

## MODEL APPLICATION

Year	Model	Beginning Frame No.
2008	ZX1000E8F	JKAZXCE1□8A000001 or JKAZXT00EEA000001 or ZXT00E-000001
2009	ZX1000E9F	JKAZXCE1□9A02002 or JKAZXT00EEA021002 or ZXT00E-021001
2010	ZX1000FAF	JKAZXCF1□AA000001 or JKAZXT00FFA000001

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



KAWASAKI HEAVY INDUSTRIES, LTD.  
Motorcycle & Engine Company

Part No.99924-1388-03

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)		

## COUNTRY AND AREA CODES

AT	Austria	GB	United Kingdom
AU	Australia	MY	Malaysia
BR	Brazil	SEA	Southeast Asia
CA	Canada	TH	Thailand
CAL	California	US	United States
CH	Switzerland	WVTA	WVTA Model with Honeycomb
		(FULL H)	Catalytic Converter (Full Power)
DE	Germany	GB WVTA	WVTA Model with Honeycomb Catalytic
		(FULL H)	Converter (Left Side Traffic Full
			Power)
EUR	Europe	WVTA	WVTA Model with Honeycomb Catalytic
		(78.2 H)	Converter (Restricted Power)

# Foreword

This manual is designed primarily for use by trained mechanics in a properly equipped shop. However, it contains enough detail and basic information to make it useful to the owner who desires to perform his own basic maintenance and repair work. A basic knowledge of mechanics, the proper use of tools, and workshop procedures must be understood in order to carry out maintenance and repair satisfactorily. Whenever the owner has insufficient experience or doubts his ability to do the work, all adjustments, maintenance, and repair should be carried out only by qualified mechanics.

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

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

To get the longest life out of your vehicle.

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

## How to Use This Manual

In this manual, the product is divided into its major systems and these systems make up the manual's chapters. The Quick Reference Guide shows you all of the product's system and assists in locating their chapters. Each chapter in turn has its own comprehensive Table of Contents.

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

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

### **DANGER**

**DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.

### **WARNING**

**WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.

### **CAUTION**

**CAUTION** indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

### **NOTICE**

**NOTICE** is used to address practices not related to personal injury.

This manual contains four more symbols 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

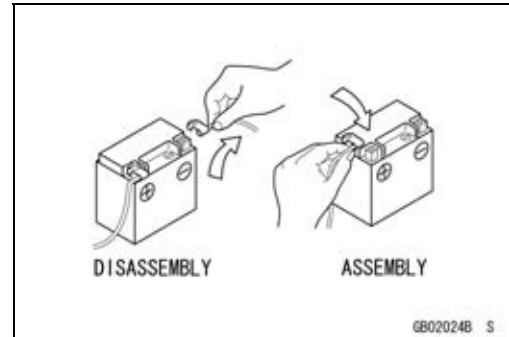
### Before Servicing

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.

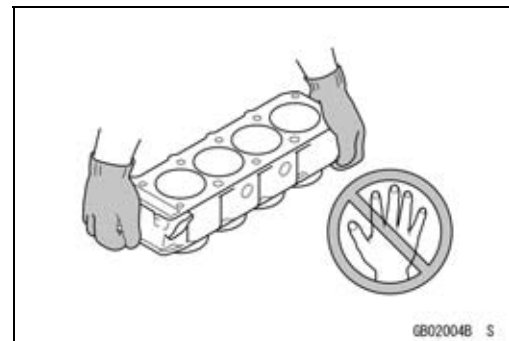
#### **Battery Ground**

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



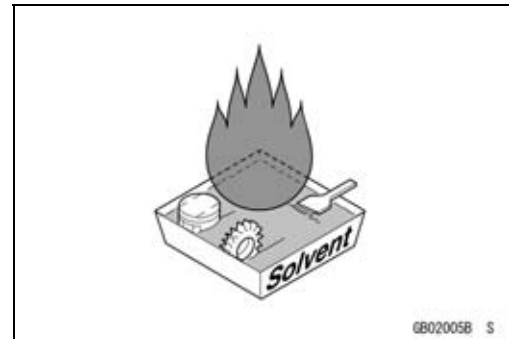
#### **Edges of Parts**

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



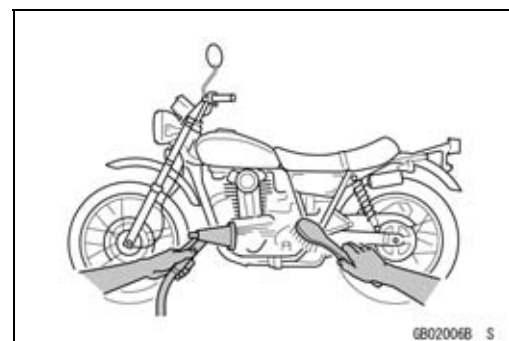
#### **Solvent**

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



#### **Cleaning Vehicle before Disassembly**

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

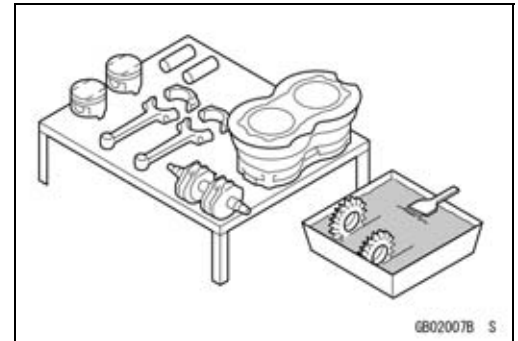




## Before Servicing

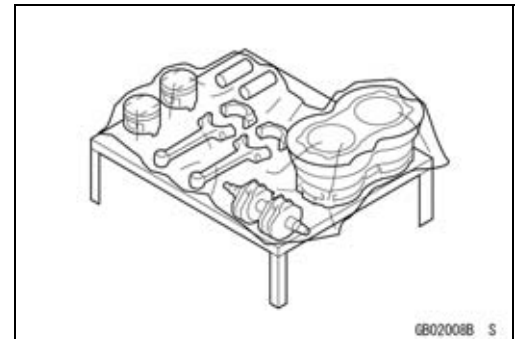
### **Arrangement and Cleaning of Removed Parts**

