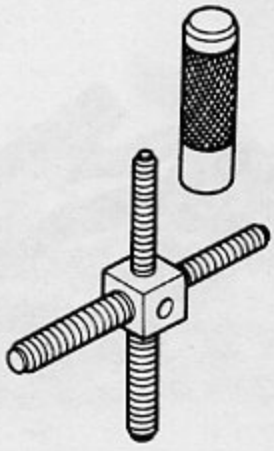
HONDA
Gold Wing 1200

1984 thru 1987 □ 1200cc

Owners Workshop Manual

Haynes

2199



Alternator rotor puller

open-ended ones, they offer the advantages of both types of wrench.

Combination wrench set (6 mm to 22 mm)
Adjustable wrench - 8 in
Spark plug socket (with rubber insert)
Spark plug gap adjusting tool
Feeler gauge set
Standard screwdriver (5/16 in x 6 in)
Phillips screwdriver (No. 2 x 6 in)
Allen (hex) wrench set (4 mm to 12 mm)
Combination (slip-joint) pliers - 6 in
Hacksaw and assortment of blades
Tire pressure gauge
Control cable pressure luber
Grease gun
Oil can
Fine emery cloth
Wire brush
Hand impact screwdriver and bits
Funnel (medium size)
Safety goggles
Drain pan
Work light with extension cord

Repair and overhaul tool set

These tools are essential for anyone who plans to perform major repairs and are intended to supplement those in the Maintenance and minor repair tool kit. Included is a comprehensive set of sockets which, though expensive, are invaluable because of their versatility (especially when various extensions and drives are available). We recommend the 3/8 inch drive over the 1/2 inch drive for general motorcycle maintenance and repair (ideally, the mechanic would have a 3/8 inch drive set and a 1/2 inch drive set).

Alternator rotor removal tool
Socket set(s)
Reversible ratchet
Extension - 6 in
Universal joint
Torque wrench (same size drive as sockets)
Ball pein hammer - 8 oz
Soft-faced hammer (plastic/rubber)
Standard screwdriver (1/4 in x 6 in)
Standard screwdriver (stubby - 5/16 in)
Phillips screwdriver (No. 3 x 8 in)
Phillips screwdriver (stubby - No. 2)
Pliers - locking
Pliers - lineman's
Pliers - needle nose
Pliers - snap-ring (internal and external)
Cold chisel - 1/2 in
Scriber
Scraper (made from flattened copper tubing)
Center punch
Pin punches (1/16, 1/8, 3/16 in)
Steel rule/straightedge - 12 in
Pin-type spanner wrench
A selection of files
Wire brush (large)

Note: *Another tool which is often useful is an electric drill with a chuck capacity of 3/8 inch (and a set of good quality drill bits).*

Special tools

The tools in this list include those which are not used regularly, are expensive to buy, or which need to be used in accordance with their manufacturer's instructions. Unless these tools will be used frequently, it is not very economical to purchase many of them. A consideration would be to split the cost and use between yourself and a friend or friends (i.e. members of a motorcycle club).

This list primarily contains tools and instruments widely available to the public, as well as some special tools produced by the vehicle manufacturer for distribution to dealer service departments. As a result, references to the manufacturer's special tools are occasionally included in the text of this manual. Generally, an alternative method of doing the job without the special tool is offered. However, sometimes there is no alternative to their use. Where this is the case, and the tool can't be purchased or borrowed, the work should be turned over to the dealer service department or a motorcycle repair shop.

Paddock stand (for models not fitted with a centerstand)
Valve spring compressor
Piston ring removal and installation tool
Piston pin puller
Telescoping gauges
Micrometer(s) and/or dial/Vernier calipers
Cylinder surfacing hone
Cylinder compression gauge
Dial indicator set
Multimeter
Adjustable spanner
Manometer or vacuum gauge set
Small air compressor with blow gun and tire chuck

Buying tools

For the do-it-yourselfer who is just starting to get involved in motorcycle maintenance and repair, there are a number of options available when purchasing tools. If maintenance and minor repair is the extent of the work to be done, the purchase of individual tools is satisfactory. If, on the other hand, extensive work is planned, it would be a good idea to purchase a modest tool set from one of the large retail chain stores. A set can usually be bought at a substantial savings over the individual tool prices (and they often come with a tool box). As additional tools are needed, add-on sets, individual tools and a larger tool box can be purchased to expand the tool selection. Building a tool set gradually allows the cost of the tools to be spread over a longer period of time and gives the mechanic the freedom to choose only those tools that will actually be used.

Tool stores and motorcycle dealers will often be the only source of some of the special tools that are needed, but regardless of where tools are bought, try to avoid cheap ones (especially when buying screwdrivers and sockets) because they won't last very long. There are plenty of tools around at reasonable prices, but always aim to purchase items which meet the relevant national safety standards. The expense involved in replacing cheap tools will eventually be greater than the initial cost of quality tools.

It is obviously not possible to cover the subject of tools fully here. For those who wish to learn more about tools and their use, there is a book entitled *Motorcycle Workshop Practice Manual* (Book no. 1454) available from the publishers of this manual. It also provides an intro-

wear. Replace the drum and bearing (Chapter 2).
5 Shift lever return spring weak or broken (Chapter 2).
6 Shift lever broken. Splines stripped out of lever or shaft, caused by allowing the lever to get loose or from dropping the machine. Replace necessary parts (Chapter 2).
7 Shift mechanism pawl broken or worn. Full engagement and rotary movement of shift drum results. Replace shaft assembly (Chapter 2).
8 Pawl spring broken. Allows pawl to float, causing sporadic shift operation. Replace spring (Chapter 2).

29 Jumps out of gear

1 Shift fork(s) worn. Overhaul the transmission (Chapter 2).
2 Gear groove(s) worn. Overhaul the transmission (Chapter 2).
3 Gear dogs or dog slots worn or damaged. The gears should be inspected and replaced. No attempt should be made to service the worn parts.

30 Overshifts

1 Pawl spring weak or broken (Chapter 2).
2 Shift drum stopper lever not functioning (Chapter 2).
3 Overshift limiter broken or distorted (Chapter 2).

Abnormal engine noise

31 Knocking or pinging

1 Carbon build-up in combustion chamber. Use of a fuel additive that will dissolve the adhesive bonding the carbon particles to the piston crown and chamber is the easiest way to remove the build-up. Otherwise, the cylinder head will have to be removed and decarbonized (Chapter 2).
2 Incorrect or poor quality fuel. Old or improper fuel can cause detonation. This causes the pistons to rattle, thus the knocking or pinging sound. Drain the old fuel and always use the recommended grade fuel (Chapter 4).
3 Spark plug heat range incorrect. Uncontrolled detonation indicates that the plug heat range is too hot. The plug in effect becomes a glow plug, raising cylinder temperatures. Install the proper heat range plug (Chapter 1).
4 Improper air/fuel mixture. This will cause the cylinders to run hot and lead to detonation. Clogged jets or an air leak can cause this imbalance (Chapter 4).

32 Piston slap or rattling

1 Cylinder-to-piston clearance excessive. Caused by improper assembly. Inspect and overhaul top end parts (Chapter 2).
2 Connecting rod bent. Caused by over-revving, trying to start a badly flooded engine or from ingesting a foreign object into the combustion chamber. Replace the damaged parts (Chapter 2).
3 Piston pin or piston pin bore worn or seized from wear or lack of lubrication. Replace damaged parts (Chapter 2).
4 Piston ring(s) worn, broken or sticking. Overhaul the top end (Chapter 2).
5 Piston seizure damage. Usually from lack of lubrication or overheating. Replace the pistons and bore the cylinders, as necessary (Chapter 2).
6 Connecting rod upper or lower end clearance excessive. Caused by excessive wear or lack of lubrication. Replace worn parts.

33 Valve noise

1 Incorrect valve clearances. Adjust the clearances by referring to Chapter 1.
2 Valve spring broken or weak. Check and replace weak valve springs (Chapter 2).
3 Camshaft or cylinder head worn or damaged. Lack of lubrication at high rpm is usually the cause of damage. Insufficient oil or failure to change the oil at the recommended intervals are the chief causes. Since there are no replaceable bearings in the head, the head itself will have to be replaced if there is excessive wear or damage (Chapter 2).

34 Other noise

1 Cylinder head gasket leaking.
2 Exhaust pipe leaking at cylinder head connection. Caused by improper fit of pipe(s) or loose exhaust flange. All exhaust fasteners should be tightened evenly and carefully. Failure to do this will lead to a leak.
3 Crankshaft runout excessive. Caused by a bent crankshaft (from over-revving) or damage from an upper cylinder component failure.
4 Engine mounting bolts loose. Tighten all engine mount bolts to the specified torque (Chapter 2).
5 Crankshaft bearings worn (Chapter 2 or Chapter 3).
6 Camshaft chain tensioner defective. Replace according to the procedure in Chapter 2.
7 Camshaft chain, sprockets or guides worn (Chapter 2).

Abnormal driveline noise

35 Clutch noise

1 Clutch housing/friction plate clearance excessive (Chapter 2).
2 Loose or damaged clutch pressure plate and/or bolts (Chapter 2).

36 Transmission noise

1 Bearings worn. Also includes the possibility that the shafts are worn. Overhaul the transmission (Chapter 2).
2 Gears worn or chipped (Chapter 2).
3 Metal chips jammed in gear teeth. Probably pieces from a broken clutch, gear or shift mechanism that were picked up by the gears. This will cause early bearing failure (Chapter 2).
4 Engine oil level too low. Causes a howl from transmission. Also affects engine power and clutch operation (Chapter 1).

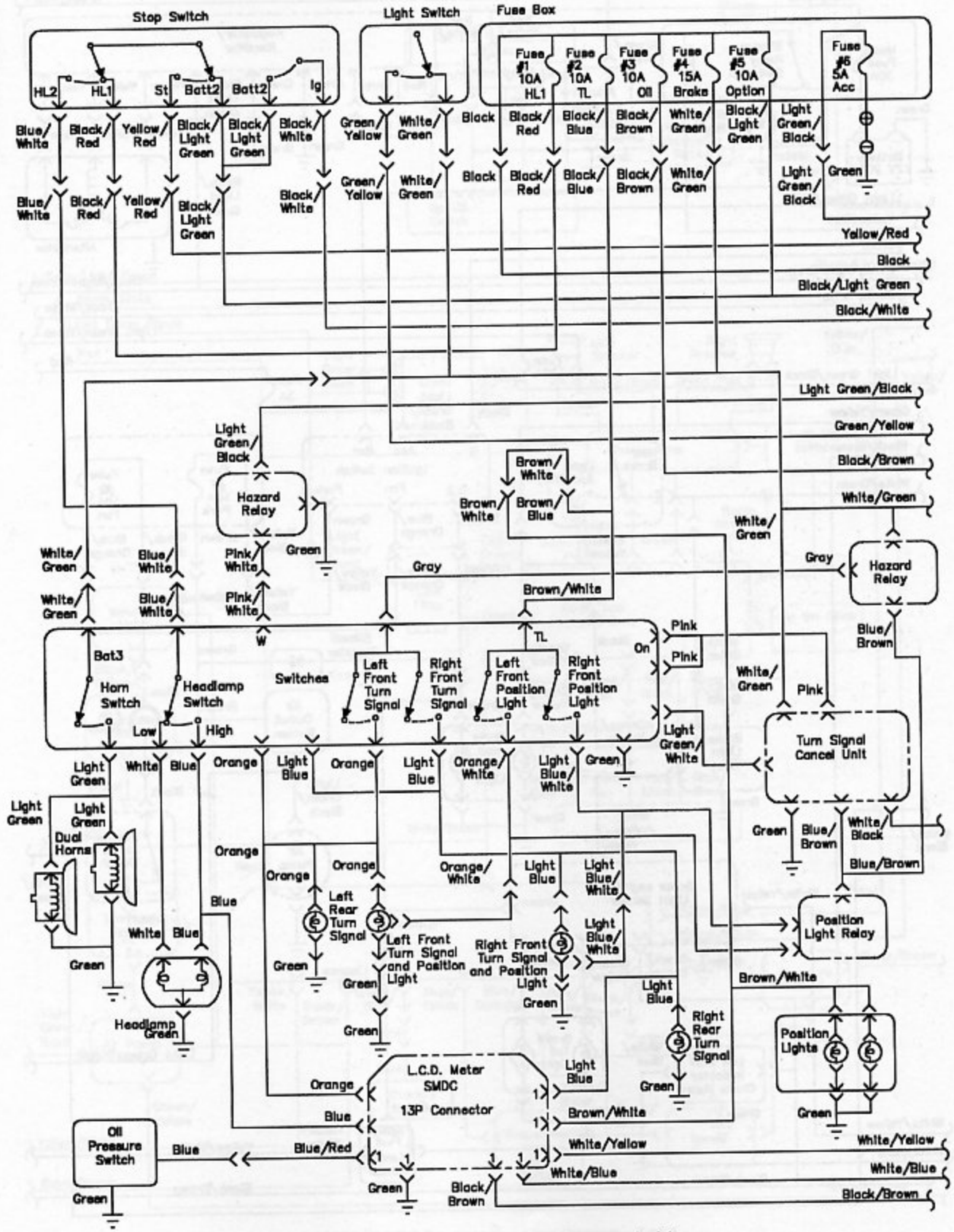
37 Final drive noise

1 Final drive oil level too low (Chapter 1).
2 Final drive gear lash out of adjustment.
3 Final drive gear(s) damaged or worn.

