

### MODEL APPLICATION

Year	Model	Beginning Frame No.
2007	ZX600P7F	JKAZX4P1□7A000001 JKAZX600PPA000001 ZX600P-000001

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



KAWASAKI HEAVY INDUSTRIES, LTD.  
Consumer Products & Machinery Company

Part No.99924-1382-01

Printed in Japan



**Kawasaki**

**Ninja ZX-6R**



# **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

AU	Australia	MY	Malaysia
CA	Canada	US	United States
CAL	California	WVTA	Whole Vehicle Type Approval
FR	France		

# 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.

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## How to Use This Manual

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

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

For example, if you want stick 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 Stick 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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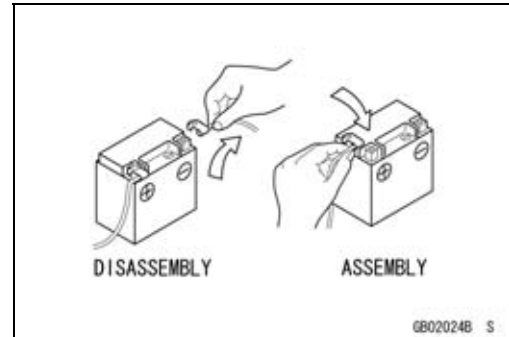
### Before Servicing

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.

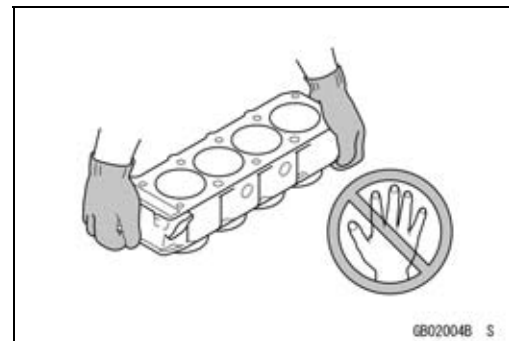
#### **Battery Ground**

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 cable (-) first and then the positive (+). When completed with the service, first connect the positive (+) cable to the positive (+) terminal of the battery then the negative (-) cable to the negative terminal.



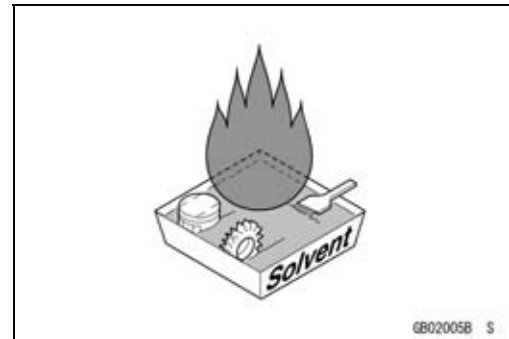
#### **Edges of Parts**

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



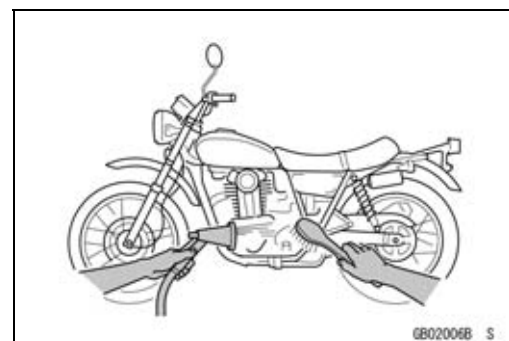
#### **Solvent**

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



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

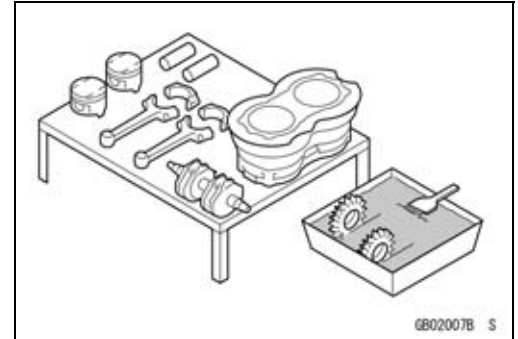
Clean the vehicle thoroughly before disassembly. Dirt or other foreign materials entering into sealed areas during vehicle disassembly can cause excessive wear and decrease performance of the vehicle.



## Before Servicing

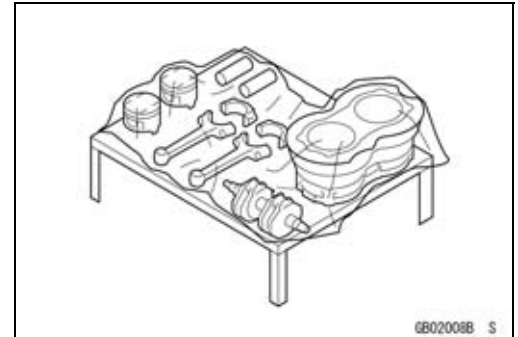
### **Arrangement and Cleaning of Removed Parts**

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



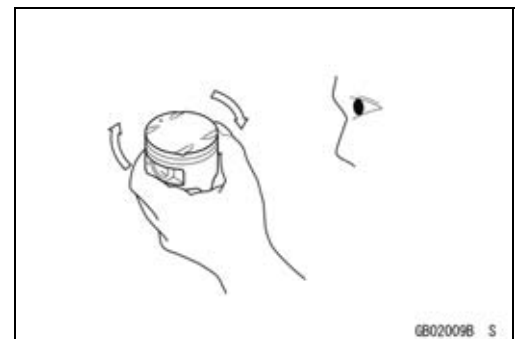
### **Storage of Removed Parts**

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



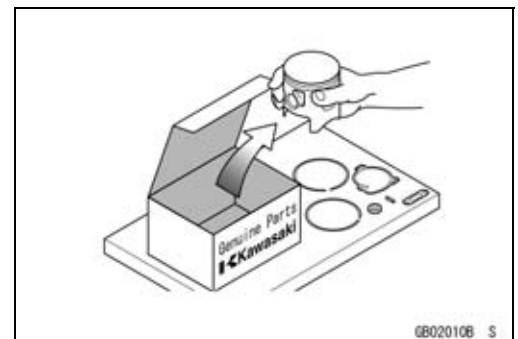
### **Inspection**

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



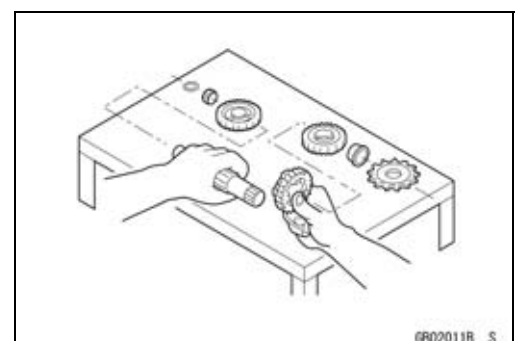
### **Replacement Parts**

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



### **Assembly Order**

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



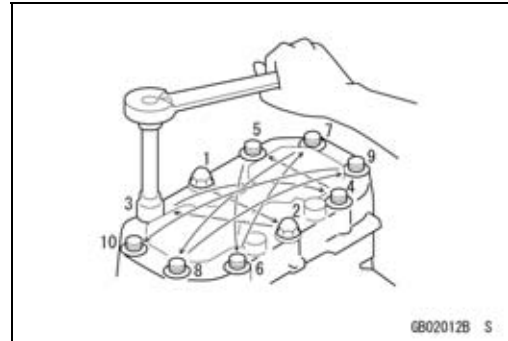


## 1-4 GENERAL INFORMATION

### Before Servicing

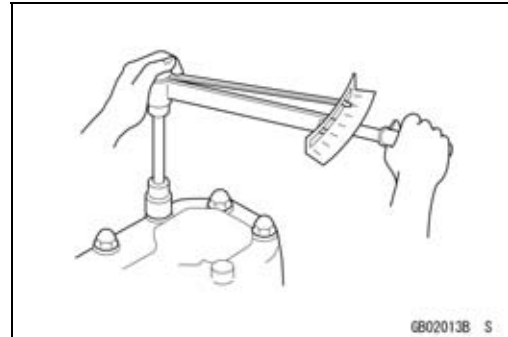
#### **Tightening Sequence**

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



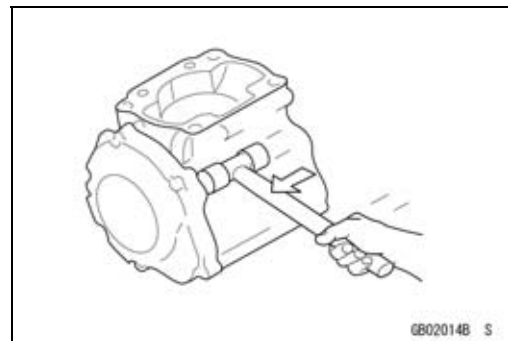
#### **Tightening Torque**

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



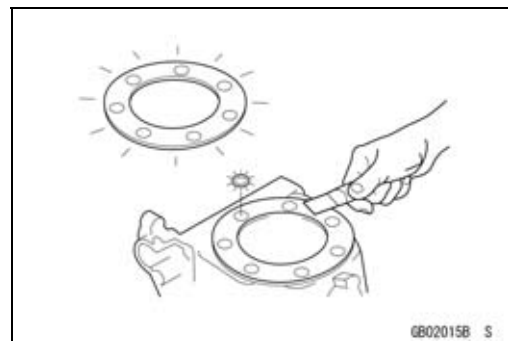
#### **Force**

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



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

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



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

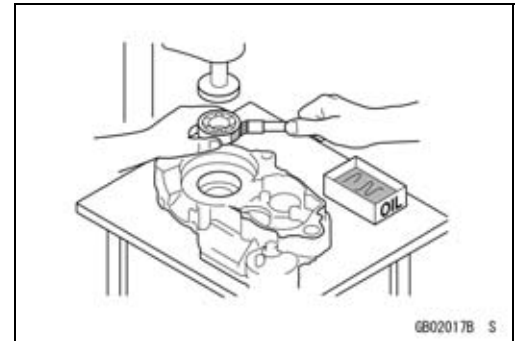
For applications that require Liquid Gasket or a Non-permanent Locking Agent, clean the surfaces so that no oil residue remains before applying liquid gasket or non-permanent locking agent. Do not apply them excessively. Excessive application can clog oil passages and cause serious damage.



