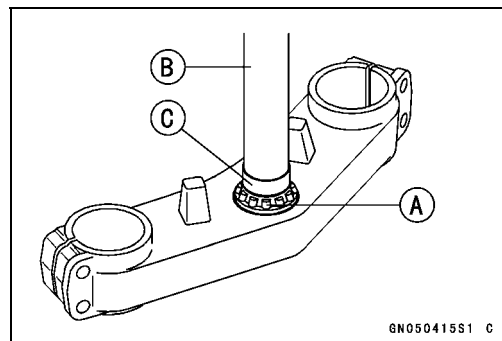
**Head Pipe Outer Race Driver,  $\phi 46.5$ : 57001-1106 [B]**



- Apply grease to the lower tapered roller bearing [A], and drive it onto the steering stem using the bearing driver and adapter.

**Special Tool - Bearing Driver,  $\phi 32$ : 57001-382 [B]**

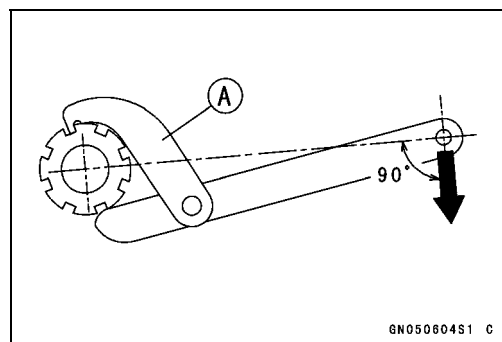
**Steering Stem Bearing Driver Adapter: 57001-1092 [C]**



- The following steps should be performed after steering bearing installation. This procedure settles the bearings in place.
- Using the stem nut wrench [A], 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 on the stem nut, and pull the wrench at the hole by 22.2 kg (49 lb) force in the direction shown.)

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

**Torque - Steering Stem Nut: 4.9 N·m (0.49 kgf·m, 43 in·lb)**





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## Steering Stem Bearing

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- Check that there is no play and the steering stem turns smoothly without the rattle.
- ★ If not, the steering stem bearing may be damaged.
- Again back out the stem nut a fraction of 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.

### *Lubrication*

- Perform the following.
- Remove the steering stem.
- Using a high-flash point solvent, wash the upper and lower tapered roller bearings in the cages.
- Wipe the upper and lower outer races, which are press-fitted into the frame head pipe, clean of grease and dirt.
- Visually check the outer races and the rollers.
- ★ Replace the bearing assemblies if they show wear or damage.
- Pack the upper and lower tapered roller bearings in the cages with grease, and apply light coat of grease to the upper and lower outer races.
- Install the steering stem, and adjust the steering (see Steering Adjustment).

### *Wear, Damage Inspection*

- Using a high-flash point solvent, wash the upper and lower tapered rollers 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 the rollers.
- ★ Replace the bearing assemblies if they show damage.

### **NOTE**

- *If either steering stem bearing is damaged, it is recommended that both the upper and lower bearings (including outer races) should be replaced with new ones.*

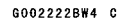


# Frame

## Table of Contents

Exploded View .....	13-2
Seat .....	13-3
Seat Removal .....	13-3
Seat Installation .....	13-3
Side Covers .....	13-4
Side Cover Removal .....	13-4

## Exploded View

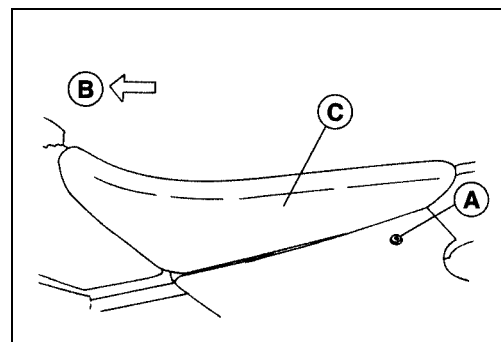


1. Rear Frame Pipe.
  2. Front Fender Mounting Bolts
- T1: 34 N·m (3.5 kgf·m, 25 ft·lb)  
T2: 5.9 N·m (0.60 kgf·m, 52 in·lb)  
O: Apply Oil.

## Seat

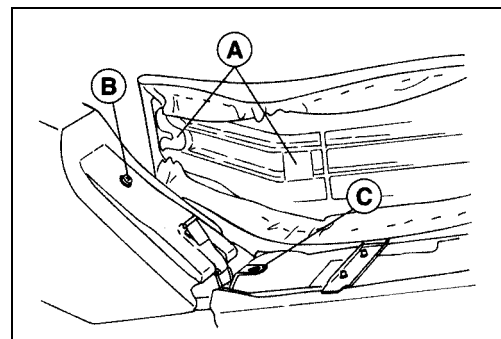
### *Seat Removal*

- Remove the seat bolts [A].
- Move back [B] and swing open the seat [C], and then remove it.



### *Seat Installation*

- Slip the hooks [A] of the seat under the washer [B] on the fuel tank and the brace [C].
- Tighten the seat bolts.



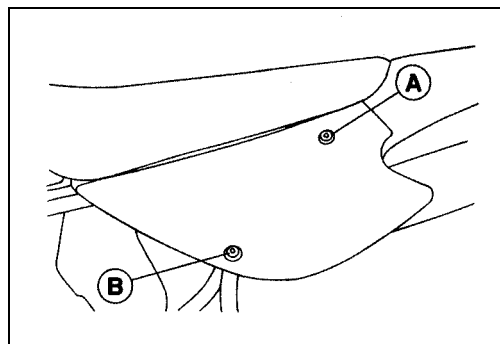
## 13-4 FRAME

### Side Covers

---

#### *Side Cover Removal*

- Remove:
  - Seat Bolts [A]
  - Side Cover Bolts [B]
  - Side Covers



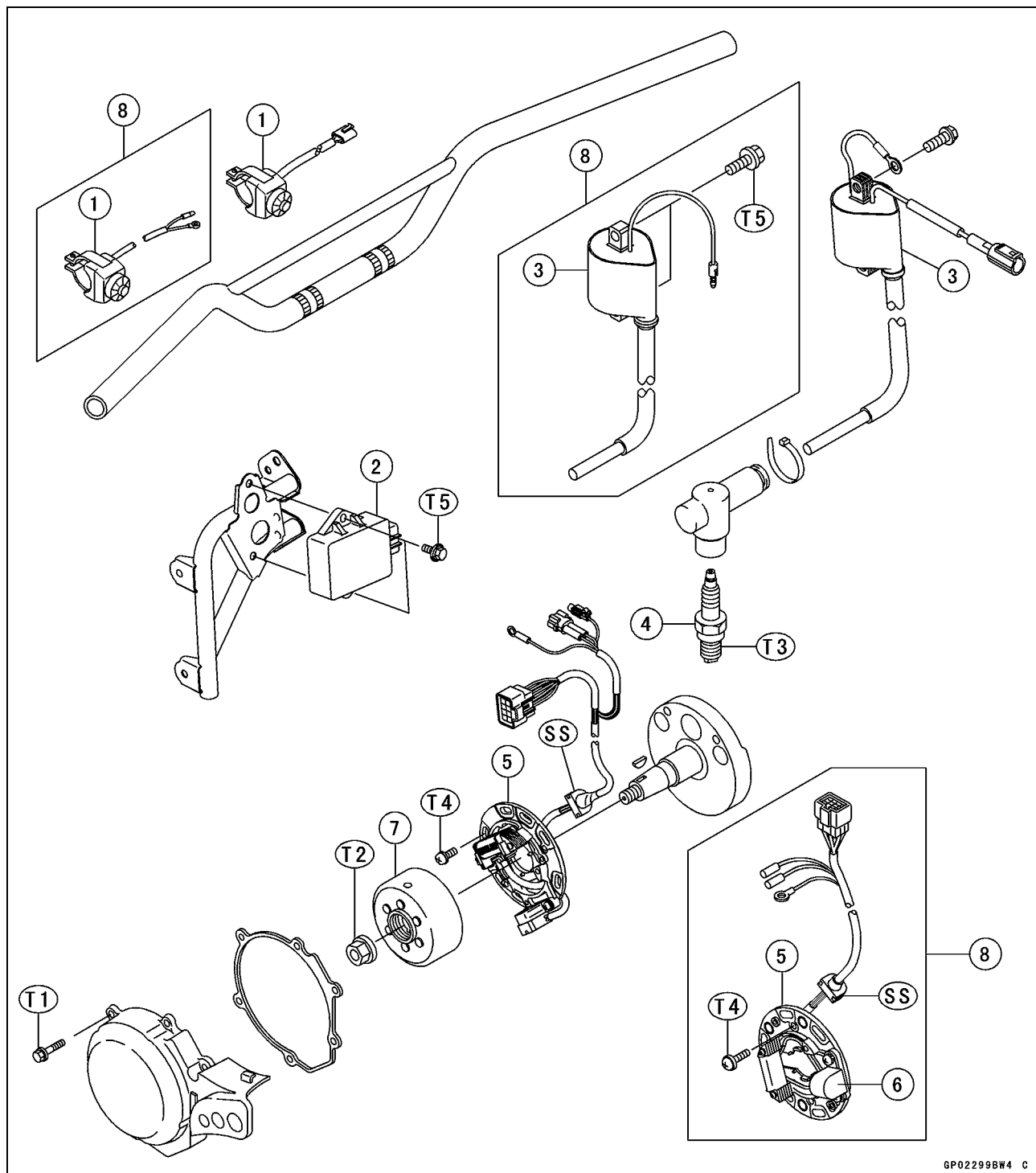
# Electrical System

## Table of Contents

Exploded View .....	14-2
Wiring Diagram .....	14-3
Specifications .....	14-4
Precautions and Safety Instructions .....	14-5
Safety Instructions .....	14-5
Electrical Wiring .....	14-6
Inspection .....	14-6
Ignition Timing .....	14-7
Adjustment .....	14-7
Flywheel Magneto .....	14-8
Removal .....	14-8
Installation .....	14-8
Inspection .....	14-9
Ignition System .....	14-11
Crankshaft Sensor Installation .....	14-12
Crankshaft Sensor Air Gap Adjustment .....	14-12
Crankshaft Sensor Inspection .....	14-12
Crankshaft Sensor Peak Voltage Inspection .....	14-13
Ignition Coil Removal .....	14-13
Ignition Coil Installation .....	14-13
Ignition Coil Inspection .....	14-13
Spark Plug Cleaning and Inspection .....	14-15
Spark Plug Gap Inspection .....	14-15
CDI Unit Inspection .....	14-15
Engine Stop Button Electric Current Inspection .....	14-16

