YAMAHA

IT250G/IT425G

OWNER'S SERVICE MANUAL

LIT-11616-01-72

3R7-28199-10

IMPORTANT NOTICE

Always check the local regulations governing the areas where you will ride. An 86 dB(A) silencer spark arrestor kit is provided with this vehicle for use where required. Installation of kit will reduce performance substantially. This vehicle may not be legally operated public streets, roads or highways. Such use is prohibited by law.

SAFETY WARNINGS:

1. **GASOLINE IS HIGHLY FLAMMABLE:**
   - * **Always turn off the engine when refueling.**
   - * **Take care not to spill on the engine or exhaust pipe / muffler, when refueling.**
   - * **If any gasoline spills on the engine or exhaust pipe / muffler, wipe it off immediately.**
   - * **Never refuel while smoking or in the vicinity of an open flame.**
2. **If you should swallow some gasoline or inhale a lot of gasoline vapor, or allow some gasoline to get in your eye(s), see your doctor immediately. If any gasoline spills on your skin or clothing, immediately wash it with soap and water, and change your clothes.**
3. **When parking the machine, note the followings:**
   - * **The engine and exhaust pipe / muffler are heated up. Park the machine in a place where pedestrians or children are not likely to touch the machine.**
   - * **Do not park the machine on a slope or soft ground; the machine can easily overturn.**
4. **When transporting the machine in another vehicle, be sure it is kept upright and that the fuel petcock is turned to the "OFF" position. If it should lean over, gasoline may leak out of the carburetor or fuel tank.**
5. **Never start your engine or let it run for any length of time in a closed area. The exhaust fumes are poisonous and can cause loss of consciousness and death within a short time. Always operate your machine in an area with adequate ventilation.**
6. **Always wear a helmet, groves, boots, MX's trousers and jacket.**

Particularly important information is distinguished in this manual by the following notations:

NOTE: . . . . . A NOTE provides key information to make procedures easier or clearer.

CAUTION: . . . . A CAUTION indicates special procedures that must be followed to avoid damage to the machine.

WARNING: . . . . A WARNING indicates special procedures that must be followed to avoid injury to a machine operator or person inspecting or repairing the machine.

TO THE NEW OWNER

Yamaha's IT250G/400G are designed and built by Yamaha engineers for both the rigors of off-road use. It offers many outstanding features, not found on previous Yamaha machines. This owner's service manual provides the basic information for operation and proper care and maintenance. Careful attention to the procedures described in this manual will help insure trouble-free operation and optimum performance.

SERVICE DEPARTMENT
INTERNATIONAL DIVISION
YAMAHA MOTOR COMPANY, LTD.

IT250G/IT425G OWNER'S SERVICE MANUAL
FIRST EDITION JULY 1979

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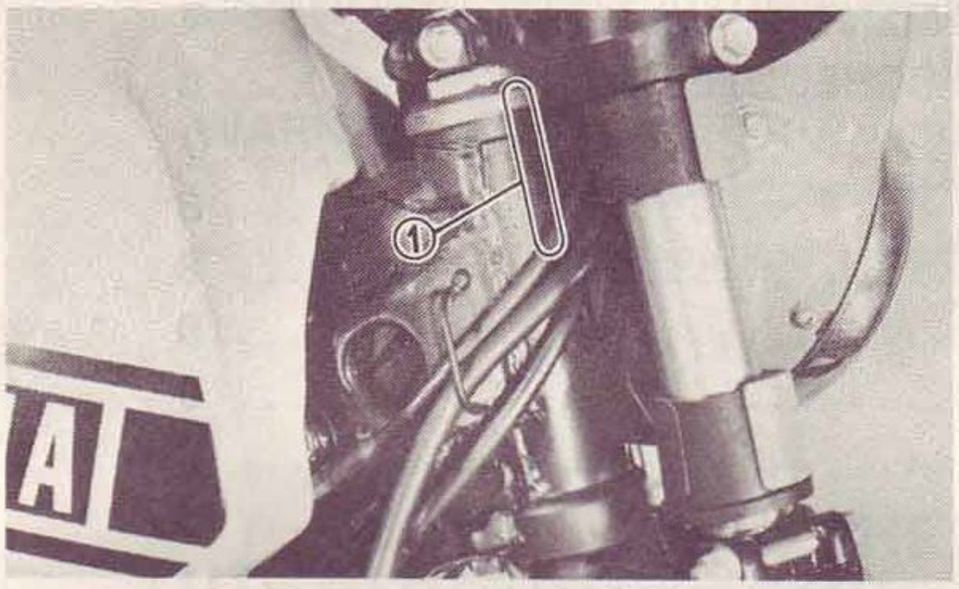
CONTENTS

MACHINE IDENTIFICATION

Frame serial number

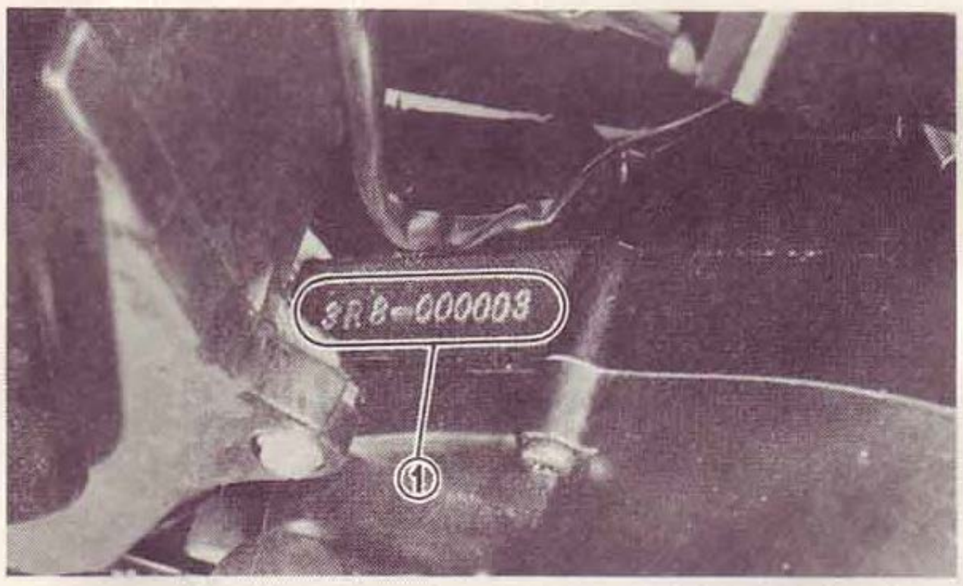
The frame serial number is stamped on the right side of the steering head stock.



1. Frame serial number

Engine serial number

The engine serial number is stamped into the raised part of the right rear section of the engine.



1. Engine serial number

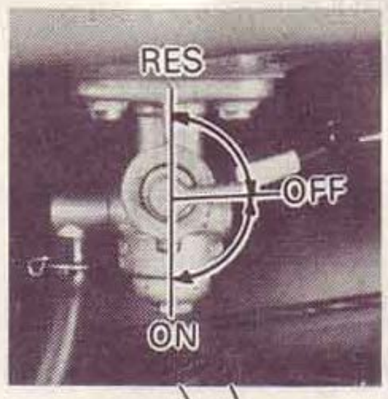
NOTE:

The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.

CONTROL FUNCTIONS

WARNING:

1. **Before riding this motorcycle, become thoroughly familiar with all operating controls and their function.**
   Consult your Yamaha dealer regarding any control or function you do not thoroughly understand.
2. **Observe the break-in procedures to preclude mechanical failures.**
3. **This model is designed for OFF ROAD use only. It is not equipped with highway approved lighting, mirrors, horn or directional signals. In most instances, it is illegal to ride this model (either day or night) on any public street or highway.**



Fuel petcock

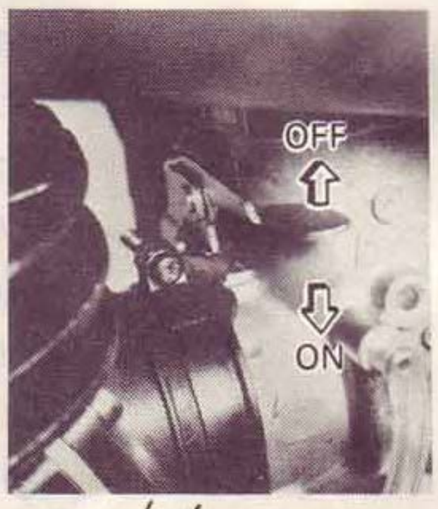
Tool bag
Owner's tool kit is in this bag.

25W Head light

Rear brake pedal

Kick crank

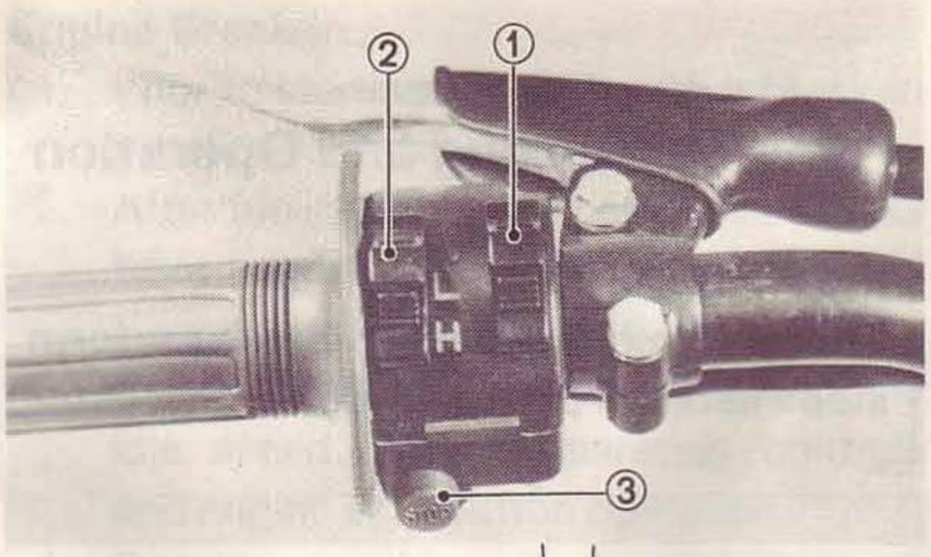
Starter jet lever
For starting a cold engine, push lever down to open the jet.



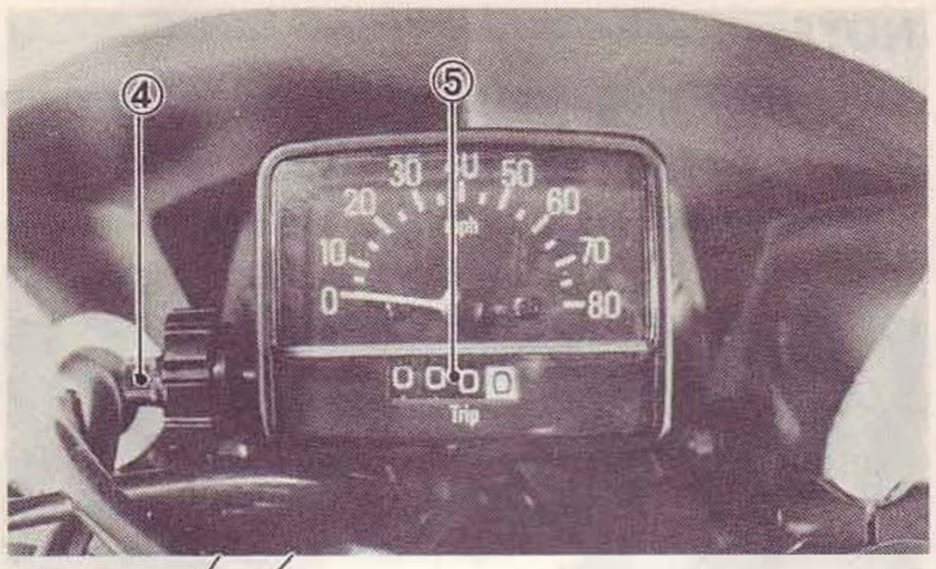
Shift pedal

Racheeting type 6-speed transmission (IT250G)

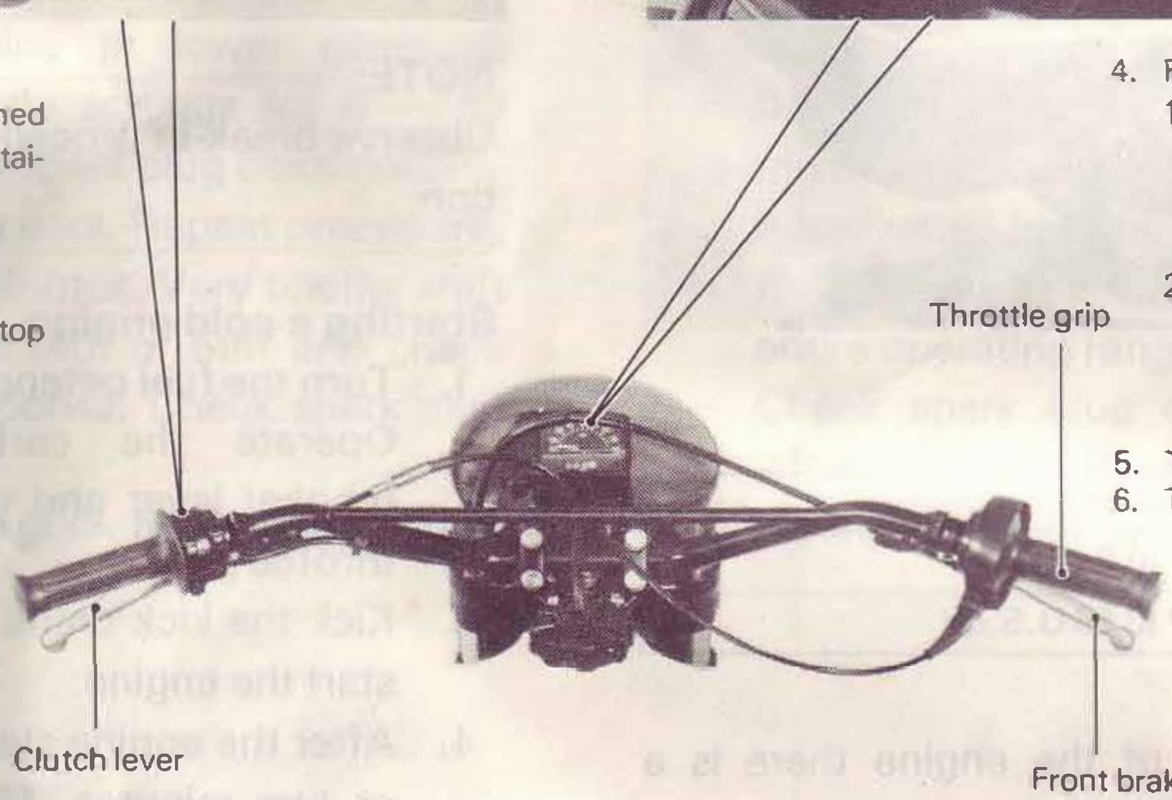
Chain tensioner



1. Lighting switch
   If the light switch is turned forward, headlight and tail-light come on.
2. Dimmer switch
3. Engine stop button
   Push and hold to stop engine.



4. Reset knob
   1. Turn the knob counter clockwise for resetting the entire place numbers to zeros.
   2. Pull the knob and turn it either way for place-by-place reading adjustment.
5. Trip odometer
6. Trip odometer



Fuel and Oil

Fuel

Use premium gasoline with an octane rating of 90+ mixed with oil at a gas/oil ratio of 20:1. Always use fresh, name-brand gasoline. Always mix a fresh batch of fuel the morning of the race and do not retain a mixed batch overnight.

Fuel tank capacity: 12 lit (12.7 U.S. qt)

Oil

1. Engine Mixing Oil:

Recommended oil: Yamalube "R" (Yamalube Racing 2-cycle oil)

If for any reason you should use another type, the oil should meet BIA certification. "TC-W".
Check the container top or label for service specification and mixing ratios.

2. Transmission Oil:

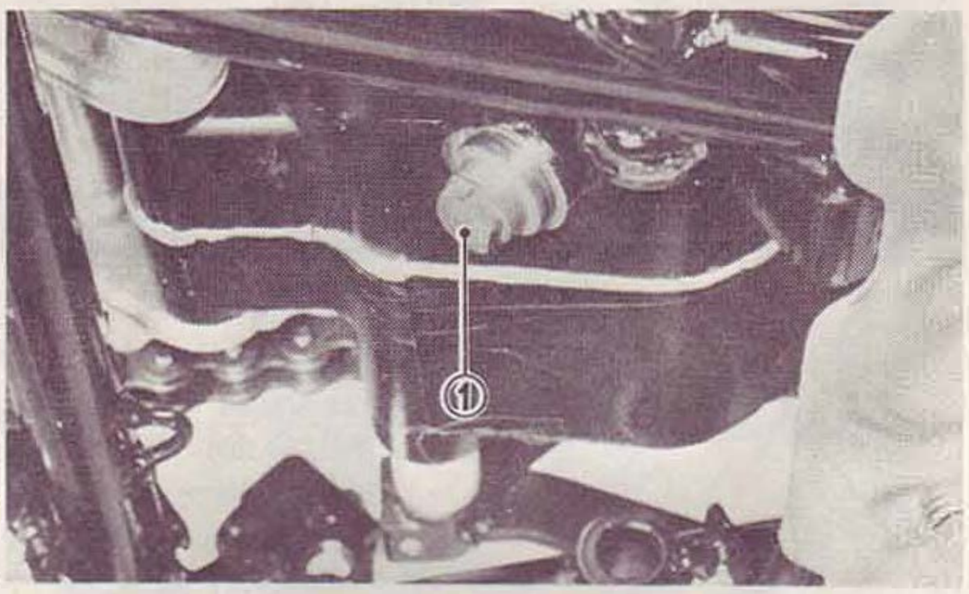
Recommended oil: Yamalube 4-cycle oil or SAE 10W/30 "SE" name-brand motor oil

1. Filler plug

On the bottom of the engine there is a drain plug. Remove it and drain all the oil from the transmission. Reinstall the drain plug (make sure it is tight).
Add oil through filler hole.

NOTE:

This drain plug can also serve as the cam stopper. Take care so that the stopper and spring are not lost.



1. Drain plug

	Transmission oil capacity
Oil change	800 cm³ (0.8 U.S.qt)
Total	850 cm³ (0.85 U.S.qt)

On the right side of the engine there is a checking screw. To check, warm up the engine for 2 ~ 3 minutes. Place the motorcycle upright and remove the oil level checking screw. If oil flows out, the oil level is correct.

The transmission oil should be drained and refilled every 500 km (300 mi).

1. Checking screw

CAUTION:

Do not add any chemical additives. Transmission oil also lubricates the clutch and additives could cause the clutch to slip

Engine Starting and Operation

CAUTION:

Prior to operating the machine, perform steps listed in pre-operation check list.

NOTE:

Observe break-in procedures for initial operation

Starting a cold engine

1. Turn the fuel petcock to "ON".
2. Operate the carburetor starter jet (choke) lever and completely close the throttle grip.
3. Kick the kick crank with full strength to start the engine.
4. After the engine starts, warm up for one or two minutes. Make sure the starter jet (choke) lever is returned to the original position before riding.

Starting a warm engine

Do not engage starter jet. Open throttle slightly. Engage the kick starter and start the engine.

Warm-up

Run the engine at idle or slightly higher using the starter jet as required until the engine is warm. This procedure normally takes 1 to 2 minutes. To check, see if the engine responds normally to throttle with starter jet off.

CAUTION:

Do not operate engine for extended warm-up periods.

Engine Break-in

1. Prior to starting, fill tank with a break-in gasoline/oil mixture of 12:1 to 14:1.
2. After fueling and pre-operational checks have been made, refer to Starting and Operation and start engine.
3. Allow engine to warm up. Check engine idle speed. Check operating controls and engine stop button operation.
4. Operate machine in lower gears at moderate throttle settings for 8 — 10 minutes. Check spark plug condition.
5. Allow engine to cool. Repeat procedure, running for 5 minutes. Very briefly, shift to higher gears (4th or 5th) and check full throttle response. Check spark plug condition.
6. Allow engine to cool. Repeat procedure, running for 10 minutes. Full throttle and higher gears may be used, but avoid sustained full throttle operation. Check spark plug condition.
7. Allow engine to cool. Remove top end and inspect. Remove "high" spots on piston with No. 600 grit, wet sandpaper. Clean, and carefully reassemble.
8. Remove break-in fuel/oil mixture from tank. Refill with 20:1 operating fuel/oil mixture. Check entire unit for loose or misadjusted fittings/controls/fasteners.
9. Re-start engine and check through entire operating range thoroughly. Stop. Check spark plug condition. Re-start. After 10 — 15 minutes operation, machine is ready to OFF-ROAD riding.

PERIODIC MAINTENANCE AND ADJUSTMENTS

PRE-OPERATION CHECK LIST

ITEM	ROUTINE	PAGE
BRAKES	Check operation/adjustment	10
CLUTCH	Check operation/lever adjustment	11
FUEL TANK	Fill with proper fuel/oil mix	2
TRANSMISSION	Change oil as required	2
DRIVE CHAIN	Check alignment/adjustment/lubrication	11
SPARK PLUG	Check condition/clean or replace as required	12
THROTTLE	Check for proper cable operation	8
AIR FILTER	Foam type — must be clean and damp with oil always	14
WHEELS & TIRES	Check pressure/runout/spoke tightness/axle nuts	34
FITTINGS/FASTENERS	Check all/tighten as necessary	51
LIGHTS	Check for proper operation	—

NOTE:

Pre-operation check should be made each time machine is used. Such an inspection can be thoroughly accomplished in a very short time and the added safety it assures is more than worth the time involved.

The maintenance and lubrication schedule chart should be considered strictly as a guide to general maintenance and lubrication intervals. You must take into consideration that weather, terrain, geographical locations, and a variety of individual uses all tend to demand that each owner alter this time schedule to match his environment. For example, if the machine is continually operated in an area of high humidity then all parts must be lubricated much more frequently than shown on the chart to avoid rust and damage. If you are in doubt as to how closely you can follow these time recommendations, check with the YAMAHA dealer in your area.

MAINTENANCE AND LUBRICATION SCHEDULE CHART

	After Every Ride	Every 500 km	Every 1,500 km	After Every Event	As Required	Recommended Lubricant type
WASH MACHINE	(This item is also essential to proper performance)				×	
PISTON Inspect Clean Replace		× ×		× ×	 ×	
PISTON RING Inspect Replace		×	 ×	×	 ×	
CYLINDER Inspect Head torque Replace		× ×		× ×	 ×	
CLUTCH Adjust Replace (Plates)					× ×	
TRANSMISSION Oil change Inspect gears/ Shift mech. Replace bearings		×	 ×	×	 × ×	No. 1
CRANKSHAFT Main bearing check Big end check Small end check Piston pin check		 × ×	× ×	 × ×		
CARBURETOR Clean, inspect, & adjust		×		×		
EXHAUST SYSTEM Inspect & tighten Clean and decarbonize		×		×	 ×	
FRAME Clean & inspect		×		×		
SWING ARM Check lubricate		×	 ×	×	 ×	 NO. 5
CONTROLS & CABLES Check & adjust Lubricate	 ×	 ×		 ×		 NO. 2
BRAKES Check & adjust Replace linings		×		×	 ×	
WHEELS & TIRES Check runout Check spokes Check bearings	 ×	× ×		× × ×		

	After Every Ride	Every 500 km	Every 1,500 km	After Every Event	As Required	Recommended lubricant type
STEERING HEAD Check Clean, lube & repair		×	× × (every two events)			NO. 6
CDI Check connectors		×		×		
AIR FILTER Clean & oil Replace	×			×	× ×	NO. 3
SPARK PLUG Check condition	×					
DRIVE CHAIN Clean & lubricate Check tension Replace	× ×			×	×	NO. 2
FUEL TANK Clean & flush Clean petcock filter		× ×	×	× ×		
REAR SHOCK Clean & inspect				×		
FRONT FORKS Clean & change oil Replace seals		×		×	× ×	NO. 4
CLUTCH & BRAKE SHAFT Lubricate		×		×		NO. 5

RECOMMENDED LUBRICANT

NO. 1 Use Yamaha 4-cycle oil or SAE 10W/30 "SE" motor oil.

NO. 2 Use Yamaha Chain and Cable Lube or SAE 10W/30 "SE" motor oil.

NO. 3 Air filters-foam element air filters must be damp with oil at all times to function properly. Clean and lube every meet and every ride. Do not over-oil. Use SAE 10W/30 "SE" motor oil.

NO. 4 Use Yamaha Fork Oil 20wt.

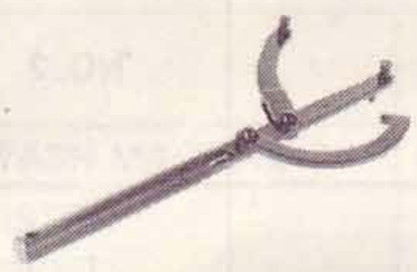
NO. 5 Use lithium base grease.

NO. 6 Medium-weight wheel bearing-grease of quality manufacturer — preferably waterproof.

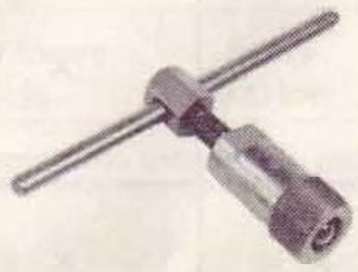
SPECIAL TOOLS AND GAUGES

NOTE:

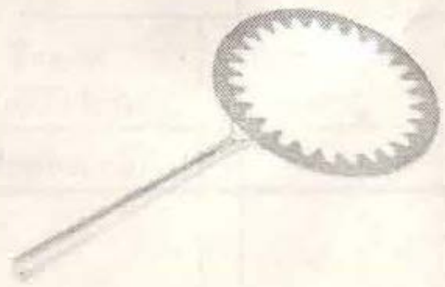
The Research and Engineering Departments of Yamaha are continually striving to further perfect all models. Improvements and modifications are therefore inevitable. In light of this fact, the foregoing specifications are subject to change without notice to the owner. Information regarding significant changes is forwarded to all Authorized Yamaha Dealers as soon as available. If a discrepancy is noted, please consult you dealer.



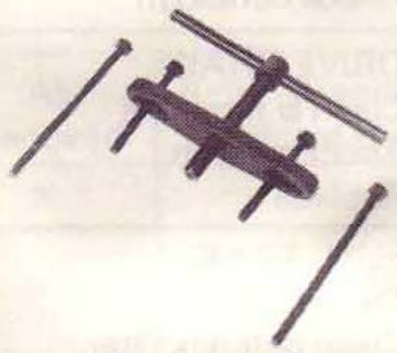
90890-01235
Flywheel holding tool



90890-01189
Flywheel puller



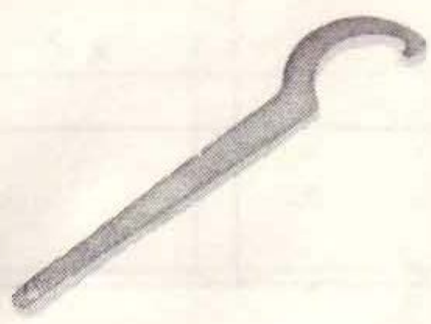
90890-01024
Clutch holding tool



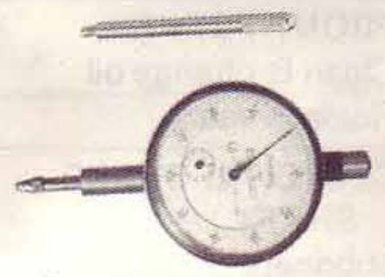
90890-01135
Crankcase separating tool

90890-01012
Crankshaft setting pot
90880-01015
Crankshaft setting tool

90890-01016
Spacer

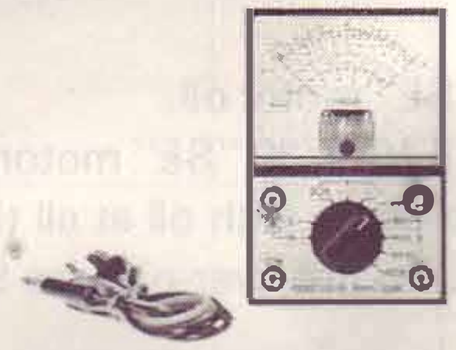


90890-01051
Steering nut wrench



90890-03099
Dial gauge needle
90890-03002
Dial gauge

90890-01195
Dial gauge stand

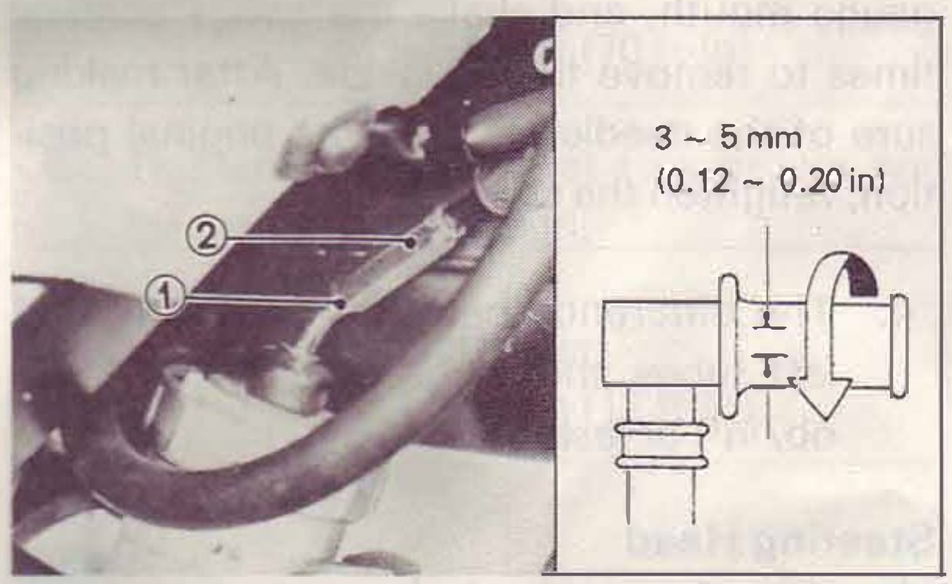


90890-03104
Pocket tester

ADJUSTMENTS

Carburetor
Under normal operating conditions, there are only two adjustments to be made to the carburetor.

Throttle cable adjustment
Check play in turning direction of throttle grip. The play should be 3 — 5 mm (0.12 — 0.20 in) at grip flange, loosen the lock nut and turn the wire adjuster to make the necessary adjustment.
Tighten the adjuster lock nut.

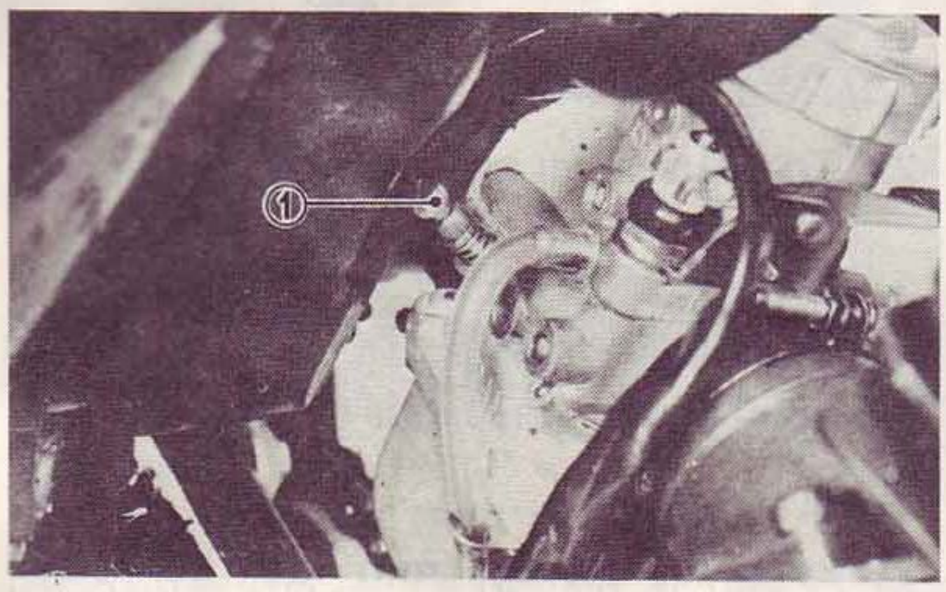


1. Lock nut
2. Adjuster

Idle speed and idle air adjustments

1. Turn pilot air screw in until lightly seated.
2. Back out as specified.

Pilot air screw turns out:	
IT250G	1-1/2
IT425G	1-1/2

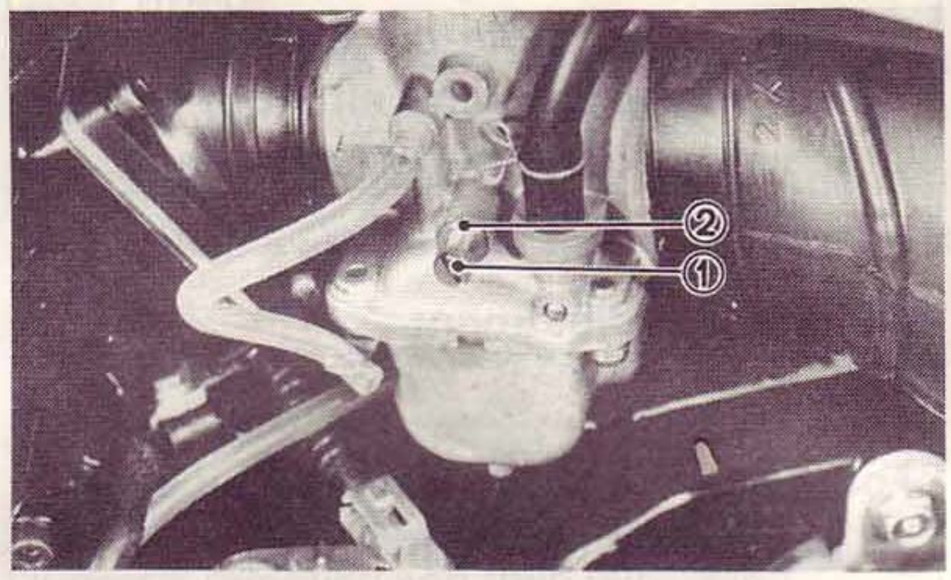


1. Pilot air screw

3. Turn the throttle stop screw until idle is at recommended r/min.

NOTE:
A lock nut is incorporated for positive retention of idle adjusting screw.

4. Turn the pilot screw in or out until idle speed is at highest rpm.
5. Turn the throttle stop screw in or out until idle speed is at desired r/min.



1. Throttle stop screw
2. Lock nut

NOTE:
Pilot air and throttle stop screws should be so adjusted that engine response from idle position is rapid and without hesitation.

Idle speed: 1,300 ± 50 r/min

If the engine, when warm, hesitates after adjusting as described, turn the pilot air screw screw in or out in 1/4 turn increments until the problem is eliminated.

Front Forks

CAUTION:

To prevent an accidental explosion of air, the following instructions should be observed:

1. **Use only air or nitrogen for filling. Never use any other gas. An explosion may result.**
2. **Never throw the air shock absorber into fire.**
3. **Before removing the air shock absorbers out from the front forks, be sure to extract the air from the air chamber (inner tube) completely.**

Air pressure adjustment

CAUTION:

For proper damping effects, the sealed air pressure must be maintained at the following levels. Both forks must have the same pressure.

