



**Kawasaki**

**KX65**



# **Motorcycle Service Manual**



# Quick Reference Guide

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

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

## 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)                  |     |                          |

**This motorcycle is designed for a rider weighing less than 121 pounds (55 kg). Exceeding this limit could damage the motorcycle.**

**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

## Table of Contents

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## 1-2 GENERAL INFORMATION

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### 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.

(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.

**Before Servicing**

(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

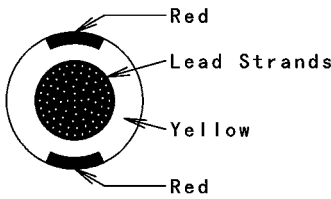

When there is a replacement instruction, replace these parts with new ones every time they are removed.

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.

**Two-Color Electrical**

| Lead (cross-section)  | Color Indicated on the Lead | Color Indicated on the Wiring Diagram   |
|---|-----------------------------|---|
|  | <p>Yellow/Red</p>           |  |

## 1-4 GENERAL INFORMATION

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### Before Servicing

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#### (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

KX65-A1 Left Side View



KX65-A1 Right Side View



# 1-6 GENERAL INFORMATION

## General Specifications

| Items                                  | KX65-A1 ~ A2                                 | KX65-A3 ~ A6, A6F ~                            |
|--|--|--|
| <b>Dimensions</b>                      |  |  |
| Overall Length                         | 1 580 mm                                     | 1 590 mm                                       |
| Overall Width                          | 690 mm (KX65-A1), 730 mm (KX65-A2)           | 760 mm   |
| Overall Height                         | 925 mm (KX65-A1), 935 mm (KX65-A2)           | 955 mm   |
| Wheelbase                              | 1 110 mm                                     | 1 120 mm                                       |
| Road Clearance                         | 270 mm (KX65-A1), 280 mm (KX65-A2)           | 305 mm   |
| Seat Height                            | 720 mm (KX65-A1), 730 mm (KX65-A2)           | 760 mm   |
| Dry Mass                               | 53 kg  | 57 kg  |
| Curb Mass:                             |  |  |
| Front                                  | 26.5 kg                                      | 28.5 kg  |
| Rear                                   | 29.5 kg                                      | 31.5 kg  |
| Fuel Tank Capacity                     | 3.8 L  | ←  |
| <b>Engine</b>                          |  |  |
| Type                                   | 2-stroke, single cylinder, piston reed valve | ←  |
| Cooling System                         | Liquid-cooled                                | ←  |
| Bore and Stroke                        | 44.5 × 41.6 mm                               | ←  |
| Displacement                           | 64 cm <sup>3</sup>                           | ←  |
| Compression Ratio                      | 8.4: 1                                       | ←  |
| Carburetion System                     | MIKUNI VM24SS                                | ←  |
| Starting System                        | Primary kick                                 | ←  |
| Ignition System                        | MAGNETO CDI                                  | ←  |
| Ignition Timing                        | 20.5° BTDC @6 000 r/min (rpm)                | ←  |
|  |  | 20.5°BTDC<br>@7 100 r/min (rpm)<br>(KX65A6F ~) |
| Spark Plug                             | NGK BR10EG (US) NGK B10EG                    | ←<br>NGK BR10EG<br>(KX65A6F ~)                 |
| Port Timing                            |  |  |
| Inlet:                                 |  |  |
| Open                                   | Full open                                    | ←  |
| Close                                  | —  | ←  |
| Scavenging:                            |  |  |
| Open                                   | 61.8° BBDC                                   | ←  |
| Close                                  | 61.8° ABDC                                   | ←  |
| Duration                               | 123.6°                                       | ←  |
| Exhaust:                               |  |  |
| Open                                   | 91.5° BBDC                                   | ←  |
| Close                                  | 91.5° ABDC                                   | ←  |
| Duration                               | 183°   | ←  |
| Lubrication System<br>(Gasoline : Oil) | Petrol mix (32:1)                            | ←  |

General Specifications

| Items                     | KX65-A1 ~ A2                                  | KX65-A3 ~ A6, A6F ~                   |
|---------------------------|---|---------------------------------------|
| <b>Drive Train</b>        |   |                                       |
| Primary Reduction System: |   |                                       |
| Type                      | Gear  | ←                                     |
| Reduction Ratio           | 3.500 (77/22)                                 | ←                                     |
| Clutch Type               | Wet, multi disc                               | ←                                     |
| Transmission:             |   |                                       |
| Type                      | 6-speed, constant mesh, return shift          | ←                                     |
| Gear Ratios:              |   |                                       |
| 1st                       | 2.846 (37/13)                                 | ←                                     |
| 2nd                       | 2.125 (34/16)                                 | ←                                     |
| 3rd                       | 1.722 (31/18)                                 | ←                                     |
| 4th                       | 1.428 (30/21)                                 | ←                                     |
| 5th                       | 1.217 (28/23)                                 | ←                                     |
| 6th                       | 1.083 (26/24)                                 | ←                                     |
| Final Drive System:       |   |                                       |
| Type                      | Chain drive                                   | ←                                     |
| Reduction Ratio           | 3.538 (46/13)                                 | 3.615 (47/13)                         |
| Overall Drive Ratio       | 13.416 @Top gear                              | 13.703 @Top gear                      |
| Transmission Oil:         |   |                                       |
| Grade                     | API SE, SF or SG<br>API SH or SJ with JASO MA | ←<br>API SH, SJ or SL<br>with JASO MA |
| Viscosity                 | SAE 10W-40                                    | ←                                     |
| Capacity                  | 0.5 L   | ←                                     |
| <b>Frame</b>              |   |                                       |
| Type                      | Tubular, semi-double cradle                   | ←                                     |
| Steering Angle            | 40° to either side                            | ←                                     |
| Caster (Rake Angle)       | 26.5°   | 27°                                   |
| Trail                     | 60 mm   | ←                                     |
| Front Tire:               |   |                                       |
| Size                      | 60/100-14 30M                                 | ←                                     |
| Type                      | tube type                                     | ←                                     |
| Rear Tire:                |   |                                       |
| Size                      | 80/100-12 41M                                 | ←                                     |
| Type                      | tube type                                     | ←                                     |
| Rim Size:                 |   |                                       |
| Front                     | 14 × 1.40                                     | ←                                     |
| Rear                      | 12 × 1.60                                     | ←                                     |
| Front Suspension:         |   |                                       |
| Type                      | Telescopic fork                               | ←                                     |
| Wheel Travel              | 210 mm  | ←                                     |
| Rear Suspension:          |   |                                       |
| Type                      | Swingarm (Uni-trak)                           | ←                                     |
| Wheel Travel              | 225 mm  | 240 mm                                |

## 1-8 GENERAL INFORMATION

### General Specifications

| Items                    | KX65-A1 ~ A2 | KX65-A3 ~ A6, A6F ~ |
|--------------------------|--------------|---------------------|
| Brake Type:              |              |                     |
| Front and Rear           | Single disc  | ←                   |
| Effective Disc Diameter: |              | ←                   |
| Front                    | 164.8 mm     | ←                   |
| Rear                     | 146 mm       | ←                   |

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

US: United States Model



## GENERAL INFORMATION 1-9

### Periodic Maintenance Chart

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

| OPERATION   | FREQUENCY                                  |                            |                             |                            |  | As required |
|---|--|----------------------------|-----------------------------|----------------------------|--|-------------|
|   | After each race (or 2.5 hr.)               | Every 3 races (or 7.5 hr.) | Every 5 races (or 12.5 hr.) | Every 10 races (or 25 hr.) |  |             |
| Clutch - adjust                                   | •  |                            |                             |                            |  |             |
| Clutch and friction plates - inspect †            |  | •                          | R                           |                            |  |             |
| Throttle cable - adjust                           | •  |                            |                             |                            |  |             |
| Spark plug - clean, gap †                         | •  | 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                 |  | •                          |                             |                            |  |             |
| Muffler body - clean/inspect †                    | •  |                            |                             |                            |  |             |
| Muffler body 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 †                            | •  |                            |                             |                            |  |             |
| 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 hose - replace                              | Every 4 years                              |                            |                             |                            |  |             |
| Brake hoses, connections - inspect †              | •  |                            |                             |                            |  |             |
| Spoke tightness and rim runout - inspect †        | •  |                            |                             |                            |  |             |
| Drive chain - adjust                              | •  |                            |                             |                            |  |             |
| Drive chain - lubricate                           | •  |                            |                             |                            |  |             |
| Drive chain wear - inspect †                      |  |                            | •                           |                            |  |             |
| Drive chain slipper and guide - replace           | When damaged                               |                            |                             |                            |  |             |
| Front fork - inspect/clean                        | •  |                            |                             |                            |  |             |
| Front fork oil - change                           | 1st time after 2 races, then every 5 races |                            |                             |                            |  |             |
| Nuts, bolts, fasteners - inspect †                | •  |                            |                             |                            |  |             |
| Fuel system - clean                               | •  |                            |                             |                            |  |             |
| Fuel hose - replace                               | Every 4 years                              |                            |                             |                            |  |             |

## 1-10 GENERAL INFORMATION

### Periodic Maintenance Chart

| OPERATION   | FREQUENCY                                  |                            |                             |                            |  | As required |
|---|--|----------------------------|-----------------------------|----------------------------|--|-------------|
|   | After each race (or 2.5 hr.)               | Every 3 races (or 7.5 hr.) | Every 5 races (or 12.5 hr.) | Every 10 races (or 25 hr.) |  |             |
| Fuel hoses, connections - inspect †               | •  |                            |                             |                            |  |             |
| Steering play - inspect †                         | •  |                            |                             |                            |  |             |
| Steering stem bearing - grease                    |  |                            | •                           |                            |  |             |
| Rear sprocket - inspect †                         |  |                            | •                           |                            |  |             |
| General lubrication - perform                     | •  |                            |                             |                            |  |             |
| Wheel bearing - inspect †                         |  |                            |                             | •                          |  |             |
| Swing arm and Uni-Trak linkage pivots - grease    |  |                            | •                           |                            |  |             |
| Swing arm 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**

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

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

Letters used in the "Remarks" column mean:

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

Lh: Left-hand Threads.

S: Tighten the fasteners following the specified sequence.

| Fastener                                    | Torque |       |           | Remarks |
|---|--------|-------|-----------|---------|
|   | N·m    | kgf·m | ft·lb     |         |
| <b>Fuel System</b>                          |        |       |           |         |
| Rear Frame Mounting Bolts                   | 34     | 3.5   | 25        |         |
| Carburetor Clamp Screws                     | 1.5    | 0.15  | 13 in·lb  |         |
| Carburetor Holder Mounting Bolts            | 8.8    | 0.90  | 78 in·lb  |         |
| Air Cleaner Housing Plate Nuts              | 3.0    | 0.31  | 27 in·lb  |         |
| Air Cleaner Housing Mounting Bolts          | 8.8    | 0.90  | 78 in·lb  |         |
| Reed Valve Screws                           | 9.8    | 1.0   | 87 in·lb  |         |
| <b>Cooling System</b>                       |        |       |           |         |
| Radiator Mounting Bolts                     | 8.8    | 0.90  | 78 in·lb  |         |
| Shroud Mounting Bolts                       | 8.8    | 0.90  | 78 in·lb  |         |
| Air Bleeder Bolt                            | 8.8    | 0.90  | 78 in·lb  |         |
| Water Pump Cover Bolts                      | 8.8    | 0.90  | 78 in·lb  |         |
| Water Pump Impeller Bolt                    | 8.3    | 0.85  | 73 in·lb  |         |
| Water Hose Clamp Screws                     | 1.5    | 0.15  | 13 in·lb  |         |
| Coolant Drain Plug (Water Pump)             | 8.8    | 0.90  | 78 in·lb  |         |
| Water Pump Cover Fitting Bolts              | 5.9    | 0.60  | 52 in·lb  |         |
| <b>Engine Top End</b>                       |        |       |           |         |
| Cylinder Head Nuts                          | 25     | 2.5   | 18        |         |
| Spark Plug                                  | 26     | 2.6   | 19        |         |
| Cylinder Nuts                               | 25     | 2.5   | 18        |         |
| Muffler Mounting Bolts                      | 8.8    | 0.90  | 78 in·lb  | L       |
| Expansion Chamber Damper Mounting Bolt, Nut | 8.8    | 0.90  | 78 in·lb  |         |
| Inner Pipe Mounting Bolts                   | 5.9    | 0.6   | 52 in·lb  | L       |
| <b>Engine Right Side</b>                    |        |       |           |         |
| Primary Gear Nut (KX65A6F ~)                | 49     | 5.0   | 36        | Lh      |
| Clutch Spring Bolts                         | 9.3    | 0.95  | 82 in·lb  |         |
| Clutch Hub Bolt                             | 64     | 6.5   | 47        |         |
| Ratchet Guide Bolt                          | 8.8    | 0.90  | 78 in·lb  |         |
| Ratchet Guide Screw                         | 5.2    | 0.53  | 46 in·lb  |         |
| Kick Pedal Bolt                             | 12     | 1.2   | 104 in·lb |         |
| Right Engine Cover Bolts                    | 8.8    | 0.90  | 78 in·lb  |         |
| Oil Filler Cap                              | 1.5    | 0.15  | 13 in·lb  |         |
| Gear Set Lever Screw                        | 8.8    | 0.90  | 78 in·lb  |         |

# 1-12 GENERAL INFORMATION

## Torque and Locking Agent

| Fastener                                  | Torque            |                    |                        | Remarks          |
|---|-------------------|--------------------|------------------------|------------------|
|   | N·m               | kgf·m              | ft·lb                  |                  |
| <b>Engine Removal/Installation</b>        |                   |                    |                        |                  |
| Engine Mounting Nuts                      | 25                | 2.5                | 18                     |                  |
| Engine Mounting Nuts (KX65-A3 ~)          | 29                | 3.0                | 21                     |                  |
| Swing Arm Pivot Shaft Nut                 | 69                | 7.0                | 51                     |                  |
| <b>Engine Bottom End/Transmission</b>     |                   |                    |                        |                  |
| Cylinder Stud                             | –                 | –                  | –                      | L (Planted Side) |
| Crankcase Bolts                           | 8.8               | 0.90               | 78 in·lb               |                  |
| Shift Pedal Bolt                          | 8.8               | 0.90               | 78 in·lb               |                  |
| Engine Oil Drain Plug                     | 20                | 2.0                | 15                     |                  |
| Bearing Retaining Screws                  | 8.8               | 0.90               | 78 in·lb               |                  |
| Shift Drum Operating Plate Bolt           | 24                | 2.4                | 17                     | L                |
| Shift Drum Plate Mounting Screws          | 5.2               | 0.53               | 46 in·lb               | L                |
| Gear Set Lever Screw                      | 8.8               | 0.90               | 78 in·lb               |                  |
| Flywheel Nut                              | 29                | 3.0                | 21                     |                  |
| <b>Wheels/Tires</b>                       |                   |                    |                        |                  |
| Front Axle Nut                            | 79                | 8.0                | 58                     |                  |
| Rear Axle Nut                             | 79                | 8.0                | 58                     |                  |
| Spoke Nipple                              | Not less than 1.5 | Not less than 0.15 | Not less than 13 in·lb |                  |
| <b>Final Drive</b>                        |                   |                    |                        |                  |
| Rear Axle Nut                             | 79                | 8.0                | 58                     |                  |
| Rear Sprocket Bolts                       | 26                | 2.7                | 20                     |                  |
| <b>Brakes</b>                             |                   |                    |                        |                  |
| Caliper Mounting Bolts (Front, Rear)      | 25                | 2.5                | 18                     |                  |
| Brake Hose Banjo Bolts                    | 25                | 2.5                | 18                     |                  |
| Master Cylinder Clamp Bolts               | 8.8               | 0.90               | 78 in·lb               | S                |
| Rear Master Cylinder Mounting Screws      | 9.8               | 1.0                | 87 in·lb               |                  |
| Rear Master Cylinder Push Rod Locknut     | 18                | 1.8                | 13                     |                  |
| Brake Disc Mounting Bolts (Front, Rear)   | 9.8               | 1.0                | 87 in·lb               | L                |
| Caliper Bleed Valves (Front, Rear)        | 7.8               | 0.80               | 69 in·lb               |                  |
| Brake Pedal Mounting Bolt                 | 25                | 2.5                | 18                     |                  |
| Brake Lever Adjuster locknut              | 4.9               | 0.50               | 43 in·lb               |                  |
| Brake Pad Bolts                           | 18                | 1.8                | 13                     |                  |
| <b>Suspension</b>                         |                   |                    |                        |                  |
| Front Fork Clamp Bolts (Upper)            | 20                | 2.0                | 14                     |                  |
| Front Fork Clamp Bolt (Lower)             | 29                | 3.0                | 22                     |                  |
| Fork Bottom Allen Bolt                    | 20                | 2.0                | 14                     | L                |
| Front Fork Top Plug                       | 22                | 2.2                | 16                     |                  |
| Swingarm Pivot Shaft Nut                  | 69                | 7.0                | 51                     |                  |
| Rear Shock Absorber Mounting Bolt (Upper) | 39                | 4.0                | 29                     |                  |
| Rear Shock Absorber Mounting Nut (Lower)  | 34                | 3.5                | 25                     |                  |
| Tie-rod Mounting Nuts (Front, Rear)       | 59                | 6.0                | 43                     |                  |

**Torque and Locking Agent**

| Fastener                       | Torque |       |          | Remarks |
|--------------------------------|--------|-------|----------|---------|
|                                | N·m    | kgf·m | ft·lb    |         |
| Rocker Arm Pivot Nut           | 83     | 8.5   | 61       |         |
| Caliper Mounting Bolts         | 25     | 2.5   | 18       |         |
| Rear Frame Mounting Bolts      | 34     | 3.5   | 25       |         |
| <b>Steering</b>                |        |       |          |         |
| Steering Stem Head Nut         | 44     | 4.5   | 33       |         |
| Steering Stem Nut              | 2.9    | 0.30  | 26 in·lb |         |
| Handlebar Clamp Bolts          | 25     | 2.5   | 18       |         |
| Clutch Lever Clamp Bolts       | 8.8    | 0.90  | 78 in·lb |         |
| Front Fork Clamp Bolts (Upper) | 20     | 2.0   | 15       |         |
| Front Fork Clamp Bolts (Lower) | 29     | 3.0   | 22       |         |
| <b>Electrical System</b>       |        |       |          |         |
| Magneto Cover Bolts            | 8.8    | 0.90  | 78 in·lb |         |
| Flywheel Nut                   | 29     | 3.0   | 21       |         |
| Stator Plate Mounting Screws   | 4.9    | 0.50  | 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 |         |
| Spark Plug                     | 26     | 2.6   | 19       |         |

The table below relating tightening torque to thread diameter, lists the basic torque 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**

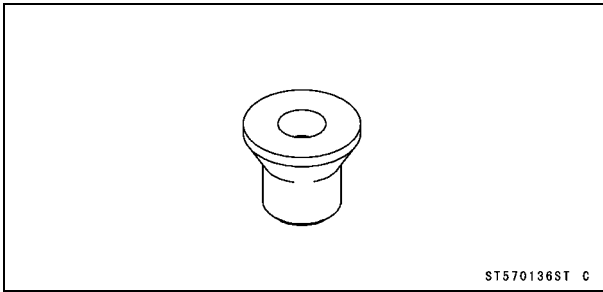
| Threads dia.<br>(mm) | Torque    |             |               |
|----------------------|-----------|-------------|---------------|
|                      | N·m       | kgf·m       | ft·lb         |
| 5                    | 3.4 ~ 4.9 | 0.35 ~ 0.50 | 30 ~ 43 in·lb |
| 6                    | 5.9 ~ 7.8 | 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 ~ 23     | 125 ~ 165     |
| 20                   | 225 ~ 325 | 23 ~ 33     | 165 ~ 240     |

# 1-14 GENERAL INFORMATION

## Special Tools and Sealants

**Bearing Puller Adapter:**

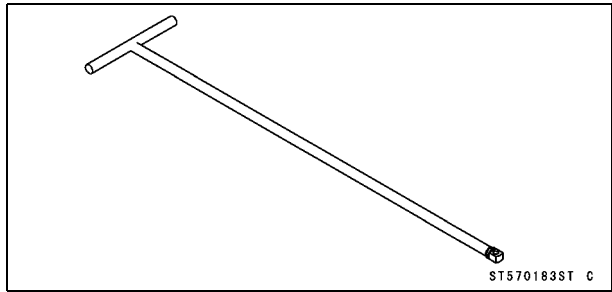
**57001-136**



ST570136ST C

**Fork Cylinder Holder Handle:**

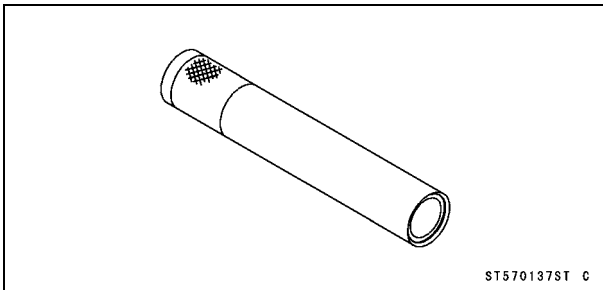
**57001-183**



ST570183ST C

**Steering Stem Bearing Driver:**

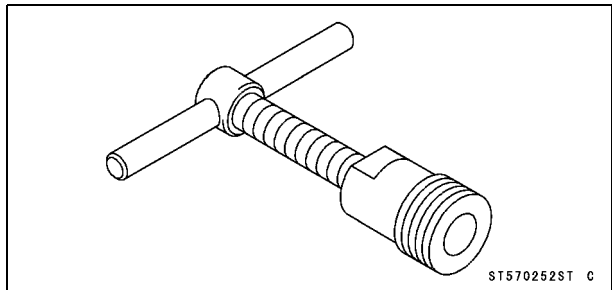
**57001-137**



ST570137ST C

**Flywheel Puller, M12 x 1.75:**

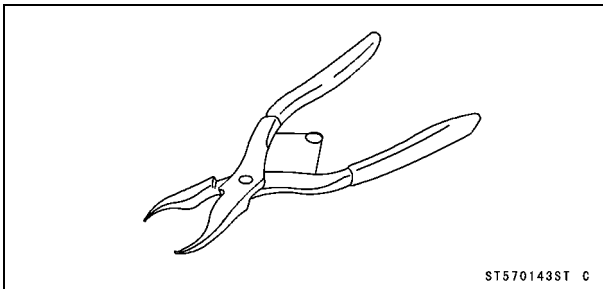
**57001-252**



ST570252ST C

**Inside Circlip Pliers:**

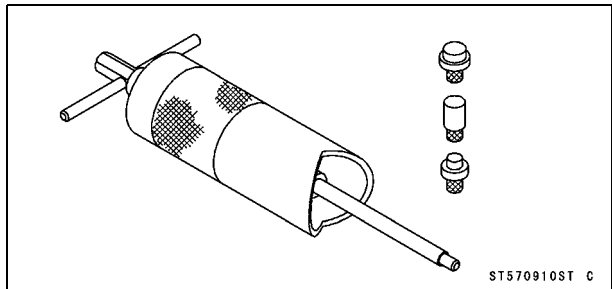
**57001-143**



ST570143ST C

**Piston Pin Puller Assembly:**

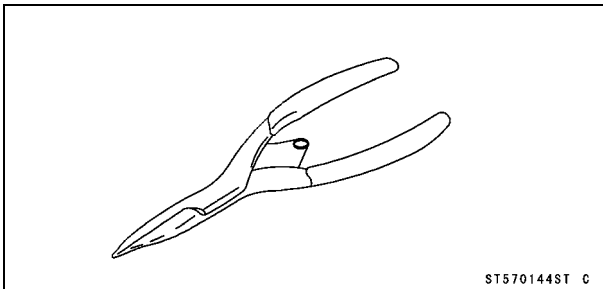
**57001-910**



ST570910ST C

**Outside Circlip Pliers:**

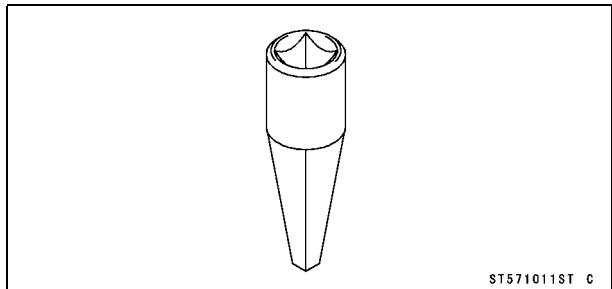
**57001-144**



ST570144ST C

**Fork Cylinder Holder Adapter:**

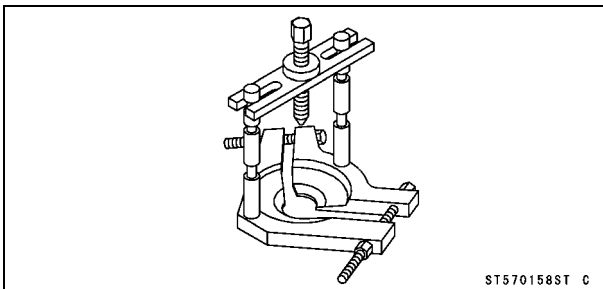
**57001-1011**



ST571011ST C

**Bearing Puller:**

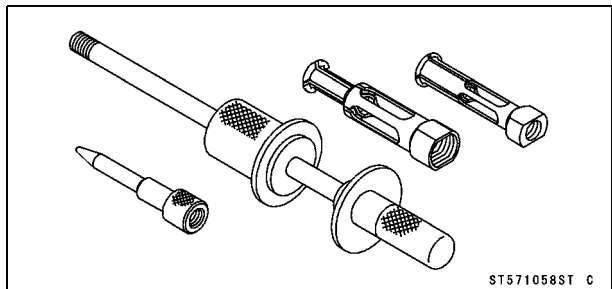
**57001-158**



ST570158ST C

**Oil Seal & Bearing Remover:**

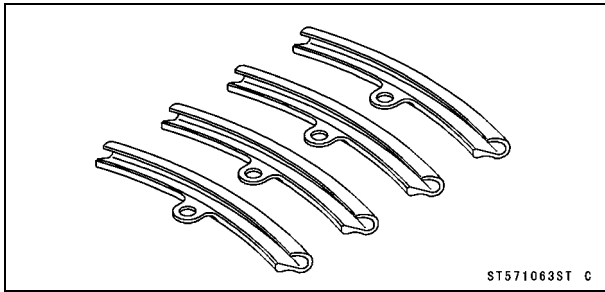
**57001-1058**



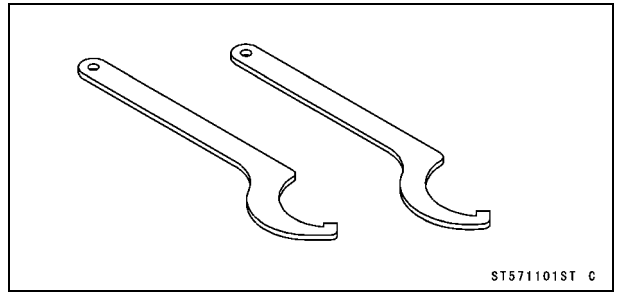
ST571058ST C

Special Tools and Sealants

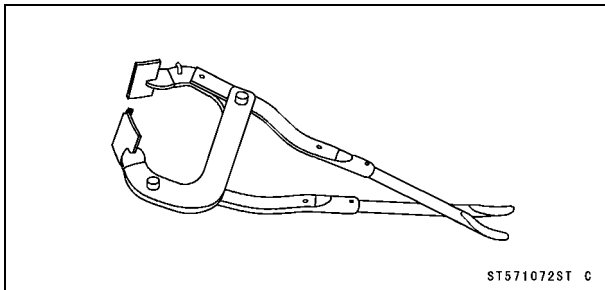
Rim Protector:  
57001-1063



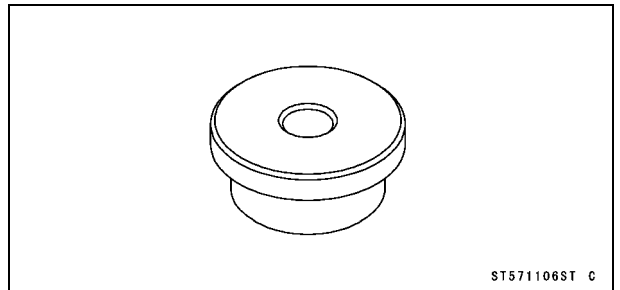
Hook Wrench R37.5, R42:  
57001-1101



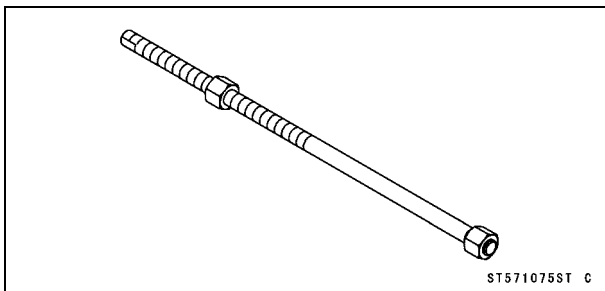
Bead Breaker Assembly:  
57001-1072



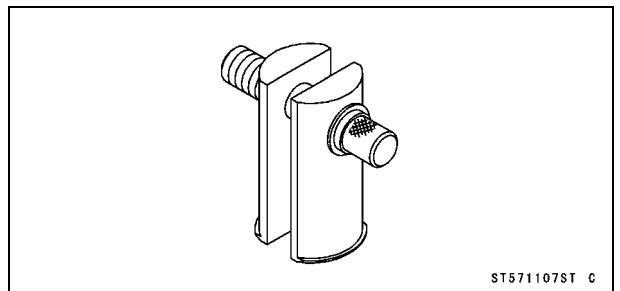
Head Pipe Outer Race Driver,  $\phi 46.5$ :  
57001-1106



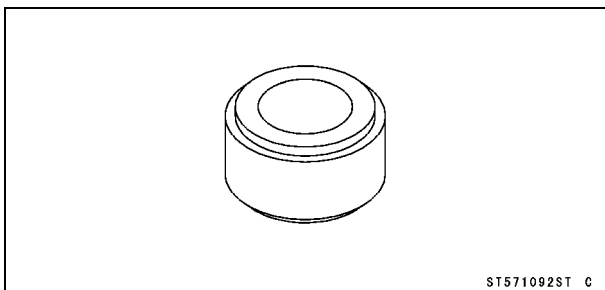
Head Pipe Outer Race Press Shaft:  
57001-1075



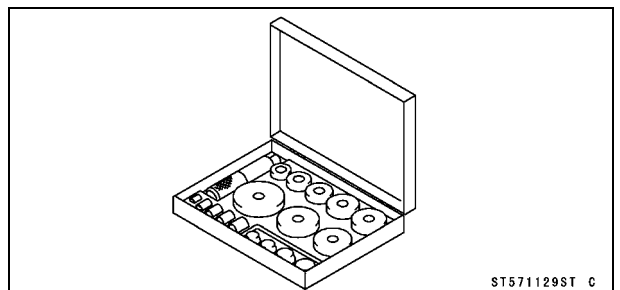
Head Pipe Outer Race Remover ID > 37 mm:  
57001-1107



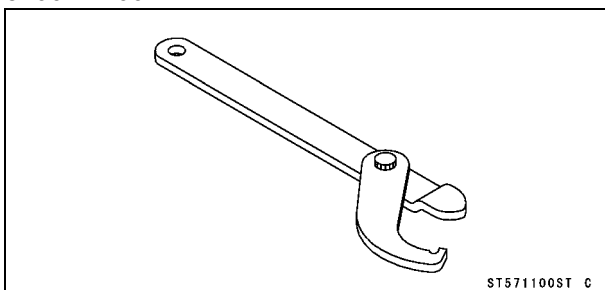
Steering Stem Bearing Driver Adapter,  $\phi 29.7$ :  
57001-1092



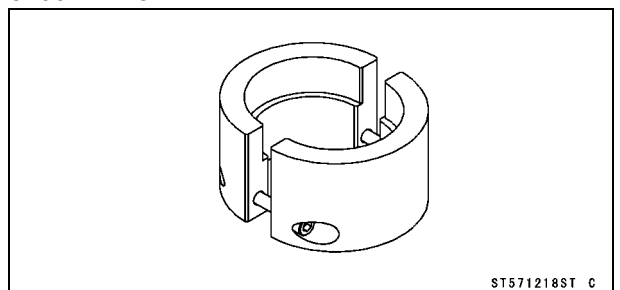
Bearing Driver Set:  
57001-1129



Steering Stem Nut Wrench:  
57001-1100



Fork Outer Tube Weight:  
57001-1218

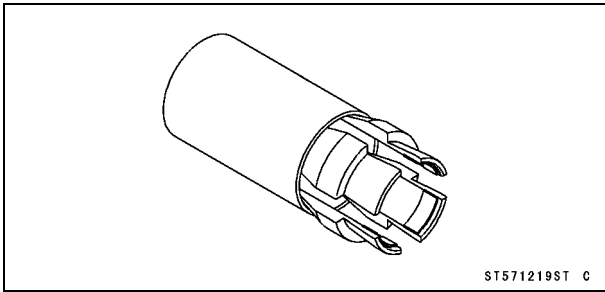


# 1-16 GENERAL INFORMATION

## Special Tools and Sealants

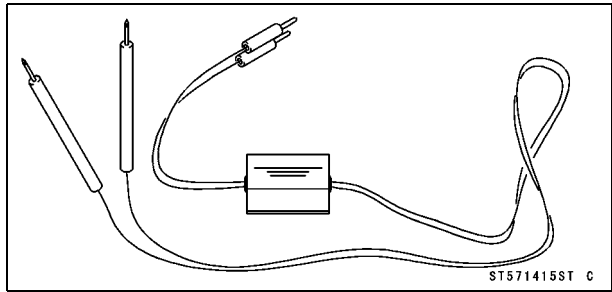
**Front Fork Oil Seal Driver:**

**57001-1219**



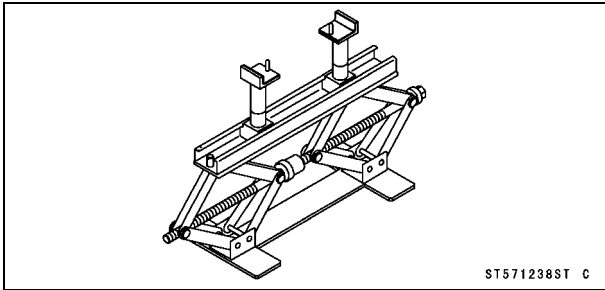
**Peak Voltage Adapter:**

**57001-1415**



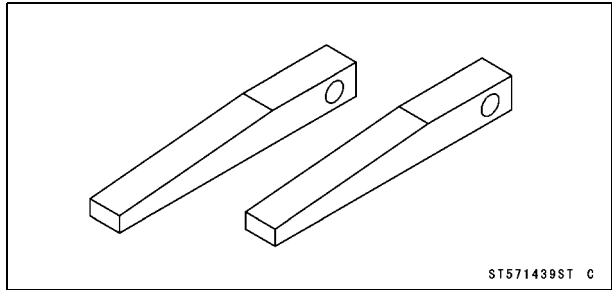
**Jack:**

**57001-1238**



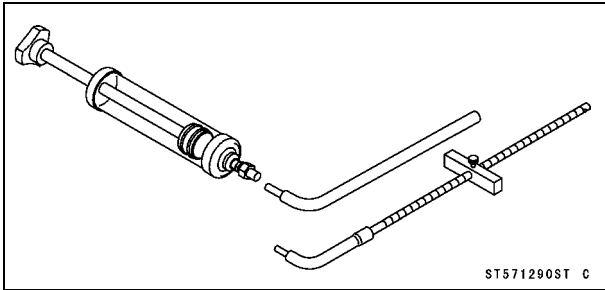
**Crank Shaft Jig:**

**57001-1439**



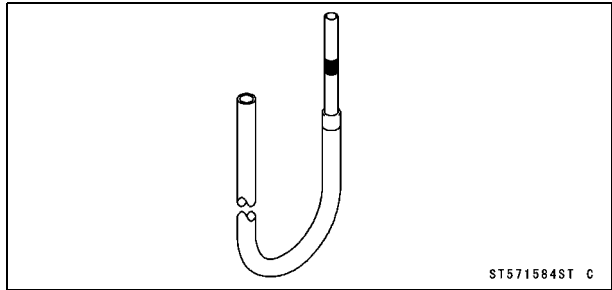
**Fork Oil Level Gauge:**

**57001-1290**



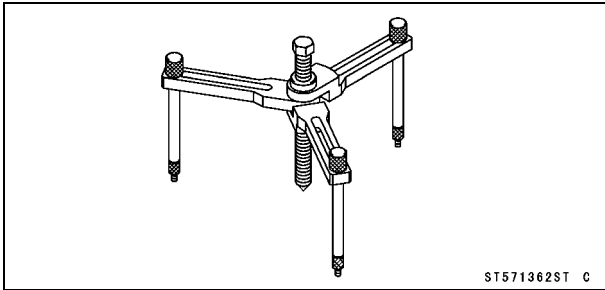
**Graduated Cylinder & Tube:**

**57001-1584**



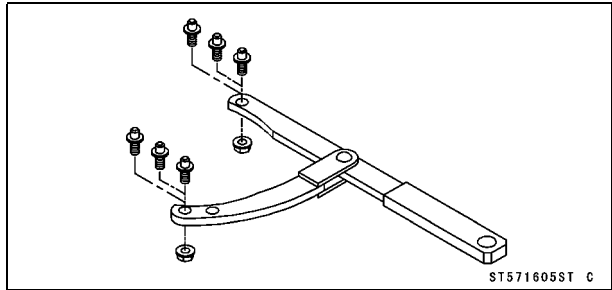
**Crankcase Splitting Tool Assembly:**

**57001-1362**



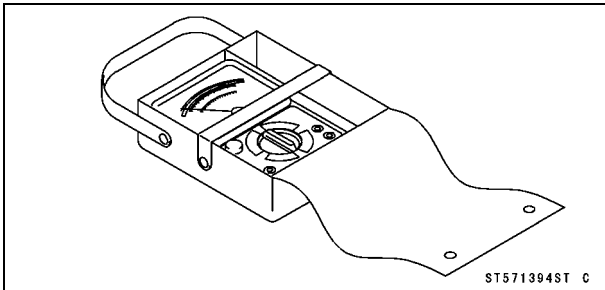
**Flywheel & Pulley Holder:**

**57001-1605**



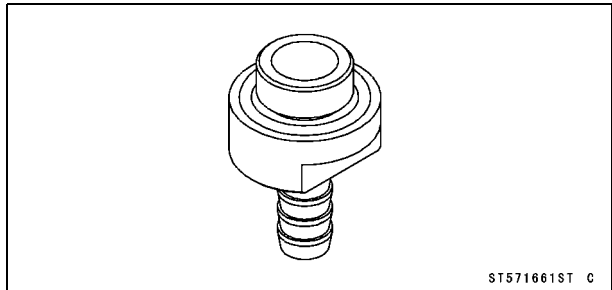
**Hand Tester:**

**57001-1394**



**Fuel Level Gauge Adapter, M16 x 1:**

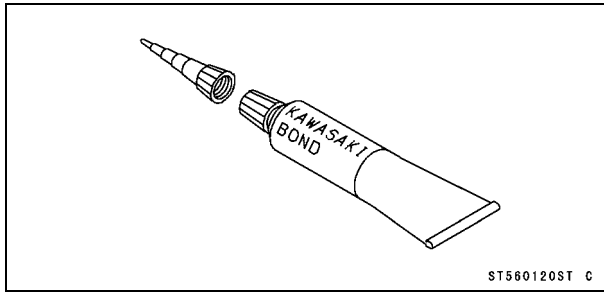
**57001-1661**



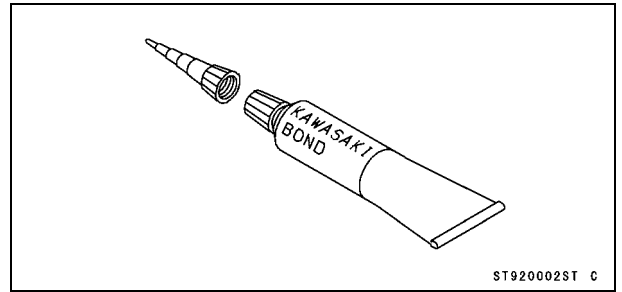


Special Tools and Sealants

Kawasaki Bond (Silicone Sealant):  
56019-120

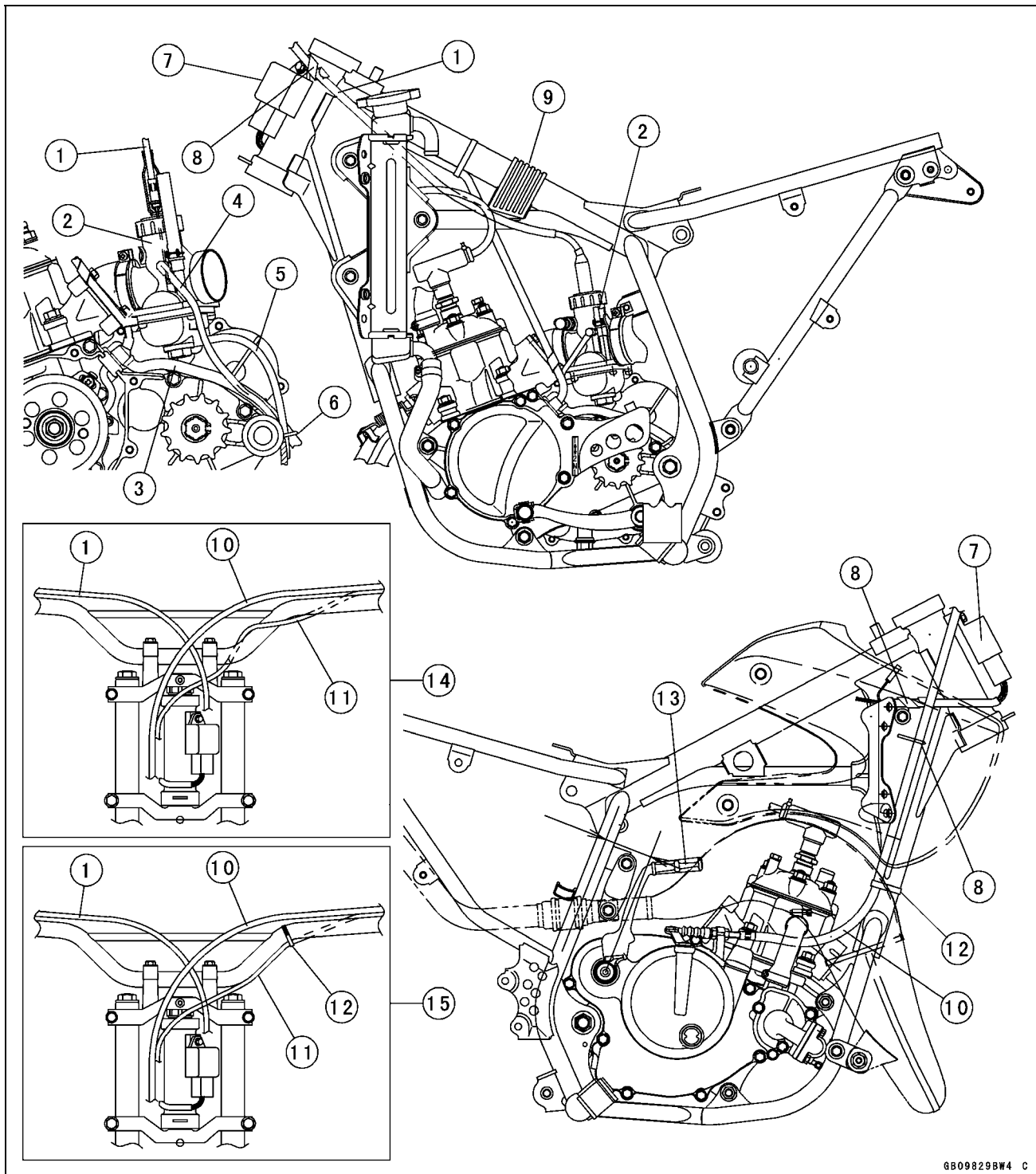


Kawasaki Bond (Liquid Gasket - Silver):  
92104-002



# 1-18 GENERAL INFORMATION

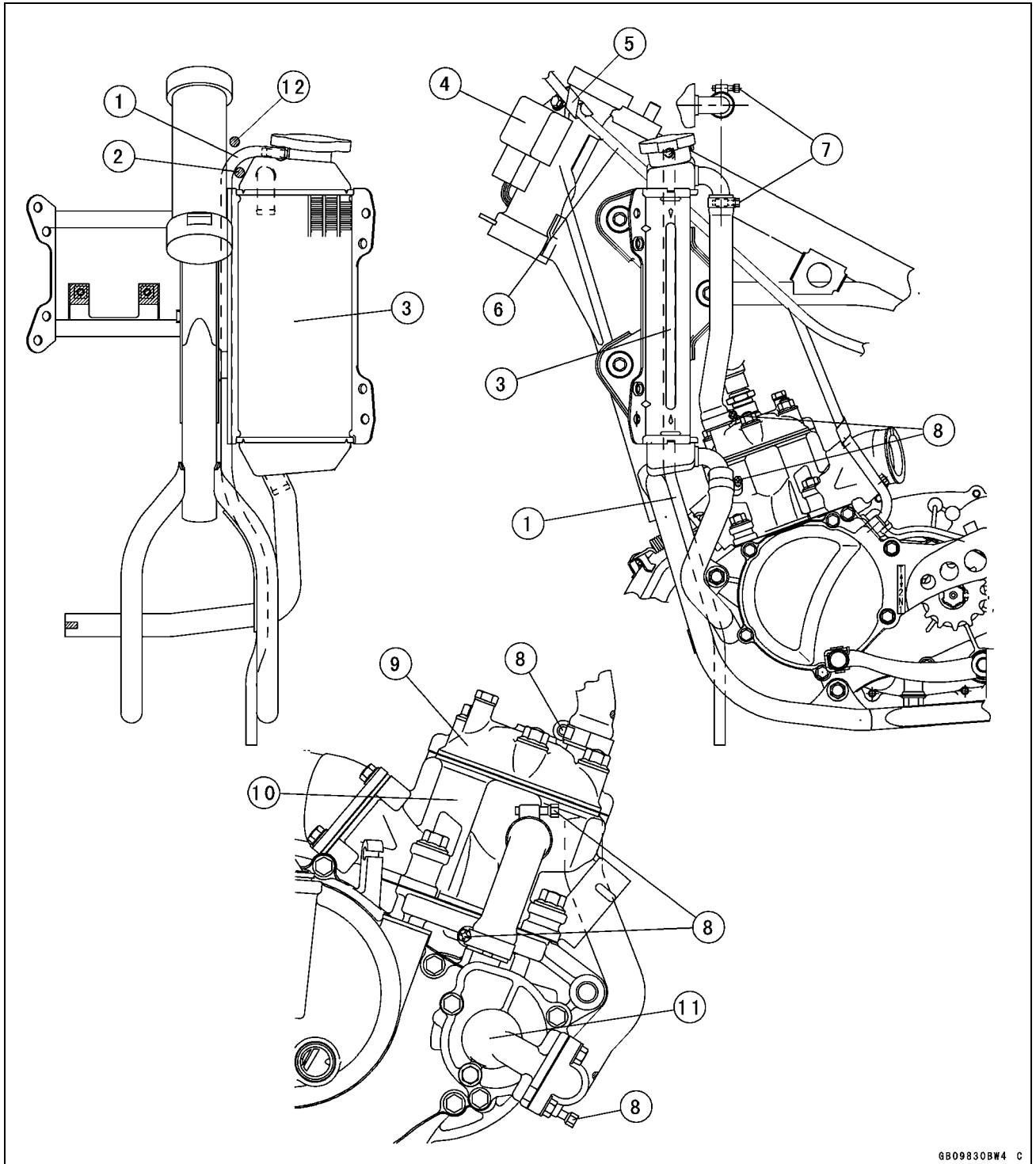
## Cable, Wire and Hose Routing



6B09829B4 C

1. Throttle Cable
2. Carburetor
3. Breather Hose
4. Air Vent Hose
5. Overflow Hose
6. The hoses are passed from the left side of the engine through the clamp in order of the air vent hose, the overflow hose and the breather hose as shown in figure.
7. CDI Unit (KX65-A1 ~ A6)
8. Clamp
9. Rubber Damper (Note its installing direction.)
10. Clutch Cable
11. Engine Stop Button Lead
12. Band
13. Install the kick pedal so that it should be parallel to the frame as shown in figure.
14. KX65-A1 ~ A2
15. KX65-A3 ~ A6

Cable, Wire and Hose Routing

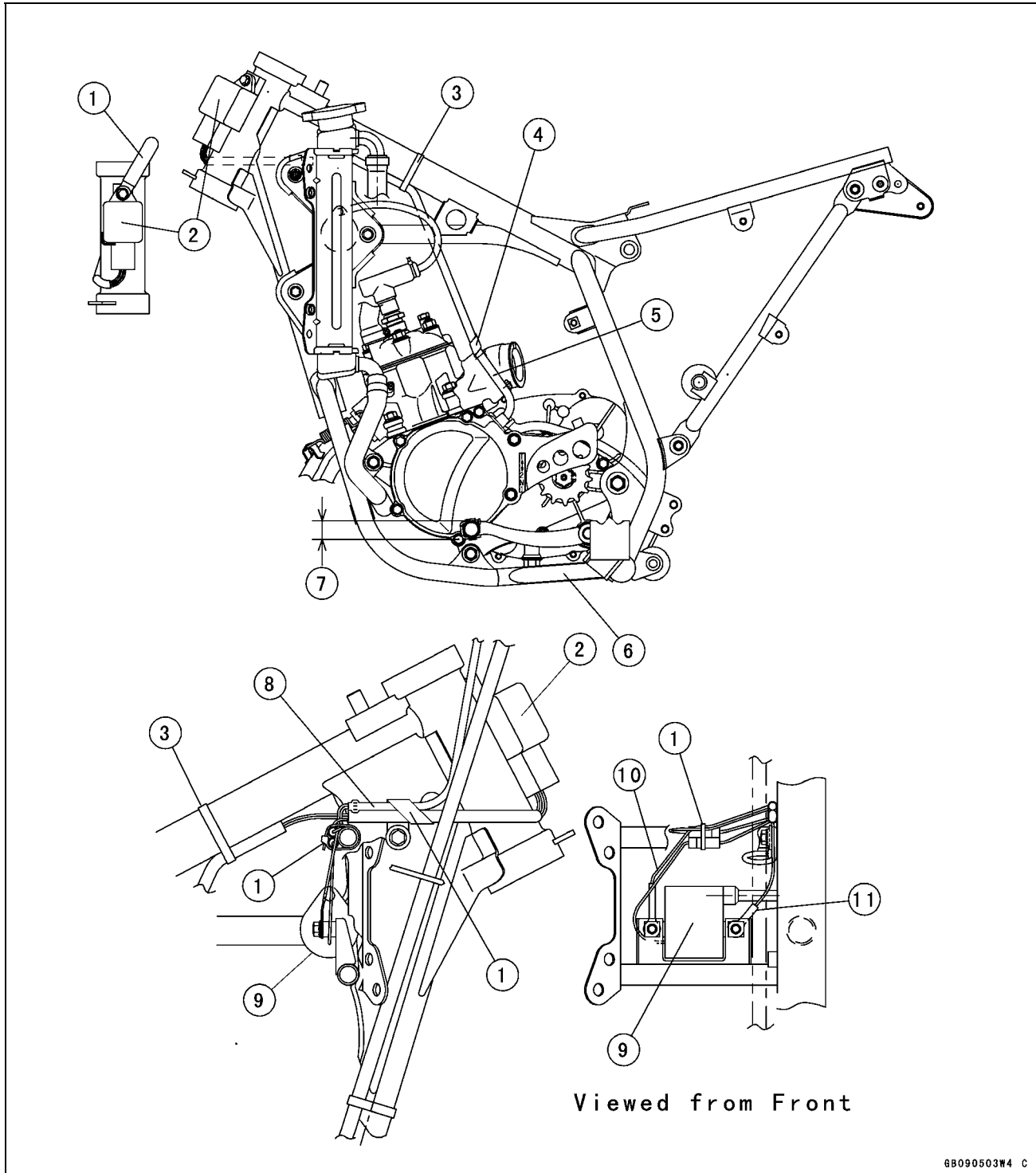


GB09830BW4 C

1. Breather Hose
2. Run the throttle cable under the breather hose.
3. Radiator
4. CDI Unit (KX65-A1 ~ A6)
5. Clamp (KX65-A1 ~ A6)
6. Throttle Cable
7. Clamp as shown in figure. (Be sure the clamp screw position is inside.)
8. Clamp as shown in figure.
9. Cylinder Head
10. Cylinder
11. Water Pump Cover
12. Engine Stop Button Lead (KX65A6F ~)

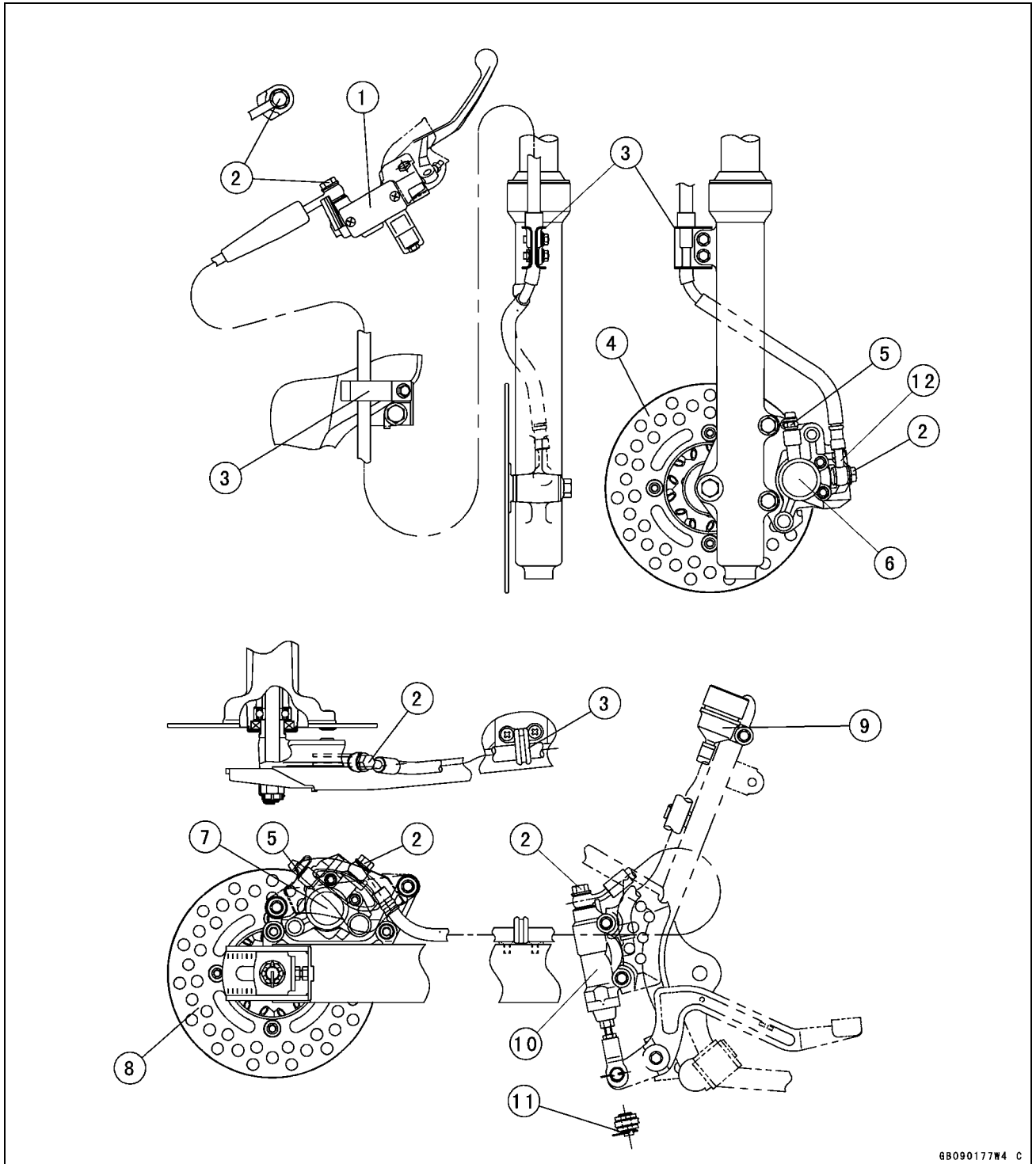
# 1-20 GENERAL INFORMATION

## Cable, Wire and Hose Routing



1. Clamp
2. CDI Unit (KX65-A1 ~ A6)
3. Band
4. Clamp the magneto leads at the upper part of the left on the carburetor holder.
5. Magneto Leads
6. Shift Pedal
7.  $19 \pm 10$  mm (Shift Pedal Position)
8. Engine Stop Button Lead
9. Ignition Coil
10. Engine Stop Button Lead Ground
11. CDI Unit Ground Lead

