MODEL APPLICATION

Year	Model	Beginning Frame No.
2008	EX250J8F	JKAEXMJ1□8DA00001

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

Kawasaki
KAWASAKI HEAVY INDUSTRIES, LTD.
Consumer Products & Machinery Company

Part No.99924-1391-01

Printed in Japan

Kawasaki

Ninja 250R

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
CA	Canada	US	United States
CAL	California	ID	Indonesia
CH	Switzerland	PH	Philippines
DE	Germany	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.

How to Use This Manual

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

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

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

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

⚠ WARNING

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

CAUTION

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

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

NOTE

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

- Indicates a procedural step or work to be done.

○ Indicates a procedural sub-step or how to do the work of the procedural step it follows. It also precedes the text of a NOTE.

★ Indicates a conditional step or what action to take based on the results of the test or inspection in the procedural step or sub-step it follows.

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

General Information

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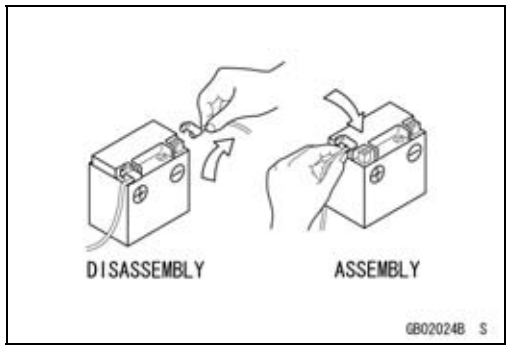
Before Servicing

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.

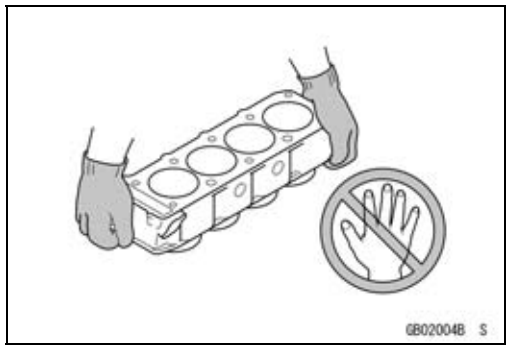
Battery Ground

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.



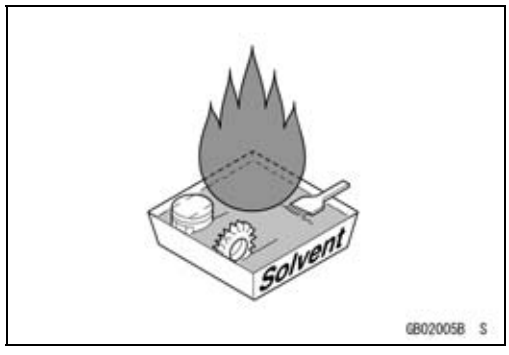
Edges of Parts

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



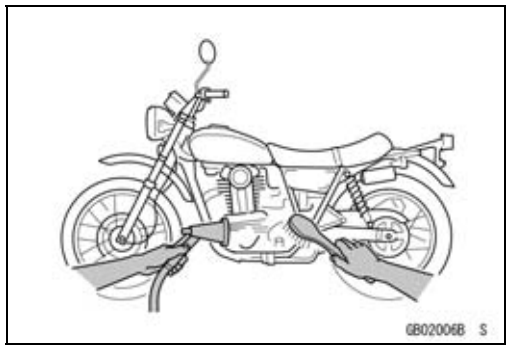
Solvent

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



Cleaning vehicle before disassembly

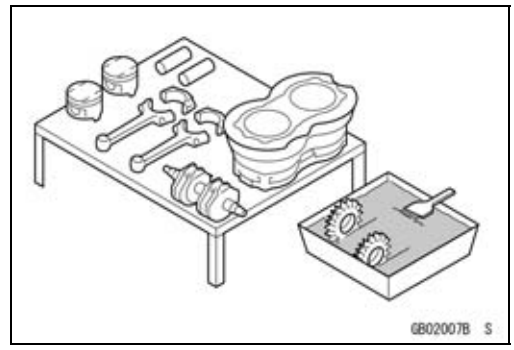
Clean the vehicle thoroughly before disassembly. Dirt or other foreign materials entering into sealed areas during vehicle disassembly can cause excessive wear and decrease performance of the vehicle.



Before Servicing

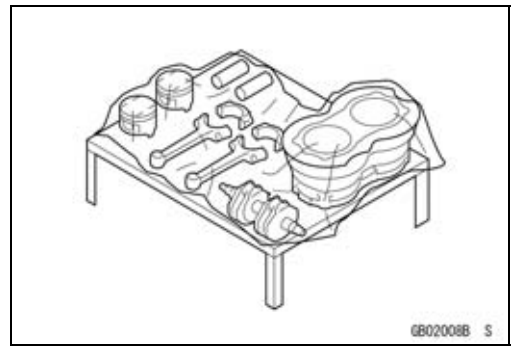
Arrangement and Cleaning of Removed Parts

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.



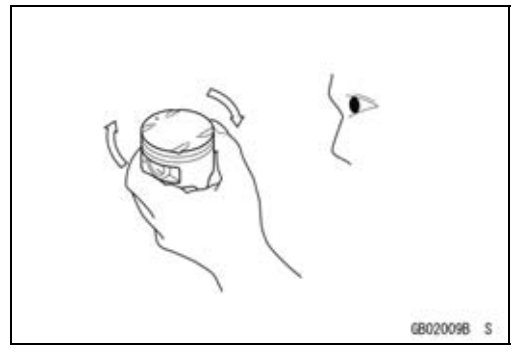
Storage of Removed Parts

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.



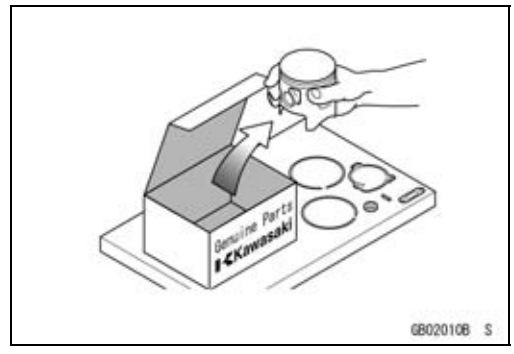
Inspection

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.



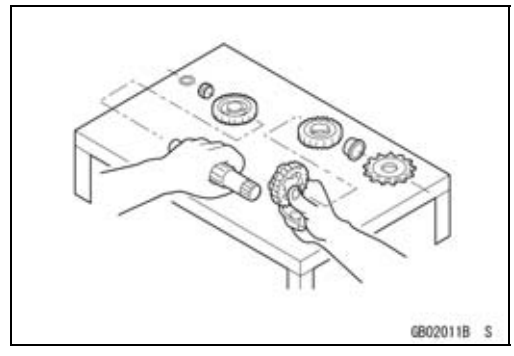
Replacement Parts

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

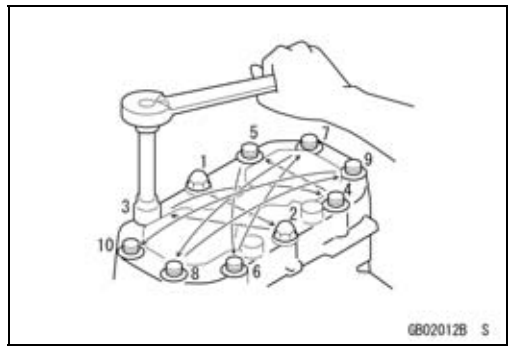
In most cases assembly order is the reverse of disassembly, however, if assembly order is provided in this Service Manual, follow the procedures given.



Before Servicing

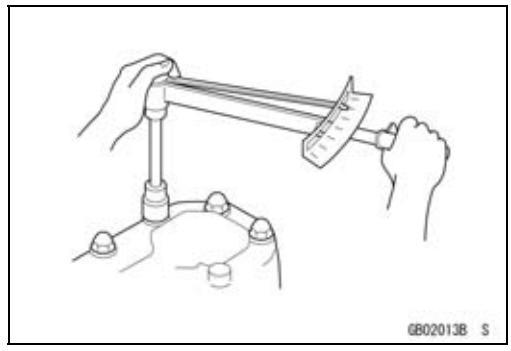
Tightening Sequence

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.