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



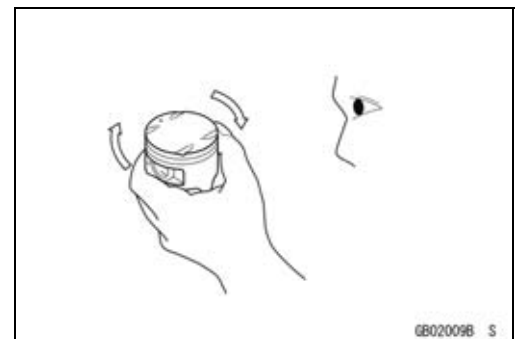
### **Storage of Removed Parts**

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



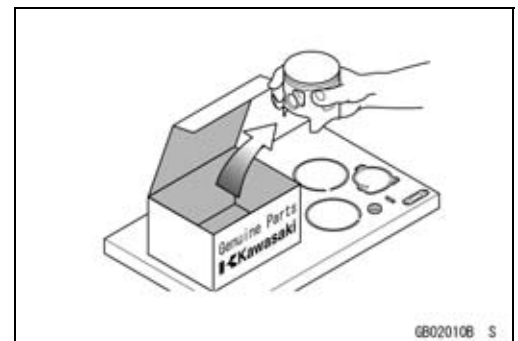
### **Inspection**

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



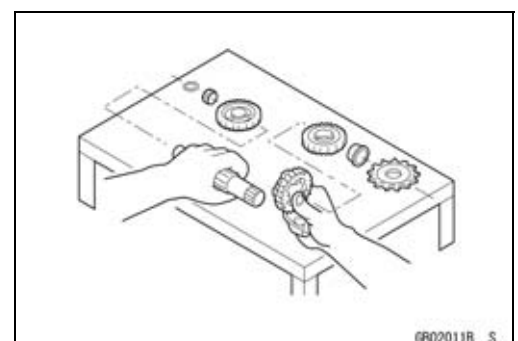
### **Replacement Parts**

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



### **Assembly Order**

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

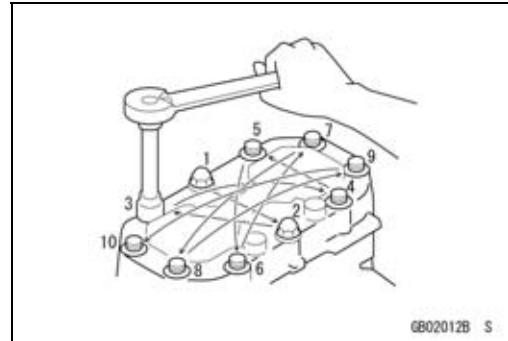


## 1-4 GENERAL INFORMATION

### Before Servicing

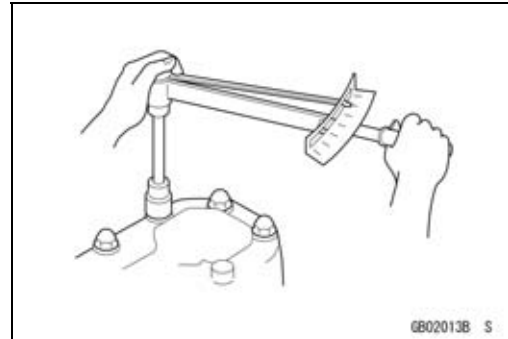
#### **Tightening Sequence**

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



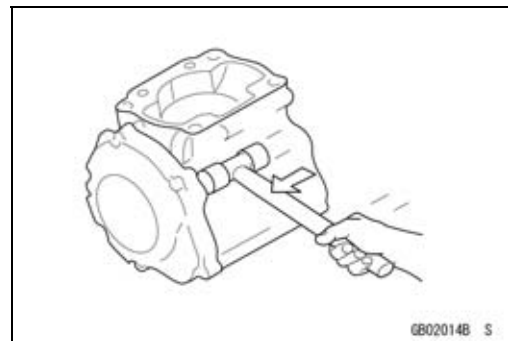
#### **Tightening Torque**

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



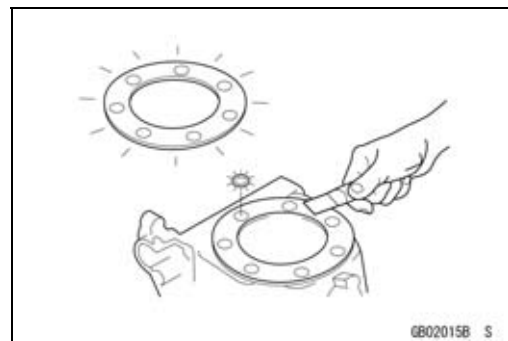
#### **Force**

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



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

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



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

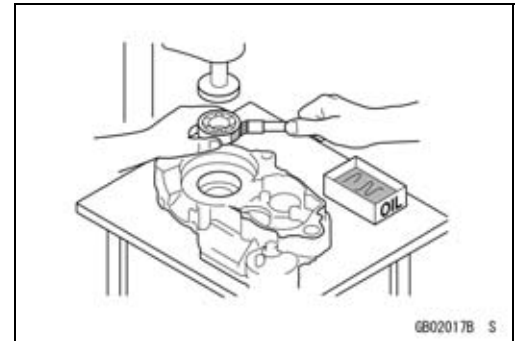
For applications that require Liquid Gasket or a Non-permanent Locking Agent, clean the surfaces so that no oil residue remains before applying liquid gasket or non-permanent locking agent. Do not apply them excessively. Excessive application can clog oil passages and cause serious damage.



**Before Servicing**

**Press**

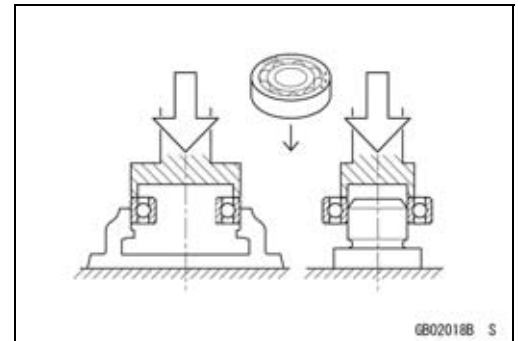
For items such as bearings or oil seals that must be pressed into place, apply small amount of oil to the contact area. Be sure to maintain proper alignment and use smooth movements when installing.



**Ball Bearing and Needle Bearing**

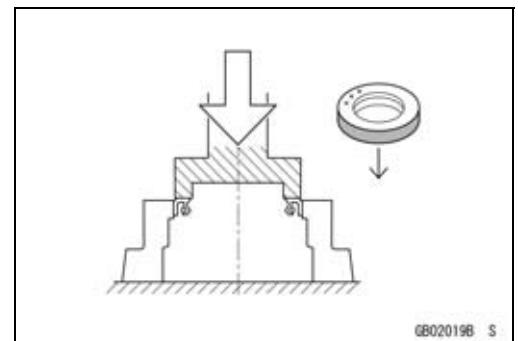
Do not remove pressed ball or needle unless removal is absolutely necessary. Replace with new ones whenever removed. Press bearings with the manufacturer and size marks facing out. Press the bearing into place by putting pressure on the correct bearing race as shown.

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

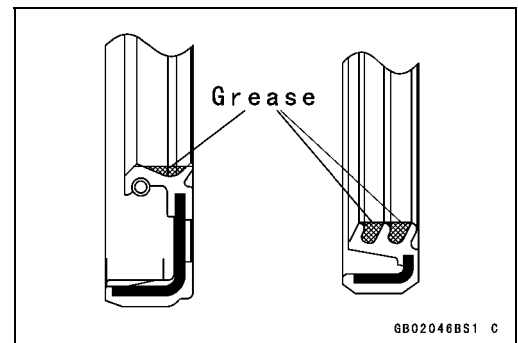


**Oil Seal, Grease Seal**

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

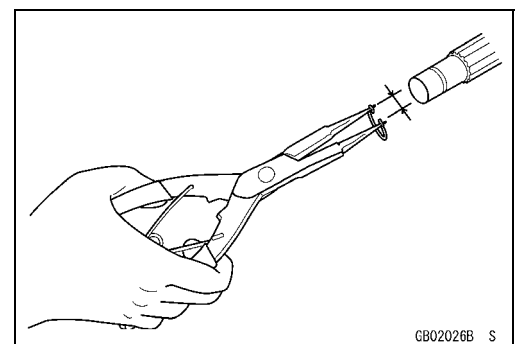


Apply specified grease to the lip of seal before installing the seal.



**Circlips, Cotter Pins**

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

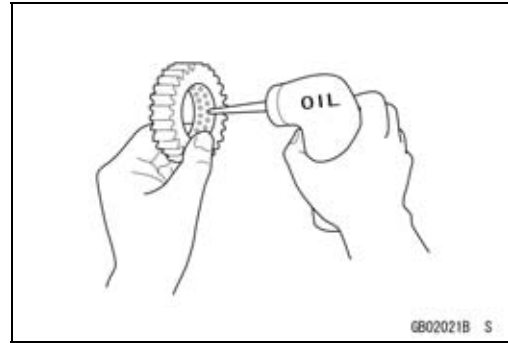


## 1-6 GENERAL INFORMATION

### Before Servicing

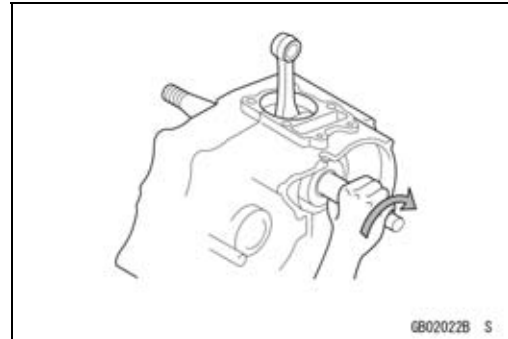
#### **Lubrication**

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



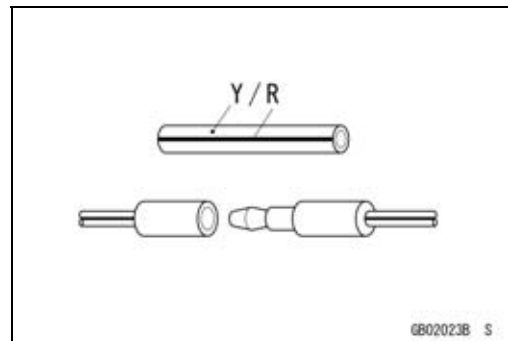
#### **Direction of Engine Rotation**

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



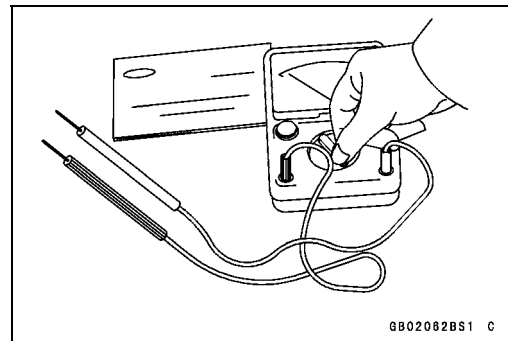
#### **Electrical Wires**

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.