Abnormal frame and suspension noise

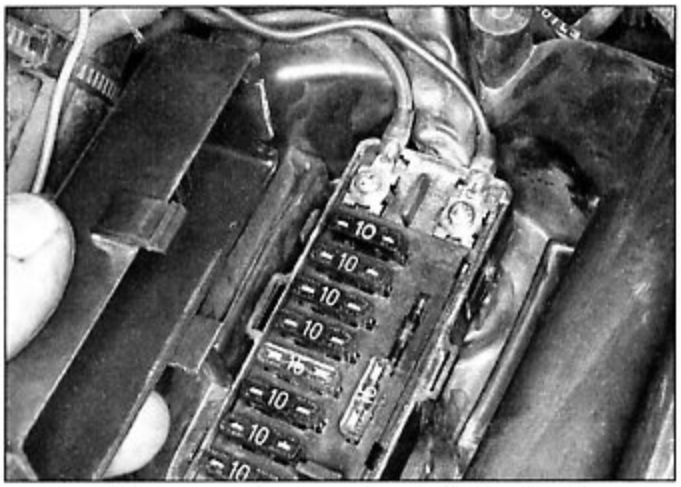
38 Front end noise

1 Low fluid level or improper viscosity oil in forks. This can sound



1986 GL1200 Aspencade wiring diagram - 1 of 4

5.1a The accessory fuses are beneath a cover inside the top compartment . . .



5.1b . . . spare fuses are stored in the fuse block

or knife and emery paper. Reconnect the cables and apply a thin coat of petroleum jelly to the connections to slow further corrosion.

5 The battery case should be kept clean to prevent current leakage, which can discharge the battery over a period of time (especially when it sits unused). Wash the outside of the case with a solution of baking soda and water. Do not get any baking soda solution in the battery cells. Rinse the battery thoroughly, then dry it.

6 If acid has been spilled on the frame or battery box, neutralize it with the baking soda and water solution, dry it thoroughly, then touch up any damaged paint. Make sure the battery vent tube (if equipped) is directed away from the frame and is not kinked or pinched.

7 If the motorcycle sits unused for long periods of time, disconnect the cables from the battery terminals. Refer to Section 4 and charge the battery approximately once every month.

4 Battery - removal, charging and installation

1 If the motorcycle sits idle for extended periods or if the charging system malfunctions, the battery can be charged from an external source.

2 To properly charge the battery, you will need a charger of the correct rating, a hydrometer, a clean rag and a syringe for adding distilled water to the battery cells.

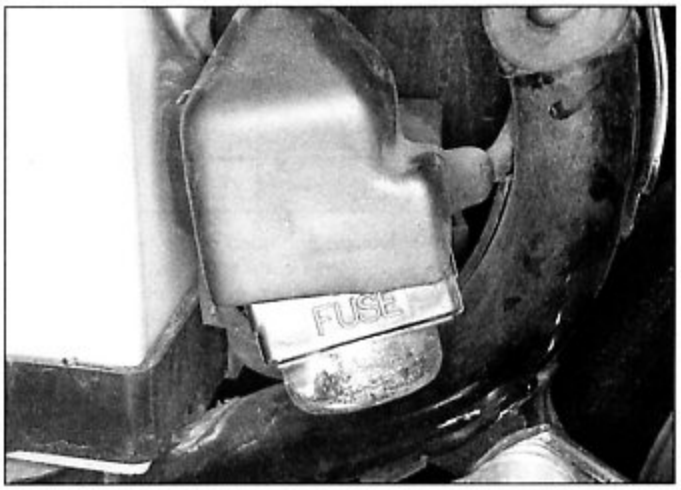
3 The maximum charging rate for any battery is 1/10 of the rated amp/hour capacity. As an example, the maximum charging rate for a 12 amp/hour battery would be 1.2 amps and the maximum charging rate for a 14 amp/hour battery would be 1.4 amps. If the battery is charged at a higher rate, it could be damaged.

4 Do not allow the battery to be subjected to a so-called quick charge (high rate of charge over a short period of time) unless you are prepared to buy a new battery.

5 When charging the battery, always remove it from the machine (see illustration 3.4) and be sure to check the electrolyte level before hooking up the charger. Add distilled water to any cells that are low.

6 Loosen the cell caps, hook up the battery charger leads (red to positive, black to negative), cover the top of the battery with a clean rag, then, and only then, plug in the battery charger. Warning: Remember, the gas escaping from a charging battery is explosive, so keep open flames and sparks well away from the area. Also, the electrolyte is extremely corrosive and will damage anything it comes in contact with.

7 Allow the battery to charge until the specific gravity is as specified (refer to Chapter 1 for specific gravity checking procedures). The charger must be unplugged and disconnected from the battery when making specific gravity checks. If the battery overheats or gases excessively, the charging rate is too high. Either disconnect the charger or lower the charging rate to prevent damage to the battery.



5.1c The main fuse is located next to the battery

8 It's time for a new battery if:

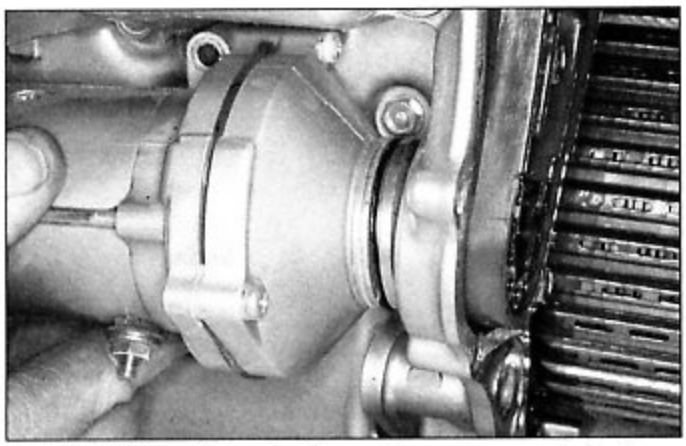
a) One or more of the cells is significantly lower in specific gravity than the others after a long slow charge;
b) The battery as a whole doesn't seem to want to take a charge;
c) Battery voltage won't increase;
d) The electrolyte doesn't bubble;
e) The plates are white (indicating sulfation) or debris has accumulated in the bottom of a cell;
f) The plates or insulators are warped or buckled.

9 When the battery is fully charged, unplug the charger first, then disconnect the leads from the battery. Install the cell caps and wipe any electrolyte off the outside of the battery case.

5 Fuses - check and replacement

Refer to illustrations 5.1a, 5.1b and 5.1c

1 These motorcycles have a fuse block containing accessory fuses and spares **(see illustrations)**. Fuse ratings and functions are printed on the cover. The fuse block is located under the tool tray in the top compartment. On 1987 Aspencade models, several relays are mounted on the fuse block. There's also a main fuse next to the battery **(see illustration)**. The cooling fan circuit is protected by an inline fuse in the fan wiring harness.



25.5 Pull the starter out of the engine and remove its O-ring

26 Charging system testing - general information and precautions

1 If the performance of the charging system is suspect, the system as a whole should be checked first, followed by testing of the individual alternator components (the brushes, slip rings and coils). **Note:** *Before beginning the checks, make sure the battery is fully charged and that all system connections are clean and tight.*

2 Checking the output of the charging system and the performance of the various components within the charging system requires the use of special electrical test equipment. A voltmeter and ammeter or a multimeter are the absolute minimum tools required. In addition, an ohmmeter is generally required for checking the remainder of the system.

3 When making the checks, follow the procedures carefully to prevent incorrect connections or short circuits, as irreparable damage to electrical system components may result if short circuits occur. Because of the special tools and expertise required, it is recommended that the job of checking the charging system be left to a dealer service department or a reputable motorcycle repair shop. **Caution:** *Never disconnect the battery cables from the battery while the engine is running. If the battery is disconnected, the alternator will be damaged.*

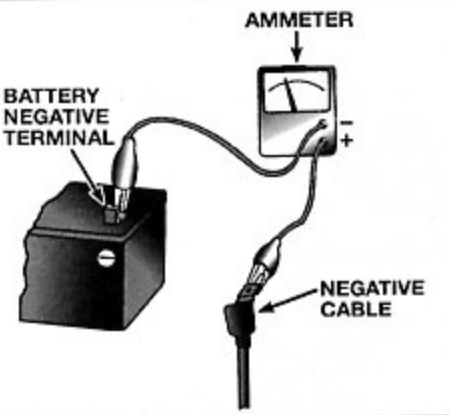
27 Charging system - leakage and output test

1 If a charging system problem is suspected, perform the following checks. Start by removing the left rear side cover for access to the battery (see Chapter 8).

Leakage test

Refer to illustration 27.3

2 Turn the ignition switch off and disconnect the cable from the battery negative terminal.



27.3 Checking the charging system leakage rate with an ammeter

3 Set the multimeter to the mA (milliamps) function and connect its negative probe to the battery negative terminal, and the positive probe to the disconnected negative cable **(see illustration)**. **Caution:** *Don't connect the ammeter between the battery terminals or the ammeter will be ruined.* Compare the reading to the value listed in this Chapter's Specifications.

4 If the reading is too high there is probably a short circuit in the wiring. Thoroughly check the wiring between the various components (see the wiring diagrams at the end of the book).

5 If the reading is satisfactory, disconnect the meter and connect the negative cable to the battery, tightening it securely. Check the alternator output as described below.

Output test

6 Warm the engine to normal operating temperature, then shut it off.

7 Remove the main fuse **(see illustration 5.1c)**. Connect an ammeter between the fuse holder terminals. **Note:** *The ammeter should be able to measure current flow in both directions.*

8 Connect the positive terminal of a voltmeter to the battery positive terminal and the voltmeter's negative terminal to the battery negative terminal (leave the battery cables connected to the battery).

9 Start the engine and let it idle. If the cooling fan is running, wait until it shuts off. Compare the ammeter and voltmeter readings to the values listed in this Chapter's Specifications. If they're not within the specified ranges, perform the tests in Section 28. **Note:** *If the voltmeter reading is above the specified range, the regulator/rectifier is probably defective.*

28 Regulator/rectifier - check and replacement

Refer to illustration 28.3

1 The regulator/rectifier is located inside the left side of the fairing.

2 Remove the seat and top compartment (see Chapter 8).

3 Follow the wiring harness from the regulator/rectifier to its connector and unplug it **(see illustration)**.

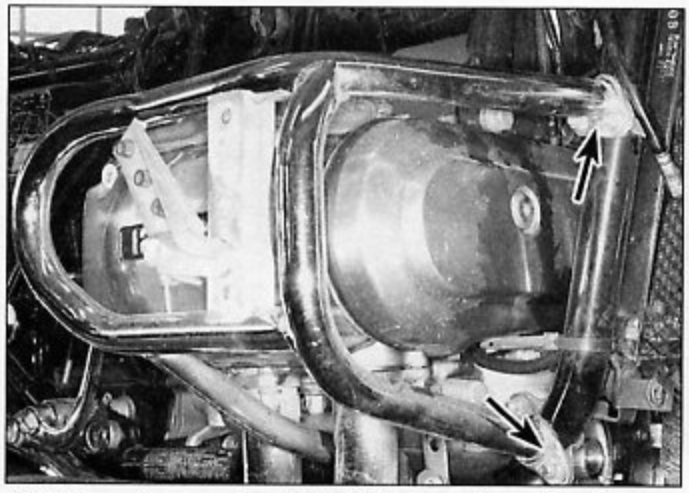
4 Connect an ohmmeter between the terminals in the regulator side of the connector (not the wiring harness side). Note the readings:

a) Positive to each of three yellows in turn, negative to green - 5 to 40 ohms
b) Positive to red-white, negative to each of three yellows in turn - 5 to 40 ohms
c) Positive to green, negative to each of three yellows in turn - no continuity (at least 6000 ohms)
d) Positive to each of three yellows in turn, negative to red-white - no continuity (at least 6000 ohms)