1. Place a suitable stand under the engine to keep the front of machine raised off the floor. No weight on front wheel.
2. Using a manual air pump fill with air.

CAUTION:

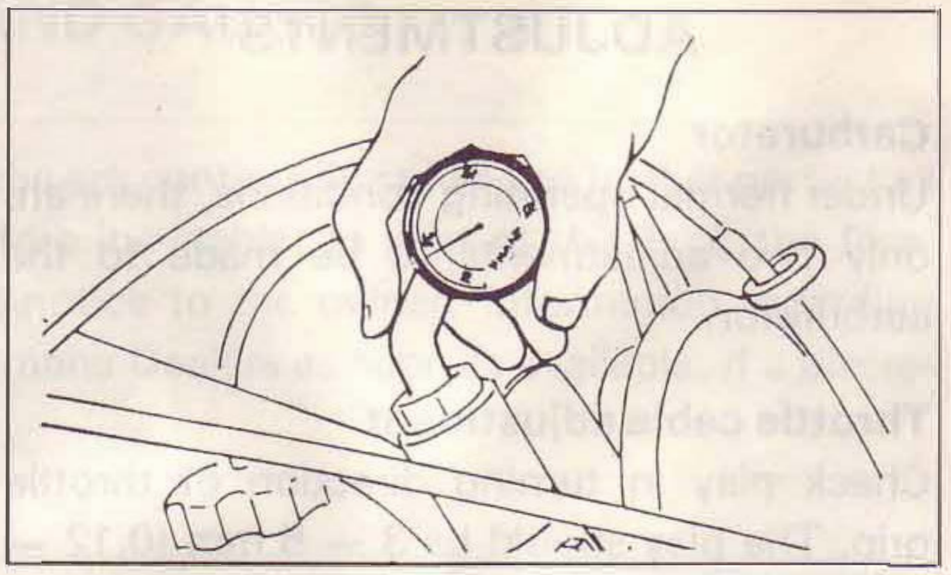
The gas pressure should not exceed 2.5 kg/cm². Excess gas pressure will cause damage to the forks.

3. Using the air check gauge, adjust the air pressure to specification.

Standard air pressure:
0 ∿ 0.05 kg/cm² (0 ∿ 0.7 psi)

NOTE:

Each time the air gauge is inserted, the air pressure decreases about 0.05 to 0.1 kg/cm².



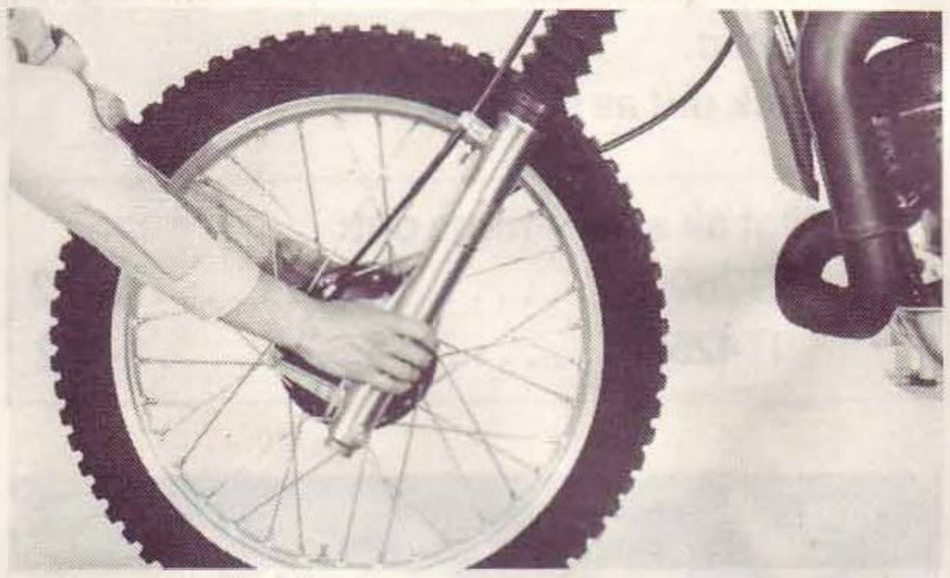
NOTE:

When oil enters the gauge, thereby keeping the needle from returning to the original position, loosen the screw in the rubber at the gauge mouth, and shake the gauge serveral times to remove the oil inside. After making sure of the needle being at the original position, retighten the screw.

4. The difference between both right and left tubes should be 0.1 kg/cm² (1.42 ob/in²) or less.

Steering Head

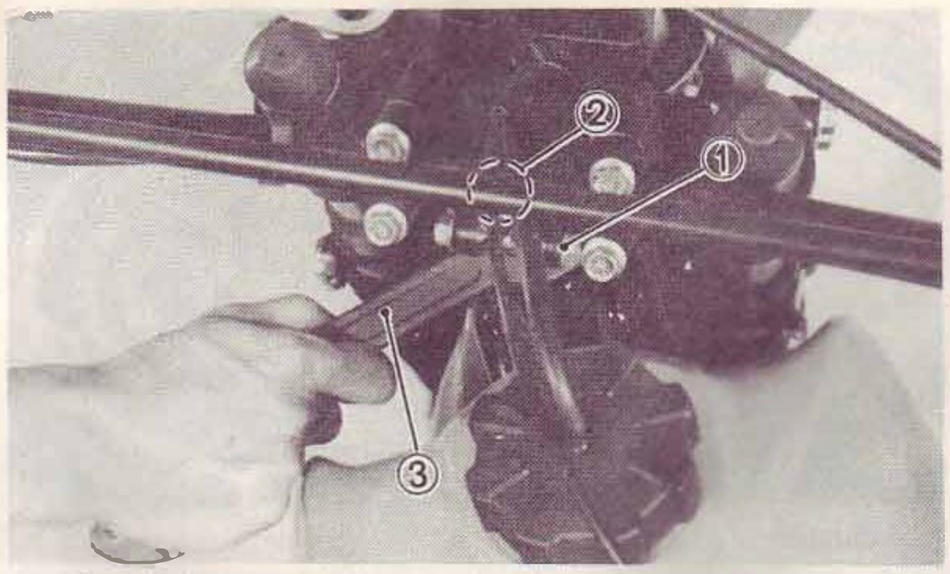
1. With front wheel elevated, grasp bottoms of fork legs and gently push and pull to check steering head freeplay. There should be no noticeable freeplay.



2. To adjust, first loosen upper stem pinch bolt.
3. Loosen stem bolt.
4. Use ring wrench to tighten adjust nut. Tighten until freeplay is eliminated.

CAUTION:

Forks must swing from lock to lock without binding or catching.



1. Pinch bolt 2. Stem bolt 3. Ring nut wrench

5. Tighten stem bolt and torque to specification.

Stem bolt torque: 9.5 m-kg (70 ft-lb)

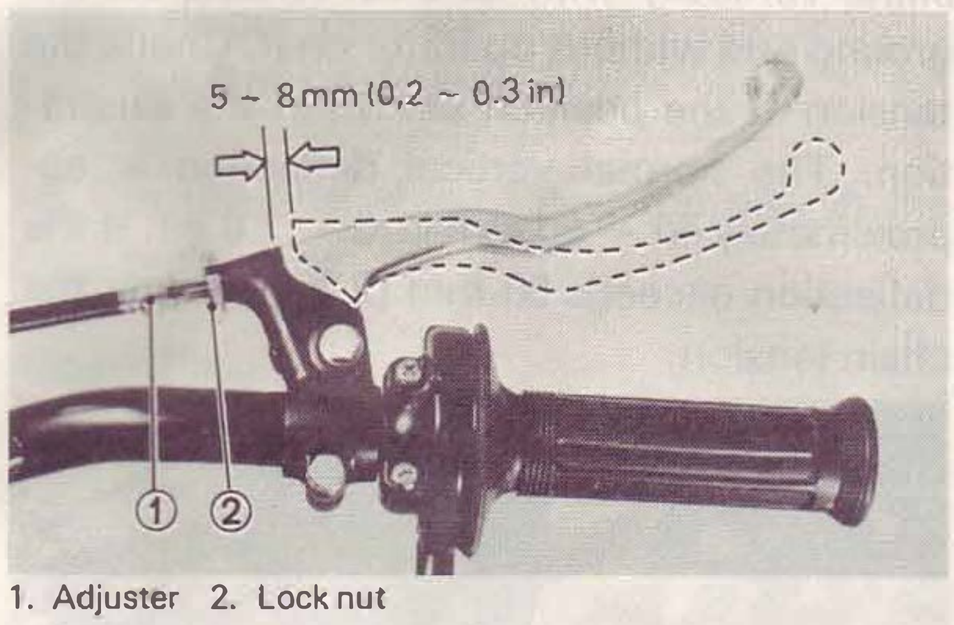
6. Tighten pinch bolts at fork crown and torque to specification.

Stem pinch bolt torque: 2.3 m-kg (17 ft-lb)

NOTE:
Steering head disassembly must be performed by your Yamaha dealer.

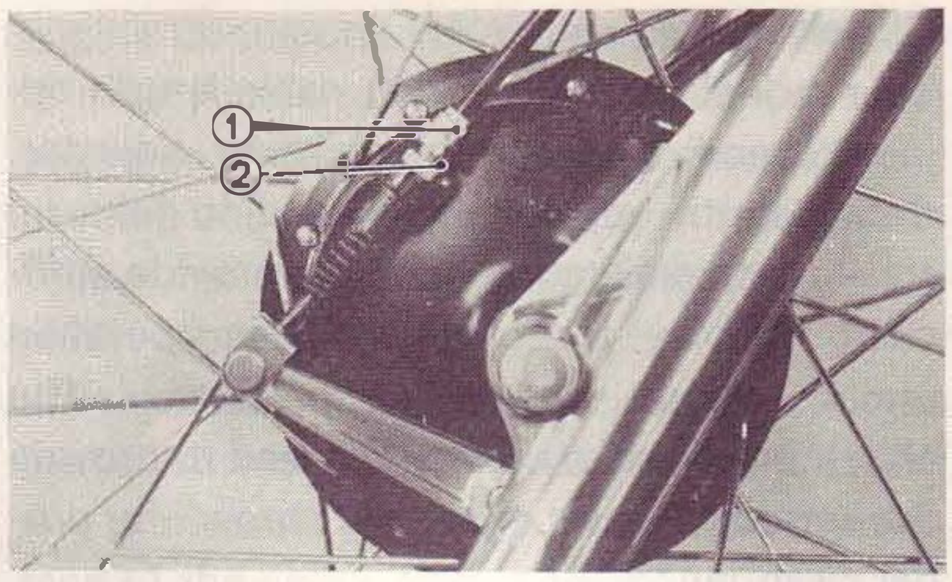
Front Brake

Front brake should be adjusted to suit rider preference with a minimum cable slack of 5 — 8 mm (0.2 — 0.32 in) play at the brake lever pivot point.



1. Adjuster 2. Lock nut

Adjustment is accomplished at one of two places; either the handle lever holder or the front brake hub.

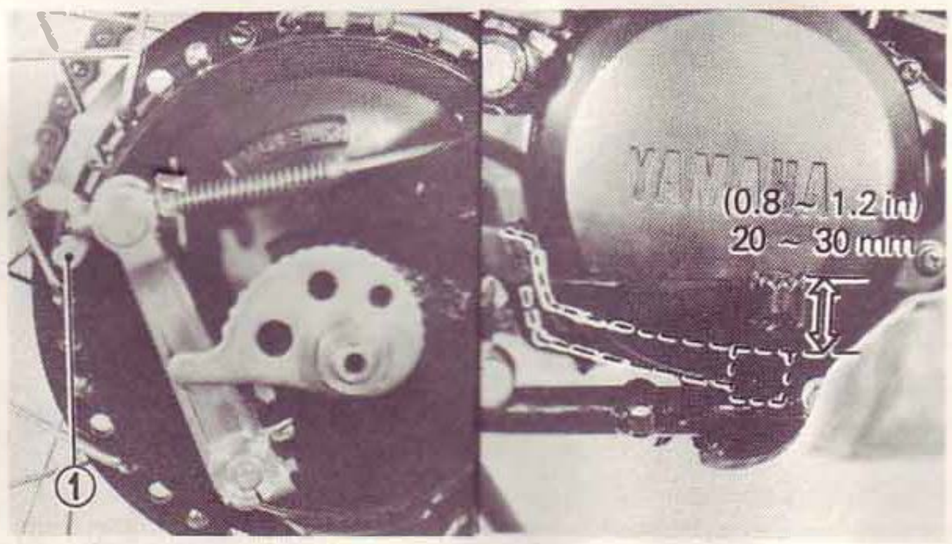


1. Adjuster 2. Lock nut

Rear Brake

Adjust rear brake pedal play to suit, providing a minimum of 20 — 30 mm (0.80 — 1.20 in) freeplay. Turn the adjusting nut on the rear brake ferrule in or out brake pedal freeplay is suitable.

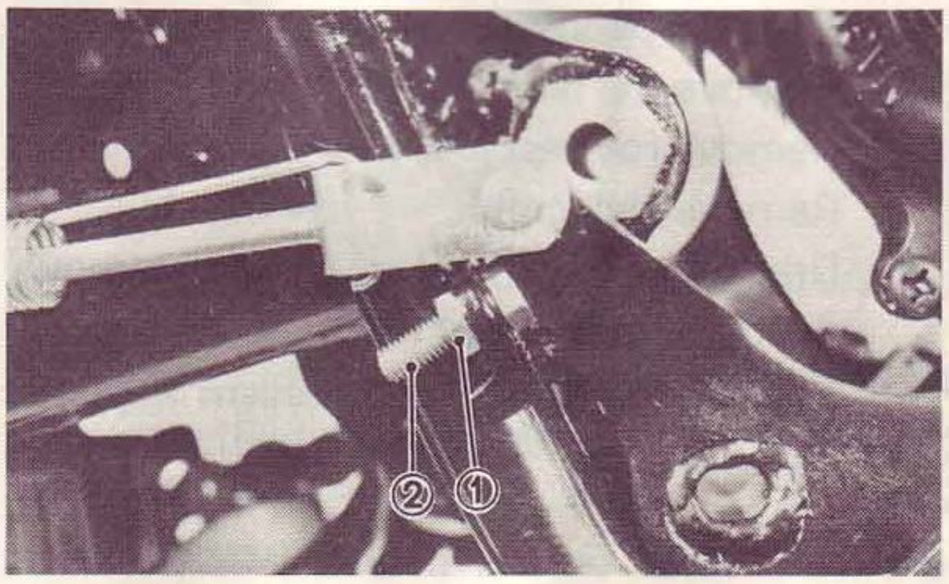
NOTE:
Rear brake pedal adjustment must be checked anytime chain is adjusted or rear wheel is removed and then reinstalled.



1. Adjuster

Brake pedal position

The position of the rear brake pedal should be adjusted with relation to the foot rest. Loosen the lock nut and adjust the pedal height by turning the adjusting bolt.



1. Lock nut 2. Adjuster

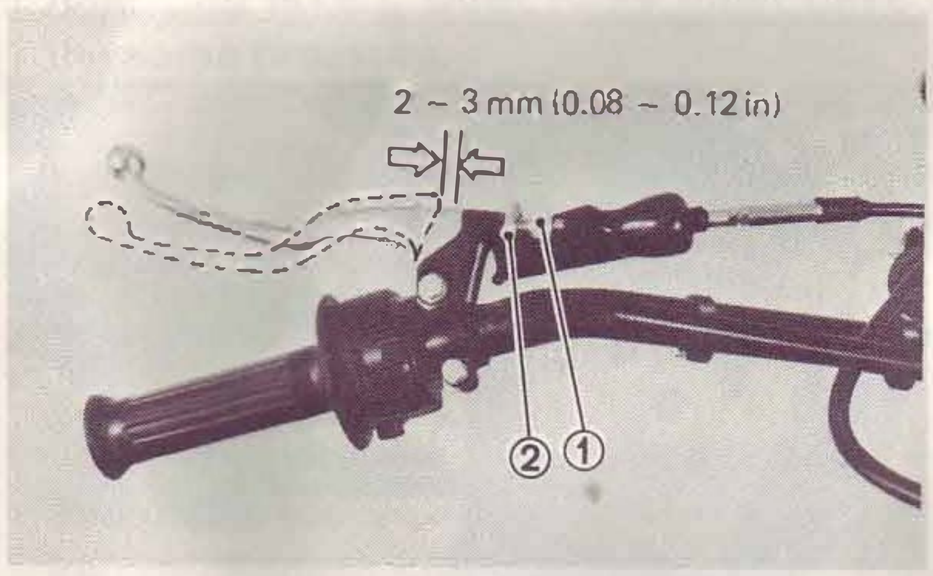
Clutch

This model has two clutch cable-length adjusters and a clutch mechanism adjuster. Cable-length adjusters are used to take up slack from cable stretch and to provide sufficient freeplay for proper clutch operation under various operating conditions. The clutch mechanism adjuster is used to provide the correct amount of clutch "throw" for proper disengagement.

Normally, once the mechanism is properly adjusted, the only adjustment required is maintenance of freeplay at the clutch handle lever.

Freeplay adjustment

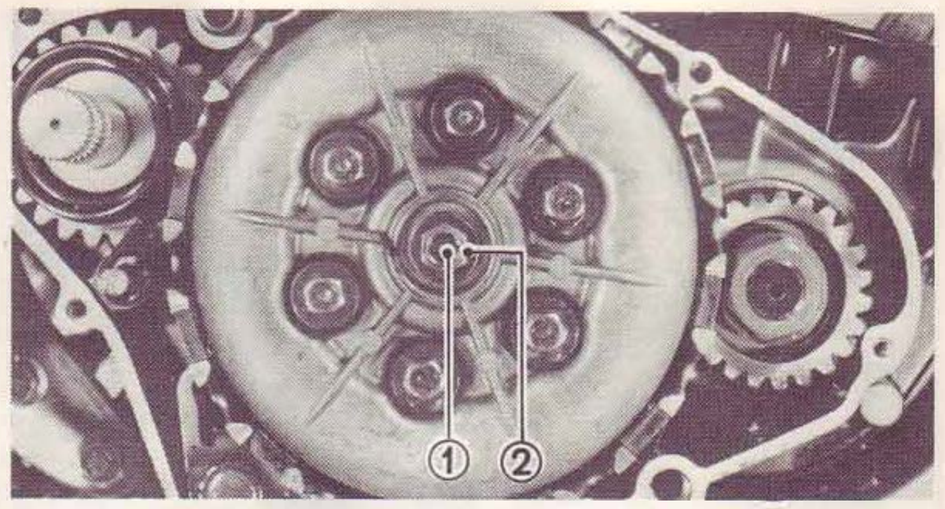
Loosen either the handle lever adjuster lock nut or the cable inline length adjuster lock nut. Next, turn the length adjuster either in or out until proper lever freeplay is achieved (see illustration).



1. Adjuster 2. Lock nut

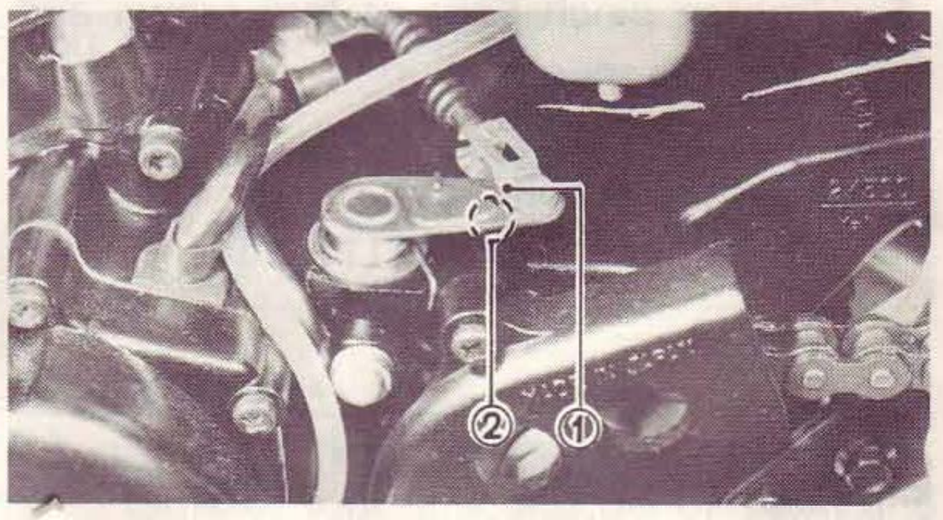
Mechanism adjustment

1. Fully loosen the cable in-line length adjuster lock nut and screw in the adjuster until tight.
2. Turn the handle lever adjuster in.
3. Remove the rear brake rod from lever. Remove footrest and brake pedal. Remove kick crank.
4. Drain the transmission oil and remove the crankcase cover (R).
5. Loosen the clutch mechanism adjuster lock nut.



1. Adjuster 2. Lock nut

6. Push the push lever toward the center of the engine with your finger until it stops. With the push lever in this position, turn the adjuster in until the push lever mark and crankcase match mark are aligned. Tighten lock nut.



1. Push lever mark 2. Case match mark

7. Install the crankcase cover, kick crank, and footrest, brake pedal and brake rod. Readjust clutch lever freeplay as required.

Dive Chain

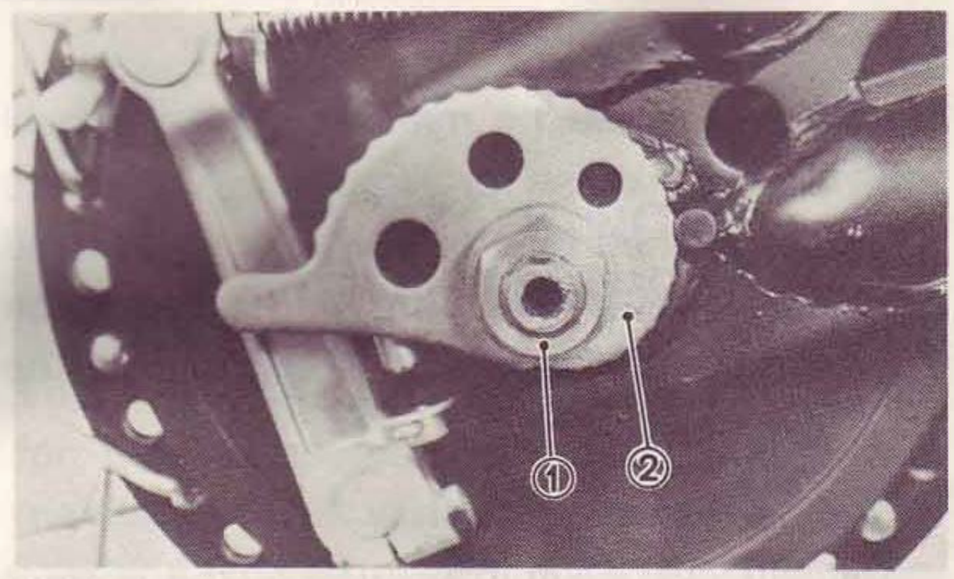
To check the chain play, the motorcycle must stand vertically with its both wheels on the ground and without operator on it. Check the tension at the position shown in the illustration. The normal vertical deflection is approximately 40 — 50 mm (1.6 — 2.0 in). If the deflection exceeds 50 mm (2.0 in) adjust the chain tension.

NOTE:

Tension inspection and adjustment should be made with the tensioner in the relaxed position (not touching the chain).

Adjustment

1. Loosen the rear brake adjuster.
2. Loosen the rear wheel axle nut.



1. Axle nut
2. Chain puller

3. Turn chain puller both left and right, until axle is situated in same cam slot position.

NOTE:

Before adjusting, rotate rear wheel through several revolutions and check tension several times to find the tightest point. Adjust chain tension with rear wheel in this "tight chain" position.

4. Tighten the rear axle nut.

Axle nut torque: 8.0 m-kg (58 ft-lb)

5. In the final step, adjust the play in the brake pedal.

Spark Plug

For normal operation use: IT250G . . . . . N-2G Champion IT425G . . . . . N-3 Champion

Spark plug gap: 0.7 mm (0.028 in)

Engine conditions will cause any spark plug to slowly break down and erode. If erosion begins to increase, or if the electrodes finally become too worn, or if for any reason you believe the spark plug is not functioning correctly, replace it.

When installing the plug, always clean the gasket surface, use a new gasket, wipe off any grime that might be present on the surface of the spark plug, and torque the spark plug properly.

Spark plug torque: 2.5 m-kg (18 ft-lb)

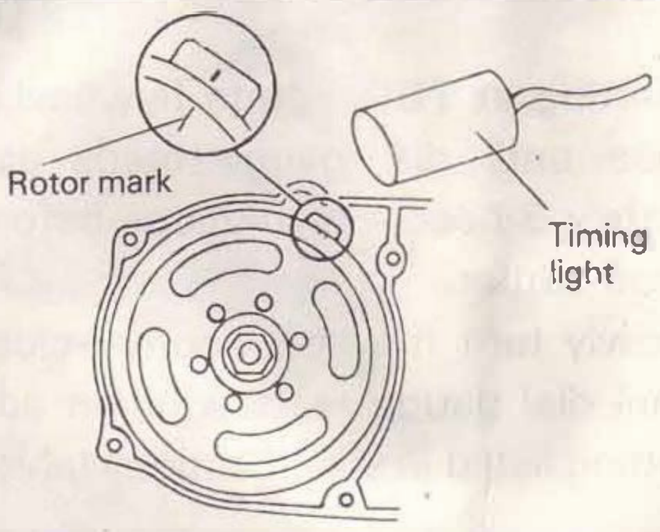
The spark plug must be removed and checked prior to using the machine. Check electrode wear, insulator color, and electrode gap.

Ignition Timing

1. Checking the ignition timing
   Ignition timing is checked with a timing light by observing the position of the marks stamped on the case and the mark on the rotor.

a. Remove the crankcase cover (L).
b. Connect the timing light to the spark plug lead wire.
c. Start the engine and keep it running at the specified speed. Use a tachometer for checking.

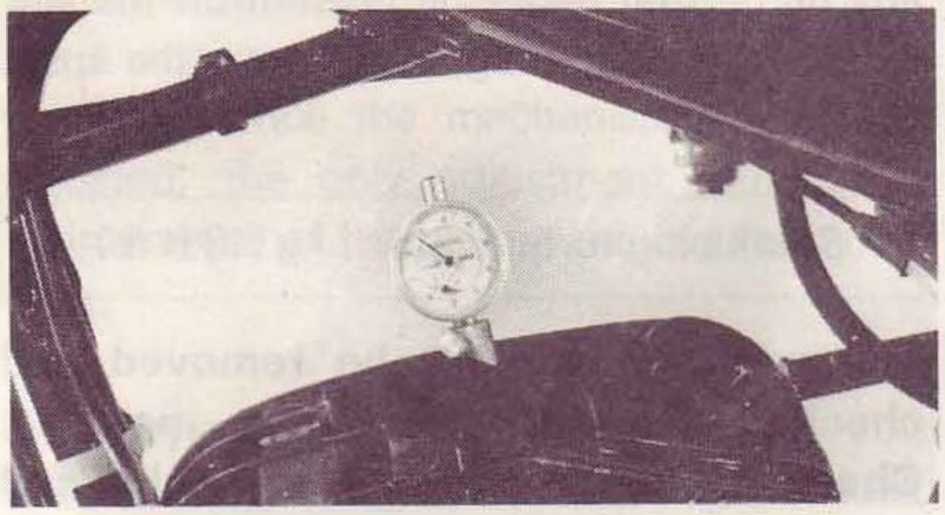
Specified Speed: 5,000 r/min (IT250G) 2,500 r/min (IT425G)



d. While keeping the engine running at a specified speeds, check that the mark on the rotor is within the range of marks (A, B) stamped on the case. If off the range, adjust ignition timing as follows:

Ignition timing must be set with a dial gauge (to determine piston position). Proceed as follows:

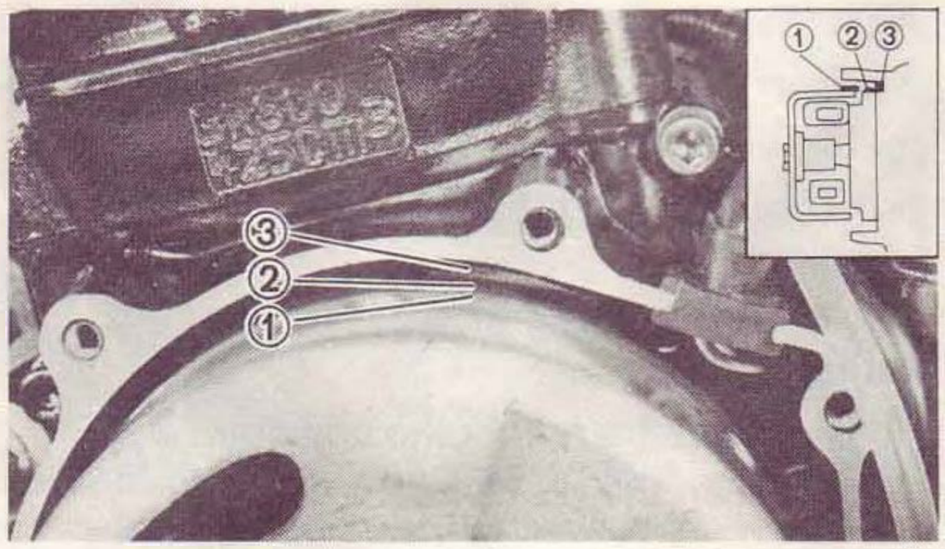
1. Remove muffler, spark plug and screw Dial Gauge Stand into spark plug hole.
2. Insert Dial Gauge Assembly with a 56 mm (2.2 in) extension (needle) into stand.



3. Remove left engine crankcase cover.
4. Rotate rotor until piston is at top-dead center (T.D.C.). Tighten set screw on dial gauge stand to secure dial gauge assembly. Set the zero on dial indicator face to line up exactly with dial indicator needle. Rotate flywheel back and forth to be sure that indicator needle does not go past zero.

5. Starting at TDC, rotate flywheel clockwise until dial gauge reads approximately 3 needle revolutions before-top-dead-center.
6. Slowly turn flywheel counter-clockwise until dial gauge reads ignition advance setting listed in specifications table.

Ignition timing	
IT250G:	2.4 ± 0.15 mm (± 0.006 in) B.T.D.C
IT425G:	3.1 ± 0.15 mm (0.094 ± 0.006 in) B.T.D.C

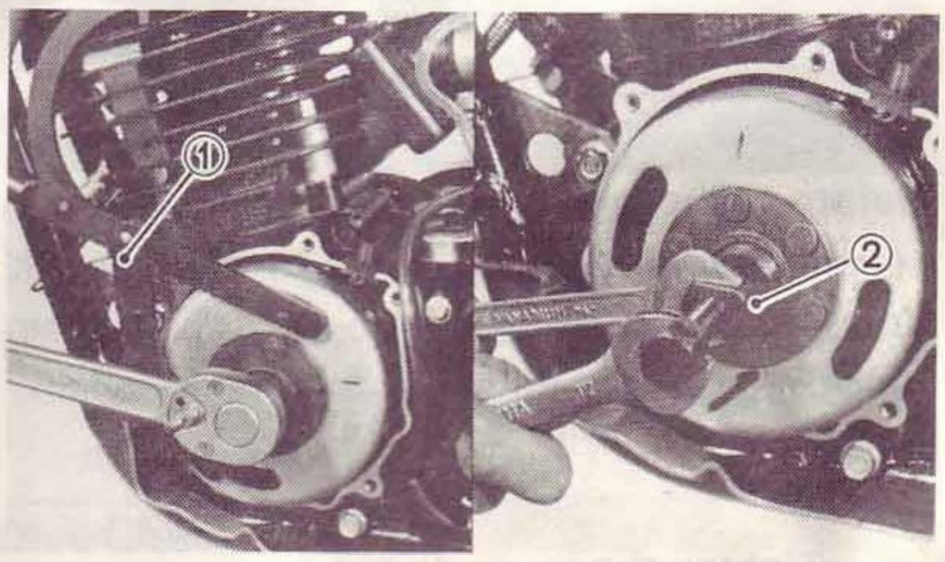


1. Flywheel mark 2. Base mark 3. Case mark

Then check the marks on the flywheel and crankcase for alignment. If they are not aligned or a new crankcase is used for replacement, punch a new mark on the crankcase matching the one on the flywheel.

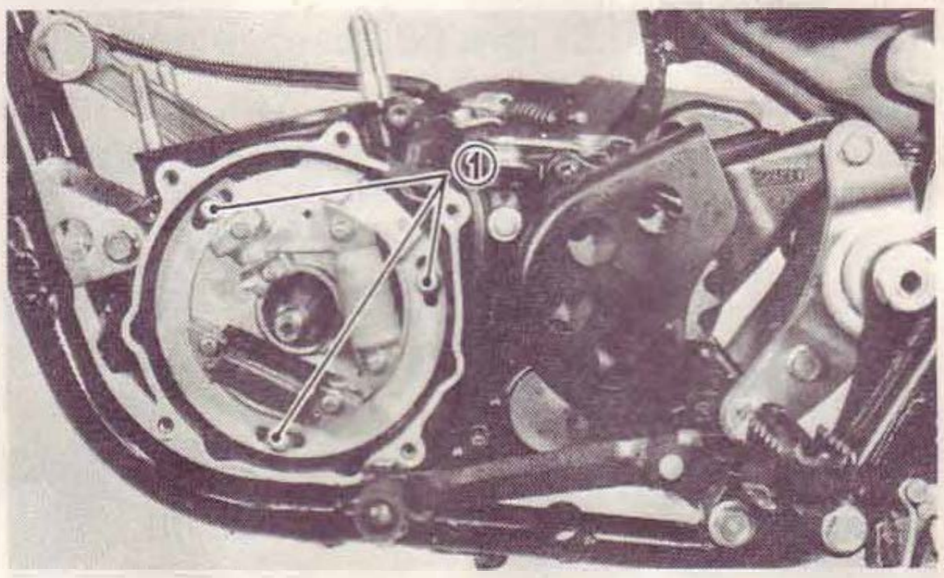
NOTE:
Be sure to locate the position in the correct position before remarking.

7. Remove the flywheel.



1. Flywheel holding tool 2. Flywheel puller

8. Check the alignment marks on the crankcase and base for alignment. If they are not aligned, loosen the base set screw until alignment is achieved.



1. Base set screw

9. Remove dial gauge assembly and stand.
   Reinstall spark plug:

Spark plug torque:
2.5 m-kg (18 ft-lb)

Reinstall crankcase cover and muffler.

MAINTENANCE AND REPAIRS

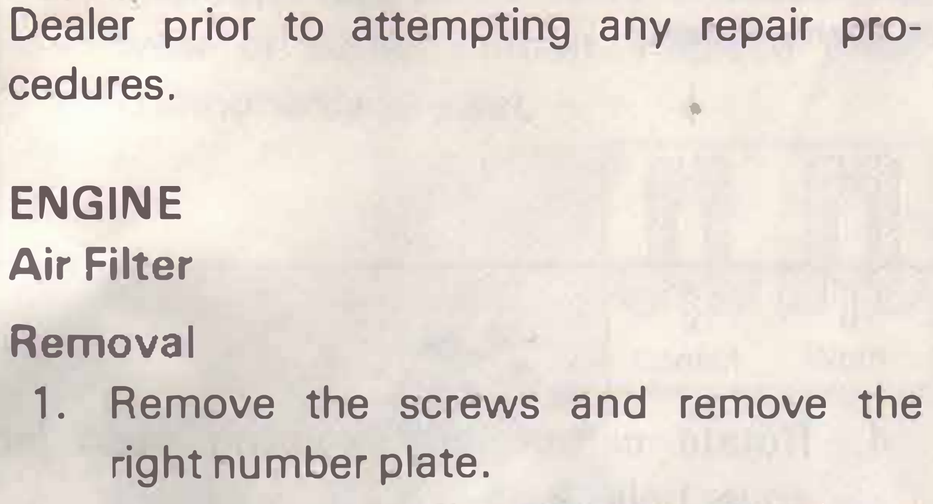
The following sections provide information for the disassembly, troubleshooting, and maintenance of various components of the machine. If you do not have the necessary tools and an understanding of the mechanical principles involved, please refrain from attempting repairs. The use of improper tools and/or procedures can cause major damage to units with resultant additional repair costs. To properly understand the procedures outlined, we suggest you consult other technical publications.
Finally, we suggest you consult Your Yamaha Dealer prior to attempting any repair procedures.