## 14-2 ELECTRICAL SYSTEM

### Exploded View



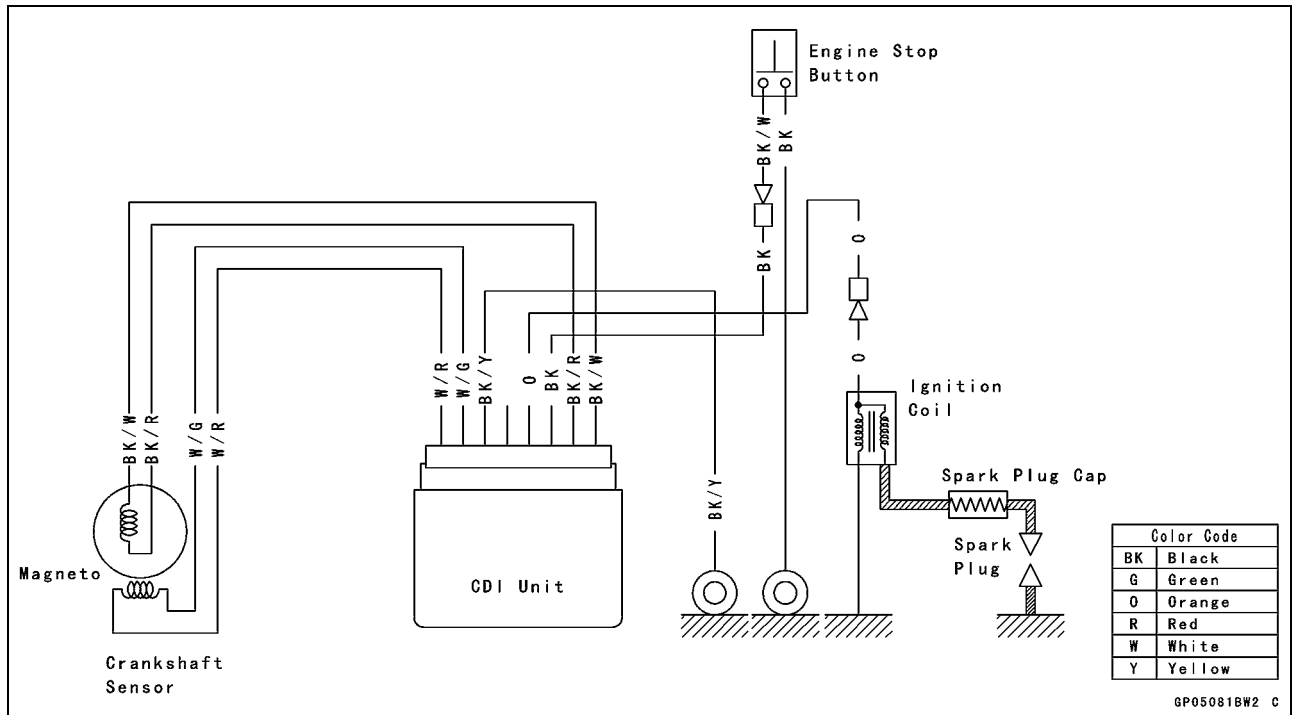
1. Engine Stop Button
2. CDI unit
3. Ignition Coil
4. Spark Plug
5. Magneto Stator
6. Crankshaft Sensor
7. Magneto Flywheel
8. KX85-A1 ~ A5, B1 ~ B5/KX100-D1 ~ D5

- T1: 9.8 N·m (1.0 kgf·m, 87 in·lb)  
 T2: 29 N·m (3.0 kgf·m, 22 ft·lb)  
 T3: 26 N·m (2.7 kgf·m, 20 ft·lb)  
 T4: 5.2 N·m (0.53 kgf·m, 43 in·lb)  
 T5: 8.8 N·m (0.90 kgf·m, 78 in·lb)  
 SS: Apply silicone sealant (Kawasaki Bond (56019-120)).

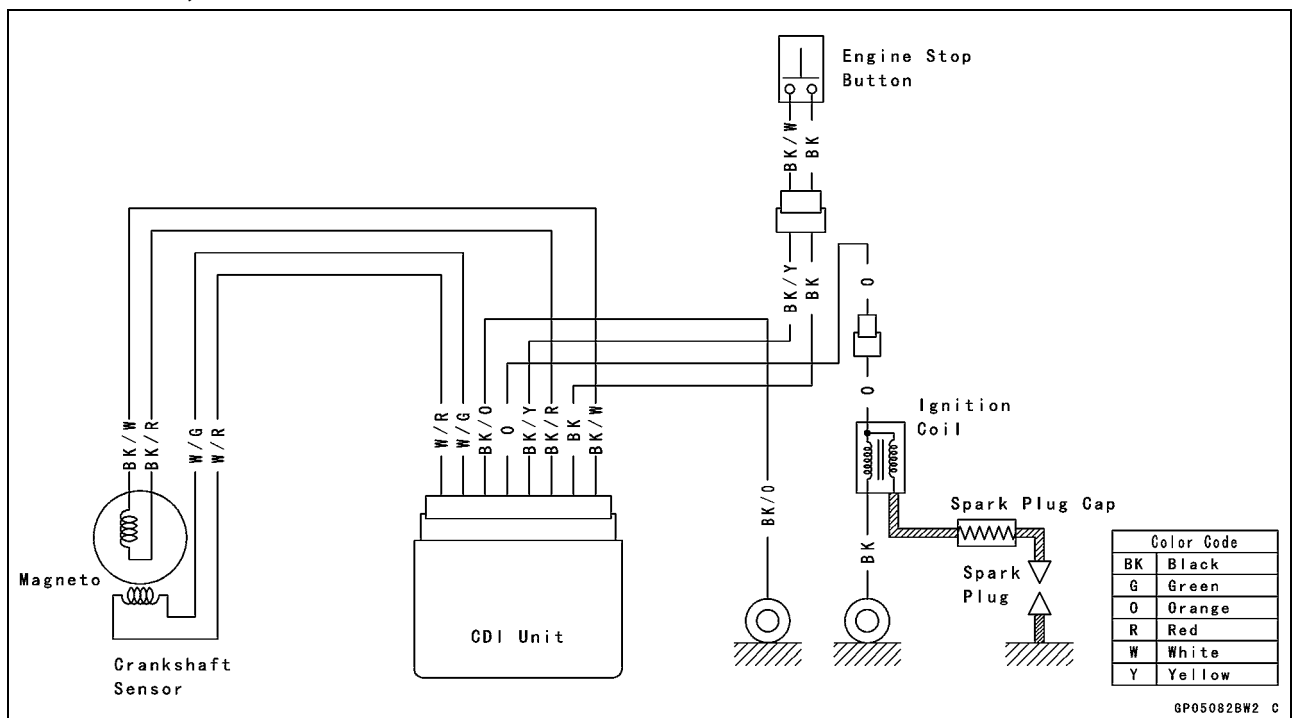


## Wiring Diagram

## KX85-A1 ~ A5, B1 ~ B5/KX100-D1 ~ D5



## KX85-A6F ~, B6F ~/KX100-D6F ~



## 14-4 ELECTRICAL SYSTEM

### Specifications

Item	Standard	Service Limit
<b>Magneto Flywheel</b>		
Magneto Output Voltage	16 V or more	-- --
<b>Ignition System</b>		
Ignition Timing	12° BTDC @12 000 r/min (rpm) (KX85A1 ~ A5/B1 ~ B5) 12° BTDC @12 040 r/min (rpm) (KX85A6F ~/B6F ~ ) 15° BTDC @12 500 r/min (rpm) (KX100D1 ~ D5) 21.2° BTDC @10 000 r/min (rpm) (KX100D6F ~ )	-- --
Crankshaft Sensor Air Gap	0.4 ~ 0.6 mm (0.016 ~ 0.024 in.)	-- --
Crankshaft Sensor Resistance	396 ~ 594 Ω (× 100 Ω)	-- --
Crankshaft Sensor Peak Voltage	4.0 V or more	-- --
Ignition Coil:		
3 Needle Arcing Distance	6 mm (0.24 in.) or more	-- --
Primary Winding Resistance	0.36 ~ 0.48 Ω (× 1 Ω)	-- --
Secondary Winding Resistance	5.4 ~ 7.4 kΩ (× 1kΩ)	-- --
Ignition Coil Peak Voltage	110 V or more	-- --
Spark Plug:		
Spark Plug Gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)	-- --
Spark Plug Cap Resistance	3.75 ~ 6.25 kΩ (× 1kΩ)	-- --
Magneto Stator Coil Resistance	288 ~ 432 Ω (× 100 Ω)	-- --