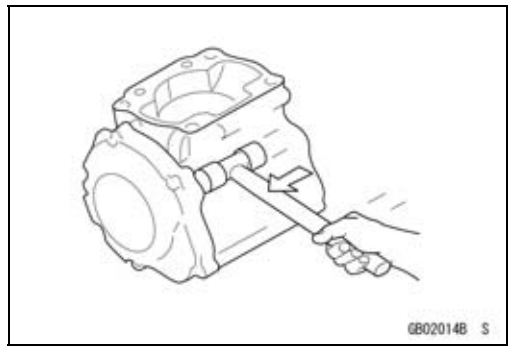
Tightening Torque

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.



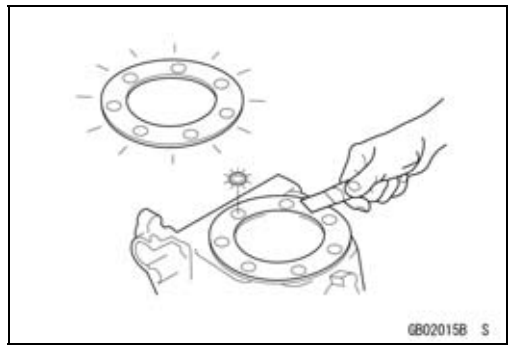
Force

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.



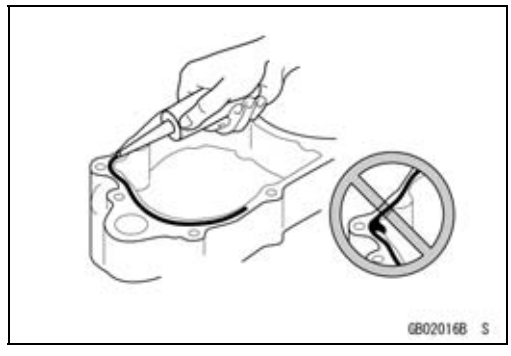
Gasket, O-ring

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

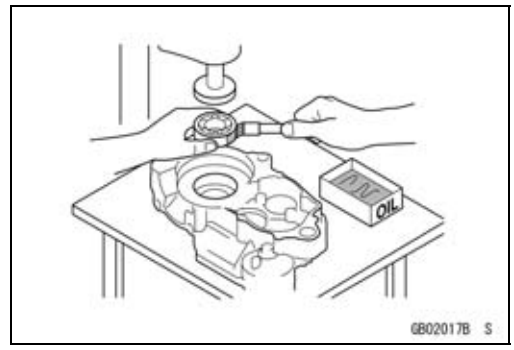
For applications that require Liquid Gasket or a Non-permanent Locking Agent, clean the surfaces so that no oil residue remains before applying liquid gasket or non-permanent locking agent. Do not apply them excessively. Excessive application can clog oil passages and cause serious damage.



Before Servicing

Press

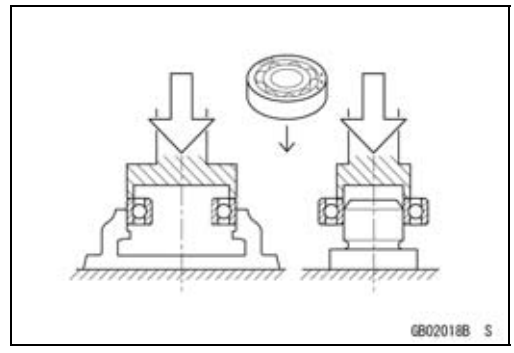
For items such as bearings or oil seals that must be pressed into place, apply small amount of oil to the contact area. Be sure to maintain proper alignment and use smooth movements when installing.



Ball Bearing and Needle Bearing

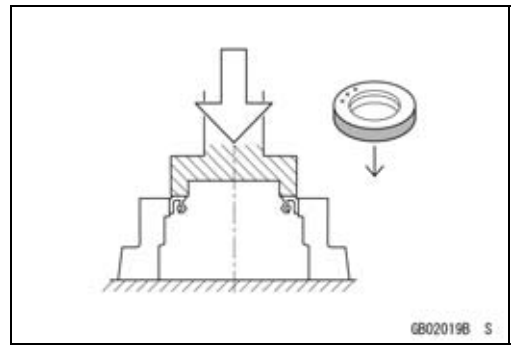
Do not remove pressed ball or needle unless removal is absolutely necessary. Replace with new ones whenever removed. Press bearings with the manufacturer and size marks facing out. Press the bearing into place by putting pressure on the correct bearing race as shown.

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

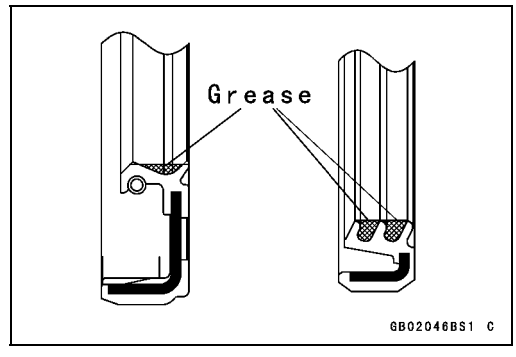


Oil Seal, Grease Seal

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.

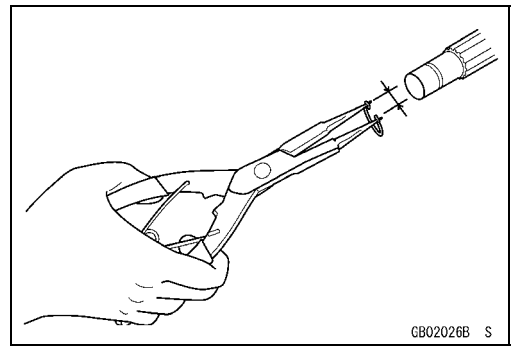


Apply specified grease to the lip of seal before installing the seal.



Circlips, Cotter Pins

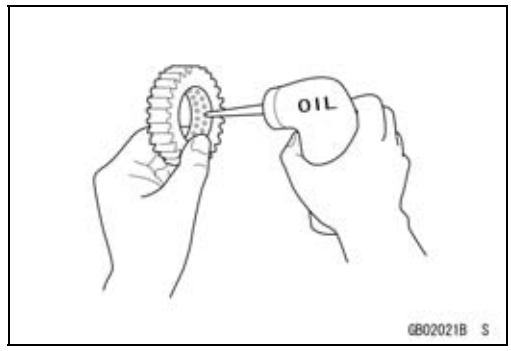
Replace the circlips or cotter pins that were removed with new ones. Take care not to open the clip excessively when installing to prevent deformation.



Before Servicing

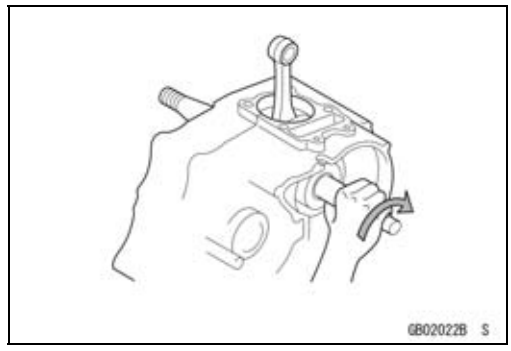
Lubrication

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.



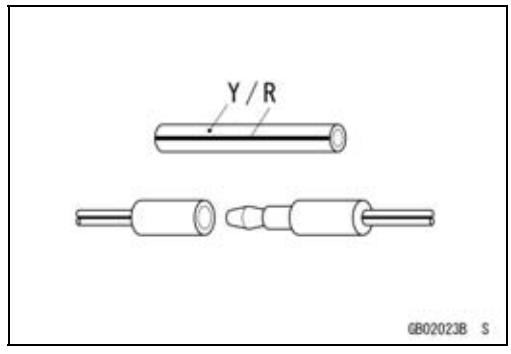
Direction of Engine Rotation

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).



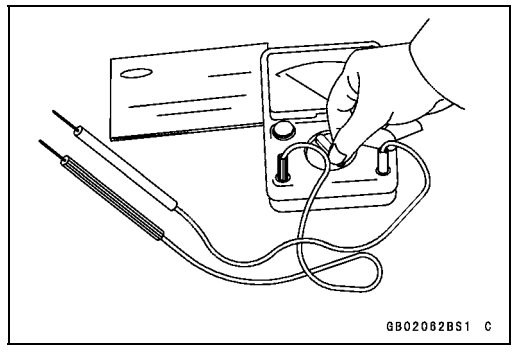
Electrical Wires

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.