5 If the regulator doesn't test correctly, unbolt it and install a new one.

28.3 Unplug the regulator/rectifier connector at the bracket (arrow)

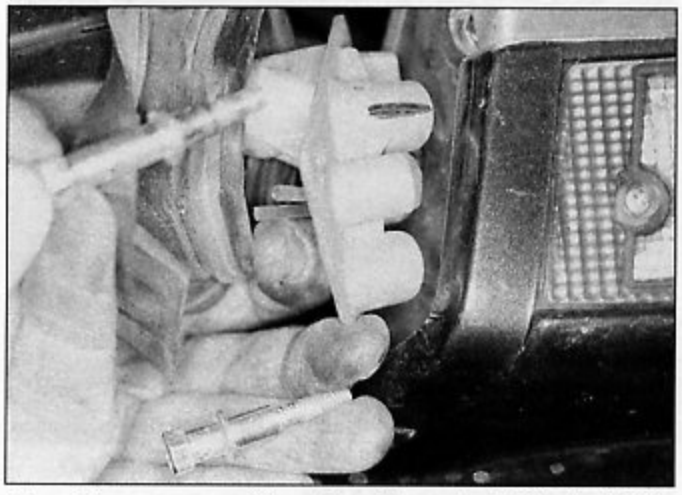
9



7.3 The engine guards are held to the frame by a pair of clamps (arrows); under the bike, they're attached to each other

8.1 The side cover posts fit into rubber grommets (arrows)

9.1 Pull back the mirror cover and remove the screws . . .



9.2 . . . The screws are different lengths; on installation, install the top screw first

3 Unbolt the front of the engine guard from the frame **(see illustration)**. Working beneath the bike, unbolt the engine guards from each other and take the guard out.

4 Installation is the reverse of the removal steps.

8 Side covers - removal and installation

Refer to illustration 8.1

1 Reach behind the cover and slowly pull the posts out of the rubber grommets on the frame, then take the cover off **(see illustration)**.

2 Installation is the reverse of the removal steps.

9 Mirrors - removal and installation

Refer to illustrations 9.1 and 9.2

1 Pull the mirror cover tabs free of the fairing and pull back the cover to expose the screws **(see illustration)**.

2 Undo the mirror screws and take the mirror off the bike **(see illustration)**.

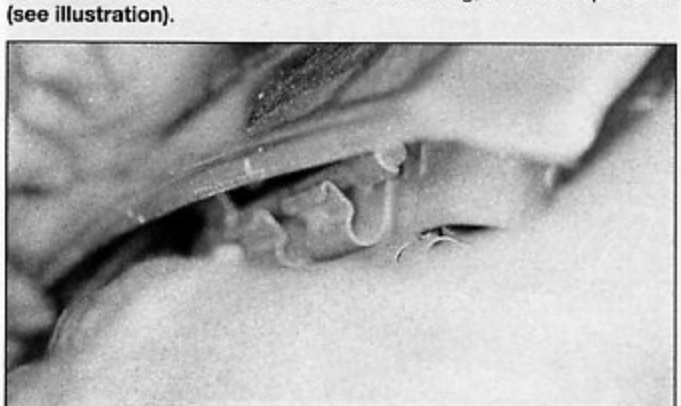
3 Installation is the reverse of the removal steps. The upper mirror screw is more difficult to align than the lower one, so start it first.

10 Windshield - removal and installation

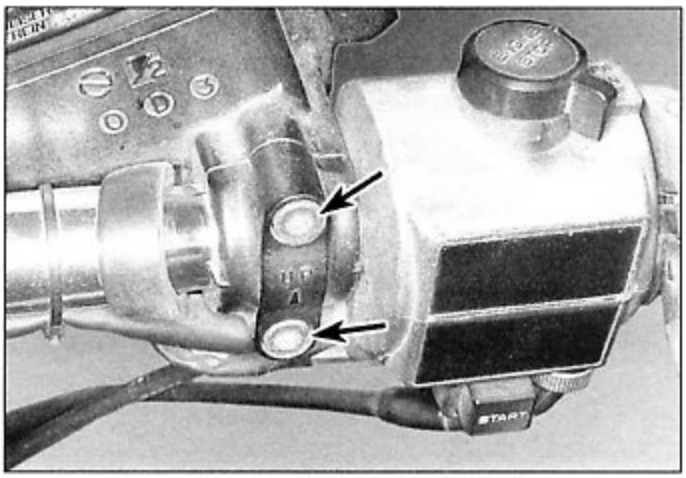
Refer to illustrations 10.2, 10.3a and 10.3b

1 Remove the mirrors (see Section 9). This detaches the outer ends of the windshield trim.

2 Free the trim from the bracket on the fairing, then lift it up and off **(see illustration)**.



10.2 Free the headlight trim clips from the bracket



5.7 Remove the Allen bolts (arrows) to separate the clamp from the master cylinder; on installation, the UP mark on the clamp must be upright

pattern, until the torque listed in this Chapter's Specifications is reached. Thoroughly clean off all grease from the brake disc(s) using acetone or brake system cleaner.

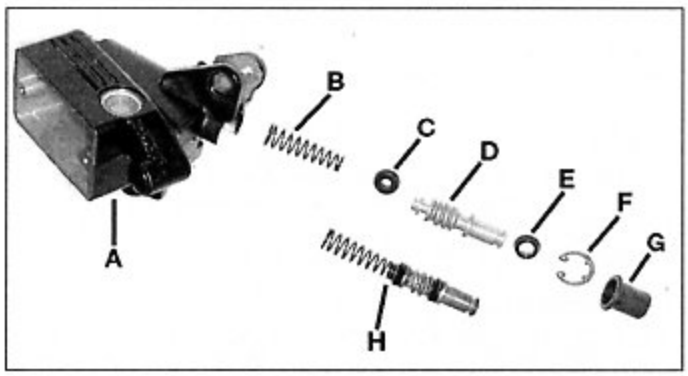
9 Install the wheel.

10 Operate the brake lever or pedal several times to bring the pads into contact with the disc. Check the operation of the brakes carefully before riding the motorcycle.

5 Front brake master cylinder - removal, overhaul and installation

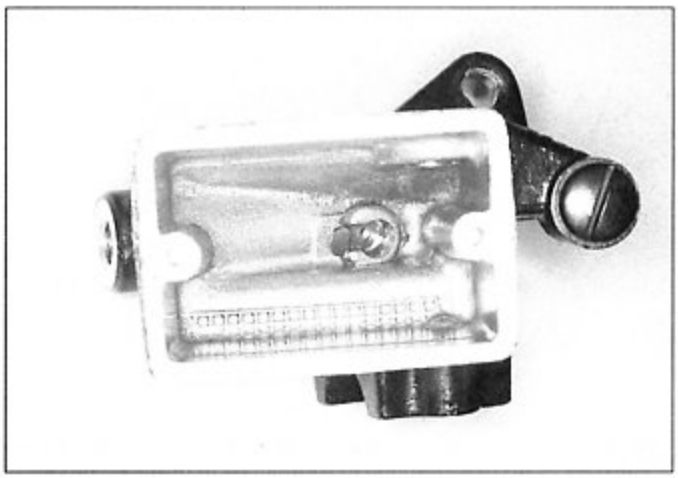
1 If the master cylinder is leaking fluid, or if the lever does not produce a firm feel when the brake is applied, and bleeding the brakes does not help, master cylinder overhaul is recommended. Before disassembling the master cylinder, read through the entire procedure and make sure that you have the correct rebuild kit. Also, you will need some new, clean brake fluid of the recommended type, some clean rags and internal snap-ring pliers. **Note:** *To prevent damage to the paint from spilled brake fluid, always cover plastic or plated parts when working on the master cylinder.*

2 **Caution:** *Disassembly, overhaul and reassembly of the brake master cylinder must be done in a spotlessly clean work area to avoid contamination and possible failure of the brake hydraulic system components.*



5.9 Front master cylinder details

A Cylinder body
B Spring
C Primary cup
D Piston
E Secondary cup
F Snap-ring
G Boot
H Assembled piston, cups and spring



5.8 Remove the baffle plate from the bottom of the reservoir

Removal

Refer to illustration 5.7

3 Loosen but do not remove the screws holding the reservoir cover in place.

4 Disconnect the electrical connectors from the brake light switch and the cruise cancel switch if equipped (see Chapter 9).

5 Remove the banjo fitting bolt and separate the brake hose from the master cylinder. Wrap the end of the hose in a clean rag and suspend the hose in an upright position or bend it down carefully and place the open end in a clean container. The objective is to prevent excessive loss of brake fluid, fluid spills and system contamination.

6 Remove the locknut from the underside of the lever pivot bolt, then unscrew the bolt.

7 Remove the master cylinder mounting bolts **(see illustration)** and separate the master cylinder from the handlebar.

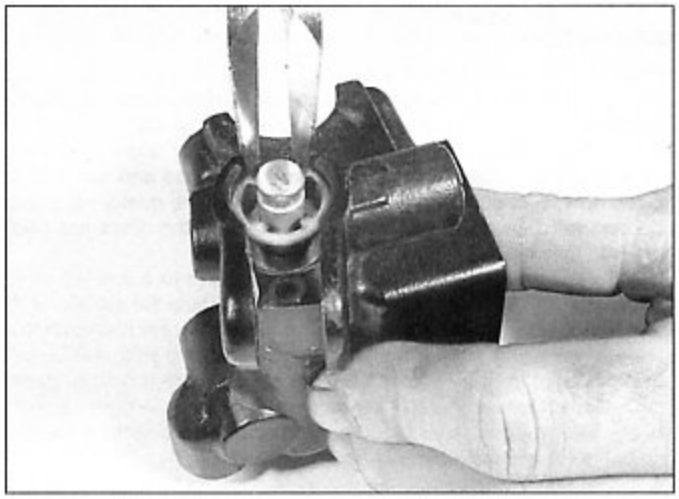
Overhaul

Refer to illustrations 5.8, 5.9 and 5.10

8 Detach the cover and the rubber diaphragm, then drain the brake fluid into a suitable container. Remove the plate from the bottom of the reservoir (if equipped) **(see illustration)**, then wipe any remaining fluid out of the reservoir with a clean rag.

9 Carefully remove the rubber dust boot from the end of the piston **(see illustration)**.

10 Using snap-ring pliers, remove the snap-ring **(see illustration)**



5.10 Remove the snap-ring from the cylinder bore

sides of the front wheel and on the left side of the rear wheel). It should be possible to push the seals in with even finger pressure, but if necessary use a seal driver, large socket or a flat piece of wood to drive the seals into place.

11 Clean off all grease from the brake disc(s) using acetone or brake system cleaner.

12 Refer to Section 12 or 13 and install the wheel.

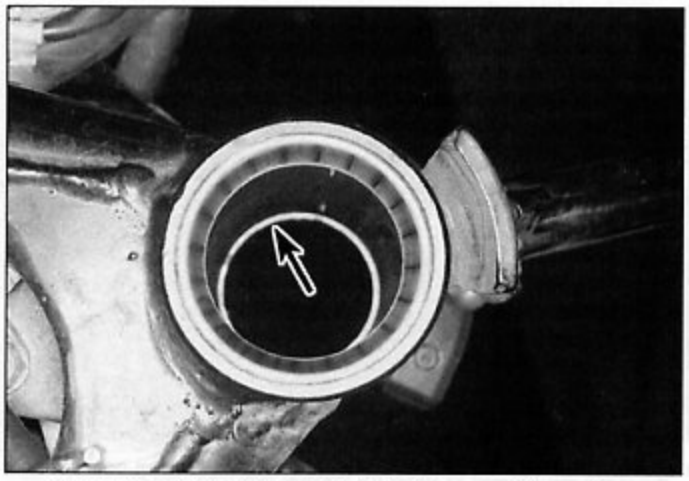
15 Tubeless tires - general information

1 Tubeless tires are used as standard equipment on this motorcycle. They are generally safer than tube-type tires but if problems do occur they require special repair techniques.

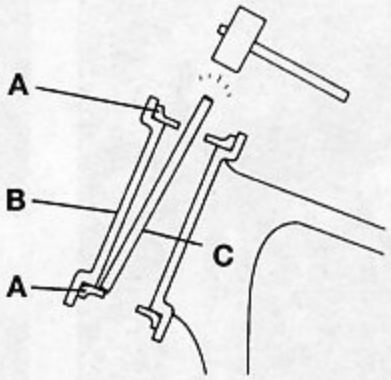
2 The force required to break the seal between the rim and the bead of the tire is substantial, and is usually beyond the capabilities of an individual working with normal tire irons.

