Quick Reference Guide

This quick reference guide will assist you in locating a desired topic or procedure.

- Bend the pages back to match the black tab of the desired chapter number with the black tab on the edge at each table of contents page.
- Refer to the sectional table of contents for the exact pages to locate the specific topic required.

Kawasaki

Ninja ZX-6R

Motorcycle Service Manual

© 2008 Kawasaki Heavy Industries, Ltd. First Edition (1) : Oct. 31, 2008 (M)

LIST OF ABBREVIATIONS

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

COUNTRY AND AREA CODES

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

EMISSION CONTROL INFORMATION

To protect the environment in which we all live, Kawasaki has incorporated crankcase emission (1) and exhaust emission (2) control systems in compliance with applicable regulations of the United States Environmental Protection Agency and California Air Resources Board. Additionally, Kawasaki has incorporated an evaporative emission control system (3) in compliance with applicable regulations of the California Air Resources Board on vehicles sold in California only.

1. Crankcase Emission Control System

This system eliminates the release of crankcase vapors into the atmosphere. Instead, the vapors are routed through an oil separator to the inlet side of the engine. While the engine is operating, the vapors are drawn into combustion chamber, where they are burned along with the fuel and air supplied by the fuel injection system.

2. Exhaust Emission Control System

This system reduces the amount of pollutants discharged into the atmosphere by the exhaust of this motorcycle. The fuel, ignition, and exhaust systems of this motorcycle have been carefully designed and constructed to ensure an efficient engine with low exhaust pollutant levels.

The exhaust system of this model motorcycle manufactured primarily for sale in California includes a catalytic converter system.

3. Evaporative Emission Control System

Vapors caused by fuel evaporation in the fuel system are not vented into the atmosphere. Instead, fuel vapors are routed into the running engine to be burned, or stored in a canister when the engine is stopped. Liquid fuel is caught by a vapor separator and returned to the fuel tank.

The Clean Air Act, which is the Federal law covering motor vehicle pollution, contains what is commonly referred to as the Act's "tampering provisions".

"Sec. 203(a) The following acts and the causing thereof are prohibited...

(3)(A) for any person to remove or render inoperative any device or element of design installed on or in a motor vehicle or motor vehicle engine in compliance with regulations under this title prior to its sale and delivery to the ultimate purchaser, or for any manufacturer or dealer knowingly to remove or render inoperative any such device or element of design after such sale and delivery to the ultimate purchaser.

(3)(B) for any person engaged in the business of repairing, servicing, selling, leasing, or trading motor vehicles or motor vehicle engines, or who operates a fleet of motor vehicles knowingly to remove or render inoperative any device or element of design installed on or in a motor vehicle or motor vehicle engine in compliance with regulations under this title following its sale and delivery to the ultimate purchaser..."

NOTE

○*The phrase "remove or render inoperative any device or element of design" has been generally interpreted as follows.*

1. *Tampering does not include the temporary removal or rendering inoperative of devices or elements of design in order to perform maintenance.*
2. *Tampering could include.*
   a. *Maladjustment of vehicle components such that the emission standards are exceeded.*
   b. *Use of replacement parts or accessories which adversely affect the performance or durability of the motorcycle.*
   c. *Addition of components or accessories that result in the vehicle exceeding the standards.*
   d. *Permanently removing, disconnecting, or rendering inoperative any component or element of design of the emission control systems.*

WE RECOMMEND THAT ALL DEALERS OBSERVE THESE PROVISIONS OF FEDERAL LAW, THE VIOLATION OF WHICH IS PUNISHABLE BY CIVIL PENALTIES NOT EXCEEDING $10 000 PER VIOLATION.

TAMPERING WITH NOISE CONTROL SYSTEM PROHIBITED

Federal law prohibits the following acts or the causing thereof. (1) The removal or rendering inoperative by any person other than for purposes of maintenance, repair, or replacement, of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use, or (2) the use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

Among those acts presumed to constitute tampering are the acts listed below.

- Replacement of the original exhaust system or muffler with a component not in compliance with Federal regulations.
- Removal of the muffler(s) or any internal portion of the muffler(s).
- Removal of the air box or air box cover.
- Modifications to the muffler(s) or air inlet system by cutting, drilling, or other means if such modifications result in increased noise levels.

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

Table of Contents

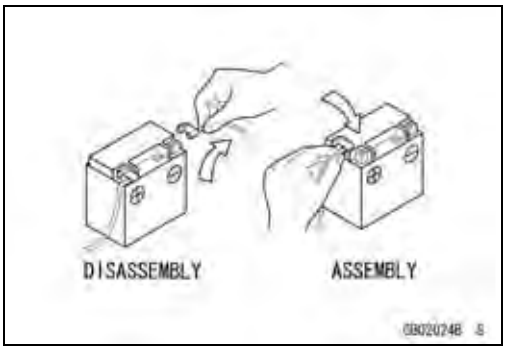
Before Servicing

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.

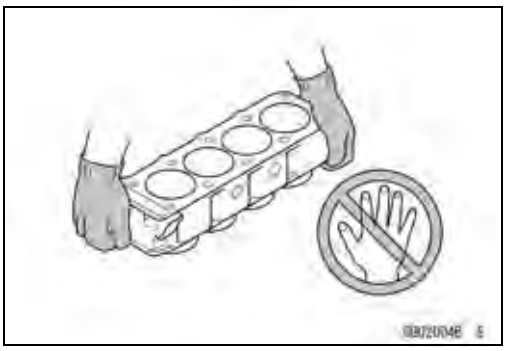
Battery Ground

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.



