M395-10

CLYMER

YAMAHA

XV535-1100 VIRAGO • 1981-2003

SERVICE • REPAIR • MAINTENANCE

A PRIMEDIA Publication

TIRE INFLATION PRESSURE (COLD)

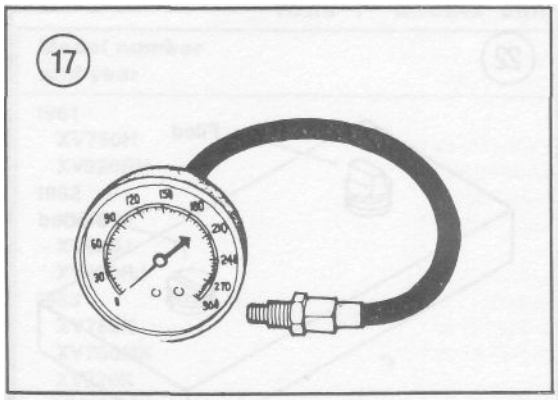
Load	XV700, XV750, XV1000.XV1100 psi (kg/cm^2)	XV920 psi (kg/cm^2)
Up to 1981b. (90 kg)		
Front	26(1.8)	26(1.8)
Rear	28 (2.0)	28 (2.0)
198-353 Ib. (90-160 kg)		
Front	28 (2.0)	
Rear	32 (2.3)	
353-529 !b. (160-240 kg)		
Front	**28 (2.0)**	
Rear	**40 (2.8)**	
198-470 Ib. (90-213 kg)		
Front	—	28 (2.0)
Rear	—	32 (2.3)
High-speed riding		
Front	32 (2.3)	28 (2.0)
Rear	36 (2.5)	32 (2.3)

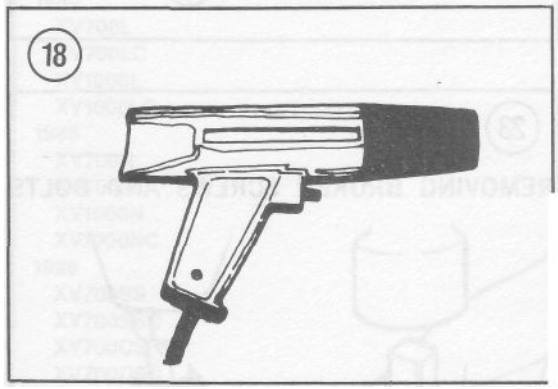
REPLACEMENT BULBS

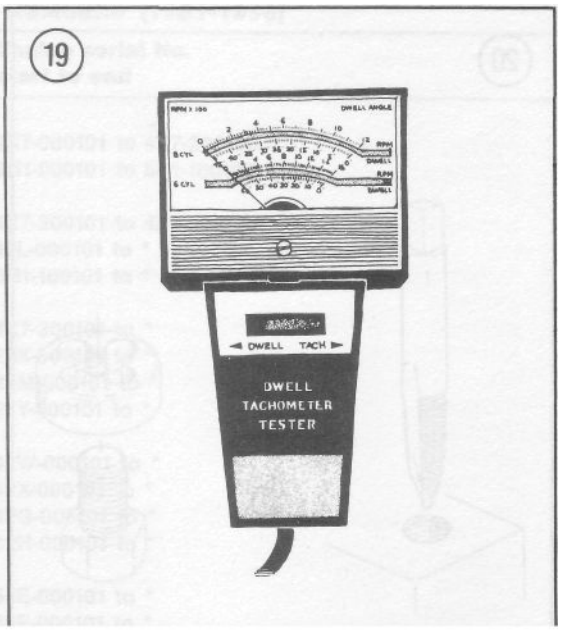
Item	Wattage
Headlight	12V60/55W
Tail/brakelight	12V8/27W
Meter light	
XV920J	12V 2W
All other models	12V3.4W
Indicator lights	
1981-1983	12V3.4W
1984-on	12V4.0W
License light	
XV750	12V 8W
XV920J	12V3.8W
All other models	Not specified
Flasher/running light	
XV700,XV1000,XV1100	12V27W
XV920J	12V27WX4/8W
All other models	Not specified

TUNE-UP SPECIFICATIONS

Ignition timing	Fixed
Valve clearance (cold)	
1981-1983	
Intake	0.004 in. (0.10 mm)
Exhaust	0.006 in. (0.15 mm)
1984-on	
Intake	0.003-0.005 in. (0.07-0.10 mm)
Exhaust	0.006 in. (0.15 mm)
Spark plug	
Type	NGK BP7ES
Gap	0.028-0.032 in. (0.7-0.8 mm)
Tightening torque	14.5ft.-lb. (20N«m)
Idle speed	950-1,050 rpm
Compression pressure (warm @ sea level)	
Standard	156 psi (11 kg/cm^2)
Minimum	128 psi (9 kg/cm^2)
Maximum	171 psi (12 kg/cm^2)
Maximum difference between cylinders:	14 psi (1.0 kg/cm^2)







Strobe Timing Light

This instrument is necessary for tuning. By flashing a light at the precise instant the spark plug fires, the position of the timing mark can be seen. Under the flashing light marks on the alternator flywheel line up with the stationary mark on the crankcase while the engine is running.

Suitable lights range from inexpensive neon bulb types to powerful xenon strobe lights. See **Figure 18.** Neon timing lights are difficult to see and must be used in dimly lit areas. Xenon strobe timing lights can be used outside in bright sunlight. Both types work on the Yamaha; use according to the manufacturer's instructions.

Portable Tachometer

A portable tachometer is necessary for tuning. See **Figure 19.** Ignition timing and carburetor adjustments must be performed at the specified engine speed. The best instrument for this purpose is one with a low range of 0-1,000 or 0-2,000 rpm and a high range of 0-4,000 rpm. Extended range (0-6,000 or 0-8,000 rpm) instruments lack accuracy at lower speeds. The instrument should be capable of detecting changes of 25 rpm on the low range.

MECHANIC'S TIPS

Removing Frozen Nuts and Screws

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

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

Remedying Stripped Threads

Occasionally, threads are stripped through carelessness or impact damage. Often the threads can be cleaned up by running a tap (for internal threads on nuts) or die (for external threads on bolts) through the threads. See **Figure 20.** To clean or repair spark plug threads, a spark plug tap can be used **(Figure 21).**

Removing Broken Screws or Bolts

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

b. Ignition timing incorrect.
c. Improper spark plug heat range.
d. Damaged or blocked cooling fins.

Smoky Exhaust and Engine Runs Roughly

a. Clogged air filter element.
b. Carburetor adjustment incorrect (mixture too rich).
c. Choke not operating correctly.
d. Water or other contaminants in fuel.
e. Clogged fuel line.
f. Clogged fuel filter on XV1000 or XVI100 models.

Engine Loses **Power**

a. Carburetor incorrectly adjusted.
b. Engine overheating.
c. Ignition timing incorrect.
d. Incorrectly gapped spark plugs.
e. Obstructed muffler.
f. Dragging brake(s).

Engine Lacks **Acceleration**

a. Carburetor mixture too lean.
b. Clogged fuel line.
c. Clogged fuel filter on XV1000 and XVI100 models.
d. Ignition timing incorrect.
e. Improper valve clearance.
f. Dragging brake(s).

ENGINE **NOISES**

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

EXCESSIVE **VIBRATION**

This can be difficult to find without disassembling the engine. Usually this is caused by loose engine mounting hardware. High-speed vibration may be due to a bent axle shaft or loose or faulty suspension components.

CLUTCH

The three basic clutch troubles are:
a. Clutch noise.
b. Clutch slipping.
c. Improper clutch disengagement.

All clutch troubles, except adjustments, require partial engine disassembly to identify and cure the problem. Refer to Chapter Five for procedures.

TRANSMISSION

The basic transmission troubles are:
a. Excessive gear noise.
b. Difficult shifting.
c. Gears pop out of mesh.
d. Incorrect shift lever operation.

Transmission symptoms are sometimes hard to distinguish from clutch symptoms. Be sure that the clutch is not causing the trouble before working on the transmission.

FRONT SUSPENSION AND STEERING

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

BRAKE PROBLEMS

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

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

ELECTRICAL PROBLEMS

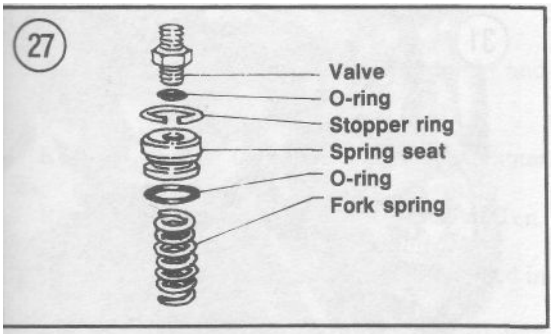
Rapid failure of bulbs may be caused by excessive vibration, loose connections that permit sudden current surges, or the installation of the wrong type of bulb.

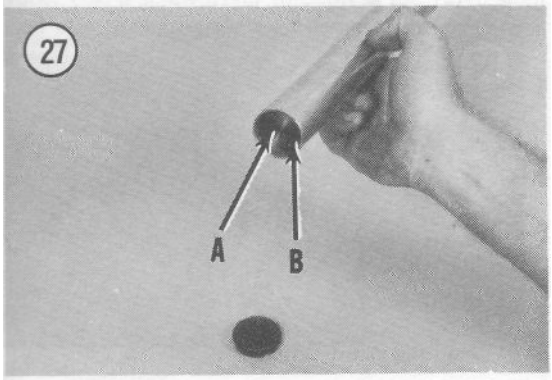
The majority of light and ignition problems are caused by loose or corroded ground connections. Check these first prior to replacing a bulb or electrical component.

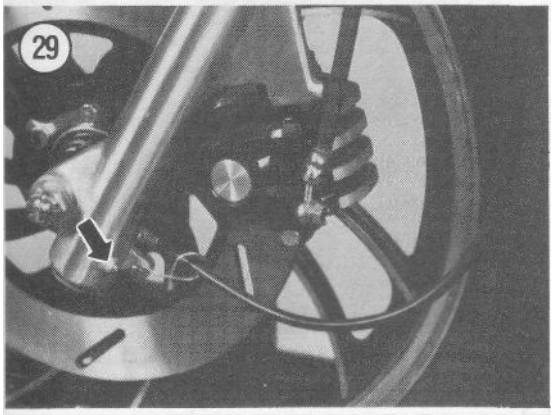
IGNITION SYSTEM

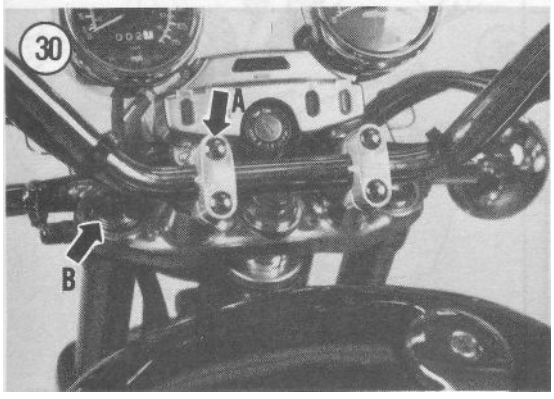
All models are equipped with a Transistor Controlled Ignition (TCI) system. This solid state system uses no contact breaker points or other moving parts. Because of the solid state design, problems with the ignition system are relatively few.

Refer to Chapter Seven for ignition system troubleshooting procedures.









13. Fill the fork tube with the recommended oil **(Table 4)** in the correct amount **(Table 5).** Slowly pump the fork up and down to distribute the oil.

NOTE

Use a baby bottle to measure the correct amount of fork oil. Baby bottles are incremented in fluid ounces (ft. oz.) and cubic centimeters (cc).

14. Install the fork spring and spring seat. Have an assistant compress the spring seat and install a *new* wire stopper ring. Make sure the wire ring seats fully in its groove in the fork tube before releasing the spring seat.
15. Repeat Steps 6-14 for the opposite fork tube assembly.
16. Install the handlebar assembly and tighten the clamp bolts securely.

NOTE

If the handlebar clamps have arrows stamped on them, the arrows must face toward the front of the bike.

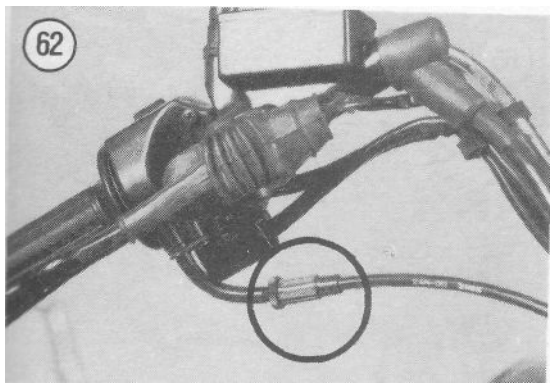
17. Fill the forks with air as described in Chapter Eleven.
18. Install all remaining components removed during disassembly.
19. Road test the bike, then check for oil and air leakage.

XV700,1983 XV750 Midnight Virago, 1988-on XV750,1983XV920,1983 Midnight Virago, XVlOOOandXVUOO

NOTE

Late model bikes are not equipped with drain screw to drain the fork oil.

1. Place the bike on the centerstand and disconnect the negative battery cable from the battery.
2. Remove the rear view mirrors.
3. Remove the fuel tank as described in Chapter Six.
4. Remove the handlebar clamps (A, **Figure 30).** Lay the handlebar assembly aside without disconnecting any cables.
5. On XV750MK and XV920K and MK, carefully pry the plastic emblem (A, **Figure 24)** from the handlebar cover using a small screwdriver. Remove the screw under the plastic emblem and remove the handlebar cover (B, **Figure 24).**
6. Using a small screwdriver, carefully pry the cap (B, **Figure 30)** from the top of the fork tube.
7. If so equipped, remove the air valve cap and depress the valve stem **(Figure 31)** with a small screwdriver to release all air from the fork tube.
8. Loosen the top fork tube pinch tube bolt (A, **Figure 32).**

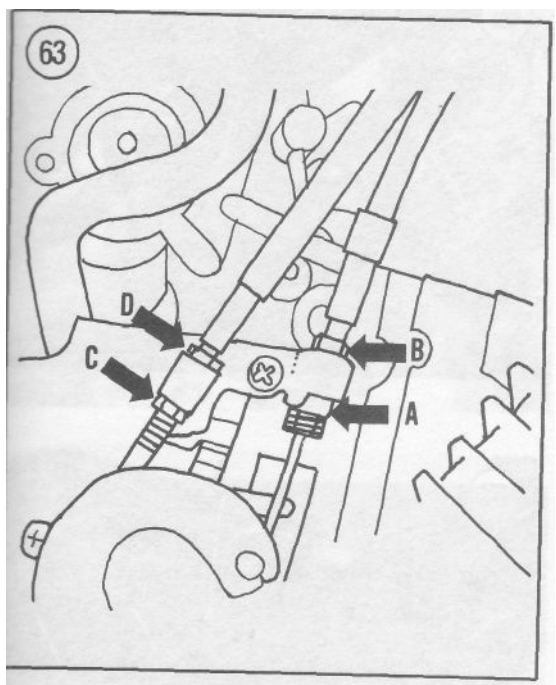


Throttle Operation/Adjustment (1981-1987)

The throttle grip should have 10-15° rotational play (Figure 61). Make sure there is free play in the cable so the carburetors will be able to close completely when the throttle is let off. If adjustment is necessary, loosen the cable locknut (Figure 62) and turn the adjuster (Figure 62) in or out to achieve the proper play. Tighten the locknut.

Check the throttle cable from grip to carburetors. Make sure it is not kinked or chafed. Replace it if necessary.

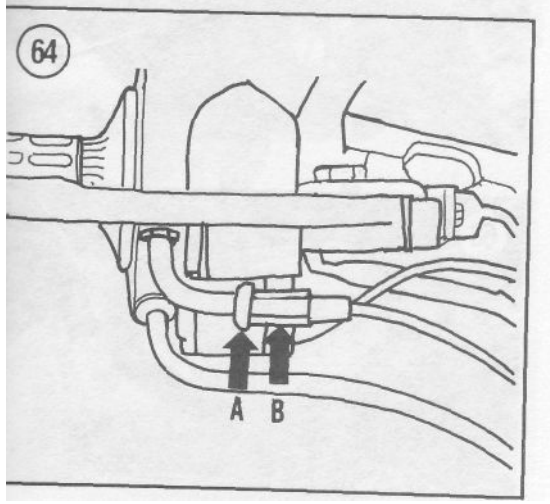
Make sure that the throttle grip rotates smoothly from fully closed to fully open. Check at center, full left and full right position of steering.



Throttle Cable Adjustment (1988-on)

The throttle should have 0.8-0.12 in. (2-3 mm) of rotational play **(Figure 61).** Make sure there is free play in the cables so the carburetors will be able to close completely when the throttle is let off. If adjustment is necessary, perform the following.

1. Remove the air cleaner as described in this chapter.
2. Loosen the front cable locknut (A, **Figure** 63) and turn the adjuster (B, **Figure** 63) in or out to achieve the proper play. Tighten the locknut (A).
3. Loosen the rear cable locknut (C, **Figure 63)** and turn the adjuster (D, **Figure 63)** in or out to achieve the proper play. Tighten the locknut (C).
4. If the correct amount of freeplay still cannot be achieved, loosen the cable adjuster locknut (A, **Figure** 64) next to the throttle grip. Turn the adjuster (B, **Figure** 64) in or out to achieve the proper play. Tighten the locknut (A).
5. Make sure all locknuts are tightened securely.
6. Check the throttle cable(s) from grip to carburetors. Make sure it is not kinked or chafed. Replace it if necessary.
7. Make sure the throttle grip rotates smoothly from fully closed to fully open. Check at center, full left and full right position of steering.
8. Install the air cleaner as described in this chapter.



Fuel Shutoff Valve/Filter

Refer to Chapter Six for complete details on removal, cleaning and installation of the fuel shutoff valve.

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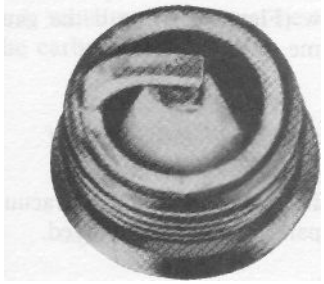
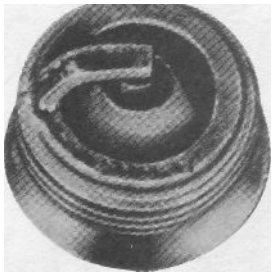
SPARK PLUG CONDITION



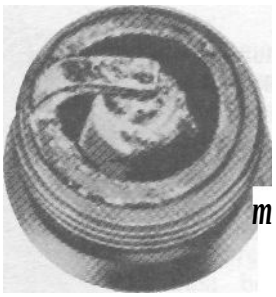
NORMAL
- Identified by light tan or gray deposits on the firing tip.
- Can be cleaned.

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

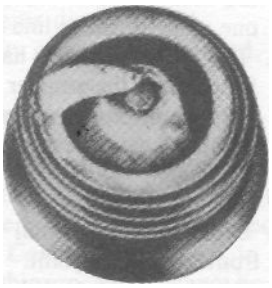
OIL FOULED
- Identified by wet black deposits on the insulator shell bore or electrodes.
- Caused by excessive oil entering combustion chamber through worn rings and pistons, excessive clearance between valve guides and stems, or worn or loose bearings. Can be cleaned. If engine is not repaired, use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



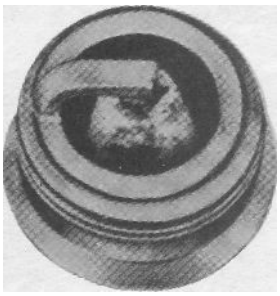
CARBON FOULED
- Identified by black, dry fluffy carbon deposits on insulator tips, exposed shell surfaces and electrodes.
- Caused by too cold a plug, weak ignition, dirty air cleaner, too rich a fuel mixture, or excessive idling. Can be cleaned.



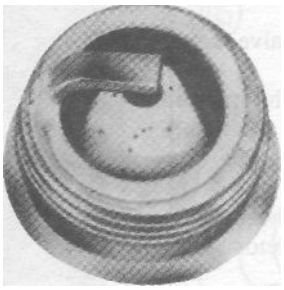
LEAD FOULED
- Identified by dark gray, black, yellow, or tan deposits or a fused glazed coating on the insulator tip.
- Caused by highly leaded gasoline Can be cleaned.



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

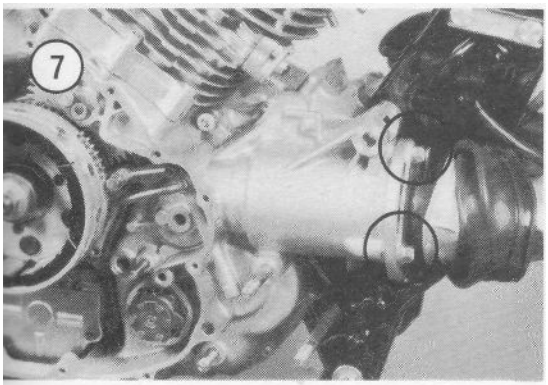


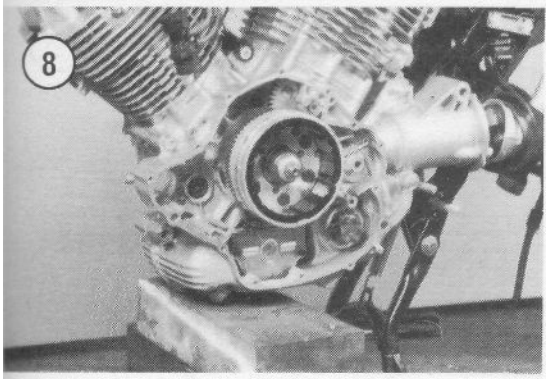
FUSED SPOT DEPOSIT
- Identified by melted or spotty deposits resembling bubbles or blisters.
- Caused by sudden acceleration. Can be cleaned.

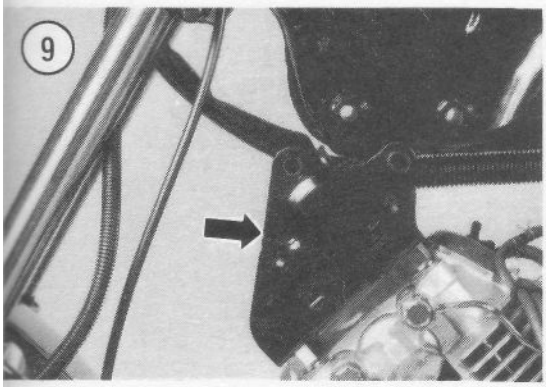


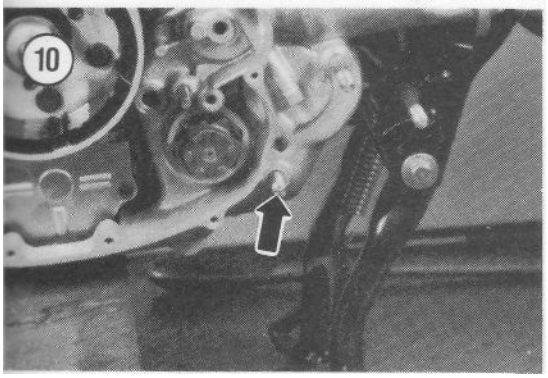
OVERHEATING
- Identified by a white or light gray insulator with small black or gray brown spots and with bluish-burnt appearance of electrodes. Caused by engine overheating, wrong type of fuel, loose spark plugs, too hot a plug, or incorrect ignition timing. Replace the plug.

