

MODEL APPLICATION

Year	Model	Beginning Frame No.
2005	ZX636-C1	JKBZXJC1□5A000001 JKBZX636CCA000001 ZX636C-000001

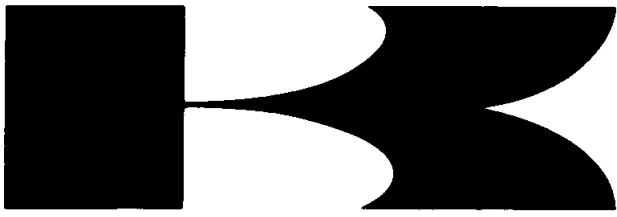
□:This digit in the frame number changes from one machine to another.



KAWASAKI HEAVY INDUSTRIES, LTD.
Consumer Products & Machinery Company

Part No.99924-1345-02

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)		

Read OWNER'S MANUAL before operating.

Foreword

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

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

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

To get the longest life out of your vehicle.

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

How to Use This Manual

In preparing this manual, we divided the product into its major systems. These systems became the manual's chapters. All information for a particular system from adjustment through disassembly and inspection is located in a single chapter.

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.

The Periodic Maintenance Chart is located in the Periodic Maintenance chapter. The chart gives a time schedule for required maintenance operations.

If you want spark plug information, for example, go to the Periodic Maintenance Chart first. The chart tells you how frequently to clean and gap the plug. Next, use the Quick Reference Guide to locate the Periodic Maintenance chapter. Then, use the Table of Contents on the first page of the chapter to find the Spark Plug section.

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

WARNING

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

CAUTION

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

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

NOTE

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

● Indicates a procedural step or work to be done.

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

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

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

General Information

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1-2 GENERAL INFORMATION

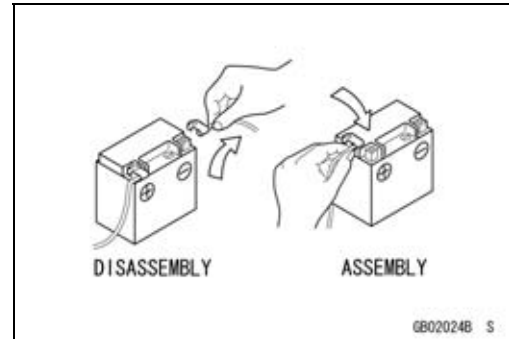
Before Servicing

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

Especially note the following.

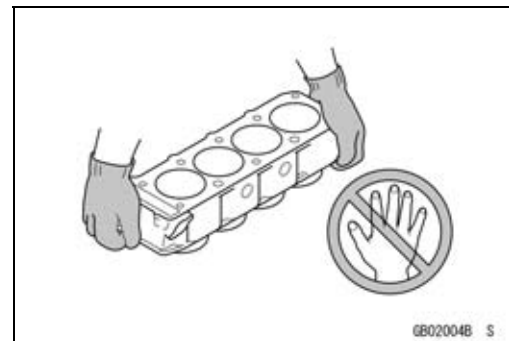
Battery Ground

Before completing any service on the motorcycle, disconnect the battery 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.



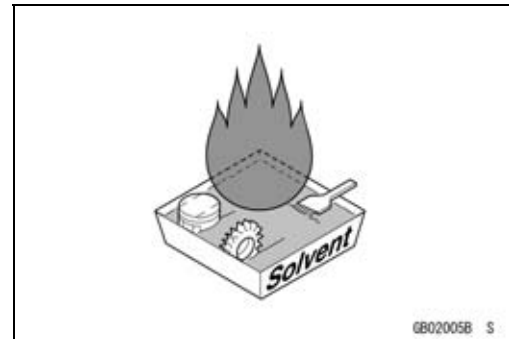
Edges of Parts

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



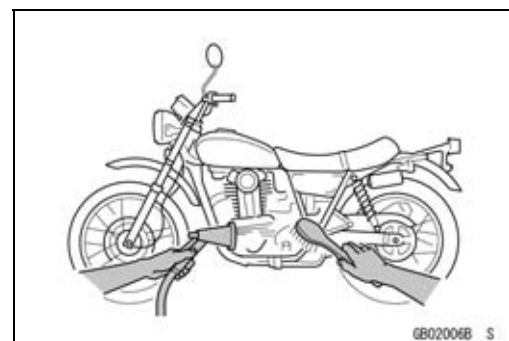
Solvent

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

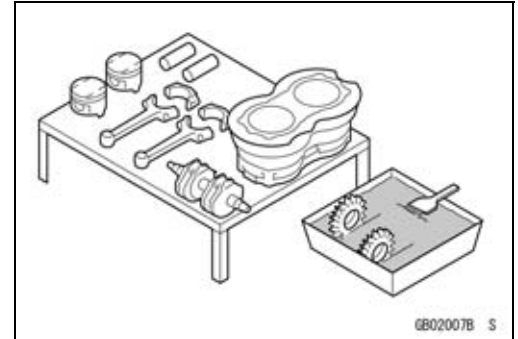
Clean the vehicle thoroughly before disassembly. Dirt or other foreign materials entering into sealed areas during vehicle disassembly can cause excessive wear and decrease performance of the vehicle.



Before Servicing

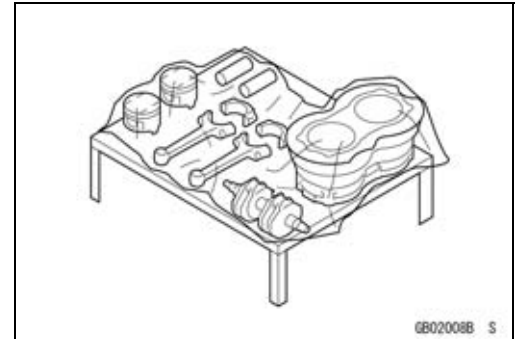
Arrangement and Cleaning of Removed Parts

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.



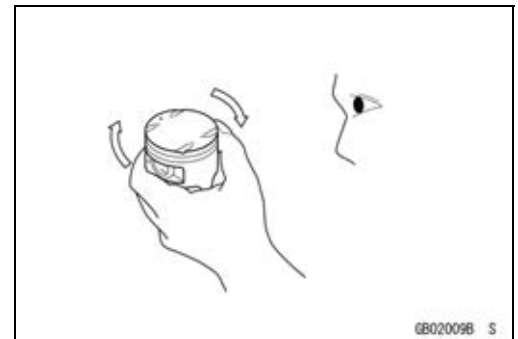
Storage of Removed Parts

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.



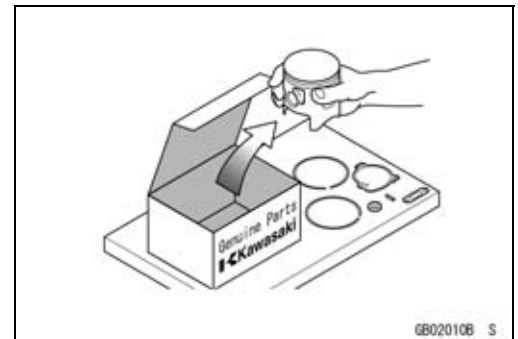
Inspection

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.



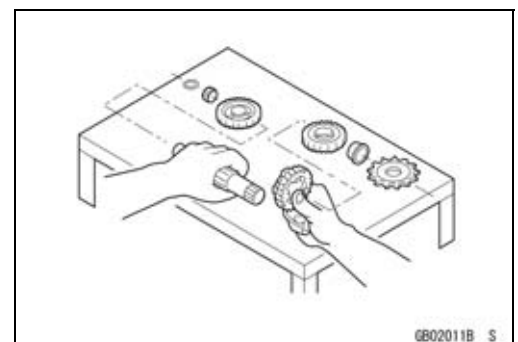
Replacement Parts

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.

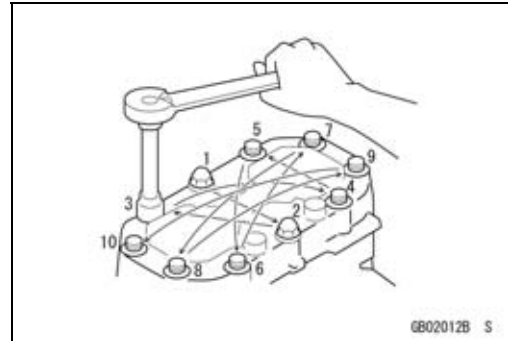


1-4 GENERAL INFORMATION

Before Servicing

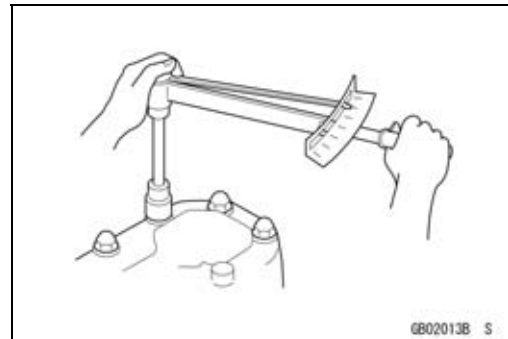
Tightening Sequence

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.