**Before Servicing**

**Press**

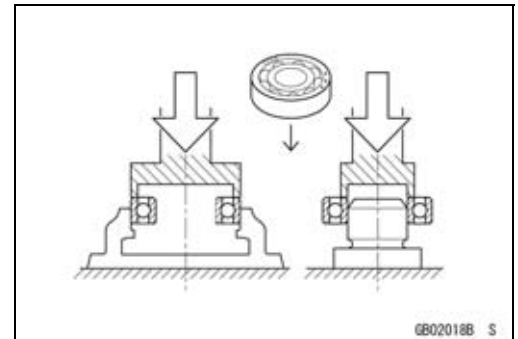
For items such as bearings or oil seals that must be pressed into place, apply small amount of oil to the contact area. Be sure to maintain proper alignment and use smooth movements when installing.



**Ball Bearing and Needle Bearing**

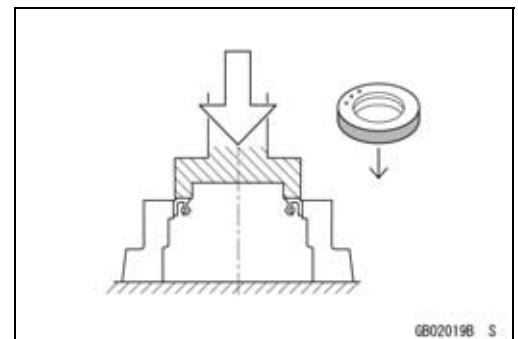
Do not remove pressed ball or needle unless removal is absolutely necessary. Replace with new ones whenever removed. Press bearings with the manufacturer and size marks facing out. Press the bearing into place by putting pressure on the correct bearing race as shown.

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

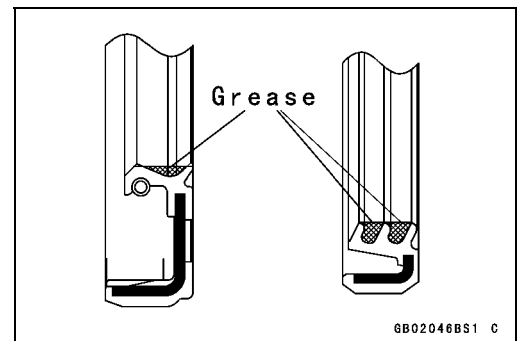


**Oil Seal, Grease Seal**

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

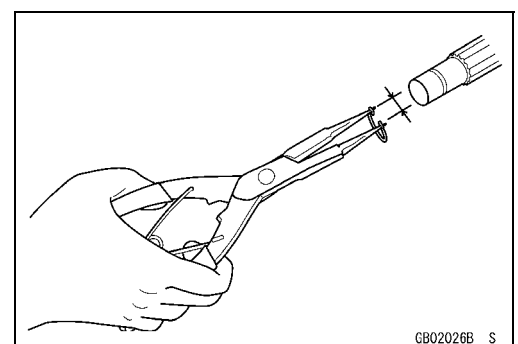


Apply specified grease to the lip of seal before installing the seal.



**Circlips, Cotter Pins**

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

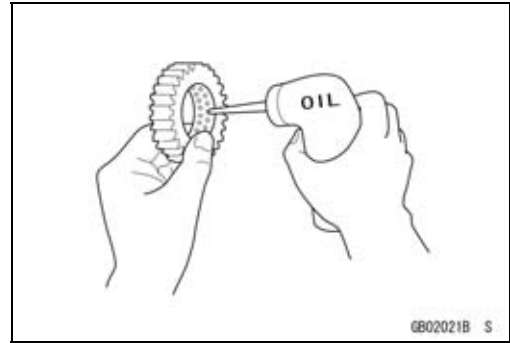


# 1-6 GENERAL INFORMATION

## Before Servicing

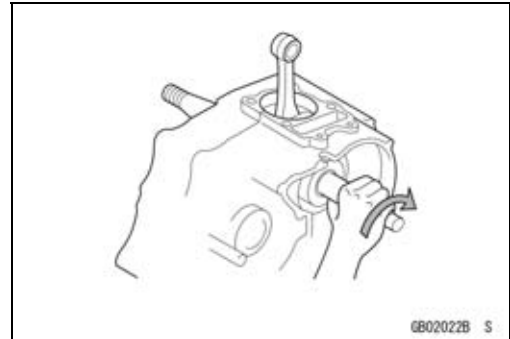
### **Lubrication**

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



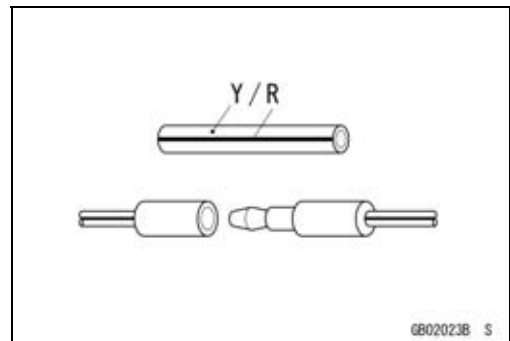
### **Direction of Engine Rotation**

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



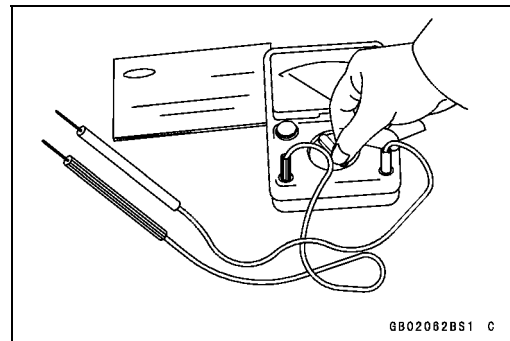
### **Electrical Wires**

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

ZX600P7F (Europe) Left Side View



ZX600P7F (Europe) Right Side View



## 1-8 GENERAL INFORMATION

### Model Identification

#### ZX600P7F (US and Canada) Left Side View



#### ZX600P7F (US and Canada) Right Side View



**General Specifications**

Items	ZX600P7F (Ninja ZX-6R)
<b>Dimensions</b>	
Overall Length	2 105 mm (82.9 in.)
Overall Width	720 mm (28.3 in.)
Overall Height	1 125 mm (44.3 in.)
Wheelbase	1 405 mm (55.3 in.)
Road Clearance	125 mm (4.7 in.)
Seat Height	820 mm (32.3 in.)
Dry Mass	167 kg (368 lb)
Curb Mass:	
Front	101 kg (223 lb)
Rear	99 kg (218 lb)
Fuel Tank Capacity	17 L (4.5 US gal)
<b>Performance</b>	
Minimum Turning Radius	3.4 m (11.2 ft)
<b>Engine</b>	
Type	4-stroke, DOHC, 4-cylinder
Cooling System	Liquid-cooled
Bore and Stroke	67.0 × 42.5 mm (2.6 × 1.7 in.)
Displacement	599 mL (36.6 cu in.)
Compression Ratio	13.3 : 1
Maximum Horsepower	91.9 kW (125 PS) @14 000 r/min (rpm), (FR) 78.2 kW (106 PS) @14 000 r/min (rpm), (MY) 80.0 kW (109 PS) @12 000 r/min (rpm), (CA), (CAL), (US) — — —
Maximum Torque	66.0 N·m (6.7 kgf·m, 49 ft·lb) @11 700 r/min (rpm), (FR) 58.4 N·m (6.0 kgf·m, 43 ft·lb) @11 700 r/min (rpm), (MY) 64 N·m (6.5 kgf·m, 47 ft·lb) @12 000 r/min (rpm) (CA), (CAL), (US) — — —
Carburetion System	FI (Fuel injection) Primary: KEIHIN TTK 38 × 4 Secondary: KEIHIN Multihole (8 holes) × 4
Starting System	Electric starter
Ignition System	Battery and coil (transistorized)
Timing Advance	Electronically advanced (digital igniter in ECU)
Ignition Timing	From 12.5° BTDC @1 300 r/min (rpm)
Spark Plug	NGK CR9E
Cylinder Numbering Method	Left to right, 1-2-3-4
Firing Order	1-2-4-3
Valve Timing:	
Inlet:	
Open	41° BTDC
Close	67° ATDC
Duration	288°
Exhaust:	
Open	63° BBDC
Close	23° ATDC

# 1-10 GENERAL INFORMATION

## General Specifications

Items	ZX600P7F (Ninja ZX-6R)
Duration Lubrication System Engine Oil: Type Viscosity Capacity	266° Forced lubrication (wet sump with cooler) API SE, SF or SG API SH, SJ or SL with JASO MA SAE10W-40 3.8 L (4.0 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 1.900 (76/40) Wet multi disc 6-speed, constant mesh, return shift 2.714 (38/14) 2.200 (33/15) 1.850 (37/20) 1.600 (32/20) 1.421 (27/19) 1.300 (26/20) Chain drive 2.688 (43/16) 6.638 @Top gear
<b>Frame</b> Type Caster (Rake Angle) Trail Front Tire: Type Size Rear Tire: Type Size Rim Size: Front Rear Front Suspension: Type Wheel Travel Rear Suspension: Type Wheel Travel	Tubular, diamond 25° 110 mm (4.3 in.) Tubeless 120/70 ZR17 M/C (58 W) Tubeless 180/55 ZR17 M/C (73 W) 17 × 3.50 17 × 5.50 Telescopic fork (upside-down) 120 mm (4.7 in.) Swingarm (uni-trak) 133 mm (5.2 in.)