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







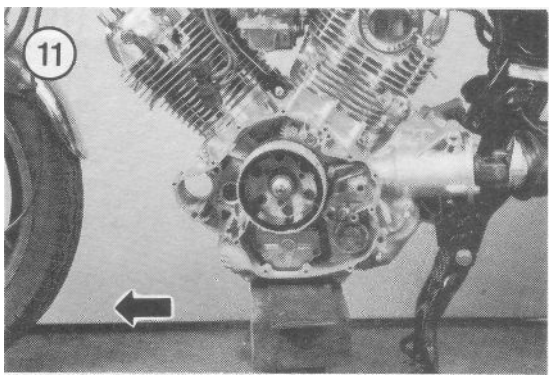


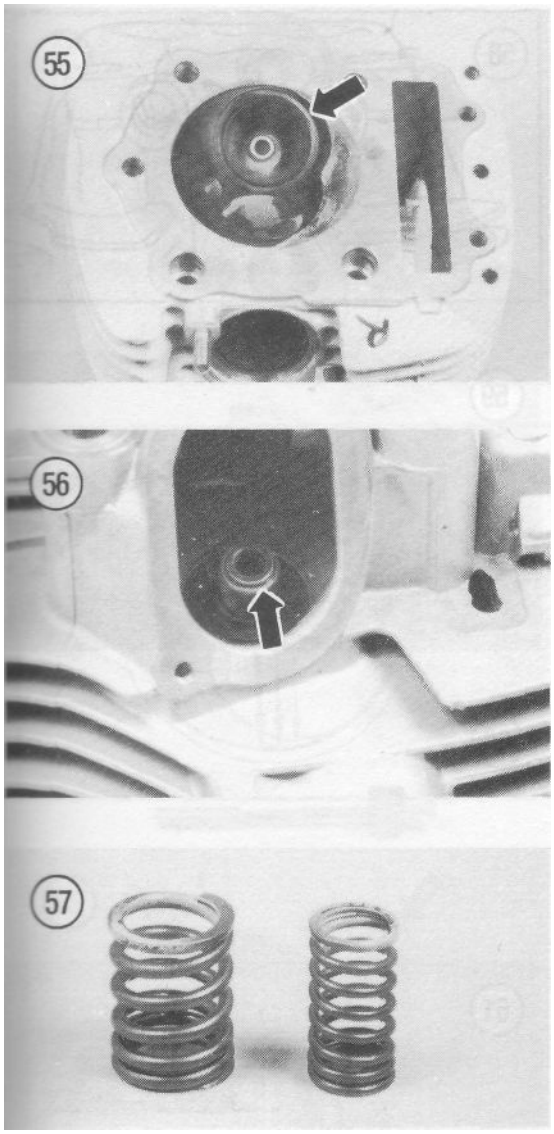
20. Examine the engine to make sure everything has been disconnected and positioned out of the way.
21. Place wooden blocks **(Figure 8)** under the crankcase to support the engine once the mounting bolts are removed.
22. Loosen, but do not remove, all engine mounting bolts and nuts.
23. Remove the front engine mount bolts, nuts and brackets **(Figure 9).**

NOTE

Rubber dampers are used on some engine mounts. Note their position for reassembly.

24. Withdraw the rear engine mount through bolt **(Figure 10).**
25. Have an assistant help you slide the engine forward **(Figure 11)** and remove it.
26. While the engine is removed for service, check all of the frame engine mounts for cracks or other damage. If any cracks are detected, take the chassis assembly to a dealer or frame specialist for further examination.
27. Install by reversing the removal steps; note the following.
28. After the engine is positioned correctly, install the rear through-bolt **(Figure 10).** Install the upper front bolts, plates and nuts. Start the nuts but do not tighten.
30. On shaft-drive models, install 4 *new* drive shaft bolts and tighten them evenly in two stages to specifications **(Table** 4). Reattach the rubber boot.
31. Tighten the front and rear top motor mount bolts to specifications **(Table 5).**
32. Fill the crankcase with the recommended type and quantity of engine oil. Refer to Chapter Three.
33. Start the engine and check for leaks.





2. Install the lower spring seat **(Figure 48)** and a new seal **(Figure 56).**

NOTE
Oil seals should be replaced whenever a valve is removed or replaced.

3. Install valve springs with the narrow pitch end (end with coils closest together) facing the cylinder head **(Figure** 57).
4. Install the upper spring seat.
5. Push down on the upper spring seat with the valve spring compressor and install valve keepers. After releasing tension from compressor, examine valve keepers to make sure they are seated correctly.
6. Repeat Steps 1-5 for remaining valve(s).

Valve Guide Replacement

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

Valve Seat Reconditioning

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

Valve Lapping

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

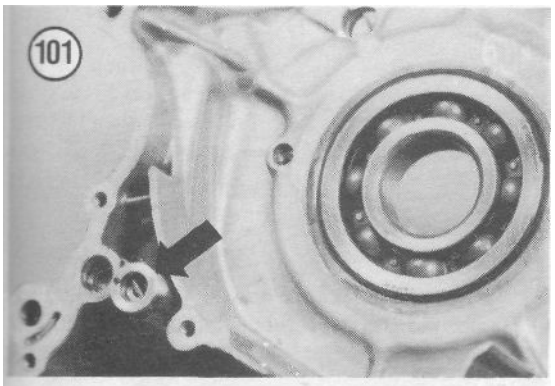
1. Smear a light coating of fine grade valve lapping compound on seating surface of valve.
2. Insert the valve into the head.
3. Wet the suction cup of the lapping stick and stick it onto the head of the valve. Lap the valve to the seat by spinning the lapping stick in both directions. Every 5 to 10 seconds, rotate the valve 180° in the valve seat; continue lapping until the contact surfaces of the valve and'the valve seat are a uniform gray. Stop as soon as they are, to avoid removing too much material.
4. Thoroughly clean the valves and cylinder head in solvent to remove all grinding compound. Any compound left on the valves or the cylinder head will end up in the engine and will cause excessive wear and damage.
5. After the lapping has been completed and the valve assemblies have been reinstalled into the head, the valve seal should be tested. Check the seal of each valve by pouring solvent into each of the intake and exhaust ports. There should be no leakage past the seat. If leakage occurs, the combustion chamber will appear wet. If fluid leaks past any of the seats, disassemble that valve assembly and repeat the lapping procedure until there is no leakage.

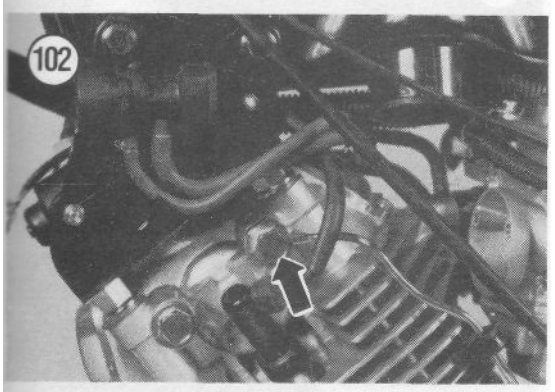
ROCKER ARM ASSEMBLIES

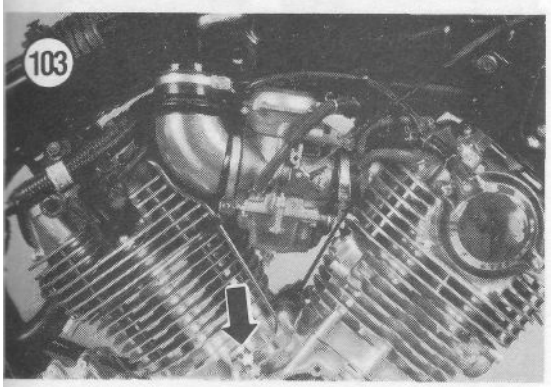
The rocker arms are identical (same Yamaha part No.) but they will develop different wear patterns during use. It is recommended that all parts be marked during removal so that they can be assembled in their original position.

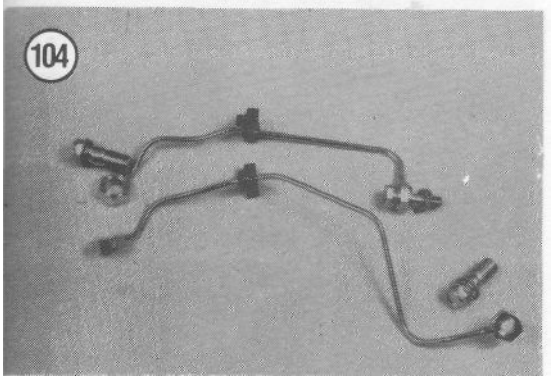
Removal/Inspection Installation

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









4. Clean all parts in solvent. Inspect all parts for damage or wear. If any part requires replacement the entire oil pressure relief valve must be replaced.
5. Lubricate all parts with *clean* engine oil. Assemble the valve in the reverse order of removal. Secure the spring and end caps with a new cotter pin.

NOTE
Measure the length of the new cotter pin and compare it to the old one. The new cotter pin must be cut to the same length to ensure correct installation.

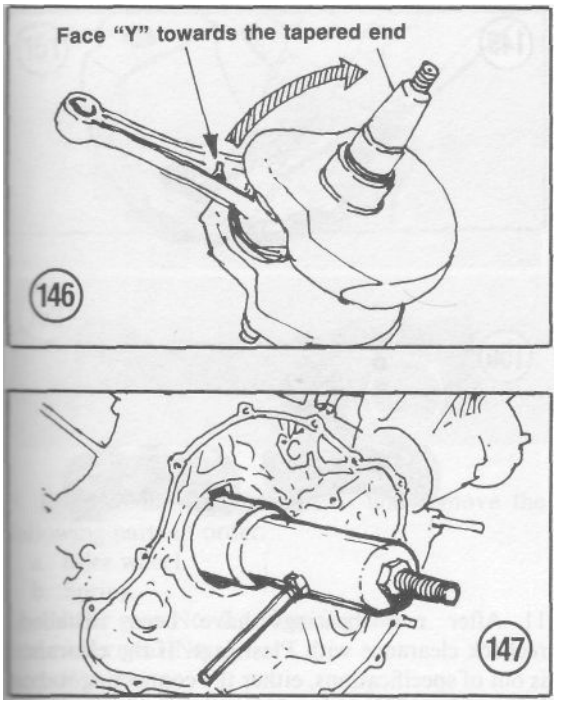
6. Install the new cotter pin and bend it tightly against the valve housing.
7. Insert the relief valve into the crankcase. Make sure the O-ring does not slide off the valve during installation.
8. Assemble the crankcase as described in this chapter.

OIL LINES

Two oil lines feed engine oil from the main engine oil gallery to the cylinder heads. These lines should be inspected once a month to ensure they have not been damaged.

Removal/Installation

1. Put the bike on the centerstand.
2. Disconnect the negative battery cable.
3. Remove the oil line union bolt and washers at the front and rear cylinders (Figure **102).**
4. Remove the union bolt where both oil lines meet at the right-hand side of the engine **(Figure 103).**
5. Carefully pull the oil line rubber dampers out of the cylinders and remove both oil lines.
6. Inspect the oil lines **(Figure 104)** for any dents or cracks and replace as required. Do not attempt to repair a damaged oil line.
7. Clean the oil lines in solvent and allow to dry before installation.
8. Clean the union bolts and copper washers **(Figure 104)** in solvent. Replace any washer that appears flattened.
9. Installation is the reverse of these steps; note the following:
   a. Align the oil lines carefully in position. The longer oil line goes to the front cylinder.
   b. Install a union bolt with a copper washer on both sides of the oil line connection. Install the bolts finger-tight at this time. The copper washers with the 3 inside tabs fit onto the longest union bolt.



2. Remove the transmission assemblies as described in Chapter Five.
3. Remove the middle driven gear as described under *Crankcase Disassembly* in this chapter.
4. Remove the oil pump drive sprocket as described under *Oil Pump* in this chapter.

NOTE

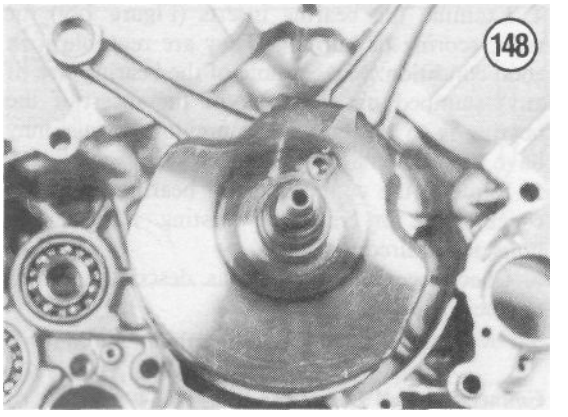
The oil pump drive sprocket will be damaged during removal; a new sprocket ***must*** *be installed during reassembly.*

5. Remove the crankshaft from the left-hand crankcase bearing with a universal type puller as shown in Figure 145.
6. Remove the connecting rod cap bolts and separate the rods from the crankshaft. Mark each rod cap and bearing insert so that they can be reinstalled in their original position.
7. Install by reversing these removal steps; note the following.
8. Install the bearing inserts into each connecting rod and cap. Make sure they are locked in place correctly.

CAUTION

If the old bearings are reused, be sure they are installed in their exact original positions.

9. Lubncate the bearings and crankpins with assembly oil and install the rods so that the letter



"Y" on each rod faces the tapered end of the crankshaft (Figure **146).** Apply molybdenum disulfide grease to the threads of the connecting rods. Install the caps and tighten the cap nuts evenly, in a couple of steps, to 35 ft.-lb. (48 N«m).

CAUTION

On the final tightening sequence, if a torque of31 ft.-lb. (43 N»m) is reached, ***do not stop*** *tightening until the final torque value is achieved. If the tightening is interrupted between 31-34 ft.-lb. (43-48 N'm), loosen the nut to less than 31 ft.-lb. (43 N-m) and tighten to the final torque value in one step.*

10. Install the crankshaft in the left-hand crankcase bearing using the Yamaha crankshaft installation puller (TLU-90900-57-01) and puller adapter No. 10 (TLU-90900-69-00). See **Figure 147.** When installing the crankshaft, align the front and rear connecting rods with their respective cylinder position **(Figure 148).** Continue to check this alignment until the crankshaft is completely installed.

CAUTION

Do not attempt to install the crankshaft without using the special tools described in Step 10. Do not knock the crankshaft into position with a hammer as this may force the crankshaft out of alignment. If you do not have the special tools, have a Yamaha dealer install the crankshaft for you.

Connecting Rod Inspection

1. Check each rod for obvious damage such as cracks and burns.
2. Check the piston pin bushing for wear or scoring.
3. Take the rods to a machine shop and have them checked for twisting and bending.

Table 3 ENGINE TIGHTENING TORQUES (continued)

	ft.-lb.	N*m
Flywheel nut		
1981-1983	112	155
1984-on	125	175
Primary drive gear		
XV750	50	**70**
XV700, XV920, XV1000, XV1100	**80**	**110**
Clutch boss	**50**	**70**
Crankshaft end cover	**9**	**12**
Oil pump cover	**7**	**10**
Oil pump sprocket	**9**	**12**
Oil pump	**7**	**10**
Neutral switch	**14**	**20**
Shift fork guide bar sprocket	**5**	**7**
Crankcase bolts		
M10	**28**	**39**
M6	**7**	**10**
Connecting rod nut	**35**	**48**
Engine drain plug	**31**	**43**
Oil level switch	**7**	**10**

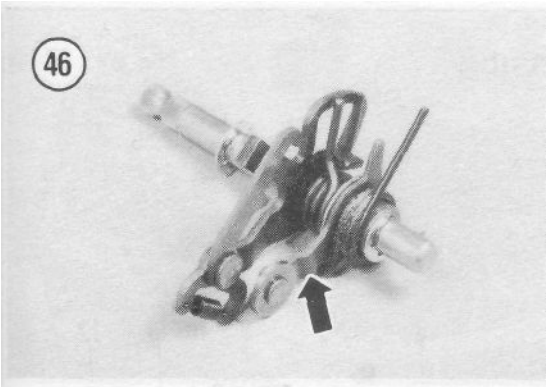
Table 4 SHAFT DRIVE UNIT TIGHTENING TORQUES

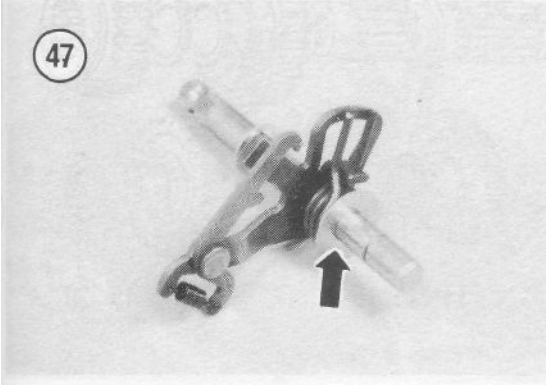
	ft.-lb.	N«m
Drive shaft nut	80	110
Bearing housing (XV750, XV920)		
Bolt	16	23
Nut	16	23
Bearing housing (XV700, XV1000, XV1100)		
Bolt	18	25
Oil drain screw	16	23
Bearing retainer*	80	110

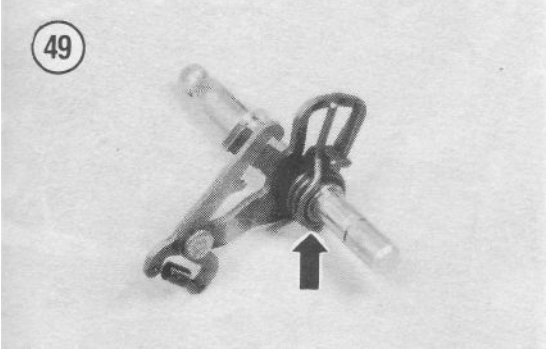
' Left-hand threads.

Table 5 ENGINE MOUNT TIGHTENING TORQUES

Item	ft.-lb.	N*m
All engine mount fasteners		
XV750, XV920RH, RJ	**39**	**54**
XV920J, K, MK	**50**	**70**
XV700, XV1000, XV1100		
Front engine mount bracket	**46**	**64**
All others	**40**	55







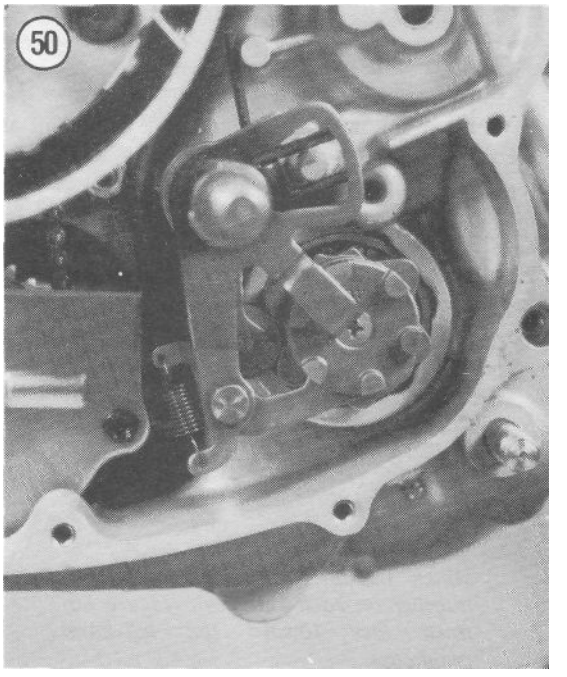
8. Examine the shift shaft assembly spindle for damage. If the spindle is bent or damaged in any way, it must be replaced.
9. Assemble the shift shaft assembly in the order shown in **Figure 41.** Install the washers on both ends of the shift shaft **(Figure 45).**
10. Insert the end of the spindle into the engine crankcase opening.
11. Pull the shift lever down **(Figure** 44) and install the shift mechanism all the way. **Figure 50** shows the installed assembly.
12. Reverse Steps 1-5 to complete installation. Refill the engine with the correct type and quantity of oil as described in Chapter Three.

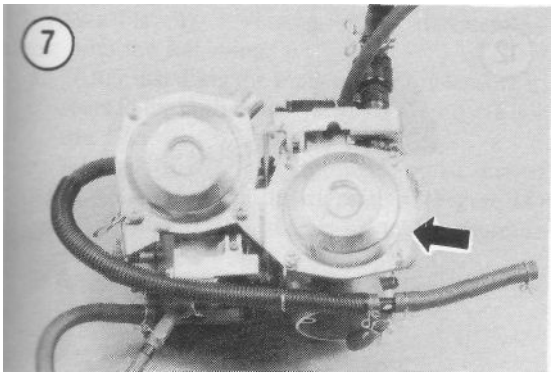
TRANSMISSION

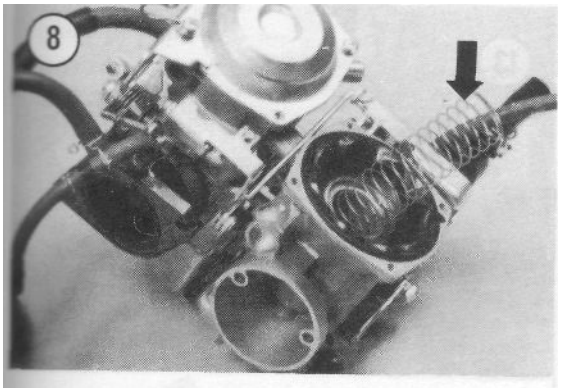
The crankcase must be disassembled as described in Chapter Four to gam access to the transmission components.

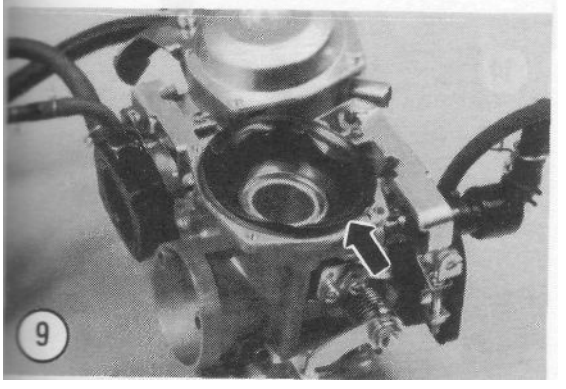
Removal/Installation

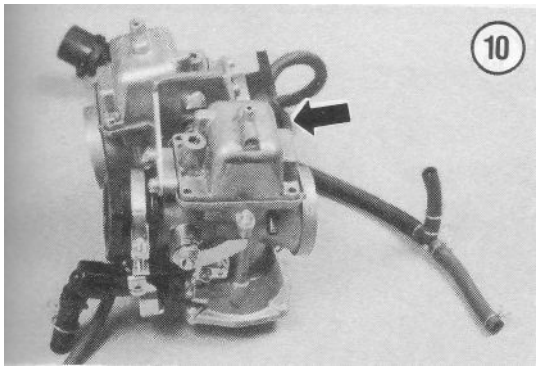
Refer to Figure 51 for this procedure.
1. Perform Steps 1-12 of *Crankcase Disassembly* in Chapter Four.
2. Slide off the middle gear (Figure 52) and first gear **(Figure** 53) from the drive axle.
3. Remove the shift fork guide bar (Figure 54).
4. Remove the drive axle fourth gear and the No. 3 shift fork. See **Figure 55.**











11. Remove the outer bolt that secures the front cylinder intake manifold and slide the intake manifold out.

12. Loosen the rear inner manifold bolt located between the intake of the front cylinder carburetor and the rear intake manifold. This bolt can be reached with an open end wrench from the right side by reaching over the intake of the front cylinder carburetor.

13. Remove the outer bolt that secures the rear cylinder intake manifold and slide the intake manifold out. Account for each manifold O-ring.

14. Remove the carburetors from the right side by rotating them slightly as they come out.

15. While the carburetors are removed, examine the intake manifolds, O-nngs, and the intake hoses for any cracks or damage that would allow unfiltered air to enter the engine. Replace any worn or damaged parts.

16. Install by reversing these removal steps; note the following:

a. Prior to installing the carburetor assembly, coat the inside surfaces of both intake manifolds with silicon based lubricant. This will make it easier to install the carburetor throats into the manifolds.

b. Be sure the throttle and chpke cables are correctly positioned in the frame-not twisted or kinked and without any sharp bends. Tighten the locknuts securely.

17. Adjust the throttle cable as described in the Chapter Three.

18. Adjust the choke cable as described in this chapter.

Disassembly/Cleaning/Inspection/ Assembly (1981-1987)

Refer to **Figure 6** for this procedure.