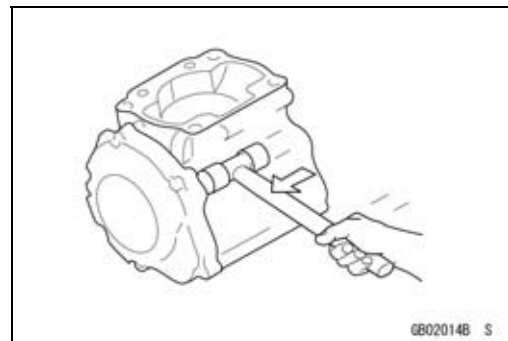
Tightening Torque

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.



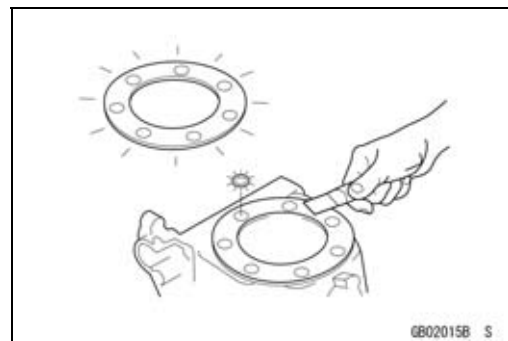
Force

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

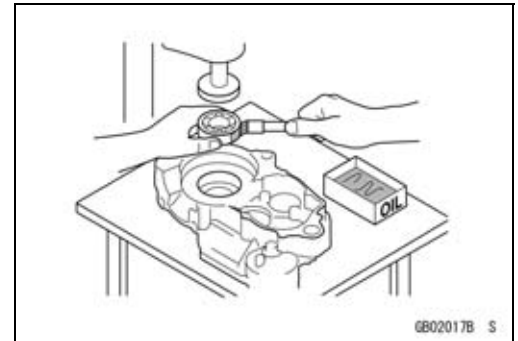
For applications that require Liquid Gasket or a Non-permanent Locking Agent, clean the surfaces so that no oil residue remains before applying liquid gasket or non-permanent locking agent. Do not apply them excessively. Excessive application can clog oil passages and cause serious damage.



Before Servicing

Press

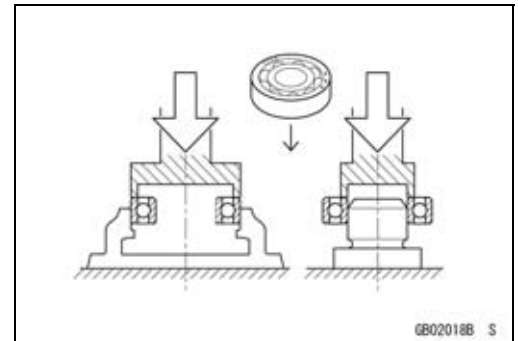
For items such as bearings or oil seals that must be pressed into place, apply small amount of oil to the contact area. Be sure to maintain proper alignment and use smooth movements when installing.



Ball Bearing and Needle Bearing

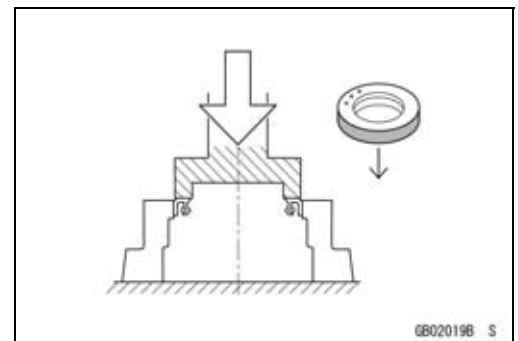
Do not remove pressed ball or needle unless removal is absolutely necessary. Replace with new ones whenever removed. Press bearings with the manufacturer and size marks facing out. Press the bearing into place by putting pressure on the correct bearing race as shown.

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

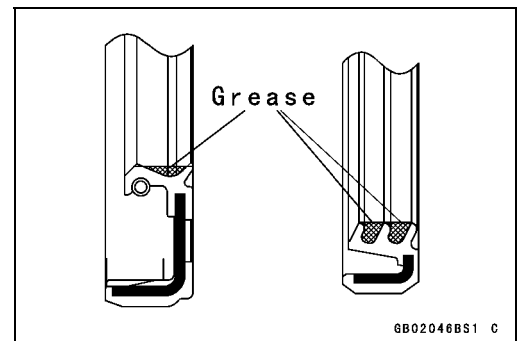


Oil Seal, Grease Seal

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.

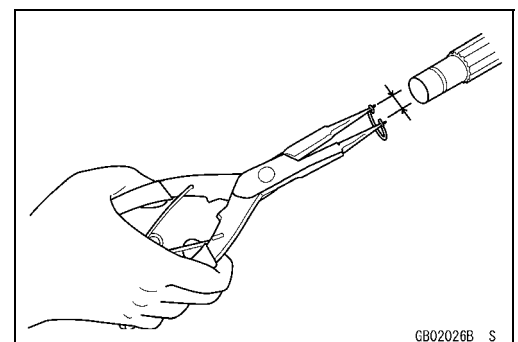


Apply specified grease to the lip of seal before installing the seal.



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.

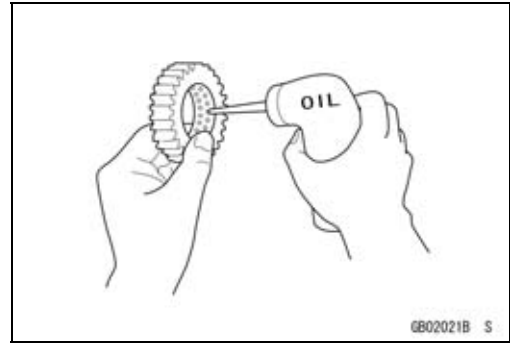


1-6 GENERAL INFORMATION

Before Servicing

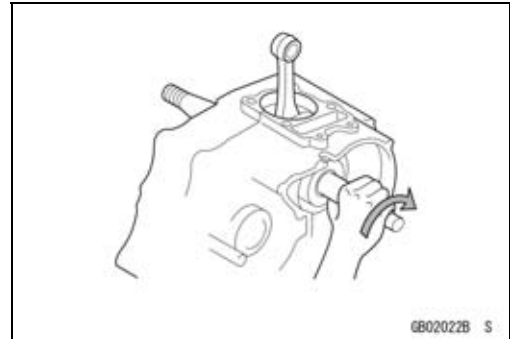
Lubrication

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.



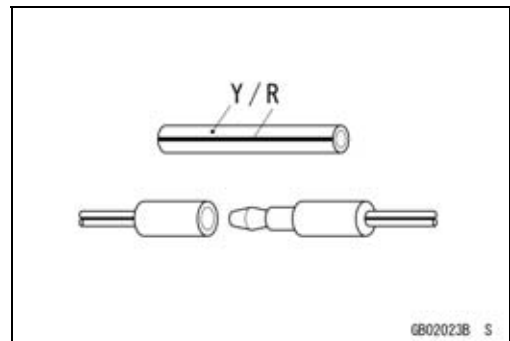
Direction of Engine Rotation

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.