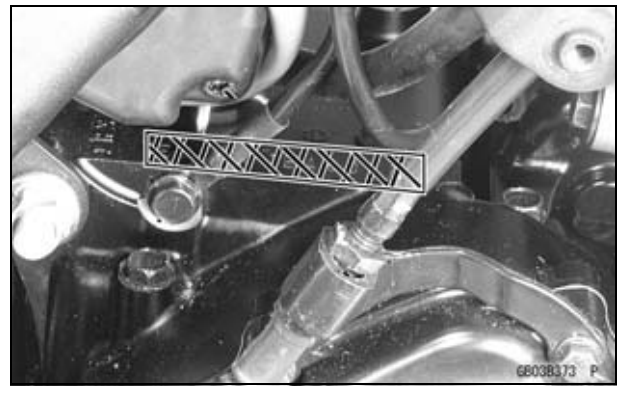
Model Identification

EX250J8F Left Side View (United States and Canada)

EX250J8F Right Side View (United States and Canada)

Frame Number

Engine Number



General Specifications

Items	EX250J8F
Dimensions	
Overall Length	2 085 mm (82.1 in.)
Overall Width	715 mm (28.1 in.)
Overall Height	1 110 mm (43.7 in.)
Wheelbase	1 400 mm (55.1 in.)
Road Clearance	130 mm (5.1 in.)
Seat Height	775 mm (30.5 in.)
Dry Mass	152 kg, (335 lb)
Curb Mass:	
Front	82 kg (181 lb)
Rear	87 kg (192 lb)
Fuel Tank Capacity	18.0 L (4.8 US gal)
Performance	
Minimum Turning Radius	2.7 m (8.9 ft)
Engine	
Type	4-stroke, DOHC, 2-cylinder
Cooling System	Liquid-cooled
Bore And Stroke	62.0× 41.2 mm (2.5 × 1.6 in.)
Displacement	249 cm³ (15.2 cu in.)
Compression Ratio	11.6
Maximum Horsepower	23.4 kW (31.8 PS) @11 000 r/min (rpm),
Maximum Torque	22.0 N·m (2.24 kg·m, 16.2 ft·lb) @9 500 r/min (rpm),
Carburetion System	Carburetor, Keihin CVK 30× 2
Starting System	Electric starter
Ignition System	Battery and coil (transistorized)
Timing Advance	Electronically advanced
Ignition Timing	From 10° BTDC @1 300 r/min (rpm) 35° BTDC @4 000 r/min (rpm)
Spark Plug	NGK CR8E or ND U24ESR-N
Cylinder Numbering Method	Left to Right, 1-2
Firing Order	1-2
Valve Timing:	
Inlet	
Open	36° BTDC
Close	56° ABDC
Duration	272°
Exhaust	
Open	61° BBDC
Close	31° ATDC
Duration	272°

General Specifications

Items	EX250J8F
Lubrication System	Forced ubrication (wet sump)
Engine Oil:	
Grade	API SE, SF or SG API SH, SJ or SL with JASO MA
Viscosity	SAE10W-40
Capacity	1.7 L (1.80 US qt)
Drive Train	
Primary Reduction System:	
Type	Gear
Reduction Tatio	3.087 (71/23)
Clutch Type	Wet multi disc
Transmission:	
Type	6-speed, constant mesh, return shift
Gear Ratios:	
1st	2.600 (39/15)
2nd	1.789 (34/19)
3rd	1.409 (31/22)
4th	1.160 (29/25)
5th	1.000 (27/27)
6th	0.893 (25/28)
Final Drive System:	
Type	Chain drive
Reduction Ratio	3.214 (45/14) (AU) 3.071 (43/14)
Overall Drive Ratio	8.859 @Top gear (AU) 8.466 @Top gear
Frame	
Type	Tubular, diamond
Caster (Rake Angle)	26°
Trail	82 mm (3.2 in.)
Front Wheel:	
Tire Type	Tubeless
Tire Size	100/70-17M/C 54H
Rim Size	17 × 2.75
Rear Wheel:	
Tire Type	Tubeless
Tire Size	130/70-17M/C 62H
Rim Size	17 × 3.50
Front suspension:	
Type	Telescopic fork
Wheel Travel	120 mm (4.7 in.)
Rear Suspension:	
Type	Swingarm (uni-trak)
Wheel Travel	130 mm (5.1 in.)

General Specifications

Items	EX250J8F
Brake Type:	
Front	Single disc
Rear	Single disc
Electrical Equipment	
Battery	12 V 6 Ah
Headlight:	
Type	Semi-sealed beam
Bulb:	
High	12 V 55 W + 55 W (quartz-halogen)
Low	12 V 55 W (quartz-halogen)
Tail/brake Light	12 V 5/21 W
Alternator:	
Type	Three-phase AC
Rated Output	19 A @5 000 r/min (rpm), 14 V

Specifications are subject to change without notice, and may not apply to every country.
AU: Australia Model

Unit Conversion Table

Prefixes for Units:

Prefix	Symbol	Power
mega	M	× 1 000 000
kilo	k	× 1 000
centi	c	× 0.01
milli	m	× 0.001
micro	μ	× 0.000001

Units of Mass:

kg	×	2.205	=	lb
g	×	0.03527	=	oz

Units of Volume:

L	×	0.2642	=	gal (US)
L	×	0.2200	=	gal (imp)
L	×	1.057	=	qt (US)
L	×	0.8799	=	qt (imp)
L	×	2.113	=	pint (US)
L	×	1.816	=	pint (imp)
mL	×	0.03381	=	oz (US)
mL	×	0.02816	=	oz (imp)
mL	×	0.06102	=	cu in

Units of Force:

N	×	0.1020	=	kg
N	×	0.2248	=	lb
kg	×	9.807	=	N
kg	×	2.205	=	lb

Units of Length:

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

Units of Torque:

N·m	×	0.1020	=	kgf·m
N·m	×	0.7376	=	ft·lb
N·m	×	8.851	=	in·lb
kgf·m	×	9.807	=	N·m
kgf·m	×	7.233	=	ft·lb
kgf·m	×	86.80	=	in·lb

Units of Pressure:

kPa	×	0.01020	=	kgf/cm²
kPa	×	0.1450	=	psi
kPa	×	0.7501	=	cm Hg
kgf/cm²	×	98.07	=	kPa
kgf/cm²	×	14.22	=	psi
cm Hg	×	1.333	=	kPa

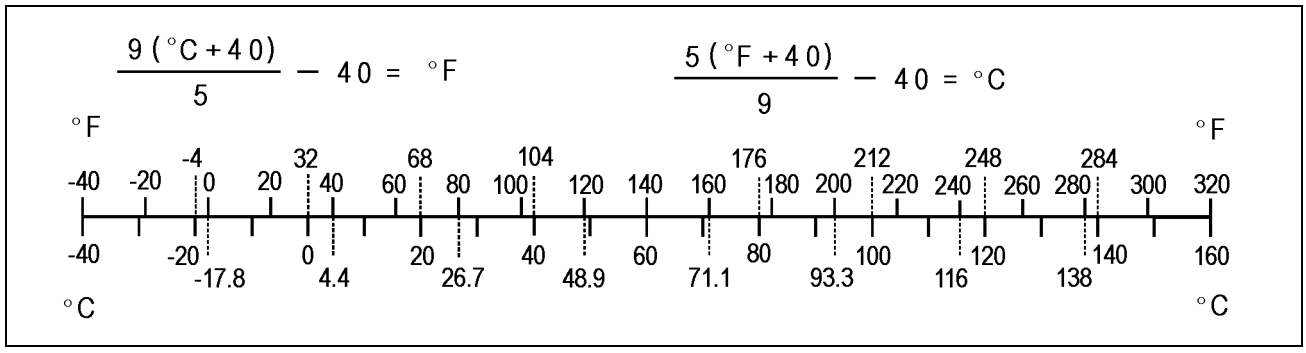
Units of Speed:

km/h	×	0.6214	=	mph

Units of Power:

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

Units of Temperature:



Periodic Maintenance

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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

