

MODEL APPLICATION

Year	Model	Beginning Frame No.
2004	ZX1000-C1	JKAZXCC1□4A000001 or JKAZXT00CCA000001 or ZXT00C-000001
2005	ZX1000-C2	JKAZXCC1□5A020001 or JKAZXT00CCA020001 or ZXT00C-020001

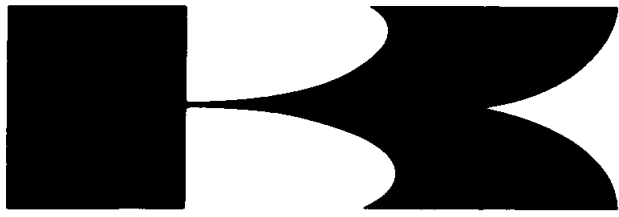
□:This digit in the frame number changes from one machine to another.



KAWASAKI HEAVY INDUSTRIES, LTD.
Consumer Products & Machinery Company

Part No.99924-1322-02

Printed in Japan



Kawasaki Ninja ZX-10R



Motorcycle Service Manual

Quick Reference Guide

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LIST OF ABBREVIATIONS

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

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 his ability to do the work, all adjustments, maintenance, and repair should be carried out only by qualified mechanics.

In order to perform the work efficiently and to avoid costly mistakes, read the text, thoroughly familiarize yourself with the procedures before starting work, and then do the work carefully in a clean area. Whenever special tools or equipment are specified, do not use makeshift tools or equipment. Precision measurements can only be made if the proper instruments are used, and the use of substitute tools may adversely affect safe operation.

For the duration of the warranty period, we recommend that all repairs and scheduled maintenance be performed in accordance with this service manual. Any owner maintenance or repair procedure not performed in accordance with this manual may void the warranty.

To get the longest life out of your vehicle:

- Follow the Periodic Maintenance Chart in the Service Manual.
- Be alert for problems and non-scheduled maintenance.
- Use proper tools and genuine Kawasaki Motorcycle parts. Special tools, gauges, and testers that are necessary when servicing Kawasaki motorcycles are introduced by the Special Tool Catalog or Manual. Genuine parts provided as spare parts are listed in the Parts Catalog.
- Follow the procedures in this manual carefully. Don't take shortcuts.
- Remember to keep complete records of maintenance and repair with dates and any new parts installed.

How to Use This Manual

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

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

For example, if you want ignition coil information, use the Quick Reference Guide to locate the Electrical System chapter. Then, use the Table of Contents on the first page of the chapter to find the ignition coil section.

Whenever you see these WARNING and CAUTION symbols, heed their instructions! Always follow safe operating and maintenance practices.

WARNING

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

CAUTION

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

This manual contains four more symbols (in addition to WARNING and CAUTION) which will help you distinguish different types of information.

NOTE

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

- Indicates a procedural step or work to be done.
- Indicates a procedural sub-step or how to do the work of the procedural step it follows. It also precedes the text of a NOTE.
- ★ Indicates a conditional step or what action to take based on the results of the test or inspection in the procedural step or sub-step it follows.

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

General Information



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1-2 GENERAL INFORMATION

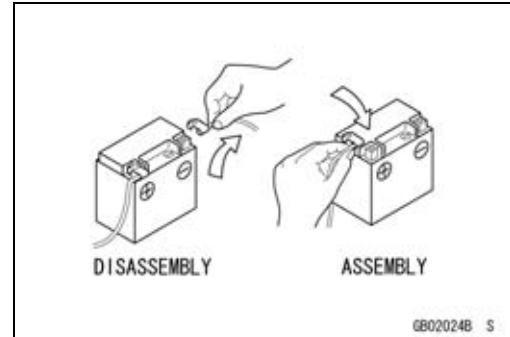
Before Servicing

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

Especially note the following:

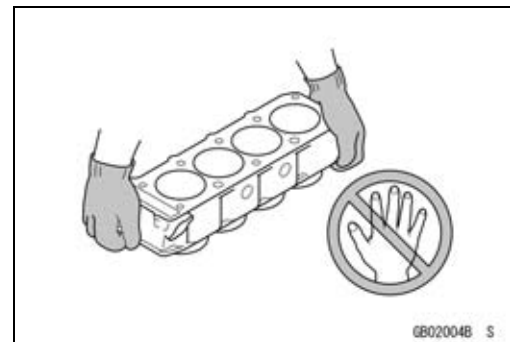
Battery Ground

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



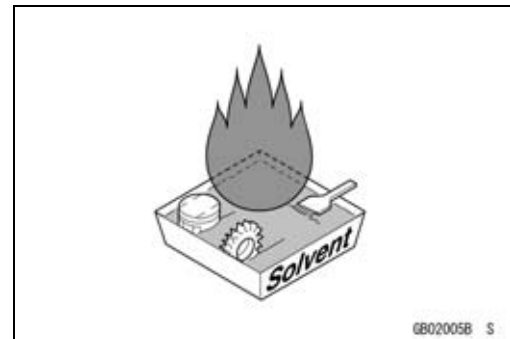
Edges of Parts

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



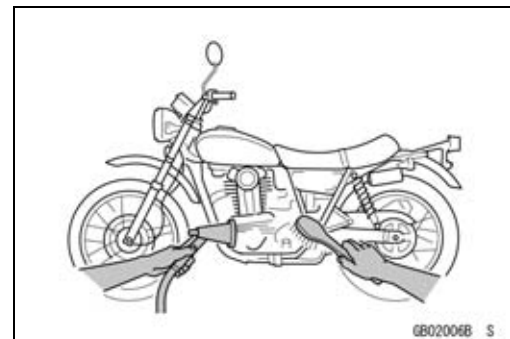
Solvent

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



Cleaning vehicle before disassembly

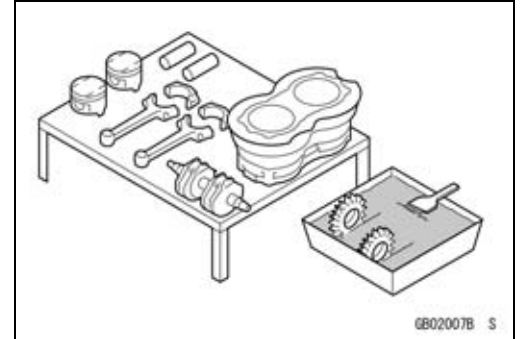
Clean the vehicle thoroughly before disassembly. Dirt or other foreign materials entering into sealed areas during vehicle disassembly can cause excessive wear and decrease performance of the vehicle.



Before Servicing

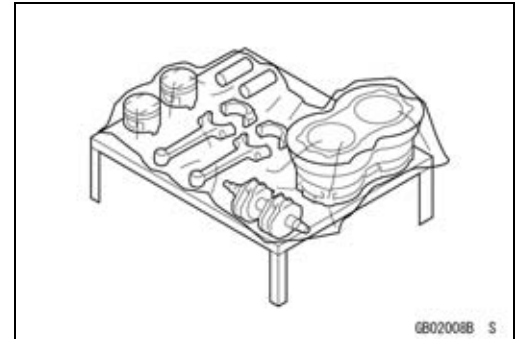
Arrangement and Cleaning of Removed Parts

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



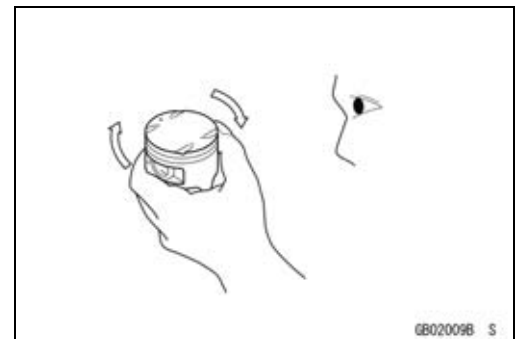
Storage of Removed Parts

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



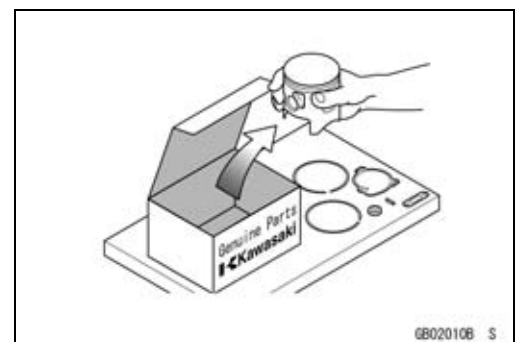
Inspection

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



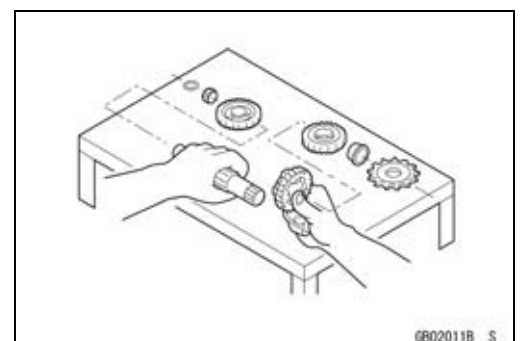
Replacement Parts

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



Assembly Order

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

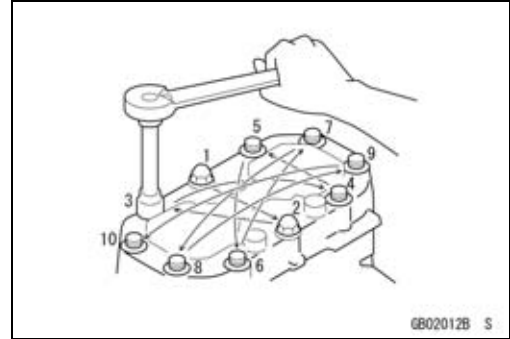


1-4 GENERAL INFORMATION

Before Servicing

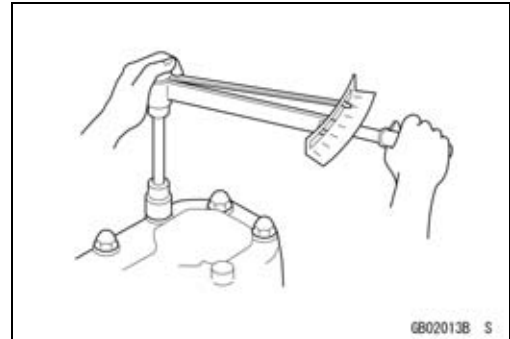
Tightening Sequence

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



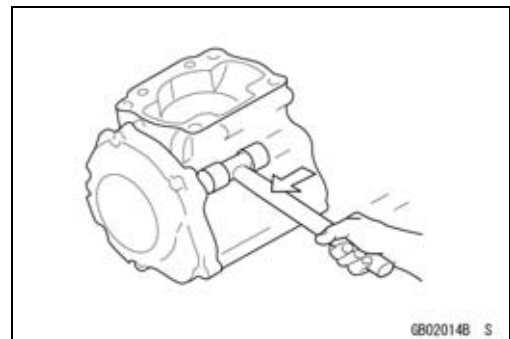
Tightening Torque

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



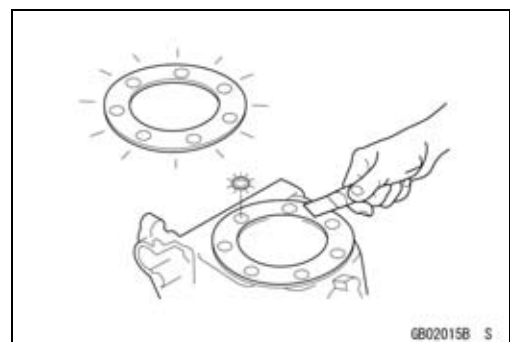
Force

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



Gasket, O-ring

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



Liquid Gasket, Locking Agent

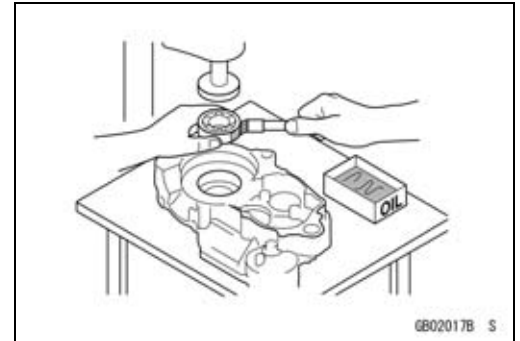
For applications that require Liquid Gasket or a Locking agent, clean the surfaces so that no oil residue remains before applying liquid gasket or locking agent. Do not apply them excessively. Excessive application can clog oil passages and cause serious damage.



Before Servicing

Press

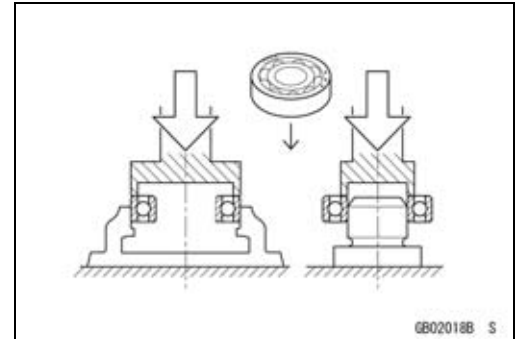
For items such as bearings or oil seals that must be pressed into place, apply small amount of oil to the contact area. Be sure to maintain proper alignment and use smooth movements when installing.



Ball Bearing and Needle Bearing

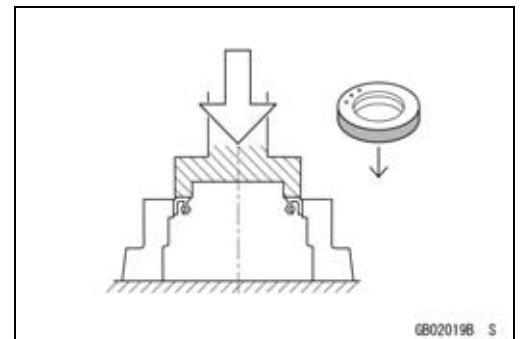
Do not remove pressed ball or needle unless removal is absolutely necessary. Replace with new ones whenever removed. Press bearings with the manufacturer and size marks facing out. Press the bearing into place by putting pressure on the correct bearing race as shown.

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

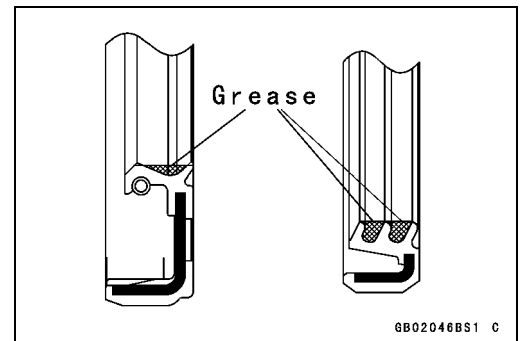


Oil Seal, Grease Seal

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

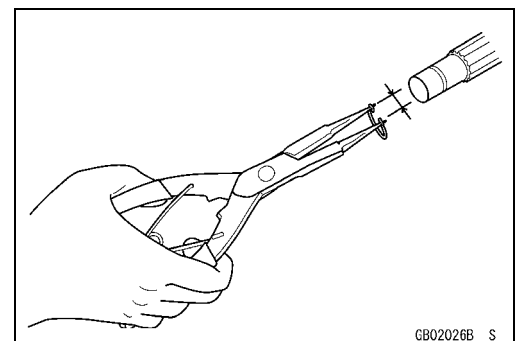


Apply specified grease to lip of seal before installing the seal.



Circlips, Cotter Pins

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



1-6 GENERAL INFORMATION

Before Servicing

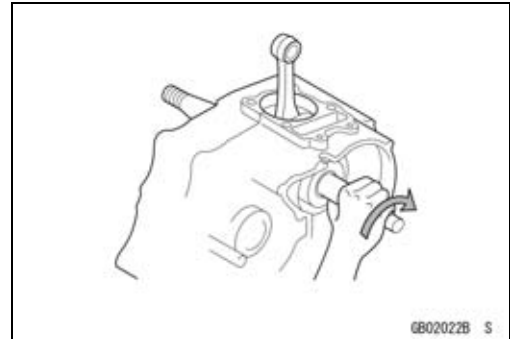
Lubrication

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



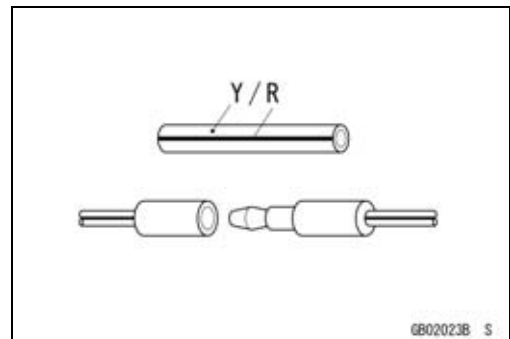
Direction of Engine Rotation

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



Electrical Wires

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



Model Identification

ZX1000-C1 (Europe) Left Side View



ZX1000-C1 (Europe) Right Side View



1-8 GENERAL INFORMATION

Model Identification

ZX1000-C1 (US and Canada) Left Side View



ZX1000-C1 (US and Canada) Right Side View



General Specifications

Items	ZX1000-C1 ~
<p>Dimensions</p> <p>Overall Length Overall Width Overall Height Wheelbase Road Clearance Seat Height Dry Mass Curb Mass: Front Rear Fuel Tank Capacity</p>	<p>2 045 mm (80.5 in.) 705 mm (27.8 in.) 1 115 mm (43.9 in.) 1 385 mm (54.5 in.) 125 mm (4.9 in.) 825 mm (32.5 in.) 170 kg (375 lb) 102 kg (225 lb) 94 kg (207 lb) 17 L (4.5 US gal)</p>
<p>Performance</p> <p>Minimum Turning Radius</p>	<p>3.3 m (10.8 ft)</p>
<p>Engine</p> <p>Type Cooling System Bore and Stroke Displacement Compression Ratio Maximum Horsepower Maximum Torque Carburetion System Starting System Ignition System Timing Advance Ignition Timing Spark Plug Cylinder Numbering Method Firing Order Valve Timing: Inlet: Open Close Duration Exhaust: Open Close Duration Lubrication System</p>	<p>4-stroke, DOHC, 4-cylinder Liquid-cooled 76.0 × 55.0 mm (3.0 × 2.2 in.) 998 mL (60.9 cu in.) 12.7:1 128.4 kW (175 PS) @11 700 r/min (rpm), (FR) 78.2 kW (106 PS) @11 500 r/min (rpm), (CA), (CAL), (US) – – – 115 N·m (11.7 kgf·m, 49 ft·lb) @9 500 r/min (rpm), (CA), (CAL), (FR), (US) – – – FI (Fuel injection), MIKUNI 43EIDW Electric starter Battery and coil (transistorized) Electronically advanced (digital igniter in ECU) 10° BTDC @1 100 r/min (rpm) NGK CR9EIA-9 Left to right, 1-2-3-4 1-2-4-3 46° BTDC 74° ABDC 300° 66° BBDC 46° ATDC 292° Forced lubrication (wet sump with cooler)</p>

1-10 GENERAL INFORMATION

General Specifications

Items	ZX1000-C1 ~
Engine Oil: Type Viscosity Capacity	API SE, SF or SG API SH or SJ with JASO MA SAE10W-40 3.7 L (3.9 US qt)
Drive Train Primary Reduction System: Type Reduction Ratio Clutch Type Transmission: Type Gear Ratios: 1st 2nd 3rd 4th 5th 6th Final Drive System: Type Reduction Ratio Overall Drive Ratio	Gear 1.611 (87/54) Wet multi disc 6-speed, constant mesh, return shift 2.533 (38/15) 2.053 (39/19) 1.737 (33/19) 1.524 (32/21) 1.381 (29/21) 1.304 (30/23) Chain drive 2.294 (39/17) 4.821 @Top gear
Frame Type Caster (Rake Angle) Trail Front Tire: Type Size Rear Tire: Type Size Front Suspension: Type Wheel Travel Rear Suspension: Type Wheel Travel Brake Type: Front Rear	Tubular, diamond 24° 102 mm (4.0 in.) Tubeless 120/70 ZR17 M/C (58W) Tubeless 190/50 ZR17 M/C (73W) Telescopic fork (upside-down) 120 mm (4.7 in.) Swingarm (uni-trak) 125 mm (4.9 in.) Dual discs Single disc

General Specifications

Items	ZX1000-C1 ~
Electrical Equipment	
Battery	12 V 10 Ah
Headlight:	
Type	Semi-sealed beam
Bulb:	
High	12 V 55 W (quartz-halogen) × 2
Low	12 V 55 W (quartz-halogen)
Tail/Brake Light	12 V 0.5/4.1 W (LED)
Alternator:	
Type	Three-phase AC
Rated Output	30.3 A, 14 V @5 000 r/min (rpm)