Model Identification

ZX636-C1 (Europe) Left Side View



ZX636-C1 (Europe) Right Side View



1-8 GENERAL INFORMATION

Model Identification

ZX636-C1 (US and Canada) Left Side View



ZX636-C1 (US and Canada) Right Side View



General Specifications

Items	ZX636-C1 (Ninja ZX-6R)
Dimensions	
Overall Length	2 065 mm (81.3 in.)
Overall Width	715 mm (28.1 in.)
Overall Height	1 110 mm (43.7 in.)
Wheelbase	1 390 mm (54.7 in.)
Road Clearance	120 mm (4.7 in.)
Seat Height	820 mm (32.3 in.)
Dry Mass	164 kg (362 lb)
Curb Mass:	
Front	95 kg (209 lb)
Rear	97 kg (214 lb)
Fuel Tank Capacity	17 L (4.5 US gal)
Performance	
Minimum Turning Radius	3.3 m (10.8 ft)
Engine	
Type	4-stroke, DOHC, 4-cylinder
Cooling System	Liquid-cooled
Bore and Stroke	68.0 × 43.8 mm (2.7 × 1.7 in.)
Displacement	636 mL (38.8 cu in.)
Compression Ratio	12.9 : 1
Maximum Horsepower	95.5 kW (130 PS) @14 000 r/min (rpm), (FR) 78.2 kW (106 PS) @13 000 r/min (rpm), (MY) 90.8 kW (123 PS) @12 500 r/min (rpm), (CA), (CAL), (US) — — —
Maximum Torque	70.5 N·m (7.1 kgf·m, 52 ft·lb) @11 500 r/min (rpm), (FR) 63 N·m (6.4 kgf·m, 46 ft·lb) @11 500 r/min (rpm), (CA), (CAL), (US) — — —
Carburetion System	FI (Fuel injection) Primary: KEIHIN TTK 38 × 4 Secondary: KEIHIN Multihole (3 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) to 35° BTDC @4 600 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	59° BTDC
Close	81° ABDC
Duration	320°
Exhaust:	
Open	61° BBDC
Close	31° ATDC

1-10 GENERAL INFORMATION

General Specifications

Items	ZX636-C1 (Ninja ZX-6R)
Duration	272°
Lubrication System	Forced lubrication (wet sump with cooler)
Engine Oil:	
Type	API SE, SF or SG API SH or SJ with JASO MA
Viscosity	SAE10W-40
Capacity	4.0 L (4.2 US qt)
Drive Train	
Primary Reduction System:	
Type	Gear
Reduction Ratio	1.891 (87/46)
Clutch Type	Wet multi disc
Transmission:	
Type	6-speed, constant mesh, return shift
Gear Ratios:	
1st	2.923 (38/13)
2nd	2.055 (37/18)
3rd	1.666 (35/21)
4th	1.450 (29/20)
5th	1.272 (28/22)
6th	1.153 (30/26)
Final Drive System:	
Type	Chain drive
Reduction Ratio	2.866 (43/15)
Overall Drive Ratio	6.255 @Top gear
Frame	
Type	Tubular, diamond
Caster (Rake Angle)	25°
Trail	106 mm (4.2 in.)
Front Tire:	
Type	Tubeless
Size	120/65 ZR17 M/C (56 W)
Rear Tire:	
Type	Tubeless
Size	180/55 ZR17 M/C (73 W)
Front Suspension:	
Type	Telescopic fork (upside-down)
Wheel Travel	120 mm (4.7 in.)
Rear Suspension:	
Type	Swingarm (uni-trak)
Wheel Travel	135 mm (5.3 in.)
Brake Type:	
Front	Dual discs
Rear	Single disc

General Specifications

Items	ZX636-C1 (Ninja ZX-6R)
Electrical Equipment	
Battery	12 V 8 Ah
Headlight:	
Type	Semi-sealed beam
Bulb:	
High	12 V 55 W (quartz-halogen) × 2
Low	12 V 55 W (quartz-halogen)
Tail/Brake Light	12 V 0.5/4.1 W (LED)
Alternator:	
Type	Three-phase AC
Rated Output	22.5 A/14 V @5 000 r/min (rpm)

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

CA: Canada Model

CAL: California Model

FR: France Model

MY: Malaysia Model

US: United States Model

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
kg	×	9.807	=	N
kg	×	2.205	=	lb

Units of Length

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

Units of Torque

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

Units of Pressure

kPa	×	0.01020	=	kgf/cm ²
kPa	×	0.1450	=	psi
kPa	×	0.7501	=	cmHg
kgf/cm ²	×	98.07	=	kPa
kgf/cm ²	×	14.22	=	psi
cmHg	×	1.333	=	kPa

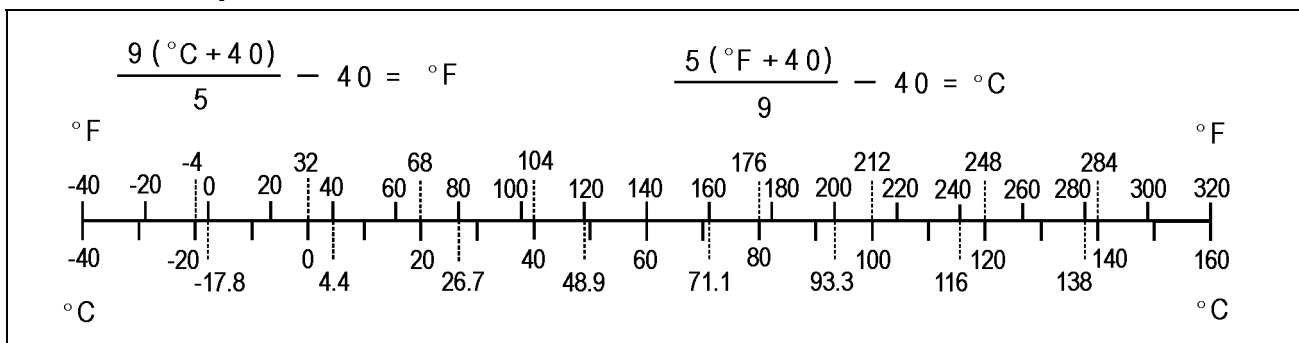
Units of Speed

km/h	×	0.6214	=	mph
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Units of Power

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

Units of Temperature



Periodic Maintenance

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PERIODIC MAINTENANCE 2-3

Periodic Maintenance Chart (United States, Canada Model)

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							See Page
	Whichever comes first ↓ Every	1 (0.6)	6 (4)	12 (7.5)	18 (12)	24 (15)	30 (20)	36 (24)	
Fuel System									
Throttle control system (play, smooth return, no drag)-inspect	year	•		•		•		•	2-18
Engine vacuum synchronization-inspect				•		•		•	2-18
Idle speed-inspect		•		•		•		•	2-22
Fuel leak (fuel hose and pipe)-inspect	year	•		•		•		•	2-22
Fuel hose and pipe damage-inspect	year	•		•		•		•	2-22
Fuel hose and pipe installation condition-inspect	year	•		•		•		•	2-22
Evaporative Emission Control System (CAL)									
Evaporative emission control system function-inspect		•	•	•	•	•	•	•	2-23
Cooling System									
Coolant level-inspect		•		•		•		•	2-24
Coolant leak (radiator hose and pipe)-inspect	year	•		•		•		•	2-24
Radiator hose damage-inspect	year	•		•		•		•	2-24
Radiator hose installation condition-inspect	year	•		•		•		•	2-24
Engine Top End									
Valve clearance-inspect						•			2-25
Air Suction System									
Air suction system damage-inspect				•		•		•	2-29
Clutch									
Clutch operation (play, disengagement, engagement)-inspect		•		•		•		•	2-29
Wheels and Tires									
Tire air pressure-inspect	year			•		•		•	2-30
Wheel/tire damage-inspect				•		•		•	2-30
Tire tread wear, abnormal wear-inspect				•		•		•	2-30
Wheel bearing damage-inspect	year			•		•		•	2-31
Drive Train									
Drive chain lubrication condition-inspect #	Every 600 km (400 mile)								2-32
Drive chain slack-inspect #	Every 1 000 km (600 mile)								2-32
Drive chain wear-inspect #				•		•		•	2-34
Drive chain guide wear-inspect				•		•		•	2-35

2-4 PERIODIC MAINTENANCE

Periodic Maintenance Chart (United States, Canada Model)

INSPECTION	FREQUENCY	Whichever comes first ↓	* ODOMETER READING × 1 000 km (× 1 000 mile)						See Page
			1 (0.6)	6 (4)	12 (7.5)	18 (12)	24 (15)	30 (20)	
Brake System									
Brake fluid leak (brake hose and pipe)-inspect	year	•	•	•	•	•	•	•	2-35
Brake hose and pipe damage-inspect	year	•	•	•	•	•	•	•	2-35
Brake pad wear-inspect #			•	•	•	•	•	•	2-36
Brake hose installation condition-inspect	year	•	•	•	•	•	•	•	2-35
Brake fluid level-inspect	6 months	•	•	•	•	•	•	•	2-36
Brake operation (effectiveness, play, no drag)-inspect	year	•	•	•	•	•	•	•	2-35
Brake light switch operation-inspect		•	•	•	•	•	•	•	2-36
Suspensions									
Front forks/rear shock absorber operation (damping and smooth stroke)-inspect				•		•		•	2-37
Front forks/rear shock absorber oil leak-inspect	year			•		•		•	2-38
Rocker arm operation-inspect				•		•		•	2-38
Tie-Rods operation-inspect				•		•		•	2-38
Steering System									
Steering play-inspect	year	•		•		•		•	2-39
Steering stem bearings-lubricate	2 years					•			2-40
Electrical System									
Spark plug condition – inspect				•		•		•	2-40
Lights and switches operation-inspect	year			•		•		•	2-42
Headlight aiming-inspect	year			•		•		•	2-44
Side stand switch operation-inspect	year			•		•		•	2-45
Engine stop switch operation-inspect	year			•		•		•	2-46
Others									
Chassis parts-lubricate	year			•		•		•	2-47
Bolts and nuts tightness-inspect		•		•		•		•	2-48