Cable, Wire and Hose Routing



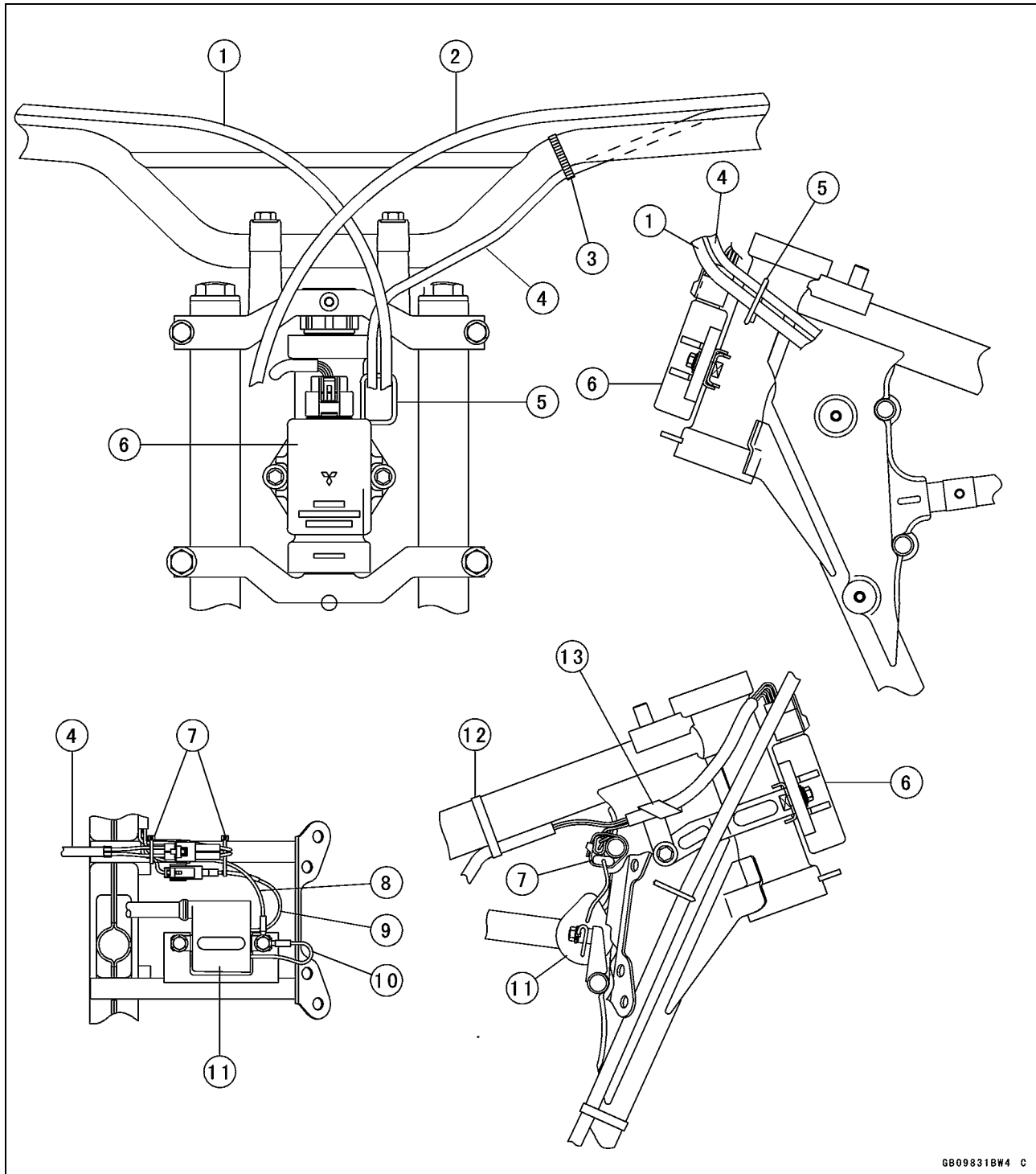
GB090177W4 C

1. Front Brake Reservoir
2. Banjo Bolts
3. Clamp
4. Front Brake Disk
5. Bleed Valves
6. Front Brake Caliper
7. Rear Brake Caliper
8. Rear Brake Disk
9. Rear Brake Reservoir
10. Rear Brake Master Cylinder
11. Bend the cotter pin end by along the joint pin.
12. White paint mark

# 1-22 GENERAL INFORMATION

## Cable, Wire and Hose Routing

KX65A6F ~



GB098318W4 C

1. Throttle Cable
2. Clutch Cable
3. Band
4. Engine Stop Button Lead
5. Clamp
6. CDI unit
7. Band
8. CDI unit Ground Lead
9. Ignition Coil Primary Lead
10. Ignition Coil Ground Lead
11. Ignition Coil
12. Band
13. Clamp the Magneto Lead

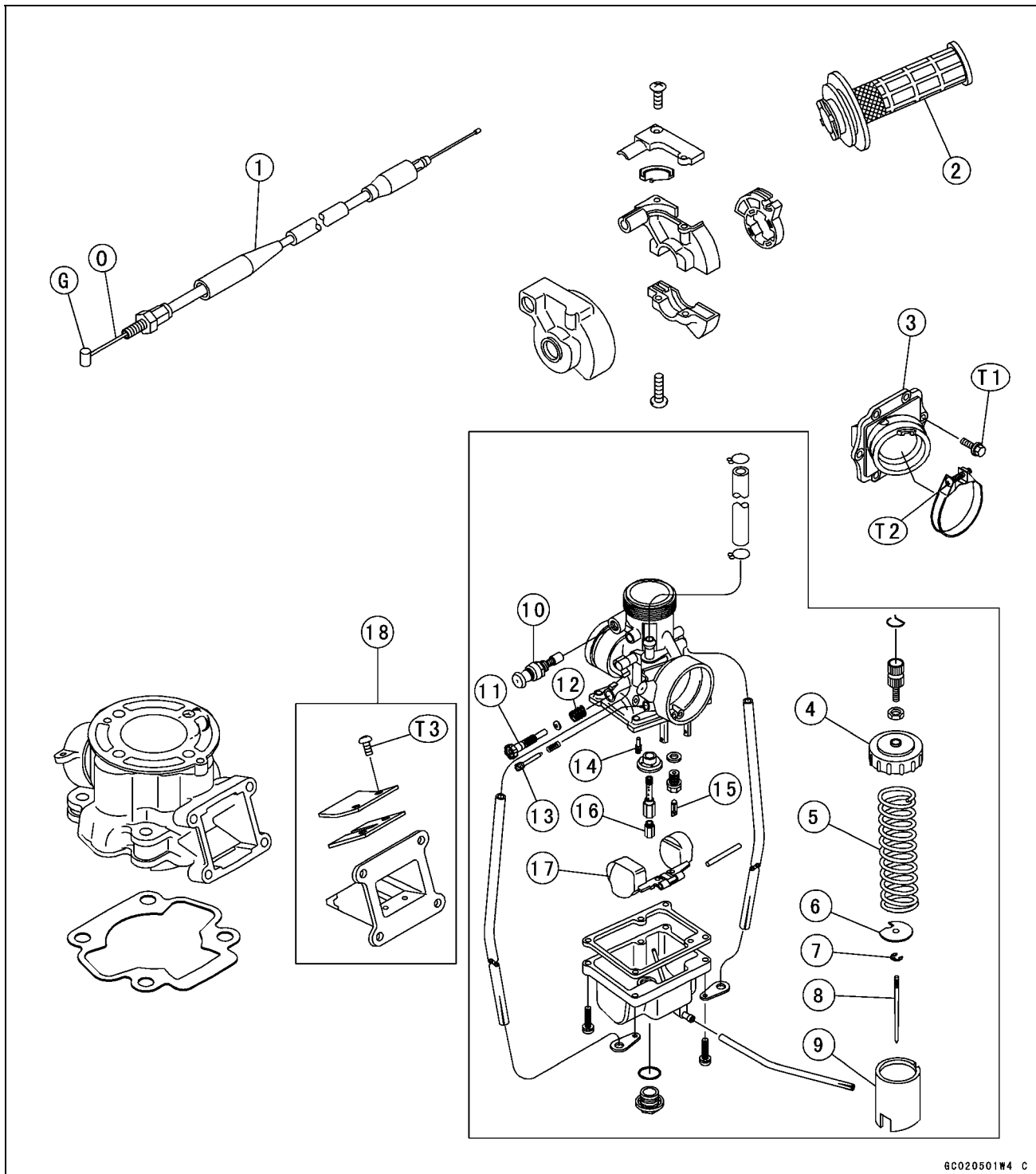
# Fuel System

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## 2-2 FUEL SYSTEM

### Exploded View

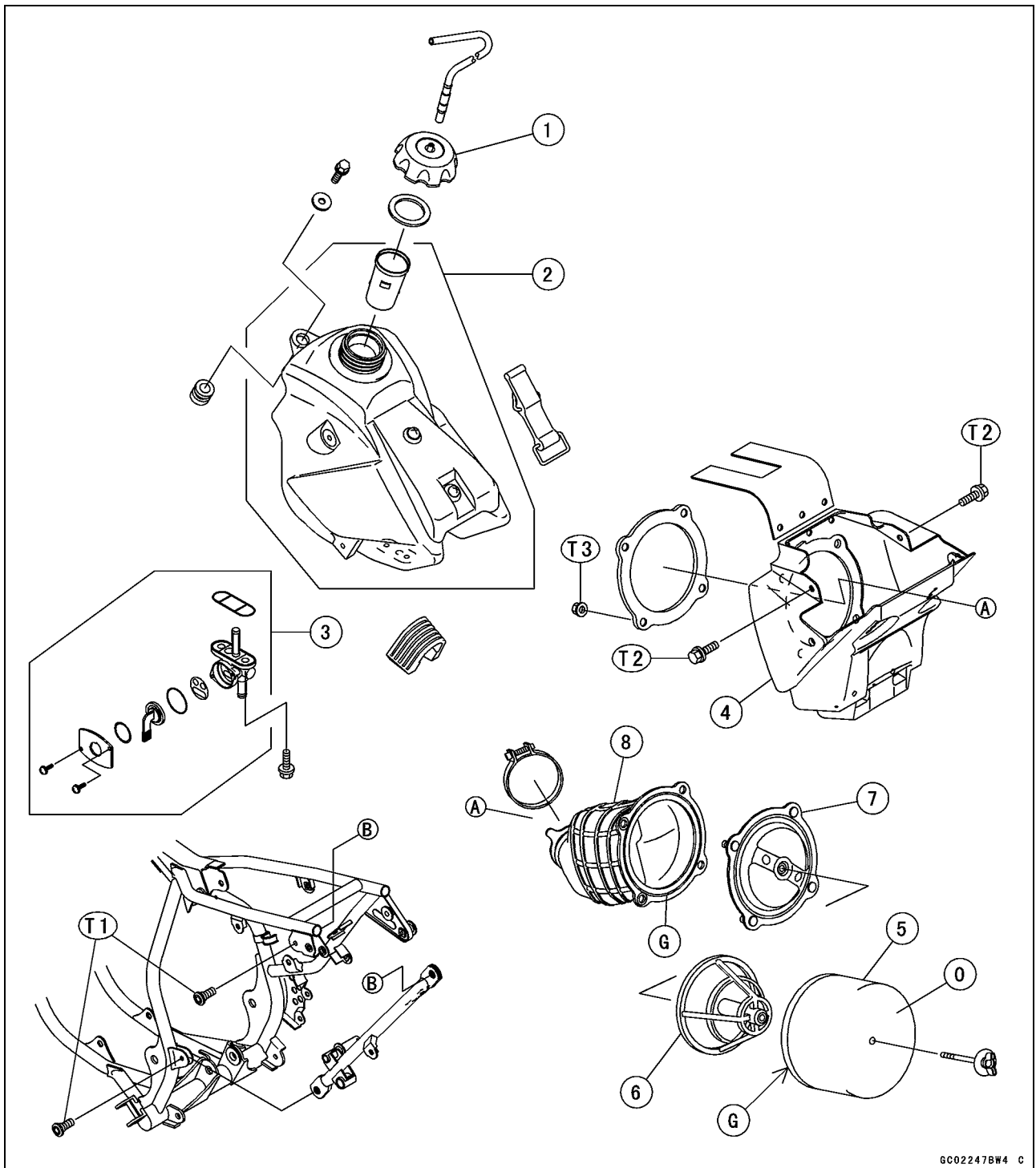


6C020501W4 C

- |                          |                                    |
|--------------------------|------------------------------------|
| 1. Throttle Cable        | 13. Air Screw                      |
| 2. Throttle Grip         | 14. Slow Jet                       |
| 3. Carburetor Holder     | 15. Float Valve Needle             |
| 4. Carburetor Cap        | 16. Main Jet                       |
| 5. Spring                | 17. Float                          |
| 6. Retainer              | 18. Reed Valve                     |
| 7. Jet Needle Clip       | T1: 8.8 N·m (0.90 kgf·m, 78 in·lb) |
| 8. Jet Needle            | T2: 1.5 N·m (0.15 kgf·m, 13 in·lb) |
| 9. Throttle Valve        | T3: 9.8 N·m (1.0 kgf·m, 87 in·lb)  |
| 10. Choke Knob           | G: Apply grease.                   |
| 11. Idle Adjusting Screw | O: Apply oil.                      |
| 12. Spring               |                                    |



Exploded View



1. Fuel Tank Cap
2. Fuel Tank
3. Fuel Tap
4. Air Cleaner Housing
5. Element
6. Frame
7. Holder
8. Air Cleaner Duct

T1: 34 N·m (3.5 kgf·m, 25 ft·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)

G: Apply grease.

O: High-quality foam-air filter oil

## 2-4 FUEL SYSTEM

### Specifications

| Item  | Standard                         |                         | Service Limit |
|---|----------------------------------|-------------------------|---------------|
|   | KX65-A1 ~ A2                     | KX65-A3 ~               |               |
| <b>Throttle Grip Free Play and Cable</b>                          | 2 ~ 3 mm                         | ←                       | ---           |
| <b>Carburetor</b>   |                                  |                         |               |
| Make/Type   | MIKUNI VM24SS                    | ←                       | ---           |
| Main Jet  | #230                             | #190                    | ---           |
| Throttle Valve Cutaway  | #2                               | #1.5                    | ---           |
| Jet Needle  | 5HS59                            | 5G SP68                 | ---           |
| Jet Needle Clip Position  | 3rd groove from the top          | 3rd groove from the top | ---           |
| Needle Jet  | O-0                              | ←                       | ---           |
| Slow Jet  | #40                              | #25                     | ---           |
| Air Screw   | 2 (turns out)                    | 1 1/2 (turns out)       | ---           |
| Main Air Jet  | 0.8 (Pressed in)                 | ←                       | ---           |
| Service Fuel Level (below the Bottom Edge of the Carburetor Body) | 0.5 ±1 mm                        | ←                       | ---           |
| Float Height  | 21.1 ±1 mm                       | ←                       | ---           |
| <b>Air Cleaner</b>  |                                  |                         |               |
| Element Oil   | High-quality foam-air filter oil |                         | ---           |
| <b>Reed Valve</b>   |                                  |                         |               |
| Reed Warp   | ---                              |                         | 0.5 mm        |

**Special Tools - Fuel Level Gauge Adapter M16 × 1: 57001-1661**  
**Graduated Cylinder & Tube: 57001-1584**

## Throttle Grip and Cable

If the throttle grip has excessive free play due to cable stretch or mis-adjustment, 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.

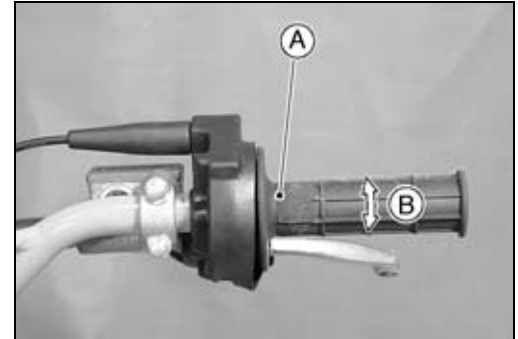
The throttle cable routing is shown in Cable, Wire and Hose Routing in the General Information chapter.

### 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.

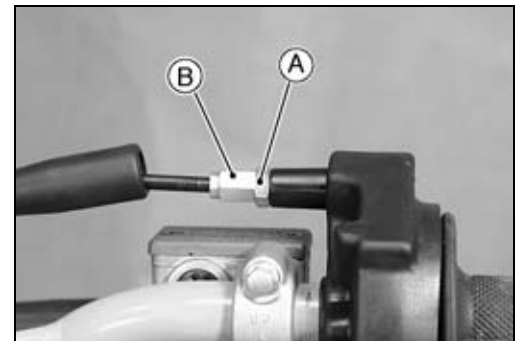
#### Throttle Grip Free Play

Standard: 2 ~ 3 mm



### 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. Make the necessary free play adjustment at the lower cable adjuster, tighten the locknut [B], and install the boot.
- 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.**

### Throttle Cable Installation

- 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.

### **⚠ WARNING**

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

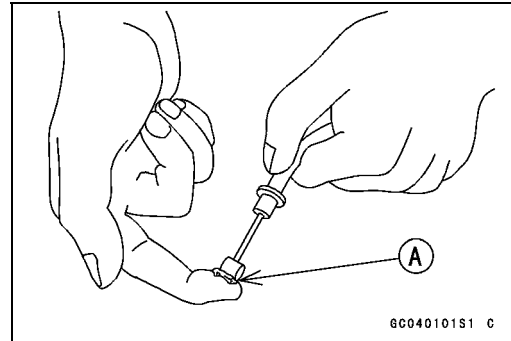
## 2-6 FUEL SYSTEM

### Throttle Grip and Cable

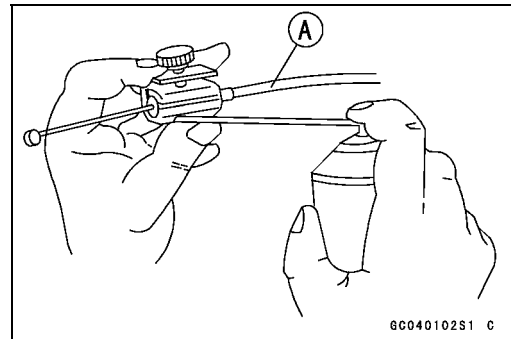
#### *Cable Lubrication*

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

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

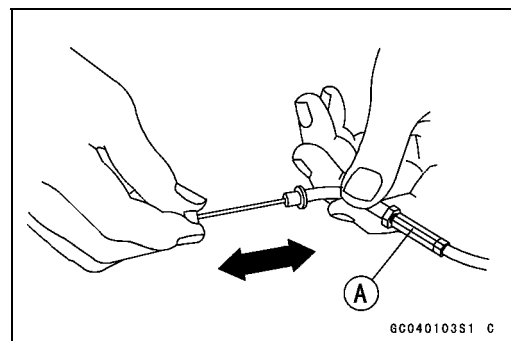


- Lubricate the cable [A] with a penetrating rust inhibitor.



#### *Cable Inspection*

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



## 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).

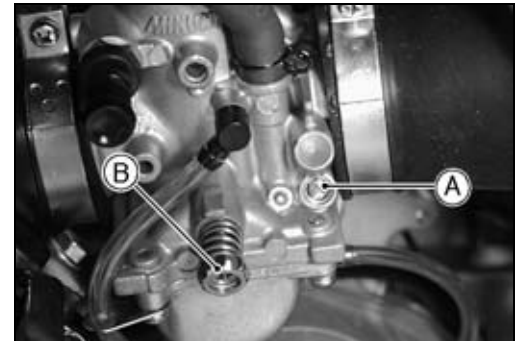
### **⚠ WARNING**

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

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

### Idle Speed Adjustment

- First turn in the air screw [A] until it seats lightly, and back it out 2 turns (KX65-A1 ~ A2).
- First turn in the air screw [A] until it seats lightly, and back out 1 1/2 turns (KX65-A3 ~).
- Start the engine and warm it up thoroughly.
- 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.



### 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 (see Fuel Tank Removal).

## 2-8 FUEL SYSTEM

### Carburetor

- Remove the carburetor, and hold it in true vertical position on a stand. The fuel hose and carburetor cable do not have to be removed to inspect the fuel level [A].
- 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 adapter [B] into the drain plug hole.
- Connect of the graduated cylinder & tube [C] to fuel level gauge adapter.

**Special Tools - Fuel Level Gauge Adapter M16 × 1: 57001-1661**

**Graduated Cylinder & Tube: 57001-1584**

- Hold the gauge vertically against the side of the carburetor body so that the "zero" line [D] is several millimeters higher than the bottom edge [E] of the carburetor body.
- 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 "zero" line is even with the bottom edge of the carburetor body.

#### NOTE

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

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

**Service Fuel Level (below the bottom edge of the carb. body)**

**Standard: 0.5 ±1 mm**

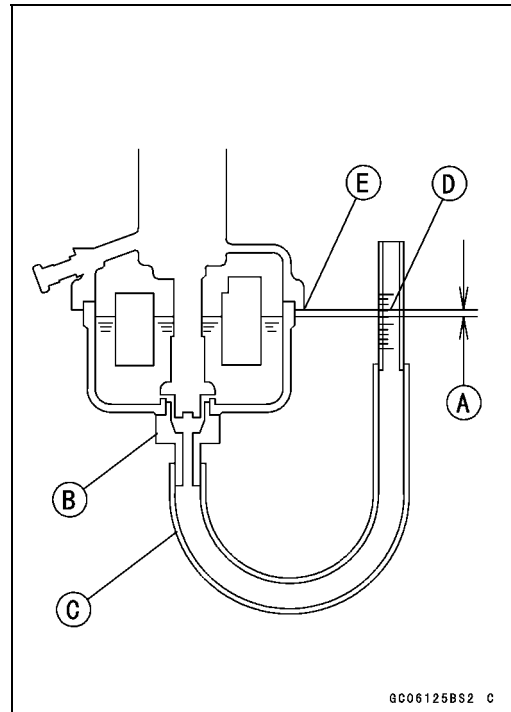
- ★ If the fuel level is incorrect, adjust it.
- Turn the fuel tap to the OFF position and remove the fuel level gauge.
- Install the drain plug on the bottom of the float bowl.

#### Service Fuel Level Adjustment

#### **⚠ WARNING**

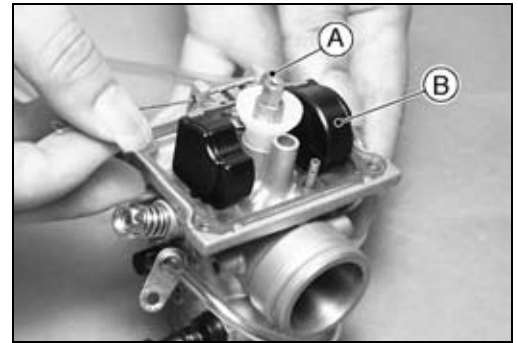
**Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.**

- Remove the carburetor, and drain the fuel into a suitable container.
- Remove the float bowl.

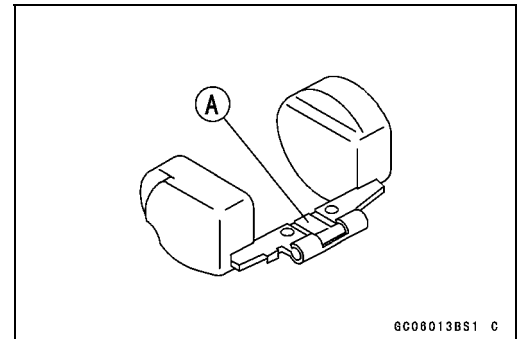


## Carburetor

- 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.

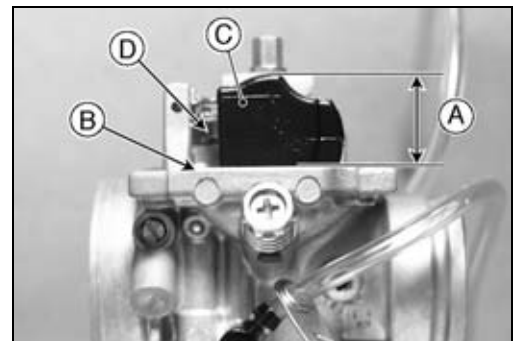


### Float Height

Standard: 21.1 ±1 mm

### NOTE

- Float height [A] is the distance from the float bowl mating surface [B] of the carburetor body (with the gasket removed) to the top of the float [C]. Measure the height with the carburetor upside down.
- Do not push the needle rod [D] in during the float height measurement.



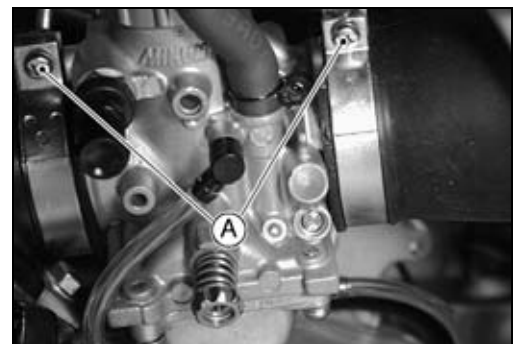
- Assemble the carburetor, and recheck the fuel level.
- ★ If the fuel level cannot be adjusted by this method, the float or the float valve is damaged.

### Carburetor 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 the tap.
- Screw in the upper and lower throttle cable adjusters to give the cable plenty of play (see Throttle Cable Adjustment).
- Loosen the carburetor clamp screws [A] and remove the carburetor from the end of the air cleaner duct, and then pull it out of the carburetor holder from the vehicle left side.



## 2-10 FUEL SYSTEM

### Carburetor

- Unscrew the carburetor cap [A], and pull out the throttle valve assembly [B].

#### CAUTION

**If the throttle valve is left attached to 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

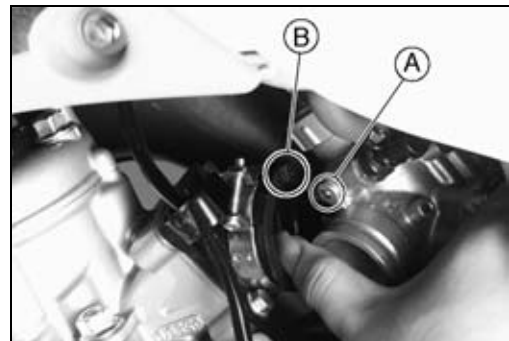
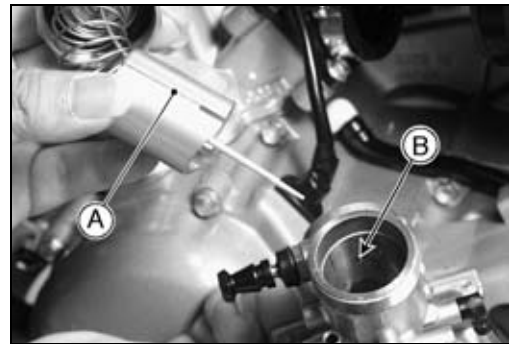
- Being careful not to bend or otherwise damage the jet needle, align the groove [A] in the throttle valve with the guide pin [B] in the carburetor body.
- Check to see that the throttle valve goes all the way down into the carburetor body, and slides smoothly.

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

- Tighten the carburetor clamp screws on the air cleaner duct and carburetor holder securely.
- Route the air vent hose and overflow hose through the clamp on the crankcase (see Cable, Wire and Hose Routing Section in the General Information chapter).

#### CAUTION

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





## Carburetor

- 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 this chapter)  
Idle Speed (see this chapter)

### *Fuel 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.**

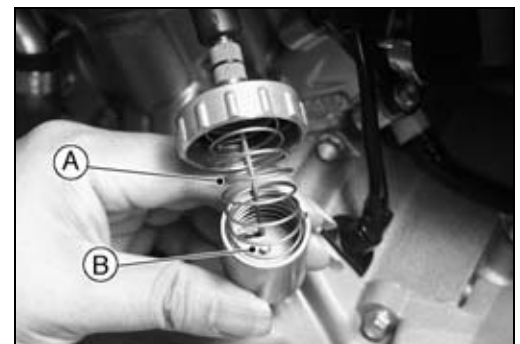
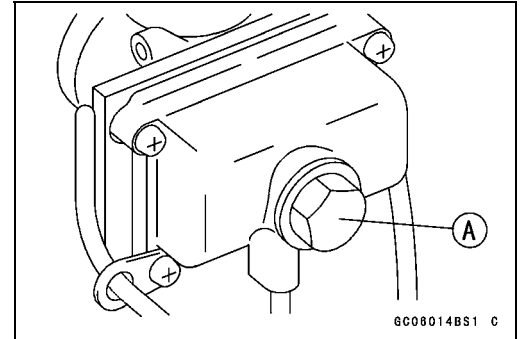
- Turn the fuel tap to the OFF position.
- Remove the carburetor.
- Place a suitable container beneath the carburetor.
- Remove the drain plug [A] from the bottom of the float bowl and check for water or dirt in the fuel.
- ★ If any water or dirt comes out, clean the carburetor, fuel tap and fuel tank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

### *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.**

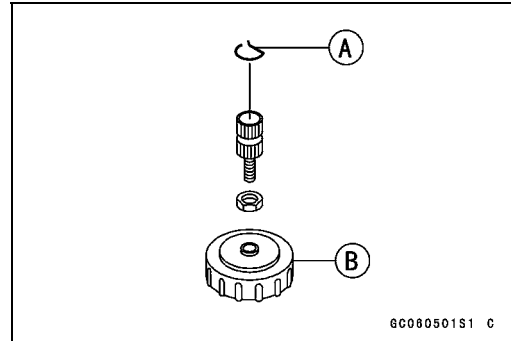
- Remove the carburetor (see this chapter).
- Disassemble the throttle valve assembly as follows.
  - Hold the throttle valve return spring [A] compressed, take out the retainer [B], and free the throttle cable by sliding it through the slot.



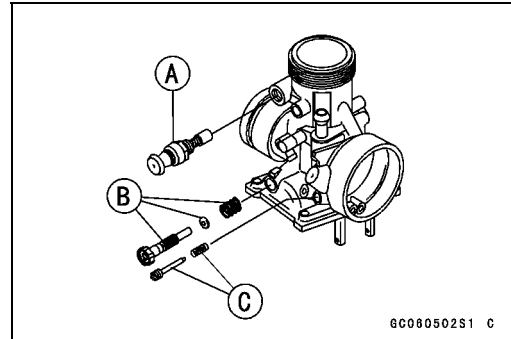
## 2-12 FUEL SYSTEM

### Carburetor

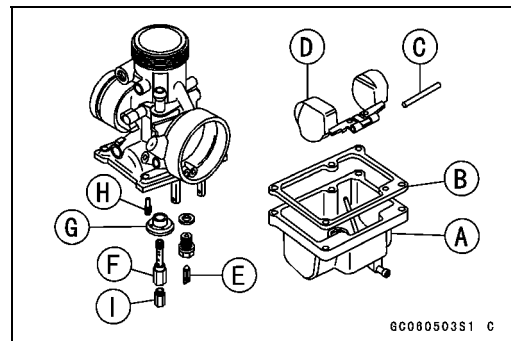
- Slide the jet needle out of the throttle valve.
- Pull out the snap ring [A], and remove the throttle cable from the carburetor cap [B].



- Disassemble the carburetor body.
  - Choke Plunger Assembly [A] (unscrew)
  - Idle Adjusting Screw, Spring and O-ring [B] (unscrew)
  - Air Screw and Spring [C] (unscrew)



- Disassemble the carburetor body bottom end.
  - Float Bowl [A]
  - Gasket [B]
  - Pivot Pin [C] (drive out)
  - Float [D]
  - Float Valve [E]
  - Needle Jet [F]
  - Plastic Holder [G]
  - Pilot Jet [H]
  - Main Jet [I]



#### Carburetor Assembly

- Clean the disassembled parts (see this chapter).

#### CAUTION

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

- Replace the float bowl gasket with a new one if it is deteriorated or damaged.
- Be sure to install the retainer [A].



#### 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.**

- Make sure the fuel tap is in the OFF position.
- Remove the carburetor.
- Drain the fuel in the carburetor.
- Disassemble the carburetor.

## Carburetor

### CAUTION

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

- Immerse all the metal parts in a carburetor cleaning solution.
- Rinse the parts in water.
- 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.

### *Carburetor Inspection*

### WARNING

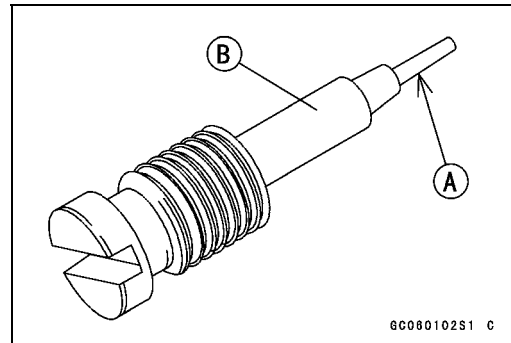
Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

- Remove the carburetor.
- 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 [A] moves smoothly and returns by spring pressure.
- ★ If the throttle valve does not move smoothly. Replace the carburetor.
- Disassemble the carburetor.
- Clean the carburetor.

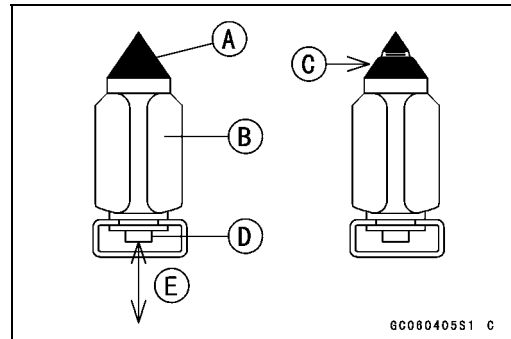
## 2-14 FUEL SYSTEM

### Carburetor

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



- Remove the float valve needle [B].
- Check the plastic tip [A] for wear.
- ★ If the needle is worn as shown [C], replace the valve needle.
- Push the rod [D] in the valve needle, then push and release [E] it.
- ★ If the rod does not come out fully by spring tension, replace the valve needle.

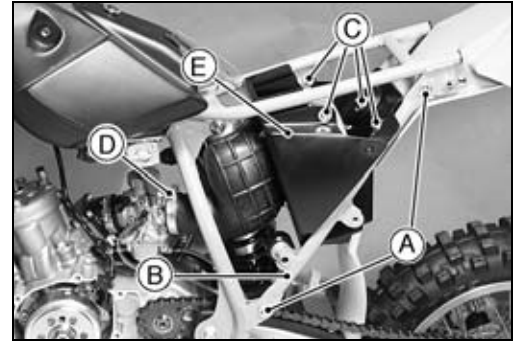


- Remove the slow jet.
- Check the slow jet for any damage.
- ★ If the slow jet is damaged, replace it with a new one.
- Remove the throttle valve and jet needle.
- Inspect the outside of the throttle valve for scratches and abnormal wear.
- ★ If it is badly scratched or worn, replace the throttle valve.
- Inspect the inside of the carburetor body for these same faults.
- ★ If it is badly scratched or worn, replace the entire carburetor.
- Check the jet needle for wear.
- ★ A worn jet needle should be replaced.
- Clean the fuel and air passages with a high flash-point solvent and compressed air.

## Air Cleaner

### Air Cleaner Housing Removal

- Remove:
  - Radiator Shrouds
  - Side Covers
  - Seat
  - Rear Fender
  - Rear Flap
  - Rear Frame Mounting Bolts [A]
  - Rear Frame [B]
  - Air Cleaner Housing Mounting Bolts [C]
- Loosen the air cleaner duct clamp [D].
- Remove the air cleaner housing [E].



### Air Cleaner Housing Installation

- Installation is the reverse of the removal.
- Tighten the rear frame mounting bolts.

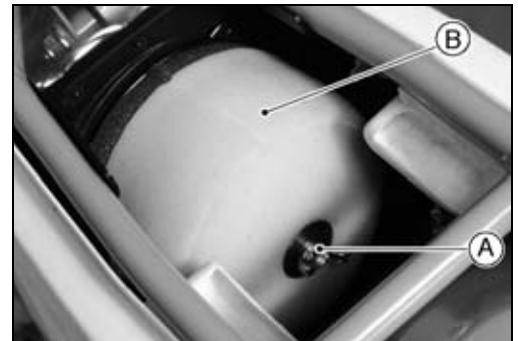
**Torque - Rear Frame Mounting Bolts: 34 N·m (3.5 kgf·m, 25 ft·lb)**

**Air Cleaner Housing Plate Nuts: 3.0 N·m (0.31 kgf·m, 27 in·lb)**

**Air Cleaner Housing Mounting Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)**

### Element Removal

- Remove the seat.
- Remove the wing bolt [A] and pull out the element [B].
- Stuff a clean, lint-free towel into the carburetor so no dirt is allowed to enter the carburetor.
- Wipe out the inside of the air cleaner housing with a clean damp towel.

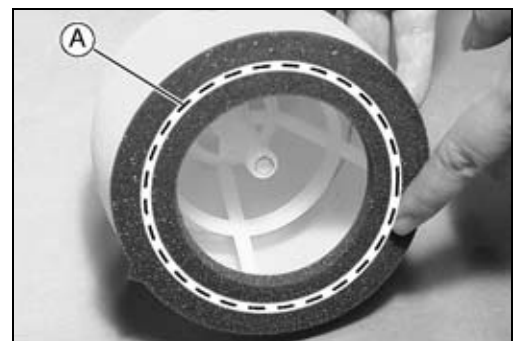


### CAUTION

**Check inside of the inlet tract and carburetor for dirt. If dirt is present, clean the intake tract and carburetor thoroughly. You may also need to replace the element and seal the housing and inlet tract.**

### Element Installation

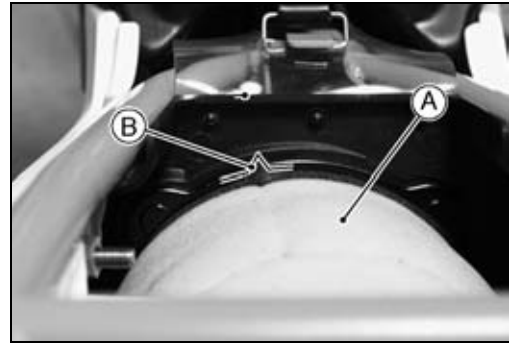
- When installing the element, coat the lip of the element with a thick layer of all purpose grease [A] to assure a complete seal against the air cleaner element base. Also, coat the base where the lip of the element fits.



## 2-16 FUEL SYSTEM

### Air Cleaner

- Install the element [A].
- The element tab [B] position is put on whichever of the holder.



#### Element Cleaning and Inspection

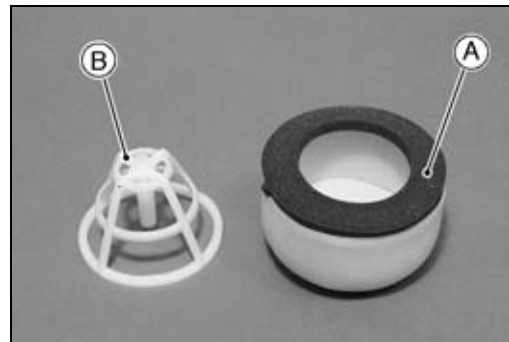
##### NOTE

- 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.
- Since repeated cleaning opens the pores of the element, replace it with a new one in accordance with the Periodic Maintenance Chart. Also, if there is a break in the element material or any other damage to the element, replace the element with a new one.

##### **⚠ WARNING**

**Clean the element in a well-ventilated area, and take 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.**

- 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 using a soft bristle brush. Squeeze it dry in a clean towel. Do not wring the element or blow it dry; the element can be damaged.
- Check all the parts of the element for visible damage.
- ★ If any of the parts of the element are damaged, replace them.
- After cleaning, saturate the 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.
- Remove the towel from the carburetor.
- Install the element.



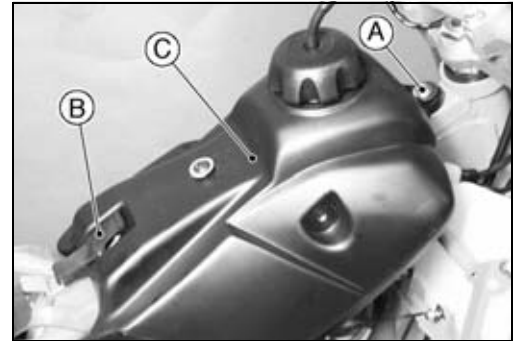
## Fuel Tank

### Fuel Tank Removal

#### **⚠ WARNING**

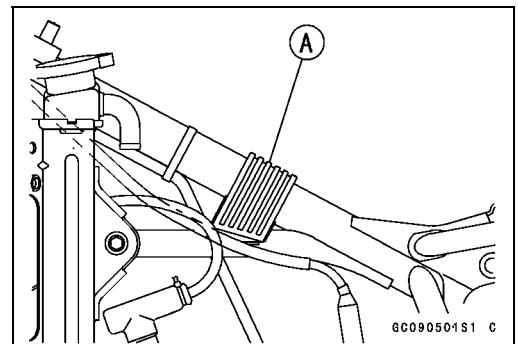
Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and do not smoke. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

- Remove:
  - Radiator Shrouds
  - Seat
- Turn the fuel tap to the OFF position.
- Pull the fuel hose off the fuel tap.
- Remove the fuel tank mounting bolt [A] and band [B].
- Remove the fuel tank [C].
- Drain the fuel tank.



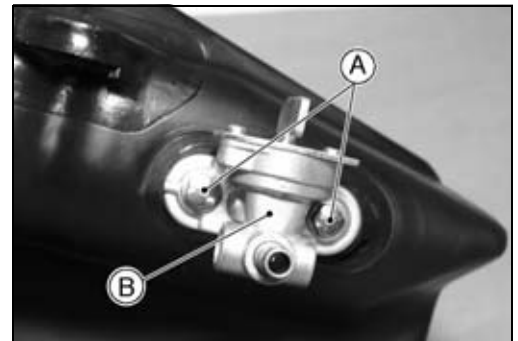
### Fuel Tank Installation

- Check the rubber damper [A] on the frame.
- ★ If the damper is damaged or deteriorated, replace it.
- Install the rubber damper [A] noting its installing direction as shown.
- 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.



### Fuel Tap Removal

- Remove the fuel tank and drain it.
- Remove the mounting bolts [A] and take out the fuel tap [B].



### Fuel Tap Installation

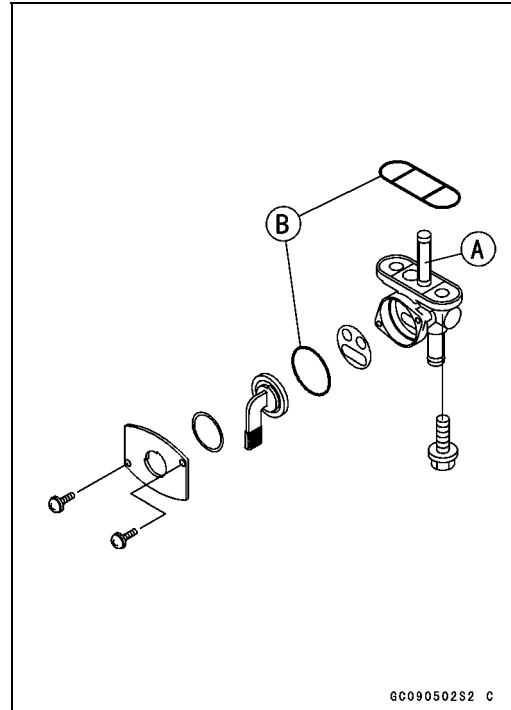
- Be sure the O-ring is in good condition to prevent leaks.
- Be sure to clamp the fuel hose to the tap to prevent leaks.

## 2-18 FUEL SYSTEM

### Fuel Tank

#### *Fuel Tap Inspection*

- Remove the fuel tap.
- Check the fuel tap filter screen [A] for any breaks or deterioration.
- ★ If the fuel tap screen have 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 [B].



#### *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.**

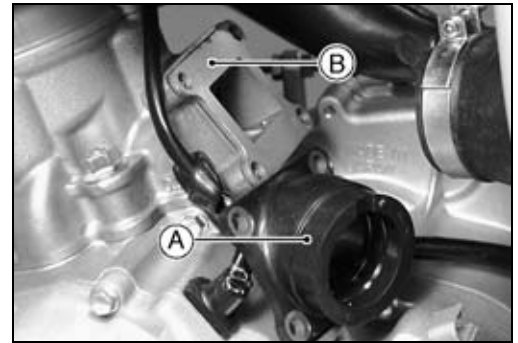
- Remove the fuel tank and drain it.
- Pour some high flash-point solvent into the fuel tank and shake the tank to remove dirt and fuel deposits.
- Pour the solvent out of the tank.
- Remove the fuel tap from the tank by taking out the bolts.
- Clean the fuel tap filter screen in a high flash-point solvent.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



## Reed Valve

### Reed Valve Removal

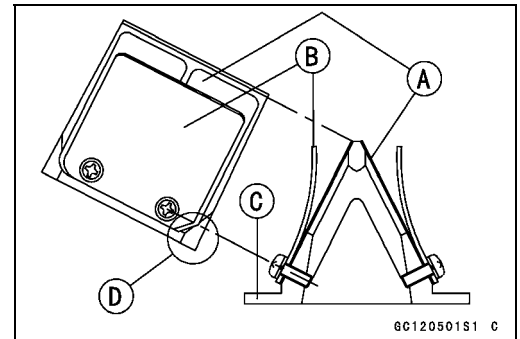
- Remove the carburetor holder mounting bolts and carburetor holder [A].
- Remove the reed valve [B] out of the cylinder.



### Reed Valve Installation

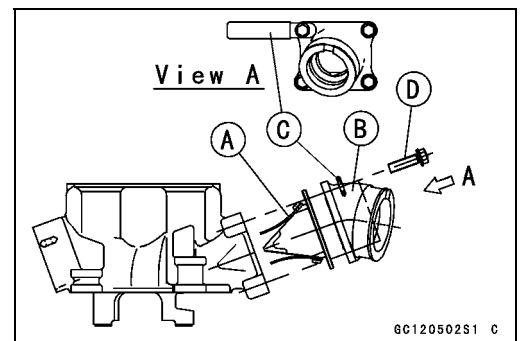
- When the reed or stop are replaced, install the reed [A] and stop [B] onto the reed valve holder [C], aligning the chamfered corner [D] of the reed with that of the reed stop.

**Torque - Reed Valve Screws: 9.8 N·m (1 kgf·m, 87 in·lb)**



- Install the reed valve [A] and carburetor holder [B].
- Be sure the clamp [C] is in horizontal and torque the carburetor holder mounting bolts [D].

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

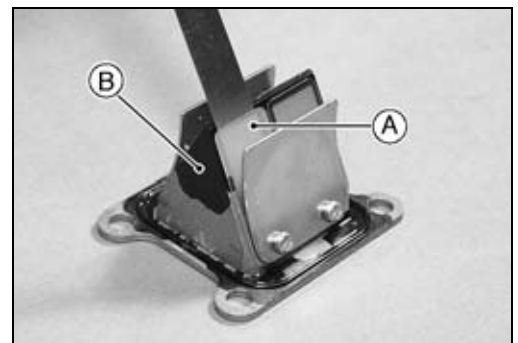


### Reed Valve Inspection

- Inspect the reeds for cracks, folds, or other visible damage.
- ★ If there is any doubt as to the condition of a reed, replace the reed valve 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: 0.5 mm**

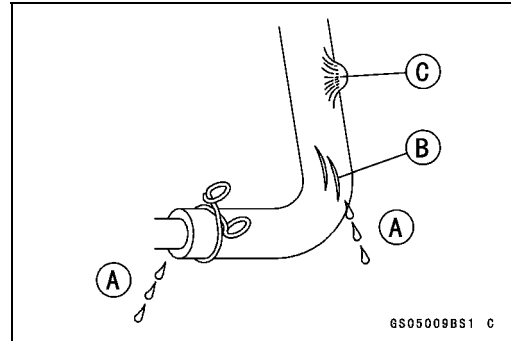


## 2-20 FUEL SYSTEM

### Fuel Hose

#### *Fuel Hoses and Connections Check*

- 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.



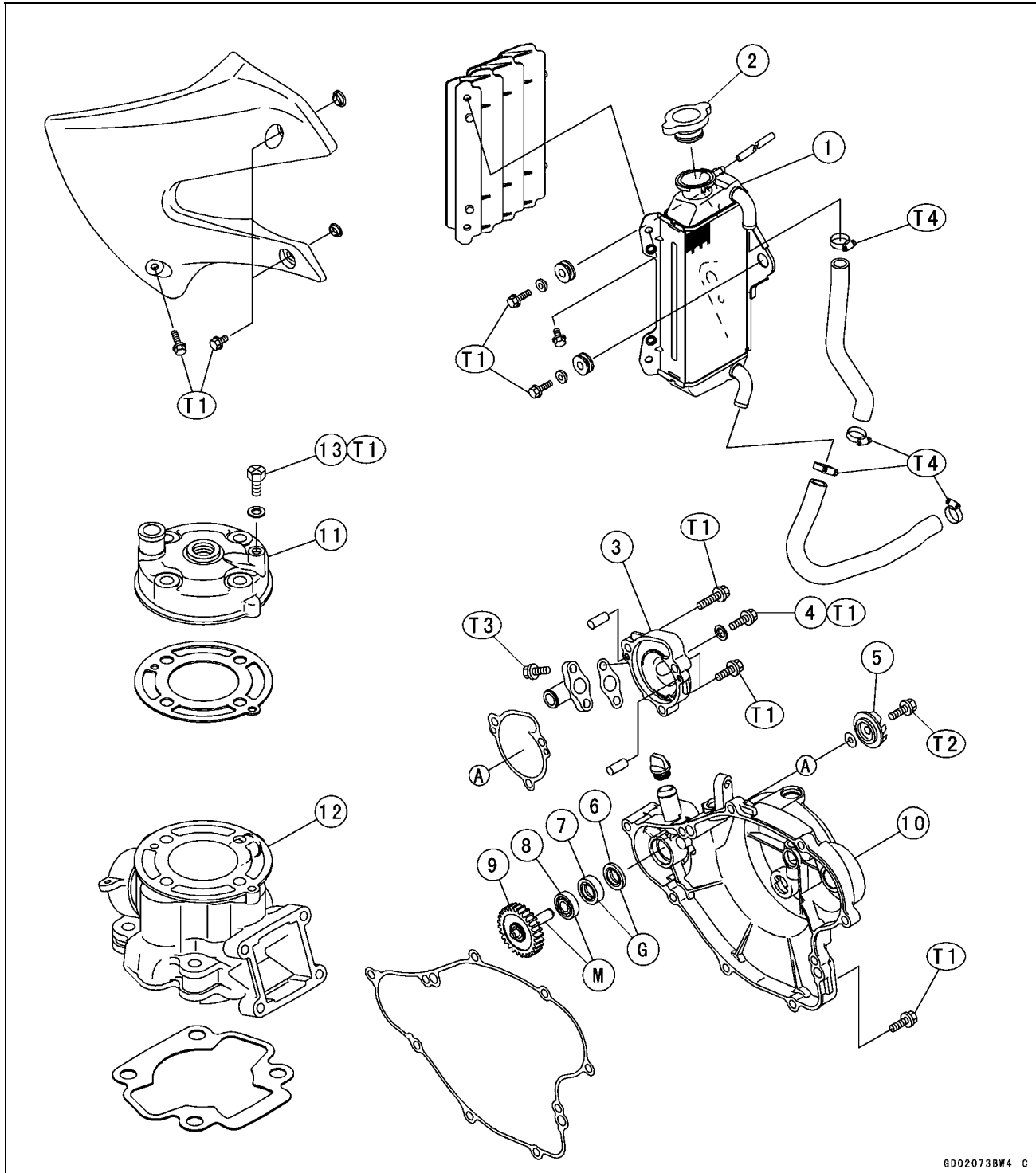
# Cooling System

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# 3-2 COOLING SYSTEM

## Exploded View



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- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>1. Radiator</li> <li>2. Radiator Cap</li> <li>3. Water Pump Cover</li> <li>4. Drain Plug</li> <li>5. Impeller</li> <li>6. Oil Seal (Short)</li> <li>7. Oil Seal (Long)</li> <li>8. Bearing</li> <li>9. Water Pump Gear</li> <li>10. Right Engine Cover</li> </ul> | <ul style="list-style-type: none"> <li>11. Cylinder Head</li> <li>12. Cylinder</li> <li>13. Air Bleeder Bolt</li> </ul> <p>T1: 8.8 N·m (0.90 kgf·m, 78 in·lb)<br/> T2: 8.3 N·m (0.85 kgf·m, 73 in·lb)<br/> T3: 5.9 N·m (0.60 kgf·m, 52 in·lb)<br/> T4: 1.5 N·m (0.15 kgf·m, 13 in·lb)</p> <p>G: Apply grease.<br/> M: Apply molybdenum disulfide grease.</p> |
|--|--|

**Specifications**

| <b>Item</b>  | <b>Standard</b>   |
|--|---|
| <b>Coolant</b><br>Type<br>Color<br>Mixed ratio<br>Total amount | Permanent type antifreeze for aluminum engines and radiators<br>Green<br>Soft water 50%, coolant 50%<br>0.4 L |
| <b>Radiator</b><br>Cap relief pressure                         | 108 ~ 137 kPa (1.1 ~ 1.4 kgf/cm <sup>2</sup> , 16 ~ 20 psi)   |

**Special Tools - Bearing Driver Set: 57001-1129**  
**Outside Circlip Pliers: 57001-144**

## 3-4 COOLING SYSTEM

### 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*

##### **NOTE**

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

- Situate the motorcycle so that it is perpendicular to the ground.
- Remove the radiator cap [A].

##### **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.

- Check the coolant level. The coolant level [A] should be at the bottom of the filler neck [B].
- ★ If the coolant level is low, add coolant through the filler opening to the bottom of the filler neck. Install the cap.

##### **Recommended Coolant:**

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

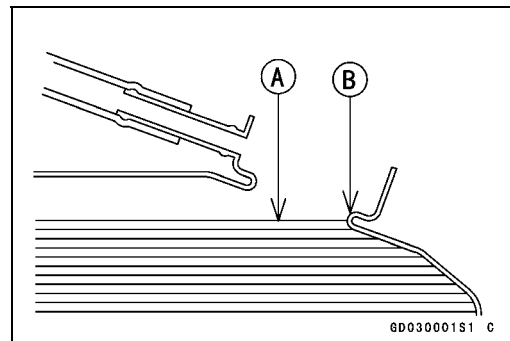
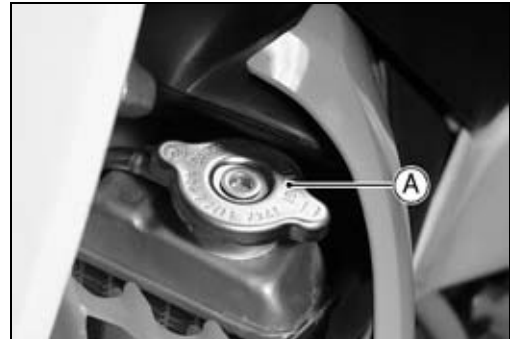
##### **Water and Coolant Mixture Ratio:**

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

**Total amount: 0.4 L**

#### *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.



## Coolant

### Coolant Draining

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

#### **⚠ WARNING**

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

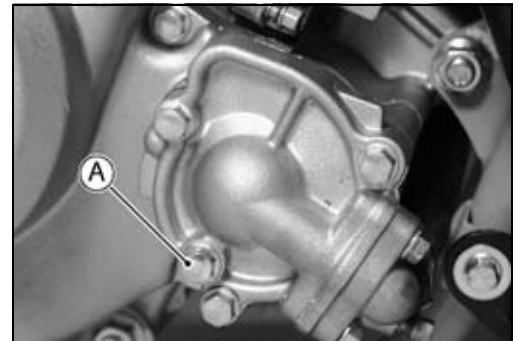
Coolant on tires will make them slippery and can cause an accident and injury. Immediately wipe up or wash away any coolant that spills on the frame, engine or other painted parts. Since coolant is harmful to the human body, do not use for drinking.

- Remove the radiator cap.

#### **NOTE**

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

- Place a container under the coolant drain plug [A], and drain the coolant from the radiator and engine by removing the drain plug on the water pump cover. Immediately wipe or wash out any coolant that spills on the frame, engine, or wheel.
- Inspect the old 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. 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.

#### 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:   | 0.4 L   |

## 3-6 COOLING SYSTEM

### Coolant

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

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

- Fill the radiator up to the bottom of the radiator filler neck [B] with coolant [A], and install the cap, turning it clockwise about 1/4 turn.

#### NOTE

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

- Check the cooling system for leaks.

#### Air Bleeding

- Bleed the air from the cooling system as follows.
- Loosen the air bleeder bolt [A] on the cylinder head 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.

**Torque - Air Bleeder Bolt: 8.8 N·m (0.90 kgf·m, 78 in·lb)**

- 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.

#### Cooling System Pressure Testing

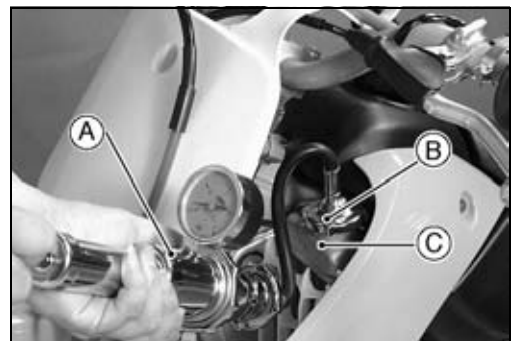
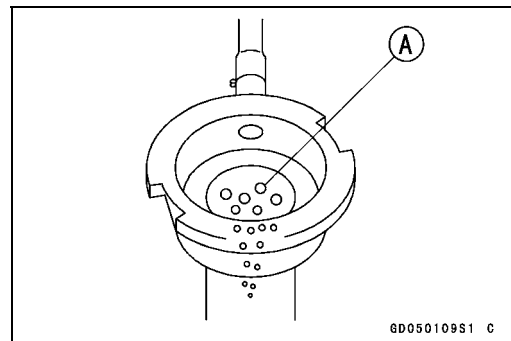
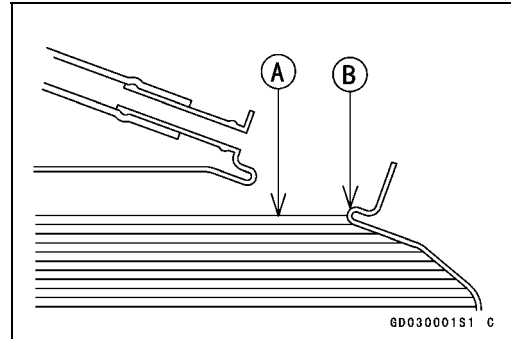
##### CAUTION

**During pressure testing, do not exceed the pressure for which the system is designed to work. The maximum pressure is 123 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.





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## Coolant

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- Build up pressure in the system carefully until the pressure reaches 123 kPa (1.25 kgf/cm<sup>2</sup>, 18 psi).
- Watch the gauge for at least 6 seconds. If the pressure holds steady, the 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.
- Fill the cooling system with fresh water mixed with a flushing compound.

| CAUTION   |
|---|
| <b>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.</b> |

- 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 Air Bleeding).

## **3-8 COOLING SYSTEM**

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### **Disassembly and Assembly Precautions**

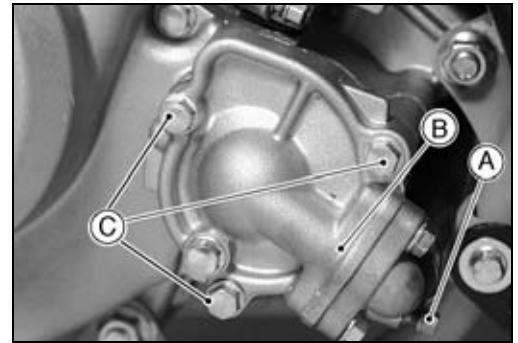
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- Prior to disassembly of cooling system parts (radiator, pump, etc), wait until the coolant cools down, and then drain the coolant.
- After assembling and filling the system with coolant, bleed any air from the system.

## Water Pump

### *Water Pump Cover Removal*

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



### *Water Pump Cover Installation*

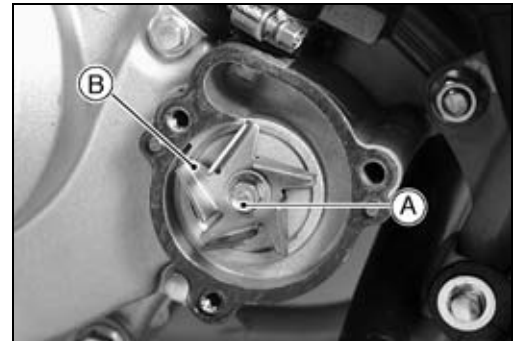
- Replace the pump cover gasket with a new one.
- Tighten the water pump cover bolts and clamps.