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**General Specifications**


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Items	ZX600P7F (Ninja ZX-6R)
Brake Type: Front Rear	Dual discs Single disc
<b>Electrical Equipment</b> Battery Headlight: Type Bulb: High Low Tail/Brake Light Alternator: Type Rated Output	12 V 8 Ah Semi-sealed beam 12 V 55 W + 65 W (quartz-halogen) 12 V 55 W (quartz-halogen) 12 V 0.1/1.6 W (LED) Three-phase AC 31 A/14 V @5 000 r/min (rpm)

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



# 1-12 GENERAL INFORMATION

## 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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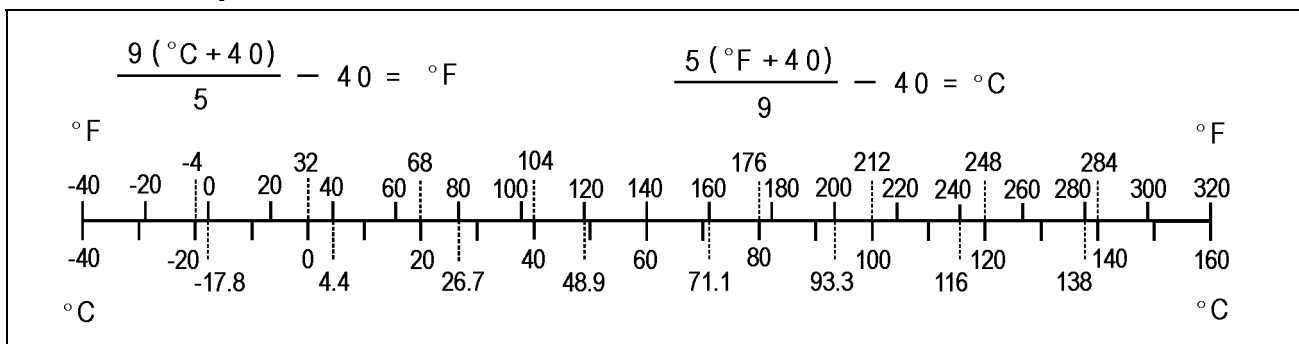
### Units of Power

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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**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**

INSPECTION	FREQUENCY	* ODOMETER READING × 1 000 km (× 1 000 mile)						
	Whichever comes first ↓ Every	1 (0.6)	6 (4)	12 (7.5)	18 (12)	24 (15)	30 (20)	36 (24)
<b>Fuel System</b>								
Throttle control system (play, smooth return, no drag)-inspect	year	•		•		•		•
Engine vacuum synchronization-inspect				•		•		•
Idle speed-inspect		•		•		•		•
Fuel leak (fuel hose and pipe)-inspect	year	•		•		•		•
Fuel hose and pipe damage-inspect	year	•		•		•		•
Fuel hose and pipe installation condition-inspect	year	•		•		•		•
<b>Evaporative Emission Control System (California Model only)</b>								
Evaporative emission control system function-inspect		•	•	•	•	•	•	•
<b>Cooling System</b>								
Coolant level-inspect		•		•		•		•
Coolant leak (radiator hose and pipe)-inspect	year	•		•		•		•
Radiator hose damage-inspect	year	•		•		•		•
Radiator hose installation condition -inspect	year	•		•		•		•
<b>Engine Top End</b>								
Valve clearance-inspect (United States and Canada Models)						•		
Valve clearance-inspect (Other than United States and Canada Models)		Every 42 000 km (26 000 mile)						
<b>Air Suction System</b>								
Air suction system damage-inspect				•		•		•
<b>Clutch</b>								
Clutch operation (play, disengagement, engagement)-inspect		•		•		•		•
<b>Wheels and Tires</b>								
Tire air pressure-inspect	year			•		•		•
Wheel/tire damage-inspect				•		•		•
Tire tread wear, abnormal wear-inspect				•		•		•
Wheel bearing damage-inspect	year			•		•		•
<b>Drive Train</b>								
Drive chain lubrication condition-inspect #		Every 600 km (400 mile)						
Drive chain slack-inspect #		Every 1 000 km (600 mile)						

## 2-4 PERIODIC MAINTENANCE

### Periodic Maintenance Chart

FREQUENCY	Whichever comes first ↓	* ODOMETER READING × 1 000 km (× 1 000 mile)							
		1 (0.6)	6 (4)	12 (7.5)	18 (12)	24 (15)	30 (20)	36 (24)	
INSPECTION	Every								
Drive chain wear-inspect #				•		•		•	
Drive chain guide wear-inspect				•		•		•	
<b>Brake System</b>									
Brake fluid leak (brake hose and pipe)-inspect	year	•	•	•	•	•	•	•	
Brake hose and pipe damage-inspect	year	•	•	•	•	•	•	•	
Brake pad wear-inspect #			•	•	•	•	•	•	
Brake hose installation condition-inspect	year	•	•	•	•	•	•	•	
Brake fluid level-inspect	6 months	•	•	•	•	•	•	•	
Brake operation (effectiveness, play, no drag)-inspect	year	•	•	•	•	•	•	•	
Brake light switch operation-inspect		•	•	•	•	•	•	•	
<b>Suspensions</b>									
Front forks/rear shock absorber operation (damping and smooth stroke)-inspect				•		•		•	
Front forks/rear shock absorber oil leak-inspect	year			•		•		•	
Rocker arm operation-inspect				•		•		•	
Tie-Rods operation-inspect				•		•		•	
<b>Steering System</b>									
Steering play-inspect	year	•		•		•		•	
Steering stem bearings-lubricate	2 years					•			
<b>Electrical System</b>									
Lights and switches operation-inspect	year			•		•		•	
Headlight aiming-inspect	year			•		•		•	
Side stand switch operation-inspect	year			•		•		•	
Engine stop switch operation-inspect	year			•		•		•	
<b>Others</b>									
Chassis parts-lubricate	year			•		•		•	
Bolts and nuts tightness-inspect		•		•		•		•	

\*: 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.

CAL: California Model

## PERIODIC MAINTENANCE 2-5

### Periodic Maintenance Chart

#### Periodic Replacement Parts

CHANGE/REPLACE ITEM	FREQUENCY	* ODOMETER READING				
	Whichever come first ↓ Every	1 (0.6)	12 (7.5)	24 (15)	36 (24)	48 (30)
Air cleaner element #	Every 18 000 km (12 000 mile)					
Fuel hose	4 years					•
Coolant	3 years				•	
Radiator hose and O-ring	3 years				•	
Engine oil #	year	•	•	•	•	•
Oil filter	year	•	•	•	•	•
Brake hose and pipe	4 years					•
Brake fluid	2 years			•		•
Rubber parts of master cylinder and caliper	4 years					•
Spark plug			•	•	•	•

\*: 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 to the threads.

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

MO: Apply molybdenum disulfide grease oil solution.

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</b>				
Air Cleaner Housing Screws	1.1	0.11	9.7 in·lb	
Air Cleaner Housing Clamp Bolts	2.0	0.20	17 in·lb	
Air Cleaner Housing Mounting Bolt	6.9	0.70	61 in·lb	
Air Inlet Duct Mounting Bolts	9.8	1.0	87 in·lb	L
Camshaft Position Sensor Bolt	9.8	1.0	87 in·lb	
Crankshaft Sensor Bolts	5.9	0.60	52 in·lb	
Delivery Pipe Mounting Screws (Nozzle Assy)	3.4	0.35	30 in·lb	
Delivery Pipe Mounting Screws (Throttle Body)	3.4	0.35	30 in·lb	
Exhaust Butterfly Valve Actuator Mounting Bolts	6.9	0.70	61 in·lb	
Exhaust Butterfly Valve Actuator Pulley Bolt	4.9	0.50	43 in·lb	
Fuel Pump Bolts	9.8	1.0	87 in·lb	L, S
Nozzle Assy Mounting Bolts	6.9	0.70	61 in·lb	
Nozzle Assy Fuel Hose Screw	4.9	0.50	43 in·lb	
Separator Bracket Mounting Bolt	0.8	0.08	7 in·lb	
Throttle Body Assembly Holder Clamp Bolts	3.0	0.30	27 in·lb	
Throttle Body Holder Bolts	12	1.2	106 in·lb	L
Throttle Cable Holder Plate Bolt	3.9	0.40	35 in·lb	L
Vehicle-down Sensor Bolts	5.9	0.60	52 in·lb	
Water Temperature Sensor	25	2.5	18	SS
<b>Cooling System</b>				
Coolant By-pass Fitting Bolt	8.8	0.90	78 in·lb	L
Coolant Drain Bolt (Cylinder)	9.8	1.0	87 in·lb	
Coolant Drain Bolt (Water Pump)	8.8	0.90	78 in·lb	
Coolant Reserve Tank Mounting Bolts	7.0	0.70	61 in·lb	
Impeller Bolt	9.8	1.0	87 in·lb	
Oil Cooler Mounting Bolts	20	2.0	15	
Radiator Bracket Mounting Bolt	9.8	1.0	87 in·lb	
Radiator Lower Bolt	6.9	0.70	61 in·lb	
Radiator Upper Bolts	9.8	1.0	87 in·lb	
Thermostat Housing Cover Bolts	5.9	0.60	52 in·lb	
Water Hose Clamp Screws	2.0	0.20	17 in·lb	
Water Hose Fitting Bolts (Cylinder)	9.8	1.0	87 in·lb	