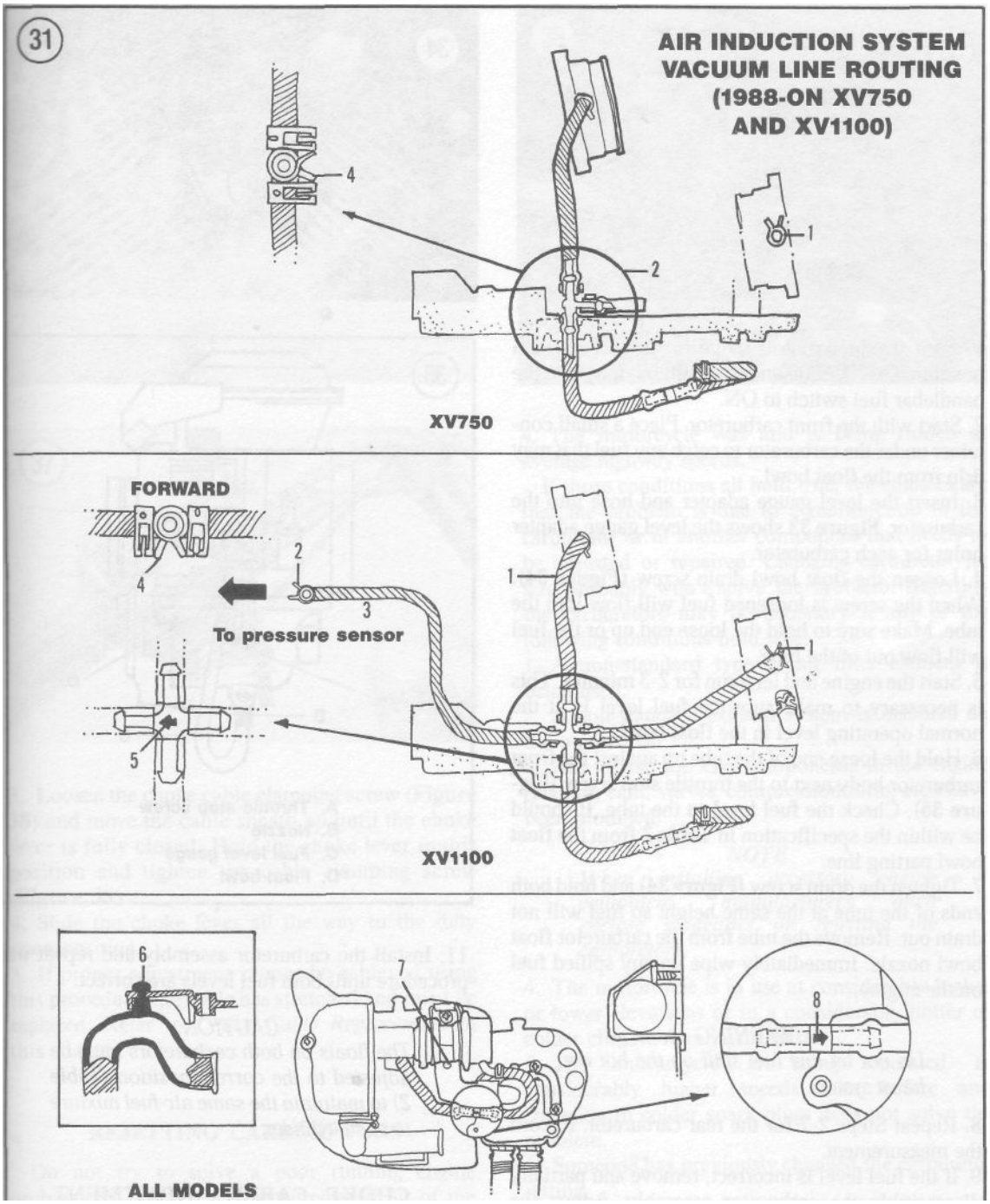
It is recommended that only one careburetor be disassembled and cleaned at one time. This will prevent mixing of parts.

All components that require cleaning can be removed from the carburetor body without removing the carburetors from the mounting plates. Do not separate the carburetors as misalignment will occur on assembly. If one carburetor body must be replaced, have a dealer or qualified specialist do the job.

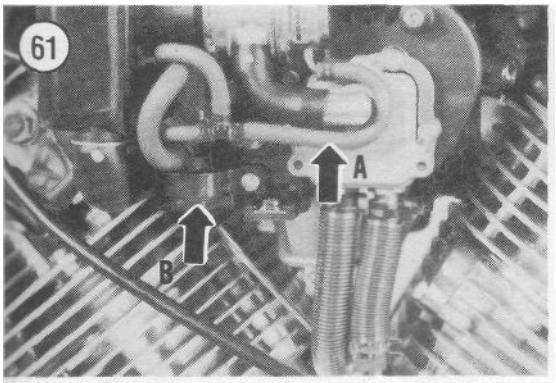
When cleaning the carburetor assembly, do not turn the pilot adjustment screw.

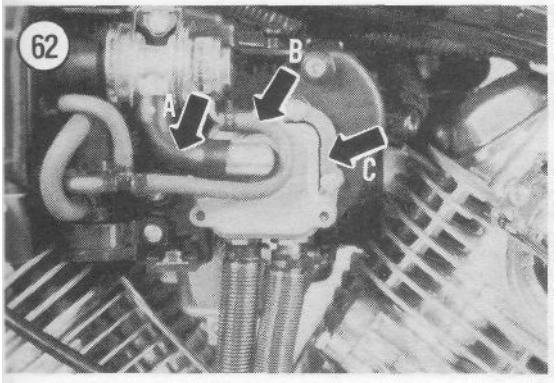
1. Remove the diaphragm cover **(Figure** 7) and pull out the spring **(Figure** 8) and diaphragm **(Figure 9).**

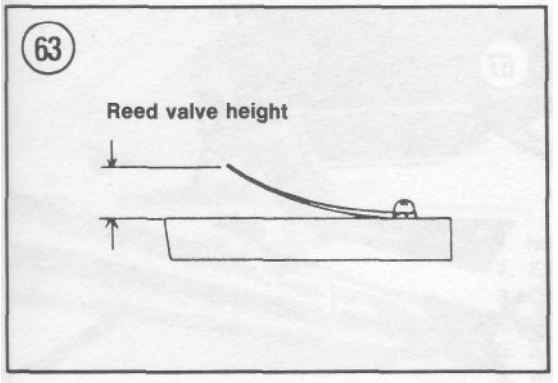
2. Remove the 4 screws securing the float bowl **(Figure 10)** and remove it and its gasket.

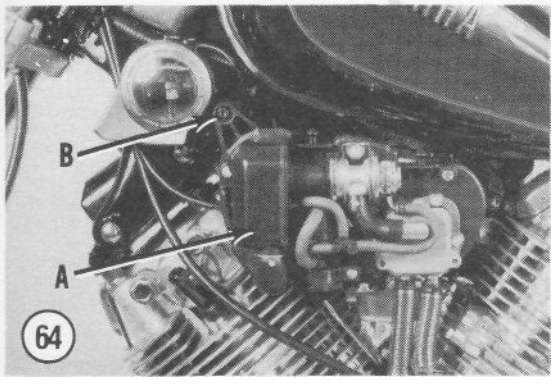


1. The hose clamp arms must face inside.
2. The hose clamp arms must face toward the front of the bike.
3. To pressure sensor.
4. The hose clamp arms must face downward.
5. The arrow on the T-connection must face toward the pressure sensor.
6. The tab on the hose must fit into the square hole.
7. The white mark must face toward the air-cut valve.
8. The connector arrow must face toward the air-cut valve.









5. If the air induction valve did not operate correctly in Step 4, perform the following steps.
6. Referring to **Figure 62,** remove the following:
   a. Hose (A).
   b. Hose (B).
   c. Reed valve case (C).
7. Remove the screws securing the reed valve case and separate it.
8. Remove the reed valve assembly. Measure the height of the reed valve as shown in **Figure 63.** The correct height is 0.3 in. (7.7 mm). Replace the reed valve assembly if necessary.
9. Remove the air filter cover (A, **Figure 64)** and remove the air filter. Clean the air filter by blowing it with compressed air.
10. Reinstall all parts removed in Steps 6-9 and retest the air induction valve. If the valve still doesn't perform as described, replace it.

Removal/Installation

1. Remove the mixture control valve cover **(Figure 59).**
2. Label and disconnect all vacuum hoses and tubes.
3. Remove the screws **(B, Figure 64)** securing the mixture control valve/air induction system assembly to the bike and remove it.
4. Installation is the reverse of these steps.

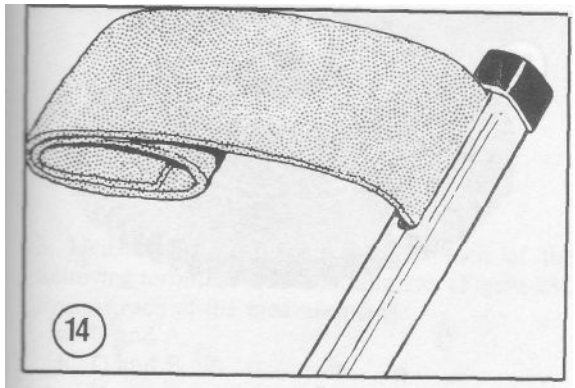
EXHAUST SYSTEM

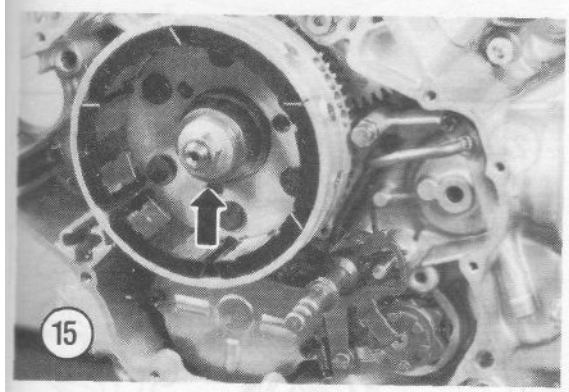
Removal/Installation (1981-1983)

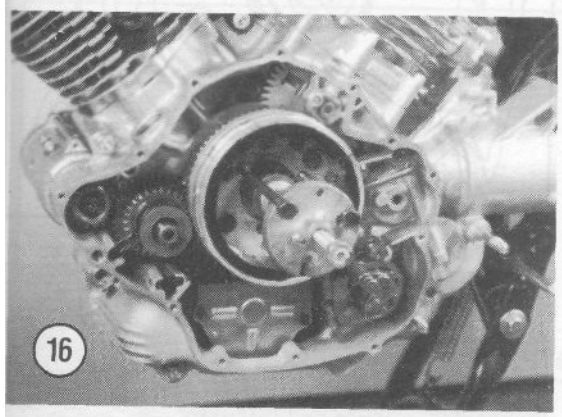
1. Place the bike on the centerstand.
2A. On all models except XV920RH and RJ (chain-drive), remove the muffler as follows:
   a. Loosen the rear cylinder exhaust pipe clamp at the muffler **(Figure 65).**
   b. Loosen the front cylinder exhaust pipe clamp at the muffler **(Figure 66).**
   c. Remove the rear muffler bolts and footpegs **(Figure 67)** and remove the muffler assembly.

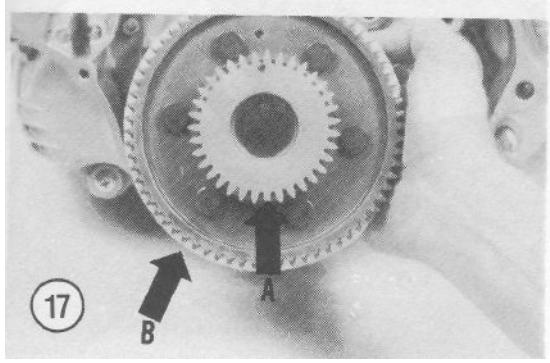
2B. See **Figure 68.** Remove the left- and right-hand mufflers on XV920RH and RJ models as follows:
   a. Loosen the exhaust pipe clamp bolts at the front and rear cylinder mufflers.
   b. Loosen the muffler mounting bolts at the rear of the mufflers and and remove the mufflers.

3. Remove the Allen bolts securing the front exhaust pipe flange at the front cylinder head **(Figure 69)** and remove the exhaust pipe and gasket. Repeat for the rear cylinder exhaust pipe **(Figure 70).**









Rotor Removal/Installation

1 Remove the alternator cover as described under *Stator Removal/Installation* in this chapter

2 Place a strap wrench **(Figure 14)** on the rotor to keep it from turning Then remove the nut **(Figure 15)** and washer securing the rotor

NOTE

When the rotor is removed in Step 3 six springs and six pins may fall out from the cam chain drive gear positioned behind the rotor Store these components in a plastic bag

3 Install the Yamaha rotor puller (Part No TLU-90901-05-20) or a similar puller, onto the rotor as shown in **Figure** 16 Make sure to thread the bolts completely into the rotor threads Use a wrench on the puller and tap on the end of it with a brass mallet until the rotor disengages Remove the puller and rotor

4 Remove the cam chain drive gear (A, **Figure** 17) from the rotor (B **Figure 17)** if attached Remove the pins and springs from the rotor **(Figure** 18)

5 Remove the Woodruff key from the crankshaft if necessary

6 Installation is the reverse of these steps note the following

7 Install the Woodruff key in the crankshaft

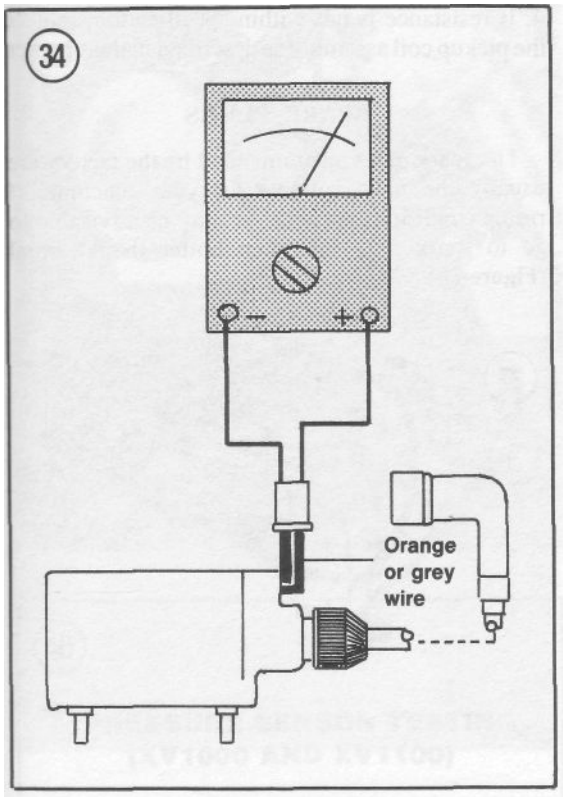
8 The three slots machined in the back of the rotor each house two springs and two pins To assemble, install a single pm m each spring and install them into the rotor See **Figure 18**

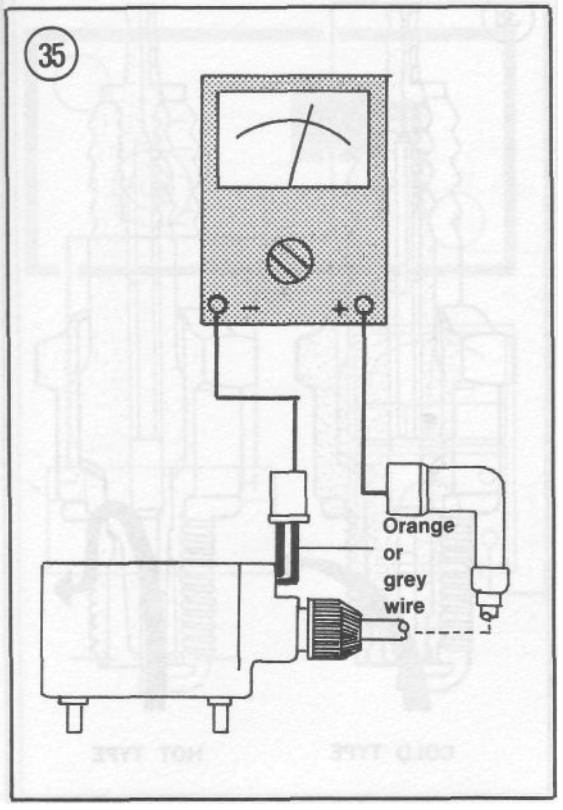
9 On the backside of the rotor, push the two springs in each individual slot as far apart as possible Then align the punch mark on the cam chain dnve gear with the mark on the rotor **(Figure 19)** and install the drive gear into the rotor Dunng installation it is necessary to push the drive dogs on the backside of the drive gear between the springs in each slot in the rotor **(Figure** 20)

CAUTION

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

10 Turn the crankshaft to align the crankshaft Woodruff key with the timing mark on the rear cylinder intermediate gear Then install the rotor, making sure to align the keyway in the rotor with the Woodruff key Check that the rotor timing hole aligns with the timing gear shaft hole as shown in **Figure 21** If the alignment is incorrect, remove the rotor and repeat this procedure





The ignition coil is a transformer which develops the high voltage necessary to jump the spark plug gap The only maintenance required is that of keeping the electrical connections clean and tight and occasionally checking to ensure the coil is mounted securely.

To check coil primary and secondary winding resistance, proceed as follows[1]

1 Disconnect the coil primary wires. Disconnect the spark plug leads from the spark plugs

2 Calibrate an ohmmeter on the R x 1 scale. To check primary winding resistance, connect the meter between the coil primary wires **(Figure 34)**

3. Next, calibrate the ohmmeter on the R xlOO scale To check secondary wmdmg resistance, connect the meter between the orange or gray primary wire and the spark plug terminal **(Figure 35)** If secondary resistance is higher than specification, be sure to check the spark plug cap resistance before replacing the coil. Remove the spark plug cap from the spark plug lead by turning it counterclockwise while pull-1 ing it away from the lead I I

NOTE

If checking secondary winding resistance with the sparkplug lead removed, be sure to factor in the sparkplug cap resistance Sparkplug cap resistance is 5000 ohms on all models and is added into coil secondary resistance specifications

4 Compare the results in Step 2 and Step 3 with the specifications in **Table 1.** Replace the ignition coil(s) if not within specification

5 Inspect the spark plug leads for cracked insulation or other damage. The spark plug leads are available for replacement on 1981-1983 models On 1984-on models, the ignition coil must be replaced if the spark plug lead is damaged or defective.

PICKUP COIL

Removal/Installation

1. Remove the alternator cover as described in this chapter

NOTE

***Figure 36** shows the early (prior to 1991) 4-wire pickup coil assembly On 1991-on models, a new 2-wire pickup coil is used The early and late coils are similar, however, and are located in the same place*

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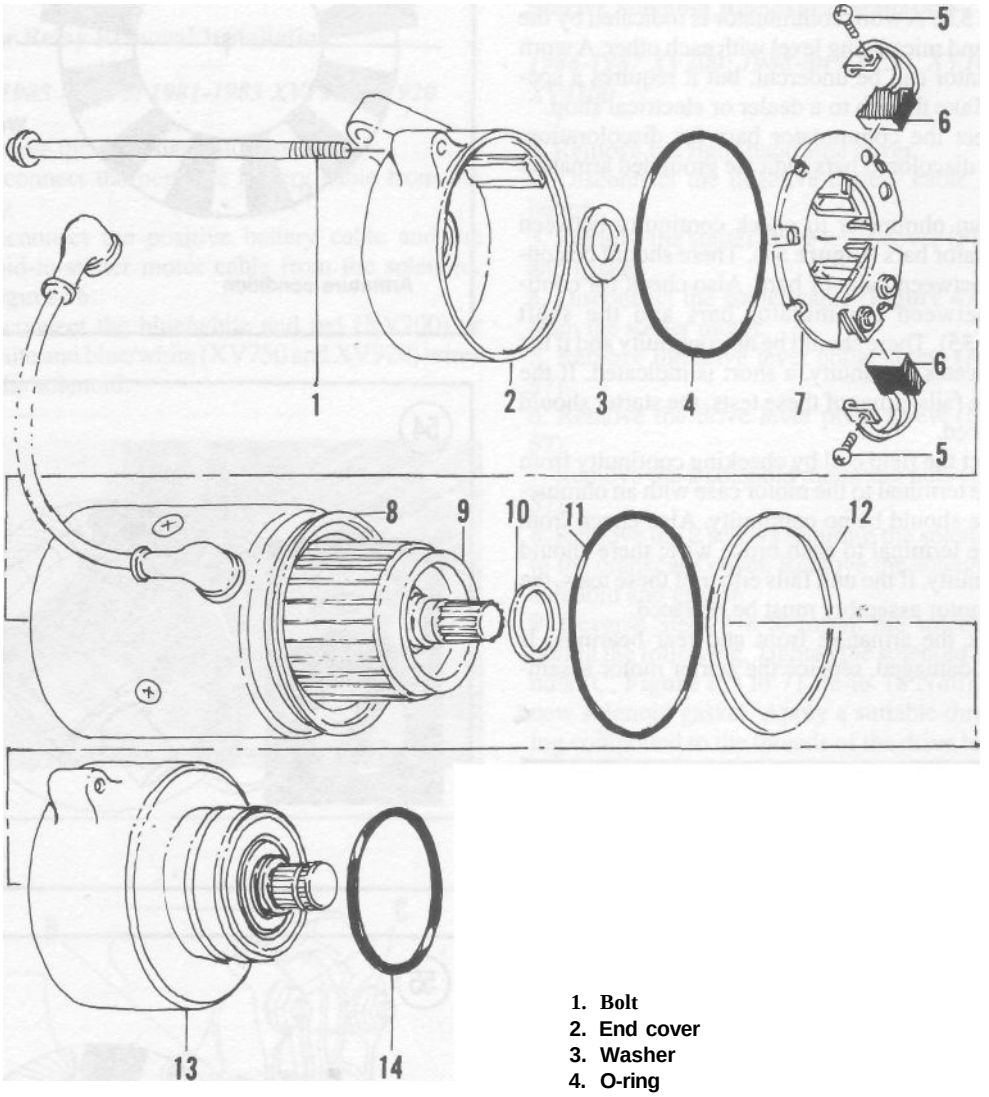
STARTER MOTOR
(1983-ON MODELS)



1. Bolt
2. End cover
3. Washer
4. O-ring
5. Screw
6. Brush
7. Brush holder assembly
8. Housing
9. Armature
10. Washer
11. O-ring
12. Gasket
13. Front bracket assembly
14. O-ring

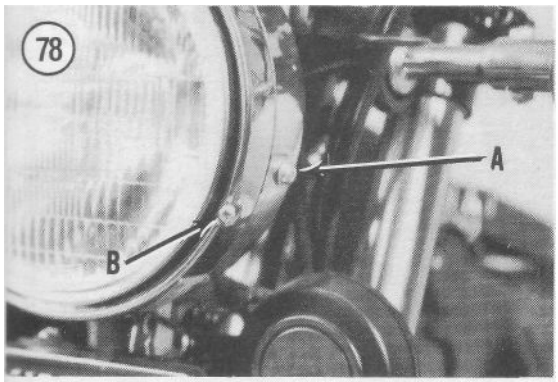
LIGHTING SYSTEM

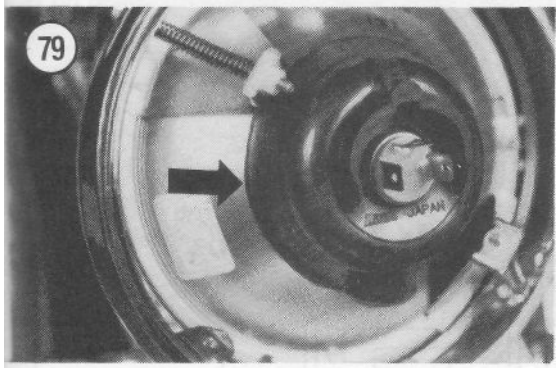
The lighting system consists of the headlight, taillight/brakelight combination, directional signals, warning lights and speedometer and tachometer illumination lights. If a light doesn't work, check the bulb. If the bulb is good, check all

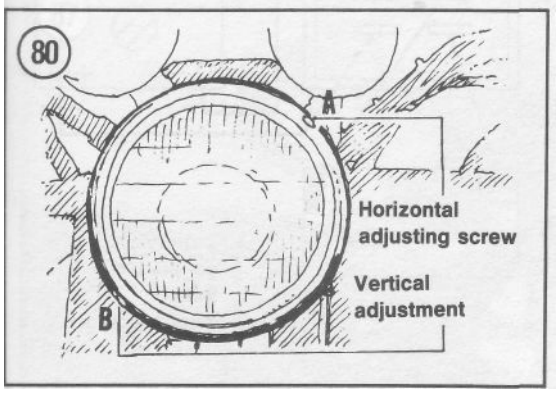
Headlight Replacement

WARNING

If the headlight has just burned out or been turned off it will be ***hot!*** *Don't touch the bulb until it cools off.*







1. Remove the mounting screws (A, **Figure 78)** on each side of the headlight housing.
2. Pull the trim bezel and headlight unit out and disconnect the electrical connector from the bulb.
3. Remove the bulb cover **(Figure 79).**

CAUTION

During the next step, do not touch the bulb glass with your fingers because traces of oil on the bulb will drastically reduce the life of the bulb. Clean any traces of oil from the bulb with a cloth moistened in alcohol or lacquer thinner.

4. Turn the bulb holder counterclockwise and remove the bulb.
5. Install by reversing these steps.
6. Adjust the headlight as described under *Headlight Adjustment.*

Headlight Adjustment

Adjust the headlight horizontally and vertically according to the Department of Motor Vehicles regulations in your area.

1. *Horizontal adjustment*—Turn the screw clockwise to move the beam to the left and counterclockwise to move the beam to the right. See **B, Figure 79** (1981-1983) or A, **Figure 80** (1984-on).
2. *Vertical adjustment—On* 1981-1983 models, loosen the screw **(Figure 81)** and turn the headlight shell up or down to adjust the beam. On 1984-on models, turn the screw clockwise to move the beam up and counterclockwise to move the beam down **(Figure 80).**

Headlight Relay Testing (1981-1983 Except XV920 Shaft Drive)

1. Place the motorcycle on the centerstand.
2. Remove the seat.
3. Disconnect the headlight relay connector. It contains 4 wires—1 black, 1 white, 1 red/yellow and 1 blue/black. The relay is marked 3H5 and is color coded yellow.