FREQUENCY / INSPECTION	Whichever comes first ➡ / Every ⬇	* ODOMETER READING × 1 000 km (× 1 000 mile) 1 (0.6)	6 (4)	12 (7.5)	18 (12)	24 (15)	30 (20)	36 (24)	See Page
Fuel System									
Air cleaner element - clean				●		●		●	2-14
Throttle control system (play, smooth return, no drag) - inspect	year	●		●		●		●	2-15
Choke operation - inspect	year	●		●		●		●	2-17
Engine vacuum synchronization - inspect				●		●		●	2-17
Idle speed - inspect		●		●		●		●	2-18
Fuel leak (fuel hose and pipe) - inspect	year	●		●		●		●	2-19
Fuel hose and pipe damage - inspect	year	●		●		●		●	2-19
Fuel hose and pipe installation condition - inspect	year	●		●		●		●	2-19
Evaporative Emission Control System (CAL)									
Evaporative emission control system function - inspect		●	●	●	●	●	●	●	2-19
Cooling System									
Coolant level - inspect		●		●		●		●	2-20
Coolant leak (radiator hose and pipe) - inspect	year	●		●		●		●	2-21
Radiator hose damage - inspect	year	●		●		●		●	2-21
Radiator hose installation condition - inspect	year	●		●		●		●	2-21
Coolant filter - clean	year								
Air Suction System									
Air suction system damage - inspect				●		●		●	2-21
Engine Top End									
Valve clearance - inspect				●		●		●	2-22
Clutch									
Clutch operation (play, disengagement, engagement) - inspect		●		●		●		●	2-26
Wheels and Tires									
Tire air pressure - inspect	year			●		●		●	2-27
Wheel/tire damage - inspect				●		●		●	2-27
Tire tread wear, abnormal wear - inspect				●		●		●	2-27
Wheel bearing damage - inspect	year			●		●		●	2-28
Drive Train									
Drive chain lubrication condition - inspect #	Every 600 km (400 mile)								2-29

2-4 PERIODIC MAINTENANCE

Periodic Maintenance Chart

FREQUENCY / INSPECTION	Whichever comes first ➡ / Every ⬇	* ODOMETER READING × 1 000 km (× 1 000 mile)							See Page
		1 (0.6)	6 (4)	12 (7.5)	18 (12)	24 (15)	30 (20)	36 (24)	
Drive chain slack - inspect #	Every 1 000 km (600 mile)								2-29
Drive chain wear - inspect #				●		●		●	2-31
Drive chain guide wear - inspect				●		●		●	2-32
Brake System									
Brake fluid leak (brake hose and pipe) - inspect	year	●	●	●	●	●	●	●	2-32
Brake hose and pipe damage - inspect	year	●	●	●	●	●	●	●	2-32
Brake hose and pipe installation condition - inspect	year	●	●	●	●	●	●	●	2-32
Brake operation (effectiveness, play, no drag) - inspect	year	●	●	●	●	●	●	●	2-32
Brake fluid level - inspect	6 months	●	●	●	●	●	●	●	2-33
Brake pad wear - inspect #			●	●	●	●	●	●	2-33
Brake light switch operation - inspect		●	●	●	●	●	●	●	2-34
Suspensions									
Front forks/rear shock absorber operation (damping and smooth stroke) - inspect				●		●		●	2-34
Front forks/rear shock absorber oil leak - inspect	year			●		●		●	2-35
Rocker arm operation - inspect				●		●		●	2-35
Tie-rods operation - inspect				●		●		●	2-35
Swingarm pivot - lubricate						●			2-36
Steering System									
Steering play - inspect	year	●		●		●		●	2-36
Steering stem bearings - lubricate	2 years					●			2-37
Electrical System									
Lights and switches operation - inspect	year			●		●		●	2-37
Headlight aiming - inspect	year			●		●		●	2-39
Sidestand switch operation - inspect	year			●		●		●	2-40
Engine stop switch operation - inspect	year			●		●		●	2-41
Others									
Chassis parts - lubricate	year			●		●		●	2-42
Bolts and nuts tightness - inspect		●		●		●		●	2-43

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

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

Periodic Maintenance Chart

Periodic Replacement Parts

FREQUENCY / CHANGE/REPLACE ITEM	Whichever comes first ➡ / ⬇ Every	* ODOMETER READING × 1 000 km (× 1 000 mile) 1 (0.6)	12 (7.5)	24 (15)	36 (24)	48 (30)	See Page
Air cleaner element #	2 years						2-44
Fuel hose	4 years					●	2-44
Coolant	3 years				●		2-44
Radiator hose and O-ring	3 years				●		2-46
Engine oil #	year	●	●	●	●	●	2-47
Oil filter	year	●	●	●	●	●	2-47
Brake hose and pipe	4 years					●	2-48
Brake fluid	2 years			●		●	2-48
Rubber parts of master cylinder and caliper	4 years					●	2-50
Spark plug			●	●	●	●	2-52

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

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

Torque and Locking Agent

Use a torque wrench to tighten bolts and nuts to their specified torque values. If too little torque is applied, the bolts and nuts could loosen and fall out. If too much torque is applied, the threads could be sheared off.

To tighten a bolt or a nut, or to check their torque, loosen the bolt or nut one-half turn before tightening it to the specified torque.

Letters used in the “Remarks” column mean:
EO: Apply engine oil.
G: Apply grease.
L: Apply a non-permanent locking agent to the threads.
M: Apply molybdenum disulfide grease.
MO: Apply molybdenum disulfide oil solution.
R: Replacement Parts
S: Tighten the fasteners following the specified sequence.
Si: Apply silicone grease.
SS: Apply silicone sealant.

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Fuel System				
Fuel Tap Mounting Bolts	2.5	0.25	22 in·lb	
Fuel Gauge Mounting Bolts	6.9	0.7	61 in·lb	
Air Cleaner Housing Cap Bolts	2.5	0.25	22 in·lb	
Air Cleaner Housing Screws	1.15	0.12	10 in·lb	
Air Cleaner Housing Mounting Bolts	9.8	1.0	87 in·lb	
Air Cleaner Housing Clamp Screws	2.0	0.2	18 in·lb	
Separate Bracket Bolt	9.8	1.0	87 in·lb	
Cooling System				
Water Temperature Switch	7.5	0.76	66 in·lb	SS
Thermostat Cover Bolts	9.8	1.0	87 in·lb	
Thermostat Housing Mounting Bolts	9.8	1.0	87 in·lb	
Radiator Fan Switch	23.5	2.4	17	
Radiator Bolts	9.8	1.0	87 in·lb	
Radiator Cap Bracket Bolt	9.8	1.0	87 in·lb	
Water Pipe Bolts	9.8	1.0	87 in·lb	
Water Hose Clamp Screws	1.5	0.15	13 in·lb	
Drain Bolt	9.8	1.0	87 in·lb	
Water Pump Cover Bolts	9.8	1.0	87 in·lb	
Water Pump Bolts	9.8	1.0	87 in·lb	
Reserve Tank Cap	–	–	–	Hand-Tighten
Reserve Tank Bolts	9.8	1.0	87 in·lb	
Reserve Tank Bracket Bolt	9.8	1.0	87 in·lb	
Engine Top End				
Cylinder Head Cover Bolts	9.8	1.0	87 in·lb	
Camshaft Sprocket Bolts	15	1.5	11	L
Chain Tensioner Cap Bolt	5.0	0.5	44 in·lb	
Air Suction Cover Bolts	9.8	1.0	87 in·lb	
Vacuum Switch Valve Bracket Bolts	9.8	1.0	87 in·lb	
Rear Camshaft Chain Guide Bolt-Lower	17	1.7	13	

