YAMAHA

XV V-Twins

(XV535, 700, 750, 920, 1000 & 1100 Viragos)

1981 to 1994 □ 535cc □ 699cc □ 748cc □ 920cc □ 981cc □ 1063cc

Owners Workshop Manual

Haynes

802

XV920 K and MK models

Wheelbase	1520 mm (59.8 inches)
Overall length	2230 mm (87.8 inches)
Overall width	805 mm (31.7 inches)
Overall height	1160 mm (45.7 inches)
Seat height	Not specified
Ground clearance (minimum)	145 mm (5.7 inches)
Weight	235 kg (518 lbs)

XV920 RH and RJ models

Wheelbase	1540 mm (60.6 inches)
Overall length	2260 mm (89.0 inches)
Overall width	930 mm (36.6 inches)
Overall height	1170 mm (46.1 inches)
Seat height	Not specified
Ground clearance (minimum)	140 mm (5.5 inches)
Weight	224 kg (493 lbs)

XV1000 models (1981 through 1985 UK TR1)

Wheelbase	1540 mm (60.6 inches)
Overall length	2265 mm (89.2 inches)
Overall width	730 mm (28.7 inches)
Overall height	1170 mm (46.1 inches)
Seat height	Not specified
Ground clearance (minimum)	140 mm (5.5 inches)
Weight	220 kg (485 lbs)

XV1100 models (1986-on)

Wheelbase	1525 mm (60.0 inches)
Overall length	
US models	2235 mm (88.0 inches) •
UK models	2285 mm (90.0 inches)
Overall width	840 mm (33.1 inches)
Overall height	
1986 and 1987	1170 mm (46.1 inches)
1988-on	1190 mm (46.9 inches)
Seat height	715 mm (28.1 inches)
Ground clearance (minimum)	145 mm (5.7 inches)
Weight (with oil and full fuel tank)	
US models	239 kg (527 lbs)
UK models	240 kg (529 lbs)

Engine doesn't start or is difficult to start

1 Starter motor does not rotate

1 Engine kill switch Off.
2 Fuse blown. Check fuse block (Chapter 8).
3 Battery voltage low. Check and recharge battery (Chapter 8).
4 Starter motor defective. Make sure the wiring to the starter is secure. Test starter relay (Chapter 8). If the relay is good, then the fault is in the wiring or motor.
5 Starter relay faulty. Check it according to the procedure in Chapter 8.
6 Starter switch not contacting. The contacts could be wet, corroded or dirty. Disassemble and clean the switch (Chapter 8).
7 Wiring open or shorted. Check all wiring connections and harnesses to make sure that they are dry, tight and not corroded. Also check for broken or frayed wires that can cause a short to ground (see wiring diagram, Chapter 8).
8 Ignition switch defective. Check the switch according to the procedure in Chapter 8. Replace the switch with a new one if it is defective.
9 Engine kill switch defective. Check for wet, dirty or corroded contacts. Clean or replace the switch as necessary (Chapter 8).

2 Starter motor rotates but engine does not turn over

1 Starter motor clutch defective. Inspect and repair or replace (Chapter 8).
2 Damaged idler or starter gears. Inspect and replace the damaged parts (Chapter 2).

3 Starter works but engine won't turn over (seized)

Seized engine caused by one or more internally damaged components. Failure due to wear, abuse or lack of lubrication. Damage can include seized valves, valve lifters, camshaft, pistons, crankshaft, connecting rod bearings, or transmission gears or bearings. Refer to Chapter 2 for engine disassembly.

4 No fuel flow

1 No fuel in tank.
2 Fuel tap vacuum hose (if equipped) broken or disconnected.
3 Tank cap air vent obstructed. Usually caused by dirt or water. Remove it and clean the cap vent hole.
4 Inline fuel filter clogged. Replace the filter (Chapter 1).
5 Electric fuel pump not working (if equipped). Test it according to the procedures in Chapter 8.
6 Fuel line clogged. Pull the fuel line loose and carefully blow through it.
7 Inlet needle valve clogged. For both of the valves to be clogged, either a very bad batch of fuel with an unusual additive has been used, or some other foreign material has entered the tank. Many times after a machine has been stored for many months without running, the fuel turns to a varnish-like liquid and forms deposits on the inlet needle valves and jets. The carburetors should be removed and overhauled if draining the float chambers doesn't solve the problem.

5 Engine flooded

1 Fuel level too high. Check and adjust as described in Chapter 3.
2 Inlet needle valve worn or stuck open. A piece of dirt, rust or other debris can cause the inlet needle to seat improperly, causing excess fuel to be admitted to the float bowl. In this case, the float chamber should be cleaned and the needle and seat inspected. If the needle and seat are worn, then the leaking will persist and the parts should be replaced with new ones (Chapter 3).
3 Starting technique incorrect. Under normal circumstances (i.e., if all the carburetor functions are sound) the machine should start with little or no throttle. When the engine is cold, the choke should be operated and the engine started without opening the throttle. When the engine is at operating temperature, only a very slight amount of throttle should be necessary. If the engine is flooded, turn the fuel tap off and hold the throttle open while cranking the engine. This will allow additional air to reach the cylinders. Remember to turn the fuel tap back on after the engine starts.

6 No spark or weak spark

1 Ignition switch Off.
2 Engine kill switch turned to the Off position.
3 Battery voltage low. Check and recharge battery as necessary (Chapter 8).
4 Spark plug dirty, defective or worn out. Locate reason for fouled plug(s) using spark plug condition chart and follow the plug maintenance procedures in Chapter 1.
5 Spark plug cap or secondary (HT) wiring faulty. Check condition. Replace either or both components if cracks or deterioration are evident (Chapter 4).
6 Spark plug cap not making good contact. Make sure that the plug cap fits snugly over the plug end.
7 Igniter defective. Check the unit, referring to Chapter 4 for details.
8 Pickup coil(s) defective. Check the unit(s), referring to Chapter 4 for details.
9 Ignition coil(s) defective. Check the coils, referring to Chapter 4.
10 Ignition or kill switch shorted. This is usually caused by water, corrosion, damage or excessive wear. The switches can be disassembled and cleaned with electrical contact cleaner. If cleaning does not help, replace the switches (Chapter 8),
11 Wiring shorted or broken between:

a) Ignition switch and engine kill switch (or blown fuse)
b) Igniter and engine kill switch
c) Igniter and ignition coil
d) Ignition coil and plug
e) Igniter and pickup coil(s)

Make sure that all wiring connections are clean, dry and tight. Look for chafed and broken wires (Chapters 4 and 8).

7 Compression low

1 Spark plug loose. Remove the plug and inspect the threads. Reinstall and tighten to the specified torque (Chapter 1).
2 Cylinder head not sufficiently tightened down. If a cylinder head is suspected of being loose, then there's a chance that the gasket or head is damaged if the problem has persisted for any length of time. The head nuts and bolts should be tightened to the proper torque in the correct sequence (Chapter 2).
3 Improper valve clearance. This means that the valve is not closing completely and compression pressure is leaking past the valve. Check and adjust the valve clearances (Chapter 1).
4 Cylinder and/or piston worn. Excessive wear will cause compression pressure to leak past the rings. This is usually accompanied by worn rings as well. A top end overhaul is necessary (Chapter 2).
5 Piston rings worn, weak, broken, or sticking. Broken or sticking piston rings usually indicate a lubrication or carburetion problem that causes excess carbon deposits or seizures to form on the pistons and rings. Top end overhaul is necessary (Chapter 2).
6 Piston ring-to-groove clearance excessive. This is caused by excessive wear of the piston ring lands. Piston replacement is necessary (Chapter 2).

Tire pressures (cold) (continued)

XV920RH and RJ

Front	
Up to 90 kg (198 lbs) load	1.79 Bars (26 psi)
90 to 213 kg (198 to 470 lbs) load	1.93 Bars (28 psi)
High speed riding	1.93 Bars (28 psi)
Rear	
Up to 90 kg (198 lbs)	1.93 Bars (28 psi)
90 to 213 kg (198 to 470 lbs)	2.20 bars (32 psi)
High speed riding	2.20 Bars (32 psi)

TR1 (XV1000 chain drive) models

Front	
Up to 90 kg (198 lbs) load	1.79 Bars (26 psi)
90 to 201 kg (198 to 443 lbs) load	1.93 Bars (28 psi)
High speed riding	1.93 Bars (28 psi)
Rear	
Up to 90 kg (198 lbs)	1.93 Bars (28 psi)
90 to 201 kg (198 to 443 lbs)	2.20 bars (32 psi)
High speed riding	2.20 Bars (32 psi)

Torque specifications

Oil drain plug	43 Nm (31 ft-lbs)
Oil filter cover bolts	10 Nm (7.2 ft-lbs)
Spark plugs	14 Nm (10 ft-lbs)
Steering head bearing ring nuts	
Initial torque	25 Nm (18 ft-lbs)
Final torque	Back off 1/4 turn
Steering stem bolt	
XV920J, K, MK	54 Nm (39 ft-lbs)
All others	50 Nm (36 ft-lbs)
Valve adjuster locknuts	27 Nm (19 ft-lbs)
Rocker cover bolts	10 Nm (7.2 ft-lbs)
Final drive filler and drain plugs	23 Nm (17 ft-lbs)

Recommended lubricants and fluids

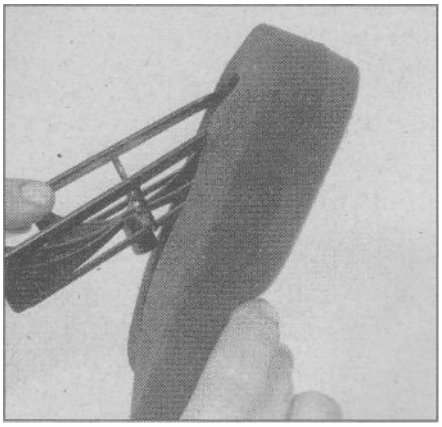
Engine/transmission oil	
Type	API grade SE or SF
Viscosity	
Consistently below 15 degrees C (60 degrees F)	SAE 10W30
Consistently above 5 degrees C (40 degrees F)	SAE 20W40
Capacity	
With filter change	3.1 liters (3.3 US qt, 5.46 Imperial pt)
Oil change only	3.0 liters (3.2 US qt, 5.28 Imperial pt)
Brake fluid	DOT 4
Final gear	
Type	SAE 80 API GL-4 hypoid gear oil
Capacity	0.20 liters (6.76 US fl oz, 7.04 Imp fl oz
Wheel bearings	Medium weight, lithium-based multi-purpose grease
Swingarm pivot bearings	Medium weight, lithium-based multi-purpose grease
Cables and lever pivots	Chain and cable lubricant or 10W30 motor oil
Sidestand/centerstand pivots	Chain and cable lubricant or 10W30 motor oil
Brake pedal/shift lever pivots	Chain and cable lubricant or 10W30 motor oil
Throttle grip	Multi-purpose grease or dry film lubricant

**In the UK, tread depth must be at least 1 mm over 3/4 of the tread breadth all the way around the tire, with no bald patches.*

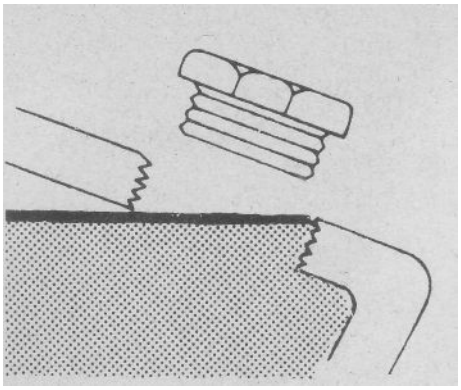
1984 and later models

Engine

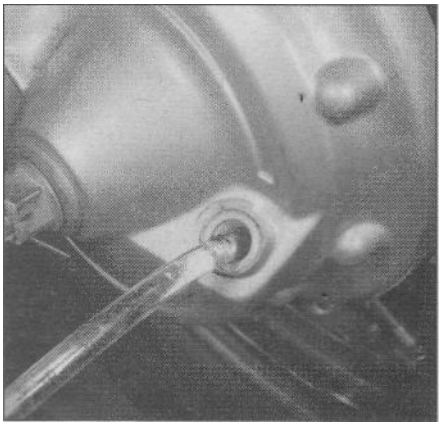
Spark plugs	
Type	NGK BP7ES or ND W22EP-U
Gap	0.7 to 0.8 mm (0.028 to 0.032 inch)
Valve clearances (COLD engine)	
Intake	0.07 to 0.12 mm (0.003 to 0.005 inch)
Exhaust	0.12 to 0.17 mm (0.005 to 0.007 inch)
Engine idle speed	950 to 1050 rpm



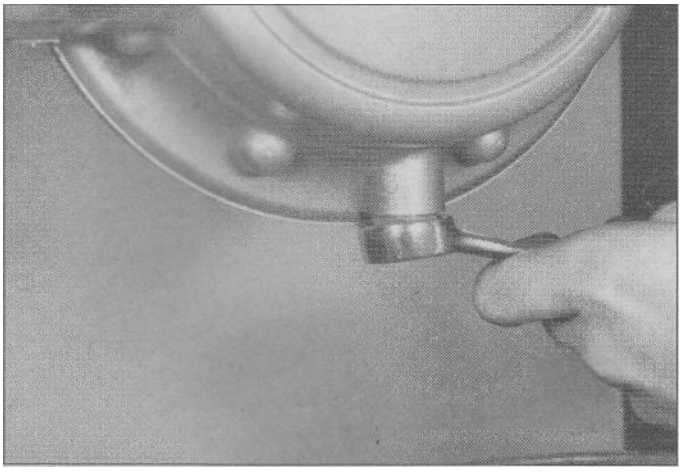
12.3 Remove the filler plug to check final drive oil level



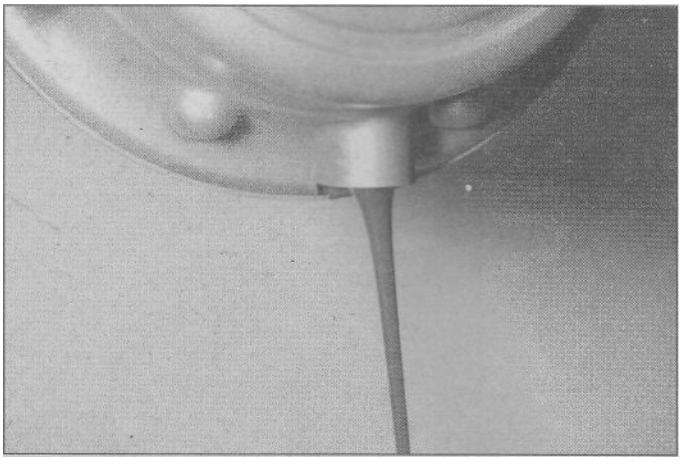
12.4a The oil should be even with the top of the filler hole



12.4b Add oil through the filler hole



12.7a Remove the drain plug ,



12.7b ... and let the oil drain into a pan, then clean the plug threads and reinstall it

3 Remove the filler plug from the final drive housing **(see illustration).**

4 Look inside the hole and check the oil level. It should be even with the top of the hole **(see illustration).** If it's low, add oil of the type listed in this Chapter's Specifications with a funnel or hose **(see illustration),** then reinstall the filler plug and tighten it to the torque listed in this Chapter's Specifications.

Oilchange

Refer to illustrations 12.7a and 12.7b

5 Ride the bike to warm the oil so it will drain completely. **Warning:** *Be careful not to touch hot components (including the oil); they may be hot enough to cause burns.*

6 Remove the filler plug **(see illustration 12.3).**

7 Remove the drain plug and let the oil drain for 10 to 15 minutes **(see illustrations).**

8 Clean the drain plug, reinstall it and tighten it to the torque listed in this Chapter's Specifications.

9 Fill the final drive unit to the correct level with oil of the type listed in this Chapter's Specifications **(see illustrations 12.4a and 12.4b).**

10 Install the filler plug and tighten it to the torque listed in this Chapter's Specifications.

13 Engine oil/filter - change

Refer to illustrations 13.4a, 13.4b, 13.4c, 13.5a through 13.5c, 13.6a, 13.6b, 13.7 and 13.13

1 Consistent routine oil and filter changes are the single most important maintenance procedure you can perform on a motorcycle. The oil not only lubricates the internal parts of the engine, transmission and clutch, but it also acts as a coolant, a cleaner, a sealant, and a protectant. Because of these demands, the oil takes a terrific amount of abuse and should be replaced' Often with new oil of the recommended grade and type. Saving a little money on the difference in cost between a good oil and a cheap oil won't pay off if the engine is damaged.

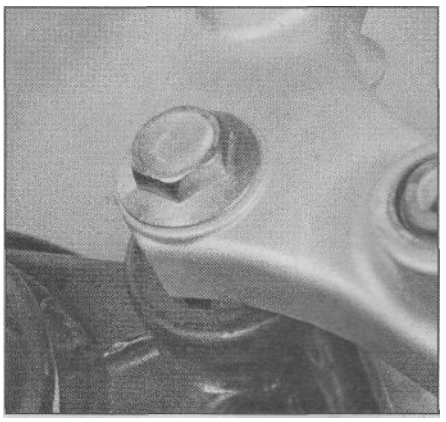
2 Before changing the oil and filter, warm up the engine so the oil will drain easily. Be careful when draining the oil, as the exhaust pipes, the engine, and the oil itself can cause severe burns.

3 Support the motorcycle securely over a clean drain pan. Remove the oil filler cap to vent the crankcase and act as a reminder that there is no oil in the engine.

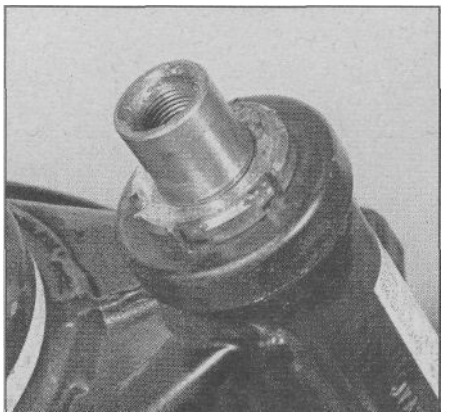
4 Next, remove the drain plug from the engine **(see illustrations)** and allow the oil to drain into the pan **(see illustration).** Discard the sealing washer on the drain plug; it should be replaced whenever the plug is removed.

5 Remove the Allen bolts and take off the filter cover **(see illustrations).**

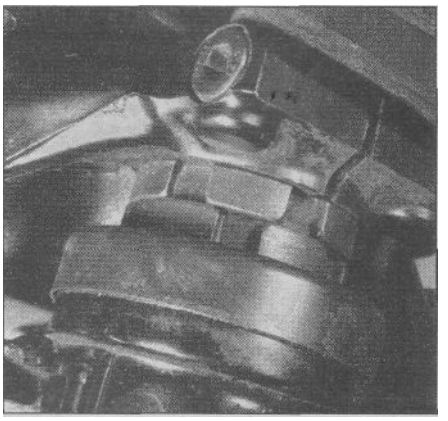
6 Remove the filter element from the engine **(see illustrations).**



23.10 Remove the steering stem bolt and lift off the upper triple clamp



23.11 Turn the ring nut to adjust steering head bearing play



23.17 Loosen the upper ring nut and adjust steering head bearing play with the lower ring nut

Allmodels

19 Start the engine and let it run until it reaches normal operating temperature.
20 Make sure there are no leaks in the vacuum gauge or manometer setup, as false readings will result.
21 Start the engine and make sure the idle speed is correct. If it isn't, adjust it (see Section 19).
22 The vacuum readings for both of the cylinders should be the same, or at least within the tolerance listed in this Chapter's Specifications. If the vacuum readings vary, adjust as necessary.
23 To perform the adjustment, synchronize the carburetors by turning the synchronizing screw, as needed, until the vacuum is identical or nearly identical for both cylinders **(see illustration 20.9).** Snap the throttle open and shut 2 or 3 times, then recheck the adjustment and readjust as necessary,
24 When the adjustment is complete, recheck the vacuum readings and idle speed, then stop the engine. Remove the vacuum gauge or manometer and reinstall all parts removed for access.

21 Crankcase ventilation system - inspection

Inspect the hose that runs from the ventilation fitting on the top of the engine to the air filter case. Make sure it's securely attached. Replace the hose if it's cracked or deteriorated.

22 Exhaust system - check

1 Periodically check all of the exhaust system joints for leaks and loose fasteners. If tightening the clamp bolts fails to stop any leaks, replace the gaskets with new ones (a procedure which requires disassembly of the system).
2 The exhaust pipe flange nuts at the cylinder heads are especially prone to loosening, which could cause damage to the head. Check them frequently and keep them tight.

23 Steering head bearings - check, adjustment and lubrication

1 All XV535 models and 1981 through 1983 models use ball bearings in the steering head. 1984 and later models are equipped with tapered roller type steering head bearings. Both types can become dented, rough or loose during normal use of the machine. In extreme cases, worn or loose steering head bearings can cause steering wobble that is potentially dangerous.

Check

2 To check the bearings, support the motorcycle securely and block the machine so the front wheel is in the air.
3 Point the wheel straight ahead and slowly move the handlebars from side-to-side. Dents or roughness in the bearing races will be felt and the bars will not move smoothly.
4 Next, grasp the wheel and try to move it forward and backward. Any looseness in the steering head bearings will be felt as front-to-rear movement of the fork legs. If play is felt in the bearings, adjust the steering head as follows.

Adjustment

XV535 models

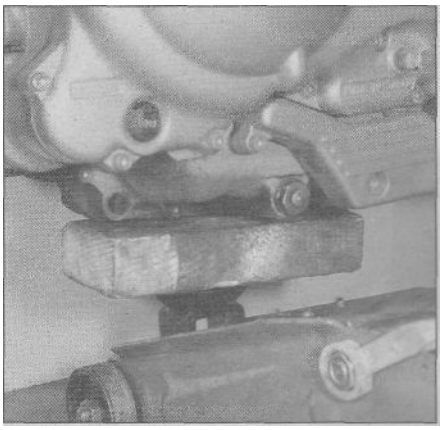
Refer to illustrations 23.10 and 23.11

5 Remove the headlight lens (see Chapter 8). Label and disconnect the wiring connectors inside the headlight body. Remove the two bolts that secure the headlight assembly to the lower triple clamp and pull the assembly (together with the turn indicator brackets) down out of the way.
6 Remove the upper triple clamp bolts, together with the cable guides (see Chapter 5).
7 Remove the brake master cylinder (see Chapter 6).
8 Remove the safety clips, nuts and washers that secure the handlebar brackets to the upper triple clamp (see Chapter 5). Lift the handlebar and bracket assembly away from the motorcycle. Separate the indicator light assembly from the handle bracket and lower it out of the way.
9 Unbolt the speedometer bracket and move the speedometer out of the way (see Chapter 8).
10 Remove the steering stem nut and the upper triple clamp **(see illustration).**
11 Loosen the steering head ring nut all the way **(see illustration).**
12 Attach the ring nut wrench to a torque wrench so they form a right angle. Tighten the ring nut to the initial torque listed in this Chapter's Specifications, then loosen it all the way again.
13 Retighten the ring nut to the final torque listed in this Chapter's Specifications.
14 Turn the steering from lock to lock and check for binding. If there is any, remove the bearings for inspection (see Chapter 5).
15 If the steering operates properly, reinstall all parts previously removed. Tighten the steering stem nut, triple clamp bolts and handlebar nuts to the torques listed in the Chapter 5 Specifications.

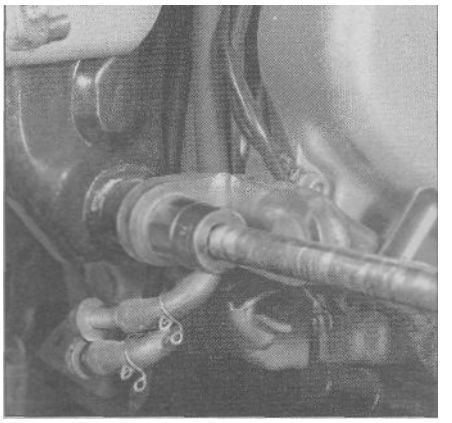
1981 through 1983 XV750 through 1000 models

Refer to illustration 23.17

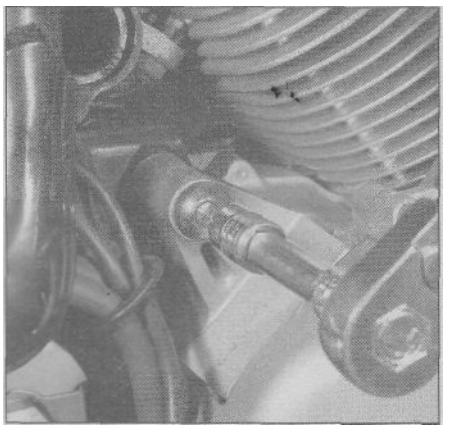
16 Loosen the pinch bolt that passes through the rear side of the upper triple clamp.