ENGINE

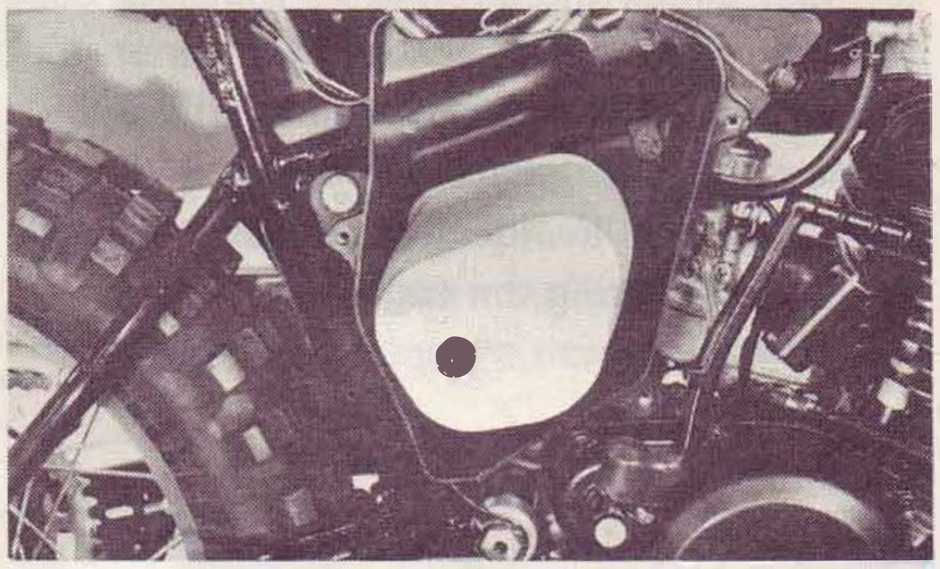
Air Filter

Removal

1. Remove the screws and remove the right number plate.
2. Remove the Phillips-head screws (3) and remove filter case cover.



3. Remove the air filter from the filter case.
4. Slip the filter from the guide.

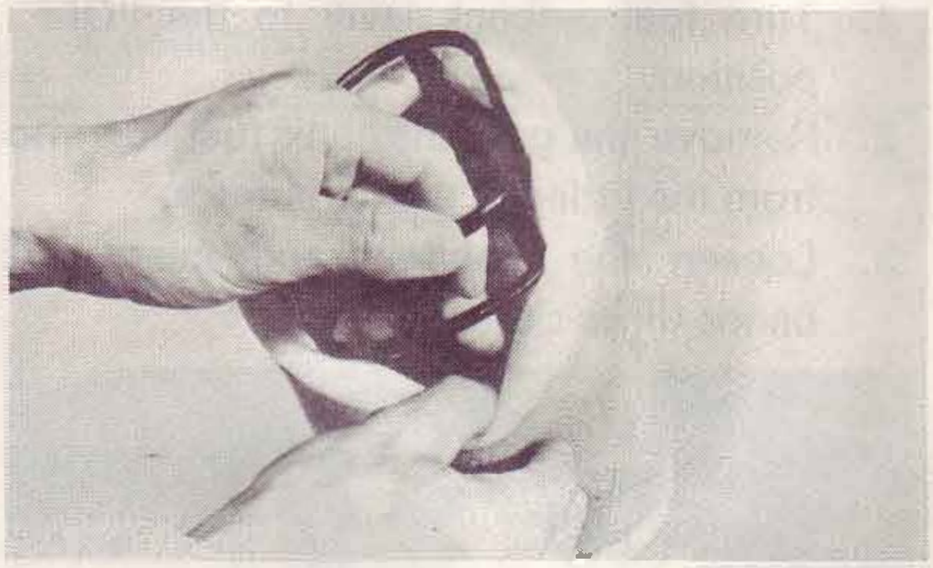


Cleaning method

1. Wash the element gently, but thoroughly, in solvent.
2. Squeeze the excess solvent out of the element and let dry.
3. Pour a small quantity of 30W motor oil onto the filter element and work thoroughly into porous foam material.

NOTE:
In order to function properly, the element must be damp with oil at all times, but not dripping with oil.

4. Re-insert the filter element guide into the element.
5. Coat the sealing edges of the filter element with light grease. This will provide an airtight seal between the filter case cover and filter seat.



6. Reinstall the element assembly and parts removed for access.

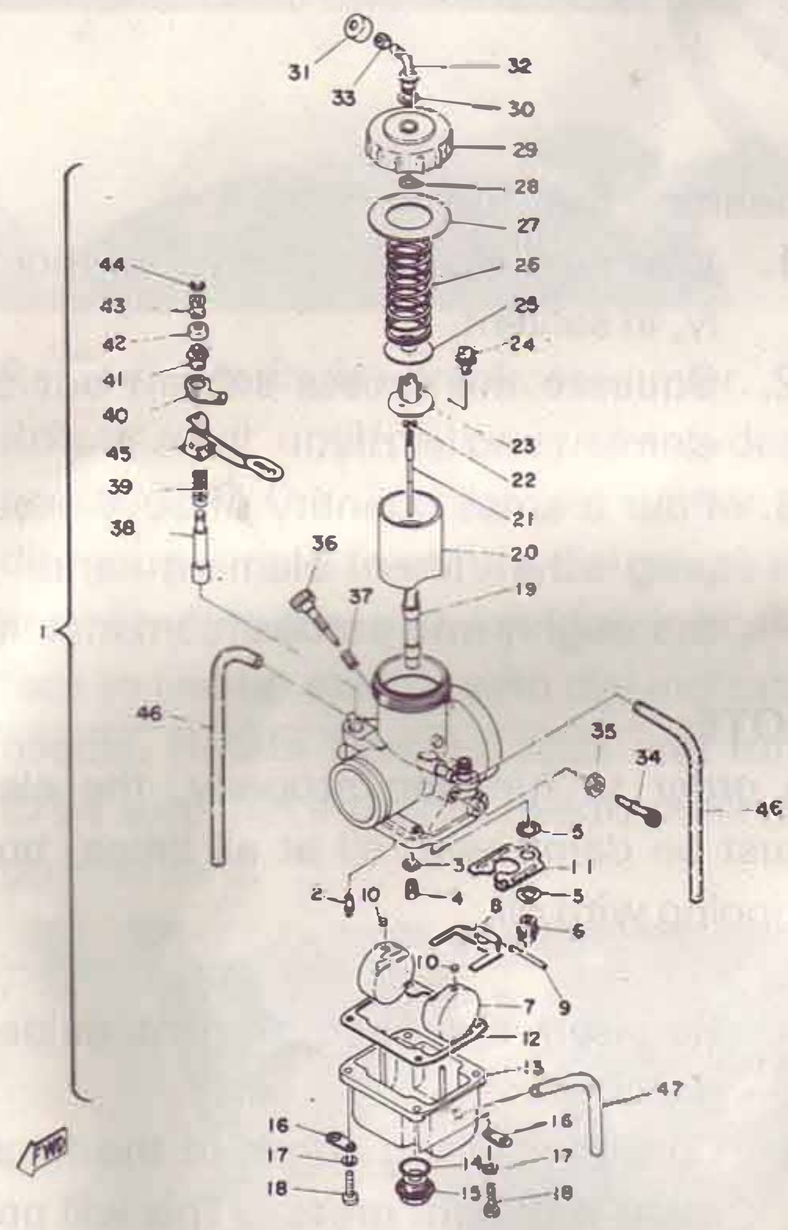
NOTE:

Each time filter element maintenance is performed, check the air inlet to the filter case for obstructions. Check the air cleaner joint rubber to the carburetor and manifold fittings for an airtight seal. Tighten all fittings thoroughly to avoid the possibility of unfiltered air entering the engine.

CAUTION:

Never operate the engine with the air filter element removed. This will alow unfiltered air to enter, causing rapid wear and possible engine damage. Additionally, operation without the filter element will affect carburetor jetting with subsequent poor performance and possible engine overheating.

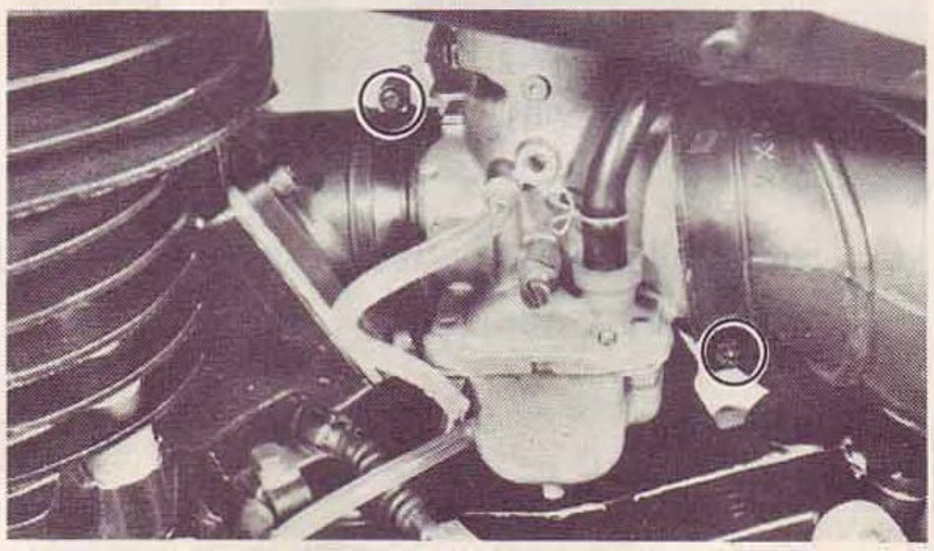
Carburetor



1. Carburetor ass'y
2. Pilot jet
3. Ring
4. Main jet
5. Valve seat washer
6. Valve seat ass'y
7. Float
8. Float arm
9. Float pin
10. Cap
11. Plate
12. Float chamber gasket
13. Float chamber body
14. O-ring
15. Screw plug
16. Plate
17. Spring washer
18. Panhead screw
19. Main nozzle
20. Throttle valve
21. Needle
22. Clip
23. Connector
24. Panhead screw
25. Seat
26. Throttle valve spring
27. Packing
28. Clip
29. Mixing chamber top
30. Gasket
31. Cap
32. Wire guide tube
33. Wire adjusting nut
34. Trottle screw
35. Wire adjusting nut
36. Air adjusting screw
37. Air adjusting spring
38. Starter plunger
39. Plunger spring
40. Starter spring plate
41. Plunger cap
42. Cap
43. Starter plunger bushing
44. Circlip
45. Starter lever
46. Air vent pipe
47. Over flow pipe

Replacement of main jet

1. Turn fuel petcock lever to the "OFF" position.
2. Remove the gasoline tank fuel line into from the fitting at the carburetor.
3. Loosen the manifold and inlet joint bands (hose clamps).



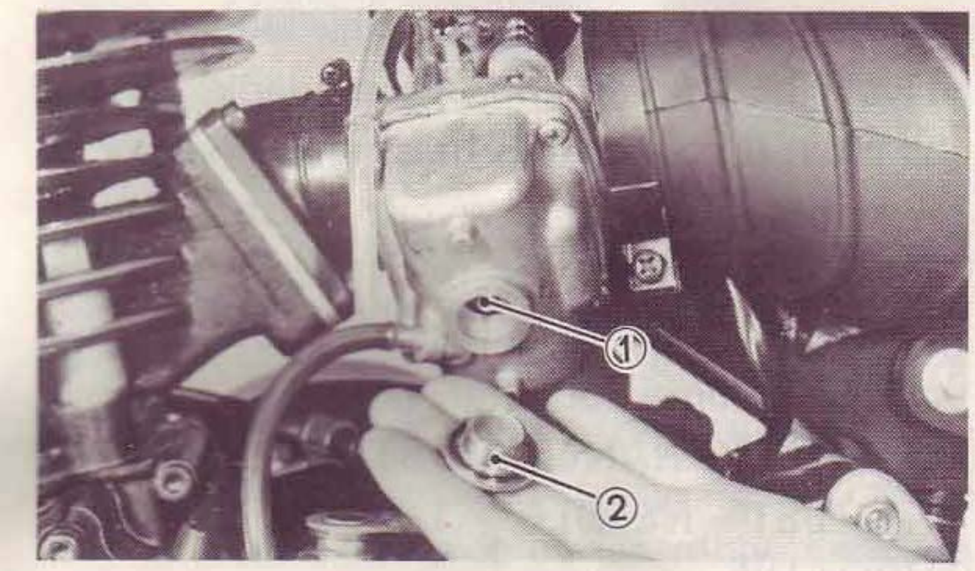
4. Rotate carburetor, exposing main jet cover bolt.
5. Remove bolt. Main jet is located directly behind bolt.

WARNING:

Removing the main jet cover bolt will allow the fuel in the float bowl to drain. Do not remove if engine is hot. Place a rag under carburetor to catch overflow. Remove bolt in well-ventilated area. Do not remove near open flame. Always clean and dry machine after reassembly.

6. Remove the main jet. Change as required. Reinstall cover bolt and reassemble, reversing steps 1 through 3.

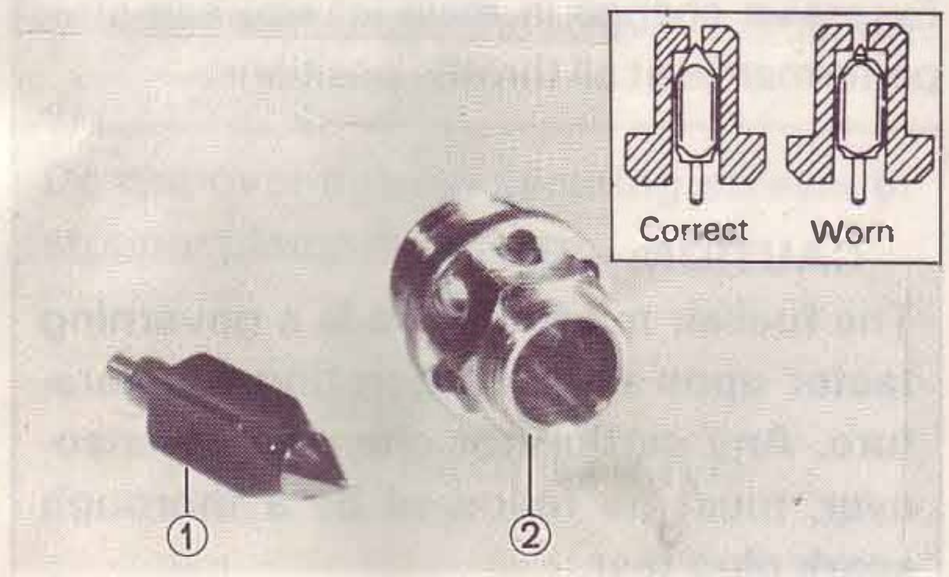
Main jet: IT250G	# 350
IT425G	# 410



1. Main jet 2. Cover bolt

Inspection

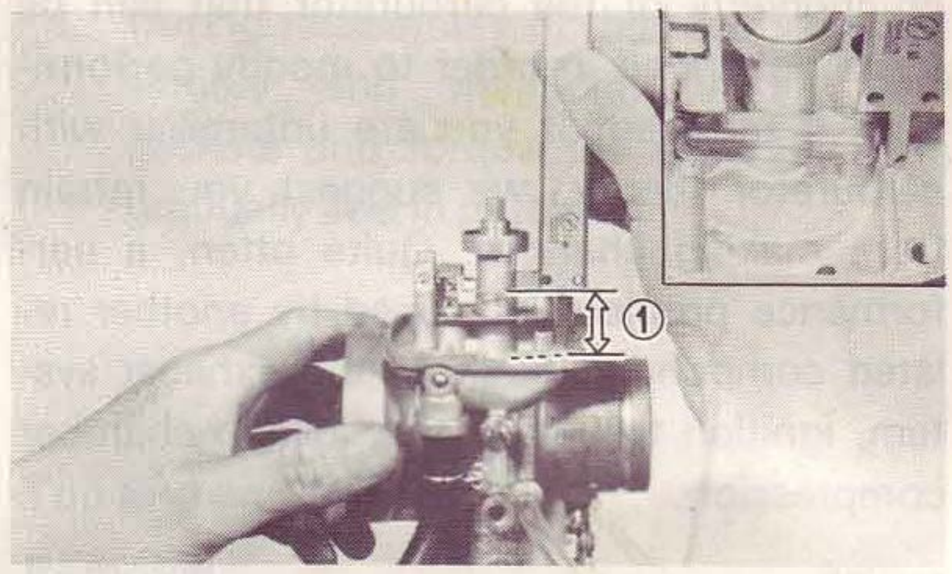
1. Examine carburetor body and fuel passages. If contaminated, wash carburetor in petroleum based solvent. Do not use caustic carburetor cleaning solutions. Blow out all passages and jets with compressed air.
2. Examine condition of floats. If floats are leaking or damaged, they should be replaced.
3. Inspect inlet needle valve and seat for wear or contamination. Replace these components as a set.



1. Float valve 2. Valve seat

Adjustments

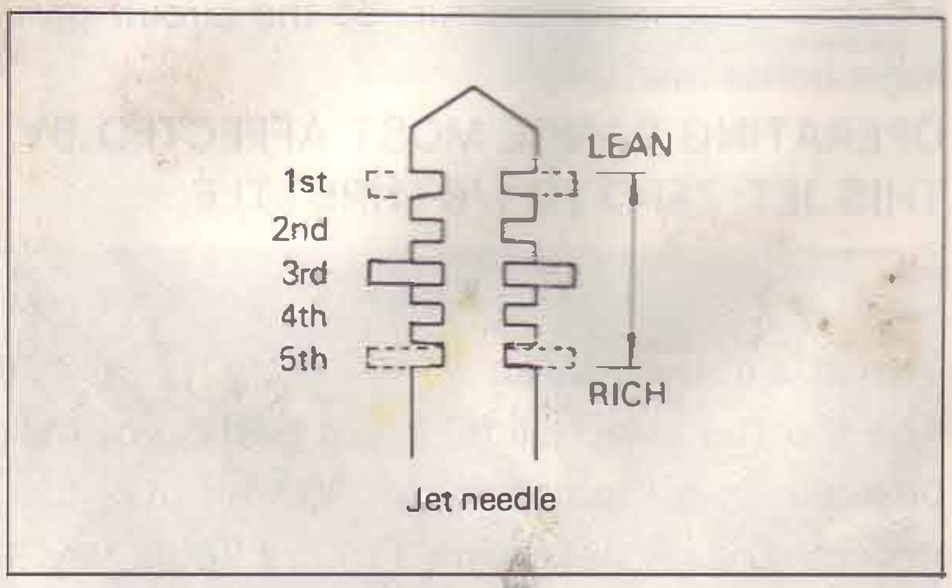
1. Float level
   Measure the distance from the float arm to the float bowl surface. Bend the tang on the float arm if any float level adjustment is necessary. Both float arms must be at the same height. If the float level is too high, a lean air/fuel mixture will occur. If too low, a rich mixture will result.



1. Float level

Float level: 18.1 ± 1 mm (0.71 ± 0.04 in)

2. Jet needle
   The mid-range air/fuel supply is affected by the position of the needle in the needle jet. If it is necessary to alter the mid-range air/fuel mixture characteristics of the machine, the jet needle position may be changed. Move the jet needle up for a leaner condition or toward the bottom position for a richer condition.



Troubleshooting

An enduro machine requires immediate, predictable throttle response over a wide operating range. Cylinder porting, combustion chamber compression, ignition timing, muffler design, and carburetor size and component selection are all balanced to achieve this goal. However, variations in temperature, humidity and altitude will affect carburetion and consequently, engine performance.

The following list gives each of the major components of the carburetor that can be readily changed in order to modify performance if required. If you are unfamiliar with carburetor theory, we suggest you refrain from making changes. Quite often, a performance problem is caused by another related component, such as the exhaust system, ignition timing or combustion chamber compression.

NOTE:

See MECHANICAL ADJUSTMENTS for additional carburetor adjustments.

Pilot air screw:

Controls the ratio of air-to-fuel in the idle circuit. Turning the screw in decreases the air supply, giving a richer mixture.

OPERATING RANGE MOST AFFECTED BY THIS ADJUSTMENT: ZERO TO 1/8 THROTTLE.

Pilot jet:

Controls the ratio of fuel-to-air in the idle circuit. Changing the jet to one with a higher number supplies more fuel to the circuit giving a richer mixture.

OPERATING RANGE MOST AFFECTED BY THIS JET: ZERO TO 1/8 THROTTLE.

Throttle valve (slide):

The throttle valve (slide) has a portion of the base cut away to control air flowing over the main nozzle. A wider angle (more "cutaway" will create a leaner mixture. Throttle valves are numbered according to the angle of the cutaway. The higher the number, the more cutaway, the leaner the mixture.

OPERATING RANGE MOST AFFECTED BY THE THROTTLE VALVE: 1/8 to 1/4 (+) THROTTLE.

Jet needle:

The jet needle is fitted within the throttle valve. The tapered end of the needle fits into the main nozzle outlet. Raising the needle allows more fuel to flow out of the needle. Moving the needle clip from the first, or top groove, through the fifth, or bottom groove, will give a correspondingly richer mixture.

OPERATING RANGE MOST AFFECTED BY THE JET NEEDLE: 1/4 to 3/4 (+) THROTTLE.

Main jet:

The main jet controls overall fuel flow through the main nozzle. changing the jet to one with a higher number supplies more fuel to the main nozzle giving a richer mixture.

OPERATING RANGE MOST AFFECTED BY THE MAIN JET: 3/4 TO FULL THROTTLE.

NOTE:

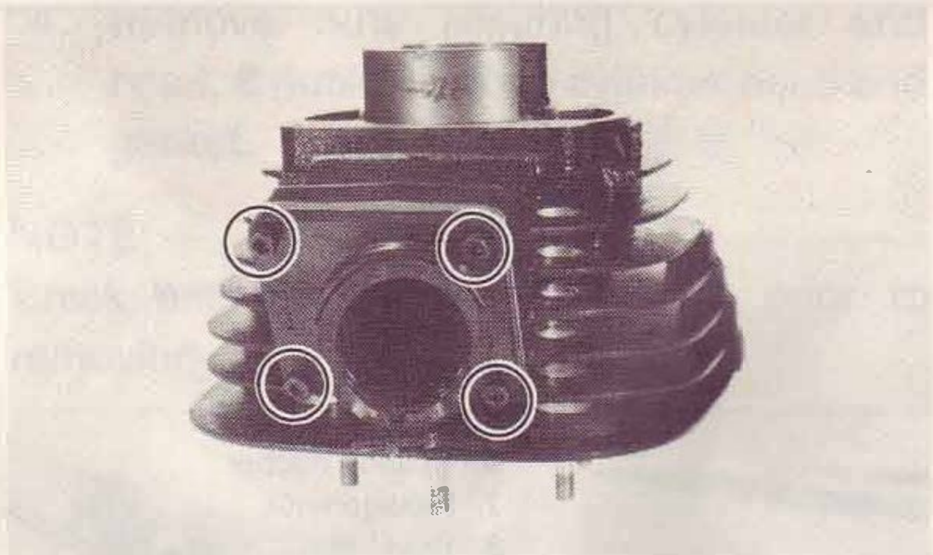
Excessive change in main jet size can affect performance at all throttle positions.

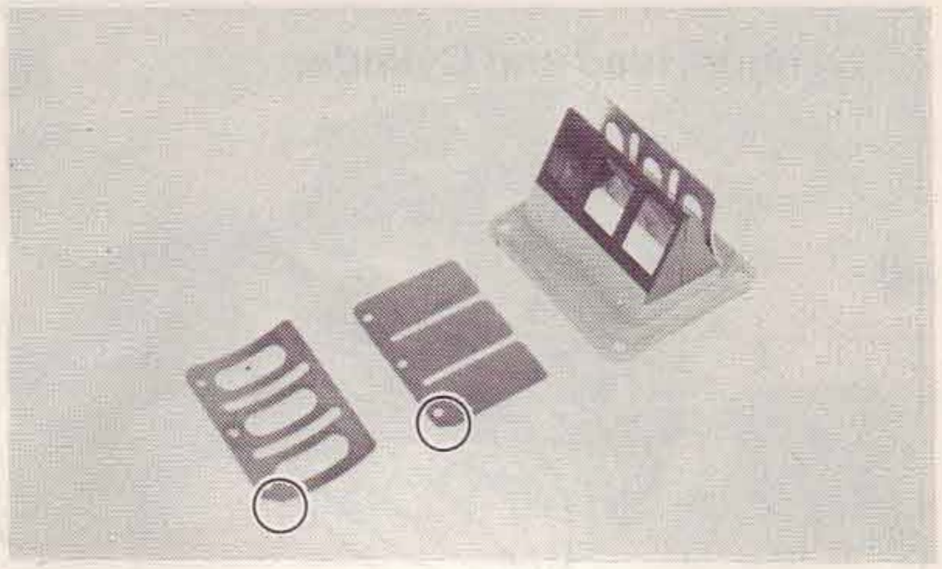
CAUTION:

The fuel/air mixture ratio is a governing factor upon engine operating temperature. Any carburetor changes, whatsoever, must be followed by a thorough spark plug test.

Reed Valve

1. With carburetor removed, remove the four bolts holding the intake manifold and reed valve assembly to the cylinder. Remove the reed valve assembly.





2. Inspect reed petals for signs of fatigue cracks. Reed petals should fit flush or nearly flush against neoprene seats. If in doubt as to sealing ability, apply suction to carburetor side of assembly. Leakage should be slight to moderate.
3. If disassembly of the reed valve assembly is required, proceed as follows:
   a. Remove phillips screws (2) securing stopper plate and reed to block. Handle reed carefully. Avoid scratches and do not bend. Note from which side of the reed block the reed and stopper plate were removed. Reinstall on same side.
   b. During reassembly, clean reed block, reed, and stopper plate thoroughly. Apply a holding agent, such as "Lock-Tite," to threads of phillips screws. Tighten screws gradually to avoid warping, then tighten the screws thoroughly.

CAUTION:

Do not over-tighten securing screws or stopper plates may warp.

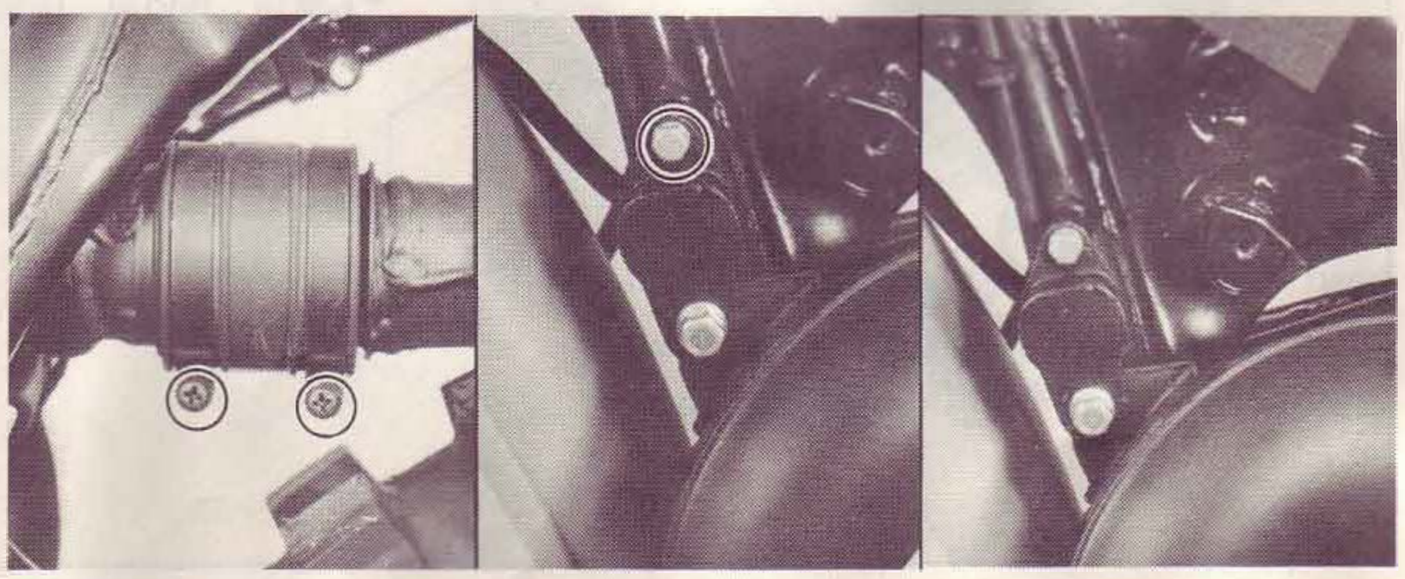
Securing screw torque:
8.0 cm-kg (6 ft-lb)

4. During reassembly of the reed valve assembly and manifold, install new gaskets and torque the securing bolts gradually and in pattern.

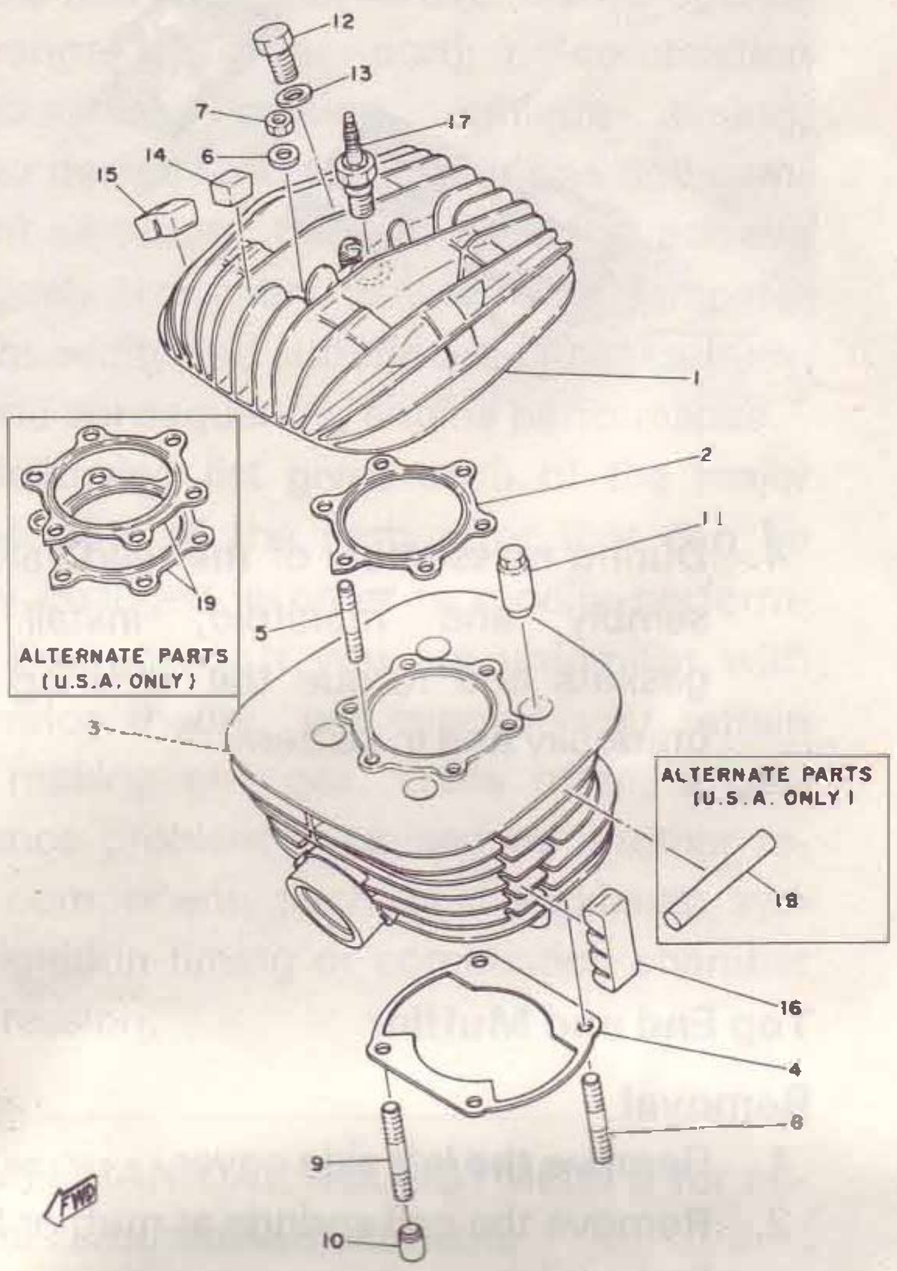
Top End and Muffler

Removal

1. Remove the left side cover.
2. Remove the coil springs at muffler to cylinder joint.
3. Remove the muffler mounting bolts and loosen the muffler joint screws.
   And remove clutch wire.