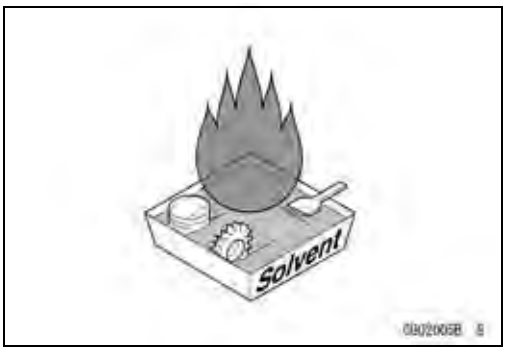
Edges of Parts

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



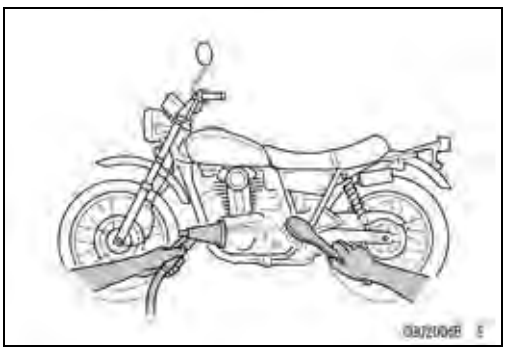
Solvent

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

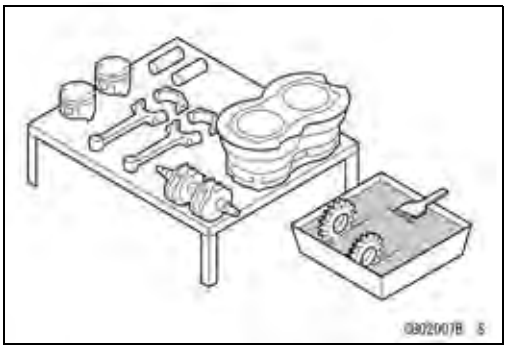
Clean the vehicle thoroughly before disassembly. Dirt or other foreign materials entering into sealed areas during vehicle disassembly can cause excessive wear and decrease performance of the vehicle.



Before Servicing

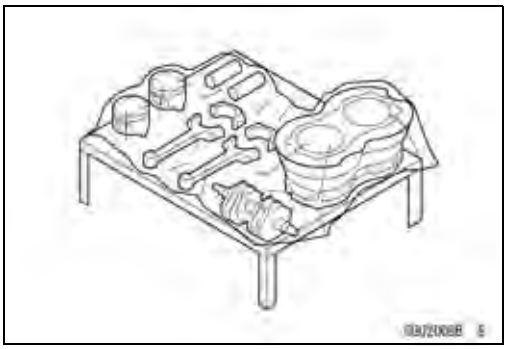
Arrangement and Cleaning of Removed Parts

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.



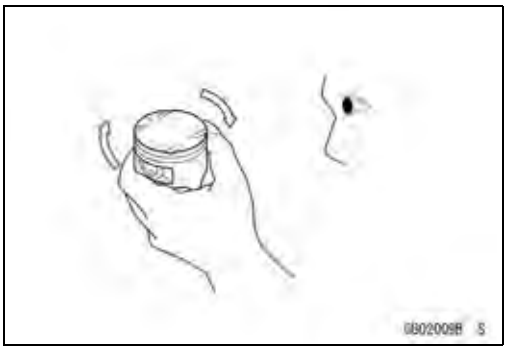
Storage of Removed Parts

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.



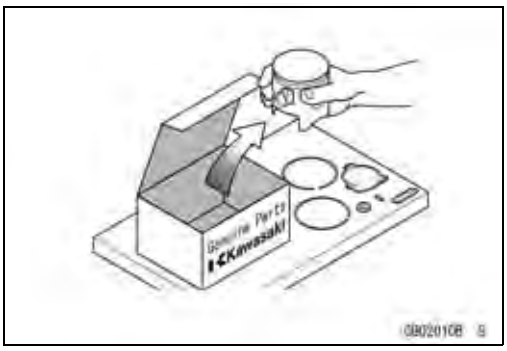
Inspection

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.



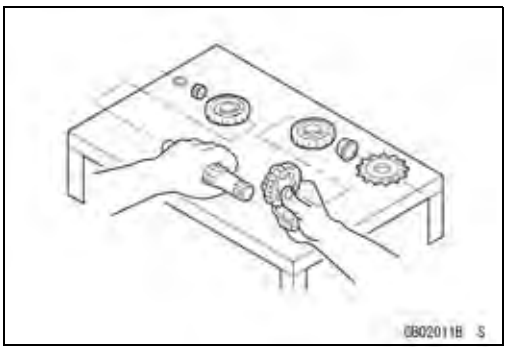
Replacement Parts

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

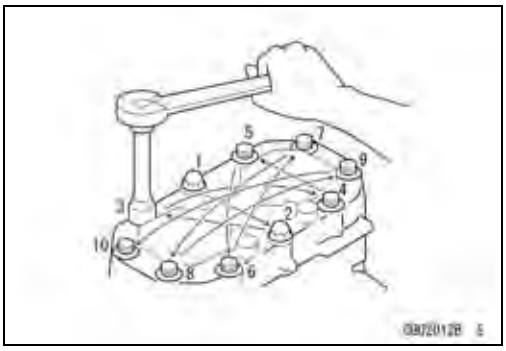
In most cases assembly order is the reverse of disassembly, however, if assembly order is provided in this Service Manual, follow the procedures given.