**Special Tools - Flywheel Puller, M12 × 1.75: 57001-252**

**Hand Tester: 57001-1394**

**Lead Wire - Magneto Lead Adapter: 57001-1469**

**Peak Voltage Adapter: 57001-1415**

**Gear Holder: 57001-1602**

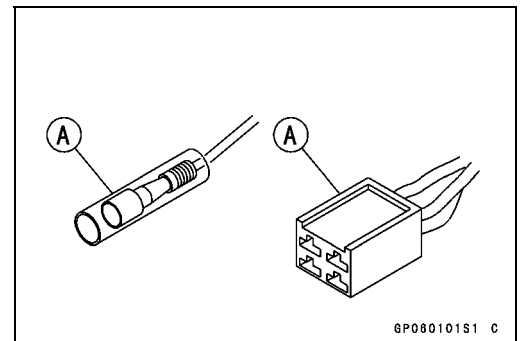
**Flywheel & Pully Holder: 57001-1605**

## Precautions and Safety Instructions

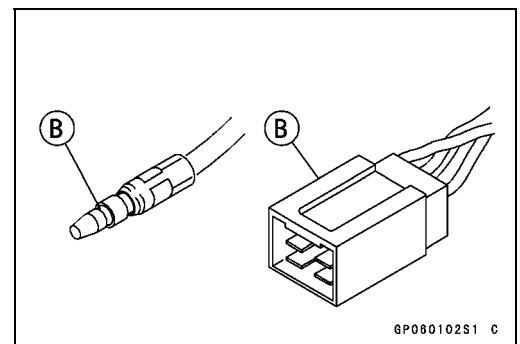
There are numbers of important precautions that are musts when servicing electrical systems. Learn and observe all the rules below.

- 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.
- Troubles may involve one or in some cases all items. Never replace a defective part without determining what CAUSED the failure. If the failure was caused by some other item or items, they too must be repaired or replaced, or the new replacement will soon fail again.
- Make sure all connectors in the circuit are clean and tight, and examine 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).
- Electrical Connectors

[A] Female Connectors



[B] Male Connectors



## Safety Instructions

### **⚠ WARNING**

The ignition system produces extremely high voltage. Do not touch the spark plug, ignition coil, or high tension lead while the engine is running, or you could receive a severe electrical shock.

## 14-6 ELECTRICAL SYSTEM

---

### Electrical Wiring

---

#### *Inspection*

- Visually inspect the wiring for signs of burning, fraying, etc.
- ★ If any wiring is poor, replace the damaged wiring.
- Pull each connector apart and 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.

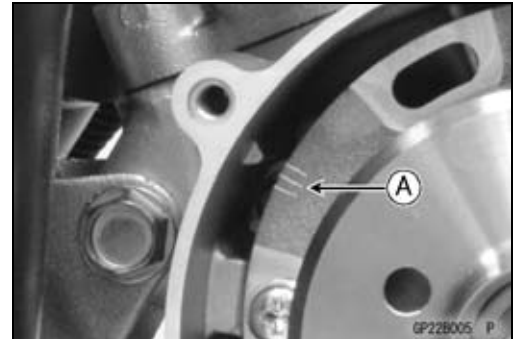
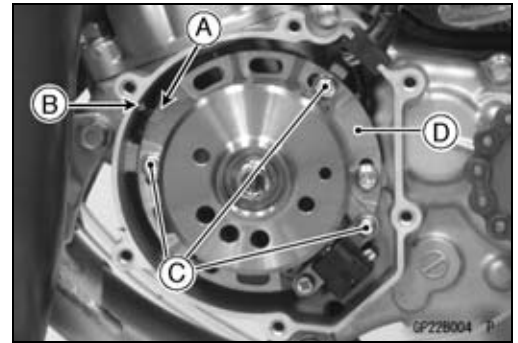
#### **Special Tool - Hand Tester: 57001-1394**

- Set the meter to the  $\times 1\Omega$  range, and lead the tester.
- ★ If the tester does not read  $0\Omega$  the lead is defective. Replace the lead or the wiring harness if necessary.

## Ignition Timing

### Adjustment

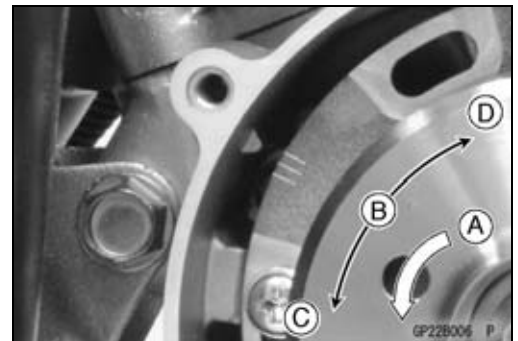
- Remove the magneto cover.
- Check to see if the middle mark [A] of the three-marks on the magneto stator is aligned with the mark [B] on the crankcase.
- ★ If the marks are not aligned, loosen the magneto stator mounting screws [C] and turn the magneto stator [D].
- The ignition timing can be adjusted to change the power band to suit the rider's preference or ability.
- If necessary, adjust the timing by shifting the stator position within the three lines [A].



### NOTE

○ For best engine performance, it is very important to adjust the ignition timing within the adjustable range just explained.

Crankshaft Rotation [A]  
 Stator Movement [B]  
 Retard [C]  
 Advance [D]



- Tighten the stator mounting screws to the specified torque.

**Torque - Stator Mounting Screw: 5.2 N·m (0.53 kgf·m, 43 in·lb)**

- Install the magneto cover.
- Test ride the motorcycle and readjust the ignition timing if necessary.

## 14-8 ELECTRICAL SYSTEM

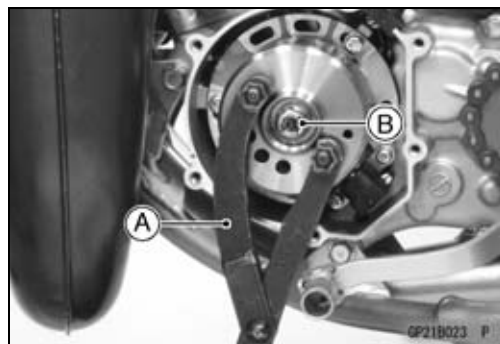
### Flywheel Magneto

#### Removal

- Remove:
  - Magneto Cover
- Hold the flywheel steady with the flywheel & pulley holder [A] and remove the flywheel nut [B].

**Special Tool - Flywheel & Pully Holder: 57001-1605**

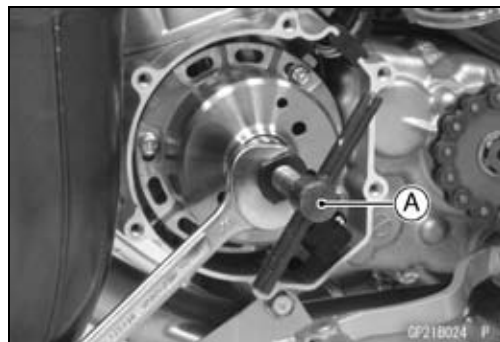
- Remove the flywheel holder.



- Screw the flywheel puller [A] into the flywheel by turning it counterclockwise (left-hand thread).

**Special Tool - Flywheel Puller, M12 × 1.75: 57001-252**

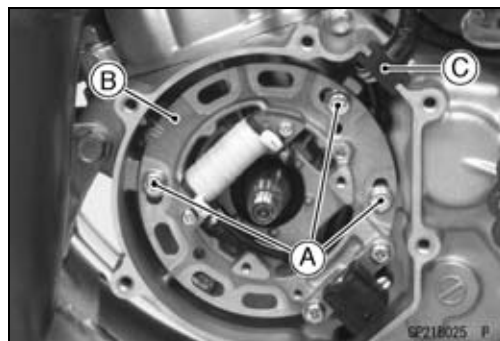
- Remove the flywheel from the crankshaft by turning in the puller center bolt and tapping the head of the bolt lightly with a hammer, while holding the puller body steady. There is a Woodruff key in the crankshaft tapered portion.



#### CAUTION

**Never strike the grab bar or the flywheel itself. Striking the bar can bond it. If the flywheel is struck, the magnets may lose their magnetism.**

- Unscrew the stator mounting screws [A], and remove the stator plate with crankshaft sensor [B] and the wiring grommet [C].

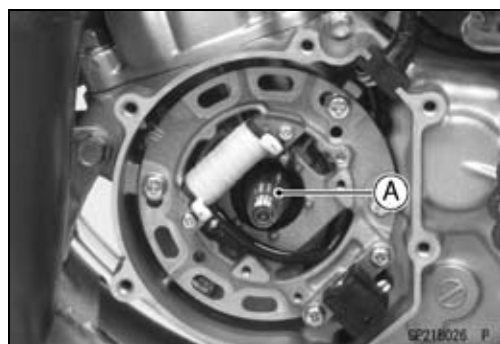


#### Installation

- Install the stator plate with crankshaft sensor.

**Torque - Stator Mounting Screws: 5.2 N·m (0.53 kgf·m, 43 in·lb)**

- Using a high flash-point solvent, clean off [A] any oil or dirt that may be on the crankshaft taper and the flywheel taper. Dry them with a clean cloth.



## Flywheel Magneto

- Set the stator wiring grommet [A] securely in the notch in the left crankcase half, and route the wires [B] according to the Cable, Wire and Hose Routing section in the General Information chapter.
- Fit the Woodruff key securely in the slot in the crankshaft before installing the flywheel.
- Hold the flywheel steady with the flywheel & pulley holder and tighten the flywheel nut to the specified torque.