#### **Instrument**

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



Model Identification

ZX1000E8F (US and CA Models) Left Side View



ZX1000E8F (US and CA Models) Right Side View



## 1-8 GENERAL INFORMATION

### Model Identification

ZX1000E8F (EUR Models) Left Side View



ZX1000E8F (EUR Models) Right Side View





# 1-10 GENERAL INFORMATION

## General Specifications

Items	ZX1000E8F ~ E9F, ZX1000FAF
<b>Dimensions</b> Overall Length Overall Width Overall Height Wheelbase Road Clearance Seat Height Dry Mass ZX1000E8F Curb Mass: ZX1000E9F, ZX1000FAF Front Rear Fuel Tank Capacity	2 110 mm (83.1 in.) 710 mm (28.0 in.) 1 135 mm (44.7 in.) 1 415 mm (55.7 in.) 125 mm (4.9 in.) 830 mm (32.7 in.) 179 kg (395 lb) 208 kg (459 lb) 106 kg (234 lb) 102 kg (225 lb) 17 L (4.5 US gal)
<b>Performance</b> Minimum Turning Radius	3.4 m (11.2 ft)
<b>Engine</b> 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	4-stroke, DOHC, 4-cylinder Liquid-cooled 76.0 × 55.0 mm (3.0 × 2.2 in.) 998 cm <sup>3</sup> (60.9 cu in.) 12.9 : 1 138.3 kW (188.1 PS) @12 500 r/min (rpm), WVTA (78.2 H) 78.2 kW (106 PS) @11 000 r/min (rpm), (MY), (TH) 119 kW (162 PS) @10 000 r/min (rpm), (SEA) 119.2 kW (162.1 PS) @10 000 r/min (rpm), (CA), (CAL), (US) – – – 113 N·m (11.5 kgf·m, 83.3 ft·lb) @8 700 r/min (rpm), WVTA (78.2 H) 83 N·m (8.5 kgf·m, 61.2 ft·lb) @5 100 r/min (rpm), (CA), (CAL), (US) – – – FI (Fuel injection), KEIHIN TTK43 × 4 Electric starter Battery and coil (transistorized) KIMS (Kawasaki Ignition Management System) Electronically advanced (IC igniter in ECU) From 10° BTDC @1 100 r/min (rpm) NGK CR9EIA-9 Left to right, 1-2-3-4 1-2-4-3 35° BTDC 77° ABDC 292°



**General Specifications**

Items	ZX1000E8F ~ E9F, ZX1000FAF
Exhaust: Open Close Duration Lubrication System Engine Oil: Grade Viscosity Capacity	62° BBDC 38° ATDC 280° Forced lubrication (wet sump with oil cooler) API SG, SH, SJ, SL or SM with JASO MA, MA1 or MA2 SAE10W-40 4.0 L (4.2 US qt)
<b>Drive Train</b> Primary Reduction System: Type Reduction Ratio Clutch Type Transmission: Type Gear Ratios: 1st 2nd 3rd 4th 5th 6th Final Drive System: Type Reduction Ratio Overall Drive Ratio	Gear 1.611 (87/54) Wet multi disc 6-speed, constant mesh, return shift 2.600 (39/15) 2.053 (39/19) 1.737 (33/19) 1.550 (31/20) 1.400 (28/20) 1.304 (30/23) Chain drive 2.412 (41/17) 5.068 @Top gear
<b>Frame</b> Type Caster (Rake Angle) Trail Front Tire: Type Size Rim Size Rear Tire: Type Size Rim Size Front Suspension: Type Wheel Travel	Tubular, diamond 25.5° 110 mm (4.3 in.) Tubeless 120/70 ZR17 M/C (58 W) 17 x 3.50 Tubeless 190/55 ZR17 M/C (75 W) 17 x 6.00 Telescopic fork (upside-down) 120 mm (4.7 in.)

## 1-12 GENERAL INFORMATION

### General Specifications

Items	ZX1000E8F ~ E9F, ZX1000FAF
Rear Suspension: Type Wheel Travel Brake Type: Front Rear	Swingarm (uni-trak) 125 mm (4.9 in.) Dual discs Single disc
<b>Electrical Equipment</b> Battery Headlight: Type Bulb: High Low Tail/Brake Light Alternator: Type Rated Output	12 V 10 Ah Semi-sealed beam 12 V 55 W + 65 W (quartz-halogen) 12 V 55 W (quartz-halogen) 12 V 0.5/4.1 W (LED) Three-phase AC 30 A/14 V @5 000 r/min (rpm)

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

**Technical Information-KIMS (Kawasaki Ignition Management System)**

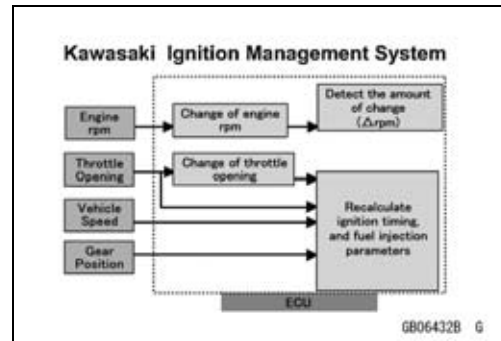
**Overview**

This motorcycle is equipped with the Kawasaki ignition management system which was developed as a rider aid for track riding using technology borrowed from racing machines. Experienced racers or track riders can deliberately cause wheel spin to occur when exiting mid/high speed corners. However, they rely on precise throttle control to maintain the optimum acceleration level without sacrificing too much wheel spin. KIMS was designed to aid such riding where precise throttle control is required.

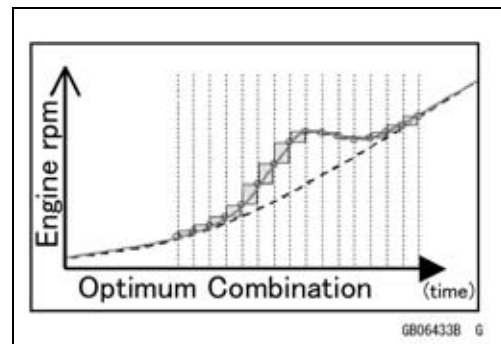
This system has not been developed to eliminate all wheel spin, as there are times when this can be advantageous for experienced riders, and too much control would lead to a very sterile riding experience.

**Operation**

In addition to normal DFI activity the ECU's complex programme monitors throttle opening, vehicle speed, gear position, and the rate of change of engine speed.

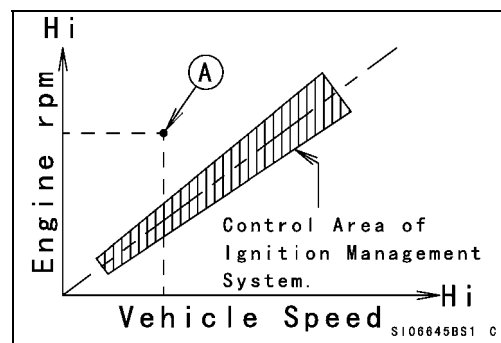


When the ECU detects the rear wheel is slipping by a sudden change in engine speed, the previously mentioned factors are calculated and within certain parameters the ignition timing is retarded to reduce excessive engine speed. The number of degrees that the ECU retards the ignition is determined by continuous sampling, with the aim being to optimize the relationship between throttle opening, engine/vehicle speed and ultimately ensuring the optimum combination of grip/acceleration.



To ensure that this system does not act unnecessarily, the following situations are taken into account.

1. This system does not act at idle speed, small throttle openings, or at full throttle.
2. In cases of snapping open the throttle with the clutch half-engaged (example [A]), the system compares the gear position, engine speed and the vehicle speed to determine whether or not to engage. This system does not act when the clutch is at the partially disengaged or slipping.



3. This system does not act on sudden throttle openings.

# 1-14 GENERAL INFORMATION

## 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

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kg	×	9.807	=	N
kg	×	2.205	=	lb

### Units of Length:

km	×	0.6214	=	mile
m	×	3.281	=	ft
mm	×	0.03937	=	in

### Units of Torque:

N·m	×	0.1020	=	kgf·m
N·m	×	0.7376	=	ft·lb
N·m	×	8.851	=	in·lb

---

kgf·m	×	9.807	=	N·m
kgf·m	×	7.233	=	ft·lb
kgf·m	×	86.80	=	in·lb

### Units of Pressure:

kPa	×	0.01020	=	kgf/cm <sup>2</sup>
kPa	×	0.1450	=	psi
kPa	×	0.7501	=	cmHg

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kgf/cm <sup>2</sup>	×	98.07	=	kPa
kgf/cm <sup>2</sup>	×	14.22	=	psi
cmHg	×	1.333	=	kPa

### Units of Speed:

km/h	×	0.6214	=	mph
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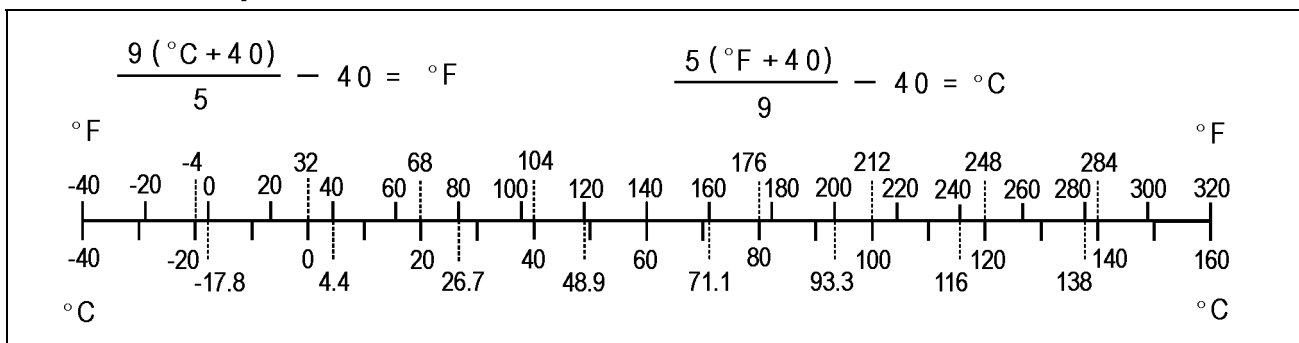
### Units of Power:

kW	×	1.360	=	PS
kW	×	1.341	=	HP

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PS	×	0.7355	=	kW
PS	×	0.9863	=	HP

### Units of Temperature:



# Periodic Maintenance

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## 2-2 PERIODIC MAINTENANCE

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**Periodic Maintenance Chart**