Before Servicing

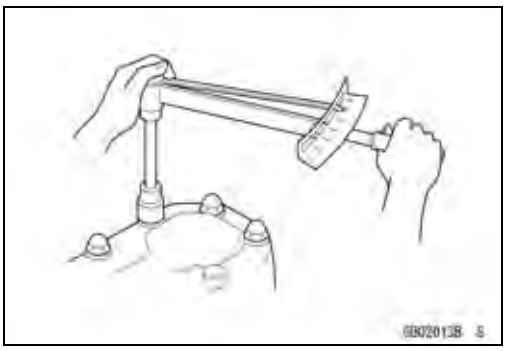
Tightening Sequence

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.



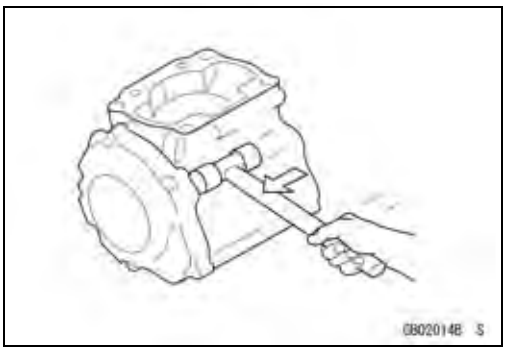
Tightening Torque

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.



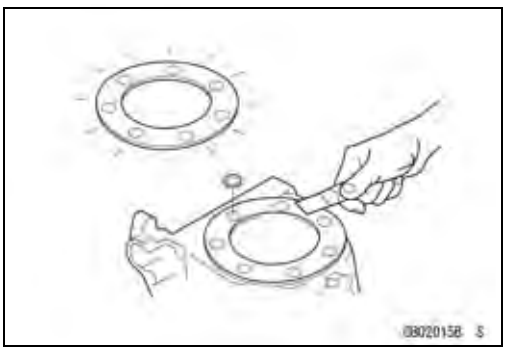
Force

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.



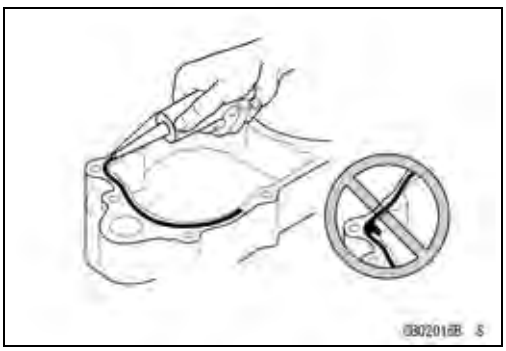
Gasket, O-ring

Hardening, shrinkage, or damage of both gaskets and O-rings after disassembly can reduce sealing performance. Remove 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

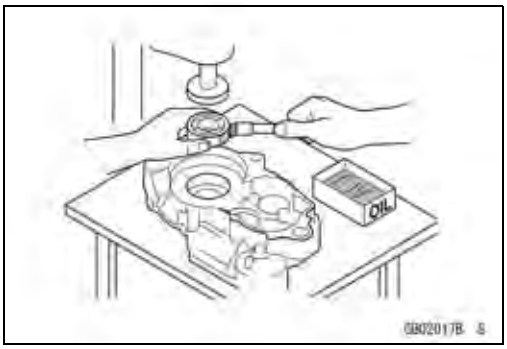
For applications that require Liquid Gasket or a Non-permanent Locking Agent, clean the surfaces so that no oil residue remains before applying liquid gasket or non-permanent locking agent. Do not apply them excessively. Excessive application can clog oil passages and cause serious damage.



Before Servicing

Press

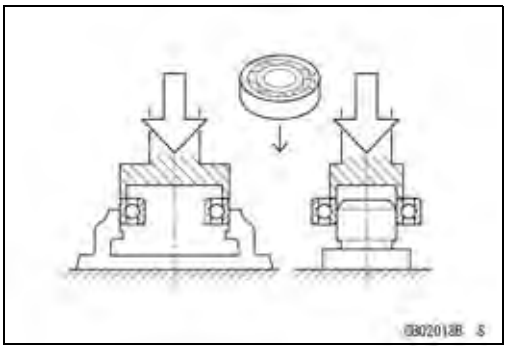
For items such as bearings or oil seals that must be pressed into place, apply small amount of oil to the contact area. Be sure to maintain proper alignment and use smooth movements when installing.



Ball Bearing and Needle Bearing

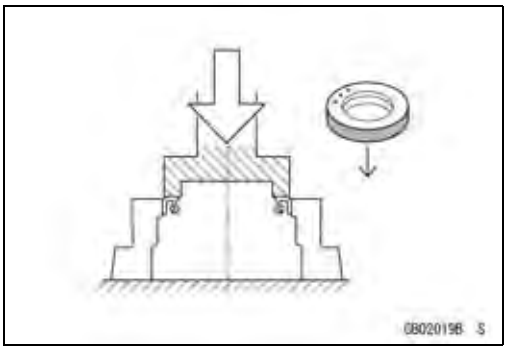
Do not remove pressed ball or needle unless removal is absolutely necessary. Replace with new ones whenever removed. Press bearings with the manufacturer and size marks facing out. Press the bearing into place by putting pressure on the correct bearing race as shown.

