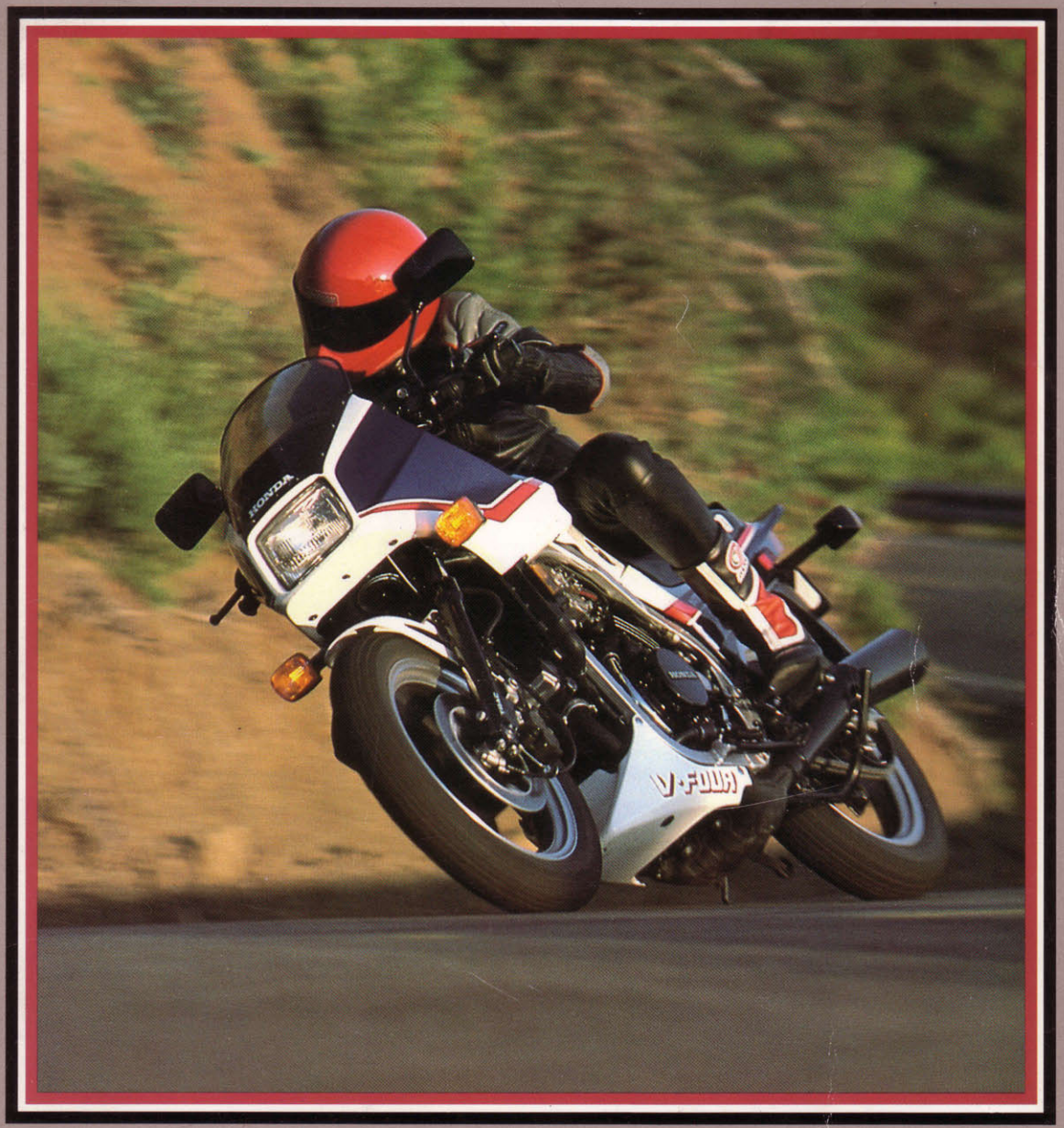
CLYMER™

HONDA

500cc V-FOURS • 1984-1986

SERVICE • REPAIR • MAINTENANCE



INTERTEC PUBLISHING
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CONTENTS

QUICK REFERENCE DATA

QUICK INDEX

TUNE-UP SPECIFICATIONS

Item	Specification
Valve clearance (cold below 35° C/95° F)	
1984-1985	
Intake	0.12 (0.004 in.)
Exhaust	0.13 (0.005 in.)
1986	
Intake	0.15 (0.006 in.)
Exhaust	0.15 (0.006 in.)
Compression pressure (at sea level)	10.0-14.0 kg/cm² (142-199 psi)
Spark plug type	
1984-1985	
Standard heat range	ND X24EPR-U9 or NGK DPR8EA-9
Cold weather*	ND X22EPR-U9 or NGK DPR7EA-9
Extended high speed	ND X27EPR-U9 or NGK DPR9EA-9
1986	
Standard heat range	ND X27EPR-U9 or NGK DPR9EA-9
Cold weather*	ND X24EPR-U9 or NGK DPR8EA-9
Spark plug gap	0.8-0.9 mm (0.031-0.035 in.)
Ignition timing @ 1,700 rpm	
1984-1985	"F" mark next to "TF"—front cylinders "F" mark next to "TR"—rear cylinders
1986	"F" mark next to "T-2"—front cylinders "F" mark next to "T-1"—rear cylinders
Idle speed	1,300 ±100 rpm
Firing order	1-4-3-2

* Cold weather climate—below 5° C (41° F).

TIRE INFLATION PRESSURE (COLD)*

Load	Air pressure	
	Magna	Interceptor
Up to 200 lb. (90 kg)		
Front	28 psi (2.00 kg/cm²)	32 psi (2.25 kg/cm²)
Rear	28 psi (2.00 kg/cm²)	32 psi (2.25 kg/cm²)
Maximum load limit**		
Front	28 psi (2.00 kg/cm²)	36 psi (2.5 kg/cm²)
Rear	32 psi (2.25 kg/cm²)	40 psi (2.8 kg/cm²)

* Recommended air pressure for original equipment tires. Aftermarket tires may require different air pressure.
** Maximum load limit includes total weight of motorcycle with accessories, rider(s) and luggage.

REPLACEMENT BULBS

Item	Wattage	Number
Headlight	12V 60/55W	
Tail/brakelight	12V 8/27W	SAE No. 1157
Turn signals		
Front	12V 23/8W	SAE No. 1034
Rear	12V 23 W	SAE No. 1073
Instrument lights	12V 3.4W	
Indicator lights	12V 3W	SAE No. 57
High beam indicator	12V 3W	SAE No. 57

FLUID CAPACITIES

Fuel capacity	
1984-1985	
Magna	13.5 liters (3.5 U.S. gal., 3.0 Imp. gal.)
Interceptor	16.5 liters (4.3 U.S. gal., 3.6 Imp. gal.)
1986	15.5 liters (4.1 U.S. gal., 3.4 Imp. gal.)
Fuel capacity (reserve)	
1984-1985	
Magna	3.5 liters (0.9 U.S. gal., 0.8 Imp. gal.)
Interceptor	4.0 liters (1.1 U.S. gal., 0.9 Imp. gal.)
1986	4.0 liters (1.1 U.S. gal., 0.9 Imp. gal.)
Oil capacity	
1984-1985	
Oil and filter change	2.5 liters (2.6 U.S. qt., 2.2 Imp. qt.)
At overhaul	3.0 liters (3.2 U.S. qt., 2.6 Imp. qt.)
1986	
Oil and filter change	2.8 liters (3.0 U.S. qt., 2.5 Imp. qt.)
At overhaul	3.4 liters (3.6 U.S. qt., 3.0 Imp. qt.)
Coolant capacity	
1984-1985	
Magna	2.2 liters (2.3 U.S. qt., 1.9 Imp. qt.)
Interceptor	2.05 liters (2.2 U.S. qt., 1.8 Imp. qt.)
1986	1.70 liters (1.80 U.S. qt., 1.5 Imp. qt.)
Front fork oil capacity*	
Right-hand leg	320 cc (10.8 U.S. oz., 9.0 Imp. oz.)
Left-hand leg	335 cc (11.3 U.S. oz., 9.4 Imp. oz.)
Drive chain number	50V3-108LE or RK50FO-108LE

* Capacity for each fork leg.

NOTE: If you own a 1986 model, first check the Supplement at the back of the book for any new service information.

CHAPTER ONE

GENERAL INFORMATION

This detailed, comprehensive manual covers the Honda 500 cc water-cooled V-4 models. The expert text gives complete information on maintenance, tune-up, repair and overhaul. Hundreds of photos and drawings guide you through every step. The book includes all you need to know to keep your Honda running right.

A shop manual is a reference. You want to be able to find information fast. As in all Clymer books, this one is designed with you in mind. All chapters are thumb tabbed. Important items are extensively indexed at the rear of the book. All procedures, tables, photos, etc., in this manual are for the reader who may be working on the bike or using this manual for the first time. All the most frequently used specifications and capacities are summarized on the *Quick Reference Data* pages at the front of the book.

Keep the book handy in your tool box. It will help you to better understand how the bike runs, lower repair and maintenance costs and generally improve your satisfaction with the bike.

Tables 1-3 are at the end of this chapter.

MANUAL ORGANIZATION

All dimensions and capacities are expressed in English units familiar to U.S. mechanics as well as in metric units.

This chapter provides general information and specifications in **Table 1** at the end of the chapter. It also discusses equipment and tools useful both for preventive maintenance and troubleshooting. Refer to **Table 2** for recommendations.

Chapter Two provides methods and suggestions for quick and accurate diagnosis and repair of problems. Troubleshooting procedures discuss typical symptoms and logical methods to pinpoint the trouble.

Chapter Three explains all periodic lubrication and routine maintenance necessary to keep the bike running well. Chapter Three also includes recommended tune-up procedures, eliminating the need to constantly consult chapters on the various assemblies.

Subsequent chapters describe specific systems such as the engine, clutch, transmission, fuel, exhaust, electrical systems, cooling, suspension and brakes. Each chapter provides disassembly, repair and assembly procedures in simple step-by-step form. If a repair is impractical for a home mechanic, it is so indicated. It is usually faster and less expensive to take such repairs to a dealer or competent repair shop. Specifications concerning a particular system are included at the end of the appropriate chapter.

Some of the procedures in this manual specify special tools. In most cases, the tool is illustrated either in actual use or alone. Well equipped mechanics may find they can substitute similar tools already on hand or can fabricate their own.

The terms NOTE, CAUTION and WARNING have specific meanings in this manual. A NOTE provides additional information to make a step or procedure easier or clearer. Disregarding a NOTE could cause inconvenience, but would not cause equipment damage or personal injury.

A CAUTION emphasizes areas where equipment damage could occur. Disregarding a CAUTION could cause permanent mechanical damage; however, personal injury is unlikely.

A WARNING emphasizes areas where personal injury or even death could result from negligence. Mechanical damage may also occur. WARNINGS *are to be taken seriously.* In some cases, serious injury or death has resulted from disregarding similar warnings.

Throughout this manual keep in mind 2 conventions. "Front" refers to the front of the bike. The front of any component, such as the engine, is the end which faces toward the front of the bike. The "left-hand" and "right-hand" sides refer to the position of the parts as viewed by a rider sitting on the seat facing forward. For example, the throttle control is on the right-hand side and the clutch lever is on the left-hand side. These rules are simple, but even experienced mechanics occasionally become disoriented.

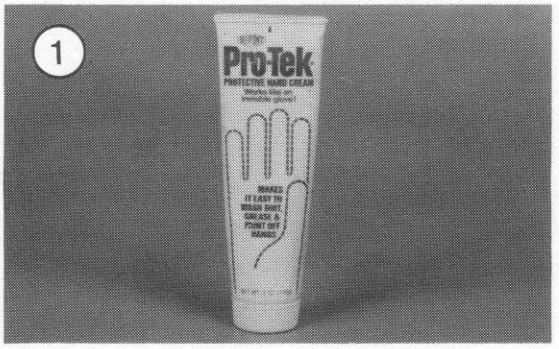
SERVICE HINTS

Most of the service procedures covered are straightforward and can be performed by anyone reasonably handy with tools. It is suggested, however, that you consider your own capabilities carefully before attempting any operation involving major disassembly of the engine.

Some operations, for example, require the use of a press. It would be wiser to have these performed by a shop equipped for such work, rather than trying to do the job yourself with makeshift equipment. Other procedures require precise measurements. Unless you have the skills and equipment required, it would be better to have a qualified repair shop make the measurements for you.

There are many items available that can be used on your hands before and after working on your bike. A little preparation prior to getting "all greased up" will help when cleaning up later.

Before starting out, work Vaseline, soap or a product such as Pro-Tek Invisible Glove (**Figure 1**) onto your forearms, into your hands and under your fingernails and cuticles. This will make cleanup a lot easier.



For cleanup, use a waterless hand soap such as Sta-Lube and then finish up with powdered Boraxo and a fingernail brush.

Repairs go much faster and easier if the bike is clean before you begin work. There are special cleaners, such as Gunk or Bel-Ray Degreaser (**Figure 2**), for washing the engine and related parts. Just spray or brush on the cleaning solution, let it stand, then rinse it away with a garden hose. Avoid the use of high pressure water (coin-operated car washes) and do not point any water spray directly at the following parts or areas:

a. Drive chain.
b. Wheel hubs.
c. Instrument cluster.
d. Ignition switch and handlebar switches.
e. Carburetor assembly.
f. Master cylinders (brakes and clutch).
g. Muffler outlets.
h. Under the seat and the fuel tank.

Clean all oily or greasy parts with cleaning solvent as you remove them.

WARNING

Never use gasoline as a cleaning agent. It presents an extreme fire hazard. Be sure to work in a well-ventilated area when using cleaning solvent. Keep a fire extinguisher, rated for gasoline fires, handy in any case.

Special tools are required for some repair procedures. These may be purchased from a dealer or motorcycle shop, rented from a tool rental dealer or fabricated by a mechanic or machinist (often at a considerable savings).

Much of the labor charged for repairs made by mechanics is for the removal and disassembly of other parts to reach the defective unit. It is usually possible to perform the preliminary operations yourself and then take the defective unit in to the dealer for repair.

Once you have decided to tackle the job yourself, read the entire section in this manual which

pertains to it, making sure you have identified the proper one. Study the illustrations and text until you have a good idea of what is involved in completing the job satisfactorily. If special tools or replacement parts are required, make arrangements to get them before you start. It is frustrating and time-consuming to get part way into a job and then be unable to complete it.

Simple wiring checks can be easily made at home, but knowledge of electronics is almost a necessity for performing tests with complicated electronic testing gear.

During disassembly of parts, keep a few general cautions in mind. Force is rarely needed to get things apart. If parts are a tight fit, such as a bearing in a case, there is usually a tool designed to separate them. Never use a screwdriver to pry parts with machined surfaces such as crankcase halves. You will mar the surfaces and end up with leaks.

Make diagrams (or take a Polaroid picture) wherever similar-appearing parts are found. For instance, crankcase bolts are often not the same length. You may think you can remember where everything came from, but mistakes are costly. There is also the possibility you may be sidetracked and not return to work for days or even weeks, in which interval carefully laid out parts may have become disturbed.

Tag all similar internal parts for location and mark all mating parts for position. Record number and thickness of any shims as they are removed. Small parts such as bolts can be identified by placing them in plastic sandwich bags. Seal and label them with masking tape.

Wiring should be tagged with masking tape and marked as each wire is removed. Even though most electrical connectors are color coded, mark them. Do not rely on memory alone.

Protect finished surfaces from physical damage or corrosion. Keep gasoline and hydraulic brake and clutch fluid off painted surfaces.

Frozen or very tight bolts and screws can often be loosened by soaking with penetrating oil, such as WD-40 or Liquid Wrench, then sharply striking the bolt head a few times with a hammer and punch (or screwdriver for screws). Avoid heat unless absolutely necessary, since it may melt, warp or remove the temper from many parts.

No parts, except those assembled with a press fit, require unusual force during assembly. If a part is hard to remove or install, find out why before proceeding.

Cover all openings after removing parts to keep dirt, small tools, etc., from falling in.

When assembling 2 parts, start all fasteners, then tighten evenly.

Wiring connections and brake components should be kept clean and free of grease and oil.

When assembling parts, be sure all shims and washers are installed exactly as they came out.

Whenever a rotating part butts against a stationary part, look for a shim or washer. Use new gaskets if there is any doubt about the condition of the old ones.

Heavy grease can be used to hold small parts in place if they tend to fall out during assembly. However, keep grease and oil away from electrical and brake components.

High spots may be sanded off a piston with sandpaper, but fine emery cloth and oil will do a much more professional job.

Carbon can be removed from the heads, the piston crowns and the exhaust ports with a dull screwdriver. *Do not* scratch machined surfaces. Wipe off the surface with a clean cloth when finished.

The carburetors are best cleaned by disassembling them and soaking the parts in a commercial carburetor cleaner. Never soak gaskets and rubber parts in these cleaners. Never use wire to clean out jets and air passages; they are easily damaged. Use compressed air to blow out the carburetor *after* the float has been removed.

A baby bottle makes a good measuring device for adding oil to the final drive and front forks. Get one that is graduated in fluid ounces and cubic centimeters. After it has been used for this purpose, do not let a small child drink out of it as there will always be an oil residue in it.

Take your time and do the job right. Do not forget that a newly rebuilt engine must be broken in the same as a new one. Keep the rpm within the limits given in your owner's manual when you get back on the road.

TORQUE SPECIFICATIONS

Torque specifications throughout this manual are given in Newton meters (N•m) and foot pounds

(ft.-lb.). Newton meters have been adopted in place of meter kilograms (mkg) in accordance with the International Modernized Metric System. Tool manufacturers offer torque wrenches calibrated in Newton meters and Sears has a Craftsman line calibrated in both values.

Existing torque wrenches calibrated in meter kilograms can be used by performing a simple conversion. All you have to do is move the decimal point one place to the right; for example, 4.7 mkg = 47 N•m. This conversion is accurate enough for mechanical work even though the exact mathematical conversion is 3.5 mkg = 34.3 N•m.

Refer to **Table 3** for standard torque specifications for various size screws, bolts and nuts that may not be covered in the various chapters.

SAFETY FIRST

Professional mechanics can work for years and never sustain a serious injury. If you observe a few rules of common sense and safety, you can enjoy many hours servicing your own machine. If you ignore these rules you can hurt yourself or damage the bike.

1. Never use gasoline as a cleaning solvent.
2. Never smoke or use a torch in the vicinity of flammable liquids such as cleaning solvent in open containers.
3. If welding or brazing is required on the machine, remove the fuel tank(s) to a safe distance, at least 50 feet away.
4. Use the proper sized wrenches to avoid damage to nuts and injury to yourself.
5. When loosening a tight or stuck nut, think about what would happen if the wrench should slip. Be careful; protect yourself accordingly.
6. Keep your work area clean and uncluttered.
7. Wear safety goggles during all operations involving drilling, grinding or the use of a cold chisel.
8. Never use worn tools.
9. Keep a fire extinguisher handy and be sure it is rated for gasoline and electrical fires.

SPECIAL TIPS

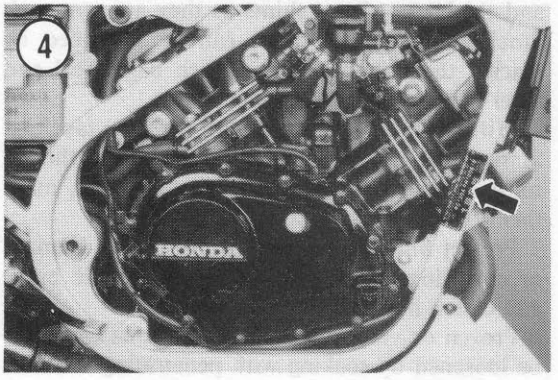
Because of the extreme demands placed on a bike, several points should be kept in mind when performing service and repair. The following items are general suggestions that may improve the overall life of the machine and help avoid costly failures.

1. Use a locking compound such as Loctite Lock N' Seal No. 2114 (blue Loctite) on bolts and nuts (used in high-stress areas) even if they are secured with lockwashers. This type of Loctite does not harden completely and allows easy removal of the bolt or nut. A screw or bolt lost from an engine cover or bearing retainer could easily cause serious and expensive damage before its loss is noticed.

When applying Loctite, use a small amount. If too much is used, it can work its way down the threads and stick parts together not meant to be stuck.

Keep a tube of Loctite in your tool box; when used properly it is cheap insurance.

2. Use a hammer-driven impact tool to remove tight bolts and screws, particularly engine cover screws. These tools help prevent the rounding off of bolt heads and ensure a tight installation.
3. When replacing missing or broken fasteners (bolts, nuts and screws), especially on the engine or frame components, always use Honda replacement parts. They are specially hardened for each application. The wrong fastener could easily cause serious and expensive damage, not to mention rider injury.
4. When installing gaskets in the engine, always use Honda replacement gaskets *without* sealer, unless designated. These gaskets are designed to swell when they come in contact with oil. Some of



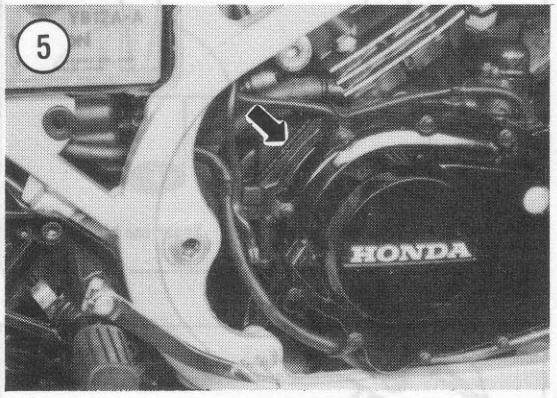
the gaskets (head gaskets) have a sticky surface on each side that ensures a good seal. Gasket sealer will prevent the gaskets from swelling or sticking as intended, which can result in oil leaks. These Honda gaskets are cut from material of the precise thickness needed. Installation of a too-thick or too-thin gasket in a critical area could cause engine damage.

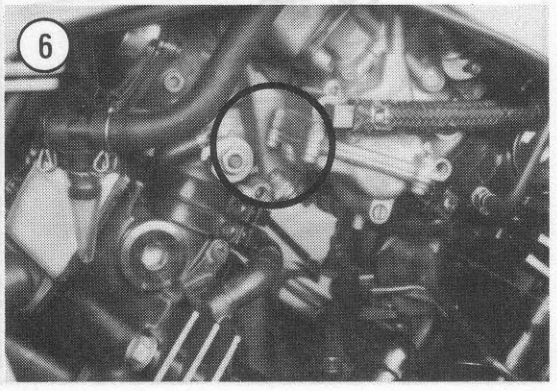
EXPENDABLE SUPPLIES

Certain expendable supplies are required during maintenance and repair work. These include grease, oil, gasket cement, wiping rags and cleaning solvent. Ask your dealer for the special locking compounds, silicone lubricants, drive chain lube and other products (**Figure 3**) which make vehicle maintenance simpler and easier. Cleaning solvent or kerosene is available at some service stations or hardware stores.

PARTS REPLACEMENT

Honda makes frequent changes during a model year—some minor, some relatively major. When you order parts from the dealer or other parts distributor, always order by engine and frame number. Write the numbers down and carry them with you. Compare new parts to old before purchasing them. If they are not alike, have the parts manager explain the difference to you.





SERIAL NUMBERS

You must know the model serial number and VIN number for registration purposes and when ordering replacement parts. The various serial numbers are located as follows:

a. The frame serial number is stamped on the right-hand side of the steering head.
b. On V-30 Magna models the vehicle identification number (VIN) is located on the left-hand side of the steering head.
c. On 500 Interceptor models the vehicle identification number (VIN) plate is on the right-hand side of the frame next to the front set of cylinders (**Figure 4**).
d. The engine serial number is located on the top right-hand side of the crankcase above the clutch cover (**Figure 5**).
e. The carburetor identification number is located on the rear of the carburetor body above the float bowl (**Figure 6**).
f. The color label is attached to the frame behind the left-hand side cover on Magna models or on the inside surface of the rear fender under the seat on Interceptor models. When ordering color-coded parts always specify the color code indicated on the label.

BASIC HAND TOOLS

A number of tools are required to maintain a bike in top riding condition. You may already have some of these tools for home or car repairs. There are also tools made especially for bike repairs; these you will have to purchase. In any case, a wide variety of quality tools will make bike repairs easier and more effective.

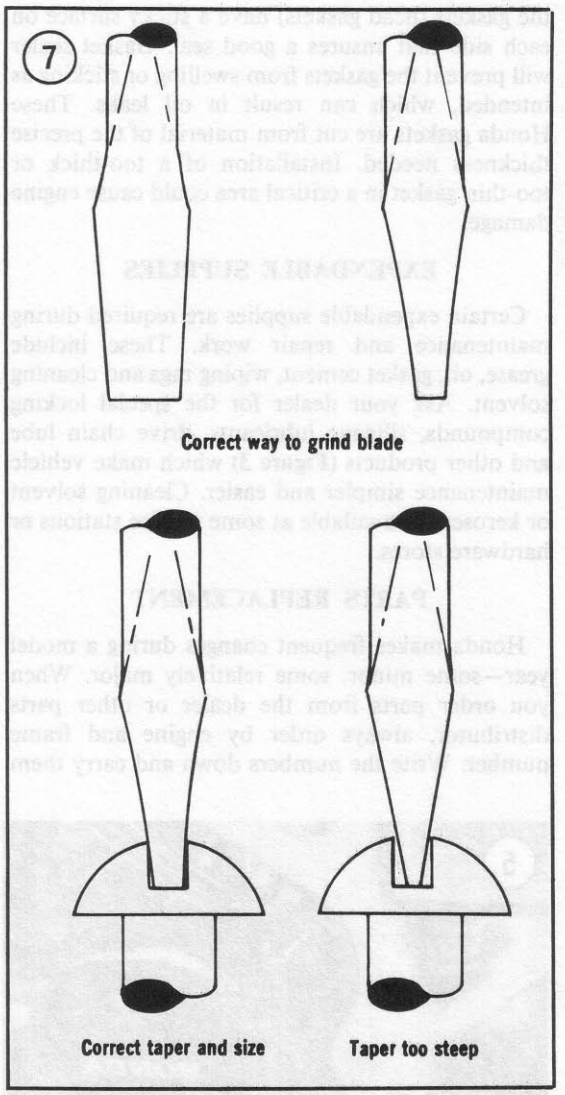
Top quality tools are essential; they are also more economical in the long run. If you are now starting to build your tool collection, stay away from the "advertised specials" featured at some parts houses, discount stores and chain drug stores. These are usually a poor grade tool that can be sold cheaply and that is exactly what they are—*cheap*. They are usually made of inferior material and are thick, heavy and clumsy. Their rough finish makes them difficult to clean and they usually don't last very long. The Stanley line, available at hardware stores, is a good all-around line of tools and will last you a lifetime if you take care of them.

Be careful when lending tools to "friends"—make sure they return them promptly; if not, your collection will soon disappear.

Quality tools are made of alloy steel and are heat treated for greater strength. They are lighter and better balanced than cheap ones. Their surface is smooth, making them a pleasure to work with and easy to clean. The initial cost of good quality tools may be more but it is cheaper in the long run. Don't try to buy everything in all sizes in the beginning; do it a little at a time until you have the necessary tools.

Keep your tools clean and in a tool box. Keep them organized with the sockets and related drives together and the open end and box wrenches together, etc. After using a tool, wipe off dirt and grease with a clean cloth and place the tool in its correct place. Doing this will save a lot of time you would have spent trying to find a socket buried in a bunch of clutch parts.

The following tools are required to perform virtually any repair job on a bike. Each tool is described and the recommended size given for starting a tool collection. **Table 2** includes the tools that should be on hand for simple home repairs and/or major overhaul. Additional tools and some duplications may be added as you become more familiar with the bike. Almost all motorcycles (with the exception of the U.S. built Harley and some English bikes) use metric size bolts and nuts. If you are starting your collection now, buy metric sizes.



Screwdrivers

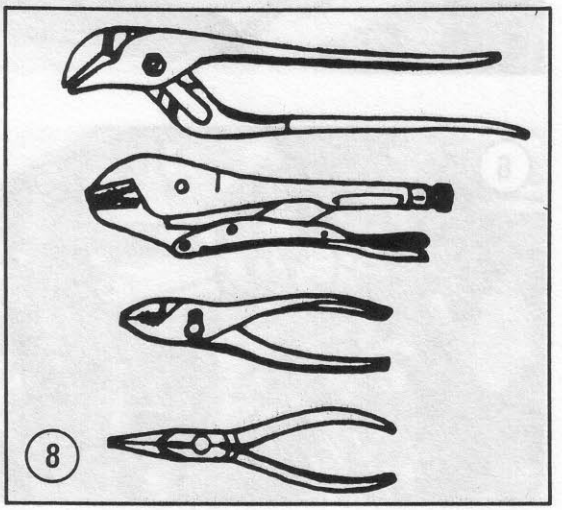
The screwdriver is a very basic tool, but if used improperly it will do more damage than good. The slot on a screw has a definite dimension and shape. A screwdriver must be selected to conform with that shape. Use a small screwdriver for small screws and a large one for large screws or the screw head will be damaged.

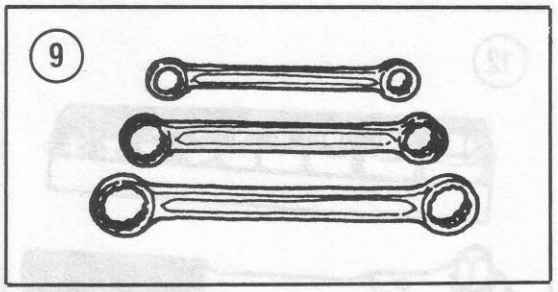
Two basic types of screwdriver are required to repair the bike—a common (flat blade) screwdriver and the Phillips screwdriver.

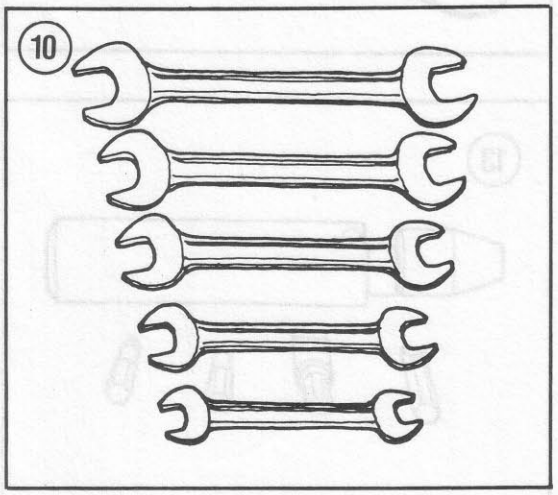
Screwdrivers are available in sets which often include an assortment of common and Phillips blades. If you buy them individually, buy at least the following:

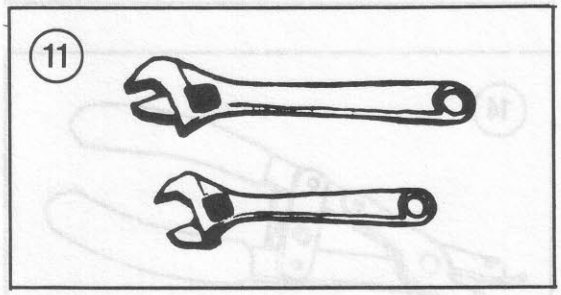
a. Common screwdriver—5/16×6 in. blade.
b. Common screwdriver—3/8×12 in. blade.
c. Phillips screwdriver—size 2 tip, 6 in. blade.

Use screwdrivers only for driving screws. Never use a screwdiver for prying or chiseling. Do not try to remove a Phillips or Allen head screw with a









common screwdriver; you can damage the head so that the proper tool will be unable to remove it.

Keep screwdrivers in the proper condition and they will last longer and perform better. Always keep the tip of a common screwdriver in good condition. **Figure 7** shows how to grind the tip to the proper shape if it becomes damaged. Note the symmetrical sides of the tip.

Pliers

Pliers come in a wide range of types and sizes. Pliers are useful for cutting, bending and crimping. They should never be used to cut hardened objects or to turn bolts or nuts. **Figure 8** shows several pliers useful in bike repairs.

Each type of pliers has a specialized function. Gas pliers are general purpose pliers and are used mainly for holding things and for bending. Vise Grips are used as pliers or to hold objects very tight like a vise. Needlenose pliers are used to hold or bend small objects. Channel lock pliers can be adjusted to hold various sizes of objects; the jaws remain parallel to grip around objects such as pipe or tubing. There are many more types of pliers. The ones described here are most suitable for bike repairs.

Box and Open-end Wrenches

Box and open-end wrenches are available in sets or separately in a variety of sizes. See **Figure 9** and **Figure 10**. The size number stamped near the end refers to the distance between 2 parallel flats on the hex head bolt or nut.

Box wrenches are usually superior to open-end wrenches. Open-end wrenches grip the nut on only 2 flats. Unless the wrench fits well, it may slip and round off the points on the nut. The box wrench grips all 6 flats. Both 6-point and 12-point openings on box wrenches are available. The 6-point gives superior holding power; the 12-point allows a shorter swing.

Combination wrenches which are open on one side and boxed on the other are also available. Both ends are the same size.

Adjustable (Crescent) Wrenches

An adjustable wrench (also called crescent wrench) can be adjusted to fit nearly any nut or bolt head. See **Figure 11**. However, it can loosen and slip, causing damage to the nut and maybe to your knuckles. Use an adjustable wrench only when other wrenches are not available.

Adjustable wrenches come in sizes ranging from 4-18 in. overall. A 6 or 8 in. wrench is recommended as an all-purpose wrench.

Socket Wrenches

This type is undoubtedly the fastest, safest and most convenient to use. See **Figure 12**. Sockets which attach to a ratchet handle are available with 6-point or 12-point openings and 1/4, 3/8 and 3/4 inch drives. The drive size indicates the size of the square hole which mates with the ratchet handle.

Torque Wrench

A torque wrench is used with a socket to measure how tightly a nut or bolt is installed. They come in a wide price range and with either 3/8 or 1/2 in. square drive. The drive indicates the size of the square drive which mates with the socket.

Purchase one that measures 0-140 N•m (0-100 ft.-lb.).

Impact Driver

This tool might have been designed with the bike in mind. See **Figure 13**. It makes removal of engine and clutch parts easy and eliminates damage to bolts and screw slots. This tool is available at most large hardware, motorcycle or auto parts stores.

Circlip Pliers

Circlip pliers (sometimes referred to as snap-ring pliers) are necessary to remove the circlips used on the transmission shaft assemblies. See **Figure 14**.

Hammers

The correct hammer is necessary for bike repairs. Use only a hammer with a face (or head) of rubber or plastic or the soft-faced type that is filled with buckshot. These are sometimes necessary in engine tear-downs. *Never* use a metal-faced hammer on the bike as severe damage will result in most cases. You can always produce the same amount of force with a soft-faced hammer.

Ignition Gauge

This tool has both flat and wire measuring gauges and is used to measure spark plug gap (**Figure 15**). This device is available at most auto or motorcycle supply stores.

Other Special Tools

A few other special tools may be required for major service. These are described in the appropriate chapters and are available either from a Honda dealer or other manufacturers as indicated.

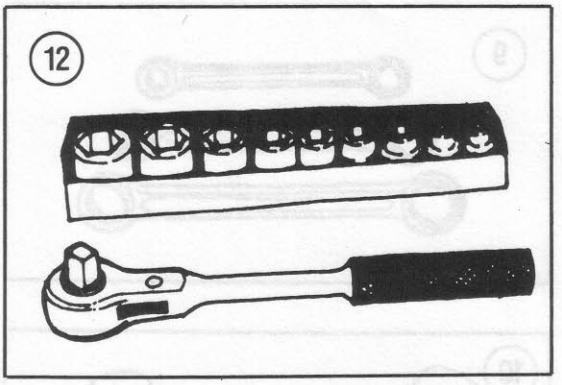
TUNE-UP AND TROUBLESHOOTING TOOLS

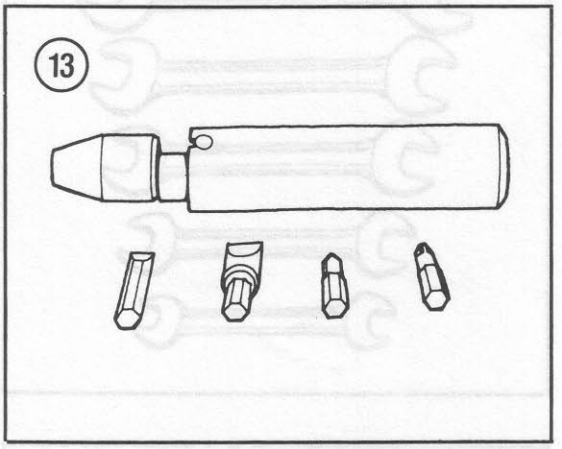
Multimeter or Volt-ohm Meter

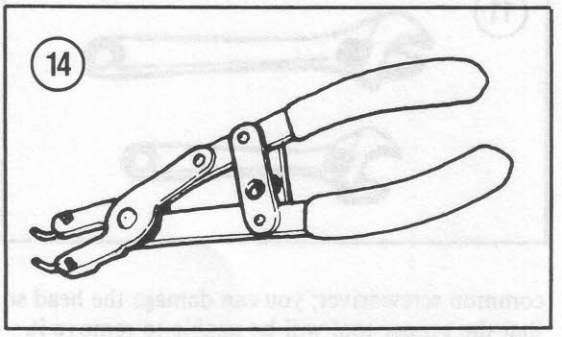
This instrument (**Figure 16**) is invaluable for electrical system troubleshooting and service. A few of its functions may be duplicated by homemade test equipment, but for the serious mechanic it is a must. Its uses are described in the applicable sections of the book.

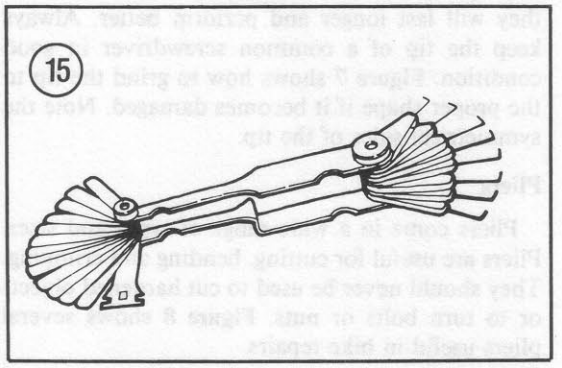
Strobe Timing Light

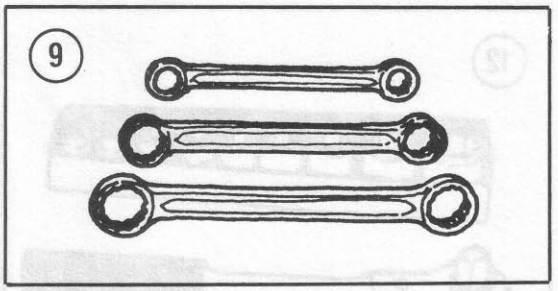
This instrument is necessary for checking the ignition timing. By flashing a light at the precise instant the spark plug fires, the position of the timing mark can be seen. Marks on the starter

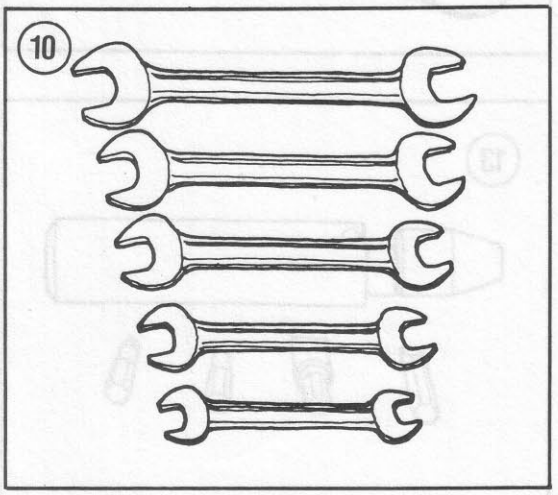


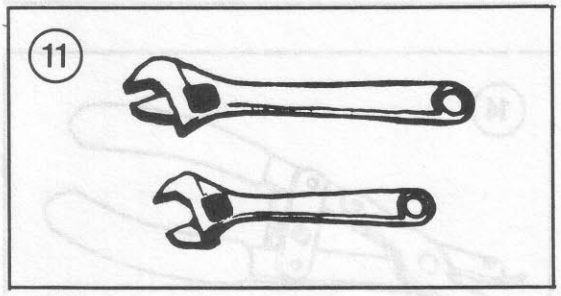












common screwdriver; you can damage the head so that the proper tool will be unable to remove it.

Keep screwdrivers in the proper condition and they will last longer and perform better. Always keep the tip of a common screwdriver in good condition. **Figure 7** shows how to grind the tip to the proper shape if it becomes damaged. Note the symmetrical sides of the tip.

Pliers

Pliers come in a wide range of types and sizes. Pliers are useful for cutting, bending and crimping. They should never be used to cut hardened objects or to turn bolts or nuts. **Figure 8** shows several pliers useful in bike repairs.

Each type of pliers has a specialized function. Gas pliers are general purpose pliers and are used mainly for holding things and for bending. Vise Grips are used as pliers or to hold objects very tight like a vise. Needlenose pliers are used to hold or bend small objects. Channel lock pliers can be adjusted to hold various sizes of objects; the jaws remain parallel to grip around objects such as pipe or tubing. There are many more types of pliers. The ones described here are most suitable for bike repairs.

Box and Open-end Wrenches

Box and open-end wrenches are available in sets or separately in a variety of sizes. See **Figure 9** and **Figure 10**. The size number stamped near the end refers to the distance between 2 parallel flats on the hex head bolt or nut.

Box wrenches are usually superior to open-end wrenches. Open-end wrenches grip the nut on only 2 flats. Unless the wrench fits well, it may slip and round off the points on the nut. The box wrench grips all 6 flats. Both 6-point and 12-point openings on box wrenches are available. The 6-point gives superior holding power; the 12-point allows a shorter swing.

Combination wrenches which are open on one side and boxed on the other are also available. Both ends are the same size.

Adjustable (Crescent) Wrenches

An adjustable wrench (also called crescent wrench) can be adjusted to fit nearly any nut or bolt head. See **Figure 11**. However, it can loosen and slip, causing damage to the nut and maybe to your knuckles. Use an adjustable wrench only when other wrenches are not available.

Adjustable wrenches come in sizes ranging from 4-18 in. overall. A 6 or 8 in. wrench is recommended as an all-purpose wrench.

Socket Wrenches

This type is undoubtedly the fastest, safest and most convenient to use. See **Figure 12**. Sockets which attach to a ratchet handle are available with 6-point or 12-point openings and 1/4, 3/8 and 3/4 inch drives. The drive size indicates the size of the square hole which mates with the ratchet handle.

Torque Wrench

A torque wrench is used with a socket to measure how tightly a nut or bolt is installed. They come in a wide price range and with either 3/8 or 1/2 in. square drive. The drive indicates the size of the square drive which mates with the socket.

Purchase one that measures 0-140 N•m (0-100 ft.-lb.).

Impact Driver

This tool might have been designed with the bike in mind. See **Figure 13**. It makes removal of engine and clutch parts easy and eliminates damage to bolts and screw slots. This tool is available at most large hardware, motorcycle or auto parts stores.

Circlip Pliers

Circlip pliers (sometimes referred to as snap-ring pliers) are necessary to remove the circlips used on the transmission shaft assemblies. See **Figure 14**.

Hammers

The correct hammer is necessary for bike repairs. Use only a hammer with a face (or head) of rubber or plastic or the soft-faced type that is filled with buckshot. These are sometimes necessary in engine tear-downs. *Never* use a metal-faced hammer on the bike as severe damage will result in most cases. You can always produce the same amount of force with a soft-faced hammer.

Ignition Gauge

This tool has both flat and wire measuring gauges and is used to measure spark plug gap (**Figure 15**). This device is available at most auto or motorcycle supply stores.

Other Special Tools

A few other special tools may be required for major service. These are described in the appropriate chapters and are available either from a Honda dealer or other manufacturers as indicated.

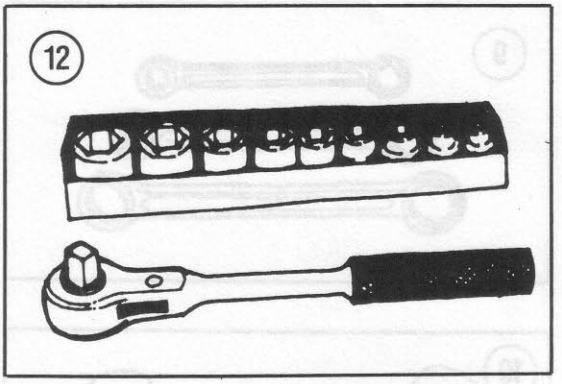
TUNE-UP AND TROUBLESHOOTING TOOLS

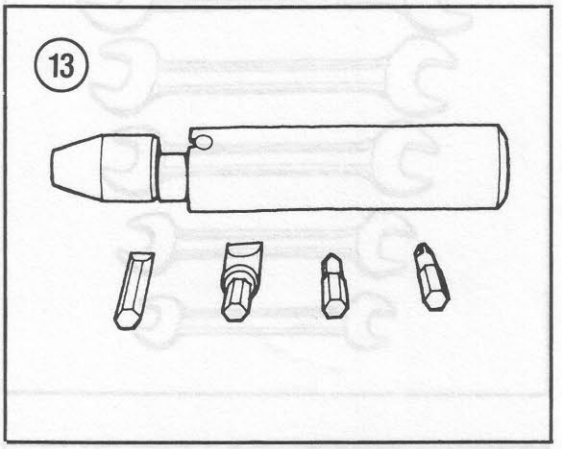
Multimeter or Volt-ohm Meter

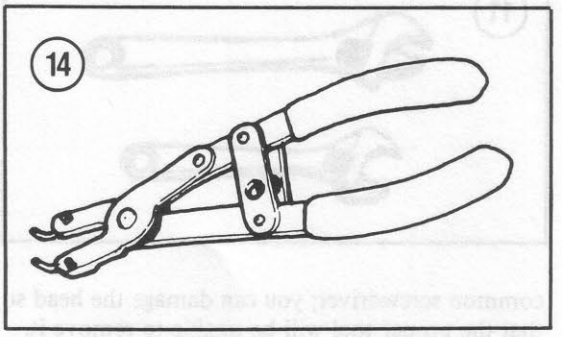
This instrument (**Figure 16**) is invaluable for electrical system troubleshooting and service. A few of its functions may be duplicated by homemade test equipment, but for the serious mechanic it is a must. Its uses are described in the applicable sections of the book.

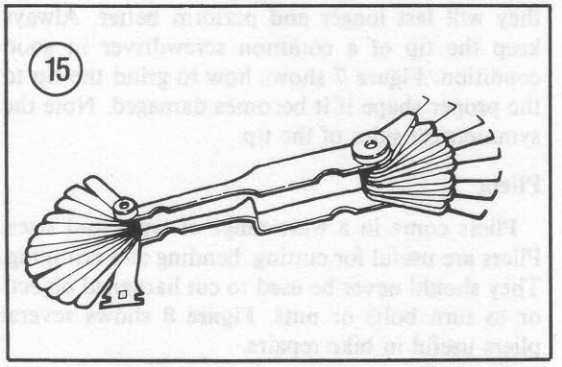
Strobe Timing Light

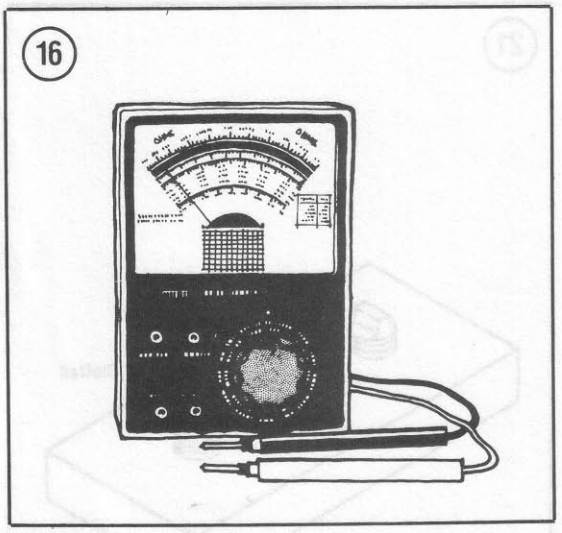
This instrument is necessary for checking the ignition timing. By flashing a light at the precise instant the spark plug fires, the position of the timing mark can be seen. Marks on the starter











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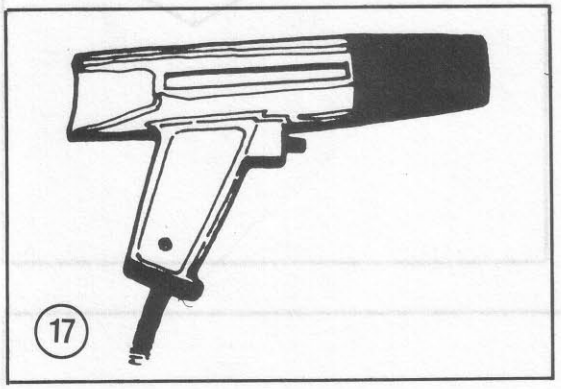

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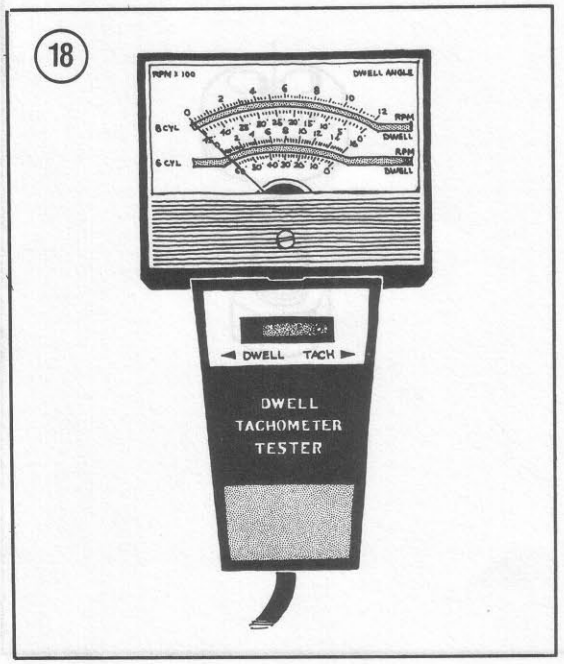


18

clutch assembly line up with the stationary mark on the crankcase cover while the engine is running.

Suitable lights range from inexpensive neon bulb types to powerful xenon strobe lights. See **Figure 17**. Neon timing lights are difficult to see and must be used in dimly lit areas. Xenon strobe timing lights can be used outside in bright sunlight. Both types work on the bike; use according to the manufacturer's instructions.

Portable Tachometer

A portable tachometer is necessary for tuning. See **Figure 18**. Ignition timing checks and carburetor adjustments must be performed at the specified idle speed. The best instrument for this purpose is one with a low range of 0-1,000 or 0-2,000 rpm and a high range of 0-4,000 rpm. Extended range (0-6,000 or 0-8,000 rpm) instruments lack accuracy at lower speeds. The instrument should be capable of detecting changes of 25 rpm on the low range.

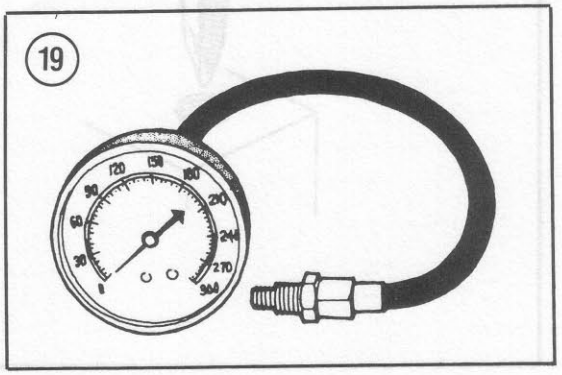
Compression Gauge

A compression gauge measures the engine compression. The one shown in **Figure 19** has a flexible stem which enables it to reach into restricted areas. This type is handy for the V-4 as there is little room for a 1-piece compression gauge to fit. They are available from motorcycle or auto supply stores and mail order outlets.

MECHANIC'S TIPS

Removing Frozen Nuts and Screws

When a fastener rusts and cannot be removed, several methods may be used to loosen it. First, apply penetrating oil such as Liquid Wrench or WD-40 (available at any hardware or auto supply store). Apply it liberally and let it penetrate for 10-15 minutes. Rap the fastener several times with a small hammer; do not hit it hard enough to cause damage. Reapply the penetrating oil if necessary.



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For frozen screws, apply penetrating oil as described, then insert a screwdriver in the slot and rap the top of the screwdriver with a hammer. This loosens the rust so the screw can be removed in the normal way. If the screw head is too chewed up to use a screwdriver, grip the head with Vise Grip pliers and twist the screw out.

Remedying Stripped Threads

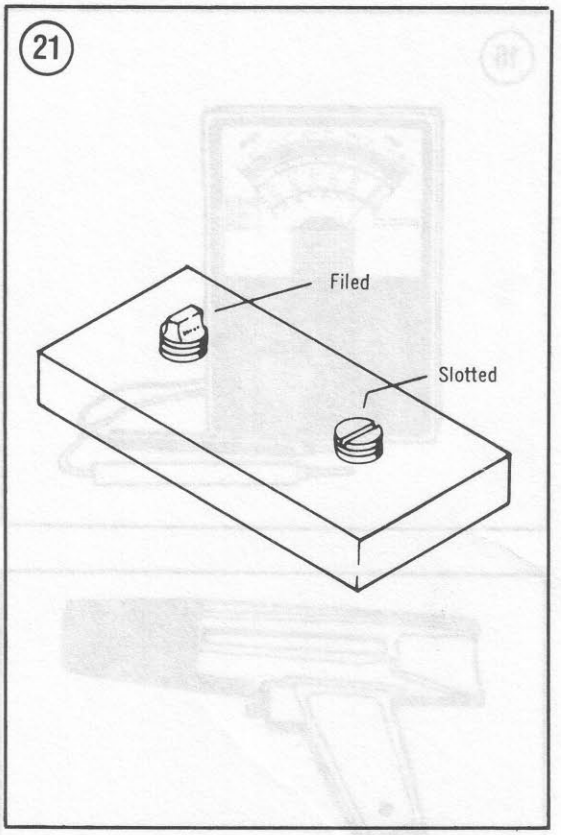
Occasionally, threads are stripped though carelessness or impact damage. Often the threads can be cleaned up by running a tap (for internal threads on nuts) or die (for external threads on bolts) through threads. See **Figure 20**.

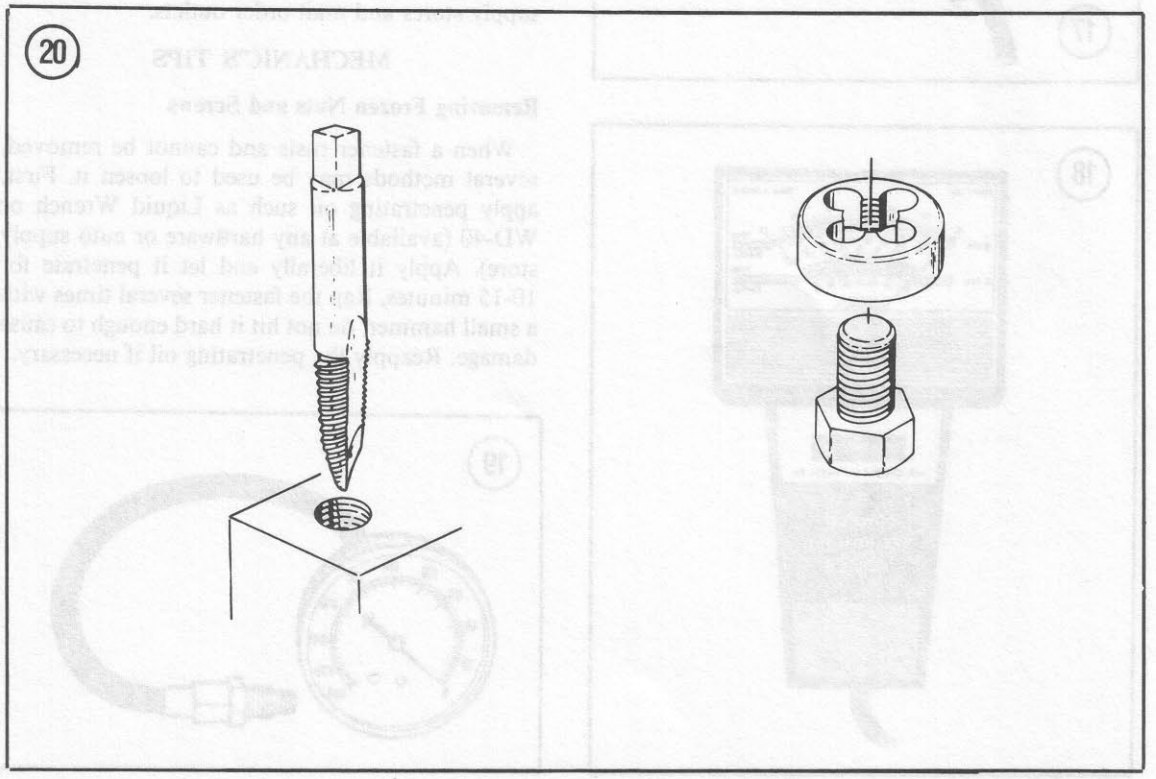
Removing Broken Screws or Bolts

When the head breaks off a screw or bolt, several methods are available for removing the remaining portion.

If a large portion of the remainder projects out, try gripping it with Vise Grips. If the projecting portion is too small, file it to fit a wrench or cut a slot in it to fit a screwdriver. See **Figure 21**.

If the head breaks off flush, use a screw extractor. To do this, centerpunch the remaining portion of the screw or bolt. Drill a small hole in the screw and tap the extractor into the hole. Back the screw out with a wrench on the extractor. See **Figure 22**.





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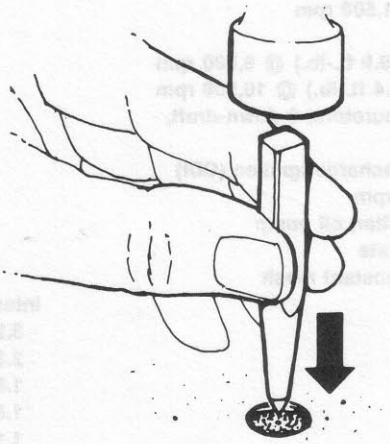
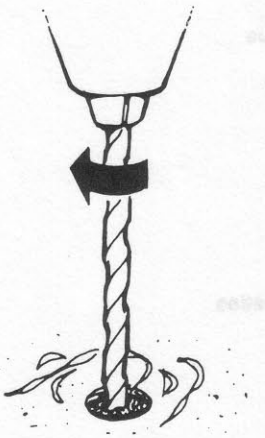
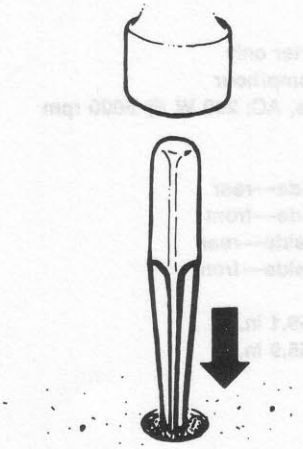
REMOVING BROKEN SCREWS AND BOLTS



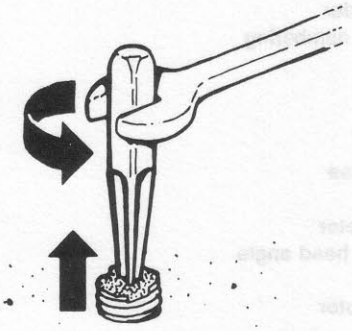
1. Center punch broken stud



2. Drill hole in stud



3. Tap in screw extractor



4. Remove broken stud

Table 1 GENERAL SPECIFICATIONS

Engine type	Water-cooled, 4-stroke, DOHC, V-4	
Bore and stroke	60.0×44.0 mm (2.36×1.73 in.)	
Displacement	498 cc (30.4 cu. in.)	
Compression ratio	11.0 to 1	
Valve train	Dual-row roller type drive chain, OHC and rocker arms	
Maximum horsepower		
Magna	62 BHP @ 11,000 rpm	
Interceptor	66 BHP @ 11,500 rpm	
Maximum torque		
Magna	4.14 kg/m (29.9 ft.-lb.) @ 9,000 rpm	
Interceptor	4.2 kg/m (30.4 ft.-lb.) @ 10,500 rpm	
Carburetion	4 Keihin carburetors; 2 down-draft, 2 side-draft	
Ignition	Capacitor discharge ignition (CDI)	
Idle speed	1,300 ±100 rpm	
Lubrication	Wet-sump, filter, oil pump	
Clutch	Wet, multi-plate	
Transmission	5-speeds, constant mesh	
Transmission ratios	Magna	Interceptor
1st	3.308	3.308
2nd	2.167	2.353
3rd	1.667	1.850
4th	1.375	1.545
5th	1.154	1.154
Final reduction ratio	2.933	2.057
Drive sprocket	15T	15T
Driven sprocket	44T	44T
Starting system	Electric starter only	
Battery	12 volt, 12 amp/hour	
Alternator	Three phase, AC: 280 W @ 5000 rpm	
Firing order	1-4-3-2	
Cylinder numbering		
No. 1	Left-hand side—rear	
No. 2	Left-hand side—front	
No. 3	Right-hand side—rear	
No. 4	Right-hand side—front	
Wheelbase		
Magna	1,500 mm (59.1 in.)	
Interceptor	1,420 mm (55.9 in.)	
Steering head angle		
Magna	58° 30'	
Interceptor	63°	
Trail		
Magna	112 mm (4.4 in.)	
Interceptor	101 mm (4.0 in.)	
Front suspension	Telescopic forks,	
Travel		
Magna	160 mm (6.3 in.) travel	
Interceptor	140 mm (5.5 in.) travel	
Air pressure	0-0.4 kg/cm² (0-6 psi)	
Rear suspension		
Magna	Swing arm and dual shock absorbers	
Travel	110 mm (4.3 in.)	
Interceptor	Swing arm and single shock absorber	
Travel	115 mm (4.5 in.)	
Air pressure	0.5-1.5 kg/cm² (7-21 psi).	

(continued)

Table 1 GENERAL SPECIFICATIONS (continued)

Front tire	
Magna	100/90-18 56H tubeless
Interceptor	100/90V-16 54H tubeless
Rear tire	
Magna	130/90-16 67H tubeless
Interceptor	110/90-18 61H tubeless
Seat height	
Magna	760 mm (29.9 in.)
Interceptor	800 mm (31.5 in.)
Ground clearance	
Magna	130 mm (5.1 in.)
Interceptor	140 mm (5.5 in.)
Overall height	
Magna	1,180 mm (46.5 in.)
Interceptor	1,175 mm (46.3 in.)
Overall width (handlebar)	
Magna	735 mm (28.9 in.)
Interceptor	760 mm (29.9 in.)
Overall length	
Magna	2,200 mm (86.6 in.)
Interceptor	2,065 mm (81.3 in.)
Weight (dry)	
Magna	181 kg (399 lb.)
Interceptor	184 kg (406 lb.)
Weight (curb)	
Magna	194 kg (548 lb.)
Interceptor	201 kg (443 lb.)
Vehicle capacity load	
Magna	158 kg (351 lb.)
Interceptor	156 kg (344 lb.)
Fuel capacity	
Magna	13.5 liters (3.5 U.S. gal., 3.0 Imp. gal.)
Interceptor	16.5 liters (4.4 U.S. gal., 3.6 Imp. gal.)
Fuel capacity (reserve)	
Magna	3.5 liters (0.9 U.S. gal., 0.8 Imp. gal.)
Interceptor	4.0 liters (1.1 U.S. gal., 0.9 Imp. gal.)
Oil capacity	
Oil and filter change	2.5 liters (2.6 U.S. qt., 2.2 Imp. qt.)
At overhaul	3.0 liters (3.2 U.S. qt., 2.6 Imp. qt.)
Coolant capacity	
Magna	1.80 liters (1.90 U.S. qt., 1.6 Imp. qt.)
Interceptor	1.70 liters (1.80 U.S. qt., 1.5 Imp. qt.)
Front fork oil capacity*	
Magna (both legs)	400 cc (13.5 U.S. oz., 11.3 Imp. oz.)
Interceptor	
Right-hand leg	320 cc (10.8 U.S. oz., 9.0 Imp. oz.)
Left-hand leg	335 cc (11.3 U.S. oz., 9.4 Imp. oz.)
Drive chain number	50V3-108LE or RK50FO-108LE

* Capacity for each fork leg.

Table 2 HOME WORKSHOP TOOLS

Tool	Size or Specification
Screwdrivers	
Slot	5/16×8 in. blade
Slot	3/8×12 in. blade
Phillips	Size 2 tip, 6 in. blade
Pliers	
Gas pliers	6 in. overall
Vise grips®	10 in. overall
Needlenose	6 in. overall
Channel lock	12 in. overall
Snap ring	–
Wrenches	
Box-end set	10-17, 20, 32 mm
Open-end set	10-17, 20, 32 mm
Crescent (adjustable)	6 and 12 in. overall
Socket set	1/2 in drive ratchet with 10-17, 20, 32 mm sockets
Allen set	2-10 mm
Cone wrenches	–
Spoke wrench	–
Other Special Tools	
Impact driver	1/2 in. drive with ass't tips
Torque wrench	1/2 in. drive—0-140 N•m (0.100 ft.-lb.)
Tire levers	For moped or motorcycle tires

Table 3 STANDARD TORQUE SPECIFICATIONS

Item	N•m	ft.-lb.
5 mm bolt and nut	4-6	3-4
6 mm bolt and nut	8-12	6-9
8 mm bolt and nut	18-25	13-18
10 mm bolt and nut	30-40	22-29
12 mm bolt and nut	50-60	36-43
6 mm flange bolt and nut	10-14	7-10
8 mm flange bolt and nut	24-30	17-22
10 mm flange bolt and nut	35-45	25-33
5 mm screw	3-5	2-4
6 mm screw	7-11	5-8

CHAPTER TWO

TROUBLESHOOTING

Diagnosing mechanical problems is relatively simple if you use orderly procedures and keep a few basic principles in mind.

The troubleshooting procedures in this chapter analyze typical symptoms and show logical methods of isolating causes. These are not the only methods. There may be several ways to solve a problem, but only a systematic, methodical approach can guarantee success.

Never assume anything. Do not overlook the obvious. If you are riding along and the engine suddenly quits, check the easiest, most accessible problems first. Is there gasoline in the tank? Is the fuel shutoff valve in the ON position? Has a spark plug wire fallen off?

If nothing obvious turns up in a quick check, look a little further. Learning to recognize and describe symptoms will make repairs easier for you or a mechanic at the shop. Describe problems accurately and fully. Saying that "it won't run" isn't the same as saying "it quit at high speed and won't start" or that it "sat in my garage for 3 months and then wouldn't start."

Gather as many symptoms together as possible to aid in diagnosis. Note whether the engine lost power gradually or all at once. Remember that the more complicated a machine is, the easier it is to troubleshoot because symptoms point to specific problems.

After the symptoms are defined, areas which could cause the problems are tested and analyzed. Guessing at the cause of a problem may provide the solution, but it can easily lead to frustration, wasted time and a series of expensive, unnecessary parts replacements.

You do not need fancy equipment or complicated test gear to determine whether repairs can be attempted at home. A few simple checks could save a large repair bill and time lost while the bike sits in a dealer's service department. On the other hand, be realistic and don't attempt repairs beyond your abilities. Service departments tend to charge a lot for putting together a disassembled engine that may have been abused. Some dealers won't even take on such a job—so use common sense and don't get in over your head.

OPERATING REQUIREMENTS

An engine needs 3 basics to run properly: correct fuel-air mixture, compression and a spark at the correct time. If one or more are missing, the engine just won't run. The electrical system is the weakest link of the 3 basics. More problems result from electrical breakdowns than from any other source. Keep that in mind before you begin tampering with carburetor adjustments and the like.

If the bike has been sitting for any length of time and refuses to start, check and clean the spark plugs and then look to the gasoline delivery system. This includes the fuel tank, fuel shutoff valve, fuel line to the carburetor, the fuel pump and inline fuel filter. Gasoline deposits may have formed and

gummed up the carburetor's jets and air passages. Gasoline tends to lose its potency after standing for long periods. Condensation may contaminate the fuel with water. Drain the old fuel and try starting with a fresh tankful.

EMERGENCY TROUBLESHOOTING

When the bike is difficult to start or won't start at all, it does not help to wear down the battery using the starter. Check for obvious problems even before getting out your tools. Go down the following list step by step. Do each one; you may be embarrassed to find your kill switch is stuck in the OFF position, but that is better than wearing down the battery. If it still will not start, refer to the appropriate troubleshooting procedure in this chapter.

1. Is there fuel in the tank? Open the filler cap (**Figure 1**) and rock the bike. Listen for fuel sloshing around.

WARNING

Do not use an open flame to check in the tank. A serious explosion is certain to result.

2. Is the fuel shutoff valve in the ON position?
3. Make sure the fuel pump is operating correctly. Refer to the fuel pump test in Chapter Seven. Also make sure the fuel filter is not clogged, replace if necessary.
4. Make sure the kill switch (**Figure 2**) is not stuck in the OFF position.
5. Are all 4 spark plug wires on tight? Push all of them on and slightly rotate them to clean the electrical connection between the plug and the connector.
6. Is the choke lever in the right position? The lever should be moved *up* for a warm engine (**Figure 3**) and *down* for a cold engine.

ENGINE STARTING

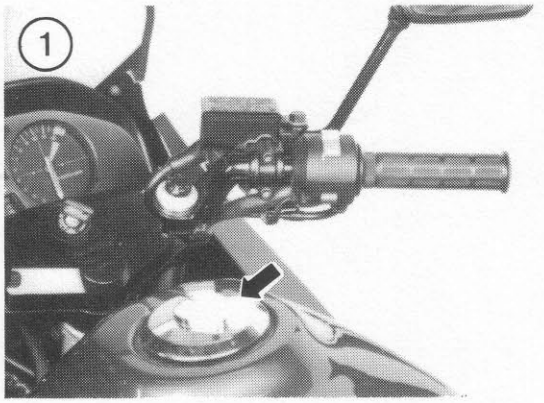
An engine that refuses to start or is difficult to start is very frustrating. More often than not, the problem is very minor and can be found with a simple and logical troubleshooting approach.

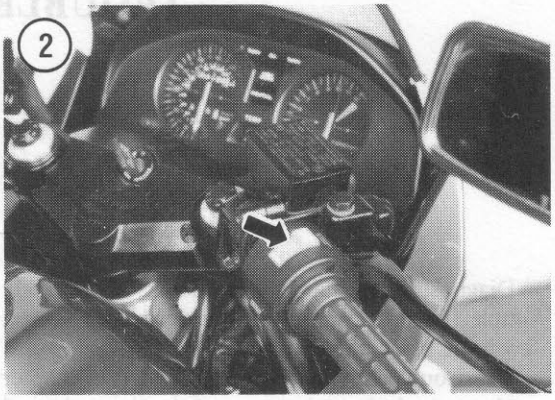
The following items show a beginning point from which to isolate engine starting problems.

Engine Fails to Start

Perform the following spark test to determine if the ignition system is operating properly.

1. Remove only one of the spark plugs.
2. Connect the spark plug wire and connector to the spark plug and touch the spark plug's base to a good ground like the bare aluminum cooling fins on the engine cylinder head. Position the spark plug so you can see the electrodes.
3. Crank the engine over with the starter. A fat blue spark should be evident across the plug's electrodes.

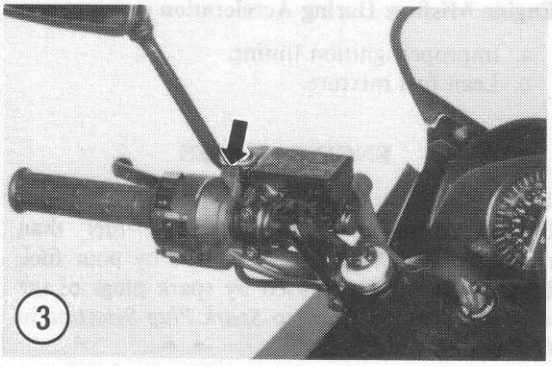




WARNING

If it is necessary to hold the high voltage lead, do so with an insulated pair of pliers. The high voltage generated by the ignition spark units could produce serious or fatal shocks.

4. If the spark is good, check for one or more of the following possible malfunctions:
   a. Obstructed fuel line.
   b. Leaking head gasket(s) or vacuum leak.
   c. Low compression.
   d. Engine flooded with fuel.
   e. Choke not operating correctly.
   f. Throttle not operating correctly.
5. If spark is not good, check for one or more of the following:
   a. Weak ignition coil(s).
   b. Weak pulse generator(s).
   c. Weak spark unit(s).



d. Broken or shorted high tension lead to the spark plug(s).
e. Loose electrical connections.
f. Loose or broken ignition coil ground wire.

Engine Is Difficult to Start

Check for one or more of the following possible malfunctions:

a. Fouled spark plug(s).
b. Improperly adjusted choke.
c. Contaminated fuel system.
d. Improperly adjusted carburetors.
e. Weak ignition coil(s).
f. Weak pulse generator(s).
g. Weak spark unit(s).
h. Incorrect type ignition coil(s).
i. Poor compression.

Engine Will Not Crank

Check for one or more of the following possible malfunctions:

a. Discharged battery.
b. Defective starter motor.
c. Seized piston(s).
d. Seized crankshaft bearings.
e. Broken connecting rod(s).
f. Locked-up transmission or clutch assembly.

ENGINE PERFORMANCE

In the following check list, it is assumed that the engine is not operating at peak performance. This will serve as a starting point from which to isolate a performance malfunction.

The possible causes for each malfunction are listed in a logical sequence and in order of probability. Where ignition timing is mentioned as a problem, remember that there is no method of adjusting the ignition timing. If ignition timing is incorrect, there is a faulty part(s) within the ignition system and that part must be replaced as described in Chapter Seven.

Engine Will Not Start Or Is Hard To Start

a. Fuel tank empty.
b. Fuel pump not operating properly.
c. Obstructed fuel line, fuel shutoff valve or fuel filter.
d. Sticking float valve in carburetor(s).
e. Carburetors incorrectly adjusted.
f. Improper starter valve (choke) operation.
g. Improper throttle operation.
h. Fouled or improperly gapped spark plug(s).
i. Ignition timing incorrect.
j. Broken or shorted ignition coil(s).
k. Weak or faulty spark unit(s) or pulse generator(s).
l. Improper valve timing.
m. Clogged air filter element.
n. Contaminated fuel.
o. Engine flooded with fuel.
p. Improper valve clearance.

Engine Will Not Idle

a. Carburetors incorrectly adjusted (too lean or too rich).
b. Fouled or improperly gapped spark plug(s).
c. Leaking head gasket(s) or vacuum leak.
d. Ignition timing incorrect.
e. Weak spark unit(s) or pulse generator(s).
f. Improper valve timing.
g. Obstructed fuel line or fuel shutoff valve.
h. Low engine compression.
i. Slow air cutoff valve faulty.
j. Starter valve (choke) stuck in the open position.
k. Incorrect pilot screw adjustment.
l. Clogged slow jet(s) in the carburetor(s).
m. Clogged air filter element.
n. Improper valve clearance.
o. Valve(s) and valve seat(s) require service.

Engine Misses at High Speed

a. Fouled or improperly gapped spark plugs.
b. Improper ignition timing.
c. Improper main jet selection in carburetors.
d. Clogged jets in the carburetors.
e. Weak ignition coil(s).
f. Weak or faulty spark unit(s) or pulse generator(s).
g. Improper valve timing.
h. Obstructed fuel line or fuel shutoff valve.

Engine Overheating

a. Coolant level low.
b. Faulty temperature gauge or gauge sensor.
c. Thermostat stuck in the closed position.
d. Faulty radiator cap.
e. Passages blocked in the radiator, hoses or water jackets in the engine.
f. Fan blades cracked or missing.
g. Faulty fan motor.
h. Improper ignition timing.
i. Improper spark plug heat range.

Smoky Exhaust and Engine Runs Roughly

a. Carburetor mixture too rich.
b. Starter valve (choke) not operating correctly.
c. Water or other contaminants in fuel.
d. Clogged fuel line.
e. Clogged air filter element.

Engine Loses Power at Normal Riding Speed

a. Carburetors incorrectly adjusted.
b. Engine overheating.
c. Improper ignition timing.
d. Incorrectly gapped spark plugs.
e. Weak ignition coil(s).
f. Weak spark unit(s).
g. Weak pulse generator(s).
h. Obstructed muffler(s).
i. Dragging brake(s).
j. Improper valve clearance.

Engine Lacks Acceleration

a. Carburetor mixture too lean.
b. Clogged fuel line.
c. Improper ignition timing.
d. Dragging brake(s).

Engine Backfires

a. Improper ignition timing.
b. Carburetors improperly adjusted.
c. Lean fuel mixture.

Engine Misfires During Acceleration

a. Improper ignition timing.
b. Lean fuel mixture.

ENGINE NOISES

1. *Knocking or pinging during acceleration*—Caused by using a lower octane fuel than recommended. May also be caused by poor fuel. Pinging can also be caused by spark plugs of the wrong heat range. Refer to *Spark Plug Selection* in Chapter Three.
2. *Slapping or rattling noises at low speed or during acceleration*—May be caused by piston slap (excessive piston to cylinder wall clearance).
3. *Knocking or rapping while decelerating*—Usually caused by excessive rod bearing clearance.
4. *Persistent knocking and vibration*—Usually caused by excessive main bearing clearance.
5. *Rapid on-off squeal*—Compression leak around cylinder head gasket(s) or spark plugs.

EXCESSIVE VIBRATION

Usually this is caused by loose engine mounting hardware. If not, it can be difficult to find without disassembling the engine.

FRONT SUSPENSION AND STEERING

Poor handling may be caused by improper tire pressure, a damaged or bent frame or front steering components, a worn front fork assembly, worn wheel bearings or dragging brakes.

BRAKE PROBLEMS

Sticking disc brakes may be caused by a stuck piston(s) in a caliper assembly or warped pad shim(s).

A sticking drum brake may be caused by worn or weak return springs, dry pivot and cam bushings or improper adjustment. Grabbing brakes may be caused by greasy linings which must be replaced. Brake grab may also be due to an out-of-round drum. Glazed linings will cause loss of stopping power.

NOTE: If you own a 1986 model, first check the Supplement at the back of the book for any new service information.

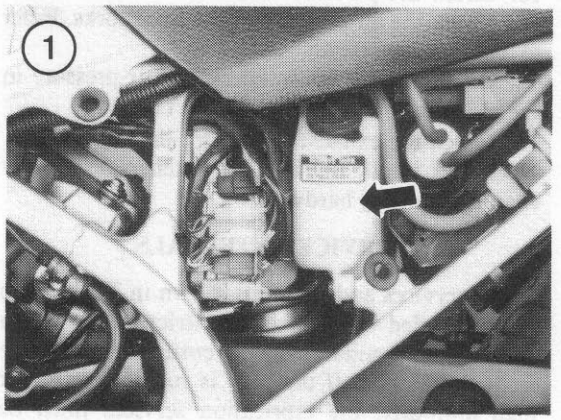
CHAPTER THREE

LUBRICATION, MAINTENANCE AND TUNE-UP

A motorcycle, even in normal use, is subjected to tremendous heat, stress and vibration. When neglected, any bike becomes unreliable and actually dangerous to ride.

To gain the utmost in safety, performance and useful life from the Honda V-4 it is necessary to make periodic inspections and adjustments. Frequently, minor problems are found during these inspections that are simple and inexpensive to correct at the time. If they are not found and corrected at this time they could lead to major and more expensive problems later on.

Start out by doing simple tune-up, lubrication and maintenance. Tackle more involved jobs as you become more acquainted with the bike.



This chapter explains lubrication, maintenance and tune-up procedures required for the Honda 500 cc water cooled V-4.

Table 1 is a suggested factory maintenance schedule. **Tables 1-10** are located at the end of this chapter.

ROUTINE CHECKS

The following simple checks should be performed at each stop at a service station for gas.

Engine Oil Level

Refer to *Engine Oil Level Check* under *Periodic Lubrication* in this chapter.

Coolant Level

Check the coolant level when the engine has warmed up to normal operating temperature.

On Magna models, remove the right-hand side cover and on Interceptor models, remove the left-hand side cover. Check the level in the coolant reserve tank. The level should be between the "UPPER" and "LOWER" marks (**Figure 1**). If necessary, add coolant to the reserve tank (not the radiator filler cap) so the level is to the "UPPER" mark.

General Inspection

1. Quickly inspect the engine for signs of oil, fuel or coolant leakage.

2. Check the tires for embedded stones. Pry them out with your ignition key.
3. Make sure all lights work.

WARNING

At least check the brake light. It can burn out at any time. Motorists cannot stop as quickly as you and need all the warning you can give.

Tire Pressure

Tire pressure must be checked with the tires cold. Correct tire pressure varies with the load you are carrying. See **Table 2.**

Battery

Remove the right-hand side cover and check the battery electrolyte level. The level must be between the upper and lower level marks on the case (**Figure 2**).

For complete details see *Battery Removal, Installation and Electrolyte Level Check* in this chapter.

Check the level more frequently in hot weather; electrolyte will evaporate rapidly as heat increases.

Lights and Horn

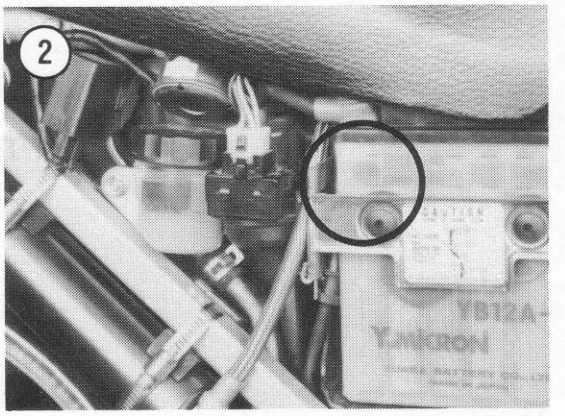
With the engine running, check the following.

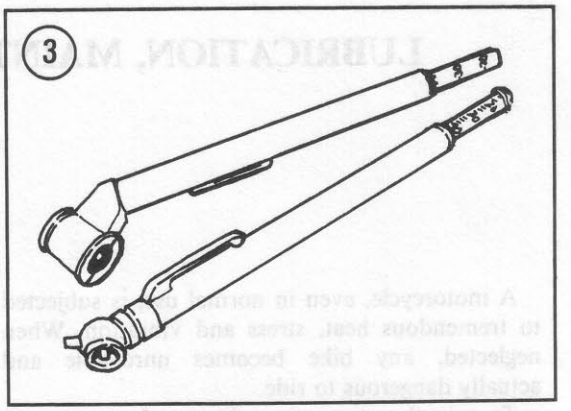
1. Pull the front brake lever on and check that the brake light comes on.
2. Push the rear brake pedal down and check that the brake light comes on soon after you have begun depressing the pedal.
3. Press the headlight dimmer switch to both the HI and LO positions and check to see that both headlight elements are working.
4. Turn the turn signal switch to the left and right positions and check that all 4 turn signals are working.
5. Push the horn button and make sure that the horn blows loudly.
6. If the horn or any of the lights failed to operate properly, refer to Chapter Seven.

PRE-CHECKS

The following checks should be performed prior to the first ride of the day.

1. Inspect all fuel lines and fittings for wetness.
2. Make sure the fuel tank is full of fresh gasoline.
3. Make sure the engine oil level is correct.
4. Inspect the coolant level in the coolant reserve tank.
5. Check the operation of the clutch and if necessary, add hydraulic fluid to the clutch master cylinder or bleed the system. Refer to Chapter Five.

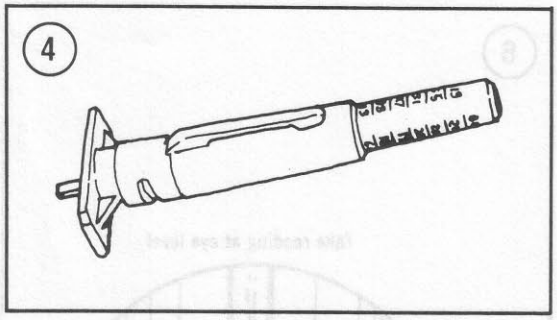


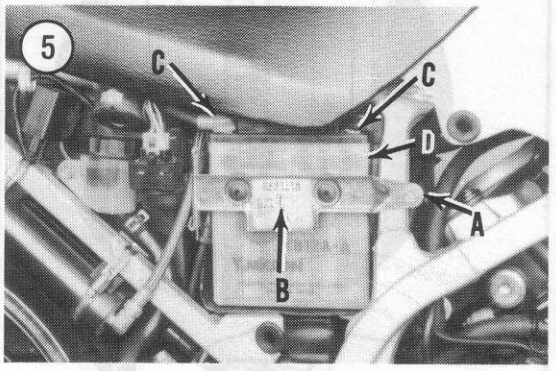


6. Check the operation of the disc brake(s). Add hydraulic fluid to the brake master cylinder(s) if necessary.
7. On models so equipped, check the rear drum brake. Make sure it operates properly with no binding.
8. Check the throttle; make sure it operates properly with no binding.
9. Inspect the front and rear suspension; make sure it has a good solid feel with no looseness.
10. Check tire pressure. Refer to **Table 2.**
11. Check the air pressure in the front forks. Refer to **Table 3.**
12. On Pro-link models, check the air pressure in the rear shock absorber. Refer to **Table 4.**
13. Check the exhaust system for damage.
14. Check the tightness of all fasteners, especially engine mounting hardware.

SERVICE INTERVALS

The services and intervals shown in **Table 1** are recommended by the factory. Strict adherence to these recommendations will ensure long service from the Honda. If the bike is run in an area of high humidity, the lubrication services must be





done more frequently to prevent possible rust damage.

For convenience when maintaining your motorcycle, most of the services shown in the table are described in this chapter. However, some procedures which require more than minor disassembly or adjustment are covered elsewhere in the appropriate chapter.

TIRES AND WHEELS

Tire Pressure

Tire pressure should be checked and adjusted to maintain the smoothness of the tire, good traction and handling and to get the maximum life out of the tire. A simple, accurate gauge (**Figure 3**) can be purchased for a few dollars and should be carried in your motorcycle tool kit. The appropriate tire pressures are shown in **Table 2**.

Tire Inspection

The tires take a lot of punishment, so inspect them periodically for excessive wear, cuts, abrasions, etc. If you find a nail or other object in the tire, mark its location with a light crayon prior to removing it. This will help locate the hole for repair. Refer to Chapter Nine for tire changing and repair information.

Check local traffic regulations concerning minimum tread depth. Measure the tread depth at the center of the tire tread using a tread depth gauge (**Figure 4**) or small ruler. Honda recommends that original equipment tires be replaced when the front tire tread depth is 1.5 mm (1/16 in.) or less, when the rear tread depth is 2.0 mm (3/32 in.) or less or when tread wear indicators appear across the tire indicating the minimum tread depth.

Rim Inspection

Frequently inspect the wheel rims. If a rim has been damaged it might have been knocked out of alignment. Improper wheel alignment can cause severe vibration and result in an unsafe riding condition. If the rim portion of the ComCast alloy wheel is damaged the wheel must be replaced as it cannot be repaired.

CRANKCASE BREATHER HOSE (U.S. MODELS ONLY)

Inspect the breather hoses for cracks and deterioration and make sure that all hose clamps are tight.

EVAPORATION EMISSION CONTROL (CALIFORNIA MODELS ONLY)

Inspect the hoses for cracks, kinks and deterioration. Make sure that all hoses are tight where they attach to the various components. For correct hose routing, refer to Chapter Six.

BATTERY

Removal, Installation and Electrolyte Level Check

The battery is the heart of the electrical system. It should be checked and serviced as indicated in **Table 1**. Most electrical system troubles can be attributed to neglect of this vital component.

The electrolyte level should be maintained between the 2 marks on the battery case (**Figure 2**). If the electrolyte level is low, remove the battery from the bike so it can be thoroughly serviced and checked.

1. Remove the right-hand side cover.
2. Remove the bolt (A, **Figure 5**) securing the battery holder bracket.
3. Swing the holder bracket (B, **Figure 5**) out of the way.
4. Disconnect the battery negative (-) lead and then the positive (+) lead from the battery (C, **Figure 5**).
5. Unhook the battery vent tube (D, **Figure 5**) from the battery. Leave it routed through the bike's frame.

6. Slide the battery out of the frame.
7. Wipe off any of the highly corrosive residue that may have dripped from the battery during removal.

WARNING

Protect your eyes, skin and clothing. If electrolyte gets into your eyes, flush your eyes thoroughly with clean water and get prompt medical attention.

CAUTION

Be careful not to spill battery electrolyte on painted or polished surfaces. The liquid contains sulfuric acid that is highly corrosive and will damage the finish. If it is spilled, wash it off immediately with soapy water and rinse thoroughly with clean water.

8. Remove the caps from the battery cells and add distilled water to correct the fluid level. Never add electrolyte (acid) to correct the level.

NOTE

If distilled water has been added, reinstall the battery caps and gently shake the battery for several minutes to mix the existing electrolyte with the new water.

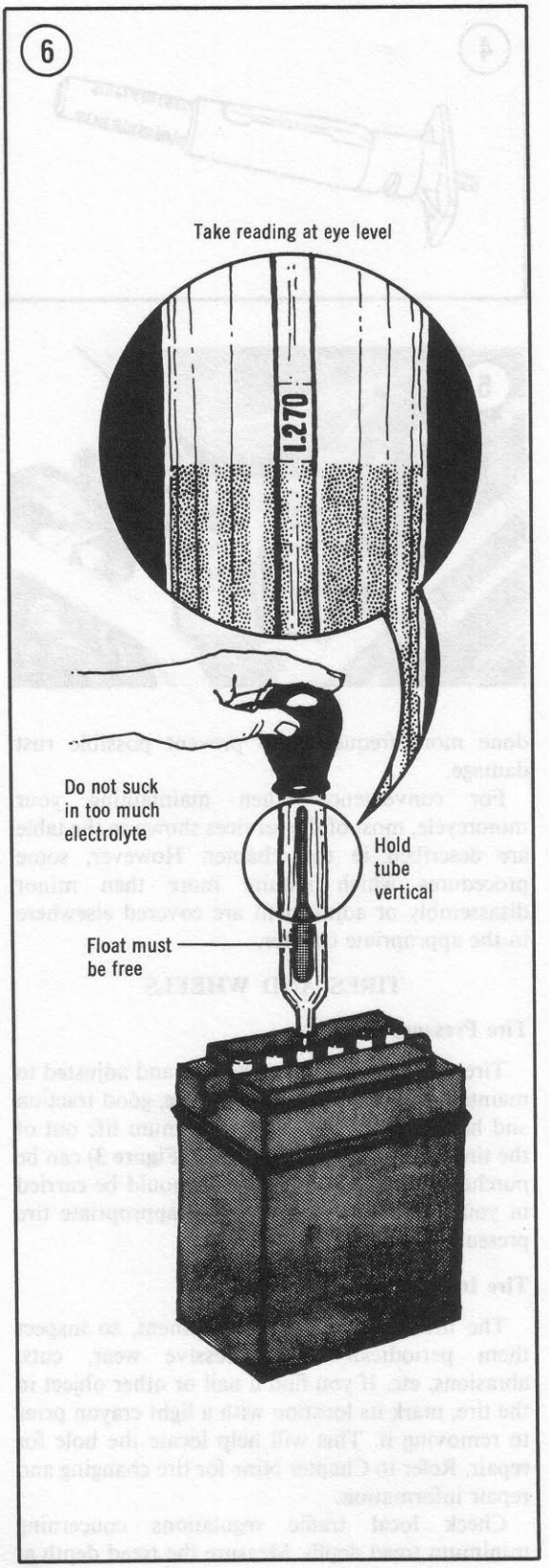
9. After the fluid level has been corrected and the battery allowed to stand a few minutes, remove the battery caps and check the specific gravity of the electrolyte in each cell with a hydrometer (**Figure 6**). See *Battery Testing* in this chapter.
10. After the battery has been refilled, recharged or replaced, install it by reversing these removal steps.

CAUTION

If you removed the breather tube from the frame, be sure to route it so that residue will not drain onto any part of the bike's frame. The tube must be free of bends or twists as any restriction may pressurize the battery and damage it.

Testing

Hydrometer testing is the best way to check battery condition. Use a hydrometer with numbered graduations from 1.100 to 1.300 rather than one with just color-coded bands. To use the hydrometer, squeeze the rubber ball, insert the tip into the cell and release the pressure on the ball. Draw enough electrolyte to float the weighted float inside the hydrometer. Note the number in line with the surface of the electrolyte; this is the specific gravity for this cell. Squeeze the rubber ball



again and return the electrolyte to the cell from which it came.

The specific gravity of the electrolyte in each battery cell is an excellent indication of that cell's condition. A fully charged cell will read from 1.265-1.280, while a cell in good condition reads from 1.225-1.265 and anything below 1.125 is practically dead.

Specific gravity varies with temperature. For each 10° the electrolyte temperature exceeds 27° C (80° F), add 0.004 to readings indicated on the hydrometer. Subtract 0.004 for each 10° below 27° C (80° F).

If the cells test in the poor range, the battery requires recharging. The hydrometer is useful for checking the progress of the charging operation. **Table 5** shows approximate state of charge.

Charging

WARNING

During the charging process, highly explosive hydrogen gas is released from the battery. The battery should be charged only in a well-ventilated area away from any open flames (including pilot lights on home gas appliances). Do not allow any smoking in the area. Never check the charge of the battery by arcing (connecting screwdrivers or other metal objects) across the terminals; the resulting spark can ignite the hydrogen gas.

CAUTION

Always remove the battery from the bike before connecting the battery charger. Never recharge a battery in the bike's frame; the corrosive mist that is emitted during the charging process will corrode all surrounding surfaces.

1. Connect the positive (+) charger lead to the positive (+) battery terminal (or lead) and the negative (-) charger lead to the negative (-) batte terminal (or lead).
2. Remove all vent caps from the battery, set the charger at 12 volts and switch the charger on. If the output of the charger is variable, it is best to select a low setting—1 1/2 to 2 amps.

CAUTION

The electrolyte level must be maintained at the upper level during the charging cycle; check and refill as necessary.

3. After the battery has been charged for about 8 hours, turn the charger off, disconnect the leads and check the specific gravity. It should be within the limits specified in **Table 5**. If it is, and remains stable for 1 hour, the battery is considered charged.
4. Clean the battery terminals, electrical cable connectors and surrounding case and tray and reinstall them in the bike, reversing the removal steps. Coat the battery terminals with Vaseline or silicone spray to retard corrosion and decomposition of the terminals.

CAUTION

Route the breather tube so that it does not drain onto any part of the bike's frame. The tube must be free of bends or twists as any restriction may pressurize the battery and damage it.

New Battery Installation

When replacing the old battery with a new one, be sure to charge it completely (specific gravity 1.260-1.280) before installing it in the bike. Failure to do so or using the battery with a low electrolyte level will permanently damage the new battery.

PERIODIC LUBRICATION

Oil

Oil is graded according to its viscosity, which is an indication of how thick it is. The Society of Automotive Engineers (SAE) system distinguishes oil viscosity by numbers. Thick oils have higher viscosity numbers than thin oils. For example, an SAE 5 oil is a thin oil while an SAE 90 oil is relatively thick.

Grease

A good quality grease (preferably waterproof) should be used. Water does not wash grease off parts as easily as it washes oil off. In addition, grease maintains its lubricating qualities better than oil on long and strenuous rides. In a pinch, though, the wrong lubricant is better than none at all. Correct the situation as soon as possible.

In many cases in this book a special grease called molybdenum disulfide grease is specified. It is used on some parts during engine reassembly and on some suspension components. Whenever this type of grease is specified it should be used as it has special lubricating qualities. Be sure to use the proper grease, even though it may be more expensive than ordinary multipurpose grease.

Engine Oil Level Check

Engine oil level is checked with the dipstick located on the right-hand crankcase/clutch cover (**Figure 7**).

1. Place the bike on level ground and on the centerstand.

2. Start the engine and let it idle for 2-3 minutes.
3. Shut off the engine and let the oil settle.
4. Unscrew the dipstick/filler cap and wipe it clean. Reinsert the dipstick/filler cap onto the threads in the hole; do not screw it in.
5. Remove the dipstick/filler cap and check the oil level.
6. The level should be between the 2 lines and not above the upper one (**Figure 8**). If the level is below the lower line, add the recommended type engine oil to correct the level.

Engine Oil and Filter Change

The factory-recommended oil and filter change interval is listed in **Table 1**. This assumes that the motorcycle is operated in moderate climates. In extreme climates, oil should be changed every 30 days. The time interval is more important than the mileage interval because acids formed by combustion blowby will contaminate the oil even if the motorcycle is not run for several months. If the motorcycle is operated under dusty conditions, the oil will get dirty more quickly and should be changed more frequently than recommended.

Use only a high-quality detergent motor oil with an API rating of SE or SF. The quality rating is stamped or printed on top of the can (**Figure 9**). Try to use the same brand of oil at each change. Use of oil additives is not recommended as they may cause clutch slippage. Refer to **Figure 10** for correct oil viscosity to use under anticipated ambient temperatures (not engine oil temperature).

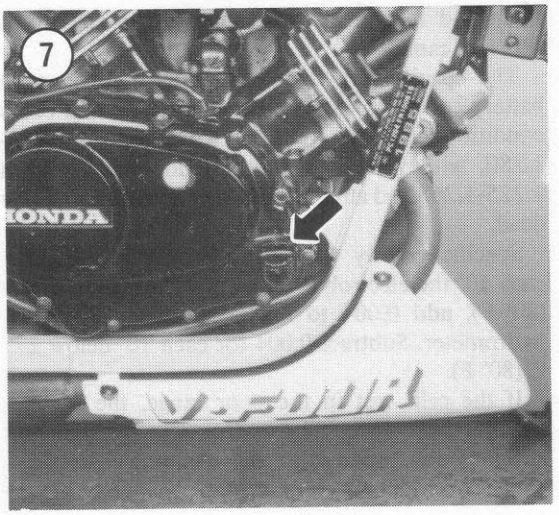
CAUTION

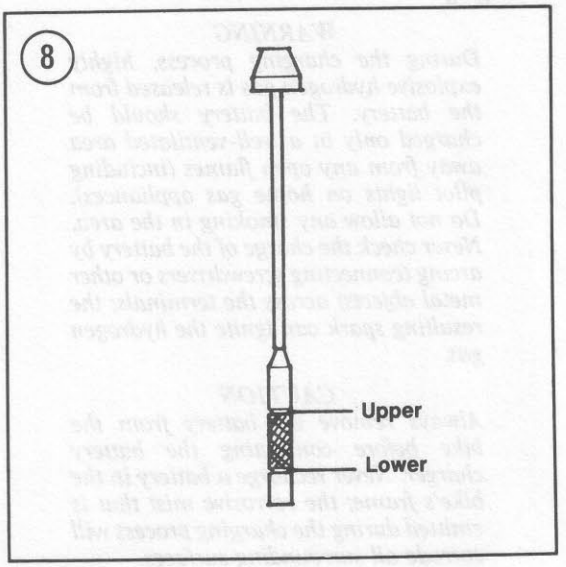
Do not add any friction-reducing additives to the oil as they will cause clutch slippage. Also do not use an engine oil with graphite added. The use of graphite oil will void any applicable Honda warranty. It is not established at this time if graphite will build up on the clutch friction discs and cause clutch problems. Until further testing is done by the oil and motorcycle industries, do not use this type of oil.

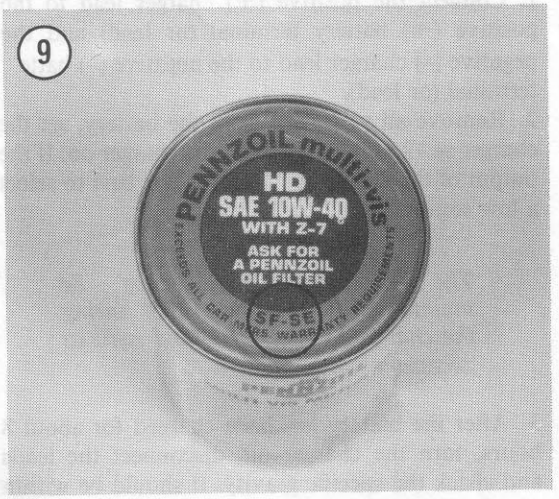
To change the engine oil and filter you will need the following:

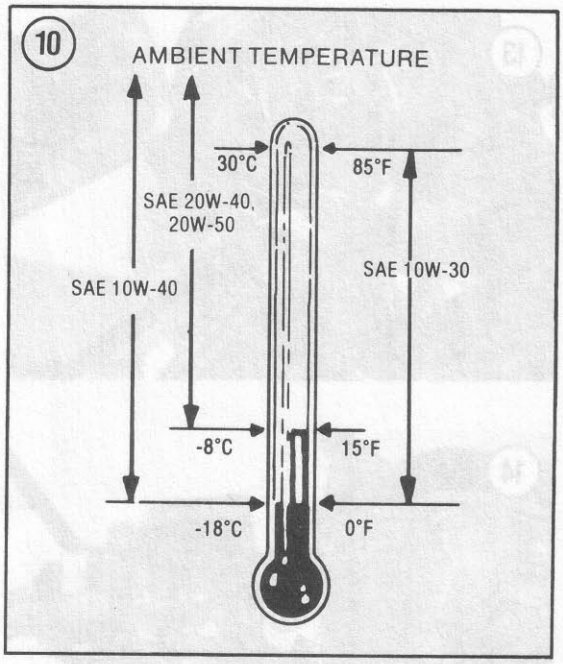
a. Drain pan.
b. Funnel.
c. Can opener or pour spout.
d. 12 mm wrench for the drain plug.
e. Strap wrench for the oil filter.
f. 3 quarts of oil.
g. New oil filter.

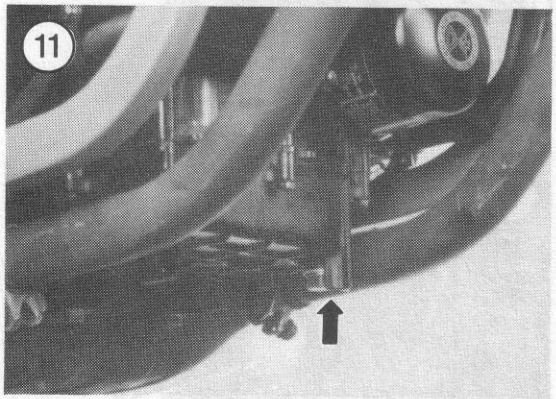
There are a number of ways to discard the old oil safely. Some service stations and oil retailers will

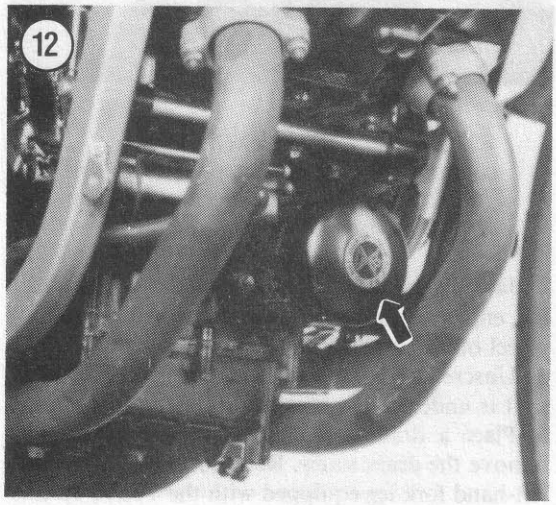












accept your used oil for recycling; some may even give you money for it. Never drain the oil onto the ground.

1. Start the engine and let it reach operating temperature; 15-20 minutes of stop-and-go riding is usually sufficient.
2. Turn the engine off and place the bike on the centerstand.
3. On Interceptor models, perform the following:
   a. Remove the lower cowl as described in Chapter Twelve.
   b. On models so equipped, remove the bolts securing the evaporation canister to the frame bracket and move the canister down and out of the way. Don't lose the collars on the bolts.
4. Place a drain pan under the engine so it is under the oil pan drain plug and oil filter.
5. Remove the oil drain plug (**Figure 11**).
6. Remove the dipstick/oil filler cap (**Figure 7**); this will speed up the flow of oil.
7. Let the oil drain for at least 15-20 minutes. During this time, push the starter button a couple of times to help drain any remaining oil.

CAUTION

Do not let the engine start and run without oil in the crankcase.

8. Use a strap wrench and loosen the oil filter (**Figure 12**) from the crankcase. This will allow air to enter the top of the oil filter and speed up the flow of oil.
9. Using a nail and hammer, carefully punch a couple of holes in the bottom of the oil filter and allow the oil to drain out of the filter.
10. Inspect the sealing washer on the cylinder block oil drain plug. Replace if its condition is in doubt.
11. Install the oil drain plug and tighten to 35-40 N•m (25-29 ft.-lb.).

CAUTION

Before removing the oil filter, thoroughly clean off all road dirt and oil residue around it.

12. Completely unscrew the oil filter from the crankcase (**Figure 12**) and discard it.

CAUTION

Prior to installing the oil filter, clean off the mating surface of the crankcase—do not allow any road dirt to enter into the oil system.

13. Apply a light coat of new engine oil to the rubber seal on the new oil filter and screw on the oil filter. Tighten the filter to approximately 20 N•m (14 ft.-lb.).

14. Insert a funnel into the oil fill hole and fill the engine with the recommended viscosity and quantity of oil. Refer to **Table 6**.
15. Screw in the dipstick/oil filler cap securely.
16A. If this is just an oil and filter change, start the engine; the oil pressure warning light should go out within 1-3 seconds. If it stays on, shut off the engine immediately and locate the problem. Do not run the engine with the oil warning light on.
16B. If the engine has been disassembled or rebuilt, refill all oil passageways in the engine by performing the following:

a. Turn the engine kill switch (**Figure 13**) to the OFF position.

CAUTION

Do not operate the starter for more than 5 seconds at a time. Let it rest for 10 seconds, then use it again.

b. Crank the engine over with the starter (at 5-second intervals) until the oil pressure warning light goes off. This will assure that the engine is properly lubricated prior to running under its own power.
c. Turn the engine kill switch (**Figure 13**) to the ON position.
d. Start the engine; the oil pressure warning light should be off. If it comes on, shut off the engine immediately and locate the problem. Do not run the engine with the oil pressure warning light on.

17. Let the engine run at moderate speed and check for leaks.
18. Turn the engine off and check for correct oil level; adjust as necessary.
19. On Interceptor models, perform the following:

a. On models so equipped, install the evaporation canister onto the frame bracket. Install the collar onto each bolt, install the bolts and tighten securely.
b. Install the lower cowl as described in Chapter Twelve.

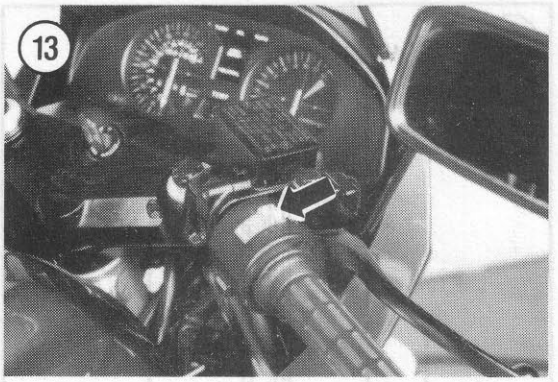
Front Fork Oil Change

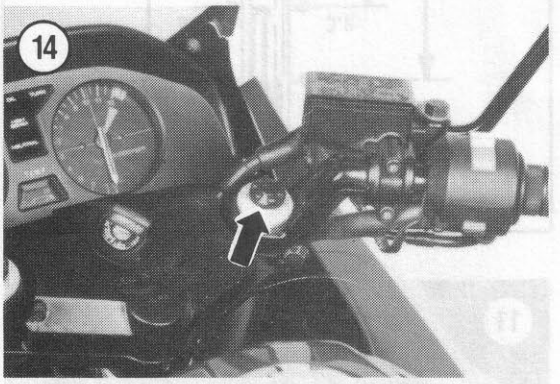
1. Unscrew each fork top cap cover (**Figure 14**).

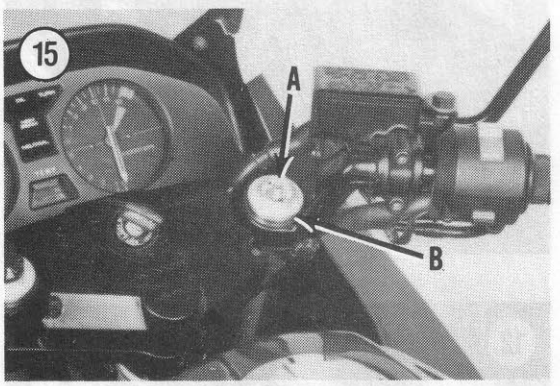
WARNING

During the next step, release the air pressure gradually. If released too fast, fork oil will spurt out with the air. Protect your eyes and clothing accordingly.

2. Place the tip of a screwdriver on the valve stem (A, **Figure 15**) and bleed off *all* air pressure from both forks.



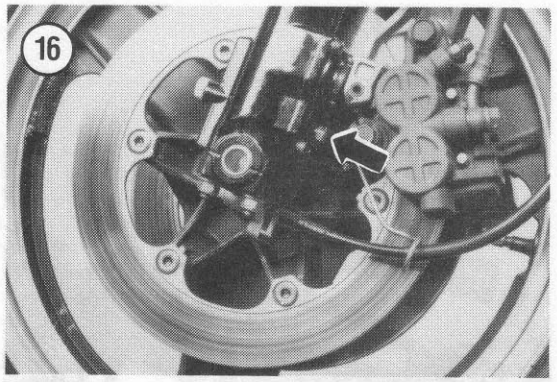


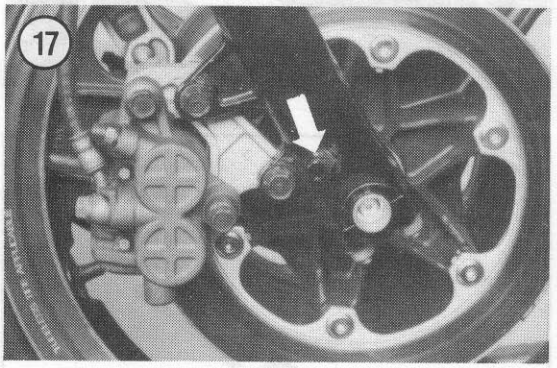


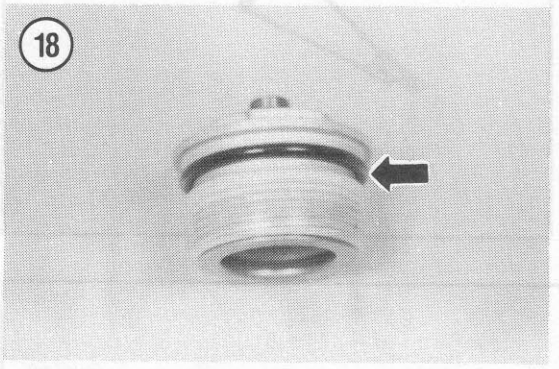
WARNING

Always bleed off all air pressure; failure to do so may cause personal injury when disassembling the fork.

3. Jack up the bike and place wood block(s) under the engine to support it securely with the front wheel off the ground.
4. Unscrew the fork top cap (B, **Figure 15**) slowly as it is under spring pressure from the fork spring.
5. Place a drain pan under the drain screw and remove the drain screw. Refer to **Figure 16** for the left-hand fork leg equipped with the TRAC system







and **Figure 17** for all other fork legs. Allow the oil to drain for at least 5 minutes. *Never* reuse the oil.

CAUTION

Do not allow the fork oil to come into contact with any of the brake components.

6. Inspect the gasket on the drain screw; replace it if necessary. Install the drain screw.
7. Place a clean shop cloth around the top of the fork tube. Remove the spacer (on models so equipped) and the fork spring. This will make it easier to refill the fork tube.
8. Repeat Steps 3-7 for the other fork.
9. Refill each fork leg with the specified quantity of DEXRON automatic transmission fluid or 10W fork oil. Refer to **Table 7** for specified quantity.

NOTE

In order to measure the correct amount of fluid, use a plastic baby bottle. These have measurements in cubic centimeters (cc) and fluid ounces (oz.) on the side.

10. There are different types of fork springs used among the various models. Check the configuration of the end of the fork spring on your model and install it in one of the following positions:
    a. Closer wound coils—position the fork spring with the closer wound coils at the bottom end and install the fork spring into the fork tube.
    b. Tapered coils—position the fork spring with the tapered coils at the bottom end and install the fork spring into the fork tube.
11. On models so equipped, install the spacer into the fork tube.
12. Inspect the O-ring seal (**Figure 18**) on the fork top cap; replace if necessary.
13. Install the fork top cap while pushing down on the spring. Start the fork top cap slowly; don't cross thread it. Tighten fork top cap to 15-30 N•m (11-22 ft.-lb.).

WARNING

During the next step, never use any type of compressed gas as an explosion may be lethal. Never heat the fork assembly with a torch or place it near an open flame or extreme heat as this will also result in an explosion.

14. Inflate the front forks to the pressure listed in **Table 3**. Do not use compressed air; only use a small hand-operated air pump. Install the air valve cap.
15. Remove the wood block(s) from under the engine.
16. Road test the bike and check for leaks.

Throttle Control Cable Lubrication

The throttle control cables should be lubricated at the interval indicated in **Table 1**. They should also be inspected at this time for fraying, and the cable sheath should be checked for chafing. The cables are relatively inexpensive and should be replaced if faulty.

The throttle control cables can be lubricated either with oil or with any of the popular cable lubricants and a cable lubricator. The first method

requires more time and complete lubrication of the entire cable is less certain.

Examine the exposed end of the inner cable. If it is dirty or the cable feels gritty when moved up and down in its housing, first spray it with a lubricant/solvent such as LPS-25 or WD-40. Let this solvent drain out, then proceed with the following steps.

Oil method

1. Remove the screws that clamp the throttle control/switch housing (**Figure 19**) together to gain access to the cable ends. Disconnect the cables from the throttle grip assembly.
2. Make a cone of stiff paper and tape it to the end of the cable sheath (**Figure 20**).

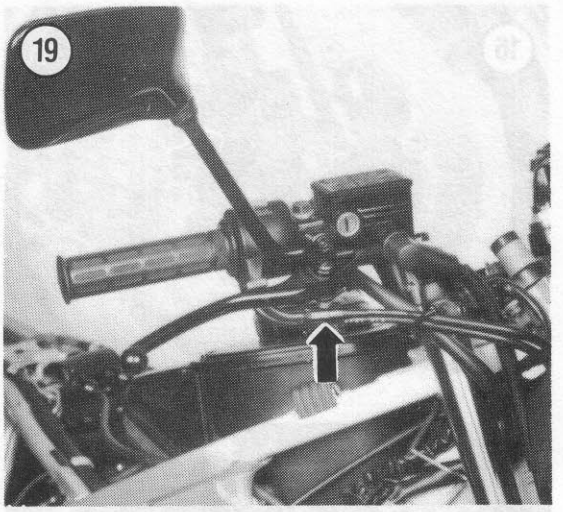
NOTE

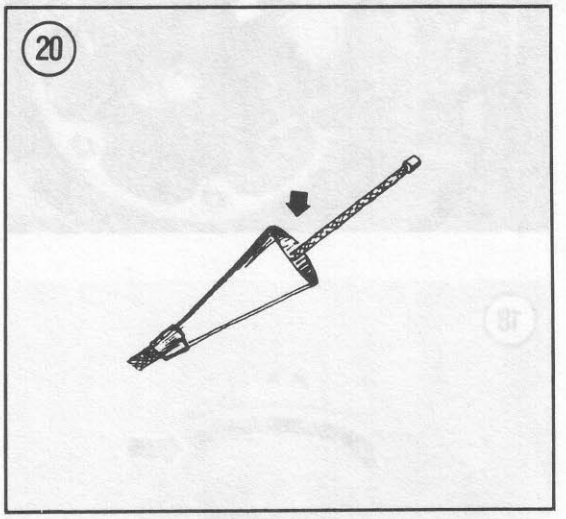
To avoid a mess, place a shop cloth at the end of the cable to catch the oil as it runs out.

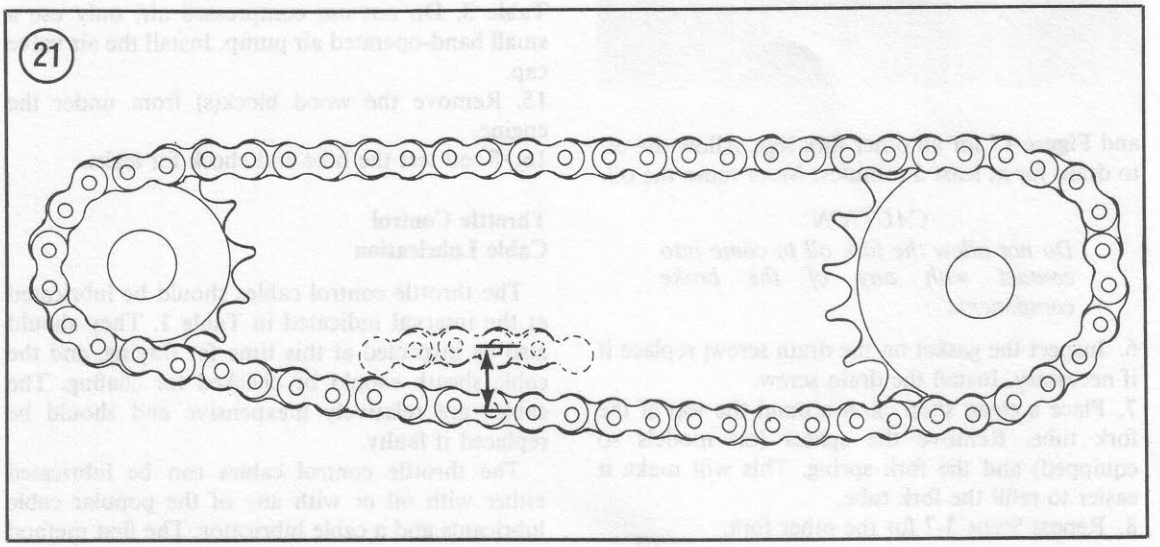
3. Hold the cable upright and pour a small amount of thin oil (SAE 10W-30) into the cone. Work the cable in and out of the sheath for several minutes to help the oil work its way down to the end of the cable.
4. Remove the cone and repeat Step 2 and Step 3 for the other cable.
5. Reconnect the cable and adjust the cable as described in this chapter.

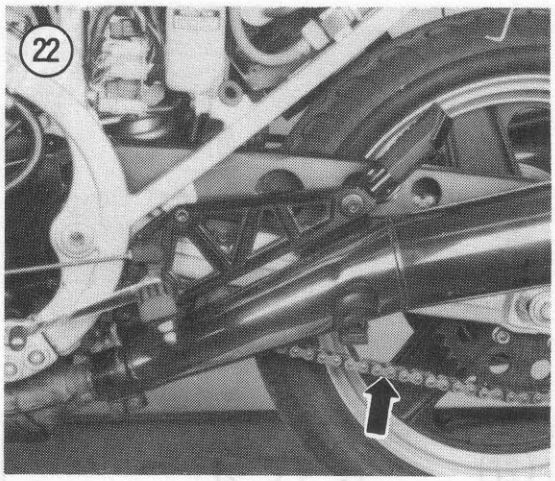
Lubricator method

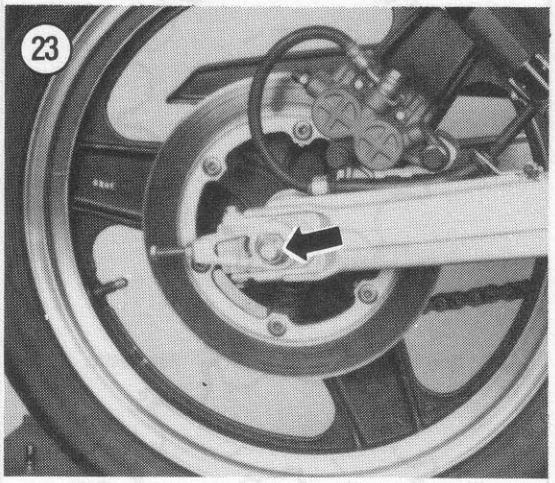
1. Remove the screws that clamp the throttle control/switch housing (**Figure 19**) together to gain access to the cable ends. Disconnect the cables from the throttle grip assembly.

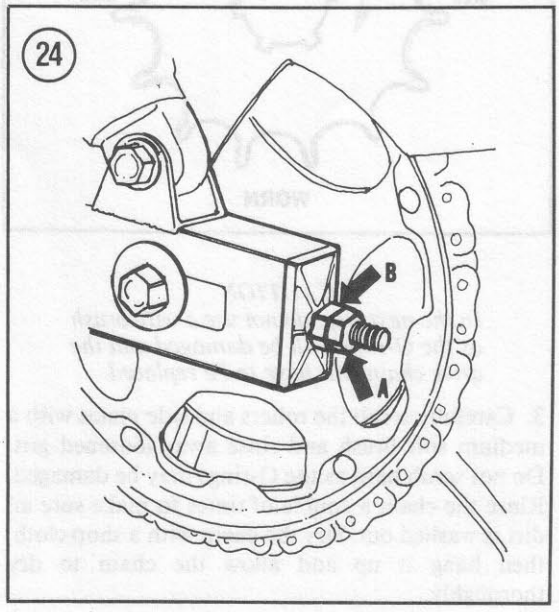












2. Attach a lubricator following the manufacturer's instructions.

NOTE

Place a shop cloth at the end of the cables to catch all excess lubricant that will flow out.

3. Insert the nozzle of the lubricant can in the lubricator, press the button on the can and hold it down until the lubricant begins to flow out the other end of the cable.
4. Remove the lubricator and repeat Step 2 and Step 3 for the other cable.
5. Reconnect the cables and adjust the cables as described in this chapter.

PERIODIC MAINTENANCE

Drive Chain Adjustment

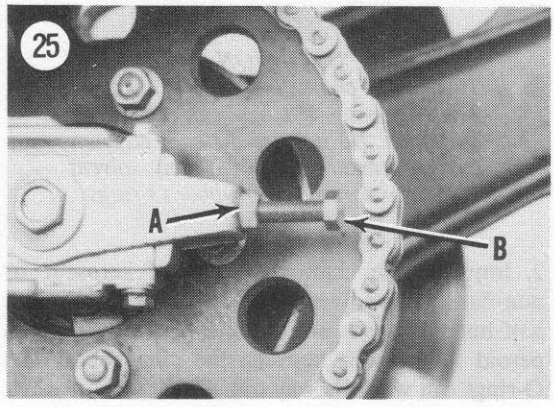
The drive chain adjustment should be checked at the interval indicated in **Table 1**. The correct amount of drive chain free play, when the chain is pushed up midway between the sprockets (**Figure 21**) on the lower chain run (**Figure 22**), should be 15-25 mm (5/8-1 in.). If adjustment is necessary, perform the following.

1. Place the bike on the centerstand.
2. Shift the transmission into NEUTRAL.
3. Loosen the axle nut (**Figure 23**).

4A. On dual-shock models, perform the following:
   a. On each side, loosen the drive chain adjuster locknut (A, **Figure 24**).
   b. Turn each drive chain adjuster nut (B, **Figure 24**) in or out as required, in equal amounts.

4B. On Pro-link models, perform the following:
   a. On each side, loosen the drive chain adjuster lock nut (A, **Figure 25**).
   b. Turn each drive chain adjuster bolt (B, **Figure 25**) in or out as required, in equal amounts.

5. Be sure that the marks on both adjusting plates align with the same marks on each side of the



swing arm. The correct amount of chain free play, pushed up midway between the sprockets on the upper chain run, should be 15-25 mm (5/8-1 in.).
6. Rotate the rear wheel to move the chain to another position and recheck the adjustment; chains rarely wear or stretch evenly, and as a result, the free play will not remain constant over the entire chain.
7. If the chain cannot be adjusted within these limits, or if the end of the red zone on the wear label (**Figure 26**) aligns with line on the swing arm, the chain is excessively worn and stretched and should be replaced as described in Chapter Ten. The replacement chain numbers are listed in **Table 8**. Always replace both sprockets when replacing the drive chain; never install a new chain over worn sprockets.

WARNING

Excess free play can result in chain breakage which could cause a serious accident.

8. Tighten the rear axle nut to 70-90 N•m (51-65 ft.-lb.).
9. Tighten the drive chain adjuster locknuts.
10. If the drive chain does *not* have to be cleaned, it should be lubricated. Lubricate the chain with SAE 80W/90 gear oil or a good grade of chain lubricant (specifically formulated for O-ring chains) following the manufacturer's instructions.

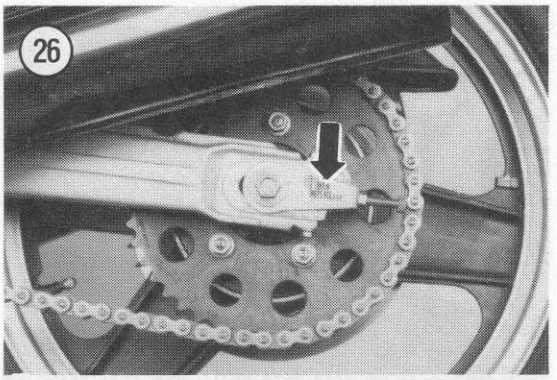
Drive Chain Cleaning, Inspection and Lubrication

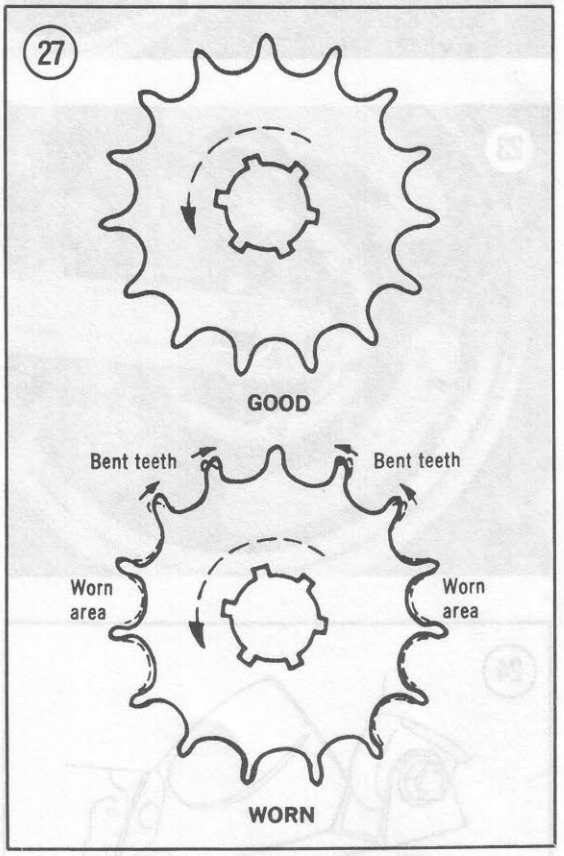
There is no factory recommended mileage interval for cleaning the drive chain but it is a food practice to remove, thoroughly clean and lubricate the drive chain every 3 months or more often if ridden in dusty or dirty terrain or through water. Inspect the drive chain every 300 miles (500 km).
1. Remove the drive chain as described in Chapter Ten.

CAUTION

The drive chain is an O-ring type. These rubber O-rings can be easily damaged. Do not use a steam cleaner, a high-pressure washer or any solvent that may damage the rubber O-rings.

2. Immerse the chain in a pan of kerosene or non-flammable solvent and let it soak for about a half hour. Move it around and flex it during this peroid so that dirt between the pins, rollers and O-rings can work its way out.

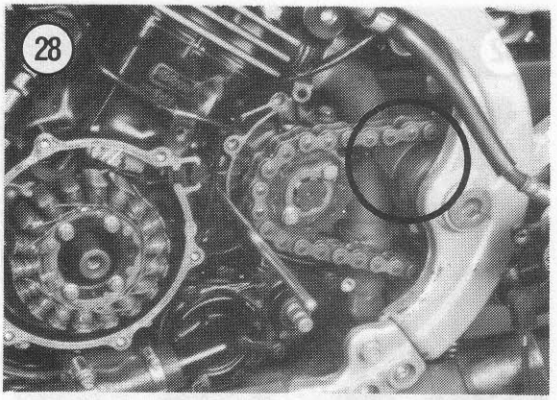


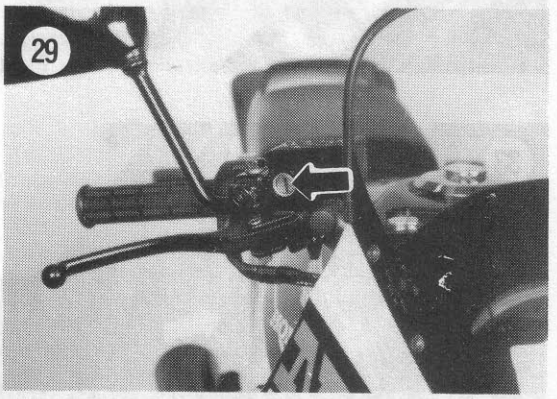


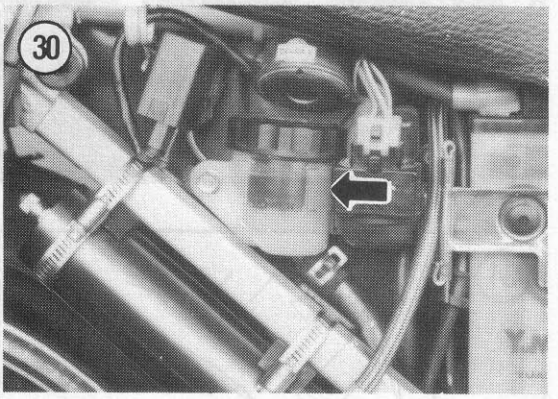
CAUTION

In the next step, do not use a wire brush as the O-rings will be damaged and the drive chain will have to be replaced.

3. Carefully scrub the rollers and side plates with a medium soft brush and rinse away loosened grit. Do not scrub hard as the O-rings may be damaged. Rinse the chain a couple of times to make sure all dirt is washed out. Dry the chain with a shop cloth, then hang it up and allow the chain to dry thoroughly.







4. After cleaning the chain, examine it carefully for wear or damage. If any signs are visible, replace the chain.

CAUTION

*Always check both sprockets (**Figure 27**) every time the drive chain is removed. If any wear is visible on the teeth, replace the sprockets. Never install a new chain over worn sprockets or a worn chain over new sprockets.*

5. Check the inner faces of the inner plates. They should be lightly polished on both sides. If they show considerable wear on both sides, the sprockets are not aligned.
6. Lubricate the chain with SAE 80W-90 gear oil or a good grade of chain lubricant (specifically formulated for O-ring chains) following the manufacturer's instructions.
7. Reinstall the chain as described in Chapter Ten.
8. Adjust chain free play as described in this chapter.

Drive Chain Slider

The drive chain slider is located on the left-hand side of the swing arm. There is no visible wear limit line on the slider. If a groove is worn down half-way through the top surface of the slider (**Figure 28**) the slider must be replaced.

To replace the slider, the swing arm must be removed as described in Chapter Ten.

Disc Brake Fluid Level

The fluid level in the front brake reservoir should be up to the upper mark within the reservoir. This upper level mark is visible only when the master cylinder top cover is removed. If the brake fluid level reaches the lower level mark (**Figure 29**) visible through the viewing port on the side of the front master cylinder reservoir, or the lower line (**Figure 30**) on the rear master cylinder (models so equipped), the fluid level must be corrected by adding fresh brake fluid.

WARNING

Use brake fluid from a sealed container clearly marked DOT 4 only (specified for disc brakes). Others may vaporize and cause brake failure. Do not intermix different brands or types of brake fluid as they may not be compatible. Do not intermix a silicone based (DOT 5) brake fluid as it can cause brake component damage leading to brake system failure.

1. Place the bike on level ground and position the handlebars so the front master cylinder reservoir is level.
2. Clean any dirt from the area around the top cover prior to removing the cover.

3A. On front master cylinder, remove the screws securing the top cover and remove the top cover (**Figure 31**) and the diaphragm. Add brake fluid until the level is to the upper level line within the master cylinder body. Use fresh brake fluid from a sealed brake fluid container.

3B. On rear master cylinder (models so equipped), unscrew the top cover and remove the top cover (**Figure 32**) and the diaphragm. Add brake fluid until the level is to the upper level line within the master cylinder body. Use fresh brake fluid from a sealed brake fluid container.

CAUTION

Be careful when handling brake fluid. Do not spill it on painted or plated surfaces as it will destroy the surface. Wash the area immediately with soapy water and thoroughly rinse it off.

4. Reinstall the diaphragm and the top cover. On the front master cylinder, tighten the screws securely. On the rear master cylinder (models so equipped) screw the top cover on securely.

Disc Brake Lines

Check brake lines between the master cylinder and the brake calipers. If there is any leakage, tighten the connections and bleed the brakes as described in Chapter Eleven. If this does not stop the leak or if a brake line is obviously damaged, cracked or chafed, replace the brake line and bleed the system.

Disc Brake Pad Wear

Inspect the brake pads for excessive or uneven wear, scoring and oil or grease on the friction surface. If any of these conditions exist, replace the pads as described in Chapter Eleven.

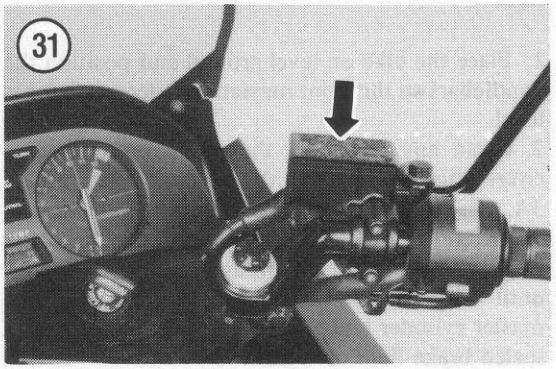
Look at the pads from the top of the caliper assembly (**Figure 33**). Replace the pads if the wear line on the pads reaches the brake disc.

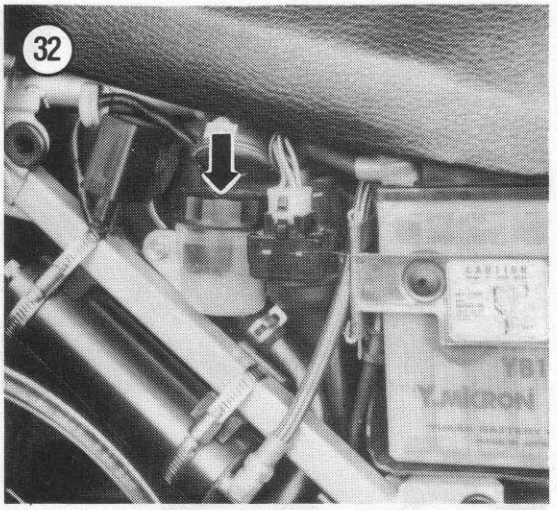
NOTE

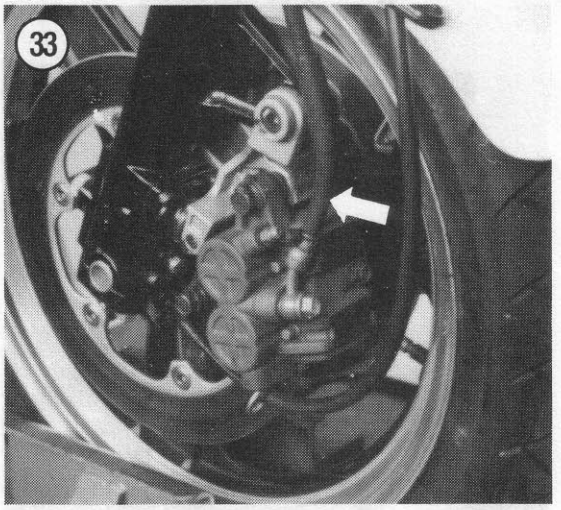
Always replace all pads in both caliper assemblies at the same time.

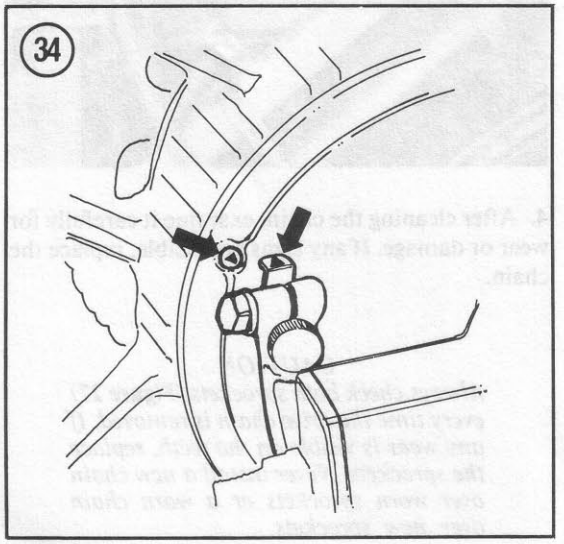
Disc Brake Fluid Change

Every time the reservoir cap is removed, a small amount of dirt and moisture enters the brake fluid.







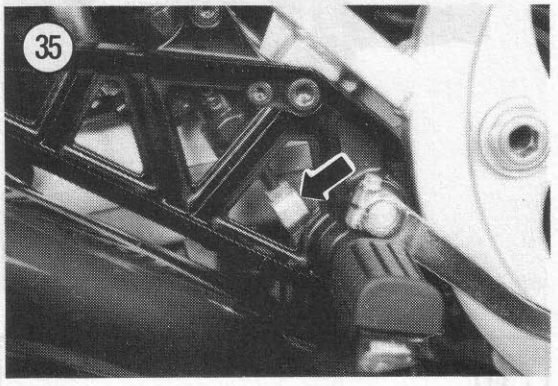


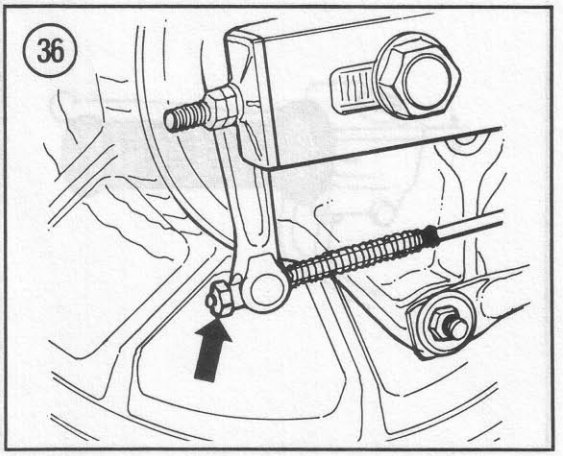
The same thing happens if a leak occurs or any part of the hydraulic system is loosened or disconnected. Dirt can clog the system and cause unnecessary wear. Water in the brake fluid vaporizes at high temperature, impairing the hydraulic action and reducing the brake's stopping ability.

To maintain peak performance, change the brake fluid as indicated in **Table 1**. To change brake fluid, follow the *Bleeding the Brake System* procedure in Chapter Eleven. Continue adding new fluid to the master cylinder and bleeding out at the calipers until the fluid leaving the calipers is clean and free of contaminants.

WARNING

Use brake fluid from a sealed container marked DOT 4 only (specified for disc brakes). Others may vaporize and cause brake failure. Do not intermix different brands or types of brake fluid as they may not be compatible. Do not intermix a silicone based (DOT 5) brake fluid as it can cause brake component damage leading to brake system failure.





Rear Drum Brake Lining (Dual-shock Models)

Check the rear brake linings for wear. If the arrow on the brake arm aligns with the raised index mark on the brake backing plate (**Figure 34**) when the brake pedal is applied, the brake linings require replacement.

If replacement is necessary, refer to Chapter Eleven.

Rear Brake Pedal Height Adjustment

The rear brake pedal should be adjusted as indicated in **Table 1**.

1. Place the bike on the centerstand.
2. Check that the brake pedal is in the at-rest position.

3A. On dual-shock models, adjust the pedal height so the brake pedal is 10-20 mm (3/8-3/4 in.) below the top surface of the front foot peg.

3B. On Pro-link models, adjust the pedal height so the brake pedal is 43 mm (1 11/16 in.) below the top surface of the front foot peg.

4A. On drum brake models, to change height position, loosen the locknut and turn the adjuster bolt on the front right-hand foot peg. Tighten the locknut.

4B. On disc brake models, to change height position, loosen the locknut and turn the master cylinder stopper bolt (**Figure 35**). Tighten the locknut.

5. Adjust the rear brake light switch as described in Chapter Seven.

Rear Brake Pedal Free Play (Drum Brake)

Free play is the distance the rear brake pedal travels from the at-rest position to the applied position when the pedal is depressed by hand.

1. Place the bike on the centerstand with the rear wheel off the ground.
2. Adjust the brake pedal to the correct height as described in this chapter.
3. Turn the adjust nut on the end of the brake rod (**Figure 36**) until the pedal has 20-30 mm (3/4-1 1/4 in.) free play.
4. Rotate the rear wheel and check for brake drag.
5. Operate the brake pedal several times to make sure the pedal returns to the at-rest position immediately after release.

Clutch Fluid Level Check

The clutch is hydraulically operated and requires no routine adjustment.

The hydraulic fluid in the clutch master cylinder should be checked as listed in **Table 1** or whenever the level drops, whichever comes first. Bleeding the clutch system and servicing clutch components are covered in Chapter Five.

CAUTION

If the clutch operates correctly when the engine is cold or in cool weather, but operates erratically (or not at all) after the engine warms up or in hot weather, there is air in the hydraulic line and the clutch system must be bled. Refer to Chapter Five.

The fluid level in the reservoir should be up to the upper mark within the reservoir. This upper level mark is only visible when the master cylinder top cover is removed. If the fluid level reaches the lower level mark (**Figure 37**) visible through the viewing port in the master cylinder reservoir, the fluid level must be corrected by adding fresh hydraulic (brake) fluid.

WARNING

Use hydraulic fluid from a sealed container marked DOT 4 only. Do not intermix different brands or types of hydraulic fluid as they may not be compatible. Do not intermix a silicone based (DOT 5) hydraulic fluid as it can cause clutch component damage leading to clutch release system failure.

CAUTION

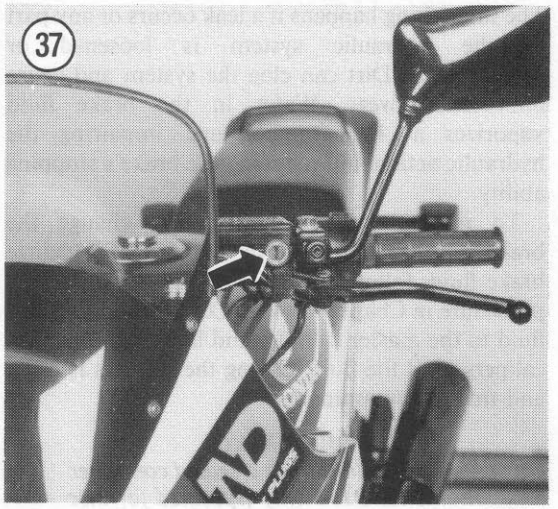
Be careful when handling hydraulic fluid. Do not spill it on painted or plated surfaces as it will destroy the surface. Wash the area immediately with soapy water and thoroughly rinse it off.

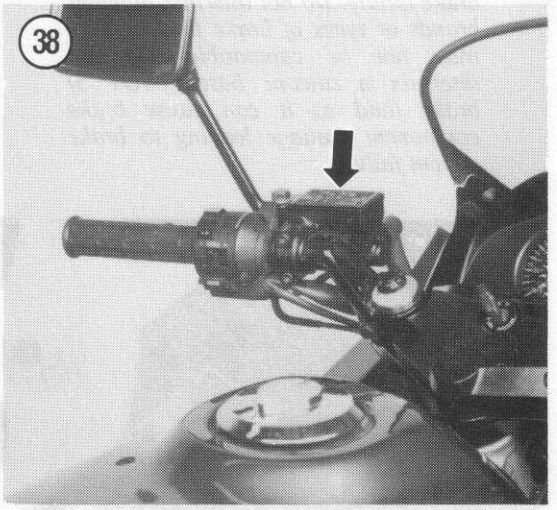
1. Place the bike on level ground and position the handlebars so the master cylinder reservoir is level.
2. Clean any dirt from the area around the top cover before removing the cover.

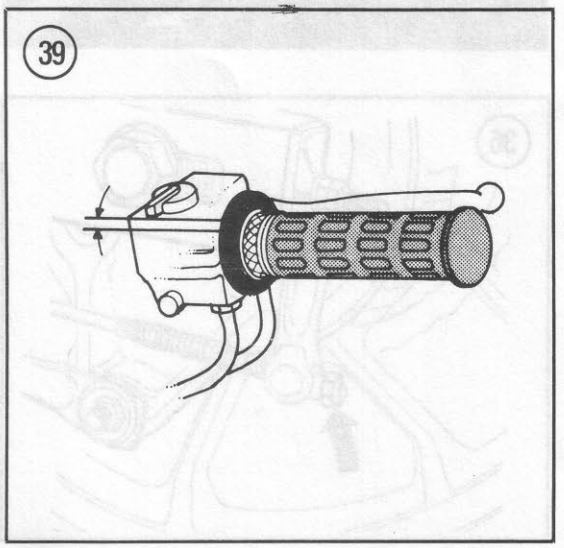
CAUTION

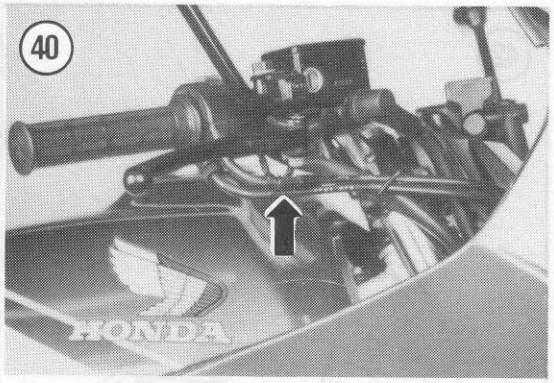
Do not operate the clutch lever after the top cover has been removed as hydraulic fluid will spurt out of the master cylinder.

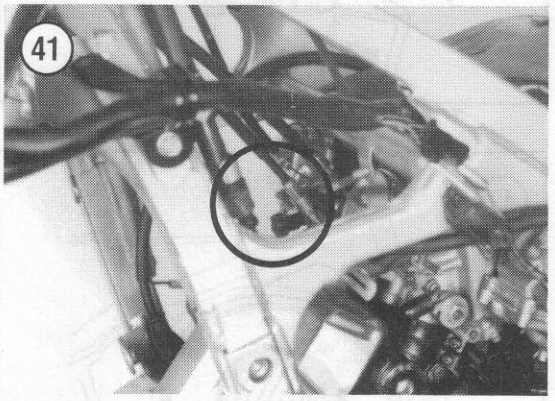
3. Remove the screws securing the top cover. Remove the top cover (**Figure 38**) and the diaphragm. Add clutch fluid until the level is to the upper level line within the master cylinder body. Use fresh hydraulic fluid from a sealed hydraulic fluid container.
4. Reinstall the diaphragm and the top cover. Tighten the screws securely.











Clutch Hydraulic Lines

Check hydraulic lines between the master cylinder and the clutch slave cylinder. If there is any leakage, tighten the connections and bleed the clutch as described in Chapter Five. If this does not stop the leak or if a line is obviously damaged, cracked or chafed, replace the line and bleed the system.

Throttle Adjustment and Operation

The throttle grip should have 2-6 mm (1/8-1/4 in.) rotational free play (**Figure 39**).

1. If minor adjustment is necessary, perform the following:
   a. Loosen the locknut and turn the adjuster (**Figure 40**) at the throttle grip in or out to achieve proper free play rotation.
   b. Tighten the locknut.
2. If major adjustment is necesary, perform the following:
   a. Remove the seat and fuel tank.
   b. Loosen the locknut and turn the adjuster (**Figure 41**) at the carburetor end of the cable to achieve proper free play rotation.
   c. Tighten the locknut and perform the minor adjustment procedure.
3. Check the throttle cables from grip to carburetor. Make sure they are not kinked or chafed. Replace as necessary.
4. Make sure the throttle grip rotates freely from a fully closed to fully open position. Check with the handlebar at center, at full right and at full left. If necessary, remove the throttle grip as described in Chapter Nine and apply a lithium base grease to it.

Air Filter Element Replacement

The air filter element should be removed and cleaned as indicated in **Table 1**.

The air filter removes dust and abrasive particles from the air before the air enters the carburetors and engine. Without the air filter, very fine particles could enter the engine and cause rapid wear of the piston rings, cylinder and bearings and might clog small passages in the carburetors. Never run the bike without the air filter element installed.

Proper air filter servicing can do more to ensure long service from your engine than almost any other single item.

1. Remove both side covers.

2A. On Magna models, perform the following:

WARNING

The fuel tank should not be raised up when the tank is full or fuel will spill out of the filler neck.

   a. Open the fuel filler cap and look straight down into the fuel tank. The fuel level must be below the raised section that goes over the frame backbone. Do *not* raise the fuel tank if the fuel level is above this raised section; siphon fuel from the tank if necessary.
   b. Remove the front bolt (A, **Figure 42**) on each side securing the front of the fuel tank to the frame.

CAUTION

To avoid damage to the painted surface of the fuel tank, turn the handlebars to the straight-ahead position.

   c. Raise the front of the fuel tank and prop it up on the tank support.
   d. Remove the Allen bolt (B, **Figure 42**) securing the frame right-hand front cover and remove the cover.
   e. Remove the screws securing the air filter cover and remove the cover.
   f. Remove the air filter element (**Figure 43**) from the air box. Discard the element.

2B. On Interceptor models, perform the following:
   a. Remove the fuel tank as described in Chapter Six.

b. Loosen the screws (**Figure 44**) securing the air filter cover and remove the cover. The screws are captured in the cover and will not fall out.
c. Remove the air filter element (**Figure 45**) from the air box. Discard the element.

NOTE

The air filter element is viscous type paper which is impregnated with oil. Do not try to clean the element with compressed air.

3. Wipe out the interior of the air box (**Figure 46**) with a shop rag dampened with cleaning solvent. Remove any foreign matter that may have passed through a broken element.
4. Install the new air filter element into the air box.
5. Inspect the gasket on the air filter cover. If it is damaged in any way, replace the gasket.
6. Install the air filter cover and secure it with the screws.
7. Squeeze the condensation collector (**Figure 47**) and drain out any moisture from the tube that interconnects the air filter air box and the crankcase breather collection box.
8. On Magna models, install the frame right-hand front cover. Install the Allen bolt and tighten securely.
9A. On Magna models, lower the fuel tank and install the front bolts. Tighten the bolts securely.
9B. On Interstate models, install the fuel tank as described in Chapter Six.
10. Install both side covers.

Fuel Filter Replacement (Magna)

WARNING

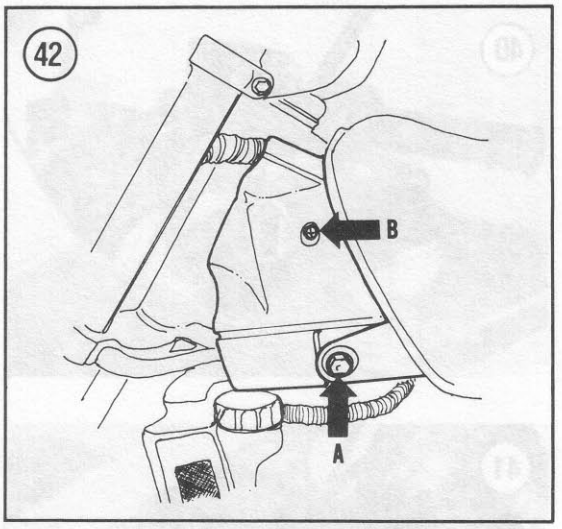
Do not smoke or allow anyone to smoke in the immediate area while changing the fuel filter. Be sure to work in a well-ventilated area and have a fire extinguisher, rated for gasoline fires, handy.

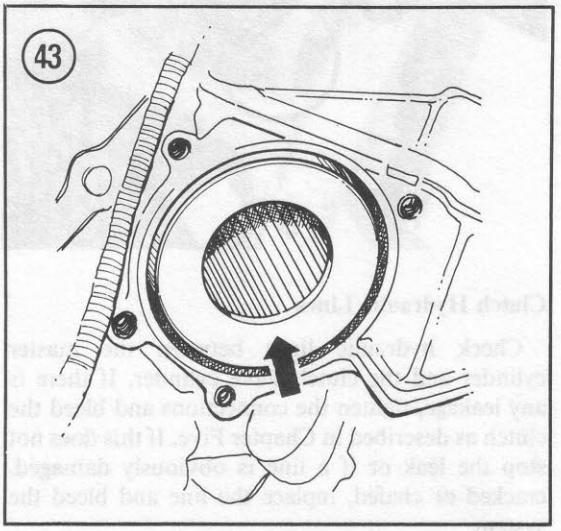
The inline fuel filter removes particles in the fuel which might otherwise enter the carburetors. These particles could cause the float needle(s) to stay in the open position or clog one of the jets.
1. Remove both side covers.

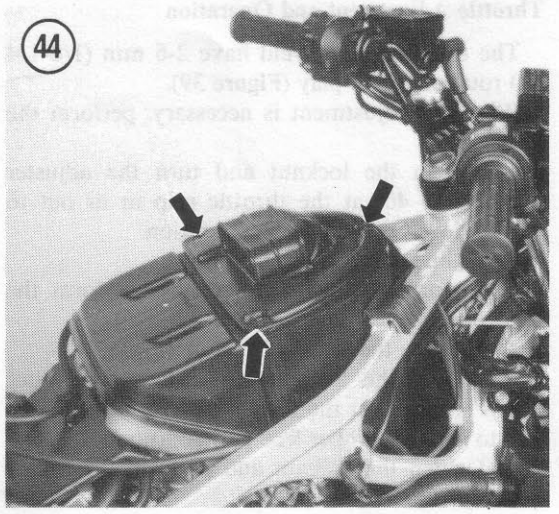
WARNING

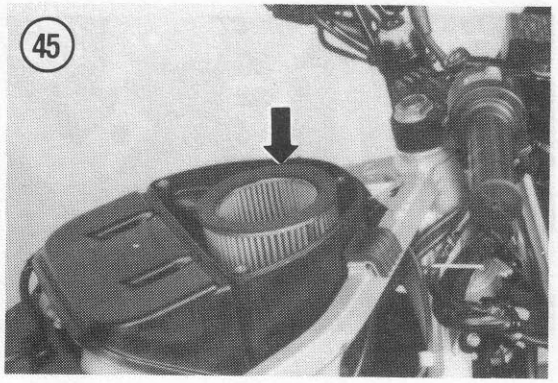
The fuel tank should not be raised up when the tank is full as fuel will spill out of the filler neck.

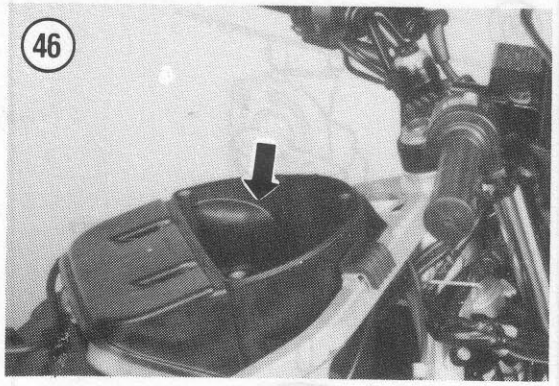
2. Open the fuel filler cap and look straight down into the fuel tank. The fuel level must be below the raised section that goes over the frame backbone. Do *not* raise the fuel tank if the fuel level is above

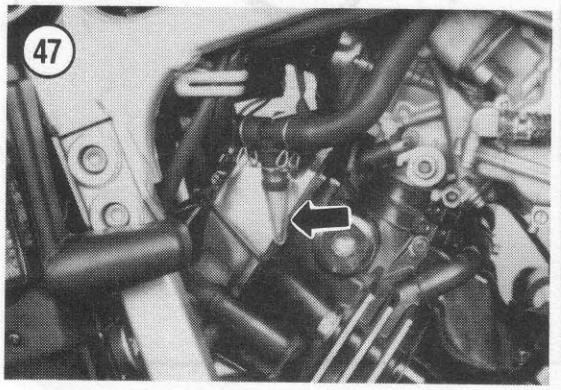


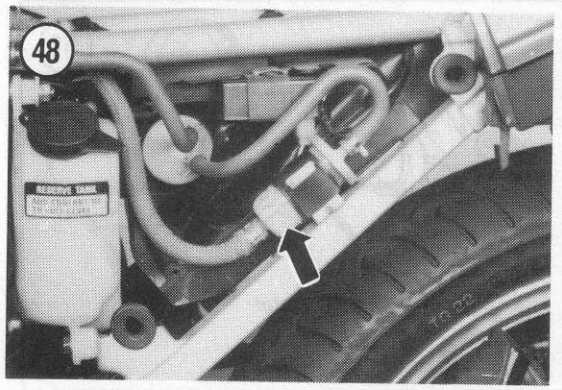












this raised section; siphon fuel from the tank if necessary.

3. Remove the front bolt (A, **Figure 42**) on each side securing the fuel tank to the frame.

CAUTION

To avoid damage to the painted surface of the fuel tank, turn the handlebars to the straight ahead position so the handlebars will not interfere with the fuel tank.

4. Raise the front of the fuel tank and prop it up on the tank support.
5. Disconnect the battery negative lead.
6. Drain the fuel from the secondary fuel tank as described under *Secondary Fuel Tank Removal/Installation* in Chapter Six. It is not necessary to remove the secondary fuel tank.
7. Remove the battery as described in this chapter.
8. Partially pull the battery box out of the frame and slide the spark units out of the back side of the battery box. Remove the battery box.
9. Disconnect the 2-pin electrical connector to the fuel pump.
10. Disconnect the fuel lines going to the carburetor assembly and the secondary fuel tank.
11. Remove the bolts securing the fuel pump mounting bracket assembly.
12. Carefully remove the fuel pump mounting bracket assembly from the frame.
13. Loosen the clamping bands and disconnect the fuel lines from the fuel filter. Plug the fuel lines with golf tees.
14. Remove the golf tees and install the new fuel filter.
15. Install all parts removed by reversing these removal steps.
16. Start the engine and check for leaks.

Fuel Filter Replacement (Interceptor)

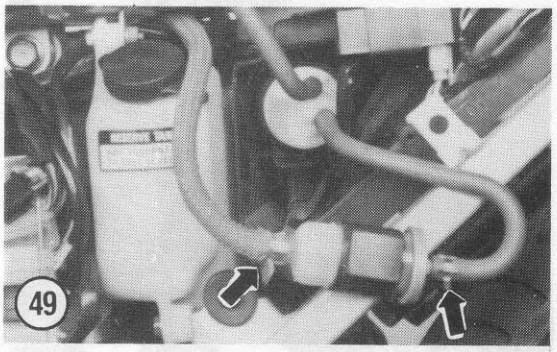
WARNING

Do not smoke or allow anyone to smoke in the immediate area while changing the fuel filter. Be sure to work in a well-ventilated area and have a fire extinguisher, rated for gasoline fires, handy.

The inline fuel filter removes particles in the fuel which might otherwise enter the carburetors. These particles could cause the float needle(s) to stay in the open position or clog one of the jets.

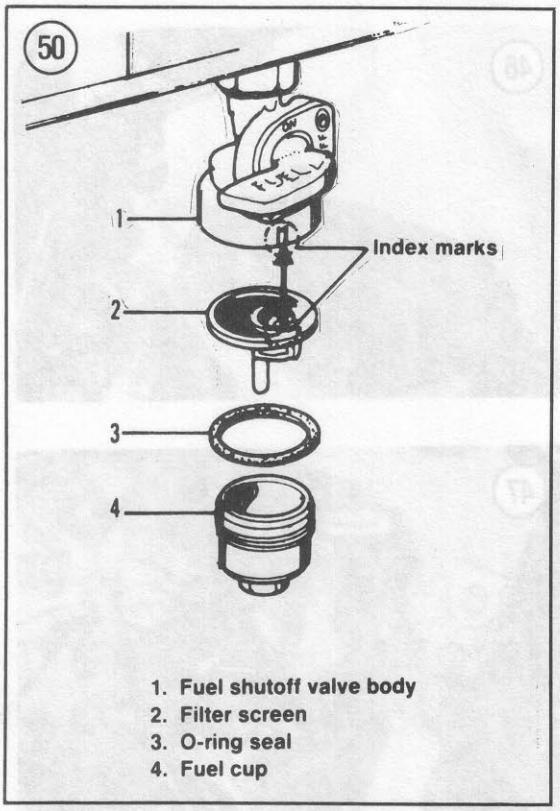
1. Turn the fuel shutoff valve to the OFF position.
2. Remove the left-hand side cover.
3. Carefully pull the fuel filter (**Figure 48**) out of the clip on the frame.

4. Disconnect the fuel lines (**Figure 49**) from the fuel filter and plug the fuel lines with golf tees.
5. Remove the golf tees and install the new fuel filter.
6. Reinstall the fuel filter into the clip on the frame.
7. Turn the fuel shutoff valve to the ON position.
8. Start the engine and check for leaks.
9. Install the left-hand side cover.



Fuel Strainer Cleaning (Interceptor)

1. Turn the fuel shutoff valve to the OFF position.
2. Remove the fuel cup, O-ring and filter screen from the bottom of the fuel shutoff valve. Dispose of fuel remaining in the fuel cup properly.
3. Clean the filter screen with a medium soft toothbrush and blow out with compressed air. Replace the filter screen if it is broken in any area.
4. Wash the fuel cup in solvent to remove any residue or foreign matter. Throughly dry with compressed air.
5. Align the index marks on the filter screen and the fuel shutoff valve body (**Figure 50**).
6. Install the O-ring seal and screw on the fuel cup.
7. Hand-tighten the fuel cup and then tighten to a final torque of 3-5 N•m (2-4 ft.-lb.). Do not overtighten the fuel cup as it may be damaged.
8. Turn the fuel shutoff valve to the ON position and check for leaks.



1. Fuel shutoff valve body
2. Filter screen
3. O-ring seal
4. Fuel cup

Fuel Line Inspection

Inspect the fuel lines from the fuel tank(s) to the carburetor assembly, fuel pump and fuel filter. If any are cracked or starting to deteriorate they must be replaced. Make sure the small hose clamps are in place and holding securely.

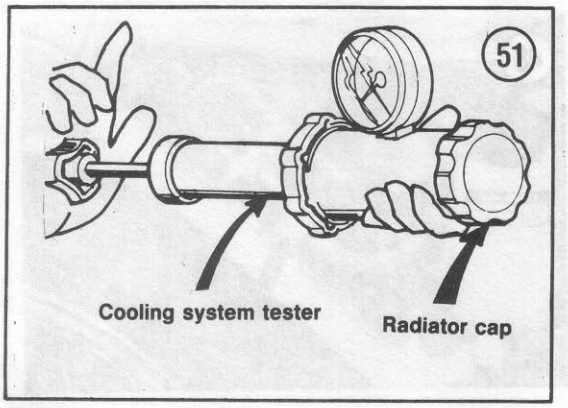
WARNING

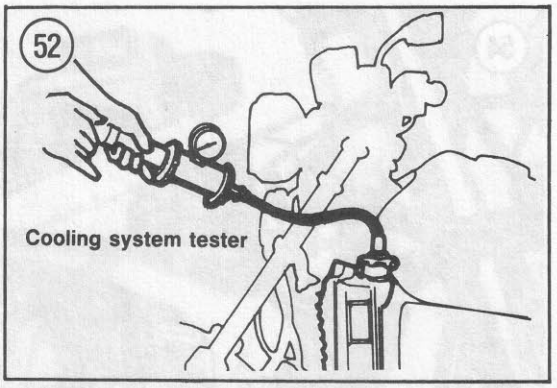
A damaged or deteriorated fuel line presents a very dangerous fire hazard to both the rider and the bike if fuel should spill onto a hot engine or exhaust pipe.

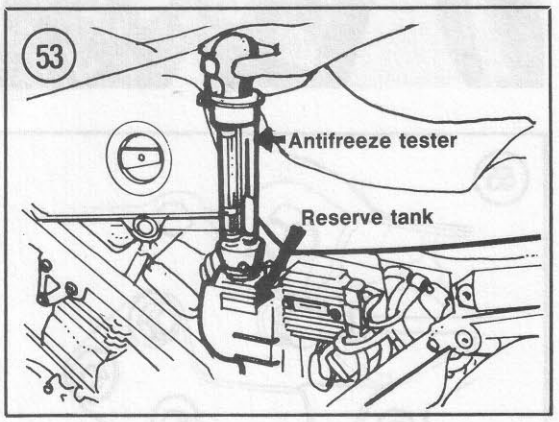
Cooling System Inspection

At the interval indicated in **Table 1**, the following items should be checked. If you do not have the test equipment, the tests can be done by a Honda dealer, automobile dealer, radiator shop or service station.

1. Have the radiator cap pressure tested (**Figure 51**). The specified radiator cap relief pressure is 0.75-1.05 kg/cm² (10.7-14.9 psi). The cap must be able to sustain this pressure for 6 seconds. Replace







the radiator cap if it does not hold pressure or if the relief pressure is too high or too low.

CAUTION

If test pressure exceeds specifications, the radiator may be damaged.

2. Leave the radiator cap off and have the entire cooling system pressure tested (**Figure 52**). The entire cooling system should be pressurized up to, but not exceeding, 1.05 kg/cm² (14.9 psi). The system must be able to sustain this pressure for 6 seconds. Replace or repair any components that fail this test.
3. Test the specific gravity of the coolant with an antifreeze tester (**Figure 53**) to ensure adequate temperature and corrosion protection. The system must have at least a 50/50 mixture of antifreeze and distilled water. Never let the mixture become less than 40% antifreeze or corrosion protection will be impaired.
4. Check all cooling system hoses for damage or deterioration. Replace any hose that is questionable. Make sure all hose clamps are tight.
5. Carefully clean any road dirt, bugs, mud, etc. from the radiator core. Use a whisk broom, compressed air or low-pressure water. If the radiator has been hit by a small rock or other item, *carefully* straighten out the fins with a screwdriver.

NOTE

If the radiator has been damaged across approximately 20% or more of the frontal area, the radiator should be recored or replaced.

Coolant Change

The cooling system should be completely drained and refilled at the interval indicated in **Table 1**.

It is sometimes necessary to remove the radiator or drain the coolant from the system in order to perform a service procedure on some parts of the bike. If the coolant is still in good condition (not time to replace the coolant), the coolant can be reused if it is kept clean. Drain the coolant into a *clean* drain pan and pour it into a *clean* sealable container like a clean plastic milk or bleach bottle. This coolant can then be reused.

The ethylene glycol in the coolant solution is very slippery. If any coolant is spilled on the ground during this procedure, wipe it up so it will not come in contact with the tire treads. If any coolant contacts the tire tread, thoroughly wash it off the tire prior to riding the bike to prevent tire slippage.

CAUTION

Use only a high quality ethylene glycol antifreeze specifically labeled for use with aluminum engines. Do not use an alcohol-based antifreeze.

In areas where freezing temperatures occur, add a higher percentage of antifreeze to protect the system to temperatures far below those likely to occur. **Table 9** lists the recommended amount of antifreeze for protection at various ambient temperatures.

The following procedure must be performed when the engine is cool.

WARNING

Antifreeze is a toxic waste. Drain into suitable containers and dispose of it according to local regulations. Do not store coolant where it is accessible to children or pets.

CAUTION

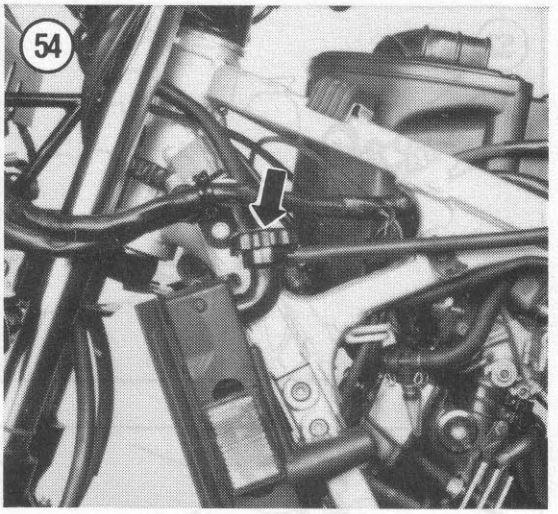
Be careful not to spill antifreeze on painted surfaces as it will destroy the surface. Wash immediately with soapy water and rinse thoroughly with clean water.

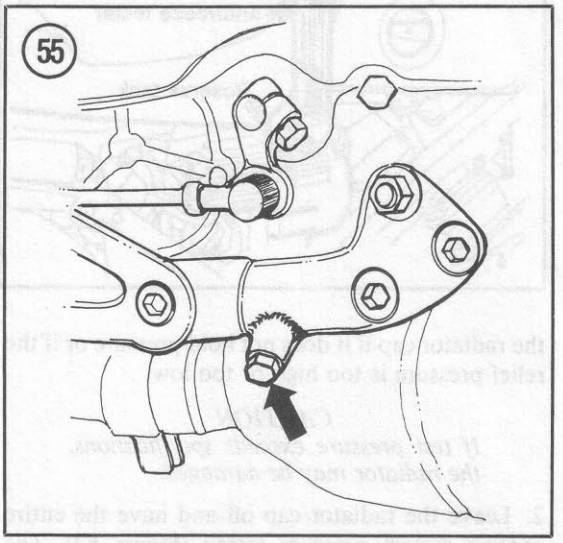
1. Place the bike on the centerstand.

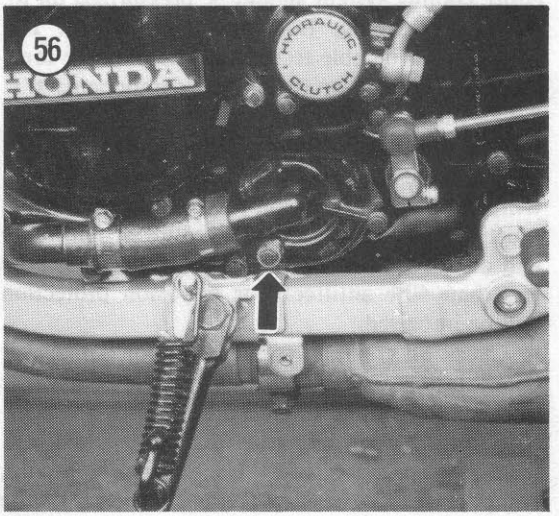
2. On Interceptor models, remove the front fairing and lower cowl as described in Chapter Twelve.
3. Remove the radiator cap (**Figure 54**). This will speed up the draining process.
4A. On Magna models, place a drain pan under the left-hand side of the frame. Remove the drain plug (**Figure 55**) on the subframe on the left-hand side.
4B. On Interceptor models, place a drain pan under the engine on the left-hand side of the bike under the water pump. Remove the drain screw (**Figure 56**) from the water pump cover.
5. Place a drain pan under the front pair of cylinders. Remove the drain screw (**Figure 57**) and sealing washer on each side of the front pair of cylinders.
6. Do not install any of the drain screws at this time.
7. Take the bike off the centerstand and tip the bike from side to side to drain any residual coolant from the cooling system. Place the bike back onto the centerstand.
8. Install both drain screws and sealing washers on the front pair of cylinders, the sub-frame (Magna models) or the water pump cover (Interceptor models).
9. Remove the coolant reserve tank as described in Chapter Eight and pour out the old coolant. Wash out any residue that may have formed in the bottom of the tank.
10. Install the coolant reserve tank as described in Chapter Eight.
11. To refill the radiator, perform the following:

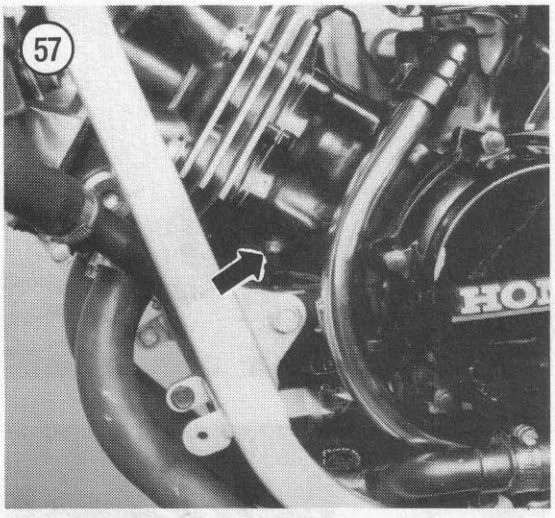
a. Use the recommended mixture of antifreeze and distilled water; see **Table 9**.
b. Add the coolant through the radiator filler neck, not the reserve tank.
c. Take the bike off the centerstand and tip the bike from side to side to bring up most of the air bubbles in the cooling system. Place the bike back onto the centerstand.
d. Do not install the radiator cap at this time.

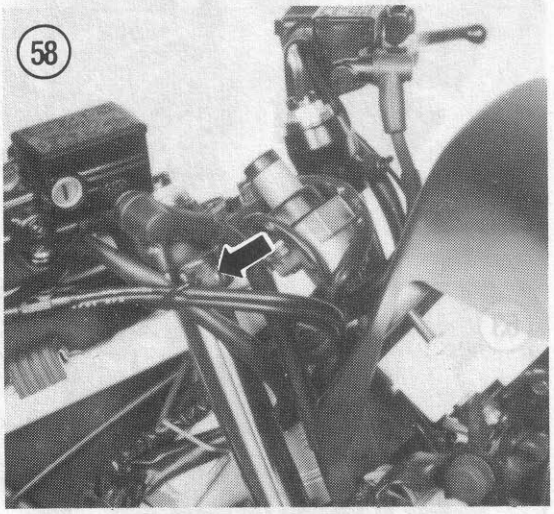
12. Start the engine and let it run at idle speed until the engine reaches normal operating temperature. Make sure there are no air bubbles in the coolant and that the coolant level stabilizes at the correct level. Add coolant as necessary.
13. Install the radiator cap.
14. Add coolant to the reserve tank to the correct level.
15. On Interceptor models, install the front fairing and the lower cowl as described in Chapter Twelve.
16. Test ride the bike and readjust the coolant level in the reserve tank if necessary.

