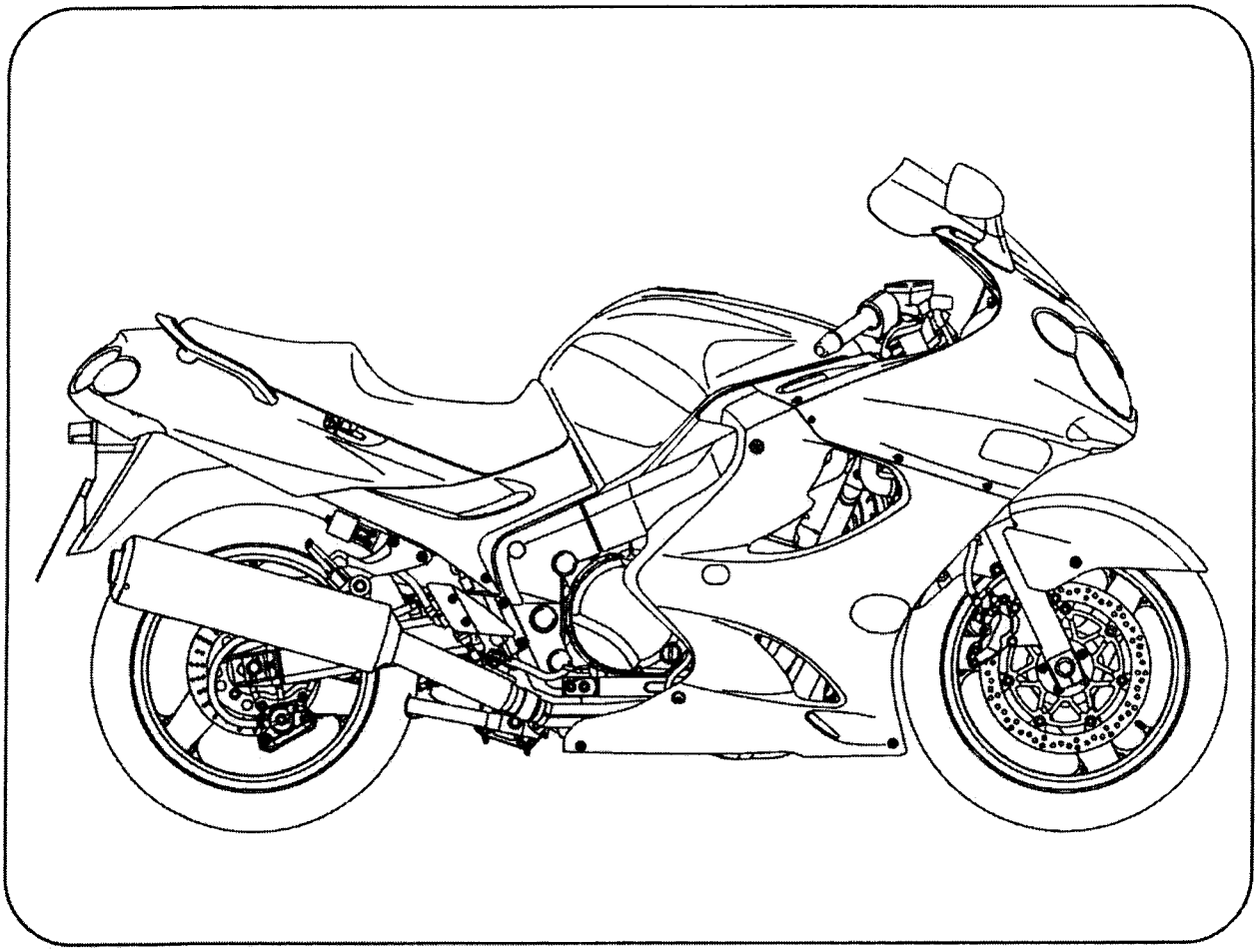
Kawasaki

ZZR1200



Motorcycle Service Manual

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 intake 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 carburetion 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 and ignition systems of this motorcycle have been carefully designed and constructed to ensure an efficient engine with low exhaust pollutant levels.

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 intake system by cutting, drilling, or other means if such modifications result in increased noise levels.

★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.

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.

General Information

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Table of Contents

1-2 GENERAL INFORMATION

Before Servicing

Before starting to service a motorcycle, careful reading of the applicable section is recommended to eliminate unnecessary work. Photographs, diagrams, notes, cautions, warnings, and detailed descriptions have been included wherever necessary. Nevertheless, even a detailed account has limitations, a certain amount of basic knowledge is also required for successful work.

Especially note the following:

(1) Dirt

Before removal and disassembly, clean the motorcycle. Any dirt entering the engine or other parts will work as an abrasive and shorten the life of the motorcycle. For the same reason, before installing a new part, clean off any dust or metal filings.

(2) Battery Leads

Disconnect the ground (-) lead from the battery before performing any disassembly operations on the motorcycle. This prevents the engine from accidentally turning over while work is being carried out, sparks from being generated while disconnecting the wires from electrical parts, as well as damage to the electrical parts themselves. For reinstallation, first connect the positive lead to the positive (+) terminal of the battery.

(3) Installation, Assembly

Generally, installation or assembly is the reverse of removal or disassembly. But if this Service Manual has installation or assembly procedures, follow them. Note parts locations and cable, wire, and hose routing during removal or disassembly so they can be installed or assembled in the same way. It is preferable to mark and record the locations and routing as much as possible.

(4) 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 evenly in a cross pattern. This is to avoid distortion of the part and/or causing gas or oil leakage. Conversely when loosening the bolts, nuts, or screws, first loosen all of them by about a quarter turn and then remove them. Where there is a tightening sequence indication in this Service Manual, the bolts, nuts, or screws must be tightened in the order and method indicated.

(5) Torque

When torque values are given in this Service Manual, use them. Either too little or too much torque may lead to serious damage. Use a good quality, reliable torque wrench.

(6) Force

Common sense should dictate how much force is necessary in assembly and disassembly. If a part seems especially difficult to remove or install, stop and examine what may be causing the problem. Whenever tapping is necessary, tap lightly using a wooden or plastic-faced mallet. Use an impact driver for screws (particularly for the removal of screws held by a locking agent) in order to avoid damaging the screw heads.

(7) Edges

Watch for sharp edges, especially during major engine disassembly and assembly. Protect your hands with gloves or a piece of thick cloth when lifting the engine or turning it over.

(8) High-Flash Point Solvent

A high-flash point solvent is recommended to reduce fire danger. A commercial solvent commonly available in North America is Stoddard solvent (generic name). Always follow manufacturer and container directions regarding the use of any solvent.

(9) Gasket, O-ring

Do not reuse a gasket or O-ring once it has been in service. The mating surfaces around the gasket should be free of foreign matter and perfectly smooth to avoid oil or compression leaks.

(10) Liquid Gasket, Non-Permanent Locking Agent

Follow manufacturer's directions for cleaning and preparing surfaces where these compounds will be used. Apply sparingly. Excessive amounts may block engine oil passages and cause serious damage. An example of a non-permanent locking agent commonly available in North America is Loctite Lock'n Seal (Blue).

(11) Press

A part installed using a press or driver, such as a wheel bearing, should first be coated with oil on its outer or inner circumference so that it will go into place smoothly.

Before Servicing

(12)Ball Bearing and Needle Bearing

Do not remove a ball bearing or a needle bearing unless it is absolutely necessary. Replace any ball or needle bearings that were removed with new ones, as removal generally damages bearings. Install bearings with the marked side facing out applying pressure evenly with a suitable driver. Only press on the race that forms the press fit with the base component to avoid damaging the bearings. This prevents severe stress on the balls or needles and races, and prevent races and balls or needles from being dented. Press a ball bearing until it stops at the stopper in the hole or on the shaft.