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

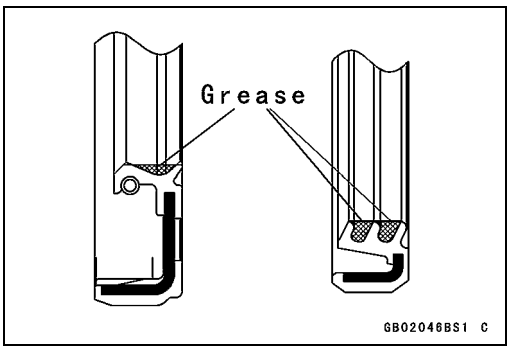


Oil Seal, Grease Seal

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.

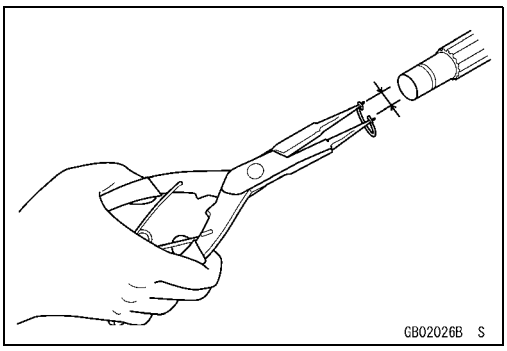


Apply specified grease to the lip of seal before installing the seal.



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.



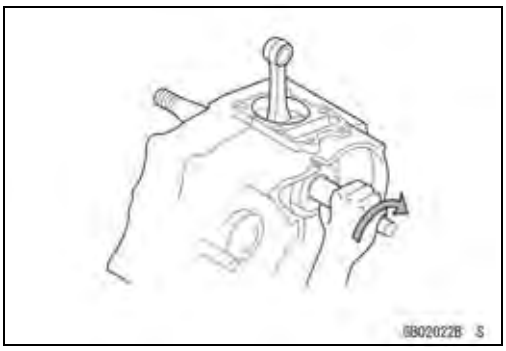
Before Servicing

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.

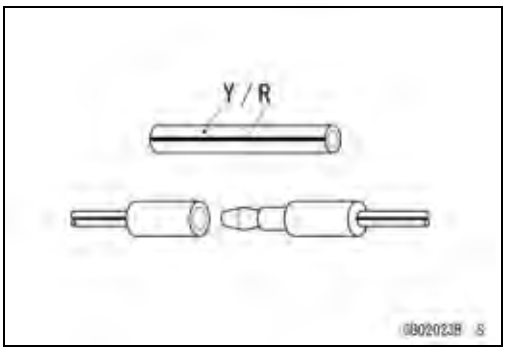
Direction of Engine Rotation

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).



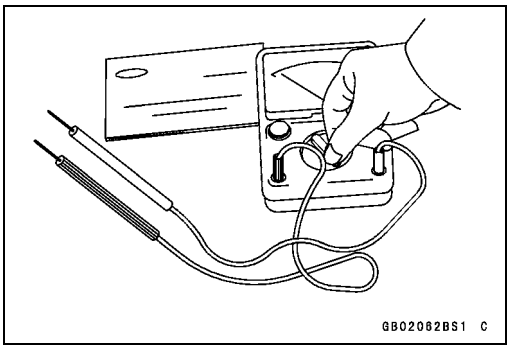
Electrical Wires

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

ZX600R9F (US and CA Models) Left Side View

ZX600R9F (US and CA Models) Right Side View

Model Identification

ZX600R9F (EUR Models) Left Side View

ZX600R9F (EUR Models) Right Side View

Frame Number

Engine Number

General Specifications

Items	ZX600R9F
Dimensions	
Overall Length	2 090 mm (82.3 in.)
Overall Width	710 mm (28.0 in.)
Overall Height	1 115 mm (43.9 in.)
Wheelbase	1 400 mm (55.1 in.)
Road Clearance	120 mm (4.72 in.)
Seat Height	815 mm (32.1 in.)
Curb Mass:	191 kg (421 lb)
Front	97 kg (214 lb)
Rear	94 kg (207 lb)
Fuel Tank Capacity	17 L (4.5 US gal)
Performance	
Minimum Turning Radius	3.4 m (11.2 ft)
Engine	
Type	4-stroke, DOHC, 4-cylinder
Cooling System	Liquid-cooled
Bore and Stroke	67.0 × 42.5 mm (2.64 × 1.67 in.)
Displacement	599 cm^3 (36.6 cu in.)
Compression Ratio	13.3:1
Maximum Horsepower	94.1 kW (128 PS) @14 000 r/min (rpm), (WVTA (78.2 H)) 78.2 kW (106 PS) @14 000 r/min (rpm), (SEA), (TH) 87.5 kW (119 PS) @12 500 r/min (rpm), (CA), (CAL), (US) – – –
Maximum Torque	66.7 N·m (6.8 kgf·m, 49.2 ft·lb) @11 800 r/min (rpm), (WVTA (78.2 H)) 60 N·m (6.1 kgf·m, 44.3 ft·lb) @11 000 r/min (rpm), (CA), (CAL), (US) – – –
Carburetion System	FI (Fuel Injection), KEIHIN TTK38 × 4
Starting System	Electric starter
Ignition System	Battery and coil (transistorized)
Timing Advance	Electronically advanced (IC igniter in ECU)
Ignition Timing	From 12.5° BTDC @1 300 r/min (rpm)
Spark Plug	NGK CR9E
Cylinder Numbering Method	Left to right, 1-2-3-4
Firing Order	1-2-4-3
Valve Timing:	
Inlet:	
Open	41° (BTDC)
Close	67° (ABDC)
Duration	288°
Exhaust:	
Open	58° (BBDC)
Close	20° (ATDC)
Duration	258°