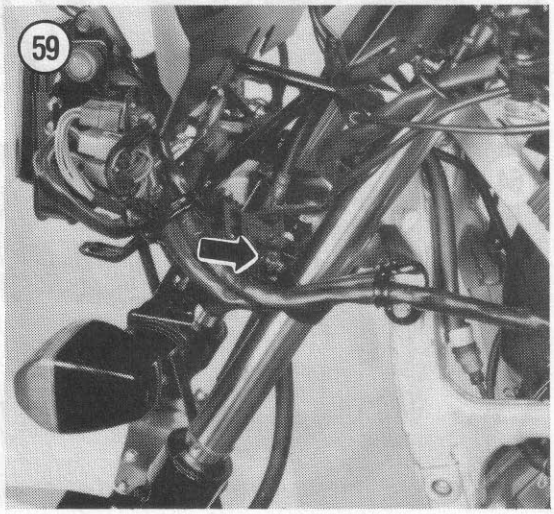












Wheel Bearings

There is no factory-recommended mileage interval for inspecting the wheel bearings. They should be checked whenever the wheel(s) is removed or whenever there is the likelihood of water contamination. The correct service procedures are covered in Chapter Nine and Chapter Ten.

Steering Head Adjustment Check

The steering head is fitted with either loose or assembled bearings. It should be checked as indicated in **Table 1**.

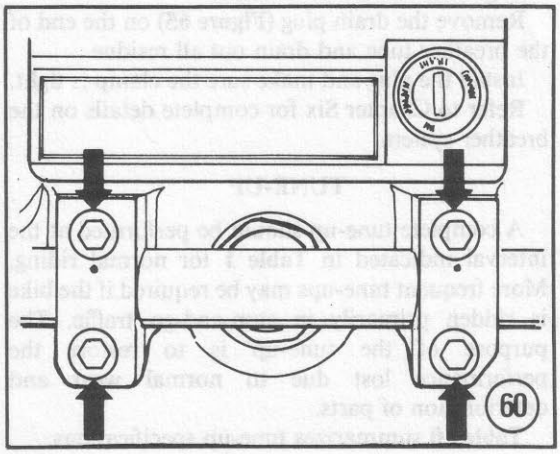
Place the bike up on wood block(s) so that the front wheel is off the ground. Hold onto the front fork tubes and gently rock the fork assembly back and forth. If you can feel looseness, the steering stem must be disassembled and adjusted; refer to Chapter Nine.

Front Suspension Check

1. Apply the front brake and pump the forks up and down as vigorously as possible. Check for smooth operation and check for any oil leaks.
2. Make sure the upper (**Figure 58**) and lower (**Figure 59**) fork bridge bolts are tight.
3A. On Magna models, make sure the handlebar holder bolts (**Figure 60**) are tight.
3B. On Interceptor models, make sure the pinch bolts (**Figure 61**) securing the handlebars are tight and that both handlebars are secure.
4. Make sure the front axle (**Figure 62**) or axle holder nuts (**Figure 63**) are tight.

CAUTION

If any of the previously mentioned bolts and nuts are loose, refer to Chapter Nine for correct procedures and torque specifications.



Rear Suspension Check

1. Place the bike on the centerstand.
2. Push hard on the rear wheel (sideways) to check for side play in the rear swing arm bushings.
3. Check the tightness of the shock absorber's upper and lower shock absorber mounting bolts and nuts.
4. Make sure the rear axle nut is tight (**Figure 64**).

CAUTION

If any of the previously mentioned bolts and nuts are loose, refer to Chapter Ten for correct procedures and torque specifications.

Nuts, Bolts and Other Fasteners

Constant vibration can loosen many of the fasteners on the motorcycle. Check the tightness of all fasteners, especially those on:

a. Engine mounting hardware.
b. Engine front and rear covers.
c. Handlebar and front forks.
d. Gearshift lever.
e. Brake pedal and lever.
f. Exhaust system.

Sidestand Rubber

The rubber pad on the sidestand kicks the sidestand up if you should forget. If it wears down to the molded line it, will no longer be effective and must be replaced.

Remove the bolt and replace the rubber pad with a new one. Be sure the new rubber pad is marked "Over 260 lbs. Only."

Crankcase Breather
(U.S. Models Only)

At the interval indicated in **Table 1** or sooner if a considerable amount of riding is done at full throttle or in the rain, the residue in the breather storage tank should be drained.

Remove the drain plug (**Figure 65**) on the end of the breather tube and drain out all residue.

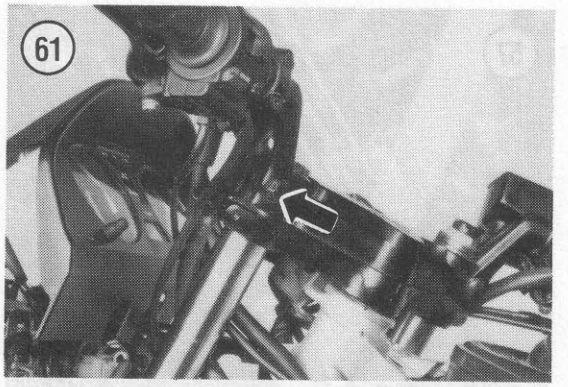
Install the plug and make sure the clamp is tight.

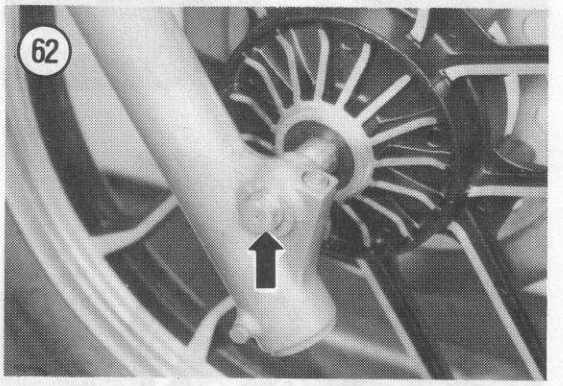
Refer to Chapter Six for complete details on the breather system.

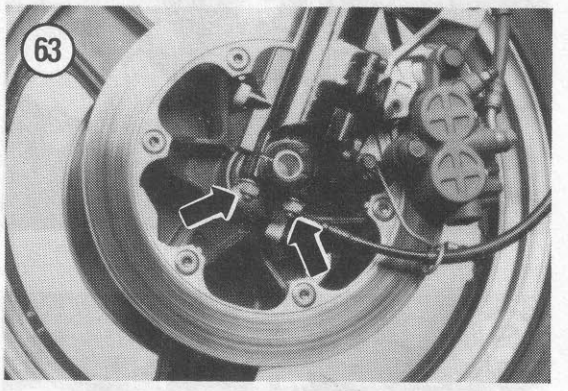
TUNE-UP

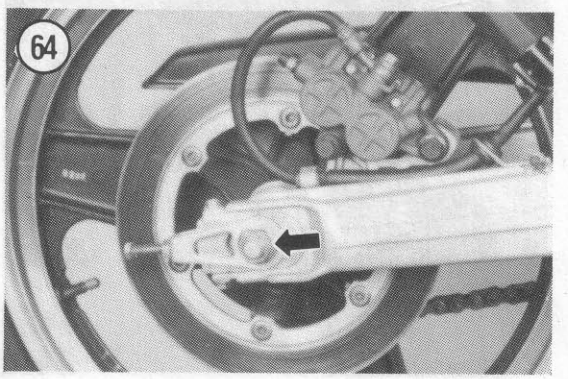
A complete tune-up should be performed at the interval indicated in **Table 1** for normal riding. More frequent tune-ups may be required if the bike is ridden primarily in stop-and-go traffic. The purpose of the tune-up is to restore the performance lost due to normal wear and deterioration of parts.

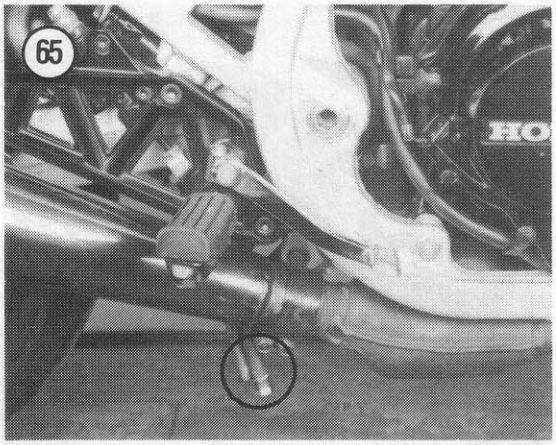
Table 10 summarizes tune-up specifications.

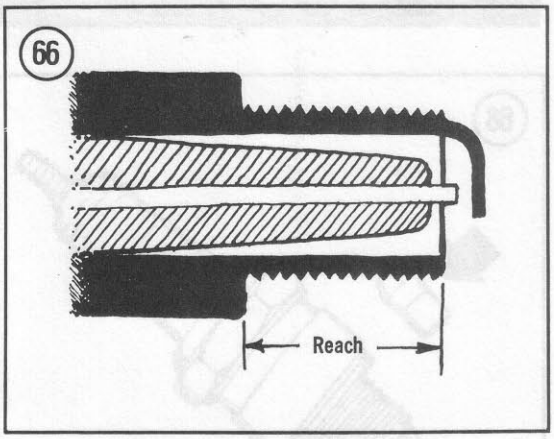












The spark plugs should be routinely replaced at every tune-up. Have the new parts on hand before you begin.

The cam chain tensioners are completely automatic and do not require any periodic adjustment. There are no provisions for tensioner adjustment on the engine.

The air filter element should be replaced prior to doing other tune-up procedures, as described in this chapter.

Because different systems in an engine interact, the procedure should be done in the following order:

a. Replace the air filter element.
b. Replace the spark plugs.
c. Adjust the valves.
d. Check the ignition timing.
e. Run a compression test.
f. Adjust the carburetor idle speed.
g. Synchronize the carburetors.

To perform a tune-up on your Honda, you will need the following tools:

a. 18 mm spark plug wrench.
b. Socket wrench and assorted sockets.
c. Compression gauge.
d. Spark plug wire feeler gauge and gapper tool.
e. Ignition timing light.
f. Tune-up tachometer.
g. Manometer (carburetor synchronization tool).

Spark Plug Selection

Spark plugs are available in various heat ranges, hotter or colder than plugs originally installed at the factory.

Select plugs of a heat range designed for the loads and temperature conditions under which the bike will be run. The use of incorrect heat ranges can cause seized pistons, scored cylinder walls or damaged piston crowns.

NOTE

Higher plug numbers designate colder plugs; lower plug numbers designate hotter plugs. For example, an NGK BP8ES plug is colder than an NGK BP7ES plug.

In general, use a hot plug for low speeds, low engine loads and low temperatures. Use a cold plug for high speeds, high engine loads and high temperatures. The plug should operate hot enough to burn off unwanted deposits, but not so hot that it is damaged or causes preignition. A spark plug of the correct heat range will show a light tan color on the portion of the insulator within the cylinder after the plug has been in service.

In areas where seasonal temperature variations are great, the factory recommends a "2-plug system"—cold plugs for hard summer riding and hot plugs for slower winter operation.

The reach (length) of a plug is also important. A longer than normal plug could interfere with the valves and pistons, causing permanent and severe damage. Refer to **Figure 66**. The recommended spark plugs are listed in **Table 10**.

Spark Plug Removal/Cleaning

1. Grasp the spark plug lead (**Figure 67**) as near to the plug as possible and pull it off the plug. If the boot is stuck to the plug, twist it slightly back and forth to break it loose.
2. Blow away any dirt that has accumulated in the spark plug wells.

CAUTION

The dirt could fall into the cylinders when the plugs are removed, causing serious engine damage.

3. Remove spark plugs with an 18 mm spark plug wrench.

NOTE

If plugs are difficult to remove, apply penetrating oil around base of plugs and let it soak in about 10-20 minutes.

4. Inspect each spark plug carefully. Look for a plug with a broken center porcelain, excessively eroded electrodes and excessive carbon or oil fouling. Replace such plugs. If deposits are light, the plug may be cleaned in solvent with a wire brush or in a special spark plug sandblast cleaner. Regap the plug as explained in this chapter.

Spark Plug Gapping and Installation

New plugs should be carefully gapped to ensure a reliable, consistent spark. You must use a special spark plug gapping tool with a wire feeler gauge.

Be sure to replace all 4 spark plugs at the same time; all 4 plugs must be of the same heat range.

1. Remove the new plugs from the box. Do *not* screw in the small piece that is loose in each box (**Figure 68**); it is not used.
2. Insert a wire feeler gauge between the center and the side electrode of each plug (**Figure 69**). The correct gap is 0.8-0.9 mm (0.031-0.035 in.). If the gap is correct, you will feel a slight drag as you pull the wire through. If there is no drag or the gauge won't pass through, bend the side electrode *with the gapping tool* (**Figure 70**) to set the proper gap.
3. Put a *small* drop of oil or aluminum anti-seize compound on the threads of each spark plug.
4. Install the spark plug into a spark plug wrench and extension.
5. Screw each spark plug in by hand until it seats. Very little effort is required. If force is necessary, you have a plug cross-threaded; unscrew it and try again.
6. Tighten the spark plugs an additional 1/2 turn after the gasket has made contact with the head. If you are reinstalling old, regapped plugs and are reusing the old gasket, tighten only an additional 1/4 turn.

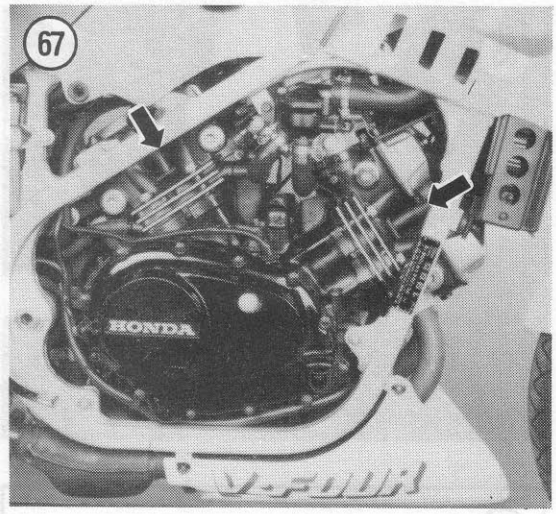
CAUTION

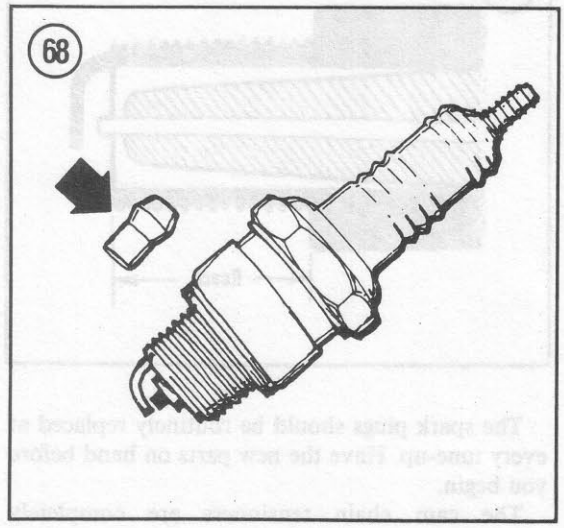
Do not overtighten. This will only squash the gasket and destroy its sealing ability.

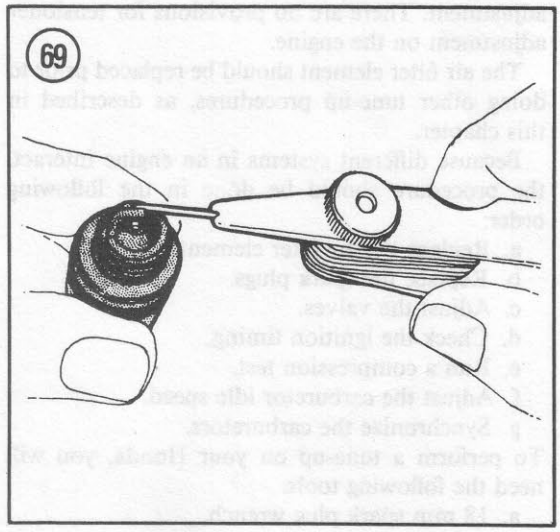
7. Install each spark plug lead; make sure the lead is on tight.

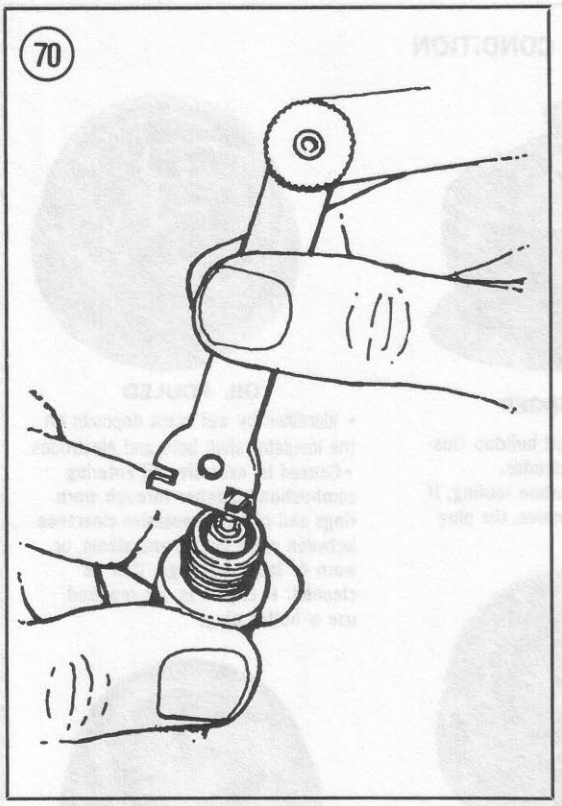
Reading Spark Plugs

Much information about engine and spark plug performance can be determined by careful









examination of the spark plugs. This information is valid only after performing the following steps.

1. Ride the bike a short distance at full throttle in any gear.
2. Turn the engine kill switch to the OFF position before closing the throttle and simultaneously pull in the clutch or shift to NEUTRAL; coast and brake to a stop.
3. Remove the spark plugs and examine them. Compare them to **Figure 71**. If the electrodes are white or burned, the plug is too hot and should be replaced with a colder one.

A too-cold plug will have sooty or oily deposits ranging in color from dark brown to black. Replace with a hotter plug and check for too-rich carburetion or evidence of oil blowby at the piston rings.

If the plug has a light tan or gray colored deposit and no abnormal gap wear or electrode erosion is evident, the plug and the engine are running properly.

If the plug exhibits a black insulator tip, a damp and oily film over the firing end and a carbon layer over the entire nose, it is oil fouled. An oil fouled plug can be cleaned, but it is better to replace it.

If any one plug is found unsatisfactory, discard and replace all plugs.

Valve Clearance Adjustment

Valve clearance must be measured with the engine cool, at room temperature (95° F/35° C or less). The correct valve clearance for all models is as follows:

a. Intake valves: 0.12 mm (0.004 in.).
b. Exhaust valves: 0.13 mm (0.005 in.).

There are 2 intake and 2 exhaust valves in each cylinder. To achieve the most accurate valve clearance use the factory suggested method described in this procedure.

In this procedure, 2 Honda special tools are recommended. They are not absolutely necessary but due to the limited working room within the cylinder head it is a lot easier with these tools.

1. Lean the bike from side to side to drain residual oil from the pockets in the cylinder heads into the crankcase.
2. Place the bike on the centerstand.
3. Remove the seat as described in Chapter Twelve.
4. Remove the right-hand and left-hand side covers.
5. Disconnect the battery negative (-) lead.
6. Remove the fuel tank as described in Chapter Six.
7. On Interceptor models, remove the lower cowl as described in Chapter Twelve. Removal of the lower cowl is to gain more room to work.
8. Remove the radiator as described in Chapter Eight.
9. Disconnect the spark plug caps and leads.

10A. On Magna models, perform the following:

a. Remove the front cylinders' spark plug wires from the clips on the frame cross bar.
b. Remove the bolt on each side securing the frame cross bar to the frame and remove the cross bar.

10B. On Interceptor models, perform the following:

a. Disconnect the ignition coil primary wires (A, **Figure 72**).
b. Remove the bolts (B, **Figure 72**) securing the ignition coil assembly and remove the assembly.
c. Remove the plastic heat shield (C, **Figure 72**).

11. Remove the bolts securing the front and rear cylinder head covers (**Figure 73**) and remove both covers. The rubber sealing gaskets will come off with each cover.
12. Remove the clutch slave cylinder as described under *Clutch Slave Cylinder Removal/Installation (Intact)* in Chapter Five.
13. Place a drain pan under the alternator cover and remove the bolts securing the alternator cover

(71)

SPARK PLUG CONDITION

NORMAL

- Identified by light tan or gray deposits on the firing tip.
- Can be cleaned.

GAP BRIDGED

- Identified by deposit buildup closing gap between electrodes.
- Caused by oil or carbon fouling. If deposits are not excessive, the plug can be cleaned.

OIL FOULED

- Identified by wet black deposits on the insulator shell bore and electrodes.
- Caused by excessive oil entering combustion chamber through worn rings and pistons, excessive clearance between valve guides and stems, or worn or loose bearings. Can be cleaned. If engine is not repaired, use a hotter plug.

CARBON FOULED

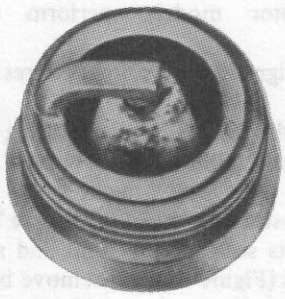
- Identified by black, dry fluffy carbon deposits on insulator tips, exposed shell surfaces and electrodes.
- Caused by too cold a plug, weak ignition, dirty air cleaner, too rich a fuel mixture, or excessive idling. Can be cleaned.

LEAD FOULED

- Identified by dark gray, black, yellow, or tan deposits or a fused glazed coating on the insulator tip.
- Caused by highly leaded gasoline. Can be cleaned.

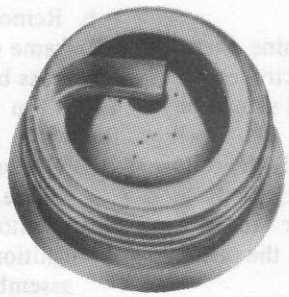
WORN

- Identified by severely eroded or worn electrodes.
- Caused by normal wear. Should be replaced.



FUSED SPOT DEPOSIT

- Identified by melted or spotty deposits resembling bubbles or blisters.
- Caused by sudden acceleration. Can be cleaned.



OVERHEATING

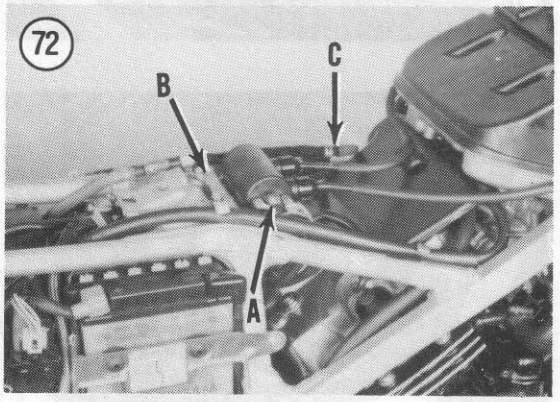
- Identified by a white or light gray insulator with small black or gray brown spots and with bluish-burnt appearance of electrodes.
- Caused by engine overheating, wrong type of fuel, loose spark plugs, too hot a plug, or incorrect ignition timing. Replace the plug.

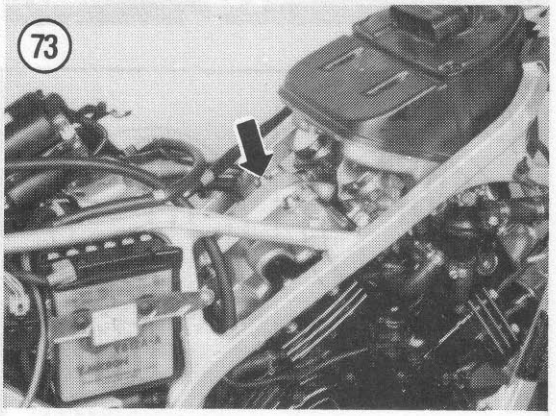
PREIGNITION

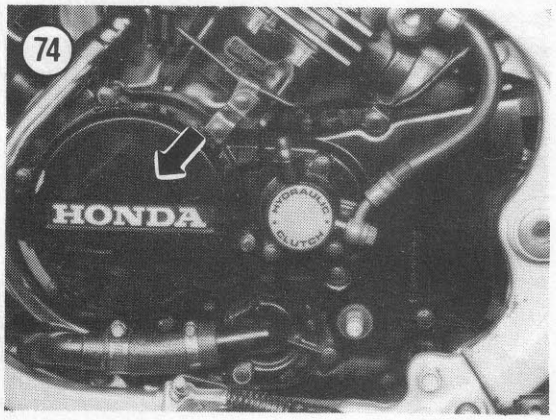
- Identified by melted electrodes and possibly blistered insulator. Metallic deposits on insulator indicate engine damage.
- Caused by wrong type of fuel, incorrect ignition timing or advance, too hot a plug, burned valves, or engine overheating. Replace the plug.

(**Figure 74**). Remove the cover and gasket. Some engine oil may drain out.

14. Remove all 4 spark plugs as described in this chapter (this will make it easier to turn the engine over by hand).
15. Shift the transmission into NEUTRAL.
16. The correct valve clearance for all models is as follows:
    a. Intake valves: 0.12 mm (0.004 in.).
    b. Exhaust valves: 0.13 mm (0.005 in.).







NOTE

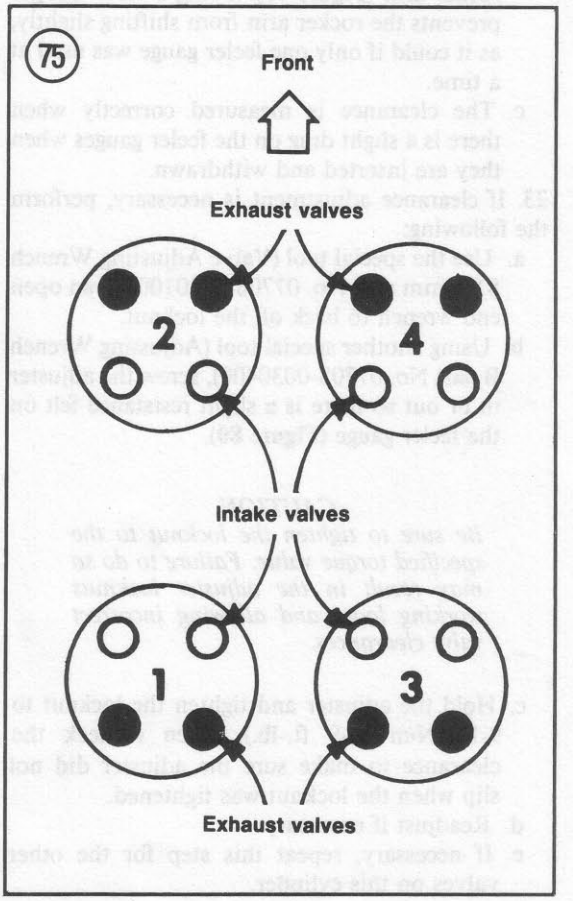
The No. 2 and 4 cylinders are at the front with the No. 2 cylinder on the left-hand side. Refer to ***Figure 75****. The No. 1 and 3 cylinders are at the rear with the No. 1 on the left-hand side. The left-hand side refers to a rider sitting on the seat facing forward. The intake valves are located toward the center "V" of the engine (near the carburetors) and the exhaust valves are located at the front and rear of the engine (near the exhaust pipes).*

17. Unscrew the ignition timing inspection hole cover (**Figure 76**).

NOTE

The following step requires the aid of a helper since the alternator is on one side of the bike and the timing mark is on the other side.

18. Using a wrench on the alternator bolt (**Figure 77**), rotate the crankshaft *counterclockwise* (as viewed from the left-hand side) until the "TR" timing mark (on the starter clutch assembly) aligns



with the index mark on the crankcase cover timing hole (**Figure 78**).

19. The No. 1 cylinder must be at top dead center (TDC) on the compression stroke.

NOTE

A cylinder at TDC on its compression stroke will have free play in all of its rocker arms, indicating that both pairs of intake and exhaust valves are closed.

20. If the No. 1 cylinder is not at TDC, repeat Step 18. Rotate the crankshaft 360° (one full turn) and realign the "TR" timing mark (**Figure 78**). Check that the cylinder is now at TDC on the compression stroke.

21. Check and record the clearances on both intake valves and both exhaust valves on the No. 1 cylinder.

22. To measure the clearance, perform the following:

a. Insert a flat feeler gauge between the valve stem and the valve adjuster.

b. Insert a separate flat feeler gauge at both of the valve measurement points on a common rocker arm (**Figure 79**). Using 2 feeler gauges prevents the rocker arm from shifting slightly, as it could if only one feeler gauge was used at a time.

c. The clearance is measured correctly when there is a slight drag on the feeler gauges when they are inserted and withdrawn.

23. If clearance adjustment is necessary, perform the following:

a. Use the special tool (Valve Adjusting Wrench 8×9 mm part No. 07708-0030100) or an open end wrench to back off the locknut.

b. Using another special tool (Adjusting Wrench B part No. 07708-0030400), screw the adjuster in or out so there is a slight resistance felt on the feeler gauge (**Figure 80**).

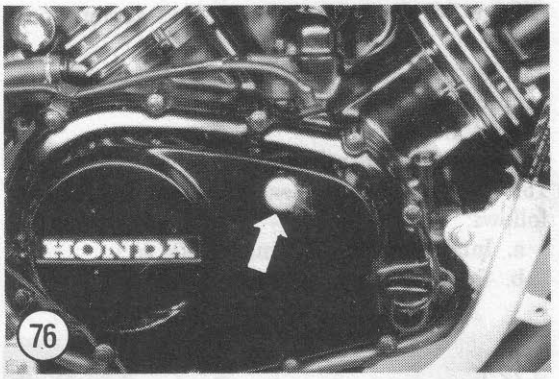
CAUTION

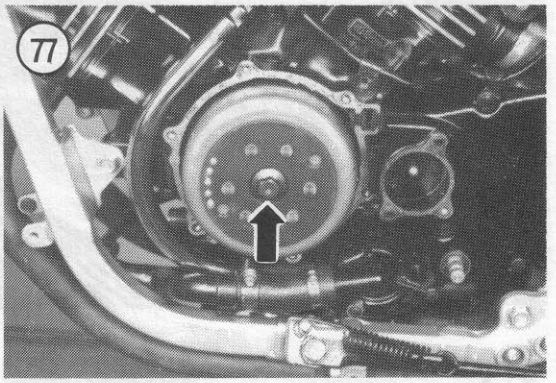
Be sure to tighten the locknut to the specified torque value. Failure to do so may result in the adjuster locknuts working loose and allowing incorrect valve clearances.

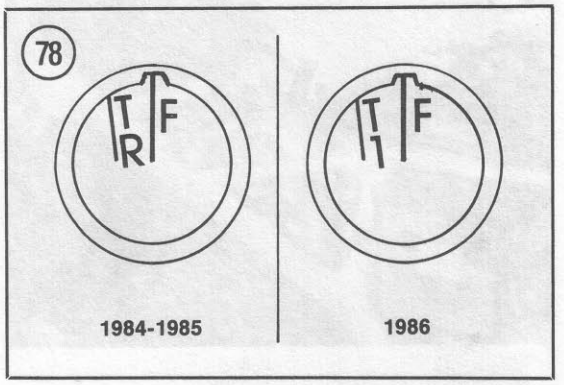
c. Hold the adjuster and tighten the locknut to 9-12 N•m (6-9 ft.-lb.). Then recheck the clearance to make sure the adjuster did not slip when the locknut was tightened.

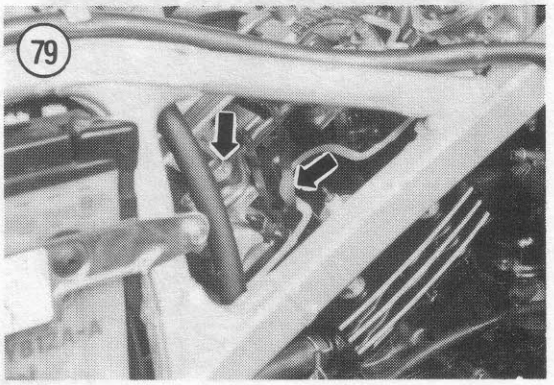
d. Readjust if necessary.

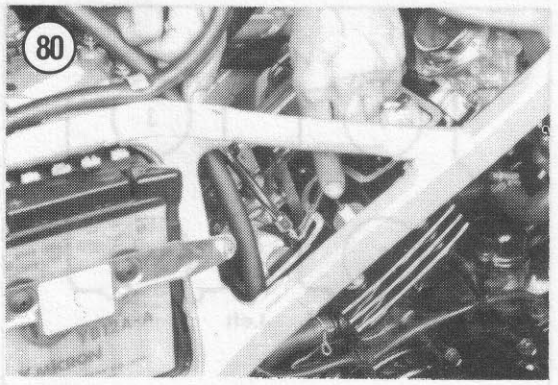
e. If necessary, repeat this step for the other valves on this cylinder.

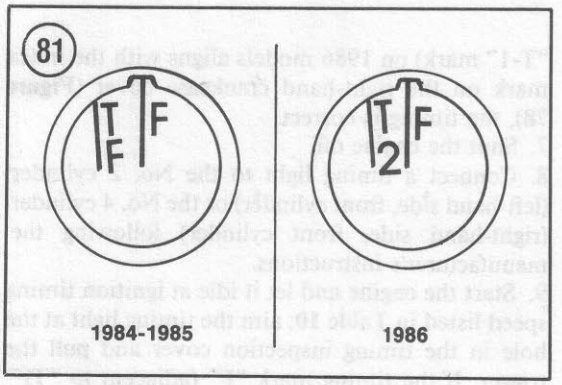


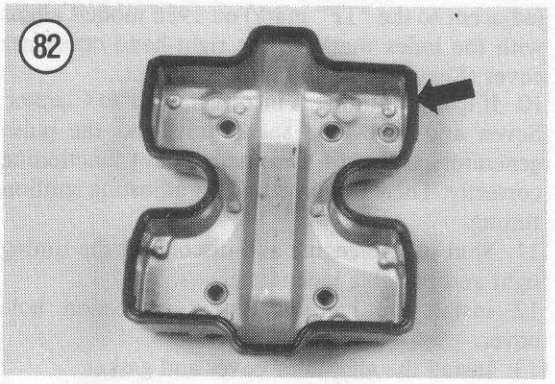


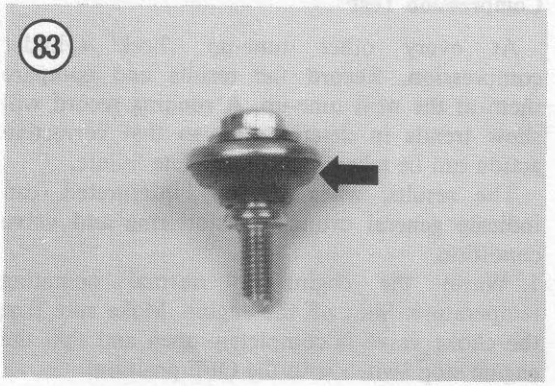












24. Using a wrench on the alternator bolt (**Figure 77**), rotate the crankshaft *counterclockwise* (as viewed from the left-hand side) 90° until the "TF" timing mark (on the starter clutch assembly) aligns with the index mark on the crankcase cover timing hole (**Figure 81**).
25. The No. 4 cylinder must be at top dead center (TDC) on the compression stroke.
26. With the engine at this position, repeat Step 22 and Step 23 to check and record the clearance for the valves of the No. 4 cylinder.
27. Using a wrench on the alternator bolt (**Figure 77**), rotate the crankshaft *counterclockwise* (as viewed from the left-hand side) 270° until the "TR" timing mark (on the starter clutch assembly) aligns with the index mark on the crankcase cover timing hole (**Figure 78**).
28. The No. 3 cylinder must be at top dead center (TDC) on the compression stroke.
29. With the engine at this position, repeat Step 22 and Step 23 to check and record the clearance for the valves of the No. 3 cylinder.
30. Using a wrench on the alternator bolt (**Figure 77**), rotate the crankshaft *counterclockwise* (as viewed from the left-hand side) until the "TF" timing mark (on the starter clutch assembly) aligns with the index mark on the crankcase cover timing hole (**Figure 81**).
31. The No. 2 cylinder must be at top dead center (TDC) on the compression stroke.
32. With the engine at this position, repeat Step 22 and Step 23 to check and record the clearance for the valves of the No. 2 cylinder.
33. Inspect the the rubber gasket on each cylinder head cover (**Figure 82**) and cover bolt (**Figure 83**). Replace if they are starting to deteriorate or harden; replace as a set even if only one is bad.
34. Install the covers and tighten the bolts to 8-12 N•m (6-9 ft.-lb.).
35. Install all 4 spark plugs.
36. Install a new gasket, then install the alternator cover. Tighten the bolts securely.
37. Install the clutch slave cylinder as described under *Clutch Slave Cylinder Removal/Installation (Intact)* in Chapter Five.

38A. On Magna models, perform the following:
- a. Install the frame cross bar onto the frame and tighten the bolts securely.
- b. Attach the front cylinders' spark plug wires to the clips on the cross bar.

38B. On Interceptor models, perform the following:
- a. Install the plastic heat shield.
- b. Install the ignition coil assembly, then install the bolts. Tighten the bolts securely.

c. Connect the ignition coil primary wires to the ignition coils.

39. Install the ignition timing inspection hole cover (**Figure 76**).
40. Connect the spark plug caps and leads.
41. Install the radiator as described in Chapter Eight.
42. On Interceptor models, install the lower cowl as described in Chapter Twelve.
43. Install the fuel tank as described in Chapter Six.
44. Connect the battery negative (-) lead.
45. Install the right-hand and left-hand side covers.
46. Install the seat as described in Chapter Twelve.
47. Check engine oil level as described in this chapter and add oil if necesary.

Ignition Timing

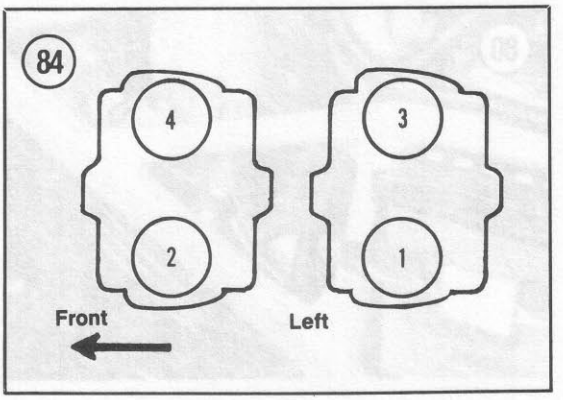
The Honda V-Fours are equipped with a capacitor discharge ignition system (CDI). This system uses no breaker points and is non-adjustable. The timing should be checked to make sure all ignition components are operating correctly.

Incorrect ignition timing can cause a drastic loss of engine performance and efficiency. It may also cause overheating.

Before starting on this procedure, check all electrical connections related to the ignition system. Make sure all connections are tight and free of corrosion and that all ground connections are tight.

Refer to **Figure 84** for cylinder number locations.

1. Start the engine and let it reach normal operating temperature. Shut the engine off.
2. Place the bike on the centerstand.
3. Unscrew the ignition timing inspection hole cover (**Figure 76**).
4. Connect a portable tachometer following the manufacturer's instructions. The bike's tachometer is not accurate enough in the low rpm range for this adjustment.
5. Connect a timing light to the No. 1 cylinder (left-hand side, rear cylinder) or the No. 3 cylinder (right-hand side, rear cylinder) following the manufacturer's instructions.
6. Start the engine and let it idle at ignition timing speed listed in **Table 10**; aim the timing light at the hole in the timing inspection cover and pull the trigger. If the timing mark "F" (adjacent to "TR" mark) on 1984-1985 models or "F" (adjacent to "T-1" mark) on 1986 models aligns with the index mark on the right-hand crankcase cover (**Figure 78**), the timing is correct.
7. Shut the engine off.
8. Connect a timing light to the No. 2 cylinder (left-hand side, front cylinder) or the No. 4 cylinder (right-hand side, front cylinder) following the manufacturer's instructions.
9. Start the engine and let it idle at ignition timing speed listed in **Table 10**; aim the timing light at the hole in the timing inspection cover and pull the trigger. If the timing mark "F" (adjacent to "TF" mark) on 1984-1985 models or "T-2" mark (adjacent to the "TF" mark) on 1986 models aligns with the index mark on the right-hand crankcase cover (**Figure 81**), the timing is correct.
10. If ignition timing is incorrect, refer to Chapter Seven and check the spark units and the pulse generators as one of these parts is not functioning correctly. There is no method for adjusting ignition timing.
11. Shut off the engine and disconnect the timing light and portable tachometer.
12. Install the ignition timing inspection hole cover.
13. Install the alternator cover and gasket.



Compression Test

At every other tune-up check cylinder compression. Record the results and compare them at the next tune-up. A running record will show trends in deterioration so that corrective action can be taken before complete failure.

The results, when properly interpreted, can indicate general cylinder, piston ring and valve condition.

1. Warm the engine to normal operating temperature. Shut off the engine. Make sure that the choke valve is completely open and that the engine stop switch is in the OFF position.

2. Place the bike on the centerstand.
3. Disconnect the spark plug wires from all spark plugs.
4. Remove the spark plug from each cylinder.
5. Connect the compression tester to one cylinder following manufacturer's instructions.
6. Open the throttle completely and using the starter, crank the engine over until there is no further rise in pressure. Maximum pressure is usually reached within 4-7 seconds of engine cranking.

NOTE

Do not turn the engine over more than absolutely necessary. When spark plug leads are disconnected, the electronic ignition will produce the highest voltage possible and the coils may overheat and be damaged.

7. Remove the tester and record the reading.
8. Repeat Steps 5-7 for the other cylinders.

When interpreting the results, actual readings are not as important as the difference between the readings. Readings should be about 10-14 kg/cm2 (142-199 psi). A maximum difference of 1.0 kg/cm2 (14 psi) between the cylinders is acceptable. Greater differences indicate worn or broken rings, leaking or sticking valves, a blown head gasket(s) or a combination of all.

If compression readings do not differ between the cylinders by more than 10 psi, the rings and valves are in good condition.

If a low reading (10% or more) is obtained on one of the cylinders, it indicates valve or ring trouble. To determine which, insert a small funnel into the spark plug hole and pour about a teaspoon of engine oil through it onto the top of the piston. Turn the engine over once to clear some of the excess oil, then take another compression test and record the reading. If the compression returns to normal, the valves are good but the rings are defective on that cylinder. If compression does not increase, the valves require servicing. A valve could be hanging open or a piece of carbon could be on a valve seat.

9. Install the spark plugs and spark plug wires.

Carburetor Idle Mixture

The idle mixture (pilot screw) is preset at the factory and *is not to be reset*. This pertains to all 4 carburetors. Do not adjust the pilot screws unless the carburetors have been overhauled; refer to *Pilot Screw Adjustment* in Chapter Six.

Carburetor Synchronization

When the carburetors are properly synchronized the engine will warm up faster and there will be an improvement in throttle response, performance and mileage.

Prior to synchronizing the carburetors, the air filter element must be clean and valve clearances must be properly adjusted. The ignition timing must also be checked to make sure all components are operating correctly.

This procedure requires special tools. You will need a mercury manometer (carb-sync tool). This is a tool that measures the manifold vacuum for all 4 cylinders simultaneously. A carb-sync tool can be purchased from a Honda dealer, motorcycle supply store or mail order firm.

NOTE

When purchasing this tool, check that it is equipped with restrictors. These restrictors keep the mercury from being drawn into the engine when engine rpm is increased during the adjustment procedure. If the mercury is drawn into the engine the tool will have to be replaced.

One additional special tool is needed. It is the carburetor pilot screw adjusting wrench (Honda part No. 07908-KE70000). This tool is used to turn the synchronization screws that are very difficult, if not impossible, to get to with a screwdriver.

Magna models

1. Start the engine and let it warm up to normal operating temperature. Ten minutes of stop-and-go riding is usually sufficient. Shut off the engine.
2. Place the bike on the centerstand.
3. Remove both side covers.

NOTE

It is necessary to lift the coolant hose to gain access to the vacuum plug on the No. 4 cylinder.

4. Remove the vacuum plug (consisting of a screw and flat washer) from all 4 cylinder heads (**Figure 85**).
5. Connect the vacuum lines from the carb-sync tool, following the manufacturer's instructions. Be sure to route the vacuum lines to the correct cylinder. Most carb-sync tools have the cylinder number indicated on them next to each tube containing mercury.

NOTE

The No. 4 carburetor has no synchronization screw; the other 3

carburetors must be synchronized to it. The carburetors are numbered in the same manner as the cylinders as shown in ***Figure 84****.*

6. Start the engine and let it idle at 1,300 rpm ±100 rpm.
7. If the difference in gauge readings is 60 mm Hg (2.4 in. Hg) or less among all 4 cylinders, the carburetors are considered synchronized. If not, proceed as follows.

NOTE

Figure 86 *is shown with the carburetor assembly removed for clarity. Do not remove the carburetor assembly to perform this procedure.*

8. Using the special tool described in the introduction to the procedure, turn the adjusting screw on the No. 3 carburetor (A, **Figure 86**). Turn the adjusting screw until the reading is the same as that on the No. 4 carburetor. Open the throttle a little and close it back down after each adjustment.

CAUTION

If your carb-sync tool is not equipped with restrictors, open and close the throttle very gently to avoid sucking mercury into the engine. If this happens, it will not harm the engine but will render the tool useless.

9. Repeat Step 8 for the No. 1 (B, **Figure 86**) and No. 2 (C, **Figure 86**) carburetors. Repeat Step 8 until all carburetors have the same gauge readings as the No. 4 carburetor.

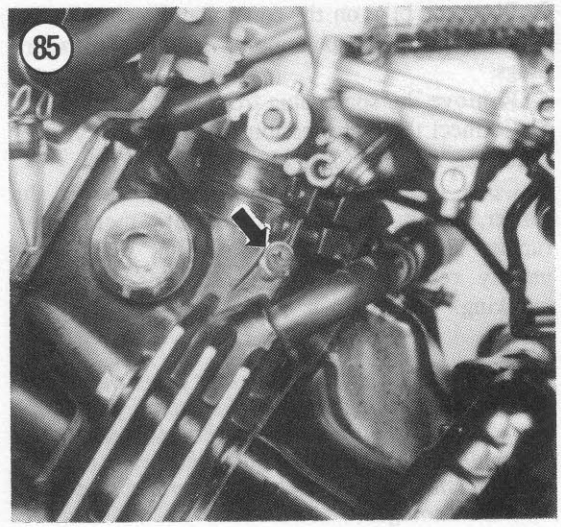
NOTE

To gain the utmost in performance and efficiency from the engine, adjust the carburetors so that the gauge readings are as close to each other as possible.

10. Shut off the engine and remove the vacuum lines. Install the screws and washers into the vacuum ports in the cylinder heads (**Figure 85**). Make sure they are in tight to prevent a vacuum leak.
11. Install the side covers.
12. Restart the engine and readjust the idle speed if necessary as described in this chapter.

Interceptor models

1. Start the engine and let it warm up to normal operating temperature. Ten minutes of stop-and-go riding is usually sufficient. Shut off the engine.
2. Place the bike on the centerstand.
3. Remove both side covers.

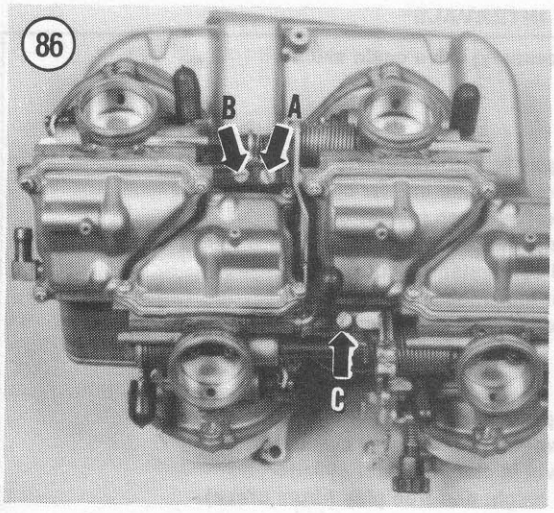


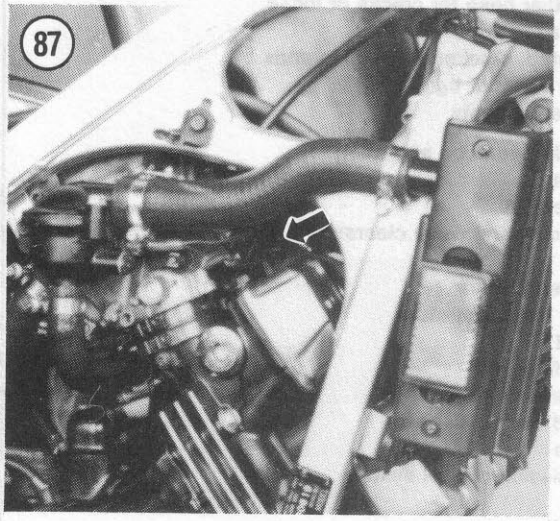
4. Remove the vacuum plug (consisting of a screw and flat washer) from the No. 2, No. 3 and No. 4 cylinder heads (**Figure 85**).
5. Connect the vacuum lines from the carb-sync tool, following the manufacturer's instructions, to these 3 cylinders only. Be sure to route the vacuum lines to the correct cylinder. Most carb-sync tools have the cylinder number indicated on them next to each tube containing mercury.
6. Restart the engine and let it idle.
7. Pinch the vacuum line going to the fuel shutoff valve from the No. 1 cylinder. This line must be pinched off completely so the vacuum will not be lost. If the vacuum is lost the fuel shutoff valve will close, shutting off the fuel supply, and the engine will stop running.
8. Disconnect the vacuum line from the No. 1 cylinder.
9. Connect the last vacuum line from the carb-sync tool to the No. 1 cylinder. Connect the vacuum line directly to the special fitting on the cylinder head or remove the fitting and connect the vacuum line as specified by the manufacturer.

NOTE

The No. 4 carburetor has no synchronization screw; the other 3 carburetors must be synchronized to it. The carburetors are numbered in the same manner as the cylinders as shown in ***Figure 84****.*

10. Start the engine and let it idle at 1,300 rpm ±100 rpm.
11. If the difference in gauge readings is 60 mm Hg (2.4 in. Hg) or less among all 4 cylinders, the carburetors are considered synchronized. If not, proceed as follows.





NOTE

Figure 86 is shown with the carburetor assembly removed for clarity. Do not remove the carburetor assembly to perform this procedure.

12. Using the special tool described in the introduction to the procedure, turn the adjusting screw on the No. 3 carburetor (A, **Figure 86**). Turn the adjusting screw until the reading is the same as that on the No. 4 carburetor. Open the throttle a little and close it back down after each adjustment.

CAUTION

If your carb-sync tool is not equipped with restrictors, open and close the throttle very gently to avoid sucking mercury into the engine. If this happens, it will not harm the engine but will render the tool useless.

13. Repeat Step 8 for the No. 1 (B, **Figure 86**) and No. 2 (C, **Figure 86**) carburetors. Repeat Step 8 until all carburetors have the same gauge readings as the No. 4 carburetor.

NOTE

To gain the utmost in performance and efficiency from the engine, adjust the carburetors so that the gauge readings are as close to each other as possible.

14. Shut off the engine and remove the vacuum lines. Install the screws and washers into the vacuum ports in the No. 1, No. 2 and No. 3 cylinder heads (**Figure 85**). Make sure they are in tight to prevent a vacuum leak.
15. If removed, install the special fitting onto the No. 1 cylinder head.
16. Connect the vacuum line from the fuel shutoff valve to the No. 1 cylinder.
17. Install the side covers.
18. Restart the engine and readjust the idle speed if necessary as described in this chapter.

Idle Speed Adjustment

Before making this adjustment, the air filter element must be clean, the carburetors must be synchronized and the engine must have adequate compression. Otherwise, this procedure cannot be done properly.

1. Attach a portable tachometer following the manufacturer's instructions.

NOTE

The bike's tachometer is not accurate enough in the low rpm range for this adjustment.

2. Start the engine and let it warm up to normal operating temperature.
3. Set the idle speed by turning the idle speed stop screw (**Figure 87**) in to increase or out to decrease idle speed. The correct idle speed is listed in **Table 10**.
4. Open and close the throttle a couple of times; check for variations in idle speed. Readjust if necessary.

WARNING

With the engine idling, move the handlebar from side to side. If idle speed increases during this movement, the throttle cables may need adjusting or they may be incorrectly routed through the frame. Correct this problem immediately. Do ***not*** *ride the bike in this unsafe condition.*

5. Shut off the engine and disconnect the portable tachometer.

Table 1 SERVICE INTERVALS*

Every 500 miles (300 miles) or 3 months	• Check and adjust (if necessary) drive chain slack • Lubricate drive chain
Every 1,000 km (600 km) or 6 months	• Check engine oil level • Check battery specific gravity and electrolyte level • Check hydraulic fluid level in brake master cylinder(s) • Check hydraulic fluid level in clutch master cylinder • Lubricate rear brake pedal and shift lever • Lubricate sidestand and centerstand pivot points • Inspect front steering for looseness • Check wheel bearings for smooth operation • Check wheel runout
Every 6,400 km (4,400 miles)	• Replace spark plugs • Check and adjust idle speed • Check hydraulic fluid level in brake master cylinder(s) • Check hydraulic fluid level in clutch master cylinder • Adjust rear brake pedal height and free play (drum brake) • Inspect brake pads and shoes for wear • Inspect crankcase breather hose for cracks or loose hose clamps; drain out all residue • Inspect fuel line for chafed, cracked or swollen ends • Check engine mounting bolts for tightness • Check all suspension components
Every 12,800 km (8,000 miles)	• Check and adjust throttle operation and free play • Check and adjust choke • Replace the air filter element • Check and adjust (if necessary) valve clearance • Check ignition timing • Check and adjust the carburetors • Check and synchronize the carburetors • Run a compression test • Change engine oil and filter • Inspect fuel lines for wetness or damage • Inspect the radiator and cooling system for damage or leakage • Inspect evaporative emission control system (California only) • Change front fork oil • Inspect wheel bearings • Inspect and repack the steering head bearings • Lubricate the speedometer drive cable • Check and adjust headlight aim
Every 19,200 km (12,000 miles)	• Change hydraulic fluid in clutch master cylinder • Change hydraulic fluid in brake master cyinder(s)
Every 24,000 miles (38,000 km)	• Replace fuel filter • Change coolant
Every 4 years	• Replace all hydraulic brake hoses • Replace all hydraulic clutch hoses

* This maintenance schedule should be considered as a guide to general maintenance and lubrication intervals. Harder than normal use and exposure to mud, water, sand, high humidity, etc. will naturally dictate more frequent attention to most maintenance items.

Table 2 TIRE INFLATION PRESSURE (COLD)*

Load	Air pressure	
	Magna	Interceptor
Up to 200 lb. (90 kg)		
Front	28 psi (2.00 kg/cm²)	32 psi (2.25 kg/cm²)
Rear	28 psi (2.00 kg/cm²)	32 psi (2.25 kg/cm²)
Maximum load limit**		
Front	28 psi (2.00 kg/cm²)	36 psi (2.5 kg/cm²)
Rear	32 psi (2.25 kg/cm²)	40 psi (2.8 kg/cm²)

* Recommended air pressure for original equipment tires. Aftermarket tires may require different air pressure.
** Maximum load limit includes total weight of motorcycle with accessories, rider(s) and luggage.

Table 3 FRONT FORK AIR PRESSURE

Model	Air pressure
All models	0-0.4 kg/cm² (0-6 psi)

Table 4 REAR SHOCK AIR PRESSURE

Model	Air pressure
Interceptor	0.5-1.5 kg/cm² (7-21 psi).

Table 5 STATE OF CHARGE

Specific Gravity	State of Charge
1.110-1.130	Discharged
1.140-1.160	Almost discharged
1.170-1.190	One-quarter charged
1.200-1.220	One-half charged
1.230-1.250	Three-quarters charged
1.260-1.280	Fully charged

Table 6 ENGINE OIL CAPACITY

Oil and filter change	2.5 liters (2.6 U.S. qt., 2.2 Imp. qt.)
At overhaul	3.0 liters (3.2 U.S. qt., 2.6 Imp. qt.)

Table 7 FRONT FORK OIL CAPACITY*

Model	Quantity
Magna (both legs)	400 cc (13.5 U.S. oz., 11.3 Imp. oz.)
Interceptor	
Right-hand leg	320 cc (10.8 U.S. oz., 9.0 Imp. oz.)
Left-hand leg	335 cc (11.3 U.S. oz., 9.4 Imp. oz.)

* Capacity for each fork leg.

Table 8 DRIVE CHAIN REPLACEMENT NUMBERS

Diado 50V3-108LE or Takasago RK50FO-108LE

Table 9 ANTIFREEZE PROTECTION

Temperature	Antifreeze-to-water Ratio
Above –25° F (–32° C)	45/55
Above –34° F (–37° C)	50/50
Above –48° F (–44.5° C)	55/45

Table 10 TUNE-UP SPECIFICATIONS

Item	Specification
Valve clearance (cold below 35° C/95° F)	
Intake	0.12 (0.004 in.)
Exhaust	0.13 (0.005 in.)
Compression pressure (at sea level)	10.0-14.0 kg/cm² (142-196 psi)
Spark plug type	
Standard heat range	ND X24EPR-U9 or NGK DPR8EA-9
Cold weather*	ND X22EPR-U9 or NGK DPR7EA-9
Extended high speed	ND X27EPR-U9 or NGK DPR9EA-9
Spark plug gap	0.8-0.9 mm (0.031-0.035 in.)
Ignition timing	"F" mark next to "TF"—front cylinders
at 1,700 rpm	"F" mark next to "TR"—rear cylinders
Idle speed	1,300 ±100 rpm
Firing order	1-4-3-2

* Cold weather climate—below 5° C (41° F).

NOTE: If you own a 1986 model, first check the Supplement at the back of the book for any new service information.

CHAPTER FOUR

ENGINE

The engine is a water-cooled, 4-stroke, V-configuration 4 cylinder (V-4) with double overhead camshafts. The crankshaft is supported by 4 main bearings and the camshafts are chain driven from the timing sprockets on the crankshaft. The camshafts operate rocker arms above each of the 4 valves per cylinder. Each valve has its own adjuster.

The engine does not have a separate cylinder block. The cylinders are an integral part of the upper crankcase.

Engine lubrication is by wet sump, with the oil supply housed in the crankcase. The chain-driven oil pump supplies oil under pressure throughout the engine.

The starter motor is located under the front cylinder head and drives the starter clutch just forward of the clutch.

This chapter provides complete service and overhaul procedures for the Honda V-4 engine. Although the clutch and the transmission are located within the engine, they are covered separately in Chapter Five to simplify the presentation of this material.

Service procedures for all models are virtually the same. Where differences occur, they are identified.

Table 1 provides complete engine specifications. **Tables 1-6** are located at the end of this chapter.

ENGINE PRINCIPLES

Figure 1 explains how the engine works. This will be helpful when troubleshooting or repairing the engine.

SERVICING ENGINE IN FRAME

The following components can be serviced while the engine is mounted in the frame (the bike's frame is a great holding fixture for breaking loose stubborn bolts and nuts):

a. Camshafts.
b. Cylinder heads.
c. Clutch assembly.
d. Alternator.
e. Carburetor assembly.
f. External shift mechanism.
g. Oil pump.

NOTE

The camshafts and cylinder heads can be removed with the engine in the frame, but it's ***much*** *easier to remove them after the engine has been removed.*

Interceptor Frame Drain Hole Drilling

Water may enter the frame on some 1984 and 1985 models when riding in the rain or when

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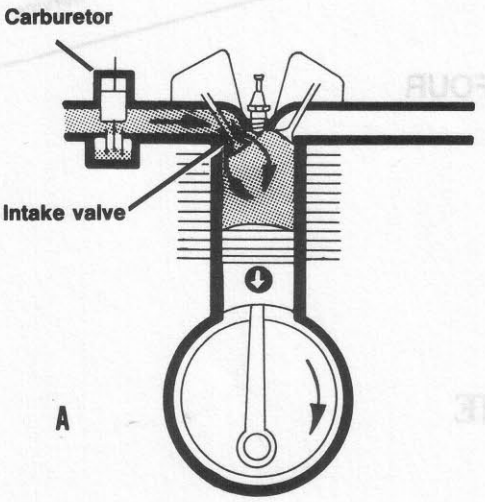
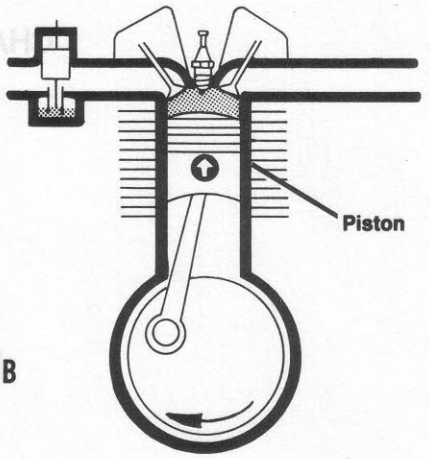
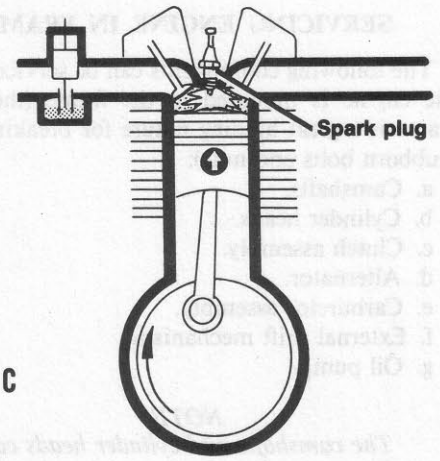
4-STROKE OPERATING PRINCIPLES



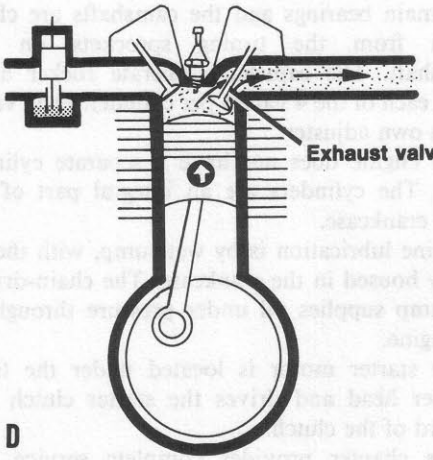
As the piston travels downward, the exhaust valve is closed and the intake valve opens, allowing the new air-fuel mixture from the carburetor to be drawn into the cylinder. When the piston reaches the bottom of its travel (BDC), the intake valve closes and remains closed for the next 1 1/2 revolutions of the crankshaft.



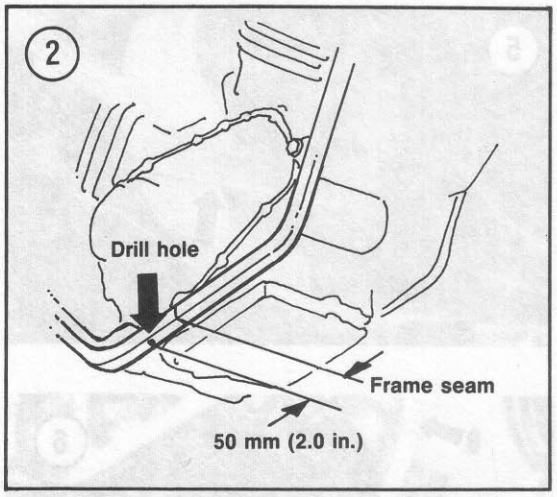
While the crankshaft continues to rotate, the piston moves upward, compressing the air-fuel mixture.

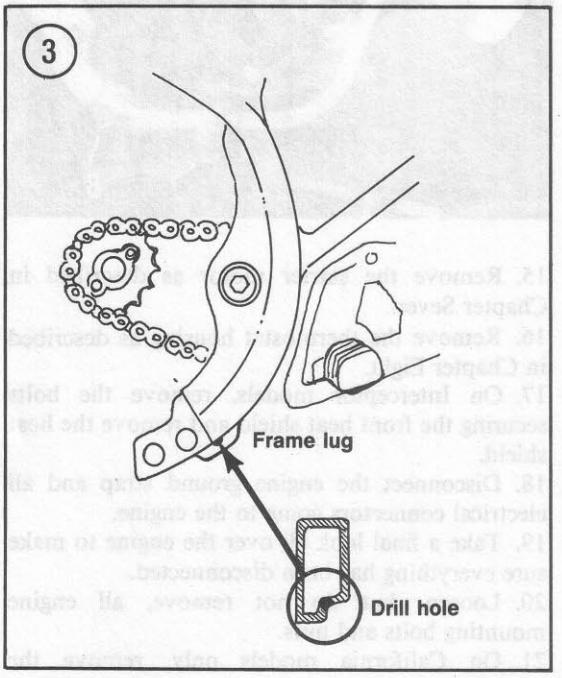


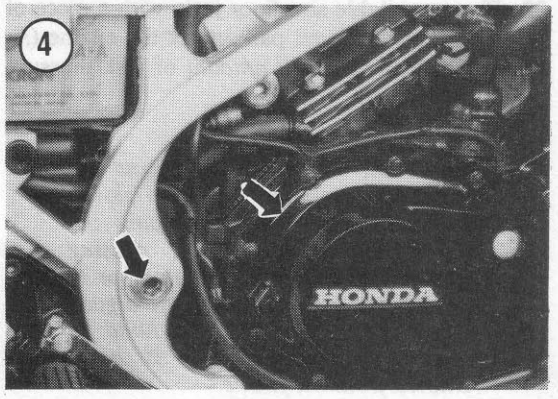
As the piston almost reaches the top of its travel, the spark plug fires, igniting the compressed air-fuel mixture. The piston continues to top dead center (TDC) and is pushed downward by the expanding gases.



When the piston almost reaches BDC, the exhaust valve opens and remains open until the piston is near TDC. The upward travel of the piston forces the exhaust gases out of the cylinder. After the piston has reached TDC, the exhaust valve closes and the cycle starts all over again.







washing down the bike. This water collects in the lower frame rails and will rust the frame and may freeze in cold weather. The freezing could cause the frame to distort in these areas.

To prevent water from collecting in these areas, drain holes should be drilled in the lower frame rail on each side.

The affected frame serial numbers are as follows:

a. 1984 California models—all frames.
b. 1984 49-state models—000001-007500 and 002558-002779.
c. 1985 California models—none affected.
d. 1985 49-state models—000001-001624.

Right-hand frame rail

Refer to **Figure 2** for this procedure.

1. Measure 50 mm (2.0 in.) back from the seam on the frame rail.
2. Drill a 4 mm (5/32 in.) hole in the bottom surface of the frame rail.
3. Clean off the exterior of the hole and repaint with a gloss black rust-inhibiting paint to prevent rust from forming.

Left-hand frame rail

Refer to **Figure 3** for this procedure.

1. Using a center punch and hammer, punch a guide mark in the center of the frame lug.
2. Drill a 4 mm (5/32 in.) hole in the bottom surface of the frame rail.
3. Clean off the exterior of the hole and repaint with a gloss black rust-inhibiting paint to prevent rust from forming.

Interceptor Engine
Replacement by Honda Factory

Some of the engines in the early 1984 model year may develop a crack in the crankshaft if the engine is operated above 10,000 rpm for any sustained period of time. The engine is warranteed and American Honda will replace the entire engine without cost to the owner. American Honda has sent out mailgrams to all registered owners informing them of this potential problem.

After the engine has been replaced by an authorized Honda dealer the bike is to be identified indicating that the engine swap has been performed. The dealer is to stamp an "X" after the new engine serial number and stamp an "X" on the frame above the swing arm right-hand pivot bolt as shown in **Figure 4**.

If you have purchased a used Interceptor 500 that falls within the frame serial numbers listed here, make sure that the engine has been replaced.

If the engine has not been done, contact an authorized Honda dealer immediately for information.

The affected engines were installed in the following *frame serial numbers*, not engine serial numbers.

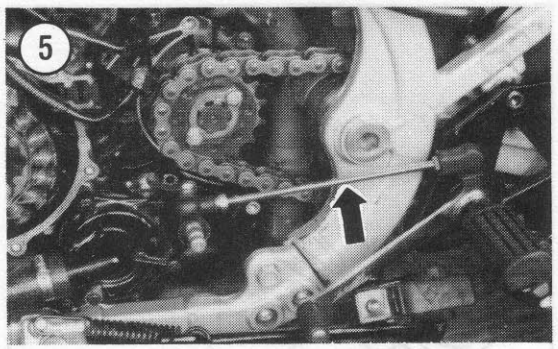
1. California models:
   a. 000255-000584.
2. 49-State models:
   a. 001839-001876.
   b. 001879-002023.
   c. 002025-002071.
   d. 002073-002157.
   e. 002159-002358.
   f. 002360-002556.
   g. 002558-002779.

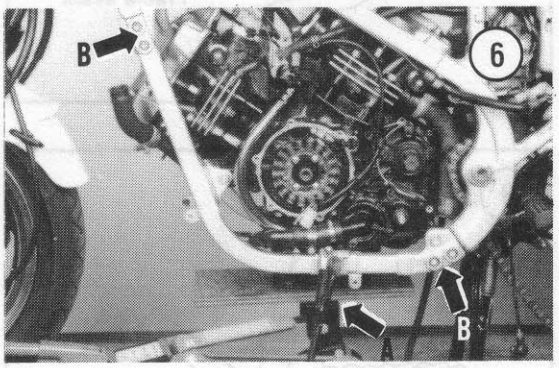
ENGINE REMOVAL/INSTALLATION

WARNING

The engine weighs 59 kg (130 lb.). Due to its weight and bulk, it is essential that a minimum of 2, preferably 3, people be used during engine removal and installation.

1. Place the bike on the centerstand and remove the seat and the side covers as described in Chapter Twelve.
2. Disconnect the battery negative and positive leads.
3. Remove the fuel tank as described in Chapter Six.
4. Drain the engine oil as described in Chapter Three.
5. Drain the engine coolant as described in Chapter Three.
6. Disconnect the spark plug wires and tie them up out of the way.
7. Remove the exhaust system as described in Chapter Six.
8. Remove the air filter case and the carburetor assembly as described in Chapter Six.
9. Remove the alternator as described in this chapter.
10. Remove the clutch as described in Chapter Five.
11. Remove the external shift mechanism as described in Chapter Five.
12. Remove the clutch slave cylinder as described under *Clutch Slave Cylinder Removal/Installation (Intact)* in Chapter Five.
13. Remove the bolt securing the gearshift lever (**Figure 5**) and remove the lever assembly.
14. Remove the drive sprocket and drive chain from the engine as described in Chapter Ten.

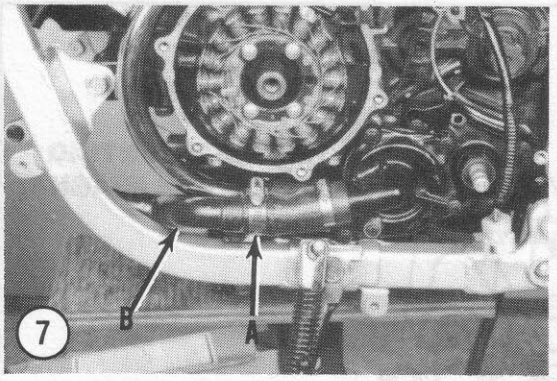


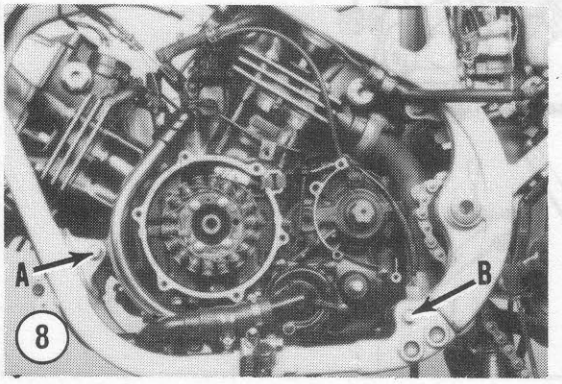


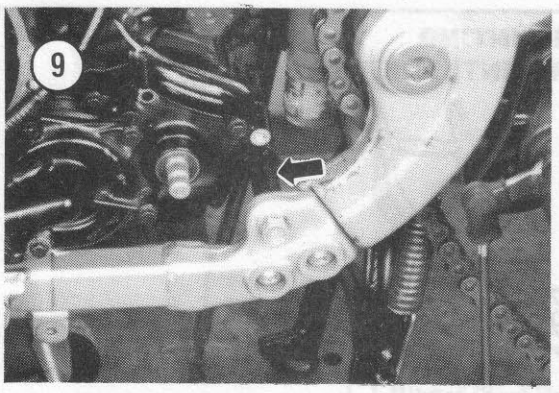
15. Remove the starter motor as described in Chapter Seven.
16. Remove the thermostat housing as described in Chapter Eight.
17. On Interceptor models, remove the bolts securing the front heat shield and remove the heat shield.
18. Disconnect the engine ground strap and all electrical connectors going to the engine.
19. Take a final look all over the engine to make sure everything has been disconnected.
20. Loosen, but do not remove, all engine mounting bolts and nuts.
21. On California models only, remove the evaporation canister as described in Chapter Six.
22. Place a suitable size floor jack, with a piece of wood to protect the oil pan, under the engine (A, **Figure 6**). Apply a *small amount* of jack pressure up on the engine.

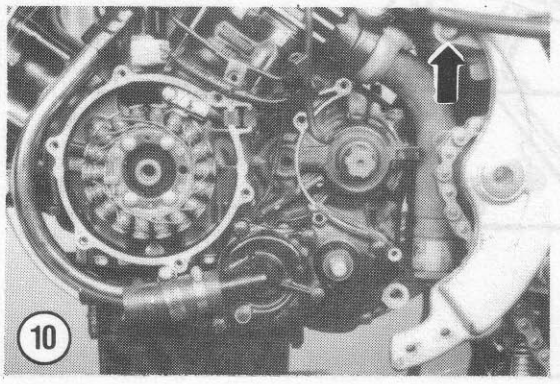
WARNING

Due to the weight of the engine the following steps must be taken slowly and carefully to avoid dropping the engine out of the frame, causing damage not only to the engine but to yourself and your helpers. Have a good supply of wood blocks on hand to support the engine as it is being removed from the frame.









23A. On Magna models, loosen the hose clamps on the coolant hose that runs from the water pump to the left-hand subframe and disconnect the hose from the subframe.

23B. On Interceptor models, loosen the hose clamps (A, **Figure 7**) on the coolant hose that runs from the water pump to the radiator coolant pipe and remove the radiator coolant pipe (B, **Figure 7**).

24. On the left-hand side, remove the nuts on the lower front throughbolt (A, **Figure 8**) and the lower rear throughbolt (B, **Figure 8**). Don't lose the spacer on the lower throughbolt (**Figure 9**) on the left-hand side.

25. On the left-hand side, remove the Allen bolts (B, **Figure 6**) at the front and at the rear securing the removable subframe to the main frame.

26. Remove the subframe.

27. Remove the upper throughbolt (**Figure 10**).

WARNING

The engine assembly is very heavy. This final step requires a minimum of 2, preferably 3, people to safely remove the engine from the frame.

28. Jack the engine up a little more.

29. Carefully and slowly pivot the engine on the floor jack out of the left-hand side of the frame in order to gain access to all sides. Move it out far enough so that everyone can get a good handhold on the engine.

30. Slide the engine out of the open frame area on the left-hand side.

31. Place the engine in an engine stand or take it to a work bench for further disassembly.

32. Install by reversing these removal steps, noting the following.

NOTE

Due to the weight of the complete engine assembly, it is suggested that all components removed be left off until the crankcase assembly is reinstalled into the frame. Installing a completed engine assembly requires a minimum of 3 people.

33. Engine mounting hardware is shown in **Figure 11** (Magna) or **Figure 12** (Interceptor).

34. Tighten the bolts and nuts to the torque specifications listed in **Table 2**.

35. Fill the crankcase with the recommended type and quantity of engine oil. Refer to Chapter Three.

36. Start the engine and check for leaks.

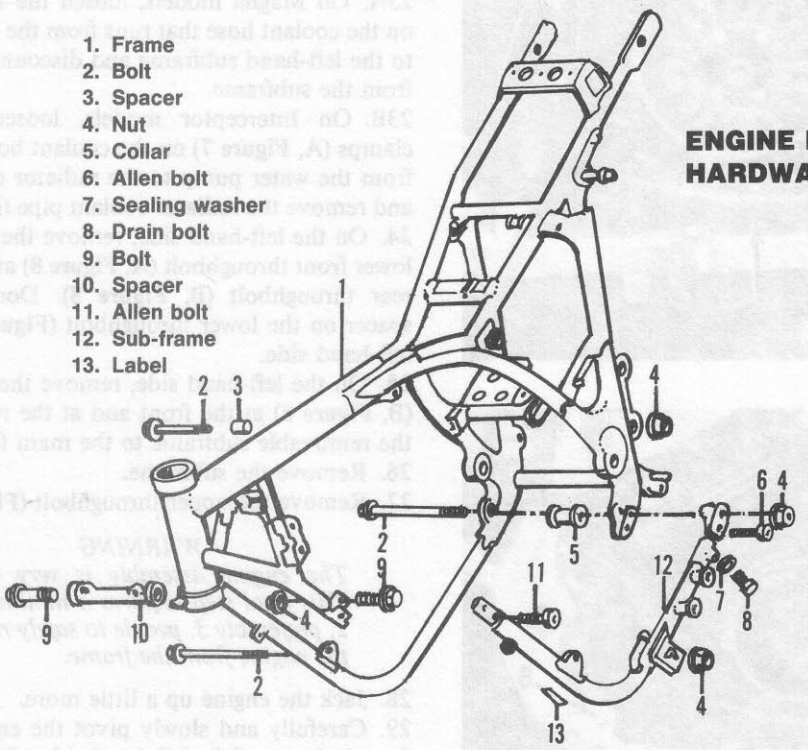
CAMSHAFTS

There are 4 camshafts and 2 cam chains. Each bank of cylinders has an intake and an exhaust

11

1. Frame
2. Bolt
3. Spacer
4. Nut
5. Collar
6. Allen bolt
7. Sealing washer
8. Drain bolt
9. Bolt
10. Spacer
11. Allen bolt
12. Sub-frame
13. Label

ENGINE MOUNTING HARDWARE (MAGNA)



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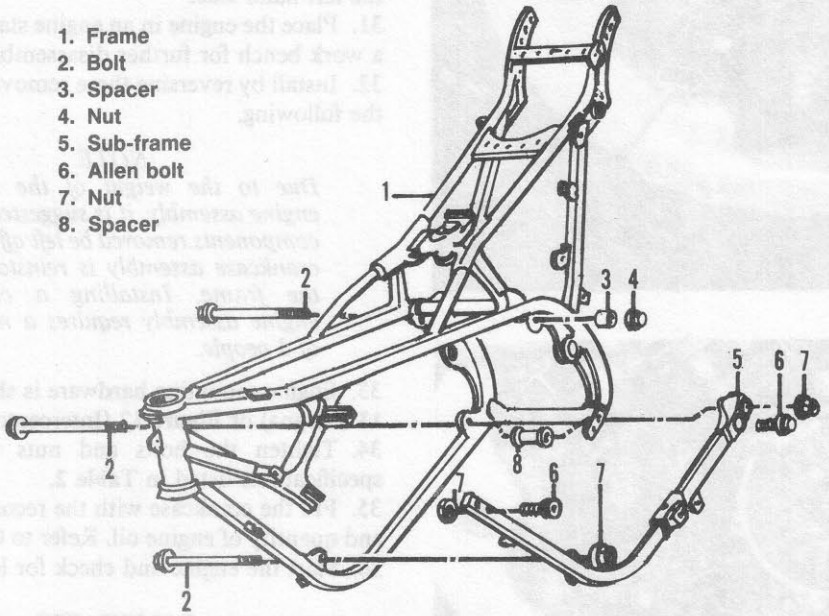
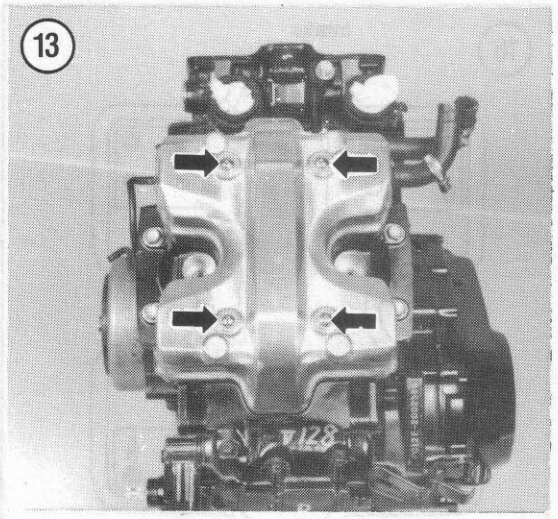
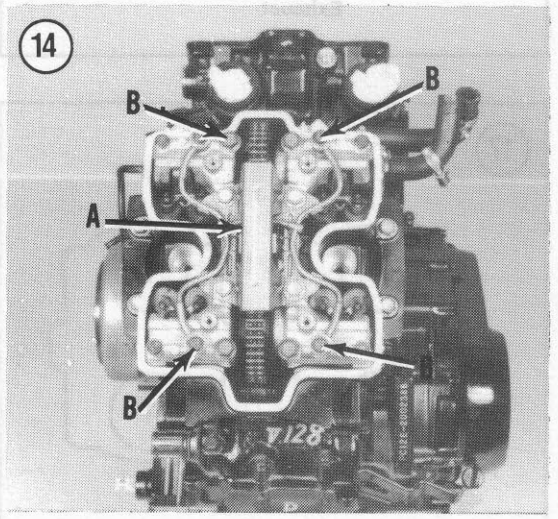
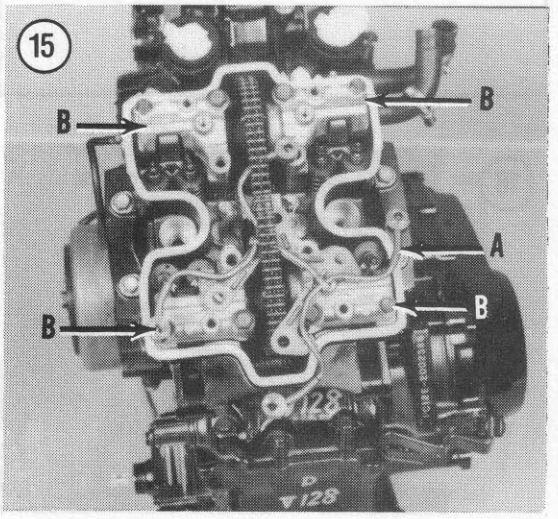
ENGINE MOUNTING HARDWARE (INTERCEPTOR)

1. Frame
2. Bolt
3. Spacer
4. Nut
5. Sub-frame
6. Allen bolt
7. Nut
8. Spacer









camshaft that operate the valves for those 2 cylinders. Both the intake and exhaust camshafts for one bank of cylinders are driven by one cam chain.

There are 2 cam chain sprockets on the crankshaft. Both cam chains are of the dual-row link plate type. The engine must be removed and disassembled to remove the chains.

NOTE

The cams can be removed with the engine in the frame but it is much easier with the engine removed. This procedure is shown with the engine removed.

Removal

1. Remove the engine as described in this chapter.
2. Remove the bolts (**Figure 13**) securing the cylinder head covers and remove both covers.
3. Remove the bolts securing the cam chain guide (A, **Figure 14**) and remove the guide from the front and rear cylinder heads.
4. Remove the bolts (B, **Figure 14**) securing the oil pipe assembly.
5. If removed, temporarily install the alternator rotor and the right-hand crankcase/clutch cover.
6. Using the bolt on the alternator rotor, rotate the engine until there is slack in the cam chain. Pull up on the middle of the chain and carefully remove the oil pipe (A, **Figure 15**). Remove the oil pipe from both the front and rear cylinder heads.
7. Place a clean shop cloth into the cam chain cavity in the cylinder head to keep small parts from falling down into the crankcase.
8. Loosen all valve adjustment locknuts and loosen all valve adjusters. This will relieve stress on the cams and rocker arms during cam removal.

NOTE

During the next step, loosen the bolts in 2-3 stages on all 4 bearing caps. This will gradually release the pressure on the cam as the lobes on one cylinder will be under pressure.

NOTE

On some models the camshaft holders have a cast identification mark as indicated in ***Figure 16****.*

9. Remove the bolts securing the camshaft holders (B, **Figure 15**). Before removing the holders mark them with a permanent marker pen so they will be installed in the same location. Mark them with the cylinder number (**Figure 17**) and either intake or exhaust; for example, "4E" would indicate cylinder No. 4, exhaust.

10. Remove the camshaft holders and locating dowels (**Figure 18**).

11A. For the front set of cylinders (No. 2 and 4), perform the following:

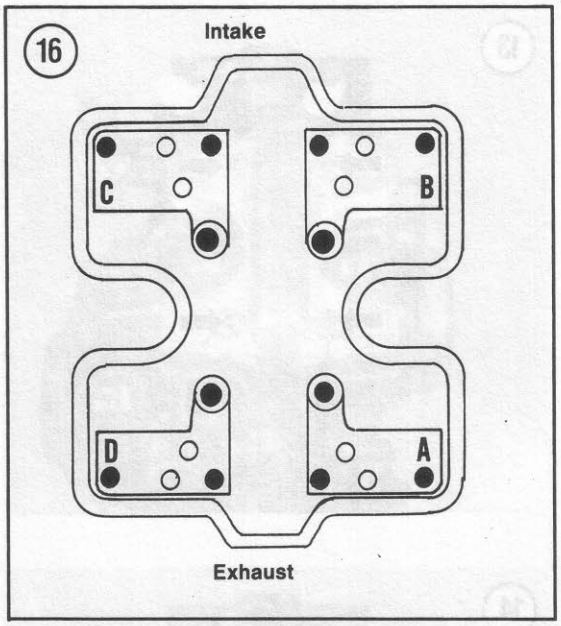
a. Using the bolt on the alternator rotor, rotate the engine *counterclockwise* until the "TF" mark (**Figure 19**) aligns with the index mark on the right-hand crankcase/clutch cover.
b. Remove the exposed cam sprocket bolt on both the intake and exhaust camshaft sprockets.
c. Using the bolt on the alternator rotor, rotate the engine *counterclockwise* 360° until the "TF" mark (**Figure 19**) again aligns with the index mark on the crankcase/clutch cover.
d. Remove the other exposed sprocket bolt on both the intake and exhaust camshaft sprockets.

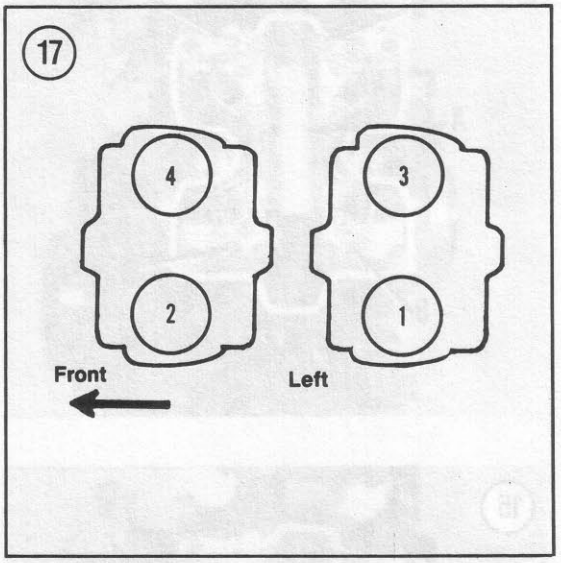
CAUTION

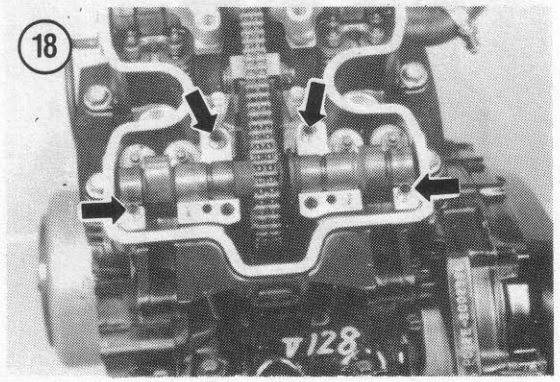
Step 11B requires the aid of a helper. The cam sprockets (front set of cylinders) may slide off the camshaft shoulder after all sprocket bolts are removed. If this happens, the cam chain is no longer taut nor properly meshed with the sprocket on the crankshaft. When rotating the engine in the following steps, have the helper either keep the cam sprocket on the camshaft shoulders or pull up on the cam chain and keep it properly meshed with the sprocket on the crankshaft. This is necessary to avoid letting the chain bunch up and damage the crankcase, the timing sprocket on the crankshaft, the cam chain tensioner assembly or the cam chain.

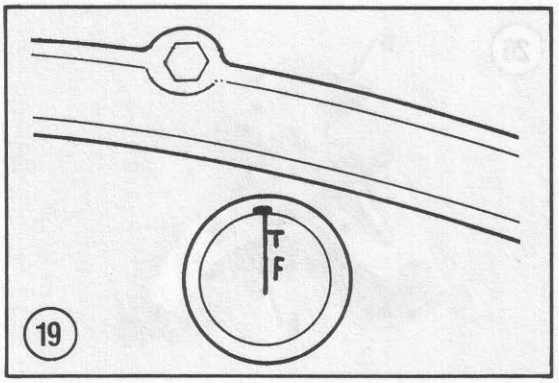
11B. For the rear set of cylinders (No. 1 and 3), perform the following:

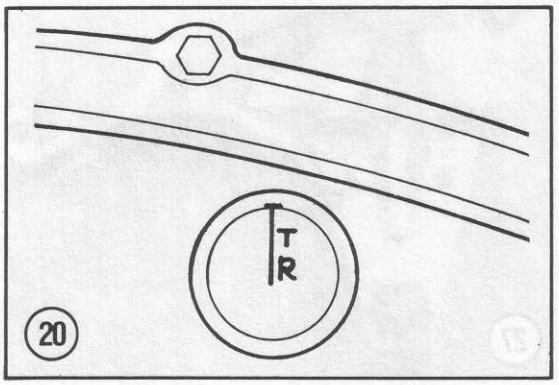
a. Using the bolt on the alternator rotor, rotate the engine *counterclockwise* until the "TR" mark (**Figure 20**) aligns with the index mark on the right-hand crankcase/clutch cover.
b. Remove the exposed cam sprocket bolt on both the intake and exhaust camshaft sprockets (**Figure 21**).
c. Using the bolt on the alternator rotor, rotate the engine *counterclockwise* 360° until the "TR" mark (**Figure 20**) again aligns with the index mark on the crankcase/clutch cover.
d. Remove the other exposed sprocket bolt on both the intake and exhaust camshaft sprockets.

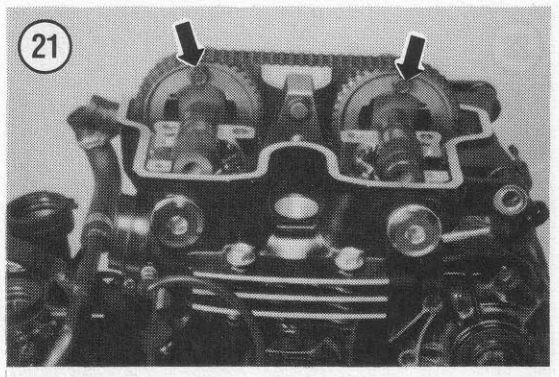


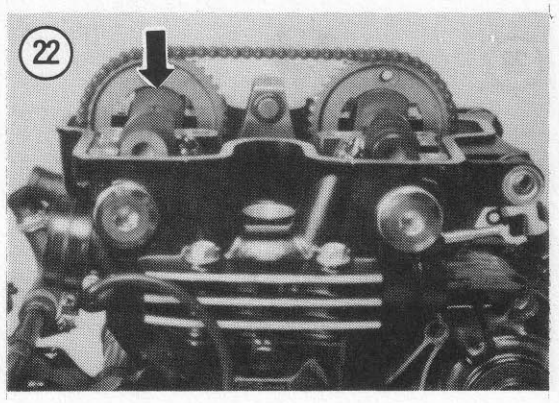












NOTE

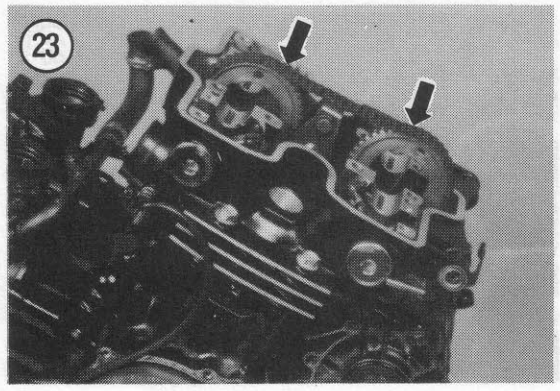
The following steps relate to both the front and rear sets of cylinders.

12. Slide the cam sprockets off the shoulder on each camshaft (**Figure 22**).
13. Before removing the camshafts, note on which side of the flange the sprocket is mounted as follows:
    a. On the front set of cylinders (No. 2 and 4), both cam sprockets are on the right-hand side.
    b. On the rear set of cylinders (No. 1 and 3), both cam sprockets are on the left-hand side.
14. Tie a piece of wire around each cam chain and remove the camshafts from the cylinder heads. Tie the wire to an external part of the engine so the chain won't fall into the crankcase.
15. Remove the cam chain from both cam sprockets (**Figure 23**) and remove both sprockets.
16. Repeat Steps 12-15 for the set of cylinders.

NOTE

The cam chain tensioner assembly must be removed so it can be locked into the relaxed position. This is necessary to allow slack in the cam chain for camshaft installation. If the tensioner is not in the relaxed position it will take up all chain slack and make it almost impossible to install the cam chain and camshaft sprockets onto the shoulders on the camshafts.

17. Remove the bolts (**Figure 24**) securing the cam chain tensioner assembly. Pull the cam chain tensioner assembly partway out and remove the clip, washer (**Figure 25**) and pivot pin securing the slipper.
18. Remove the slipper and the cam chain tensioner assembly.
19. Pull out on the tensioner arm (A, **Figure 26**) in the direction shown, move the lockplate (B, **Figure**



26) until the holes align (**Figure 27**) on the tensioner arm and bracket.

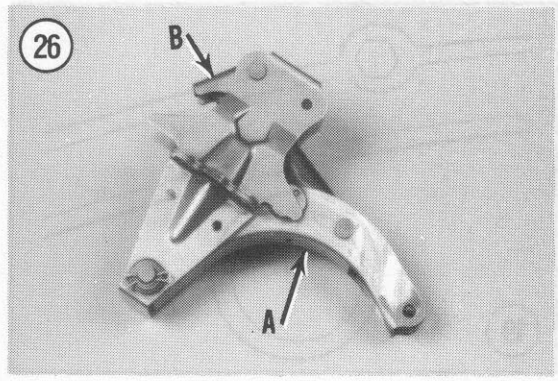
20. Install a cotter pin (**Figure 28**) or piece of wire through the aligned holes to lock the tensioner into the relaxed position. This pin is to stay in place until the camshaft installation is almost completed as noted in the installation procedure.

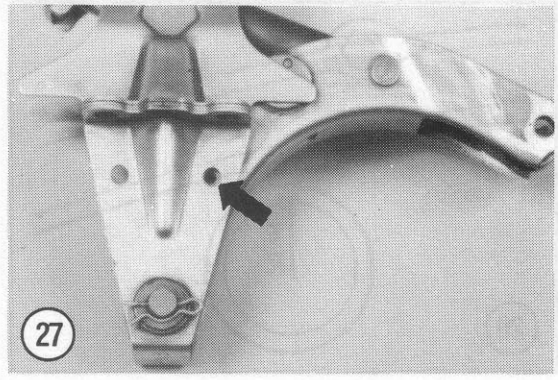
CAUTION

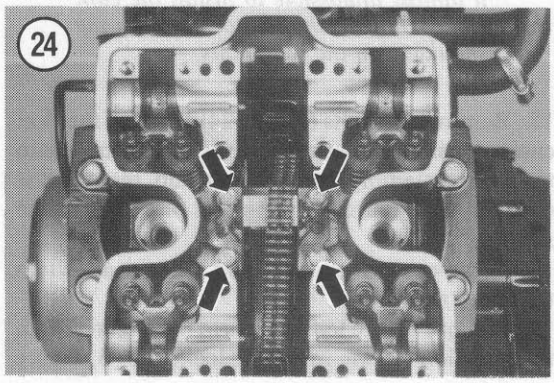
If the crankshaft must be rotated when the camshafts are removed, pull up on both cam chains and keep them taut while rotating the crankshaft. Make certain that the chains are positioned onto the crankshaft sprockets. If this is not done, the chains may become kinked and may damage the chains, the sprockets on the crankshaft and the cam chain tensioner assemblies.

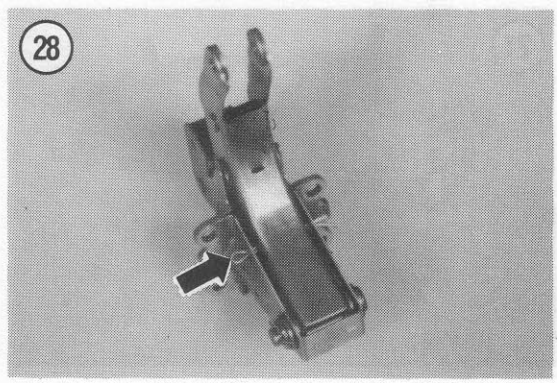
Inspection

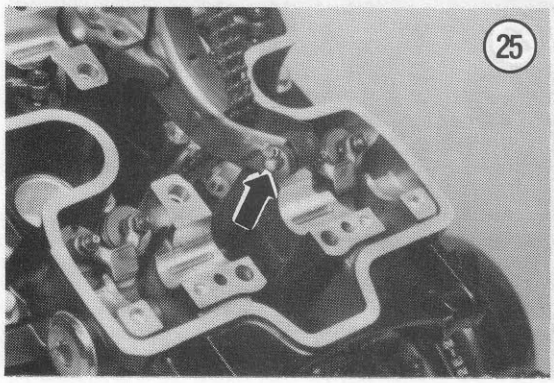
1. Check the camshaft bearing journals for wear and scoring (**Figure 29**).
2. Check the camshaft lobes for wear (**Figure 30**). The lobes should not be scored and the edges should be square. Slight damage may be removed with a silicon carbide oilstone. Use No. 100-200 grit initially, then polish with a No. 280-320 grit.

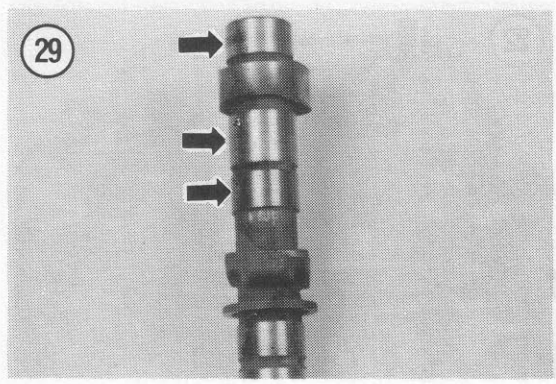


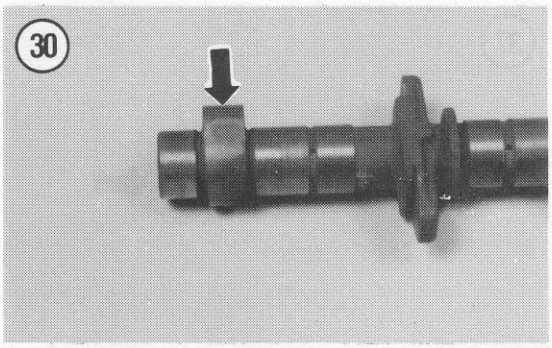


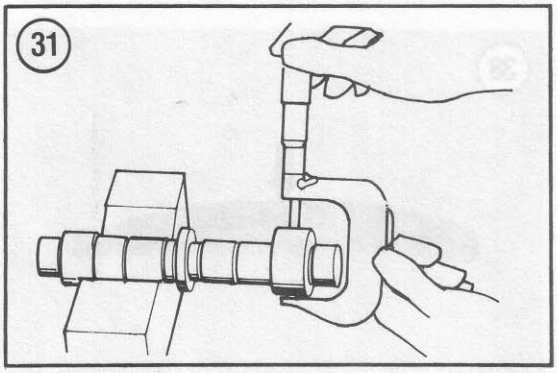


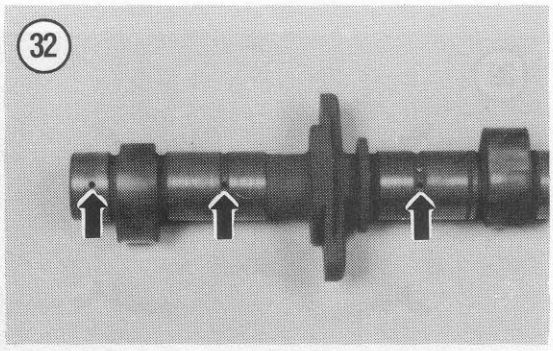


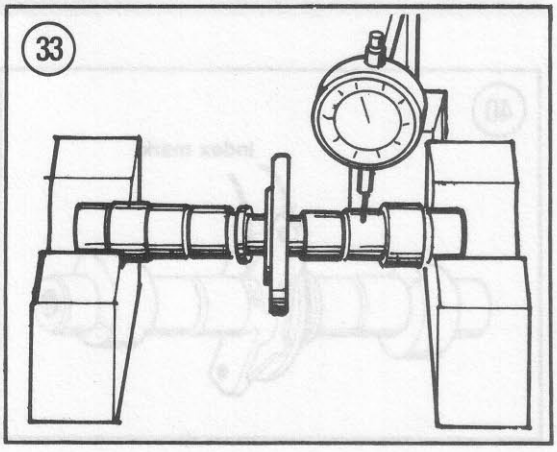




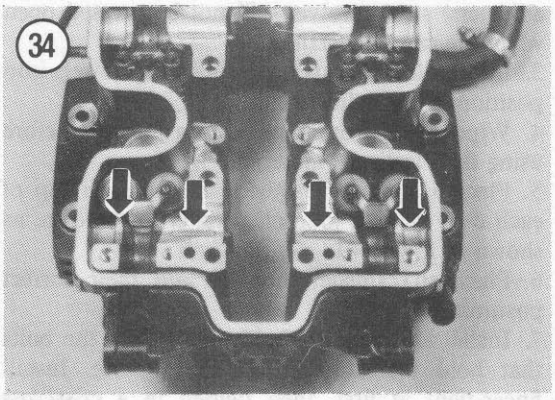


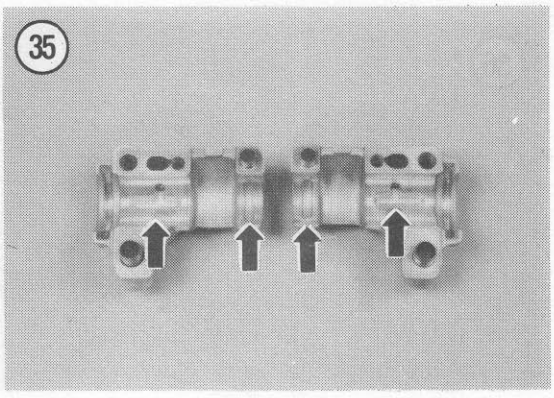






3. Even though the camshaft lobe surface appears to be satisfactory, with no visible signs of wear, the camshaft lobes must be measured with a micrometer as shown in **Figure 31**. Replace the camshaft(s) if worn beyond the service limits listed in **Table 1**.
4. Make sure the oil holes (**Figure 32**) in the camshaft are clear. Clean out with a stiff wire and solvent if necessary then blow out with compressed air.
5. Measure the runout of the camshaft with a dial indicator and V-blocks as shown in **Figure 33**. Use half of the total runout and compare to the service limits listed in **Table 1**.
6. Check the bearing journal surfaces in the cylinder head (**Figure 34**) and camshaft holders (**Figure 35**). They should not be scored or excessively worn. If replacement is necessary, the cylinder head and the camshaft holders must be replaced as a set.
7. Inspect the sprockets (**Figure 36**) for wear; replace if necessary.
8. Inspect the underside of the cam chain guide (**Figure 37**) for wear; replace if necessary.
9. Inspect the cam chain tensioner slipper (**Figure 38**) for wear or damage. Replace if necessary.



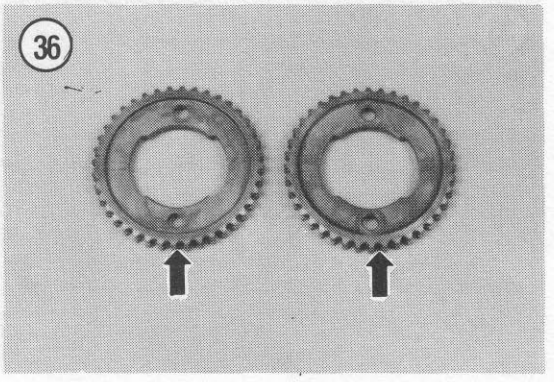


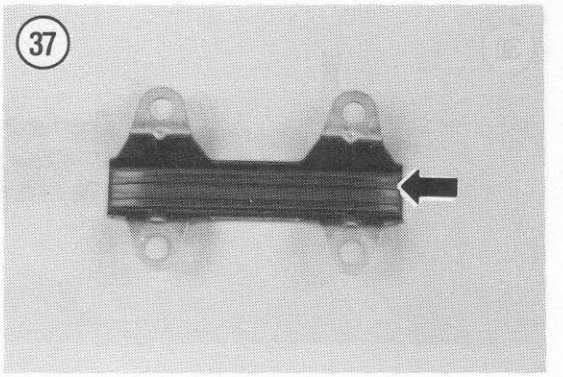
10. Inspect the cam chain tensioner assembly pivot points for wear or damage. Replace the assembly if necessary.
11. Check the oil passageways in the oil line (**Figure 39**). Make sure they are all open. Blow out with compressed air.

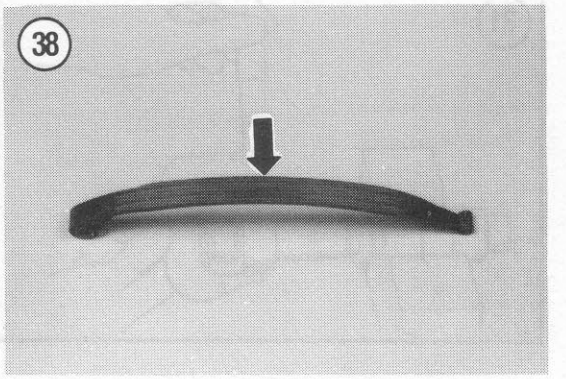
Camshaft Bearing Clearance Measurement

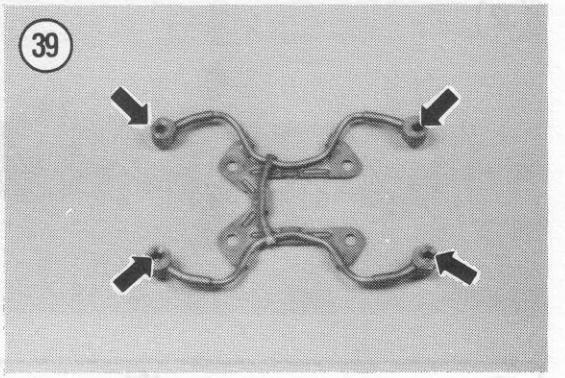
This procedure requires the use of a Plastigage set. The camshafts must be installed into the heads. Before installation, wipe all oil residue from each cam bearing journal and bearing surface in the head and all camshaft holders.

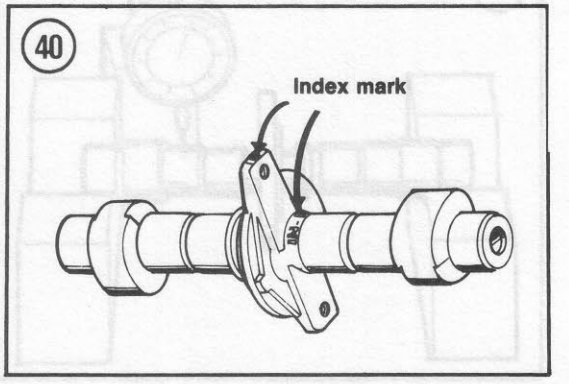
1. Each camshaft is identified for correct placement in its cylinder head. Identification marks are shown in **Figure 40**. They are identified as follows:
   a. "EX-F"—exhaust, front cylinders.
   b. "IN-F"—intake, front cylinders.
   c. "EX-R"—exhaust, rear cylinders.
   d. "IN-R"—intake, rear cylinders.
2. Install each camshaft into its correct location in the head. Position the cam lobes so they are not depressing any rocker arms (or back off the valve adjusters) so the valves will not be pressed open when the cam is installed.
3. Install all camshaft holder locating dowels into position in the cylinder heads.
4. Wipe all oil from cam bearing journals before using the Plastigage material.
5. Place a strip of Plastigage material on top of each cam bearing journal, parallel to the cam, as shown in **Figure 41**.
6. Place all camshaft holders into their correct position.
7. Install all camshaft holder bolts and the bolts that hold the camshaft guide in place. Install finger-tight at first, then tighten in a crisscross

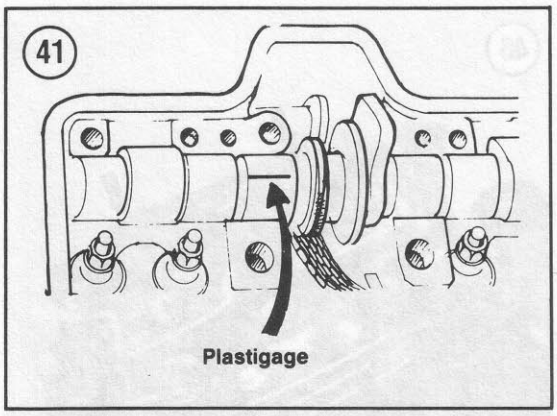


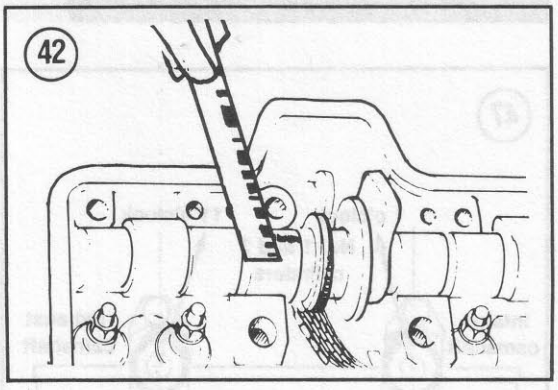


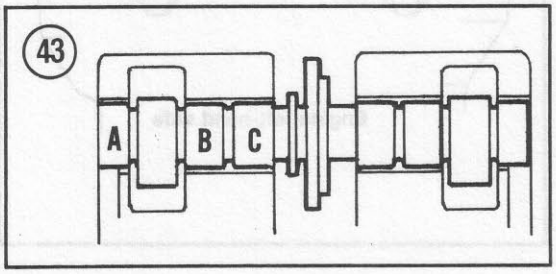


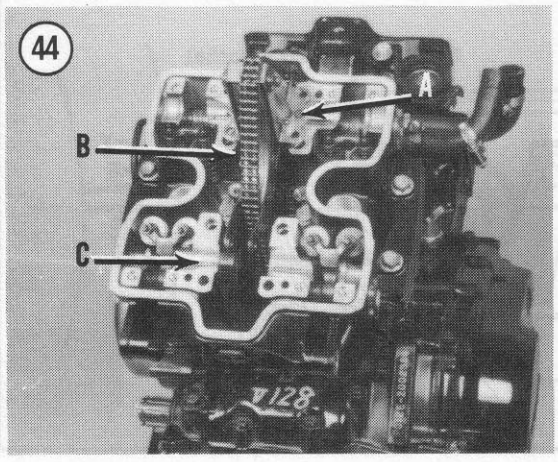












pattern to the final torque specification listed in **Table 2.**

NOTE

Do not rotate either camshaft with the Plastigage material in place.

8. Gradually remove the bolts in a crisscross pattern. Remove the bearing caps carefully.
9. Measure the width of the flattened Plastigage according to manufacturer's instructions (**Figure 42**). The oil clearance is different for all 3 bearing surfaces at each end of the camshaft as shown in **Figure 43** and **Table 1.**

NOTE

Honda does not provide service limit dimensions for the camshaft bearing surfaces.

10. If the clearance exceeds the wear limit at locations A, B or C in **Table 1**, replace the camshaft(s). If the clearance still exceeds the service limit, replace the cylinder head(s) and camshaft holders as a set.

CAUTION

Remove all particles of Plastigage material from all camshaft bearing journals and bearing caps. This material must not be left in the engine as it can plug up a small oil control orifice and cause severe engine damage.

Installation

1. Install the cam chain tensioner assembly (A, **Figure 44**) into the cylinder head.
2. Install the cam chain through the tensioner assembly (B, **Figure 44**).
3. Install the cam chain tensioner slipper (C, **Figure 44**) and make sure the lower end fits into the receptacle in the crankcase. Move the slipper into position and install the pin, washer and clip (**Figure 25**). Make sure the clip is installed completely into the pin so it will not pop out.
4. Install the bolts securing the tensioner assembly and tighten the bolts securely.
5. Coat all camshaft lobes and bearing journals with molybdenum disulfide grease. Also coat the bearing surfaces in the cylinder head and cam bearing holders.

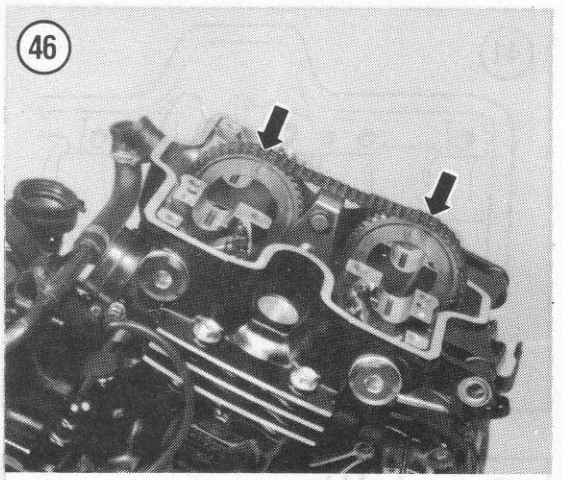
NOTE

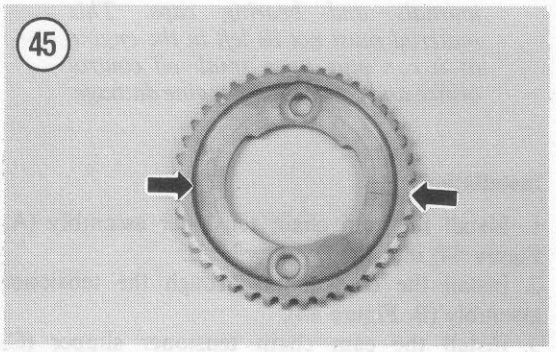
*Position the cam chain sprockets with their identification marks (**Figure 45**) facing the left-hand side (toward the alternator rotor). This is necessary for camshaft timing.*

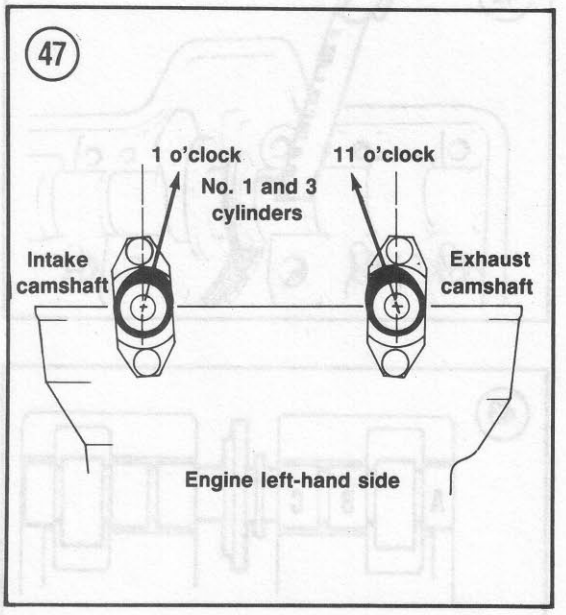
6. Install the cam chain sprockets into position. Temporarily align the index line with the top surface of the cylinder head and mesh the sprockets with the cam chain (**Figure 46**). Remove the wire from the chain.
7. Each camshaft is identified for correct placement in the cylinder heads. They are marked as shown in **Figure 40**. Refer to **Figure 17** for cylinder numbers.
8. Install a camshaft into each sprocket. The cam sprocket relationships to the camshafts and the cylinders are as follows:
   a. On the front set of cylinders (No. 2 and 4), both cam sprockets are on the right-hand side.
   b. On the rear set of cylinders (No. 1 and 3), both cam sprockets are on the left-hand side.
9. Pull the cam chain and both sprockets up onto the shoulder on each camshaft.

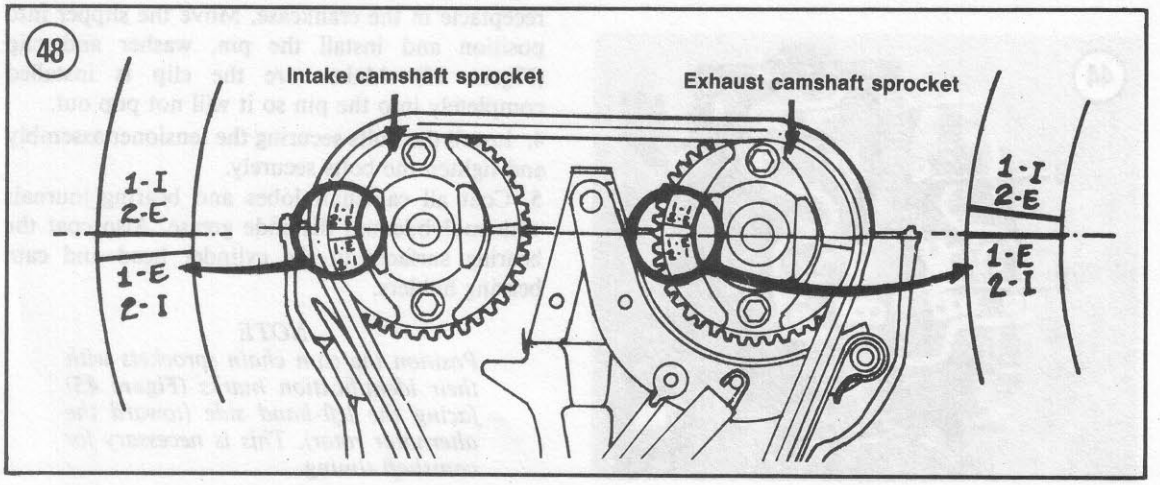
NOTE
*Steps 10-15 relate to the **rear cylinder head**.*

10. Rotate the alternator rotor *counterclockwise* until the "TR" mark (**Figure 20**) aligns with the index mark on the right-hand crankcase cover.







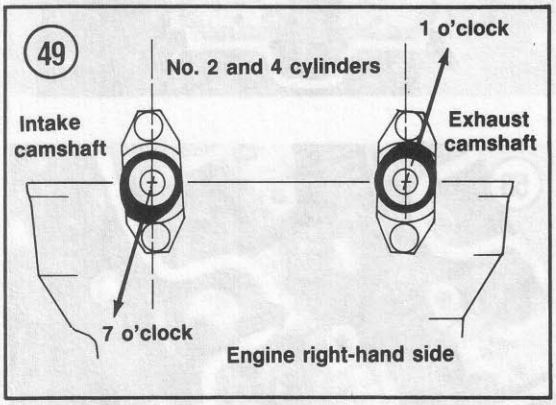


11. As viewed from the left-hand side of the engine, rotate the rear camshafts as follows:
   a. Intake cam lobe on the No. 1 cylinder faces the 1 o'clock position (**Figure 47**).
   b. Exhaust cam lobe on the No. 1 cylinder faces at the 11 o' clock position (**Figure 47**).
12. Align the "1.E, 2.I" index line on the exhaust cam sprocket with the top of the *rear* cylinder head (**Figure 48**).
13. Align the "1.I, 2.E" index line on the intake cam sprocket with the top of the *rear* cylinder head (**Figure 48**).

CAUTION

Very expensive damage could result from improper camshaft and chain alignment. Recheck your work several times to be sure alignment is correct.

14. Again check the alignment of the index marks on both cam sprockets. If the alignment is incorrect, correct it at this time.
15. Temporarily install the sprocket bolts into the exposed holes (**Figure 21**). Tighten the bolts to only a firm finger-tight at this time. They will be tightened later along with the installation of the other 2 sprocket bolts.



NOTE

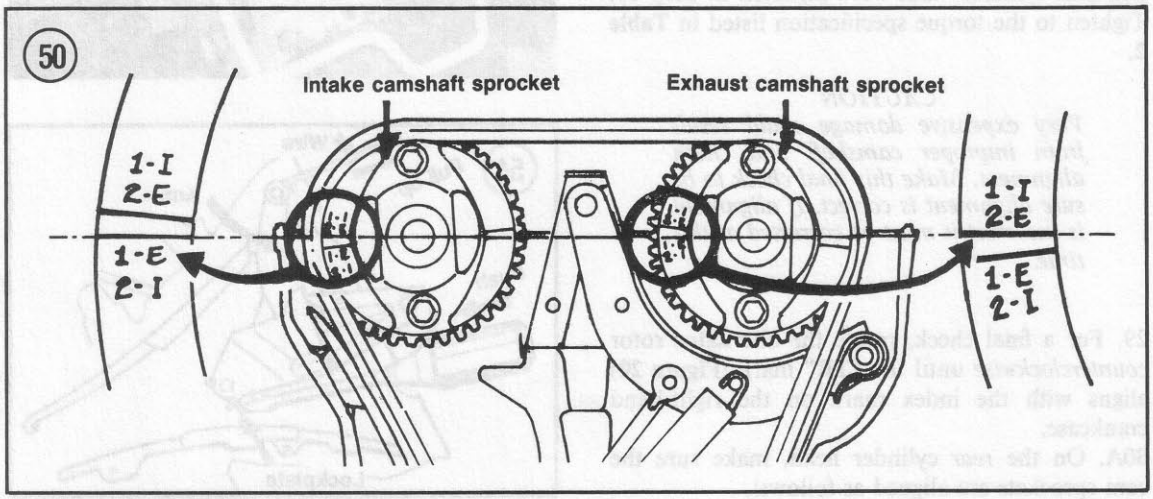
Steps 16-20 relate to the front cylinder head.

16. As viewed from the right-hand side of the engine, rotate the front camshafts as follows:
   a. Intake cam lobe on the No. 4 cylinder faces the 7 o'clock position (**Figure 49**).
   b. Exhaust cam lobe on the No. 4 cylinder faces the 1 o'clock position (**Figure 49**).
17. Align the "1.I, 2.E" index line on the exhaust cam sprocket with the top of the *front* cylinder head (**Figure 50**).
18. Align the "1.E, 2.I" index line on the intake cam sprocket with the top of the *front* cylinder head (**Figure 50**).

CAUTION

Very expensive damage could result from improper camshaft and chain alignment. Recheck your work several times to be sure alignment is correct.

19. Again check the alignment of the index marks on both cam sprockets. If the alignment is incorrect, correct it at this time.
20. Temporarily install the sprocket bolts into the exposed holes (**Figure 21**). Tighten the bolts to only a firm finger-tight at this time. They will be tightened later along with the remaining 2 sprocket bolts.
21. Install all camshaft holder locating dowels (**Figure 18**) into the cylinder head.



NOTE

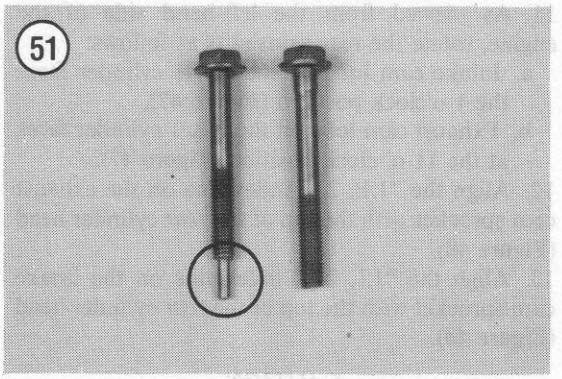
There are 2 differently shaped camshaft holders used on each cylinder head. When reassembling a well run-in bike or if some of the upper end components have been replaced, it is very important that the camshaft holders be installed into their original positions as marked during removal.

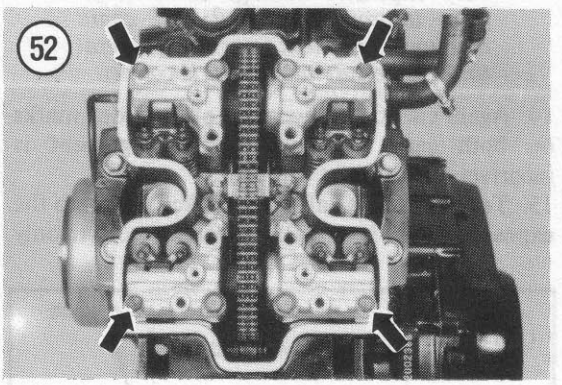
22. Install all camshaft holders into their correct positions. Refer to the location marks made in Step 9, *Removal*, or the identification marks cast in the camshaft holder. The groove in the bottom of each holder must align with the camshaft locating ridge.
23. There are 2 different types of bolts used to hold down the camshaft holders. The 6 mm bolts with the special end tip (**Figure 51**) are used at the outside corners of all camshaft holders as shown in **Figure 52**.
24. Install only 8 of the bolts securing the camshaft holders. Do not install the 4 center bolts as they also hold down the cam chain guide. Tighten the bolts only a firm finger-tight at this time.
25. Remove the cotter pin (**Figure 53**) or piece of wire in the camshaft tensioner assembly to release the tensioner pressure onto the cam chain.
26. Using a long screwdriver, push down on the lockplate (**Figure 54**) to release the lockplate on the tensioner. The correct amount of chain tension is now applied; no further adjustment is necessary or possible.
27. Rotate the engine *counterclockwise* 360°. Install the remaining 4 cam sprocket bolts on the front and rear cylinders and tighten to the torque specification listed in **Table 2**.
28. Again rotate the engine *counterclockwise* 360° and tighten the 4 cam sprocket bolts on the front and rear cylinders that were installed in Step 15. Tighten to the torque specification listed in **Table 2**.

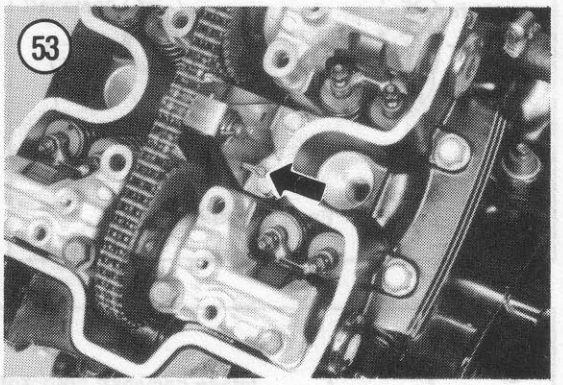
CAUTION

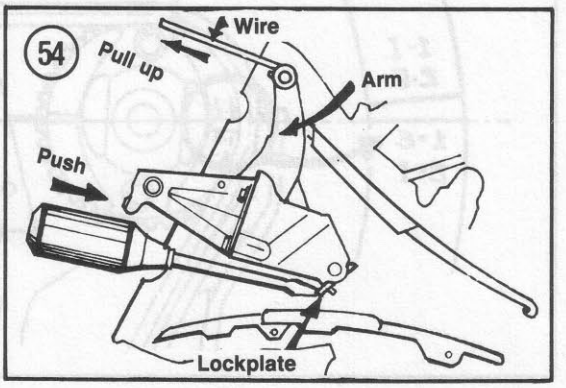
Very expensive damage could result from improper camshaft and chain alignment. Make this final check to be sure alignment is correct. If alignment is incorrect it must be corrected at this time.

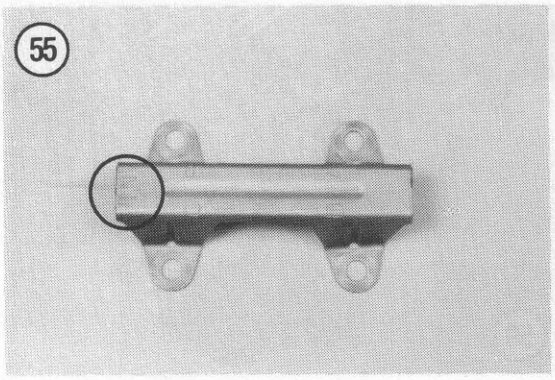
29. For a final check, rotate the alternator rotor *counterclockwise* until the "TR" mark (**Figure 20**) aligns with the index mark on the right-hand crankcase.
30A. On the *rear* cylinder head, make sure the cam sprockets are aligned as follows:

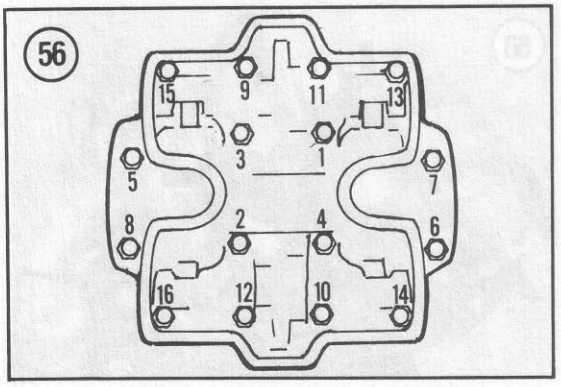


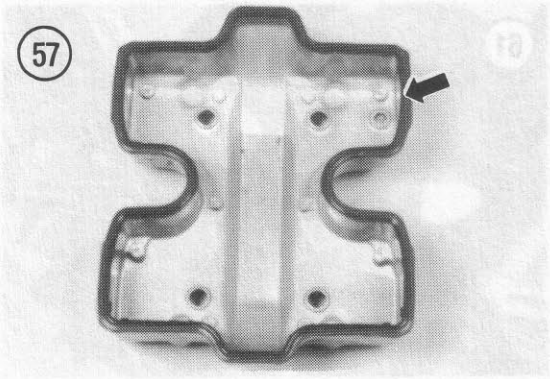


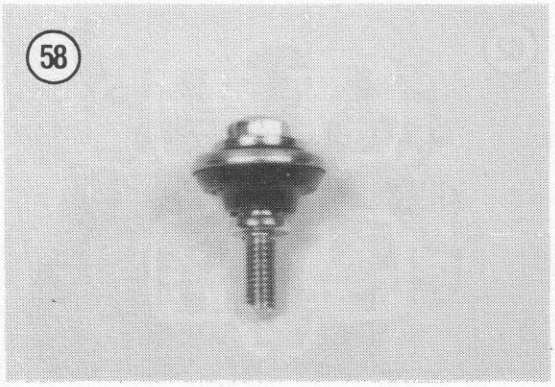












a. The "1.E, 2.I" index line on the exhaust cam sprocket aligns with the top of the *rear* cylinder head (**Figure 48**).
b. The "1.I, 2.E" index line on the intake cam sprocket aligns with the top of the *rear* cylinder head (**Figure 48**).

30B. On the *front* cylinder head, make sure the cam sprockets are aligned as follows:

a. The "1.I, 2.E" index line on the exhaust cam sprocket aligns with the top of the *front* cylinder head (**Figure 50**).
b. The "1.E, 2.I" index line on the intake cam sprocket aligns with the top of the *front* cylinder head (**Figure 50**).

31. Rotate the engine *counterclockwise* using the bolt on the alternator rotor until there is slack in the cam chain. Pull up on the middle of the chain and carefully install the oil pipe (A, **Figure 15**). Do not install the oil pipe bolts at this time.
32. Position the cam chain guide with the IN mark (**Figure 55**) toward the intake ports and install the bolts.

NOTE

After the bolts in the following step are tightened to the specified torque value, recheck them after about one hour. The longer bolts may require a little more torque.

33. Tighten all the camshaft holder bolts, cam chain guide bolts and (if removed) the cylinder head bolts in torque pattern shown in **Figure 56** in 2-3 stages. Even if the cylinder head bolts were not removed, check their torque values. Tighten the bolts to the torque specifications listed in **Table 2**.
34. Repeat Step 31 and Step 32 for the other set of cylinders.
35. Apply a good coat of engine oil to all exposed surfaces of all camshafts.
36. Adjust the valve clearance as described in Chapter Three.
37. Install the rubber gasket on the cylinder head cover (**Figure 57**) and bolts (**Figure 58**).
38. Install the cylinder head cover and bolts. Tighten the bolts to the torque specification listed in **Table 2**.
39. Install the engine as described in this chapter.

CYLINDER HEADS

Either cylinder head can be removed first. The front cylinder head can be removed with the engine in the frame but it is *much* easier with the engine removed. To remove the rear cylinder head the engine must be removed from the frame.

This sequence is shown with the engine removed.

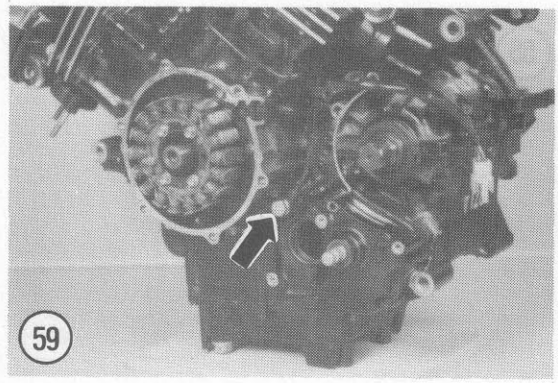
Removal/Installation

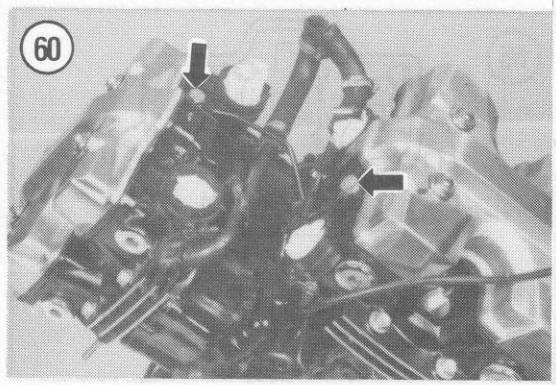
1. Remove the engine as described in this chapter.
2. Remove the camshafts as described in this chapter.
3. On the rear set of cylinders, perform the following:
   a. Make a scribe mark on each exhaust pipe and a mating mark on the exhaust pipe flange. These marks will be used for preliminary alignment of the exhaust pipes during installation.
   b. Remove the nuts securing the rear exhaust pipe flanges to the cylinder head and remove the exhaust pipes and flanges.
4. Remove the bolt (**Figure 59**) and sealing washers securing the rear of the oil line to the left-hand side of the lower crankcase.
5. Remove the bolts (**Figure 60**) and sealing washers securing the oil line to each cylinder head. Don't lose the 2 sealing washers on either side of the fittings.
6. On models so equipped, remove the bolt (**Figure 61**) securing the mounting bracket to the upper crankcase. Remove the oil line assembly.
7. Remove the coolant pipes to both cylinder heads as described in Chapter Eight. Don't lose the O-ring seals on the end of each pipe where it fits into each cylinder head.
8. To prevent cylinder head warpage, loosen the head bolts (**Figure 62**) 1/2 turn at a time in a crisscross pattern.
9. After all bolts have been loosened, remove the bolts and their washers.
10. Loosen the head by tapping around the perimeter with a rubber or plastic mallet. If necessary, *gently* pry the head loose with a broad-tipped screwdriver only at the pry point (**Figure 63**) on each side of each head.

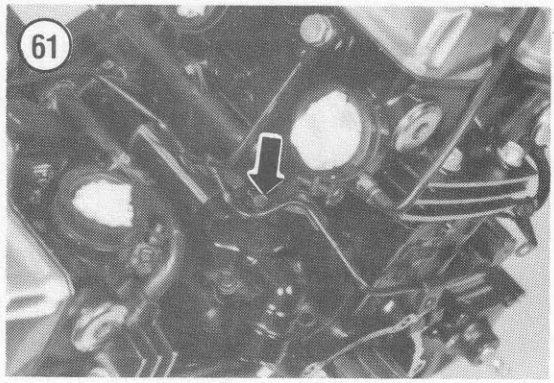
CAUTION

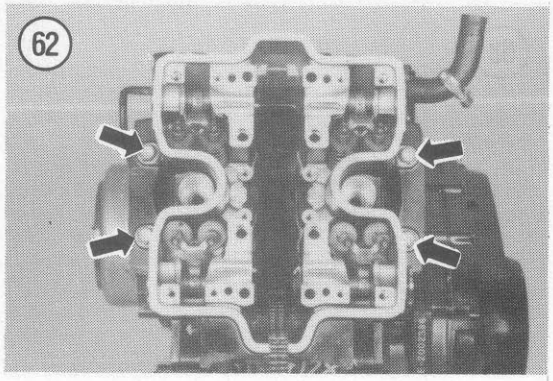
Remember, the fins on the cylinder head are fragile and may be damaged if tapped or pried on too hard. Never use a metal hammer. These fins are more for cosmetic value than cooling. They are not as fragile as those on an air-cooled engine but they still may break.

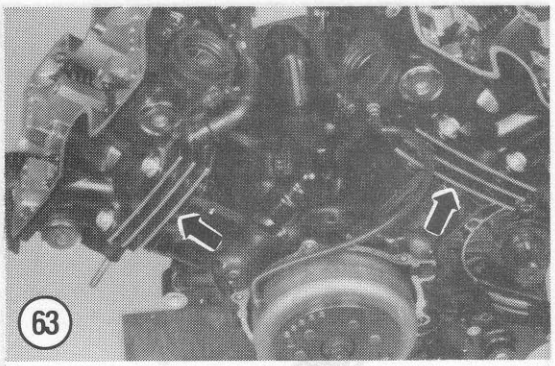
11. Untie the wire securing the cam chain and retie it to the cylinder head. Lift the cylinder head straight up and off the cylinder block. Pull the cam chain and wire through the opening in the cylinder head and retie the cam chain up to the cam chain guide.
12. Remove the head gasket and dowel pins.

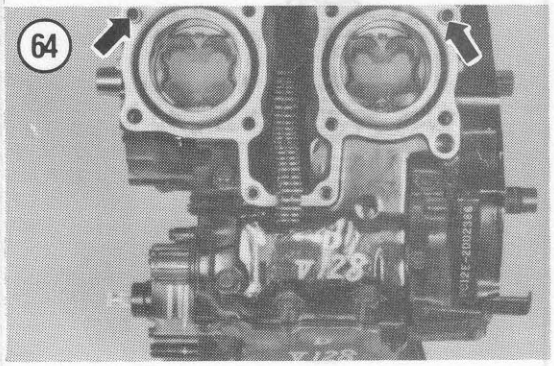


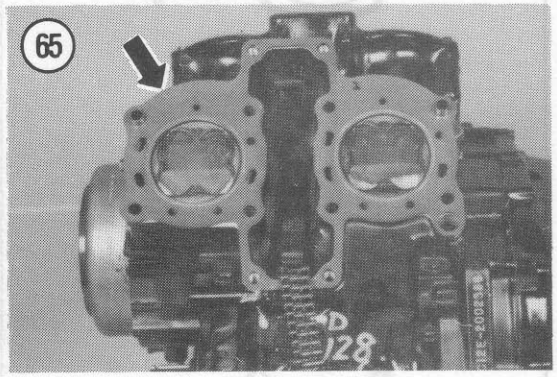


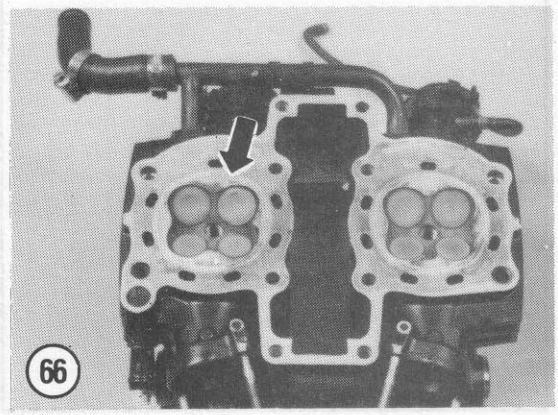








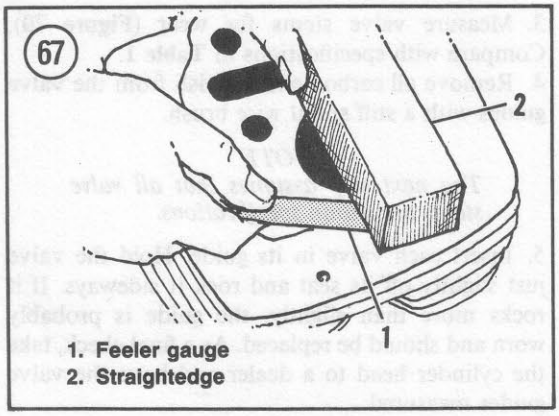




13. Place a clean shop rag into the cam chain opening in the block to prevent entry of foreign matter.
14. Repeat Steps 8-13 for the other cylinder head.
15. Install by reversing these removal steps, noting the following.
16. Clean the cylinder head mating surfaces of any old gasket material.
17. Install the locating dowels (**Figure 64**).
18. Install a new head gasket (**Figure 65**).
19. Install the bolts securing the cylinder head. *Do not* tighten the bolts at this time as they will be tightened after the camshafts are installed.
20. Install the oil line assembly. Place a sealing washer on each side of each fitting, then insert the bolts. These washers must be installed as noted to prevent an oil leak.
21. Repeat for the other cylinder head.

Inspection

1. Remove all traces of old gasket material from the cylinder head (**Figure 66**) and the cylinder block mating surface.
2. *Without removing the valves*, remove all carbon deposits from the combustion chambers with a wire brush. A blunt screwdriver or chisel may be used if care is taken not to damage the head, valves and spark plug threads.
3. After all carbon is removed from the combustion chambers and valve intake and exhaust ports, clean the entire head in solvent.
4. Clean away all carbon on the piston crowns. Do not remove the carbon ridges at the tops of the cylinder bores.
5. Check for cracks in the combustion chamber and exhaust ports. A cracked head must be replaced.
6. After the head has been thoroughly cleaned, place a straightedge across the gasket surface (**Figure 67**) at several points. Measure warp by



1. Feeler gauge
2. Straightedge

inserting a flat feeler gauge between the straightedge and the cylinder head at each location. There should be no warpage; if a small amount is present, the head can be resurfaced by a Honda dealer or qualified machine shop.

7. Check the valves and valve guides as described under *Valves and Valve Components* in this chapter.

VALVES AND VALVE COMPONENTS

Removal

Refer to **Figure 68** for this procedure.

1. Remove the cylinder head(s) as described in this chapter.

CAUTION

To avoid loss of spring tension, do not compress the springs any more than necessary to remove the keepers.

2. Compress springs with a valve spring compressor tool. Remove the valve keepers and release compression. Remove the valve compressor tool.
3. Before removing the valves, remove any burrs from the valve stem (**Figure 69**). Otherwise, the valve guides will be damaged.
4. Remove the valve keepers, valve spring retainer and both inner and outer springs.

Inspection

1. Clean all valves with a wire brush and solvent.
2. Inspect the contact surface of each valve for burning. Minor roughness and pitting can be removed by lapping the valve as described in this chapter. Excessive unevenness of the contact surface means the valve is not serviceable.

NOTE

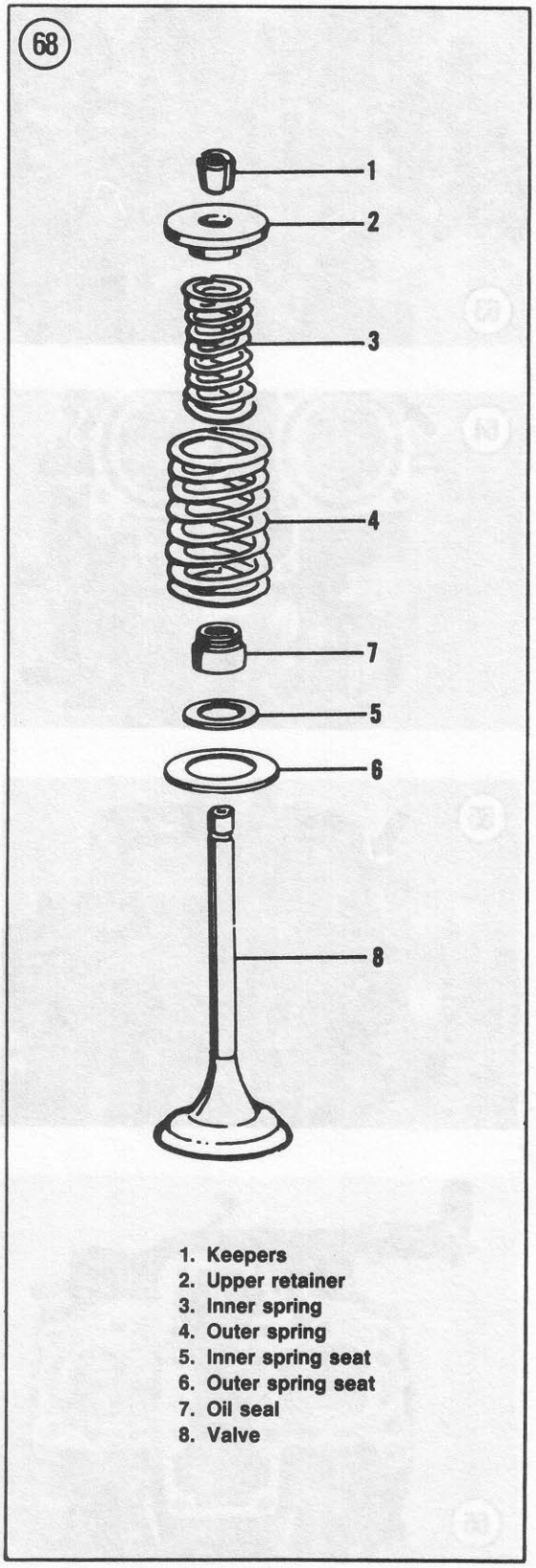
*The contact surface of the valve **cannot be ground**; the valve must be replaced if this area is damaged.*

3. Measure valve stems for wear (**Figure 70**). Compare with specifications in **Table 1**.
4. Remove all carbon and varnish from the valve guides with a stiff spiral wire brush.

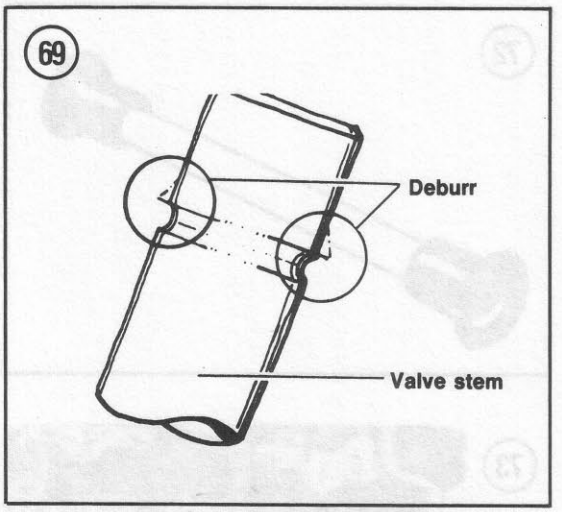
NOTE

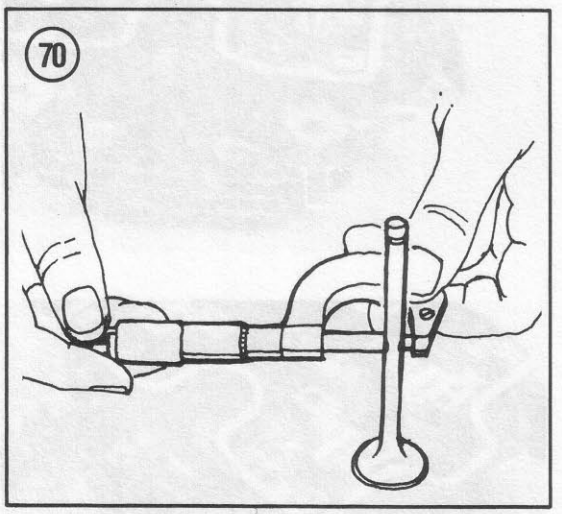
The next step assumes that all valve stems are within specifications.

5. Insert each valve in its guide. Hold the valve just slightly off its seat and rock it sideways. If it rocks more than slightly, the guide is probably worn and should be replaced. As a final check, take the cylinder head to a dealer and have the valve guides measured.



1. **Keepers**
2. **Upper retainer**
3. **Inner spring**
4. **Outer spring**
5. **Inner spring seat**
6. **Outer spring seat**
7. **Oil seal**
8. **Valve**





6. Measure the valve spring heights with a vernier caliper (**Figure 71**). All should be the length specified in **Table 1** with no bends or other distortion. Replace defective springs.
7. Check the valve spring retainer and valve keepers. If they are in good condition, they may be reused.
8. Inspect valve seats. If worn or burned, they must be reconditioned. This should be performed by your dealer or a qualified machine shop. Seats and valves in near-perfect condition can be reconditioned by lapping with a fine carborundum paste. Lapping, however, is always inferior to precision grinding.

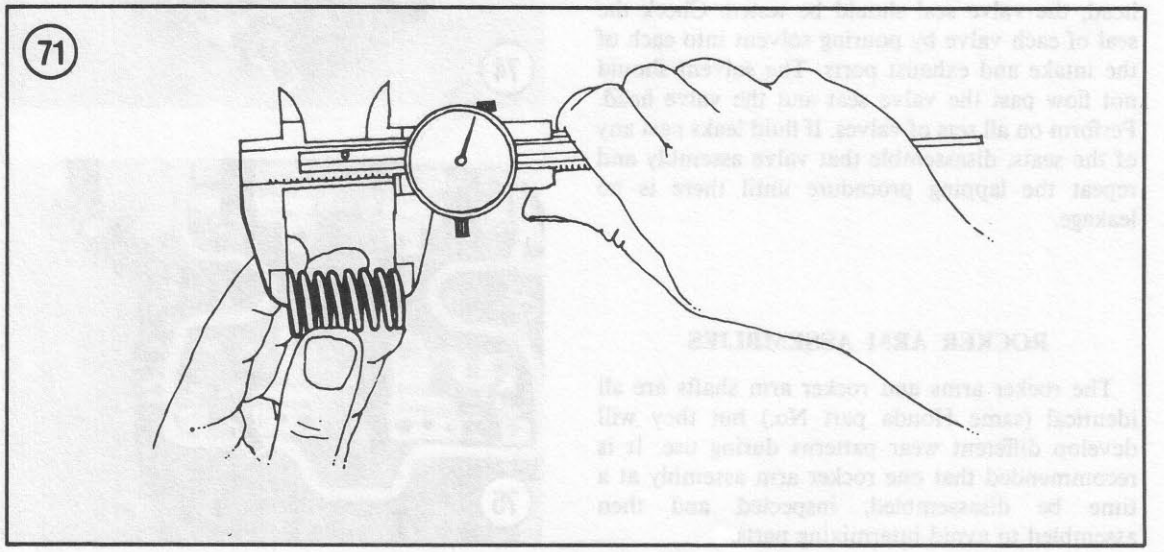
Installation

1. Coat the valve stems with molybdenum disulfide grease. To avoid damage to the valve stem seal, turn the valve slowly while inserting the valve into the cylinder head.
2. Install the bottom spring retainers and new seals.
3. Install the valve springs with the narrow pitch end (end with coils closest together) facing the head. Install the upper valve spring retainers.

CAUTION

To avoid loss of spring tension, do not compress the springs any more than necessary to install the keepers.

4. Push down on upper valve spring retainers with the valve spring compressor and install valve keepers.
5. After all keepers have been installed, gently tap the valve stems with a plastic mallet to make sure the keepers are properly seated.



Valve Guide Replacement

When guides are worn so that there is excessive stem-to-guide clearance or valve tipping, they must be replaced. Replace all, even if only one is worn. This job should be done only by a dealer, as special tools are required.

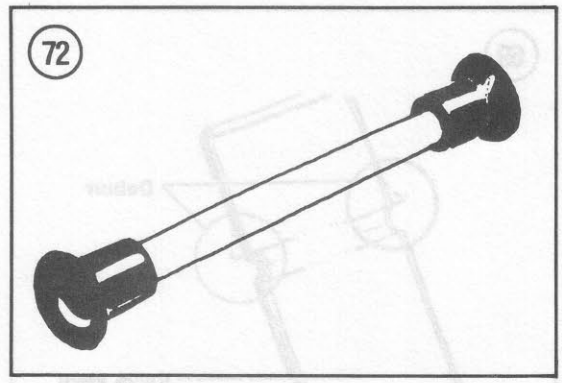
Valve Seat Reconditioning

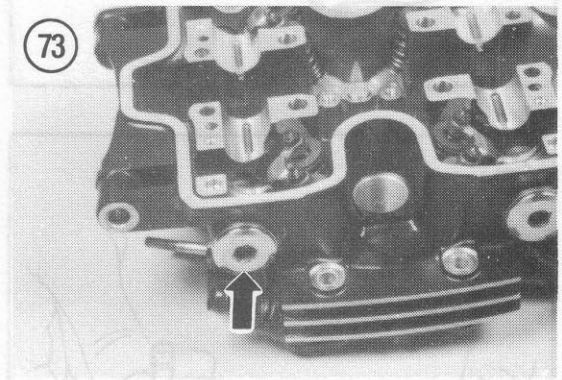
This job is best left to your dealer or local machine shop. They have the special equipment and knowledge for this exacting job. You can still save considerable money by removing the cylinder heads and taking just the heads to the shop.

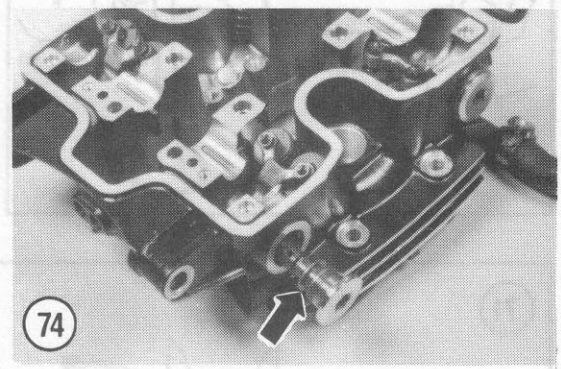
Valve Lapping

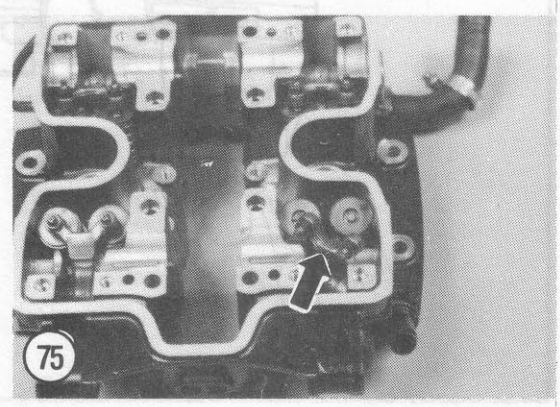
Valve lapping is a simple operation which can restore the valve seal without machining if the amount of wear or distortion is not too great.

1. Coat the valve seating area in the head with a lapping compound such as Carborundum or Clover Brand.
2. Insert the valve into the cylinder head.
3. Wet the suction cup (**Figure 72**) of the lapping stick and stick it onto the head of the valve. Lap the valve to the seat by rotating the lapping stick in both directions. Every 5 to 10 seconds, rotate the valve 180° in the valve seat; continue lapping until the contact surfaces of the valve and the valve seat are a uniform grey. Stop as soon as they are, to avoid removing too much material.
4. Thoroughly clean the valves and cylinder head in solvent to remove all grinding compound. Any compound left on the valves or the cylinder head will end up in the engine and will cause damage.
5. After the lapping has been completed and the valve assemblies have been reinstalled into the head, the valve seal should be tested. Check the seal of each valve by pouring solvent into each of the intake and exhaust ports. The solvent should not flow past the valve seat and the valve head. Perform on all sets of valves. If fluid leaks past any of the seats, disassemble that valve assembly and repeat the lapping procedure until there is no leakage.



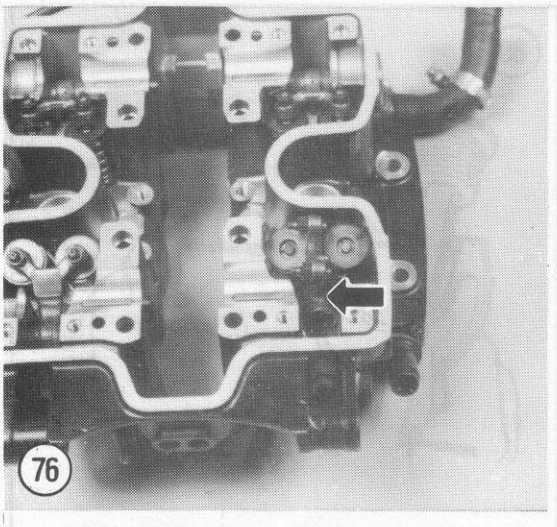


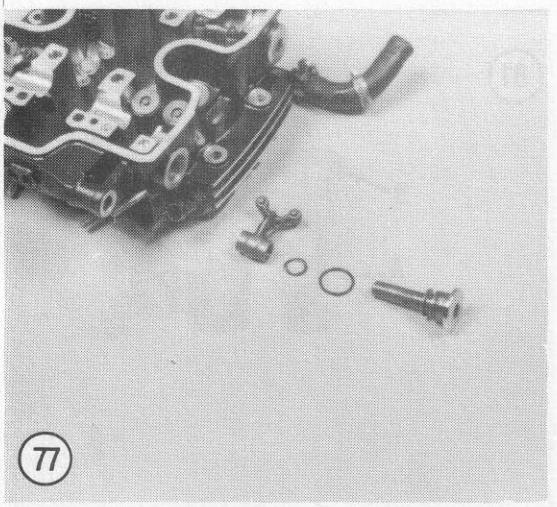


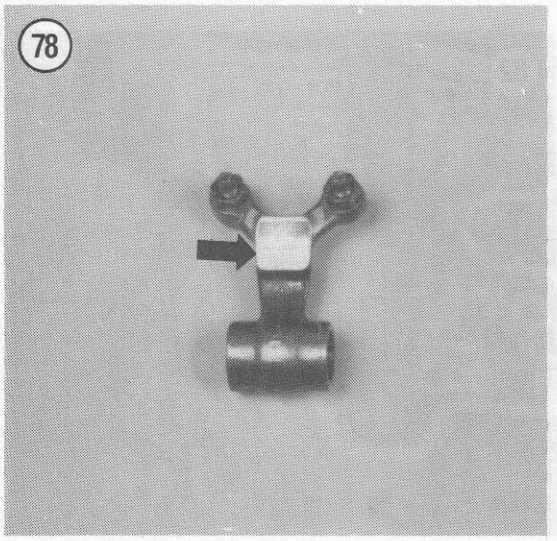


ROCKER ARM ASSEMBLIES

The rocker arms and rocker arm shafts are all identical (same Honda part No.) but they will develop different wear patterns during use. It is recommended that one rocker arm assembly at a time be disassembled, inspected and then assembled to avoid intermixing parts.



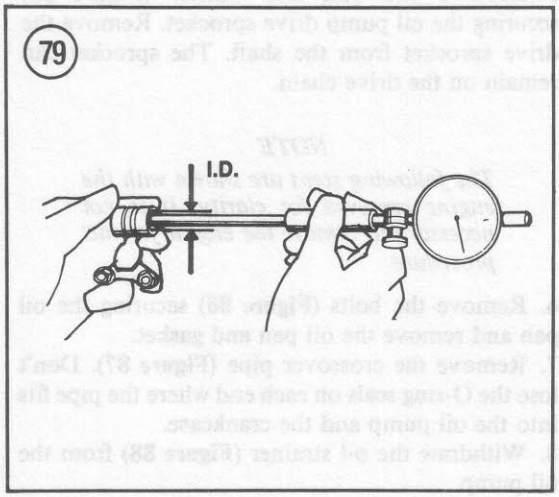




Removal/Inspection/Installation

The rocker arms are a little tricky to remove and install. The surrounding area is relatively small and they must be removed and installed one way only. This procedure is typical of all rocker arms.

1. Unscrew the rocker arm shaft (**Figure 73**) from the cylinder head and remove the rocker arm shaft, O-ring seal and the wave washer (**Figure 74**).
2. Tip the rocker arm shaft end of the rocker arm down (**Figure 75**) and rotate it sideways, moving the lower end out of the rocker arm shaft bore in the cylinder head.
3. Pull the rocker arm straight up and out of the cylinder head (**Figure 76**).
4. Wash all parts (**Figure 77**) in cleaning solvent and thoroughly dry.
5. Inspect the rocker arm pad (**Figure 78**) where it rides on the cam lobe and where the adjuster rides on the valve stems. If the pad is scratched or unevenly worn, inspect the cam lobe for scoring, chipping or flat spots. Replace the rocker arm if defective.
6. Measure the inside diameter of the rocker arm (**Figure 79**) with an inside micrometer and check against dimensions in **Table 1**. Replace if worn to the service limit or greater.
7. Inspect the rocker arm shaft for signs of wear or scoring. Measure the outside diameter (**Figure 80**) with a micrometer and check against dimensions in **Table 1**. Replace if worn to the service limit or less.
8. Coat the rocker arm shaft and rocker arm bore (A, **Figure 81**) with clean engine oil.
9. Install the O-ring (B, **Figure 81**) onto the rocker arm shaft.
10. Install the wave washer onto the rocker arm shaft.



11. Insert the rocker arm into the cylinder head with the valve adjuster portion facing toward the cam chain cavity (**Figure 82**).

CAUTION

In the following step, do not force the rocker arm into position as you will damage the rocker arm bore in the cylinder head, ruining the head.

12. Pull up slightly and rotate the rocker arm sideways, moving the lower end into the rocker arm shaft bore in the cylinder head (**Figure 75**). This step is tricky but it *will* go in, believe me.
13. Partially install the rocker arm into the cylinder head. Pull up slightly on the rocker arm aligning the hole with the rocker arm shaft and push the rocker arm all the way in until the threads touch.
14. Screw the rocker arm shaft into the cylinder head and tighten to the torque specification listed in **Table 2**.

OIL PUMP

The oil pump is mounted within the crankcase and can be removed with the engine in the frame. This procedure is shown with the engine removed from the frame for clarity.

Refer to **Figure 83** for this procedure.

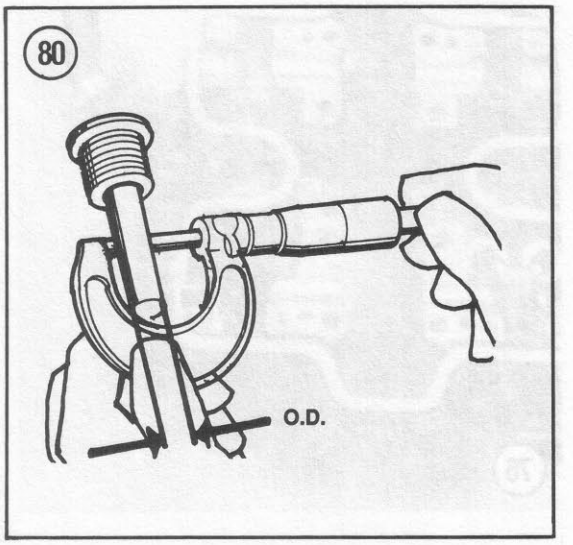
Removal/Installation

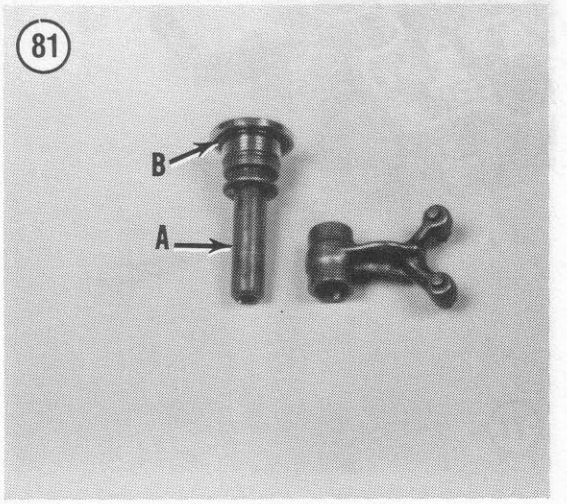
1. Place the bike on the centerstand.
2. Remove the exhaust system (A, **Figure 84**) as described in Chapter Six.
3. Drain the engine oil as described in Chapter Three.
4. Remove the bolts securing the right-hand crankcase/clutch cover (B, **Figure 84**) and remove the cover.
5. Remove the bolt and washer (**Figure 85**) securing the oil pump drive sprocket. Remove the drive sprocket from the shaft. The sprocket can remain on the drive chain.

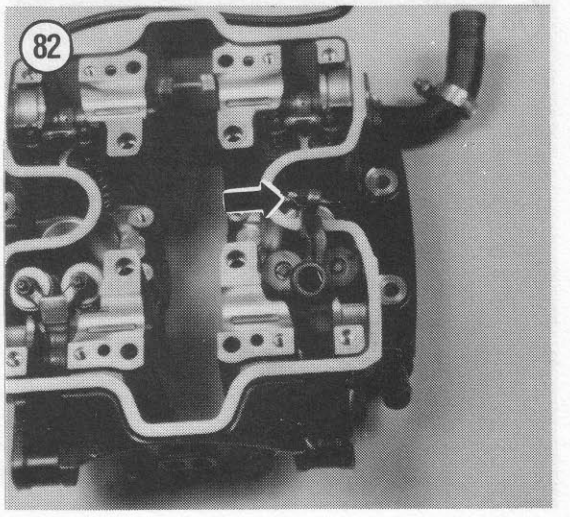
NOTE

The following steps are shown with the engine removed for clarity. It is not necessary to remove the engine for this procedure.

6. Remove the bolts (**Figure 86**) securing the oil pan and remove the oil pan and gasket.
7. Remove the crossover pipe (**Figure 87**). Don't lose the O-ring seals on each end where the pipe fits into the oil pump and the crankcase.
8. Withdraw the oil strainer (**Figure 88**) from the oil pump.







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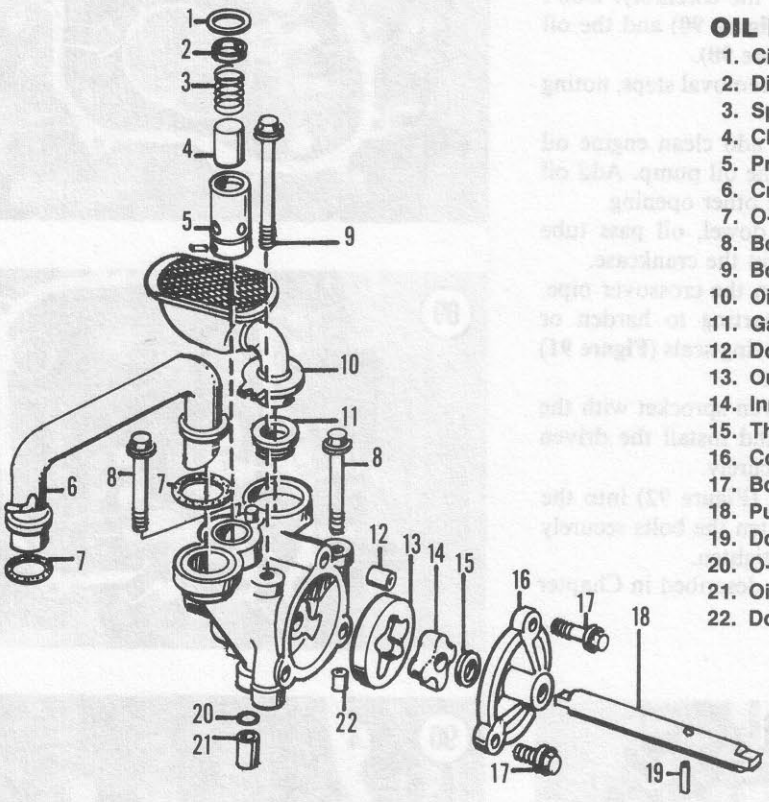
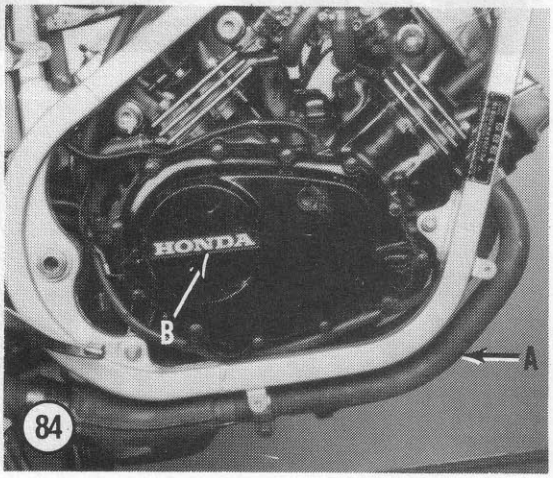


OIL PUMP

1. Circlip
2. Dished washer
3. Spring
4. Check valve
5. Pressure relief valve
6. Crossover pipe
7. O-ring
8. Bolt
9. Bolt
10. Oil strainer
11. Gasket
12. Dowel pin
13. Outer rotor
14. Inner rotor
15. Thrust washer
16. Cover
17. Bolt
18. Pump shaft
19. Dowel pin
20. O-ring
21. Oil passage tube
22. Dowel pin



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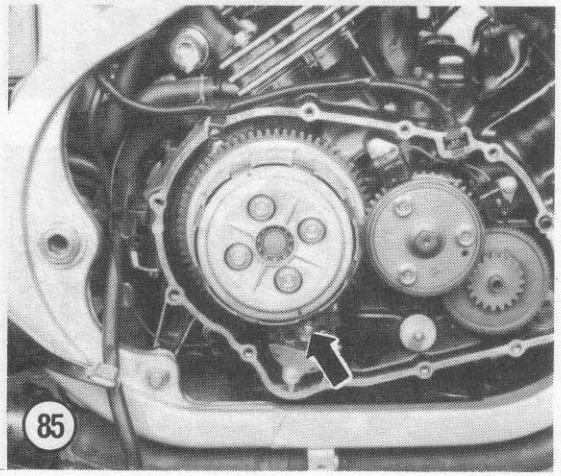
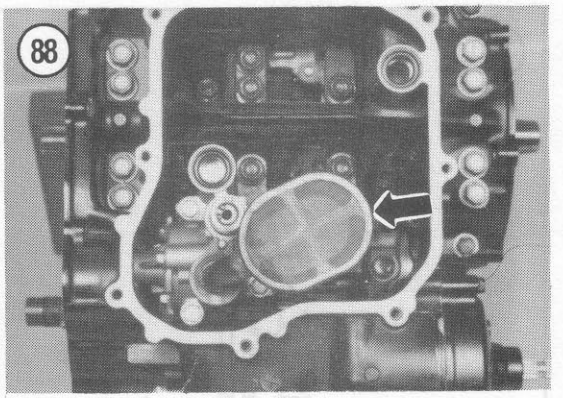
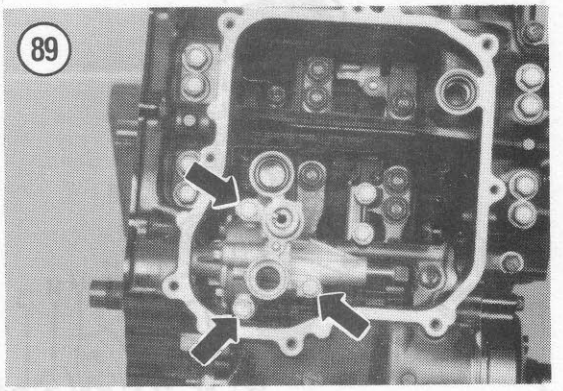
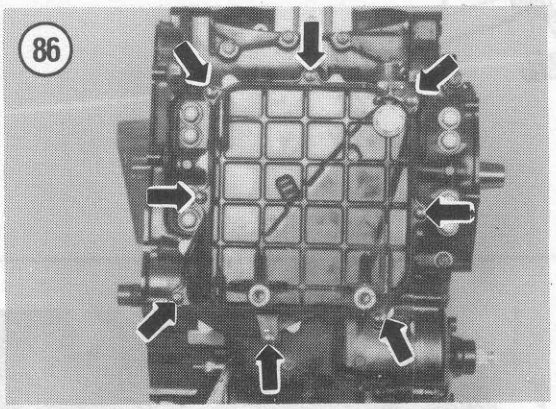


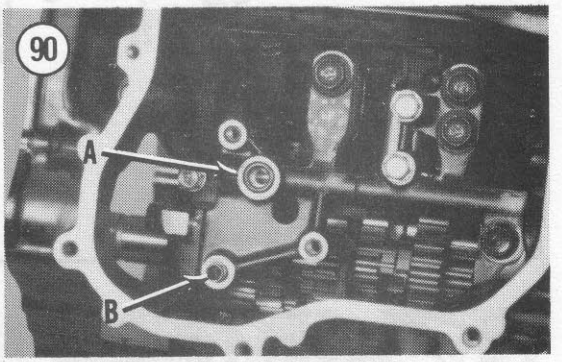
85

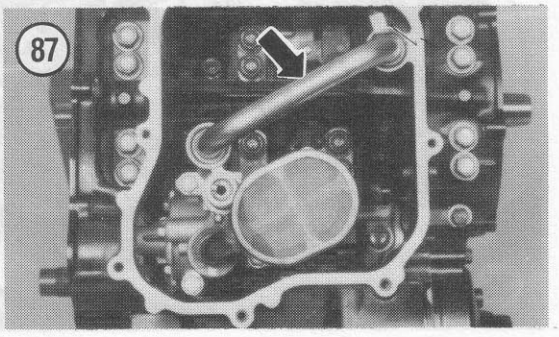
9. Temporarily install the oil pump drive sprocket and rotate the oil pump until the cutout on the water pump drive shaft is visible and aligns with the oil pan gasket surface of the crankcase.
10. Remove the bolts (**Figure 89**) securing the oil pump assembly and remove the assembly. Don't lose the locating dowel (A, **Figure 90**) and the oil pass tube and O-ring (B, **Figure 90**).
11. Install by reversing these removal steps, noting the following.
12. To prime the oil pump, add clean engine oil into one of the openings in the oil pump. Add oil until the oil drains out of the other opening.
13. Make sure the locating dowel, oil pass tube and O-ring seal are installed in the crankcase.
14. Check the O-ring seals on the crossover pipe. Replace both if they are starting to harden or deteriorate. Make sure the O-ring seals (**Figure 91**) are installed in the crankcase.
15. Align the slot in the driven sprocket with the tab on the oil pump shaft and install the driven sprocket. Tighten the bolt securely.
16. Install a new pan gasket (**Figure 92**) into the pan and install the pan. Tighten the bolts securely and evenly, but do not over tighten.
and quantity of engine oil as described in Chapter Three.