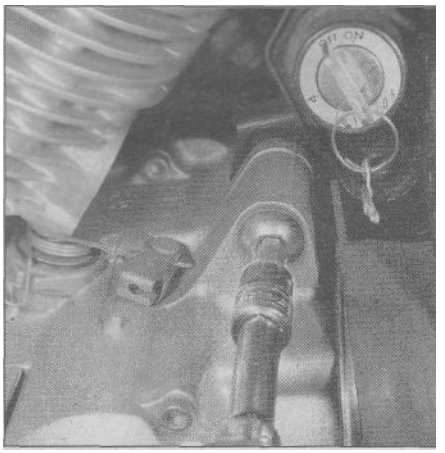
5.24 Support the engine with a jack and a block of wood



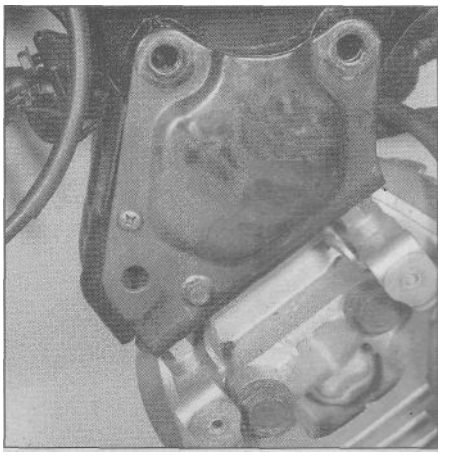
5.25a Remove the lower rear mounting bolt...



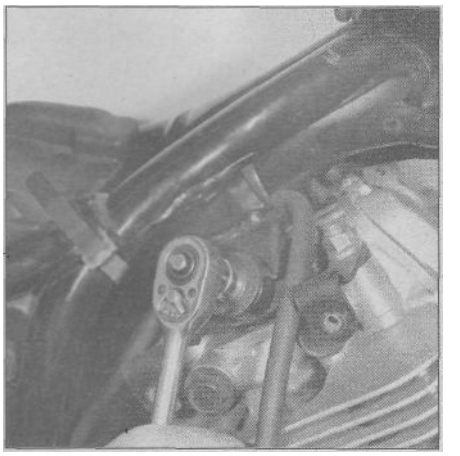
5.25b ... and the upper rear mounting bolts...



5.25c ... (there's an upper rear mounting bolt on each side of the engine)



5.25d Unbolt the front cylinder head bracket from the frame



5.25e Unbolt the rear cylinder head mounting brackets from the frame ...

23 Remove the starter motor (see Chapter 8).

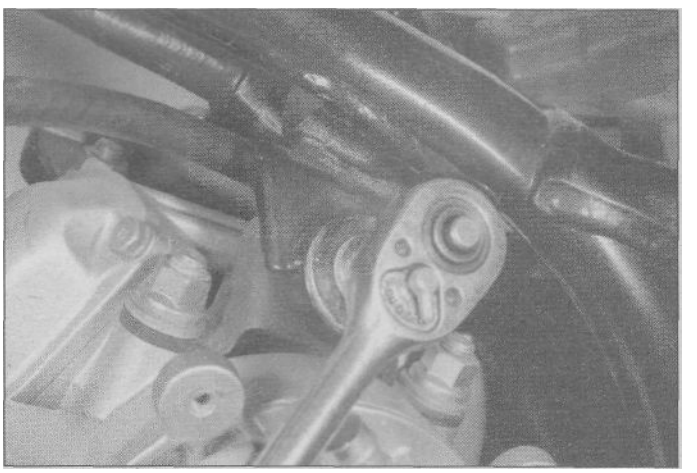
24 Support the engine with a jack and wood block **(see illustration).** Make sure the support is still in position under the swingarm pivot and that the bike is still securely braced.

25 Remove the engine mounting bolts at the lower rear of the crankcase, upper rear of the crankcase and at the top of each cylinder **(see illustrations).**

26 Disconnect both battery cables from the battery. **Warning:** *Always disconnect the negative cable first and reconnect it last to prevent a battery explosion.*

27 Make sure no wires or hoses are still attached to the engine assembly. **Warning:** *The engine is heavy 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.*

28 Slowly and carefully lower the engine assembly to the floor, then guide it out from under the right side of the bike.



5.25f ... (there's one on each side of the engine)

Installation

29 Installation is the reverse of removal. Note the following points:

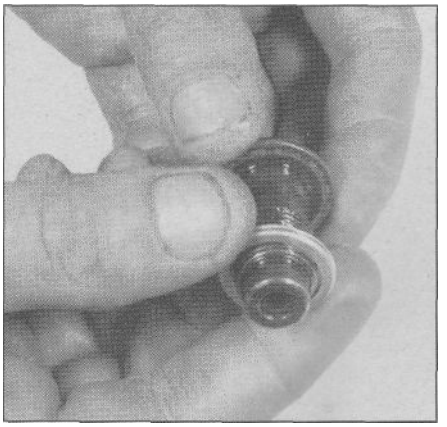
a) Don't tighten any of the engine mounting bolts until they all have been installed.

b) Use new gaskets at all exhaust pipe connections.

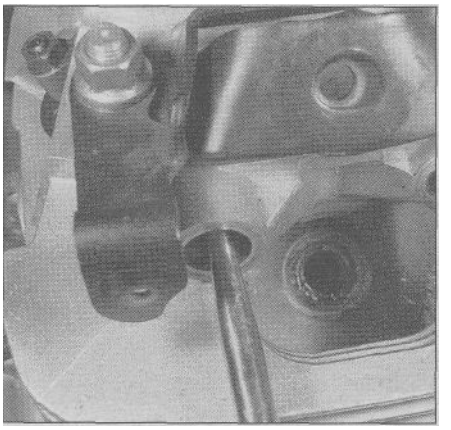
c) Tighten the engine mounting bolts securely.

d) Adjust the rear brake rod, clutch cable and throttle cable(s) following the procedures in Chapter 1 and Chapter 2.

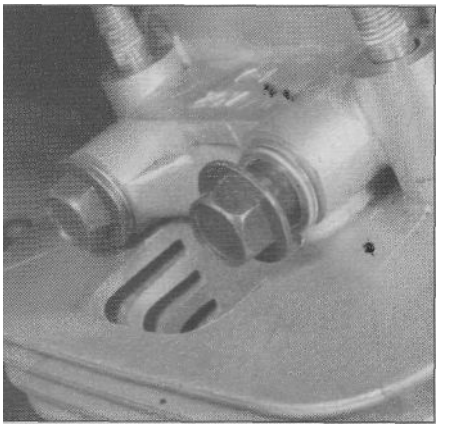
e) Be sure to refill the engine oil before starting the engine.



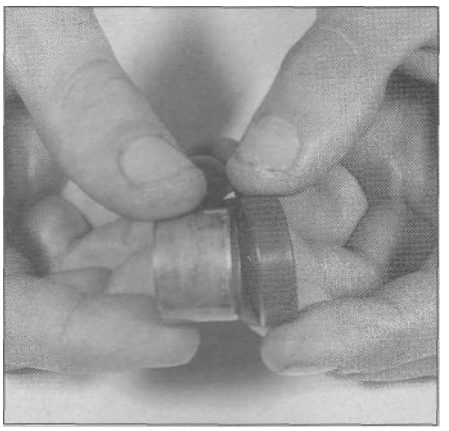
8.42a Install new sealing washers on the rocker shaft bolts



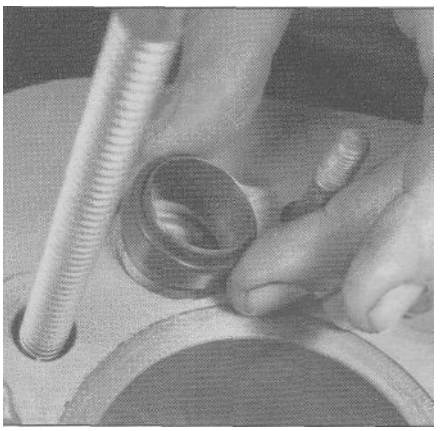
8.42b Use a screwdriver to position the rocker shafts so the bolts will line up with them



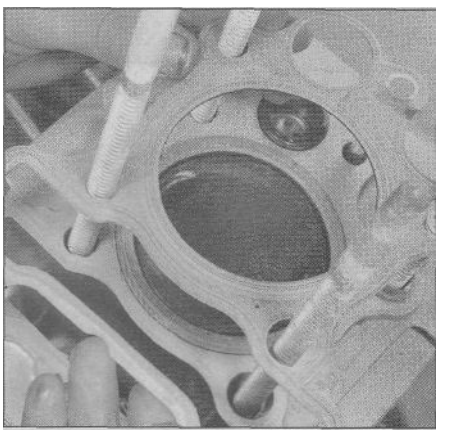
8.42c Install the bolts with their sealing washers and tighten them to the torque listed in this Chapter's Specifications



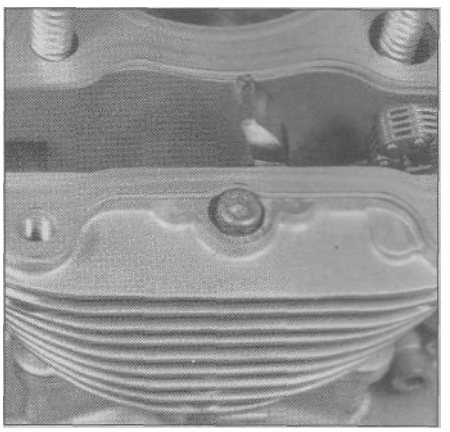
8.44a Slip the O-ring **onto the large dowel..**



8.44b ... and install the large dowel and two small dowels in their bores ...

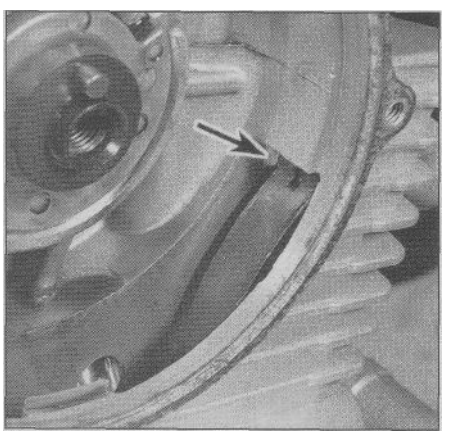


8.44c ... and install the head gasket over the studs and dowels



8.45 Install the exhaust side cam chain damper in its slot with the UP mark (arrow) up

8.46a As you lower the head onto the studs, move the cam chain and damper aside so they don't obstruct installation of the head



8.46b Slip the exhaust side chain damper into its notch (arrow) as the head is lowered into position

Chapter's Specifications, then bend the lockwasher tabs against the bolt heads.

42 Install new sealing washers on the rocker arm holding bolts **(see illustration).** Use a screwdriver to position the ends of the rocker shafts so the bolts will align with them **(see illustration),** then install the bolts with their sealing washers and tighten them to the torque listed in this Chapter's Specifications **(see illustration).**

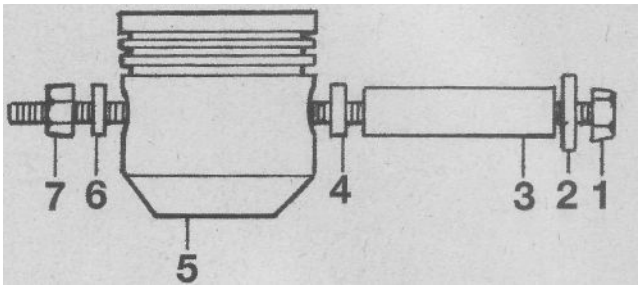
Cylinder head installation

Rear cylinder head

Refer to illustrations 8.44a, 8.44b, 8.44c, 8.45, 8.46a, 8.46b, 8.47a, 8.47b, 8.47c, 8.47d,8.50, 8.57a, 8.57b, 8.57c and 8.57'd

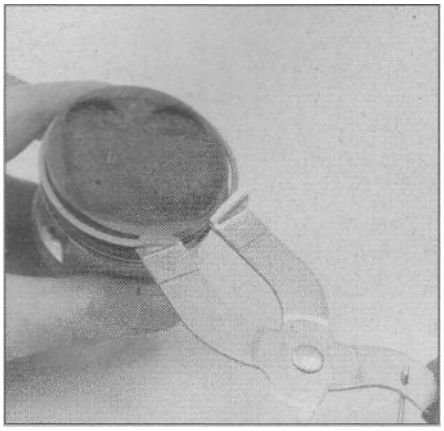
43 If both cylinder heads have been removed, install the rear cylinder head first. '

12.4a Push the piston pin partway out, then grasp it and pull it the rest of the way

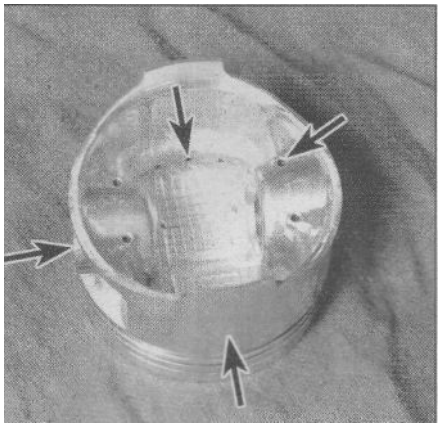


12.4b The piston pins should come out with hand pressure - if they don't, this removal tool can be fabricated from readily available parts

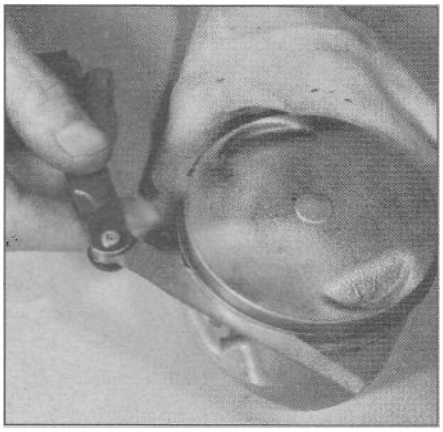
1) Bolt
2) Washer
3) Pipe (A)
4) Padding (A)
5). Piston
6) Washer (B)
7) Nut(B)
A Large enough for piston pin to fit inside
B Small enough to fit through piston pin bore



12.6 Remove the piston rings with a ring removal and installation tool



12.11 Check the piston pin bore and the piston skirt for wear, and make sure the internal holes are clear (arrows)



12.13 Measure ring side clearance with a feeler gauge

Inspection

Refer to illustrations 12.6, 12.11, 12.13, 12.14 and 12.15

5 Before the inspection process can be carried out, the pistons must be cleaned and the old piston rings removed.

6 Using a piston ring installation tool, carefully remove the rings from the pistons **(see illustration).** Do not nick or gouge the pistons in the process.

7 Scrape all traces of carbon from the tops of the pistons. A hand-held wire brush or a piece of fine emery cloth can be used once most of the deposits have been scraped away. Do not, under any circumstances, use a wire brush mounted in a drill motor to remove deposits from the pistons; the piston material is soft and will be eroded away by the wire brush.

8 Use a piston ring groove cleaning tool to remove any carbon deposits from the ring grooves. If a tool is not available, a piece broken off the old ring will do the job. Be very careful to remove only the carbon deposits. Do not remove any metal and do not nick or gouge the sides of the ring grooves.

9 Once the deposits have been removed, clean the pistons with solvent and dry them thoroughly. Make sure the oil return holes below the oil ring grooves are clear.

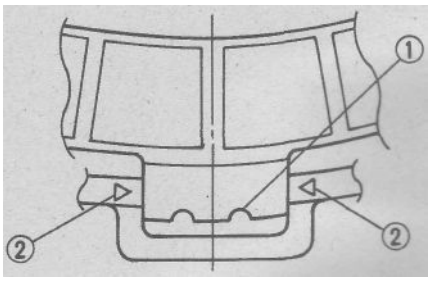
10 If the pistons are not damaged or worn excessively and if the cylinders are not rebored, new pistons will not be necessary. Normal piston wear appears as even, vertical wear on the thrust surfaces of the piston and slight looseness of the top ring in its groove. New piston rings, on the other hand, should always be used when an engine is rebuilt.

11 Carefully inspect each piston for cracks around the skirt, at the pin bosses and at the ring lands **(see illustration).**

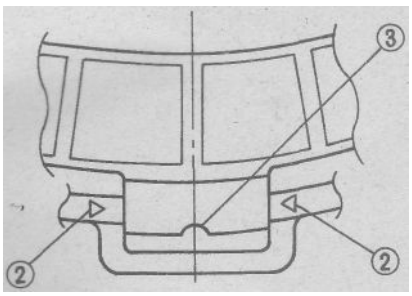
12 Look for scoring and scuffing on the thrust faces of the skirt, holes in the piston crown and burned areas at the edge of the crown. If the skirt is scored or scuffed, the engine may have been suffering from overheating and/or abnormal combustion, which caused excessively high operating temperatures. The oil pump should be checked thoroughly. A hole in the piston crown, an extreme to be sure, is an indication that abnormal combustion (pre-ignition) was occurring. Burned areas at the edge of the piston crown are usually evidence of spark knock (detonation). If any of the above problems exist, the causes must be corrected or the damage will occur again.

13 Measure the piston ring-to-groove clearance by laying a new piston ring in the ring groove and slipping a feeler gauge in beside it **(see illustration).** Check the clearance at three or four locations around the groove. Be sure to use the correct ring for each groove; they are different. If the clearance is greater than specified, new pistons will have to be used when the engine is reassembled.

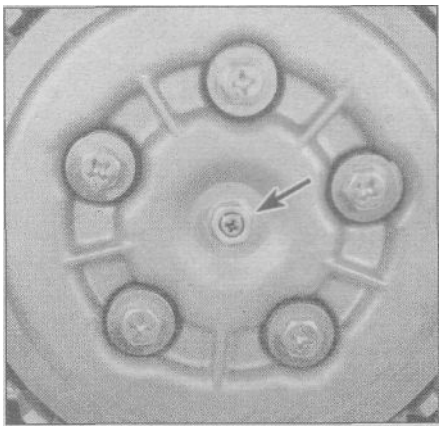
14 Check the piston-to-bore clearance by measuring the bore (see Section 13) and the piston diameter. Make sure that the pistons and cylinders are correctly matched. Measure the piston across the skirt on the thrust faces at a 90-degree angle to the piston pin, at the distance from the bottom of the skirt listed in this Chapter's Specifications **(see illustration).** Subtract the piston diameter from the bore diameter to



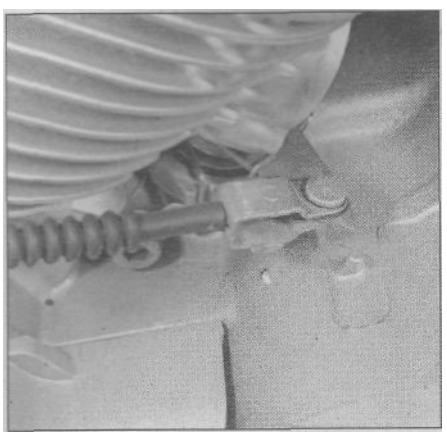
16.34 On models so equipped, align the **double notches in** the friction **plates (1) with the marks** on the clutch housing **(2) .**



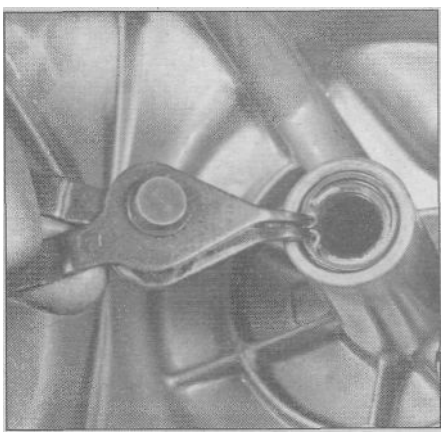
16.35 ... if tight friction plates impede clutch movement, align the single notches (3) with the marks (2)



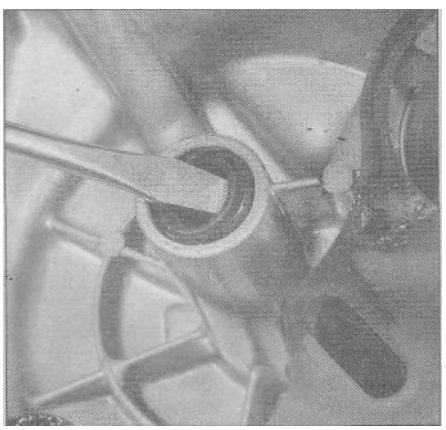
16.37a Loosen the adjuster locknut (arrow)



16.37b Align the clutch lever mark with the mark on the crankcase



16.38a Remove the snap-ring ,



16.3&b ... **and pry out the seal**

32 If you removed the clutch damper, reverse Step 13 to install it. The OUTSIDE mark on the seat spring faces out (away from the engine). Make sure the wire ring is securely seated in its groove in the clutch boss.

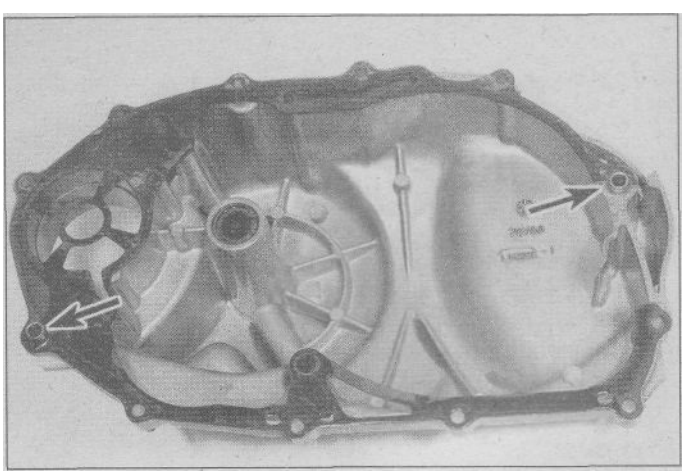
33 Coat the pushrods and steel ball with multipurpose grease. Install the long pushrod and ball in the engine and the short pushrod in the pressure plate **(see illustrations 16.6b, 16.6a and 16.5b).**

34 Coat one of the friction plates with engine oil and install it in the clutch housing so its double notch aligns with the embossed marks on the clutch housing **(see illustration).** If there aren't any visible marks on the clutch housing, align the double notches on all of the friction plates with each other. Engage the tabs on the friction plate with the slots in the clutch housing.

35 Coat a metal plate with engine oil and install it on top of the friction plate with its rounded side in. Continue to install alternate friction and metal plates, coated with engine oil (a friction plate is the last one installed). Align the double notch on each remaining friction plate with the clutch housing marks (if equipped) or with the double notches on the previously installed friction plates. **Note:** ***If*** *any of the friction plates fit tightly in the clutch housing, remove all of the friction and metal plates, then reinstall them so the single notches are aligned with the clutch housing marks* ***(see illustration).***

36 Install the pressure plate, springs and screws. Tighten the screws evenly in a criss-cross pattern to the torque listed in this Chapter's Specifications.

37 Loosen the locknut on the clutch mechanism freeplay adjuster **(see illustration).** Push the lever by hand toward the front of the engine as far as it will go, then note the positions of the lever mark and the match mark on the crankcase **(see illustration).** If they aren't aligned, turn the adjuster in or out until they are, then tighten the locknut.



16.38c Make sure the dowels are in position (arrows) and install the gasket

38 Remove the snap-ring and pry the seal out of the clutch cover **(see illustrations).** Tap in a new seal with a socket the same diameter as the seal, then install a new snap-ring. Make sure the clutch cover dowels are in position and install a new gasket **(see illustration).**

Caution: *The crankcase halves should fit together completely without being forced. If they're slightly apart, DO NOT force them together by tightening the crankcase bolts.*

20 Install the crankcase bolts in their holes **(see illustrations 22.9a and 22.9b).** Bolts 1 through 12 have steel washers.

21 Tighten the bolts in numerical order, starting with the lowest-numbered bolt and working to the highest. Tighten all bolts to the torque listed in this Chapter's Specifications. **Note:** *There are different torque settings for the 8mm bolts and the 6mm bolts.*

22 Turn the mainshaft and the transmission driveshaft to make sure they turn freely. Also make sure the crankshaft turns freely. Rotate the shift cam by hand to make sure the transmission shifts into the different gear positions.

23 The remainder of assembly is the reverse of disassembly.

24 Be sure to refill the engine oil (see Chapter 1).

23 Crankcase components - inspection and servicing

1 After the crankcases have been separated and the crankshaft, shift cam and forks and transmission components removed, the crankcases should be cleaned thoroughly wiih new solvent and dried with compressed air.

2 Remove any oil passage plugs that haven't already been removed. All oil passages should be blown out with compressed air.

3 All traces of old gasket sealant should be removed from the mating surfaces. Minor damage to the surfaces can be cleaned up with a fine sharpening stone or grindstone. **Caution:** *Be very careful not to nick or gouge the crankcase mating surfaces or leaks will result.* Check both crankcase halves very carefully for cracks and other damage.