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

**Periodic Inspection**

ITEM	FREQUENCY	* ODOMETER READING							See Page
		Whichever comes first ↓ Every	1 (0.6)	6 (3.75)	12 (7.5)	18 (11.25)	24 (15)	30 (18.75)	
<b>Fuel System</b>									
Throttle control system (play, smooth return, no drag)-inspect	year	●		●		●		●	2-17
Engine vacuum synchronization -inspect				●		●		●	2-17
Idle speed-inspect		●		●		●		●	2-22
Fuel leak (fuel hose and pipe)-inspect	year	●		●		●		●	2-23
Fuel hose and pipe damage-inspect	year	●		●		●		●	2-23
Fuel hose and pipe installation condition-inspect	year	●		●		●		●	2-23
Evaporative emission control system function (CAL, SEA and TH Models) -inspect		●	●	●	●	●	●	●	2-24
<b>Cooling System</b>									
Coolant level-inspect		●		●		●		●	2-25
Coolant leak (water hose and pipe)-inspect	year	●		●		●		●	2-26
Water hose damage-inspect	year	●		●		●		●	2-26
Water hose installation condition-inspect	year	●		●		●		●	2-26
<b>Engine Top End</b>									
Valve clearance-inspect						●			2-26
Air suction system damage-inspect				●		●		●	2-30
<b>Clutch</b>									
Clutch operation (play, disengagement, engagement) -inspect		●		●		●		●	2-31
<b>Wheels and Tires</b>									
Tire air pressure-inspect	year			●		●		●	2-32
Wheel/tire damage-inspect				●		●		●	2-33
Tire tread wear, abnormal wear-inspect				●		●		●	2-33
Wheel bearing damage-inspect	year			●		●		●	2-34
<b>Final Drive</b>									
Drive chain lubrication condition-inspect #		Every 600 km (400 mile)							2-34
Drive chain slack-inspect #		Every 1 000 km (600 mile)							2-35
Drive chain wear-inspect #				●		●		●	2-36

## 2-4 PERIODIC MAINTENANCE

### Periodic Maintenance Chart

ITEM	FREQUENCY	* ODOMETER READING × 1 000 km (× 1 000 mile)							See Page
		Whichever comes first ↓ Every	1 (0.6)	6 (3.75)	12 (7.5)	18 (11.25)	24 (15)	30 (18.75)	
Drive chain guide wear-inspect				●		●		●	2-37
<b>Brakes</b>									
Brake fluid leak (brake hose and pipe)-inspect	year	●	●	●	●	●	●	●	2-37
Brake hose and pipe damage-inspect	year	●	●	●	●	●	●	●	2-38
Brake hose installation condition-inspect	year	●	●	●	●	●	●	●	2-38
Brake operation (effectiveness, play, no drag)-inspect	year	●	●	●	●	●	●	●	2-38
Brake fluid level-inspect	6 months	●	●	●	●	●	●	●	2-38
Brake pad wear-inspect #			●	●	●	●	●	●	2-39
Brake light switch operation-inspect		●	●	●	●	●	●	●	2-39
<b>Suspension</b>									
Front forks/rear shock absorber operation (damping and smooth stroke)-inspect				●		●		●	2-40
Front forks/rear shock absorber oil leak-inspect	year			●		●		●	2-40, 2-41
Rocker arm operation-inspect				●		●		●	2-41
Tie-rods operation-inspect				●		●		●	2-41
<b>Steering</b>									
Steering play-inspect	year	●		●		●		●	2-41
Steering stem bearings-lubricate	2 years					●			2-43
Steering damper oil leak-inspect			●	●	●	●	●	●	2-43
<b>Electrical System</b>									
Lights and switches operation -inspect	year			●		●		●	2-44
Headlight aiming-inspect	year			●		●		●	2-46
Sidestand switch operation-inspect	year			●		●		●	2-47
Engine stop switch operation-inspect	year			●		●		●	2-48
<b>Others</b>									
Chassis parts-lubricate	year			●		●		●	2-48
Bolts and nuts tightness-inspect		●		●		●		●	2-49

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

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



**Periodic Maintenance Chart**

**Periodic Replacement Parts**

ITEM	FREQUENCY	* ODOMETER READING × 1 000 km (× 1 000 mile)					See Page
		Whichever come first ↓ Every	1 (0.6)	12 (7.5)	24 (15)	36 (22.5)	
Air cleaner element # - replace		Every 18 000 km (12 000 mile)					2-51
Fuel hose - replace	4 years					●	2-51
Coolant - change	3 years				●		2-55
Radiator hose and O-ring - replace	3 years				●		2-58
Engine oil # - change	year	●	●	●	●	●	2-59
Oil filter - replace	year	●	●	●	●	●	2-60
Brake hose and pipe - replace	4 years					●	2-60
Brake fluid - change	2 years			●		●	2-61
Rubber parts of master cylinder and caliper - replace	4 years					●	2-63, 2-64
Spark plug - replace			●	●	●	●	2-68

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

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

## 2-6 PERIODIC MAINTENANCE

### Torque and Locking Agent

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

Letters used in the "Remarks" column mean:

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

G: Apply grease.

L: Apply a non-permanent locking agent.

MO: Apply molybdenum disulfide oil solution.

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

R: Replacement Parts

S: Follow the specified tightening sequence.

Si: Apply silicone grease.

SS: Apply silicone sealant.

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
<b>Fuel System (DFI)</b>				
Inlet Air Temperature Sensor Screw	1.2	0.12	11 in·lb	
Air Inlet Duct Mounting Bolts	7.0	0.71	62 in·lb	L
Air Cleaner Housing Bracket Bolt	7.0	0.71	62 in·lb	
Air Cleaner Housing Mounting Bolt (Upper)	7.0	0.71	62 in·lb	
Air Cleaner Housing Mounting Bolts (Lower)	4.2	0.43	37 in·lb	L
Air Cleaner Housing Assembly Screws	1.1	0.11	9.7 in·lb	
Rubber Plate Holder Screws	1.1	0.11	9.7 in·lb	
Delivery Pipe Assy Mounting Screws (Nozzle Assy)	3.4	0.35	30 in·lb	
Nozzle Assy Mounting Bolts	7.0	0.71	62 in·lb	
Delivery Pipe Assy Mounting Screws (Throttle Body Assy)	3.4	0.35	30 in·lb	
Throttle Body Assy Holder Clamp Bolts	2.0	0.20	18 in·lb	
Throttle Body Assy Holder Bolts	10	1.0	89 in·lb	S
Vehicle-down Sensor Bolts	6.0	0.61	53 in·lb	
Camshaft Position Sensor Bolt	10	1.0	89 in·lb	
Water Temperature Sensor	25	2.5	18	
Crankshaft Sensor Bolts	6.0	0.61	53 in·lb	L
Fuel Pump Bolts	10	1.0	89 in·lb	L, S
Gear Position Switch Screws	3.0	0.31	27 in·lb	L
Speed Sensor Bolt	10	1.0	89 in·lb	
Inlet Air Pressure Sensor Bracket Screws	3.4	0.35	30 in·lb	
Exhaust Butterfly Valve Actuator Mounting Screws	4.3	0.44	38 in·lb	
Exhaust Butterfly Valve Actuator Pulley Bolt	5.0	0.51	44 in·lb	
Separator Bracket Bolts	7.0	0.71	62 in·lb	
Canister Bracket Bolts	4.3	0.44	38 in·lb	
<b>Cooling System</b>				
Water Hose Clamp Screws	3.0	0.31	27 in·lb	
Coolant Drain Bolt (Cylinder)	10	1.0	89 in·lb	
Water Pump Cover Bolts	10	1.0	89 in·lb	
Water Temperature Sensor	25	2.5	18	
Coolant Reserve Tank Mounting Bolts	7.0	0.71	62 in·lb	