3 Also, repair of the punctured tire and replacement on the wheel rim requires special tools, skills and experience that the average do-it-yourselfer lacks.

4 For these reasons, if a puncture or flat occurs with a tubeless tire, the wheel should be removed from the motorcycle and taken to a dealer service department or a motorcycle repair shop for repair or replacement of the tire. The accompanying illustrations can be used to replace a tubeless tire in an emergency.



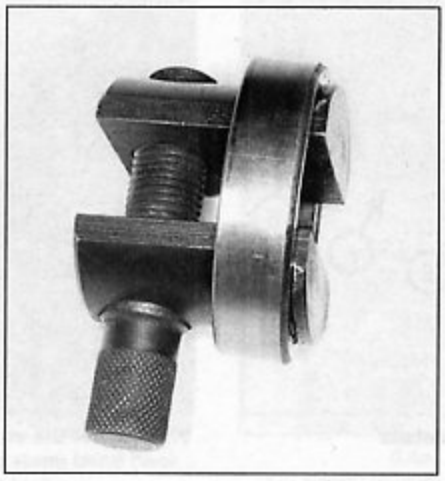
7.10a If the bearing races protrude far enough (arrow) . . .



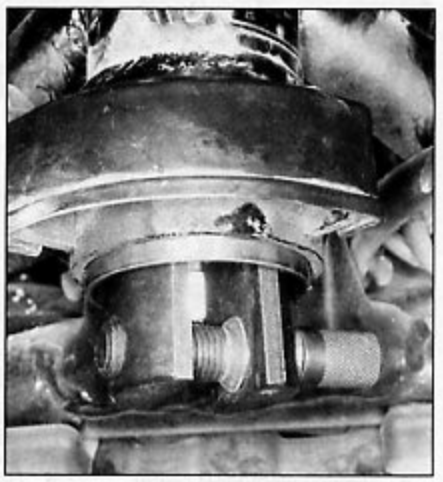
7.10b . . . the races can be driven out with a hammer and drift (drive out the upper race first)

A Outer races
B Steering head
C Drift

7.11a This Honda tool fits into the upper bearing race; tapping the tool upward from below will push the race out



7.11b This tool is inserted into the lower race and expanded to catch its edges . . .



7.11c . . . tapping on the tool from above will push the lower race out (race shown partially removed)

compressed air, if available. If you do use compressed air, don't let the bearings spin as they're dried - it could ruin them. Wipe the old grease out of the frame steering head and bearing races.

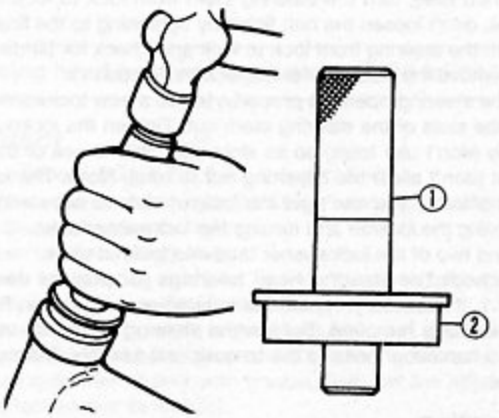
9 Examine the races in the steering head for cracks, dents, and pits. If even the slightest amount of wear or damage is evident, the races should be replaced with new ones.

10 The usual method of removing bearing races is to drive them out of the steering head with a hammer and long rod **(see illustration)**. For this method to work, the bearing races must protrude far enough that you can catch the edge of them with the rod **(see illustration)**. A slide hammer with the proper internal-jaw puller will also work.

11 Since these bearing races don't protrude very far into the steering head, special tools may be necessary to remove them. At the top, Honda race remover attachment 07953-MJ1000A fits under the bearing, allowing it to be tapped out from below **(see illustration)**. At the bottom, remover 07946-3710500 can be expanded to grip the race, then tapped out of the steering head together with the race **(see illustrations)**.

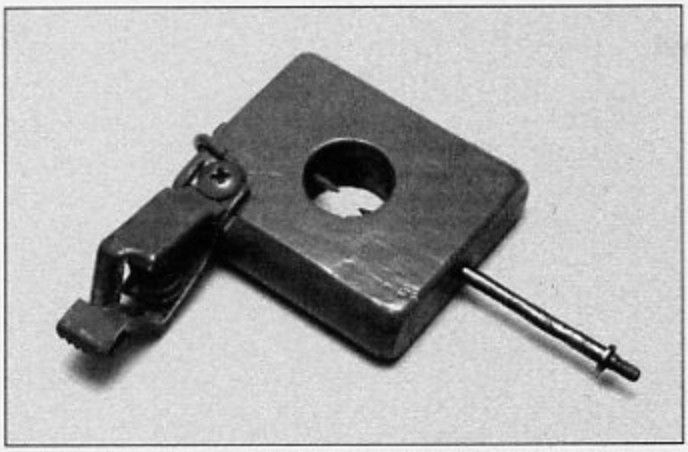
12 Since the races are an interference fit in the frame, installation will be easier if the new races are left overnight in a freezer. This will cause them to contract and slip into place in the frame with very little effort. When installing the races, tap them gently into place with a hammer and a bearing driver, punch or a large socket **(see illustration)**. Do not strike the bearing surface or the race will be damaged.

13 Check the bearings for wear. Look for cracks, dents, and pits in the races and flat spots on the bearings. Replace any defective parts with new ones. If a new bearing is required, replace both of them as a set.



7.12 Drive in the bearing races with a bearing driver or socket the same diameter as the bearing race

1 Bearing driver handle
2 Bearing driver



2.13 A simple spark gap testing fixture can be made from a block of wood, a large alligator clip, two nails, a screw and a piece of wire

2 Ignition system - check

Refer to illustration 2.13

Warning: *Because of the very high voltage generated by the ignition system, extreme care should be taken when these checks are performed.*

1 If the ignition system is the suspected cause of poor engine performance or failure to start, a number of checks can be made to isolate the problem.

2 Make sure the engine kill switch is in the Run position.

Engine will not start

3 Disconnect one of the spark plug wires, connect the wire to a spare spark plug and lay the plug on the engine with the threads contacting the engine. If necessary, hold the spark plug with an insulated tool. Crank the engine over and make sure a well-defined, blue spark occurs between the spark plug electrodes. **Warning:** *Don't remove one of the spark plugs from the engine to perform this check - atomized fuel being pumped out of the open spark plug hole could ignite, causing severe injury!*

4 If no spark occurs, the following checks should be made:

5 Detach the spark plug caps from the plugs and check the resistance of the resistor inside each cap with an ohmmeter. If the resistance is not within the range listed in this Chapter's Specifications, replace the spark plug cap.

6 Connect a voltmeter between the terminals of one ignition coil (positive to black-white, negative to blue-yellow). Turn the ignition switch to the On position and note the voltmeter reading, then crank the engine and note the reading again. If voltage doesn't change by more than one volt, check the primary wiring. Make sure all electrical connectors are clean and tight. Check all wires for shorts, opens and correct installation.

7 Check the battery voltage with a voltmeter and check the specific gravity with a hydrometer (see Chapter 1). If the voltage is less than 12-volts or if the specific gravity is low, recharge the battery.

8 Check the ignition fuse and the fuse connections. If the fuse is blown, replace it with a new one; if the connections are loose or corroded, clean or repair them.

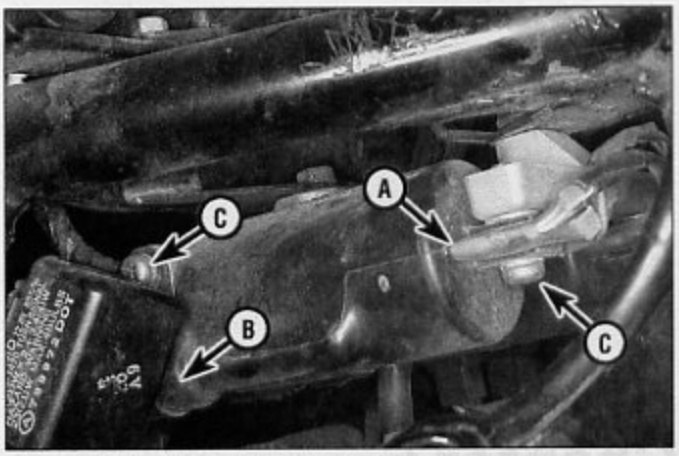
9 Refer to Chapter 9 and check the ignition switch, engine kill switch, neutral switch and sidestand switch.

10 Refer to Section 3 and check the ignition coil primary and secondary resistance.

11 Refer to Section 4 and check the pulse generator resistance.

Engine starts but misfires

12 If the engine starts but misfires, make the following checks before deciding that the ignition system is at fault.



3.3 Ignition coil mounting details (right coil shown)

A Primary terminals
B Secondary terminals
C Mounting screws

13 The ignition system must be able to produce a spark across a six millimeter (1/4-inch) gap (minimum). A simple test fixture **(see illustration)** can be constructed to make sure the minimum spark gap can be jumped. Make sure the fixture electrodes are positioned six millimeters apart.

14 Connect one of the spark plug wires to the protruding test fixture electrode, then attach the fixture's alligator clip to a good engine ground/earth.

15 Crank the engine over (it will probably start and run on the remaining cylinders) and see if well-defined, blue sparks occur between the test fixture electrodes. If the minimum spark gap test is positive, the ignition coil for that cylinder (and its companion cylinder) is functioning properly. Repeat the check on one of the spark plug wires that is connected to the other coils. If the spark will not jump the gap during either test, or if it is weak (orange colored), refer to Steps 5 through 11 of this Section and perform the component checks described.

3 Ignition coils - check, removal and installation

Check

Refer to illustrations 3.3 and 3.7

1 In order to determine conclusively that the ignition coils are defective, they should be tested by an authorized Honda dealer service department which is equipped with the special electrical tester required for this check.

2 However, the coils can be checked visually (for cracks and other damage) and the primary and secondary coil resistances can be measured with an ohmmeter. If the coils are undamaged, and if the resistances are as specified, they are probably capable of proper operation.

3 To check the primary resistances, remove the top compartment (see Chapter 8) and disconnect the primary wires from the coil being tested **(see illustration)**.

4 Place the ohmmeter selector switch in the Rx1 position. Attach one ohmmeter lead to the black/white terminal in the primary connector, then connect the other ohmmeter lead to the yellow-blue or blue-yellow terminal. Compare the measured resistance to the value listed in this Chapter's Specifications.

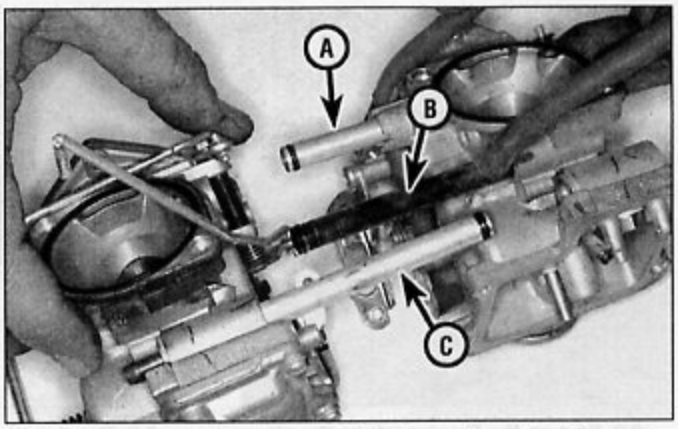
5 If the primary resistance isn't as specified, the coil is defective and must be replaced as described below.

6 If the coil primary resistance is as specified, check the coil secondary resistance. Disconnect the spark plug wires from the plugs and connect an ohmmeter between the disconnected wires. Place the ohmmeter selector switch in the Rx100 position and compare the measured resistance to the values listed in this Chapter's Specifications.

7 Pull the carburetors straight apart from each other **(see illustration)**. Don't bend or twist them or the connecting tubes may be bent. Separate the carburetors and remove the O-rings from the connecting tubes.

8 Reconnection is the reverse of the separation steps, with the following additions:

a) Use new O-rings on the connecting tubes and at the air chamber, its fuel tube and the air horn.
b) Replace any removed cotter pins with new ones.
c) Make sure the choke and throttle linkages operate smoothly.



