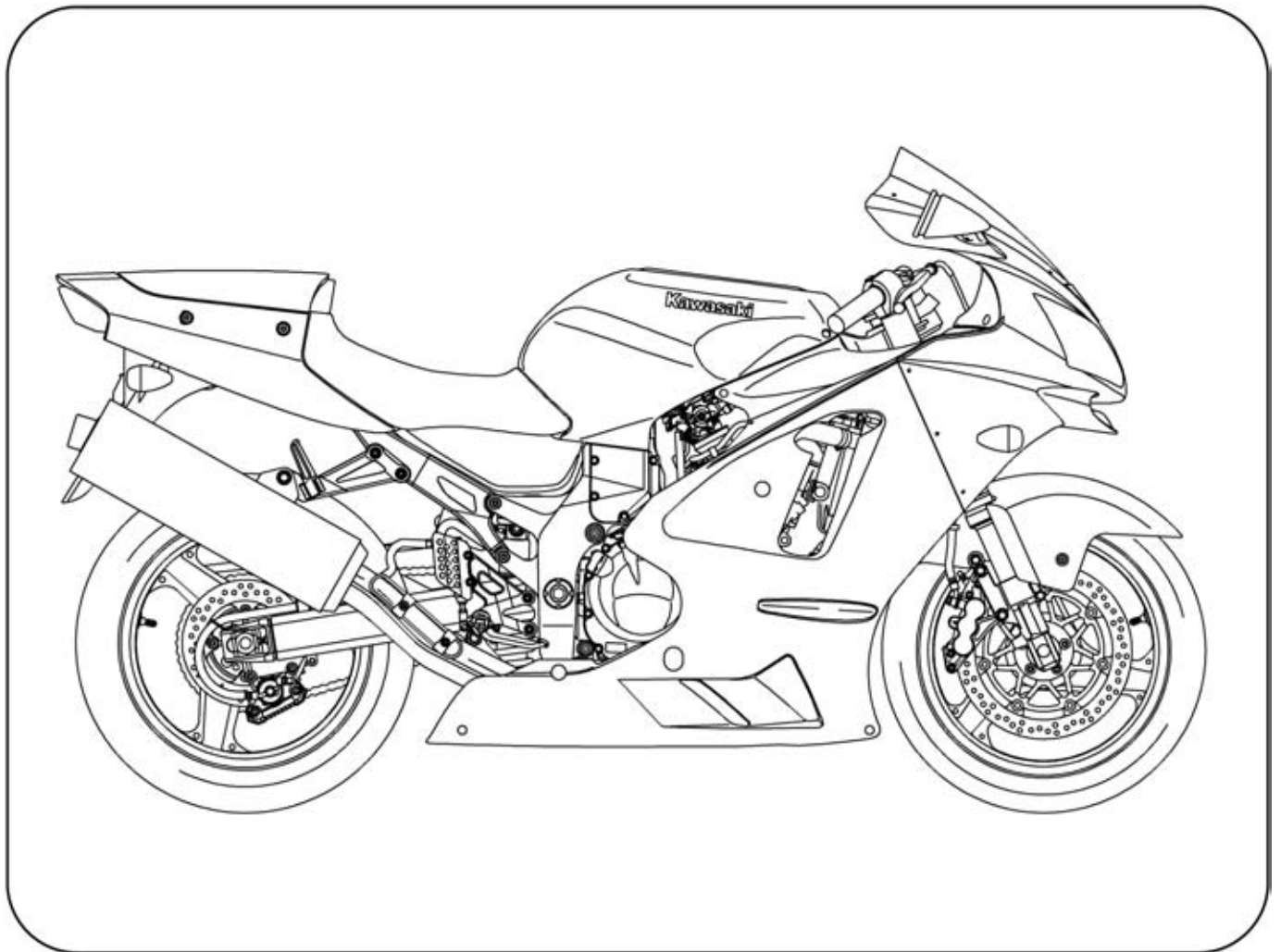


Kawasaki Ninja ZX-12R



Motorcycle Service Manual

Quick Reference Guide

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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.



Ninja ZX-12R

Motorcycle Service Manual

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No liability can be accepted for any inaccuracies or omissions in this publication, although every possible care has been taken to make it as complete and accurate as possible.

The right is reserved to make changes at any time without prior notice and without incurring an obligation to make such changes to products manufactured previously. See your Motorcycle dealer for the latest information on product improvements incorporated after this publication.