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

CA: Canada Model

CAL: California Model

FR: France Model

US: United States Model

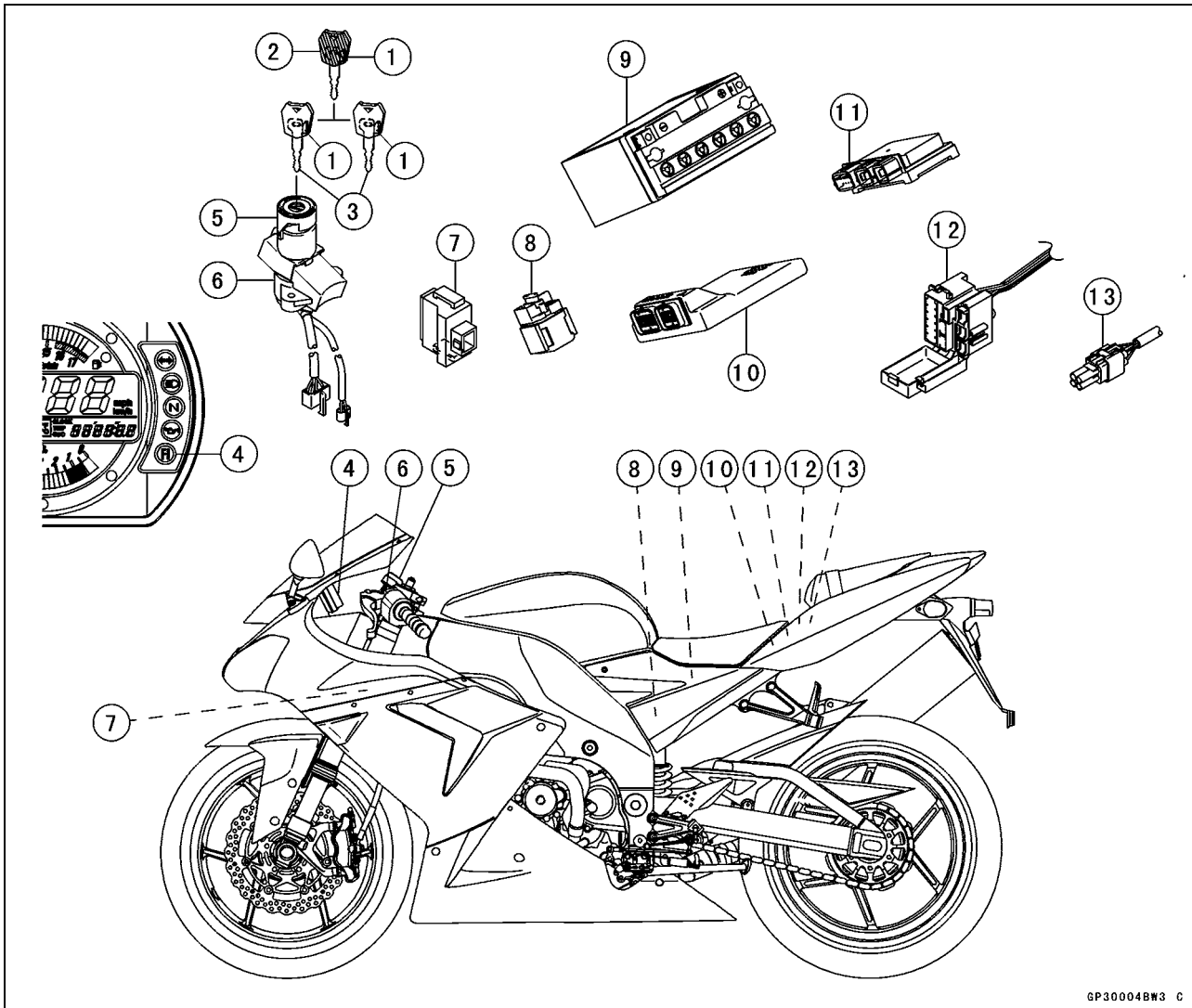
1-12 GENERAL INFORMATION

Technical Information-Immobilizer System

Overview

This system provides a theft proof device by means of matching a code between the inbuilt key transponder and the ECU (Electronic Control Unit). If this code does not match, the fuel pump, injectors, ignition system, sub-throttle valve actuator and exhaust butterfly valve actuator will not operate and the engine will not start.

Related Parts and Function



1. Transponder (Inside Keys)
2. Master Key
3. User Keys
4. FI Indicator Light
5. Immobilizer Antenna
6. Ignition Switch
7. Immobilizer Amplifier

8. Starter Relay
9. Battery
10. Electronic Control Unit (ECU)
11. Relay Box
12. Fuse Box
13. Immobilizer/Kawasaki Diagnostic System Connector

Master Key (1 piece)

The master key (colored red) has an inbuilt transponder, containing a master key code. These codes are unique to each key. This code and an additional two user key codes must be registered in the ECU for the system to operate. The master key is necessary when registering user keys and should not be used as the main key to start the motorcycle except in emergencies (loss or damage of user keys). It should be kept in a safe place.

Transponder (in Keys)

The transponder (made by Texas Instruments, Inc.) has an integrated circuit with a unique code that also calculates data sent by the ECU. When the ignition switch is turned ON, the transponder is excited by the radio wave transmitted from the antenna and then transmits a unique code to the antenna.

Technical Information-Immobilizer System

User Key (2 pieces)

The user keys (colored black) should be used when riding the motorcycle. These keys have unique codes which differ from the master key. Up to a maximum of five user key codes can be stored by the ECU at any one time. These codes can not be registered to the ECU without firstly registering the master key code.

Antenna

The antenna transmits a radio wave to excite the transponder, receives the code from the transponder and then transmits the code to the ECU through the amplifier.

Ignition Switch

The ignition switch turns the main circuit ON and OFF.

Amplifier

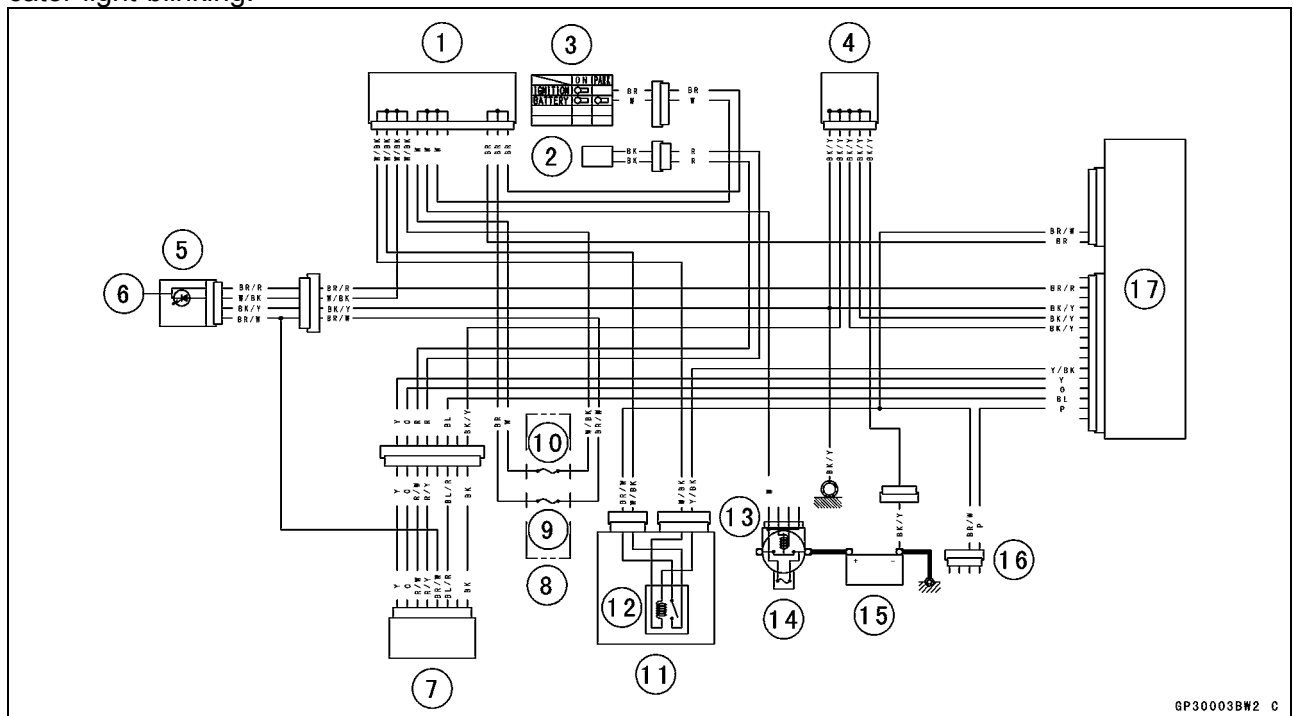
The amplifier (which is approximately the same size as a match box), amplifies signals from the antenna and the ECU.

ECU

The ECU has the capacity to store a maximum of six key code memories (one master and five user keys). The owner can have a total of five user keys at any one time. The master key memory can not be rewritten after initial registration, whereas the user key memories can be rewritten as necessary. When the ECU communicates with the transponder, a cipher generator changes the code every time it is used to avoid cloning.

FI Indicator Light

The condition or the failure of the immobilizer system is indicated by various patterns of the FI indicator light blinking.



GP30003BW2 C

- | | |
|--------------------------|--|
| 1. Joint Connector 4 | 10. ECU Fuse 15 A |
| 2. Immobilizer Antenna | 11. Relay Box |
| 3. Ignition Switch | 12. ECU Main Relay |
| 4. Joint Connector 2 | 13. Starter Relay |
| 5. Meter Unit | 14. Main Fuse 30 A |
| 6. FI Indicator Light | 15. Battery 12 V 10 Ah |
| 7. Immobilizer Amplifier | 16. Immobilizer/Kawasaki Diagnostic System Connector |
| 8. Fuse Box | 17. Electronic Control Unit (ECU) |
| 9. Ignition Fuse 10 A | |

1-14 GENERAL INFORMATION

Technical Information-Immobilizer System

Sequence of Operation

1. Turn ON the ignition switch, the ECU, amplifier and antenna start working, and the meter assembly FI indicator lights up.
2. The transponder excited by radio waves transmitted from the antenna receives the ciphered code from the ECU.
3. The transponder transmits the calculated result from the key's unique code to the ECU.
4. The ECU compares this with its memorized code, and if they match the engine can start. At this time, the FI indicator in the meter assembly is switched off.

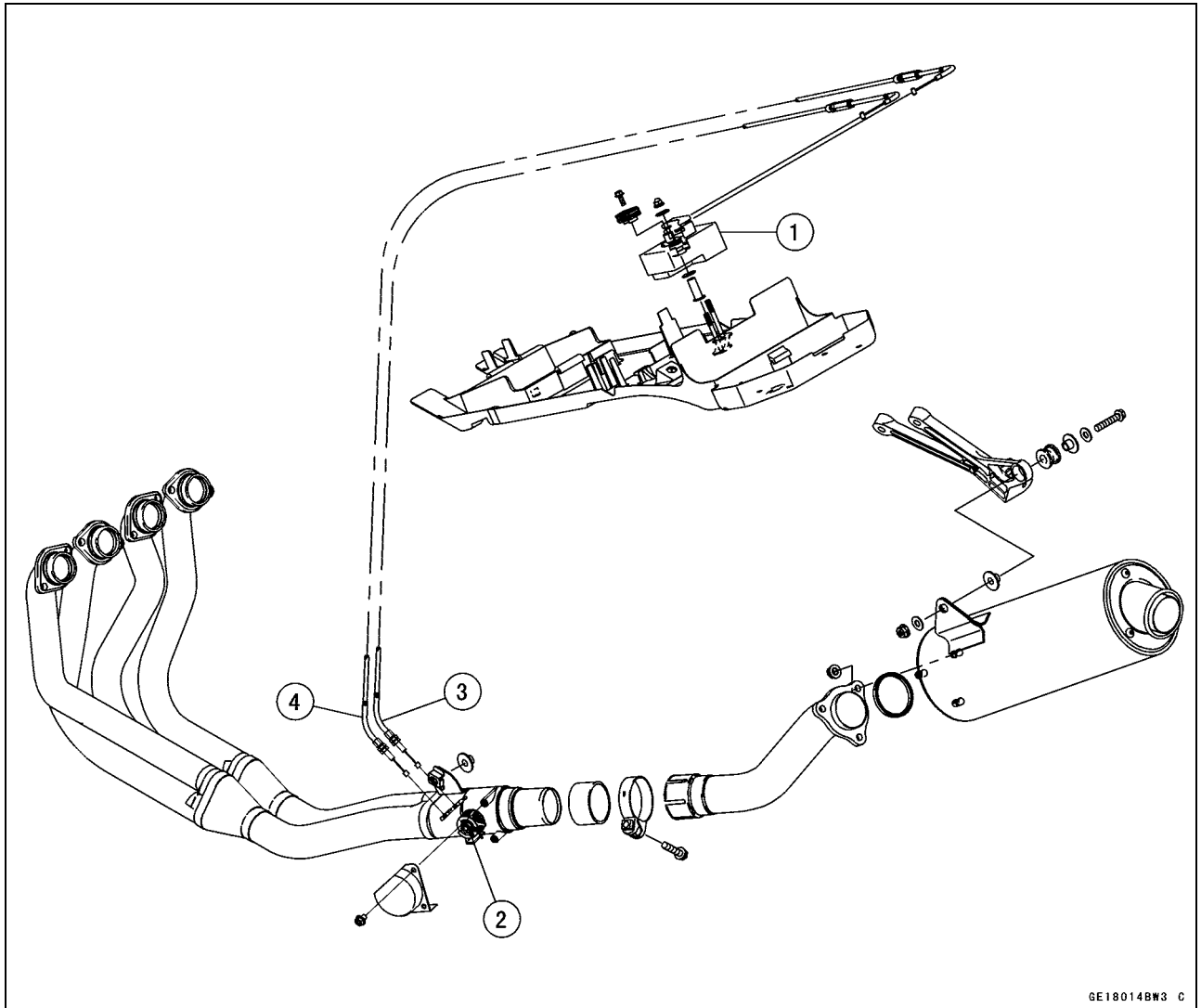
Technical Information-Exhaust Device System**Exhaust Device System**

The exhaust device system consists of the ECU, exhaust butterfly valve, exhaust butterfly valve actuator and exhaust device cables.

Exhaust butterfly valve is installed in the exhaust pipe end. Exhaust butterfly valve actuator is under the seat. The exhaust butterfly valve is operated by the exhaust device cables. Exhaust device system is designed to improve the engine torque at low engine rpms and to reduce the exhaust noise.

Information on RPM, the throttle position, and the gear position sensor is sent to ECU and controlled.

The instruction from ECU is received, exhaust butterfly valve actuator is moved, and exhaust butterfly valve is opened and closed through the cable.



GE18014BW3 C

1. Exhaust Butterfly Valve Actuator
2. Exhaust Butterfly Valve
3. Open Cable (Yellow)
4. Close Cable (Dark Green)

1-16 GENERAL INFORMATION

Technical Information

Crankcase Upper

Crankcase upper and cylinder are a one piece casting, permitting light weight and compact engine.



High-speed Generator

The high-speed generator is located behind the cylinder, atop the transmission. Although small in diameter it is wider and is driven at twice the crank speed by the clutch to generate ample output at lower rpm.



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 ²
kPa	×	0.1450	=	psi
kPa	×	0.7501	=	cmHg
kgf/cm ²	×	98.07	=	kPa
kgf/cm ²	×	14.22	=	psi
cmHg	×	1.333	=	kPa

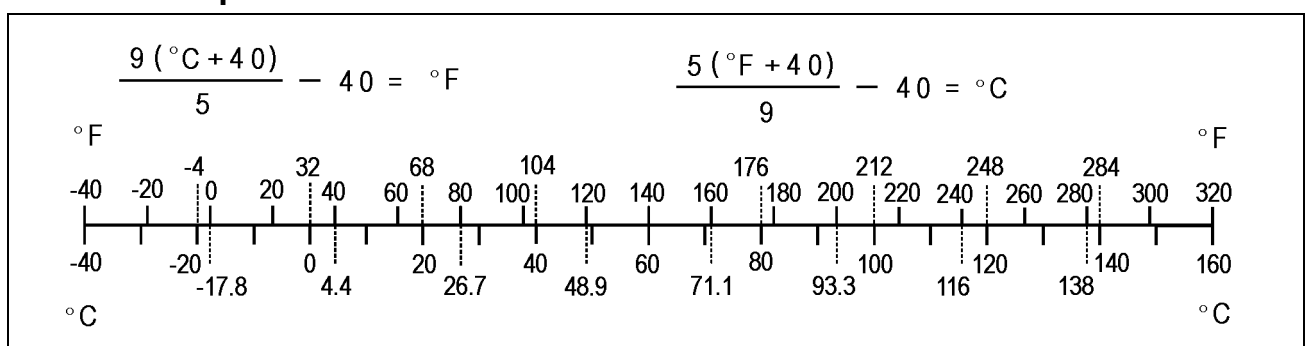
Units of Speed:

km/h	×	0.6214	=	mph
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Units of Power:

kW	×	1.360	=	PS
kW	×	1.341	=	HP
PS	×	0.7355	=	kW
PS	×	0.9863	=	HP

Units of Temperature:



Periodic Maintenance

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Brake Operation Inspection	2-31		

PERIODIC MAINTENANCE 2-3

Periodic Maintenance Chart

FREQUENCY	Whichever comes first ↓	* ODOMETER READING × 1000 km (× 1000 mile)							See Page
		1 (0.6)	6 (4)	12 (7.5)	18 (12)	24 (15)	30 (20)	36 (24)	
INSPECTION	Every	•	•	•	•	•	•	•	
Brake light switch operation-inspect		•	•	•	•	•	•	•	2-33
Suspensions									
Front forks/rear shock absorber operation (damping and smooth stroke)-inspect				•		•		•	2-34
Front forks/rear shock absorber oil leak-inspect	year			•		•		•	2-34
Rocker arm operation-inspect				•		•		•	2-34
Tie-rods operation-inspect				•		•		•	2-35
Steering System									
Steering play-inspect	year	•		•		•		•	2-35
Steering stem bearings-lubricate	2 years					•			2-36
Electrical System									
Lights and switches operation-inspect	year			•		•		•	2-37
Headlight aiming-inspect	year			•		•		•	2-39
Side stand switch operation-inspect	year			•		•		•	2-40
Engine stop switch operation-inspect	year			•		•		•	2-41
Others									
Chassis parts-lubricate	year			•		•		•	2-42
Bolts, nuts and fasteners tightness-inspect		•		•		•		•	2-43

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

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

CAL: California Model

2-4 PERIODIC MAINTENANCE

Periodic Maintenance Chart

Periodic Replacement Parts

CHANGE/REPLACEMENT	FREQUENCY ↓ Every	* ODOMETER READING × 1000 km (× 1000 mile)						See Page
		1 (0.6)	12 (7.5)	18 (12)	24 (15)	36 (24)	48 (30)	
Fuel hose	4 years						●	2-44
Air cleaner element #				●		●		2-46
Coolant	3 years					●		2-47
Radiator hose and O-ring	3 years					●		2-49
Engine oil #	year	●	●		●	●	●	2-49
Oil filter	year	●	●		●	●	●	2-50
Brake hose and pipe	4 years						●	2-50
Brake fluid	2 years				●		●	2-51
Master Cylinder/Caliper Rubber Parts	4 years						●	2-53
Spark plug		●	●		●	●	●	2-57

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

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

Torque and Locking Agent

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

Letters used in the “Remarks” column mean:

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

G: Apply grease to the threads.

HL: Apply a heavy duty non-permanent locking agent (Three Bond 1360N).

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

M: Apply molybdenum disulfide grease.

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

O: Apply oil to the threads and seating surface.

R: Replacement Parts

S: Tighten the fasteners following the specified sequence.

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

SS: Apply silicone sealant.