General Specifications

Items	ZX600R9F
Lubrication System	Forced lubrication (wet sump with oil cooler)
Engine Oil:	
Type	API SE, SF or SG API SH, SJ, SL or SM with JASO MA, MA1 or MA2
Viscosity	SAE 10W-40
Capacity	3.6 L (3.8 US qt)
Drive Train	
Primary Reduction System:	
Type	Gear
Reduction Ratio	1.900 (76/40)
Clutch Type	Wet multi disc
Transmission:	
Type	6-speed, constant mesh, return shift
Gear Ratios:	
1st	2.714 (38/14)
2nd	2.200 (33/15)
3rd	1.850 (37/20)
4th	1.600 (32/20)
5th	1.421 (27/19)
6th	1.300 (26/20)
Final Drive System:	
Type	Chain drive
Reduction Ratio	2.688 (43/16)
Overall Drive Ratio	6.638 @Top gear
Frame	
Type	Tubular, diamond
Caster (Rake Angle)	24°
Trail	103 mm (4.06 in.)
Front Tire:	
Type	Tubeless
Size	120/70 ZR17 M/C (58 W)
Rim Size	17 × 3.50
Rear Tire:	
Type	Tubeless
Size	180/55 ZR17 M/C (73 W)
Rim Size	17 × 5.50
Front Suspension:	
Type	Telescopic fork (upside-down)
Wheel Travel	120 mm (4.72 in.)
Rear Suspension:	
Type	Swingarm (uni-trak)
Wheel Travel	134 mm (5.28 in.)

General Specifications

Items	ZX600R9F
Brake Type:	
Front	Dual discs
Rear	Single disc
Electrical Equipment	
Battery	12 V 8 Ah
Headlight:	
Type	Semi-sealed beam
Bulb:	
High	12 V 55 W + 65 W (quartz-halogen)
Low	12 V 55 W (quartz-halogen)
Tail/Brake Light	LED
Alternator:	
Type	Three-phase AC
Rated Output	30 A/14 V @5 000 r/min (rpm)

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

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	=	cmHg
kgf/cm²	×	98.07	=	kPa
kgf/cm²	×	14.22	=	psi
cmHg	×	1.333	=	kPa

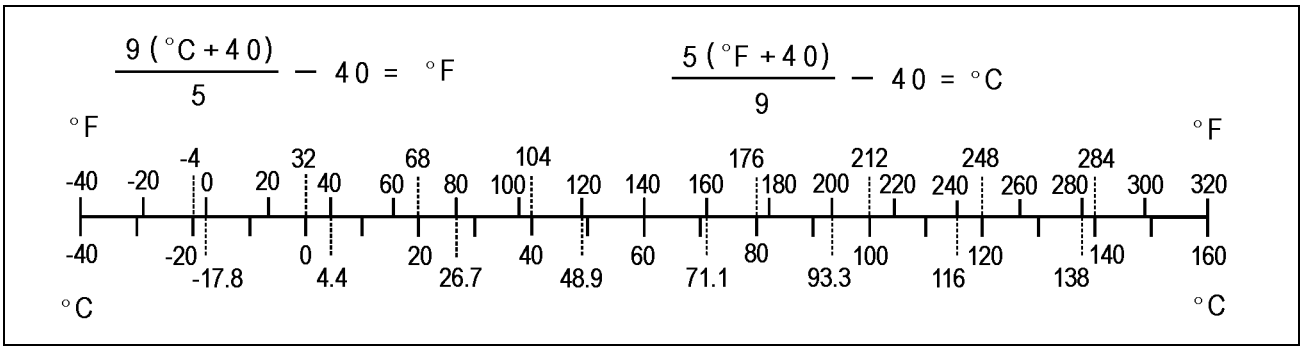
Units of Speed:

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 / ITEM	Whichever comes first ➡ / ⬇ Every	* ODOMETER READING × 1 000 km (× 1 000 mile)							See Page
		1 (0.6)	6 (3.75)	12 (7.5)	18 (11.25)	24 (15)	30 (18.75)	36 (22.5)	
Fuel System									
Throttle control system (play, smooth return, no drag) - inspect	year	●		●		●		●	2-16
Engine vacuum synchronization - inspect				●		●		●	2-16
Idle speed - inspect		●		●		●		●	2-20
Fuel leak (fuel hose and pipe) - inspect	year	●		●		●		●	2-20
Fuel hose and pipe damage - inspect	year	●		●		●		●	2-20
Fuel hose and pipe installation condition - inspect	year	●		●		●		●	2-20
Evaporative emission control system function - inspect (CAL, SEA and TH Models)		●	●	●	●	●	●	●	2-21
Cooling System									
Coolant level - inspect		●		●		●		●	2-22
Coolant leak (water hose and pipe) - inspect	year	●		●		●		●	2-23
Water hose damage - inspect	year	●		●		●		●	2-23
Water hose installation condition - inspect	year	●		●		●		●	2-23
Engine Top End									
Valve clearance - inspect: CA, CAL and US Models						●			2-23
Valve clearance - inspect: Other than CA, CAL and US Models	Every 42 000 km (26 250 mile)								2-23
Air suction system damage - inspect				●		●		●	2-27
Clutch									
Clutch operation (play, disengagement, engagement) - inspect		●		●		●		●	2-28
Wheels and Tires									
Tire air pressure - inspect	year			●		●		●	2-29
Wheel/tire damage - inspect				●		●		●	2-29
Tire tread wear, abnormal wear - inspect				●		●		●	2-29