**PERIODIC MAINTENANCE 2-7**

**Torque and Locking Agent**

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Water Hose Fitting Bolts (Head Cover)	15	1.5	11	L
Water Pump Cover Bolts	12	1.2	106 in·lb	L
Water Temperature Sensor	25	2.5	18	SS
<b>Engine Top End</b>				
Air Suction Valve Cover Bolts	9.8	1.0	87 in·lb	L
Camshaft Cap Bolts	12	1.2	106 in·lb	S
Camshaft Chain Tensioner Cap Bolt	20	2.0	15	
Camshaft Chain Tensioner Mounting Bolts	11	1.1	97 in·lb	
Cam Sprocket Mounting Bolts	15	1.5	11	L
Cylinder Head Bolts (M9)	39	4.0	29	MO, S
Cylinder Head Bolts (M6)	12	1.2	106 in·lb	S
Cylinder Head Cover Bolts	9.8	1.0	87 in·lb	
Exhaust Butterfly Valve Actuator Mounting Nuts	6.9	0.70	61 in·lb	
Exhaust Butterfly Valve Actuator Pulley Bolt	4.9	0.50	43 in·lb	
Exhaust Butterfly Valve Cable Adjuster Locknuts	6.9	0.70	61 in·lb	
Exhaust Butterfly Valve Cable Locknuts	6.9	0.70	61 in·lb	
Exhaust Butterfly Valve Cover Bolt	6.9	0.70	61 in·lb	
Exhaust Pipe Clamp Bolt	17	1.7	13	
Exhaust Manifold Holder Nuts	17	1.7	13	
Exhaust Pipe Mounting Bolt	28	2.8	21	
Exhaust Manifold Holder Studs	–	–	–	(stopped)
Front Camshaft Chain Guide Bolt (Lower)	12	1.2	106 in·lb	
Front Camshaft Chain Guide Bolt (Upper)	25	2.5	18	
Muffler Body Clamp Bolt	17	1.7	12	
Muffler Body Mounting Bolts	28	2.8	21	
Muffler Rear Cover Bolts	6.9	0.70	61 in·lb	
Muffler Slide Cover Bolts	6.9	0.70	61 in·lb	
Muffler Upper Cover Bolts	6.9	0.70	61 in·lb	
Upper Camshaft Chain Guide Bolt	25	2.5	18	
Spark Plugs	13	1.3	113 in·lb	
Oxygen Sensors	25	2.5	18	
Throttle Body Assy Holder Clamp Bolts	2.9	0.30	26 in·lb	
Throttle Body Holder Bolts	12	1.2	106 in·lb	L
Water Passage Plugs	20	2.0	15	L
<b>Clutch</b>				
Clutch Cover Bolts (M6, L = 40 mm)	9.8	1.0	87 in·lb	
Clutch Cover Bolts (M6, L = 25 mm)	9.8	1.0	87 in·lb	
Clutch Hub Nut	135	14	100	R
Clutch Lever Clamp Bolts	7.8	0.80	69 in·lb	S
Clutch Spring Bolts	8.8	0.90	78 in·lb	
Sub Clutch Hub Bolts	25	2.5	18	L
<b>Engine Lubrication System</b>				
Oil Filler Cap	2.0	0.20	17 in·lb	



## 2-8 PERIODIC MAINTENANCE

### Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Air Bleed Bolt	9.8	1.0	87 in·lb	
Engine Oil Drain Bolt	29	3.0	22	
Oil Cooler/Oil Filter Case Mounting Bolts	20	2.0	15	L
Oil Pump Gear Bolt	9.8	1.0	87 in·lb	L
Oil Cooler Mounting Bolts	20	2.0	15	
Oil Filter	31	3.2	23	G, R
Oil Filter Guard Bolts	4.0	0.41	35 in·lb	L
Oil Filter Holder Bolt	25	2.5	18	L
Oil Pan Bolts	9.8	1.0	87 in·lb	
Oil Passage Nozzle	4.9	0.50	43 in·lb	
Oil Passage Plugs (Taper)	20	2.0	15	L
Oil Passage Plug (Left Side)	17	1.7	13	
Oil Pressure Relief Valve	15	1.5	11	L
Oil Pressure Switch	15	1.5	11	SS
Oil Pressure Switch Terminal Bolt	–	–	–	Hand-tighten
Water Hose Clamp Screws	2.0	0.20	17 in·lb	
Water Pump Cover Bolts	12	1.2	104 in·lb	L
<b>Engine Removal/Installation</b>				
Adjusting Collar Locknut	49	5.0	36	S
Adjusting Collar	9.8	1.0	87 in·lb	S
Lower Engine Mounting Nut	44	4.5	33	S
Middle Engine Mounting Bracket Bolt	25	2.5	18	S
Middle Engine Mounting Nut	44	4.5	33	S
Upper Engine Mounting Bolts	44	4.5	33	S
<b>Crankshaft/Transmission</b>				
Breather Plate Bolts	9.8	1.0	87 in·lb	L
Connecting Rod Big End Nuts	see the text	see the text	see the text	MO
Crankcase Bolts (M8) (Lower) (First)	15	1.5	11	MO, S
Crankcase Bolts (M8) (Lower) (Final)	31	3.2	23	MO, S
Crankcase Bolts (M6, L = 50 mm) (Lower)	12	1.2	104 in·lb	S
Gear Position Switch Screws	2.9	0.30	26 in·lb	L
Crankcase Bolt (M8, L = 90 mm) (Upper)	27	2.8	20	S
Crankcase Bolts (M8, L = 75 mm) (Upper)	27	2.8	20	S
Crankcase Bolts (M6, L = 68 mm) (Upper)	12	1.2	104 in·lb	S
Transmission Case Bolts (M8)	20	2.0	15	
Transmission Case Bolts (M6)	9.8	1.0	87 in·lb	
Piston Oil Nozzles	2.9	0.30	26 in·lb	
Gear Positioning Lever Bolt	12	1.2	104 in·lb	
Oil Passage Plugs (Taper Side)	20	2.0	15	L
Oil Passage Plug (Left Side)	17	1.7	13	
Oil Pressure Switch	15	1.5	11	SS
Fitting (breather)	15	1.5	11	L

## PERIODIC MAINTENANCE 2-9

### Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Oil Passage Nozzle	4.9	0.50	43 in·lb	
Oil Pressure Switch Terminal Bolt	–	–	–	Hand-tighten
Bearing Holder Screws	4.9	0.50	43 in·lb	L
Shift Drum Cam Holder Bolt	12	1.2	104 in·lb	L
Shift Lever Bolt	6.9	0.70	61 in·lb	
Shift Pedal Mounting Bolt	25	2.5	18	
Shift Shaft Return Spring Pin	28	2.9	21	L
Shift Tie-Rod Locknuts	6.9	0.70	61 in·lb	
Starter Clutch Bolt	49	5.0	36	
Starter Clutch Bolt Cap	–	–	–	Hand-tighten
Timing Inspection Cap	–	–	–	Hand-tighten
Starter Clutch Cover Bolts	9.8	1.0	87 in·lb	
Idle Gear Cover Bolts	9.8	1.0	87 in·lb	
<b>Wheels/Tires</b>				
Front Axle Clamp Bolts	20	2.0	15	AL
Front Axle Nut	127	13	94	
Rear Axle Nut	127	13	94	
<b>Final Drive</b>				
Engine Sprocket Cover Bolts	9.8	1.0	87 in·lb	
Engine Sprocket Nut	125	13	92	MO
Rear Sprocket Nuts	59	6.0	43	
Chain Guide Bolts (Front)	9.8	1.0	87 in·lb	L
Chain Guide Bolt (Rear)	4.9	0.50	43 in·lb	L
<b>Brakes</b>				
Caliper 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	5.9	0.60	52 in·lb	
Brake Pedal Bolt	8.8	0.90	78 in·lb	
Front Brake Light Switch Screw	1.2	0.12	10 in·lb	
Front Brake Reservoir Cap Stopper Screw	1.2	0.12	10 in·lb	
Front Brake Disc Mounting Bolts	27	2.8	20	L
Front Brake Pad Pins	17	1.7	13	
Front Caliper Assembly Bolts	27	2.8	20	
Front Caliper Mounting Bolts	34	3.5	25	
Front Master Cylinder Bleed Valve	5.9	0.60	52 in·lb	
Front Master Cylinder Clamp Bolts	8.8	0.90	78 in·lb	S
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	18	1.8	13	
<b>Suspension</b>				
Front Axle Clamp Bolts	20	2.0	15	AL