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

- Fill the cooling system (see Coolant Filling).
- Bleed the air from the cooling system.

### *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 water hoses attached.
- Remove the water pump impeller bolt [A], and take out the impeller [B] and washer.



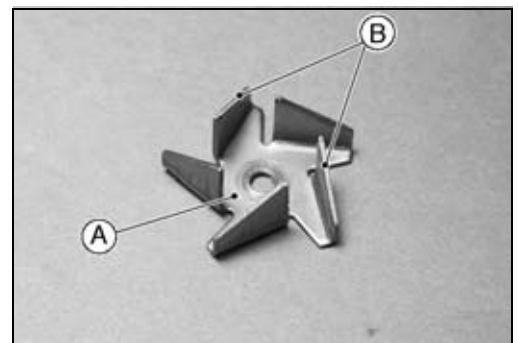
### *Impeller Installation*

- Tighten the water pump impeller bolt.

**Torque - Water Pump Impeller Bolt: 8.3 N·m (0.85 kgf·m, 73 in·lb)**

### *Impeller Inspection*

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



## 3-10 COOLING SYSTEM

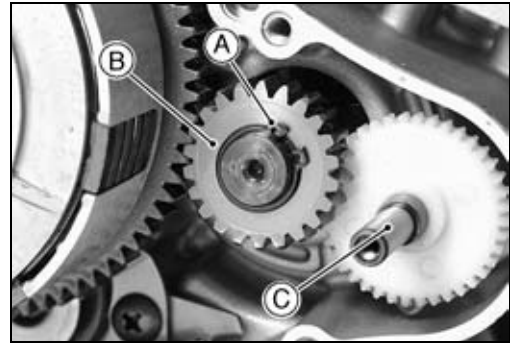
### Water Pump

#### Water Pump Shaft Removal

- Remove:
  - Right Engine Cover (see Engine Right Side chapter)
- Remove the circlip [A], and pull off the primary gear [B].  
**Special Tool - Outside Circlip Pliers: 57001-144**

#### KX65A6F ~:

- Remove the primary gear [B] (see Engine Right Side chapter).
- Pull out the water pump shaft [C] toward inside of the right engine cover.



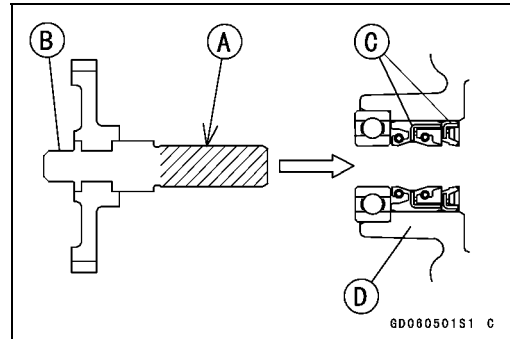
#### Water Pump Shaft Installation

- To prevent the oil seal lips from peeling, apply a molybdenum disulfide grease [A] to the water pump shaft [B] and insert it into the oil seals [C] from the inside of the right engine cover [D].

#### CAUTION

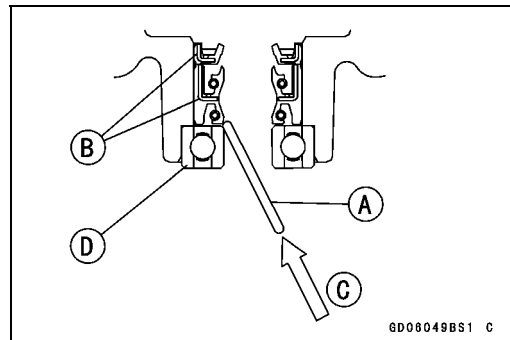
**Be sure to apply a molybdenum disulfide grease to the water pump shaft when installing. If it is installed dry, the seals may wear excessively.**

- Replace the circlip for the primary gear with a new one.  
**Special Tool - Outside Circlip Pliers: 57001-144**
- Instal the impeller and check to see that the impeller turn freely.



#### Oil Seal Removal

- Remove:
  - Impeller (see this chapter)
  - Right Engine Cover (see Engine Right Side chapter)
- To remove the oil seals. Insert a metal rod into the right engine cover from the opposite side of the impeller, and tap evenly around the bottom of the seal.
  - [A] Metal Rod
  - [B] Oil Seals
  - [C] Tap
  - [D] Ball Bearing



#### Oil Seal Installation

#### CAUTION

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

- Be sure to replace the oil seals.

## Water Pump

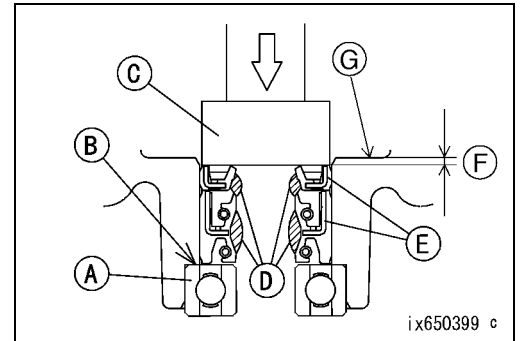
- Press the ball bearing [A] into the hole until the bearing is bottomed against the step [B].

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

- Apply plenty of high temperature grease to the oil seal lips [D].
- Set the oil seal (thick) so that dual lips side face outward and set the oil seal (thin) so that a lip faces outward as shown.
- Press the oil seals [E] into the hole until the oil seal is bottomed against the ball bearing or the seal.

**Special Tools - Bearing Driver Set: 57001-1129 [C]**

- The end of the oil seal must be  $0.5 \pm 0.2$  mm [F] lower than the end of the right engine cover end [G].
- Be sure the inner race of the ball bearing [A] turns smoothly.

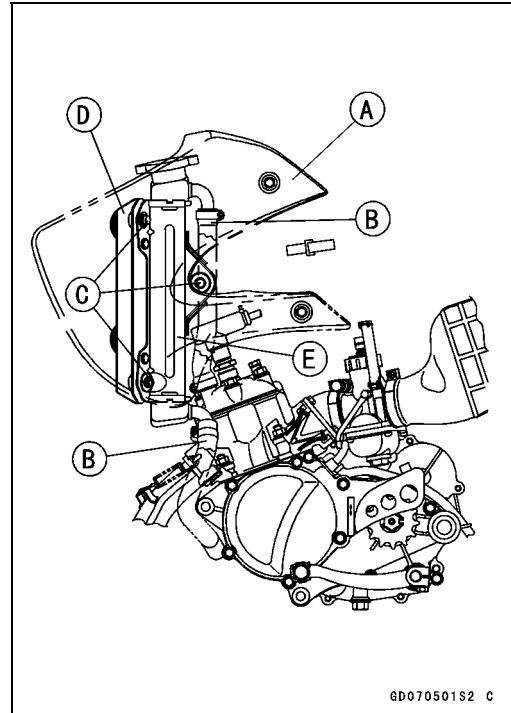


## 3-12 COOLING SYSTEM

### Radiator

#### Radiator Removal

- Drain the coolant (see Coolant Draining).
- Remove:
  - Left Shroud [A]
  - Water Hose [B]
  - Radiator Mounting Bolts [C]
  - Radiator Screen [D]
  - Breather Hose
  - Radiator [E]



#### Radiator Installation

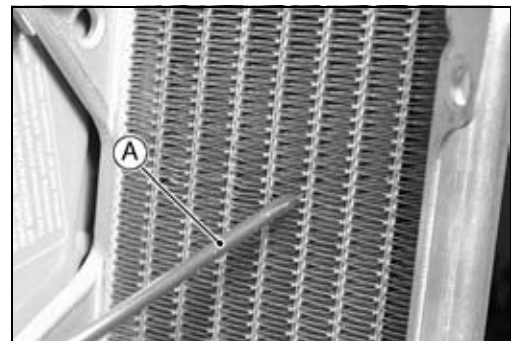
- Radiator installation is the reverse of removal.
- Route the water and breather hoses correctly.
  - Torque - Radiator Mounting Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)**
  - Shroud Mounting Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)**

#### 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

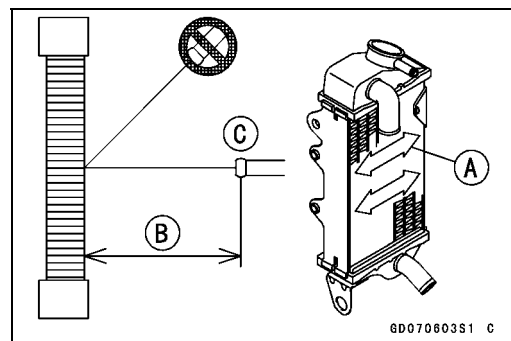
**Do not tear the radiator tubes while straightening the fins.**



- ★ 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.

#### CAUTION

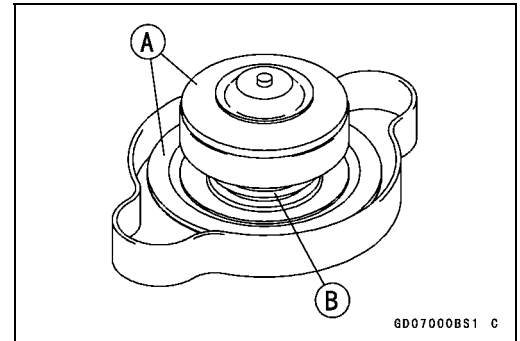
**When cleaning the radiator with a steam cleaner, be careful of the following to prevent radiator damage. Keep the steam gun [C] away more than 0.5 m [B] from the radiator core. Hold the steam gun perpendicular to the core surface. Run the steam gun following the core fin direction [A].**



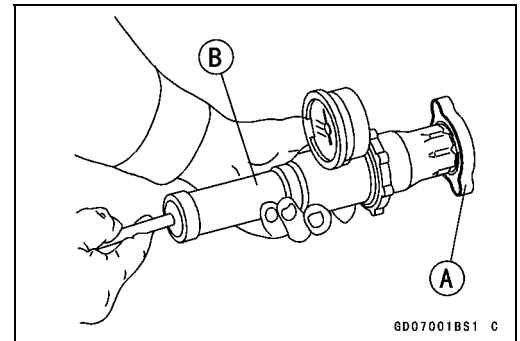
## Radiator

### 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, slowly pump the pressure tester to build up the pressure. The gauge hand must remain within the relief pressure range in the table below at least 6 seconds. Continue to pump the tester until the relief valve opens, indicated by the gauge hand flicking downward. The relief valve must open within the specified range.



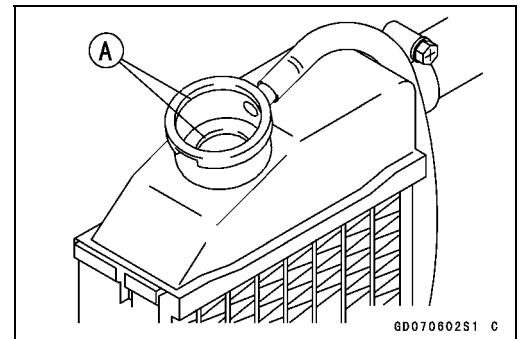
### Radiator Cap Relief Pressure:

**Standard:** 108 ~ 137 kPa (1.1 ~ 1.4 kgf/cm<sup>2</sup>, 16 ~ 20 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, Breather Hose Inspection

- In accordance with the Periodic Maintenance Chart, visually inspect the hoses [A] 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 General Information chapter). Avoid sharp bending, kinking, flattening, or twisting.
- Tighten the hose clamps securely.





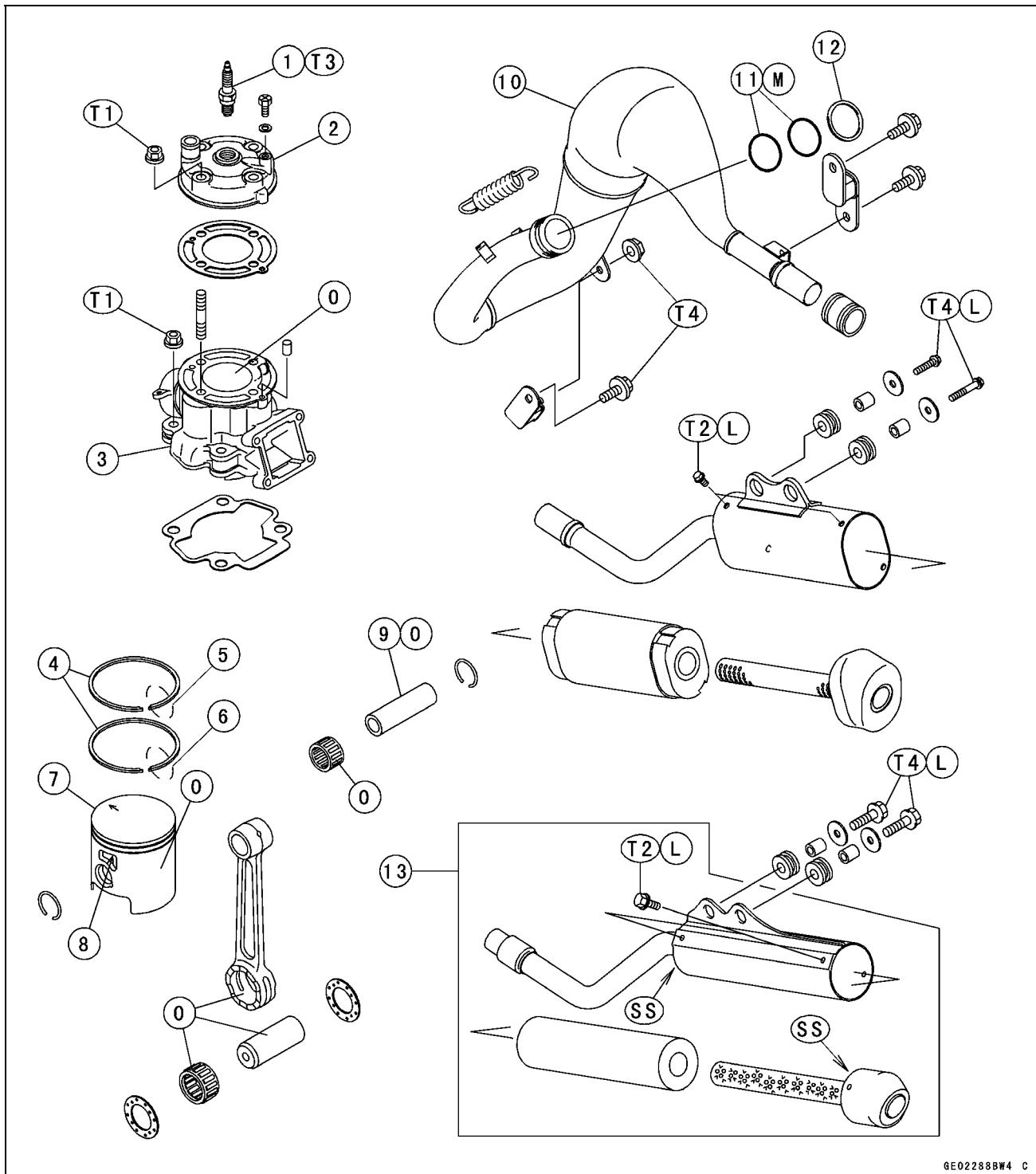
# Engine Top End

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# 4-2 ENGINE TOP END

## Exploded View



GE02288BW4 C

- 1. Spark Plug
- 2. Cylinder Head
- 3. Cylinder
- 4. Piston Ring
- 5. "1N" Mark
- 6. "2N" Mark
- 7. Piston
- 8. "IN" Mark
- 9. Piston Pin
- 10. Expansion Chamber
- 11. Rubber Seal

- 12. Gasket
- 13. Muffler Body (KX65-A1 ~ A2)
- T1: 25 N·m (2.5 kgf·m, 18 ft·lb)
- T2: 5.9 N·m (0.60 kgf·m, 52 in·lb)
- T3: 26 N·m (2.6 kgf·m, 19 ft·lb)
- T4: 8.8 N·m (0.90 kgf·m, 78 in·lb)
- L: Apply a non-permanent locking agent.
- M: Apply molybdenum disulfide grease.
- O: Apply 2-stroke engine oil.
- SS: Apply silicone sealant.

## Specifications

| Item  | Standard   | Service Limit |
|---|--|---------------|
| <b>Cylinder Head</b>  |  |               |
| Cylinder Compression  | (Usable range)<br>755 ~ 1 177 kPa (7.70 ~ 12.0 kgf/cm <sup>2</sup> ,<br>109 ~ 171 psi) | — — —         |
| Cylinder head warp  | — — —  | 0.03 mm       |
| <b>Cylinder, Piston</b>   |  |               |
| Cylinder Inside Diameter (15 mm below<br>from the Cylinder Top End) | 44.500 ~ 44.515 mm   | 44.64 mm      |
| Piston Diameter   | 44.453 ~ 44.468 mm   | 44.30 mm      |
| Piston/Cylinder Clearance   | 0.042 ~ 0.052 mm   | — — —         |
| Piston Ring/Groove Clearance (Top,<br>Second)                       | 0.02 ~ 0.06 mm   | 0.16 mm       |
| Piston Ring Groove Width (Top,<br>Second)                           | 1.01 ~ 1.03 mm   | 1.11 mm       |
| Piston Ring Thickness (Top, Second)                                 | 0.97 ~ 0.99 mm   | 0.90 mm       |
| Piston Ring End Gap (Top, Second)                                   | 0.15 ~ 0.35 mm   | 0.65 mm       |
| Piston Pin Diameter   | 11.995 ~ 12.000 mm   | 11.96 mm      |
| Piston Pin Hole Diameter  | 12.001 ~ 12.011 mm   | 12.08 mm      |
| Small End Inside Diameter   | 16.002 ~ 16.013 mm   | 16.05 mm      |

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

## 4-4 ENGINE TOP END

### Cylinder Head

#### *Cylinder Compression Measurement*

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

#### **NOTE**

○ Use a compression gauge commercially available. It's impossible to install as the frame will interfere with the operation if using KAWASAKI special tools (PN: 57001-221 & 57001-1159).

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

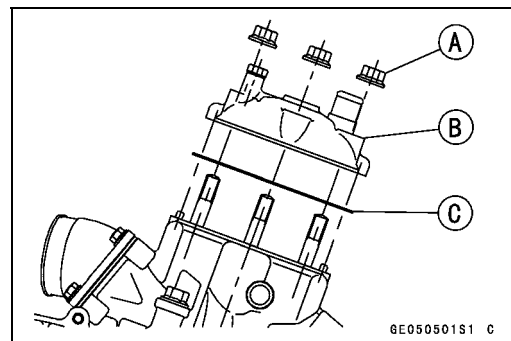
#### **Cylinder Compression**

**Usable Range:**      **755 ~ 1 177 kPa (7.70 ~ 12.0**  
                                 **kgf/cm<sup>2</sup>, 109 ~ 171 psi)**

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

#### *Cylinder Head Removal*

- Drain the coolant (see Cooling System chapter).
- Remove:
  - Shrouds
  - Side Covers
  - Fuel Tank (see Fuel System chapter)
  - Cooling Hose at Cylinder Head
  - Spark Plug
- Remove the cylinder head nuts [A], and take off the cylinder head [B] and gasket [C].



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## Cylinder Head

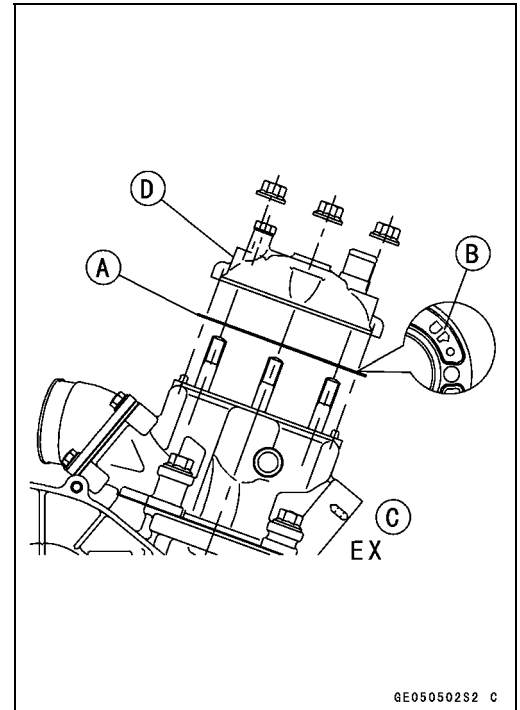
### Cylinder Head Installation

- Replace the head gasket with a new one.
- Scrape out any carbon and clean the head with a high flash-point solvent.
- Check for a crust of minerals and rust in the head water jacket, and remove them if necessary.
- Install a new cylinder head gasket [A] so that its "UP" mark [B] faces toward exhaust side [C] and can be read as "UP".
- Install the cylinder head [D], noting its direction as shown.
- Tighten the head nuts diagonally.

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

- Tighten the spark plug.

**Torque - Spark plug: 26 N·m (2.6 kgf·m, 19 ft·lb)**

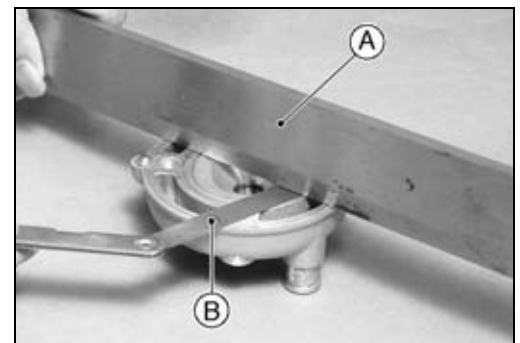


### Cylinder Head Warp Inspection

- 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

**Standard: 0.03 mm**

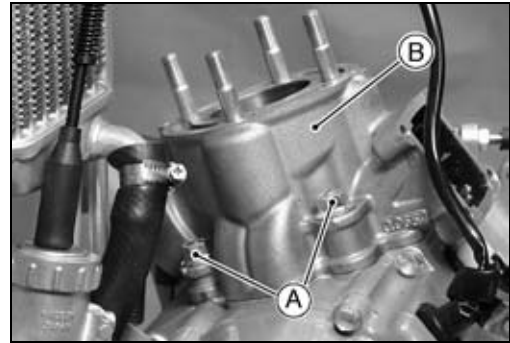


## 4-6 ENGINE TOP END

### Cylinder

#### Cylinder Removal

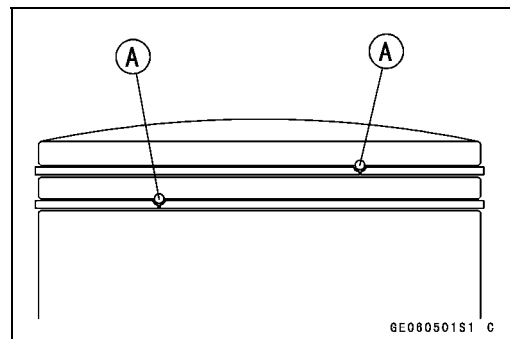
- Drain the coolant (see Cooling System chapter).
- Remove:
  - Cylinder Head (see this chapter)
  - Carburetor (see Fuel System chapter)
  - Water Hose Upper End
  - Clutch Cable Lower End
  - Muffler Holding Springs
- Remove the cylinder nuts [A].
- Lift off the cylinder [B], and remove the cylinder 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.
- Tighten the cylinder nuts diagonally.

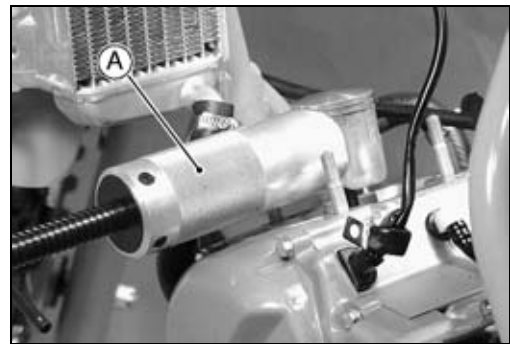
**Torque - Cylinder Nuts: 25 N·m (2.5 kgf·m, 18 ft·lb)**



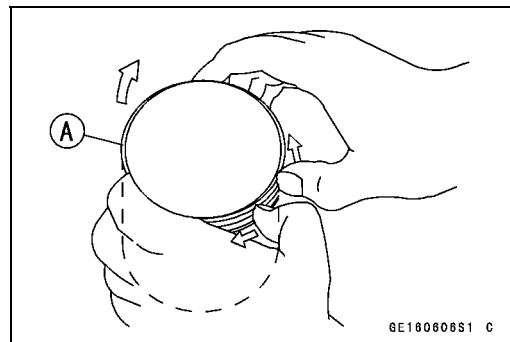
#### Piston Removal

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

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



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



## Cylinder

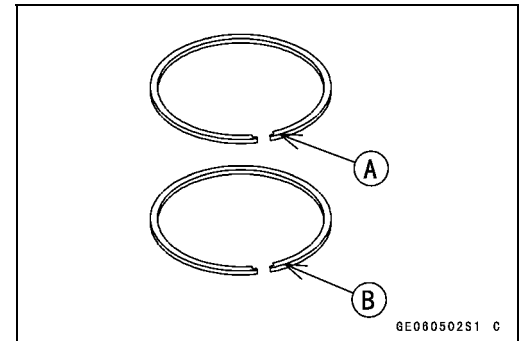
### Piston Installation

- 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.

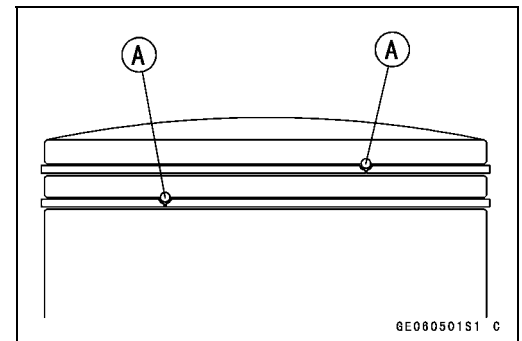
#### CAUTION

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

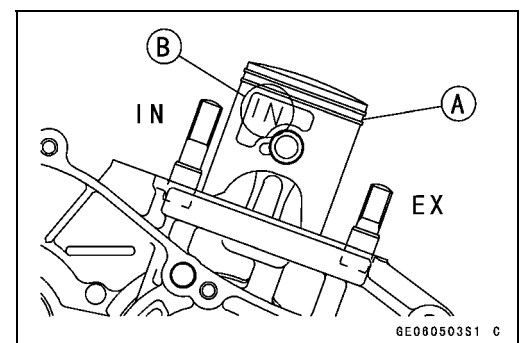
- When installing the piston ring on the piston, note the following:
  - First fit one end of the piston ring against the pin in the ring groove, spread the ring opening with the other hand and then slip the ring into the groove.
  - The top ring have a "1N" mark [A] on its upper surface.
  - The second ring have a "2N" mark [B] on its upper surface.



- 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 [A] so that the "IN" marked side [B] faces the back (intake) side of the engine.

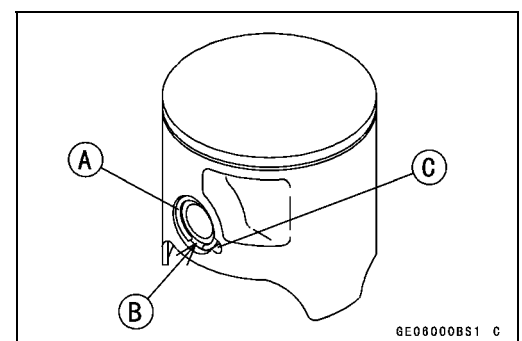


- When installing a piston pin snap ring [A], compress it only enough to install it and no more.

#### CAUTION

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

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



## 4-8 ENGINE TOP END

### Cylinder

#### Cylinder Wear Inspection

##### NOTE

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

- Visually 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 ELECTRO FUSION cylinder cannot be bored or honed.

##### Cylinder Inside Diameter

**Standard:** 44.500 ~ 44.515 mm, and less than 0.01 mm difference between any two measurements.

**Service Limit:** 44.64 mm, or more than 0.05 mm difference between any two measurements.

**[A]:** 15 mm

#### Piston Diameter Measurement

- Measure the outside diameter [B] of the piston 6.0 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:** 44.453 ~ 44.468 mm

**Service Limit:** 44.30 mm

**[A]:** 6.0 mm

#### Piston/Cylinder Clearance Inspection

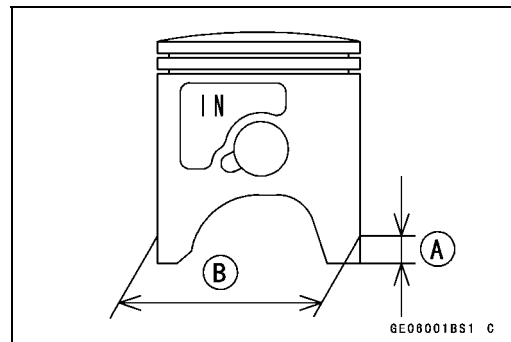
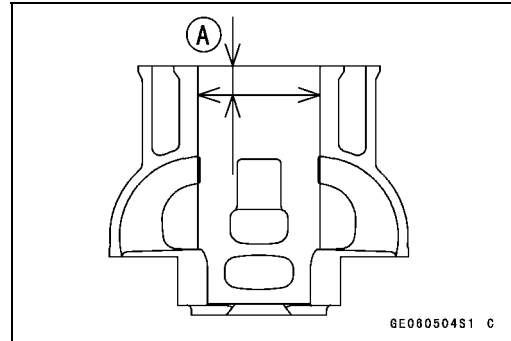
The piston-to-cylinder clearance is measured whenever a piston or cylinder is replaced with a new one. The standard piston-to-cylinder clearance must be adhered to whenever the cylinder is replaced.

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.

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

##### Piston/Cylinder Clearance

**Standard:** 0.042 ~ 0.052 mm





## Cylinder

### *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 (Top, Second)**

**Standard:** 0.02 ~ 0.06 mm

**Service Limit:** 0.16 mm

#### **Piston Ring Thickness (Top, Second)**

**Standard:** 0.97 ~ 0.99 mm

**Service Limit:** 0.90 mm

#### **Piston Ring Groove Width (Top, Second)**

**Standard:** 1.01 ~ 1.03 mm

**Service Limit:** 1.11 mm

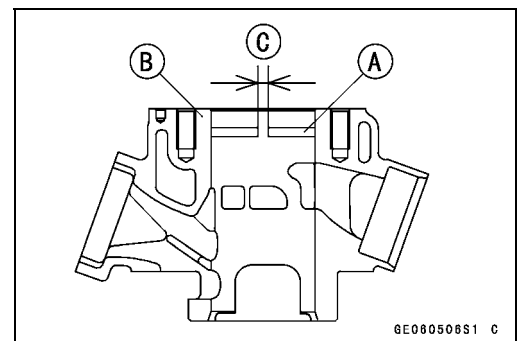
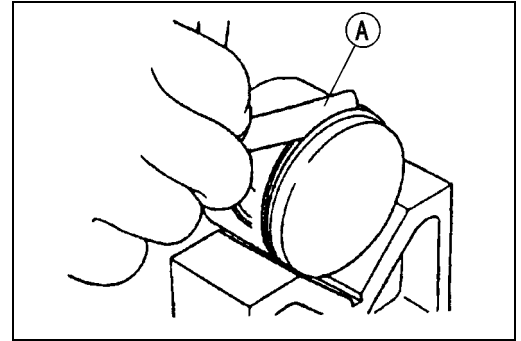
### *Piston Ring End Gap Inspection*

- 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 [C] between the ends of the ring with a thickness gauge.
- ★ If the gap is wider than the service limit, the ring is over-worn and must be replaced.

#### **Piston Ring End Gap (Top, Second)**

**Standard:** 0.15 ~ 0.35 mm

**Service Limit:** 0.65 mm



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## 4-10 ENGINE TOP END

### Cylinder

#### *Piston, Piston Pin, 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 [B] 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 of piston pin holes [C] 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 connecting rod small end inside diameter exceeds the service limit, replace the crankshaft assembly.
  - Check the needle bearing [D].
  - 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.
- ★ If there is any doubt as to the condition of a needle bearing, replace the bearing and piston pin.

#### **Piston Pin Diameter**

**Standard:** 11.995 ~ 12.000 mm

**Service Limit:** 11.96 mm

#### **Piston Pin Hole Diameter**

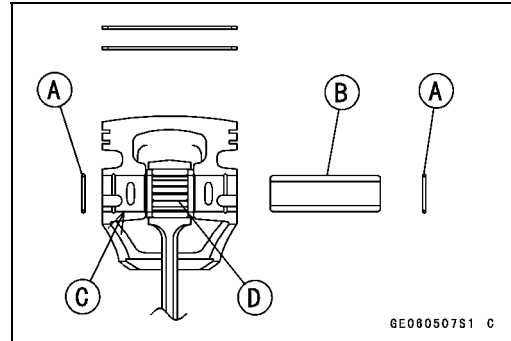
**Standard:** 12.001 ~ 12.011 mm

**Service Limit:** 12.08 mm

#### **Small End Inside Diameter**

**Standard:** 16.002 ~ 16.013 mm

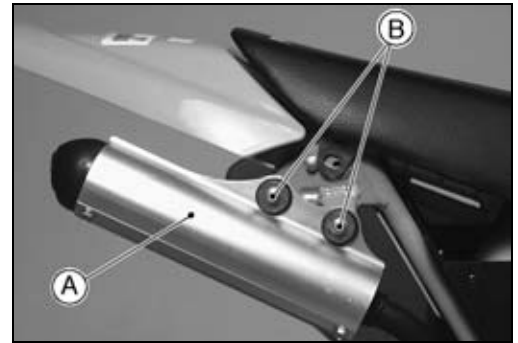
**Service Limit:** 16.05 mm



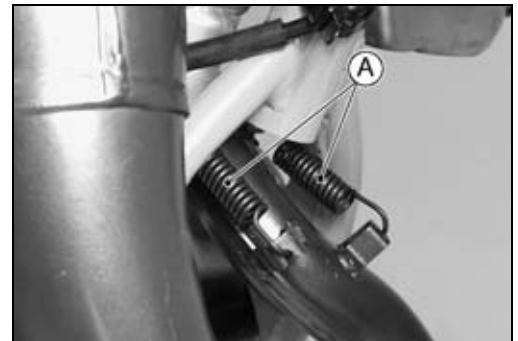
## Muffler (Expansion Chamber)

### Muffler Removal

- Remove:
  - Right Shroud
  - Right Side Cover
- Remove the muffler mounting bolts [B] and pull the muffler [A] off toward the rear.



- Remove the springs [A] holding the exhaust pipe holding



- Remove the expansion chamber damper mounting bolts [A], and pull off the expansion chamber to the forward.
- Remove the exhaust gasket.

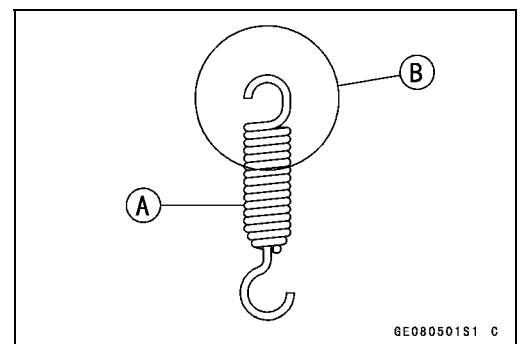


### Muffler Installation

- Scrape any carbon out of the expansion chamber.
- Check the exhaust O-rings for signs of damage.
- ★ If necessary, replace them with new ones.
- Install the springs [A] holding the exhaust pipe so that their fixed hooks [B] face the cylinder.

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

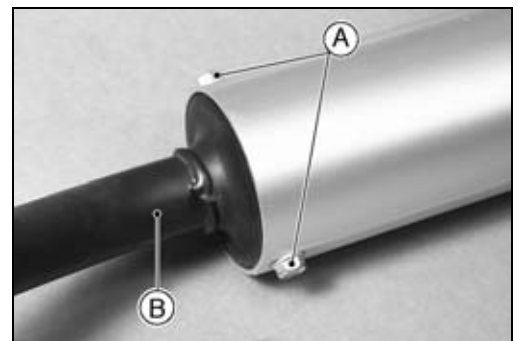
**Expansion Chamber Damper Mounting Bolt, Nut: 8.8 N·m (0.90 kgf·m, 78 in·lb)**



### Muffler Baffle Replacement

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

- Remove the muffler pipe bolts [A], and pull the muffler pipe [B] from the muffler body.
- Remove the muffler.



## 4-12 ENGINE TOP END

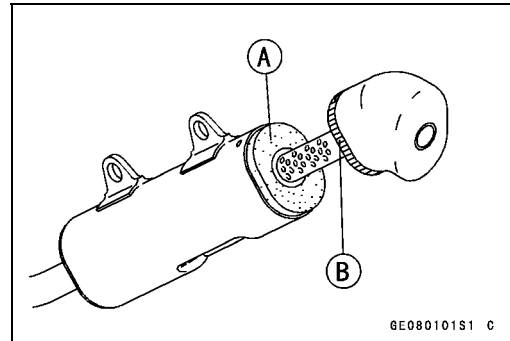
### Muffler (Expansion Chamber)

- Unscrew the inner pipe mounting bolts [A].
- Pull the inner pipe [B] from the muffler body.



- Pull off the old muffler baffle, and install the new muffler baffle [A] into the muffler body.
- Apply silicone sealant to the circumference [B] of the inner pipe.
- Apply a non-permanent locking agent to the inner pipe mounting bolts.
- Install the muffler.

**Torque - Inner Pipe Mounting Bolts: 5.9 N·m (0.6 kgf·m, 52 in·lb)**



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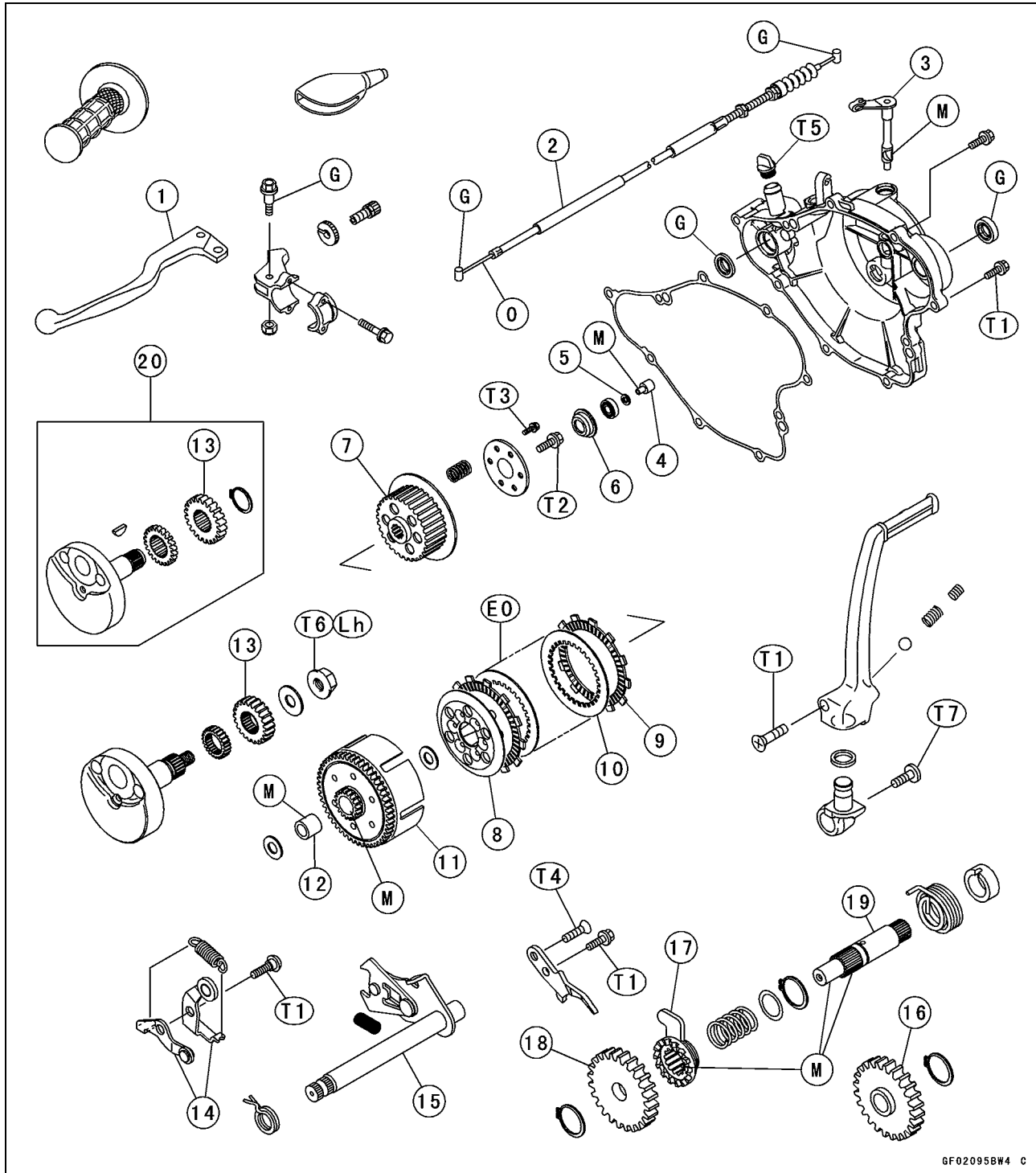
# Engine Right Side

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# 5-2 ENGINE RIGHT SIDE

## Exploded View



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**Exploded View**

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1. Clutch Lever
2. Clutch Cable
3. Release Lever Shaft
4. Clutch Pusher
5. Shim(s)
6. Spring Plate Pusher
7. Clutch Hub
8. Clutch Wheel
9. Friction Plate
10. Steel Plate
11. Clutch Housing
12. Sleeve
13. Primary Gear
14. Gear Set Levers
15. Shift Shaft
16. Kickstarter Idle Gear
17. Ratchet Gear
18. Kick Gear
19. Kick Shaft
20. KX65-A1 ~ A6

T1: 8.8 N·m (0.90 kgf·m, 78 in·lb)

T2: 64 N·m (6.5 kgf·m, 47 ft·lb)

T3: 9.3 N·m (0.95 kgf·m, 82 in·lb)

T4: 5.2 N·m (0.53 kgf·m, 46 in·lb)

T5: 1.5 N·m (0.15 kgf·m, 13 in·lb)

T6: 49 N·m (5.0 kgf·m, 36 ft·lb)

T7: 12 N·m (1.2 kgf·m, 104 in·lb)

EO: Apply Engine oil.

G: Apply high temperature grease.

Lh: Left-hand Threads

M: Apply molybdenum disulfide grease.

O: Apply oil.

## 5-4 ENGINE RIGHT SIDE

### Specifications

| Item                                    | Standard              | Service Limit |
|---|-----------------------|---------------|
| <b>Clutch</b>                           |                       |               |
| Lever Free Play                         | 2 ~ 3 mm              | — — —         |
| Friction Plate Thickness                | 3.1 ~ 3.3 mm          | 2.9 mm        |
| Steel Plate Thickness                   | 1.47 ~ 1.73 mm        | 1.37 mm       |
| Friction Plate Warp                     | Not more than 0.2 mm  | 0.3 mm        |
| Steel Plate Warp                        | Not more than 0.15 mm | 0.3 mm        |
| Clutch Spring Free Length               | 28.1 mm               | 26.7 mm       |
| Friction Plate/Clutch Housing Clearance | 0.3 ~ 0.6 mm          | 0.9 mm        |

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

**Outside Circlip Pliers: 57001-144**



## Clutch Cable

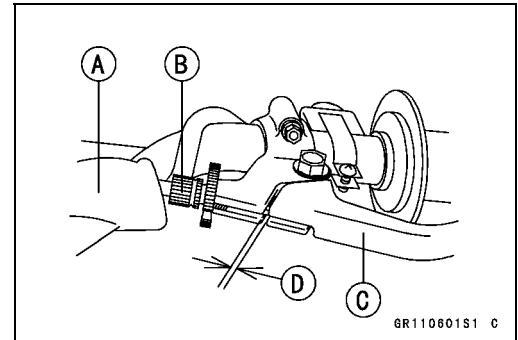
Due to friction plate wear and clutch cable stretch over a long period of use, the clutch must be adjusted in accordance with the Periodic Maintenance Chart.

### **⚠ WARNING**

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

### *Clutch Lever 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 it does not, adjust the lever play.

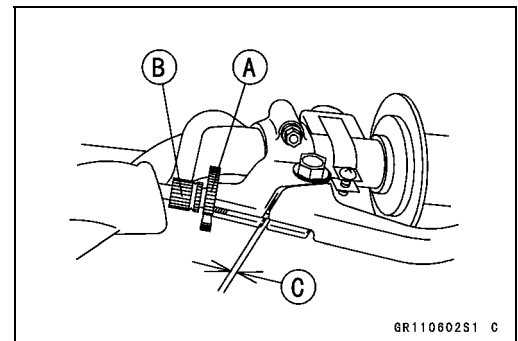


### *Free Play Adjustment*

- 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 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.

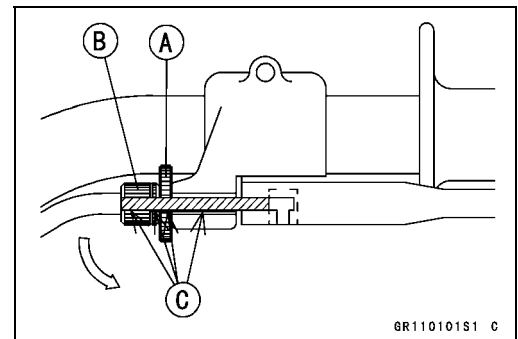


- Tighten the locknut.
- If it cannot be done, loosen the adjusting nuts [A] at the bottom of the clutch cable, and turn the nuts so that clutch lever has 2 ~ 3 mm of play.
- After the adjustment is made, tighten the locknut, and start the engine and check that the clutch does not slip and that it release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



### *Clutch Cable Removal*

- Slide the dust cover out of place.
- Loosen the adjusting nuts at the lower of the cable, and turn the adjusting nuts 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.



## 5-6 ENGINE RIGHT SIDE

### Clutch Cable

- 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.**

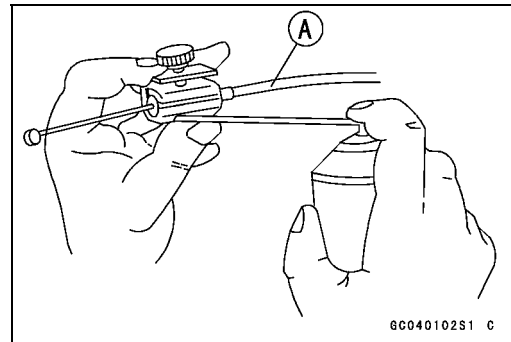
- Pull the clutch cable out of the frame.

#### *Clutch Cable Installation*

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

#### *Clutch Cable Lubrication and Inspection*

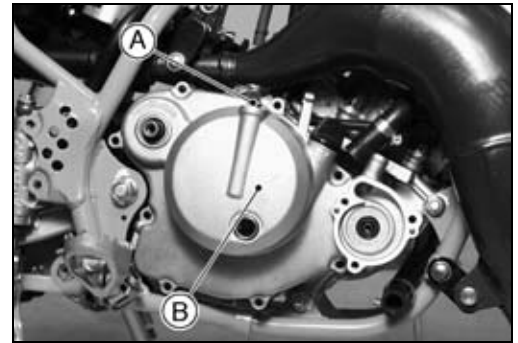
- Lubricate the clutch cable [A] using the pressure cable lubber in accordance with the Periodic Maintenance Chart.
- With the cable disconnected at both ends, the cable should move freely within the cable housing (see Appendix chapter).



## Right Engine Cover

### Right Engine Cover Removal

- Drain the engine oil (see Engine Oil Change in the Engine Bottom End/Transmission chapter).
- Drain the coolant (see Coolant Draining in the Cooling System chapter).
- Remove:
  - Water Hose Lower Ends
  - Kick Pedal
  - Clutch Cable Lower End (see this chapter)
  - Brake Pedal
  - Water Pump Impeller (see Cooling System chapter)
- Remove the right engine cover mounting bolts.
- Turn the clutch release lever [A] toward the rear and remove the right engine cover [B].



### Engine Right Cover Installation

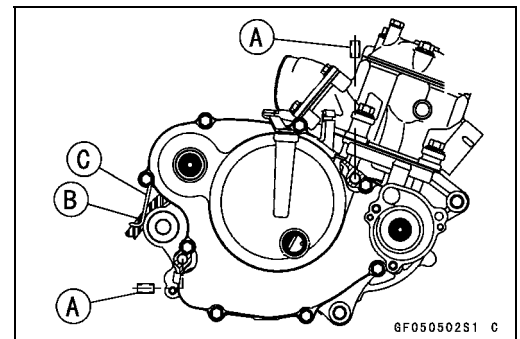
- Apply molybdenum disulfide grease [A] to the water pump shaft to prevent water pump seal damage.

#### CAUTION

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



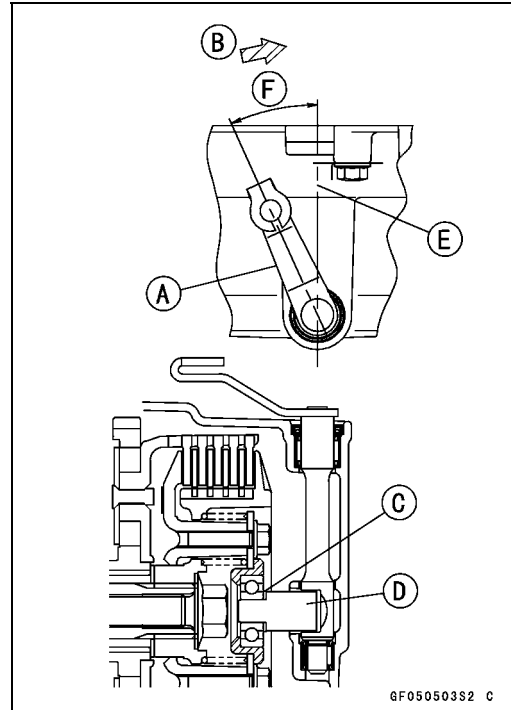
- There are two knock pins [A] on the mating surfaces of the crankcase and right engine cover .
- Run the breather hose [B] into the clamp [C] and position it with the right engine cover mounting bolt as shown.



## 5-8 ENGINE RIGHT SIDE

### Right Engine Cover

- When the release lever [A] is turned to the right [B] lightly, choose the amount of shims [C] on the clutch pusher [D] so that the included angle between the release lever [A] and the line [E] at the right angle to the right engine cover is approx. 24° [F].



- Stick the new right engine cover gasket in position with a thin layer of grease.
- Apply a high temperature grease kick shaft oil seal lips and kick shaft spline.
- Torque the right engine cover bolts and kick shaft mounting bolt.

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

**Kick Pedal Bolt: 12 N·m (1.2 kgf·m, 89 in·lb)**

- Run the clutch cable and the cooling hoses according to the Cable, Wire, and Hose Routing section in the General Information chapter.
- Adjust the clutch cable (see this chapter).
- Check the clutch release lever angle.
- Fill the crankcase with engine oil (see Engine Bottom End/Transmission chapter).
- Fill the engine with coolant (see Cooling System chapter).

#### CAUTION

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

- Refer to the cooling system chapter for water pump seal and water pump bearing removal.

## Right Engine Cover

### Right Engine Cover Disassembly

- Remove the right engine cover (see this chapter).
- Pull out the clutch release shaft [A].

#### CAUTION

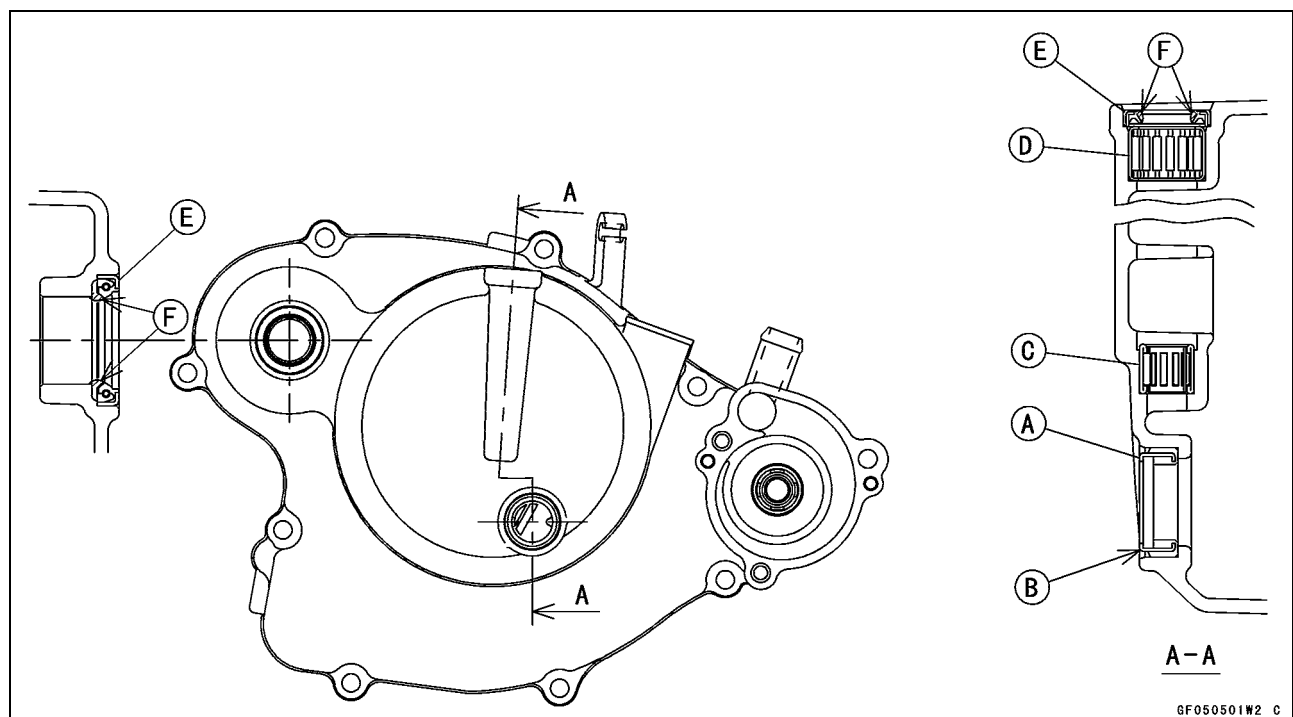
**Do not remove the clutch release shaft unless it is absolutely necessary. If removed, you must replace the oil seal with a new ones.**

- Refer to the cooling system chapter for water pump seal and water pump bearing removal.



### Right Engine Cover Assembly

- When the oil level gauge, needle bearings and oil seal were removed, note the following .
- Set the new oil level gauge [A] so that its metal portion [B] faces outward and press in the gauge until it is bottomed.
- Press the new lower needle bearing [C] until it is bottomed. As for the installation direction, both sides are available.
- Set the new upper needle bearing [D] with the marked side facing out and press bearing until it is bottomed.
- Press the new oil seals [E] until they are bottomed and apply a little high temperature grease [F] on the lips.



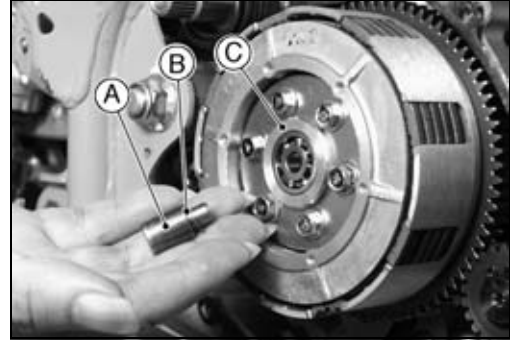
- Refer to the Cooling System chapter for water pump seal and water pump bearing installation.

## 5-10 ENGINE RIGHT SIDE

### Clutch

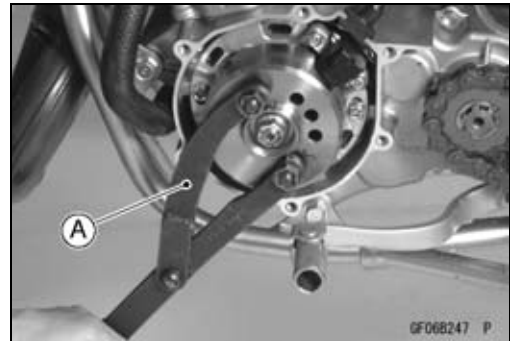
#### Clutch Removal

- Remove the right engine cover (see Right Engine Cover Removal).
- Remove the clutch pusher [A], shim [B] (as required) and spring plate pusher [C].

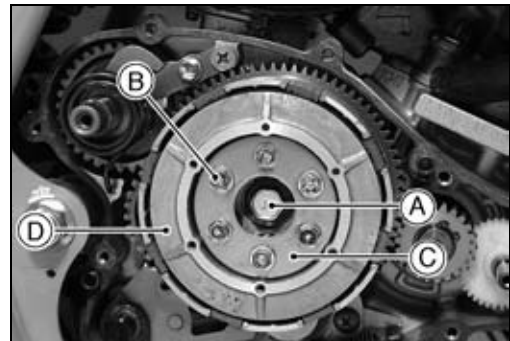


- Remove the magneto cover.
- Hold the magneto flywheel steady with flywheel & pulley holder [A].

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



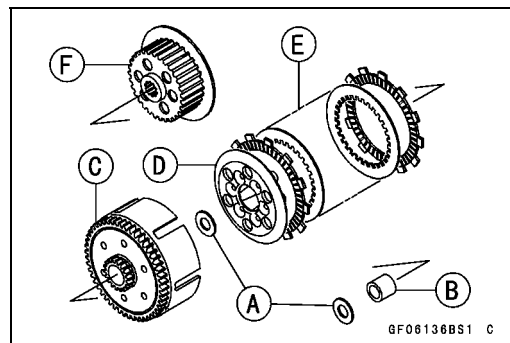
- Remove:
  - Clutch Hub Nut [A]
  - Clutch Spring Bolts [B]
  - Clutch Spring Holder [C]
  - Clutch Hub [D]



- Remove:
  - Friction Plates and Steel Plates
  - Clutch Wheel
  - Clutch Housing
  - Sleeve and Washers

#### Clutch Installation

- Apply molybdenum disulfide grease to the outside of the sleeve and clutch housing bearing hole.
- Install:
  - Thrust Washers [A]
  - Sleeve [B]
  - Clutch Housing [C]
  - Clutch Wheel [D]
  - Friction Plates and Steel Plates [E]
  - Clutch Hub [F]



**Clutch**

**CAUTION**

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

- Install the friction plates and steel plates, starting with a friction plate and alternating them, finishing with a friction plate.
- Install the hub nut and clutch spring bolts.