(13)Oil Seal and Grease Seal

Replace any oil or grease seals that were removed with new ones, as removal generally damages seals. When pressing in a seal which has manufacturer's marks, press it in with the marks facing out. Seals should be pressed into place using a suitable driver, which contacts evenly with the side of seal, until the face of the seal is even with the end of the hole. Before a shaft passes through a seal, apply a little high temperature grease on the lips to reduce rubber to metal friction.

(14)Circlip, Retaining Ring, and Cotter Pin

Replace any circlips, retaining rings, and cotter pins that were removed with new ones, as removal weakens and deforms them. When installing circlips and retaining rings, take care to compress or expand them only enough to install them and no more.

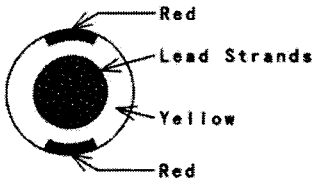
(15)Lubrication

Engine wear is generally at its maximum while the engine is warming up and before all the rubbing surfaces have an adequate lubricative film. During assembly, oil or grease (whichever is more suitable) should be applied to any rubbing surface which has lost its lubricative film. Old grease and dirty oil should be cleaned off. Deteriorated grease has lost its lubricative quality and may contain abrasive foreign particles.

Don't use just any oil or grease. Some oils and greases in particular should be used only in certain applications and may be harmful if used in an application for which they are not intended. This manual makes reference to molybdenum disulfide grease (MoS_2) and molybdenum disulfide oil in the assembly of certain engine and chassis parts. The molybdenum disulfide oil is a mixture of engine oil and molybdenum disulfide grease with a weight ratio (10 : 1), which can be made in your work shop. Always check manufacturer recommendations before using such special lubricants.

(16)Electrical Wires

All the electrical wires are either single-color or two-color and, with only a few exceptions, must be connected to wires of the same color. On any of the two-color wires there is a greater amount of one color and a lesser amount of a second color, so a two-color wire is identified by first the primary color and then the secondary color. For example, a yellow wire with thin red stripes is referred to as a "yellow/red" wire; it would be a "red/yellow" wire if the colors were reversed to make red the main color.

Lead (cross-section)	Color Indicated on the Lead	Color Indicated on the Wiring Diagram
	Yellow/Red	Y/R

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(17)Replacement Parts

When there is a replacement instruction, replace these parts with new ones every time they are removed. These replacement parts will be damaged or lose their original function once removed.

(18)Inspection

When parts have been disassembled, visually inspect these parts for the following conditions or other damage. If there is any doubt as to the condition of them, replace them with new ones.

Abrasion	Crack	Hardening	Warp
Bent	Dent	Scratch	Wear
Color change	Deterioration	Seizure	

Before Servicing

(19)Specifications

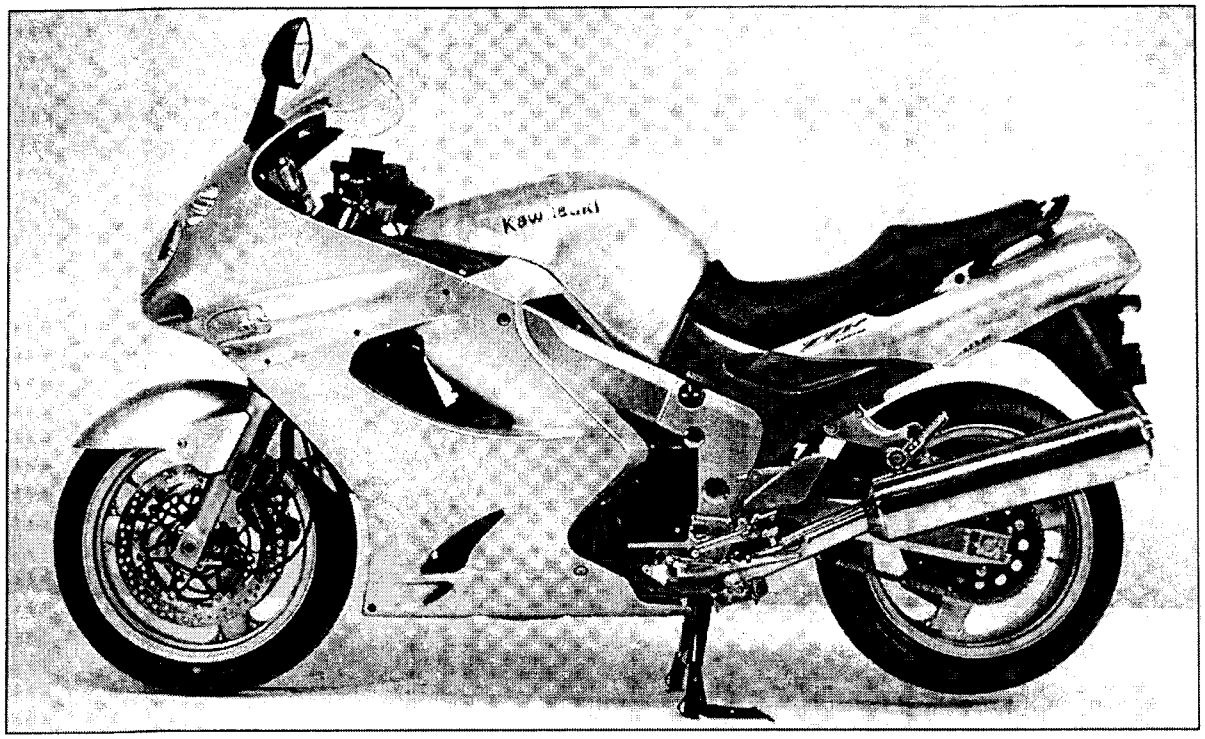
Specification terms are defined as follows:

"Standards" show dimensions or performances which brand-new parts or systems have.

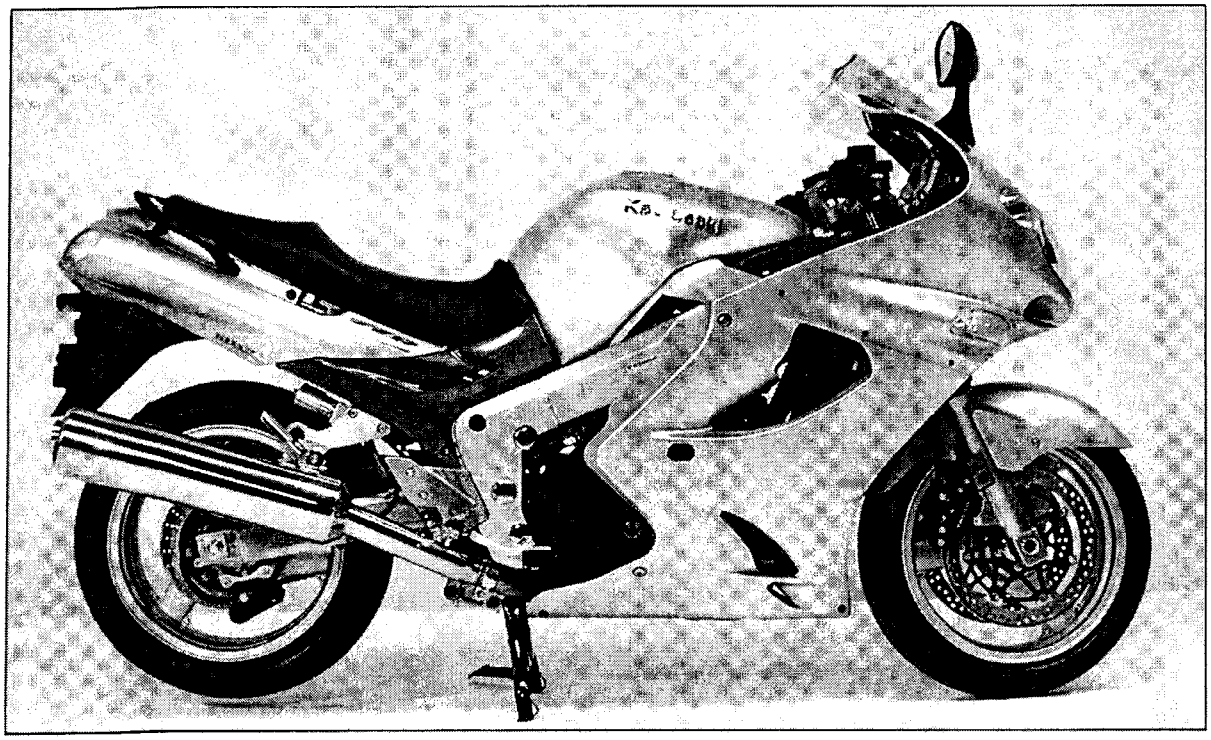
"Service Limits" indicate the usable limits. If the measurement shows excessive wear or deteriorated performance, replace the damaged parts.