All information contained in this publication is based on the latest product information available at the time of publication. Illustrations and photographs in this publication are intended for reference use only and may not depict actual model component parts.

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.

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 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 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

1

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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 Cables

Disconnect the ground (–) cable 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 leads from electrical parts, as well as damage to the electrical parts themselves. For reinstallation, first connect the positive cable 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, lead, 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 leakage.

(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 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 little high temperature grease on the lips to reduce rubber to metal friction.

(14)Circlip, Retaining Ring, and Cotter Pin

Replace any circlips and 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.

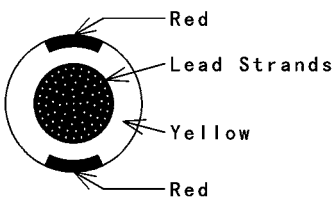

(15)Lubrication

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 (MoS₂) 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 Leads

All the electrical leads are either single-color or two-color and, with only a few exceptions, must be connected to leads of the same color. On any of the two-color leads there is a greater amount of one color and a lesser amount of a second color, so a two-color lead is identified by first the primary color and then the secondary color. For example, a yellow lead with thin red stripes is referred to as a "yellow/red" lead; it would be a "red/yellow" lead 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
	<p>Yellow/Red</p>	

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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.

1-4 GENERAL INFORMATION

Before Servicing

(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	

(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.

(20) Instrument

Use a meter that has enough accuracy for an accurate measurement.

Read the manufacturer's instructions thoroughly before using the meter.

Incorrect values may lead to improper adjustments.

Model Identification

ZX1200-B1 Left Side View



ZX1200-B1 Right Side View



1-6 GENERAL INFORMATION

General Specifications

Items	ZX1200-B1 ~ B3
Dimensions Overall Length Overall Width Overall Height Wheelbase Road Clearance Seat Height Dry Mass Curb Mass: Front Rear Fuel Tank Capacity	2 085 mm (82.09 in.) 740 mm (29.13 in.) 1 200 mm (47.24 in.) 1 450 mm (57.09 in.) 120 mm (4.72 in.) 820 mm (32.28 in.) 210 kg (463 lb) 125 kg (276 lb) 121 kg (267 lb) 19.0 L (5.0 US gal)
Performance Minimum Turning Radius	3.0 m (9.8 ft)
Engine Type Cooling System Bore and Stroke Displacement Compression Ratio Maximum Horsepower Maximum Torque Carburetion System Starting System Ignition System Timing Advance Ignition Timing Spark Plugs Cylinder Numbering Method Firing Order	4-stroke, DOHC, 4-cylinder Liquid-cooled 83.0 × 55.4 mm (3.27 × 2.18 in.) 1 199 mL (73.16 cu in.) 12.2 (H) 131 kW (178 PS) @9 500 r/min (rpm), (AU) ZX1200-B1/B2: 130 kW (177 PS) @10 500 r/min (rpm), (AU) ZX1200-B3: 131 kW (178 PS) @10 500 r/min (rpm), (HR) 78.2 kW (106.4 PS) @8 500 r/min (rpm), (MY) ZX1200-B1/B2: 131 kW (178 PS) @ 9 500 r/min (rpm), (MY) ZX1200-B3: 128 kW (174 PS) @9 500 r/min (rpm) (US), (CA) – – – (H, AU) 134 N·m (13.7 kgf·m, 99 ft·lb) @7 500 r/min (rpm), (MY) ZX1200-B1/B2: 134 N·m (13.7 kgf·m, 99 ft·lb) @7 500 r/min (rpm), (MY) ZX1200-B3: 130 N·m (13.3 kgf·m, 96 ft·lb) @7 500 r/min (rpm), (HR) 111 N·m (11.3 kgf·m, 82 ft·lb) @5 000 r/min (rpm), (US), (CA) – – – FI (Fuel Injection), ZX1200-B1/B2: MIKUNI 46 EIS × 4 ZX1200-B3: KEIHIN (φ46 × 4) Electric starter Battery and coil (transistorized) Electronically advanced (digital igniter in ECU) 10° BTDC @1 000 r/min (rpm) NGK CR9EKPA Left to right, 1-2-3-4 1-2-4-3