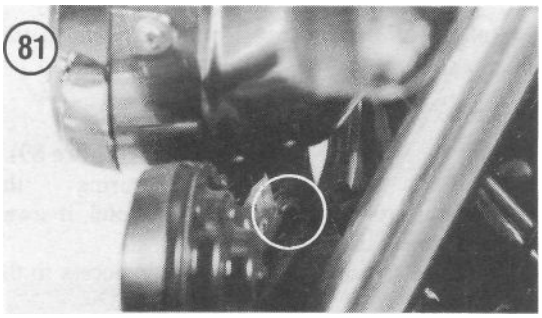


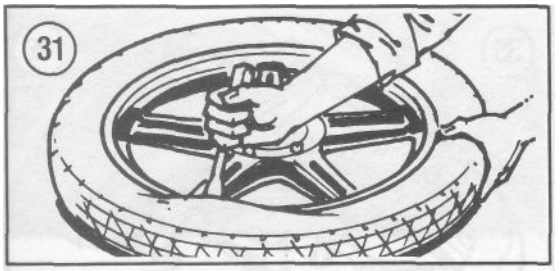
Table 3 REPLACEMENT BULBS (continued)

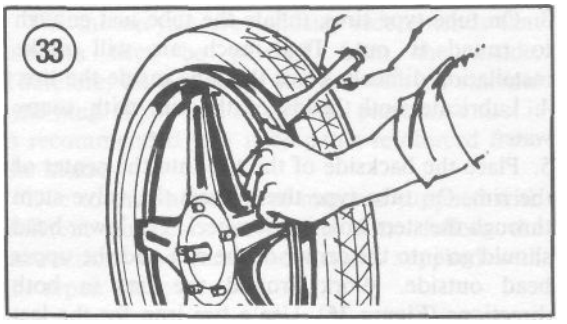
License light	
XV750	12V 8W
1982 XV920 (shaft drive)	12V3.8W
All other models	*
Flasher/running light	
XV700, XV1000, XV1100	12V 27W
1982 XV920 (shaft drive)	12V27WX4/8W
All other models	*

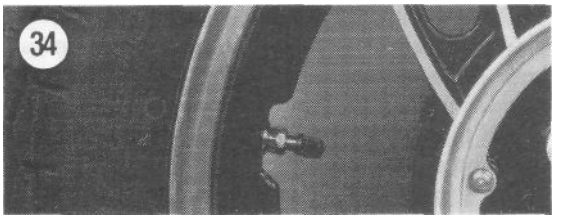
*Not specified.

Table 4 FUSES

	Amperage
Main	
1982 XV920 (shaft drive)	30
All others	20
Headlight	15
Signal	15
Ignition	10
Tail	10







taken with tire irons to avoid scratches and gouges to the outer rim surface. Insert scraps of leather between the tire iron and the rim to protect the rim from damage.

The stock cast wheels are designed for use with either tubeless or tube-type tires. Spoked wheels are designed for tube-type tires only. Tire removal and installation are basically the same for tube and tubeless tires; where differences occur they are noted. Tire repair is different and is covered in separate procedures.

When removing a tubeless tire, take care not to damage the tire beads, inner liner of the tire or the wheel rim flange. Use Yamaha tire levers or flat-handled tire irons with rounded ends.

Removal

1. Remove the valve core to deflate the tire.
2. Press the entire bead on both sides of the tire into the center of the rim.
3. Lubricate the beads with soapy water.
4. Insert the tire iron under the bead next to the valve **(Figure 31).** Force the bead on the opposite side of the tire into the center of the rim and pry the bead over the rim with the tire iron.

NOTE

Insert scraps of leather between the tire irons and the nm to protect the rim from damage.

5. Insert a second tire iron next to the first to hold the bead over the rim. Then work around the tire with the first tool prying the bead over the rim **(Figure** 32). On tube-type tires, be careful not to pinch the inner tube with the tools.
6. On tube-type tires, use your thumb to push the valve from its hole in the rim to the inside of the tire. Carefully pull the tube out of the tire and lay it aside.

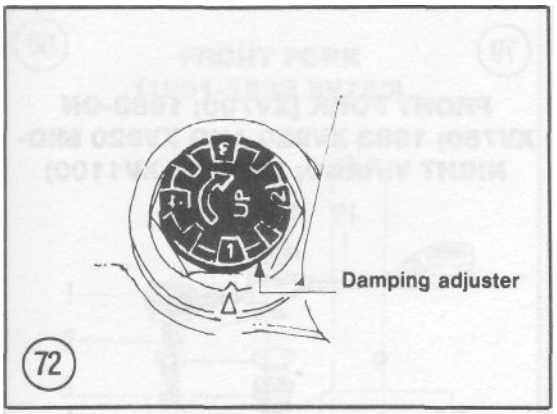
NOTE

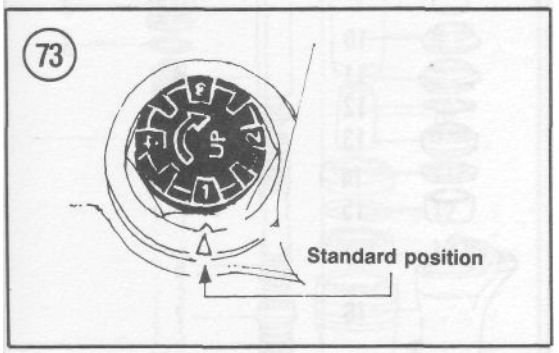
Step 7 is required only if it is necessary to completely remove the tire from the rim, such as for tire replacement or tubeless tire repair.

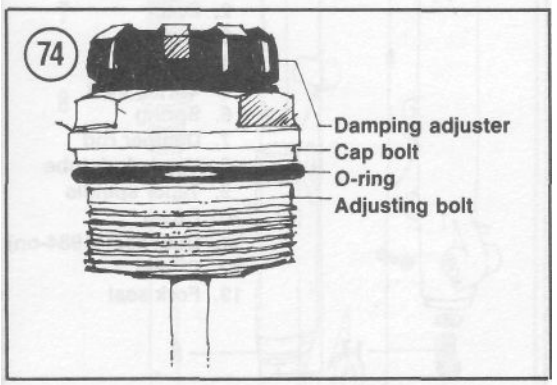
7. Turn the wheel over. Insert a tire tool between the second bead and the same side of the rim that the first bead was pried over **(Figure 33).** Force the bead on the opposite side from the tool into the center of the rim. Pry the second bead off the rim, working around the wheel with 2 tire irons as with the first.
8. On tubeless tires, inspect the rubber O-ring where the valve stem seats against the inner surface of the wheel. Replace it if it's starting to deteriorate or has lost its resiliency. This is a common cause of air loss.

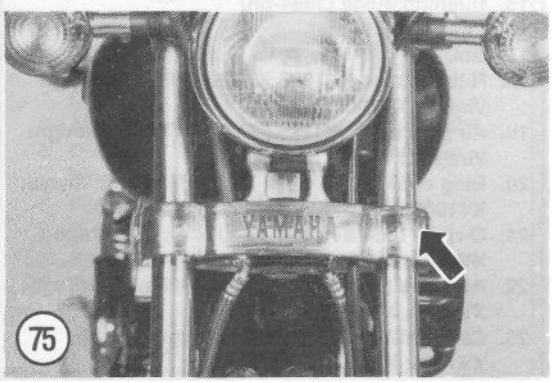
Installation

1. Carefully inspect the tire for any damage, especially inside.
2. A new tire may have balancing rubbers inside. These are not patches and should not be disturbed. A colored spot near the bead indicates a lighter point on the tire. This spot should be placed next to the valve stem **(Figure 34).** In addition, most tires have directional arrows on the side of the tire that indicate which direction the tire should rotate. Make sure to install the tire accordingly.









CAUTION

The fork tube cap is fitted with a damper adjustment rod ***(Figure 74).*** *When handling the fork cap, make sure not to bend or damage the rod in any way as this will cause improper fork operation.*

9. On 1984-on models, remove the lower fork bridge cover **(Figure 75).**

10. Loosen the lower fork bridge bolts. See **Figure 76** or **Figure 77.**

11A. *XV700, XV750 and 1981-1982 XV920 chain drive*—Remove the fork tube. It may be necessary to slightly rotate the tube while removing it.

11B. *1983 XV920 and XV920 Midnight Virago, XVlOOOandXVllOO:*

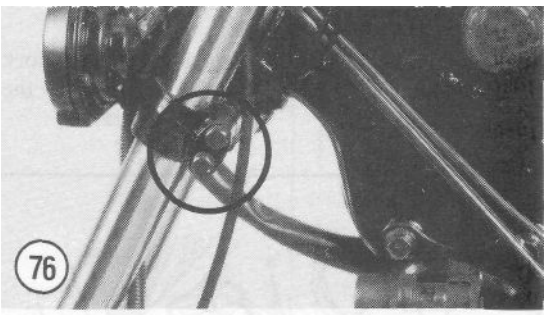
a. Withdraw the fork tube 3-4 inches.
b. Remove the rubber spacer and air joint bracket.
c. Remove the fork tube. On XV920 Midnight models, remove the O-rings and fork tube cover as the fork tube is withdrawn.

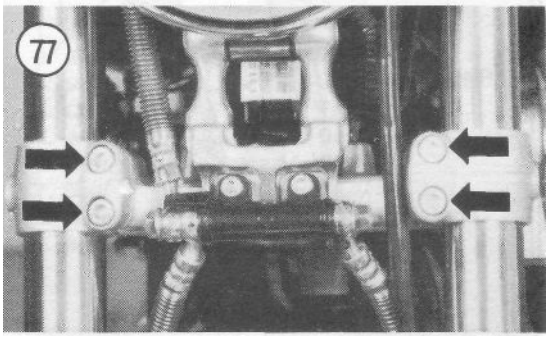
11C. *1982 XV920 shaft drive:*

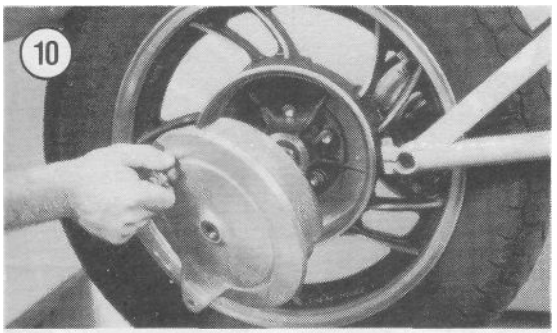
a. Withdraw the fork tube 3-4 inches.
b. Remove the rubber spacer and the air joint bracket. Then, pry the ring clip out of the fork tube **(Figure 78)** and slide.the clip up and off the fork tube. Remove the fork tube.

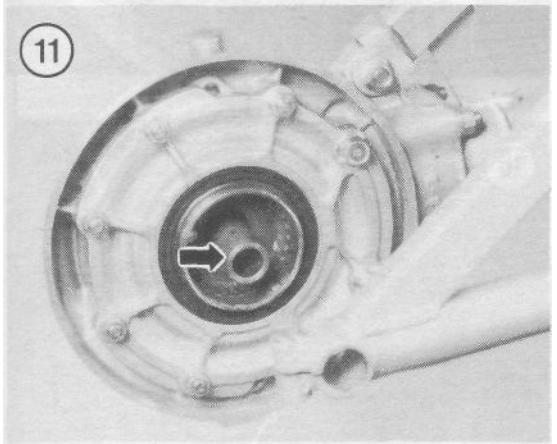
12. Repeat for the opposite side.

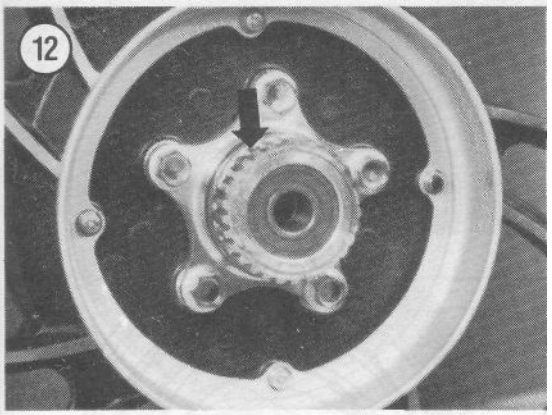
13. Install by reversing these removal steps, noting the following.

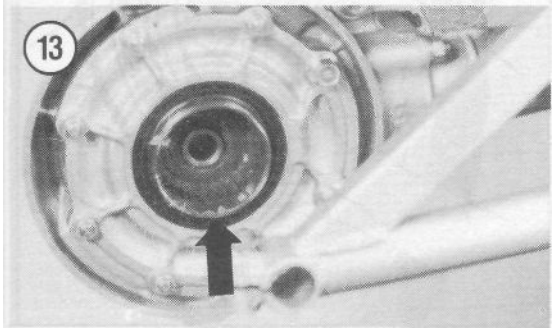












d Tighten the pinch bolt on shaft-dnve models to specifications in **Table 2.**

e Tighten the axle nut to specifications in **Table** 2. Install a new axle nut cotter pin

f. Adjust the rear brake pedal free play as described in Chapter Three,

g Rotate the wheel several times to make sure it rotates freely and that the brake works properly,

h Adjust the drive chain, if so equipped, as described in Chapter Three

Inspection

Measure the axial and radial runout of the wheel with a dial indicator as shown in **Figure** 14. The maximum allowable axial and radial runout is 0.08 in (2.0 mm). If the runout exceeds this dimension, check the wheel bearing condition If the wheel bearings are okay, check the wheel rim for damage. Cast wheels cannot be serviced but must be replaced if damaged. For wire wheels, refer to the wheel and spoke information in Chapter Eight.

Inspect the wheel for signs of cracks, fractures, dents or bends. If it is damaged in any way, it must be replaced.

WARNING'
Do not try to repair any damage to the rear wheel as it will result in an unsafe ridingcondition

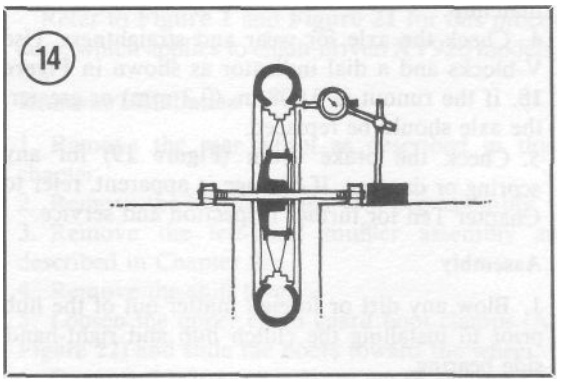
Check axle runout as described under *Rear Hub Inspection* m this chapter.

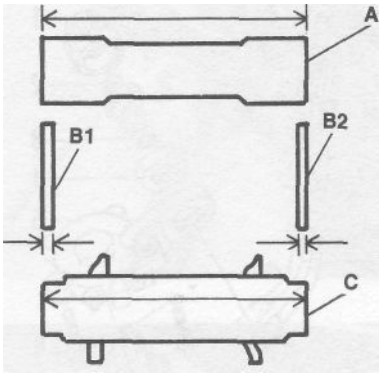
REAR HUB

Disassembly

Refer to **Figure 1** or **Figure 2** for this procedure.

1. Remove the rear wheel as described in this chapter.
2. Pull the brake assembly straight out of the wheel **(Figure 10).**





A. Bushing
B. Thrust washers
C. Swingarm mounting bracket

0 004-0 012 in (0.1-0.3 mm), install new thrust washer(s) of the appropriate thickness. Thrust washers of various thicknesses are available from Yamaha dealers.

1984-on

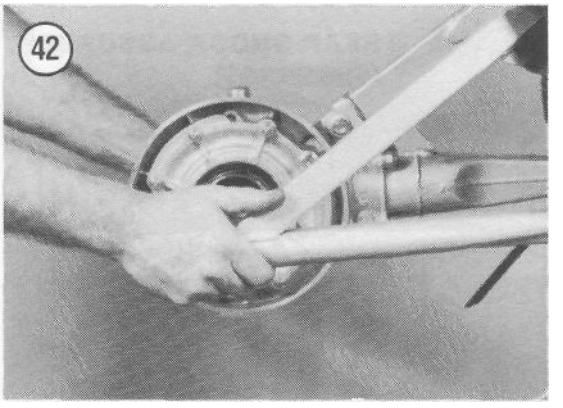
1. This adjustment must be performed with the lower shock absorber mounts disconnected from the swing arm.
2. Grasp the swing arm at the rear **(Figure** 42) and attempt to move it from side to side. No noticeable movement should be observed If movement occurs, proceed to Step 3.
3. Remove the pivot shaft cap from the right-hand side of the swing arm **(Figure** 35)
4 Loosen the pivot shaft locknut **(Figure 39)** and tighten the pivot shaft **(Figure** 40) to 4 ft -lb. (5-6 Nvn).
5 Tighten the locknut to 72 ft.-lb. (100 Nvn).

NOTE
When tightening the locknut, make sure the pivot shaft does not turn

6 Repeat Step 2 If movement is still noticeable, the swing arm bearings are probably worn. Replace them as described in this chapter.

SHOCK ABSORBERS

The rear shocks are spring controlled and hydrauhcally damped. Spring preload can be adjusted on all models, see Chapter Eleven.

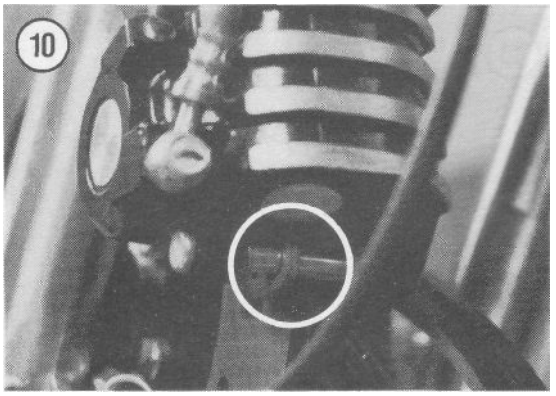


Removal/Inspection/Installation (1981-1983)

Refer to **Figure 43**
1 Remove the fuel tank as described in Chapter Six.
2. Remove the rear wheel as described in this chapter.
3. Remove the cotter pm and remove the lower shock absorber pivot shaft **(Figure 44)**
4. Remove the shock absorber adjuster unit **(Figure** 45) from the frame. Do not disconnect any lines or cables.
5. Remove the front shock absorber bolt **(Figure 46).**
6. Remove the shock absorber by pulling it carefully to the rear of the bike. Do not damage any hoses or cables dunng removal.
7. Inspect the shock absorber for oil leakage at the O-rmgs and along the body. If oil leakage occurs at an O-nng connection, have a dealer or qualified specialist replace the O-nng. If the oil leakage is from the shock absorber body, replace the shock absorber.
8. Installation is the reverse of these steps, note the following
9. Install a new cotter pin at the bottom shock absorber pivot pin.
10. Turn the shock adjuster to the standard setting **(Figure 47).** Then check the shock absorber cable free play by hand. If the free play is excessive, turn the cable adjusters **(Figure 48)** as necessary
11. Adjust the shock absorber as described in Chapter Eleven

Removal/Inspection/Installation (1984-on)

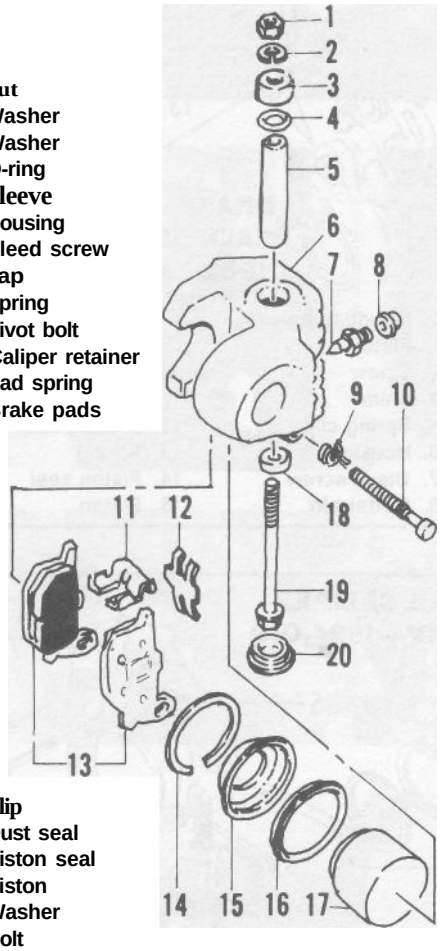
Removal and installation of the rear shocks is easier if they are done separately The remaining unit will support the rear of the bike and maintain the correct relationship between the top and



The Type I front brake **(Figure 11)** is used on 1981-1983 XV750 and 1983 XV920 models, Type II **(Figure 12)** is used on XV920 chain drive models, Type III **(Figure 13)** is used on 1982 XV920 shaft drive models, and Type IV **(Figure 14)** is used on all 1984-on models.

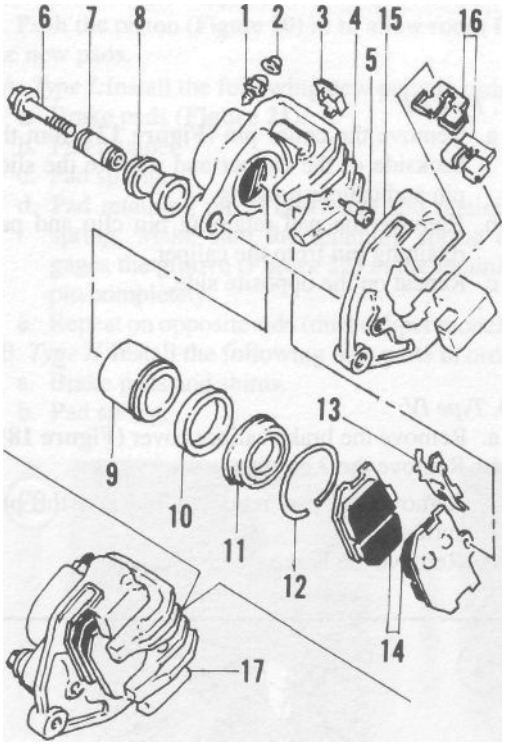
It is not necessary to disassemble the caliper or open the hydraulic brake fluid lines to replace the brake pads.