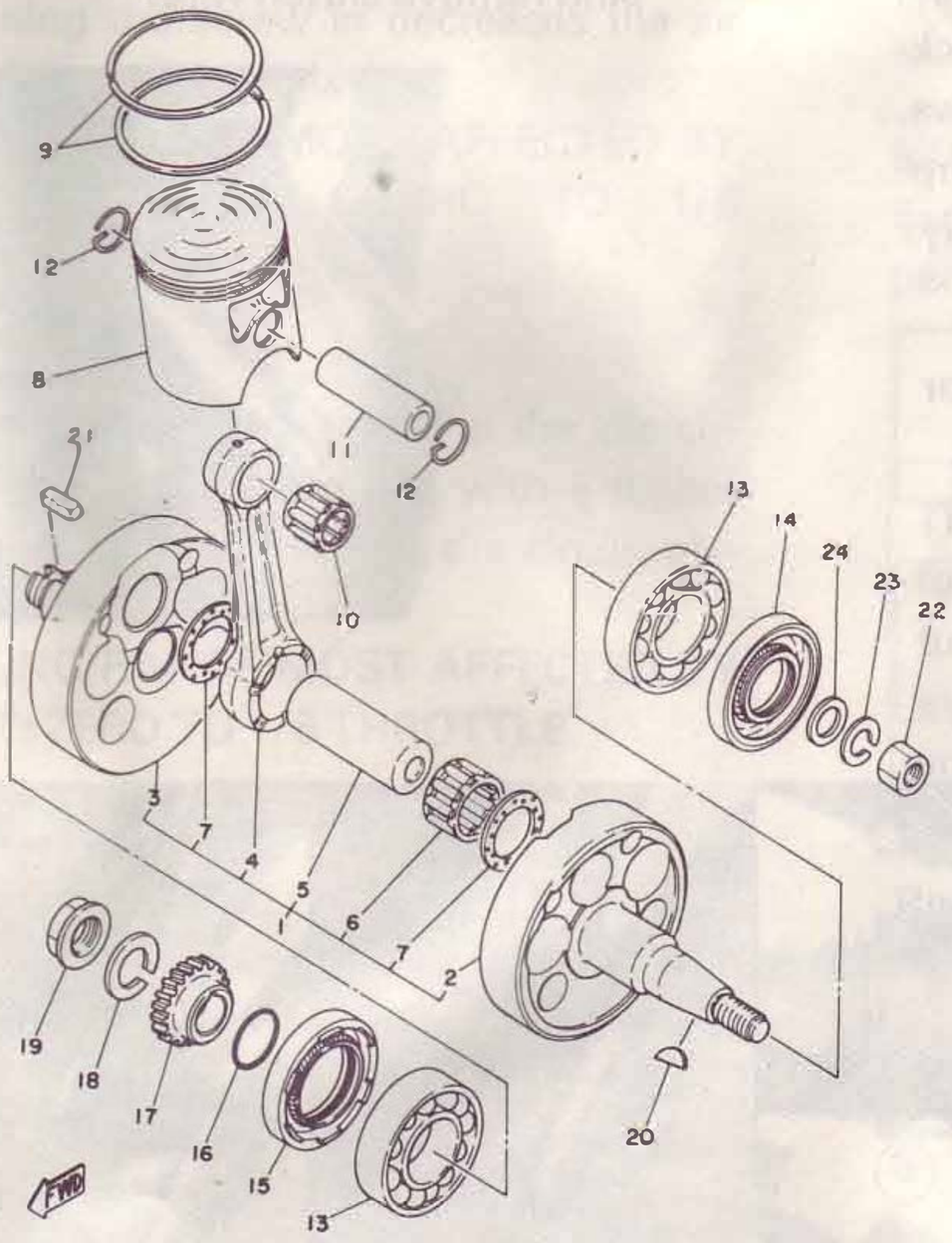
Cylinder Head and Cylinder



1. Cylinder head
2. Cylinder head gasket
3. Cylinder
4. Cylinder gasket
5. Stud bolt
6. Holding washer
7. Hexagon nut
8. Stud bold
9. Stud bold
10. Dowel pin
11. Nut
12. Plug
13. Gasket
14. Absorber 1
15. Absorber 1
16. Absorber 3
17. Spark (N2G), PLUG
18. Absorber 1*
19. Cylinder head gasket *

*Alternate Parts (U.S.A. Only)

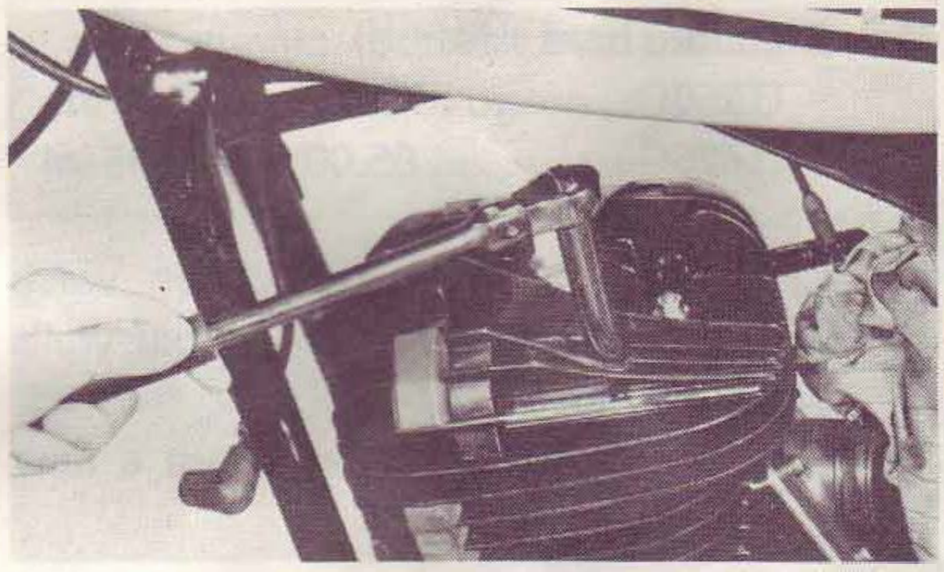
Piston



1. CRANK ASS'Y
2. Left crank
3. Right crank
4. Connecting rod
5. Crank pin
6. Con-rod big end bearing
7. Washer
8. Piston
9. Piston ring set (STD)
10. Con-rod small end bearing
11. Piston pin
12. Circlip
13. Bearing
14. Oil seal
15. Oil seal
16. O-ring
17. Primary drive gear
18. Spring washer
19. Nut
20. Woodruff key
21. Straight key
22. Hexagon nut
23. Spring washer
24. Plate washer

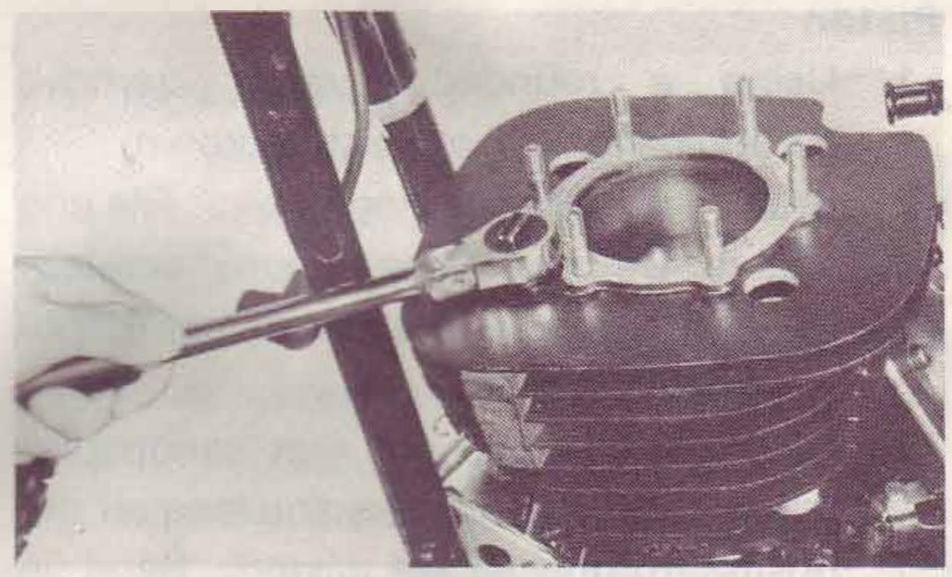
4. Remove nuts securing cylinder and head, 6 nuts. Remove cylinder head and gasket.

NOTE:
Break each nut loose (1/4 turn) prior to removing.

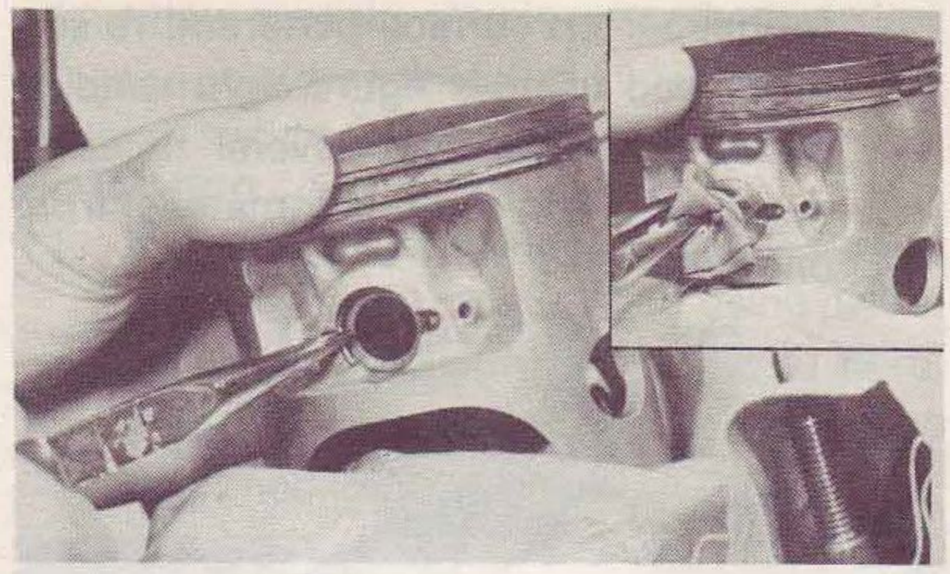


Cylinder and piston removal

1. Remove the cylinder holding nuts.



2. With the piston at top dead center, raise the cylinder until the cylinder skirts clear crankcase. Stuff a clean shop rag into crankcase cavity, around rod, to prevent dirt and other foreign particles from entering. Remove cylinder and base gasket.
3. Remove the piston and small end bearing.



NOTE:
If the pin hangs up, use a wrist pin puller. Do not pound on pin as damage to rod, piston and hearing will result.

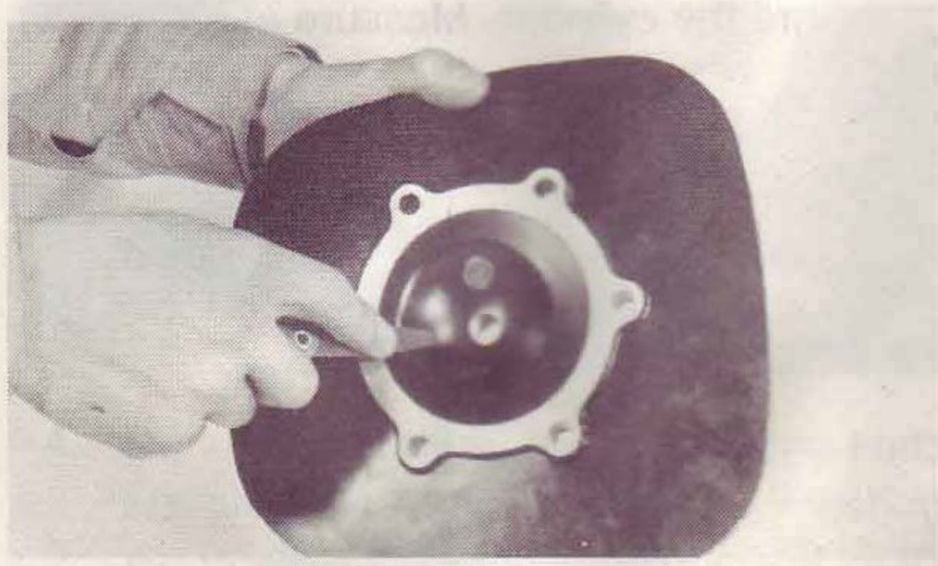
Maintenance

Exhaust pipe

1. Using a rounded scraper, remove excess carbon deposits from manifold area of exhaust pipe.
2. Carbon deposits within the silencer may be removed by lightly tapping the outer shell with a hammer and then blowing out with compressed air. Heavy wire, such as a coat hanger, may be inserted to break loose deposits. Use care.

Cylinder head

1. Remove spark plug.
2. Using a rounded scraper, remove carbon deposits from combustion chamber.
   Avoid scratching the metal surface.



3. Place the head on a surface plate. There should be no warpage. Correct by resurfacing. Place 400-600 grit wet emery

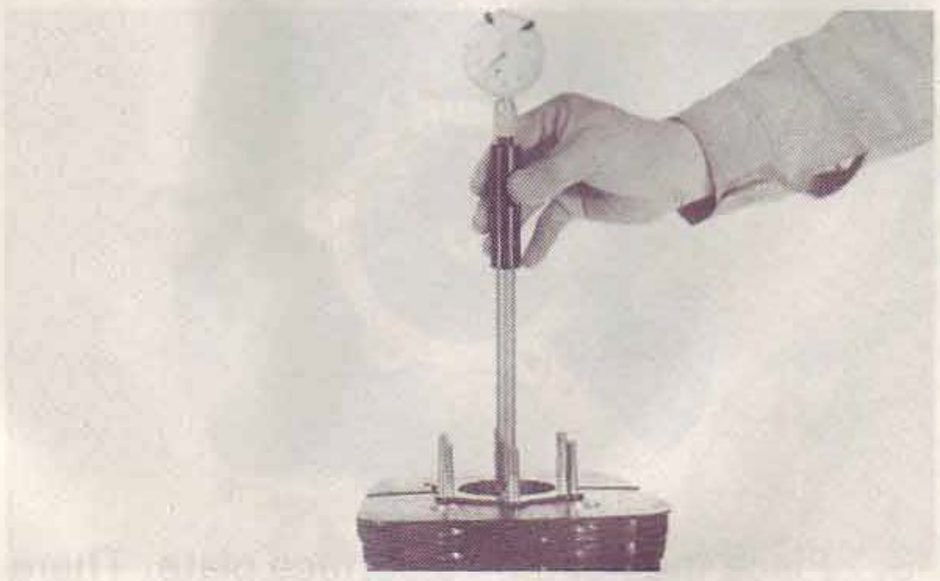
sandpaper on surface plate and re-surface head using a figure-eight sanding pattern. Rotate head several times to avoid removing too much material from one side.

4. Clean the spark plug gasket mating surface thoroughly.
5. Wash the head in solvent and wipe dry.
6. Install new cylinder head gasket during reassembly.

Cylinder head nut torque:
2.5 m-kg (18.0 ft-lb)

Cylinder

1. Remove reed valve assembly.
2. Using a rounded scraper, remove carbon deposits from exhaust port.
3. Remove cylinder base gasket and clean gasket seat on cylinder and crankcase thoroughly.
4. Check cylinder bore. Using a cylinder gauge set to standard bore size, measure the cylinder. Measure at six points; at top, center, and from bottom of piston, in line with the wrist pin and at right angle to pin. Minimum cylinder dia. is bottom of piston, at right angle to pin. Compare to piston measurements. If over tolerance, and not correctable by honing, rebore to next over-size.



Standard bore size:
IT250G. . . . . 70.00 mm (2.76 in)
IT425G . . . . . 85.00 mm (3.35 in)

5. Clean cylinder in solvent, then wash with hot soapy water. Dry. Coat walls with light film of oil.
6. During re-assembly, always use a new cylinder base gasket.

Cylinder head nut torque:
3.5 m-kg (25 ft-lb)

Piston

1. Using a rounded scraper, remove carbon deposits from piston crown.
2. Break a used piston ring in two. File end square. De-burr edges to avoid scratching ring groove and clean carbon deposits from ring groove.
3. Using 400 — 600 grit wet sandpaper, lightly sand score marks and lacquer deposits from sides of piston. Sand in crisscross pattern. Do not sand excessively.

4. Wash piston in solvent and wipe dry.
5. Using an outside micrometer, measure piston diameter. The piston is cam-ground and tapered. The only measuring point is at right-angles to the piston pin holes, 10 mm (0.4 in) from the bottom of the piston skirts. Compare piston diameter to cylinder bore measurements (bottom two measurements at right angles to piston pin line).

Piston clearance =
Minimum cylinder dia. —
Maximum piston dia.

If beyond tolerance, replace piston or rebore cylinder as required.

Nominal piston clearance:
IT250G: 0.045 ~ 0.050 mm
(0.0018 ~ 0.0020 in)
IT425G: 0.055 ~ 0.060
(0,0020 ~ 0.0023 in)

6. During re-assembly, coat the piston skirt areas liberally with two-stroke oil.
7. Install new piston pin circlips and make sure they are fully seated within their grooves.
8. Take care during installation to avoid damaging the piston skirts against the crankcase as the cylinder is installed.

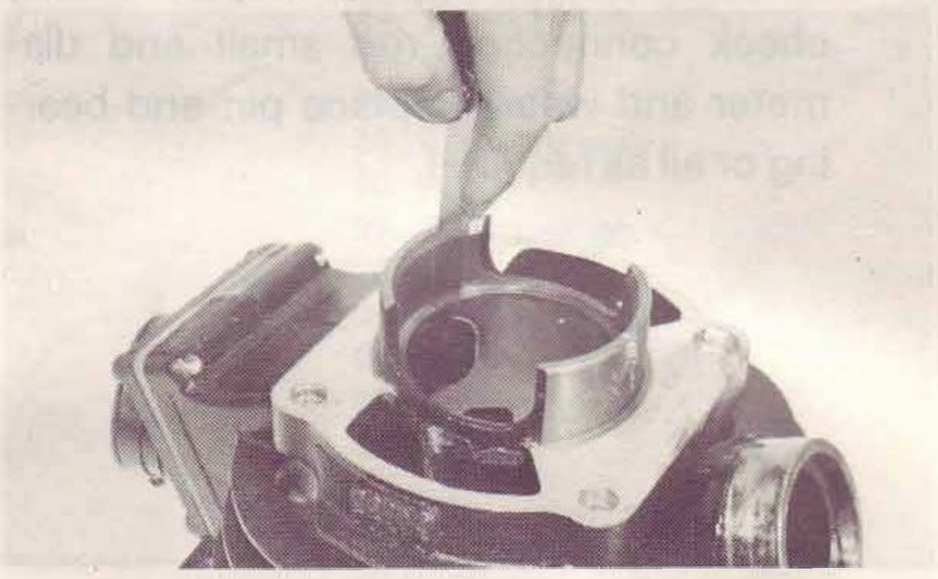
NOTE:
The arrow on piston dome must face forward.

9. Make sure the ring is properly seated as the cylinder is installed.

Piston ring

1. Insert ring into cylinder. Push down approximately 20 mm (0.79 in) using piston crown to maintain right angle to bore. Measure installed end gap. If beyond tolerance, replace ring.

Ring end gap, installed:
(Top and second)
0.3 ~ 0.5 mm (0.012 ~ 0.020 in)



2. Holding cylinder towards light, check for full seating of ring around bore. If not fully seated, check cylinder. If cylinder is not out-of-round, replace ring.
3. Fit the piston rings in the grooves and measure the side clearance. If it measures more than 0.1 mm replace both piston and piston rings as an assembly.

4. During installation, make sure ring ends are properly fitted around ring location pin in piston groove. Apply liberal coating of two-stroke oil to ring.

NOTE:
New ring requires break-in. Follow first portion of new machine break-in procedure.

Piston pin, bearing and connecting rod.

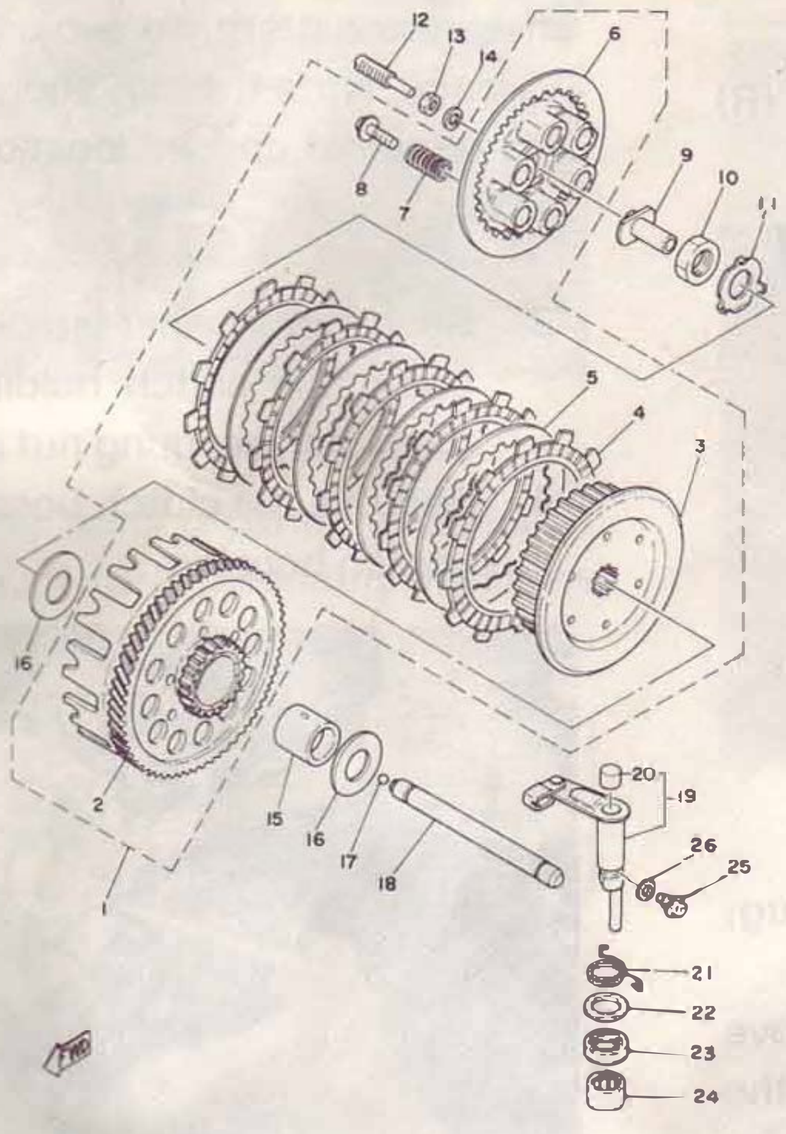
1. Check the pin for signs of wear. If any wear is evident, replace pin and bearing.
2. Check the pin and bearing for signs of heat discoloration. If excessive (heavily blued), replace both.
3. Check the bearing cage for excessive wear. Check the rollers for signs of flat spots. If found, replace pin and bearing.
4. Apply a light film of oil to pin and bearing surfaces. Install in connecting rod small end.

   Check for play. There should be no noticeable vertical play. If play exists, check connecting rod small end diameter and wear. Replace pin and bearing or all as required.

5. During reassembly, apply a liberal coating of two-stroke oil to the piston pin and bearing. Apply several drops of oil to the connecting rod big end. Apply several drops of oil into each crankshaft bearing oil delivery hole.

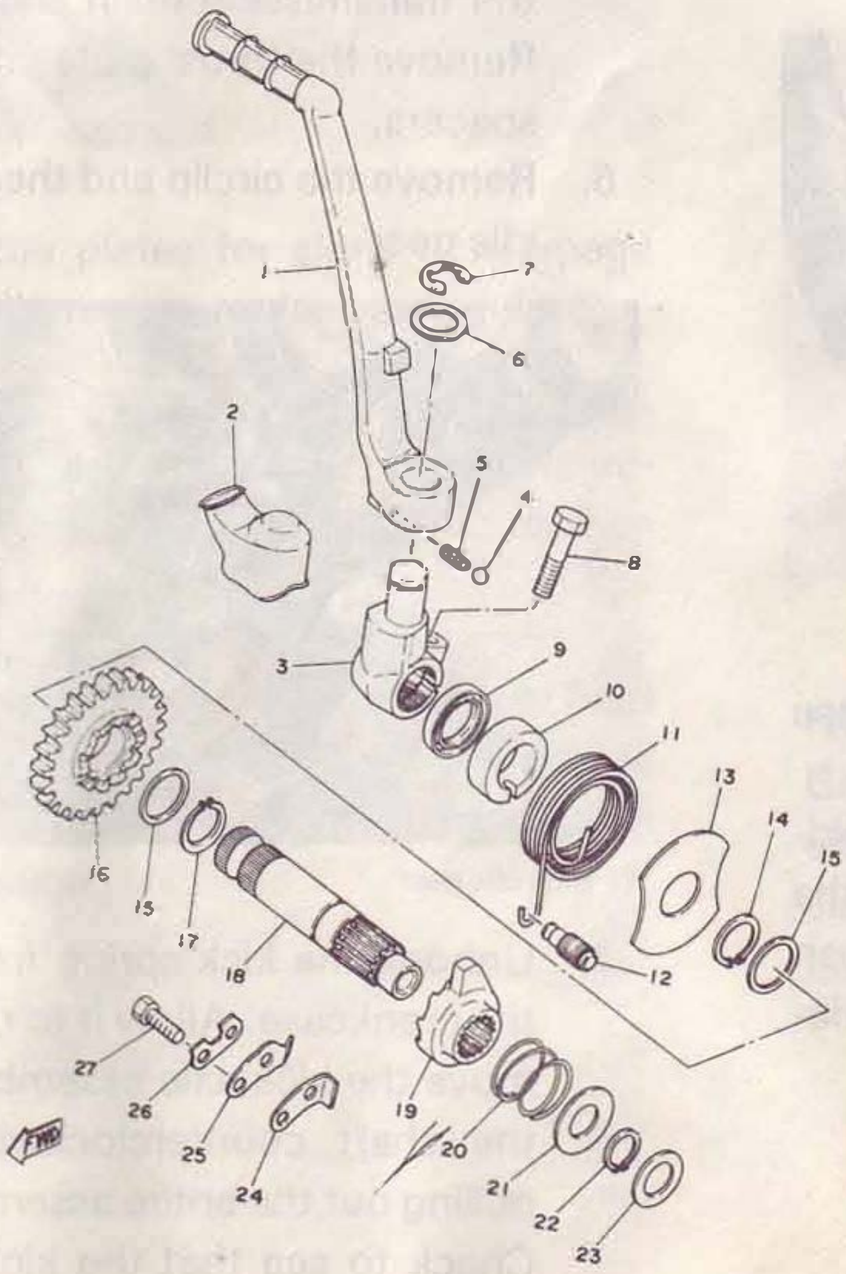
Clutch, Shifter, Kickstarter

Clutch



1. Clutch ass'y
2. Primary driven gear comp.
3. Cluch boss
4. Friction plate
5. Clutch plate
6. Pressure plate
7. compression spring
8. with washer screw
9. Push 1 rod
10. Nut
11. Lock washer
12. Screw
13. Spring washer
14. Hexagon nut
15. Spacer
16. Thrust 1 plate
17. BALL
18. Push 2 rod
19. Push lever ass'y
20. Plug
21. Torsion spring
22. Plate washer
23. Oil seal
24. Bearing
25. Screw
26. Gasket

Kickstarter

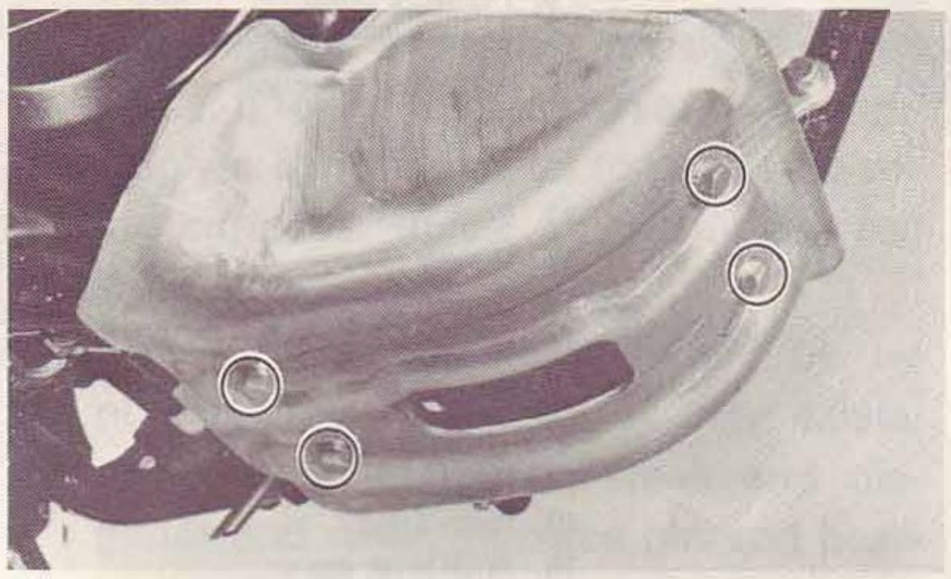


1. Kick crank
2. Kick lever cover
3. Kick crank boss
4. Ball
5. Compression spring
6. Plate washer
7. Circlip
8. Hexagon bolt
9. Oil seal
10. Springguide
11. Torsion spring
12. Kick spring stopper
13. Spring cover
14. Circlip
15. Plate washer
16. Kick gear
17. Circlip
18. Kick axle
19. Ratchet wheel
20. Compression spring
21. Spring cover
22. Circlip
23. Shim
24. Kick stopper
25. Ratchet wheel guide
26. Lock washer
27. Hexagon bolt

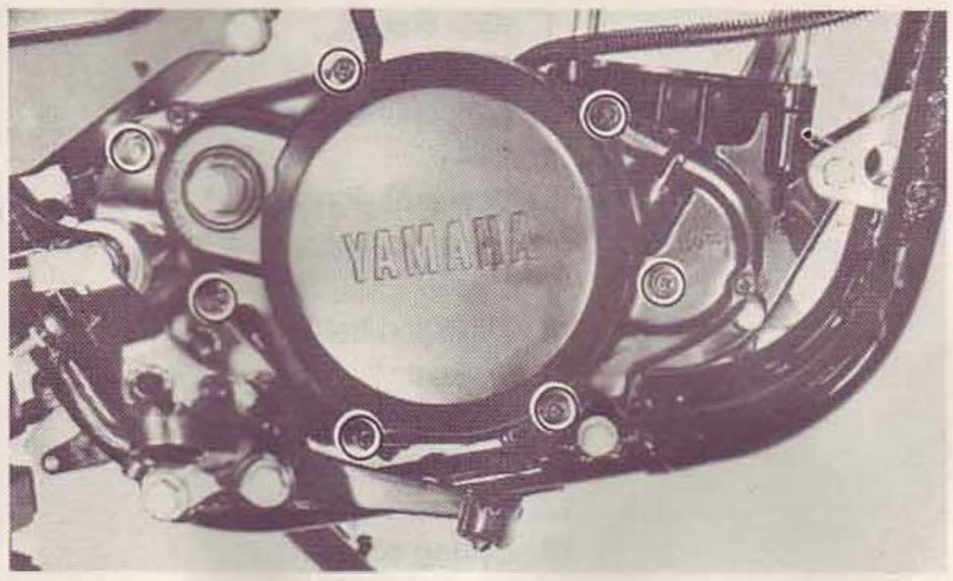
NOTE:

Clutch adjustment is covered in "Mechanical Adjustments".

Kick starter and crankcase cover (R) removal



1. Remove the engine protector.
2. Remove the filler plug and drain plug, and drain the transmission oil.
3. Remove the rear brake rod. Remove footrest and brake pedal. Remove the kick starter crank.
4. Remove the Allen bolts holding the side cover in place and remove the cover. Note the position of the dowel pins.



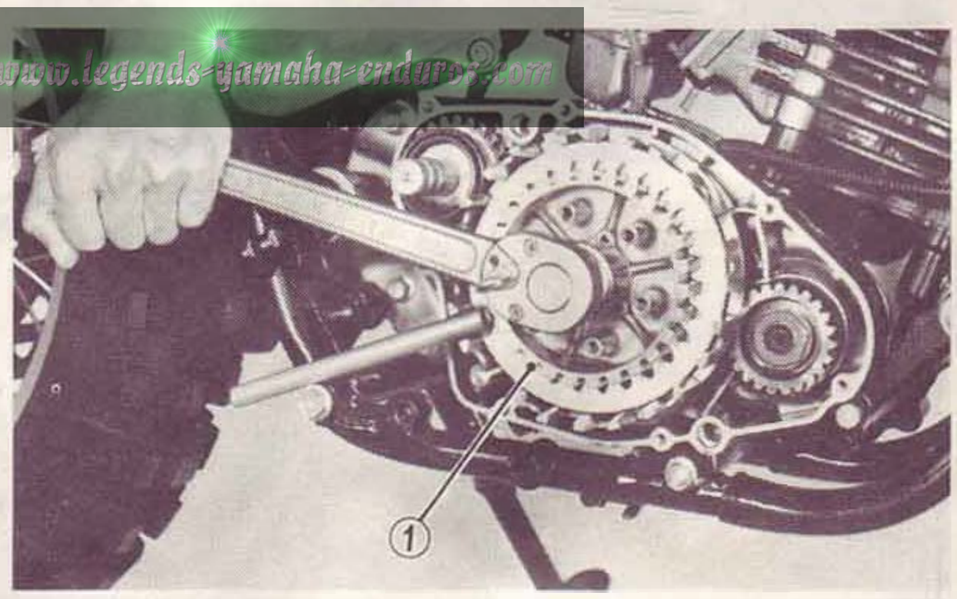
Clutch and kick assembly removal

1. Repeat steps Kick starter and crankcase cover (R) removal.
2. Remove the hexagon head screws holding the pressure plate. Remove the clutch springs, pressure plate and push rod 1. Remove the clutch plates and friction plates.

NOTE:

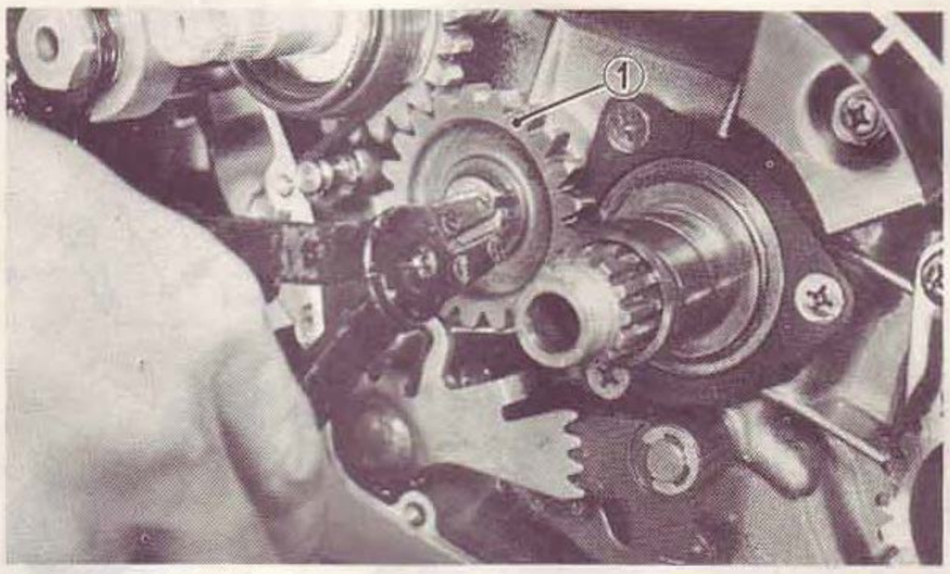
When removing hexagon head screw, loosen each screw in several stages, working in a crisscross pattern, to avoid any unnecessary warpage. Note the condition of each piece as it is removed and its location within the assembly.

3. Bend lock washer tab down.
   Using the clutch holding tool, remove the clutch securing nut and lock washer.
4. Remove the clutch boss and driven gear (clutch housing).



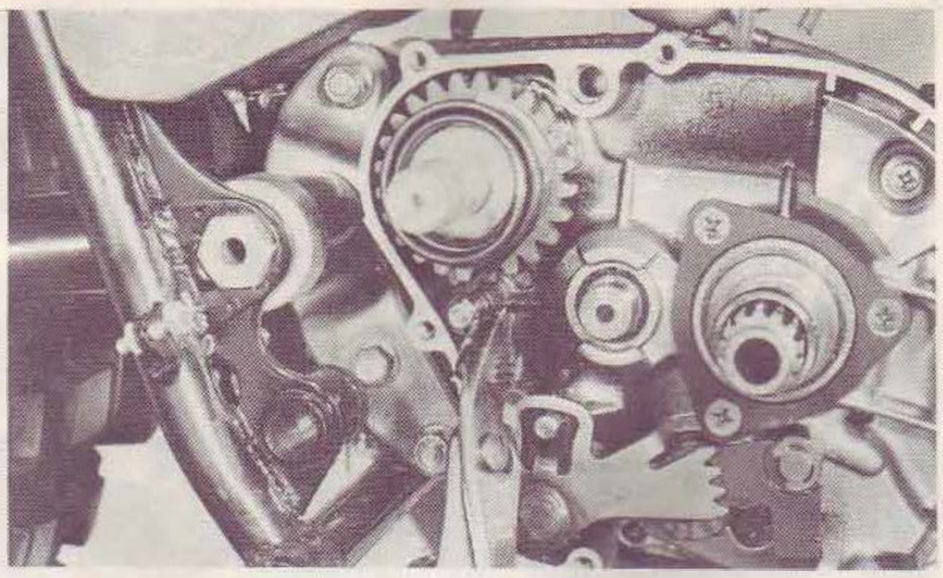
1. Clutch holding tool

5. If the clutch housing spacer remains on the transmission main shaft, remove it. Remove the thrust plate and thrust plate spacers.
6. Remove the circlip and then remove kick idle gear.