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Chain Tensioner Mounting Bolts	9.8	1.0	87 in·lb	
Camshaft Cap Bolts	12	1.2	106 in·lb	S
Camshaft Cap Bolts	12	1.2	106 in·lb	S
Cylinder Head Bolt (M6)	12	1.2	106 in·lb	MO, S
Cylinder Head Bolts (M8)	24.5	2.5	18	MO, S
Water Passage Plugs	20	2.0	15	L
Carburetor Holder Clamp Screws	2.0	0.2	18 in·lb	
Water Drain Bolt	5.9	0.6	52 in·lb	
Muffler Body Rear Cover Bolts	9.8	1.0	87 in·lb	L
Muffler Body Mounting Bolt	30	3.1	22	
Muffler Body Clamp Bolt	17	1.7	13	
Muffler Cover Bolts	9.8	1.0	87 in·lb	
Muffler Cover Clamp Screw	6.9	0.70	61 in·lb	
Exhaust Pipe Mounting Bolt	9.8	1.0	87 in·lb	
Exhaust Pipe Holder Nuts	12	1.2	104 in·lb	
Clutch				
Clutch Lever Holder Clamp Bolts	8.8	0.9	78 in·lb	
Clutch Spring Bolts	8.8	0.9	78 in·lb	
Clutch Hub Nut	132	13.5	97.4	
Oil Filler Plug	–	–	–	Hand-Tighten
Clutch Cover Bolts	9.8	1.0	87 in·lb	
Engine Lubrication System				
Oil Hose Banjo Bolts	19.6	2.0	14.5	
Oil Pressure Relief Valve	15	1.5	11	L
Crankcase Oil Passage Plug	15	1.5	11	
Oil Passage Plugs for Oil Pump	20	2.0	15	L
Oil Pipe Banjo Bolts	12	1.2	104 in·lb	
Oil Drain Bolt	19.6	2.0	14.5	
Oil Pressure Switch	15	1.5	11	SS
Oil Pressure Switch Terminal Bolt	1.5	0.15	13 in·lb	
Oil Filter Mounting Bolts	19.6	2.0	14.5	
Oil Breather Mounting Bolts	9.8	1.0	87 in·lb	L
Oil Pump Mounting Bolts	9.8	1.0	87 in·lb	L
Oil Screen Cover Bolts	9.8	1.0	87 in·lb	
Plug	19.6	2.0	14.5	
Breather Bolt	9.8	1.0	87 in·lb	
Engine Removal/Installation				
Engine Mounting Bracket Bolts and Nuts	64	6.5	47	
Engine Mounting Nuts	64	6.5	47	
Crankshaft/Transmission				
Oil Breather Mounting Bolts	9.8	1.0	87 in·lb	L
Crankcase Bolts ϕ6	12	1.2	104 in·lb	
Crankcase Bolts ϕ8 (L = 90)	24	2.4	18	MO, S

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Crankcase Bolts ϕ8 (L = 73)	19	1.9	14	MO, S
Starter Motor Clutch Bolts	34.3	3.5	25	L
Connecting Rod Big End Cap Nuts	27.5	2.8	20	MO
Shift Drum Bearing Holder Bolt	12	1.2	104 in·lb	L
Shift Drum Pin Plate Bolt	9.0	0.9	80 in·lb	L
Neutral Switch	15	1.5	11	
External Shift Mechanism Return Spring Pin	19.6	2.0	14.5	L
Shift Drum Positioning Bolt	24.5	2.5	18	
Shift Lever Link Bolt	12	1.2	104 in·lb	
Front Tie-Rod Locknut (Left-Hand Threads)	7.0	0.7	62 in·lb	
Rear Tie-Rod Locknut (Right-Hand Threads)	7.0	0.7	62 in·lb	
Shift Pedal Mounting Bolt	25	2.5	18	
Wheels/Tires				
Front Axle Nut	88	9.0	65	
Rear Axle Nut	98	10.0	72	
Final Drive				
Engine Sprocket Cover Bolts	9.8	1.0	87 in·lb	
Engine Sprocket Nut	127	13	94	MO
Rear Sprocket Nuts	59	6.0	44	
Rear Sprocket Studs	–	–	–	L
Brakes				
Brake Lever Pivot Bolt Locknut	5.9	0.6	52 in·lb	
Bleed Valve	5.5	0.55	49 in·lb	
Front Master Cylinder Clamp Bolts	8.8	0.9	78 in·lb	S
Brake Disc Mounting Bolts	27	2.8	20	L
Brake Hose Banjo Bolts	25	2.5	18	
Front Caliper Mounting Bolts	25	2.5	18	
Front Brake Light Switch Screw	1.0	0.1	9 in·lb	
Brake Lever Pivot Bolt	1.0	0.1	9 in·lb	
Front Reservoir Cap Screws	1.5	0.15	13 in·lb	
Reservoir Mounting Bolt	6.9	0.7	61 in·lb	
Bleed Valve	5.5	0.55	49 in·lb	
Brake Pedal Pivot Bolt	8.8	0.9	78 in·lb	L
Push Rod Locknut	18	1.8	13	
Brake Disc Mounting Bolts	27	2.8	20	L
Brake Hose Banjo Bolts	25	2.5	18	
Rear Master Cylinder Mounting Bolts	25	2.5	18	
Rear Caliper Mounting Bolts	25	2.5	18	
Suspension				
Front Fork Clamp Bolts (Upper)	21	2.1	15	
Front Fork Top Plugs	23	2.3	16.5	
Front Fork Clamp Bolts (Lower)	30	3.1	22	
Front Fork Bottom Allen Bolts	20	2.0	15	L

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Rocker Arm Pivot Nut	59	6.0	44	
Tie-Rod Nuts	59	6.0	44	
Rear Shock Absorber Mounting Nuts	59	6.0	44	
Swingarm Pivot Nut	98	10.0	72	
Steering				
Steering Stem Nut	4.9	0.5	43 in·lb	
Handlebar Holder Mounting Bolts	25	2.5	18	
Steering Stem Head Bolt	44	4.5	32	
Front Fork Clamp Bolts (Upper)	20	2.0	15	
Front Fork Clamp Bolts (Lower)	30	3.1	22	
Frame				
Sidestand Nut	44	4.5	32	
Front Footpeg Bracket Mounting Bolts	25	2.5	18	
Rear Footpeg Bracket Mounting Bolts	25	2.5	18	
Sidestand Switch Bolt	8.8	0.90	78 in·lb	L
Windshield Mounting Screws	0.42	0.043	3.7 in·lb	
Electrical System				
Tail/Brake Light Mounting Bolts	5.9	0.6	52 in·lb	
Plugs on Alternator Cover	–	–	–	Hand-Tighten
Alternator Cover Bolts	9.8	1.0	87 in·lb	
Alternator Rotor Bolt	68.6	7.0	51	
Alternator Stator Bolts	12	1.2	104 in·lb	
Regulator/Rectifier Bolts	9.8	1.0	87 in·lb	
Starter Motor Clutch Bolts	34.3	3.5	25	L
Crankshaft Sensor Screws	3.0	0.30	27 in·lb	
Ignition Coil Bolts	–	–	–	see text
Spark Plugs	13	1.3	115 in·lb	
Starter Motor Terminal Locknut	9.8	1.0	87 in·lb	
Starter Motor Assembly Bolts	3.5	0.36	31 in·lb	
Starter Motor Mounting Bolts	9.8	1.0	87 in·lb	
Starter Relay Terminal Nut	5.0	0.5	44 in·lb	
Oil Pressure Switch	15	1.5	11	SS
Neutral Switch	15	1.5	11	

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

Specifications

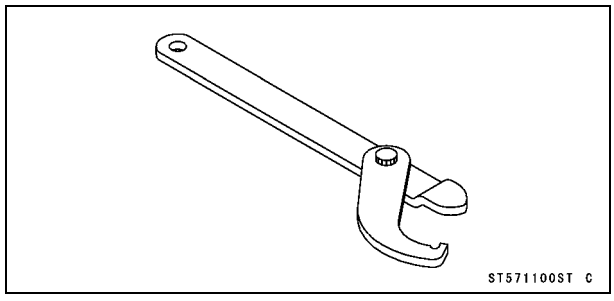
Item	Standard	Service Limit
Fuel System		
Throttle Grip Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)	– – –
Idle Speed	1 300 ±50 r/min (rpm)	– – –
Carburetor Synchronization Vacuum	Less than 2.7 kpa (2 cmHg) difference between two carburetors	– – –
Air Cleaner Element	Polyurethane foam	– – –
Cooling System		
Coolant:		
Type (Recommended)	Permanent type antifreeze	– – –
Color	Green	– – –
Mixed Ratio	Soft water 50%, coolant 50%	– – –
Freezing Point	–35°C (–31°F)	– – –
Capacity	1.5 L (1.59 US qt)	– – –
Engine Top End		
Valve Clearance:		
Inlet	0.15 ~ 0.24 mm (0.0059 ~ 0.0094 in.)	– – –
Exhaust	0.22 ~ 0.29 mm (0.0087 ~ 0.0114 in.)	– – –
Clutch		
Clutch Lever Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)	– – –
Engine Lubrication System		
Engine Oil:		
Grade	API SE, SF or SG API SH, SJ or SL with JASO MA	– – –
Viscosity	SAE 10W-40	– – –
Capacity	1.3 L (1.4 US qt) (when filter is not removed) 1.6 L (1.7 US qt) (when filter is removed)	– – –
Level	Between upper and lower level lines (Wait 2 ~ 3 minutes after idling or running)	– – –
Wheels/Tires		
Tread Depth:		
Front:		
BRIDGESTONE	4.6 mm (0.181 in.)	1 mm (0.04 in.)
DUNLOP	4.5 mm (0.177 in.)	
Rear:		
BRIDGESTONE	7.0 mm (0.276 in.)	2 mm (0.08 in.) up to 130 km/h (80 mph) 3 mm (0.12 in.) over 130 km/h (80 mph)
DUNLOP	7.4 mm (0.291 in.)	
Air pressure: (when Cold)		
Front	Up to 170 kg (375 lb) load: 200 kPa (2.0 kgf/cm², 28 psi)	– – –
Rear	Up to 170 kg (375 lb) load: 225 kPa (2.25 kgf/cm², 32 psi)	– – –
Final Drive		
Drive Chain Slack	20 ~ 30 mm (0.8 ~ 1.2 in.)	– – –