**Torque - Clutch Hub Bolt: 64 N·m (6.5 kgf·m, 47 ft·lb)**

**Clutch Spring Bolts: 9.3 N·m (0.95 kgf·m, 82 in·lb)**

- Apply molybdenum disulfide grease to the clutch spring plate pusher.
- Install:
  - Clutch Spring Plate Pusher
  - Shim (as required)
  - Clutch Pusher
  - Magneto Cover
  - Engine Right Side Cover

*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] and steel plates with vernier calipers.
- ★ If they have worn past the service limit, replace them with new ones.

**Friction Plate Thickness**

**Standard: 3.1 ~ 3.3 mm**

**Service Limit: 2.9 mm**

**Steel Plate Thickness**

**Standard: 1.47 ~ 1.73 mm**

**Service Limit: 1.37 mm**

*Friction and Steel Plate Warp Inspection*

- Place each friction plate or steel plate on a surface plate, and measure the gap between the surface plate [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:**

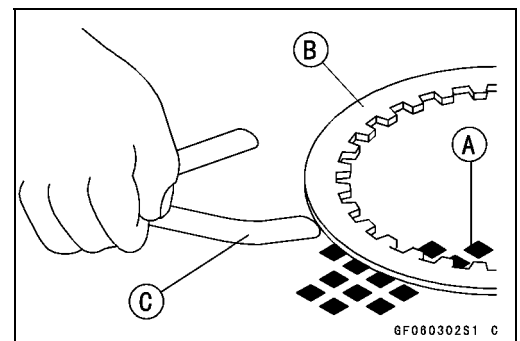
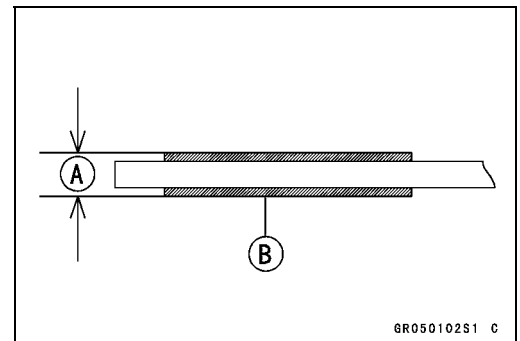
**Friction Plate Not more than 0.2 mm**

**Steel Plate Not more than 0.15 mm**

**Service Limit:**

**Friction Plate 0.3 mm**

**Steel Plate 0.3 mm**



## 5-12 ENGINE RIGHT SIDE

### Clutch

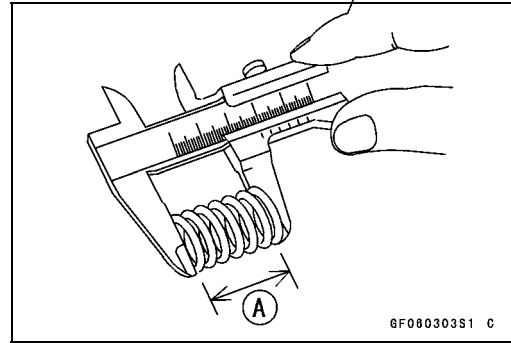
#### *Spring Free Length Measurement*

- 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: 28.1 mm**

**Service Limit: 26.7 mm**



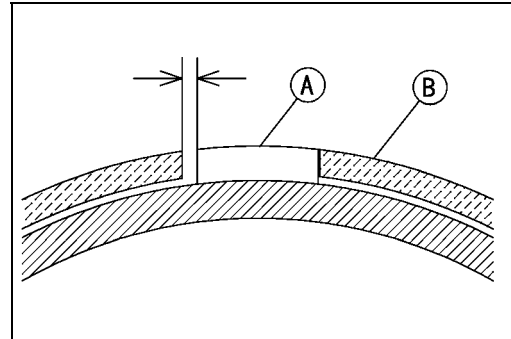
#### *Friction Plate/Clutch Housing Clearance Inspection*

- Measure the clearance between the tongues [A] on the friction plate and the fingers [B] of the clutch housing.
- ★ If this clearance is excessive, the clutch will be noisy.
- ★ If the clearance exceeds the service limit, replace the friction plates.

#### **Friction Plate/Clutch Housing Clearance**

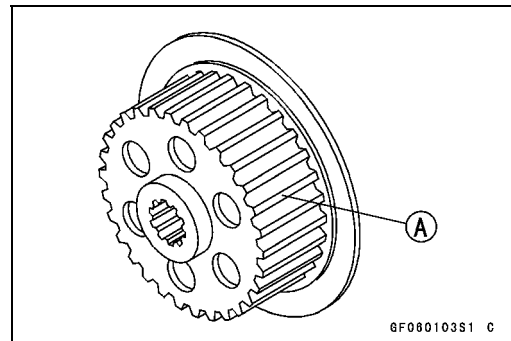
**Standard: 0.3 ~ 0.6 mm**

**Service Limit: 0.9 mm**



#### *Clutch Hub Spline Inspection*

- Visually inspect where the teeth on the steel plates wear against the 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 teeth are damaged.

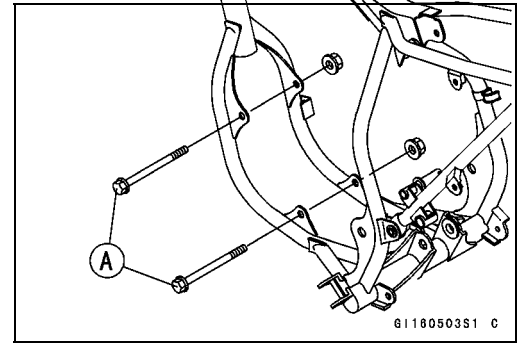




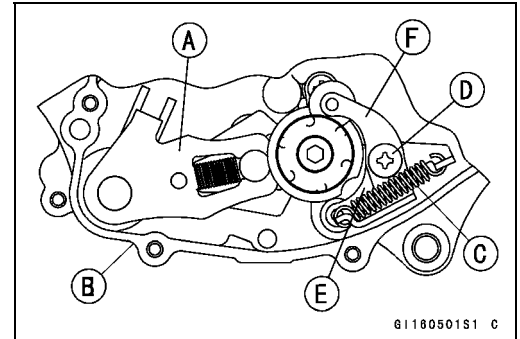
## External Shift Mechanism

### External Shift Mechanism Removal

- Remove:
  - Shift Pedal
  - Right Engine Cover
  - Clutch Housing
- Remove the engine mounting bolts [A] to pull out the external shift mechanism.



- Pull out the external shift mechanism [A], lifting the engine [B].
- Remove the gear set lever spring [C].
- Remove the lever set screw [D] and take off the set levers [D] [E].



### External Shift Mechanism Installation

- Install the return spring [A] so that the large round edge side faces in.
- Before installing the shift shaft, apply high temperature grease to the oil seal lips and shift shaft splines.
- Tighten the gear set lever screw.

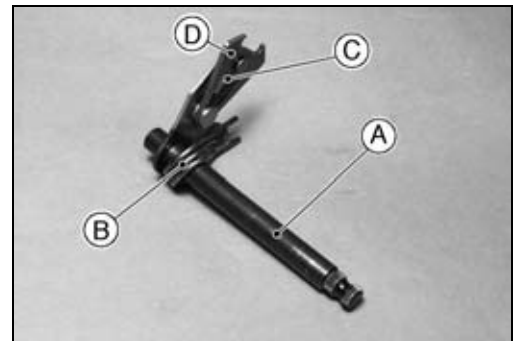
**Torque - Gear Set Lever Screw: 8.8 N·m (0.90 kgf·m, 78 in·lb)**

**Shift Pedal Bolt: 8.8 N·m (0.90 kgf·m, 78 in·lb)**



### External Shift Mechanism 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 the gear set levers, and its spring for cracks or distortion.
  - ★ If the lever or spring is damaged in any way, replace them.



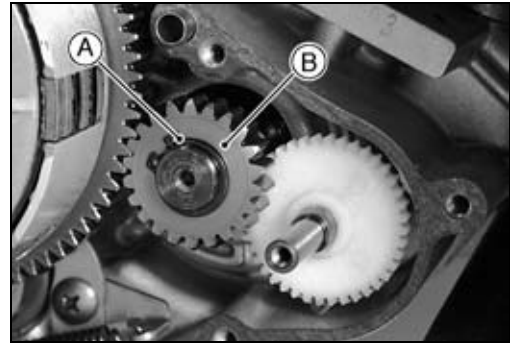
## 5-14 ENGINE RIGHT SIDE

### Primary Gear

#### Primary Gear Removal

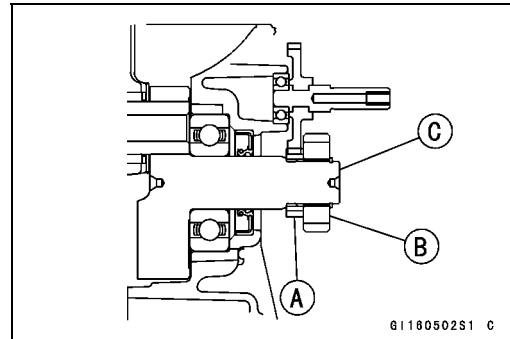
- Remove the right engine cover (see Right Engine Cover Removal)
- Remove the circlip [A], and take off the primary gear [B] and water pump drive gear .

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



#### Primary Gear Installation

- Put the water pump drive gear [A] and primary gear [B] on the crankshaft [C]. For the both gears, installation either obverse or reverse side is available.



#### Primary Gear Removal (KX65A6F ~)

- Remove the right engine cover (see Right Engine Cover Removal).
  - Remove the magneto cover.
  - Remove the primary gear nut [A], washer, and the primary gear [B].
- Primary gear nut is left-hand threads.

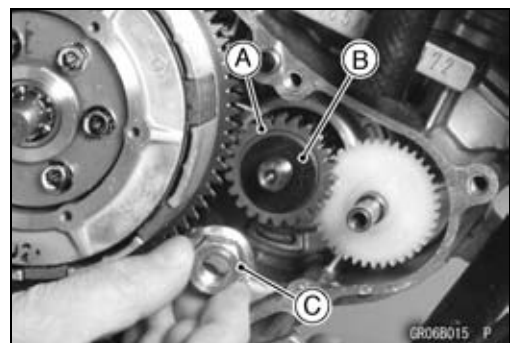
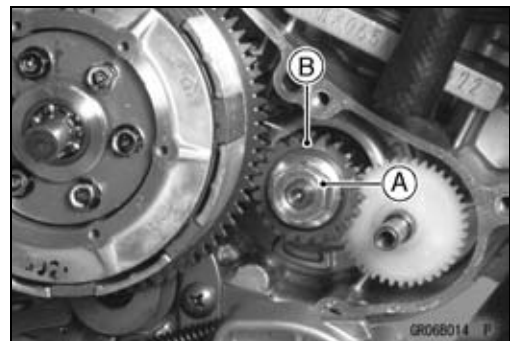
#### NOTE

○Use the fly wheel & pulley holder to prevent the crankshaft from the rotating.

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

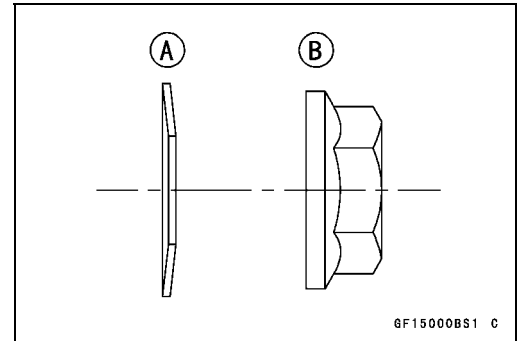
#### Primary Gear Installation (KX65A6F ~)

- Insert the primary gear [A] to the crankshaft then hollow side facing to the outside.
- Install:
  - Spring Washer [B]
  - Primary Gear Nut [C]



## Primary Gear

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



- Tighten the primary gear nut
- Primary gear nut is left-hand threads.  
**Torque - Primary Gear Nut: 49 N·m (5.0 kgf·m, 36 ft·lb)**  
**Special Tools - Flywheel & Pulley Holder: 57001-1605**

### NOTE

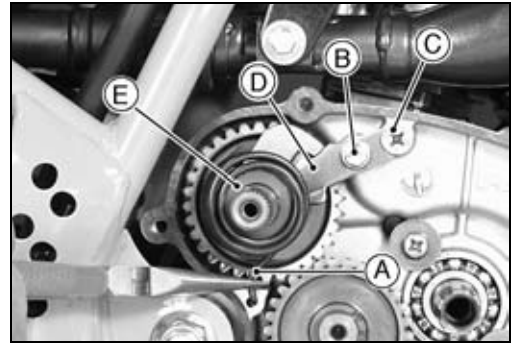
- Use the fly wheel & pulley holder to prevent the crankshaft from the rotating.
- Install:  
Right Engine Cover (see Right Engine Cover)  
Magneto Cover

## 5-16 ENGINE RIGHT SIDE

### Kickstarter

#### Kickshaft Removal

- Remove:
  - Right Engine Cover (see Right Engine Cover Removal)
  - Clutch Housing
- Pull the end of the kick spring [A] out of the hole in the crankcase.
- Remove the ratchet guide bolt [B] and ratchet guide screw [C], take off the ratchet guide [D].
- Remove the kickstarter assembly [E].

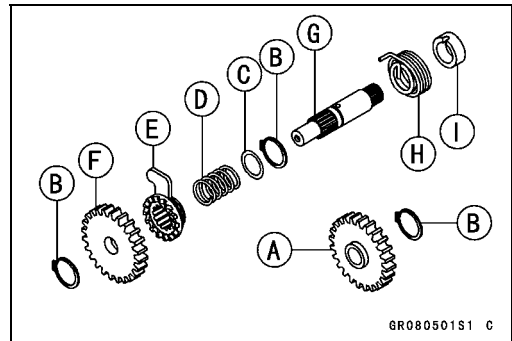


#### Kickshaft Installation

- Torque the ratchet guide bolt and screw.
  - Torque - Ratchet Guide Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)**
  - Ratchet Guide Screw: 5.2 N·m (0.53 kgf·m, 46 in·lb)**

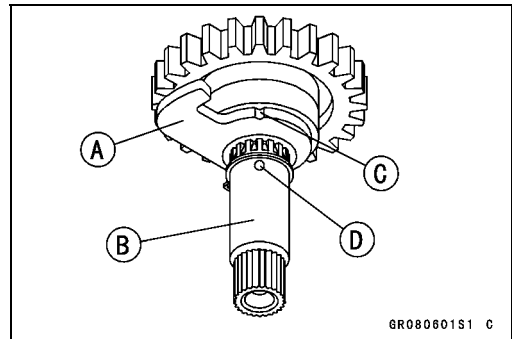
#### Kickstarter Assembly Disassembly/Assembly

- The kickstarter assembly consists of the following parts.
- Check the kickstarter assembly parts for damage. Any damaged parts should be replaced with new ones.
  - A. Idle Gear
  - B. Circlip
  - C. Washer
  - D. Spring
  - E. Ratchet Gear
  - F. Kick Gear
  - G. Kick Shaft
  - H. Kick Spring
  - I. Spring Guide



- Apply molybdenum disulfide grease to the inside of the kick gear and ratchet gear.
- When assembling the ratchet gear [A] onto the kick shaft [B], align the notch [C] on the ratchet gear with the hole [D] on the kick shaft.
- Replace the circlips that were removed with new ones.

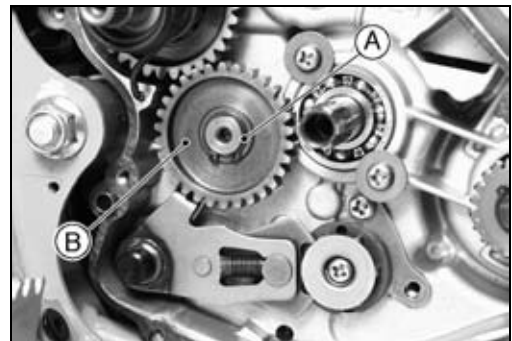
**Special Tool - Outside Circlip Pliers: 57001-144**



#### Idle Gear Removal

- Remove:
  - Right Engine Cover (see Right Engine Cover Removal)
  - Clutch Housing (see Clutch Removal)
- Remove the circlip [A] and pull off the idle gear [B].

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



#### Idle Gear Installation

- Apply molybdenum disulfide grease to the inside of the idle gear.
- Replace the circlip with a new one.

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

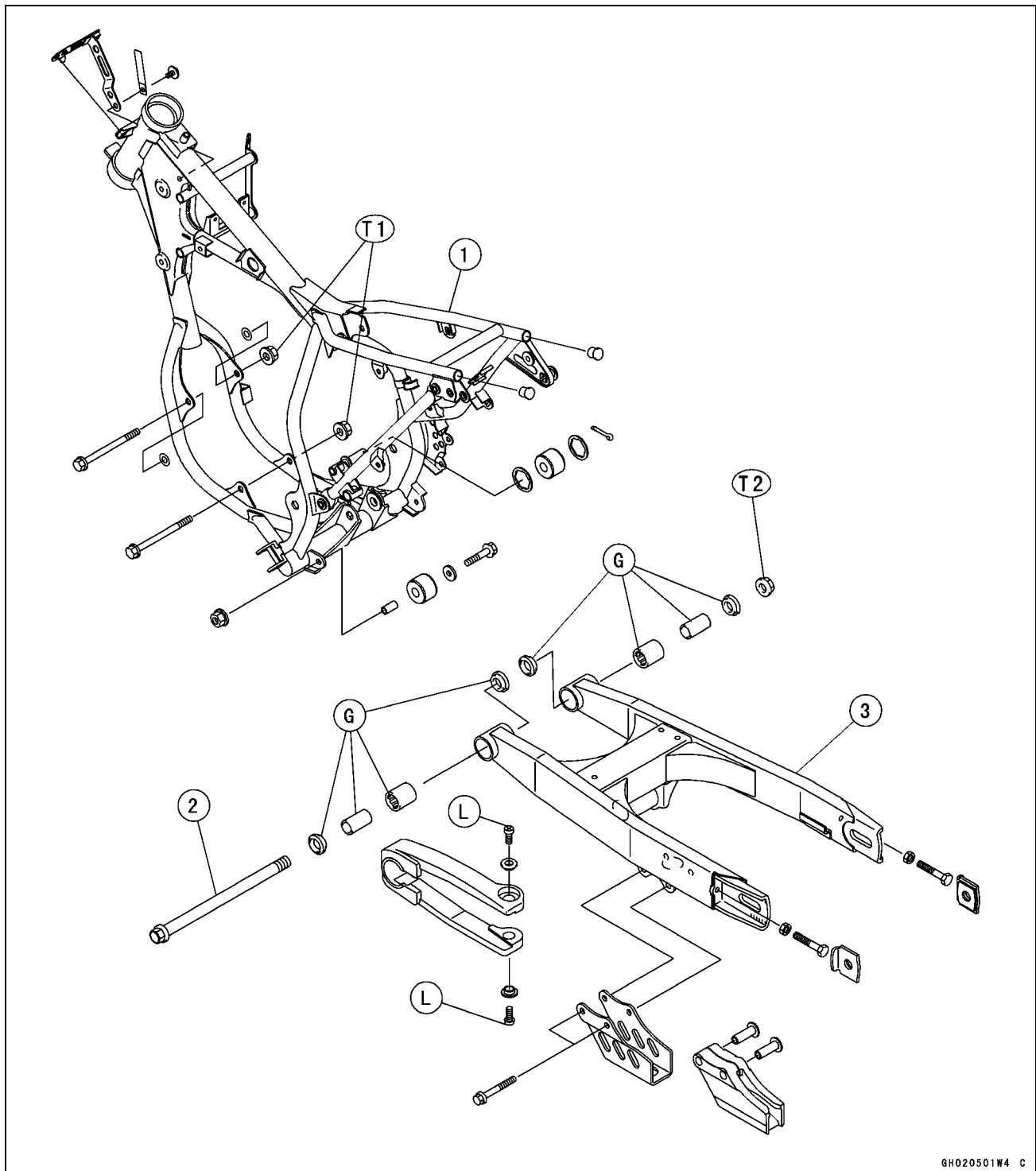
# Engine Removal/Installation

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| Engine Removal .....              | 6-3 |
| Engine Installation .....         | 6-4 |

## 6-2 ENGINE REMOVAL/INSTALLATION

### Exploded View



GH020501W4 C

1. Frame

2. Pivot Shaft

3. Swingarm

T1: 25 N·m (2.5 kgf·m, 18 ft·lb)

29 N·m (3.0 kgf·m, 21 ft·lb): KX65-A3 ~

T2: 69 N·m (7.0 kgf·m, 51 ft·lb)

G: Apply grease.

L: Apply a non-permanent locking agent.

## Engine Removal/Installation

### Engine Removal

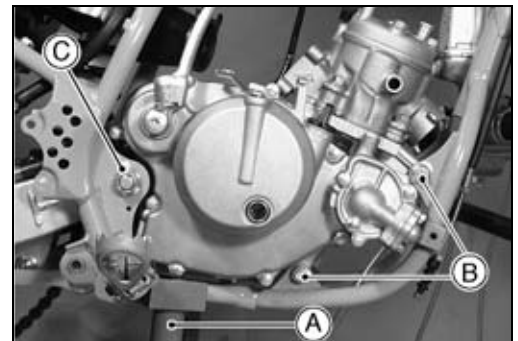
- Drain the engine oil (see Engine Bottom End/Transmission chapter).
- Drain the coolant (see Cooling System chapter).
- Remove:
  - Radiator Shrouds
  - Side Covers
  - Seat
  - Fuel Tank
  - Water Hoses
  - Radiators
  - Expansion Chamber
  - Spark Plug
  - Carburetor (with Cables and Hoses)
  - Clutch Cable Lower End
  - Drive Chain
  - Engine Sprocket
  - Shift Pedal
  - Brake Pedal
- Disconnect the magneto output lead, and free the leads from the clamp.
- Place a jack [A] under the frame to lift the motorcycle off the ground, and put blocks under the front and rear tires to steady the motorcycle.

### **⚠ 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.**

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

- Remove the engine mounting bolts [B].
- Pull out the swing arm pivot shaft [C].
- Lift the engine out to the right.



## 6-4 ENGINE REMOVAL/INSTALLATION

### Engine Removal/Installation

#### *Engine Installation*

- Install the engine on the frame.
- Before tightening the engine mounting nuts, measure the left and right clearance [A] between the bosses [B] of crankcase and frame brackets [C] with thickness gauge.

**Clearance: Under 0.3 mm**

- ★ If the clearances are over the specified value, adjust them by inserting the shim (Part No. 92180-1354) and tighten the following nuts.

#### **Torque - Engine Mounting Nuts:**

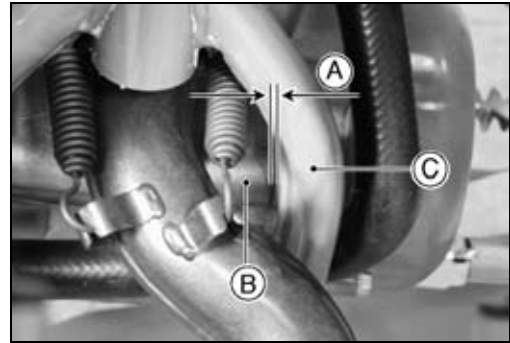
**25 N·m (2.5 kgf·m, 18 ft·lb)**

**29 N·m (3.0 kgf·m, 21 ft·lb): KX65-A3 ~**

**Swing Arm Pivot Shaft Nut: 69 N·m (7.0 kgf·m, 51 ft·lb)**

**Shift Pedal Bolt: 8.8 N·m (0.90 kgf·m, 78 in·lb)**

- To route the leads, cables and hoses, refer to the General Information chapter.
- To install parts removed, refer to the appropriate chapters.
- Fill the cooling system with coolant (see Cooling System chapter).
- Fill the engine with engine oil (see Engine Bottom End/Transmission chapter).
- Adjust:
  - Throttle Cable
  - Clutch Cable
  - Drive Chain
  - Rear Brake





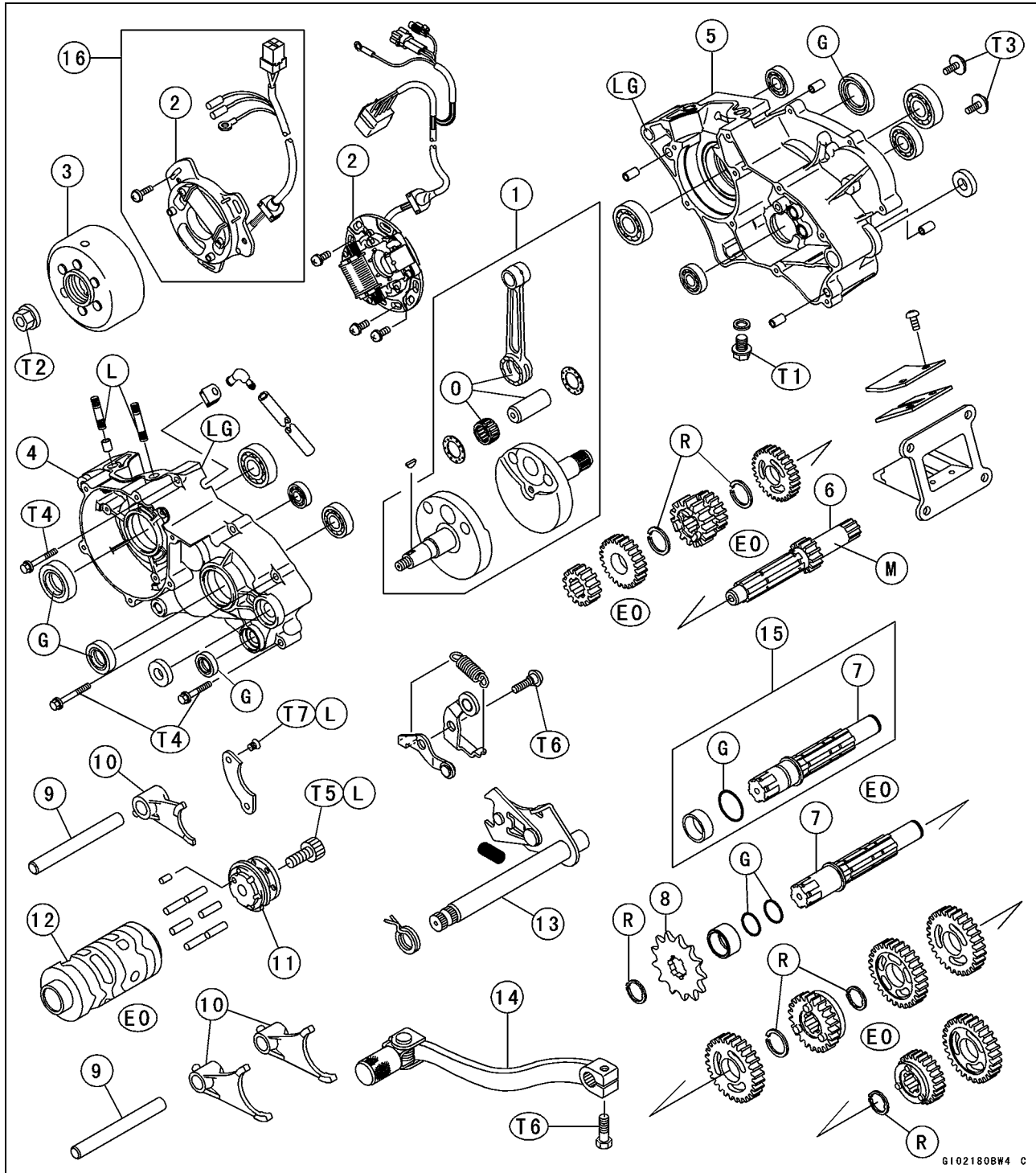
# Engine Bottom End/Transmission

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# 7-2 ENGINE BOTTOM END/TRANSMISSION

## Exploded View



### Exploded View

---

1. Crankshaft Assembly
2. Magneto Stator
3. Magneto Flywheel
4. Left Crankcase
5. Right Crankcase
6. Drive Shaft
7. Output Shaft
8. Engine Sprocket
9. Shift Rod
10. Shift Fork
11. Operating Plate
12. Shift Drum
13. Shift Shaft
14. Shift Pedal
15. KX65-A1 ~ A5
16. KX65-A1 ~ A6

T1: 20 N·m (2.0 kgf·m, 15 ft·lb)

T2: 29 N·m (3.0 kgf·m, 21 ft·lb)

T3: 8.8 N·m (0.90 kgf·m, 78 in·lb)

T4: 8.8 N·m (0.90 kgf·m, 78 in·lb)

T5: 24 N·m (2.4 kgf·m, 17 ft·lb)

T6: 8.8 N·m (0.90 kgf·m, 78 in·lb)

T7: 5.2 N·m (0.53 kgf·m, 46 in·lb)

EO: Apply engine oil to the transmission gears and shift forks, etc.

G: Apply high temperature grease.

L: Apply a non-permanent locking agent.

LG: Apply liquid gasket to the left and right case mating surface.

M: Apply molybdenum disulfide grease.

O: Apply 2-stroke engine oil.

R: Replacement parts

## 7-4 ENGINE BOTTOM END/TRANSMISSION

### Specifications

| Item                                    | Standard  | Service Limit |
|---|---|---------------|
| <b>Transmission Oil:</b>                |   |               |
| <b>Engine Oil:</b>                      |   |               |
| Grade                                   | API SE, SF or SG<br>API SH, SJ or SL with JASO MA | ---           |
| Viscosity                               | SAE10W-40   | ---           |
| Capacity                                | 0.5 L   | ---           |
| <b>Crankshaft, Connecting Rod</b>       |   |               |
| Connecting Rod Bend                     | Not more than 0.05 mm/100 mm                      | 0.2 mm/100 mm |
| Connecting Rod Twist                    | Not more than 0.05 mm/100 mm                      | 0.2 mm/100 mm |
| Connecting Rod Big End Radial Clearance | 0.025 ~ 0.037 mm                                  | 0.09 mm       |
| Connecting Rod Big End Side Clearance   | 0.35 ~ 0.45 mm                                    | 0.65 mm       |
| Crankshaft Runout                       | Not more than 0.03 mm                             | 0.05 mm       |
| <b>Transmission</b>                     |   |               |
| Shift Fork Ear Thickness                | 3.90 ~ 4.00 mm                                    | 3.80 mm       |
| Gear Shift Fork Groove Width            | 4.05 ~ 4.15 mm                                    | 4.25 mm       |
| Shift Fork Guide Pin Diameter           | 5.90 ~ 6.00 mm                                    | 5.80 mm       |
| Shift Drum Groove Width                 | 6.05 ~ 6.20 mm                                    | 6.25 mm       |

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

**Outside Circlip Pliers: 57001-144**

**Bearing Puller: 57001-158**

**Bearing Driver Set: 57001-1129**

**Crankcase Splitting Tool Assembly: 57001-1362**

**Crankshaft Jig: 57001-1439**

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

## Transmission Oil

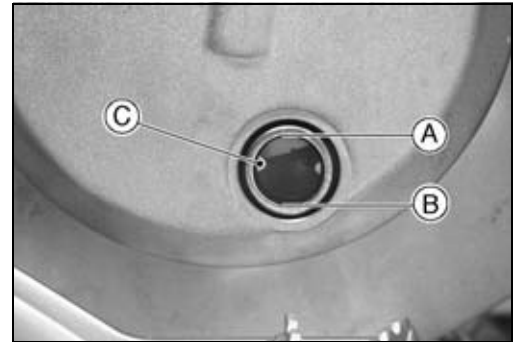
In order for the transmission and clutch to function properly, always maintain the transmission oil at the proper level and change the oil periodically.

### **⚠ WARNING**

**Motorcycle operation with insufficient, deteriorated, or contaminated transmission oil will 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 between the upper level [A] and lower level [B] through the oil level gauge [C] on the right engine cover .
- ★ If the oil level is too high, remove the excess oil through the oil filler opening 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.

### *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 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 oil 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 oil drain plug with the gasket, and tighten it.

**Torque - Engine Oil Drain Plug: 20 N·m (2.0 kgf·m, 15 ft·lb)**

- Fill the engine with a good quality engine oil specified below.
- Check the oil level.

#### Recommended Engine Oil

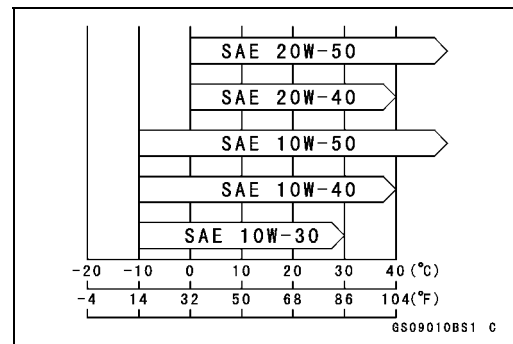
**Grade: API SE, SF or SG  
API SH, SJ or SL with JASO MA**

**Viscosity: SAE 10W-40**

#### Engine Oil Capacity

**Capacity: 0.5 L**

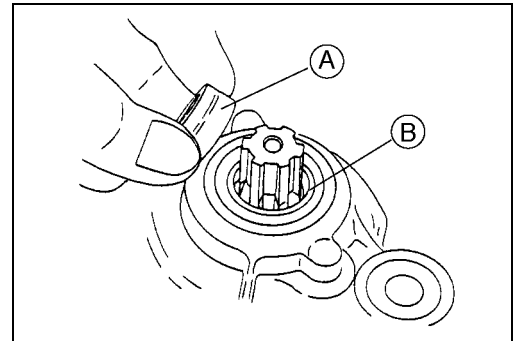
Although 10W-40 engine oil is the recommended oil for most conditions, the oil viscosity may need to be changed to accommodate atmospheric conditions in your riding area.



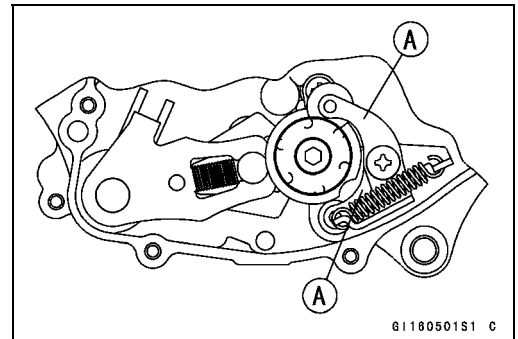
## Crankcase

### Crankcase Splitting

- Remove the engine (see the Engine Removal/Installation chapter).
- Set the engine on a clean surface while parts are being removed.
- Remove:
  - Magneto Cover
  - Output Shaft Sleeve [A] and O-ring [B]



- Cylinder Head (see Engine Top End Chapter)
- Cylinder (see Engine Top End Chapter)
- Piston (see Engine Top End Chapter)
- Right Engine Cover (see Engine Right Side Chapter)
- Clutch (see Engine Right Side Chapter)
- Primary Gear (see Engine Right Side Chapter)
- Kickstarter Assembly (see Engine Right Side Chapter)
- Kickstarter Idle Gear (see Engine Right Side Chapter)
- Gear Set and Neutral Set Levers [A]
- Magneto Flywheel and Stator (see Electrical System Chapter)



- Remove the crankcase bolts [A].

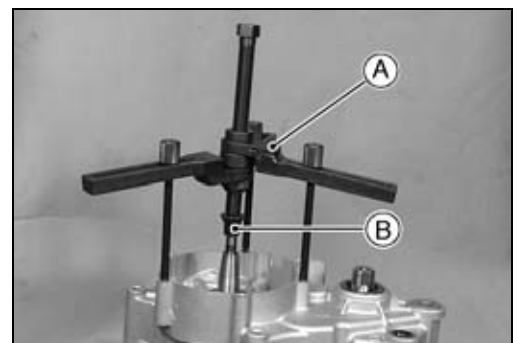


- Install the crankcase splitting tool [A] and adapter [B] into the left side of the crankcase. Be certain to screw the tool in all the way.

**Special Tools - Crankcase Splitting Tool Assembly: 57001-1362**

**Bearing Puller Adapter: 57001-136**

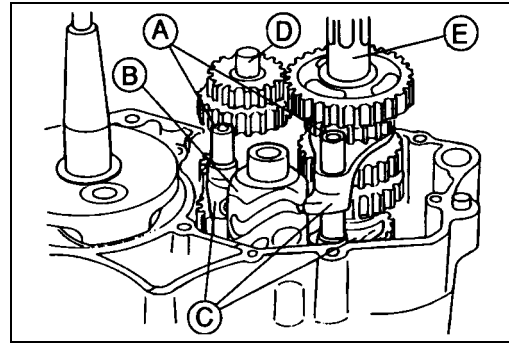
- Tighten the bolt on the crankcase splitting tool to split the crankcase halves.
- Once the crankcase is split, remove the crankcase splitting tool, and lift off the left crankcase half.



## 7-8 ENGINE BOTTOM END/TRANSMISSION

### Crankcase

- Pull out the shift rods [A].
- Disengage the shift fork guide pins from the shift drum grooves.
- Take off 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 gear meshed.
- Remove the crankshaft from the right crankcase half using a press.



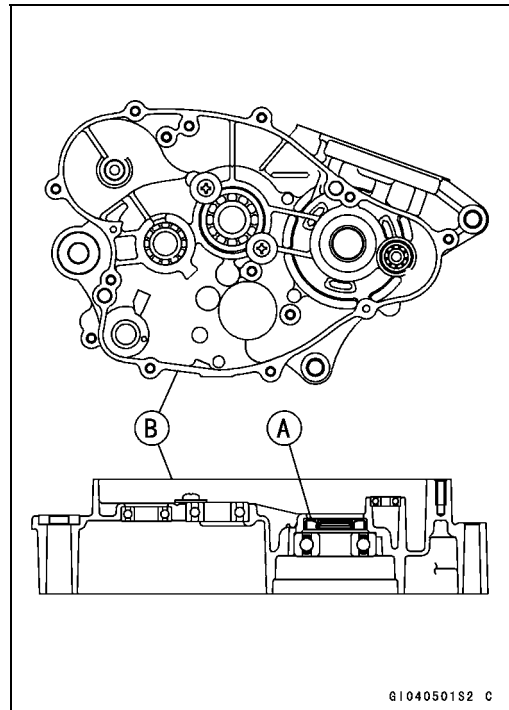
### Crankcase Disassembly

#### CAUTION

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

### Crankcase Assembly

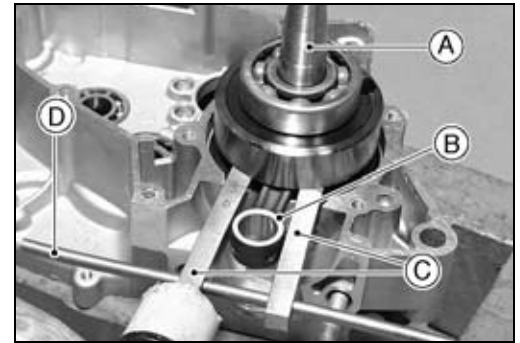
- Before fitting the left case on the right case, note the following:
  - Chip off the old gasket from the mating surfaces of the crankcase halves, and clean off the crankcase with a high flash-point solvent. After cleaning, apply transmission oil to the transmission gears, shift drum, shift forks and so on.
  - Be sure to replace any oil seal removed with a new one. Press in the new oil seal using a press and suitable tools so that the seal surface is flush with the surface of the crankcase.
  - As for the crankshaft oil seal [A], on the right crankcase half [B] press in the seal until it is bottomed.
  - 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 Tool - Bearing Driver Set: 57001-1129**
  - Tighten the drive shaft bearing retaining screws securely.  
**Torque - Bearing Retaining Screws: 8.8 N·m (0.90 kgf·m, 78 in·lb)**
  - If the crankshaft bearings stay on the crankshaft when splitting the crankcase, remove the bearings from the crankshaft and reinstall them in the crankcase, and then assemble the crankcase (see Crankshaft Removal and Installation).





## Crankcase

- Turn the crankshaft [A] to BDC [B], and install the crankshaft jig [C] between the flywheels opposite the connecting rod big end to protect flywheel alignment as shown. Install the suitable shaft [D] to the rear end of the crankshaft jig.



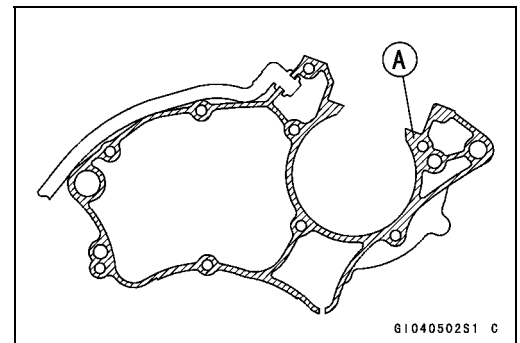
- If the crankshaft has been removed from the crankcase, install the jig between the crankshaft flywheels before pressing the crankshaft into the right crankcase half.

**Special Tool - Crankshaft Jig: 57001-1439**

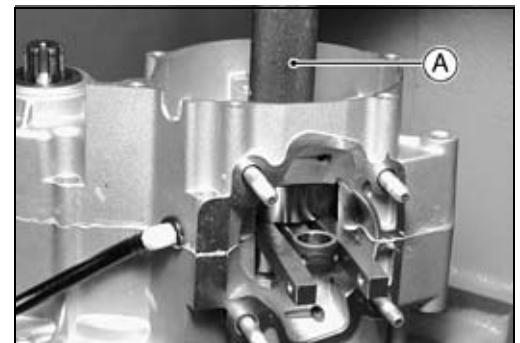
- Install the transmission shaft as a set (see this chapter).
- Install the shift fork, shift drum and shift rod.
- Check to see that the crankcase knock pins are in place on the right crankcase half. If any of them has been removed, replace it with a new one.

- Apply liquid gasket to the mating surface [A] of the left crankcase half.

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



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



### NOTE

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

- Remove the crankshaft jig from the flywheels.
- Tighten the crankcase bolts 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.
- Install the parts removed in the reverse order of removal, and refer to the appropriate chapters.
- Replace the O-ring on the output shaft with a new one.

## 7-10 ENGINE BOTTOM END/TRANSMISSION

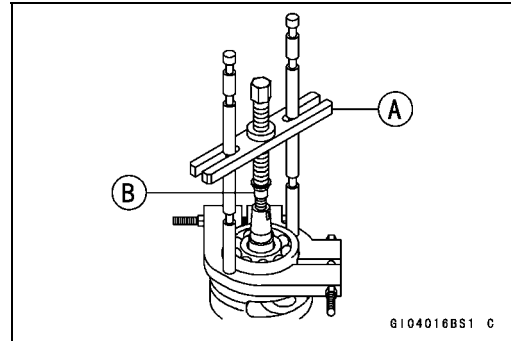
### Crankshaft, Connecting Rod

#### *Crankshaft Removal*

- Split the crankcase (see Crankcase Splitting).
- Remove the transmission shafts (see Transmission Shaft Removal).
- Using a press, remove the crankshaft from the right crankcase.
- If the bearings stay on the crankshaft when splitting the crankcase or removing the crankshaft from the right crankcase, remove the bearings from the crankshaft with a bearing puller [A] and adapter [B].

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

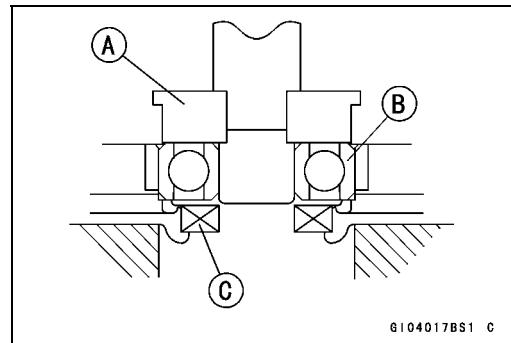
**Bearing Puller Adapter: 57001-136**



#### *Crankshaft Installation*

- When installing the crankshaft bearings [B], apply high temperature grease to the outer sides of the bearings, and then press them into the crankcase using the bearing driver [A] until the bearing bottoms against the step.
- Position the crankcase half so that the main bearing housing is seated on a suitable press fixture.
- Install the crankshaft bearing so that the sealed side in (to the oil seal [C] side).

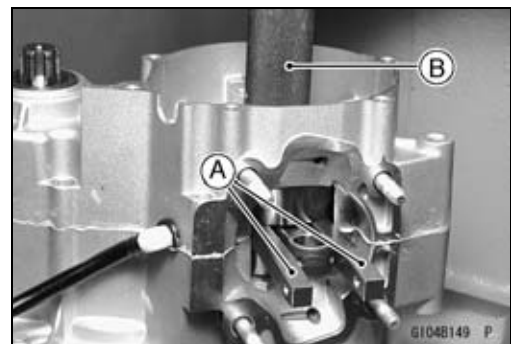
**Special Tool - Bearing Driver Set: 57001-1129**



- Insert the crankshaft jig [A] between the crankshaft flywheels opposite the connecting rod big end to protect flywheel alignment as shown, and using a suitable tool [B] on the left crankcase to press around the hole for the crankshaft.
- When pressing, position the jig in the crankcase opening so the jig does not hit the crankcase.

**Special Tool - Crankshaft Jig: 57001-1439**

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



#### *Crankshaft Disassembly*

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

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

#### *Crankshaft Assembly*

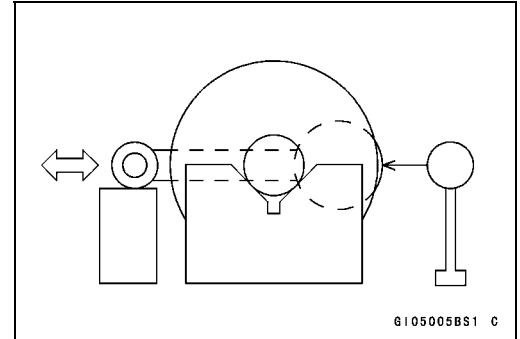
Since the assembly of the crankshaft demands exacting tolerances, the disassembly and reassembly of the crankshaft can only be done by a shop having the necessary tools and equipment.

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

## 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:** 0.025 ~ 0.037 mm

**Service Limit:** 0.09 mm

### Connecting Rod 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.

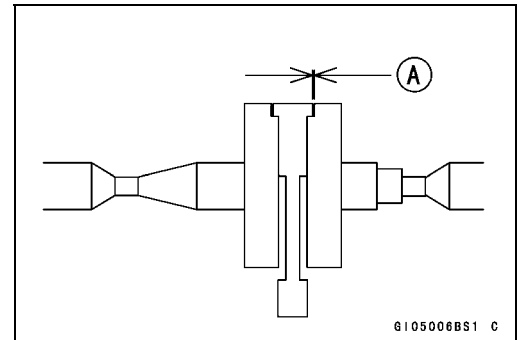
### Connecting Rod Big End Side Clearance Inspection

- 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

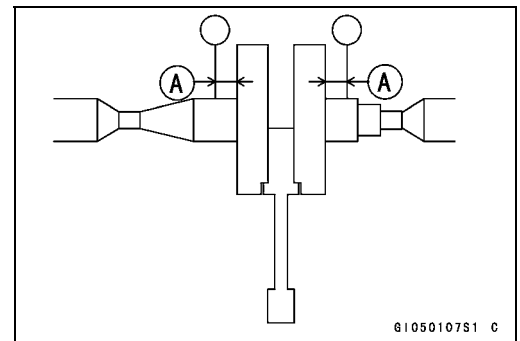
**Standard:** 0.35 ~ 0.45 mm

**Service Limit:** 0.65 mm



### Crankshaft Runout Inspection

- Set the crankshaft in a flywheel alignment jig or on V blocks, and place a dial gauge against the points indicated.
- Turn the crankshaft slowly. The maximum difference in gauge readings is the crankshaft runout.
- ★ If the runout at either point exceeds the service limit, align the flywheels so that the runout falls within the service limit.



### Crankshaft Runout

**Standard:** Not more than 0.03 mm

**Service Limit:** 0.05 mm

**[A]:** 7.5 mm

## 7-12 ENGINE BOTTOM END/TRANSMISSION

### Crankshaft, Connecting Rod

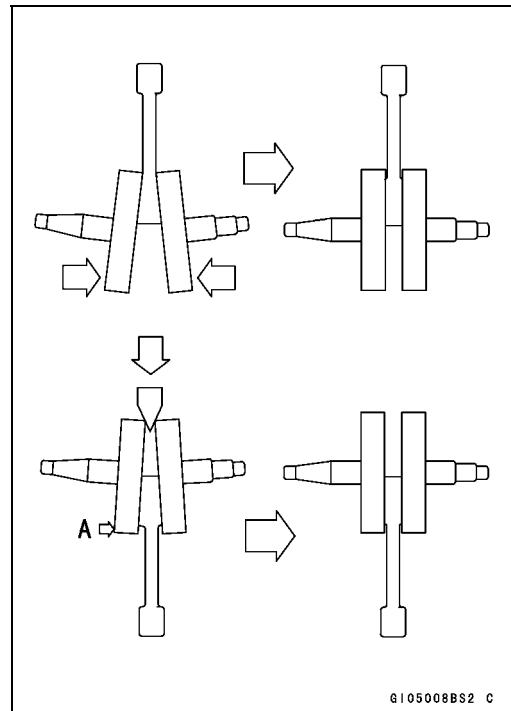
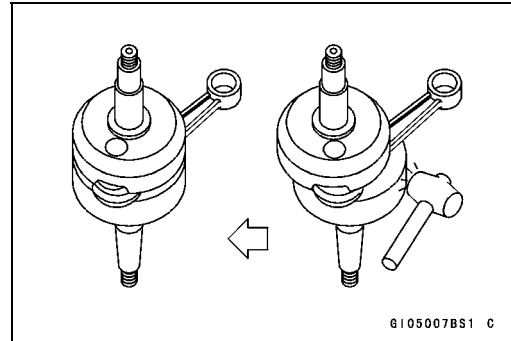
#### *Crankshaft Alignment Inspection*

- 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.

#### **CAUTION**

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

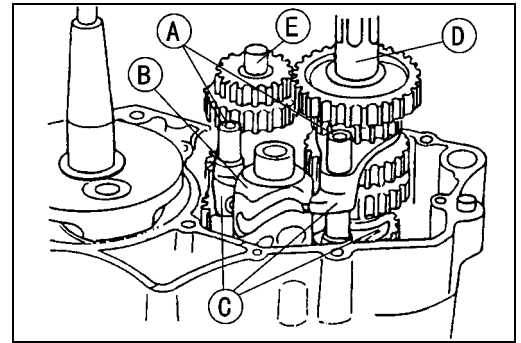
- ★ If flywheel misalignment cannot be corrected by the above method, replace the crankpin or the crankshaft itself.



## Transmission

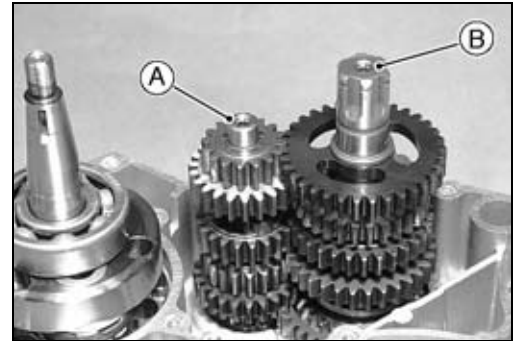
### Shaft Removal

- 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.



### Shaft Installation

- Hold the drive shaft [A] and output shaft [B] together, with their gears meshed, and fit them into the right crankcase half.
- To install the shift forks and shift drum, see the Shift Drum and Fork Installation.



### Shaft Disassembly

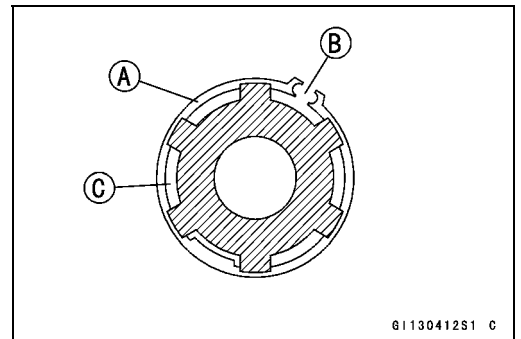
- Remove the transmission shafts (see Shaft Removal).
- Using circlip pliers to remove the circlips, disassemble the transmission shaft.

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

### Shaft Assembly

- Apply transmission oil liberally to the transmission shaft, gears and bearings.
- Replace any circlips that were removed with new ones.
- Always install circlips [A] so that the opening [B] is aligned with a spline groove [C].

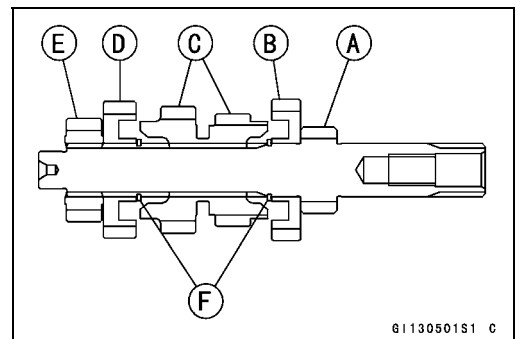
**Special Tool - Outside Circlip Pliers: 57001-144**



G1130412S1 C

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

- [A] 1st Gear (13T; part of drive shaft)
- [B] 6th Gear (24T; plain side faces right)
- [C] 3rd/4th Gear (18T/21T; larger gear faces left)
- [D] 5th Gear (23T; plain side faces left)
- [E] 2nd Gear (16T; either side may face in)
- [F] Circlip (1.2 × 15 × 19)

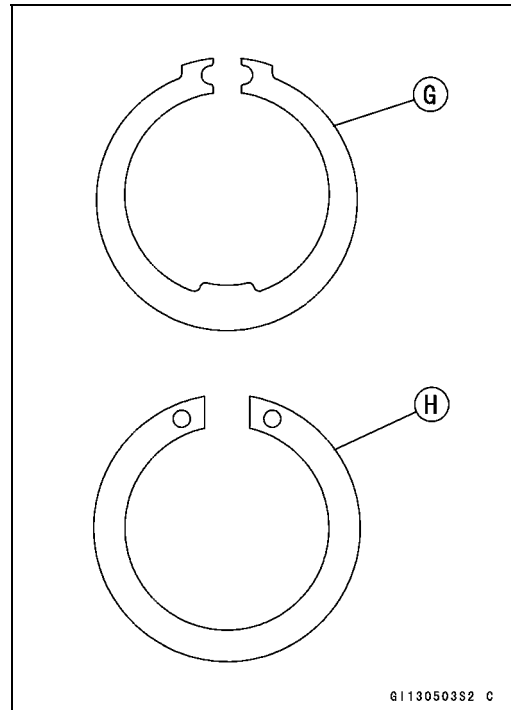
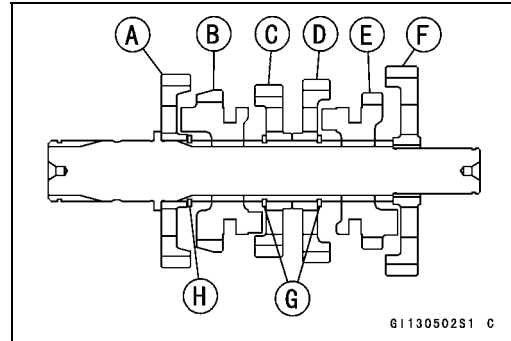


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# 7-14 ENGINE BOTTOM END/TRANSMISSION

## Transmission

- The output shaft gears can be identified by size; the largest diameter gear is 1st gear, and the smallest is 6th. Be sure that all parts are put back in the correct sequence and facing the proper direction, and that all circlips are properly in place.
  - [A] 2nd Gear (34T; dog recesses face right)
  - [B] 5th Gear (28T; fork groove goes to the right side of the gear teeth)
  - [C] 4th gear (30T; dog recesses face left)
  - [D] 3rd gear (31T; dog recesses face right)
  - [E] 6th gear (26T; fork groove goes to the left side of the gear teeth)
  - [F] 1st gear (37T; plain side faces right)
  - [G] Circlip (1.2 × 18)
  - [H] Circlip (1.2 × 18 × 23.5)
- Check that each gear spins or slides freely on the transmission shaft without binding after assembly.

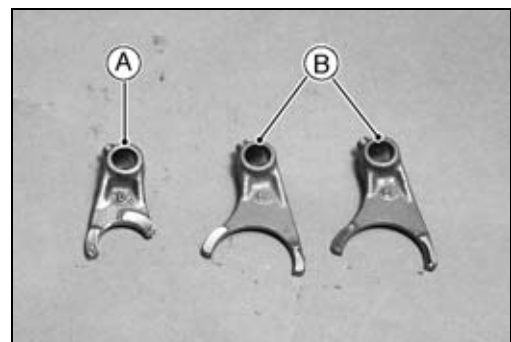


### Shift Drum and Fork Installation

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

### Shift Fork Identification

|  |  |
|--|--|
| Drive shaft 3rd gear and 4th gear shift fork [A] | ears are shorter than those of the other two shift forks     |
| Output shaft 5th and 6th gear shift forks [B]    | ears are longer than the drive shaft 3rd/4th gear shift fork |



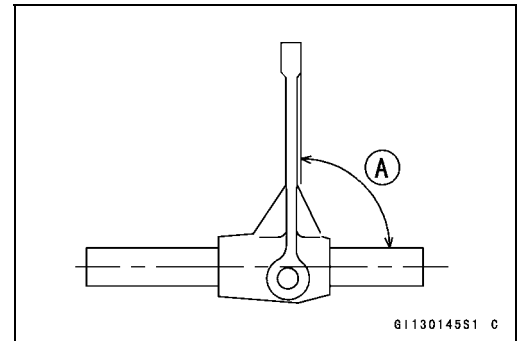
## Transmission

- Install the shift drum.
- Fit the shift fork guide pins into the corresponding shift drum grooves.
- Apply a little transmission oil to the shift rods, and slide them into the shift forks.
- Holding the shift drum with the suitable tool and tighten the shift drum operating plate bolt.
- Apply a non-permanent locking agent to the shift drum operating plate bolt.