Model Identification

ZX1200-C1 (US, and Canada) Left Side View:

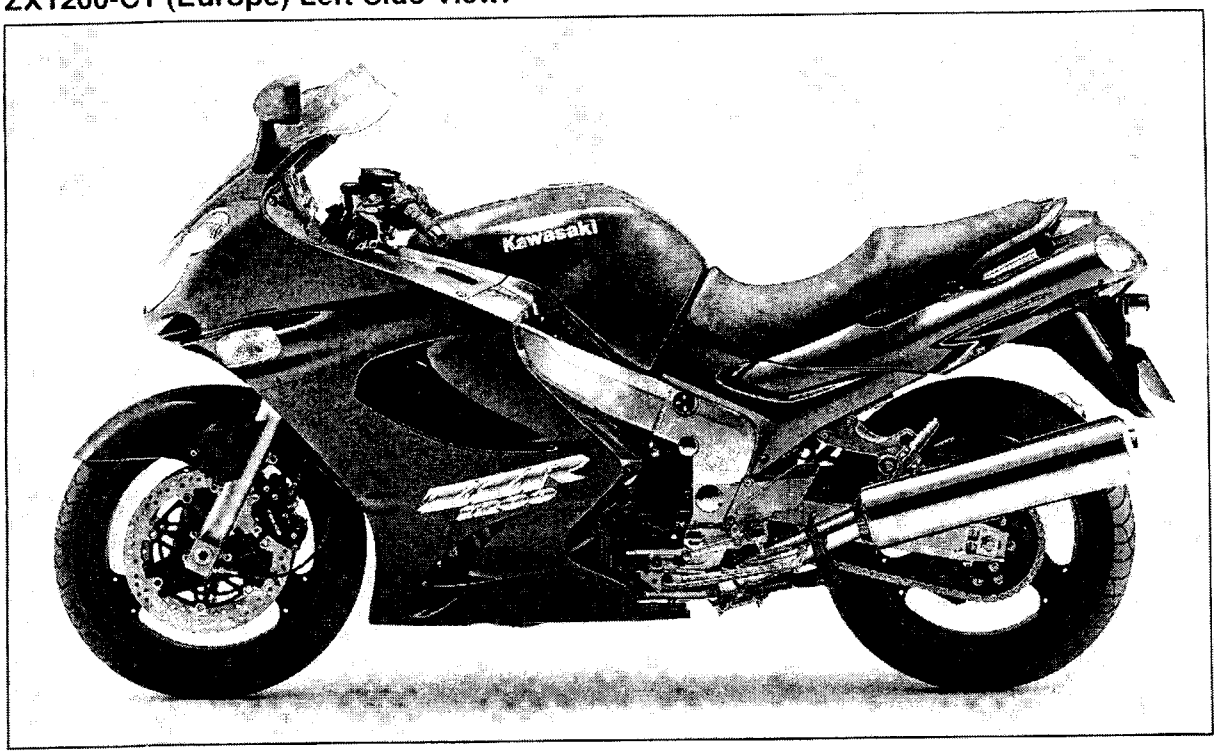


ZX1200-C1 (US, and Canada) Right Side View:

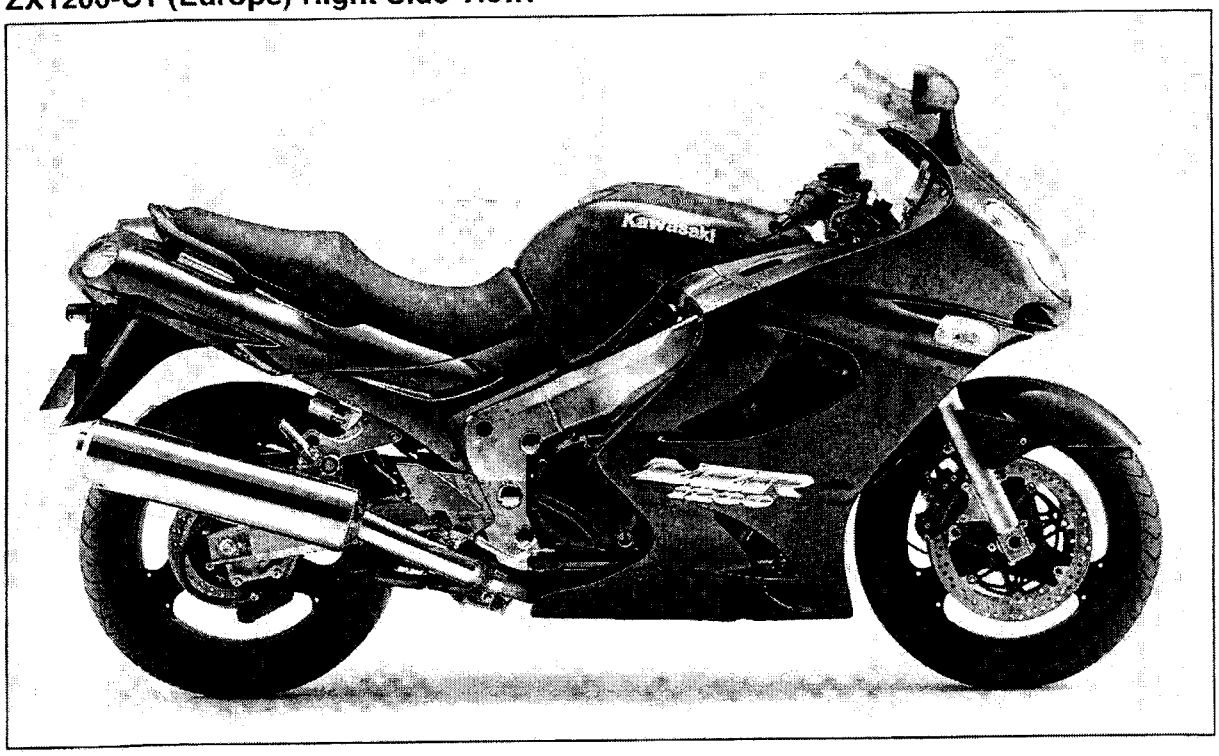


Model Identification

ZX1200-C1 (Europe) Left Side View:



ZX1200-C1 (Europe) Right Side View:



General Specifications

Items		ZX1200-C1 ~ C3/D1
Dimensions		
Overall length		2 160 mm (85.0 in.)
Overall width		755 mm (29.7 in.)
Overall height		1 245 mm (49.0 in.)
Wheelbase		1 505 mm (59.3 in.)
Road clearance		130 mm (5.12 in.)
Seat height		800 mm (31.5 in.)
Dry mass		236 kg (520 lb)
Curb mass:	Front	132 kg (291 lb)
	Rear	139 kg (306 lb)
Fuel tank capacity		23 L (6.1 US gal)
Performance		
Minimum turning radius		3.1 m (10.2 ft)
Engine		
Type		4-stroke, DOHC, 4-cylinder, 4 valves per cylinder
Cooling system		Liquid-cooled
Bore and stroke		79.0 x 59.4 mm (3.11 x 2.34 in.)
Displacement		1 164 mL (71.03 cu in.)
Compression ratio		10.6 : 1
Maximum horsepower		112 kW (152 PS) @9 800 r/min (rpm), (HR) 78.2 kW (106 PS) @9 000 r/min (rpm), (AU) (MY) (D1) 114 kW (155 PS) @9 800 r/min (rpm), (CA) (CAL) (US) - - -
Maximum torque		124 N·m (12.6 kgf·m, 91.1 ft·lb) @8 200 r/min (rpm), (HR) 108 N·m (11.0 kgf·m, 79.6 ft·lb) @4 700 r/min (rpm), (AU) (MY) (D1) 125 N·m (12.7 kgf·m, 91.9 ft·lb) @8 200 r/min (rpm), (CA) (CAL) (US) - - -
Carburetion system		Carburetors, Keihin CVKD 40 × 4
Starting system		Electric starter
Ignition system		Battery and coil (transistorized)
Timing advance		Electronically advanced (digital)
Ignition timing		From 10° BTDC @1 000 r/min (rpm) to 47.6° BTDC @7 000 r/min (rpm)
Spark plug		NGK CR9E or ND U27ESR-N
Cylinder numbering method		Left to right, 1-2-3-4
Firing order		1-2-4-3
Valve timing:		
Inlet	Open	40° BTDC
	Close	70° ABDC
	Duration	290°
Exhaust	Open	63° BBDC
	Close	43° ATDC
	Duration	286°

General Specifications

Items		ZX1200-C1 ~ C3/D1
Lubrication system		Forced lubrication (wet sump)
Engine oil:		
Grade		API SE, SF or SG class API SH or SJ class with JASO MA
Viscosity		SAE10W-40
Capacity		4.2 L (4.4 US qt, when engine is completely disassembled and dry)
Drive Train		
Primary reduction system:		
Type		Gear
Reduction ratio		1.637 (95/58)
Clutch type		Wet multi disc
Transmission:		
Type		6-speed, constant mesh, return shift
Gear ratios:		
	1st	2.733 (41/15)
	2nd	1.947 (37/19)
	3rd	1.590 (35/22)
	4th	1.333 (32/24)
	5th	1.153 (30/26)
	6th	1.035 (29/28)
Final drive system:		
Type		Chain drive
Reduction ratio		2.588 (44/17)
Overall drive ratio		4.390 @Top gear
Frame		
Type		Tubular, double cradle
Caster (rake angle)		25°
Trail		104 mm (4.09 in.)
Front tire:	Type	Tubeless
	Size	120/70 ZR17 M/C (58W)
Rear tire:	Type	Tubeless
	Size	180/55 ZR17 M/C (73W)
Front suspension:		
	Type	Telescopic fork
	Wheel travel	120 mm (4.72 in.)
Rear suspension:		
	Type	Swingarm (uni-trak)
	Wheel travel	120 mm (4.72 in.)
Brake Type:	Front	Dual disc
	Rear	Single disc

General Specifications

Items		ZX1200-C1 ~ C3/D1
Electrical Equipment		
Battery		12 V 14 Ah (sealed battery)
		12 V 12 Ah (sealed battery): ZX1200-C3 ~
Headlight:	Type	Semi-sealed beam
	Bulb	12 V 60/55 W (quartz-halogen) × 2
Tail/brake light		12 V 5/21 W × 2
Alternator:	Type	Three-phase AC
	Rated output	45 A/13.5 V @8 000 r/min (rpm)

Specifications are subject to change without notice, and may not apply to every country.
AU: Australia
CA: Canada
CAL: California
D1: ZX1200–D1 (H): WVTA Approval Model with honeycomb catalitic converter
HR: WVTA Approval Model with honeycomb catalitic converter (restricted model)
MY: Malaysia
US: United States

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	=	kgf
N	×	0.2248	=	lb
kgf	×	9.807	=	N
kgf	×	2.205	=	lb

Units of Length:

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

Units of Torque:

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

Units of Pressure:

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

Units of Speed:

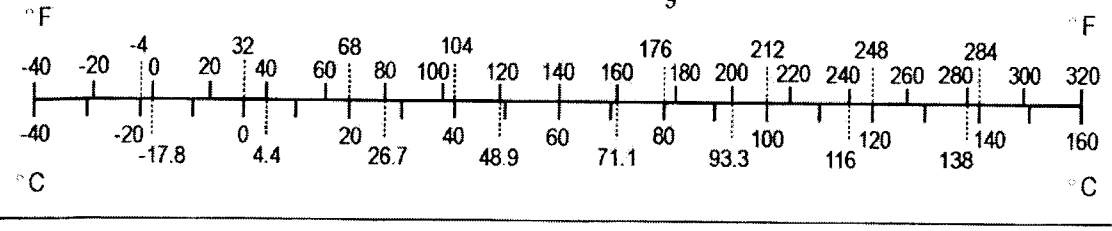
km/h	×	0.6214	=	mph

Units of Power:

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

Units of Temperature:

$\frac{9(°C+40)}{5} - 40 = °F$ $\qquad$ $\frac{5(°F+40)}{9} - 40 = °C$



Periodic Maintenance

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2-2 PERIODIC MAINTENANCE

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.**

OPERATION	Whichever comes first ⬇ Every	*Odometer Reading km × 1000 (mile × 1000) ➡ 1 (0.6)	6 (4)	12 (7.5)	18 (12)	24 (15)	30 (20)	36 (24)
Spark plug (e) - clean and gap †			●	●	●	●	●	●
Valve clearance (e) - inspect †				●		●		●
Air suction valve (e) - inspect †			●	●	●	●	●	●
Air cleaner element and air vent filter (e) - clean†#				●		●		●
Throttle grip play (e) - inspect †		●		●		●		●
Idle speed (e) - inspect †		●		●		●		●
Carburetor synchronization (e) - inspect †				●		●		●
Fuel hoses, connections - inspect †			●	●	●	●	●	●
Engine oil - change #	6 months	●	●	●	●	●	●	●
Oil filter - replace		●		●		●		●
Evaporative emission control system (e) (CAL) - inspect †		●	●	●	●	●	●	●
Drive chain wear - inspect † #			●	●	●	●	●	●
Brake pad wear - inspect † #			●	●	●	●	●	●
Brake light switch - inspect †		●	●	●	●	●	●	●
Steering - inspect †		●	●	●	●	●	●	●
Front fork oil - change	2 years					●		
Rear shock absorber oil leak - inspect †				●		●		●
Front fork oil leak - inspect †				●		●		●
Tire wear - inspect †			●	●	●	●	●	●
Swingarm pivot - lubricate				●		●		●
General lubrication - perform				●		●		●
Nut, bolt, and fastener tightness - inspect †		●		●		●		●
Drive chain - lubricate #	600 km							
Drive chain slack - inspect † #	1000 km							
Brake/clutch hoses, connections - inspect †			●	●	●	●	●	●
Brake/clutch fluid level - inspect † #	month	●	●	●	●	●	●	●
Radiator hoses, connections - inspect †		●						
Brake/clutch fluid - change	2 years					●		
Brake/clutch master cylinder cup and dust seal - replace	4 years							
Coolant - change	2 years					●		
Caliper piston seal and dust seal - replace	4 years							
Steering stem bearing - lubricate	2 years					●		
Clutch slave cylinder piston seal - replace	4 years							

Periodic Maintenance Chart

OPERATION	Whichever comes first ⬇ Every	*Odometer Reading km × 1000 (mile × 1000) ➡ 1 (0.6)	6 (4)	12 (7.5)	18 (12)	24 (15)	30 (20)	36 (24)
Coolant filter (except for CA, CAL, US) - clean	year							

#: 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.
†: Replace, add, adjust, clean, or torque if necessary.
CA: Canadian Model
CAL: California Model
US: United States Model
e: Emission Related Items

2-4 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 .