Specifications

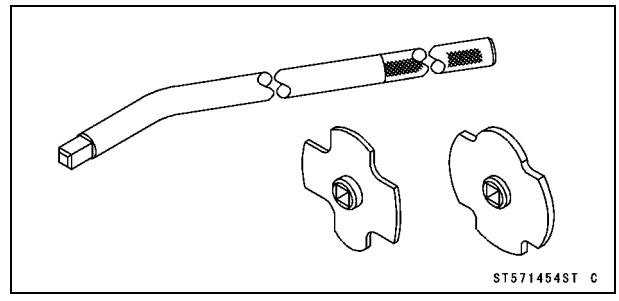
Item	Standard	Service Limit
Brakes		
Brake Fluid:		
Grade	DOT4	– – –
Brake Pad Lining Thickness:	4.5 mm (0.18 in.)	1 mm (0.04 in.)
Brake Light Timing:		– – –
Front	Pulled ON	
Rear	ON after 10 mm (0.39 in.) of pedal travel	
Electrical System		
Type	CR8E, U24ESR-N	– – –

Special Tools

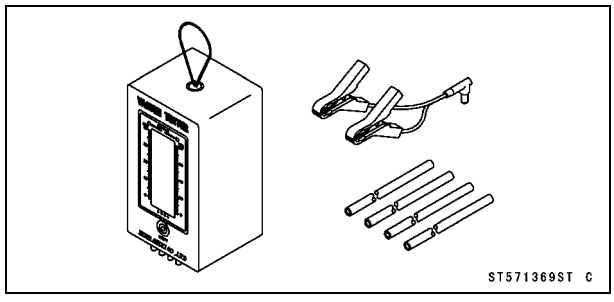
Steering Stem Nut Wrench:
57001-1100



Filler Cap Driver:
57001-1454



Vacuum Gauge KEK-55-5:
57001-1369

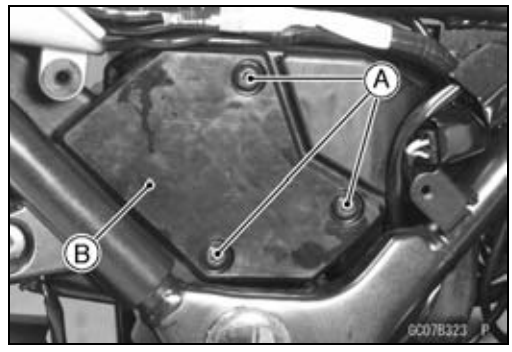


Periodic Maintenance Procedures

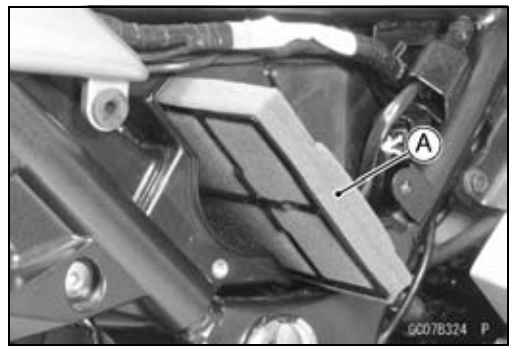
Fuel System

Air Cleaner Element Cleaning

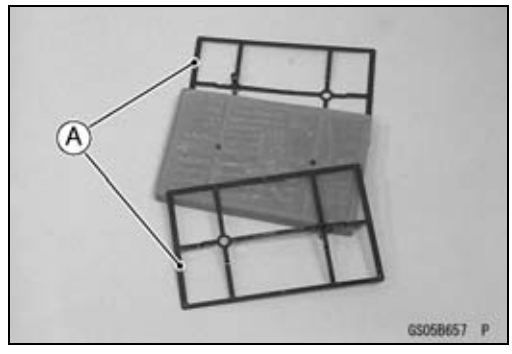
- Remove:
  Right Side Cover (see Side Cover Removal in the Frame chapter)
  Air Cleaner Cap Bolts [A]
  Air Cleaner Cap [B]



- Pull out the air cleaner element [A].



- Separate the plastic holders [A].



⚠ WARNING

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

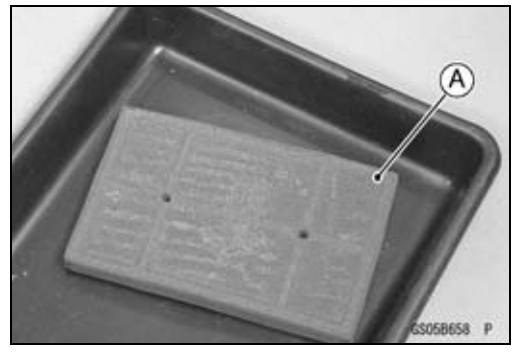
CAUTION

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

Periodic Maintenance Procedures

⚠ WARNING

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



- Clean the element [A] in a bath of high-flash point solvent, and then dry it with compressed air or by shaking it.
- After cleaning, saturate a clean, lint-free towel with SE, SF, or SG class SAE 30 oil and apply the oil to the element by tapping the element outside with the towel.
- Visually check the element for tears or breaks.
- If the element has any tears or breaks, replace the element.

Air Cleaner Element Installation

- Install the removed parts in reverse of removal.
- Torque the air cleaner cap bolts.

Torque - Air Cleaner Cap Bolts: 2.5 N·m (0.25 kgf·m, 22 in·lb)

Throttle Control System Inspection

- Check that the throttle grip moves smoothly from full open to close [A], and the throttle closes quickly and completely by the return spring in all steering positions.

★If the throttle grip doesn't return properly, check the throttle cable routing, grip free play, and cable damage. Then lubricate the throttle cable.

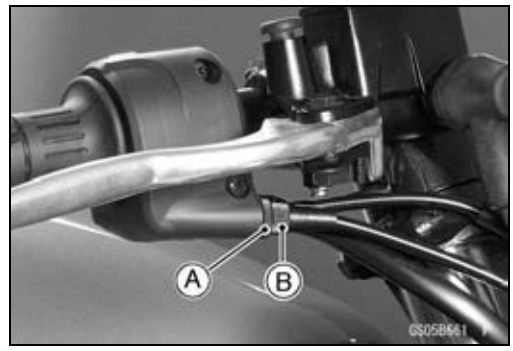
- Check the throttle grip free play [A].

★If the free play is incorrect, adjust the throttle cable.

Throttle Grip Free Play
Standard: 2 ~ 3 mm (0.08 ~ 0.12 in.)

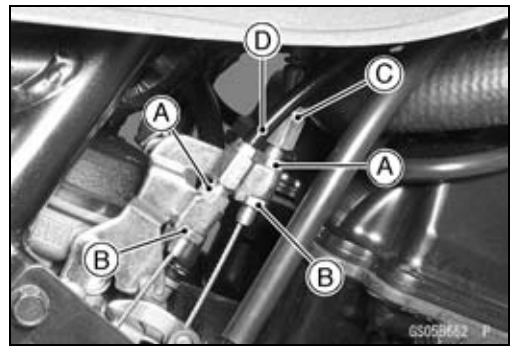
Periodic Maintenance Procedures

- Loosen the locknut [A], and screw accelerator cable adjuster [B] in completely so as to give the throttle grip plenty of play.
- Turn the accelerator cable adjuster until 2 ~ 3 mm (0.08 ~ 0.12 in.) of throttle grip play is obtained.
- Tighten the locknut.

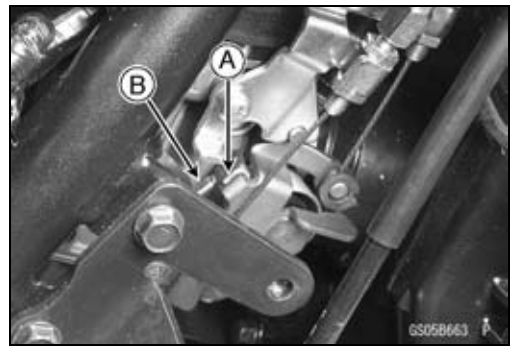


★If the throttle cables can not be adjusted by using the cable adjuster at the upper end of the throttle cable, use the cable adjusters at the lower ends of the throttle cables.