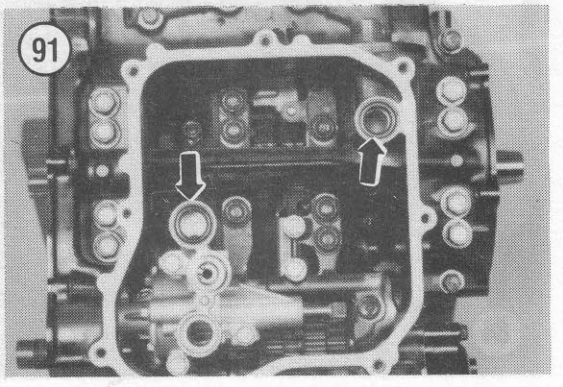


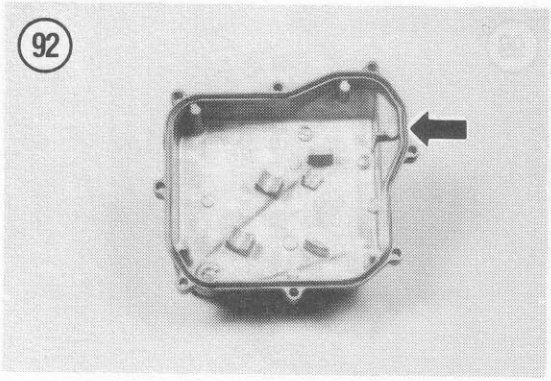


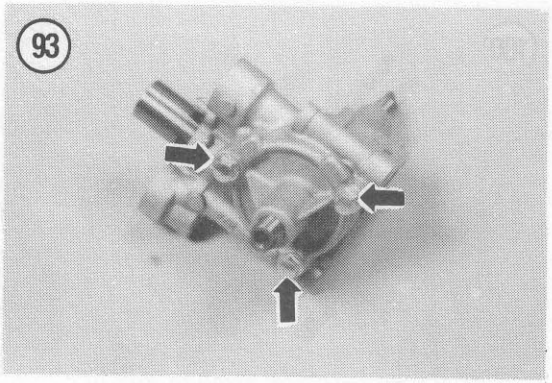


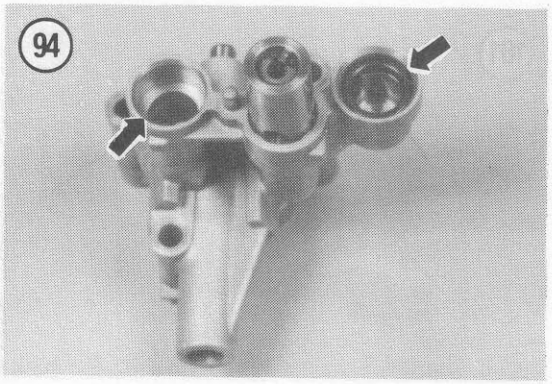


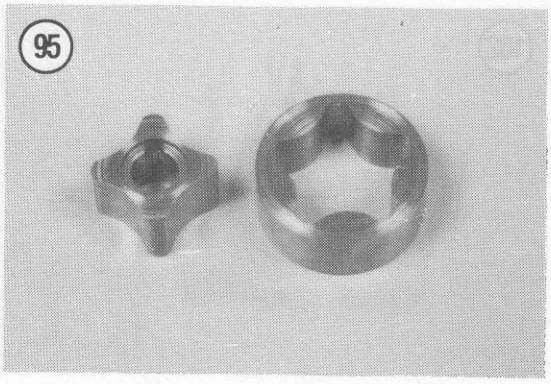












18. Start the engine and check for leaks.

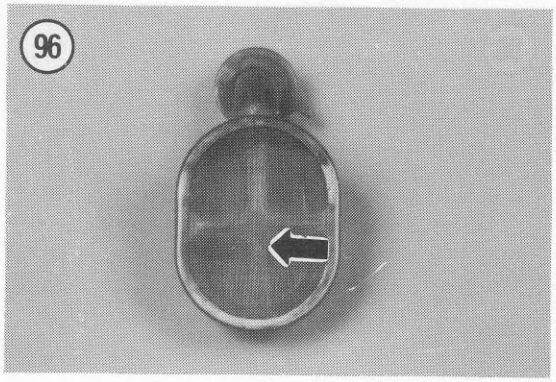
Disassembly/Inspection/Assembly

Refer to **Figure 83** for this procedure.

NOTE

Internal replacement parts are not available for the oil pump. If any of the internal components are worn or damaged, the entire oil pump assembly must be replaced. The driven sprocket and the pressure relief valve are available as replacement parts.

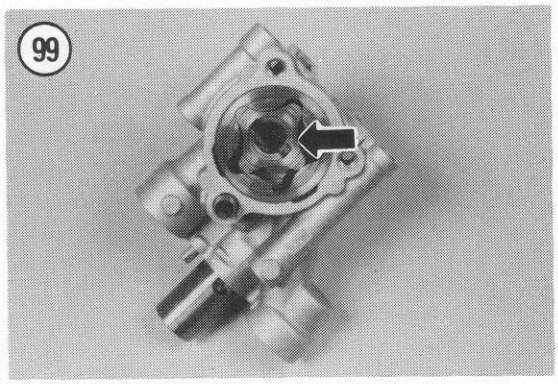
1. Inspect the pump cover and body for cracks.
2. Remove the bolts (**Figure 93**) securing the pump cover to the pump body. Remove the pump cover. Don't lose the locating dowel.
3. Remove the thrust washer from the oil pump drive shaft.
4. Withdraw the oil pump drive shaft and pin. Don't lose the pin; it will slide out of the shaft.
5. Remove the inner and outer rotors. Check all parts for scratches and abrasion.
6. Clean all parts in solvent and dry thoroughly. Coat all parts with fresh oil prior to installation.
7. Inspect the interior passageways (**Figure 94**) of the oil pump body. Make sure that all oil sludge and foreign matter is removed.
8. Inspect the inner and outer rotor (**Figure 95**) for wear or damage. Replace if necessary.
9. Inspect the oil strainer (**Figure 96**) and gasket (**Figure 97**). Replace if deteriorated or damaged.
10. Install the outer rotor (**Figure 98**) into the pump body.
11. Install the inner rotor (**Figure 99**) into the outer rotor.
12. Install the oil pump drive shaft (**Figure 100**) through the inner rotor.
13. Align the grooves in the inner rotor with the pin on the shaft and install the pin (**Figure 101**). Make sure the pin is meshed properly into the groove in the inner rotor.

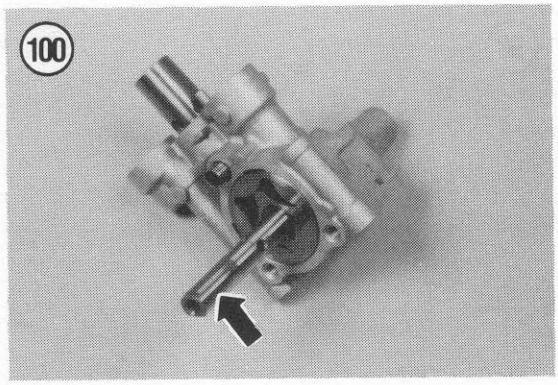


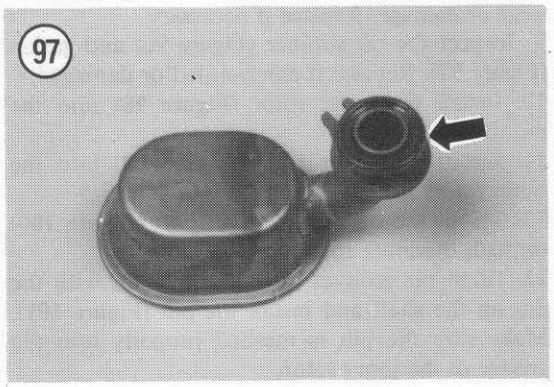
14. Check the clearance between the inner tip and outer rotor (**Figure 102**) with a flat feeler gauge. If the clearance is greater than the service limit in **Table 1** the oil pump must be replaced.
15. Check the clearance between the outer rotor and the body (**Figure 103**) with a flat feeler gauge. If the clearance is greater than the service limit in **Table 1** the oil pump must be replaced.
16. Check the rotor end clearance with a straightedge and flat feeler gauge. If the clearance is greater than the service limit in **Table 1** the oil pump must be replaced.
17. Install the thrust washer (**Figure 104**).
18. If removed, install the locating dowel (**Figure 105**) into the pump body.
19. Install the cover and tighten the screws securely (**Figure 93**).
20. After the oil pump is assembled, turn the shaft and make sure the oil pump turns freely with no binding.
21. Install the oil pump assembly.

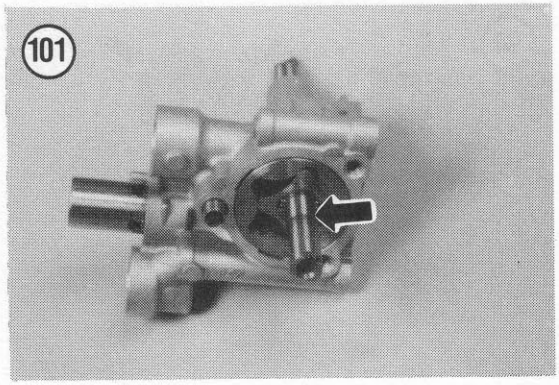
NOTE

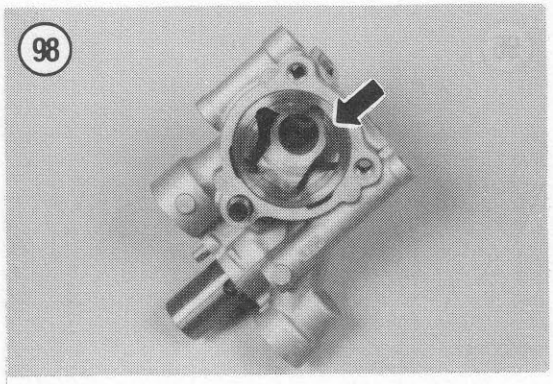
*If the condition of the oil pump is doubtful, run the **Oil Pump Pressure Test** described in this chapter.*

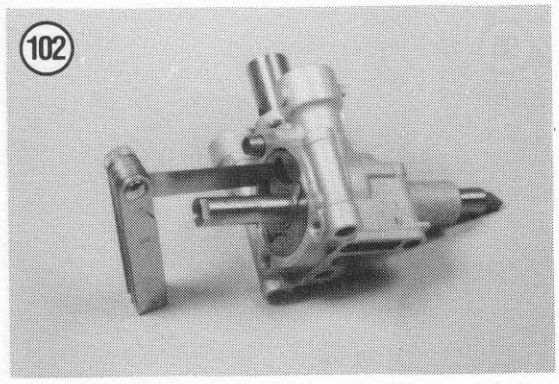


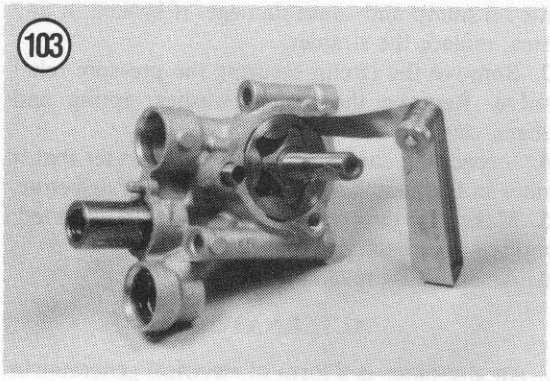


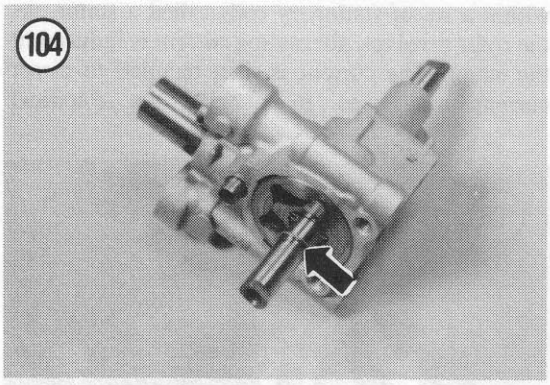


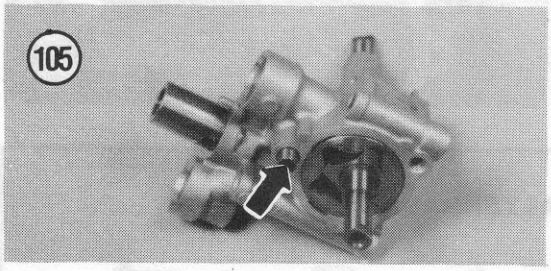


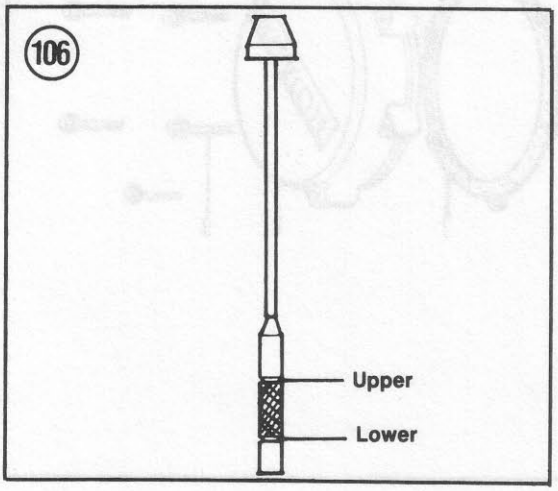












Oil Pump Pressure Test

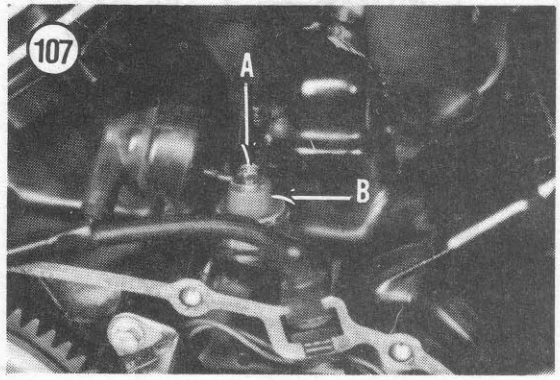
If the oil pump output is doubtful, the following test can be performed.

1. Warm the engine up to normal operating temperature (80° C/176° F). Shut off the engine.
2. Place the bike on the centerstand.
3. Check the engine oil level. It must be to the upper line (**Figure 106**); add oil if necessary. Do not run this test with the oil level low or the test readings will be false.
4. Remove the electrical wire (**Figure 107**) front the oil pressure sending unit.
5. Remove the oil pressure sending unit (B, **Figure 107**).
6. Screw a portable oil pressure gauge into the switch hole in the crankcase.

NOTE

These can be purchased in an automotive or motorcycle supply store or from a Honda dealer. The Honda parts are No. 07506-3000000 (Oil Pressure Gauge) and No. 07510-4220100 (Oil Pressure Gauge Attachment).

7. Start the engine and run it at 9,000 rpm. The standard pressure is 5.4 kg/cm² (77 psi) at 9,000 rpm and with the engine temperature at 80° C (176° F). If the pressure is less than specified the oil pump must be replaced as it cannot be serviced.
8. Remove the portable oil pressure gauge.
9. Apply liquid sealant (Gasgacinch or equivalent) to the sending unit threads before installation. Tighten the switch to the torque specifications listed in **Table 2**. Install the electrical wire to the top of the switch. This connection must be free of oil to make good electrical contact.



OIL STRAINER AND PRESSURE RELIEF VALVE

Removal/Installation

This procedure is shown with the engine removed for clarity. It is not necessary to remove the engine to perform this procedure.

Refer to **Figure 83** for this procedure.

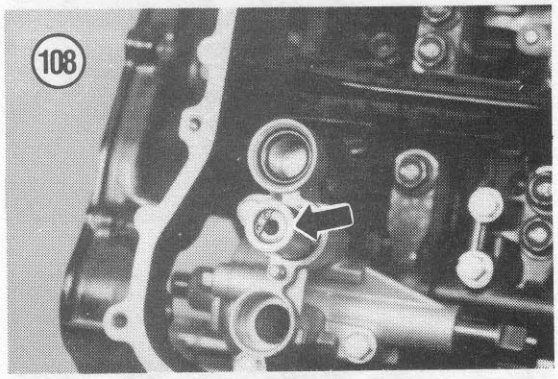
1. Place the bike on the centerstand.
2. Remove the exhaust system as described in Chapter Six.
3. Drain the engine oil as described in Chapter Three.
4. Remove the bolts (**Figure 86**) securing the oil pan and remove the oil pan and gasket.
5. Withdraw the oil strainer (**Figure 88**) from the oil pump.
6. If necessary, remove the oil pressure relief valve (**Figure 108**) from the oil pump.
7. Install a new pan gasket and the pan. Install all bolts securely.
8. Refill the engine with the recommended type and quantity of engine oil. Refer to Chapter Three.
9. Start the engine and check for leaks.

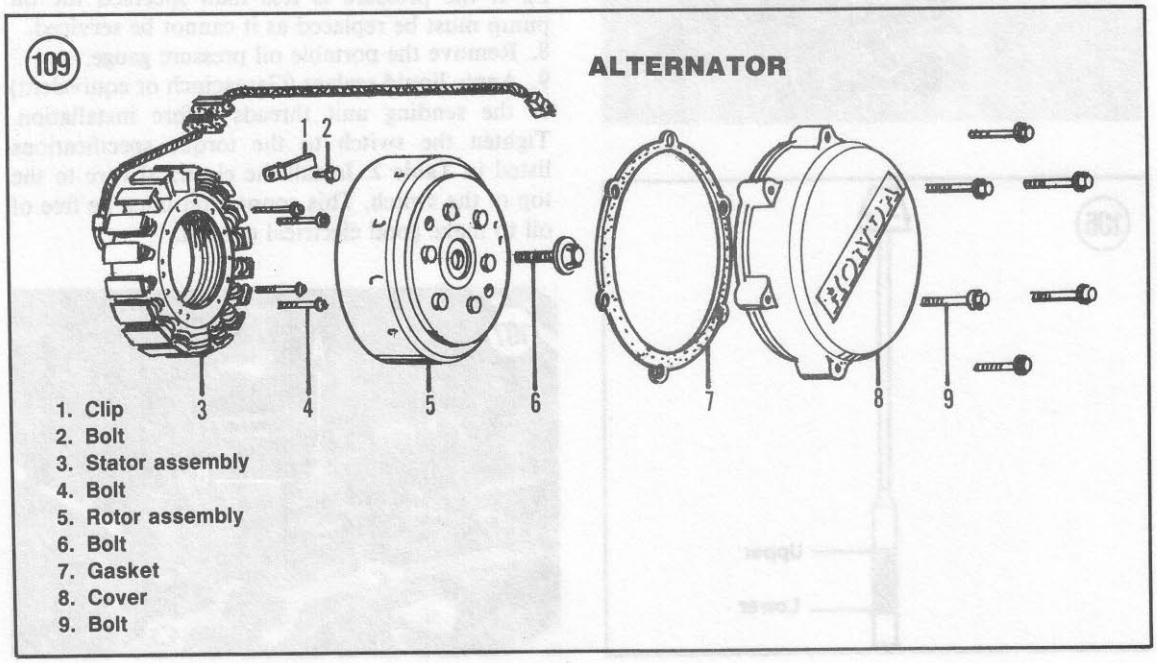
Inspection

1. Wash all parts in cleaning solvent and dry thoroughly with compressed air. Carefully scrub the strainer screen with a soft toothbrush; do not damage the screen.
2. Inspect the strainer screen for broken areas. These would allow small foreign particles to enter the oil pump and cause damage. If broken in any area, replace the strainer.
3. Remove the circlip securing the pressure relief valve. Remove the dished washer, spring and check valve.
4. Inspect the check valve and the cylinder that it rides in for scratches or wear. Replace if defective.
5. Make sure the spring is not broken or distorted; replace if necessary.
6. Assemble by reversing Step 3.

ALTERNATOR

An alternator is a form of electrical generator in which a magnetized field called a rotor revolves within a set of stationary coils called a stator. As the rotor revolves, alternating current is induced in the stator. The current is then rectified to direct current and used to operate the electrical





rotor from turning while removing the bolt. You could also shift the transmission into gear and hold the rear brake on.

8. Screw in the rotor puller (**Figure 116**) until it stops. Use the Honda rotor puller (part No. 07733-3000000 or equivalent.

CAUTION

Don't try to remove the rotor without a puller; any attempt to do so will ultimately lead to some form of damage to the engine and/or rotor. Many aftermarket pullers are available from motorcycle dealers or mail order houses. The cost of one of these pullers is about $10 and it makes an excellent addition to any mechanic's tool box. If you can't buy or borrow one, have a dealer remove the rotor.

9. Turn the rotor puller with a wrench until the rotor is free.

NOTE

If the rotor is difficult to remove, strike the puller with a hammer a few times. This will usually break it loose.

CAUTION

If normal rotor removal attempts fail, do not force the puller as the threads may be stripped out of the rotor causing expensive damage. Take the bike to a dealer and have the rotor removed.

10. Remove the rotor from the crankshaft. Remove the rotor puller from the rotor.

CAUTION

*Carefully inspect the inside of the rotor (**Figure 117**) for small bolts, washers or other metal "trash" that may have been picked up by the magnets. These small metal bits can cause severe damage to the alternator stator assembly.*

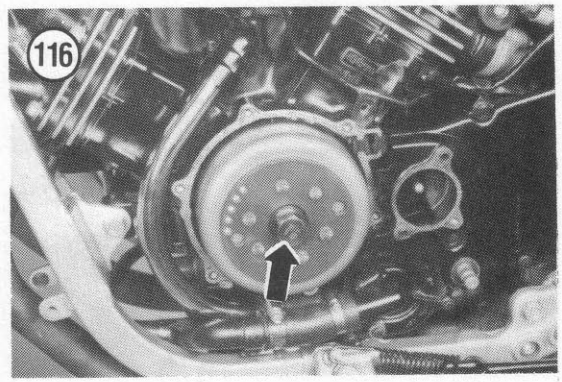
11. Install by reversing these removal steps. Tighten the rotor bolt to torque specification listed in **Table 2**.

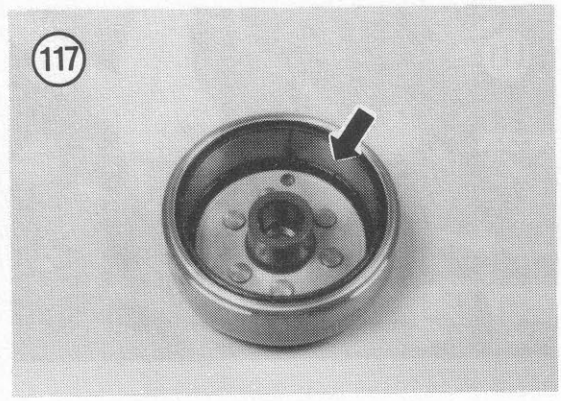
Rotor Testing

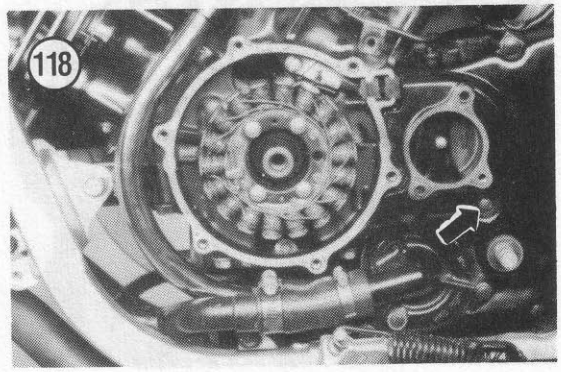
The rotor is permanently magnetized and cannot be tested except by replacement with a rotor known to be good. A rotor can lose magnetism from old age or a sharp blow. If defective, the rotor must be replaced; it cannot be remagnetized.

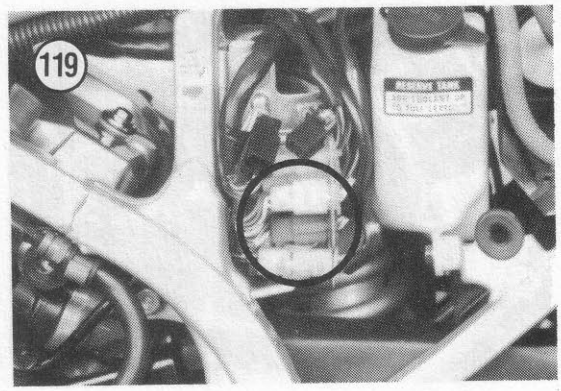
Stator Removal/Installation

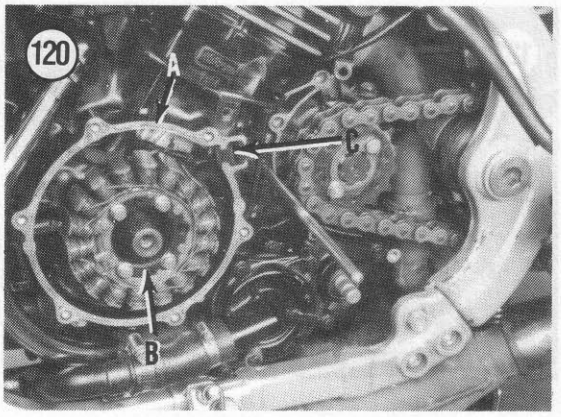
1. Remove the alternator rotor as described in this chapter.

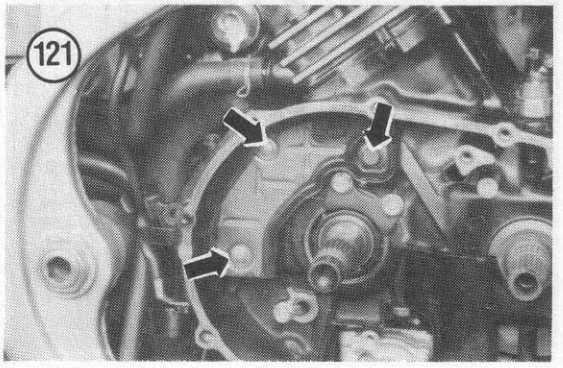


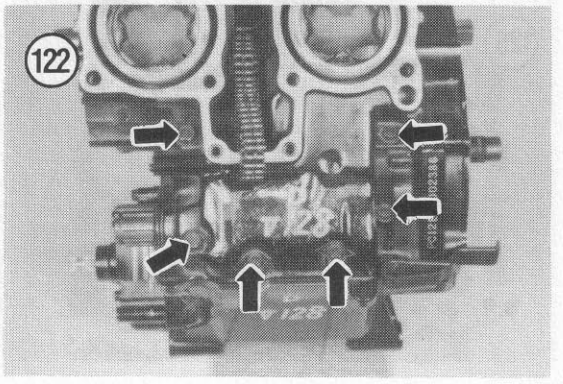












2. Remove the bolts securing the drive sprocket cover and remove the cover (**Figure 118**).

3A. On Magna models, disconnect the 3-pin alternator electrical connector on the bracket attached to the rear fender.

3B. On Interceptor models, disconnect the 3-pin alternator electrical connector (**Figure 119**) next to the coolant recovery tank on the right-hand side.

4. Remove the electrical harness from the clips on the engine.

5. Remove the bolt and wire clamp (A, **Figure 120**) securing the wire to the housing.

CAUTION

In the next step, during bolt removal, be careful not to damage the coils of the stator assembly. If the tool slips the wires may be damaged and a good stator will have to be replaced.

6. Remove the bolts securing the alternator stator to the crankcase (B, **Figure 120**).

7. Carefully pull the rubber grommets and electrical wire harness (C, **Figure 120**) from the crankcase and remove the wires from the frame. Note the path of the wire harness as it must be routed the same during installation.

8. Install by reversing these removal steps, noting the following.

9. If removed, be sure to install the wire clamp over the electrical wires on the backside of the stator base and secure with the screw. If the clamp is left off, the wires may rub against the crankcase, wear off the insulation and cause a short in the circuit.

10. Make sure that the electrical wire harness is routed through the frame exactly as before. Keep it away from the rear exhaust pipes.

CYLINDER BLOCK AND CRANKCASE

Service to the lower end requires that the engine be removed from the bike's frame.

Disassembly

1. Remove the engine from the frame as described in this chapter.

2. Remove the following exterior assemblies from the crankcase:
   a. Cylinder heads: this chapter.
   b. Alternator: this chapter.
   c. Countershaft bearing cover: this chapter.
   d. Starter clutch: this chapter.
   e. External shift mechanism: Chapter Five.
   f. Clutch: Chapter Five.
   g. Water pump: Chapter Eight.
   h. Starter motor: Chapter Seven.
   i. Neutral switch: Chapter Seven.
   j. Coolant pipes: Chapter Eight.

3. On the right-hand side, remove the bolts (**Figure 121**) securing the seal plate and remove the seal plate.

4. Loosen the upper crankcase bolts at the rear (**Figure 122**) and the one bolt at the front (**Figure 123**) in 2-3 stages in a crisscross pattern to avoid warpage. Remove all bolts.

5. Turn the engine upside down on the workbench and remove the oil pan, oil strainer and oil pump as described in this chapter.

6. Loosen the lower crankcase bolts in 2-3 stages in a crisscross pattern to avoid warpage (**Figure 124**). Leaving the 14 crankshaft bearing bolts for last, remove all bolts.
7. Tap around the perimeter of the crankcase halves with a plastic mallet—do not use a metal hammer as it will cause damage.
8. Pull the lower case half off of the upper cylinder block. Don't lose the locating dowel.

CAUTION

Honda's thin-walled crankcase castings are just that—thin. To avoid damage to the cases, do not hammer on the projected walls that surround the clutch or alternator. These areas are easily damaged.

CAUTION

If it is necessary to pry the crankcase apart, do it very carefully so that you do not mar the gasket surfaces. If you do, the cases will leak and must be replaced as a set. They cannot be repaired.

9. Remove the transmission assemblies as described in Chapter Five.
10. Remove the gearshift drum and forks as described in Chapter Five.
11. Remove the pistons and connecting rods as described in this chapter.
12. Remove the crankshaft and both cam chains.

NOTE

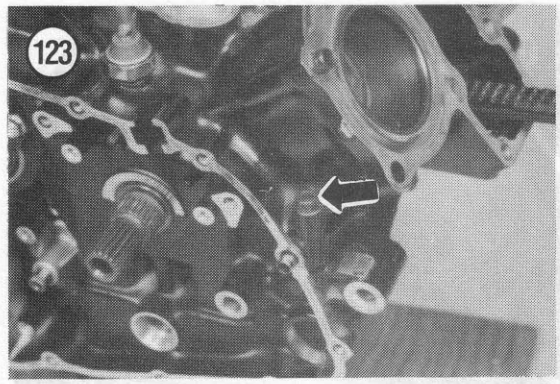
In the following step, the numbers assigned to the bearing inserts relate to the cylinder numbers (1, 2, 3 and 4).

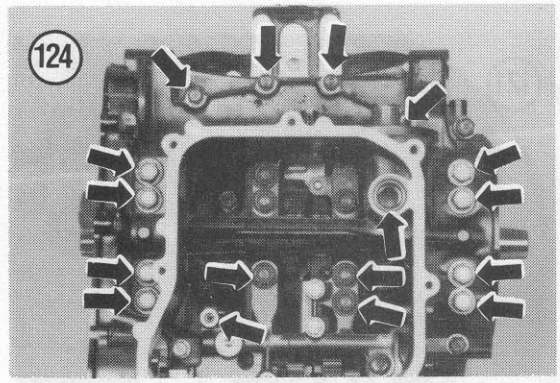
13. Remove the crankcase main bearing inserts from the upper and lower crankcase halves. Mark the backsides of the inserts with a "1," "2," "3" and "4" and "U" (upper) or "L" (lower) (**Figure 125**). Start from the left-hand side, so they can be reinstalled into the same position.

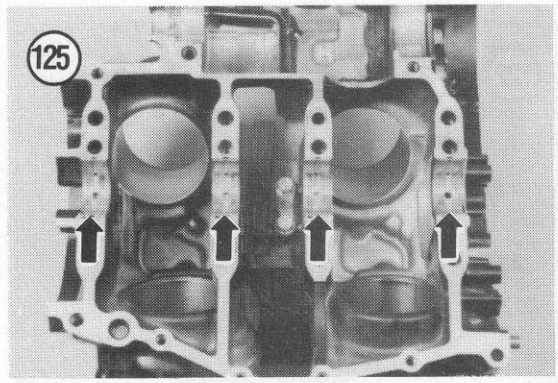
NOTE

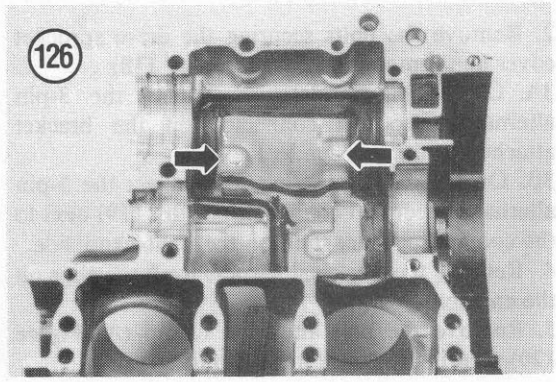
The left-hand side refers to the engine as it sits in the bike's frame—not necessarily as it sits on your workbench.

14. Remove the bolts (**Figure 126**) securing the crankcase breather baffle and remove the baffle.
15. Remove the bolts securing the cam chain slippers and remove both slippers. Refer to **Figure 127** for the upper crankcase and **Figure 128** for the lower crankcase.
16. Remove the oil pressure sending unit (**Figure 129**).





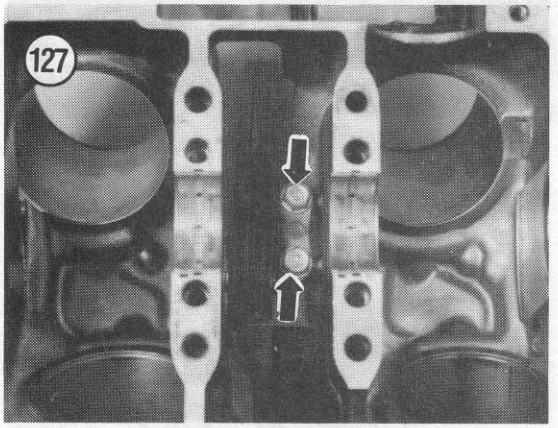


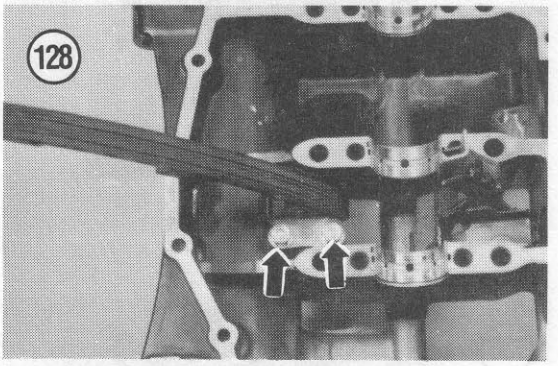


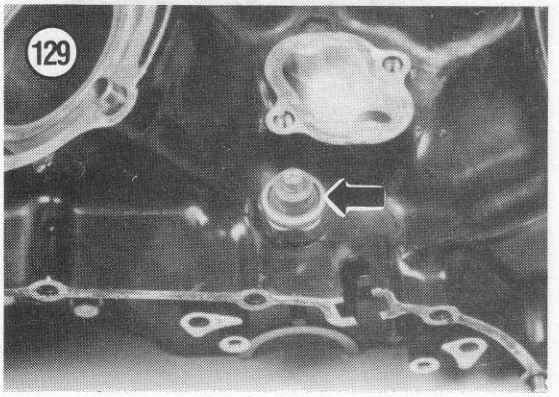
Inspection

The following procedure requires the use of highly specialized and expensive measuring instruments. If such instruments are not readily available, have the measurements performed by a dealer or qualified machine shop.

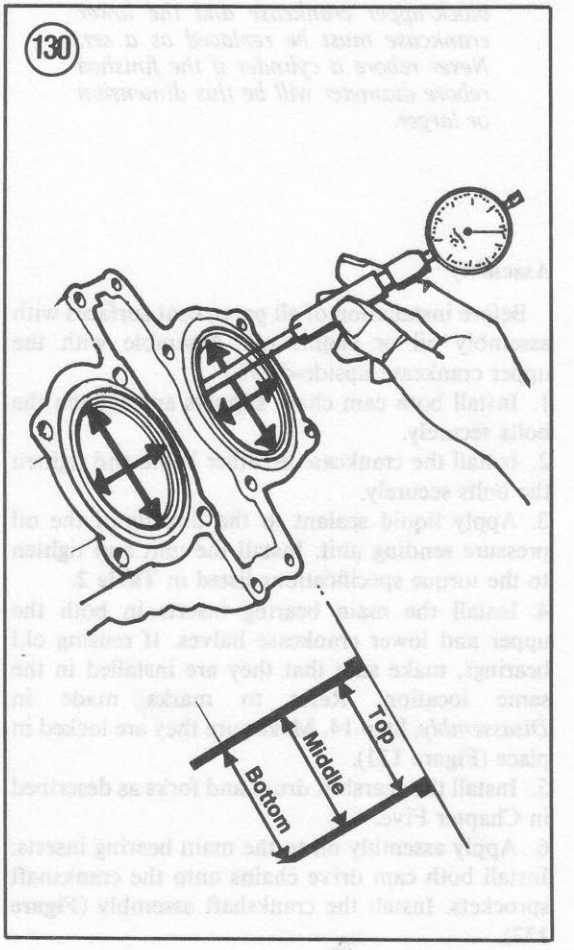
1. Thoroughly clean the inside and outside of both crankcase halves with cleaning solvent. Dry with compressed air. Make sure there is no solvent residue left in the cases as it will contaminate the new engine oil.







2. Check the crankcases for possible damage, such as cracks. Inspect the mating surface of both halves. They must be free of gouges, burrs or any damage that could cause an oil leak.
3. Soak with solvent any old cylinder head gasket material that may be stuck to the top of the cylinder block. Use a broad-tipped *dull* chisel and gently scrape off all gasket residue. Do not gouge the sealing surfaces as oil and air leaks will result.
4. After the cylinder block has been thoroughly cleaned, place a straightedge across the cylinder block/cylinder head gasket surfaces at several points. Measure the warpage by inserting a flat feeler gauge between the straightedge and the cylinder block at each location. There should be no warpage; if a small amount is present, it can be resurfaced by a dealer or qualified machine shop. If the cylinder head is warped in any direction by 0.10 mm (0.004 in.) or more, it must be replaced.
5. Measure the cylinder bores with a cylinder gauge (**Figure 130**) or inside micrometer at points near the top, in the middle and toward the bottom



as shown in **Figure 130**. Measure in 2 axes—in line with the piston pin and at 90° to the pin. If the taper or out-of-round is greater than 0.05 mm (0.002 in.), the cylinders must be rebored to the next oversize and new pistons and rings installed. Rebore all cylinders even though only one may be faulty.

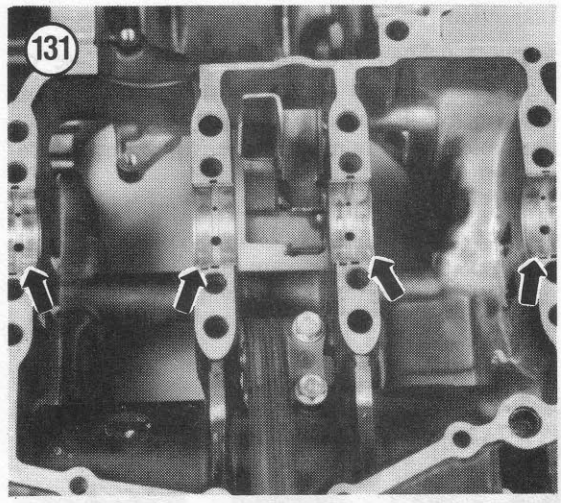
NOTE

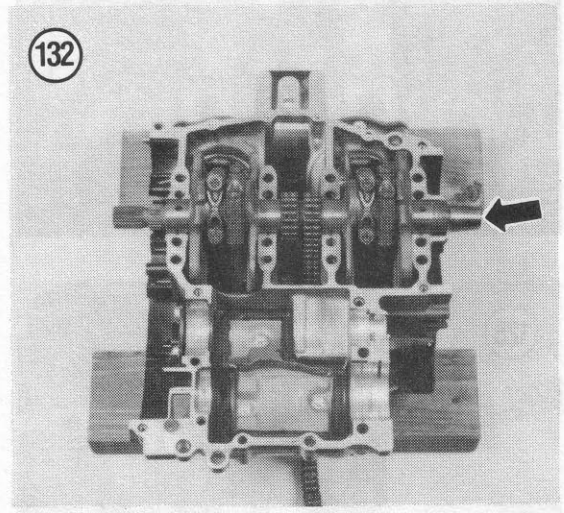
The new pistons should be obtained first before the cylinder block is rebored so that the pistons can be measured; slight manufacturing tolerances must be taken into account to determine the actual size and the working clearance. The standard and service limit dimensions for piston-to-cylinder clearance are listed in ***Table 1****.*

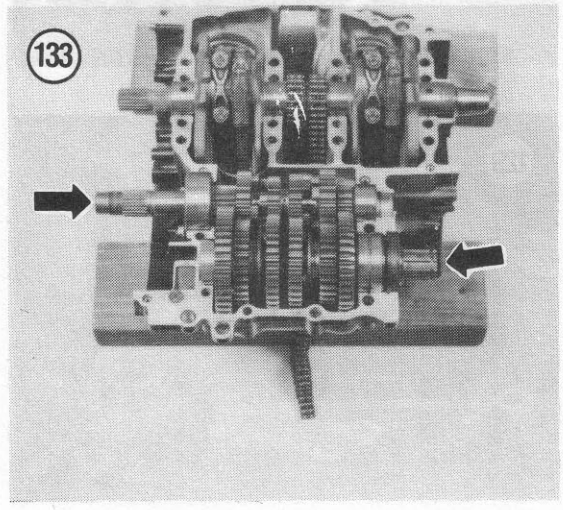
6. Check all cylinder walls for scratches; if evident, the cylinders should be rebored.

NOTE

The maximum wear limit for cylinder bores is listed in ***Table 1****. If any cylinder is worn to this limit, the cylinder block/upper crankcase and the lower crankcase must be replaced as a set. Never rebore a cylinder if the finished rebore diameter will be this dimension or larger.*



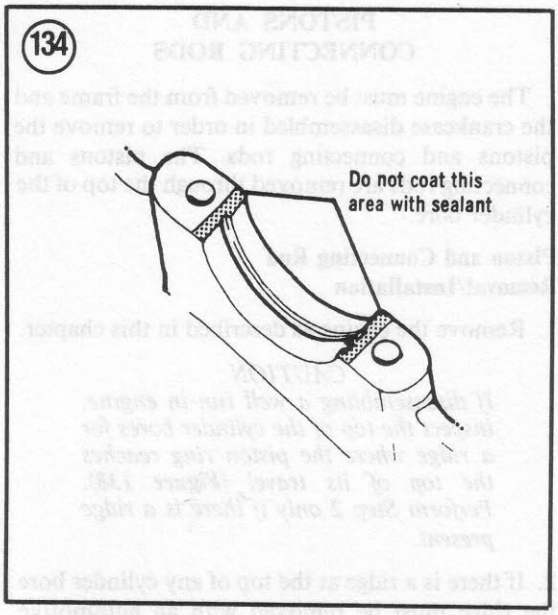


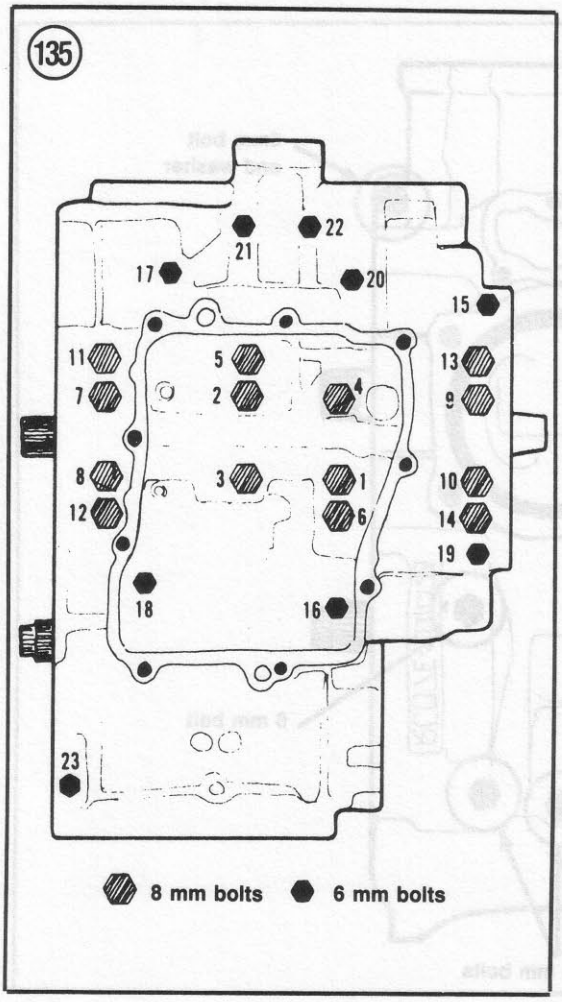


Assembly

Before installation of all parts, coat surfaces with assembly oil or engine oil. Assemble with the upper crankcase upside-down.

1. Install both cam chain slippers and tighten the bolts securely.
2. Install the crankcase breather baffle and tighten the bolts securely.
3. Apply liquid sealant to the threads of the oil pressure sending unit. Install the unit and tighten to the torque specifications listed in **Table 2**.
4. Install the main bearing inserts in both the upper and lower crankcase halves. If reusing old bearings, make sure that they are installed in the same location. Refer to marks made in *Disassembly*, Step 14. Make sure they are locked in place (**Figure 131**).
5. Install the gearshift drum and forks as described in Chapter Five.
6. Apply assembly oil to the main bearing inserts. Install both cam drive chains onto the crankshaft sprockets. Install the crankshaft assembly (**Figure 132**).





7. Install the transmission shaft assemblies (**Figure 133**) into the upper crankcase half as described in Chapter Five.
8. Install the locating dowel in the lower crankcase.
9. Spray contact cleaner on the upper cylinder block and lower case half sealing surfaces and make sure they are perfectly clean and dry.
10. Apply a light coat of gasket sealer to the sealing surfaces of both halves. Cover only flat surfaces, not curved bearing surfaces. Make the coating as thin as possible or the case can shift and hammer out the bearings. Do not apply sealant close to the edge of the bearing inserts (**Figure 134**) as it would restrict oil flow.

NOTE

Use Gasgacinch Gasket Sealer, Three Bond or equivalent. When selecting an equivalent, avoid thick or hard-setting materials.

NOTE

Make sure the lower crankcase main bearing inserts are in place and correctly positioned.

11. In the upper cylinder block, position the shift drum into NEUTRAL. The shift forks will automatically locate in the correct position.
12. Position the lower crankcase onto the upper cylinder block. Set the rear portion down first and lower the rear while making sure the shift forks engage properly into the transmission assemblies.
13. Lower the crankcase completely, making sure the locating dowel is seated into both case halves.

CAUTION

Do not install any crankcase bolts until the sealing surface around the entire crankcase perimeter has seated completely.

14. Before installing the bolts, slowly spin the transmission main shaft and shift the transmission through all 5 gears. This is done to check that the shift forks are properly engaged.
15. Apply oil to the threads of all crankcase bolts. Install the lower crankcase bolts only finger-tight at this time.
16. Tighten all bolts in 2-3 stages in the torque sequence shown in **Figure 135**. Tighten to the torque specifications listed in **Table 2**.
17. Turn the crankcase assembly over and install all upper crankcase bolts and washers only finger-tight. Tighten the bolts (**Figure 136**) in 2-3 stages in a crisscross pattern to the torque specifications listed in **Table 2**.

18. Make sure the seal (**Figure 137**) on the seal plate is in good condition. Replace if necessary.
19. Install the seal plate and tighten the screws securely.
20. Install the following exterior assemblies onto the crankcase:
    a. Cylinder heads: this chapter.
    b. Alternator: this chapter.
    c. Countershaft bearing cover: this chapter.
    d. Starter clutch: this chapter.
    e. External shift mechanism: Chapter Five.
    f. Clutch: Chapter Five.
    g. Water pump: Chapter Eight.
    h. Starter motor: Chapter Seven.
    i. Neutral switch: Chapter Seven.
    j. Coolant pipes: Chapter Eight.
21. Install the engine as described in this chapter.
22. Fill the crankcase with the recommended type and quantity of engine oil. Refer to Chapter Three.
23. Fill the cooling system with the recommended coolant. Refer to Chapter Three.

PISTONS AND CONNECTING RODS

The engine must be removed from the frame and the crankcase disassembled in order to remove the pistons and connecting rods. The pistons and connecting rods are removed through the top of the cylinder bore.

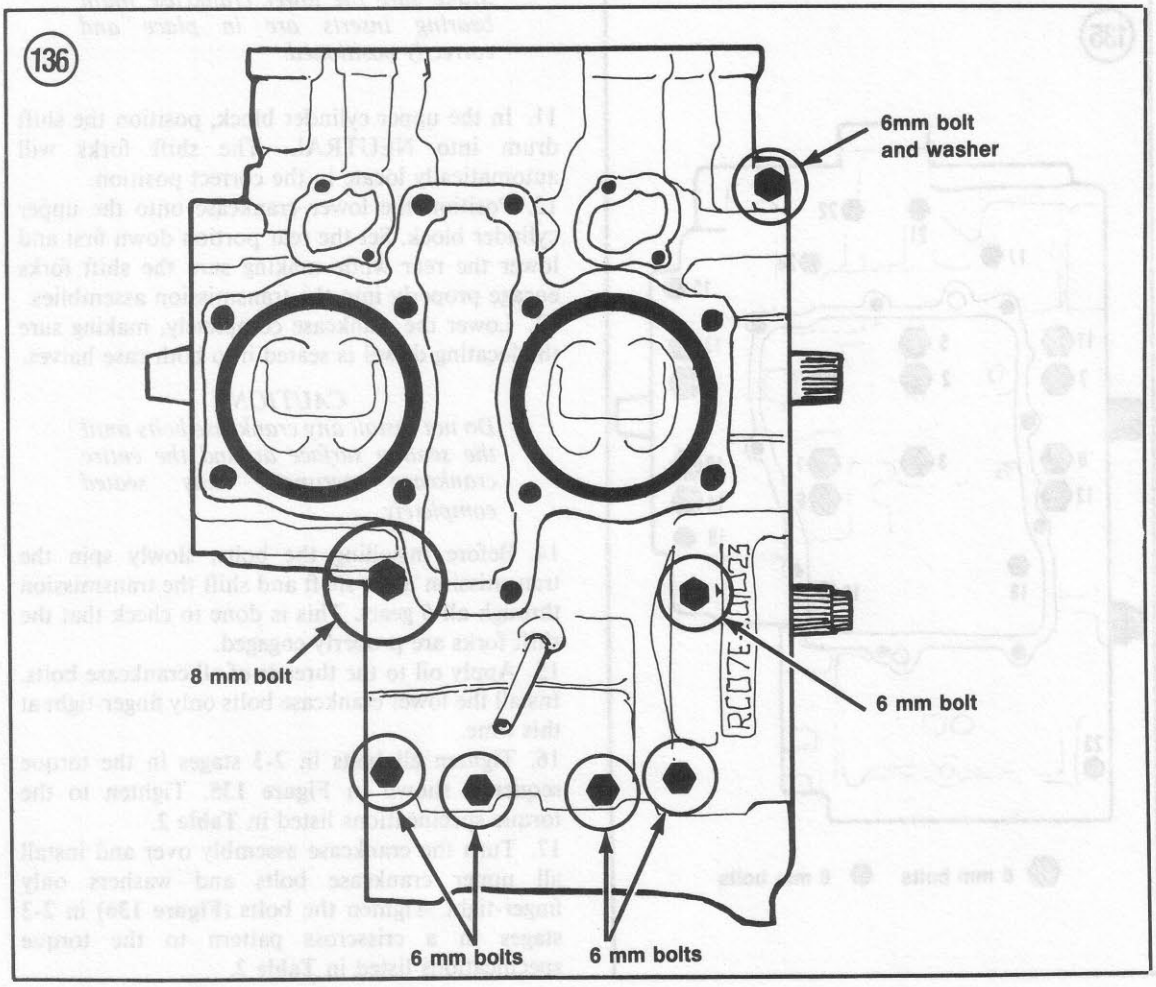
Piston and Connecting Rod Removal/Installation

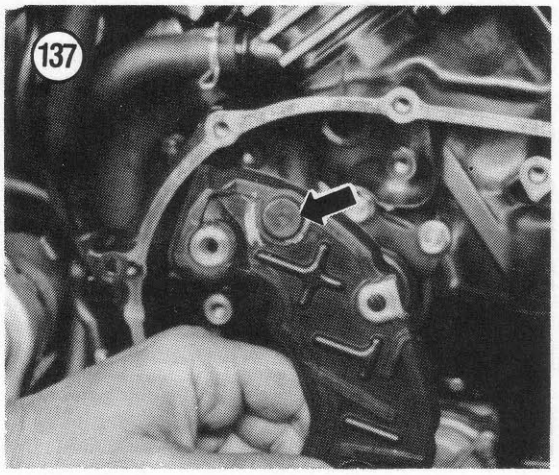
1. Remove the engine as described in this chapter.

CAUTION

*If disassembling a well run-in engine, inspect the top of the cylinder bores for a ridge where the piston ring reaches the top of its travel (**Figure 138**). Perform Step 2 only if there is a ridge present.*

2. If there is a ridge at the top of any cylinder bore the ridge must be removed with an automotive





type ridge reamer. Do one cylinder at a time as follows:

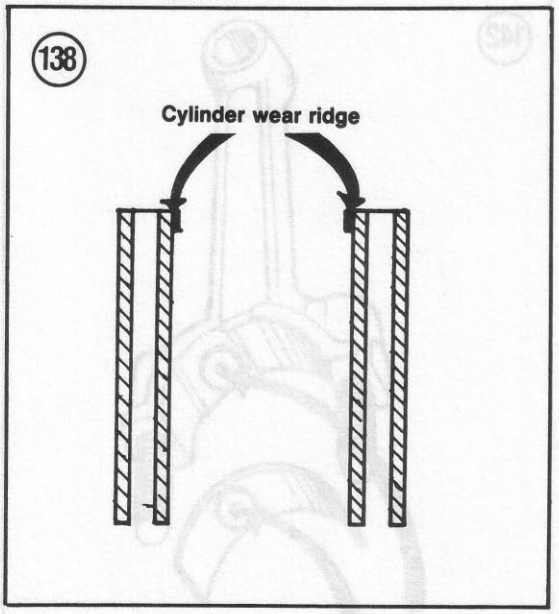
a. Rotate the crankshaft until two of the pistons are at the bottom of their travel.
b. Place an oil-soaked shop cloth into each of these cylinders and over the piston to collect the cuttings. Remove the ridge and/or deposits from the top of the cylinder bore with a ridge reamer.
c. Turn the crankshaft until that piston is at top dead center and remove the rag and the cuttings. Make sure to remove all cuttings as they may scratch the cylinder wall during piston removal. Make sure that none of the cuttings fall into the water jacket surrounding the cylinder bore.
d. Repeat for all cylinders.

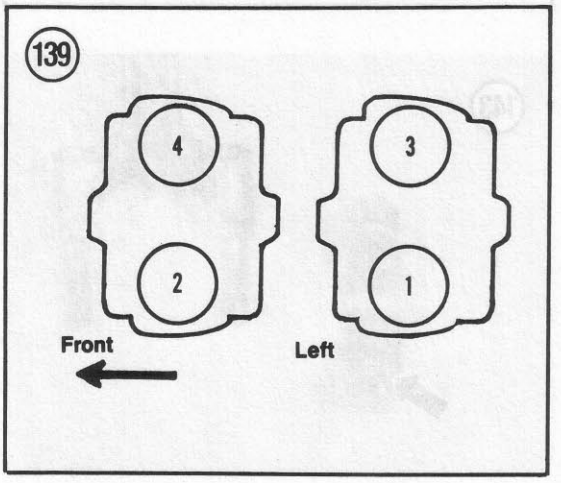
3. After the cylinder heads are removed, mark the piston crown with the corresponding cylinder number so the piston will be reinstalled in the correct cylinder. Refer to **Figure 139** for cylinder numbers.
4. Split the crankcases as described under *Crankcase Disassembly* in this chapter.
5. Remove the transmission shaft assemblies.

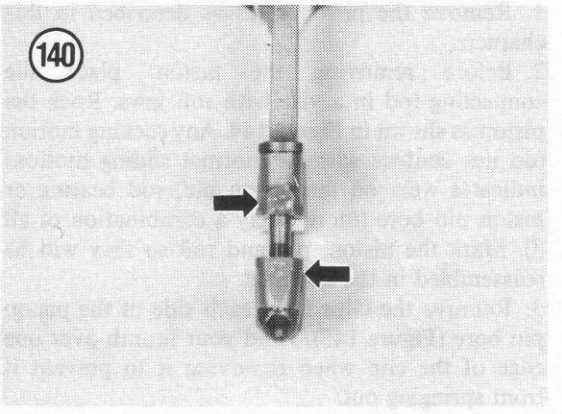
NOTE

*Before disassembly, mark the rods and caps (**Figure 140**). Number them "1," "2," "3" or "4" starting from the left-hand side. The left-hand side refers to the engine sitting in the bike's frame—not as it sits on your workbench.*

6. Remove the nuts securing the connecting rod caps and remove the caps (**Figure 141**).
7. Carefully remove the connecting rods and piston assemblies out through the tops of the cylinder bores.
8. Mark the back of each bearing insert with the cylinder number and "U" (upper) or "L" (lower).







9. Install by reversing these removal steps, noting the following.
10. Install the bearing inserts into each connecting rod and cap. Align the oil holes in the upper bearing inserts (**Figure 142**). Make sure they are locked into place (**Figure 143**) correctly.

NOTE

If the old bearing inserts are reused, be sure they are installed into their original positions; refer to Step 9.

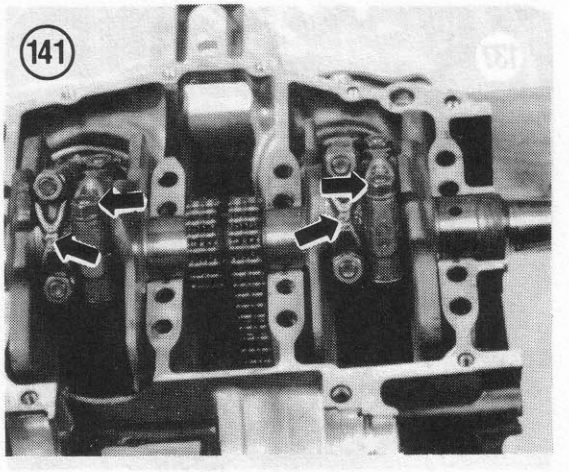
11. Apply a light coat of engine oil to the cylinder walls and to the piston rings prior to installation.
12. Install a piston ring compressor onto the piston and carefully install the piston and connecting rod assembly into the correct cylinder. Remove the ring compressor and carefully push the piston and connecting rod assembly all the way down. Guide the connecting rod onto the crankshaft so the bearing surface will not be damaged by the connecting rod during installation.
13. Apply molybdenum disulfide grease to the bearing inserts, crankpins and connecting rod bolt threads. Install the connecting rods and rod caps. Tighten the cap nuts evenly in 2-3 steps to the torque specifications listed in **Table 2**.
14. After all rod caps have been installed, rotate the crankshaft several times and check that the bearings are not too tight. Make sure there is no binding.

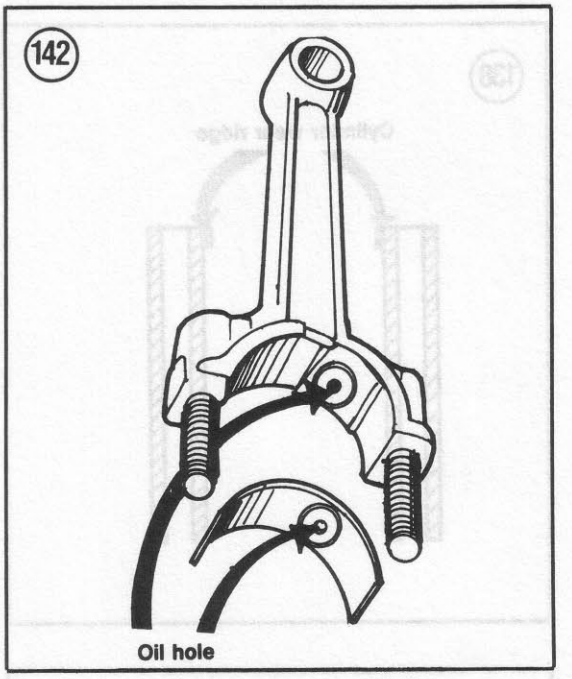
Piston Disassembly

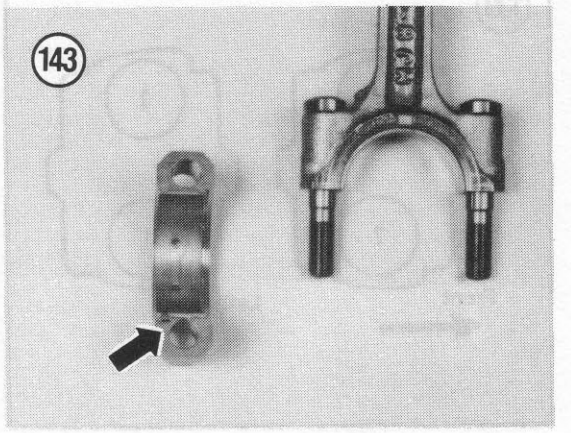
WARNING

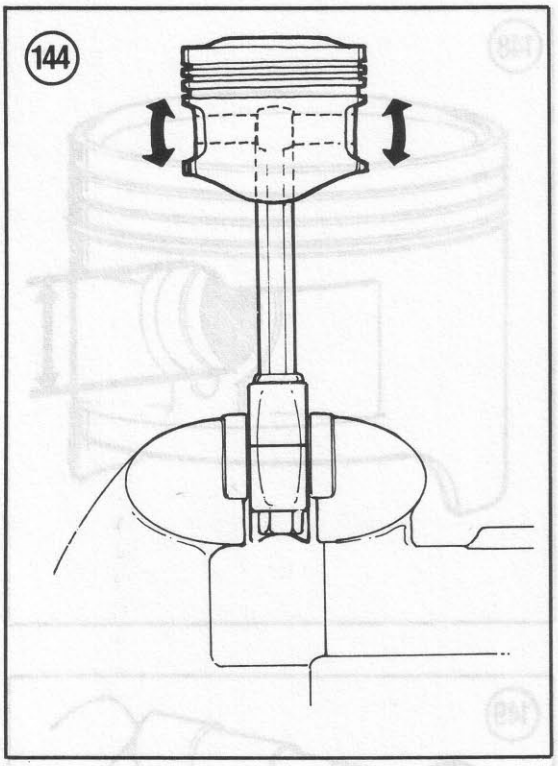
The edges of all piston rings are very sharp. Be careful when handling them to avoid cut fingers.

1. Remove the piston rings as described in this chapter.
2. Before removing the piston, place the connecting rod in a vise with soft jaws. Rock the piston as shown in **Figure 144**. Any rocking motion (do not confuse with the normal sliding motion) indicates wear on the piston pin, rod bearing or piston pin bore (more likely a combination of all 3). Mark the piston, pin and rod so they will be reassembled in the same set.
3. Remove the clips from each side of the piston pin bore (**Figure 145**). Hold your thumb over one edge of the clip when removing it to prevent it from springing out.









4. Use a proper size wooden dowel or socket extension and push out the piston pin.

CAUTION

Be careful when removing the pin to avoid damaging the connecting rod. If necessary, gently tap the pin to remove it, but be sure the piston is properly supported.

5. If the piston pin is difficult to remove, heat the piston and pin with a small butane torch. The pin will probably push right out. If not, heat the piston to about 60° C (140° F), i.e., until it is too warm to touch, but not excessively hot. If the pin is still difficult to push out, use a special tool as shown in **Figure 146**.
6. Lift the piston off the connecting rod.

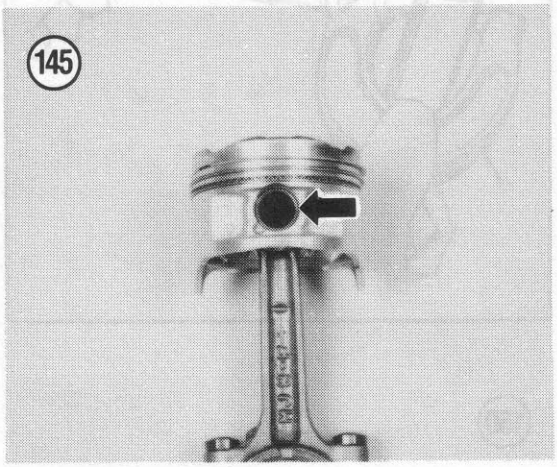
Piston Inspection

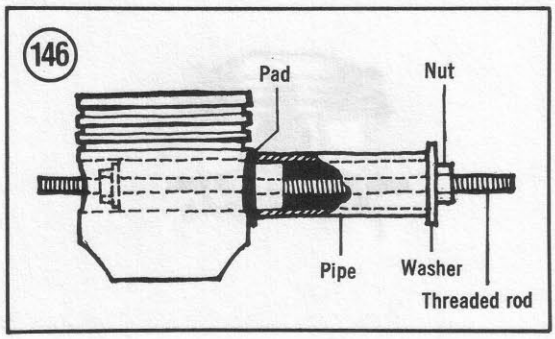
1. Carefully clean the carbon from the piston crown with a chemical remover or with a soft scraper. Do not remove or damage the carbon ridge around the circumference of the piston above the top ring. If the pistons, rings and cylinders are found to be dimensionally correct and can be reused, removal of the carbon ring from the tops of pistons or carbon ridges from the tops of cylinder bores will promote excessive oil consumption.

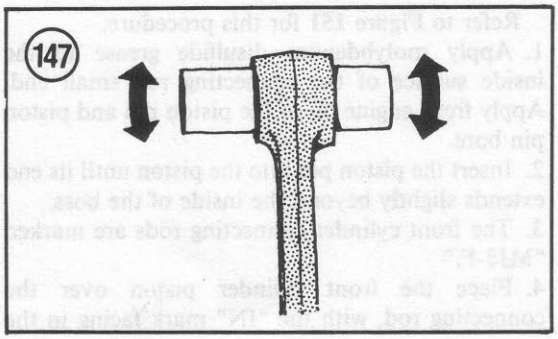
CAUTION

Do not wire brush piston skirts.

2. Examine each ring groove for burrs, dented edges and wide wear. Pay particular attention to the top compression ring groove, as it usually wears more than the others.
3. Measure piston-to-cylinder clearance as described in this chapter. If damage or wear indicates piston replacement, select a new piston as described under *Piston Clearance Measurement* in this chapter.
4. Oil the piston pin and install it in the connecting rod. Slowly rotate the piston pin and check for radial play (**Figure 147**). If any play







exists, the piston pin should be replaced, providing the rod bore is in good condition.

5. Measure the piston pin bore (**Figure 148**) with a snap gauge and measure the outside diameter of the piston pin with a micrometer (**Figure 149**). Compare against dimensions given in **Table 1**. A machinist can do this for you if you do not have the measuring tools. Replace the piston and piston pin as a set if either is worn.

6. Check the piston skirt for galling and abrasion which may have been caused by piston seizure. If light galling is present, smooth the affected area with No. 400 emery cloth and oil or a fine oilstone. However, if galling is severe or if the piston is deeply scored, replace it.

Piston Clearance Measurement

1. Make sure the piston and cylinder walls are clean and dry.

2. Measure the inside diameter of the cylinder bore at a point 13 mm (1/2 in.) from the upper edge with a bore gauge.

3. Measure the outside diameter of the piston across the skirt (**Figure 150**) at right angles to the piston pin. Measure at a distance 10 mm (0.4 in.) up from the bottom of the piston skirt.

4. Piston clearance is the difference between the maximum piston diameter and the minimum cylinder diameter. Subtract the dimension of the piston from the cylinder dimension. If the clearance exceeds the dimension listed in **Table 1** the cylinder should be rebored to the next oversize and a new piston installed.

5. To establish a final overbore dimension with a new piston, add the new piston skirt measurement to the specified piston-to-cylinder clearance. This will determine the dimension for the cylinder overbore size. Remember, do not exceed the cylinder maximum inside diameter listed in **Table 1**.

6. Pistons are available in oversizes of 0.25, 0.50, 0.75 and 1.00 mm.

Piston Assembly

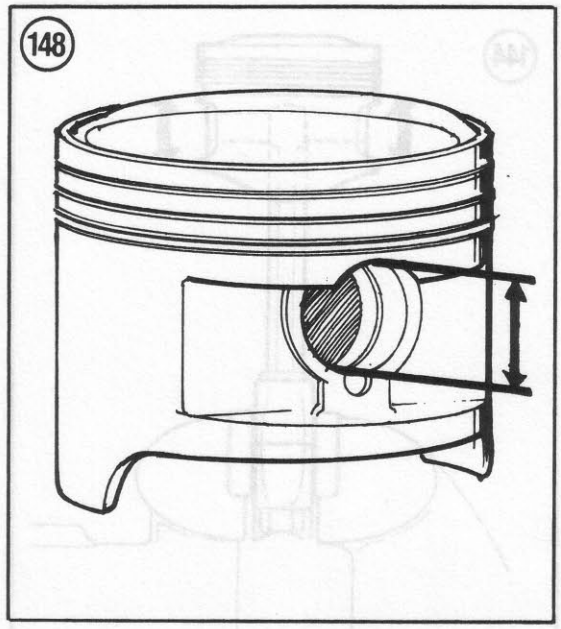
Refer to **Figure 151** for this procedure.

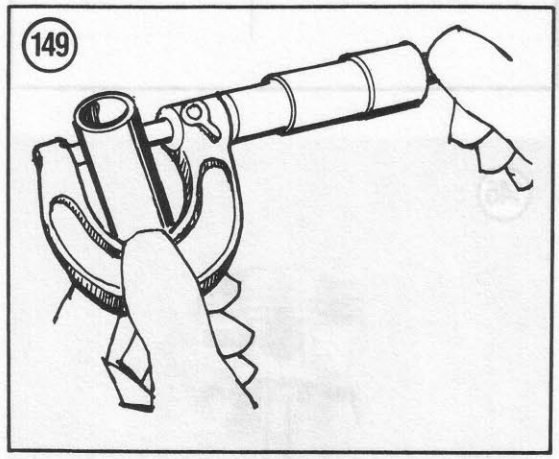
1. Apply molybdenum disulfide grease to the inside surface of the connecting rod small end. Apply fresh engine oil to the piston pin and piston pin bore.

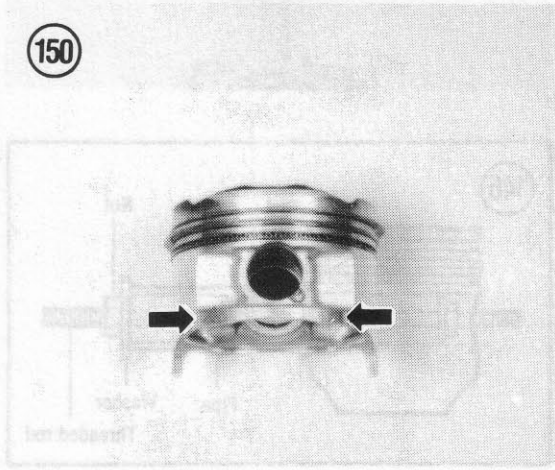
2. Insert the piston pin into the piston until its end extends slightly beyond the inside of the boss.

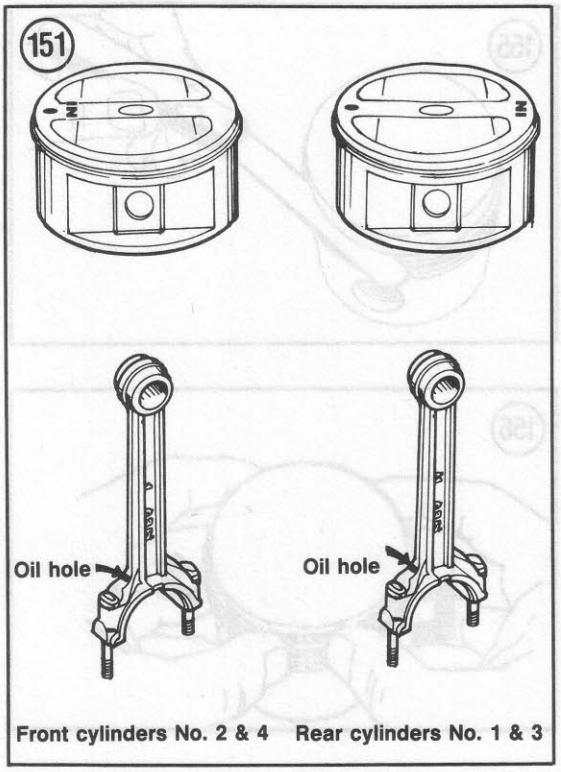
3. The front cylinder connecting rods are marked "MJ8-F."

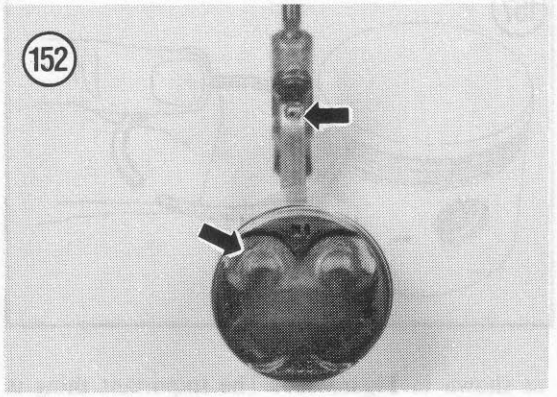
4. Place the front cylinder piston over the connecting rod, with the "IN" mark facing in the

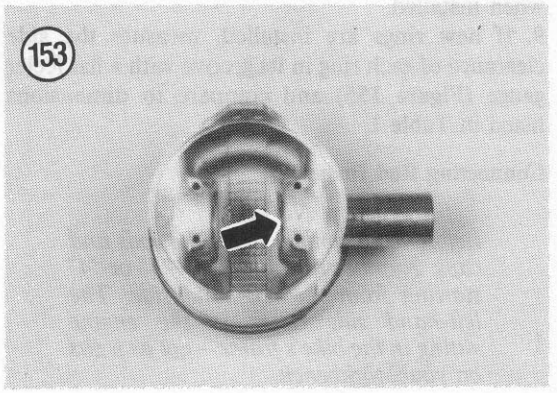












same direction as the oil hole on the rod (**Figure 152**). Be sure to install the correct piston (No. 1, 2, 3 or 4) onto the same rod from which it was removed.

5. The rear cylinder connecting rods are marked "MJ8-R."

6. Place the piston over the connecting rod, with the "IN" mark facing in the opposite direction from the oil hole on the rod. Be sure to install the correct piston (No. 1, 2, 3 or 4) onto the same rod from which it was removed.

7. Partially insert the piston pin into the piston until it is flush with the inside surface of the piston boss (**Figure 153**).

8. Line up the piston pin with the holes in the piston and connecting rod and push the pin into the piston until its ends are even with the clip grooves.

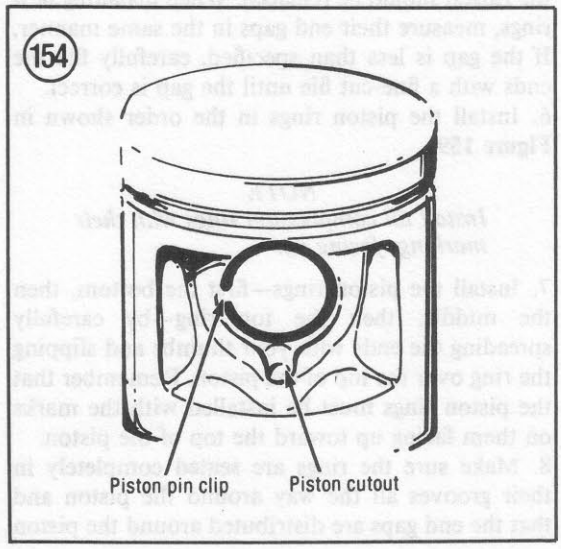
NOTE

If the piston pin does not slide in easily, heat the piston until it is too warm to touch but not excessively hot (60° C/140° F). Continue to drive the piston pin while holding the piston so the rod does not have to take any shock. Drive the piston pin in until it is centered in the rod. If the pin is still difficult to install, use the special tool used during the removal sequence.

NOTE

*In the next step, install the clips with the gap away from the cutout in the piston (**Figure 154**).*

9. Install new piston pin clips in the ends of the pin boss (**Figure 145**). Make sure the clip is seated in the groove in the piston.



10. Check installation by rocking the piston back and forth around the pin axis and from side to side along the axis. It should rotate freely back and forth but not from side to side.
11. Repeat Steps 1-10 for all remaining pistons.
12. Install the rings as described in this chapter.

Piston Ring Removal/Installation

WARNING

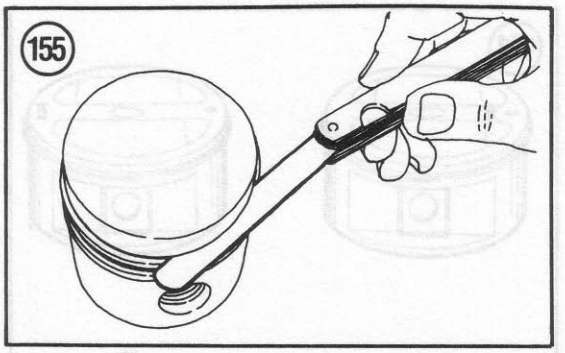
The edges of all piston rings are very sharp. Be careful when handling them to avoid cut fingers.

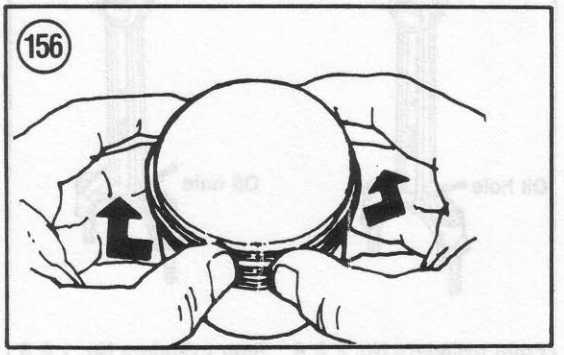
1. Measure the side clearance of each ring in its groove with a flat feeler gauge (**Figure 155**) and compare with dimensions listed in **Table 1**. If the clearance is greater than specified, the rings must be replaced. If the clearance is still excessive with the new rings, the piston must be replaced.
2. Remove the top ring with a ring expander tool or by spreading the ring ends with your thumbs and lifting the ring up and over the piston (**Figure 156**). Repeat for the remaining rings.
3. Carefully remove all carbon from the ring grooves. Inspect grooves carefully for burrs, nicks or broken and cracked lands. Recondition or replace the piston if necessary.
4. Roll each ring around its piston groove as shown in **Figure 157** to check for binding. Minor binding may be cleaned up with a fine-cut file.
5. Measure the rings for wear as shown in **Figure 158**. Place each ring, one at a time, into the cylinder and push it in about 20 mm (3/4 in.) with the crown of the piston to ensure that the ring is square in the cylinder bore. Measure the gap with a flat feeler gauge and compare with dimensions listed in **Table 1**. If the gap is greater than specified, the ring(s) should be replaced. When installing new rings, measure their end gaps in the same manner. If the gap is less than specified, carefully file the ends with a fine-cut file until the gap is correct.
6. Install the piston rings in the order shown in **Figure 159**.

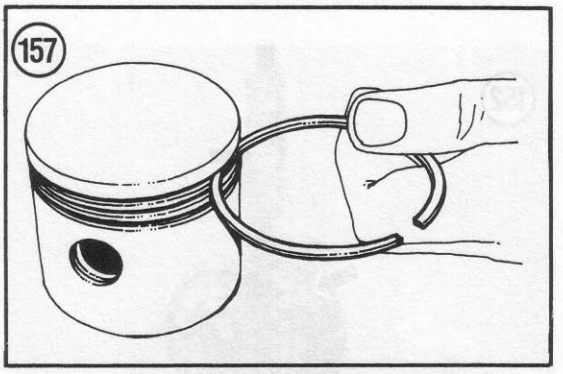
NOTE

Install all compression rings with their markings facing up.

7. Install the piston rings—first the bottom, then the middle, then the top ring—by carefully spreading the ends with your thumbs and slipping the ring over the top of the piston. Remember that the piston rings must be installed with the marks on them facing up toward the top of the piston.
8. Make sure the rings are seated completely in their grooves all the way around the piston and that the end gaps are distributed around the piston as shown in **Figure 159**. The important thing is that the ring gaps are not aligned with each other when installed.
9. If new rings are installed, measure the side clearance of each ring in its groove with a flat feeler gauge (**Figure 155**) and compare to dimensions listed in **Table 1**.



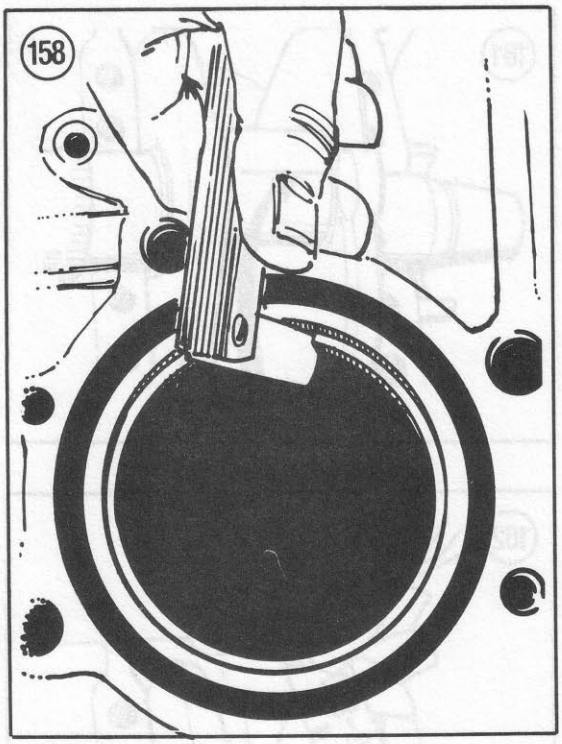


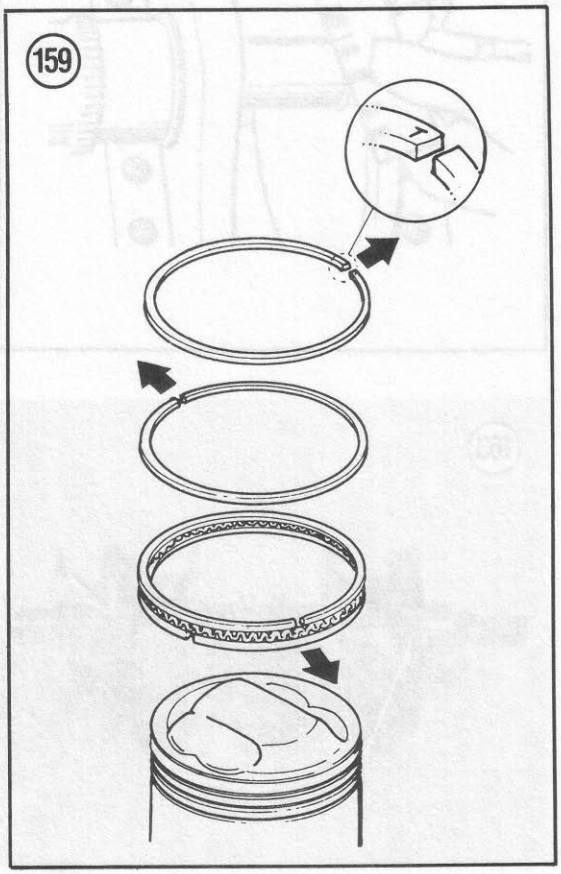


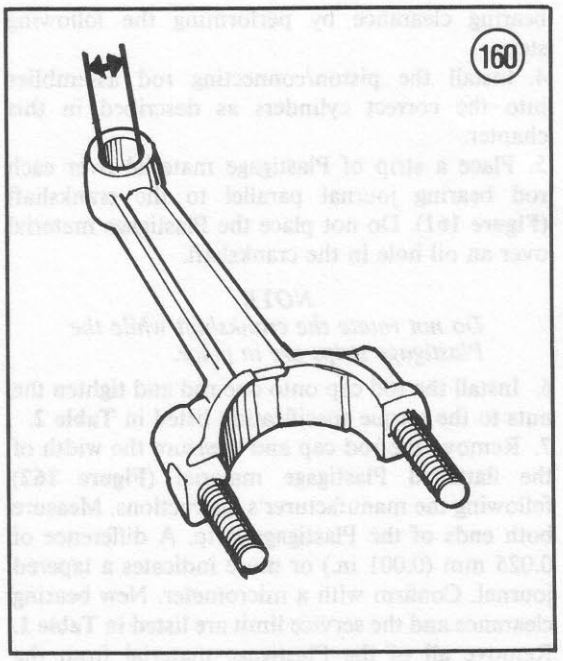
Connecting Rod Inspection

NOTE

Before disassembly, mark the rods and caps. Number them "1," "2," "3" or "4" starting from the left-hand side. The left-hand side refers to the engine sitting in the bike's frame—not as it sits on your workbench.







1. Before removing the connecting rods from the crankshaft, check the side clearance of the rod with a flat feeler gauge. Compare to dimensions listed in **Table 1**.
2. Remove the connecting rods and pistons as described in this chapter.
3. Clean the connecting rods and inserts in solvent and dry with compressed air.
4. Carefully inspect each rod journal on the crankshaft for scratches, ridges, scoring, nicks, etc. Very small nicks and scratches may be removed with fine emery cloth. More serious damage must be removed by grinding—a job for a machine shop or dealer.
5. If the surface on all journals is satisfactory, take the crankshaft to a dealer or machine shop to be checked for out-of-roundness, taper and wear on the rod bearing journals.

Connecting Rod Bearing and Journal Inspection

1. Check the inside and outside surfaces of the bearing inserts for wear, bluish tint (burned), flaking, abrasion and scoring. If the bearings are good, they may be reused. If any insert is questionable, replace the entire set.
2. Measure the inside diameter of the small end of the connecting rod with an inside dial gauge (**Figure 160**). Check against the dimension listed in **Table 1**; replace the rod if necessary.
3. Clean the rod bearing inserts and the rod bearing surfaces of the crankshaft. Measure the rod

bearing clearance by performing the following steps.

4. Install the piston/connecting rod assemblies into the correct cylinders as described in this chapter.

5. Place a strip of Plastigage material over each rod bearing journal parallel to the crankshaft (**Figure 161**). Do not place the Plastigage material over an oil hole in the crankshaft.

NOTE

Do not rotate the crankshaft while the Plastigage strips are in place.

6. Install the rod cap onto one rod and tighten the nuts to the torque specification listed in **Table 2**.

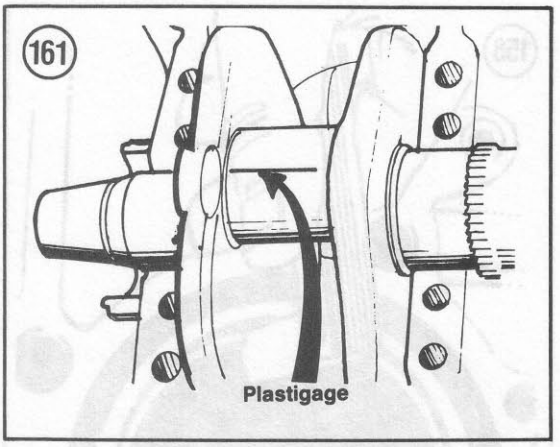
7. Remove the rod cap and measure the width of the flattened Plastigage material (**Figure 162**) following the manufacturer's instructions. Measure both ends of the Plastigage strip. A difference of 0.025 mm (0.001 in.) or more indicates a tapered journal. Confirm with a micrometer. New bearing clearance and the service limit are listed in **Table 1**. Remove all of the Plastigage material from the crankshaft journals and the connecting rods.

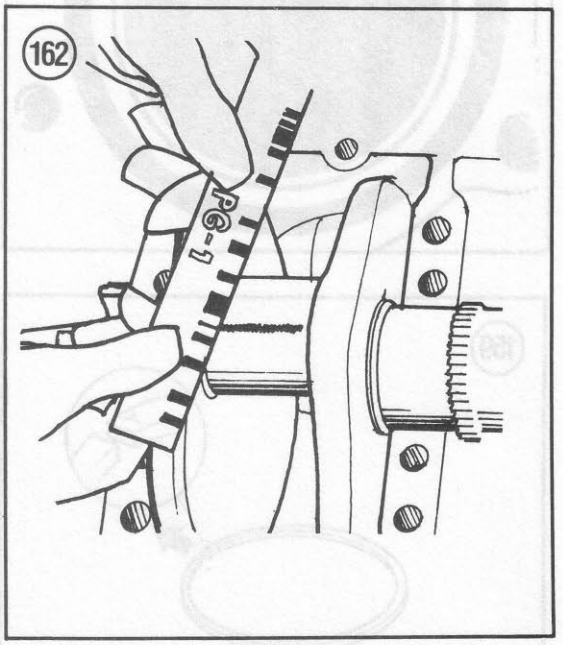
8. If the rod bearing clearance is greater than specified, use the following steps for new bearing selection.

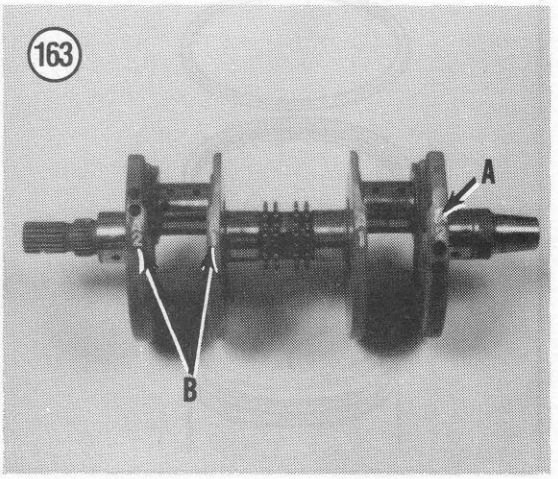
9. The crankshaft rod journals are marked with letters "A" or "B" (A, **Figure 163**) on the counterbalance weights. The connecting rod and cap are marked with numbers "1" or "2" (**Figure 164**).

10. Measure the rod journal (A, **Figure 165**) with a micrometer. If the rod journal dimension is within the tolerances stated for each letter code in **Table 3** the bearing can be simply selected by color code. Select new bearings by cross-referencing the rod journal letters (A, **Figure 163**) in the horizontal column of **Table 3** to the rod bearing number (**Figure 164**) in the vertical column. Where the 2 columns intersect, the new bearing color is indicated. **Table 4** gives the bearing insert color and thickness.

11. If any rod bearing journal measurements taken during inspection do not fall within the tolerance range for the stamped letter codes, the serviceability of the crankshaft must be carefully examined. If the rod bearing journal in question is not tapered, out-of-round or scored, the crankshaft may be still used. However, the bearing selection will have to be made based on the measured diameter of the bearing journal and not by the stamped letter code. Honda recommends the crankshaft be replaced whenever a rod bearing journal dimension is beyond the specified range of the stamped letter code.







Crankshaft Main Bearing and Journal Inspection

1. Check the inside and outside surfaces of the bearing inserts for wear, bluish tint (burned), flaking, abrasion and scoring. If the bearings are good, they may be reused. If any insert is questionable, replace the entire set.
2. Clean the main bearing inserts and the bearing surfaces of the crankshaft. Measure main bearing clearance by performing the following steps.
3. Set the cylinder block upside down on the workbench on wood blocks.
4. Install the existing main bearing inserts into the upper crankcase.
5. Install the crankshaft into the upper crankcase.
6. Place a strip of Plastigage material over each main bearing journal parallel to the crankshaft (**Figure 169**). Do not place the Plastigage strip over an oil hole in the crankshaft.

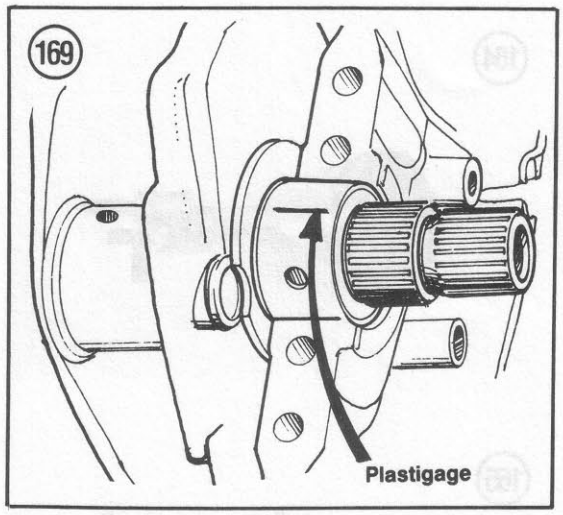
NOTE

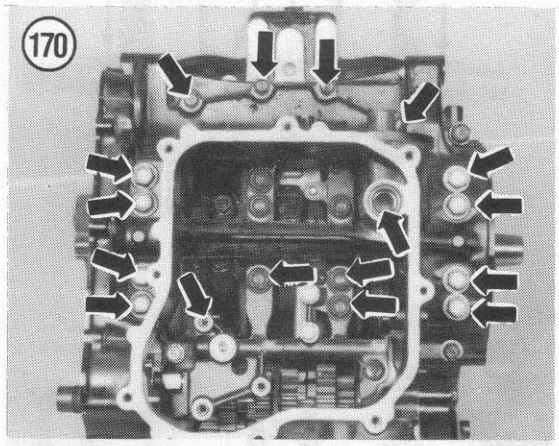
Do not rotate the crankshaft while the Plastigage strips are in place.

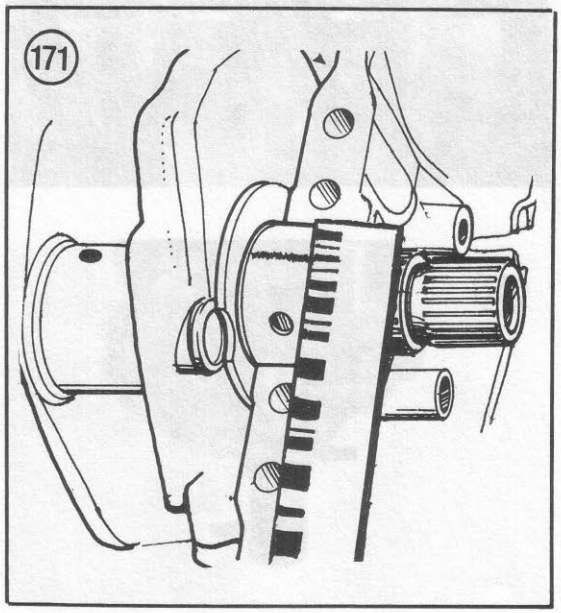
7. Install the existing bearing inserts into the lower crankcase.
8. Carefully turn the lower crankcase over and install it onto the cylinder block.
9. Apply oil to the threads of all lower crankcase bolts and install them into the crankcase (**Figure 170**). Tighten them in 2-3 steps in the torque sequence shown in **Figure 135**. Tighten to the torque specifications listed in **Table 2**.
10. Remove the crankcase bolts in the reverse order of installation.
11. Carefully remove the lower crankcase and measure the width of the flattened Plastigage material following manufacturer's instructions. Measure both ends of the Plastigage strip (**Figure 171**). A difference of 0.025 mm (0.001 in.) or more indicates a tapered journal. Confirm with a micrometer. New bearing clearance and service limit dimensions are listed in **Table 1**. Remove the Plastigage strips from all bearing journals.
12. If the bearing clearance is greater than specified, use the following steps for new bearing selection.
13. The crankshaft main journals are marked with numbers "1" or "2" (B, **Figure 163**). The cylinder block is marked with letters "A" or "B" (**Figure 172**) on the mating surface at the front.

NOTE

The letter on the left-hand end relates to the bearing insert in the left-hand side and so on, working across from left





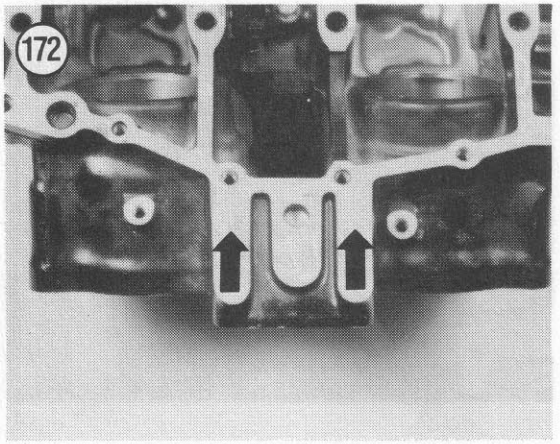


to right. Remember, the left-hand side relates to the engine as it sits in the bike's frame, not as it sits on your workbench.

14. Measure the main journal (B, **Figure 165**) with a micrometer. If the main journal dimension is within the tolerances stated for each number code in **Table 5** the bearing can be simply selected by color code. Select new main bearings by cross-referencing the main journal number (B, **Figure 163**) in the horizontal column of **Table 5** to the crankcase bearing letter (**Figure 172**) in the vertical column. Where the 2 columns intersect, the new bearing color is indicated. **Table 6** gives the bearing insert color and thickness.

15. If any main bearing journal measurements taken during inspection do not fall within the tolerance range for the stamped letter codes, the serviceability of the crankshaft must be carefully examined. If the main bearing journal in question is not tapered, out-of-round or scored, the crankshaft may be still used. However, the bearing selection will have to be made based on the measured diameter of the bearing journal and not by the stamped letter code. Honda recommends the crankshaft be replaced whenever a main bearing journal dimension is beyound the specified range of the stamped letter code.

16. After new bearings have been installed, recheck clearance by repeating this procedure.



CAMSHAFT CHAIN INSPECTION

Honda does not provide a service length limit for the camshaft chains.

1. Split the cylinder block/crankcase and remove the crankshaft as described in this chapter.
2. Inspect the links on the cam chains. Check for uneven wear or damage to the rollers and side plates.
3. Replace the chain(s) if necessary.
4. If chain replacement is necessary, inspect the sprockets on the crankshaft and camshafts for wear or damage. Replace the cam sprockets if necessary. If the crankshaft sprockets are damaged, the crankshaft must be replaced.

STARTER CLUTCH ASSEMBLY, STARTER GEARS AND PRIMARY DRIVE GEAR

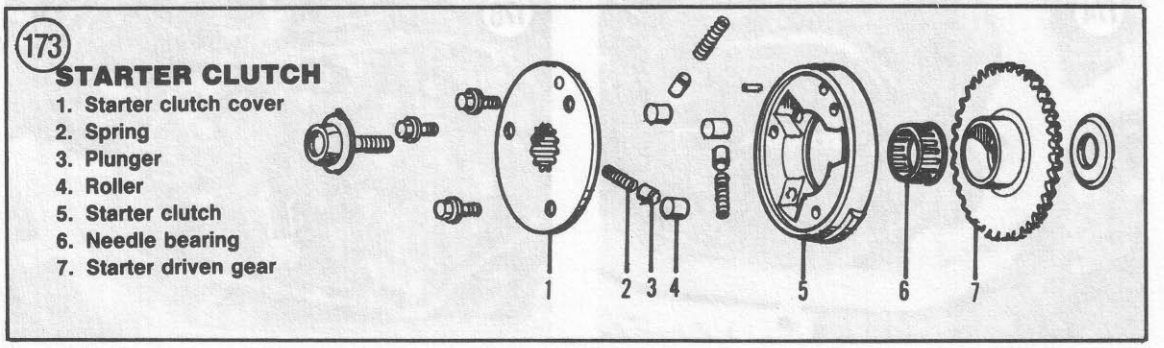
The starter clutch assembly and gears can be removed with the engine in the frame. The starter motor can be left in place, if desired.

Refer to **Figure 173** for this procedure.

Removal/Installation

This procedure is shown with the clutch assembly removed for clarity.

1. Place the bike on the centerstand.
2. Remove the seat and left-hand side cover. Disconnect the battery negative lead.
3. Drain the engine oil as described in Chapter Three.
4. On Magna models, perform the following:
   a. Remove the clamping bolt on the rear brake pedal and remove the brake pedal.
   b. Remove the bolts securing the left-hand front foot peg assembly and remove the foot peg assembly.



5. Remove the bolts securing the right-hand crankcase cover (**Figure 174**) and remove the cover and gasket.

NOTE

Don't lose the locating dowels.

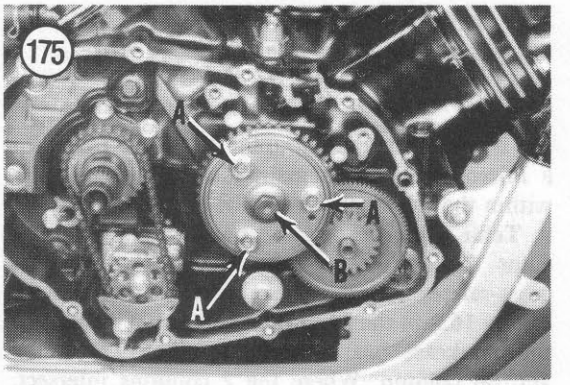
NOTE

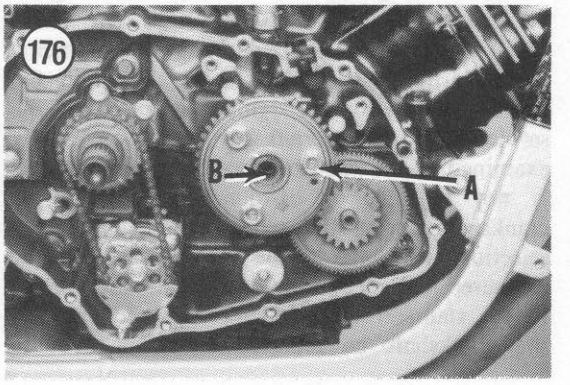
*If the starter clutch is going to be rebuilt or disassembled for inspection, loosen the bolts (A, **Figure 175**) holding the starter clutch assembly together.*

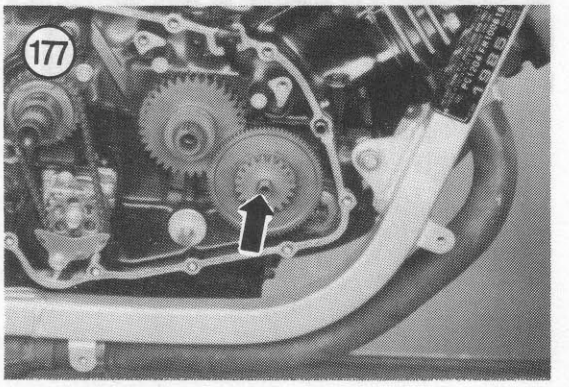
6. Remove the bolt (B, **Figure 175**) securing the starter clutch assembly. Install a copper washer (or copper penny) between the clutch outer housing and the primary drive gear. This will keep the primary drive gear from turning while removing the bolt.
7. Remove the starter clutch assembly (A, **Figure 176**).
8. Remove the starter idle gear and shaft (**Figure 177**).
9. Remove the thrust washer, collar and the primary drive gear (**Figure 178**).

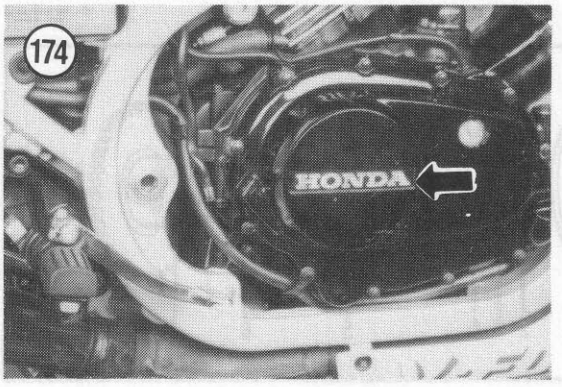
Inspection

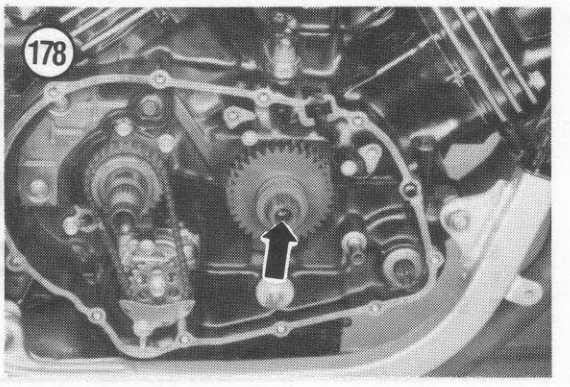
1. Place the starter clutch assembly with the gear side facing up. Rotate the starter driven gear *clockwise* and pull up at the same time. Remove the starter driven gear from the starter clutch assembly.
2. Inspect the teeth on the starter driven gear (A, **Figure 179**) and on the idle gear (**Figure 180**). Check for chipped or missing teeth. Look for uneven or excessive wear on the gear faces. Replace if necessary.
3. Check the needle bearing (**Figure 181**) for wear or damage. It must rotate freely. Replace if necessary.
4. Check the rollers (**Figure 182**) in the starter clutch for uneven or excessive wear; replace as a set if any are bad.

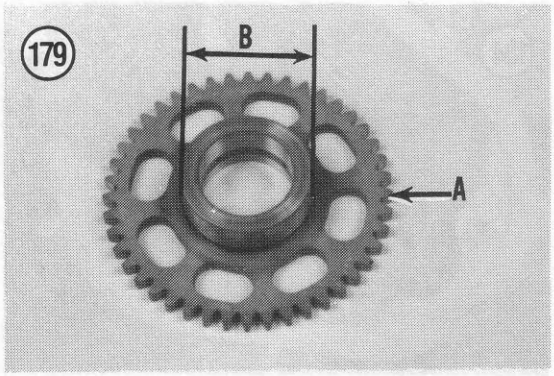


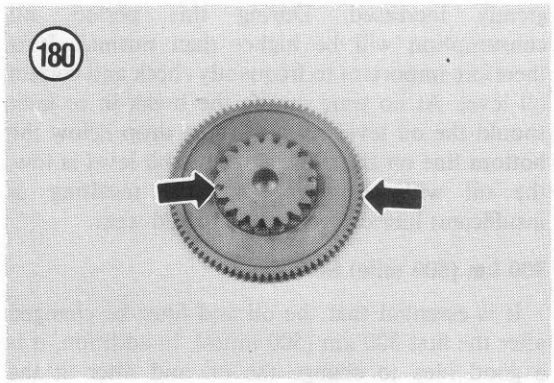


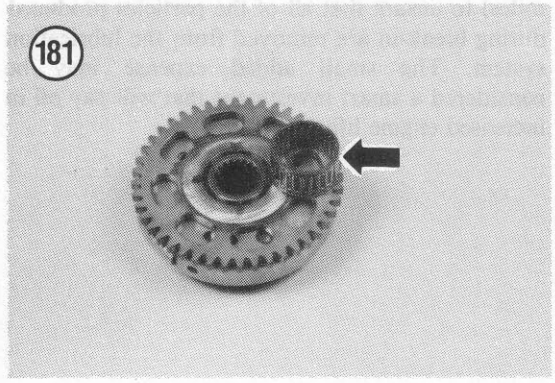


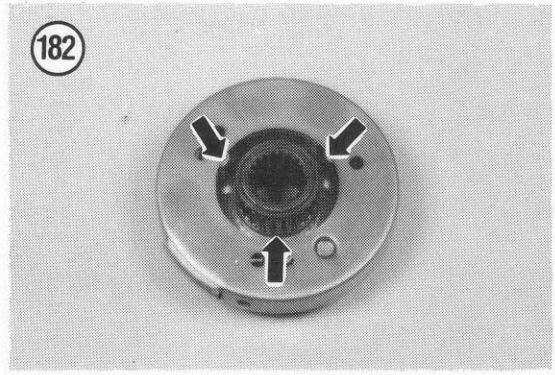


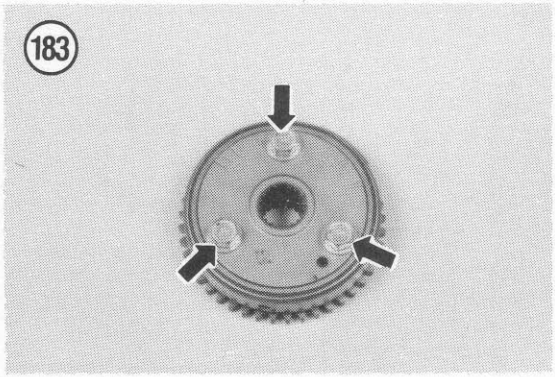












5. To replace the rollers, perform the following:
   a. Remove the bolts (**Figure 183**) securing the starter clutch together.
   b. Remove the cover, rollers, plungers and springs.
   c. Remove the dowel pin.
   d. Install the dowel pin.
   e. Install the springs, plungers and the rollers.
   f. Align the hole in the cover with the dowel pin in the starter clutch.
   g. Install the cover.
   h. Apply Loctite Lock N' Seal to the threads before installing the bolts and tighten to the torque specifications listed in **Table 2**.
6. Measure the OD of the starter gear contact surface (B, **Figure 179**) where it rides against the rollers. Compare to the dimension listed in **Table 1**.

Installation

1. Partially install the primary drive gear onto the crankshaft.
2. Install the thrust washer and collar.
3. Install the idle gear and shaft.
4. Align the punch mark on the crankshaft with the wide groove on the starter clutch assembly (B, **Figure 176**) and push the starter clutch assembly all the way on until it stops.
5. Install the bolt (B, **Figure 175**) securing the starter cluch assembly. Install a copper washer (or copper penny) between the clutch outer housing and the primary drive gear. This will keep the primary drive gear from turning while tightening the bolt.
6. Tighten the bolt to the torque specification listed in **Table 2**.
7. Install a new gasket (A, **Figure 184**) and 2 locating dowels (B, **Figure 184**).
8. Install the right-hand crankcase cover and tighten the bolts securely.

9. On Magna models, perform the following:
   a. Install the right-hand front foot peg assembly and tighten the bolts securely.
   b. Align the punch mark on the brake pedal shaft with the punch mark on the brake pedal and install the brake pedal.
   c. Install the clamping bolt and tighten securely.
10. Connect the battery negative lead.
11. Install the seat and left-hand side cover.

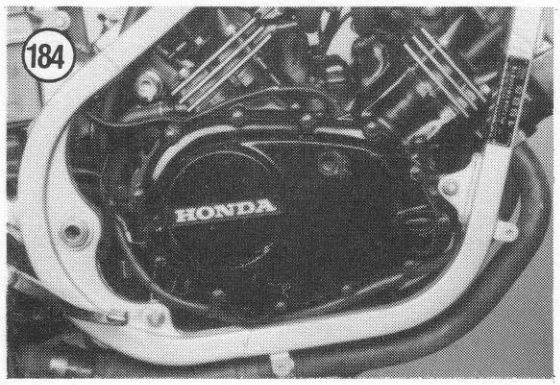
BREAK-IN PROCEDURE

If the rings were replaced, new pistons installed, the cylinders rebored or honed or major lower-end work performed, the engine should be broken in just as though it were new. The performance and service life of the engine depend greatly on a careful and sensible break-in.

For the first 800 km (500 miles), no more than one-third throttle should be used and speed should be varied as much as possible within the one-third throttle limit. Prolonged steady running at one speed, no matter how moderate, is to be avoided as well as hard acceleration.

Following the *800 km (500 mile) Service* described in this chapter more than one-third throttle should not be used until the motorcycle has covered at least 1,600 km (1,000 miles) and then it should be limited to short bursts of speed until 2,410 km (1,500 miles) have been logged.

The mono-grade oils recommended for break-in and normal use provide a better bedding pattern for rings and cylinders than do multi-grade oils. As a result, piston ring and cylinder bore life are



greatly increased. During this period, oil consumption will be higher than normal. It is therefore important to frequently check and correct oil level. At no time during the break-in or later should the oil level be allowed to drop below the bottom line on the dipstick; if the oil level is low, the oil will become overheated resulting in insufficient lubrication and increased wear.

800 km (500 mile) Service

It is essential that the oil and filter be changed after the first 800 km (500 miles). In addition, it is a good idea to change the oil and filter at the completion of the break-in (about 2,410 km/1,500 miles) to ensure that all of the particles produced during break-in are removed from the lubrication system. The small added expense may be considered a smart investment that will pay off in increased engine life.

Table 1 ENGINE SPECIFICATIONS

Item	Specifications	Wear limit
General		
Engine type	Water-cooled, 4-stroke, DOHC, V-4	
Bore and stroke	60.0×44.0 mm (2.36×1.73 in.)	
Displacement	498 cm² (30.4 cu. in.)	
Compression ratio	11.0 to 1	
Valve train	Dual-row roller type drive chain, OHC and rocker arms	
Maximum horsepower		
Magna	62 BHP @ 11,000 rpm	
Interceptor	66 BHP @ 11,500 rpm	
Maximum torque		
Magna	4.14 kg/m (29.9 ft.-lb.) @ 9,000 rpm	
Interceptor	4.2 kg/m (30.4 ft.-lb.) @ 10,500 rpm	
Lubrication	Wet sump	
Air filtration	Replaceable paper element type	
Engine weight (dry)	63.6 kg (140 lb.)	
Cylinders		
Bore	60.000-60.015 mm (2.3622-2.3628 in.)	60.10 mm (2.366 in.)
Out of round		0.10 mm (0.004 in.)
Piston/cylinder clearance	0.01-0.055 mm (0.0004-0.002 in.)	0.10 mm (0.004 in.)
Pistons		
Diameter	59.96-59.99 mm (2.3606-2.3618 in.)	59.85 mm (2.365 in.)
Clearance in bore	0.01-0.05 mm (0.0004-0.002 in.)	0.10 mm (0.004 in.)
Piston pin bore	16.002-16.008 mm (0.6300-0.6302 in.)	16.06 mm (0.632 in.)
Piston pin outer diameter	15.994-16.000 mm (0.6297-0.630 in.)	15.98 mm (0.629 in.)
Piston rings		
Number per piston		
Compression	2	
Oil control	1	
Ring end gap		
Top and second	0.10-0.30 mm (0.004-0.012 in.)	0.50 mm (0.020 in.)
Oil (side rail)	0.30-0.90 mm (0.012-0.035 in.)	1.1 mm (0.04 in.)
Ring side clearance		
Top and second	0.015-0.045 mm (0.0006-0.0018 in.)	0.10 mm (0.004 in.)
Connecting rod		
Small end inner diameter	16.016-16.034 mm (0.6305-0.6313 in.)	16.08 mm (0.633 in.)
Crankshaft		
Runout		0.03 mm (0.001 in.)
Main bearing oil clearance	0.028-0.052 mm (0.0011-0.0020 in.)	0.08 mm (0.003 in.)
Connecting rod oil clearance	0.028-0.052 mm (0.0011-0.0020 in.)	0.08 mm (0.003 in.
Connecting rod big end side clearance	0.10-0.30 mm (0.004-0.012 in.)	0.4 mm (0.016 in.)

(continued)

Table 1 ENGINE SPECIFICATIONS (continued)

Item	Specifications	Wear limit
Camshaft		
Cam lobe height		
Intake	35.22-35.38 mm (1.387-1.393 in.)	35.18 mm (1.385 in.)
Exhaust	35.12-35.28 mm (1.383-1.389 in.)	35.08 mm (1.381 in.)
Runout		0.05 mm (0.002 in.)
Oil clearance @		
Location A	0.045-0.106 mm (0.0018-0.0042 in.)	0.110 mm (0.0043 in.)
Location B	0.060-0.126 mm (0.0024-0.0050 in.)	0.130 mm (0.0051 in.)
Location C	0.110-0.190 mm (0.0043-0.0075 in.)	0.194 mm (0.0076 in.)
Valves		
Valve stem outer diameter		
Intake	4.975-4.990 mm (0.1959-0.1965 in.)	4.97 mm (0.196 in.)
Exhaust	4.955-4.970 mm (0.1951-0.1957 in.)	4.94 mm (0.195 in.)
Valve guide inner diameter		
Intake and exhaust	5.000-5.012 mm (0.1969-0.1973 in.)	5.04 mm (0.198 in.)
Stem to guide clearance		
Intake	0.010-0.037 mm (0.0004-0.0015 in.)	0.07 mm (0.003 in.)
Exhaust	0.030-0.057 mm (0.0012-0.0022 in.)	0.10 mm (0.004 in.)
Valve seat width		
Intake and exhaust	0.90-1.10 mm (0.035-0.043 in.)	1.5 mm (0.06 in.)
Valve springs free length		
Outer	35.66 mm (1.404 in.)	
Inner	32.35 mm (1.274 in.)	34.36 mm (1.353 in.)
Rocker arm I.D.	12.000-12.018 mm (0.4724-0.4731 in.)	30.65 mm (1.207 in.)
Rocker arm shaft O.D.	11.966-11.984 mm (0.4711-0.4718 in.)	12.05 (0.474 in.) 11.93 mm (0.470 in.)
Cylinder head warpage		0.10 mm (0.004 in.)
Oil pump		
Inner rotor tip to outer clearance	0.15 mm (0.006 in.)	0.20 mm (0.008 in.)
Outer rotor to body clearance	0.15-0.21 mm (0.006-0.008 in.)	0.35 mm (0.014 in.)
End clearance to body	0.04-0.09 mm (0.002-0.004 in.)	0.12 mm (0.005 in.)
Oil pump pressure @ switch	5.4 kg/cm² (77 psi)	
Starter gear contact surface	42.175-42.200 mm (1.809-1.814 in.)	42.16 mm (1.660 in.)

Table 2 ENGINE TORQUE SPECIFICATIONS

Item	N•m	ft.-lb.
Engine mounting bolts		
Front and rear throughbolts	35-45	25-32
Subframe bolts		
Allen bolts	35-45	25-32
Cylinder head cover	8-12	6-9
Cam holder bolts		
6 mm bolts	10-14	7-10
8 mm bolts	21-25	15-18
Cam sprocket bolts	18-20	13-14
Cam guide bolts	30-34	22-25
Rocker arm shaft	45-55	33-40
Valve adjuster nuts	9-12	6-9
Cylinder head bolts	30-34	22-25
Crankcase bolts		
6 mm	10-14	7-10
8 mm	21-25	15-18
Connecting rod cap nuts	30-34	22-25
Alternator rotor bolt	50-60	36-43
Starter clutch bolt	50-60	36-43
Oil pass pipe	10-14	7-10
Oil pipe union bolts	20-25	7-10
Oil pressure sending unit	15-20	11-14
Spark plugs	12-16	9-12
Oil pan drain plug	35-40	25-29

* Apply liquid sealant to threads prior to installation.

Table 3 CONNECTING ROD BEARING SELECTION

	Crankpin journal OD size code letter and dimension	
	Letter A 31.992-32.000 mm (1.2595-1.2598 in.)	Letter B 31.984-31.992 mm (1.2592-1.2595 in.)
Connecting rod ID code number and dimension		
Number 1 35.000-35.008 mm (1.3780-1.3783 in.)	Yellow (C)	Green (B)
Number 2 35.008-35.016 mm (1.3783-1.3786 in.)	Green (B)	Brown (A)

Table 4 CONNECTING ROD BEARING INSERT THICKNESS

Color	mm	in.
Brown (A)	1.494-1.498	0.0588-0.0590
Green (B)	1.490-1.494	0.0587-0.0588
Yellow (C)	1.486-1.490	0.0585-0.0587

Table 5 MAIN JOURNAL BEARING SELECTION

	Main journal OD size code letter and dimension	
	Number 1 31.992-32.000 mm (1.2575-1.2598 in.)	Number 2 31.984-31.992 mm (1.2592-1.2595 in.)
Crankcase ID letter code and dimension		
Letter A 35.000-35.008 mm (1.3780-1.3783 in.)	Yellow (D)	Green (C)
Letter B 35.008-35.016 mm (1.3783-1.3786 in.)	Green (C)	Brown (B)

Table 6 MAIN JOURNAL BEARING INSERT THICKNESS

Color	mm	in.
Brown (B)	1.494-1.498	0.0588-0.0590
Green (C)	1.490-1.494	0.0587-0.0588
Yellow (D)	1.486-1.490	0.0585-0.0587

NOTE: If you own a 1986 model, first check the Supplement at the back of the book for any new service information.

CHAPTER FIVE

CLUTCH AND TRANSMISSION

This chapter contains repair and service information for the clutch, the external and internal shift mechanism and the transmission.

Tables 1-4 are located at the end of this chapter.

CLUTCH

The clutch is a wet, multiplate type which operates immersed in the engine oil. It is mounted on the right-hand end of the transmission main shaft. The clutch center is splined to the main shaft and the outer hub can rotate freely on the main shaft. The outer housing is geared to the primary driven gear on the right-hand end of the crankshaft.

The clutch release mechanism is hydraulic and requires no routine adjustment. The mechanism consists of a clutch master cylinder on the left-hand handlebar, a slave cylinder on the left-hand side of the engine just behind the alternator and a pushrod that rides within the channel in the transmission main shaft.

The clutch is activated by hydraulic fluid pressure and is controlled by the clutch master cylinder. The hydraulic pressure generated by the master cylinder activates the clutch slave cylinder that in turn pushes the clutch pushrod. The clutch pushrod pushes on the lifter guide, thus moving the pressure plate which disengages the clutch mechanism.

Refer to **Table 1** for all clutch torque specifications.

Removal/Disassembly

Refer to **Figure 1** for the clutch assembly.

1. Place the bike on the centerstand.
2. Drain the engine oil as described in Chapter Three.
3. Remove the clutch slave cylinder as described in this chapter.

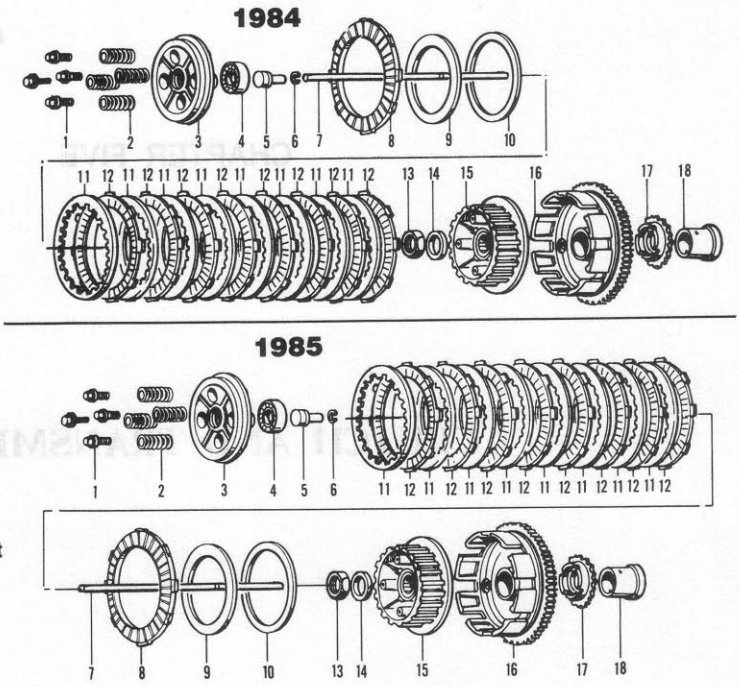
NOTE

To prevent air from entering the clutch hydraulic system, squeeze the clutch lever all the way to the hand grip. Secure the lever to the hand grip with a tie wrap or piece of wire.

4. On Magna models, perform the following:
   a. Remove the rear brake pedal as described in Chapter Eleven.
   b. Remove the bolts securing the right-hand foot peg and remove the foot peg assembly.
5. Remove the bolts securing the right-hand crankcase cover (**Figure 2**) and remove the cover and gasket. Don't lose the 2 locating dowels.
6. Using a crisscross pattern, loosen the clutch bolts in 2-3 stages then remove the clutch bolts, washers and the clutch springs (**Figure 3**) securing the pressure plate.

1 CLUTCH

1. Clutch bolt
2. Spring
3. Pressure plate
4. Bearing
5. Lifter guide
6. Circlip
7. Pushrod
8. Friction disc (narrow)
9. Judder spring seat
10. Judder spring
11. Clutch plate
12. Friction disc
13. Locknut
14. Lockwasher
15. Clutch center
16. Clutch outer housing
17. Oil pump drive sprocket
18. Clutch outer guide



7. Remove the pressure plate.

8A. On 1984 models, remove the clutch pushrod, the judder spring, spring seat (the spring seat will sometimes stick to and come out with the pressure plate), the friction discs and the clutch plates.

8B. On 1985 models, remove the clutch pushrod, the friction discs, the clutch plates, the judder spring and the spring seat.

9. Remove the clutch nut and the lockwasher.

NOTE

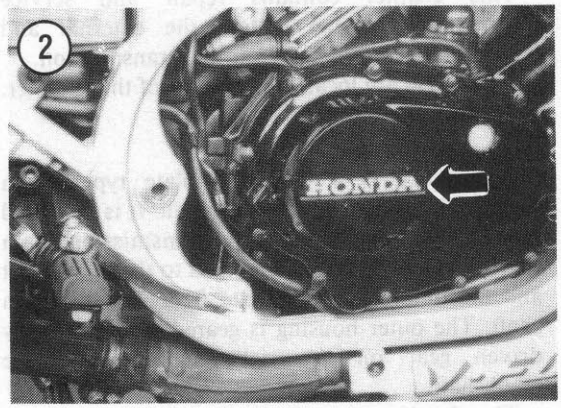
To keep the clutch housing from turning, use the "Grabbit" special tool (part No. 969103) available from Joe Bolger Products Inc., Summer Street, Barre MA. 01005.

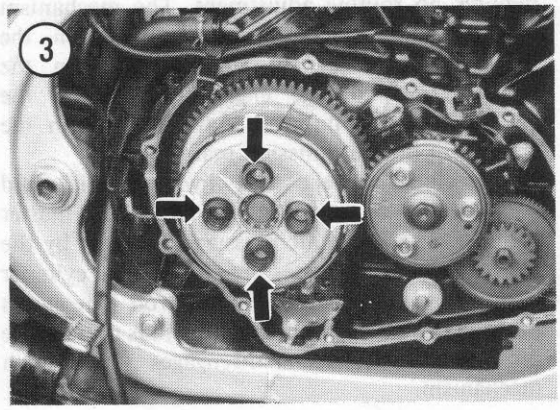
10. Remove the clutch center and the clutch outer housing.

11. Remove the starter clutch assembly as described in Chapter Four.

12. Remove the bolt and washer securing the oil pump driven sprocket and remove the sprocket and chain from the oil pump.

13. Slide off the oil pump drive sprocket, clutch outer housing guide and chain as an assembly from the transmission main shaft.

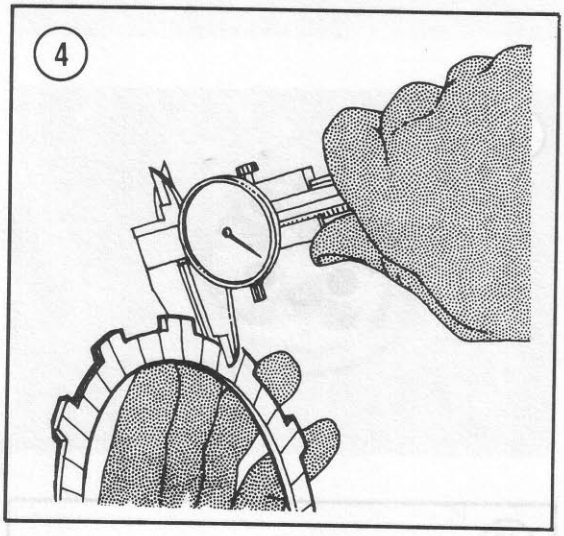


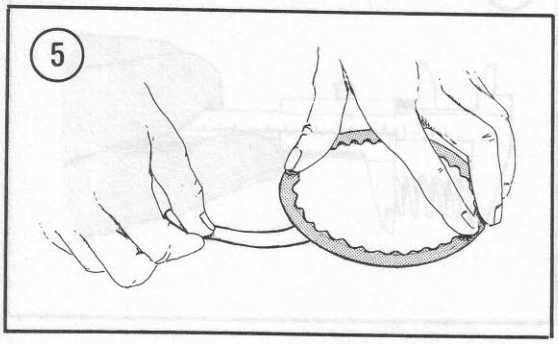


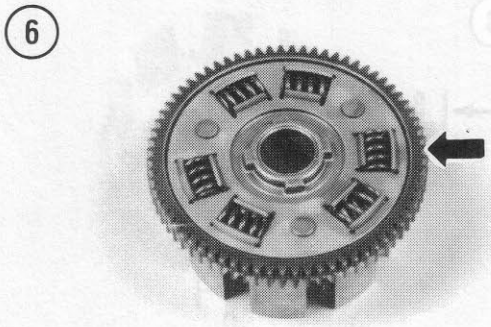
Inspection

Refer to **Table 2** for clutch specifications.

1. Clean all clutch parts in petroleum-based solvent such as kerosene and dry thoroughly with compressed air.
2. Measure the thickness of each friction disc at several places around the disc as shown in **Figure 4**. Compare to the specifications listed in **Table 2**. Replace any disc that is worn to the service limit or less.





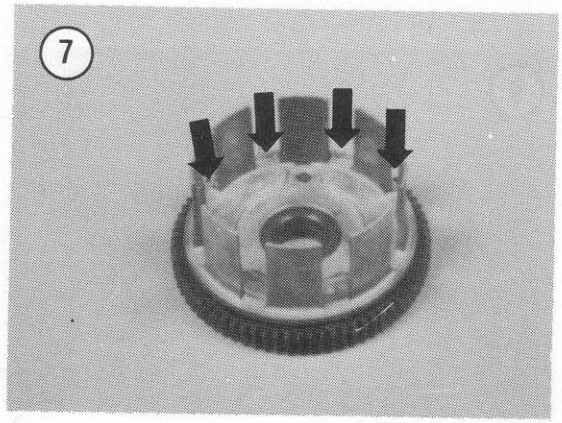


3. Check the clutch plates for warpage on a surface plate such as a piece of plate glass (**Figure 5**). Compare to the specifications listed in **Table 2**. Replace any plate that is warped to the service limit or more.

NOTE

If any of the friction discs or clutch plates require replacement you should consider replacing all of them as a set to retain maximum clutch performance.

4. Inspect the gear teeth of the outer housing (**Figure 6**) for damage. Remove any small nicks on the gear teeth with an oilstone. If damage is severe, the housing must be replaced. Check the teeth and inner splines on the driven gear; it may also need replacing.
5. Inspect the slots in the clutch outer housing (**Figure 7**) for cracks, nicks or galling where they come in contact with the friction disc tabs. If any severe damage is evident, the housing must be replaced.
6. Inspect the inner splines (**Figure 8**) of the clutch center. Replace if necessary.
7. Inspect the outer grooves (**Figure 9**) and raised posts (**Figure 10**) of clutch center. Replace if necessary.
8. Inspect the inner grooves (**Figure 11**) of the clutch pressure plate. Replace if necessary.
9. Measure the free length of each clutch spring as shown in **Figure 12**. Compare to the specifications listed in **Table 2**. Replace any springs that have sagged to the service limit or less.
10. Measure the inside diameter of the clutch outer housing (A, **Figure 13**). If it is worn to the service limit listed in **Table 2**, the clutch outer housing must be replaced.



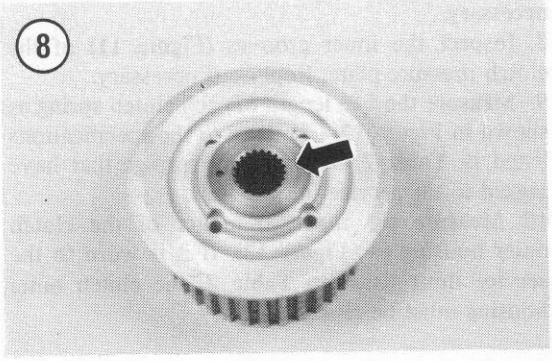
11. Measure the outside diameter of the clutch outer housing guide (B, **Figure 13**). If it is worn to the service limit listed in **Table 2**, the guide must be replaced.
12. Make sure the lifter guide and the bearing (**Figure 14**) rotate smoothly with no signs of wear or damage. Replace if necessary.
13. Inspect the oil pump drive sprocket and drive chain (**Figure 15**) for wear or damage. Replace the drive sprocket, driven sprocket and chain as a set if worn or damaged.

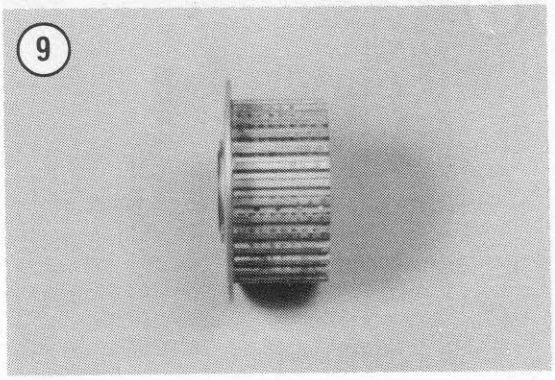
Assembly/Installation

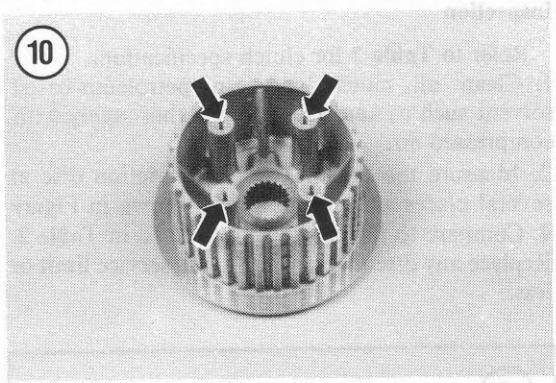
CAUTION

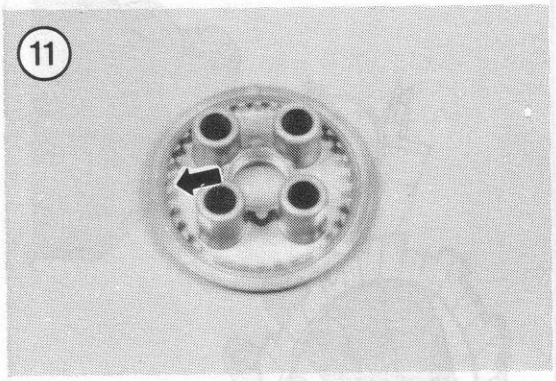
If either or both friction discs and clutch plates have been replaced with new ones, apply new engine oil to all surfaces to avoid having the clutch lock up when used for the first time.

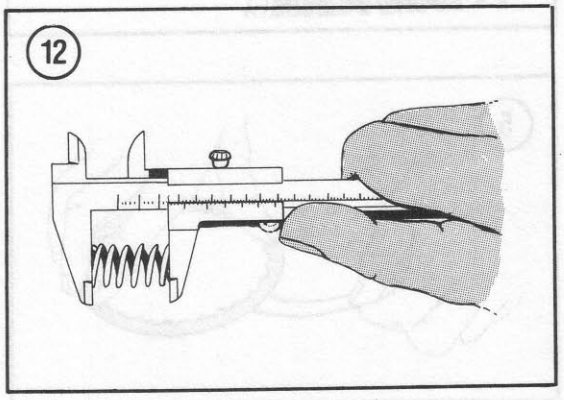
1. If removed, install the clutch pushrod (**Figure 16**), with the groove (**Figure 17**) on the left-hand side.
2. Position the oil pump drive sprocket so the raised tabs and relieved grooves are facing toward the outside.

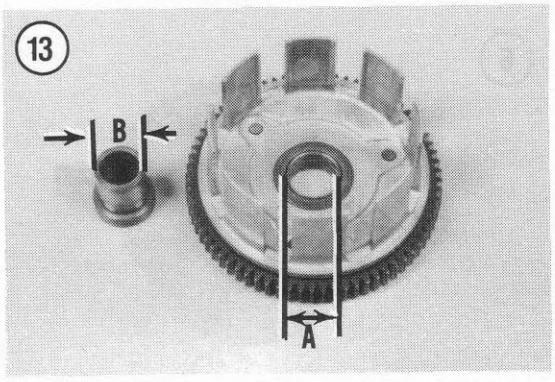


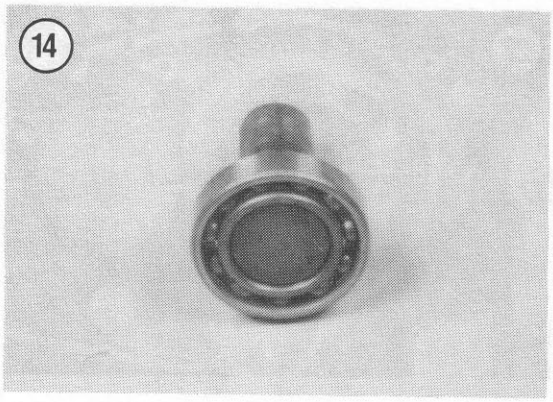


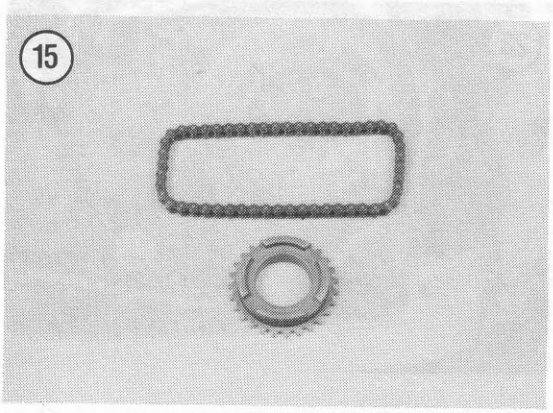


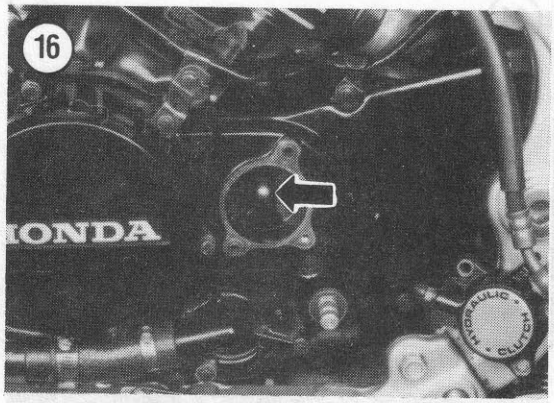


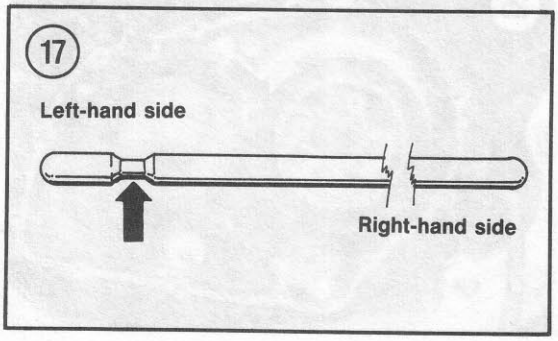








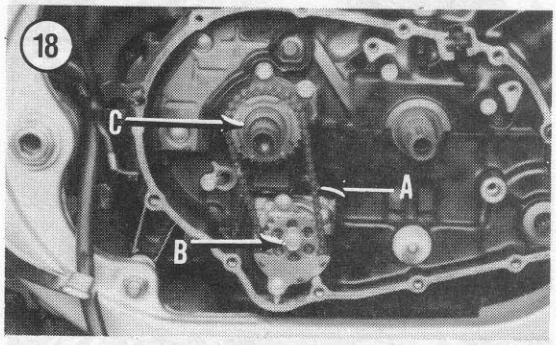


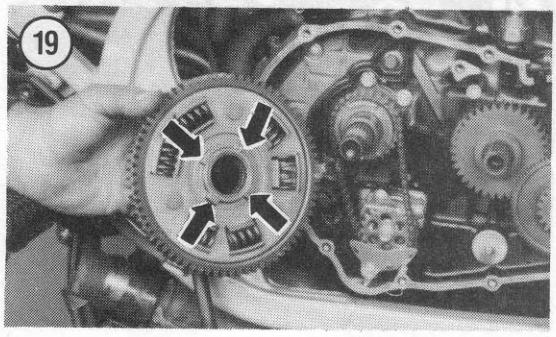


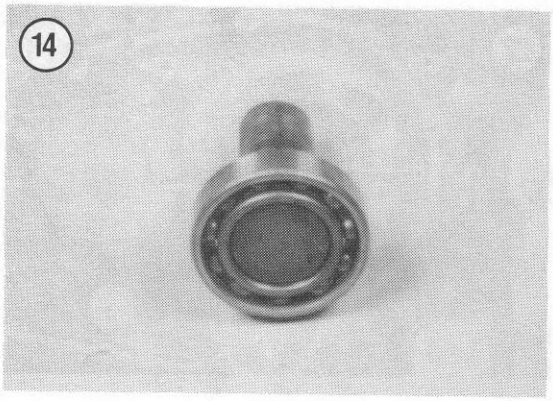
3. Install the clutch outer housing guide into the oil pump drive sprocket and install this assembly onto the transmission main shaft.
4. Mesh the oil pump driven sprocket onto the oil pump drive chain.
5. Install the oil pump drive chain (A, **Figure 18**) onto the oil pump drive sprocket.
6. Align the flat on the oil pump shaft with the flat on the oil pump driven sprocket and install the driven sprocket onto the oil pump shaft.
7. Install the bolt and washer (B, **Figure 18**) securing the oil pump driven sprocket. Tighten the bolt to the torque specification listed in **Table 1**.
8. Rotate the oil pump drive sprocket so the sprocket grooves are lined up at the 12, 3, 6 and 9 o'clock positions (C, **Figure 18**).
9. Align the raised lugs (**Figure 19**) on the back of the clutch outer housing with the sprocket grooves and install the clutch outer housing.
10. Push the clutch outer housing (A, **Figure 20**) on all the way and make sure that the lugs and grooves are indexed properly. Slowly rotate the oil pump driven gear (B, **Figure 20**) until the lugs and grooves align properly.

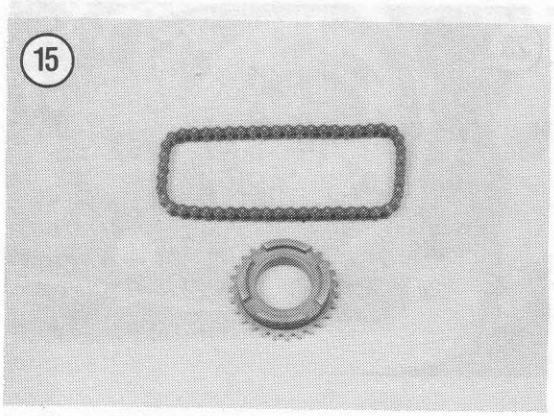
CAUTION

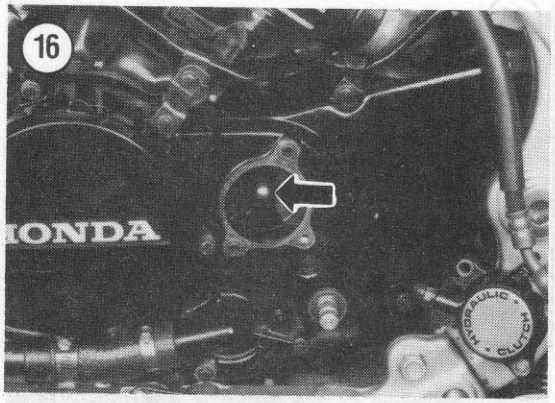
The oil pump sprocket and the clutch outer housing must index properly or the housing will not go on all the way. The clutch will not function properly, nor will the oil pump rotate.

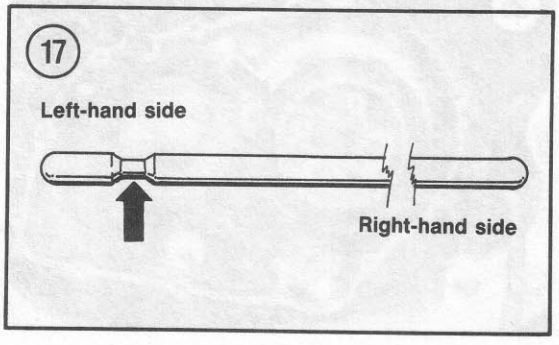








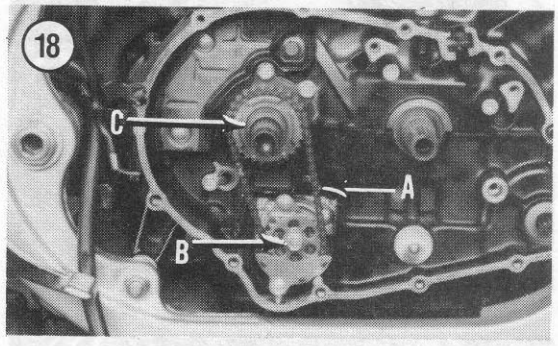


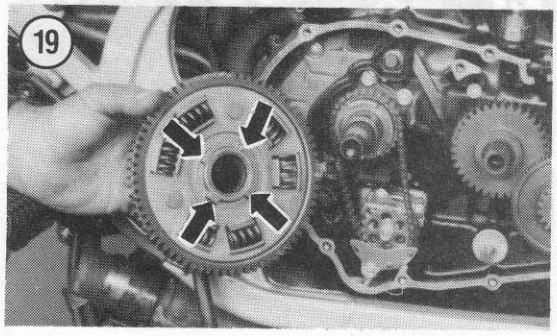


3. Install the clutch outer housing guide into the oil pump drive sprocket and install this assembly onto the transmission main shaft.
4. Mesh the oil pump driven sprocket onto the oil pump drive chain.
5. Install the oil pump drive chain (A, **Figure 18**) onto the oil pump drive sprocket.
6. Align the flat on the oil pump shaft with the flat on the oil pump driven sprocket and install the driven sprocket onto the oil pump shaft.
7. Install the bolt and washer (B, **Figure 18**) securing the oil pump driven sprocket. Tighten the bolt to the torque specification listed in **Table 1**.
8. Rotate the oil pump drive sprocket so the sprocket grooves are lined up at the 12, 3, 6 and 9 o'clock positions (C, **Figure 18**).
9. Align the raised lugs (**Figure 19**) on the back of the clutch outer housing with the sprocket grooves and install the clutch outer housing.
10. Push the clutch outer housing (A, **Figure 20**) on all the way and make sure that the lugs and grooves are indexed properly. Slowly rotate the oil pump driven gear (B, **Figure 20**) until the lugs and grooves align properly.

CAUTION

The oil pump sprocket and the clutch outer housing must index properly or the housing will not go on all the way. The clutch will not function properly, nor will the oil pump rotate.

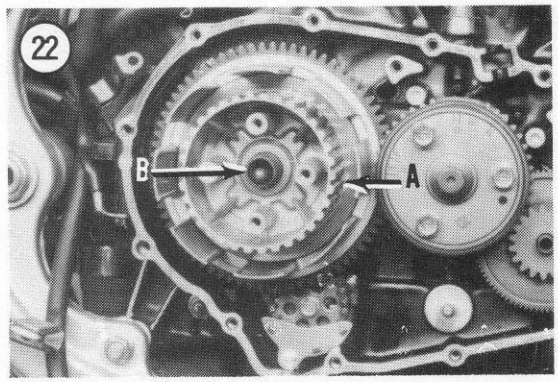


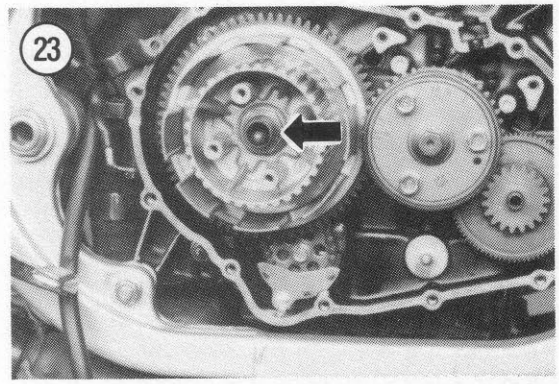


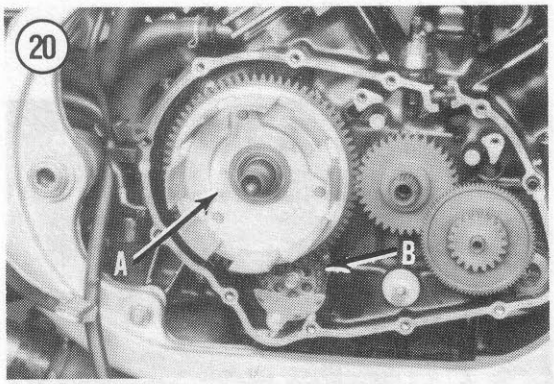
11. After the clutch outer housing is installed, rotate it and make sure the oil pump drive chain and driven sprocket rotate with it. This is a last check to make sure that the 2 parts are meshed properly.
12. Install the starter clutch assembly (**Figure 21**) as described in Chapter Four.
13. Install the clutch center (A, **Figure 22**) and the lockwasher with the OUTSIDE mark (B, **Figure 22**) facing out.
14. Install the clutch locknut (**Figure 23**) with the chamfered side facing in (**Figure 24**) and tighten to the torque specifications listed in **Table 1**. To keep the clutch housing from turning, use the same tool set-up used in Step 9, *Removal/Disassembly.*

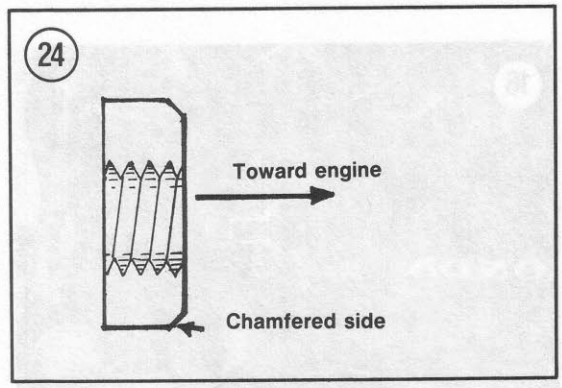
NOTE
In the next step, the narrow friction disc is to be installed last.

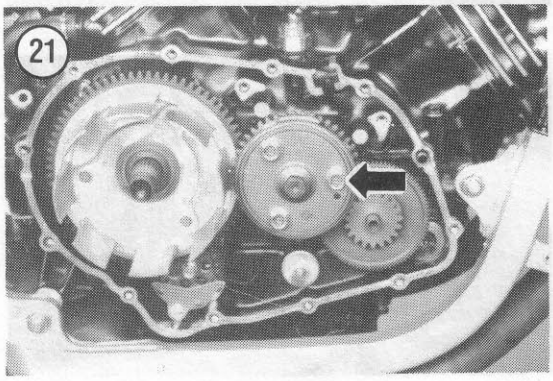
15A. On 1984 models, perform the following:
a. Install a friction disc (**Figure 25**), a clutch plate and a friction disc. Continue to install a clutch plate and friction disc; alternate them until all are installed.
b. Install the judder spring (**Figure 26**) with the convex side toward the outside (**Figure 27**).

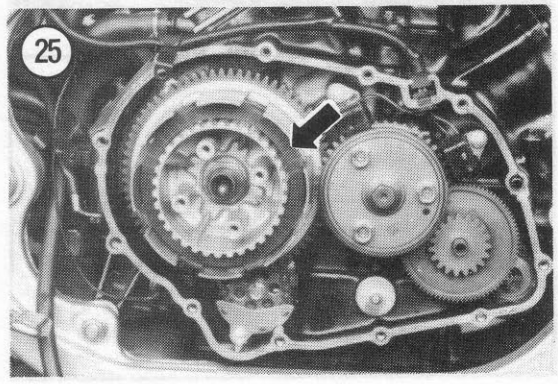


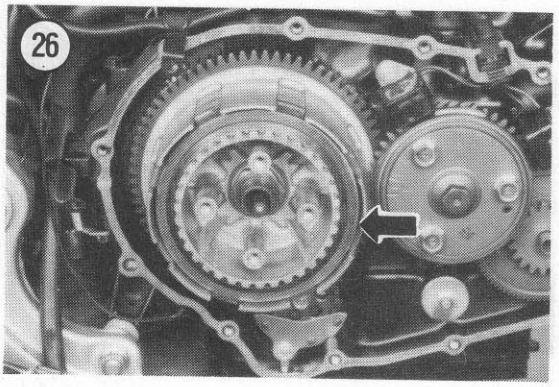


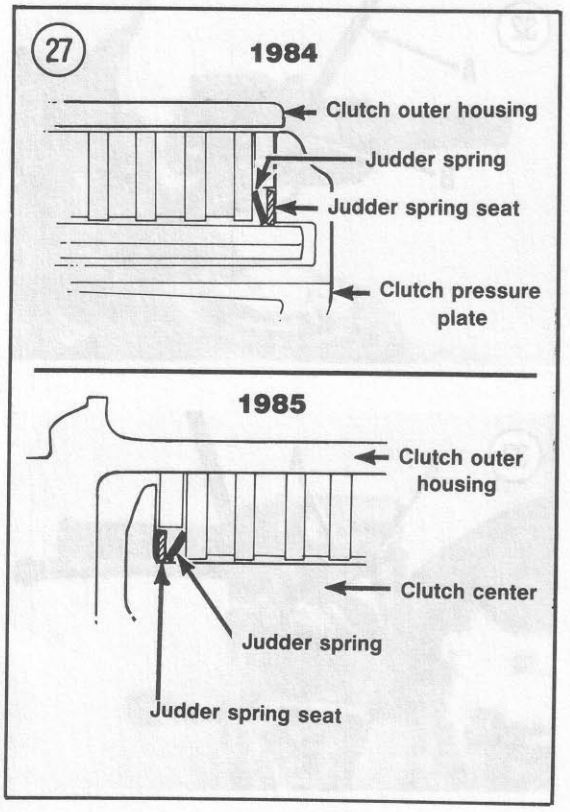


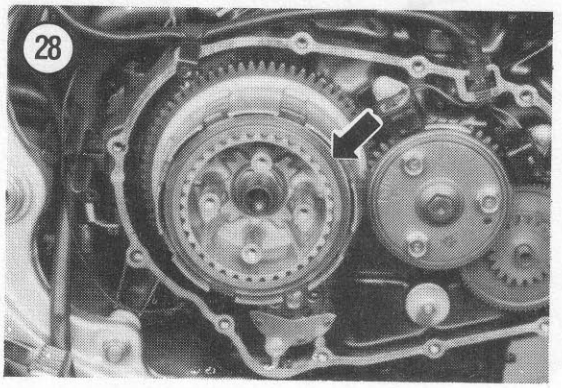












c. Install the spring seat (**Figure 28**) and the narrow friction disc (**Figure 29**).

15B. On 1985 models, perform the following:

a. Install the spring seat.

b. Install the judder spring with the convex side toward the outside (**Figure 27**) then install the narrow friction disc.

c. Install a friction disc, a clutch plate and a friction disc. Continue to install a clutch plate and friction disc; alternate them until all are installed.

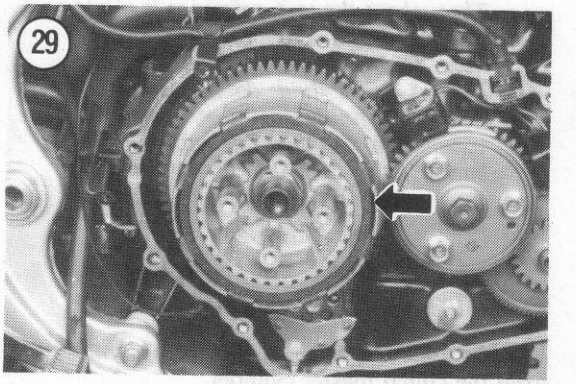
16. Align the arrow (A, **Figure 30**) on the clutch pressure plate with the index mark (B, **Figure 30**) on the clutch center and install the clutch pressure plate.

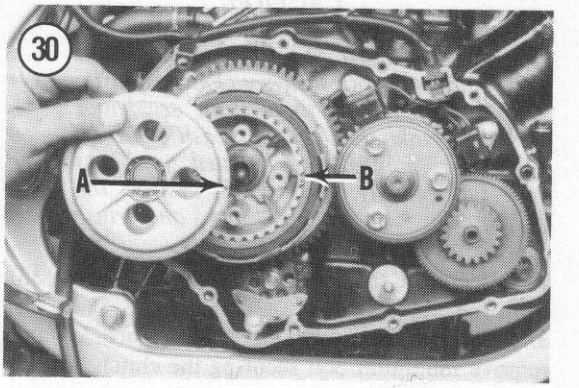
17. Make sure the lifter guide and release bearing are in place in the clutch pressure plate.

18. Refer to **Figure 1** and **Figure 27** and make sure that all parts have been installed correctly so far.

19. Install the clutch springs, bolts and washers. Tighten the bolts in a crisscross pattern in 2 or 3 stages.

20. Install a new gasket (A, **Figure 31**) if removed, then install the 2 locating dowels (B, **Figure 31**) on the crankcase. Install the cover and tighten the bolts securely.





21. On Magna models, perform the following:
    a. Install the right-hand foot peg and bolts. Tighten the bolts securely.
    b. Install the rear brake pedal as described in Chapter Eleven.
22. Fill the crankcase with the recommended type and quantity of engine oil. Refer to Chapter Three.

CLUTCH HYDRAULIC SYSTEM

The clutch is actuated by hydraulic fluid pressure and is controlled by the hand lever on the clutch master cylinder. The clutch master cylinder is located on the left-hand handlebar. As clutch components wear, the fluid level drops in the reservoir and automatically adjusts for wear. There is no routine adjustment necessary or possible.

When working on the clutch hydraulic system, the work area and all tools must be absolutely clean. Any tiny particles of foreign matter and grit in the clutch slave cylinder or the clutch master cylinder can damage the components. Also, sharp tools must not be used inside the slave cylinder or on the piston. If there is any doubt about your ability to correctly and safely carry out major service on the clutch hydraulic components, take the job to a dealer.

WARNING

Throughout the text, reference is made to hydraulic fluid. Hydraulic fluid is the same as DOT 4 brake fluid. Use only DOT 4 brake fluid; ***do not use other types of fluids*** *as they are not compatible. Do not intermix silicone based (DOT 5) brake fluid as it can cause clutch component damage leading to clutch system failure.*

MASTER CYLINDER

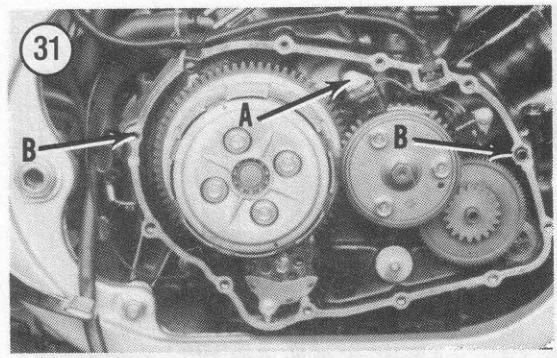
Removal/Installation

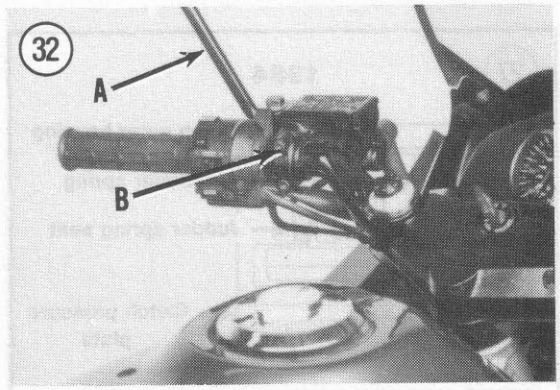
1. Remove the rear view mirror (A, **Figure 32**) from the clutch master cylinder.

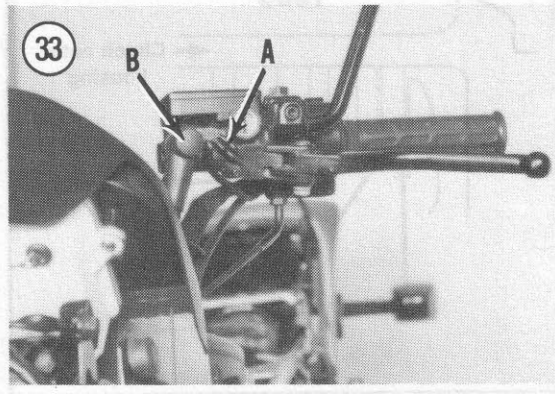
CAUTION

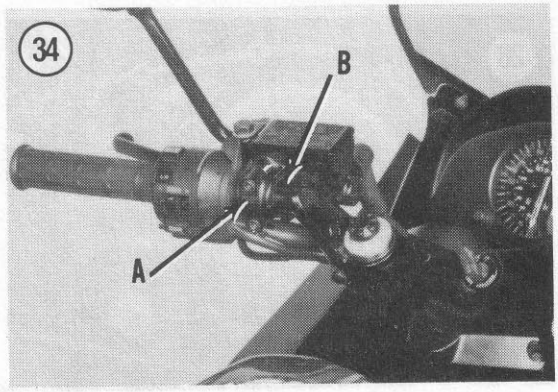
Cover the fuel tank and instrument cluster (and front fairing on models so equipped) with a heavy cloth or plastic tarp to protect them from accidental hydraulic fluid spills. Wash fluid off any painted or plated surfaces immediately, as it will destroy the finish. Use soapy water and rinse completely.

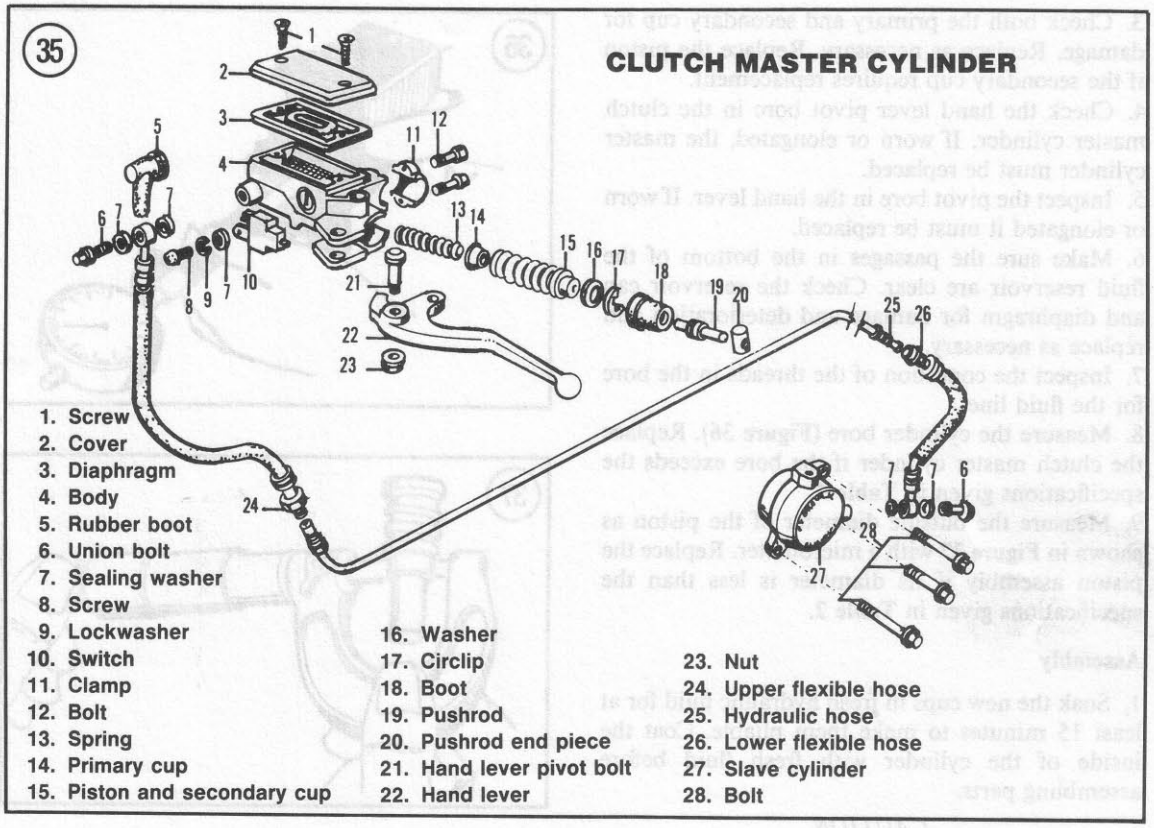
2. Disconnect the electrical wires (A, **Figure 33**) from the clutch switch.
3. Pull back the rubber boot (B, **Figure 33**) and remove the union bolt securing the clutch hose to











the clutch master cylinder. Remove the clutch hose; tie the hose up and cover the end to prevent entry of foreign matter.

4. Remove the clamping bolts (B, **Figure 32**) and clamp securing the clutch master cylinder to the handlebar and remove the clutch master cylinder.

5. Install by reversing these removal steps, noting the following.

6. Position the clamp with the UP mark (A, **Figure 34**) facing up and install the clamp.

7. Align the clamp mating surface with the punch mark on the handlebar (B, **Figure 34**).

8. Tighten the upper bolt first, then the lower. Tighten the bolts securely.

9. Install the clutch hose onto the clutch master cylinder. Be sure to place a sealing washer on each side of the fitting. Install the union bolt and tighten the union bolt to the torque specifications listed in **Table 1**.

10. Attach the electrical wires to the clutch switch.

11. Bleed the clutch as described in this chapter.

Disassembly

Refer to **Figure 35** for this procedure.

1. Remove the clutch master cylinder as described in this chapter.

2. Remove the bolt and nut securing the clutch lever and remove the lever.

3. Remove the screws securing the cover and remove the cover and diaphragm; pour out the hydraulic fluid and discard it. *Never reuse hydraulic fluid.*

4. Remove the pushrod and the end piece.

5. Remove the rubber boot from the area where the hand lever pushrod actuates the internal piston.

6. Using circlip pliers, remove the internal circlip from the body.

7. Remove the secondary cup and the piston assembly.

8. Remove the primary cup and spring.

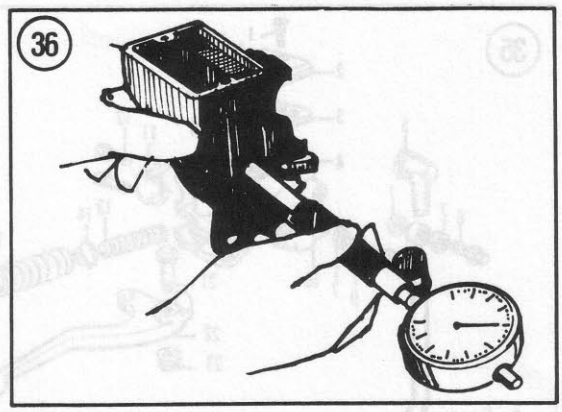
9. Remove the clutch switch if necessary.

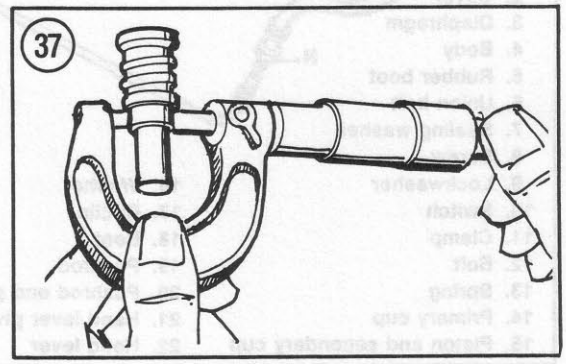
Inspection

1. Clean all parts in denatured alcohol or fresh hydraulic fluid. Inspect the cylinder bore and piston contact surfaces for signs of wear and damage. If either part is less than perfect, replace it.

2. Check the end of the piston for wear caused by the hand lever pushrod. Replace the piston if necessary.

3. Check both the primary and secondary cup for damage. Replace as necessary. Replace the piston if the secondary cup requires replacement.
4. Check the hand lever pivot bore in the clutch master cylinder. If worn or elongated, the master cylinder must be replaced.
5. Inspect the pivot bore in the hand lever. If worn or elongated it must be replaced.
6. Make sure the passages in the bottom of the fluid reservoir are clear. Check the reservoir cap and diaphragm for damage and deterioration and replace as necessary.
7. Inspect the condition of the threads in the bore for the fluid line.
8. Measure the cylinder bore (**Figure 36**). Replace the clutch master cylinder if the bore exceeds the specifications given in **Table 2**.
9. Measure the outside diameter of the piston as shown in **Figure 37** with a micrometer. Replace the piston assembly if its diameter is less than the specifications given in **Table 2**.





Assembly

1. Soak the new cups in fresh hydraulic fluid for at least 15 minutes to make them pliable. Coat the inside of the cylinder with fresh fluid before assembling parts.

CAUTION

When installing the piston assembly, do not allow the cups to turn inside out, as they will be damaged and allow clutch fluid leakage within the cylinder bore.

2. Install the spring, primary cup and piston assembly into the cylinder together.

NOTE

Be sure to install the primary cup with the open end in first, toward the spring.

3. Install the circlip; make sure it seats firmly in the groove.
4. Slide in the rubber boot, the pushrod and the pushrod end piece.
5. Install the diaphragm and cover. Do not tighten the cover screws at this time as fluid will have to be added later.
6. Install the lever onto the master cylinder body.
7. If removed, install the clutch switch.
8. Install the clutch master cylinder and bleed the clutch system as described in this chapter.

Clutch Hose Replacement

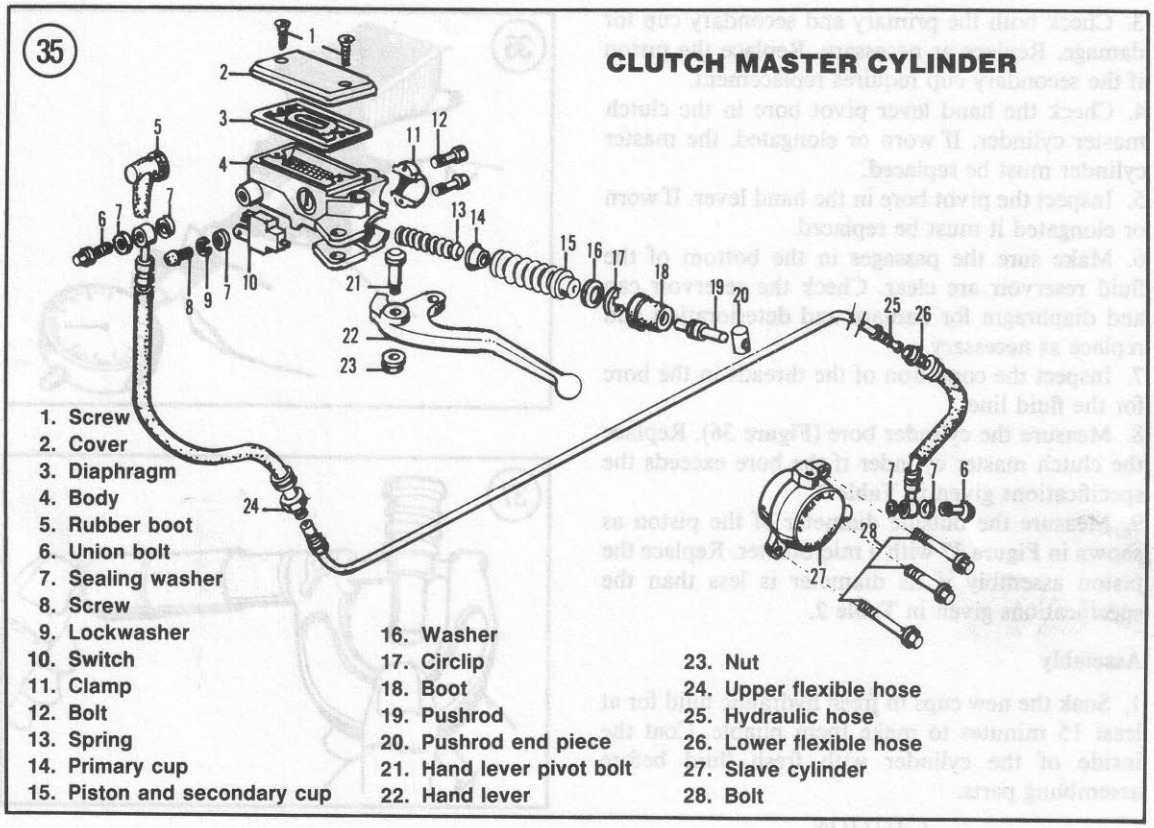
There is no factory-recommended replacement interval but it is a good idea to replace the clutch hoses every four years or when they show signs of cracking or damage. The hydraulic hose assembly consists of 2 flexible hoses and 1 section of metal tubing.

Refer to **Figure 35** for this procedure.

CAUTION

Cover the front wheel, fender, (front fairing on models so equipped) and frame with a heavy cloth or plastic tarp to protect them from accidental spilling of hydraulic fluid. Wash the fluid off of any painted or plated surface immediately, as it will destroy the finish. Use soapy water and rinse completely.