BRAKE CALIPER (TYPE 1—1981-1983 XV750; 1983XV920)



1. Nut
2. Washer
3. Washer
4. O-ring
5. Sleeve
6. Housing
7. Bleed screw
8. Cap
9. Spring
10. Pivot bolt
11. Caliper retainer
12. Pad spring
13. Brake pads
14. Clip
15. Dust seal
16. Piston seal
17. Piston
18. Washer
19. Bolt
20. Cap

BRAKE CALIPER (TYPE 11—1981-1982 XV920 CHAIN DRIVE)



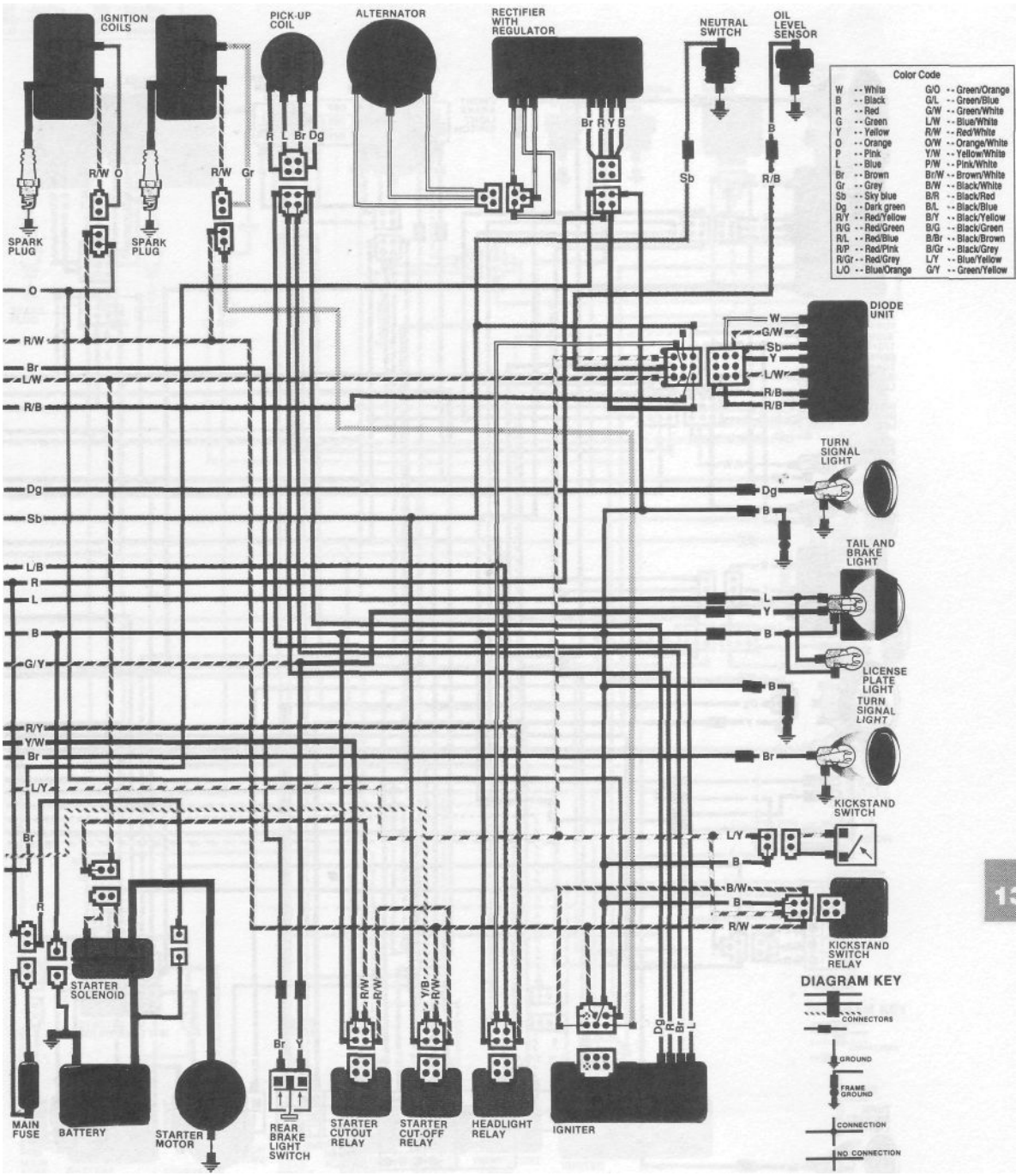
1. Bleed screw
2. Cap
3. Indicator cap
4. Housing
5. Pin
6. Bolt
7. Caliper sleeve
8. Caliper boot
9. Piston
10. Piston seal
11. Dust seal
12. Circlip
13. Anti-rattle spring
14. Brake pads
15. Mounting bracket
16. Anti-rattle shim
17. Housing

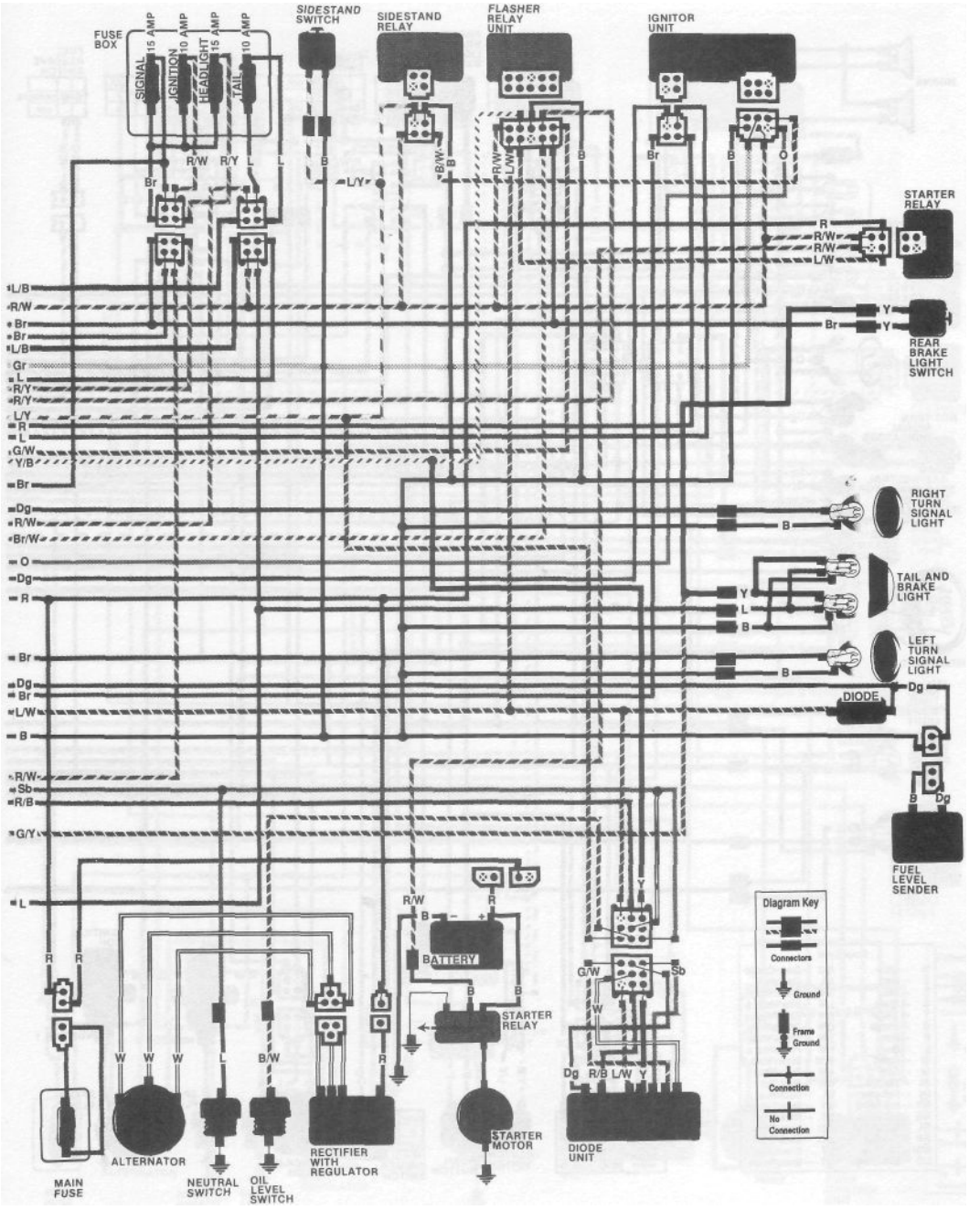
Table 1 BRAKE SPECIFICATIONS

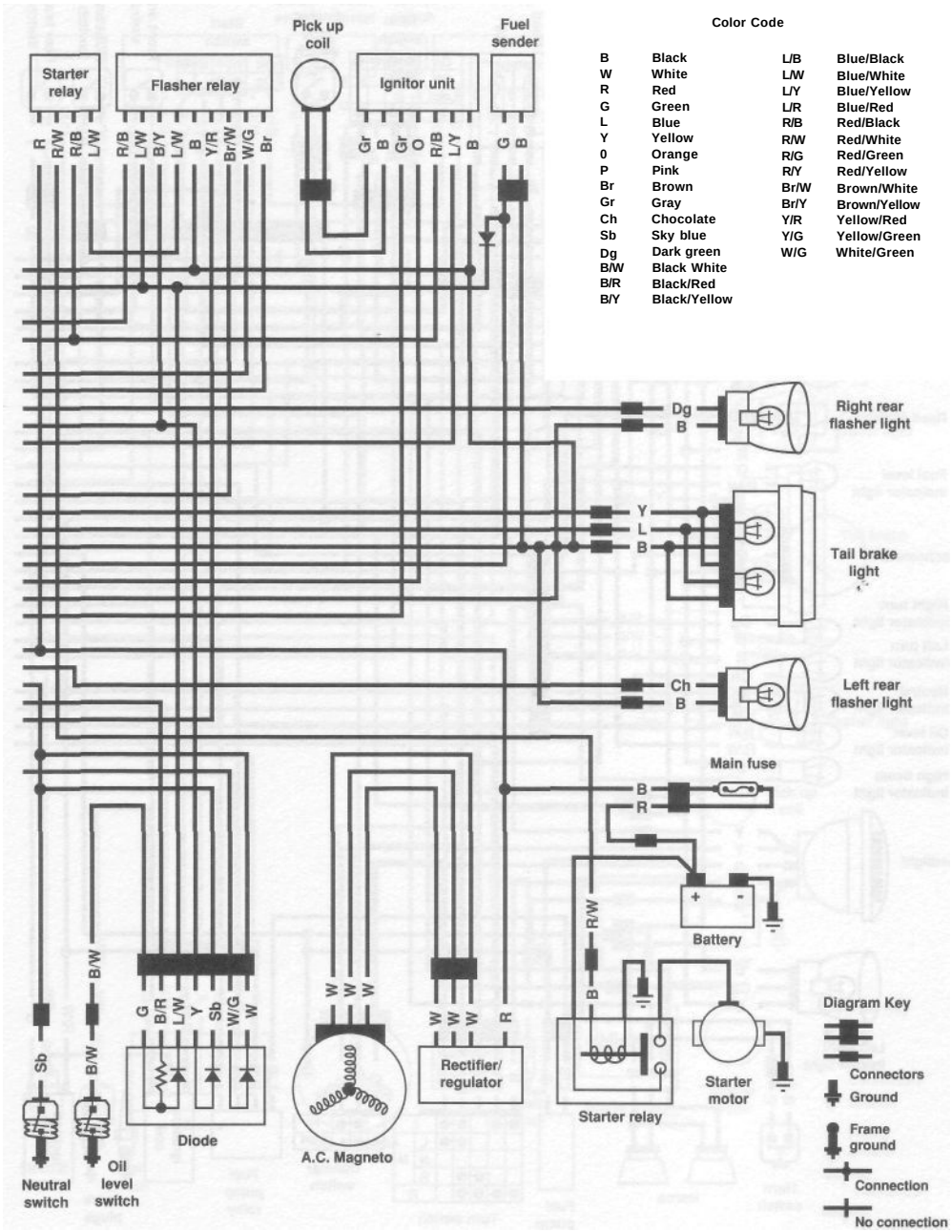
Brake fluid	DOT 3 or DOT 4
Front brake	
Disc thickness	
XV750	0.28 in. (7 mm)
XV700, XV920, XV1000, XV1100	0.20 in. (5 mm)
Wear limit	
XV750	0.256 in. (6.5 mm)
XV920	0.117 in. (4.5 mm)
XV700, XV1000, XV1100	Not specified
Pad thickness	
XV700, XV1000, XV1100, XV750 (1988-on)	0.217 in. (5.5 mm)
XV750 (1981-1983)	0.224 in. (5.7 mm)
XV920 (chain drive)	0.433 in. (11 mm)
XV920 (shaft drive)	0.326 in. (6 mm)
Pad wear limit	
XV700, XV1000, XV1100, XV750 (1988-on)	0.0197 in. (0.5 mm)
XV750 (1981-1983)	0.047 in. (1.2 mm)
XV920 (chain drive)	Not specified
XV920 (shaft drive)	0.03 in. (0.8 mm)
Rear brake	
Drum diameter	
XV750	7.087 in. (180 mm)
XV700, XV920, XV1000, XV1100	7.874 in. (200 mm)
Wear limit	
XV750	Not specified
XV700, XV920, XV1000, XV1100	7.91 in. (201 mm)
Lining thickness	0.157 in. (4 mm)
Lining wear limit	0.079 in. (2 mm)
Brake shoe spring free length	2.7 in. (68 mm)

Table 2 BRAKE TIGHTENING TORQUES

	ft.-lb.	**N-rn**
Brake disc @ hub	**14**	20
Brake caliper @ front fork		
XV750, XV920 (chain drive)	**19**	**26**
XV920 (shaft drive), XV700, XV1000, XV1100	**25**	**35**
Brake hose union bolts	**19**	**26**
Rear brake arm bolt/nut	**14**	20


IGNITION COILS
PICK-UP COIL
ALTERNATOR
RECTIFIER WITH REGULATOR
NEUTRAL SWITCH
OIL LEVEL SENSOR
Color Code
W -- White
B -- Black
R -- Red
G -- Green
Y -- Yellow
O -- Orange
P -- Pink
L -- Blue
Br -- Brown
Gr -- Grey
Sb -- Sky blue
Dg -- Dark green
R/Y -- Red/Yellow
R/G -- Red/Green
R/L -- Red/Blue
R/P -- Red/Pink
R/Gr -- Red/Grey
L/O -- Blue/Orange
G/O -- Green/Orange
G/L -- Green/Blue
G/W -- Green/White
L/W -- Blue/White
R/W -- Red/White
O/W -- Orange/White
Y/W -- Yellow/White
P/W -- Pink/White
Br/W -- Brown/White
B/W -- Black/White
B/R -- Black/Red
B/L -- Black/Blue
B/Y -- Black/Yellow
B/G -- Black/Green
B/Br -- Black/Brown
B/Gr -- Black/Grey
L/Y -- Blue/Yellow
G/Y -- Green/Yellow
SPARK PLUG
SPARK PLUG
DIODE UNIT
TURN SIGNAL LIGHT
TAIL AND BRAKE LIGHT
LICENSE PLATE LIGHT
TURN SIGNAL LIGHT
KICKSTAND SWITCH
KICKSTAND SWITCH RELAY
STARTER SOLENOID
MAIN FUSE
BATTERY
STARTER MOTOR
REAR BRAKE LIGHT SWITCH
STARTER CUTOUT RELAY
STARTER CUT-OFF RELAY
HEADLIGHT RELAY
IGNITER
DIAGRAM KEY
CONNECTORS
GROUND
FRAME GROUND
CONNECTION
NO CONNECTION


FUSE BOX
SIGNAL 15 AMP
IGNITION 10 AMP
HEADLIGHT 15 AMP
TAIL 10 AMP
SIDESTAND SWITCH
SIDESTAND RELAY
FLASHER RELAY UNIT
IGNITOR UNIT
STARTER RELAY
REAR BRAKE LIGHT SWITCH
RIGHT TURN SIGNAL LIGHT
TAIL AND BRAKE LIGHT
LEFT TURN SIGNAL LIGHT
DIODE
FUEL LEVEL SENDER
BATTERY
STARTER RELAY
STARTER MOTOR
ALTERNATOR
RECTIFIER WITH REGULATOR
DIODE UNIT
MAIN FUSE
NEUTRAL SWITCH
OIL LEVEL SWITCH
Diagram Key
Connectors
Ground
Frame Ground
Connection
No Connection


Color Code
B Black
W White
R Red
G Green
L Blue
Y Yellow
0 Orange
P Pink
Br Brown
Gr Gray
Ch Chocolate
Sb Sky blue
Dg Dark green
B/W Black White
B/R Black/Red
B/Y Black/Yellow
L/B Blue/Black
L/W Blue/White
L/Y Blue/Yellow
L/R Blue/Red
R/B Red/Black
R/W Red/White
R/G Red/Green
R/Y Red/Yellow
Br/W Brown/White
Br/Y Brown/Yellow
Y/R Yellow/Red
Y/G Yellow/Green
W/G White/Green
Pick up coil
Fuel sender
Starter relay
Flasher relay
Ignitor unit
Right rear flasher light
Tail brake light
Left rear flasher light
Main fuse
Battery
Starter relay
Starter motor
Rectifier/ regulator
A.C. Magneto
Diode
Neutral switch
Oil level switch
Diagram Key
Connectors
Ground
Frame ground
Connection
No connection

CHAPTER ONE

GENERAL INFORMATION

This detailed, comprehensive manual covers the U.S. and the U.K. models of the Yamaha XV535 Virago V-twins from 1987-on. **Table 1** lists engine, chassis and primary identification numbers for models covered in this manual and **Table 2** lists the general specifications.

Table 1 and **Table 2** are found at the end of the chapter.

NOTE

This chapter covers all procedures unique to the XV535 Virago V-twins. If a specific procedure is not included in this chapter, refer to Chapter One at the front of this manual for service procedures.

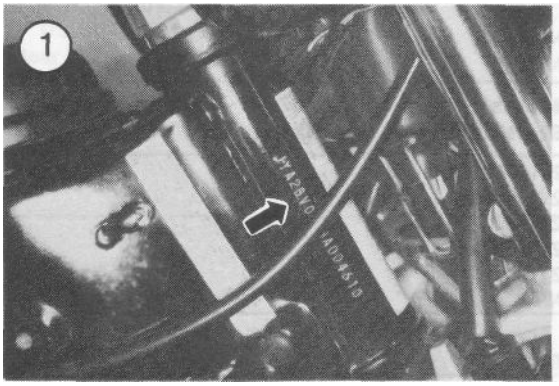
PARTS REPLACEMENT

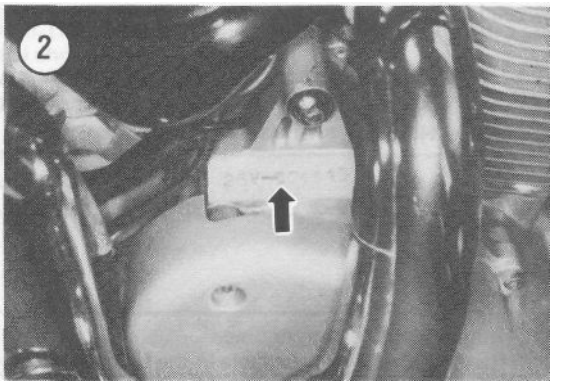
Yamaha makes frequent changes during a model year, some minor, some relatively major. When you order parts from the dealer or other parts distributors, always order by frame and engine numbers. The frame serial number and vehicle identification number (VIN) is stamped on the right-hand side of the steering stem **(Figure 1).** The engine number is stamped on a raised pad on the right-hand side of the crankcase **(Figure 2)** by the rear cylinder. The carburetor number is on the left-hand side of the NO. 1 carburetor body just below the top cover.

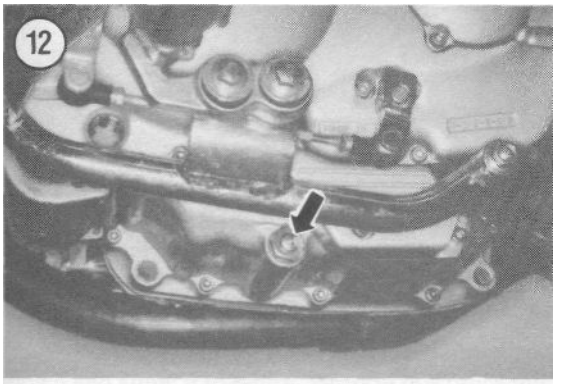
Write the numbers down and carry them with you. Compare new parts to old before purchasing them. If they are not alike, have the parts manager explain the difference to you. **Table 1** lists engine and frame serial numbers for the models covered in this manual.

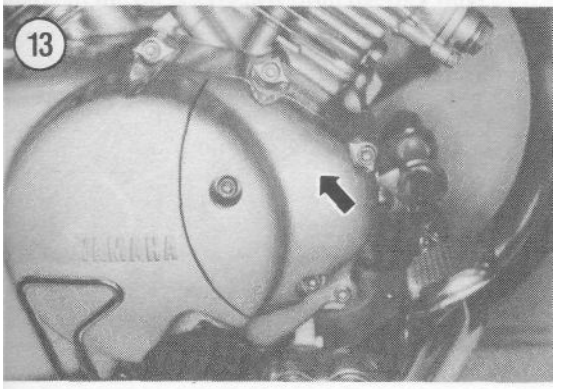
NOTE

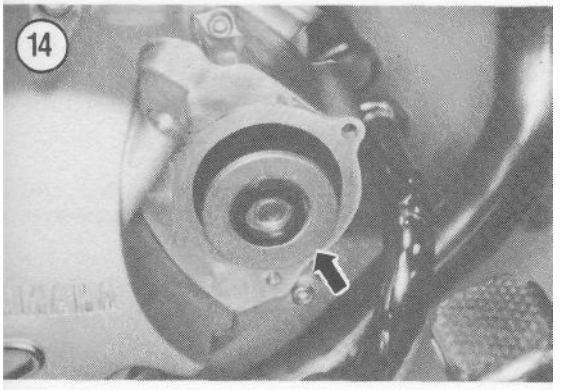
If your Yamaha was purchased second-hand and you are not sure of its model

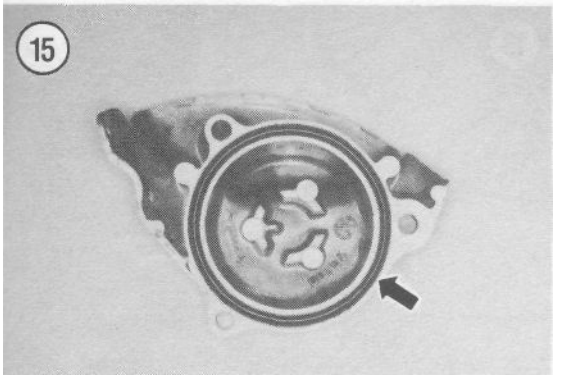












To change the engine oil and filter you will need the following:

a. Drain pan.
b. Funnel.
c. Wrench or socket to remove drain plug.
d. 3 quarts of oil.
e. Oil filter element.

NOTE

Never dispose of motor oil in the trash, on the ground, or down a storm drain. Many service stations accept used motor oil and waste haulers provide curbside used motor oil collection. Do not combine other fluids with motor oil to be recycled. To locate a recycler, contact the American Petroleum Institute (API) at www.recycleoU.org.

There are a number of ways to discard the used oil safely. The easiest way is to pour it from the drain pan into a gallon plastic bleach, juice or milk container for recycling or disposal. Do not discard oil in your household trash or pour it onto the ground.

1. Place the motorcycle on the sidestand.
2. Start the engine and run it until it is at normal operating temperature, then turn it off.
3. Place a drip pan under the crankcase and remove the drain plug **(Figure 12).**
4. Remove the oil filler cap **(Figure 10);** this will speed up the flow of oil.
5. Allow the oil to drain for at least 15-20 minutes.

NOTE

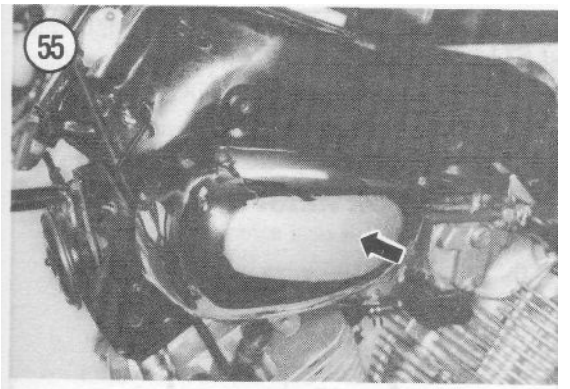
Before removing the oil filter cover, thoroughly clean off all dirt and oil around it.

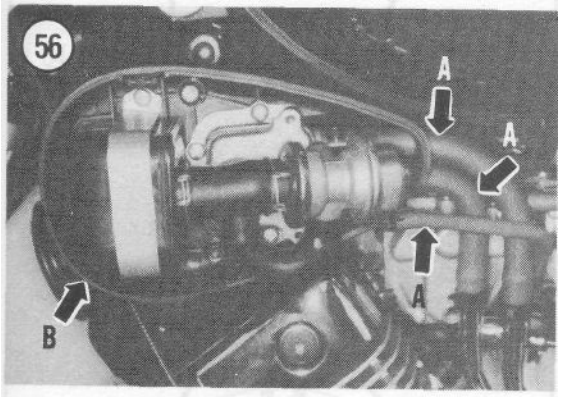
6. Remove the bolts securing the filter cover **(Figure 13)** to the crankcase.
7. Remove the cover and the filter **(Figure** 14). Discard the oil filter and clean out the cover and filter housing with cleaning solvent. Dry parts thoroughly.
8. Inspect the O-ring in the end of the cover **(Figure 15)** and replace if necessary.

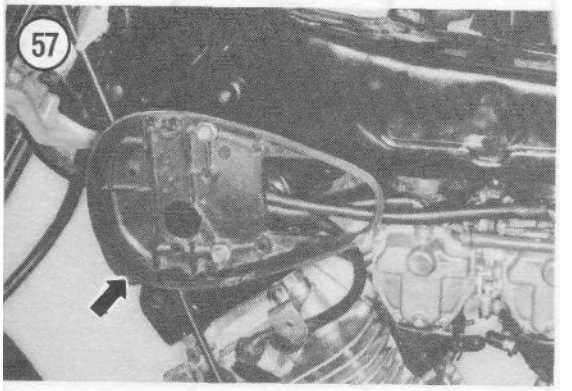
NOTE

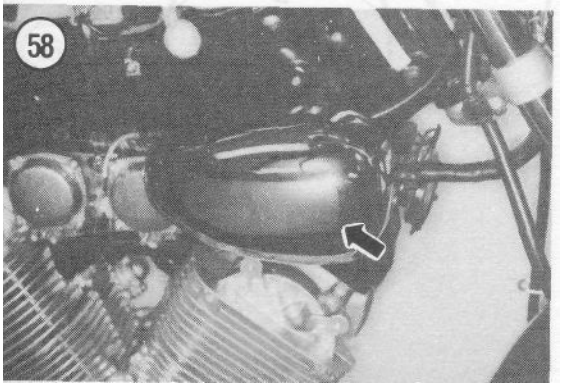
Prior to installing the cover, clean off the mating surface of the crankcase—do not allow any dirt to enter the oil system.