**Torque - Shift Drum Operating Plate Bolt: 24 N·m (2.4 kgf·m, 17 ft·lb)**

### 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°



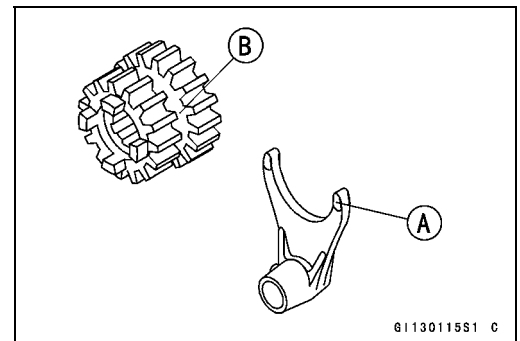
### Shift Fork/Gear Groove Wear Inspection

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

#### Shift Fork Ear Thickness

**Standard: 3.90 ~ 4.00 mm**

**Service Limit: 3.80 mm**



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

#### Shift Fork Groove Width

**Standard: 4.05 ~ 4.15 mm**

**Service Limit: 4.25 mm**

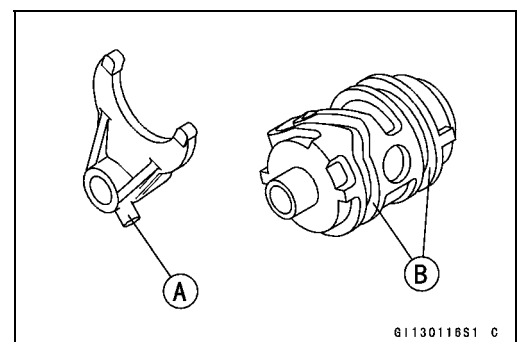
### Shift Fork Guide Pin/Shift Drum Groove Wear Inspection

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

#### Shift Fork Guide Pin Diameter

**Standard: 5.90 ~ 6.00 mm**

**Service Limit: 5.80 mm**



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

#### Shift Drum Groove Width

**Standard: 6.05 ~ 6.20 mm**

**Service Limit: 6.25 mm**

## 7-16 ENGINE BOTTOM END/TRANSMISSION

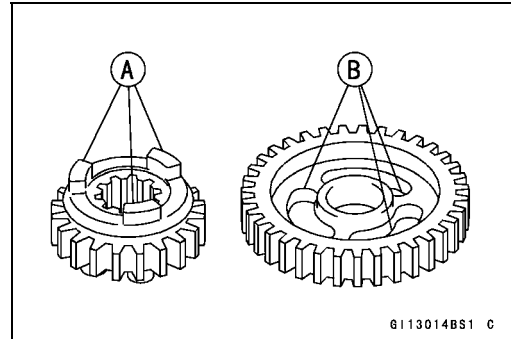
### Transmission

#### *Gear Damage Inspection*

- Visually inspect the gear teeth on the transmission gears.
- ★ Repair lightly damaged gear teeth with an oilstone. The gear must be replaced if the teeth are badly damaged.
- ★ When gear is repaired or replaced, the driving gear should also be inspected and repaired or replaced if necessary.

#### *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.



#### *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. Clean each bearing in a high flash-point solvent, dry it (do not spin the bearing while it is dry), and oil it with transmission oil.
- Spin the bearing by hand to check its condition.
- ★ If the bearing is noisy, does not spin smoothly, or has any rough spots, replace it.



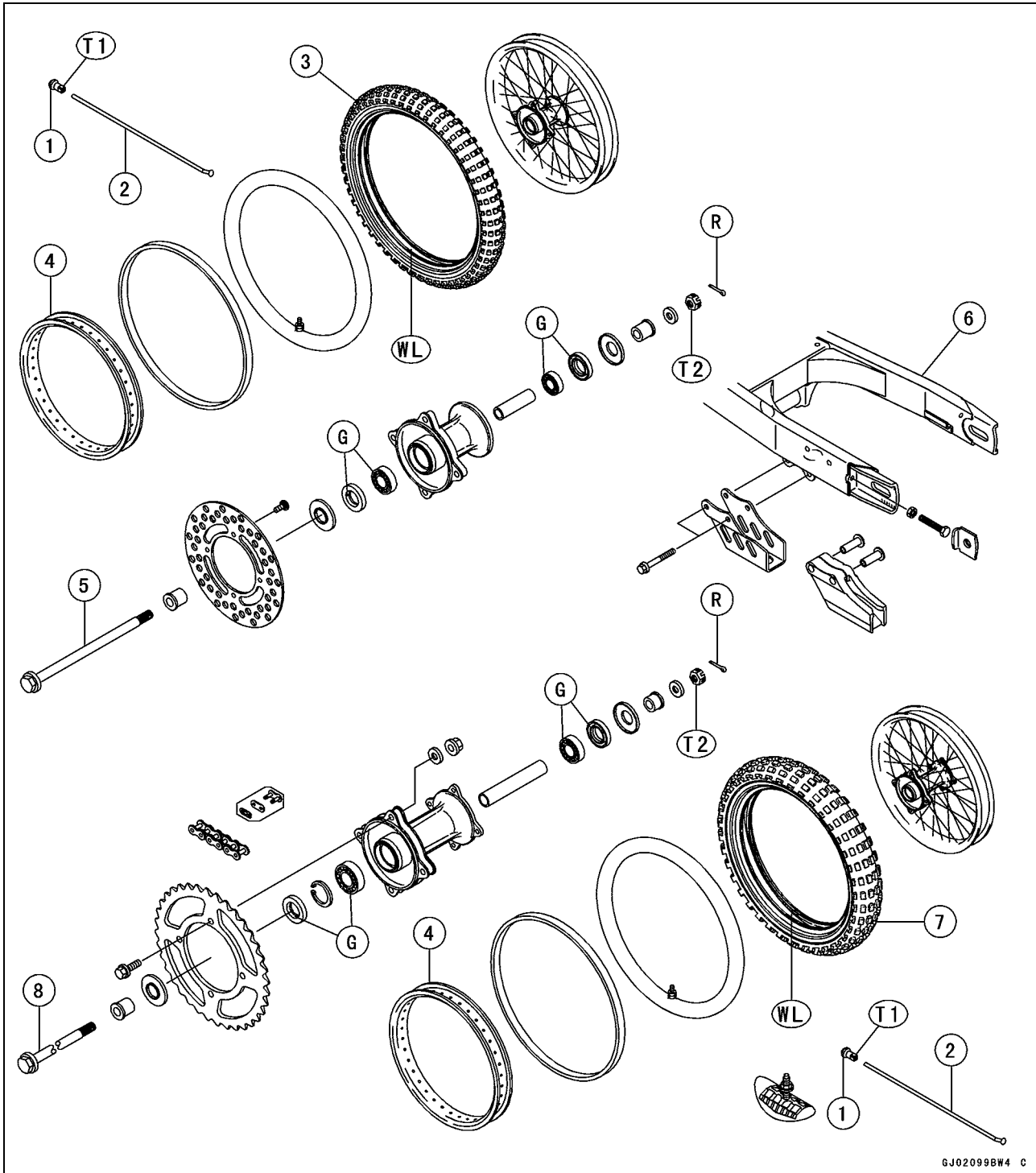
# Wheels/Tires

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## 8-2 WHEELS/TIRES

### Exploded View



GJ02099BW4 C

1. Nipple
2. Spoke
3. Front Tire
4. Rim
5. Front Axle
6. Swingarm
7. Rear Tire
8. Rear Axle

T1: 1.5 N·m (0.15 kgf·m, 13 in·lb)

T2: 79 N·m (8.0 kgf·m, 58 ft·lb)

G: Apply Grease.

R: Replacement Parts

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

**Specifications**

| Item  | Standard   | Service Limit                      |
|---|--|------------------------------------|
| <b>Wheels (Rims):</b><br>Rim Size:<br>Front<br>Rear<br>Rim Runout:<br>Axial<br>Radial<br>Axle Runout/100 mm | <br>14 × 1.40<br>12 × 1.60<br><br>1.0 mm or less<br>1.0 mm or less<br>0.1 mm   | <br><br><br>2 mm<br>2 mm<br>0.2 mm |
| <b>Tires Air Pressure</b><br>Front and Rear   | 98 kPa (1.0 kgf/cm <sup>2</sup> , 14 psi)  | - - -                              |
| <b>Tires</b><br>Standard Tire:<br>Front:<br>Size<br>Make<br>Type<br><br>Rear:<br>Size<br>Make<br>Type       | <br>60/100-14 30M<br>DUNLOP<br>D755F, Tube (KX65-A1 ~ A6)<br>D756F, Tube<br><br>80/100-12 41M<br>DUNLOP<br>D755, Tube (KX65-A1 ~ A6)<br>D756, Tube | <br><br>- - -<br><br><br>- - -     |

- Special Tools - Inside Circlip Pliers: 57001-143**  
**Rim Protector: 57001-1063**  
**Bead Breaker Assembly: 57001-1072**  
**Bearing Driver Set: 57001-1129**  
**Jack: 57001-1238**

## 8-4 WHEELS/TIRES

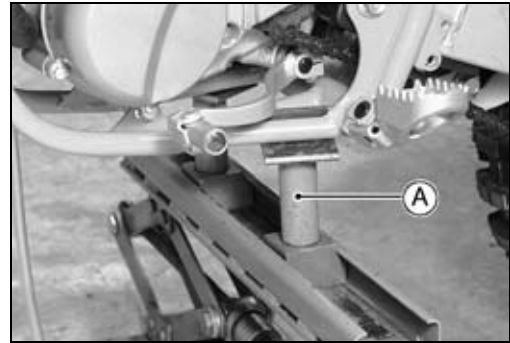
### Wheels (Rims)

#### Front Wheel Removal

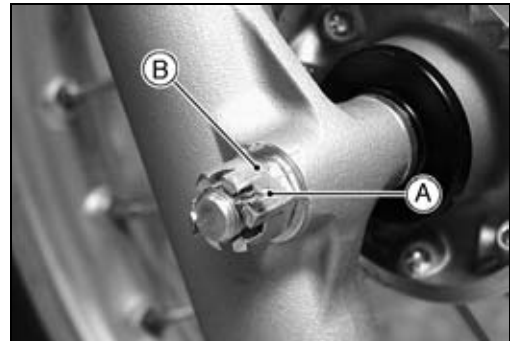
- Using the jack [A] under the frame, and stabilize the motorcycle.

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

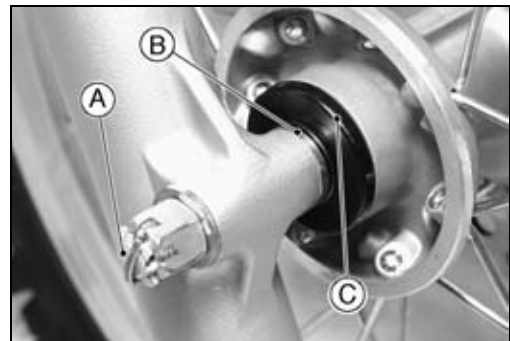
- Place a stand under the engine to raise the front wheel the ground.



- Remove the cotter pin [A]
- Unscrew the axle nut [B].



- Remove the axle [A], and pull out the wheel. Take off the collar [B] and cap [C] from each side of the front hub.



#### CAUTION

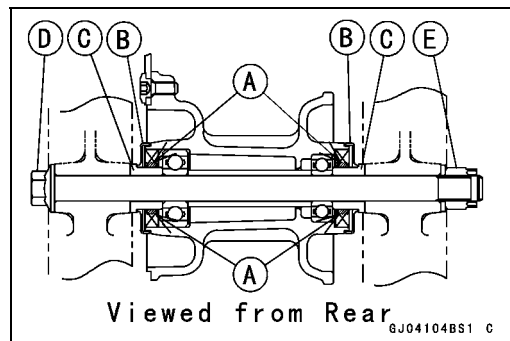
**Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so the disc does not touch the ground.**

- 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

- Apply grease [A] to the seals.
- Fit the projection on the cap to the groove on the collar.
- Install the caps [B] collars [C] on the left and right side of the hub. The collars and caps are the same.
- Insert the axle [D] from left side.
- Tighten the front axle nut [E].

**Torque - Front Axle Nut: 79 N·m (8.0 kgf·m, 58 ft·lb)**

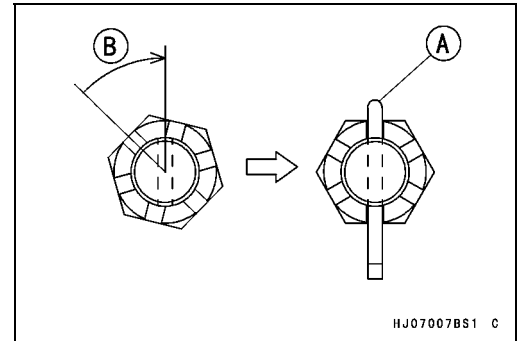


**Wheels (Rims)**

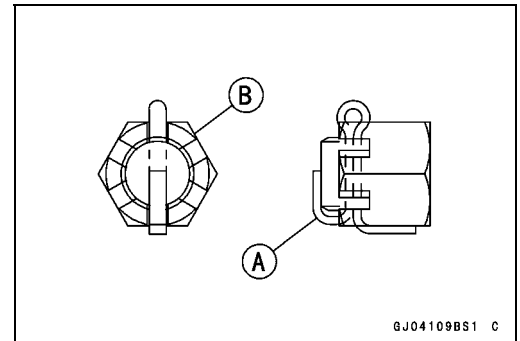
- Insert a new cotter pin [A].

**NOTE**

- When inserting the cotter pin, if the slots in the nut do not align with the cotter pin hole in the axle, tighten the nut clockwise [B] up to next alignment.
- It should be within 30 degree.
- Loosen once and tighten again when the slot goes past the nearest hole.



- Bend the cotter pin [A] over the nut [B].



- Remove the jack.
- Check the front brake for good braking power and no brake drag.

**⚠ WARNING**

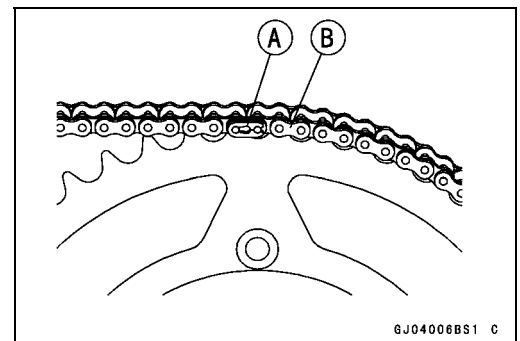
**Do not attempt to drive the motorcycle until a full brake lever is obtained by pumping the brake lever until the pads are against the disc. The brake will not function on the first application of the lever if this is not done.**

*Rear Wheel Removal*

- Using the jack under the frame so that the rear wheel is raised off the ground.

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

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



## 8-6 WHEELS/TIRES

### Wheels (Rims)

- Remove the cotter pin [A].
- Remove the axle nut [B].
- Pull out the axle [C].
- Move the rear wheel back with the rear caliper installed.
- Take off the collar and cap from the each side of the rear hub.

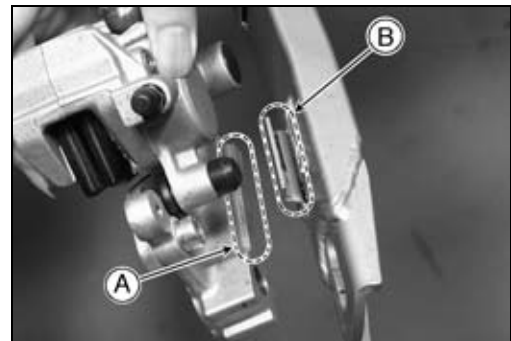
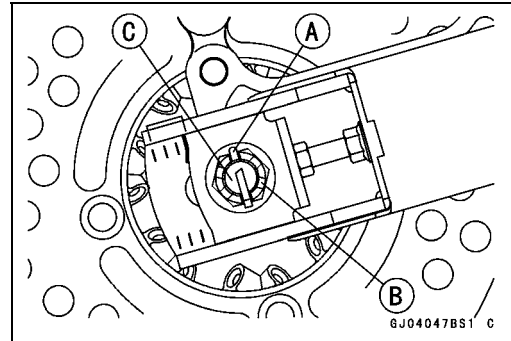
#### CAUTION

**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.**

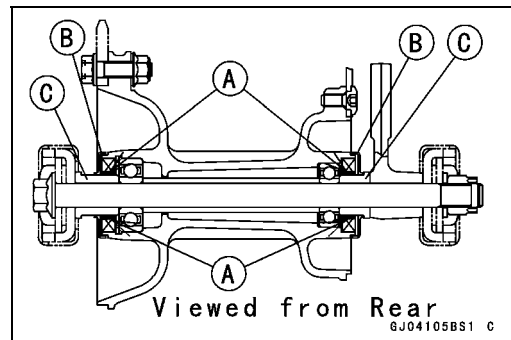
- Insert a wood wedge between the brake pads. This prevents them from being moved out of their proper position, should the brake pedal be squeezed accidentally.

#### Rear Wheel Installation

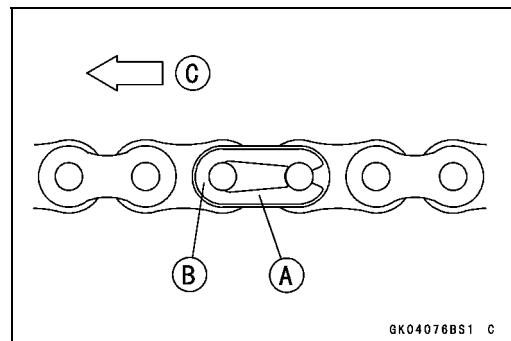
- Fit the brake holder stop [A] against the stop projection [B] on the swingarm.



- Apply grease [A] to the seals.
- Fit the projection on the cap to the groove on the collar.
- Install the caps [B] and collars [C] on the left (longer collar) and right (shorter collar) side of the hub.



- Install the drive chain. Install the clip [A] so that the closed end of the "U" [B] points in the direction of chain rotation [C].



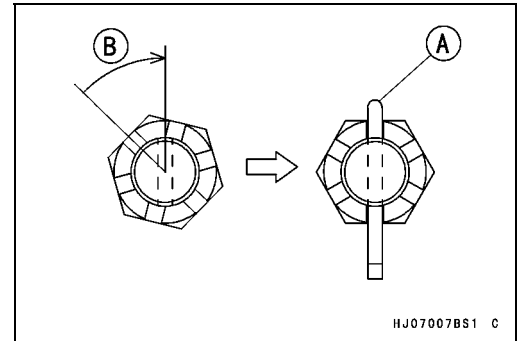
- Check the drive chain slack (see Final Drive chapter).
- Insert the axle from left side and tighten the rear axle nut.  
**Torque - Rear Axle Nut: 79 N·m (8.0 kgf·m, 58 ft·lb)**

**Wheels (Rims)**

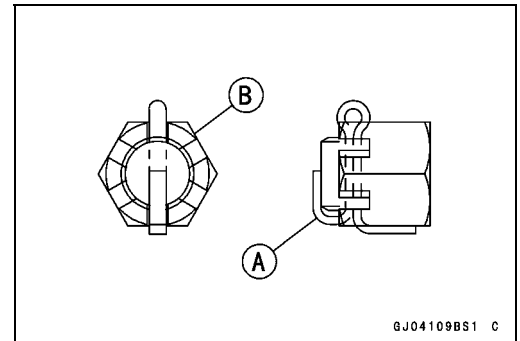
- Insert a new cotter pin [A].

**NOTE**

- When inserting the cotter pin, if the slots in the nut do not align with the cotter pin hole in the axle, tighten the nut clockwise [B] up to next alignment.
- It should be within 30 degree.
- Loosen once and tighten again when the slot goes past the nearest hole.



- Bend the cotter pin [A] over the nut [B].



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

**⚠ WARNING**

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

*Wheels Inspection*

- Place 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 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 evenly.

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

- Check the rim runout.

**⚠ WARNING**

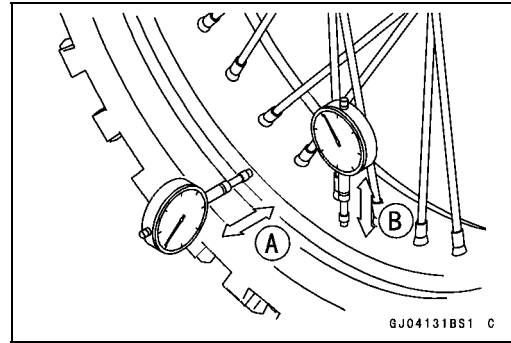
**If any spoke breaks, it should be replaced immediately. A missing spoke places an additional load on the other spokes, which will eventually cause other spokes to break.**

# 8-8 WHEELS/TIRES

## Wheels (Rims)

### 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 0.8 mm or less**

**Radial**                   **TIR 1.0 mm or less**

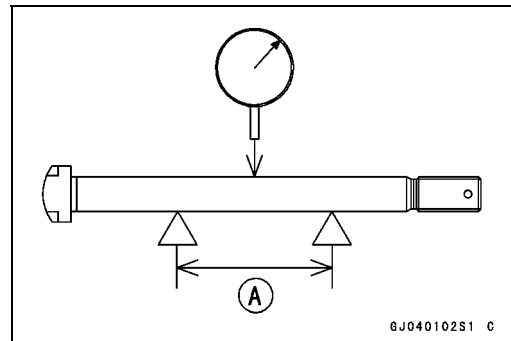
#### Service Limit:

**Axial**                    **TIR 2.0 mm**

**Radial**                   **TIR 2.0 mm**

### Axle Inspection

- Visually inspect the front and rear axle for damages.
- ★ If the axle is damaged or bent, replace it.
- Place the axle in V blocks that are 100 mm [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 runout exceeds the service limit, replace the axle.



### Axle Runout/100 mm

**Standard:**              **Under 0.1 mm**

**Service Limit:**        **0.2 mm**

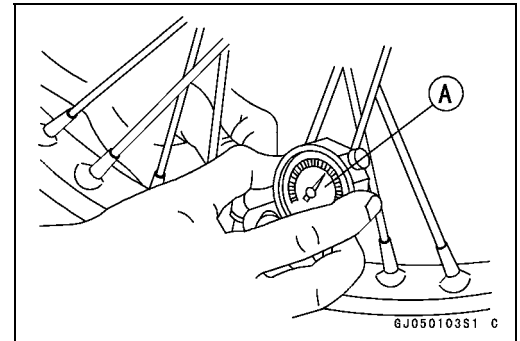


**Tires**

**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.

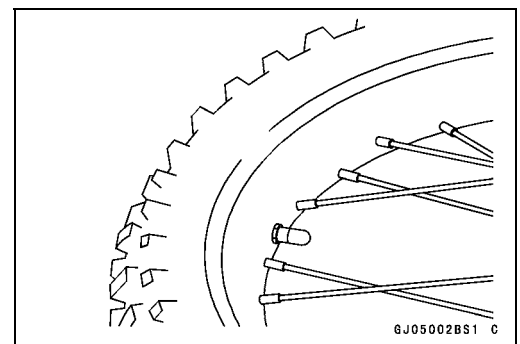
| Track Condition   | Tire Pressure                                     |
|---|---|
| When the track is wet, muddy, sandy or slippery, reduce the tire pressure to increase the tire tread surface on the ground.           | 80 kPa<br>(0.8 kgf/cm <sup>2</sup> , 11 psi)<br>↑ |
| When the track is pebbly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



**Tires 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 for replacement, inflated to the standard pressure.**

**NOTE**

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

**Standard Tire**

**Front:**

- Size:** 60/100-14 30M
- Make:** DUNLOP
- Type:** D755F, Tube (KX65-A1 ~ A6)  
D756F, Tube

**Rear:**

- Size:** 80/100-12 41M
- Make:** DUNLOP
- Type:** D755, Tube (KX65-A1 ~ A6)  
D756, Tube

## 8-10 WHEELS/TIRES

### Tires

#### Tire Removal

#### CAUTION

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

- Remove the wheel from the motorcycle (see Wheels Removal).
  - 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.
  - Remove the valve stem nut [C].
- When handling the rim, be careful not to damage the rim flanges.
- Remove the bead protector nut.
  - Lubricate the tire beads and rim flanges on both sides with a soap and water solution or rubber lubricant. This helps the tire beads slip off the rim flanges.

#### CAUTION

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

- Break the beads away from both sides of the rim with the bead breaker [A].

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

- Step on the side of the tire opposite valve stem, pry the tire off the rim with the tire iron [A] of the bead breaker protecting the rim with rim protectors [B].

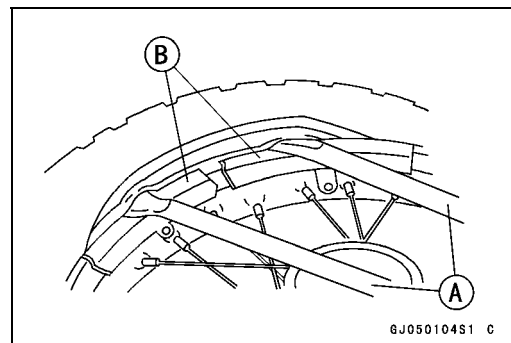
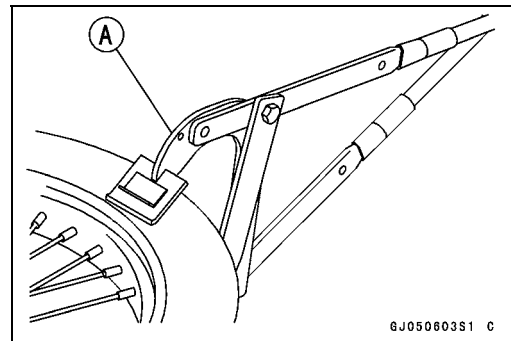
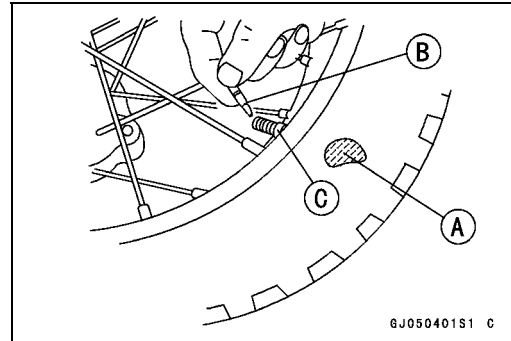
**Special Tools - Rim Protector: 57001-1063**

**Tire Iron Protection of the Bead Breaker Assembly: 57001-1072**

#### CAUTION

Take care not to insert the tire irons so deeply that the tube gets damaged.

- Remove the tube when one side of the tire is pried off.
- Pry the tire off the rim.



## Tires

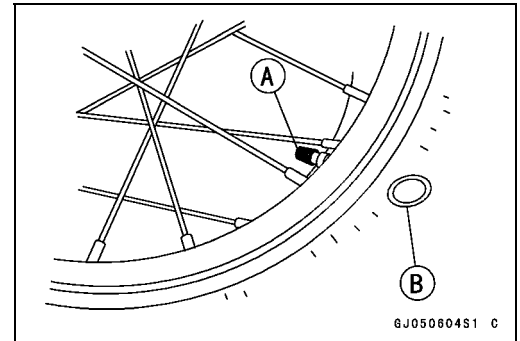
### *Tire Installation*

- 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 Tire 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.
- 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 and valve stem nut, and put on the valve cap.
- Check and adjust the air pressure after installing.



## 8-12 WHEELS/TIRES

### Hub Bearings

#### Hub Bearing Removal

- Remove the wheel (see Wheel Removal).

#### CAUTION

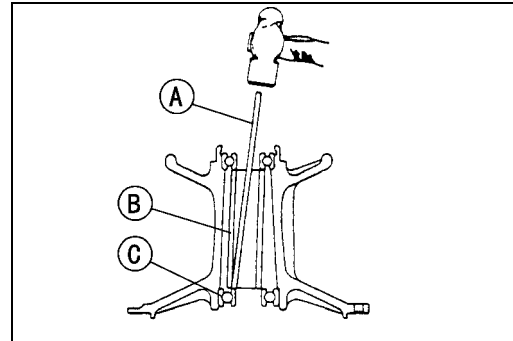
**Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.**

- Remove the oil seals and circlip.
- Remove the hub bearing by tapping evenly around the bearing inner race as shown.

[A] Bar

[B] Distance Collar

[C] Hub Bearing



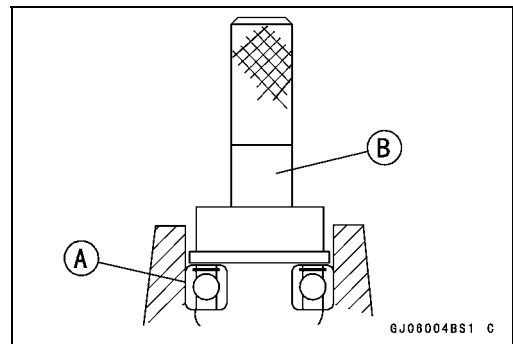
#### Hub Bearing Installation

- 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.

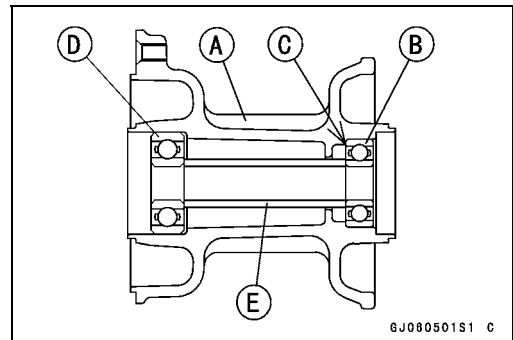
**Special Tool - Bearing Driver Set: 57001-1129**

#### NOTE

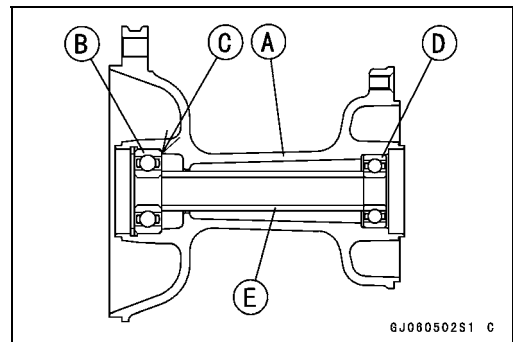
○Install the bearings so that the marked side, or the sealed side faces out.



- Press in the bearings as follows.
- When the bearings are installed in the front hub [A], press in the right side bearing [B] until it is bottomed against the step [C] of the hub. And press in the left side bearing [D] until it is bottomed against the collar [E].



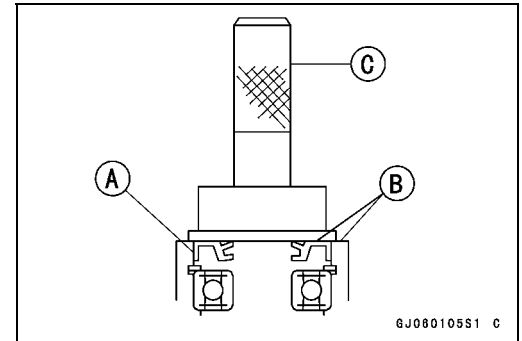
- When the bearings are installed in the rear hub [A], press in the left side bearing [B] until it is bottomed against the step [C] of the hub. And press in the right side bearing [D] until it is bottomed against the collar [E].



## Hub Bearings

- Replace the circlip and oil seals with new ones.
- Press in the oil seals [A] so that the seal surface is flush [B] with the end of the hole.
- Apply high temperature grease to the oil seal lips.

**Special Tool - Bearing Driver set: 57001-1129 [C]**  
**Inside Circlip Pliers: 57001-143**

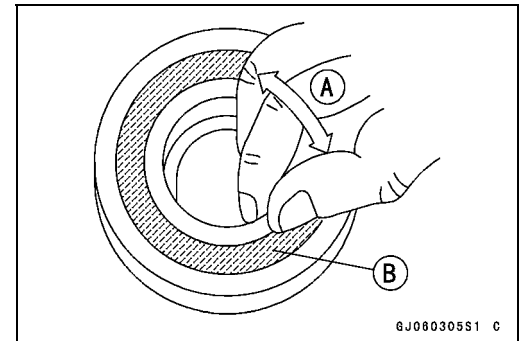


### Bearing Inspection

#### NOTE

○ *It is not necessary to remove any bearings for inspection. If any bearings are removed, they will need to be replaced with new ones.*

- Spin [A] it by hand to check its condition.
- ★ If it is noisy, does not spin smoothly, or has any rough spots, it must be replaced.
- Examine the bearing seal [B] for tears or leakage.
- ★ If the seal is torn or is leaking, replace the bearing.





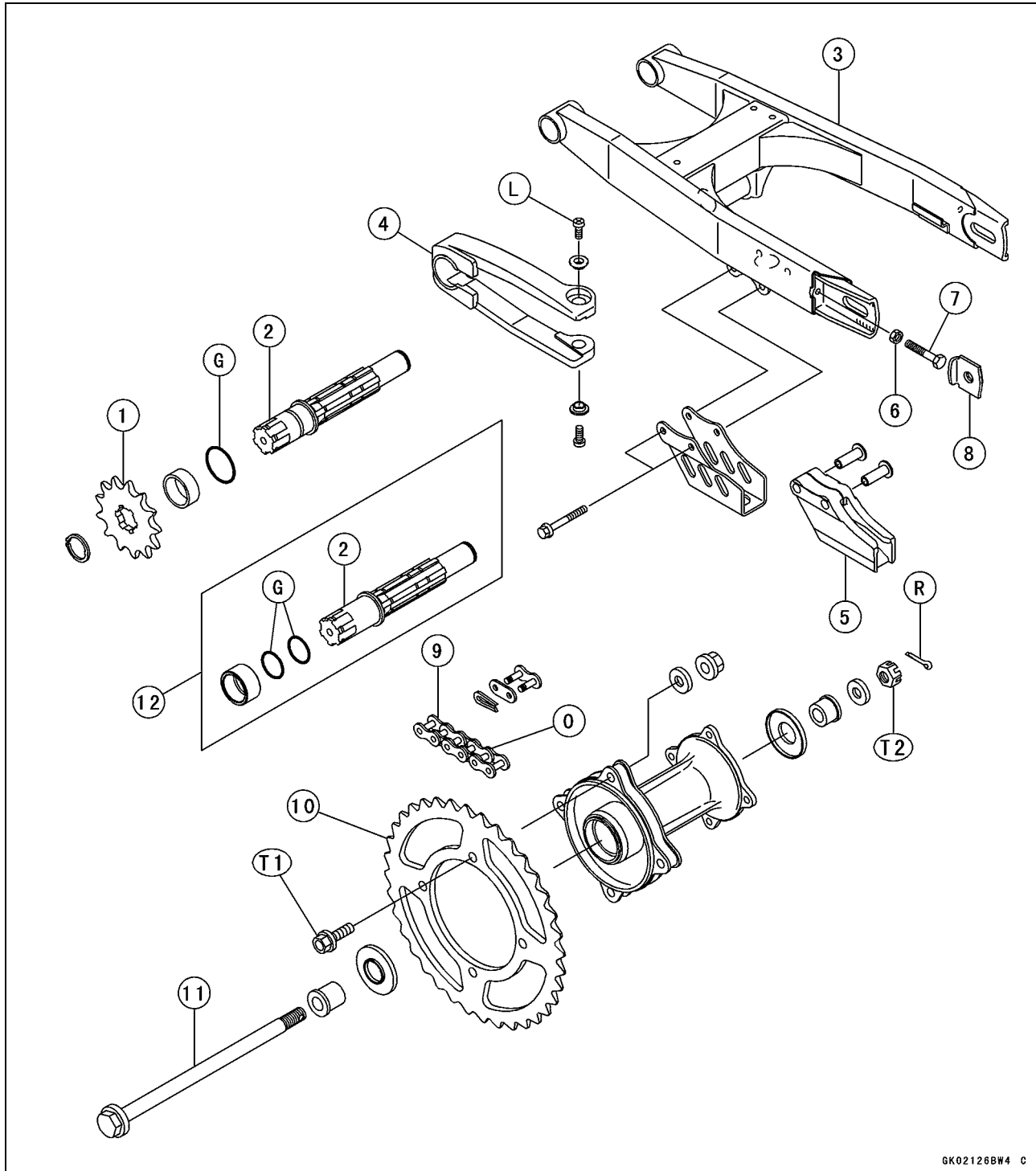
# Final Drive

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# 9-2 FINAL DRIVE

## Exploded View



GK02126BW4 C

- 1. Engine Sprocket
- 2. Output Shaft
- 3. Swingarm
- 4. Chain Slipper
- 5. Chain Guide
- 6. Locknut
- 7. Adjusting Bolt
- 8. Chain Adjuster
- 9. Drive Chain

- 10. Rear Sprocket
- 11. Rear Axle
- 12. KX65-A6, A6F ~
- T1: 26 N·m (2.7 kgf·m, 20 ft·lb)
- T2: 79 N·m (8.0 kgf·m, 58 ft·lb)
- G: Apply grease.
- L: Apply a non-permanent locking agent.
- O: Apply oil.
- R: Replacement Parts



## Specifications

| Item                     | Standard               | Service Limit |
|--------------------------|------------------------|---------------|
| <b>Drive Chain</b>       |                        |               |
| Chain Slack              | 44 ~ 54 mm             | ---           |
|                          | 45 ~ 55 mm (KX65-A3 ~) | ---           |
| Chain 20-link Length     | 254.0 ~ 254.6 mm       | 259 mm        |
| Standard Chain:          |                        |               |
| Make                     | DAIDO                  | ---           |
| Type                     | DID 420MBK1            | ---           |
| Length                   | 108 Links              | ---           |
|                          | 110 Links (KX65-A3 ~)  | ---           |
| <b>Sprocket</b>          |                        |               |
| Engine Sprocket Diameter | 44.70 ~ 44.90 mm/13T   | 44.0 mm       |
| Rear Sprocket Warp       | Under 0.4 mm           | 0.5 mm        |

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

**Jack: 57001-1238**

## 9-4 FINAL DRIVE

### Drive Chain

#### Drive Chain Slack Inspection

- Support the motorcycle on its stand.
- Check the wheel alignment (see Wheel Alignment Inspection), and adjust it if necessary (see Wheel Alignment Adjustment).

#### NOTE

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

- Rotate the rear wheel to find the position where the chain is tightest.
- Measure the space (chain slack) [A] between the chain and the swingarm at the rear of the chain slipper with the rear wheel raised off the ground.
- ★ If the drive chain slack exceeds the standard, adjust it.

#### Chain Slack

##### Standard:

|           |            |
|-----------|------------|
| KX65-A1 ~ | 44 ~ 54 mm |
| A2        |            |
| KX65-A3 ~ | 45 ~ 55 mm |

#### Drive Chain Slack Adjustment

- Loosen the left and right chain adjuster locknuts [A].
- Remove the cotter pin [B] and loosen the axle nut [C].
- ★ If the chain is too tight, back out the left and right chain adjusting bolts [D] evenly, and push the wheel forward until the chain is too loose.
- ★ If the chain is too loose, turn both chain adjusting bolts [D] evenly until the drive chain has the correct amount of slack. To keep the chain and wheel properly aligned, the rear end of the left chain adjuster should align with the same swingarm mark [E] as the rear end [F] of the right chain adjuster.

- Check the wheel alignment.
- Tighten both chain adjuster locknuts securely.
- Tighten the axle nut.

**Torque - Rear Axle Nut: 79 N·m (8.0 kgf·m, 58 ft·lb)**

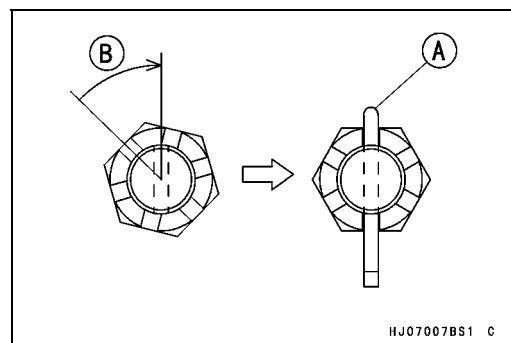
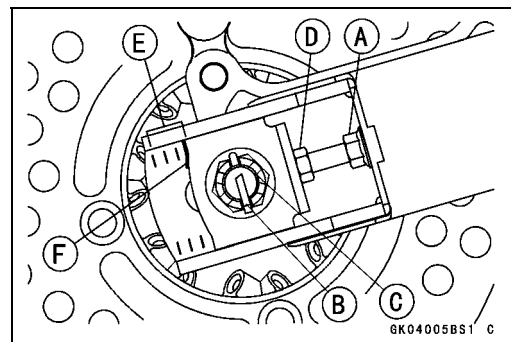
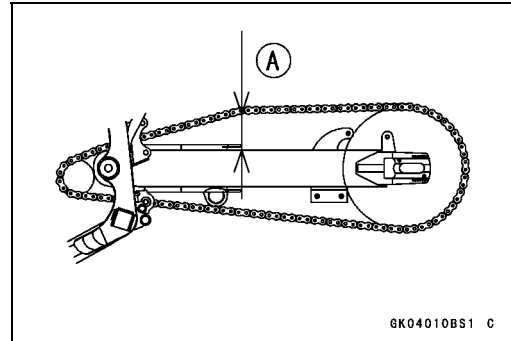
- Insert a new cotter pin [A].

#### NOTE

○ When inserting the cotter pin, if the slots in the nut do not align with the cotter pin hole in the axle, tighten the nut clockwise [B] up to next alignment.

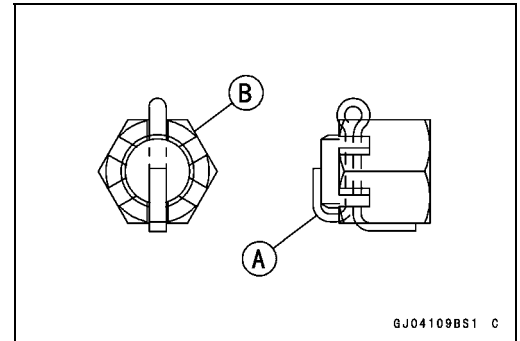
○ It should be within 30 degree.

○ Loosen once and tighten again when the slot goes past the nearest hole.



**Drive Chain**

- Bend the cotter pin [A] over the nut [B].



- Rotate the wheel, measure the chain slack again at the tightest position, and readjust if necessary.

**⚠ WARNING**

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

**NOTE**

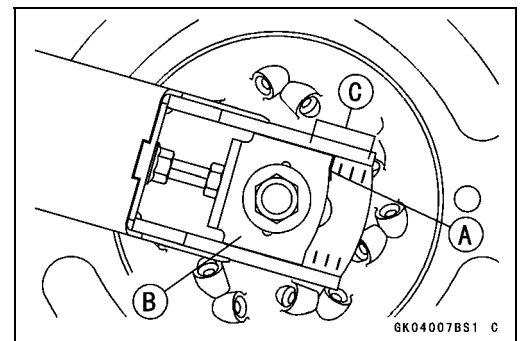
○ In wet and muddy conditions, mud sticks to the chain and sprockets resulting in an overly tight chain, and the chain may break. To prevent this, adjust the chain to 54 ~ 64 mm (KX65-A3 ~, 55 ~ 65 mm) of slack whenever necessary.

*Wheel Alignment Inspection*

- Check that the rear end [A] of the left chain adjuster [B] aligns with the same swingarm mark [C] as the right chain adjuster.

**NOTE**

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



**⚠ WARNING**

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

*Wheel Alignment Adjustment*

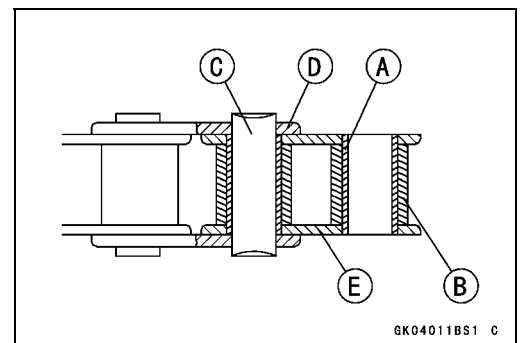
These procedures are the same as Drive Chain Slack Adjustment.

*Drive Chain Wear Inspection*

- Rotate the rear wheel to inspect the drive chain for damaged rollers, and loose pins and links.

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

- ★ If there is any irregularity, replace the drive chain.
- ★ Lubricate the drive chain if it appears dry.



## 9-6 FINAL DRIVE

### Drive Chain

- Stretch the chain taut by hanging a 98 N (10 kg, 20 lb) weight [A] on the chain.
- Measure the length of 20 links [B] on the straight part [C] of the chain from the pin center of the 1st pin to the pin center of the 21st pin. Since the chain may wear unevenly, take measurements at several places.

#### Chain 20-link Length

Standard: 254.0 ~ 254.6 mm

Service Limit: 259 mm

- ★ 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.

#### Standard Chain

Make: DAIDO

Type: DID 420MBK1

Link: 108 Links

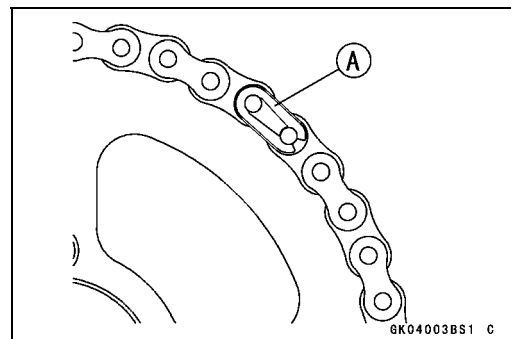
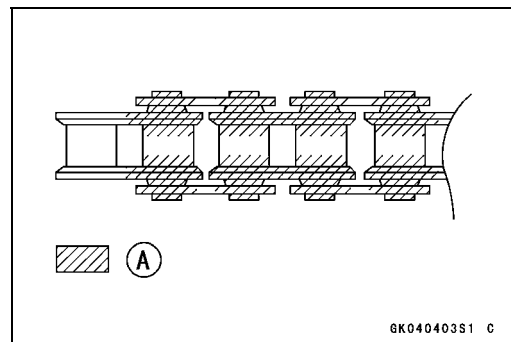
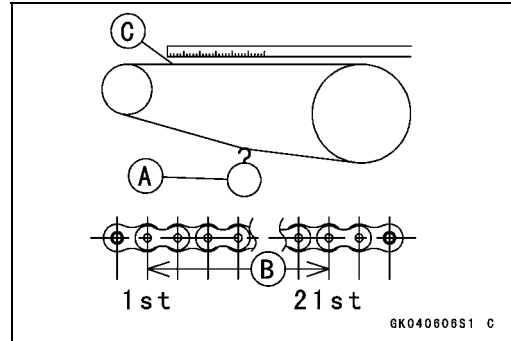
110 Links (KX65-A3 ~)

#### Drive Chain Lubrication

- If the chain appears especially dirty, it should be cleaned before lubrication with high flash-point solvent.
- If a special lubricant is not available, a heavy oil such as SAE90 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.  
Oil Applied Areas [A]
- Wipe off any excess oil.

#### Drive Chain Removal

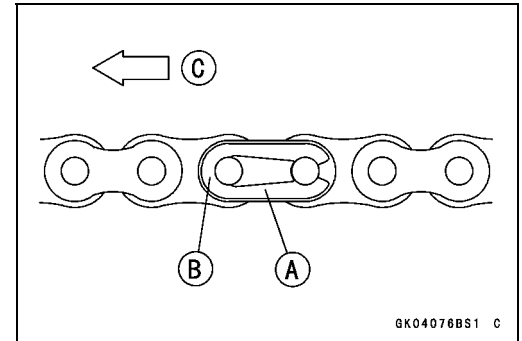
- Remove the engine sprocket cover.
- Remove the clip [A] from the master link using pliers, and free the drive chain from the rear sprocket.
- Remove the drive chain from the chassis.



## Drive Chain

### *Drive Chain Installation*

- Fit the drive chain back onto the sprockets with the ends at the rear sprocket.
- Install the master link from the frame side.
- Install the clip [A] so that the closed end of the "U" [B] points in the direction of chain rotation [C].
- Adjust the drive chain slack (see Drive Chain Slack Adjustment).
- Check the rear brake (see the Brakes chapter).



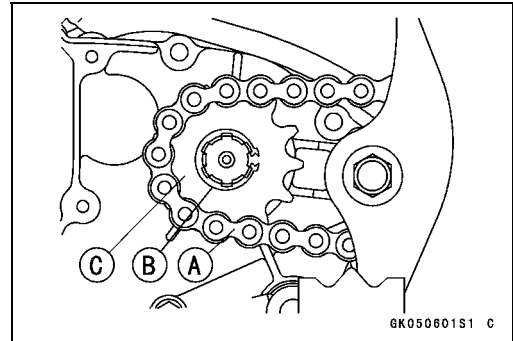
## 9-8 FINAL DRIVE

### Sprockets

#### Engine Sprocket Removal

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

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



#### Engine Sprocket Installation

- Replace the circlip with a new one.
- Install the circlip so that the tooth is aligned with a spline groove.

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

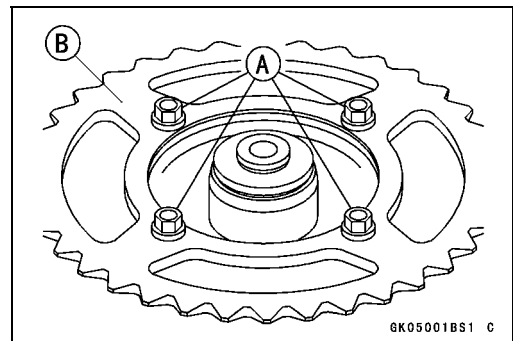
#### Rear Sprocket Removal

- 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.**

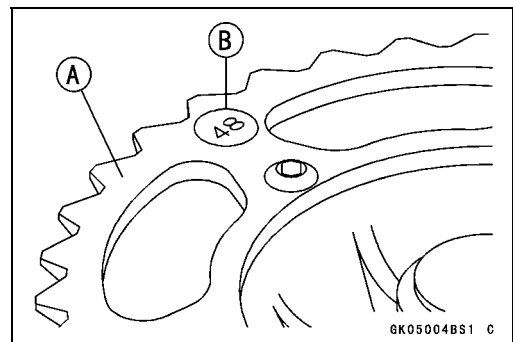
- Unscrew the rear sprocket bolts [A], and remove the rear sprocket [B].



#### Rear Sprocket Installation

- Install the rear sprocket [A] so that the marked side [B] faces out.
- Tighten the rear sprocket bolts.

**Torque - Rear Sprocket Bolts: 26 N·m (2.7 kgf·m, 20 ft·lb)**



#### Sprocket Wear Inspection

- Visually inspect the front 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).

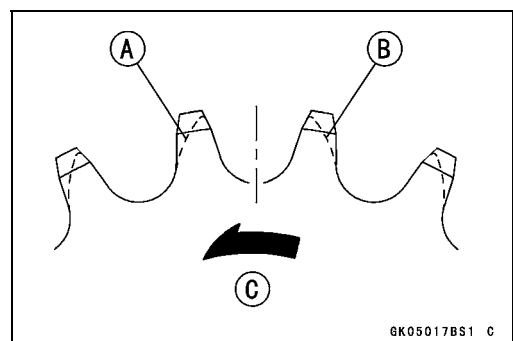
Worn Tooth (Engine Sprocket) [A]

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.

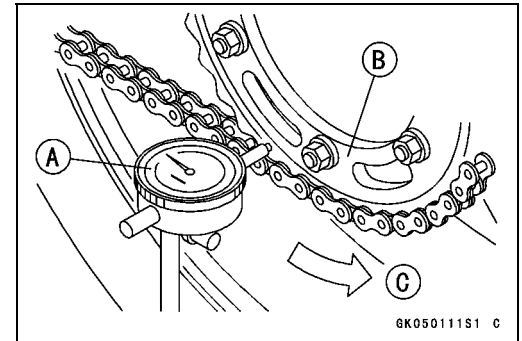
## Sprockets

### *Rear Sprocket Warp Inspection*

- Using the jack, raise the rear wheel off the ground.

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

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



### **Rear Sprocket Warp**

**Standard: Under 0.4 mm**

**Service Limit: 0.5 mm**





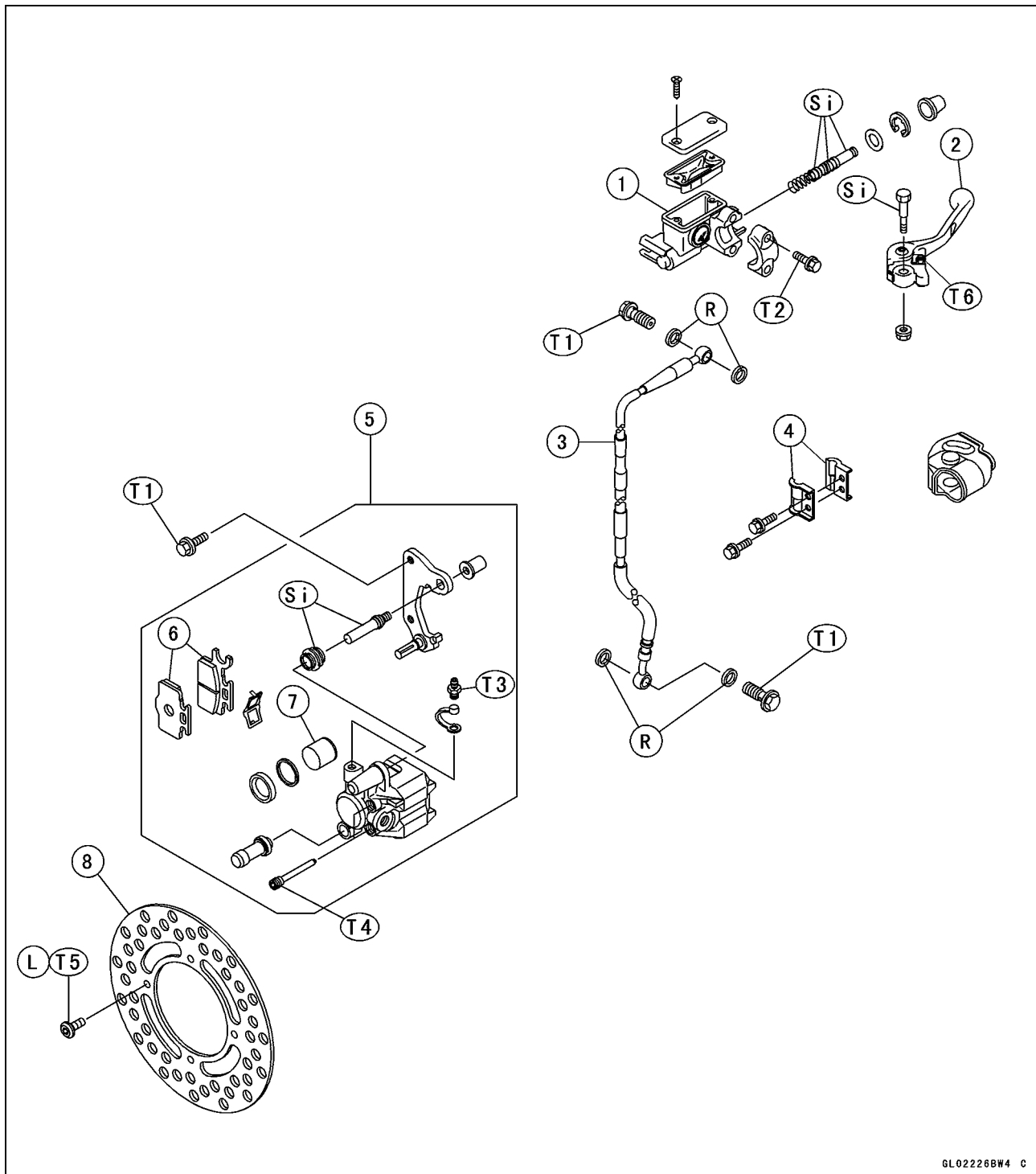
# Brakes

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# 10-2 BRAKES

## Exploded View

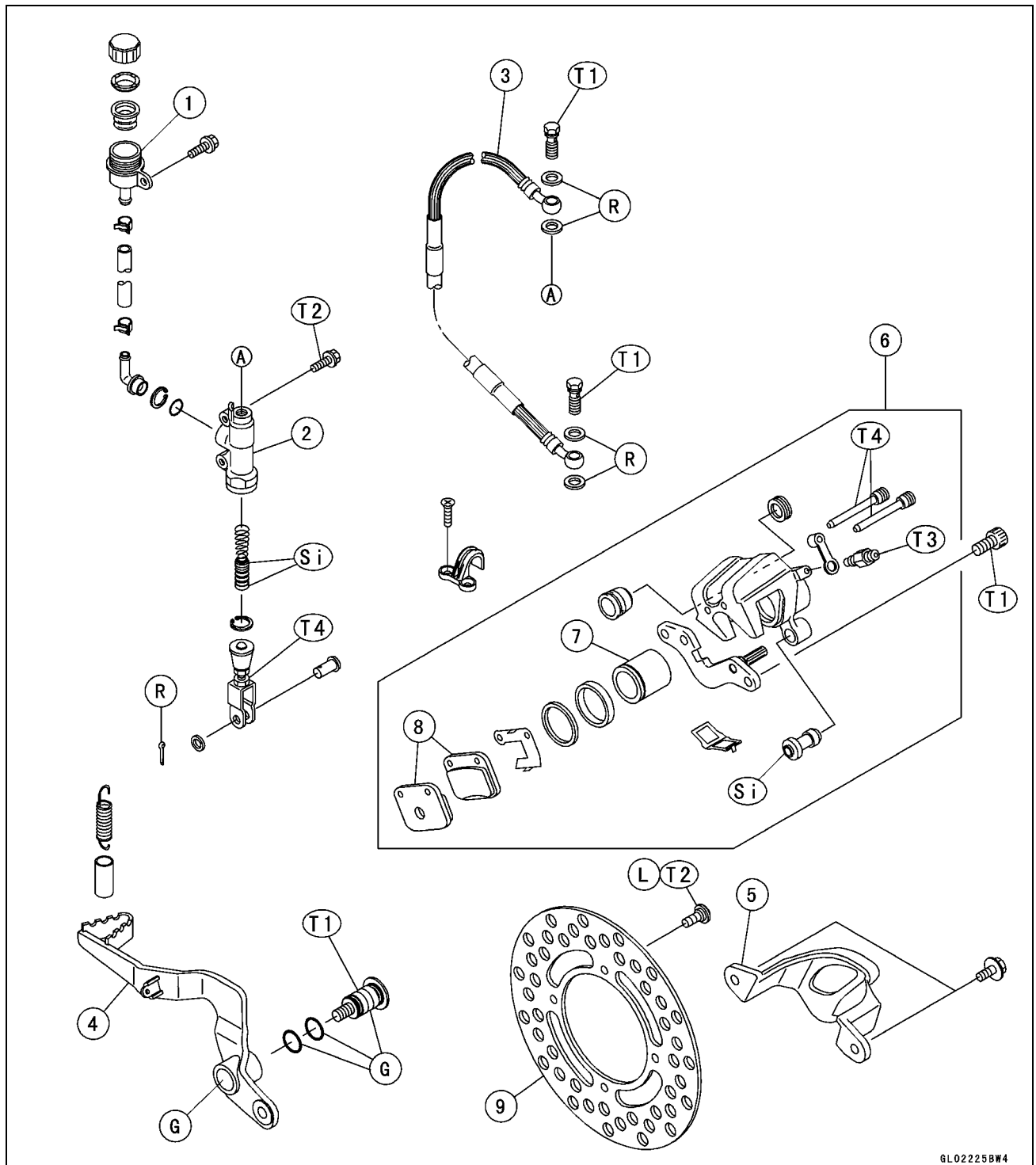


GL02226BW4 C

- 1. Front Brake Reservoir
  - 2. Brake Lever
  - 3. Brake Hose
  - 4. Clamps
  - 5. Front Caliper
  - 6. Brake Pad
  - 7. Piston
  - 8. Front Disc
- T1: 25 N·m (2.5 kgf·m, 18 ft·lb)

- T2: 8.8 N·m (0.90 kgf·m, 78 in·lb)
- T3: 7.8 N·m (0.80 kgf·m, 69 in·lb)
- T4: 18 N·m (1.8 kgf·m, 13 ft·lb)
- T5: 9.8 N·m (1.0 kgf·m, 87 in·lb)
- T6: 4.9 N·m (0.50 kgf·m, 43 in·lb)
- L: Apply a non-permanent locking agent.
- R: Replacement Parts
- Si: Apply Silicone grease.

