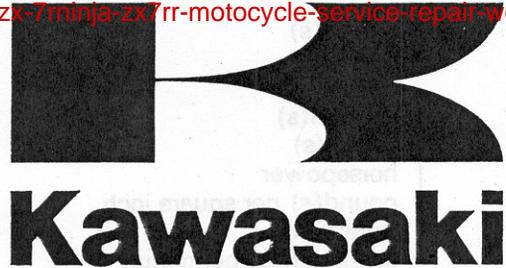


Product: 1996-2003 Kawasaki Ninja ZX-7R,Ninja ZX7RR Motorcycle Service Repair Workshop Manual
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Ninja ZX-7RR
Ninja ZX-7R

Motorcycle Service Manual

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LIST OF ABBREVIATIONS

| | | | |
|------|---------------------------|-----|--------------------------|
| A | ampere(s) | lb | pound(s) |
| ABDC | after bottom dead center | m | meter(s) |
| AC | alternating current | min | minute(s) |
| ATDC | after top dead center | N | newton(s) |
| BBDC | before bottom dead center | Pa | pascal(s) |
| BDC | bottom dead center | PS | horsepower |
| BTDC | before top dead center | psi | pound(s) per square inch |
| °C | degree(s) Celcius | 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.

Quick Reference Guide

| | |
|------------------------------------|-----------|
| General Information | 1 |
| Fuel System | 2 |
| Cooling System | 3 |
| Engine Top End | 4 |
| Clutch | 5 |
| Engine Lubrication System | 6 |
| Engine Removal/Installation | 7 |
| Crankshaft/Transmission | 8 |
| Wheels/Tires | 9 |
| Final Drive | 10 |
| Brakes | 11 |
| Suspension | 12 |
| Steering | 13 |
| Frame | 14 |
| Electrical System | 15 |
| Appendix | 16 |

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.

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..."

(Continued on next page.)

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.

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 motorcycle:

- 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 Manual. Genuine parts provided as spare parts are listed in the Parts Catalog.
- Follow the procedures in this manual carefully. Don't take shortcuts.
- Remember to keep complete records of maintenance and repair with dates and any new parts installed.

How to Use This Manual

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

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

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

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

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

⚠ WARNING

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

CAUTION

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

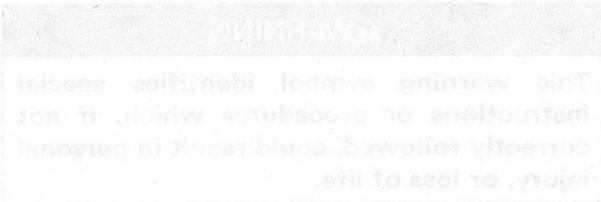
This manual contains four more symbols (in addition to WARNING and CAUTION) which will help you distinguish different types of information.

NOTE

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

- Indicates a procedural step or work to be done.
- Indicates a procedural sub-step or how to do the work of the procedural step it follows. It also precedes the text of a NOTE.
- ★ Indicates a conditional step or what action to take based on the results of the test or inspection in the procedural step or sub-step it follows.

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



The 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 the own basic maintenance and repair work. A basic knowledge of mechanics, the proper use of tools, and working procedures must be understood in order to carry out maintenance and repair satisfactorily. Whenever the owner has inefficient experience or doubts his ability to do the work, all adjustments, maintenance, and repair should be turned 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 motorcycle, follow the Periodic Maintenance Chart in the Service Manual. Also see the Periodic Maintenance Chart in the Service Manual. Use proper tools and genuine Kawasaki Motorcycle parts. Special tools, gauges, and testers that are necessary when servicing Kawasaki motorcycle are introduced by the Special Tool 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.

General Information

Table of Contents

| | |
|---|------|
| Before Servicing | 1-2 |
| Model Identification | 1-4 |
| General Specifications | 1-8 |
| Periodic Maintenance Chart | 1-12 |
| Technical Information – Maintenance Free Battery | 1-13 |
| Technical Information – Flat CR Slide Carburetor | 1-17 |
| Technical Information – Side Camshaft Chain | 1-19 |
| Technical Information – Engine Lubrication System | 1-20 |
| Technical Information – Connecting Rod Big End Nut Tightening | 1-21 |
| Technical Information – Swingarm | 1-24 |
| Technical Information – Alternator Unit | 1-24 |
| Torque and Locking Agent | 1-25 |
| Special Tools and Sealant | 1-30 |
| Cable, Wire, and Hose Routing | 1-36 |

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 Ground**

Remove the ground (-) lead from the battery before performing any disassembly operations on the motorcycle. This prevents:

 - (a) the possibility of accidentally turning the engine over while partially disassembled.
 - (b) sparks at electrical connections which will occur when they are disconnected.
 - (c) damage to electrical parts.
- (3) **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.
- (4) **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.
- (5) **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.
- (6) **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.
- (7) **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.
- (8) **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.
- (9) **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).
- (10) **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.
- (11) **Ball Bearing and Needle Bearing**

Do not remove any ball or needle bearings that are pressed in unless it is necessary. If they are removed, replace them with new ones.

When installing a bearing, press it in with the marked side facing out using a suitable driver until it is bottomed. Bearings should be pressed into place by pushing evenly the bearing race which is affected by friction.

(12) 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.

(13) Seal Guide

A seal guide is required for certain oil or grease seals during installation to avoid damage to the seal lips. 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

Replace any circlips and retaining rings 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) Cotter Pin

Replace any cotter pins that were removed with new ones, as removal deforms and breaks them.

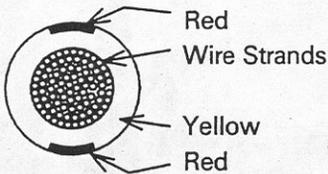
(16) Lubrication

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) in the assembly of certain engine and chassis parts. Always check manufacturer recommendations before using such special lubricants.

(17) 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.

| Wire (cross-section) | Name of Wire Color |
|---|---|
|  | <p style="text-align: center;">Yellow/Red</p> |

(18) 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.

(19) 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 | |

(20) Specifications

Specification terms are defined as follows:

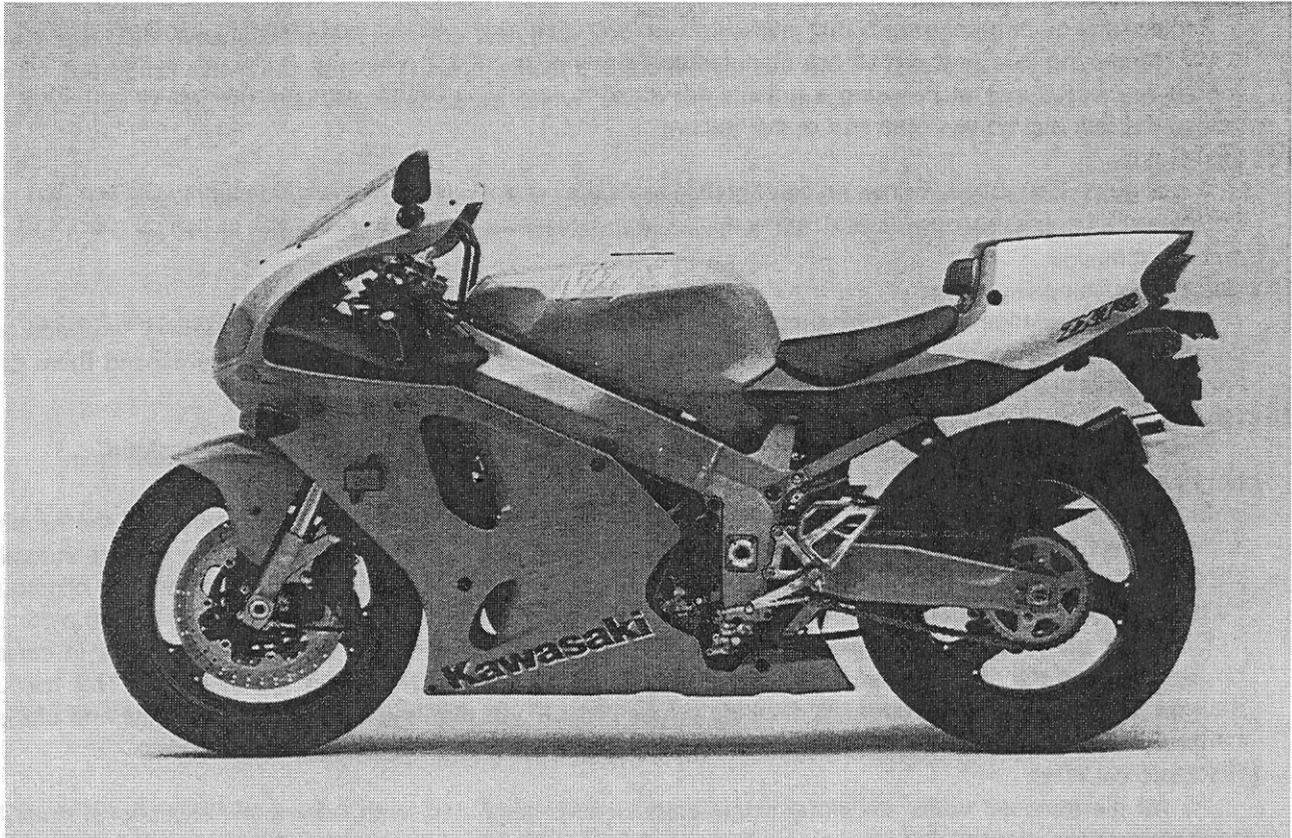
"Standards" show dimensions or performances which brand-new parts or systems have.