*: 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 (United States, Canada Model)

Periodic Replacement Parts

CHANGE/REPLACE ITEM	FREQUENCY	* ODOMETER READING × 1 000 km (× 1 000 mile)					See Page
		Whichever come first ↓ Every	1 (0.6)	12 (7.5)	24 (15)	36 (24)	
Air cleaner element #		Every 18 000 km (12 000 mile)					2-50
Fuel hose	4 years					●	2-50
Coolant	3 years				●		2-52
Radiator hose and O-ring	3 years				●		2-54
Engine oil #	year	●	●	●	●	●	2-55
Oil filter	year	●	●	●	●	●	2-55
Brake hose and pipe	4 years					●	2-56
Brake fluid	2 years			●		●	2-56
Rubber parts of master cylinder and caliper	4 years					●	2-58, 2-59
Spark plug			●	●	●	●	2-62

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

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

PERIODIC MAINTENANCE 2-7

Periodic Maintenance Chart (Other than United States, Canada Model)

FREQUENCY	Whichever comes first ↓	* 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)	
INSPECTION	Every								
Brake hose and pipe damage-inspect	year	•	•	•	•	•	•	•	2-35
Brake pad wear-inspect #			•	•	•	•	•	•	2-36
Brake hose installation condition-inspect	year	•	•	•	•	•	•	•	2-35
Brake fluid level-inspect	6 months	•	•	•	•	•	•	•	2-36
Brake operation (effectiveness, play, no drag)-inspect	year	•	•	•	•	•	•	•	2-35
Brake light switch operation-inspect		•	•	•	•	•	•	•	2-36
Suspensions									
Front forks/rear shock absorber operation (damping and smooth stroke)-inspect				•		•		•	2-37
Front forks/rear shock absorber oil leak-inspect	year			•		•		•	2-38
Rocker arm operation-inspect				•		•		•	2-38
Tie-Rods operation-inspect				•		•		•	2-38
Steering System									
Steering play-inspect	year	•		•		•		•	2-39
Steering stem bearings-lubricate	2 years					•			2-40
Electrical System									
Spark plug condition – inspect				•		•		•	2-40
Lights and switches operation-inspect	year			•		•		•	2-42
Headlight aiming-inspect	year			•		•		•	2-44
Side stand switch operation-inspect	year			•		•		•	2-45
Engine stop switch operation-inspect	year			•		•		•	2-46
Others									
Chassis parts-lubricate	year			•		•		•	2-47
Bolts and nuts tightness-inspect		•		•		•		•	2-48

*: 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.

2-8 PERIODIC MAINTENANCE

Periodic Maintenance Chart (Other than United States, Canada Model)

Periodic Replacement Parts

FREQUENCY	Whichever come first ↓	* ODOMETER READING × 1 000 km (× 1 000 mile)					See Page
		1 (0.6)	12 (7.5)	24 (15)	36 (24)	48 (30)	
CHANGE/REPLACE ITEM	Every						
Air cleaner element #	Every 18 000 km (12 000 mile)						2-50
Fuel hose	4 years					●	2-50
Coolant	3 years				●		2-52
Radiator hose and O-ring	3 years				●		2-54
Engine oil #	year	●	●	●	●	●	2-55
Oil filter	year	●	●	●	●	●	2-55
Brake hose and pipe	4 years					●	2-56
Brake fluid	2 years			●		●	2-56
Rubber parts of master cylinder and caliper	4 years					●	2-58, 2-59
Spark plug			●	●	●	●	2-62

*: 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.

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: 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				
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	6.9	0.70	61 in·lb	L
Canister Bracket Mounting Bolt (M6)	6.9	0.70	61 in·lb	
Canister Bracket Mounting Bolt (M5)	0.4	0.04	4 in·lb	
Camshaft Position Sensor Bolt	12	1.2	104 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 Hose Mounting Screw	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	
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	104 in·lb	L
Throttle Cable Holder Bolt	3.9	0.40	35 in·lb	
Vehicle-down Sensor Bolts	5.9	0.60	52 in·lb	
Water Temperature Sensor	25	2.5	18	SS
Cooling System				
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	6.9	0.70	61 in·lb	
Impeller Bolt	9.8	1.0	87 in·lb	
Oil Cooler Mounting Bolts	12	1.2	104 in·lb	S
Radiator Bracket Mounting Bolt	6.9	0.70	61 in·lb	
Radiator Lower Bolt	6.9	0.70	61 in·lb	
Radiator Upper Bolt	12	1.2	104 in·lb	
Thermostat Housing Cover Bolts	5.9	0.60	52 in·lb	
Water Hose Clamp Screws	2.0	0.20	17 in·lb	

2-10 PERIODIC MAINTENANCE

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Water Hose Fitting Bolts	12	1.2	104 in·lb	
Water Pump Cover Bolts	12	1.2	104 in·lb	L
Water Temperature Sensor	25	2.5	18	SS
Engine Top End				
Air Suction Valve Cover Bolts	12	1.2	104 in·lb	L
Camshaft Cap Bolts	12	1.2	104 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
Coolant Drain Bolt (Cylinder)	9.8	1.0	87 in·lb	
Crankshaft Sensor Cover Bolts	9.8	1.0	87 in·lb	L (1)
Cylinder Head Bolts (M9)	39	4.0	29	MO, S
Cylinder Head Bolts (M6)	12	1.2	104 in·lb	S
Cylinder Head Cover Bolts	9.8	1.0	87 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	
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	12	
Exhaust Pipe Manifold Holder Nuts	17	1.7	12	
Exhaust Pipe Mounting Bolt	25	2.5	18	
Front Camshaft Chain Guide Bolt (Lower)	12	1.2	104 in·lb	
Front Camshaft Chain Guide Bolt (Upper)	25	2.5	18	
Muffler Body Clamp Bolt	17	1.7	12	
Muffler Body Mounting Bolts	25	2.5	18	
Muffler Rear Cover Bolts	6.9	0.70	61 in·lb	
Muffler Upper Cover Bolts	6.9	0.70	61 in·lb	
Rear Camshaft Chain Guide Bolt	25	2.5	18	
Spark Plugs	13	1.3	113 in·lb	
Throttle Body Assy Holder Clamp Bolts	2.9	0.30	26 in·lb	
Throttle Body Holder Bolts	12	1.2	104 in·lb	L
Water Passage Plug (Left)	20	2.0	15	L
Water Passage Plugs (Upper)	20	2.0	15	L
Clutch				
Clutch Cover Bolt (M6, L = 50 mm)	12	1.2	104 in·lb	
Clutch Cover Bolt (M6, L = 40 mm)	12	1.2	104 in·lb	L (1)
Clutch Cover Bolts (M6, L = 30 mm)	12	1.2	104 in·lb	L (1)
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	
Oil Filler Plug	1.5	0.15	13 in·lb	
Sub Clutch Hub Bolts	25	2.5	18	L