**Torque and Locking Agent**

Fastener	Torque			Remarks
	N-m	kgf-m	ft-lb	
Coolant By-pass Fitting Bolt	9.0	0.92	80 in-lb	L
Thermostat Housing Cover Bolts	6.0	0.61	53 in-lb	
Thermostat Housing Mounting Bolts	10	1.0	89 in-lb	
Oil Cooler Mounting Bolts	20	2.0	15	
Water Hose Fitting Bolts	10	1.0	89 in-lb	
Water Passage Plugs	20	2.0	15	L
Radiator Bracket Mounting Bolt	7.0	0.71	62 in-lb	
Radiator Upper Bolt	7.0	0.71	62 in-lb	
Radiator Lower Bolt	7.0	0.71	62 in-lb	
Coolant Drain Bolt (Water Pump)	10	1.0	89 in-lb	
Radiator Overflow Hose Clamp Bolt	10	1.0	89 in-lb	
<b>Engine Top End</b>				
Air Suction Valve Cover Bolts	10	1.0	89 in-lb	L
Cylinder Head Cover Bolts	10	1.0	89 in-lb	
Camshaft Cap Bolts	12	1.2	106 in-lb	S
Upper Camshaft Chain Guide Bolts	12	1.2	106 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	106 in-lb	S
Water Passage Plugs	19.6	2.0	14.5	L
Throttle Body Assy Holder Bolts	10	1.0	89 in-lb	S
Throttle Body Assy Holder Clamp Bolts	2.0	0.20	18 in-lb	
Camshaft Position Sensor Bolt	10	1.0	89 in-lb	
Front Camshaft Chain Guide Bolt (Upper)	25	2.5	18	
Front Camshaft Chain Guide Bolt (Lower)	12	1.2	106 in-lb	
Camshaft Chain Tensioner Mounting Bolts	10	1.0	89 in-lb	
Camshaft Chain Tensioner Cap Bolt	20	2.0	15	
Spark Plugs	13	1.3	115 in-lb	
Cam Sprocket Mounting Bolts	15	1.5	11	L
Starter Clutch Cover Bolts (M6, L = 30)	10	1.0	89 in-lb	
Starter Clutch Cover Bolts (M6, L = 20)	10	1.0	89 in-lb	
Torque Limiter Cover Bolts	10	1.0	89 in-lb	L (1), S
Coolant Drain Plug (Cylinder)	10	1.0	89 in-lb	
Starter Clutch Bolt Cap	–	–	–	Hand-tighten
Timing Inspection Cap	–	–	–	Hand-tighten
Right Engine Bracket Bolts (Cylinder Head)	9.8	1.0	87 in-lb	L
Exhaust Pipe Holder Nuts	17	1.7	13	
Exhaust Manifold Clamp Bolt	25	2.5	18	
Premuffler Chamber Mounting Bolt	25	2.5	18	
Premuffler Chamber Outer Cover Bolts	7.0	0.71	62 in-lb	
Premuffler Chamber Inner Cover Bolts	7.0	0.71	62 in-lb	
Exhaust Butterfly Valve Cable Clamp Bolt	10	1.0	89 in-lb	
Exhaust Butterfly Valve Pulley Cover Bolts	7.0	0.71	62 in-lb	

## 2-8 PERIODIC MAINTENANCE

### Torque and Locking Agent

Fastener	Torque			Remarks
	N-m	kgf-m	ft-lb	
Muffler Body Clamp Bolt	25	2.5	18	
Muffler Body Mounting Bolt	25	2.5	18	
Muffler Body Front Cover Bolts	7.0	0.71	62 in-lb	
Muffler Body Rear Cover Bolts	7.0	0.71	62 in-lb	
<b>Clutch</b>				
Clutch Lever Clamp Bolts	7.8	0.80	69 in-lb	S
Clutch Cover Bolts (M6, L = 25)	10	1.0	89 in-lb	S
Clutch Cover Bolts (M6, L = 35)	10	1.0	89 in-lb	S
Oil Filler Plug	–	–	–	Hand-tighten
Clutch Spring Bolts	11	1.1	97 in-lb	
Clutch Hub Nut	130	13.3	96	R
Sub Clutch Hub Bolts	25	2.5	18	L
<b>Engine Lubrication System</b>				
Engine Oil Drain Bolt	30	3.1	22	
Oil Filter	17	1.7	13	G, R
Oil Filter Pipe	35	3.6	26	L
Oil Pan Bolts	10	1.0	89 in-lb	
Oil Pressure Relief Valve	15	1.5	11	L
Oil Pressure Switch	15	1.5	11	SS
Oil Pressure Switch Terminal Bolt	–	–	–	Hand-tighten
Oil Pump Gear Bolts	10	1.0	89 in-lb	L
Oil Passage Plugs	20	2.0	15	L
Oil Pump Cover Bolts	10	1.0	89 in-lb	
Oil Cooler/Oil Filter Case Mounting Bolts	20	2.0	15	L
Oil Cooler Mounting Bolts	20	2.0	15	
<b>Engine Removal/Installation</b>				
Adjusting Collar Locknut	49	5.0	36	S
Left Front Engine Mounting Bolt (M10, L = 42)	44	4.5	32	S
Right Front Engine Mounting Bolt (M10, L = 67)	44	4.5	32	S
Middle Engine Mounting Bolt	9.8	1.0	87 in-lb	S
Middle Engine Mounting Nut	44	4.5	32	S
Lower Engine Mounting Bolt	9.8	1.0	87 in-lb	S
Lower Engine Mounting Nut	44	4.5	32	S
Left Engine Bracket Bolts (M10, L = 30)	44	4.5	32	S
Right Engine Bracket Bolts (M10, L = 30)	44	4.5	32	S
Right Engine Bracket Bolt (M10, L = 35)	44	4.5	32	S
Right Engine Bracket Bolts (Cylinder Head)	9.8	1.0	87 in-lb	L
<b>Crankshaft/Transmission</b>				
Breather Plate Bolts	10	1.0	89 in-lb	L
Crankcase Bolts (M9)	39	4.0	29	MO, S
Crankcase Bolts (M8)	27	2.8	20	S
Crankcase Bolts (M7, L = 32)	20	2.0	15	S
Crankcase Bolt (M7, L = 50)	20	2.0	15	S

**Torque and Locking Agent**

Fastener	Torque			Remarks
	N-m	kgf-m	ft-lb	
Crankcase Bolt (M7, L = 85)	20	2.0	15	S
Crankcase Bolts (M6, L = 45)	12	1.2	106 in-lb	S
Crankcase Bolts (M6, L = 40)	12	1.2	106 in-lb	S
Shift Drum Bearing Holder Screws	5.0	0.51	44 in-lb	L
Plate Screw	5.0	0.51	44 in-lb	L
Drive Shaft Bearing Holder Screws	5.0	0.51	44 in-lb	L
Connecting Rod Big End Nuts	see Text	←	←	MO
Oil Passage Plugs	20	2.0	15	L
Piston Oil Jet	3.0	0.30	27 in-lb	
Coolant Drain Bolt (Cylinder)	10	1.0	89 in-lb	
Drive Shaft Cover Bolts	25	2.5	18	
Plug	20	2.0	15	L
Shift Pedal Mounting Bolt	25	2.5	18	L
Gear Positioning Lever Bolt	12	1.2	106 in-lb	
Shift Ratchet Assembly Holder Bolts	15	1.5	11	L
Shift Shaft Return Spring Pin	29	3.0	21	L
Shift Drum Cam Bolt	12	1.2	106 in-lb	L
Shift Lever Bolt	7.0	0.71	62 in-lb	
Tie-Rod Locknuts	7.0	0.71	62 in-lb	Lh (1)
Gear Position Switch Screws	3.0	0.30	27 in-lb	L
Torque Limiter Cover Bolts	10	1.0	89 in-lb	L (1), S
Starter Clutch Bolt Cap	–	–	–	Hand-tighten
Timing Inspection Cap	–	–	–	Hand-tighten
Starter Clutch Cover Bolts (M6, L = 30)	10	1.0	89 in-lb	
Starter Clutch Cover Bolts (M6, L = 20)	10	1.0	89 in-lb	
Starter Clutch Bolt	49	5.0	36	
<b>Wheels/Tires</b>				
Front Axle Clamp Bolts	20	2.0	15	AL
Front Axle Nut	127	13.0	94	
Rear Axle Nut	108	11.0	80	
<b>Final Drive</b>				
Rear Axle Nut	108	11.0	80	
Rear Sprocket Nuts	59	6.0	44	
Engine Sprocket Nut	125	12.7	92	MO
Engine Sprocket Cover Bolts	10	1.0	89 in-lb	
<b>Brakes</b>				
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 Nut	5.9	0.60	52 in-lb	
Front Brake Disc Mounting Bolts	27	2.8	20	L
Front Brake Light Switch Screw	1.2	0.12	11 in-lb	
Front Brake Pad Pins	15	1.5	11	

## 2-10 PERIODIC MAINTENANCE

### Torque and Locking Agent

Fastener	Torque			Remarks
	N-m	kgf-m	ft-lb	
Front Brake Reservoir Cap Stopper Screw	1.2	0.12	11 in-lb	
Front Caliper Assembly Bolts	22	2.2	16	
Front Caliper Mounting Bolts	34	3.5	25	
Front Master Cylinder Bleed Valve	5.4	0.55	48 in-lb	
Front Master Cylinder Clamp Bolts	11	1.1	97 in-lb	S
Brake Pedal Bolt	8.8	0.90	78 in-lb	
Rear 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	17	1.7	13	
<b>Suspension</b>				
Front Axle Clamp Bolts	20	2.0	15	AL
Front Fork Bottom Allen Bolts	23	2.3	17	L
Lower Front Fork Clamp Bolts	30	3.1	22	AL
Upper Front Fork Clamp Bolts	20	2.0	15	
Front Fork Top Plugs	23	2.3	17	
Piston Rod Nuts	15	1.5	11	
Rear Shock Absorber Bracket Nut	59	6.0	44	
Lower Rear Shock Absorber Nut	34	3.5	25	
Upper Rear Shock Absorber Nut	34	3.5	25	
Uni-Trak Rocker Arm Nut	34	3.5	25	
Swingarm Pivot Shaft	20	2.0	15	
Swingarm Pivot Adjusting Collar Locknut	98	10.0	72	
Swingarm Pivot Shaft Nut	108	11.0	80	
Tie-Rod Nuts	59	6.0	44	
<b>Steering</b>				
Left Switch Housing Screws	3.5	0.36	31 in-lb	
Right Switch Housing Screws	3.5	0.36	31 in-lb	
Handlebar Clamp Bolts	25	2.5	18	
Handlebar Positioning Bolts	9.8	1.0	87 in-lb	L
Steering Stem Head Bolt	108	11.0	80	
Upper Front Fork Clamp Bolts	20	2.0	15	
Steering Stem Nut	20	2.0	15	
Lower Front Fork Clamp Bolts	30	3.1	22	AL
Steering Damper Mounting Bolts	11	1.1	97 in-lb	L
<b>Frame</b>				
Front Footpeg Bracket Bolts	25	2.5	18	
Rear Footpeg Bracket Bolts	25	2.5	18	
Rear Frame Front Bolts	44	4.5	32	L
Rear Frame Rear Bolts	25	2.5	18	L
Sidestand Bolt	44	4.5	32	
Sidestand Switch Bolt	8.8	0.90	78 in-lb	L
Sidestand Bracket Bolts	49	5.0	36	L