Periodic Maintenance Chart

FREQUENCY / ITEM	Whichever comes first ➡ / Every ⬇	* ODOMETER READING × 1 000 km (× 1 000 mile)							See Page
		1 (0.6)	6 (3.75)	12 (7.5)	18 (11.25)	24 (15)	30 (18.75)	36 (22.5)	
Wheel bearing damage - inspect	year			●		●		●	2-30
Final Drive									
Drive chain lubrication condition - inspect #	Every 600 km (400 mile)								2-31
Drive chain slack - inspect #	Every 1 000 km (600 mile)								2-31
Drive chain wear - inspect #				●		●		●	2-33
Chain guide wear - inspect				●		●		●	2-34
Brakes									
Brake fluid leak (brake hose and pipe) - inspect	year	●	●	●	●	●	●	●	2-34
Brake hose and pipe damage - inspect	year	●	●	●	●	●	●	●	2-34
Brake hose installation condition - inspect	year	●	●	●	●	●	●	●	2-34
Brake fluid level - inspect	6 months	●	●	●	●	●	●	●	2-35
Brake pad wear - inspect #			●	●	●	●	●	●	2-36
Brake operation (effectiveness, play, no drag) - inspect	year	●	●	●	●	●	●	●	2-36
Brake light switch operation - inspect		●	●	●	●	●	●	●	2-36
Suspension									
Front forks/rear shock absorber operation (damping and smooth stroke) - inspect				●		●		●	2-37
Front forks/rear shock absorber oil leak - inspect	year			●		●		●	2-37, 2-38
Rocker arm operation - inspect				●		●		●	2-38
Tie-rods operation - inspect				●		●		●	2-38
Steering									
Steering play - inspect	year	●		●		●		●	2-38
Steering stem bearings - lubricate	2 years					●			2-40
Steering damper oil leak - inspect			●	●	●	●	●	●	2-40
Electrical System									
Lights and switches operation - inspect	year			●		●		●	2-41
Headlight aiming - inspect	year			●		●		●	2-43
Sidestand switch operation - inspect	year			●		●		●	2-44

Periodic Maintenance Chart

FREQUENCY / ITEM	Whichever comes first ➡ / Every ⬇	* ODOMETER READING × 1 000 km (× 1 000 mile) 1 (0.6)	6 (3.75)	12 (7.5)	18 (11.25)	24 (15)	30 (18.75)	36 (22.5)	See Page
Engine stop switch operation - inspect	year			●		●		●	2-45
Others									
Chassis parts - lubricate	year			●		●		●	2-46
Bolts and nuts tightness - inspect		●		●		●		●	2-47

#: 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 Replacement Parts

FREQUENCY / ITEM	Whichever comes first ➡ / Every ⬇	* ODOMETER READING × 1 000 km (× 1 000 mile) 1 (0.6)	12 (7.5)	24 (15)	36 (22.5)	48 (30)	See Page
Air cleaner element # - replace	Every 18 000 km (12 000 mile)						2-48
Fuel hose - replace	4 years					●	2-48
Coolant - change	3 years				●		2-51
Radiator hose and O-ring - replace	3 years				●		2-54
Engine oil # - change	year	●	●	●	●	●	2-55
Oil filter - replace	year	●	●	●	●	●	2-56
Brake hose and pipe - replace	4 years					●	2-57
Brake fluid - change	2 years			●		●	2-57
Rubber parts of master cylinder and caliper - replace	4 years					●	2-59, 2-60
Spark plug - replace			●	●	●	●	2-63

#: 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.

2-6 PERIODIC MAINTENANCE

Torque and Locking Agent

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

Letters used in the “Remarks” column mean:
AL: Tighten the two clamp bolts alternately two times to ensure even tightening torque.
G: Apply grease.
L: Apply a non-permanent locking agent.
Lh: Left-hand Threads
MO: Apply molybdenum disulfide oil solution.
(mixture of the engine oil and molybdenum disulfide grease in a weight ratio 10:1)
R: Replacement Parts
S: Follow the specified tightening sequence.
Si: Apply silicone grease (ex. PBC grease).
SS: Apply silicone sealant.

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Fuel System (DFI)				
Air Cleaner Housing Assembly Screws	1.2	0.12	11 in·lb	
Air Cleaner Housing Clamp Bolts	2.0	0.20	18 in·lb	
Air Cleaner Housing Mounting Bolt	6.9	0.70	61 in·lb	
Air Inlet Duct Mounting Bolts	9.8	1.0	87 in·lb	L
Canister Bracket Screws	1.2	0.12	11 in·lb	
Crankshaft Sensor Bolts	5.9	0.60	52 in·lb	
Delivery Pipe Assy Mounting Screws (Nozzle Assy)	3.43	0.35	30 in·lb	
Delivery Pipe Assy Mounting Screws (Throttle Body Assy)	3.43	0.35	30 in·lb	
Exhaust Butterfly Valve Actuator Mounting Screws	4.3	0.44	38 in·lb	
Exhaust Butterfly Valve Actuator Pulley Bolt	4.9	0.50	43 in·lb	
Fuel Pump Bolts	9.8	1.0	87 in·lb	L, S
Gear Position Switch Screws	2.9	0.30	26 in·lb	L
Inlet Air Temperature Sensor Screw	0.80	0.081	7.1 in·lb	
Nozzle Assy Mounting Screws	1.2	0.12	11 in·lb	S
Oxygen Sensor (Equipped Models)	25	2.5	18	
Separator Bracket Mounting Bolt	6.9	0.70	61 in·lb	
Speed Sensor Bolt	6.9	0.70	61 in·lb	L
Throttle Body Assy Holder Bolts	12	1.2	106 in·lb	L
Throttle Body Assy Holder Clamp Bolts	2.9	0.30	26 in·lb	
Throttle Cable Holder Plate Bolt	3.9	0.40	35 in·lb	L
Water Temperature Sensor	25	2.5	18	
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	
Heat Insulation Plate Bolt	3.9	0.40	35 in·lb	L
Impeller Bolt	9.8	1.0	87 in·lb	
Oil Cooler Mounting Bolts	20	2.0	15	