1. Kick idle gear

7. Unhook the kick spring from its post in the crankcase. Allow it to relax. Then remove the kick axle assembly by rotating the shaft counterclockwise and then pulling out the entire assembly.
   Check to see that the kick gear spirals freely on the worm shaft. Check the gear teeth for wear and breakage.



Clutch

1. Measure the friction plates at three or four points. If their minimum thickness exceeds tolerance, replace all plates.

	New	Wear Limit
Friction plate thickness	3.0 mm (0.12 in)	2.7 mm (0.11 in)

2. Check the plates for signs of warpage and heat damage, replace as required.

NOTE:

For optimum performance, if any plate requires replacement, it is advisable to replace the entire set.

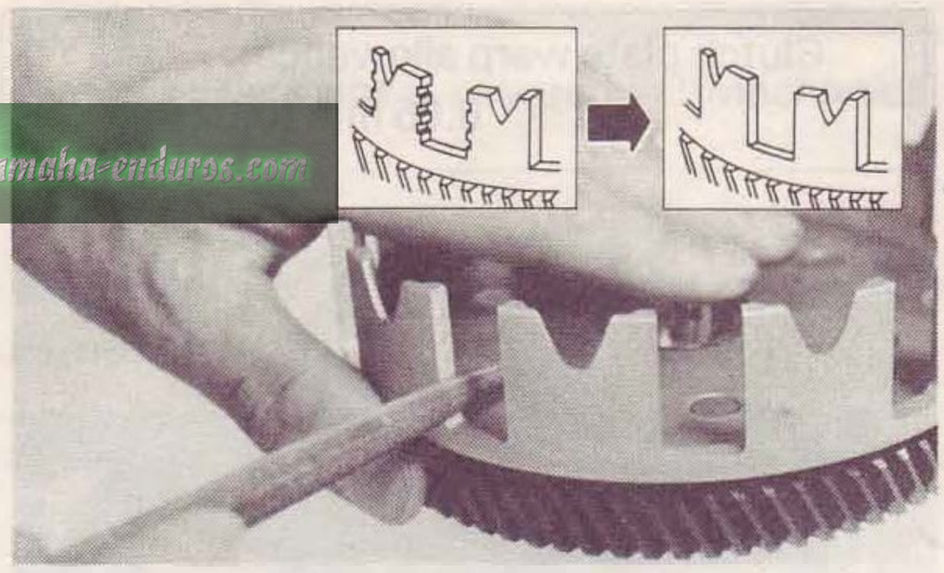
3. Check each clutch plate for signs of heat damage and warpage. Place on surface plate (plate glass is acceptable) and use feeler gauge.

Clutch plate warp allowance:
0.05 mm (0.02 in)

4. Throughly clean the clutch housing and spacer. Apply a light film of oil on the bushing surface and spacer. Fit the spacer into the bushing. It should be a smooth, thumb-press fit. The spacer should rotate smoothly within the bushing. If necessary, replace spacer or clutch housing.
5. Check the bushing and spacer for signs of galling, heat damage, etc. If severe, replace as required.
6. Apply thin coat of oil to transmission main shaft and bushing spacer I.D. Slip spacer over main shaft. Spacer should fit with approximately same "feel" as in clutch housing. Replace as requred.
7. Check dogs on driven gear (clutch housing). Look for cracks and signs of galling on edges. If moderate, deburr. If severe, replace.
8. Check splines on clutch boss for signs of galling. If moderate, deburr. If severe, replace.

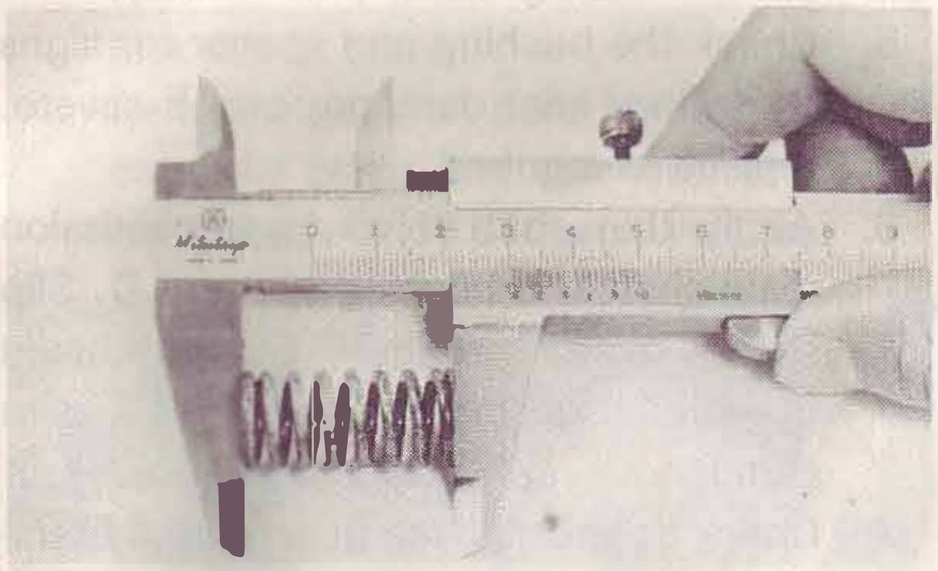
NOTE:

Galling on either the friction plate dogs of the clutch housing or clutch plate splines of the clutch boss will cause erratic clutch operation.



9. Fit the clutch thrust plate with a light film of oil on all parts. Check for smooth rotation. Check for signs of excessive wear, all parts. Replace as necessary.
10. Measure each clutch spring. If beyond tolerance, replace.

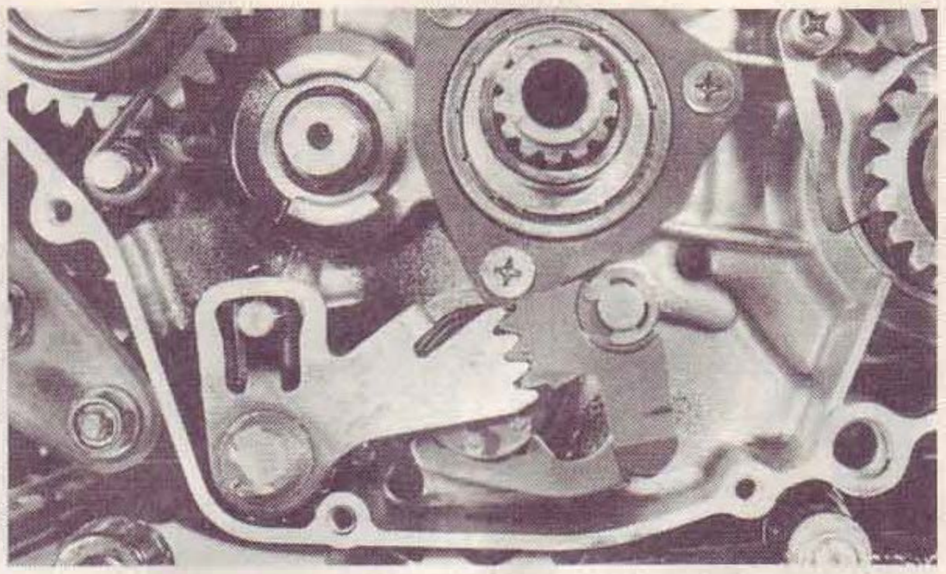
	New	Minimum
Clutch spring free length	36 mm (1.42 in)	35 mm (1.38 in)



11. Stack the clutch spring set on a level surface. Rotate each spring until all are at approximately the same vertical angle and maximum apparent height. Place straightedge across set. If any spring exceeds tolerance, it is advisable to replace the clutch springs as a set.
12. Before installation, apply grease to push rod 1 and ball.

Shift mechanism

During installation, match the index mark on change lever 2 and center of change lever 1. Align.



1. Change lever 1
2. Change lever 2

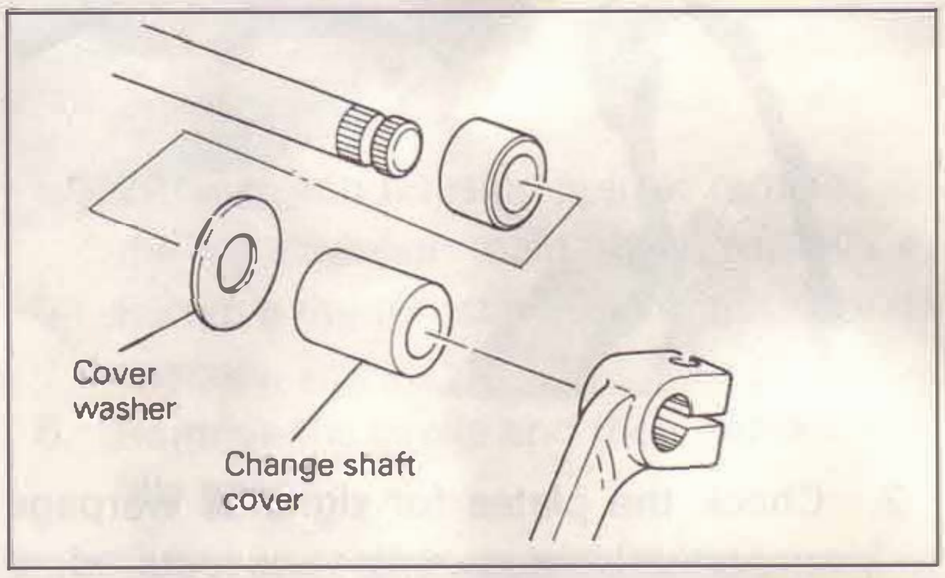
Crankcase

Engine removal

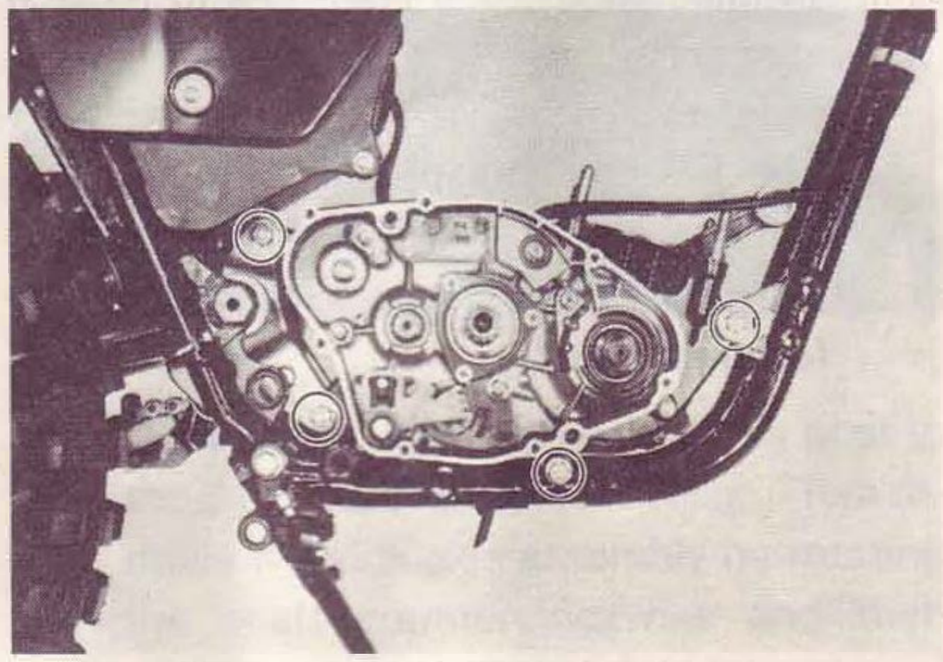
1. Remove the magneto base, change pedal, and chain cover.

NOTE:

When removing the chain cover, be careful not to lose the change shaft cover and cover washer.



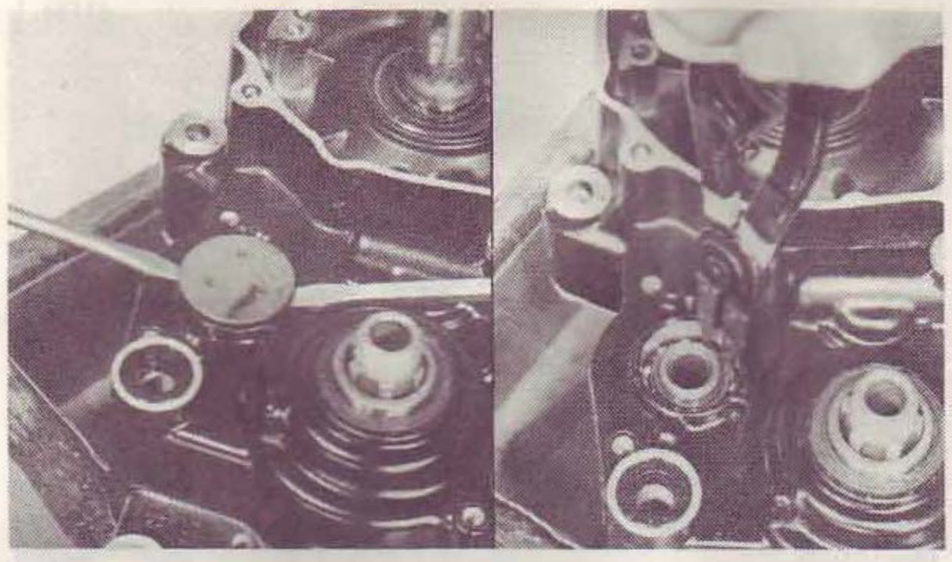
2. Remove the chain and four engine mounting bolts.



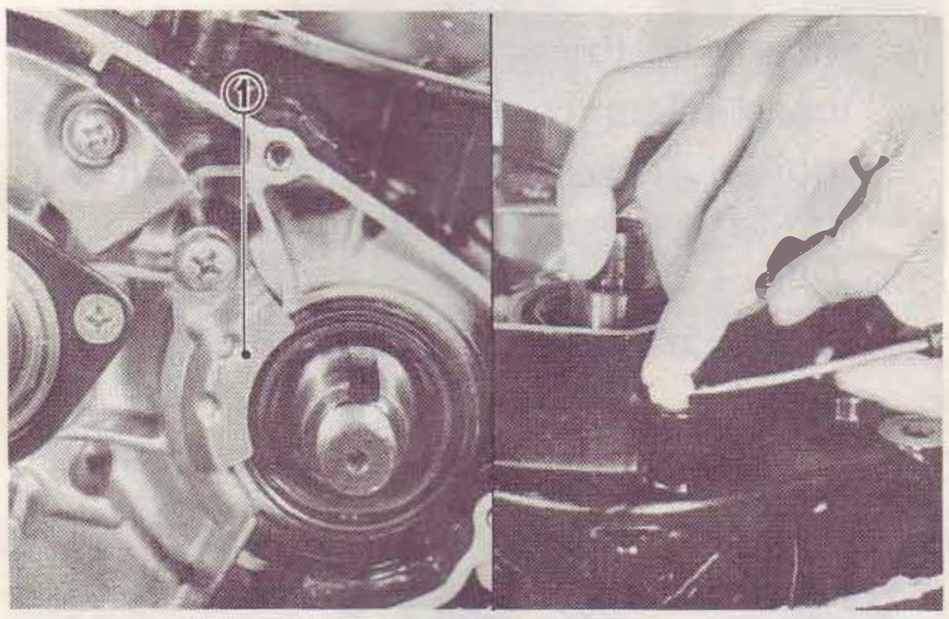
3. Remove the engine from right side of the frame.

Disassembling

1. Working in a crisscross pattern, loosen 14 panhead screws 1/4 turn each. Remove them after all are loosened.
2. Remove the brind plug and circlip.



3. Remove the oil seal retainer and plug. Install crankcase separating tool as shown.



1. Retainer

NOTE:

Tighten the securing bolts on the crankcase separating tool, but make sure the tool body is parallel with the case. If necessary, one screw may be backed out slightly to level tool body.

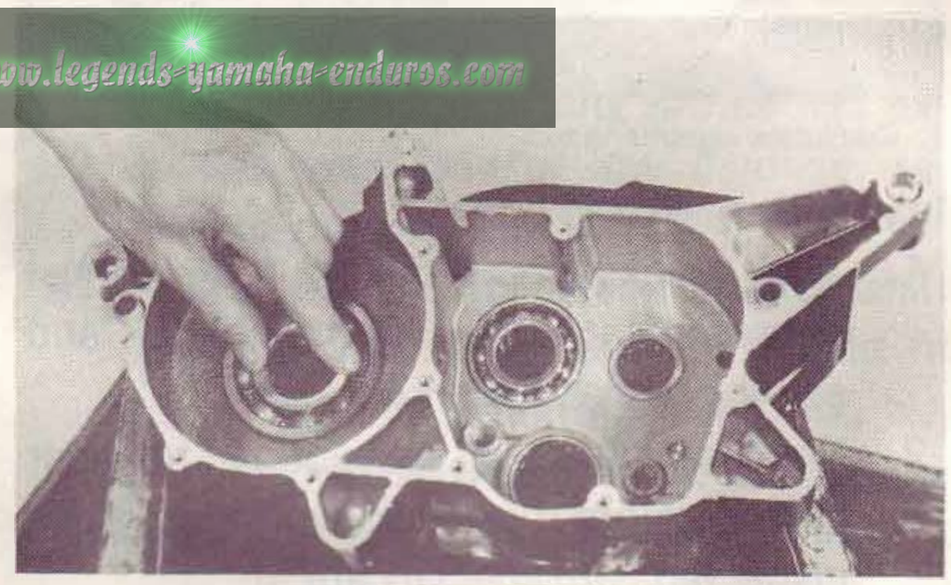
1. Crankcase separating tool

CAUTION:

Use a soft hammer to tap on the case half. Tap only on reinforced portions of case. Do not tap on gasket mating surface. Work slowly and carefully. Make sure the case halves separate evenly. If one end "hangs up", take pressure off the push screw, realign and start over. If the halves are reluctant to separate, check for a remaining case screw or fitting. Do not forece.

Bearings and Oil Seals

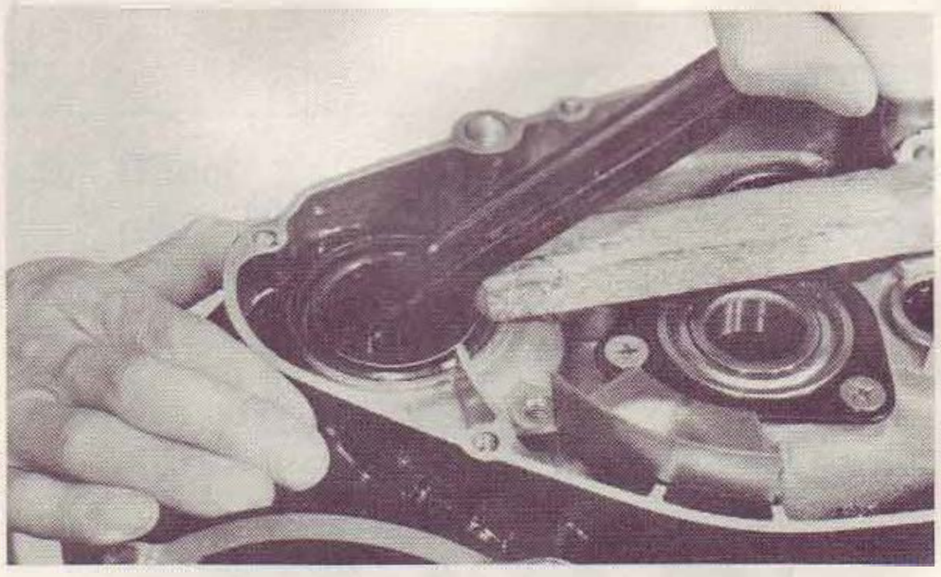
1. After cleaning and lubricating the bearings, rotate inner race with a finger. If rough spots are noticed, replace the bearing.



NOTE:

Bearing(s) are most easily removed or installed if the cases are first heated to approximately 90° ~ 120°C (194° ~ 248°F). Bring the case up to proper temperature slowly. Use an oven.

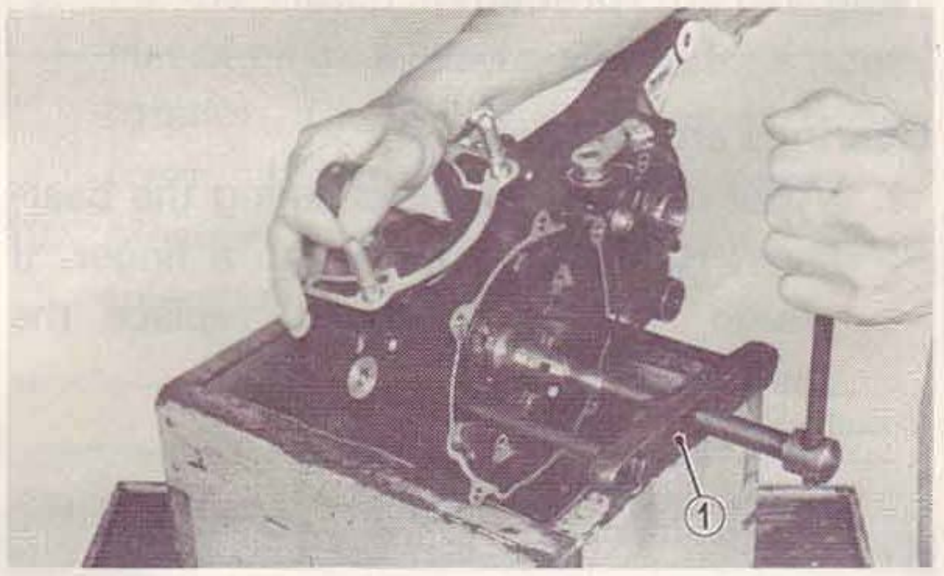
2. Check oil seal lips for damage or wear. Replace as required.



3. Always replace crankshaft oil seals whenever the crankshaft is removed.
4. Install bearing(s) and oil seal(s) with their manufacturer marks or numbers facing outward. Before installation, apply grease to oil seal lip(s) and bearing(s).

Crankshaft

1. Remove crankshaft assembly with crankcase separating tool.



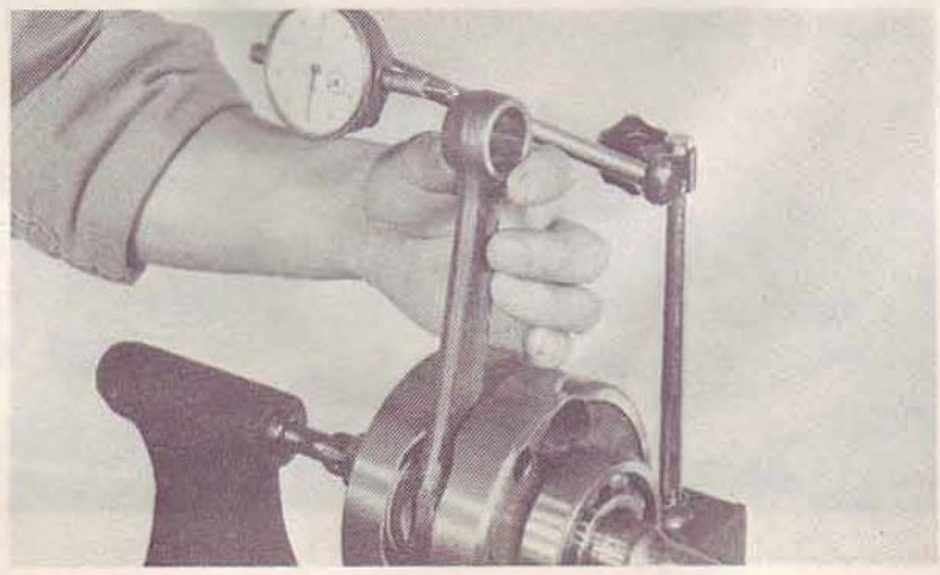
1. Crankcase separating tool

Inspection

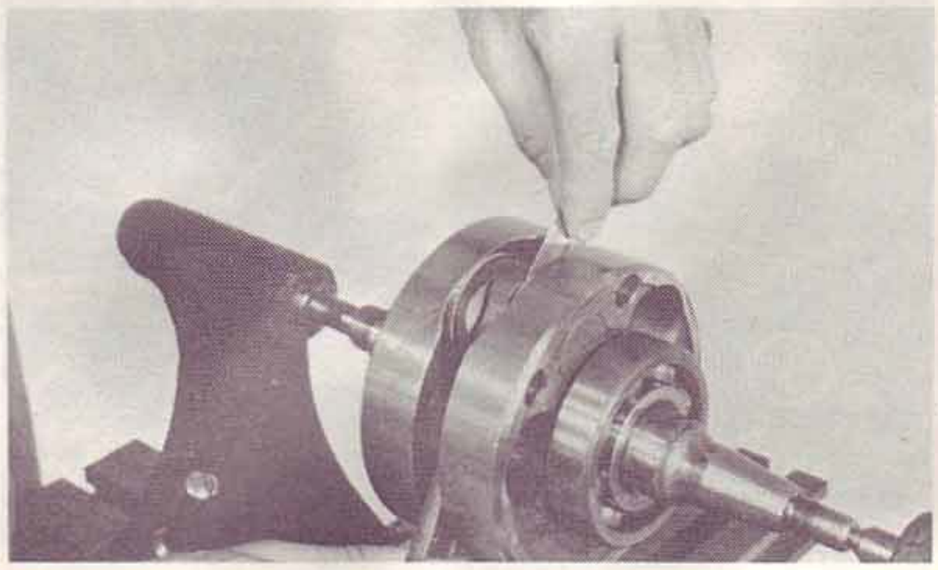
1. The crankshaft requires the highest degree of accuracy in engineering and servicing of all the engine parts.
2. The crankshaft is susceptible to wear and therefore the crank bearing must be inspected with special care.
3. Check crankshaft components.

a. Mount the dial gauge at right angles to the connecting rod small end, holding the bottom of rod toward the dial indicator. Rock top of rod and measure axial play.

Connecting rod axial play (C):
0.4 ~ 2.0 mm (0.016 ~ 0.079 in)

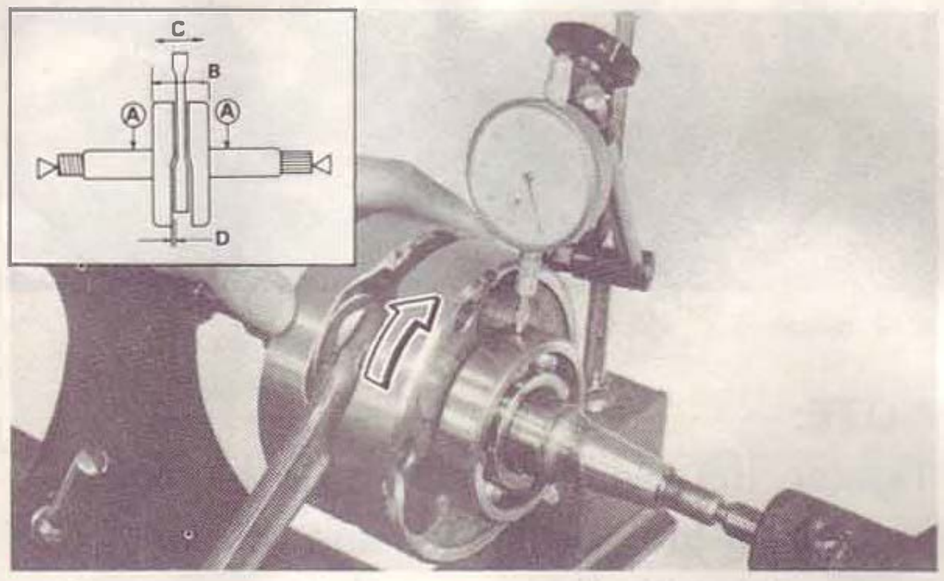


b. Remove the dial guage and slide the connecting rod to one side. Insert a thickness gauge between the side of the connecting rod big end and the crank wheel. Measure clearance.



Connecting rod/crank side clearance (D):
0.25 ~ 0.75 mm (0.01 ~ 0.030 in)

c. If any of the above measurements exceed tolerance, crankshaft repair is required. Take the machine to your Authorized Yamaha Dealer.



Unit: mm(in)

Deflection tolerance (A)		Flywheel width (B)
Left side	Right side	IT250G: $62^{+0}_{-0.05}$ ($2.441^{+0}_{-0.002}$) IT425G: $66^{+0}_{-0.005}$ ($2.598^{+0}_{-0.002}$)
0.03 (0.0012)	0.03 (0.0012)	

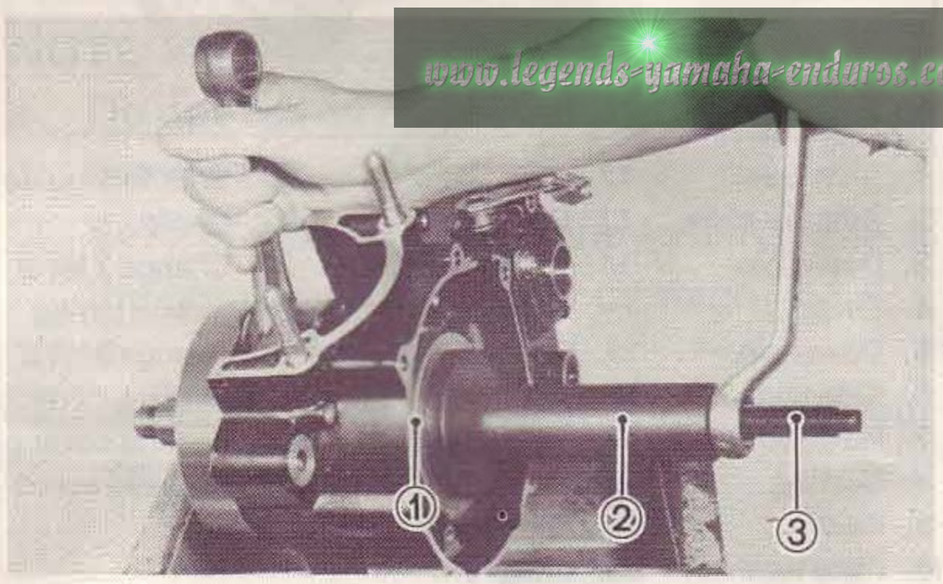
Crankshaft Installation

After all bearings and seals have been installed in both crankcase halves, install crankshaft as follows:

CAUTION:

To protect the crankshaft against scratches or to facilitate the operation of installation: Pack the oil seal lips with grease. Apply engine oil to each bearing.

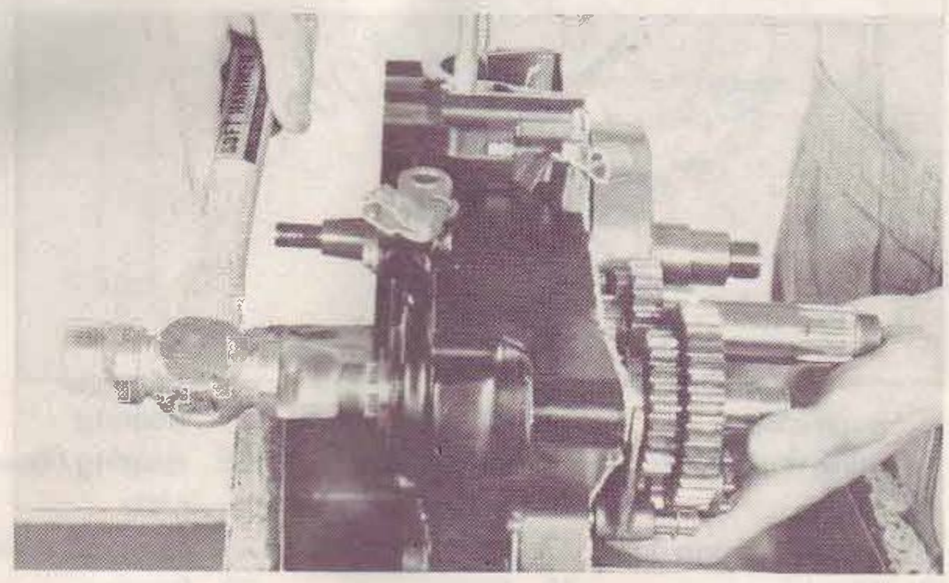
1. Set the crankshaft into left case half and install crankshaft installing tool.
2. Hold the connecting rod at top dead center with one hand while turning the handle of the installing tool with the other. Operate tool until crankshaft bottoms against bearing.



1. Adapter
2. Crankshaft installer pot
3. Crankshaft installer bolt

Transmission

1. Remove drive sprocket nut, lock washer, sprocket and collar.
2. Tap lightly on the transmission drive shaft with a soft hammer to remove.

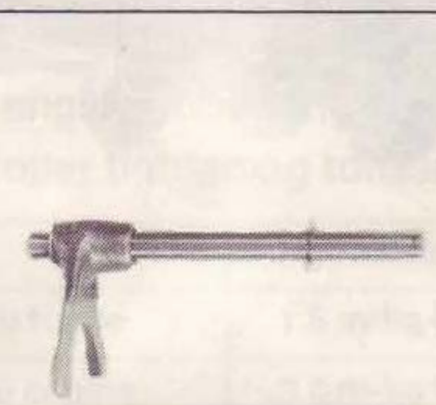


NOTE:

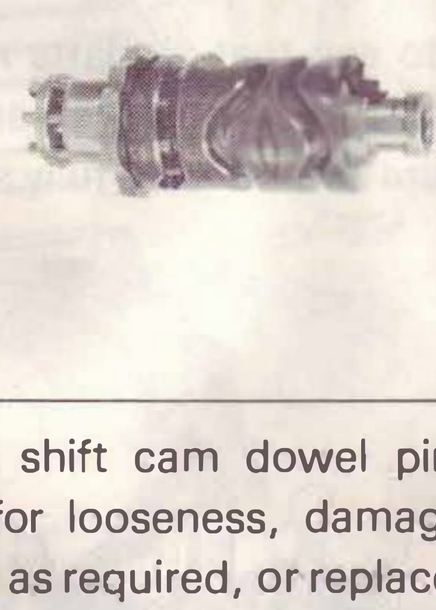
Remove assembly carefully. Note the position of each part. Pay particular attention to the location and direction of shift forks.