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

Basic Torque for General Fasteners

Threads diameter (mm)	Torque		
	N·m	kgf·m	ft·lb
5	3.4 ~ 4.9	0.35 ~ 0.50	30 ~ 43 in·lb
6	5.9 ~ 7.8	0.60 ~ 0.80	52 ~ 69 in·lb
8	14 ~19	1.4 ~1.9	10.0 ~ 13.5
10	25 ~ 34	2.6 ~ 3.5	19.0 ~ 25
12	44 ~ 61	4.5 ~ 6.2	33 ~ 45
14	73 ~ 98	7.4 ~ 10.0	54 ~ 72
16	115 ~ 155	11.5 ~ 16.0	83 ~ 115
18	165 ~ 225	17.0 ~ 23.0	125 ~ 165
20	225 ~ 325	23 ~ 33	165 ~ 240

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Fuel System				
Air Inlet Duct Mounting Bolts	7.0	0.70	62 in·lb	
Air Cleaner Element Cover Screws	1.1	0.11	9.7 in·lb	
Air Cleaner Housing Holder Clamp Screws	4.9	0.50	43 in·lb	
Camshaft Position Sensor Bolt	9.8	1.0	87 in·lb	
Water Temperature Sensor	25	2.5	18	
Vehicle-down Sensor Bolts	6.0	0.60	53 in·lb	
Gear Position Switch Screws	4.9	0.50	43 in·lb	L
Speed Sensor Bolt	4.0	0.40	35 in·lb	L
Crankshaft Sensor Bolts	6.0	0.60	53 in·lb	
Delivery Pipe Mounting Screws	4.9	0.50	43 in·lb	
Throttle Body Assembly Holder Clamp Bolts	2.0	0.20	18 in·lb	
Throttle Body Holder Bolts	9.8	1.0	87 in·lb	
Inlet Air Pressure Sensor Screw	3.5	0.36	31 in·lb	

2-6 PERIODIC MAINTENANCE

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Exhaust Butterfly Valve Actuator Mounting Nuts	7.0	0.70	62 in·lb	L, S
Exhaust Butterfly Valve Actuator Pulley Bolt	4.9	0.50	43 in·lb	
Exhaust Butterfly Valve Cover Bolts	8.8	0.90	78 in·lb	
Fuel Pump Bolts	9.8	1.0	87 in·lb	
Separator Mounting Bolt	11	1.1	97 in·lb	
Cooling System				
Water Hose Clamp Screws	2.0	0.20	17 in·lb	L
Coolant Drain Plug (Water Pump)	9.8	1.0	87 in·lb	
Coolant Drain Plug (Cylinder)	9.8	1.0	87 in·lb	
Coolant Drain Plug (Lower Crankcase)	9.8	1.0	87 in·lb	
Water Pump Cover Bolts	9.8	1.0	87 in·lb	
Oil Cooler Mounting Bolts	20	2.0	14	
Water Passage Plugs	20	2.0	14	
Thermostat Housing Cover Bolts	6.0	0.61	53 in·lb	
Thermostat Housing Mounting Bolts	9.8	1.0	87 in·lb	
Radiator Upper Bolt	7.0	0.70	61 in·lb	
Radiator Lower Bolt	7.0	0.70	61 in·lb	
Radiator Bracket Mounting Bolt	7.0	0.70	61 in·lb	
Coolant Reserve Tank Mounting Screws	9.8	1.0	87 in·lb	
Water Hose Fitting Bolts	9.8	1.0	87 in·lb	
Coolant By-pass Fitting Bolt	8.8	0.90	78 in·lb	
Water Temperature Sensor	25	2.5	18	L
Engine Top End				
Air Suction Valve Cover Bolts	9.8	1.0	87 in·lb	L
Cylinder Head Cover Bolts	9.8	1.0	87 in·lb	
Camshaft Cap Bolts	12	1.2	104 in·lb	S
Camshaft Chain Guide Bolts	12	1.2	104 in·lb	S
Cylinder Head Bolts (M10 New Bolts)	59	6.0	44	MO, S
Cylinder Head Bolts (M10 Used Bolts)	57	5.8	42	MO, S
Cylinder Head Bolts (M6)	12	1.2	104 in·lb	S
Water Passage Plugs	20	2.0	15	L
Throttle Body Holder Bolts	9.8	1.0	87 in·lb	S
Throttle Body Assembly Holder Clamp Bolts	2.0	0.20	17 in·lb	
Camshaft Position Sensor Bolt	9.8	1.0	87 in·lb	
Front Camshaft Chain Guide Bolt (Upper)	25	2.5	18	
Front Camshaft Chain Guide Bolt (Lower)	12	1.2	104 in·lb	
Camshaft Chain Tensioner Mounting Bolts	9.8	1.0	87 in·lb	
Camshaft Chain Tensioner Cap Bolt	20	2.0	15	
Spark Plugs	13	1.3	113 in·lb	
Cam Sprocket Mounting Bolts	15	1.5	11	L
Coolant Drain Plug (Cylinder)	9.8	1.0	87 in·lb	
Exhaust Pipe Manifold Holder Nuts	17	1.7	12	
Muffler Body Clamp Bolt	17	1.7	12	

PERIODIC MAINTENANCE 2-7

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Muffler Body Mounting Bolts	25	2.5	18	
Crankshaft Sensor Cover Bolts	9.8	1.0	87 in·lb	L
Muffler Body Assembly Nuts	22	2.2	16	
Exhaust Butterfly Valve Cable Locknuts	7.0	0.71	62 in·lb	
Exhaust Butterfly Valve Cover Bolts	9.0	0.90	80 in·lb	
Exhaust Butterfly Valve Cable Adjuster Locknuts	7.0	0.71	62 in·lb	
Bracket Mounting Bolts	9.8	1.0	87 in·lb	
Clutch				
Clutch Lever Clamp Bolts	7.8	0.80	69 in·lb	S
Clutch Cover Mounting Bolts (M6, L = 40 mm)	9.8	1.0	87 in·lb	S
Clutch Cover Mounting Bolt (M6, L = 30 mm)	9.8	1.0	87 in·lb	S
Clutch Cover Mounting Bolts (M6, L = 25 mm)	9.8	1.0	87 in·lb	S
Oil Filler Plug	2.0	0.20	18 in·lb	
Clutch Spring Bolts	9.8	1.0	87 in·lb	
Clutch Hub Nut	130	13.3	96	R
Sub Clutch Hub Bolts	11	1.1	95 in·lb	L
Engine Lubrication System				
Engine Oil Drain Bolt	20	2.0	14	
Oil Filter	31	3.2	23	G, R
Holder Mounting Bolt	35	3.6	26	L
Oil Pan Bolt (M6, L = 85 mm)	9.8	1.0	87 in·lb	
Oil Pan Bolts (M6, L = 25 mm)	9.8	1.0	87 in·lb	
Oil Pressure Relief Valve	15	1.5	11	L
Oil Pressure Switch	15	1.5	11	SS
Oil Pressure Switch Terminal Bolt	1.5	0.15	13 in·lb	
Sub Oil Pan Bolts	25	2.5	18	
Oil Filter Case Mounting Bolts	20	2.0	14	L
Oil Passage Plugs	20	2.0	14	L
Oil Pump Cover Bolts	9.8	1.0	87 in·lb	
Oil Pump Drive Gear Bolts	9.8	1.0	87 in·lb	
Oil Cooler Mounting Bolts	20	2.0	14	
Engine Removal/Installation				
Adjusting Collar Locknut	49	5.0	36	S
Upper Bracket Bolts	44	4.5	33	S
Upper Bracket Bolts	25	2.5	18	S
Engine Bracket Bolts	44	4.5	33	S
Middle Engine Mounting Nut	44	4.5	33	S
Lower Engine Mounting Nut	44	4.5	33	S
Engine Mounting Adjusting Bolt	9.8	1.0	87 in·lb	M, S
Front Engine Mounting Bolts	44	4.5	33	S
Middle Engine Mounting Bolt	9.8	1.0	87 in·lb	S
Lower Engine Mounting Bolt	9.8	1.0	87 in·lb	S

2-8 PERIODIC MAINTENANCE

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Crankshaft/Transmission				
Breather Plate Bolts	9.8	1.0	87 in·lb	L
Crankcase Bolts (M9)	46	4.7	34	MO, S
Crankcase Bolts (M8, L = 90 mm)	27	2.8	20	S
Crankcase Bolt (M8, L = 45 mm)	27	2.8	20	S
Crankcase Bolt (M7, L = 85 mm)	25	2.5	18	S
Crankcase Bolt (M7, L = 50 mm)	25	2.5	18	S
Crankcase Bolts (M7, L = 45 mm)	25	2.5	18	S
Crankcase Bolts (M7, L = 32 mm)	25	2.5	18	S
Crankcase Bolts (M6, L = 40 mm)	12	1.2	104 in·lb	S
Crankcase Bolt (M6, L = 22 mm)	12	1.2	104 in·lb	S
Shift Drum Bearing Holder Screws	5.0	0.51	44 in·lb	L
Shift Fork Holder Bolt	12	1.2	104 in·lb	L
Connecting Rod Big End Nuts	see the text	←	←	←
Timing Rotor Bolt	40	4.1	30	
Oil Pressure Switch	15	1.5	11	SS
Oil Pressure Switch Terminal Bolt	1.5	0.15	13 in·lb	
Oil Passage Plugs	20	2.0	14	L
Plate Screw	5.0	0.51	44 in·lb	L
Bearing Position Plate Screws	5.0	0.51	44 in·lb	L
Drive Shaft Cover Bolts	25	2.5	18	
Plugs	17	1.7	13	
Coolant Drain Plug (Lower Crankcase)	9.8	1.0	87 in·lb	
Plug	15	1.5	11	
Shift Pedal Mounting Bolt	25	2.5	18	
Gear Positioning Lever Bolt	12	1.2	104 in·lb	
Shift Shaft Return Spring Pin	29	3.0	22	L
Shift Drum Cam Holder Bolt	12	1.2	104 in·lb	L
Shift Lever Bolt	7.0	0.71	62 in·lb	
Tie-rod Locknuts	7.0	0.71	62 in·lb	
Gear Position Switch Screws	5.0	0.51	44 in·lb	L
Wheels/Tires				
Front Axle Clamp Bolts	20	2.0	14.5	AL
Front Axle Nut	108	11	81	
Rear Axle Nut	108	11	81	
Final Drive				
Engine Sprocket Nut	127	13	94	MO
Engine Sprocket Cover Bolts	9.8	1.0	87 in·lb	
Chain Guide Bolts	9.8	1.0	87 in·lb	
Speed Sensor Bolt	4.0	0.40	35 in·lb	L
Rear Sprocket Nuts	59	6.0	43	
Rear Sprocket Studs	–	–	–	L

PERIODIC MAINTENANCE 2-9

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Brakes				
Bleed Valves	7.8	0.80	69 in·lb	
Brake Hose Banjo Bolts	25	2.5	18	
Brake Lever Pivot Bolt	1.0	0.10	9 in·lb	Si
Brake Lever Pivot Bolt Locknut	6.0	0.61	53 in·lb	
Front Brake Reservoir Cap Stopper Screw	1.2	0.12	11 in·lb	
Front Brake Light Switch Screw	1.2	0.12	11 in·lb	
Brake Pedal Bolt	8.8	0.90	78 in·lb	
Front Master Cylinder Clamp Bolts	8.8	0.90	78 in·lb	S
Front Caliper Mounting Bolts	34	3.5	25	
Front Caliper Assembly Bolts	22	2.2	16	
Brake Disc Mounting Bolts	27	2.8	20	L
Rear Caliper Mounting Bolts	25	2.5	18	
Rear Master Cylinder Mounting Bolts	25	2.5	18	
Rear Master Cylinder Push Rod Locknut	18	1.8	13	
Front Brake Pad Pins	15	1.5	11	
Right Foot Guard Bolts	25	2.5	18	
Suspension				
Front Fork Clamp Bolts (Upper)	20	2.0	14.5	
Front Fork Clamp Bolts (Lower)	30	3.0	22	AL
Front Fork Top Plugs	23	2.3	17	
Piston Rod Nut	15	1.5	11	
Front Fork Bottom Allen Bolts	23	2.3	17	L
Front Axle Clamp Bolts	20	2.0	14.5	AL
Rear Shock Absorber Nuts	34	3.5	25	
Rear Shock Absorber Bracket Nut	59	6.0	43	
Swingarm Pivot Shaft Nut	108	11	81	
Uni-track Rocker Arm Nut	34	3.5	25	
Tie-rod Nuts	59	6.0	43	
Swingarm Pivot Adjusting Collar	20	2.0	14	
Swingarm Pivot Adjusting Collar Locknut	98	10	72	
Steering				
Steering Stem Head Nut	78	8.0	58	
Steering Stem Nut	20	2.0	14.5	
Handlebar Bolts	25	2.5	18	
Handlebar Position Bolts	9.8	1.0	87 in·lb	L
Handlebar Weight Screws	29	3.0	22	O
Handlebar Switch Housing Screws	3.5	0.36	31 in·lb	
Frame				
Side Stand Bolt	44	4.5	32	G
Footpeg Stay Bolts	25	2.5	18	
Side Stand Bracket Bolts	49	5.0	36	L
Rear Frame Bolts	44	4.5	32	

2-10 PERIODIC MAINTENANCE

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Side Stand Switch Bolt	8.8	0.90	78 in·lb	L
Wind Shield Mounting Screws	0.40	0.04	3.5 in·lb	
Front Fender Mounting Bolts	3.9	0.40	35 in·lb	
Inner Fender Mounting Bolts	2.5	0.25	1.8 in·lb	
Electrical System				
Alternator Shaft Lever Bolt	25	2.5	18	L
Alternator Shaft Spring Bolt	9.8	1.0	87 in·lb	
Alternator Shaft Clamp Bolt	12	1.2	104 in·lb	
Spark Plugs	13	1.3	113 in·lb	
Stator Coil Bolts	8.0	0.80	71 in·lb	HL
Alternator Lead Holding Plate Bolts	6.0	0.60	52 in·lb	
Alternator Cover Bolts	25	2.5	18	
Crankshaft Sensor Cover Bolts	9.8	1.0	87 in·lb	L
Crankshaft Sensor Bolts	6.0	0.60	52 in·lb	
Timing Rotor Bolt	40	4.0	29	
Starter Motor Mounting Bolts	9.8	1.0	87 in·lb	
Starter Motor Through Bolts	3.5	0.36	31 in·lb	
Starter Motor Lead Terminal Nut	6.0	0.61	53 in·lb	
Starter Motor Lead Mounting Bolt	4.0	0.41	35 in·lb	
Battery Lead Mounting Bolt	4.0	0.41	35 in·lb	
Front Brake Light Switch Screws	1.2	0.12	11 in·lb	
Switch Housing	1.2	0.12	11 in·lb	
Gear Position Switch Screws	4.9	0.50	43 in·lb	L
Water Temperature Sensor	25	2.5	18	
License Plate Light Mounting Screws	1.2	0.12	11 in·lb	
Camshaft Position Sensor Bolt	9.8	1.0	87 in·lb	
Starter Clutch Bolts	50	5.0	36	Lh
Starter Clutch Cover Bolts	9.8	1.0	87 in·lb	
Idle Gear Cover Bolts	9.8	1.0	87 in·lb	
Meter Mounting Screws	1.2	0.12	11 in·lb	
Headlight Mounting Screws	1.2	0.12	11 in·lb	
Front Turn Signal Light Mounting Screws	1.2	0.12	11 in·lb	
Regulator/rectifier Bolts	9.8	1.0	87 in·lb	

Specifications

Item	Standard	Service Limit
Fuel System		
Throttle Grip Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)	---
Idle Speed	1 100 ±50 r/min (rpm)	---
Throttle Body Vacuum	30 ±1.3 kPa (225 ±10 mmHg) at idle speed	---
Air Cleaner Element	Viscous paper element	---
Cooling System		
Coolant:		
Type (Recommended)	Permanent type antifreeze	---
Color	Green	---
Mixed Ratio	Soft water 50%, coolant 50%	---
Freezing Point	-35°C (-31°F)	---
Total Amount	2.5 L (2.6 US qt)	---
Engine Top End		
Valve Clearance:		
Exhaust	0.17 ~ 0.22 mm (0.0067 ~ 0.0087 in.)	---
Inlet	0.15 ~ 0.24 mm (0.0059 ~ 0.0094 in.)	---
Clutch		
Clutch Lever Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)	---
Engine Lubrication System		
Engine Oil:		
Type	API SE, SF or SG API SH or SJ with JASO MA	---
Viscosity	SAE 10W-40	---
Capacity	2.7 L (2.9 US qt) (when filter is not removed)	---
	3.0 L (3.2 US qt) (when filter is removed)	---
	3.7 L (3.9 US qt) (when engine is completely dry)	---
Level	Between upper and lower level lines (Wait 2 ~ 3 minutes after idling or running)	---
Tires		
Tread Depth:		
Front	DUNLOP: 4.0 mm (0.16 in.)	1 mm (0.04 in.), (DE, AT, CH) 1.6 mm (0.06 in.)
Rear	DUNLOP: 5.5 mm (0.22 in.)	Up to 130 km/h (80 mph): 2 mm (0.08 in.), Over 130 km/h (80 mph): 3 mm (0.12 in.)
Air Pressure (when Cold):		
Front	Up to 180 kg (397 lb) load: 250 kPa (2.5 kgf/cm ² , 36 psi)	---
Rear	Up to 180 kg (397 lb) load: 290 kPa (2.9 kgf/cm ² , 42 psi)	---

2-12 PERIODIC MAINTENANCE

Specifications

Item	Standard	Service Limit
Final Drive		
Drive Chain Slack	35 ~ 45 mm (1.4 ~ 1.8 in.)	---
Drive Chain Wear (20-link Length)	317.5 ~ 318.2 mm (12.50 ~ 12.53 in.)	323 mm (12.7 in.)
Standard Chain:		
Make	RK EXCEL	---
Type	RK 525MFO	---
Link	110 links	---
Brakes		
Brake Fluid:		
Grade	DOT4	---
Brake Pad Lining Thickness:		
Front	4 mm (0.16 in.)	1 mm (0.04 in.)
Rear	5 mm (0.20 in.)	1 mm (0.04 in.)
Brake Light Timing:		
Front	Pulled ON	---
Rear	On after about 10 mm (0.39 in.) of pedal travel	---
Electrical System		
Spark Plug Gap	0.8 ~ 0.9 mm (0.032 ~ 0.035 in.)	---

AT: Austria

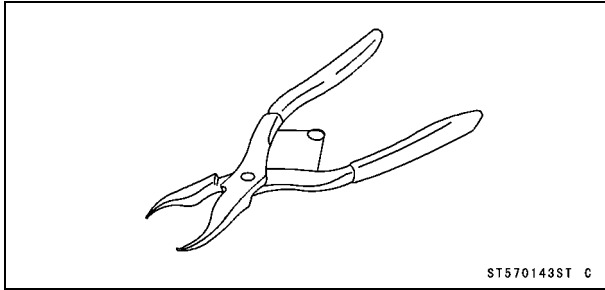
CH: Switzerland

DE: Germany

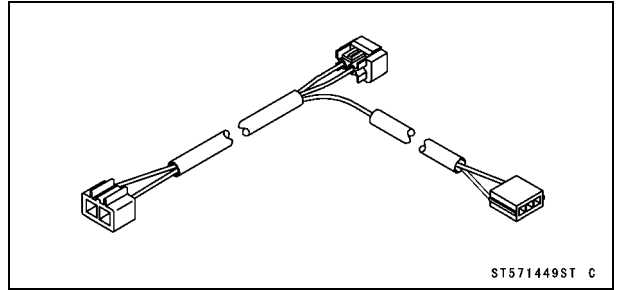
US: United States

Special Tools

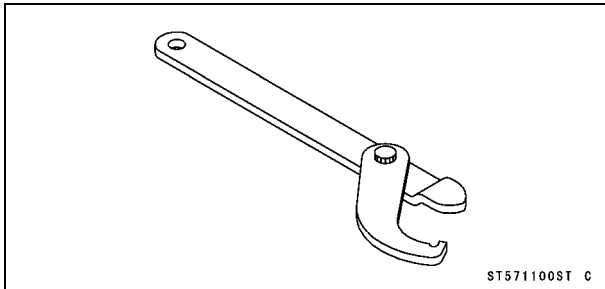
Inside Circlip Pliers:
57001-143



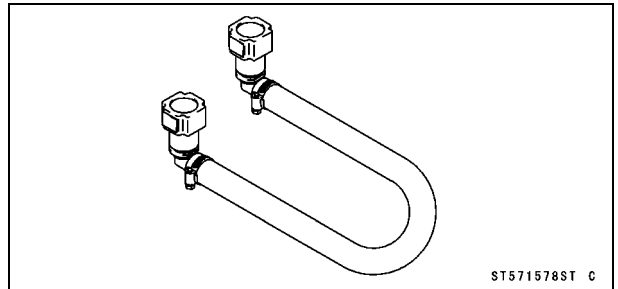
Lead Wire - Peak Voltage Adapter:
57001-1449



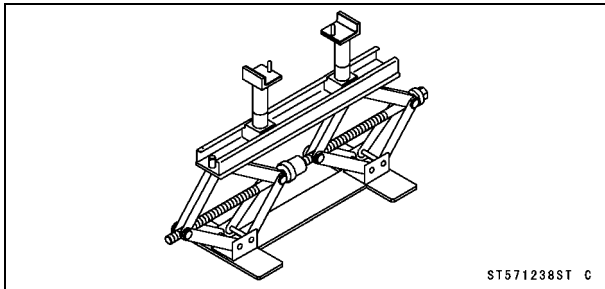
Steering Stem Nut Wrench:
57001-1100



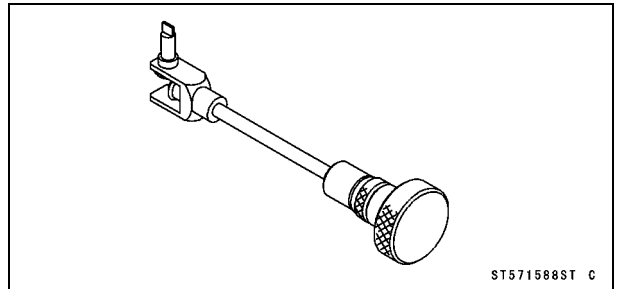
Extension Tube:
57001-1578



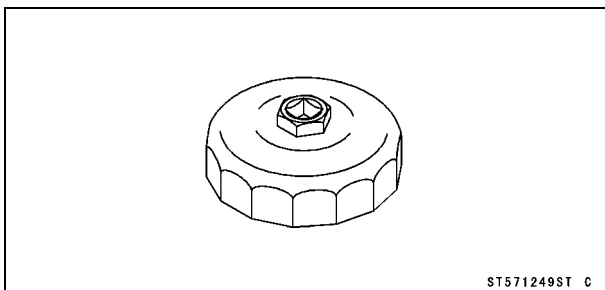
Jack:
57001-1238



Pilot Screw Adjuster, D:
57001-1588



Oil Filter Wrench:
57001-1249



2-14 PERIODIC MAINTENANCE

Maintenance Procedure

Fuel System (DFI)

Throttle Cable Inspection

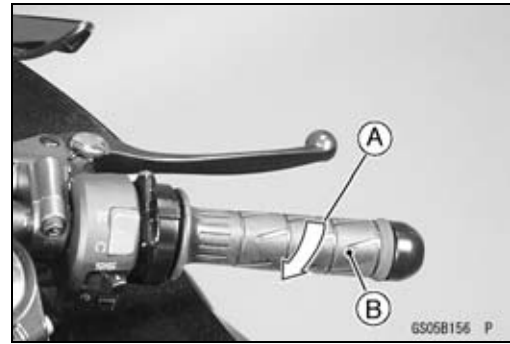
Throttle Grip Free Play Inspection

- Check the throttle grip free play [A].
- ★ If the free play is incorrect, adjust the throttle cables.