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

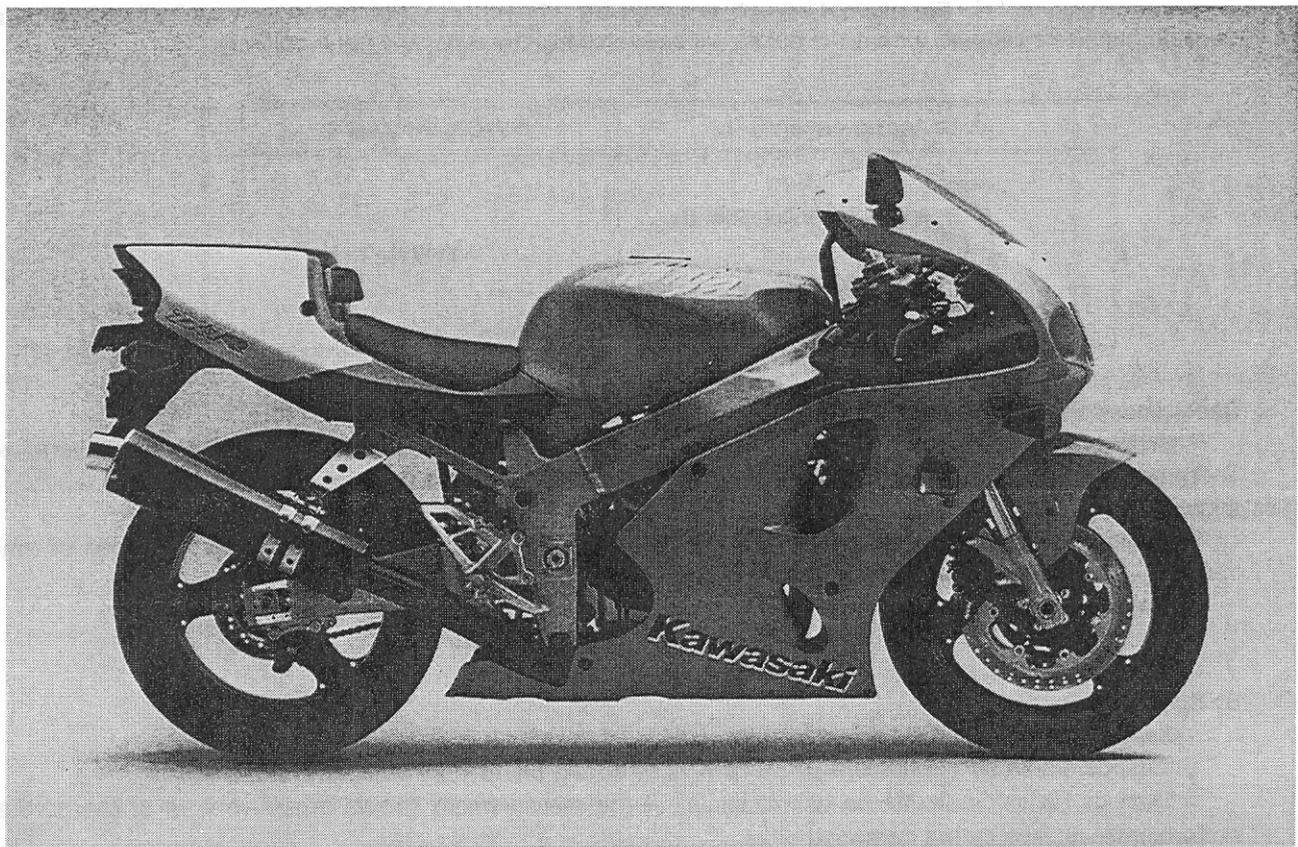
1-4 GENERAL INFORMATION

Model Identification

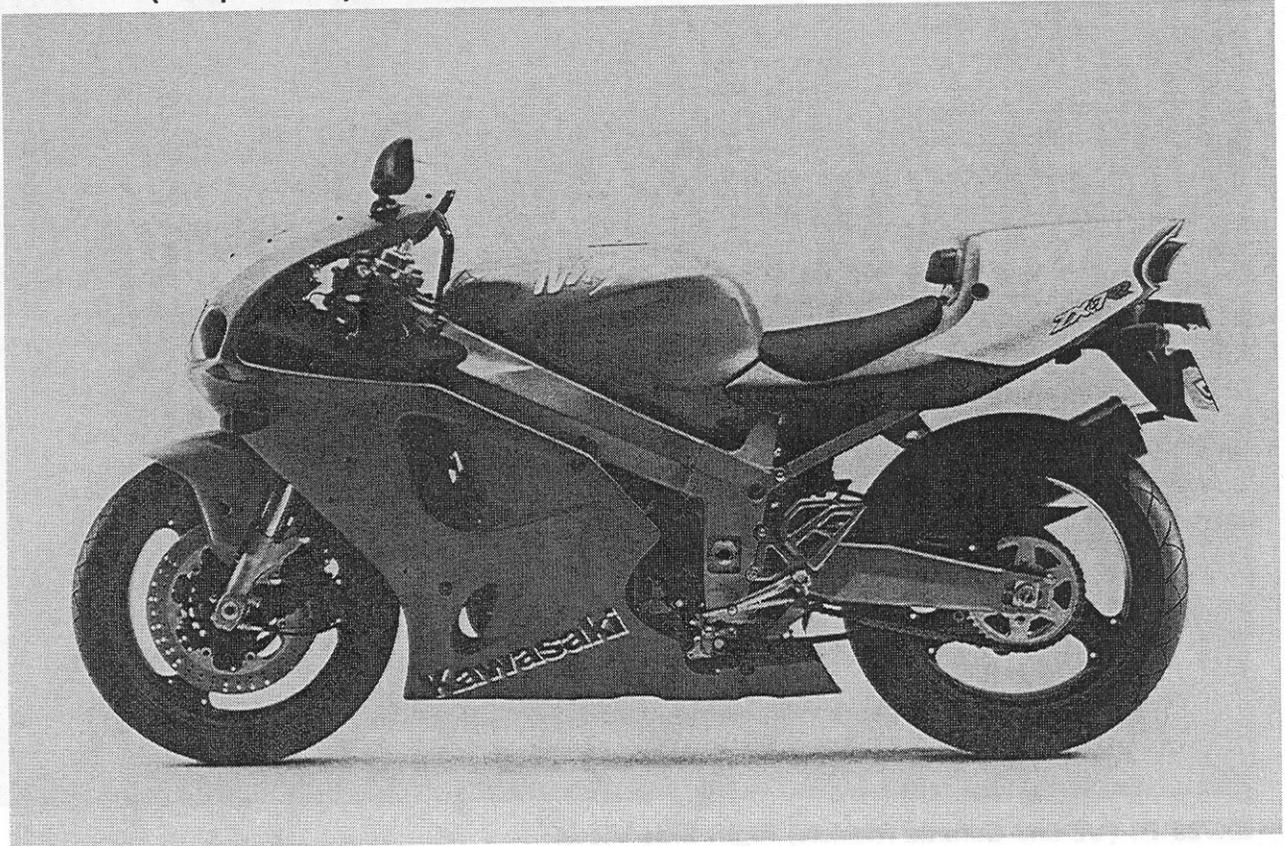
ZX750-N1 (US and Canada Models) Left Side View:



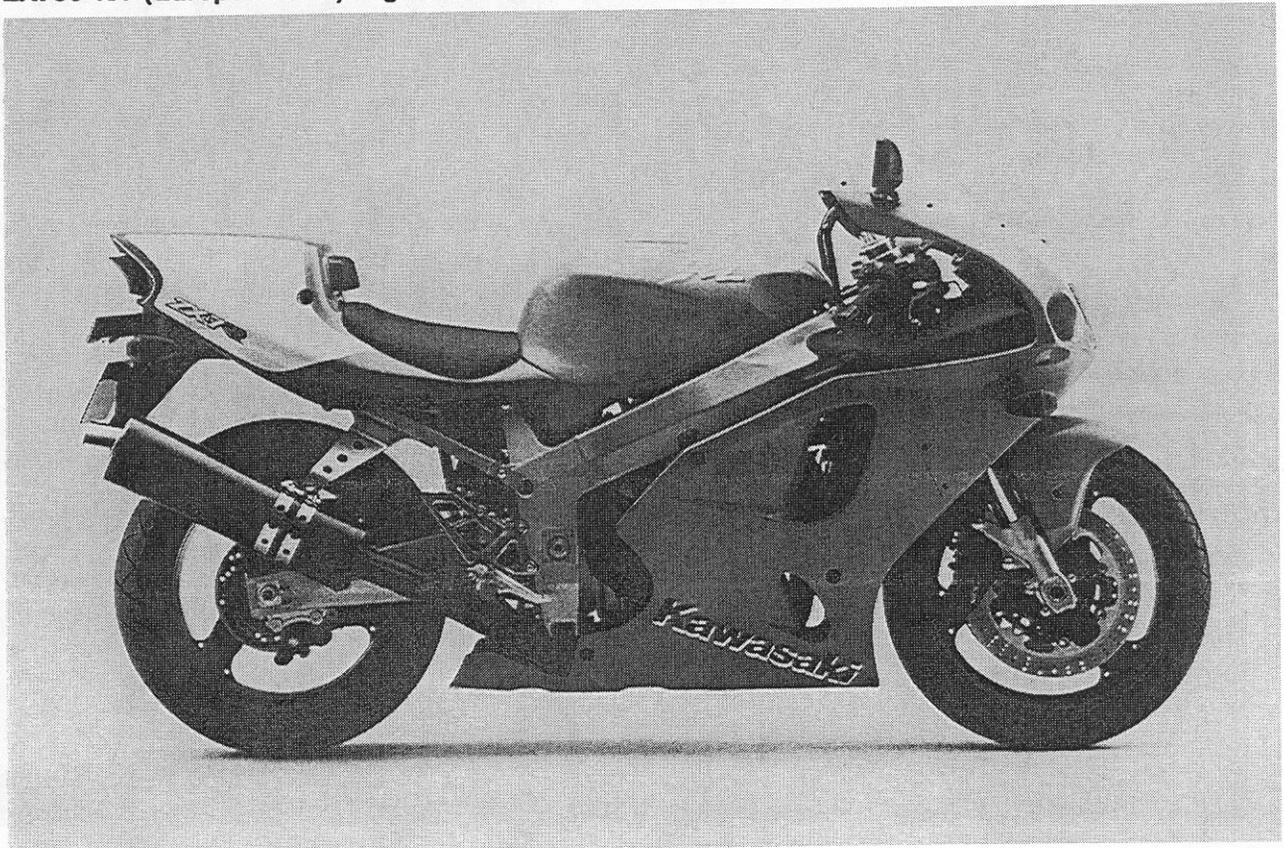
ZX750-N1 (US and Canada Models) Right Side View:



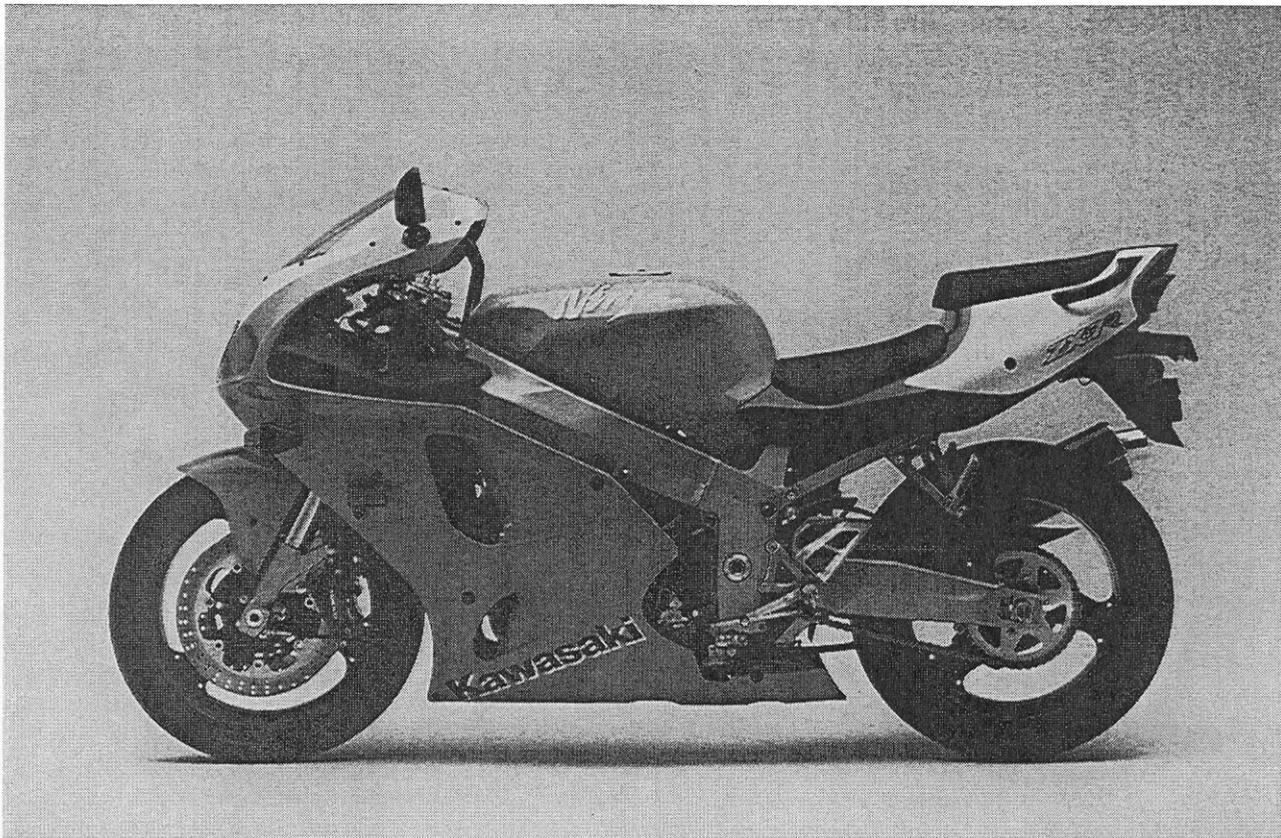
ZX750-N1 (Europe Model) Left Side View:



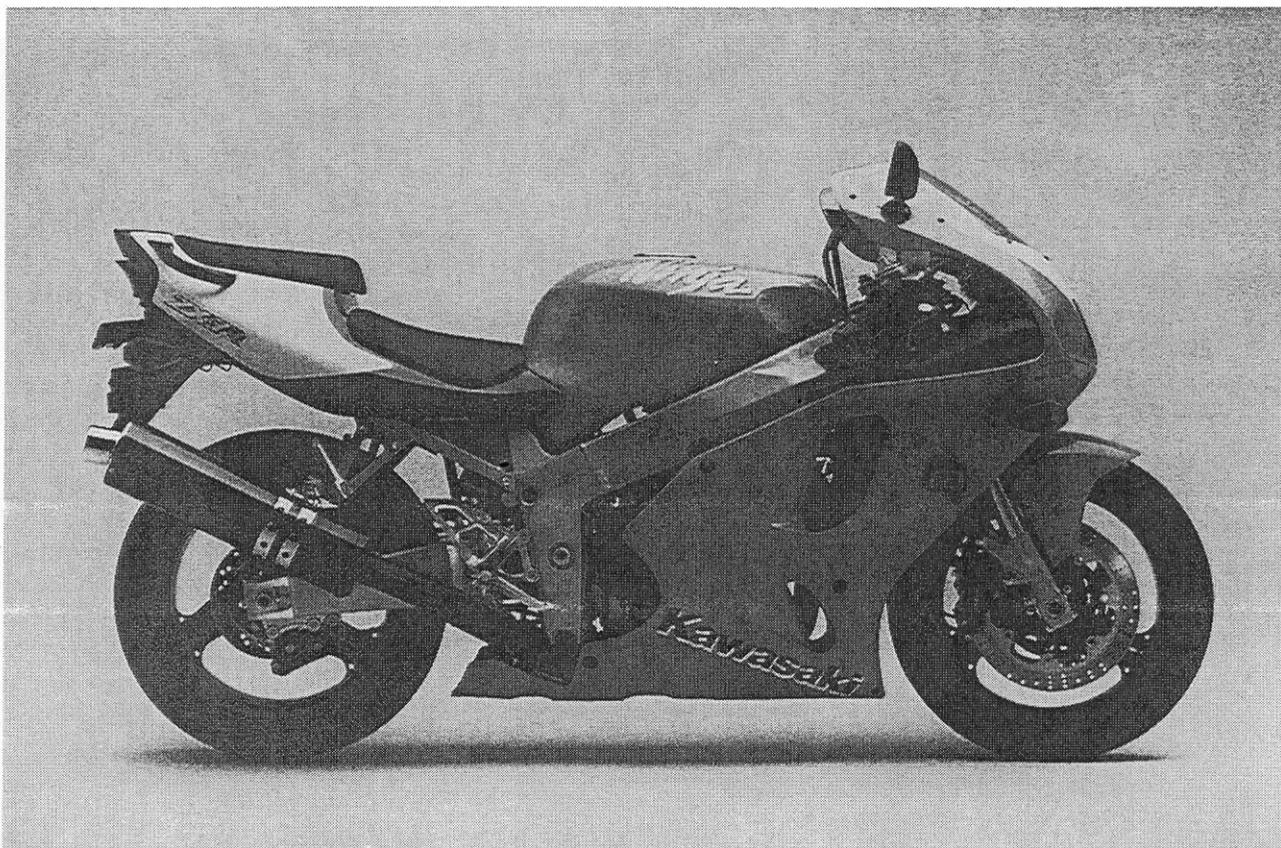
ZX750-N1 (Europe Model) Right Side View:



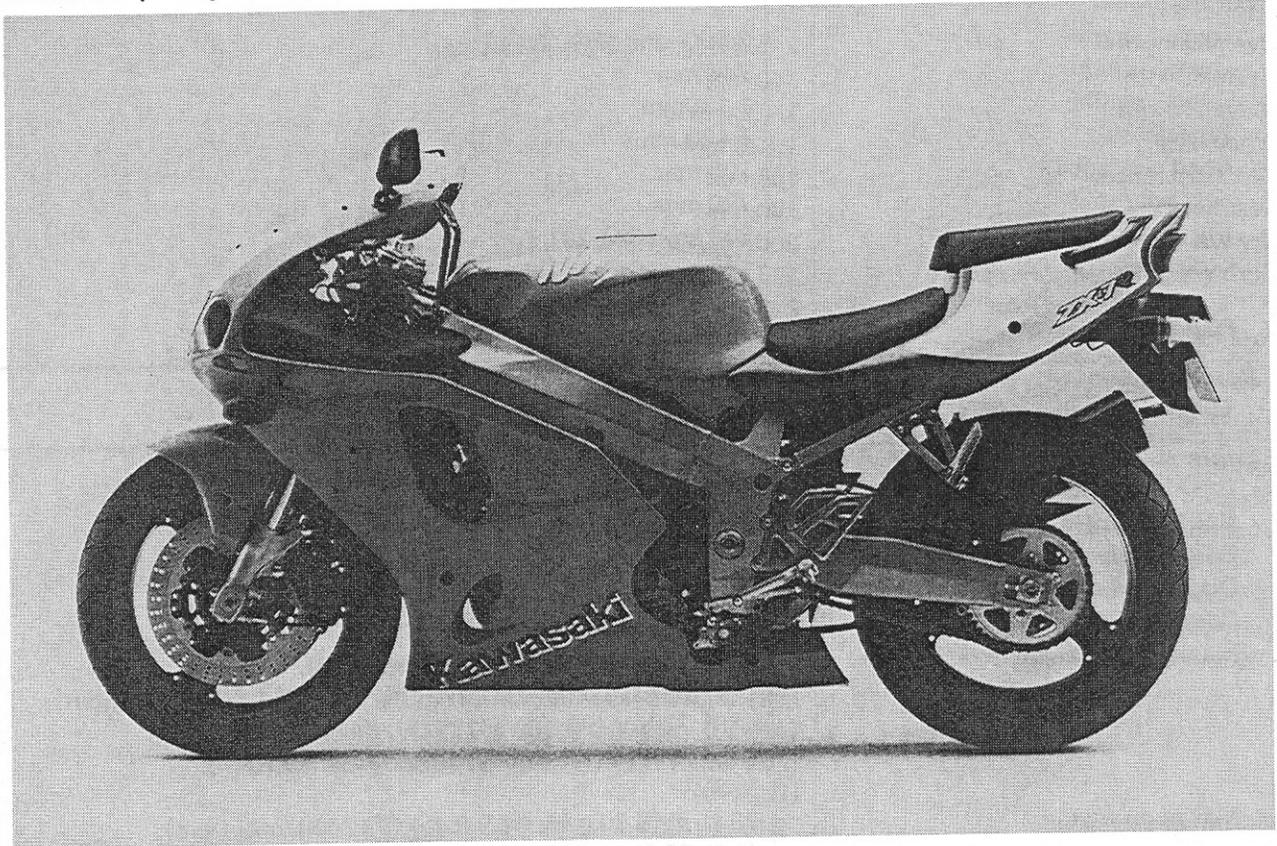
ZX750-P1 (US and Canada Models) Left Side View:



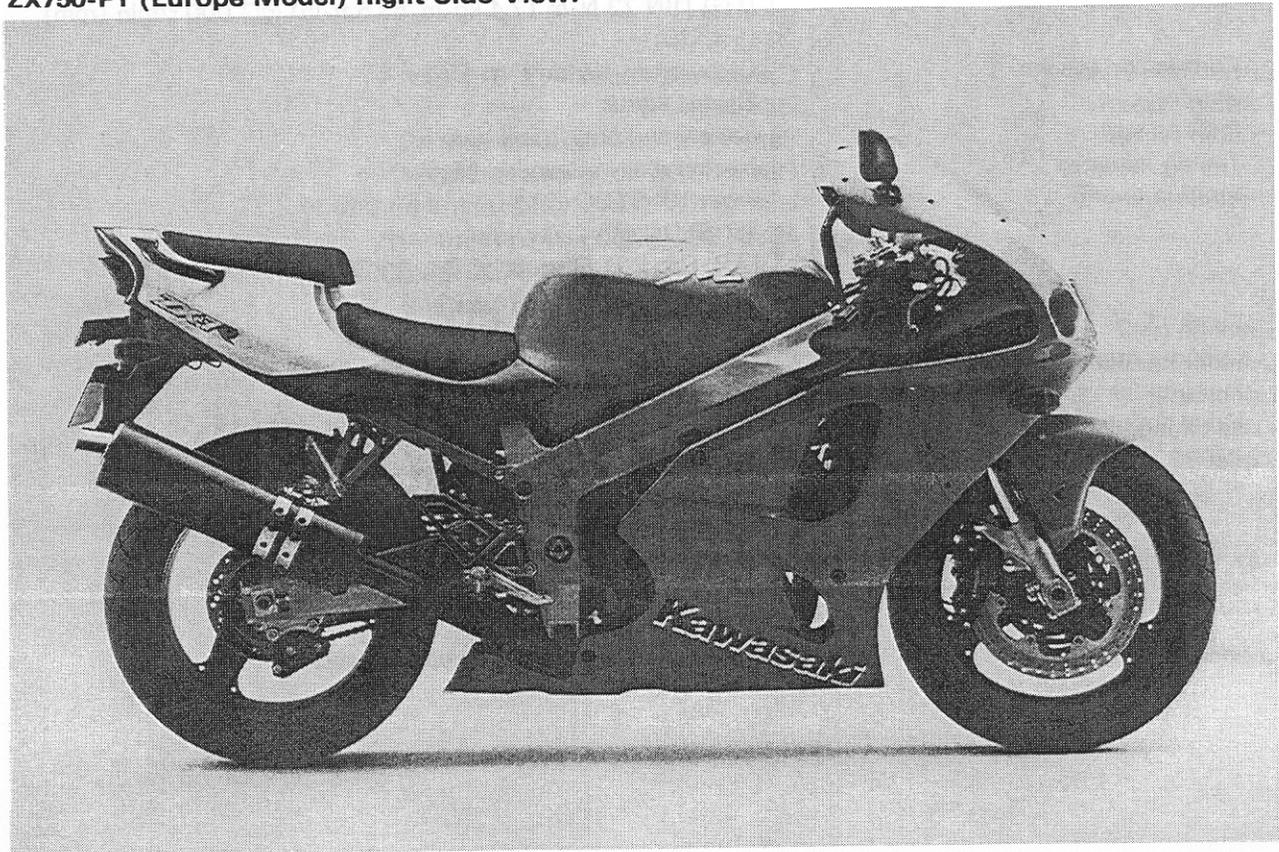
ZX750-P1 (US and Canada Models) Right Side View:



ZX750-P1 (Europe Model) Left Side View:



ZX750-P1 (Europe Model) Right Side View:



1-8 GENERAL INFORMATION

General Specifications

| Item | ZX750-N1, N2 |
|---------------------------|--|
| Dimensions: | |
| Overall length | 2 090 mm, (FG) 2 190 mm |
| Overall width | 740 mm |
| Overall height | 1 130mm |
| Wheelbase | 1 420 mm |
| Road clearance | 105 mm |
| Seat height | 790 mm |
| Dry weight | 200 kg, (CA) 201 kg |
| Curb weight: | Front 117 kg, (CA) 117.5 kg |
| | Rear 112 kg, (CA) 112.5 kg |
| Fuel tank capacity | 18.0 L |
| Performance: | |
| Minimum turning radius | 3.4 m |
| Engine: | |
| Type | 4-stroke, DOHC, 4-cylinder |
| Cooling system | Liquid-cooled |
| Bore and stroke | 73.0 x 44.7 mm |
| Displacement | 748 mL |
| Compression ratio | 11.5, (FR) 10.8 |
| Maximum horsepower | 90 kW (122 PS) @12 000 r/min (rpm), (FR) UTAC's norm 75.1 kW (102 PS) @11 500 r/min (rpm), (AR) 72 kW (98 PS) @12 000 r/min (rpm), (FG) DIN 72kW (98 PS) @12 000 r/min (rpm), (US) - |
| Maximum torque | 78 N-m (8.0 kg-m, 57.9 ft-lb) @9 300 r/min (rpm), (AR) 73 N-m (7.4 kg-m, 53.5 ft-lb) @7 000 r/min (rpm), (FG) DIN 73 N-m (7.4 kg-m, 53.5 ft-lb) @7 000 r/min (rpm), (FR, US) - |
| Carburetion system | Carburetors, Keihin FVK-D41 x 4 |
| Starting system | Electric starter |
| Ignition system | Battery and coil (transistorized) |
| Timing advance | Electronically advanced (digital) |
| Ignition timing | From 10° BTDC @1 100 r/min (rpm) to 45° BTDC @5 000 r/min (rpm) (AR, CA, FG) From 5° BTDC @1 300 r/min (rpm) to 40° BTDC @5 000 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 44° (BTDC), (FR) 27° (BTDC) |
| | Close 64° (ABDC), (FR) 57° (ABDC) |
| | Duration 288°, (FR) 264° |
| Exhaust | Open 54° (BBDC), (FR) 57° (BBDC) |
| | Close 34° (ATDC), (FR) 27° (ATDC) |
| | Duration 268°, (FR) 264° |
| Lubrication system | Forced lubrication (wet sump with cooler) |

| Item | ZX750-N1, N2 | |
|------------------------------|--|--|
| Engine oil: | Grade Viscosity Capacity | SE, SF or SG class SAE10W-40, 10W-50, 20W-40, or 20W-50 3.6 L |
| Drive Train: | | |
| Primary reduction system: | Type Reduction ratio | Gear 1.754 (93/53) |
| Clutch type | | Wet multi disc |
| Transmission: | Type | 6-speed, constant mesh, return shift |
| Gear ratios: | 1st 2nd 3rd 4th 5th 6th | 2.375 (38/16) 1.894 (36/19) 1.619 (34/21) 1.409 (31/22) 1.291 (31/24) 1.200 (30/25) |
| Final drive system: | Type Reduction ratio Overall drive ratio | Chain drive 2.625 (42/16) 5.527 @Top gear |
| Frame: | | |
| Type | | Press, diamond |
| Caster (rake angle) | | 25° |
| Trail | | 99 mm |
| Front tire: | Type Size | Tubeless 120/70 ZR17 |
| Rear tire: | Type Size | Tubeless 190/50 ZR17 |
| Front suspension: | Type Wheel travel | Telescopic fork 120 mm |
| Rear suspension: | Type Wheel travel | Swing arm (uni-trak) 130 mm |
| Brake type: | Front Rear | Dual discs Single disc |
| Electrical Equipment: | | |
| Battery | | 12 V 8 Ah |
| Headlight: | Type Bulb | Semi-sealed beam Quartz-halogen Left 12 V 55 W, Right 12 V 55 W (US, CN, UK) 12 V 45/45 W x 2 |
| Tail/brake light | | 12 V 5/21 W x 2, (US, CN) 12 V 8/27W x 2 |
| Alternator: | Type Rated output | Three-phase AC 30.7 A / 14 V @6 000 r/min (rpm) |

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

(AR) : Austria Model
(CA) : California Model
(CN) : Canada Model
(FG) : Germany Model
(FR) : France Model

(UK) : U.K. Model
(US) : U.S. Model

1-10 GENERAL INFORMATION

| Item | ZX750-P1, P2, P3, P4 |
|---------------------------|---|
| Dimensions: | |
| Overall length | 2 090 mm, (FG, GR, NR, SD, ST) 2 190 mm |
| Overall width | 740 mm |
| Overall height | 1 130 mm |
| Wheelbase | 1 435 mm |
| Road clearance | 105 mm |
| Seat height | 790 mm |
| Dry weight | 203 kg, (CA) 204 kg |
| Curb weight: | |
| Front | 117 kg, (CA) 117.5 kg |
| Rear | 115 kg, (CA) 115.5 kg |
| Fuel tank capacity | 18.0 L |
| Performance: | |
| Minimum turning radius | 3.4 m |
| Engine: | |
| Type | 4-stroke, DOHC, 4-cylinder |
| Cooling system | Liquid-cooled |
| Bore and stroke | 73.0 x 44.7 mm |
| Displacement | 748 mL |
| Compression ratio | 11.5, (FR) 10.8 |
| Maximum horsepower | 90 kW (122 PS) @11 800 r/min (rpm), (AR) P1 - P3: 72 kW (98 PS) @11 500 r/min (rpm), (FG) P1 - P3: DIN 72 kW (98 PS) @11 500 r/min (rpm), (FR) UTAC's norm 75.1 kW @11 000 r/min (rpm), (SD) 61 kW (83 PS) @9 500 r/min (rpm), (ST) 39 kW (53 PS) @7 500 r/min (rpm), (US) - |
| Maximum torque | 78 N-m (8.0 kg-m, 57.9 ft-lb) @9 300 r/min (rpm), (AR) P1 - P3: 74 N-m (7.5 kg-m, 54.2 ft-lb) @6 800 r/min (rpm), (FG) P1 - P3: DIN 74 N-m (7.5 kg-m, 54.2 ft-lb) @6 800 r/min (rpm), (SD) 70 N-m (7.1 kg-m, 51.4 ft-lb) @6 500 r/min (rpm), (ST) 56 N-m (5.7 kg-m, 41.2 ft-lb) @5 000 r/min (rpm), (FR, US) - |
| Carburetion system | KEIHIN CVK-D38 x 4 |
| Starting system | Electric starter |
| Ignition system | Battery and coil (transistorized) |
| Timing advance | Electronically advanced (digital) |
| Ignition timing | From 10° BTDC @1 100 r/min (rpm) to 45° BTDC @5 000 r/min (rpm), (AR, CA, FG, ST) From 5° BTDC @1 300 r/min (rpm) to 40° BTDC @5 000 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 44° (BTDC), (FR) 27° (BTDC) Close 64° (ABDC), (FR) 57° (ABDC) Duration 288°, (FR) 264° |
| Exhaust | Open 54° (BBDC), (FR) 57° (BBDC) Close 34° (ATDC), (FR) 27° (ATDC) Duration 268°, (FR) 264° |
| Lubrication system | Forced lubrication (wet sump with cooler) |
| Engine oil: | |
| Grade | SE, SF or SG class |
| Viscosity | SAE10W-40, 10W-50, 20W-40, or 20W-50 |
| Capacity | 3.6 L |