Letters used in the "Remarks" column mean:
EO: Apply engine oil to the threads.
G: Apply grease to the threads.
L: Apply a non-permanent locking agent to the threads.
Lh: Left-hand threads.
MO: Apply molybdenum disulfide oil. The molybdenum disulfide oil is a mixture of engine oil and molybdenum disulfide grease with a weight ratio (10 : 1).
R: Replacement parts
S: Tighten the fasteners following the specified sequence.
se: Seating Surface
SS: Apply silicone sealant.
th: Threads
ws: Washer

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

Basic Torque for General Fasteners

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

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Fuel System:				
Fuel Tap Bolts	2.5	0.25	22 in·lb	
Fuel Tap Plate Screws	0.8	0.08	7 in·lb	
Fuel Tap Knob Screw	1.5	0.15	13 in·lb	
Fuel Level Sensor Bolts	6.9	0.70	61 in·lb	
Carburetor Holder Bolts	13	1.3	115 in·lb	L
Vacuum Valve Drain Screw	1.0	0.10	9 in·lb	CAL
Cooling System:				
Water Hose Clamp Screws	2.5	0.25	22 in·lb	
Water Pump Air Bleeder Bolt	10	1.0	89 in·lb	
Thermostat Housing Air Bleeder Bolt	7.8	0.80	69 in·lb	
Coolant Drain Plug (water pipe)	11	1.1	97 in·lb	
Radiator Fan Switch	18	1.8	13	
Water Temperature Sensor	7.8	0.80	69 in·lb	SS

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Water Pump Outlet Pipe Bolt	11	1.1	97 in·lb	
Water Pump Inlet Pipe Bolt	11	1.1	97 in·lb	L
Water Pump Mounting Bolts	11	1.1	97 in·lb	
Water Pump Cover Bolts	11	1.1	97 in·lb	
Engine Top End:				
Spark Plugs	14	1.4	10	
Air Suction Valve Cover Bolts	11	1.1	97 in·lb	
Cylinder Head Cover Bolts	10	1.0	89 in·lb	
Pickup Coil Cover Bolts	11	1.1	97 in·lb	L (2)
Chain Tensioner Mounting Bolts	11	1.1	97 in·lb	L
Chain Tensioner Cap	20	2.0	15	
Camshaft Cap Bolts	12	1.2	110 in·lb	S
Camshaft Bracket Bolts	12	1.2	110 in·lb	S
Camshaft Sprocket Bolts	15	1.5	11	L
Upper Chain Guide Bolts	12	1.2	110 in·lb	L
Cylinder Water Pipe Mounting Bolts (front)	11	1.1	97 in·lb	L
Cylinder Head Water Pipe Mounting Bolts (rear)	11	1.1	97 in·lb	
Water Hose Clamp Screws	2.5	0.25	22 in·lb	
Head Oil Hose Fitting	22	2.2	16	cylinder head
T-fitting Banjo Bolts	25	2.5	18	cylinder head
Cylinder Head Bolts:				
ϕ11 mm	62	6.3	46	S, MO (ws, se, th)
ϕ10 mm	46	4.7	34	S, MO (ws, se, th)
ϕ6 mm	9.8	1.0	87 in·lb	S
Cylinder Bolts: ϕ6 mm	15	1.5	11	S
Cylinder Coolant Drain Bolts	10	1.0	89 in·lb	
Rear Camshaft Chain Guide Bolt	20	2.0	15	L
Lower Chain Guide Bolts	11	1.1	97 in·lb	lower, L
Carburetor Holder Bolts	13	1.3	115 in·lb	L
Clutch:				
Clutch Lever Pivot Bolt	1.0	0.10	8.9 in·lb	
Clutch Lever Pivot Bolt Locknut	5.9	0.60	52 in·lb	
Clutch Slave Cylinder Bleed Valve	8.2	0.84	73 in·lb	
Clutch Slave Cylinder Bolts	–	–	–	L (2)
Clutch Hose Banjo Bolt	25	2.5	18	
Clutch Pipe Banjo Bolt	25	2.5	18	
Clutch Reservoir Cap Screws	1.5	0.15	13 in·lb	
Clutch Master Cylinder Clamp Bolts	11	1.1	97 in·lb	S
Starter Lockout Switch Screw	1.2	0.12	11 in·lb	
Clutch Cover Bolts	11	1.1	97 in·lb	L (4)
Clutch Cover Damper Bolts	10	1.0	89 in·lb	L
Clutch Cover Oil Pipe Banjo Bolt	12	1.2	110 in·lb	

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Clutch Cover Oil Pipe Mounting Bolt	6.0	0.60	53 in·lb	
Clutch Spring Bolts	11	1.1	97 in·lb	
Clutch Hub Nut	130	13.1	96	R
Engine Lubrication System:				
Oil Filler Cap	2.5	0.25	22 in·lb	
Engine Drain Plugs	20	2.0	15	
Oil Filter Bolt	20	2.0	15	
Oil Pan Bolts	15	1.5	11	L (6)
Oil Pressure Relief Valve	15	1.5	11	L
Oil Nozzle	3.5	0.36	31 in·lb	oil pan
Oil Pressure Switch Terminal Screw	1.6	0.16	14 in·lb	
Oil Pressure Switch	15	1.5	11	SS
Oil Pump Mounting Bolts	12	1.2	110 in·lb	three
Oil Pump Cover Bolts	9.8	1.0	87 in·lb	
Oil Pump Drive Gear Holder Screws	5.2	0.53	46 in·lb	L
Oil Pipe Banjo Bolts: ϕ12 mm	25	2.5	18	
Head Oil Hose Banjo Bolts:ϕ12 mm	25	2.5	18	on oil pan
Oil Cooler Left Hose Banjo Bolt: ϕ14 mm	34	3.5	25	on oil pan
Oil Cooler Right Hose Banjo Bolt: ϕ14 mm	34	3.5	25	Lh, on oil pan
Oil Pump Bracket Bolts	11	1.1	97 in·lb	
Oil Pump Bracket Plug	25	2.5	18	L
Main Oil Passage Plug	18	1.8	13	
Oil Pan Plug R 1/8	15	1.5	11	L, taper threads
Oil Screen Holder Screws	5.2	0.53	46 in·lb	
Oil Separator Screws	5.2	0.53	46 in·lb	
Crankcase Breather Cover Bolts	11	1.1	97 in·lb	
Oil Cooler Banjo Bolts	25	2.5	18	on oil cooler
Oil Cooler Screen Bolt	11	1.1	97 in·lb	lower right
Oil Cooler Screen Screw	4.5	0.46	40 in·lb	lower left
Engine Removal/Installation:				
Downtube Bolts	44	4.5	32	
Engine Mounting Bolts and Nuts	44	4.5	32	
Front Engine Bracket Bolts	44	4.5	32	
Engine Mounting Locknuts	49	5.0	36	
Oil Cooler Left Hose Banjo Bolt: ϕ14	34	3.5	25	on oil pan
Oil Cooler Right Hose Banjo Bolt: ϕ14	34	3.5	25	Lh, on oil pan
Engine Sprocket Nut	127	13.0	94	MO (th, se)
Crankshaft/Transmission:				
Lower Crankcase Plug: ϕ 25 mm	18	1.8	13	
Crankcase Bolts:				
ϕ9 mm	32	3.3	24	S