4 If any damage is found that can't be repaired, replace the crankcase halves as a set.

24 Main and connecting rod bearings - general note

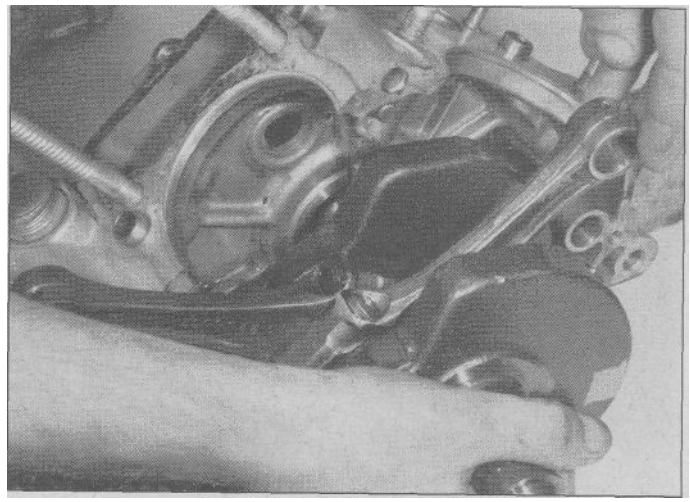
1 Even though main and connecting rod bearings are generally replaced with new ones during the engine overhaul, the old bearings should be retained for close examination as they may reveal valuable information about the condition of the engine.

2 Bearing failure occurs mainly because of lack of lubrication, the presence of dirt or other foreign particles, overloading the engine and/or corrosion. Regardless of the cause of bearing failure, it must be corrected before the engine is reassembled to prevent it from happening again.

3 When examining the bearings, remove the rod bearings from the connecting rods and caps and lay them out on a clean surface in the same general position as their location on the crankshaft journals. This will enable you to match any noted bearing problems with the corresponding side of the crankshaft journal. The main bearings are pressed into the crankcase halves and are only removed if they need to be replaced.

4 Dirt and other foreign particles get into the engine in a variety of ways. It may be left in the engine during assembly or it may pass through filters or breathers. It may get into the oil and from there into the bearings. Metal chips from machining operations and normal engine wear are often present. Abrasives are sometimes left in engine components after reconditioning operations such as cylinder honing, especially when parts are not thoroughly cleaned using the proper cleaning methods. Whatever the source, these foreign objects often end up imbedded in the soft bearing material and are easily recognized. Large particles will not imbed in the bearing and will score or gouge the bearing and journal. The best prevention for this cause of bearing failure is to clean all parts thoroughly and keep everything spotlessly clean during engine reassembly. Frequent and regular oil and filter changes are also recommended.

5 Lack of lubrication or lubrication breakdown has a number of interrelated causes. Excessive heat (which thins the oil), overloading (which squeezes the oil from the bearing face) and oil leakage or throw



25.2 Lift the crankshaft and connecting rods out of the crankcase

off (from excessive bearing clearances, worn oil pump or high engine speeds) all contribute to lubrication breakdown. Blocked oil passages will also starve a bearing and destroy it. When lack of lubrication is the cause of bearing failure, the bearing material is wiped or extruded from the steel backing of the bearing. Temperatures may increase to the point where the steel backing and the journal turn blue from overheating.

6 Riding habits can have a definite effect on bearing life. Full throttle low speed operation, or lugging the engine, puts very high loads on bearings, which tend to. squeeze out the oil film. These loads cause the bearings to flex, which produces fine cracks in the bearing face (fatigue failure). Eventually the bearing material will loosen in pieces and tear away from the steel backing. Short trip driving leads to corrosion of bearings, as insufficient engine heat is produced to drive off the condensed water and corrosive gases produced. These products collect in the engine oil, forming acid and sludge. As the oil is carried to the engine bearings, the acid attacks and corrodes the bearing material.

7 Incorrect bearing installation during engine assembly will lead to bearing failure as well. Tight fitting bearings which leave insufficient bearing oil clearances result in oil starvation. Dirt or foreign particles trapped behind a bearing insert result in high spots on the bearing which lead to failure.

8 To avoid bearing problems, clean all parts thoroughly before reassembly, double check all bearing clearance measurements and lubricate the new bearings with engine assembly lube or moly-based grease during installation.

25 Crankshaft and main bearings - removal, inspection, main bearing selection and installation

Crankshaftremoval

Refer to illustration 25.2

1 Separate the crankcase halves (see Section 22).

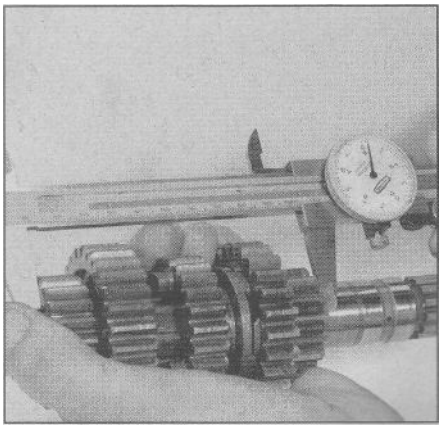
2 Lift the crankshaft out, together with the connecting rods, and set them on a clean surface **(see** illustration).

Inspection

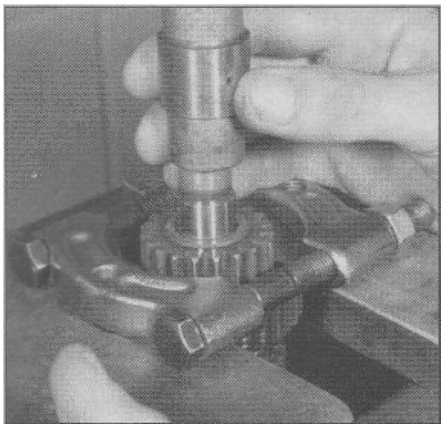
Refer to illustration 25.6

3 If you haven't already done so, mark and remove the connecting rods from the crankshaft (see Section 26).

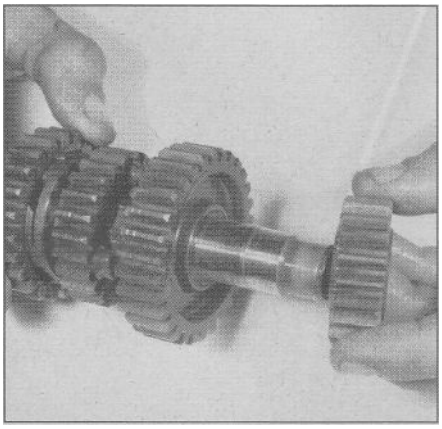
4 Clean the crankshaft with solvent, using a rifle-cleaning brush to scrub out the oil passages. If available, blow the crank dry with compressed air. Check the main and connecting rod journals for uneven wear, scoring and pits. Rub a copper coin across the journal



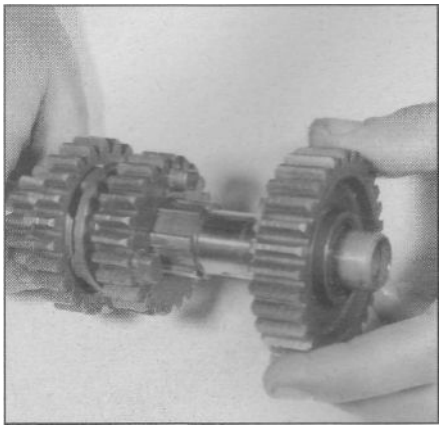
28.13 Measure the length of the gearset on the main axle assembly and compare to the Specifications



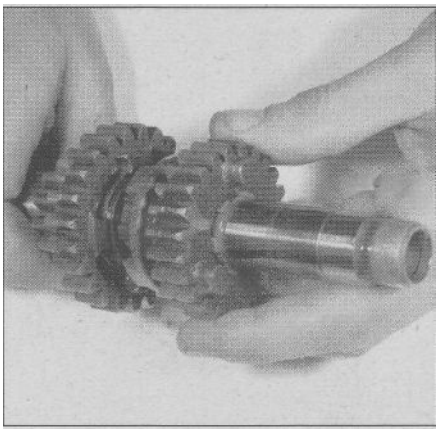
28.14a Press the main axle out of second pinion gear until it's loose ...



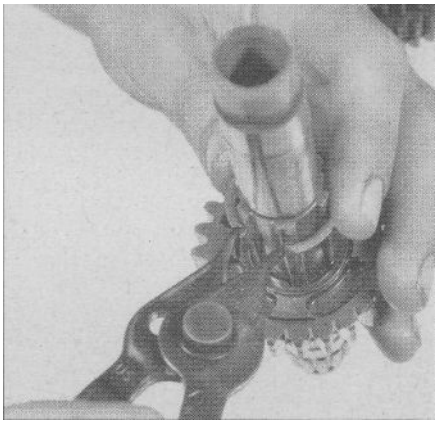
28.14b ... then remove the gear from the shaft



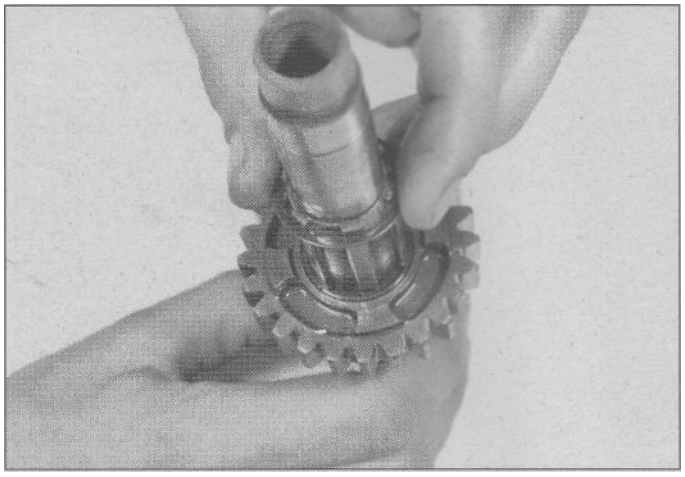
28.15a Take off fifth pinion gear. ..



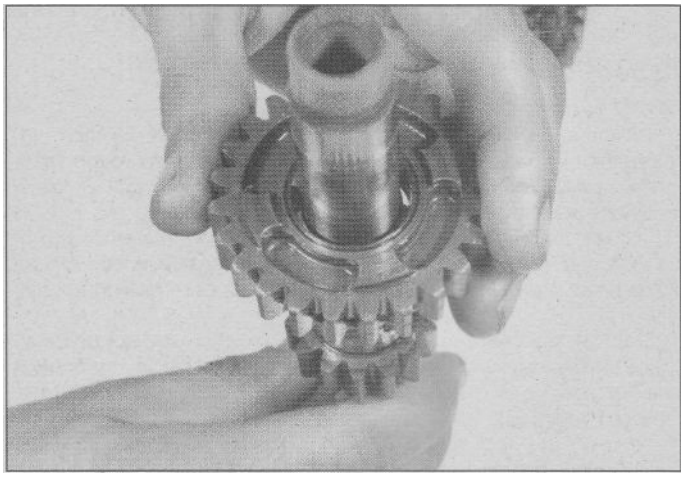
28.15b ... and third pinion gear



28.16a Remove the snap-ring .



28.16b ... the thrust washer ...



28.16c ... and fourth pinion gear

main axle **(see illustration).** The length is determined by how far the gears are pressed onto the shaft. Compare it to the value in illustration 28.3a.

14 Place the main axle in a press with a bearing splitter behind second pinion gear **(see illustration).** Press the main axle out of second pinion gear. Once the gear is loose, take it off the shaft **(see illustration).**

15 Take fifth pinion gear off the shaft **(see illustration),** then take off third pinion gear **(see illustration).**

16 Remove the snap-ring and thrust washer, then take off fourth pinion gear **(see illustrations).**

Transmission

Driveaxle and mainshaft runout limit	0.08 mm (0.0031 inch)

Torque specifications

Alternator cover bolts	10 Nm (7.2 **ft**-lbs)
Alternator cover screws	7 Nm (5.1 ft-lbs)
Alternator rotor nut	See Chapter 8
Cam chain damper bolt	8 Nm (5.8 ft-lbs)
Cam chain damper bolt locknut	12 Nm ((8.7 ft-lbs)
Cam chain tensioner bolts	10 Nm (7.2 **ft**-lbs)
Cam sprocket bolt	55 Nm (40 ft-lbs)
Cam sprocket cover bolts	10 Nm (7.2 **ft**-lbs)
Camshaft retainer bolts	20 Nm (14 ft-lbs)
Clutch push screw locknut	12 Nm (8.7 **ft**-lbs)
Clutch boss nut	70 Nm (50 ft-lbs) (4)
Clutch cover bolts	10 Nm (7.2 **ft**-lbs)
Clutch pressure plate screws	8 Nm (5.8 ft-lbs)
Connecting rod nuts	48 Nm (35 ft-lbs) (2)
Crankcase bolts (6 mm)	10 Nm (7.2 **ft**-lbs)
Crankcase bolts (10 mm)	39 Nm (28 ft-lbs)
Cylinder bolts	10 Nm (7.2 ft-lbs)
Cylinder head 12 mm nuts	
First stage	50 Nm (36 ft-lbs) (3)
Second stage	64 Nm (46 ft-lbs)
Cylinder head bolts (8 mm)	20 Nm (14 ft-lbs)
Cylinder head nuts (10 mm)	40 Nm (29 ft-lbs)
Intermediate gear stopper plate bolts	10 Nm (7.2 **ft**-lbs)
Oil line union bolts	20 Nm (14 ft-lbs) (1)
Oil pump bolts	10 Nm (7.2 **ft**-lbs)
Oil pump chain cover bolts	10 Nm (7.2 **ft**-lbs)
Oil pump sprocket bolts	12 Nm (8.7 **ft**-lbs)
Primary drive gear nut	110 Nm (80 **ft**-lbs) (4)
Rocker arm cover bolts	10 Nm (7.2 ft-lbs)
Rocker arm shaft holding bolts	38 Nm (27 ft-lbs) (1)
Shift fork guide bar stopper screws	7 Nm (5.1 ft-lbs) (5)
Shift pedal pinch bolt	10 Nm (7.2 ft-lbs)

7 Use new sealing washers.
2 Apply molybdenum disulfide grease to the threads and nut surfaces; follow special tightening procedure in the text.
3 Apply engine oil to the threads.
4 Use a new lockwasher.
5 Apply Loctite Stud 'n' Bearing Mount or equivalent to the threads.

XV1000 models

General

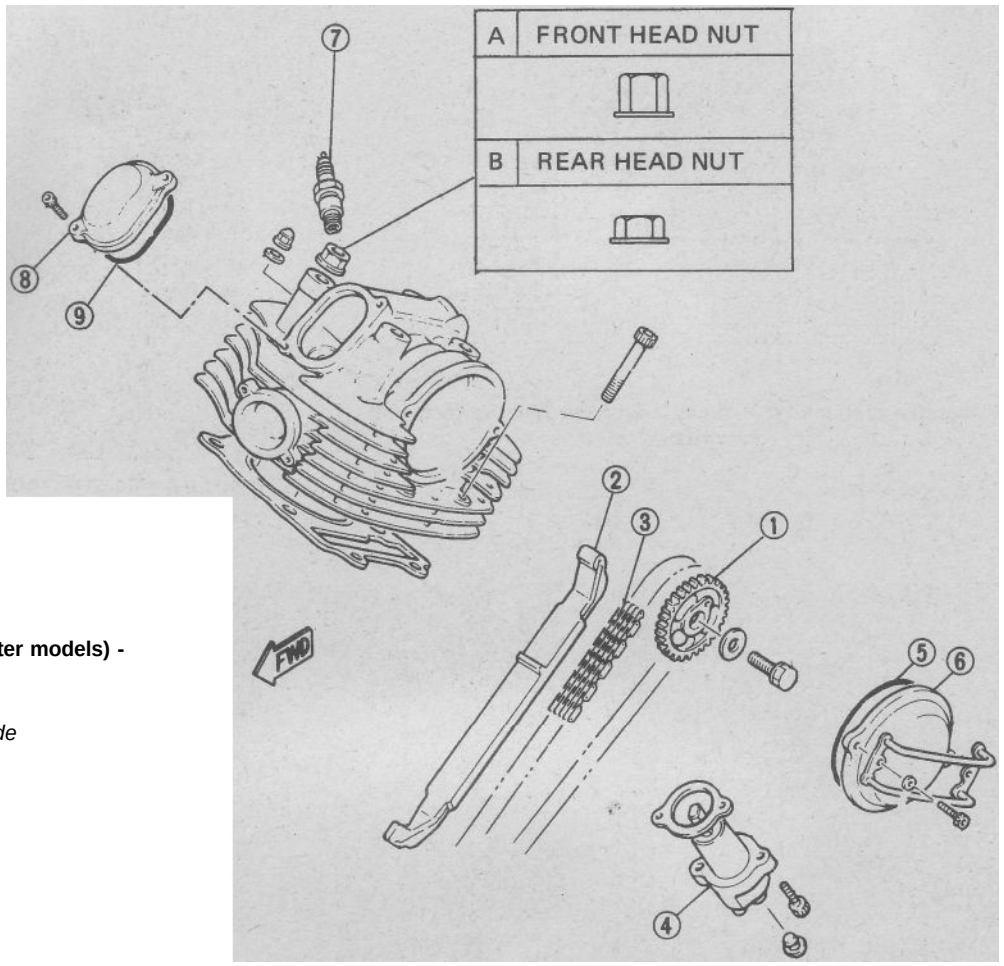
Bore x stroke	95.0 x 69.2 mm (3.74 x 2.72 inches)
Displacement	981 cc
Compression ratio	8.3 to 1

Camshafts

Lobe height	
Intake	39.17 mm (1.5421 inch)
Exhaust	39.20 mm (1.5433 inch)
Base circle	
Intake	32.17 mm (1.2665 inch)
Exhaust	32.27 mm (1.2705 inch)
Bearing oil clearance	0.020 to 0.061 mm (0.0008 to 0.0024 inch)
Journal diameter	24.96 to 24.98 mm (0.9432 to 0.9440 inch)
Bearing bore	25.00 to 25.021 mm (0.9448 to 0.9456 inch)
Camshaft runout limit	0.03 mm (0.0012 inch)
Rocker arm inside diameter	14.000 to 14.018 mm (0.5511 to 0.5518 inch)
Rocker arm shaft diameter	13.975 to 13.990 mm (0.5501 to 0.5507 inch)
Rocker arm to shaft clearance	0.010 to 0.043 mm (0.0004 to 0.0017 inch)

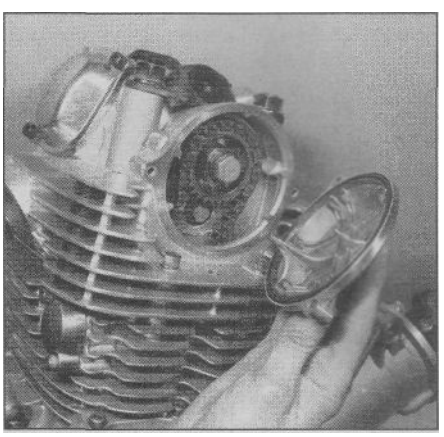
Cylinder head, valves and valve springs

Cylinder head warpage limit	0.03 mm (0.0012 inch)
Valve stem bend limit	0.03 mm (0.0012 inch)
Valve head diameter	
Intake	47.0 to 47.02 mm (1.850 to 1.858 inch)
Exhaust	39.0 to 39.2 mm (1.540 to 1.562 inch)

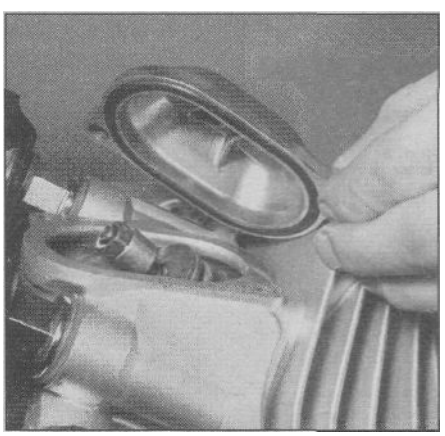


8.4b Cylinder heads (1984 and later models) - exploded view

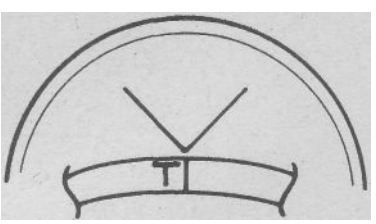
1 Cam sprocket
2 Front cam chain guide
3 Cam chain
4 Cam chain tensioner
5 O-ring
6 Cam sprocket cover
7 Spark plug
8 Rocker arm cover
9 O-ring



8.4c Remove the cam sprocket cover; use a new O-ring on installation



8.5 Remove the rocker arm cover; use a new O-ring on installation



8.6a Align the line next to the T mark with the pointer

5 Remove the rocker arm covers and their O-rings from the exhaust side and intake side of the cylinder **(see illustration).**

Rear cylinder

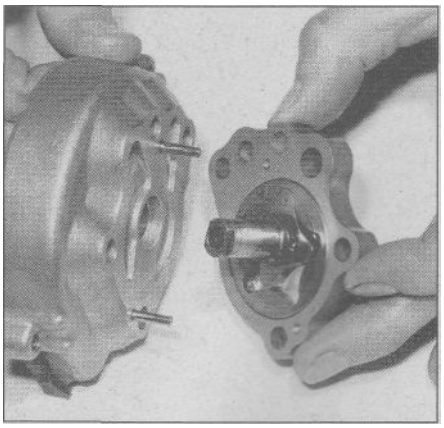
Referto illustrations 8.6a, 8.6b, 8.13,8.14a, 8.14b, 8.15a, 8.15b, 8.16 and 8.17

6 Turn the engine so the rear cylinder is at top dead center on its compression stroke (see *Valve clearance - adjustment* in Chapter 1). When the rear cylinder is on its compression stroke, the line on the alternator rotor with a T mark next to it will be aligned with the notch in the timing window **(see illustration).** Also, the camshaft sprocket mark will be aligned with the mark inside the sprocket housing on the cylinder head **(see illustration).**

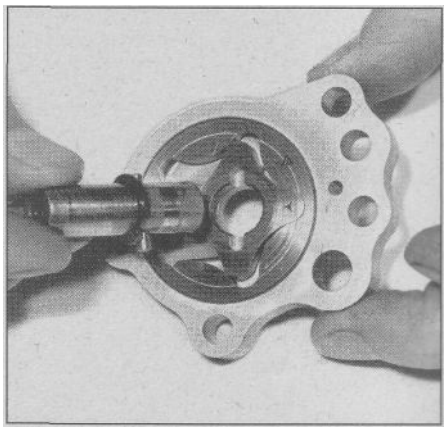
7 Remove the cam chain tensioner for the rear cylinder (see Section 7).

8 Place a piece of mechanic's wire where you can reach it easily during the next steps.

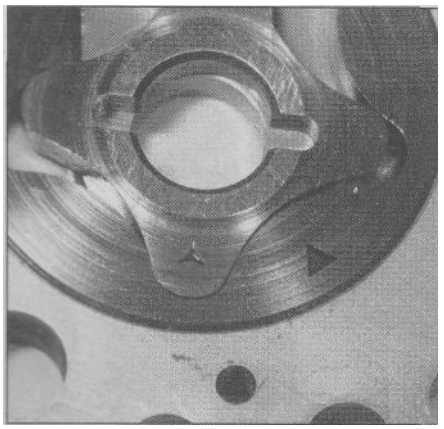
9 Hold the engine from turning with a socket on the alternator rotor bolt. If the engine is in the frame, you can also keep it from turning by



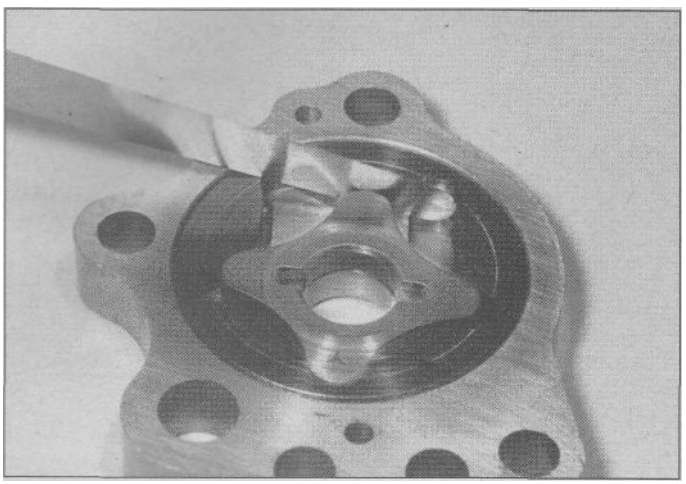
15.7d Lift off the remaining rotor housing and oil pump shaft...