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Engine Lubrication System				
Coolant Drain Bolt (Water Pump)	8.8	0.90	78 in·lb	
Engine Oil Drain Bolt	29	3.0	22	
Impeller Bolt	9.8	1.0	87 in·lb	
Oil Cooler Mounting Bolts	12	1.2	104 in·lb	S
Oil Filter	31	3.2	23	EO, R
Oil Filter Mounting Bolt	25	2.5	18	L
Oil Jet Nozzle Bolts	6.9	0.70	61 in·lb	L
Oil Pan Bolts	9.8	1.0	87 in·lb	
Oil Pan Clamp Bolt	9.8	1.0	87 in·lb	
Oil Passage Plug (Left Side)	20	2.0	15	L
Oil Passage Plug (Right Side)	15	1.5	11	
Oil Pipe Bolts	12	1.2	104 in·lb	
Oil Pressure Relief Valve	15	1.5	11	L
Oil Pressure Switch	15	1.5	11	SS
Oil Pressure Switch Terminal Bolt	1.5	0.15	13 in·lb	
Water Hose Clamp Screws	2.0	0.20	17 in·lb	
Water Pump Cover Bolts	12	1.2	104 in·lb	L
Engine Removal/Installation				
Adjusting Collar Locknut	49	5.0	36	S
Lower Engine Mounting Bolt	10	1.0	87 in·lb	S
Lower Engine Mounting Nut	44	4.5	33	S
Middle Engine Mounting Bolt	10	1.0	87 in·lb	S
Middle Engine Mounting Nut	44	4.5	33	S
Upper Engine Mounting Bolts	44	4.5	33	S
Crankshaft/Transmission				
Breather Plate Bolts	5.9	0.60	52 in·lb	L
Connecting Rod Big End Nuts	see the text	←	←	←
Crankcase Bolts (M8)	31	3.2	23	MO, S
Crankcase Bolts (M7, L = 38 mm)	27	2.8	20	S
Crankcase Bolt (M7, L = 70 mm)	20	2.0	14	S
Crankcase Bolts (M6, L = 65 mm)	12	1.2	104 in·lb	S
Crankcase Bolts (M6, L = 50 mm)	12	1.2	104 in·lb	S
Crankcase Bolts (M6, L = 38 mm)	12	1.2	104 in·lb	S
Crankcase Bolt (M6, L = 95 mm)	12	1.2	104 in·lb	S
Crankcase Bolt (M6, L = 85 mm)	12	1.2	104 in·lb	S
Crankcase Bolt (M6, L = 35 mm)	12	1.2	104 in·lb	S
Neutral Switch	15	1.5	11	L
Gear Positioning Lever Bolt	12	1.2	104 in·lb	
Harness Clamp Bolt	8.8	0.90	78 in·lb	L
Oil Passage Plug (Left Side)	20	2.0	15	L
Oil Passage Plug (Right Side)	15	1.5	11	
Oil Pressure Switch	15	1.5	11	SS

2-12 PERIODIC MAINTENANCE

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Oil Pressure Switch Terminal Bolt	1.5	0.15	13 in·lb	
Plate Screws	5.9	0.60	52 in·lb	L
Shift Drum Bearing Holder Bolts	12	1.2	104 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
Tie-Rod Locknuts	6.9	0.70	61 in·lb	
Wheels/Tires				
Front Axle Clamp Bolts	20	2.0	15	AL
Front Axle Nut	127	13	94	
Rear Axle Nut	127	13	94	
Final Drive				
Engine Sprocket Cover Bolts	6.9	0.70	61 in·lb	
Engine Sprocket Nut	125	13	92	MO
Rear Axle Nut	127	13	94	
Rear Sprocket Nuts	59	6.0	43	
Brakes				
Bleed Valves	7.8	0.80	69 in·lb	
Brake Hose Banjo Bolts	34	3.5	25	
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	
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	15	1.5	11	
Front Caliper Assembly Bolts	22	2.2	16	
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	
Suspension				
Front Axle Clamp Bolts	20	2.0	15	AL
Front Fork Bottom Allen Bolts	35	3.5	26	L
Front Fork Clamp Bolts (Lower)	25	2.5	18	AL
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	

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
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	
Swingarm Pivot Adjusting Collar Locknut	98	10	72	
Swingarm Pivot Shaft Nut	108	11	81	
Tie-Rod Nuts	59	6.0	43	
Uni-Trak Rocker Arm Nut	34	3.5	25	
Steering				
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	
Frame				
Air Inlet Duct Mounting Bolts	6.9	0.70	61	L
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	59	6.0	44	L (2)
Side Stand Bolt	44	4.5	32	G
Side Stand Bracket Bolts	49	5.0	36	L
Side Stand Switch Bolt	8.8	0.90	78 in·lb	L
Side Stand Switch Bracket Bolt	3.9	0.40	35 in·lb	L
Windshield Mounting Bolts	0.4	0.04	4 in·lb	
Electrical System				
Alternator Cover Bolts	12	1.2	104 in·lb	
Alternator Lead Holding Plate Bolts	6.9	0.70	61 in·lb	L
Alternator Rotor Bolt	110	11	81	
Camshaft Position Sensor Bolt	12	1.2	104 in·lb	
Crankshaft Sensor Bolts	5.9	0.60	52 in·lb	
Crankshaft Sensor Cover Bolts	9.8	1.0	87 in·lb	L (1)
Engine Ground Lead Terminal Bolt	9.8	1.0	87 in·lb	
Front Brake Light Switch Screw	1.2	0.12	10 in·lb	
Front Turn Signal Light Lens Screws	1.0	0.10	9 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	
Neutral Switch	15	1.5	11	L
Rear Turn Signal Light Lens Screws	1.0	0.10	9 in·lb	

2-14 PERIODIC MAINTENANCE

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Rear Turn Signal Light Mounting Screws	1.2	0.12	10 in·lb	
Regulator/Rectifier Bolts	6.9	0.70	61 in·lb	
Side Stand Switch Bolt	8.8	0.90	78 in·lb	L
Side Stand Switch Bracket Bolt	3.9	0.40	35 in·lb	L
Spark Plugs	13	1.3	115 in·lb	
Speed Sensor Bolt	12	1.2	104 in·lb	
Stator Coil Bolts	12	1.2	104 in·lb	L
Starter Motor Cable Terminal Bolt	2.7	0.28	24 in·lb	
Starter Motor Clutch Bolts	34	3.5	25	L
Starter Motor Mounting Bolts	11	1.1	97 in·lb	
Starter Relay Cable Terminal Bolts	3.9	0.40	35 in·lb	
Switch Housing Screws	3.5	0.36	31 in·lb	
Tail/Brake Light Mounting Screws	4.0	0.40	35 in·lb	
Timing Rotor Bolt	45	4.5	33	
Vehicle-down Sensor Bolts	5.9	0.60	52 in·lb	
Water Temperature Sensor	25	2.5	18	SS

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

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)	---
Throttle Body Vacuum	27.3 ±1.3 kPa (205 ±10 mmHg) at idle speed	---
Air Cleaner Element	Viscous paper element	---
Cooling System		
Coolant:		
Type (Recommended)	Permanent type antifreeze	---
Color	Green	---
Mixed Ratio	Soft water 50%, coolant 50%	---
Freezing Point	-35°C (-31°F)	---
Total Amount	2.6 L (2.7 US qt)	---
Engine Top End		
Valve Clearance:		
Exhaust	0.22 ~ 0.31 mm (0.0087 ~ 0.0122 in.)	---
Inlet	0.11 ~ 0.19 mm (0.0043 ~ 0.0075 in.)	---
Clutch		
Clutch Lever Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)	---
Engine Lubrication System		
Engine Oil:		
Type	API SE, SF or SG API SH or SJ with JASO MA	---
Viscosity	SAE 10W-40	---
Capacity	3.4 L (3.6 US qt) (when filter is not removed)	---
	3.6 L (3.8 US qt) (when filter is removed)	---
	4.0 L (4.2 US qt) (when engine is completely dry)	---
Level	Between upper and lower level lines (Wait 2 ~ 3 minutes after idling or running)	---
Tires		
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: 5.8 mm (0.23 in.)	Up to 130 km/h (80 mph): 2 mm (0.08 in.), Over 130 km/h (80 mph): 3 mm (0.12 in.)
Air Pressure (when Cold):		
Front	Up to 180 kg (397 lb) load: 250 kPa (2.5 kgf/cm ² , 36 psi)	---
Rear	Up to 180 kg (397 lb) load: 290 kPa (2.9 kgf/cm ² , 42 psi)	---

2-16 PERIODIC MAINTENANCE

Specifications

Item	Standard	Service Limit
Final Drive		
Drive Chain Slack	30 ~ 35 mm (1.2 ~ 1.4 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	EK520MVXL	---
Link	110 links	---
Brakes		
Brake Fluid:		
Grade	DOT4	---
Brake Pad Lining Thickness:		
Front	4.0 mm (0.16 in.)	1 mm (0.04 in.)
Rear	5.0 mm (0.20 in.)	1 mm (0.04 in.)
Brake Light Timing:		
Front	Pulled ON	---
Rear	On after about 10 mm (0.39 in.) of pedal travel	---
Electrical System		
Spark Plug Gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)	---