| Item | ZX750-P1, P2, P3, P4 | |
|------------------------------|----------------------|---|
| Drive Train: | | |
| Primary reduction system: | Type | Gear |
| | Reduction ratio | 1.754 (93/53) |
| Clutch type | | Wet multi disc |
| Transmission: | | |
| Type | | 6-speed, constant mesh, return shift |
| Gear ratios: | 1st | 2.857 (40/14) |
| | 2nd | 2.000 (36/18) |
| | 3rd | 1.619 (34/21) |
| | 4th | 1.391 (32/23) |
| | 5th | 1.222 (33/27) |
| | 6th | 1.103 (32/29) |
| Final drive system: | Type | Chain drive |
| | Reduction ratio | 2.687 (43/16) |
| | Overall drive ratio | 5.203 @Top gear |
| Frame: | | |
| Type | | Press, diamond |
| Caster (rake angle) | | 25° |
| Trail | | 99 mm |
| Front tire: | Type | Tubeless |
| | Size | 120/70 ZR17 |
| Rear tire: | Type | Tubeless |
| | Size | 190/50 ZR17 |
| Front suspension: | Type | Telescopic fork |
| | Wheel travel | 120 mm |
| Rear suspension: | Type | Swing arm (uni-trak) |
| | Wheel travel | 130 mm |
| Brake type: | Front | Dual discs |
| | Rear | Single disc |
| Electrical Equipment: | | |
| Battery | | 12 V 10 Ah |
| Headlight: | Type | Semi-sealed beam |
| | Bulb | Quartz-halogen |
| | | Left 12 V 55 W, Right 12 V 55 W |
| | | (AS, CN, UK, US) 12 V 45/45 W x 2 |
| Tail/brake light | | 12 V 5/21 W x 2, (US, CA, CN) 12 V 8/27 W x 2 |
| Alternator: | Type | Three-phase AC |
| | Rated output | 30.7 A / 14 V @6 000 r/min (rpm) |

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

(AR) : Austria Model

(AS) : Australia Model

(CA) : California Model

(CN) : Canada Model

(FG) : Germany Model

(FR) : France Model

(GR) : Greece Model

(NR) : Norway Model

(SD) : Sweden Model

(ST) : Switzerland Model

(UK) : U.K. Model

(US) : U.S. Model

1-12 GENERAL INFORMATION

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 | FREQUENCY | *ODOMETER READING | | | | | | | |
|--|-----------|-----------------------|---------------------|-----------------------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | | Whichever comes first | 1 000 km (600 mile) | 6 000 km (4 000 mile) | 12 000 km (7 500 mile) | 18 000 km (12 000 mile) | 24 000 km (15 000 mile) | 30 000 km (20 000 mile) | 36 000 km (24 000 mile) |
| | Every | | | | | | | | |
| Spark plug - clean and gap † | | | • | • | • | • | • | • | • |
| Valve clearance - check † | | | | • | | | • | | • |
| Air Suction valve - check † | | | • | • | • | • | • | • | |
| Air cleaner element - clean † # | | | | • | | | • | | • |
| Throttle grip play - check † | | • | | • | | | • | | • |
| Idle speed - check † | | • | | • | | | • | | • |
| Carburetor synchronization - check † | | | | • | | | • | | • |
| Evaporative emission control system (CA) - check † | | • | • | • | • | • | • | • | • |
| Engine oil - change # | 6 months | • | • | • | • | • | • | • | • |
| Oil filter - replace | | • | | • | | | • | | • |
| Drive chain wear - check † # | | | • | • | • | • | • | • | • |
| Brake pad wear - check † # | | | • | • | • | • | • | • | • |
| Brake light switch - check † | | • | • | • | • | • | • | • | • |
| Steering - check † | | • | • | • | • | • | • | • | • |
| Front fork oil - change | 2 years | | | | | • | | | |
| Rear shock absorber oil leak - check † | | | | • | | • | | | • |
| Front fork oil leak - check † | | | | • | | • | | | • |
| Tire wear - check † | | | • | • | • | • | • | • | • |
| Swingarm pivot, uni-trak linkage - lubricate | | | | • | | • | | | • |
| General lubrication - perform | | | | • | | • | | | • |
| Nuts, bolts, and fasteners tightness - check † | | • | | • | | • | | | • |
| Drive chain - lubricate # | 600 km | | • | • | • | • | • | • | • |
| Drive chain slack - check † # | 1000 km | • | • | • | • | • | • | • | • |
| Brake fluid level - check † | month | • | • | • | • | • | • | • | • |
| Clutch fluid level - check † | month | • | • | • | • | • | • | • | • |
| Radiator hoses, connection - check † | | • | | | | | | | |
| Brake fluid - change | 2 years | | | | | • | | | |
| Brake 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 fluid - change | 2 years | | | | | • | | | |
| Clutch master cylinder cup and seal - replace | 4 years | | | | | | | | |
| Clutch slave cylinder piston seal - replace | 4 years | | | | | | | | |

: 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.

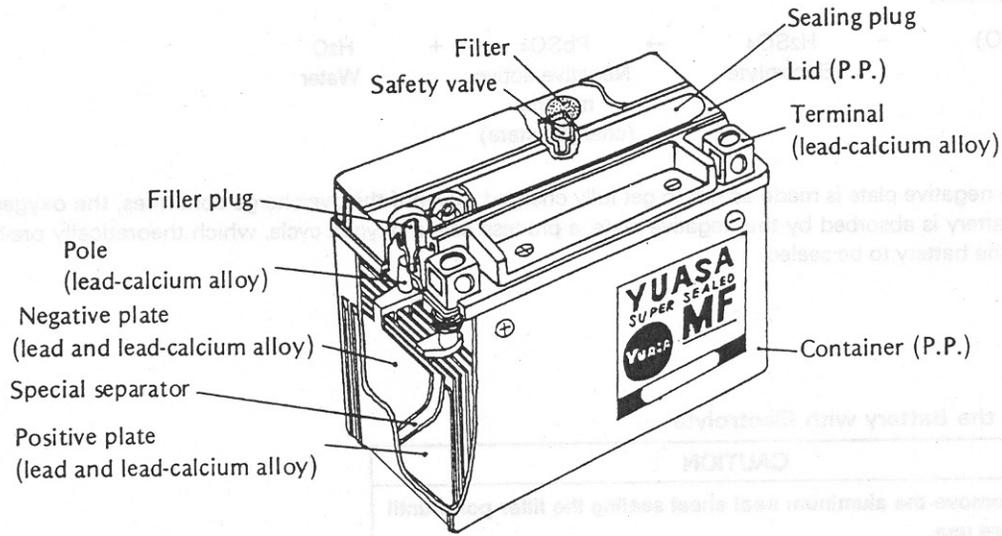
† : Replace, add, adjust, clean, or torque if necessary.

(CA): California Model only

Technical Information - Maintenance Free Battery

A maintenance free battery is installed in this model. The maintenance free battery is a sealed type, and so the electrolyte level check and topping-up cannot be performed.

(I) Construction

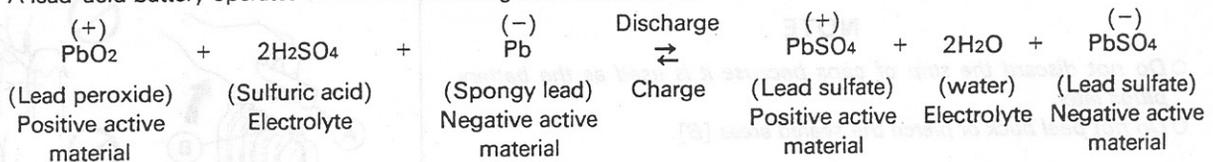


(II) Main Features

- 1) Maintenance free..... It is not necessary to check the electrolyte level and top-up the electrolyte.
- 2) No electrolyte leakage..... As the electrolyte is retained firmly in the special separators, there is no free electrolyte in the battery.
- 3) Instant activation system..... It can be used instantly after filling only the electrolyte without initial charge.
- 4) One-push motion electrolyte filling..... It is possible to fill the electrolyte by easy one-push motion.
- 5) Safety construction..... If the battery internal pressure rises abnormally high, the safety valve opens to release the gas inside the battery to restore the normal pressure and prevent the battery from rupturing. After restoring the normal pressure, the safety valve closes and the battery is sealed again. Moreover, a ceramic filter is disposed on top of the safety valve under the lid to remove risk of ignition or explosion caused by fire from outside.
- 6) Compact and high performance..... No presence of free electrolyte allows the battery made lower in height, thus resulting in enhanced volume efficiency. Moreover, gas being absorbed inside the battery eliminates the need for a gas exhaust tube.
- 7) Strong charge/discharge characteristics It can amply withstand deep charge/discharge cycles.

(III) Principle of Sealing Structure

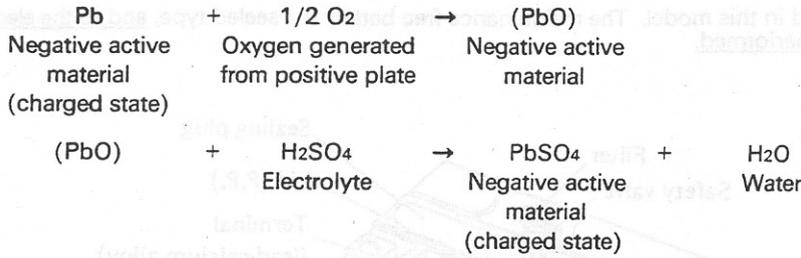
A lead-acid battery operates under the following chemical reaction:



Normally in an ordinary lead-acid battery when it comes to an end of a charge, where the lead sulfate being a discharge product returns to lead peroxide and spongy lead, the charge current flowing thereafter is used exclusively to decompose electrolytically water from the electrolyte, thus resulting in generation of hydrogen gas from the negative plate and oxygen gas from the positive plate. The gases so generated are released out of the battery, causing the amount of electrolyte decreased to require occasional water replenishment.