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Radiator Bracket Mounting Bolt	9.8	1.0	87 in·lb	
Radiator Lower Bolt	6.9	0.70	61 in·lb	
Radiator Upper Bolts	9.8	1.0	87 in·lb	
Thermostat Housing Cover Bolts	5.9	0.60	52 in·lb	
Water Hose Clamp Screws	2.0	0.20	18 in·lb	
Water Hose Fitting Bolts	9.8	1.0	87 in·lb	
Water Pump Cover Bolts	12	1.2	106 in·lb	L
Water Temperature Sensor	25	2.5	18	
Engine Top End				
Air Suction Valve Cover Bolts	9.8	1.0	87 in·lb	L
Breather Hose Fitting	15	1.5	11	L
Camshaft Cap Bolts	12	1.2	106 in·lb	S
Camshaft Chain Tensioner Cap Bolt	20	2.0	15	
Camshaft Chain Tensioner Mounting Bolts	11	1.1	97 in·lb	
Camshaft Sprocket Bolts	15	1.5	11	L
Coolant Drain Bolt (Cylinder)	9.8	1.0	87 in·lb	
Cylinder Head Bolts (M9)	39	4.0	29	MO, S
Cylinder Head Bolts (M6)	12	1.2	106 in·lb	S
Cylinder Head Cover Bolts	9.8	1.0	87 in·lb	S
Exhaust Butterfly Valve Cable Adjuster Locknuts	6.9	0.70	61 in·lb	
Exhaust Butterfly Valve Cable Locknuts	7.0	0.71	62 in·lb	
Exhaust Pipe Clamp Bolt	17	1.7	13	
Exhaust Pipe Guard Bolts	6.9	0.70	61 in·lb	
Exhaust Pipe Holder Nuts	17	1.7	13	
Front Camshaft Chain Guide Bolt (Lower)	12	1.2	106 in·lb	
Front Camshaft Chain Guide Bolt (Upper)	25	2.5	18	
Muffler Body Clamp Bolt	17	1.7	13	
Muffler Body Cover Bolts	7.0	0.71	62 in·lb	
Muffler Body Mounting Bolt	25	2.5	18	
Muffler Body Rear Cover Bolts	7.0	0.71	62 in·lb	
Premuffler Chamber Bracket Bolt	35	3.6	26	
Premuffler Chamber Guard Bolts	6.9	0.70	61 in·lb	
Premuffler Chamber Mounting Bolt	35	3.6	26	
Spark Plugs	13	1.3	115 in·lb	
Starter Clutch Bolt Cap	–	–	–	Hand-tighten
Throttle Body Assy Holder Bolts	12	1.2	106 in·lb	L
Throttle Body Assy Holder Clamp Bolts	2.9	0.30	26 in·lb	
Timing Inspection Cap	–	–	–	Hand-tighten
Upper Camshaft Chain Guide Bolts	12	1.2	106 in·lb	S
Water Passage Plugs	19.6	2.0	14	L
Clutch				
Clutch Cover Bolts (M6, L = 40 mm)	9.8	1.0	87 in·lb	
Clutch Cover Bolts (M6, L = 25 mm)	9.8	1.0	87 in·lb	

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Clutch Cover Plate Bolts	9.8	1.0	87 in·lb	L
Clutch Hub Nut	135	13.8	99.6	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	–	–	–	Hand-tighten
Sub Clutch Hub Bolts	25	2.5	18	L
Engine Lubrication System				
Air Bleed Bolt	9.8	1.0	87 in·lb	
Engine Oil Drain Bolt	29	3.0	21	
Impeller Bolt	9.8	1.0	87 in·lb	
Oil Cooler Mounting Bolts	20	2.0	15	
Oil Cooler/Oil Filter Case Mounting Bolts	20	2.0	15	L
Oil Filter	17	1.7	13	G, R
Oil Filter Guard Bolts	4.0	0.41	35 in·lb	L
Oil Filter Holder Bolt	25	2.5	18	L
Oil Jet Nozzles	2.9	0.30	26 in·lb	
Oil Pan Bolts	9.8	1.0	87 in·lb	S
Oil Passage Plug	17	1.7	13	
Oil Passage Plugs (Taper)	20	2.0	15	L
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	G
Oil Pump Drive Gear Bolt	9.8	1.0	87 in·lb	L
Water Pump Cover Bolts	12	1.2	106 in·lb	L
Engine Removal/Installation				
Adjusting Collar Locknuts	49	5.0	36	S
Adjusting Collars	9.8	1.0	87 in·lb	S
Left Front Engine Mounting Bolt	44	4.5	32	S
Lower Engine Mounting Nut	44	4.5	32	S
Middle Engine Mounting Nut	44	4.5	32	S
Right Front Engine Mounting Bolt	44	4.5	32	S
Crankshaft/Transmission				
Bearing Holder Screws	4.9	0.50	43 in·lb	L
Breather Hose Fitting	15	1.5	11	L
Breather Plate Bolts	9.8	1.0	87 in·lb	L
Connecting Rod Big End Nuts	see the text	←	←	MO
Crankcase Bolt (M8, L = 90 mm)	27	2.8	20	S
Crankcase Bolts (M8, L = 95 mm)	31	3.2	23	MO, S
Crankcase Bolts (M8, L = 75 mm)	27	2.8	20	S
Crankcase Bolts (M6, L = 65 mm)	12	1.2	106 in·lb	S
Crankcase Bolts (M6, L = 50 mm)	12	1.2	106 in·lb	
Gear Position Switch Screws	2.9	0.30	26 in·lb	L