**Special Tool - Flywheel & Pully Holder: 57001-1605**

**Torque - Flywheel Nut: 29 N·m (3.0 kgf·m, 22 ft·lb)**

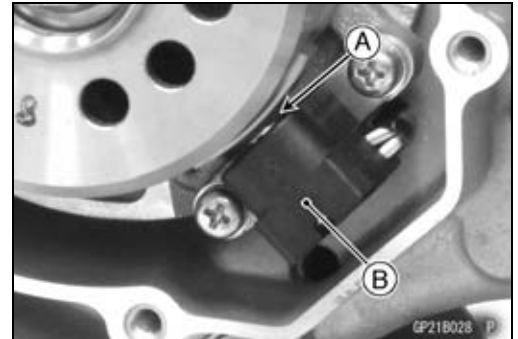
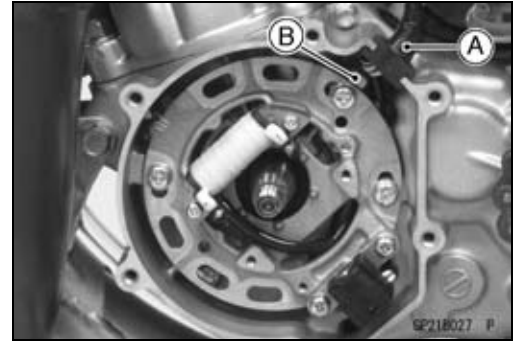
- Measure the crankshaft sensor air gap [A] (Clearance between the flywheel and the crankshaft sensor [B] core).

**Crankshaft Sensor Air Gap**

**0.5 ±0.1 mm (0.020 ±0.004 in.)**

- ★ If the gap is incorrect, reinstall the crankshaft sensor so that the gap has correct clearance.
- ★ Install the magneto cover.

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



### Inspection

- There are three types of magneto problems: short, open (wire burned out), or loss in flywheel magnetism. A short or open in one of the coil wires will result in either a low output, or no output at all. A loss in flywheel magnetism, which may be caused by dropping or hitting the flywheel, or just by aging, will result in low output. Inspect the stator coils (see Ignition System) or replace the flywheel if the stator coils are good.

### Magneto output voltage check

- To check the magneto output voltage, do the following procedures.
  - Connect the hand tester [A] and magneto lead adapter [B] as shown in the diagram.
  - Start the engine.
  - Run it at the rpm given in the table.
  - Note the voltage readings.
    - CDI unit [C]
    - Magneto [D]

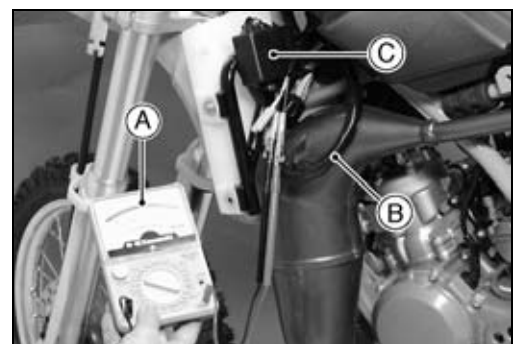
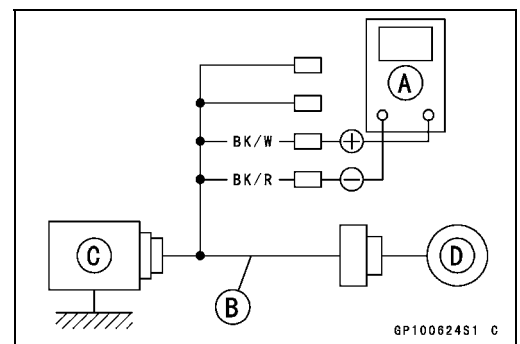
**Special Tool - Lead Wire-Magneto Lead Adapter: 57001-1469**

**Hand Tester: 57001-1394**

### Magneto Output Voltage

Tester Range	Connections		Reading @4 000 rpm
	Tester (+) to	Tester (-) to	
X250 V DC	BK/W	BK/R	16 V or more

- ★ If the output voltage shows the value in the table, the magneto operates properly.
- ★ If the output voltage shows a much lower reading than that given in the table indicates that the magneto is defective.



# 14-10 ELECTRICAL SYSTEM

## Flywheel Magneto

### Magneto stator coil check

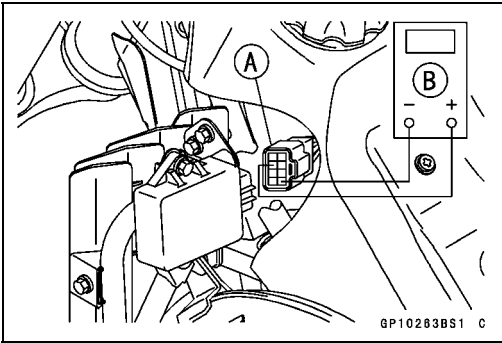
- Check the magneto stator coil resistance as follows.
- Disconnect the magneto lead connector [A].
- Connect the hand tester [B] as shown in the diagram.

Special Tool - Hand Tester: 57001-1394

### Magneto Stator Coil Resistance

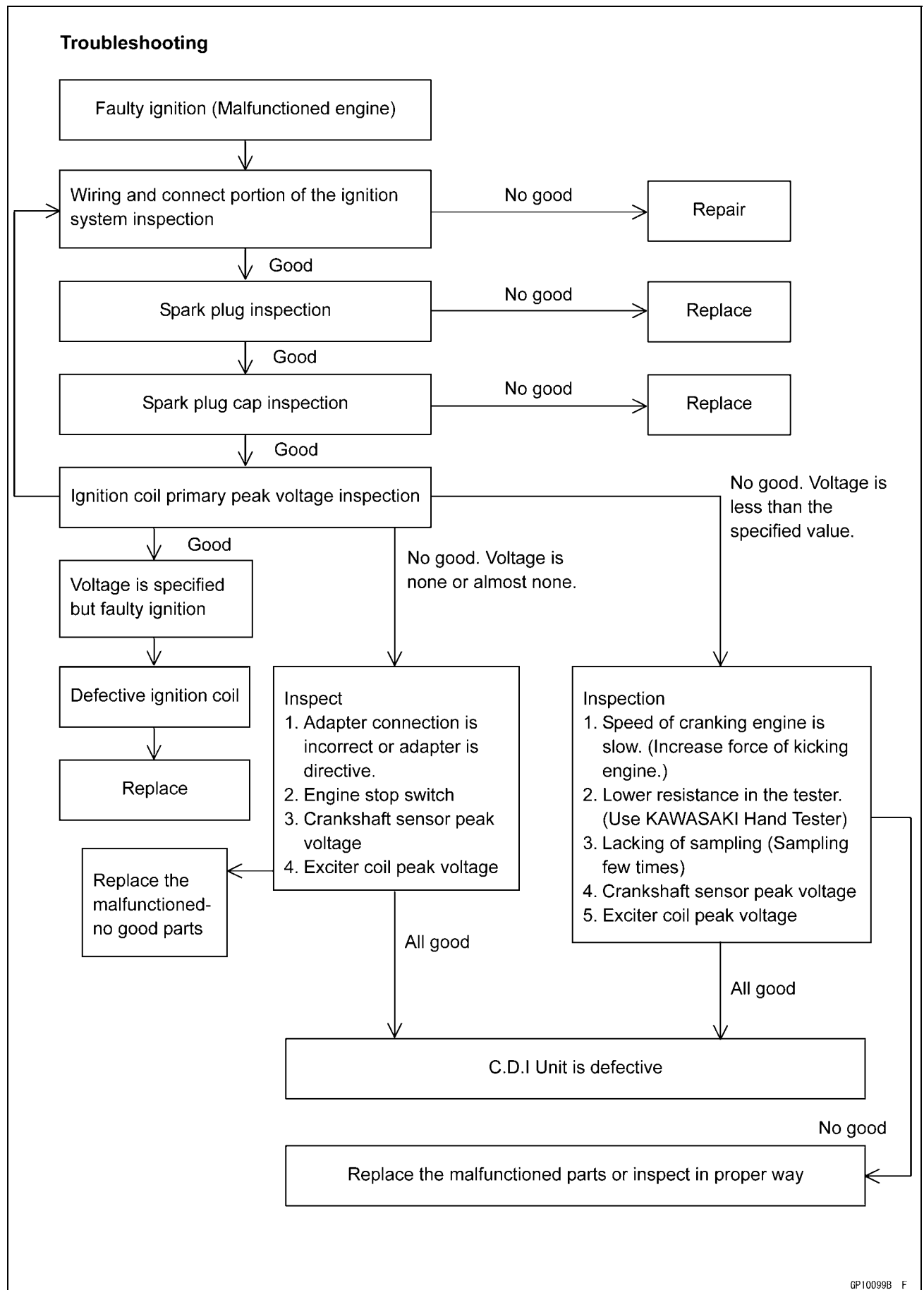
Tester Range	Connections		Reading
	Tester (+)	Tester (–) to	
× 100 Ω	BK/W	BK/R	288 ~ 432 Ω

★If there is more resistance than shown in the table or no hand tester reading (infinity) the stator has an open lead and must be replaced. A much lower reading than this resistance means that the stator coil is shorted, and must be replaced.





## Ignition System



## 14-12 ELECTRICAL SYSTEM

### Ignition System

#### WARNING

The ignition system produces extremely high voltage. Do not touch the spark plug, ignition coil, or high tension lead while the engine is running, or you could receive a severe electrical shock.

#### *Crankshaft Sensor Installation*

- Install the crankshaft sensor so that the air gap (clearance between the flywheel and the crankshaft sensor core) has correct clearance (see Flywheel Magneto Installation).

#### *Crankshaft Sensor Air Gap Adjustment*

- Remove the magneto cover. (see Flywheel Magneto Removal)
- Loosen the crankshaft sensor screws.
- Insert a 0.5 mm thickness gauge between the crankshaft sensor [B] core and the timing plate.
- While pressing the crankshaft sensor toward the magneto flywheel, tighten the coil screws and remove the thickness gauge.
- Check the air gap [A] (See Flywheel Magneto Installation).