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
φ8 mm	30	3.1	22	S
φ7 mm	20	2.0	15	S
φ6 mm	20	2.0	15	S
Main Oil Passage Plug	18	1.8	13	
Connecting Rod Big End Nuts	in the text	←	←	MO (th, se)
Main Bearing Cap Bolts	32	3.3	24	
Balancer Lever Bolt	9.8	1.0	87 in·lb	L
Balancer Shaft Plate Bolt	11	1.1	97 in·lb	L
Balancer Shaft Clamp Bolt	11	1.1	97 in·lb	
Alternator Shaft Nut	59	6.0	44	right
Alternator Shaft Bearing Retainer Bolts	12	1.2	110 in·lb	L
Alternator Shaft Bolt	25	2.5	18	left
Alternator Chain Tensioner Bolts	11	1.1	97 in·lb	L
Alternator Chain Sprocket Bolt	25	2.5	18	crankshaft
Alternator Chain Guide Bolt	11	1.1	97 in·lb	L
Starter Motor Clutch Bolts	12	1.2	110 in·lb	L
Timing Rotor Bolt	25	2.5	18	L
External Shift Mechanism Cover Bolts	11	1.1	97 in·lb	L (4)
Shift Shaft Return Spring Pin (bolt)	30	3.1	22	L
Neutral Switch	15	1.5	11	
Shift Drum Bearing Holder Bolts	13	1.3	120 in·lb	L
Shift Drum Cam Screw	–	–	–	L
Bearing Holder Bolts	11	1.1	97 in·lb	
Transmission Oil Pipe Holder Bolt	11	1.1	97 in·lb	
Gear Set Lever Nut	11	1.1	97 in·lb	
Neutral Set Lever Nut	11	1.1	97 in·lb	
Crankcase Breather Cover Bolts	11	1.1	97 in·lb	
Oil Separator Screws	5.2	0.53	46 in·lb	
Wheels/Tires:				
Front Axle Clamp Bolts	20	2.0	15	
Front Axle Nut	127	13.0	94	
Rear Axle Nut	108	11.0	80	
Final Drive:				
Engine Sprocket Nut	125	12.8	92	MO (th, se)
Rear Sprocket Nuts	59	6.0	44	
Rear Sprocket Studs	–	–	–	L
Brakes:				
Brake Pedal Bolt	8.8	0.90	78 in·lb	
Caliper Bleed Valves	7.8	0.80	69 in·lb	
Brake Hose Banjo Bolts	25	2.5	18	
Brake Lever Pivot Bolt	1.0	0.10	9 in·lb	
Brake Lever Pivot Bolt Locknut	5.9	0.60	52 in·lb	
Front Brake Reservoir Cap Screws	1.5	0.15	13 in·lb	

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Front Brake Light Switch Screw	1.2	0.12	11 in·lb	
Front Master Cylinder Clamp Bolts	8.8	0.90	78 in·lb	S
Front Caliper Mounting Bolts	25	2.5	18	
Rear Caliper Mounting Bolts	25	2.5	18	
Front Caliper Assembly Bolts	21	2.1	15	
Rear Caliper Assembly Bolts	29	3.0	21	
Front Brake Pad Spring Bolts	2.9	0.30	26 in·lb	
Front Brake Pad Pin	16	1.6	12	
Brake Disc Mounting Bolts	27	2.8	20	L
Rear Master Cylinder Mounting Bolts	25	2.5	18	
Rear Master Cylinder Push Rod Locknut	18	1.8	13	
Suspension:				
Upper Front Fork Clamp Bolts	29	3.0	21	
Lower Front Fork Clamp Bolts	21	2.1	15	
Front Fork Top Plugs	23	2.3	17	
Fork Piston Rod Nut	15	1.5	11	
Front Fork Bottom Allen Bolts	40	4.0	29	L
Front Axle Clamp Bolts	20	2.0	15	S
Rear Shock Absorber Upper Mounting Nut	59	6.0	44	
Rear Shock Absorber Lower Mounting Nut	59	6.0	44	
Tie-rod Nuts	59	6.0	44	
Rocker-arm Nut	59	6.0	44	
Swingarm Pivot Shaft Nut	108	11.0	80	
Swingarm Pivot Shaft Lock Nut	98	10	72	
Steering:				
Steering Stem Head Nut	78	8.0	57	
Steering Stem Head Bolt (ZX1200-C3 –)	108	11.0	80	
Steering Stem Nut	20	2.0	15	
Handlebar Bolts	25	2.5	18	
Handlebar Weight Screws	–	–	–	L
Handlebar Switch Housing Screws	3.4	0.35	30 in·lb	
Upper Front Fork Clamp Bolts	29	3.0	21	
Lower Front Fork Clamp Bolts	21	2.1	15	
Frame:				
Center Stand Bolts	29	3.0	21	
Rear Frame Bolts	44	4.5	32	L
Downtube Bolts	44	4.5	32	
Sidestand Bolt	44	4.5	32	
Sidestand Bracket Bolts	49	5.0	36	
Sidestand Switch Bolt	8.8	0.90	78 in·lb	L
Grub Rail Bolts	25	2.5	18	

Specifications

Item	Standard	Service Limit
Fuel System		– – –
Throttle grip or choke lever	2 ~ 3 mm (0.08 ~ 0.12 in.)	
Free play Idle speed	1 000 ±50 r/min (rpm)	
Carburetor synchronization vacuum	2.7 kPa (2 cmHg, 0.39 psi) or less difference between any two carburetors	
Cooling System		– – –
Coolant:		
Type (recommended)	Permanent type antifreeze	
Color	Green	
Mixed ratio	Soft water 50% and coolant 50%	
Freezing point	–35°C (–31°F)	
Total amount	3.2 L (3.4 US qt)	
Engine Top End		– – –
Valve clearance:		
Exhaust	0.18 ~ 0.24 mm (0.0071 ~ 0.0095 in.)	
Inlet	0.13 ~ 0.19 mm (0.0051 ~ 0.0075 in.)	
Clutch		– – –
Clutch fluid: Grade	DOT4	
Clutch lever free play	Non-adjustable	
Engine Lubrication System		– – –
Engine oil:		
Type	API SE, SF or SG API SH or SJ with JASO MA	
Viscosity	SAE 10W-40	
Capacity	3.3 L (3.5 US qt, when filter is not removed) 3.6 L (3.8 US qt, when filter is removed) 4.2 L (4.4 US qt, when engine is completely disassembled and dry)	
Level	Between upper and lower level lines (Wait 2 ~ 3 minutes after the engine stopped.)	
Tires		
Tread depth:		
Front		
BRIDGESTONE BT020E RADIAL AA 120/70 ZR17 M/C (58W)	4.3 mm (0.17 in.)	1 mm (0.04 in.) (DE, AT, CH) 1.6 mm (0.063 in.)
Rear		
BRIDGESTONE BT020R RADIAL AA 180/55 ZR17 M/C (73W)	6.2 mm (0.24 in.)	Up to 130 km/h (80 mph): 2 mm (0.08 in.) Over 130 km/h (80 mph): 3 mm (0.12 in.)