General Specifications

Items	ZX1200-B1 ~ B3
Valve Timing: Inlet: Open Close Duration Exhaust: Open Close Duration Lubrication System Engine Oil: Grade Viscosity Capacity	46° BTDC 74° ABDC 300° 69° BBDC 45° ATDC 294° Forced lubrication (wet sump with cooler) API SE, SF or SG API SH or SJ with JASO MA SAE 10W-40 3.6 L (3.8 US qt)
Drive Train Primary Reduction System: Type Reduction Ratio Clutch Type Transmission: Type Gear Ratios: 1st 2nd 3rd 4th 5th 6th Final Drive System: Type Reduction Ratio Overall Drive Ratio	Gear 1.596 (83/52) Wet, multi disc 6-speed, constant mesh, return shift 2.429 (34/14) 1.824 (31/17) 1.440 (36/25) 1.250 (30/24) 1.130 (26/23) 1.033 (31/30) Chain drive 2.556 (46/18) 4.215 @Top gear
Frame Type Caster (Rake Angle) Trail Front Tire: Type Size Rear Tire: Type Size	Press backbone 23.5° 98 mm (3.86 in.) Tubeless 120/70 ZR17 M/C (58W) Tubeless 200/50 ZR17 M/C (75W)

1-8 GENERAL INFORMATION

General Specifications

Items	ZX1200-B1 ~ B3
Front Suspension: Type Wheel Travel Rear Suspension: Type Wheel Travel Brake Type: Front Rear	Telescopic fork (upside-down) 120 mm (4.72 in.) Swingarm (uni-trak) 140 mm (5.51 in.) Dual discs Single disc
Electrical Equipment Battery Headlight: Type Bulb Tail/Brake Light Alternator: Type Rated Output	12 V 12 Ah Semi-sealed beam 12 V 60/55 W (quartz-halogen) × 2 12 V 5/21 W × 2 Three-phase AC 31 A/14 V @5 000 r/min (rpm)

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

AU: Australian Model

US: U.S.A. Model

CA: Canadian Model

MY: Malaysian Model

HR: WVTA Approval Model, Honeycomb Catalytic Converter (Restricted Power)

H: WVTA Approval Model, Honeycomb Catalytic Converter

Technical Information – KAWASAKI LOW EXHAUST EMISSION SYSTEM

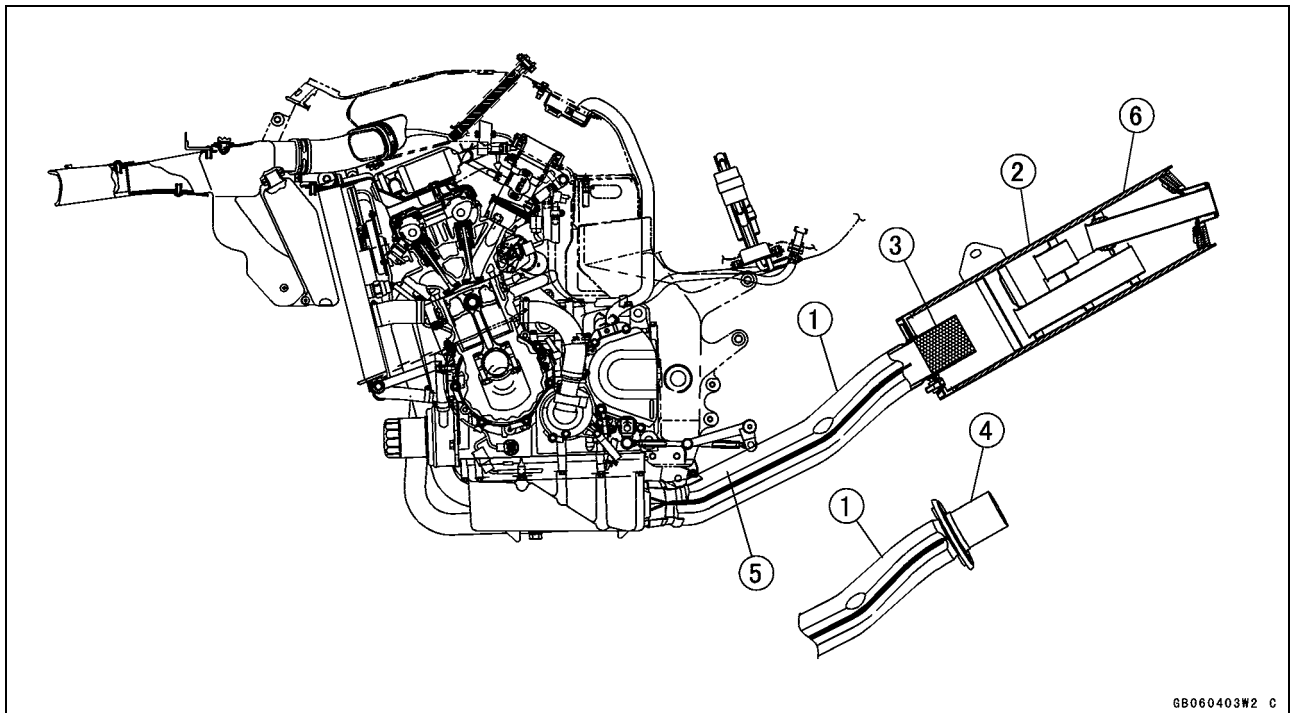
Since the emission regulations become more severe, Kawasaki has adopted a type of simplified KAWASAKI LOW EXHAUST EMISSION SYSTEM (KLEEN), which have no catalyst protection system, according to each regulation of different countries.