Inspection

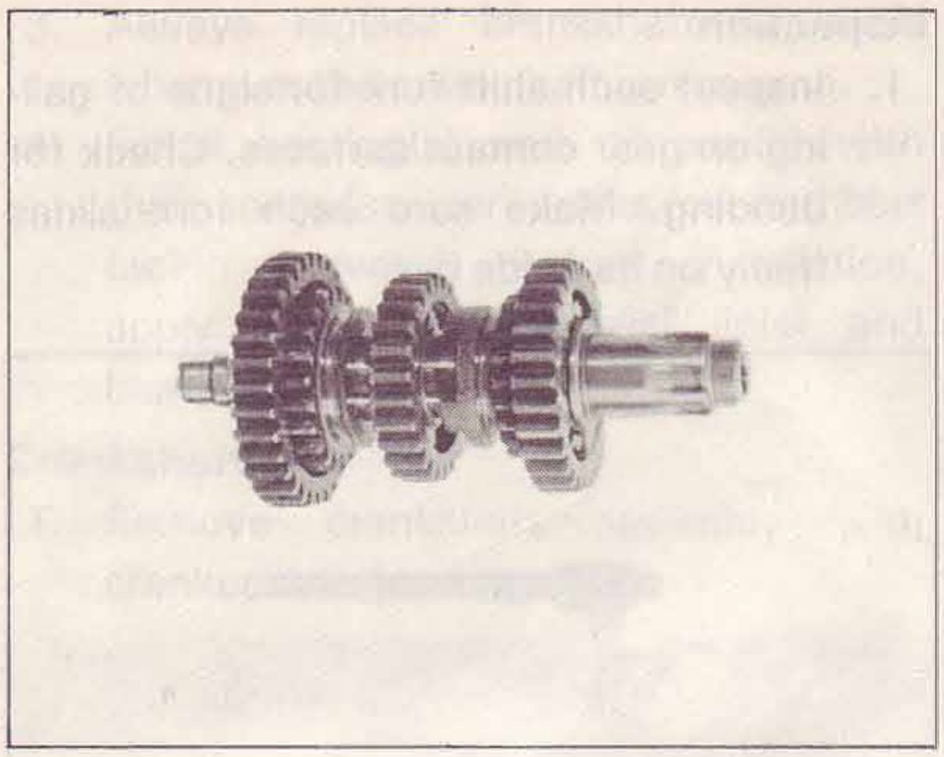
1. Inspect each shift fork for signs of galling on gear contact surfaces. Check for bending. Make sure each fork slides freely on its guide bar.



2. Roll the guide bars across a surface plate. If any bar is bent, replace.
3. Check the shift cam grooves for signs of wear or damage. If any profile has excessive wear and/or any damage, replace cam.
4. Check the cam followers on each shift fork for wear. The follower should fit snugly into its seat in the shift fork, but should not be overly tight. Check the ends that ride in the grooves in the shift cam. If they are worn or damaged, replace.



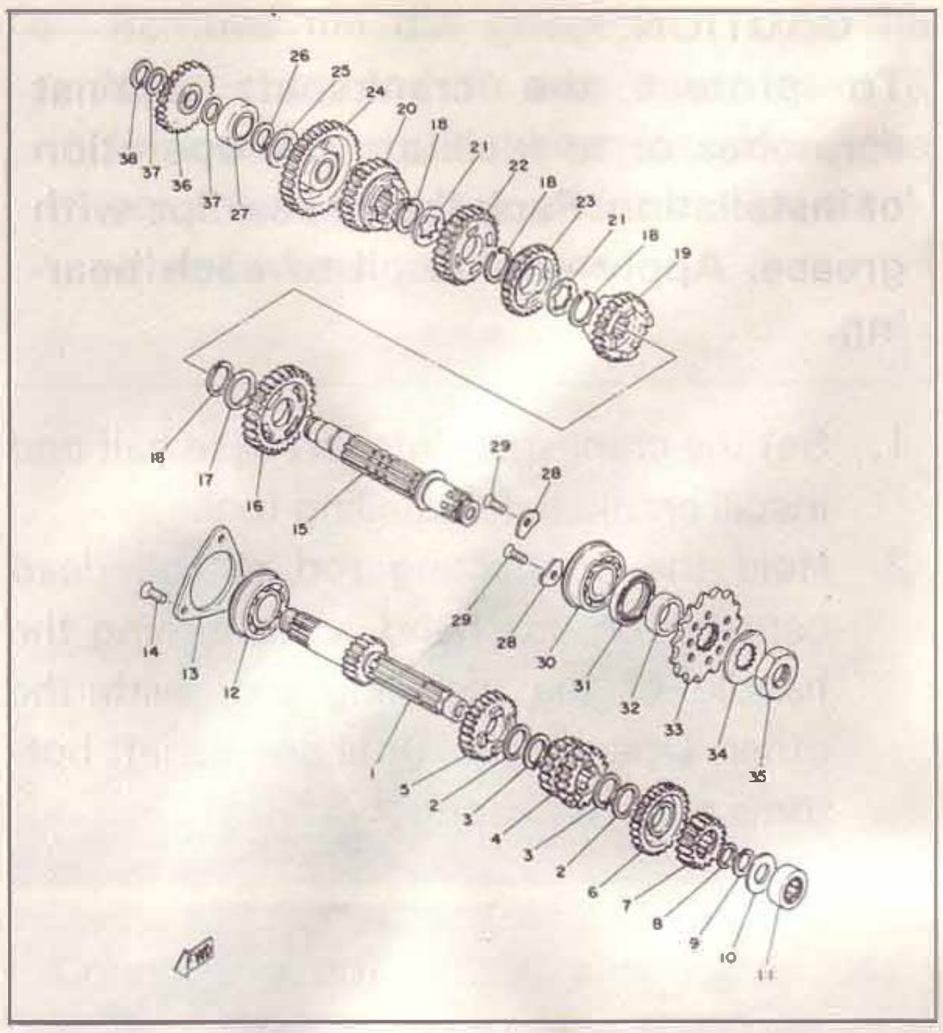
5. Check shift cam dowel pins and side plate for looseness, damage, or wear. Repair as required, or replace.
6. Check the shift cam stopper plate, circlip, stopper for wear.
7. Check the transmission shafts using a centering device and dial gauge. If any shaft is bent, replace.



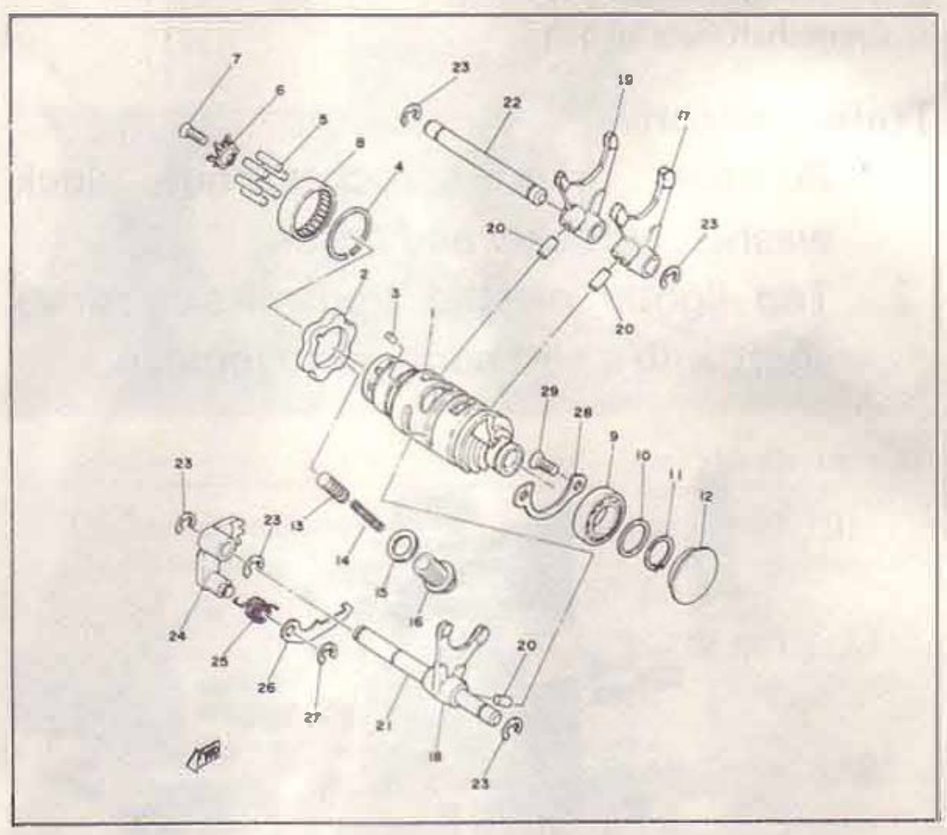
8. Carefully inspect each gear. Look for signs of obvious heat damage (blue discoloration). Check the gear teeth for signs of pitting, galling, or other extreme wear. Replace as required.
9. Check to see that each gear moves freely on its shaft.
10. Check to see that all washers and clips are properly installed and undamaged. Replace bent or loose clips and bent washers.
11. Check to see that each gear properly engages its counterpart on the shaft. Check the mating dogs for rounded edges, cracks, or missing portions. Replace as required.

Installation

1. Check to see that all parts move freely and that all loose shims are in place Make sure all shafts are fully seated.



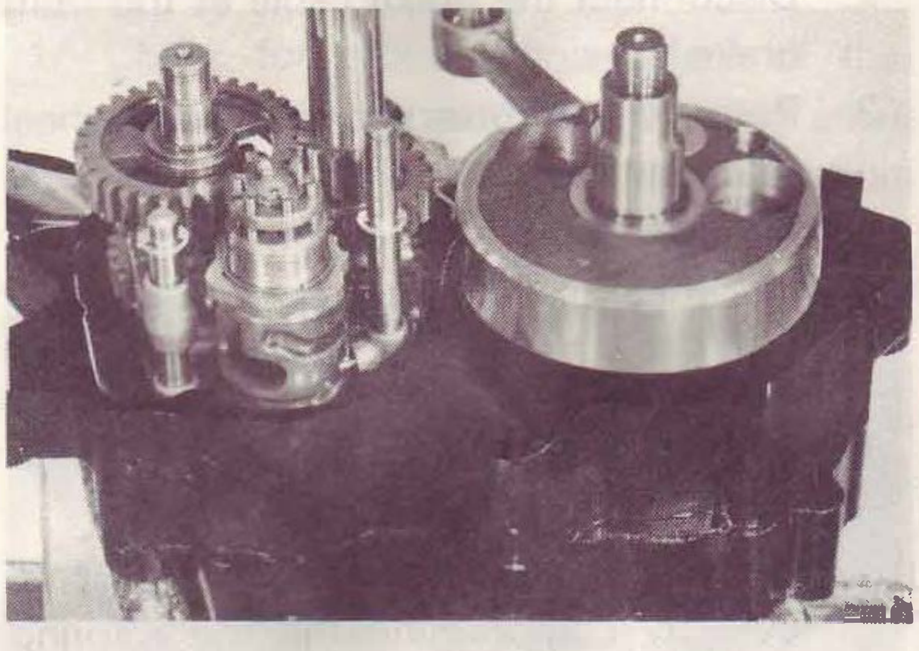
1. Shift cam
2. Stopper plate
3. Dowel pin
4. Circlip
5. Dowel pin
6. Side plate
7. Flathead screw
8. Bearing
9. Bearing
10. Plate washer
11. Circlip
12. Plug
13. Cam stopper
14. Compression spring
15. Drain plug gasket
16. Bolt
17. Shift 1 fork
18. Shift 2 fork
19. Shift 3 fork
20. Dowel pin
21. Shift fork guide 1 bar
22. Shift fork guide 2 bar
23. Circlip
24. Change 2 lever
25. torsion spring
26. Change 3 lever
27. Circlip
28. Bearing cover plate
29. Flathead screw



1. main axle
2. Plate washer
3. Circlip
4. 3rd/4th pinion gear
5. 5th pinion gear
6. 6th pinion gear
7. 2nd pinion gear
8. Plate washer
9. Circlip
10. Plate washer
11. Bearing
12. Bearing
13. Bearing cover plate
14. Flathead screw
15. Drive axle
16. 2nd wheel gear
17. Plate washer
18. Circlip
19. 6th wheel gear
20. 5th wheel bear
21. Washer
22. 3rd wheel gear
23. 4th wheel gear
24. 1st wheel gear
25. Plate washer
26. Circlip
27. Bearing
28. Bearing cover plate
29. Flathead screw
30. Bearing
31. Oil seal
32. Collar
33. Drive sprocket
34. Lock washer
35. Nut
36. Kick idle gear
37. Plate washer
38. Circlip

Reassembling

1. Apply YAMAHA BOND #4 to the mating surfaces of both case halves.



NOTE:

a. Do not tap on machined surface or end of crankshaft.
b. Before installing the crankshaft, check the crankshaft O-ring for damage.

2. After reassembly, apply a liberal coating of two-stroke oil to the crank pin and bearing and into each crankshaft bearing oil delivery hole.
3. Check crankshaft and transmission shafts for proper operation and freedom of movement.

Mounting

1. Install engine mounting bolts and nuts with proper tightening torque.

Bolt	Tightening Torque
Bracket to frame	1.5 m-kg (28 ft-lb)
Bracket to engine	3.0 m-kg (18 ft-lb)

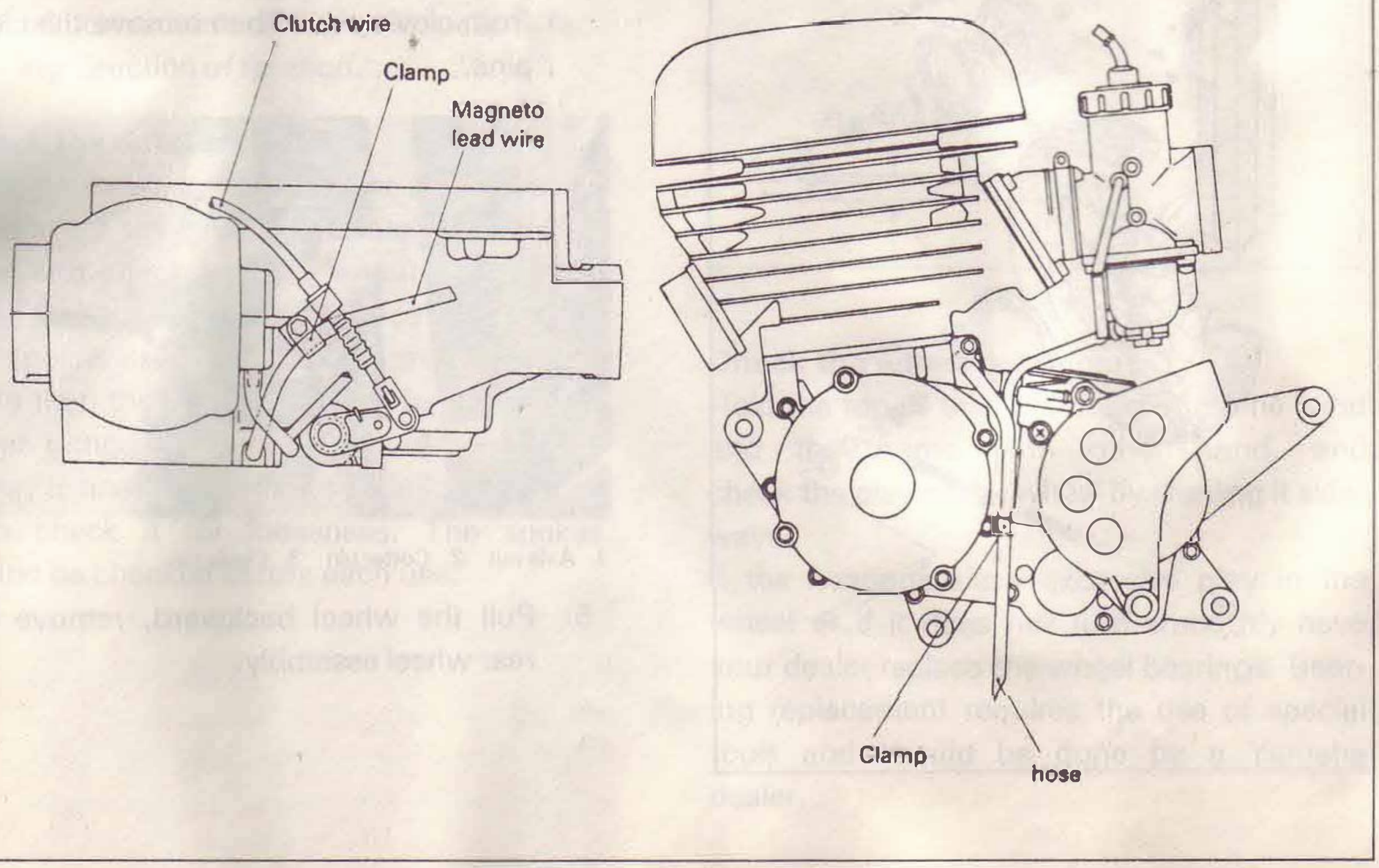
2. Install drive sprocket.

Drive sprocket nut torque: 7.5 m-kg (54 ft-lb)

3. Install flywheel magneto.

Rotor nut torque: 8.5 m-kg (65 ft-lb)

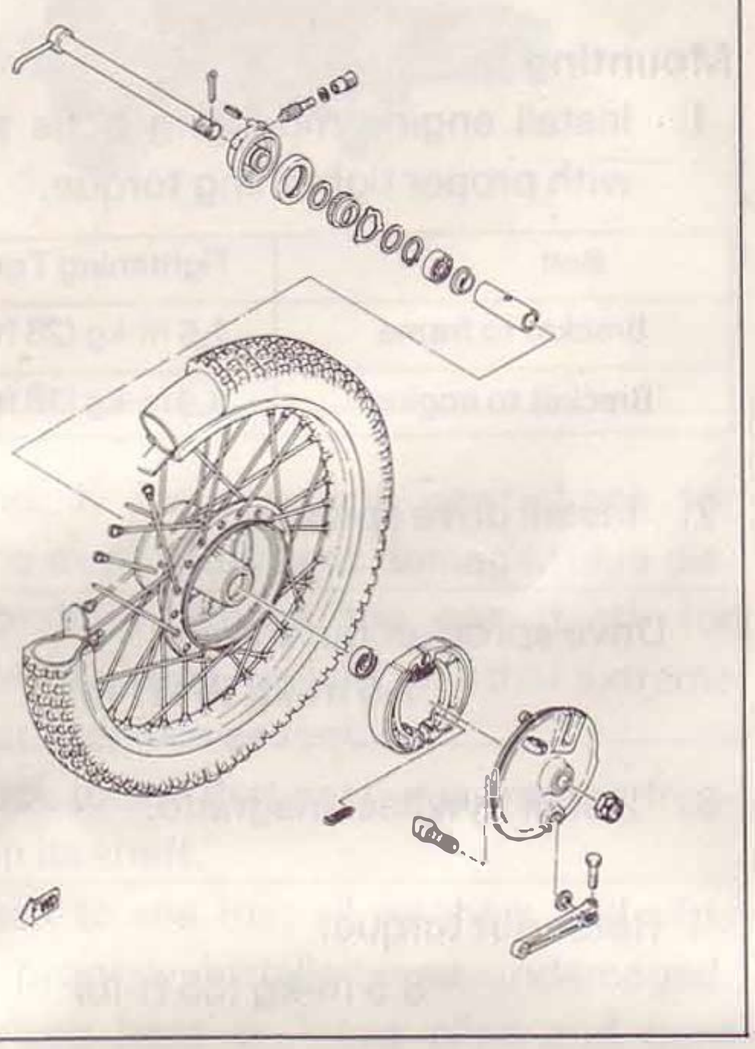
PIPE AND WIRE ROUTING DIAGRAM (For engine)



CHASSIS

Wheels

FRONT WHEEL



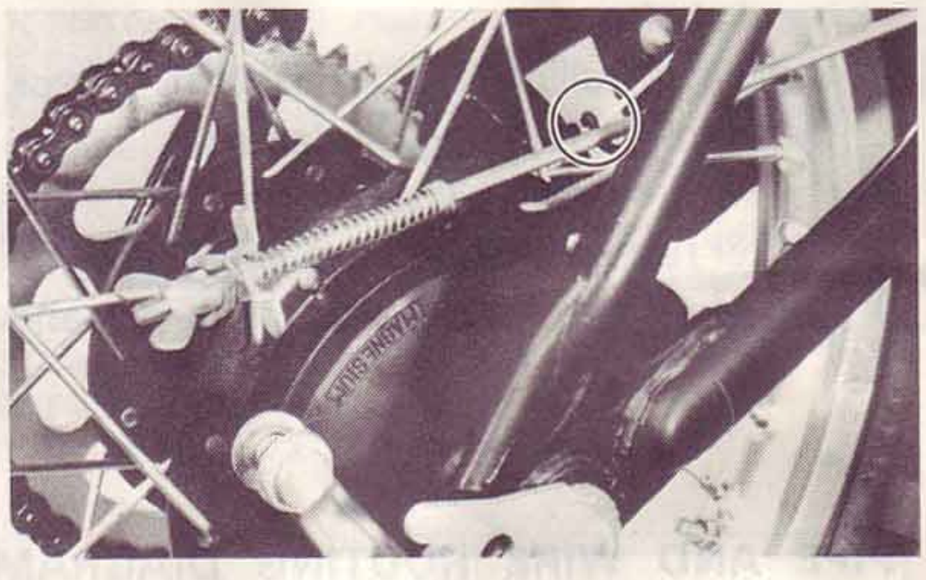
REAR WHEEL

Front wheel removal

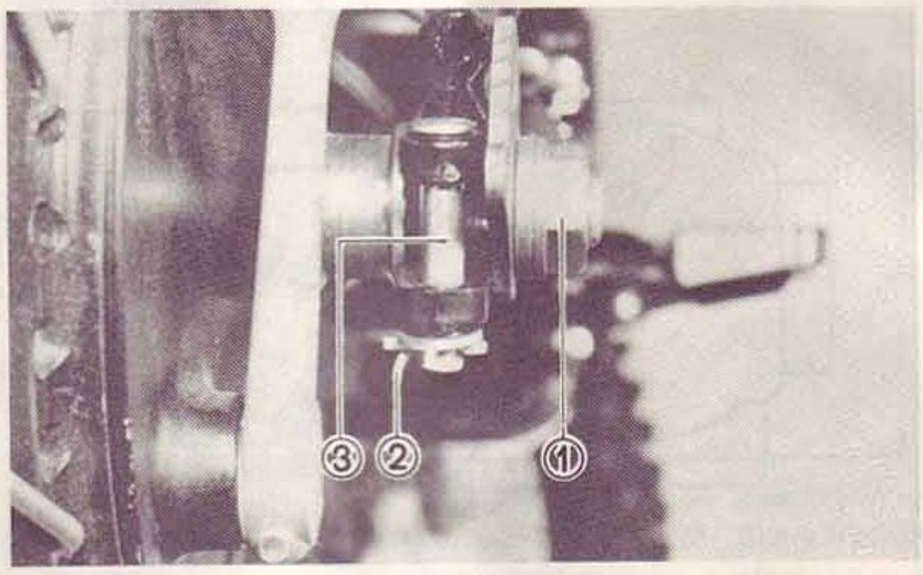
1. Elevate the front wheel by placing a suitable stand under the engine.
2. Disconnect the brake cable at the front brake lever.
3. Remove the cotter pin and front wheel axle nut.
4. Turn and pull out the front wheel axle; the wheel assembly can be removed.

Rear wheel removal

1. Elevate the rear wheel by placing a suitable stand under the engine.
2. Remove the brake rod from the cam lever by compressing the rod's spring seat. Then hold it up and place rod on the hook of the rear arm.



3. Loosen the axle nut and remove chain.
4. Remove the cotter pins (left and right) from clevis pins. Then remove the clevis pins.



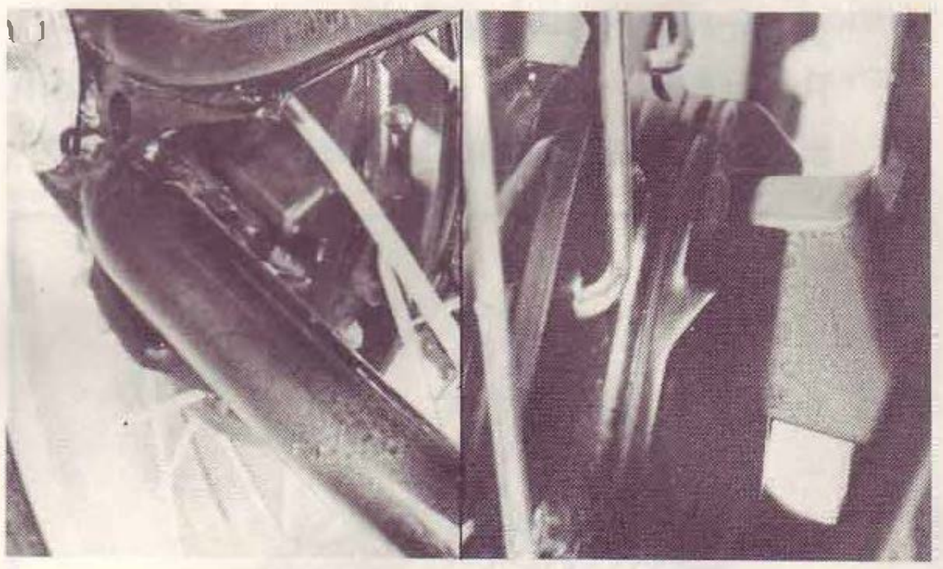
1. Axle nut 2. Cotter pin 3. Clevis pin

5. Pull the wheel backward, remove the rear wheel assembly.

Wheels installation

When installing wheels, reverse the removal procedure, taking care of the following points:

1. Check for proper engagement of the boss on the outer tube (or swing arm) with the locating slot on the brake shoe plate.



2. Make sure the axle nuts are properly tightened.

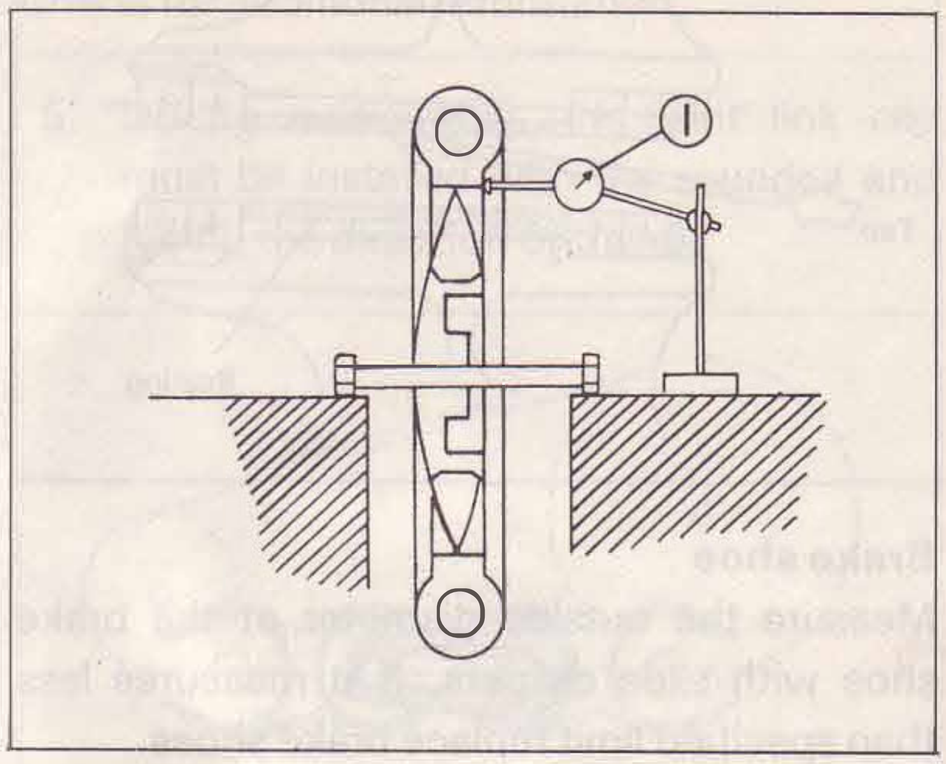
Front axle nut: 6 m-kg (48 ft-lb)
Rear axle nut: 8 m-kg (58 ft-lb)

3. Always use new cotter pins.
4. Adjust the play in the brake lever and pedal.
5. When connecting the chain, make certain closed end of master link clip is facing direction of rotation.

Check the rims and spokes

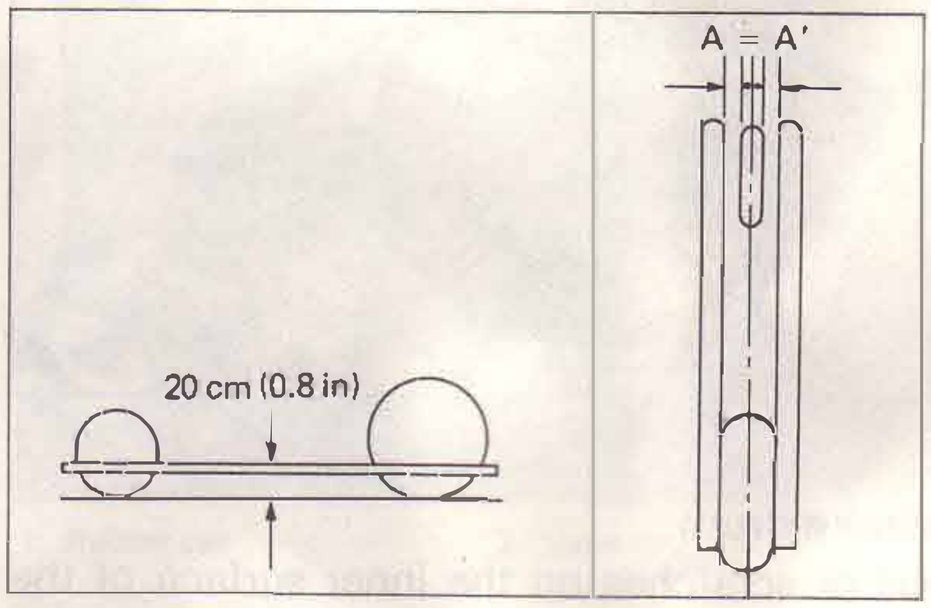
Place a suitable stand under the engine to rise wheels off the ground. Rotate a wheel by hand and check for rim run-out. If they are loose or bent, tighten or replace them. If all the spokes are tightened approximately the same then the sound given off by the screwdriver hitting the spokes should sound the same. If one spoke makes a dull flat sound, then check it for looseness. The spokes should be checked before each use.

Run-out limits: 2 mm (0.08 in)



Wheel alignment

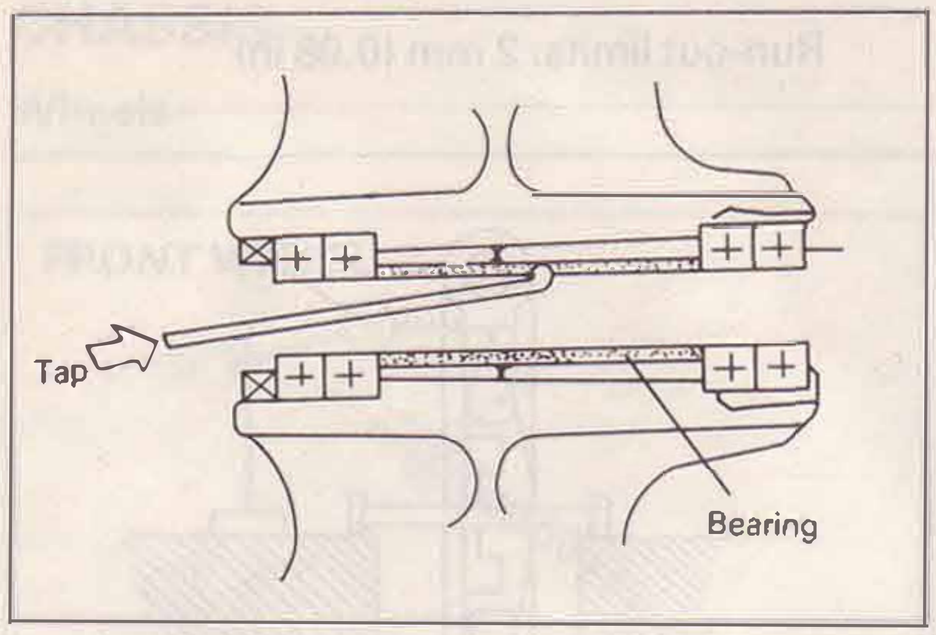
Stand the machine upright with the wheels on ground, and place two straight bars in parallel on both sides of the rear wheel at a point 20 cm (0.8 in) above ground, as illustrated below. If the front wheel is not in the center between the bars or not in parallel to the bars, the wheels are out of alignment. Adjust drive chain tension.



Check the wheel bearings

Hold the top of the rear wheel with one hand and the frame with other hand, and check the play of the wheel by shaking it sideways.

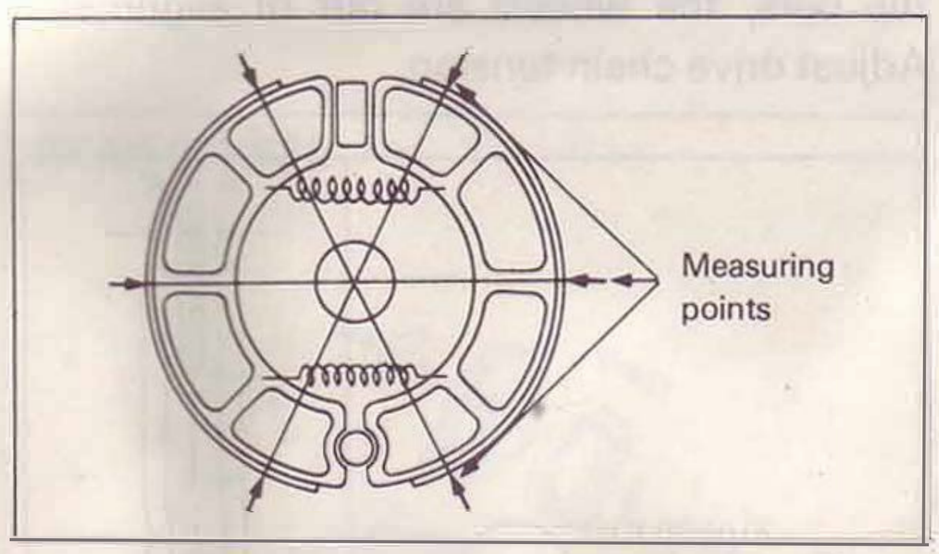
If the bearings allow excessive play in the wheel or if it does not turn smoothly have your dealer replace the wheel bearings. Bearing replacement requires the use of special tools and should be done by a Yamaha dealer.



Brake shoe

Measure the outside diameter at the brake shoe with slide calipers. If it measures less than specified limit replace brake shoes.

Minimum brake lining thickness: 2 mm		
	Brake shoe dia.	Wear limit
Front	130 mm (5.12 in)	126 mm (4.96 in)
Rear	160 mm (6.30 in)	156 mm (6.14 in)



Brake drum

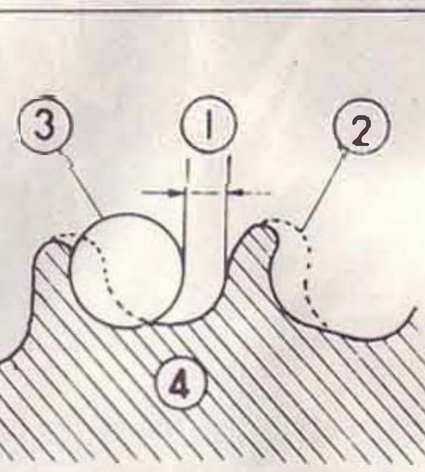
Oil or scratches on the inner surface of the brake drum will impair braking performance or result in abnormal noises. Remove oil by wiping with a rag soaked in lacquer thinner or solvent. Remove scratches by lightly and evenly rubbing with emery cloth.

Sprockets

NOTE:

Please refer to Maintenance Intervals and Lubrication Intervals charts for additional information.

1. Check sprocket wear. Replace if wear decrease tooth height to a point approaching the roller center line.
2. Replace if tooth wear shows a pattern such as that in the illustration.