## 2-10 PERIODIC MAINTENANCE

### Torque and Locking Agent

Fastener	Torque			Remarks	
	N·m	kgf·m	ft·lb		
Front Fork Bottom Allen Bolts	35	3.5	26	AL	
Front Fork Clamp Bolts (Lower)	25	2.5	18		
Front Fork Clamp Bolts (Upper)	20	2.0	15		
Front Fork Top Plugs	35	3.5	26		
Piston Rod Nuts	20	2.0	15		
Rear Shock Absorber Bracket Nut	59	6.0	43		
Rear Shock Absorber Nut (Lower)	34	3.5	25		
Rear Shock Absorber Nut (Upper)	34	3.5	25		
Swingarm Pivot Adjusting Collar	20	2.0	15		S
Swingarm Pivot Adjusting Collar Locknut	98	10	72		S
Swingarm Pivot Shaft Nut	108	11	81		S
Tie-Rod Nuts	59	6.0	43		
Uni-Trak Rocker Arm Nut	34	3.5	25		
<b>Steering</b>					
Front Fork Clamp Bolts (Lower)	25	2.5	18	AL	
Front Fork Clamp Bolts (Upper)	20	2.0	15		
Handlebar Bolts	25	2.5	18		
Handlebar Position Bolts	9.8	1.0	87 in·lb	L	
Steering Stem Head Nut	78	8.0	58		
Steering Stem Nut	20	2.0	15		
Switch Housing Screws	3.5	0.36	31 in·lb		
<b>Frame</b>					
Front Fender Mounting Bolts	3.9	0.40	35 in·lb		
Front Footpeg Bracket Bolts	25	2.5	18		
Rear Footpeg Bracket Bolts	25	2.5	18		
Rear Frame Bolts	44	4.5	32	L	
Sidestand Bolt	44	4.5	32	G	
Sidestand Bracket Bolts	49	5.0	36	L	
Sidestand Switch Bolt	8.8	0.90	78 in·lb	L	
Windshield Mounting Bolts	0.4	0.04	4 in·lb		
<b>Electrical System</b>					
Alternator Cover Bolts	9.8	1.0	87 in·lb	L	
Alternator Lead Holding Plate Bolt	9.8	1.0	87 in·lb		
Alternator Rotor Bolt	155	16	115		
Camshaft Position Sensor Bolt	9.8	1.0	87 in·lb		
Crankshaft Sensor Bolts	5.9	0.60	52 in·lb		
Cylinder Head Cover Ground Bolt	9.8	1.0	87 in·lb		
Front Brake Light Switch Screw	1.2	0.12	10 in·lb		
Front Turn Signal Light Mounting Screws	1.2	0.12	10 in·lb		
Headlight Mounting Screws	1.2	0.12	10 in·lb		
Licence Light Assembly Screws	0.9	0.09	8 in·lb		
Licence Light Mounting Screws	1.2	0.12	10 in·lb		
Meter Mounting Screws	1.2	0.12	10 in·lb		

**Torque and Locking Agent**

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Gear Position Switch Screws	2.9	0.30	26 in·lb	L
Rear Turn Signal Light Lens Screws	1.0	0.10	9 in·lb	
Rear Turn Signal Light Mounting Screws	1.2	0.12	10 in·lb	
Regulator/Rectifier Bolts	6.9	0.70	61 in·lb	
Regulator/Rectifier Bracket Nuts	6.9	0.70	61 in·lb	
Side Stand Switch Bolt	8.8	0.90	78 in·lb	L
Spark Plugs	13	1.3	113 in·lb	
Speed Sensor Bolt	6.9	0.70	61 in·lb	L
Stator Coil Bolts	12	1.2	106 in·lb	L
Starter Motor Cable Terminal Bolt	2.9	0.30	26 in·lb	
Starter Clutch Bolt	49	5.0	36	
Starter Motor Mounting Bolts	9.8	1.0	87 in·lb	
Starter Relay Cable Terminal Bolts	4.0	0.41	35 in·lb	
Switch Housing Screws	3.5	0.36	31 in·lb	
Tail/Brake Light Mounting Bolts	4.0	0.40	35 in·lb	
Vehicle-down Sensor Bolts	5.9	0.60	52 in·lb	
Water Temperature Sensor	25	2.5	18	SS
Idle Gear Cover Bolts	9.8	1.0	87 in·lb	
Starter Clutch Cover Bolts	9.8	1.0	87 in·lb	
Starter Clutch Bolt Cap	–	–	–	Hand-tighten
Timing Inspection Cap	–	–	–	Hand-tighten

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

## 2-12 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	1 300 ±50 r/min (rpm)	---
Throttle Body Vacuum	27.3 ±1.333 kPa (205 ±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	2.6 L (2.7 US qt)	---
<b>Engine Top End</b>		
Valve Clearance:		
Exhaust	0.24 ~ 0.31 mm (0.0094 ~ 0.0122 in.)	---
Inlet	0.13 ~ 0.19 mm (0.0051 ~ 0.0075 in.)	---
<b>Clutch</b>		
Clutch Lever Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)	---
<b>Engine Lubrication System</b>		
Engine Oil:		
Type	API SE, SF or SG API SH, SJ or SL with JASO MA	---
Viscosity	SAE 10W-40	---
Capacity	2.9 L (3.1 US qt) (when filter is not removed)	---
	3.2 L (3.4 US qt) (when filter is removed)	---
	3.8 L (4.0 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:		
Front	BRIDGESTONE: 3.6 mm (0.14 in.)	1 mm (0.04 in.), (AT, CH, DE) 1.6 mm (0.06 in.)
Rear	BRIDGESTONE: 4.8 mm (0.19 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 <sup>2</sup> , 36 psi)	---
Rear	Up to 180 kg (397 lb) load: 290 kPa (2.9 kgf/cm <sup>2</sup> , 42 psi)	---

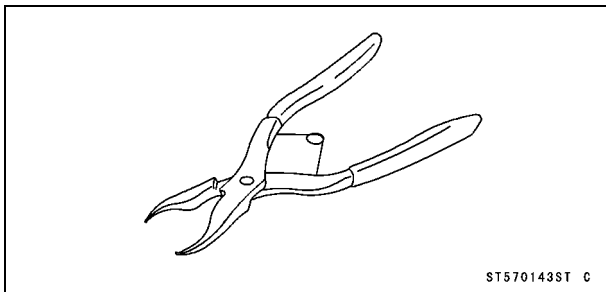
**Specifications**

Item	Standard	Service Limit
<b>Final Drive</b>		
Drive Chain Slack	30 ~ 40 mm (1.2 ~ 1.6 in.)	---
Drive Chain Wear (20-link Length)	317.5 ~ 318.2 mm (12.50 ~ 12.53 in.)	323 mm (12.7 in.)
Standard Chain:		
Make	ENUMA	---
Type	EK520MVXL1	---
Link	112 links	---
<b>Brakes</b>		
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	---

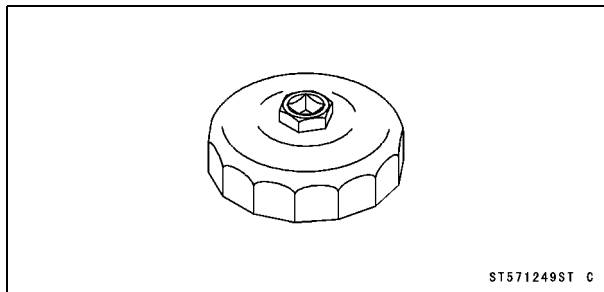
# 2-14 PERIODIC MAINTENANCE

## Special Tools

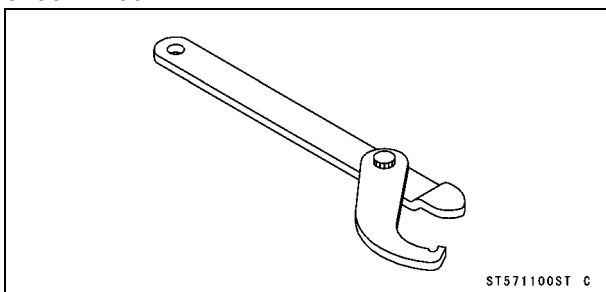
**Inside Circlip Pliers:**  
57001-143



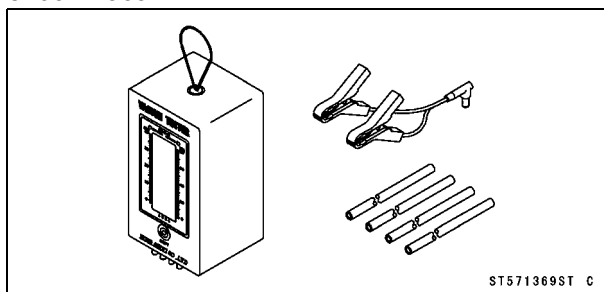
**Oil Filter Wrench:**  
57001-1249



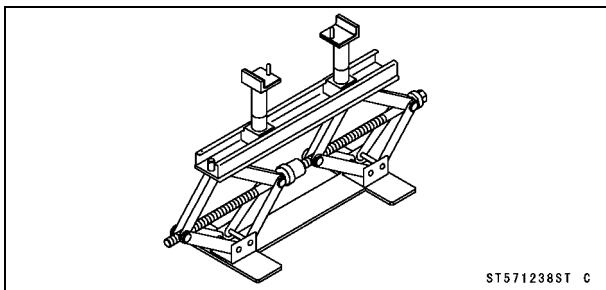
**Steering Stem Nut Wrench:**  
57001-1100