- Remove:
  Side Cover (see Side Cover Removal in the Frame chapter)
  Right Lower Fairing (see Lower Fairing Removal in the Frame chapter)
- To make service easy, unscrew the reserver tank bolts and remove the reserver tank with hoses
- Turn out both upper nuts [A] and turn in both lower nuts [B] as far as they will go so as to give the throttle grip plenty of play.
- With the throttle grip completely closed, turn out the lower nut and turn in the upper nut of the decelerator cable [C] until the inner cable just becomes tight.
- Turn out the lower nut and turn in the upper nut of the accelerator cable [D] until the correct free play is obtained.

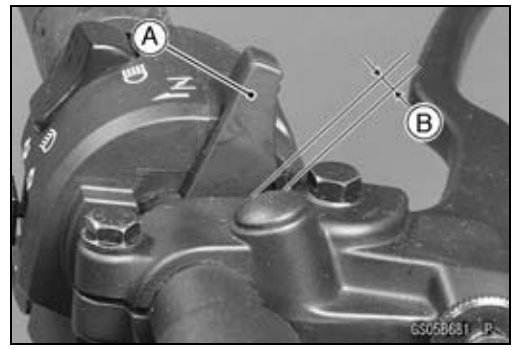


- Check that the throttle linkage lever [A] stops against the idle adjusting screw [B] with the throttle grip closed.



Periodic Maintenance Procedures

Choke Operation Inspection

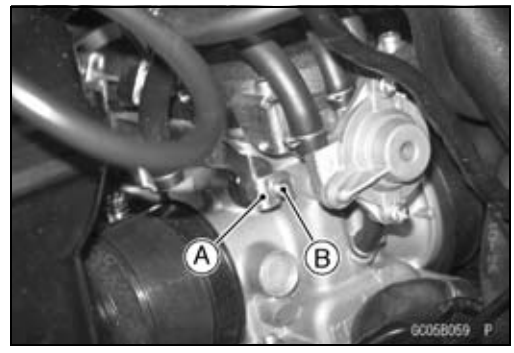


- Remove:
  Front Seat (see Front Seat Removal in the Frame chapter)
  Fuel Tank (see Fuel Tank Removal)
  Side Covers (see Side Cover Removal in the Frame chapter)
  Lower Fairings (see Lower Fairing Removal in the Frame chapter)
  Fuel Tank (see Fuel Tank Removal)
- Push the choke lever [A] back all the way to its released position.
- Check choke cable free play [B].

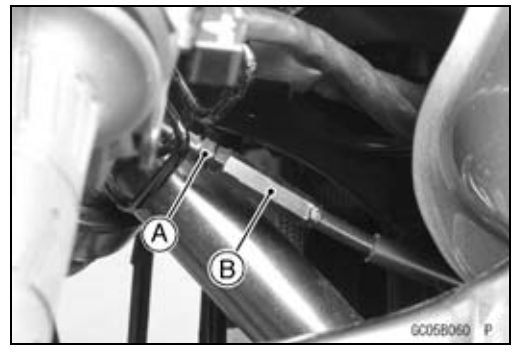
○Determine the amount of choke cable play at the choke lever.

★If the free play is incorrect, adjust the choke cable.

Choke Cable Free Play
Standard: 2 ~ 3 mm (0.08 ~ 0.12 in.)

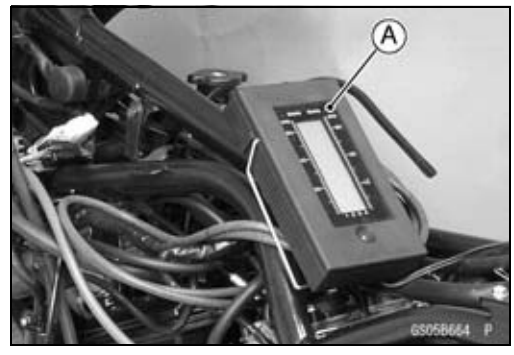


- Push the choke lever back all the way to its released position.
- Pull the choke lever until the starter plunger lever [A] at the carburetor touches the starter plunger [B]; the amount of choke lever travel is the amount of choke cable play.



- Loosen the locknut [A], and turn the adjuster [B] until the cable has the proper amount of free play.
- Tighten the locknut securely.

Engine Vacuum Synchronization Inspection



- Situate the motorcycle using the center stand so that it is perpendicular to the ground.
- Remove the fuel tank, and connect the sub-fuel tank to supply the fuel.
- Remove the right lower fairing.
- Warm up the engine.
- Check the idle speed and adjust if necessary.
- Pull the vacuum hoses off, and attach vacuum gauge [A] to the vacuum hose fittings on the carburetors.

Special Tool - Vacuum Gauge KEK-55-5: 57001-1369

Periodic Maintenance Procedures

- Start the engine and let it idle to measure the carburetor intake vacuum.

★If the intake vacuum difference between the two cylinders exceeds the limit, adjust the synchronization.

Engine Vacuum Synchronization
Less than 2.7 kPa (2 cmHg) difference between both cylinders

- Turn the adjusting screw [A] to synchronize the carburetor.

★If the carburetor synchronization cannot be obtained by using the adjusting screw, check for dirt or blockage, and then check the pilot screw settings.

- Check the Carburetor Synchronization again.

NOTE

○*Do not turn the pilot screws carelessly during carburetor synchronization. You may cause poor running at low engine speed.*

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 Throttle Control System Inspection or 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 idle speed.

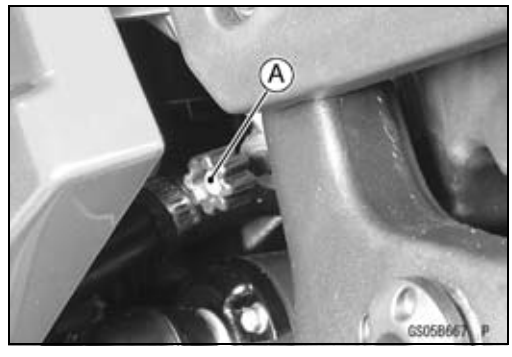
★If the idle speed is out of the specified range, adjust it.

Idle Speed
Standard: 1 300 ±50 r/min (rpm)

Idle Speed Adjustment

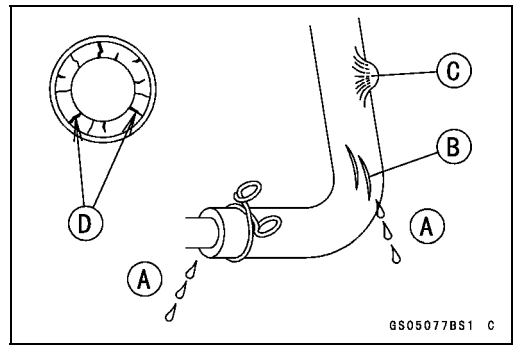
- Start the engine and warm it up thoroughly.
- Turn the adjusting screw [A] until the idle speed is correct.

○Open and close the throttle a few times to make sure that the idle speed is within the specified range. Readjust if necessary.



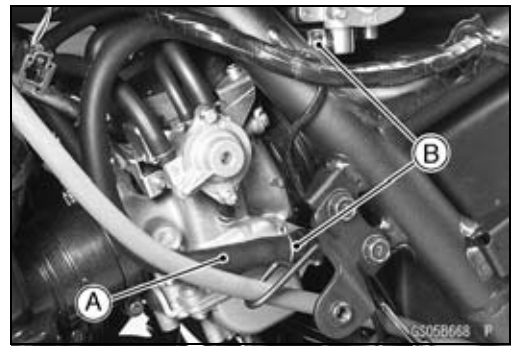
Periodic Maintenance Procedures

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



○The fuel hose is designed to be used throughout the motorcycle's life without any maintenance. However, if the motorcycle is not properly handled, the high pressure inside the fuel line can cause fuel to leak [A] or the hose to burst. Remove the fuel tank (see Fuel Tank Removal in the Fuel System chapter) and check the fuel hose.

★Replace the fuel hose if any fraying, cracks [B], bulges [C] or ozone cracks [D] are noticed.