Throttle Grip Free Play

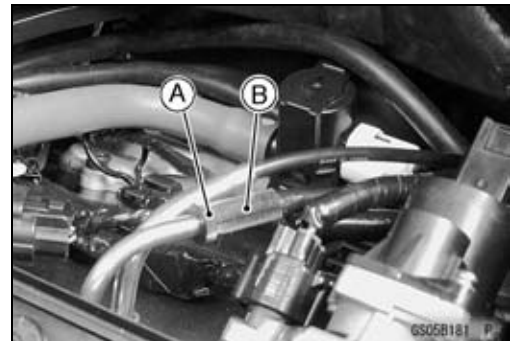
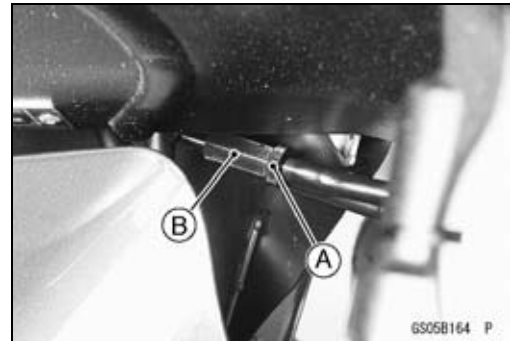
Standard: 2 ~ 3 mm (0.08 ~ 0.12 in.)

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



Throttle Grip Free Play Adjustment

- Loosen the locknut [A].
- Screw accelerator cable adjuster [B] to give the throttle grip plenty of play.
- Turn the accelerator cable adjuster until 2 ~ 3 mm (0.08 ~ 0.12 in.) of throttle grip play is obtained.
- Tighten the locknut.
- ★ If necessary, adjust the decelerator cable as follows:
- Remove:
 - Air Cleaner Housing (see Fuel System (DFI) chapter)
- Loosen the locknut [A].
- Screw decelerator cable adjuster [B] to give the throttle grip plenty of play.
- Turn the decelerator cable adjuster until 2 ~ 3 mm (0.08 ~ 0.12 in.) of throttle grip play is obtained.
- Tighten the locknut.

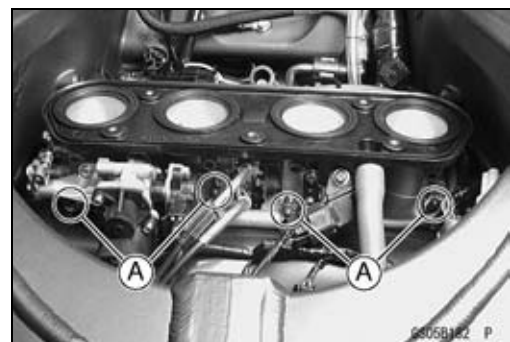


Engine Vacuum Synchronization Inspection

NOTE

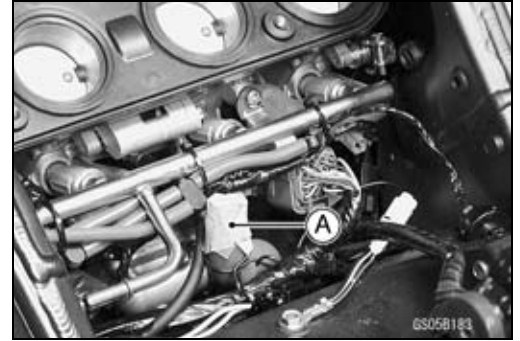
○ These procedures are explained on the assumption that the inlet and exhaust systems of the engine are in good condition.

- Situate the motorcycle so that it is vertical.
- Remove:
 - Air Cleaner Housing (see Fuel System (DFI) chapter)
- Pull off the rubber caps [A] from the fittings of each throttle body.
- For California model, pull off the vacuum hose and return hose.

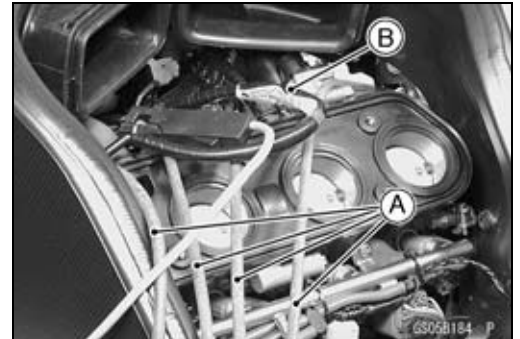


Maintenance Procedure

- Plug the engine breather hose end [A].

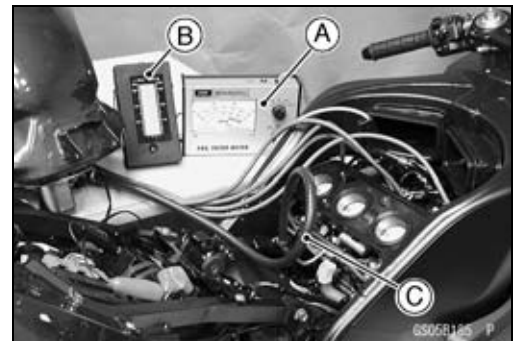


- Connect a commercially available vacuum gauge and hoses [A] to the fittings on the throttle body.
- Connect a highly accurate tachometer to one of the stick coil primary leads using the adapter [B].



Special Tool - Lead Wire-Peak Voltage Adapter: 57001-1449

- Install:
 - Tachometer [A]
 - Vacuum Gauge [B]
- Connect:
 - Fuel Pump Lead Connector
 - Extension Tube [C]



Special Tool - Extension Tube: 57001-1578

- Start the engine and warm it up thoroughly.
- Check the idle speed.
- ★ If the idle speed is out of the specified range, adjust it with the adjust screw.

CAUTION

Do not measure the idle speed by the tachometer of the meter unit.

- While idling the engine, inspect the throttle body vacuum, using the vacuum gauge.

Throttle Body Vacuum

Standard: 30 ±1.3 kPa (225 ±10 mmHg) at Idle Speed
1 100 ±50 r/min (rpm)

2-16 PERIODIC MAINTENANCE

Maintenance Procedure

★ If any vacuum is not within specifications, first synchronize the balance of the left (#1, #2 throttle valves) and right (#3, #4 throttle valves) assemblies.

Example:

- #1: 210 mmHg
- #2: 240 mmHg
- #3: 200 mmHg
- #4: 220 mmHg

- With the engine at the correct idle speed, equalize higher vacuum of #1 or #2 (for example 240 mmHg) to higher vacuum of #3 or #4 (for example 220 mmHg) by turning the center adjusting screw [A].

NOTE

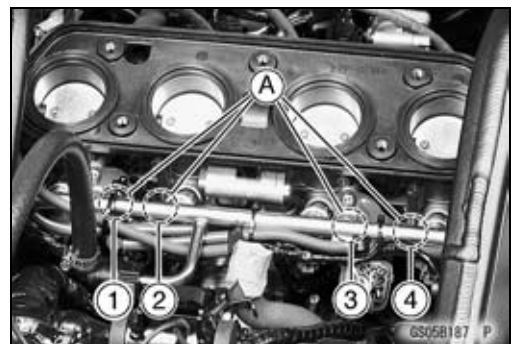
○ After adjustment, the final vacuum measurement between the highest throttle valves may not be 240 mmHg (for example). The goal is to have the highest two vacuums between the left (1 and 2) and right (3 and 4) banks be the same and be within the service limits.

- Open and close the throttle after each measurement, and adjust the idle speed as necessary.
- Once the throttle valves have been synchronized, inspect output voltage of the main throttle sensors to ensure proper operation (procedure is explained at the end of this section).

★ If a value of measured vacuum pressure is out of the specified range after synchronization, adjust the bypass screws [A].

Special Tool - Pilot Screw Adjuster, D: 57001-1588

- Adjust lower vacuum between #1 and #2 to higher vacuum of #1 and #2.
- Adjust the lower vacuum between #3 and #4 to higher vacuum of #3 and #4.
- Open and close the throttle valves after each measurement, and adjust the idle speed as necessary.
- Check the vacuums as before.
- ★ If all vacuums are within the specification range, finish the engine vacuum synchronization.
- ★ If any vacuum cannot be adjusted within the specification, remove the bypass screws #1 ~ #4 and clean them.



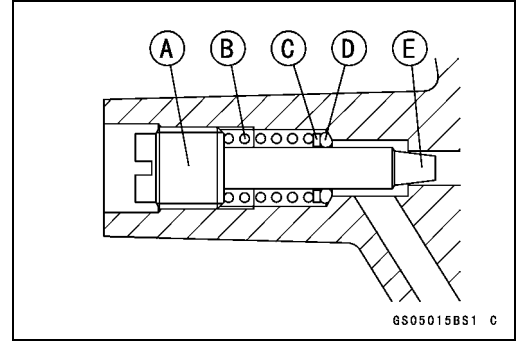
Maintenance Procedure

- Turn in the bypass screw [A] with counting the number of turns until it seals fully but not tightly. Record the number of turns.

Torque - Bypass Screw: 0.2 N·m (0.02 kgf·m, 1.7 in·lb)

CAUTION

Do not over tighten them. They could be damaged, requiring replacement.



- Remove:
 - Bypass Screw
 - Spring [B]
 - Washer [C]
 - O-ring [D]
- Check the bypass screw and its hole for carbon deposits.
- ★ If any carbons accumulate, wipe the carbons off from the bypass screw and the hole, using a cotton pad penetrated with a high-flash point solvent.
- Replace the O-ring with a new one.
- Check the tapered portion [E] of the bypass screw for wear or damage.

- ★ If the bypass screw is worn or damaged, replace it.
- Turn in the bypass screw until it seats fully but not tightly.

Torque - Bypass Screw: 0.2 N·m (0.02 kgf·m, 1.7 in·lb)

- Back out the same number of turns counted when first turned in. This is to set the screw to its original position.

NOTE

○ A throttle body has different “turns out” of the bypass screw for each individual unit. On setting the bypass screw, use the “turns out” determined during disassembly.

- Repeat the same procedure for other bypass screws.
- Repeat the synchronization.
- ★ If the vacuums are correct, check the output voltage of the main throttle sensor (see Output Voltage Inspection of Main Throttle Sensor in the Fuel System (DFI) chapter).

Main Throttle Sensor Output Voltage

Connections to ECU

Meter (+) → Y/W lead (terminal 5)

Meter (–) → BR/BK lead (terminal 59)

Standard:

0.66 ~ 0.68 V DC (at idle throttle opening)

- ★ If the output voltage is out of the range, check the throttle input voltage (see Input Voltage Inspection of Main Throttle Sensor in the Fuel System (DFI) chapter).

- Remove the vacuum gauge hoses and install the rubber caps on the original position.

2-18 PERIODIC MAINTENANCE

Maintenance Procedure

Idle Speed Inspection

Idle Speed Inspection

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



⚠ WARNING

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

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

Idle Speed

Standard: 1 100 ±50 r/min (rpm)

Idle Speed Adjustment

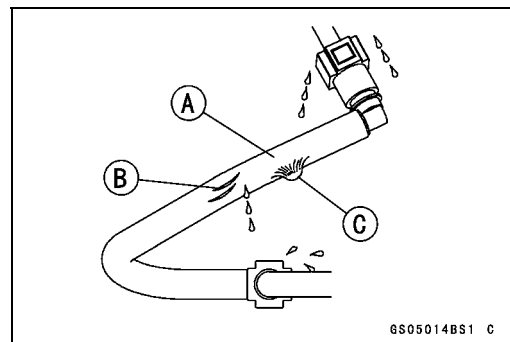
- Start the engine and warm it up thoroughly.
- Turn the adjusting screw [A] until the idle speed is correct.
- Open and close the throttle a few times to make sure that the idle speed is within the specified range. Readjust if necessary.



Fuel Hose and Connection Inspection

Fuel Hose and Pipe Leak, Damage Inspection

- The fuel hose [A] is designed to be used throughout the motorcycle's life without any maintenance. However, if the motorcycle is not properly handled, the high pressure inside the fuel line can cause fuel to leak or the hose to burst.
- Remove the fuel tank (see Fuel System (DFI) chapter) and check the fuel hose.
- ★ Replace the fuel hose if any fraying, cracks [B] or bulges [C] are noticed.



Fuel Hose and Pipe Installation Condition Inspection

- Check that the hose joints are securely connected.
- When installing the fuel hose, avoid sharp bending, kinking, flattening or twisting.
- ★ Replace the hose if it has been sharply bent or kinked.

Maintenance Procedure

Cooling System

Coolant Level Inspection

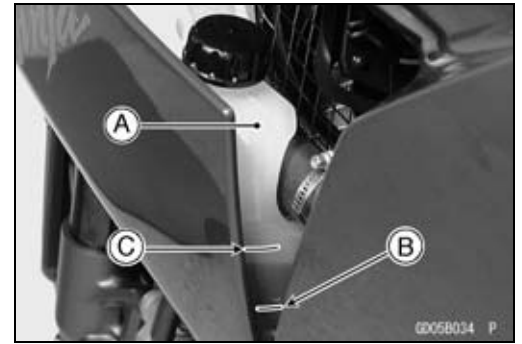
NOTE

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

- Check the coolant level in the reserve tank [A] with the motorcycle held perpendicular (Do not use the sidestand).
- ★ If the coolant level is lower than the “L” level line [B], unscrew the reserve tank cap and add coolant to the “F” level line [C].

“L”: low

“F”: full



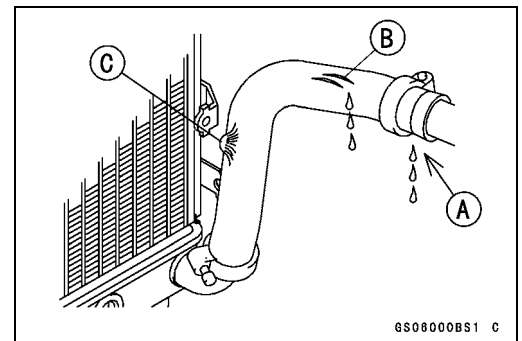
CAUTION

For refilling, add the specified mixture of coolant and soft water. Adding water alone dilutes the coolant and degrades its anticorrosion properties. The diluted coolant can attack the aluminum engine parts. In an emergency, soft water alone can be added. But the diluted coolant must be returned to the correct mixture ratio within a few days. If coolant must be added often or the reservoir tank has run completely dry, there is probably leakage in the cooling system. Check the system for leaks. Coolant ruins painted surfaces. Immediately wash away any coolant that spills on the frame, engine, wheels or other painted parts.

Radiator Hose and Connection Inspection

Coolant Leak and Radiator Hose Damage Inspection

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



Radiator Hose Installation Condition Inspection

- Check that the hoses are securely connected and clamps are tightened correctly.

Torque - Radiator Hose Clamp Screws: 2.0 N·m (0.20 kgf·m, 17 in·lb)

2-20 PERIODIC MAINTENANCE

Maintenance Procedure

Evaporative Emission Control System (California Model)

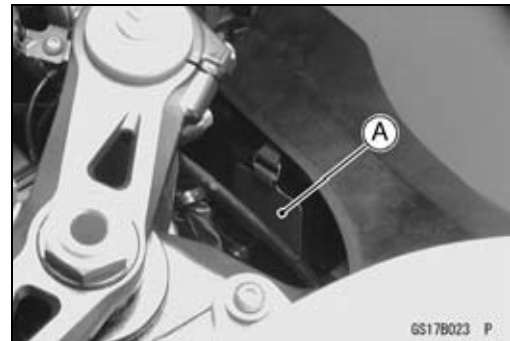
Evaporative Emission Control System Function Inspection

- Inspect the canister as follow:
 - Remove:
 - Right Lower Fairing (see Frame chapter)
 - Right Middle Fairing (see Frame chapter)
 - Remove the canister [A], and disconnect the hoses from the canister.
 - Visually inspect the canister for cracks or other damage.
 - ★ If the canister has any cracks or bad damage, replace it with a new one.

NOTE

- *The canister is designed to work well through the motorcycle's life without any maintenance if it is used under normal conditions.*

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

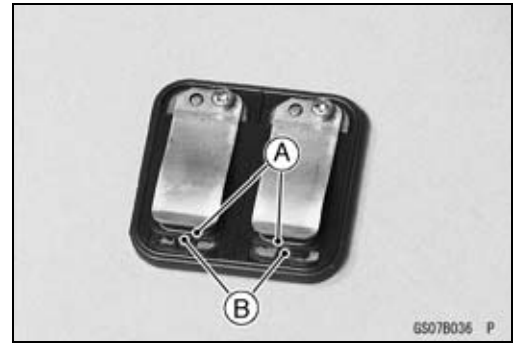


Maintenance Procedure

Air Suction System

Air Suction Valve Inspection

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



CAUTION

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

Engine Top End

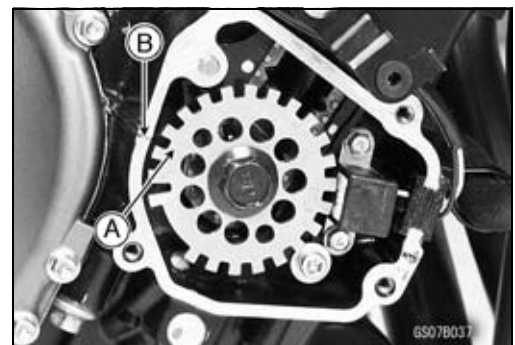
Valve Clearance Inspection

Valve Clearance Inspection

NOTE

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

- Remove:
 - Lower Fairing (see Frame chapter)
 - Crankshaft Sensor Cover
 - Cylinder Head Cover (see Engine Top End chapter)
- Position the crankshaft at 1, 4 piston TDC.
 - TDC Mark [A] for #1, 4 Pistons
 - Timing Mark [B] (crankcase halves mating surface)



2-22 PERIODIC MAINTENANCE

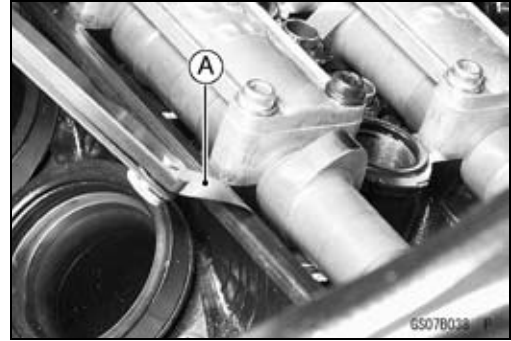
Maintenance Procedure

- Using a thickness gauge [A], measure the valve clearance between the cam and the valve lifter.

Valve Clearance

Standard:

Exhaust	0.17 ~ 0.22 mm (0.0067 ~ 0.0087 in.)
Inlet	0.15 ~ 0.24 mm (0.0059 ~ 0.0094 in.)



NOTE

- Thickness gauge is horizontally inserted on the valve lifter.