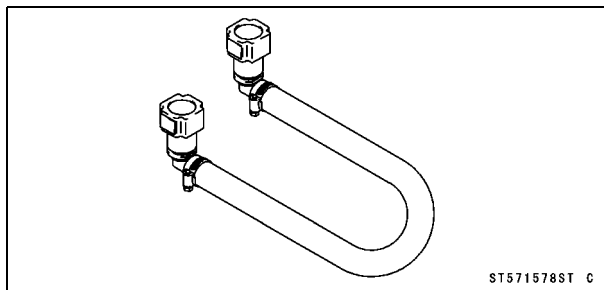
**Vacuum Gauge:**  
57001-1369



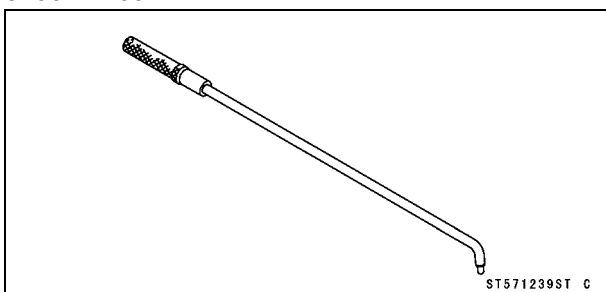
**Jack:**  
57001-1238



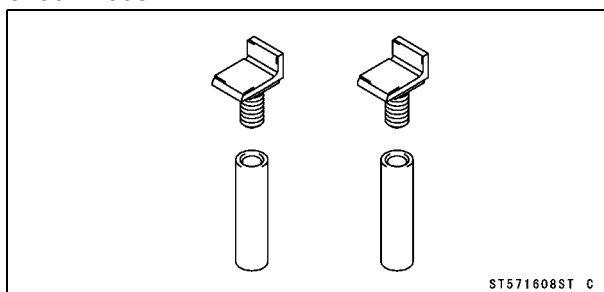
**Extension Tube:**  
57001-1578



**Pilot Screw Adjuster, A:**  
57001-1239



**Jack Attachment:**  
57001-1608

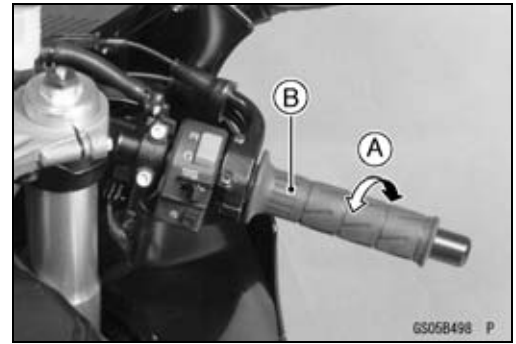


**Maintenance Procedure**

**Fuel System (DFI)**

**Throttle Control System Inspection**

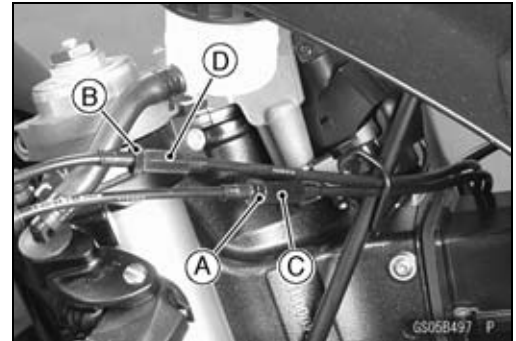
- Check that the throttle grip [A] moves smoothly from full open to close, and the throttle closes quickly and completely by the return spring in all steering positions.
- ★ If the throttle grip does not return properly, check the throttle cables routing, grip free play, and cable damage. Then lubricate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



**Throttle Grip Free Play**

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

- ★ If the free play is incorrect, adjust the throttle cable as follows.
  - Loosen the 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.

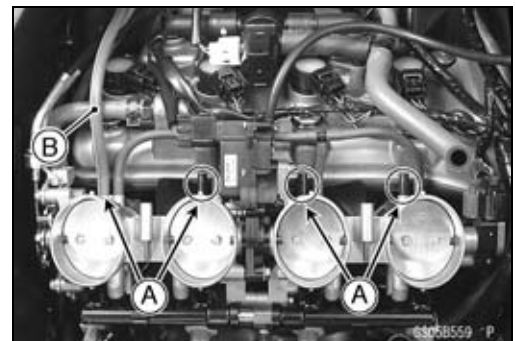


**Engine Vacuum Synchronization Inspection**

**NOTE**

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

- Situate the motorcycle so that it is vertical.
- Remove:
  - Fuel Tank (see Fuel Tank Removal in the Fuel System (DFI) chapter)
  - Air Cleaner Housing (see Air Cleaner Housing Removal in the Fuel System (DFI) chapter)
  - Fuel Hose (see Fuel Hose Replacement in the Periodic Maintenance chapter)
- When removing the air cleaner housing, do not remove the inlet air pressure sensor hose.
- Pull off the rubber caps [A] from the fittings of each throttle body.
- For the California Model, pull off the vacuum hose [B].





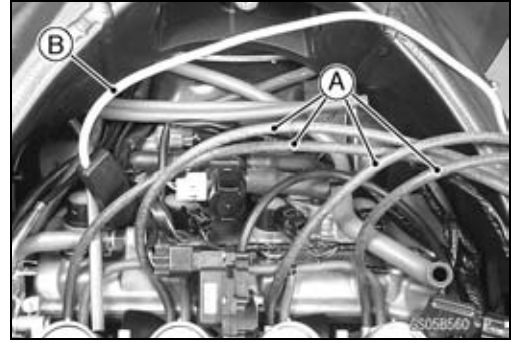
## 2-16 PERIODIC MAINTENANCE

### Maintenance Procedure

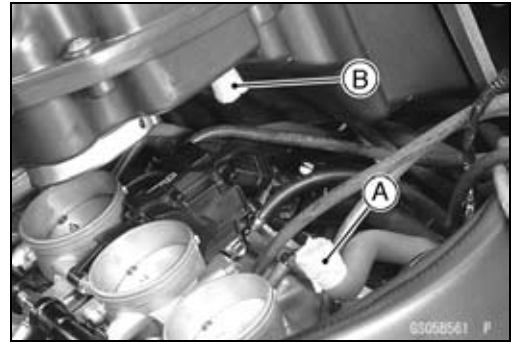
- Connect a vacuum gauge (special tool) and hoses [A] to the fittings on the throttle body.

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

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



- Plug the air switching valve hose end [A] and air cleaner housing fitting [B].



- Install the air cleaner housing (see Air Cleaner Housing Installation in the Fuel System (DFI) chapter).
- Connect the following parts temporary.
  - Fuel Pump Lead Connector [A]
  - Extension Tube [B]

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



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

#### Idle Speed

**Standard: 1 300 ±50 r/min (rpm)**

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

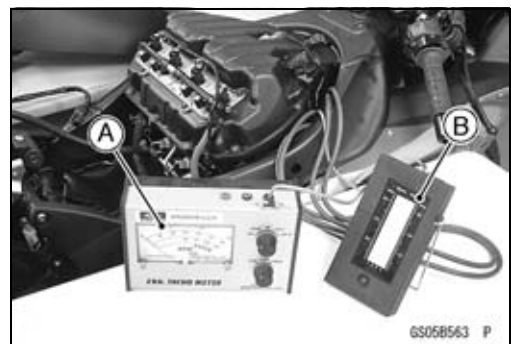
#### CAUTION

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

- When idling the engine, inspect the throttle body vacuum, using the vacuum gauge [B].

#### Engine Vacuum

**Standard: 27.3 ±1.333 kPa (205 ±10 mmHg) at idle speed**



**Maintenance Procedure**

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

**Example:**

- #1: 165 mmHg
- #2: 190 mmHg
- #3: 170 mmHg
- #4: 200 mmHg

● With the engine at the correct idle speed, equalize the highest vacuum of #3 and #4 (example 200 mmHg) to the highest vacuum of #1 and #2 (example 190 mmHg) by turning the center adjusting screw [A].

Rear View [B]

**NOTE**

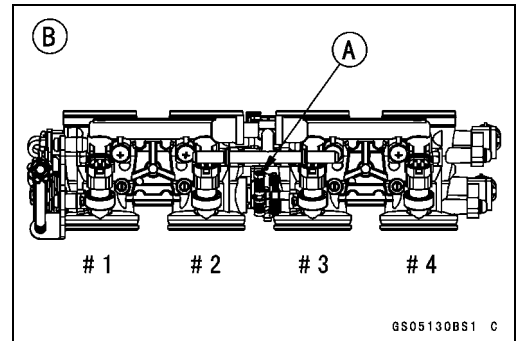
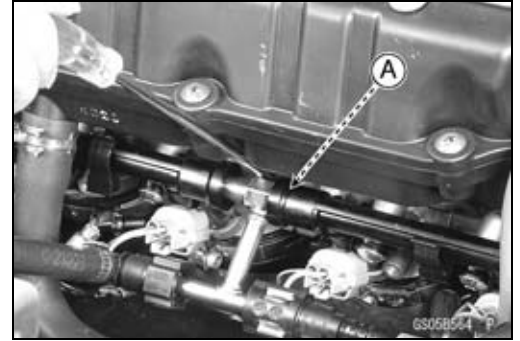
○ After adjustment, the final vacuum measurement between the lowest throttle valves may not be 205 mmHg (in this example). The goal is to have the lower two vacuums between the left (#1 and #2) and right (#3 and #4) banks be the same.

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

★ If any one vacuum measurement is out of the standard measurement after left and right synchronization, turn in the bypass screws [A] until it seats fully but not tightly.