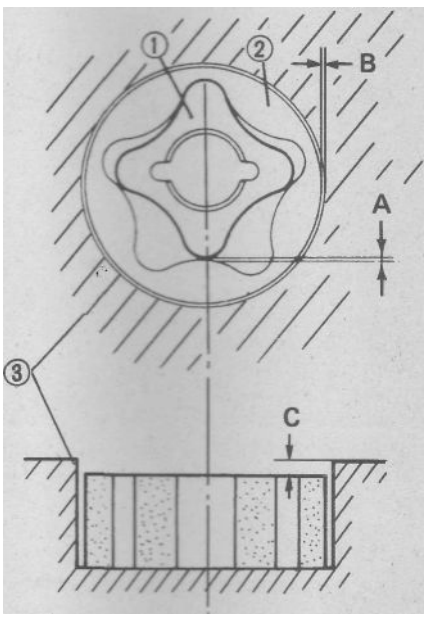
15.7e ... and separate the shaft from the rotors



15.7f Note the marks on the rotors; they must face **in the same direction when the pump is assembled .**

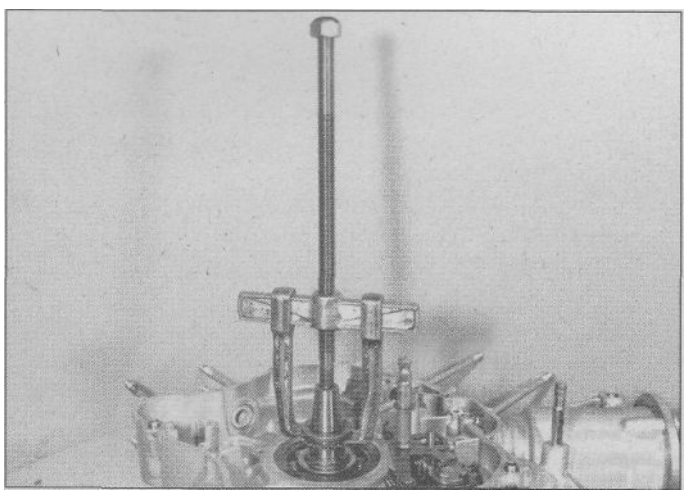


15.9a Measure oil pump clearances with a feeler gauge



15.9b Oil pump **measurement points**

1 Inner rotor
2 Outer rotor
3 Pump housing
A Inner to outer rotor clearance
B Outer rotor to housing clearance
C Side clearance



15.13a Remove the oil pump sprocket from the crankshaft with a puller (the sprocket must be replaced with a **new one whenever it's removed)**

8 Check the pump body and rotors for scoring and wear. If any damage or uneven or excessive wear is evident, replace the pump (individual parts aren't available). If you are rebuilding the engine, it's a good idea to install a new oil pump.

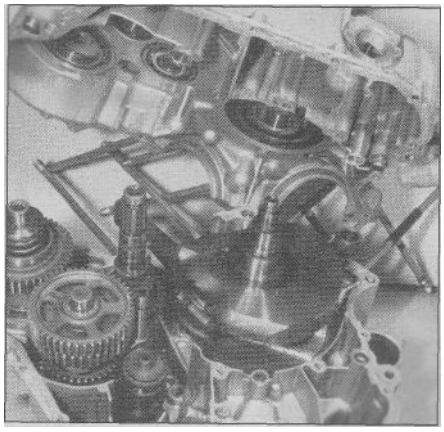
9 Measure the clearance between the inner and outer rotors and between the outer rotor and housing **(see illustrations).** Replace the pump if the clearance is excessive.

10 Lay a straightedge across the pump body and measure the side clearance between the rotors and straightedge with a feeler gauge (see illustration 15.9b). Replace the pump if the clearance is excessive.

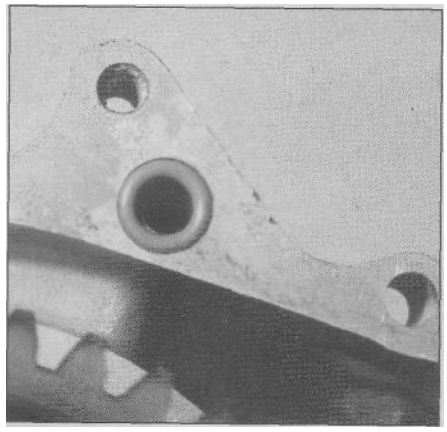
11 If the pump is good, reverse the disassembly steps to reassemble it. Make sure the pins are centered in the rotor shaft so they will align with the slots in the inner rotors.

12 Inspect the oil pump drive chain and sprockets. Replace all three components as a set if any one of them is worn or damaged.

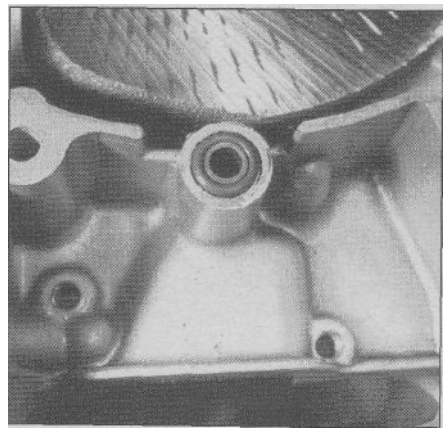
13 To replace the oil pump drive sprocket, remove it from the crankshaft with a puller **(see illustration). Note:** *Removal will damage the sprocket It must be replaced with a new one if it's removed from the crankshaft.* Position the new sprocket on the crankshaft with the teeth toward the crankcase **(see illustration),** then drive it all the way on with a hammer and a piece of pipe **(see illustration).**



20.9 With all fasteners removed, lift the right crankcase half off the left crankcase half



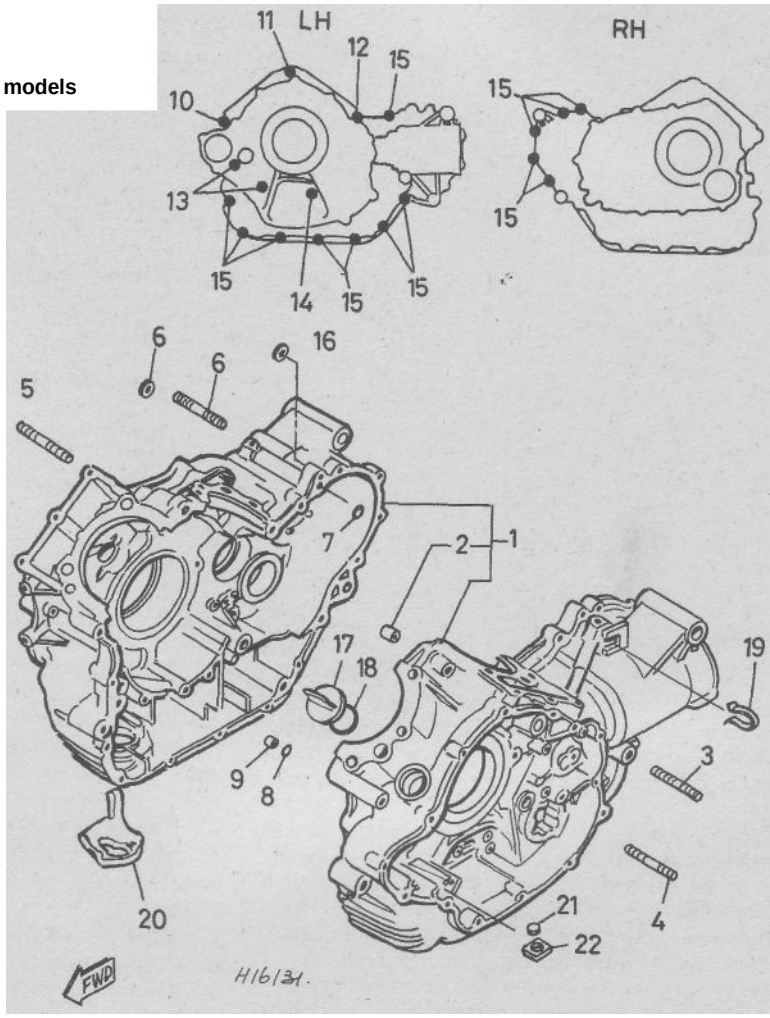
20.10a Locate the orange O-ring



20.10b ... and the black O-ring

20.10c Crankcase halves - shaft drive models

1 *Crankcase halves*
2 *Dowels*
3 *Stud*
4 *Stud*
5 *Stud*
6 *Stud*
7 *O-ring*
8 *O-ring*
9 *Dowel*
10 *Bolt*
11 *Bolt*
12 *Bolt*
13 *Bolt*
14 *Bolt*
15 *Bolt*
16 *Sealing washer*
17 *Oil filler plug*
18 *O-ring*
19 *Clamp*
20 *Protector plate*
21 *Plug*
22 *Grommet*



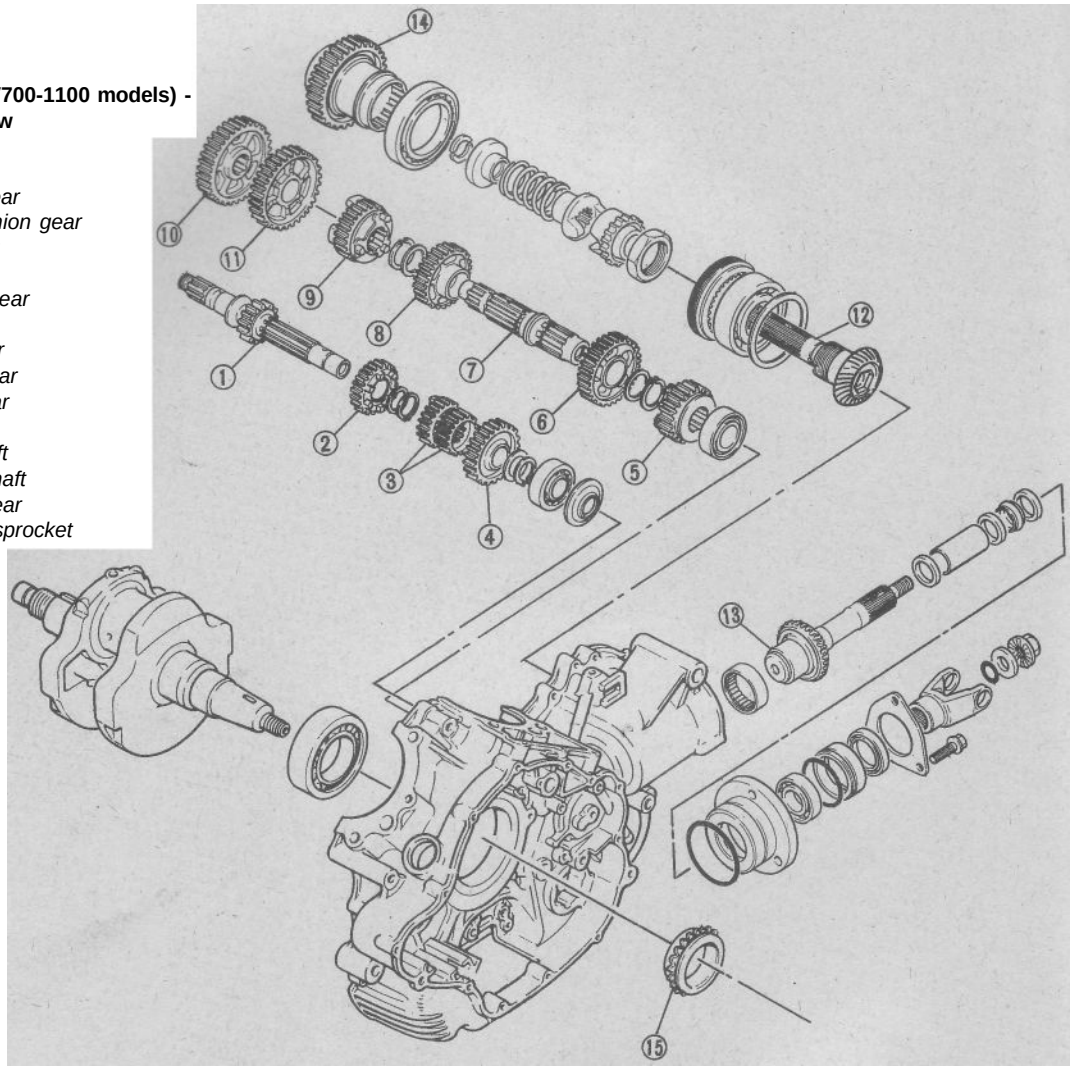
9 Carefully lift the right crankcase half away from the left crankcase half **(see illustration).** As you lift, pry gently and evenly at the pry points around the crankcase seam. Tap alternately on the transmission shafts. If the halves won't separate easily, make sure all fasteners have been removed. Don't pry against the crankcase mating surfaces or they'll leak.

10 Look for the O-rings and dowels **(see illustrations).** If they're not in one of the crankcase halves, locate them.

11 Refer to Sections 21 through 25 for information on the internal components of the crankcase.

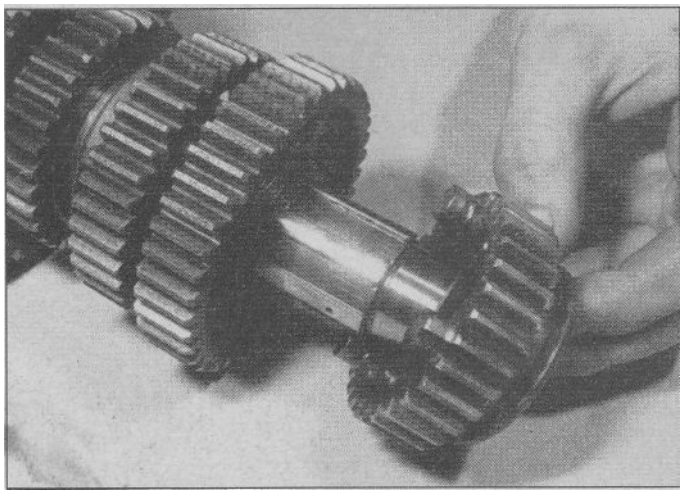
Reassembly

12 Make sure the crankshaft and transmission shafts are correctly positioned in the left crankcase half (see Sections 23 and 26). Make sure the shift cam is correctly aligned with the neutral switch (see Section 26).

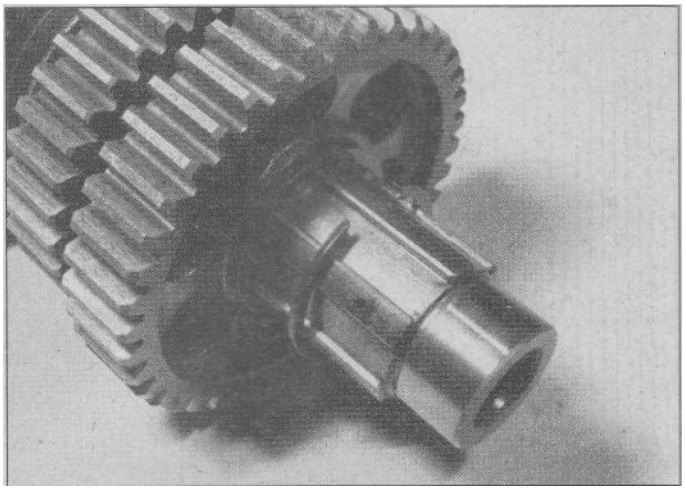


26.9h Transmission shafts (XV700-1100 models) - exploded view

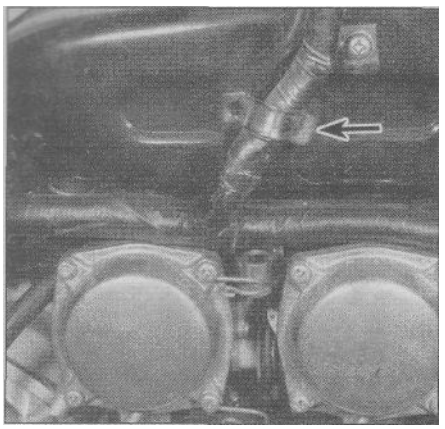
1 Mainshaft
2 Fourth pinion gear
3 Second-third pinion gear
4 Fifth pinion gear
5 Fifth wheel gear
6 Second wheel gear
7 Driveaxle
8 Third wheel gear
9 Fourth wheel gear
10 Middle drive gear
11 First wheel gear
12 Middle driveshaft
13 Middle driven shaft
14 Middle driven gear
15 Oil pump drive sprocket



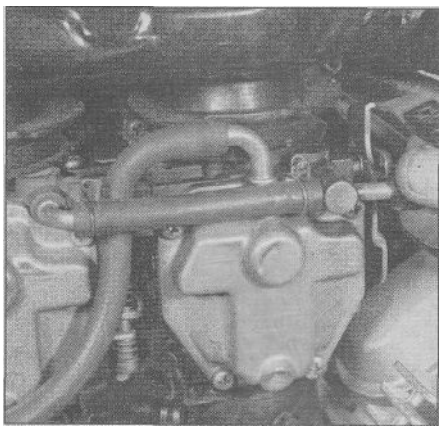
26.10a Slide the fifth wheel gear off the driveaxle



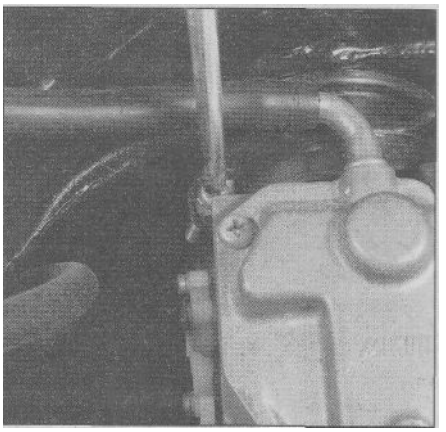
26.10b Remove the snap-ring ,



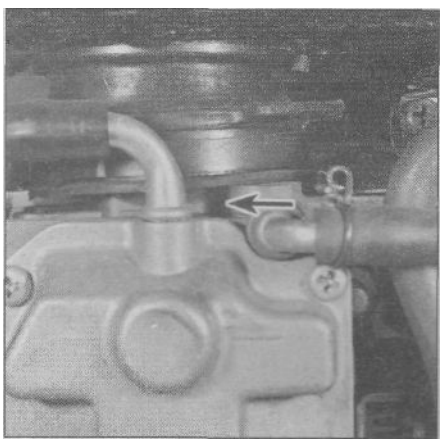
6.8 If this wiring harness obstructs removal, detach it from its clip (arrow) and move it out of the way



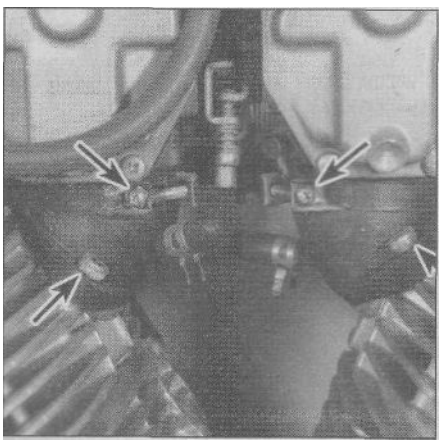
6.9 Loosen the clamp and pull the fuel line off the fitting



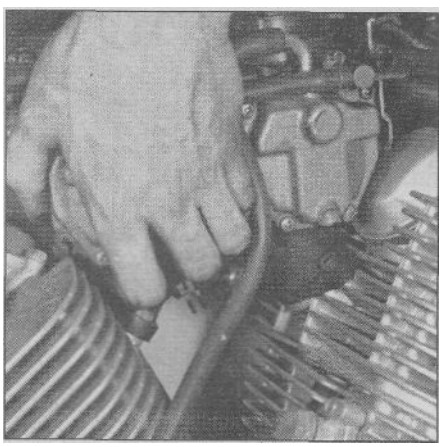
6.10a Loosen the clamping band screws on the air cleaner joints ...



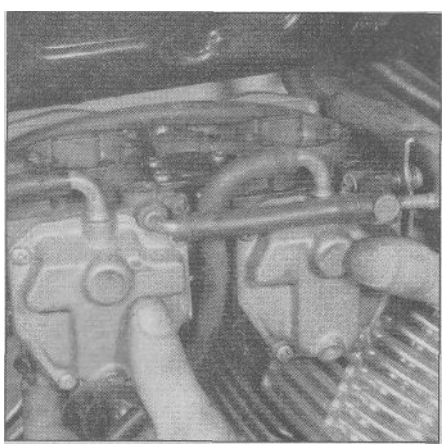
6.10b ... insert a flat-bladed screwdriver between the joint and carburetor (arrow) and push the joint up into the air cleaner cavity



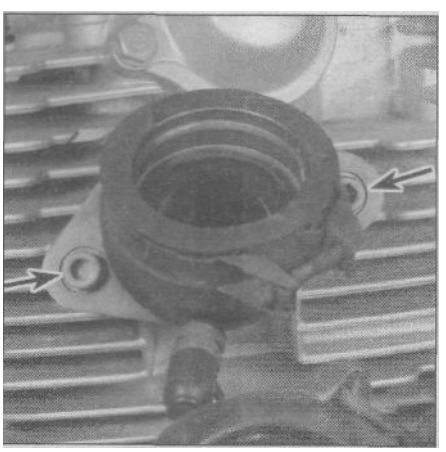
6.11 a Loosen the clamping band screws (upper arrows); an alternative method is to unbolt the intake joints from the cylinder head (lower arrows)



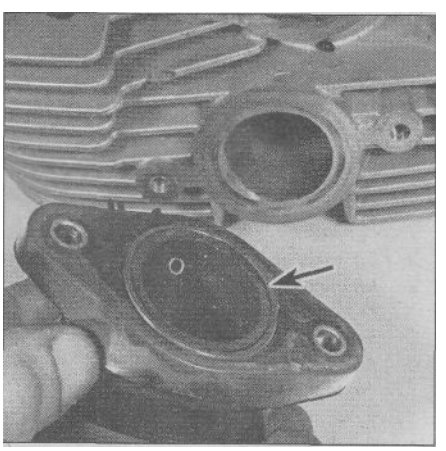
6.11 b Work the carburetors free of the intake joints (if they're still bolted to the engine)...



6.11c ... and remove the carburetors from the left side of the bike



6.13a Remove the Allen bolts (arrows)



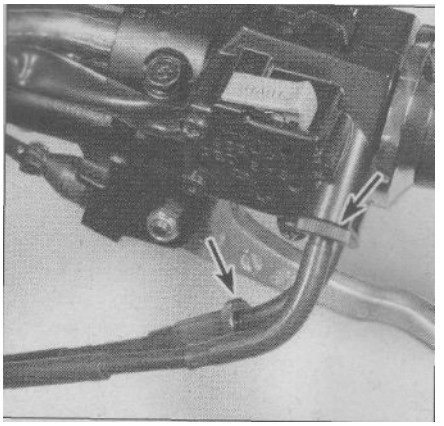
6.13b ... and take the intake joints off; replace the O-rings (arrow)

8 The wiring harness on the right side may interfere with removal **(see illustration).** If it does, free it from its clip and move it aside. On 1991 and later UK models, disconnect the carburetor heater unit valve from each carburetor.

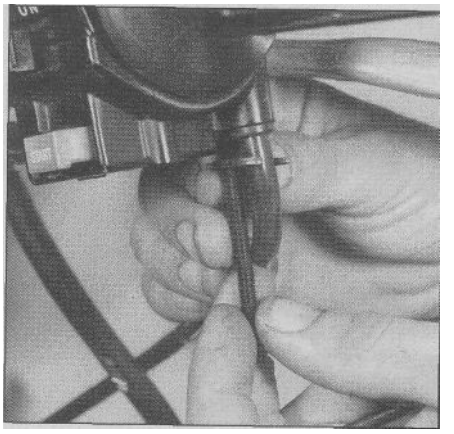
9 Disconnect the fuel inlet line from the carburetor fitting **(see illustration).**

10 Loosen the clamp screws and disconnect the air cleaner joints from the carburetors **(see illustrations).** Push the joints up off the carburetors with a screwdriver (they'll fold into the air cleaner cavity in the frame).

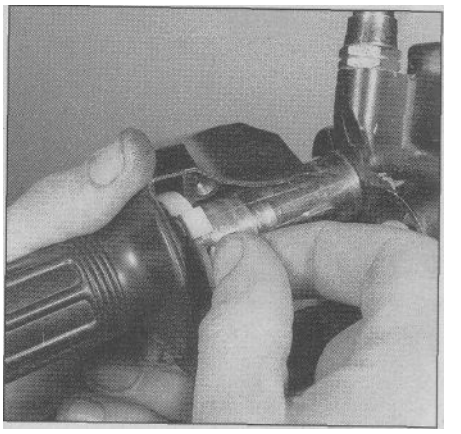
11 Loosen the screws on the carburetor joints **(see illustration).** Work the carburetors free of the joints and lift them out **(see**



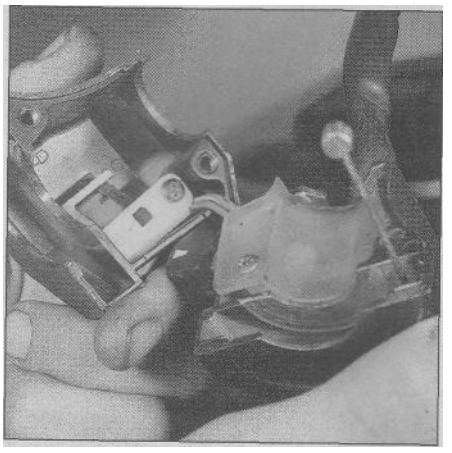
9.1 Loosen the throttle cable adjuster locknuts and loosen the adjusters (arrows)



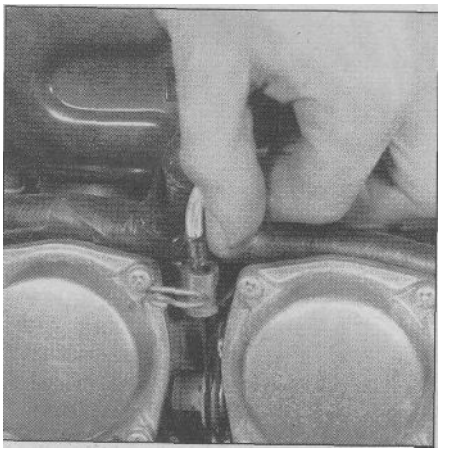
9.2 Remove the screw that secures the throttle cables to the housing



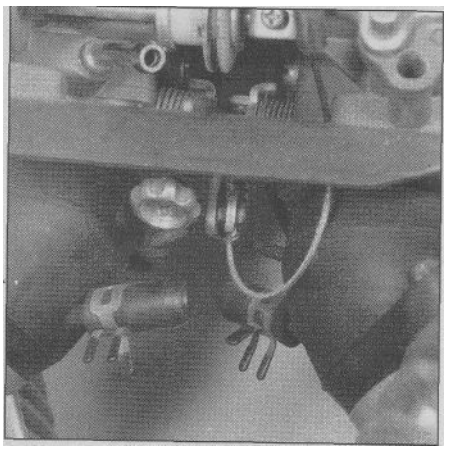
9.3a Slip the cable out of its groove .