● Check that the hose [A] are securely connected and clamps [B] are tightened correctly.

● 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.

Evaporative Emission Control System (California Model)

Evaporative Emission Control System Inspection

● Inspect the canister as follows.

○Remove:

Left Lower Fairing (see Lower Fairing 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

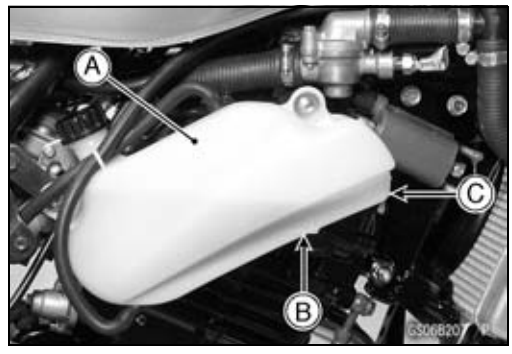
○*The canister is designed to work well through the motorcycle's life without any maintenance if it is used under normal conditions.*

Periodic Maintenance Procedures

● Check the liquid/vapor separator as follows.
○Remove:
Left Lower Fairing (see Lower Fairing Removal in the Frame chapter)
○Disconnect the hoses from the separator, and remove the separator [B] 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.

Cooling System

Coolant Level Inspection



NOTE

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

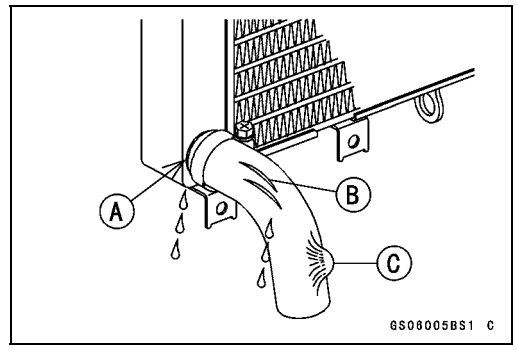
● Check the coolant level in the reserve tank [A] with the motorcycle held perpendicular (Do not use the sidestand).
★If the coolant level is lower than the “L” level line [B], remove the right center fairing (see Center Fairing Removal in the Frame chapter) and unscrew the reserve tank cap, and add 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.

Periodic Maintenance Procedures

Radiator Hose Damage and Installation Condition Inspection



○The high pressure inside the radiator hose and pipe can cause coolant to leak [A] or the hose to burst if the line is not properly maintained.

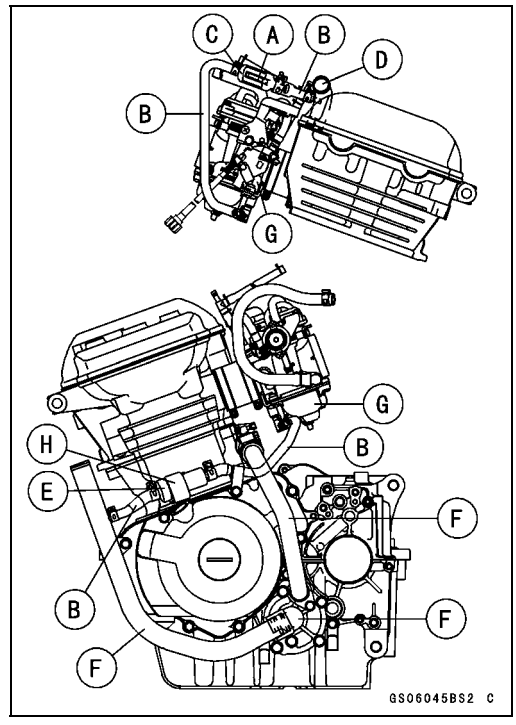
- Visually inspect the hoses for signs of deterioration. Squeeze the hoses. A hose should not be hard and brittle, nor should it be soft or swollen.

★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 - Radiator Hose Clamp Screws: 1.5 N·m (0.15 kgf·m, 13 in·lb)

Coolant Filter Cleaning (Australia Model)

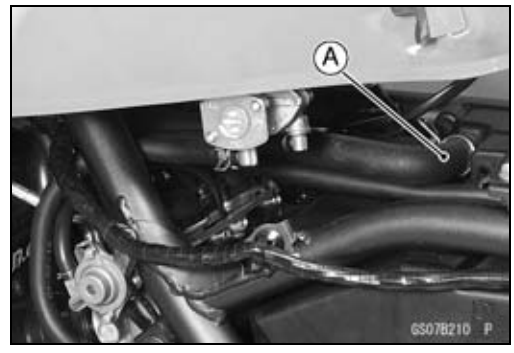


- Remove the fuel tank (see Fuel Tank Removal in the Fuel System chapter).
- Drain the coolant (see Coolant Change).
- Remove the filter [A] from the water hoses [B] of carburetor system.
- Blow off dirt and sediment on the filter with compressed air.

Filter Body [C]
Water Pipe [D]
Coolant Valve Assy [E]
Water Pump [F]
Carburetor [G]
Damper [H]

Air Suction System

Air Suction System Damage Inspection

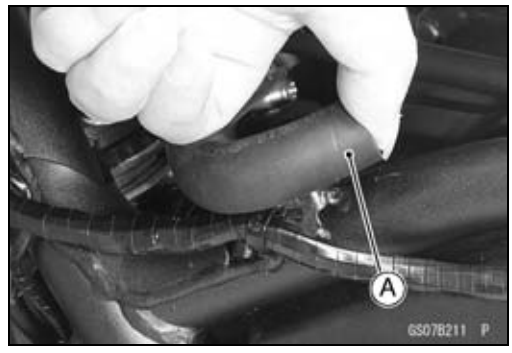


- Pull the vacuum switch valve hose [A] out of the air cleaner.

Periodic Maintenance Procedures

- Start the engine and run it at idle speed.
- Plug [A] the vacuum switch 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 vacuum switch valve or air suction valve (see Engine Top End chapter).



Engine Top End

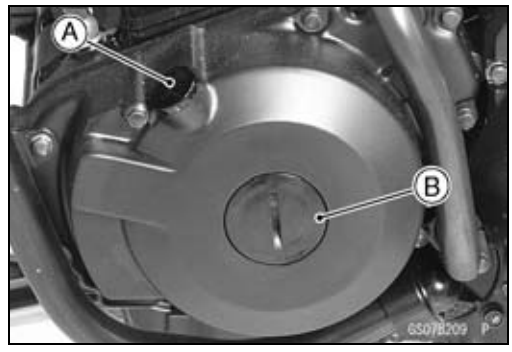
Valve Clearance Inspection

NOTE

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

- Remove:
  Cylinder Head Cover (see Cylinder Head Cover Removal in the Engine Top End chapter)
  Left Lower Fairing (see Lower Fairing Removal in the Frame chapter)
- Unscrew the two plugs [A], [B] on the alternator cover.

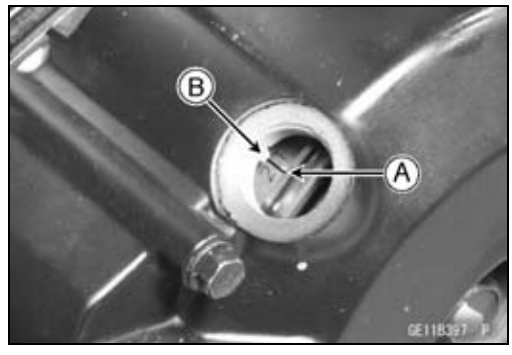
Special Tool - Filler Cap Driver: 57001-1454



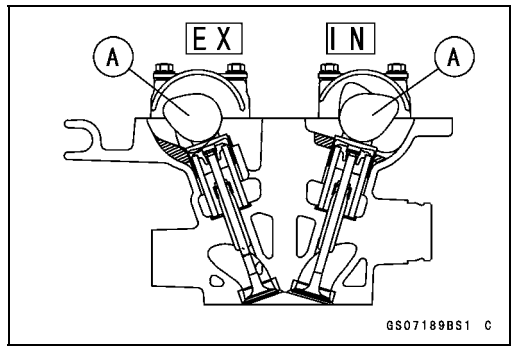
- Check the valve clearance when the pistons are at TDC.

○The pistons are numbered beginning with the engine left side.

- Using a wrench on the crankshaft rotation bolt, turn the crankshaft clockwise until the "2/T" [A] mark on the timing rotor is aligned with the projection [B] in the inspection window on the alternator cover.



○Measure the valve clearance of the valves for which the cam [A] are turned away from each other.



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