9.7 Pull the carburetors straight apart, without bending or twisting them; use new O-rings on assembly

A Vent tube B Air tube C Fuel tube

10 Carburetors - disassembly, cleaning and inspection

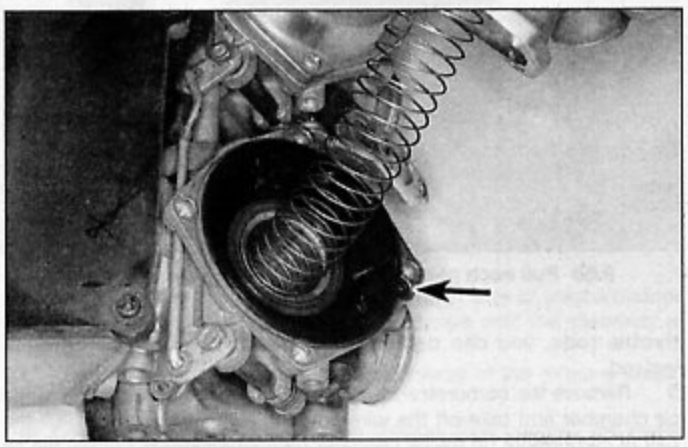
Warning: *Gasoline is extremely flammable, so take extra precautions when you work on any part of the fuel system. Don't smoke or allow open flames or bare light bulbs near the work area, and don't work in a garage where a natural gas-type appliance (such as a water heater or clothes dryer) is present. If you spill any fuel on your skin, rinse it off immediately with soap and water. When you perform any kind of work on the fuel system, wear safety glasses and have a fire extinguisher suitable for class B fires (flammable liquids) on hand.*

Disassembly

Refer to illustrations 10.2a through 10.2g

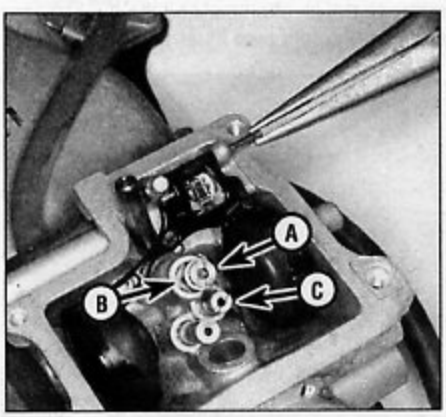
1 Remove the carburetors from the motorcycle as described in Section 8, then separate them as described in Section 9. Set the assembly on a clean working surface. **Note:** *Work on one carburetor at a time to avoid getting parts mixed up.*

2 Refer to the accompanying illustrations to disassemble the carburetor **(see illustrations)**.

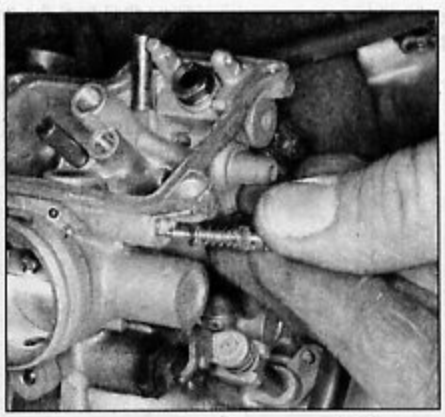


10.2a Remove the cover screws and lift off the cover to remove the spring and diaphragm; on assembly, align the diaphragm tab (arrow) with the notches in carburetor body and cover

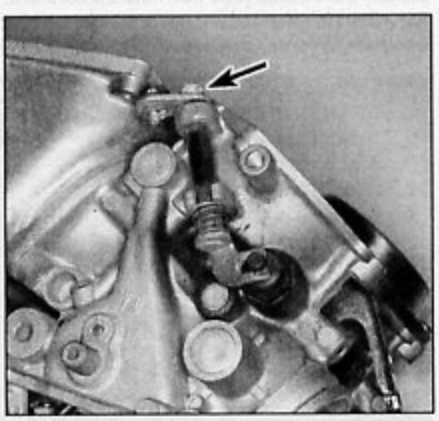
10.2b Remove the screws and take off the float chamber cover; on assembly, use a new O-ring and make sure the dowels are in position



10.2c Pull out the float pivot pin and lift the float out, pulling the needle valve with it; unscrew the main jet (A) and slow jet (C) with a screwdriver, and use a wrench to unscrew the main jet holder (B)

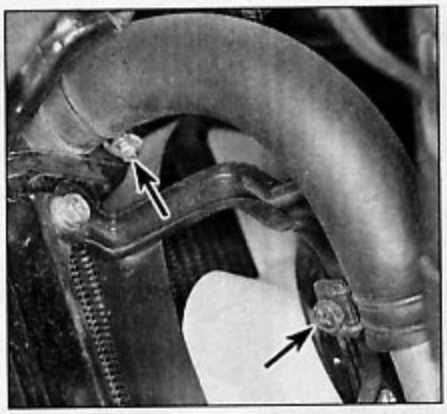


10.2d Unscrew the pilot screw all the way and pull it out, together with the spring, washer and O-ring

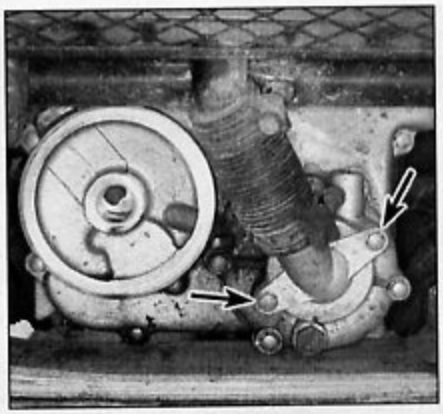


10.2e Remove the nut and lockwasher from the choke lever (arrow), then work the choke lever fork free of the choke valve

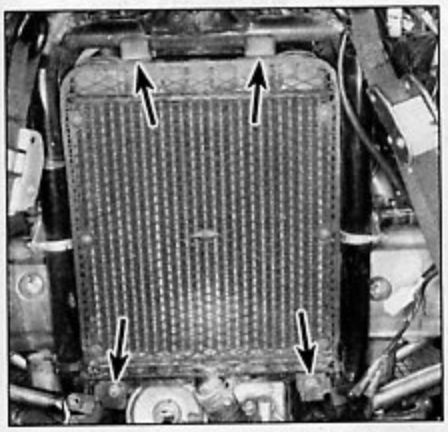
7.4 Disconnect the siphon hose from the radiator filler neck



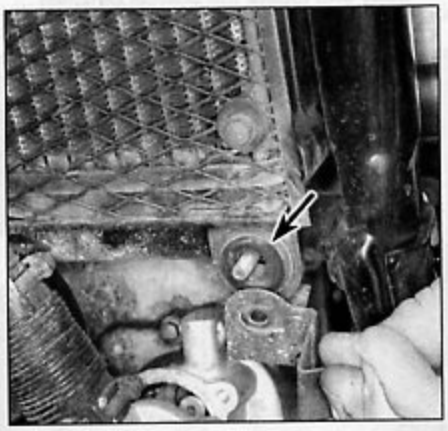
7.5a Loosen the clamp screws (arrows) and remove the upper radiator hose



7.5b Loosen the lower hose clamp screws and remove the water pump cover bolts (arrows)



7.6a The radiator is secured by nuts and studs at the bottom and tabs at the top (arrows); the stone shield is secured to the radiator by six bolts



7.6b The mounting studs also support fairing brackets on some models; replace the grommets (arrow) if they're worn or deteriorated

7.7 Check the collars and mounting studs for corrosion or damage

4 Remove the radiator cap and disconnect the siphon hose from the radiator **(see illustration)**.

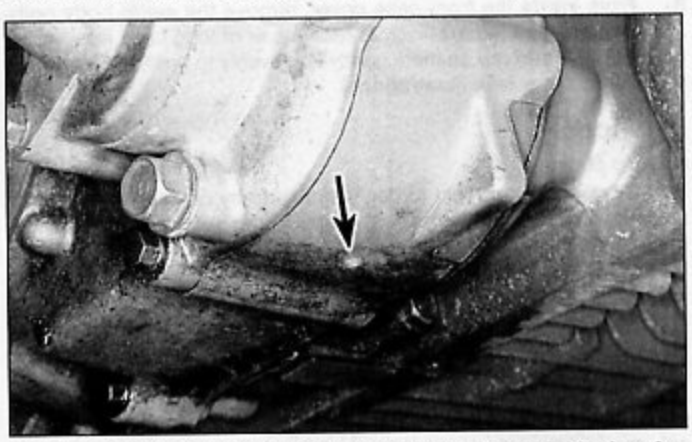
5 Loosen the clamps at the ends of the upper and lower hoses **(see illustrations)**. Refer to Section 8 and remove the water pump cover from the pump and lower hose. Work the hoses free from the fittings, taking care not to damage the fittings in the process.

6 Remove the mounting nuts from the bottom of the radiator **(see illustration)**. If you're working on an Interstate or Aspencade, remove the lower fairing brackets that are secured by the radiator nuts **(see illustration)**. Pull the radiator forward off the mounting studs and disconnect the fan connector. Lower the radiator out of its upper mounts and remove it from the motorcycle.

7 Inspect the radiator mounting grommets. Replace them if they're cracked or deteriorated. Check the mounting studs for corrosion **(see illustration)**.

8 Installation is the reverse of the removal steps, with the following additions:

a) *Don't forget to connect the fan wires.*
b) *Fill the cooling system with the recommended coolant* (see Chapter 1).



8.1 If coolant is leaking from the telltale hole (arrow), it's time for a new water pump

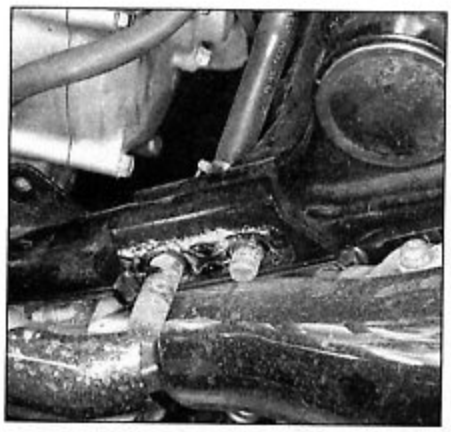
8 Water pump - check, removal, disassembly, inspection and installation

Warning: *The engine must be completely cool before beginning this procedure.*

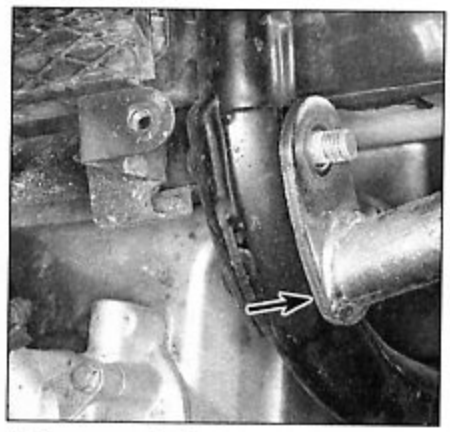
Check and removal

Refer to illustrations 8.1, 8.6a, 8.6b, 8.8a, 8.8b and 8.8c

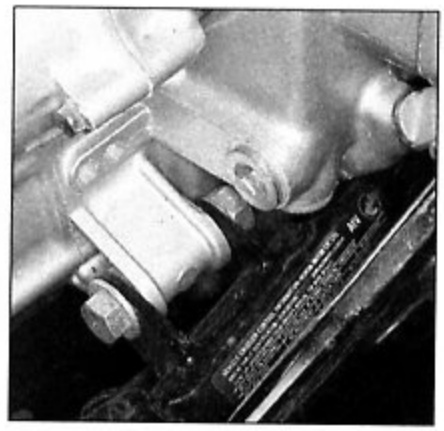
1 Visually check the area around the water pump for coolant leaks. Try to determine if the leak is simply the result of a loose hose clamp or deteriorated hose. Coolant dripping from the telltale hole in the underside of the pump body indicates a leaking mechanical seal; in this case the pump will have to be replaced with a new one **(see illustration)**.



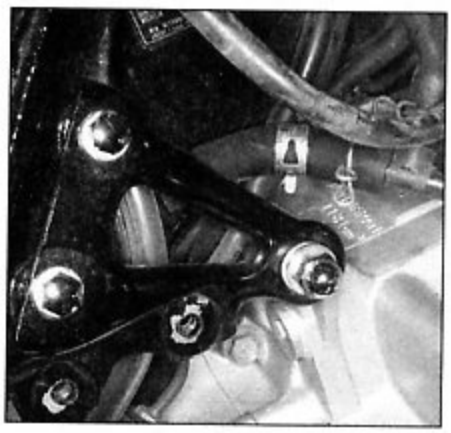
5.18b Remove the cap nuts from these studs at the rear end of the subframe . . .