## Exploded View



GL02225BW4

1. Rear Brake Reservoir
2. Rear Master Cylinder
3. Brake Hose
4. Brake Pedal
5. Rear Caliper Cover
6. Rear Caliper
7. Piston
8. Brake Pad
9. Rear Disc

- T1: 25 N·m (2.5 kgf·m, 18 ft·lb)  
 T2: 9.8 N·m (1.0 kgf·m, 87 in·lb)  
 T3: 7.8 N·m (0.80 kgf·m, 69 in·lb)  
 T4: 18 N·m (1.8 kgf·m, 13 ft·lb)  
 G: Apply high temperature 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><br>Lever Play                       | Adjustable (to suit rider)                                | — — —                      |
| <b>Brake Fluid</b><br>Recommended Disc Brake Fluid:<br>Type | DOT3 or DOT4  | — — —<br>— — —             |
| <b>Brake Pads</b><br>Lining Thickness:<br>Front<br>Rear     | 4.5 mm<br>4.5 mm  | 0.7 mm<br>0.7 mm           |
| <b>Brake Disc</b><br>Thickness:<br>Front<br>Rear<br>Runout  | 2.80 ~ 3.20 mm<br>2.80 ~ 3.20 mm<br>Not more than 0.15 mm | 2.5 mm<br>2.5 mm<br>0.3 mm |

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

**Jack: 57001-1238**

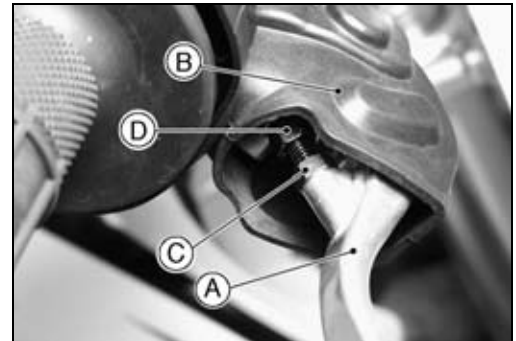
## Brake Lever, Brake Pedal

### Brake Lever Play Adjustment

- Adjust the front brake lever [A] to suit you.
- Slide the brake lever dust cover [B] out of place.
- Loosen the adjuster locknut [C] and turn the adjuster [D] to either side.
- After adjustment, tighten the locknut.

### ⚠ 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.



### Brake Pedal Position/Pedal Play 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: 80.5 mm**

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

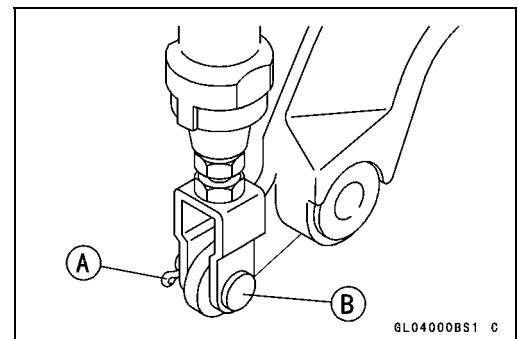
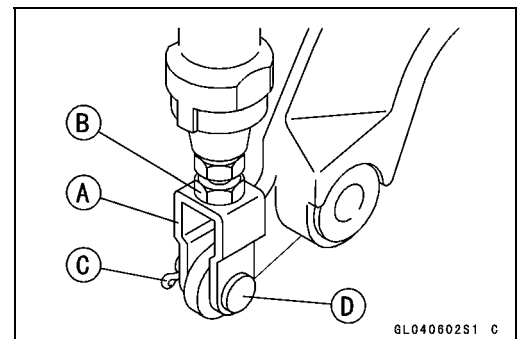
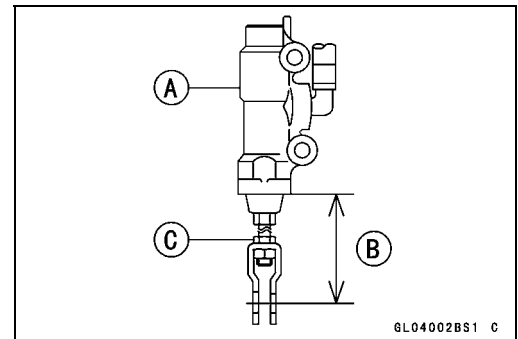
- Install the joint pin and new cotter pin.

### NOTE

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

### Brake Pedal Removal

- Remove:
  - Cotter Pin [A]
  - Joint Pin [B]
  - Washer

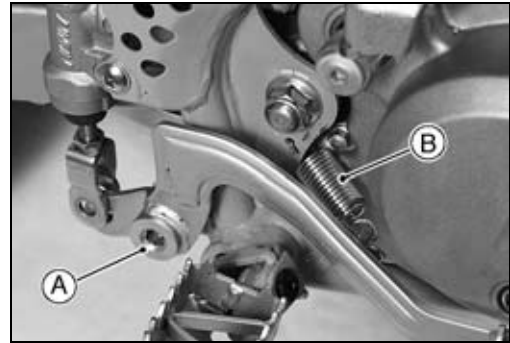


## 10-6 BRAKES

### Brake Lever, Brake Pedal

---

- Remove the brake pedal mounting bolt [A] and take off the brake pedal and return spring [B].



#### *Brake Pedal Installation*

- Check the pedal O-ring for signs of damage. If necessary, replace them with new one.
- Apply high temperature grease to the shaft portion of the brake pedal, and install the pedal with return spring onto the frame.

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

- Check the brake pedal position.
- Install the joint pin, washer and a new cotter pin.

---

**Brake Fluid**

---

**⚠ WARNING**

**When working with the disc brake, observe the precautions listed below.**

1. Never reuse old brake fluid.
2. Do not use fluid from a container that has been left unsealed or that has been open for a long time.
3. Do not mix two types and brands of fluid for use in the brake. This lowers the brake fluid boiling point and could cause the brake to be ineffective. It may also cause the rubber brake parts to deteriorate.
4. Don't leave the reservoir cap off for any length of time to avoid moisture contamination of the fluid.
5. Don't change the fluid in the rain or when a strong wind is blowing.
6. Except for the disc pads and disc, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol for cleaning 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.**

## 10-8 BRAKES

### Brake Fluid

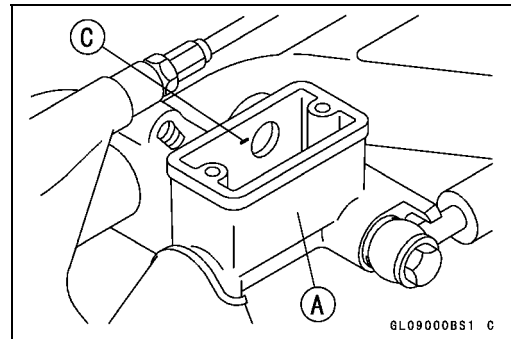
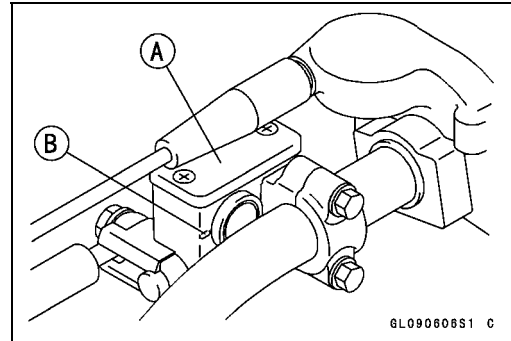
#### Fluid Level Inspection

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

- Check the brake fluid level in the front brake reservoir [A].

#### NOTE

- Hold the reservoir horizontal when checking brake fluid level.
- The front reservoir 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 stopped end showing the upper level line [C].



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



#### 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. Furthermore, the brake fluid should be changed to bleed the air quickly and completely whenever the brake line parts are removed.

#### ⚠ 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 brand of fluid thereafter. Mixing different types and brand 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.**

#### Recommended Disc Brake Fluid

Type: DOT3 or DOT4



## Brake Fluid

### NOTE

○The procedure to change the front brake fluid is as follows. Changing the rear brake fluid is the same as for the front brake.

- Level the brake fluid reservoir.
  - Remove the reservoir cap.
  - Remove the rubber cap [A] on the bleed valve [B].
  - Attach a clear plastic hose to the bleed valve on the caliper, and run the other end of the hose into a container.
- Change the brake fluid as follows:
- Repeat this operation until fresh brake fluid comes out from the plastic hose or the color of the fluid changes.
1. Open the bleed valve [A]
  2. Apply the brake and hold it [B]
  3. Close the bleed valve [C]
  4. Release the brake [D]
- Fill the reservoir with fresh specified brake fluid.

### NOTE

○The fluid level must be checked often during the changing operation and replenished with fresh brake fluid. If the fluid in the reservoir runs out any time during the changing operation, the brakes will need to be bled since air will have entered the brake line.

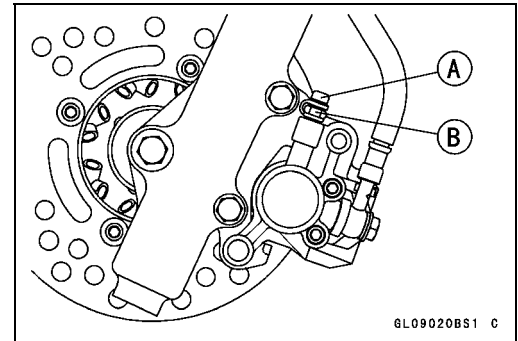
- Remove the clear plastic hose.
  - Tighten the bleed valves, and install the rubber cap.
- Torque - Caliper Bleed Valve: 7.8 N·m (0.8 kgf·m, 69 in·lb)**
- After changing the fluid, check the brake for good braking power, no brake drag, and no fluid leakage.
  - ★ If necessary, bleed the air from the lines.

### ⚠ WARNING

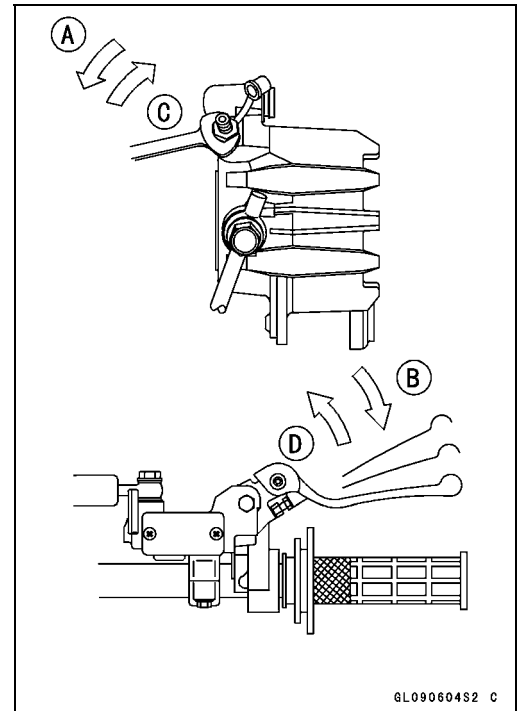
**Do not mix two brands of fluid. Change the brake fluid in the brake line completely if the brake fluid must be refilled but the type and brand of the brake fluid that is already in the reservoir are unidentified.**

### NOTE

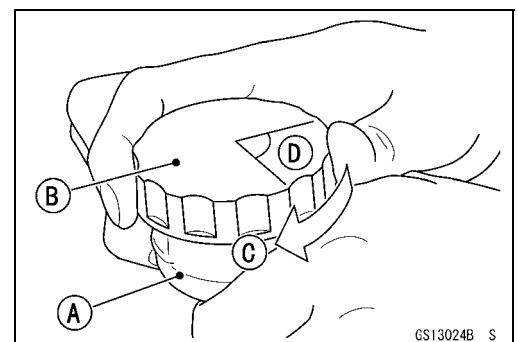
○Follow the procedure shown below to install the rear brake fluid reservoir cap correctly. First, tighten the rear brake reservoir cap [B] clockwise [C] by hand until slight resistance is felt indicating that the cap is seated on the reservoir body, then tighten the cap an additional 1/6 turn [D] while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



GL09020BS1 C



GL090604S2 C



CS13024B S

## 10-10 BRAKES

### Brake Fluid

#### Bleeding the Brake Line

The brake fluid has a very low compression coefficient so that almost all the movement of the brake lever or pedal is transmitted directly to the caliper for braking action. Air, however, is easily compressed. When air enters the brake lines, brake lever or pedal movement will be partially used in compressing the air. This will make the lever or pedal feel spongy, and there will be a loss in braking power.

#### **⚠ WARNING**

**Be sure to bleed the air from the brake whenever brake lever or pedal action feels soft or spongy, after the brake fluid is changed, or whenever a brake line fitting has been loosened for any reason.**

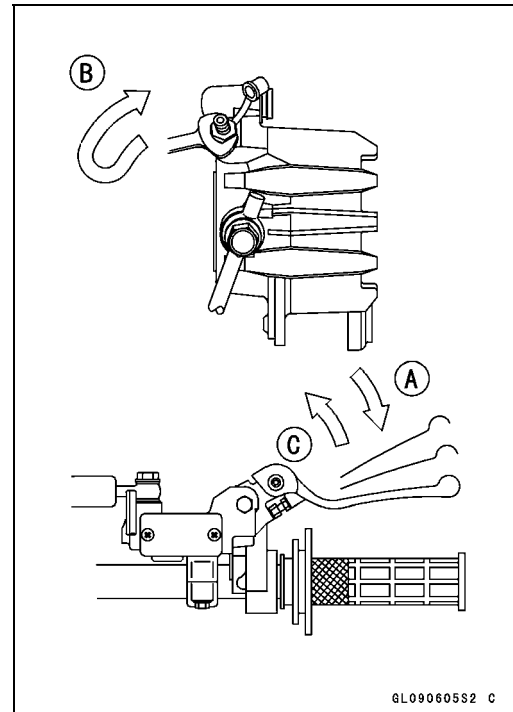
#### **NOTE**

○ *The procedure to bleed the front brake line is as follows. Bleeding the rear brake line is the same as for the front brake.*

- Remove the reservoir cap, and check that there is plenty of fluid in the reservoir.
- With the reservoir cap off, slowly pump the brake lever several times until no air bubbles can be seen rising up through the fluid from the holes at the bottom of the reservoir.
- Bleed the air completely from the master cylinder by this operation.
- Install the reservoir cap.
- Attach a clear plastic hose to the bleed valve on the caliper, and run the other end of the hose into a container.
- Bleed the brake line and the caliper as follows:
  - Repeat this operation until no more air can be seen coming out into the plastic hose.
    1. Pump the brake lever until it becomes hard, and apply the brake and hold it [A].
    2. Quickly open and close the bleed valve while holding the brake applied [B].
    3. Release the brake [C].

#### **NOTE**

- *The fluid level must be checked often during the bleeding operation and replenished with fresh brake fluid as necessary. If the fluid in the reservoir runs almost out any time during bleeding operation, the bleeding operation must be done over again from the beginning since air will have entered the line.*
- *Tap the brake hose lightly from the caliper to the reservoir for easier bleeding.*



---

## Brake Fluid

---

- Remove the clear plastic hose.
- Tighten the bleed valves, and install the rubber cap.  
**Torque - Caliper Bleed Valve: 7.8 N·m (0.8 kgf·m, 69 in·lb)**
- Check the fluid level.
- 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.**

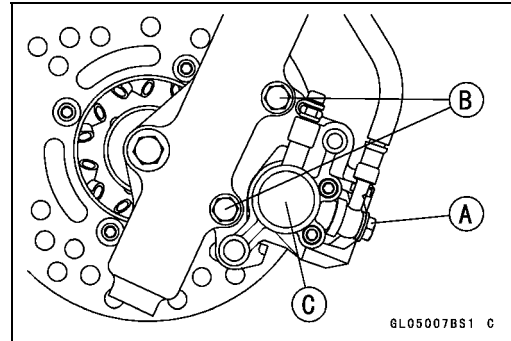
## 10-12 BRAKES

### Caliper

#### Caliper Removal

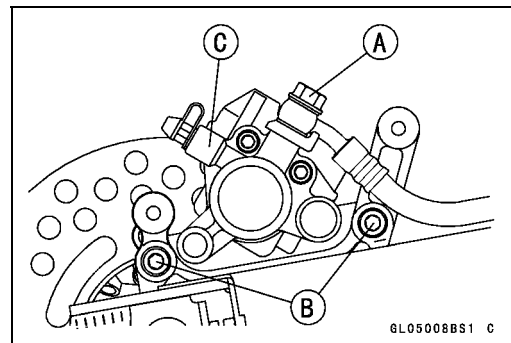
##### Front Brake

- Loosen the banjo bolt [A] so as not to spill brake fluid.
- Remove the caliper mounting bolts [B].
- Remove the banjo bolt and take off the brake hose from the caliper [C].
- 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 to remove the piston.



##### Rear Brake

- Unbolt the guard bolts and remove the rear caliper guard.
- Loosen the banjo bolt [A] so as not to spill brake fluid.
- Remove the caliper mounting bolts [B].
- Remove the banjo bolt and take off the brake hose from the caliper [C].
- 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 to remove the piston.



#### CAUTION

**Immediately wipe up any brake fluid that is spilled.**

#### Caliper Installation

- Tighten the brake pad bolts if they were removed.
  - Torque - Brake Pad Bolts: 18 N·m (1.8 kgf·m, 13 ft·lb)**
- Install the caliper, and the brake hose lower end.
  - Replace the washers that are on each side of hose fitting with new ones.
  - Install the brake hose lower end so that the white paint mark on it faces backward.
  - Torque - Caliper Mounting Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)**
  - Brake Hose Banjo Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)**
- Bleed the brake line (see Bleeding the Brake Line).
- Check the brake for good braking power, no brake drag, and no fluid leakage.

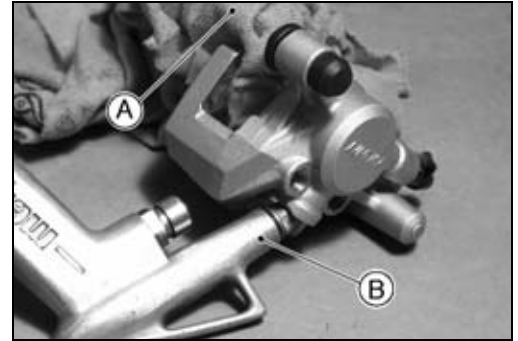
#### ⚠ WARNING

**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

### Caliper Disassembly

- Remove the front/rear caliper (see Caliper removal).
- Remove the pads and spring (see Pad Removal).
- Remove the caliper holder, shaft rubber friction boot and cover.
- Using compressed air, remove the piston(s).
- Cover the caliper opening with a clean, heavy cloth [A].
- Remove the piston(s) by lightly applying compressed air [B] to the hose joint opening.



### **⚠ 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(s) may crush your hand or fingers.**

### **NOTE**

- If the caliper is to be disassembled after removal and compressed air is not available, remove the piston(s) using the following three steps before disconnecting the brake hose from the caliper.
- Prepare a container for brake fluid, and perform the work above it.
- Remove the pads and spring (see Pad Removal).
- Pump the brake lever or pedal to remove the caliper piston(s).
- Remove the dust seal(s) and fluid seal(s).
- Remove the bleed valve and rubber cap.

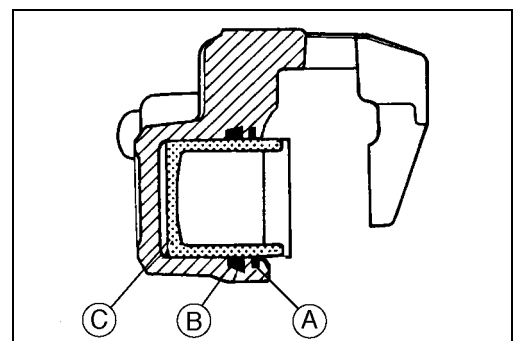
### Caliper Assembly

- Clean the caliper parts except for the pads.

### **CAUTION**

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

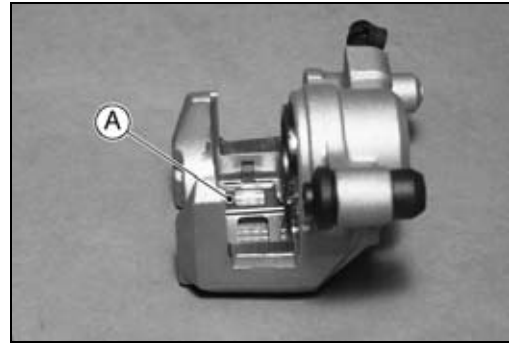
- Tighten the bleed valve with rubber cap.
- Torque - Caliper Bleed Valve: 7.8 N·m (0.8 kgf·m, 69 in·lb)**
- Replace the fluid seal which is removed with new one.
- Apply brake fluid to the fluid seal [B], and install it into the cylinder by hand.
- Replace the dust seal with new one if it is damaged.
- Apply brake fluid to the dust seal [A], and install it into the cylinder by hand.
- Apply brake fluid to the outside of the piston [C], and push it into the cylinder by hand.



## 10-14 BRAKES

### Caliper

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



- Replace the 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 (PBC is a special high temperature, water-resistant grease).
- Install the pads (see Pads Installation).
- Wipe up any spilled brake fluid on the caliper.

#### *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 overheat; (c) there is a large difference in left and right pad wear; (d) the seal is stuck to the piston. If the fluid seal is replaced, replace the dust seal as well. Also, replace all seals every other time the pads are changed.

#### *Dust Seal 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.

#### *Caliper Holder Shaft Wear Inspection*

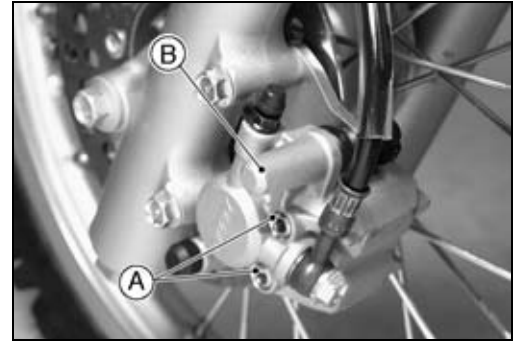
The caliper body must slide smoothly on the caliper holder shafts. If the body does not slide smoothly, one pad will wear more than the other, pad wear will increase, and constant drag on the disc will raise brake and brake fluid temperature.

- 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.

## Caliper

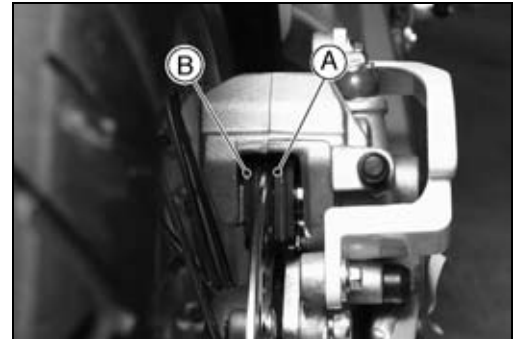
### Brake Pad Removal

- Loosen the pad bolts [A].
- Remove the caliper [B].
- Remove the pad bolts.
- Take out the piston side pad.
- Push the caliper holder toward the piston, and then remove another pad from the caliper holder.



### Brake Pad Installation

- Push the caliper pistons in by hand as far as they will go.
- Install the piston side pad [A] first, and then another pad [B].
- Tighten the brake pad bolt.
  - Torque - Brake Pad Bolts: 18 N·m (1.8 kgf·m, 13 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.

### Brake Pad Inspection

- Check the lining thickness and condition of the pads in each caliper.
- ★ If either pad is damaged, replace both pads in the caliper as a set.
- ★ If the lining thickness [A] of either pad is less than the service limit [B], replace both pads in the caliper as a set.

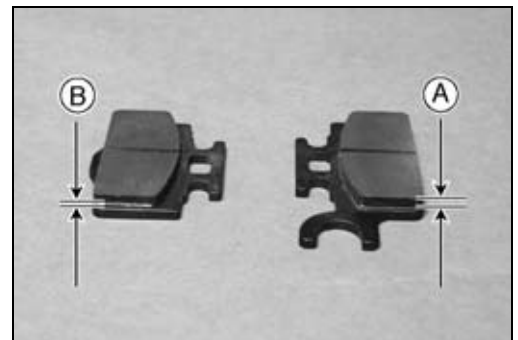
#### Lining Thickness

##### Standard:

|       |        |
|-------|--------|
| Front | 4.5 mm |
| Rear  | 4.5 mm |

##### Service Limit:

|       |        |
|-------|--------|
| Front | 0.7 mm |
| Rear  | 0.7 mm |



## 10-16 BRAKES

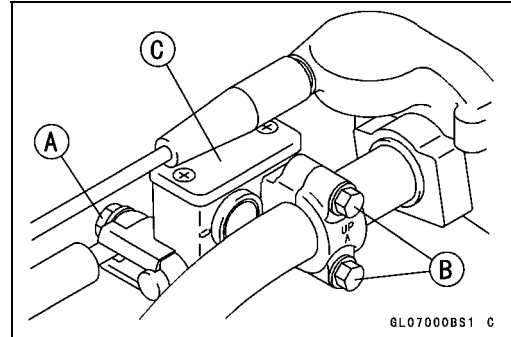
### Master Cylinder

#### CAUTION

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

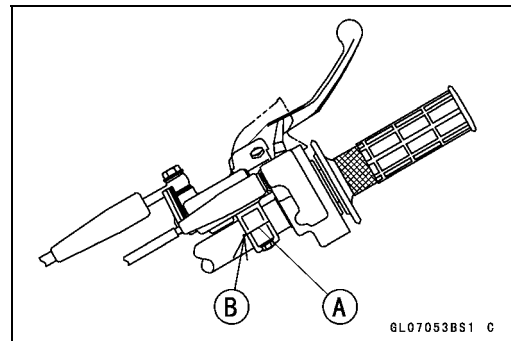
#### Front Master Cylinder Removal

- Remove the banjo bolt [A] to disconnect the upper brake hose from the master cylinder (see Brake Hose Removal/Installation).
- When removing the brake hose, temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.
- Unscrew the master cylinder clamp bolts [B], and take off the master cylinder [C] as an assembly with the reservoir and brake lever.



#### Front Master Cylinder Installation

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



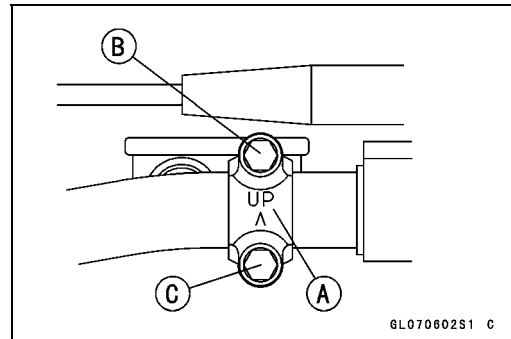
- The master cylinder clamp must be installed with the arrow mark [A] upward.
- Tighten the upper clamp bolt [B] first, and then the lower clamp bolt [C]. There will be a gap at the lower part of the clamp after tightening.

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

- Replace the washers that are on each side of hose fitting with new ones.
- Tighten the brake hose banjo bolt.

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

- Bleed the brake line (see Bleeding the Brake Line).
- Check the brake for good braking power, no brake drag, and no fluid leakage.





## Master Cylinder

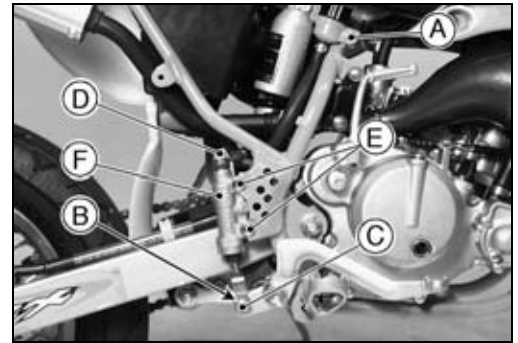
### Rear Master Cylinder Removal

- Remove the right side cover and the reservoir mounting bolt [A].
- Remove the cotter pin [B].
- Pull off the joint pin [C] with washer.

#### NOTE

○ Pull off the joint pin while pressing down the brake pedal.

- Unscrew the brake hose banjo bolt [D] (see Brake Hose Removal/Installation).
- When removing the brake hose, temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.
- Unscrew the master cylinder mounting bolts [E], and remove the master cylinder [F] with the reservoir.
- Remove the reservoir cap, and pour the brake fluid into a container.
- Remove the reservoir and its hose from the master cylinder.



### Rear Master Cylinder Installation

- Replace the cotter pin with a new one.
- Replace the washers on each side of hose fitting with new ones.
- Tighten the following:

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

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

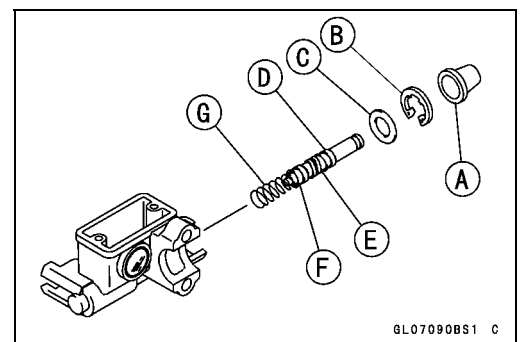
- Bleed the brake line (see Bleeding the Brake Line).
- Check the brake for good braking power, no brake drag, and no fluid leakage.
- Check the brake pedal position (master cylinder push rod length).

### Front Master Cylinder Disassembly

- Remove the front master cylinder.
- Remove the reservoir cap and diaphragm, and pour the brake fluid into a container.
- Unscrew the locknut and pivot bolt, and remove the brake lever.
- Push the dust cover [A] out of place, and remove the circlip [B].

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

- Remove the washer [C], pull out the piston [D], primary cup [F], and return spring [G].



GL07090BS1 C

#### CAUTION

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

## 10-18 BRAKES

### Master Cylinder

#### Rear Master Cylinder Disassembly

- Remove the rear master cylinder.
- Slide the dust cover [A] on the push rod [B] out of place, and remove the retainer [C].

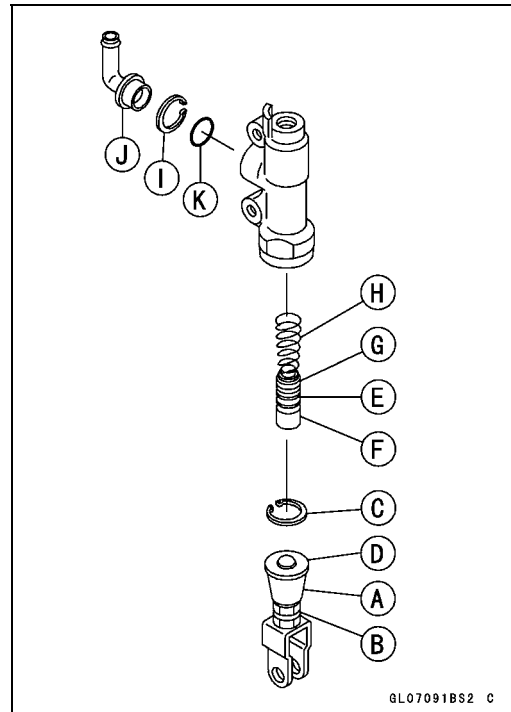
**Special Tool - Inside Circlip Pliers: 57001-143**

- Pull out the push rod with the piston stop [D].
- Take off the piston [E], primary cup [G], and return spring [H].

#### CAUTION

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

- Remove the circlip [I], and take off the connector [J] and O-ring [K].



#### Master Cylinder Assembly

- Before assembly, clean all parts including the master cylinder with brake fluid or alcohol.
- Apply brake fluid to the removed parts and to the inner wall of the cylinder.

#### CAUTION

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

- Take care not to scratch the piston or the inner wall of the cylinder.
- Tighten the brake lever pivot bolt and the locknut securely.

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

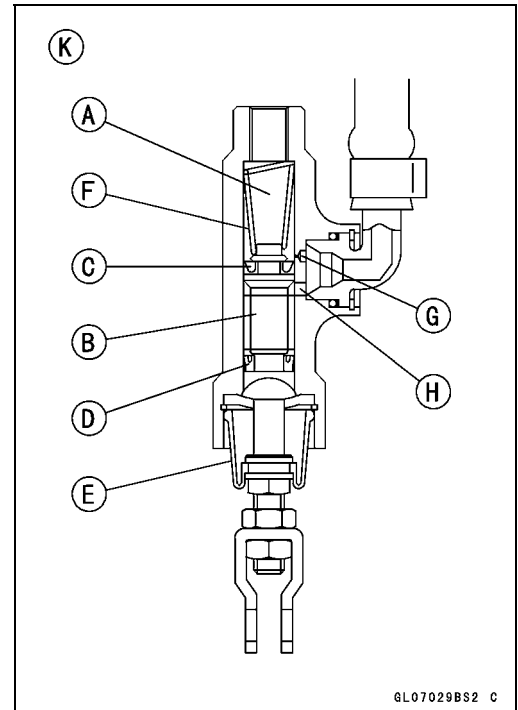
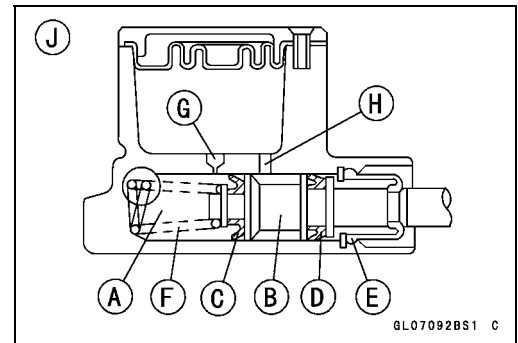
## Master Cylinder

### Master Cylinder Inspection (Visual Inspection)

- Disassemble the front and rear master cylinders.
- Check that there are no scratches, rust or pitting on the inner wall of each master cylinder [A] and on the outside of each piston [B].
- ★ If a master cylinder or piston shows any damage, replace them.
- Inspect the primary [C] and secondary [D] cups.
- ★ If a cup is worn, damaged, softened (rotted), or swollen, the piston assembly should be replaced to renew the cups.
- ★ If fluid leakage is noted at the brake lever, the piston assembly should be replaced to renew the cup.
- Check the dust covers [E] for damage.
- ★ If they are damaged, replace them.
- Check that the relief [G] and supply [H] ports are not plugged.
- ★ If the small relief port becomes plugged, the brake pads will drag on the disc. Blow the ports clean with compressed air.
- Check the piston return springs [F] for any damage.
- ★ If a spring is damaged, replace it.

[J] Front Master Cylinder

[K] Rear Master Cylinder



# 10-20 BRAKES

## Brake Disk

### Brake Disc Inspection

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

#### Thickness

##### Standard:

Front            2.80 ~ 3.20 mm

Rear             2.80 ~ 3.20 mm

##### Service Limit:

Front            2.5 mm

Rear             2.5 mm

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

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

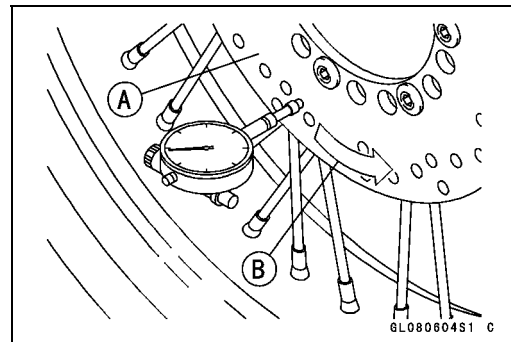
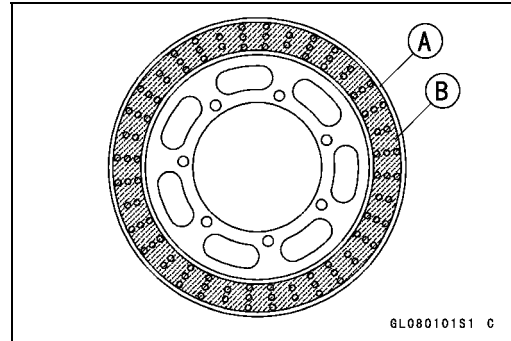
#### Special Tool - Jack: 57001-1238

- Set up a dial gauge against the disc [A] as illustrated.
- For the front disc, turn the handlebar fully to one side.
- Measure the disc runout while rotating the wheel slowly [B].
- ★ If the runout exceeds the service limit, replace the disc.

#### Runout

Standard:        Not more than 0.15 mm

Service Limit:  0.3 mm



## Brake Hose

### Brake Hose Removal/Installation

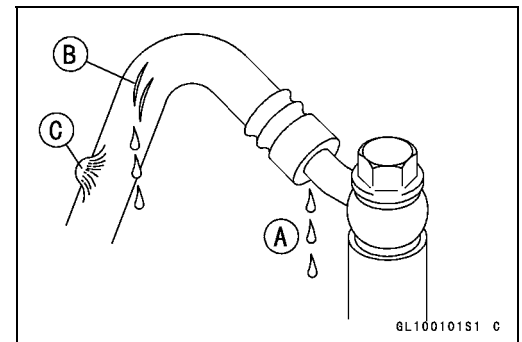
#### CAUTION

**Brake fluid quickly ruins painted or plastic surfaces; any spilled fluid should be completely wiped up immediately with watered cloth.**

- 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.
- There are washers 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.
- Torque the banjo bolts at the hose fittings.  
**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).

### Brake Hose 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





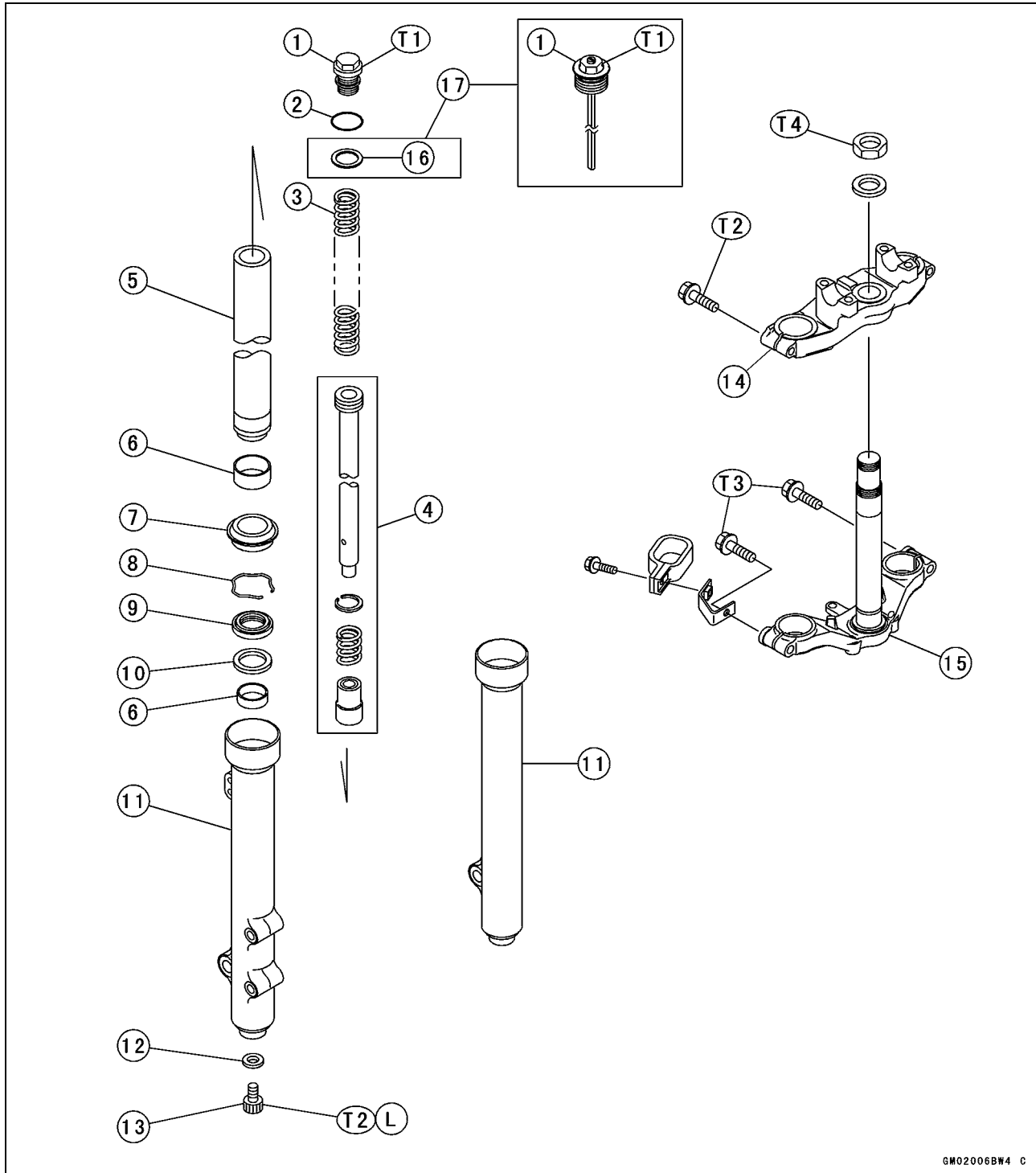
# Suspension

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# 11-2 SUSPENSION

## Exploded View





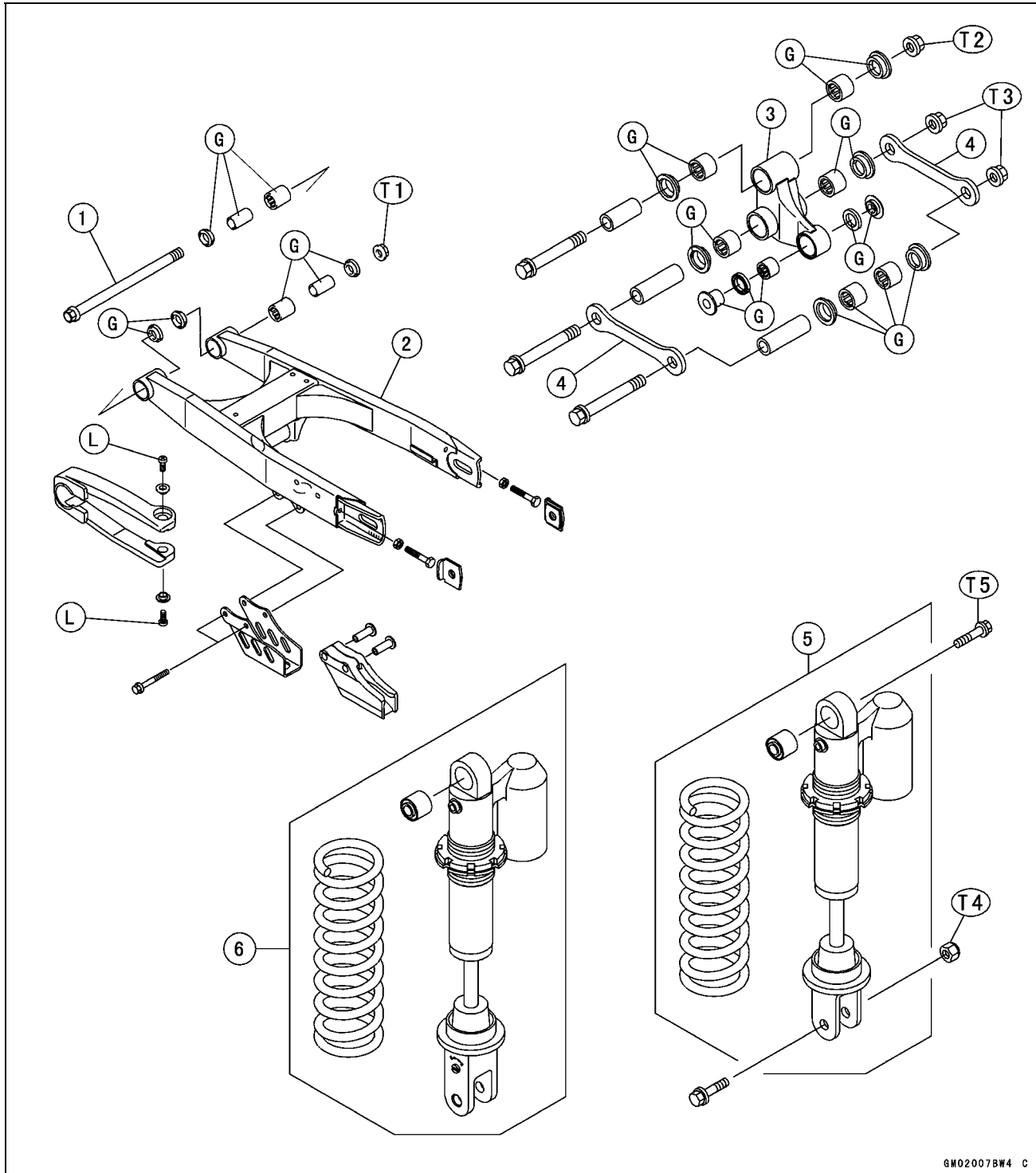
### Exploded View

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1. Top Plug
  2. O-ring
  3. Fork Spring
  4. Piston Cylinder Unit
  5. Inner Tube
  6. Guide Bushes
  7. Dust Seal
  8. Retaining Ring
  9. Oil Seal
  10. Washer
  11. Outer Tube
  12. Gasket
  13. Allen Bolt
  14. Steering Stem Head
  15. Steering Stem
  16. Spring Seat
  17. KX65-A3 ~
- T1: 22 N·m (2.2 kgf·m, 16 ft·lb)  
T2: 20 N·m (2.0 kgf·m, 14 ft·lb)  
T3: 29 N·m (3.0 kgf·m, 22 ft·lb)  
T4: 44 N·m (4.5 kgf·m, 33 ft·lb)  
L: Apply a non-permanent locking agent.

# 11-4 SUSPENSION

## Exploded View



### Exploded View

---

1. Pivot Shaft
  2. Swingarm
  3. Rocker Arm
  4. Tie-rod
  5. Rear Shock Absorber
  6. Rear Shock Absorber (KX65-A3 ~)
- T1: 69 N·m (7.0 kgf·m, 51 ft·lb)  
T2: 83 N·m (8.5 kgf·m, 61 ft·lb)  
T3: 59 N·m (6.0 kgf·m, 43 ft·lb)  
T4: 34 N·m (3.5 kgf·m, 25 ft·lb)  
T5: 39 N·m (4.0 kgf·m, 29 ft·lb)
- G: Apply grease.  
L: Apply a non-permanent locking agent.

## 11-6 SUSPENSION

### Specifications

| Item  | Standard  | Service Limit           |
|---|---|-------------------------|
| <b>Front Fork</b>   |   |                         |
| Oil   | SHOWA SS-8 or equivalent                          | — — —                   |
| Oil Capacity (Completely Dry)   | 238 ±2.5 mL (KX65-A1)                             | — — —                   |
|   | 240 ±2.5 mL (KX65-A2)                             | — — —                   |
|   | 252 ±2.5 mL (KX65-A3 ~)                           | — — —                   |
| Oil Level (Fully Compressed,<br>Spring Removed)   | 124 ±2 mm (KX65-A1)<br>(from top of inner tube)   | 98 ~ 140 mm (KX65-A1)   |
|   | 126 ±2 mm (KX65-A2)<br>(from top of inner tube)   | 96 ~ 139 mm (KX65-A2)   |
|   | 132 ±2 mm (KX65-A3 ~)<br>(from top of inner tube) | 98 ~ 142 mm (KX65-A3 ~) |
| Fork Spring Free Length   | 455.7 mm (KX65-A1)                                | 446.6 mm (KX65-A1)      |
|   | 470.7 mm (KX65-A2)                                | 461.3 mm (KX65-A2)      |
|   | 497.1 mm (KX65-A3 ~)                              | 487.2 mm (KX65-A3 ~)    |
| <b>Rear Suspension (Uni-Trak)</b>   |   |                         |
| <b>Rear Shock Absorber</b>  |   | (Adjustable Range)      |
| Spring Preload Adjustment<br>(Adjusting nut position from the<br>center of the upper mounting hole) | 88.8 mm (KX65-A1)                                 | 82.8 ~ 94.8 mm          |
|   | 86.6 mm (KX65-A2)                                 |                         |
|   | 79.6 mm (KX65-A3 ~)                               | 75.6 ~ 83.6 mm          |
| Rear Shock Spring Free Length   | 206.1 mm  | 202.0 mm                |
|   | 211.1 mm (KX65-A3 ~)                              | 206.9 mm (KX65-A3 ~)    |
| <b>Gas Reservoir</b>  |   |                         |
| Gas Pressure  | 980 kPa (10 kgf/cm <sup>2</sup> , 142 psi)        | — — —                   |
| <b>Tie-rod, Rocker Arm</b>  |   |                         |
| Sleeve Outside Diameter   | 17.989 ~ 18.000 mm                                | 17.96 mm                |
| Rocker Arm Mounting Bolt Runout   | under 0.1 mm                                      | 0.2 mm                  |

**Special Tools - Fork Cylinder Holder Handle: 57001-183**  
**Fork Cylinder Holder Adapter: 57001-1011**  
**Oil Seal & Bearing Remover: 57001-1058**  
**Hook Wrench: 57001-1101**  
**Bearing Driver Set: 57001-1129**  
**Fork Outer Tube Weight: 57001-1218**  
**Fork Oil Seal Driver: 57001-1219**  
**Jack: 57001-1238**  
**Fork Oil Level Gauge: 57001-1290**

## Front Fork

The front fork should always be adjusted for the rider's weight and track conditions by using one or more of the following methods.

- Oil level adjustment - The effects of higher or lower fork oil level are only felt during the final 100 mm of fork travel. A higher oil level (more oil) will make the fork repulsion more large. A lower oil level (less oil) will make the fork repulsion more small.
- Fork springs - Optional springs are available that are softer and stiffer than standard.
- Fork clamp position - Steering qualities are greatly affected by the fork clamp position. 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 the change in weight bias. Also, it tends to understeer in turns and "wash out". When the height is greater, the results are opposite.

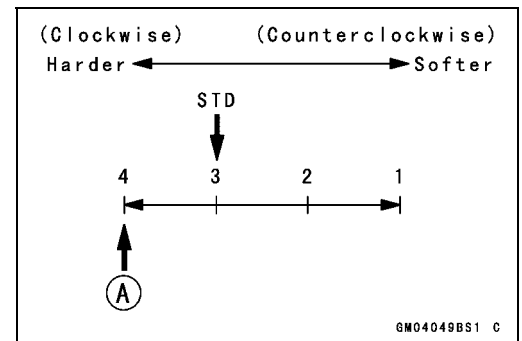
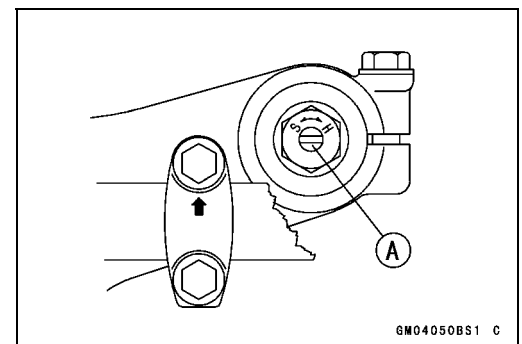
### Rebound Damping Adjustment (KX65-A3 ~)

- To adjust rebound damping, turn the adjuster [A] on the front fork top plugs with the blade of a screwdriver until you feel a click. Adjust the rebound damping to suit you preference under special condition.

|   |
|---|
| <b>CAUTION</b>  |
| <b>The left and right fork legs must have the same shock damping.</b> |

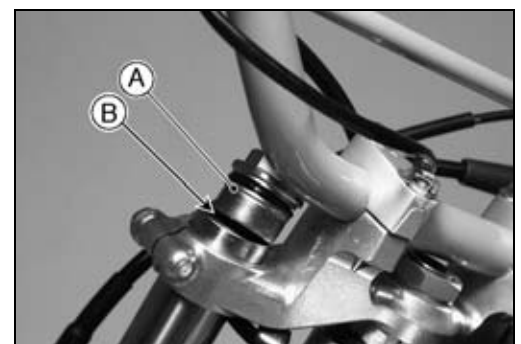
Seated positions: adjuster turned fully clockwise [A].

**Rebound Damping Adjuster Setting**  
**Standard: 3 clicks**



### Fork Oil Level Adjustment (Simplify)

- Raise the front wheel off the ground using a jack.
- Special Tool - Jack: 57001-1238**
- Remove the number plate.
- Remove the front fork top plugs [A] and the fork spring [B].

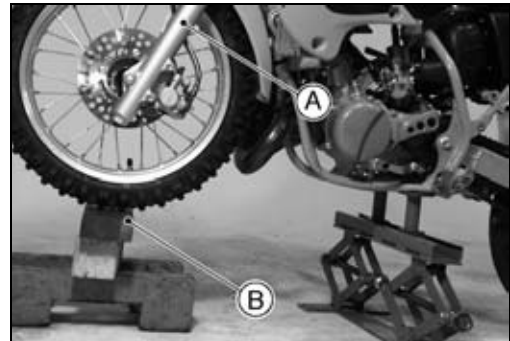
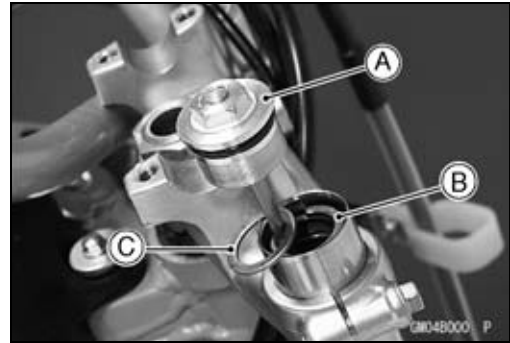


## 11-8 SUSPENSION

### Front Fork

#### KX65-A3 ~

- Remove:
  - Number Plate
  - Handlebar Assembly
  - Front Fork Top Plug [A]
  - Fork Spring [B]
  - Fork Spring Seat [C]
- Slowly compress the front fork fully by pushing up the outer tubes [A] using a jack or other suitable means under the front wheel.
- Place a stand or other suitable support [B] under the front wheel.



- Use the oil level gauge to measure the fork oil level.
  - With the fork fully compressed, put the oil level gauge [A] and the stopper [B], and adjust the distance from the top of the inner tube to oil.

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

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

|           |                       |
|-----------|-----------------------|
| Standard: | 124 ±2 mm (KX65-A1)   |
|           | 126 ±2 mm (KX65-A2)   |
|           | 132 ±2 mm (KX65-A3 ~) |

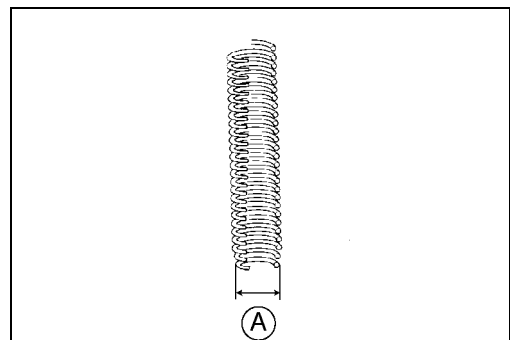
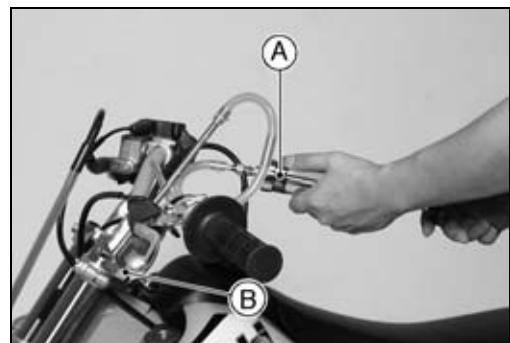
|                   |                         |
|-------------------|-------------------------|
| Adjustable Range: | 98 ~ 140 mm (KX65-A1)   |
|                   | 96 ~ 139 mm (KX65-A2)   |
|                   | 98 ~ 142 mm (KX65-A3 ~) |

- ★ If no oil is drawn out, there is insufficient oil in the fork tube. Pour in enough oil, then pump out the excess oil.

#### Fork Oil:

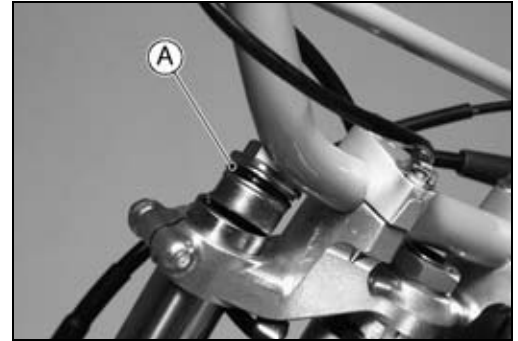
**SHOWA SS-8 or equivalent**

- Measure the both diameters of the fork spring ends and insert the fork spring with the small diameter end [A] facing down.



## Front Fork

- Check both top plug O-ring [A] for damage and replace them if necessary.



- Install the fork top plug.
- Install the fork top plug and fork spring seat (KX65-A3 ~).
- Tighten the fork top plug.

**Torque - Front Fork Top Plug: 22 N·m (2.2 kgf·m, 16 ft·lb)**

- Assemble the other fork tube in the same way as described above.
- Install the parts removed.
- Install the handlebar assembly (see Steering). :  
KX65-A3 ~

### *Oil Change/Oil Level Adjustment (each fork leg)*

- Remove the front fork (see this chapter).
- Remove the following.
  - Top Plug
  - Fork Spring
  - Fork Spring Seat (KX65-A3 ~)

### **⚠ WARNING**

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

- Hold the fork tube upside down over a clean container and pump it to drain the oil.
- Fill the front fork to the top with specified oil.