1. Remove the seat (Chapter Twelve) and both side.
2. On Interceptor models, remove the front fairing as described in Chapter Twelve.
3. Remove the fuel tank as described in Chapter Six.
4. Drain the fluid from the entire system as follows:
   a. Attach a hose to the bleed valve (**Figure 38**) on the clutch slave cylinder.
   b. Place the loose end into a container and open the bleed valve.



the clutch master cylinder. Remove the clutch hose; tie the hose up and cover the end to prevent entry of foreign matter.

4. Remove the clamping bolts (B, **Figure 32**) and clamp securing the clutch master cylinder to the handlebar and remove the clutch master cylinder.

5. Install by reversing these removal steps, noting the following.

6. Position the clamp with the UP mark (A, **Figure 34**) facing up and install the clamp.

7. Align the clamp mating surface with the punch mark on the handlebar (B, **Figure 34**).

8. Tighten the upper bolt first, then the lower. Tighten the bolts securely.

9. Install the clutch hose onto the clutch master cylinder. Be sure to place a sealing washer on each side of the fitting. Install the union bolt and tighten the union bolt to the torque specifications listed in **Table 1**.

10. Attach the electrical wires to the clutch switch.

11. Bleed the clutch as described in this chapter.

Disassembly

Refer to **Figure 35** for this procedure.

1. Remove the clutch master cylinder as described in this chapter.

2. Remove the bolt and nut securing the clutch lever and remove the lever.

3. Remove the screws securing the cover and remove the cover and diaphragm; pour out the hydraulic fluid and discard it. *Never reuse hydraulic fluid.*

4. Remove the pushrod and the end piece.

5. Remove the rubber boot from the area where the hand lever pushrod actuates the internal piston.

6. Using circlip pliers, remove the internal circlip from the body.

7. Remove the secondary cup and the piston assembly.

8. Remove the primary cup and spring.

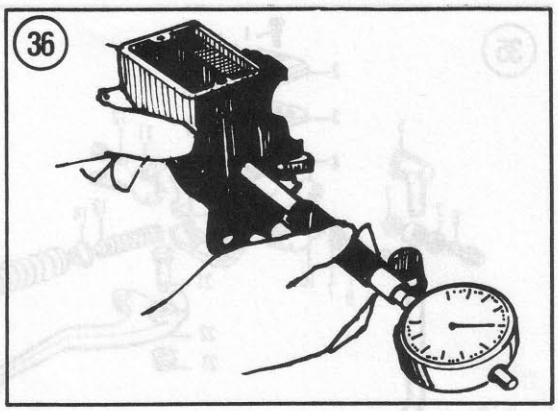
9. Remove the clutch switch if necessary.

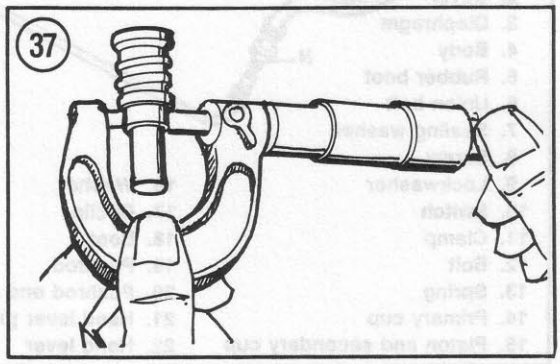
Inspection

1. Clean all parts in denatured alcohol or fresh hydraulic fluid. Inspect the cylinder bore and piston contact surfaces for signs of wear and damage. If either part is less than perfect, replace it.

2. Check the end of the piston for wear caused by the hand lever pushrod. Replace the piston if necessary.

3. Check both the primary and secondary cup for damage. Replace as necessary. Replace the piston if the secondary cup requires replacement.
4. Check the hand lever pivot bore in the clutch master cylinder. If worn or elongated, the master cylinder must be replaced.
5. Inspect the pivot bore in the hand lever. If worn or elongated it must be replaced.
6. Make sure the passages in the bottom of the fluid reservoir are clear. Check the reservoir cap and diaphragm for damage and deterioration and replace as necessary.
7. Inspect the condition of the threads in the bore for the fluid line.
8. Measure the cylinder bore (**Figure 36**). Replace the clutch master cylinder if the bore exceeds the specifications given in **Table 2**.
9. Measure the outside diameter of the piston as shown in **Figure 37** with a micrometer. Replace the piston assembly if its diameter is less than the specifications given in **Table 2**.





Assembly

1. Soak the new cups in fresh hydraulic fluid for at least 15 minutes to make them pliable. Coat the inside of the cylinder with fresh fluid before assembling parts.

CAUTION

When installing the piston assembly, do not allow the cups to turn inside out, as they will be damaged and allow clutch fluid leakage within the cylinder bore.

2. Install the spring, primary cup and piston assembly into the cylinder together.

NOTE

Be sure to install the primary cup with the open end in first, toward the spring.

3. Install the circlip; make sure it seats firmly in the groove.
4. Slide in the rubber boot, the pushrod and the pushrod end piece.
5. Install the diaphragm and cover. Do not tighten the cover screws at this time as fluid will have to be added later.
6. Install the lever onto the master cylinder body.
7. If removed, install the clutch switch.
8. Install the clutch master cylinder and bleed the clutch system as described in this chapter.

Clutch Hose Replacement

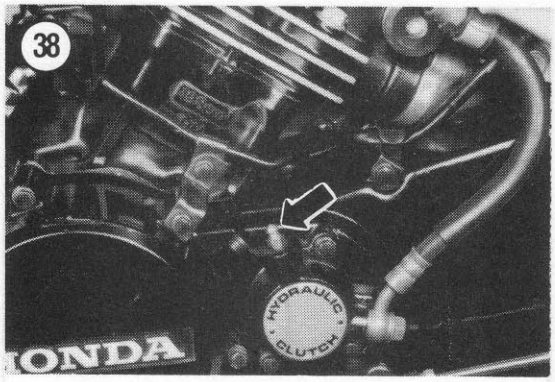
There is no factory-recommended replacement interval but it is a good idea to replace the clutch hoses every four years or when they show signs of cracking or damage. The hydraulic hose assembly consists of 2 flexible hoses and 1 section of metal tubing.

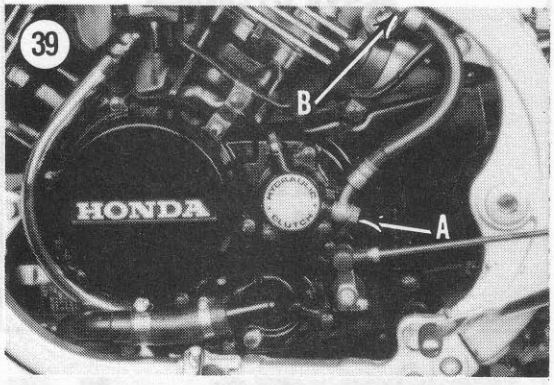
Refer to **Figure 35** for this procedure.

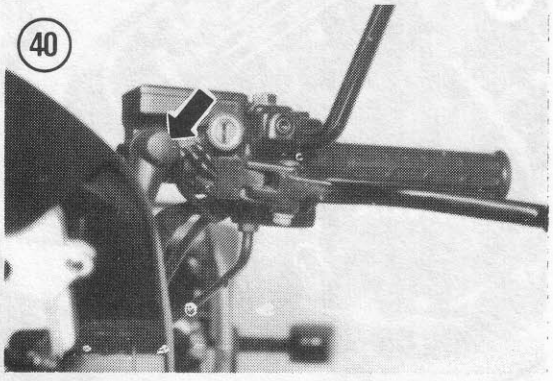
CAUTION

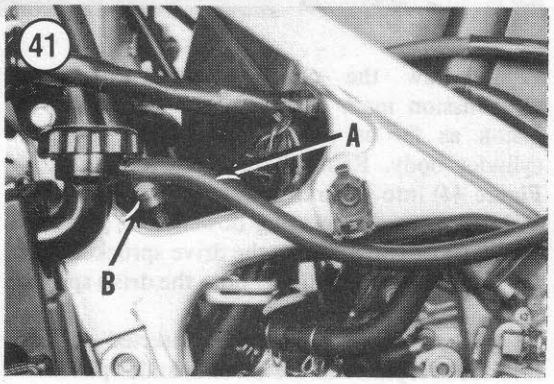
Cover the front wheel, fender, (front fairing on models so equipped) and frame with a heavy cloth or plastic tarp to protect them from accidental spilling of hydraulic fluid. Wash the fluid off of any painted or plated surface immediately, as it will destroy the finish. Use soapy water and rinse completely.

1. Remove the seat (Chapter Twelve) and both side.
2. On Interceptor models, remove the front fairing as described in Chapter Twelve.
3. Remove the fuel tank as described in Chapter Six.
4. Drain the fluid from the entire system as follows:
   a. Attach a hose to the bleed valve (**Figure 38**) on the clutch slave cylinder.
   b. Place the loose end into a container and open the bleed valve.









c. Operate the clutch lever until all fluid is pumped out of the system.
d. Close the bleed valve and remove the hose.

WARNING

Dispose of this fluid—never reuse hydraulic fluid. Contaminated fluid can cause clutch failure.

5. Place a container under the lower flexible hose at the clutch slave cylinder to catch any remaining fluid. Remove the union bolt and sealing washers (A, **Figure 39**) securing the hose to the clutch slave cylinder.
6. Disconnect the flexible hose and let any remaining fluid drain out into the container.
7. Hold onto the fitting on the metal tubing with a wrench and unscrew the lower hose from the rear joint on the metal tubing (B, **Figure 39**). Remove the lower hose.
8. Pull back the rubber boot (**Figure 40**) and remove the union bolt and sealing washers securing the upper flexible hose to the clutch master cylinder. Disconnect the flexible hose.
9. Disconnect the overflow hose (A, **Figure 41**) from the radiator fill neck.
10. Hold onto the fitting on the metal tubing with a wrench and unscrew the upper hose from the front joint on the metal tubing (B, **Figure 41**). Remove the upper hose.
11. The metal tubing rarely requires replacement unless it has been hit hard and is kinked or the end fittings are leaking. If necessary, remove the metal bands securing the metal tubing to the frame and remove the tubing assembly from the frame.

CAUTION

After removing the hose assembly, wash any hydraulic fluid off of any painted or plated surface immediately, as it will destroy the finish.

12. Install the metal tubing, flexible hoses, sealing washers and union bolts in the reverse order of removal. Be sure to install new sealing washers in the correct position on each side of each union bolt; refer to **Figure 35**.
13. Tighten all union bolts to torque specifications listed in **Table 1**.
14. Refill the clutch master cylinder with fresh hydraulic fluid marked DOT 4 only. Bleed the clutch system as described in this chapter.
15. On Interceptor models, install the front fairing as described in Chapter Twelve.
16. Install the fuel tank, seat and side covers.

SLAVE CYLINDER

Removal and installation are covered in 2 different ways. The first procedure is for removing the slave cylinder from the crankcase intact when no service procedures are going to be performed. The second procedure is to be used when the slave cylinder is going to be disassembled, inspected and serviced. Follow the correct procedure for your specific needs.

Refer to **Figure 42** for both procedures.

Removal/Installation (Intact)

This procedure is for removal and installation only—not for disassembly, inspection and service.

1. Place a piece of wood between the clutch lever and the hand grip to hold the lever in the released position. Secure the piece of wood with a rubber band or duct tape. This will prevent the clutch lever from being applied accidentally after the clutch slave cylinder is removed from the crankcase.

NOTE

Do not operate the clutch lever after the slave cylinder is removed from the crankcase. If the clutch lever is applied it will force the piston out of the slave cylinder body and make installation difficult.

2. On Magna models, remove the bolts securing the slave cylinder cover and remove the cover.
3. Remove the bolts (**Figure 43**) securing the clutch slave cylinder to the drive sprocket cover and withdraw the unit and gasket from the cover. Don't lose the locating dowels on the drive sprocket cover.
4. Tie the clutch slave cylinder up and out of the way.
5. Apply a light coat of high-temperature silicone grease (or hydraulic fluid) to the piston seal and the oil seal before installing the assembly.

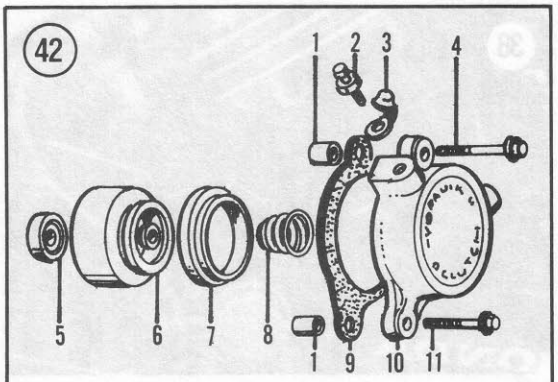
CAUTION

Inspect the piston seal and the oil seal. Replace if their condition is doubtful. If either seal is removed from the piston it must be replaced with a new seal.

6. Make sure the piston seal is still correctly seated in the piston groove. If not seated correctly, fluid will leak past the seal and render the clutch useless.

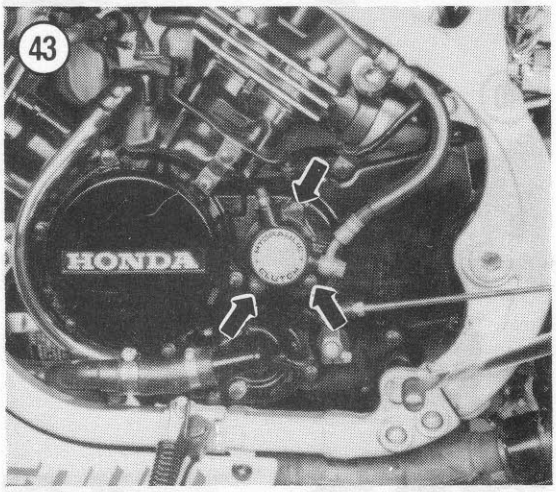
NOTE

Sometimes the piston will move out slightly from the slave cylinder body when the body is withdrawn from the crankcase during removal. This presents no problem.

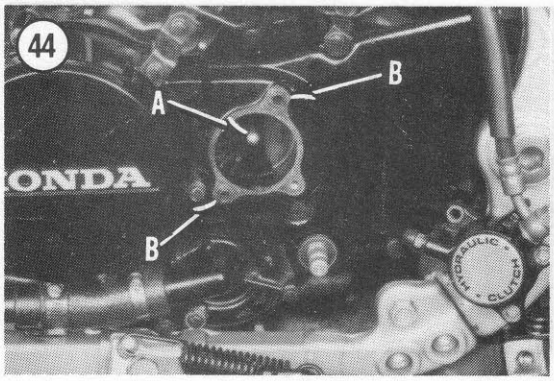


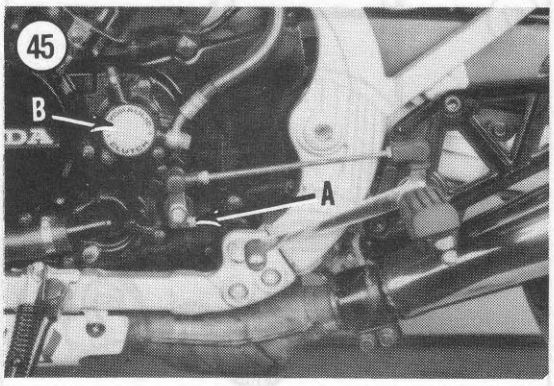
SLAVE CYLINDER

1. Locating dowel
2. Bleed valve
3. Cap
4. Bolt
5. Seal
6. Piston
7. Piston seal
8. Spring
9. Gasket
10. Cover
11. Bolt



7. Withdraw the clutch pushrod from the transmission main shaft and use it to push the piston as far as possible back into the slave cylinder body. Reinstall the clutch pushrod (A, **Figure 44**) into the transmission main shaft.
8. Make sure the locating dowels and gasket (B, **Figure 44**) are in place on the drive sprocket cover.
9. Install the slave cylinder onto the drive sprocket cover.
10. Make sure the pushrod is inserted correctly into the receptacle in the slave cylinder piston.





NOTE

*After being positioned correctly into the drive chain cover, the slave cylinder assembly **may** stick out by about 3/8 in. from the mating surface of the cover. This is due to the pressure within the hydraulic system.*

11. Install the bolts securing the slave cylinder and gradually tighten the bolts in a crisscross pattern. Continue to tighten until the slave cylinder has bottomed out on the mating surface of the cover. Tighten the bolts securely.
12. On Magna models, install the slave cylinder cover and tighen the bolts securely.

Removal/Disassembly

This procedure is for a complete service procedure of removal, disassembly, inspection, assembly and installation of the slave cylinder.
1. On Magna models, remove the bolts securing the slave cylinder cover and remove the cover.
2. Drain the hydraulic fluid from the entire system as follows:
   a. Attach a hose to the bleed valve on the clutch slave cylinder (**Figure 38**).
   b. Place the loose end into a container and open the bleed valve.
   c. Operate the clutch lever until all fluid is pumped out of the system.
   d. Close the bleed valve and remove the hose.

WARNING

Dispose of this fluid—never reuse hydraulic fluid. Contaminated fluid can cause clutch failure.

3. Place a container under the lower flexible portion of the clutch hose at the clutch slave cylinder to catch any remaining fluid. Remove the union bolt and sealing washers (A, **Figure 45**) securing the hose to the clutch slave cylinder. Remove the hose and let any remaining fluid drain out into the container.
4. Remove the bolts securing the clutch slave cylinder (B, **Figure 45**) to the drive sprocket cover and withdraw the unit and gasket from the cover. Don't lose the locating dowels on the cover.

Inspection

WARNING

Do not apply high air pressure during the next step. If the piston is stuck, it may shoot out suddenly and cause serious injury.

1. To remove the piston, hold the slave cylinder body in your hand with the piston facing away from you. Place a clean shop cloth behind the piston. Carefully apply a *small* amount of compressed air in short spurts into the hole where the union bolt was attached. The air pressure will force the piston out of the body.

CAUTION

Be sure to catch the piston when it is pushed out of the body. Failure to do so will result in damage to the piston.

2. Remove the spring from the piston.
3. Check the spring for damage or sagging. Honda does not provide service limit dimensions for this spring. Replace the spring if its condition is doubtful.
4. Remove the oil seal and the piston seal from the piston; discard both seals.
5. Use a vernier caliper and measure the outside diameter of the piston as shown in **Figure 46**. Replace the piston if it is worn to the service limit listed in **Table 2**.
6. Use a vernier caliper and measure the inside diameter of the slave cylinder body as shown in **Figure 47**. Replace the body if it is worn to the service limit listed in **Table 2**.

Assembly/Installation

1. Apply a light coat of high-temperature silicone grease (or hydraulic fluid) to the new piston seal and the oil seal prior to installation.
2. Install both seals onto the piston. Make sure the piston seal is correctly seated in the groove in the piston. If not seated correctly, fluid will leak past the seal and render the clutch useless.

NOTE

A new piston seal and oil seal must be installed every time the slave cylinder is removed.

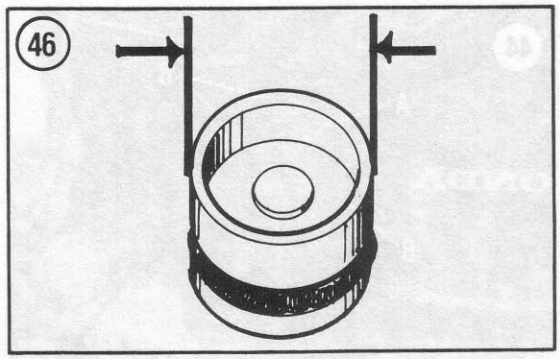
3. Install the spring onto the piston with the largest end facing out.
4. Withdraw the clutch pushrod from the transmission main shaft and use it to push the piston all the way into the slave cylinder body. Reinstall the clutch pushrod (A, **Figure 44**).
5. Make sure the locating dowels and gasket (B, **Figure 44**) are in place on the drive sprocket cover.
6. Install the slave cylinder onto the drive sprocket cover.
7. Install the bolts and tighten in a crisscross pattern in 2-3 stages. Tighten the bolts securely.
8. Install the union bolt and sealing washers to the slave cylinder. Tighten the union bolts to the torque specification listed in **Table 1**.
9. Clean the top of the clutch master cylinder of all dirt and foreign matter. Remove the screws securing the cap and remove the cap (**Figure 48**) and the diaphragm. Fill the reservoir almost to the top lip; insert the diaphragm and install the cap loosely.
10. Bleed the clutch as described in this chapter.
11. On Magna models, install the slave cylinder cover and tighten the bolts securely.

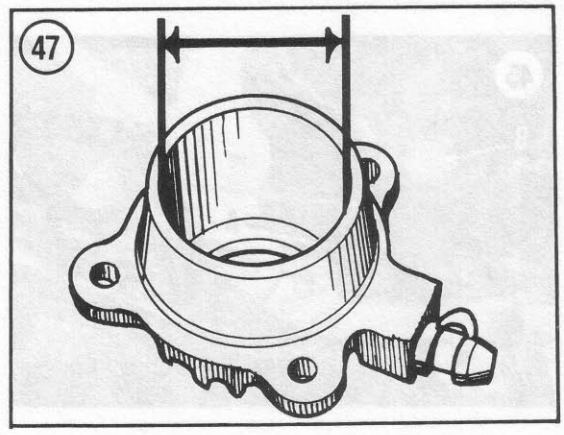
BLEEDING THE CLUTCH SYSTEM

This procedure is not necessary unless the clutch feels spongy, there has been a leak in the system, the clutch does not work properly when hot, a component has been replaced or the hydraulic fluid has been replaced.

CAUTION

*Throughout the text, reference is made to hydraulic fluid. Hydraulic fluid is the same as DOT 4 brake fluid. Use only DOT 4 fluid; **do not use other fluids** as they are not compatible. Do not intermix silicone based (DOT 5) brake fluid as it can cause clutch component damage leading to clutch system failure.*



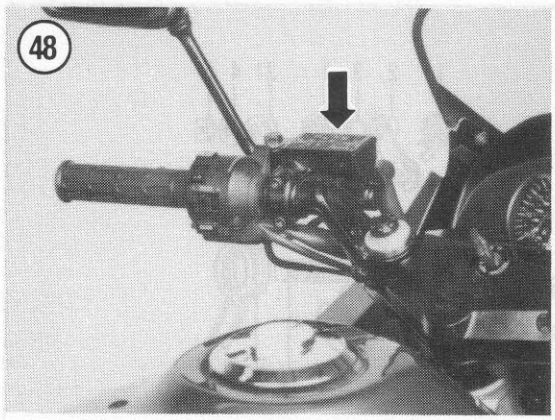


1. On Magna models, remove the bolts securing the slave cylinder cover and remove the cover.
2. Remove the dust cap from the bleed valve on the clutch slave cylinder (**Figure 38**).
3. Connect a length of clear tubing to the bleed valve on the clutch slave cylinder.
4. Place the other end of the tube into a clean container. Fill the container with enough fresh hydraulic fluid to keep the end submerged. The tube should be long enough so that a loop can be made higher than the bleed valve to prevent air from being drawn into the clutch slave cylinder during bleeding.

CAUTION

Cover the clutch slave cylinder and lower frame with a heavy cloth or plastic tarp to protect them from accidental fluid spillings. Wash any fluid off of any painted or plated surface immediately, as it will destroy the finish. Use soapy water and rinse completely.

5. Clean the top of the clutch master cylinder of all dirt and foreign matter. Remove the screws securing the cap and remove the cap and the diaphragm (**Figure 48**). Fill the reservoir almost to



the top lip; insert the diaphragm and install the cap loosely.

CAUTION

Failure to install the diaphragm on the master cylinder will allow fluid to spurt out when the clutch lever is applied.

WARNING

Use hydraulic fluid marked DOT 4 only. Others may vaporize and cause clutch failure. Always use the same brand name; do not intermix as many brands are not compatible. Do not intermix silicone based (DOT 5) brake fluid as it can cause clutch component damage leading to clutch failure.

6. Slowly apply the clutch lever several times. Hold the lever in the applied position.
7. Open the bleed valve about one-half turn. Allow the lever to travel to its limit. When this limit is reached, tighten the bleed valve.
8. Occasionally tap the slave cylinder to loosen any trapped air bubbles that won't come up the normal way. As the fluid enters the system, the level will drop in the reservoir. Maintain the level at the top of the reservoir to prevent air from being drawn into the system.
9. Repeat Step 6 and Step 7 until the fluid emerging from the hose is completely free of bubbles.

NOTE

Do not allow the reservoir to empty during the bleeding operation or air will enter the system. If this occurs, the entire procedure must be repeated.

10. Hold the lever in, tighten the bleed valve, remove the bleed tube and install the bleed valve dust cap.
11. If necessary, add fluid to correct the level in the reservoir. It should be to the upper level line.
12. Install the reservoir cap.
13. Test the feel of the clutch lever. It should be firm and should offer the same resistance each time it's operated. If it feels spongy, it is likely that there still is air in the system and it must be bled again. When all air has been bled from the system and the fluid level is correct in the reservoir, double-check for leaks and tighten all the fittings and connections.
14. On Magna models, install the slave cylinder cover and tighten the bolts securely.

EXTERNAL SHIFT MECHANISM

The external shift mechanism is located on the same side of the engine as the drive sprocket. The external shift mechanism is a planetary gear shift system that is very compact and allows a much shorter movement of the gearshift lever for gear changing than conventional systems.

To remove the internal shift mechanism (shift drum and shift forks) it is necessary to remove the engine and split the upper cylinder block and lower crankcase. That procedure is covered separately in this chapter.

Refer to **Figure 49** for this procedure.

Removal

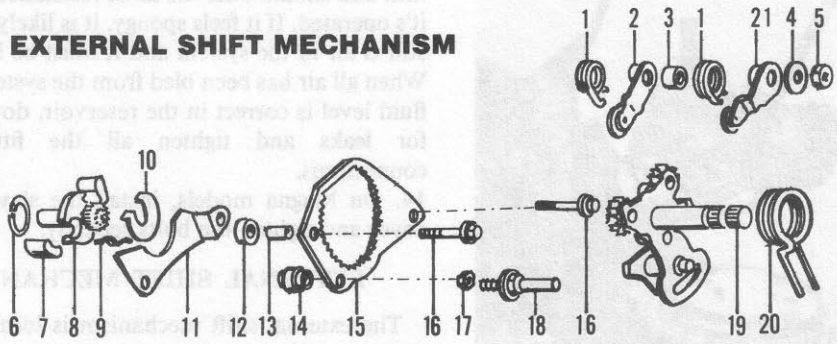
1. Remove both side covers.
2. Drain the engine oil as described in Chapter Three.
3. Drain the coolant as described in Chapter Three.
4. On Interceptor models, remove the lower cowl as described in Chapter Three.
5. Shift the transmission into neutral.
6. On Magna models, perform the following:
   a. Remove the bolts securing the left-hand front footpeg and remove the footpeg assembly.
   b. Remove the bolts securing the slave cylinder cover and remove the cover.
7. Remove the clutch slave cylinder as described under *Clutch Slave Cylinder Removal/Installation (Intact)* in this chapter.
8. Remove the bolt (**Figure 50**) securing the gearshift arm to the gearshift spindle assembly. Move the gearshift arm out of the way.
9. Remove the bolts securing the drive sprocket cover and remove the cover (A, **Figure 51**).
10. Remove the water pump (B, **Figure 51**) as described in Chapter Eight.

NOTE

The following steps are shown with the engine removed from the frame and partially disassembled for clarity. It is not necessaary to remove the engine to perform this procedure.

49

EXTERNAL SHIFT MECHANISM



1. Spring
2. Gear shift stopper arm
3. Collar
4. Washer
5. Nut
6. Ratchet spring
7. Ratchet pawl
8. Drum shifter
9. Ratchet spring
10. Side plate
11. Ratchet guide plate
12. Spacer
13. Dowel pin
14. Collar
15. Guide plate
16. Bolt
17. Nut
18. Return spring pin
19. Gearshift spindle
20. Return spring
21. Neutral stopper arm

11. Remove the bolts (A, **Figure 52**) securing the gearshift cover.
12. Place your thumbs over the end of the gearshift spindle (B, **Figure 52**) where it projects out of the gearshift cover, and pull the cover (C, **Figure 52**) away from the crankcase.
13. Carefully pull the gearshift cover off of the gearshift spindle and remove the cover and gasket. Do not allow the gearshift spindle to move out with the cover. Don't lose the locating dowels.
14. Remove the one nut (A, **Figure 53**) and bolts (B, **Figure 53**) securing the gearshift spindle assembly.
15. Withdraw the gearshift spindle, guide plate and return spring as a set (C, **Figure 53**).
16. Remove the gearshift drum shifter (A, **Figure 54**) from the end of the gearshift drum.
17. Loosen the nut and washer (A, **Figure 55**) securing the neutral stopper arm (B, **Figure 55**). Unscrew the nut to the end of the threads but do not remove the nut at this time.

WARNING

The neutral stopper arm is spring loaded. Protect yourself accordingly.

18. Carefully pull the neutral stopper arm out of engagement with the shift drum. After the spring

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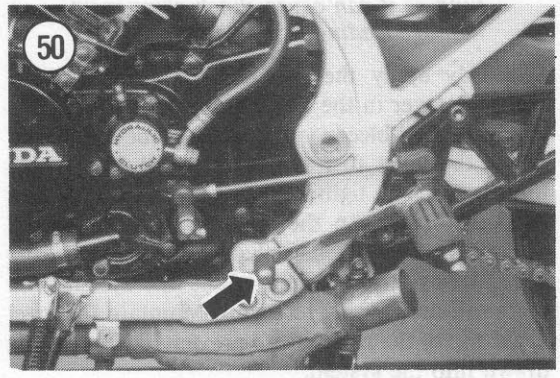

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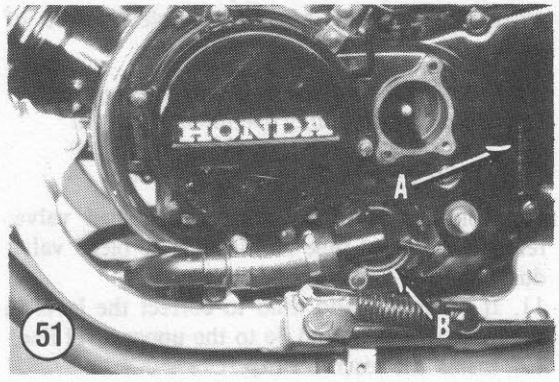
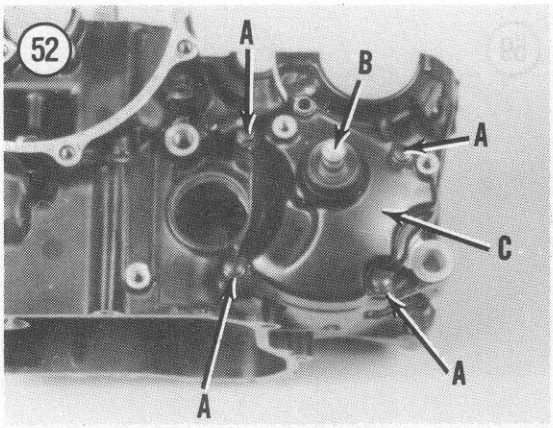
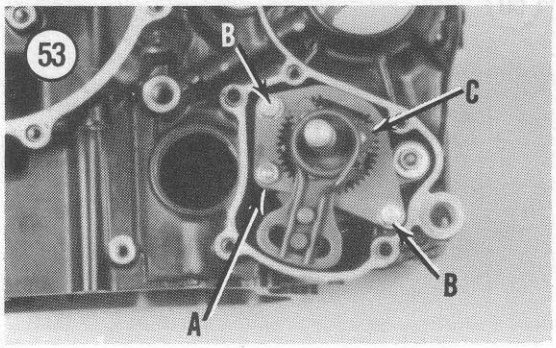
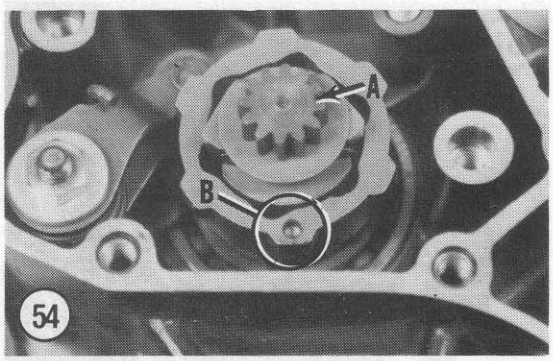
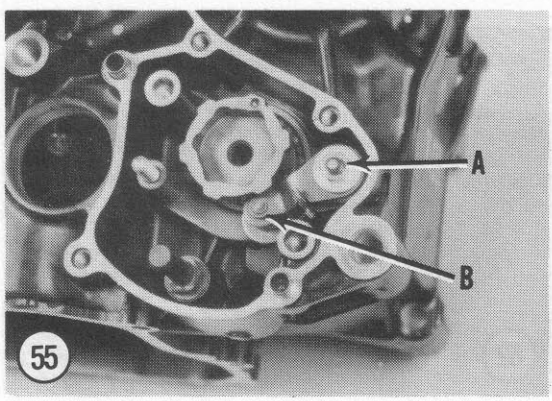
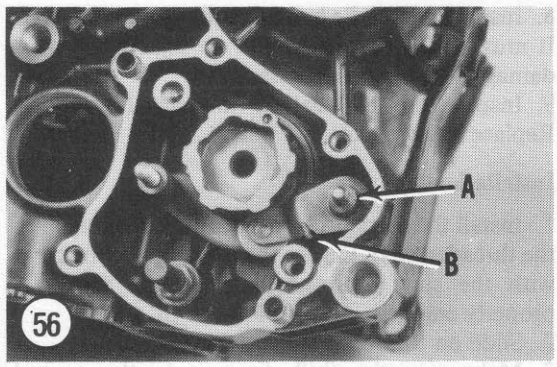


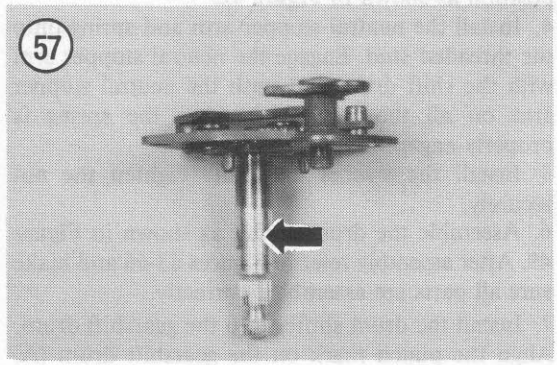












tension is relieved, remove the nut, washer, neutral stopper arm and spring.

19. Slide off the collar (A, **Figure 56**).

20. Carefully pull the gearshift stopper arm (B, **Figure 56**) out of engagement with the shift drum. After the spring tension is relieved, remove the gearshift stopper arm and spring.

Inspection

1. Inspect the return spring on the gearshift arm assembly. If broken or weak it must be replaced.
2. Inspect the gearshift spindle assembly shaft (**Figure 57**) for bending, wear or other damage; replace if necessary.
3. Inspect the planetary gears (A, **Figure 58**) on the spindle assembly for wear or damage. Replace the spindle assembly if necessary.
4. Inspect the gear teeth (B, **Figure 58**) on the guide plate for wear or damage. Replace the guide plate if necessary.
5. Inspect the rollers (**Figure 59**) on the gear shift and neutral stopper arms for wear or damage. Replace the arm(s) if necessary.
6. Inspect the components of the drum shifter (**Figure 60**) for wear or damage. Replace as an assembly if any parts are damaged.
7. Make sure the return spring stud (**Figure 61**) is secure. Tighten if necessary.

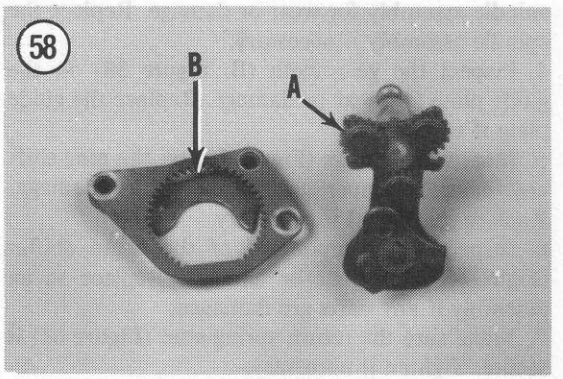
8. Inspect the needle bearing in the gearshift cover. It must rotate smoothly with no signs of wear or damage. Replace as necessary.
9. Inspect the oil seal in the gearshift cover. Replace as necessary.

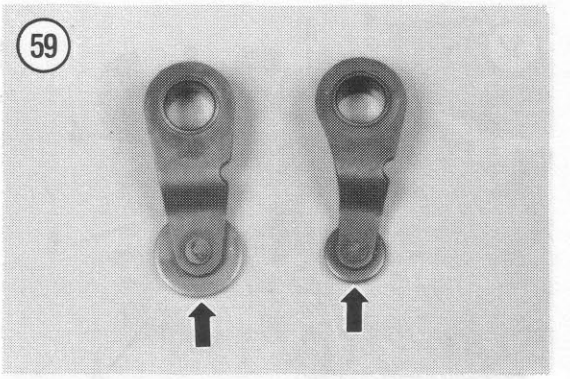
Installation

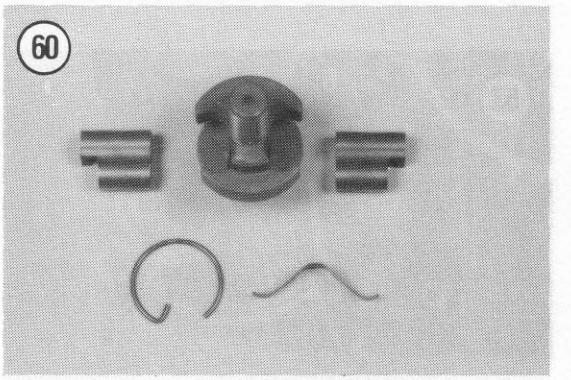
1. Install the gearshift stopper arm and spring onto the threaded stud. Engage the gearshift stopper arm with the shift drum. Make sure the spring is properly engaged.
2. Slide on the collar (**Figure 56**).
3. Make sure the shift drum is in the neutral position as shown in **Figure 62**.
4. Install the neutral stopper arm and spring onto the threaded stud. Engage the neutral stopper arm with the shift drum and push the neutral stopper arm on all the way. Make sure the spring is properly engaged.
5. Install the washer and nut. Tighten the nut securely.
6. Assemble the drum shifter as shown in **Figure 49**. After assembly refer to **Figures 63-66** and make sure all parts are assembled correctly.
7. Install the drum shifter into the gearshift drum. Align the punch mark on the gearshift drum (A, **Figure 67**) with the punch mark on the drum shifter (B, **Figure 67**). Refer to B, **Figure 54**.
8. If disassembled, assemble the gearshift spindle assembly into the guide plate.

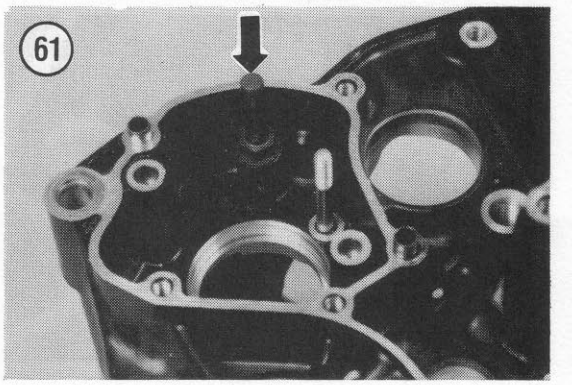
NOTE
In the next step do not move the drum shifter from the neutral position.

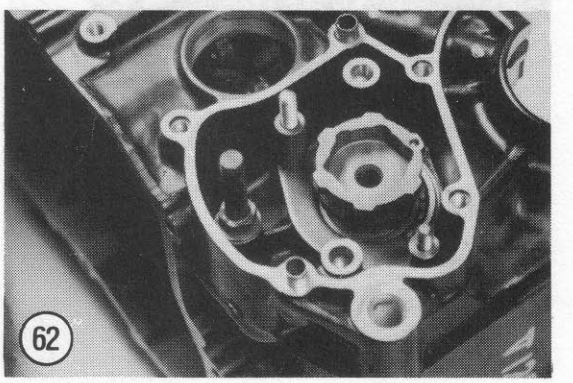
10. Install the gearshift spindle assembly and align the center of the groove (A, **Figure 68**) with the pin (B, **Figure 68**).
11. Install the one nut and bolts securing the gearshift spindle assembly and tighten the nut and bolts securely.











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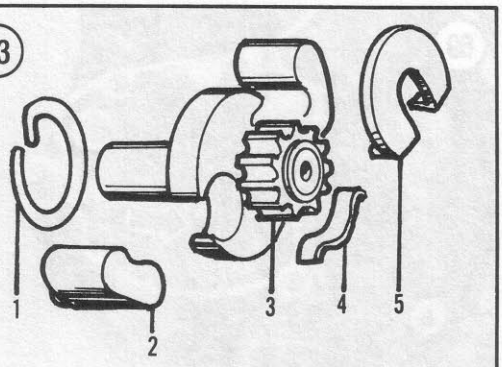

1. Ratchet spring
2. Ratchet pawl
3. Drum shifter
4. Ratchet spring
5. Side plate

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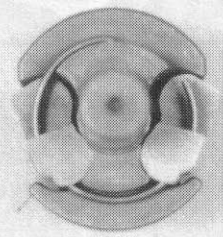

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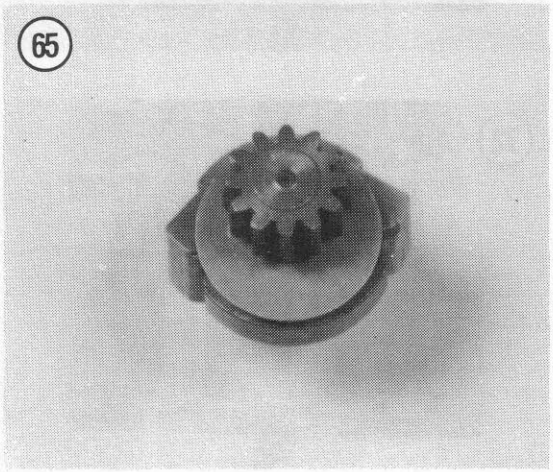

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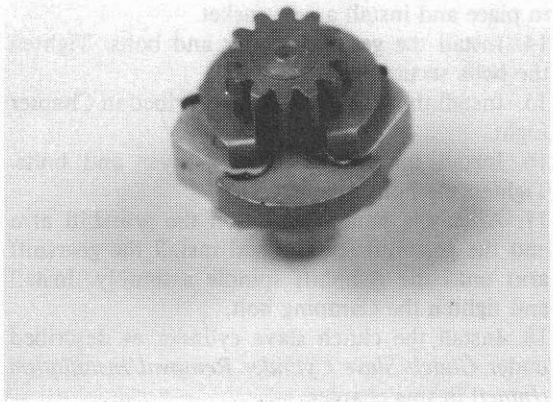

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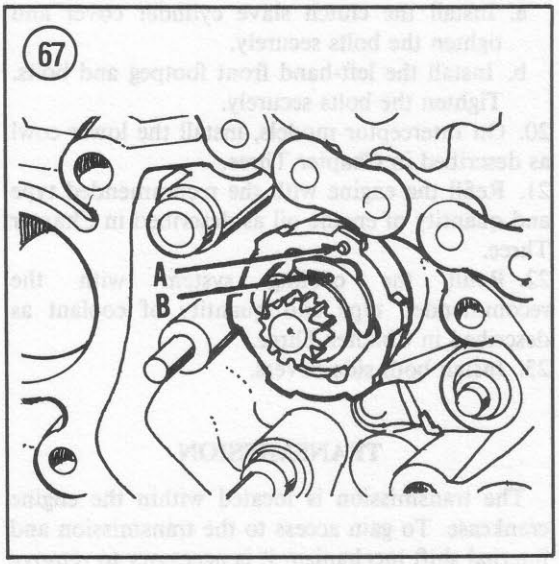

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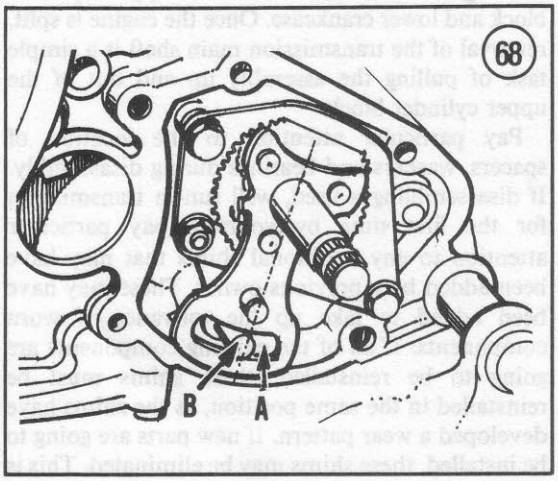
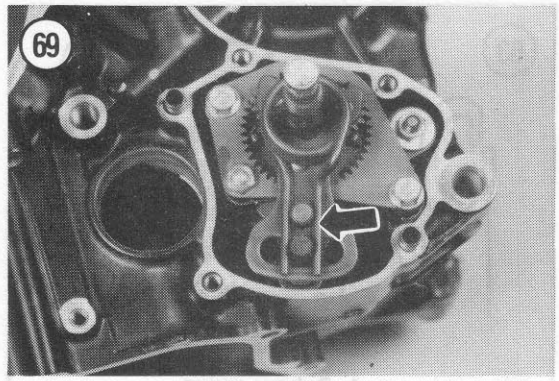


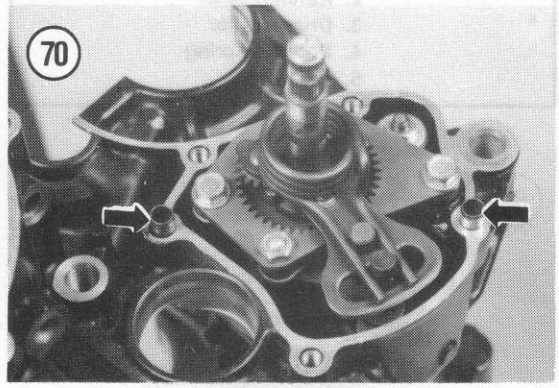
12. Install the return spring and make sure it is properly seated on the return spring stud (**Figure 69**).
13. Make sure the locating dowels (**Figure 70**) are in place and install a new gasket.
14. Install the gearshift cover and bolts. Tighten the bolts securely.
15. Install the water pump as described in Chapter Eight.
16. Install the drive sprocket cover and bolts. Tighten the bolts securely.
17. Align the punch marks on the gearshift arm and the gearshift spindle and install the gearshift arm onto the gearshift spindle assembly. Install and tighten the clamping bolt.
18. Install the clutch slave cylinder as described under *Clutch Slave Cylinder Removal/Installation (Intact)* in this chapter.
19. On Magna models, perform the following:
    a. Install the clutch slave cylinder cover and tighten the bolts securely.
    b. Install the left-hand front footpeg and bolts. Tighten the bolts securely.
20. On Interceptor models, install the lower cowl as described in Chapter Three.
21. Refill the engine with the recommended type and quantity of engine oil as described in Chapter Three.
22. Refill the cooling system with the recommended type and quantity of coolant as described in Chapter Three.
23. Install both side covers.

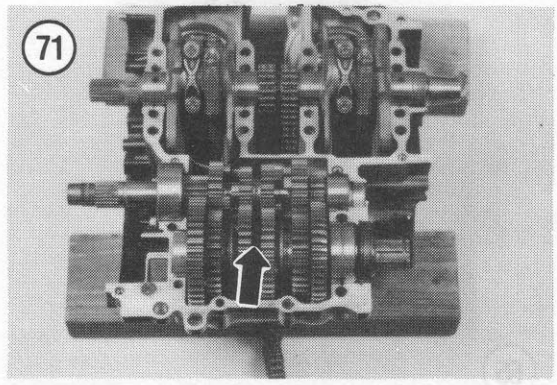
TRANSMISSION

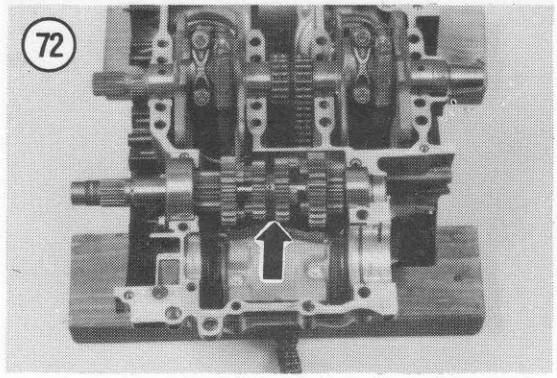
The transmission is located within the engine crankcase. To gain access to the transmission and internal shift mechanism it is necessary to remove the engine and disassemble the upper cylinder block and lower crankcase. Once the engine is split, removal of the transmission main shaft is a simple task of pulling the assembly up and out of the upper cylinder block.

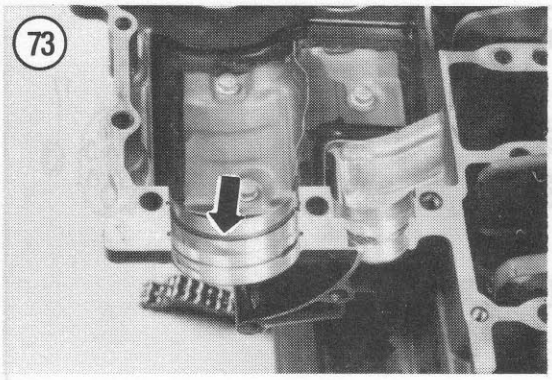
Pay particular attention to the location of spacers, washers and bearings during disassembly. If disassembling a used, well run-in transmission for the first time by yourself, pay particular attention to any additional shims that may have been added by a previous owner. These may have been added to take up the tolerance of worn components. If all of the existing components are going to be reinstalled, these shims must be reinstalled in the same position, as the shims have developed a wear pattern. If new parts are going to be installed, these shims may be eliminated. This is

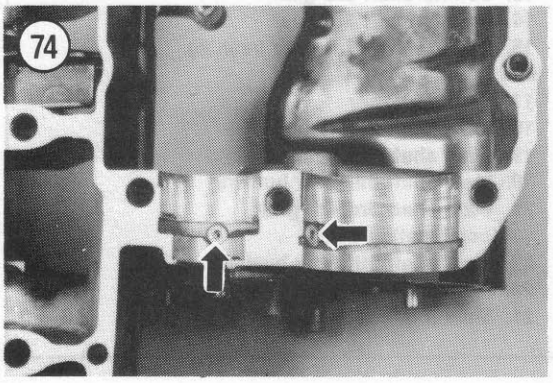


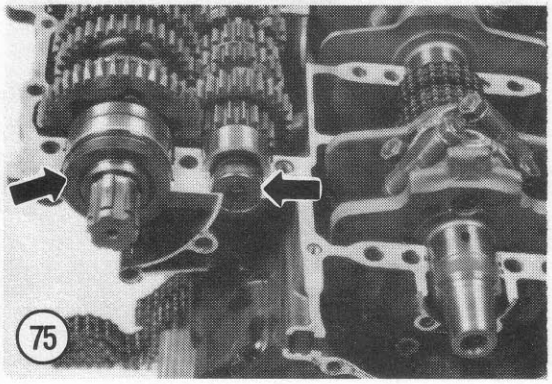


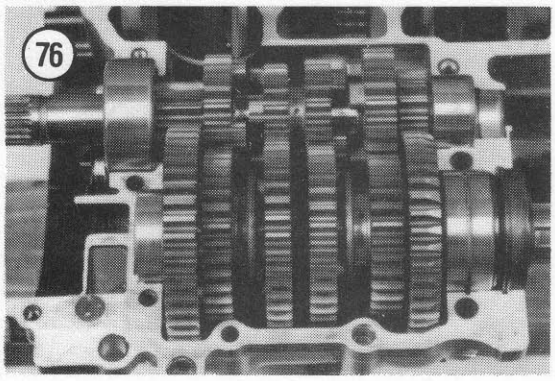












something you will have to determine upon reassembly.

Specifications for the transmission components are listed in **Table 3**.

Removal/Installation

1. Disassemble the cylinder block and lower crankcase as described in Chapter Four.
2. Remove the main shaft assembly (**Figure 71**).
3. Remove the countershaft assembly (**Figure 72**). Don't lose the bearing set ring (**Figure 73**) in the cylinder block.

NOTE

Prior to installing any components, coat all bearing surfaces with assembly oil.

4. Inspect the oil control orifices (**Figure 74**) in the lower crankcase. Make sure they are not clogged. If necessary, clean out with solvent and blow out with compressed air.
5. Make sure the bearing set ring (**Figure 73**) is in place in the cylinder block.
6. Install the countershaft assembly (**Figure 72**) into the cylinder block.
7. Install the main shaft assembly (**Figure 71**) into the cylinder block.
8. Make sure the oil seal on each shaft assembly is positioned correctly in the receptacle (**Figure 75**) in the cylinder block.
9. Position the transmission gears into the NEUTRAL position as shown in **Figure 76**. This is necessary so the shift forks will be able to mesh correctly into the gears for the next step.
10. Assemble the cylinder block and lower crankcase as described in Chapter Four.

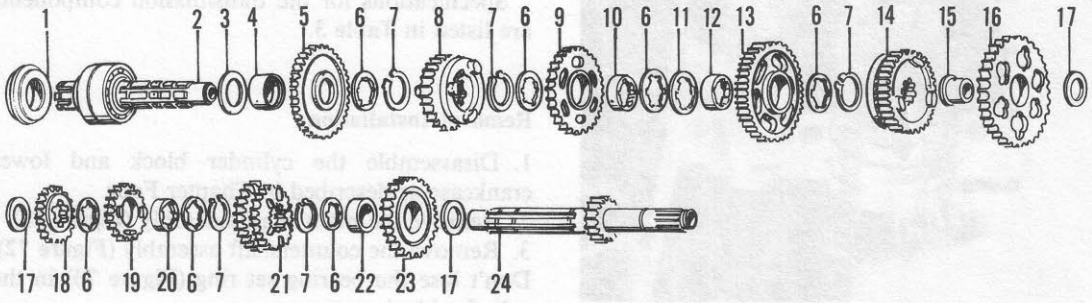
Preliminary Inspection

After the transmission assemblies have been removed from the cylinder block, clean and inspect them prior to disassembling them. Place the assembled shaft into a large can or plastic bucket and thoroughly clean with a petroleum-based solvent such as kerosene and a stiff brush. Dry the assembly with compressed air or let it sit on rags to drip dry.

1. After the assembly has been cleaned, visually inspect the components of the assembly for excessive wear. Any burrs, pitting or roughness on the teeth of a gear will cause wear on the mating gear. Minor roughness can be cleaned up with an oilstone but there's little point in attempting to remove deep scars.

77

TRANSMISSION



1. Oil seal
2. Countershaft
3. Thrust washer
4. Countershaft 2nd gear bushing
5. Countershaft 2nd gear
6. Splined washer
7. Circlip
8. Countershaft 6th gear
9. Countershaft 4th gear
10. Countershaft 4th gear bushing
11. Splined lockwasher
12. Countershaft 3rd gear bushing
13. Countershaft 3rd gear
14. Countershaft 5th gear
15. Countershaft 1st gear bushing
16. Countershaft 1st gear
17. Thrust washer
18. Main shaft 2nd gear
19. Main shaft 6th gear
20. Main shaft 6th gear bushing
21. Main shaft 3rd/4th gear (combination gear)
22. Main shaft 5th gear bushing
23. Main shaft 5th gear
24. Main shaft/1st gear

NOTE

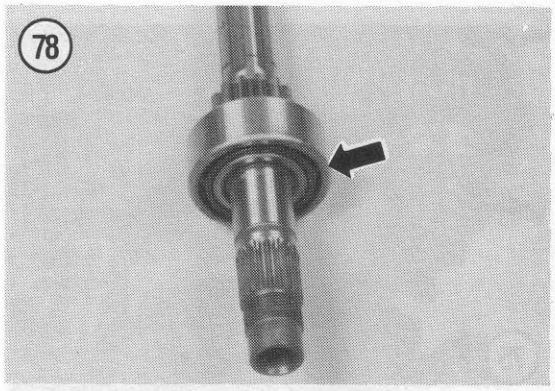
Defective gears should be replaced. It's a good idea to replace the mating gear on the other shaft even though it may not show as much wear or damage.

2. Carefully check the engagement dogs. If any are chipped, worn, rounded or missing, the affected gear must be replaced.
3. If the transmission main shaft is satisfactory and is not going to be disassembled, apply assembly oil or engine oil to all components and reinstall it in the crankcase as described in this chapter.

NOTE

If disassembling a used, well run-in (high mileage) transmission for the first time by yourself, pay particular attention to any additional shims that may have been added by a previous owner. These may have been added to take up the tolerance of worn components and must be reinstalled in the same position since the shims have developed a wear pattern. If new parts are going to be installed these shims may be eliminated. This is something you will have to determine upon reassembly.

78



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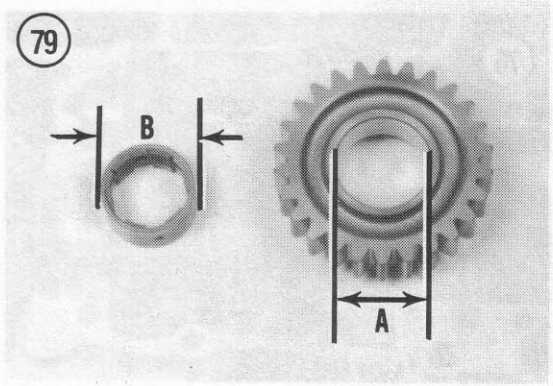
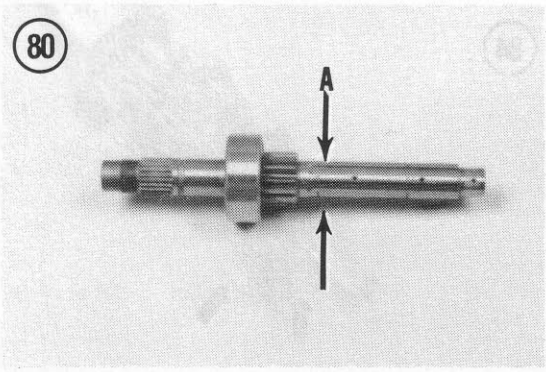
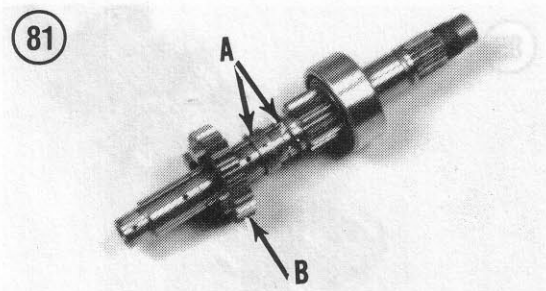
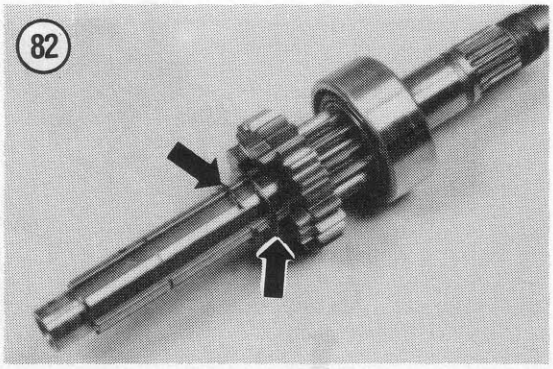








Main Shaft Disassembly/ Inspection/Assembly

Refer to **Figure 77** for this procedure.

1. Clean the shaft as described under *Preliminary Inspection* in this chapter.

NOTE

A helpful "tool" that should be used for transmission disassembly is a large egg flat (the type restaurants get their eggs in). As you remove a part from the shaft, set it in one of the depressions in the same position from which it was removed. This is an easy way to remember the correct relationship of all parts.

2. Remove the needle bearing assembly and the thrust washer.
3. Slide off the 2nd gear and splined washer.
4. Slide off the 6th gear, 6th gear bushing and the splined washer.
5. Remove the circlip and slide off the 3rd/4th combination gear.
6. Remove the circlip and splined washer.
7. Slide off the 5th gear, 5th gear bushing and the thrust washer.

NOTE

The 1st gear is part of the main shaft. If the gear is defective, the shaft must be replaced.

8. Make sure that all gears slide smoothly on the main shaft splines.
9. Inspect the bearing (**Figure 78**) on the main shaft. Make sure it rotates freely with no binding. Replace if necessary.
10. Measure the inside diameter (A, **Figure 79**) of the 5th and the 6th gears. Compare with the dimensions listed in **Table 3**.
11. Measure the inside diameter of the 5th gear bushing. Compare with the dimension listed in **Table 3**.
12. Measure the outside diameter (B, **Figure 79**) of the 5th and the 6th gear bushings. Compare with the dimensions listed in **Table 3**.
13. Measure the outside diameter of the shaft at location A (5th gear bushing location) (A, **Figure 80**). Compare with the dimension listed in **Table 3**.

NOTE

It is a good idea to replace the circlips every other time the transmission is disassembled to ensure proper gear alignment.

14. Slide on the thrust washer and 5th gear bushing (A, **Figure 81**). There is no oil hole alignment for this bushing.
15. Slide on the 5th gear (B, **Figure 81**).
16. Slide on the splined washer and circlip (**Figure 82**).
17. Position the 3rd/4th combination gear with the smaller diameter 3rd gear going on first. Slide on the 3rd/4th combination gear (A, **Figure 83**).
18. Install the circlip and slide on the splined washer (B, **Figure 83**).
19. Align the oil hole in the 6th gear bushing with the oil hole in the main shaft (C, **Figure 83**). This alignment is necessary for proper oil flow.

20. Slide on the 6th gear and splined washer (**Figure 84**).
21. Slide on the 2nd gear (**Figure 85**).
22. Slide on the thrust washer and the needle bearing (**Figure 86**).
23. Install the bearing outer race (**Figure 87**).
24. After assembly is complete, refer to **Figure 88** for correct placement of all gears. Make sure all circlips are seated correctly in the main shaft grooves.
25. Make sure each gear engages properly with the adjoining gears where applicable.

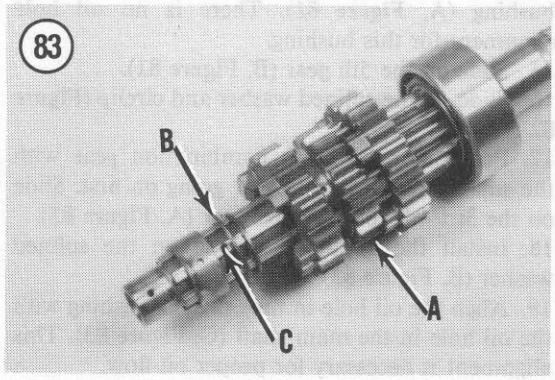
Countershaft Disassembly/ Inspection/Assembly

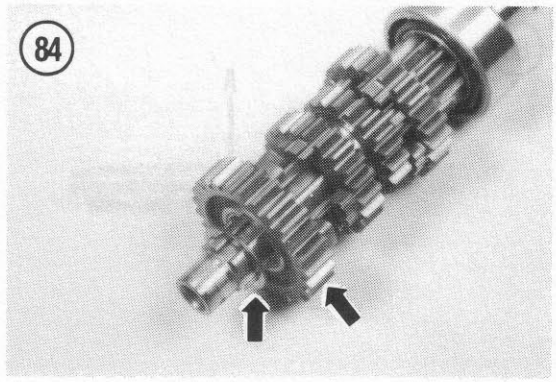
Refer to **Figure 77** for this procedure.

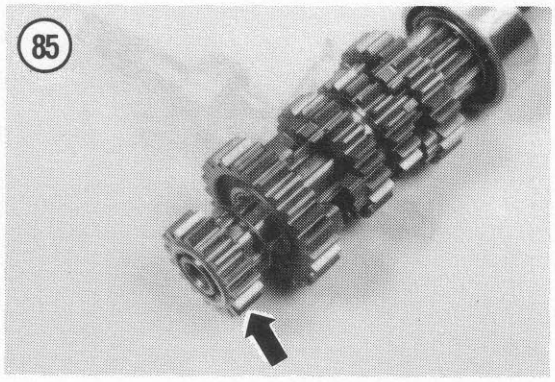
NOTE

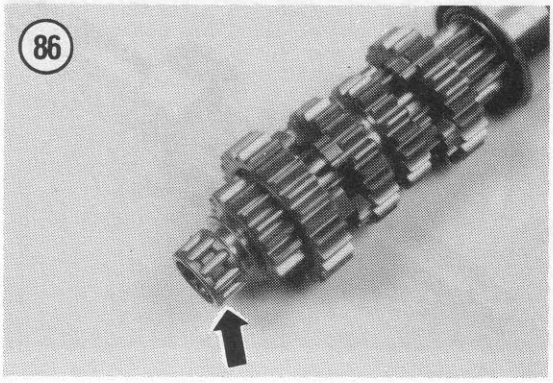
Use the same large egg flat (used on the main shaft disassembly) during the countershaft disassembly. This is an easy way to remember the correct relationship of all parts.

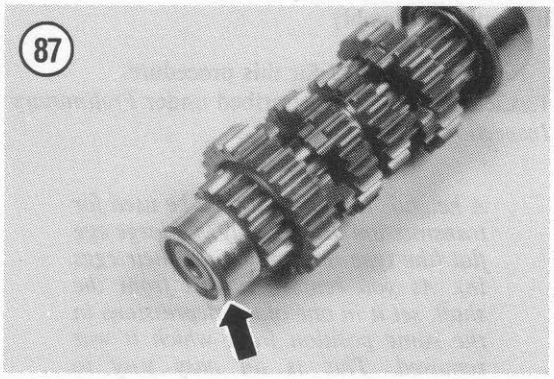
1. Slide off the thrust washer, the 1st gear and the 1st gear bushing.
2. Slide off the 5th gear and remove the circlip.
3. Slide off the splined washer, the 3rd gear and 3rd gear bushing.
4. Slide off the splined lockwasher. Rotate the splined washer in either direction to disengage the tangs from the grooves on the transmission shaft. Slide off the splined washer.
5. Slide off the 4th gear, the 4th gear bushing and the splined washer.
6. Remove the circlip and slide off the 6th gear.
7. Remove the circlip and splined washer.
8. Remove the the 2nd gear, the 2nd gear bushing and thrust washer.
9. Check each gear for excessive wear, burrs, pitting or chipped or missing teeth. Make sure the lugs are in good condition.

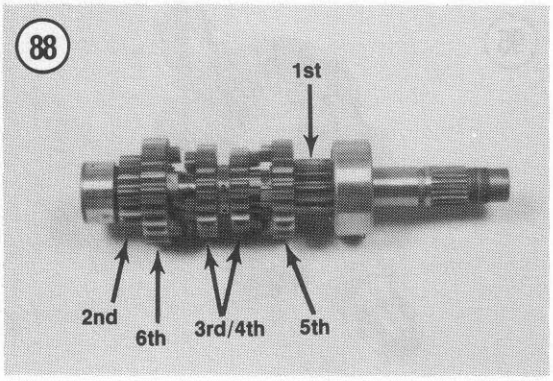


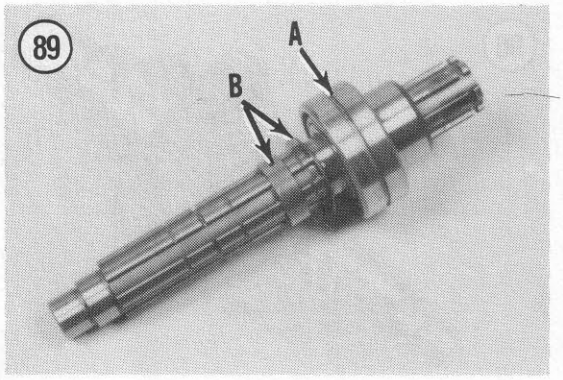


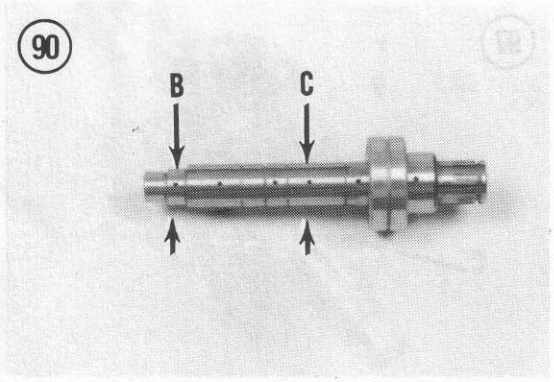


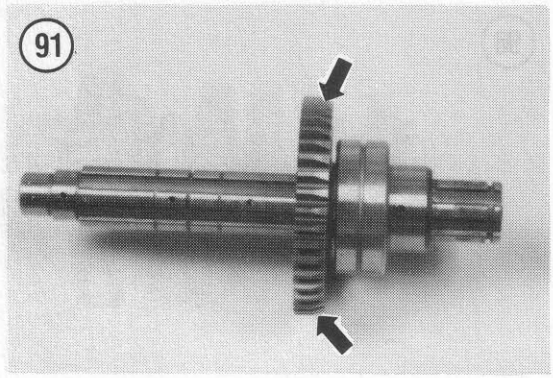


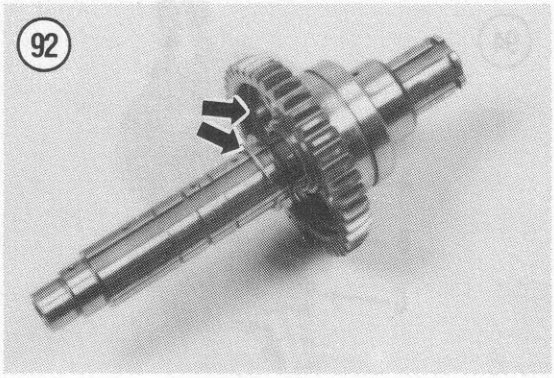












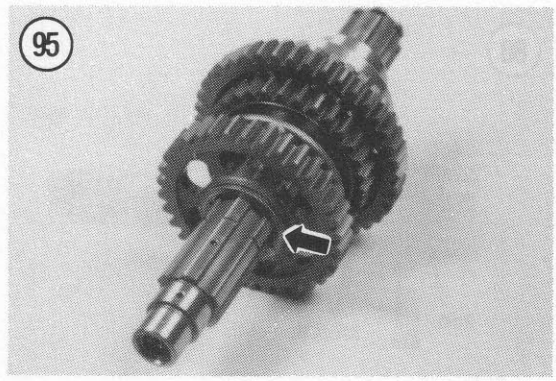
NOTE

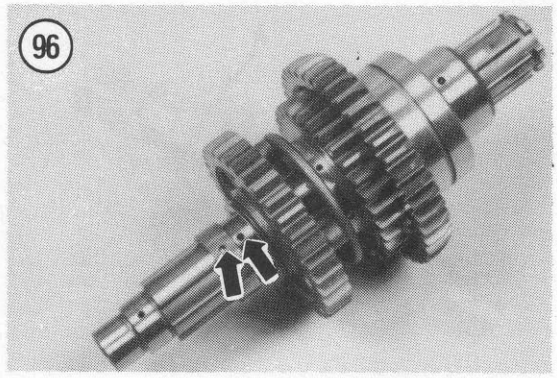
Defective gears should be replaced. It is a good idea to replace the mating gear on the main shaft even though it may not show signs of wear or damage.

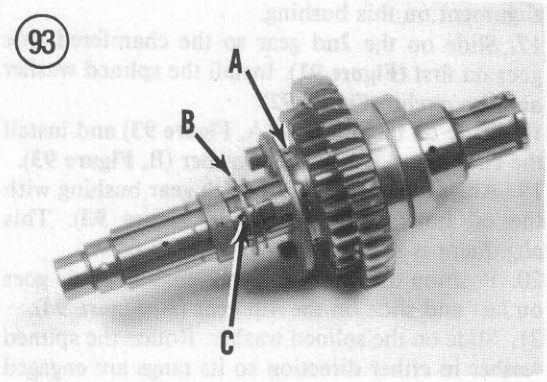
10. Make sure all gears and gear bushings slide smoothly on the countershaft splines.
11. Inspect the bearing (A, **Figure 89**) on the countershaft. Make sure it rotates smoothly with no signs of wear or damage. If the bearing is damaged, the countershaft and bearing assembly must be replaced as a unit. The bearing is not sold separately.
12. Measure the inside diameter (A, **Figure 79**) of the 1st, 2nd, 3rd and 4th gears. Compare with the dimensions listed in **Table 3**.
13. Measure the inside diameter of the countershaft, 1st and 2nd gear bushings.
14. Measure the outside diameter (B, **Figure 79**) of the lst, 2nd, 3rd gear and 4th gear bushings. Compare with the dimensions listed in **Table 3**.
15. Measure the outside diameter of the shaft at location B (the 1st gear bushing; B, **Figure 90**) and location C (the 2nd gear bushing; C, **Figure 90**). Compare with dimensions listed in **Table 3**.
16. Slide on the thrust washer and the 2nd gear bushing (B, **Figure 89**). There is no oil hole alignment on this bushing.
17. Slide on the 2nd gear so the chamfered side goes on first (**Figure 91**). Install the splined washer and the circlip (**Figure 92**).
18. Slide on the 6th gear (A, **Figure 93**) and install the circlip and the splined washer (B, **Figure 93**).
19. Align the oil hole in the 4th gear bushing with the oil hole in the shaft (C, **Figure 93**). This alignment is necessary for proper oil flow.
20. Position the 4th gear so the shoulder side goes on last and slide on the 4th gear (A, **Figure 94**).
21. Slide on the splined washer. Rotate the splined washer in either direction so its tangs are engaged

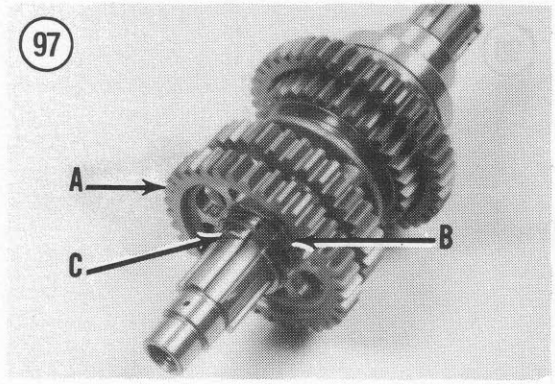
in the groove in the transmission shaft (B, **Figure 94**).

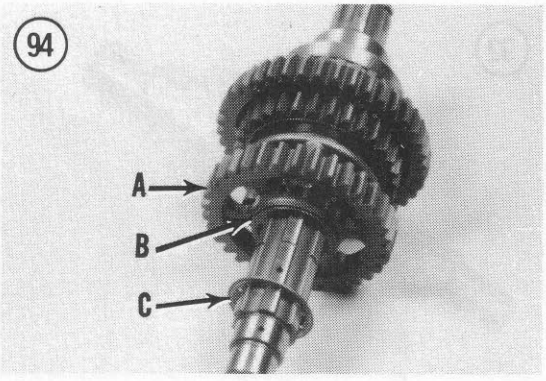
22. Slide on the splined lockwasher (C, **Figure 94**) so that the tangs go into the open areas of the splined washer and lock the washer in place (**Figure 95**).
23. Align the oil hole in the 3rd gear bushing with the oil hole in the shaft (**Figure 96**). This alignment is necessary for proper oil flow.
24. Position the 3rd gear so the shoulder side goes on first and slide on the 3rd gear (A, **Figure 97**), the splined washer (B, **Figure 97**) and the circlip (C, **Figure 97**).
25. Align the oil hole in the 5th gear with the oil hole in the shaft (**Figure 98**) and slide on the 5th gear. This alignment is necessary for proper oil flow.
26. Position the 1st gear bushing so the shoulder side goes on first and slide on the bushing (**Figure 99**).
27. Install the 1st gear (**Figure 100**) and the thrust washer (**Figure 101**).
28. Install the ball bearing (**Figure 102**).
29. After assembly is completed, refer to **Figure 103** for the correct placement of all gears. Make sure all circlips are correctly seated in the countershaft grooves.

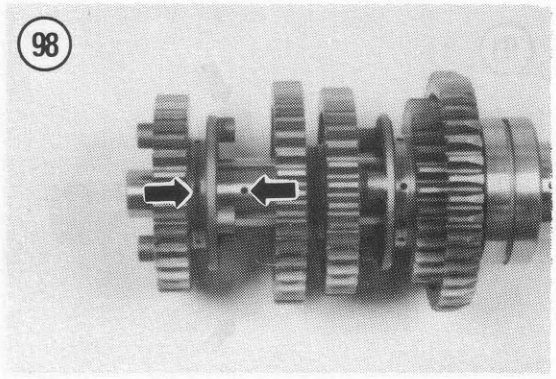


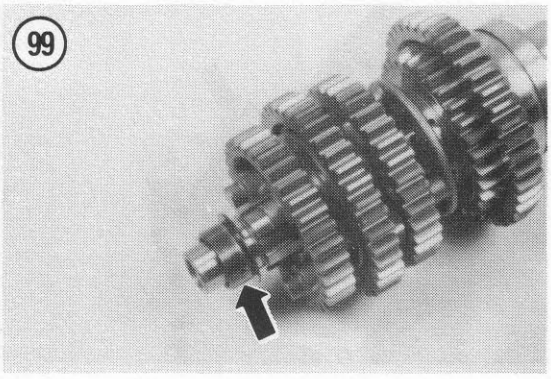


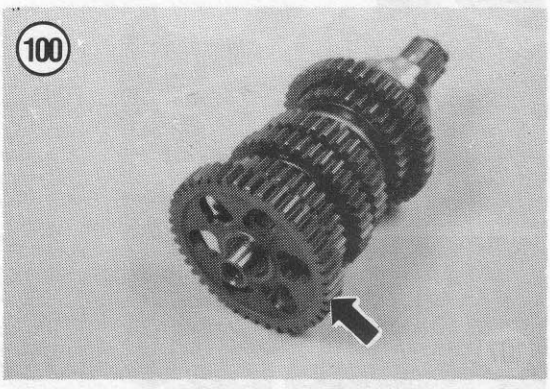


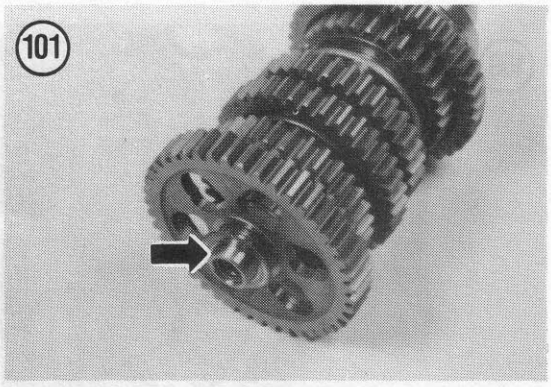


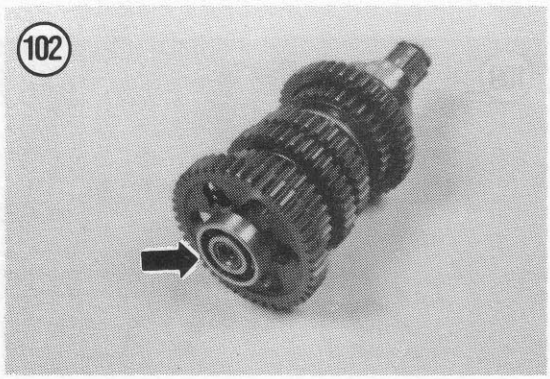












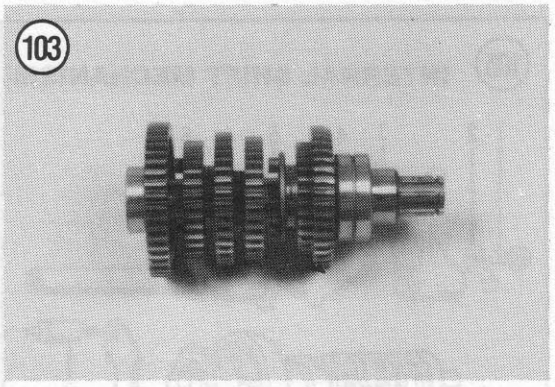
30. If removed, position the oil seal with the raised lip side on first and slide the oil seal (**Figure 104**) onto the shaft.

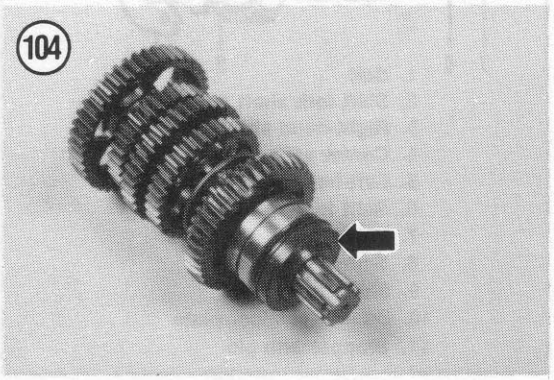
INTERNAL SHIFT MECHANISM

Refer to **Figure 105** for this procedure.

Removal

1. Remove the external shift mechanism as described in this chapter.
2. Separate the cylinder block and lower crankcase as described in Chapter Four.
3. Remove the transmission assemblies as described in this chapter.
4. Perform the following on the stopper arm pin:
   a. Install a 6 mm nut. Run the nut down to the shoulder on the stopper arm pin and tighten it.
   b. Install another 6 mm nut and run it down until it is tight up against the other 6 mm nut (**Figure 106**).
   c. Tighten and lock the 2 nuts against each other.
5. Using these 2 nuts, unscrew the stopper arm pin and remove the shift drum bearing retainer plate.
6. Withdraw the shift drum (**Figure 107**) out through the left-hand side.





7. Remove the bolt securing the shift fork shaft stopper (**Figure 108**) and remove the stopper.
8. Withdraw the shift fork shaft from the right-hand side and remove the shift forks.

Inspection

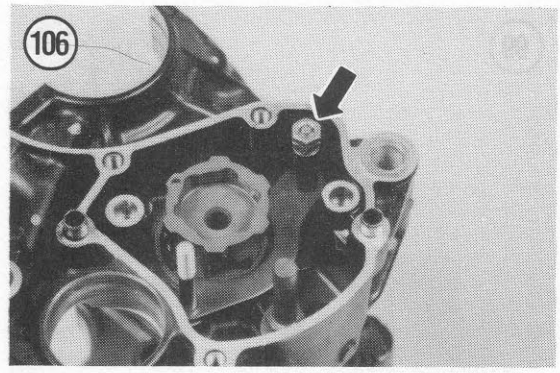
Refer to **Table 4** for internal shift mechanism specifications.

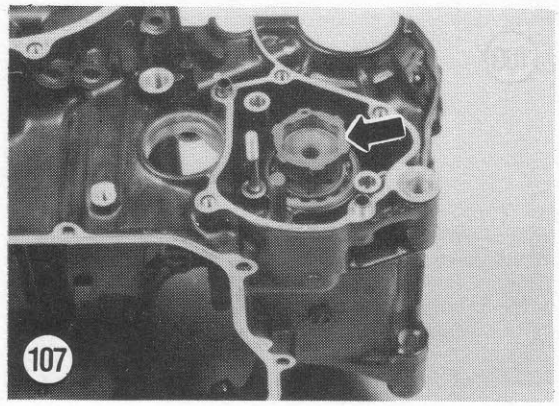
1. Inspect each shift fork for signs of wear or cracking. Make sure the forks slide smoothly on their respective shafts. Replace any worn forks.

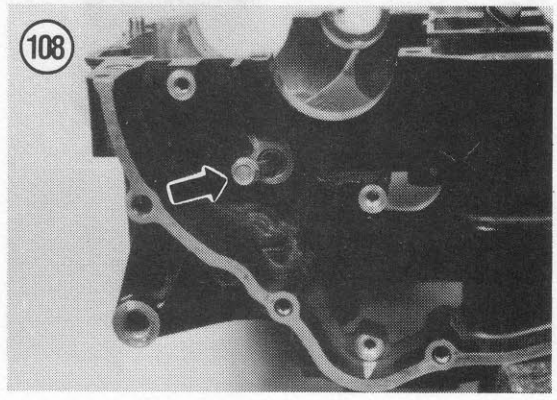
NOTE

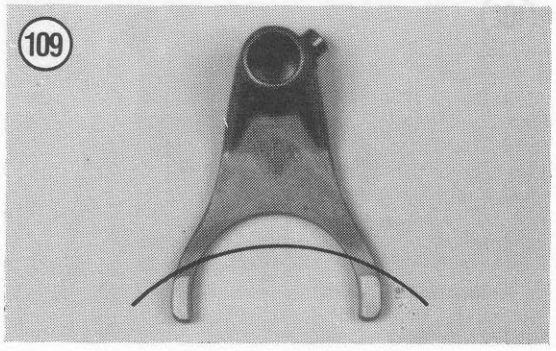
*Check for any arc-shaped wear or burn marks on the shift forks (**Figure 109**). If this is apparent, the shift fork has come in contact with the gear, indicating that the fingers are worn beyond use and the fork must be replaced.*

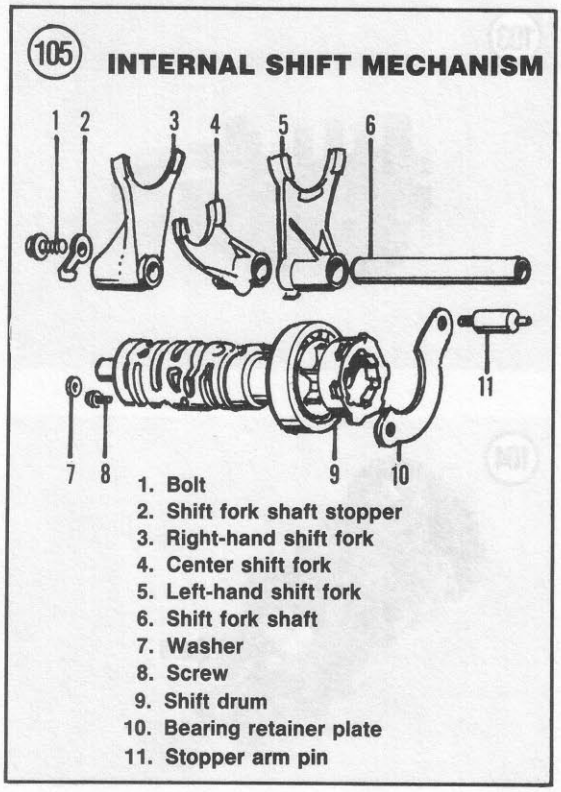
2. Roll the shift fork shaft (A, **Figure 110**) on a flat surface such as a piece of plate glass and check for bends. If the fork shaft is bent, it must be replaced.
3. Check the cam pin followers (B, **Figure 110**) on each shift fork for wear or burrs. If worn or damaged the shift fork must be replaced.
4. Measure the inside diameter of the shift forks with an inside micrometer (**Figure 111**). Replace any that are worn beyond the limit in **Table 4**.

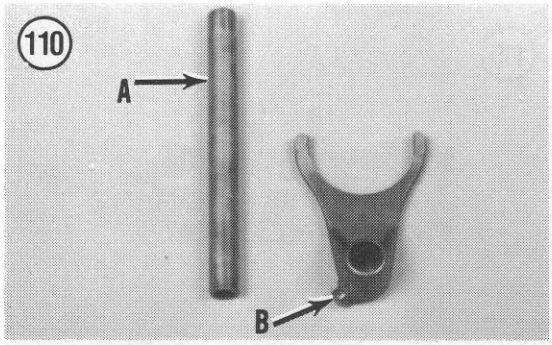


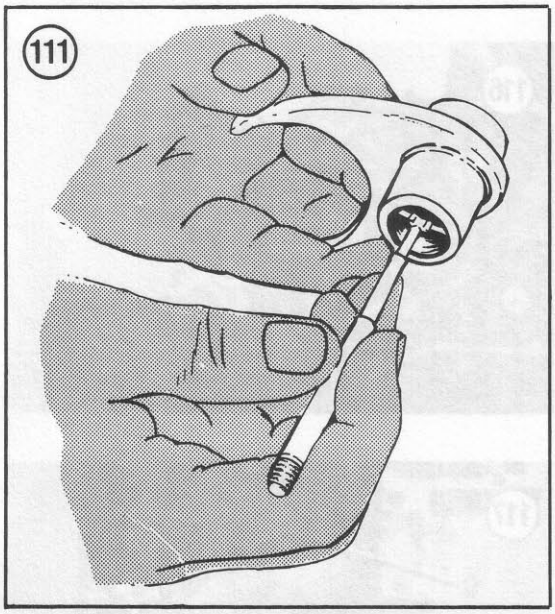


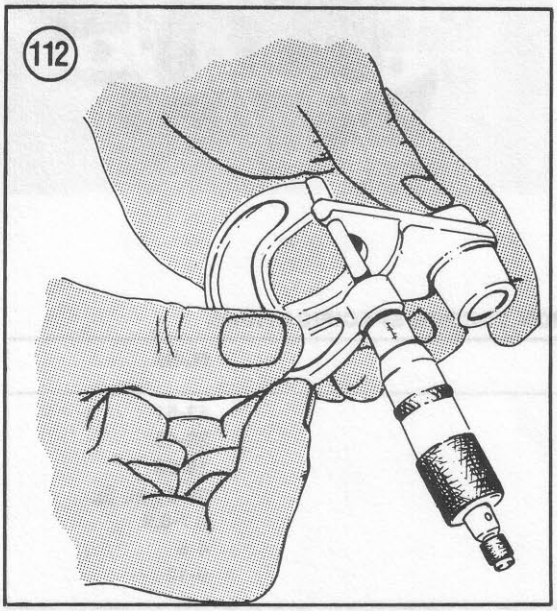




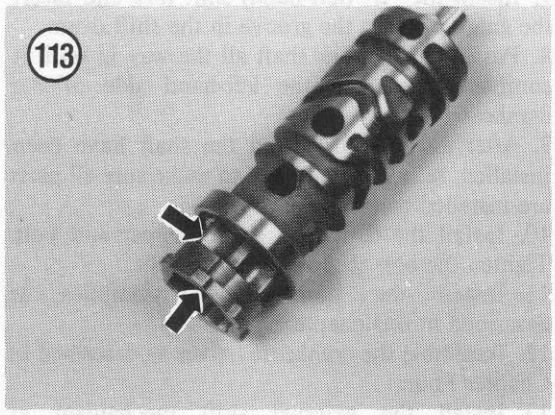


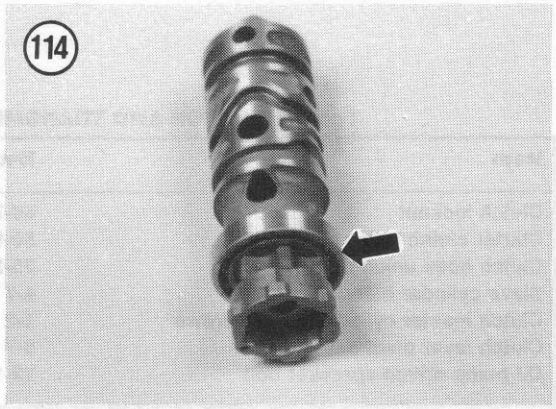






5. Measure the width of the gearshift fingers with a micrometer (**Figure 112**). Replace if worn to the limit or less as listed in **Table 4**.
6. Measure the outside diameter of the shift fork shaft with a micrometer. Replace if worn to the limit or less as listed in **Table 4**.
7. Make sure all shift forks slide easily on the shift fork shaft. If there is any binding, either the shift fork(s) or the shaft must be replaced.
8. Check for wear in the shift drum recesses (**Figure 113**) for the neutral stopper arm and shift drum stopper arm; replace the shift drum if necessary.
9. Check the shift drum bearing (**Figure 114**). Make sure it operates smoothly with no signs of wear or damage. If the bearing is faulty the entire assembly must be replaced.
10. Check the grooves in the shift drum (**Figure 115**) for wear or roughness. If any of the groove profiles have excessive wear or damage, replace the shift drum.
11. Inspect all bearing surfaces in the lower crankcase where the shift fork shaft and shift drum ride. Check for scoring or scratches. If severely damaged, the lower crankcase must be replaced.





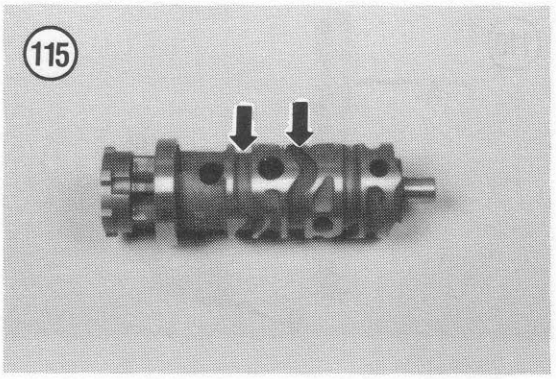
Installation

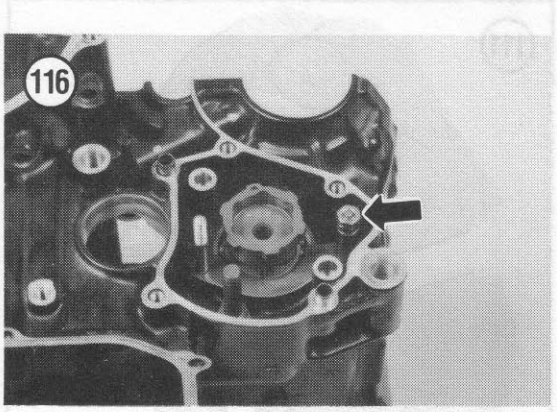
1. Coat all bearing and sliding surfaces with assembly oil.
2. Install the shift drum from the left-hand side. Push it in until it seats completely.
3. Install the shift drum bearing retainer plate. Install the stopper arm pin and tighten securely.
4. Hold onto the inner 6 mm nut with a wrench and remove the outer 6 mm nut (these are the nuts that were used during pin removal). Refer to **Figure 116**.

NOTE

The shift forks are marked with an "R" (right-hand side), "C" (center) or "L" (left-hand side). This relates to the engine as it sits in the bike's frame. These marks must face toward the right-hand side of the crankcase.

5. Position the "R" (right-hand) shift fork and insert the guide pin into the groove in the shift drum. Insert the shift fork shaft through the crankcase and into the right-hand shift fork.
6. Position the "C" (center) shift fork and push the shift fork shaft through it.
7. Install the "L" (left-hand) shift fork and insert the guide pin into the groove in the shift drum.
8. Push the shift fork shaft all the way in until it completely seats in the left-hand side of the crankcase.
9. After all shift forks and the shaft have been installed, refer to **Figure 117** to make sure all parts are installed correctly.
10. Install the shift fork shaft stopper and bolt. Tighten the bolt securely (**Figure 108**).
11. Install the transmission assemblies as described in this chapter.
12. Assemble the crankcase halves as described in Chapter Four.
13. Install the external shift mechanism as described in this chapter.





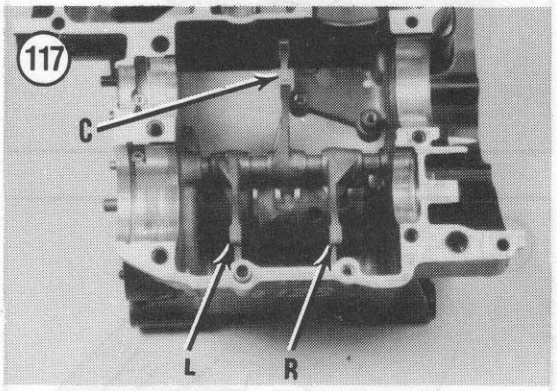


Table 1 CLUTCH AND TRANSMISSION TORQUE SPECIFICATIONS

Item	N•m	ft.-lb.
Clutch locknut	60-70	43-51
Starter clutch bolt	50-60	36-43
Clutch hose union bolts	25-35	18-25
Slave cylinder bleeder valve	4-7	35-61 in. lb.
Clutch master cylinder cover screws	1-2	0.7-0.9
Clutch lever pivot nut	5-7	4-5
Oil pump driven sprocket bolt	13-17	9-12

Table 2 CLUTCH SPECIFICATIONS

Item	Standard	Wear limit
Friction disc thickness		
Disc A	2.8-2.9 mm (0.110-0.114 in.)	2.6 mm (0.10 in.)
Disc B	3.5-3.6 mm (0.137-0.141 in.)	3.3 mm (0.13 in.)
Clutch plate warpage		0.30 mm (0.012 in.)
Clutch spring free length	35.420 mm (1.3945 in.)	34.0 mm (1.34 in.)
Outer guide OD	28.967-28.980 mm (1.1404-1.1409 in.)	28.93 mm (1.139 in.)
Outer guide bushing ID	29.000-29.021 mm (1.1417-1.1426 in.)	20.06 mm (1.144 in.)
Clutch slave cylinder		
Piston OD	35.650-35.675 mm (1.4035-1.4045 in.)	35.62 mm (1.402 in.)
Cylinder bore ID	35.700-35.762 mm (1.4055-1.4079 in.)	35.78 mm (1.409 in.)
Clutch master cylinder		
Piston OD	13.957-13.984 mm (0.5495-0.5506 in.)	13.94 mm (0.549 in.)
Cylinder bore ID	14.000-14.043 mm (0.5512-0.5524 in.)	14.06 mm (0.553 in.)
Starter clutch driven gear OD	42.175-42.200 mm (1.809-1.814 in.)	42.16 mm (1.660 in.)

Table 3 TRANSMISSION SPECIFICATIONS

Item	Specifications	Wear limit
Gear ID main shaft		
5th and 6th	25.000-25.021 mm (0.9843-0.9851 in.)	25.05 mm (0.986 in.)
Gear ID countershaft		
1st	23.000-23.021 mm (0.9055-0.9063 in.)	23.05 mm (0.789 in.)
2nd, 3rd, 4th	28.000-28.025 mm (1.1024-1.1032 in.)	28.05 mm (1.104 in.)
Gear bushing OD		
Main shaft, 5th & 6th	24.959-24.980 mm (0.9826-0.9835 in.)	24.92 mm (0.981 in.)
Countershaft		
1st	22.959-22.980 mm (0.9039-0.9047 in.)	22.92 mm (0.902 in.)
2nd, 3rd, 4th	27.959-27.980 mm (1.1007-1.1016 in.)	27.92 mm (1.099 in.)
Gear splined bushing ID		
Main shaft 5th	21.985-22.006 mm (0.8655-0.8664 in.)	22.07 mm (0.869 in.)
Countershaft		
1st	20.020-20.041 mm (0.7882-0.7890 in.)	20.11 mm (0.792 in.)
2nd	25.030-25.051 mm (0.9845-0.9863 in.)	25.11 mm (0.989 in.)

(continued)

Table 3 TRANSMISSION SPECIFICATIONS (continued)

Item	Specifications	Wear limit
Main shaft OD		
@ 5th gear bushing location (A)	21.959-21.980 mm (0.8645-0.8654 in.)	21.92 mm (0.863 in.)
Countershaft OD		
@ 1st gear bushing location (B)	19.987-20.000 mm (0.7869-0.7874 in.)	19.95 mm (0.785 in.)
@ 2nd gear bushing location (C)	25.002-25.015 mm (0.9843-0.9848 in.)	24.97 mm (0.983 in.)

Table 4 INTERNAL SHIFT MECHANISM SPECIFICATIONS

Item	Specifications	Wear limit
Shift fork ID	12.000-12.021 mm (0.4724-0.4733 in.)	12.04 mm (0.474 in.)
Shift fork fingers	5.93-6.00 mm (0.234-0.236 in.)	5.60 mm (0.2220 in.)
Shift fork shaft OD	11.996-11.984 mm (0.4711-0.4718 in.)	11.90 mm (0.469 in.)

NOTE: If you own a 1986 model, first check the Supplement at the back of the book for any new service information.

CHAPTER SIX

FUEL AND EXHAUST SYSTEMS AND EMISSION CONTROLS

The fuel system consists of the fuel tank(s), shutoff valve, fuel pump, fuel filter, 2 down-draft and 2 side-draft Keihin constant velocity carburetors and the air filter.

The exhaust system consists of 4 exhaust pipes, a common collector and 2 mufflers.

This chapter includes service procedures for all parts of the fuel and exhaust systems. Carburetor specifications are listed in **Table 1** at the end of this chapter.

Air filter service is covered in Chapter Three.

CARBURETOR OPERATION

Understanding the function of all carburetor components and their relationships is a valuable aid for pinpointing carburetor trouble.

The carburetor's purpose is to supply and atomize fuel and mix it in correct proportions with air that is drawn in through the air intake. At the primary throttle opening (idle), a small amount of fuel is siphoned through the pilot jet by the incoming air. As the throttle is opened further, the air stream begins to siphon fuel through the main jet and needle jet. The tapered needle increases the effective flow capacity of the needle jet as it is lifted, in that it occupies less of the area of the jet.

At full throttle, the carburetor venturi is fully open and the needle is lifted far enough to permit the main jet to flow at full capacity.

The choke is a "bystarter" system in which the choke lever opens a valve rather than closing a butterfly in the venturi area. In the open position, the slow jet discharges a stream of fuel into the carburetor venturi, enriching the fuel mixture when the engine is cold.

CARBURETOR SERVICE

Carburetor service (removal and cleaning) should be performed when poor engine performance or hesitation is observed. If, after servicing the carburetors and making the adjustments described in this chapter, the motorcycle does not perform correctly (and assuming that other factors affecting performance are correct, such as ignition timing and condition, valve adjustment, etc.), the motorcycle should be checked by a dealer or a qualified performance tuning specialist.

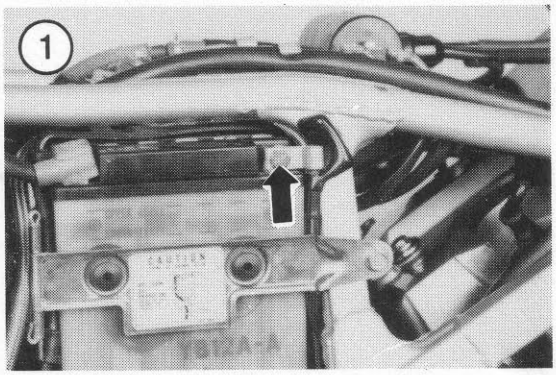
Removal/Installation

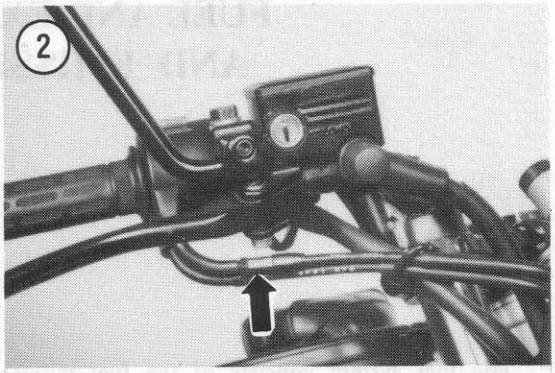
1. Place the bike on the centerstand and remove both side covers.
2. Remove the seat as described in Chapter Twelve.
3. Disconnect the battery negative lead (**Figure 1**).
4. Remove the fuel tank as described in this chapter.

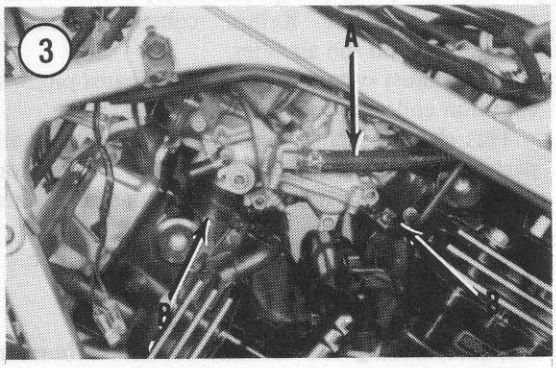
CAUTION

Before removing the air filter or carburetor assembly, use compressed air and blow out all dirt and foreign matter that may have accumulated in the area surrounding the carburetor assembly and cylinder heads. If this dirt isn't removed, it may fall into the intake tubes that are attached to the cylinder heads and drop down into the engine.

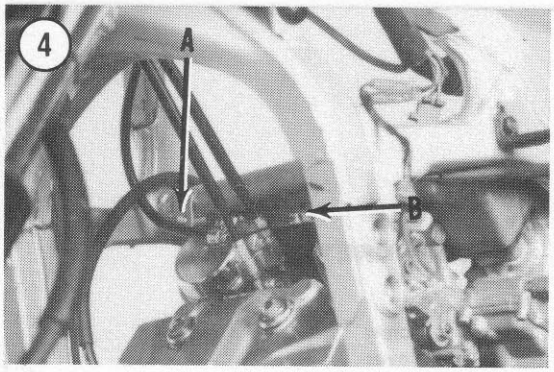
5. On Magna models, remove the air filter element as described in Chapter Three.
6. Remove the air filter case as described in this chapter.
7. At the hand throttle, loosen the throttle cable locknut and turn the adjusting barrel (**Figure 2**) all the way in. This provides the necessary slack for ease of cable removal at the carburetor assembly.
8. Disconnect the fuel line from the carburetor assembly (A, **Figure 3**). Insert a golf tee into the end of the fuel line.
9. Loosen the carburetor band clamping screws (B, **Figure 3**) on the rubber intake tubes where they attach to the carburetor assembly. Leave the intake tubes attached to the cylinder head intake ports.
10. Pull the carburetor assembly up and out of the rubber intake tubes on the cylinder heads.
11. On California models, disconnect the vacuum lines from the carburetor assembly going to the PCV valve.
12. Pull the carburetor assembly up at the front to allow room for choke cable removal.
13. Loosen the clamping screw (A, **Figure 4**) and remove the choke cable from the clamp on the carburetor assembly.
14. Disconnect the choke cable (B, **Figure 4**) from the choke lever on the carburetor assembly.
15. Pull the carburetor assembly up a little more to gain additional access for removal of the throttle cables.
16. Loosen the cable locknuts and remove the throttle cables from the clamp at the throttle wheel.
17. Disconnect the throttle cables from the throttle wheel on the carburetor assembly. Tie the cable ends up and out of the way onto the frame.
18A. On Magna models, slowly and carefully pull the carburetor assembly out through the right-hand side of the frame. Be careful not to not damage any of the carburetor components.
18B. On Interceptor models, slowly and carefully pull the carburetor assembly out through the top of the frame. Be careful not to not damage any of the carburetor components.
19. Install by reversing these removal steps, noting the following.

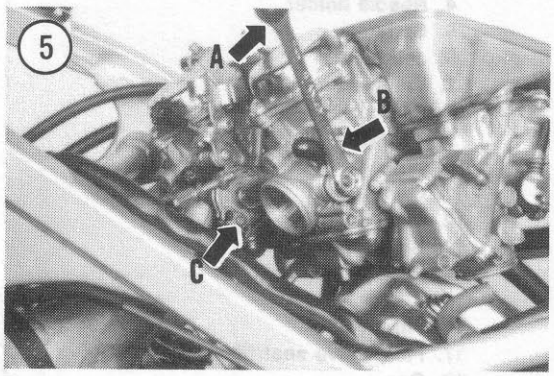


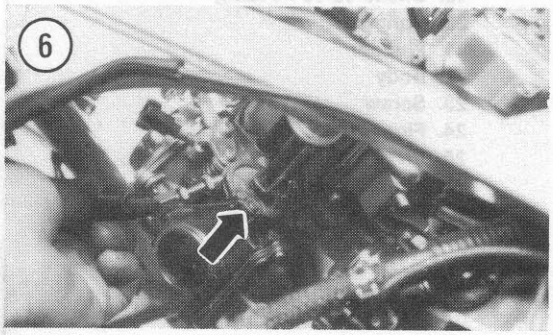




20. If the rubber intake tubes were removed from the cylinder heads, reinstall them so the recess in the rubber points straight up to the 12 o'clock position.
21. Before installing the carburetor assembly, coat the inside surface of all 4 rubber intake tubes with Armor All, WD40 or rubber lube. This will make it easier to install the carburetor throats into the intake tubes.
22. Partially install the carburetor assembly and connect the throttle and choke cables.
23. Be sure the throttle cables and the choke cable are correctly positioned in the frame—not twisted or kinked and without any sharp bends.







24. The throttle return spring is very strong and the throttle wheel openings are positioned out of sight which makes throttle cable installation a bit difficult. To aid in installation, rotate the throttle wheel to the open position and install a box wrench (A, **Figure 5**) on the throttle shaft and rest the wrench on the raised boss (B, **Figure 5**). This will hold the throttle wheel in a position which allows easy access to the throttle cable receptacles.
25. Attach the "pull" throttle cable into the top portion of the bracket and into the rear slot (C, **Figure 5**) in the throttle wheel.
26. Attach the "push" throttle cable into the lower portion of the bracket and into the front slot (**Figure 6**) in the throttle wheel.
27. Remove the box wrench from the throttle shaft.
28. Connect the choke cable (B, **Figure 4**) onto the choke lever on the carburetor assembly.
29. Position the choke cable into the clamp and tighten the clamping screw (A, **Figure 4**).
30. Install the front portion of the carburetor assembly into the intake tubes in the front cylinder, then push the rear of the carburetor assembly down and into the rear rubber intake tubes.
31. Tighten the carburetor band clamping screws on all rubber intake tubes. These clamps must be tight to prevent a vacuum leak.
32. Adjust the throttle cable as described in Chapter Three.
33. Adjust the choke as described in this chapter.

Disassembly/Cleaning/Inspection

Refer to **Figure 7** for this procedure.

The front cylinders are fed by down-draft carburetors and the rear cylinders are fed by side-draft carburetors. Most components are *not* interchangeable between the 2 different types.

It is recommended that only one carburetor be disassembled and cleaned at a time. This will prevent an accidental interchange of parts. On Interceptor models the No. 1 and No. 3 carburetors have different jet needles than those on the No. 2 and No. 4 carburetors.

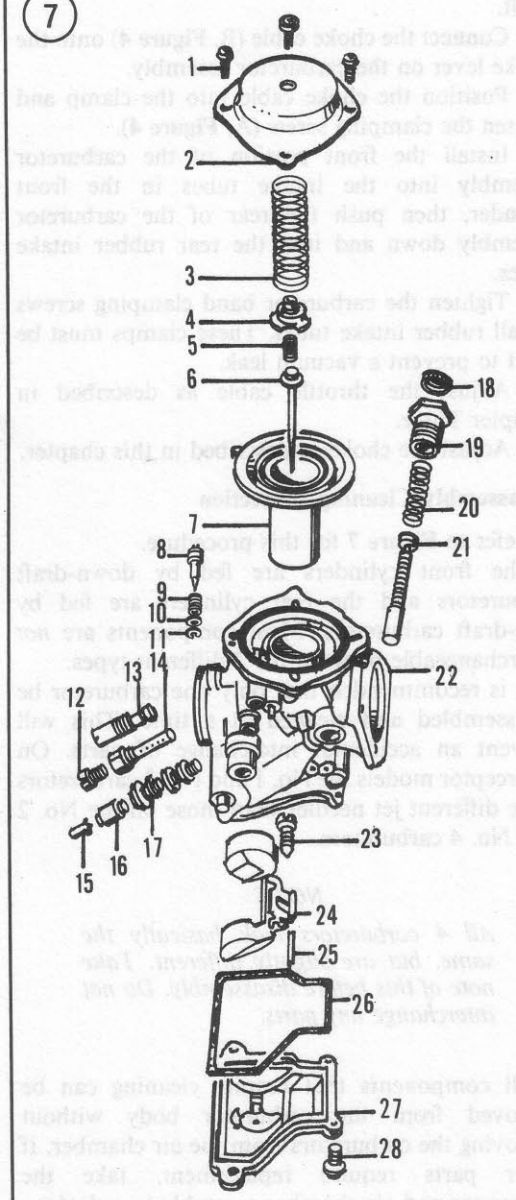
NOTE

All 4 carburetors look basically the same, but are slightly different. Take note of this before disassembly. Do not interchange any parts.

All components that require cleaning can be removed from the carburetor body without removing the carburetors from the air chamber. If other parts require replacement, take the carburetor and air chamber assembly to a dealer.

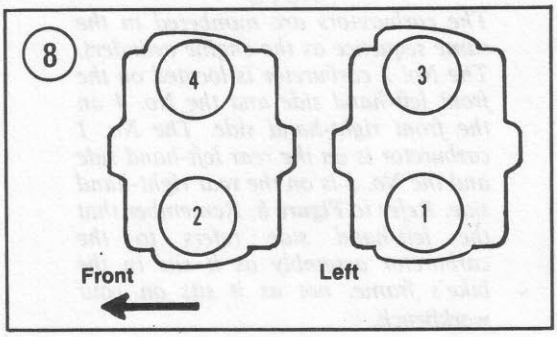
NOTE

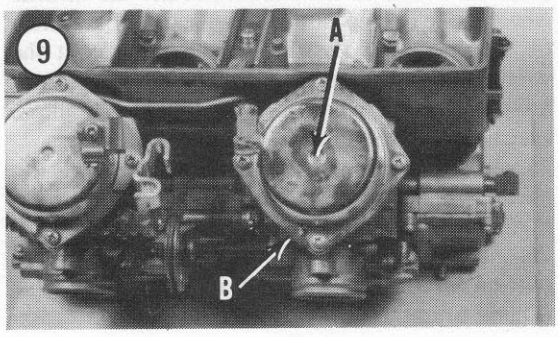
The carburetors are numbered in the same sequence as the engine cylinders. The No. 2 carburetor is located on the front left-hand side and the No. 4 on the front right-hand side. The No. 1 carburetor is on the rear left-hand side and the No. 3 is on the rear right-hand side. Refer to ***Figure 8****. Remember that the left-hand side refers to the carburetor assembly as it sits in the bike's frame, not as it sits on your workbench.*

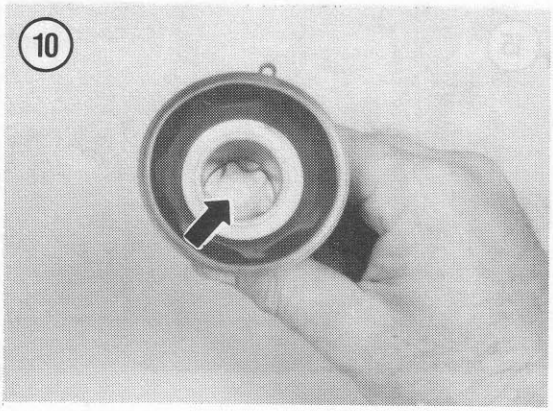


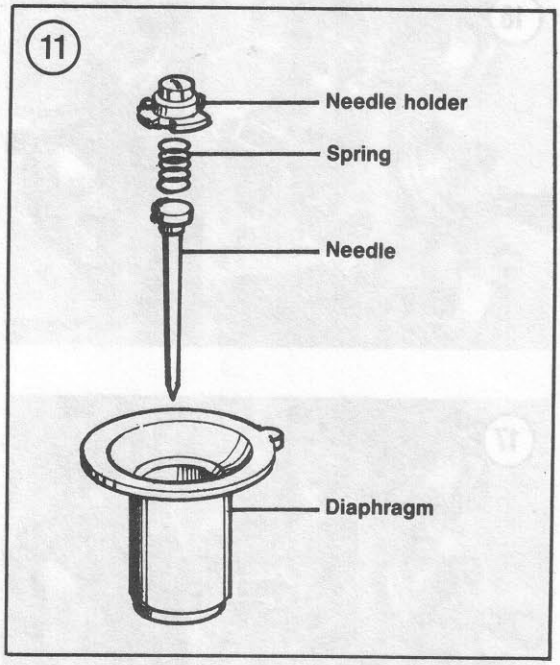
CARBURETOR

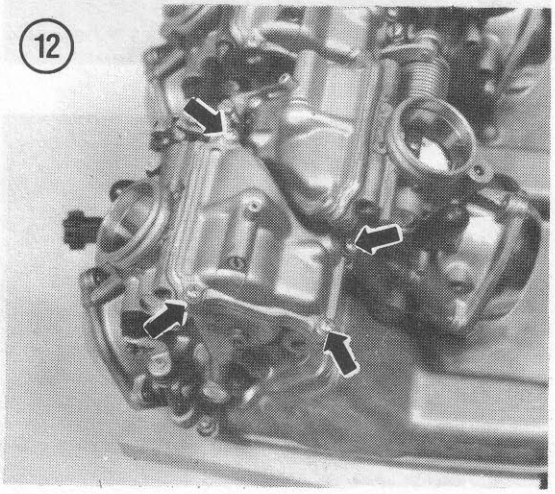
1. Screw
2. Cover
3. Spring
4. Needle holder
5. Spring
6. Jet needle
7. Diaphragm
8. Pilot screw
9. Spring
10. Washer
11. O-ring
12. Main jet
13. Slow jet
14. Main jet holder
15. Clip
16. Float valve
17. Float valve seat/filter
18. Cap
19. Choke valve housing
20. Spring
21. Plunger
22. Body
23. Screw
24. Float
25. Pivot pin
26. Float bowl gasket
27. Float bowl
28. Screw



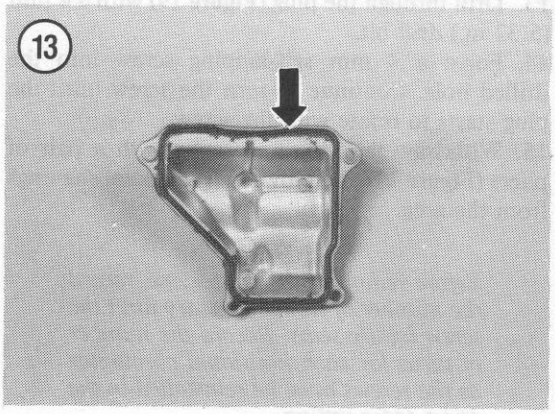


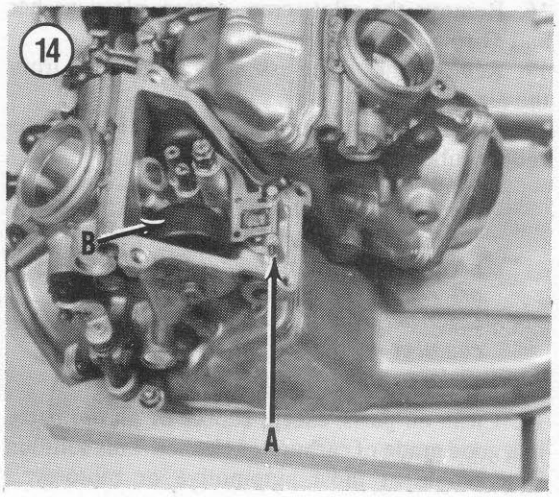






1. Remove the screws securing the carburetor top cover (A, **Figure 9**) to the carburetor body and remove the cover.
2. Remove the vacuum cylinder spring and vacuum cylinder assembly.
3. Put an 8 mm socket down into the vacuum cylinder cavity. Place the socket on the needle holder and turn the holder 60° in either direction to unlock it from the tangs within the vacuum cylinder (**Figure 10**). Remove the needle holder, jet needle spring and the jet needle (**Figure 11**).
4. Remove the screws (**Figure 12**) securing the float bowl to the main body and remove the float bowl.
5. Remove the gasket from the float bowl (**Figure 13**).
6. Carefully push out the float pin (A, **Figure 14**).
7. Lift the float and float valve (B, **Figure 14**) out of the main body.
8. Remove the main jet (**Figure 15**).
9. Remove the jet holder (**Figure 16**).
10. Remove the slow jet (**Figure 17**).





11. Remove the float valve seat and filter (A, **Figure 18**).

NOTE

*The pilot jets are covered by a metal plug (B, **Figure 18**) that has to be drilled out in order to remove the pilot jet. The pilot jets can be removed with the carburetor assembly either installed on the bike or removed. Do not remove these plugs and jets unless you suspect they are not functioning properly. Perform Steps 12-16 for their removal.*

CAUTION

Put tape over all openings in the carburetor bodies to keep out metal shavings during the drilling operation.

12. Use a small center punch and hammer and centerpunch the middle of the plug for a drill guide.

CAUTION

Be careful to not drill too far into the plug; you could damage the pilot screw.

13. Drill through the plug (**Figure 19**) with a 4 mm (5/32 in.) drill bit.
14. Force a 4 mm self-tapping screw into the drilled hole. Continue to turn the screw until the plug starts to rotate with the screw.
15. Withdraw the plug and screw with a pair of pliers (**Figure 20**) and blow away all metal shavings from the area.

NOTE

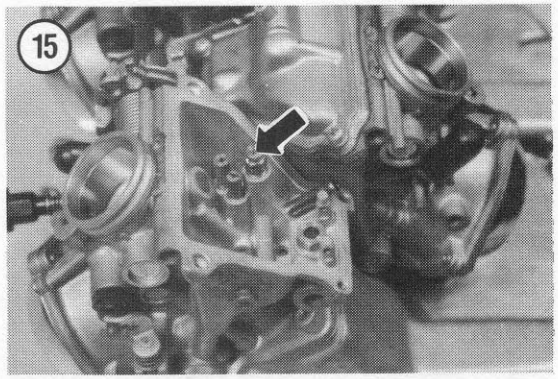
Before removing the pilot screw, record the number of turns necessary until the screw lightly seats. Record the number of turns for each individual carburetor as the screws must be reinstalled in the exact same setting.

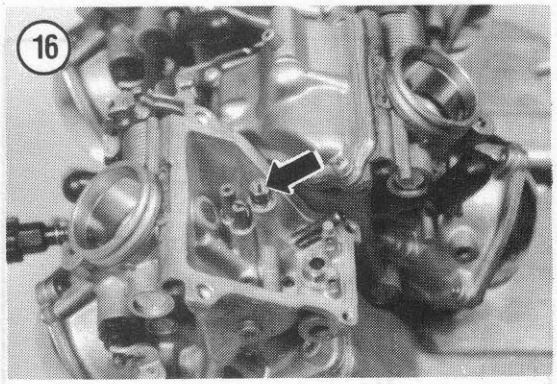
16. Remove the pilot screw, spring, plain washer and O-ring (**Figure 21**).
17. Remove the screen assembly (**Figure 22**) from the air chamber.
18. Clean the air chamber (**Figure 23**) and the rubber tubes of all dirt and fuel residue.

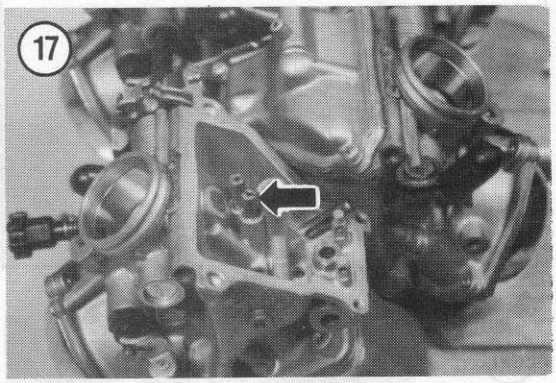
NOTE

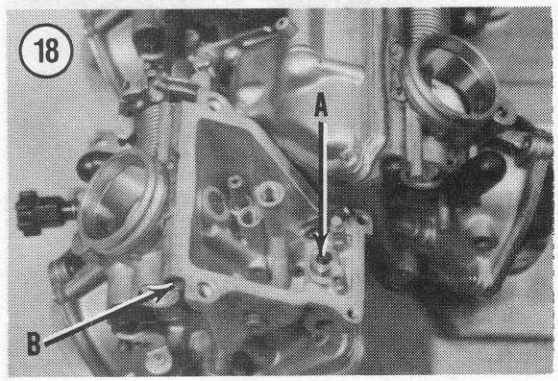
Further disassembly is neither necessary nor recommended. If throttle or choke shafts or butterflies are damaged, take the carburetor and air chamber assembly to a dealer for replacement.

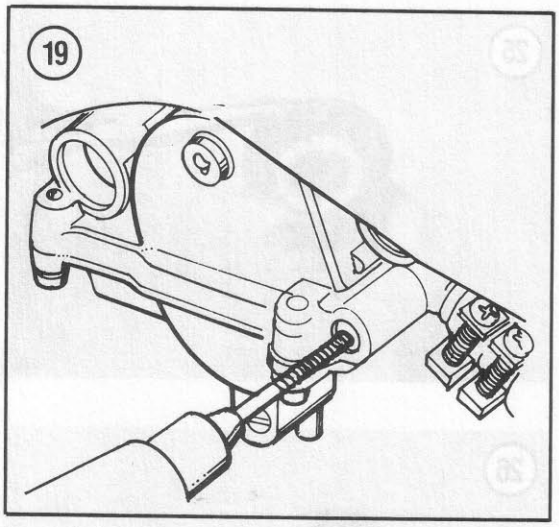
19. Clean all parts, except rubber or plastic parts, in a good grade of carburetor cleaner. This solution is available at most automotive or motorcycle

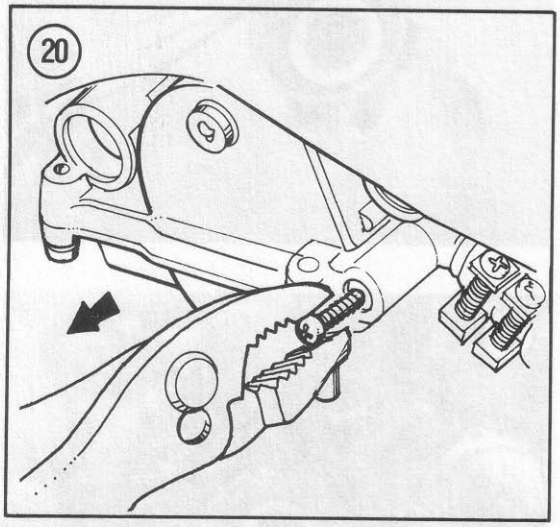


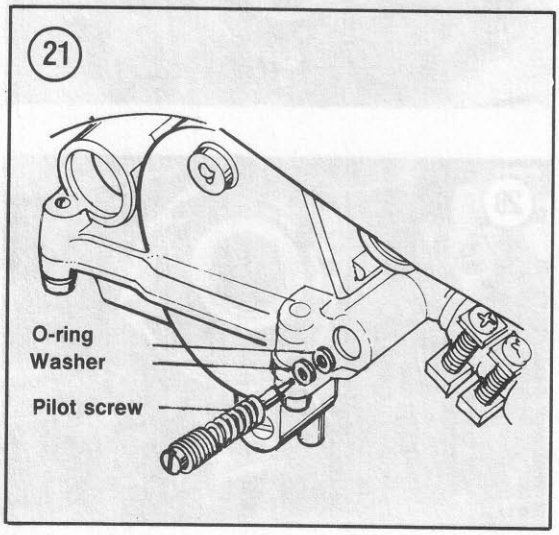












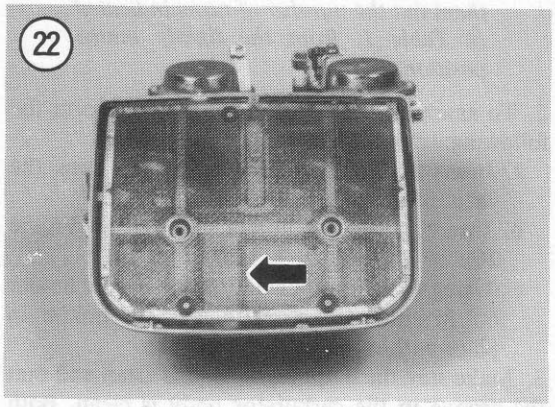
supply stores in a small, resealable tank with a dip basket. If it is tightly sealed when not in use, the solution will last for several cleanings. Follow the manufacturer's instructions for correct soak time (usually about 1/2 hour).

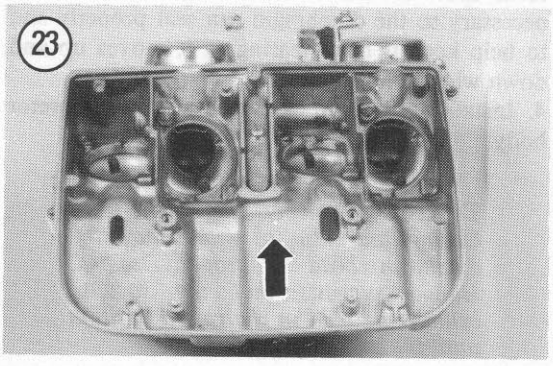
NOTE

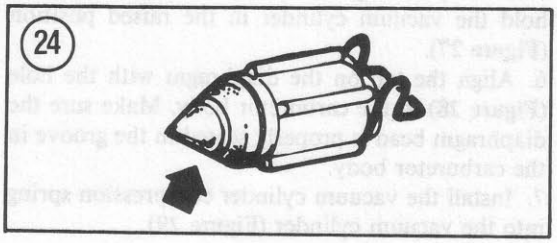
It is recommended that one carburetor be cleaned at a time to avoid interchanging of parts.

20. Remove the parts from the cleaner and blow dry with compressed air. Blow out the jets with compressed air. *Do not* use a piece of wire to clean them as minor gouges in a jet can alter flow rate and upset the fuel/air mixture.

21. Inspect the end of the float valve needle (**Figure 24**) and seat for wear or damage; replace either or both parts if necessary.







22. Inspect the pilot jet for wear or damage that may have occured during removal. Replace all 4 pilot screws even if only 1 requires replacement. This is necessary for correct pilot screw adjustment as described in this chapter.
23. Repeat Steps 1-22 for the other 3 carburetors.
24. Replace any O-rings and gaskets that appear to be damaged or deteriorated. O-ring seals tend to become hardened after prolonged use and exposure to heat and therefore lose their ability to seal properly. Replace as necessary.

Assembly

1. Screw the pilot screw into the exact same position (same number of turns) as recorded during disassembly.

NOTE

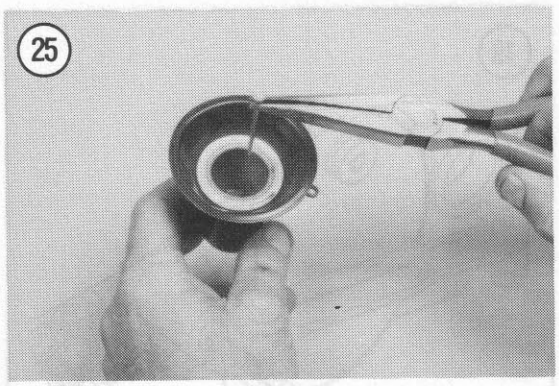
*If new pilot screws were installed, turn them out the number of turns indicated in **Table 1**, from the **lightly seated** position.*

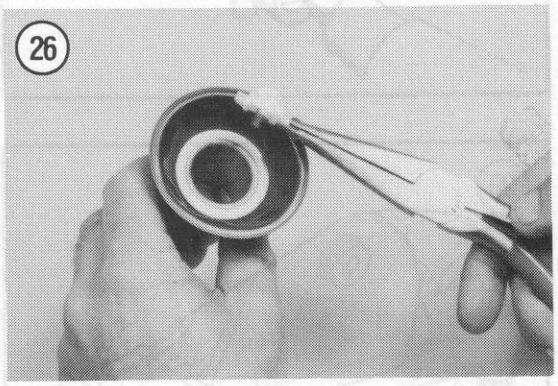
2. To assemble the vacuum cylinder, perform the following:
   a. Insert the jet needle (**Figure 25**) into the vacuum cylinder.
   b. Insert the needle holder and spring (**Figure 26**).
   c. Using an 8 mm socket, turn the needle holder 60° in either direction to lock the holder in place within the vacuum cylinder.
3. Make sure the diaphragm bead is clean and that the groove in the carburetor body is clean. Both areas must be free of all dirt and lint. This is necessary so the diaphragm can seat properly and to help keep it from tearing as it moves up and down when in use.
4. Install the vacuum cylinder into the carburetor body.

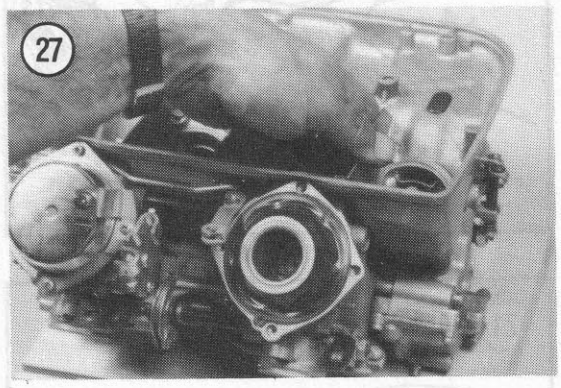
CAUTION

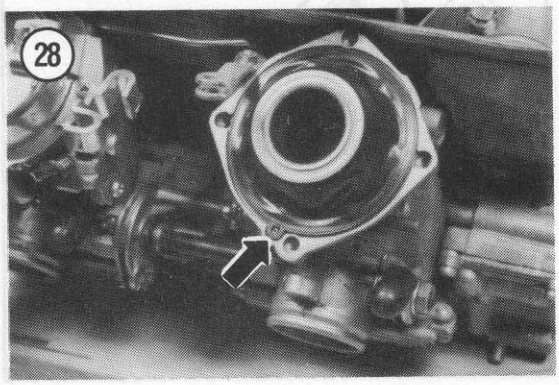
To keep the rubber diaphragm from tearing and also to make sure the diaphram bead is properly seated, Honda suggests that the vacuum cylinder be held in the raised position until the top cover is installed.

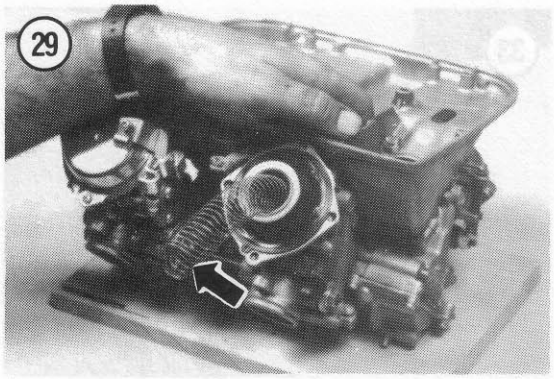
5. Insert your finger into the carburetor throat and hold the vacuum cylinder in the raised position (**Figure 27**).
6. Align the tab on the diaphragm with the hole (**Figure 28**) in the carburetor body. Make sure the diaphragm bead is properly seated in the groove in the carburetor body.
7. Install the vacuum cylinder compression spring into the vacuum cylinder (**Figure 29**).

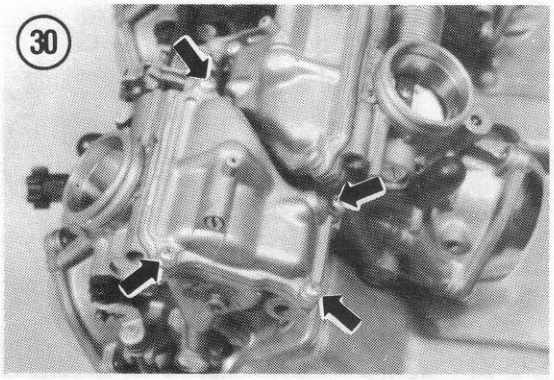


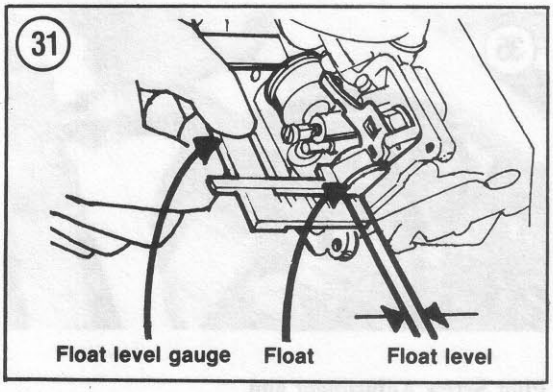


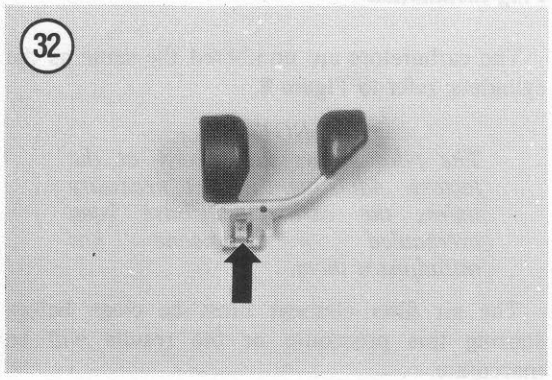












8. Align the hole in the vacuum cylinder with the raised boss (B, **Figure 9**) on the top cover. Install the top cover and tighten the screws securely.
9. Install the float valve seat and filter (A, **Figure 18**).
10. Install the slow jet (**Figure 17**).
11. Install the needle jet holder (**Figure 16**) and the main jet (**Figure 15**).
12. Install the needle valve onto the float.
13. Install the float and needle valve and install the float pin (**Figure 14**).
14. Inspect the float height and adjust if necessary. Refer to *Float Adjustment* in this chapter.
15. Install the gasket in the float bowl (**Figure 13**).
16. Install the float bowl (**Figure 12**) and tighten the screws securely.
17. Repeat Steps 1-16 for the other 3 carburetors.
18. After assembly and installation are completed, adjust the carburetors as described in this chapter and Chapter Three.

CARBURETOR ADJUSTMENTS

Float Adjustment

The carburetor assembly has to be removed and partially disassembled for this adjustment.
1. Remove the carburetors as described in this chapter.
2. Remove the screws (**Figure 30**) securing the float bowls to the main bodies and remove the float bowls.
3. Hold the carburetor assembly with the carburetor inclined 15-45° from vertical so that the float arm is just touching the float needle. Use a float level gauge (Honda part No. 07401-0010000 or equivalent) and measure the distance from the carburetor body to the float arm (**Figure 31**). The correct height is listed in **Table 1**.
4. Adjust by carefully bending the tang on the float arm (**Figure 32**).
5. If the float level is too high, the result will be a rich fuel/air mixture. If it is too low, the mixture will be too lean.

NOTE

The floats on all 4 carburetors must be adjusted to the same height to maintain the same fuel/air mixture to all 4 cylinders.

6. Reassemble and install the carburetors.

Needle Jet Adjustment

The needle jet is *non-adjustable* on all models.

Choke Adjustment

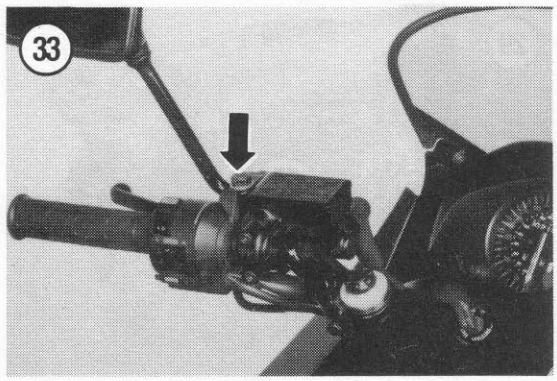
First make sure the choke operates smoothly with no binding. If the cable binds, lubricate it as described in Chapter Three. If the cable still does not operate smoothly, it must be replaced as described in this chapter.

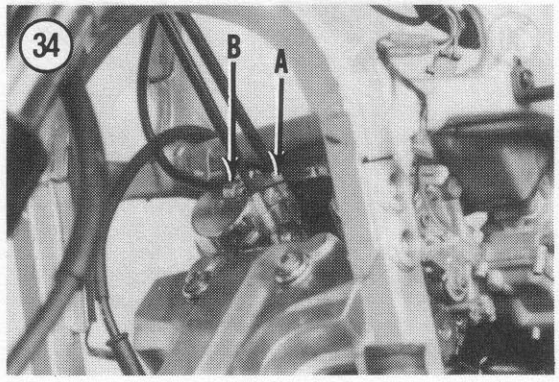
1. Operate the choke lever (**Figure 33**) and check for smooth operation of the cable and choke mechanism.
2. Move the lever all the way *down* to the open position.

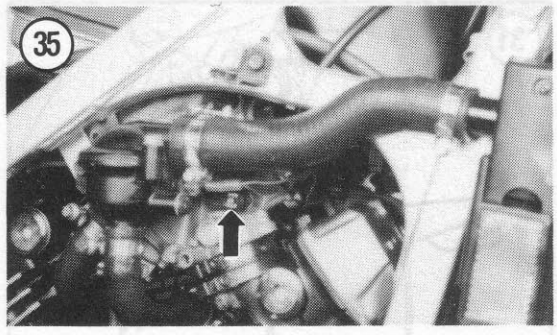
NOTE

The choke circuit is a "bystarter" system in which the choke lever opens a valve rather than closing a butterfly in the venturi area as on many carburetors. In the open position, the slow jet discharges a stream of fuel into the carburetor venturi to enrich the fuel mixture when the engine is cold.

3. At the carburetor assembly, pull on the choke lever (A, **Figure 34**) to make sure it is at the end of its travel, thus opening the bystarter valves. If you can move the choke lever an additional amount it must be adjusted.
4. To adjust, loosen the cable clamping screw (B, **Figure 34**) and move the cable sheath until the choke lever is fully open. Hold the cable sheath in this position and tighten the cable clamping screw securely.
5. Move the choke lever all the way *up* to the fully open position.
6. At the carburetor assembly, check that the choke lever is fully closed by checking for free play between the cable and the choke lever. The cable should move slightly as there should be no tension on it.
7. To check for correct stroke length, perform the following:
   a. Move the choke lever from the fully open to fully closed positions and measure the amount of stroke movement at the choke valve on the carburetor assembly (**Figure 35**).
   b. The correct amount of stroke is 6-7 mm (0.2-0.3 in.) as shown in **Figure 36**.
   c. To adjust, loosen the cable clamping screw (**Figure 34**) and move the cable sheath until the correct amount of choke stroke is achieved. Hold the choke sheath in this position and tighten the cable clamping screw securely.
8. If proper adjustment cannot be achieved using this procedure the cable has stretched and must be replaced as described in this chapter.







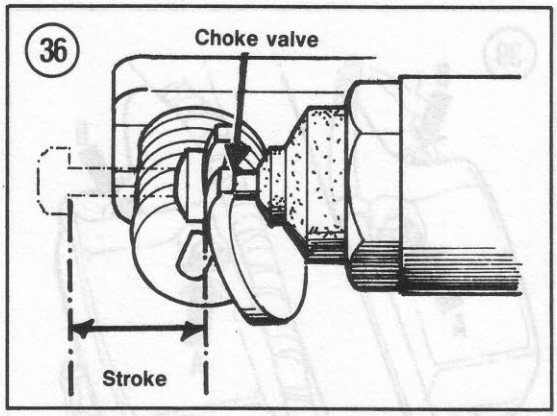
Pilot Screw Adjustment and Plug Installation

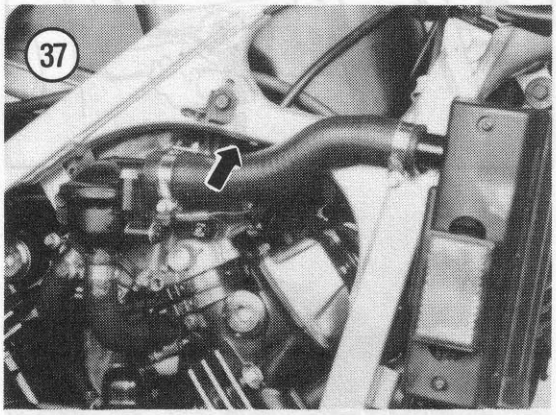
The carburetors are numbered the same as the cylinders; refer to **Figure 8**.

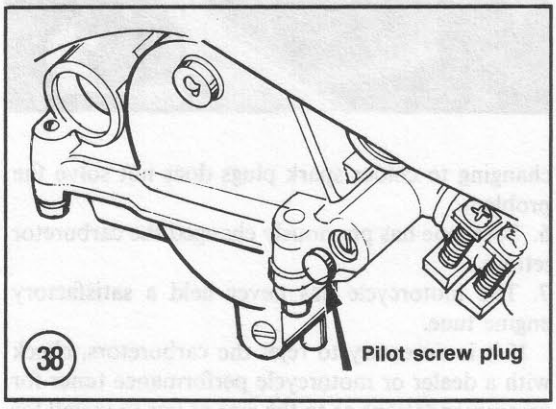
NOTE

The pilot screws are pre-set at the factory. Adjustment is not necessary unless the carburetors have been overhauled or someone has misadjusted them.

The air filter element must be clean before starting this procedure or the results will be inaccurate.







The plugs must be removed from the carburetor bodies as described under *Disassembly/Cleaning/Inspection* in this chapter.

1. For the preliminary adjustment, carefully turn the pilot screw on each carburetor in until it *lightly* seats, then back it out the number of turns listed in **Table 1**.
2. Start the engine and let it reach normal operating temperature. Stop-and-go riding for approximately 10-15 minutes is sufficient.
3. Shut the engine off and place the bike on the centerstand.
4. Connect a portable tachometer following the manufacturer's instructions. Use a tachometer that can register a change of 50 rpm. The bike's tachometer is not accurate enough at low rpm.
5. Start the engine and turn the large black plastic idle adjust screw (**Figure 37**) in or out to achieve the idle speed listed in **Table 1**.
6. Turn each pilot screw *out* 1/2 turn from the initial setting of Step 1.
7. If the engine speed increases by 50 rpm or more, turn each pilot screw out by an additional 1/2 turn at a time until engine speed drops by 50 rpm or less.
8. Turn the idle adjust screw in or out again to achieve the desired idle speed listed in **Table 1**.
9. Turn the pilot screw on the No. 1 carburetor *in* until engine speed drops by 50 rpm.
10. Turn the pilot screw on the No. 1 carburetor *out* 1 turn from the position obtained in Step 9.
11. Turn the idle adjust screw in or out again to achieve the desired idle speed listed in **Table 1**.
12. Repeat Steps 9-11 for the No. 2, 3 and 4 carburetor pilot screws.

WARNING

With the engine idling, move the handlebar from side to side. If idle speed increases during this movement, the throttle cables need adjustment or they may be incorrectly routed through the frame. Correct this problem immediately. Do not ride the bike in this unsafe condition.

13. Turn the engine off and disconnect the portable tachometer.
14. After this adjustment is completed, test ride the bike. Throttle response from idle should be rapid and without any hesitation. Readjust if necessary.
15. Use a suitable size drift and carefully drive a new plug (**Figure 38**) into each pilot screw bore in the carburetor body. The plug is fully seated when it is recessed into the hole by 1 mm.

High Altitude Adjustment

Make sure the pilot jet is adjusted properly before performing this procedure.

If the bike is going to be ridden for any sustained period of time at high elevations (2,000 m/6,500 ft.) the carburetors must be readjusted to improve performance and decrease exhaust emissions.

1. Remove each pilot screw plug as described in this chapter.

2. Start the engine and let it reach normal operating temperature. Stop-and-go riding for approximately 10-15 minutes is sufficient. Turn off the engine.
3. Connect a portable tachometer following the manufacturer's instructions. The bike's tach is not accurate enough at low rpm.
4. Turn each pilot screw *clockwise*, as viewed from the side of the carburetor, the following number of turns:
   a. Magna models: 1 1/2 turns.
   b. Interceptor models: 3/4 turn.
5. Restart the engine and turn the large idle screw (**Figure 37**) to achieve an idle speed listed in **Table 1**.
6. Turn the engine off and disconnect the portable tachometer.
7. Install new pilot screw plugs as descirbed in this chapter.
8. When the bike is returned to lower elevations (near sea level), the pilot screws must be returned to their original position and the idle speed readjusted to the idle speed listed in **Table 1**.

Rejetting The Carburetors

Do not try to solve a poor-running engine problem by rejetting the carburetors if all of the following conditions hold true.
1. The engine has held a good tune in the past with the standard jetting.
2. The engine has not been modified.
3. The motorcycle is being operated in the same geographical region under the same general climatic conditions as in the past.
4. The motorcycle was and is being ridden at average highway speeds.

If those conditions all hold true, the chances are that the problem is due to a malfunction in the carburetor or in another component that needs to be adjusted or repaired. Changing carburetor jet size probably won't solve the problem. Rejetting the carburetors may be necessary if any of the following conditions hold true:
1. A non-standard air filter element is being used.
2. A non-standard exhaust system is installed on the motorcycle.
3. Any of the top end components in the engine (pistons, cams, valves, compression ratio, etc.) have been modified.
4. The motorcycle is in use at considerably higher or lower altitudes or in a considerably hotter or colder climate than in the past.
5. The motorcycle is being operated at considerably higher speeds than before and changing to colder spark plugs does not solve the problem.
6. Someone has previously changed the carburetor jetting.
7. The motorcycle has never held a satisfactory engine tune.

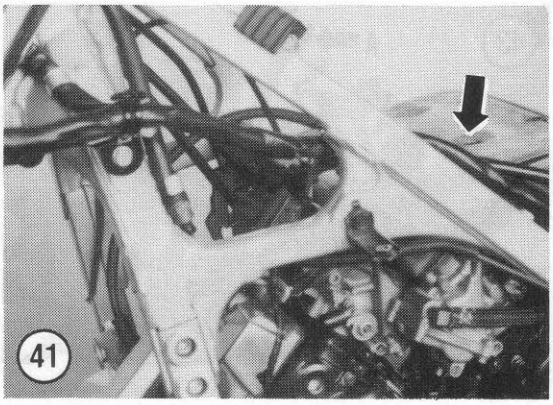
If it is necessary to rejet the carburetors, check with a dealer or motorcycle performance tuner for recommendations as to the size of jets to install for your specific situation.

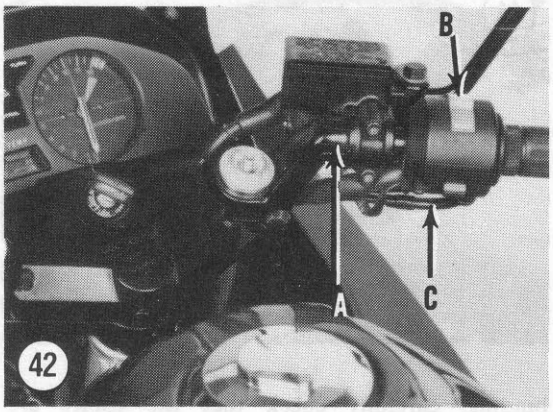
If you do change the jets, do so only one size at a time. After rejetting, test ride the bike and perform a spark plug test; refer to *Reading Spark Plugs* in Chapter Three.

AIR FILTER CASE

Removal/Installation

1. Remove both side covers. Remove the seat as described in Chapter Twelve.





2. Remove the fuel tank as described in this chapter.

3A. On Magna models, perform the following:

a. Remove the bolts (A, **Figure 39**) securing the air filter case to the frame bracket.

b. Remove the screws (B, **Figure 39**) securing the air filter cover to the air filter case.

c. Disconnect the crankcase breather tube from the front of the air filter case.

d. Remove the bolts securing the frame left-hand front cover and remove the front cover.

e. Remove the bolts securing the fuel tank bracket on the left-hand side and remove the fuel tank bracket.

f. Lift up on the air filter cover and carefully pull the air filter case out of either side of the frame.

g. Lift up and remove the air filter case.

3B. On Interceptor models, perform the following:

a. Disconnect the crankcase breather tube from the air filter case.

b. Remove the bolts (**Figure 40**) securing the air filter case to the carburetor assembly air chamber.

c. Carefully pull the air filter case up and out of the frame. Don't knock off the rubber air inlet ducts at the front of the air filter case.

4. After removing the air filter case, stuff clean shop cloths into the 4 openings in the carburetors (rubber intake tubes) to prevent the entry of foreign matter.

5. Install by reversing these removal steps, noting the following.

6. Check the rubber seal on the base of the air filter case. Replace if necessary.

7. Inspect the inner filter screen (**Figure 41**) for damage. Replace if necessary.

8. Make sure the air filter case is correctly seated on the carburetor assembly air chamber before installing the screws. The alignment around the perimeter of these 2 parts must be correct or unfiltered air will enter the air chamber. This could lead to carburetor and engine damage.

9. Install the fuel tank as described in this chapter.

THROTTLE CABLE REPLACEMENT

1. Remove the seat as described in Chapter Twelve.

2. Remove the fuel tank as described in this chapter.

3. On Interceptor models, remove the front fairing as described in Chapter Twelve.

4. Remove the air filter case as described in this chapter.

5. Disconnect the front brake light switch electrical connectors (A, **Figure 42**).

6. Remove the screws securing the right-hand switch/throttle housing halves together (B, **Figure 42**).

7. Remove the housing from the handlebar and disengage the throttle cables (C, **Figure 42**) from the throttle grip.

8. Partially remove the carburetor assembly, as described in this chapter, until it is easy to gain access to the throttle cable attachment points.

NOTE

It may not look like it, but it is practically impossible to remove the throttle cables from the carburetors with the carburetor assembly in place. There is not enough room for 2 hands within the area.

9. Loosen the throttle cable locknuts and remove both cables from the carburetor assembly.

NOTE

The piece of string attached in the next step will be used to pull the new throttle cables back through the frame so they

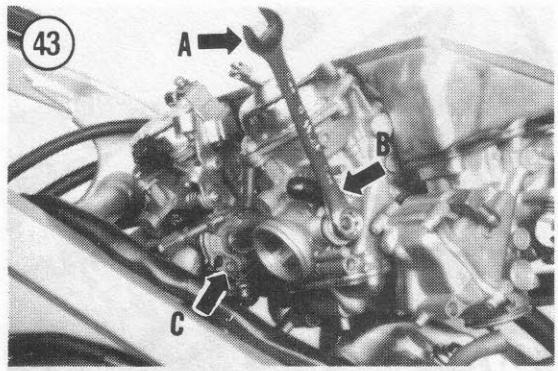
will be routed in exactly the same position as the old ones were.

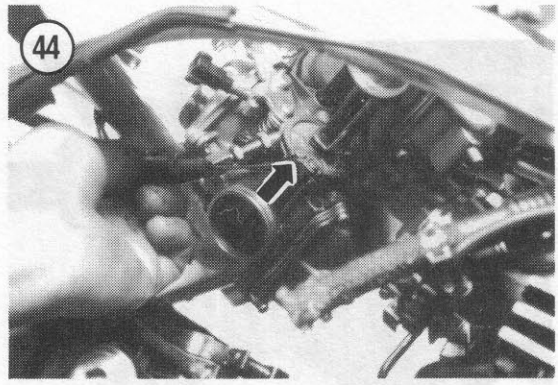
10. Tie a piece of heavy string or cord (approximately 1.8-2.4 m/6-8 ft. long) to the carburetor end of the throttle cables. Wrap this end with masking or duct tape. Do not use an excessive amount of tape as it must be pulled through the frame loop during removal. Tie the other end of the string to the frame or air box.
11. At the throttle grip end of the cables, carefully pull the cables (and attached string) out through the frame, past the electrical harness and from behind the headlight housing. Make sure the attached string follows the same path as the cables through the frame.
12. Remove the tape and untie the string from the old cables.
13. Lubricate the new cables as described in Chapter Three.
14. Tie the string to the new throttle cables and wrap it with tape.
15. Carefully pull the string back through the frame, routing the new cables through the same path as the old cables.
16. Remove the tape and untie the string from the cables and the frame.

CAUTION

The throttle cables are the push/pull type and must be installed as described and shown in Steps 17-19. ***Do not interchange the 2 cables.***

17. The throttle return spring is very strong and the throttle wheel openings are positioned out of sights which makes throttle cable installation a bit difficult. To aid in installation, rotate the throttle wheel to the open position and install a box wrench (A, **Figure 43**) on the throttle shaft and rest the wrench on the raised boss (B, **Figure 43**). This will hold the throttle wheel in a position which allows easy access to the throttle cable receptacles.
18. Attach the "pull" throttle cable into the top portion of the bracket and into the rear slot (C, **Figure 43**) in the throttle wheel.
19. Attach the "push" throttle cable into the lower portion of the bracket and into the front slot (**Figure 44**) in the throttle wheel.
20. Remove the box wrench from the throttle shaft.
21. Install the throttle/switch housing and tighten the screws securely.
22. Attach the front brake light switch connectors.
23. Operate the throttle grip and make sure the carburetor throttle linkage is operating correctly, with no binding. If operation is incorrect or there is





binding, carefully check that the cables are attached correctly and there are no tight bends in the cables.
24. Install all parts that were removed as described in this chapter and and other related chapters.
   a. Carburetor assembly.
   b. Air filter case.
   c. Front fairing (Interceptor models).
   d. Fuel tank.
   e. Side covers and seat.
25. Adjust the throttle cables as described in Chapter Three.
26. Test ride the bike slowly at first and make sure the throttle is operating correctly.

CHOKE CABLE REPLACEMENT

1. Remove the side covers. Remove the seat as described in Chapter Twelve.
2. Remove the fuel tank as described in this chapter.
3. On Interceptor models, remove the front fairing as described in Chapter Twelve.
4. Loosen the choke cable clamp screw (B, **Figure 34**) and remove the cable end from the choke linkage (B, **Figure 34**).
5. Remove the clutch master cylinder (A, **Figure 45**) as described in Chapter Five.

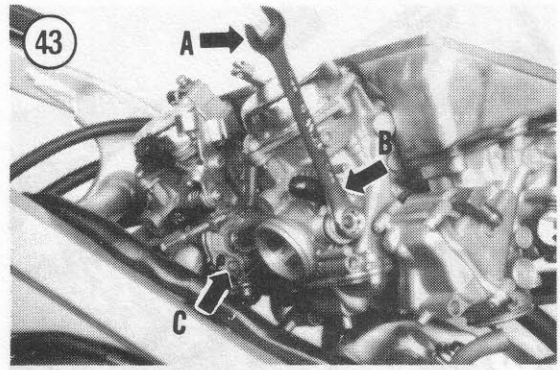
will be routed in exactly the same position as the old ones were.

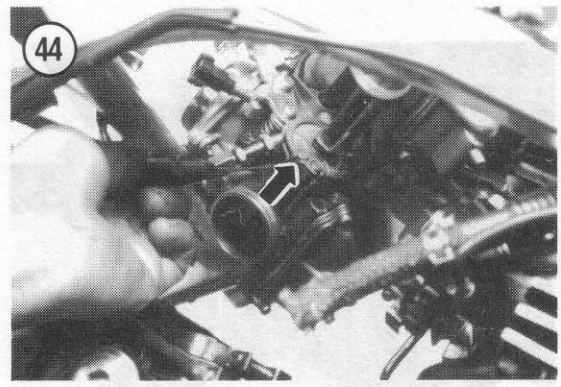
10. Tie a piece of heavy string or cord (approximately 1.8-2.4 m/6-8 ft. long) to the carburetor end of the throttle cables. Wrap this end with masking or duct tape. Do not use an excessive amount of tape as it must be pulled through the frame loop during removal. Tie the other end of the string to the frame or air box.
11. At the throttle grip end of the cables, carefully pull the cables (and attached string) out through the frame, past the electrical harness and from behind the headlight housing. Make sure the attached string follows the same path as the cables through the frame.
12. Remove the tape and untie the string from the old cables.
13. Lubricate the new cables as described in Chapter Three.
14. Tie the string to the new throttle cables and wrap it with tape.
15. Carefully pull the string back through the frame, routing the new cables through the same path as the old cables.
16. Remove the tape and untie the string from the cables and the frame.

CAUTION

The throttle cables are the push/pull type and must be installed as described and shown in Steps 17-19. ***Do not interchange the 2 cables.***

17. The throttle return spring is very strong and the throttle wheel openings are positioned out of sights which makes throttle cable installation a bit difficult. To aid in installation, rotate the throttle wheel to the open position and install a box wrench (A, **Figure 43**) on the throttle shaft and rest the wrench on the raised boss (B, **Figure 43**). This will hold the throttle wheel in a position which allows easy access to the throttle cable receptacles.
18. Attach the "pull" throttle cable into the top portion of the bracket and into the rear slot (C, **Figure 43**) in the throttle wheel.
19. Attach the "push" throttle cable into the lower portion of the bracket and into the front slot (**Figure 44**) in the throttle wheel.
20. Remove the box wrench from the throttle shaft.
21. Install the throttle/switch housing and tighten the screws securely.
22. Attach the front brake light switch connectors.
23. Operate the throttle grip and make sure the carburetor throttle linkage is operating correctly, with no binding. If operation is incorrect or there is

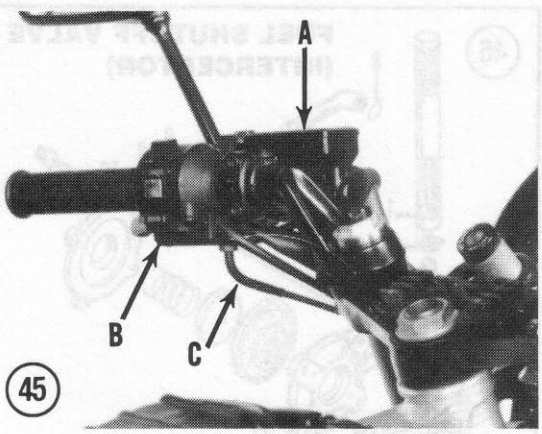




binding, carefully check that the cables are attached correctly and there are no tight bends in the cables.
24. Install all parts that were removed as described in this chapter and and other related chapters.
   a. Carburetor assembly.
   b. Air filter case.
   c. Front fairing (Interceptor models).
   d. Fuel tank.
   e. Side covers and seat.
25. Adjust the throttle cables as described in Chapter Three.
26. Test ride the bike slowly at first and make sure the throttle is operating correctly.

CHOKE CABLE REPLACEMENT

1. Remove the side covers. Remove the seat as described in Chapter Twelve.
2. Remove the fuel tank as described in this chapter.
3. On Interceptor models, remove the front fairing as described in Chapter Twelve.
4. Loosen the choke cable clamp screw (B, **Figure 34**) and remove the cable end from the choke linkage (B, **Figure 34**).
5. Remove the clutch master cylinder (A, **Figure 45**) as described in Chapter Five.



6. Remove the screws securing the left-hand switch assembly (B, **Figure 45**) and remove the switch assembly from the handlebar.
7. Remove the choke cable (C, **Figure 45**) from the clutch lever assembly on the handlebar.

NOTE

The piece of string attached in the next step will be used to pull the new choke cable back through the frame so it will be routed in the same position as the old cable.

8. Tie a piece of heavy string or cord (approximately 1.8-2-4 m/6-8 ft. long) to the carburetor end of the choke cable. Wrap this end with masking or duct tape. Do not use an excessive amount of tape as it must be pulled through the frame loop during removal. Tie the other end of the string to the frame or air box.
9. At the choke lever end of the cable, carefully pull the cable (and attached string) out through the frame. Make sure the attached string follows the same path that the cable does through the frame.
10. Remove the tape and untie the string from the old cable.
11. Lubricate the new cable as described in Chapter Three.
12. Tie the string to the new choke cable and wrap it with tape.
13. Carefully pull the string back through the frame, routing the new cable through the same path as the old cable.
14. Remove the tape and untie the string from the cable and the frame.
15. Install the choke cable onto the choke lever assembly.
16. Attach the choke cable to the carburetor choke linkage and tighten the clamping screw.
17. Install the clutch master cylinder as described in Chapter Five.
18. Install the left-hand switch assembly halves onto the handlebar and install the screws securing the halves together.
19. Operate the choke lever and make sure the carburetor choke linkage is operating correctly, with no binding. If operation is incorrect or there is binding, carefully check that the cable is attached correctly and there are no tight bends in the cable.
20. Adjust the choke cable as described in this chapter.
21. Install the fuel tank as described in this chapter.
22. Install the side covers. Install the seat as described in Chapter Twelve.

FUEL SHUTOFF VALVE

Removal/Installation (Magna Models)

The fuel tank should be almost empty to perform this procedure. Drain the fuel from the tank prior to removing the tank from the frame.

WARNING

Do not smoke or allow anyone to smoke in the immediate area while working on the fuel system. Be sure to work in a well-ventilated area and have a fire extinguisher, rated for gasoline fires, handy.

1. Remove both side covers.
2. Disconnect the battery negative lead.
3. Drain the fuel from both fuel tanks as described under *Secondary Fuel Tank Removal/Installation* in this chapter. It is not necessary to remove the secondary fuel tank.
4. Remove the battery as described in Chapter Three.
5. Partially pull the battery box out of the frame and slide the spark units out of the back side of the battery box. Remove the battery box.
6. Disconnect the 2- pin electrical connector to the fuel pump.
7. Disconnect the fuel lines going to the carburetor assembly and the secondary fuel tank.
8. Remove the nuts securing the fuel pump mounting bracket assembly.
9. Carefully remove the fuel pump mounting bracket assembly from the frame.
10. Remove the fuel lines from the fuel shutoff valve. Plug the fuel lines with golf tees.
11. Remove the screws securing the fuel shutoff valve to the fuel pump mounting bracket and remove the shutoff valve.
12. Install a new shutoff valve.

13. Remove the golf tees and install the fuel lines to the shutoff valve.
14. Install all parts removed by reversing these removal steps.
15. Start the engine and check for leaks.

Removal/Cleaning/Installation (Interceptor Models)

Refer to **Figure 46** for this procedure.

WARNING

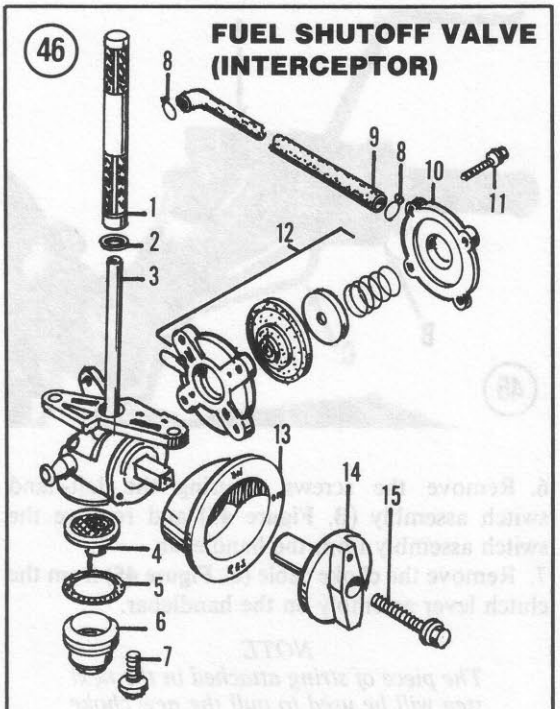
Do not smoke or allow anyone to smoke in the immediate area while working on the fuel system. Be sure to work in a well-ventilated area and have a fire extinguisher, rated for gasoline fires, handy.

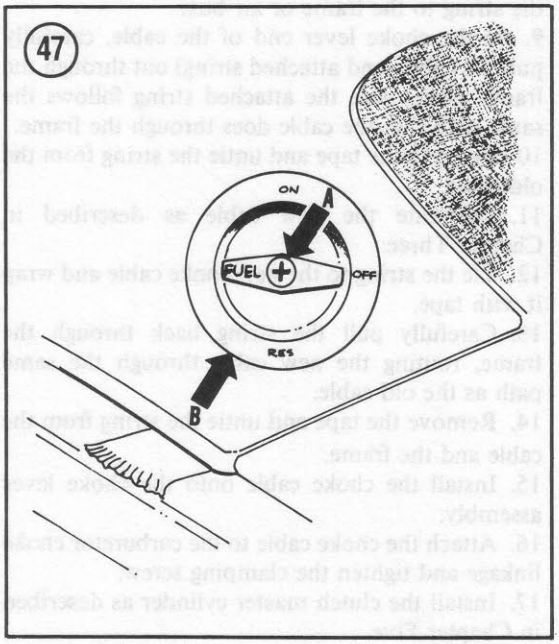
1. Remove both side covers.
2. Disconnect the battery negative lead.
3. Remove the screw securing the fuel shutoff valve lever (A, **Figure 47**) and remove the lever and the lever ring (B, **Figure 47**).
4. Remove the fuel tank as described in this chapter.
5. Place a blanket or some clean shop cloths on the workbench to protect the painted finish of the fuel tank.
6. Lay the fuel tank on its right-hand side.
7. Remove the screws (**Figure 48**) securing the shutoff valve to the fuel tank.
8. Remove the shutoff valve from the fuel tank.
9. Remove the fuel filter from the shutoff valve. Clean it with a medium soft toothbrush and blow out with compressed air. Replace if it is defective.
10. Be sure to install the O-ring seal prior to installation.
11. Install by reversing these removal steps.
12. After installation is complete, thoroughly check for fuel leaks.

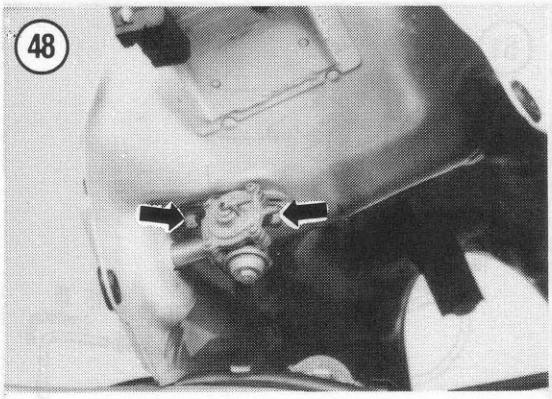
Vacuum Operation Inspection (Interceptor Models)

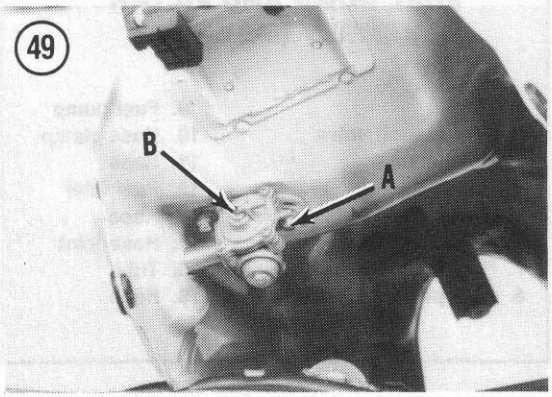
To perform this test the fuel tank should be almost full of fuel.

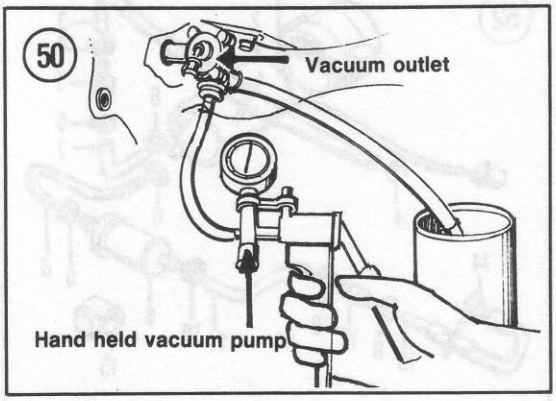
1. Remove the fuel tank as described in this chapter.
2. Leave the carburetor fuel line attached to the fuel shutoff valve (the one that normally leads to the carburetor assembly).
3. Place the fuel tank up on a box so it is higher than the work surface of your workbench.
4. Position the loose end of the fuel line into a clean container.











NOTE

If the drained fuel is kept clean it can be reused. If it becomes contaminated during this procedure, dispose of it properly. Check with local regulations for proper disposal of gasoline.

5. Connect a portable hand vacuum pump to the vacuum side (diaphragm cover) of the fuel shutoff valve (A, **Figure 49**).
6. Turn the fuel shutoff valve to the ON position. Fuel should *not* flow from the carburetor fuel line.
7. Apply vacuum to the diaphragm with the hand pump (**Figure 50**). Fuel *should* flow out when 10-20 mm Hg (0.5-0.8 in. Hg) of vacuum is applied.
8. If fuel does not flow, turn the fuel shutoff valve to the RES posititon and check if fuel flows out.
9. If the fuel flows in the RES position the vacuum diaphragm is damaged or the vacuum circuit is blocked.
10. If the fuel will not flow in the RES position, the internal strainer, the fuel passageway or the fuel tank cap breather hole is blocked.
11. To inspect the vacuum diaphragm, perform the following:
    a. Turn the fuel shutoff valve to the OFF position.
    b. Remove the screws securing the vacuum diaphragm assembly (B, **Figure 49**) and remove the assembly.
    c. Inspect the diaphragm for wear or damage.
    d. Check the spring to see if it has sagged or is broken.
    e. If any of the parts of the vacuum diaphragm are worn or damaged, all parts of the vacuum diaphragm must be replaced as a unit. They are not sold separately.
    f. Reassemble the vacuum diaphragm assembly. Make sure that the diaphragm is not pinched in the valve body during assembly.
12. Install the fuel tank as described in this chapter.

FUEL PUMP

Fuel pump performance testing is covered in Chapter Seven.

Removal/Installation (Magna Models)

Refer to **Figure 51** for this procedure.
1. Remove both side covers.
2. Disconnect the battery negative lead.
3. Drain the fuel from both fuel tanks as described under *Secondary Fuel Tank Removal/Installation* in this chapter. It is not necessary to remove the secondary fuel tank.
4. Remove the battery as described in Chapter Three.
5. Partially pull the battery box out of the frame and slide the spark units out of the back side of the battery box. Remove the battery box.
6. Disconnect the 2-pin electrical connector to the fuel pump.
7. Disconnect the fuel lines going to the carburetor assembly and to the secondary fuel tank. Insert golf tees into the end of each fuel line to prevent fuel leakage.

8. Remove the nuts securing the fuel pump mounting bracket assembly.
9. Carefully remove the fuel pump mounting bracket assembly from the frame.
10. Remove the fuel inlet and outlet flexible fuel lines from the fuel pump. Plug the ends of the fuel lines with golf tees to prevent fuel leakage.
11. Pull the fuel pump from the rubber holder on the mounting bracket.
12. Install a new fuel pump into the rubber holder on the mounting bracket.
13. Install by reversing these removal steps.
14. Be sure to hook up the fuel pump hoses to the correct fittings on the fuel pump. Refer to **Figure 51**.
15. Make sure the hose clamps are positioned correctly and are tight.
16. After installation is complete, check thoroughly for fuel leaks.