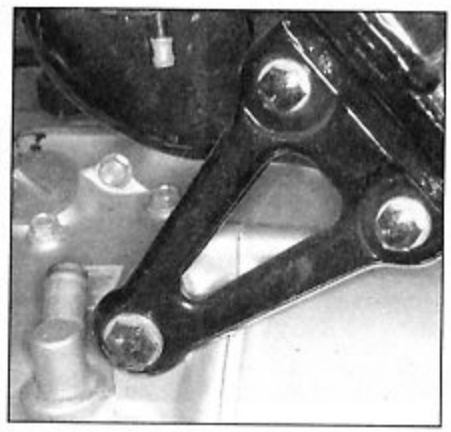
5.18c . . . and at the front; the lower front cap nut is hidden by the engine guard (arrow)



5.19 On the right side of the bike, remove the lower rear engine-to-frame bolt (shown) and the lower engine-to-frame bolt that's beneath the cylinder head



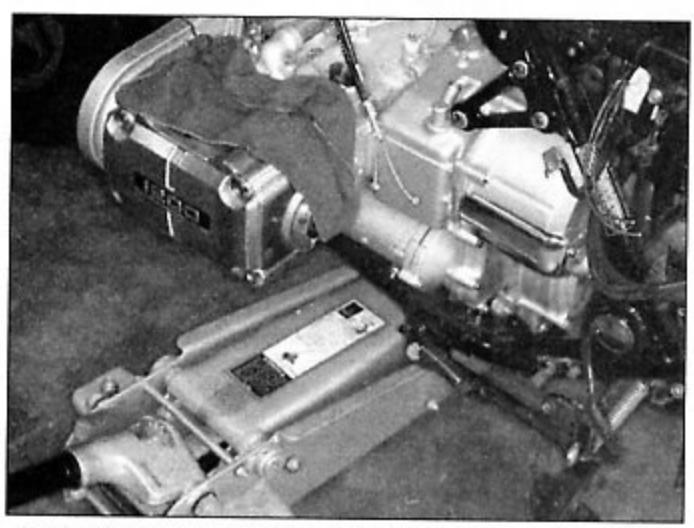
5.20a Remove the two bolts and cap nut from the right engine mount . . .



5.20b . . . remove two small bolts from the left engine mount . . .

5.20c . . . the through-bolt, which connects the left and right engine mounts, secures a ground cable (arrow) on the left side

Remove the other subframe to engine mounting bolt (it's underneath the cylinder head). Remove the cap nuts at each end of the subframe, then take the subframe off **(see illustrations)**.



5.22 Use a jack to lower the engine and have an assistant help guide it out of the frame

19 Remove two engine mounting bolts along the lower right side of the frame **(see illustration)**.

20 Remove the upper engine mount from each side of the bike **(see illustrations)**. The through-bolt secures a ground cable on the left side **(see illustration)**.

21 Make sure no wires or hoses are still attached to the engine assembly. **Warning:** *The engine weighs nearly 300 pounds and may cause injury if it falls. Be sure it's securely supported. Have an assistant help you steady the engine on the jack as you remove it.*

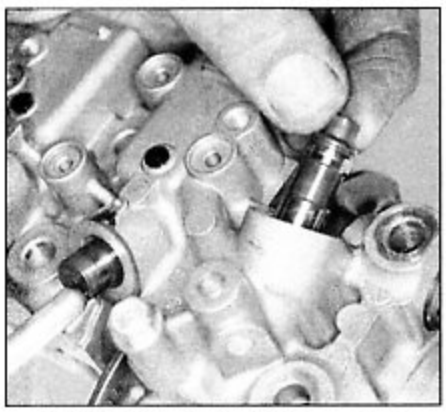
22 Slide the front end of the driveshaft off of the output shaft splines (see Chapter 6). Slowly and carefully lower the engine assembly to the floor, then guide it out from under the bike **(see illustration)**.

Installation

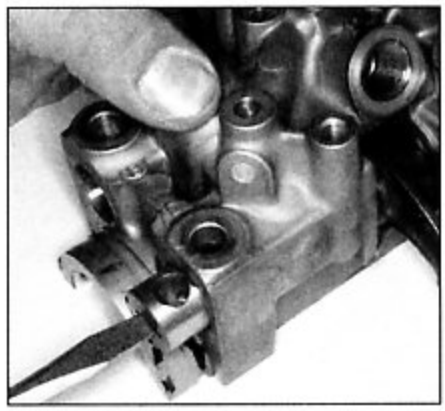
23 Installation is the reverse of removal. Note the following points.

24 Tighten all of the mounting bolts finger-tight in the following order:

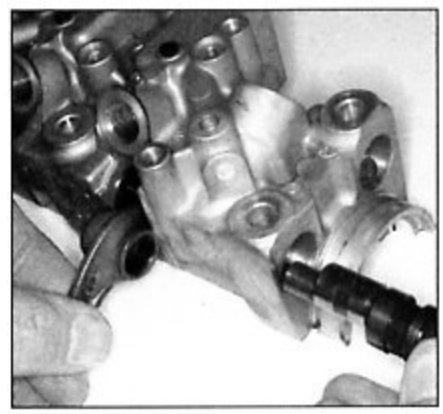
a) Right rear lower
b) Right front lower
c) Right front upper
d) Left front and rear brackets
e) Upper rear (don't forget the collar)
f) Subframe Allen bolts
g) Subframe hex bolt on right side
h) Engine guards
i) Left lower rear
j) Left lower front



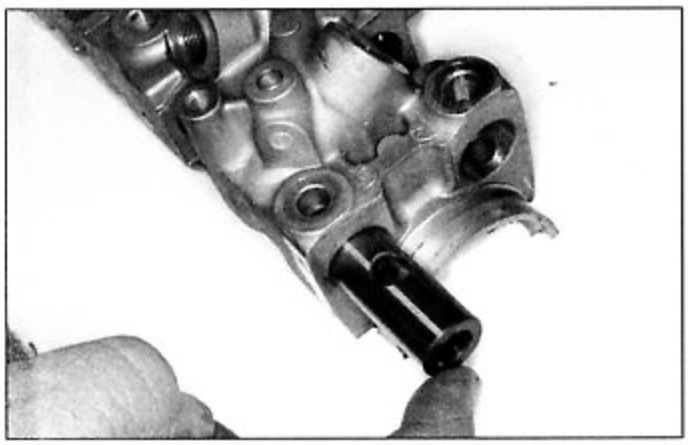
9.30 Pull the lash adjusters out of their bores



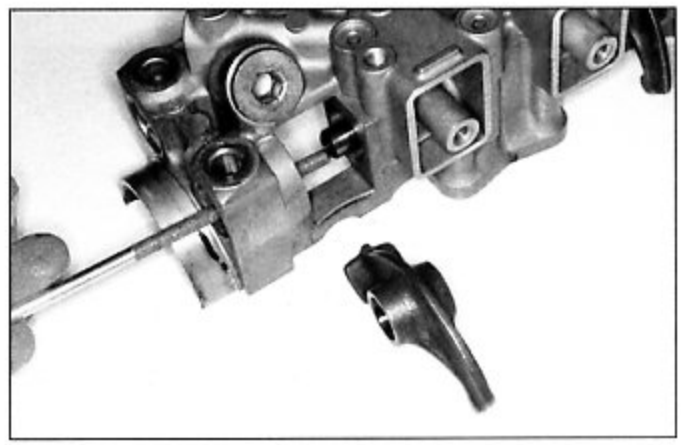
9.31a Twist the end collars to free them, using their screwdriver slots, then pull them out of their bores



9.31b Pull out the rocker shafts and take the rocker arms out



9.31c Pull the center rocker shaft out of the exhaust side

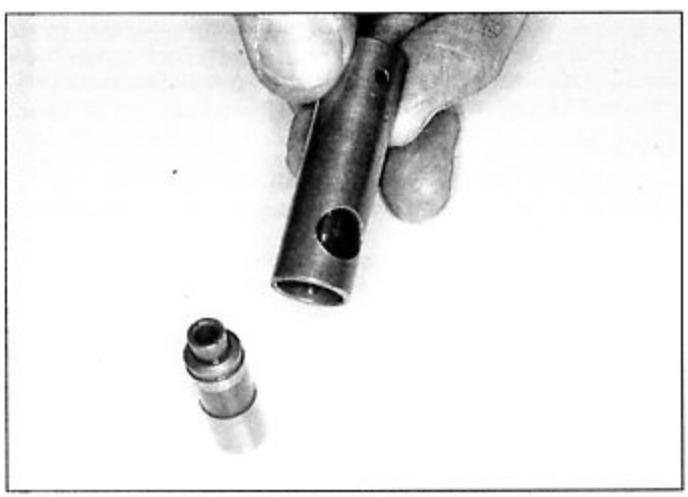


9.32 Push the intake rocker shafts toward the center, take out the rocker arms, then pull the rocker shafts out

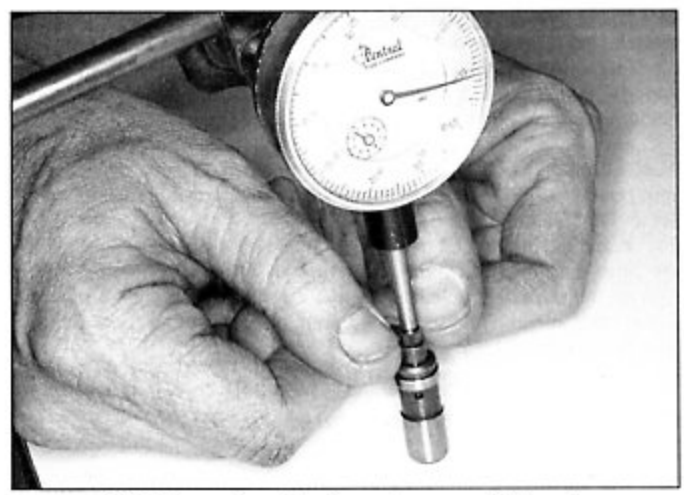
30 Remove the two remaining assist shafts and springs (two were removed as part of camshaft holder removal) **(see illustration 9.29)**. Unscrew the stopper plugs and remove them from the adjuster bores, together with their shims. Pull the adjusters (and their caps if they're intake valve adjusters) out of the bores, using a magnet if necessary **(see illustration)**. If the adjusters are stuck, spray the area around them with carburetor cleaner and let it soak in. Place the adjusters in order in their holder.

31 On the exhaust side of the cylinder head, remove the collar from each end **(see illustration)**. Pull out the rocker shafts, remove the rocker arms and pull out the center collar **(see illustrations)**.

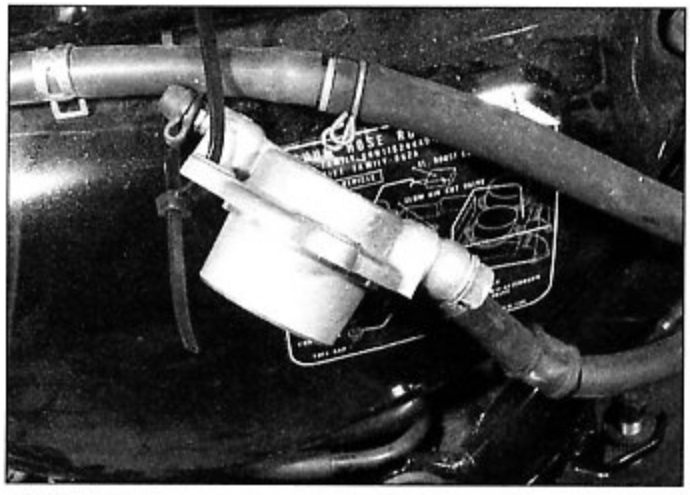
32 On the intake side, remove the collar from each end. Push the rocker shafts toward the center and take out the rocker arms, then pull the rocker shafts out of the camshaft holder **(see illustration)**.