AT: Austria

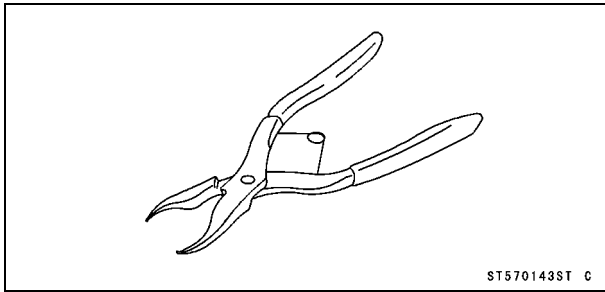
CH: Switzerland

DE: Germany

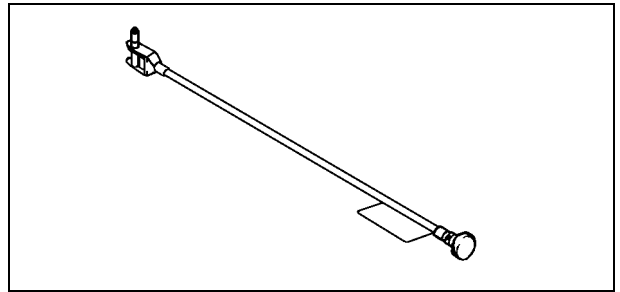
US: United States

Special Tools

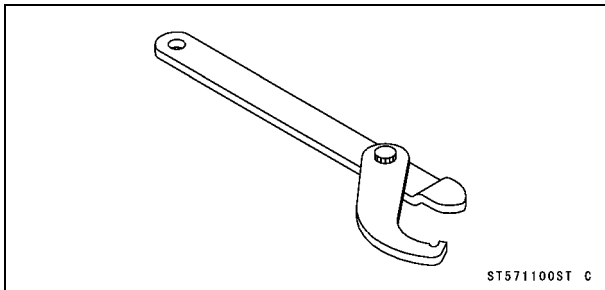
Inside Circlip Pliers:
57001-143



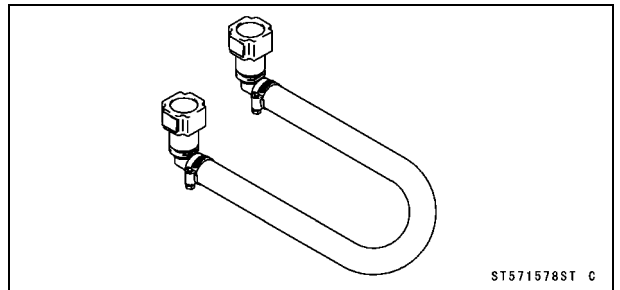
Pilot Screw Adjuster, C:
57001-1292



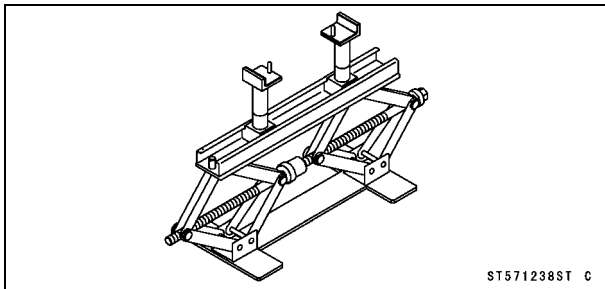
Steering Stem Nut Wrench:
57001-1100



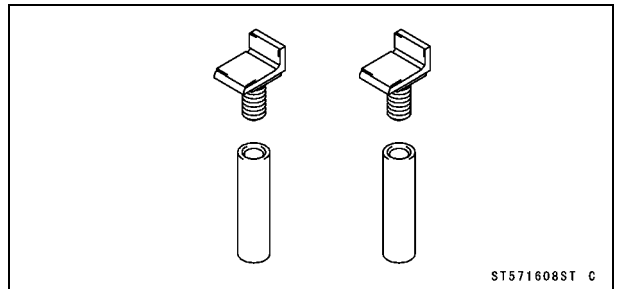
Extension Tube:
57001-1578



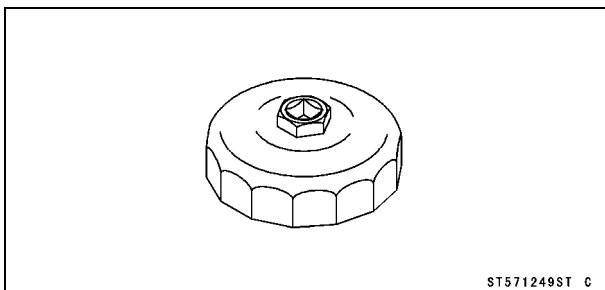
Jack:
57001-1238



Jack Attachment:
57001-1608



Oil Filter Wrench:
57001-1249



2-18 PERIODIC MAINTENANCE

Maintenance Procedure

Fuel System (DFI)

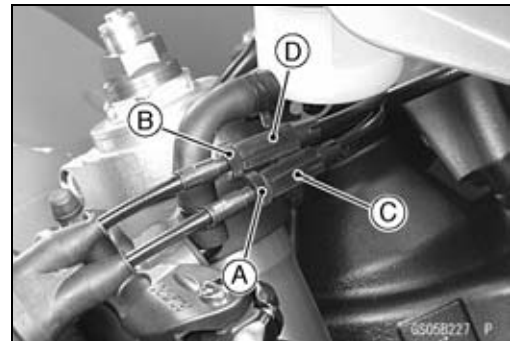
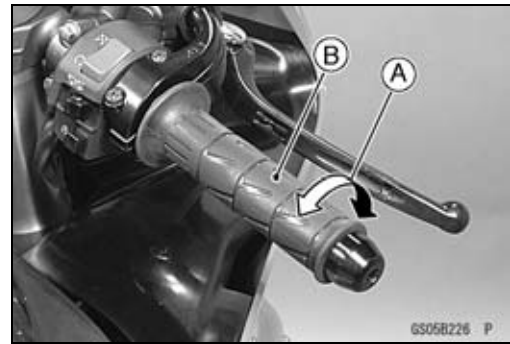
Throttle Control System Inspection

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

Throttle Grip Free Play

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

- Check that the throttle grip [B] moves smoothly from full open to close, and the throttle closes quickly and completely by the return spring in all steering positions.
- ★ If the throttle grip does not return properly, check the throttle cables routing, grip free play, and cable damage. Then lubricate the throttle cable.
- Run the engine at the idle speed, and turn the handlebar all the way to the right and left to ensure that the idle speed does not change.
- ★ If the idle speed increases, check the throttle cable free play and the cable routing.
- ★ If necessary, adjust the throttle cable as follows.
 - Loosen the locknuts [A] [B].
 - Screw both throttle cable adjusters [C] [D] to give the throttle grip plenty of play.
 - Turn the decelerator cable adjuster [C] until 2 ~ 3 mm (0.08 ~ 0.12 in.) of throttle grip play is obtained.
 - Tighten the locknut [A].
 - Turn the accelerator cable adjuster [D] until 2 ~ 3 mm (0.08 ~ 0.12 in.) of throttle grip play is obtained.
 - Tighten the locknut [B].
- ★ If the free play cannot be adjusted with the adjusters, replace the cable.

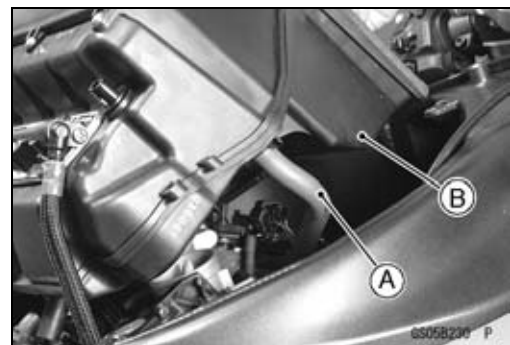


Engine Vacuum Synchronization Inspection

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 the fuel tank (see Fuel Tank Removal in the Fuel System (DFI) chapter).
- Pull off the vacuum hoses and the rubber cap(s) from the right fitting of each throttle body.
- Pull off the vacuum switch valve hose (thick) [A] from the air cleaner housing [B].

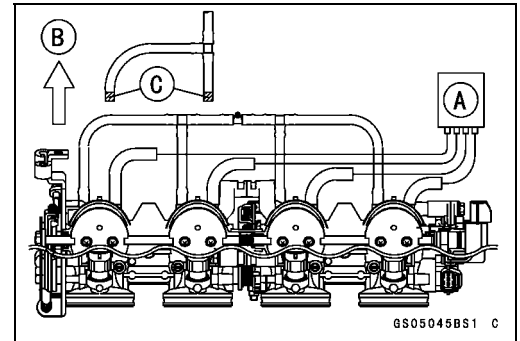


CAUTION

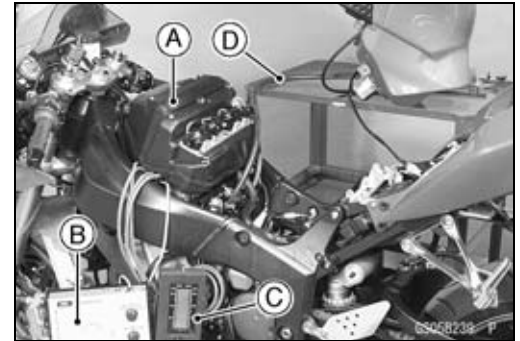
Do not remove the inlet air pressure sensor hoses on the left fitting of each throttle body.