#### **Recommended Oil**

**SHOWA SS-8 or equivalent**

#### **Front Fork Oil Capacity (completely dry)**

**238 ±2.5 mL (KX65-A1)**

**240 ±2.5 mL (KX65-A2)**

**252 ±2.5 mL (KX65-A3 ~)**

# 11-10 SUSPENSION

## Front Fork

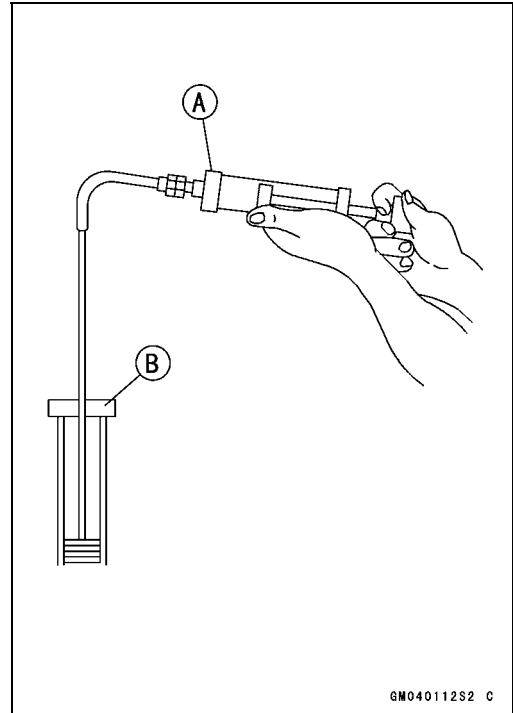
- Adjust the oil level.
- With the fork fully compressed, put the oil level gauge [A] and the stopper [B], and inspect the distance from the top of the inner tube to the oil.

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

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

|                          |                                |
|--------------------------|--------------------------------|
| <b>Standard:</b>         | <b>124 ±2 mm (KX65-A1)</b>     |
|                          | <b>126 ±2 mm (KX65-A2)</b>     |
|                          | <b>132 ±2 mm (KX65-A3 ~)</b>   |
| <b>Adjustable Range:</b> | <b>98 ~ 140 mm (KX65-A1)</b>   |
|                          | <b>96 ~ 139 mm (KX65-A2)</b>   |
|                          | <b>98 ~ 142 mm (KX65-A3 ~)</b> |

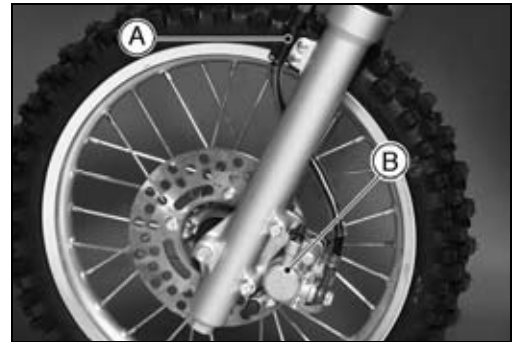
- ★ If no oil is drawn out, there is insufficient oil in the fork tube. Pour in enough oil, then drawn out the excess oil.
- Install the parts removed (see Front Fork Assembly)



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### Front Fork Removal

- Remove the front brake hose clamps [A].
  - Remove the caliper [B] from the fork leg to be removed, and rest the caliper on some kind of stand so that it doesn't dangle.
  - Remove the front wheel (see Wheels/Tires chapter).
- 
- Remove the number plate.
  - Loosen the upper and lower fork clamp bolts [A].
  - With a twisting motion, work the fork leg down and out.

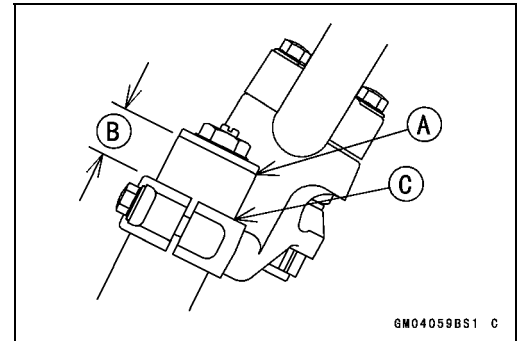




## Front Fork

### Front Fork Installation

- If the fork leg was disassembled, check the fork oil level.
- Install the fork so that the top end [A] of the inner tube is 10 mm up [B] with the upper surface [C] of the steering stem head.
- Install the fork so that the top end [A] of the inner tube is 20 mm up [B] with the upper surface [C] of the steering stem head (KX65-A3 ~).
- Route the cables and hose according to the Cable, Wire and Hose Routing section in the General Information chapter.
- Install the front wheel (see Wheels/Tires chapter).
- Tighten the following:
  - Torque - Front Fork Clamp Bolts (Upper): 20 N·m (2.0 kgf·m, 14 ft·lb)**
  - Front Fork Clamp Bolts (Lower): 29 N·m (3.0 kgf·m, 22 ft·lb)**
  - Caliper Mounting Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)**
- Check the front brake operation after installation.

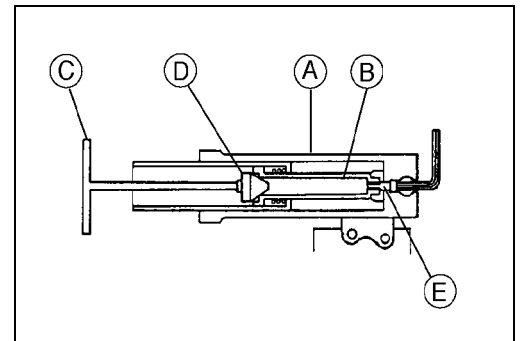


### Front Fork Disassembly (each fork)

- Remove the front fork (see this chapter).
- Remove the top plug and the fork spring.
- Drain the fork oil with the fork upside down (see Fork Oil Change)
- Hold the outer tube [A] in a vise.
- Stop the cylinder [B] from turning by using the front fork cylinder holder.

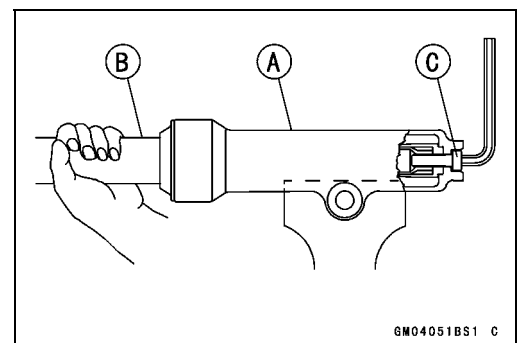
**Special Tools - Fork Cylinder Holder Handle: 57001-183 [C]**  
**Fork Cylinder Holder Adapter: 57001-1011 [D]**

- Unscrew the Allen bolt [E], then take the bolt and gasket out of the bottom of the outer tube.



### KX65-A3 ~

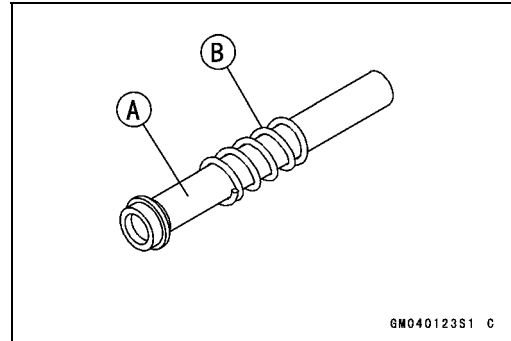
- Loosen the top plug.
- Remove the front fork (see this chapter).
- Hold the outer tube [A] in a vise.
- Hold of the inner tube [B] and loosen the Allen bolt [C].
- Remove the top plug, the fork spring seat and fork spring (see Fork Oil Level Adjustment).
- Drain the fork oil with the fork upside down (see Fork Oil Change)
- Take out the Allen bolt [C] and gasket.



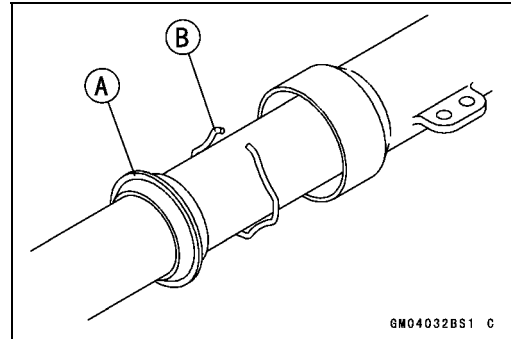
# 11-12 SUSPENSION

## Front Fork

- Remove the cylinder unit [A] and spring [B] from the fork.



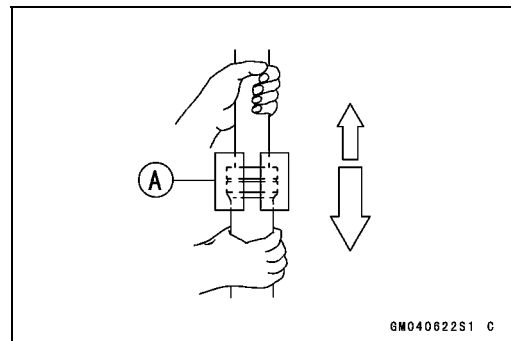
- Remove the dust seal [A] and retaining ring [B].



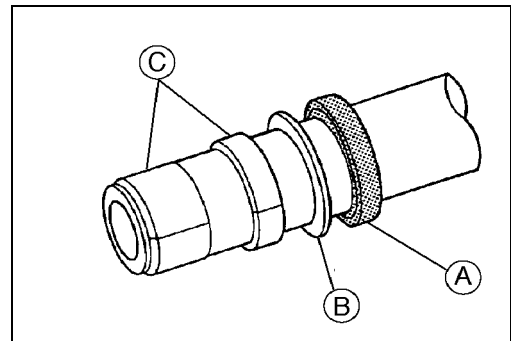
- Use the fork outer tube weight [A] to separate the inner tube from the outer tube.

**Special Tool - Fork Outer Tube Weight: 57001-1218**

- Holding the inner tube by hand in a vertical position, pull down the outer tube several times to pull out the inner tube.



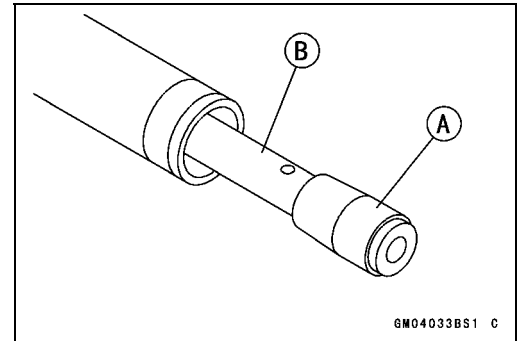
- The oil seal [A], washer [B], and guide bushes [C] come off with the inner tube.
- Take the cylinder base out of the outer tube.



**Front Fork**

*Front Fork Assembly (each fork)*

- Assembly is the reverse of disassembly.
- Replace the following parts removed with a new one.
  - Guide Bushes
  - Oil Seal
  - Bottom Allen Bolt Gasket
- Inspect the following and replace them with new ones if damaged.
  - Inner Tube (see Inner Tube Inspection)
  - Top Plug O-ring
- Insert the cylinder unit and spring in the inner tube.
- Insert the cylinder base [A] in the cylinder unit [B].
- The cylinder base must be installed with the tapered side facing upward.
- Install the cylinder unit in the inner tube and the cylinder base in the bottom of the outer tube.

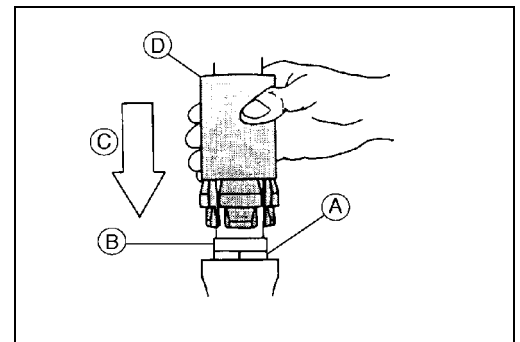


- Apply a non-permanent locking agent to the bottom Allen bolt and tighten it to the specified torque, using the front fork cylinder holder.

**Torque - Fork Bottom Allen Bolts: 20 N·m (2.0 kgf·m, 14 ft·lb)**

**Special Tools - Fork Cylinder Holder Handle: 57001-183 (use for KX65-A1 ~ A2)**

**Fork Cylinder Holder Adapter: 57001-1011 (use for KX65-A1 ~ A2)**

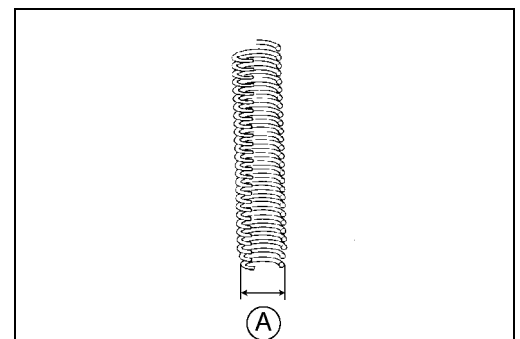


- Install the guide bush [A] (with a used guide bush [B] on it) by tapping [C] the used guide bush with the fork oil seal driver [D] until it stops.

**Special Tool - Fork Oil Seal Driver: 57001-1219**

- Install the following.
  - Washer
  - Oil Seal (use the fork oil seal driver: 57001-1219, the marked side upward)
  - Retaining Ring
  - Dust Seal

- Measure the both diameters of the fork spring ends and insert the fork spring with the small diameter [A] facing down.
- Pour the fork oil (see Fork Oil change).
- Install the front fork (see Front Fork Installation).

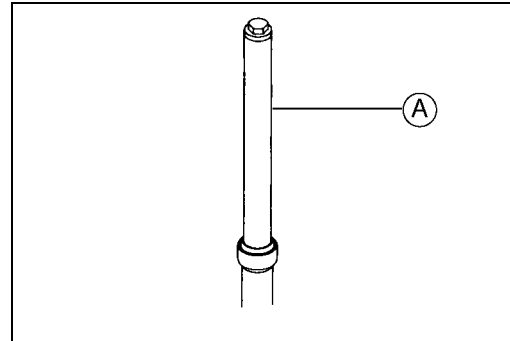


# 11-14 SUSPENSION

## Front Fork

### Inner Tube Inspection

- Visually inspect the inner tube [A], repair any damage.
- Nick or rust damage can sometimes be repaired by using a wet-stone to remove sharp edges or raised areas which cause seal damage.
- ★ If the damage is not repairable, replace the inner tube. Since damage to the inner tube damages the oil seal, replace the oil seal whenever the inner tube is repaired or replaced.
- Temporarily assemble the inner and outer tubes, and pump them back and forth manually to check for smooth operation.

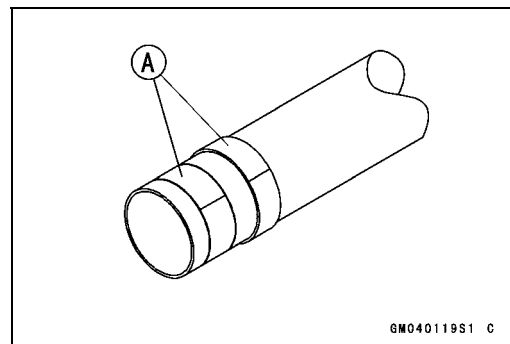


### CAUTION

**If the inner tube is badly bent or creased, replace it. Excessive bending, followed by subsequent straightening, can weaken the inner tube.**

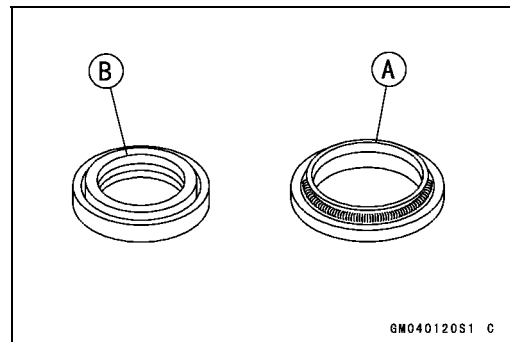
### Guide Bush Inspection

- Visually inspect the guide bushes [A], and replace them if necessary.



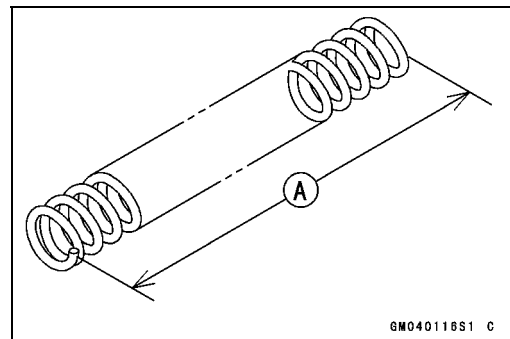
### Dust Seal/Oil Seal Inspection

- Inspect the dust seal [A] for any signs of deterioration or damage.
- ★ Replace it if necessary.
- Replace the oil seal [B] with a new one whenever it has been removed.



### Spring Tension Inspection

- Since a spring becomes shorter as it weakens, check its free length [A] to determine its condition.
- ★ If the spring of either fork leg is shorter than the service limit, it must be replaced. If the length of a replacement spring and that of the remaining spring vary greatly, the remaining spring should also be replaced in order to keep the fork legs balanced for motorcycle stability.



### Fork Spring Free Length

- |                |                      |
|----------------|----------------------|
| Standard:      | 455.7 mm (KX65-A1)   |
|                | 470.7 mm (KX65-A2)   |
|                | 497.1 mm (KX65-A3 ~) |
| Service Limit: | 446.6 mm (KX65-A1)   |
|                | 461.3 mm (KX65-A2)   |
|                | 487.2 mm (KX65-A3 ~) |

## Rear Suspension (Uni-Trak)

### Rear Shock Absorber

The rear suspension system of this motorcycle is Uni-trak. It consists of a rear shock absorber, swingarm, tie-rod and rocker arm.

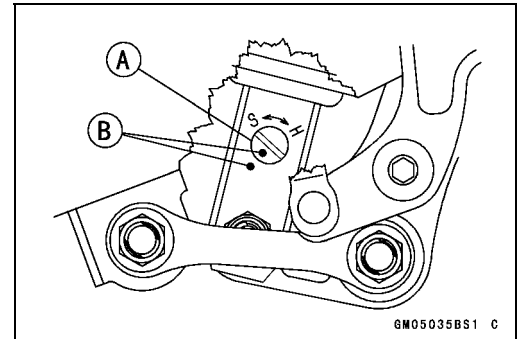
To suit to various riding conditions, the spring preload of the shock absorber can be adjusted or the spring can be replaced with an optional one.

#### KX65-A3 ~

The damping force can be adjusted easily so changing oil viscosity unnecessary.

#### Rebound Damping Force Adjustment

- To adjust the rebound damping force, turn the lower damping adjuster [A] punch mark [B].
- ★ If the damping feels too soft or too stiff, adjust it.

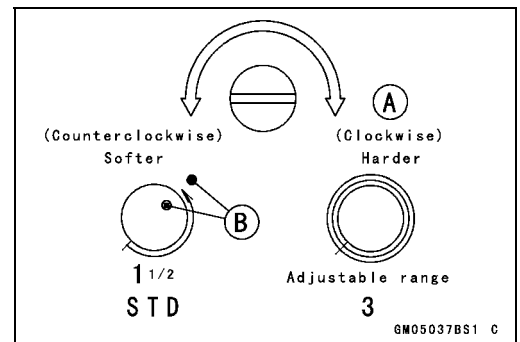


Seated position: adjuster tuned fully clockwise [A]

#### Rebound Damping Adjuster Setting

**Standard: 1 1/2 turns out**

- Differ the individually for shock absorber side of the punch mark position [B].



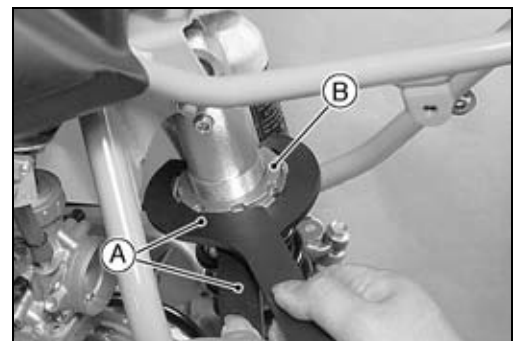
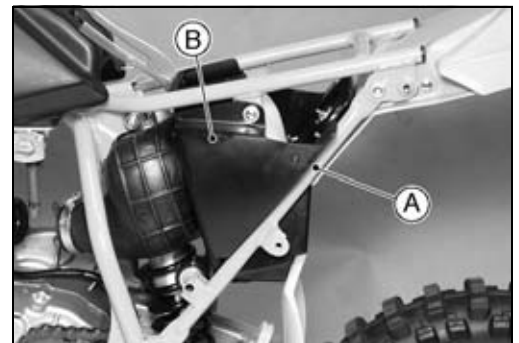
#### Spring Preload Adjustment

- Remove:
  - Seat
  - Side Covers
  - Rear Frame [A]
  - Air Cleaner Housing [B]
- Using the jack under the frame, raise the rear wheel off the ground.

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

- Using the hook wrenches [A], loosen the locknut [B] on the rear shock absorber.

**Special Tool - Hook Wrench: 57001-1101**

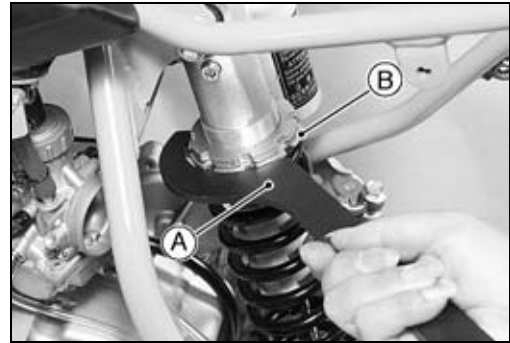


# 11-16 SUSPENSION

## Rear Suspension (Uni-Trak)

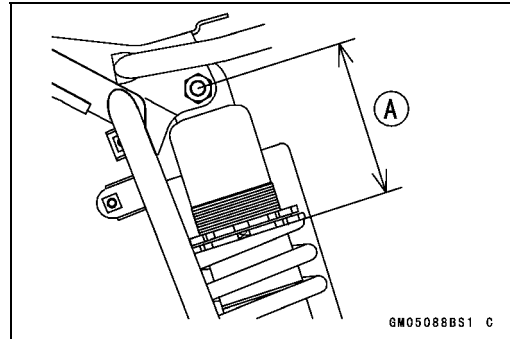
- Using the hook wrench [A], turn the adjusting nut [B] as required. Turning the adjusting nut downward marks the spring action harder and upward softer.

**Special Tool - Hook Wrench: 57001-1101**



### Spring Preload Adjustment (Adjusting nut position [A] from the center of the mounting hole)

- |                          |                               |
|--------------------------|-------------------------------|
| <b>Standard:</b>         | 88.8 mm (KX65-A1)             |
|                          | 86.6 mm (KX65-A2)             |
|                          | 79.6 mm (KX65-A3 ~)           |
| <b>Adjustable Range:</b> | 82.8 ~ 94.8 mm (KX65-A1 ~ A2) |
|                          | 75.6 ~ 83.6 mm (KX65-A3 ~)    |



- Tighten the locknut securely.
- After adjusting, move the spring up and down to make sure that the spring is seated.
- Install the parts removed.
- Tighten the rear frame mounting bolts.

**Torque - Rear Frame Mounting Bolts: 34 N·m (3.5 kgf·m 25 ft·lb)**

### Rear Shock Absorber Removal

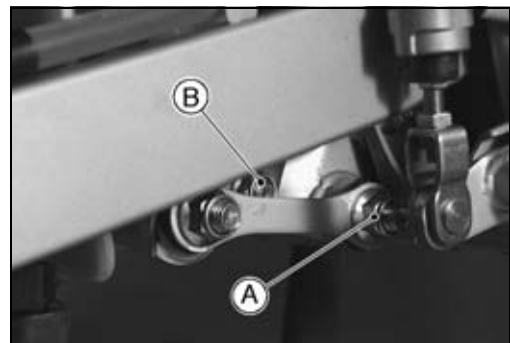
- Remove:
  - Seat
  - Side Covers
  - Rear Frame
  - Air Cleaner Housing
- Using the jack under the frame, raise the rear wheel off the ground.

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

- Remove the tie-rod front mounting bolt [A].

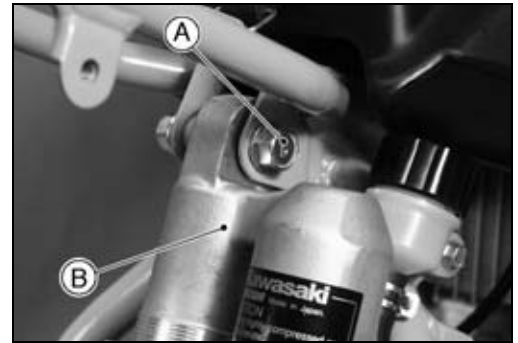
|   |
|---|
| <b>CAUTION</b>  |
| <b>When pulling out the mounting bolts, lift the rear wheel slightly. Forcing or tapping on a bolt could damage the bolt, sleeve, and bearing</b> |

- Remove the rear shock absorber mounting bolt [B].



## Rear Suspension (Uni-Trak)

- Remove the rear shock absorber upper mounting bolt [A], and pull out the rear shock absorber [B].



### Rear Shock Absorber Installation

- Pack the rocker arm needle bearings with grease.
- Tighten the following:

**Torque - Rear Shock Absorber Mounting Bolt (Upper): 39 N·m (4.0 kgf·m, 29 ft·lb)**

**Rear Shock Absorber Mounting Nut (Lower): 34 N·m (3.5 kgf·m, 25 ft·lb)**

**Tie-rod Mounting Nut: 59 N·m (6.0 kgf·m, 43 ft·lb)**

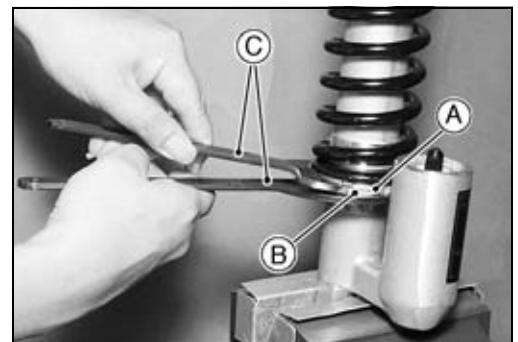
**Rear Frame Mounting Bolts: 34 N·m (3.5 kgf·m, 25 ft·lb)**

### 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
  - Side Covers
  - Seat
  - Rear Frame
  - Air Cleaner Housing
- Remove the rear shock absorber.
- 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 hook wrenches [C], loosen the locknut [B] and turn the adjusting nut [A] all way up.

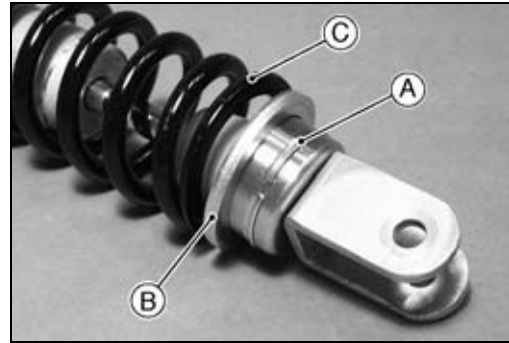
**Special Tool - Hook Wrench: 57001-1101**



## 11-18 SUSPENSION

### Rear Suspension (Uni-Trak)

- Remove the rear shock absorber from the vise.
- Remove the stopper ring [A].
- Remove the spring seat [B] from the shock absorber and lift off the spring [C].



- Install the spring guide.
- Adjust the spring preload (see Spring Preload Adjustment).
- Install the rear shock absorber.
- Install the parts removed.

#### Spring Tension

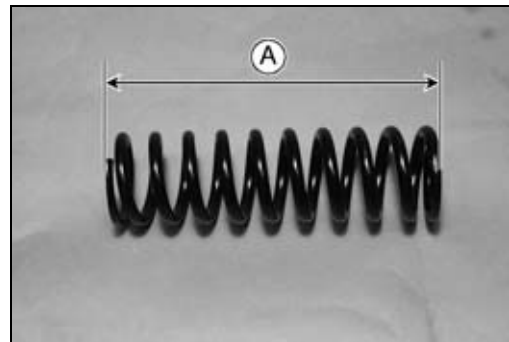
Since a spring becomes shorter as it weakens, check its free length [A] to determine its condition.

★ If the spring is shorter than the service limit, it must be replaced.

#### Rear Shock Absorber Spring Free Length

Standard: 206.1 mm (KX65-A1 ~ A2)  
211.1 mm (KX65-A3 ~)

Service Limit: 202.0 mm (KX65-A1 ~ A2)  
206.9 mm (KX65-A3 ~)



#### Rear Shock Absorber Scrapping

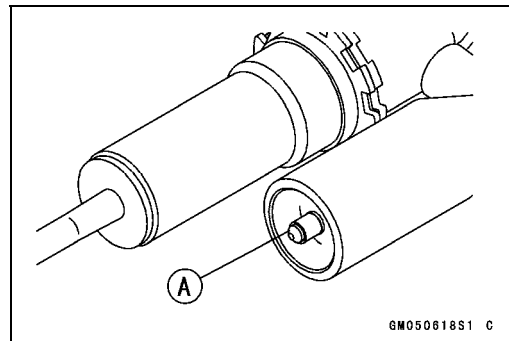
##### ⚠ WARNING

Since the reservoir tank of the rear shock absorber contains nitrogen gas, do not incinerate the reservoir tank without first releasing the gas or it may explode.

- Remove the shock absorber (see Rear Shock Absorber Removal).
- Remove the valve cap [A] and release the nitrogen gas completely from the gas reservoir.
- Remove the valve.

##### ⚠ WARNING

Since the high pressure gas is dangerous, do not point the valve toward your face or body.





## Swingarm

### Swingarm Removal

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

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

- Remove the rear wheel (see Wheels/Tires chapter).
- Remove the brake pedal [A].
- Remove the tie-rod rear mounting bolt [B].

### CAUTION

**When pulling out the mounting bolts, lift the rear wheel slightly. Forcing or tapping on a bolt could damage the bolt, sleeve, and bearing.**

- Pull out the swingarm pivot shaft [C], and remove the swingarm [D].
- Separate the chain guide and chain slipper from the swingarm.

### Swingarm Installation

- Apply plenty of grease to the inside of the needle bearings, sleeves, and oil seals caps.
- Tighten the following:

**Torque - Swingarm Pivot Shaft Nut: 69 N·m (7.0 kgf·m, 51 ft·lb)**

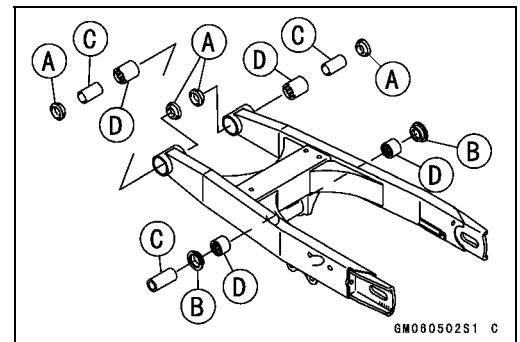
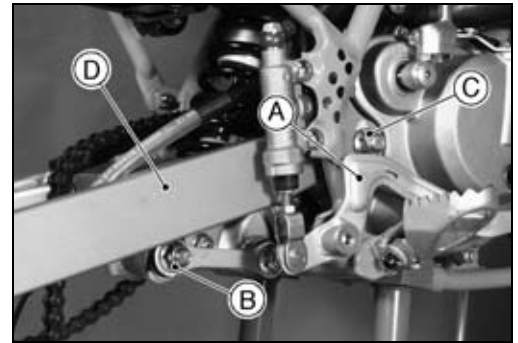
**Tie-rod Mounting Nut: 59 N·m (6.0 kgf·m, 43 ft·lb)**

- Refer to the Wheels/Tires, Final Drive, and Brakes chapters for wheel installing.

### Swingarm Bearing Removal

- Remove:
  - Swingarm
  - Dust Seals [A]
  - Oil Seals [B]
  - Sleeves [C]
- Remove the needle bearings [D] using the bearing remover.

**Special Tool - Oil Seal & Bearing Remover: 57001-1058**



6M080502S1 C

## 11-20 SUSPENSION

### Swingarm

#### Swingarm Bearing Installation

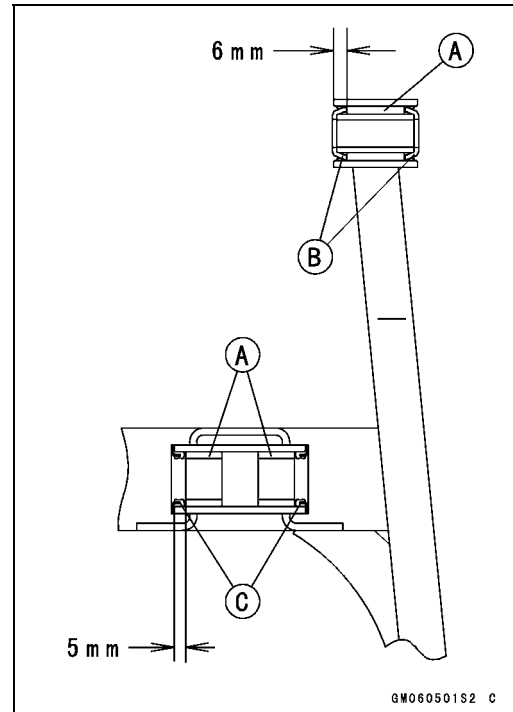
- Replace the needle bearings, dust seals and oil seals with new ones.
- Apply plenty of grease to the dust seals, oil seals and needle bearings.

#### 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.
- The installation procedure is the same as the counter side.



## Tie-rod, Rocker Arm

### Tie-rod Removal

- Using the jack under the frame, raise the rear wheel off the ground.

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

- Remove the tie-rod front mounting bolt [A].

#### CAUTION

**When pulling out the mounting bolts, lift the rear wheel slightly. Forcing or tapping on a bolt could damage the bolt, sleeve, and bearing.**

- Remove the tie-rod rear mounting bolt [B], and then take out the tie-rods [C].

### Tie-rod Installation

- Apply plenty of grease to the inside of the needle bearings and oil seals.
- Tighten the tie-rod front and rear mounting nuts.

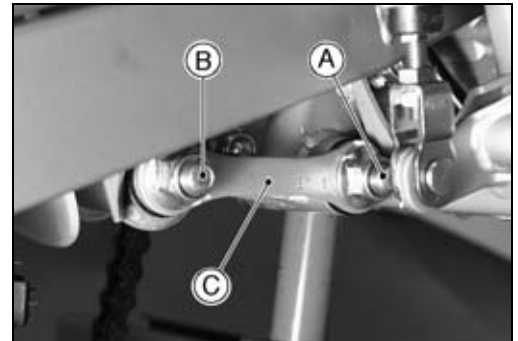
**Torque - Tie-rod Mounting Nuts: 59 N·m (6.0 kgf·m, 43 ft·lb)**

### Rocker Arm Removal

- Using the jack under the frame, raise the rear wheel off the ground.

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

- Remove the chain [A] and the lower chain guide roller [B].

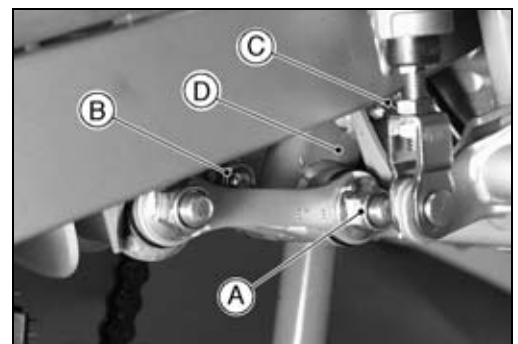
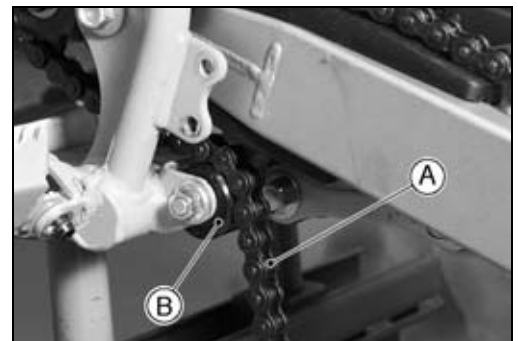


- Remove the tie-rod front mounting bolt [A].

#### CAUTION

**When pulling out the mounting bolts, lift the rear wheel slightly. Forcing or tapping on bolt could damage the bolt, sleeve, and bearing.**

- Remove the rear shock absorber lower mounting bolt [B].
- Remove the rocker arm pivot shaft [C].
- Remove the rocker arm [D].



## 11-22 SUSPENSION

### Tie-rod, Rocker Arm

#### Rocker Arm Installation

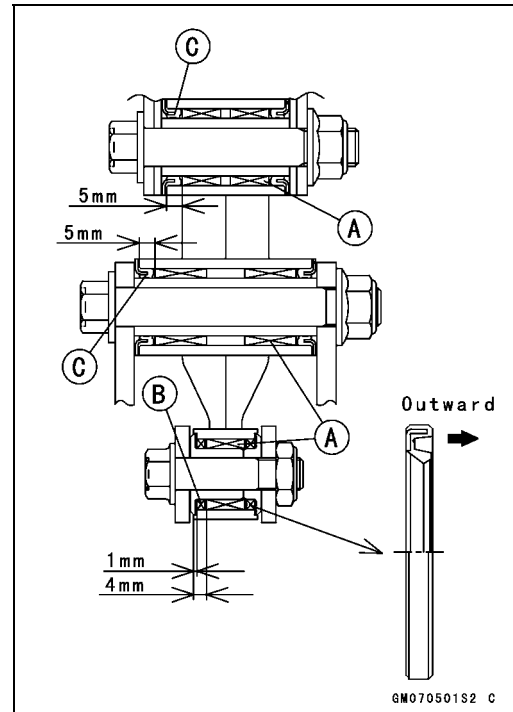
- Apply plenty of grease to the inside of the rocker arm holes, needle bearings, oil seals and grease seals outside of the sleeve.
- Install the needle bearing [A], grease seals [B] and oil seals [C] position as shown.
- Tighten the following:

**Torque - Rocker Arm Pivot Nut: 83 N·m (8.5 kgf·m, 61 ft·lb)**

**Rear Shock Absorber Mounting Nut (Lower): 34 N·m (3.5 kgf·m, 25 ft·lb)**

**Tie-rod Mounting Nuts: 59 N·m (6.0 kgf·m, 43 ft·lb)**

**Swingarm Pivot Shaft Nut: 69 N·m (7.0 kgf·m, 51 ft·lb)**



#### Needle Bearing Inspection

- ★ If there is any doubt as to the condition of either needle bearing, replace the bearing and sleeve as a set.

## Uni-Trak Maintenance

Check the uni-trak component parts for wear periodically, or whenever excessive play is suspected.

- Using the jack under the frame, raise the rear wheel off the ground.

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

- Push and pull on the swingarm [A], up and down, to check for wear.
- ★ A small amount of play on the swingarm is normal and no corrective action is needed. However, if excessive play is felt, remove the uni-trak parts from the frame and check for wear.



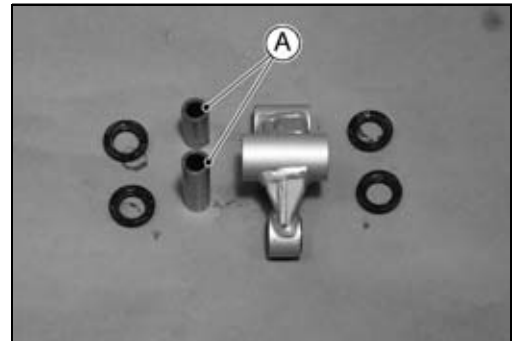
### Rocker Arm Sleeve Wear Inspection

- Pull out the sleeves [A] of the rocker arm, and measure the outside diameter of the sleeve.
- ★ If the sleeve is worn past the service limit, replace the sleeve.

#### Sleeve Outside Diameter

**Standard: 17.989 ~ 18.000 mm**

**Service Limit: 17.96 mm**



### Rocker Arm Mounting Bolt Bend Inspection

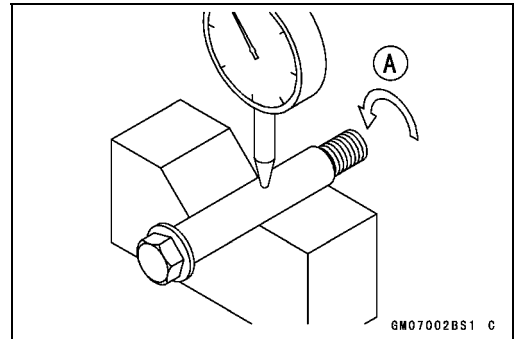
A bent bolt causes vibration, poor handling, and instability.

- To measure the bolt runout, remove the bolt, place it in V block, and set a dial gauge to the bolt at a point halfway between the block. Turn [A] the bolt to measure the runout. The amount of dial variation is the amount of runout.
- ★ If runout exceeds the service limit, replace the bolt.

#### Bolt Runout

**Standard: Under 0.1 mm**

**Service Limit: 0.2 mm**





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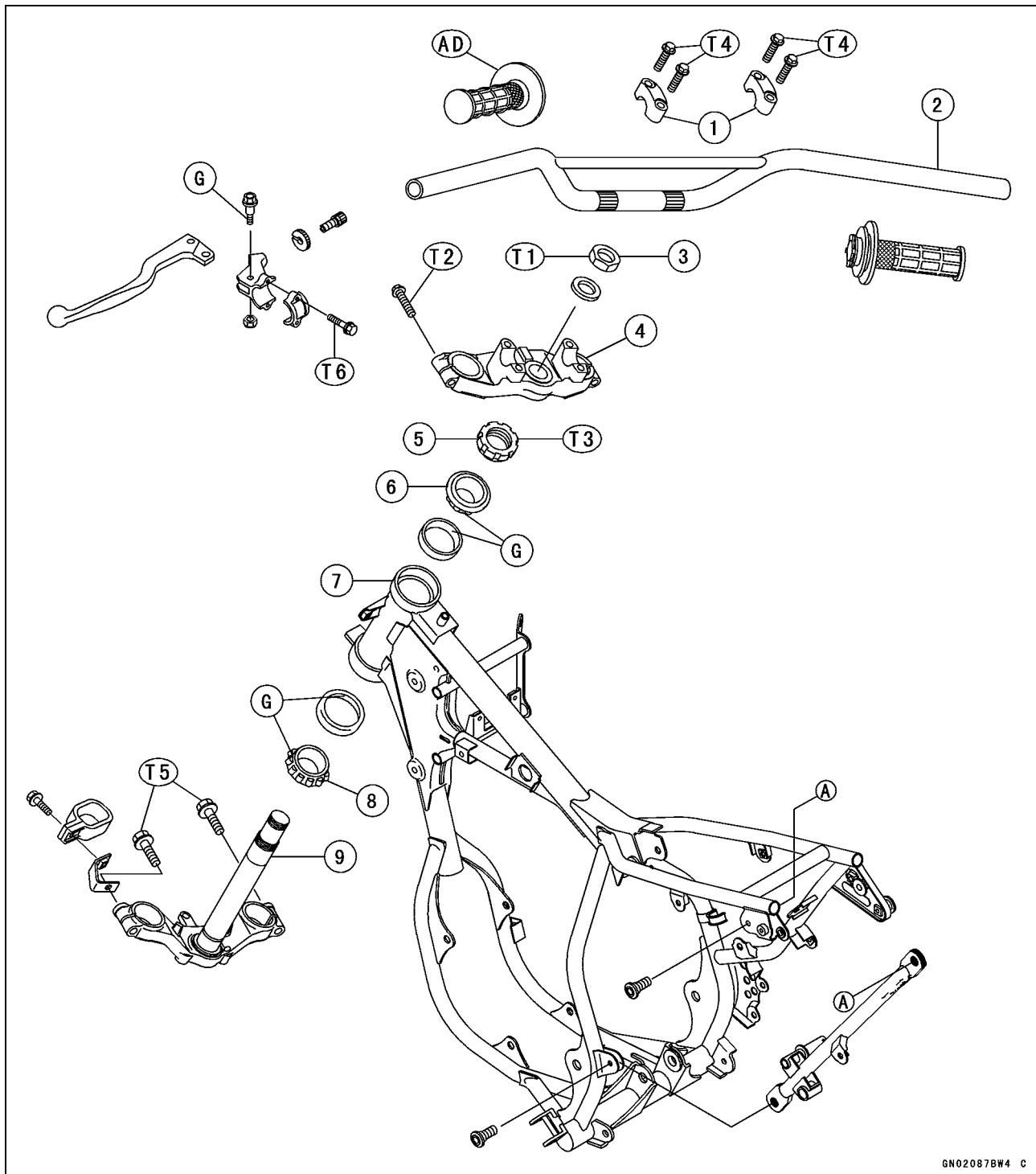
# Steering

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# 12-2 STEERING

## Exploded View



GN02087B4 C

- 1. Handlebar Clamp
- 2. Handlebar
- 3. Steering Stem Head Nut
- 4. Steering Stem Head Bracket
- 5. Steering Stem Nut
- 6. Tapered Roller Bearing
- 7. Head Pipe
- 8. Tapered Roller Bearing
- 9. Steering Stem

- T1: 44 N·m (4.5 kgf·m, 33 ft·lb)
- T2: 20 N·m (2.0 kgf·m, 15 ft·lb)
- T3: 2.9 N·m (0.30 kgf·m, 26 in·lb)
- T4: 25 N·m (2.5 kgf·m, 18 ft·lb)
- T5: 29 N·m (3.0 kgf·m, 22 ft·lb)
- T6: 8.8 N·m (0.90 kgf·m, 78 in·lb)
- AD: Apply adhesive cement.
- G: Apply grease.



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**Specifications**

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**Special Tools - Steering Stem Bearing Driver: 57001-137**  
**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: 57001-1106**  
**Head Pipe Outer Race Remover: 57001-1107**  
**Jack: 57001-1238**

## 12-4 STEERING

### Steering

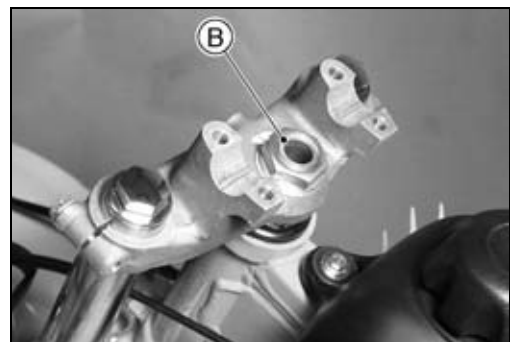
#### Steering Inspection

- Using the jack, raise the front wheel off the ground.  
**Special Tool - Jack: 57001-1238**
- With the front wheel pointing straight ahead, alternately nudge each end of the handlebar. The front wheel should swing fully left and right from the force of gravity until the fork hits the stop.
- ★ If the steering binds or catches before the stop, check the routing of the cables, hoses, and harnesses.
- ★ If the steering feels tight, adjust or lubricate the steering.
- Feel for steering looseness by pushing and pulling the forks.
- ★ If you feel looseness, adjust the steering.



#### Steering Adjustment

- Remove the number plate.
- Using the jack, raise the front wheel off the ground.  
**Special Tool - Jack: 57001-1238**
- Remove the handlebar.
- Loosen the front fork clamp bolts [A] and steering stem head nut [B].

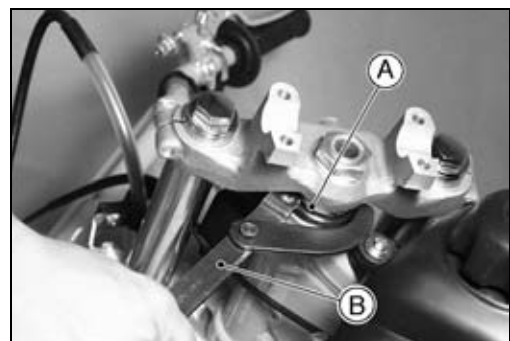


- Turn the steering stem nut [A] with the steering stem nut wrench [B] to obtain the proper adjustment.
- ★ If the steering is too tight, loosen the steering stem nut a fraction of a turn; if the steering is too loose, tighten the nut a fraction of a turn.

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

#### NOTE

○ Turn the steering stem nut 1/8 turn at a time maximum.



- Tighten the following:

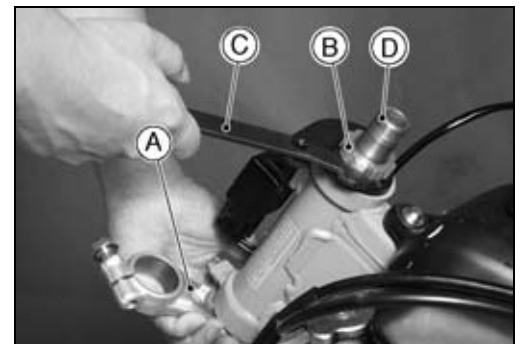
**Torque - Steering Stem Head Nut: 44 N·m (4.5 kgf·m, 33 ft·lb)**

**Front Fork Clamp Bolts (Lower): 29 N·m (3.0 kgf·m, 22 ft·lb)**

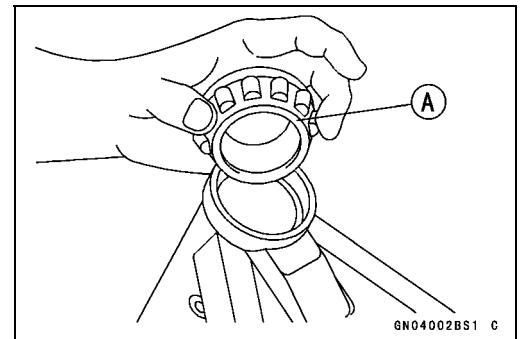
**Steering**

*Steering Stem, Stem Bearing Removal*

- Remove:
    - Front Wheel (see Wheels/Tires chapter)
    - Brake Hose Clamp (see Brake System chapter)
    - Caliper Mounting Bolts (see Brake System chapter)
    - Master Cylinder Clamp (see Brake System chapter)
    - Front Fender
    - Handlebar (see Handlebar Removal)
    - Front Fork (see Suspension chapter)
  - Remove the steering stem head nut and washer.
  - Remove the steering stem head.
  - Pushing up on the stem base [A], and remove the steering stem nut [B], with the steering stem nut wrench [C], then remove the steering stem [D].
- Special Tool - Steering Stem Nut Wrench: 57001-1100**

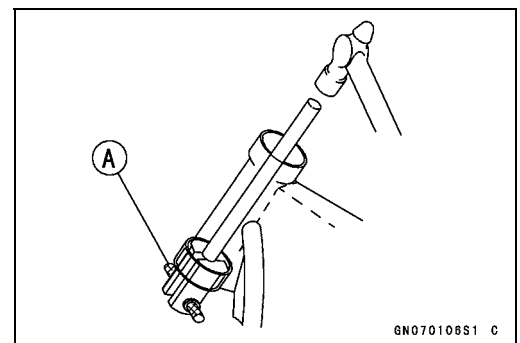


- Take off the upper stem bearing inner race (tapered roller bearing) [A].



- Drive out the bearing outer races from the head pipe.
- Remove the outer races pressed into the head pipe, using the head pipe outer race remover [A], and hammer the head pipe outer race remover to drive it out.

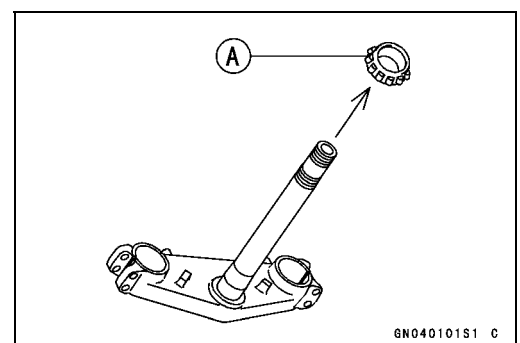
**Special Tool - Head Pipe Outer Race Remover: 57001-1107**



**NOTE**

*○If either steering stem bearing is damaged, it is recommended that both the upper and lower bearing (including outer races) should be replaced with new ones.*

- Remove the lower stem bearing inner race (tapered roller bearing) [A] with its grease seal from the stem using suitable tools.



## 12-6 STEERING

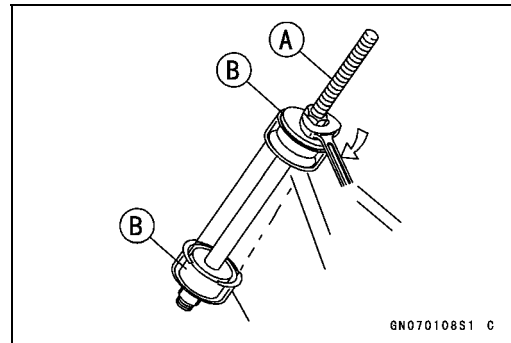
### Steering

#### Steering Stem, Stem Bearing Installation

- Replace the bearing outer race with new ones.
- Apply grease to the outer races, and drive them into the head pipe using the press shaft [A] and the drivers [B].

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

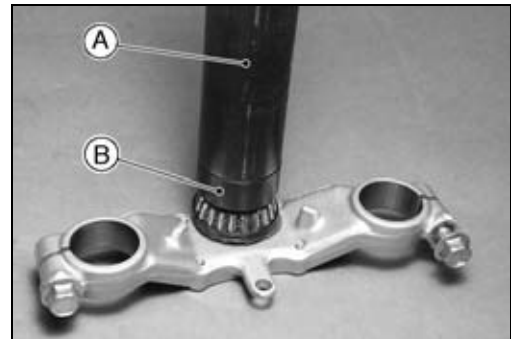
**Head Pipe Outer Race Driver: 57001-1106**



- Replace the lower inner races with new ones.
- Apply grease to the lower inner race, and drive it onto the stem using the steering stem bearing driver [A] and adapter [B].

**Special Tools - Steering Stem Bearing Driver: 57001-137**

**Steering Stem Bearing Driver Adapter: 57001-1092**



- Apply grease to the upper inner race, and install it in the head pipe.
- Install the stem through steering the head pipe and upper bearing, and hand-tighten the steering stem nut while pushing up on the stem base.
- Install the stem head and washer, and tighten the stem head nut lightly.
- Settle the bearing in place as follows;
- Tighten the steering stem nut to 39 N·m (4.0 kgf·m, 29 ft·lb) of torque. (To tighten the steering stem nut to the specified torque, hook the wrench [A] on the steering stem nut, and pull the wrench at the hole by 22.2 kg force [B] in the direction shown.)

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

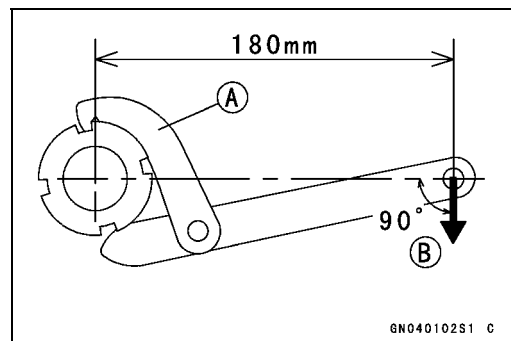
- Check that there is no play and the steering stem turns smoothly without rattles. If not, the steering stem bearings may be damaged.
- Again back out the steering stem nut a fraction of a turn until it turns lightly.
- Turn the steering stem nut lightly clockwise until it just becomes hard to turn. Do not overtighten, or the steering will be too tight.

**Torque - Steering Stem Nut: 2.9 N·m (0.3 kgf·m, 26 in·lb)**

- Install the front fork (see the Suspension chapter).

#### NOTE

- Tighten the fork upper clamp bolts first, next the stem head nut, last the fork lower clamp bolt.



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## Steering

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**Torque - Steering Stem Head Nut:** 44 N·m (4.5 kgf·m, 33 ft·lb)

**Front Fork Clamp Bolt:**

Upper: 20 N·m (2.0 kgf·m, 15 ft·lb)

Lower: 29 N·m (3.0 kgf·m, 22 ft·lb)

- Install the parts removed (see the appropriate chapter).

**⚠ WARNING**

**Do not impede the handlebar turning by routing the cables, wires and hoses improperly (see the General Information chapter).**

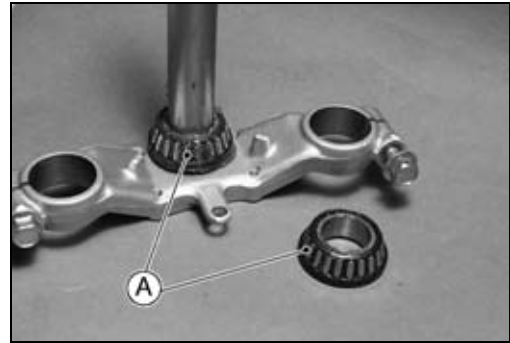
- Check and Adjust:
  - Steering
  - Front Brake
  - Clutch Cable
  - Throttle Cable

## 12-8 STEERING

### Steering Maintenance

#### *Stem Bearing Lubrication*

- Remove the steering stem (see Steering Stem Removal).
- 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 wear or damage.
- Pack the upper and lower tapered roller bearings [A] in the cages with grease, and apply a light coat of grease to the upper and lower outer races.
- Install the steering stem, and adjust the steering (see Steering Stem, Stem Bearing Installation, Steering Adjustment).

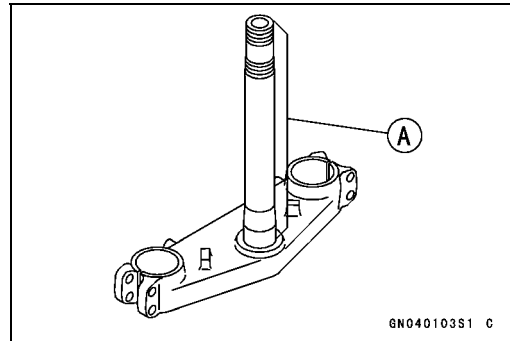


#### *Stem Bearing Wear, Damage Inspection*

- 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 race and the rollers.
- ★ Replace the bearing assembly if it show damage.

#### *Stem Warp Inspection*

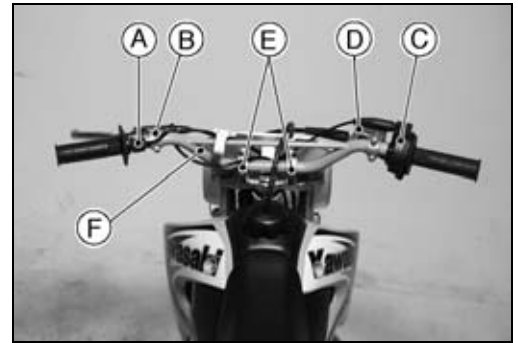
- Whenever the steering stem is removed, or if the steering cannot be adjusted for smooth action, check the steering stem for straightness.
- ★ If the steering stem shaft is bent [A], replace the steering stem.