Appropriateness [A]

Inadequacy [B]

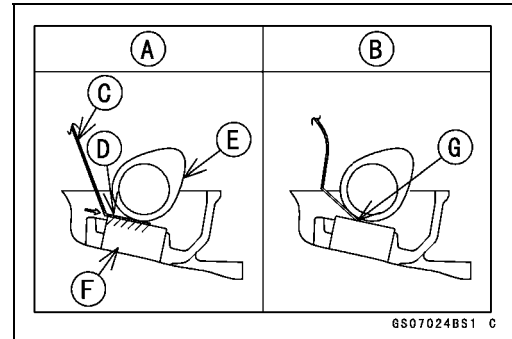
Thickness Gauge [C]

Horizontally Inserts [D]

Cam [E]

Valve Lifter [F]

Hits the Valve Lifter Ahead [G]

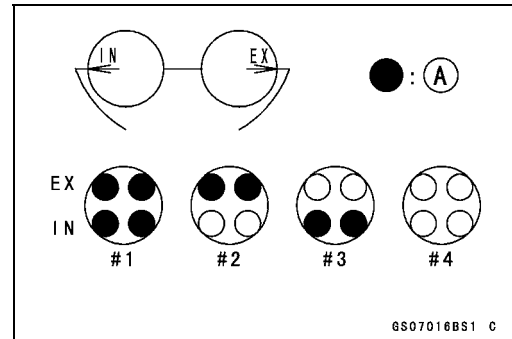


- When positioning #1 piston TDC at the end of the compression stroke:

Inlet Valve Clearance of #1 and #3 Cylinders

Exhaust Valve Clearance of #1 and #2 Cylinders

Measuring Valve [A]

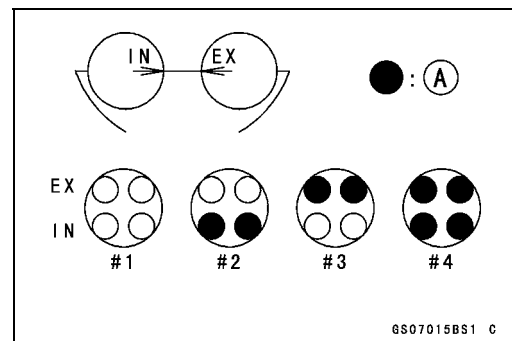


- When positioning #4 piston TDC at the end of the compression stroke:

Inlet Valve Clearance of #2 and #4 Cylinders

Exhaust Valve Clearance of #3 and #4 Cylinders

Measuring Valve [A]



- ★ If the valve clearance is not within the specified range, first record the clearance, and then adjust it.

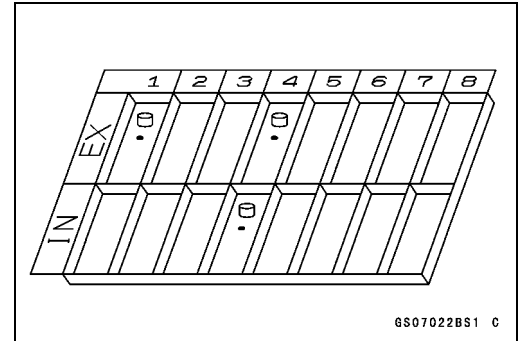
Maintenance Procedure

Valve Clearance Adjustment

- To change the valve clearance, remove the camshaft chain tensioner, camshafts and valve lifters. Replace the shim with one of a different thickness.

NOTE

○ Mark and record the locations of the valve lifters and shims so that they can be reinstalled in their original positions.



- Clean the shim to remove any dust or oil.
- Measure the thickness of the removed shim [A].
- Select a new shim thickness calculation as follows.
 - $a + b - c = d$
 - [a] Present Shim Thickness
 - [b] Measured Valve Clearance
 - [c] Specified Valve Clearance (Mean Value = 0.195)
 - [d] Replace Shim Thickness

Example:

$$1.600 + 0.31 - 0.195 = 1.715 \text{ mm}$$

○ Exchange the shim for the 1.725 size shim.



CAUTION

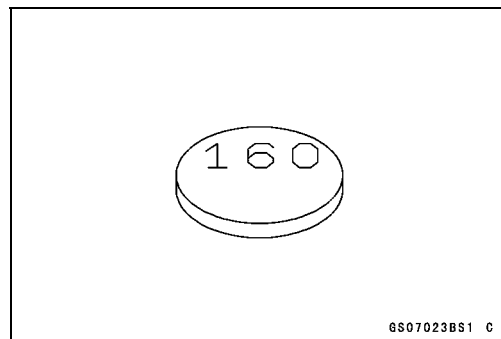
Don't use the shims for another models. This could cause wear of the valve stem end, and valve stem damage.

2-24 PERIODIC MAINTENANCE

Maintenance Procedure

Adjustment Shims

Thickness	Part Number	Mark
1.300	92180-0108	130
1.325	92180-0109	133
1.350	92180-0110	135
1.375	92180-0111	138
1.400	92180-0112	140
1.425	92180-0113	143
1.450	92180-0114	145
1.475	92180-0115	148
1.500	92180-0116	150
1.525	92180-0117	153
1.550	92180-0118	155
1.575	92180-0119	158
1.600	92180-0120	160
1.625	92180-0121	163
1.650	92180-0122	165
1.675	92180-0123	168
1.700	92180-0124	170
1.725	92180-0125	173
1.750	92180-0126	175
1.775	92180-0127	178
1.800	92180-0128	180
1.825	92180-0129	183
1.850	92180-0130	185
1.875	92180-0131	188
1.900	92180-0132	190
1.925	92180-0133	193
1.950	92180-0134	195
1.975	92180-0135	198
2.000	92180-0136	200
2.025	92180-0137	203
2.050	92180-0138	205
2.075	92180-0139	208
2.100	92180-0140	210
2.125	92180-0141	213
2.150	92180-0142	215
2.175	92180-0143	218
2.200	92180-0144	220
2.225	92180-0145	223
2.250	92180-0146	225
2.275	92180-0147	228
2.300	92180-0148	230



Maintenance Procedure

CAUTION

Be sure to remeasure the clearance after selecting a shim. The clearance can be out of the specified range because of the shim tolerance.

- If there is no valve clearance, use a shim that is a few sizes smaller, and remeasure the valve clearance.
- When installing the shim, face the marked side toward the valve lifter. At this time, apply engine oil to the shim or the valve lifter to keep the shim in place during camshaft installation.

CAUTION

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

- Apply engine oil to the valve lifter surface and install the lifter.
- Install the camshaft (see Engine Top End chapter).
- Recheck the valve clearance and readjust if necessary.
- Install the removed parts (see appropriate chapters).

Clutch and Drive Train

Clutch Operation Inspection

- Pull the clutch lever just enough to take up the free play [A].
- Measure the gap between the lever and the lever holder.
- ★ If the gap is too wide, the clutch may not release fully. If the gap is too narrow, the clutch may not engage fully. In either case, adjust it.

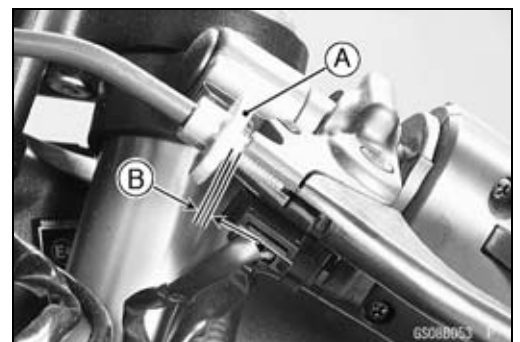
Clutch Lever Free Play

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



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

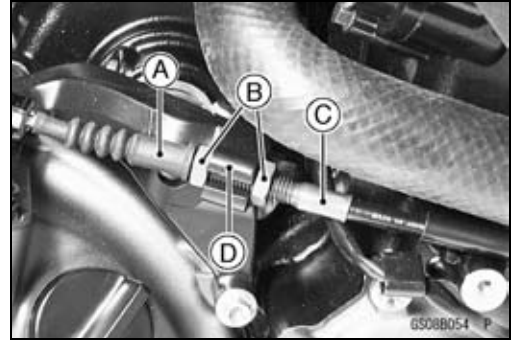
- Turn the adjuster [A] so that 5 ~ 6 mm (0.20 ~ 0.24 in.) [B] of threads is visible.



2-26 PERIODIC MAINTENANCE

Maintenance Procedure

- Slide the dust cover [A] at the clutch cable lower end out of place.
- Loosen both adjusting nuts [B] at the clutch cover as far as they will go.
- Pull the clutch outer cable [C] tight and tighten the adjusting nuts against the bracket [D].
- Slip the rubber dust cover back onto place.
- Turn the adjuster at the clutch lever until the free play is correct.



- Push the release lever [A] toward the front of the motorcycle until it becomes hard to turn.
- At this time, the release lever should have the proper angle shown.
- ★ If the angle is wrong, check the clutch and release parts for wear.



⚠ WARNING

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

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

Drive Chain Lubrication Condition Inspection

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

CAUTION

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

Use only kerosene or diesel oil for cleaning of the O-ring of the drive chain.

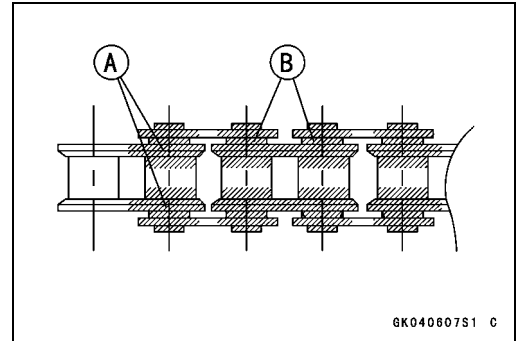
Any other cleaning solution such as gasoline or trichloroethylene will cause deterioration and swelling of the O-ring.

Immediately blow the chain dry with compressed air after cleaning.

Complete cleaning and drying the chain within 10 minutes.

Maintenance Procedure

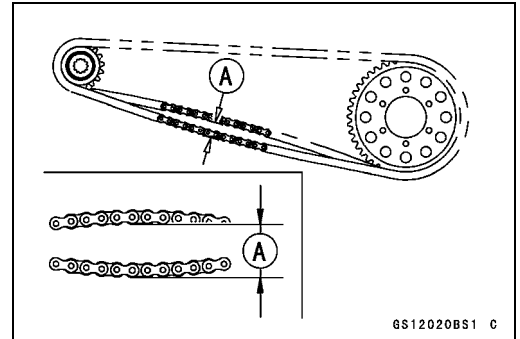
- Apply oil to the sides of the rollers so that oil will penetrate to the rollers and bushings. Apply the oil to the O-rings so that the O-rings will be coated with oil.
- Wipe off any excess oil.
 - Oil Applied Areas [A]
 - O-ring [B]



Drive Chain Slack Inspection

NOTE

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

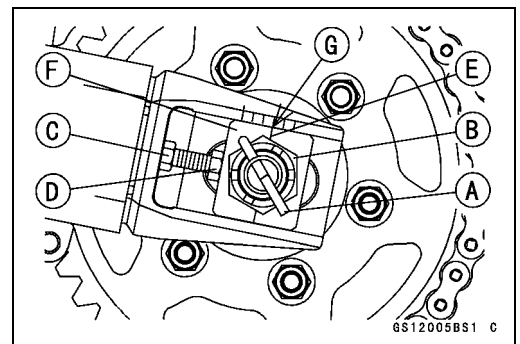


Chain Slack

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

Drive Chain Slack Adjustment

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



⚠ WARNING

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

- Tighten both chain adjuster locknuts securely.
- Tighten the axle nut.
 - Torque - Rear Axle Nut: 108 N·m (11 kgf·m, 81 ft·lb)**
- Turn the wheel, measure the chain slack again at the tightest position, and readjust if necessary.
- Insert a new cotter pin into the axle and bend its end securely.

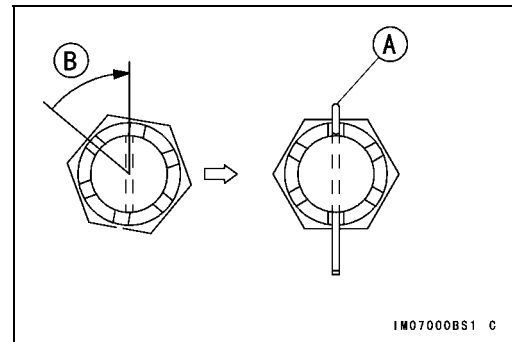
2-28 PERIODIC MAINTENANCE

Maintenance Procedure

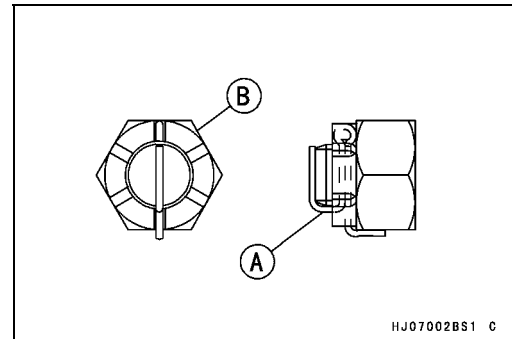
- Insert a new cotter pin [A].

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].

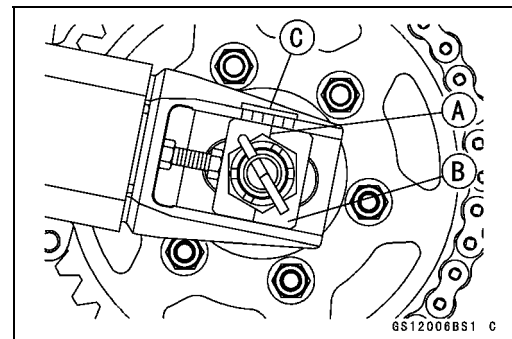


Wheel Alignment Inspection

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

NOTE

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

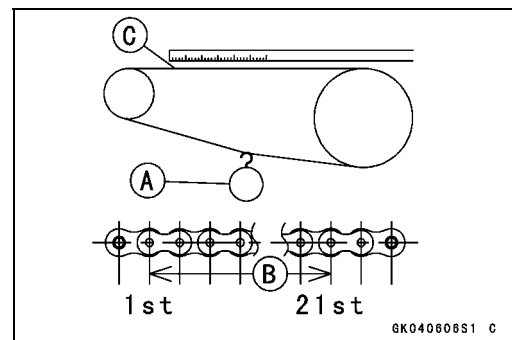


⚠ WARNING

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

Drive Chain Wear Inspection

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



Drive Chain 20-link Length

- Standard: 317.5 ~ 318.2 mm (12.50 ~ 12.53 in.)
- Service Limit: 323 mm (12.7 in.)

Maintenance Procedure

⚠ WARNING

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

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

Standard Chain

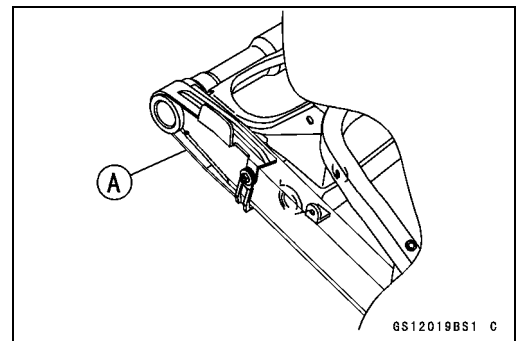
Make: RK EXCEL

Type: RK 525MFO

Link: 110 links

Drive Chain Guide Wear Inspection

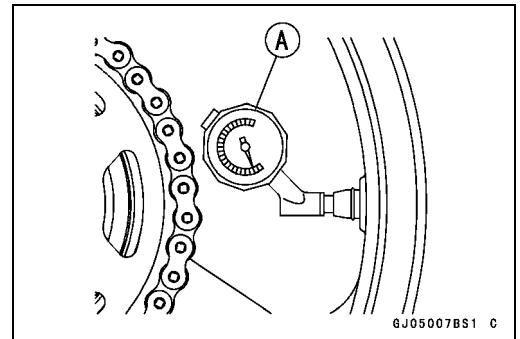
- Remove:
 - Drive Chain (see Final Drive chapter)
- Visually inspect the chain guide [A].
- ★ Replace the chain guide if it shows any signs of abnormal wear or damage.



Wheels/Tires

Tire Air Pressure Inspection

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



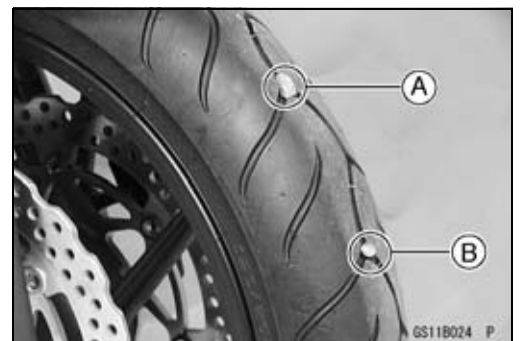
Air Pressure (when Cold)

Front: Up to 180 kg (397 lb)
250 kPa (2.5 kgf/cm², 36 psi)

Rear: Up to 180 kg (397 lb)
290 kPa (2.9 kgf/cm², 42 psi)

Wheel/Tire Damage Inspection

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



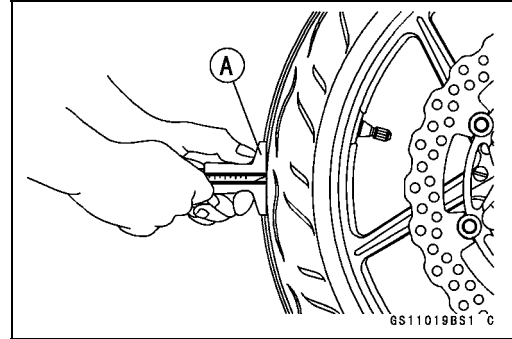
2-30 PERIODIC MAINTENANCE

Maintenance Procedure

Tire Tread Wear Inspection

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

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



Tread Depth

Front:

- Standard: 4.0 mm (0.16 in.)
- Service Limit: 1 mm (0.04 in.)
(AT, CH, DE,) 1.6 mm (0.06 in.)

Rear:

- Standard: 5.5 mm (0.22 in.)
- Service Limit: 2 mm (0.08 in.) (Up to 130 km/h)
3 mm (0.12 in.) (Over 130 km/h)

⚠ WARNING

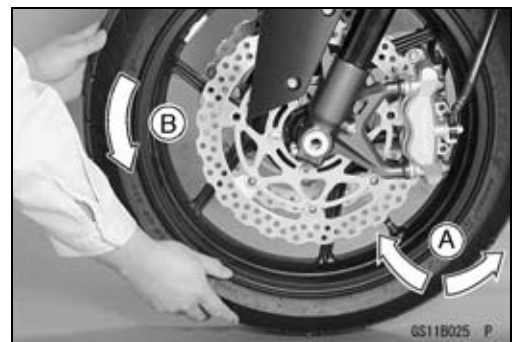
To ensure safe handling and stability, use only the recommended standard tires for replacement, inflated to the standard pressure.

NOTE

- Most countries may have their own regulations a minimum tire tread depth: be sure to follow them.
- Check and balance the wheel when a tire is replaced with a new one.

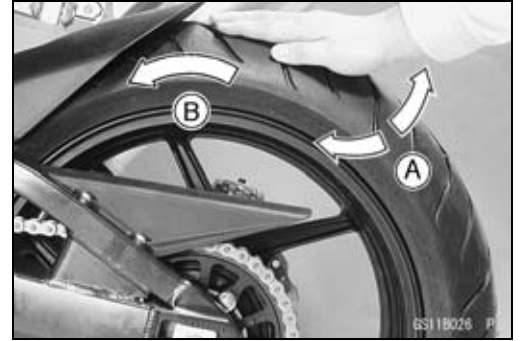
Wheel Bearing Damage Inspection

- Using a jack and attachment, raise the front wheel off the ground (see Wheels/Tires chapter).
- Turn the handlebar all the way to the right or left.
- Inspect the roughness of the front wheel bearing by pushing and pulling [A] the wheel.
- Spin [B] the front wheel lightly, and check for smoothly turn, roughness, binding or noise.
- ★ If roughness, binding or noise is found, remove the front wheel and inspect the wheel bearing (see Wheels/Tires chapter).



Maintenance Procedure

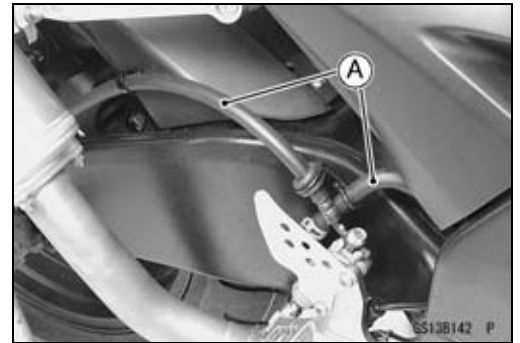
- Using a jack and attachment, raise the rear wheel off the ground (see *Wheels/Tires* chapter).
- Inspect the roughness of the rear wheel bearing by pushing and pulling [A] the wheel.
- Spin [B] the rear wheel lightly, and check for smoothly turn, roughness, binding or noise.
- ★ If roughness, binding or noise is found, remove the rear wheel and inspect the wheel bearing (see *Wheels/Tires* chapter) and coupling (see *Final Drive* chapter).



Brake System

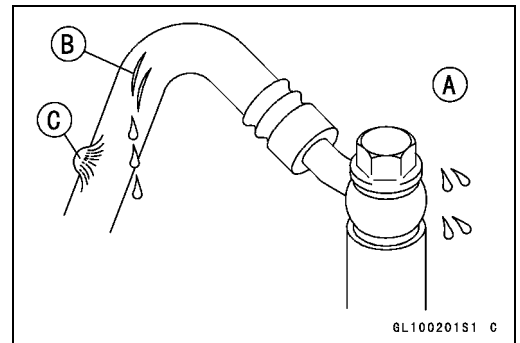
Brake Fluid Leak (Brake Hose and Pipe) Inspection

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



Brake Hose Damage and Installation Condition Inspection

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



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

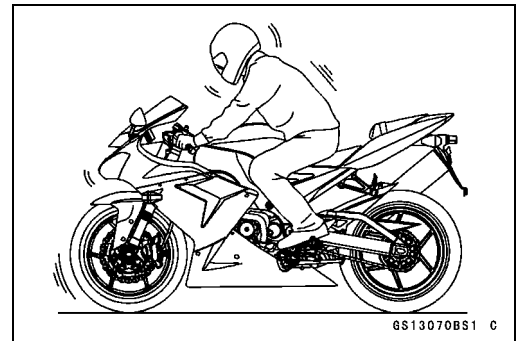
- Inspect the brake hose routing.
- ★ If any brake hose routing is incorrect, route the brake hose according to Cable, Wire and Hose Routing section in the Appendix chapter.