Maintenance Procedure

- Connect a commercially available vacuum gauge [A] to these right fittings of the throttle body as shown.
Front [B]
- Connect a highly accurate tachometer to one of the stick coil primary leads.
- Plug:
Vacuum Switch Valve Hose (Thick) and its Air Cleaner Housing Hole
Vacuum Switch Valve Vacuum Hose Ends [C]



- Install:
Air Cleaner Housing [A] (see Air Cleaner Housing Removal in the Fuel System (DFI) chapter)
Tachometer [B]
Vacuum Gauge [C]
- Connect:
Extension Tube [D]
Special Tool - Extension Tube: 57001-1578
- Start the engine and warm it up thoroughly.
- Check the idle speed.
- Open and close the throttle.
- ★ If the idle speed is out of the specified range, adjust it.



CAUTION

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

- While idling the engine, inspect the engine vacuum, using the vacuum gauge [B].

Engine Vacuum

Standard: 27.3 ±1.333 kPa (205 ±10 mmHg) at Idle Speed 1 300 ±50 r/min (rpm)

2-20 PERIODIC MAINTENANCE

Maintenance Procedure

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

Example:

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

● With the engine at the correct idle speed, equalize the lower vacuum of #3 and #4 (example 170 mmHg) to the lower vacuum of #1 and #2 (example 165 mmHg) by turning the center adjusting screw [A].

Special Tool - Pilot Screw Adjuster, C: 57001-1292

Front [B]

NOTE

○ After adjustment, the final vacuum measurement between the lowest throttle valves may not be 165 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.

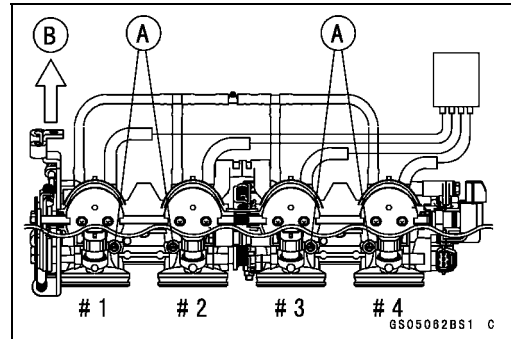
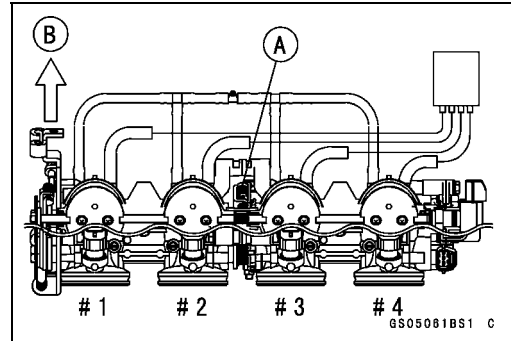
- Open and close the throttle after each measurement and adjust the idle speed as necessary.
- Once the throttle valves have been synchronized, inspect the main throttle sensor's output voltage to ensure proper operation (procedure is at the end of this section).

★ 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.
Front [B]

CAUTION

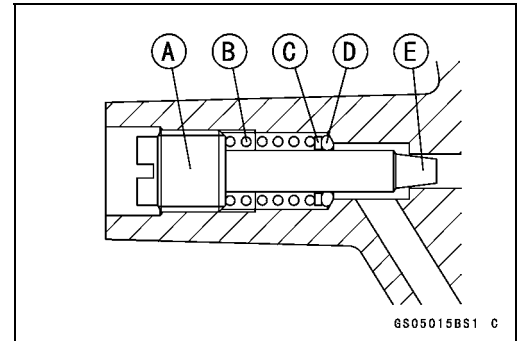
Do not over tighten them. They could be damaged, requiring replacement.

- 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.



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).

Main Throttle Sensor Output Voltage

Connections to ECU

Meter (+) → Y/W lead (terminal 7)

Meter (-) → BR/BK lead (terminal 28)

Standard: 1.02 ~ 1.06 V DC (at idle throttle opening)

- ★ If the output voltage is out of the range, check the throttle input voltage (see Input Voltage Inspection of the Main Throttle Sensor in the Fuel System (DFI) chapter).
- Remove the vacuum gauge hoses and install the vacuum hoses [A] and rubber caps [B] on the original position as shown.

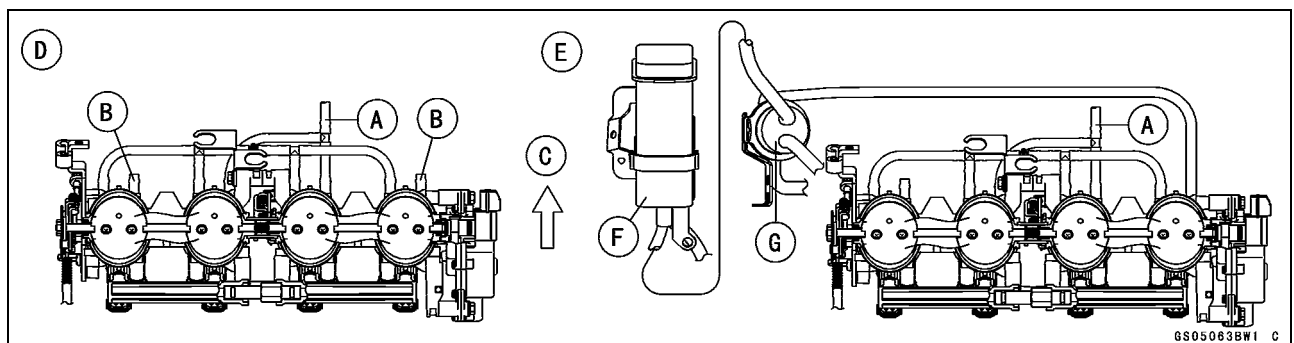
Front [C]

Except California Model [D]

California Model [E]

Separator [F]

Canister [G]



2-22 PERIODIC MAINTENANCE

Maintenance Procedure

Idle Speed Inspection

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

⚠ WARNING

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

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

Idle Speed

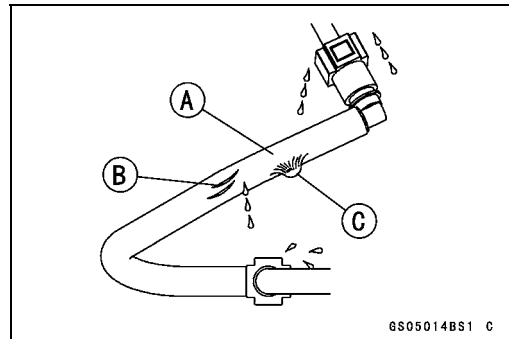
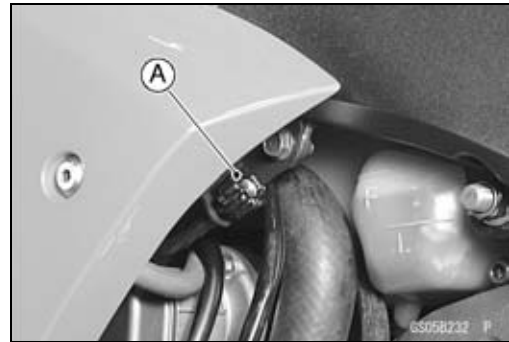
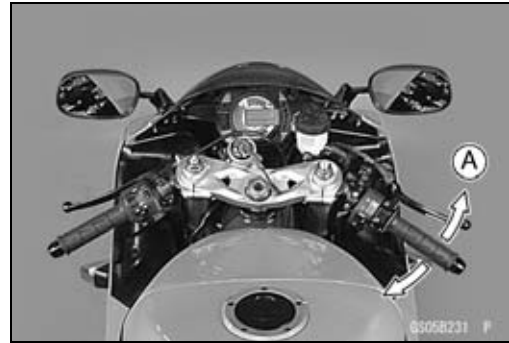
Standard: 1 300 ±50 r/min (rpm)

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.

Fuel Hose Damage and Installation Condition Inspection

- The motorcycle is not properly handled, the high pressure inside the fuel line can cause fuel to leak or the hose to burst. Remove the fuel tank (see Fuel Tank Removal in the Fuel System (DFI) chapter) and check the fuel hose [A].
- ★ Replace the fuel hose if any fraying, cracks [B] or bulges [C] are noticed.
- Check that the hose joints are securely connected.
- When installing the fuel hose, avoid sharp bending, kinking, flattening or twisting.
- ★ Replace the hose if it has been sharply bent or kinked.