## Handlebar

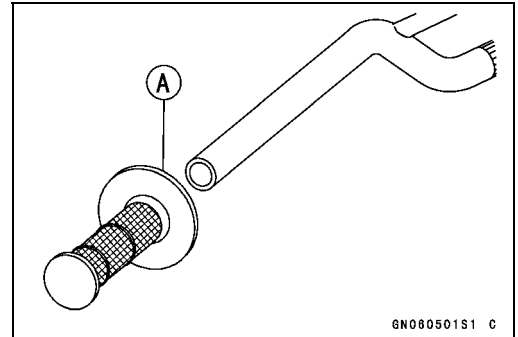
### Handlebar Removal

- Remove:
  - Engine Stop Button [A]
  - Clutch Holder [B]
  - Throttle Grip Assembly [C]
  - Front Master Cylinder [D]
  - Handlebar Holders [E]
  - Handlebar [F]



### Handlebar Installation

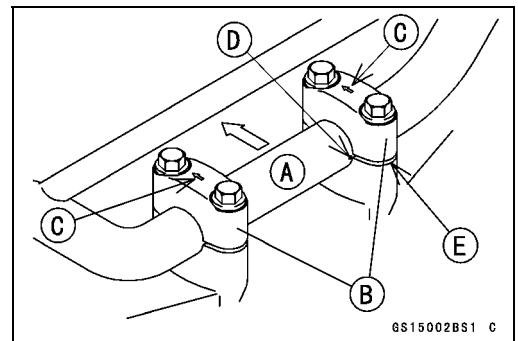
- Apply adhesive cement to the inside of the left handlebar grip [A].
- Install the front master cylinder (see Front Master Cylinder Installation in the Brakes chapter).



- Mount the handlebar clamps [B] so that the arrows [C] on the clamp point at the front [A].
- Align the punch mark [D] on the handlebar to the mating surface of each clamp of handlebar.
- Tighten the handlebar clamp bolts.

**Torque - Handlebar Clamp Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)**

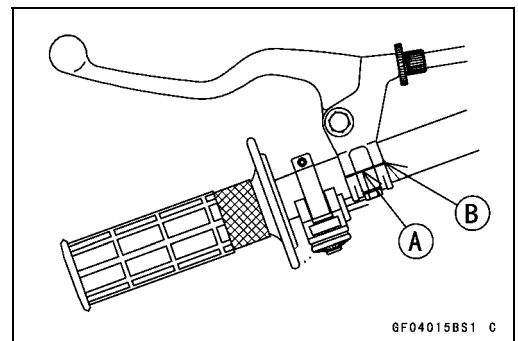
- Tighten the clamp bolts, front first and then the rear. If the handlebar clamp is correctly installed, there will be no gap at the front and a gap [E] at the rear after tightening.



### 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)**







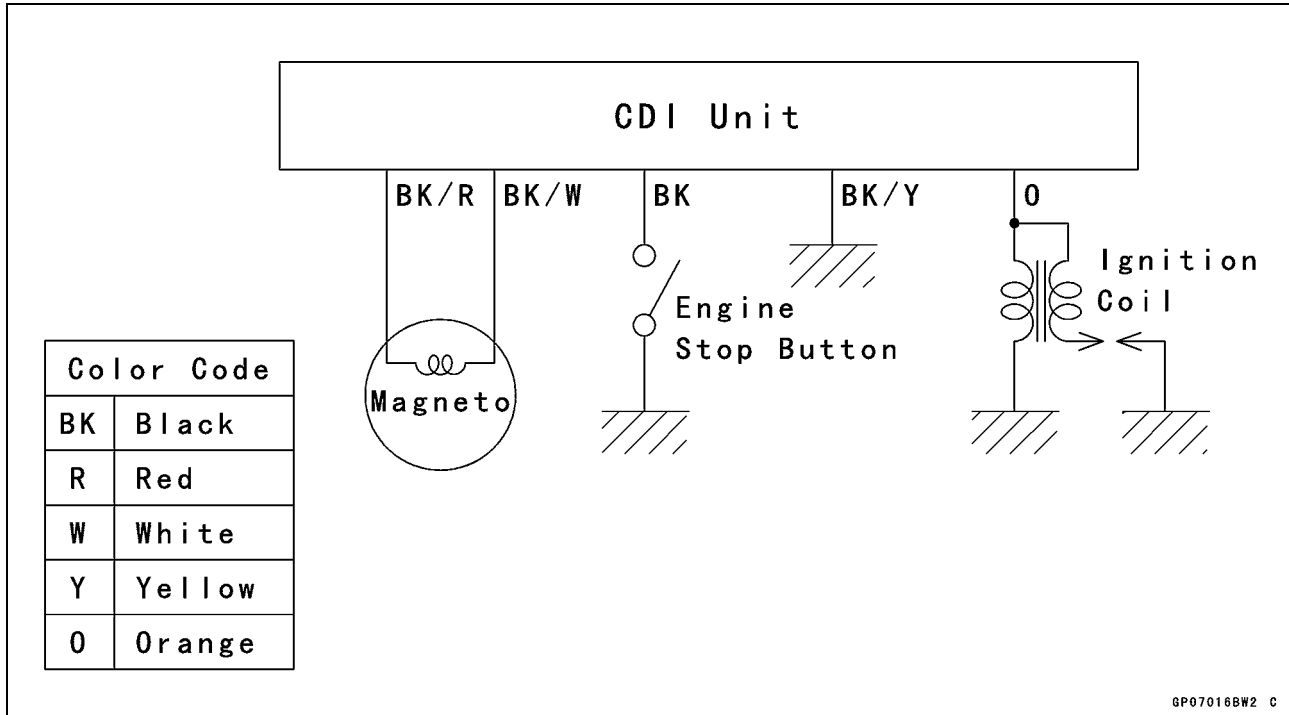
# Electrical System

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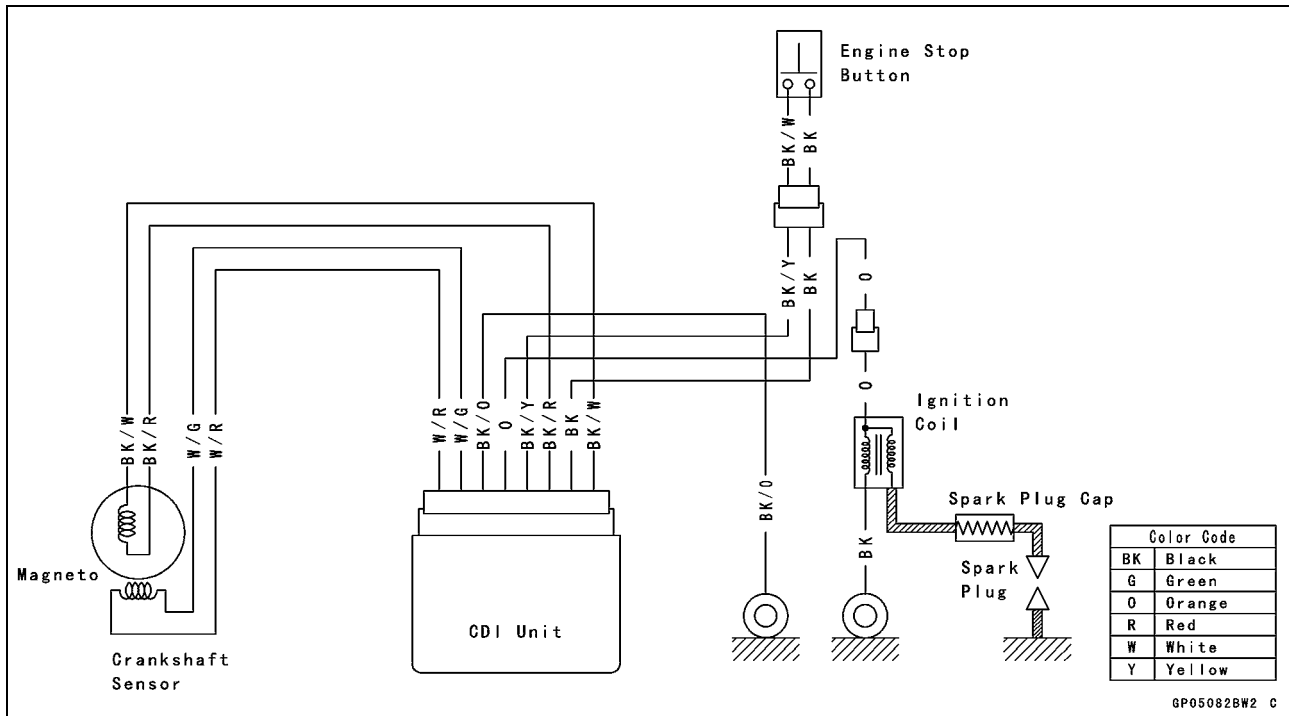
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# 13-2 ELECTRICAL SYSTEM

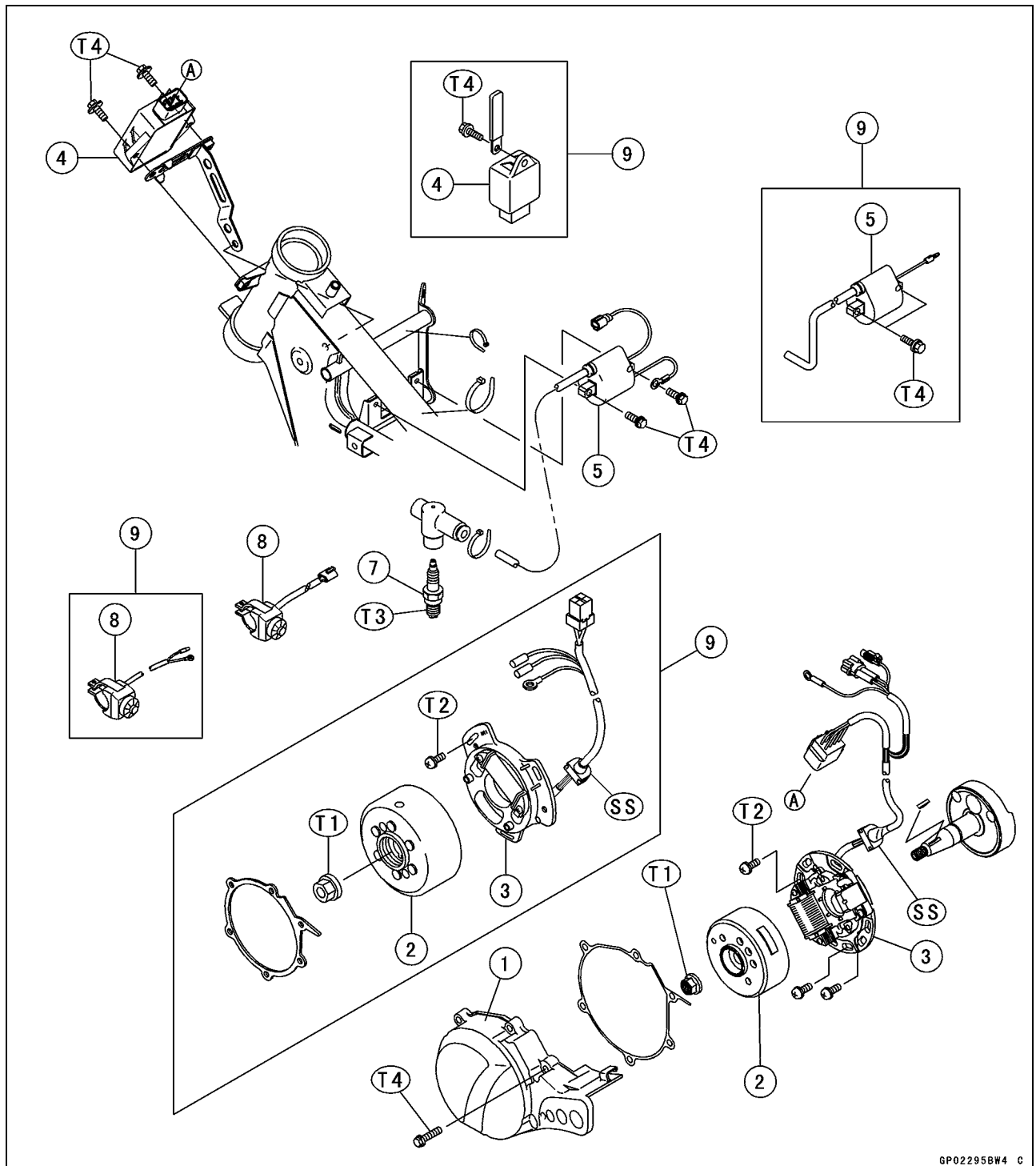
## Wiring Diagram



### KX65A6F ~



## Exploded View



GP02295BW4 C

1. Magneto Cover
  2. Magneto Flywheel
  3. Stator
  4. CDI Unit
  5. Ignition Coil
  6. Spark Plug Cap
  7. Spark Plug
  8. Engine Stop Button
  9. KX65-A1 ~ A6
- T1: 29 N·m (3.0 kgf·m, 21 ft·lb)  
 T2: 4.9 N·m (0.50 kgf·m, 43 in·lb)  
 T3: 25 N·m (2.6 kgf·m, 19 ft·lb)  
 T4: 8.8 N·m (0.90 kgf·m, 78 in·lb)  
 SS: Apply silicone sealant.

## 13-4 ELECTRICAL SYSTEM

### Specifications

| Item   | Standard   |
|--|--|
| <b>Magneto</b><br>Stator coil resistance   | in the text  |
| <b>Ignition System</b><br>Ignition Timing:<br>Ignition Coil:<br>3 Needle Arcing Distance<br>Primary Winding Resistance<br>Secondary Winding Resistance<br>Spark Plug:<br>Type<br>Gap<br>CDI. unit: | 20.5° BTDC @6 000 r/min (rpm)<br>20.5° BTDC @7 100 r/min (rpm) (KX65A6F ~)<br>7 mm or more<br>0.31 Ω ±15% (at 20°C)<br>3.1 kΩ ±15% (at 20°C)<br>NGK BR10EG<br>NGK B10EG (KX65-A1 ~ A6 (US))<br>0.5 ~ 0.6 mm<br>in the text |

**Special Tools - Flywheel Puller: 57001-252**

**Flywheel & Pulley Holder: 57001-1343**

**Hand Tester: 57001-1394**

**Peak Voltage Adapter: 57001-1415**

**Kawasaki Bond (silicone sealant): 56019-120**

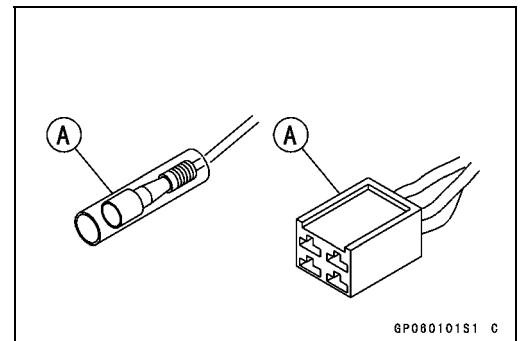
US: United States Model

## Precautions

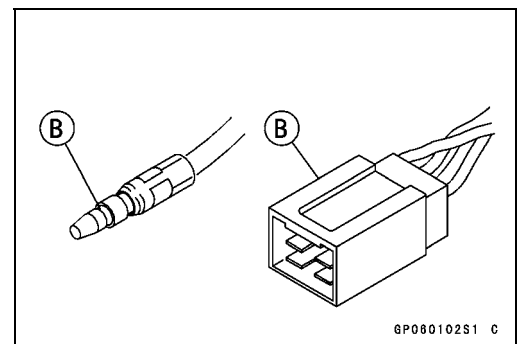
There are numbers of important precautions that are musts when servicing electrical systems. Learn and observe all the rules below.

- 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 wires for signs of burning, fraying, etc. Poor wires and bad connections will affect electrical system operation.
- Measure coil and winding resistance when the part is cold (at room temperature).
- Electrical Connectors

[A] Female Connectors



[B] Male Connectors



## Safety Instructions

### **⚠ WARNING**

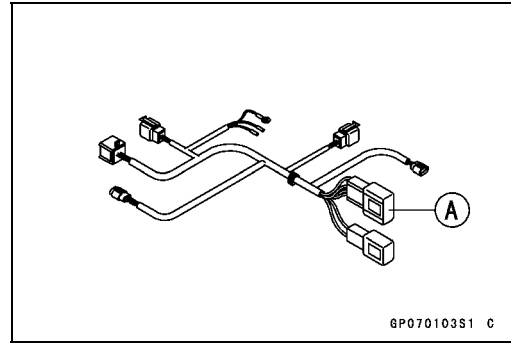
The ignition system produces extremely high voltage. Do not touch the spark plug, ignition coil, or high tension lead while the engine is running, or you could receive a severe electrical shock.

## 13-6 ELECTRICAL SYSTEM

### Electrical Wiring

#### *Wiring Inspection*

- Visually inspect the wiring for signs of burning, fraying, etc.
- ★ If any wiring is poor, replace the damaged wiring.
- Pull each connector [A] apart and inspect it for corrosion, dirt, and damage.
- ★ If the connector is corroded or dirty, clean it carefully. If it is damaged, replace it.
- Check the wiring for continuity.
- Use the wiring diagram to find the ends of the lead which is suspected of being a problem.
- Connect an ohmmeter between the ends of the leads.
- Set the meter to the  $\times 1 \Omega$  range, and lead the meter.
- ★ If the meter does not read  $0 \Omega$  the lead is defective. Replace the lead or the wiring harness if necessary.



## Ignition Timing

### Ignition Timing Adjustment

- Remove the magneto cover.
- Check to see if the center mark of the three marks [A] on the magneto stator plate is aligned with the mark [B] on the crankcase.
- ★ If the marks are not aligned, loosen the magneto stator plate mounting screws [C] and turn the stator [D].
- Tighten the stator plate mounting screws securely.

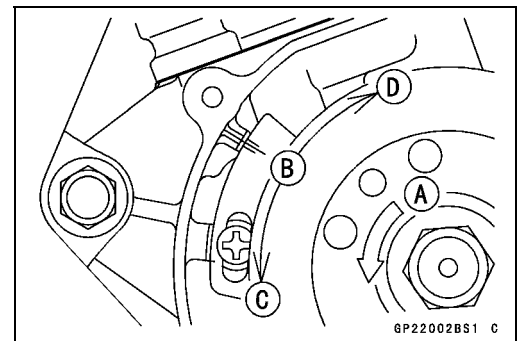
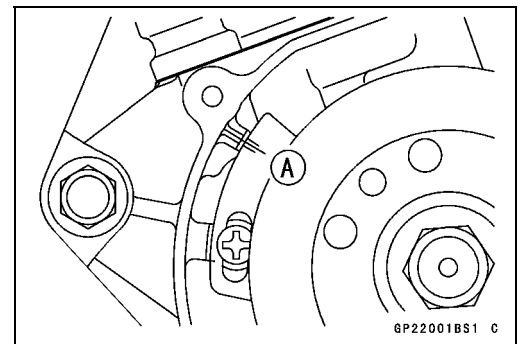
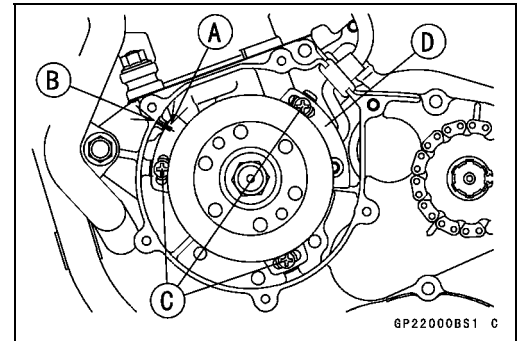
**Torque - Stator Plate Mounting Screws: 4.9 N·m (0.50 kgf·m, 43 in·lb)**

- Install the magneto cover.

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

The ignition timing can be adjusted for different power band to suit to rider's preference ability.

- Remove the magneto cover.
- Loosen the stator plate mounting screws.
- 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.

- [A] Crankshaft Rotation
- [B] Stator plate of movement
- [C] Advance
- [D] Retard

- Tighten the stator plate mounting screws securely (see Ignition Timing Adjustment).
- Install the magneto cover.
- Test ride the motorcycle and readjust the ignition timing if necessary.

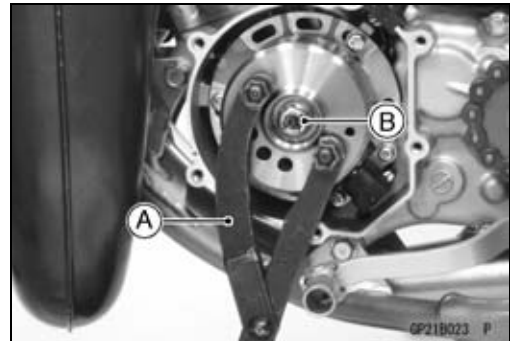
## 13-8 ELECTRICAL SYSTEM

### Flywheel Magneto

#### *Flywheel Magneto Removal*

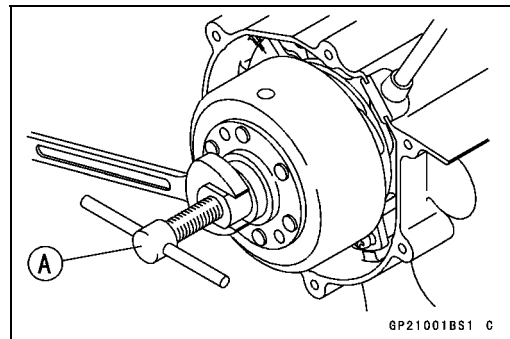
- Remove the magneto cover.
- Hold the flywheel steady, with the flywheel & pulley holder [A], and remove the flywheel nut [B].

**Special Tool - Flywheel & Pulley Holder: 57001-1343**



- Screw the flywheel puller [A] into the flywheel by turning it counterclockwise (left-hand thread).
- 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.

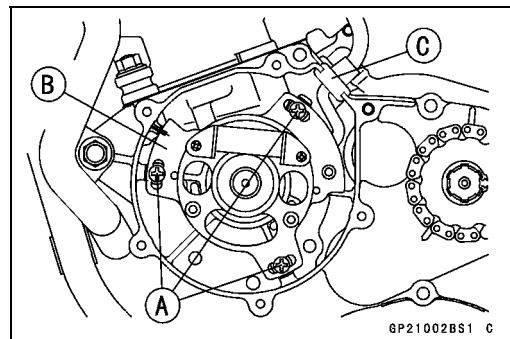
**Special Tool - Flywheel Puller: 57001-252**



#### **CAUTION**

**Never strike the grab bar or the flywheel itself. Strike the bar can bond it. If the flywheel is strike, the magnets may lose their magnetism.**

- Unscrew the mounting screws [A], and remove the stator plate [B] and the wiring grommet [C].
- Remove the band.
- Disconnect the stator lead connectors from the harness.

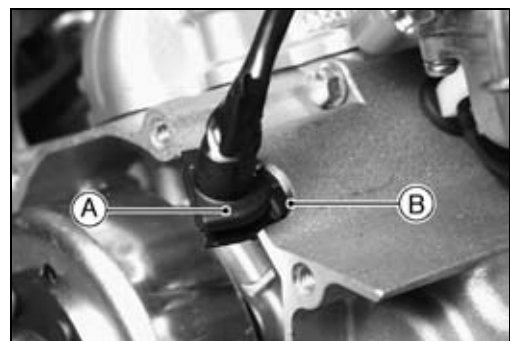


#### *Flywheel Magneto Installation*

- Install the stator plate.
- Apply silicone sealant around the stator wiring grommet [A], and set it in the notch [B] in the left crankcase half securely, and route the leads according to the Cable, Wire and Hose Routing section in the General Information chapter.

**Torque - Stator Plate Mounting Screws: 4.9 N·m (0.50 kgf·m, 43 in·lb)**

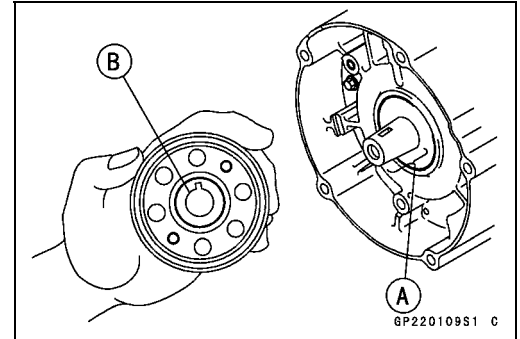
**Sealant - Kawasaki Bond (silicone sealant): 56019-120**



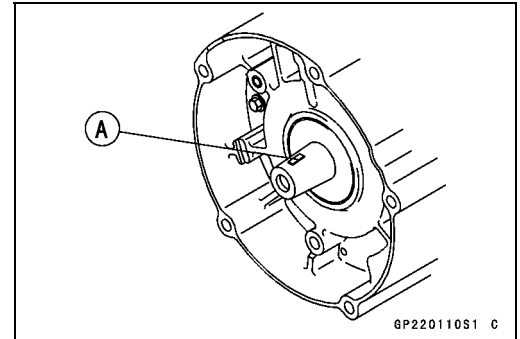


## Flywheel Magneto

- Using a high flash-point solvent, clean off any oil or dirt that may be on the crankshaft taper [A] or in the hole [B] in the flywheel. Dry them with a clean cloth.



- Fit the woodruff key [A] securely in the slot in the crankshaft before installing the stator plate.

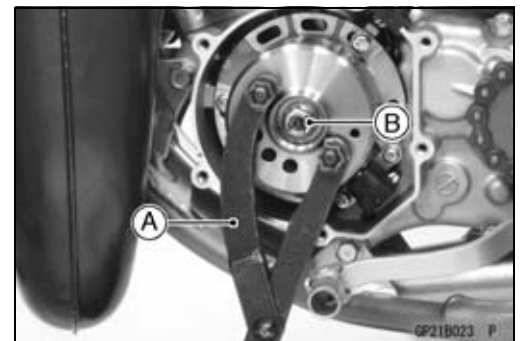


- Holding the flywheel steady, with the flywheel holder [A], and tighten the flywheel nut [B].

**Special Tool - Flywheel & Pulley Holder: 57001-1343**

**Torque - Flywheel Nut: 29 N·m (3.0 kgf·m, 21 ft·lb)**

**Magneto Cover Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)**



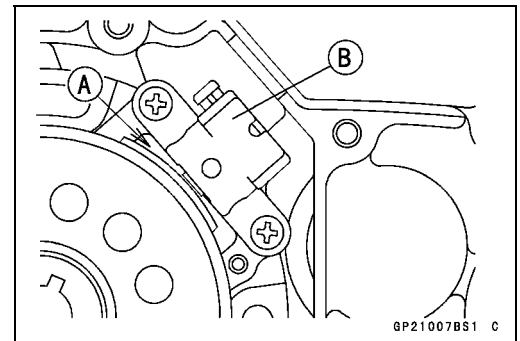
### Crankshaft Sensor Air Gap Inspection (KX65A6F ~)

- Remove the magneto cover.
- 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.



### Flywheel Magneto Inspection

- There are three types of magneto problems: short, open (wire burned out), or loss in flywheel magnetism. A short or open in one of the coil wires will result in either a low output, or no output at all. A loss in flywheel magnetism, which may be caused by dropping or hitting the flywheel by leaving it near an electromagnetic field, or just by aging, will result in low output.

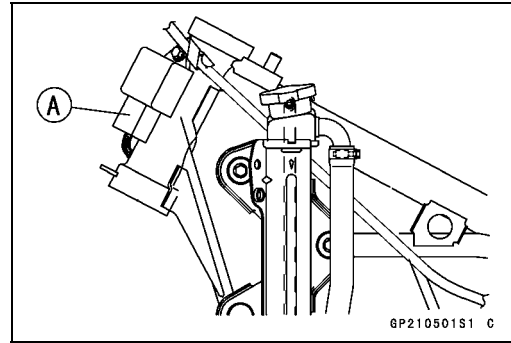
# 13-10 ELECTRICAL SYSTEM

## Flywheel Magneto

- To check the stator coil resistance as follows.
- Connect the hand tester to the terminals of the harness connector [A] as shown in the table 2.
- Note the readings.

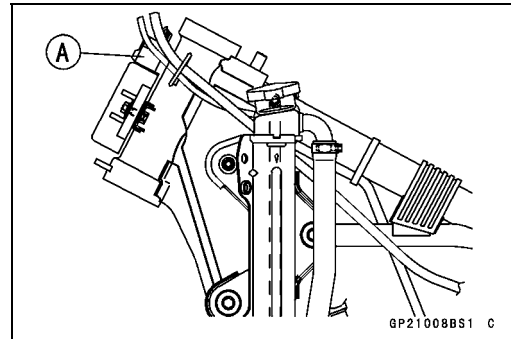
**Table 2 Stator Coil Resistance**

| Tester Range | Connections    |                  | Reading    |
|--------------|----------------|------------------|------------|
|              | Tester (+)     | Tester (-) to    |            |
| × 1 Ω        | Black/Red Lead | Black/White Lead | 214 Ω ±20% |



**KX65A6F ~:**

| Tester Range | Connections      |                | Reading    |
|--------------|------------------|----------------|------------|
|              | Tester (+)       | Tester (-) to  |            |
| × 1 Ω        | Black/White Lead | Black/Red Lead | 214 Ω ±20% |



- ★ 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. Much less than this resistance means the stator is shorted, and must be replaced.
- Using the highest resistance range of the hand tester, measure the resistance between each leads and chassis ground.
- ★ Any hand tester reading less than infinity (∞) indicates a short, necessitating stator replacement.
- ★ If the stator coils have normal resistance, but the voltage check showed the magneto to be defective; then the rotor magnets have probably weakened, and the rotor must be replaced.

**Special Tool - Hand Tester: 57001-1394**

## Ignition System

### 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.

#### *Crankshaft Sensor Installation (KX65A6F ~)*

- 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 (KX65A6F ~)*

- Remove the magneto cover.
- Loosen the crankshaft sensor screws [A].
- Insert a 0.5 mm thickness gauge [B] between the crankshaft sensor 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 (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 (KX65A6F ~)*

- Remove the following  
Magneto Lead Connector [A]
- Set the hand tester [B] to the  $\times 100 \Omega$  range and connect it to the magneto lead connector (crankshaft sensor lead) connector.

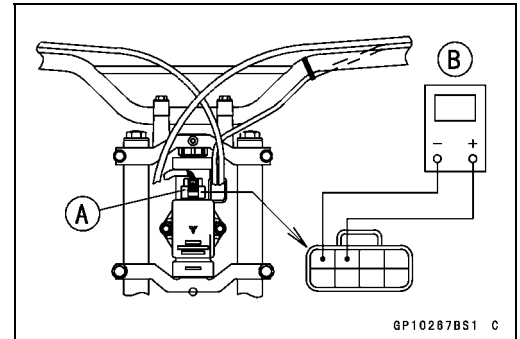
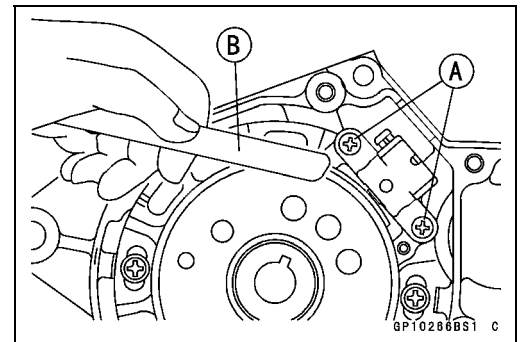
**Special Tool - Hand Tester: 57001-1394**

- ★ 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.



## 13-12 ELECTRICAL SYSTEM

### Ignition System

#### Crankshaft Sensor Peak Voltage Inspection (KX65A6F ~)

- Disconnect the magneto lead connector [C].
- Set the hand tester [B] to the × 25 V DC range, and connect it a commercially available 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 Toos - 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 pickup coil.

#### Ignition Coil Removal

- Remove:
  - Seat
  - Side Covers
  - Shroud
  - Fuel Tank
- Disconnect the ignition coil primary lead [A].
- Pull the plug cap off the spark plug.
- Unscrew the mounting bolts [B], and remove the ignition coil [C].

#### Ignition Coil Installation

- Installation is the reverse of removal.

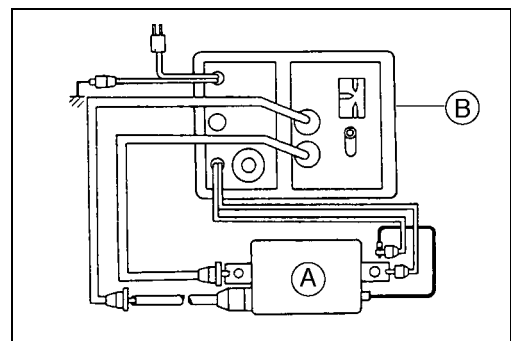
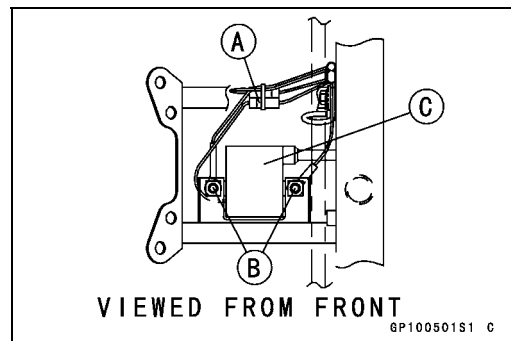
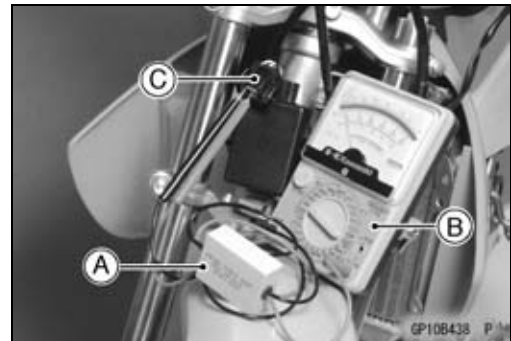
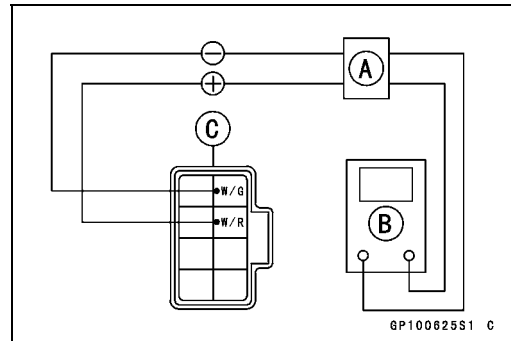
Torque - Ignition Coil Mounting Bolts: 8.8 N·m (0.90 kgf·m,  
78 in·lb)

#### Ignition Coil Inspection

##### Measuring 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.



## Ignition System

### ⚠ 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.

#### 3 Needle Arcing Distance

Standard: 7 mm or more

- To determine which part is defective, measure the arcing distance again with the spark plug cap removed from the ignition coil lead.
- ★ If the arcing distance is subnormal as before, the trouble is with the ignition coil itself. If the arcing distance is now normal, the trouble is with the spark plug cap.

C: KX65A6F ~

### 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 an ohmmeter between the coil terminals.
- Set the meter to the  $\times 1 \Omega$  range, and read the meter.
- KX65A6F [C]
- 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 meter.
- ★ 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: 0.26 ~ 0.36  $\Omega$  ( $\times 1 \Omega$ )

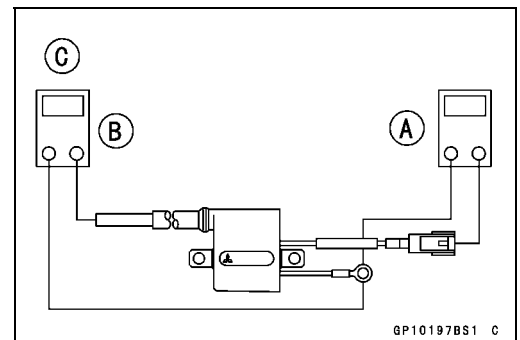
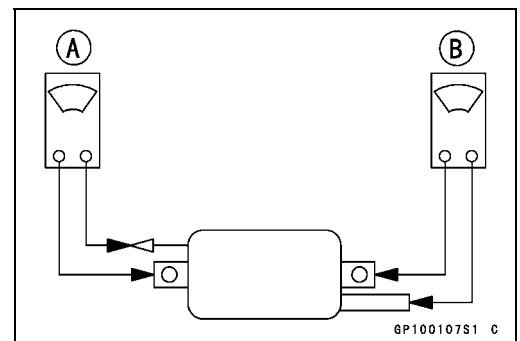
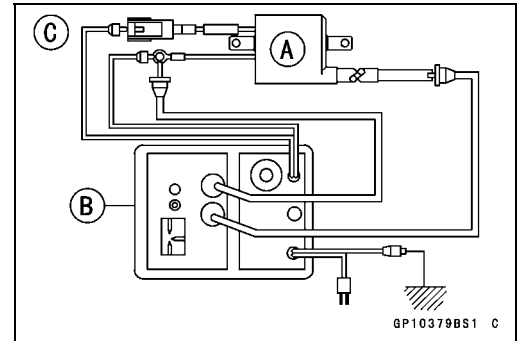
Secondary Windings: 2.64 ~ 3.57  $\Omega$  ( $\times 1 \text{ k}\Omega$ )

KX65A6F ~

Primary Windings: 0.36 ~ 0.48  $\Omega$  ( $\times 1 \Omega$ )

Secondary Windings: 5.4 ~ 7.4  $\Omega$  ( $\times 1 \text{ k}\Omega$ )

- Check the spark plug lead for visible damage.
- ★ If the spark plug lead is damaged, replace the coil.



## 13-14 ELECTRICAL SYSTEM

### Ignition System

#### 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.

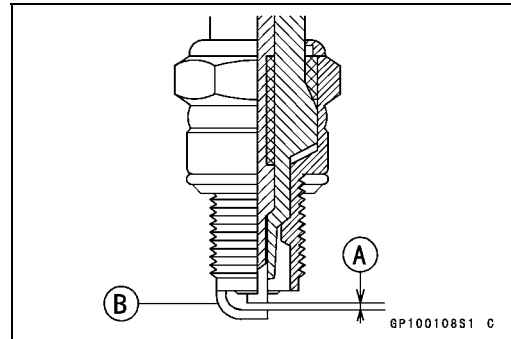
**Torque - Spark Plug: 26 N·m (2.6 kgf·m, 19 ft·lb)**

#### 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.

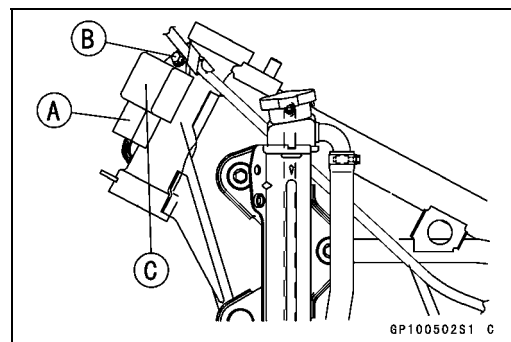
#### Spark Plug Gap

**Standard: 0.5 ~ 0.6 mm**



#### CDI Unit Removal

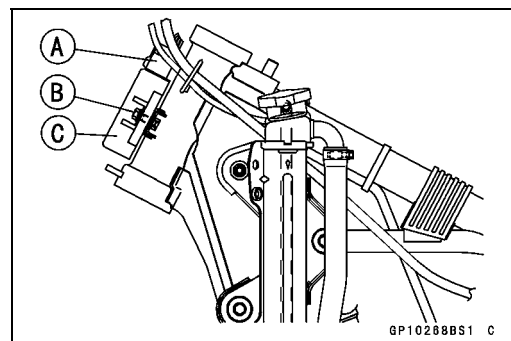
- Turn the handlebar to the right. (KX65-A1 ~ A6)
- Disconnect the harness connector [A].
- Unscrew the mounting bolt [B] and remove the CDI Unit [C].



#### KX65A6F ~:

- Disconnect the harness connector [A].
- Remove the CDI Unit mounting bolts [B] and remove the CDI Unit [C].

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



#### CDI Unit Inspection

#### CAUTION

**When inspecting the CDI Unit observe the following to avoid damage to the CDI Unit.  
Do not disconnect the CDI Unit while the engine is running.  
This may damage the CDI Unit.**

## Ignition System

### Ignition Coil Primary Peak Voltage Check

- Remove:
  - Shrouds
  - Side Covers
  - Seat
  - Fuel Tank
- Disconnect the spark plug cap from the spark plug [A].
- Connect the new spark plug [B] to the spark plug cap, then ground it to the engine.

#### NOTE

○ Measure the voltage with each lead connected correctly. The correct value may not be obtained if disconnected.

○ Maintain the correct value of compression pressure for the cylinder. (Be sure to measure the voltage with the spark plug installed to the cylinder head.)

- Connect the peak voltage adapter [A] between the terminal of primary lead (orange) and ground connection of the lead of the ignition coil [B].

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

**Type: KEK-54-9-B**

**Hand Tester: 57001-1394**

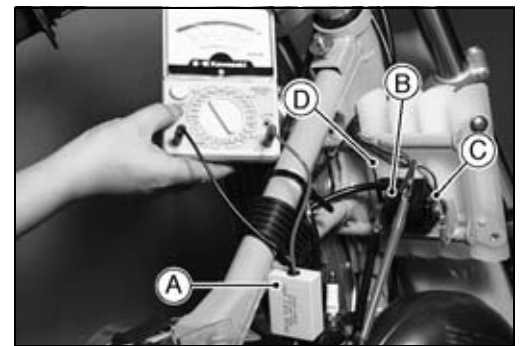
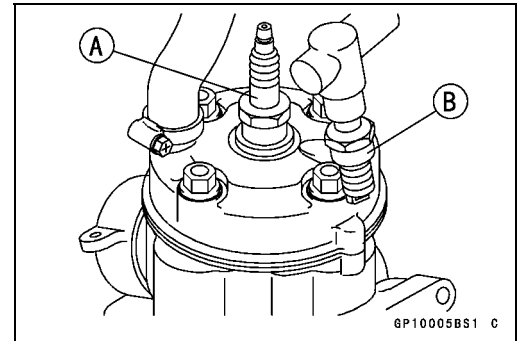
#### Connection:

**Tester Positive → Ground Lead [C]**

**Tester Negative → Orange Lead [D]**

- Shift the gear to the neutral position, then push the engine stop button.
- Crank the engine by kicking the pedal several times to measure the peak voltage of the primary ignition coil.

**Peak Voltage: DC 115 V or above**



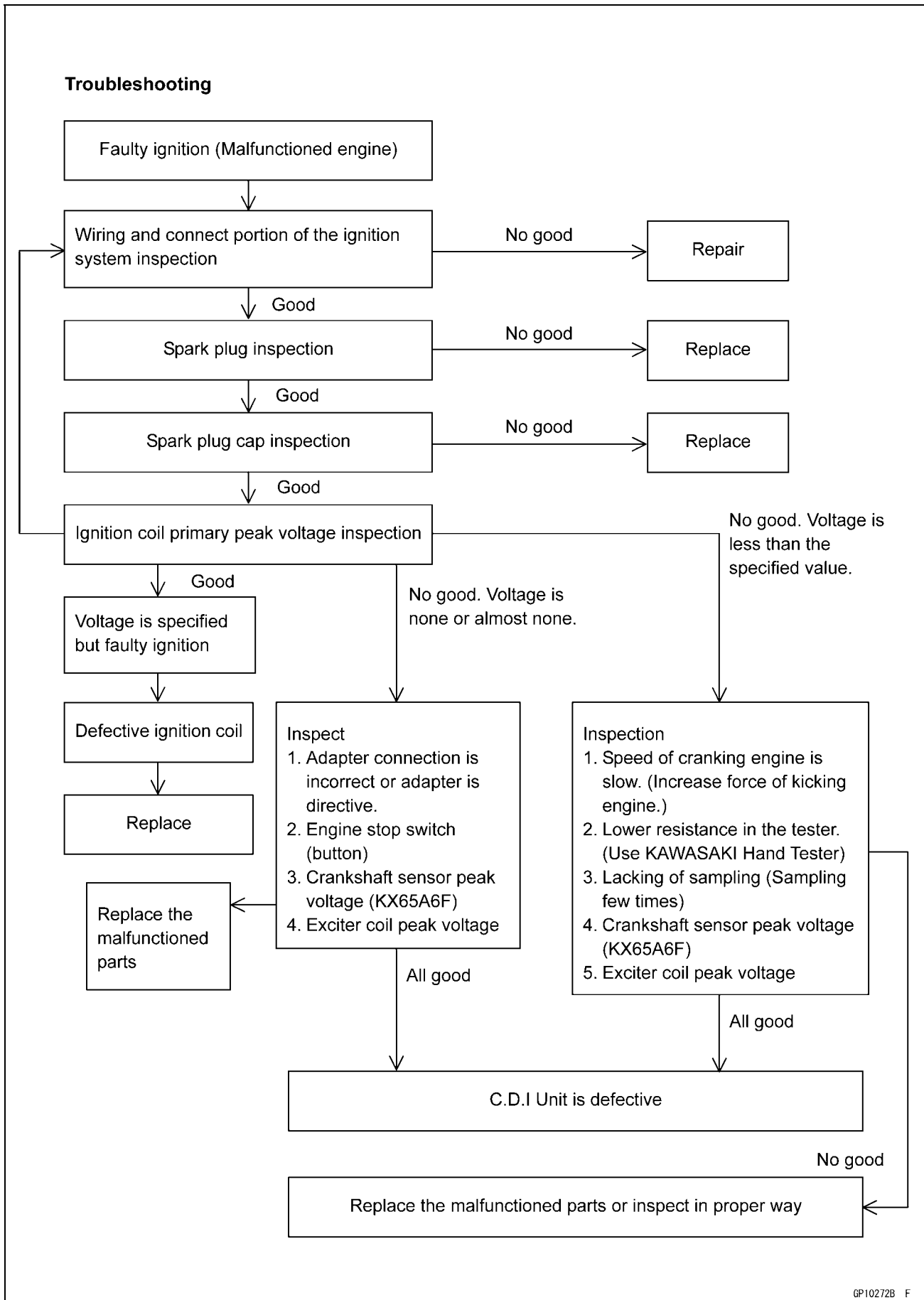
#### **⚠ WARNING**

**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 value, see the next page.

# 13-16 ELECTRICAL SYSTEM

## Ignition System





## Ignition System

### Exciter (Stator) Coil Peak Voltage Check

- Disconnect the connector of the harness from the CDI Unit.
- To check the peak voltage, do the following procedures.

#### NOTE

- Measure the voltage with each lead connected correctly. The correct value may not be obtained if disconnected.
- Maintain the correct value of compression pressure for the cylinder (Be sure to measure the voltage with the spark plug installed to the cylinder head).
- Connect the peak voltage adapter [A] of the tester to the terminals of the harness connector [B].

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

**Type: KEK-54-9-B**

**Hand Tester: 57001-1394**

#### Connection:

**Adapter Positive → Black/Red Lead**

**Adapter Negative → Black/White Lead**

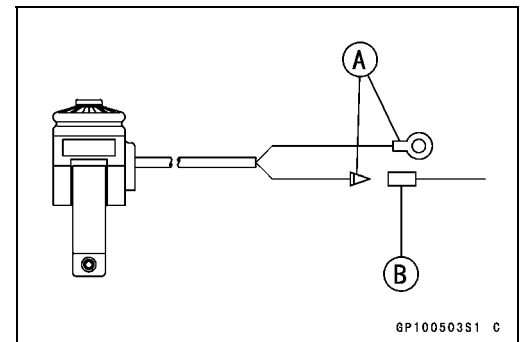
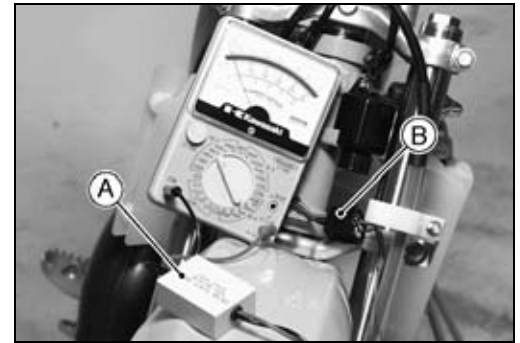
- Crank the engine by kicking the pedal several times to measure the peak voltage of the exciter (stator) coil.

**Peak Voltage      DC 100 V or above**

- ★ If the voltage is less than the specified, check the exciter (stator) coil.

### Engine Stop Function Check

- Disconnect the engine stop button (switch) leads [A].
- Start the engine.
- Ground the stop button (switch) lead [B] of the main harness side while the engine is running.
- ★ If the engine does not stop, the CDI Unit is defective.



### Engine Stop Button Electric Current Check (KX65A6F ~)

- Disconnect the engine stop button (switch) lead connector.
- Start the engine.
- Ground the stop button (switch) black/yellow lead of the magneto lead while the engine is running.
- ★ If the engine does not stop, replace the CDI Unit.



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# Appendix

## Table of Contents

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## 14-2 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:

- Float level too high
- Float valve worn or stuck open
- Starting technique faulty  
(when flooded, kick with the throttle fully open to allow more air to reach the engine.)

##### No spark; spark weak:

- Spark plug dirty, broken, or maladjusted
- Spark plug cap or high tension wiring trouble
- Spark plug cap not in good contact
- Spark plug incorrect
- CDI 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 and 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
- CDI Unit trouble
- Ignition coil trouble
- Flywheel magneto damaged
- Ignition coil lead or CDI Unit lead not in good contact

##### Fuel/air mixture incorrect:

- Idle adjusting screw maladjusted
- Slow jet or air passage clogged
- Air cleaner clogged, poorly sealed, or missing
- Choke plunger stuck open
- Float level too high or too low
- Fuel tank air vent obstructed
- Carburetor holder loose
- Air cleaner duct loose

##### Compression Low:

- Spark plug loose
- Cylinder head not sufficiently tightened down
- Cylinder, piston worn
- Piston ring bad (worn, weak, broken, or sticking)
- Piston ring/land clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Cylinder base gasket damaged
- Reed valve damaged
- Cylinder nut loose

##### Other:

- CDI Unit trouble
- Transmission oil viscosity too high
- Brake dragging

#### Poor Running or No Power at High Speed:

##### Firing incorrect:

- Spark plug dirty, damaged, or maladjusted
- Spark plug cap or high tension wiring damaged
- Spark plug cap shorted or not in good contact
- Spark plug incorrect
- CDI Unit trouble
- Ignition coil trouble

## Troubleshooting Guide

Flywheel magneto damaged  
Ignition coil lead or CDI 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  
Float level too high or too low  
Air jet or air passage clogged  
Air cleaner clogged, poorly sealed, or missing

Choke plunger stuck open  
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  
Float level too high or too low  
Main jet clogged  
Throttle valve does not fully open  
Air cleaner clogged  
Muffler clogged  
Water or foreign matter in fuel  
Cylinder exhaust port clogged  
Brake dragging  
Clutch slipping  
Overheating  
Transmission oil level too high  
Transmission oil viscosity too high  
Crankshaft bearing worn or damaged

### **Knocking:**

Carbon built up in combustion chamber  
Fuel poor quality or incorrect  
Spark plug incorrect  
CDI Unit trouble

## **Overheating:**

### **Firing incorrect:**

Spark plug dirty, broken, or maladjusted  
Spark plug incorrect

CDI Unit trouble

### **Fuel/air mixture incorrect:**

Main jet clogged or wrong size  
Fuel level in carburetor float bowl too low  
Carburetor holder loose  
Air cleaner poorly sealed, or missing  
Air cleaner duct poorly sealed  
Air cleaner clogged

### **Compression high:**

Carbon built up in combustion chamber

### **Engine load faulty:**

Brake dragging  
Clutch slipping  
Transmission oil level too high  
Transmission oil viscosity too high

### **Lubrication inadequate:**

Transmission oil level too low  
Transmission oil poor quality or incorrect

### **Coolant incorrect:**

Coolant level too low  
Coolant deteriorated

### **Cooling system component incorrect:**

Radiator clogged  
Radiator cap trouble  
Water pump not rotating

### **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  
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

### **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 positioning 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

## 14-4 APPENDIX

### Troubleshooting Guide

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#### **Jumps out of gear:**

- Shift fork worn
- Gear groove worn
- Gear dogs and/or dog holes worn
- Shift drum groove worn
- Gear positioning lever spring weak or broken
- Shift fork guide pin worn
- Drive shaft, output shaft, and/or gear splines worn

#### **Overshifts:**

- Gear positioning lever spring weak or broken
- Shift mechanism arm spring broken

#### **Abnormal Engine Noise:**

##### **Knocking:**

- CDI 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 damaged
- 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
- Clutch 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
- Cylinder damaged

##### **Other noise**

- Bracket, nut, bolt, etc. not properly mounted or tightened

#### **Exhaust Smoke:**

##### **Excessive white smoke:**

- Throttle cable maladjusted

##### **Brownish smoke:**

- Air cleaner clogged
- Main jet too large or fallen out
- Choke plunger stuck open
- Float level too high

#### **Handling and/or Stability**

##### **Unsatisfactory:**

##### **Handlebar hard to turn:**

- Control Cable routing incorrect
- Wiring routing incorrect
- Steering stem nut 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 clamp loose
- Steering stem head nut loose

##### **Handlebar pulls to one side:**

- Frame bent

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**Troubleshooting Guide**

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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)

## 14-6 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

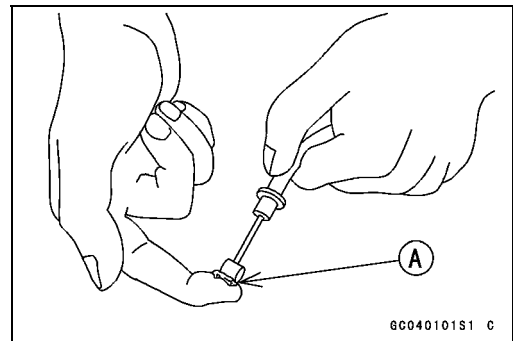
○Whenever the vehicle has been operated under wet or rainy conditions, or especially after using a high-pressure water spray, perform the general lubrication.

#### Pivots: Lubricate with Motor Oil

Clutch Lever  
Brake Lever  
Kick Pedal  
Shift Pedal  
Drive Chain

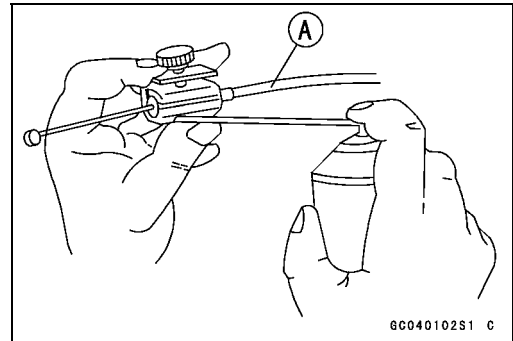
#### Points: Lubricate with Grease [A].

Clutch Inner Cable Upper and Lower Ends  
Throttle Inner Cable Upper Ends  
Swingarm Pivot  
Tie-Rod Pivot  
Rocker arm Pivot  
Steering Stem Bearing

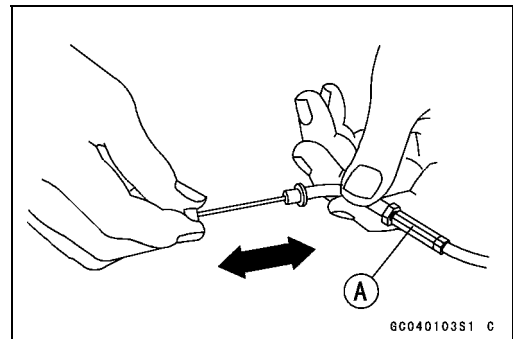


#### Cables: Lubricate with Rust Inhibitor.

Throttle Cables  
Clutch Cable [A]



- With the cable disconnected at the both ends, the cable [A] should move freely 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.





## Nut, Bolt, and Fastener Tightness

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### *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:

- Master Cylinder Clamp Bolts
- Caliper Mounting Bolts
- Brake Pedal Mounting Bolt

#### Suspension:

- Front Fork Clamp Bolts
- Rear Shock Absorber Mounting Bolt and Nut
- Swingarm Pivot Shaft Nut
- Tie-rod Mounting Nut

#### Steering:

- Steering Stem Head Nut
- Handlebar Clamp Bolts
- Steering Stem Nut

#### Engine:

- Engine Mounting Nuts
- Engine Bracket Nuts
- Cylinder Head Nuts
- Shift Pedal Bolt
- Muffler Mounting Bolt and Nut
- Kick Pedal Bolt

#### Others:

- Rear Frame Mounting Bolts
- Front Fender Mounting Bolt

# 14-8 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/cm <sup>2</sup> |
| kPa                 | × | 0.1450  | = | psi                 |
| kPa                 | × | 0.7501  | = | cmHg                |
| kgf/cm <sup>2</sup> | × | 98.07   | = | kPa                 |
| kgf/cm <sup>2</sup> | × | 14.22   | = | psi                 |
| cmHg                | × | 1.333   | = | kPa                 |

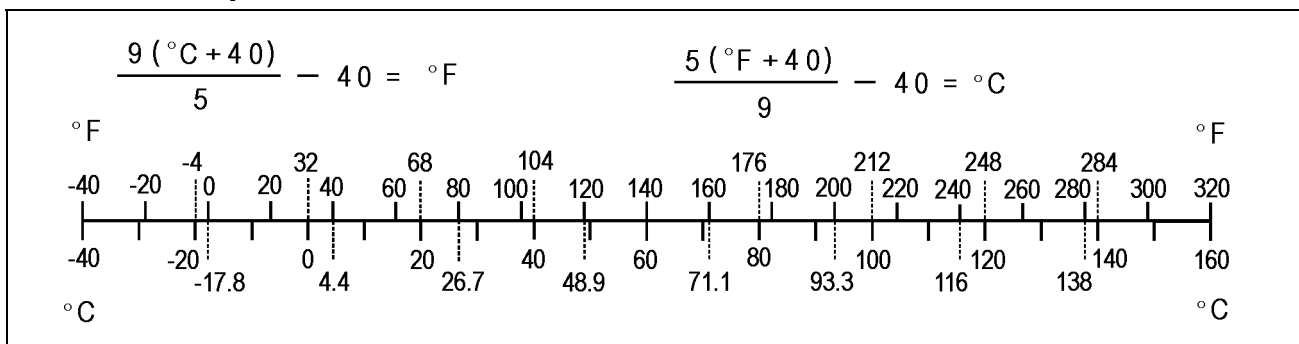
### Units of Speed:

|      |   |        |   |     |
|------|---|--------|---|-----|
| km/h | × | 0.6214 | = | mph |
|------|---|--------|---|-----|

### 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.                       |
|------|---------|---|
| 2000 | KX65-A1 | JKBKEAC□YA000001 or<br>JKAKX065AAA000001  |
| 2001 | KX65-A2 | JKBKXEAC□1A009001 or<br>JKBKX065AAA009001 |
| 2002 | KX65-A3 | JKBKXEAC□2A016001 or<br>JKBKX065AAA016001 |
| 2003 | KX65-A4 | JKBKXEAC□3A027001 or<br>JKBKX065AAA027001 |
| 2004 | KX65-A5 | JKBKXEAC□4A036001 or<br>JKBKX065AAA036001 |
| 2005 | KX65-A6 | JKBKXEAC□5A042001 or<br>JKBKX065AAA042001 |
| 2006 | KX65A6F | JKBKXEAC□6A048001 or<br>JKBKX065AAA048001 |
| 2007 | KX65A7F | JKBKXEAC□7A054001<br>JKBKX065AAA054001    |

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



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