**Crankshaft Sensor Air Gap: 0.4 ~ 0.6 mm (0.016 ~ 0.024 in.)**

- ★ If the air gap is not within the specified range, readjust the gap.

#### *Crankshaft Sensor Inspection*

- Remove the following  
Magneto Lead Connector [A]
- Set the hand tester to the  $\times 100 \Omega$  range and connect it to the magneto lead connector (crankshaft sensor lead) connector.

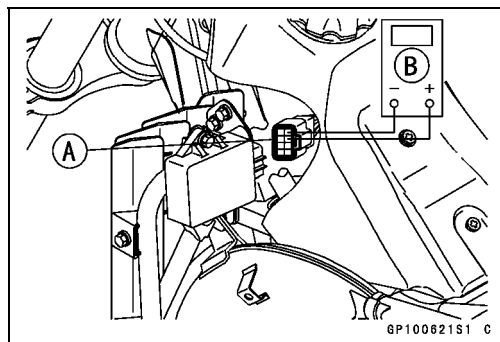
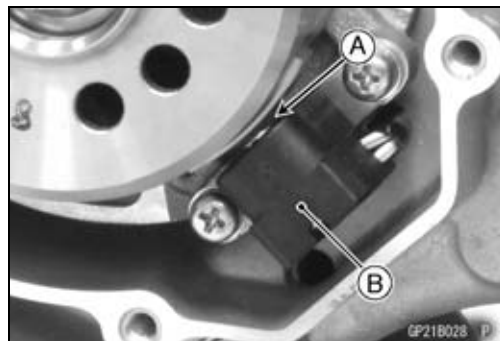
**Special Tool - Hand Tester: 57001-1394**

- ★ 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.

#### **Crankshaft Sensor Resistance**

**W/G ~ W/R Leads: 396 ~ 594  $\Omega$  ( $\times 100 \Omega$ )**

- Using the highest resistance range of the hand tester, measure the resistance between the crankshaft sensor leads and chassis ground.
- ★ Any hand tester reading less than infinity ( $\infty$ ) indicates a short, necessitating replacement of the stator.



## Ignition System

### Crankshaft Sensor Peak Voltage Inspection

- Disconnect the magneto lead connector [C].
- Set the hand tester [B] to the  $\times 25$  V DC range, and connect it the Peak voltage adapter [A] as shown in the diagram.
- Connect the black lead of the adapter to White/Green lead and red lead to White/Red lead of the magneto lead adapter.
- Kicking the primary kick, turn the engine 4 ~ 5 seconds with the transmission gear in neutral to measure the crankshaft sensor peak voltage.
- Repeat the measurement 5 or more times.

**Crankshaft Sensor Peak Voltage**  
**Standard: 4.0 V or more**

**Special Tools - Hand Tester: 57001-1394**  
**Peak Voltage Adapter: 57001-1415**  
**Type: KEK-54-9-B**

### **⚠ WARNING**

**Do not touch the metal portion of the Probe in case of measuring the voltage, or you may receive a serious electric shock**

★ If the voltage is less than the specified, replace the crankshaft sensor.

### Ignition Coil Removal

- Remove the following parts  
 Seat (see Frame chapter)  
 Fuel Tank (see Fuel System chapter)
- Disconnect the ignition coil primary leads.
- Pull the plug cap off the spark plug.
- Unscrew the mounting bolt [A], and remove the ignition coil [B].

### Ignition Coil Installation

- Connect the leads according to the Cable, Wire and Hose Routing section in the Appendix chapter.

### Ignition Coil Inspection

#### Measuring the arcing distance

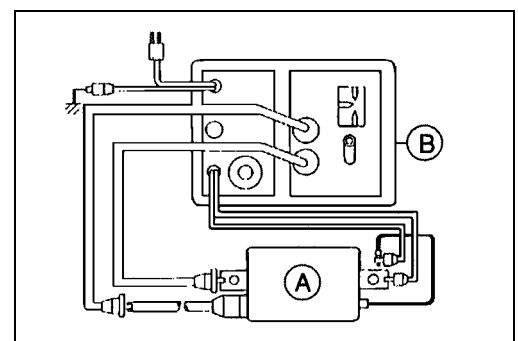
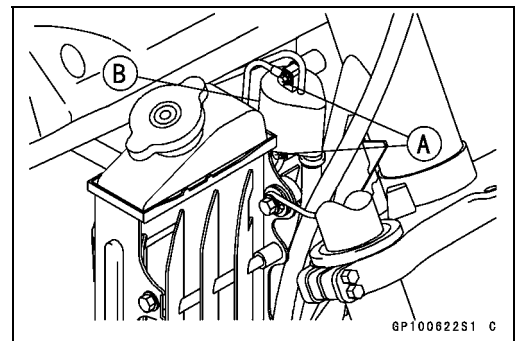
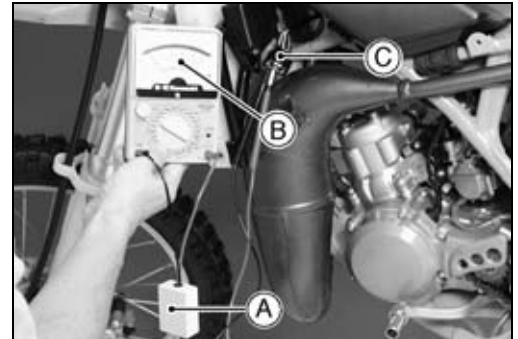
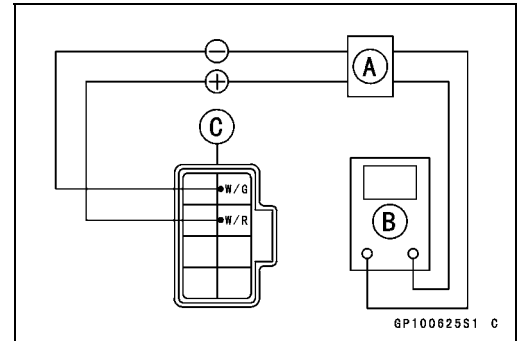
The most accurate test for determining the condition of the ignition coil is made by measuring arcing distance using the coil tester for the 3-needle method.

- Remove the ignition coil.
- Connect the ignition coil (with the spark plug cap left installed on the spark plug lead) [A] to the tester [B], and measure the arcing distance.

### **⚠ WARNING**

**To avoid extremely high voltage shocks, do not touch the coil or lead.**

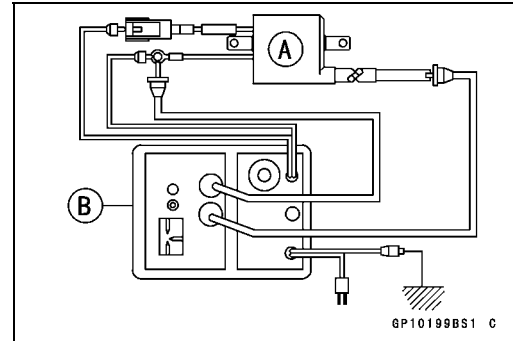
★ If the distance reading is less than the specified value, the ignition coil or spark plug cap is defective.



## 14-14 ELECTRICAL SYSTEM

### Ignition System

KX85A6F ~, B6F ~/KX100DA6F ~



#### Ignition Coil Arcing Distance

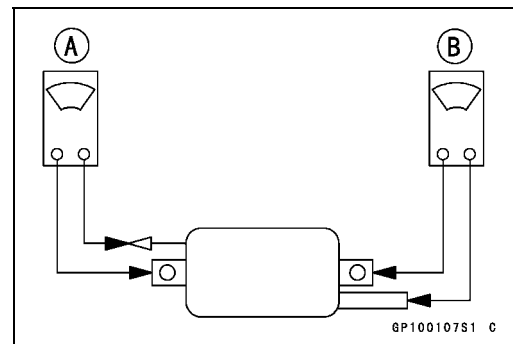
**Standard:** 6 mm (0.24 in.) or more

- To determine which part is defective, measure the arcing distance again with the spark plug cap removed from the ignition coil lead.
- ★ If the arcing distance is subnormal as before, the trouble is with the ignition coil itself. If the arcing distance is now normal, the trouble is with the spark plug cap.

#### Measuring Coil Resistance

If the arcing tester is not available, the coil can be checked for a broken or badly shorted winding with an ohmmeter. However, an ohmmeter cannot detect layer shorts and shorts resulting from insulation breakdown under high voltage.

- Remove the ignition coil.
- Measure the primary winding resistance [A].
  - Connect the tester between the coil terminals.
  - Set the tester to the  $\times 1 \Omega$  range, and read the tester.
- Measure the secondary winding resistance [B].
  - Pull the spark plug cap off the lead.
  - Connect an ohmmeter between the spark plug lead and the ground lead terminal.
  - Set the meter to the  $\times 1 \text{ k}\Omega$  range, and read the tester.
- ★ If the meter does not read as specified, replace the coil.
- ★ If the meter reads as specified, the ignition coil windings are probably good. However, if the ignition system still does not perform as it should after all other components have been checked, test replace the coil with one known to be good.