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Gear Positioning Lever Bolt	12	1.2	106 in·lb	
Idle Gear Cover Bolts	9.8	1.0	87 in·lb	
Oil Jet Nozzles	2.9	0.30	26 in·lb	
Oil Passage Nozzle	4.9	0.50	43 in·lb	
Oil Passage Plug	17	1.7	13	
Oil Passage Plugs (Taper)	20	2.0	15	L
Race Holder Screws	4.9	0.50	43 in·lb	L
Shift Drum Cam Holder Bolt	12	1.2	106 in·lb	L
Shift Lever Bolt	6.9	0.70	61 in·lb	
Shift Pedal Mounting Bolt	25	2.5	18	L
Shift Shaft Return Spring Pin	28	2.9	21	L
Starter Clutch Bolt	49	5.0	36	
Starter Clutch Cover Bolt (L = 40 mm)	9.8	1.0	87 in·lb	
Starter Clutch Cover Bolt (L = 20 mm)	9.8	1.0	87 in·lb	
Starter Clutch Cover Bolts (L = 30 mm)	9.8	1.0	87 in·lb	
Tie-Rod Locknut (Front)	6.9	0.70	61 in·lb	Lh
Tie-Rod Locknut (Rear)	6.9	0.70	61 in·lb	
Transmission Case Bolt (M6)	9.8	1.0	87 in·lb	
Transmission Case Bolts (M8)	20	2.0	15	
Wheels/Tires				
Front Axle Clamp Bolts	20	2.0	15	AL
Front Axle Nut	127	13.0	93.7	
Rear Axle Nut	127	13.0	93.7	
Final Drive				
Chain Guide Bolts	9.8	1.0	87 in·lb	L
Engine Sprocket Cover Bolts	9.8	1.0	87 in·lb	
Engine Sprocket Cover Plate Mounting Bolts	9.8	1.0	87 in·lb	L
Engine Sprocket Nut	125	13.0	92.2	MO
Rear Axle Nut	127	13.0	93.7	
Rear Sprocket Nuts	59	6.0	44	
Speed Sensor Bolt	6.9	0.70	61 in·lb	L
Brakes				
Bleed Valves	7.8	0.80	69 in·lb	
Brake Hose Banjo Bolts	25	2.5	18	
Brake Lever Pivot Bolt	1.0	0.10	8.9 in·lb	Si
Brake Lever Pivot Bolt Locknut	5.9	0.60	52 in·lb	
Brake Pedal Mounting Bolt	34	3.5	25	L
Front Brake Disc Mounting Bolts	27	2.8	20	L
Front Brake Light Switch Screw	1.2	0.12	11 in·lb	
Front Brake Pad Pins	17	1.7	13	
Front Brake Reservoir Cap Stopper Screw	1.2	0.12	11 in·lb	
Front Caliper Assembly Bolts	27	2.8	20	L
Front Caliper Mounting Bolts	34	3.5	25	

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Front Master Cylinder Bleed Valve	5.4	0.55	48 in·lb	
Front Master Cylinder Clamp Bolts	11	1.1	97 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	17	1.7	13	
Suspension				
Front Axle Clamp Bolts	20	2.0	15	AL
Front Fork Top Plugs	35	3.6	26	
Lower Front Fork Clamp Bolts	23	2.3	17	AL
Lower Rear Shock Absorber Nut	34	3.5	25	
Piston Rod Guide Case	90	9.2	66	
Rear Shock Absorber Bracket Nut	59	6.0	44	
Swingarm Pivot Adjusting Collar Locknut	98	10.0	72.3	
Swingarm Pivot Shaft	20	2.0	15	
Swingarm Pivot Shaft Nut	108	11.0	79.7	
Tie-Rod Nuts	59	6.0	44	
Uni-Trak Rocker Arm Bolt	34	3.5	25	
Upper Front Fork Clamp Bolts	20	2.0	15	
Upper Rear Shock Absorber Nut	34	3.5	25	
Steering				
Handlebar Clamp Bolts	25	2.5	18	
Handlebar Positioning Bolts	9.8	1.0	87 in·lb	L
Left Switch Housing Screws	3.5	0.36	31 in·lb	
Lower Front Fork Clamp Bolts	23	2.3	17	AL
Right Switch Housing Screws	3.5	0.36	31 in·lb	
Steering Damper Mounting Bolts	11	1.1	97 in·lb	L
Steering Stem Head Nut	78	8.0	58	
Steering Stem Nut	20	2.0	15	
Throttle Case Screws	3.5	0.36	31 in·lb	
Upper Front Fork Clamp Bolts	20	2.0	15	
Frame				
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 (M10)	44	4.5	32	L
Rear Frame Bolts (M8)	25	2.5	18	L
Sidestand Bolt	44	4.5	32	G
Sidestand Bracket Bolts	49	5.0	36	L
Sidestand Switch Bolt	8.8	0.90	78 in·lb	L
Windshield Mounting Bolts	0.42	0.043	3.7 in·lb	
Electrical System				
Alternator Cover Bolts	9.8	1.0	87 in·lb	