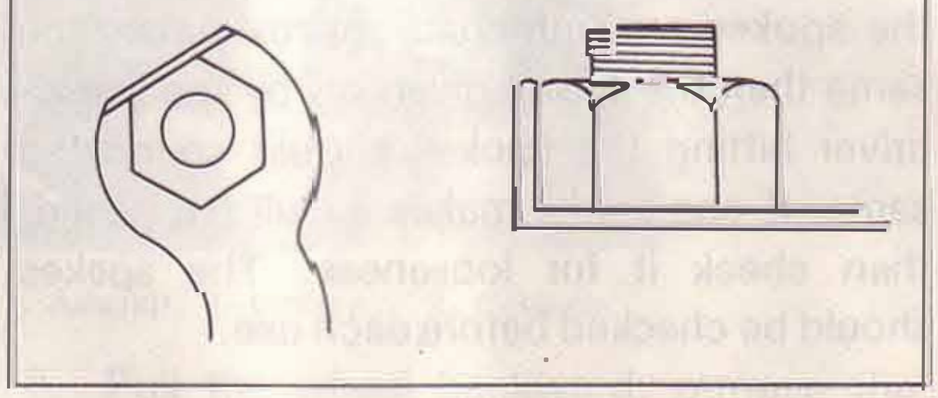


1. 1/4 tooth 2. Correct 3. Roller 4. Sprocket

Drive sprocket securing nut torque: 7.5 m-kg (54 ft-lb)

Driven sprocket securing nut torque: 3.0 m-kg (22 ft-lb)

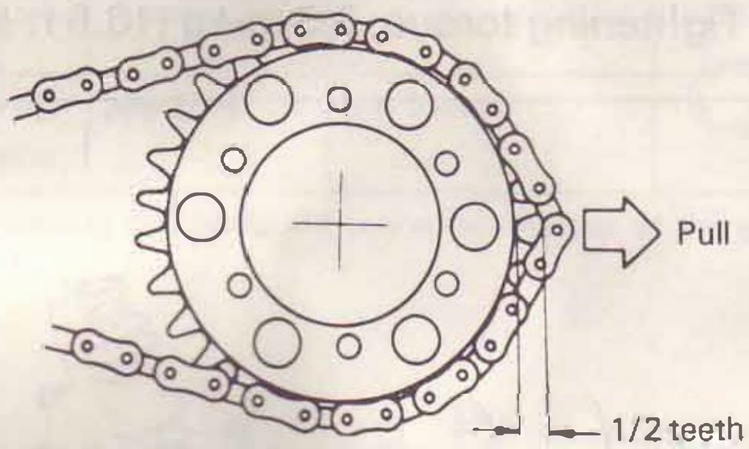
3. When replacing the sprocket, always use a new lock washer. After tightening the sprocket nut to the specification, be sure to lock it with the lock washer.



Chain

Troubleshooting

With the chain installed on the machine, excessive wear may be roughly determined by attempting to pull the chain away from the rear sprocket. If the chain will lift away more than one-half the length of the sprocket teeth, remove and inspect. If any portion of the chain shows signs of damage, or if either sprocket shows signs of excessive wear, remove and inspect.



CHECKING FOR EXCESSIVELY WORN CHAIN

Maintenance

The chain should be lubricated after every use of the machine.

1. Wipe off dirt with shop rag. If accumulation is severe, use wire brush, then rag.
2. Apply lubricant between roller and side plates on both inside and outside of chain. Don't skip a portion as this will cause uneven wear. Apply thoroughly. Wipe off excess.

NOTE:

Chain and lubricant should be at room temperature to assure penetration of lubricant into rollers.

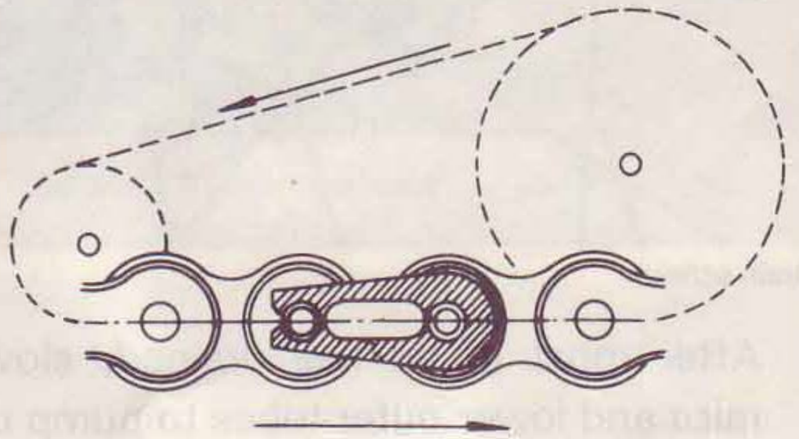
Use Yamaha Chain and Cable Spray Lubricant.

3. Periodically, remove the chain, wipe and/or brush excess dirt off. Blow off with high pressure air.
4. Soak chain in solvent, brushing off remaining dirt. Dry with high pressure air. Lubricate thoroughly while off machine. Work each roller thoroughly to make sure lubricant penetrates. Wipe off excess. Re-install.

NOTE:

See Maintenance and Lubrication Schedule Charts for additional information.

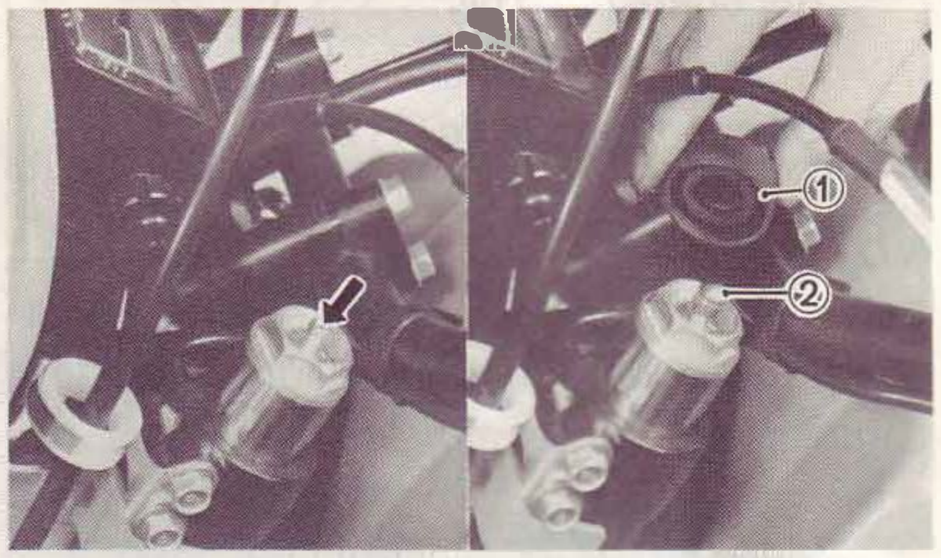
5. During reassembly, the joint link clip must be installed with the rounded end facing the direction of travel.



Front Forks

Fork oil replacement

1. Place a suitable stand under the engine to keep the front of machine raised off the floor.
2. Remove the rubber cap and valve cap.



1. Rubber cap
2. Valve cap

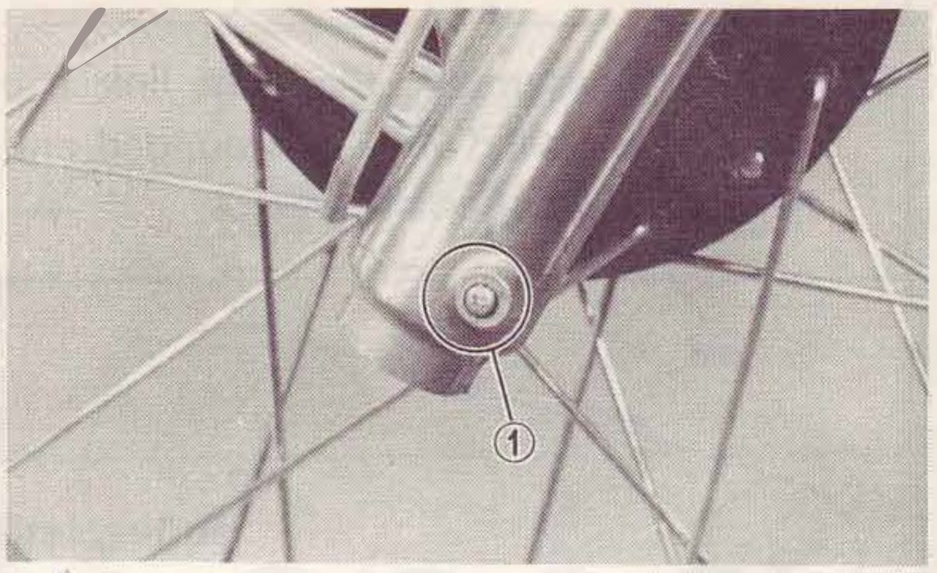
3. Using a slotted-head screwdriver, press the valve and keep it open for more than 3 seconds so that the air can be let out from the inner tube.

NOTE:

When the air has to be extracted from the tube extract little by little. If not, oil stout out together with the air, causing harm to you.

4. Remove the cap bolt assembly, spring and spacer.

5. Remove drain screw from each outer tube open container under each drain hole.



1. Drain screw

6. After most of oil has drained, slowly raise and lower outer tubes to pump out remaining oil.
7. Install drain screws.

NOTE:

Check gasket, replace if damaged.

8. Measure correct amount of oil and pour into each leg.

Recommended oil:

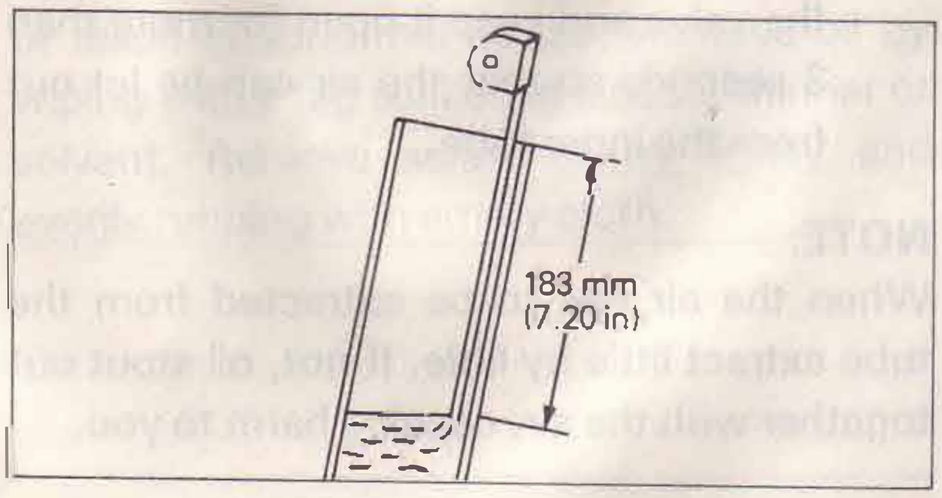
Yamaha Fork Oil 20 wt

Oil quantity: 326 cc (11 oz)

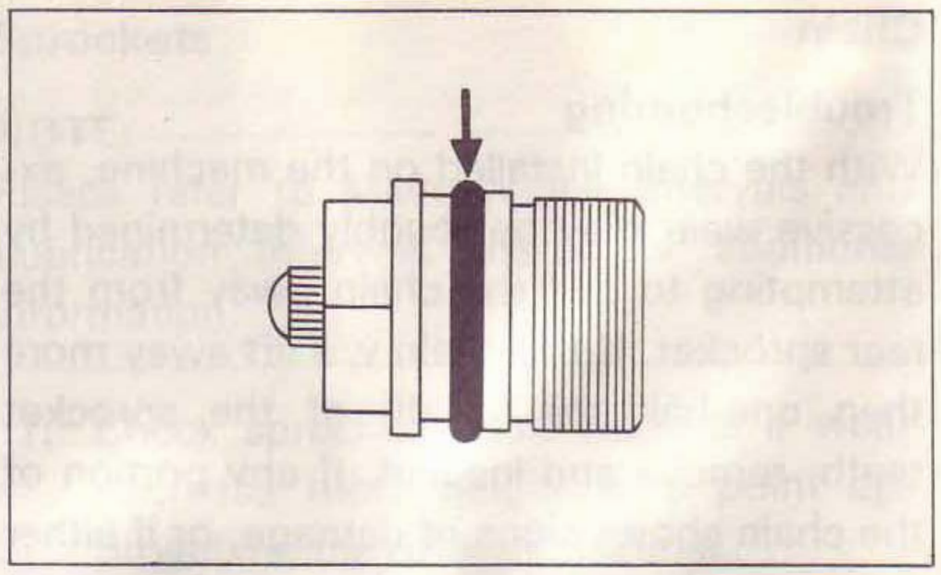
NOTE:

Select the weight oil that suits local conditions and your preference (lighter for less damping, heavier for more damping).

9. Measure the oil level from top of the fork tube with a tape measure. The fork tubes must be fully bottomed.

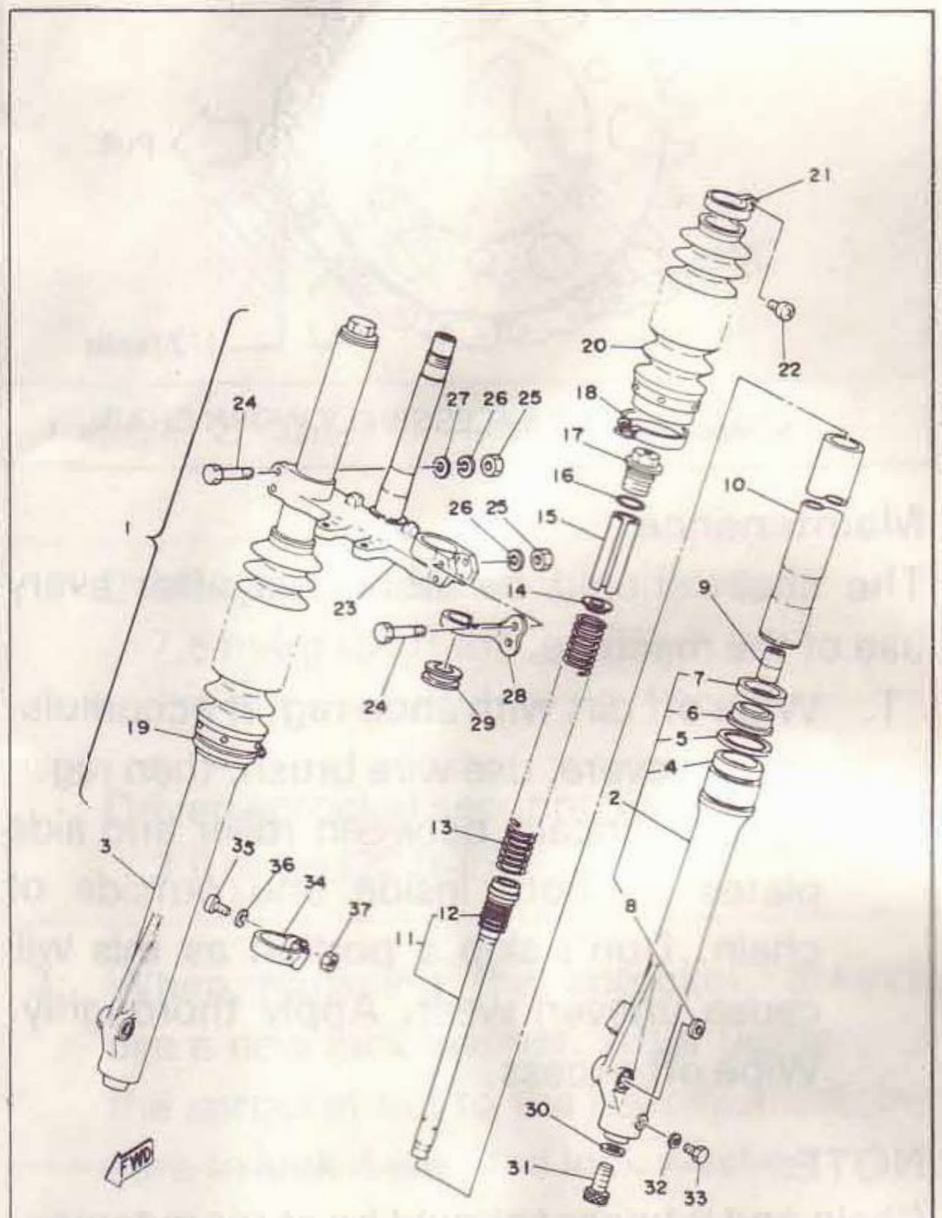


10. After filling, slowly pump the outer tubes up and down to distribute the oil.
11. Inspect the O-ring on cap bolt and replace if damaged.



12. Install cap bolt, spring and spacer and torque to specification.

Tightening torque: 2.3 m-kg (16.5 ft-lb)



1. Front fork ass'y
2. Outer left tube
3. Outer right tube
4. Oil seal
5. Snap ring
6. Dust seal
7. dust seal case
8. Washer
9. Spindle
10. Inner tube
11. Front fork cylinder comp
12. Rebound spring
13. Front fork spring
14. Spring upper seat
15. Spacer
16. O-ring
17. Cap
18. Wire holder
19. Boot band comp.
20. Boot
21. Boot band
22. Screw
23. Under bracket comp.
24. Bolt
25. Hexagon nut
26. Spring washer
27. Plate washer
28. Wire holder
29. Wire guide
30. Packing
31. Bolt
32. Drain plug gasket
33. Drain plug
34. Wire holder
35. Panhead screw
36. Plate washer
37. Hexagon nut

Front fork spring replacement

In addition to the standard type, two different type front fork springs are sold. A proper type should be selected according to the conditions of a racing course or the weight of the rider.

Type	Part No.	Spring rate (kg/mm)	I.D. mark*
Soft			
Spring	3R8-23141-10	k = 0.356	
Spacer	—	—	—
Standard			
Spring	3R8-23141-00	k = 0.4	
Spacer	1W1-23118-LO	ℓ = 30 mm	—
Hard			
Spring	3R8-23141-20	k = 0.44	
Spacer	—	—	—

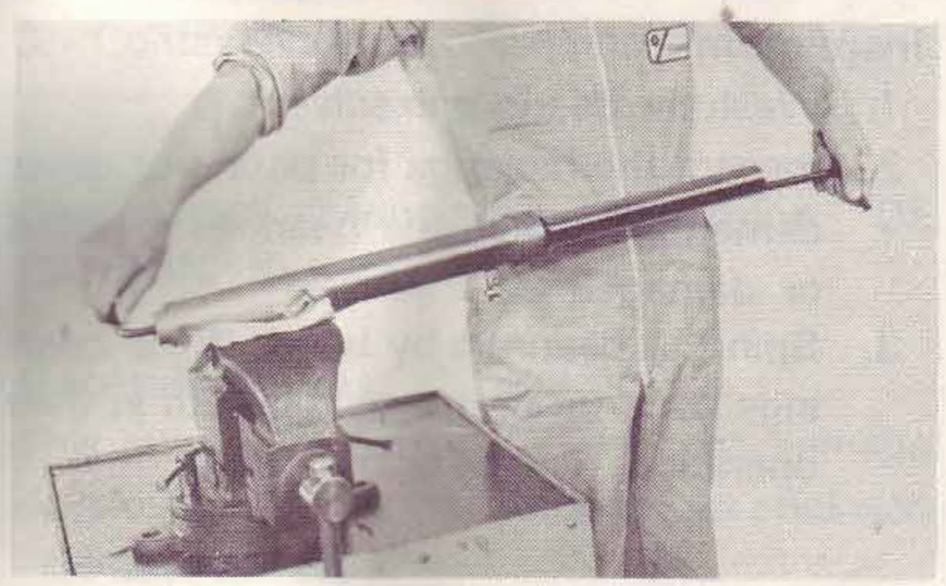
*I.D. marking can be found scored on the top of the spring end.

Front fork disassembly

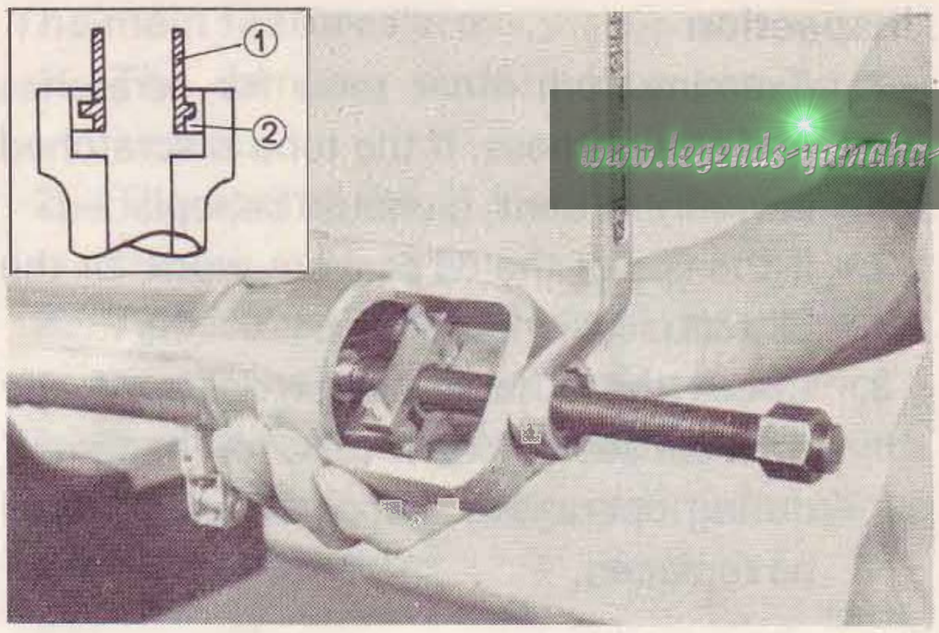
1. To disassemble, the front fork assembly, remove the cylinder holding bolt from the bottom of the outer tube and pull the inner and outer tubes apart.

NOTE:

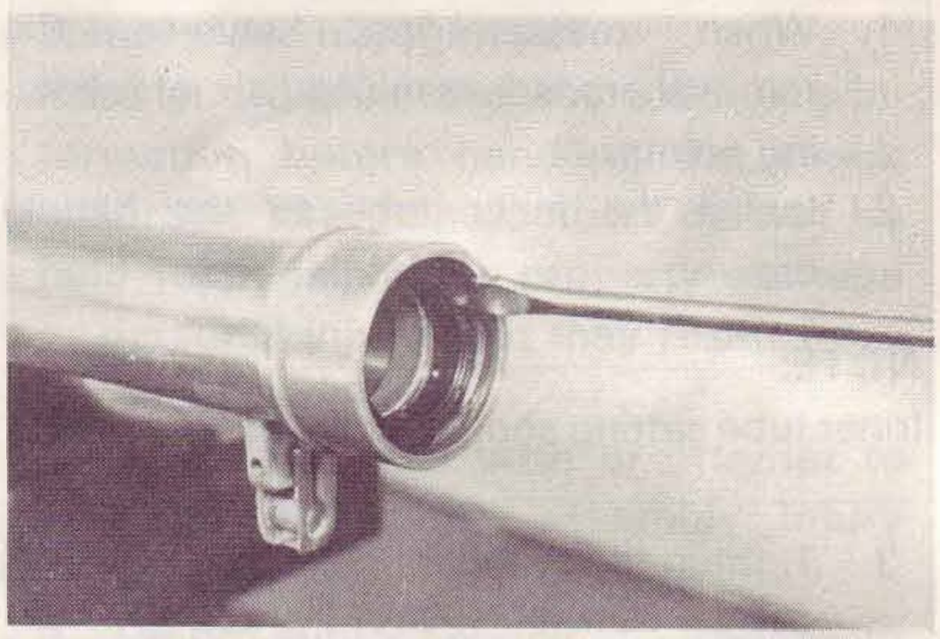
Use the cylinder holding wrench for removing the cylinder holding bolt.



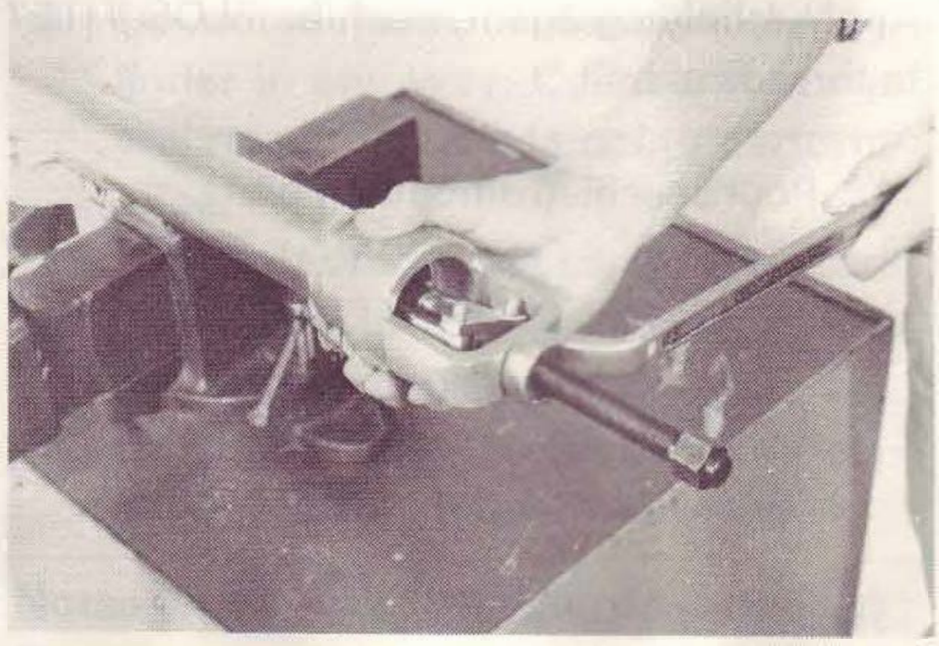
2. To replace the fork seal, remove the dust seal and pull out the dust seal case, such as bearing puller. And remove the snap ring with screw driver.



1. Dust seal 2. Dust seal case



3. Carefully pry out the old seal without damaging fork tube.



4. Insert the new seal "Open" side down (Manufacture's marks up) using large socket and soft hammer.

Inspection

1. Examine fork inner tube for scratches and straightness. If the tube is scratched severely or bent, it should be replaced.
2. If the lips of the oil seal are worn, or the oil seal is leaking, replace it.
3. Check the outer tube for dents. If any dent causes the inner tube to "hang up" during operation, the outer tube should be replaced.

Reassembly

1. When reassembling, reverse the removal procedure taking care of following points.
2. Install the inner tube to the handle crown.

NOTE:

Inner tube setting should be set as illustrated.

3. Tighten the cylinder holding bolt.

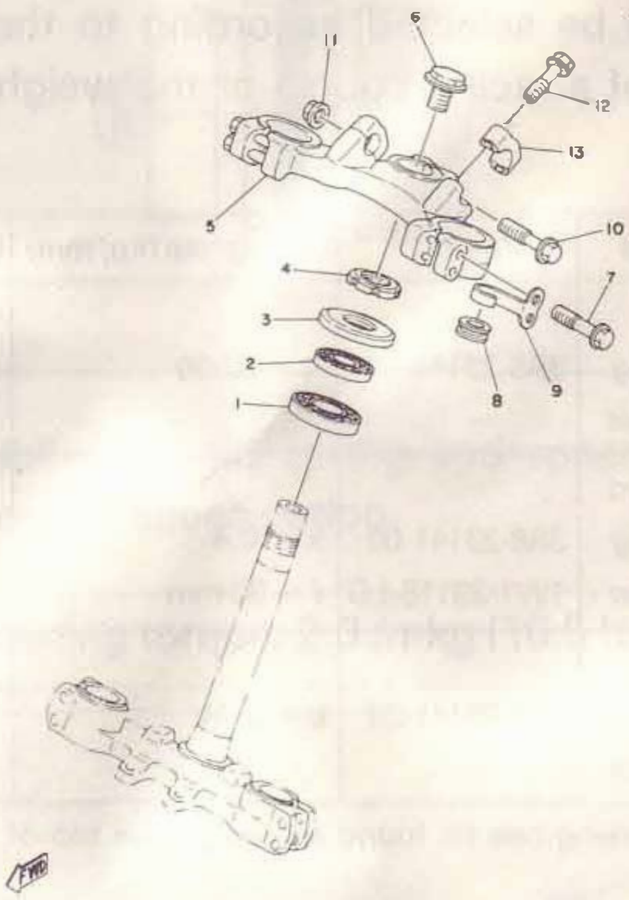
Tightening torque: 2.3 m-kg (16 ft-lb)

NOTE:

Apply a holding agent, such as "LOC TITE" to threads of bolt.

4. Pour specified amount of oil.

Steering Head



1. Bearing
2. Bearing
3. Ball race cover
4. Nut
5. Handle crown
6. Bolt
7. Flange bolt
8. Wire guide
9. Wire holder
10. Flange bolt
11. Flange nut
12. Flange bolt
13. Handle upper holder

Inspection

1. Wash the bearings in solvent.
2. Inspect the bearings for pitting or other damage. Replace the bearings if pitted or damaged.
3. Spin the bearings by hand. If the bearings hang up or are not smooth in their operation, replace bearing.

Swing Arm

1. Grasp the ends of the arm and move from right to left to check for free play.

Swing arm free play:
0 ~ 1 mm (0 ~ 0.04 in)

2. If free play is excessive, remove swing arm and replace swing arm bushings and bearings.

3. Check the swing arm for cracks. If there is any crack, repair or replace the swing arm, as required.

NOTE:

When assembling, grease the following points.

1. Oil seal lips and inside of guard seal.
2. Inside of spacer.
3. Contact surfaces of bearing and bush.

Rear Shock (Monocross Suspension "DE CARBON" System)

General features:

This rear shock absorber, a recent Yamaha development, is of the nitrogen gas enclosed "De Carbon" type.

The main features are:

1. The damping performance can be adjusted.
2. The spring fitting load can be adjusted freely.
3. Application of the thermal compensator greatly helps improve fading resistance.

These noteworthy improvements have greatly contributed to the improved performance of the shock absorber.

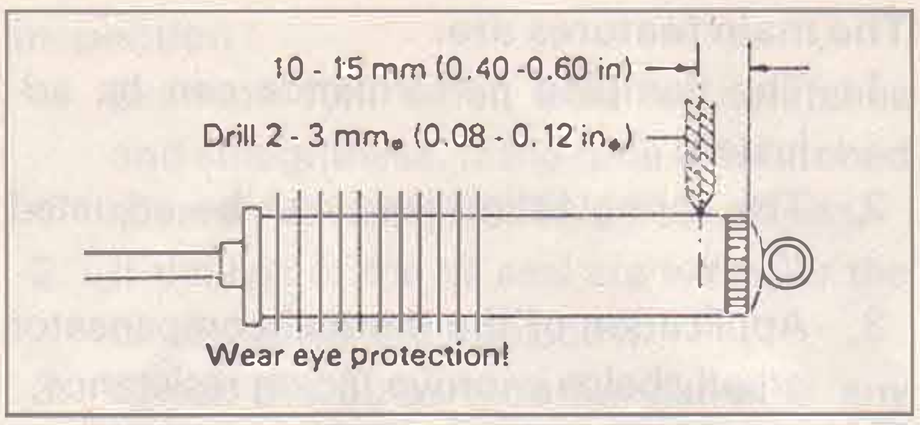
WARNING: READ CAREFULLY

This shock absorber contains highly compressed nitrogen gas.
Read and understand the following information before handling the shock absorber. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling.

1. **Do not tamper with or attempt to open the cylinder assembly. Injury may result.**
2. **Do not subject shock absorber to an open flame or other high heat. This may cause the unit to explode due to excessive gas pressure.**
3. **Do not deform or damage the cylinder in any way. Cylinder damage will result in poor damping performance.**
4. **Handle it with great care, for a score or scratch in the piston rod sliding portion will cause oil leakage.**
5. **Never remove the plug on the cylinder bottom. Injury may result.**

Notes on disposal (Yamaha dealers only)

Gas pressure must be released before disposal of shock absorber. To do so, drill a 2 — 3 mm hole through the cylinder wall at a point 10 — 15 mm above the bottom of the cylinder. At this time, wear eye protection to prevent eye damage from escaping gas and/or metal chips.

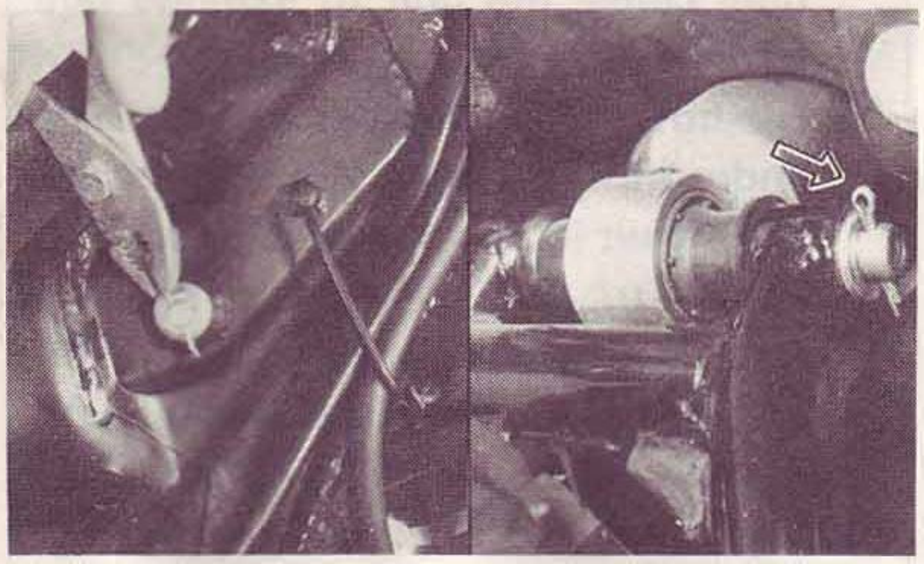


WARNING:

To dispose of a damaged or wornout shock absorber, take the unit to your Yamaha dealer for this disposal procedure.

Rear shock absorber (Monocross suspension) removal

1. Remove the two bolts holding the fuel tank (petcock lever must be turned OFF). Lift up the front of the tank and remove it. And remove the rear wheel.
2. Remove the cotter pin and nut. Remove the bolt securing the upper bracket to frame.
3. Remove the cotter pin and pull out the pivot shaft from the lower bracket.



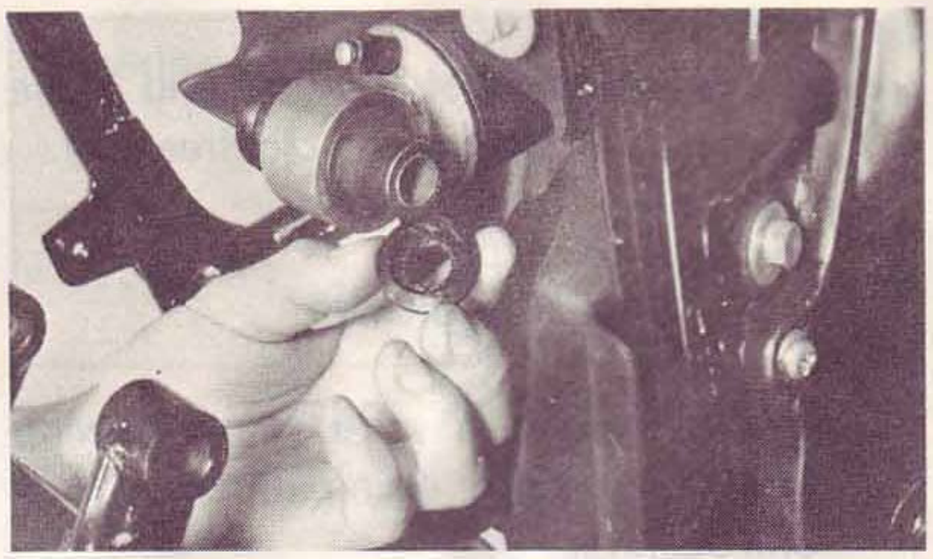
NOTE:

Put a proper support under the engine to keep the machine from falling over.