**Torque and Locking Agent**

Fastener	Torque			Remarks
	N-m	kgf-m	ft-lb	
Front Fender Mounting Bolts	3.9	0.40	35 in-lb	
Windshield Mounting Bolts	0.40	0.041	3.5 in-lb	
<b>Electrical System</b>				
Meter Unit Mounting Screws	1.2	0.12	11 in-lb	
Front Turn Signal Light Lens Screws	1.0	0.10	9 in-lb	
Rear Turn Signal Light Lens Screws	1.0	0.10	9 in-lb	
License Plate Light Cover Screws	1.0	0.10	9 in-lb	
Camshaft Position Sensor Bolt	10	1.0	89 in-lb	
Water Temperature Sensor	25	2.5	18	
Oxygen Sensors (Equipped Models)	25	2.5	18	
Vehicle-down Sensor Bolts	6.0	0.61	53 in-lb	
Gear Position Switch Screws	3.0	0.30	27 in-lb	L
Spark Plugs	13	1.3	115 in-lb	
Stator Coil Bolts	12	1.2	106 in-lb	
Alternator Rotor Bolt	155	15.8	114	
Crankshaft Sensor Bolts	6.0	0.61	53 in-lb	L
Regulator/Rectifier Bolts	7.0	0.71	62 in-lb	
Regulator/Rectifier Bracket Bolts	7.0	0.71	62 in-lb	
Speed Sensor Bolt	10	1.0	89 in-lb	
Alternator Cover Bolts	10	1.0	89 in-lb	
Alternator Lead Holding Plate Bolt	10	1.0	89 in-lb	L
Oil Pressure Switch	15	1.5	11	SS
Oil Pressure Switch Terminal Bolt	–	–	–	Hand-tighten
Torque Limiter Cover Bolts	10	1.0	89 in-lb	L (1), S
Starter Clutch Cover Bolts (M6, L = 30)	10	1.0	89 in-lb	
Starter Clutch Cover Bolts (M6, L = 20)	10	1.0	89 in-lb	
Starter Clutch Bolt	49	5.0	36	
Front Brake Light Switch Screw	1.2	0.12	11 in-lb	
Right Switch Housing Screws (M5, L = 45)	3.5	0.36	31 in-lb	
Left Switch Housing Screws (M5, L = 25)	3.5	0.36	31 in-lb	
Starter Motor Mounting Bolts	10	1.0	89 in-lb	
Sidestand Switch Bolt	8.8	0.90	78 in-lb	L
Starter Motor Cable Mounting Bolt	4.0	0.41	35 in-lb	
Starter Motor Cable Terminal Nut	6.0	0.61	53 in-lb	
Battery Cable Mounting Bolt	4.0	0.41	35 in-lb	
Starter Motor Terminal Locknut	6.9	0.70	61 in-lb	
Starter Motor Through Bolts	3.4	0.35	30 in-lb	
Starter Motor Terminal Locknut (Engine No.: ZXT00DE043312 ~)	11	1.1	97 in-lb	
Starter Motor Through Bolts (Engine No.: ZXT00DE043312 ~)	5.0	0.51	44 in-lb	
Brush Holder Screw (Engine No.: ZXT00DE043312 ~)	3.8	0.39	34 in-lb	

## 2-12 PERIODIC MAINTENANCE

### Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Engine Ground Cable Terminal Bolt	10	1.0	89 in·lb	
Fuel Pump Bolts	10	1.0	89 in·lb	L, S



**Torque and Locking Agent**

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

**Basic Torque for General Fasteners**

Threads Diameter (mm)	Torque		
	N·m	kgf·m	ft·lb
5	3.4 ~ 4.9	0.35 ~ 0.50	30 ~ 43 in·lb
6	5.9 ~ 7.8	0.60 ~ 0.80	52 ~ 69 in·lb
8	14 ~ 19	1.4 ~ 1.9	10 ~ 13.5
10	25 ~ 34	2.6 ~ 3.5	19 ~ 25
12	44 ~ 61	4.5 ~ 6.2	33 ~ 45
14	73 ~ 98	7.4 ~ 10.0	54 ~ 72
16	115 ~ 155	11.5 ~ 16.0	83 ~ 115
18	165 ~ 225	17.0 ~ 23.0	125 ~ 165
20	225 ~ 325	23.0 ~ 33.0	165 ~ 240

## 2-14 PERIODIC MAINTENANCE

### Specifications

Item	Standard	Service Limit
<b>Fuel System (DFI)</b>		
Throttle Grip Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)	---
Idle Speed	1 100 ±50 r/min (rpm)	---
Bypass Screws (Turn Out)	2 1/2 (for reference)	---
Throttle Body Vacuum	32.7 ±1.33 kPa (245 ±10 mmHg) at idle speed	---
Air Cleaner Element	Viscous paper element	---
<b>Cooling System</b>		
Coolant:		
Type (Recommended)	Permanent type antifreeze	---
Color	Green	---
Mixed Ratio	Soft water 50%, coolant 50%	---
Freezing Point	-35°C (-31°F)	---
Total Amount	2.9 L (3.1 US qt)	---
<b>Engine Top End</b>		
Valve Clearance:		
Exhaust	0.17 ~ 0.22 mm (0.0067 ~ 0.0087 in.)	---
Inlet	0.15 ~ 0.22 mm (0.0059 ~ 0.0087 in.)	---
<b>Clutch</b>		
Clutch Lever Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)	---
<b>Engine Lubrication System</b>		
Engine Oil:		
Grade	API SG, SH, SJ, SL or SM with JASO MA, MA1 or MA2	---
Viscosity	SAE 10W-40	---
Capacity	3.2 L (3.4 US qt) (when filter is not removed)	---
	3.7 L (3.9 US qt) (when filter is removed)	---
	4.0 L (4.2 US qt) (when engine is completely dry)	---
Level	Between upper and lower level lines (Wait 2 ~ 3 minutes after idling or running)	---
<b>Wheels/Tires</b>		
Tread Depth:		
EUR, CA and BR Models:		
Front	3.8 mm (0.15 in.)	1 mm (0.04 in.) (AT, CH, DE) 1.6 mm (0.06 in.)
Rear	5.2 mm (0.20 in.)	Up to 130 km/h (80 mph): 2 mm (0.08 in.) Over 130 km/h (80 mph): 3 mm (0.12 in.)

**Specifications**

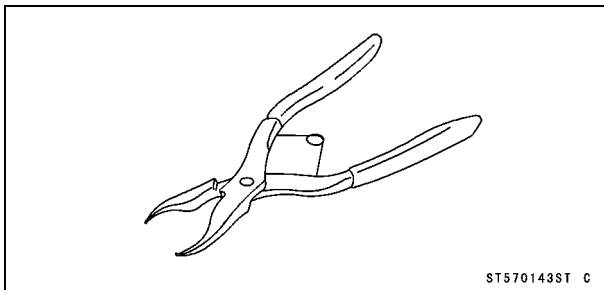
Item	Standard	Service Limit
<p>Other than EUR, CA and BR Models:</p> <p>Front</p> <p>Rear</p> <p>Air Pressure (when Cold):</p> <p>Front</p> <p>Rear</p>	<p>3.6 mm (0.14 in.)</p> <p>5.3 mm (0.21 in.)</p> <p>Up to 180 kg (397 lb) load: 250 kPa (2.5 kgf/cm<sup>2</sup>, 36 psi)</p> <p>Up to 180 kg (397 lb) load: 290 kPa (2.9 kgf/cm<sup>2</sup>, 42 psi)</p>	<p>1 mm (0.04 in.)</p> <p>Up to 130 km/h (80 mph): 2 mm (0.08 in.)</p> <p>Over 130 km/h (80 mph): 3 mm (0.12 in.)</p> <p>---</p> <p>---</p>
<p><b>Final Drive</b></p> <p>Drive Chain Slack</p> <p>Drive Chain Wear (20-link Length)</p> <p>Standard Chain:</p> <p>Make</p> <p>Type</p> <p>Link</p>	<p>30 ~ 40 mm (1.2 ~ 1.6 in.)</p> <p>317.5 ~ 318.2 mm (12.50 ~ 12.53 in.)</p> <p>RK EXCEL</p> <p>RK 525MFOZ, Endless</p> <p>110 links</p>	<p>---</p> <p>323 mm (12.7 in.)</p> <p>---</p> <p>---</p> <p>---</p>
<p><b>Brakes</b></p> <p>Brake Fluid:</p> <p>Grade</p> <p>Brake Pad Lining Thickness:</p> <p>Front</p> <p>Rear</p> <p>Brake Light Timing:</p> <p>Front</p> <p>Rear</p>	<p>DOT4</p> <p>4.0 mm (0.16 in.)</p> <p>5.0 mm (0.20 in.)</p> <p>Pulled ON</p> <p>On after about 10 mm (0.39 in.) of pedal travel</p>	<p>---</p> <p>1 mm (0.04 in.)</p> <p>1 mm (0.04 in.)</p> <p>---</p> <p>---</p>
<p><b>Electrical System</b></p> <p>Spark Plug:</p> <p>Type</p>	<p>NGK CR9EIA-9</p>	<p>---</p>