9. Position the new oil filter with the shoulder end **(Figure 16)** going in first and install the filter.
10. Reinstall the filter cover to the crankcase and tighten the bolts to 7.2 ft.-lb. (10 N.m).
11. Install the drain plug and gasket and tighten to 31 ft.-lb. (43 N.m).

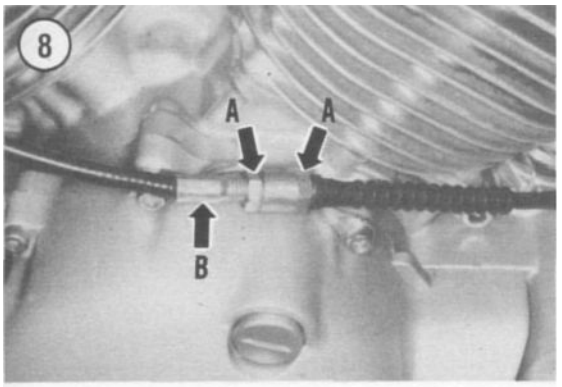


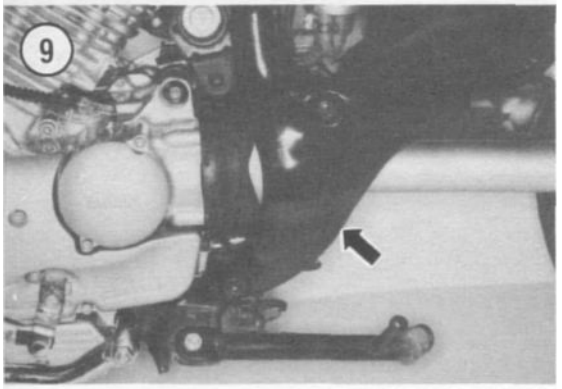






3. Unhook the battery strap (A, **Figure 50).**
4. Disconnect the battery vent tube (B, **Figure** 50).
5. Pull the battery part way up out of the battery box to gain access to the battery cable attachment points.
6. Disconnect the negative (-) battery cable **(Figure 51)** from the battery.
7. Remove the frame right-hand side cover **(Figure 52).**
8. Disconnect the fuel hose from the frame clamp (A, **Figure 53)** and move it out of the way.
9. Carefully pull the starter relay (B, **Figure 53)** from its frame mount and move it out of the way. Do not disconnect the cables from the relay.
10. Remove the battery as described in this chapter.
11. From the rear cylinder, remove the following:
    a. The cylinder head side cover (A, **Figure 54)** from each side.
    b. The spark plug (this makes it easier to turn over the engine by hand).
    c. The intake and exhaust valve adjuster covers.
12. Remove both frame side covers.
13. Remove bolts securing the left-hand side cover **(Figure 55)** and remove the cover.
14A. On models equipped with the air injection system, disconnect the hoses (A, **Figure 56)** from the air injection system and remove the left-hand bracket assembly **(B, Figure 56)** with the system components still attached to it.
14B. On all other models, remove the bracket **(Figure 57).**
15. Remove bolts securing the right-hand side cover **(Figure** 58) and electrical component bracket **(Figure 59)** and move the bracket assembly out of the way.
16. From the front cylinder, remove the following:
    a. The cylinder head side cover (B, **Figure** 54) from each side.
    b. The spark plug (this makes it easier to turn over the engine by hand).
    c. The intake and exhaust valve covers **(Figure 60).**
17. On the left-hand crankcase cover, remove the timing hole cover (A, **Figure 61)** and the crankshaft cover **(B, Figure 61).**
18. Rotate the engine by turning the crankshaft *clockwise.* Use a socket on the bolt **(Figure 62)** located on the left-hand end of the crankshaft. Continue to rotate the crankshaft until the "T" mark on the rotor for the *rear cylinder* **(Figure 63)** is aligned with the crankcase cover stationary pointer as





8. Loosen the clutch cable locknut (A, **Figure** 7) and rotate the adjuster **(B, Figure 7)** to allow maximum slack in the clutch cable.

9. At the clutch cable lower adjuster, loosen the locknuts (A, **Figure 8)** and rotate the adjuster (B, **Figure** 8) to allow maximum slack in the clutch cable. Disconnect the clutch cable from the actuating lever.

10. Remove the starter motor as described in Chapter Seven in this section of the manual.

11. Remove the bolts securing the left-hand under cover **(Figure 9)** and remove the cover.

12. Remove the following from the right-hand side:

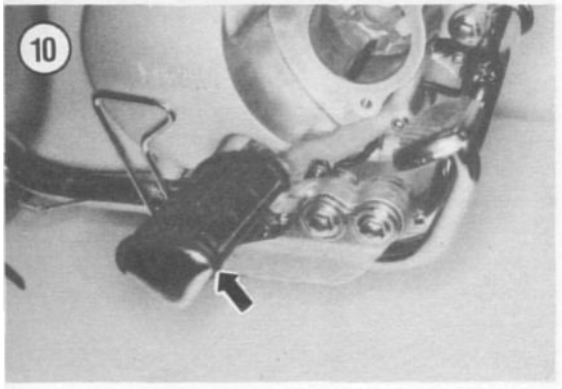
a. Right-hand footpeg assembly **(Figure 10).**

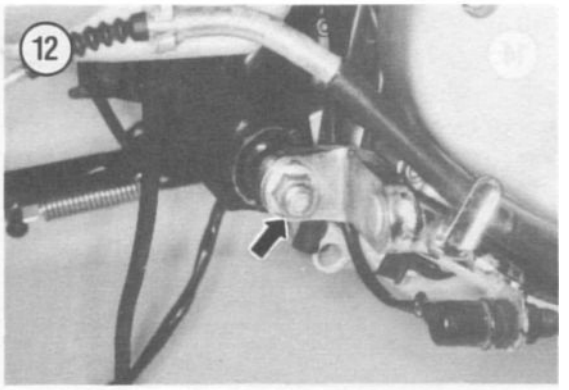
b. Remove the front **(Figure 11)** and rear **(Figure 12)** nuts securing the rear brake pedal and engine guard assembly **(Figure 13)** and remove the assembly.

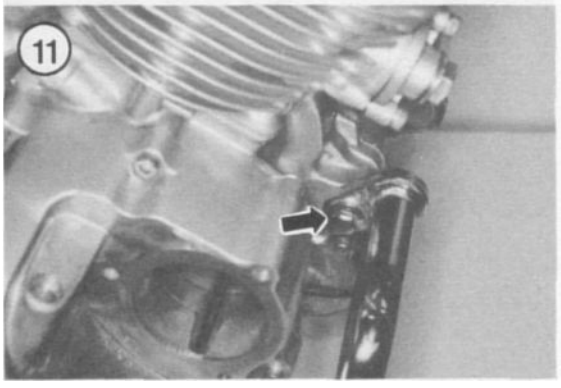
13. Remove the bolt **(Figure 14)** securing the shift lever arm and slide it off the shift shaft.

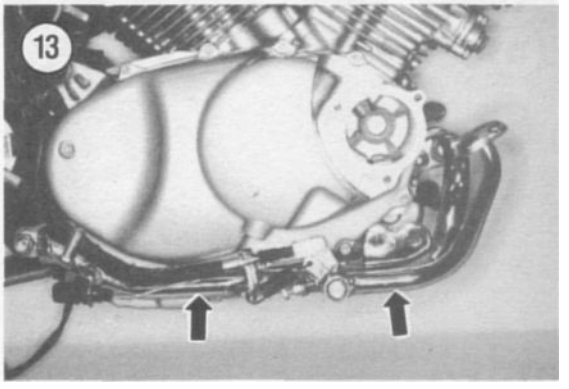
14. Remove the left-hand foot peg (A, **Figure IS).**

15. Remove the left-hand footrest bar assembly **(B, Figure 15).**



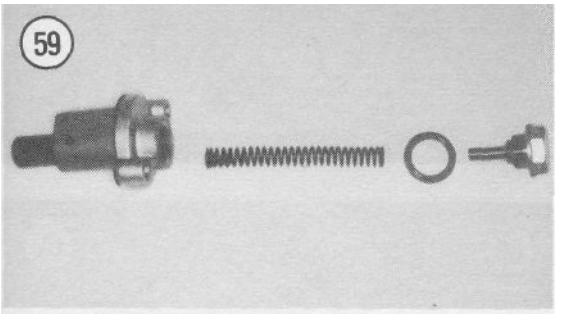


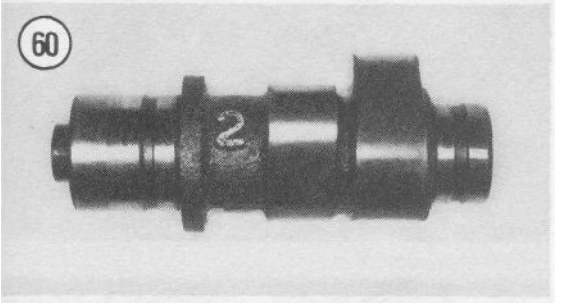


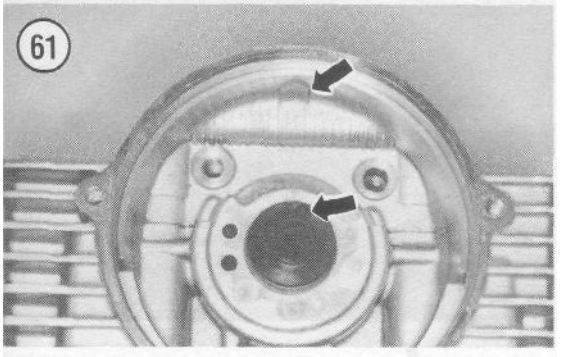


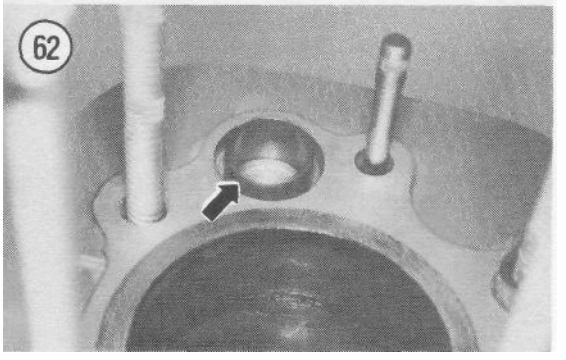
9. Inspect the valve and valve guides as described in this chapter,

10. Inspect the exhaust side camshaft chain guide **(Figure 58)** for excessive wear or separation. Replace if necessary.









11. Inspect the camshaft chain tensioner assembly **(Figure 59)** for wear or damage. If any part is damaged, replace the assembly.

Installation

NOTE

This procedure is for the rear cylinder. Installation of the front cylinder is identical, except for differences noted in Step 27. If both cylinder heads have been removed; install the rear cylinder assembly first, then the front cylinder.

1. Lubricate the camshaft bearing journals and bearing surfaces in the cylinder head and camshaft bushing with molybdenum disulfide grease or assembly oil.

NOTE

*If both cylinder heads have been disassembled, be sure to install the correct camshaft into the correct cylinder head. The front camshaft is marked with a "2" **(Figure 60)** and the rear camshaft is marked with a "I."*

2. Position the camshaft with the locating dowel hole facing up toward the timing mark in the cylinder head. Install the camshaft and camshaft bushing (B, **Figure 41)** into the cylinder head. After installation, check this basic alignment **(Figure 61)** and realign if necessary.

NOTE

*The bolts have different lengths. The long bolt (A, **Figure 39)** is used on the exhaust side and short bolt (B, **Figure 39)** is used on the intake side. The bolts must be installed in this location during installation.*

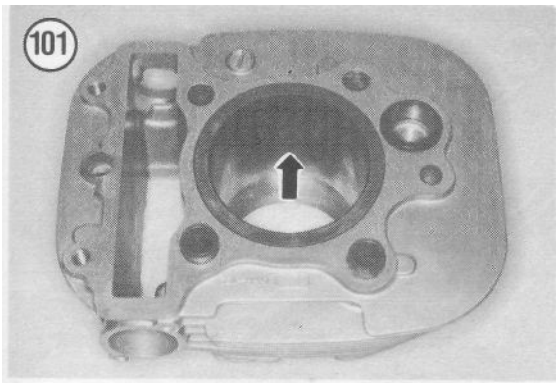
3. Install a new lockwasher (B, **Figure 40)** and the bolts (A, **Figure 40)** in their correct location. Tighten the bolts to the torque specifications in **Table 2.**

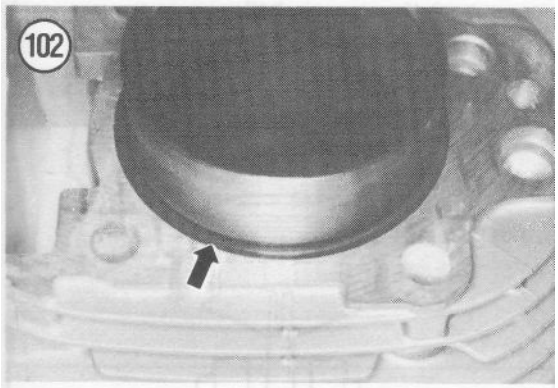
4. Stake the locking tabs **(Figure** 38) onto the flat of each bolt.

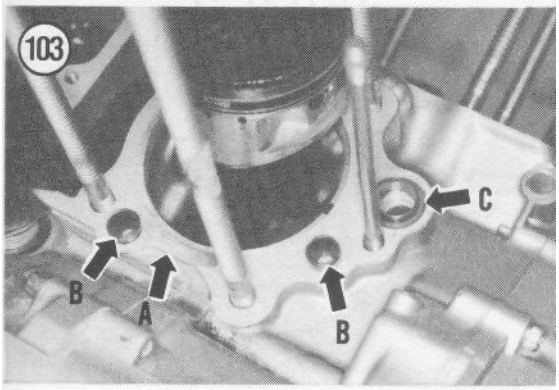
5. Remove the shop cloth from the cam chain opening in the cylinder.

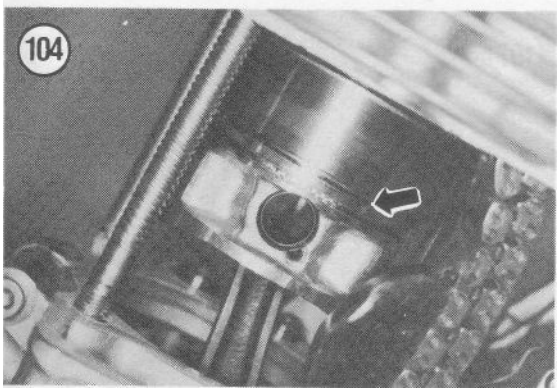
6. Install the large dowel pin **(Figure 62)** and O-ring seal **(Figure** 63).

7. Position the camshaft chain slipper on the exhaust side with the "UP" mark and arrow **(Figure 64)**









*piston can be measured; slight manufacturing tolerances must be taken into account to determine the actual size and working clearance. Piston-to-cylinder wear limit is listed in **Table 1**.*

4. Check the cylinder wall **(Figure 101)** for scratches; if evident, the cylinder should be rebored.

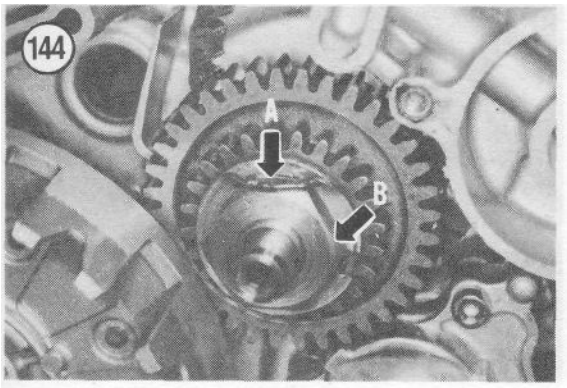
NOTE

*The maximum wear limit on the cylinder is listed in **Table 1.** If the cylinder is worn to this limit, it must be replaced. Never rebore a cylinder if the finished rebore diameter will be this dimension or greater.*

5. Check the cylinder base O-ring **(Figure 102).** Replace if worn or damaged.

Installation

1. Check that the top surface of the crankcase and the bottom surface of the cylinder are clean prior to installing a new base gasket.
2. Install a new cylinder base 'gasket (A, **Figure 103).**
3. Install the 2 small dowel pins **(B, Figure 103)** and the large dowel pin and O-ring seal (C, **Figure 103).**
4. Make sure the end gaps of the piston rings are *not* lined up with each other—they must be staggered. Lubricate the piston rings and the inside of the cylinder bore with assembly oil or fresh engine oil.
5. Carefully install the cylinder and slide it down onto the crankcase studs. Guide the camshaft chain and camshaft tensioner assembly into the camshaft chain slot in the cylinder.
6. Carefully feed the cam chain and wire up through the opening in the cylinder and tie it to the engine.
7. Install the cylinder and slide it down onto the crankcase studs. Guide the camshaft chain and camshaft tensioner assembly into the camshaft chain slot in the cylinder.
8. Carefully feed the camshaft chain wire up through the opening in the cylinder and tie the wire to the exterior of the engine.
9. Start the cylinder down over the piston. Compress each piston ring with your fingers as it enters the cylinder **(Figure 104).**
10. Slide the cylinder down until it bottoms out on the crankcase **(Figure 105).**
11. Repeat Steps 1-10 for the other cylinder.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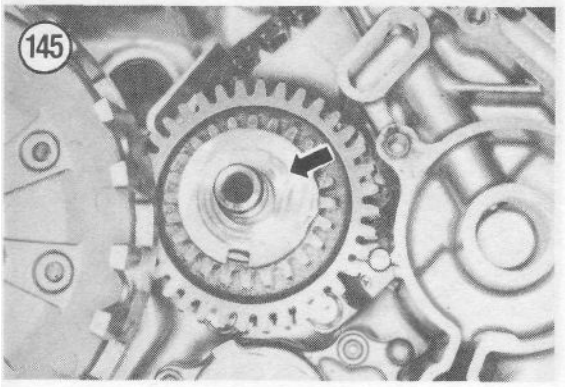
A
B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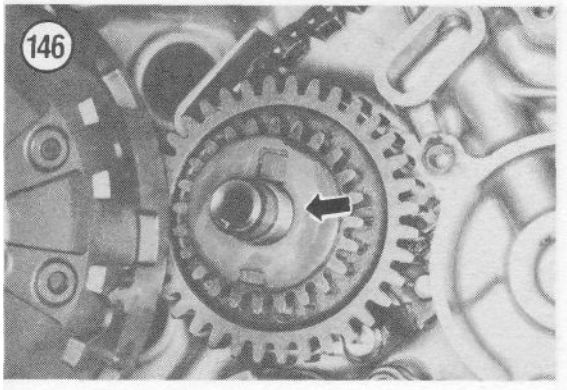
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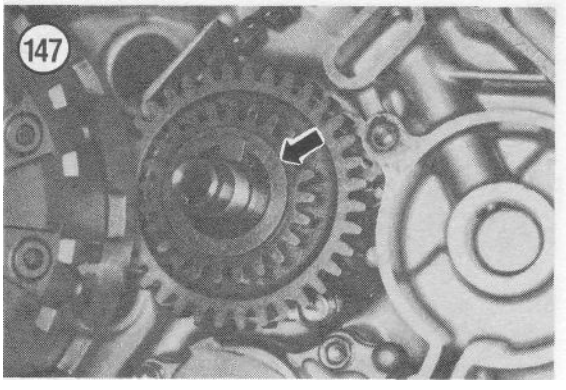
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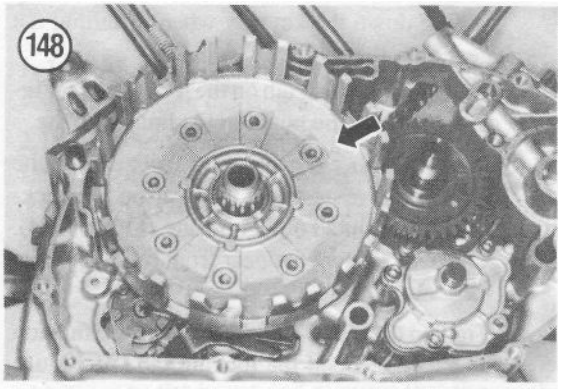
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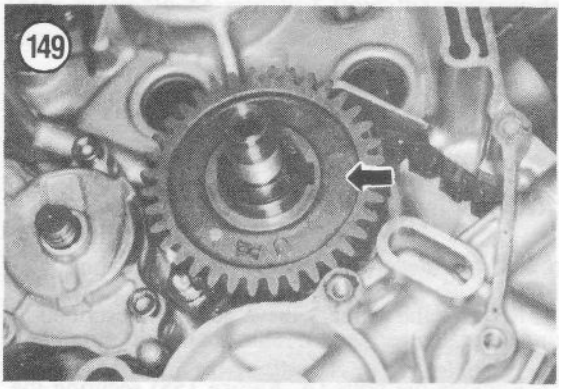
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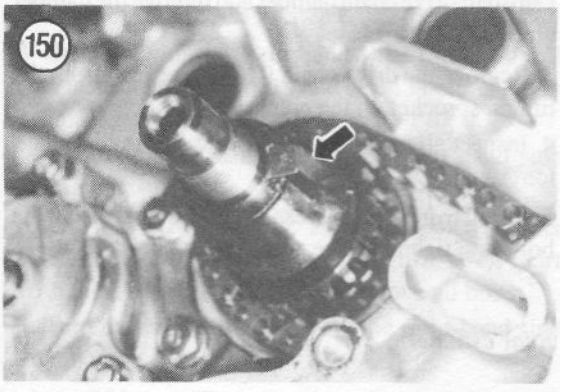
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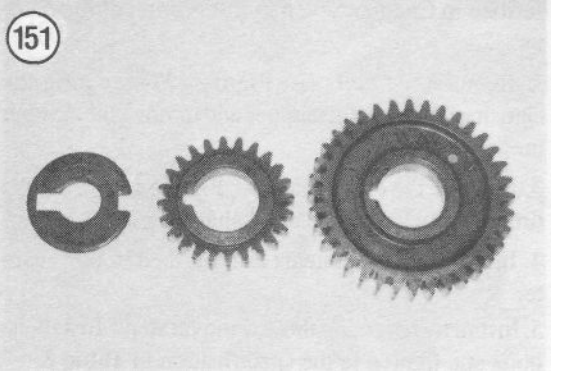
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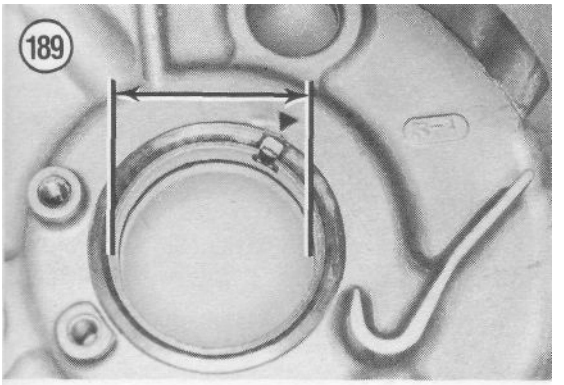
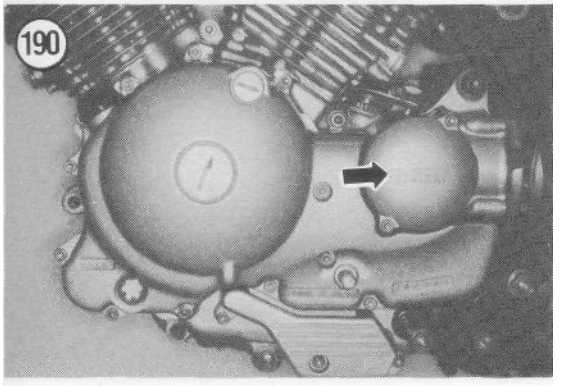
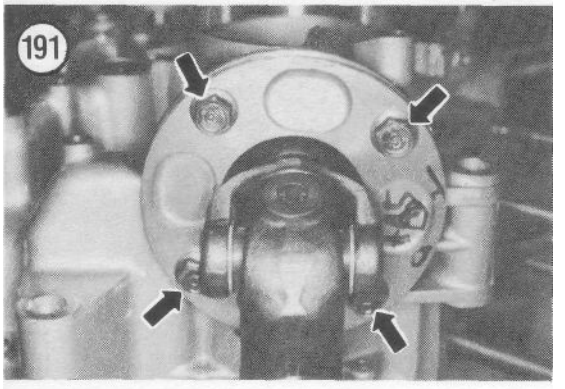
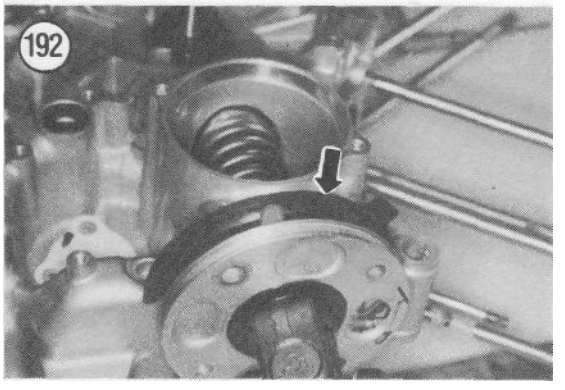








4. To select the proper bearing insert number, subtract the crankshaft OD (Step 2) from the main journal insert ID (Step 3).