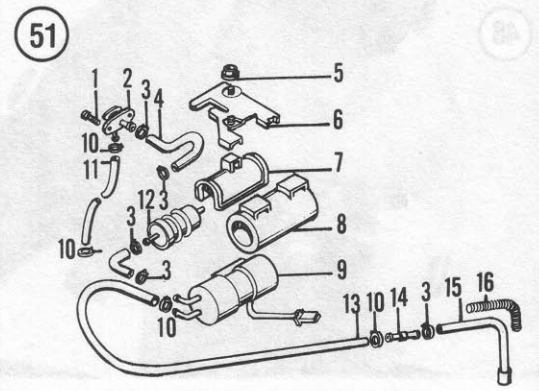
Removal/Installation (Interceptor Models)

Refer to **Figure 52** for this procedure.
1. Remove both side covers.
2. Disconnect the battery negative lead.
3. Disconnect the 2-pin electrical connector going to the fuel pump.
4. On the left-hand side, pull the fuel filter assembly (**Figure 53**) from the mounting tab on the frame. Move the filter out of the way.
5. Pull the fuel pump assembly (**Figure 54**) carefully out of the frame.
6. Pull the fuel pump out of the fuel pump holder.
7. Remove the fuel inlet and outlet flexible fuel lines from the fuel pump. Plug the ends of the fuel lines with golf tees to prevent fuel leakage.
8. Install a new fuel pump into the rubber holder.
9. Install by reversing these removal steps.
10. Be sure to hook up the fuel pump hoses to the correct fittings on the fuel pump. Refer to **Figure 52**.
11. Make sure the hose clamps are positioned correctly and are tight.
12. After installation is complete, thoroughly check for fuel leaks.

MAIN FUEL TANK (MAGNA MODELS)

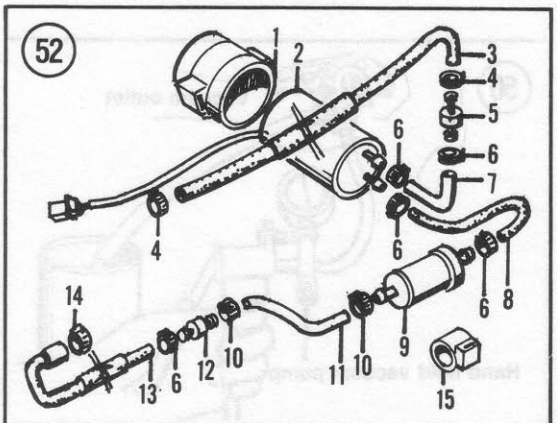
Removal/Installation

Refer to **Figure 55** for this procedure.
1. Place the bike on the centerstand.
2. Remove the seat and side panels.
3. Disconnect the battery negative lead.
4. Drain the fuel from both fuel tanks as described under *Secondary Fuel Tank Removal/Installation*



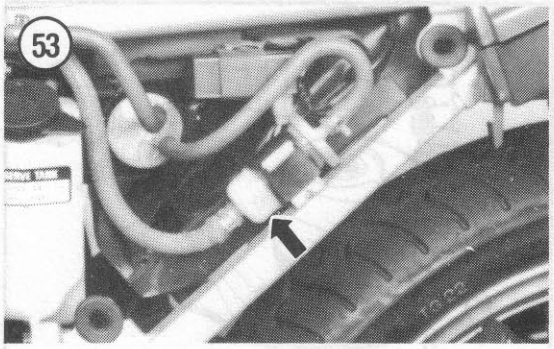
FUEL PUMP AND FILTER ASSEMBLY (MAGNA)

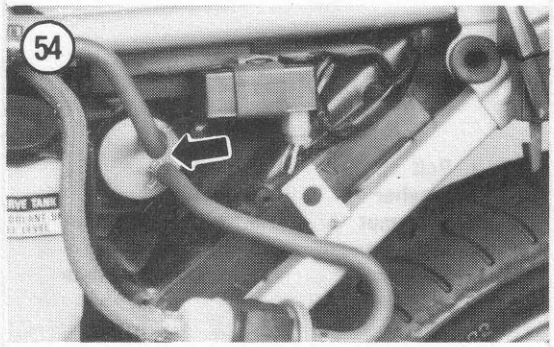
1. Screw
2. Fuel shutoff valve
3. Hose clamp
4. Hose
5. Nut
6. Mounting plate
7. Fuel filter rubber holder
8. Fuel pump rubber holder
9. Fuel pump
10. Hose clamp
11. Hose
12. Fuel filter
13. Hose
14. Hose joint
15. Tube
16. Hose



FUEL PUMP AND FILTER ASSEMBLY (INTERCEPTOR)

1. Fuel pump rubber holder
2. Fuel pump
3. Hose
4. Hose clamp
5. Hose joint
6. Hose clamp
7. Hose
8. Hose
9. Fuel filter
10. Hose clamp
11. Hose
12. Hose joint
13. Hose
14. Hose clamp
15. Fuel filter holder





in this chapter. It is not necessary to remove the secondary fuel tank.

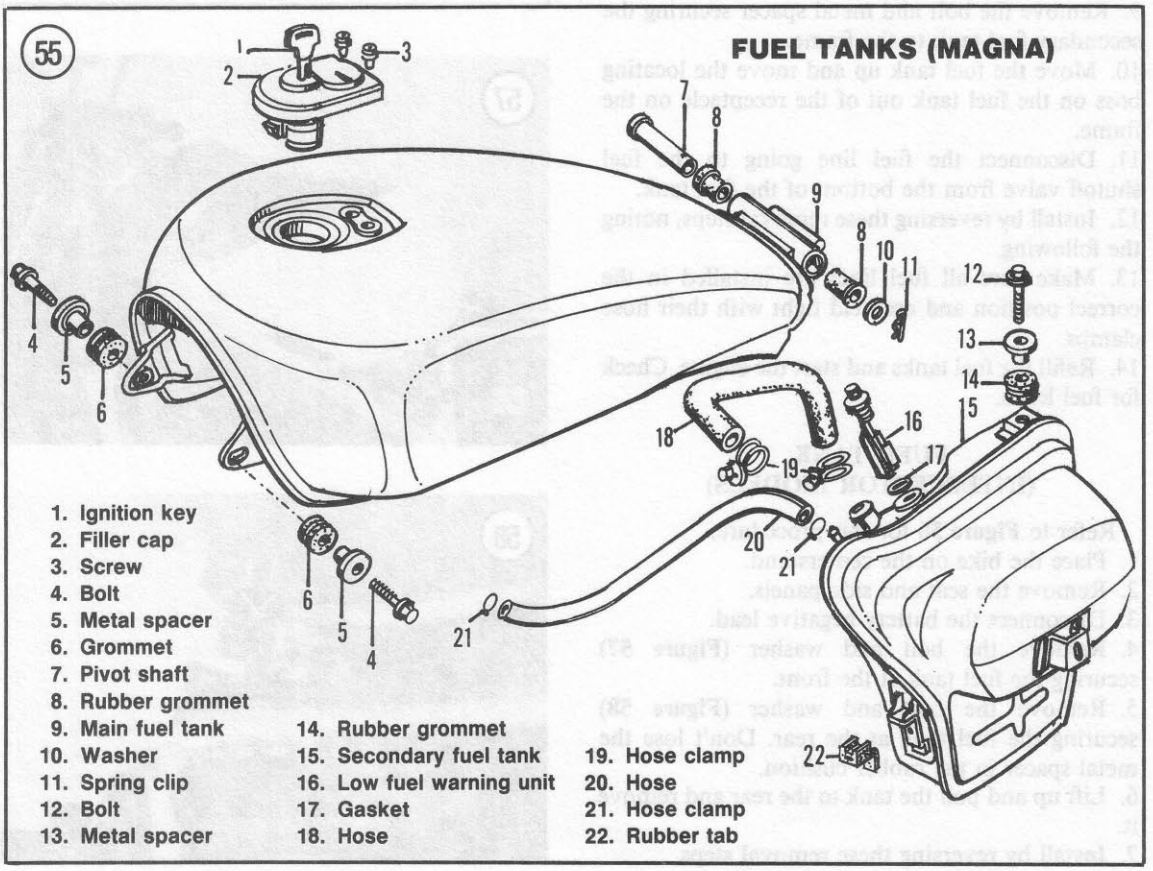
5. Remove the bolt and metal spacer on each side of the front of the tank.
6. Remove the spring pin and washer on the pivot shaft at the rear of the tank.
7. Withdraw the pivot shaft from the rear of the tank.
8. On California models, lift the fuel tank up and disconnect the purge line from the front of the fuel tank.
9. Lift the fuel tank up and disconnect the fuel lines at the back of the fuel tank. Remove the fuel tank.
10. Install by reversing these removal steps.

SECONDARY FUEL TANK (MAGNA MODELS)

Removal/Installation

Refer to **Figure 55** for this procedure.

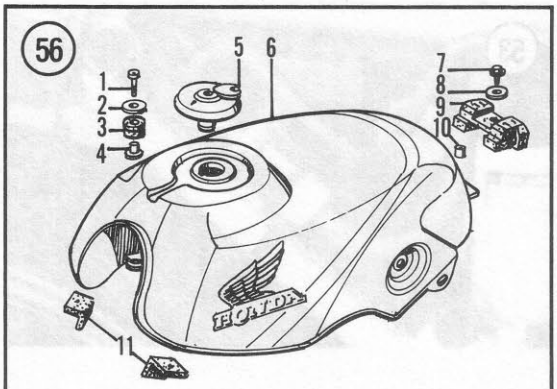
1. Place the bike on the centerstand.
2. Remove the seat and side panels.
3. Remove the battery as described in Chapter Three.



4. To drain both fuel tanks, perform the following:
   a. Open the fuel filler cap. This will speed up the fuel flow.
   b. Turn the fuel valve to the OFF position.
   c. Disconnect the fuel line at the base of the fuel shutoff valve.
   d. Connect another piece of fuel line to the fitting on the base of the fuel shutoff valve.
   e. Place the other end of the fuel line into a clean sealable metal container and turn the fuel shutoff valve to the RES position. Dispose of the drained fuel properly.
   f. Drain both fuel tanks, then disconnect the piece of fuel line from the base of the fuel shutoff valve.
   g. Install the fuel line (from the secondary fuel tank) to the base of the fuel shutoff valve.
5. Partially pull the battery box out of the frame and slide the spark units out of the back side of the battery box. Remove the battery box.
6. Remove the coolant reserve tank as described in Chapter Eight.
7. Remove the starter solenoid assembly from the frame.
8. Disconnect the electrical connectors from the low fuel warning unit.
9. Remove the bolt and metal spacer securing the secondary fuel tank to the frame.
10. Move the fuel tank up and move the locating boss on the fuel tank out of the receptacle on the frame.
11. Disconnect the fuel line going to the fuel shutoff valve from the bottom of the fuel tank.
12. Install by reversing these removal steps, noting the following.
13. Make sure all fuel lines are installed in the correct position and are held tight with their hose clamps.
14. Refill the fuel tanks and start the engine. Check for fuel leaks.

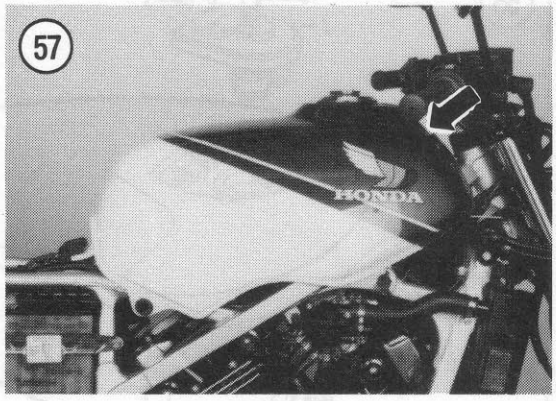
FUEL TANK (INTERCEPTOR MODELS)

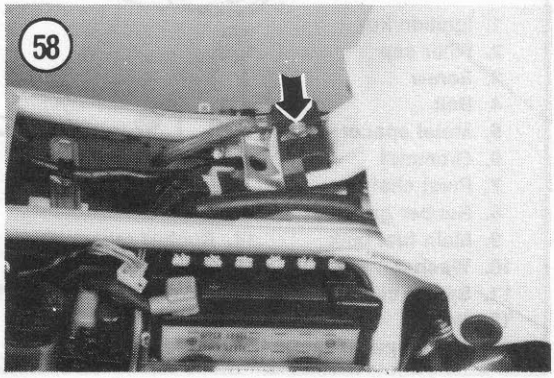
Refer to **Figure 56** for this procedure.
1. Place the bike on the centerstand.
2. Remove the seat and side panels.
3. Disconnect the battery negative lead.
4. Remove the bolt and washer (**Figure 57**) securing the fuel tank at the front.
5. Remove the bolt and washer (**Figure 58**) securing the fuel tank at the rear. Don't lose the metal spacer in the rubber cushion.
6. Lift up and pull the tank to the rear and remove it.
7. Install by reversing these removal steps.

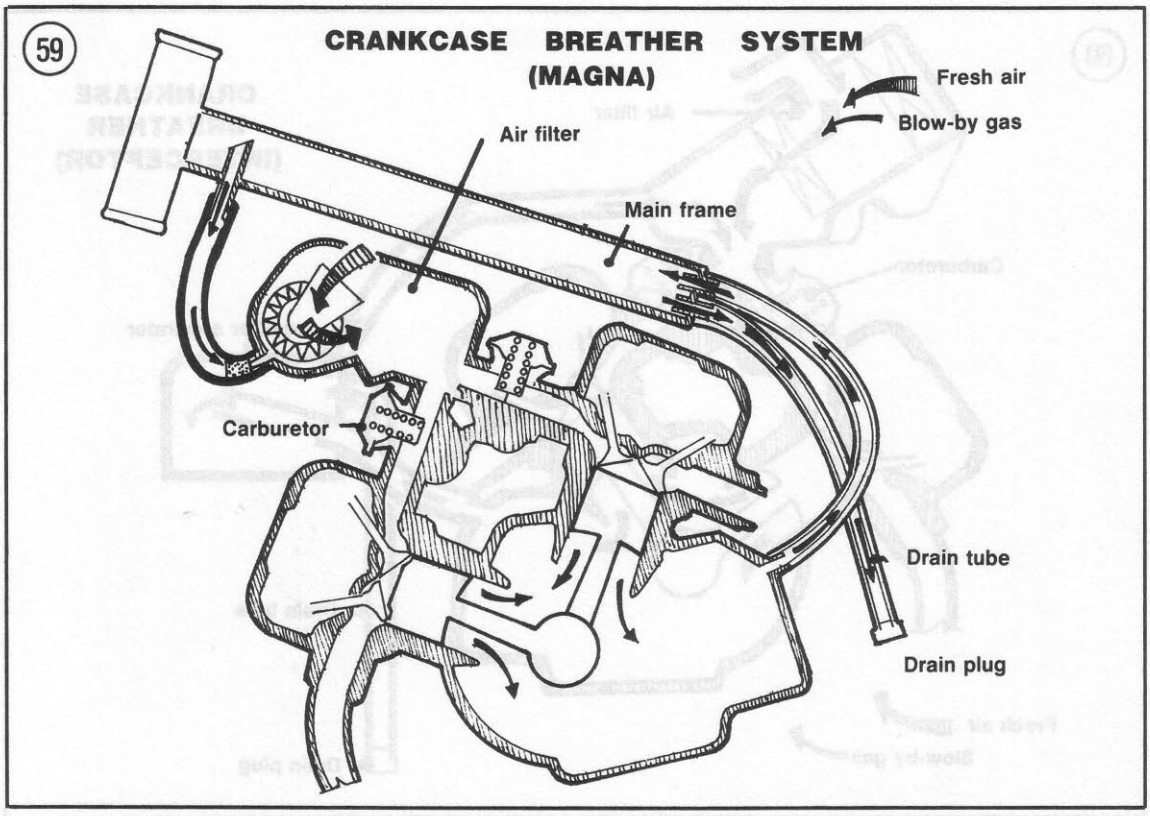


FUEL TANK (INTERCEPTOR)

1. Bolt
2. Washer
3. Grommet
4. Metal spacer
5. Filler cap
6. Fuel tank
7. Bolt
8. Washer
9. Rubber grommet
10. Spacer
11. Rubber cushions







CRANKCASE BREATHER SYSTEM (U.S. ONLY)

To comply with air pollution standards, the Honda V-4's are equipped with a crankcase breather system. The system shown in **Figure 59** is used on Magna models and **Figure 60** shows the system used on Interceptor models. Each system draws blowby gases from the crankcase and recirculates them into the fuel/air mixture and thus into the engine to be burned.

Inspection/Cleaning

1. Make sure all hose clamps are tight. Check all hoses for deterioration and replace as necessary.
2. Remove the clamp and plug (**Figure 61**) from the drain hose and drain out all residue.
3. This cleaning procedure should be done more frequently if a considerable amount of riding is done at full throttle or in the rain.

NOTE

Be sure to install the drain plug and clamp.

EVAPORATIVE EMISSION CONTROL SYSTEM (CALIFORNIA MODELS ONLY)

Fuel vapor from within the fuel tank is routed into a charcoal canister. This vapor is stored when the engine is not running. When the engine is running, these vapors are drawn through a purge control valve and into the carburetor to be burned.

Make sure all hose clamps are tight. Check all hoses for deterioration and replace as necessary.

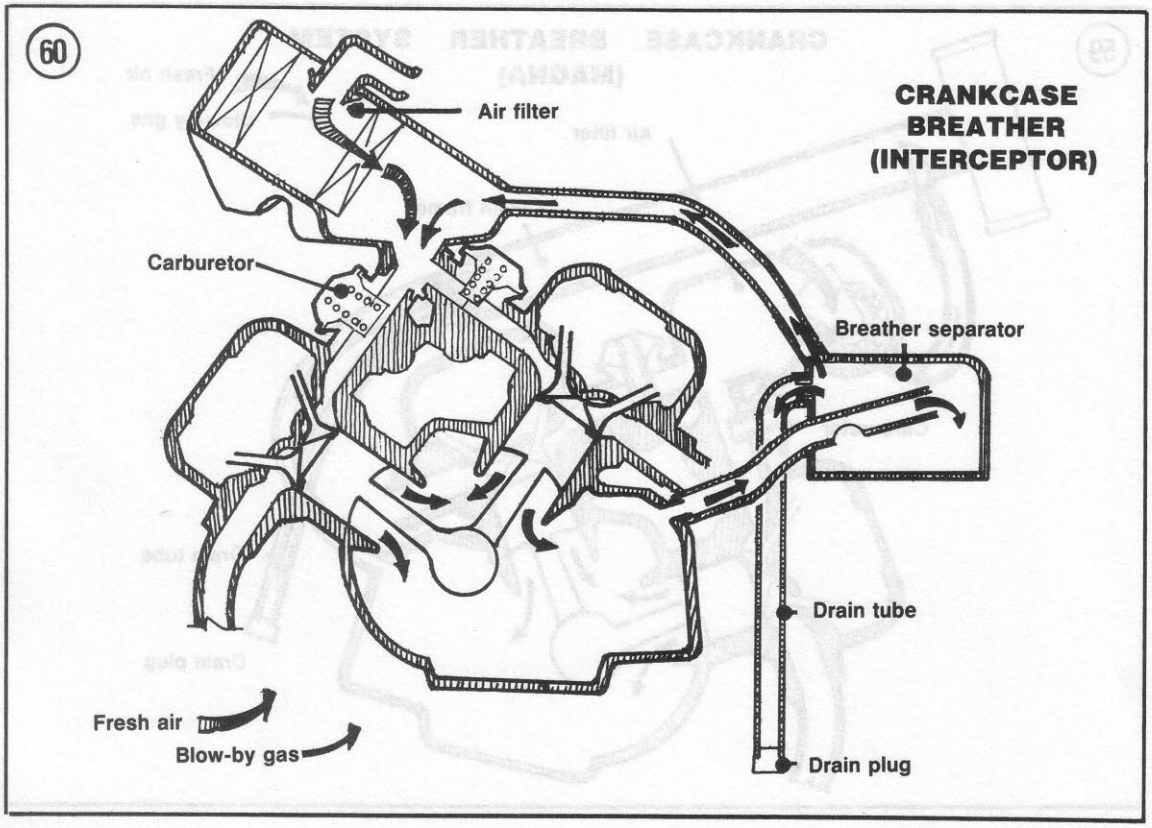
Figure 62 shows the system layout. **Figure 63** shows hose routing and connections.

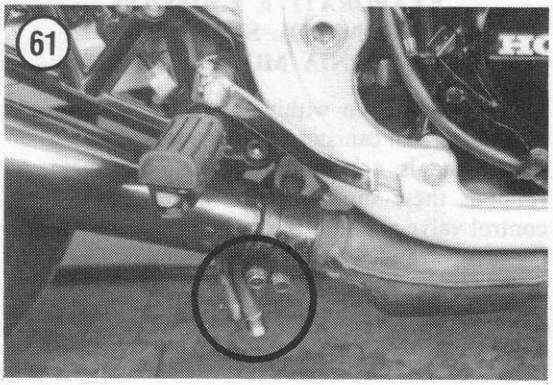
NOTE

Before disconnecting any hose, label the hose and its fittings with masking tape so the hose can be reconnected properly. The system uses many hoses which can easily be misconnected.

Removal/Installation

1. Remove the seat as described in Chapter Twelve.
2. On Interceptor models, remove the front fairing as described in Chapter Twelve.





NOTE
Before disconnecting the hoses from the PCV valve, label the hoses and fittings with masking tape for reconnection.

3. Disconnect the hoses from the PCV valve going to the charcoal canister.
4. Pull the vacuum hoses from the clips on the frame.
5. Pull the PCV valve from the mounting tabs on the frame.
6. Remove the bolts securing the charcoal canister to the mounting bracket.
7. Install by reversing these removal steps, noting the following.
8. Be sure to install the hoses to their correct places on the PCV valve.

EXHAUST SYSTEM

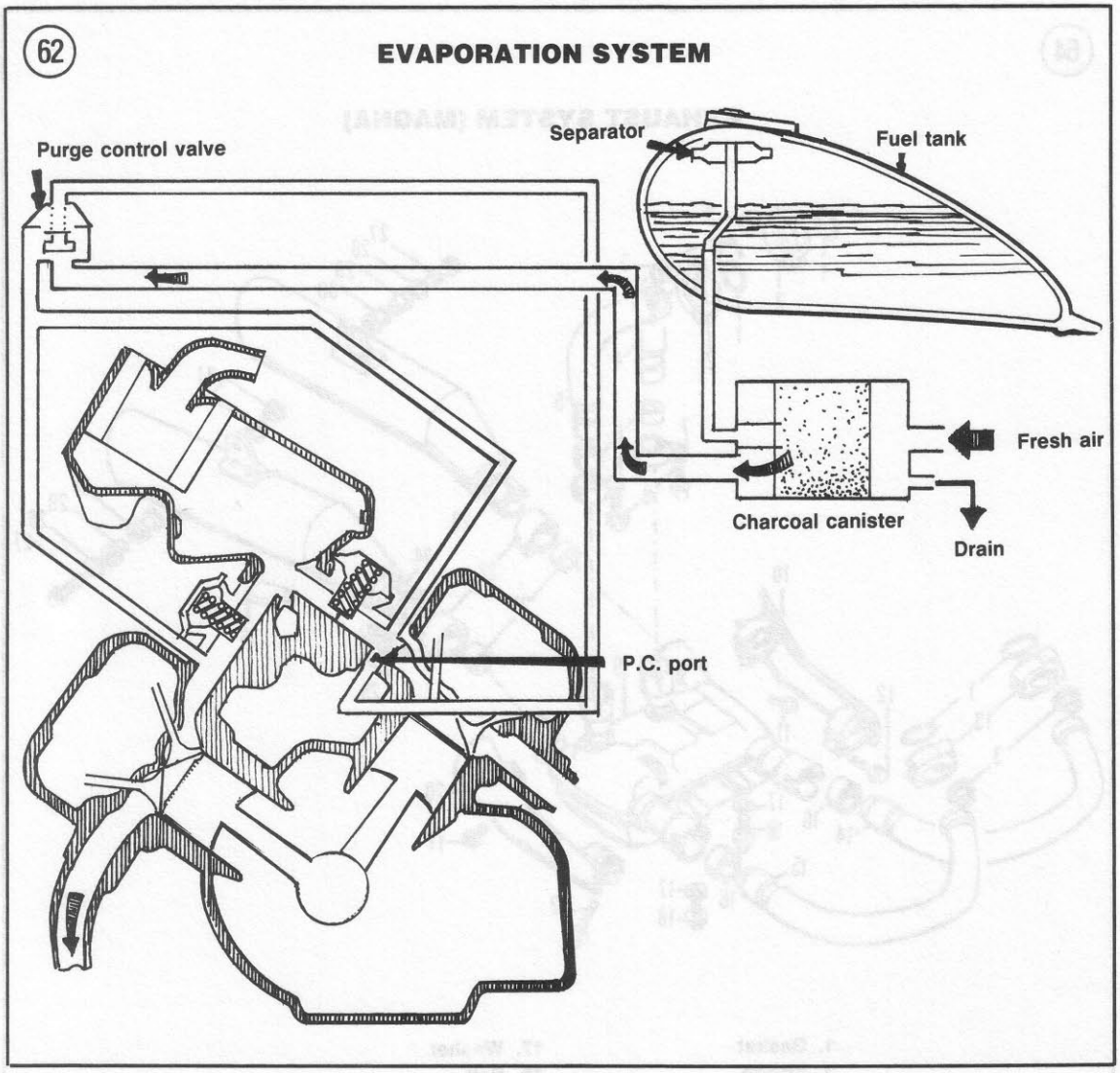
The exhaust system consists of 4 exhaust pipes, a common collector and 2 mufflers. The exhaust pipes for the front 2 cylinders can be removed with the engine in the frame. Removing the pipes for the rear 2 cylinders requires that the engine be removed from the frame as described in Chapter Four.

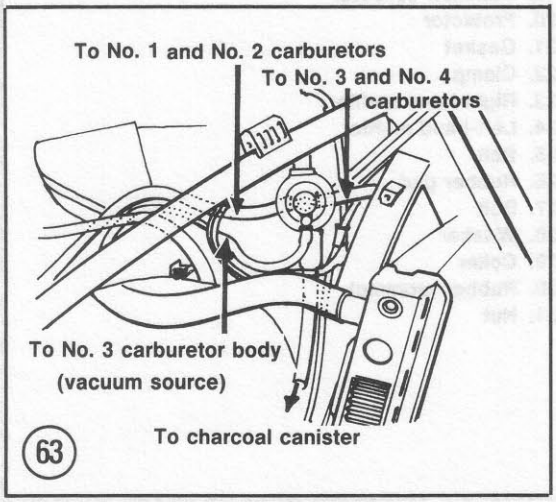
Removal/Installation

Refer to **Figure 64** for Magna models or **Figure 65** for Interceptor models.

This procedure is best done with the aid of a helper. One person can work on each side of the bike.

1. Place the bike on the centerstand.
2. On Interceptor models, remove the lower fairing as described in Chapter Twelve.
3. Remove the nuts (**Figure 66**) securing both forward exhaust pipe flanges to the front cylinder head.

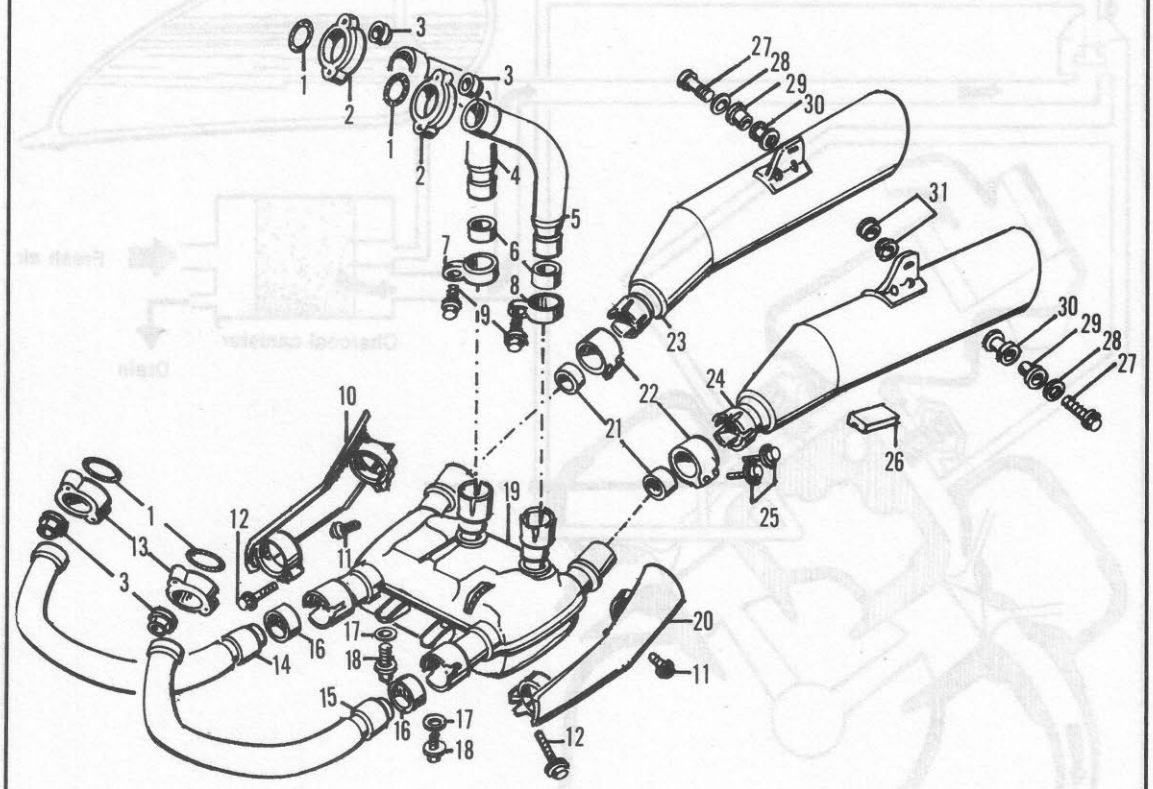




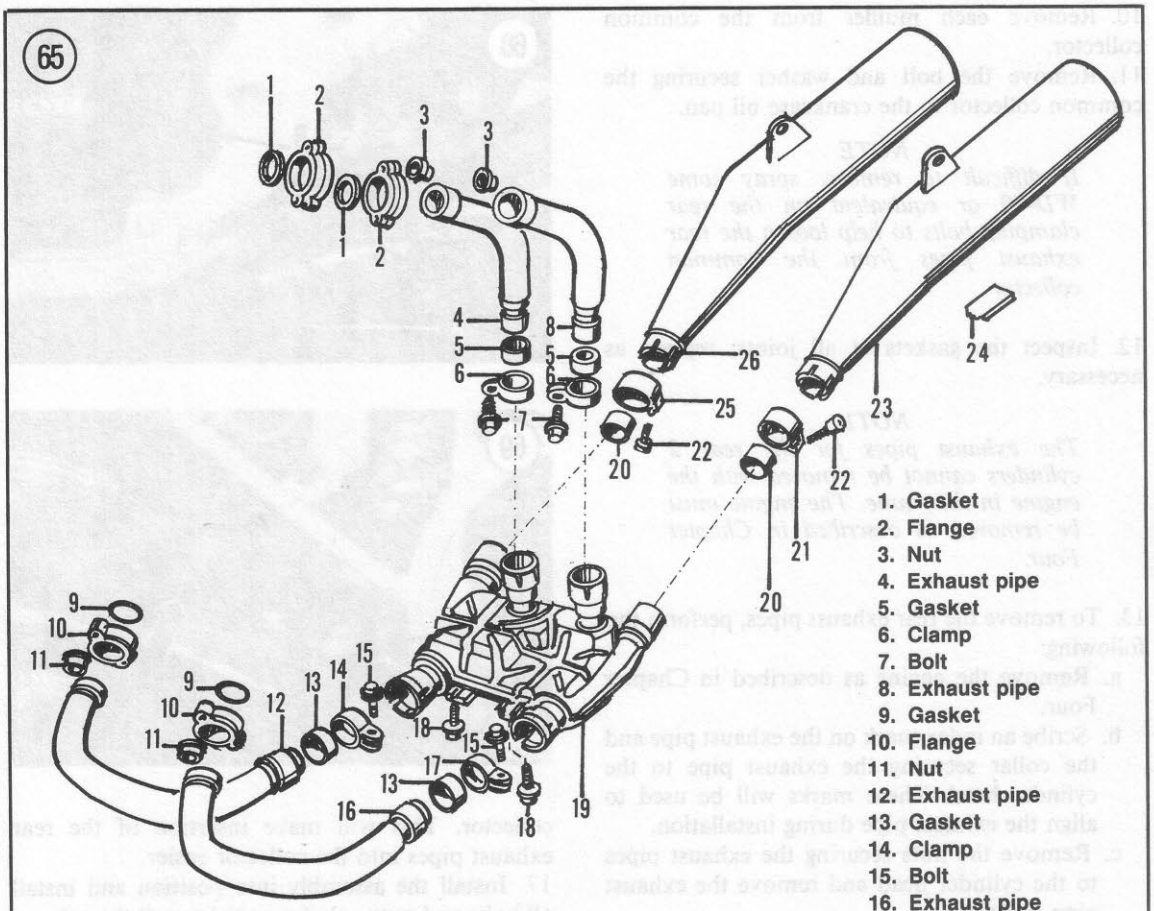
4. Slide the flanges down.
5. Loosen the clamping bolts (**Figure 67**) on each side securing the front exhaust pipes to the common collector.
6. Pull the front portion of each front exhaust pipe down and slightly forward and remove each exhaust pipe from the engine and the common collector.
7. Loosen the bolts (A, **Figure 68**) securing each muffler to the common collector.
8. Loosen the bolt (B, **Figure 68**) securing each rear exhaust pipe to the common collector.
9. Remove the bolt, washer and nut (**Figure 69**) securing the muffler to the rear footpeg bracket on each side. Don't lose the collar and rubber bushing within the mounting hole in the rear footpeg bracket.

64

EXHAUST SYSTEM (MAGNA)

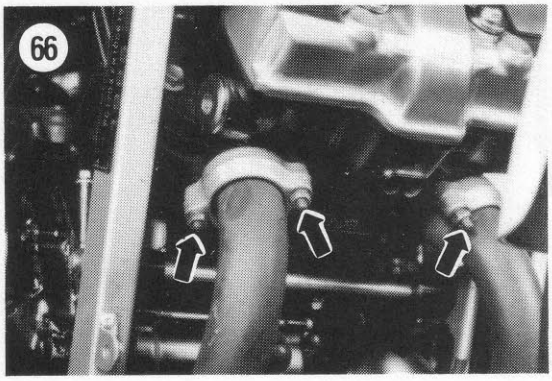


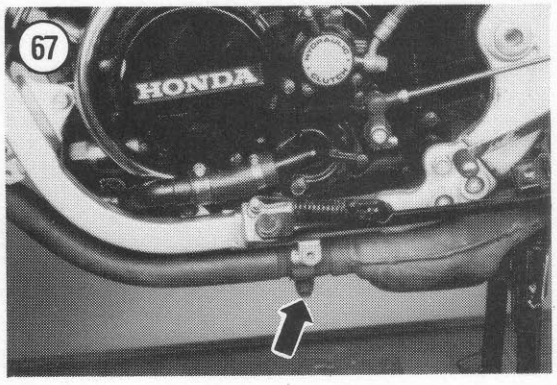
1. Gasket
2. Flange
3. Nut
4. Exhaust pipe
5. Exhaust pipe
6. Gasket
7. Clamp
8. Clamp
9. Bolt
10. Protector
11. Bolt
12. Bolt
13. Flange
14. Exhaust pipe
15. Exhaust pipe
16. Clamp
17. Washer
18. Bolt
19. Common collector
20. Protector
21. Gasket
22. Clamp
23. Right-hand muffler
24. Left-hand muffler
25. Bolt
26. Rubber pad
27. Bolt
28. Washer
29. Collar
30. Rubber grommet
31. Nut



EXHAUST SYSTEM (INTERCEPTOR)

1. Gasket
2. Flange
3. Nut
4. Exhaust pipe
5. Gasket
6. Clamp
7. Bolt
8. Exhaust pipe
9. Gasket
10. Flange
11. Nut
12. Exhaust pipe
13. Gasket
14. Clamp
15. Bolt
16. Exhaust pipe
17. Clamp
18. Bolt
19. Common collector
20. Gasket
21. Clamp
22. Bolt
23. Left-hand muffler
24. Rubber pad
25. Clamp
26. Right-hand muffler





10. Remove each muffler from the common collector.
11. Remove the bolt and washer securing the common collector to the crankcase oil pan.

NOTE

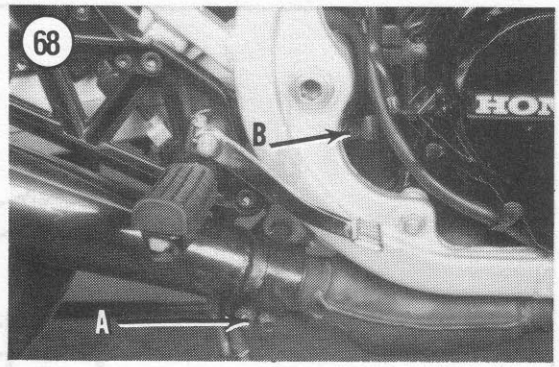
If difficult to remove, spray some WD-40 or equivalent on the rear clamping bolts to help loosen the rear exhaust pipes from the common collector.

12. Inspect the gaskets at all joints; replace as necessary.

NOTE

The exhaust pipes for the rear 2 cylinders cannot be removed with the engine in the frame. The engine must be removed as described in Chapter Four.

13. To remove the rear exhaust pipes, perform the following:
   a. Remove the engine as described in Chapter Four.
   b. Scribe an index mark on the exhaust pipe and the collar securing the exhaust pipe to the cylinder head. These marks will be used to align the exhuast pipe during installation.
   c. Remove the nuts securing the exhaust pipes to the cylinder head and remove the exhaust pipe assembly.
14. Be sure to install a new gasket in each exhaust port in both cylinder heads.
15. Install the exhaust pipe assembly to the rear cylinder head and install the engine.
16. Apply a light coat of multipurpose grease to the inside surface of the gaskets in the common collector. This will make insertion of the rear exhaust pipes into the collector easier.
17. Install the assembly into position and install all bolts and nuts only finger-tight until the exhaust flange nuts and washers are installed and securely tightened. This will minimize any exhaust leak at the cylinder head.
18. Tighten all bolts and nuts securely.
19. After installation is complete, make sure there are no exhaust leaks.



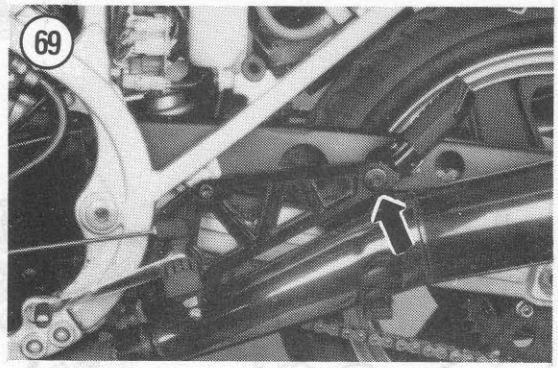


Table 1 CARBURETOR SPECIFICATIONS

	1984 Magna 49-State models	1984 Magna California models
Carburetor model No.	VD58A	VD59A
Main jet number		
Carburetor		
No. 1 and 3 (rear)	No. 108	No. 108
No. 2 and 4 (front)	No. 108	No. 108
Slow jet	No. 38	No. 38
Jet needle clip setting	Non-adjustable	Non-adjustable
Float level	6.2 mm (0.24 in.)	6.2 mm (0.24 in.)
Idle speed	1,300 ±100 rpm	1,300 ±100 rpm
Pilot screw initital opening	2 1/2 full turns out	2 1/2 full turns out
	1985 Magna 49-State models	**1985 Magna California models**
Carburetor model No.	VD85B	VD59B
Main jet number		
Carburetor		
No. 1 and 3 (rear)	No. 105	No. 105
No. 2 and 4 (front)	No. 105	No. 105
Slow jet	No. 38	No. 38
Jet needle clip setting	Non-adjustable	Non-adjustable
Float level	6.2 mm (0.24 in.)	6.2 mm (0.24 in.)
Idle speed	1,300 ±100 rpm	1,300 ±100 rpm
Pilot screw initital opening	2 1/2 full turns out	2 1/2 full turns out
	1984 Interceptor 49-State models	**1984 Interceptor California models**
Carburetor model No.	VD56A	VD57A
Main jet number		
Carburetor		
No. 1 and 3 (rear)	No. 102	No. 102
No. 2 and 4 (front)	No. 105	No. 105
Slow jet	No. 38	No. 38
Jet needle clip setting	Non-adjustable	Non-adjustable
Float level	6.2 mm (0.24 in.)	6.2 mm (0.24 in.)
Idle speed	1,300 ±100 rpm	1,300 ±100 rpm
Pilot screw initial opening	2 full turns out	2 full turns out
	1985 Interceptor 49-State models	**1985 Interceptor California models**
Carburetor model No.	VD85B	VD59B
Main jet number		
Carburetor		
No. 1 and 3 (rear)	No. 105	No. 105
No. 2 and 4 (front)	No. 105	No. 105
Slow jet	No. 38	No. 38
Jet needle clip setting	Non-adjustable	Non-adjustable
Float level	6.2 mm (0.24 in.)	6.2 mm (0.24 in.)
Idle speed	1,300 ±100 rpm	1,300 ±100 rpm
Pilot screw initital opening	2 full turns out	2 full turns out

NOTE: If you own a 1986 model, first check the Supplement at the back of the book for any new service information.

CHAPTER SEVEN

ELECTRICAL SYSTEM

The electrical system consists of the following:

a. Charging system.
b. Ignition system.
c. Starting system.
d. Lighting system.
e. Directional signal system.
f. Switches.
g. Electrical components.

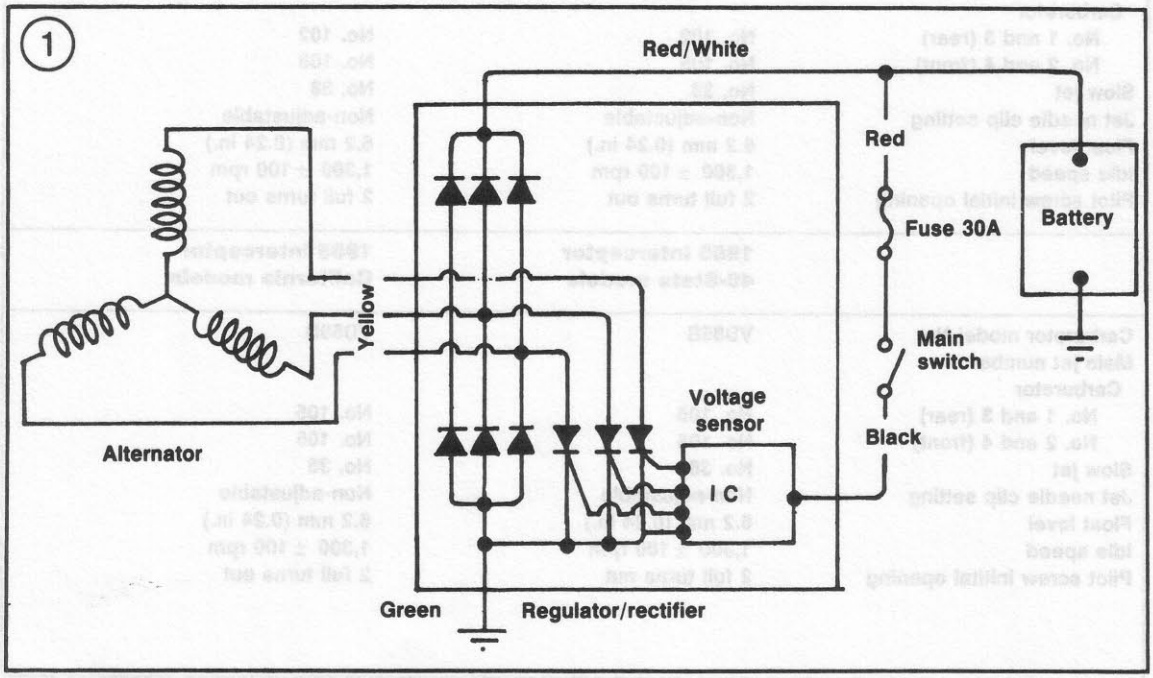
Tables 1-5 are located at the end of this chapter. Wiring diagrams are at the end of the book.

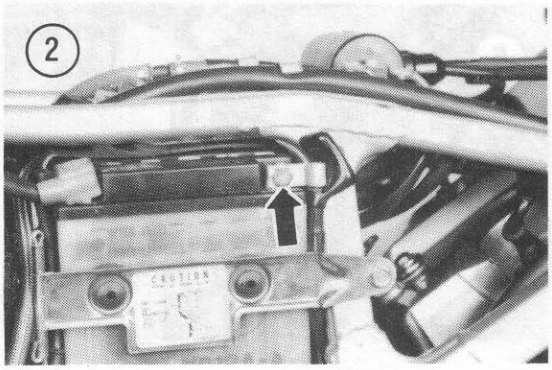
For complete spark plug and battery information, refer to Chapter Three.

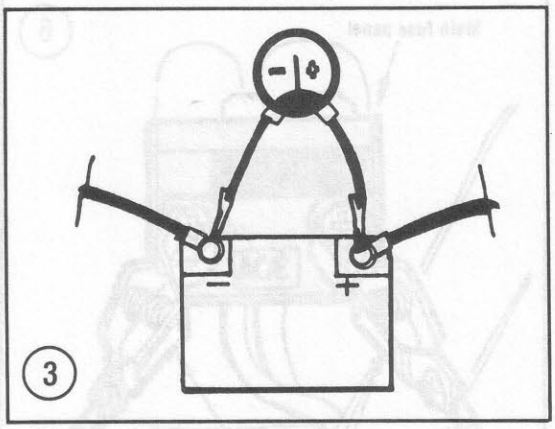
CHARGING SYSTEM

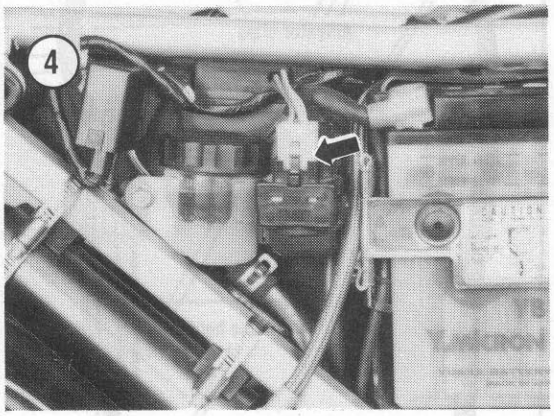
The charging system consists of the battery, alternator and a voltage regulator/rectifier (**Figure 1**).

Alternating current generated by the alternator is rectified to direct current. The voltage regulator maintains the voltage to the battery and additional









electrical loads (lights, ignition, etc.) at a constant setting regardless of variations in engine speed and load.

Leakage Test

Perform this test before performing the output test.

1. Remove the right-hand side cover.
2. Turn the ignition switch to the OFF position.
3. Disconnect the battery negative (–) lead (**Figure 2**).
4. Connect a voltmeter between the battery negative lead and the negative terminal on the battery.
5. The voltmeter should read 0 volts.
6. If there is a voltage reading, this indicates a voltage drain in the system that will drain the battery. Test the components of the charging system as listed in this chapter.
7. Remove the voltmeter and reconect the battery negative lead.

Output Test

Whenever a charging system problem is suspected, make sure the battery is fully charged and in good condition before going any further. Clean and test the battery as described in Chapter Three.

Before starting this test, start the bike and let it *almost* reach normal operating temperature; shut off the engine. The cooling fan must *not* be running during this test.

1. Remove the seat as described in Chapter Twelve.
2. Remove the right-hand side cover.
3. Disconnect the regulator/rectifier 6-pin electrical connector. Use a narrow-bladed screwdriver and carefully push the male end of the black wire out of the connector. Reconnect the connector with the black wire left out in the open, not connected.

NOTE

Do not disconnect either the positive or negative battery cables; they are to remain in the circuit.

4. Connect the voltmeter between the battery negative and positive leads (**Figure 3**).

NOTE

Use an ammeter which can measure current flow in both directions.

5. Connect a 0-10 amp *DC* ammeter in line with the main fuse connectors (fusible link) as follows:
   a. Disconnect the electrical connector (**Figure 4**) attached to the top of the fusible link holder.
   b. Loosen the screws securing the fusible link and remove the fusible link (**Figure 5**).
   c. Install an inline fuse/fuse holder (available at most auto supply or electronic supply stores) along with the ammeter as shown in **Figure 6**.
   d. Use alligator clips on the test leads for a good electrical connection.

CAUTION

In order to protect the ammeter during the next step, always run the test with the inline fuse in the circuit. Do not try to test the charging system by connecting an ammeter between the positive (+) battery terminal and the starter cable. The ammeter will burn out when the electric starter is operated.

6. Start the engine and let it idle at 1,500 rpm. The charging amperage should be 1.0 amperes minimum.
7. Gradually increase engine speed to 5,000 rpm. At 5,000 rpm the charging amperage should be a maximum of 5.0 amperes.
8. If the ammeter shows a discharge even when the engine speed is increased, the probable causes are:
   a. Faulty alternator.
   b. Overcharged battery.
   c. Short circuit in the system.
   d. Loose, dirty or faulty connection between the alternator and the voltage regulator/rectifier.
9. If the ammeter shows charging even when the engine speed is lowered, the probable causes are:
   a. Faulty voltage regulator/rectifier.
   b. Discharged battery.
10. If the output voltage is above 14-15 volts when the engine speed is increased, check the voltage regulator/rectifier as described in this chapter.
11. Disconnect the ammeter and voltmeter and reinstall the fusible link.
12. Reconnect the electrical connector to the top of the fusible link holder.
13. Reconnect the black wire to the voltage regulator/rectifier electrical connector and connect the connector.
14. Reinstall the seat and right-hand side cover.

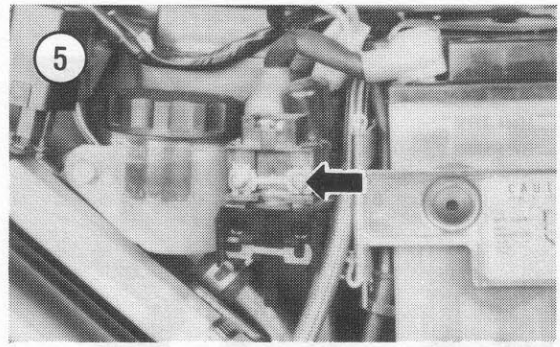
ALTERNATOR

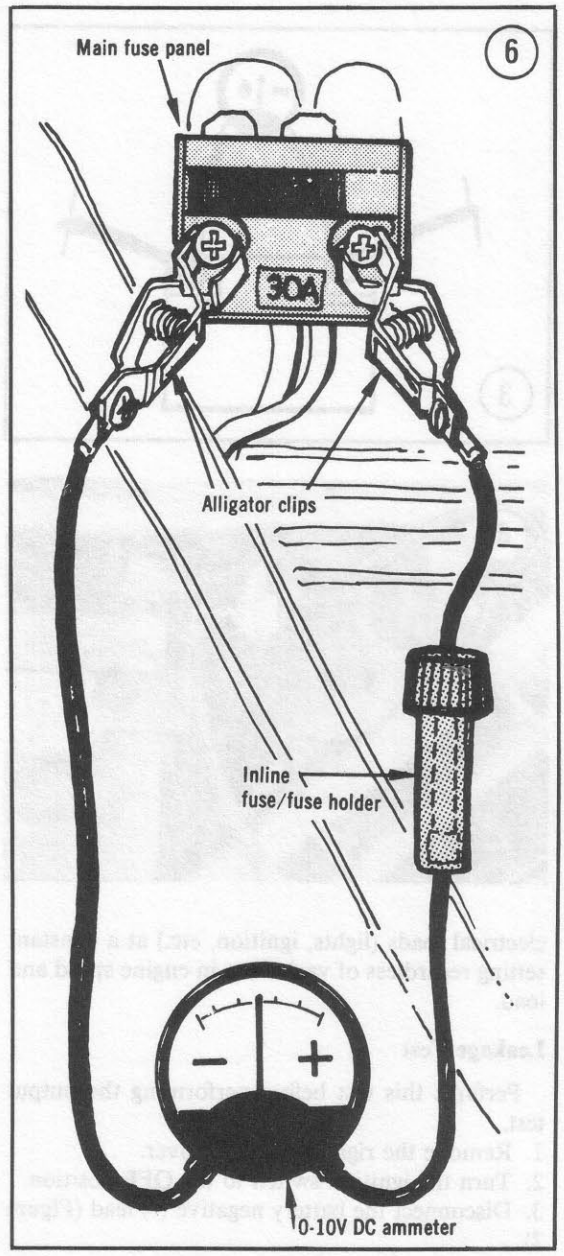
An alternator is a form of electrical generator in which a magnetized field called a rotor revolves around a set of stationary coils called a stator. As the rotor revolves, alternating current is induced in the stator. The current is then rectified to direct current and used to operate the electrical accessories on the motorcycle and to charge the battery. The rotor is permanently magnetized.

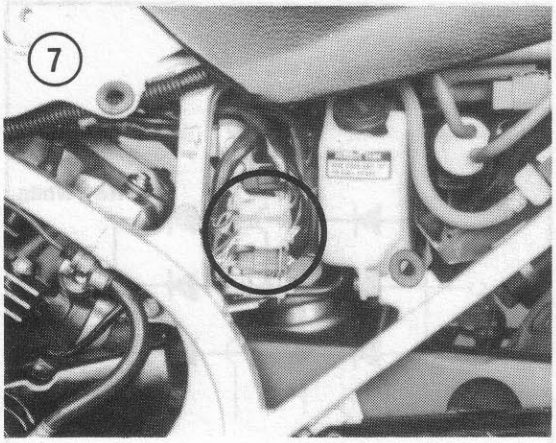
Stator and rotor removal and installation are covered in Chapter Four.

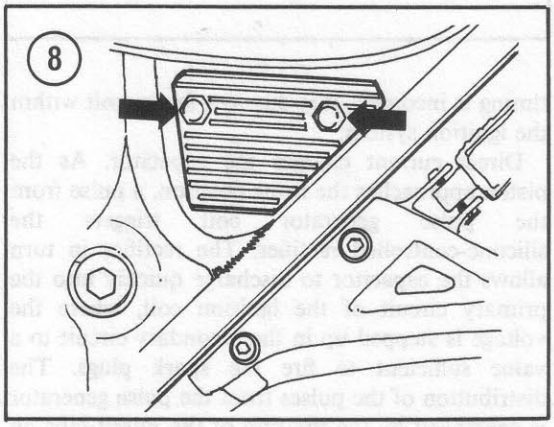
Rotor Testing

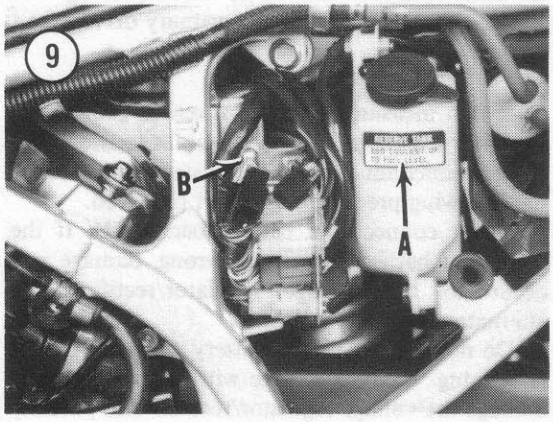
The rotor is permanently magnetized and cannot be tested except by replacement with a rotor known to be good. A rotor can lose magnetism











from old age or a sharp blow. If defective, the rotor must be replaced; it cannot be remagnetized.

Stator Testing

1A. On Magna models, remove the seat as described in Chapter Twelve.
1B. On Interceptor models, remove the left-hand side cover.
2. Disconnect the 3-pin alternator electrical connector. The electrical connector is located on top of the rear fender on Magna models or next to the coolant reserve tank (**Figure 7**) on Interceptor models.
3. Use an ohmmeter set at R×1 and check continuity between each yellow terminal. Replace the stator if any yellow terminal shows no continuity (infinite resistance) to any other. This would indicate an open in the winding.
4. Use an ohmmeter and check for continuity between each yellow terminal and ground. Replace the stator if any of the terminals show continuity (low resistance) to ground. This would indicate a short within a winding.

NOTE

Before replacing the stator with a new one, check the electrical wires to and within the terminal connector for any opens or poor connections.

5. Install the seat or left-hand side cover.

VOLTAGE REGULATOR/RECTIFIER

Removal/Installation

1. Remove both side covers.
2. Remove the seat as described in Chapter Twelve.
3. Disconnect the battery negative lead (**Figure 2**).

NOTE

*The voltage regulator/rectifier electrical connectors are located on top of the rear fender on Magna models or next to the coolant reserve tank (**Figure 7**) on Interceptor models.*

4. Disconnect the 6-wire electrical connector that runs from the voltage regulator to the wire harness.
5. Disconnect the 3-wire electrical connector that runs from the voltage regulator to the alternator.
6A. On Magna models, remove the bolts (**Figure 8**) securing the voltage regulator/rectifier to the frame bracket and remove the voltage regulator/rectifier.
6B. On Interceptor models, perform the following:
   a. Remove the coolant recovery tank (A, **Figure 9**) as described in Chapter Eight.
   b. Remove the bolt securing the electrical connector panel to the frame (B, **Figure 9**).
   c. Carefully pull the panel and the electrical connectors out of the frame.
   d. Remove the bolts securing the voltage regulator/rectifier to the electrical connector panel and remove the voltage regulator/rectifier.

7. Install by reversing these removal steps. Make sure all electrical connections are tight.

Testing

To test the voltage regulator/rectifier, disconnect the 6-wire electrical connector from the harness.

Make the following measurements using an ohmmeter and referring to **Figure 10**.

NOTE

The following tests are set up for a positive ground ohmmeter. If a negative ground ohmmeter is used, the test results will be the opposite.

1. Connect the positive (+) ohmmeter lead to the yellow lead and the negative (–) ohmmeter lead to the green lead. There should be continuity (low resistance).
2. Reverse the ohmmeter leads and repeat Step 1. This time there should be no continuity (infinite resistance).
3. Connect the positive (+) ohmmeter lead to the red/white lead and the negative (–) ohmmeter lead to the yellow lead. There should be continuity (low resistance).
4. Reverse the ohmmeter leads and repeat Step 3. This time there should be no continuity (infinite resistance).
5. If the voltage regulator/rectifier fails to pass any of these tests, the unit is defective and must be replaced.

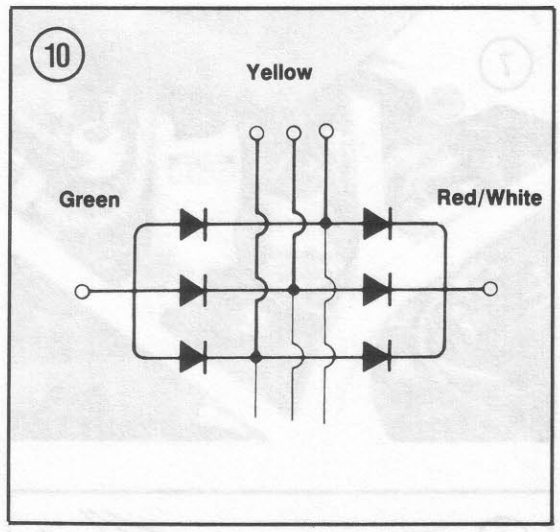
Voltage Regulator Performance Test

Connect a voltmeter to the battery negative and positive terminals (**Figure 3**). Leave the battery cables attached. Start the engine and let it idle; increase engine speed until the voltage going to the battery reaches 14.0-15.0 volts. At this point, the voltage regulator/rectifier should prevent any further increase in voltage. If voltage increases above specifications, the voltage regulator/rectifier is faulty and must be replaced.

IGNITION SYSTEM

The ignition system consists of 2 ignition coils, 2 spark units, 2 ignition pulse generators and 4 spark plugs. Refer to **Figure 11** for a diagram of the ignition circuit.

All models are equipped with a solid state capacitor discharge ignition (CDI) system that uses no breaker points. This system provides a longer component life than breaker-point ignitions and delivers a more efficient spark throughout the entire speed range of the engine. Ignition timing is fixed with no means of adjustment. If ignition timing is incorrect, it is due to a faulty unit within the ignition system.

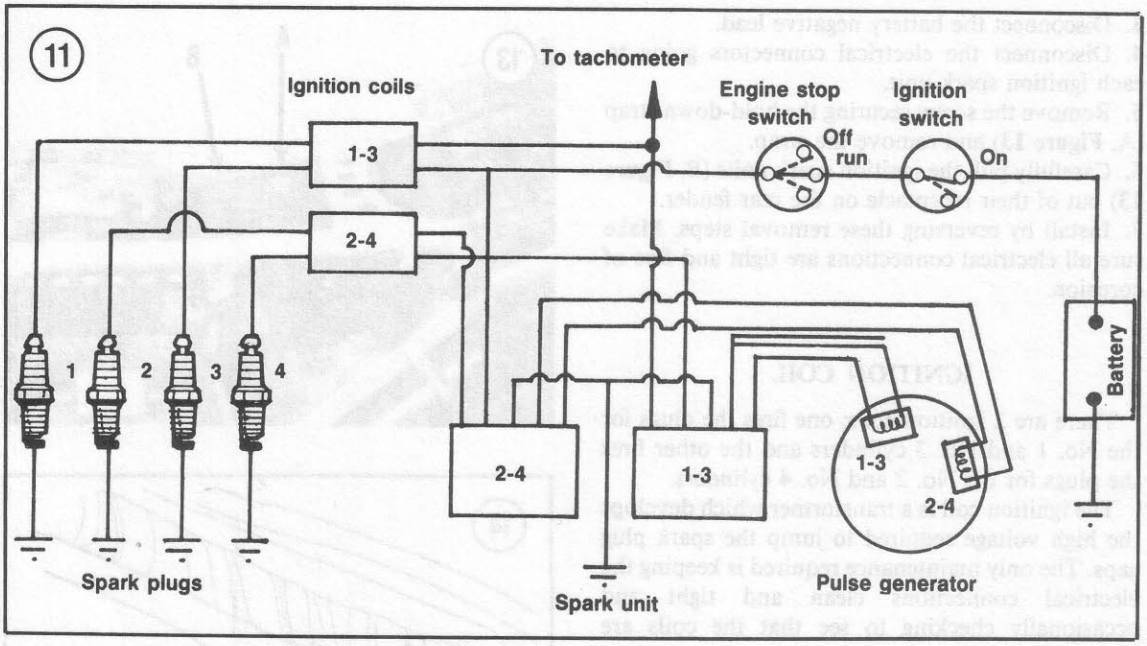


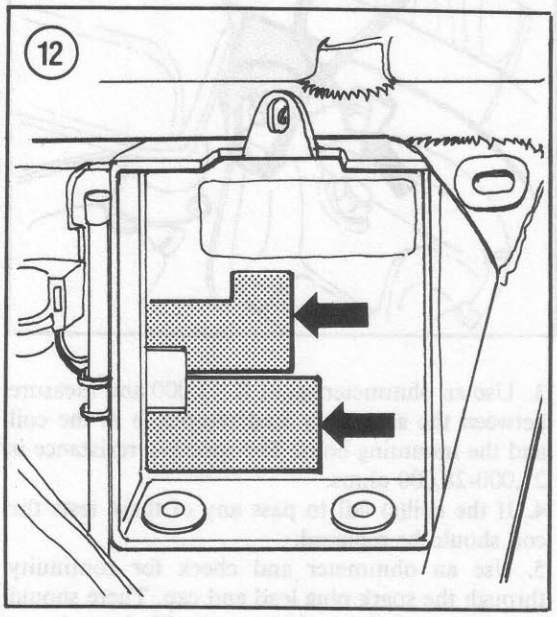
Direct current charges the capacitor. As the piston approaches the firing position, a pulse from the pulse generator coil triggers the silicone-controlled rectifier. The rectifier in turn allows the capacitor to discharge quickly into the primary circuit of the ignition coil, where the voltage is stepped up in the secondary circuit to a value sufficient to fire the spark plugs. The distribution of the pulses from the pulse generator is controlled by the rotation of the raised tabs on the outer surface of the starter clutch housing. The starter clutch is bolted to the primary drive gear.

CDI Precautions

Certain measures must be taken to protect the capacitor discharge system. Instantaneous damage to the semiconductors in the system will occur if the following precautions are not observed.

1. Never connect the battery backwards. If the connected battery polarity is wrong, damage will occur to the voltage regulator/rectifier, the alternator and the spark units.
2. Do not disconnect the battery when the engine is running. A voltage surge will occur which will damage the voltage regulator/rectifier and possibly burn out the lights.
3. Keep all connections between the various units clean and tight. Be sure that the wiring connections are pushed together firmly to help keep out moisture.
4. Do not substitute another type of ignition coil.
5. Each component is mounted within a rubber vibration isolator. Always be sure that the isolator is in place when installing any units in the system.





CDI Troubleshooting

Problems with the capacitor discharge system are usually the production of a weak spark or no spark at all.

1. Check all connections to make sure they are tight and free of corrosion.
2. Check the ignition coils as described in this chapter.
3. Check the ignition pulse generator coils as described in this chapter.
4. If the ignition coils and ignition pulse generator assembly check out okay, the ignition spark units are at fault and must be replaced.

IGNITION SPARK UNITS

Testing

Honda does not provide test procedures or specifications for the ignition spark units. If the ignition coils, the pulse generator assembly and the wiring harness are good and the ignition timing is not within specifications, replace the ignition spark units with known good units.

Replacement (Magna)

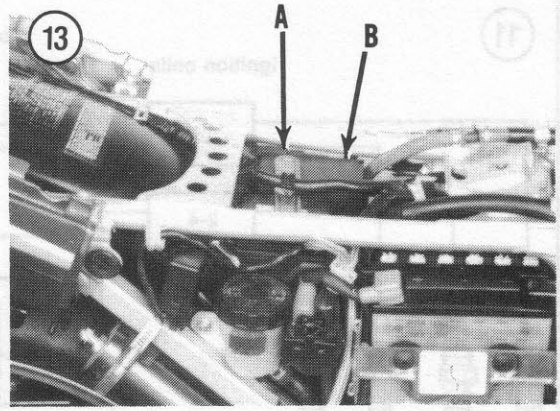
1. Remove the seat as described in Chapter Twelve.
2. Remove both side covers.
3. Remove the battery as described in Chapter Three.
4. Carefully pull the battery box out of the frame.
5. Disconnect the electrical connectors going to each ignition spark unit.
6. Carefully pull the ignition spark units (**Figure 12**) out from the back of the battery box.
7. Install by reversing these removal steps. Make sure all electrical connections are tight and free of corrosion.

Replacement (Interceptor)

1. Remove the seat as described in Chapter Twelve.
2. Remove both side covers.

7

3. Disconnect the battery negative lead.
4. Disconnect the electrical connectors going to each ignition spark unit.
5. Remove the screw securing the hold-down strap (A, **Figure 13**) and remove the strap.
6. Carefully pull the ignition spark units (B, **Figure 13**) out of their receptacle on the rear fender.
7. Install by reversing these removal steps. Make sure all electrical connections are tight and free of corosion.



IGNITION COIL

There are 2 ignition coils; one fires the plugs for the No. 1 and No. 3 cylinders and the other fires the plugs for the No. 2 and No. 4 cylinders.

The ignition coil is a transformer which develops the high voltage required to jump the spark plug gaps. The only maintenance required is keeping the electrical connections clean and tight and occasionally checking to see that the coils are mounted securely.

Dynamic Test

Make sure the kill switch and key are in the ON position. Disconnect the high voltage lead from one of the spark plugs. Remove the spark plug from the cylinder head as described in Chapter Three. Connect a new or known good spark plug to the high voltage lead and place the spark plug base on a good ground like the engine cylinder head (not on a painted surface as the paint sometimes acts as a good insulator). Position the spark plug so you can see the electrodes.

WARNING

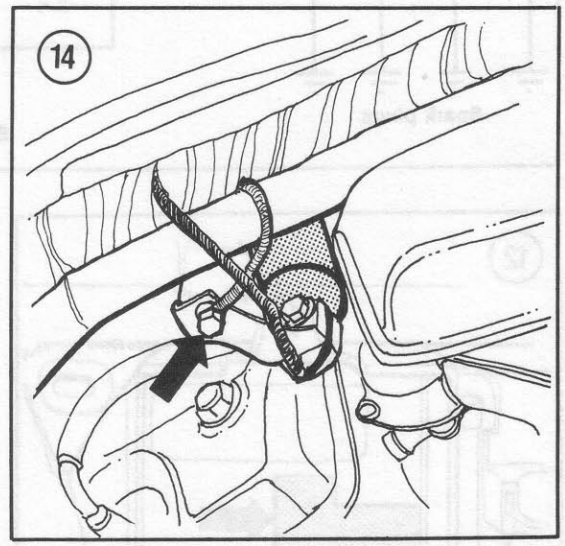
If it is necessary to hold the high voltage lead, do so with an insulated pair of pliers. The high voltage generated could produce serious or fatal shocks.

Push the starter button to turn the engine over a couple of times. If a fat blue spark occurs, the coil is in good condition; if not it must be replaced. Make sure that you are using a known good spark plug for this test. If the spark plug used is defective the test results will be incorrect.

Reinstall the spark plug in the cylinder head.

Continuity Test

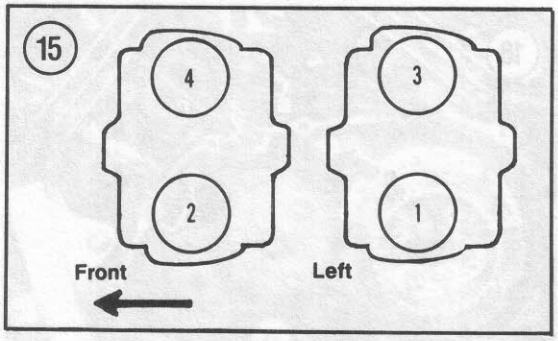
1. Disconnect the primary leads from the coil. Use an ohmmeter set at R×10 and measure between the 2 primary connector lugs on the coil. The specified resistance is 2.8 ohms.
2. Remove the secondary leads (spark plug leads) from the coils.

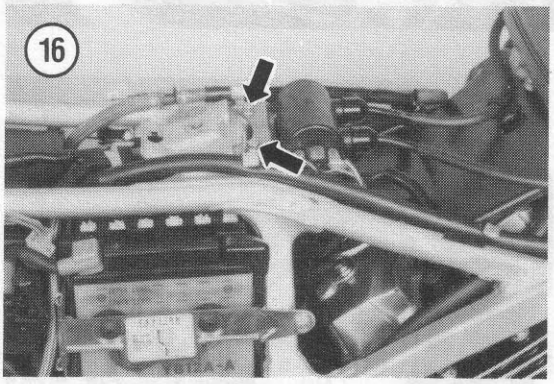


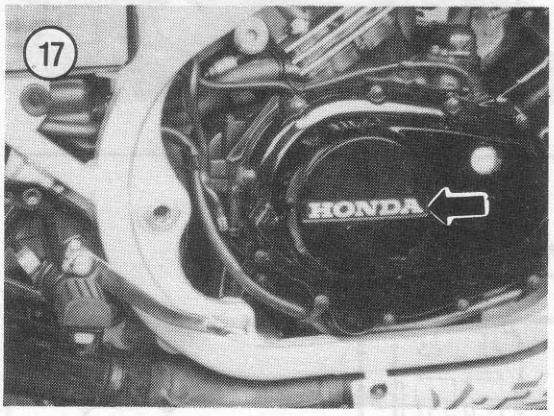
3. Use an ohmmeter set at R×1,000 and measure between the secondary lead receptacle in the coil and the mounting bolts. The specified resistance is 21,000-28,000 ohms.
4. If the coil(s) fail to pass any of these tests the coil should be replaced.
5. Use an ohmmeter and check for continuity through the spark plug lead and cap. There should be continuity (high resistance). If there is no continuity, the spark plug lead or cap is faulty and must be replaced. Perform this test on all 4 spark plug leads.

Removal/Installation (Magna)

1. Remove the seat as described in Chapter Twelve.
2. Remove both side covers.
3. Disconnect the battery negative lead.
4. Remove the fuel tank as described in Chapter Six.







5. Disconnect all spark plug leads.
6. To remove the front coil, perform the following:
   a. Remove the bolt securing the frame front cover on each side and remove both covers.
   b. Disconnect the primary wire connectors from the front coil (No. 2 and No. 4 cylinders). The wire colors are blue and black/white.
   c. Remove the bolts securing the coil to the frame and remove the coil.
7. To remove the rear coil, perform the following:
   a. Disconnect the primary wire connectors from the rear coil (No. 1 and No. 3 cylinders). The wire colors are yellow and black/white.
   b. Remove the bolts (**Figure 14**) securing the coil to the frame and remove the coil.
8. Install by reversing these removal steps, noting the following.
9. Make sure all electrical connections are tight and free of corrosion.
10. Route the spark plug wires to the correct cylinder. Each spark plug wire is numbered next to the spark plug rubber boot. The cylinders are numbered as shown in **Figure 15**.

Removal/Installation (Interceptor)

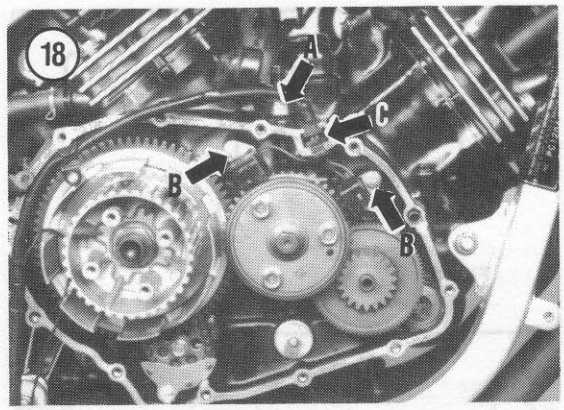
1. Remove the seat as described in Chapter Twelve.
2. Remove both side covers.
3. Disconnect the battery negative lead (**Figure 2**).
4. Remove the fuel tank as described in Chapter Six.
5. Disconnect the spark plug leads.
6. Disconnect the primary wire connectors for both coils. The top coil (No. 2 and No. 4 cylinders) wires are blue and black/white. The bottom coil (No. 1 and No. 3 cylinders) wires are yellow and black/white.
7. Remove the bolts (**Figure 16**) securing the ignition coil assembly to the frame.
8. Remove the ignition coil assembly.
9. Install by reversing these removal steps, noting the following.
10. Make sure all electrical connections are tight and free of corrosion.
11. Route the spark plug wires to the correct cylinder. Each spark plug wire is numbered next to the spark plug rubber boot. The cylinders are numbered as shown in **Figure 15**.

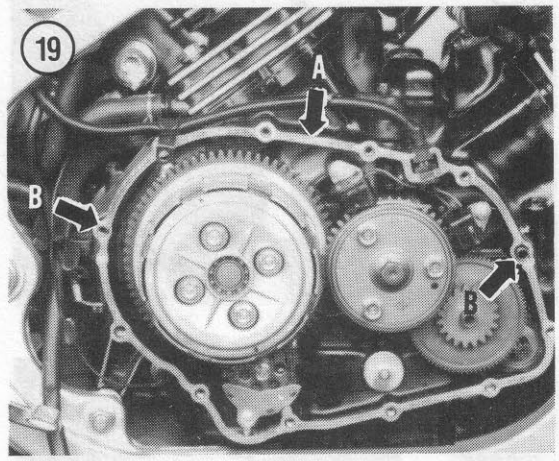
PULSE GENERATOR

Removal/Installation

1. Remove the right-hand side cover.
2. Remove the seat as described in Chapter Twelve.
3. Disconnect the battery negative lead.
4. Remove the fuel tank as described in Chapter Six.
5. Drain the engine oil as described in Chapter Three.
6. On Magna models, perform the following:
   a. Remove the rear brake pedal as described in Chapter Eleven.
   b. Remove the bolts securing the front right-hand footpeg and remove the footpeg assembly.
7. Remove the bolts securing the right-hand crankcase/clutch cover (**Figure 17**) and remove the cover and gasket.

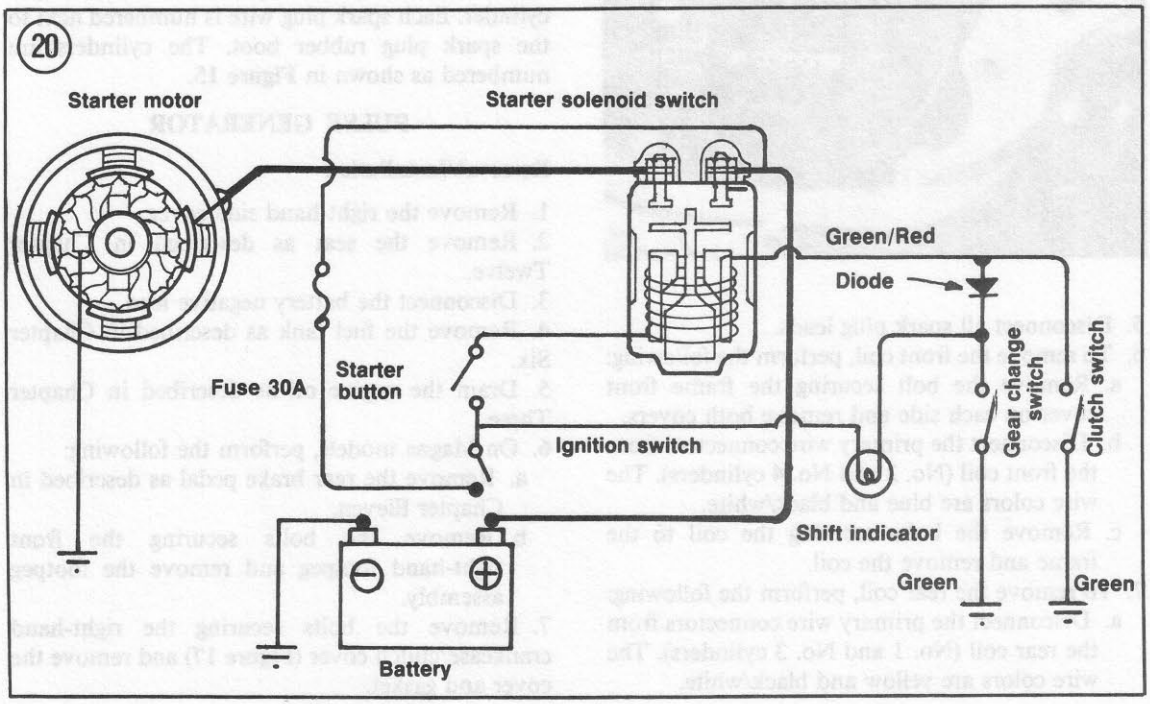
8. Disconnect the 6-pin ignition pulse generator electrical connector.
9. Pull back the rubber boot on the oil pressure warning switch and disconnect the electrical wire from the top of the switch (A, **Figure 18**). This electrical wire is part of the pulse generator wiring harness.
10. Remove the bolts securing each pulse generator (B, **Figure 18**) to the case.
11. Carefully remove the rubber grommet (C, **Figure 18**) and elecrical wires from the crankcase and remove the assembly from the frame.
12. Install by reversing these removal steps, noting the following.
13. Insert the pin on each pulse generator into the hole in the crankcase. This is necessary for proper alignment of the pulse generator with the raised tab on the starter clutch housing.
14. Make sure the locating dowels are in place in the crankcase (B, **Figure 19**). Install a new gasket (A, **Figure 19**) and the right-hand crankcase/clutch cover. Tighten the bolts securely.
15. Make sure all electrical connections are free of corrosion and are tight.

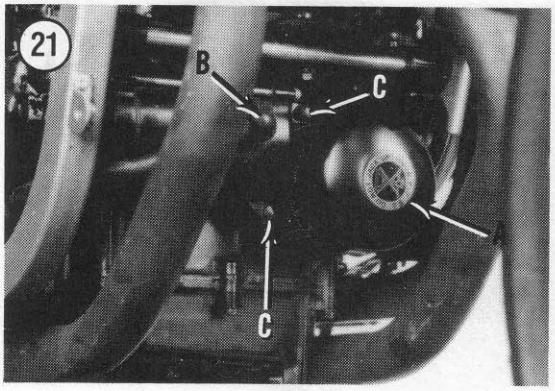


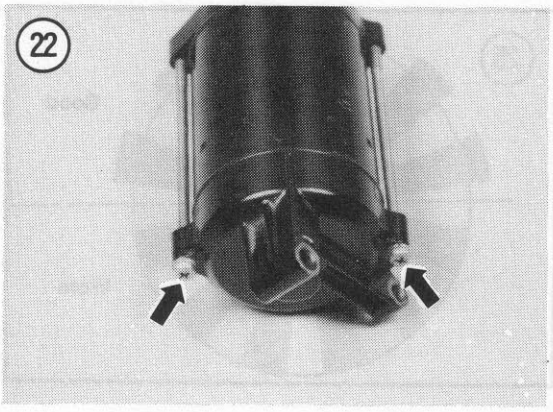


Testing

1. Remove both side covers.
2. Disconnect the 6-pin ignition pulse generator electrical connector (**Figure 7**).







3. Connect the ohmmeter leads between the white/yellow and the yellow leads (No. 1 and No. 3 cylinders) and then between the white and the blue leads (No. 2 and No. 4 cylinders).
4. The resistance for each coil should be 315-385 ohms at 20° C (68° F). If the pulse generator coils do not meet these specifications, the ignition pulse generator assembly must be replaced as described in this chapter. It cannot be serviced.

STARTING SYSTEM

The starting system consists of the starter motor, starter gears, solenoid and the starter button.

The starting system is shown in **Figure 20**. When the starter button is pressed, it allows current flow through the solenoid coil. The coil contacts close, allowing current to flow from the battery to the starter motor.

CAUTION

Do not operate the starter for more than 5 seconds at a time. Let it rest approximately 10 seconds, then use it again.

The starter gears and starter clutch assembly are covered in Chapter Four.

Table 1, at the end of the chapter, lists possible starter problems, probable causes and most common remedies.

Starter Removal/Installation

1. On Interceptor models, remove the lower cowl as described in Chapter Twelve.
2. To remove the oil filter, perform the following:
   a. Place a drain pan under the oil filter.
   b. Use a strap wrench and remove the oil filter (A, **Figure 21**). If it is not time to change the engine oil and to replace the oil filter, keep the oil filter upright to keep as much oil within the filter as possible.
3. Disconnect the electric starter cable from the starter (B, **Figure 21**).
4. Remove the bolts (C, **Figure 21**) securing the starter to the crankcase.
5. Pull the starter to the left and remove the starter from the crankcase.
6. Install by reversing these removal steps, noting the following.
7. Make sure the electrical wire connection is tight and free of corrosion.
8. Before installing the oil filter, clean off the mating surface of the crankcase—do not allow any road dirt to enter the oil system.
9. Install the oil filter and tighten to approximately 20 N•m (14 ft.-lb.).
10. Start the engine and let it run for a short while, then shut off the engine and check for correct oil level. Adjust if necessary as described in Chapter Three.

Starter Disassembly/Inspection/Assembly

Starter motor overhaul is best left to an expert. This procedure shows how to detect a defective starter.

1. Remove the case screws (**Figure 22**) and separate the cover from the case.

NOTE

Write down the number of shims used on the shaft next to the commutator. Be sure to install the same number when reassembling the starter.

2. Clean all grease, dirt and carbon from the armature, case and end cover.

CAUTION

Do not immerse brushes or the wire windings in solvent as the insulation may be damaged. Wipe the windings with a cloth lightly moistened with solvent and dry thoroughly.

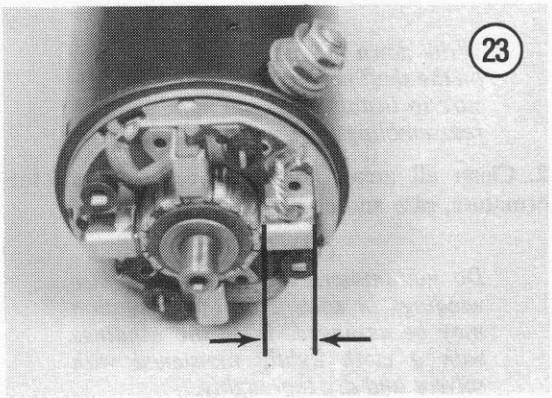
3. Measure the length of each brush (**Figure 23**) with a vernier caliper. If the length is 6.5 mm (0.26 in.) or less for any one of the brushes, the brush holder assembly and brush assembly must be replaced. The brushes cannot be replaced individually.
4. To replace the brushes, perform the following:

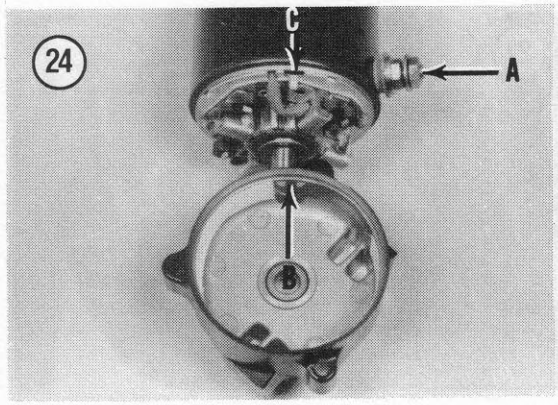
NOTE

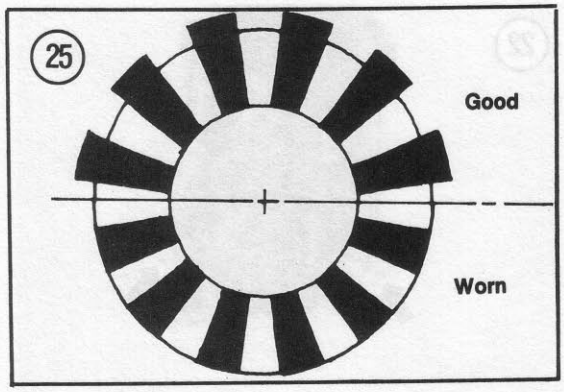
Before removing the nuts and washers, write down their description and order. They must be reinstalled in the same order to insulate this set of brushes from the case.

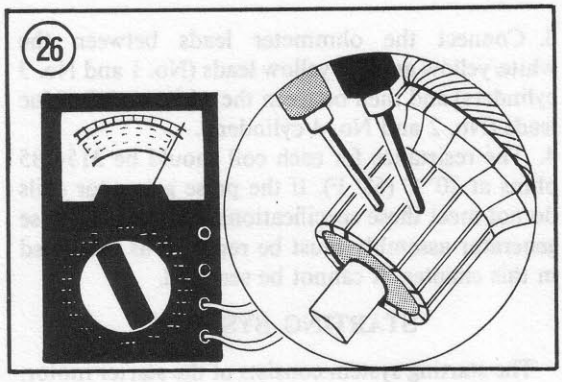
a. Remove the nuts, washers and O-ring (A, **Figure 24**) securing the brush assembly.
b. Slide the armature and brush holder assemblies partially out of the case.
c. Remove the old brush holders and install new brush holders.
d. Slide the armature and brush holder assemblies back into the case.
e. Install the nuts and washers in the original order to secure the brush assembly.

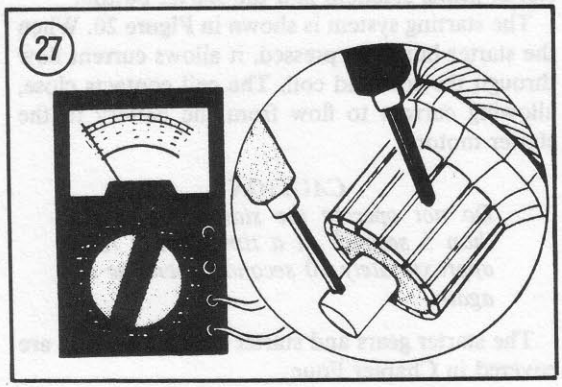
5. Inspect the commutator. The mica in a good commutator is below the surface of the copper bars. On a worn commutator, the mica and copper bars may be worn to the same level (**Figure 25**). If necessary, have the commutator serviced by a dealer or electrical repair shop.
6. Inspect the commutator copper bars for discoloration. If a pair of bars are discolored, grounded armature coils are indicated.
7. Use an ohmmeter to check for continuity between the commutator bars (**Figure 26**); there should be continuity (low resistance) between pairs of bars. Also check for continuity between the commutator bars and the shaft (**Figure 27**); there should be no continuity (infinite resistance). If the unit fails either of these tests, the armature is faulty and must be replaced.

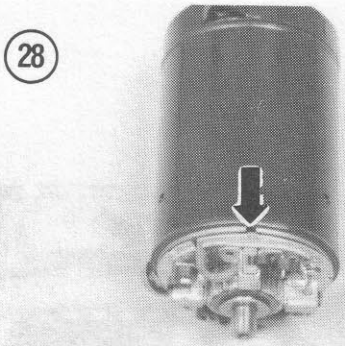


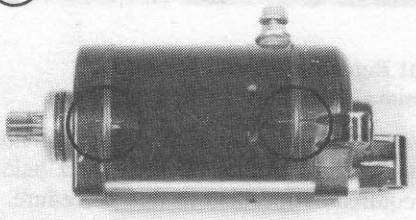


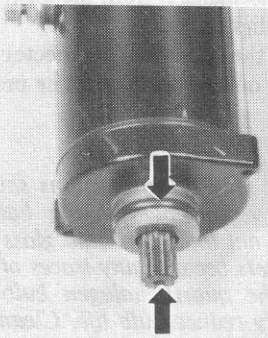












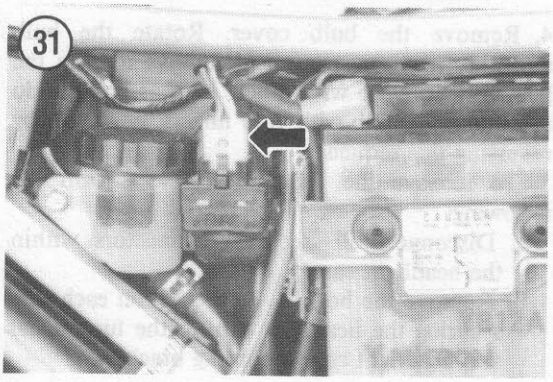
8. Use an ohmmeter and check for continuity between the starter cable terminal and the starter case; there should be no continuity (infinite resistance). Also check for continuity between the starter cable terminal and each brush wire terminal; there should be continuity (low resistance). If the unit fails either of these tests, the case/field coil assembly must be replaced.
9. Assemble the case as follows:
   a. If removed, install the shims onto the shaft next to the commutator.
   b. Align the pin in the brush holder with the notch in the case (**Figure 28**).
   c. Make sure the slot in the rear cover (B, **Figure 24**) is aligned with the pin on the brush holder (C, **Figure 24**).
   d. Align the marks on the case and end cover (**Figure 29**) and assemble the case.
10. Inspect the gear and O-ring seal (**Figure 30**). If the gear is chipped or worn, the armature must be replaced. Replace the O-ring if it has hardened or is starting to deteriorate.

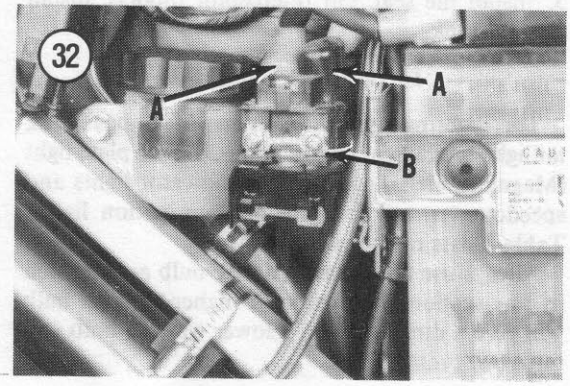
Starter Solenoid Removal/Installation

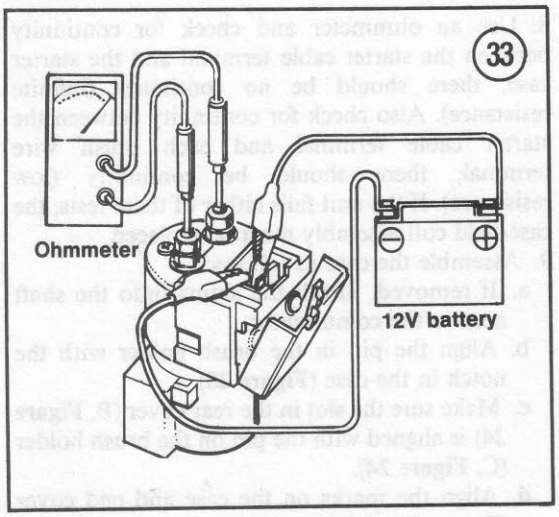
1. Remove the seat as described in Chapter Twelve.
2. Remove the right-hand side cover.
3. Disconnect the negative battery lead (**Figure 2**).
4. Disconnect the electrical connector (**Figure 31**) from the top of the fusible link holder.
5. Slide off the rubber protective boots (A, **Figure 32**) and disconnect the electrical wires from the top terminals.
6. Remove the solenoid (B, **Figure 32**) from the rubber mounting receptacle on the frame.
7. Install by reversing these removal steps.

Starter Solenoid Testing

1. Remove the solenoid as described in this chapter.







2. Connect an ohmmeter to the starter solenoid terminals as shown in **Figure 33**.
3. Connect a 12-volt battery to the switch terminals as shown in **Figure 33**.
4. There should be continuity (low resistance).
5. If there is no continuity (infinite resistance) the solenoid is faulty and must be replaced.

Clutch Diode

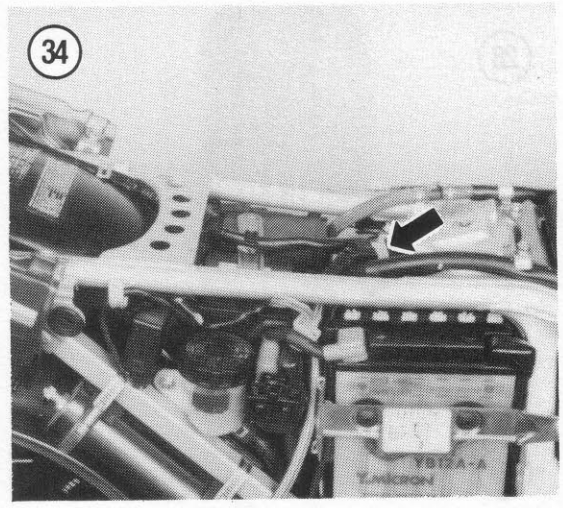
Testing

1. Remove the seat as described in Chapter Twelve.
2. On Interceptor models, remove the fuel tank as described in Chapter Six.
3. Disconnect the clutch diode (**Figure 34**) from the wire harness.
4. Use an ohmmeter and check for continuity between the 2 terminals on the clutch diode. There should be continuity (low resistance) in the normal direction and no continuity (infinite resistance) in the reverse direction. Replace the diode if it fails this test.
5. Install the seat. On Interceptor models, install the fuel tank.

LIGHTING SYSTEM

The lighting system consists of a headlight, taillight/brake light combination, license plate light (Magna models), turn signals, indicator lights and speedometer and tachometer illumination lights. **Table 2** lists replacement bulbs.

Always use the correct wattage bulb as indicated in this section. The use of a higher wattage bulb will give a dim light and a lower wattage bulb will burn out prematurely.



Headlight Replacement and Headlight Case Removal/Installation (Magna)

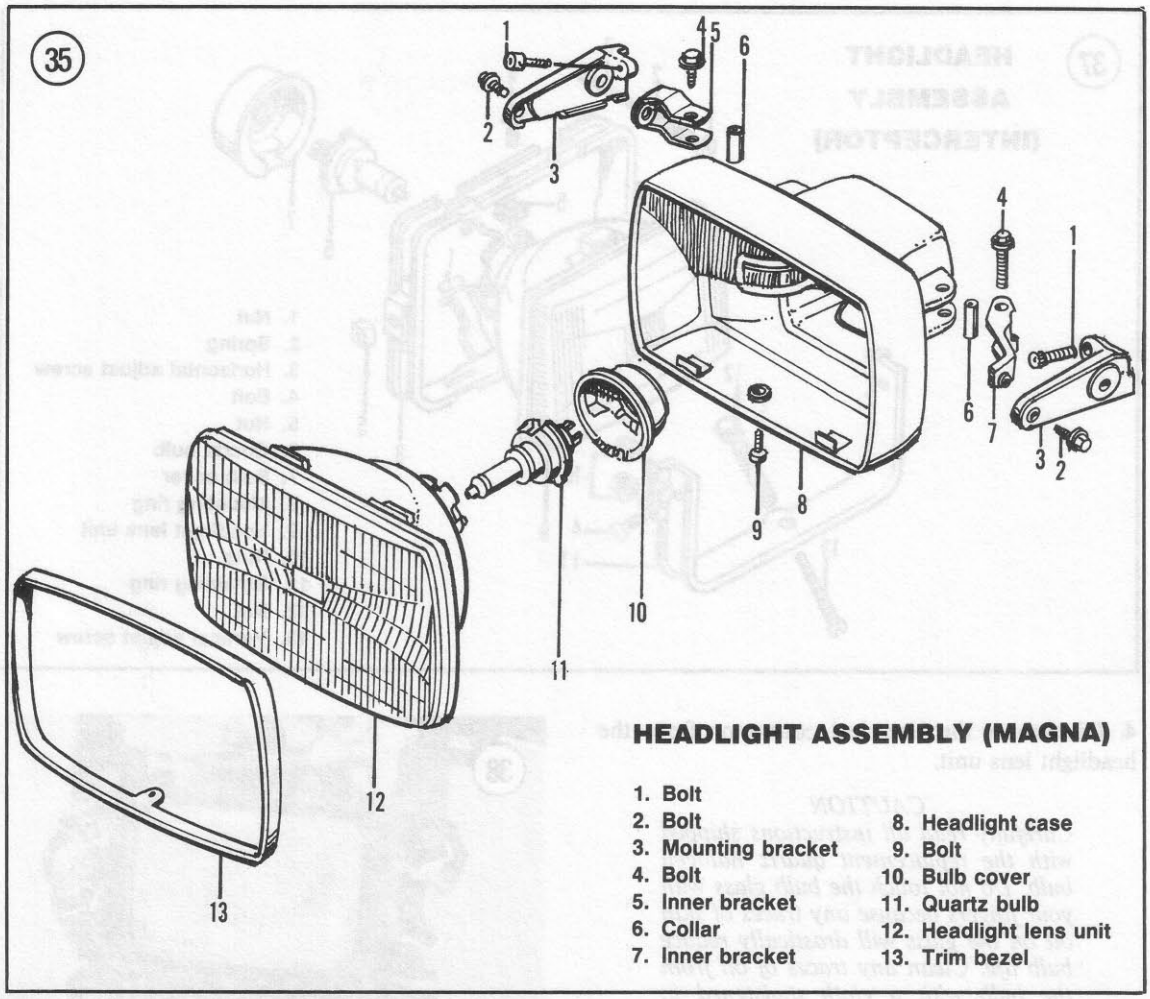
The Magna is equipped with a quartz halogen headlight. Special handling of the quartz halogen bulb is required as specified in this procedure.

Refer to **Figure 35** for this procedure.
1. Remove the screw (A, **Figure 36**) on the bottom of the trim bezel securing the headlight assembly.
2. Pull out on the bottom of the headlight assembly and disengage it from the locating tabs on top of the headlight housing.
3. Disconnect the electrical connector from the bulb connector on the headlight lens unit.

CAUTION

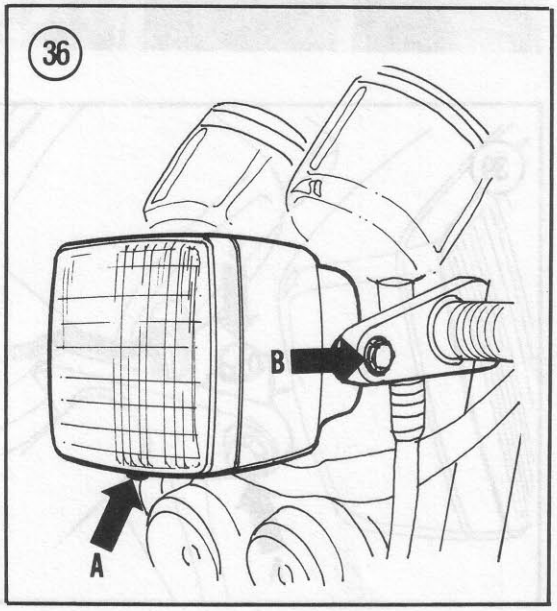
Carefully read all instructions shipped with the replacement quartz halogen bulb. Do not touch the bulb glass with your fingers because any traces of skin oil on the quartz halogen bulb will drastically reduce bulb life. Clean any traces of oil from the bulb with a cloth moistened in alcohol or lacquer thinner.

4. Remove the bulb cover. Rotate the bulb assembly to disengage it and remove it from the lens unit. Replace with a new bulb assembly—do not touch the bulb with your fingers. Assemble by reversing this sequence.
5. To remove the headlight case, perform the following:
   a. Disconnect all electrical connectors within the headlight case.
   b. Remove the bolt (B, **Figure 36**) on each side securing the headlight case to the turn signal and headlight case mounting brackets.



HEADLIGHT ASSEMBLY (MAGNA)

1. Bolt
2. Bolt
3. Mounting bracket
4. Bolt
5. Inner bracket
6. Collar
7. Inner bracket
8. Headlight case
9. Bolt
10. Bulb cover
11. Quartz bulb
12. Headlight lens unit
13. Trim bezel



c. Carefully withdraw the electrical wires out though the backside of the headlight case and remove the case.

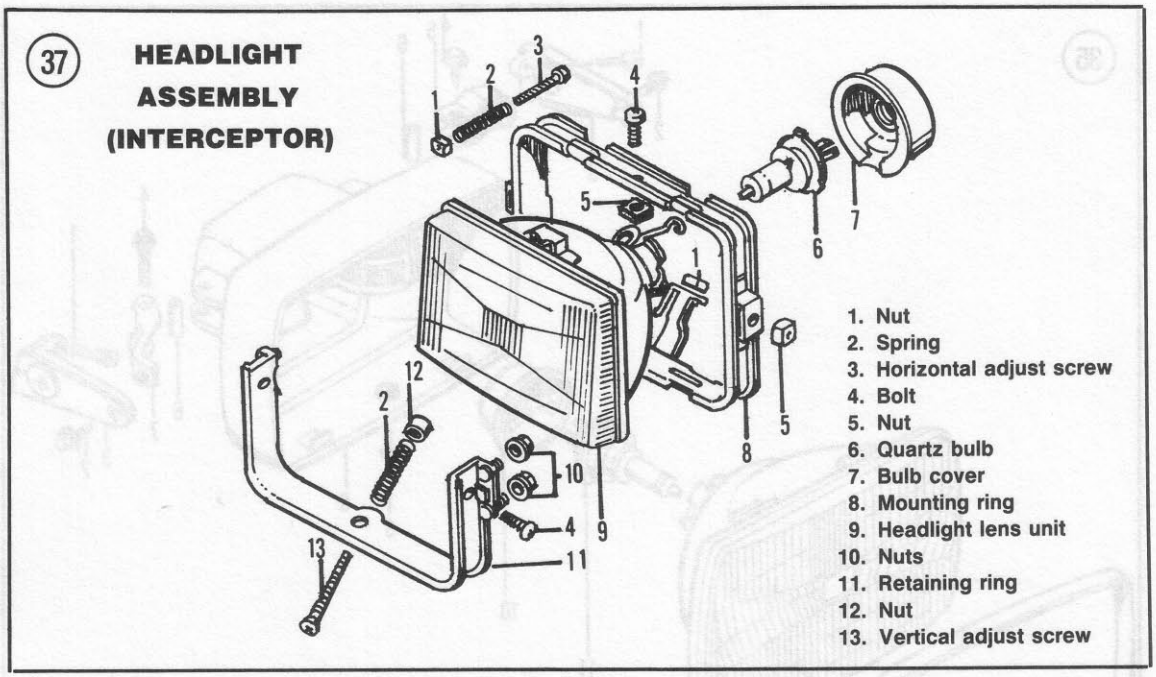
6. Install by reversing these removal steps.
7. Adjust the headlight as described in this chapter.

Headlight Replacement and Headlight Assembly Removal/Installation (Interceptor)

The headlight is equipped with a quartz halogen bulb. Special handling of the quartz halogen bulb is required as specified in this procedure.

Refer to **Figure 37** for this procedure.

1. Remove the front fairing as described in Chapter Twelve.
2. Remove the nuts (**Figure 38**) on each side of the retaining rim securing the headlight mounting ring and lens unit.
3. Remove the headlight assembly.

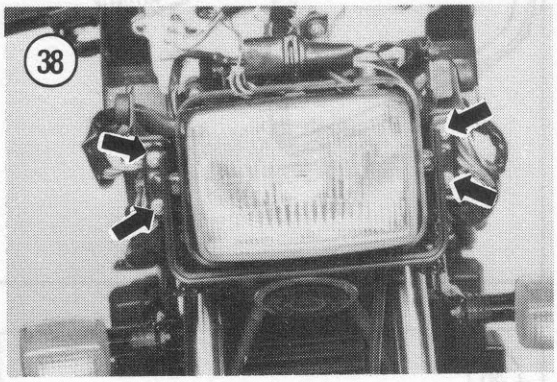


4. Disconnect the electrical connector from the headlight lens unit.

CAUTION

Carefully read all instructions shipped with the replacement quartz halogen bulb. Do not touch the bulb glass with your fingers because any traces of skin oil on the glass will drastically reduce bulb life. Clean any traces of oil from the bulb with a cloth moistened in alcohol or lacquer thinner.

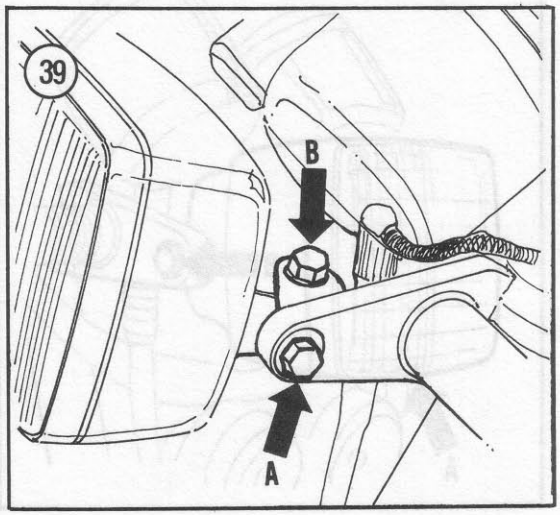
5. Remove the bulb cover.
6. Unhook the set spring and remove the bulb assembly.
7. Replace with a new bulb assembly—do not touch the bulb with your fingers.
8. Assemble and install by reversing these removal steps, noting the following.
9. Install the bulb cover with the UP mark facing up.
10. Adjust the headlight as described in this chapter.

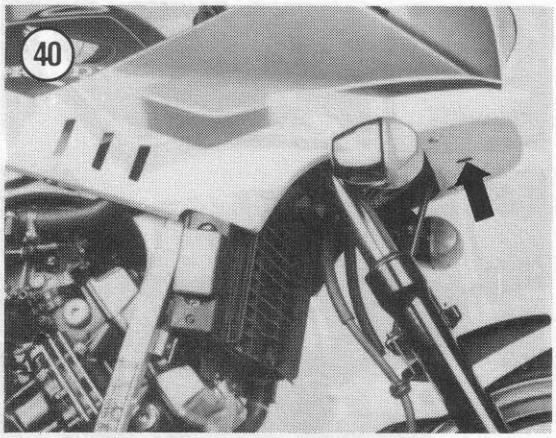


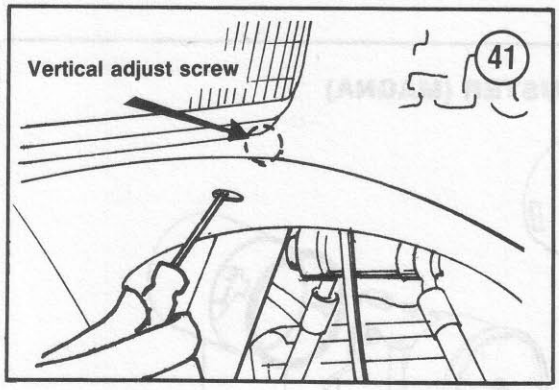
Headlight Adjustment (Magna)

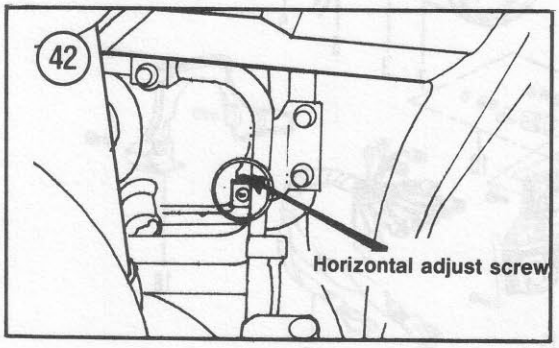
Adjust the headlight vertically and horizontally according to Department of Motor Vehicles regulations in your area.

To adjust the headlight vertically, loosen the headlight case mounting bolts (A, **Figure 39**) on each side of the headlight assembly. Position the headlight correctly. Retighten the bolts.









To adjust the headlight horizontally, loosen the headlight case inner bracket mounting bolts (B, **Figure 39**) on each side of the headlight assembly. Position the headlight correctly. Retighten the bolts.

Headlight Adjustment (Interceptor)

Adjust the headlight horizontally and vertically according to Department of Motor Vehicles regulations in your area.

The headlight can be adjusted with the front fairing in place.

To adjust the headlight vertically, insert a screwdriver into the hole (**Figure 40**) in the base of the front fairing. Turn the screw (**Figure 41**) at the base of the headlight lens. Turning the screw clockwise turns the light downward and counterclockwise will direct the light upward.

To adjust the headlight horizontally, from within the right-hand side of the front fairing, turn the screw (**Figure 42**) on the mounting ring. Turning the screw clockwise turns the light toward the right-hand side of the rider and counterclockwise will direct the light to the left-hand side of the rider.

Taillight/Brake Light Replacement

1. Remove the seat as described in Chapter Twelve.

NOTE
Interceptor models have 2 bulbs. Magna models use only one.

2. Reach into the rear cowl area and rotate the bulb socket assembly and withdraw the socket assembly from the taillight housing.
3. Inspect the socket assembly gasket and replace if it is damaged or deteriorated.
4. Replace the bulb and install the socket assembly. Turn the socket assembly and make sure it is secure in the lens assembly.

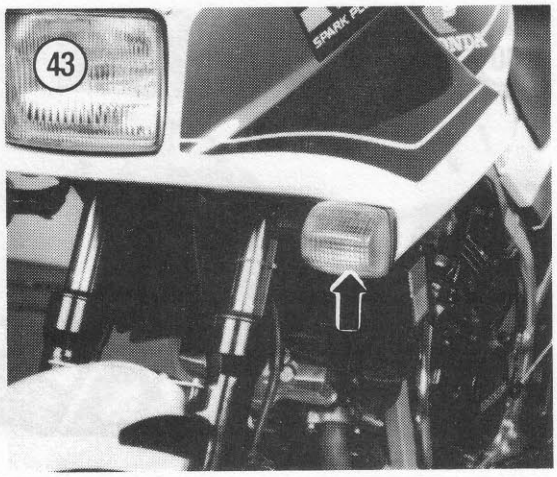
License Plate Light Replacement (Magna)

1. From the underside of the rear fender, remove the cap nuts (toward the center of the light assembly) securing the license plate light assembly. Do not remove the outer flange nuts as they secure the entire assembly to the rear fender.
2. Pull the license plate light cover, lens and gasket as an assembly from the socket backing plate.
3. Wash the inside and outside of the lens with a mild detergent and wipe dry.
4. Inspect the lens gasket and replace if it is damaged or deteriorated.
5. Replace the bulb.
6. Install the gasket, lens and cover.
7. Tighten the nuts securely.

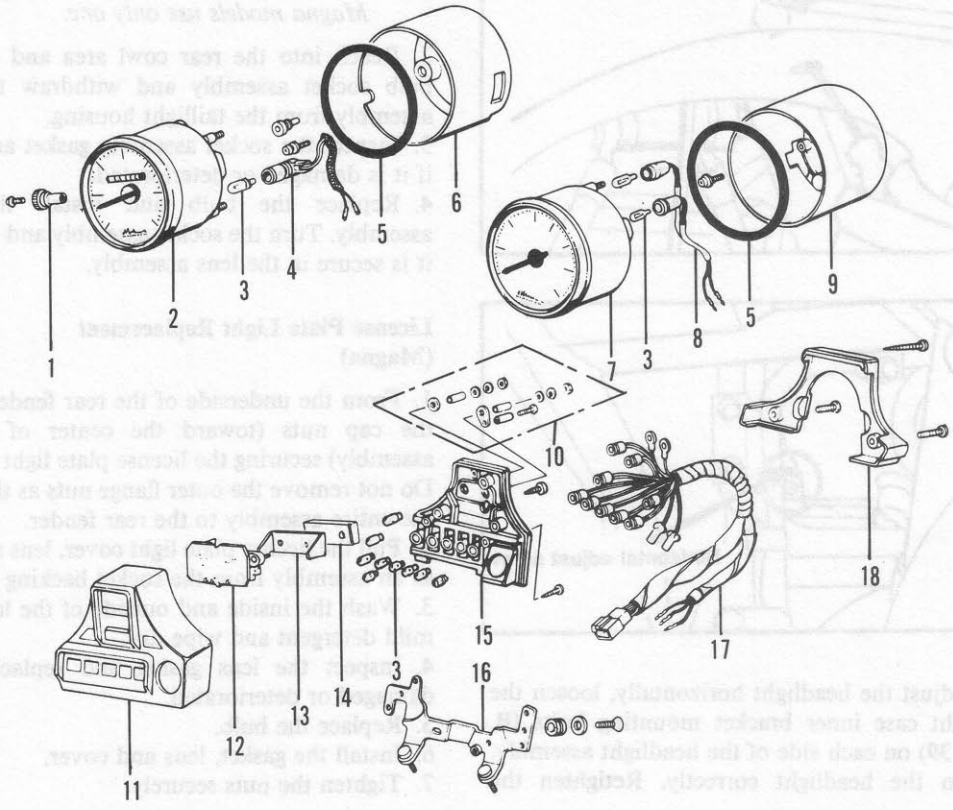
Front and Rear Turn Signal Light Replacement

1A. On Magna models, remove the lens assembly securing the screws on the front of the lens.
1B. On Interceptor models, remove the lens assembly securing screw (**Figure 43**) on the underside of the turn signal housing.

2. Carefully pull the lens assembly away from the housing.
3. Rotate the bulb socket assembly and withdraw the socket assembly from the lens assembly.
4. Inspect the socket assembly gasket and replace if it is damaged or deteriorated.
5. Wash the inside and outside of the lens with a mild detergent and wipe dry.
6. Replace the bulb and install the socket assembly. Turn the socket assembly and make sure it is secure in the lens assembly. If not tightened correctly, water will enter the lens area.
7. Install the lens assembly turn signal housing and install the screw(s) securing the lens assembly. On Magna models, do not overtighten the screws or the lens may crack.



INSTRUMENT CLUSTER (MAGNA)



1. Reset knob
2. Speedometer
3. Bulb
4. Socket assembly
5. Gasket
6. Case
7. Tachometer
8. Socket assembly
9. Case
10. Mounting hardware
11. Meter cover
12. Meter
13. Bracket
14. Pad
15. Backing
16. Mounting bracket
17. Wiring harness
18. Rear cover

Indicator Light and Meter Illumination Light Replacement (Magna)

Refer to **Figure 44** for this procedure.

1. Remove the instrument cluster as described in this chapter.

CAUTION

In the next steps, do not allow the instruments to remain upside down any longer than necessary as the needle damping fluid will leak out onto the instrument face and lens.

2. Turn this assembly upside down.
3. Remove the screws securing the lower cover and remove the lower cover.
4. Remove the screw securing the indicator panel to the mounting bracket.
5. Disconnect the electrical wires going to the meters and remove the indicator panel from the mounting bracket.
6. To replace the meter illumination lights, remove the screws securing the meter covers and remove the meter covers.
7. To replace the indicator lights, remove the screws securing the indicator panel cover and remove the panel cover.
8. Pull the defective bulb(s) straight up and out of the socket base and replace with new ones.
9. Assemble and install by reversing these steps.

Indicator Light and Meter Illumination Light Replacement (Interceptor)

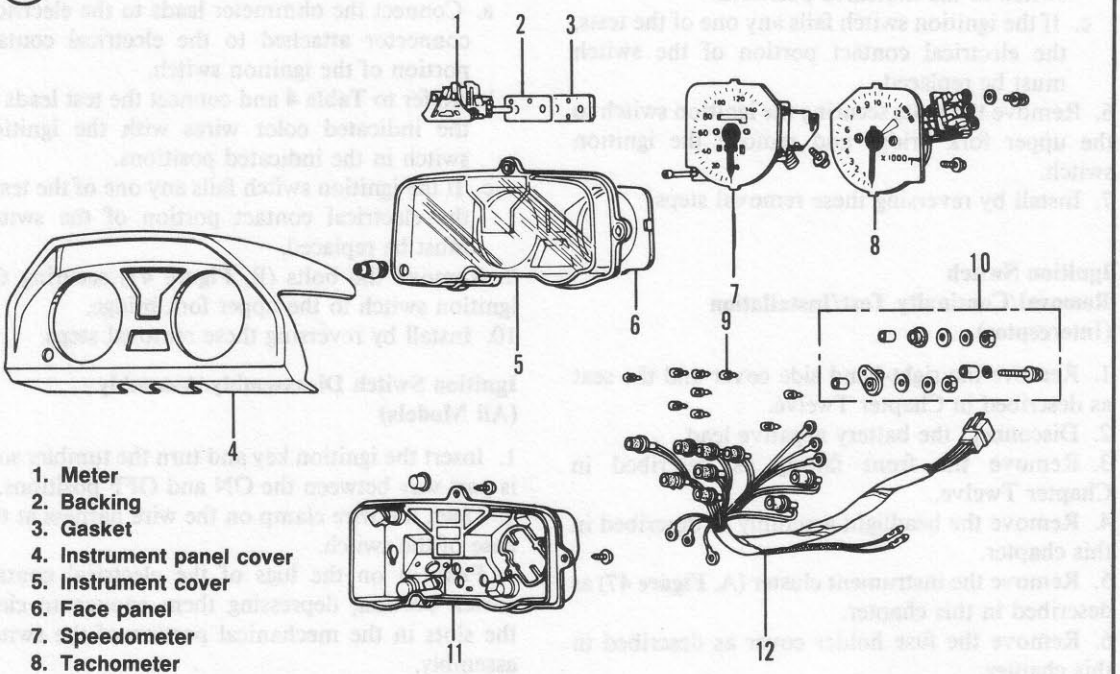
Refer to **Figure 45** for this procedure.

1. Remove the headlight as described in this chapter.
2. Remove the front fairing as described in Chapter Twelve.
3. From the backside of the instrument cluster, pull the defective bulb(s) (**Figure 46**) straight up and out of the socket base and replace with new ones.
4. Assemble and install by reversing these steps.

SWITCHES

During some of the test procedures in this section, it is necessary to ground an ohmmeter test

45 **INSTRUMENT CLUSTER (INTERCEPTOR)**



1. Meter
2. Backing
3. Gasket
4. Instrument panel cover
5. Instrument cover
6. Face panel
7. Speedometer
8. Tachometer
9. Bulb
10. Mounting hardware
11. Meter backing
12. Wiring harness

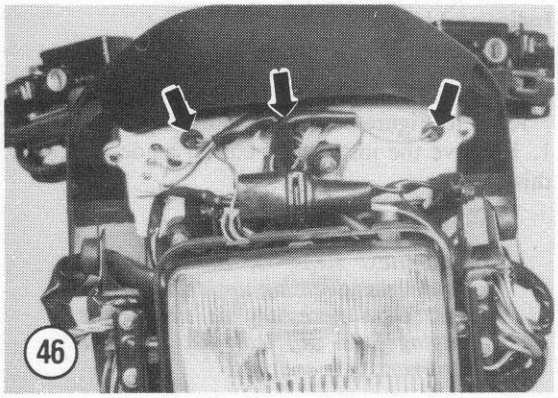
lead or electrical wire. In some cases the black painted surface of the engine works as a great electrical insulator. Therefore, either touch the test lead or electrical wire to a bare bolt or nut or carefully scratch through the black paint (in an area that won't be seen) until you reach a bare aluminum surface. If you don't make a good electrical contact with a good grounding surface the test readings may be false. This could result in the unnecessary purchase of an electrical part.

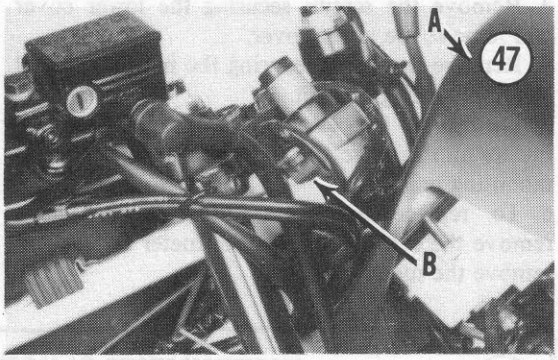
Ignition Switch
Removal/Continuity Test/Installation
(Magna)

1. Remove the headlight and headlight case as described in this chapter.
2. Remove the right-hand side cover and the seat.
3. Disconnect the battery negative lead.
4. Disconnect the ignition switch 6-pin electrical connector from the wiring harness.
5. To check continuity of the switch, use an ohmmeter and perform the following:
   a. Connect the ohmmeter leads to the electrical connector attached to the electrical contact portion of the ignition switch.
   b. Refer to **Table 3** and connect the test leads to the indicated color wires with the ignition switch in the indicated positions.
   c. If the ignition switch fails any one of the tests, the electrical contact portion of the switch must be replaced.
6. Remove the bolts securing the ignition switch to the upper fork bridge and remove the ignition switch.
7. Install by reversing these removal steps.

Ignition Switch
Removal/Continuity Test/Installation
(Interceptor)

1. Remove the right-hand side cover and the seat as described in Chapter Twelve.
2. Disconnect the battery negative lead.
3. Remove the front fairing as described in Chapter Twelve.
4. Remove the headlight assembly as described in this chapter.
5. Remove the instrument cluster (A, **Figure 47**) as described in this chapter.
6. Remove the fuse holder cover as described in this chapter.
7. Disconnect the ignition switch 6-pin electrical connector from the wiring harness.
8. To check continuity of the switch, use an ohmmeter and perform the following:

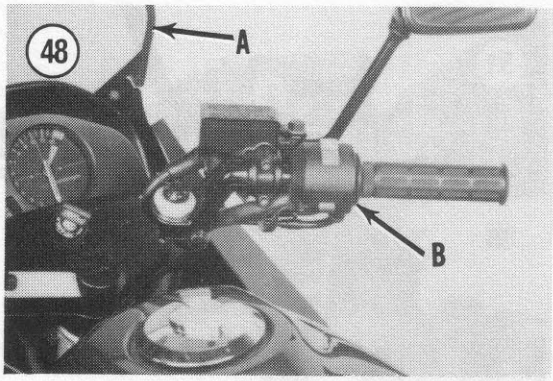


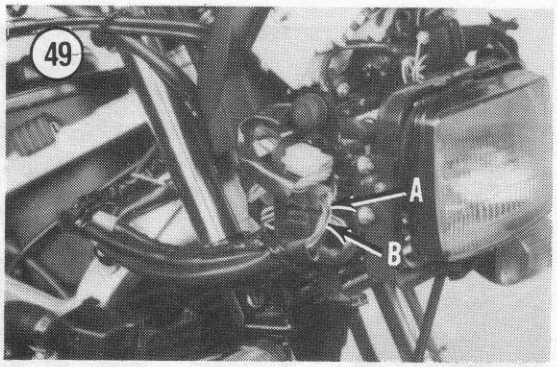


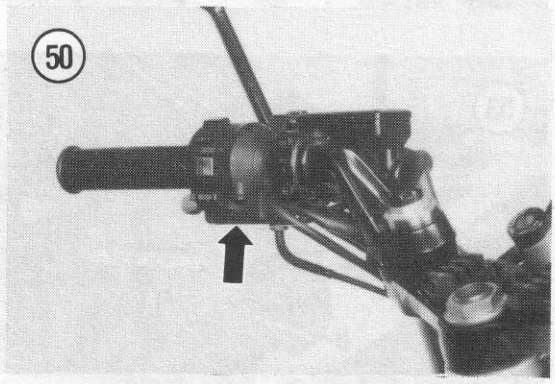
   a. Connect the ohmmeter leads to the electrical connector attached to the electrical contact portion of the ignition switch.
   b. Refer to **Table 4** and connect the test leads to the indicated color wires with the ignition switch in the indicated positions.
   c. If the ignition switch fails any one of the tests, the electrical contact portion of the switch must be replaced.
9. Remove the bolts (B, **Figure 47**) securing the ignition switch to the upper fork bridge.
10. Install by reversing these removal steps.

Ignition Switch Disassembly/Assembly
(All Models)

1. Insert the ignition key and turn the tumbler so it is part way between the ON and OFF positions.
2. Open the wire clamp on the wire harness at the base of the switch.
3. Push in on the lugs of the electrical contact switch portion, depressing them enough to clear the slots in the mechanical portion of the switch assembly.
4. Withdraw the electrical contact switch from the mechanical portion of the ignition switch.
5. Replace the defective component.
6. Assemble by reversing these disassembly steps.







Engine Stop Switch and Starter Button Removal/Installation

The engine stop switch and starter button are an integral part of the right-hand switch assembly. If either of these switches are faulty, the entire switch assembly must be replaced.

1A. On Interceptor models, remove the front fairing (A, **Figure 48**) as described in Chapter Twelve.

1B. On Magna models, remove the headlight as described in this chapter.

2. Disconnect the front brake light switch electrical connector from the front master cylinder. These wires are part of the engine stop switch and starter button wire harness.

3A. Magna models—within the headlight case, disconnect the 9-pin electrical connector going to the right-hand switch assembly.

3B. Interceptor models—at the electrical connector holder next to the right-hand side of the lower fork bridge (A, **Figure 49**), disconnect the 9 pin electrical connector going to the right-hand switch assembly.

4. Remove the screws clamping the right-hand switch assembly together (B, **Figure 48**).

5. Unhook any straps securing the electrical wires to the handlebar.

6. On Magna models, carefully withdraw the electrical wires through the rear of the headlight case.

7. Remove the left-hand switch assembly and electrical wires from the frame.

8. Install a new switch by reversing these removal steps, noting the following.

9. Make sure all electrical connections are tight and free of corrosion.

Headlight Dimmer Switch, Horn Button and Turn Signal Switch Removal/Installation

The headlight dimmer switch, horn button and turn signal switch are an integral part of the left-hand switch assembly. If any are faulty the entire switch assembly must be replaced.

1A. On Interceptor models, remove the front fairing as described in Chapter Twelve.

1B. On Magna models, remove the headlight as described in this chapter.

2. In the following steps, disconnect the following electrical connectors going to the left-hand switch assembly:

a. Clutch switch.
b. Horn.
c. Right-hand and left-hand front turn signal light assemblies.
d. Headlight.

These wires are part of the left-hand switch wire harness.

3A. Magna models—within the headlight case, disconnect the 9-pin electrical connector going to the left-hand switch assembly.

3B. Interceptor models—at the electrical connector holder next to the right-hand side of the lower fork bridge (B, **Figure 49**), disconnect the 9 pin electrical connector going to the right-hand switch assembly.

4. Remove the screws clamping the left-hand switch assembly together (**Figure 50**).

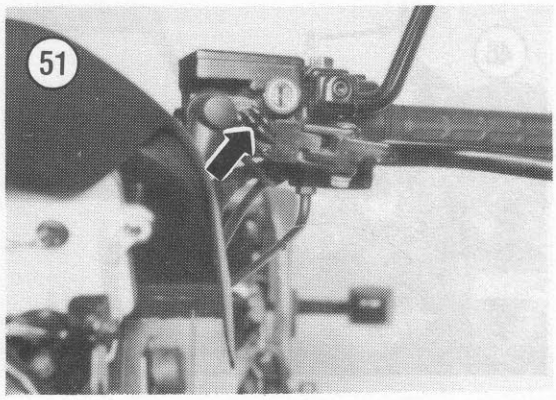
5. Unhook any straps securing the electrical wires to the handlebar.
6. On Magna models, carefully withdraw the electrical wires through the rear of the headlight case.
7. Remove the left-hand switch assembly and electrical wires from the frame.
8. Install a new switch by reversing these removal steps, noting the following.
9. Make sure all electrical connections are tight and free of corrosion.

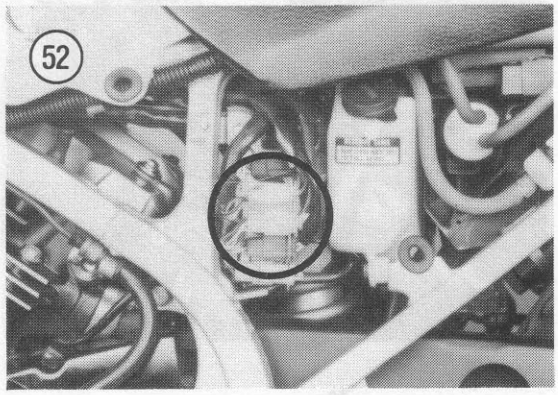
Clutch Switch Testing/Replacement

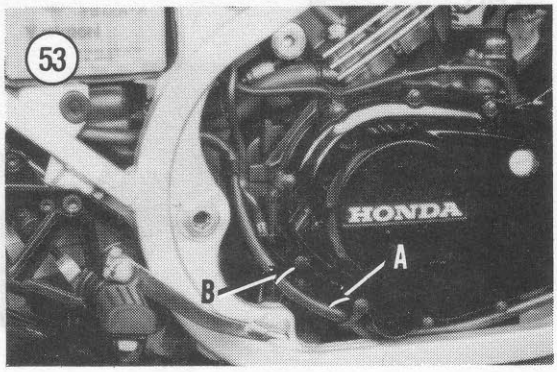
1. Remove the screw (**Figure 51**) securing the clutch switch and remove the switch assembly from the clutch master cylinder.
2. Use an ohmmeter and check for continuity between the 2 terminals on the clutch switch. There should be no continuity (infinite resistance) with the clutch lever released. With the clutch lever pulled, there should be continuity (low resistance). If the switch fails either of these tests, the switch must be replaced.
3. Install a new switch by reversing these removal steps, noting the following.
4. The small portrusion on the switch housing must point toward the handlebar.
5. Make sure all electrical connections are tight and free of corrosion.

Neutral/OD Switch Testing (Magna)

1. Remove the right-hand side cover.
2. Disconnect the 2-pin electrical connector containing 2 wires (1 light green/red and 1 green/orange).
3. To check the neutral portion of the switch, perform the following:
   a. Shift the transmission into NEUTRAL.
   b. Use an ohmmeter and check for continuity between the switch side of the green/orange wire and to ground. There should be continuity (indicated resistance).
   c. Shift the transmission into any gear and repeat Step 3b. There should be no continuity (infinite resistance).
4. To check the OD (6th gear or overdrive) portion of the switch, perform the following:
   a. Shift the transmission into 6th gear.
   b. Use an ohmmeter and check for continuity between the switch side of the light green/red wire and to ground. There should be continuity (indicated resistance).
   c. Shift the transmission into any *other* gear and repeat Step 4b. There should be no continuity (infinite resistance).



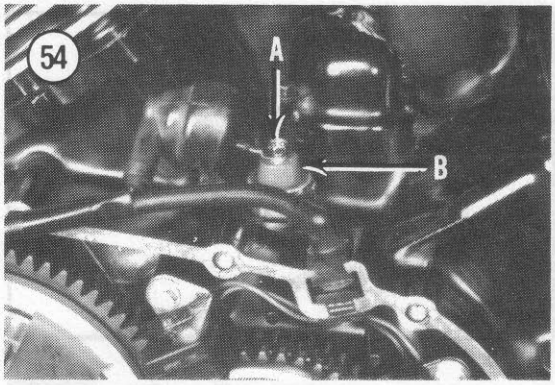


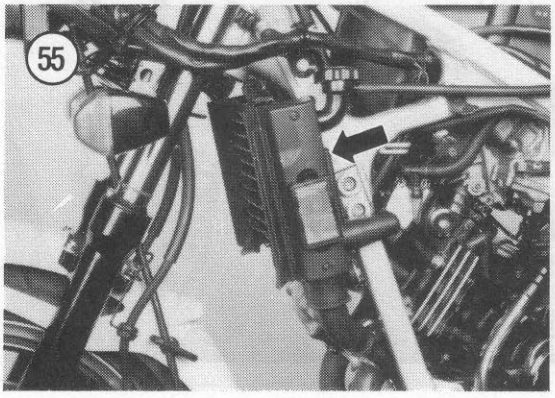


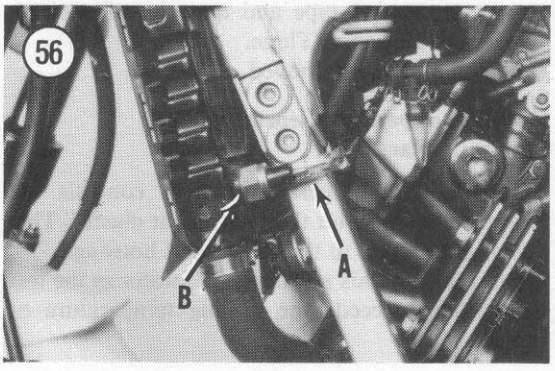
5. If the switch fails any of these tests it must be replaced.

Neutral Switch Testing (Interceptor)

1. Remove the left-hand side cover.
2. Disconnect the 6-pin electrical connector for the pulse generator (**Figure 52**).
3. Use an ohmmeter and check for continuity between the neutral switch side of the black lead (with red and light green tubes) and ground.
4. With the transmission in NEUTRAL there should be continuity (indicated resistance).







5. With the transmission in any gear there should be no continuity (infinite resistance).
6. If the switch fails this test it must be replaced.

Neutral Switch Removal/Installation

1. Disconnect the battery negative lead.
2. Unhook the clamps and move the starter motor electrical cable (A, **Figure 53**) out of the way.
3. Disconnect the electrical connector from the end of the the neutral switch.
4. Unscrew the neutral switch (B, **Figure 53**) from the crankcase.
5. Install by reversing these removal steps.

Oil Pressure Warning Switch Testing/Replacement

The oil pressure warning switch is located on the upper right-hand side of the crankcase above the right-hand crankcase/clutch cover.

1. Pull back the rubber boot and remove the screw securing the electrical connector to the switch (A, **Figure 54**).
2. Temporarily ground the electrical connector to the engine or frame (do not use a painted surface of the engine). Do not ground the connector for any length of time as the circuit can be damaged.
3. The oil pressure warning light should come on if the system is working correctly.
4. If the light does not come on, make sure the warning light bulb is good. Replace if necessary and repeat Step 2 and Step 3.
5. If the light is good but still fails to light, the switch is defective and must be replaced.
6. To replace the switch, perform the following:
   a. Unscrew the switch (B, **Figure 54**) from the top of the crankcase.
   b. Apply a liquid sealant to the threads of the new switch before installation.
   c. Install the switch and screw it in, then tighten the switch to 10-14 N•m (7-10 ft.-lb.).
7. Attach the electrical wire. Make sure the connection is tight and free from oil.
8. Slide the rubber boot back into position.

Thermostatic Switch Testing/Replacement

The thermostatic switch controls the radiator fan according to engine coolant temperature. This switch is attached to the lower left-hand corner of the radiator.

NOTE

If the cooling fan is not operating correctly, make sure that the cooling fan fuse has not blown before starting this test. Also clean off any rust or corrosion from the electrical terminals on the thermostatic switch.

1. Place the bike on the centerstand.
2. Check the coolant level in the coolant reserve tank as described in Chapter Three. Add coolant if necessary.
3. Remove the screws securing the radiator left-hand side cover and remove the side cover (**Figure 55**).
4. Disconnect the electrical wires (A, **Figure 56**) from the thermostatic switch.
5. Place a jumper wire (**Figure 57**) between the black and green electrical wires.

6. Turn the ignition switch ON. The cooling fan should start running.

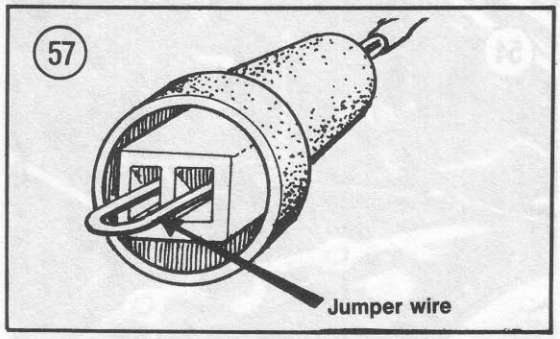
7A. If the fan does not run under any circumstances, either the fan or the wiring to the fan is faulty. Disconnect the fan electrical connector and check for battery voltage between the black lead (positive) and black/blue (negative) in the harness side of the connector. There should be 12 volts present. Replace the fan motor if the wiring checks out okay.

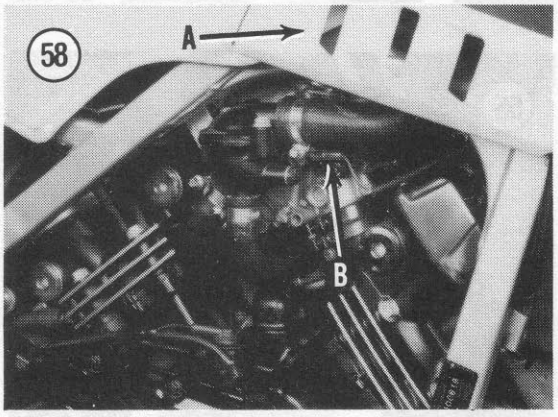
7B. If the fan now runs, the thermostatic switch may be defective; test the switch as follows:

WARNING

Wear safety glasses or goggles and gloves during this test. The coolant is heated to a high temperature, so protect yourself accordingly.

a. Turn the ignition switch OFF.
b. Drain the cooling system as described in Chapter Three.
c. Disconnect the electrical wires (A, **Figure 56**) from the switch and carefully unscrew the switch (B, **Figure 56**) from the radiator.
d. Use an ohmmeter with alligator clips on the test lead ends. Attach the alligator clips to the electrical connectors on the switch. At room temperature there should be no continuity (infinite resistance).
e. Suspend the switch or place the switch on a small piece of wood in a small pan of coolant (40 percent distilled water and 60 percent antifreeze). The switch must be positioned so that all of its threads are submerged in the coolant.
f. Place a thermometer in the pan of coolant (use a cooking or candy thermometer that is rated for higher than the test temperature). Do not let the switch or the thermometer touch the pan as it will give false reading.
g. Heat the coolant slowly.
h. Let the temperature reach 98-102° C (208-215° F), then maintain this temperature for at least 3 minutes before taking a reading. A sudden change in temperature will cause a different ohmmeter reading. After this 3-minute interval is up, check the ohmmeter; there should be continuity (low resistance).
i. If the switch fails this test, the switch must be replaced.
j. Apply a silicone based sealant to the threads of the switch and install the switch in the radiator.





k. Refill the cooling system with the recommended type and quantity of coolant. Refer to Chapter Three.

8. Install all items removed.

Coolant Temperature Sensor Testing/Replacement

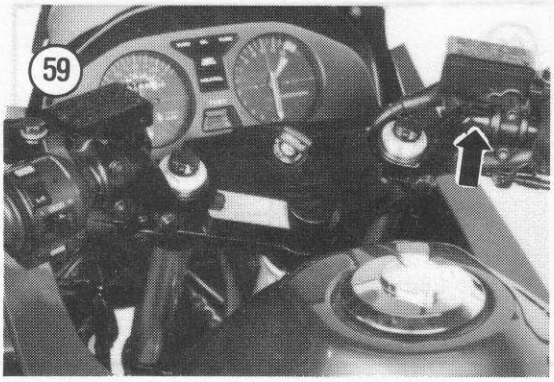
The coolant temperature sensor controls the temperature gauge on the instrument cluster. This sensor is attached to the thermostat housing.

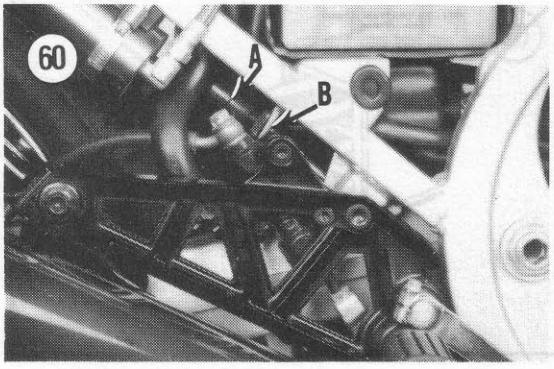
Oil is used in this test instead of water as the test temperature exceeds the boiling temperature of water.

WARNING

Wear safety glasses or goggles and gloves during this test. The oil is heated to a very high temperature, so protect youself accordingly.

1. On Interceptor models, remove the front fairing (A, **Figure 58**) as described in Chapter Twelve.
2. Drain the cooling system as described in Chapter Three.
3. Disconnect the green/blue electrical wire from the temperature sensor located on the thermostat housing (B, **Figure 58**).
4. Remove the temperature sensor from the thermostat housing.





5. Use an ohmmeter with alligator clips on the test lead ends. Attach one of the alligator clips to the electrical connector on the sensor. Attach the other alligator clip to the sensor body.

6. Suspend the sensor or place the sensor on a small piece of wood in a small pan of oil. Place a thermometer in the pan of oil (use a cooking or candy thermometer that is rated for higher than the test temperature). Do not let the sensor or the thermometer touch the pan as it will give false readings.

7. Heat the oil and check the resistance readings as listed in **Table 5**.

8. If the sensor readings do not correspond to those listed in **Table 5** during any of the temperature ranges, the sensor must be replaced.

9. Thoroughly clean the oil from the threads of the sensor.

10. Apply a silicone-based sealant to the threads of the sensor and install the sensor in the thermostat housing. Tighten the sensor securely.

11. Connect the green/blue electrical wire to the temperature sensor.

12. Refill the cooling system as described in Chapter Three.

13. On Interceptor models, install the front fairing as described in Chapter Twelve.

Front Brake Light Switch Testing/Replacement

1. Disconnect the electrical wires to the brake light switch (**Figure 59**).

2. Use an ohmmeter and check for continuity between the 2 terminals on the brake light switch. There should be no continuity (infinite resistance) with the brake lever released. With the brake lever applied, there should be continuity (low resistance). If the switch fails either of these tests the switch must be replaced.

3. Remove the screw securing the brake light switch and remove the brake light switch from the brake master cylinder.

4. Install a new switch by reversing these removal steps, noting the following.

5. Make sure all electrical connections are tight and free of corrosion.

Rear Brake Light Switch Testing/Replacement

1. Disconnect the electrical wires (A, **Figure 60**) to the rear brake light switch.

2. Use an ohmmeter and check for continuity between the 2 terminals on the brake light switch. There should be no continuity (infinite resistance) with the brake pedal released. With the brake pedal down or applied there should be continuity (low resistance). If the switch fails either of these tests, the switch must be replaced.

3. Unhook the return spring and unscrew the adjust nut (B, **Figure 60**) securing the rear brake light switch to the frame. Remove the switch from the frame.

4. Install a new switch by reversing these removal steps, noting the following.

5. Make sure all electrical connections are tight and free of corrosion.

6. Adjust the switch as described in this chapter.

Rear Brake Light Switch Adjustment

1. Turn the ignition switch to the ON position.

2. Depress the brake pedal. The light should come on just as the brake begins to work.

3. To make the light come on earlier, hold the switch body and turn the adjust nut (B, **Figure 60**), *clockwise* as viewed from the top. Turn *counterclockwise* to delay the light from coming on.

NOTE

Some riders prefer the light to come on a little early. This way, they can tap the pedal without braking to warn drivers who are following too closely.

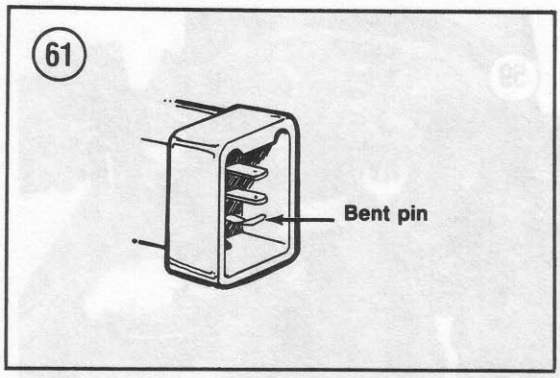
ELECTRICAL COMPONENTS

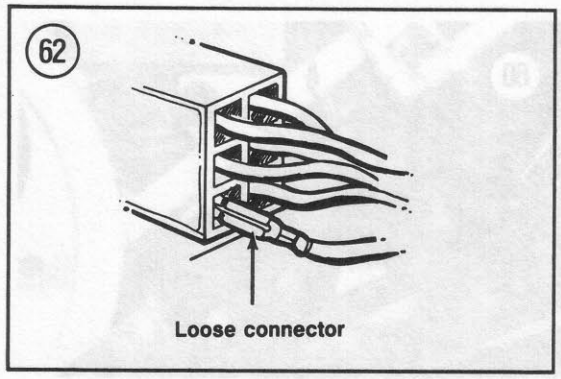
This section contains information on electrical components other than switches.

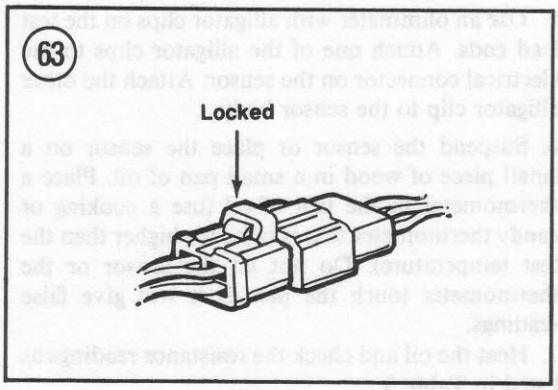
Some of the test procedures covered in this section specify taking a meter reading within the electrical connector attached to a specific part. Under these conditions, make sure that the meter test lead has penetrated into the connector and is touching the bare metal wire, *not* the insulation on the wire. If the test lead does not touch the bare metal wire, the readings will be false and may lead to the unnecessary purchase of an expensive electrical part that cannot be returned for a refund. Most dealers and parts houses will not accept any returns on electrical parts.

If you are having trouble with electrical components, these quick preliminary checks may save a lot of time.

a. Disconnect each electrical connector and check that there are no bent metal pins on the male side of the electrical connenctor (**Figure 61**). A bent pin will not connect to its mating receptacle in the female end of the connector, causing an open circuit.
b. Check each female end of the connector. Make sure that the metal connector on the end of each wire (**Figure 62**) is pushed all the way into the plastic connector. If not, carefully push them in with a narrow bladed screwdriver.
c. Check all electrical wires where they enter the individual metal connector in both the male and female plastic connector.
d. After all is checked out, push the connectors together and make sure they are fully engaged and locked together (**Figure 63**).







Instrument Cluster Removal/Installation (Magna)

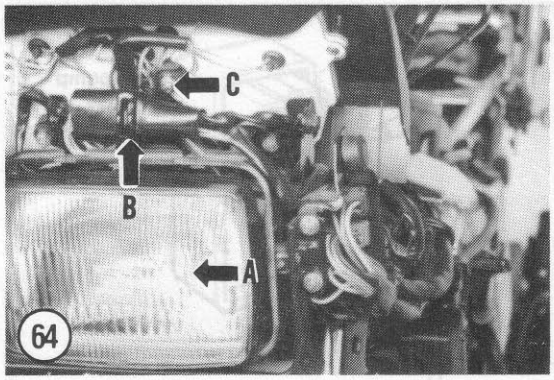
Refer to **Figure 44** for this procedure.

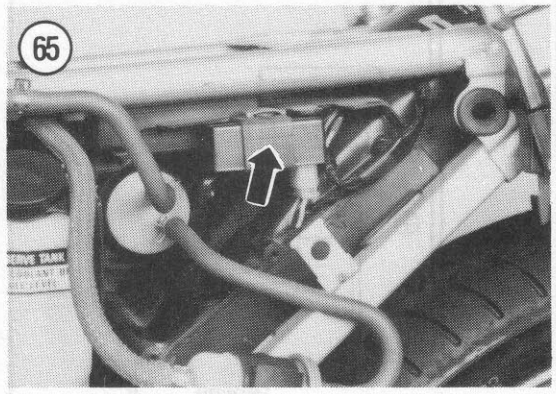
1. Remove both side covers.
2. Disconnect the battery negative lead.
3. Remove the headlight and headlight case as described in this chapter.
4. Disconnect the speedometer cable from the meter.
5. Disconnect the 4-pin and 9-pin electrical connectors and individual electrical connectors from the instrument cluster. Label the individual wires.
6. Remove the nuts securing the instrument cluster to the upper fork bridge. Remove the instrument cluster.

CAUTION

After the instrument cluster has been removed, set the cluster down with the meter face and needles facing upward. If the cluster is set with the faces down, the needle damping fluid will leak out onto the instrument face and lens.

7. Install by reversing these removal steps.
8. Make sure all electrical connectors are tight and free of corrosion.





Instrument Cluster

Removal/Installation (Interceptor)

Refer to **Figure 45** for this procedure.

1. Remove both side covers.
2. Disconnect the battery negative lead.
3. Remove the front fairing as described in Chapter Twelve.
4. Remove the headlight assembly (A, **Figure 64**) as described in this chapter.
5. Disconnect the speedometer cable from the meter.
6. Disconnect the 9-pin electrical connector (B, **Figure 64**) and the individual electrical connectors going to the instrument cluster. Label the individual wires.
7. Remove the nuts (C, **Figure 64**) securing the instrument cluster to the front fairing mounting bracket. Remove the instrument cluster.

CAUTION

After the instrument cluster has been removed, set the cluster down with the meter face and needles facing upward. If the cluster is set with the faces down the needle damping fluid will leak out onto the instrument face and lens.

8. Install by reversing these removal steps.
9. Make sure all electrical connectors are tight and free of corrosion.

Fuel Pump Relay Testing/Replacement

1. Remove both side covers. Remove the seat as described in Chapter Twelve.
2. Remove the fuel tank as described in Chapter Six.

3A. On Magna models, perform the following:

a. Remove the battery as described in Chapter Three.
b. Remove the bolt securing the starter solenoid mounting bracket and carefully pull the bracket out from the frame.
c. Pull the fuel pump relay from the bracket.

3B. On 1984 Interceptor models, perform the following:

a. Remove the coolant recovery tank as described in Chapter Eight.
b. Remove the bolt securing the electrical connector panel and carefully pull the panel out from the frame.
c. Pull the fuel pump relay from the panel.

3C. On 1985 Interceptor models, pull the fuel pump relay (**Figure 65**) from the mounting tab on the frame.

4. Do *not* disconnect the electrical connector from the fuel pump relay.
5. Unscrew the spark plug wires from the coils. Turn the ignition switch and the engine stop switch ON.
6. Connect one test lead of an ohmmeter to the white wire terminal in the fuel pump relay electrical connector. Connect the other test lead to ground. There should be no continuity (infinite resistance). Disconnect the ohmmeter.
7. Press the starter button and hold it down—do not start the engine.
8. Temporarily reinstall the battery. Using a DC voltmeter, check for continuous voltage between the white electrical wire in the electrical connector attached to the fuel pump relay and to ground (**Figure 66**). There should be 12 volts present. Disconnect the voltmeter.
9. If the fuel pump relay fails either of these test the unit must be replaced as follows:

a. Disconnect the electrical connector from the fuel pump relay.
b. Connect the electrical connector to the new fuel pump relay and install the relay into either the mounting bracket or the panel.

10. Install by reversing these removal steps. Make sure all electrical connections are tight.

Fuel Reserve Sensor Testing/Replacement (Magna)

NOTE

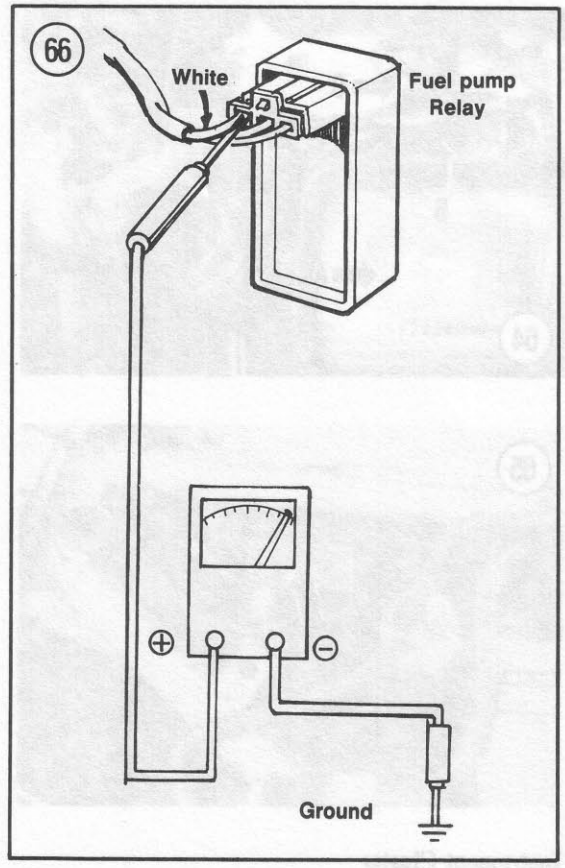
The fuel tank must contain less than 3.5 liters (0.93 U.S. gal.) of fuel in order to perform this test.

1. Place the bike on the centerstand on level ground.
2. Drain both fuel tanks as described in Chapter Six.
3. Turn the ignition switch to the ON position.
4. The fuel reserve sensor light should come ON.
5. If the light does *not* come on, perform the following:
   a. Remove the seat as described in Chapter Twleve.
   b. Disconnect the green/blue wire from the fuel reserve sensor (**Figure 67**) and ground it to a bare part of the frame.
   c. The light should now come on.
   d. If the light still does *not* come on, check for a blown fuse or broken wire in the circuit. Replace the fuse or repair the circuit.
   e. If the light still does *not* come on, replace the sensor.
6. To remove the sensor, disconnect the electrical connector from the sensor. Carefully unscrew the sensor from the secondary fuel tank (**Figure 67**).
7. Apply a light coat of non-hardening gasket sealer to the threads of the sensor. Install a new sensor and O-ring into the secondary fuel tank and repeat this test.
8. After a new sensor is installed, add fuel to the tank to bring the total amount to above 3.5 liters (0.9 U.S. gal.).
9. Turn the ignition switch to the ON position.
10. The fuel reserve light should come ON, then should go out after a few seconds.

Fuel Pump Flow Test

The electromagnetic fuel pump pumps fuel from the fuel tank(s) to the carburetor assembly.

When the ignition switch is turned ON, the electromagnet is energized, pulling the armature and the diaphragm up. This causes a vacuum and pulls fuel through the inlet check valve. As the armature reaches the limit of its upward travel, the contact points are opened in the switch and the circuit is broken. The elecromagnet is pushed down by the return spring, which in turn pushes the fuel through the outlet check valve and to the carburetor assembly. This continuing up-and-down movement moves or pumps the fuel from the fuel tank(s) into the carburetors.

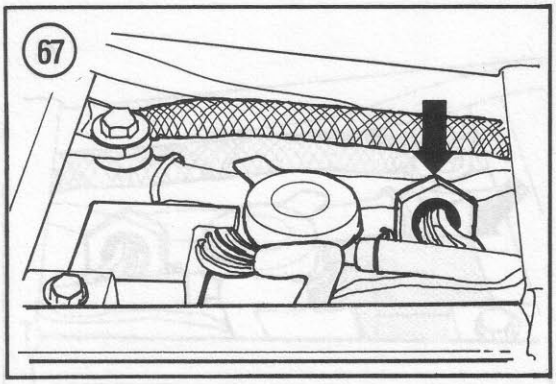


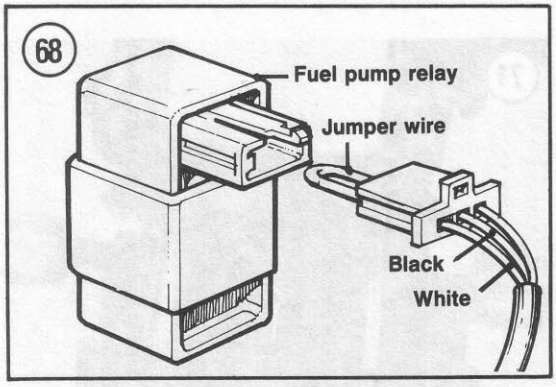
Fuel pump removal and installation are covered in Chapter Six.

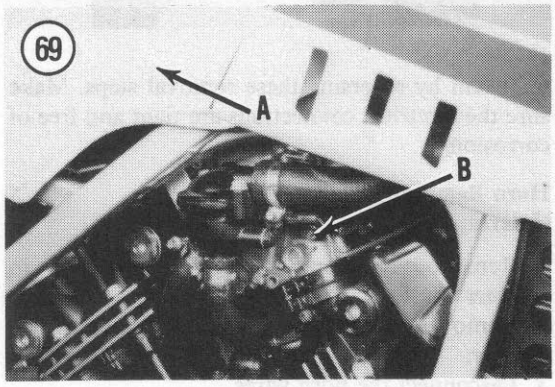
1. Remove the left-hand side cover.
2. On Interceptor models, perform the following:
   a. Start the engine and let it idle.
   b. Pinch off the vacuum line going from the No. 1 cylinder (left-hand rear cylinder) to the fuel shutoff valve.
   c. Shut off the engine.
   d. Turn the fuel shutoff valve OFF.

3A. On Magna models, perform the following:
   a. Remove the battery as described in Chapter Three.
   b. Remove the bolt securing the starter solenoid mounting bracket and carefully pull the bracket out from the frame.
   c. Pull the fuel pump relay from the bracket.

3B. On 1984 Interceptor models, perform the following:
   a. Remove the coolant recovery tank as described in Chapter Eight.
   b. Remove the bolt securing the electrical connector panel and carefully pull the panel out from the frame.
   c. Pull the fuel pump relay from the panel.







3C. On 1985 Interceptor models, pull the fuel pump relay (**Figure 65**) from the mounting tab on the frame.
4. Disconnect the electrical connector from the fuel pump relay.
5. Connect a jumper wire between the white wire and the black wire in the fuel pump relay electrical connector on the wire harness side (**Figure 68**).
6. Disconnect the fuel line from the carburetors.
7. Place the loose end of the fuel line into a graduated beaker.
8. Temporarily reinstall the battery. Turn the ignition switch to the ON position and allow the fuel to run out of the fuel line (into the graduated beaker) for 10 seconds.
9. Turn the ignition OFF.
10. Multiply the amount of fuel in the beaker by 6 ($10 \times 6 = 60$ seconds). This will give the fuel pump flow capacity for one minute.
11. The fuel pump minimum flow capacity for one minute is 700 cc (0.74 U.S. qt., 0.62 Imp. qt.) $\pm 10\%$ per minute.
12. If the fuel pump does not flow to the specified capacity, the fuel pump must be replaced. Refer to Chapter Six.
13. Reconnect the fuel line to the carburetors.
14. Disconnect the jumper wire from the fuel pump relay.
15. On Interceptor models, remove the clamp from the vacuum line.
16. Install all items removed by reversing these removal steps. Make sure all electrical connectors are tight and free of corrosion.

Temperature Gauge Testing

1. Remove the side covers and the seat as described in Chapter Twelve.
2A. On Magna models, perform the following:
   a. Remove the screws securing the fuel tank at the front.
   b. Lift the fuel tank to the raised position as described in Chapter Six.
   c. Remove the screws securing the radiator right-hand trim panel and remove the trim panel.
2B. On Interceptor models, remove the fuel tank (A, **Figure 69**) as described in Chapter Six.
3. Disconnect the green/blue electrical wire from the temperature sensor located on the thermostat housing (B, **Figure 69**).
4. Attach a short piece of wire into the female connector of the green/blue electrical wire just disconnected from the temperture sensor.
5. Turn the ignition switch to the ON position.

CAUTION

Do not ground the wire for more than 1-2 seconds or the temperature gauge will be damaged.

6. Ground the wire to the frame or the engine for only 1-2 seconds.
7. The temperature gauge needle should swing all the way over to the H mark on the temperature gauge.
8. If the gauge needle does not move at all, or if it does not move all the way over to the H, the gauge is faulty and must be replaced.
9. Install all parts removed.

Tachometer Testing

The tachometer is electronic and it receives signals from the No. 1 and No. 3 cylinders' ignition spark unit. If the tachometer is not operating at all or operating erratically, perform the following test.

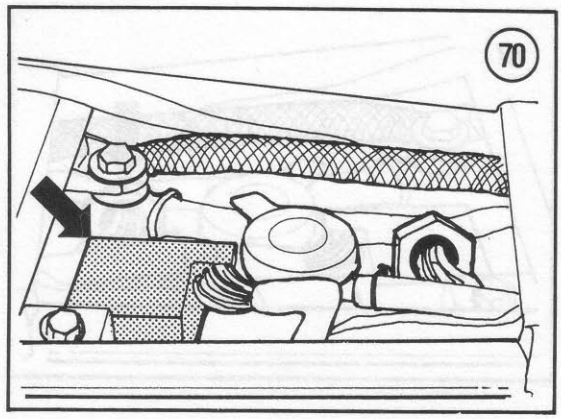
1. Remove the No. 1 and No. 3 cylinders' ignition spark unit as described in this chapter.
2. Use an ohmmeter to check the continuity from the yellow wire terminal at the tachometer end of the wire harness to the yellow wire terminal of the No. 1 and No. 3 ignition coil.
3. There should be continuity (low resistance). If there is no continuity (infinite resistance), there is an open in the circuit.
4. Repair the open circuit.
5. If there is continuity, install a new ignition spark unit (No. 1 and No. 3 cylinder) and retest the tachometer.
6. If the tachometer still does not operate or operates incorrectly, replace the tachometer.

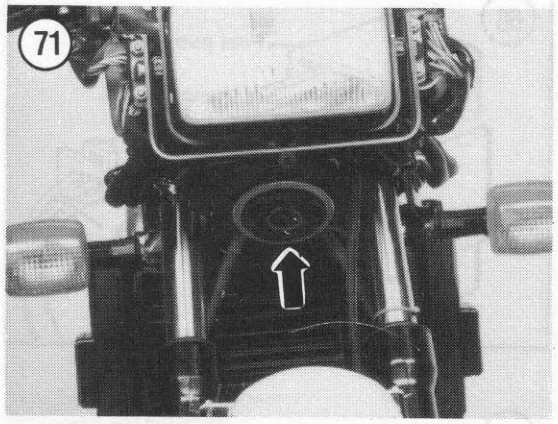
Brake and Taillight Sensor Testing (Magna)

1. Remove the seat as described in Chapter Twelve.
2. Turn the ignition switch to the ON position.
3. At the 9-pin electrical connector, use a 12-volt DC voltmeter to check for source voltage at the black/brown lead.
4. If there is no voltage, there is an open circuit. Check and repair the source voltage circuit.
5. If there is voltage, measure the voltage at the white/yellow (positive) and the green/yellow (negative) leads on the electrical connector. The specified voltage is 5 volts.
6. If there is no voltage, replace the brake and taillight sensor as follows:
   a. Disconnect the electrical connector from the brake and taillight sensor.
   b. Remove the brake and taillight sensor (**Figure 70**) and install a new sensor.
7. Install all items removed.
8. Make sure all electrical connectors are tight and free of corrosion.

Horn Removal/Installation (Magna)

1. Carefully pull out on the center of the lower fork bridge cover plate and remove the cover plate.
2. Remove the screws securing the fuse holder cover and remove the cover.
3. Disconnect the wires.
4. Remove the bolt securing each horn to the fuse panel bracket.
5. Remove the horns.





6. Install by reversing these removal steps. Make sure the electrical connections are tight and free of corrosion.

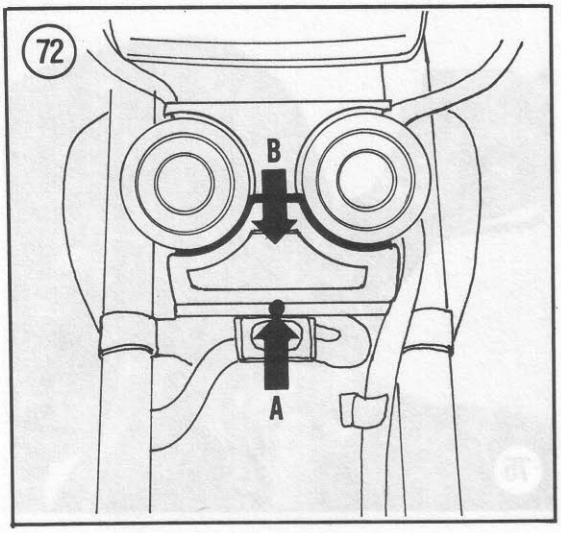
Horn Removal/Installation (Interceptor)

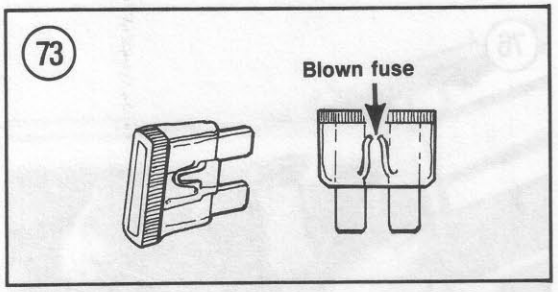
1. Remove the front fairing as described in Chapter Twelve.
2. Remove the headlight case as described in this chapter.
3. Disconnect the horn wires.
4. Remove the bolts securing the horn/mounting bracket assembly and the hydraulic brake 2-way joint to the lower fork bridge.

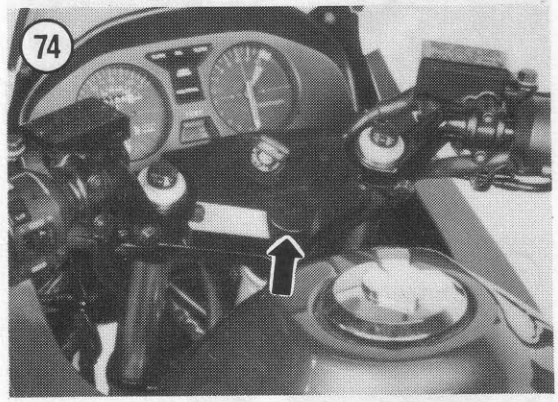
NOTE

If the horn is going to be left off for some time, reinstall the bolts and secure the hydraulic brake 2-way joint to the lower fork bridge.

5. Remove the horn/mounting bracket assembly (**Figure 71**).
6. Install by reversing these removal steps. Make sure the electrical connections are tight and free of corrosion.







Horn Testing

Remove the horn as described in this chapter. Connect a 12-volt battery to the horn. If the horn is good, it will sound. If not, replace it.

FUSES

The number of fuses varies from model to model. Fuses are located under the fuse holder cover at the base of the handlebars (Magna) or below the headlight assembly (Interceptor).

All models also have a main fuse (fusible link) located on the starter solenoid.

Whenever a fuse blows, find out the reason for the failure before replacing the fuse. Usually the trouble is a short circuit in the wiring. This may be caused by worn-through insulation or a disconnected wire shorted to ground.

CAUTION

Never substitute aluminum foil or wire for a fuse. Never use a higher amperage fuse than specified. An overload could cause a fire and complete loss of the motorcycle.

CAUTION

When replacing a fuse, make sure the ignition switch is in the OFF position. This will lessen the chance of a short circuit.

Fuse Replacement (Magna)

If a fuse in the fuse holder blows, perform the following.

1. Carefully pull out on the center of the lower fork bridge cover plate and remove the cover plate.
2. Remove the screw (A, **Figure 72**) securing the cover on the fuse holder and remove the cover (B, **Figure 72**).

NOTE

*These fuses (**Figure 73**) are not the typical glass tube with metal ends. Carry extra fuses in your tool box as this type fuse may not be as readily available on the road as the glass tube type.*

3. Remove the old fuse and install a new one.
4. Install the fuse holder cover and cover plate.

Fuse Replacement (Interceptor)

If a fuse in the fuse holder blows, perform the following.

1. Remove the screws securing the cover and remove the cover (**Figure 74**) on the fuse holder.

NOTE

*On 1985 models, the fuses (**Figure 73**) are not the typical glass tube with metal ends as are used on 1984 models. Carry extra fuses in your tool box as this type fuse may not be as readily available on the road as the glass tube type.*

2. Remove the old fuse (**Figure 75**) and install a new one.
3. Install the fuse holder cover and tighten the screws securely.

Fusible Link

If the main fusible link blows, perform the following.

1. Remove right-hand side cover.
2. Disconnect the electrical connector (A, **Figure 76**) from the top of the fusible link holder.
2. Open the main fuse cover (B, **Figure 76**).
3. Remove the Phillips screws securing the fusible link and replace it (**Figure 77**). There is a spare link inside the cover.

Fuse Holder Removal/Installation (Magna)

Refer to **Figure 78** for this procedure.

1. Carefully pull out on the center of the lower fork bridge cover plate and remove the cover plate.
2. Remove the screw (A, **Figure 72**) securing the cover on the fuse holder and remove the cover (B, **Figure 72**).
3. Disconnect the 4-pin and 6-pin electrical connectors coming from the fuse holder.

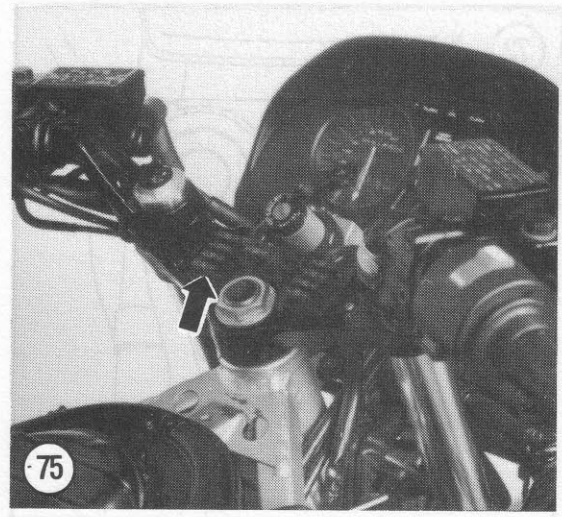
NOTE

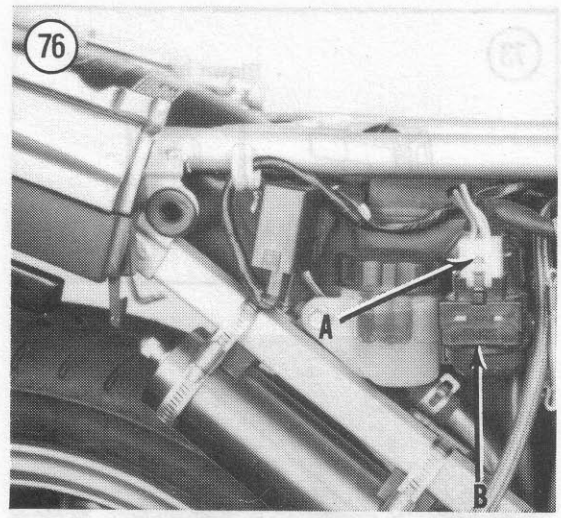
Note the routing of the electrical wire harness from the fuse holder to the main wiring harness. It must be installed in the same location so it will not get pinched when the handlebar and front forks move from side to side.

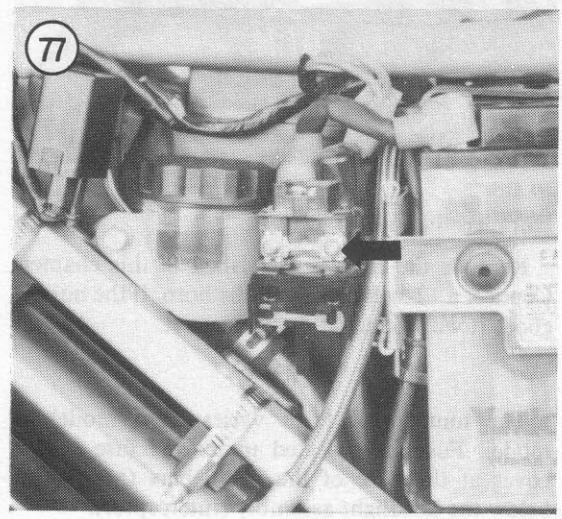
4. Remove the fuse holder from the fuse holder mounting bracket.
5. To remove the fuse holder mounting bracket and case, perform the following:
   a. Loosen the bolts securing the fuse holder mounting bracket, case and brake hose clamp to the lower fork bridge.
   b. Slide out the brake hose clamp.
   c. Remove the bolts and remove the fuse holder mounting bracket and the fuse holder case.
6. Install by reversing these removal steps, noting the following.
7. Make sure the electrical harness is routed correctly as noted during removal.
8. Be sure to install the brake hose clamp with the clamp end on the left-hand side.
9. Make sure all electrical connectors are tight and free of corrosion.

Fuse Holder Removal/Installation (Interceptor)

1. Remove the screws securing the cover and remove the cover (**Figure 74**) from the fuse holder.
2. Disconnect the 4-pin and 6-pin electrical connectors coming from the right-hand side of the fuse holder.