9.3b ... and disengage the end from the pulley



9.4a Pull the end of the cable out of the socket and slip the cable sideways through the slot to disengage it...



9.4b ... then slide the end of the cable sideways out of the pulley

9 Throttle cables and grip - removal, installation and adjustment

Refer to illustrations 9.1, 9.2, 9.3a, 9.3b, 9.4a and 9.4b

Removal

1 Loosen the throttle cabfe(s) with the adjusters **(see illustration).**

2 Remove the throttle cable securing screw at the handlebar **(see illustration).**

3 Remove the handlebar switch mounting screws.. Separate the halves of the handlebar switch and detach the throttle cable(s) from the throttle grip pulley **(see illustrations).**

4 Detach the throttle cables from the throttle pulley at the carburetors **(see illustrations).** Remove the cables, noting how they are routed.

5 Slide the throttle grip off the handlebar.

Installation

6 Clean the handlebar and apply a light coat of multi-purpose grease.

7 Route the cable(s) into place, following the same route as noted n removal - the cables should pass behind the upper part of the right fork leg. Make sure they don't interfere with any other components and aren't kinked or bent sharply.

8 Lubricate the ends of the accelerator cable (and decelerator cable if equipped) with multi-purpose grease and connect them to the throttle pulleys at the carburetors and at the throttle grip.

Adjustment

9 Follow the procedure outlined in Chapter 1, Throttle operation/grip freeplay - check and adjustment, to adjust the cables.

10 Turn the handlebars back and forth to make sure the cables don't cause the steering to bind. With the engine idling, turn the handlebars back and forth and make sure idle speed doesn't change. If it does, find and fix the cause before riding the motorcycle.

10 Exhaust system - removal and installation

Removal

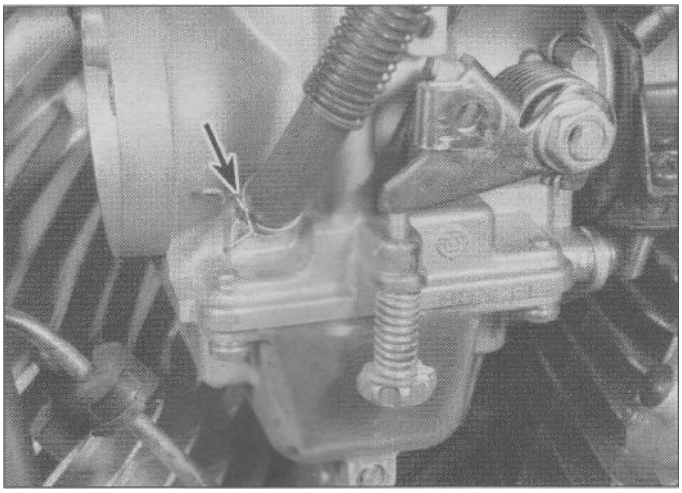
Refer to illustrations 10.2a, 10.2b, 10.3a, 10.3b, 10.4, 10.5 and 10.6

1 Support the bike securely so it can't be knocked over during this procedure.

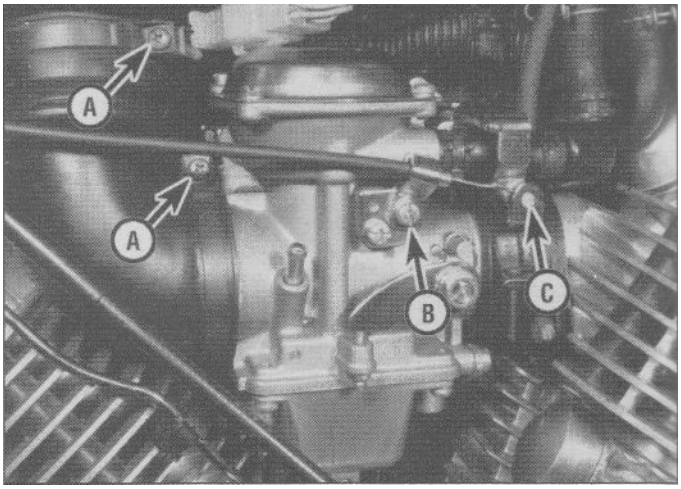
2 Remove the nuts that secure the front exhaust pipe to the cylinder head **(see illustrations).**

3 Remove the Allen bolts and detach the rear exhaust pipe from the joint pipe at the cylinder head **(see illustration).** Remove the nuts and detach the joint pipe from the head **(see illustration).**

4 Unbolt the muffler/silencer bracket at the right passenger footpeg **(see illustration).**



6.3 Squeeze the clip (arrow) and slide it down the fuel line, then pry the fuel line off the fitting



6.4 Loosen the air hose clamp screws (A) and the choke cable retaining screw (B), then disconnect the choke cable (C) from the carburetor

6 Carburetors and intake joints - removal and installation

Warning: *Gasoline (petrol) 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 an extinguisher suitable for class B fires (flammable liquids) on hand.*

Removal

Refer to illustrations 6.3, 6.4, 6.5a, 6.5b and 6.7

1 Lift or remove the seat as necessary (see Chapter 7) and remove the fuel tank (see Section 2). If you're working on a 1984 or later model, remove the mixture control valve case (see Chapter 7).

2 Disconnect the throttle and choke cables (see Section 9).

3 Disconnect the fuel inlet lines from the carburetor fittings **(see illustration).** Label and disconnect all hoses, vacuum lines and wires.

4 Loosen the clamp screws and disconnect the air cleaner hoses from the carburetors **(see illustration).** Detach the hoses from the air cleaner and carburetors and remove them from the motorcycle.

5 Loosen the clamp screws on the carburetor intake joints. Twist the carburetors clockwise to free them from the joints and lift them out **(see illustrations).**

6 After the carburetors have been removed, stuff clean rags into the joints or intake ports to prevent the entry of dirt or other objects.

7 Inspect the air cleaner hoses and carburetor intake joints. If they're cracked or brittle, replace them **(see illustration).**

Installation

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

a) Lightly lubricate the ends of the throttle cable(s) and the choke cable with multi-purpose grease and attach them to the throttle pulley and choke lever. Make sure the accelerator cable (and decelerator cable if equipped) are in their proper positions.

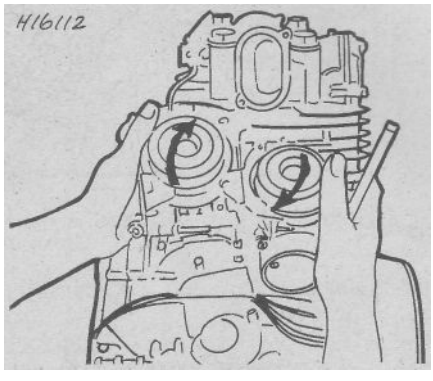
b) Make sure the carburetor is seated securely in the intake joints and the air cleaner hoses are fitted securely over the carburetors, then tighten the clamping band screws.

c) Adjust the throttle grip freeplay (see Chapter 1).

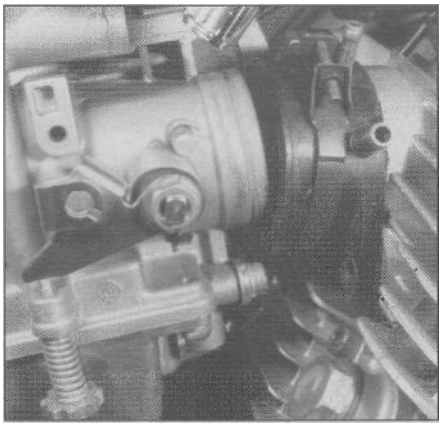
d) Check and, if necessary, adjust the idle speed and carburetor synchronization (see Chapter 1).

7 Carburetors - disassembly, inspection, cleaning and reassembly

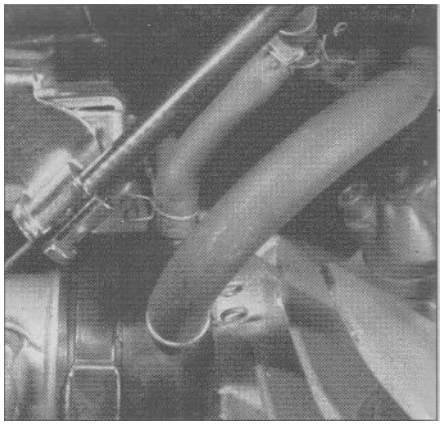
Warning: *Gasoline (petrol) is extremely flammable, so take extra precautions when you work on any part of the fuel system. Don't smoke or allow open flames or bare light bulbs near the work area, and don't*



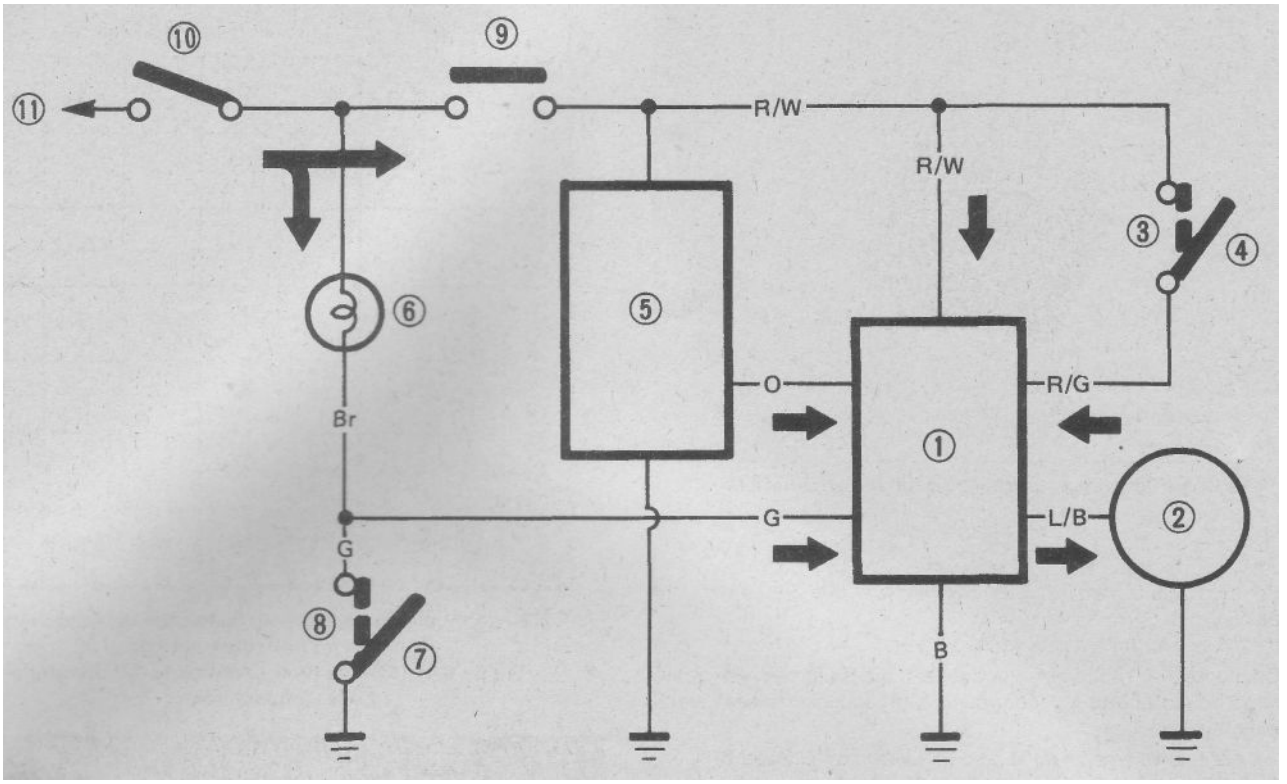
6.5a Loosen the intake joint clamp screws and twist the carburetors clockwise ...



6.5b ... to free them from the intake joints



6.7 Label and disconnect any vacuum hoses attached to the intake joints



12.2 Fuel pump circuit

1 Fuel pump controller
2 Fuel pump
3 Fuel reserve switch (Res position)
4 Fuel reserve switch (On position)
5 Igniter unit
6 Fuel warning light
7 Fuel sender (Full position)
8 Fuel sender (Empty position)
9 Engine kill switch
10 Ignition (main key) switch
11 To main fuse and battery

switched on (with the fuel warning light on or off). It should shut off once the carburetor float chambers are full, then run again once the engine is started,

2 The fuel pump circuit consists of the pump, the pump controller, the igniter unit (which controls the fuel pump as well as ignition timing), the engine kill switch, the ignition switch, the main and ignition fuses, the battery and related wiring **(see illustration).**

3 Lift or remove the seat.

4 Check the battery condition and charge (see Chapter 1 and Chapter 8).

5 Check the main and ignition fuses, the ignition switch and the engine kill switch (see Chapter 8). Replace them if they're defective, then try the fuel pump again.

Pump won't run after engine is started

6 If the pump won't run while the engine is running, check battery voltage to the pump. Disconnect the fuel pump electrical connector and connect a 20-volt DC voltmeter between the blue/black wire terminal in the harness and a good grounding/earthing point (bare metal on the engine).

7 Turn the ignition switch to On and the engine kill switch to Run, then push the Start switch. The voltmeter should indicate more than 11 volts. If the reading is more than 11 volts, test the fuel pump (see Step 24 below).

8 If the reading is less than 11 volts, test the output voltage of the igniter's orange lead. To do this, check the spark output of the rear cylinder (see Chapter 4). If the spark will jump the specified gap, you can assume that the igniter output voltage is within specifications. Go to Step 10 below.

9 If the spark won't jump the specified gap, measure the igniter input voltage at the red wire **(see illustration 12.2).**

a) If it's at least 12 volts, the igniter may be defective. Check the ignition system as described in Chapter 4.
b) If there's no voltage at the red wire, check the engine kill switch, ignition main key switch and the main fuse. Check the wiring in the fuel pump circuit for breaks or bad connections. Be sure to check the battery terminal connections and the battery ground/earth cable connection to the motorcycle.

10 Make sure the fuel pump controller ground/earth wire is clean and tight. If it is, test the fuel pump controller (see Step 24 below).

Fuel pump doesn't run for five seconds when ignition is switched on

11 With the fuel reserve switch set to Res and the kill switch in the On position, switch on the ignition. If the fuel level in the carburetors is low, the pump should run for five seconds. If it doesn't, perform the following steps.

12 Place the ignition switch, kill switch and fuel reserve switch in the On position, but don't start the engine.

13 Check for voltage at the fuel pump (see Step 6 above).

a) If it's more than 11 volts, go to Step 14.
b) If it's less than 11 volts, go to Step 17.

14 Turn the fuel reserve switch to the Res position and recheck

1 General information

These motorcycles are equipped with a battery operated, fully transistorized, breakerless ignition system. The system consists of the following components:

Pick-up coil(s)
Igniter unit
Battery and fuse
Ignition coils
Spark plugs
Ignition (main), engine kill (stop), sidestand and neutral switches
Primary and secondary (HT) circuit wiring

The transistorized ignition system functions on the same principle as a breaker point DC ignition systenxwith the pick-up coil or coils and igniter performing the tasks previously associated with the breaker points and mechanical advance system. As a result, adjustment and maintenance of ignition components is eliminated (with the exception of spark plug replacement). Models through 1990 use two pick-up coils; 1991 and later models use a single pick-up coil.

Because of their nature, the individual ignition system components can be checked but not repaired. If ignition system troubles occur, and the faulty component can be isolated, the only cure for the problem is to replace the part with a new one. Keep in mind that most electrical parts, once purchased, can't be returned. To avoid unnecessary expense, make very sure the faulty component has been positively identified before buying a replacement part.

2 Ignition system - check

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.

Enginewillnotstart

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 Unscrew a spark plug cap from a plug wire and lay the plug wire on the cylinder head. Crank the engine over and check for spark again. If a strong blue spark occurs between the end of the wire and the engine, the plug cap or plug is faulty. If not, go to the next steps.

6 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 - on models equipped with batteries having removable filler caps - 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.

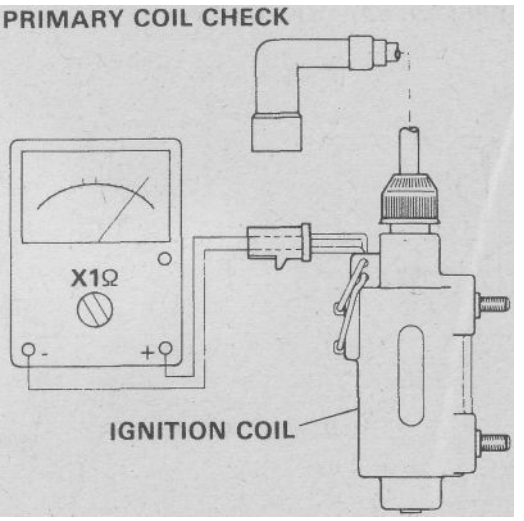
8 Check the ignition fuse and the fuse connections. If the fuse is blown, replace it with a new one; if the connections are loose or corroded, clean or repair them.

9 Refer to Chapter 8 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 pick-up coil resistance.

12 If the preceding checks produce positive results but there is still no spark at the plug, remove the igniter and have it checked by a Yamaha dealer service department or other repair shop equipped with the special tester required.



3.4 To test the coil primary resistance, connect the ohmmeter leads between the primary terminals in the coil connector

Enginestartsbutmisfires

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

14 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 2.14 in Part A of this Chapter)** can be constructed to make sure the minimum spark gap can be jumped. Make sure the fixture electrodes are positioned six millimeters apart.

15 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.

16 Crank the engine over (it may start and run on the remaining cylinder) 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 is functioning properly. Repeat the check on the spark plug wire that is connected to the other coil. 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

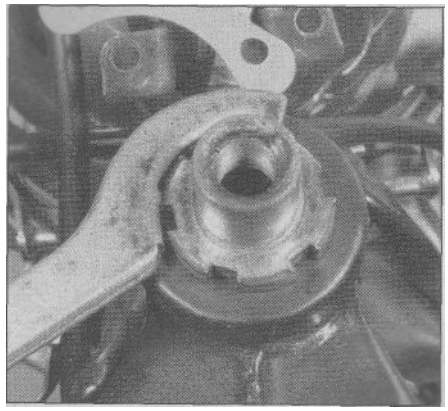
Refer to illustrations 3.4 and 3.6

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

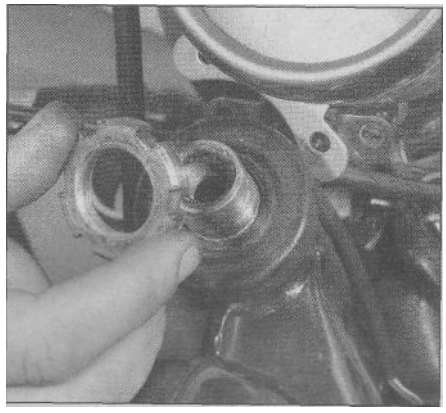
2 However, the coils can be checked visually (for cracks and other damage) and the primary and secondary coil resistances can be measured with an ohmmeter. If the coils are undamaged, and if the resistances are as specified, they are probably capable of proper operation.

3 To check the coils for physical damage, they must be removed (see Step 9). To check the resistances, simply remove the ignition coil cover from the forward side of the front cylinder's mounting bracket, unplug the primary circuit electrical connectors from the coil(s) and remove the spark plug wire from the plug that is connected to the coil being checked. Mark the locations of all wires before disconnecting them.

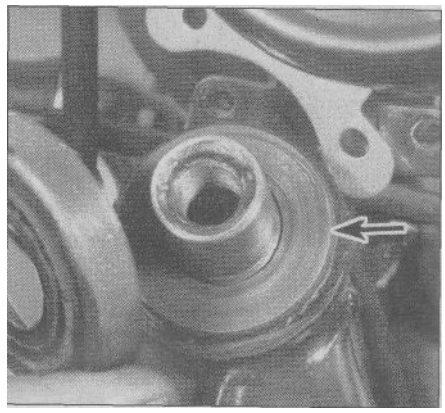
4 To check the coil primary resistance, attach one ohmmeter lead to one of the primary terminals and the other ohmmeter lead to the



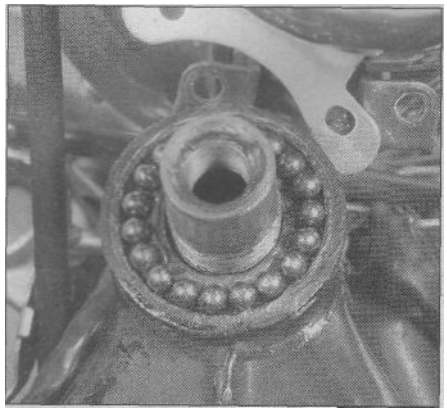
6.7a Loosen the ring nut with a ring nut wrench (C-spanner)



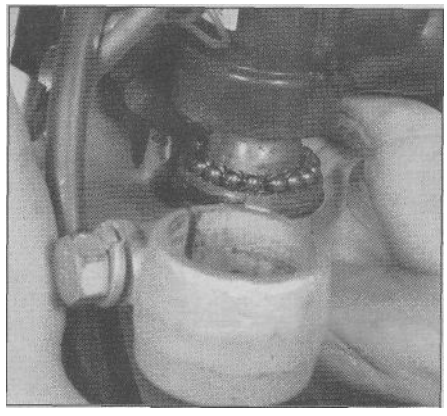
6.7b Take the ring nut off the steering stem



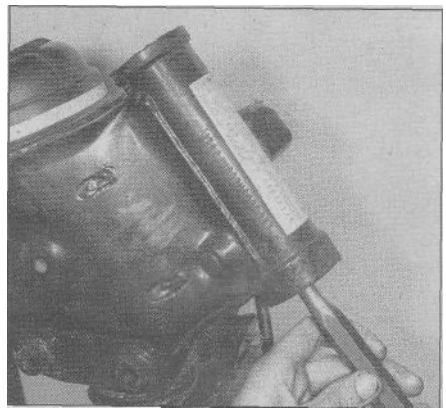
6.7c Lift off the bearing cover and the upper bearing top race (arrow)



6.7d Remove the 19 steel balls



6.8 Lower the steering stem and lower bearing balls out of the steering head



6.10a Insert a long punch or rod from below to tap out the upper bearing bottom race . . .

7 Remove the ring nut with a special wrench such as Yamaha tool YU-33975 (part no. 90890-01403) **(see illustration).** Remove the bearing cover, upper race and 19 steel balls **(see illustrations).**

8 Lower the steering stem partway out of the steering head and remove the 19 steel balls from the lower bearing **(see illustration).**

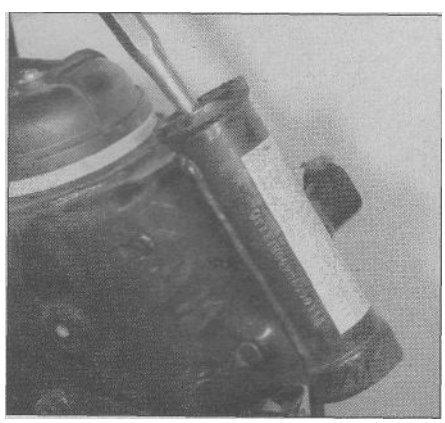
Inspection

Refer to illustrations 6.10a, 6.10b, 6.11a, 6.11b, 6.11c, 6.116, 6.13, 6.14a, 6.14b and 6.14c

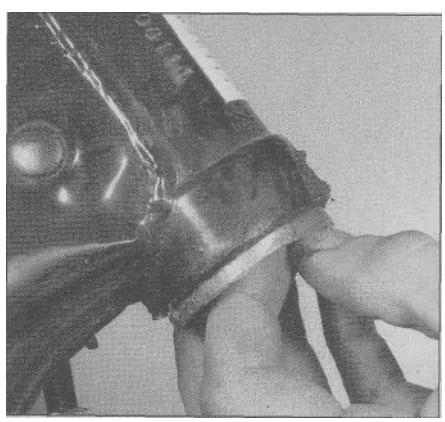
9 Check the bearings for wear. Look for cracks, dents, and pits in the races and flat spots, pitting or galling on the bearing balls. Replace any defective parts with new ones. If a new bearing is required, replace both bearings, their races and both dust seals as a set.