#### Ignition Coil Winding Resistance

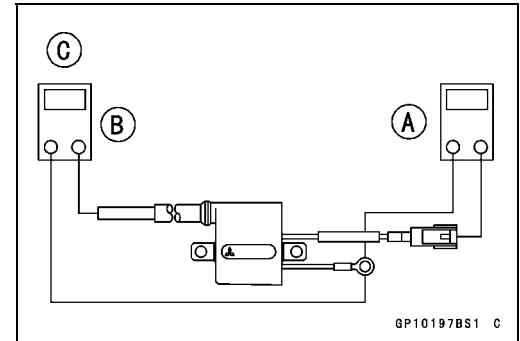
**Primary windings:** 0.36 ~ 0.48  $\Omega$  ( $\times 1 \Omega$ )

**Secondary windings:** 5.4 ~ 7.4  $\text{k}\Omega$  ( $\times 1 \text{ k}\Omega$ )

- Check the spark plug lead for visible damage.
- To install the plug cap, turn it clockwise.

## Ignition System

KX85A6F ~, B6F ~/KX100D6F ~ (C)



### Spark Plug Cleaning and Inspection

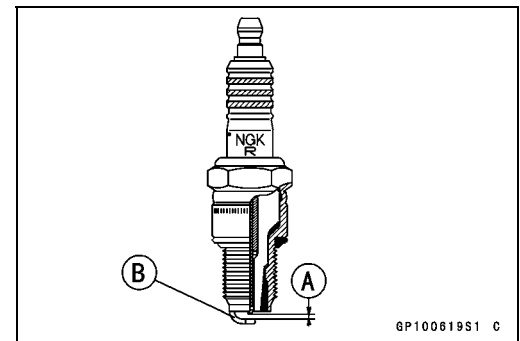
- Remove the spark plug, and visually inspect it.
- Clean the spark plug, preferably in a sandblasting device, and then clean off any abrasive particles. The plug may also be cleaned using a high flash-point solvent and a wire brush or other suitable tool.
- ★ If the spark plug electrodes are corroded or damaged, or if the insulator is cracked, replace the plug. Use the standard spark plug.

### Spark Plug Gap Inspection

- Measure the gap [A] with a wire-type thickness gauge.
- ★ If the gap is incorrect, carefully bend the side electrode [B] with a suitable tool to obtain the correct gap.

#### Spark Plug Gap

Standard: 0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)



### CDI Unit Inspection

#### Ignition Coil Primary Peak Voltage Check:

CAUTION
<p>When inspecting the CDI Unit, observe the following to avoid damage to the CDI Unit.</p> <p>Do not disconnect the CDI Unit while the engine is running.</p> <p>This may damage the CDI Unit.</p>

- Remove the spark plug cap, but do not remove the spark plug.
- Install new spark plug into the spark plug cap, and ground it onto the engine.

## 14-16 ELECTRICAL SYSTEM

### Ignition System

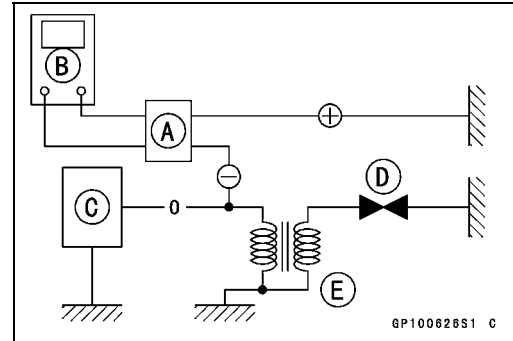
- Install the peak voltage Adapter [A] into the Hand Tester [B].
- Connect the adapter to the ignition coil primary lead terminal and the engine ground with the primary lead connected.

CDI Unit [C]  
New Spark Plug [D]  
Ignition Coil [E]

**Special Tool - Hand Tester: 57001-1394**

**Peak Voltage Adapter: 57001-1415**

**Type: KEK-54-9-B**



#### Primary lead connection

Adapter (R, +)      ↔      Ground

Adapter (BK, -)    ↔      Orange

### ⚠ WARNING

**To avoid extremely high voltage shocks, do not touch the spark plug or tester connections.**

- Kicking the primary kick, turn the engine several seconds with the transmission in neutral to measure the primary peak voltage.
- Repeat the measurements 5 or more times.

#### Ignition Coil Peak Voltage

**Standard:      110 V or more**

- ★ If the reading is less than the specified value, check the following.

Ignition Coil  
Crankshaft Sensor  
CDI Unit

#### Engine Stop Button Electric Current Inspection

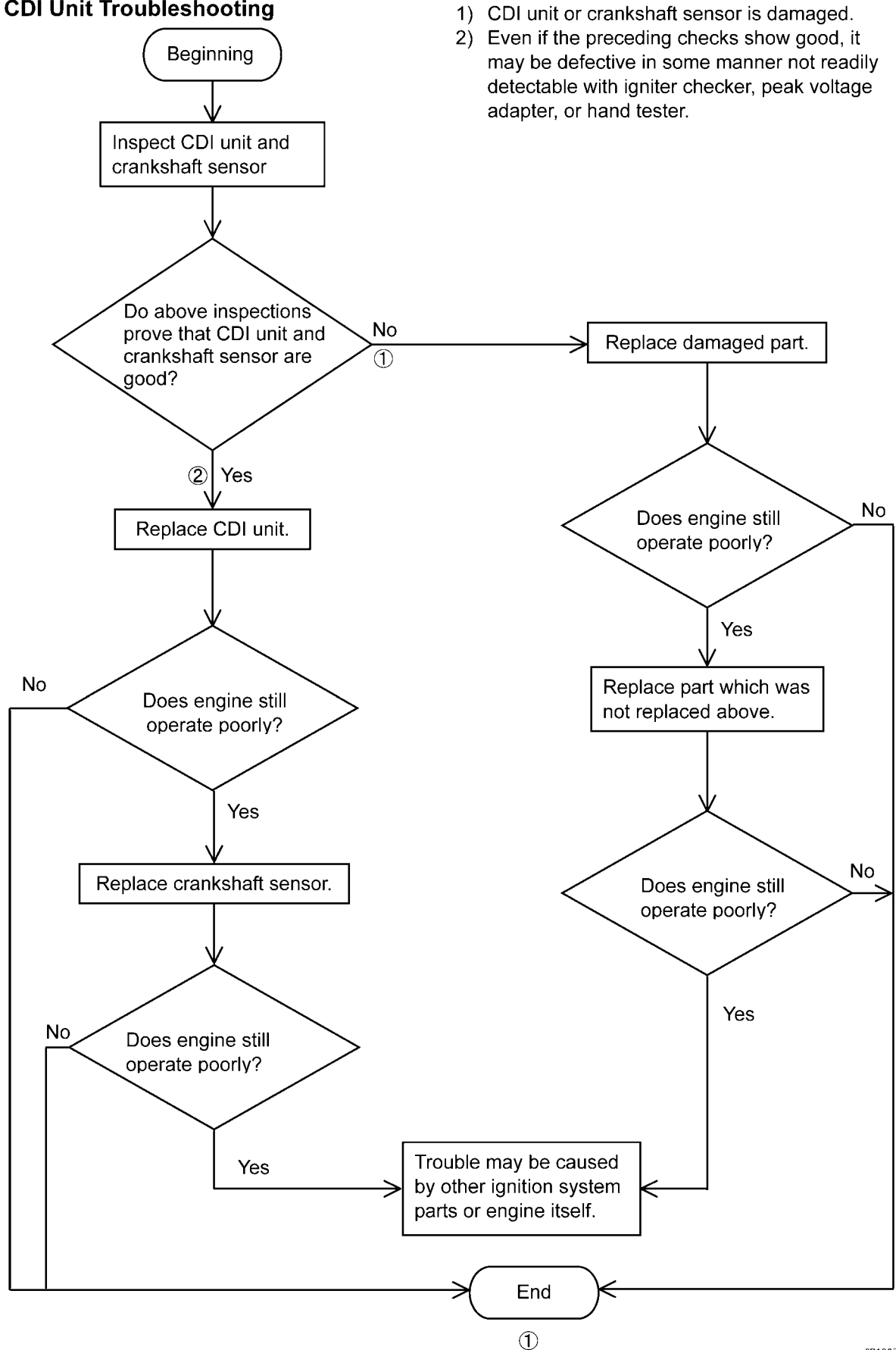
- Disconnect the engine stop button lead or connector.
- Start the engine.
- Ground the stop button lead or black/yellow of the magneto lead (KX85A6F ~ /B6F ~, KX100D6F ~) while the engine is running.
- ★ If the engine does not stop by this action, replace the CDI unit.

### NOTE

- The Cause of trouble may be not able to clear enough by inspecting some items. If the cause of trouble is not solved, replace the CDI Unit with a new one.

## Ignition System

## CDI Unit Troubleshooting







# Appendix

## Table of Contents

Troubleshooting Guide .....	15-2
General Lubrication .....	15-6
Lubrication (Periodic Maintenance) .....	15-6
Bolt, Nut, and Fastener Tightness .....	15-7
Tightness Inspection .....	15-7
Unit Conversion Table .....	15-8

## 15-2 APPENDIX

### Troubleshooting Guide

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#### NOTE

○ *This is not an exhaustive list, giving every possible cause for each problem listed. It is meant simply as a rough guide to assist the troubleshooting for some of the more common difficulties.*

#### Engine Doesn't Start, Starting Difficulty:

##### Engine won't turn over:

- Cylinder, piston seizure
- Crankshaft seizure
- Connecting rod small end seizure
- Connecting rod big end seizure
- Transmission gear or bearing seizure
- Kick shaft return spring broken
- Kick ratchet gear not engaging

##### No fuel flow:

- No fuel in tank
- Fuel tap turned off
- Tank cap air vent obstructed
- Fuel tap clogged
- Fuel line clogged
- Float valve clogged

##### Engine flooded:

- Fuel level too high
- Float valve worn or stuck open
- Starting technique faulty  
(when flooded, kick with the throttle fully open to allow more air to reach the engine.)