A maintenance free battery, however, is so designed that, when it is overcharged, even if the positive plate is fully charged, the negative plate remains not fully turned to spongy lead. Therefore, even when the positive plate is overcharged generating oxygen gas, the negative plate is not fully charged, hence generating no hydrogen gas.

Moreover, the oxygen gas generated from the positive plate immediately reacts with the charged active material on the negative plate, and returns to water, with the ultimate result of no water loss.



Thus, the negative plate is made as not to get fully charged. Even if the overcharge continues, the oxygen gas generated inside the battery is absorbed by the negative plate, a process called oxygen cycle, which theoretically prevents water loss, and allows the battery to be sealed.

(IV) Filling the Battery with Electrolyte

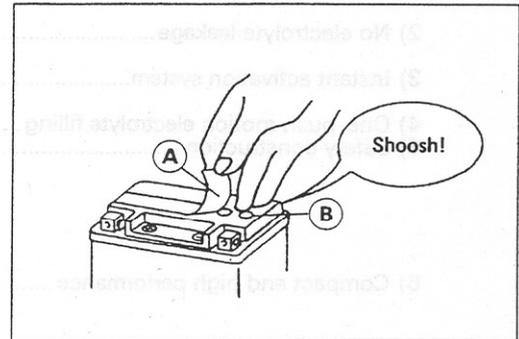
CAUTION

Do not remove the aluminum seal sheet sealing the filler ports until just before use.
Be sure to use the dedicated electrolyte container for correct electrolyte volume.

- Check to see that there is no peeling, tears or holes in the sealing sheet.
- Place the battery on a level surface.
- Remove the sealing sheet [A].
- When removing, check to hear an air-sucking sound "Shoosh!" from filler ports [B].

NOTE

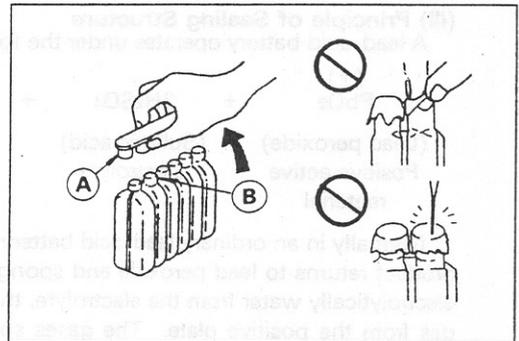
- A battery whose sealing sheet has any peeling, tears, holes, or from which the air-sucking sound was not heard requires a refreshing charge (initial charge).



- Take the electrolyte container out of the vinyl bag.
- Detach the strip of caps [A] from the container.

NOTE

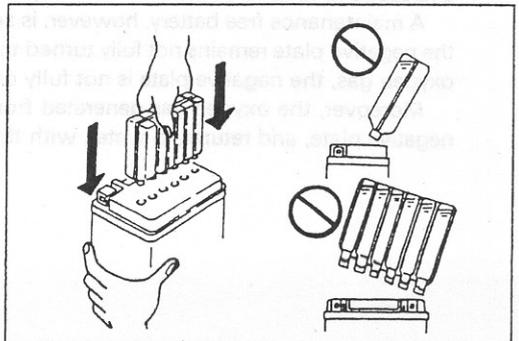
- Do not discard the strip of caps because it is used as the battery plugs later.
- Do not peel back or pierce the sealed areas [B].



- Place the electrolyte container upside down with the six sealed areas in line with the six battery filler ports.
- Push the container down strongly enough to break the seals. Now the electrolyte should start to flow into the battery.

NOTE

- Do not tilt the container as the electrolyte flow may be interrupted.



(VI) Precautions

1) No need of topping-up
 No topping-up is necessary in this battery until it ends its life under normal use. Forcibly prying off the sealing plug to add water is very dangerous. Never do that.

2) Refreshing charge
 If an engine will not start, a horn sounds weak, or lamps are dim, it indicates the battery has been discharged. Give refresh charge for 5 to 10 hours with charge current shown in the specification (see the Electrical System chapter).
 When a fast charge is inevitably required, do it following precisely the maximum charge current and time conditions indicated on the battery.

CAUTION

This battery is designed to sustain no unusual deterioration if refresh-charged according to the method specified above. However, the battery's performance may be reduced noticeably if charged under conditions other than given above. Never remove the sealing plug during refresh charge.
 If by chance an excessive amount of gas is generated due to overcharging, the safety valve operates to keep the battery safe.

3) When you do not use the motorcycle for months
 Give a refresh charge before you store the motorcycle and store it with the negative lead removed. Give a refresh charge **once a month** during storage.

4) Battery life
 If the battery will not start the engine even after several refresh charges, the battery has exceeded its useful life. Replace it. (Provided, however, the vehicle's starting system has no problem.)

⚠WARNING

Keep the battery away from sparks and open flames during charging, since the battery gives off an explosive gas mixture of hydrogen and oxygen. When using a battery charger, connect the battery to the charger before turning on the charger. This procedure prevents sparks at the battery terminals which could ignite any battery gases.
 No fire should be drawn near the battery, or no terminals should have the tightening loosened.
 The electrolyte contains sulfuric acid. Be careful not to have it touch your skin or eyes. If touched, wash it off with liberal amount of water. Get medical attention if severe.

(VII) Interchangeability with Ordinary Battery

A maintenance free battery can fully display its performance only when combined with a proper vehicle electric system. Therefore, replace a maintenance free battery only on a motorcycle which was originally equipped with a maintenance free battery.

Be careful, if a maintenance free battery is installed on a motorcycle which had an ordinary battery as original equipment, the maintenance free battery's life will be shortened.

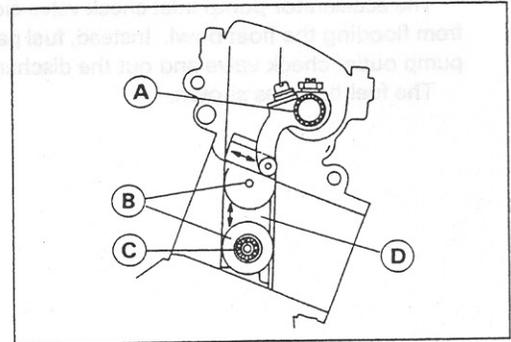
Technical Information – Flat CR Slide Carburetor

The ZX750N has flat slide carburetors.

Throttle Mechanism:

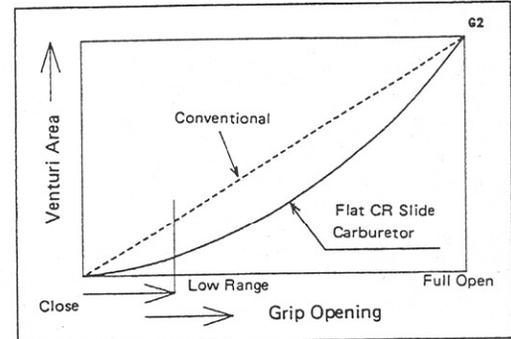
The slides are Teflon coated and two rollers are located on each side of the slide to reduce friction. The rollers are mounted on shielded ball bearings and the throttle shaft on sealed needle bearings.

- [A] Needle Bearing
- [B] Plastic Roller
- [C] Shielded Ball Bearing
- [D] Slide



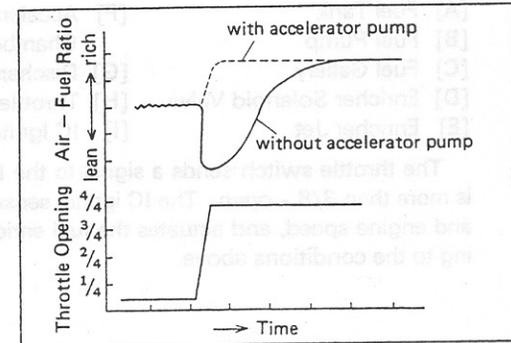
The resulting reduction in effort to move the slides gives the rider very precise throttle control.

The throttle links open the throttle valves progressively. This makes engine control easier at low and mid-range and vehicle control easier when riding on tight corners or wet roads.



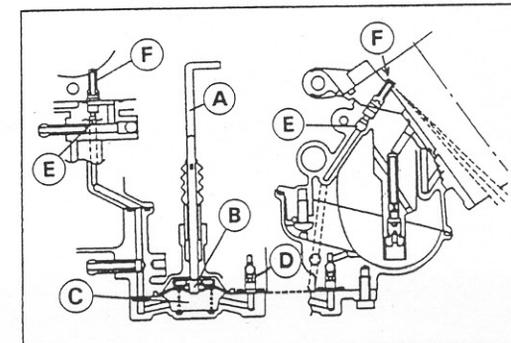
Accelerator Pumps:

Air, being lighter than fuel, accelerates away from the fuel when the throttle valve is quickly opened. When the air arrives at the combustion chamber, there is not enough fuel with it and a lean stumble or hesitation results. This is especially true of large-bore carburetors such as on the ZX750N. To combat this, the "CR" carburetors have two diaphragm-type accelerator pumps which shoot a stream of fuel down each venturi toward the intake valves. This supplies an enriched fuel mixture that arrives at the combustion chamber with the air.



When the throttle is suddenly opened, the pump rod linked to the throttle shaft pushes the pump diaphragm forcing the fuel from the pump chamber. The inlet check valve closes and the outlet check valve opens allowing fuel to spray from the discharge nozzle. As the diaphragm relaxes, the inlet valve opens letting fuel from the float bowl refill the pump chamber. The outlet check valve closes as accelerator pump pressure falls stopping fuel from syphoning out the discharge nozzle.