The muffler with built-in catalyst has the same durability as the conventional muffler, however, do not use leaded gasoline and do not coast with the ignition system OFF. Running the engine without ignition damages catalyst.

Refer to the ZX900E Service Manual (Part No. 99924-1255) for more information about the KLEEN (theory, maintenance, and handling precautions), including the secondary air injection system.

Honeycomb Type Catalytic Converter

- The converter is a three-way catalytic converter, and its surface is covered with alumina upon which platinum and rhodium are applied, and has a cylindrical metallic honeycomb structure made by bending a corrugated sheet and a flat sheet of stainless steel into a spiral of increasing diameter. The honeycomb structure is convenient for the catalytic converter because it has a large surface area but small size to react effectively and has low exhaust resistance. In addition, its inherent strength helps resist vibration, and has simple structure welded directly on the silencer.
- Generally, the temperature of the exhaust gas must be higher than activation temperature, so the converters are installed in the exhaust manifold rear end where the temperature of exhaust gas is still high. And, the converters will be activated even under low load conditions.
- After the exhaust gas is diluted with the secondary air injection, the catalytic converter works well because of rich oxygen to reduce CO, HC, and NO_x. Accordingly, we can keep the exhaust gas emission within regulation.
- This type of converter works more efficiently as a three-way catalytic converter to reduce CO, HC, and NO_x than the pipe type catalytic converter because of its more and denser catalysts.



6B060403W2 C

1. Manifold
2. Silencer
3. Honeycomb Type Catalyst
4. Non-Catalyst
5. Mark for Manifold
6. Mark for Silencer

1-10 GENERAL INFORMATION

Technical Information – KAWASAKI LOW EXHAUST EMISSION SYSTEM

Exhaust System (ZX1200-B1/B2)

MANIFOLD	SILENCER	ITEM NAME	ORG PRODUCT
<p>Non-Catalyst</p> <hr/> <p>P/No. 39178-1335 Mark : KHI M 063</p>	<p>Non-Catalyst</p> <hr/> <p>P/No. 18090-1997 Mark : KHI K 412 TITANIUM</p>	AUSTRALIA	ZX1200-B1 ~
<p>Honeycomb Type Catalyst</p> <hr/> <p>P/No. 39178-1338 Mark : KHI M 070</p>	<p>Non-Catalyst</p> <hr/> <p>P/No. 18090-1995 Mark : KHI K 400 TITANIUM</p>	<p>WVTA (FULL H) UK WVTA (FULL H) ISRAEL WVTA (78.2 H) MALAYSIA</p>	<p>ZX1200-B1H ~ ZX1200-B1H ~ ZX1200-B1 ~ ZX1200-B1H ~ ZX1200-B1 ~</p>
<p>Honeycomb Type Catalyst</p> <hr/> <p>P/No. 39178-1336 Mark : KHI M 070</p>	<p>Non-Catalyst</p> <hr/> <p>P/No. 18090-1996 Mark : KHI K 400 EPA Noise Emission Control Information TITANIUM</p>	<p>U.S.A. (CALIF) U.S.A. CANADA</p>	<p>ZX1200-B1L ~ ZX1200-B1 ~ ZX1200-B1 ~</p>

GEO2106B F

78.2: Horsepower 78.2 kW (106.3 ps)

Full: Full Power

H: Honeycomb Type Catalyst

UK: United Kingdom Model