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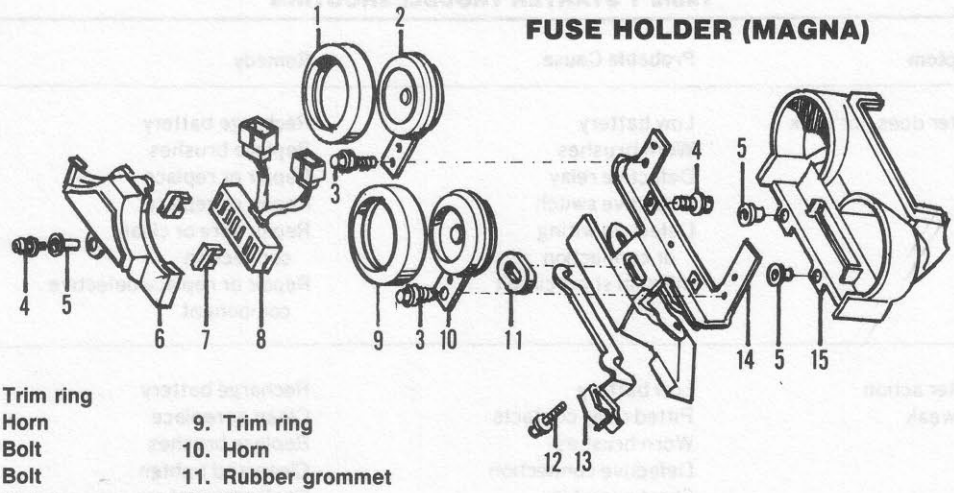
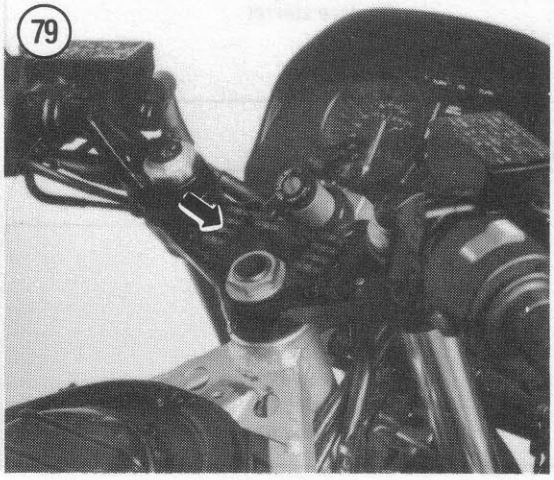


1. Trim ring
2. Horn
3. Bolt
4. Bolt
5. Metal spacer
6. Front cover
7. Fuse
8. Fuse holder
9. Trim ring
10. Horn
11. Rubber grommet
12. Bolt
13. Brake hose clamp
14. Fuse holder mounting bracket
15. Fuse holder case

79



3. Remove the screws (**Figure 79**) securing the fuse holder to the upper fork bridge.
4. Remove the fuse holder and electrical harness.

NOTE

Note the routing of the electrical wire harness from the fuse holder to the main wiring harness. It must be installed in the same location so it will not be pinched when the handlebar and front forks move from side to side.

5. Install by reversing these removal steps, noting the following.
6. Make sure the electrical harness is routed correctly as noted during removal.
7. Make sure all electrical connectors are tight and free of corrosion.

Tables are on the following pages.

Table 1 STARTER TROUBLESHOOTING

Symptom	Probable Cause	Remedy
Starter does not work	Low battery	Recharge battery
	Worn brushes	Replace brushes
	Defective relay	Repair or replace
	Defective switch	Repair or replace
	Defective wiring or connection	Repair wire or clean connection
	Internal short circuit	Repair or replace defective component
Starter action is weak	Low battery	Recharge battery
	Pitted relay contacts	Clean or replace
	Worn brushes	Replace brushes
	Defective connection	Clean and tighten
	Short circuit in commutator	Replace armature
Starter runs continuously	Stuck relay	Replace relay
Starter turns; does not turn engine	Defective starter clutch	Replace starter clutch

Table 2 REPLACEMENT BULBS

Item	Wattage	Number
Headlight	12V 60/55W	
Tail/brakelight	12V 8/27W	SAE No. 1157
Turn signals		
Front	12V 23/8W	SAE No. 1034
Rear	12V 23 W	SAE No. 1073
Instruments lights	12V 3.4W	
Indicator lights	12V 3W	SAE No. 57
High beam indicator	12V 3W	SAE No. 57

Table 3 IGNITION SWITCH CONTINUITY TEST (MAGNA)

Wire Color	Switch position OFF	ON	P
Red/black	0	X	X
Red	0	X	X
Blue/orange	0	X	0
Brown/white	0	X	0
Brown	0	X	0
Yellow/black	0	0	X

0 = No continuity (infinite resistance)
X = Continuity (low resistance)

Table 4 IGNITION SWITCH CONTINUITY TEST (INTERCEPTOR)

Wire Color	Switch position OFF	ON	P
Red	0	X	X
Red/black	0	X	0
Blue/orange	0	X	0
Brown/white	0	X	0
Brown	0	X	0
Yellow/black	0	0	X

0 = No continuity (infinite resistance)
X = Continuity (low resistance)

Table 5 TEMPERATURE GAUGE SENSOR READINGS

Temperature	Resistance (ohms)
50° C (122° F)	154.0
80° C (176° F)	52
100° C (212° F)	27
120° C (248° F)	16

NOTE: If you own a 1986 model, first check the Supplement at the back of the book for any new service information.

CHAPTER EIGHT

LIQUID COOLING SYSTEM

The pressurized liquid cooling system consists of radiator, water pump, thermostat, electric cooling fan and a coolant reserve tank. **Figure 1** shows the major components of the liquid cooling system for Magna models and **Figure 2** for Interceptor models. The coolant hose layout is shown in **Figure 3** for Magna models or **Figure 4** for Interceptor models.

The system uses a 0.75-1.05 kg/cm² (10.7-14.9 psi) radiator fill cap and is designed to operate with an 82° C (180° F) thermostat.

The water pump requires no routine maintenance and is replaced as a complete unit if defective. Replacement parts are not available for the unit.

It is important to keep the coolant level to the "FULL" mark on the coolant reserve tank (**Figure 5**). Always add coolant to the reserve tank, *not* to the radiator.

CAUTION

Drain and flush the cooling system at least every 2 years. Refill with a mixture of ethylene glycol antifreeze (formulated for aluminum engines) and distilled water. Do not reuse the old coolant as it deteriorates with use. ***Do not*** *operate the cooling system with only distilled water (even in climates where antifreeze protection is not required). This is important because the engine is all aluminum; it will not rust but it will oxidize internally and have to be replaced. Refer to* ***Coolant Change*** *in Chapter Three.*

Different types of hose clamps are used. The clamping screw type is released with a screwdriver or the clamping band type is pinched with a pair of pliers to be released. These clamps are used at specific locations due to space limitations around a specific part. Be sure to reinstall the correct type of clamp at its correct place.

The small diameter coolant hoses are very stiff and are sometimes difficult to install onto the metal fittings of the various cooling system parts. Before installing the hoses, apply a small amount of Armor All or rubber lube to the inside surface and they will slide on much easier.

This chapter describes repair and replacement of cooling system components. **Table 1** lists cooling system specifications. For routine maintenance of the system, refer to Chapter Three.

WARNING

Do not remove the radiator fill cap when the engine is hot. The coolant is very hot and is under pressure. Severe scalding could result if the coolant comes in contact with your skin.

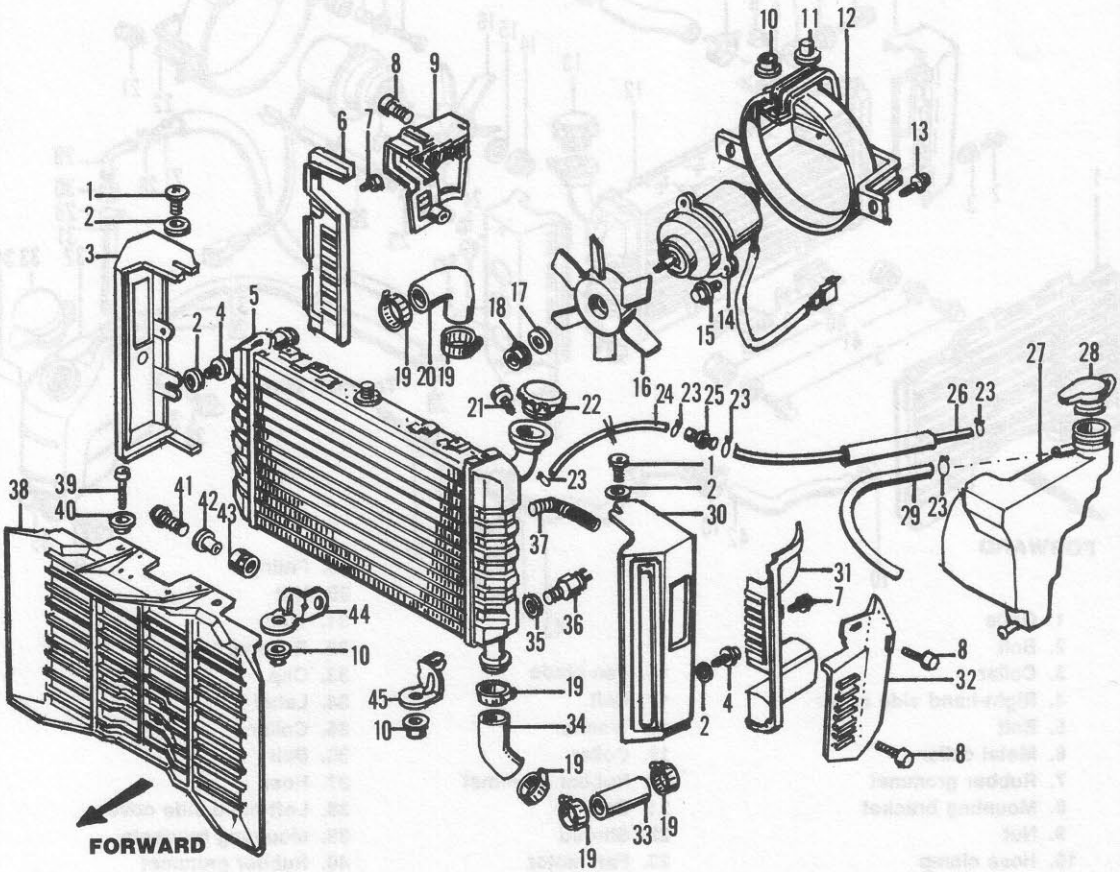
The cooling system must be cool before removing any component of the system.

Table 1 and **Table 2** are at the end of this chapter.

COOLING SYSTEM CHECKS

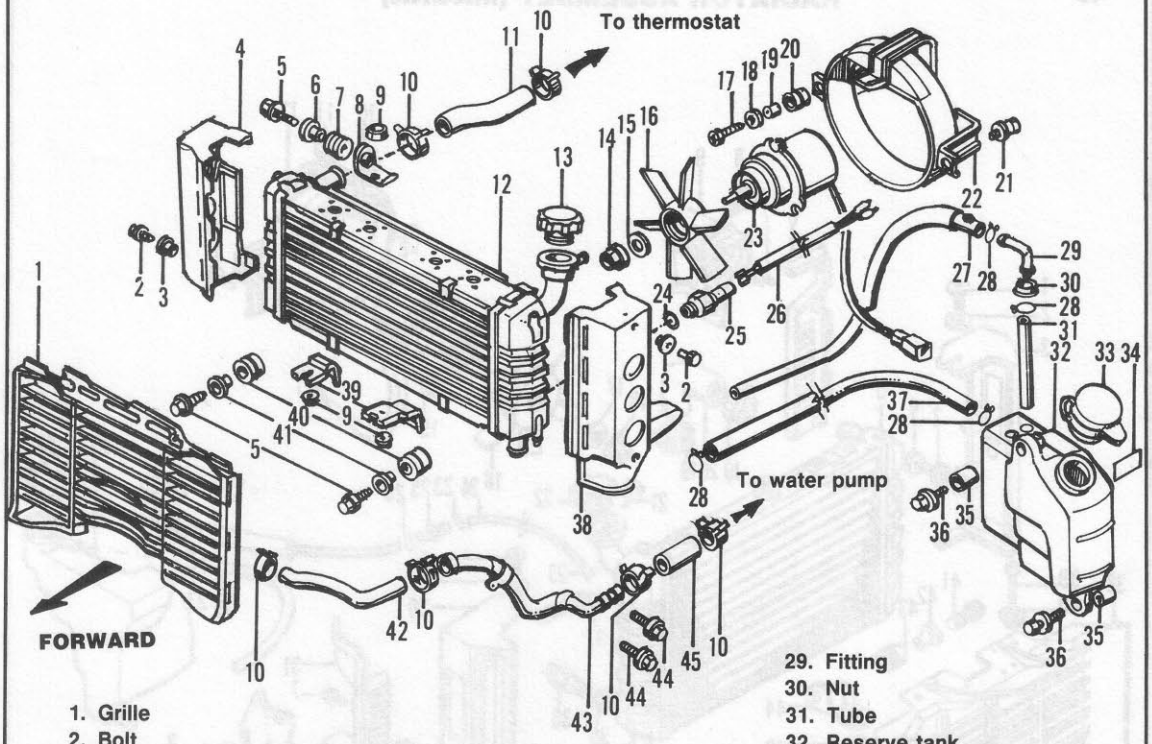
Two checks should be made before disassembly if a cooling system fault is suspected.

① RADIATOR ASSEMBLY (MAGNA)



1. Bolt
2. Washer
3. Right-hand side cover
4. Bolt
5. Radiator
6. Radiator right-hand cover
7. Bolt
8. Bolt
9. Thermostat housing cover
10. Rubber cushion
11. Bolt
12. Shroud
13. Bolt
14. Fan motor
15. Bolt
16. Fan blade
17. Washer
18. Nut
19. Hose clamp
20. Upper hose
21. Bolt
22. Radiator cap
23. Hose clamp
24. Hose
25. Hose fitting
26. Overflow hose
27. Reserve tank
28. Cap
29. Hose
30. Left-hand side cover
31. Radiator left-hand cover
32. Fan cover
33. Water pump hose
34. Radiator lower hose
35. O-ring
36. Thermostatic switch
37. Hose
38. Grille
39. Bolt
40. Washer
41. Bolt
42. Metal collar
43. Rubber grommet
44. Mounting bracket
45. Mounting bracket

(2) RADIATOR ASSEMBLY (INTERCEPTOR)



1. Grille
2. Bolt
3. Collar
4. Right-hand side cover
5. Bolt
6. Metal collar
7. Rubber grommet
8. Mounting bracket
9. Nut
10. Hose clamp
11. Hose
12. Radiator
13. Radiator cap
14. Nut
15. Washer
16. Fan blade
17. Bolt
18. Washer
19. Collar
20. Rubber grommet
21. Bolt
22. Shroud
23. Fan motor
24. O-ring
25. Thermostatic switch
26. Wiring harness
27. Overflow hose
28. Hose clamp
29. Fitting
30. Nut
31. Tube
32. Reserve tank
33. Cap
34. Label
35. Collar
36. Bolt
37. Hose
38. Left-hand side cover
39. Mounting brackets
40. Rubber grommet
41. Metal collar
42. Radiator lower hose
43. Outer metal coolant pipe
44. Bolt
45. Hose

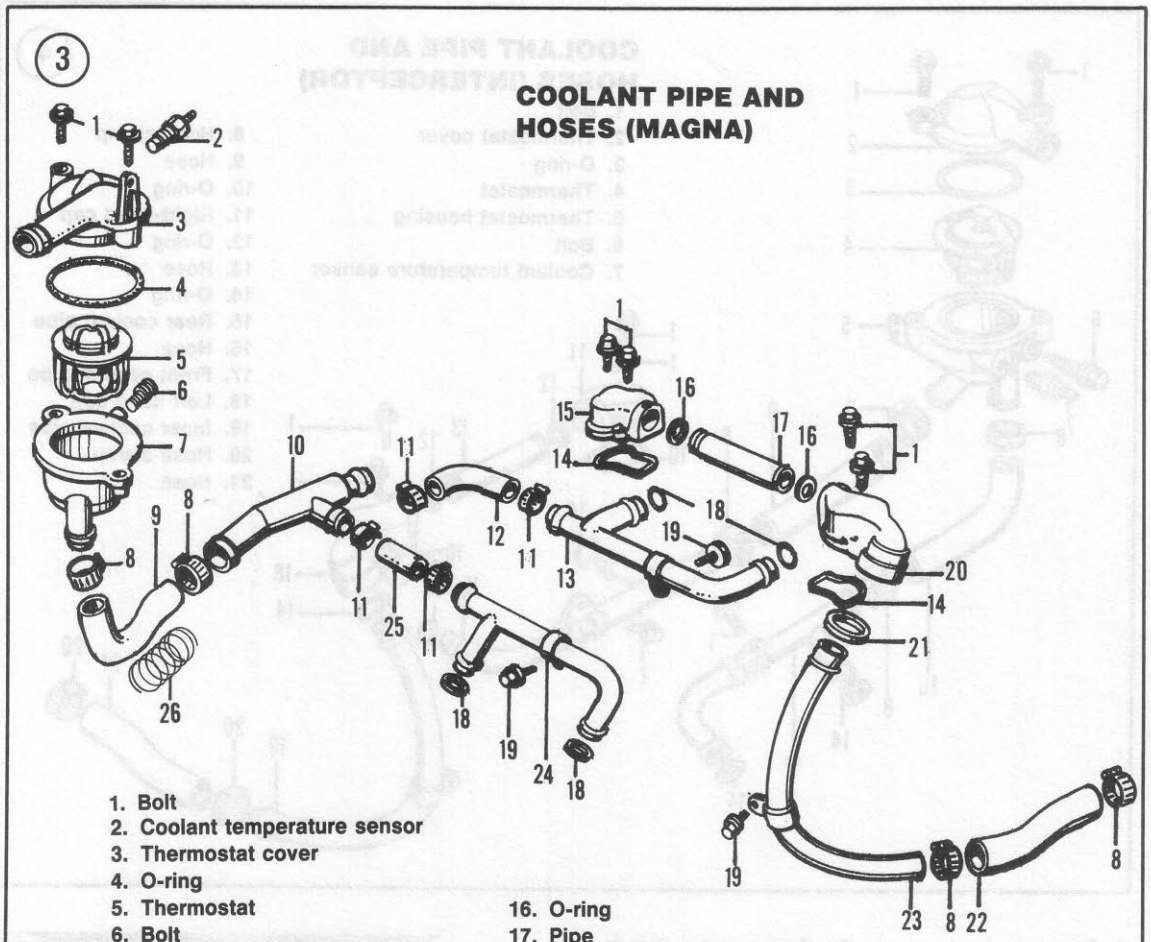
1. Run the engine until it reaches operating temperature. While the engine is running, a pressure surge should be felt when the radiator's upper hose is squeezed.
2. If a substantial coolant loss is noted, one of the head gaskets may be blown. In extreme cases, enough coolant will leak into a cylinder(s) when the bike is left standing for several hours so the engine cannot be turned over with the starter. White smoke (steam) might also be observed at the muffler(s) when the engine is running. Coolant may also find its way into the oil. Check the dipstick; if it looks like a chocolate malt or has a white, foamy appearance, there is coolant in the oil system. If so, correct the cooling system problem immediately.

CAUTION

After the cooling system is corrected, drain and thoroughly flush out the engine oil system to eliminate all coolant residue. Refill with fresh engine oil; refer to Chapter Three.

PRESSURE CHECK

If the cooling system requires repeated refilling, there is probably a leak somewhere in the system.



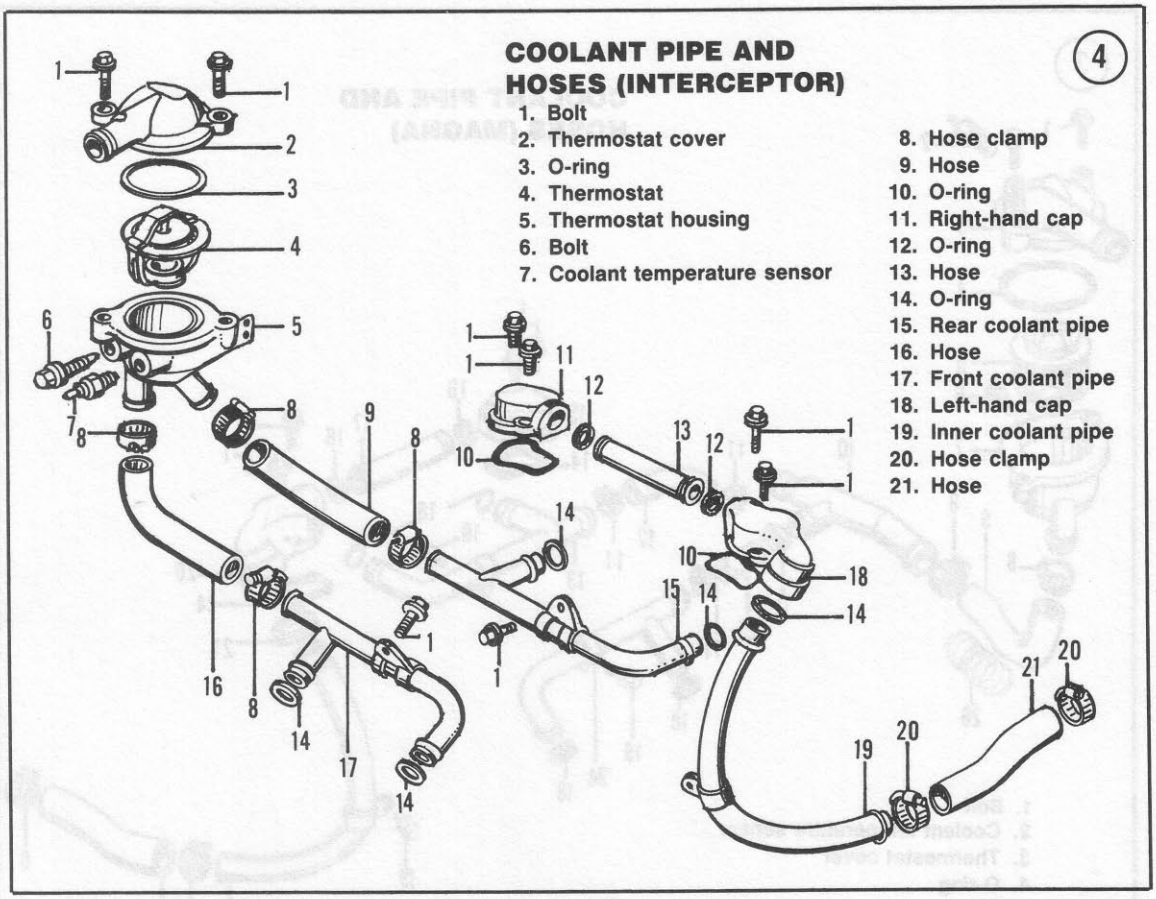
Perform *Cooling System Inspection* in Chapter Three.

RADIATOR

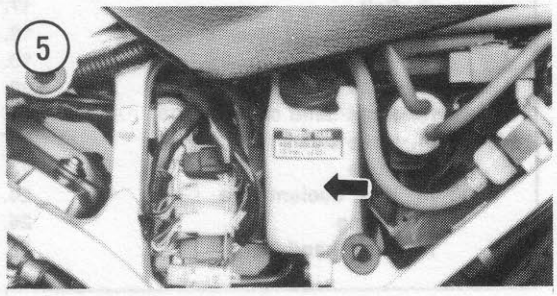
Removal/Installation (Magna)

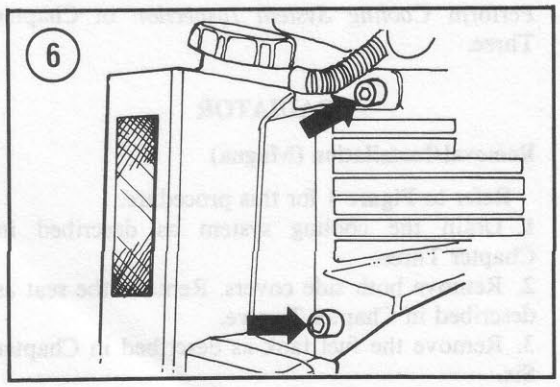
Refer to **Figure 1** for this procedure.

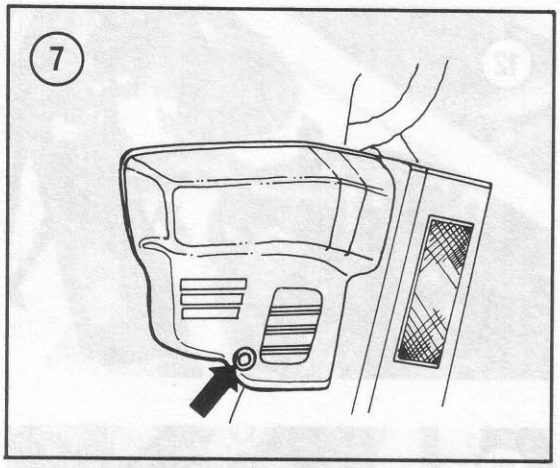
1. Drain the cooling system as described in Chapter Three.
2. Remove both side covers. Remove the seat as described in Chapter Twelve.
3. Remove the fuel tank as described in Chapter Six.
4. Remove the screws securing the frame front cover on each side and remove both covers.
5. Remove the screws securing the left-hand cover (**Figure 6**) and remove the cover.
6. Remove the screws securing the thermostat housing cover (**Figure 7**) and remove the cover.
7. Disconnect the cooling fan's 2-pin electrical connector located just above the thermostat housing.
8. Loosen the clamping screw on the upper hose (**Figure 8**) where it attaches to the thermostat housing. Move the clamp back onto the hose and off of the neck of the thermostat housing.

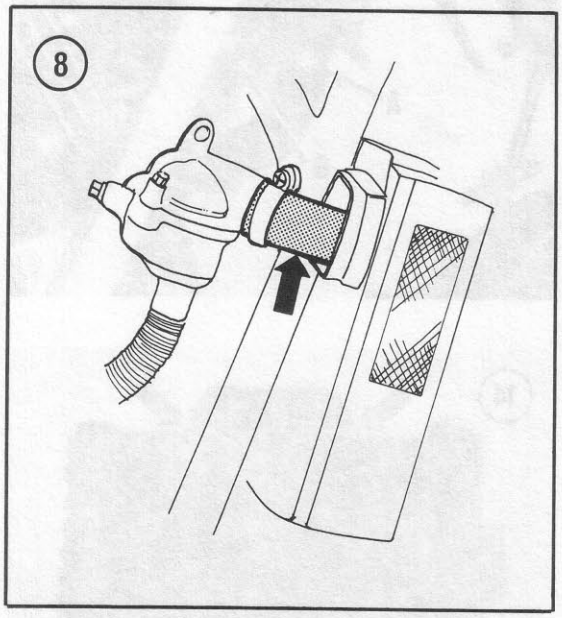


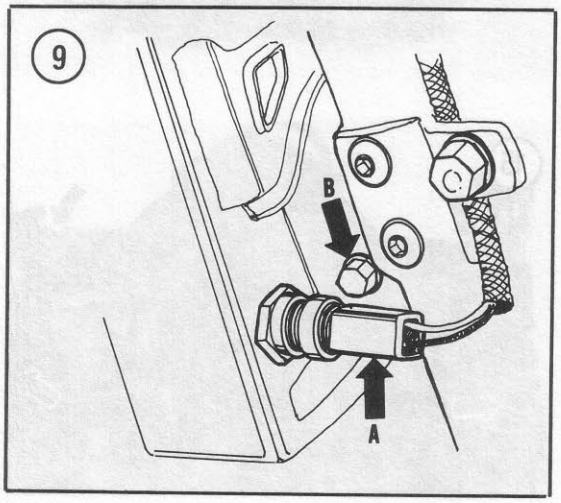
9. Remove the cover on the thermostatic switch.
10. Disconnect the electrical connector (A, **Figure 9**) from the thermostatic switch at the base of the radiator on the left-hand side.
11. Disconnect the overflow tube from the filler neck.
12. Loosen the clamping screw on the lower hose (**Figure 10**). Move the clamp back onto the hose and off of the neck of the subframe rail.
13. Remove the bolt (B, **Figure 9**) on each side securing the radiator at the bottom.
14. Pull the radiator slightly forward and disengage the radiator's upper positioning lug from the receptacle in the fuse holder mounting bracket.
15. Remove the radiator from the frame.
16. Install by reversing these removal steps, noting the following.
17. Replace both radiator hoses if either is starting to deteriorate or is damaged.
18. Make sure the electrical connections are free of corrosion and are tight.
19. Refill the cooling system with the recommended type and quantity of coolant as described in Chapter Three.

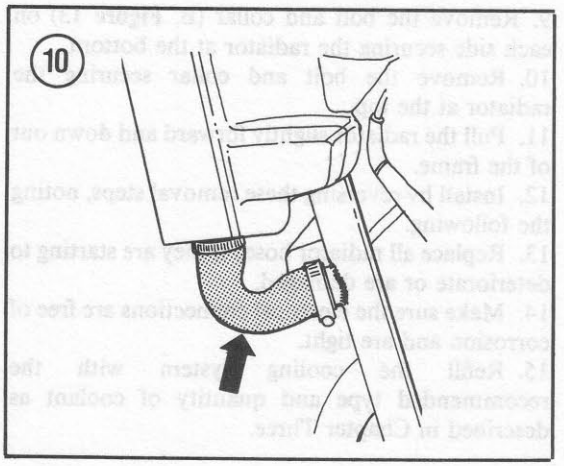


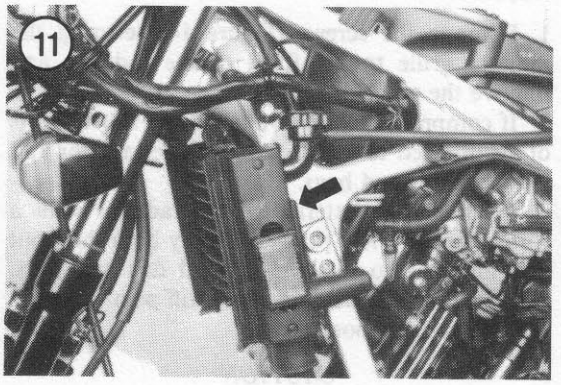










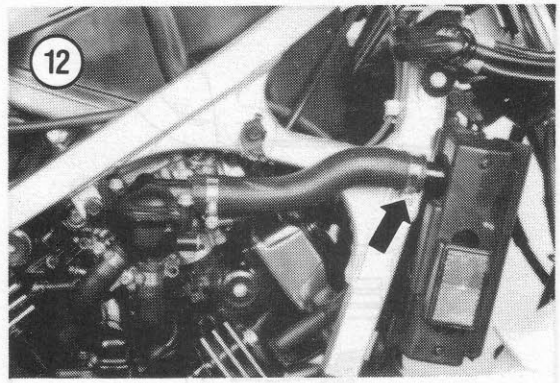


Removal/Installation (Interceptor)

Refer to **Figure 2** for this procedure.

1. Remove the front fairing as described in Chapter Twelve.
2. Drain the cooling system as described in Chapter Three.
3. Disconnect the cooling fan 2-pin electrical connector containing 2 wires on the left-hand side.
4. Remove the screw securing the radiator left-hand side cover (**Figure 11**) and remove the cover.
5. Disconnect the overflow tube from the filler neck.
6. Disconnect the electrical wires from the thermostatic switch on the left-hand side of the radiator.
7. Loosen the clamping screw on the upper hose (**Figure 12**). Move the clamp back onto the hose and off of the neck of the radiator and remove the hose from the radiator.
8. Loosen the clamping screw on the lower hose (A, **Figure 13**). Move the clamp back onto the hose and off of the neck of the radiator and remove the hose from the radiator.

9. Remove the bolt and collar (B, **Figure 13**) on each side securing the radiator at the bottom.
10. Remove the bolt and collar securing the radiator at the top.
11. Pull the radiator slightly forward and down out of the frame.
12. Install by reversing these removal steps, noting the following.
13. Replace all radiator hoses if they are starting to deteriorate or are damaged.
14. Make sure the electrical connections are free of corrosion and are tight.
15. Refill the cooling system with the recommended type and quantity of coolant as described in Chapter Three.



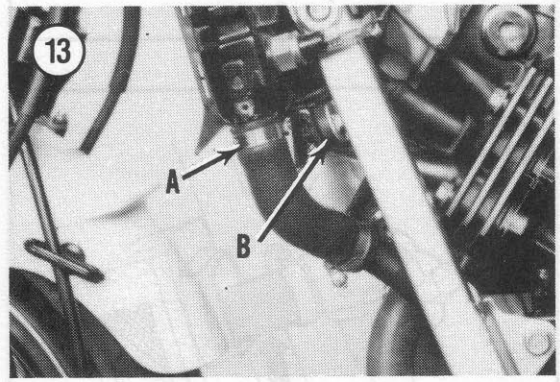
Inspection

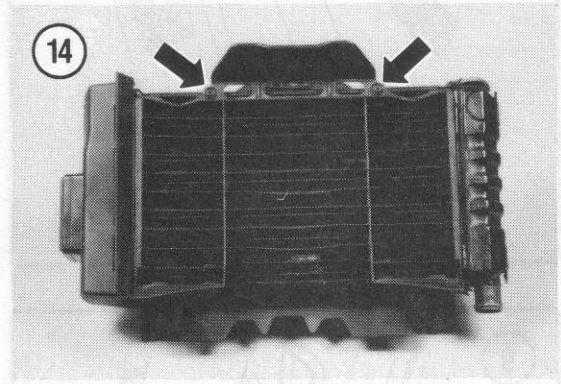
1. Remove the screws (**Figure 14**) securing the radiator grille to the front of the radiator and remove the grille.
2. If compressed air is available, use short spurts of air directed to the backside of the radiator and blow out dirt and bugs.
3. Flush off the exterior of the radiator with a garden hose on low pressure. Spray both the front and the back to remove all road dirt and bugs. Carefully use a whisk broom or stiff paint brush to remove any stubborn dirt.

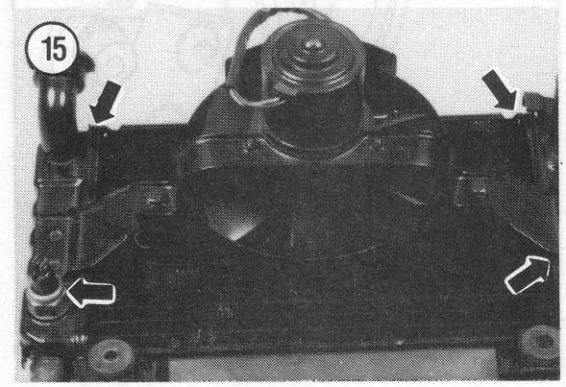
CAUTION

Do not press too hard or the cooling fins and tubes may be damaged, causing a leak.

4. Carefully straighten out any bent cooling fins with a broad-tipped screwdriver or putty knife.
5. Check for cracks or leakage (usually a moss-green colored residue) at the filler neck, the inlet and outlet hose fittings and both side tank seams (**Figure 15**).
6. If the condition of the radiator is doubtful, have it checked as described under *Pressure Check* in Chapter Three. The radiator can be pressure checked while removed or installed on the bike.
7. To prevent oxidation to the radiator, touch up any area where the black paint is worn off. Use a good quality spray paint and apply several *light* coats of paint. Do not apply heavy coats as this will cut down on the cooling efficiency of the radiator.



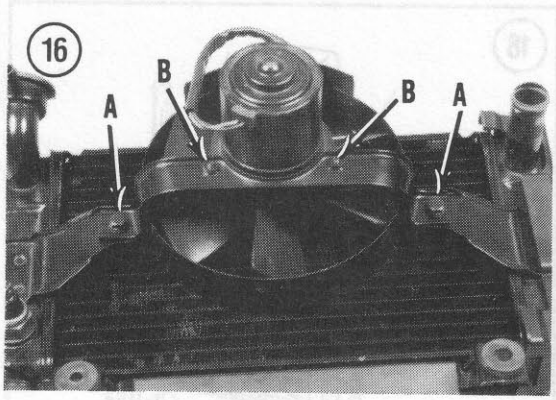


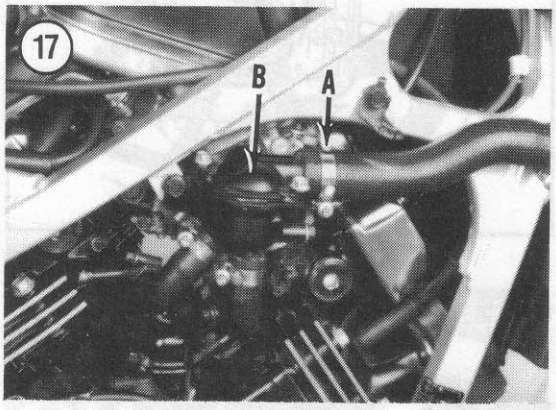


COOLING FAN

Removal/Installation

1. Remove the radiator as described in this chapter.





2. Remove the bolts (A, **Figure 16**) securing the fan shroud and fan assembly to the radiator and remove the assembly.
3. To remove the fan blade from the motor, remove the nut and washer securing the fan blade. Remove the fan blade from the motor.
4. If necessary, remove the screws (B, **Figure 16**) securing the fan motor to the fan shroud and remove the motor assembly.
5. Install by reversing these removal steps, noting the following.
6. Apply Loctite Lock N' Seal to the threads on the fan motor shaft before installing the fan blade nut. Install the nut and tighten the nut securely.
7. Refill the cooling system with the recommended type and quantity of coolant as described in Chapter Three.

THERMOSTAT

Removal/Installation (Magna)

The thermostat is located on the right-hand side.
1. Remove both side covers. Remove the seat as described in Chapter Twelve.
2. Remove the fuel tank as described in Chapter Six.
3. Drain the cooling system as described in Chapter Three.
4. Remove the screws securing the thermostat housing cover (**Figure 7**) and remove the cover.
5. Disconnect the electrical connector from the temperature sensor on the thermostat housing.
6. Loosen the clamping screw on the hose clamp on the radiator upper hose (**Figure 8**) and move the band back off of the thermostat cover neck.
7. Remove the bolts securing the thermostat housing cover.
8. Remove the thermostat housing cover and O-ring seal, then slide the housing off of the radiator upper hose.
9. Remove the thermostat from the housing.
10. Install by reversing these removal steps, noting the following.
11. Install a new O-ring seal in the thermostat housing cover.
12. Refill the cooling system with the recommended type and quantity of coolant as described in Chapter Three.

Removal/Installation (Interceptor)

The thermostat is located on the right-hand side.
1. Remove both side covers and the seat as described in Chapter Twelve.
2. Remove the fuel tank as described in Chapter Six.
3. Drain the cooling system as described in Chapter Three.
4. Loosen the clamping screw (A, **Figure 17**) on the radiator upper hose and move the clamp back off of the thermostat cover neck. Remove the radiator upper hose from the thermostat cover.
5. Remove the bolts securing the thermostat housing cover (B, **Figure 17**).
6. Remove the thermostat housing cover and O-ring seal.
7. Remove the thermostat from the housing.
8. Install by reversing these removal steps, noting the following.
9. Install a new O-ring seal in the thermostat housing cover.
10. Refill the cooling system with the recommended type and quantity of coolant as described in Chapter Three.

Testing

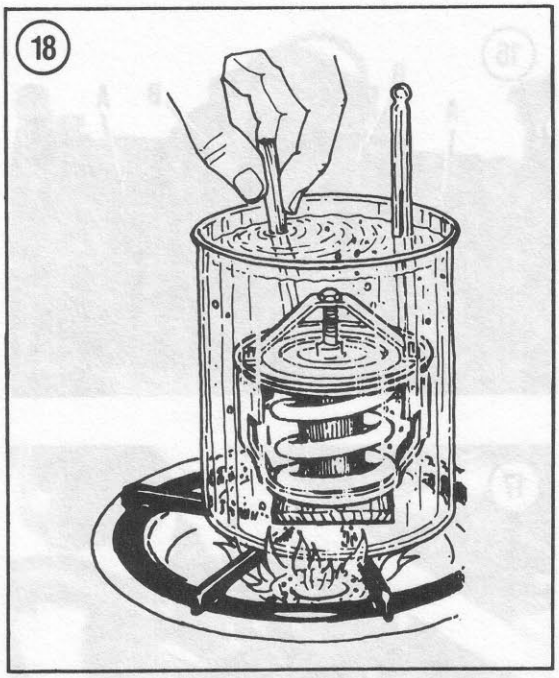
Test the thermostat to ensure proper operation. The thermostat should be replaced if it remains open at normal room temperature or stays closed after the specified temperature has been reached during the test procedure.

Place the thermostat on a small piece of wood in a pan of water (**Figure 18**). Place a thermometer in the pan of water (use a cooking or candy thermometer that is rated higher than the test temperature). Gradually heat the water and continue to gently stir the water until it reaches 80-84° C (176-183° F). At this temperature the thermostat valve should open.

NOTE

Valve operation is sometimes sluggish; it usually takes 3-5 minutes for the valve to operate properly.

If the valve fails to open, the thermostat should be replaced (it cannot be serviced). Be sure to replace it with one of the same temperature rating.



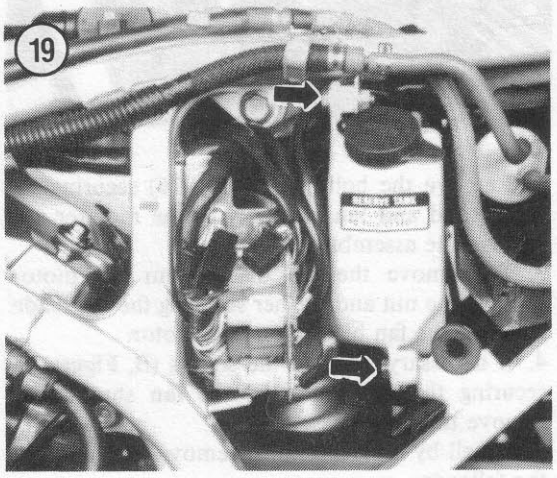
COOLANT RECOVERY TANK

Removal/Installation (Magna)

1. Remove both side covers. Remove the seat as described in Chapter Twelve.
2. Remove the fuel tank as described in Chapter Six.
3. Remove the battery as described in Chapter Three.
4. Carefully pull the battery box partially out of the frame.
5. Remove all electrical parts from the backside of the battery box.
6. Disconnect the hoses from the recovery tank and remove the tank from the frame.
7. Install by reversing these removal steps.

Removal/Installation (Interceptor)

1. Remove both side covers. Remove the seat as described in Chapter Twelve.
2. Remove the fuel tank as described in Chapter Six.
3. Disconnect the hoses from the recovery tank.
4. Remove the bolts securing the coolant recovery tank (**Figure 19**) to the frame and remove the tank from the frame.
5. Install by reversing these removal steps.

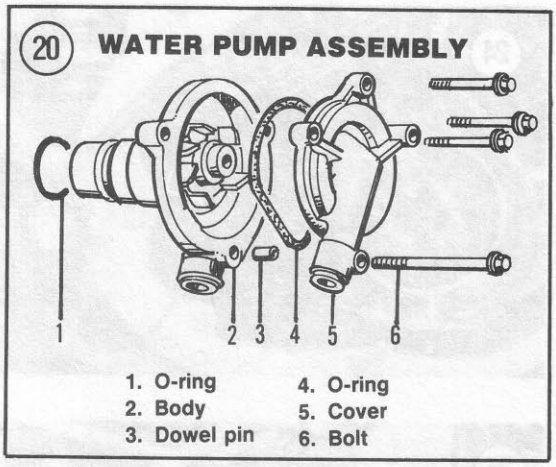


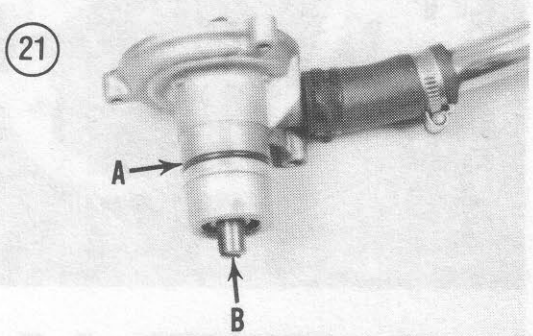
WATER PUMP

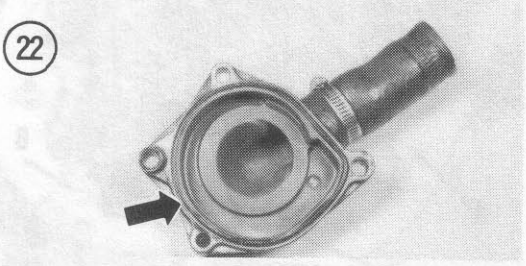
Removal (Magna)

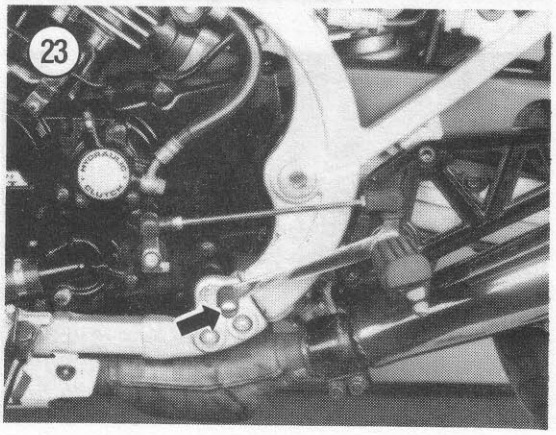
Refer to **Figure 20** for this procedure.

1. Drain the cooling system as described in Chapter Three.
2. Remove the clutch slave cylinder as described under *Clutch Slave Cylinder Removal/Installation (Intact)* in Chapter Five.
3. Remove the bolts securing the drive sprocket cover and remove the cover.
4. Loosen the clamping screw on the hose clamp securing the short section of coolant hose going to the fitting on the sub-frame rail. Move the band back off of the fitting on the frame rail.
5. Remove the bolts securing the water pump cover and remove the cover and short section of coolant hose from the crankcase. Don't lose the locating dowels.
6. Pinch the hose clamp on the short section of hose that is attached to the metal coolant pipe (going to the top of the cylinder block). Move the clamp back off of the metal coolant pipe.
7. Withdraw the water pump and short section of hose from the crankcase.









Installation (Magna)

1. Within the crankcase, rotate the oil pump shaft so the tab on the end of the shaft is vertical.
2. Apply a coat of clean engine oil to the O-ring seal (A, **Figure 21**) on the water pump housing.
3. Position the groove on the water pump shaft (B, **Figure 21**) vertically so it will align with the tab on the oil pump shaft.
4. Install the water pump into the crankcase and slightly wiggle the water pump impeller to assure proper alignment of the tab and groove. Push the water pump assembly all the way on until it is properly seated against the crankcase. The assembly should fit snugly without using any force. If it will not fit properly, withdraw the assembly and realign the tab of the oil pump shaft and the groove on the water pump.

CAUTION

Do not install the cover or any bolts until the assembly is completely seated against the crankcase. Do not try to force the assembly into place with the mounting bolts.

5. Install the short section of water hose onto the metal coolant pipe. Move the pinch clamp on the short section of hose into position.
6. Install the dowel pins on the water pump body if they were removed.
7. Install a new O-ring seal (**Figure 22**) into the water pump cover.
8. Insert the water pump cover inlet fitting short hose onto the fitting on the frame rail.
9. Install the water pump cover. Install the bolts and tighten them securely.
10. Move the clamp into position on the water hose from the frame rail to the water pump cover. Tighten the clamping screw securely.
11. Install the clutch slave cylinder as described in Chapter Five.
12. Refill the cooling system with the recommended type and quantity of coolant. Refer to *Coolant Change* in Chapter Three.
13. Start the bike and check for leaks.

Removal (Interceptor)

Refer to **Figure 20** for this procedure.

1. Drain the cooling system as described in Chapter Three.
2. Remove the clutch slave cylinder as described under *Clutch Slave Cylinder Removal/Installation (Intact)* in Chapter Five.
3. Remove the bolt (**Figure 23**) securing the gearshift arm to the gearshift spindle and remove

the gearshift arm. Move the gearshift arm down and out of the way.

4. Remove the bolts securing the drive sprocket cover (**Figure 24**) and remove the cover.

5. Place a suitable size jack (A, **Figure 25**) with a piece of wood to protect the crankcase, under the engine. Apply a *small amount* of jack pressure up on the engine.

6. Remove the front lower through-bolt (A, **Figure 26**) and rear lower through-bolt (B, **Figure 26**) securing the engine to the subframe. Don't lose the spacer (**Figure 27**) on the lower through-bolt.

7. Remove the Allen bolts (B, **Figure 25**) securing the removable subframe and remove the subframe.

8. Remove the bolts securing the metal coolant pipe (going to the radiator lower hose) to the crankcase.

9. Loosen the clamping screw on the hose clamp (C, **Figure 26**) securing the outer short section of coolant hose going to the water pump cover. Move the band back off of the fitting on the water pump cover.

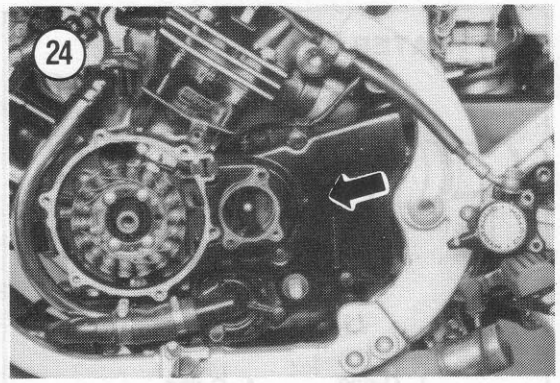
10. Remove the bolts (**Figure 28**) securing the water pump cover.

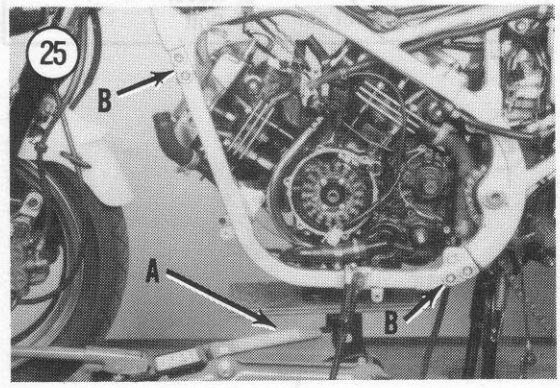
11. Pull water pump cover off of the short section of coolant hose and remove the cover. Don't lose the locating dowel.

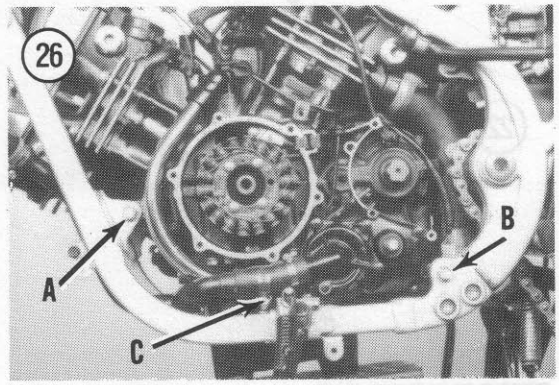
12. Remove the bolt securing the inner metal coolant pipe (going to the top of the cylinder block) to the crankcase.

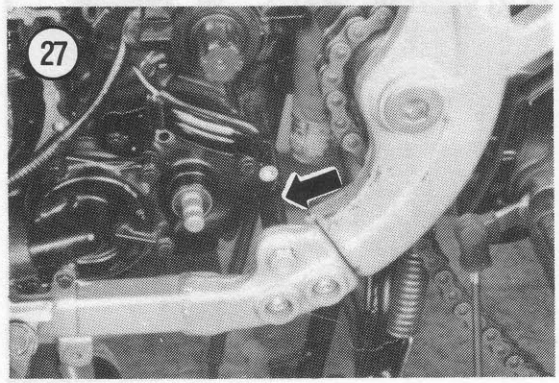
13. Pinch the hose clamp (A, **Figure 29**) on the short section of hose that is attached to the water pump body. Move the clamp back off of the water pump body.

14. Withdraw the water pump (B, **Figure 29**) from the crankcase. Twist the hose slightly to loosen it if stuck.









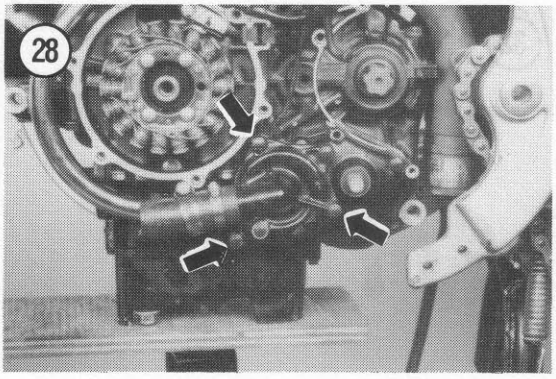
Installation (Interceptor)

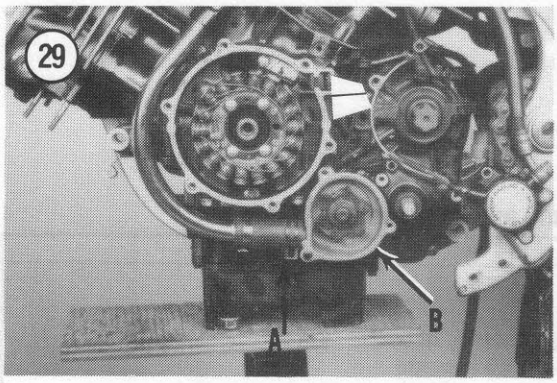
1. Within the crankcase, rotate the oil pump shaft (**Figure 30**) so the tab on the end of the shaft is vertical.

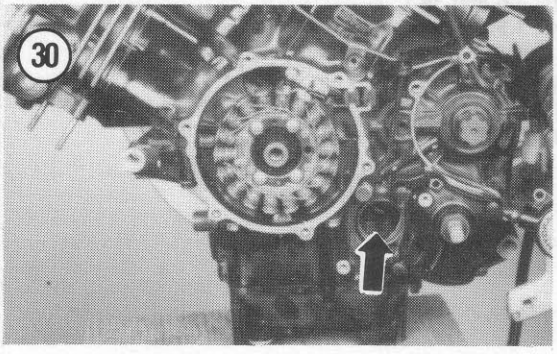
2. Apply a coat of clean engine oil to the O-ring seal (A, **Figure 21**) on the water pump housing.

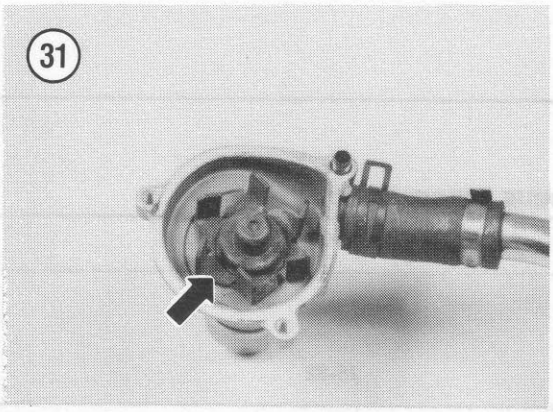
3. Position the groove on the water pump shaft (B, **Figure 21**) vertically so it will align with the tab on the oil pump shaft.

4. Install the water pump into the crankcase and slightly wiggle the water pump impeller to assure proper alignment of the tab and groove. Push the water pump assembly all the way on until it is properly seated against the crankcase. The assembly should fit snugly without using any force. If it will not fit properly, withdraw the assembly









and realign the tab of the oil pump shaft and the groove on the water pump.

CAUTION

Do not install the cover or any bolts until the assembly is completely seated against the crankcase. Do not try to force the assembly into place with the mounting screws.

5. Install the inner metal coolant pipe and short section of water hose onto the water pump body. Move the pinch clamp on the short section of hose into position.
6. Install the bolt securing the inner metal coolant pipe and tighten the bolt securely.
7. Install the dowel pin on the water pump body if it was removed.
8. Install a new O-ring seal (**Figure 22**) into the water pump cover.
9. Insert the water pump cover fitting into the short section of hose attached to the outer metal coolant pipe. Move the clamp into position and tighten the clamping screw securely.
10. Install the lower bolt. Securely tighten both the upper and lower bolt securing the outer metal coolant pipe (going to the radiator lower hose) to the crankcase.
11. Install the water pump cover. Install the bolts and tighten them securely.
12. Install the removable subframe and tighten the bolts to the torque specification listed in **Table 2**.
13. Install the clutch slave cylinder as described in Chapter Five.
14. Refill the cooling system with the recommended type and quantity of coolant. Refer to *Coolant Change* in Chapter Three.
15. Start the bike and check for leaks.

Inspection (All Models)

Inspect the water pump assembly for wear or damage. Rotate the impeller to make sure the bearings are not worn or damaged. If the bearings are damaged, the assembly must be replaced, as it cannot be serviced.

Check the impeller blades (**Figure 31**). Straighten any that are bent.

HOSES

Hoses deteriorate with age and should be replaced periodically or whenever they show signs of cracking or leakage. To be safe, replace the hoses every 2 years. The spray of hot coolant from a cracked hose can injure the rider and passenger. Loss of coolant can also cause the engine to overheat, causing damage.

Whenever any component of the cooling system is removed, inspect the hose(s) and determine if replacement is necessary.

COOLANT PIPES AND HOSES

Refer to **Figure 3** (Magna) or **Figure 4** (Interceptor).

Whenever any of the coolant pipes and fittings are removed for service procedures, the O-ring seals (**Figure 32**) should be inspected and replaced as necessary. O-ring seals tend to harden after prolonged use and exposure to heat and therefore lose their abality to seal properly.

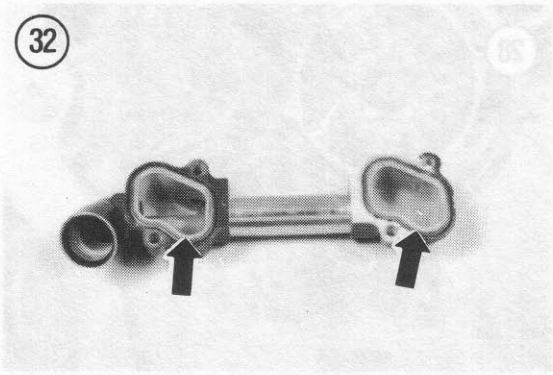


Table 1 COOLING SYSTEM SPECIFICATIONS

Coolant capacity	
Total system	
Magna	2.2 liters (2.3 U.S. qt., 1.9 Imp. qt.)
Interceptor	2.05 liters (2.2 U.S. qt., 1.8 Imp. qt.)
Radiator and engine	
Magna	1.8 liters (1.9 U.S. qt., 1.6 Imp. qt.)
Interceptor	1.7 liters (1.8 U.S. qt., 1.5 Imp. qt.)
Reserve tank	
Magna	0.4 liters (0.4 U.S. qt., 0.4 Imp. qt.)
Interceptor	0.35 liters (0.37 U.S. qt., 0.31 Imp. qt.)
Radiator cap relief pressure	0.75-1.05 kg/cm² (10.7-14.9 psi)
Thermostat	
Begins to open	80-84° C (176-183° F)
Valve lift	Minimum of 8 mm @ 95° C (203° F)
Boiling point (50/50 mixture)	
Unpressurized:	107.7° C (226° F)
Pressurized (cap on)	125.6° C (258° F)
Freezing point (hydrometer test)	
Water-to-antifreeze ratio	
55/45	-32° C (-25° F)
50/50	-37° C (-34° F)
45/55	-44.5° C (-48° F)

Table 2 SUB-FRAME TORQUE SPECIFICATIONS

Item	N•m	ft.-lb.
Engine mounting bolts		
Front and rear throughbolts	35-45	25-32
Subframe bolts		
Allen bolts	35-45	25-32

NOTE: If you own a 1986 model, first check the Supplement at the back of the book for any new service information.

CHAPTER NINE

FRONT SUSPENSION AND STEERING

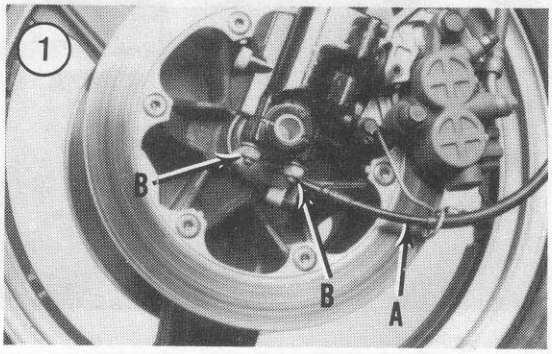
This chapter describes repair and maintenance procedures for the front wheel, forks and steering components.

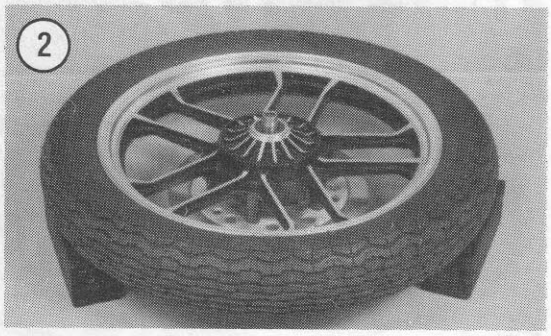
Front suspension torque specifications are covered in **Table 1**. **Tables 1-4** are at the end of this chapter.

FRONT WHEEL

Removal (Standard Axle)

1. Place a suitable size jack, with a wood block to protect the crankcase, under the engine. Carefully jack up the bike and place wood blocks under the crankcase or frame so the front wheel is off of the ground.





2. Remove the right-hand caliper assembly as described in Chapter Eleven. Tie the caliper up to the front fork to relieve strain on the brake line.

NOTE

Insert a piece of wood or vinyl tubing in the caliper in place of the disc. That way, if the brake lever is inadvertently squeezed, the piston will not be forced out of the cylinder. If this does happen, the caliper might have to be disassembled to reseat the piston and the system will have to be bled. By using the wood, bleeding the brake is not necessary when installing the wheel.

3. Remove the speedometer cable set screw. Pull the speedometer cable (A, **Figure 1**) from the speedometer gear box.
4. Remove the axle clamp nuts (B, **Figure 1**), washers and lockwashers from both fork sliders and remove both axle clamps.
5. Pull the wheel down and forward, being careful not to damage the studs on the fork end.

CAUTION

*Do not set the wheel down on the disc surface as it may be scratched or warped. Set the wheel on 2 blocks of wood (**Figure 2**).*

Installation (Standard Axle)

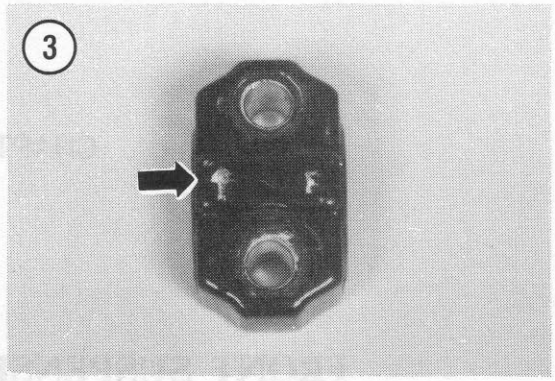
1. Make sure the axle bearing surfaces of the fork slider, the axle holder and each end of the axle are free from dirt or small burrs.
2. Remove the vinyl tubing or wood piece from the caliper.

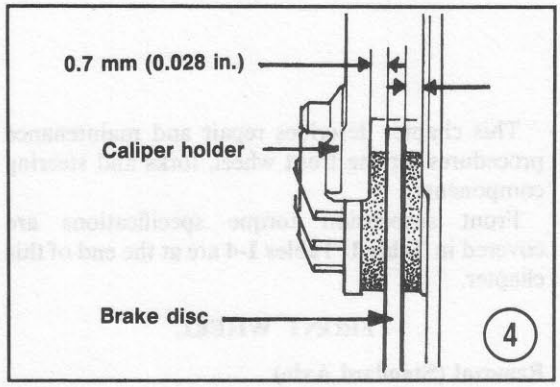
3. Position the wheel in place, carefully inserting the disc between the pads on the left-hand caliper assembly.
4. Install both axle clamps with the arrow (**Figure 3**) facing forward. Install the lockwashers and nuts, finger-tight only at this time.
5. Align the speedometer gearbox with the tang on the left-hand fork leg.

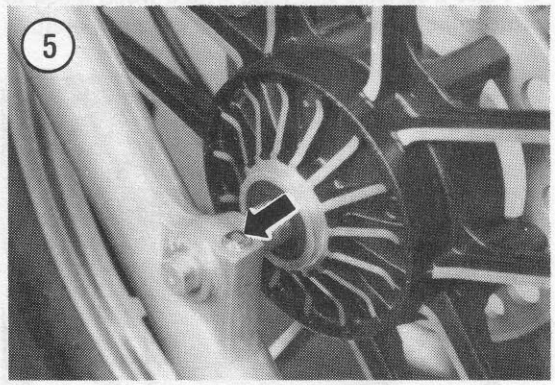
WARNING

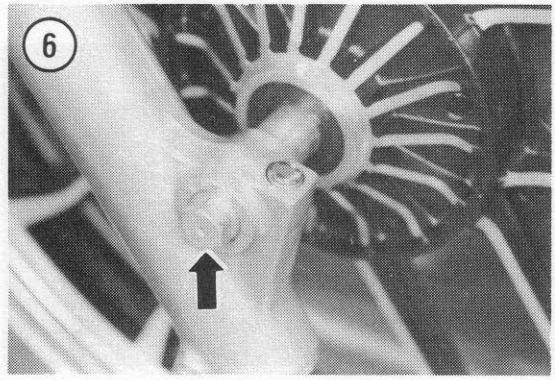
In the following step, the clamp nuts must be tightened in the manner and to the torque value described. After installation is complete, there will be a slight gap at the rear, with ***no gap*** *at the front. If done incorrectly, the studs could fail, resulting in loss of control of the bike when riding.*

6. Tighten the front axle clamp nut first and then the rear nut to the torque specification listed in **Table 1**.
7. Carefully install the right-hand caliper assembly onto the disc as described in Chapter Eleven.
8. After the brake caliper and axle holders are installed and tightened to the correct torque specifications, check the left-hand caliper bracket-to-disc clearance as follows:
   a. Measure the distance between each surface of the left-hand brake disc and the brake caliper bracket with a flat feeler gauge (**Figure 4**).
   b. The clearance must be 0.70 mm (0.028 in.) or more on each side.
   c. If the clearance is insufficient, loosen the nuts on the left-hand axle holder and move the left-hand fork leg in or out until the correct clearance is obtained.
   d. Tighten the axle holder nuts described in Step 6. Refer to WARNING preceding Step 6.
   e. Recheck the clearance again. Readjust if necessary.
9. Slowly rotate the wheel and install the speedometer cable into the speedometer housing. Install the cable set screw.
10. After the wheel is completely installed, rotate it several times and apply the brakes a couple of times to make sure the wheel rotates freely and that the brake pads seat against the discs correctly.



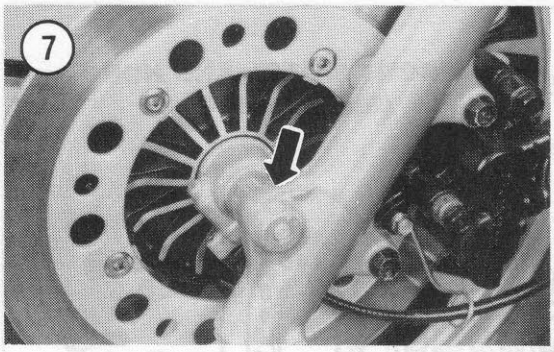


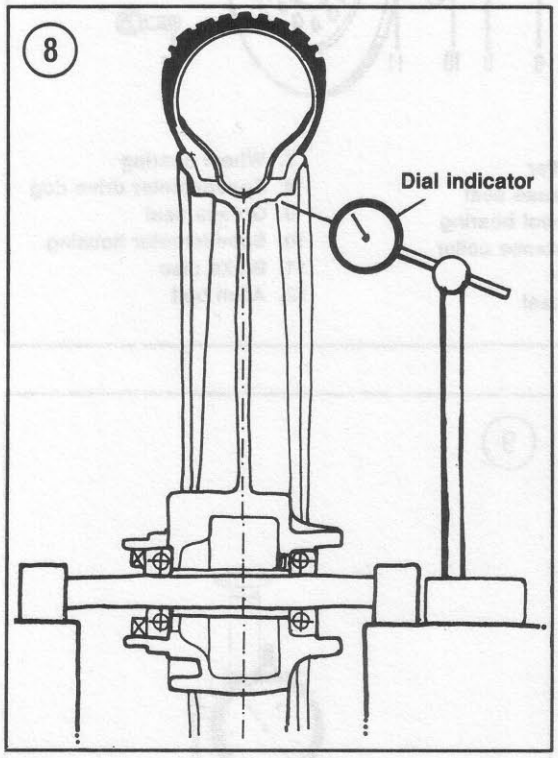




Removal (Leading Axle)

1. Place a suitable size jack, with a wood block to protect the crankcase, under the engine. Carefully jack up the bike and place wood blocks under the crankcase or frame so the front wheel is off of the ground.





2. Remove the speedometer cable set screw. Pull the speedometer cable free from the speedometer gear box.
3. Remove the cap from the axle pinch bolt.
4. Remove the axle pinch bolt (**Figure 5**).
5. Unscrew and withdraw the front axle (**Figure 6**) from the right-hand side.
6. Pull the wheel down and forward and remove it.

CAUTION

*Do not set the wheel down on the disc surface as it may be scratched or warped. Set the sidewalls on 2 wood blocks (**Figure 2**).*

7. After the front wheel has been removed, insert a piece of wood or vinyl tubing in the brake caliper in place of the disc. That way, if the brake lever is inadvertently squeezed, the piston will not be forced out of the cylinder. If this does happen, the caliper might have to be disassembled to reseat the piston and the system will have to be bled. By using the wood, bleeding the brake is not necessary when installing the wheel.

Installation (Leading Axle)

1. Make sure the axle bearing surfaces of the fork slider and axle are free from burrs and nicks.
2. Remove the vinyl tubing or wood block(s) from the brake caliper.
3. Position the wheel into place, carefully inserting the brake disc between the brake pads.
4. Align the speedometer housing with the tang on the left-hand fork (**Figure 7**).
5. Insert the front axle from the right-hand side and screw it into the left-hand fork leg.
6. Tighten the front axle to the torque specification listed in **Table 1**.
7. Install the pinch bolt and nut and tighten it to the torque specification listed in **Table 1**. Install the cap into the pinch bolt.
8. Slowly rotate the wheel and install the speedometer cable into the speedometer housing. Install the cable set screw.
9. After the wheel is completely installed, rotate it several times and apply the brake a couple of times to make sure that it rotates freely and that the brake pads seat against the disc correctly.

Inspection (All Models)

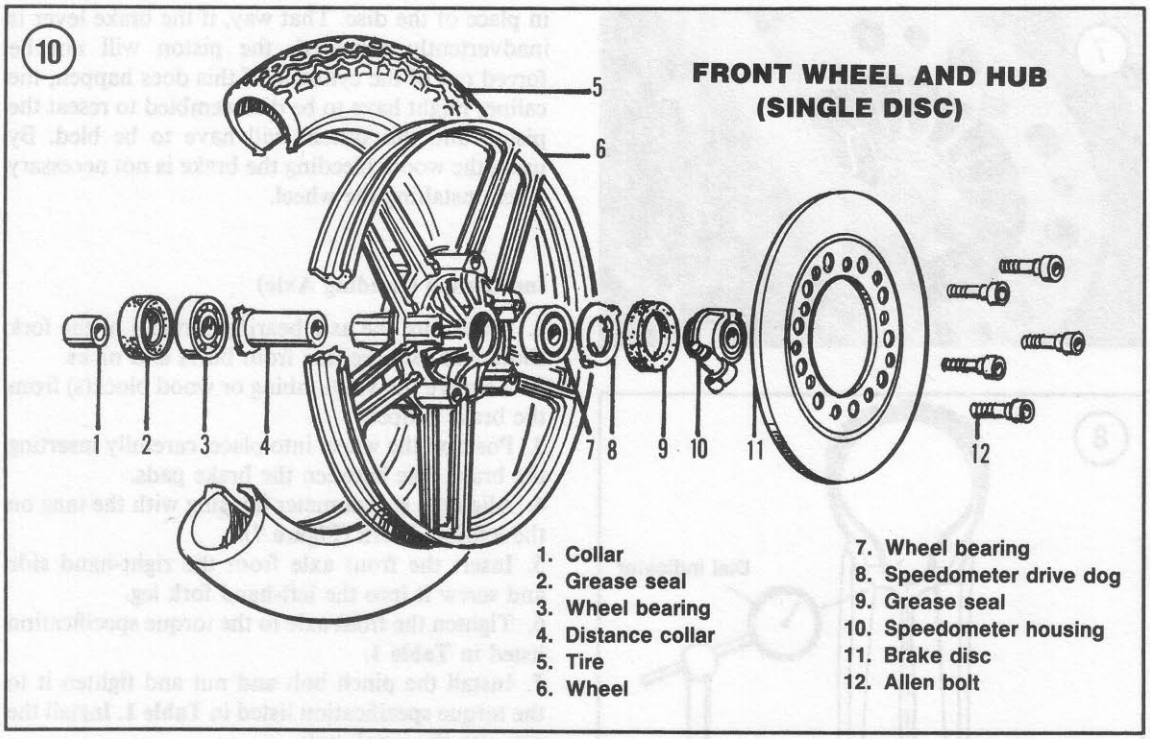
Measure the axial and radial runout of the wheel with a dial indicator as shown in **Figure 8**. The maximum axial and radial runout is 2.0 mm (0.08 in.). If the runout exceeds this dimension, check the wheel bearing condition.

If the wheel bearings are okay, the alloy wheel will have to be replaced as it cannot be serviced. Inspect the wheel for signs of cracks, fractures, dents or bends. If it is damaged in any way, it must be replaced.

WARNING

Do not try to repair any damage to the ComCast alloy wheel as it will result in an unsafe riding condition.

Check axle runout as described under *Front Hub Inspection* in this chapter.



FRONT HUB

Inspection

Inspect each wheel bearing before removing it from the wheel hub.

CAUTION

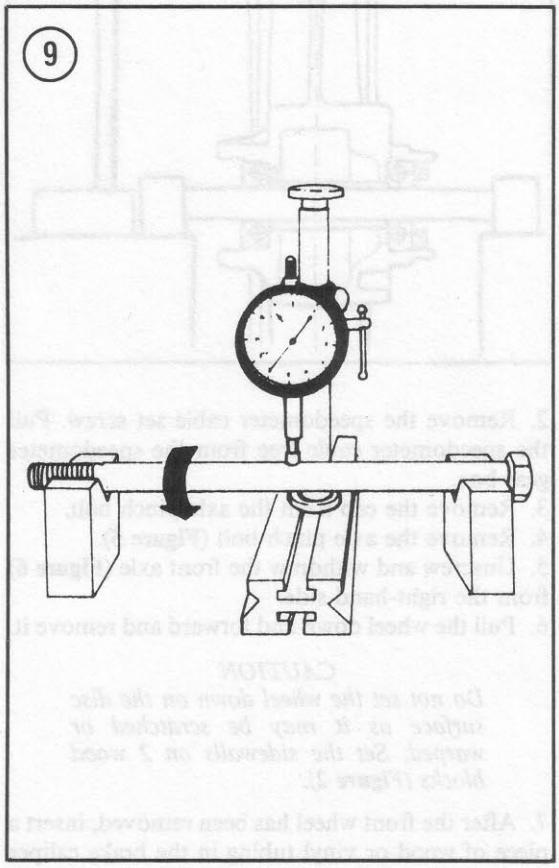
Do not remove the wheel bearings for inspection as they will be damaged during removal. Remove wheel bearings only if they are to be replaced.

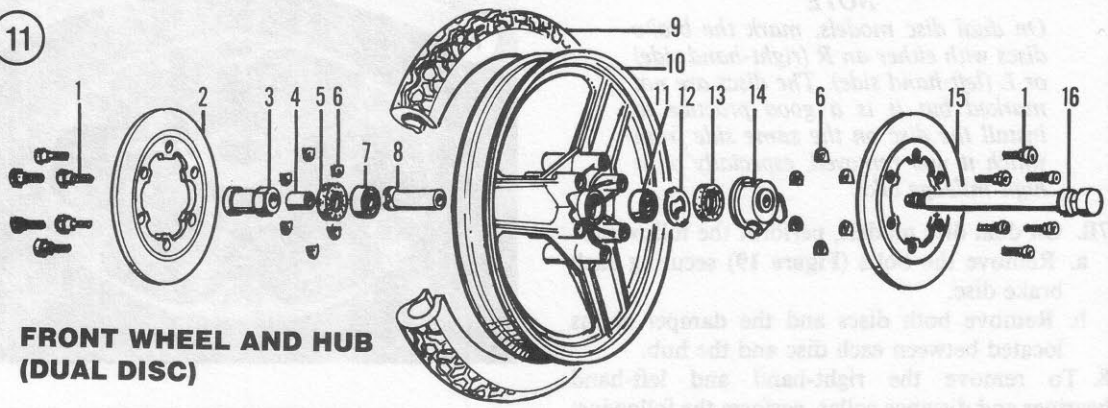
1. Perform Steps 1-5 of *Disassembly* in this chapter.
2. Turn each bearing by hand. Make sure bearings turn smoothly.
3. On non-sealed bearings, check the balls for evidence of wear, pitting or excessive heat (bluish tint). Replace the bearings if necessary; always replace as a complete set. When replacing the bearings, be sure to take your old bearings along to ensure a perfect matchup.

NOTE

Fully sealed bearings are available from many bearing specialty shops. Fully sealed bearings provide better protection from dirt and moisture that may get into the hub.

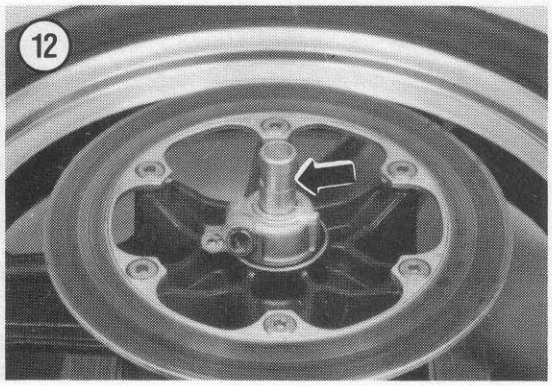
4. Check the axle for wear and straightness. Use V-blocks and a dial indicator as shown in **Figure 9**.

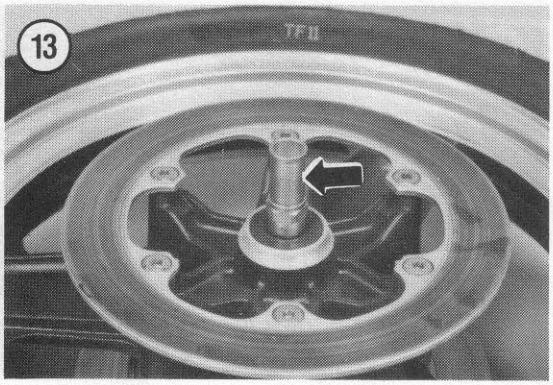




FRONT WHEEL AND HUB (DUAL DISC)

1. Allen bolt
2. Right-hand brake disc
3. Axle nut
4. Collar
5. Grease seal
6. Shim
7. Wheel bearing
8. Distance collar
9. Tire
10. Wheel
11. Wheel bearing
12. Speedometer drive dog
13. Grease seal
14. Speedometer housing
15. Left-hand brake disc
16. Front axle





If the runout is 0.2 mm (0.01 in.) or greater, the axle should be replaced.

Disassembly

Refer to **Figure 10** (Magna) or **Figure 11** (Interceptor) for this procedure.

1. Remove the front wheel as described in this chapter.
2. On standard axle models, perform the following:
   a. Hold onto the left-hand end (**Figure 12**) of the front axle and unscrew the axle nut (**Figure 13**) from the right-hand end.
   b. Remove the front axle nut and withdraw the front axle from the hub.
3. Remove the speedometer gear box (**Figure 14**).
4. Remove the collar (**Figure 15**) and grease seal (**Figure 16**) from the right-hand side.
5. Remove the grease seal and speedometer drive dog (**Figure 17**) from the left-hand side.
6. Before proceeding further, inspect the wheel bearings as described in this chapter. If they must be replaced, proceed as follows.

7A. On single disc models, perform the following:
   a. Remove the bolts (**Figure 18**) securing the brake disc.
   b. Remove the disc from the hub.

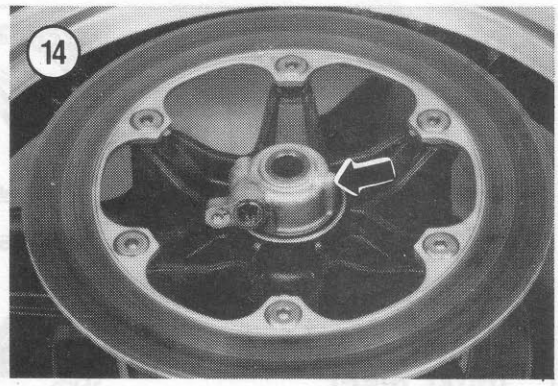
NOTE

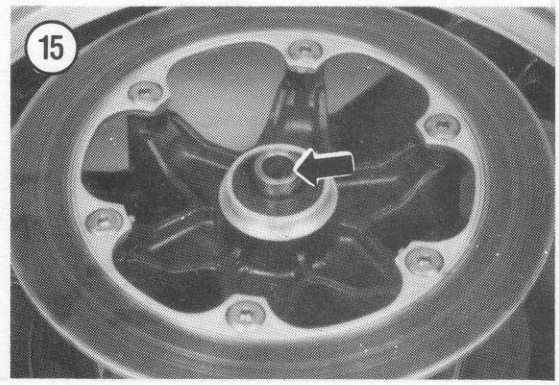
On dual disc models, mark the brake discs with either an R (right-hand side) or L (left-hand side). The discs are not marked but it is a good practice to install the disc on the same side from which it was removed, especially on a high-mileage bike.

7B. On dual disc models, perform the following:
a. Remove the bolts (**Figure 19**) securing each brake disc.
b. Remove both discs and the damper shims located between each disc and the hub.

8. To remove the right-hand and left-hand bearings and distance collar, perform the following:
a. Insert a soft aluminum or brass drift into one side of the hub.
b. Push the distance collar over to one side and place the drift on the inner race of the lower bearing.
c. Tap the bearing out of the hub with a hammer, working around the perimeter of the inner race.
d. Repeat for the other bearing.

9. Clean the inside and the outside of the hub with solvent. Dry with compressed air.



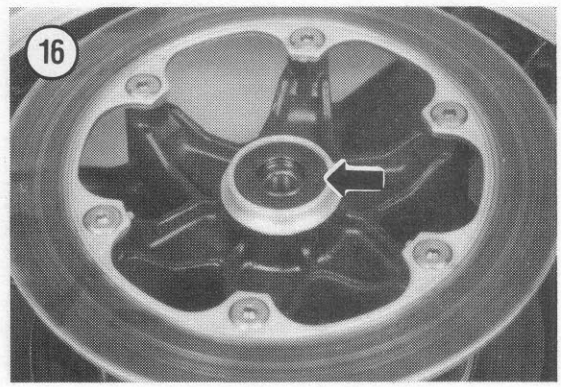


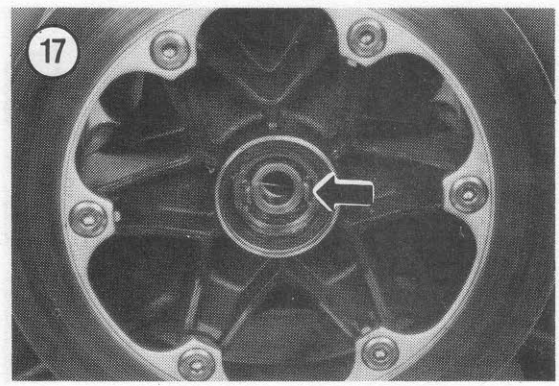
Assembly

1. On non-sealed bearings, pack the bearings with a good quality bearing grease. Work the grease in between the balls thoroughly; turn the bearing by hand a couple of times to make sure the grease is distributed evenly inside the bearing.
2. Blow any dirt or foreign matter out of the hub before installing the bearings.

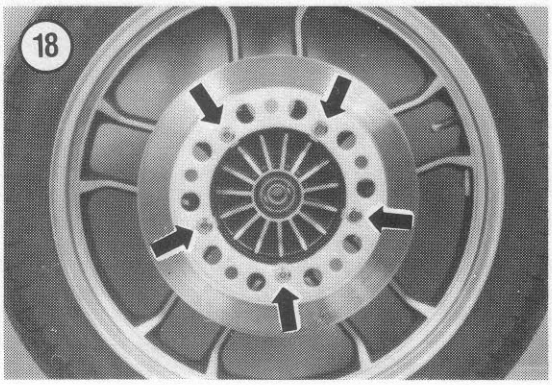
CAUTION

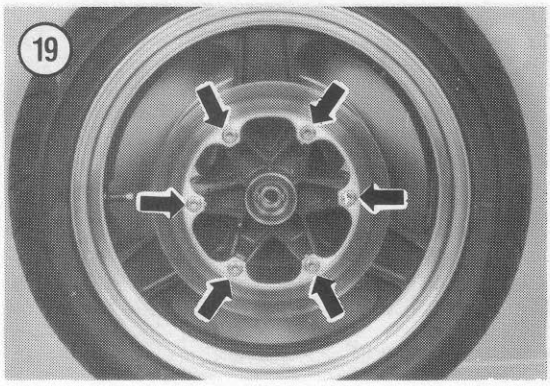
*Install non-sealed bearings with the single sealed side facing outward. Tap the bearings squarely into place and tap on the outer race only. Use a socket (**Figure 20**) that matches the outer race diameter. Do not tap on the inner race or the bearing might be damaged. Be sure that the bearings are completely seated.*

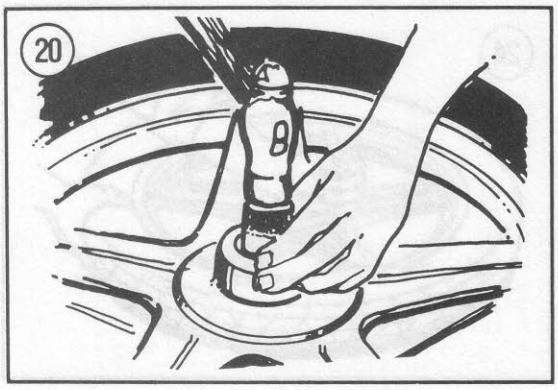


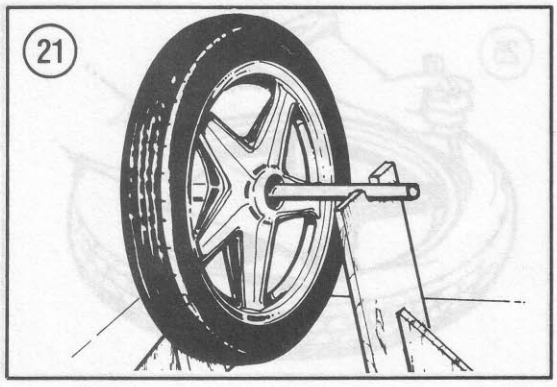


3. Install the right-hand bearing and press the distance collar into place.
4. Install the left-hand bearing.
5A. On single disc models, perform the following:
a. Install the brake disc onto the hub.
b. Install the bolts and tighten to the torque specification listed in **Table 1**.









NOTE

On dual-disc models, install the disc on the same side of the wheel from which it was removed, especially on a high-mileage bike.

5B. On dual disc models, perform the following:

a. Install the damper shims onto the hub and then install the left-hand brake disc onto the left-hand side of the hub.

b. Install the bolts and tighten to the torque specification listed in **Table 1**.

c. Repeat for the right-hand brake disc.

6. Install the grease seal (**Figure 16**) on the right-hand side.

7. Pull the speedometer drive gear out of the speedometer gear box. Pack the cavity with multipurpose grease and reinstall the drive gear. If the washer comes out with the drive gear, be sure to reinstall it before installing the drive gear.

8. Install the speedometer drive dog and grease seal (**Figure 17**) on the left-hand side.

9. Align the tangs of the speedometer drive gear with the drive dog in the hub and install the speedometer gear box (**Figure 14**).

10. Install the collar (**Figure 15**) on the right-hand side.

11. On standard axle models, perform the following:

a. Insert the front axle from the left-hand side and install the axle nut (**Figure 13**) on the right-hand side.

b. Tighten the axle nut to the torque specification listed in **Table 1**.

12. Install the front wheel as described in this chapter.

WHEEL BALANCE

An unbalanced wheel is unsafe. Depending on the degree of unbalance and the speed of the motorcycle, the rider may experience anything from a mild vibration to a violent shimmy which may result in loss of control.

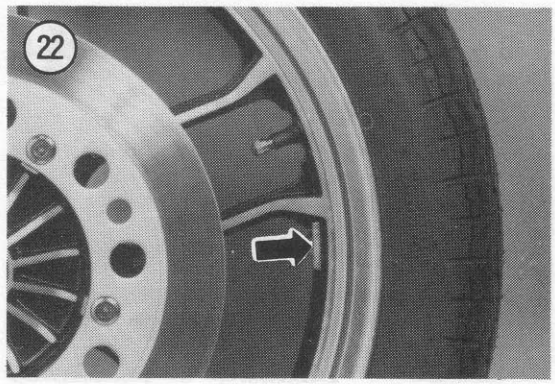
On alloy wheels, weights are attached to the rim. A kit of Tape-A-Weight or equivalent may be purchased from most motorcycle supply stores. This kit contains test weights and strips of adhesive-backed weights that can be cut to the desired weight and attached directly to the rim.

Before you attempt to balance the wheel, check to be sure that the wheel bearings are in good condition and properly lubricated and that the brakes do not drag. The wheel must rotate freely.

1. Remove the wheel as described in this chapter or Chapter Ten.

2. Mount the wheel on a fixture such as the one shown in **Figure 21** so it can rotate freely.

3. Give the wheel a spin and let it coast to a stop. Mark the tire at the lowest point.
4. Spin the wheel several more times. If the wheel keeps coming to rest at the same point, it is out of balance.
5. Tape a test weight to the upper (or light) side of the wheel.
6. Experiment with different weights until the wheel, when spun, comes to a rest at a different position each time.
7. Remove the test weight and install the correct size adhesive-backed or clamp-on weight (**Figure 22**).

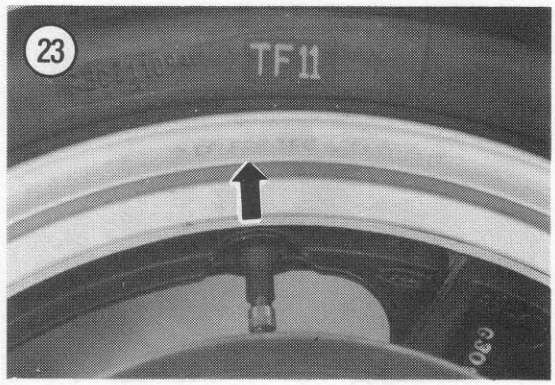


TIRE CHANGING

The rim of the alloy wheel is aluminum and the exterior appearance can easily be damaged. Special care must be taken with tire irons when changing a tire to avoid scratches and gouges to the outer rim surface. Insert scraps of leather between the tire iron and the rim to protect the rim from gouges. Honda offers rim protectors (part No. 07772-0020200) for this purpose that are very handy to use. All models are factory-equipped with tubeless tires and wheels designed specifically for use with tubeless tires.

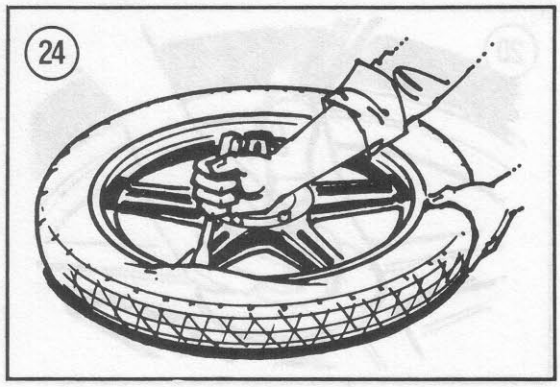
WARNING

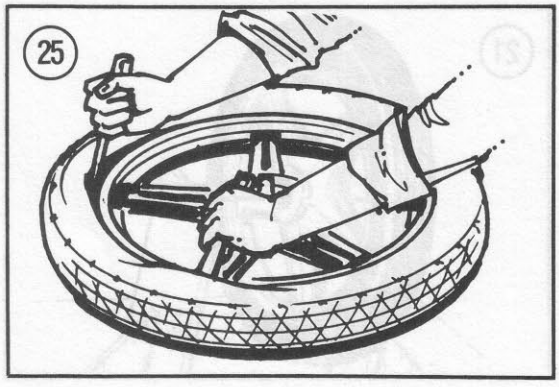
*Do not install tubeless tires on wheels designed for use only with tube-type tires. Personal injury and tire failure may result from rapid tire deflation while riding. Wheels for use with tubeless tires are so marked (**Figure 23**).*

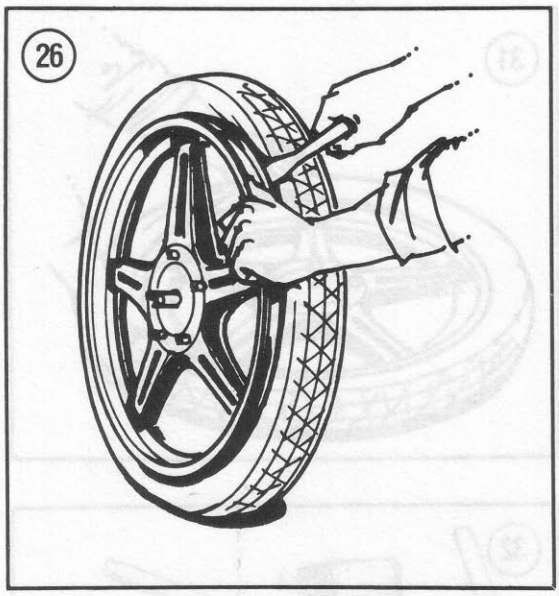


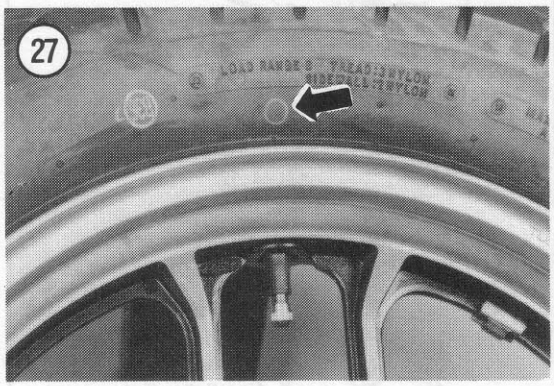
Removal

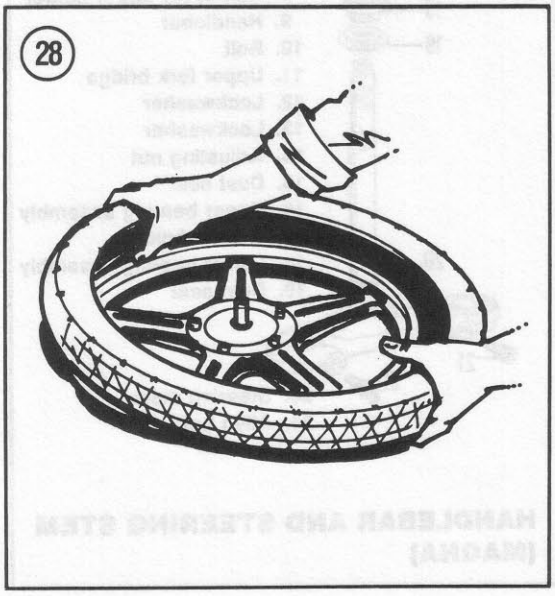
1. Remove the valve core to deflate the tire.
2. Press the entire bead on both sides of the tire into the center of the rim. Lubricate the beads with soapy water.
3. Insert the tire iron under the bead next to the valve (**Figure 24**). Force the bead on the opposite side of the tire into the center of the rim and pry the bead over the rim with the tire iron.
4. Insert a second tire iron next to the first to hold the bead over the rim. Then work around the tire with the first tire iron, prying the bead over the rim (**Figure 25**).
5. Stand the tire upright. Insert the tire iron between the second bead and the side of the rim that the first bead was pried over (**Figure 26**). Force the bead on the opposite side from the tire iron into the center of the rim. Pry the second bead off the rim, working around as with the first.
6. Honda recommends that the tire valve stem be replaced whenever the tire is removed from the wheel.





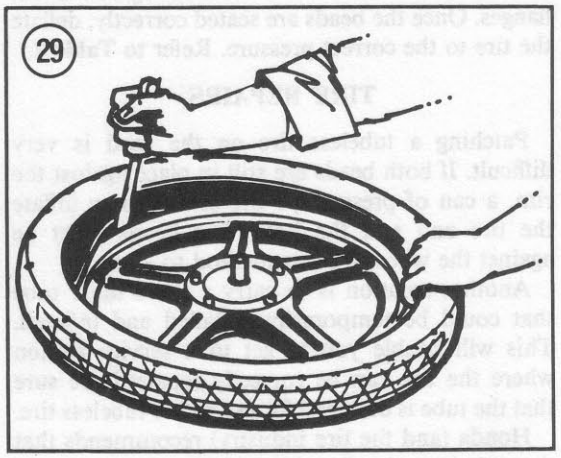


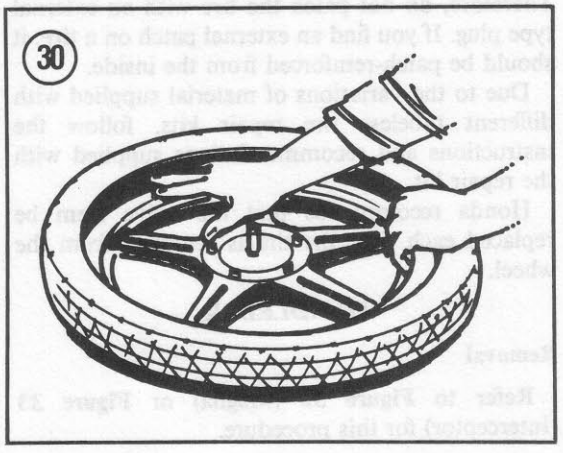




Installation

1. Carefully inspect the tire for any damage, especially inside.
2. A new tire may have balancing rubbers inside. These are not patches and should not be disturbed. A colored spot near the bead indicates a lighter point on the tire. This spot (**Figure 27**) should be placed next to the valve stem.
3. Lubricate both beads of the tire with soapy water.
4. Place the backside of the tire into the center of the rim. The lower bead should go into the center of the rim and the upper bead outside. Work around the tire in both directions (**Figure 28**). Use a tire iron for the last few inches of bead (**Figure 29**).
5. Press the upper bead into the rim opposite the valve (**Figure 30**). Pry the bead into the rim on both sides of the initial point with a tire iron, working around the rim to the valve (**Figure 31**).
6. Check the bead on both sides of the tire for even fit around the rim.





7. Bounce the wheel several times, rotating it each time. This will force the tire beads against the rim flanges. After the tire beads are in contact with the rim evenly, inflate the tire to seat the beads.

NOTE

If you are unable to get an airtight seal this way, install an inflatable band around the circumference of the tire. Slowly inflate the band until the beads are seated against the rim flanges, then inflate the tire. If you still encounter trouble, deflate the inflatable band and the tire. Apply additional lubricant to the beads and repeat the inflation procedure. Also try rolling the tire back and forth while inflating it.

WARNING

During the next step, never exceed 4.0 kg/cm² (56 psi) inflation pressure as the tire could burst causing severe injury. Never stand directly over the tire while inflating it.

8. Inflate the tire to more than the recommended inflation pressure for the initial seating of the rim flanges. Once the beads are seated correctly, deflate the tire to the correct pressure. Refer to **Table 2**.

TIRE REPAIRS

Patching a tubeless tire on the road is very difficult. If both beads are still in place against the rim, a can of pressurized tire sealant may inflate the tire and seal the hole. The beads must be against the wheel for this method to work.

Another solution is to carry a spare inner tube that could be temporarily installed and inflated. This will enable you to get to a service station where the tire can be correctly repaired. Be sure that the tube is designed for use with a tubeless tire.

Honda (and the tire industry) recommends that the tubeless tire be patched from the inside. Therefore, do not patch the tire with an external type plug. If you find an external patch on a tire, it should be patch-reinforced from the inside.

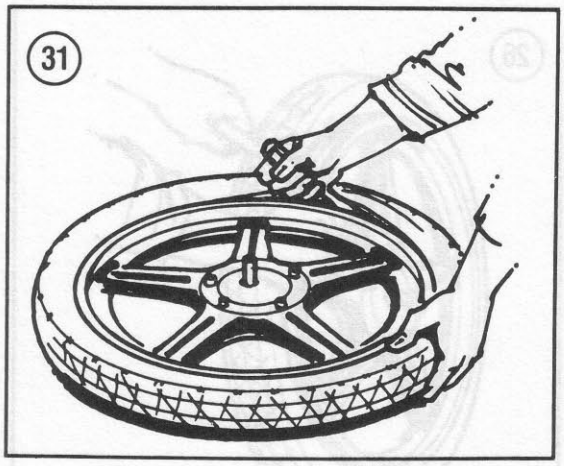
Due to the variations of material supplied with different tubeless tire repair kits, follow the instructions and recommendations supplied with the repair kit.

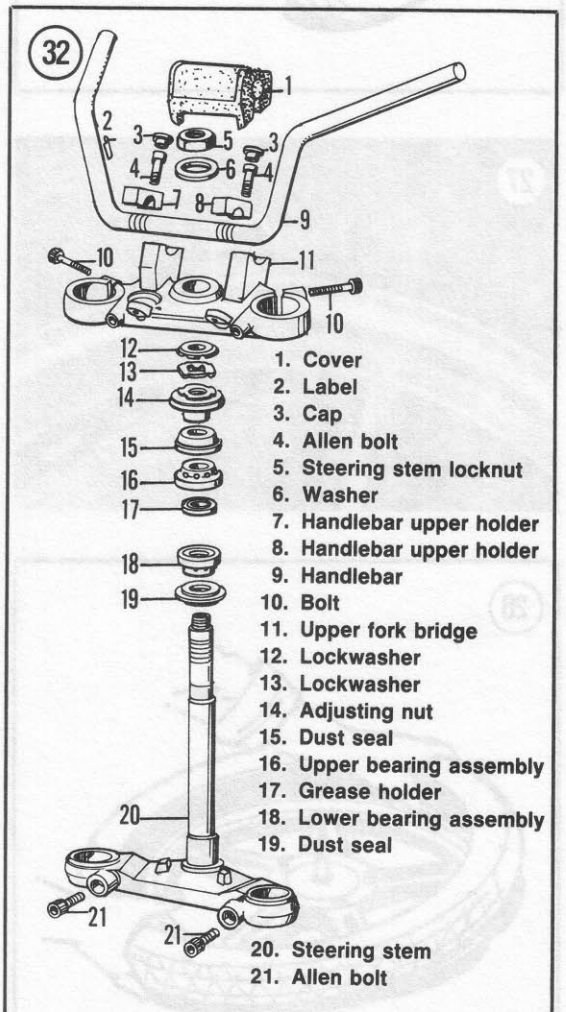
Honda recommends that the valve stem be replaced each time the tire is removed from the wheel.

HANDLEBAR

Removal

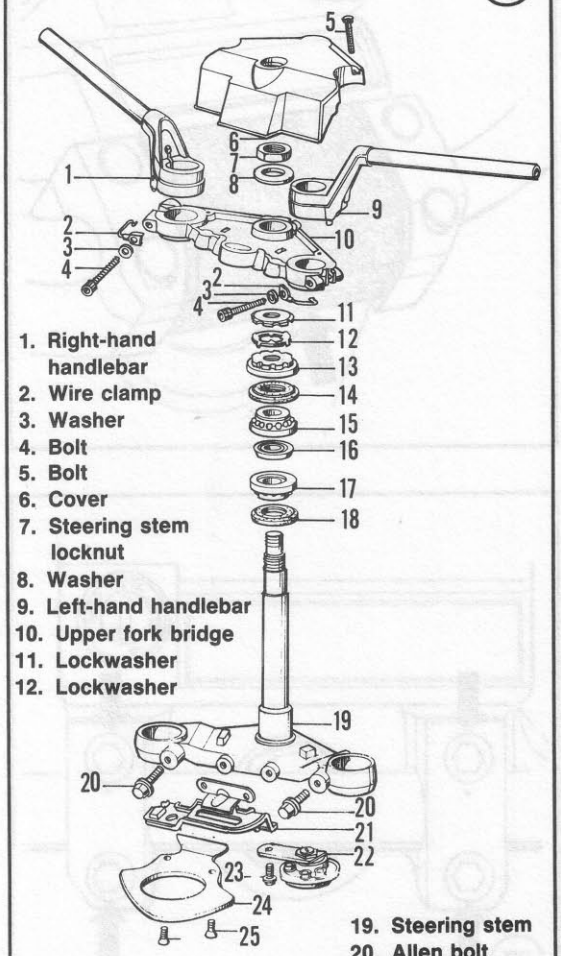
Refer to **Figure 32** (Magna) or **Figure 33** (Interceptor) for this procedure.





HANDLEBAR AND STEERING STEM (MAGNA)

HANDLEBAR AND STEERING STEM (INTERCEPTOR) (33)



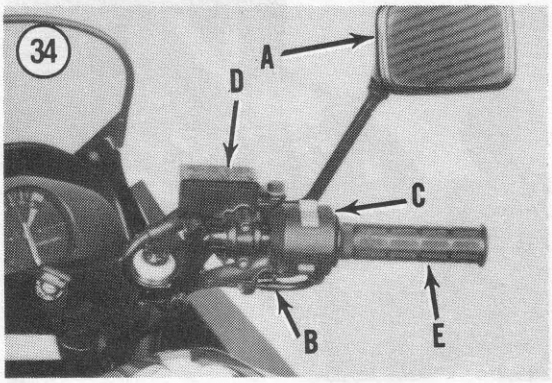
1. Right-hand handlebar
2. Wire clamp
3. Washer
4. Bolt
5. Bolt
6. Cover
7. Steering stem locknut
8. Washer
9. Left-hand handlebar
10. Upper fork bridge
11. Lockwasher
12. Lockwasher
13. Adjusting nut
14. Dust seal
15. Upper bearing assembly
16. Grease holder
17. Lower bearing assembly
18. Dust seal
19. Steering stem
20. Allen bolt bracket
21. Horn mounting
22. Horn
23. Bolt
24. Bracket
25. Bolt

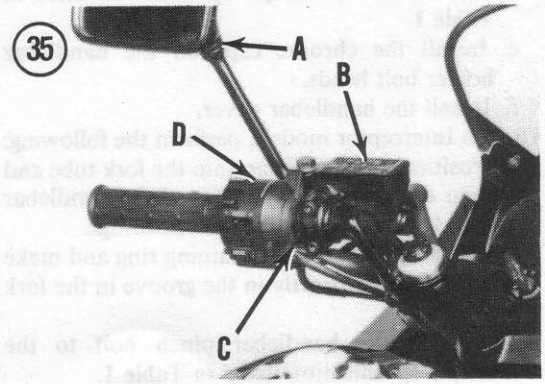
1. Remove the right-hand side cover.
2. Disconnect the battery negative lead.
3. Remove the right-hand rear view mirror (A, **Figure 34**).
4. Disconnect the brake light switch electrical connector (B, **Figure 34**).
5. Remove the screws securing the right-hand handlebar switch assembly (C, **Figure 34**) and remove the electrical wires from the clips on the handlebar.

CAUTION

Cover the instrument cluster, front fairing (Interceptor models) and frame with a heavy cloth or plastic tarp to protect it from accidental spilling of brake fluid. Wash any spilled brake fluid off any painted or plated surface immediately, as it will destroy the finish. Use soapy water and rinse thoroughly.

6. Remove the 2 bolts securing the brake master cylinder (D, **Figure 34**) and lay it over the frame. Keep the reservoir in the upright position to minimize loss of brake fluid and to keep air from entering into the brake system. It is not necessary to remove the hydraulic brake line.
7. Remove the throttle assembly (E, **Figure 34**) and carefully lay the throttle assembly and cables over the fender or back over the frame. Be careful that the cables do not get crimped or damaged.
8. Remove the left-hand rear view mirror (A, **Figure 35**).
9. Disconnect the clutch switch wires.
10. Remove the 2 bolts (B, **Figure 35**) securing the clutch master cylinder and lay it over the frame. Keep the reservoir in the upright position to minimize loss of hydraulic fluid and to keep air from entering into the clutch system. It is not necessary to remove the hydraulic line.
11. Disconnect the choke cable (C, **Figure 35**) from the choke lever.





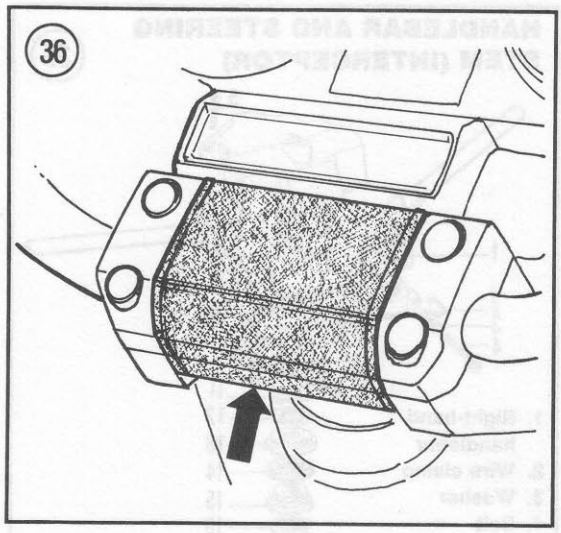
12. Remove the screws securing the left-hand handlebar switch assembly (D, **Figure 35**) and remove the electrical wires from the clips on the handlebar.

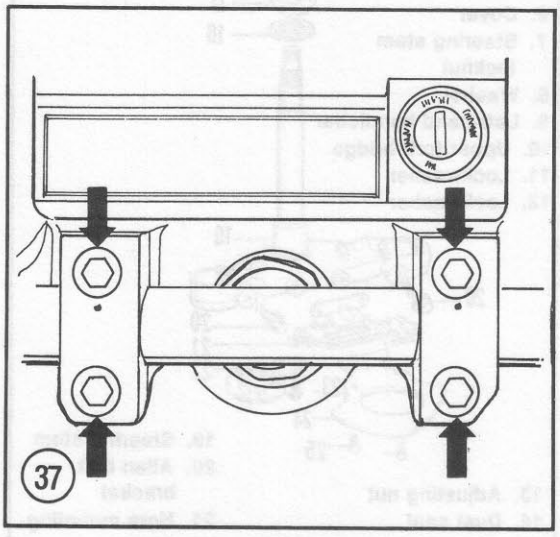
13A. On Magna models, perform the following:

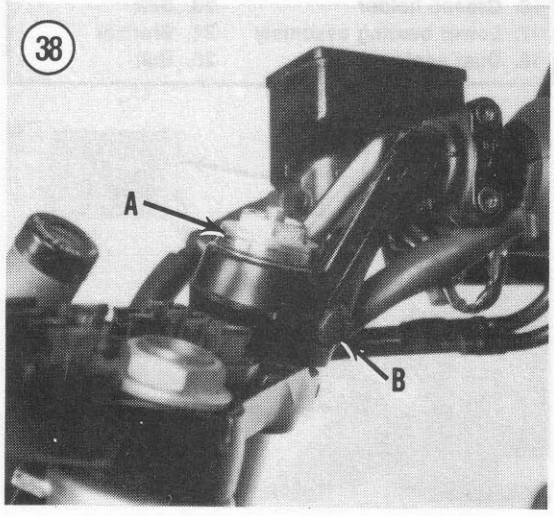
a. Remove the handlebar cover (**Figure 36**).
b. Remove the chrome caps on the handlebar holder bolt heads.
c. Remove the Allen bolts (**Figure 37**) securing the handlebar holders.
d. Remove the handlebar.
e. To maintain a good grip on the handlebar and to prevent it from slipping down, clean the knurled section of the handlebar with a wire brush. It should be kept rough so it will be held securely by the holders. The holders should also be kept free of any metal that may have been gouged loose by handlebar slippage.

13B. On Interceptor models, remove the handlebars one at a time as follows:

a. Remove the handlebar retaining ring (A, **Figure 38**) from the groove in the top of the fork tube.
b. Loosen the handlebar pinch bolt (B, **Figure 38**).
c. Remove the handlebar from the fork tube.
d. To remove the other handlebar, repeat this step.







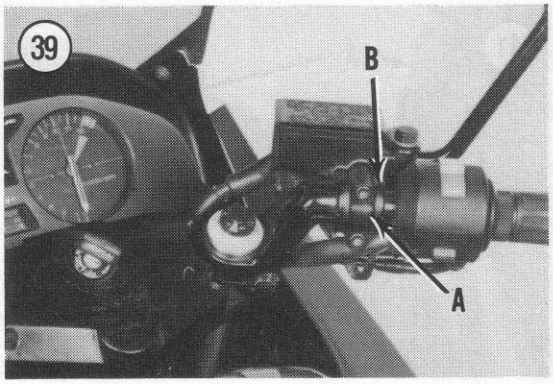
Installation

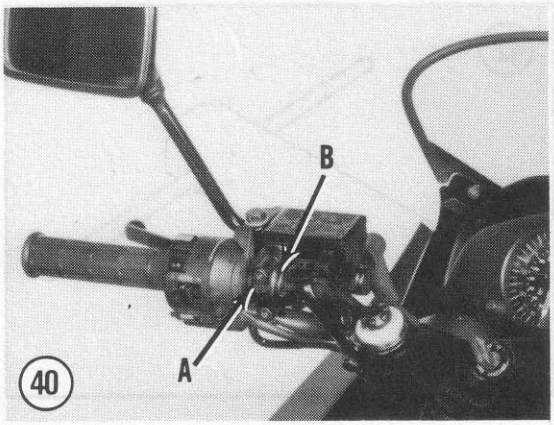
1A. On Magna models, perform the following:

a. Install the handlebar on the upper fork bridge so the punch mark on the handlebar is aligned with the top surface of the raised portion of the upper fork bridge.
b. Install the handlebar holders with the punch marks facing toward the front.
c. Install the Allen bolts securing the handlebar holders.
d. Tighten the forward Allen bolts first, then the rear bolts to the torque specification listed in **Table 1**.
e. Install the chrome caps on the handlebar holder bolt heads.
f. Install the handlebar cover.

1B. On Interceptor models, perform the following:

a. Position the handlebar onto the fork tube and align the pin on the bottom of the handlebar with the hole in the upper fork bridge.
b. Install the handlebar retaining ring and make sure it seats correctly in the groove in the fork tube.
c. Tighten the handlebar pinch bolt to the torque specification listed in **Table 1**.





d. To install the other handlebar, repeat this step.

2. Apply a light coat of multipurpose grease to the throttle grip area on the handlebar before installing the throttle grip assembly.
3. Install the throttle grip assembly.
4. Insert the pin on the bottom half of the right-hand switch assembly into the hole in the handlebar. Tighten the forward screws first, then the rear.
5. Install the brake master cylinder onto the handlebar. Install the clamp with the UP arrow (A, **Figure 39**) facing up and align the clamp's raised mark with the punch mark on the handlebar (B, **Figure 39**). Tighten the upper bolt first, then the lower bolt.

WARNING

After installation is completed, make sure the brake lever does not come in contact with the throttle grip assembly when it is pulled on fully. If it does, the brake fluid may be low in the reservoir; refill as necessary. Refer to Chapter Eleven.

6. Connect the brake light switch wires.
7. If removed, apply contact cement to the left-hand hand grip and install the grip onto the handlebar.
8. Apply a light coat of grease to the sliding surfaces of the choke lever.
9. Connect the choke cable end into the hole in the choke lever.
10. Insert the pin on the bottom half of the left-hand switch assembly into the hole in the handlebar. Tighten the forward screws first, then the rear.
11. Install the clutch master cylinder onto the handlebar. Install the clamp with the UP arrow (A, **Figure 40**) facing up and align the clamp's raised mark with the punch mark on the handlebar (B, **Figure 40**). Tighten the upper bolt first and then the lower bolt.

WARNING

After installation is completed, make sure the clutch lever does not come in contact with the hand grip assembly when it is pulled on fully. If it does, the hydraulic fluid may be low in the reservoir; refill as necessary. Refer to ***Clutch Master Cylinder*** *in Chapter Five.*

12. Connect the clutch switch wires.
13. Install the clips onto the electrical wires on the handlebar.
14. Connect the battery negative lead to the battery.
15. Install the rear view mirrors.
16. Adjust the choke and throttle as described in Chapter Three.
17. Install the right-hand side cover.

STEERING HEAD AND STEM

Disassembly

Refer to **Figure 32** (Magna) or **Figure 33** (Interceptor) for this procedure.

1. Remove the front wheel as described in this chapter.
2. Remove the handlebar(s) (A, **Figure 41**) as described in this chapter.

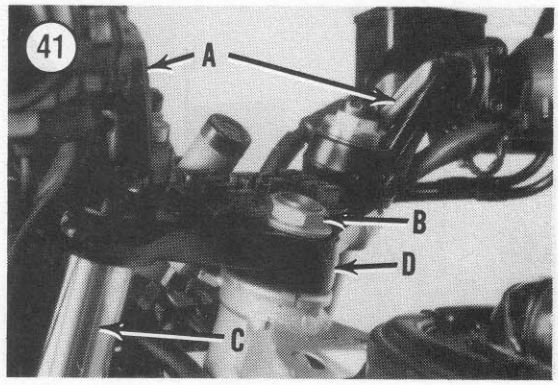
3A. On Magna models, perform the following:

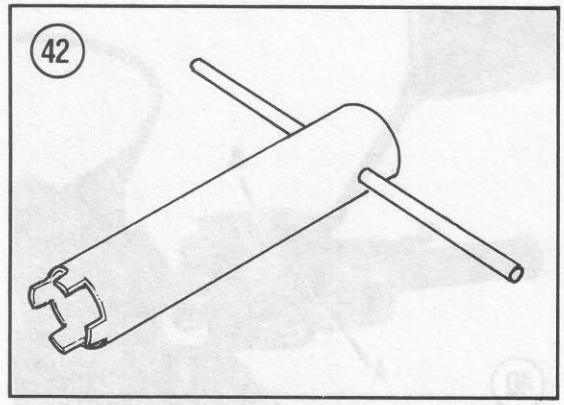
a. Remove the headlight assembly as described in Chapter Seven.
b. Remove the instrument cluster as described in Chapter Seven.
c. Remove the ignition switch as described in Chapter Seven.
d. Remove the front wheel as described in this chapter.

e. Remove the horns and fuse cover as described in Chapter Seven.
f. Remove the front brake 3-way joint as described in Chapter Eleven.

3B. On Interceptor models, perform the following:
a. Remove the front fairing as described in Chapter Twelve.
b. Remove the headlight assembly as described in Chapter Seven.
c. Remove the front fairing mounting bracket as described in Chapter Twelve.
d. Remove the ignition switch as described in Chapter Seven.
e. Remove the fuse cover as described in Chapter Seven.
f. Remove the front wheel as described in this chapter.
g. Remove the front brake 3-way joint as described in Chapter Eleven.

4. Remove the bolts securing the front fender and remove the front fender.
5. Remove the bolts securing the fork brace and remove the fork brace.
6. Loosen the steering stem nut and washer (B, **Figure 41**).
7. Remove the front forks (C, **Figure 41**) as described in this chapter.
8. Remove the steering stem nut and washer.
9. Remove the upper fork bridge (D, **Figure 41**).
10. Bend down the locking tabs from the grooves in the locknut.
11. Remove the locknut and the lockwasher. Discard the lockwasher.
12. Loosen the steering stem adjust nut. To loosen the nut, use a large drift and hammer or use the easily improvised tool shown in **Figure 42**. Honda offers a special tool (Steering Stem Socket) for this purpose (part No. 07916-3710100).
13. Have an assistant hold onto the steering stem and remove the steering stem adjust nut and dust seal.
14. Lower the steering stem out of the steering head. Don't worry about catching any loose steel balls as the steering stem is equipped with assembled ball bearings.
15. Remove the upper bearing and grease holder from the steering head.





Inspection

1. Clean the bearings and the bearing races in the steering head with solvent.
2. Check the welds around the steering head for cracks and fractures. If any are found, have them repaired by a competent frame shop or welding service.
3. Check the bearings for pitting, scratches or discoloration indicating wear or corrosion.
4. Check the races for pitting, galling and corrosion. If any of these conditions exist, replace the races as described in this chapter.
5. Check the steering stem for cracks and check its races for damage or wear. Replace if necessary.
6. Thread the steering stem adjust nut onto the steering stem. Make sure it screws on easily with no roughness. Unscrew the steering stem adjust nut. If necessary clean the threads in both parts with a wire brush or tap and die of the correct size.

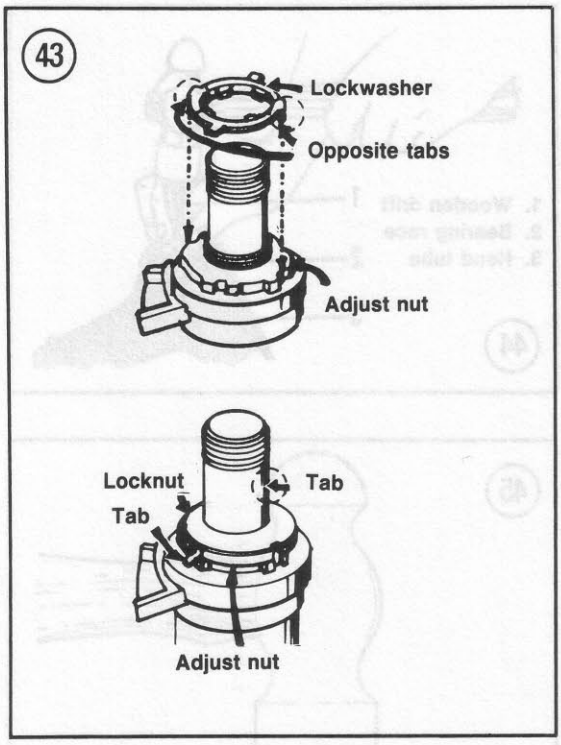
Assembly

Refer to **Figure 32** (Magna) or **Figure 33** (Interceptor) for this procedure.

1. Make sure both steering head bearing outer races are properly seated in the steering head tube.
2. Pack the bearing cavities of both ball bearings with bearing grease. Coat the outer bearing races in the steering head with bearing grease also.
3. Apply a coat of grease to the threads of the steering stem and steering stem adjust nut.

NOTE

The lower bearing has a larger inside diameter than the upper bearing.



4. Install the steering stem, with the lower bearing in place, into the steering head tube and hold it firmly in place.
5. Install the upper bearing asembly and new grease holder.
6. Install the steering stem adjust nut and tighten it to the torque specification listed in **Table 1.**
7. Turn the steering stem from lock-to-lock 5-6 times to seat the bearings.
8. Loosen the steering stem nut and repeat Step 6 and Step 7 twice more to make sure the bearings are properly seated.
9. Install a new lockwasher and insert 2 opposite tabs of the lockwasher into the notches in the steering stem adjust nut as shown in **Figure 43.** Always install a new lockwasher; never reinstall a used one as the tabs may break off, making the lockwasher ineffective.
10. Install the locknut and hand-tighten it. Further tighten the locknut just until the grooves align with 2 of the tabs of the lockwasher. Bend the 2 tabs up into the grooves in the locknut as shown in **Figure 43.**

NOTE

If the grooves in the locknut will not align easily with 2 of the tabs of the locknut, remove the locknut, turn it over and reinstall the locknut. Repeat Step 10.

11. Install the upper fork bridge, washer and the steering stem nut. Tighten the nut only finger-tight at this time.
12A. On Magna models, install the fork tubes into the lower and upper fork bridge. Position the fork tube so the groove is aligned with the top surface of the upper fork bridge. Tighten the lower fork bridge bolt loosely.

NOTE

In the next step, do not align the 1st groove from the top with the top surface of the upper fork bridge. It must be aligned with the 2nd groove so there is enough fork tube showing above the upper fork bridge for the handlebars to be attached.

12B. On Interceptor models, install the fork tubes in the lower and upper fork bridge. Position the fork tube so that the *2nd groove* from the top is aligned with the top surface of the upper fork bridge. Tighten the lower fork bridge bolts loosely.
13. Install the steering stem washer and nut. Tighten the steering stem nut to the torque specification listed in **Table 1.**
14. Tighten the upper fork bridge bolts to the torque specification listed in **Table 1.**
15. Apply oil to the threads of the lower fork bridge bolts.
16. Tighten the lower fork bridge bolts to the torque specifications listed in **Table 1.**
torque specification listed in **Table 1.**
17A. On Magna models, perform the following:
a. Install the front brake 3-way joint as described in Chapter Eleven.
b. Install the horns and fuse cover as described in Chapter Seven.
c. Install the front wheel as described in this chapter.
d. Install the ignition switch as described in Chapter Seven.
e. Install the instrument cluster as described in Chapter Seven.
f. Install the headlight assembly as described in Chapter Seven.

17B. On Interceptor models, perform the following:
a. Install the front brake 3-way joint as described in Chapter Eleven.
b. Install the front wheel as described in this chapter.
c. Install the fuse cover as described in Chapter Seven.
d. Install the ignition switch as described in Chapter Seven.

e. Install the front fairing mounting bracket as described in Chapter Twelve.
f. Install the headlight assembly as described in Chapter Seven.
g. Install the front fairing as described in Chapter Twelve.

18. Install the handlebars as described in this chapter.
19. Install the front wheel as described in this chapter.
20. Install the fork brace and bolts. Tighten the bolts only finger-tight. Do not tighten the bolts at this time.
21. Install the front fender and tighten the bolts securely.
22. Install the front wheel as described in this chapter.
23. Apply the front brake and push down on the front forks several times to seat the fork brace.
24. Tighten the fork bridge bolts to the torque specification listed in **Table 1**.

Steering Stem Adjustment

If play develops or there is binding in the steering system, it may only require adjustment. However, don't take a chance on it. Disassemble the steering stem assembly and look for possible damage as described in this chapter.

STEERING HEAD BEARING RACES

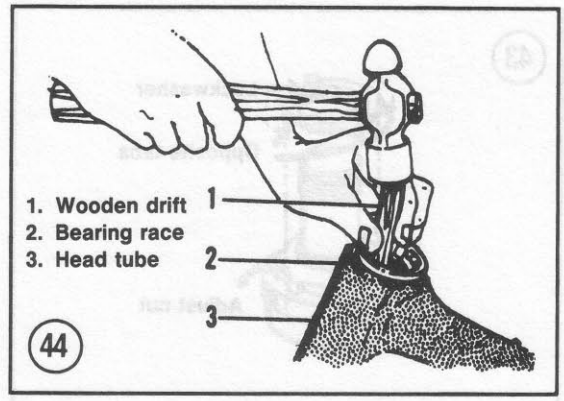
The headset and steering stem bearing races are pressed into place. Because they are easily bent, do not remove them unless they are worn and require replacement.

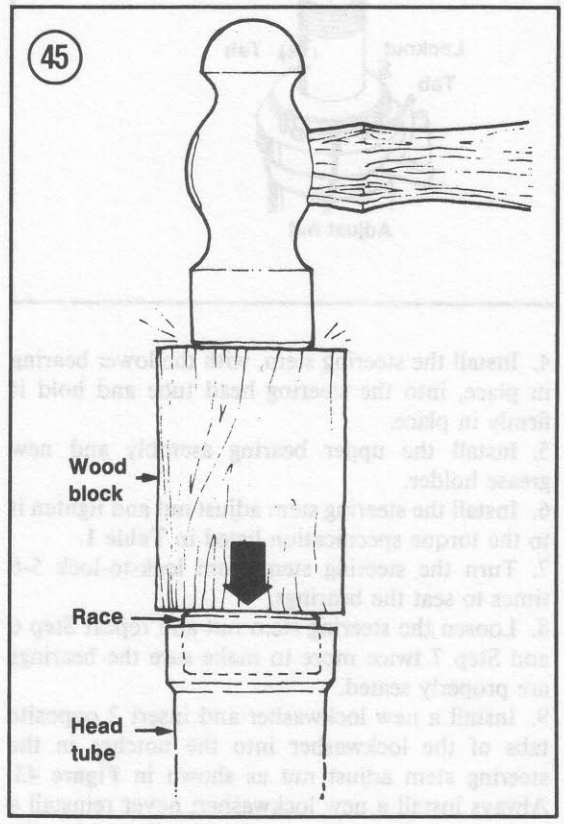
The top and bottom bearing races are not the same size. The lower race has a larger inside diameter than upper the race. Be sure that you install them in the proper ends of the frame steering head tube.

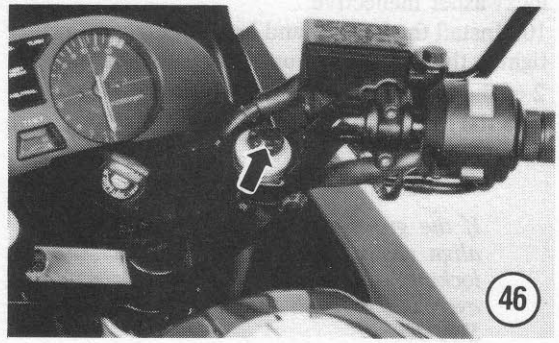
Steering Head Bearing Outer Race Replacement

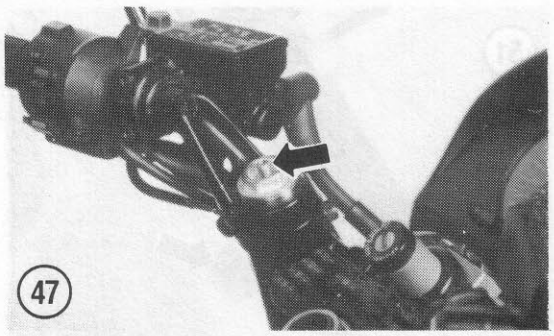
To remove the headset race, insert a hardwood stick or soft punch into the head tube (**Figure 44**) and carefully tap the race out from the inside. After it is started, tap around the race so that neither the race nor the steering head tube is damaged. The inside diameters of the inner races are different. The lower bearing race has a *larger* inside diameter than the upper.

To install the steering head bearing race, tap it in slowly with a block of wood, a suitable size socket or piece of pipe (**Figure 45**). Make sure that the race is squarely seated in the steering head tube









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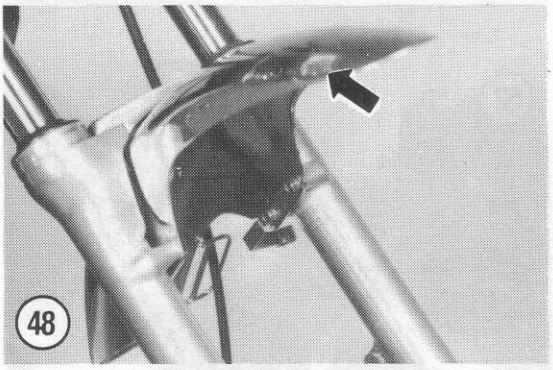

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bore before tapping it into place. Tap the race in until it is flush with the steering head surface.

Steering Stem Lower Bearing Assembly and Dust Seal Removal/Installation

NOTE

Do not remove the steering stem lower bearing race unless it is going to be replaced with a new bearing race. Do not reinstall a bearing race that has been removed as it is no longer true to alignment.

1. Install the steering stem adjust nut to the steering stem to protect the threads during this procedure.
2. To remove the steering stem lower bearing assembly, carefully pry it up from the base of the steering stem with a screwdriver; work around in a circle, prying a little at a time. Remove the bearing assembly and the dust seal.
3. Remove the steering stem adjust nut.
4. Slide a new dust seal over the steering stem.
5. Slide the lower bearing assembly over the steering stem. Tap the race down with a long piece of metal pipe that fits the inner race diameter or use a piece of hardwood; work around in a circle so the bearing and inner race will not be bent. Make sure it is seated squarely and is all the way down.

FRONT FORKS

The front suspension uses a spring controlled, hydraulically damped, telescopic fork with air assist. On Interceptor models, an anti-dive feature (TRAC) is built into the left-hand fork leg and is covered separately in this chapter.

Before suspecting major trouble, drain the front fork oil and refill with the proper type and quantity of fork oil; refer to Chapter Three. If you still have trouble, such as poor damping, a tendency to bottom or top out or leakage around the rubber seals, follow the service procedures in this section.

To simplify fork service and to prevent the mixing of parts, the legs should be removed, serviced and installed individually.

Removal

1. On Interceptor models, perform the following:
   a. Remove the front fairing as described in Chapter Twelve.
   b. Remove the handlebars as described in this chapter.
2. Remove the front wheel as described in this chapter.
3. Remove the air valve cap (**Figure 46**) from each fork tube.

WARNING

During the next step, always bleed off all air pressure; failure to do so may cause personal injury when disassembing the fork.

4. Depress the air valve (**Figure 47**) on each fork tube and bleed off *all* air pressure.

WARNING

During the next step, release the air pressure gradually. If released too fast, fork oil will spurt out with the air. Protect your eyes and clothing accordingly.

5A. On Magna models, perform the following:
   a. Remove the bolts securing the front fender (**Figure 48**) and remove the fender.
   b. Remove the bolts securing the fork brace (**Figure 49**) and remove the fork brace.
   c. Carefully pull on the center of the lower fork bridge cover and remove the cover.

5B. On Interceptor models, remove the bolts securing the fork brace and the front fender (**Figure 50**). Remove the fork brace and the front fender.

6. On Interceptor models, remove the front brake caliper (**Figure 51**) from the left-hand fork as described in Chapter Eleven.

7. Loosen the upper (**Figure 52**) and lower (**Figure 53**) fork bridge bolts.
8. Remove the fork assembly. It may be necessary to slightly rotate the fork tube while pulling it down and out.

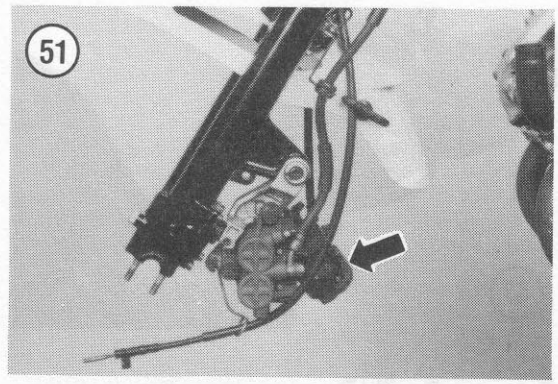
Installation

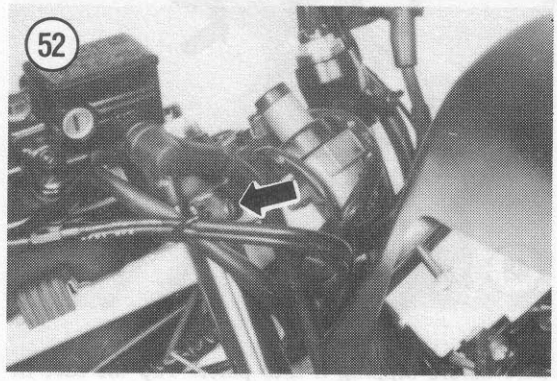
1A. On Magna models, install the fork tubes into the lower and upper fork bridge. Position the fork tube so the groove is aligned with the top surface of the upper fork bridge. Tighten the lower fork bridge bolt loosely.

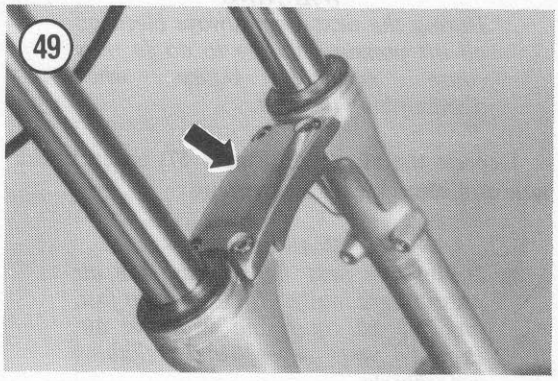
NOTE

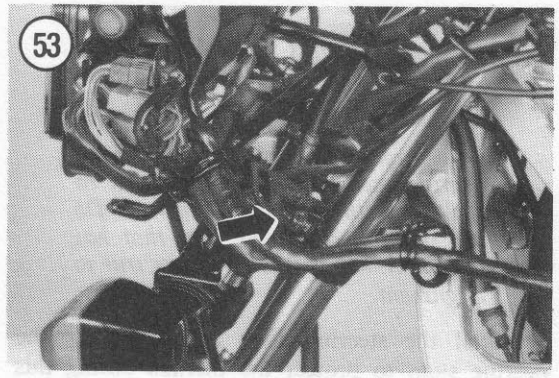
In the next step, do not align the 1st groove from the top with the top surface of the upper fork bridge. It must be aligned with the 2nd groove so there is enough fork tube showing above the upper fork bridge for the handlebars to be attached.

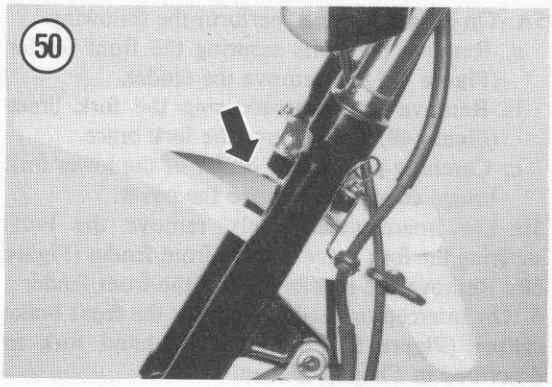
1B. On Interceptor models, install the fork tubes in the lower and upper fork bridge. Position the fork tube so that the lower groove (**Figure 54**) is aligned with the top surface of the upper fork bridge. Tighten the lower fork bridge bolt loosely.
2. Tighten the upper and lower fork bridge bolts to the torque specification listed in **Table 1**.

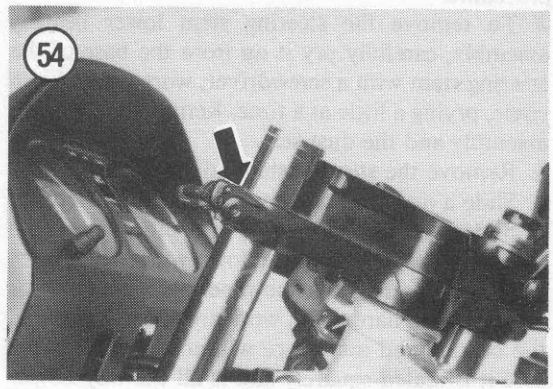


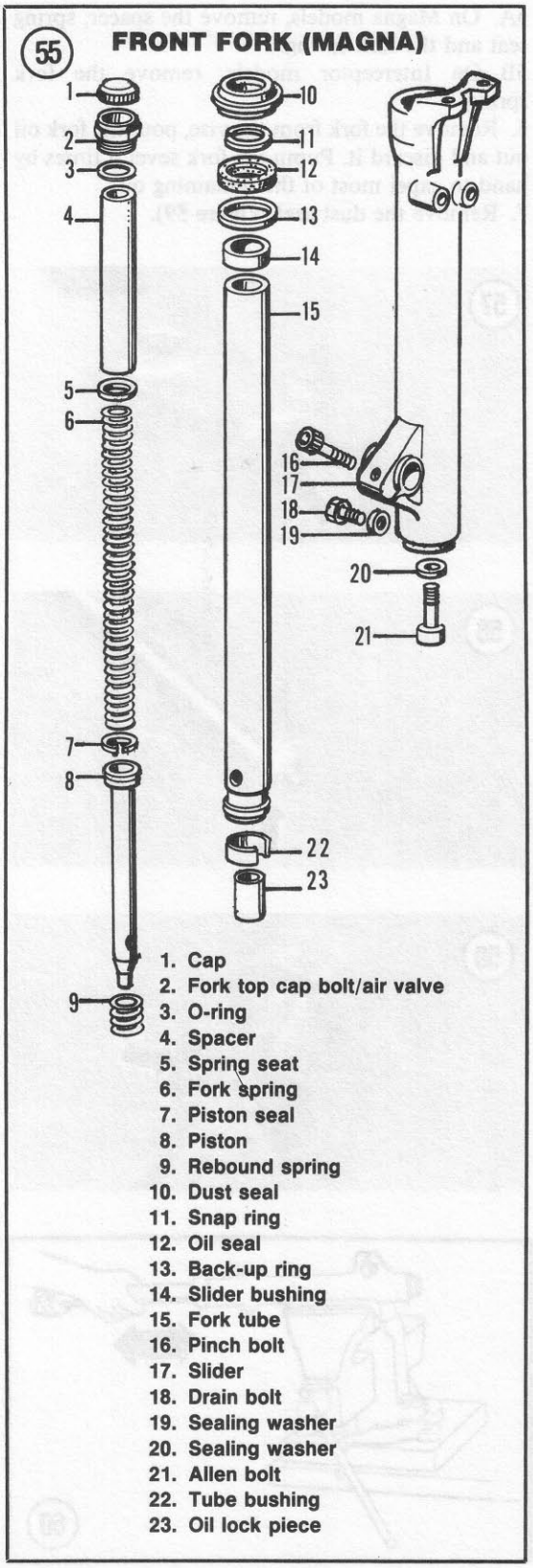












1. Cap
2. Fork top cap bolt/air valve
3. O-ring
4. Spacer
5. Spring seat
6. Fork spring
7. Piston seal
8. Piston
9. Rebound spring
10. Dust seal
11. Snap ring
12. Oil seal
13. Back-up ring
14. Slider bushing
15. Fork tube
16. Pinch bolt
17. Slider
18. Drain bolt
19. Sealing washer
20. Sealing washer
21. Allen bolt
22. Tube bushing
23. Oil lock piece

3A. On Magna models, perform the following:
a. Install the lower fork bridge cover.
b. Install the fork brace and tighten the bolts to the torque specification listed in **Table 1**.
c. Install the front fender and tighten the bolts securely.

3B. On Interceptor models, install the fork brace and the front fender. Tighen the bolts securely.

4. On Interceptor models, install the front brake caliper onto the left-hand fork as described in Chapter Eleven.

5. On Interceptor models, perform the following:
a. Install the handlebars as described in this chapter.
b. Install the front fairing as described in Chapter Twelve.

6. Install the front wheel as described in this chapter.

7. Apply the front brake and pump the front forks several times to seat the forks and front wheel.

WARNING

During the next step, never use any type of compressed gas as an explosion may be lethal. Never heat the fork assembly with a torch or place it near an open flame or extreme heat, as this will also result in an explosion.

8. Make sure the front wheel is off the ground and inflate the forks to 0-0.4 kg/cm² (0-6 psi). Do not use compressed air; use only a small hand-operated air pump.

CAUTION

Never exceed an air pressure of 43 psi (3.0 kg/cm²) as damage may occur to internal components of the fork assembly.

9. Take the bike off of the centerstand, apply the front brake and pump the forks several times. Recheck the air pressure and readjust if necessary. Install the air valve cap on each fork leg.

Fork Leg Disassembly

Both fork legs (Magna) and right-hand fork leg (Interceptor)

During the disassembly procedure, refer to **Figure 55** (Magna) or **Figure 56** (Interceptor).

1. Clamp the slider in a vise with soft jaws.

2. Remove the Allen head screw and gasket (**Figure 57**) from the bottom of the slider.

NOTE

This screw has been secured with Loctite and is often very difficult to remove because the damper rod will

turn inside the slider. It sometimes can be removed with an air impact driver. If you are unable to remove it, take the fork assemblies to a dealer and have the screws removed.

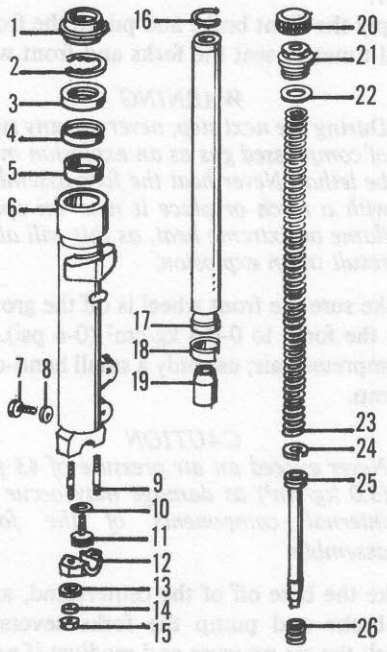
3. Hold the upper fork tube in a vise with soft jaws and loosen the fork top cap bolt (**Figure 58**).

WARNING

Be careful when removing the fork top cap bolt as the spring is under pressure. Protect your eyes accordingly.

4. Remove the fork top cap bolt from the fork.

FRONT FORK RIGHT-HAND SIDE (INTERCEPTOR)



1. Dust seal
2. Snap ring
3. Oil seal
4. Back-up ring
5. Slider bushing
6. Slider
7. Drain bolt
8. Sealing washer
9. Threaded stud
10. Sealing washer
11. Allen bolt
12. Axle clamp
13. Lockwasher
14. Washer
15. Nut
16. Circlip
17. Fork tube
18. Tube bushing
19. Oil lock piece
20. Cap
21. Fork top cap bolt/air valve
22. O-ring
23. Fork spring
24. Piston seal
25. Piston
26. Rebound spring

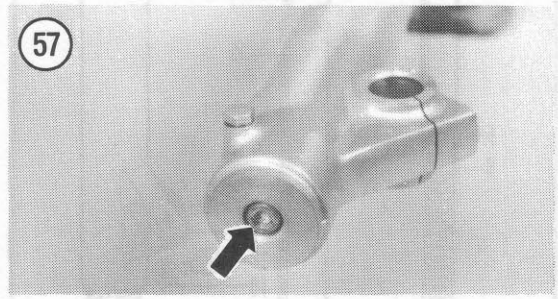
56

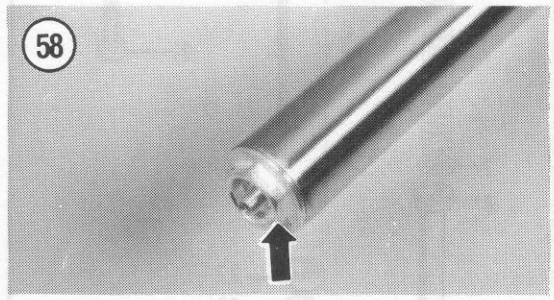
5A. On Magna models, remove the spacer, spring seat and the fork spring.

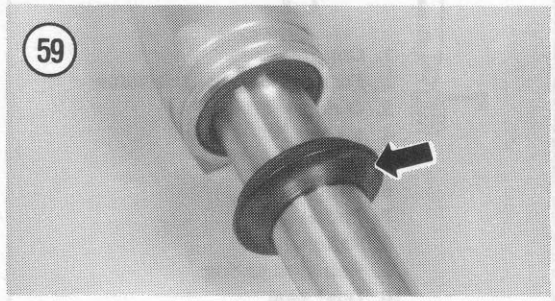
5B. On Interceptor models, remove the fork spring.

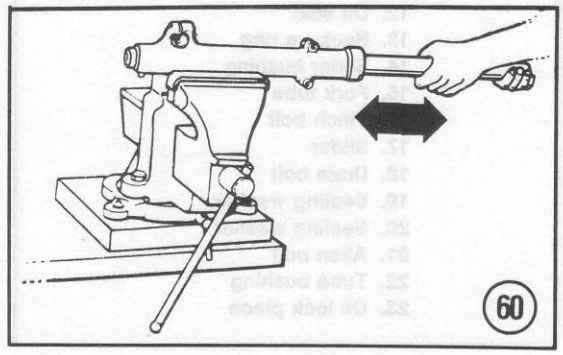
6. Remove the fork from the vise, pour the fork oil out and discard it. Pump the fork several times by hand to expel most of the remaining oil.

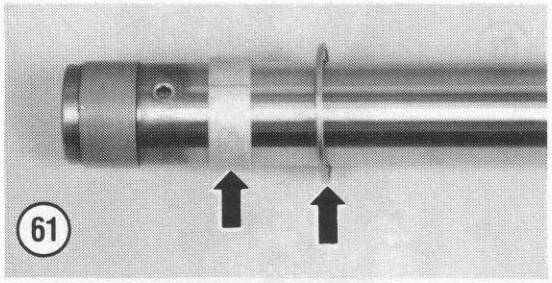
7. Remove the dust seal (**Figure 59**).





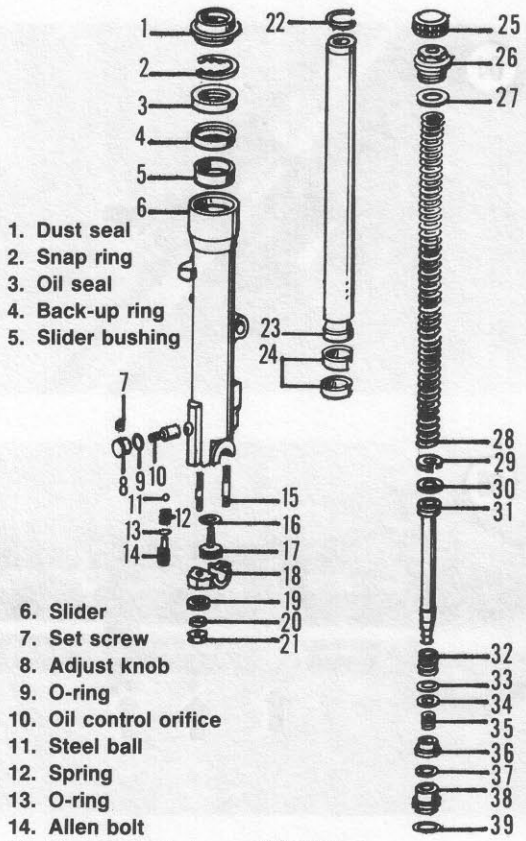






61

FRONT FORK LEFT-HAND SIDE (INTERCEPTOR)



1. Dust seal
2. Snap ring
3. Oil seal
4. Back-up ring
5. Slider bushing
6. Slider
7. Set screw
8. Adjust knob
9. O-ring
10. Oil control orifice
11. Steel ball
12. Spring
13. O-ring
14. Allen bolt
15. Threaded stud
16. Sealing washer
17. Allen bolt
18. Axle clamp
19. Lockwasher
20. Washer
21. Nut
22. Circlip
23. Fork tube
24. Tube bushing
25. Cap
26. Fork top cap bolt/air valve
27. O-ring
28. Fork spring
29. Piston seal
30. Piston seal
31. Piston
32. Rebound spring
33. Stopper spring
34. Spring seat
35. Spring
36. Oil lock valve
37. Stopper ring
38. Oil lock piece
39. O-ring

62

NOTE

Honda has determined that the foam seal may work its way down into the oil seal and give the appearance of a worn or leaking oil seal. Therefore, do ***not*** *reinstall the foam seal and plastic washer under the dust seal during the assembly procedure. If you purchase a new seal kit that still has these 2 parts in it, discard them; they are not to be used.*

8. Remove the foam seal, the plastic washer and the circlip. Discard the foam seal and plastic washer as they are not to be reinstalled.

NOTE

On this type of fork, force is needed to remove the fork tube from the slider.

9. Install the fork slider in a vise with soft jaws.
10. There is an interference fit between the bushing in the fork slider and the bushing on the fork tube. In order to remove the fork tube from the slider, pull hard on the fork tube using quick in-and-out strokes (**Figure 60**). Doing this will withdraw the bushing, backup ring and oil seal from the slider.

NOTE

It may be necessary to slightly heat the area on the slider around the oil seal before removal. Use a rag soaked in hot water; do not apply a flame directly to the fork slider.

11. Withdraw the fork tube from the slider.

NOTE

Do not remove the fork tube bushing unless it is going to be replaced. Inspect it as described in this chapter.

12. Turn the fork tube upside down and slide off the oil seal, backup ring and slider bushing (**Figure 61**) from the fork tube.

NOTE

Do not discard the slider bushing at this time. It will be used during the installation procedure.

13. Remove the damper rod and rebound spring from the slider.

Left-hand fork leg
(Interceptor Only)

During the disassembly of the left-hand fork leg, refer to **Figure 62**.
1. Clamp the slider in a vise with soft jaws.

2. Remove the Allen head screw and gasket from the bottom of the slider (**Figure 63**).

NOTE

This screw has been secured with Loctite and is often very difficult to remove because the damper rod will turn inside the slider. It sometimes can be removed with an air impact driver. If you are unable to remove it, take the fork tubes to a dealer and have the screws removed.

3. Hold the upper fork tube in a vise with soft jaws and loosen the fork top cap bolt.

WARNING

Be careful when removing the fork top cap bolt as the spring is under pressure. Protect your eyes accordingly.

4. Remove the fork top cap bolt from the fork.
5. Remove the fork spring.
6. Remove the fork from the vise, pour the fork oil out and discard it. Pump the fork several times by hand to expel most of the remaining oil.
7. Remove the dust seal (**Figure 64**).

NOTE

The Honda factory has determined that the foam seal may work its way down into the oil seal and give the appearance of a worn or leaking oil seal. Therefore do ***not*** *reinstall the foam seal and plastic washer under the dust seal during the assembly procedure. If you purchase a new seal kit that still has these 2 parts in it, discard them; they are not to be used.*

8. Remove the foam seal, the plastic washer and the circlip. Discard the foam seal and plastic washer as they are not to be reinstalled.

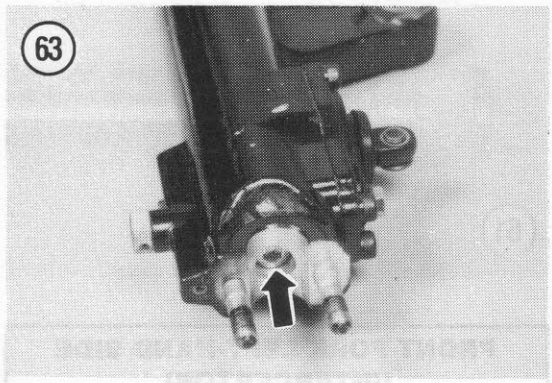
NOTE

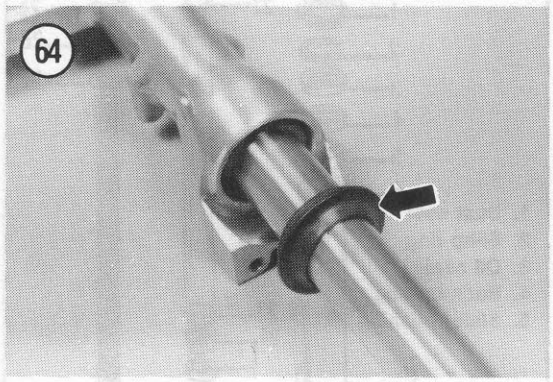
On this type of fork, force is needed to remove the fork tube from the slider.

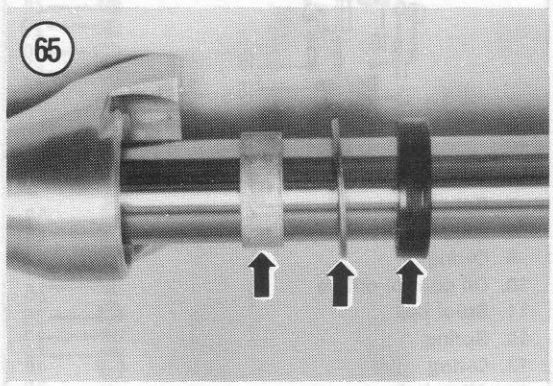
9. Install the fork slider in a vise with soft jaws.
10. There is an interference fit between the bushing in the fork slider and the bushing on the fork tube. In order to remove the fork tube from the slider, pull hard on the fork tube using quick in-and-out strokes (**Figure 60**). Doing this will withdraw the bushing, backup ring and oil seal from the slider.

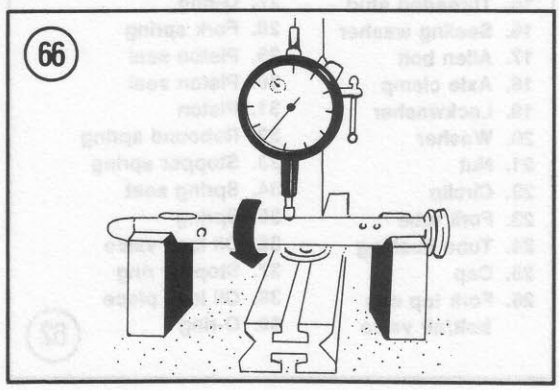
NOTE

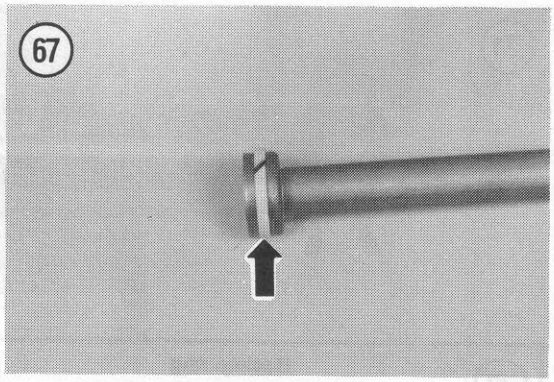
It may be necessary to slightly heat the area on the slider around the oil seal before removal. Use a rag soaked in hot

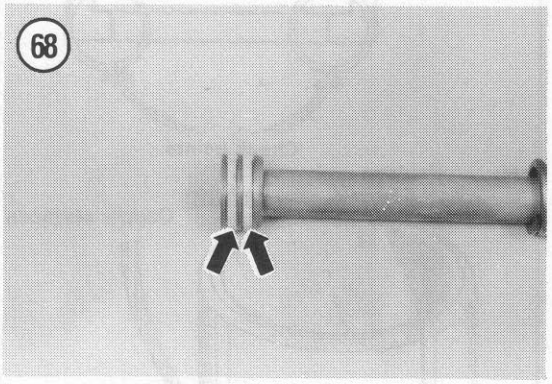


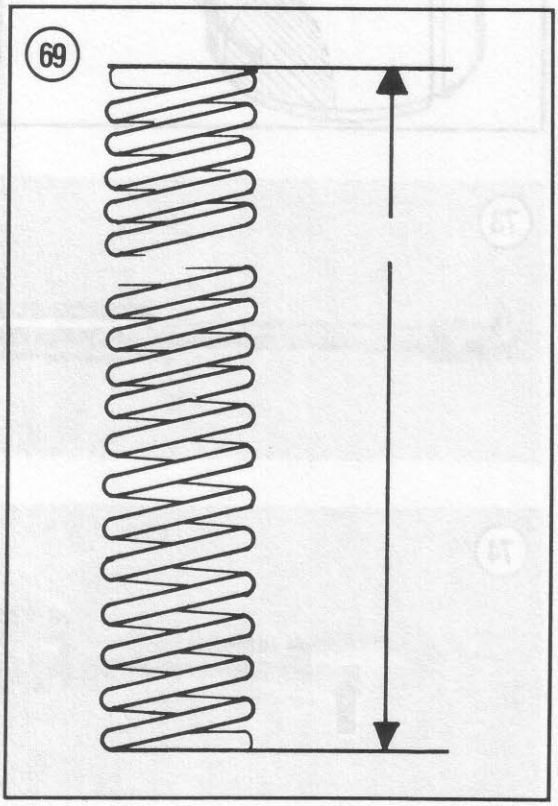












water; do not apply a flame directly to the fork slider.

11. Withdraw the fork tube from the slider.

NOTE

Do not remove the fork tube bushing unless it is going to be replaced. Inspect it as described in this chapter.

12. Turn the fork tube upside down and slide off the oil seal, backup ring and slider bushing (**Figure 65**) from the fork tube.

NOTE

Do not discard the slider bushing at this time. It will be used during the installation procedure.

13. Remove the stopper ring, oil lock valve, spring, spring seat and the stopper ring from the damper rod. Remove the damper rod from the slider.

NOTE

The oil lock piece and its O-ring may stay in the fork slider. It is not necessary that they be removed.

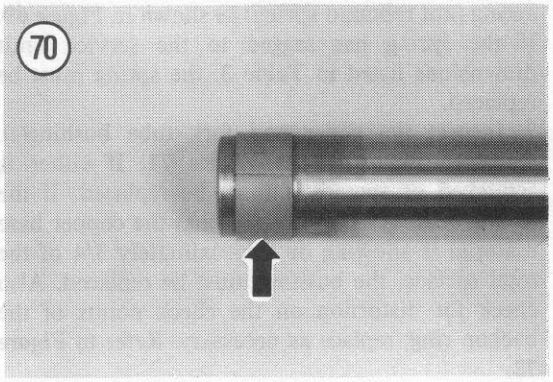
Inspection

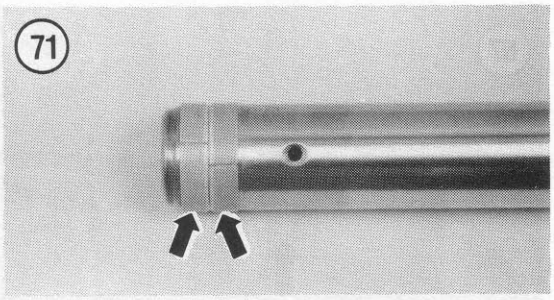
1. Thoroughly clean all parts in solvent and dry them. Check the fork tube for signs of wear or scratches.
2. Check the damper rod for straightness. **Figure 66** shows one method. The rod should be replaced if the runout is 0.2 mm (0.008 in.) or greater.
3. Carefully check the damper rod and piston ring(s) for wear or damage. Refer to **Figure 67** for the right-hand fork leg and **Figure 68** for the left-hand fork leg.
4. Check the upper fork tube for straightness. If bent or severely scratched, it should be replaced.
5. Check the lower slider for dents or exterior damage that may cause the upper fork tube to hang up during riding. Replace if necessary.
6. Measure the uncompressed length of the fork spring (not rebound spring) as shown in **Figure 69**. If the spring has sagged to the service limit dimensions listed in **Table 3**, the spring must be replaced.
7. Inspect the slider and fork tube bushing(s). Refer to **Figure 70** or **Figure 71**. If either is scratched or scored, it must be replaced. If the Teflon coating is worn off so that the copper base material is showing on approximately 3/4 of the total surface, the bushing must be replaced. Also check for distortion on the check points of the backup ring; replace as necessary. Refer to **Figure 72**.

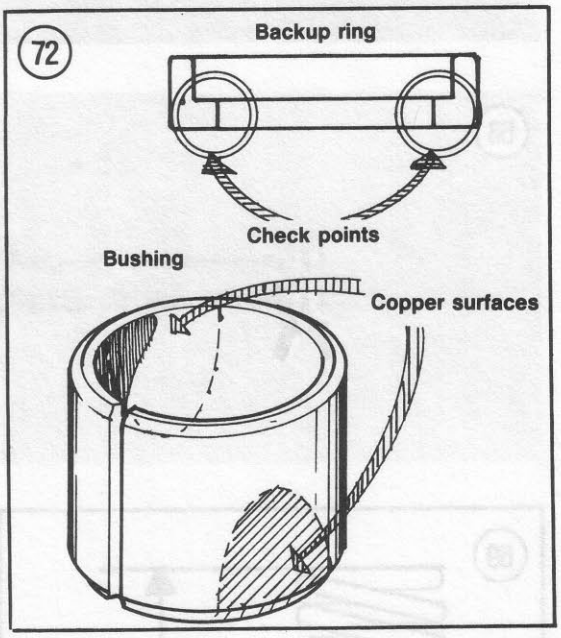
8. Any parts that are worn or damaged should be replaced. Simply cleaning and reinstalling unserviceable components will not improve performance of the front suspension.

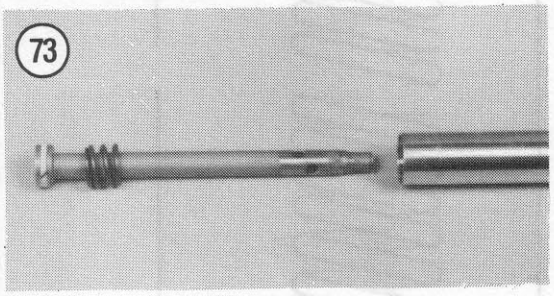
Fork Leg Assembly
Both fork legs (Magna)
Right-hand fork leg (Interceptor)

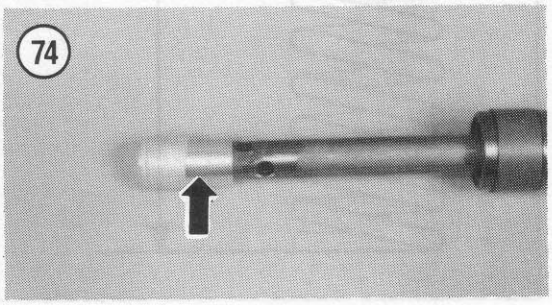
During the disassembly provedure, refer to **Figure 55** (Magna) or **Figure 56** (Interceptor).
1. Coat all parts with fresh DEXRON automatic transmission fluid or fork oil before installation.
2. If removed, install new fork tube bushings.
3. Install the rebound spring onto the damper rod and insert this assembly into the fork tube (**Figure 73**).
4. Install the oil lock piece (**Figure 74**) onto the damper rod.
5A. On Magna models, temporarily install the fork spring, spring seat and the spacer.
5B. On Interceptor models, temporarily install the fork spring.
6. Install the top fork cap and hold the damper rod in place. Push down on the fork top cap and compress the spring. Start the bolt slowly; don't crossthread it.
7. Install the upper fork assembly into the slider (**Figure 75**).
8. Make sure the gasket (**Figure 76**) is on the Allen head screw.
9. Apply Loctite Lock N' Seal to the threads of the Allen head screw before installation. Install it in the fork slider (**Figure 57**) and tighten to the torque specification listed in **Table 1**.
10. To install the fork slider bushing, perform the following:
   a. Slide the fork slider bushing down the fork tube and rest it on the slider.
   b. Slide the fork slider backup ring (flange side up) down the fork tube and rest it on top of the fork slider bushing.

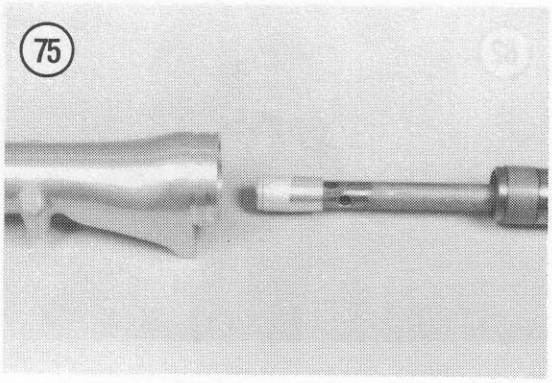


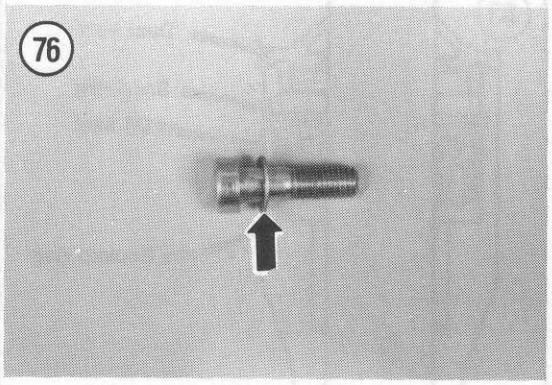


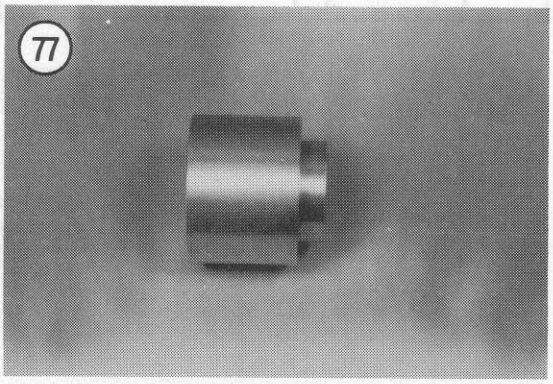


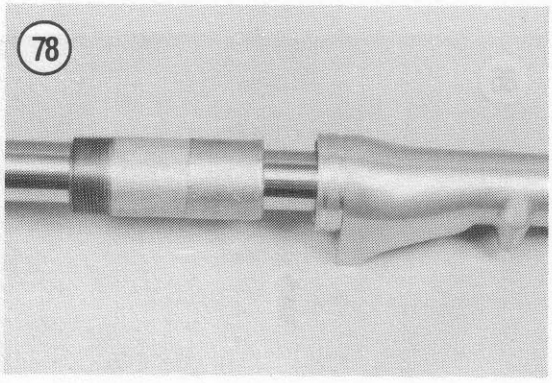












c. Place the old fork slider bushing on top of the backup ring.
d. Drive the bushing into the fork slider with Honda special tool Fork Seal Driver (part No. 07947-3710101).
e. Drive the bushing into place until it seats completely in the recess in the slider.
f. Remove the installation tool and the old fork slider bushing.

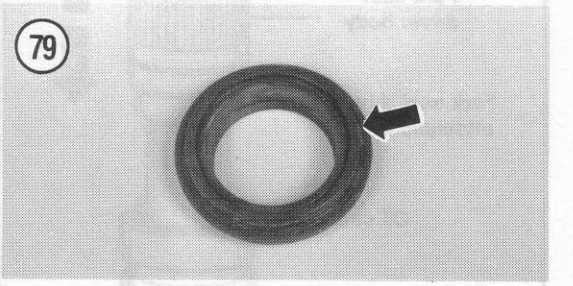
NOTE

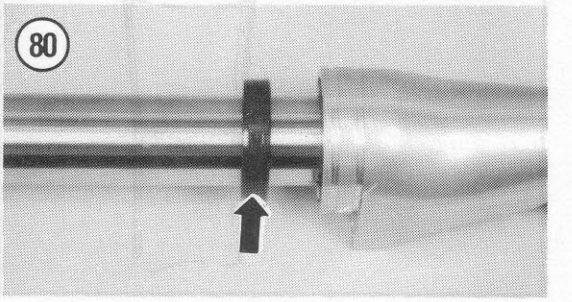
*The slider bushing can be driven in with a homemade tool (**Figure 77**). This tool can be made at a machine shop from a piece of aluminum.*

NOTE

*A piece of 2 in. galvanized pipe can also work as a tool. If both ends are threaded (a close nipple pipe fitting), wrap one end with duct tape (**Figure 78**) to prevent the threads from damaging the interior of the slider.*

11. To prevent damage to the inside of the new fork seal during installation, wrap the stopper ring groove(s) toward the top of the fork tube with clear tape (something smooth and non-abrasive—do not use duct or masking tape).
12. Install the fork seal as follows:
    a. Coat the new seal with DEXRON automatic transmission fluid.
    b. Position the seal with the marking (**Figure 79**) facing upward and slide it down onto the fork tube (**Figure 80**).





c. Drive the seal into the slider with Honda special tool Fork Seal Driver (part No. 07947-3710101). Refer to **Figure 81**.

13. Drive the oil seal in until the groove in the slider can be seen above the top surface of the oil seal. Remove the pieces of tape from the fork tube.

NOTE

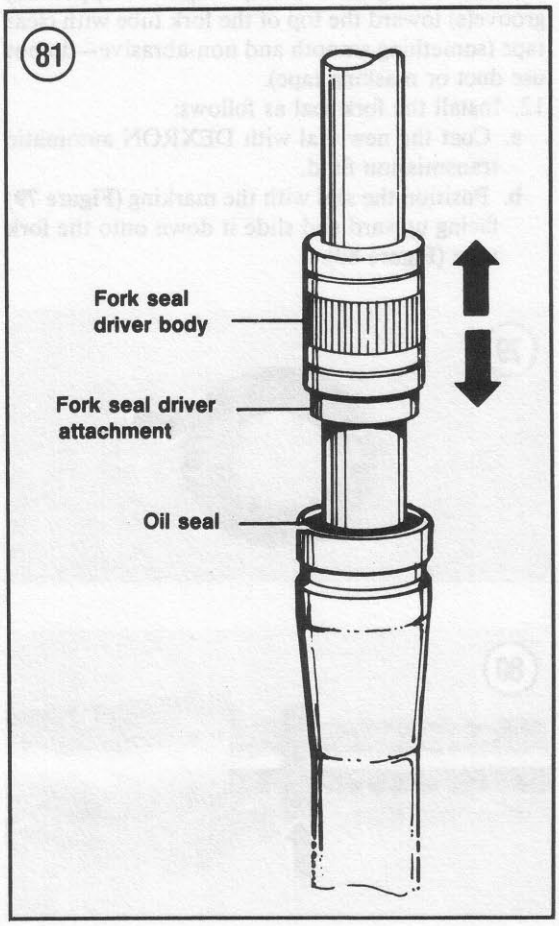
The slider seal can be driven in with a homemade tool described in the NOTES following Step 10.

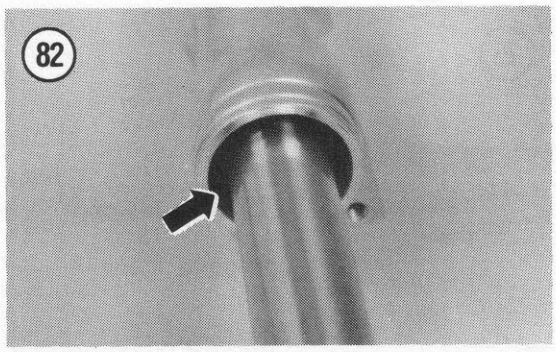
14. Install the circlip (**Figure 82**) with the sharp side facing up. Make sure the circlip is completely seated in the groove in the fork slider.

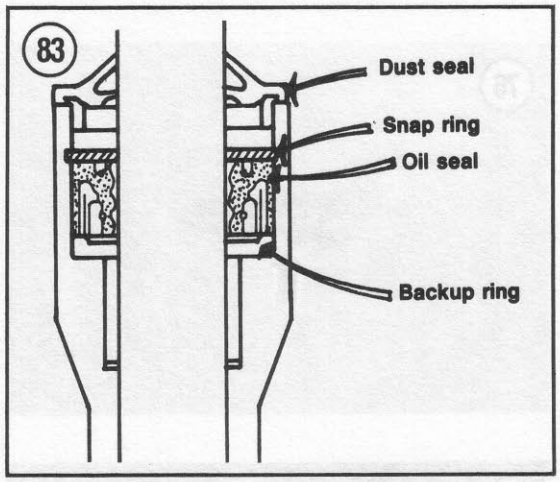
15. Install the dust seal (**Figure 59**). Remember, do *not* install the plastic washer and the foam seal if they are included in a new seal kit that you may have purchased. Refer to the NOTE regarding these items in the Disassembly procedure.