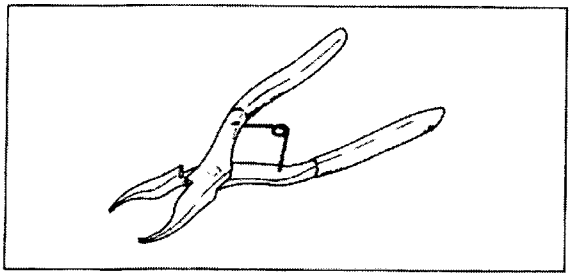
Specifications

Item	Standard	Service Limit
Air pressure (when cold):		
Front	Up to 180 kg (397 lb) load: 290 kPa (2.9 kgf/cm², 42 psi)	– – –
Rear	Up to 180 kg (397 lb) load: 290 kPa (2.9 kgf/cm², 42 psi)	– – –
Final Drive		
Drive chain slack	25 ~ 35 mm (1 ~ 1.4 in.)	
Drive chain wear (20-link length)	317.5 ~ 318.2 mm (12.50 ~ 12.53 in.)	323 mm (12.7 in.)
Brakes		
Brake fluid: Grade	DOT4	– – –
Brake pad lining thickness:		
Front	4.0 mm (0.16 in.)	1 mm (0.04 in.)
Rear	4.0 mm (0.16 in.)	1 mm (0.04 in.)
Brake light timing:		
Front	Pulled ON	– – –
Rear	ON after about 10 mm (0.39 in.) of pedal travel	– – –
Suspension		
Fork Oil:		
Viscosity	SAE 5W	– – –
When changing oil amount	approx. 350 mL (11.8 US oz)	– – –
After disassembly and completely dry amount	409 ±4 mL (13.8 ±0.14 US oz)	– – –
Fork Oil Level: (fully compressed, without spring)	167 ±2 mm (6.57 ±0.08 in.)	
Electrical System		
Spark plug gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)	– – –

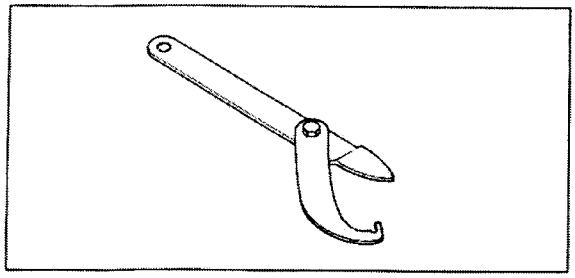
AT: Republic of Austria
CH: Swiss Confederation
DE: Federal Republic of Germany

Special Tools

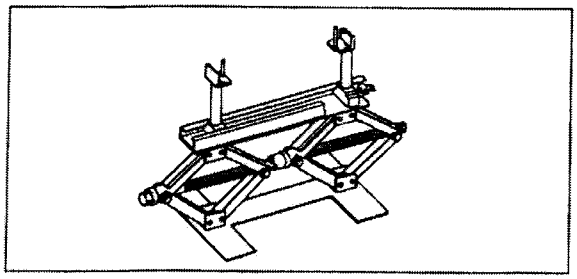
Inside Circlip Pliers:
57001–143



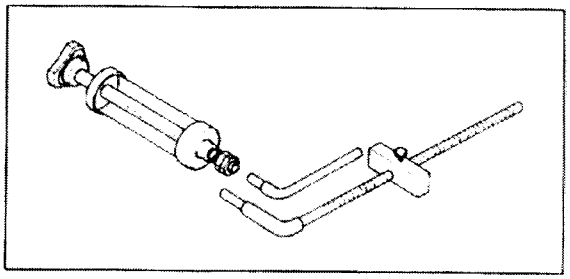
Steering Stem Nut Wrench:
57001–1100



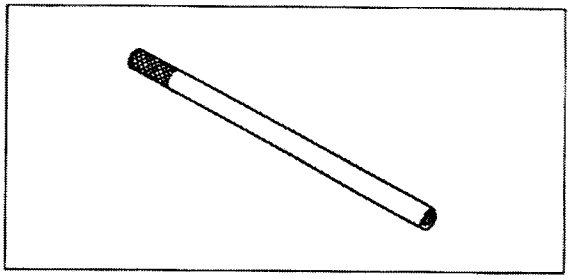
Jack:
57001–1238



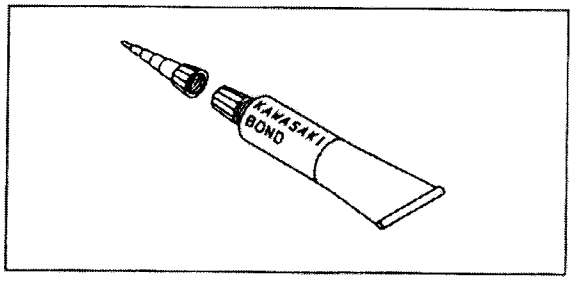
Fork Oil Level Gauge:
57001–1290



Fork Piston Rod Puller, M10 x 1.0:
57001–1298



Kawasaki Bond (Silicone Sealant):
56019–120



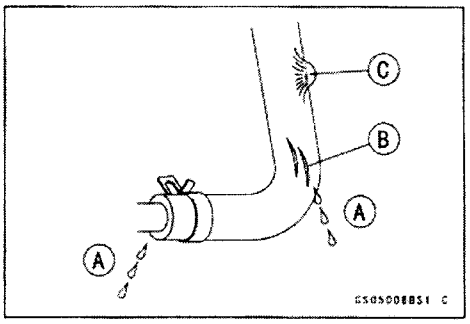
Periodic Maintenance Procedures

Fuel System

Fuel Hose and Connection Inspection

OThe fuel hoses are designed to be used throughout the motorcycle's life without any maintenance, however, if the motorcycle is not properly handled, the pressure inside the fuel line can cause fuel to leak [A] or the hose to burst. Remove the fuel tank (see Fuel System chapter) and check the fuel hose.

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



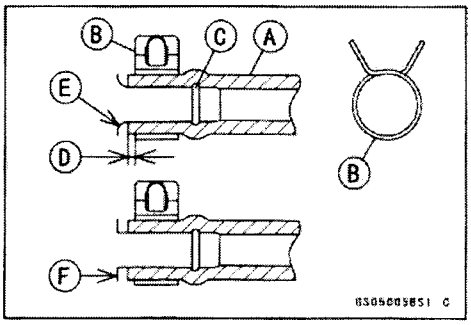
- Check that the hoses are securely connected and clamps are installed correctly.
- When installing, route the hoses according to Cable, Wire, and Hose Routing section in the General Information chapter.
- When installing the fuel hoses, avoid sharp bending, kinking, flattening or twisting, and route the fuel hoses with a minimum of bending so that the fuel flow will not be obstructed.

★Replace the hose if it has been sharply bent or kinked.

- Fit the fuel hose [A] onto the fitting fully and install the plate clamp [B] beyond the raised rib [C].
  1 ~ 2 mm (0.0039 ~ 0.0078 in.) [D]

OThe hose end must reach the fillet [E] or be as near as possible to the step [F].

OFit the fuel pump inlet hoses onto the Y-joint fully until each end of the inlet hose touches the second raised rib.

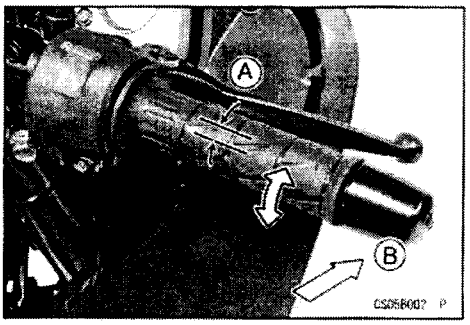


Throttle Grip Play Inspection

- Check the throttle grip free play [A].
  Front [B]

★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 moves smoothly from close to full open, and the throttle closes quickly and completely in all steering positions by the return spring.

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

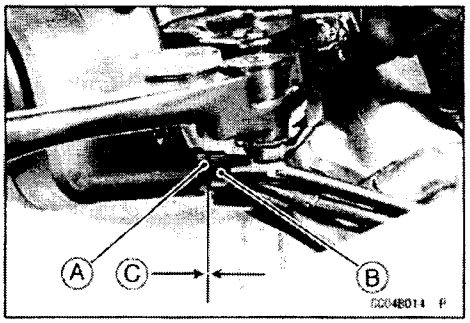
- Run the engine at the idle speed, and turn the handlebar all the way to the right and left to ensure that the idle speed doesn't change.