Rear View [B]

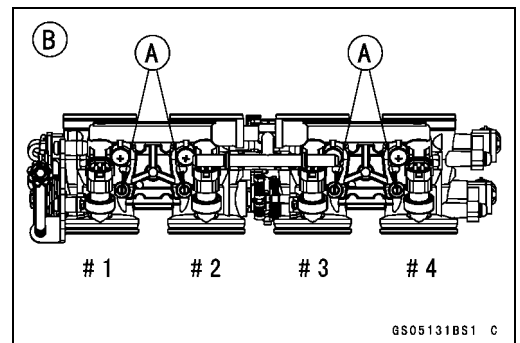
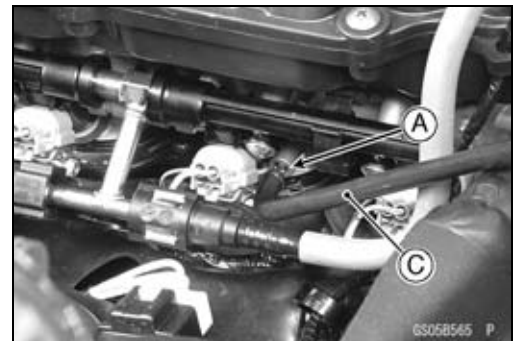
**Special Tool - Pilot Screw Adjuster, A [C]: 57001-1239**



**CAUTION**

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

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



## 2-18 PERIODIC MAINTENANCE

### Maintenance Procedure

- Remove the bypass screw [A], spring [B], washer [C] and O-ring [D].
- Check the bypass screw and its hole for carbon deposits.
- ★ If any carbon accumulates, wipe the carbon off 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.
- 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 the Main Throttle Sensor in the Fuel System (DFI) chapter).

**Special Tool - Throttle Sensor Setting Adapter: 57001-1538**

#### Main Throttle Sensor Output Voltage

##### Connections to Sensor

Meter (+) → Y/W lead

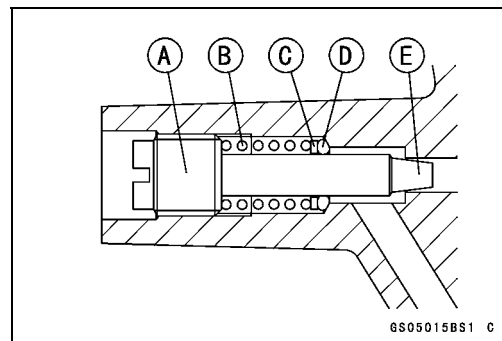
Meter (-) → BR/BK lead

**Standard: DC 1.025 ~ 1.055 V (at idle throttle opening)**

- ★ If the output voltage is out of the standard, check the input voltage of the main throttle sensor (see Input Voltage Inspection of the Main Throttle Sensor in the Fuel System (DFI) chapter).
- Remove the vacuum gauge hoses and install the rubber caps on the original position.
- For the California Model, install the vacuum hose.
- Route the vacuum hose according to Cable, Wire, and Hose Routing section in the Appendix chapter.

#### 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 Idle Speed Inspection and Cable, Wire, and Hose Routing section in the Appendix chapter).



### **⚠ WARNING**

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

- Check the idle speed.

#### Idle Speed

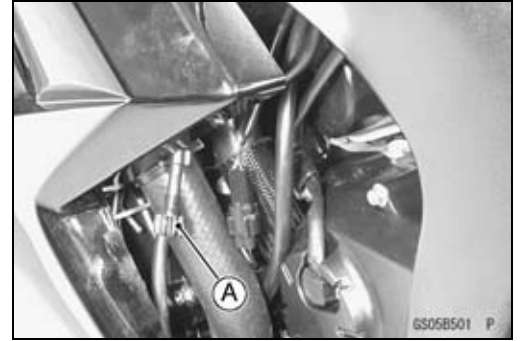
**Standard: 1 300 ±50 r/min (rpm)**

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

**Maintenance Procedure**

**Idle Speed Adjustment**

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

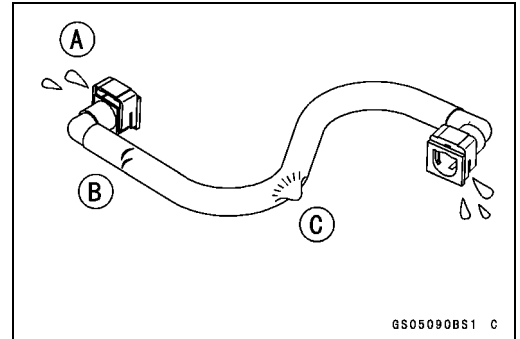


**Fuel Hose Inspection (fuel leak, damage, installation condition)**

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

Remove the fuel tank (see Fuel Tank Removal in the Fuel System (DFI) chapter) and check the fuel hose.

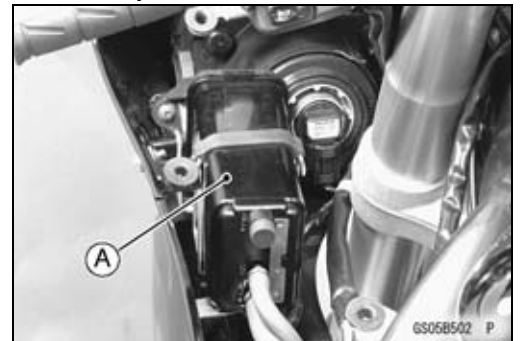
- ★ Replace the fuel hose if any fraying, cracks [B] or bulges [C] are noticed.
- Check that the hose joints are securely connected.
- Check that the hoses are routed according to Cable, Wire, and Hose Routing section in the Appendix chapter.
- ★ Replace the hose if it has been sharply bent or kinked.
- ★ If it does not lock, reinstall the hose joint.



**Evaporative Emission Control System (California Model)**

**Evaporative Emission Control System Inspection**

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



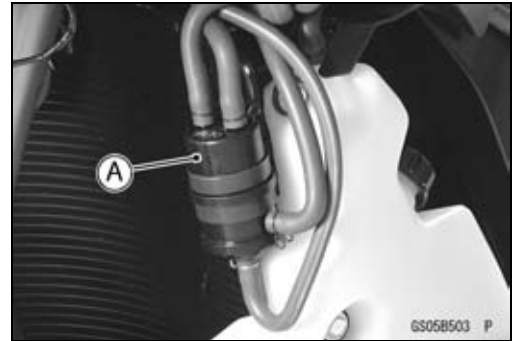
**NOTE**

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

## 2-20 PERIODIC MAINTENANCE

### Maintenance Procedure

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



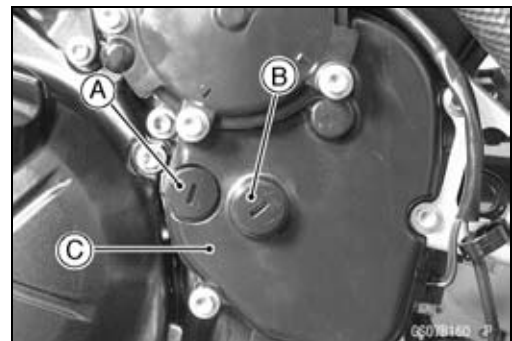
### Engine Top End

#### Valve Clearance Inspection

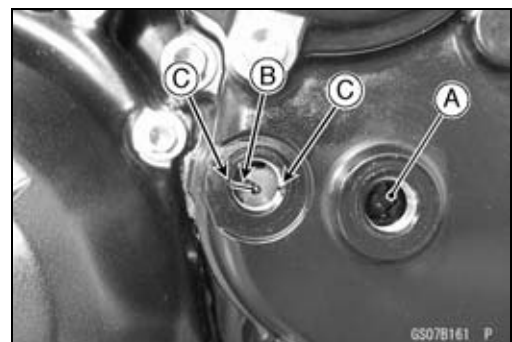
##### NOTE

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

- Remove the cylinder head cover (see Cylinder Head Cover Removal in the Engine Top End chapter).
- Remove the timing inspection cap [A] and starter clutch bolt cap [B] on the starter clutch cover [C].



- Using a wrench on the starter clutch bolt [A], turn the crankshaft clockwise until the line [B] (TDC mark for #1,4 pistons) on the starter clutch is aligned with the notches [C] in the edge of the timing inspection hole in the starter clutch cover.



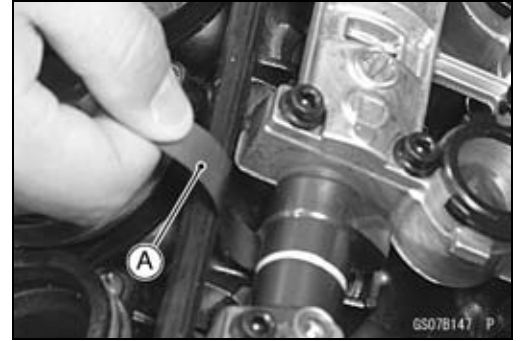
**Maintenance Procedure**

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

**Valve Clearance**

**Standard:**

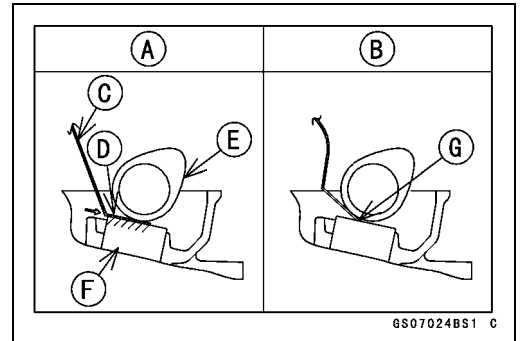
- Exhaust 0.24 ~ 0.31 mm (0.0094 ~ 0.0122 in.)
- Inlet 0.13 ~ 0.19 mm (0.0051 ~ 0.0075 in.)



**NOTE**

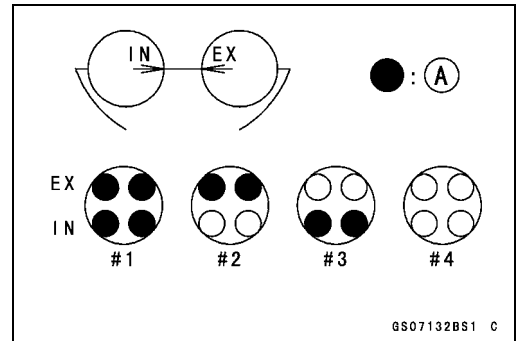
- Thickness gauge is horizontally inserted on the valve lifter.