Maintenance Procedure

Evaporative Emission Control System (California Model)

Evaporative Emission Control System Inspection

- Inspect the canister as follows.
- Remove:
 - Left Upper Inner Fairing (see Upper Inner 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.*
- Check the liquid/vapor separator as follows.
- Remove:
 - Left Center Fairing (see Center 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.



2-24 PERIODIC MAINTENANCE

Maintenance Procedure

Cooling System

Coolant Level Inspection

NOTE

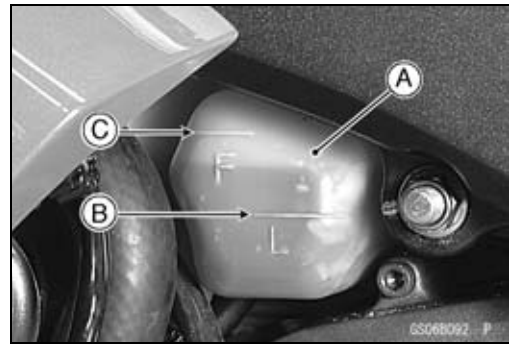
○ Check the level when the engine is cold (room or ambient temperature).

- 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.

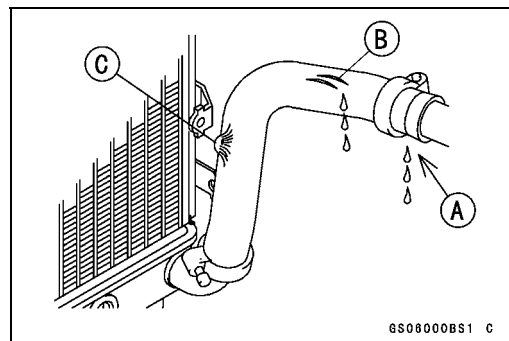
Radiator Hose Damage and Installation Condition Inspection

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



Maintenance Procedure

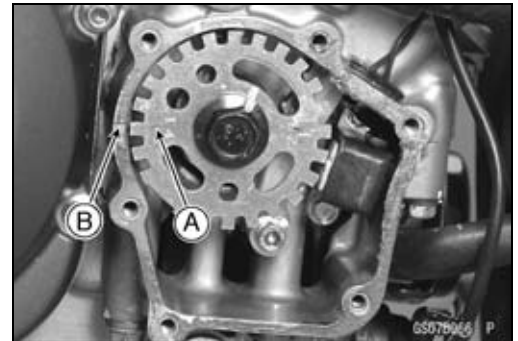
Engine Top End

Valve Clearance Inspection

NOTE

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

- Remove:
 - Lower Fairings (see Lower Fairing Removal in the Frame chapter)
 - Crankshaft Sensor Cover (see Crankshaft Sensor Removal in the Electrical System chapter)
 - Cylinder Head Cover (see Cylinder Head Cover Removal in the Engine Top End chapter)
- Position the crankshaft at #1, 4 piston TDC.
 - TDC Mark [A] for #1, 4 Pistons
 - Timing Mark [B] (Crankcase Halves Mating Surface)



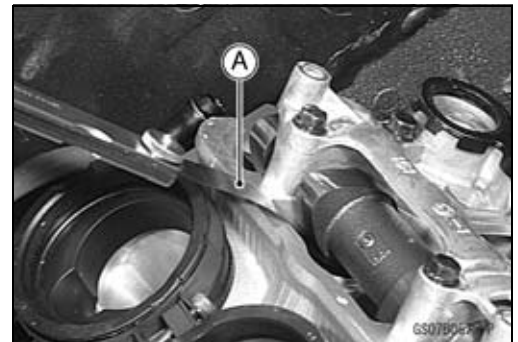
- Using a thickness gauge [A], measure the valve clearance between the cam and the valve lifter.

Valve Clearance

Standard:

Exhaust 0.22 ~ 0.31 mm (0.0087 ~ 0.0122 in.)

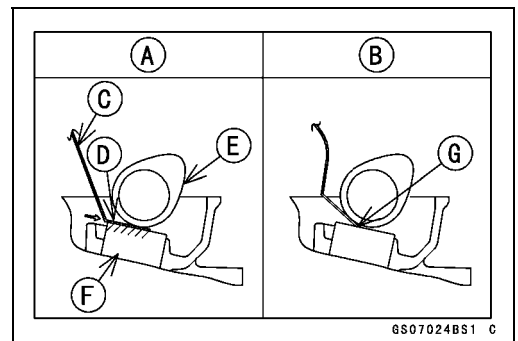
Inlet 0.11 ~ 0.19 mm (0.0043 ~ 0.0075 in.)



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]

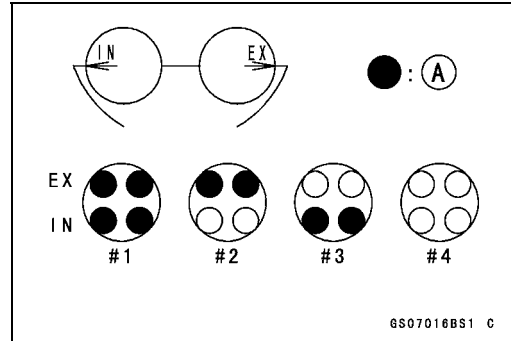


2-26 PERIODIC MAINTENANCE

Maintenance Procedure

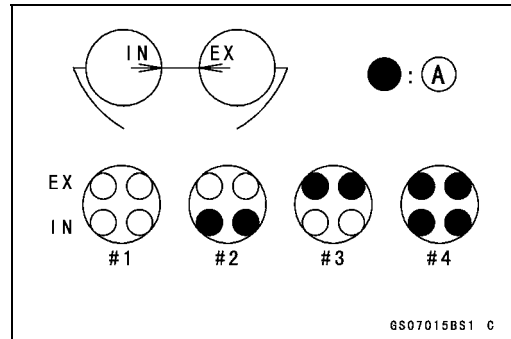
○When positioning #1 piston TDC at the end of the compression stroke.

- 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.

Valve Clearance Adjustment

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

NOTE

- Mark and record the valve lifter and shim locations so they can be reinstalled in their original positions.
- If there is no clearance, select a shim which is several sizes smaller and then measure the clearance.
- To select a new shim which brings the valve clearance within the specified range, refer to the Valve Clearance Adjustment Charts.
- Apply a thin coat of engine oil to the valve lifter surface and install the lifter.
- Install the camshafts. Be sure to time the camshafts properly (see Camshaft Installation in the Engine Top End chapter).
- Remeasure any valve clearance that was adjusted. Readjust if necessary.

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.

Maintenance Procedure

VALVE CLEARANCE ADJUSTMENT CHART INLET VALVE

		PRESENT SHIM																			Example					
PART No. (92180-)		1014	1016	1018	1020	1022	1024	1026	1028	1030	1032	1034	1036	1038	1040	1042	1044	1046	1048	1050	1052	1054				
MARK		50	55	60	65	70	75	80	85	90	95	00	05	10	15	20	25	30	35	40	45	50				
THICKNESS (mm)		2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50				
VALVE CLEARANCE MEASUREMENT	Example	0.00~0.05	-	-	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40			
		0.06~0.10	-	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50		
		0.11~0.19	SPECIFIED CLEARANCE/NO CHANGE REQUIRED																							
		0.20~0.24	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50				
		0.25~0.29	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50					
		0.30~0.34	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50						
		0.35~0.39	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50							
		0.40~0.44	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50								
		0.45~0.49	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50									
		0.50~0.54	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50										
		0.55~0.59	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50											
		0.60~0.64	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50												
		0.65~0.69	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50													
		0.70~0.74	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50														
		0.75~0.79	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50															
		0.80~0.84	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50																
		0.85~0.89	3.20	3.25	3.30	3.35	3.40	3.45	3.50																	
0.90~0.94	3.25	3.30	3.35	3.40	3.45	3.50																				
0.95~0.99	3.30	3.35	3.40	3.45	3.50																					
1.00~1.04	3.35	3.40	3.45	3.50																						
1.05~1.09	3.40	3.45	3.50																							
1.10~1.14	3.45	3.50																								
1.15~1.19	3.50																									

INSTALL THE SHIM OF THIS THICKNESS (mm)

6S07027B*3 C

1. Measure the clearance (when engine is cold).
2. Check present shim size.
3. Match clearance in vertical column with present shim size in horizontal column.
4. Install the shim specified where the lines intersect. This shim will give the proper clearance.

Example:

Present shim is **3.05 mm**.
 Measured clearance is **0.35 mm**.
 Replace **3.05 mm** shim with **3.25 mm** shim.

5. Remeasure the valve clearance and readjust if necessary.



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