10 To remove the bearing races, drive them out of the steering head with a hammer and long rod or punch **(see illustrations).** A slide hammer with the proper internal-jaw puller will also work.

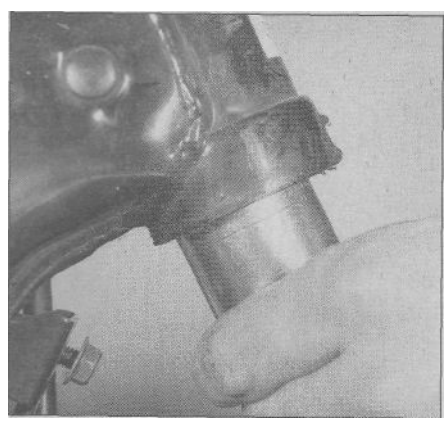
11 Since the races are an interference fit in the frame, installation will be easier if the new races are left overnight in a refrigerator. This will cause them to contract and slip into place in the frame with very little effort. When installing the races, tap them gently into place with a



6.10b . . . and from above to tap out the lower bearing top race



6.11a Position the lower bearing top race in the steering head . . .



6.11b . . . and tap it into position with a socket just smaller in diameter than the race

Fork oil level (US)	
1981 through 1983 models	Not specified
XV700, XV750, XV1000	155 mm (6.1 inches) below top of inner fork tube*
XV1100	179 mm (7.0 inches) below top of inner fork tube*
Fork oil capacity (UK)	
1981 through 1983 XV750	278 cc (9.40 US fl oz, 9.78 Imp fl oz)
XV920J	303 cc (10.24 US fl oz, 10.66 Imp fl oz)
XV920K and MK	290 cc (9.80 US fl oz, 10.20 Imp fl oz)
XV920 RH, RJ and TR1	264 cc (8.92 US fl oz, 9.30 Imp fl oz)
1986 and later models	396 cc (13.4 US fl oz, 13.9 Imp fl oz)
Fork oil level (UK)	
1981 through 1983 models	Not specified
1992-on XV750, 1994 XV1100	155 mm (6.1 inches) below top of inner fork tube*
1986 through 1993 XV1000 and 1100	179 mm (7.0 inches) below top of inner fork tube*

Rear suspension

Rear spring free length	
1981 through 1983 XV750	167 mm (6.57 inches)
XV920 J, K, MK	168.5 mm (6.63 inches)
XV920 RH, RJ and TR1	172 mm (6.77 inches)
1984 and 1985 models (except TR1)	223 mm (8.78 inches)
1986-on XV700 and XV750	224.5 mm (8.83 inches)
1986-on XV1100	216.5 mm (8.5 inches)
Rear spring sag limit	5 mm (0.20 inch)
Swingarm end play and side play limits	1 mm (0.04 inch)

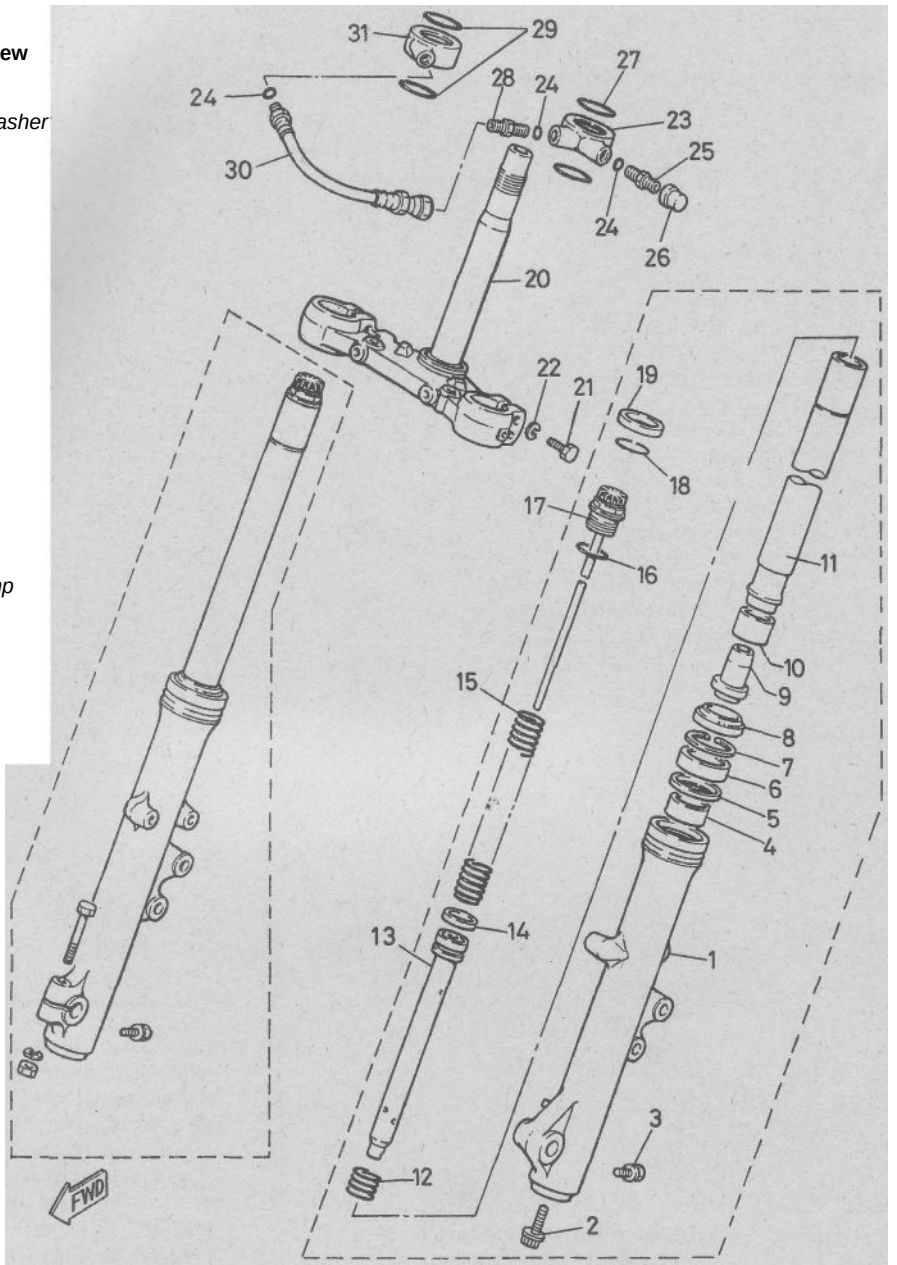
**With spring removed and fork fully compressed.*

Torque specifications

1981 through 1983 models	
Front forks	
Damper rod bolt	20 Nm (14 ft-lbs)**
Triple clamp pinch bolts	20 Nm (14 ft-lbs)
Handlebars and steering stem	
Handlebar bracket to upper triple clamp nuts (XV920J only)	23 Nm (17 ft-lbs)
Handlebar pinch bolts (XV920J only)	
Inner sections	30 Nm (22 ft-lbs)
Outer sections	13 Nm (9 ft-lbs)
Steering stem bolt	
XV920 J, K, MK	50 Nm (36 ft-lbs)
All others	54 Nm (39 ft-lbs)
Steering head bearing ring nut	see Chapter 1
Rear suspension unit pivot bolt	45 Nm (32.5 ft-lbs)
Swingarm pivot bolt	78 Nm (56 ft-lbs)
Final drive unit to swingarm nuts	43 Nm (31 ft-lbs)
1984-on models	
Front forks	
Damper rod bolt	23 Nm (17 ft-lbs)**
Upper triple clamp pinch bolts	20 Nm (14 ft-lbs)
Lower triple clamp pinch bolts	23 Nm (17 ft-lbs)
Cap bolt	23 Nm (17 ft-lbs)
Handlebars and steering stem	
Handlebar bracket to upper triple clamp nuts	
All except 1988-on XV750	not specified
1988-on XV750	59 Nm (43 ft-lbs)
Handlebar pinch bolts	20 Nm (14 ft-lbs)
Steering stem nut	110 Nm (80 ft-lbs)
Steering head bearing ring nut	see Chapter 1
Rear shock absorber upper bolts	20 Nm (14 ft-lbs)
Rear shock absorber lower bolts/nuts	30 Nm (22 ft-lbs)
Swingarm pivot shafts	
Left pivot shaft	100 Nm (72 ft-lbs)
Right pivot shaft	
All except 1988-on XV750	5.5 Nm (4 ft-lbs)
1988-on XV750	6 Nm (4.3 ft-lbs)
Right pivot shaft nut	100 Nm (72 ft-lbs)
Final drive unit to swingarm nuts	
All except 1988-on XV750	43 Nm (32 ft-lbs)
1988-on XV750	42 Nm (30 ft-lbs)

***Apply non-permanent thread locking agent to the bolt threads.*

7.7d Front forks (XV920J) - exploded view



1 *Outer fork tube*
2 *Damper rod bolt and copper washer*
3 *Drain plug and gasket*
4 *Upper bushing*
5 *Spacer*
6 *Oil seal*
7 *Retainer*
8 *Dust seal*
9 *Damper rod seat*
10 *Lower bushing*
11 *Inner fork tube*
12 *Rebound spring*
13 *Damper rod*
14 *Teflon ring*
15 *Fork spring*
16 *O-ring*
17 *Cap bolt*
18 *Retainer*
19 *Rubber spacer*
20 *Steering stem/lower triple clamp*
21 *Bolt*
22 *Lockwasher*
23 *Left air hose union*
24 *O-ring*
25 *Air charging valve*
26 *Valve cap*
27 *O-ring*
28 *Hose fitting*
29 *O-ring*
30 *Air charging hose*
31 *Right hose union*

Installation

8 Slide each fork leg into the lower triple clamp.

9 Slide the fork legs up, installing the tops of the tubes into the upper triple clamp. Position the top of the fork tube so that it is level with the top surface of the upper triple clamp.

10 The remainder of installation is the reverse of the removal procedure. Tighten all fasteners to the torques listed in this Chapter's Specifications and the Chapter 6 Specifications.

11 Pump the front brake lever several times to bring the pads into contact with the disc.

8 Forks - disassembly, inspection and reassembly

Disassembly

Refer to illustrations 8.2, 8.5a, 8.5b, 8.6a, 8.6b, 8.7 and 8.8

Note: *The following procedures apply to 1981 through 1983 XV750 models, XV920 K, MK, RH and RJ models and the 1982 through 1985 XV1000 (TR1). The forks used on XV920J models, as well as on all 1984 and later models except the TRI, require a press, special tools ana procedures for disassembly, including heating the outer fork tube with a torch. Fork overhaul on these models should be done by a Yamaha dealer service department or other qualified repair shop.*

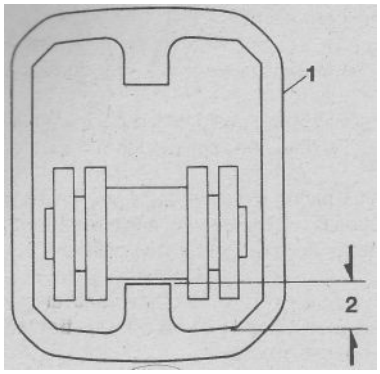
1 Remove the forks following the procedure in Section 6. Work on one fork leg at a time to avoid mixing up the parts.

2 On all except XV920K and MK models, remove the fork cap, stopper ring, spring seat and spring **(see illustrations 6.5a, 6.5b and the accompanying illustration).**

3 If you're working on an XV920K or MK, unscrew the top bolt with an Allen bolt bit. **Note:** *If you don't have an Allen bolt bit of the correct size, use a bolt with a head size that Jits into the top bolt. Turn the bolt with locking pliers.*

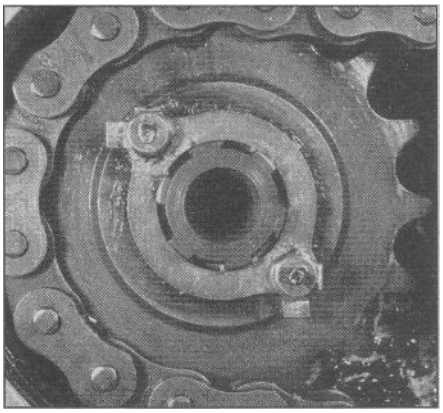
4 Invert the fork assembly over a container and allow the oil to drain out.

5 Prevent the damper rod from turning using a holding handle (Yamaha tool no. YM-01326, part no. 90890-01326) and adapter (Yamaha tool no. YM-01300-01, part no. 90890-01294) **(see illustration)**

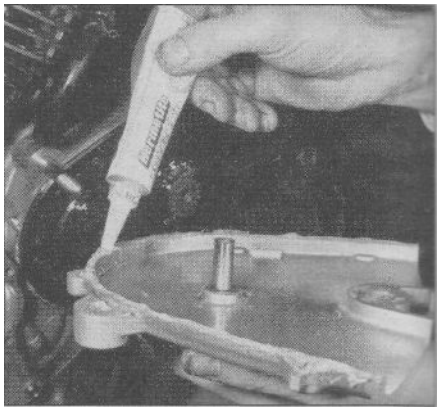


13.16 Chain case internal rib measurement

1 Chain case 2 Rib height



13.18 The engine sprocket is secured by two bolts and a lockwasher



13.35 Coat the mating surface of the engine sprocket housing with silicone sealant

16 Check the chain cases for cracks or.brittleness and replace as necessary. Measure the height of the internal ribs and compare it to the value listed in this Chapter's Specifications **(see illustration).** If the ribs are worn, replace the chain cases.

17 Check the sprocket housings for cracks or other damage and replace as necessary. Make sure the breather on the engine sprocket housing is clear of obstructions.

Sprocketreplacement

Refer to illustration 13.18

18 To replace the engine sprocket, flatten the tabs on the lockwashers and remove the sprocket bolts **(see illustration).** Slide the sprocket off and install the new one. Install a new lockwasher, tighten the bolts to the torque listed in this Chapter's Specifications, then bend the lockwasher tabs against the bolts.

19 To replace the rear sprocket, loosen the lockwasher tabs (see **illustration 6.5c in Chapter 6, Part B).** Remove the nuts ana lockwashers and lift off the sprocket. Install the new sprocket and *nev,* lockwashers. Tighten the sprocket evenly, in a criss-cross pattern tc the torque listed in this Chapter's Specifications, then bend the lockwasher tabs against the nuts.

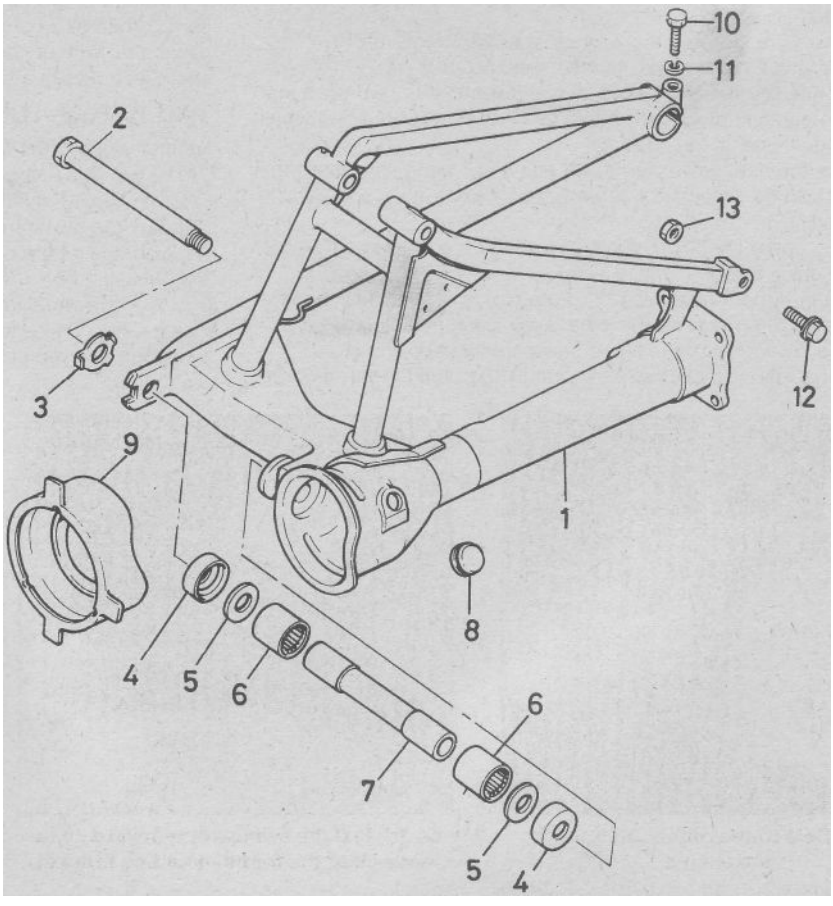
Couplingbearingreplacement

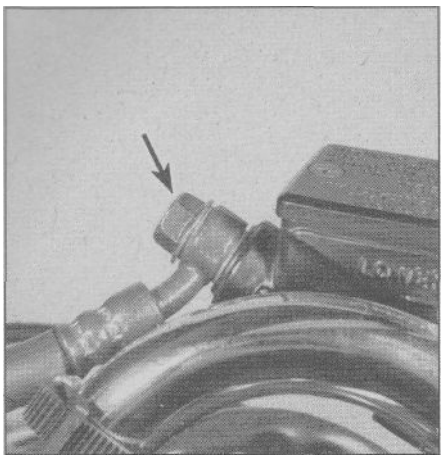
20 Remove the bearing snap-ring from the coupling **(see illustration 6.5c in Chapter 6, Part B).**

21 Pry out the grease seal and remove the spacer.

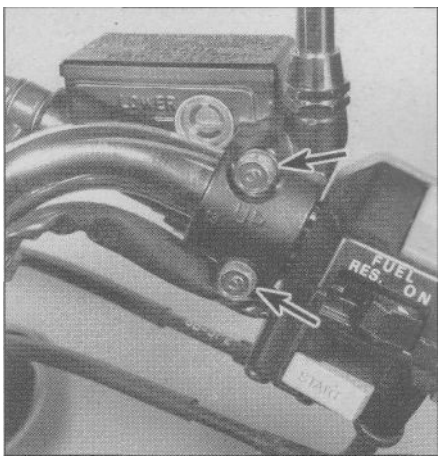
14.7a Swingarm (1981 through 1983 shaft drive models) - exploded view

7 Swingarm
2 Pivot bolt
3 Lockwasher
4 Dust cap
5 Thrust washer
6 Bearing
7 Bushing
8 Viewing plug
9 Rubber boot
10 Axle pinch bolt
11 Lockwasher
12 Final drive housing bolt
13 Nut

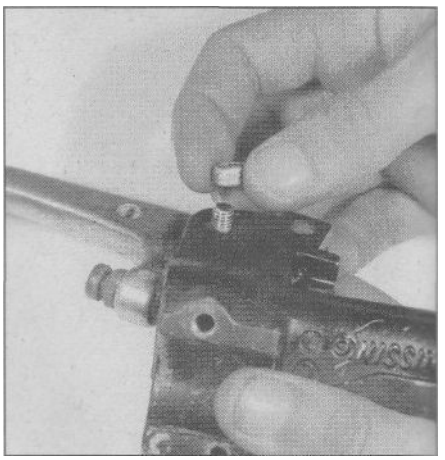




5.5 Unscrew the banjo bolt (arrow); there's a sealing washer on each side of the fitting



5.6 Remove the mounting bolts (arrows); note the position of the UP mark, which must be upright when the master cylinder is installed



5.7a Remove the locknut from the lever pivot bolt...

Removal

5 Remove the wheel (see Section 11 for front wheel removal or Section 12 for rear wheel removal). **Caution:** *Don't lay the wheel down and allow it to rest on the disc - the disc could become warped. Set the wheel on wood blocks so the disc doesn't support the weight of the wheel.*

6 Mark the relationship of the disc to the wheel, so it can be installed in the same position. Bend back the lockwasher tabs and remove the bolts that retain the disc to the wheel **(see illustration** 2.3c). Loosen the bolts a little at a time, in a criss-cross pattern, to avoid distorting the disc. Once all the bolts are loose, take the disc off.

7 Take note of any paper shims that may be present where the disc mates to the wheel. If there are any, mark their position and be sure to include them when installing the disc.

Installation

8 Position the disc on the wheel, aligning the previously applied match marks (if you're reinstalling the original disc). Make sure the arrow (stamped on the disc) marking the direction of rotation is pointing in the proper direction.

9 Apply a non-hardening thread locking compound to the threads of the bolts. Install the bolts with new lockwashers, tightening them a little at a time, in a criss-cross pattern, until the torque listed in this Chapter's Specifications is reached. Clean off all grease from the brake disc using acetone or brake system cleaner.

10 Install the wheel.

11 Operate the brake lever 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 the top cover or upper fuel tank 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.*

Removal

Refer to illustrations 5.5 and 5.6

3 Loosen but do not remove the screws holding the reservoir cover in place **(see illustration 3.2b).**

4 Disconnect the electrical connectors from the brake light switch (see Chapter 8).

5 Pull back the rubber boot (if equipped), loosen the banjo fitting bolt **(see illustration)** and separate the brake hose from the maste' 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 master cylinder mounting bolts **(see illustration)** and separate the master cylinder from the handlebar. **Caution:** *Do not tip the master cylinder upside down or brake fluid will run out.*

Overhaul

Refer to illustrations 5.7a, 5.7b, 5.7c, 5.9, 5.10a and 5.10b

7 Remove the locknut and unscrew the brake lever pivot bolt (see **illustrations).** Remove the lever and its return spring **(see illustration).**

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

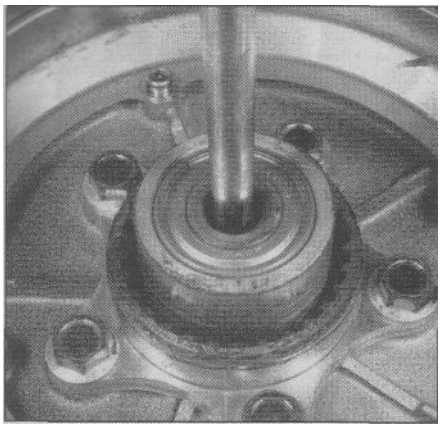
9 Carefully remove the rubber dust boot from the end of the piston **(see illustration).**

10 Using snap-ring pliers, remove the snap-ring **(see** illustration) and slide out the piston assembly and the spring **(see illustration).** Lay the parts out in the proper order to prevent confusion during reassembly.

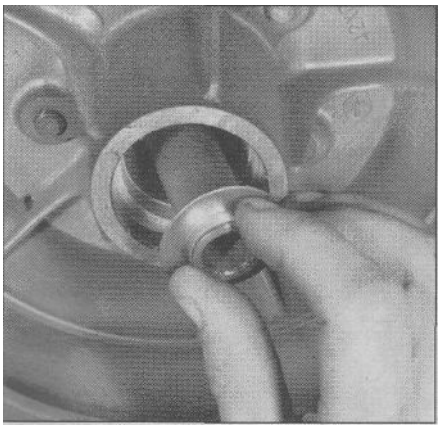
11 Clean all of the parts with brake system cleaner (available at motorcycle dealerships and auto parts stores), isopropyl alcohol or clean brake fluid. **Caution:** *Do not, under any circumstances, use a petroleum-based solvent to clean brake parts. If compressed air is available, use it to dry the parts thoroughly (make sure it's filtered and unlubricated). Check the master cylinder bore for corrosion, scratches, nicks and score marks. If damage is evident, the master cylinder must be replaced with a new one. If the master cylinder is in poor condition, then the calipers should be checked as well.*

12 The dust seal, piston assembly and spring are included in the rebuild kit. Use all of the new parts, regardless of the apparent condition of the old ones.