5. The oil clearance specification is listed in **Table 1.** If the clearance is out of specifications, either the crankshaft or the bearing insert is worn beyond the service limit. Refer the engine to a dealer or qualified specialist.

MIDDLE DRIVE GEAR

Removal/Installation

1. Remove the bolts securing the middle drive gear cover **(Figure 190)** and remove the cover and O-ring gasket.

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

3. Remove the bolts **(Figure 191)** securing the middle driven gear bearing housing.

4. Remove the bearing housing and shims from the crankcase. Note the location and number of shims **(Figure 192).** They must be reinstalled in the same location.

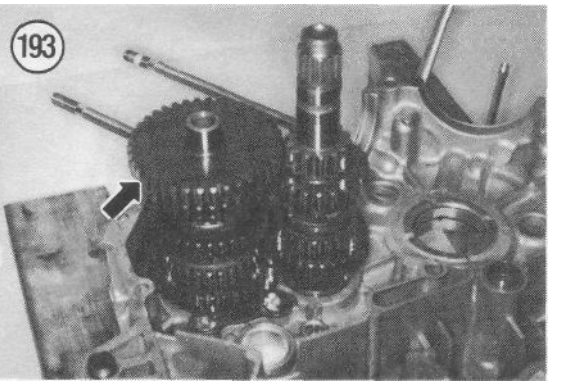
5. Separate the crankcase as described in this chapter. Do not remove the transmission shaft assemblies.

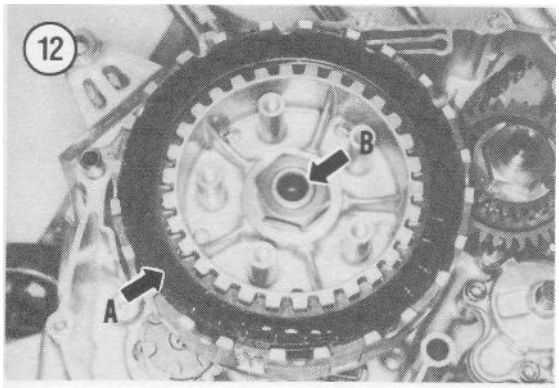
6. Unstake the nut securing the middle drive gear.

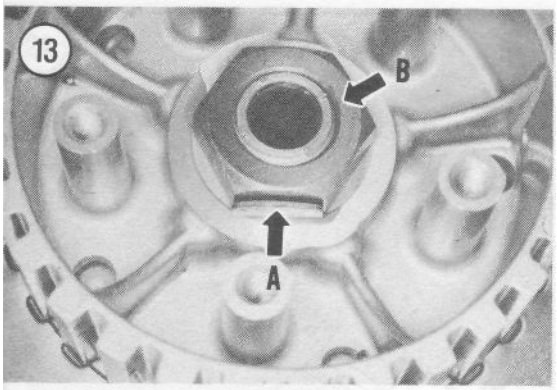
7. Remove the first gear **(Figure 193)** from the transmission drive shaft.

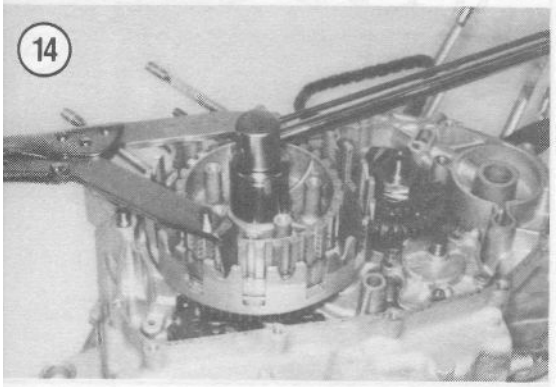
8. Install the "Grabbit," or equivalent onto the transmission drive shaft forth gear **(Figure 194)** this will keep the transmission shaft from rotating while loosening the middle drive gear nut.

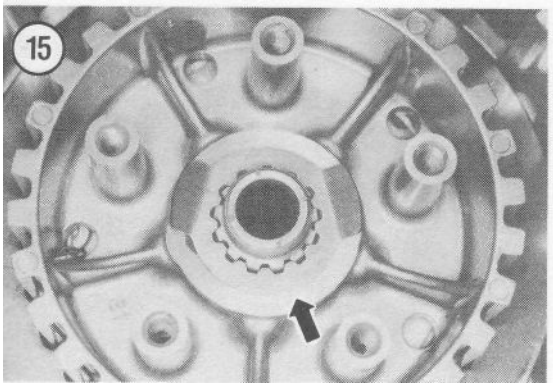
9. Loosen, then remove the middle drive gear nut (A, **Figure 195).**











7. Remove the bolts securing the right-hand crankcase cover **(Figure** 7) and remove the cover and gasket. Don't lose the dowel pins.

8. Remove the circlip (A, **Figure** 8) and remove the oil pump drive gear (B, **Figure** 8).

9. Remove the 5 pressure plate screws **(Figure** 9) and springs **(Figure** 10).

10. Remove the pressure plate **(Figure 11).**

11. Remove the clutch plates and friction disc (A, **Figure** 12) and keep them in order.

12. Use a magnetic tool and remove the steel ball from the center of the transmission shaft (B, **Figure 12).**

13. Straighten out the locking tab (A, **Figure 13)** on the clutch nut lockwasher.

NOTE

To keep the clutch housing from turning, use the "Grabbit" or Yamaha Universal Clutch Holder special tool (part No YM-91042) on the clutch boss See Figure 14

14. Loosen, then remove the clutch nut (B, **Figure** 13) and the lockwasher **(Figure** 15). Discard the lockwasher as a new one must be installed during assembly.

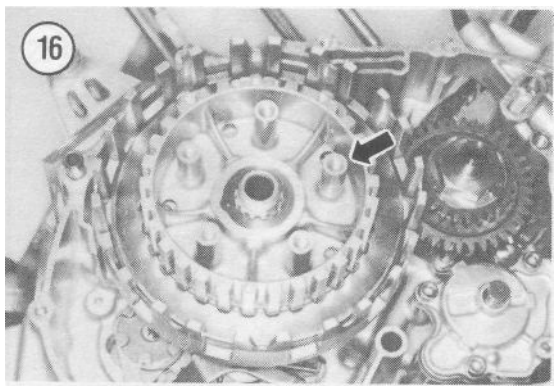
15. Remove the clutch boss **(Figure** 16).

16 Remove the thrust plate **(Figure** 17) and clutch housing **(Figure** 18).

17. Remove the long push rod No. 2 from the center of the transmission shaft.

Inspection

1. Clean all clutch parts in a petroleum-based solvent such as kerosene and thoroughly dry with compressed an"



17. Push the shift arm down and install the shift mechanism all the way. **Figure 61** and **Figure 62** shows the installed assembly.

18. Reverse Steps 2-12 to complete installation. Refill the engine with the correct type and quantity of oil as described in Chapter Three in this section of the manual.

TRANSMISSION

The crankcase must be disassembled to gain access to the transmission components.

Removal/Installation

Refer to **Figure 63** for this procedure.

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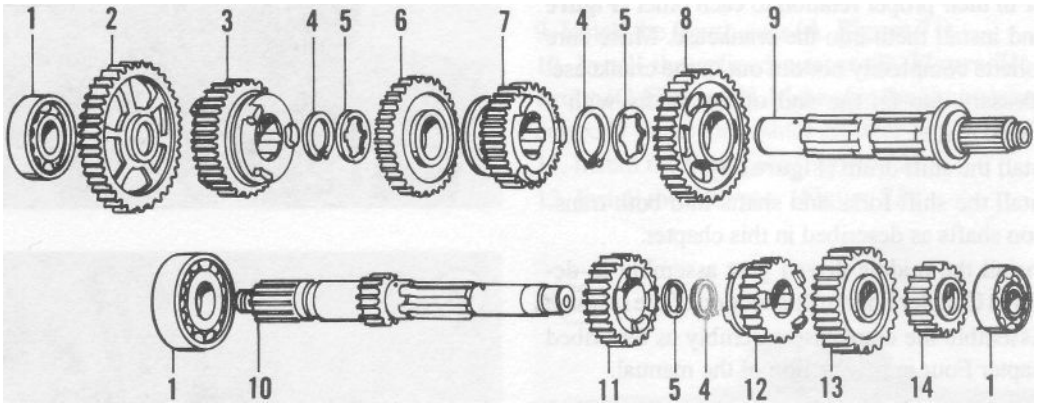
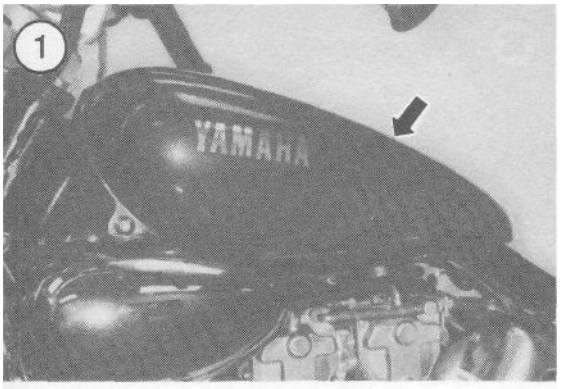
TRANSMISSION



1. Ball bearing
2. Drive axle 1st gear
3. Drive axle 4th gear
4. Circlip
5. Splined washer
6. Drive axle 3rd gear
7. Drive axle 5th gear
8. Drive axle 2nd gear
9. Drive axle
10. Main shaft/1 st gear
11. Main shaft 4th gear
12. Main shaft 3rd gear
13. Main shaft 5th gear
14. Main shaft 2nd gear

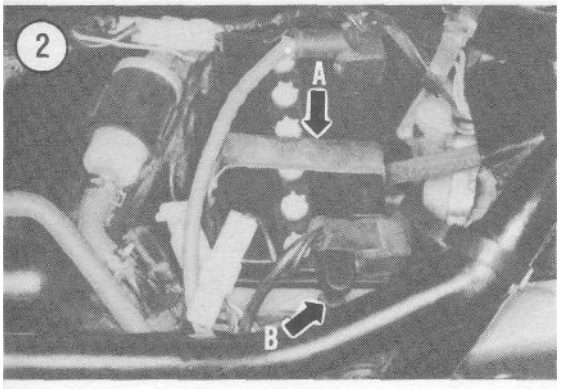


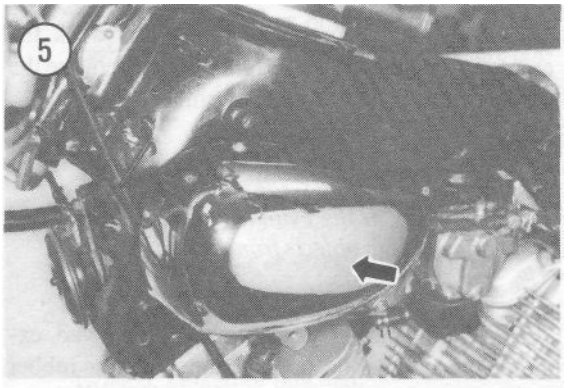
10. Disconnect the vent hose **(B, Figure 6)** from each carburetor.

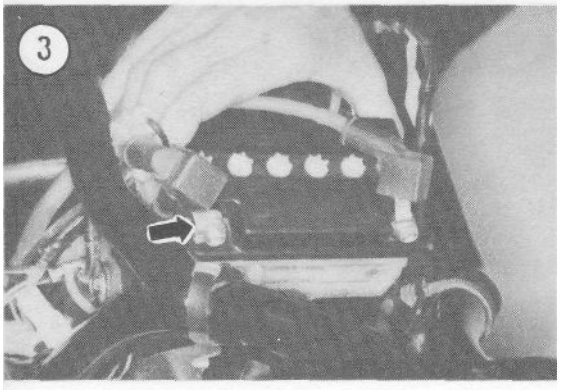
11. Remove bolts securing the right-hand side cover **(Figure 7)** and electrical component bracket **(Figure 8)** and move the bracket assembly out of the way.

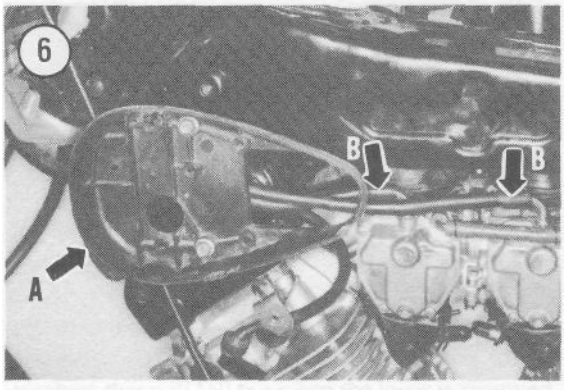
12. Remove the bolts securing the rubber intake tube to each cylinder head **(Figure 9).**

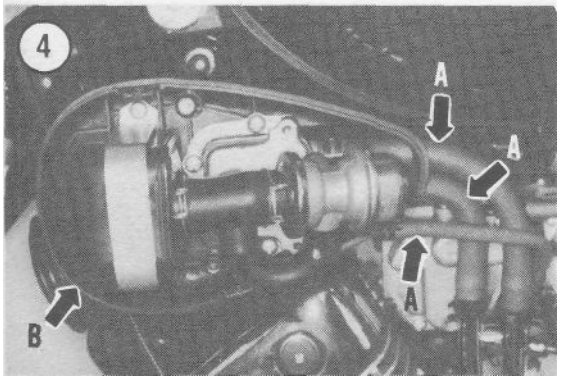
13. At the throttle lever, loosen the cable locknut (A, **Figure 10)** and loosen the adjuster (B, **Figure 10)** to allow maximum amount of slack in the throttle cable.

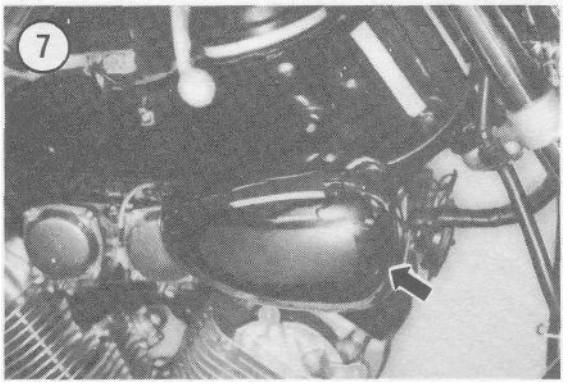










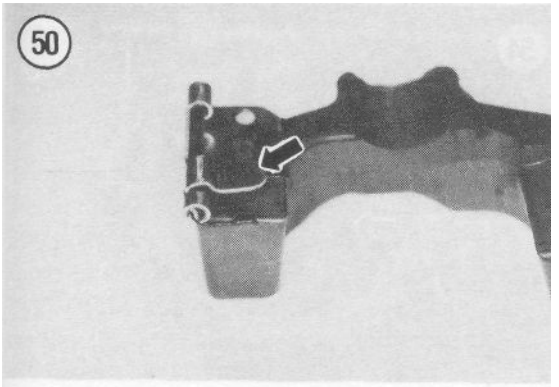


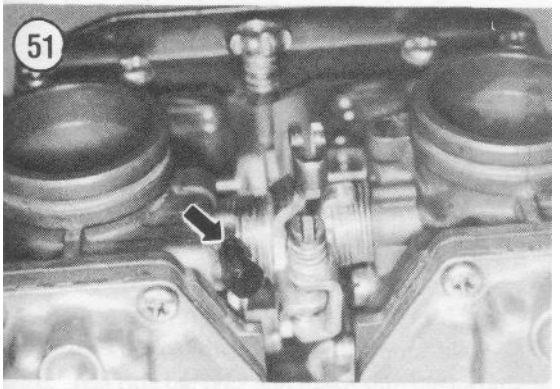
a vinyl tube with an inside diameter of 6 mm (0.24 in.).

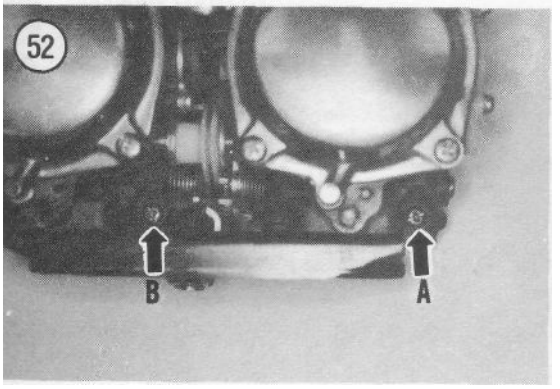
The fuel level is adjusted by bending the float arm tang **(Figure 50).**

Inspection/adjustment

Carburetors leave the factory with float levels properly adjusted. Rough riding, a worn needle valve or bent float arm can cause the float level to change. To adjust the float level on these carburetors, perform the following.







WARNING

Some gasoline will drain from the carburetors during this procedure. Work in a well-ventilated area, at least 50 feet from any open flame. Do not allow anyone to smoke. Wipe up spills immediately.

1. Place the motorcycle securely on the sidestand. Make sure the bike and carburetor assembly are in a true vertical position. If necessary, place shims under the sidestand to achieve a true vertical position for the carburetor assembly.

NOTE

Figure 51 *and* ***Figure 52*** *are shown with the carburetor assembly removed for clarity. Do not remove the assembly for this procedure.*

2. Connect the fuel level gauge (U.S. part No. YM-01312, U.K. part No. 90890-01312) or a vinyl tube (with a 0.24 in./6 mm inner diameter) to the drain nozzle on the float chamber **(Figure 51)** on the front carburetor. Secure the gauge so that it is vertical against the float bowl.

3. Loosen the carburetor drain screw. Refer to A, **Figure 52** for the front cylinder or B, **Figure 52** for the rear cylinder.

4. Start the engine and allow it to idle for a few minutes. Turn the engine off.

5. Wait until the fuel in the gauge settles.

6. The fuel level should be 0.53-0.57 in. (13.5-14.5 mm) below the piston valve center mark on the float bowl. Note the reading for the front carburetor.

7. If the fuel level is incorrect, note the dimension for the front carburetor, tighten the drain screw and then repeat this procedure for the rear carburetor. Note the fuel level in the rear carburetor.

8. If the fuel level is incorrect, adjust the float height as follows:

a. Remove the carburetor assembly as described in this chapter.

b. Remove the screws **(Figure 53)** securing the float bowl and remove the float bowl and gasket.

c. Remove the float **(Figure 54)** and the needle valve.

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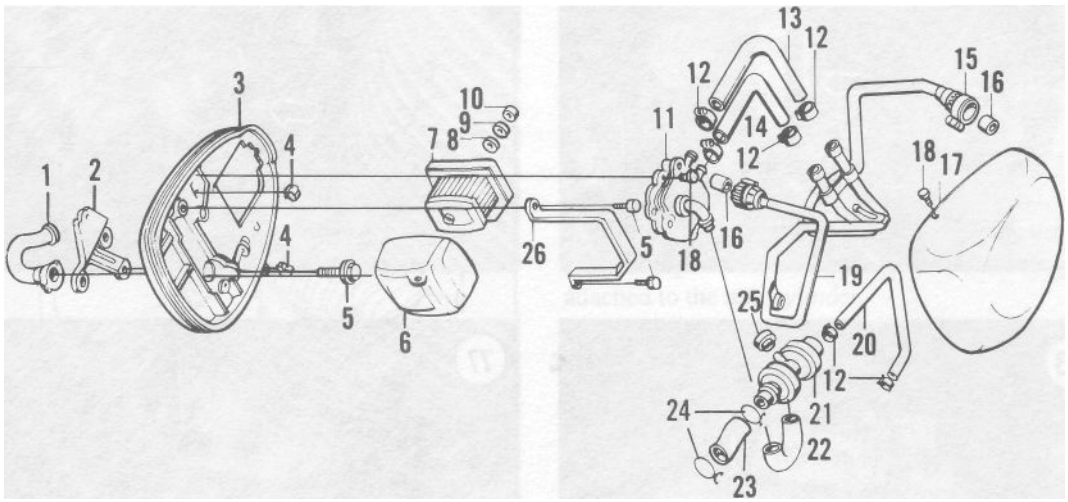
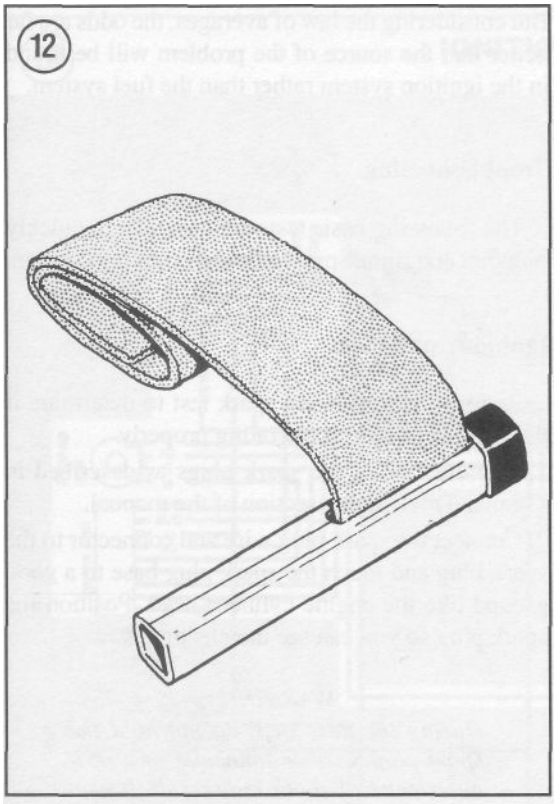
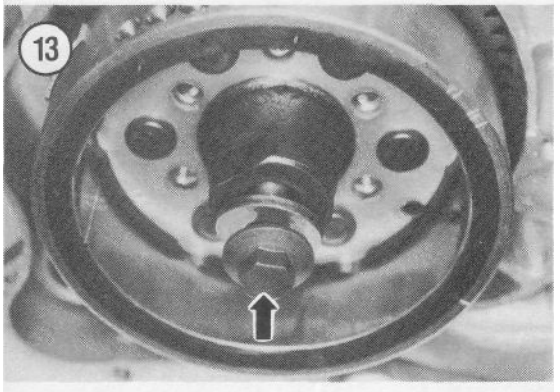
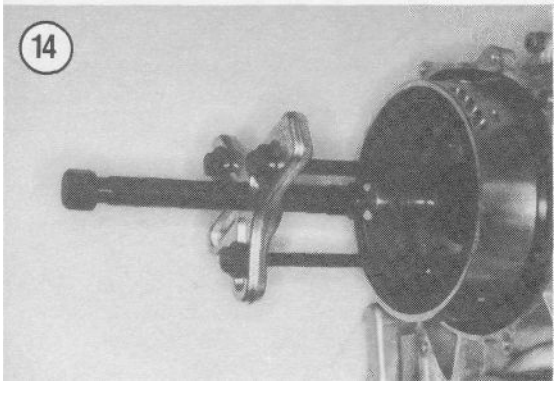
AIR INJECTION SYSTEM COMPONENTS (1990-ON U.S. AND 1989-ON U.K. MODELS)



1. Hose No. 1
2. Mounting bracket
3. Bracket
4. Rubber bumper
5. Bolt
6. Cap
7. Air cleaner
8. Washer
9. Washer
10. Nut
11. Reed valve assembly
12. Hose clamp
13. Hose No. 5
14. Hose No. 4
15. Air pipe No. 1
16. Muffler
17. Cover
18. Screw
19. Air pipe No. 2
20. Vacuum hose
21. Air cut valve
22. Air hose No. 3
23. Air hose No. 2
24. Hose clamp
25. Plug
26. Bracket