##### No spark; spark weak:

- Spark plug dirty, broken, or maladjusted
- Spark plug cap or high tension wiring trouble
- Spark plug cap not in good contact
- Spark plug incorrect
- C.D.I Unit trouble
- Ignition coil trouble
- Ignition coil resistor open
- Flywheel magneto damaged
- Wiring shorted or open

##### Fuel/air mixture incorrect:

- Idle adjusting screw maladjusted
- Slow jet or air passage clogged
- Air cleaner clogged, poorly sealed, or missing
- Starter jet clogged

##### Compression Low:

- Spark plug loose
- Cylinder head not sufficiently tightened down
- Cylinder, piston worn
- Piston ring bad (worn, weak, broken, or sticking)
- Piston ring/land clearance excessive
- Cylinder head gasket damaged

- Cylinder head warped
- Cylinder base gasket damaged
- Reed valve damaged
- Cylinder nut loose

#### Poor Running at Low Speed:

##### Spark weak:

- Spark plug dirty, broken, or maladjusted
- Spark plug cap or high tension wiring trouble
- Spark plug cap shorted or not in good contact
- Spark plug incorrect
- C.D.I Unit trouble
- Crankshaft sensor broken or maladjusted
- Ignition coil trouble
- Flywheel magneto damaged
- Ignition coil lead or C.D.I Unit lead not in good contact

##### Fuel/air mixture incorrect:

- Idle adjusting screw maladjusted
- Pilot (Slow) jet or air passage clogged
- Air cleaner clogged, poorly sealed, or missing
- Choke plunger stuck open
- Fuel level too high or too low
- Fuel tank air vent obstructed
- Carburetor holder loose
- Air cleaner duct loose
- Crankshaft oil seal deteriorated or damaged

##### Compression Low:

- Spark plug loose
- Cylinder head not sufficiently tightened down
- Cylinder, piston worn
- Piston ring bad (worn, weak, broken, or sticking)
- Piston ring/land clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Cylinder base gasket damaged
- Reed valve damaged
- Cylinder nut loose

##### Kips ports stuck open:

- KIPS exhaust valve stuck open (valve seizure, or carbon accumulation)
- KIPS exhaust valves assembled incorrectly
- Exhaust advancer spring damaged
- Exhaust valve operating rod seizure
- Rod (for KIPS) seized in cylinder

##### Other:

- C.D.I Unit trouble
- Transmission oil viscosity too high
- Brake dragging

## Troubleshooting Guide

### Poor Running or No Power at High Speed:

#### Firing incorrect:

- Spark plug dirty, damaged, or maladjusted
- Spark plug cap or high tension wiring damaged
- Spark plug cap shorted or not in good contact
- Spark plug incorrect
- C.D.I Unit trouble
- Crankshaft sensor broken or maladjusted
- Ignition coil trouble
- Flywheel magneto damaged
- Ignition coil lead or C.D.I Unit lead not in good contact

#### Fuel/air mixture incorrect:

- Main jet clogged or wrong size
- Jet needle or needle jet worn
- Jet needle clip in wrong position
- Fuel level too high or too low
- Air jet or air passage clogged
- Air cleaner clogged, poorly sealed, or missing
- Choke plunger stuck open
- Crankshaft oil seal deteriorated or damaged
- Fuel to carburetor insufficient
- Water or foreign matter in fuel
- Fuel tank air vent obstructed
- Carburetor holder loose
- Air cleaner duct loose
- Fuel tap clogged
- Fuel line clogged

#### Compression low:

- Spark plug loose
- Cylinder head not sufficiently tightened down
- Cylinder, piston worn
- Piston ring bad (worn, weak, broken, or sticking)
- Piston ring/and clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Cylinder base gasket damaged
- Reed valve damaged
- Cylinder nut loose

#### Engine rpm will not rise properly:

- Choke plunger stuck open
- Fuel level too high or too low
- Main jet clogged
- Throttle valve does not fully open
- Air cleaner clogged
- Muffler clogged
- Water or foreign matter in fuel
- Cylinder exhaust port clogged
- Brake dragging
- Clutch slipping

#### Overheating

- Transmission oil level too high
- Transmission oil viscosity too high
- Crankshaft bearing worn or damaged

#### KIPS ports stuck closed:

- KIPS ports stuck closed
- KIPS exhaust valves stuck closed (valve seizure, or carbon accumulation)
- KIPS exhaust valves assembled incorrectly
- KIPS ports clogged (carbon accumulation)
- Exhaust valve operating rod seizure
- Rod (for KIPS) seized in cylinder

#### Knocking:

- Carbon built up in combustion chamber
- Fuel poor quality or incorrect
- Spark plug incorrect
- C.D.I Unit trouble
- Ignition timing maladjusted

### Overheating:

#### Firing incorrect:

- Spark plug dirty, broken, or maladjusted
- Spark plug incorrect
- C.D.I Unit trouble
- Ignition timing maladjusted

#### Fuel/air mixture incorrect:

- Main jet clogged or wrong size
- Fuel level in carburetor float bowl too low
- Carburetor holder loose
- Air cleaner poorly sealed, or missing
- Air cleaner duct poorly sealed
- Air cleaner clogged

#### Compression high:

- Carbon built up in combustion chamber

#### Engine load faulty:

- Brake dragging
- Clutch slipping
- Transmission oil level too high
- Transmission oil viscosity too high

#### Lubrication inadequate:

- Transmission oil level too low
- Transmission oil poor quality or incorrect

#### Coolant incorrect:

- Coolant level too low
- Coolant deteriorated

#### Cooling system component incorrect:

- Radiator clogged
- Radiator cap trouble
- Water pump not rotating
- Water pump impeller damaged

### Clutch Operation Faulty:

#### Clutch slipping:

- No clutch lever play
- Clutch cable maladjusted
- Clutch inner cable catching
- Friction plate worn or warped
- Steel plate worn or warped

## 15-4 APPENDIX

### Troubleshooting Guide

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- Clutch spring broken or weak
- Clutch release mechanism trouble
- Clutch hub or housing unevenly worn

**Clutch not disengaging properly:**

- Clutch lever play excessive
- Clutch plate warped or too rough
- Clutch spring tension uneven
- Transmission oil deteriorated
- Transmission viscosity too high
- Transmission oil level too high
- Clutch housing frozen on drive shaft
- Clutch release mechanism trouble
- Friction plates installed incorrectly

**Gear Shifting Faulty:**

**Doesn't into gear; shift pedal doesn't return:**

- Clutch not disengaging
- Shift fork bent or seized
- Gear stuck on the shaft
- Gear set lever binding
- Shift return spring weak or broken
- Shift return spring pin loose
- Shift mechanism arm spring broken
- Shift mechanism arm broken
- Shift drum broken

**Jumps out of gear:**

- Shift fork worn
- Gear groove worn
- Gear dogs and/or dog holes worn
- Shift drum groove worn
- Gear set lever spring weak or broken
- Shift fork guide pin worn
- Drive shaft, output shaft, and/or gear splines worn

**Overshifts:**

- Gear set lever spring weak or broken
- Shift mechanism arm spring broken

### Abnormal Engine Noise:

**Knocking:**

- Ignition timing maladjusted
- C.D.I Unit 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

**Other noise:**

- Connecting rod small end clearance excessive
- Connecting rod big end clearance excessive
- Piston ring worn, broken or stuck

- Piston seizure or damage
- Cylinder head gasket leaking
- Exhaust pipe leaking at cylinder head connection
- Crankshaft runout excessive
- Engine mounts loose
- Crankshaft bearing worn
- Primary gear worn or chipped

### Abnormal Drive Train Noise

**Clutch noise:**

- Clutch housing/friction plate clearance excessive
- Cutch housing gear/primary gear backlash excessive
- Metal chip jammed in clutch housing gear teeth

**Transmission noise:**

- Crankcase bearing worn or damaged
- Transmission gear worn or chipped
- Metal chip jammed in gear teeth
- Transmission oil insufficient or too thin
- Kick ratchet gear not properly disengaging from kick gear
- Output shaft idle gear worn or chipped

**Drive chain noise:**

- Drive chain adjusted improperly
- Chain worn
- Rear and/or engine sprocket(s) worn
- Chain lubrication insufficient
- Rear wheel misaligned

### Abnormal Frame Noise:

**Front fork noise:**

- Oil insufficient or too thin
- Spring weak or broken

**Rear shock absorber noise:**

- Shock absorber damaged

**Disc brake noise:**

- Pad installed incorrectly
- Pad surface glazed
- Disc warped
- Caliper trouble
- Master cylinder damaged

**Other noise**

- Bracket, nut, bolt, etc. not properly mounted or tightened

### Exhaust Smoke:

**Excessive white smoke:**

- Throttle cable maladjusted
- Crankshaft oil seal damaged

**Brownish smoke:**

- Air cleaner clogged
- Main jet too large or fallen out
- Choke plunger stuck open

## Troubleshooting Guide

---

Fuel level too high

### Handling and/or Stability Unsatisfactory:

#### Handlebar hard to turn:

Control Cable routing incorrect  
Wiring routing incorrect  
Steering stem locknut too tight  
Bearing ball damaged  
Bearing race dented or worn  
Steering stem bearing lubrication inadequate  
Steering stem bent  
Tire air pressure too low

#### Handlebar shakes or excessively vibrates:

Tire worn  
Swingarm sleeve or needle bearing damaged  
Rim warped, or not balanced  
Front, rear axle runout excessive  
Wheel bearing worn  
Handlebar holder loose  
Steering stem head nut loose

#### Handlebar pulls to one side:

Frame bent  
Wheel misalignment  
Swingarm bent or twisted  
Swingarm pivot shaft runout excessive  
Steering maladjusted