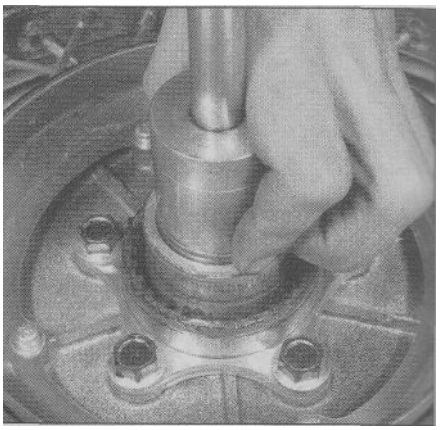
13 Before reassembling the master cylinder, soak the piston and the



13.16b Drive out the bearings with a long rod



13.16c Lift out the spacer and collar (be sure to reinstall both during assembly)



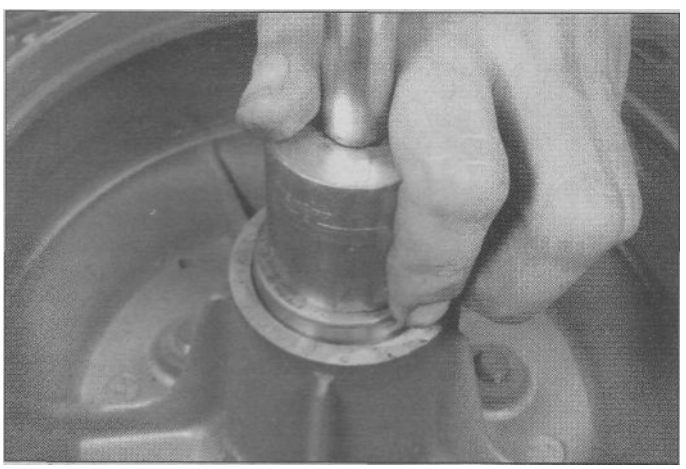
13.16d Drive the clutch hub side bearing into position with a bearing driver or socket that bears on the outer race

14 Tubed tires - general information

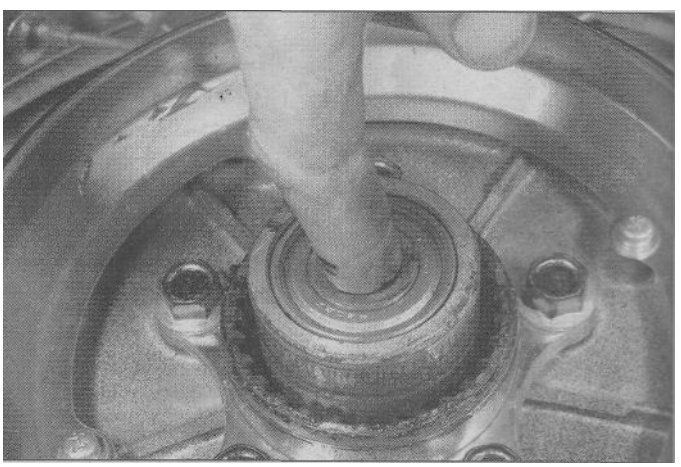
1 Tires with tubes are used as standard equipment on this motorcycle. They are generally easier to change than tubeless tires.

2 Before changing a tire yourself, check with your local dealership or repair shop to find out the labor charge for changing a tire. Although the procedure is not complicated, it is time-consuming, and for safety, it must be done correctly. For these reasons, it may be more practicai to have the job done. Watching a professional technician do the job before attempting it yourself can provide valuable information.

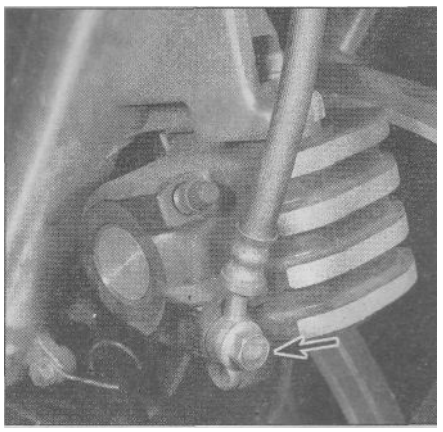
3 The accompanying illustrations can be used to replace a tubec tire in an emergency.



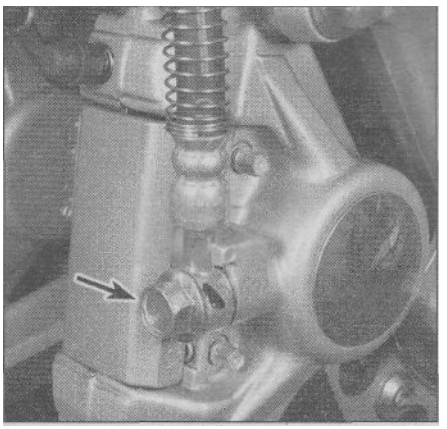
13.16e Make sure the spacer and **collar are in place, then drive in the bearing** on **the opposite side**



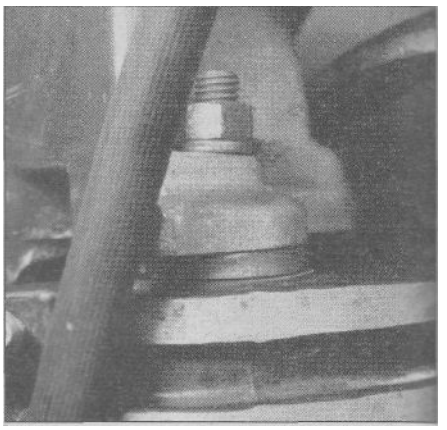
13.16f Spin the bearings with a finger to make sure they turn easily



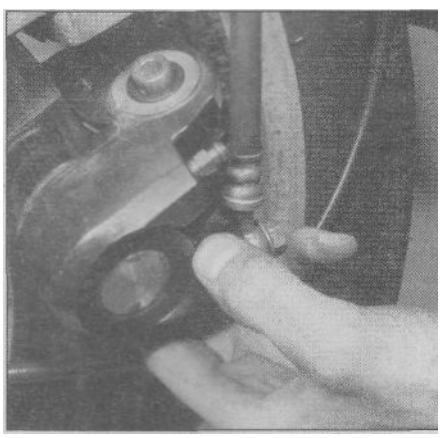
3.2a Remove the union bolt (arrow); this type of caliper is used on 1981 through 1983 shaft drive models ...



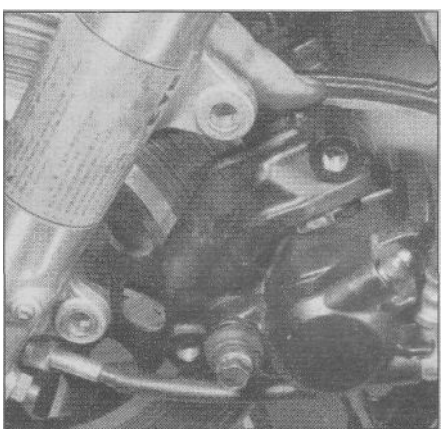
3.2b ... and this type is used on 1984 and later models (except 1994 UK)



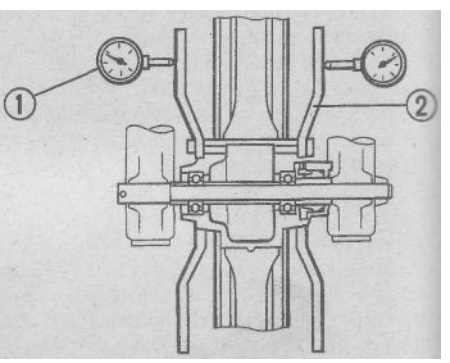
3.3a If you're working on a 1981 through 1983 XV750, an XV920K or an XV920 MK, remove the nut and washer ...



3.3b . .. and slide the caliper off the pivot post



3.4 Remove the caliper mounting bolts and detach the caliper from the fork



4.3 Set up a dial indicator (1) to measure runout of the brake disc(s) (2)

Removal

Refer to illustrations 3.2a, 3.2b, 3.3a, 3.3b and 3.4

1 Support the bike securely so it can't be knocked over during this procedure.

2 Remove the union bolt from the brake hose banjo fitting and separate the hose from the caliper **(see illustrations).** Discard the sealing washers. Place the end of the hose in a container and operate the brake lever to pump out the fluid. Once this is done, wrap a clean shop rag tightly around the hose fitting to soak up any drips and prevent contamination.

3 If you're working on a 1981 through 1983 XV750, an XV920K, or an XV920MK, remove the nut and lockwasher from the top of the caliper, then slide the caliper down out of the bracket in the fork leg **(see illustrations).**

4 On all other models, unscrew the caliper mounting bolts and separate the caliper from the front fork (see **illustration).**

Overhaul

5 Clean the exterior of the caliper with denatured alcohol or brake system cleaner.

6 Place a few rags between the piston and the caliper frame to act as a cushion, then use compressed air, directed into the fluid inlet, to remove the piston(s) **(see illustration 2.3c in Part A of this Chapter and illustrations 2.3b, 2.5b, 2.7, 2.9b and 2.11).** Use only enough air pressure to ease the piston out of the bore. If a piston is blown out, even with the cushion in place, it may be damaged. **Warning:** *Never place your fingers in front of the piston in an attempt to catch orprotec: it when applying compressed air, as serious injury could occur.*

7 If compressed air isn't available, reconnect the caliper to the brake hose and pump the brake lever until the piston is free.

8 Using a wood or plastic tool, remove the dust seal. Metal tools may damage the bore.

9 Using a wood or plastic tool, remove the piston seal from the groove in the caliper bore.

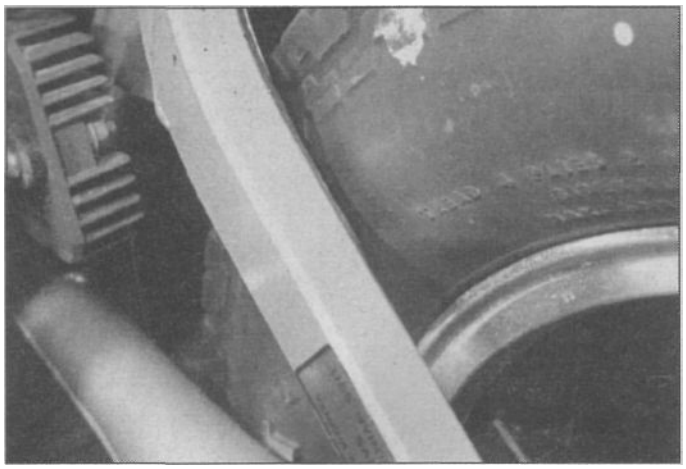
10 Clean the piston and the bore with denatured alcohol, clean brake fluid or brake system cleaner and blow dry them with filtered, unlubricated compressed air. Inspect the surfaces of the piston for nicks and burrs and loss of plating. Check the caliper bore, too. If surface defects are present, the caliper must be replaced. If the caliper is in bad shape, the master cylinder should also be checked.

11 Lubricate the piston seal with clean brake fluid and install it in **its** j groove in the caliper bore. Make sure it isn't twisted and sea:s completely.

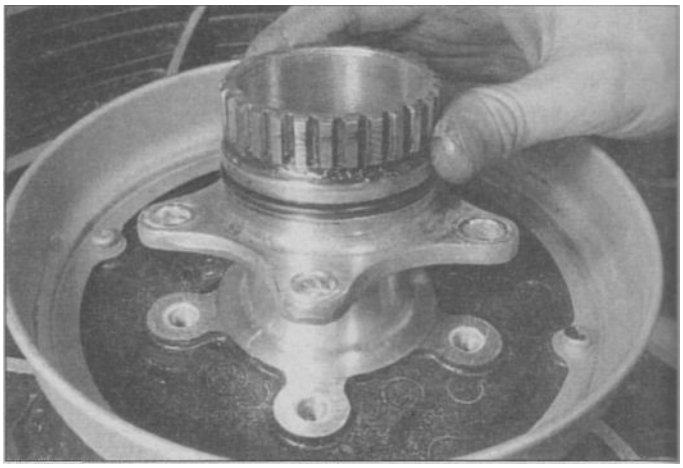
12 Lubricate the dust seal with clean brake fluid and install it in its groove, making sure it seats correctly.

13 Lubricate the piston with clean brake fluid and install it into **the** caliper bore. Using your thumbs, push the piston all the way in, making sure it doesn't get cocked in the bore.

14 On bracket-mounted calipers, the caliper body should be able to slide in relation to its mounting bracket. If it's seized or stiff - operation, lubricate the friction points or slide pins with hig^- temperature disc brake grease. If the dust boots are split or crackec. replace them with new ones.



12.11c Make sure the tire clears the swingarm



13.4 If necessary, unbolt the clutch hub and remove it

d) Tighten the axle nut to the torque listed in this Chapter's Specifications. Install a new cotter pin, tightening the axle nut an additional amount, if necessary, to align the hole in the axle with the castellations on the nut.

e) Tighten the axle pinch bolt to the torque listed in this Chapter's Specifications.

f) Make sure the tire clears the swingarm **(see illustration).**

11 Adjust the rear brake (see Chapter 1) and check its operation carefully before riding the motorcycle.

13 Wheel bearings - inspection and maintenance

1 Support the bike securely so it can't be knocked over during this procedure and remove the wheel. See Section 11 (front wheel) or 12 (rear wheel).

2 Set the wheel on blocks so as not to allow the weight of the wheel to rest on the brake disc or hub.

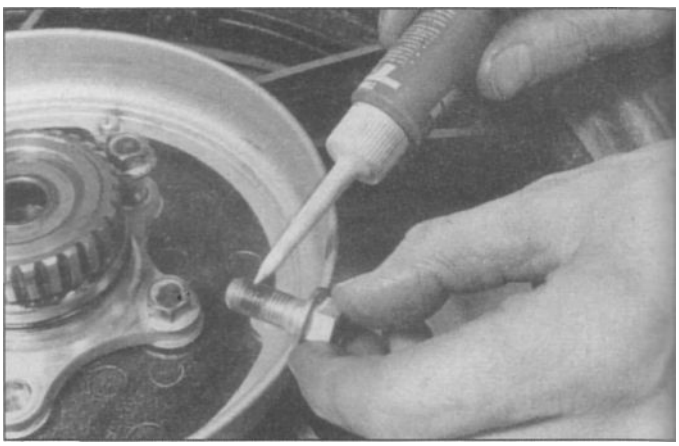
Frontwheelbearings

3 Removal, inspection and installation of the front wheel bearings is the same as for XV535 models (see Part A of this Chapter). Refer to **illustration 11.3a, 11.3b or 11.3c** and the Part B Specifications.

Rearwheelbearings

Refer to illustrations 13.4 and 13.5a through 13.5e

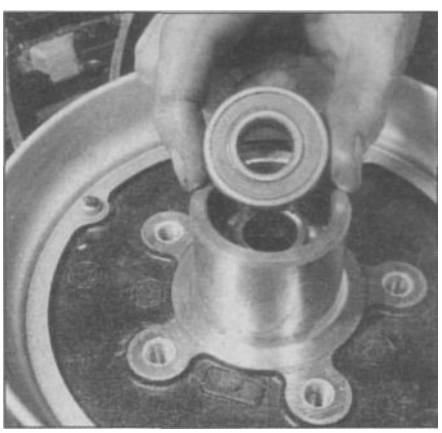
4 If necessary for inspection, the dust seal and clutch hub can be detached from the wheel **(see illustration 12.3 and the accompanying**



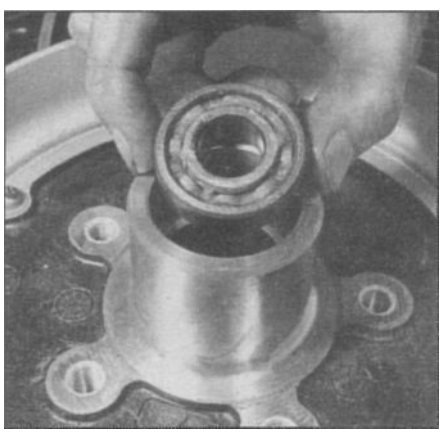
13.5a Use non-permanent thread locking agent on the threads of the clutch hub bolts

illustration). The rear wheel bearings can be removed and installed these parts in place.

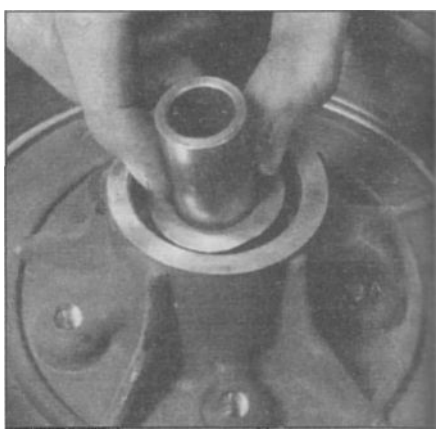
5 Rear wheel bearing removal, inspection and installation **an** generally the same as for front wheel bearings (see part A of tr - Chapter and the accompanying illustrations). On installation, be sure I install the spacer and its collar between the bearings. Apply no- permanent thread locking agent to the threads of the clutch hub bolts **(see illustration)** and tighten them securely.



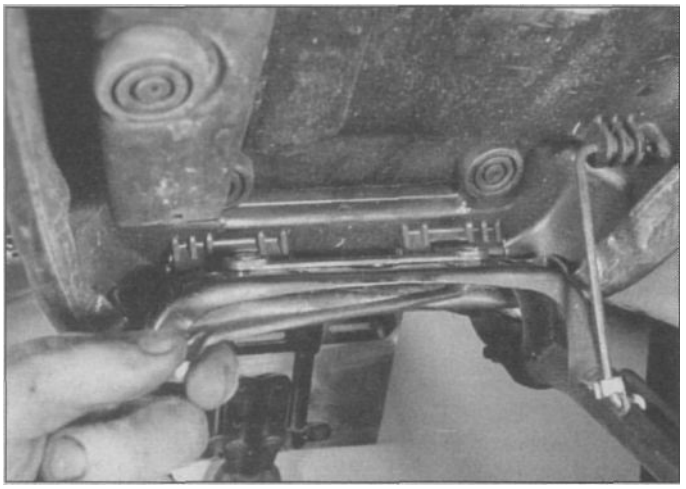
13.5b Drive the two bearings out of the let side of the hub with a long bar . . .



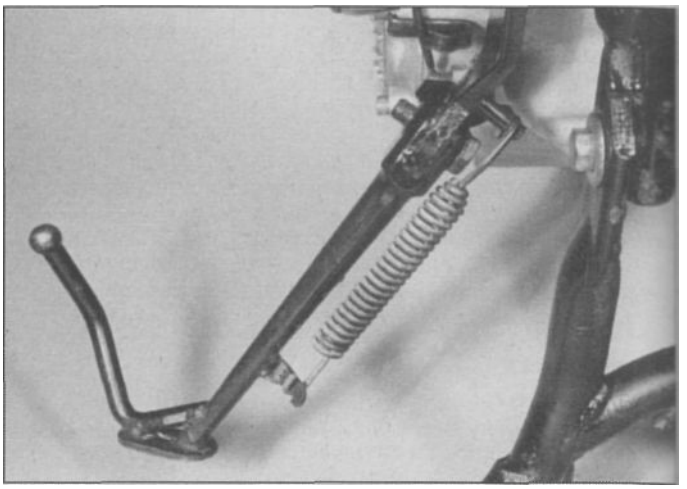
13.5c . . . and use the same tool to remove the single bearing from the right side



13.5d Remove the spacer and collar from the hub



4.1 Remove one mounting nut, detach the prop rod and remove the other mounting nut



5.1a The sidestand spring must be properly connected and in good condition

removing the right rear footpeg assembly on an early shaft drive model, support the exhaust system and unbolt the footpeg from the frame (the same boit also secures an exhaust bracket).

3 To remove a footpeg assembly on chain drive models, remove the pivot bracket nut and washer from the inside of the alloy bracket.

4 Installation is the reverse of removal. Lubricate the footpeg pivots (see Chapter 1).

4 Seat - removal and installation

Refer to illustration 4.1

1 If you're working on a hinged seat, unlock and lift the seat and remove one of the mounting nuts **(see illustration).** Detach the prop rod, then remove the remaining mounting nut.

2 If the seat is secured by clips, unlock it, then detach it from the clips.

3 If you're working on a bolted seat (1984 and later models), remove the bolts (one on each side at the front of the seat). Detach the rear of the seat from its bracket and lift it off.

4 Installation is the reverse of the removal steps.

5 Sidestand and centerstand - maintenance

Refer to illustrations 5.1a and 5.1b

1 The sidestand (and centerstand on models so equipped) is attached to the frame. An extension spring(s) anchored to the bracket ensures that the stand is held in the extended or retracted position **(see illustrations).**

2 Make sure the pivot bolt or nuts are tight and the extension spring is in good condition and not overstretched. An accident is almost certain to occur if the stand extends while the machine is in motion.

6 Sidestand and centerstand - removal and installation

1 Support the bike securely so it can't be knocked over during this procedure.

2 Unhook the spring **(see illustration 5.1a or 5.1b).** Remove the pivot bolt or nuts and take the stand off the pivot shaft(s).

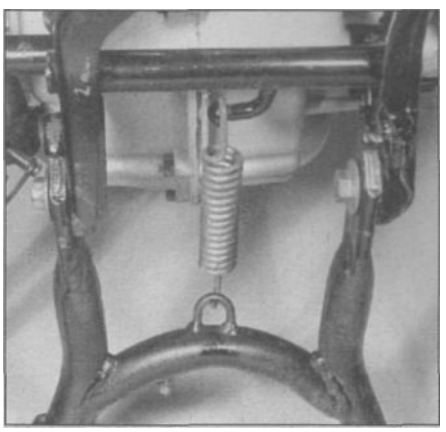
3 Installation is the reverse of the removal steps.

7 Side covers - removal and installation

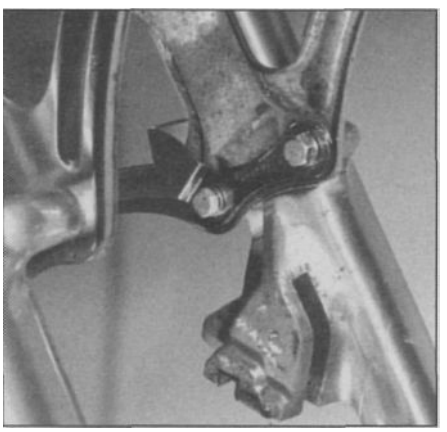
1 Side covers on all models are secured by rubber grommets. In some cases, posts fit into the grommets; in other cases, a slot in the edge of the cover fits into a slot in the grommet.

2 To remove a side cover, pull it gently to disengage the cover from the grommets. **Caution:** *Don't force the cover loose. If it won't come easily, make sure you're pulling in the right direction.*

3 Installation is the reverse of the removal steps.

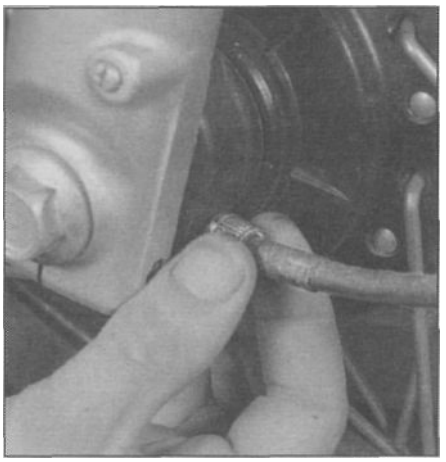


5.1b . . . the centerstand spring must also be properly connected and in good condition

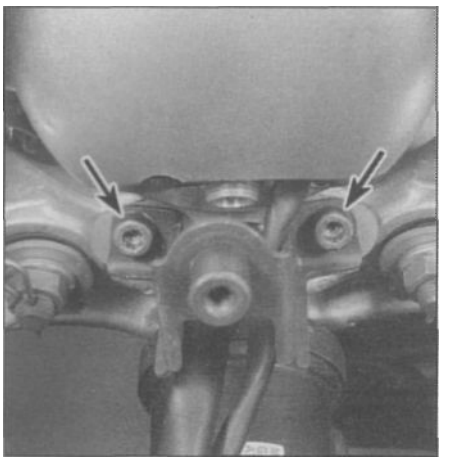


8.1 Remove the fender/mudguard mounting bolts

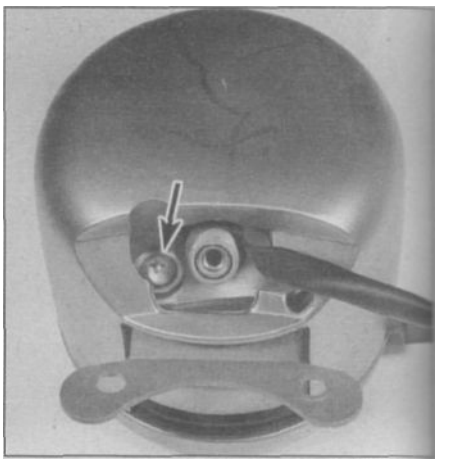
8.2 Slip the speedometer cable out of the guide



13.2 ... and from the drive unit on the left fork leg



13.4 Remove the speedometer mounting nuts...



13.5 ... and the mounting screws, then detach the speedometer from the housing

2 Note how it's routed, then unscrew the speedometer cable from the drive gear at the left front fork **(see illustration).**

Speedometer removal

Refer to illustrations 13.4 and 13.5

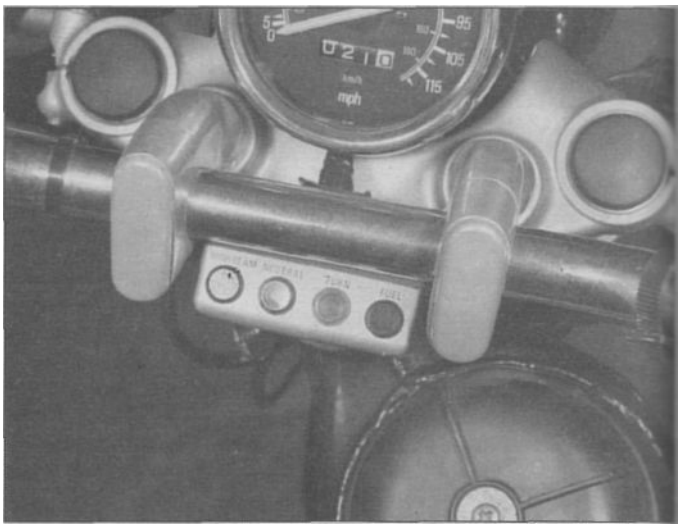
3 Disconnect the cable from the speedometer **(see illustration 13.1).**

4 Remove the Allen bolts and washers and detach the speedometer housing bracket **(see illustration).**

5 Lift the speedometer away from the bracket and turn it over. Remove the self-tapping screw and detach the speedometer from the housing **(see illustration).** Follow the speedometer wiring harness to its connector (inside a rubber cover below the speedometer) and disconnect it.