Brake Operation Inspection

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

⚠ WARNING

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



2-32 PERIODIC MAINTENANCE

Maintenance Procedure

Brake Fluid Level Inspection

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

NOTE

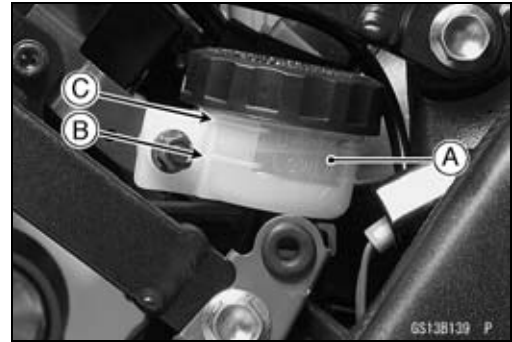
○ Hold the reservoir horizontal by turning the handlebar when checking brake fluid level.

- ★ If the fluid level is lower than the lower level line, fill the reservoir to the upper level line [C].



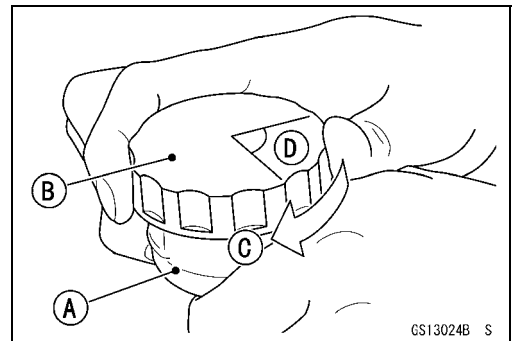
- Check that the brake fluid level in the rear brake reservoir [A] is above the lower level [B].

- ★ If the fluid level is lower than the lower level line, remove the reservoir cap and fill the reservoir to the upper level line [C].



- Follow the procedure below to install the brake fluid reservoir cap correctly.

- First, tighten the brake fluid reservoir cap [B] clockwise [C] by hand until the resistance is felt fully; then, tighten the cap an additional 1/6 turn [D] while holding the brake fluid reservoir body [A].



⚠ WARNING

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

Recommended Disc Brake Fluid

Grade: DOT4

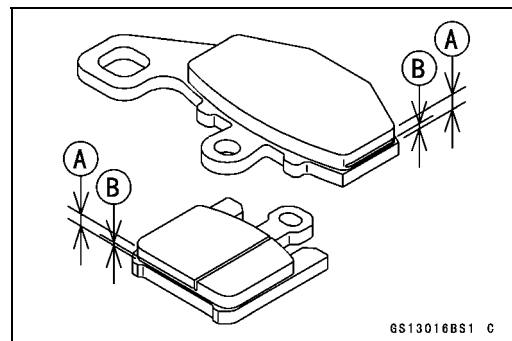
Brake Pad Wear Inspection

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

Pad Lining Thickness

Standard:

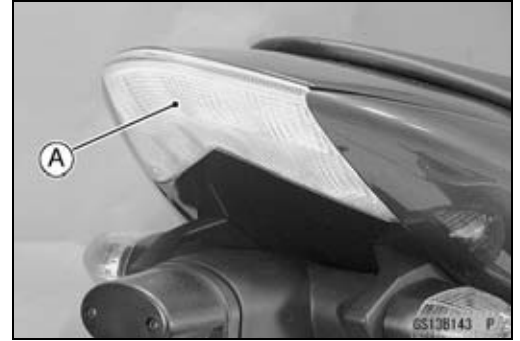
Front	4 mm (0.16 in.)
Rear	5 mm (0.20 in.)
Service Limit:	1 mm (0.04 in.)



Maintenance Procedure

Brake Light Switch Operation

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

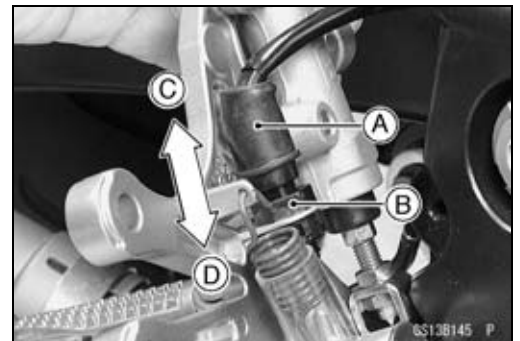


★ If it does not, adjust the brake light switch.

- Remove:
 - Right Footpeg Stay Bolts [A]
 - Footpeg Stay Assy



- While holding the switch body, turn the adjusting nut to adjust the switch.
 - Switch Body [A]
 - Adjusting Nut [B]
 - Light sooner as the body rises [C]
 - Light later as the body lowers [D]



CAUTION

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

- ★ If it does not go on, inspect or replace the following items.
 - Battery (see Electrical System chapter)
 - Brake Light (see Electrical System chapter)
 - Main Fuse 30 A and Taillight Fuse 10 A (see Electrical System chapter)
 - Front Brake Light Switch [A] (see Electrical System chapter)
 - Rear Brake Light Switch (see Electrical System chapter)
 - Harness (see Wiring Inspection in Electrical System chapter)



2-34 PERIODIC MAINTENANCE

Maintenance Procedure

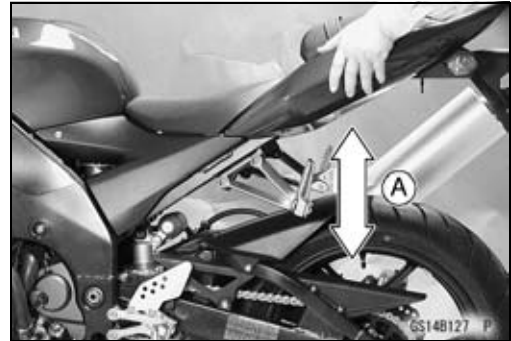
Suspensions

Front Forks/Rear Shock Absorber Operation Inspection

- Pump the forks down and up [A] 4 or 5 times, and inspect the smooth stroke.
- ★ If the forks do not smoothly or noise is found, inspect the fork oil level or fork clamps (see Suspension chapter).



- Pump the seat down and up [A] 4 or 5 times, and inspect the smooth stroke.
- ★ If the shock absorber does not smoothly stroke or noise is found, inspect the oil leak (see Rear Shock Absorber Oil Leak Inspection) or shock absorber clamps (see Suspension chapter).



Front Fork Oil Leak Inspection

- Visually inspect the front forks [A] for oil leakage.
- ★ Replace or repair any defective parts, if necessary.



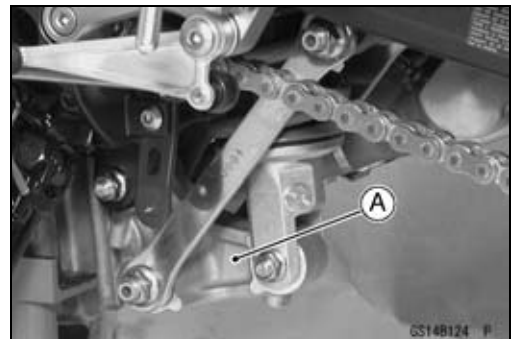
Rear Shock Absorber Oil Leak Inspection

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



Rocker Arm Operation Inspection

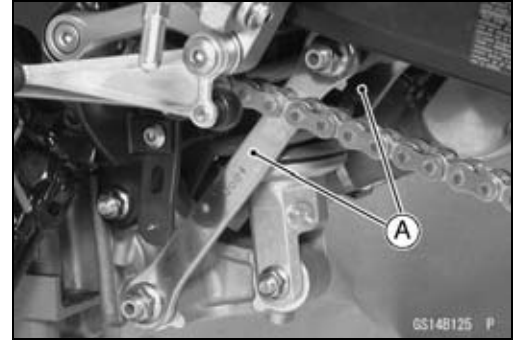
- Remove the lower fairings (see Frame chapter).
- Pump the seat down and up 4 or 5 times, and inspect the smooth stroke.
- ★ If the rocker arm [A] does not smoothly stroke or noise is found, inspect the fasteners and bearings (see Suspension chapter).



Maintenance Procedure

Tie-rod Operation Inspection

- Remove the lower fairings (see Frame chapter).
- Pump the seat down and up 4 or 5 times, and inspect the smooth stroke.
- ★ If the tie-rods [A] do not smoothly stroke or noise is found, inspect the fasteners and tie-rod bearings (see Suspension chapter).



Steering System

Steering Play Inspection

Steering Play Inspection

- Lift the front wheel off the ground using the jack.

Special Tool - Jack: 57001-1238

- With the front wheel pointing straight ahead, alternately tap each end of the handlebar. The front wheel should swing fully left and right from the force of gravity until the fork hits the stop.
- ★ If the wheel binds or catches before the stop, the steering is too tight.
- Feel for steering looseness by pushing and pulling the forks.
- ★ If you feel looseness, the steering is too loose.

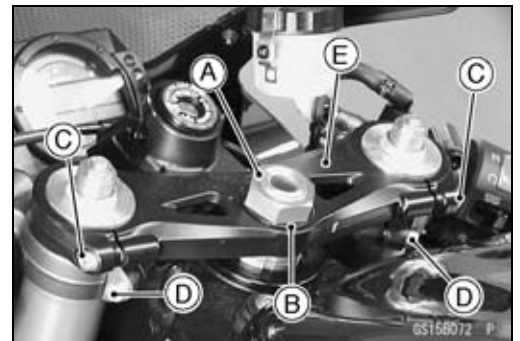


NOTE

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

Steering Play Adjustment

- Remove:
 - Stem Head Nut [A] and Washer [B]
- Loosen the upper fork clamp bolts [C] and handlebar bolts [D].
- Remove the stem head [E] with handlebar.



- Bend the claw washer tabs [A].
- Remove the steering stem locknut [B] and claw washer [C].



2-36 PERIODIC MAINTENANCE

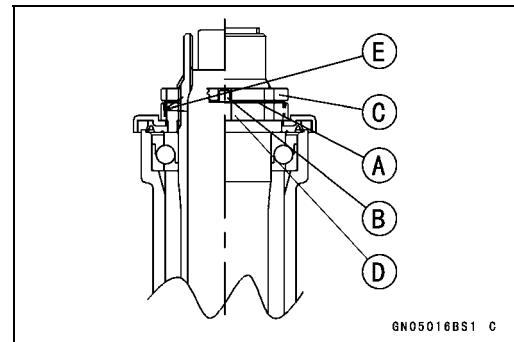
Maintenance Procedure

- Adjust the steering.
 - Special Tool - **Steering Stem Nut Wrench: 57001-1100**
- ★ If the steering is too tight, loosen the stem nut a fraction of a turn.
- ★ If the steering is too loose, tighten the stem nut a fraction of a turn.

NOTE

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

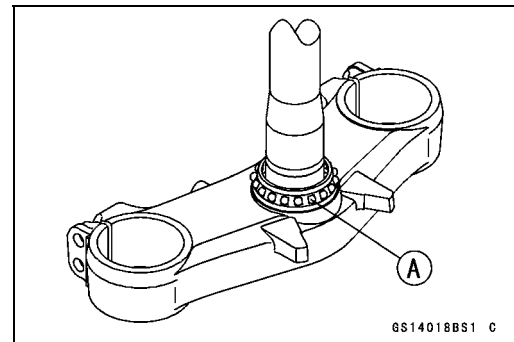
- Install the claw washer [A] so that its bent side [B] faces upward, and engage the bent claws with the grooves of stem locknut [C].
- Hand tighten the stem locknut until it touches the claw washer.
- Tighten the stem locknut clockwise until the claws are aligned with the grooves (ranging from 2nd to 4th) of stem nut [D], and bend the 2 claws downward [E].



- Tighten:
 - Torque - **Upper Fork Clamp Bolts: 20 N·m (2.0 kgf·m, 14.5 ft·lb)**
 - Handlebar Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)**
 - Steering Stem Head Nut: 78 N·m (8.0 kgf·m, 58 ft·lb)**
- Check the steering again.
- ★ If the steering is still too tight or too loose, repeat the adjustment.

Steering Stem Bearing Lubrication

- Remove the steering stem (see Steering chapter).
- Using a high flash-point solvent, wash the upper and lower ball bearings 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 ball bearings.
- ★ Replace the bearing assemblies if they show wear or damage.
- Pack the upper and lower ball 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.



Maintenance Procedure

Electrical System

Lights and Switches Operation Inspection

First Step

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

City Light [A]	goes on
Taillight [B]	goes on
License Plate Light [C]	goes on
Meter Panel LCD [D]	goes on
Neutral Indicator LED [E]	goes on
Oil Pressure Warning Indicator LED [F]	goes on
FI Indicator LED [G]	goes on (about 2 seconds)

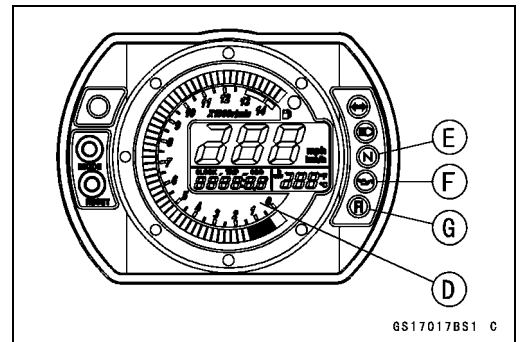
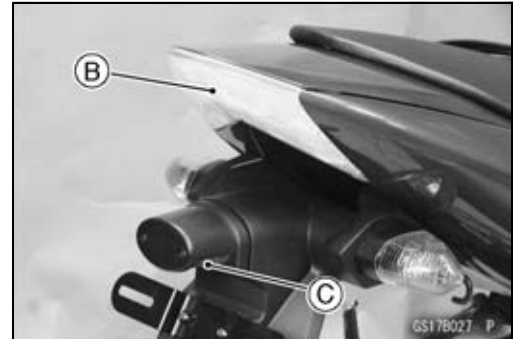
★ If the light does not go on, inspect or replace the following item.

- Battery (see Electrical System chapter)
- Applicable Bulb (see Electrical System chapter)
- Meter Unit for Meter Panel LED (see Electrical System chapter)
- Meter Unit for Neutral Indicator LED (see Electrical System chapter)
- Meter Unit for Oil Pressure Warning Indicator LED (see Electrical System chapter)
- Meter Unit and ECU for FI Indicator LED (see Electrical System chapter)
- Main Fuse 30 A and Taillight Fuse 10 A (see Electrical System chapter)
- Ignition Switch (see Electrical System chapter)
- Gear Position Switch (for Neutral Indicator LED, see Electrical System chapter)
- Harness (see Wiring Inspection in Electrical System chapter)

- Turn off the ignition switch.
- The all lights should go off (for the immobilizer model, FI indicator LED will blink. see Electrical System chapter).
- ★ If the light does not go off, replace the ignition switch.

Second Step

- Turn the ignition switch to P (Park) position.
- The city light, taillight and license plate light should go on.
- ★ If the light does not go on, inspect or replace the following item.
- Ignition Switch (see Electrical System chapter)



2-38 PERIODIC MAINTENANCE

Maintenance Procedure

Third Step

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

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

Turn Signal Light Bulb (see Electrical System chapter)

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

Turn Signal Relay Fuse 10 A (see Electrical System chapter)

Turn Signal Switch (see Electrical System chapter)

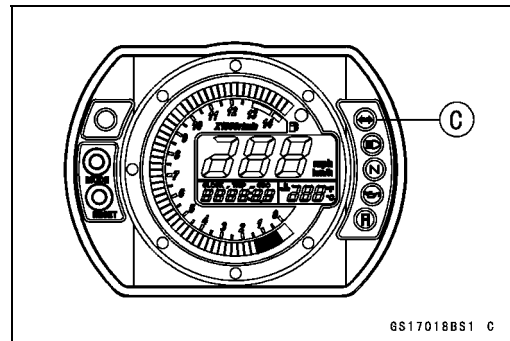
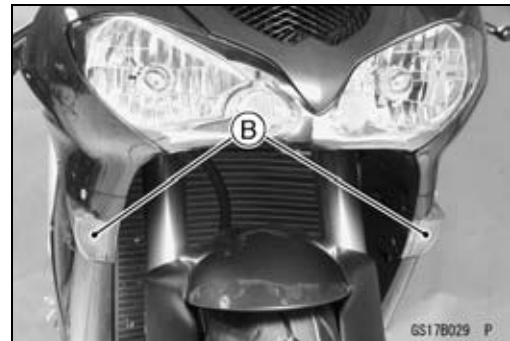
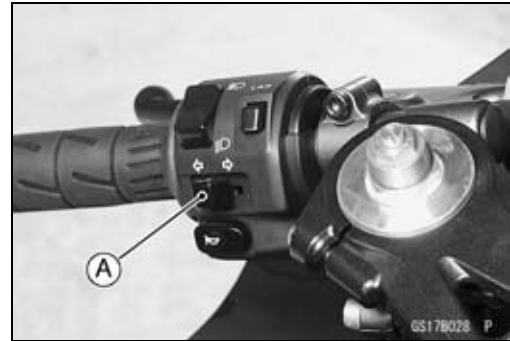
Turn Signal Relay (see Electrical System chapter)

Harness (see Wiring Inspection in Electrical System chapter)

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

Turn Signal Switch (see Electrical System chapter)

Turn Signal Relay (see Electrical System chapter)



Fourth Step

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

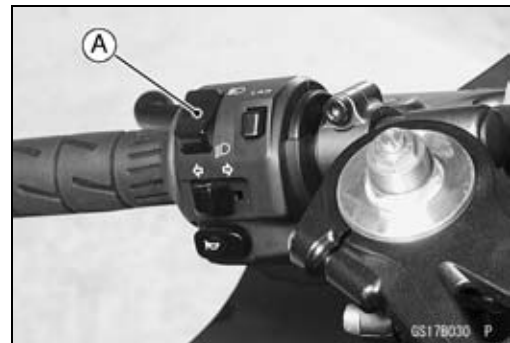
Headlight Low Beam Bulb (see Electrical System chapter)

Headlight Fuse 10 A (see Electrical System chapter)

Dimmer Switch (see Electrical System chapter)

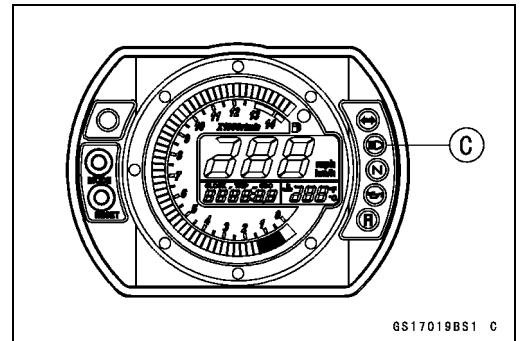
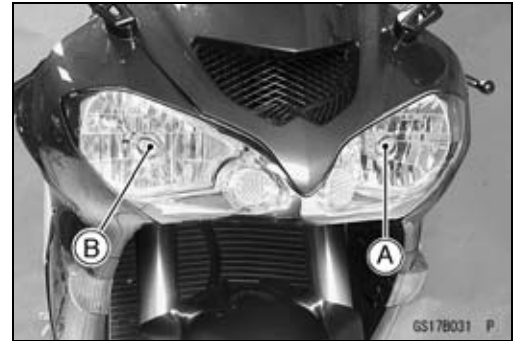
Headlight Relay in Relay Box (see Electrical System chapter)

Harness (see Wiring Inspection in Electrical System chapter)



Maintenance Procedure

- Set the dimmer switch to high beam position.
- The low beam [A] and high beam [B] headlights should go on.
- The high beam indicator LED [C] should go on.
- ★ If the high beam headlight and/or high beam indicator LED does not go on, inspect or replace the following item.
 - Headlight High Beam Bulb (see Electrical System chapter)
 - Dimmer Switch (see Electrical System chapter)
- Turn off the engine stop switch.
- The low beam and high beam headlights should stay going on.
- ★ If the headlights and high beam indicator LED does go off, inspect or replace the following item.
 - Headlight Relay in Relay Box (see Electrical System chapter)
- Turn off the ignition switch.
- The headlights and high beam indicator LED should go off.



Headlight Aiming Inspection

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

Headlight Beam Horizontal Adjustment

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

Headlight Beam Vertical Adjustment

- Turn the vertical adjuster [B] in both headlights in or out with a screwdriver to adjust the headlight vertically.



2-40 PERIODIC MAINTENANCE

Maintenance Procedure

NOTE

- ON high beam, the brightest points should be slightly below horizontal with the motorcycle on its wheels and the rider seated. Adjust the headlight to the proper angle according to local regulations.
- For US model, the proper angle is 0.4 degrees below horizontal. This is 50 mm (2 in.) drop at 7.6 m (25 ft) measured from the center of the headlight with the motorcycle on its wheels and the rider seated.