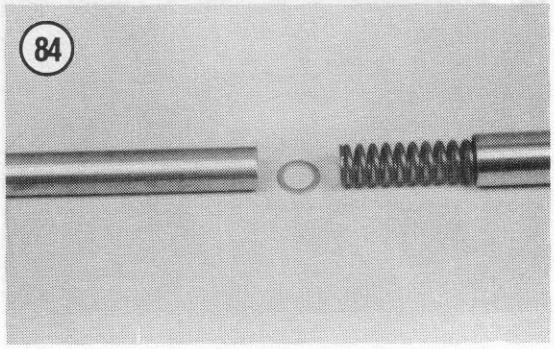
NOTE

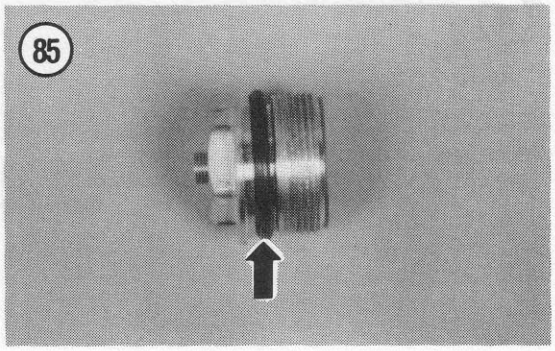
***Figure 83** shows the correct placement of all components installed during Steps 11-18.*

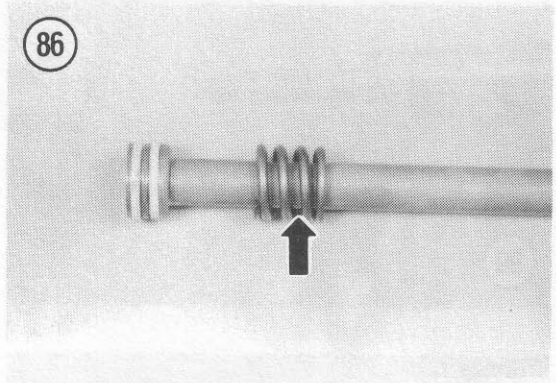


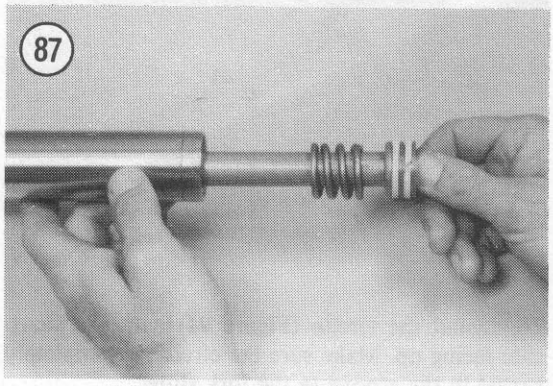


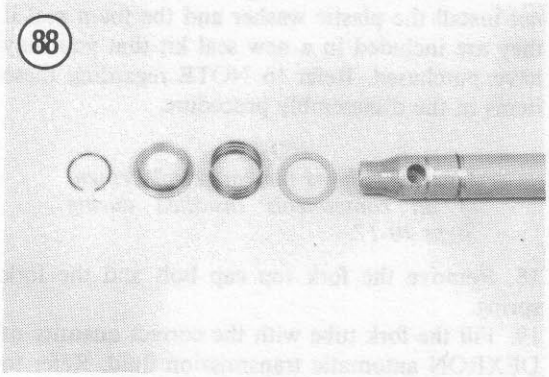


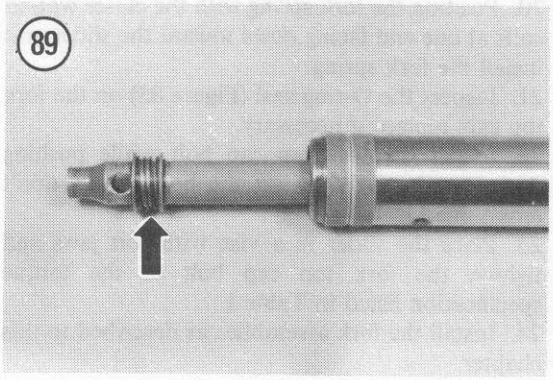












16A. On Magna models, remove the fork top cap bolt, spacer, spring seat and the fork spring.
16B. On Interceptor models, remove the fork top cap bolt and the fork spring.
17. Fill the fork tube with the correct quantity of DEXRON automatic transmission fluid. Refer to *Front Fork Oil Change* in Chapter Three.
18A. On Magna models, position the fork spring with the tapered end *down* toward the slider and install the fork spring.
18B. On Interceptor models, position the fork spring with the closer wound coils at one end facing *down* toward the slider and install the fork spring.
19. On Magna models, install the spring seat and spacer (**Figure 84**).
20. Inspect the O-ring seal (**Figure 85**) on the fork top cap; replace if necessary.
21. To install the top fork cap, push down on the fork top cap and compress the spring. Start the bolt slowly; don't crossthread it.
22. Place the slider in a vise with soft jaws and tighten the fork top cap bolt to the torque specifications listed in **Table 1**.
23. Install the fork assemblies as described in this chapter.

Left-hand fork leg
(Interceptor only)

During the assembly of the left-hand fork leg, refer to **Figure 62**.
1. Coat all parts with fresh DEXRON automatic transmission fluid or fork oil before installation.
2. If removed, install new fork tube bushings (**Figure 71**).
3. Install the rebound spring onto the damper rod (**Figure 86**) and insert this assembly into the fork tube (**Figure 87**).
4. Onto the damper rod install the stopper ring, spring seat, spring, oil lock valve and the stopper ring. Refer to **Figure 88** and **Figure 89**.
5. Temporarily install the fork spring and fork top cap bolt to hold the damper rod in place.
6. Install the fork top cap bolt (to hold the damper rod in place) while pushing down on the spring. Start the bolt slowly; don't crossthread it.

NOTE
Remember that the oil lock piece may still be inside the fork slider.

7. Install the upper fork assembly into the slider (**Figure 90**).
8. Make sure the gasket (**Figure 76**) is on the Allen head screw.

9. Apply Loctite Lock N' Seal to the threads of the Allen head screw before installation. Install it in the fork slider (**Figure 63**) and tighten to the torque specification listed in **Table 1**.
10. Slide the fork slider bushing down the fork tube and rest it on the slider.
11. Slide the fork slider backup ring (flange side up) down the fork tube and rest it on top of the fork slider bushing.
12. To install the fork slider bushing, perform the following:
    a. Place the old fork slider bushing on top of the backup ring.
    b. Drive the bushing into the fork slider with Honda special tool Fork Seal Driver (part No. 07947-3710101).
    c. Drive the bushing into place until it seats completely in the recess in the slider.
    d. Remove the installation tool and the old fork slider bushing.

NOTE

*The slider bushing can be driven in with a homemade tool (**Figure 77**). This tool can be made at a machine shop from a piece of aluminum.*

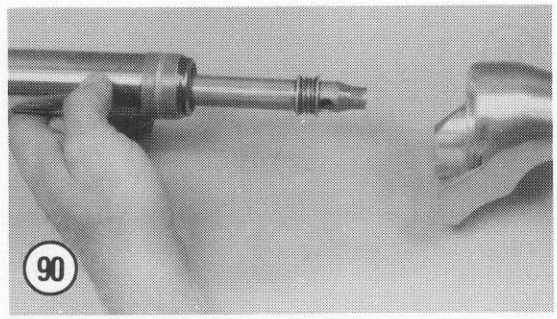
NOTE

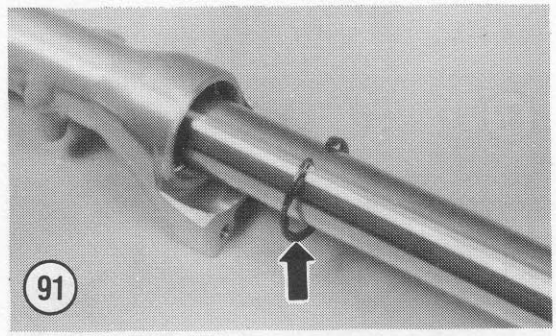
*A piece of 2 in. galvanized pipe can also work as a tool. If both ends are threaded (a close nipple pipe fitting), wrap one end with duct tape (**Figure 78**) to prevent the threads from damaging the interior of the slider.*

13. To prevent damage to the inside of the new fork seal during installation, wrap the stop ring grooves toward the top of the fork tube with clear tape (something smooth and non-abrasive—do not use duct or masking tape).
14. To install the fork seal, perform the following:
    a. Coat the new seal with DEXRON automatic transmission fluid.
    b. Position the seal with the marking (**Figure 79**) facing upward and slide it down onto the fork tube.
    c. Drive the seal into the slider with Honda special tool Fork Seal Driver (part No. 07947-3710101), refer to **Figure 81**.
15. Drive the oil seal in until the groove in the slider can be seen above the top surface of the oil seal. Remove the tape from the fork tube.

NOTE

The slider seal can be driven in with a homemade tool described in the NOTES following Step 11.



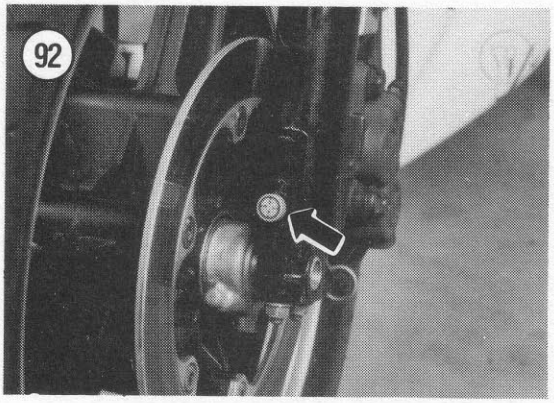


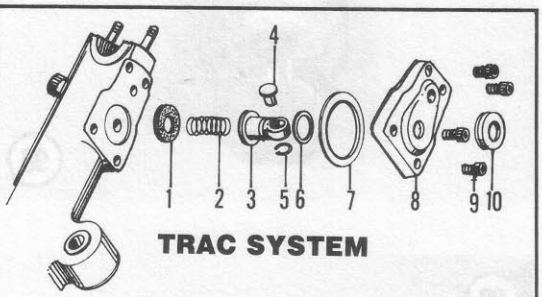
16. Install the circlip (**Figure 91**) with the sharp side facing up. Make sure the circlip is completely seated in the groove in the fork slider.
17. Install the dust seal (**Figure 64**). Remember, do *not* install the plastic washer and the foam seal if they are included in a new seal kit that you may have purchased. Refer to NOTE regarding these items in the disassembly procedure.

NOTE

***Figure 83** shows the correct placement of all components installed during Steps 10-17.*

18. Remove the fork top cap bolt and the fork spring.
19. Fill the fork tube with the correct quantity of DEXRON automatic transmission fluid. Refer to *Front Fork Oil Change* in Chapter Three.
20. Position the fork spring with the closer wound coils at one end facing *down* toward the slider and install the fork spring.
21. Inspect the O-ring seal (**Figure 85**) on the fork top cap; replace if necessary.
22. Install the fork top cap bolt while pushing down on the spring. Start the bolt slowly; don't crossthread it.
23. Place the slider in a vise with soft jaws and tighten the fork top cap bolt to the torque specification listed in **Table 1**.
24. Install the fork assemblies as described in this chapter.

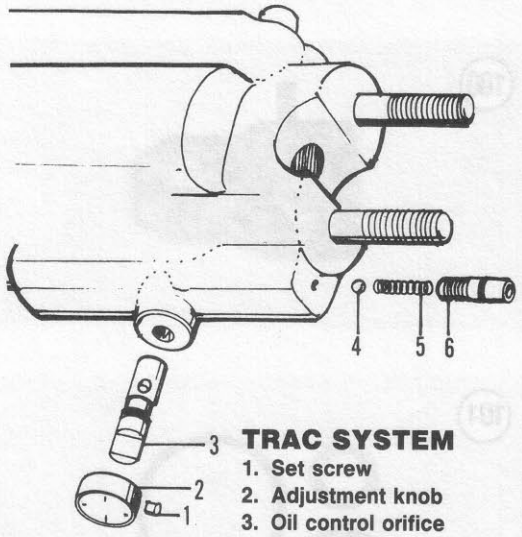




TRAC SYSTEM

1. Flat seal
2. Spring
3. Piston
4. Piston collar
5. Stopper ring
6. Rubber stopper
7. O-ring
8. Anti-dive case
9. Allen bolt
10. Boot

93



TRAC SYSTEM

1. Set screw
2. Adjustment knob
3. Oil control orifice
4. Steel ball
5. Spring
6. Allen bolt/O-ring

94

ANTI-DIVE FRONT SUSPENSION

Interceptor models are equipped with the TRAC (Torque Reactive Anti-dive Control) system that is integrated into the left-hand fork leg. The system reacts to the forward weight transfer of the bike and rider(s) during braking. This system is strictly mechanical; some other systems rely on brake fluid pressure.

The left-hand caliper assembly is pivot-mounted on the fork slider. As the brake is applied the caliper tries to move, or ride, with the disc, thus pivoting the caliper assembly toward the TRAC unit. This action forces a tab on the caliper assembly against the piston and main spring in the TRAC unit.

As the TRAC piston moves in it uncovers a small secondary valve (the oil control orifice) to restrict the fork leg's compression-damping passageway and divert the fork oil through the oil control orifice. The internal damping action increases, the fork resists compression and the anti-dive action is created. The harder the brake is applied, the farther the valve moves and the greater the anti-dive action. The secondary valve is adjustable and controls the damping effect rate. There are 4 different settings, from soft to extra firm; adjustment is covered in this chapter.

If the forks encounter a bump when the brake is applied, the hydraulic pressure inside the fork leg progressively forces the main valve to open. By doing this the fork can move to absorb the shock.

Damping Adjustment

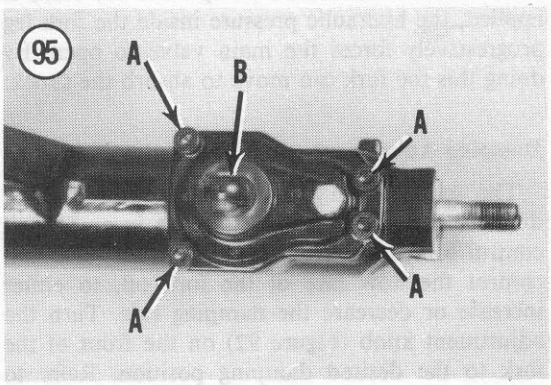
The fork damping rate can be adjusted to 4 different settings from soft to extra firm. The oil control orifice has 4 different diameter holes that control the flow rate of the fork oil, to either increase or decrease the damping rate. Turn the adjustment knob (**Figure 92**) on the front of the fork to the desired damping position. Refer to **Table 4** for the different settings and their damping effects.

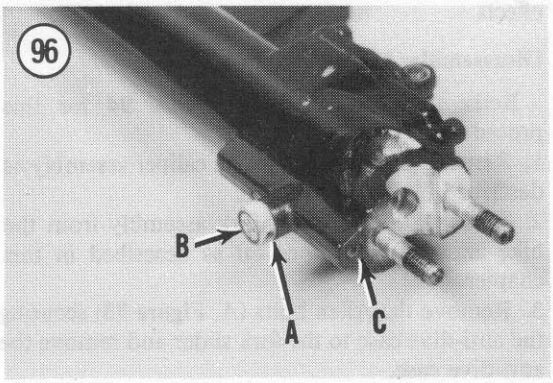
Disassembly/Assembly

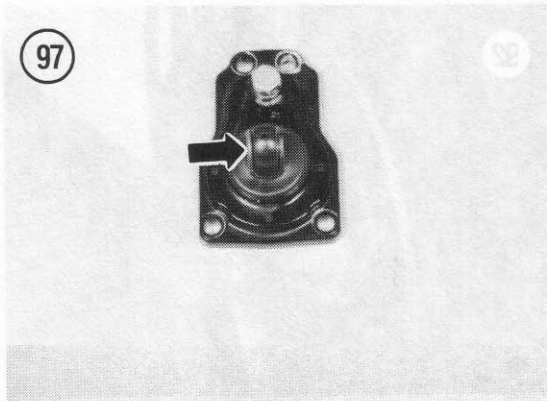
Refer to **Figure 93** and **Figure 94** for this procedure.

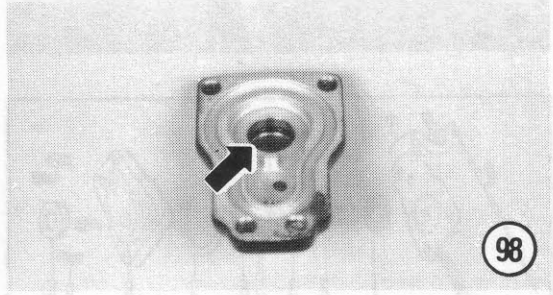
1. Remove the left-hand brake caliper assembly as described in Chapter Eleven.
2. Remove the left-hand fork assembly from the bike and drain the fork oil as described in this chapter.
3. Remove the Allen bolts (A, **Figure 95**) securing the anti-dive case to the fork slider and remove the anti-dive case.

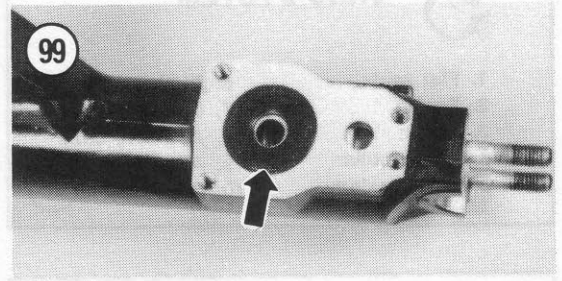
4. Remove the stopper ring from the piston collar and remove the collar from the piston.
5. Remove the boot from the piston and anti-dive case.
6. From the case, remove the piston and the return spring.
7. Remove the set screw (A, **Figure 96**) from the adjustment knob (B, **Figure 96**) and remove the adjustment knob.
8. Withdraw the oil control orifice from the fork slider.
9. From the bottom of the slider, remove the Allen bolt and O-ring seal (C, **Figure 96**), the check ball spring and the check ball.
10. Assemble by reversing these removal steps, noting the following.
11. Apply Loctite Lock N' Seal to all screw and Allen bolt threads before installation.
12. Apply DEXRON automatic transmission fluid to all O-ring seals before installation.
13. Apply a light coat of silicone grease to the pivot bolt collar before installation.
14. Install the piston collar with the large end (**Figure 97**) on the side that will be next to the wheel when the fork assembly is reinstalled.
15. Tighten the case mounting bolts to the torque specification listed in **Table 1**.

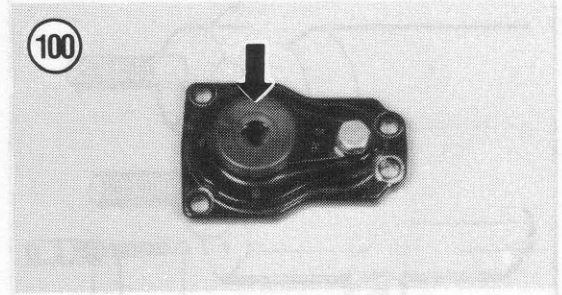


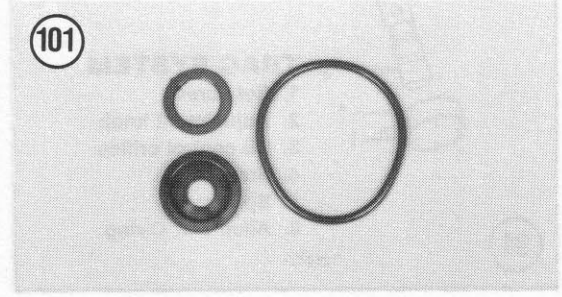


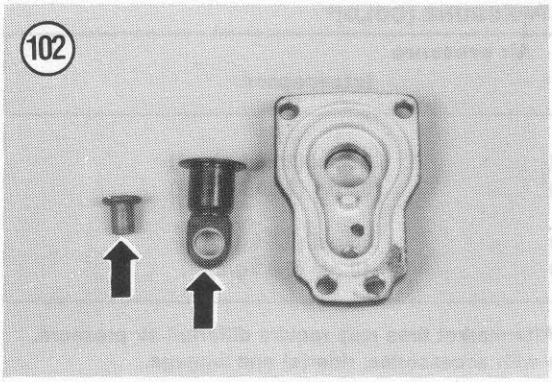


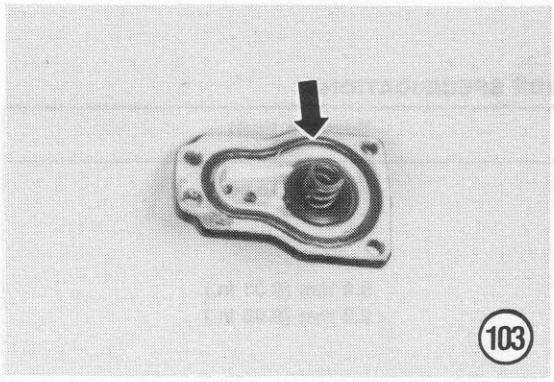












16. After the assembly is complete, push on the piston (B, **Figure 95**) and make sure it moves freely. Turn the adjustment knob to all 4 settings. Make sure it moves freely.

Inspection

1. Clean all parts in solvent and dry thoroughly with compressed air.
2. Inspect the piston return spring and the check ball spring for wear or damage.
3. Inspect the piston O-ring seal in the case (**Figure 98**) and the oil control orifice for wear or deterioration. Replace if necessary.
4. Inspect the flat seal on the fork leg (**Figure 99**) for wear or deterioration. Replace if necessary.
5. Inspect the piston boot (**Figure 100**) and all rubber parts (**Figure 101**) for wear or deterioration. Replace if necessary.
6. Inspect the piston and piston collar (**Figure 102**) for scratches and wear. Replace as necessary.
7. Make sure the oil flow holes in the oil control orifice and the case are clean and unobstructed. Blow out with compressed air; do not use a piece of wire as it may gouge the interior surface and disrupt the flow path.
8. Inspect the O-ring seal on the case (**Figure 103**) for wear or deterioration. Replace if necessary.

Table 1 FRONT SUSPENSION TORQUE SPECIFICATIONS

Item	N•m	ft.-lb.
Front axle	55-65	40-47
Front axle pinch bolt	15-25	11-18
Front axle nut	55-65	40-47
Front axle clamp nuts	18-25	13-18
Brake system union bolts	25-35	18-25
Handlebar		
Holder bolts (Magna)	25-35	18-25
Pinch bolts (Interceptor)	25-30	18-22
Fork bridge bolts		
Upper	9-13	7-9
Lower	45-55	33-40
Steering stem		
Adjustment nut	23-27	17-20
Locknut (above top fork bridge)	80-120	58-87
Fork cap bolt	15-30	11-22
Fork slider Allen screw	15-25	11-18
Fork brace Allen bolts (Magna)	18-25	13-18
Anti-dive case bolts	6-9	4-7
Disc-to-hub bolt	35-40	25-29

Table 2 TIRE INFLATION PRESSURE (COLD)*

Load	Air pressure	
	Magna	Interceptor
Up to 200 lb. (90 kg)		
Front	28 psi (2.00 kg/cm²)	32 psi (2.25 kg/cm²)
Rear	28 psi (2.00 kg/cm²)	32 psi (2.25 kg/cm²)
Maximum load limit**		
Front	28 psi (2.00 kg/cm²)	36 psi (2.5 kg/cm²)
Rear	32 psi (2.25 kg/cm²)	40 psi (2.8 kg/cm²)

* Recommended air pressure for factory equipped tires. Aftermarket tires may require different air pressure.
** Maximum load limit includes total weight of motorcycle with accessories, rider(s) and luggage.

Table 3 FRONT SUSPENSION SPECIFICATIONS

Item	Standard	Service limit
Front suspension type	Telescopic forks	
Travel		
Magna	160 mm (6.3 in.)	
Interceptor	140 mm (5.5 in.)	
Front axle runout		0.2 mm (0.01 in.)
Front wheel rim runout (radial and axial)		2.0 mm (0.08 in.)
Fork spring free length		
Magna	450.1 mm (17.72 in.)	441.1 mm (17.37 in.)
Interceptor	544.0 mm (24.1 in.)	533.0 mm (21.0 in.)
Fork tube runout		0.2 mm (0.01 in.)
Front fork oil capacity*		
Magna (both forks)	400 cc (13.5 oz., 11.26 Imp. oz.)	
Interceptor		
Right-hand fork	317.5-322.5 cc (10.7-10.9 oz., 8.94-9.08 Imp. oz.)	
Left-hand fork	332.5-337.5 cc (11.2-11.4 oz., 9.36-9.50 Imp. oz.)	
Front fork air pressure		
All models	0-6 psi (0-0.4 kg/cm²)	

* Capacity for each leg.

Table 4 ANTI-DIVE ADJUSTMENT CHART*

Position	Damping force
1	Light
2	Medium
3	Hard
4	Maximum

* Do not position the adjuster between the numbered detent adjustment points.

NOTE: If you own a 1986 model, first check the Supplement at the back of the book for any new service information.

CHAPTER TEN

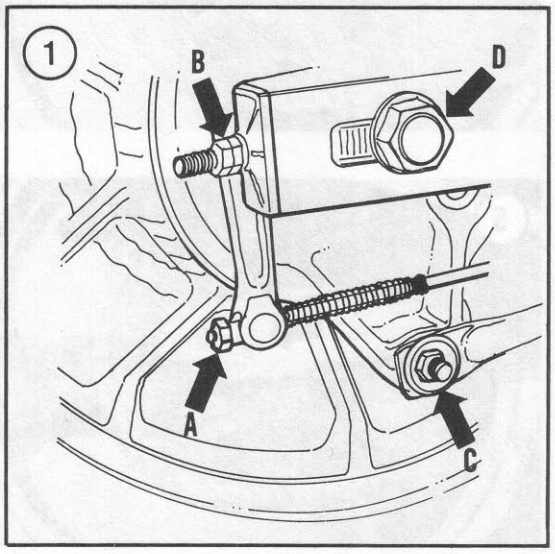
REAR SUSPENSION

This chapter includes repair and replacement procedures for the rear wheel and rear suspension components.

Power from the engine is transmitted to the rear wheel by a drive chain and the drive and driven sprockets.

Tire changing, tire repair and wheel balancing are covered in Chapter Nine.

Refer to **Table 1** for rear suspension torque specifications. **Tables 1-3** are located at the end of this chapter.



REAR WHEEL

Removal/Installation (Magna)

1. Place the bike on the centerstand or block up the engine so that the rear wheel clears the ground.
2. Remove the bolts securing the drive chain cover and remove the cover.
3. Completely unscrew the rear brake adjusting nut (A, **Figure 1**).
4. Depress the brake pedal and remove the brake rod from the pivot joint in the brake arm. Install the pivot joint and the adjusting nut onto the brake rod to avoid misplacing them.
5. Loosen the drive chain adjuster lock nut and adjuster nut (B, **Figure 1**) on each side of the swing arm.
6. To remove the rear brake torque link, perform the following:
   a. Remove the cotter pin on the rear brake torque link.
   b. Remove the nut, washer, rubber seat and bolt (C, **Figure 1**).
   c. Remove the torque link from the brake backing plate.
7. Remove the rear axle self-locking nut (D, **Figure 1**).
8. Push the rear wheel forward until the drive chain is loose.
9. Withdraw the axle from the left-hand side. Don't lose the spacer on each side of the wheel hub.

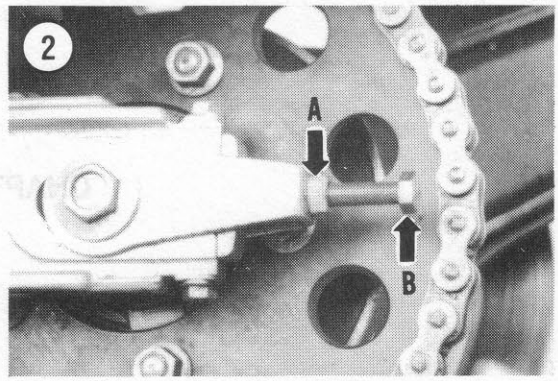
10. Roll the rear wheel forward and remove the drive chain from the driven sprocket.
11. Remove the rear wheel.
12. Leave the drive chain adjusters on the swing arm. If they are loose, remove them, tap the open end slightly with a hammer and reinstall the adjusters on the swing arm.
13. Install by reversing these removal steps, noting the following.
14. Install the rear axle from the left-hand side and install the axle nut, finger-tight at this time.
15. Adjust the drive chain as described in Chapter Three.
16. Tighten the nut to the torque specifications listed in **Table 1**.
17. Tighten the bolt and nut on the rear brake torque link to the torque specification listed in **Table 1**.
18. After the wheel is installed, completely rotate it and apply the brake several times to make sure it rotates freely and that the brake works properly.
19. Remove the block(s) from under the engine.
20. Adjust the rear brake as described in Chapter Three.

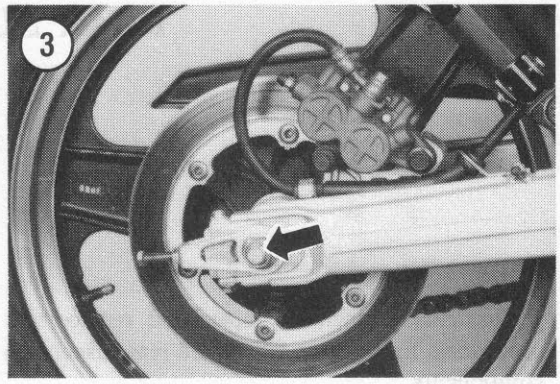
Removal/Installation (Interceptor)

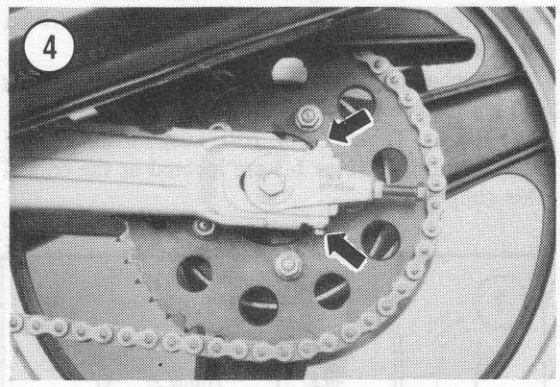
1. Place the bike on the centerstand or block up the engine so that the rear wheel clears the ground.
2. Remove the bolts securing the drive chain cover and remove the cover.
3. Loosen the drive chain adjuster lock nut (A, **Figure 2**) and adjuster bolt (B, **Figure 2**) on each side of the swing arm.
4. Loosen the rear axle self-locking nut (**Figure 3**).
5. Remove the drive chain adjuster stopper mount bolt and nut (**Figure 4**) on each side of the swing arm.
6. Swing the drive chain adjusters down and remove the adjuster stopper on each side of the swing arm.
7. Push the rear wheel forward until the drive chain is loose.
8. Withdraw the rear axle (**Figure 5**) toward the left enough to remove the caliper assembly from the axle.
9. Withdraw the axle from the left-hand side. Don't lose the spacer on each side of the wheel hub.
10. Roll the rear wheel forward and remove the drive chain from the driven sprocket.
11. Remove the rear wheel.

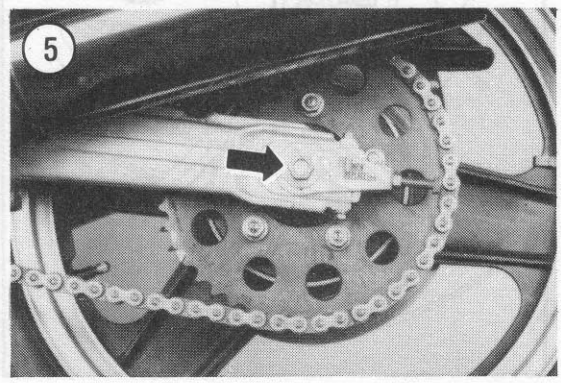
CAUTION

Never set the wheel and brake disc assembly directly onto the brake disc, as it may be damaged. Place the outer







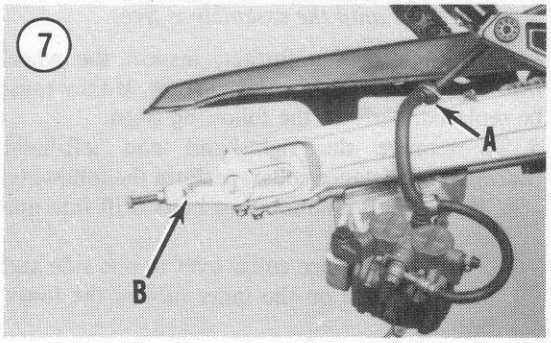


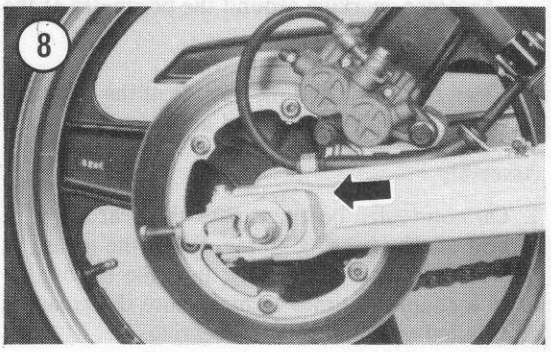
*edge of the tire on wood blocks (**Figure 6**).*

12. Let the rear caliper assembly hang from the brake hose clip on the swing arm (A, **Figure 7**).

NOTE

Insert a piece of wood or vinyl tubing in the caliper between the brake pads in place of the disc. That way, if the brake pedal is inadvertently depressed, the pistons will not be forced out of the cylinders. If this does happen, the caliper might have to be disassembled to reseat the pistons and the system will have to be bled. By using the wood or vinyl tubing, bleeding the brake is not necessary when installing the wheel.

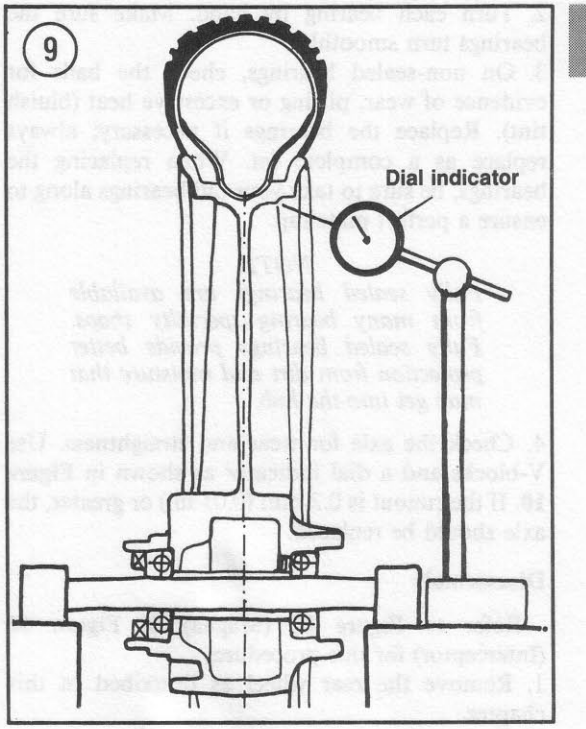




13. Leave the drive chain adjusters on the swing arm (B, **Figure 7**). If they are loose, remove them, tap the open end slightly with a hammer and reinstall the adjusters on the swing arm.
14. Install by reversing these removal steps, noting the following.
15. Carefully install the brake caliper onto the brake disc. Be careful not to damage the leading edge of the brake pads during installation.
16. Align the groove on the caliper bracket with the raised boss on the inside surface of the swing arm (**Figure 8**).
17. Install the rear axle from the left-hand side and install the axle nut, finger-tight.
18. Adjust the drive chain as described in Chapter Three.
19. Tighten the nut to the torque specifications listed in **Table 1**.
20. After the wheel is installed, completely rotate it and apply the brake several times to make sure it rotates freely and that the brake works properly.
21. Remove the block(s) from under the engine.

Inspection

Measure the axial and radial runout of the wheel with a dial indicator as shown in **Figure 9**. The



maximum axial and radial runout is 2.0 mm (0.08 in.). If the runout exceeds this dimension, check the wheel bearing condition.

If the wheel bearings are okay, the wheel will have to be replaced, as it cannot be serviced. Inspect the wheel for signs of cracks, fractures, dents or bends. If it is damaged in any way, it must be replaced.

WARNING

Do not try to repair any damage to a ComCast alloy wheel as it will result in an unsafe riding condition.

Check axial runout as described under *Rear Hub Inspection* in this chapter.

REAR HUB

Inspection

Inspect each wheel bearing before removing it from the wheel hub.

CAUTION

Do not remove the wheel bearings for inspection as they will be damaged during removal. Remove wheel bearings only if they are to be replaced.

1. Perform Steps 1-3 of *Disassembly* in this chapter.
2. Turn each bearing by hand. Make sure the bearings turn smoothly.
3. On non-sealed bearings, check the balls for evidence of wear, pitting or excessive heat (bluish tint). Replace the bearings if necessary; always replace as a complete set. When replacing the bearings, be sure to take your old bearings along to ensure a perfect matchup.

NOTE

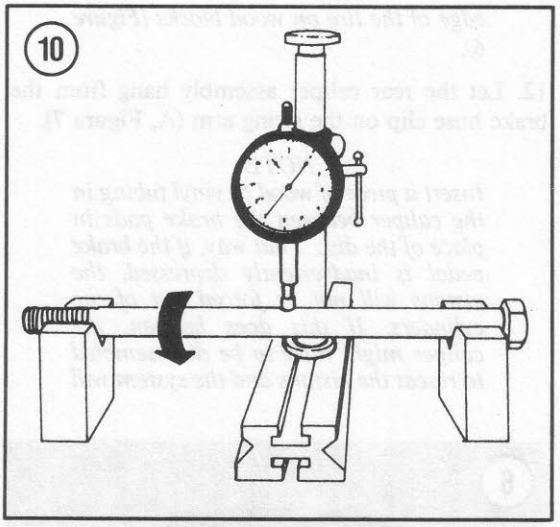
Fully sealed bearings are available from many bearing specialty shops. Fully sealed bearings provide better protection from dirt and moisture that may get into the hub.

4. Check the axle for wear and straightness. Use V-blocks and a dial indicator as shown in **Figure 10**. If the runout is 0.2 mm (0.01 in.) or greater, the axle should be replaced.

Disassembly

Refer to **Figure 11** (Magna) or **Figure 12** (Interceptor) for this procedure.

1. Remove the rear wheel as described in this chapter.



2. On disc brake models, remove the bolts (**Figure 13**) securing the brake disc and remove the brake disc.
3. Remove the driven flange assembly (A, **Figure 14**) straight up and out of the rear hub.

NOTE

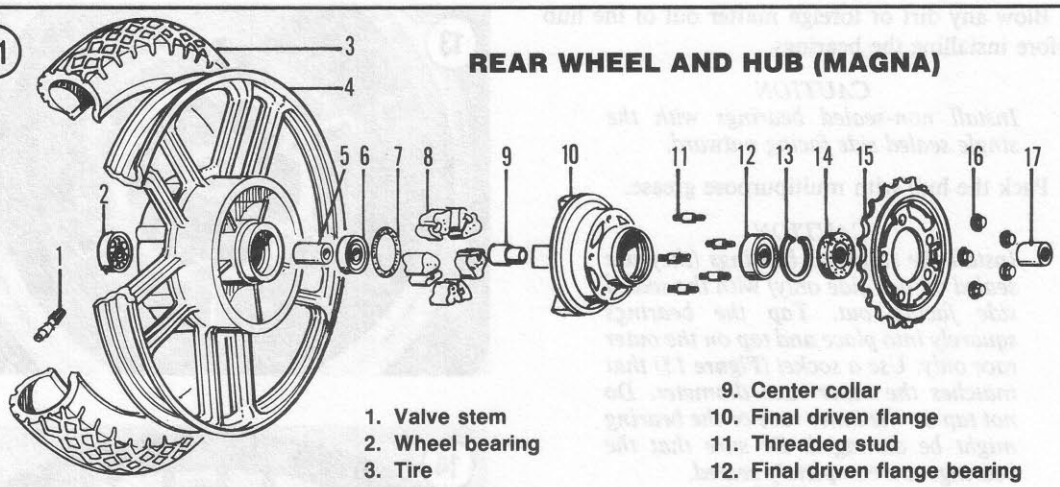
If the driven flange assembly is difficult to remove, tap on the backside of the sprocket (from the opposite side of the wheel through the wheel spokes) with a wooden handle of a hammer. Tap evenly around the perimeter of the sprocket until the assembly is free.

4. Before proceeding further, inspect the wheel bearings as described in this chapter. If they must be replaced, perform the following steps.
5. To remove the right-hand and left-hand bearings and distance collar, perform the following:
   a. Insert a soft aluminum or brass drift into one side of the hub.
   b. Push the distance collar over to one side and place the drift on the inner race of the lower bearing.
   c. Tap the bearing out of the hub with a hammer, working around the perimeter of the inner race.
   d. Repeat for the other bearing.
6. Clean the inside and the outside of the hub with solvent. Dry with compressed air.

Assembly

1. On non-sealed bearings, pack the bearings with a good quality bearing grease. Work the grease in between the balls thoroughly; turn the bearing by hand a couple of times to make sure the grease is distributed evenly inside the bearing.

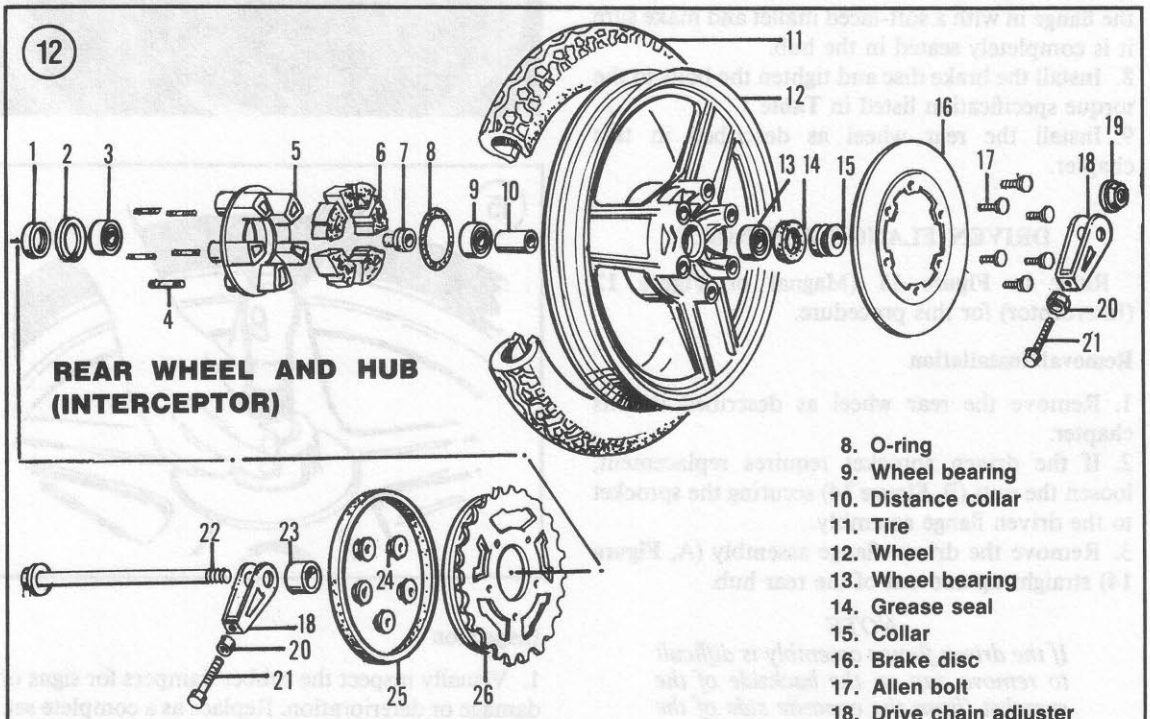
(11)



REAR WHEEL AND HUB (MAGNA)

1. Valve stem
2. Wheel bearing
3. Tire
4. Wheel
5. Distance collar
6. Wheel bearing
7. O-ring
8. Rubber damper
9. Center collar
10. Final driven flange
11. Threaded stud
12. Final driven flange bearing
13. Circlip
14. Grease seal
15. Driven sprocket
16. Nut
17. Spacer

(12)



REAR WHEEL AND HUB (INTERCEPTOR)

1. Grease seal
2. Circlip
3. Final driven flange bearing
4. Threaded stud
5. Final driven flange
6. Rubber damper
7. Collar
8. O-ring
9. Wheel bearing
10. Distance collar
11. Tire
12. Wheel
13. Wheel bearing
14. Grease seal
15. Collar
16. Brake disc
17. Allen bolt
18. Drive chain adjuster
19. Axle nut
20. Locknut
21. Adjust bolt
22. Rear axle
23. Collar
24. Nut
25. Seal
26. Driven sprocket

2. Blow any dirt or foreign matter out of the hub before installing the bearings.

CAUTION

Install non-sealed bearings with the single sealed side facing outward.

3. Pack the hub with multipurpose grease.

CAUTION

*Install the standard bearings (they are sealed on one side only) with the sealed side facing out. Tap the bearings squarely into place and tap on the outer race only. Use a socket (**Figure 15**) that matches the outer race diameter. Do not tap on the inner race or the bearing might be damaged. Be sure that the bearings are completely seated.*

4. Install the right-hand bearing into the hub.
5. Press the distance collar into the hub from the left-hand side.
6. Install the left-hand bearing into the hub.
7. Make sure the rubber dampers are in place in the hub and install the driven flange assembly. Tap the flange in with a soft-faced mallet and make sure it is completely seated in the hub.
8. Install the brake disc and tighten the bolts to the torque specification listed in **Table 1**.
9. Install the rear wheel as described in this chapter.

DRIVEN FLANGE ASSEMBLY

Refer to **Figure 11** (Magna) or **Figure 12** (Interceptor) for this procedure.

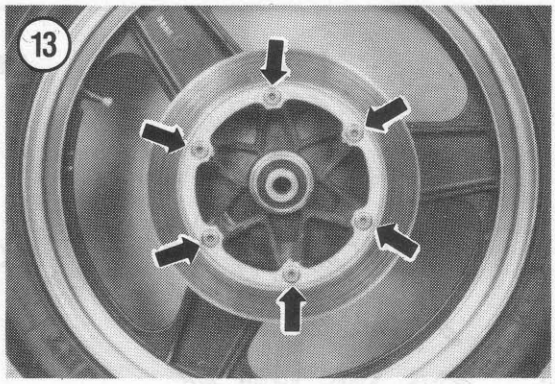
Removal/Installation

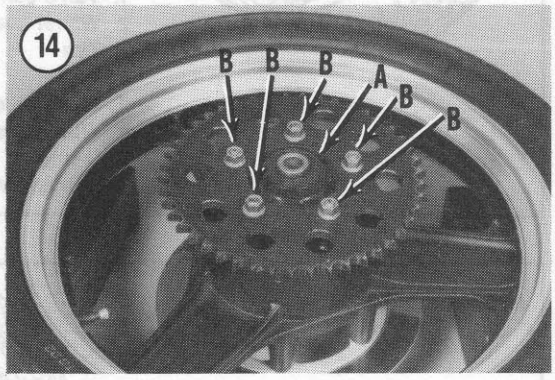
1. Remove the rear wheel as described in this chapter.
2. If the driven sprocket requires replacement, loosen the nuts (B, **Figure 14**) securing the sprocket to the driven flange assembly.
3. Remove the driven flange assembly (A, **Figure 14**) straight up and out of the rear hub.

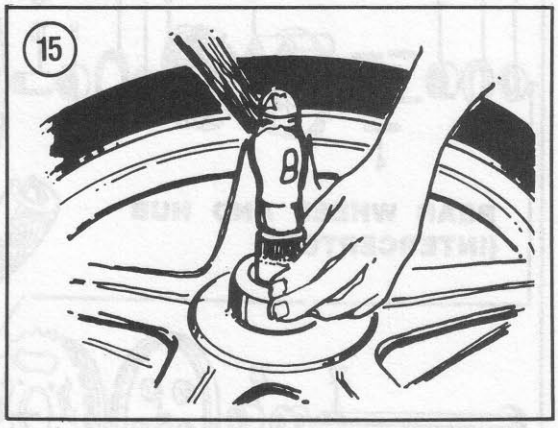
NOTE

If the driven flange assembly is difficult to remove, tap on the backside of the sprocket (from the opposite side of the wheel through the wheel spokes) with a wooden hammer handle. Tap evenly around the perimeter of the sprocket until the assembly is free.

4. Install by reversing these removal steps, noting the following.
5. If the driven sprocket was removed, tighten the nuts to the torque specification listed in **Table 1**.

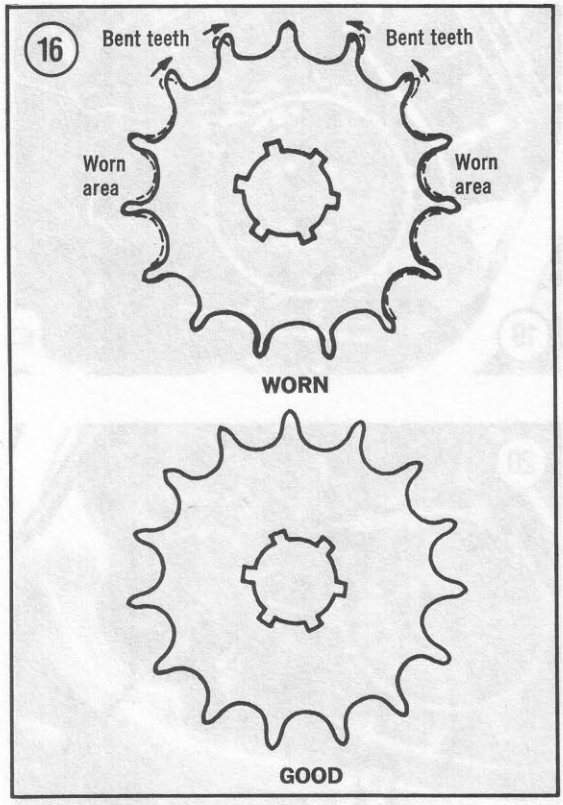


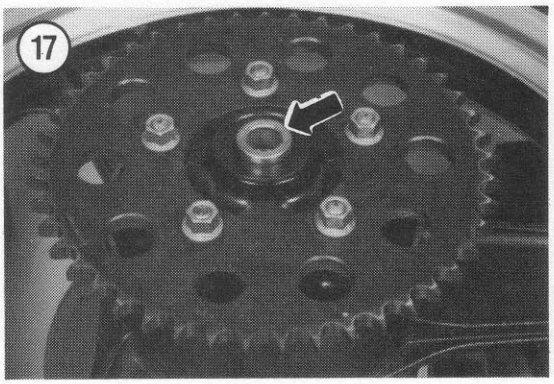


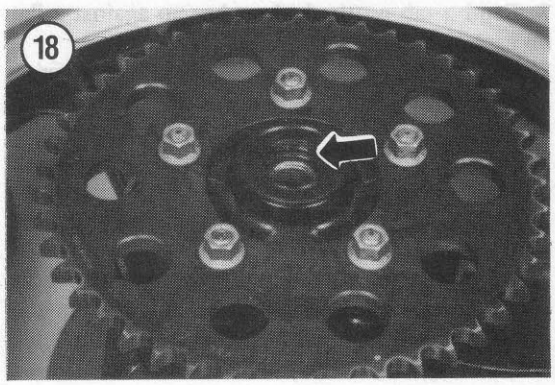


Inspection

1. Visually inspect the rubber dampers for signs of damage or deterioration. Replace as a complete set.
2. Inspect the driven flange assembly housing for cracks or damage. Replace if necessary.
3. Inspect the teeth of the driven sprocket. If the teeth are visibly worn (**Figure 16**), remove the nuts and replace the sprocket.
4. If the sprocket requires replacement, also inspect the drive chain and the drive sprocket. They also may be worn and need replacing.







Bearing Replacement

1. Prior to removing the bearing in the driven flange, inspect it as described under *Rear Hub Inspection* in this chapter.
2. Remove the center collar (**Figure 17**) from the driven flange assembly.
3. To remove the bearing, perform the following:
   a. Remove the grease seal (**Figure 18**).
   b. Remove the circlip.
   c. Turn the driven flange with the sprocket side facing down.
   d. Insert a soft aluminum or brass drift into the side of the driven flange facing up.
   e. Tap the bearing out of the driven flange with a hammer, working around the perimeter of the inner race.
4. Clean the inside and the outside of the driven flange with solvent. Dry with compressed air.
5. Pack the driven flange with multipurpose grease.

CAUTION

*Install the standard bearing (it is sealed on one side only) with the sealed side facing out. Tap the bearing squarely into place and tap on the outer race only. Use a socket (**Figure 15**) that matches the outer race diameter. Do not tap on the inner race or the bearing might be damaged. Be sure that the bearing is completely seated.*

6. Install the bearing into the driven flange.
7. Install the circlip and the grease seal.
8. Install the center collar.

DRIVE SPROCKET AND DRIVE CHAIN

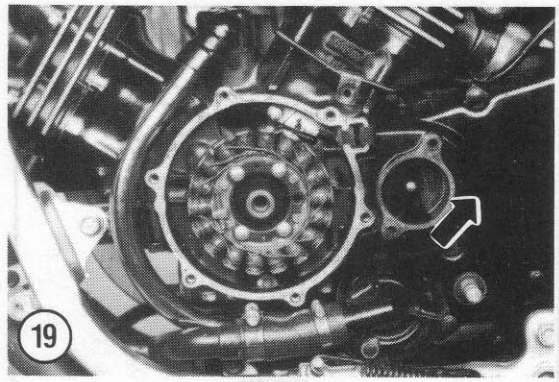
Removal

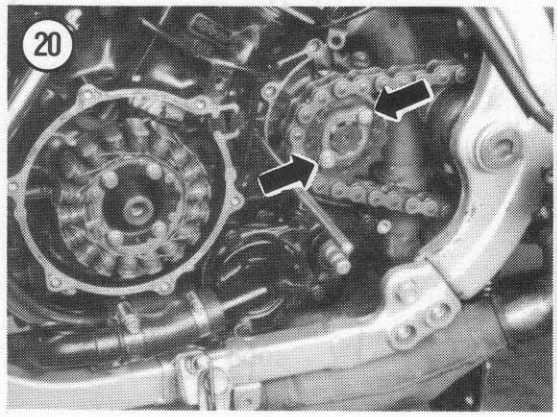
WARNING

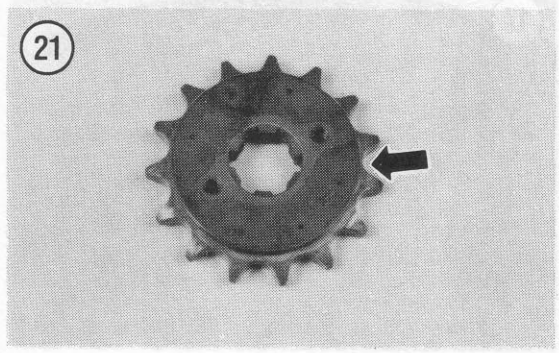
The drive chain is manufactured as a continuous closed loop with no master link. Do not cut the chain with a chain cutter as this will result in future chain failure and possible loss of control of the bike under riding conditions.

1. Place the bike on the centerstand.
2. On Magna models, remove the bolts securing the clutch slave cylinder cover and remove the cover.
3. On Interceptor models, remove the bolt securing the gearshift arm to the gearshift spindle and remove the gearshift arm. Move the gearshift arm down and out of the way.
4. Remove the clutch slave cylinder as described under *Clutch Slave Cylinder Removal/Installation (Intact)* in Chapter Five.

5. Remove the bolts securing the drive sprocket cover (**Figure 19**) and remove the cover.
6. Straighten the lockwasher tabs that are against the bolt heads.
7. Have an assistant apply the rear brake to keep the drive chain taut and keet the drive sprocket from turning.
8. Loosen the bolts (**Figure 20**) securing the lockwasher, drive sprocket holding plate and drive sprocket.
9A. On Magna models, loosen the drive chain adjuster locknut and adjuster nuts (B, **Figure 1**) on each side of the swing arm.
9B. On Interceptor models, loosen the drive chain adjuster locknut (A, **Figure 2**) and adjuster bolts (B, **Figure 2**) on each side of the swing arm.
10. Loosen the rear axle nut (**Figure 3**).
11. Remove the bolts and collars securing the drive chain guard to the swing arm and remove the chain guard.
12. Move the rear wheel slightly forward to allow slack in the drive chain.
13. Remove the bolts (**Figure 20**) securing the lockwasher, drive sprocket holding plate and drive sprocket.
14. Remove the lockwasher and discard it. The lockwasher must be replaced every time it is removed.
15. Rotate the holding plate in either direction and slide it off the transmission shaft.
16. Slide the drive sprocket and drive chain off of the transmission countershaft.
17. Remove the drive sprocket from the drive chain.
18. Remove the swing arm as described in this chapter.
19. Remove the drive chain.
20. Inspect the drive sprocket (**Figure 21**) for wear or damage. Replace if necessary.

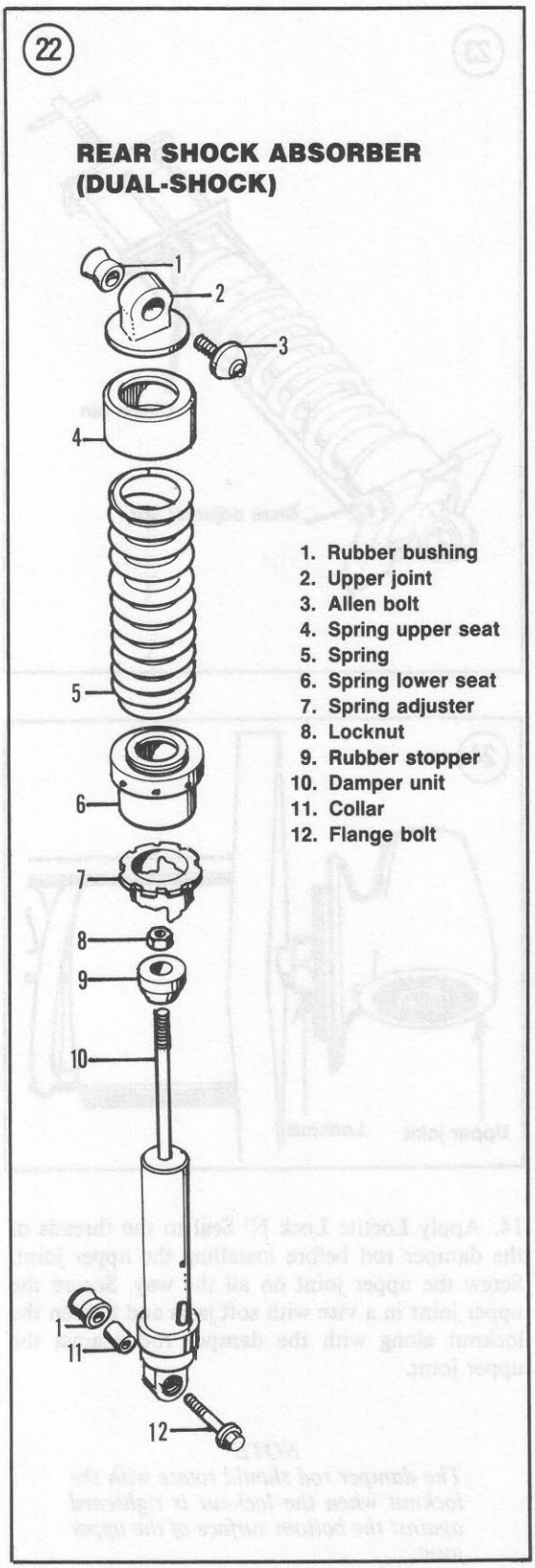






Installation

1. Position the drive chain over the left-hand side of the swing arm and install the swing arm and rear wheel as described in this chapter.
2. Install the drive chain onto the driven sprocket.
3. Install the drive chain onto the drive sprocket and slide both items onto the transmission countershaft.
4. Install the holding plate and rotate it in either direction until the bolt holes align.
5. Install a *new* lockwasher and both bolts.
6. Have an assistant apply the rear brake to keep the drive chain taut and keep the drive sprocket from turning. Tighten the bolts to the torque specification listed in **Table 1**.
7. Bend a tab on the lockwasher up against a flat on each of the bolts.
8. Install the drive chain guard onto the swing arm. Install the bolts and collars and tighten them securely.
9. Install the clutch slave cylinder as described in Chapter Five.
10. Install the drive sprocket cover and tighten the bolts securely.
11. On Interceptor models, align the punch marks on the gearshift arm with the gearshift spindle and install the gearshift arm and linkage. Install the bolt and tighten securely.



12. On Magna models, install the clutch slave cylinder cover and tighten the bolts securely.
13. Adjust the drive chain as described in Chapter Three.

SHOCK ABSORBERS (DUAL-SHOCK MODELS)

Spring Pre-load Adjustment

Spring pre-load can be adjusted by rotating the spring adjuster at the base of the spring. Rotate it *clockwise* to increase pre-load or *counterclockwise* to decrease pre-load. Use the spanner wrench provided in the owner's tool kit for this adjustment.

Both spring adjusters must be indexed on the same detent.

Removal/Installation

Removal and installation of the rear shocks is easier if done separately. The remaining unit will support the rear of the bike and maintain the correct relationship between the top and bottom shock mounts.

1. Place the bike on the centerstand and remove the seat as described in Chapter Twelve.

NOTE

It is not necessary to remove the seat but it will protect the cover from the accidental slippage of a tool during removal and installation of the upper Allen bolt.

2. Adjust both shocks to their softest setting, completely *counterclockwise.*
3. Remove the lower flange bolt and the upper Allen bolt and remove the shock absorber.

NOTE

The lower bolts are different lengths and must be reinstalled on the correct side during installation. The longer bolt is on the left-hand side and is 10×38 mm; the shorter bolt is on the right-hand side and is 10×35 mm.

4. Install by reversing these removal steps, noting the following.
5. Be sure to install the lower bolts on the correct sides as described in the previous NOTE.
6. Tighten the bolts to the torque specifications listed in **Table 1.**
7. Repeat for the other side.

Disassembly/Inspection/Assembly

Refer to **Figure 22** for this procedure.

The shock is spring-controlled and hydraulically damped. The shock damper unit is sealed and cannot be serviced. Service is limited to removal and replacement of the damper unit and the spring.

WARNING

Without the proper tool, this procedure can be dangerous. The spring can fly loose, causing injury. For a small bench fee, a dealer can do the job for you.

1. Install the shock absorber in a compression tool as shown in **Figure 23**. This is a special tool and is available from a Honda dealer. It is a Rear Shock Compression Tool (Honda part No. 07959-3290001).

NOTE

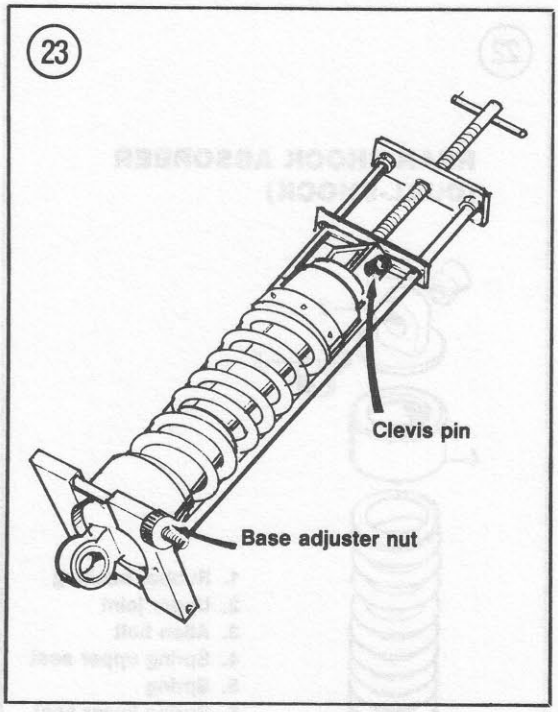
One additional component must be added to the basic compressor tool. Replace the base and guide with a set of attachments (Honda part No. 07959-MB 10000).

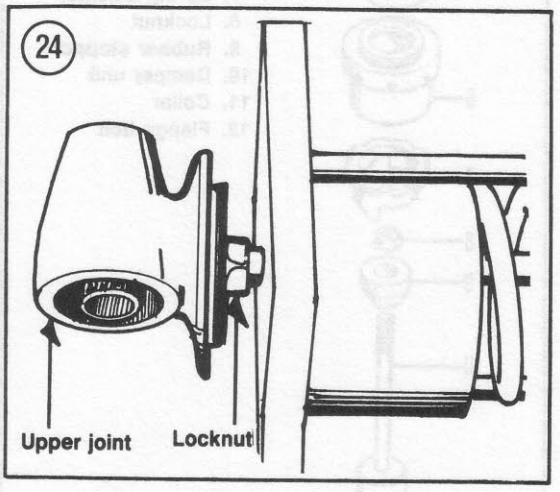
2. Compress the spring just enough (approximately 30 mm) to gain access to the locknut under the upper joint (**Figure 24**).
3. Place the upper joint in a vise with soft jaws and loosen the locknut.
4. Completely unscrew the upper joint. This part may be difficult to break loose as Loctite Lock N' Seal was applied during assembly.
5. Release the spring tension and remove the shock from the compression tool.
6. Remove the spring upper seat, the spring and the spring lower seat from the damper unit.
7. Slide off the spring adjuster.
8. Measure the spring free length (**Figure 25**). The spring must be replaced if it has sagged to the service limit listed in **Table 2** or less.
9. Check the damper unit for leakage and make sure the damper rod is straight.

NOTE

The damper unit cannot be rebuilt; it must be replaced as a unit.

10. Inspect the rubber bushings in the upper and lower joints. Replace if necessary.
11. Inspect the rubber stopper. If it is worn or deteriorated, remove the locknut and slide off the rubber stopper. Replace with a new one.
12. Assembly is the reverse of these disassembly steps, noting the following.
13. If the locknut was removed, apply Loctite Lock N' Seal to the threads of the damper rod before installing the locknut. Screw the locknut all the way down and tight against the end of the threads.

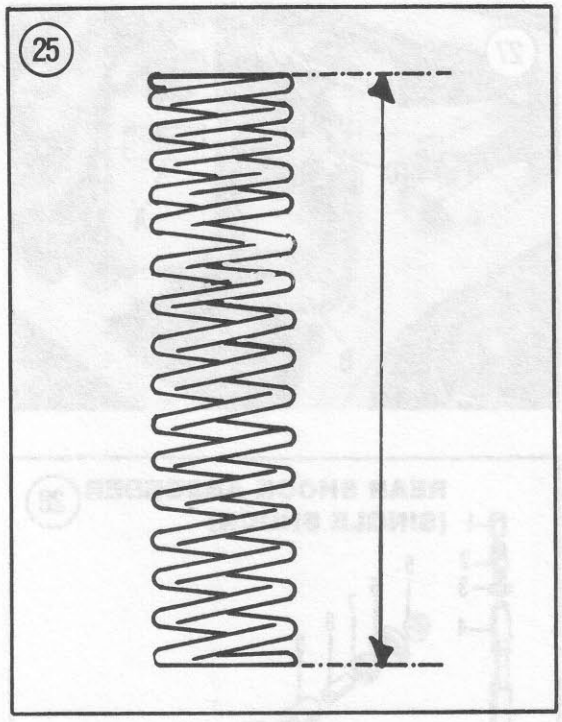


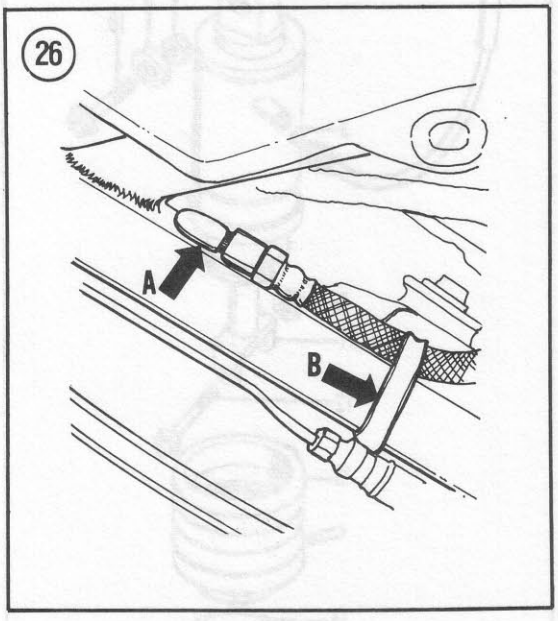


14. Apply Loctite Lock N' Seal to the threads of the damper rod before installing the upper joint. Screw the upper joint on all the way. Secure the upper joint in a vise with soft jaws and tighten the locknut along with the damper rod against the upper joint.

NOTE

The damper rod should rotate with the locknut when the locknut is tightened against the bottom surface of the upper joint.





NOTE

After the locknut is tightened completely the locknut must be against the bottom surface of the upper joint and against the end of the threads on the damper rod.

15. Align the upper spring seat to the upper joint when releasing the spring compressor tool.

SHOCK ABSORBER (PRO-LINK MODELS)

The pivot areas of the parts of the Pro-Link suspension must be lubricated with a paste grease containing 40% or more of molybdenum disulfide grease. The following list includes some brands of paste grease recommended by Honda:

a. Dow Corning—Molykote G-n Paste.
b. Bel-Ray—Moly-Lube NIC-8.
c. Sumico Lubricant—Locol Paste (Japan).
d. Any other brand that meets these requirements.

Air Pressure Adjustment

The single shock absorber used in the Pro-Link suspension system is an air/oil type. The air pressure within the shock absorber can be varied to correspond to different weight loads and road conditions.

Low air pressure will provide a softer ride and is for light loads and smooth road conditions.

High air pressure will provide a harder ride and is for heavy loads and rough road conditions.

The factory recommended air pressure is listed in **Table 3**.

To vary the air pressure, perform the following:

1. Place the bike on the centerstand. Do not rest the bike on the sidestand or you will get a false reading.
2. Remove the left-hand side cover.
3. Remove the air valve cap (A, **Figure 26**) from the air hose and check the air pressure with a gauge.

NOTE

A small amount of air pressure will be lost when removing the gauge from the air valve. Determine the amount of loss and compensate for it.

NOTE

Always check the air pressure when the shock absorber is cold.

4. To increase air pressure, inflate the shock with a small hand operated air pump.

WARNING

During the next step, never use any type of compressed gas as an explosion may be lethal. Never heat the shock assembly with a torch or place it near an open flame or extreme heat, as this may also result in an explosion.

Rebound Adjustment

The rear shock absorber is also equipped with a rebound adjustment knob. Along with varying the

air pressure you can vary the rebound characteristics of the shock to correspond to different weight loads and road conditions. The rebound adjust knob is located on top of the shock absorber.

The rebound adjust knob can be moved to any of the 4 positions. The No. 1 position is the softest and the No. 4 position is the hardest. Refer to **Table 3** for recommended rebound settings to be used with various air pressures to produce a variety of riding conditions with various loads and road conditions.

Removal

1. Place wood block(s) under the engine to support the bike securely with the rear wheel off of the ground.
2. Remove the seat (Chapter Twelve) and both side covers.
3. Remove both mufflers as described in Chapter Six.
4. Remove the coolant recovery tank (A, **Figure 27**) as described in Chapter Eight.
5. Disconnect the electrical connectors (B, **Figure 27**) mounted on the electrical panel.
6. Remove the bolt (C, **Figure 27**) securing the electrical panel and remove the panel from the frame.
7. Disconnect the wire strap securing the shock absorber air hose to the frame on the left-hand side.
8. Remove the lower mounting flange bolt and nut securing the shock absorber to the shock arm.
9. Remove the upper mounting flange bolt and nut (D, **Figure 27**) securing the shock to the frame.

NOTE

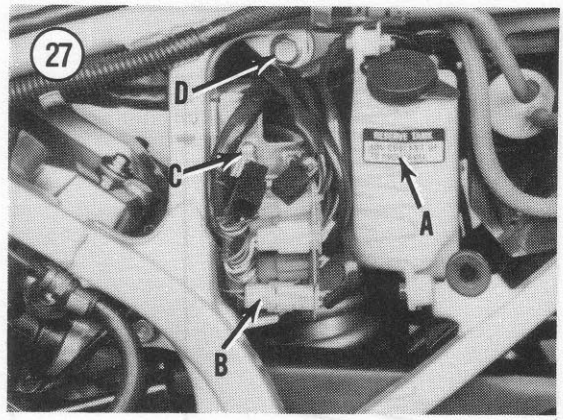
Before removing the shock absorber from the frame, note the routing of the air hose. Make a quick drawing or take a Polaroid picture so you won't forget. It must be reinstalled in the same path so it will not interfere with the shock absorber.

10. Tilt the shock absorber toward the left-hand side and carefully remove the shock absorber out through the left-hand side of the frame. Carefully pull the air hose out with the shock absorber unit.

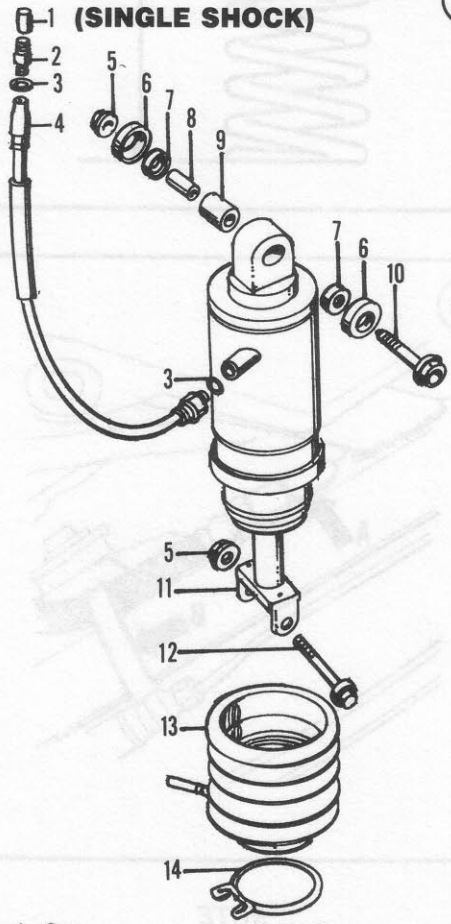
Inspection

Refer to **Figure 28** for this procedure.

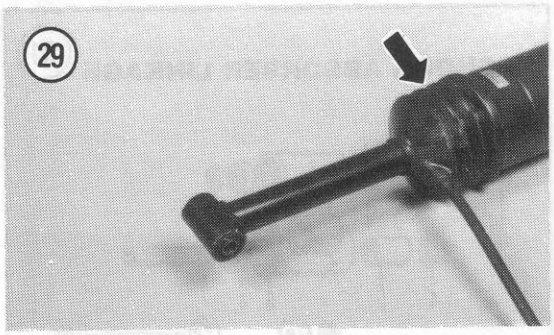
Service by the home mechanic is limited to removal, replacement and installation of the shock unit. Service by a dealer is limited to oil seal replacement and replenishing the ATF in the unit.

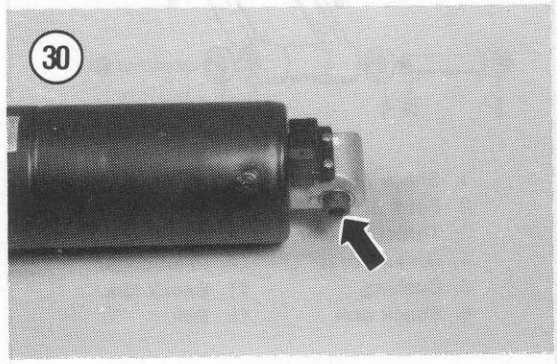


REAR SHOCK ABSORBER (SINGLE SHOCK) 28



1. Cap
2. Air valve
3. O-ring
4. Hose
5. Nut
6. Cap
7. Dust seal
8. Collar
9. Metal bushing
10. Bolt
11. Damper unit
12. Bolt
13. Rubber boot
14. Metal clamp





A hydraulic press is required for service on the shock, which should be entrusted to a dealer.

1. Inspect the lower portion of the shock absorber in the area of the rubber boot. If oil is leaking, the oil seal is faulty and should be replaced.
2. If the rubber boot is torn or deteriorated, it should be replaced as follows:
   a. Remove the metal clamp at the base of the rubber boot.
   b. Carefully pull the rubber boot (**Figure 29**) from the damper unit and replace with a new one.
   c. Install the metal clamp with the sharp edge facing down.
3. Remove the cap and dust seal from the upper mounting receptacle on each side.
4. Push out the upper mounting metal bushing and collar (**Figure 30**) and clean with solvent. Dry thoroughly and apply molybdenum disulfide paste grease to the bushing and collar and the upper mounting receptacle in the shock absorber.
5. Reinstall the metal bushing and collar into the shock absorber.
6. Install the cap and dust seal onto the upper mounting receptacle on each side.

NOTE

Before removing the air valve fitting, depress the valve stem and bleed off all air pressure.

7. If an air leak is suspected, perform the following:
   a. Remove the air hose assembly from the top of the shock absorber. Replace the O-ring seal on the fitting.
   b. Remove the air valve from the end of the air hose assembly. Replace the O-ring seal on the valve.

NOTE

Rubber O-rings tend to lose their sealing ability with age and when subjected to heat.

   c. Apply a light coat of grease to all new O-rings before installation.

Installation

WARNING

All bolts and nuts used on the Pro-Link suspension must be replaced with parts of the same type. Do ***not*** *use a replacement part of lesser quality or substitute design, as this may affect the performance of the system or result in failure of the part which will lead to loss of control of the bike. Torque values listed must be used during installation to assure proper retention of these parts.*

1. Apply a light coat of molybdenum disulfide paste grease to the upper mounting bracket on the frame.
2. Make sure the dust seal and cap are in place on each side of the upper mounting receptacle.
3. Position the shock absorber assembly with the air hose facing toward the left-hand side of the bike.
4. Install the shock absorber from the left-hand side of the frame.
5. Push the shock absorber down into position and place the air hose in the same location as noted in the NOTE ahead of Step 10, *Removal.*
6. Apply a coat of molybdenum disulfide paste grease to the pivot points of the shock link.
7. Position the shock absorber into the shock link.
8. Install the lower mounting flange bolt from the left-hand side. Install the nut and tighten to the torqe specification listed in **Table 1.**
9. Install the upper mounting flange bolt from the left-hand side (D, **Figure 27**). Install the nut and tighten to the torque specification listed in **Table 1.**
10. Install the metal band securing the air hose to the left-hand side of the frame (B, **Figure 26**).

11. Remove the wood block(s) from under the engine. Push down on the rear of the bike and make sure the rear suspension is operating properly. Make sure the air hose is not rubbing on the shock absorber. Relocate the air hose if necessary.
12. Place the bike on the centerstand.
13. Install the electrical panel and tighten the bolts securely.
14. Connect the electrical connectors to the parts mounted on the electrical panel.
15. Install both mufflers as described in Chapter Six.
16. Install the coolant recovery tank as described in Chapter Eight.
17. Pressurize the shock absorber to the desired air pressure as described in this chapter.
18. Install the seat and both side covers.

PRO-LINK SUSPENSION SYSTEM

The single shock absorber and linkage of the Pro-Link rear suspension system are attached to the swing arm just aft of the swing arm pivot point and to the lower rear portion of the frame. All of these items are located forward of the rear wheel.

The shock link and shock arms working together with the matched spring rate and damping rates of the shock absorber combine to achieve a "progressive rising rate" rear suspension. This system provides the rider with the best of two worlds—greater rider comfort and better transfer of power to the ground.

As the rear suspension is moved upward by bumps, the shock absorber is compressed by the movement of the shock arm. The shock arm and shock links are attached to the swing arm and to the lower portion of the frame.

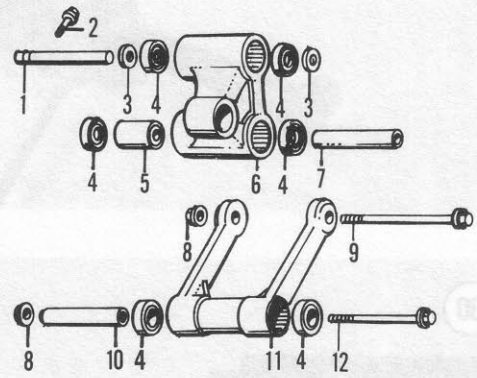
As rear suspension travel increases, the portion of the shock link where the shock absorber is attached rises above the swing arm, thus increasing shock absorber travel (compression). This provides a progressive rise rate in which the shock eventally moves at a faster rate than the wheel. At about halfway through the wheel travel the shock begins to move at a faster rate than it did in the beginning.

Shock Absorber Linkage Removal

The pivot areas of the parts of the Pro-Link suspension must be lubricated with a paste grease containing 40% or more of molybdenum disulfide grease. The following list includes some brands of paste grease recommended by Honda:

a. Dow Corning—Molykote G-n Paste.
b. Bel-Ray—Moly-Lube NIC-8.
c. Sumico Lubricant—Locol Paste (Japan).
d. Any other brand that meets these requirements.

SHOCK ABSORBER LINKAGE (31)



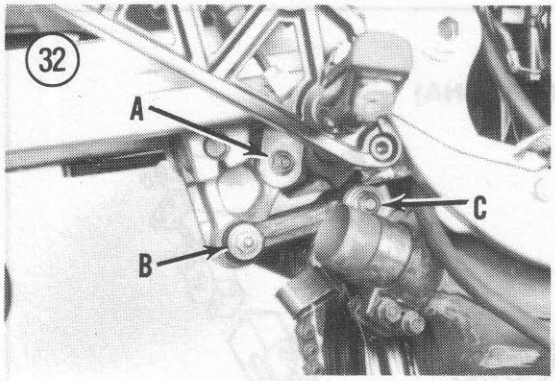
1. Shock arm shaft
2. Set bolt
3. Thrust washer
4. Grease seal
5. Bushing
6. Shock arm
7. Pivot collar
8. Nut
9. Bolt
10. Pivot collar
11. Shock link
12. Bolt

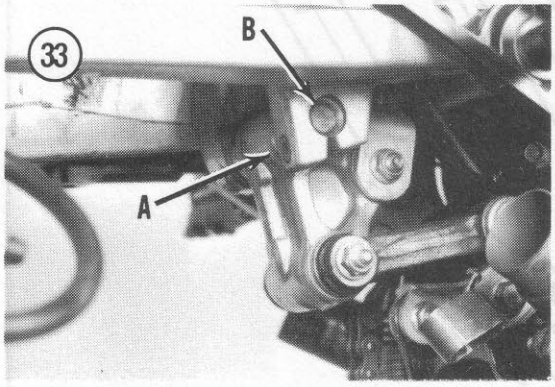
Refer to **Figure 31** for this procedure.

1. Remove both mufflers as described in Chapter Six.
2. Remove the shock absorber lower mounting flange bolt and nut (A, **Figure 32**).
3. Remove the swing arm pinch bolt (A, **Figure 33**) securing the shock arm shaft (B, **Figure 33**).
4. Remove the bolt and nut (B, **Figure 32**) securing the shock link to the shock arm.
5. Push the shock arm shaft (B, **Figure 33**) out through the mounting bracket on each side of the swing arm and through the shock link. Remove the shock arm.
6. Remove the flange bolt and nut (C, **Figure 32**) securing the shock link to the frame and remove the shock link.

Inspection

1. Inspect all arms for cracks or damage; replace as necessary.
2. Remove the dust seals at all pivot points and push out the pivot collars.
3. Clean all parts in solvent and dry thoroughly with compressed air.
4. Inspect the pivot collars for scratches, abrasion or abnormal wear; replace as necessary.





5. Inspect the needle bearings for abnormal wear. If any of the bearings are damaged, the part must be replaced as the bearings are not replaceable.
6. Inspect the dust seals. Replace all of them as a set if any are worn or starting to deteriorate. If the dust seals are in poor condition they will allow dirt to enter into the pivot areas and cause the pivot collars to wear.
7. Coat all surfaces of the pivot receptacles, the pivot collars and the insides of the dust seals with molybdenum disulfide paste grease. Insert the pivot collars into the shock link and the shock arm and install the dust seals.

NOTE

Make sure the dust seal lips seat correctly. If not they will allow dirt and moisture into the pivot collar areas and cause wear.

Installation

1. Install the shock link as follows:
   a. Position the shock link onto the mounting bracket on the frame.
   b. Insert the flange bolt (C, **Figure 32**) from the left-hand side and through the shock link assembly.
   c. Install the nut, but do not tighten at this time.
2. Locate the shock arm into position with the mounting brackets on the swing arm and align the shock arm shaft holes in all the parts.
3. Position the shock arm shaft so the groove for the Allen bolt is on the right-hand side.
4. Insert the shock arm shaft (B, **Figure 33**) through the mounting bracket on each side of the swing arm and through the shock link.
5. Install the shock arm pinch bolt (A, **Figure 33**) and tighten to the torque specification listed in **Table 1**.
6. Move the shock link assembly up and into alignment with the hole in the shock arm.
7. Insert the flange bolt in from the left-hand side and through the shock link assembly and shock arm (B, **Figure 32**).
8. Install the nut and tighten to the torque specification listed in **Table 1**.
9. Tighten the bolt and nut installed in Step 1 to the torque specification listed in **Table 1**.
10. Install the shock absorber lower mounting flange bolt (A, **Figure 32**) and nut and tighten to the torque specification listed in **Table 1**.
11. Install both mufflers as described in Chapter Six.

SWING ARM

In time, the roller bearings will wear and will have to be replaced. The condition of the bearings can greatly affect handling performance and if worn parts are not replaced they can produce erratic and dangerous handling. Common symptoms are wheel hop, pulling to one side during acceleration and pulling to the other side during braking.

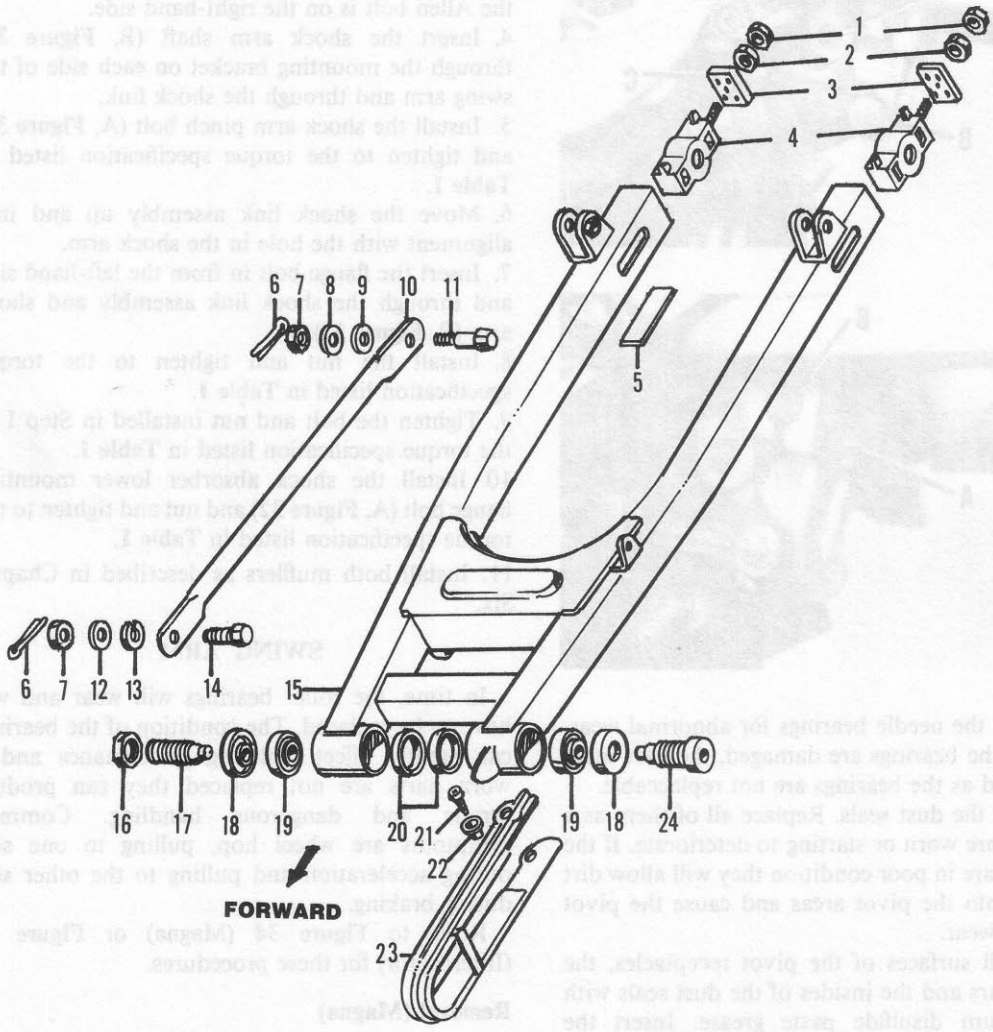
Refer to **Figure 34** (Magna) or **Figure 35** (Interceptor) for these procedures.

Removal (Magna)

1. Place the bike on the centerstand.
2. Remove the mufflers as described in Chapter Six.
3. Remove the rear wheel as described in this chapter.
4. Remove the bolts and collars securing the drive chain guard to the swing arm and remove the chain guard.
5. Remove the bolts securing the clutch slave cylinder cover and remove the cover.
6. Remove the clutch slave cylinder as described in Chapter Five.
7. Remove the bolts securing the drive sprocket cover and remove the cover.
8. Remove both shock absorbers as described in this chapter.

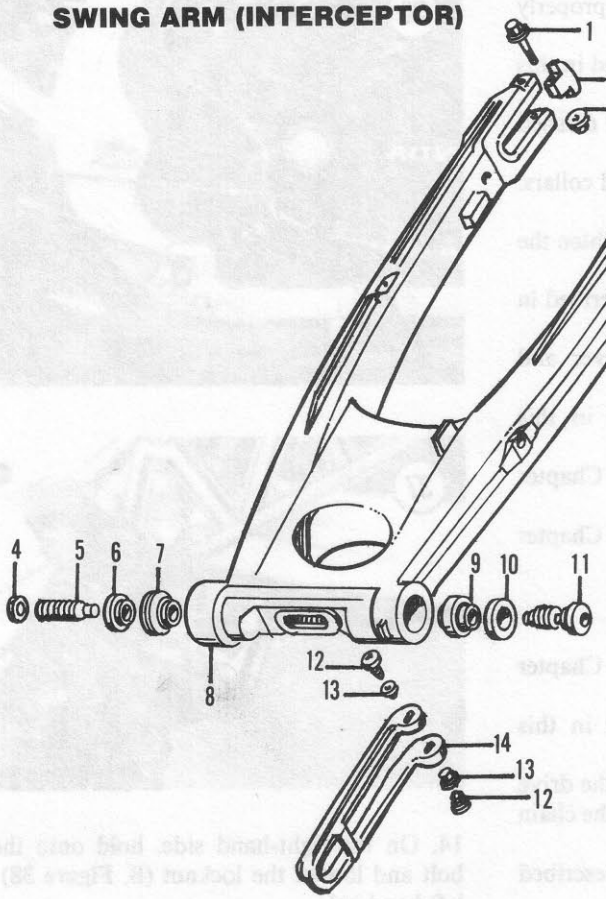
(34)

SWING ARM (MAGNA)



1. Adjust nut
2. Locknut
3. Chain tensioner plate
4. Chain adjuster stopper
5. Label
6. Cotter pin
7. Nut
8. Washer
9. Rubber bushing
10. Rear brake torque arm
11. Bolt
12. Washer
13. Lockwasher
14. Bolt
15. Swing arm
16. Locknut
17. Right-hand pivot bolt
18. Grease seal
19. Bearing
20. Grease holder
21. Bolt
22. Metal collar
23. Drive chain slider
24. Left-hand pivot bolt

(35) **SWING ARM (INTERCEPTOR)**



1. Bolt
2. Chain adjuster stopper
3. Nut
4. Nut
5. Right-hand pivot bolt
6. Grease seal
7. Bearing
8. Swing arm
9. Bearing
10. Grease seal
11. Left-hand pivot bolt
12. Bolt
13. Metal collar
14. Drive chain slider

9. Grasp the rear end of the swing arm and try to move it from side to side in a horizontal arc. There should be no noticeable side play. If play is evident and the pivot bolts are tightened correctly, the bearings should be replaced.
10. On the right-hand side, hold onto the pivot bolt and loosen the locknut.
11. Loosen the right-hand and left-hand pivot bolts.
12. Set a box under the swing arm and then remove both pivot bolts.
13. Remove the swing arm from the frame.
14. Inspect the swing arm as described in this chapter.

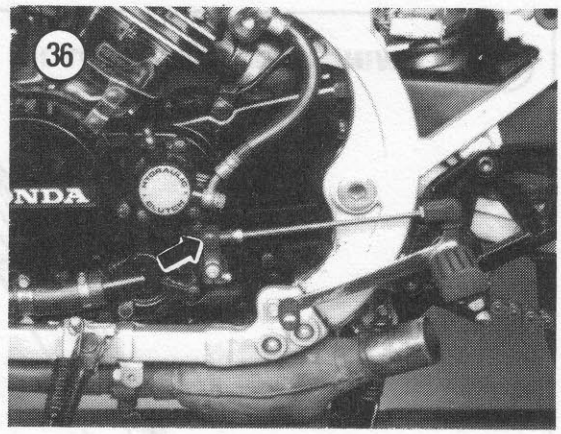
Installation (Magna)

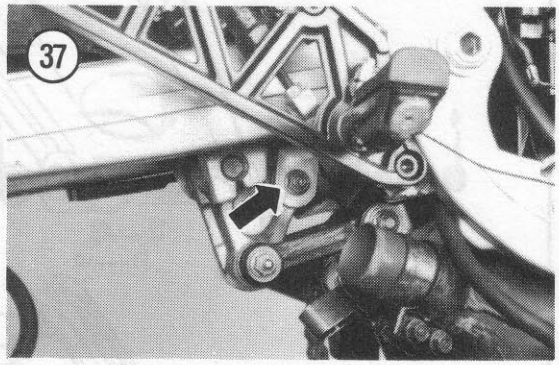
1. Position the drive chain over the left-hand side of the swing arm.
2. Set the swing arm onto the box and position the swing arm into the mounting area of the frame.
3. Align the holes in the swing arm with the holes in the frame.
4. Apply a light coat of grease to the inner tip of both the right-hand and left-hand pivot bolts.
5. Install the right-hand pivot bolt and locknut. Do not tighten the pivot bolt at this time.
6. Install the left-hand pivot bolt.
7. Make sure the swing arm is properly located in the frame and then tighten the left-hand pivot bolt to the torque specification listed in **Table 1**.
8. Tighten the right-hand pivot bolt to 25 N•m (18 ft.-lb.) and then loosen the pivot bolt.
9. Tighten the right-hand pivot bolt to the torque specification listed in **Table 1**.
10. Hold onto the right-hand pivot bolt and tighten the locknut to the torque specification listed in **Table 1**.

11. Move the swing arm up and down several times to make sure all components are properly seated.
12. Install the shock absorbers as described in this chapter.
13. Make sure the drive chain is correctly meshed with the drive sprocket.
14. Install the drive chain cover, bolts and collars. Tighten the bolts securely.
15. Install the drive sprocket cover and tighten the bolts securely.
16. Install the clutch slave cylinder as described in Chapter Five.
17. Install the clutch slave cylinder cover and tighten the bolts securely.
18. Install the rear wheel as described in this chapter.
19. Install the mufflers as described in Chapter Six.
20. Adjust the drive chain as described in Chapter Three.

Removal (Interceptor)

1. Place the bike on the centerstand.
2. Remove the mufflers as described in Chapter Six.
3. Remove the rear wheel as described in this chapter.
4. Remove the bolts and collars securing the drive chain guard to the swing arm and remove the chain guard.
5. Remove the clutch slave cylinder as described in Chapter Five.
6. Remove the bolt on the gearshift arm and remove the gearshift arm and linkage from the gearshift spindle (**Figure 36**).
7. Remove the bolts securing the drive sprocket cover and remove the cover (**Figure 19**).
8. Remove the lower mounting bolt and nut (**Figure 37**) securing the shock absorber to the shock arm.
9. Remove the swing arm pinch bolt (A, **Figure 33**) securing the shock arm shaft.
10. Push the shock arm shaft (B, **Figure 33**) out through the mounting bracket on each side of the swing arm and through the shock link.
11. Leave the shock arm attached to the shock link and the shock absorber attached at the top; there is no need to remove them.
12. Remove the rear brake caliper hose (A, **Figure 38**) from the swing arm.
13. Grasp the rear end of the swing arm and try to move it from side to side in a horizontal arc. There should be no noticeable side play. If play is evident and the pivot adjusting bolt is tightened correctly, the bearings should be replaced.

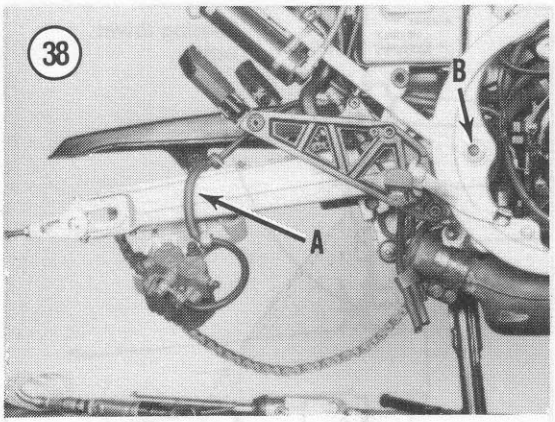




14. On the right-hand side, hold onto the pivot bolt and loosen the locknut (B, **Figure 38**) on the left-hand side.
15. Loosen the right-hand and left-hand pivot bolts.
16. Set a box under the swing arm and then remove both pivot bolts.
17. Remove the swing arm from the frame.
18. Inspect the swing arm as described in this chapter.

Installation (Interceptor)

1. Position the drive chain over the left-hand side of the swing arm.
2. Set the swing arm onto the box and position the swing arm into the mounting area of the frame.
3. Align the holes in the swing arm with the holes in the frame.
4. Apply a light coat of grease to the inner tip of both the right-hand and left-hand pivot bolts.
5. Install the right-hand pivot bolt and locknut. Do not tighten the pivot bolt at this time.
6. Install the left-hand pivot bolt.
7. Make sure the swing arm is properly located in the frame and then tighten the left-hand pivot bolt to the torque specification listed in **Table 1**.



8. Tighten the right-hand pivot bolt to 25 N•m (18 ft.-lb.) and then loosen the pivot bolt.
9. Tighten the right-hand pivot bolt to the torque specification listed in **Table 1**.
10. Hold onto the right-hand pivot bolt and tighten the locknut to the torque specification listed in **Table 1**.
11. Move the swing arm up and down several times to make sure all components are properly seated.
12. Locate the shock arm into position with the mounting bracket on the swing arm and align the shock arm shaft holes in all the parts.
13. Position the shock arm shaft with the groove for the Allen bolt on the right-hand side.
14. Insert the shock arm shaft through the mounting bracket on each side of the swing arm and through the shock link.
15. Install the swing arm pinch bolt and tighten to the torque specification listed in **Table 1**.
16. Install the shock absorber lower mounting bolt from the left-hand side and install the nut. Tighten the bolt and nut to the torque specification listed in **Table 1**.
17. Make sure the drive chain is correctly meshed with the drive sprocket.
18. Install the drive chain cover, bolts, and collars. Tighten the bolts securely.
19. Install the clutch slave cylinder as described in Chapter Five.
20. Align the punch marks on the gearshift arm with the gearshift spindle and install the gearshift arm and linkage. Install the bolt and tighten securely.
21. Install the rear wheel as described in this chapter.
22. Install the mufflers as described in Chapter Six.
23. Adjust the drive chain as described in Chapter Three.

Bearing Replacement

The swing arm is equipped with a roller bearing at each side. The inner race and roller bearing assembly will come right out (no force needed) after the grease seal is removed. The bearing outer race is pressed into place and has to be removed with force. The race will be distorted when removed, so don't remove it unless absolutely necessary.

The bearing outer race must be removed with special tools that are available from a Honda dealer. The special tools are as follows:

a. 30 mm bearing remover, Honda part No. 07963-8890300.
b. Remover handle, Honda part No. 07963-3710200.
c. Slide hammer weight, Honda part No. 07963-3710200.
d. Driver handle, Honda part No. 07749-0010000.
e. Bearing attachment (37×40 mm), Honda part No. 07746-0010200.

1. Remove the swing arm as described in this chapter.
2. Remove the screws and collars securing the drive chain slider and remove the slider.
3. On Magna models, remove the grease holder from the inside surface of both pivot points.
4. Remove the grease seal from the outside surface of both pivot points.
5. Remove the inner race and the roller bearing assembly.

NOTE

These special tools grab the outer race and then withdraw it from the swing arm with a tool similar to a body shop slide hammer.

6. To remove the bearing outer race, perform the following:
   a. Secure the swing arm in a vise with soft jaws.
   b. Install the bearing remover onto the remover handle and slide hammer weight.
   c. Install the bearing remover through the outer race and behind the outer race and expand it as much as possible.
   d. Slide the weight on the hammer several times to move the bearing race out slightly.
   e. Expand the bearing remover completely and slide the weight up and down until the bearing race is removed.
   f. Turn the swing arm over in the vise and repeat for the other bearing outer race.
7. Thoroughly clean out the inside of the swing arm with solvent and dry with compressed air.

8. Apply a light coat of waterproof grease to all parts before installation.

NOTE

Drive the bearings into each side of the swing arm from the outside surface.

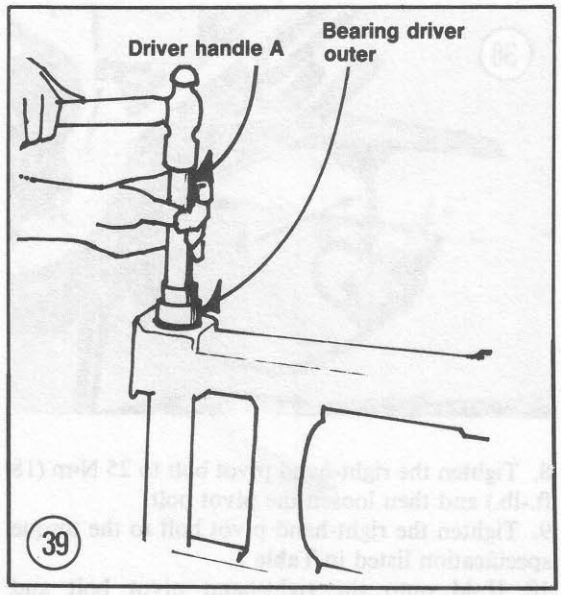
WARNING

Never reinstall a bearing that has been removed. During removal, it becomes slightly damaged and is no longer true to alignment. If installed, it will create an unsafe riding condition.

CAUTION

In order to prevent damage the swing arm must be supported with the wood block under the pivot area when installing the bearings.

9. On Magna models, place a wood block under the inside surface of the swing arm pivot area.
10. To install the bearing outer race, perform the following:
   a. Place the bearing driver attachment over the bearing outer race.
   b. Drive the race into place with the driver handle and hammer (**Figure 39**).
   c. Drive the race into place slowly and squarely. Make sure they are properly seated.



11. Install the grease seal into the outside surface of the pivot point.
12. On Magna models, install the grease holder into the inside surface of each pivot point.
13. Install the drive chain slider. Be sure to install the collars with the bolts. Tighten the bolts securely.
14. Install the swing arm as described in this chapter.

Table 1 REAR SUSPENSION TORQUE SPECIFICATIONS

Item	N·m	ft.-lb.
Rear axle nut	70-90	51-65
Swing arm pivot bolts		
Left-hand side	80-110	58-80
Right-hand side		
Initial torque	25	18
Final torque	13-17	9-12
Shock absorber mounting bolts		
Dual-shock models		
Upper	20-30	14-22
Lower	30-40	22-29
Pro-link models		
Upper and lower	40-50	29-36
Shock absorber linkage bolts (Pro-link models)		
Shock arm pinch bolt	20-30	14-22
Shock link to frame	50-60	36-43
Shock link to shock arm	40-50	29-36
Shock link to shock absorber	40-50	20-36
Brake torque link bolt (disc brake models)	18-25	13-18
Disc-to-hub bolts	35-40	25-29
Drive sprocket bolts	60-70	43-51
Final driven sprocket nuts	60-70	43-51

Table 2 REAR SHOCK ABSORBER SPRING FREE LENGTH (DUAL-SHOCK MODELS)

Standard	Service limit
255 mm (10.04 in.)	249.9 mm (9.84 in.)

Table 3 REAR SHOCK ABSOBER ADJUSTMENT CHART (PRO-LINK MODELS)*

Position**	Riders/load	Riding conditions
1	One	Ordinary or city road conditions
2	One/two	Ordinary or city road conditions
3	One/two or carrying load	Highway or winding road conditions
4	One/two or carrying load	Rough road conditions

* Air pressure can vary from 0.5 kg/cm² (7 psi) to 1.5 kg/cm² (21 psi) as the road conditions become more severe or the load increases.
** Do not position the adjuster between the numbered detent adjustment points.

CHAPTER ELEVEN

BRAKES

The brake system consists of either a single disc or dual discs on the front wheel and a single disc or drum brake on the rear.

Refer to **Table 1** for brake specifications and **Table 2** for torque specifications. **Table 1** and **Table 2** are located at the end of this chapter.

FRONT DISC BRAKE

The front disc brake(s) is actuated by hydraulic fluid and is controlled by a hand lever on the master cylinder. As the brake pads wear, the brake fluid level drops in the reservoir and automatically adjusts for wear.

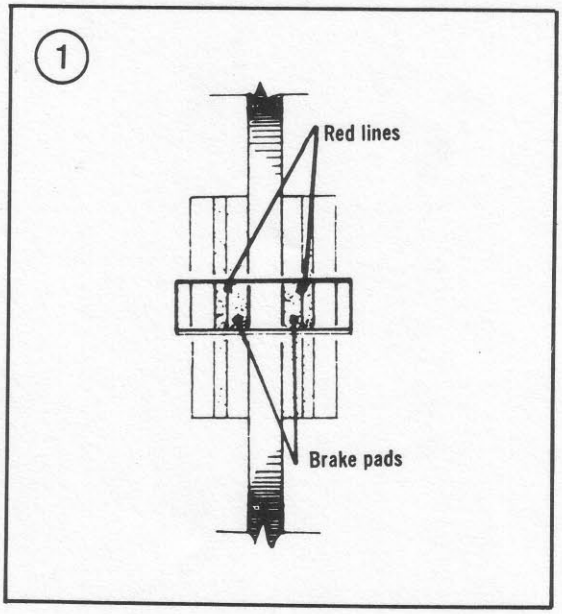
When working on hydraulic brake systems, it is necessary that the work area and all tools be absolutely clean. Any tiny particles of foreign matter and grit in the caliper assembly or the master cylinder can damage the components. Also, sharp tools must not be used inside the caliper or on the piston. If there is any doubt about your ability to correctly and safely carry out major service on the brake components, take the job to a dealer or brake specialist.

FRONT BRAKE PAD REPLACEMENT

There is no recommended mileage interval for changing the friction pads in the disc brake. Pad wear depends greatly on riding habits and conditions. The pads should be checked for wear every 6,400 km (4,000 miles) and replaced when the wear indicator (**Figure 1**) reaches the edge of the brake disc. To maintain an even brake pressure on the disc, always replace both pads in each caliper at the same time.

CAUTION

Watch the pads more closely when the wear line approaches the disc. On some pads the wear line is very close to the metal backing plate. If pad wear happens to be uneven for some reason, the backing plate may come in contact with the disc and cause damage.



Refer to **Figure 2** (Magna) or **Figure 3** (Interceptor) for this procedure.

NOTE

If the front brake lever is inadverently applied, the caliper pistons will be forced out of the cylinders in the caliper assembly(ies). If this does happen, the caliper may have to be disassembled to reseat the pistons.

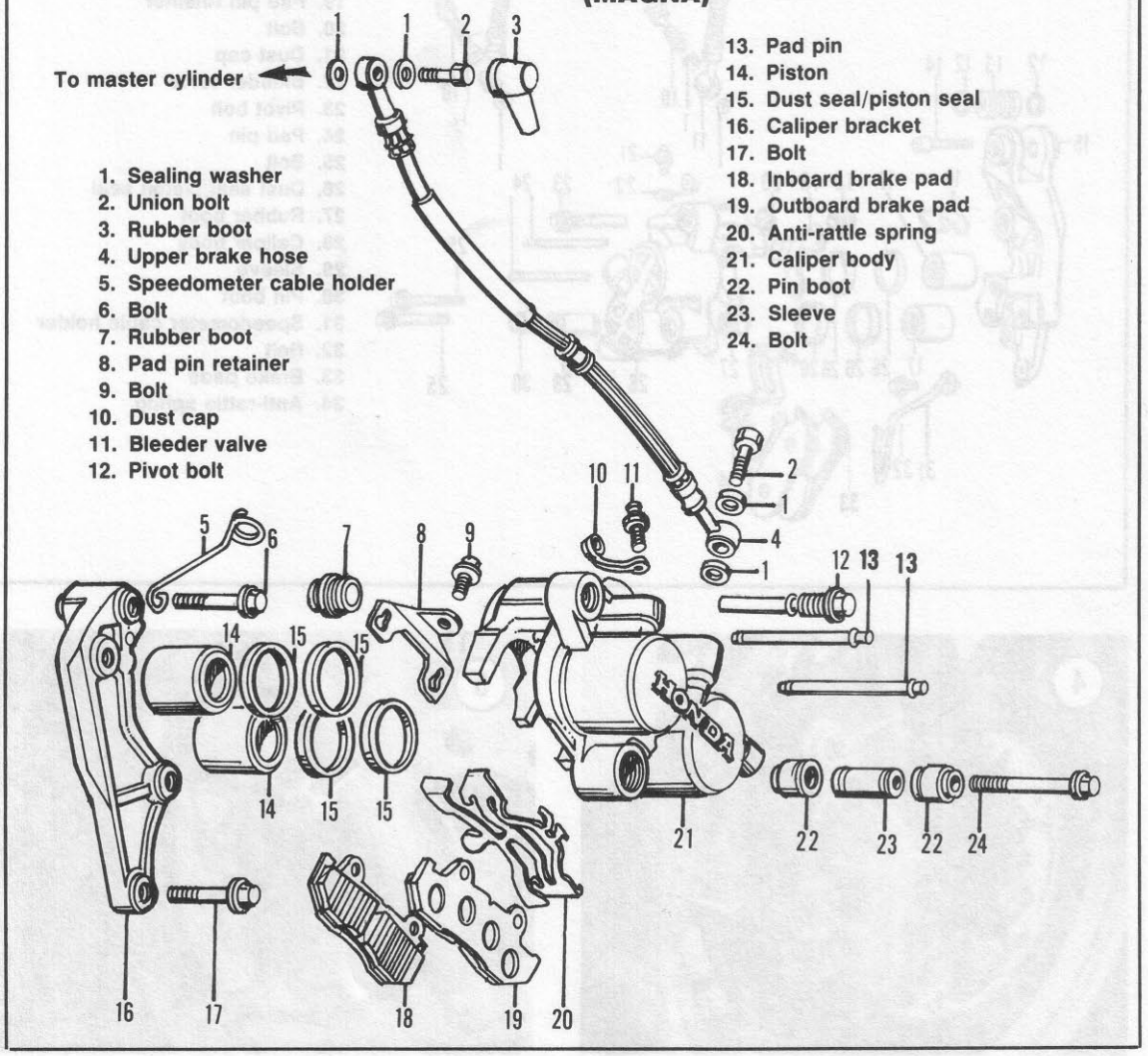
1. To prevent the accidental application of the front brake lever, place a spacer between the front brake lever and the hand grip. Hold the spacer in place with tape or a large rubber band.
2. Loosen the pad pin retainer bolt (**Figure 4**).

3A. On Magna models, perform the following:
   a. Remove the caliper mounting bolts (**Figure 5**).
   b. Pivot the caliper assembly up and off of the disc.
   c. Withdraw the caliper assembly from the pivot bolt boot on the caliper bracket and remove the caliper assembly.

3B. On Interceptor models, perform the following:
   a. Remove the caliper mounting bolts securing the caliper to the caliper bracket. Refer to **Figure 6** for the right-hand side and **Figure 7** for the left-hand side.
   b. Pivot the caliper assembly up and off the disc and remove the caliper assembly.

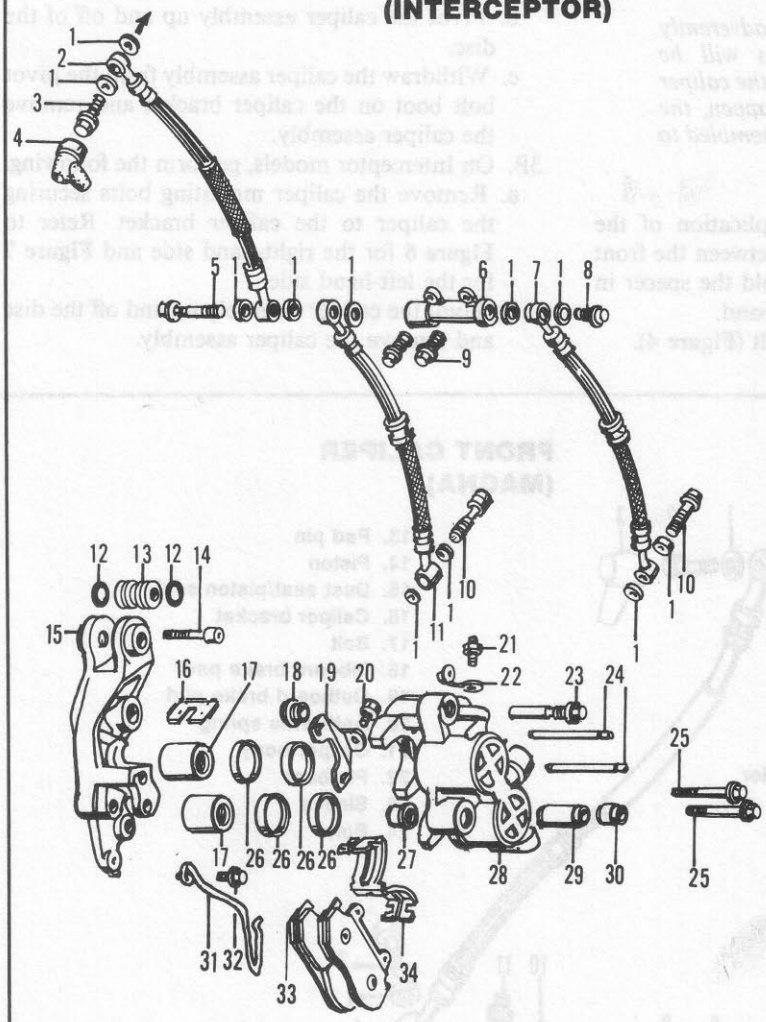
(2)

FRONT CALIPER (MAGNA)



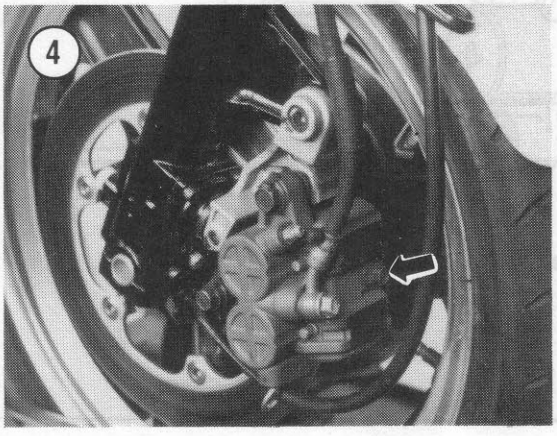
3

FRONT CALIPER (INTERCEPTOR)



1. Sealing washer
2. Upper brake hose
3. Union bolt
4. Rubber boot
5. Union bolt
6. 3-way fitting
7. Left-hand caliper brake hose
8. Union bolt
9. Bolt
10. Union bolt
11. Right-hand caliper brake hose
12. O-ring
13. Pivot bolt boot
14. Bolt
15. Caliper bracket
16. Bracket retainer
17. Piston
18. Rubber boot
19. Pad pin retainer
20. Bolt
21. Dust cap
22. Bleeder valve
23. Pivot bolt
24. Pad pin
25. Bolt
26. Dust seal/piston seal
27. Rubber boot
28. Caliper body
29. Sleeve
30. Pin boot
31. Speedometer cable holder
32. Bolt
33. Brake pads
34. Anti-rattle spring

4



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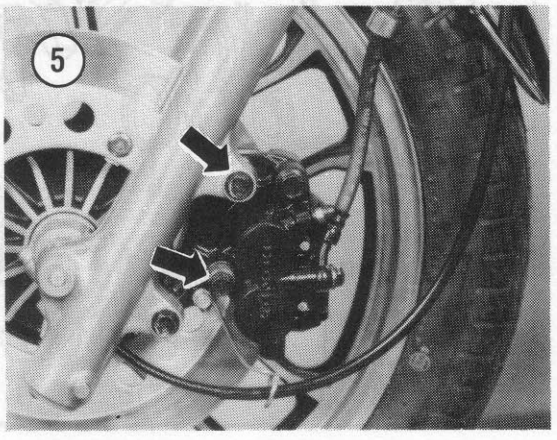
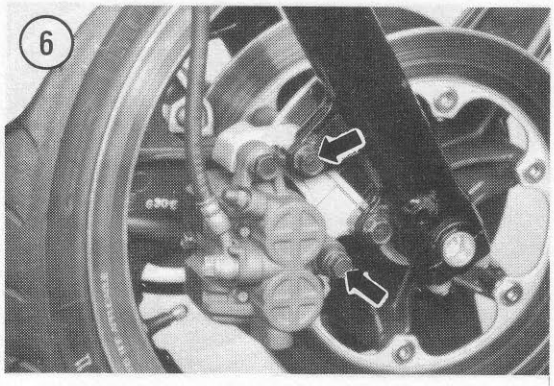
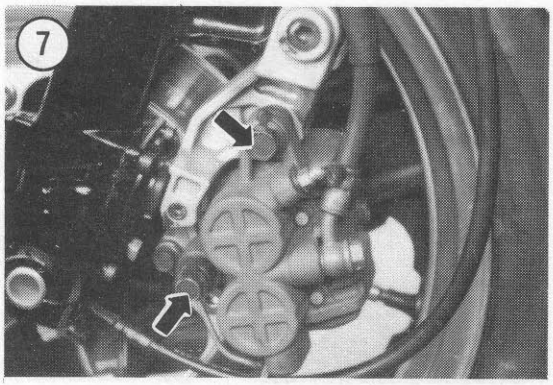
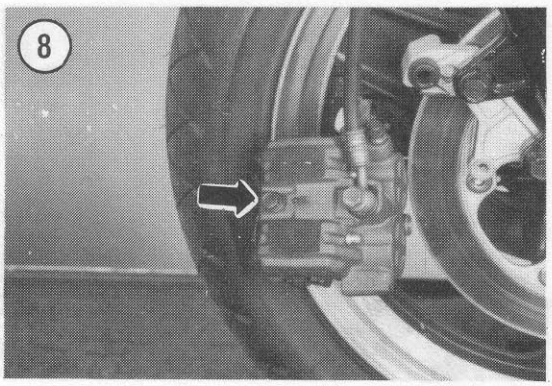
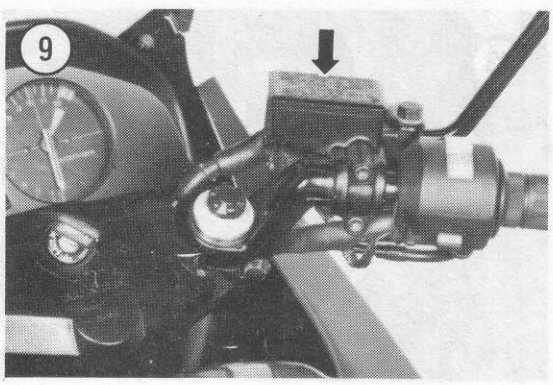










NOTE

The following steps pertain to all models and to both the right-hand and left-hand caliper assemblies.

4. Remove the bolt (**Figure 8**) securing the pin retainer to the caliper assembly and remove the pin retainer.
5. Remove both pad pins and both brake pads.
6. Clean the pad recess and the ends of the pistons with a soft brush. Do not use solvent, a wire brush or any hard tool which would damage the cylinders or pistons.
7. Carefully remove any rust or corrosion from the disc.
8. Lightly coat the ends of the pistons and the backs of the new pads *(not the friction material)* with disc brake lubricant.

NOTE

When purchasing new pads, check with your dealer to make sure the friction compound of the new pads is compatible with the disc material. Remove any roughness from the backs of the new pads with a fine-cut file; blow them clean with compressed air.

9. When new pads are installed in the caliper, the master cylinder brake fluid level will rise as the caliper pistons are repositioned. Perform the following:
   a. Clean the top of the master cylinder of all dirt and foreign matter. Remove the screws securing the cap (**Figure 9**) and remove the cap and the diaphragm from the front master cylinder.
   b. Slowly push both caliper pistons into the caliper.
   c. Constantly check the reservoir to make sure brake fluid does not overflow. Remove brake fluid, if necessary, before it overflows.
   d. The pistons should move freely. If they don't, and there is evidence of them sticking in the cylinder, the caliper should be removed and serviced as described under *Front Caliper Rebuilding* in this chapter.
10. Push the caliper pistons in all the way to allow room for the new pads.
11. Install the anti-rattle spring as shown in **Figure 10**.
12. Install the inboard pad (**Figure 11**) and partially install the pins through that pad.
13. Install the outboard pad (**Figure 12**).
14. Push the pins (**Figure 13**) all the way through.
15. Install the pad pin retainer onto the ends of the pins. Push the pin retainer down and make sure it seats completely on the groove in each pin.

16. Install the pad pin retaining bolt (**Figure 8**).

17A. On Magna models, perform the following:

a. Lubricate the caliper pivot bolt and pivot boot on the caliper bracket with silicone grease.

b. Install the caliper pivot bolt into the pivot boot on the caliper bracket and push the caliper assembly on all the way.

c. Carefully install the caliper assembly onto the disc. Be careful not to damage the leading edge of the pads during installation.

d. Install the caliper mounting bolt.

17B. On Interceptor models, perform the following:

a. Carefully install the caliper assembly onto the disc. Be careful not to damage the leading edge of the pads during installation.

b. Install the caliper mounting bolts.

18. Tighten all caliper bolts to the torque specifications listed in **Table 2**.

19. Remove the spacer between the front brake lever and the hand grip.

20. Place wood blocks under the engine or frame so that the front wheel is off the ground. Spin the front wheel and activate the brake lever as many times as it takes to refill the cylinders in the caliper and correctly locate the pads.

WARNING

Use brake fluid marked DOT 4 from a sealed container. Other types may vaporize and cause brake failure. Always use the same brand name; do not intermix silicone based (DOT 5) brake fluid as it can cause brake component damage leading to brake system failure.

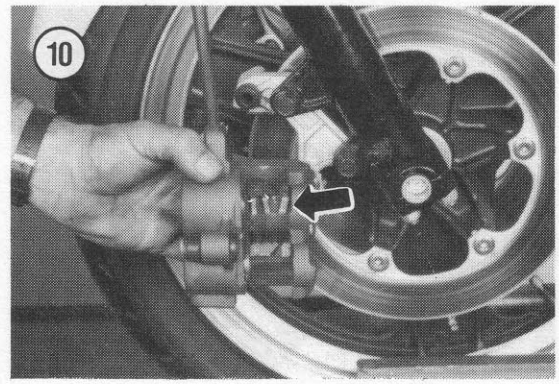
21. Refill the master cylinder reservoir, if necessary, to maintain the correct fluid level. Install the diaphragm and top cap.

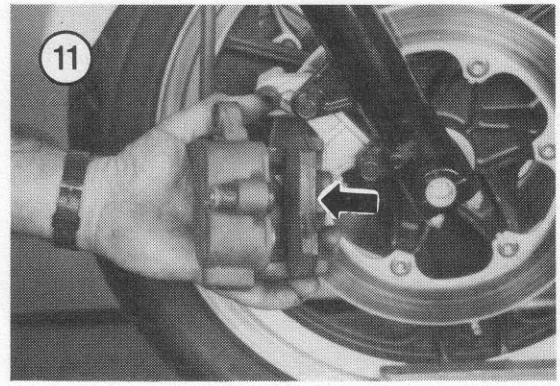
22. On dual-disc models only, after the caliper assemblies are installed and the brake pads correctly seated, the following inspection must be made on the *left-hand caliper only* to check the caliper bracket-to-disc clearance:

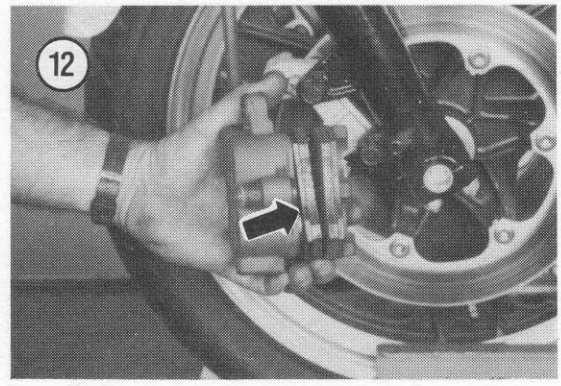
a. Measure the distance between each surface of both brake discs and their brake caliper bracket with a flat feeler gauge (**Figure 14**).

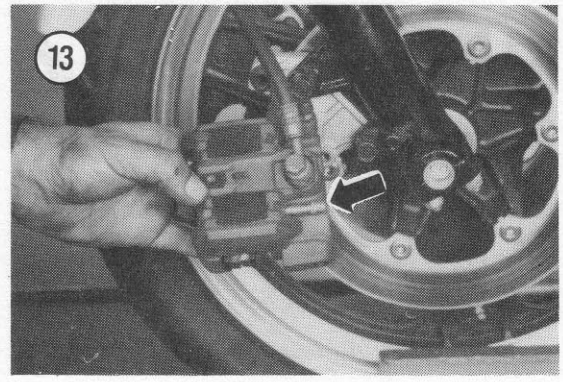
b. The clearance must be 0.70 mm (0.028 in.) or more on each side.

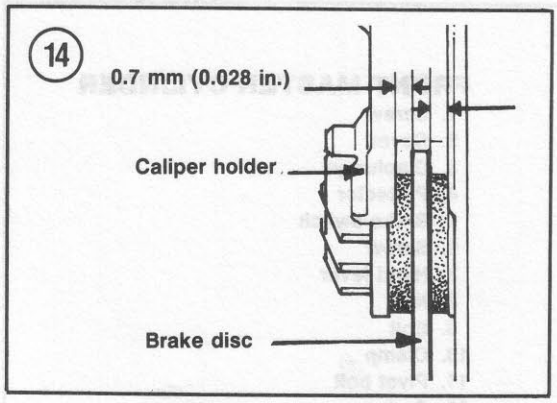
c. If the clearance is insufficient, loosen the nuts on the left-hand axle holder and move the left-hand fork leg in or out until the correct clearance is obtained.

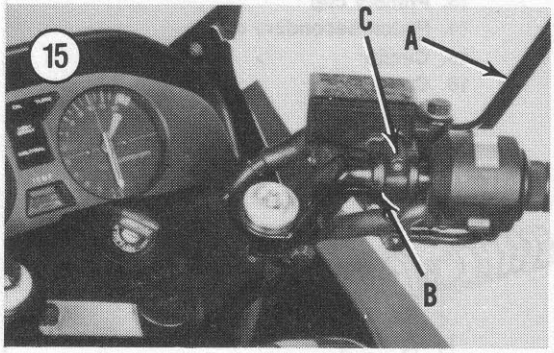


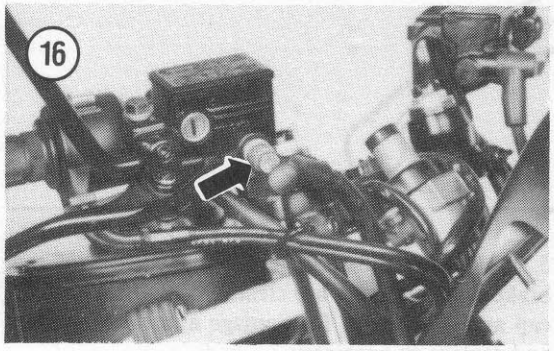












d. Tighten the axle holder's front nut first and then the rear to the torque specification listed in **Table 2.**

e. Recheck the clearance again. Readjust if necessary.

WARNING

Do not ride the motorcycle until you are sure the brakes are operating correctly with full hydraulic advantage. If necessary, bleed the brake as described in this chapter.

23. Bed the pads in gradually for the first 80 km (50 miles) by using only light pressure as much as possible. Immediate hard application will glaze the new friction pads and greatly reduce the effectiveness of the brake.

FRONT MASTER CYLINDER

Removal/Installation

1. Remove the rear view mirror (A, **Figure 15**) from the master cylinder.

CAUTION

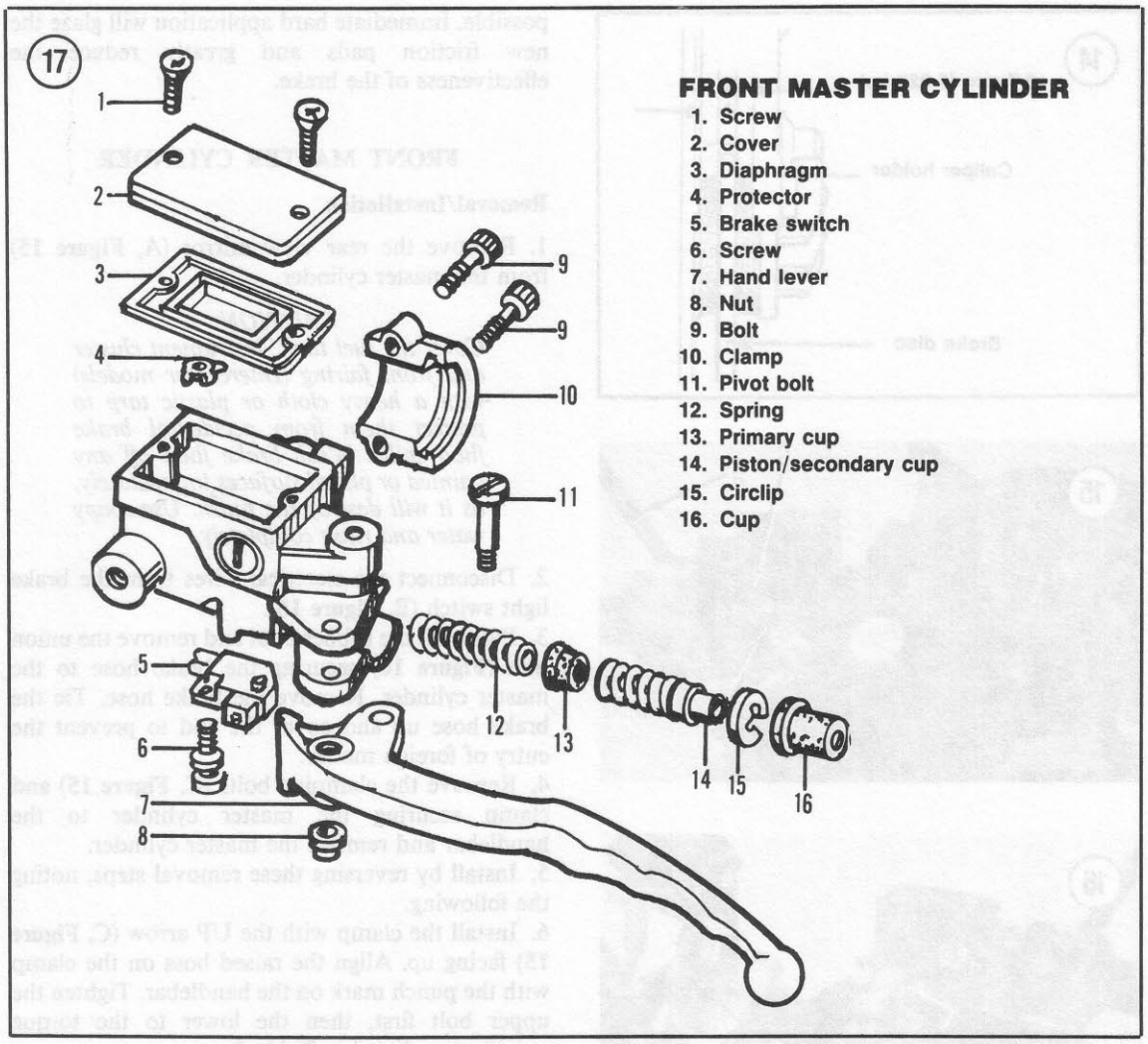
Cover the fuel tank, instrument cluster and front fairing (Interceptor models) with a heavy cloth or plastic tarp to protect them from accidental brake fluid spills. Wash brake fluid off any painted or plated surfaces immediately, as it will destroy the finish. Use soapy water and rinse completely.

2. Disconnect the electrical wires from the brake light switch (B, **Figure 15**).
3. Pull back the rubber boot and remove the union bolt (**Figure 16**) securing the brake hose to the master cylinder. Remove the brake hose. Tie the brake hose up and cover the end to prevent the entry of foreign matter.
4. Remove the clamping bolts (C, **Figure 15**) and clamp securing the master cylinder to the handlebar and remove the master cylinder.
5. Install by reversing these removal steps, noting the following.
6. Install the clamp with the UP arrow (C, **Figure 15**) facing up. Align the raised boss on the clamp with the punch mark on the handlebar. Tighten the upper bolt first, then the lower to the torque specification listed in **Table 2.**
7. Install the brake hose onto the master cylinder. Be sure to place a sealing washer on each side of the fitting and install the union bolt. Tighten the union bolt to the torque specifications listed in **Table 2.**
8. Install the rear view mirror.
9. Bleed the brake as described in this chapter.

Disassembly

Refer to **Figure 17** for this procedure.

1. Remove the master cylinder as described in this chapter.
2. Remove the bolt and nut securing the brake lever and remove the lever.
3. Remove the screws securing the cover and remove the cover and diaphragm; pour out the brake fluid and discard it. *Never reuse brake fluid.*
4. Remove the rubber boot from the area where the hand lever actuates the internal piston.



FRONT MASTER CYLINDER

1. Screw
2. Cover
3. Diaphragm
4. Protector
5. Brake switch
6. Screw
7. Hand lever
8. Nut
9. Bolt
10. Clamp
11. Pivot bolt
12. Spring
13. Primary cup
14. Piston/secondary cup
15. Circlip
16. Cup

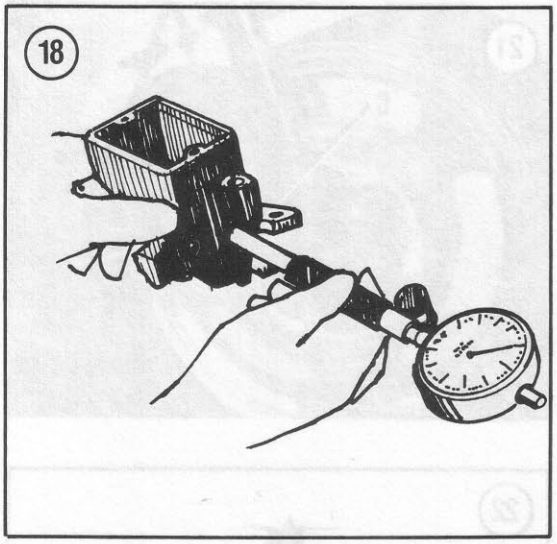
5. Using circlip pliers, remove the internal circlip from the body.
6. Remove the secondary cup and the piston assembly.
7. Remove the primary cup and spring.
8. Remove the brake light switch if necessary.

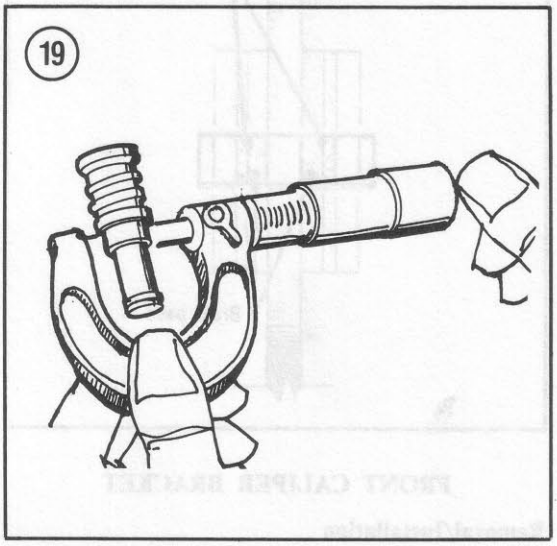
Inspection

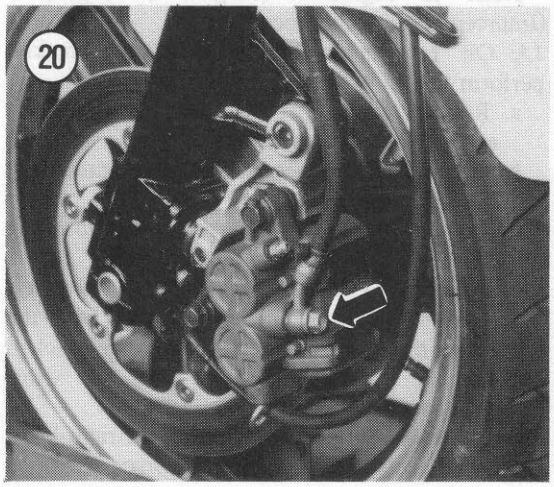
1. Clean all parts in denatured alcohol or fresh brake fluid. Inspect the cylinder bore and piston contact surfaces for signs of wear and damage. If either part is less than perfect, replace it.
2. Check the end of the piston for wear caused by the hand lever. Replace if worn.
3. Replace the piston if the secondary cup requires replacement.
4. Inspect the pivot hole in the hand lever. If worn or elongated it must be replaced.
5. Make sure the passages in the bottom of the brake fluid reservoir are clear. Check the reservoir cap and diaphragm for damage and deterioration and replace as necessary.
6. Inspect the threads in the bore for the brake line.
7. Check the hand lever pivot lugs on the master cylinder body for cracks.
8. Measure the cylinder bore (**Figure 18**). Replace the master cylinder if the bore exceeds the specifications given in **Table 1**.
9. Measure the outside diameter of the piston as shown in **Figure 19** with a micrometer. Replace the piston assembly if it is less than the specifications given in **Table 1**.

Assembly

1. Soak the new cups in fresh brake fluid for at least 15 minutes to make them pliable. Coat the







inside of the cylinder with fresh brake fluid before assembling parts.

CAUTION

When installing the piston assembly, do not allow the cups to turn inside out as they will be damaged and allow brake fluid leakage within the cylinder bore.

2. Install the spring, primary cup and piston assembly into the cylinder together. Install the spring with the tapered end facing toward the primary cup.

NOTE

Be sure to install the primary cup with the open end in first, toward the spring.

3. Install the circlip and slide in the rubber boot.
4. Install the diaphragm and cover. Do not tighten the cover screws at this time as fluid will have to be added later.
5. Install the brake lever onto the master cylinder body.
6. If removed, install the brake light switch.
7. Install the master cylinder as described in this chapter.

FRONT CALIPER

Removal

Refer to **Figure 2** (Magna) or **Figure 3** (Interceptor) for this procedure.

CAUTION

Do not spill any brake fluid on the painted portion of the front wheel or front fork slider. Wash off any spilled brake fluid immediately, as it will destroy the finish. Use soapy water and rinse completely.

1. Place a container under the brake line at the caliper. Remove the union bolt and sealing washers (**Figure 20**) securing the brake line to the caliper assembly.
2. Remove the brake line and let the brake fluid drain out into the container. Dispose of this brake fluid—never reuse brake fluid.
3. To prevent the entry of moisture and dirt, cap the end of the brake line and tie the loose end up to the forks.

4A. On Magna models, perform the following:

a. Remove the caliper mounting bolts (**Figure 5**).
b. Pivot the caliper assembly up and off of the disc.

c. Withdraw the caliper assembly from the pivot bolt boot on the caliper bracket and remove the caliper assembly.

4B. On Interceptor models, perform the following:

a. Remove the caliper mounting bolts securing the caliper to the caliper bracket. Refer to **Figure 6** for the right-hand side and **Figure 7** for the left-hand side.

b. Pivot the caliper assembly up and off the disc and remove the caliper assembly.

Installation

1A. On Magna models, perform the following:

a. Lubricate the caliper pivot bolt and pivot boot on the caliper bracket with silicone grease.

b. Install the caliper pivot bolt into the pivot boot on the caliper bracket and push the caliper assembly on all the way.

c. Carefully install the caliper assembly onto the disc. Be careful not to damage the leading edge of the pads during installation.

d. Install the caliper mounting bolt.

1B. On Interceptor models, perform the following:

a. Carefully install the caliper assembly onto the disc. Be careful not to damage the leading edges of the pads during installation.

b. Install the caliper mounting bolts.

2. Tighten all bolts to the torque specifications listed in **Table 2**.

3. Install the brake hose, with a sealing washer on each side of the fitting, onto the caliper. Install the union bolt and tighten to the torque specification listed in **Table 2**.

4. Bleed the brake as described in this chapter.

WARNING

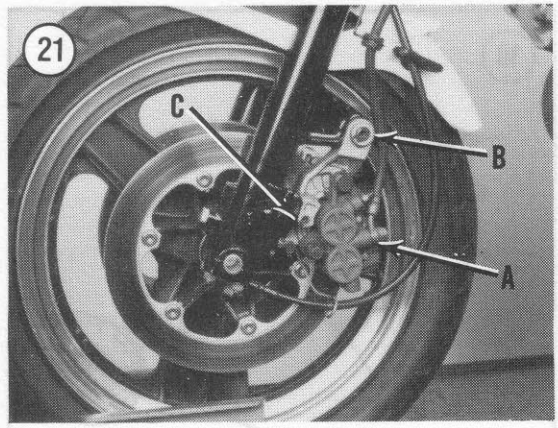
Do not ride the motorcycle until you are sure that the brakes are operating properly.

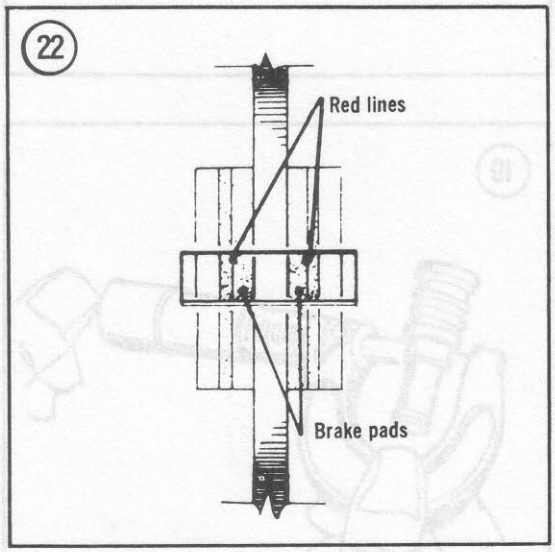
Rebuilding

If the caliper leaks, the caliper should be rebuilt. If the pistons stick in the cylinders, indicating severe wear or galling, the entire unit should be replaced. Rebuilding a leaky caliper requires special tools and experience.

Caliper service should be entrusted to a dealer, motorcycle repair shop or brake specialist. Considerable money can be saved by removing the caliper yourself and taking it in for repair.

All specifications for the caliper assembly are included in **Table 1**.





FRONT CALIPER BRACKET

Removal/Installation

Refer to **Figure 2** (Magna) or **Figure 3** (Interceptor) for this procedure.

1A. On Interceptor left-hand caliper bracket, perform the following:

a. Remove the caliper assembly (A, **Figure 21**) as described in this chapter.

b. Remove the caliper bracket upper mounting bolt (B, **Figure 21**).

c. Remove the caliper bracket lower mounting bolt (C, **Figure 21**).

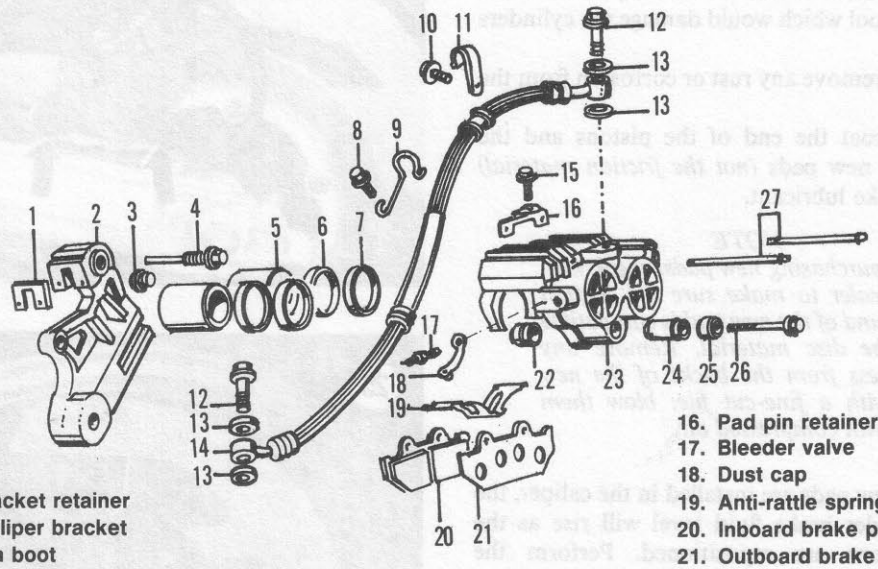
d. Remove the caliper bracket from the fork leg.

e. Remove the sleeve and O-ring seals from the upper mounting bolt receptacle in the bracket.

f. Inspect the sleeve and O-rings for wear. Replace if necessary.

1B. On Magna models and Interceptor right-hand caliper brackets, perform the following:

(23) **REAR CALIPER (INTERCEPTOR)**



1. Bracket retainer
2. Caliper bracket
3. Pin boot
4. Pivot bolt
5. Piston
6. Piston seal
7. Dust seal
8. Bolt
9. Speedometer cable holder
10. Bolt
11. Clip
12. Union bolt
13. Sealing washer
14. Brake hose
15. Bolt
16. Pad pin retainer
17. Bleeder valve
18. Dust cap
19. Anti-rattle spring
20. Inboard brake pad
21. Outboard brake pad
22. Pin boot
23. Caliper body
24. Sleeve
25. Pin boot
26. Bolt
27. Pad pin

a. Remove the caliper assembly as described in this chapter.
b. Remove the bolts securing the bracket to the fork leg and remove the bracket.

3. Install by reversing these removal steps, noting the following.
4. Tighten the bolts to the torque specification listed in **Table 2**.

REAR DISC BRAKE

The rear disc brake is actuated by hydraulic fluid and is controlled by the foot-operated pedal that is linked to the master cylinder. As the brake pads wear, the brake fluid level drops in the reservoir and automatically adjusts for wear.

REAR BRAKE PAD REPLACEMENT

There is no recommended mileage interval for changing the friction pads in the disc brake. Pad wear depends greatly on riding habits and conditions. The pads should be checked for wear every 6,400 km (4,000 miles) and replaced when the wear indicator reaches the edge of the brake disc. To maintain an even brake pressure on the disc always replace both pads in the caliper at the same time.

CAUTION

*Watch the pads more closely when the wear line approaches the disc (**Figure 22**). On some pads the wear line is very close to the metal backing plate. If pad wear happens to be uneven for some reason the backing plate may come in contact with the disc and cause damage.*

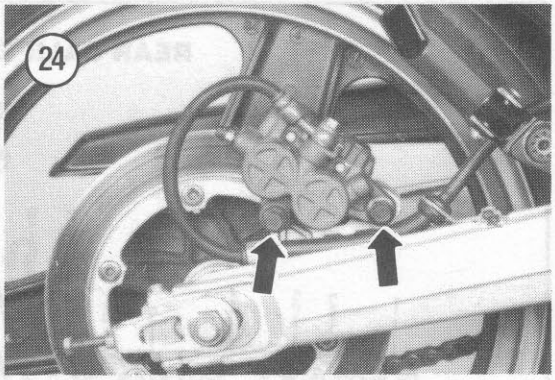
Refer to **Figure 23** for this procedure.
1. Remove the right-hand muffler as described in Chapter Six.
2. Remove the caliper mounting bolts (**Figure 24**) securing the caliper assembly to the caliper bracket.
3. Loosen the bolt (**Figure 25**) securing the pin retainer to the caliper assembly.
4. Pivot the caliper assembly up and off the disc.
5. Withdraw the caliper assembly from the pivot bolt boot on the caliper bracket and remove the caliper assembly.
6. Remove the bolt (**Figure 25**) securing the pin retainer to the caliper assembly and remove the pin retainer.

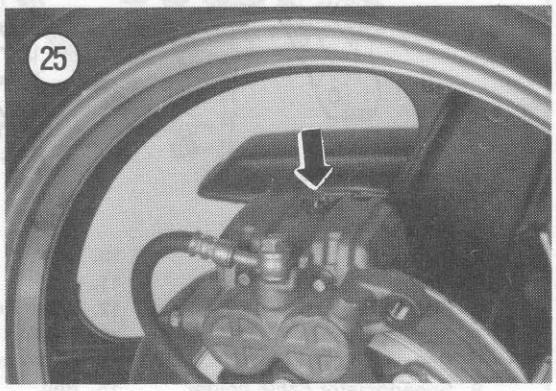
7. Remove both pad pins and both brake pads.
8. Clean the pad recess and the end of the pistons with a soft brush. Do not use solvent, a wire brush or any hard tool which would damage the cylinders or pistons.
9. Carefully remove any rust or corrosion from the disc.
10. Lightly coat the end of the pistons and the backs of the new pads *(not the friction material)* with disc brake lubricant.

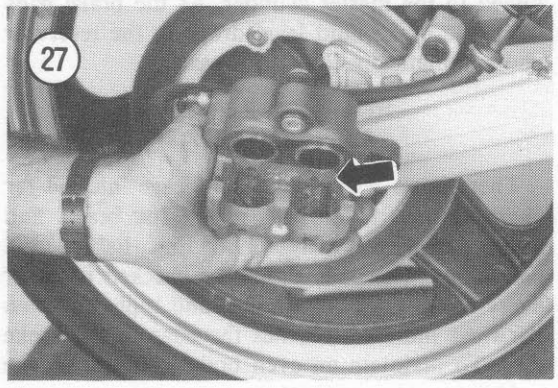
NOTE

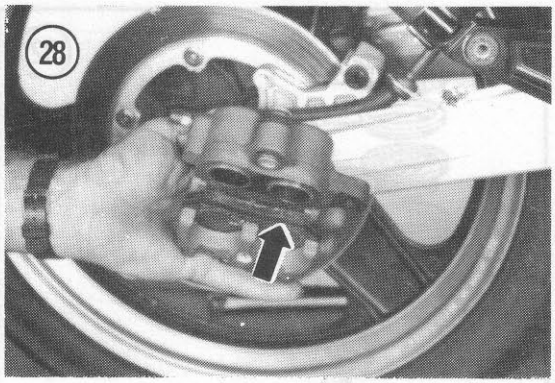
When purchasing new pads, check with your dealer to make sure the friction compound of the new pad is compatible with the disc material. Remove any roughness from the backs of the new pads with a fine-cut file; blow them clean with compressed air.

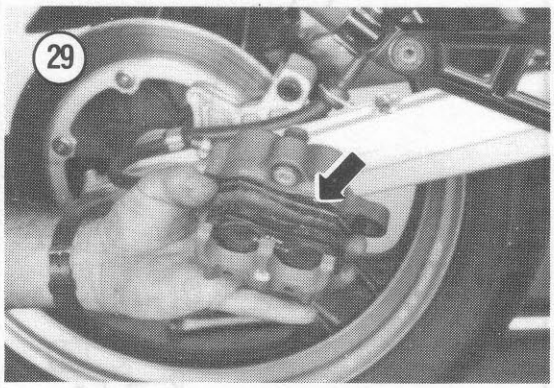
11. When new pads are installed in the caliper, the master cylinder brake fluid level will rise as the caliper pistons are repositioned. Perform the following:
    a. Clean the top of the master cylinder reservoir of all dirt and foreign matter.
    b. Unscrew the cap (**Figure 26**) and remove the diaphragm from the reservoir. Slowly push the caliper pistons into the caliper. Constantly check the reservoir to make sure brake fluid does not overflow.
    c. Remove fluid, if necessary, before it overflows.
    d. The pistons should move freely. If they don't, and there is evidence of them sticking in the cylinder, the caliper should be removed and serviced as described under *Rear Caliper Rebuilding* in this chapter.
12. Push the caliper pistons in all the way to allow room for the new pads.
13. Install the anti-rattle spring as shown in **Figure 27**.
14. Install the inboard pad (**Figure 28**) and partially install the pins through that pad.
15. Install the outboard pad (**Figure 29**).
16. Push the pins all the way through (**Figure 30**).
17. Install the pad pin retainer onto the ends of the pins. Push the pin retainer down and make sure it seats completely on the groove in each pin.
18. Install the pad pin retaining bolt (**Figure 25**).
19. Make sure the retaining clip (**Figure 31**) is installed on the caliper bracket.
20. Inspect the pivot boot in the caliper bracket for wear or damage. Replace if necessary.
21. Lubricate the caliper pivot bolt and pivot boot on the caliper bracket with silicone grease.

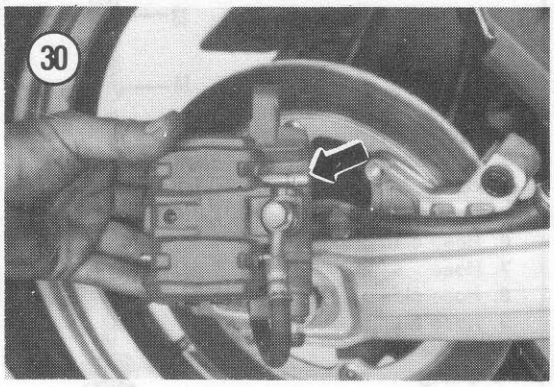


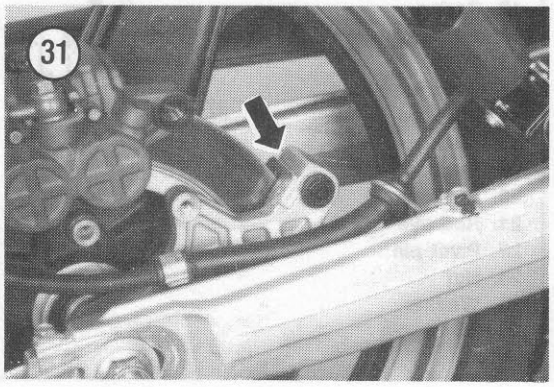












22. Install the pivot bolt into the pivot boot and push the caliper all the way onto the caliper bracket.
23. Carefully pivot the caliper assembly down onto the disc. Be careful not to damage the leading edge of the pads during installation.
24. Install the caliper mounting bolt and tighten to torque specifications listed in **Table 2**.
25. Place wood blocks under the engine or frame so that the rear wheel is off the ground. Spin the rear wheel and press the brake pedal as many times as it takes to refill the cylinder in the caliper and correctly locate the pads.
26. Refill the master cylinder reservoir, if necessary, to maintain the correct fluid level. Install the diaphragm and top cap.

WARNING

Use brake fluid marked DOT 4 from a sealed container. Other types may vaporize and cause brake failure. Always use the same brand name; do not intermix, as many brands are not compatible. Do not intermix silicone based (DOT 5) brake fluid as it can cause brake component damage leading to brake system failure.

WARNING

Do not ride the motorcycle until you are sure the brakes are operating correctly with full hydraulic advantage. If necessary, bleed the brake as described in this chapter.

27. Install the right-hand muffler as described in Chapter Six.
28. Bed the pads in gradually for the first 80 km (50 miles) by using only light pressure as much as possible. Immediate hard application will glaze the new friction pads and greatly reduce the effectiveness of the brake.

REAR MASTER CYLINDER

Removal/Installation

Refer to **Figure 32** for this procedure.
1. Remove the right-hand muffler as described in Chapter Six. It is not necessary to remove the muffler but this will prevent any accidental damage to it during this procedure.

CAUTION

Cover the surrounding area of the frame and the wheel with a heavy cloth or plastic tarp to protect them from accidental brake fluid spills. Wash brake fluid off any painted or plated surfaces immediately, as it will destroy

the finish. Use soapy water and rinse completely.

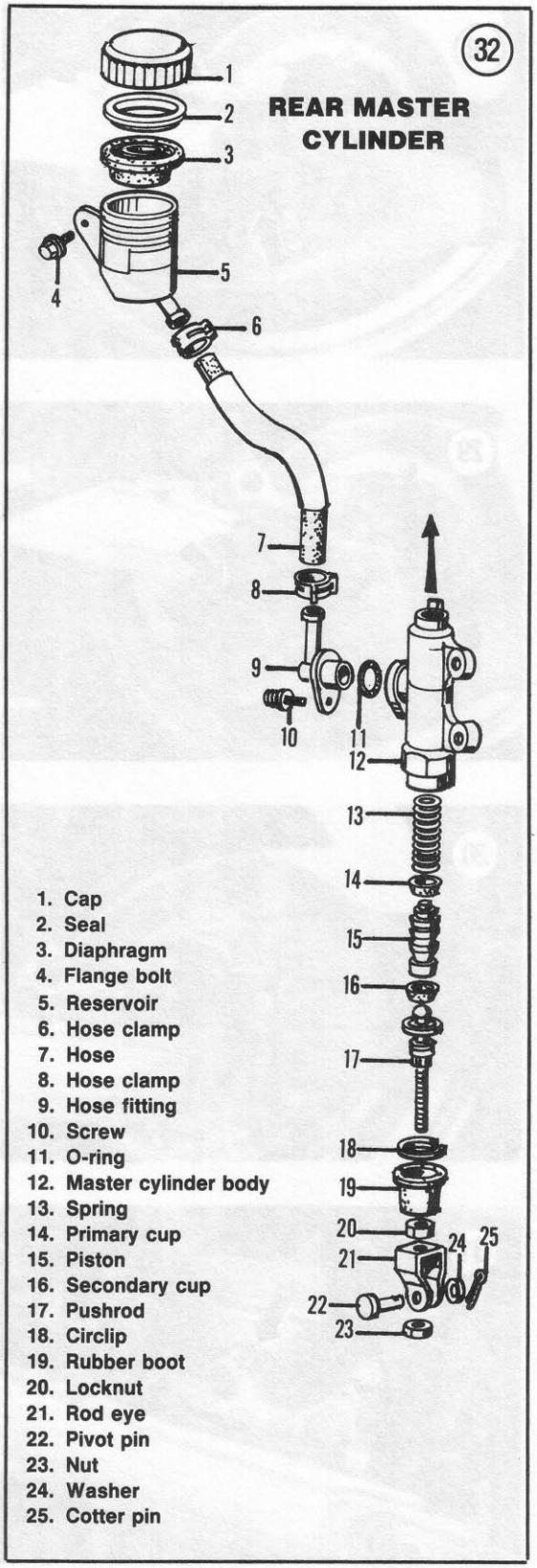
2. Place a container under the brake hose at the master cylinder.
3. Remove the union bolt and sealing washers (A, **Figure 33**) securing the brake hose to the top of the master cylinder.

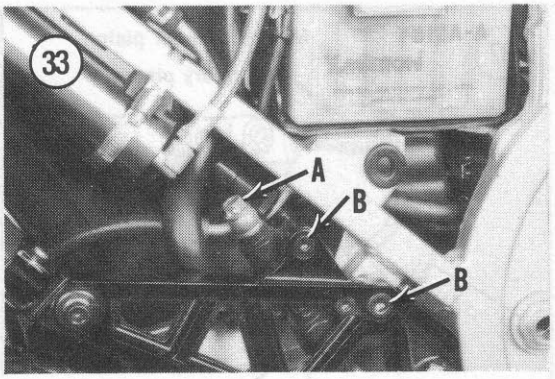
NOTE
Drain the brake fluid from the hose and discard it—never reuse brake fluid. Contaminated brake fluid may cause brake failure.

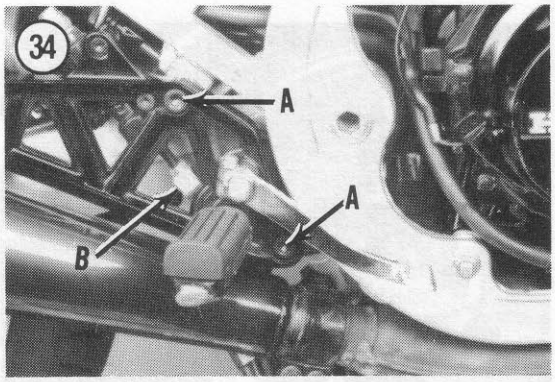
4. Cover the end of the brake hose to prevent the entry of foreign matter. Tie the loose end of the hose up to the frame.
5. Loosen, but do not remove, the Allen bolts (A, **Figure 34**) securing the passenger's right-hand footpeg bracket.
6. Remove the Allen bolts (B, **Figure 33**) securing the master cylinder to the passenger's right-hand footpeg bracket.
7. Squeeze the clamp (A, **Figure 35**) securing the brake fluid reservoir hose to the master cylinder. Move the clamp off of the reservoir fitting and remove the hose from the master cylinder.
8. Partially pull the master cylinder up and perform the following:
   a. Remove the cotter pin and washer from the pivot pin.
   b. Remove the pivot pin (B, **Figure 34**) securing the rod eye to the brake pedal.
9. Remove the master cylinder from the frame.
10. To remove the master cylinder reservoir, perform the following:
   a. Remove the flange bolt (B, **Figure 35**) securing the master cylinder reservoir to the frame.
   b. Remove the reservoir and the hose assembly.
11. Install by reversing these removal steps, noting the following.
12. Install a new cotter pin on the joint pin and bend the ends over completely.
13. Be sure to install a sealing washer on each side of the brake hose fitting and install the union bolt into the top of the master cylinder. Tighten the union bolt to the torque specification listed in **Table 2**.
14. Fill the reservoir and bleed the brake as described in this chapter.

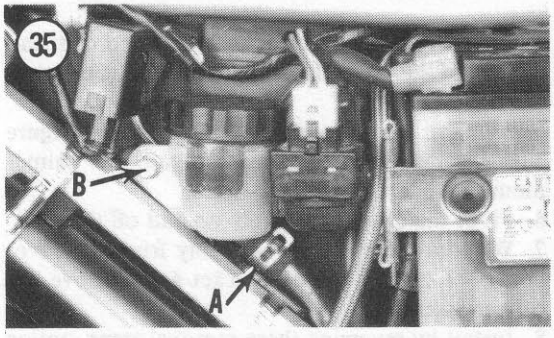
Disassembly

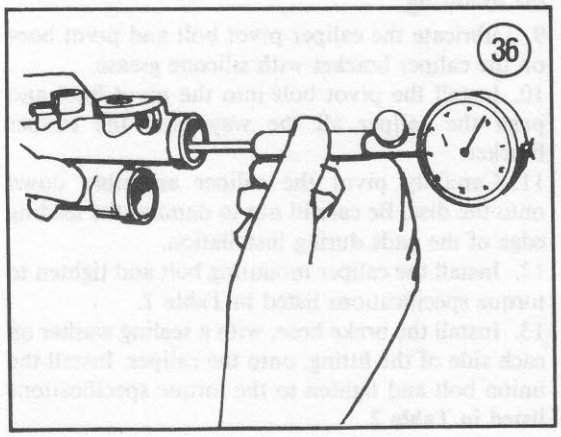
Refer to **Figure 32** for this procedure.
1. Remove the master cylinder as described in this chapter.











2. Place the master cylinder in a vise with soft jaws. Do not tighten the jaws too tight or the master cylinder may be distorted or damaged.
3. Slide the rubber boot off the base of the master cylinder. It is not necessary to remove the boot.

CAUTION

When the circlip is removed, the pushrod will be pushed out by the internal spring pressure. Protect yourself accordingly.

4. Using circlip pliers, remove the internal circlip from the body.
5. Remove the pushrod from the body.
6. Remove the secondary cup, piston, primary cup and spring.

NOTE

It may be necessary to apply a small amount of air pressure to the brake fluid outlet to remove the piston and primary cup. If necessary, apply the air in short spurts and catch the piston as is comes out.

7. To remove the hose fitting, perform the following:
   a. Remove the screw securing the hose fitting to the master cylinder.
   b. Remove the hose fitting and O-ring seal from the master cylinder body.

Inspection

1. Clean all parts in denatured alcohol or fresh brake fluid.
2. Apply compressed air to all openings in the master cylinder body to dry it thoroughly.
3. Inspect the cylinder bore and piston contact surfaces for signs of wear and damage. If either part is less than perfect, replace it.
4. Check the end of the piston for wear caused by the pushrod. Replace if worn.
5. Replace the piston if the primary cup requires replacement.
6. Make sure the passages in the bottom of the brake fluid reservoir are clear. Check the reservoir cap and diaphragm for damage and deterioration and replace as necessary.
7. Inspect the brake line threads in the body. If damaged, the master cylinder must be replaced.
8. Measure the cylinder bore (**Figure 36**). Replace the master cylinder if the bore exceeds the specifications given in **Table 1**.
9. Measure the outside diameter of the piston with a micrometer (**Figure 37**). Replace the piston

assembly if it is less than the specifications given in **Table 1**.

Assembly

1. Soak the new cups in fresh brake fluid for at least 15 minutes to make them pliable. Coat the inside of the cylinder with fresh brake fluid before the assembly of parts.

CAUTION

When installing the piston assembly, do not allow the cups to turn inside out as they will be damaged and allow brake fluid leakage within the cylinder bore.

2. Place the master cylinder in a vise with soft jaws. Do not tighten the jaws too tight or the master cylinder may be distorted or damaged.

NOTE

Be sure to install the primary cup with the open end in first, toward the spring.

3. Install the spring, primary cup, piston and secondary cup assembly into the cylinder together. Install the spring with the tapered end facing toward the primary cup.
4. Install the pushrod and press it into the body.
5. Install the circlip and slide on the rubber boot.
6. Install the master cylinder as described in this chapter.

REAR CALIPER

Removal/Installation

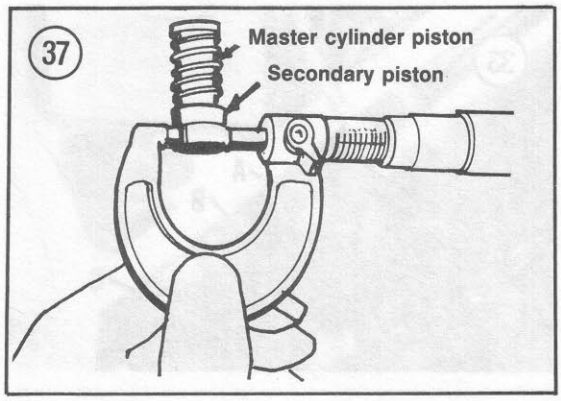
Refer to **Figure 23** for this procedure.

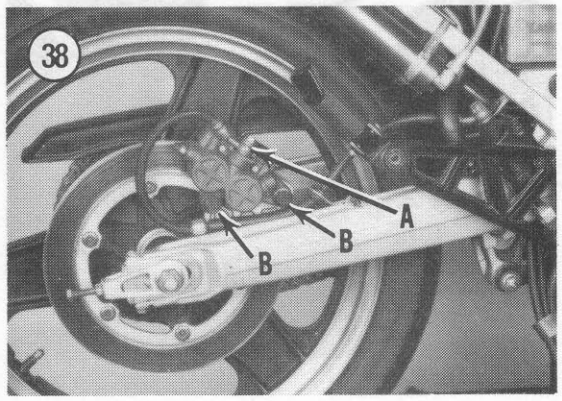
It is not necessary to remove the rear wheel in order to remove the caliper assembly. If the caliper mounting bracket is to be removed, then the rear wheel must be removed.

CAUTION

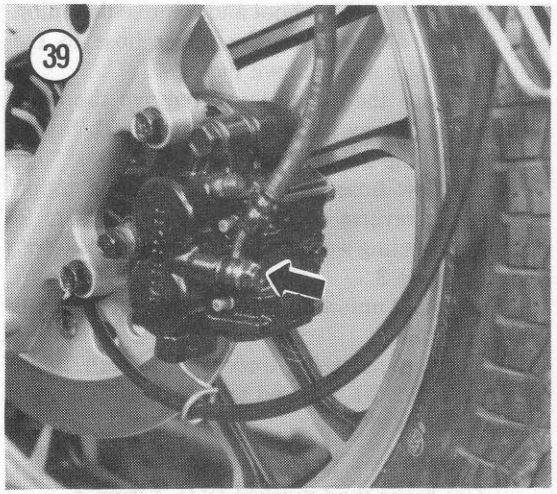
Do not spill any brake fluid on the painted portion of the rear wheel. Wash any spilled brake fluid immediately, as it will destroy the finish. Use soapy water and rinse completely.

1. Remove the right-hand muffler as described in Chapter Six.
2. Place a container under the brake line at the caliper. Remove the union bolt and sealing washers securing the brake line to the caliper assembly (A, **Figure 38**).
3. Remove the brake line and let the brake fluid drain out into the container. Dispose of this brake fluid—never reuse brake fluid.





4. To prevent the entry of moisture and dirt, cap the end of the brake line and tie the loose end up to the frame.
5. Remove the caliper mounting bolts (B, **Figure 38**) securing the caliper assembly to the caliper mounting bracket.
6. Pivot the caliper assembly up and off the disc.
7. Withdraw the caliper assembly from the pivot bolt boot on the caliper bracket and remove the caliper assembly.
8. Install by reversing these removal steps, noting the following.
9. Lubricate the caliper pivot bolt and pivot boot on the caliper bracket with silicone grease.
10. Install the pivot bolt into the pivot boot and push the caliper all the way onto the caliper bracket.
11. Carefully pivot the caliper assembly down onto the disc. Be careful not to damage the leading edge of the pads during installation.
12. Install the caliper mounting bolt and tighten to torque specifications listed in **Table 2**.
13. Install the brake hose, with a sealing washer on each side of the fitting, onto the caliper. Install the union bolt and tighten to the torque specifications listed in **Table 2**.



14. Fill the rear master cylinder and bleed the brake as described in this chapter.

WARNING

Do not ride the motorcycle until you are sure that the brakes are operating properly.

Rebuilding

If the caliper leaks, the caliper should be rebuilt. If the pistons stick in the cylinders, indicating severe wear or galling, the entire unit should be replaced. Rebuilding a leaky caliper requires special tools and experience.

Caliper service should be entrusted to a dealer, motorcycle repair shop or brake specialist. Considerable money can be saved by removing the caliper yourself and taking it in for repair.

Caliper Mounting Bracket Removal/Installation

1. Remove the rear caliper assembly as described in this chapter.
2. Remove the rear wheel as described in Chapter Ten.
3. Remove the caliper mounting bracket from the swing arm area.
4. Install by reversing these removal steps, noting the following.
5. Be sure to install the boss on the swing arm with the groove in the caliper mounting bracket while installing the rear wheel.

BRAKE HOSE REPLACEMENT

There is no factory-recommended replacement interval but it is a good idea to replace all brake hoses every four years or when they show signs of cracking or damage.

For front brake hoses, refer to **Figure 2** (Magna) or **Figure 3** (Interceptor). Refer to **Figure 23** for the rear brake hose.

CAUTION

Cover the fuel tank, front wheel, front fender, front fairing (Interceptor models), rear wheel and rear portion of the frame with a heavy cloth or plastic tarp to protect it from accidental spilling of brake fluid. Wash brake fluid off of any painted or plated surface immediately, as it will destroy the finish. Use soapy water and rinse completely.

Front Hose (Magna) Removal/Installation

1. Remove the fuse holder as described in Chapter Seven.
2. Place a container under the brake line at the caliper.
3. Remove the union bolt and sealing washer (**Figure 39**) securing the brake line to the caliper assembly.
4. Remove brake line from the clip on the fork leg.
5. Remove the brake line and let the brake fluid drain out into the container.
6. To prevent the entry of moisture and dirt, cap the end of the brake line.

WARNING

Dispose of this brake fluid—never reuse brake fluid. Contaminated brake fluid can cause brake failure.

7. Remove the union bolt securing the hose to the master cylinder.
8. Carefully withdraw the brake hose from the steering stem area and remove the hose.
9. Install the new hose, sealing washers and union bolts in the reverse order of removal. Be sure to install new sealing washers in the correct positions; refer to **Figure 2**.
10. Tighten all union bolts to torque specifications listed in **Table 2**.
11. Refill the master cylinder with fresh brake fluid marked DOT 4. Bleed the brake as described in this chapter.

WARNING

Use brake fluid marked DOT 4 from a sealed container. Other types may vaporize and cause brake failure. Always use the same brand name; do not intermix as many brands are not compatible. Do not intermix silicone based (DOT 5) brake fluid as it can cause brake component damage leading to brake system failure.

WARNING

Do not ride the motorcycle until you are sure that the brakes are operating properly.

12. Install the fuse holder as described in Chapter Seven.

Front Hoses and 3-Way Joint (Interceptor) Removal/Installation

1. Remove the front fairing as as described in Chapter Twelve.
2. Remove the fuse holder as described in Chapter Seven.
3. Perform the following on the left-hand caliper assembly:
   a. Place a container under the brake line at the caliper.
   b. Remove the union bolt and sealing washer (**Figure 40**) securing the brake line to the left-hand caliper assembly.
   c. Remove brake line from the clip on the fork leg.
   d. Remove the brake line and let the brake fluid drain out into the container.
   e. To prevent the entry of moisture and dirt, cap the end of the brake line.

WARNING

Dispose of this brake fluid—never reuse brake fluid. Contaminated brake fluid can cause brake failure.

4. Repeat Step 3 for the right-hand caliper assembly.
5. Remove the union bolt (A, **Figure 41**) securing the left-hand brake hose to the 3-way joint.
6. Remove the union bolt (B, **Figure 41**) securing the right-hand lower hose and upper hose to the fitting on the 3-way joint and remove them.
7. Pull back the rubber boot and remove the union bolt (**Figure 42**) securing the upper hose to the master cylinder and remove the hose.
8. To remove the 3-way joint, remove the bolts securing the 3-way joint to the lower fork bridge and remove the 3-way joint.
9. Install new hoses, sealing washers and union bolts in the reverse order of removal. Be sure to install new sealing washers in the correct positions; refer to **Figure 3**.
10. Tighten all union bolts to torque specifications listed in **Table 2**.
11. Refill the master cylinder with fresh brake fluid marked DOT 4. Bleed the brake as described in this chapter.

WARNING

Use brake fluid marked DOT 4 from a sealed container. Other types may vaporize and cause brake failure. Always use the same brand name; do not intermix, as many brands are not compatible. Do not intermix silicone based (DOT 5) brake fluid as it can cause brake component damage leading to brake system failure.