Installation

6 Installation is the reverse of the removal procedure. Be sure the speedometer cable and wiring harness are routed so it doesn't cause the steering to bind or interfere with other components. The squared-off ends of the cable must fit into their spindles in the speedometer and drive gear.



14.1 The warning lights are contained in this housing

14 Instrument and warning light bulbs - replacement

Warninglightbulbs

Refer to illustrations 14.1 and 14.3

1 The warning light bulbs are beneath a cover located behind and beneath the handlebar **(see illustration).**

2 For access to the bulbs, remove the handlebar (see Chapter 5). The cables, wiring and brake hoses can be left attached; just support the handlebar so no components are strained.

3 Remove the screws and lift off the cover **(see illustration).** Pull the bulb out and install a new one.

4 Install the cover and the handlebar. Tighten the handlebar fasteners to the torque listed in the Chapter 5 Specifications.

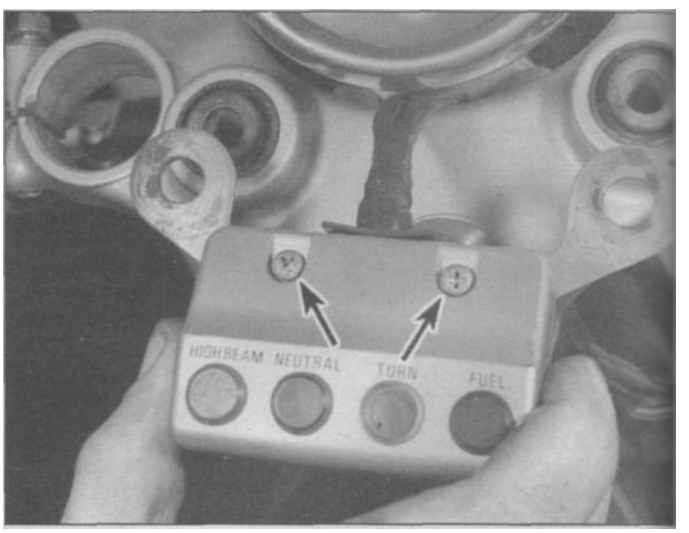
Speedometerlightbulb

Refer to illustrations 14.6a and 14.6b

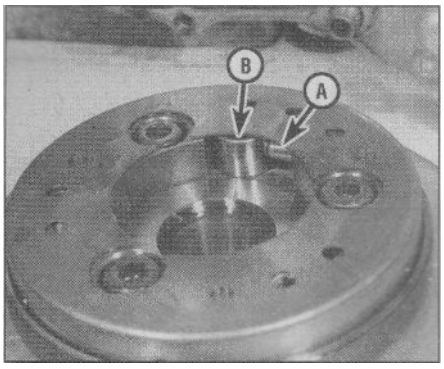
5 Remove the speedometer from the housing (see Section 13).

6 Pull the rubber socket out of the back of the speedometer **(see illustration),** then pull the bulb out of the socket **(see illustration).** If the socket contacts are dirty or corroded, they should be scraped clean and sprayed with electrical contact cleaner before new bulbs are installed.

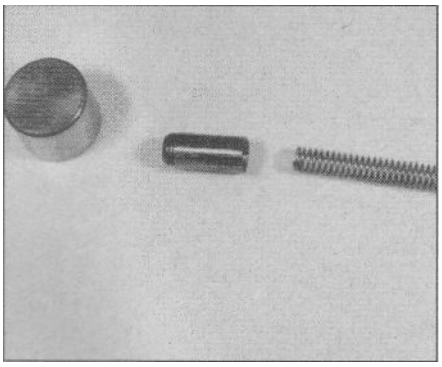
7 Carefully push the new bulb into position, then push the socket into the speedometer.



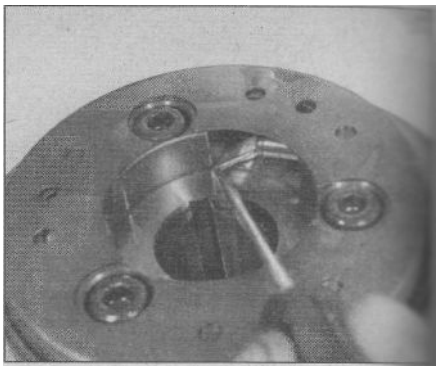
14.3 With the handlebar removed, remove the cover screws (arrows), lift off the cover and pull the bulb out of the socket



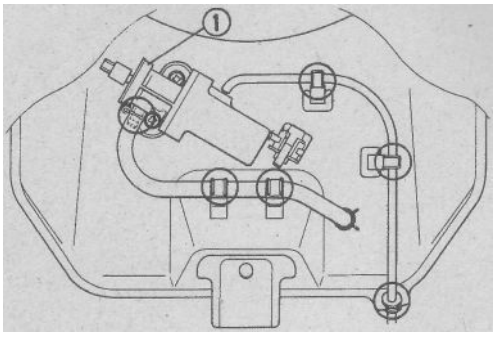
29.3a Compress the pin and spring (A) and remove the roller (B)...



29.3b ... then remove the pin and spring from their bore



29.6 Press the pin and spring into their bore with a pointed tool and install the roller



30.2 Free the wiring harness and hose, remove the screws and remove the fuel tap (1) from the tank

2 Place the large starter driven gear in the starter clutch and try to turn it. It should turn freely in one direction and not at all in the other. If it turns both ways or neither way, remove the idler gear and disassemble the starter clutch for inspection.

3 Compress the pin against its internal spring with a pointed tool and take out the roller (see illustration). Remove the pin and spring (see illustration).

4 Remove the remaining two pins, rollers and springs in the same way.

5 Check all parts for wear and damage and replace parts with these conditions. If the starter clutch needs to be replaced, unstake the ends of its three bolts inside the alternator rotor and unscrew them to separate the starter clutch body from the rotor. Position the new starter clutch on the rotor and apply non-permanent thread locking agent to the threads of the bolts. Install the bolts, tighten them to the torque listed in this Chapter's Specifications and stake their ends on the inside of the rotor.

6 Position the spring inside one of the pins. Place the spring and pin in their bore, compress the pin against the spring with a pointed tool (see illustration) and install the roller.

7 Install the remaining springs, pins and rollers in the same way.

8 The remainder of installation is the reverse of the removal steps. When installing the starter driven gear, don't forget to install the thrust washer first (see illustration 28.11c).

30 Fuel tap solenoid (1989 and later models) - removal, testing and installation

Refer to illustration 30.2

1 Remove the main fuel tank (see Chapter 3). Pour the fuel into an approved container.

2 Free the wiring harness and hose from their clips, remove the screws and detach the fuel tap from the tank **(see illustration)**.

3 Disconnect the hose from the fuel nozzle and connect a length of clean rubber hose in its place.

4 Turn the fuel tap lever to On and try to blow air into the hose. It should go through. If it doesn't, replace the fuel tap.

5 Connect a 12-volt battery (the motorcycle's battery will work) to the solenoid wire terminals (positive to black/yellow; negative to black. Try to blow air into the hose again. It shouldn't be possible with the battery connected to the solenoid. If air will go through, replace the solenoid.

31 Carburetor heater (1994 UK models) - testing

1 Follow the wiring harness from the heater unit at the carburetor assembly to the thermoswitch (it can be identified by its wire color). Remove the thermoswitch from the wiring harness.

2 Immerse the thermoswitch in a container of water (suspend it so it doesn't touch the sides or bottom of the container).

3 Connect an ohmmeter to the thermoswitch wires and heat the water. Note the ohmmeter readings as the water heats, then cools down.

a) Zero to 17+1- 5-degrees C (32 to 63 +/- 9-degrees F) - continuity (little or no resistance)

b) 17 +/- 5 to 70-degrees C (63 +/- 9 to 158-degrees F) - no continuity (infinite resistance)

c) 70 to 11 +/- 3-degrees C (158 to 52 +/- 5-degrees F) - no continuity

d) Less than 11 +/- 3-degrees C (52 +/- 5-degrees F) - continuity

4 If the thermoswitch doesn't give the readings described, replace it.

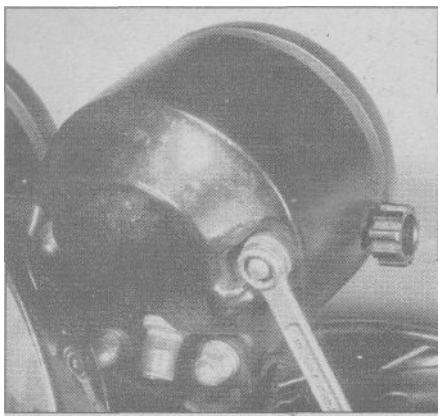
5 Disconnect the wiring from the heater unit at the carburetor assembly. Connect an ohmmeter to the terminal on the heater unit note the reading and compare it to the value listed in this Chapter's Specifications. If the resistance reading is not with the specified range replace the heater unit.

32 Wiring diagrams

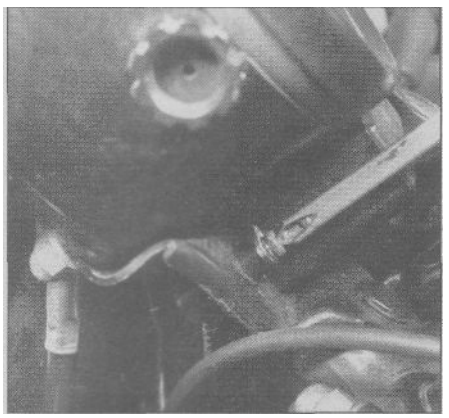
Prior to troubleshooting a circuit, check the fuses to make sure they're in good condition. Make sure the battery is fully charged and check the cable connections.

When checking a circuit, make sure all connectors are clean, with no broken or loose terminals or wires. When unplugging a connector don't pull on the wires - pull only on the connector housings themselves.

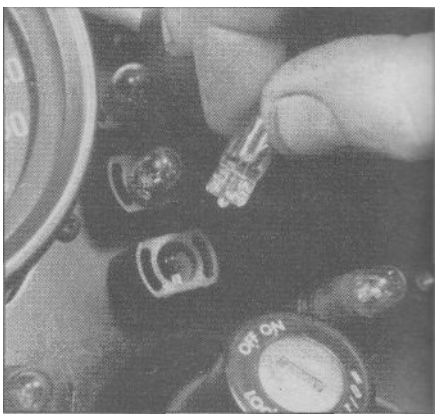
Refer to the table in Chapter 9 for the wire color codes.



13.6 Remove the speedometer securing nut and lift the speedometer out



14.1a Remove the warning light cover screws and lift off the cover . . .



14.1b . . . and pull the bulb from the socket

5 If you're working on a 1981 through 1983 XV750, an XV920J, or an XV920 K or MK, disassemble the cluster as necessary for access to speedometer,

6 If you're working on an XV920 RH, XV920 RJ or TR1. remove the nut, washer and grommet from the back of the speedometer housing and remove the speedometer **(see illustration).**

7 If you're working on a 1984 or later model, lift the speedometer away from the bracket and turn it over. Remove the self-tapping screw and detach the speedometer from the housing **(see illustration 13.5** in **Part A of this Chapter).** Follow the speedometer wiring harness to its connector (inside a rubber cover below the speedometer) and disconnect it.

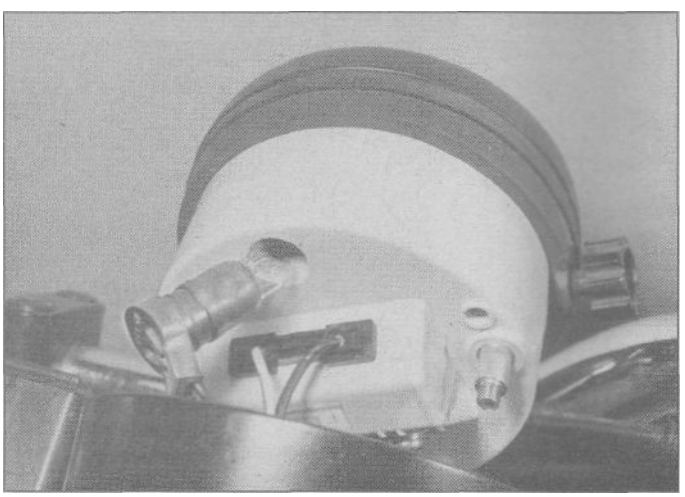
Installation

8 Installation is the reverse of the removal procedure. Be sure the speedometer cable and wiring harness are routed so it doesn't cause the steering to bind or interfere with other components. The squared-off ends of the cable must fit into their spindles in the speedometer and drive gear.

14 Instrument and warning light bulbs - replacement

Refer to illustrations 14.1a, 14.1b and 14.3

1 To replace a warning light bulb on an XV920 RH, XV920 RJ or TR1, remove the warning light cover screws **(see** illustration). Pull the bulb outof its socket **(see illustration),** push in a new one and install the cover.



14.3 On chain drive models, remove the instrument and pull the bulb socket from its underside, then pull the bulb from the socket

2 To replace an instrument light bulb on an XV920 RH, XV920 RJ or TR1, remove the speedometer or tachometer (see Section 13). Pull the bulb socket from the back of the instrument, pull the bulb out of the socket and push in a new one. Reinstall the instrument.

3 To replace bulbs on an XV920J, remove the instrument cluster from its mounting bracket (see Section 13). Pull the bulb socket from the bottom of the instrument cluster **(see illustration),** pull the bulb out of the socket and push in a new one. Reinstall the instrument cluster.

4 To replace bulbs on an XV750, XV920K or XV920 MK, remove the cluster partway and remove the lower cover (see Section 13). Pull the bulb socket from the bottom of the instrument, pull the bulb out of the socket and push in a,new one. Reinstall the instrument cluster.

15 Ignition main (key) switch - check and replacement

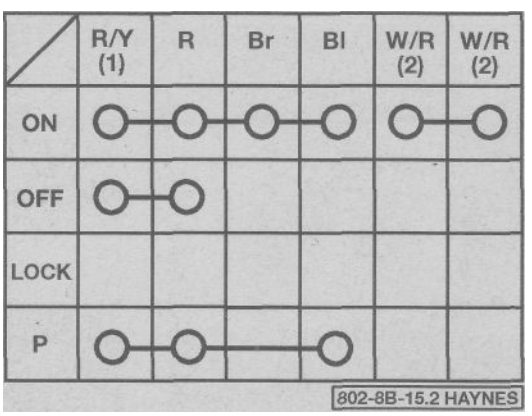
Check

Refer to illustration 15.2

1 Follow the wiring harness from the ignition switch (on the upper triple clamp) to the connector and disconnect it.

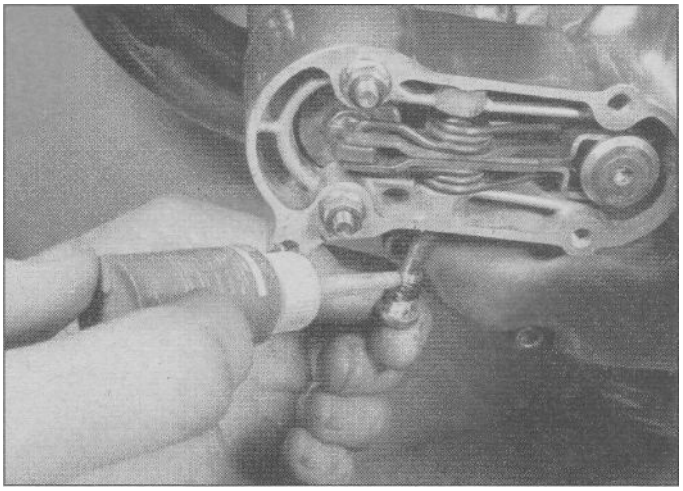
2 Using an ohmmeter, check the continuity of the terminal pairs indicated in the accompanying table **(see illustration).** Continuity should exist between the terminals connected by a solid line when the switch is in the indicated position. **Note:** *Connect the ohmmeter to the switch side of the connector, not the wiring harness side.*

3 If the switch fails any of the tests, replace it.

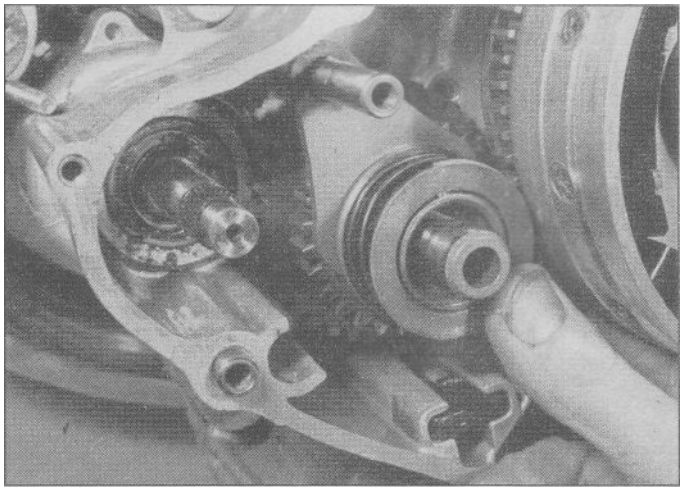


15.2 Ignition (main key) switch continuity diagram

1 XV920J, 1984-on 1000 and XV1100 only
2 XV920J only



30.21 Appiy non-permanent thread locking agent to the threads of the pivot bolt



30,23 Install the starter drive assembly

Apply non-permanent thread locking agent to the pivot bolt, then install it and tighten it securely **(see illustration).**

22 Install the starter motor (see Section 24).

23 Install the thrust collar, idler gear, drive lever shaft, idler gear, spring, starter wheel, shaft and thrust collar **(see illustration).**

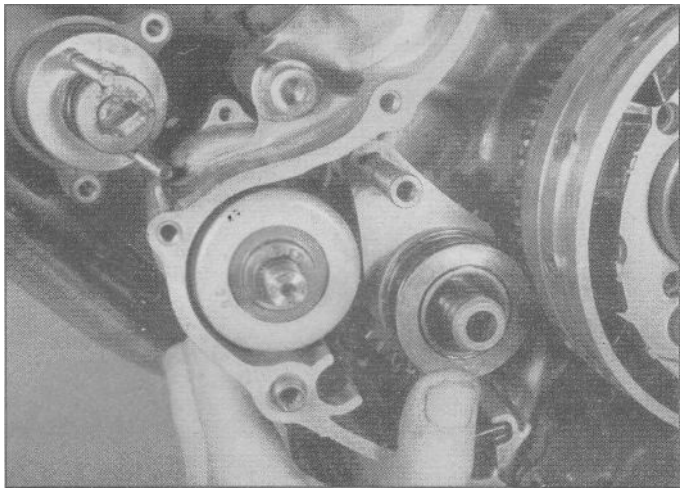
24 Install the snap-ring, starter clutch and second snap-ring **(see illustration).**

25 Install the alternator cover (see Section 28).

All models

26 The remainder of installation is the reverse of the removal steps.

27 Fill the engine with oil (see Chapter 1).



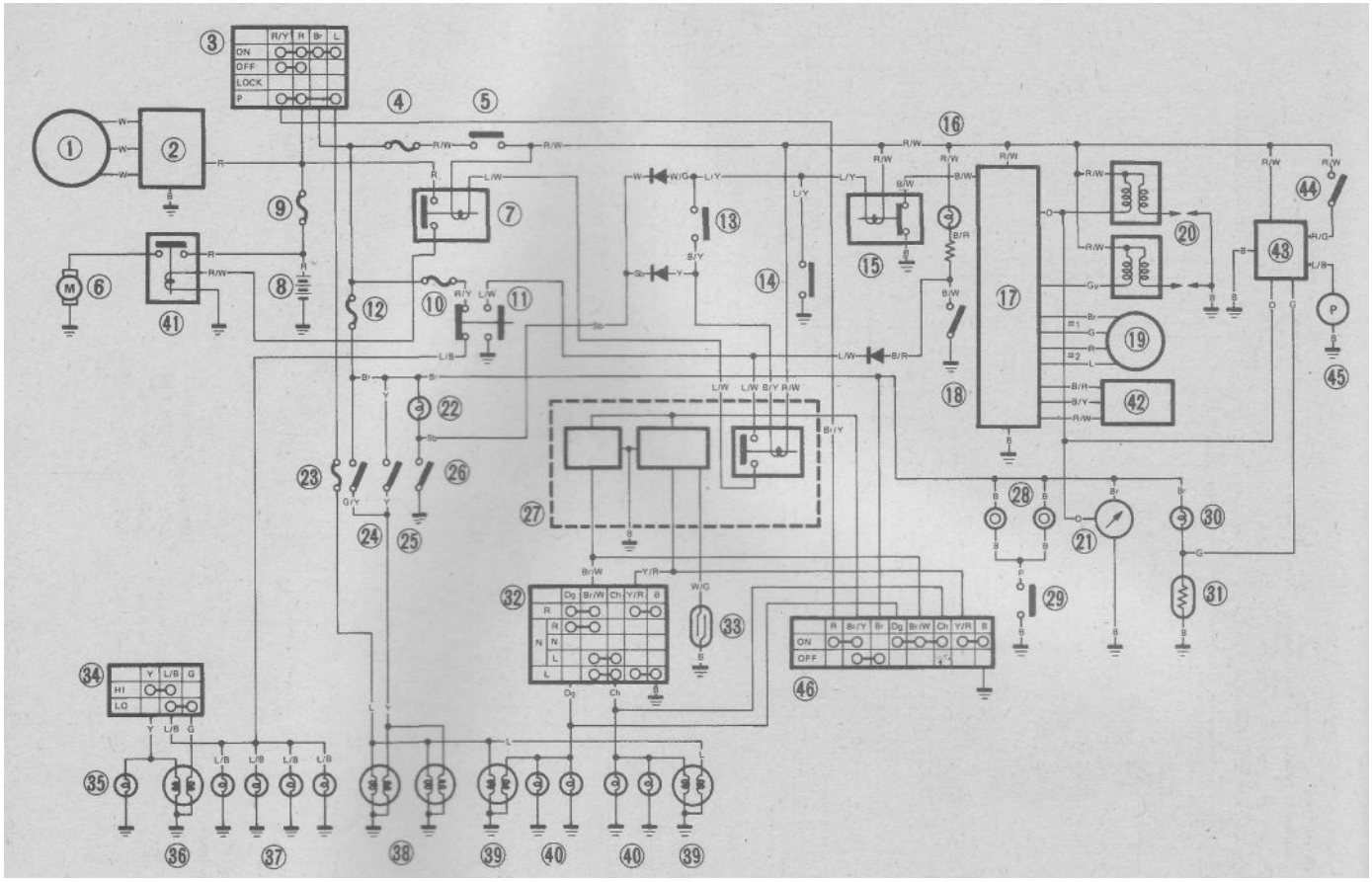
30.24 Install the snap-ring, starter clutch and second snap-ring

31 Wiring diagrams

Prior to troubleshooting a circuit, check the fuses to make sure they're in good condition. Make sure the battery is fully charged and check the cable connections.

When checking a circuit, make sure all connectors are clean, with no broken or loose terminals or wires. When unplugging a connector, don't pull on the wires - pull only on the connector housings themselves.

Refer to the accompanying table for the wire color codes.



Wiring **diagram** - **XV700 and 1000 (1984 and 1985 US models)**

1 *Alternator*
2 *Rectifier/regulator*
3 *Main key switch*
4 *Ignition fuse*
5 *Engine kill switch*
6 *Starter motor*
7 *Starter relay (XV700) or solenoid switch (XV1000)*
8 *Battery*
9 *Main fuse*
10 *Headlight fuse*
11 *Starter switch*
12 *Signal fuse*
13 *Clutch switch*
14 *Sidestand switch*
15 *Sidestand relay*
16 *Oil level indicator light*
17 *Igniter unit*
18 *Oil level switch*
19 *Pickup coil*
20 *Ignition coil*
21 *Tachometer*
22 *Neutral indicator light*
23 *Tail fuse*
24 *Front brake switch*
25 *Rear brake switch*
26 *Neutral switch*
27 *Relay assembly*
28 *Horn*
29 *Horn switch*
30 *Fuel warning indicator light*
31 *Fuel sender*
32 *Flasher switch*
33 *Reed switch*
34 *Dimmer switch*
35 *High beam indicator light*
36 *Headlight*
37 *Instrument illumination light*
38 *Tail/brake light*
39 *Turn signal indicator light*
40 *Flasher light*
41 *Solenoid switch (XV1000)*
42 *Pressure sensor (XV1000)*
43 *Fuel pump controller (XV1000)*
44 *Reserve switch (XV1000)*
45 *Fuel pump (XV1000)*
46 *Hazard switch (XVI000)*