50 mm (2 in.) [A]

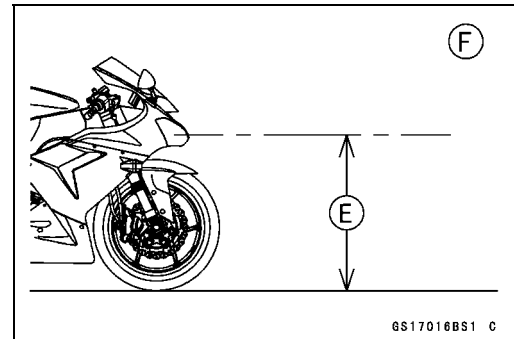
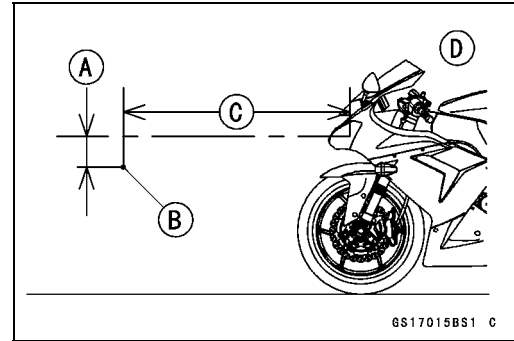
Center of Brightest Spot [B]

7.6 m (25 ft) [C]

Low Beam [D]

Height of Headlight Center [E]

High Beam [F]



Side Stand Switch Operation Inspection

- Inspect the side stand switch [A] operation accordance to below table.

Sidestand Switch Operation

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



Maintenance Procedure

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

- Battery (see Electrical System chapter)
- Main Fuse 30 A (see Electrical System chapter)
- Ignition Fuse 10 A (see Electrical System chapter)
- Ignition Switch (see Electrical System chapter)
- Side Stand Switch (see Electrical System chapter)
- Engine Stop Switch (see Electrical System chapter)
- Starter Button (see Electrical System chapter)
- Gear Position Switch (see Electrical System chapter)
- Starter Control Relay (see Electrical System chapter)
- Relay Box (see Electrical System chapter)
- Starter Circuit Relay (see Electrical System chapter)
- Harness (see Wiring Inspection in Electrical System chapter)

★ If the all parts are good condition, replace the ECU.

Engine Stop Switch Operation Inspection

First Step

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



Second Step

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



2-42 PERIODIC MAINTENANCE

Maintenance Procedure

Others

Chassis Parts Lubrication

- Before lubricating each part, clean off any rusty spots with rust remover and wipe off any grease, oil, dirt, or grime.
- Lubricate the points listed below with indicated lubricant.

NOTE

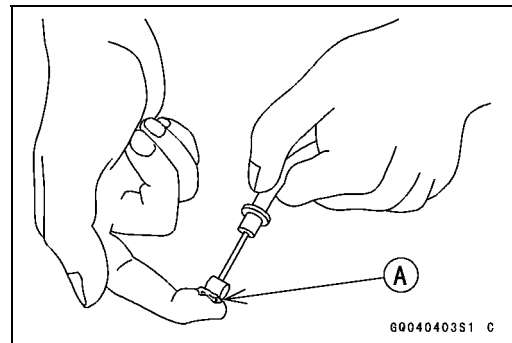
○ *Whenever the vehicle has been operated under wet or rainy conditions, or especially after using a high-pressure water spray, perform the general lubrication*

Pivots: Lubricate with Motor Oil.

Clutch Lever
Brake Lever
Brake Pedal
Side Stand
Rear Brake Joint Pin

Points: Lubricate with Grease.

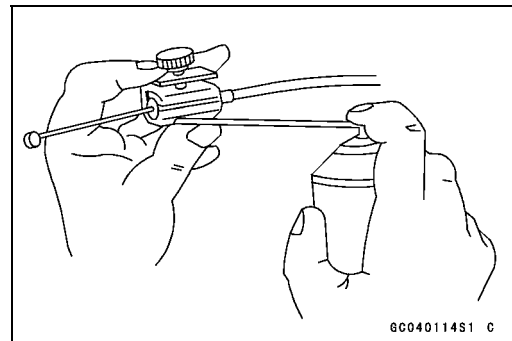
Clutch Inner Cable Upper and Lower Ends [A]
Throttle Inner Cable Upper and Lower Ends



Cables: Lubricate with Rust Inhibitor

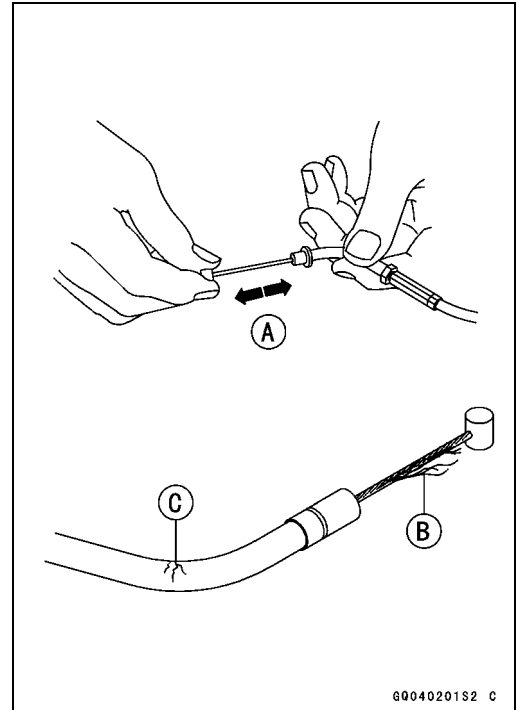
Throttle Cables
Clutch Cable

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



Maintenance Procedure

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



Bolts, Nuts and Fasteners Tightness Inspection

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

NOTE

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

- ★ If there are loose fasteners, 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.

2-44 PERIODIC MAINTENANCE

Maintenance Procedure

Bolt, Nut and Fastener to be checked

Wheels:

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

Brakes:

- Front Master Cylinder Clamp Bolts
- Caliper Mounting Bolts
- Rear Master Cylinder Mounting Bolts
- Brake Lever Pivot Nut
- Brake Pedal Bolt
- Brake Rod Joint Cotter Pin

Suspension:

- Front Fork Clamp Bolts
- Front Fender Mounting Bolts
- Rear Shock Absorber Mounting Nuts
- Swingarm Pivot Shaft Nut
- Uni-track Link Nuts

Steering:

- Stem Head Nut
- Handlebar Mounting Bolts

Engine:

- Engine Mounting Bolts
- Cylinder Head Bolts
- Muffler Mounting Bolts
- Exhaust Manifold Holder Nuts
- Muffler Connecting Clamp Bolt
- Clutch Lever Pivot Nut

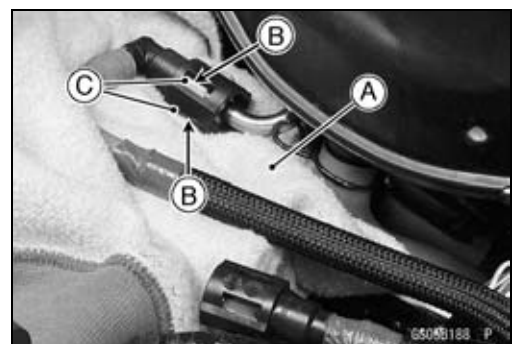
Others:

- Side Stand Bolt
- Footpeg Mounting Bolts
- Footpeg Bracket Mounting Bolts

Replacement Parts

Fuel Hose Replacement

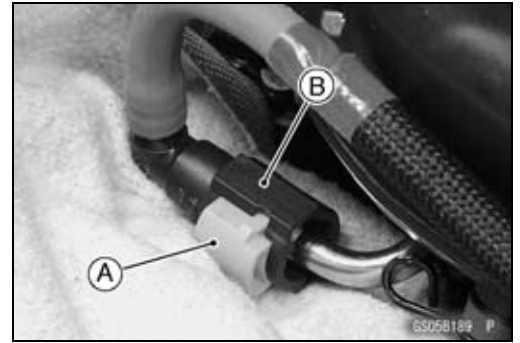
- Remove the fuel tank (see Fuel System (DFI) chapter).
- Be sure to place a piece of cloth [A] around the fuel hose joint.
- Push [B] the joint lock claws [C].



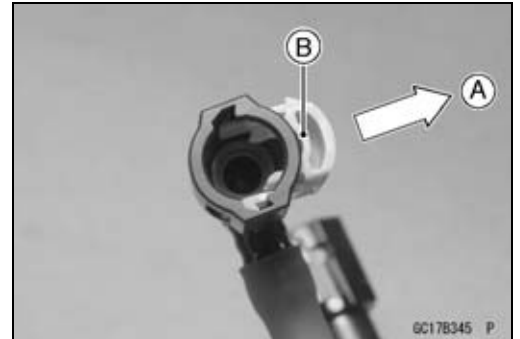
Maintenance Procedure

- Pull the joint lock [A] as shown.
- Pull the fuel hose joint [B] out of the delivery pipe.

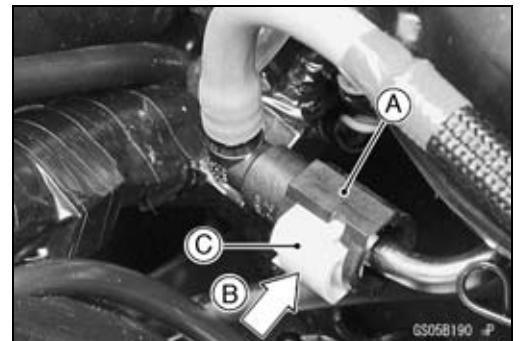
⚠ WARNING
Be prepared for fuel spillage; any spilled fuel must be completely wiped up immediately. When the fuel hose is disconnected, fuel spills out from the hose and the pipe. Cover the hose connection with a clean shop towel to prevent fuel spillage.



- Install the new fuel hose.
- Pull [A] the joint lock [B] fully as shown.

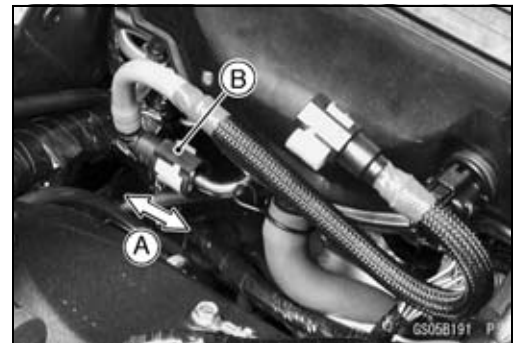


- Insert the fuel hose joint [A] straight onto the delivery pipe until the hose joint clicks.
- Push [B] the joint lock [C] until the hose joint clicks.



- Push and pull [A] the fuel hose joint [B] back and forth more than two times and make sure it is locked and doesn't come off.

⚠ WARNING
Make sure the fuel hose joint is installed correctly on the delivery pipe or the fuel could leak.



- ★ If it comes off, reinstall the hose joint.
- Run the fuel hose in accordance with the Cable, Wire and Hose Routing section in the Appendix chapter.
- Install the removed part.
- Start the engine and check the fuel hose for leaks.

2-46 PERIODIC MAINTENANCE

Maintenance Procedure

Air Cleaner Element Replacement

NOTE

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

⚠ WARNING

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

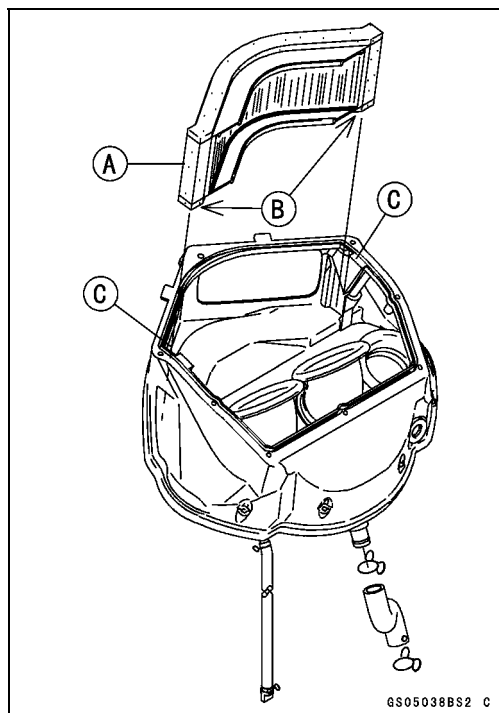
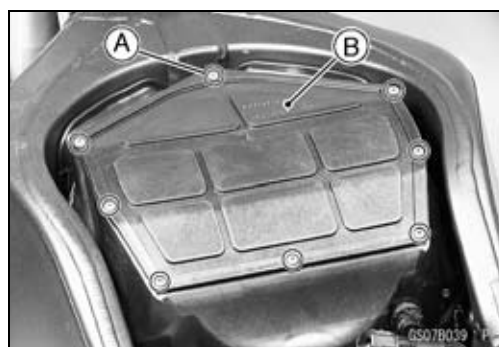
CAUTION

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

- Remove:
 - Seats (see Frame chapter)
 - Fuel Tank (see Fuel System (DFI) chapter)
 - Air Cleaner Element Cover Screws [A]
 - Air Cleaner Element Cover [B]
- Discard:
 - Air Cleaner Element
- Install a new element [A] so that the element ends [B] insert along the rib [C] in the housing.

CAUTION

Use only the recommended air cleaner element (Kawasaki part number 11013-0004). Using another air cleaner element will wear the engine prematurely or lower the engine performance.



Maintenance Procedure

Coolant Change

⚠ WARNING

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

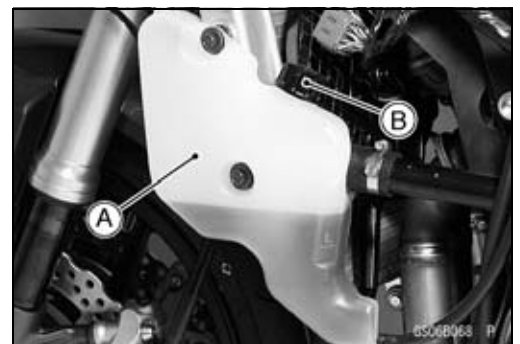
- Remove:
 - Right Middle Fairing (see Frame chapter)
 - Radiator Cap [A]
- Remove the radiator cap in two steps. First turn the cap counterclockwise to the first stop. Then push and turn it further in the same direction and remove the cap.



- Remove:
 - Left Lower Fairing (see Frame chapter)
 - Left Middle Fairing (see Frame chapter)
- Place a containers under the drain plugs [A] [B] at the bottom of the water pump cover and cylinder.
- Drain the coolant from the radiator and engine by removing the drain plugs.



- Remove:
 - Coolant Reserve Tank [A] (see Cooling System chapter)
- Remove the cap [B] and pour the coolant into a container.



- Install the reserve tank (see Cooling System chapter).
- Tighten the drain plugs with the washers.
- Replace the drain plug gasket with a new one if it is damaged.

Torque - Coolant Drain Plug (Water Pump): 9.8 N·m (1.0 kgf·m, 87 in·lb)
Coolant Drain Plug (Cylinder): 9.8 N·m (1.0 kgf·m, 87 in·lb)

2-48 PERIODIC MAINTENANCE

Maintenance Procedure

- Fill the radiator up to the radiator filler neck [A] with coolant, and install the radiator cap.

NOTE

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

- Fill the reserve tank up to the full level line with coolant, and install the cap.

CAUTION

Soft or distilled water must be used with the antifreeze (see below for antifreeze) in the cooling system.

If hard water is used in the system, it causes scales accumulation in the water passages, and considerably reduces the efficiency of the cooling system.

Water and Coolant Mixture Ratio (Recommended)

Soft Water:	50%
Coolant:	50%
Freezing Point:	-35°C (-31°F)
Total Amount:	2.5 L (2.6 US qt)

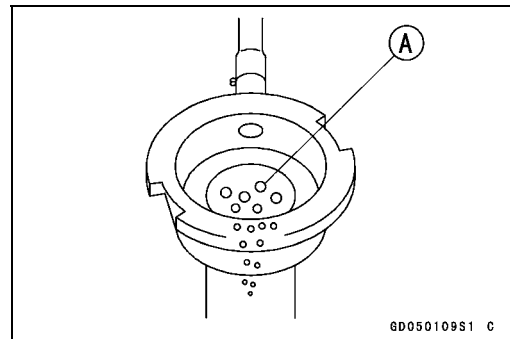
NOTE

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

- Bleed the air from the cooling system as follows.
 - 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 radiator hoses to force any air bubbles caught inside.
 - Stop the engine and add coolant up to the radiator filler neck.
- Install the radiator cap.
- Start the engine, warm it up thoroughly until the radiator fan turns on and then stop the engine.
- Check the coolant level in the reserve tank after the engine cools down.
- ★ If the coolant level is lower than the low level line, add coolant to the full level line.

CAUTION

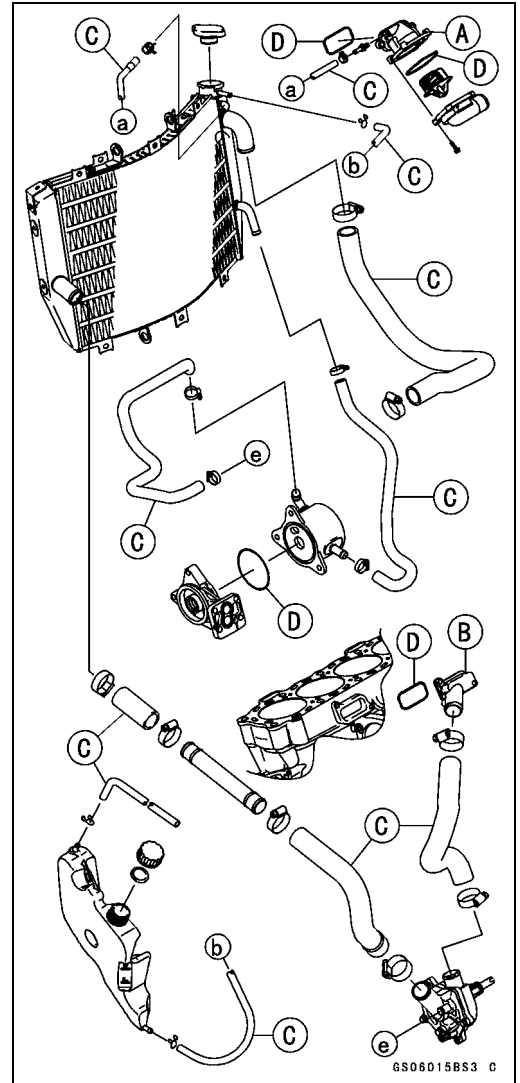
Do not add more coolant above the full level line.



Maintenance Procedure

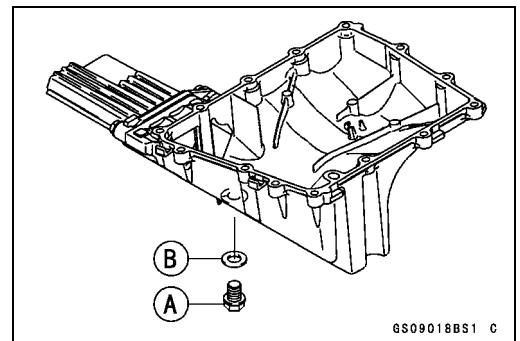
Radiator Hose and O-ring Replacement

- Drain the coolant (see Coolant Change).
- Remove:
 - Lower Fairings (see Frame chapter)
 - Middle Fairings (see Frame chapter)
 - Throttle Body Assy (see Fuel System (DFI) chapter)
 - Thermostat Housing [A]
 - Fitting [B]
 - Hoses [C]
 - O-rings [D]
- Apply grease to the new O-rings and install them.
- Instal the new hoses and tighten the clamps securely.
- Fill the coolant (see Coolant Change).
- Check the cooling system for leaks.



Engine Oil Change

- Situate the motorcycle so that it is vertical after warming up the engine.
- Remove the engine oil drain bolt [A] to drain the oil.
- The oil in the oil filter can be drained by removing the filter (see Oil Filter Replacement).
- ★ Replace the drain bolt gasket [B] with a new one.
- Tighten the drain bolt.
- Torque - Engine Oil Drain Bolt: 20 N·m (2.0 kgf·m, 14 ft·lb)**
- Pour in the specified type and amount of oil.