★If the idle speed increases, check the throttle grip free play and the cable routing.

Periodic Maintenance Procedures

★If necessary, adjust the throttle cable as follows.
- Loosen the locknut [A] (right-front view).
- Turn the adjuster [B] until the proper amount of free play can be obtained.
- Tighten [C] the locknut against the adjuster securely.

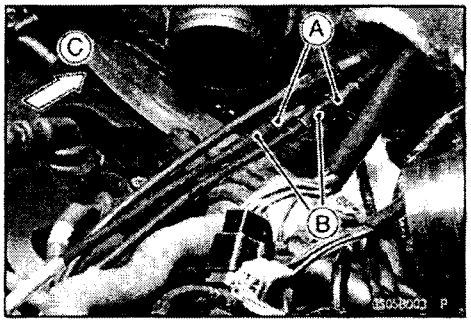
★If the throttle grip free play cannot be adjusted with the adjuster, use the adjusters in the middle of the throttle cables.
- Loosen the locknut, and screw the adjuster at the upper end of the accelerator cable all the way in.
- Tighten the locknut against the adjuster securely.



- Remove the fuel tank (see Fuel Tank Removal in the Fuel System chapter).
- Remove the air cleaner housing (see Fuel System chapter).
- Loosen the locknuts [A], and turn the lower adjusters [B] until the proper amount of throttle grip free play is obtained.
- Tighten the locknuts against the adjusters securely.

Front [C]

★If the throttle grip free play cannot be adjusted with the lower adjusters, use the adjuster at the upper end of the cable again.



Idle Speed Inspection
- Start the engine and warm it up thoroughly.
- With the engine idling, turn the handlebar to both sides.

★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 idle speed.

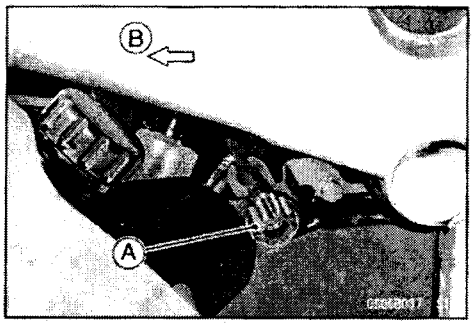
★If the idle speed is out of the specified range, adjust it.

Idle Speed
Standard: 1 000 ±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.

Front [B]



Periodic Maintenance Procedures

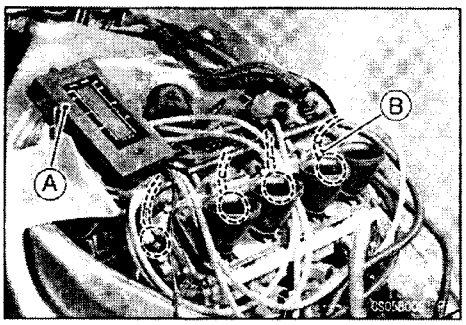
Carburetor Synchronization Inspection

- Situate the motorcycle so that it is vertical.
- Start the engine and warm it up thoroughly.
- Check idle speed, using an accurate commercially available tachometer.

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

- Remove the fuel tank and the air cleaner housing (see Fuel System chapter).
- Supply fuel to the carburetors with an auxiliary fuel tank.
- Pull the vacuum hoses off, and attach a commercially available vacuum gauge [A] to the fittings [B] on the carburetor holders (rear view).
- Start the engine and let it idle to measure each carburetor inlet vacuum.

★If the vacuum is incorrect, adjust the synchronization as follows:



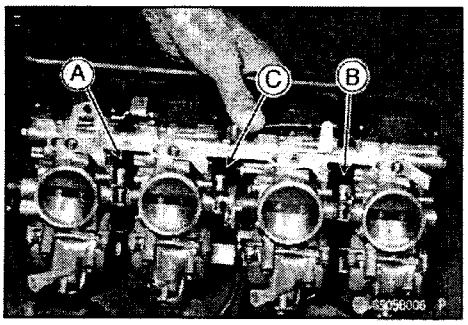
Carburetor Synchronization Vacuum

Standard:	**2.7 kPa (2 cmHg, 0.39 psi) or less difference between any two carburetors.**

★If combustion varies from cylinder to cylinder, adjust the synchronization (in the photo, the carburetors have been removed for clarity).

- While idling the engine, turn the balance adjusting screws on the levers to synchronize the carburetors.

○First synchronize the right two and then the left two carburetors by means of the adjusting screws [A] and [B] (front view). Then synchronize the right two carburetors and the left two carburetors using the center adjusting screw [C]. Adjust the idle speed as necessary.



★If the carburetor synchronization cannot be obtained by using the balance adjusting screws, check the carburetor for dirt or blockage, and then check the pilot screw settings (see Pilot Screw Setting in the Fuel System chapter).

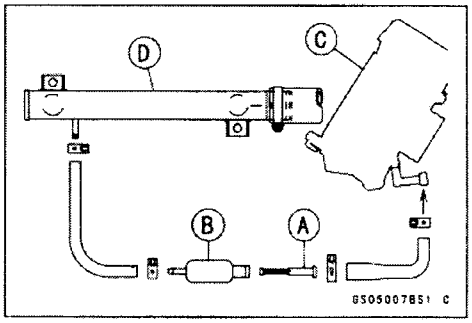
CAUTION

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

- Open and close the throttle a few times to make sure that the throttle valves are synchronized. Readjust if necessary.
- Install all parts previously removed, and adjust the idle speed.
- Connect the vacuum hoses to their original positions.

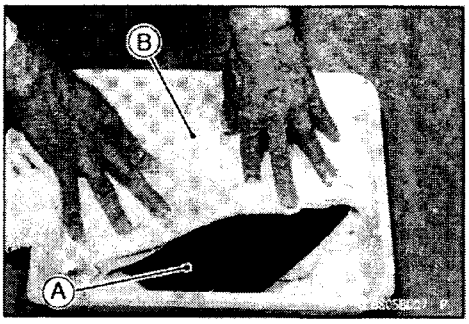
Periodic Maintenance Procedures

Coolant Filter Cleaning



○Before winter season starts or in accordance with the Periodic Maintenance Chart, clean the coolant filter [A] in the carburetor system (except for CA, CAL, and US models).
- Remove the fuel tank (see Fuel System chapter).
- Remove the case [B] and take out the coolant filter. Carburetor [C] and Water Pipe [D]
- Plug the coolant hose immediately and wash away any coolant that spills on the engine.
- Blow dirt and sediment off the filter with compressed air.
- Install the coolant filter (see Fuel System chapter).

Air Cleaner Element/Air Vent Filter Cleaning



NOTE

○*In dusty areas, the element should be cleaned more frequently than the recommend interval.*
○*After riding through rain or on muddy roads, the element should be cleaned immediately.*

- Remove the air cleaner element (see Element Removal in the Fuel System chapter).
- Clean the element [A] in a bath of a high-flash point solvent.
- Squeeze the element dry in a clean towel [B].

⚠ WARNING

Clean the element in a well-ventilated area, and make sure that there are no sparks or flames anywhere near the working area; this includes any appliance with a pilot light. To avoid a fire or explosion, do not use gasoline or a low-flash point solvent to clean the element.

CAUTION

Do not twist, wring or blow the element dry to avoid damaging it.

- After cleaning, saturate the element [A] with a high-quality foam-air-filter oil, squeeze out the excess oil, then wrap it in a clean towel [B] and squeeze it dry as much as possible. Be careful not to tear the element.
- Before installation, check the element for damage such as tears, hardening or shrinkage. If damaged, replace the element.