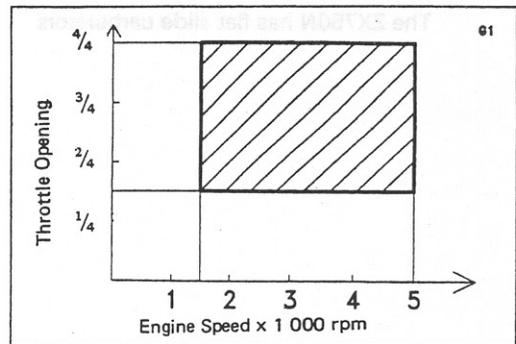
- [A] Pump Rod
- [B] Pump Diaphragm
- [C] Pump Chamber
- [D] Inlet Check Valve
- [E] Outlet Check Valve
- [F] Discharge Nozzle



Fuel Enricher:

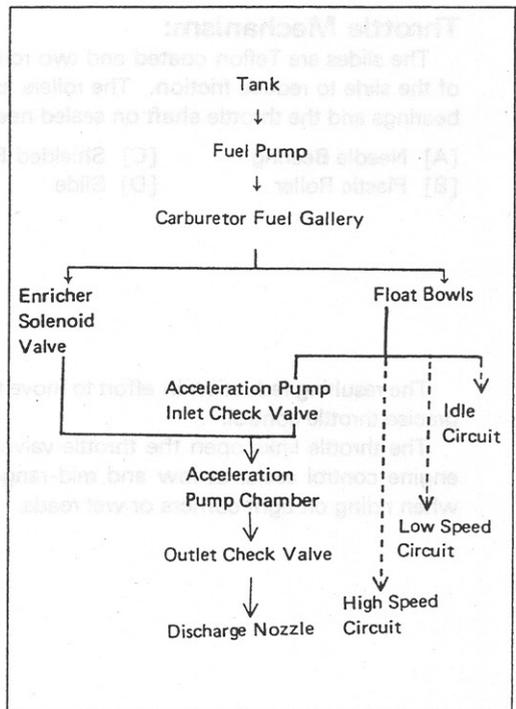
The fuel enricher provides a richer mixture to the engine in order to improve throttle response at lower engine speeds and prevent misfiring when the throttle is quickly opened.

When the throttle is more than 3/8 - open and the engine is turning between 1 500 rpm and 5 000 rpm, the fuel enricher solenoid valve opens and pressured fuel is available to the accelerator pump chamber.



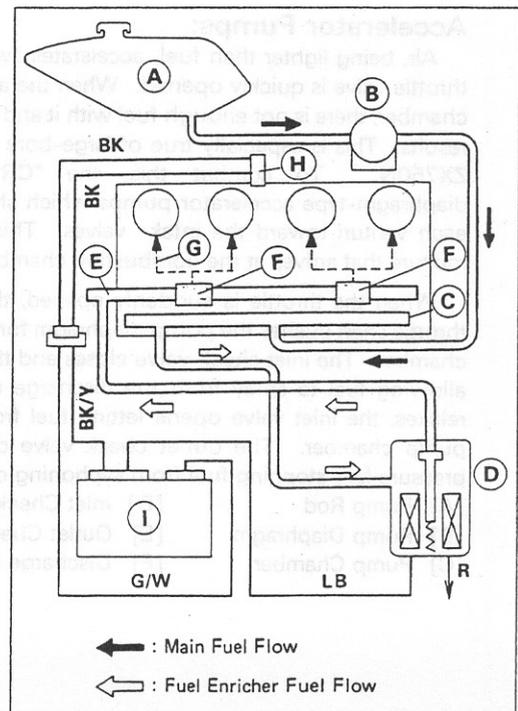
The accelerator pump inlet check valve closes preventing enricher fuel from flooding the float bowl. Instead, fuel passes through the accelerator pump outlet check valve and out the discharge nozzle.

The fuel flows as shown.



- [A] Fuel Tank
- [B] Fuel Pump
- [C] Fuel Gallery
- [D] Enricher Solenoid Valve
- [E] Enricher Jet
- [F] Accelerator Pump Chambers
- [G] Discharge Nozzles
- [H] Throttle Switch
- [I] IC Igniter

The throttle switch sends a signal to the IC igniter when the throttle is more than 3/8 - open. The IC igniter senses the throttle switch signal and engine speed, and actuates the fuel enricher solenoid valve according to the conditions above.

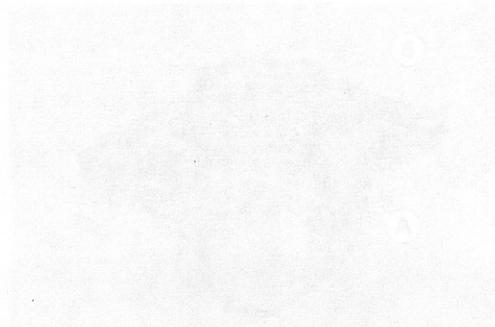
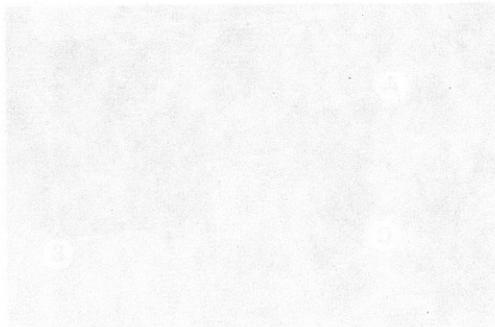
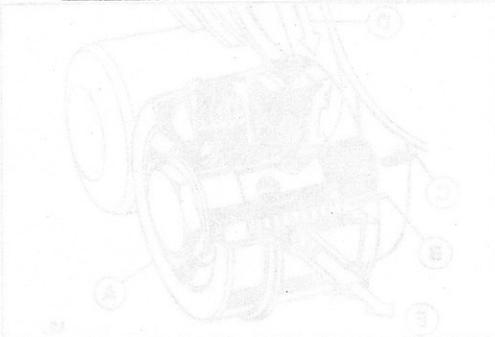
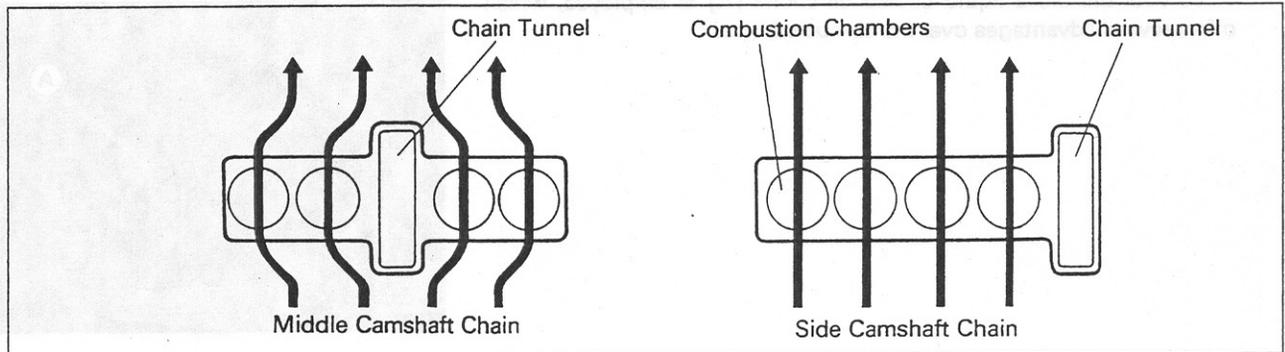


Technical Information – Side Camshaft Chain

Positioning the cam chain on the right side of the cylinders enables all of the combustion paths from the airbox to the exhaust pipe to be short and straight as shown, improving breathing efficiency and shortening the cylinder block.

It shortens the crankshaft and improves its rigidity.

It also allows the crankshaft camchain sprocket to be as small as possible, without effecting crankshaft strength. This permits the camshaft sprockets to be as small as possible also, allowing the cylinder head to be compact. The compact cylinder head reduces engine weight and provides more freedom in the design of the frame.



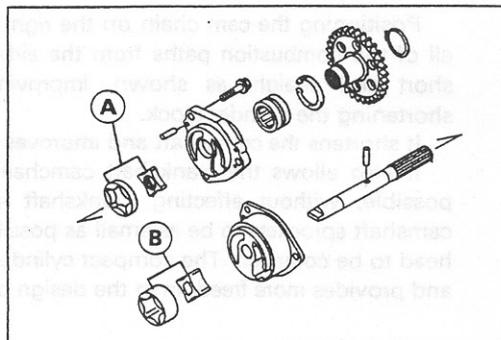
The EX150V² oil system has dual oil pumps (Sub-Oil Pump Factor) (A) feeding pressure oil to the other (Main Oil Pump Factor) (B) which feeds the main oil pump rotor. However, the main oil pump rotor, at a rate of 14 mm, significantly reduces mechanical loss. The two-pump system also reduces engine torque reduction by avoiding oil starvation under extreme loading conditions.

[A] Liquid-cooled Oil Cooler
 [B] Hot Oil
 [C] Cold Oil
 [D] Cold Coolant
 [E] Hot Coolant

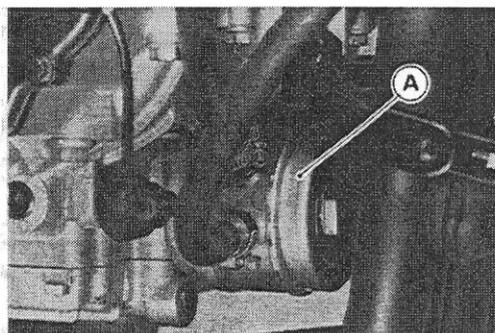
The semi-dry clutch system is designed to reduce oil slinging loss by keeping the oil from collecting in the clearance below the crankshaft and in the clutch. Baffles (A) and passages (B) are fitted in the crankcase below the transmission to collect the oil so that it returns from the lubrication system, feeding it to the oil pump filter (C) and away from the crankcase and clutch basket.

Technical Information - Engine Lubrication System

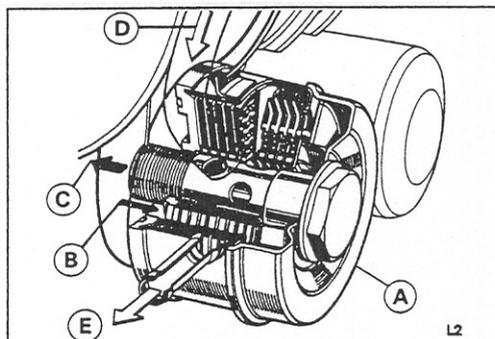
The ZX750N/P oil system has dual oil pumps, with one pump (Sub-Oil Pump Rotor) [A] feeding pressurised oil to the oil cooler and the other (Main Oil Pump Rotor) [B] to the top end, crank, and transmission. However, the main oil pump rotor width, at a mere 14 mm, significantly reduces mechanical loss. This two-pump system helps ensure reliable lubrication by avoiding drops in oil pressure during extreme riding conditions.



To cool the oil, a liquid-cooled oil cooler [A] is employed, which offers several advantages over the air-cooled type.