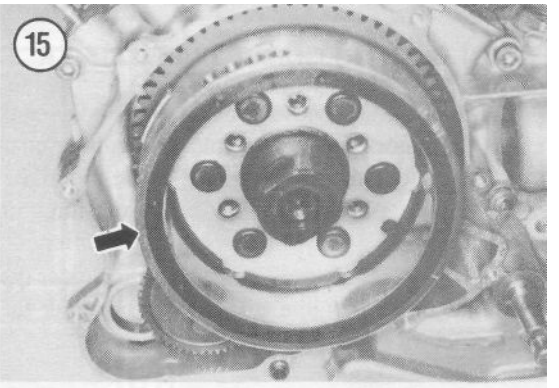


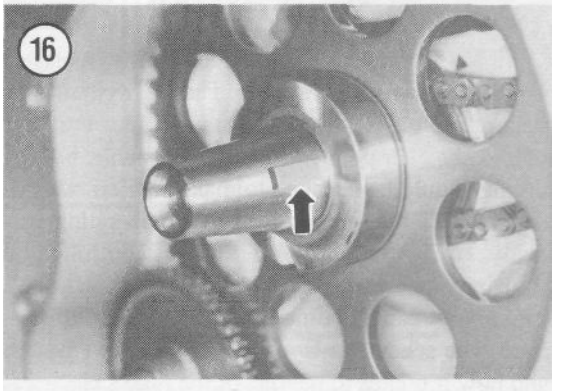


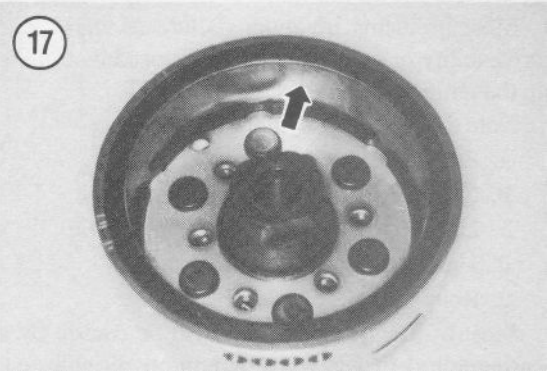
a If removed, install the Woodruff key **(Figure 16)** in the crankshaft

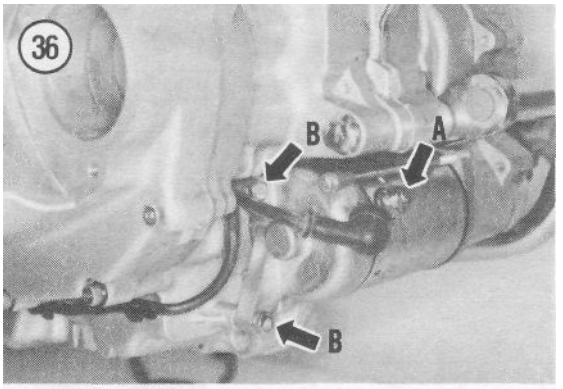
CAUTION

*Carefully inspect the inside of the flywheel **(Figure 17)** for small bolts, washers or other metal "trash" that may have been picked up by the magnets These small metal bits can cause severe damage to the alternator stator assembly*





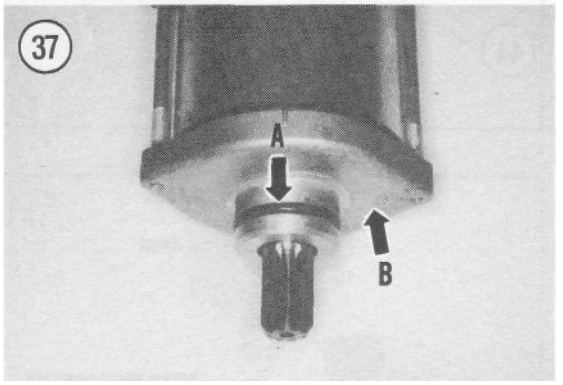


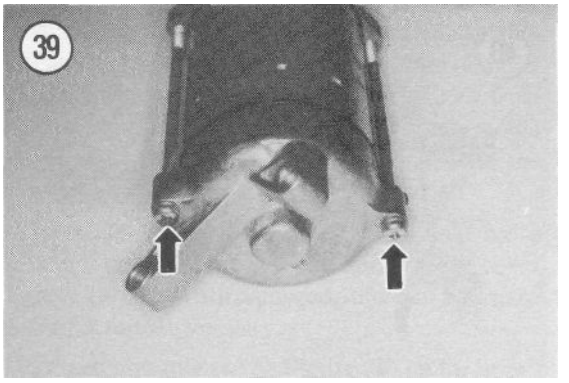


2. Slide off the front cover **(B, Figure 37).**
3. Slide off the rear cover **(Figure 40)** and shims **(Figure 41).** Record the number of shims as the same number must be installed during assembly.
4. Withdraw the armature from the case **(Figure 42).**
5. Clean all grease, dirt, and carbon dust from the armature, case and end covers

CAUTION

Do not immerse brushes or the wire windings in solvent or the insulation might be damaged Wipe the windings





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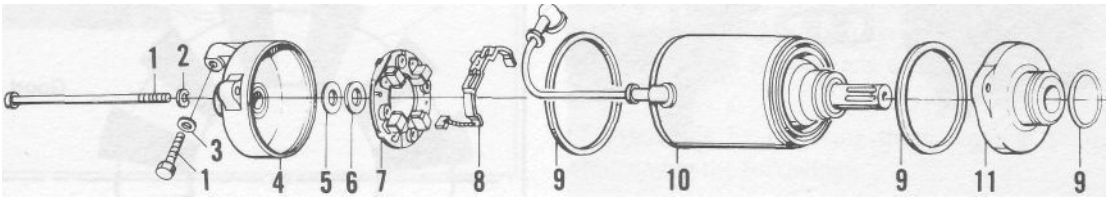
STARTER MOTOR



1. Bolt
2. Lockwasher
3. Washer
4. Rear cover
5. Shim
6. Shim
7. Brush holder (negative)
8. Brush holder (positive)
9. O-ring
10. Case and armature
11. Front cover

17. Push both the START button and the FUEL (reserve) button at the same time. Interpret results as follows:
   a. Fuel pump input voltage less than 11 volts: replace the fuel pump relay.
   b. Fuel pump input voltage more than 11 volts: Re-check the entire fuel system electrical connections to make sure they are tight and free of corrosion. If all connections are OK, replace the fuel pump.
18. Do not install the right-hand cover if Test 3 is going to be performed.

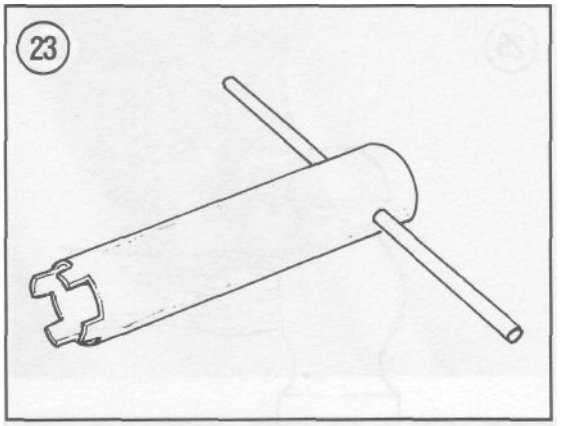
Test 3

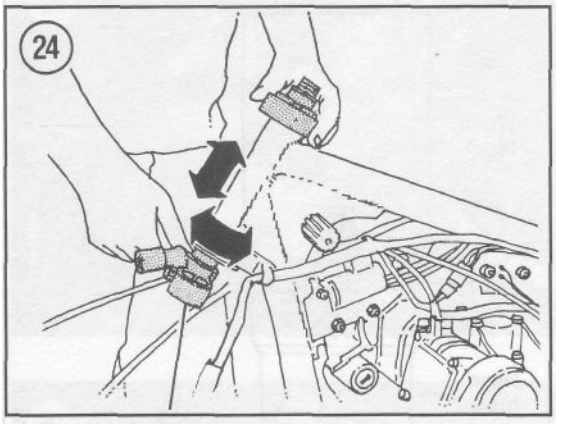
1. Remove the headlight as described in this chapter.
2. Within the headlight housing, disconnect the right-hand handlebar switch 9-pin electrical connector.
3. Connect an ohmmeter to the right-hand switch side of the electrical connector. Connect the test leads to the red/white and the red/green terminals.
4. Move the FUEL (reserve) switch button as follows and check continuity. Interpret results as follows:
   a. Push the switch button in: there should be continuity (low resistance).
   b. Release the switch button from the pushed position: there should be no continuity (infinity).
   c. If the switch fails either of these tests, the switch assembly is faulty and must be replaced.
5. Reconnect the 9-pin electrical connector and install the headlight.
6. If still in place, remove the right-hand cover **(Figure 33).**
7. Shift the transmission into neutral.
8. Disconnect the fuel pump relay 6-pin electrical connector **(Figure 71).**
9. Connect a 0-20 V DC voltmeter to the wiring harness side of the connector. Connect the positive (+) test lead to the red/green terminals and the negative (-) test lead to ground.
10. Turn the main switch ON and the engine stop switch to RUN.
11. Push the START button and measure the voltage. Interpret results as follows:
   a. Less than 12 volts: check the main switch.
   b. More than 12 volts: proceed to Step 12.
12. Reconnect the 6-pin electrical connector.
13. Carefully insert the positive (+) test lead into the blue/black wire terminal of the connector. Make sure it touches bare metal within the connector.
14. Connect the negative (-) test lead to ground.
15. Turn the main switch ON and the engine stop switch to the RUN position.
16. Push both the START button and the FUEL (reserve) button at the same time. Interpret results as follows:
   a. Fuel pump input voltage less than 11 volts: replace the fuel pump relay.
   b. Fuel pump input voltage more than 11 volts for 5 seconds: Re-check the entire fuel system electrical connections to make sure they are tight and free of corrosion. If all connections are OK, replace the fuel pump.
17. Do not install the right-hand cover if Test 4 is going to be performed.

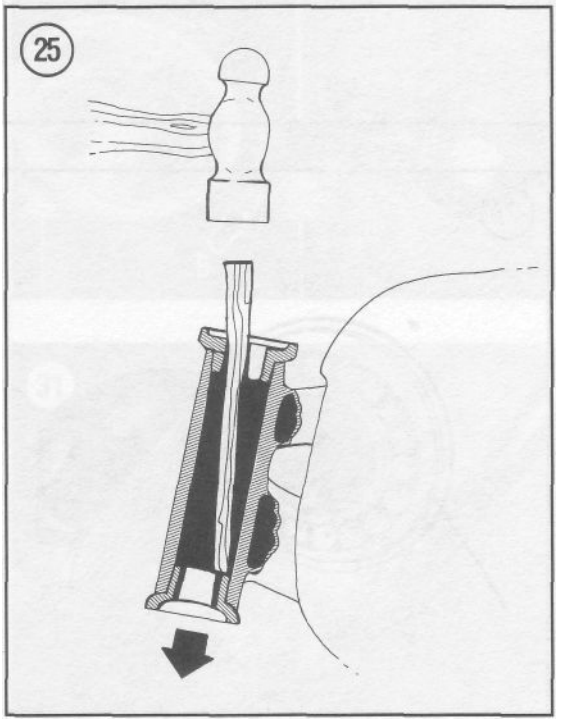
Test 4 (1987-1989 models only)

NOTE
1990 and later models are not equipped with afuel sender, therefor this test cannot be performed on these models.

1. Remove the seat.
2. Disconnect the fuel sender 2-pin electrical connector (1 green and 1 black wire).
3. Connect a jumper wire between the green and black terminals on the wiring harness side of the connector. Make sure the jumper wire stays in place during the remainder of this test.
4. Connect a 0-20 V DC voltmeter to the other side of the connector. Connect the positive (+) test lead to the blue/black terminals and the negative (-) test lead to ground.
5. Turn the main switch ON and the engine stop switch to RUN.
6. Push the START button and measure the fuel pump input voltage. Interpret results as follows:
   a. 0 volts after about 30 seconds: fuel sender is faulty, replace it.
   b. More than 0 volts after about 30 seconds: Re-check the entire fuel system electrical connections to make sure they are tight and free of corrosion. If all connections are OK, replace the fuel pump relay.







as they fall out. Remove all bearings that are held in the steering head by grease.

NOTE

There is a total number of 38 ball bearings used—19 in the top and 19 in the bottom. The bearings should not be intermixed because if worn or damaged, they must be replaced in sets. However, balls in both sets are the same size.

Inspection

1. Clean the bearing races in the steering head and all bearings with solvent.
2. Check for broken welds on the frame around the steering head. If any are found, have them repaired by a competent frame shop or welding service familiar with motorcycle frame repair.
3. Check the balls for pitting, scratches, or discoloration indicating wear or corrosion. Replace them in sets if any are bad.
4. Check the upper and lower races in the steering head for pitting, galling and corrosion. If any of these conditions exist, replace the races as described in this chapter.
5. Check steering stem for cracks and check its race for damage or wear. Replace if necessary.

Bearing Race Replacement

The headset and steering stem bearing races are pressed mto place. Because they are easily bent, do not remove them unless they are worn and require replacement. Take old races to the dealer to ensure exact replacement.

To remove a headset race, insert a hardwood stick into the head tube and carefully tap the race out from the inside **(Figure 25).** Tap all around the race so that neither the race nor the head tube are bent. To install a race, fit it into the end of the head tube. Tap it slowly and squarely with a block of wood **(Figure 26).**

Assembly

Refer to **Figure 18** for this procedure.

1. Make sure the steering head bearing races are properly seated.

CHAPTER NINE

REAR SUSPENSION AND FINAL DRIVE

This chapter includes repair and replacement procedures for the rear wheel, shaft drive unit and rear suspension components.

Specifications **(Table 1)** and tightening torques **(Table 2)** are found at the end of the chapter.

NOTE

This chapter covers all procedures unique to the XV535 Virago V-twins. If a specific procedure is not included in this chapter, refer to Chapter Two at the front of this manual for service procedures.

REAR WHEEL

Refer to **Figure 1** for this procedure.

Removal/Installation

1. Unscrew the rear brake adjusting nut **(Figure 2)** and disconnect the brake rod from the brake lever.

NOTE

Install the spring, nut and cotter pin back onto the brake rod to prevent their loss.

2. Remove the cotter pin and nut (A, **Figure 3)** securing the brake torque rod and disconnect it from the brake panel.

3. Loosen the axle pinch bolt (B, **Figure 3).**

4. Remove the cotter pin and loosen the rear axle nut **(Figure 4).** Discard the cotter pin; never reuse a cotter pin.

5. Place the bike securely on wood blocks so that the rear wheel clears the ground.

CHAPTER TEN

BRAKES

The brake system consists of a single disc unit on the front and drum on the rear. This chapter describes repair and replacement procedure for all brake components.

Refer to **Table 1** for brake specifications. **Tables 1-2** are found at the end of the chapter.

NOTE

This chapter covers all procedures unique to the XV535 Virago V-twins. If a specific procedure is not included in this chapter, refer to Chapter Ten at the front of this manual for service procedures.

FRONT DISC BRAKE

The front disc brake is actuated by hydraulic fluid controlled by the hand lever on the right-hand side of the handlebar. As the brake pads wear, the brake fluid level drops in the master cylinder reservoir and automatically adjusts for pad wear. However, brake lever free play must be maintained. Refer to *Front Brake Lever Adjustment* in Chapter Three in this section of the manual.

When working on a hydraulic brake system, it is necessary that the work area and all tools be absolutely clean. Any tiny particles of foreign matter or grit on the caliper assembly or the master cylinder can damage the components. Also, sharp tools must not be used inside the caliper or on the caliper piston. If there is any doubt about your ability to correctly and safely carry out major service on the brake components, take the job to a Yamaha dealer or brake specialist.

When adding brake fluid use only a type clearly marked DOT 3 and use it from a sealed container. Brake fluid will draw moisture which greatly reduces its ability to perform correctly, so it is a good idea to purchase brake fluid in small containers and discard what is not used.

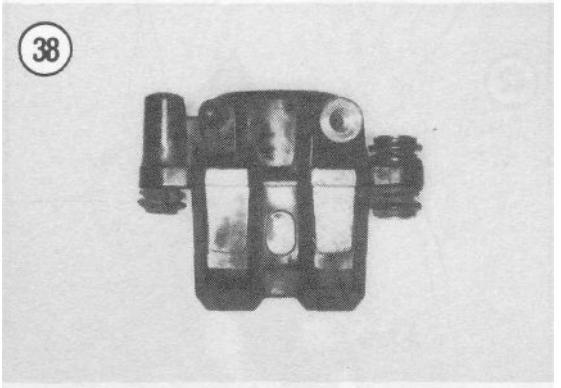
Whenever *any* component has been removed from the brake system the system is considered "opened" and must be bled to remove air bubbles. Also, if the brake feels "spongy," this usually means there are

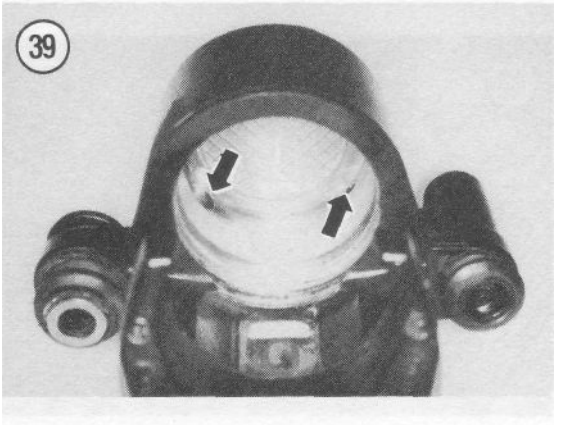
open. Apply compressed air to the opening and make sure it is clear. Clean out if necessary with fresh brake fluid.

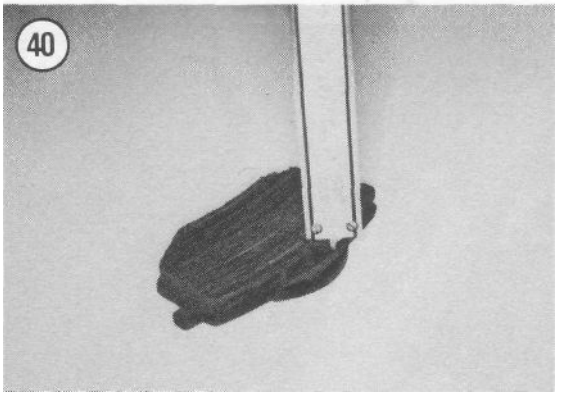
10. Inspect the union bolt threads in the caliper for wear or damage. Clean up any minor thread damage or replace the caliper assembly if necessary.

11. The piston seal maintains correct brake pad to disc clearance. If the seal is worn or damaged, the brake pads will drag and cause excessive pad wear and elevate brake fluid temperatures. Replace the piston and dust seals if the following conditions exist:

a. Brake fluid leaks around the brake pad.
b. The piston seal is stuck in the caliper groove.
c. There is a large difference in inner and outer brake pad wear.
d. Measure the brake pad friction thickness material with a vernier caliper **(Figure 40).** Replace both brake pads if any one pad is worn to the service limit dimension listed in **Table 1** or less.







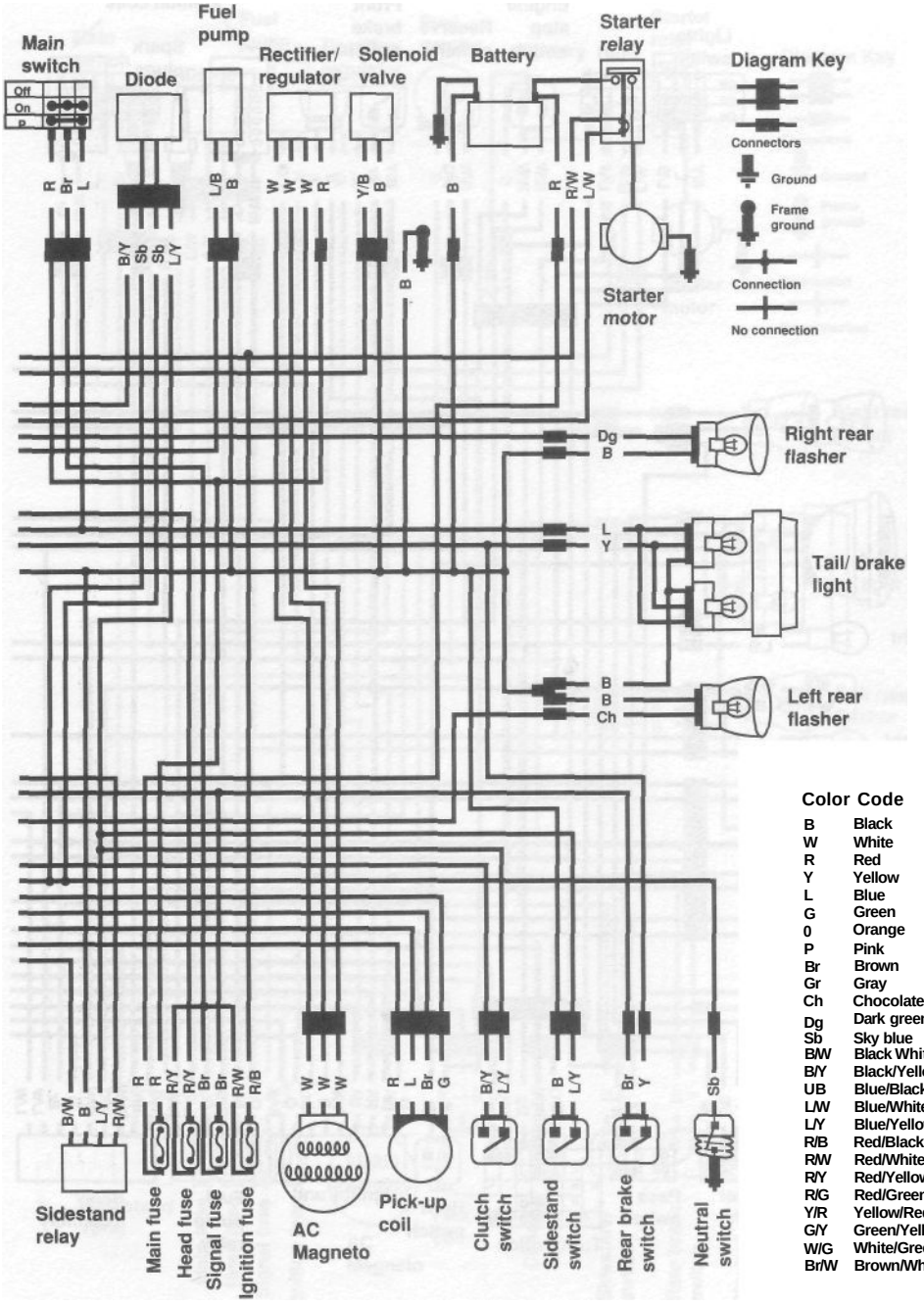
FRONT BRAKE HOSE REPLACEMENT

The factory-recommended brake hose replacement interval is every 4 years, but it is a good idea to replace brake hoses whenever signs of cracking, leakage or damage are apparent.

CAUTION

Cover the front wheel, fender and top cover or fuel tank with a heavy cloth or plastic tarp to protect it from the accidental spilling of brake fluid. Wash any spilled brake fluid off of any painted or plated surface immediately, as it will destroy the finish. Use soapy water and rinse completely.

1. Drain the master cylinder and caliper as follows:
   a. Attach a hose to the brake caliper bleed screw **(Figure 26).**
   b. Place the end of the hose in a clean container.
   c. Open the bleed screw and operate the brake lever to drain all brake fluid from the master cylinder reservoir.
   d. Close the bleed screw and disconnect the hose.
   e. Discard the brake fluid.
2. Remove the union bolt **(Figure 27)** and copper sealing washers attaching the brake hose to the caliper.
3. Disconnect the hose from the clamp on the fork **(Figure 41).**
4. Slide back the rubber boot (A, **Figure 42)** and remove the union bolt **(B, Figure 42)** securing the hose to the master cylinder.
5. Remove the brake hose.
6. Install new brake hose, copper sealing washers and union bolts in the reverse order of removal. Be sure to install the new sealing washers in their cor-



Color Code

B	Black
W	White
R	Red
Y	Yellow
L	Blue
G	Green
0	Orange
P	Pink
Br	Brown
Gr	Gray
Ch	Chocolate
Dg	Dark green
Sb	Sky blue
B/W	Black White
B/Y	Black/Yellow
UB	Blue/Black
L/W	Blue/White
L/Y	Blue/Yellow
R/B	Red/Black
R/W	Red/White
R/Y	Red/Yellow
R/G	Red/Green
Y/R	Yellow/Red
G/Y	Green/Yellow
W/G	White/Green
Br/W	Brown/White