## 2-16 PERIODIC MAINTENANCE

### Special Tools

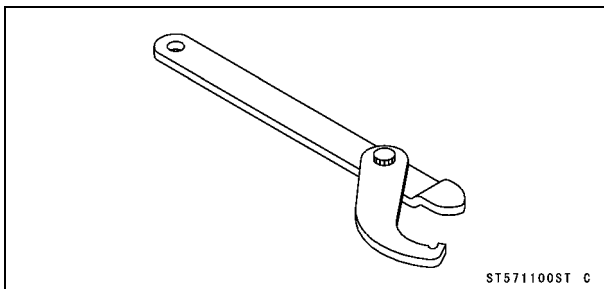
Inside Circlip Pliers:

57001-143



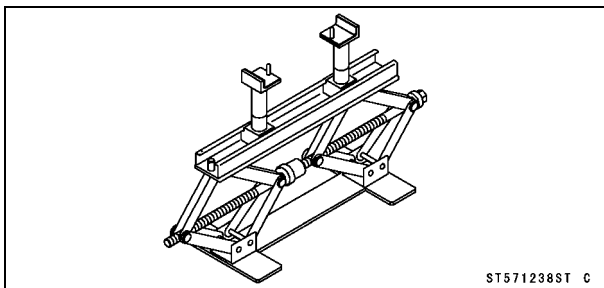
Steering Stem Nut Wrench:

57001-1100



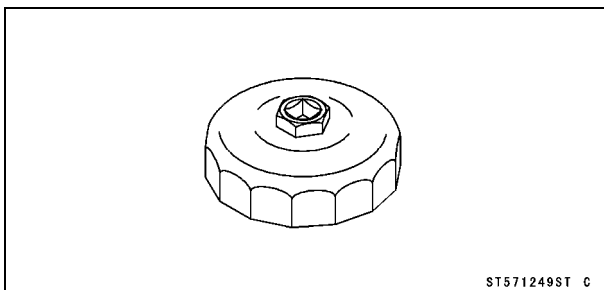
Jack:

57001-1238



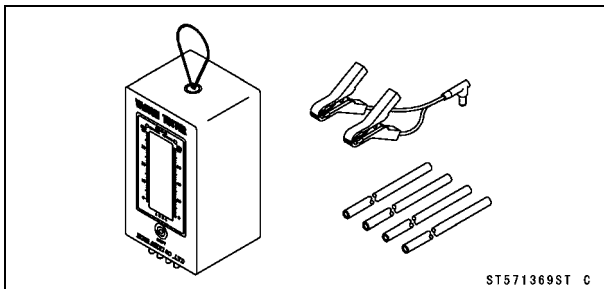
Oil Filter Wrench:

57001-1249



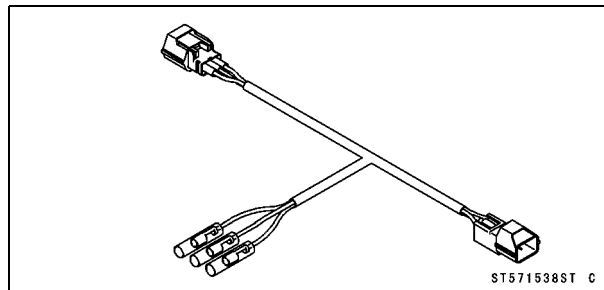
Vacuum Gauge:

57001-1369



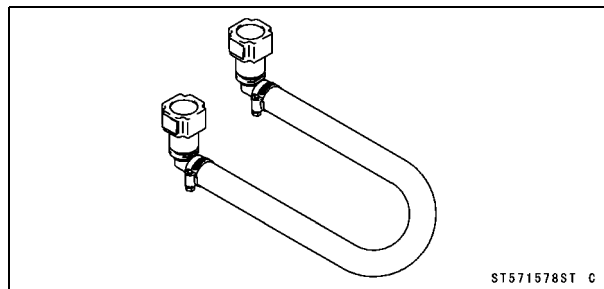
Throttle Sensor Setting Adapter:

57001-1538



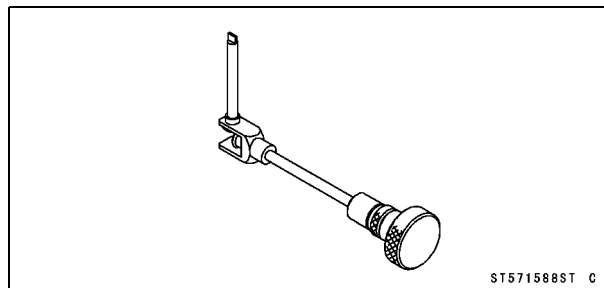
Extension Tube:

57001-1578



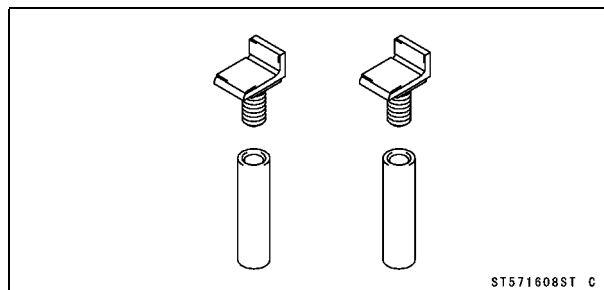
Pilot Screw Adjuster, D:

57001-1588



Jack Attachment:

57001-1608



## Maintenance Procedure

### Fuel System (DFI)

#### Throttle Control System Inspection

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

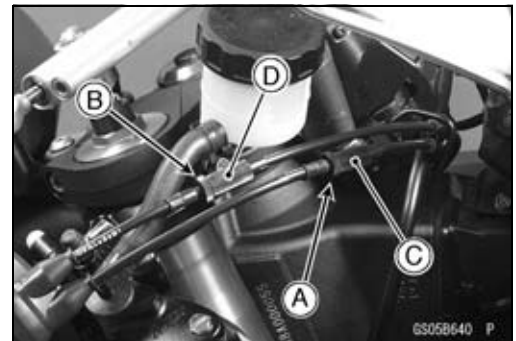
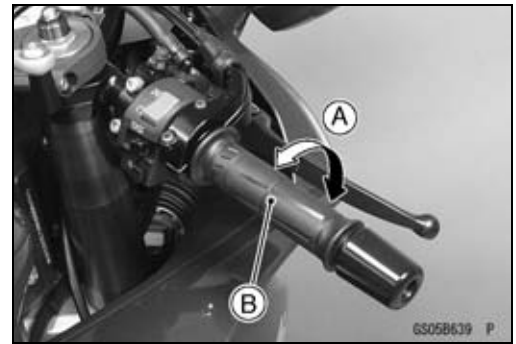
#### Throttle Grip Free Play

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.

★ If necessary, adjust the throttle cable as follows.

- Loosen the locknuts [A] [B].
- Screw both throttle cable adjusters [C] [D] to give the throttle grip plenty of play.
- Turn the decelerator cable adjuster [C] until 2 ~ 3 mm (0.08 ~ 0.12 in.) of throttle grip play is obtained.
- Tighten the locknut [A].
- Turn the accelerator cable adjuster [D] until 2 ~ 3 mm (0.08 ~ 0.12 in.) of throttle grip play is obtained.
- Tighten the locknut [B].
- ★ If the free play can not be adjusted with the adjusters, replace the cable.

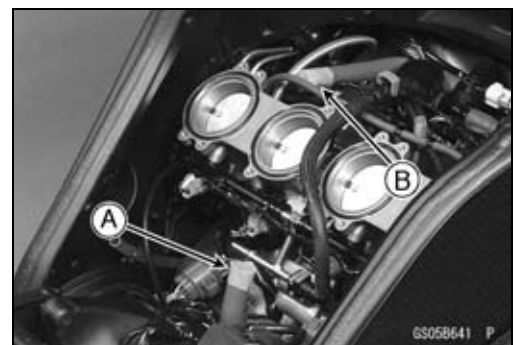


#### Engine Vacuum Synchronization Inspection

#### NOTE

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

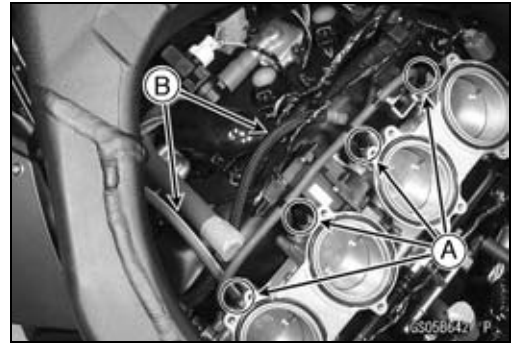
- Situate the motorcycle so that it is vertical.
- Remove:
  - Air Cleaner Housing (see Air Cleaner Housing Removal in the Fuel System (DFI) chapter)
  - Primary Fuel Hose (see Fuel Hose Replacement)
- Plug the breather hose end [A] and air switching valve hose end [B].