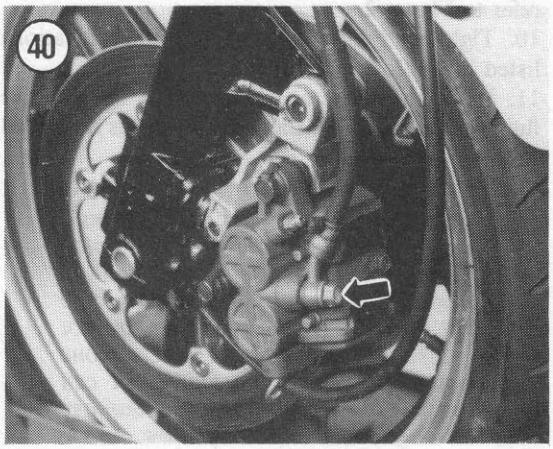
WARNING

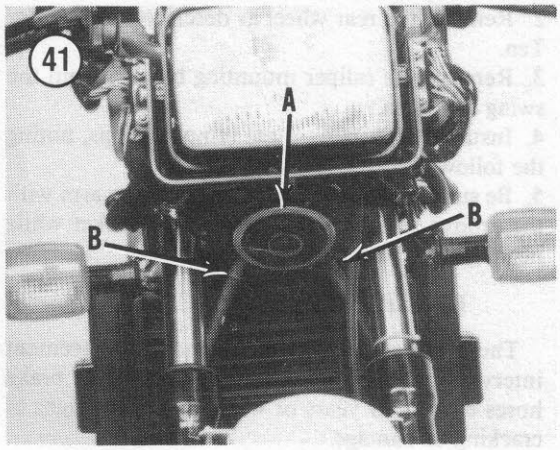
Do not ride the motorcycle until you are sure that the brakes are operating properly.

12. Install the headlight as described in Chapter Seven.
13. Install the front fairing as described in Chapter Twelve.

Rear Brake Hose Removal/Installation

1. Remove the right-hand muffler as described in Chapter Six.



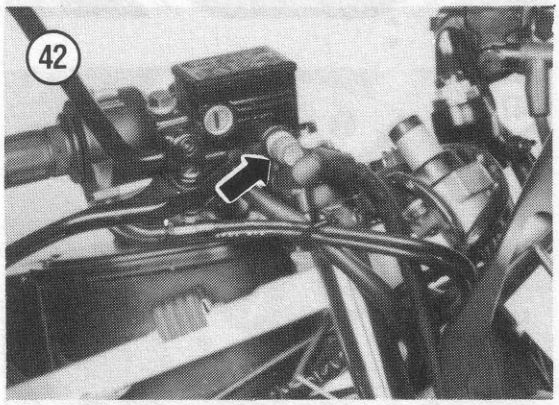


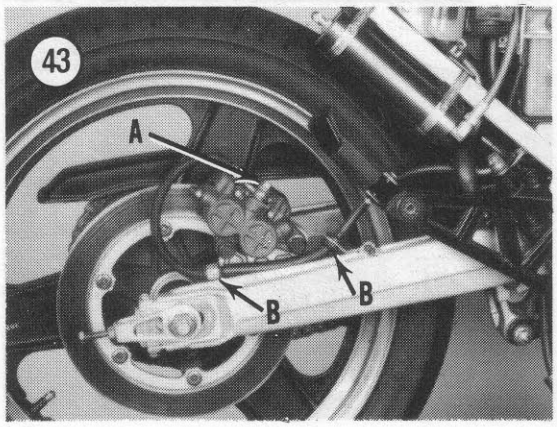
2. Place a container under the brake line at the caliper.
3. Remove the union bolt (A, **Figure 43**) and sealing washers securing the brake line to the caliper assembly.
4. Remove bolts and clips (B, **Figure 43**) securing the brake line to the swing arm.
5. Remove the brake line and let the brake fluid drain out into the container.
6. To prevent the entry of moisture and dirt, cap the union bolt hole in the caliper.

WARNING

Dispose of this brake fluid—never reuse brake fluid. Contaminated brake fluid can cause brake failure.

7. Remove the union bolt and sealing washers (**Figure 44**) securing the brake hose to the top of the master cylinder and remove the hose.
8. Install a new hose, sealing washers and the union bolts in the reverse order of removal. Be sure to install new sealing washers in the correct positions; refer to **Figure 23**.
9. Tighten all union bolts to torque specifications listed in **Table 2**.





10. Refill the master cylinder with fresh brake fluid marked DOT 4 only. Bleed the brake as described in this chapter.

WARNING

Use brake fluid marked DOT 4 from a sealed container. Other types may vaporize and cause brake failure. Always use the same brand name; do not intermix, as many brands are not compatible. Do not intermix silicone based (DOT 5) brake fluid as it can cause brake component damage leading to brake system failure.

WARNING

Do not ride the motorcycle until you are sure that the brakes are operating properly.

BRAKE DISC—FRONT AND REAR

Removal/Installation

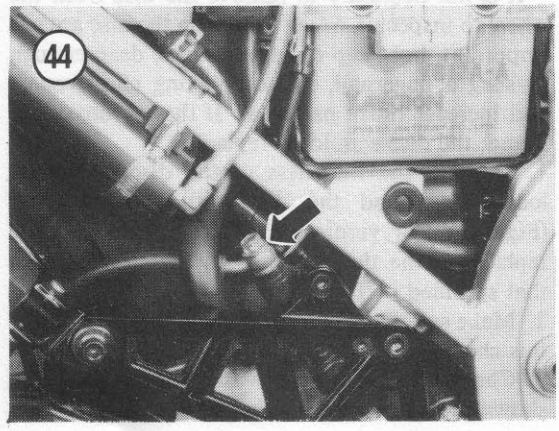
1. Remove the front or rear wheel as described in Chapter Nine or Chapter Ten.

NOTE

Place a piece of wood or vinyl tube in the caliper(s) in place of the disc(s). This way, if the brake lever is inadvertently squeezed or the brake pedal depressed, the pistons will not be forced out of the cylinders. If this does happen, the caliper might have to be disassembled to reseat the pistons and the system will have to be bled. By using the wood or vinyl tube, bleeding the system is not necessary when installing the wheel.

CAUTION

*Do not set the wheel down on the disc surface, as it may be scratched or warped. Set the tire sidewall on 2 blocks of wood (**Figure 45**).*



NOTE

On dual disc models, mark the brake discs with either an R (right-hand side) or L (left-hand side). The discs are not marked but it is a good practice to install the disc on the same side from which it was removed, especially on a high-mileage bike.

2A. On the front wheel of dual-disc models, perform the following:

a. Remove the Allen bolts (**Figure 46**) securing the right-hand and left-hand brake disc.
b. Remove the disc and the damper shims located between the disc and the wheel hub.

2B. On the front wheel of single-disc models, perform the following:

c. Remove the Allen bolts (**Figure 47**) securing the brake disc and remove the disc.

3. On the rear wheel, remove the Allen bolts (**Figure 48**) securing the disc to the wheel. Remove the brake disc.

4. Install by reversing these removal steps, noting the following.

NOTE

On dual-disc models, install the disc on the same side of the wheel from which it was removed, especially on a high-mileage bike.

5. On front wheel of dual-disc models, perform the following:

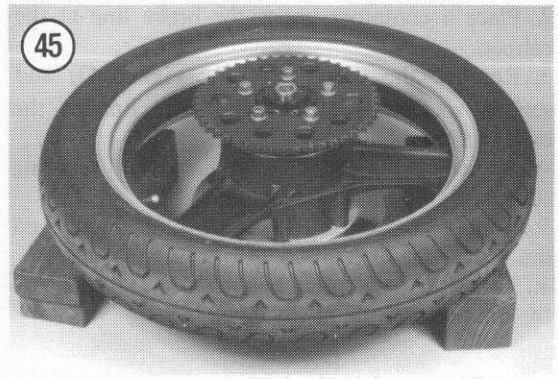
a. Install the damper shims onto the hub.
b. Install the brake disc and Allen bolts. Tighten the Allen bolts to the torque specification listed in **Table 2**.
c. Repeat for the other brake disc.

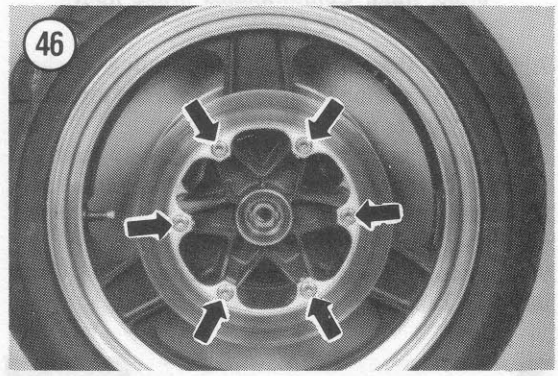
6. On the rear wheel, install the brake disc and the disc mounting Allen bolts. Tighten the bolts to the torque specification listed in **Table 2**.

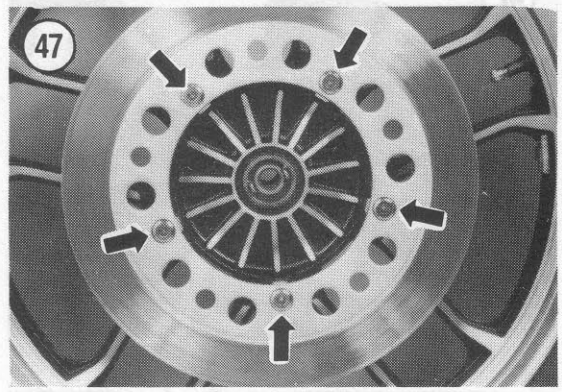
Inspection

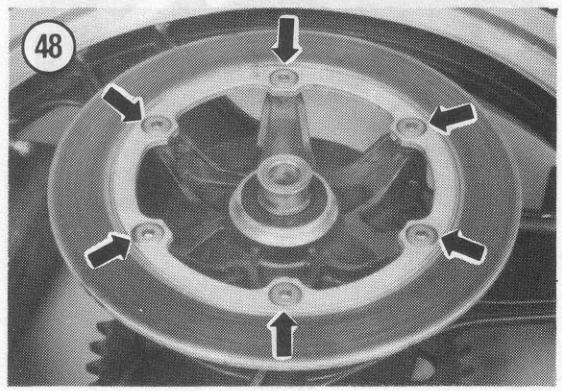
It is not necessary to remove the disc from the wheel to inspect it. Small marks on the disc are not important, but deep radial scratches, deep enough to snag a fingernail, reduce braking effectiveness and increase brake pad wear. If these grooves are found, the disc should be replaced.

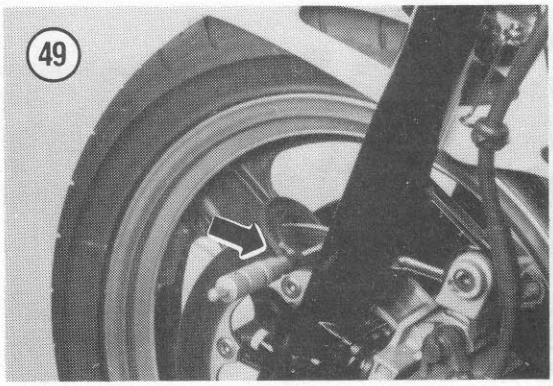
1. Measure the thickness of the disc at several locations around the disc with a micrometer (**Figure 49**) or vernier caliper. The disc must be replaced if the thickness in any area is less than that specified in **Table 1**.
2. Make sure the disc bolts are tight before running this check.
3. Check the disc runout with a dial indicator as shown in **Figure 50**.

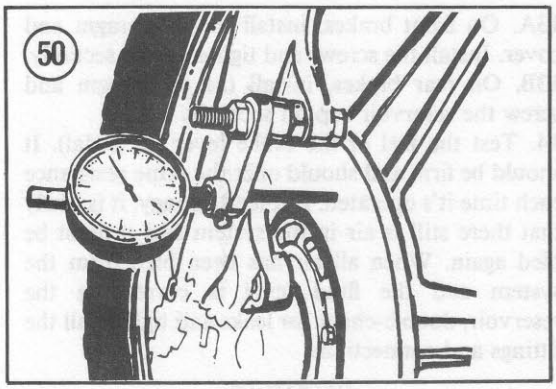


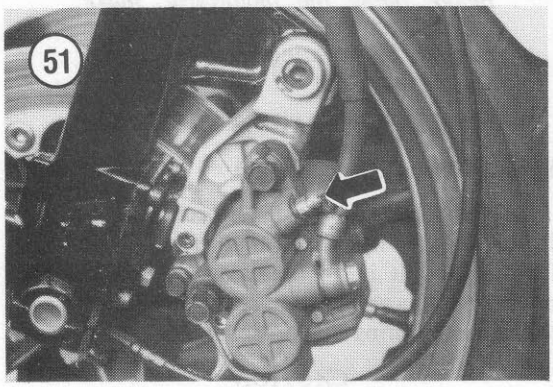


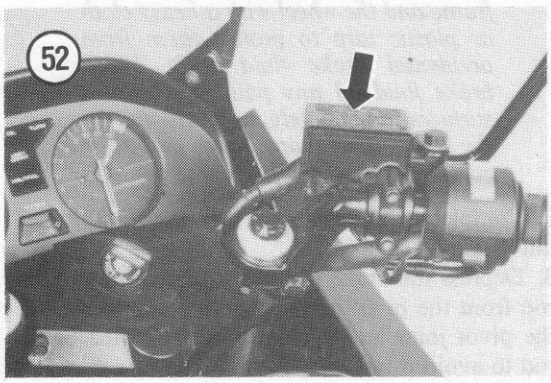












4. Slowly rotate the wheel and watch the dial indicator. On all models, if the runout exceeds that listed in **Table 1** the disc(s) must be replaced.
5. Clean the disc of any rust or corrosion and wipe clean with lacquer thinner. Never use an oil based solvent that may leave an oil residue on the disc.

BLEEDING THE SYSTEM

This procedure is not necessary unless the brakes feel spongy, there has been a leak in the system, a component has been replaced or the brake fluid has been replaced.

When bleeding the front brakes on dual-disc models, bleed one caliper at a time.

1. Remove the dust cap from the brake bleed valve (**Figure 51**).
2. Connect a length of clear tubing to the bleed valve on the caliper.
3. Place the other end of the tube into a clean container. Fill the container with enough fresh brake fluid to keep the end submerged. The tube should be long enough so that a loop can be made higher than the bleed valve to prevent air from being drawn into the caliper during bleeding.

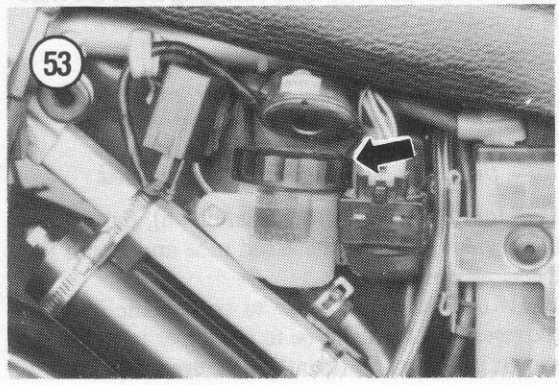
CAUTION

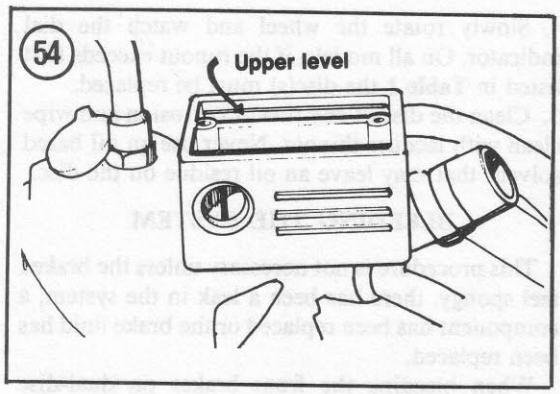
Cover the fuel tank, frame, wheels and front fairing (Interceptor models) with a heavy cloth or plastic tarp to protect it from the accidental spilling of brake fluid. Wash brake fluid off of any painted or plated surface immediately, as it will destroy the finish. Use soapy water and rinse completely.

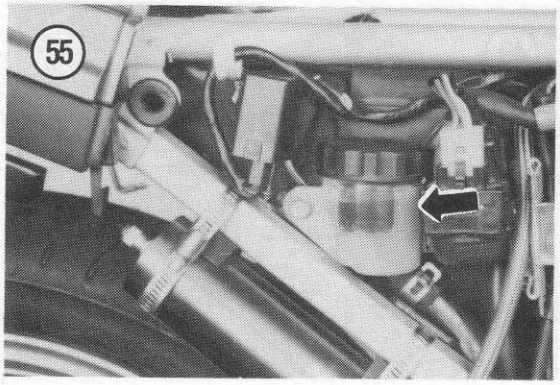
4. Clean the top of the master cylinder of all dirt and foreign matter.

5A. On the front brakes, remove the screws securing the top cap (**Figure 52**) and remove the cap and diaphragm.

5B. On the rear brake, unscrew the reservoir cap and remove the cap (**Figure 53**) and diaphragm.







6. Fill the reservoir almost to the top lip; insert the diaphragm and the cap loosely. Leave the cap in place during this procedure to prevent brake fluid from squirting out of the reservoir and prevent the entry of dirt.

WARNING

Use brake fluid marked DOT 4 only. Others may vaporize and cause brake failure. Always use the same brand name; do not intermix, as many brands are not compatible. Do not intermix silicone based (DOT 5) brake fluid as it can cause brake component damage leading to brake system failure.

7. Slowly apply the brake lever (or pedal) several times. Hold the lever (or pedal) in the applied position.
8. Open the bleed valve about one-half turn. Allow the lever (or pedal) to travel to its limit. When this limit is reached, tighten the bleed screw.
9. Occasionally tap the caliper assembly to loosen any trapped air bubbles that won't come up the normal way. As the fluid enters the system, the level will drop in the reservoir. Maintain the level at about 3/8 inch from the top of the reservoir to prevent air from being drawn into the system.
10. Continue to pump the lever (or pedal) and fill the reservoir until the fluid emerging from the hose is completely free of bubbles.

NOTE

Do not allow the reservoir to empty during the bleeding operation or more air will enter the system. If this occurs, the entire procedure must be repeated.

11. Hold the lever in (or pedal down), tighten the bleed valve, remove the bleed tube and install the bleed valve dust cap.
12. If necessary, add fluid to correct the level in the reservoir. It should be to the upper level line as shown in **Figure 54** (front) or **Figure 55** (rear).

13A. On front brakes, install the diaphragm and cover. Install the screws and tighten them securely.
13B. On rear brakes, install the diaphragm and screw the reservoir cap on securely.
14. Test the feel of the brake lever (or pedal). It should be firm and should offer the same resistance each time it's operated. If it feels spongy, it is likely that there still is air in the system and it must be bled again. When all air has been bled from the system and the fluid level is correct in the reservoir, double-check for leaks and tighten all the fittings and connections.

WARNING

Before riding the motorcycle, make certain that the brakes are operating correctly by operating the lever or pedal several times.

REAR BRAKE PEDAL

Removal/Installation (Magna)

Refer to **Figure 56** for this procedure.
1. Remove the right-hand muffler as described in Chapter Six. It is not necessary to remove the muffler but this will prevent any accidental damage to the finish during this procedure.

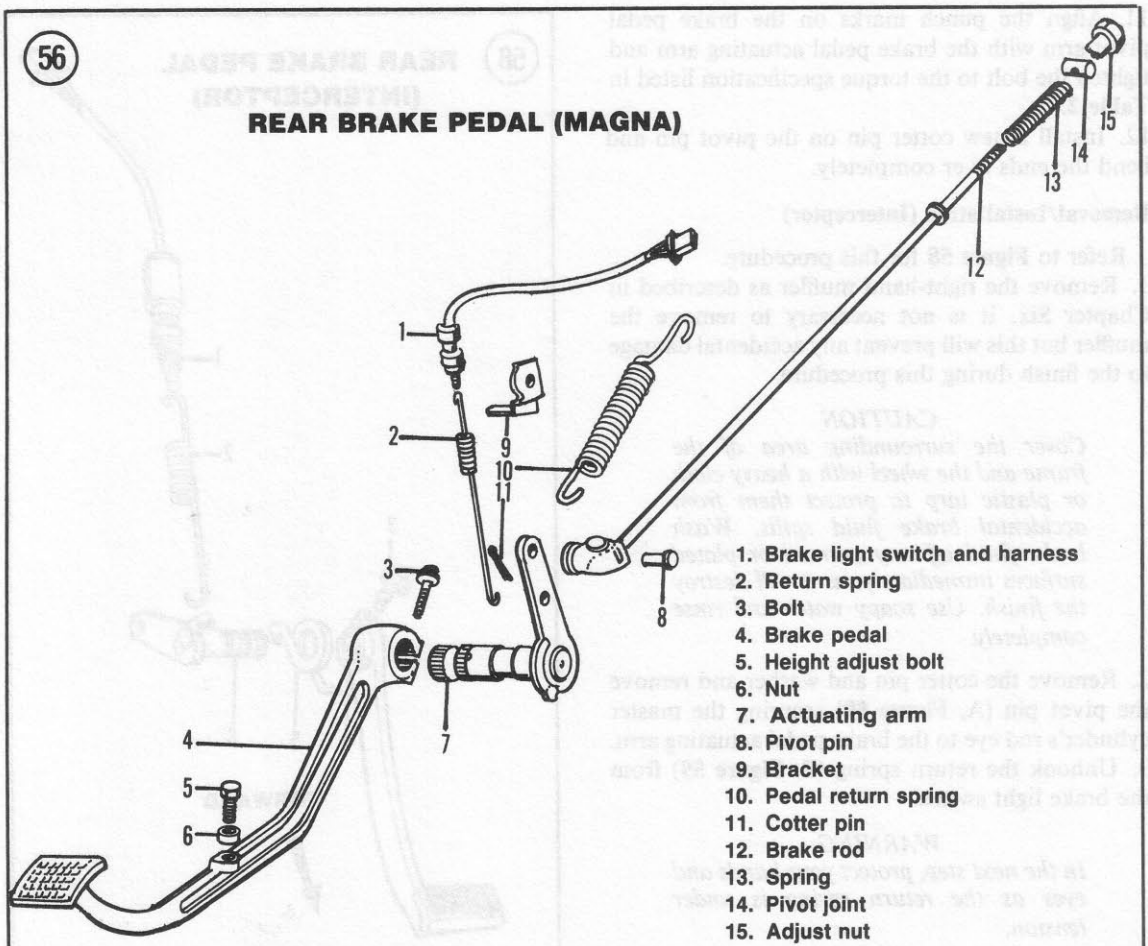
CAUTION

Cover the surrounding area of the frame and the wheel with a heavy cloth or plastic tarp to protect them from accidental brake fluid spills. Wash brake fluid off any painted or plated surfaces immediately, as it will destroy the finish. Use soapy water and rinse completely.

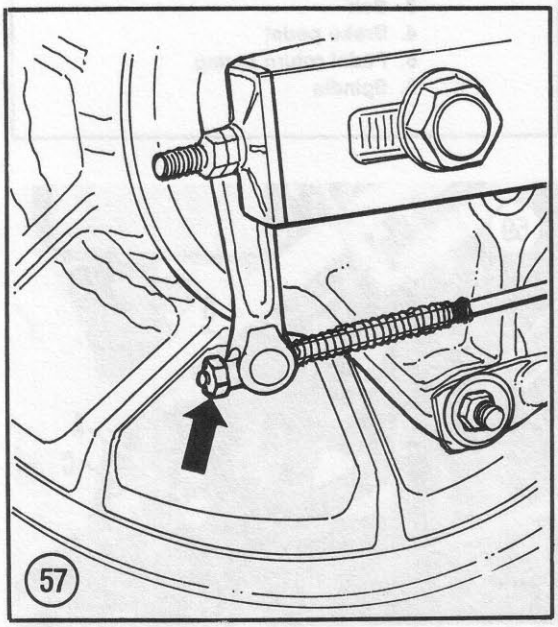
2. Completely unscrew the rear brake adjusting nut (**Figure 57**).
3. Depress the brake pedal and remove the brake rod from the pivot joint in the brake arm. Install the pivot joint and adjusting nut onto the brake rod to avoid misplacing them.

56

REAR BRAKE PEDAL (MAGNA)



1. Brake light switch and harness
2. Return spring
3. Bolt
4. Brake pedal
5. Height adjust bolt
6. Nut
7. Actuating arm
8. Pivot pin
9. Bracket
10. Pedal return spring
11. Cotter pin
12. Brake rod
13. Spring
14. Pivot joint
15. Adjust nut



4. Remove the cotter pin and remove the pivot pin securing the brake rod to the brake pedal actuating arm.
5. Unhook the return spring from the brake light switch.

WARNING

In the next step, protect your hands and eyes as the return spring is under tension.

6. Using a pair of Vise Grip pliers, unhook the brake pedal return spring from the hole in the brake pedal actuating arm.
7. Remove the clamping bolt from the brake pedal and remove the brake pedal.
8. Remove the brake pedal actuating arm from the frame.
9. Install by reversing these removal steps, noting the following.
10. Apply a light coat of multi-purpose grease to all pivot areas before installing any components.

11. Align the punch marks on the brake pedal pivot arm with the brake pedal actuating arm and tighten the bolt to the torque specification listed in **Table 2.**
12. Install a new cotter pin on the pivot pin and bend the ends over completely.

Removal/Installation (Interceptor)

Refer to **Figure 58** for this procedure.
1. Remove the right-hand muffler as described in Chapter Six. It is not necessary to remove the muffler but this will prevent any accidental damage to the finish during this procedure.

CAUTION

Cover the surrounding area of the frame and the wheel with a heavy cloth or plastic tarp to protect them from accidental brake fluid spills. Wash brake fluid off any painted or plated surfaces immediately, as it will destroy the finish. Use soapy water and rinse completely.

2. Remove the cotter pin and washer and remove the pivot pin (A, **Figure 59**) securing the master cylinder's rod eye to the brake pedal actuating arm.
3. Unhook the return spring (B, **Figure 59**) from the brake light switch.

WARNING

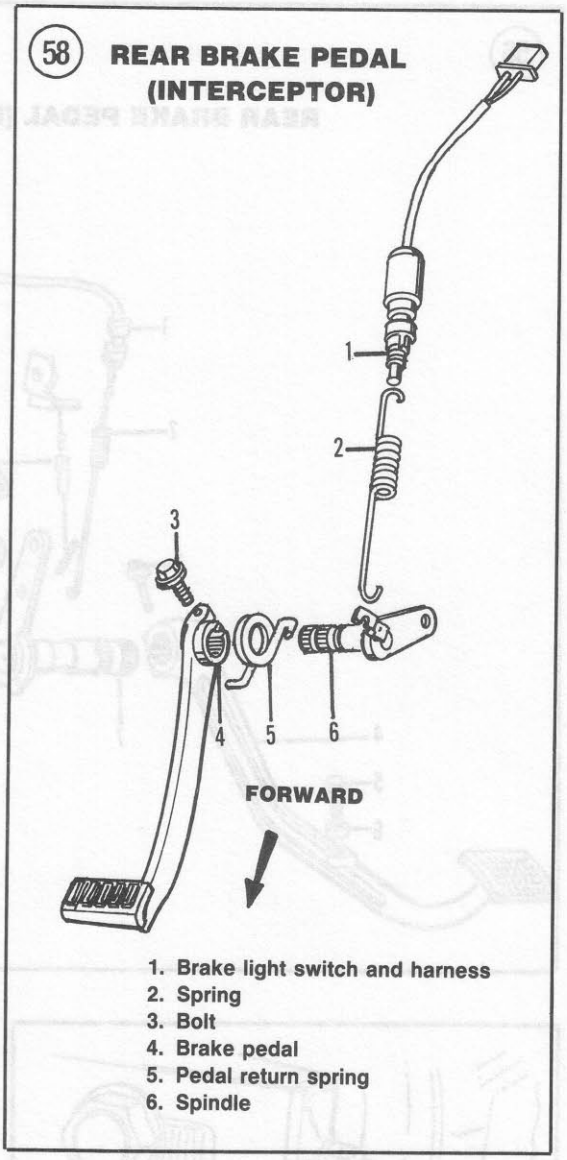
In the next step, protect your hands and eyes as the return spring is under tension.

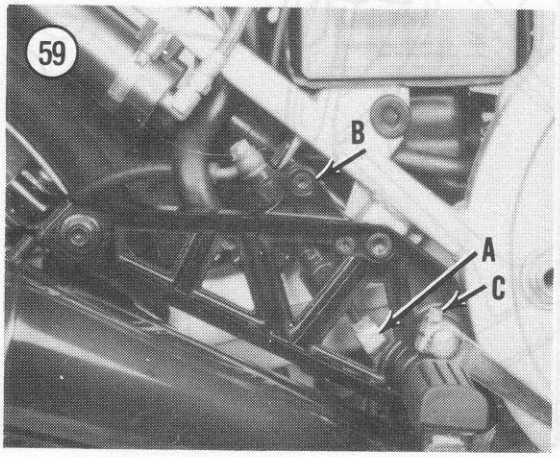
4. Using a pair of Vise Grip pliers, unhook the brake pedal return spring from the locating tab on the frame.
5. Remove the clamping bolt from the brake pedal (C, **Figure 59**) and remove the brake pedal.
6. Remove the brake pedal actuating arm from the frame.
7. Install by reversing these removal steps, noting the following.
8. Apply a light coat of multi-purpose grease to all pivot areas before installing any components.
9. Align the punch marks on the brake pedal pivot arm to the brake pedal actuating arm and tighten the bolt to the torque specification listed in **Table 2.**

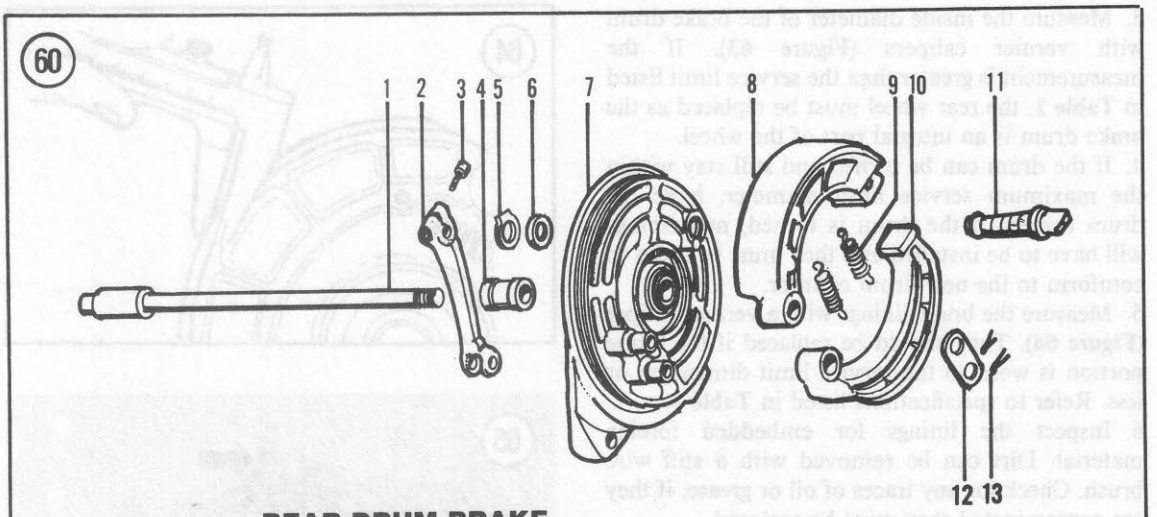
REAR DRUM BRAKE

Pushing down on the brake pedal pulls the rod, which in turn rotates the camshaft. This forces the brake shoes out into contact with the brake drum.

Pedal free play must be maintained to minimize brake drag and premature brake wear and

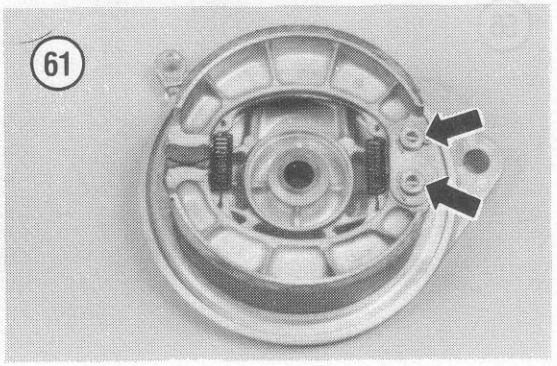


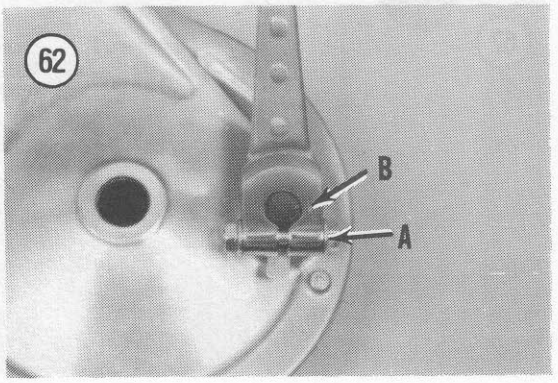




REAR DRUM BRAKE

1. Rear axle
2. Brake arm
3. Screw
4. Spacer
5. Wear indicator
6. Dust seal
7. Backing plate
8. Brake shoe
9. Return springs
10. Brake shoe
11. Camshaft
12. Anchor pin washer
13. Cotter pin





maximize braking effectiveness. Refer to Chapter Three for complete brake adjustment procedures.

Disassembly

Refer to **Figure 60** for this procedure.

1. Remove the rear wheel as described in Chapter Ten.
2. Pull the brake assembly straight up and out of the brake drum.
3. Remove the cotter pins and anchor pin washer from the brake backing plate (**Figure 61**).
4. Remove the bolt and nut (A, **Figure 62**) securing the brake arm and remove the brake arm, wear indicator and dust seal. Withdraw the camshaft from the backing plate.
5. Using needlenose pliers, remove the return spring, adjacent to the camshaft, from the brake linings. Remove the other return spring in the same manner.

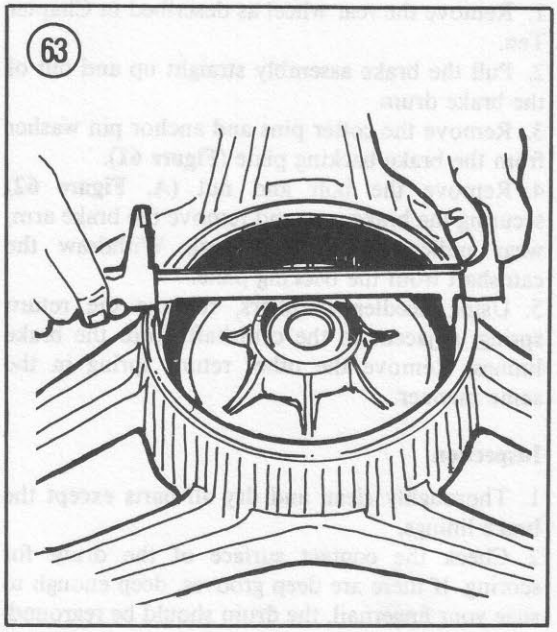
Inspection

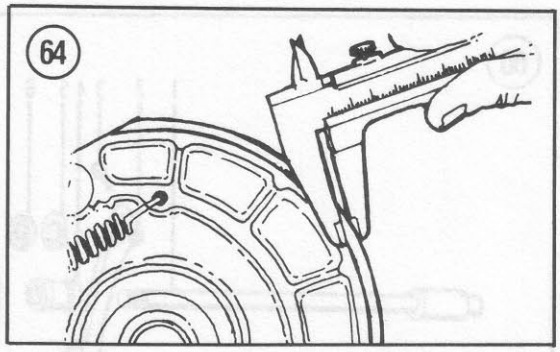
1. Thoroughly clean and dry all parts except the brake linings.
2. Check the contact surface of the drum for scoring. If there are deep grooves, deep enough to snag your fingernail, the drum should be reground.

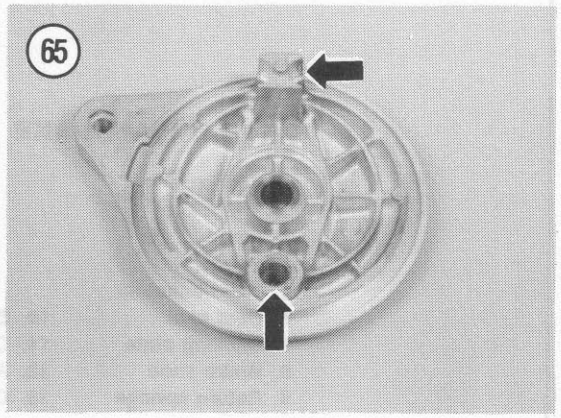
3. Measure the inside diameter of the brake drum with vernier calipers (**Figure 63**). If the measurement is greater than the service limit listed in **Table 1**, the rear wheel must be replaced as the brake drum is an integral part of the wheel.
4. If the drum can be turned and still stay within the maximum service limit diameter, have the drum turned. If the drum is turned, new linings will have to be installed and they must be arced to comform to the new drum contour.
5. Measure the brake linings with a vernier caliper (**Figure 64**). They should be replaced if the lining portion is worn to the service limit dimension or less. Refer to specifications listed in **Table 1**.
6. Inspect the linings for embedded foreign material. Dirt can be removed with a stiff wire brush. Check for any traces of oil or grease; if they are contaminated they must be replaced.
7. Inspect the cam lobe and pivot pin area of the backing plate (**Figure 65**) for wear or corrosion. Minor roughness can be removed with fine emery cloth.
8. Inspect the brake shoe return springs for wear. If they are stretched, they will not fully retract the brake shoes and they will drag and wear out prematurely. Replace as necessary.

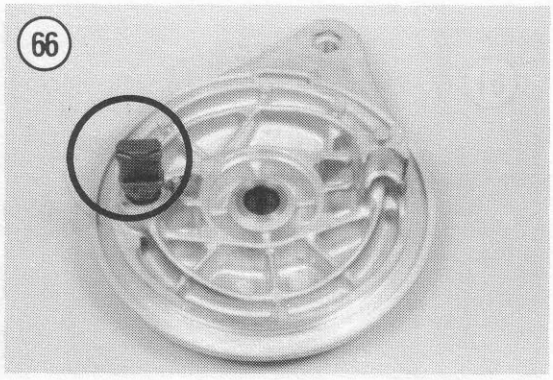
Assembly

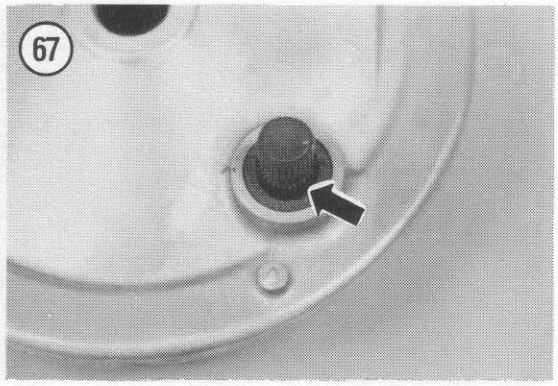
1. Grease the camshaft with a light coat of molybdenum disulfide grease. Install the cam into the backing plate from the backside (**Figure 66**).
2. From the outside of the backing plate, install the dust seal (**Figure 67**).

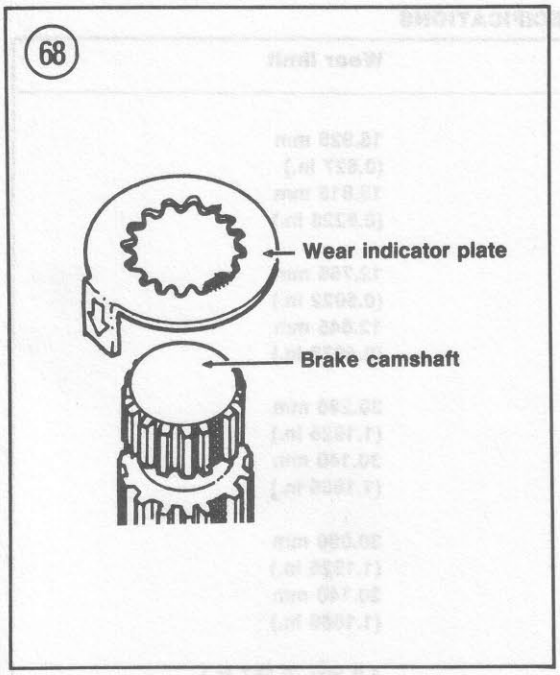




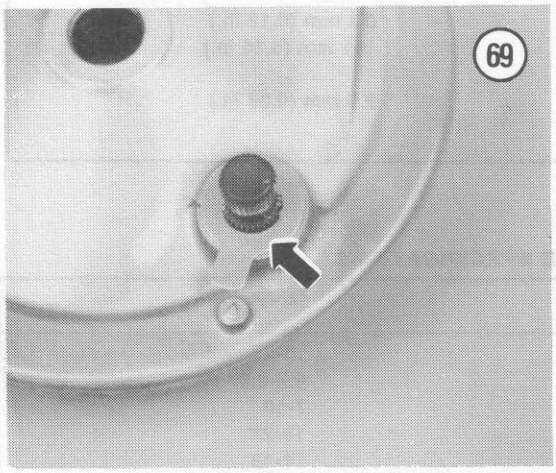


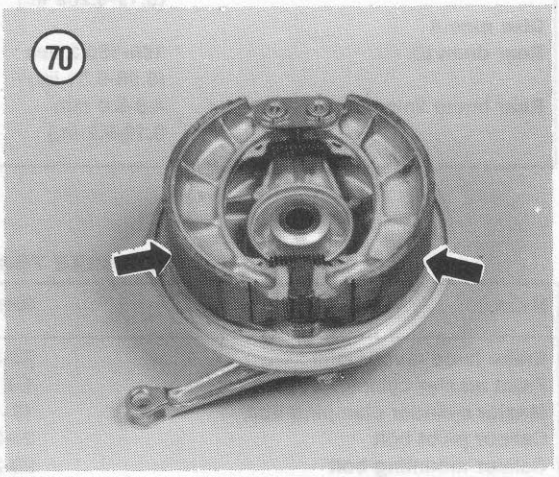






3. Align the wear indicator to the camshaft as shown in **Figure 68** and push it down all the way to the backing plate (**Figure 69**).
4. When installing the brake arm onto the camshaft, be sure to align the dimples on the two parts (B, **Figure 62**). Tighten the bolt and nut to the torque specification listed in **Table 2**.
5. Grease the camshaft and pivot post with a light coat of molybdenum disulfide grease; avoid getting any grease on the brake backing plate where the brake linings may come in contact with it.
6. Hold the brake shoes in a "V" formation with the return springs attached and snap them into place on the brake backing plate. Make sure they are firmly seated on it (**Figure 70**). Install the anchor pin lockwasher and new cotter pins. Bend the ends over completely.
7. Install the brake panel assembly into the brake drum.
8. Install the rear wheel as described in Chapter Ten.
9. Adjust the rear brake as described in Chapter Three.





Tables are on the following page.

Table 1 BRAKE SPECIFICATIONS

Item	Specifications	Wear limit
Front master cylinder		
Cylinder bore ID	15.870-15.913 mm (0.6248-0.6265 in.)	15.925 mm (0.627 in.)
Piston OD	15.827-15.854 mm (0.6231-0.6242 in.)	15.815 mm (0.6226 in.)
Rear master cylinder		
Cylinder bore ID	12.700-12.743 mm (0.5000-0.5017 in.)	12.755 mm (0.5022 in.)
Piston OD	12.657-12.684 mm (0.4983-0.4994 in.)	12.645 mm (0.4978 in.)
Front caliper		
Cylinder bore ID	30.230-30.280 mm (1.1902-1.1921 in.)	30.290 mm (1.1925 in.)
Piston OD	30.148-30.198 mm (1.1869-1.1889 in.)	30.140 mm (1.1866 in.)
Rear caliper		
Cylinder bore ID	30.030-30.080 mm (1.1902-1.1921 in.)	30.090 mm (1.1925 in.)
Piston OD	30.148-30.198 mm (1.1869-1.1889 in.)	30.140 mm (1.1866 in.)
Brake disc thickness		
Front and rear	4.8-5.2 mm (0.19-0.205 in.)	4.0 mm (0.157 in.)
Disc runout		0.3 mm (0.12 in.)
Rear drum ID	160-160.3 mm (6.30-6.31 in.)	161 mm (6.34 in.)
Rear brake lining thickness	4.9-5.0 mm 0.19-0.2 in.)	2.0 mm (0.08 in.)

Table 2 BRAKE TORQUE SPECIFICATIONS

Item	N•m	ft.-lb.
Brake hose union bolts	25-35	18-25
Front master cylinder cover screws	1-2	0.7-0.9
Master cylinder clamping bolt	10-14	7-10
Caliper pivot bolt	25-30	18-22
Caliper mounting bolt	20-25	14-18
Caliper bracket mounting bolts	30-40	22-29
Brake disc mounting bolts	35-40	25-29
Front axle holder nuts	18-25	13-18
Rear brake torque link	18-25	13-18
Brake arm bolt	24-30	17-22

CHAPTER TWELVE

FRAME AND BODY

This chapter includes replacement procedures for components attached to the frame that are not covered in the rest of the book. Also included are the body components included on all models.

This chapter describes procedures for completely stripping the frame. Recommendations are provided for repainting the stripped frame.

KICKSTAND (SIDESTAND)

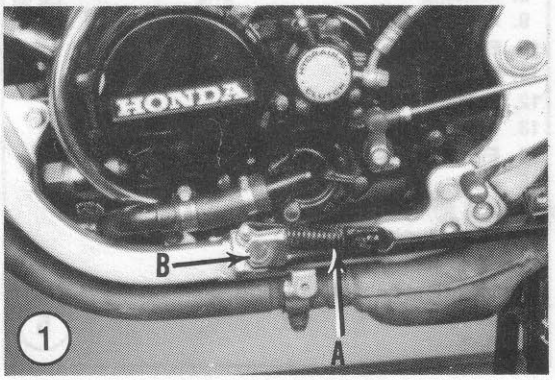
Removal/Installation

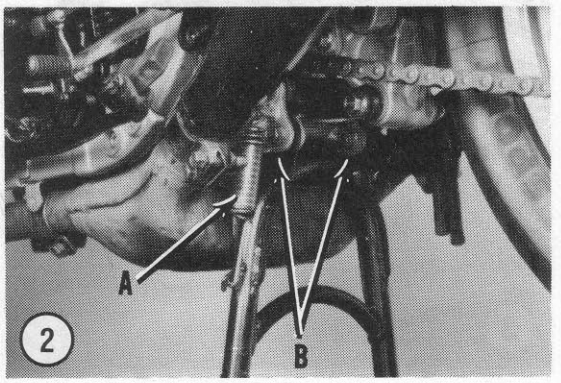
1. Place the bike on the centerstand.
2. Raise the kickstand and disconnect the return spring (A, **Figure 1**) from the pin on the frame with Vise Grips.
3. From under the frame, remove the nut on the bolt (B, **Figure 1**) and remove the kickstand from the frame.
4. Install by reversing these removal steps, noting the following.
5. Apply a light coat of multipurpose grease to the pivot surfaces of the frame tab and the kickstand yoke before installation.
6. Tighten the bolt and nut securely.

CENTERSTAND

Removal/Installation

1. Place a wood block(s) under the frame to hold the bike securely in place.
2. Raise the centerstand and use Vise Grip pliers to unhook the return spring (A, **Figure 2**) from the centerstand.
3. Lower the centerstand.
4. Loosen the bolts and nuts (B, **Figure 2**) on each side securing the centerstand to the frame.





5. Remove the bolt nut, and pivot collar on each side. Don't lose the battery overflow tube bracket on the right-hand side.
6. Remove the centerstand from the frame.
7. Install by reversing these removal steps, noting the following.
8. Apply multipurpose grease to the pivot collar and to the pivot area of the centerstand where the pivot collar rides.
9. Tighten the bolts and nuts securely.

FOOTPEGS

Replacement

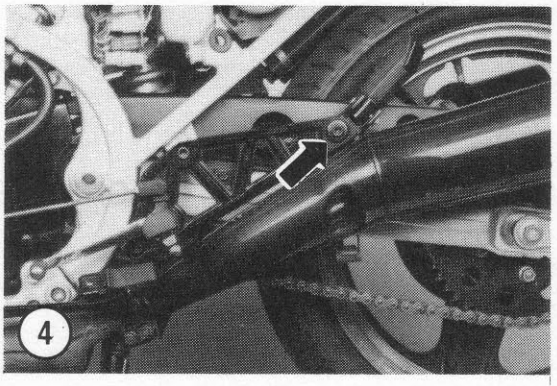
1. Remove the cotter pin and washer securing the footpeg to the bracket. Remove the pivot pin (**Figure 3**) and the footpeg.
2. Make sure the spring is in good condition and not broken. Replace as necessary.
3. Lubricate the pivot point and pivot pin before installation. Install a new cotter pin and bend the ends over completely.
4. To remove the entire footpeg assembly, remove the bolt (**Figure 4**) securing the assembly to the footpeg mounting bracket and remove the assembly.
5. Install by reversing these removal steps, noting the following.
6. Tighten the bolt securing the footpeg assembly securely.

FRONT FAIRING AND MOUNTING BRACKET

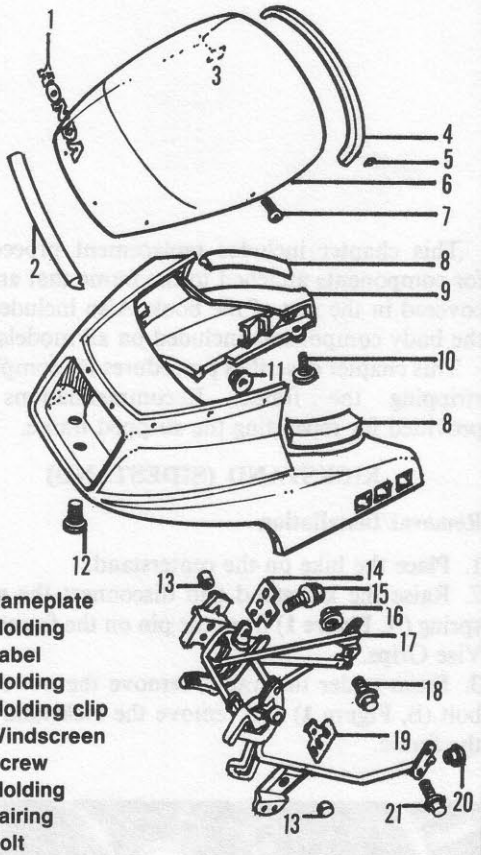
Removal/Installation (Interceptor)

Refer to **Figure 5** for this procedure.

1. Remove the shoulder bolts (A, **Figure 6**) securing the fairing at each side.
2. Carefully pull the front fairing directly forward and remove the fairing from the mounting bracket.
3. Remove the headlight as described in Chapter Seven.

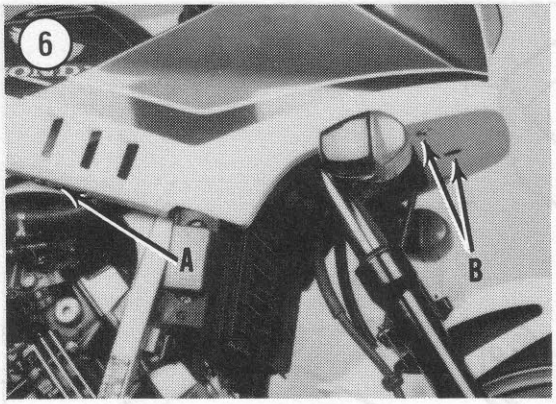


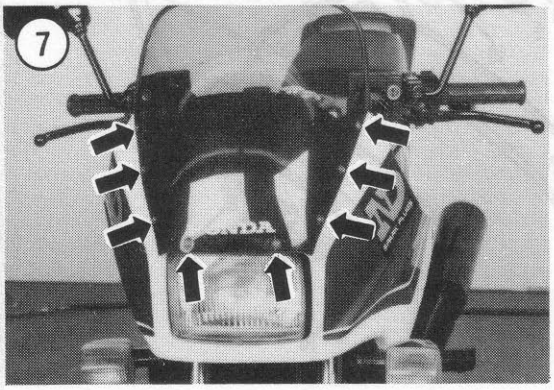
FRONT FAIRING (INTERCEPTOR)

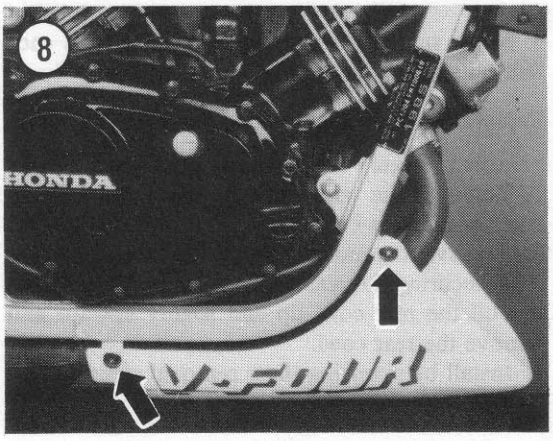


1. Nameplate
2. Molding
3. Label
4. Molding
5. Molding clip
6. Windscreen
7. Screw
8. Molding
9. Fairing
10. Bolt
11. Nut
12. Bolt
13. Rubber bumper
14. Electrical connector holder plate
15. Bolt
16. Nut
17. Mounting bracket
18. Bolt
19. Electrical connector holder plate
20. Cap
21. Bolt

5







4. Disconnect all electrical connectors attached to the front fairing mounting bracket.
5. Remove the bolts securing the front fairing bracket to the frame (B, **Figure 6**).
6. Remove the mounting bracket from the frame.
7. Install by reversing these removal steps, noting the following.
8. Make sure all electrical connectors are tight and free of corrosion.
9. Tighten all bolts securely.

Windscreen Cleaning

Be careful cleaning the windscreen, as it can easily be scratched or damaged. Do not use a cleaner with an abrasive or a combination cleaner and wax. Never use gasoline or cleaning solvent. These products will either scratch or totally destroy the surface of the windshield.

For normal cleaning, use a soft cloth or sponge and plenty of water. Dry thoroughly with a soft cloth or chamois—do not press hard.

To remove oil, grease or road tar, use isopropyl alcohol or kerosene. Then wash the windshield with a solution of mild soap and lots of water. Dry thoroughly with a soft cloth or a chamois—do not press hard.

Windscreen Cracking (1984)

The windscreen on some 1984 models may crack if the attachment screws (**Figure 7**) are tightened too tight. A new mounting kit is available from the Honda factory that includes new screws, nuts, rubber washers and detailed instructions. See your Honda dealer for more information.

Honda recommends that the attachment holes in the fairing be enlarged to 5/16 in. in diameter. When enlarging these holes, be careful. Drill slowly and do not cock the drill and bit from side to side as the plastic fairing could crack.

LOWER COWL

Removal/Installation (Interceptor)

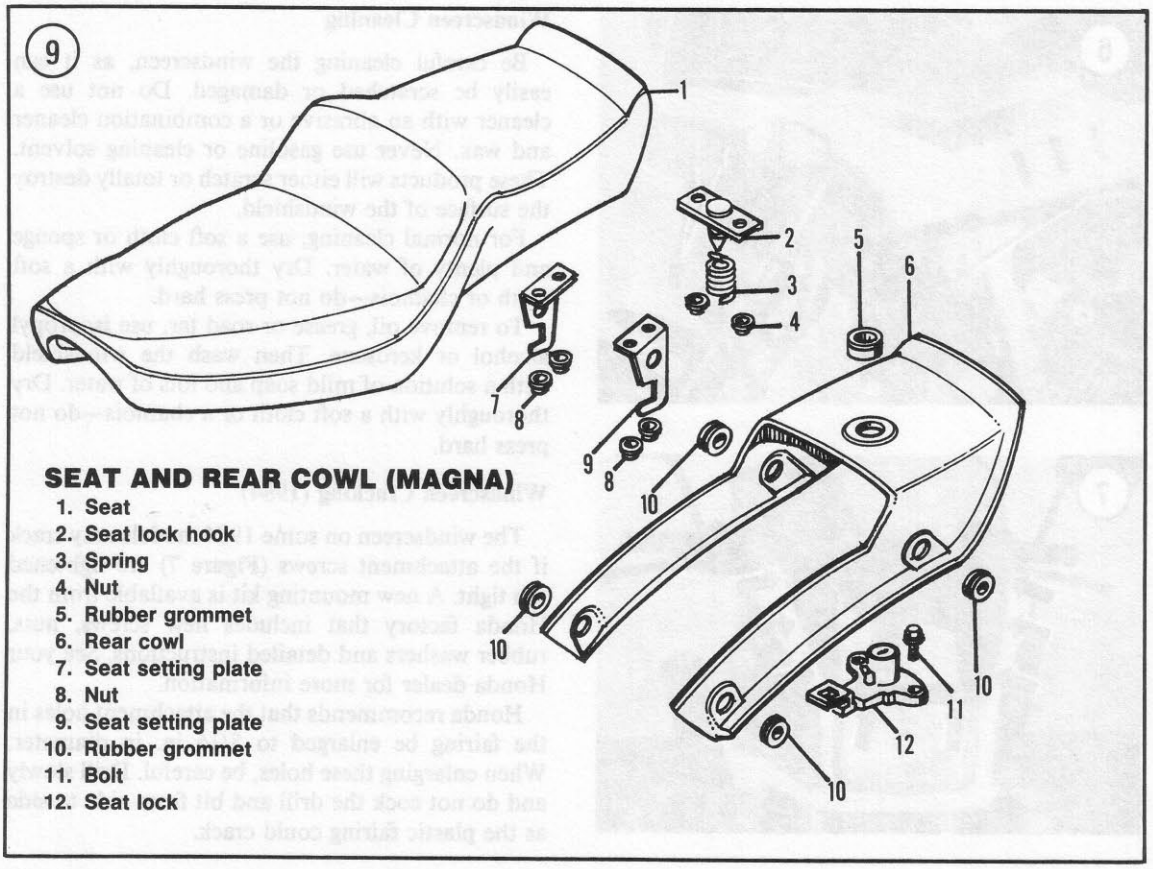
1. Remove the flange bolts (**Figure 8**) on each side securing the lower cowl to the frame and remove the cowl.
2. Inspect the heat shield on each inside surface of the cowl. Replace if it has started to deteriorate or is damaged. If damaged and not replaced, the heat from the exhaust pipes will discolor the painted surface of the cowl.
3. Install by reversing these removal steps.

SEAT

Removal/Installation (Magna)

Refer to **Figure 9** for this procedure.

1. Insert the ignition key into the lock on the rear cowl.
2. Turn the key and pull up on the rear of the seat.
3. Pull the rear seat toward the rear and remove it.
4. Install by reversing these removal steps.



SEAT AND REAR COWL (MAGNA)

1. Seat
2. Seat lock hook
3. Spring
4. Nut
5. Rubber grommet
6. Rear cowl
7. Seat setting plate
8. Nut
9. Seat setting plate
10. Rubber grommet
11. Bolt
12. Seat lock

Removal/Installation (Interceptor)

Refer to **Figure 10** for this procedure.

1. Insert the ignition key into the lock on the helmet holder on the left-hand side (A, **Figure 11**).
2. Pull back on the latch (B, **Figure 11**) on each side of the seat.
3. Pull the rear seat toward the rear and remove it.
4. Install by reversing these removal steps.

REAR COWL

Removal/Installation (Magna)

Refer to **Figure 9** for this procedure.

1. Remove the side covers and the seat as described in this chapter.
2. Remove the bolts securing the grab rail to the grab rail bracket on each side. Remove the grab rail.
3. Remove the bolts securing the rear grab rail bracket on each side. Remove both brackets.
4. Pull the rear cowl up and slighly rearward and remove the rear cowl. Don't lose the rubber grommet at each mounting bolt hole.
5. Install by reversing these removal steps, noting the following.
6. Make sure there is a rubber grommet at each bolt hole in the rear cowl.

Removal/Installation (Interceptor)

Refer to **Figure 10** for this procedure.

1. Remove the side covers and the seat as described in this chapter.
2. Remove the bolts and collars (front 2 bolts only) securing the rear cowl.
3. Pull the rear cowl up and slighly upward and remove the rear cowl.
4. Install by reversing these removal steps.

REAR FENDER

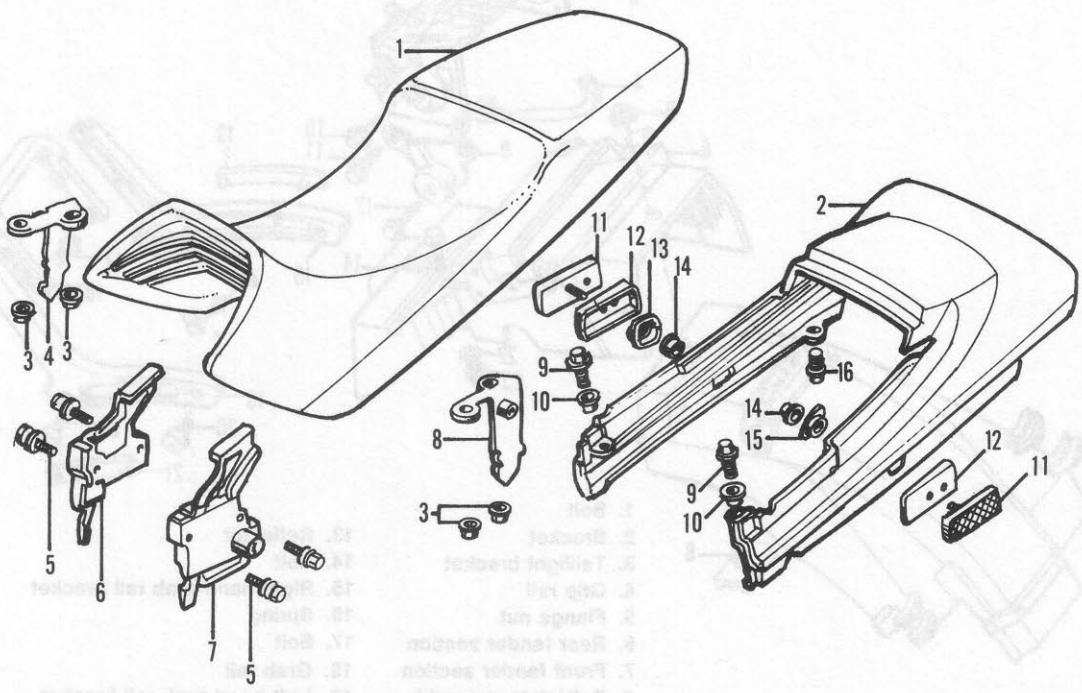
Removal/Installation (Magna)

Refer to **Figure 12** for this procedure.

1. Remove both side covers and the seat as described in this chapter.
2. Remove the rear grab rail assembly and rear cowl as described in this chapter.
3. Disconnect the taillight electrical connector.
4. Disconnect all electrical connectors from bracket on the front section of the rear fender.

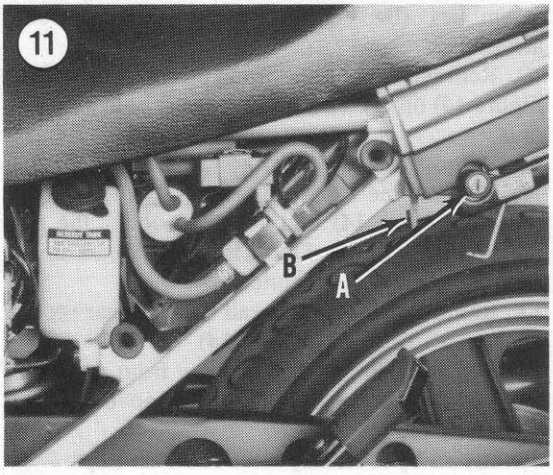
(10)

SEAT AND REAR COWL (INTERCEPTOR)

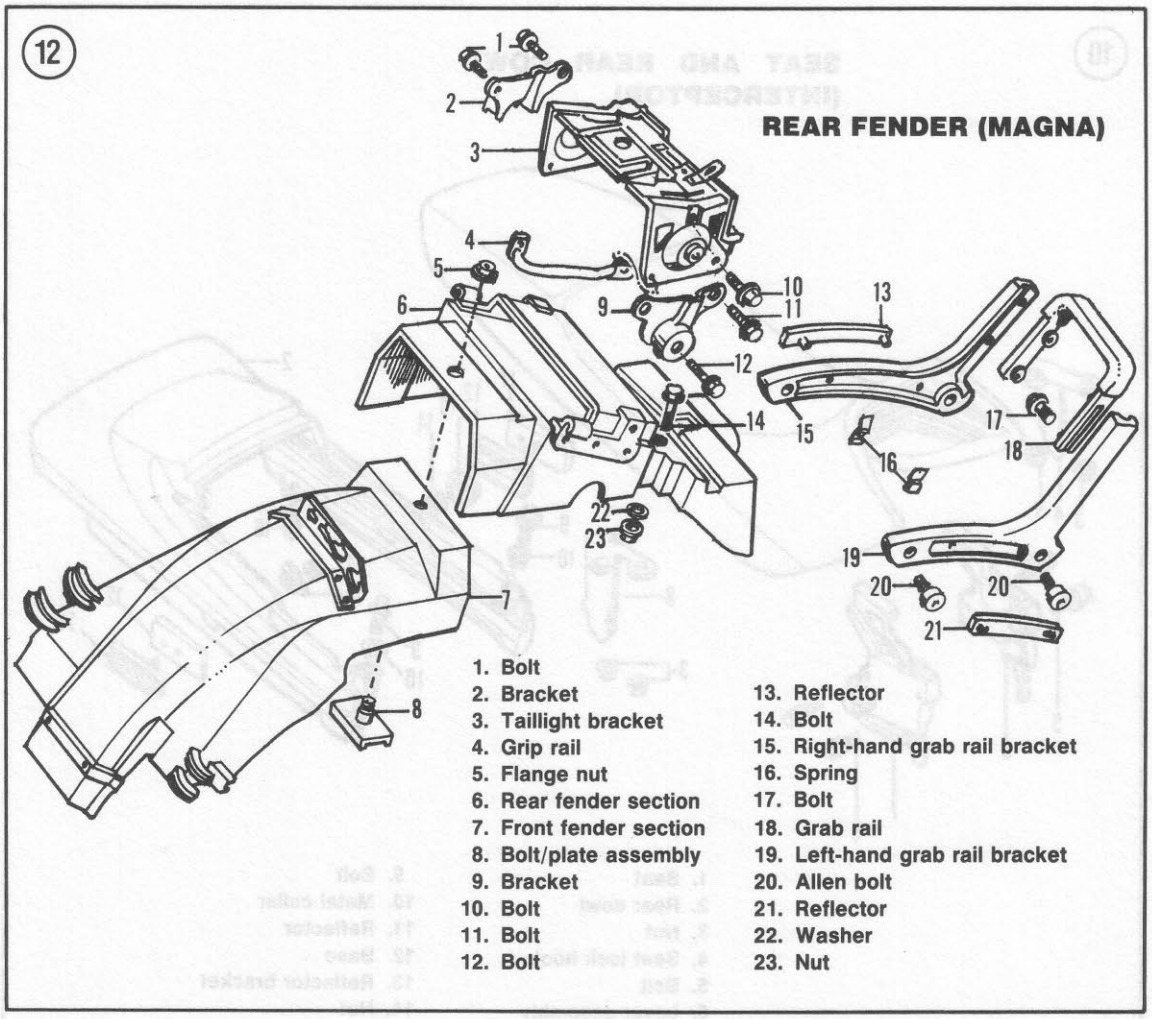


1. Seat
2. Rear cowl
3. Nut
4. Seat lock hook
5. Bolt
6. Lever assembly
7. Seat locking plate
8. Seat lock hook
9. Bolt
10. Metal collar
11. Reflector
12. Base
13. Reflector bracket
14. Nut
15. Reflector bracket
16. Bolt

(11)



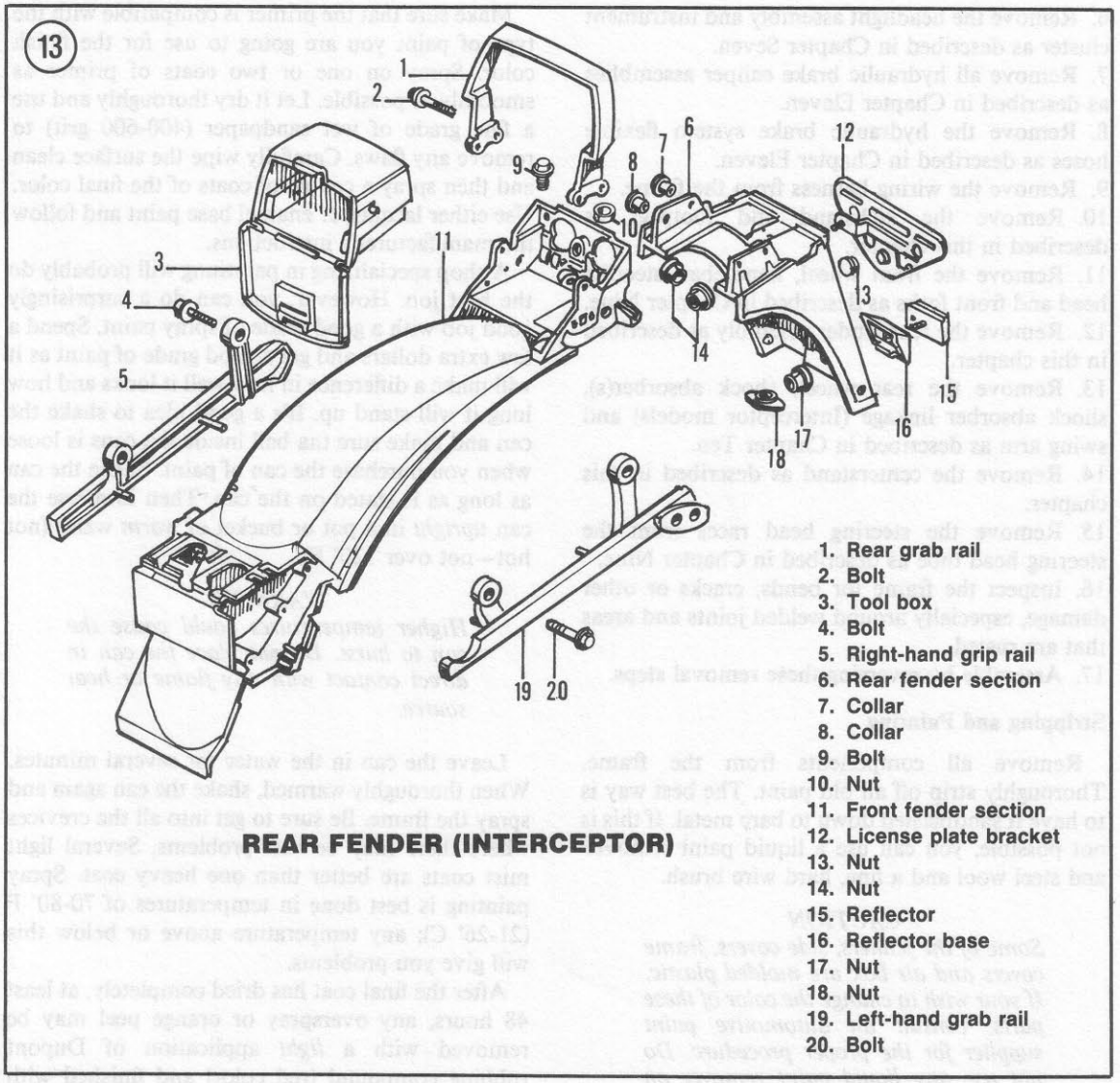
5. Disconnect the electrical connectors from both rear turn signal assemblies.
6. Remove the bolts securing both turn signal assemblies and remove both assemblies.
7. Remove the bolts securing the grip rail on each side and remove both grip rails.
8. Remove the flange bolts securing the taillight bracket and remove the taillight bracket and taillight assembly.
9. Remove the bolts securing the rear section of the rear fender.
10. From underneath the rear fender, hold onto the bolt/plate assembly and remove the nut securing the front and rear section of the rear fender to the frame bracket. Remove the bolt/plate assembly.



11. Unhook the clamps securing the electrical harness to the front section of the rear fender.
12. Remove the front and rear sections of the fender from the frame.
13. Install by reversing these removal steps.

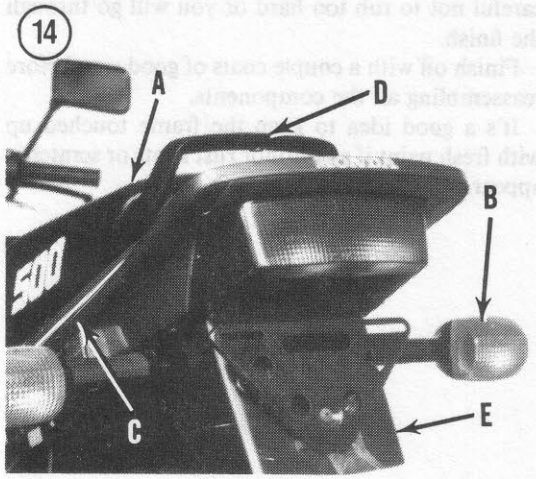
Removal/Installation (Interceptor)

Refer to **Figure 13** for this procedure.
1. Remove both side covers and the seat (A, **Figure 14**) as described in this chapter.
2. Remove the fuel pump and fuel filter as described in Chapter Six.
3. Remove the coolant recovery tank as described in Chapter Eight.
4. Disconnect the electrical connector from the turn signal relay and remove the relay.
5. Remove the rear cowl as described in this chapter.
6. Remove the spark units as described in Chapter Seven.
7. Disconnect the taillight electrical connector.
8. Disconnect the electrical connectors from both rear turn signal assemblies.
9. Remove the bolts securing both turn signal assemblies (B, **Figure 14**) and remove both assemblies.
10. Remove the bolts securing the side grip rail (C, **Figure 14**) on each side and remove both side grip rails.
11. Remove the tool box.
12. Remove the flange bolts securing the rear grip rail (D, **Figure 14**) and rear section of the rear fender to the frame. Don't lose the collars in the bolt holes in the rear fender.
13. Remove the rear grip rail and the rear section of the rear fender (E, **Figure 14**).
14. Remove the bolt securing the front section of the rear fender to the frame and remove the front section of the rear fender.
15. Install by reversing these removal steps.



REAR FENDER (INTERCEPTOR)

1. Rear grab rail
2. Bolt
3. Tool box
4. Bolt
5. Right-hand grip rail
6. Rear fender section
7. Collar
8. Collar
9. Bolt
10. Nut
11. Front fender section
12. License plate bracket
13. Nut
14. Nut
15. Reflector
16. Reflector base
17. Nut
18. Nut
19. Left-hand grab rail
20. Bolt



FRAME

The frame does not require routine maintenance. However, it should be inspected immediately after any accident or spill.

Component Removal/Installation

1. Remove both side covers and the seat as described in this chapter.
2. Remove the engine as described in Chapter Four.
3. Remove all body components as described in this chapter.
4. Remove the fuel tank(s) as described in Chapter Six.
5. Remove the battery as described in Chapter Three.

6. Remove the headlight assembly and instrument cluster as described in Chapter Seven.
7. Remove all hydraulic brake caliper assemblies as described in Chapter Eleven.
8. Remove the hydraulic brake system flexible hoses as described in Chapter Eleven.
9. Remove the wiring harness from the frame.
10. Remove the kickstand and footpegs as described in this chapter.
11. Remove the front wheel, handlebar, steering head and front forks as described in Chapter Nine.
12. Remove the rear fender assembly as described in this chapter.
13. Remove the rear wheel, shock absorber(s), shock absorber linkage (Interceptor models) and swing arm as described in Chapter Ten.
14. Remove the centerstand as described in this chapter.
15. Remove the steering head races from the steering head tube as described in Chapter Nine.
16. Inspect the frame for bends, cracks or other damage, especially around welded joints and areas that are rusted.
17. Assemble by reversing these removal steps.

Stripping and Painting

Remove all components from the frame. Thoroughly strip off all old paint. The best way is to have it sandblasted down to bare metal. If this is not possible, you can use a liquid paint remover and steel wool and a fine, hard wire brush.

CAUTION

Some of the fenders, side covers, frame covers and air box are molded plastic. If your wish to change the color of these parts, consult an automotive paint supplier for the proper procedure. Do not use any liquid paint remover on these components as it will damage the surface. The color is an integral part of some of these components and cannot be removed.

When the frame is down to bare metal, have it inspected for hairline and internal cracks. Magnaflux is the most common and complete process.

Make sure that the primer is compatible with the type of paint you are going to use for the finish color. Spray on one or two coats of primer as smoothly as possible. Let it dry thoroughly and use a fine grade of wet sandpaper (400-600 grit) to remove any flaws. Carefully wipe the surface clean and then spray a couple of coats of the final color. Use either lacquer or enamel base paint and follow the manufacturer's instructions.

A shop specializing in paintiung will probably do the best job. However, you can do a surprisingly good job with a good grade of spray paint. Spend a few extra dollars and get a good grade of paint as it will make a difference in how well it looks and how long it will stand up. It's a good idea to shake the can and make sure tha ball inside tha cans is loose when you purchase the can of paint. Shake the can as long as is stated on the can. Then immerse the can *upright* in a pot or bucket of *warm* water (not hot—not over 120° F).

WARNING

Higher temperatures could cause the can to burst. ***Do not*** *place the can in direct contact with any flame or heat source.*

Leave the can in the water for several minutes. When thoroughly warmed, shake the can again and spray the frame. Be sure to get into all the crevices where there may be rust problems. Several light mist coats are better than one heavy coat. Spray painting is best done in temperatures of 70-80° F (21-26° C); any temperature above or below this will give you problems.

After the final coat has dried completely, at least 48 hours, any overspray or orange peel may be removed with a *light* application of Dupont rubbing compound (red color) and finished with Dupont polishing compound (white color). Be careful not to rub too hard or you will go through the finish.

Finish off with a couple coats of good wax before reassembling all the components.

It's a good idea to keep the frame touched up with fresh paint if any minor rust spots or scratches appear.

SUPPLEMENT

1986 SERVICE INFORMATION

The following supplement provides procedures unique to all models since 1986.

The chapter headings in this supplement correspond to those in the main body of this book. If a change is not included in the supplement, there are no changes affecting models since 1986.

CHAPTER ONE

GENERAL INFORMATION

Refer to **Table 1** for general specifications.

Table 1 GENERAL SPECIFICATIONS

Engine type	Water-cooled, 4-stroke, DOHC, V-4
Bore and stroke	60.0×44.0 mm (2.36×1.73 in.)
Displacement	498 cm² (30.4 cu. in.)
Compression ratio	11.0 to 1
Valve train	Dual-row roller type drive chain OHC and rocker arms
Carburetion	4 Keihin carburetors; 2 down-draft, 2 side-draft
Ignition	Capacitor discharge ignition (CDI)
Idle speed	1,300 ±100 rpm
Lubrication	Wet-sump, filter, oil pump
Clutch	Wet, multi-plate
Transmission	5-speed, constant mesh
Transmission ratios	
1st	3.308
2nd	2.353
3rd	1.850
4th	1.545
5th	1.333
6th	1.154
Final reduction ratio	2.867
Drive sprocket	15T
Driven sprocket	43T
Starting system	Electric starter only
Battery	12 volt, 12 amp/hour
Alternator	Three phase, AC: 280 W@5000 rpm
Firing order	1-4-3-2
Cylinder numbering	
No. 1	Left-hand side—rear
No. 2	Left-hand side—front
No. 3	Right-hand side—rear
No. 4	Right-hand side—front
Wheelbase	1,412 mm (55.6 in.)
Steering head angle	63°
Trail	101 mm (4.0 in.)

(continued)

Table 1 GENERAL SPECIFICATIONS (continued)

Front suspension	Telescopic forks,
Travel	140 mm (5.5 in.) travel
Air pressure	0-0.4 kg/cm² (0-6 psi)
Rear suspension	Swing arm and single shock absorber
Travel	115 mm (4.5 in.)
Air pressure	0.5-1.5 kg/cm² (7-21 psi).
Front tire	100/90V-16 54H tubeless
Rear tire	110/90-18 61H tubeless
Seat height	800 mm (31.5 in.)
Ground clearance	140 mm (5.5 in.)
Overall height	1,175 mm (46.3 in.)
Overall width (handlebars)	760 mm (29.9 in.)
Overall length	2,070 mm (81.5 in.)
Weight (dry)	
49-state	186 kg (410 lb.)
California	187 kg (412 lb.)
Weight (curb)	
49-state	204 kg (450 lb.)
California	205 kg (452 lb.)
Vehicle capacity load	165 kg (364 lb.)
Fuel capacity	15.5 liters (4.1 U.S. gal., 3.4 Imp. gal.)
Fuel capacity (reserve)	4.0 liters (1.1 U.S. gal., 0.9 Imp. gal.)
Oil capacity	
Oil and filter change	2.8 liters (3.0 U.S. qt., 2.5 Imp. qt.)
At overhaul	3.4 liters (3.6 U.S. qt., 3.0 Imp. qt.)
Coolant capacity	1.70 liters (1.80 U.S. qt., 1.5 Imp. qt.)
Front fork oil capacity*	
Right-hand leg	320 cc (10.8 U.S. oz., 9.0 Imp. oz.)
Left-hand leg	335 cc (11.3 U.S. oz., 9.4 Imp. oz.)
Drive chain number	50V3-108LE or RK50FO-108LE

* Capacity for each fork leg.

CHAPTER THREE

LUBRICATION, MAINTENANCE AND TUNE-UP

PERIODIC LUBRICATION

Engine Oil and Filter Change

The engine oil and filter change procedure is the same as on previous models the engine oil capacity has been increased slightly. Refer to **Table 2** for oil capacity.

PERIODIC MAINTENANCE

Air Filter Element Replacement

The air filter replacement procedure is the same as on previous models with the exception of the design of the air filter element and additional screws to secure the air filter cover.

Install the air filter element with the pleated portion of the element facing down (**Figure 1**) into the air filter air box.

TUNE-UP

Tune up specifications are listed in **Table 3**.

Valve Clearance Adjustment

The valve clearance procedure is the same as on previous models with the exception of the

clearance specification and that the radiator does not have to be completely removed.

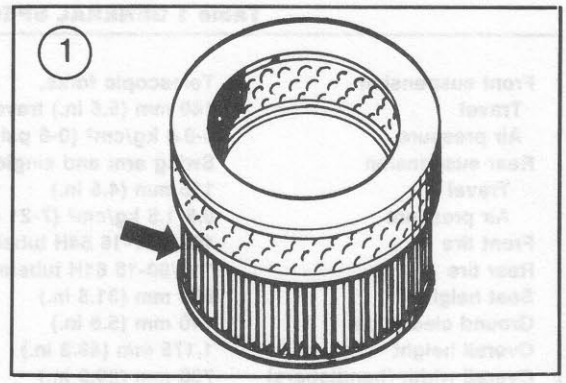
Valve clearance must be measured with the engine cool, at room temperature (maximum 95° F/35° C). The correct valve clearance is 0.15 mm (0.006 in.) for both the intake and exhaust valves.

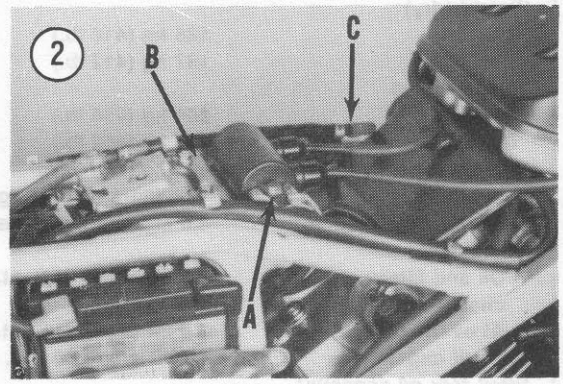
There are 2 intake and 2 exhaust valves in each cylinder. To achieve the most accurate valve clearance use the factory suggested method described in this procedure.

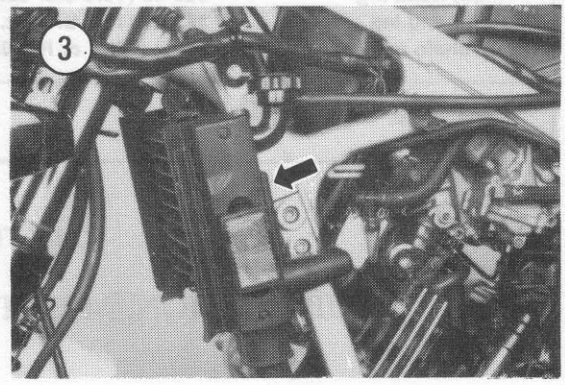
1. Lean the bike from side to side to drain residual oil from the pockets in the cylinder heads into the crankcase.
2. Place the bike on the centerstand.
3. Remove the seat as described in Chapter Twelve in the main body of this book.
4. Remove the right- and left-hand side covers.
5. Disconnect the battery negative (–) lead.
6. Remove the fuel tank as described in Chapter Six in the main body of this book.
7. Remove the lower cowl and front fairing as described in Chapter Twelve in the main body of this book. Removal of the lower cowl is to gain more work room.
8. Disconnect the spark plug caps and leads.
9. Disconnect the ignition coil primary wire (A, **Figure 2**).
10. Remove the bolts (B, **Figure 2**) securing the igntion coil assembly and remove the assembly.
11. Remove the plastic heat shield (C, **Figure 2**).
12. Remove the screws securing the radiator right- and left-hand side covers (**Figure 3**). Remove both side covers.
13. Remove the screws securing the radiator grille and remove the grille.
14. Disconnect the overflow tube from the radiator filler neck.
15. Disconnect the cooling fan electrical connector.
16. Disconnect the electrical connector from the thermostatic switch coupler at the base of the radiator on the left-hand side of the radiator.
17. Remove the bolt securing the left-hand coolant pipe to the frame.
18. Loosen the clamping screw (**Figure 4**) on the upper hose where it attaches to the radiator. Move the clamp back onto the hose and off the neck of the radiator.
19. Remove the radiator lower mounting bolts.

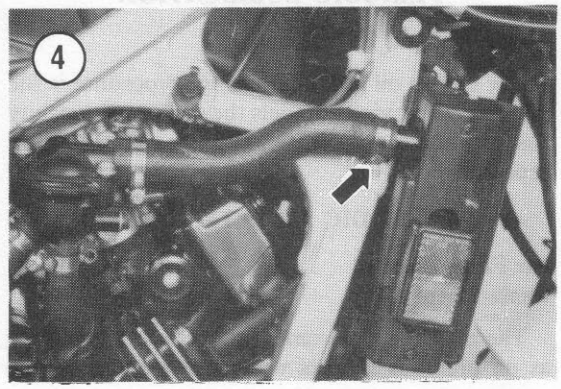
NOTE

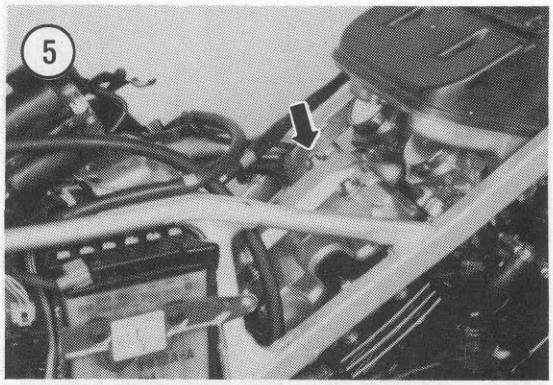
In the following step a small amount of coolant will drain out when the radiator hose is removed from the radiator neck.

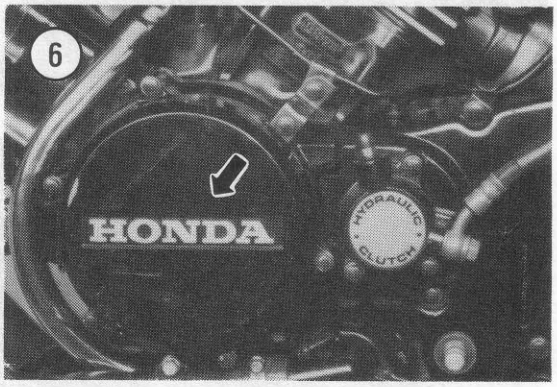


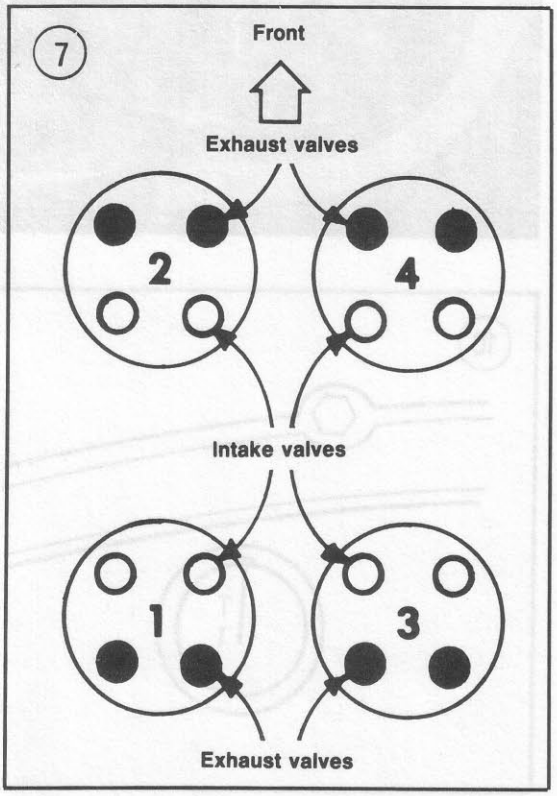












20. Place a drain pan under the radiator upper hose.
21. Pull the right-hand side of the radiator forward and disengage the upper hose from the radiator neck.
22. Tie the open end of the radiator hose up to the frame with a bunji cord or piece of wire to prevent any additional loss of coolant.
23. Using duct tape, tape shut the upper neck of the radiator.
24. Pivot the right-hand side of the radiator forward and toward the left and secure it to the frame with a Bungee cord or piece of wire.
25. Remove the bolts securing the front and rear cylinder head covers (**Figure 5**) and remove both covers. The rubber sealing gaskets will come off with each cover.
26. Remove the clutch slave cylinder as described under *Clutch Slave Cylinder Removal/Installation (Intact)* in Chapter Five in the main body of this book.
27. Place a drain pan under the alternator cover and remove the bolts securing the alternator cover (**Figure 6**). Remove the cover and gasket. Some engine oil may drain out.
28. Remove all 4 spark plugs as described in Chapter Three in the main body of this book. This will make it easier to turn the engine over by hand.
29. Shift the transmission into NEUTRAL.
30. The correct valve clearance is 0.15 mm (0.006 in.) for both the intake and exhaust valves.

NOTE

The No. 2 and No. 4 cylinders are at the front with the No. 2 cylinder on the left-hand side. Refer to ***Figure*** *7. The No. 1 and No. 3 cylinders are at the rear with the No. 1 cylinder on the left-hand side. Refer to* ***Figure*** *7. The left-hand side refers to rider sitting on the seat facing forward. The intake valves are located toward the "V" of the engine (near the carburetors) and the exhaust valves are located at the front and rear of the engine (near the exhaust pipes).*

31. Unscrew the ignition timing inspection hole cover (**Figure 8**).

NOTE

The following step requires the aid of a helper since the alternator is on one side of the bike and the timing mark is on the other side.

32. Using a wrench on the alternator bolt (**Figure 9**), rotate the crankshaft *counterclockwise* (as viewed from the left-hand side) until the "T-1" timing mark (on the starter clutch assembly) aligns with the index mark on the crankcase cover timing hole (**Figure 10**).
33. The No. 1 cylinder must be at top dead center (TDC) on the compression stroke.

NOTE

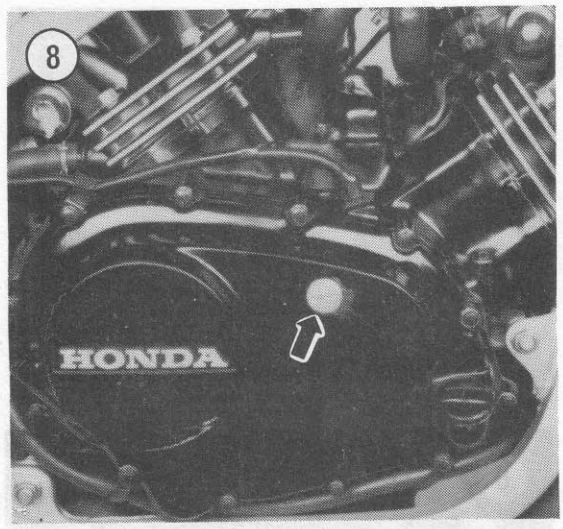
A cylinder at TDC on its compression stroke will have free play in all of its rocker arms, indicating that both pairs of intake and exhaust valves are closed.

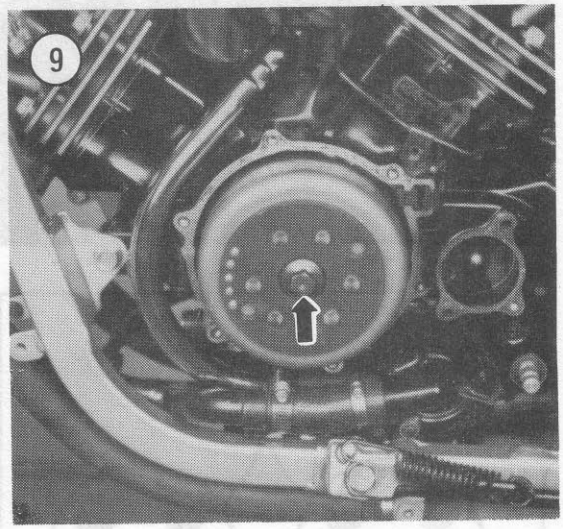
34. If the No. 1 cylinder is not at TDC, repeat Step 32. Rotate the crankshaft 360° (one full turn) and realign the "T-1" timing mark (**Figure 10**). Check that the cylinder is now at TDC on the compression stroke.
35. Check and record the clearances on both intake valves and both exhaust valves on the No. 1 cylinder.
36. To measure the clearance, perform the following:
    a. Insert a flat feeler gauge betwen the valve stem and the valve adjuster.
    b. Insert a separate flat feeler gauge at both of the valve adjustment points on a common rocker arm (**Figure 11**). Using 2 feeler gauges prevents the rocker arm from shifting slightly, as it would if only one feeler gauge is used at a time.
    c. The clearance is measured correctly when there is a slight drag on the feeler gauges when they are inserted and withdrawn.
37. If clearance adjustment is necessary, perform the following:
    a. Use the special tool (Valve Adjusting Wrench 8×9 mm part No. 07708-0030100) or an open end wrench and back off the locknut.
    b. Use another special tool (Valve Adjusting Wrench B part No. 07708-0030400), screw the adjuster in or out so there is a slight resistance felt on the feeler gauge (**Figure 12**).

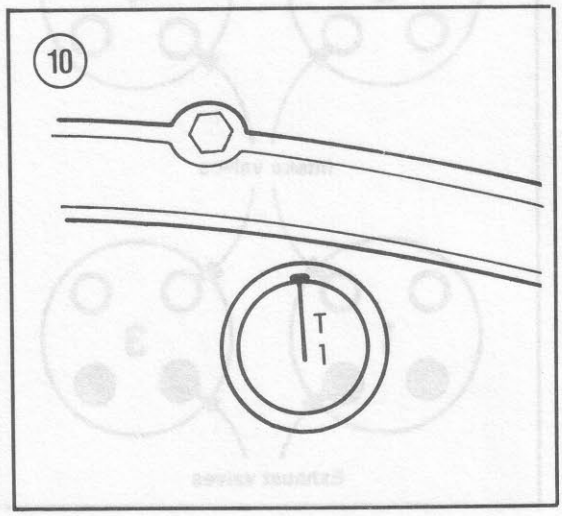
CAUTION

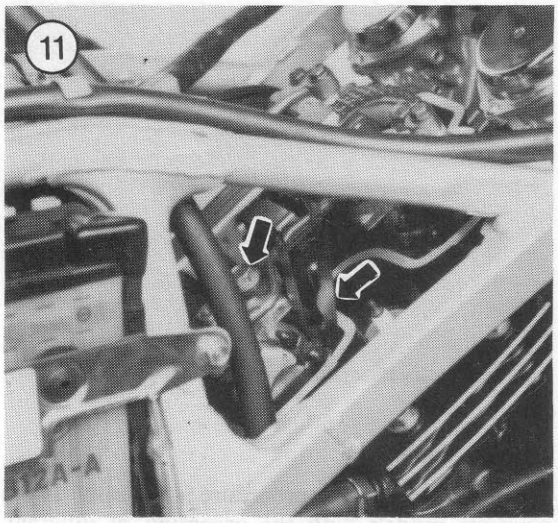
Be sure to tighten the locknut to the specified torque value. Failure to do so may result in the adjuster locknuts working loose and allowing incorrect valve clearances.

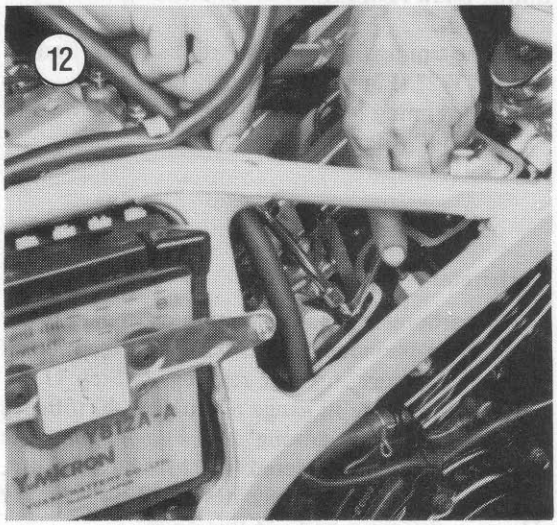
    c. Hold the adjuster and tighten the locknut to 9-12 N•m (6-9 ft.-lb.). Then recheck valve clearance to make sure the adjuster did not slip when the locknut was tightened.
    d. Readjust if necessary.

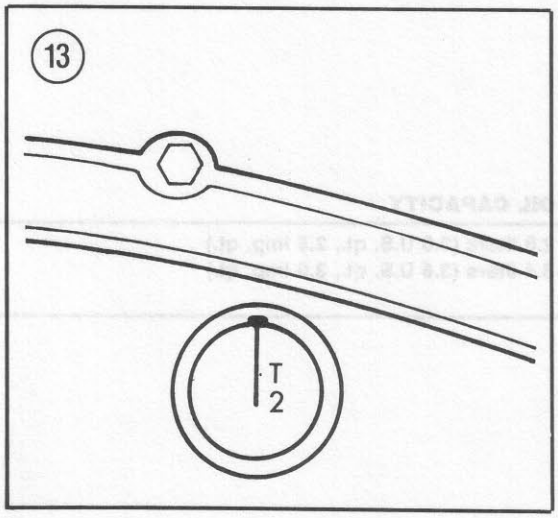






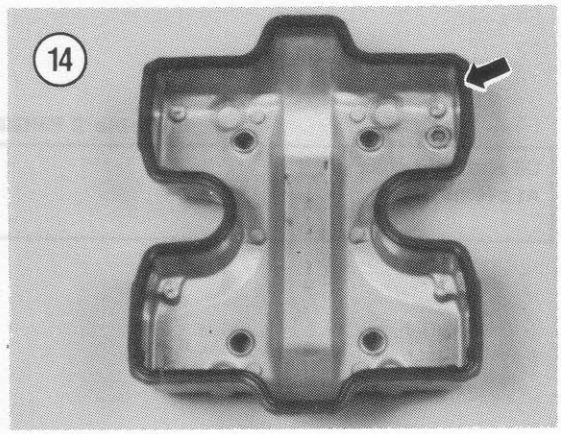






e. If necessary, repeat this step for the other valves on this cylinder.

38. Using a wrench on the alternator bolt (**Figure 9**), rotate the crankshaft *counterclockwise* (as viewed from the left-hand side) 90° until the "T-2" timing mark (on the starter clutch assembly) aligns with the index mark on the crankcase cover timing hole (**Figure 13**).
39. The No. 4 cylinder must be at top dead center (TDC) on the compression stroke.
40. With the engine in this position, repeat Step 36 and Step 37 to check and record the clearances for the valves on the No. 4 cylinder.
41. Using a wrench on the alternator bolt (**Figure 9**), rotate the crankshaft *counterclockwise* (as viewed from the left-hand side) 270° until the "T-1" timing mark (on the starter clutch assembly) aligns with the index mark on the crankcase cover timing hole (**Figure 10**).
42. The No. 3 cylinder must be at top dead center (TDC) on the compression stroke.
43. With the engine in this position, repeat Step 36 and Step 37 to check and record the clearances for the valves on the No. 3 cylinder.
44. Using a wrench on the alternator bolt (**Figure 9**), rotate the crankshaft *counterclockwise* (as viewed from the left-hand side) until the "T-2" timing mark (on the starter clutch assembly) aligns with the index mark on the crankcase cover timing hole (**Figure 13**).
45. The No. 2 cylinder must be at top dead center (TDC) on the compression stroke.
46. With the engine in this position, repeat Step 36 and Step 37 to check and record the clearances for the valves on the No. 2 cylinder.
47. Inspect the rubber gasket on each cylinder head cover (**Figure 14**) and cover bolt (**Figure 15**). Replace if they are starting to deteriorate or harden; replace as a set even if only one is bad.

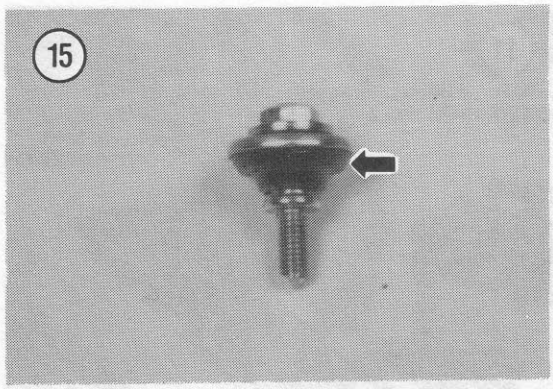


48. Install the covers and tighten the bolts to 8-12 N•m (6-9 ft.-lb.).
49. Reinstall the radiator by reversing Steps 12-24 of this procedure.
50. Install all 4 spark plugs.
51. Install a new gasket, then install the alternator cover. Tighten the bolts secuely.
52. Install the clutch slave cylinder as described under *Clutch Slave Cylinder Removal/Installation (Intact)* in Chapter Five in the main body of this book.
53. Install the plastic heat shield.
54. Install the ignition coil assembly, then install the bolts. Tighten the bolts securely.
55. Connect the ignition coil primary wires to the ignition coils.
56. Install the ignition timing inspection hole cover (**Figure 8**).
57. Connect the spark plug caps and leads.
58. Install the fuel tank as described in Chapter Six in the main body of this book.
59. Connect the battery negative (–) lead.
60. Install the right- and left-hand side covers.
61. Install the seat as described in Chapter Twelve in the main body of this book.
62. Since some coolant was lost during this procedure, perform Steps 11-16 of *Coolant Change* in Chapter Three in the main body of this book.

Spark Plug Selection

The Spark plug selection procedure is the same as on previous models with the exception of a different heat range.

Refer to **Table 3** for correct spark plug heat ranges.



Ignition Timing

The ignition timing procedure is the same as on previous models with the exception of different timing mark identifications. The timing marks are as follows:

a. The timing mark for the front set of cylinders is "T-2" (**Figure 13**).
b. The timing mark for the rear set of cylinders is "T-1" (**Figure 10**).

Carburetor Synchronization

The carburetor synchronization procedure is the same as on previous models with the exception of a lesser difference in gauge readings in Step 11.

If the difference in gauge readings is 40 mm Hg (1.6 in.) or less among all 4 cylinders, the carburetors are considered synchronized. If not, perform the procedure as described in Chapter Three in the main body of this book.

Table 2 ENGINE OIL CAPACITY

Oil and filter change	2.8 liters (3.0 U.S. qt., 2.5 Imp. qt.)
At overhaul	3.4 liters (3.6 U.S. qt., 3.0 Imp. qt.)

Table 3 TUNE-UP SUMMARY

Item	Specification
Valve clearance (cold below 35° C/95° F)	
Intake	0.15 (0.006 in.)
Exhaust	0.15 (0.006 in.)
Compression pressure (at sea level)	10.0-14.0 kg/cm² (142-199 psi)
Spark plug type	
Standard heat range	ND X27EPR-U9 or NGK DPR9EA-9
Cold weather*	ND X24EPR-U9 or NGK DPR8EA-9
Spark plug gap	0.8-0.9 mm (0.031-0.035 in.)
Ignition timing at 1,700 rpm	"F" mark next to "T-2"—front cylinders "F" mark next to "T-1"—rear cylinders
Idle speed	1,300 ±100 rpm
Firing order	1-4-3-2

* Cold weather climate—below 5° C (41° F).

CHAPTER FOUR

ENGINE

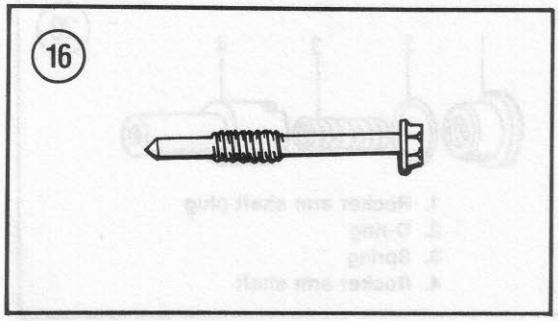
Refer to **Table 4** for engine torque specifications.

CAMSHAFTS

Removal

Camshaft removal is basically the same as on previous models except for the following items:

a. An additional bolt is added to each camshaft holder. Each camshaft holder is now held down with 4 bolts instead of 3 bolts as on previous models.
b. A 6×60 mm pin bolt (**Figure 16**) is used at each corner of the cylinder head. These bolts are unique and must be reinstalled into their original position in the camshaft holder and the cylinder head.



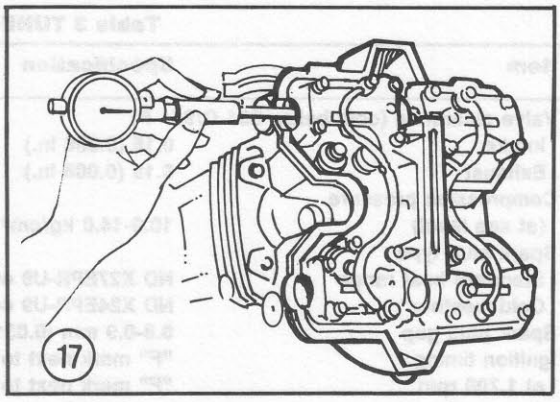
c. The locating dowels in the camshaft holders are now pressed into place in each holder and are not to be removed.
d. The timing marks in Step 11A and Step 11B are changed. The old "TF" mark for the front cylinders is now "T-2" (**Figure 13**) and the old "TR" mark for the rear cylinders is now "T-1" (**Figure 10**).

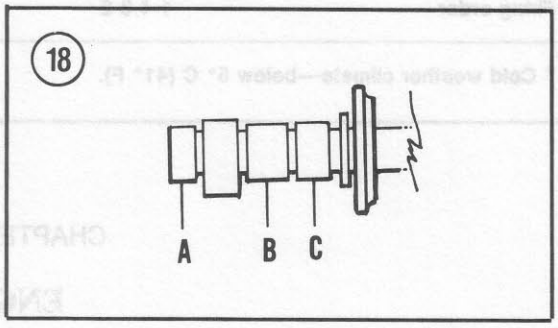
Camshaft Bearing Clearance Measurement

This procedure does *not* use a Plastigage set as on previous models to determine bearing clearance. The camshaft holders and cylinder heads are now line-bored during manufacture and the clearance measurement is performed in a different procedure.

1. Wipe all oil from the camshaft bearing surfaces on the camshaft holders and cylinder heads.
2. Install the camshaft holders into their correct positions in the cylinder head.
3. Install the camshaft holder bolts. Tighten the bolts securing the camshaft holders in 2-3 stages to the following torque specifications:
   a. 6 mm bolts: 10-14 N•m (7-10 ft.-lb.).
   b. 8×130 mm bolts: 21-25 N•m (15-18 ft.-lb.).
   c. 8×151 mm bolts: 43-47 N•m (31-34 ft.-lb.).

4. Using an inside micrometer (**Figure 17**) measure the camshaft bearing surfaces at the 3 different locations within each bearing holder and cylinder head and compare to dimensions listed in **Table 5**.
5. Using a micrometer, measure the bearing surfaces on each camshaft at the 3 different bearing surface locations (**Figure 18**) and compare to dimensions listed in **Table 5**.
6. Subtract the camshaft OD dimensions taken in Step 5 from the camshaft bearing journal dimnsions taken in Step 4. This will give you the bearing clearance. Compare to dimensions listed in **Table 5**.
7. Loosen the camshaft holder bolts in 2-3 stages then remove the bolts and the camshaft holders.
8. If the camshaft bearing journals are worn to the service limit dimensions or less, replace the camshaft(s) and recheck the oil clearance.
9. If the oil clearance still exceeds the service limit, replace all camshaft holders and cylinder head as a matched set.



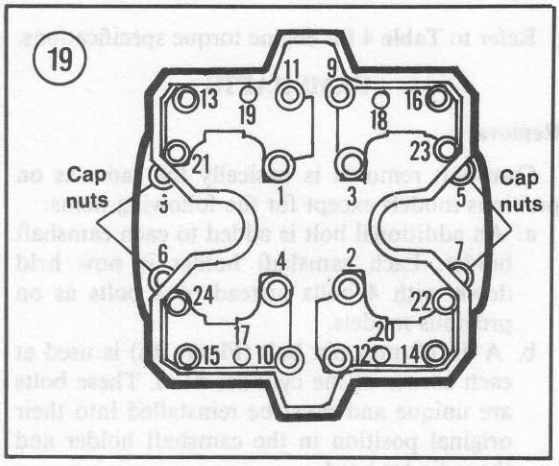


Installation

Camshaft installation is the same as on previous models except for the additional bolt added to each camshaft holder. Be sure to install the 6×62 mm pin bolts (**Figure 16**) into their original position in the camshaft holder and cylinder head. Tighten the bolts securing the camshaft holders in the torque pattern shown in **Figure 19** in 2-3 stages to the following torque specifications:

a. 6 mm bolts: 10-14 N•m (7-10 ft.-lb.).
b. 8×130 mm bolts: 21-25 N•m (15-18 ft.-lb.).
c. 8×151 mm bolts: 43-47 N•m (31-34 ft.-lb.).
d. Cylinder head cap nuts: 30-34 N•m (22-25 ft.-lb.).

If the cylinder head was removed, tighten the cap nuts to this specified torque value. Even if the cylinder head cap nuts were not removed, check their torque values.



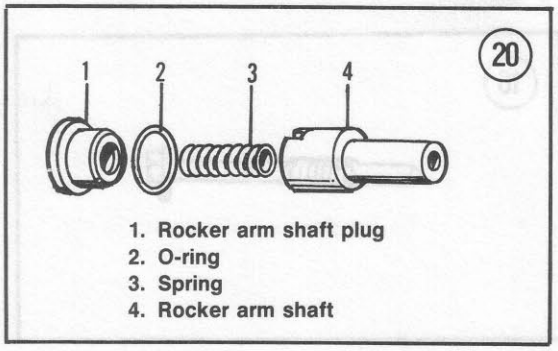
ROCKER ARM ASSEMBLIES

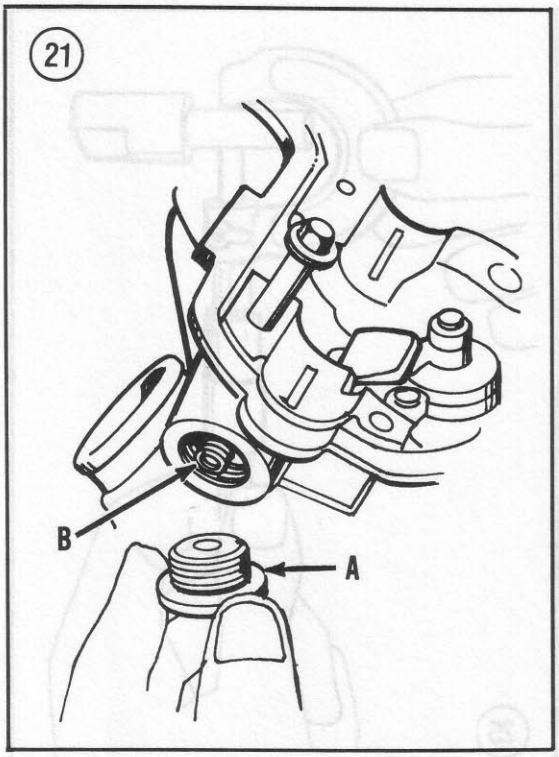
The rocker arms are all identical (same Honda part No.) but they will develop different wear patterns during use. It is recommended that one rocker arm assembly at a time be disassembled, inspected and then assembled to avoid interchanging parts.

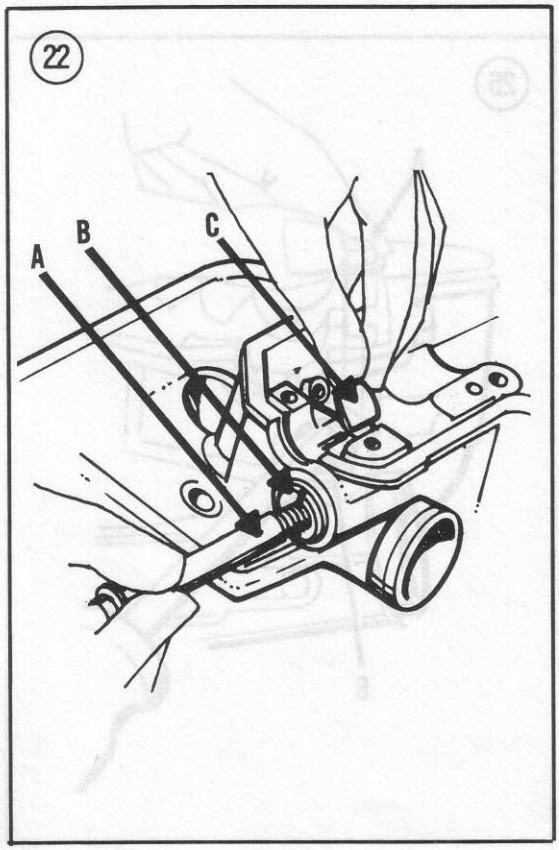
Removal/Inspection/Installation

Refer to **Figure 20** for this procedure.

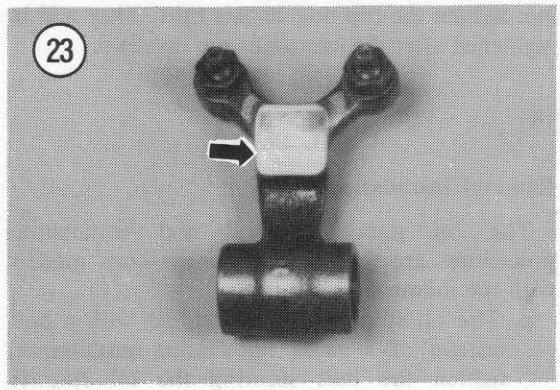
1. Unscrew the rocker arm shaft plug (A, **Figure 21**) then remove the spring (B, **Figure 21**).

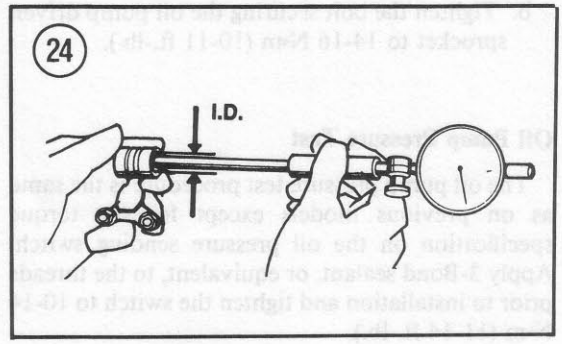




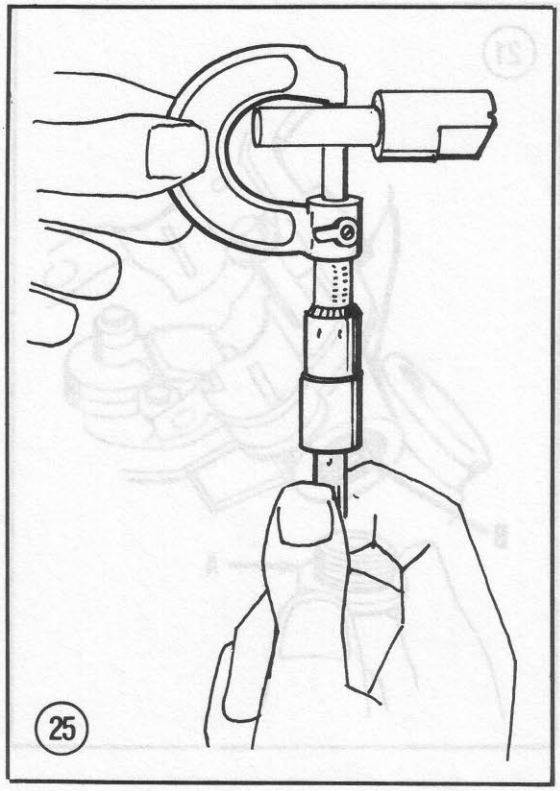


2. Screw a 10 mm bolt (A, **Figure 22**) into the rocker arm shaft (B, **Figure 22**).
3. Withdraw the 10 mm bolt and the rocker arm shaft from the cylinder head then remove the rocker arm (C, **Figure 22**) and wave washer.
4. Wash all parts in solvent and thoroughly dry.
5. Inspect the rocker arm pad (**Figure 23**) where it rides on the cam lobe and where the adjusters ride on the valve stems. If the pad is scratched or unevenly worn, inspect the cam lobe for scoring, chipping or flat spots. Replace the rocker arm if defective.
6. Measure the inside diameter of the rocker arm (**Figure 24**) and check against dimensions listed in **Table 5**. Replace if worn to the service limit dimension or greater.
7. Inspect the rocker arm shaft for signs of wear or scoring. Measure the outside diameter of the rocker arm shaft (**Figure 25**) and check against dimensions listed in **Table 5**. Replace if worn to the service limit dimension or less.
8. Apply a light coat of molybdenum disulfide grease to the rocker arm shaft and rocker arm bore.
9. Install the wave washer onto the rocker arm shaft and partially install the shaft into the cylinder head. Position the rocker arm into the cavity in the cylinder head and push the rocker arm shaft all the way in.





10. Insert a 6 mm pin bolt (A, **Figure 26**) into the cylinder head while aligning the cutout in the rocker arm shaft (B, **Figure 26**) with a flat bladed screwdriver.
11. Make sure the O-ring seal is in good condition and is in place on the rocker arm shaft plug.
12. Apply Loctite Lock N' Seal No. 271 (or equivalent) to the threads of the rocker arm shaft plug.
13. Install the spring and the rocker arm shaft plug. Tighten the plug to 45-55 N•m (33-40 ft.-lb.).
14. Remove the 6 mm pin bolt from the cylinder head.
15. Repeat for all rocker arm shafts.



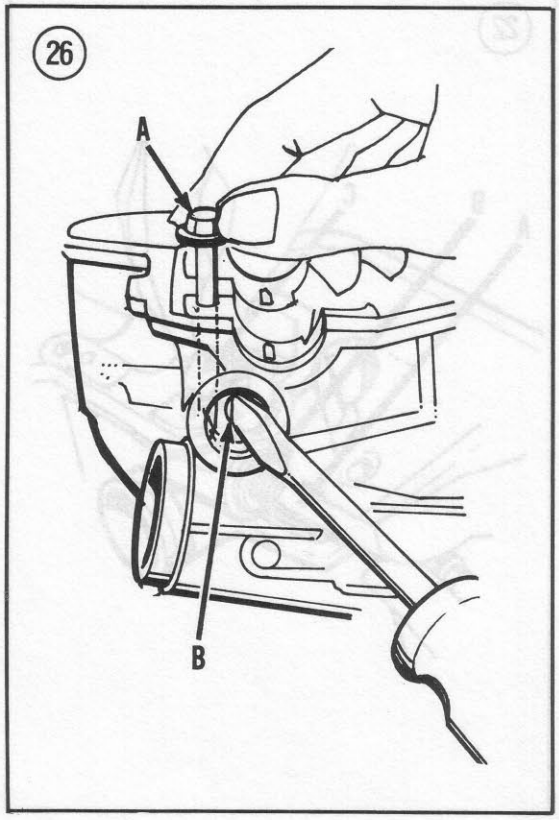
CYLINDER HEADS

Removal/Installation

The cylinder head removal and installation procedures are the same as on previous models except that the cylinder head hold down bolts used on previous models have been replaced with threaded studs and cap nuts. The threaded studs are screwed into the cylinder block.

To prevent cylinder head warpage, loosen the cap nuts (**Figure 27**) 1/2 turn at a time in a crisscross pattern.

During installation, install the cap nuts but *do not* tighten the cap nuts at this time. They will be tightened after the camshafts are installed.



OIL PUMP

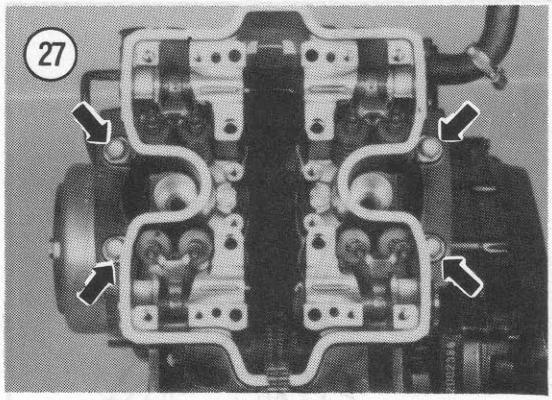
Removal/Installation

The oil pump removal and installation procedures are the same as on previous models with the following exceptions:

a. The oil strainer is now held in with a bolt instead of a press fit. During installation, tighten the bolt securing the oil strainer securely.
b. Tighten the bolt securing the oil pump driven sprocket to 14-16 N•m (10-11 ft.-lb.).

Oil Pump Pressure Test

The oil pump pressure test procedure is the same as on previous models except for the torque specification on the oil pressure sending switch. Apply 3-Bond sealant, or equivalent, to the threads prior to installation and tighten the switch to 10-14 N•m (11-14 ft.-lb.).



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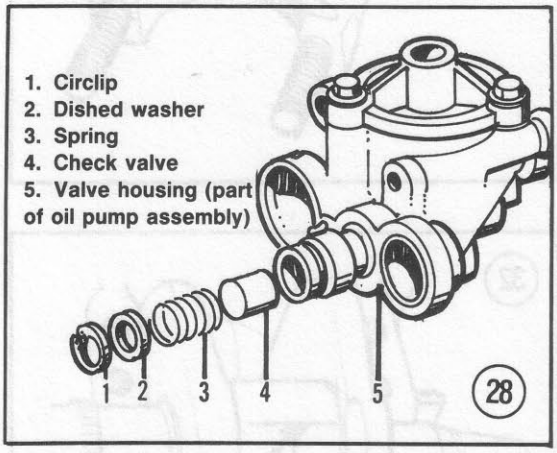

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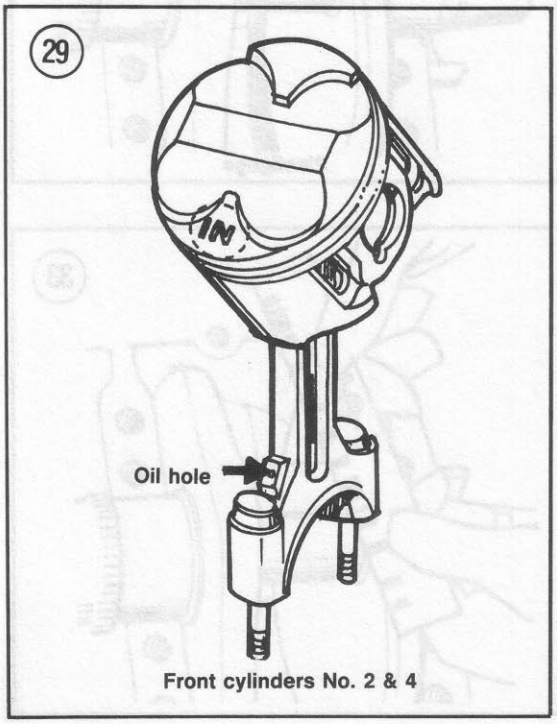


29

Front cylinders No. 2 & 4

OIL STRAINER AND PRESSURE RELIEF VALVE

The oil strainer and presure relief valve removal and installation procedures are the same as on previous models with the following exceptions:

a. The oil strainer is now held in with a bolt instead of a press fit. During installation, tighten the bolt securing the oil strainer securely.
b. The pressure relief valve is pressed into place in the oil pump and cannot be removed.
c. Refer to **Figure 28** and disassemble, inspect and assemble the pressure relief valve using the procedure described in Chapter Four in the main body of this book.

CYLINDER BLOCK AND CRANKCASE

The cylinder block and crankcase disassembly and assembly procedures are the same as on previous models except for the torque specification on the oil pressure sending switch. Apply 3-Bond sealant, or equivalent, to the threads prior to installation and tighten the switch to 10-14 N•m (11-14 ft.-lb.).

PISTONS AND CONNECTING RODS

Piston Assembly

The piston assembly procedures are the same as on previous models except for the following:

a. The identification marks on the connecting rods are different from previous models. The front cylinders are marked "MF2-F" and the rear cylinders are marked "MF2-R".
b. The relationship of the IN mark on the piston to the oil hole in the connecting rod is the same as on previous models. Refer to **Figure 29** for front cylinders and **Figure 30** for rear cylinders.

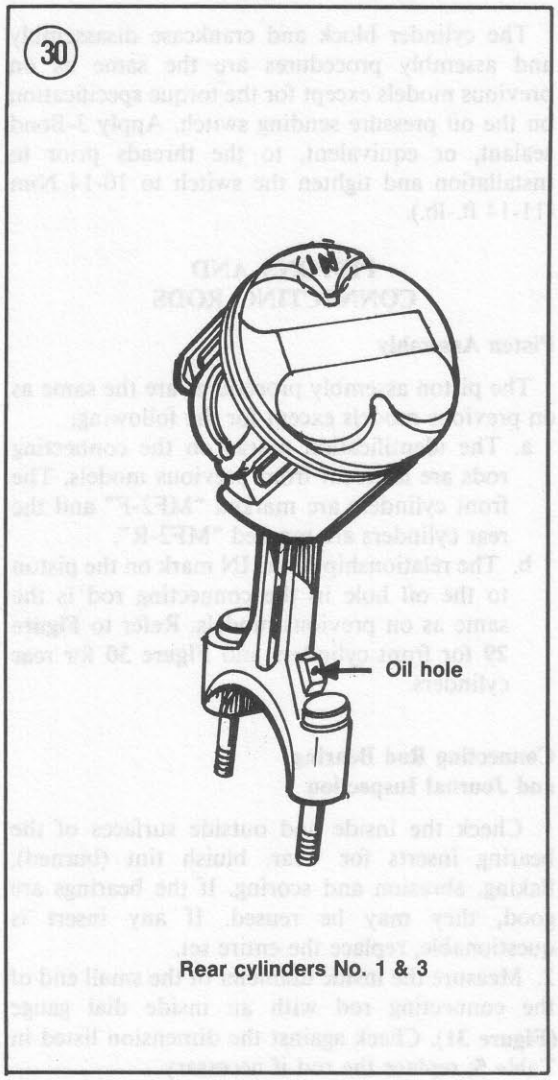
Connecting Rod Bearing and Journal Inspection

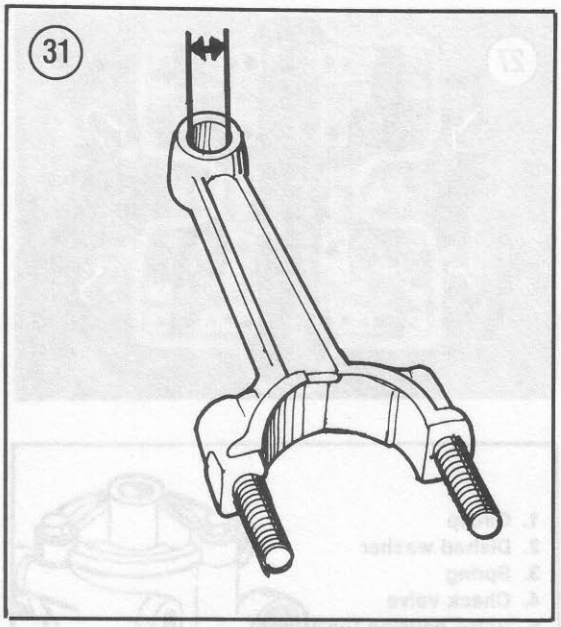
1. Check the inside and outside surfaces of the bearing inserts for wear, bluish tint (burned), flaking, abrasion and scoring. If the bearings are good, they may be reused. If any insert is questionable, replace the entire set.
2. Measure the inside diameter of the small end of the connecting rod with an inside dial gauge (**Figure 31**). Check against the dimension listed in **Table 5**; replace the rod if necessary.

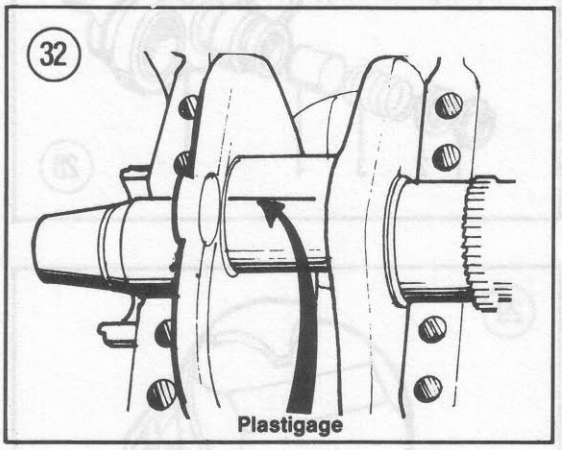
3. Clean the rod bearing inserts and the bearing surfaces of the crankshaft. Measure the rod bearing clearance by performing the following steps.
4. Install the piston/connecting rod assemblies into the correct cylinder as described in Chapter Four in the main body of this book.
5. Place a strip of Plastigage material over each rod bearing journal parallel to the crankshaft (**Figure 32**). Do not place the Plastigage material over an oil hole in the crankshaft.

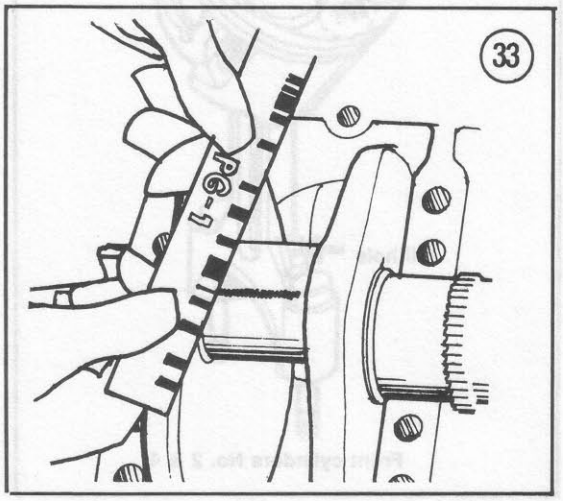
NOTE
Do not rotate the crankshaft while the Plastigage strips are in place.

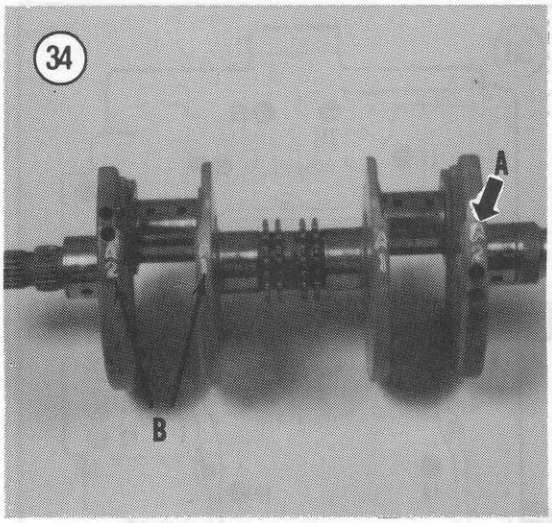
6. Install the rod cap onto one rod and tighten the nuts to the torque specification listed in **Table 4**.
7. Remove the rod cap and measure the width of the flattened Plastigage material (**Figure 33**)

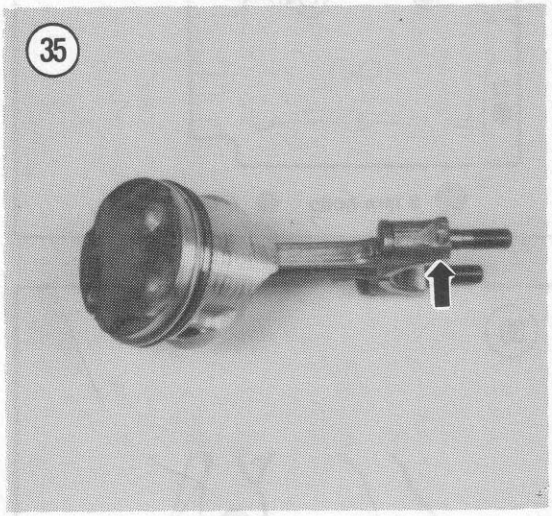


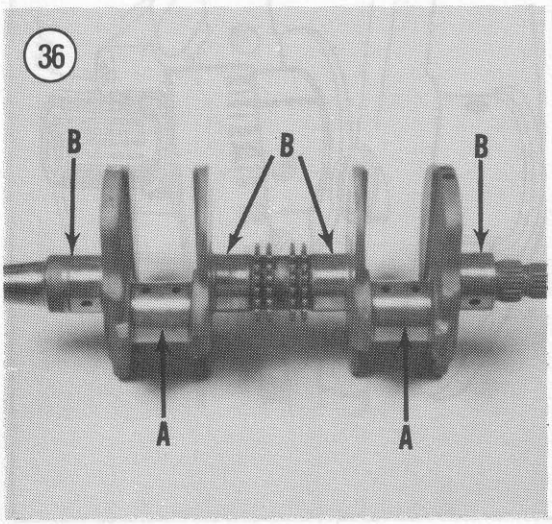












following the manufacturer's instructions. Measure both ends of the Plastigage strip. A difference of 0.025 mm (0.001 in.) or more indicates a tapered journal. Confirm with a micrometer. New bearing clearance and the service limit are listed in **Table 5**. Remove all of the Plastigage material from the crankshaft journals and the connecting rods.

8. If the rod bearing clearance is greater than specified, use the following steps for new bearing selection.
9. The crankshaft rod journals are marked with letters "A," "B" or "C" (A, **Figure 34**) on the counterbalance weights. The connecting rods are marked with numbers "1," "2" or "3" (**Figure 35**).
10. Measure the rod journal (A, **Figure 36**) with a micrometer. If the rod journal dimension is within the tolerances stated for each letter code in **Table 6** the bearing can be simply selected by color code. Select new bearings by cross-referencing the rod journal letters (A, **Figure 34**) in the horizontal column of **Table 6** to the rod bearing number (**Figure 35**) in the vertical column. Where the 2 columns intersect, the new bearing color is indicated. **Table 7** gives the bearing insert color and thickness.
11. If any rod bearing journal measurements taken during inspection do not fall within the tolerance range for the stamped letter codes, the serviceability of the crankshaft must be carefully examined. If the rod bearing journal in question is not tapered, out-of-round or scored the crankshaft may be still used. However, the bearing selection will have to be made based on the measured diameter of the bearing journal and not by the stamped letter code. Honda recommends the crankshaft be replaced whenever a rod bearing journal dimension is beyond the specified range of the stamped letter code.
12. After new bearings have been installed, recheck clearance by repeating this procedure.
13. Repeat Steps 6-12 for the other 3 cylinders.

CRANKSHAFT

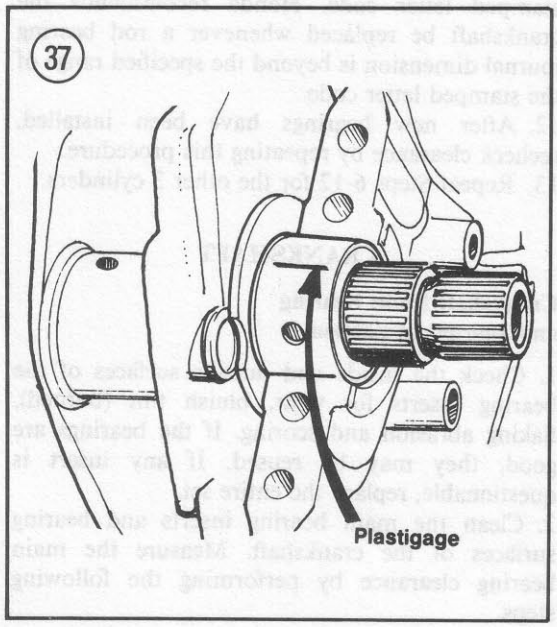
Crankshaft Main Bearing and Journal Inspection

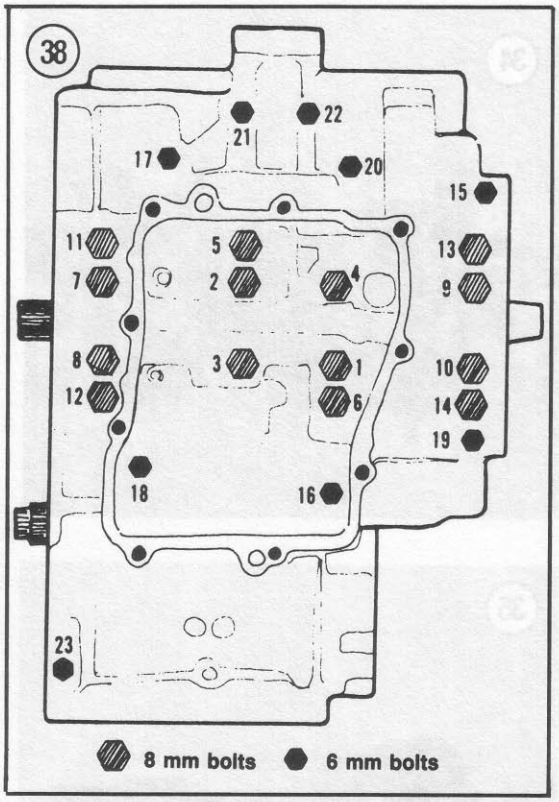
1. Check the inside and outside surfaces of the bearing inserts for wear, bluish tint (burned), flaking abrasion and scoring. If the bearings are good, they may be reused. If any insert is questionable, replace the entire set.
2. Clean the main bearing inserts and bearing surfaces of the crankshaft. Measure the main bearing clearance by performing the following steps.

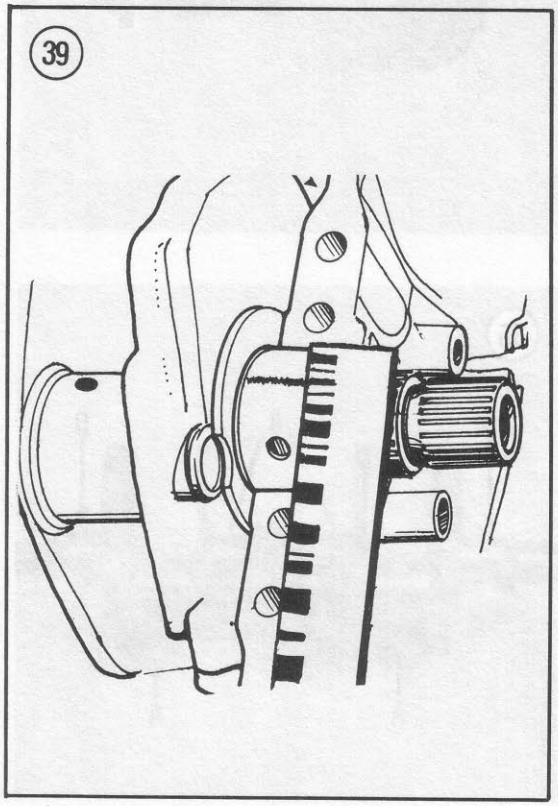
3. Set the cylinder block upside down on the workbench on wood blocks.
4. Install the existing main bearing inserts into the upper crankcase.
5. Install the crankshaft into the upper crankcase.
6. Place a strip of Plastigage material over each main bearing journal parallel to the crankshaft (**Figure 37**). Do not place the Plastigage strip over an oil hole in the crankshaft.

NOTE
Do not rotate the crankshaft while the Plastigage strips are in place.

7. Install the existing bearing inserts into the lower crankcase.
8. Carefully turn the lower crankcase over and install it onto the cylinder block.
9. Apply oil to the threads of all lower crankcase bolts and install them into the crankcase. Tighten them in 2-3 steps in the torque sequence shown in **Figure 38**. Tighten to the torque specifications listed in **Table 4**.
10. Remove the crankcase bolts in the reverse order of installation.
11. Carefully remove the lower crankcase and measure the width of the flattened Plastigage material following manufacturer's instructions. Measure both ends of the Plastigage strip (**Figure 39**). A difference of 0.025 mm (0.001 in.) or more indicates a tapered journal. Confirm with a micrometer. New bearing clearance and service limit dimensions are listed in **Table 5**. Remove the Plastigage strips from all bearing journals.





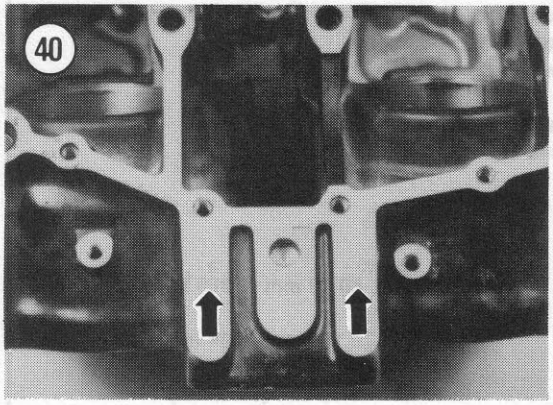


12. If the bearing clearance is greater than specified, use the following steps for new bearing selection.
13. The crankshaft main journals are marked with numbers "1" or "2" (B, **Figure 34**). The cylinder block is marked with letters "A" or "B" (**Figure 40**) on the mating surface at the front.

NOTE

The letter on the left-hand end relates to the bearing insert in the left-hand side and so on, working across from left to right. Remember, the left-hand side relates to the engine as it sits in the bike's frame, not as it sits on your workbench.

14. Measure the main journal (B, **Figure 36**) with a micrometer. If the main journal dimension is within the tolerances stated for each number code in **Table 8** the bearing can be simply selected by color-code. Select new main bearings by cross-referencing the main journal number (B, **Figure 34**) in the horizontal column of **Table 8** to the crankcase bearing letter (**Figure 40**) in the vertical column. Where the 2 columns intersect, the new bearing color is indicated. **Table 9** gives the bearing insert color and thickness.



15. If any main bearing journal measurements taken during inspection do not fall within the tolerance range for the stamped letter codes, the serviceability of the crankshaft must be carefully examined. If the main bearing journal in question is not tapered, out-of-round or scored the crankshaft may be still used. However, the bearing selection will have to be made based on the measured diameter of the bearing journal and not by the stamped letter code. Honda recommends the crankshaft be replaced whenever a main bearing journal dimension is beyond the specified range of the stamped letter code.
16. After new bearings have been installed, recheck clearance by repeating this procedure.

STARTER CLUTCH ASSEMBLY, STARTER GEARS AND PRIMARY DRIVE GEARS

The starter clutch assembly service procedures are the same as on previous models with the exception of the torque specification for the bolt securing the starter clutch to the crankshaft. Refer to **Table 4** for torque specifications.

Table 4 ENGINE TORQUE SPECIFICATIONS

Item	N•m	ft.-lb.
Engine mounting bolts		
Front and rear through-bolts	35-45	25-32
Sub-frame Allen bolts	35-45	25-32
Cylinder head cover	8-12	6-9
Cam holder bolts		
6 mm bolts	10-14	7-10
8 mm bolts	30-40	22-25
Cam sprocket bolts	18-20	13-14
Cam guide bolts	30-34	22-25
Rocker arm shaft plug	45-55	33-40
Valve adjuster locknuts	9-12	6-9
Cylinder head nuts	30-34	22-25
Crankcase bolts		
6 mm	10-14	7-10
8 mm	21-25	15-18
	22-26	16-19

(continued)

Table 4 ENGINE TORQUE SPECIFICATIONS (continued)

Item	N·m	ft.-lb.
Connecting rod cap nuts		
Alternator rotor bolt	50-60	36-43
Starter clutch bolt	70-80	51-58
Oil pass pipe	10-14	7-10
Oil pipe union bolts	20-25	7-10
Oil pressure switch*	10-14	7-10
Oil pump driven sprocket bolt	14-16	10-11
Spark plugs	12-16	9-12
Oil pan drain plug	35-40	25-29

* Apply liquid sealant to threads prior to installation.

Table 5 ENGINE SPECIFICATIONS

Item	Specifications	Wear limit
General		
Engine type	Water-cooled, 4-stroke, DOHC, V-4	
Bore and stroke	60.0×44.0 mm (2.36×1.73 in.)	
Displacement	498 cm² (30.4 cu. in.)	
Compression ratio	11.0 to 1	
Valve train	Dual-row roller type drive chain OHC and rocker arms	
Lubrication	Wet sump	
Air filtration	Replaceable paper element type	
Engine weight (dry)	60.0 kg (132 lb.)	
Cylinders		
Bore	60.000-60.015 mm (2.3622-2.3628 in.)	60.10 mm (2.366 in.)
Out of round	—	0.10 mm (0.004 in.)
Piston/cylinder clearance	0.01-0.055 mm (0.0004-0.002 in.)	0.10 mm (0.004 in.)
Pistons		
Diameter	59.96-59.99 mm (2.3606-2.3618 in.)	59.85 mm (2.365 in.)
Clearance in bore	0.01-0.05 mm (0.0004-0.002 in.)	0.10 mm (0.004 in.)
Piston pin bore	16.002-16.008 mm (0.6300-0.6302 in.)	16.06 mm (0.632 in.)
Piston pin outer diameter	15.994-16.000 mm (0.6297-0.630 in.)	15.98 mm (0.629 in.)
Piston rings		
Number per piston		
Compression	2	
Oil control	1	
Ring end gap		
Top and second	0.10-0.30 mm (0.004-0.012 in.)	0.50 mm (0.020 in.)
Oil (side rail)	0.30-0.90 mm (0.012-0.035 in.)	1.1 mm (0.04 in.)
Ring side clearance		
Top and second	0.015-0.045 mm (0.0006-0.0018 in.)	0.10 mm (0.004 in.)

(continued)

Table 5 ENGINE SPECIFICATIONS (continued)

Item	Specifications	Wear limit
Connecting rod		
Small end inner diameter	16.016-16.034 mm (0.6305-0.6313 in.)	16.08 mm (0.633 in.)
Crankshaft		
Runout	—	0.03 mm (0.001 in.)
Main bearing oil clearance	0.025-0.049 mm (0.0010-0.0019 in.)	0.07 mm (0.0028 in.)
Connecting rod oil clearance	0.032-0.050 mm (0.0013-0.0020 in.)	0.07 mm (0.0028 in.)
Connecting rod big end side clearance	0.10-0.30 mm (0.004-0.012 in.)	0.4 mm (0.016 in.)
Camshaft		
Cam lobe height		
Intake	34.78-34.94 mm (1.369-1.376 in.)	34.74 mm (1.368 in.)
Exhaust	34.98-35.07 mm (1.377-1.381 in.)	34.94 mm (1.376 in.)
Runout	—	0.05 mm (0.002 in.)
Oil clearance @		
Location A	0.030-0.072 mm (0.0012-0.0028 in.)	0.076 mm (0.0030 in.)
Location B	0.118-0.160 mm (0.0047-0.0063 in.)	0.164 mm (0.0065 in.)
Location C	0.118-0.160 mm (0.0047-0.0063 in.)	0.164 mm (0.0065 in.)
Holder journal ID Intake and exhaust	24.000-24.021 mm (0.9449-0.9457 in.)	24.031 mm (0.9461 in.)
Valves		
Valve stem outer diameter		
Intake	4.975-4.990 mm (0.1959-0.1965 in.)	4.97 mm (0.196 in.)
Exhaust	4.955-4.970 mm (0.1951-0.1957 in.)	4.94 mm (0.195 in.)
Valve guide inner diameter		
Intake and exhaust	5.000-5.012 mm (0.1969-0.1973 in.)	5.04 mm (0.198 in.)
Stem to guide clearance		
Intake	0.010-0.037 mm (0.0004-0.0015 in.)	0.07 mm (0.003 in.)
Exhaust	0.030-0.057 mm (0.0012-0.0022 in.)	0.10 mm (0.004 in.)
Valve seat width		
Intake and exhaust	0.90-1.10 mm (0.035-0.043 in.)	1.5 mm (0.06 in.)
Valve springs free length		
Outer	35.66 mm (1.404 in.)	34.36 mm (1.353 in.)
Inner	32.35 mm (1.274 in.)	30.65 mm (1.207 in.)
Cylinder head warpage	—	0.10 mm (0.004 in.)
Oil pump		
Inner rotor tip to outer clearance	0.15 mm (0.006 in.)	0.20 mm (0.008 in.)
Outer rotor to body clearance	0.15-0.21 mm (0.006-0.008 in.)	0.35 mm (0.014 in.)
End clearance to body	0.04-0.09 mm (0.002-0.004 in.)	0.12 mm (0.005 in.)
Oil pump pressure @ switch		
All models	5.4 kg/cm² (77 psi)	

13

Table 6 CONNECTING ROD BEARING SELECTION

Crankpin journal OD size code letter and dimension	Letter A 32.994-33.000 mm (1.2990-1.2992 in.)	Letter B 32.988-32.994 mm (1.2987-1.2990 in.)	Letter C 32.982-32.988 mm (1.2985-1.2987 in.)
Connecting rod ID code number and dimension			
Number 1 36.000-36.006 mm (1.4173-1.4176 in.)	Yellow	Green	Brown
Number 2 36.006-36.012 mm (1.4176-1.4178 in.)	Green	Brown	Black
Number 3 36.012-36.018 mm (1.4178-1.418 in.)	Brown	Black	Blue

Table 7 CONNECTING ROD BEARING INSERT THICKNESS

Color	mm	in.
Blue	1.497-1.500	0.0589-0.0591
Black	1.494-1.497	0.0588-0.0589
Brown	1.491-1.494	0.0587-0.0588
Green	1.488-1.491	0.0586-0.0587
Yellow	1.485-1.488	0.0585-0.0586

Table 8 MAIN JOURNAL BEARING SELECTION

	Main journal OD size code letter and dimension	
	Number 1 32.010-32.002 mm (1.260-1.2599 in.)	Number 2 31.994-32.002 mm (1.2596-1.2599 in.)
Crankcase ID letter code and dimension		
Letter A 35.000-35.008 mm (1.3780-1.3783 in.)	Yellow	Green
Letter B 35.008-35.016 mm (1.3783-1.3786 in.)	Green	Brown

Table 9 MAIN JOURNAL BEARING INSERT THICKNESS

Color	mm	in.
Brown	1.498-1.502	0.0590-0.0591
Green	1.490-1.498	0.0588-0.0590
Yellow	1.490-1.494	0.0587-0.0588

CHAPTER FIVE

CLUTCH AND TRANSMISSION

CLUTCH

Assembly/Installation

The assembly and installation procedures are the same as on previous models except for the torque specification for the bolt securing the oil pump driven sprocket. Tighten the bolt to the torque specification listed in **Table 4**.

CHAPTER SIX

FUEL AND EXHAUST SYSTEMS AND EMISSION CONTROLS

CARBURETOR SERVICE

The carburetors are basically the same as previous models with the exception of the model numbers and some specifications. Refer to **Table 10** for carburetor specifications.

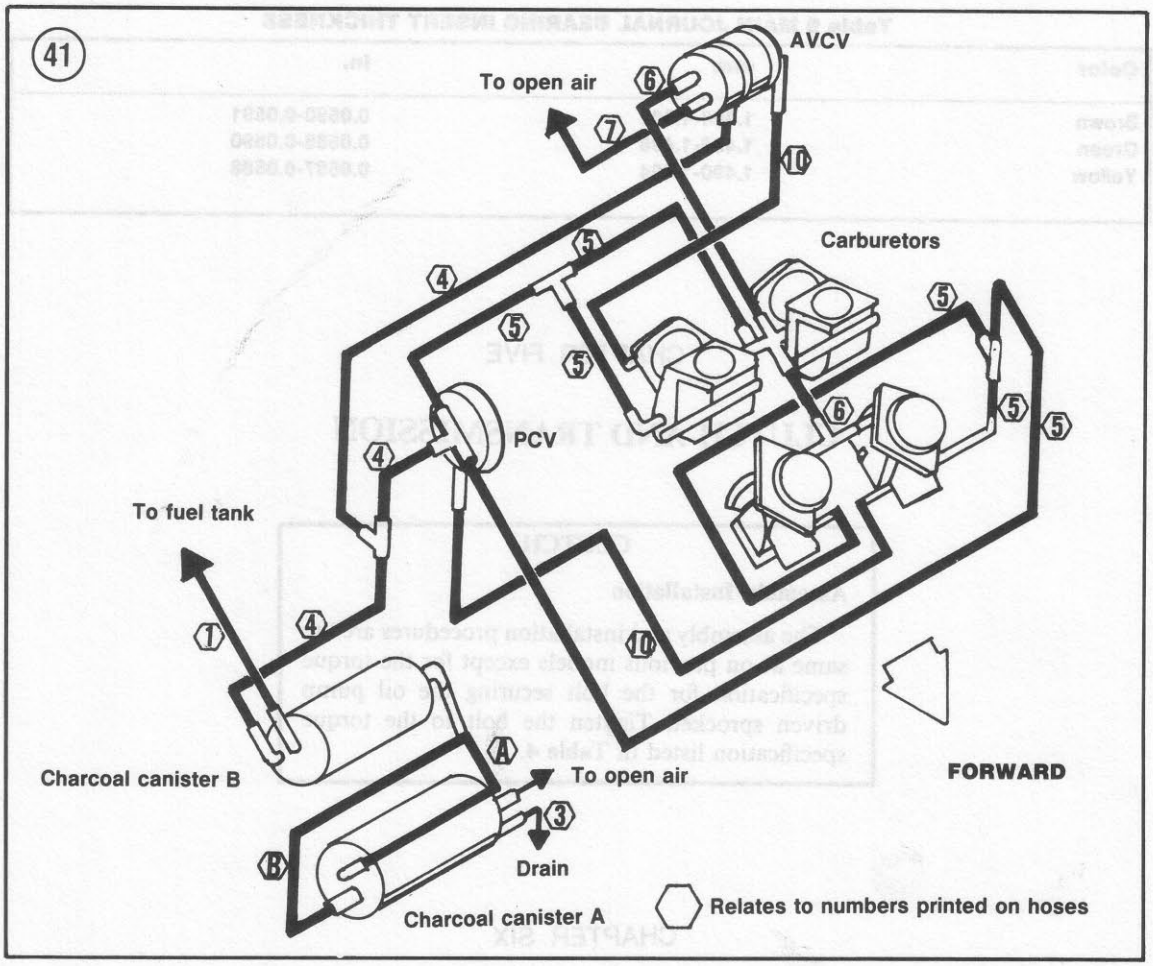
Removal/Installation

The removal and installation is the same as previous models except for the hoses for the evaporation emission control system on California models.

The hoses are numbered and correspond to the numbers on the label attached to the inside surface of the right-hand side cover. The hose layout and numbers are also shown in **Figure 41**. Even though the hoses are marked (the marks may have worn off) tag all hoses and fittings with masking tape so the hoses will be reconnected to their original positions. Disconnect the hoses from the carburetor assembly. Leave the emission control AVCV valve and the PCV valve and their respective hoses attached to the frame.

Disassembly/Inspection/Assembly

The disassembly, inspection and assembly procedures are the same as on previous models with the exception of the marks on the jet needles. Since 1986 the jet needles are the same on all 4 carburetors.



CARBURETOR ADJUSTMENTS

Float Adjustment

The float adjustment proedure is the same as on previous models with the exception of the float height. The correct float height is listed in **Table 10**.

Pilot Screw Adjustment And Plug Installation

The pilot screw adjustment procedure is the same as on previous models with the exception of the initial pilot screw setting for the preliminary adjustment. The correct initial setting is listed in **Table 10**.

Fuel Pump

The fuel pump has been eliminated on 1986 models.

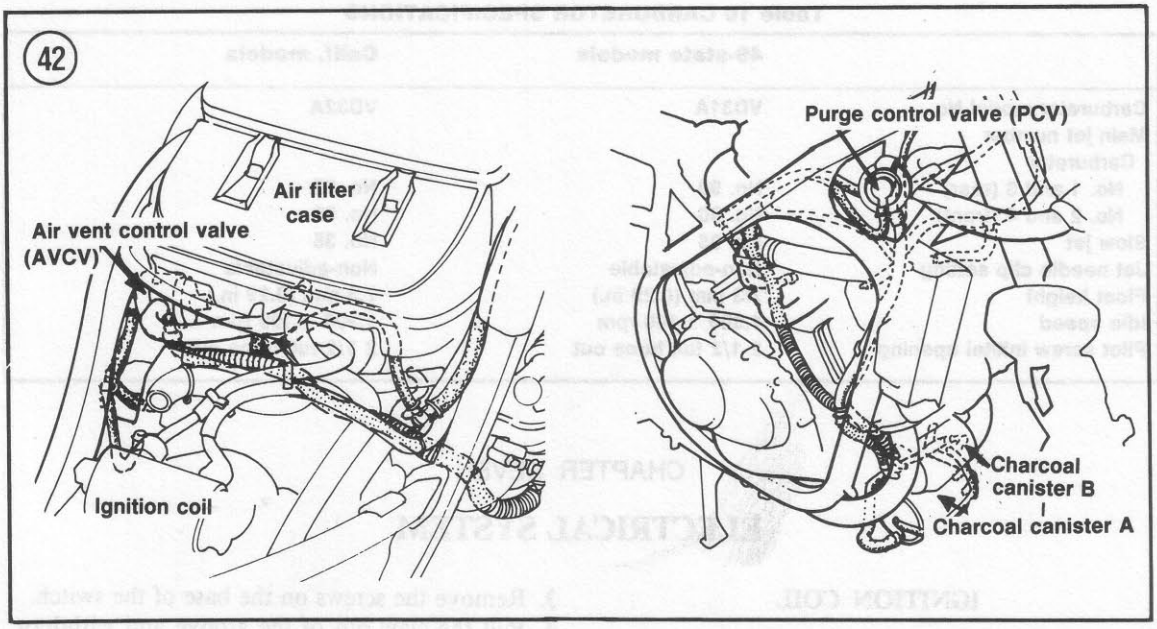
EVAPORATIVE EMISSION CONTROL SYSTEMS (CALIFORNIA MODELS ONLY)

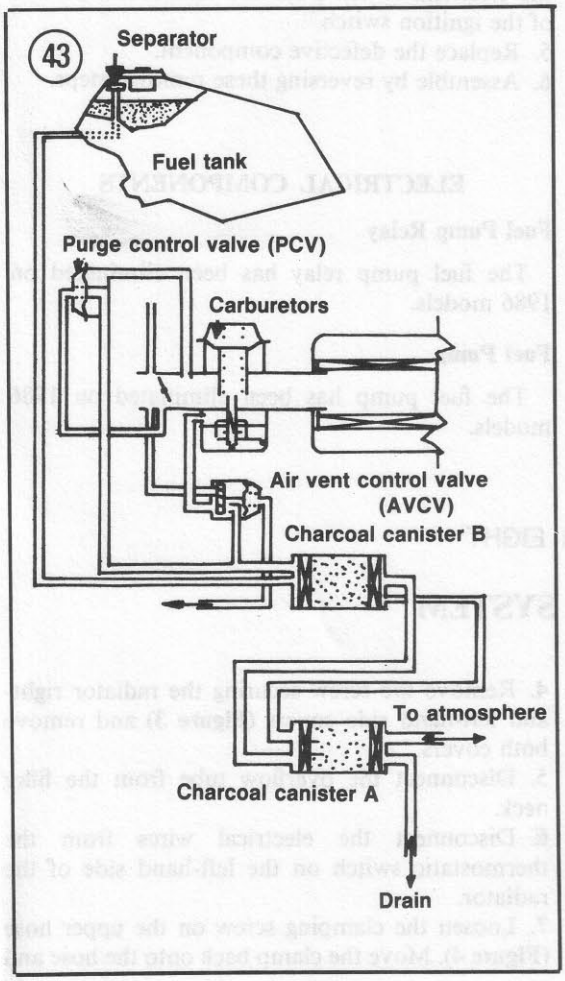
Fuel vapor from within the fuel tank is routed into 2 charcoal canisters. This vapor is stored when the engine is not running. When the engine is running these vapors are drawn through a purge control valve and into the carburetors to be burned.

Make sure all hose clamps are tight. Check all hoses for deterioration and replace as necessary.

Figure 42 and **Figure 43** show the layout and hose routing to the various parts of the system.

The hoses are numbered and correspond to the numbers on the label attached to the inside surface of the right-hand side cover. These numbers are also shown in **Figure 41**. Even though the hoses are marked (the marks may have worn off) tag all hoses and fittings with a piece of masking tape so the hoses will be reconnected to their original positions.





Removal/Installation

1. Remove the seat.
2. Remove the fuel tank as described in Chapter Six in the main body of this book.

NOTE

Prior to removing the hoses from the purge control valve (PCV) and the air vent control valve (AVCV), mark the hose and the fitting with a piece of masking tape and identify where the hose goes.

3. Disconnect the hoses from the purge control valve going to the carburetor assembly and to charcoal canister "B."
4. Disconnect the hoses from the air vent control valve going to the carburetor assembly, air filter air box and to charcoal canister "B."
5. Pull the vacuum hoses from the clips on the frame.
6. Remove the purge control valve and the air vent control valve from the mounting tabs on the frame.
7. Remove the bolts, collars, rubber bushings and mounting brackets securing charcoal canister "A" and charcoal canister "B" to the frame member. Remove both charcoal canisters.
8. Install by reversing these removal steps, noting the following.
9. Be sure to install each hose to its correct place on the purge control valve and the air vent control valve. Make sure that the hoses are not twisted or kinked.

Table 10 CARBURETOR SPECIFICATIONS

	49-state models	Calif. models
Carburetor model No.	VD31A	VD32A
Main jet number		
Carburetor		
No. 1 and 3 (rear)	No. 90	No. 92
No. 2 and 4 (front)	No. 90	No. 92
Slow jet	No. 35	No. 35
Jet needle clip setting	Non-adjustable	Non-adjustable
Float height	7.3 mm (0.29 in.)	7.3 mm (0.29 in.)
Idle speed	1,300 ±100 rpm	1,300 ±100 rpm
Pilot screw initital opening	2 1/2 full turns out	2 1/2 full turns out

CHAPTER SEVEN

ELECTRICAL SYSTEM

IGNITION COIL

Continuity Test

The service procedure is the same as on previous models with the exception of the secondary coil resistance value.

Use an ohmmeter set at R×1,000 and measure between the secondary lead receptacle in the coil and one of the mounting bolts. The specified resistance is 14,000 ohms.

SWITCHES

Ignition Switch Disassembly/Assembly

1. Insert the ignition key and turn the tumbler in between the ON and OFF position.
2. Unfasten the plastic lock band.
3. Remove the screws on the base of the switch.
4. Pull the claw out of the groove and withdraw the electrical switch from the mechanical portion of the ignition switch.
5. Replace the defective component.
6. Assemble by reversing these removal steps.

ELECTRICAL COMPONENTS

Fuel Pump Relay

The fuel pump relay has been eliminated on 1986 models.

Fuel Pump

The fuel pump has been eliminated on 1986 models.

CHAPTER EIGHT

COOLING SYSTEM

RADIATOR

Removal/Installation

Refer to **Figure 44** for this procedure.

1. Remove the front fairing as described in Chapter Twelve in the main body of this book.
2. Drain the cooling system as described in Chapter Three in the main body of this book.
3. Disconnect the cooling fan 2-pin electrical connector containing 2 wires on the left-hand side.
4. Remove the screw securing the radiator right- and left-hand side covers (**Figure 3**) and remove both covers.
5. Disconnect the overflow tube from the filler neck.
6. Disconnect the electrical wires from the thermostatic switch on the left-hand side of the radiator.
7. Loosen the clamping screw on the upper hose (**Figure 4**). Move the clamp back onto the hose and

off of the neck of the radiator and remove the hose from the radiator.

8. Remove the bolt securing the outer metal coolant pipe to the frame.

9. Loosen the clamping screw on the lower hose. Move the clamp back onto the hose and off of the neck of the radiator and remove the hose from the radiator.

10. Remove the bolt and collars on each side securing the radiator at the bottom.

11. Remove the bolt and collar securing the radiator at the top.

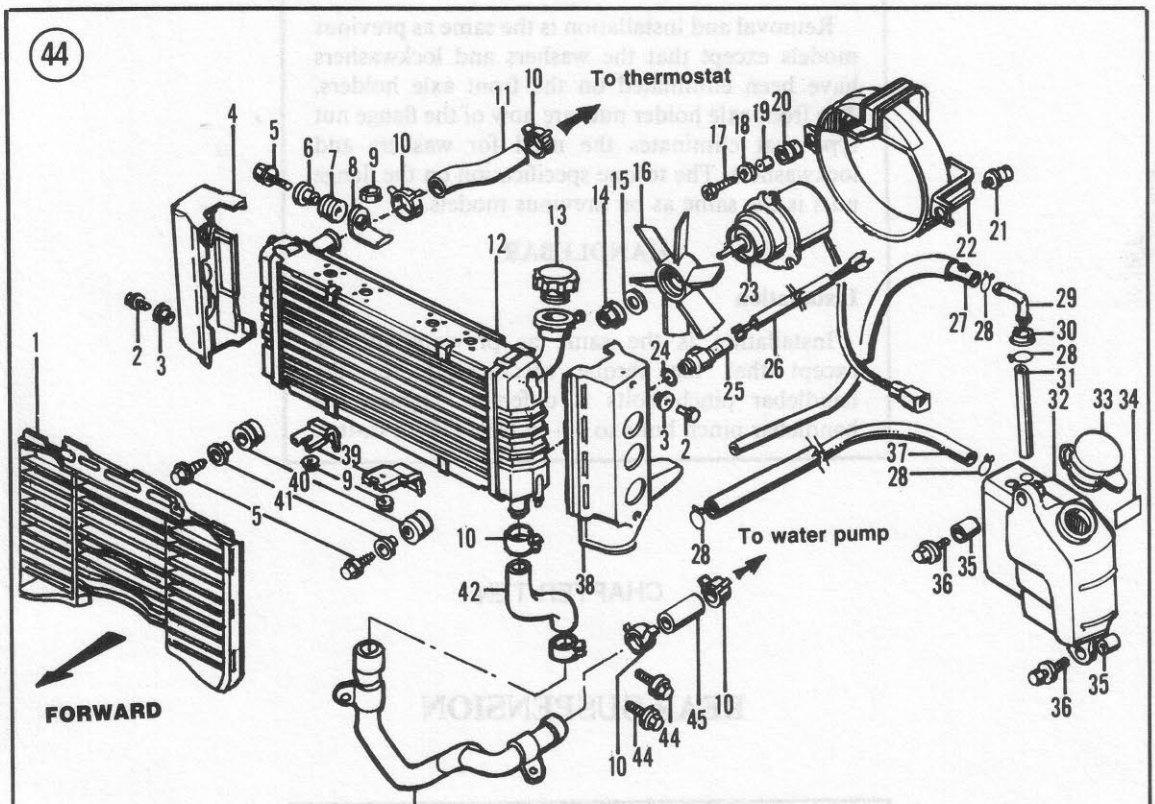
12. Pull the radiator slightly forward and down out of the frame.

13. Install by reversing these removal steps, noting the following.

14. Replace the radiator hoses if they are starting to deteriorate or are damaged.

15. Make sure the electrical connections are free of corrosion and are tight.

16. Refill the cooling system with the recommended type and quantity of coolant as described in Chapter Three.



1. Grille
2. Bolt
3. Collar
4. Right-hand trim cover
5. Bolt
6. Metal collar
7. Rubber grommet
8. Mounting bracket
9. Nut
10. Hose clamp
11. Hose
12. Radiator
13. Radiator cap
14. Nut
15. Washer
16. Fan blade
17. Bolt
18. Washer
19. Collar
20. Rubber grommet
21. Bolt
22. Shroud
23. Fan motor
24. O-ring
25. Thermostatic switch
26. Wiring harness
27. Overflow tube
28. Hose clamp
29. Fitting
30. Nut
31. Tube
32. Reserve tank
33. Cap
34. Label
35. Collar
36. Bolt
37. Hose
38. Left-hand trim cover
39. Mounting brackets
40. Rubber grommet
41. Metal collar
42. Radiator lower hose
43. Outer metal coolant pipe
44. Bolt
45. Hose

CHAPTER NINE

FRONT SUSPENSION AND STEERING

FRONT WHEEL

Removal/Installation

Removal and installation is the same as previous models except that the washers and lockwashers have been eliminated on the front axle holders. The front axle holder nuts are now of the flange nut type that eliminates the need for washers and lockwashers. The torque specification on the flange nuts is the same as on previous models.

HANDLEBAR

Installation

Installation is the same as previous models except that the torque specification for the handlebar pinch bolts is different. Tighten the handlebar pinch bolts to 35-45 N•m (25-32 ft.-lb.).

CHAPTER TEN

REAR SUSPENSION

REAR WHEEL

Removal/Installation

Rear wheel removal and installation is the same as on previous models except for the torque specification for the rear axle nut. Tighten the rear axle nut to 80-100 N•m (58-72 ft.-lb.).

INDEX

QUICK INDEX

A

B

C

D

E

F

H

I

K

L

M

O

P

R

S

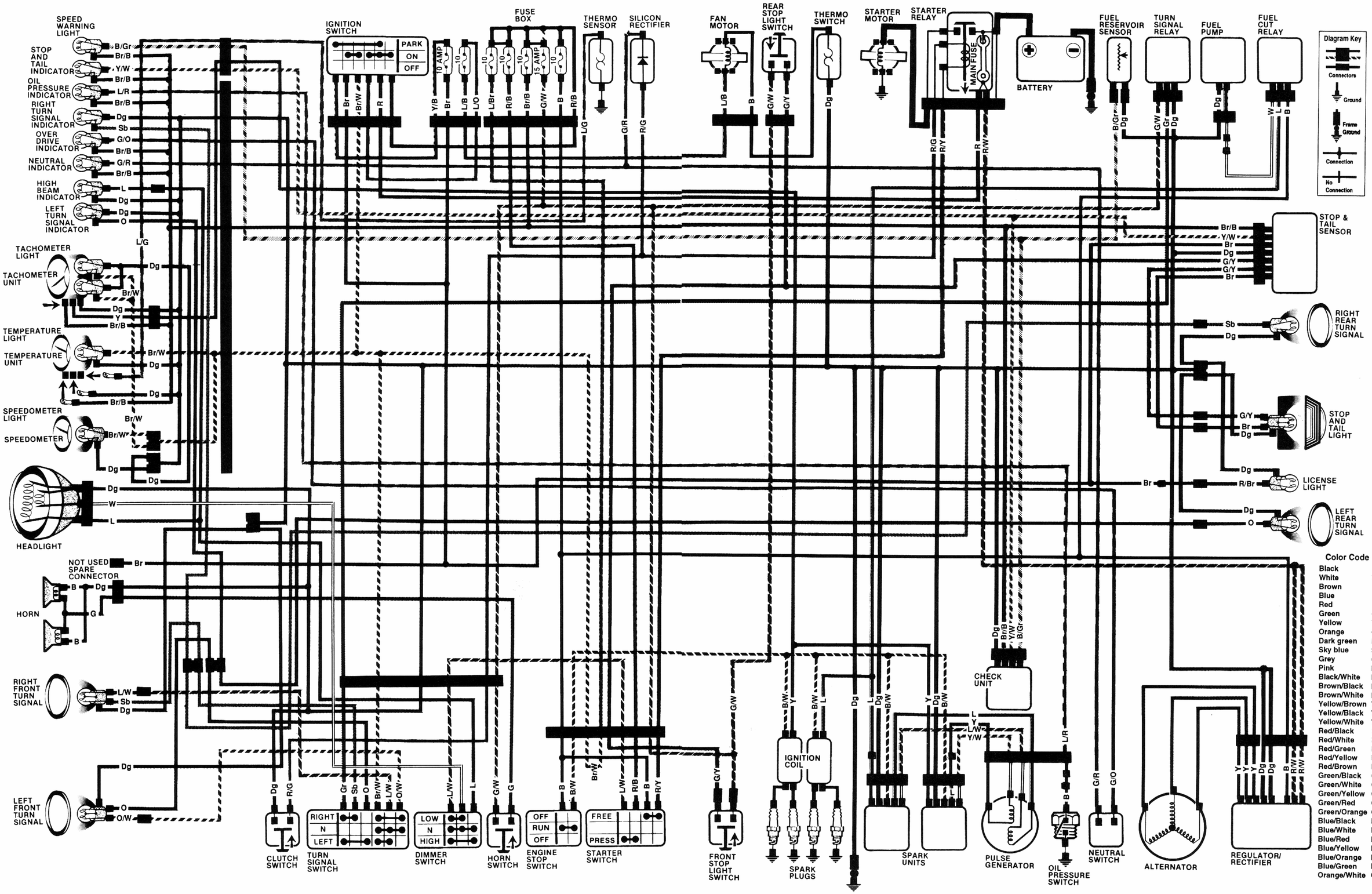
T

V

W

WIRING DIAGRAMS

1984-1985 VF500C Magna



Color Code

Black	B
White	W
Brown	Br
Blue	L
Red	R
Green	G
Yellow	Y
Orange	O
Dark green	Dg
Sky blue	Sb
Grey	Gr
Pink	P
Black/White	B/W
Brown/Black	Br/B
Brown/White	Br/W
Yellow/Brown	Y/Br
Yellow/Black	Y/B
Yellow/White	Y/W
Red/Black	R/B
Red/White	R/W
Red/Green	R/G
Red/Yellow	R/Y
Red/Brown	R/Br
Green/Black	G/B
Green/White	G/W
Green/Yellow	G/Y
Green/Red	G/R
Green/Orange	G/O
Blue/Black	L/B
Blue/White	L/W
Blue/Red	L/R
Blue/Yellow	L/Y
Blue/Orange	L/O
Blue/Green	L/G
Orange/White	O/W

1984-1986 VF500F Interceptor