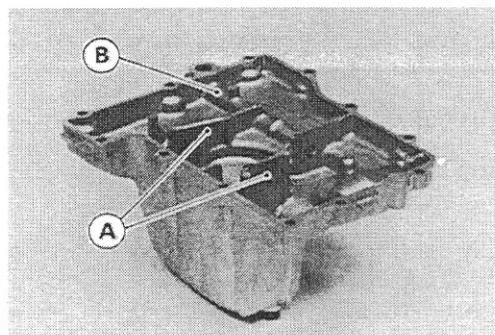
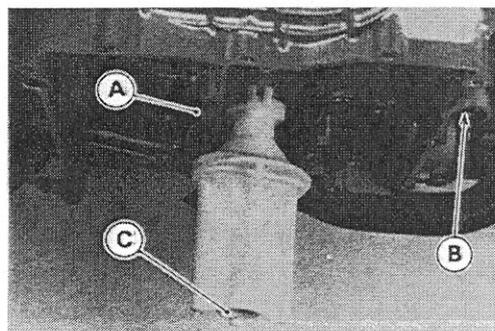


First, having almost the same cooling capability, the liquid-cooled oil cooler is more compact than the air-cooled oil cooler, fitted easily in the engine, and helps easy maintenance of engine. Next, since the cooler is installed right on the crankcase without oil hoses, there is little chance of a major oil leak and little oil pressure drop in the cooler.



- [A] Liquid-cooled Oil Cooler
- [B] Hot Oil
- [C] Cold Oil
- [D] Cold Coolant
- [E] Hot Coolant

The semi-dry sump system is designed to reduce oil stirring loss by keeping the oil from collecting in the crankcase below the crankshaft and in the clutch. Baffles [A] and passages [B] are fitted in the crankcase below the transmission to collect the oil at once as it returns from the lubrication system, feeding it to the oil pump inlet [C] and away from the crankcase and clutch basket.

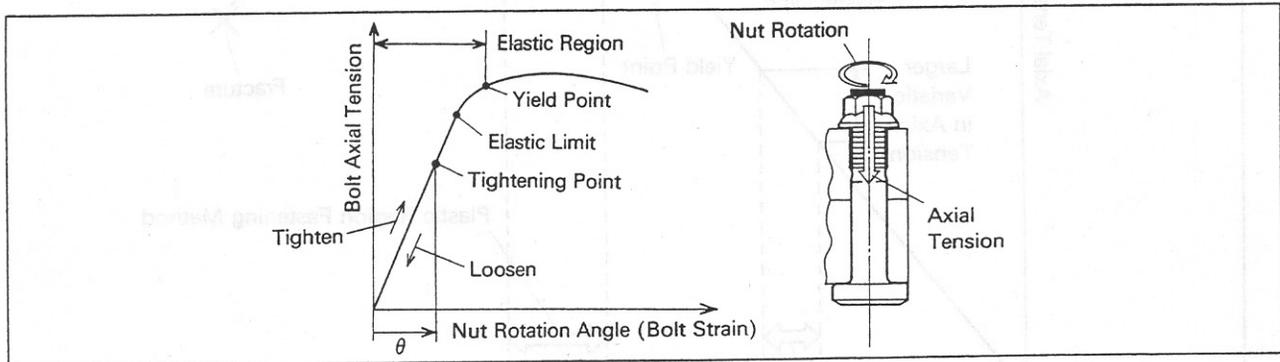


Technical Information – Connecting Rod Big End Nut Tightening

Benifits:

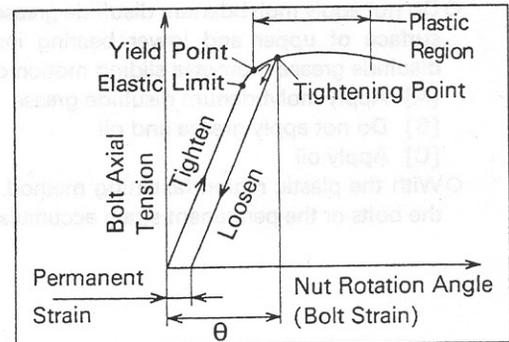
There are two methods for tightening connecting rod big end nuts: **the elastic region fastening method** and **the plastic region fastening method**. With the elastic region fastening method, bolt axial tension increases in proportion to nut rotation angle (bolt strain) when the nut is tightened. Upon removal of torque, the bolt returns to its original length.

The elastic region fastening method has been widely used because it is simple and the bolts can be retightened and reused.



However, the ZX750N/P use the plastic region fastening method for reduced connecting rod weight and increased fastening reliability. This is because the ZX750N/P's connecting rods are under very severe conditions such as high engine speed and high horsepower.

With the plastic region fastening method, the bolt is tightend beyond its yield point where bolt strain grows rapidly. Upon removal of torque, the bolt doesn't return to original length any more and permanent strain remains.



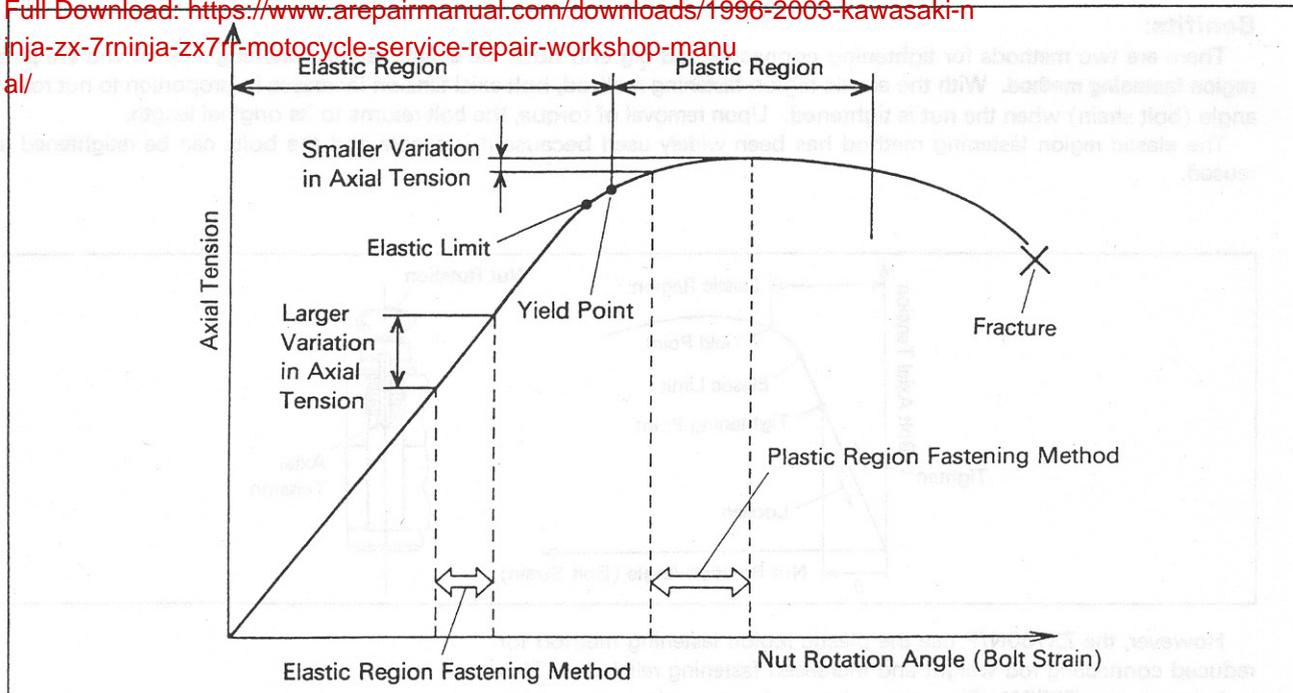
Beyond the yield point, axial tension increases gradually compared to bolt strain : axial tension varies less to variations of nut rotation angle than in the elastic region as shown. Here, axial tension corresponds to clamping force (the actual pressure applied to the two parts being bolted together), and bolt strain corresponds to nut rotation angle or to tightening torque.

From this, the plastic region fastening method provides more stable and higher axial tension. But the method is more sophisticated than conventional torquing and requires precise assembly and disassembly procedures.

Product: 1996-2003 Kawasaki Ninja ZX-7R, Ninja ZX7RR Motorcycle Service Repair Workshop Manual

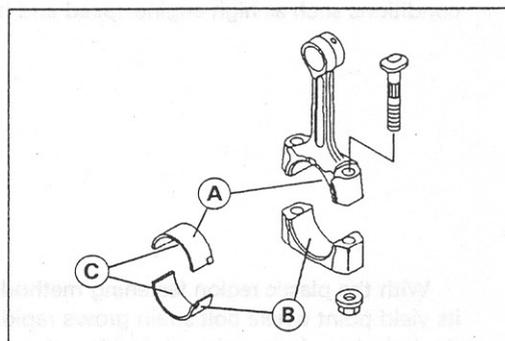
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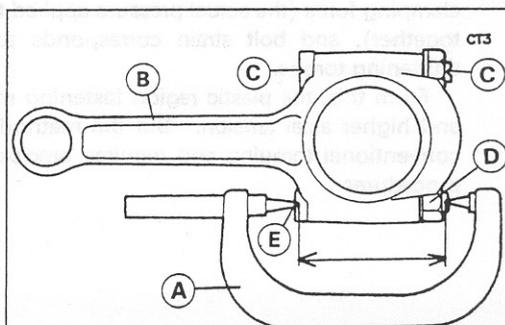
Work Notes:

- Be sure to clean the bolts, nuts, and connecting rods thoroughly with high-flash point solvent, because the new connecting rods, bolts, and nuts are treated with an anti-rust solution. This solution contains hydrogen which could weaken high tensile bolts such as connecting rod bolts and lead to bolt breakage.
- Apply molybdenum disulfide grease to the upper inner surface of the connecting rod big end. This prevents the upper bearing insert from wear and corrosion from its slight sliding motion during operation.
- Do not apply molybdenum disulfide grease, only engine oil to the inner surface of upper and lower bearing inserts because molybdenum disulfide grease promotes sliding motion of bearing inserts.
 - [A] Apply molybdenum disulfide grease
 - [B] Do not apply grease and oil
 - [C] Apply oil
- With the plastic region fastening method, do not retighten and reuse the bolts or the permanent strain accumulates and the bolts may break.



Methods:

- There are two methods of plastic region fastening. One is a **bolt length measurement method** and the other is a **rotation angle method**. Use one of the following two.
 - (1) Bolt Length Measurement Method
- This method is preferable because this is a more reliable way to tighten the big end nuts, though it requires a point micrometer [A] and cumbersome work.
 - [B] Connecting Rod
 - [C] Mark here with a punch
 - [D] Nuts
 - [E] Fit micrometer pins into punch marks
- To prevent seizure of the bolt threads, apply a small amount of engine oil to the threads.



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