## 2-18 PERIODIC MAINTENANCE

### Maintenance Procedure

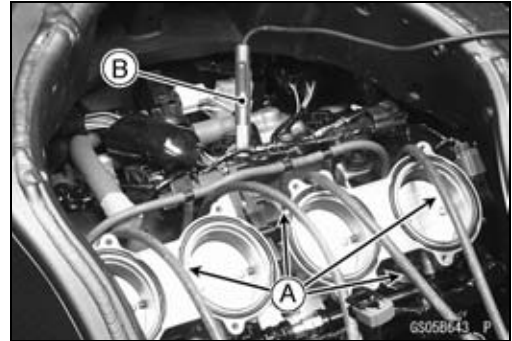
- Remove the rubber caps [A] from the fittings of each throttle body
- For the California, Southeast Asia and Thailand models, pull off the vacuum hoses [B].



- Connect a vacuum gauge and hoses [A] (Special Tool: 57001-1369) to the fittings on the throttle body.

**Special Tool - Vacuum Gauge: 57001-1369**

- Connect a highly accurate tachometer [B] to one of the stick coil primary leads.



- Connect the following parts temporarily.
  - Fuel Pump Lead Connector [A]
  - Extension Tube [B]

**Special Tool - Extension Tube: 57001-1578**



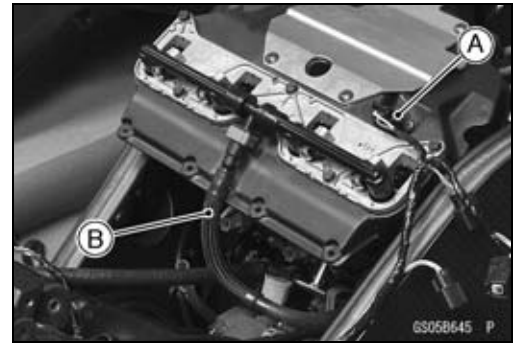
**Maintenance Procedure**

- Connect the following parts temporarily.
  - Inlet Air Temperature Sensor Connector [A]
  - Secondary Fuel Hose [B] (see Fuel Hose Replacement)

**NOTE**

- Be sure to connect the air temperature sensor connector. When the ignition switch is turned ON with inlet air temperature sensor connector disconnected, the ECU detects the service code 13. Then the ECU starts the fail-safe (see Self-diagnosis Outline in the Fuel System (DFI) chapter). In this case, the engine vacuum synchronization can not be inspected correctly.
- Do not connect the secondary fuel injector connectors. The engine vacuum synchronization is inspected with the air cleaner housing removed and the engine started. The secondary fuel injectors are operating with following conditions.

1. The engine speed is more than 6 000 r/min (rpm).
2. The throttle opening is more than 30°.



**⚠ WARNING**

**Gasoline is extremely flammable and can be explosive under certain conditions, especially when atomized by the fuel injector nozzle. To prevent a fire or explosion, be sure the secondary fuel injector connectors are disconnected before starting the engine so that fuel cannot be sprayed by the injectors.**

- Start the engine and warm it up thoroughly.
- Check the idle speed, using a highly accurate tachometer [A].

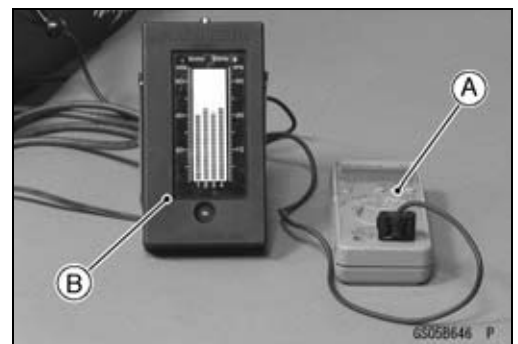
**Idle Speed**

**Standard: 1 100 ±50 r/min (rpm)**

- ★ If the idle speed is out of the specified range, adjust it with the adjusting screw (see Idle Speed Adjustment).

**NOTICE**

**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 [B].

**Throttle Body Vacuum**

**Standard: 32.7 ±1.33 kPa (245 ± 10 mmHg) at idle speed**

## 2-20 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:**

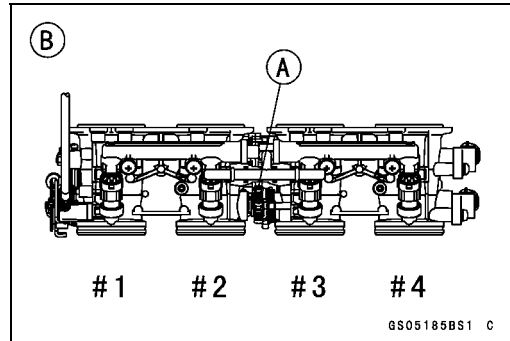
- #1: 220 mmHg
- #2: 250 mmHg
- #3: 210 mmHg
- #4: 230 mmHg

- With the engine at the correct idle speed, equalize higher vacuum of #1 or #2 (for example 250 mmHg) to higher vacuum of #3 or #4 (for example 230 mmHg) by turning the center adjusting screw [A].

Rear View [B]

**NOTE**

- After adjustment, the final vacuum measurement between the highest throttle valves may not be 250 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.



- Open and close the throttle after each measurement, and adjust the idle speed as necessary.

**NOTE**

- The engine vacuum synchronization is adjusted with the secondary fuel injector connectors disconnected. Therefore, the secondary fuel injectors do not operate while adjusting the engine vacuum synchronization. If raising the engine speed more than 6 000 r/min (rpm), the engine may not operate smoothly.
- Once the throttle valves have been synchronized, inspect output voltage of the main throttle sensor to ensure proper operation (procedure is explained at the end of this section).



**Maintenance Procedure**

★ If any one vacuum measurement is out of the specified range after left (#1, #2) and right (#2, #3) synchronization, adjust the bypass screws [A] Using the pilot screw adjuster [B].

Front View [C]

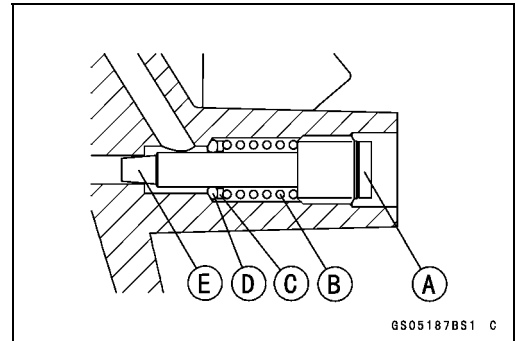
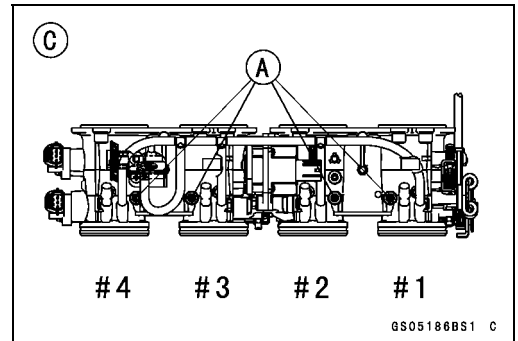
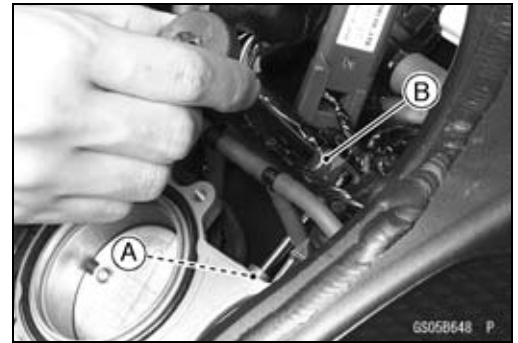
**Special Tool - Pilot Screw Adjuster, D: 57001-1588**

- Adjust the lower vacuum between #1 and #2 to the higher vacuum of #1 and #2.
- Adjust the lower vacuum between #3 and #4 to the higher vacuum of #3 and #4.
- Open and close the throttle valves after each measurement, and adjust the idle speed as necessary.

**NOTE**

○ The engine vacuum synchronization is adjusted with the secondary injector connectors disconnected. Therefore, the secondary injectors do not operate while adjusting the engine vacuum synchronization. If raising the engine speed more than 6 000 r/min (rpm), the engine may not operate smoothly.

- Check the vacuums as before.
- ★ If all vacuums are within the specification range, finish the engine vacuum synchronization.
- ★ If any vacuum can not be adjusted within the specification, remove the bypass screws #1 ~ #4 and replace them with new ones.
- Turn in the bypass screw [A] with counting the number of turns until it seals fully but not tightly. Record the number of turns.
- Remove:
  - Bypass Screw
  - Spring [B]
  - Washer [C]
  - O-ring [D]
- Check the bypass screw hole in the throttle body for carbon deposits.
- ★ If any carbons accumulate, wipe the carbons off from the hole, using a cotton pad penetrated with a high-flash point solvent.
- Replace the bypass screw, spring, washer and O-ring as a set.
- Turn in the bypass screw until it seats fully but not tightly.



**NOTICE**

**Do not over-tighten the bypass screw. The tapered portion [E] of the bypass screw could be damaged.**



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