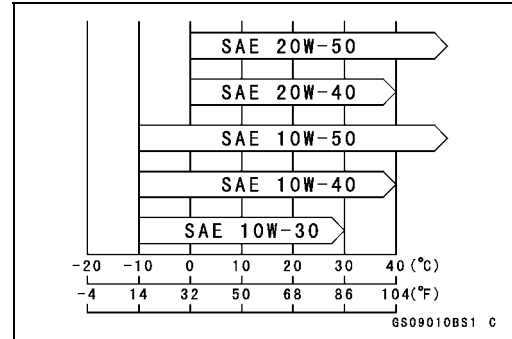


2-50 PERIODIC MAINTENANCE

Maintenance Procedure

Recommended Engine Oil

- Type: API SE, SF or SG
API SH or SJ with JASO MA
- Viscosity: SAE 10W-40
- Capacity: 2.7 L (2.9 US qt) (when filter is not removed)
3.0 L (3.2 US qt) (when filter is removed)
3.7 L (3.9 US qt) (when engine is completely dry)

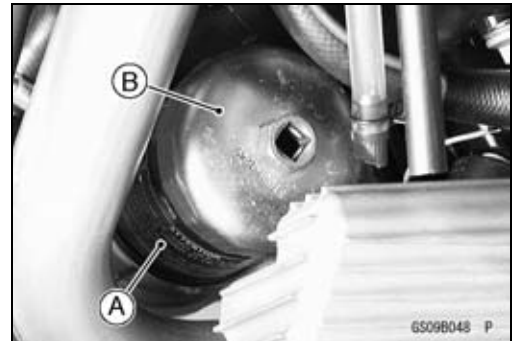


NOTE

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

Oil Filter Replacement

- Drain the engine oil (see Engine Oil Change).
 - Remove:
 - Lower Fairing (see Frame chapter)
 - Remove the oil filter [A] with the oil filter wrench [B].
- Special Tool - Oil Filter Wrench: 57001-1249



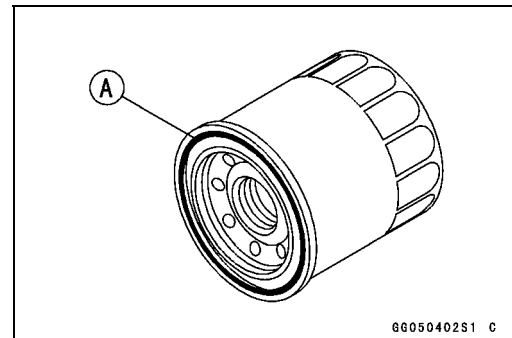
- Replace the filter with a new one.
- Apply engine oil to the gasket [A] before installation.
- Tighten the filter with the oil filter wrench.

Torque - Oil Filter: 31 N·m (3.2 kgf·m, 23 ft·lb)

NOTE

- Hand tightening of the oil filter can not be allowed since it does not reach to this tightening torque.

- Pour in the specified type and amount of oil (see Engine Oil Change).



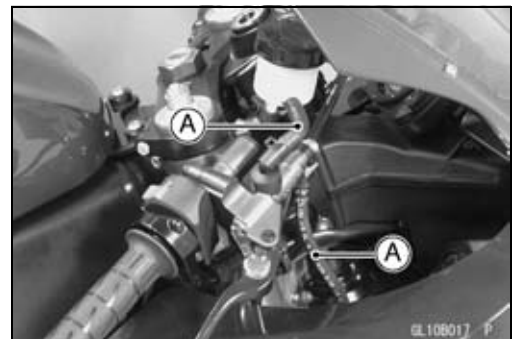
Brake Hose and Pipe Replacement

CAUTION

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

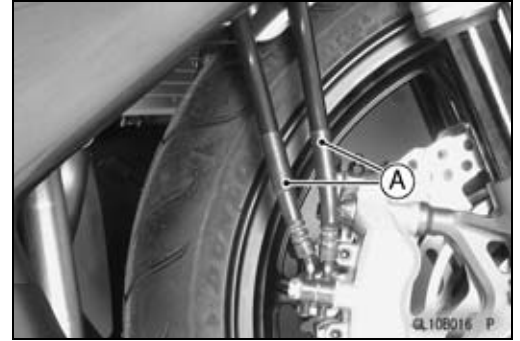
- When removing the brake hose, take care not to spill the brake fluid on the painted or plastic parts.
- When removing the brake hose [A], temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.
- Immediately wash away any brake fluid that spills.
- There are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

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



Maintenance Procedure

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

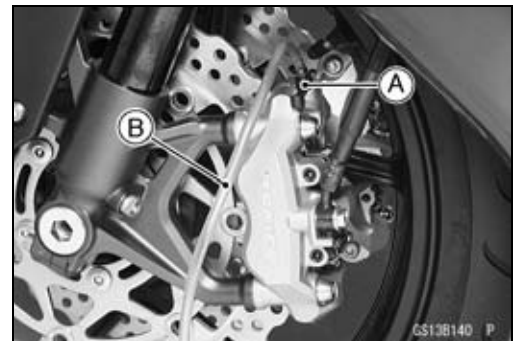


Brake Fluid Change

NOTE

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

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



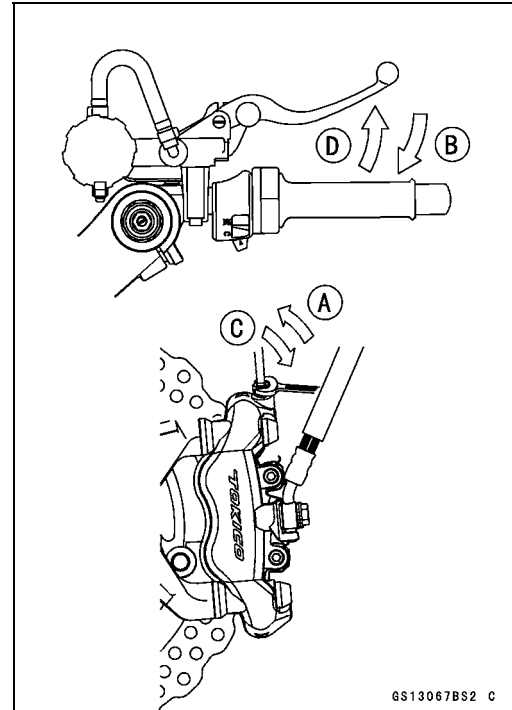
2-52 PERIODIC MAINTENANCE

Maintenance Procedure

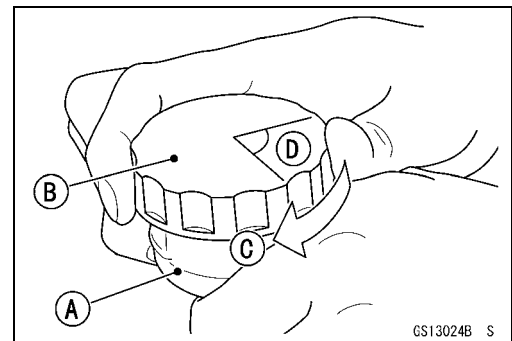
- Change the brake fluid.
- Repeat this operation until fresh brake fluid comes out from the plastic hose or the color of the fluid changes.
- 1. Open the bleed valve [A].
- 2. Apply the brake and hold it [B].
- 3. Close the bleed valve [C].
- 4. Release the brake [D].

NOTE

- The fluid level must be checked often during the changing operation and replenished with fresh brake fluid. If the fluid in the reservoir runs out any time during the changing operation, the brakes will need to be bled since air will have entered the brake line.
- Front Brake: Repeat the above steps for the other caliper.



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



- Tighten:
 - Torque - Front Brake Reservoir Cap Stopper Screw: 1.2 N·m (0.12 kgf·m, 11 in·lb)**
- Tighten the bleed valve, and install the rubber cap.
 - Torque - Bleed Valve: 7.8 N·m (0.80 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.

Maintenance Procedure

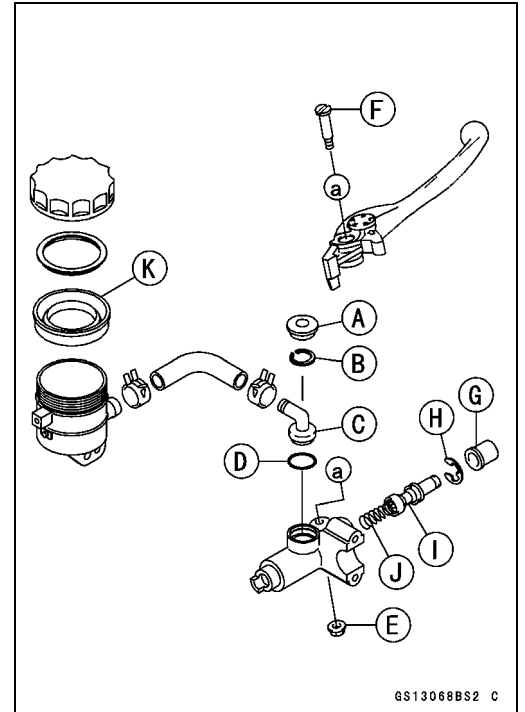
Master Cylinder Rubber Parts Replacement

Front Master Cylinder Disassembly

- Remove the front master cylinder (see Brakes chapter).
- Remove the seal cover [A], circlip [B], connector [C] and O-ring [D].

Special Tool - Inside Circlip Pliers: 57001-143

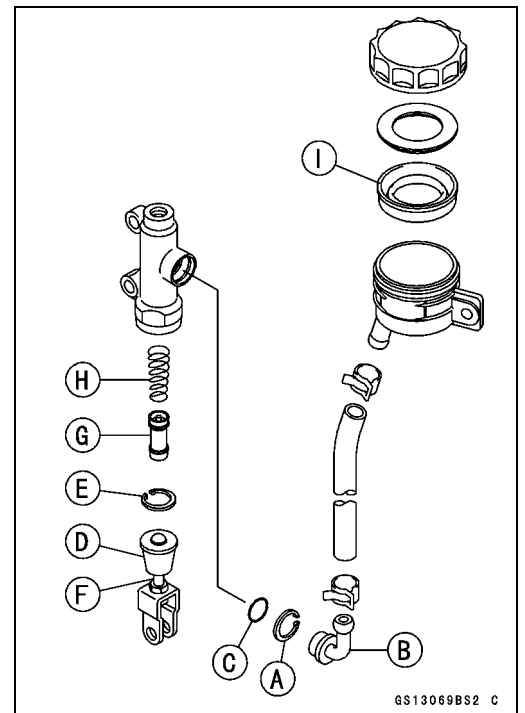
- Unscrew the locknut [E] and pivot bolt [F], and remove the brake lever.
- Pull the dust cover [G] out of place, and remove the circlip [H].
- Pull out the piston assy [I] and return spring [J].
- Replace:
 - Seal Cover [A]
 - O-ring [D]
 - Dust Cover [G]
 - Piston Assy [I]
 - Diaphragm [K]



Rear Master Cylinder Disassembly

- Remove the rear master cylinder (see Brakes chapter).
- Remove the circlip [A], connector [B], and O-ring [C].
- Slide the dust cover [D] out of place, and remove the circlip [E].
- Pull out the push rod assy [F].
- Take off the piston assy [G] and return spring [H].
- Replace:
 - O-ring [C]
 - Push Rod Assy [F]
 - Piston Assy [G]
 - Diaphragm [I]

Special Tool - Inside Circlip Pliers: 57001-143



Master Cylinder Assembly

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

CAUTION

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

2-54 PERIODIC MAINTENANCE

Maintenance Procedure

- Apply brake fluid to the new parts and to the inner wall of the cylinder.
- Take care not to scratch the piston or the inner wall of the cylinder.

CAUTION

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

- Tighten the brake lever pivot bolt and the locknut.

Silicone Grease -

Brake Lever Pivot Bolt, Brake Lever Pivot Contact, Piston Rod Contact, Dust Cover

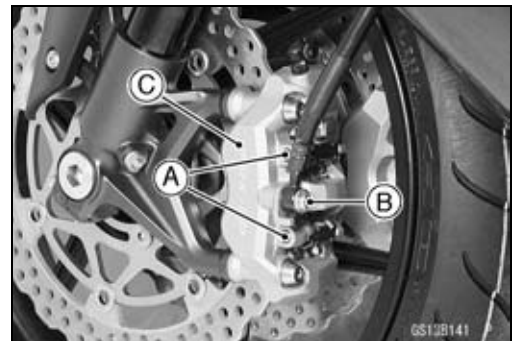
Torque - Brake Lever Pivot Bolt: 1.0 N·m (0.10 kgf·m, 9 in·lb)

Brake Lever Pivot Bolt Locknut: 6.0 N·m (0.61 kgf·m, 53 in·lb)

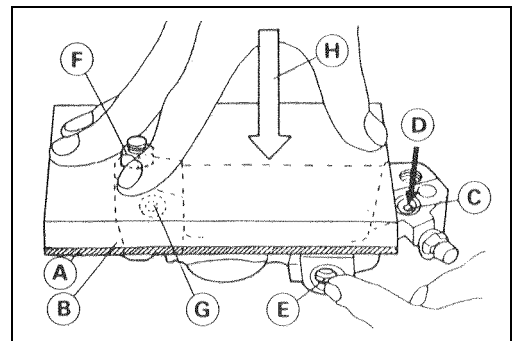
Caliper Rubber Parts Replacement

Front Caliper Disassembly

- Loosen the front caliper pad pins [A] and banjo bolt [B] and tighten them loosely.
- Remove:
 - Front Caliper (see Brakes chapter) [C]
 - Brake Pad
 - Front Caliper Assembly Bolts
 - O-rings



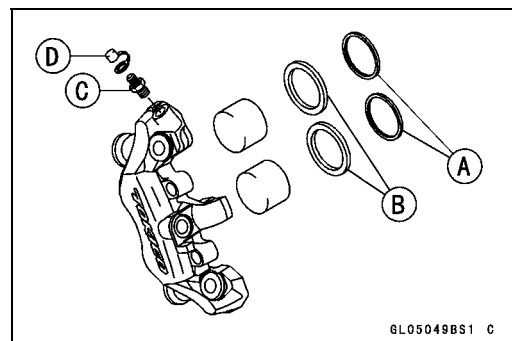
- Using compressed air, remove the pistons. One way to remove the pistons is as follows.
 - Install a rubber gasket [A] and a wooden board [B] more than 10 mm (0.4 in.) thick on the caliper half, and fasten them together with a suitable bolt and nut as shown. Leave one of the oil passages [C] open.
 - Lightly apply compressed air [D] to the oil passage until the pistons hit the rubber gasket. Block the hose joint opening [E] during this operation if the caliper half has the opening.
- [F] Bolt and Nut
[G] Oil Passage Sealed by Rubber Gasket
[H] Push down.



⚠ WARNING

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

- Pull out the pistons by hand.
- Remove the dust seals [A] and fluid seals [B].
- Remove the bleed valve [C] and rubber cap [D].
- Repeat the previous step to remove the pistons from the other side of the caliper body.



GL05049BS1 C

Maintenance Procedure

NOTE

- If compressed air is not available, do as follows for both calipers coincidentally, with the brake hose connected to the caliper.
- Prepare a container for brake fluid, and perform the work above it.
- Remove the spring and pads (see Brakes chapter).
- Pump the brake lever until the pistons come out of the cylinders, and then disassemble the caliper.

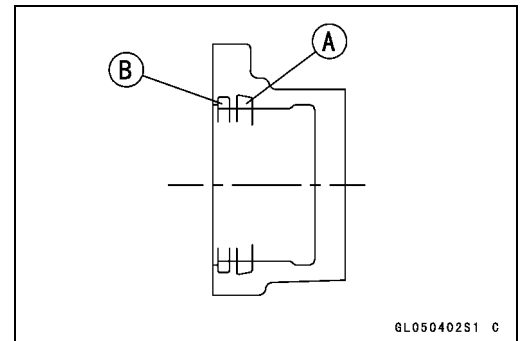
Front Caliper Assembly

- Clean the caliper parts except for the pads.

CAUTION

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

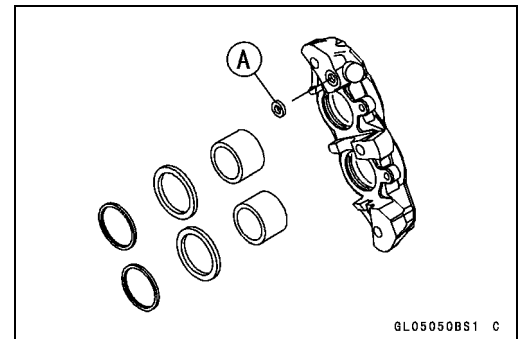
- Install the bleed valve and rubber cap.
- Torque - Bleed Valve: 7.8 N·m (0.80 kgf·m, 69 in·lb)**
- Replace the fluid seals [A] with new ones.
- Apply brake fluid to the fluid seals, and install them into the cylinders by hand.
- Replace the dust seals [B] with new ones if they are damaged.
- Apply brake fluid to the dust seals, and install them into the cylinders by hand.



GL050402S1 C

- Replace the O-ring [A].
- Apply brake fluid to the outside of the pistons, and push them into each cylinder by hand.
- Be sure to install the O-rings.
- Tighten:

Torque - Front Caliper Assembly Bolts: 22 N·m (2.2 kgf·m, 16 ft·lb)



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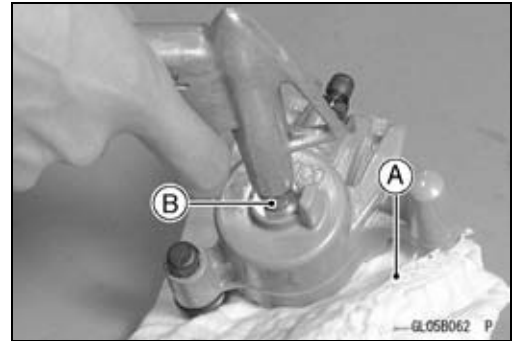
- Install the pads (see Brakes chapter).
- Wipe up any spilled brake fluid on the caliper with wet cloth.

2-56 PERIODIC MAINTENANCE

Maintenance Procedure

Rear Caliper Disassembly

- Remove the rear caliper.
- Remove the pads and anti-rattle spring (see Brakes chapter).
- Using compressed air, remove the piston.
 - Cover the caliper opening with a clean, heavy cloth [A].
 - Remove the piston by lightly applying compressed air [B] to where the brake line fits into the caliper.



⚠ WARNING

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

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

NOTE

- If compressed air is not available, do as follows with the brake hose connected to the caliper.
- Prepare a container for brake fluid, and perform the work above it.
- Remove the pads and spring (see Brakes chapter).
- Pump the brake pedal to remove the caliper piston.

Rear Caliper Assembly

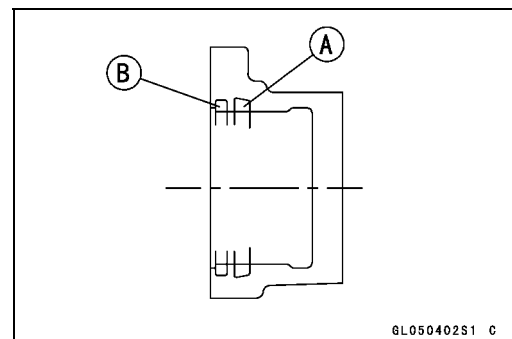
- Clean the caliper parts except for the pads.

CAUTION

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

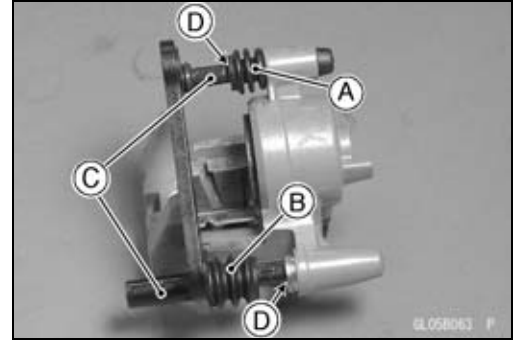
- Install the bleed valve and rubber cap.
Torque - Bleed Valve: 7.8 N·m (0.80 kgf·m, 69 in·lb)

- Replace the fluid seal [A] with a new one.
 - Apply brake fluid to the fluid seal, and install it into the cylinder by hand.
- Replace the dust seal [B] with a new one.
 - Apply brake fluid to the dust seal, and install it into the cylinder by hand.

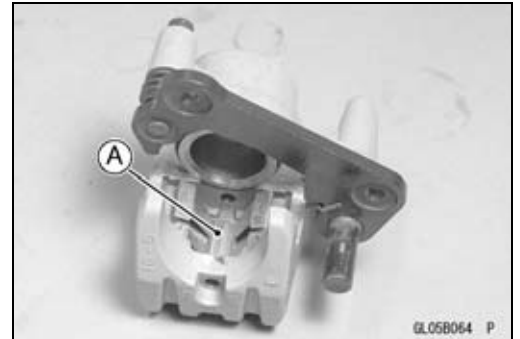


Maintenance Procedure

- Apply brake fluid to the outside of the piston, and push it into the cylinder by hand.
- Replace the shaft rubber friction boot [A] and dust boot [B].
- Apply a thin coat of PBC (Poly Butyl Cuprysil) grease to the caliper holder shafts [C] and holder holes [D] (PBC is a special high temperature, water-resistance grease).



- Install the anti-rattle spring [A] in the caliper as shown.
- Install the pads (see Rear Brake chapter).
- Wipe up any spilled brake fluid on the caliper with wet cloth.



Spark Plug Replacement

- Remove:
 - Stick Coils (see Electrical System chapter)
- Remove the spark plug using the 16 mm (0.63 in.) plug wrench [A] vertically.



- Insert new spark plug in the plug hole, and finger-tighten it first.
- Using the plug wrench [A] vertically, tighten the plug.



CAUTION

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

Torque - Spark Plugs: 13 N·m (1.3 kgf·m, 113 in·lb)

- Install the stick coils securely.
- Be sure the stick coils are installed by pulling up it lightly.

Fuel System (DFI)

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3-2 FUEL SYSTEM (DFI)

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