Steering stem bent  
Front fork leg bent  
Right/left front fork oil level uneven

### Shock absorption unsatisfactory:

(Too hard)  
Front fork oil excessive  
Front fork oil viscosity too high  
Front fork leg bent  
Tire air pressure too high  
Rear shock absorber maladjusted  
(Too soft)  
Front fork oil insufficient and/or leaking  
Front fork oil viscosity too low  
Front fork, rear shock absorber spring weak  
Rear shock absorber gas leaking  
Rear shock absorber maladjusted

### Brake Doesn't Hold:

#### Disc brake:

Air in the brake line  
Pad or disc worn  
Brake fluid leak  
Disc warped  
Contaminated pads  
Brake fluid deteriorated  
Primary or secondary cup damaged  
Master cylinder scratched inside  
Brake maladjustment (lever or pedal play excessive)

## 15-6 APPENDIX

### General Lubrication

#### *Lubrication (Periodic Maintenance)*

- 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**

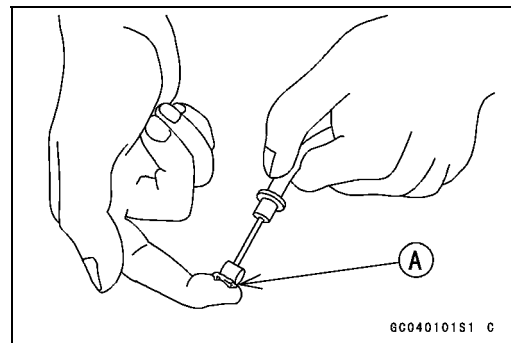
○ *Whenever the vehicle has been operated under wet or rainy conditions, or especially after using a high-pressure water spray, perform the general lubrication.*

#### **Pivots: Lubricate with Motor Oil**

Clutch Lever  
Brake Lever  
Kick Pedal  
Shift Pedal  
Rear Brake Rod Joint  
Drive Chain

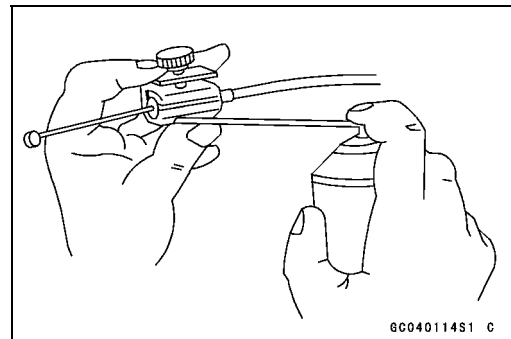
#### **Points: Lubricate with Grease [A].**

Clutch Inner Cable Upper and Lower Ends  
Throttle Inner Cable Upper Ends  
SwingArm Pivot  
Tie-Rod Pivot  
RockerArm Pivot  
Steering Stem Bearing

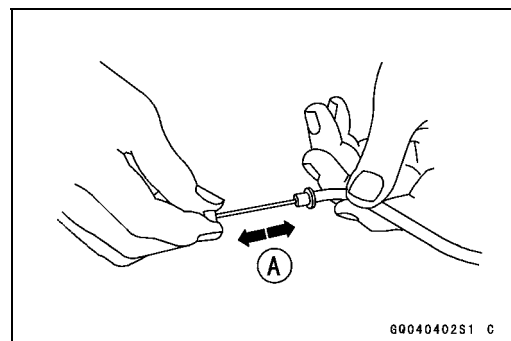


#### **Cables: Lubricate with Rust Inhibitor.**

Throttle Cables  
Clutch Cable



- 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, or if the cable housing is kinked, replace the cable.



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## Bolt, Nut, and Fastener Tightness

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### Bolt, Nut, and Fastener Tightness

#### *Tightness Inspection*

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

#### NOTE

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

- ★ If there are loose fasteners, retorque them to the specified torque following the specified tightening sequence. Refer to the appropriate chapter for torque specifications. If torque specifications are not in the appropriate chapter, see the 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.

### Nut, Bolt and Fastener to be checked

#### Wheels:

- Spoke Nipples
- Front Axle Nut
- Rear Axle Nut

#### Final Drive:

- Chain Adjuster Locknuts

#### Brakes:

- Front Master Cylinder Clamp Bolts
- Caliper Mounting Bolts
- Brake Pedal Bolt

#### Suspension:

- Front Fork Clamp Bolts
- Rear Shock Absorber Mounting Bolts
- Swingarm Pivot Shaft Nut
- Uni-Trak Tie-rod & Rocker Arm Pivot Shaft Nuts

#### Steering:

- Steering Stem Head Nut
- Handlebar Holder Bolts

#### Engine:

- Engine Mounting Nuts
- Cylinder Head Nuts
- Shift Pedal Bolt
- Muffler Mounting Bolts
- Kick Pedal Bolt

#### Others:

- Rear Frame Pipe Bolts
- Front Fender Mounting Bolt

15-8 APPENDIX

Unit Conversion Table

Prefixes for Units:

Prefix	Symbol	Power
mega	M	× 1 000 000
kilo	k	× 1 000
centi	c	× 0.01
milli	m	× 0.001
micro	μ	× 0.000001

Units of Mass:

kg	×	2.205	=	lb
g	×	0.03527	=	oz

Units of Volume:

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

Units of Force:

N	×	0.1020	=	kg
N	×	0.2248	=	lb
kg	×	9.807	=	N
kg	×	2.205	=	lb

Units of Length:

km	×	0.6214	=	mile
m	×	3.281	=	ft
mm	×	0.03937	=	in

Units of Torque:

N·m	×	0.1020	=	kgf·m
N·m	×	0.7376	=	ft·lb
N·m	×	8.851	=	in·lb
kgf·m	×	9.807	=	N·m
kgf·m	×	7.233	=	ft·lb
kgf·m	×	86.80	=	in·lb

Units of Pressure:

kPa	×	0.01020	=	kgf/cm²
kPa	×	0.1450	=	psi
kPa	×	0.7501	=	cm Hg
kgf/cm²	×	98.07	=	kPa
kgf/cm²	×	14.22	=	psi
cm Hg	×	1.333	=	kPa

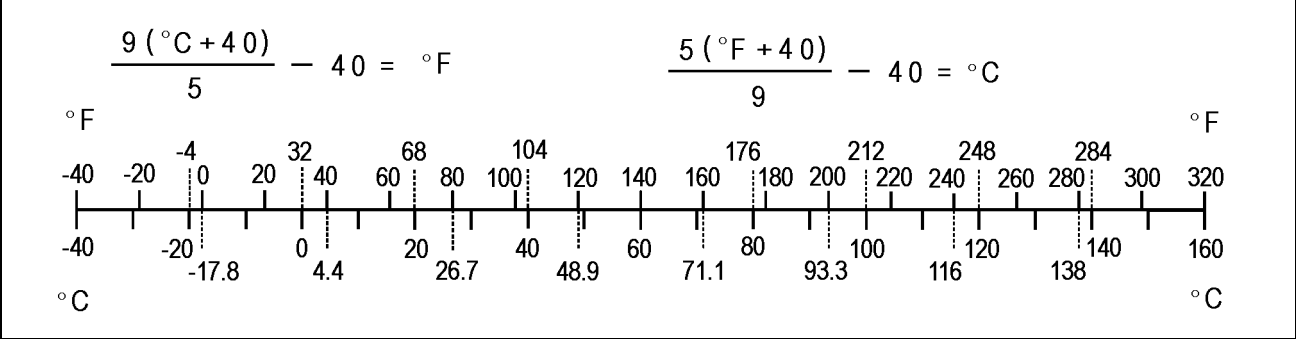
Units of Speed:

km/h	×	0.6214	=	mph
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Units of Power:

kW	×	1.360	=	PS
kW	×	1.341	=	HP
PS	×	0.7355	=	kW
PS	×	0.9863	=	HP

Units of Temperature:





## MODEL APPLICATION

Year	Model	Beginning Frame No.
2001	KX85-A1	JKBKXFAC□1A000001 or JKBKX085AAA000001
2001	KX85-B1	JKVKXFBC□1A000001 or JKBKX085BBA000001
2001	KX100-D1	JKAKXTDC□1A000001 or JKAKX100DDA000001
2002	KX85-A2	JKBKXFAC□2A007001 or JKBKX085AAA007001
2002	KX85-B2	JKBKXFBC□2A003001 or JKBKX085BB1003001
2002	KX100-D2	JKAKXTDC□2A004001 or JKAKX100DDA004001
2003	KX85-A3	JKBKXFAC□3A015001 or JKBKX085AAA015001
2003	KX85-B3	JKBKXFBC□3A006001 or JKBKX085BBA006001
2003	KX100-D3	JKAKXTDC□3A008001 or JKAKS100DDA008001
2004	KX85-A4	JKBKXFAC□4A021001
2004	KX85-B4	JKBKXFBC□4A009001 or JKBKX085BBA009001
2004	KX100-D4	JKAKXTDC□4A012001 or JKAKX100DDA012001
2005	KX85-A5	JKBKXFAC□5A026001 or JKBKX085AAA026001
2005	KX85-B5	JKBKXFBC□5A012001 or JKBKX085BBA012001
2005	KX100-D5	JKAKXTDC□5A015001
2006	KX85A6F	JKBKXFAC□6A031001 or JKBKX085AAA031001
2006	KX85B6F	JKBKXFBC□6A015001 or JKBKX085BBA015001
2006	KX100D6F	JKAKXTDC□6A018001
2007	KX85A7F	JKBKXFAC□7A036001 or JKBKX085AAA036001
2007	KX85B7F	JKBKXFBC□7A018001 or JKBKX085BBA018001
2007	KX100D7F	JKAKXTDC□7A021001

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



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