- Appropriateness [A]
- Inadequacy [B]
- Thickness Gauge [C]
- Horizontally Inserts [D]
- Cam [E]
- Valve Lifter [F]
- Hits the Valve Lifter Ahead [G]



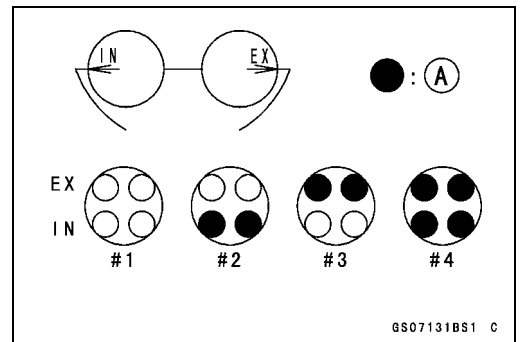
- When positioning #1 piston TDC at the end of the compression stroke:

- 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:

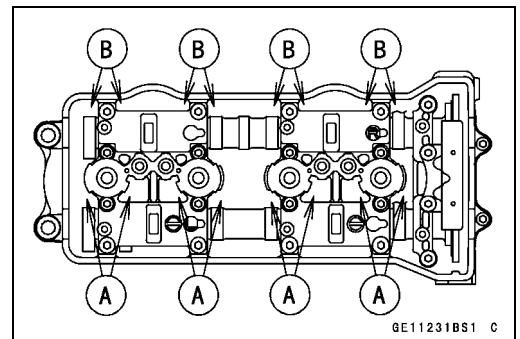
- Inlet Valve Clearance of #2 and #4 Cylinders
- Exhaust Valve Clearance of #3 and #4 Cylinders
- Measuring Valve [A]



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

- Filling engine oil to all pockets front side of the cam lobes of the camshaft.

- Inlet Side Oil Pockets [A]
- Exhaust Side Oil Pockets [B]



## 2-22 PERIODIC MAINTENANCE

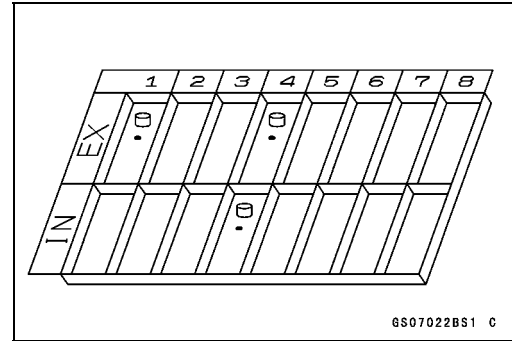
### Maintenance Procedure

#### 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.

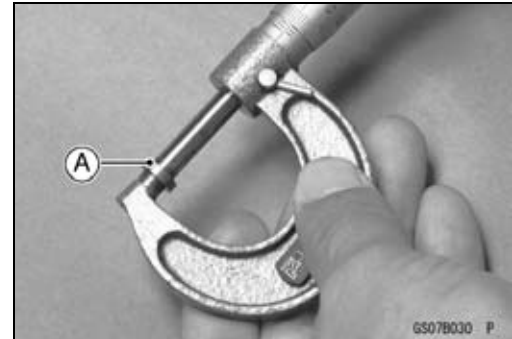


- Clean the shim to remove any dust or oil.
- Measure the thickness of the removed shim [A].
- Select a new shim thickness calculation as follows.
  - $a + b - c = d$
  - [a] Present Shim Thickness
  - [b] Measured Valve Clearance
  - [c] Specified Valve Clearance (Mean Value = 0.16)
  - [d] Replace Shim Thickness

#### Example:

$$1.600 + 0.33 - 0.16 = 1.77 \text{ mm}$$

○Exchange the shim for the 1.775 size shim.



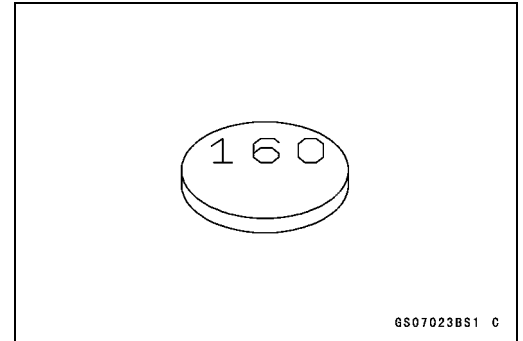
#### CAUTION

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

**Maintenance Procedure**

**Adjustment Shims**

Thickness	Part Number	Mark
1.300	92180-0108	130
1.325	92180-0109	132
1.350	92180-0110	135
1.375	92180-0111	138
1.400	92180-0112	140
1.425	92180-0113	142
1.450	92180-0114	145
1.475	92180-0115	148
1.500	92180-0116	150
1.525	92180-0117	152
1.550	92180-0118	155
1.575	92180-0119	158
1.600	92180-0120	160
1.625	92180-0121	162
1.650	92180-0122	165
1.675	92180-0123	168
1.700	92180-0124	170
1.725	92180-0125	172
1.750	92180-0126	175
1.775	92180-0127	178
1.800	92180-0128	180
1.825	92180-0129	182
1.850	92180-0130	185
1.875	92180-0131	188
1.900	92180-0132	190
1.925	92180-0133	192
1.950	92180-0134	195
1.975	92180-0135	198
2.000	92180-0136	200
2.025	92180-0137	202
2.050	92180-0138	205
2.075	92180-0139	208
2.100	92180-0140	210
2.125	92180-0141	212
2.150	92180-0142	215
2.175	92180-0143	218
2.200	92180-0144	220
2.225	92180-0145	222
2.250	92180-0146	225
2.275	92180-0147	228
2.300	92180-0148	230





## 2-24 PERIODIC MAINTENANCE

### Maintenance Procedure

#### CAUTION

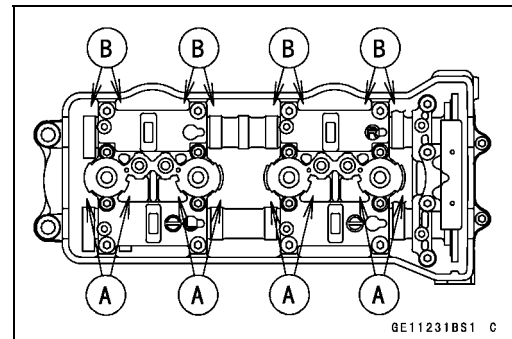
**Be sure to remeasure the clearance after selecting a shim. The clearance can be out of the specified range because of the shim tolerance.**

- 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 molybdenum disulfide oil solution to the valve lifter surface and install the lifter.
- Install the camshafts (see Camshaft Installation in the Engine Top End chapter).
- Recheck the valve clearance and readjust if necessary.
- Filling engine oil to all oil pockets front side of the cam lobes of the camshafts.
  - Inlet Side Oil Pockets [A]
  - Exhaust Side Oil Pockets [B]
- Recheck the valve clearance and readjust if necessary.
- Install the removed parts.



### Air Suction System

#### Air Suction System Damage Inspection

- Set up the fuel tank (see the Air Cleaner Element Replacement).
- Pull the air switching valve hose [A] out of the air cleaner.
- Start the engine and run it at idle speed.
- Plug [B] the air switching valve hose end with your finger and feel vacuum pulsing in the hose.
- ★ If there is no vacuum pulsation, check the hose line for leak. If there is no leak, check the air switching valve (see Air Switching Valve Unit Test in the Electrical System chapter) or air suction valve (see Air Suction Valve Inspection in the Engine Top End chapter).



**Maintenance Procedure**

**Cooling System**

**Coolant Level Inspection**

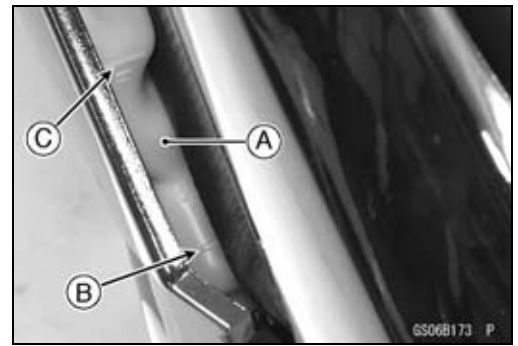
**NOTE**

○ 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 side stand).
- ★ 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**

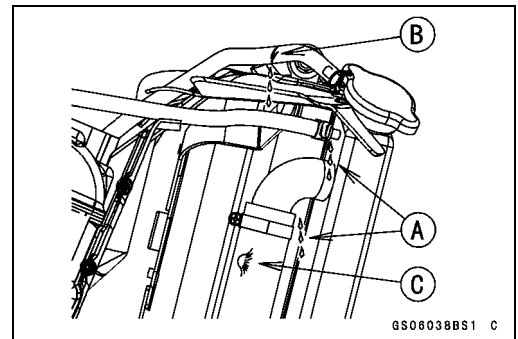
For refilling, add the specified mixture of coolant and soft water. Adding water alone dilutes the coolant and degrades its anticorrosion properties. The diluted coolant can attack the aluminum engine parts. In an emergency, soft water alone can be added. But the diluted coolant must be returned to the 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 Damage and Installation Condition 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.
- Check that the hoses are securely connected and clamps are tightened correctly.

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





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