9.37 This tool opens the check valve in the lash adjuster so it can be filled with kerosene

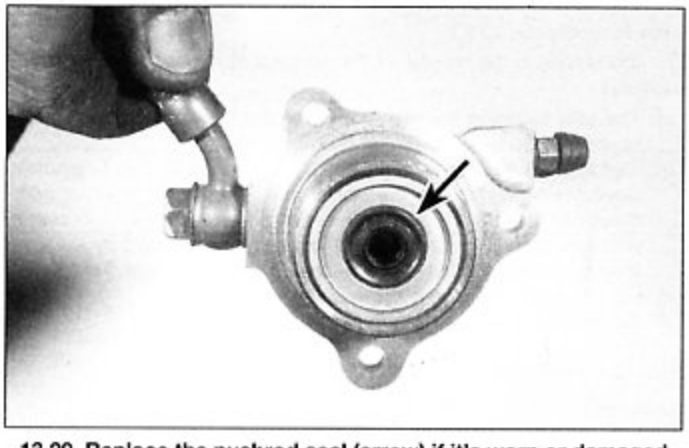


9.38 Pump the adjuster and measure its travel with a dial indicator



13.25 If you're removing the slave cylinder for access to other components, leave the fluid line connected and tie it up like this

13.26 Take the piston and spring out of the cylinder and remove the seal from the piston; the wide side of the seal faces into the bore



13.29 Replace the pushrod seal (arrow) if it's worn or damaged

Caution: *Brake fluid will damage paint. Wipe up any spills immediately and wash the area with soap and water.*

25 Remove the slave cylinder mounting bolts and take it off the rear cover. If the hose is still connected, tie the cylinder up so it doesn't hang by the hose **(see illustration)**.

Overhaul

Refer to illustrations 13.26 and 13.29

26 Remove the piston and spring **(see illustration)**. If they won't come out, blow compressed air into the fluid line hole. **Warning:** *The piston may shoot out forcefully enough to cause injury. Point the piston at a block of wood or a pile of rags inside a box and apply air pressure gradually. Never point the end of the cylinder at yourself, including your fingers.*

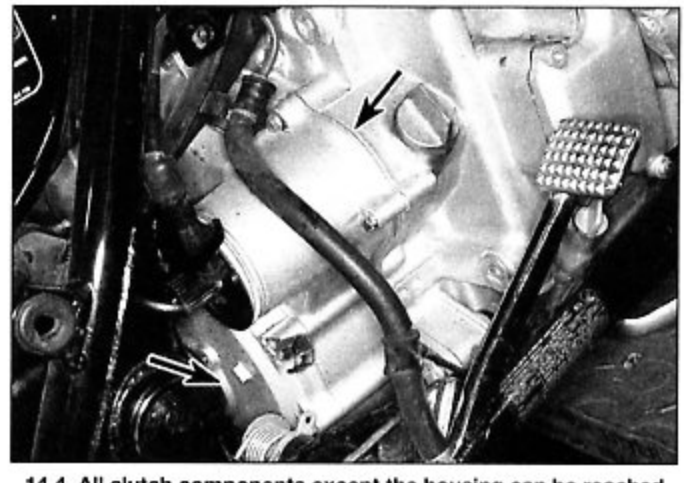
27 Thoroughly clean all of the components in clean brake fluid (don't use any type of petroleum-based solvent).

28 Check the piston and cylinder bore for wear, scratches and rust. If the piston shows these conditions, replace it and the seal as a set. If the cylinder bore has any defects, replace the entire slave cylinder. If the piston and bore are good, carefully remove the seal from the piston and install a new one with its wide side facing into the cylinder bore.

29 Check the pushrod seal in the back of the piston and replace it if it's worn or damaged **(see illustration)**.

Installation

30 Installation is the reverse of the removal procedure, with the following additions:



14.4 All clutch components except the housing can be reached by removing the clutch cover (left arrow) with the engine in the frame; to remove the clutch housing, you'll need to remove the engine and the rear crankcase cover (right arrow)

a) Use new sealing washers on the fluid line.
b) Tighten the cylinder mounting bolts securely. Tighten the fluid line union bolt to the torques listed in this Chapter's Specifications.
c) Bleed the clutch (see above).
d) Operate the clutch and check for fluid leaks.

14 Clutch - removal, inspection and installation

Note: *All clutch components except the clutch housing can be removed with the engine in the frame.*

Removal

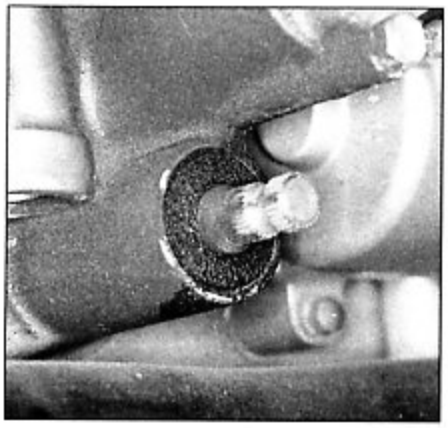
Refer to illustrations 14.4, 14.7, 14.8a, 14.8b, 14.8c, 14.8d, 14.9, 14.10a, 14.10b, 14.11a, 14.11b, 14.12a, 14.12b, 14.13a and 14.13b

1 Place the bike on its centerstand and drain the engine oil (see Chapter 1).

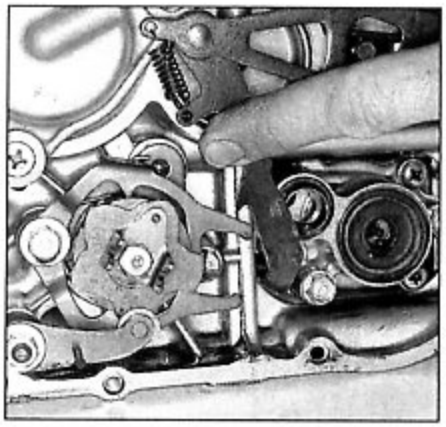
2 Remove the right rear side cover (see Chapter 8).

3 Refer to Section 13 and remove the slave cylinder.

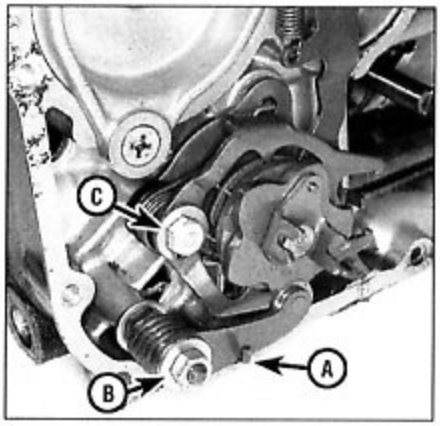
4 Unbolt the clutch cover from the rear of the engine **(see illustration)**. If the cover is stuck, tap it gently with a soft-faced mallet to free it. Don't pry between the cover and engine or the gasket surfaces will be damaged.



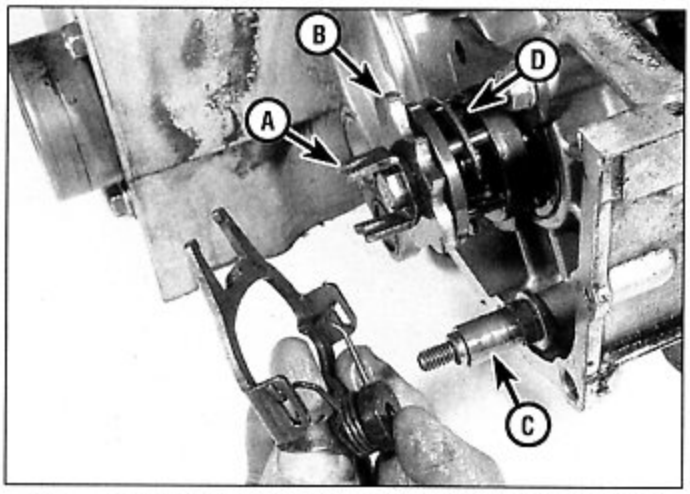
20.3 Check the shift shaft seal and replace it if it leaks



20.7 Pull the shift arm away from the linkage

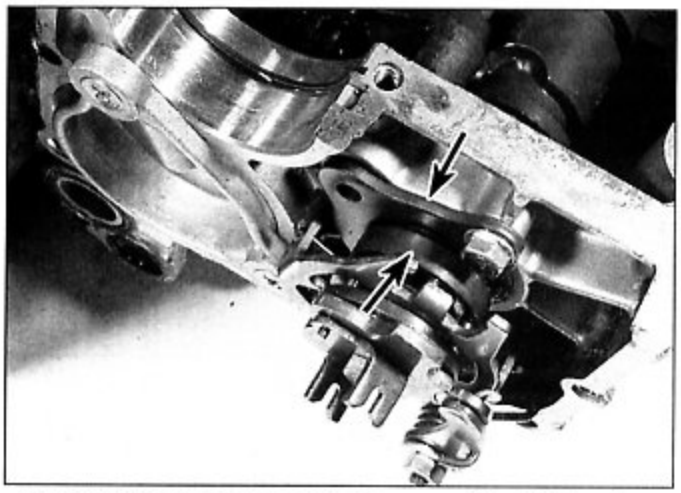


20.8 Note how the spring fits over the stopper arm (A), then remove the bolt (B), washer, arm and spring; remove the positive stopper bolt and washer (C) . . .



20.9 . . . and take off the positive stopper, its spring and collar

A *Drum joint*
B *Stopper plate*
C *Positive stopper post*
D *Stopper pins*



20.13 Remove the drum center (lower arrow) and the bearing retainer (upper arrow) for access to the bearing

3 Check the shaft seal for leakage **(see illustration)**. It it's been leaking, pry it out and tap in a new one with a socket the same diameter as the seal. You may need to remove the left side of the exhaust system for access (see Chapter 4).

4 Installation is the reverse of the removal steps. Tighten the pinch bolts securely, but don't overtighten them and strip the threads.

Shift mechanism

Removal

Refer to illustrations 20.7, 20.8 and 20.9

5 The stopper arm(s), positive stopper, drum joint and stopper plate(s) are the only parts of the external shift linkage that can be removed without disassembling the crankcase. The shift arm, generally considered part of the external linkage, is bolted to components on the inside of the crankcase, so the crankcase must be disassembled to remove it.

6 Remove the front case cover from the engine (see Section 18).

7 Pull the shift arm away from the shift drum center **(see illustration)**.

8 Remove the nut and washer from the stopper arm, then remove the stopper arm, spring and collar **(see illustration)**. If you're working on a 1984 or 1985 model, there are two stopper arms pivoting on the same collar. The lower one is the neutral stopper arm; the upper one is the stopper arm.

9 Remove the positive stopper bolt and washer, then remove the positive stopper with its spring and collar **(see illustration 20.8 and the accompanying illustration)**.

10 Remove the bolt from the center of the shift drum, then take off the drum joint and stopper plate (two stopper plates on 1984 and 1985 models).

Inspection

Refer to illustration 20.13

11 Check the condition of the stopper lever(s) and spring. Replace the stopper lever if it's worn where it contacts the shift drum. Replace the spring if it's distorted.

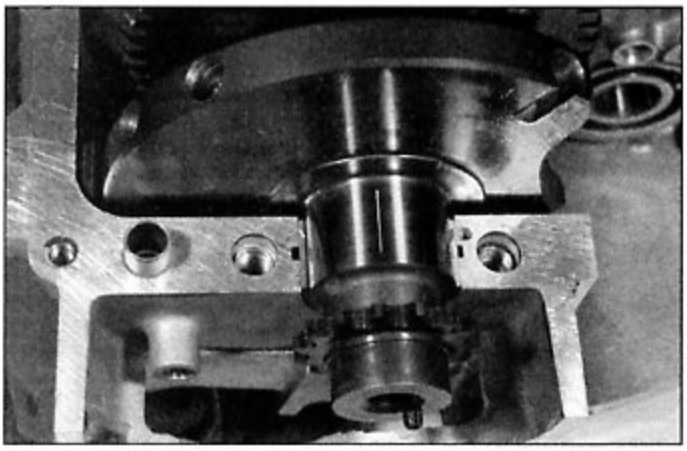
12 Inspect the stopper pins plate and the pins on the end of the shift drum **(see illustration 20.9)**. If they're worn or damaged, replace them. If their holes in the end of the shift drum are enlarged, you'll have to disassemble the crankcase to replace the shift drum.

13 If the shift drum bearing is worn, remove the bearing retainer **(see illustration)**. Take the bearing out of the case and install a new one.

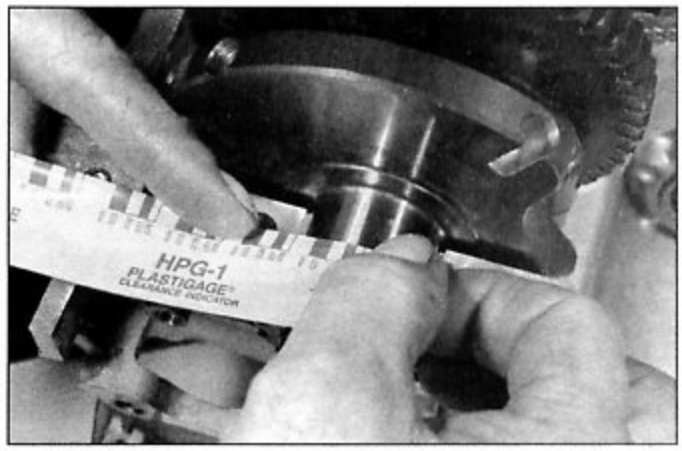
Installation

14 If the stopper pin plate was removed from the shift drum, install it. Be sure to reinstall the dowel pins.

15 Apply non-permanent thread locking agent to the threads of the stopper arm bolt, then install the stopper arm (both stopper arms on



30.13 Lay a strip of Plastigage along the bearing journal, parallel to the crankshaft centerline



30.16 Measure the width of the crushed Plastigage with the scale on the envelope

Inspection

Refer to illustrations 30.13 and 30.16

7 Clean the crankshaft with solvent, using a rifle-cleaning brush to scrub out the oil passages. If available, blow the crank dry with compressed air. Check the main and connecting rod journals for uneven wear, scoring and pits. Rub a copper coin across the journal several times - if a journal picks up copper from the coin, it's too rough. Replace the crankshaft.

8 Check the crankshaft for cracks and other damage. It should be magnafluxed to reveal hidden cracks - a dealer service department or motorcycle machine shop will handle the procedure.

9 Steps 9 though 11 require precision measuring equipment. You can have the measurements done by a dealer or motorcycle repair shop. Measure the main bearing journals with a micrometer. Compare the readings with the values listed in this Chapter's Specifications.

10 Assemble the main caps and bearings and tighten them to the specified torque. Measure the inside diameter of the bearing bore with a bore gauge.

11 Set the crankshaft on V-blocks and check the runout with a dial indicator touching each of the main journals, comparing your findings with this Chapter's Specifications. If the runout exceeds the limit, replace the crank.

12 Wipe the main bearing inserts, saddles and bearing caps clean, using a lint-free cloth.

13 Install the bearing inserts in the saddles and caps. Make sure the tab on the bearing engages with the notch in the rod or cap **(see illustration 30.6)**. Lay a strip of Plastigage (type HPG-1) across each bearing insert (in the saddle, not in the cap), parallel with the journal axis **(see illustration)**.

14 Wipe off the main bearing journals with a lint-free cloth.

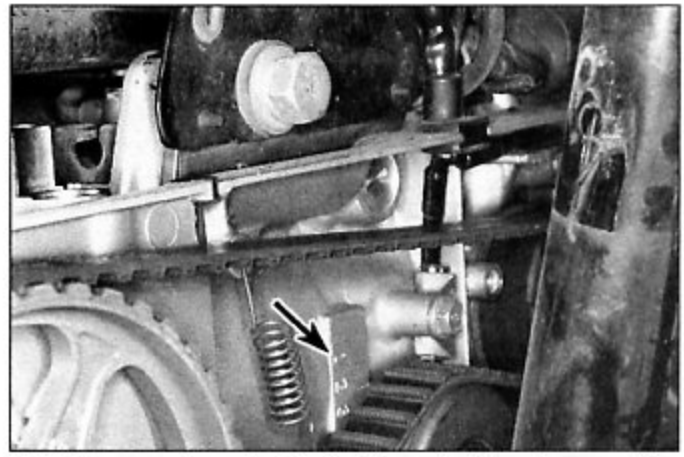
15 Lay the crankshaft in the saddles, then install the main bearing caps (with their steel plates). Tighten the rod caps to the torque listed in this Chapter's Specifications, but don't allow the crankshaft to rotate at all.

16 Unscrew the bolts and remove the caps and crankshaft, being very careful not to disturb the Plastigage. Compare the width of the crushed Plastigage to the scale printed in the Plastigage envelope to determine the bearing oil clearance **(see illustration)**.

17 If the clearance is within the range listed in this Chapter's Specifications and the bearings are in perfect condition, they can be reused. If the clearance is beyond the standard range, replace the bearing inserts with new inserts that have the same color code, then check the oil clearance once again. Always replace all of the inserts at the same time.

18 The clearance should now be within the range listed in this Chapter's Specifications.

19 Spin the ball bearing on the end of the crankshaft and check it for roughness, looseness and noise **(see illustration 21.20)**. If problems are found, remove the snap-ring, washer and bearing. Install a new bearing and washer and secure them with a new snap-ring. Install the snap-ring with its sharp edge away from the bearing and its rounded edge toward the bearing.



30.21 These marks on the front of the engine (arrow) are used for main bearing selection; the numbers 1, 2 and 3 represent the front, center and rear main bearings, while the Roman numerals are the bearing code

Main bearing

Selection

Refer to illustration 30.21

20 The clearance should be within the range listed in this Chapter's Specifications.

21 Use the number marks on the crankshaft and on the case to determine the bearing sizes required. The numbers stamped on the crankshaft next to the main journals are the main journal numbers. These correspond with the numbers on the front of the crankcase **(see illustration)**. Use these numbers and this Chapter's Specifications to determine the correct bearing color code for each journal. The color codes are painted on the edges of the bearings **(see illustration 29.7)**.

Installation

22 Clean the bearing saddles in the case halves, then install the bearing inserts in the case **(see illustration 30.6)**. When installing the bearings, use your hands only - don't tap them into place with a hammer.

23 Lubricate the bearing inserts with engine assembly lube or moly-based grease.

Chapter 1
Tune-up and routine maintenance

Contents

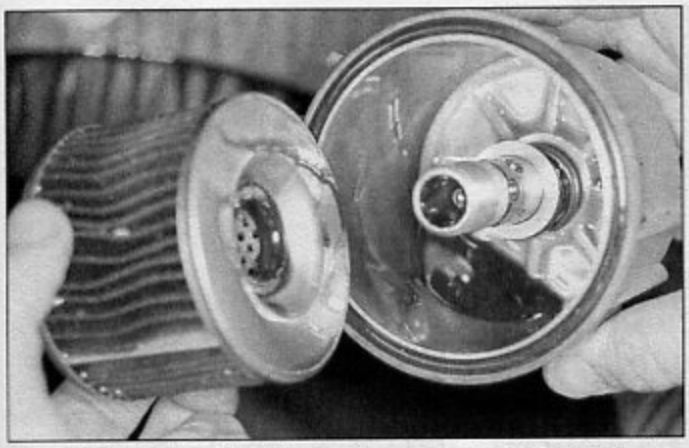
Specifications

Engine

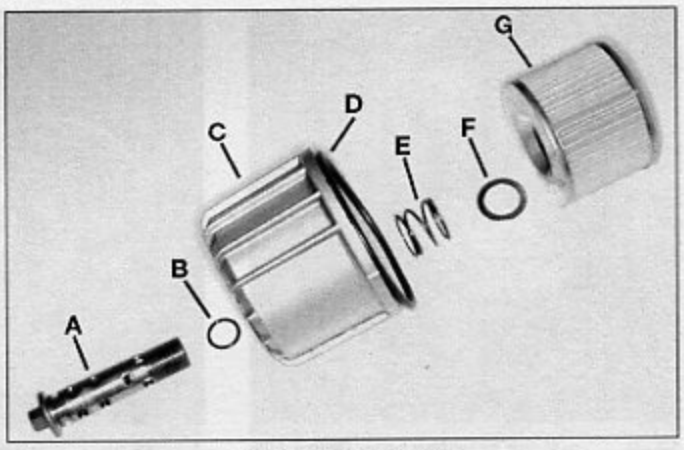
Spark plugs	
Type	
Standard	NGK DPR8EA-9 or ND X24EPR-U9
Cold weather (below 5-degrees C/41-degrees F)	NGK DPR7EA-9 or ND X22EPR-U9
Extended high-speed riding	NGK DPR9EA-9 or ND X27EPR-U9
Gap	0.8 to 0.9 mm (0.031 to 0.035 inch)
Firing order	1-3-2-4
Engine idle speed	800 +/- 80 rpm
Cylinder compression pressure (at sea level)	185 psi
Carburetor synchronization - maximum vacuum difference between cylinders	40 mm Hg (1.6 inch Hg)
Cylinder numbering (from front to rear of bike)	
Right side	1-3
Left side	2-4

Miscellaneous

Brake pad material minimum thickness	To wear groove - see text
Brake pedal position	Zero to 5 mm (zero to 3/16-inch) above the top of the footpeg
Freeplay adjustments	
Throttle grip	2 to 6 mm (1/8 to 1/4 inch)
Clutch lever	Not adjustable
Front brake lever	Not adjustable
Battery electrolyte specific gravity	1.280 at 20-degrees C (68 degrees F)



11.5b Remove the filter housing and take out the filter



11.5c Oil filter details

A Filter bolt
B Small O-ring
C Filter housing
D Large O-ring
E Spring
F Washer
G Filter element

housing **(see illustration)**. Once it's stopped draining, remove the filter bolt, take off the housing and remove the element **(see illustrations)**.

6 Apply a film of oil to the small O-ring **(see illustration 11.5c)**. Install the small O-ring on the filter bolt, then install the filter bolt in the housing and slip the spring and washer over it.

7 Coat the large O-ring with oil and install it in the groove of the filter housing. Position the filter housing on the engine with its tabs on either side of the locating boss on the water pump cover **(see illustration)**. Tighten the filter bolt to the torque listed in this Chapter's Specifications.

8 Slip a new sealing washer over the oil drain plug, then install and tighten it to the torque listed in this Chapter's Specifications. Avoid overtightening, as damage to the engine case will result.

9 Before refilling the engine, check the old oil carefully. If the oil was drained into a clean pan, small pieces of metal or other material can be easily detected. If the oil is very metallic colored, then the engine is experiencing wear from break-in (new engine) or from insufficient lubrication. If there are flakes or chips of metal in the oil, then something is drastically wrong internally and the engine will have to be disassembled for inspection and repair.

10 If there are pieces of fiber-like material in the oil, the clutch is experiencing excessive wear and should be checked.

11 If the inspection of the oil turns up nothing unusual, refill the crankcase to the proper level with the recommended oil and install the filler cap. Start the engine and let it idle for a few minutes (do not rev the engine). Shut it off, wait a few minutes, then check the oil level. If necessary, add more oil to bring the level up to the Maximum mark. Check around the drain plug and filter for leaks.

12 The old oil drained from the engine cannot be reused in its present state and should be disposed of. Check with your local refuse disposal company, disposal facility or environmental agency to see whether they will accept the used oil for recycling. Don't pour used oil into drains or onto the ground. After the oil has cooled, it can be drained into a suitable container (capped plastic jugs, topped bottles, milk cartons, etc.) for transport to one of these disposal sites.

12 Pulse air system - inspection

1 If you're working on an Interstate or Aspencade, remove the lower and inner covers from the left side of the fairing (see Chapter 8).

2 Position the fan shroud toward the front of the bike to gain access (see Chapter 3).

3 Using an inspection mirror where necessary, check the rubber hoses that connect the metal lines, check valves and control valve. Refer to Chapter 4 for complete details of the system.

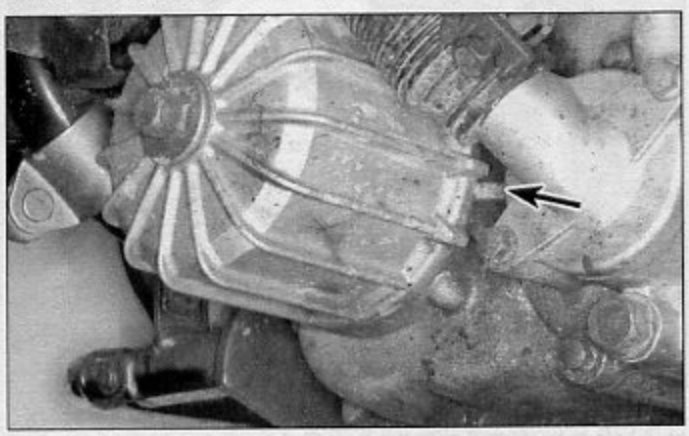
13 Air filter element - servicing

Refer to illustrations 13.3a, 13.3b and 13.3c

1 Open the top compartment and remove the tool tray (see Chapter 8).

2 Detach the fuse block and move it out of the way **(see illustration 3.21)**.

3 Pull the breather tube fitting out of the air cleaner housing **(see illustration)**. Remove the wing nut, lift off the cover and remove the



11.7 Position the filter tabs on either side of the water pump cover boss (arrow)

13.3a Undo the wing nut . . .