4. Remove the rear shock absorber from the frame. (To remove, pull the rear shock backward while lifting up the frame.)

NOTE:

a. When removing the shock absorber, be careful not to bend the absorber rod.
b. Take care so the two washers are not lost.



Adjustment

When bottoming feels excessive and too soft:

a. Increase the spring pre-load
b. Make damping performance stiffer

When springing feels excessive and too hard:

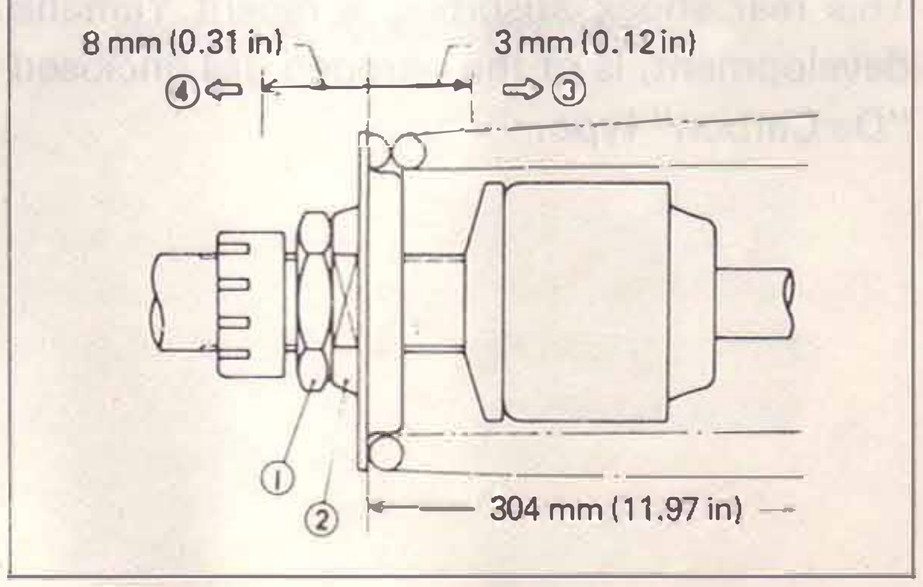
a. Decrease the spring pre-load
b. Make damping performance softer

1. Changing suspension spring pre-load: Perform this adjustment with a special wrench (in the owner's tool kit).
   a. Loosen the adjuster lock nut.
   b. To increase pre-load, screw IN the adjuster. To decrease pre-load, screw OUT the adjuster.
   c. Tighten the lock nut:

Tightening torque:
5.5 m-kg (40 ft-lb)

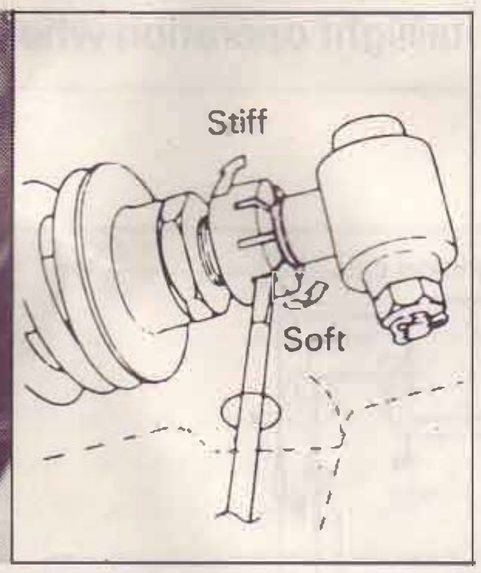
NOTE:

Initial fitting length is set for 304 mm. Adjustable extent is (maximum) 307 mm and (minimum) 296 mm. Be sure to adjust within the above limits.



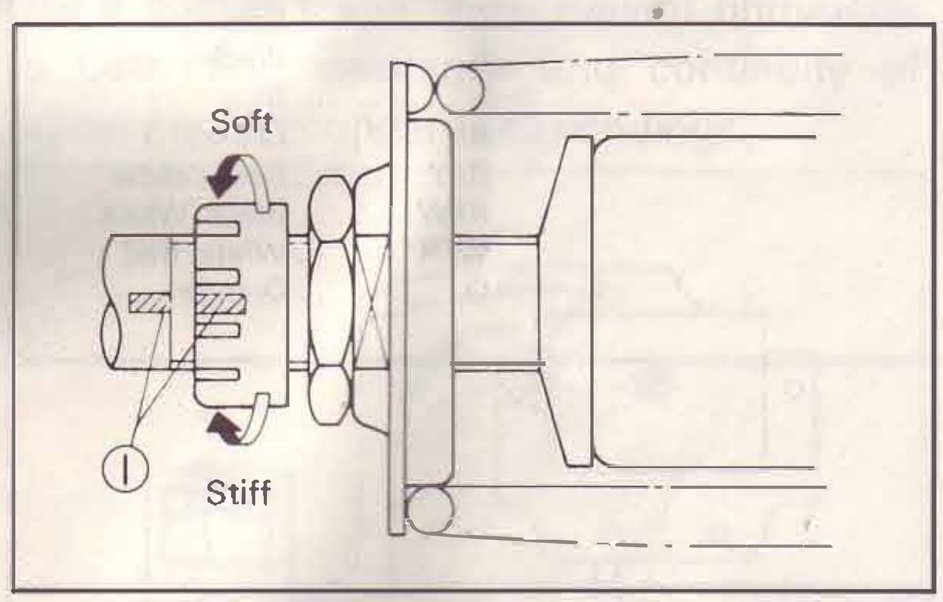
1. Lock nut
2. Adjusting nut
3. Increase
4. Decrease

2. Changing damping performance
Adjustment can be made without removing the shock absorber.
Turn the adjuster with a slotted-head screwdriver through the hole provided one each on either side of the frame.



a. To make is stiffer, screw IN the adjuster.
b. To make it softer, screw OUT the adjuster. Make notch by notch adjustment and test it by riding after each adjustment.

NOTE:
Turn the adjuster until it clicks.
Maximum (Minimum) extent can be known by the position where turning suddenly feels heavy (light).
Do not give any more turns.



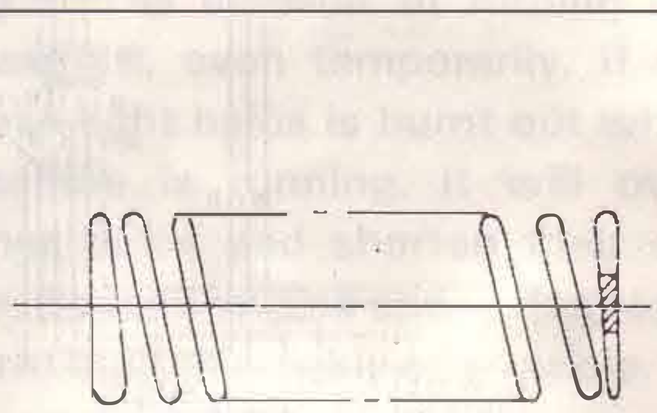
1. Alignment mark (Yellow paint)

3. Gas pressure
The gas pressure can be adjusted. For this adjustment, take the unit to your Authorized Yamaha dealer.

Rear shock spring replacement
In addition to the standard type, two different type rear shock springs are sold. A proper type should be selected according to the conditions of a racing course or the weight of the rider.

Type	Part No.	Spring constant (kg/mm)	Color code
Soft	3R8-22212-10	$K_1 = 1.8$ $K_2 = 4.8$	Green
Standard	90501-99481	$K_1 = 2.09$ $K_2 = 4.91$	Yellow
Stiff	90501-99479	$K_1 = 2.55$ $K_2 = 5.03$	Blue

NOTE:
Code color is shown on the end of the spring.



ELECTRICAL

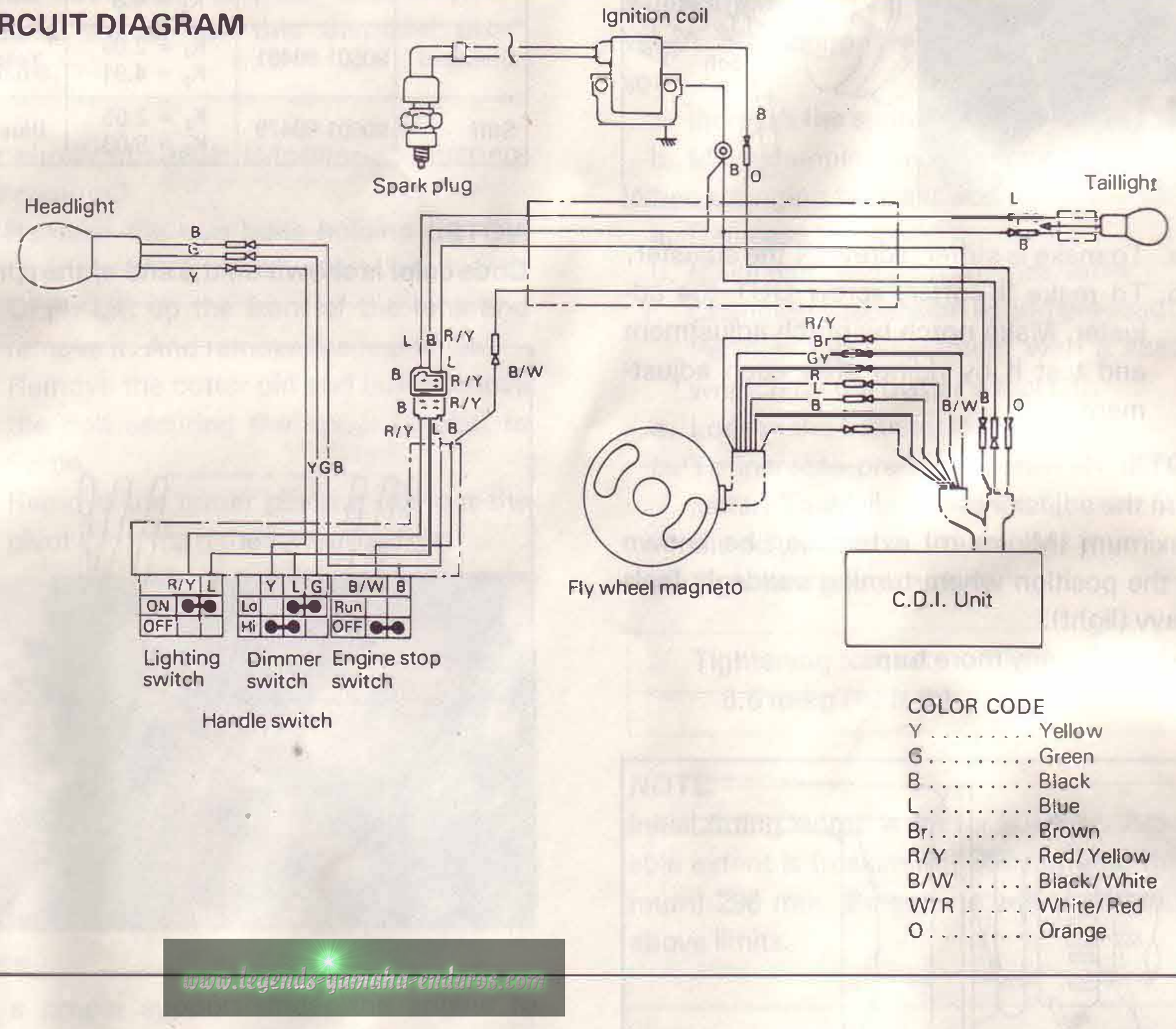
General information

The IT250G/425G use a flywheel magneto to generate electrical current/voltage for the lighting system and uses CDI system for ignition. There are two coils attached to the magneto backing plate. The righthand coil supplies primary voltage to the ignition coil. The lefthand coil provides alternating current (AC) for operation of the lights.

NOTE:

If headlight filament burns out while engine is running, the taillamp filament may also burn out because of excess voltage. Always check taillight operation when replacing headlight.

CIRCUIT DIAGRAM



COLOR CODE

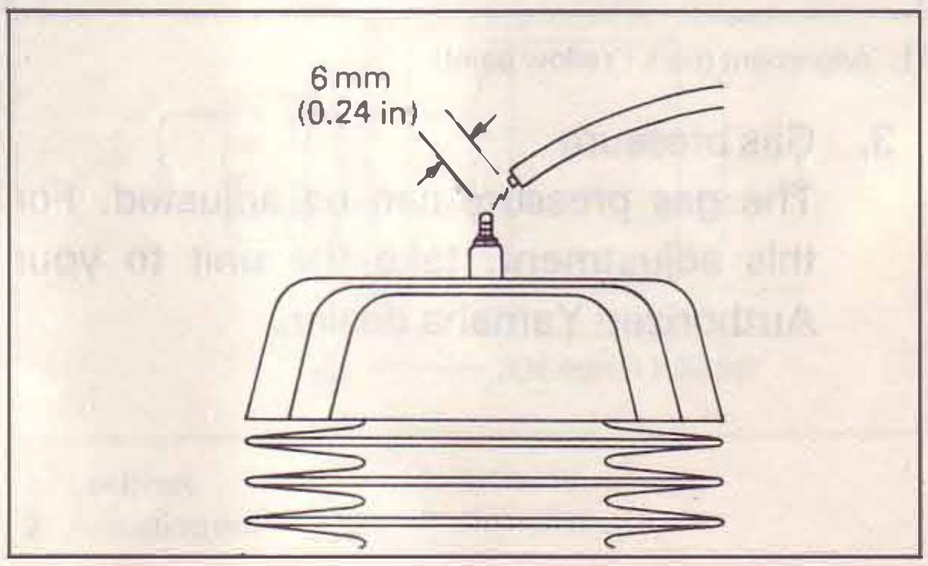
Y	Yellow
G	Green
B	Black
L	Blue
Br	Brown
R/Y	Red/Yellow
B/W	Black/White
W/R	White/Red
O	Orange

Ignition System

Spark gap test

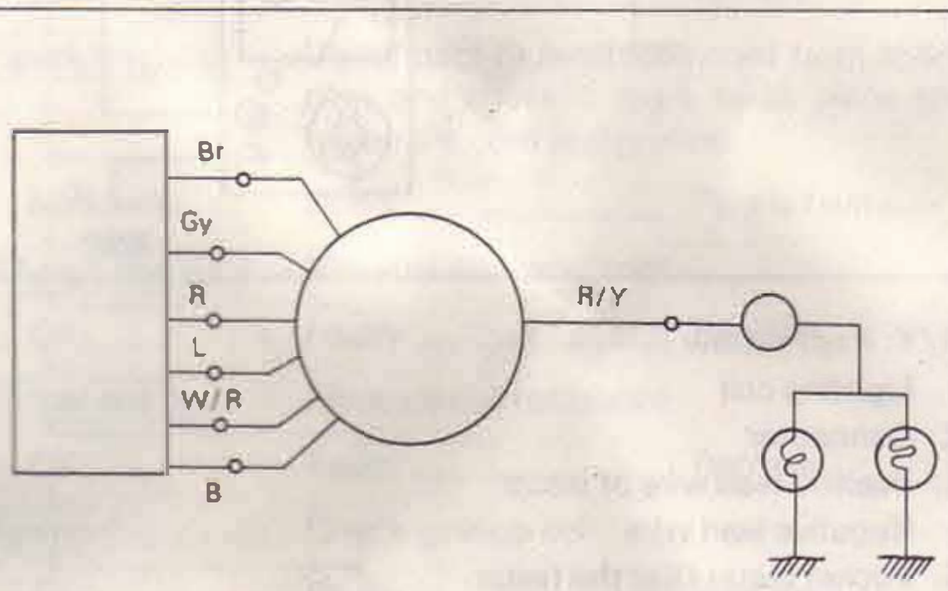
Remove the high tension wire from the spark plug cap, and as shown below, hold it 6 mm (0.23 in) off the plug.

Kick the kick crank and check if spark takes place.



Magneto coil resistance test

Measure the resistance of lighting coil, charge coil and pulser coil. If the resistance measured is off the specification below, the coil is considered to be shorted or to have a broken wire.

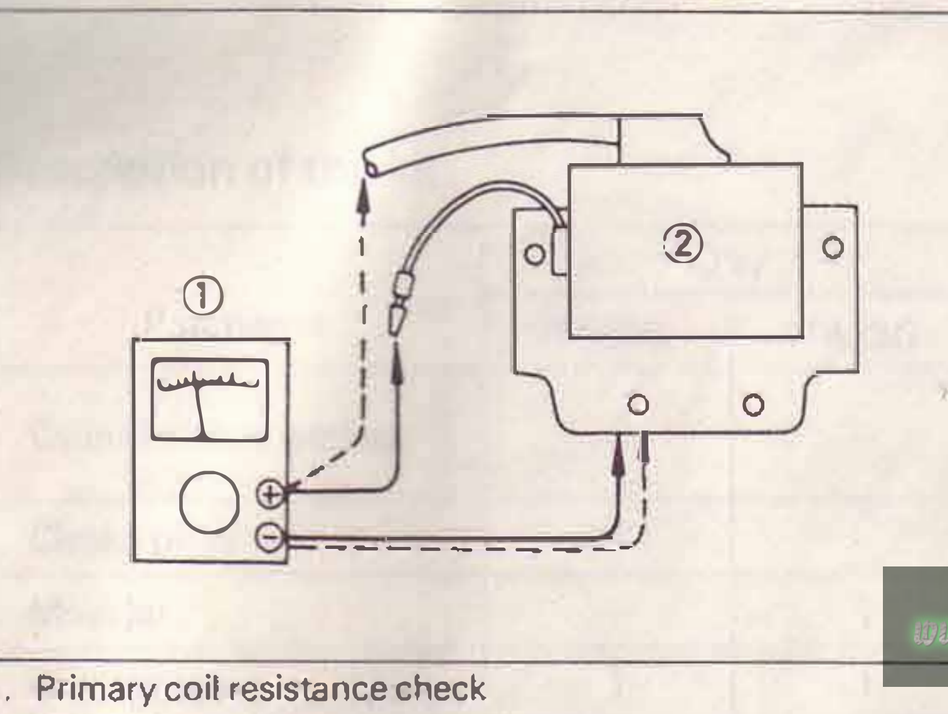


at 20°C (68°F)

Pulser coil resistance (W/R-B):
7.5Ω ± 10% (IT250G)
4.0Ω ± 10% (IT425G)
Charge coil resistance
(High speed) (R-L): 35Ω ± 10%
Charge coil resistance
(Low speed) (Br-Gy):
370Ω ± 10% (IT250G)
(Low speed) (Br-B):
240Ω ± 10% (IT425G)

Ignition coil resistance test

Use a pocket tester or equivalent ohmmeter to determine resistance and continuity of primary and secondary coil windings.



1. Primary coil resistance check
2. Secondary coil resistance check

at 20°C

Primary coil resistance: Use Ω × 1 scale 1.0Ω ± 10%
Secondary coil resistance: Use Ω × 100 scalee 5.9 kΩ ± 20%

Lighting System

Description

The lighting system consists of the lighting coil, headlight and taillight. Lighting coils in the flywheel magneto supply alternating current (A.C.) for the headlight, and taillight.

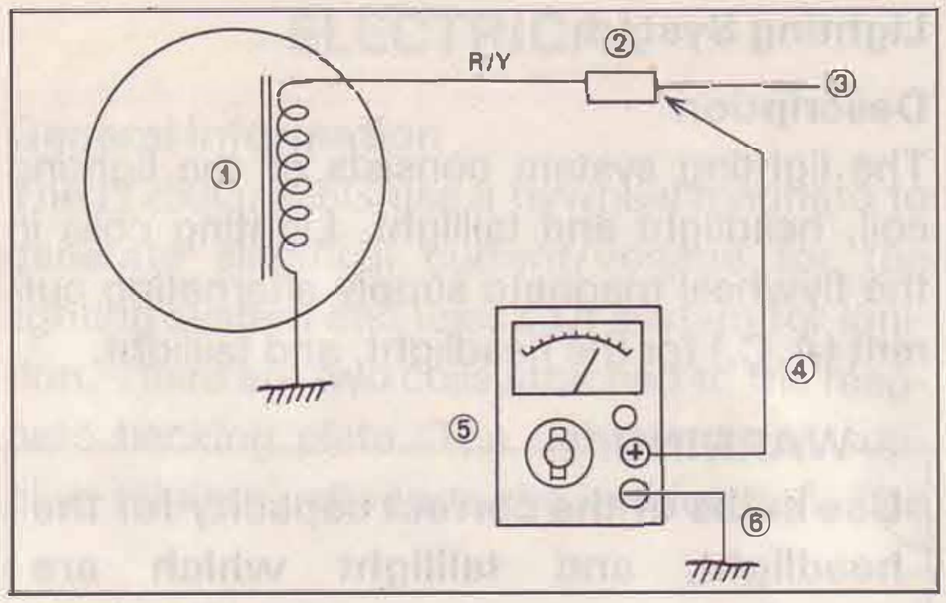
WARNING:

Use bulbs of the correct capacity for the headlight, and taillight which are directly connected to the flywheel magneto. If large capacity bulbs are used, the voltage will rise, shortening the life of bulbs. When the headlight beam switch is operated to change the beam from one to another, the headlight is designed to keep both bulbs burning during the change over. This is to protect other light bulbs from burning out as a result of turning off the headlight, even temporarily. If one of these light bulbs is burnt out while the machine is running, it will overload other bulbs and shorten their service life. Reduce engine speed and replace a burnt bulb as quickly as possible.

A.C. circuit output test

With all A.C. light in operation the circuit will be balanced and the voltage will be the same at all points at a given r.p.m.

1. Switch Pocket Tester to "AC20V" position.
2. Connect positive (+) test lead to Red/-Yellow connection and negative (−) test lead to a good ground.
3. Connect Engine speeds meter
4. Start engine, turn on lights switch and check voltage at each engine speed in table below.



1. Lighting coil
2. Connector
3. To head light and tail light
4. Positive lead wire of tester
5. Pocket tester (Set the tester in A.C.20V position)
6. Negative lead wire

R/Y: Red/Yellow

If measured voltage is too high or too low, check for bad connections, damaged wires, burned out bulbs or bulb capacities are too large throughout the A.C. lighting circuit.

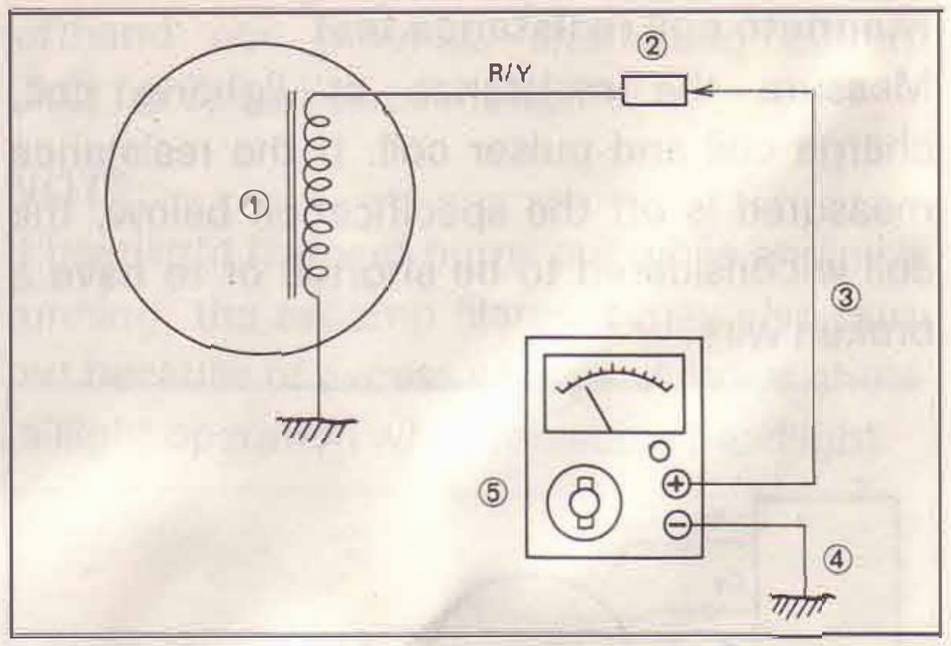
Output voltage:
5.0V or more/2,500r/min (IT250G)
5.5V or more/2,500r/min (IT425G)
7.0 or less/8,000r/min

NOTE:
Be sure to turn the lighting switch to ON.

NOTE:
This voltage test can be made at any point throughout the A.C. lighting circuit and the readings should be the same as specified above.

Lighting coil resistance check
If voltage is incorrect in A.C. lighting circuit, check the resistance of the yellow-red wire windings of the lighting coil.

1. Switch pocket tester to "Ω ÷ 1" position and zero meter.
2. Connect positive (+) test lead to Red/-Yellow wire from magneto and negative (−) test lead to a good ground on engine. Read the resistance on ohms scale.



R/Y: Red/Yellow
1. Lighting coil
2. Connector
3. Positive lead wire of tester
4. Negative lead wire
5. Pocket tester (Set the tester "Resistance" position)

Lighting coil resistance:
IT250G: 0.43Ω ± 10% at 20°C
IT425G: 240Ω ± 10% at 20°C

Troubleshooting

1. Check for spark at spark plug — if no spark, check connectors.
2. If connections are clean and tight, refer to Mechanical Adjustments, Ignition Timing. Ensure that the timing is correct.

Any further troubleshooting of the C.D.I. system must be performed by your Yamaha Dealer.

Troubleshooting:

1. No spark is produced or weak.

Check of connections . . . . . Check lead wire connections or short circuits.
↓
OK — Faulty — Correct
↓
Spark test . . . . . Disconnect high-tension cord from spark plug and check if spark takes place between the cord and ground.
↓
No spark — Spark — Plug is faulty.
↓
Charge coil test . . . Measure coil resistance.
↓
OK — Faulty — Replace
↓
Pulser coil test . . . Measure coil resistance
↓
OK — Faulty — Replace
↓
Ignition . . . . . Check ignition coil.
↓
OK — Faulty — Replace
↓
CDI unit . . . . . In case of ignition failure with all the above checkups proving in good order, replace the CDI unit.

2. The engine starts but will not pick up speed.

Spark plug . . . . . Clean or replace
↓
OK
↓
Charge coil . . . . . Make continuity test.
↓
OK
↓
Ignition timing . . . Check ignition timing.
↓
OK
↓
CDI unit . . . . . In case of ignition failure with all the above checkups proving in good order, replace the CDI unit.

MISCELLANEOUS

INSTALLATION OF THE OFF-ROAD RIDING KIT

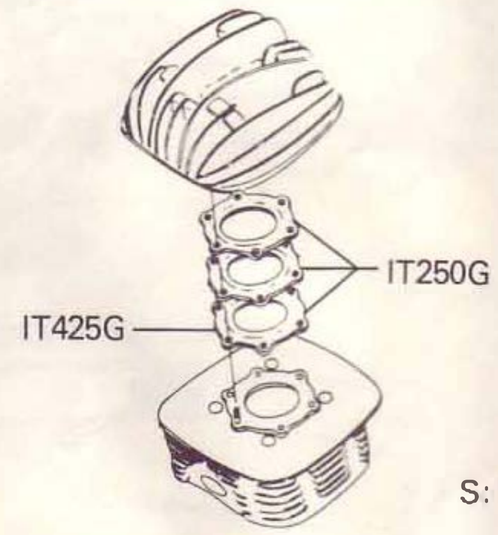
An off-road riding kit is provided with each vehicle to comply with noise level and spark arrester laws and regulations. Performance will be substantially decreased. Returning is not required.

Description of the kit

Part name	Q'ty	
	IT250G	IT425G
Cylinder head gasket	2	—
Choke plate	1	—
Main jet	—	1
Choke pipe	1	1
Silencer cap	1	1
Absorber	12	14

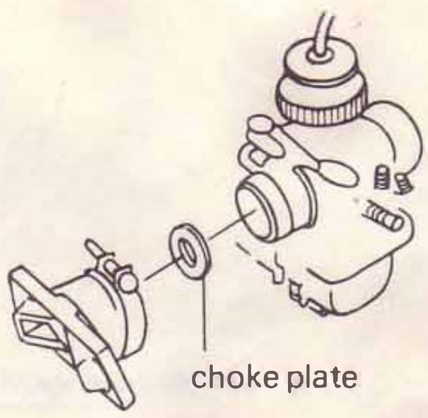
Installing the kit parts

1. Cylinder head gasket



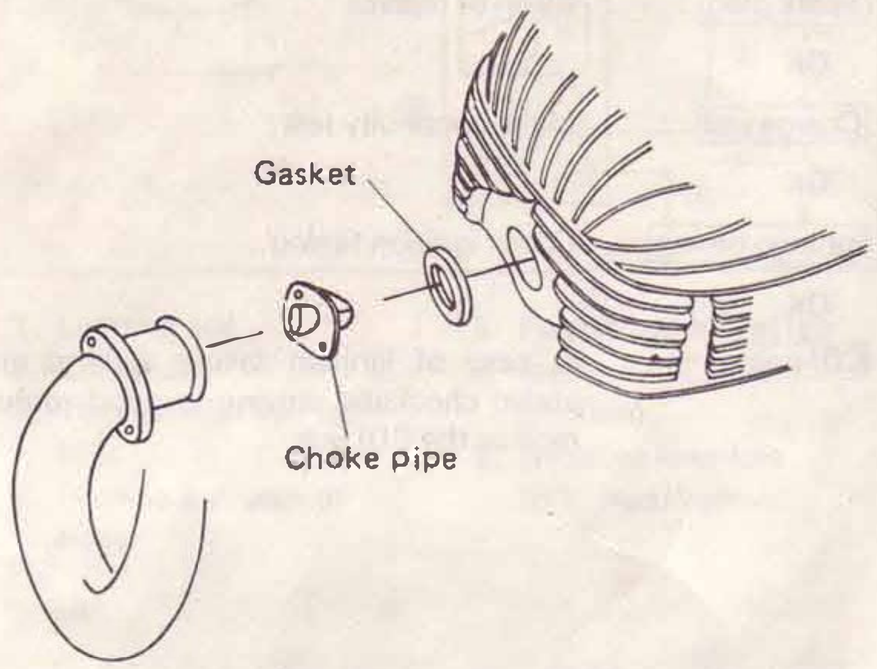
S: Standard

2. Choke plate

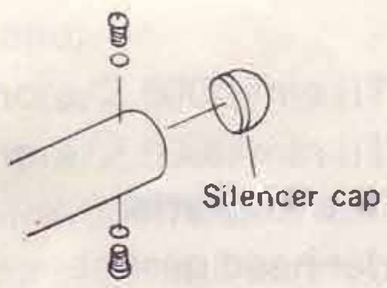


3. Main jet for main jet installation, refer to page 36.

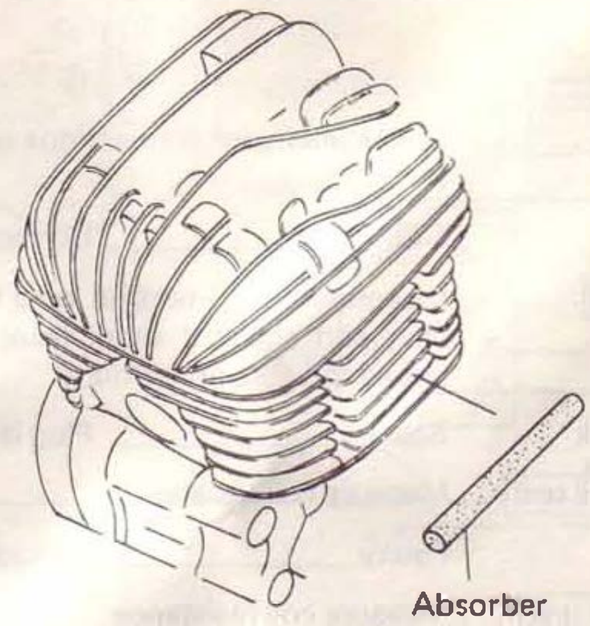
4. Choke pipe



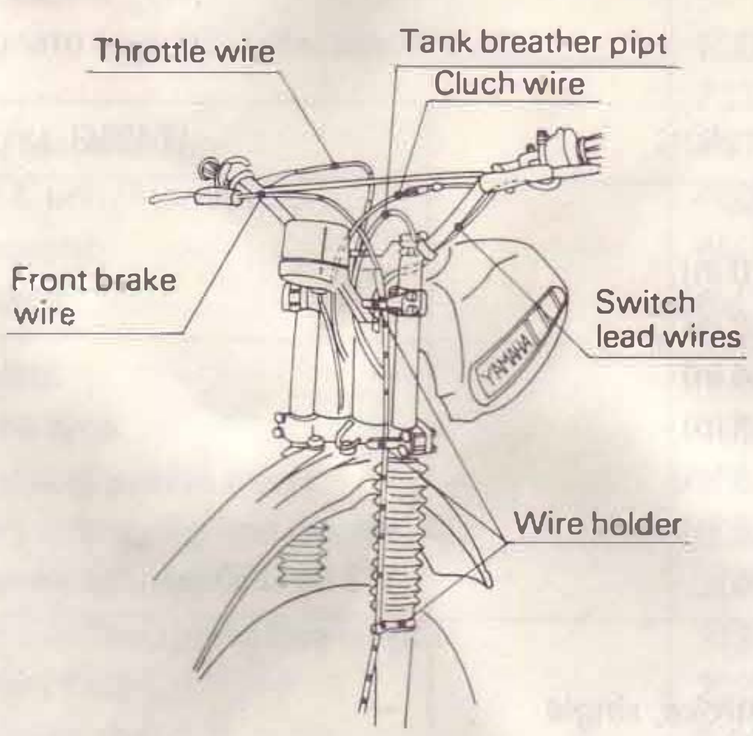
5. Silencer cap

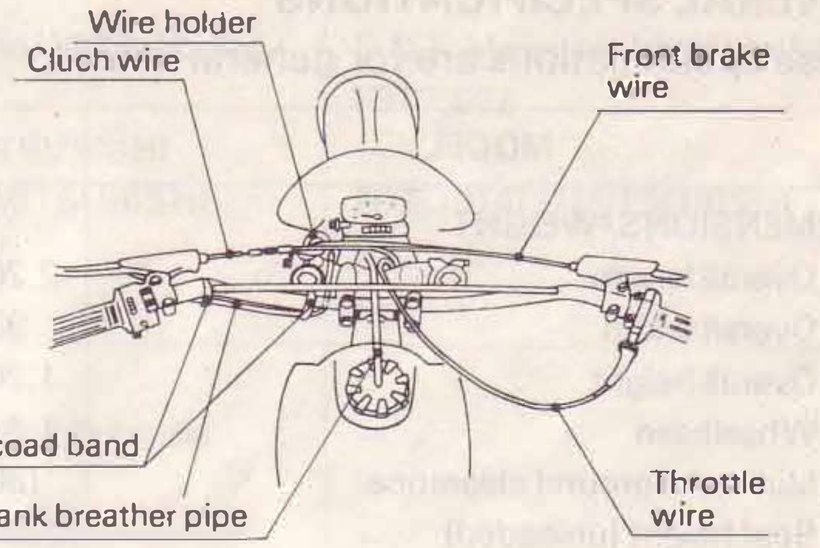


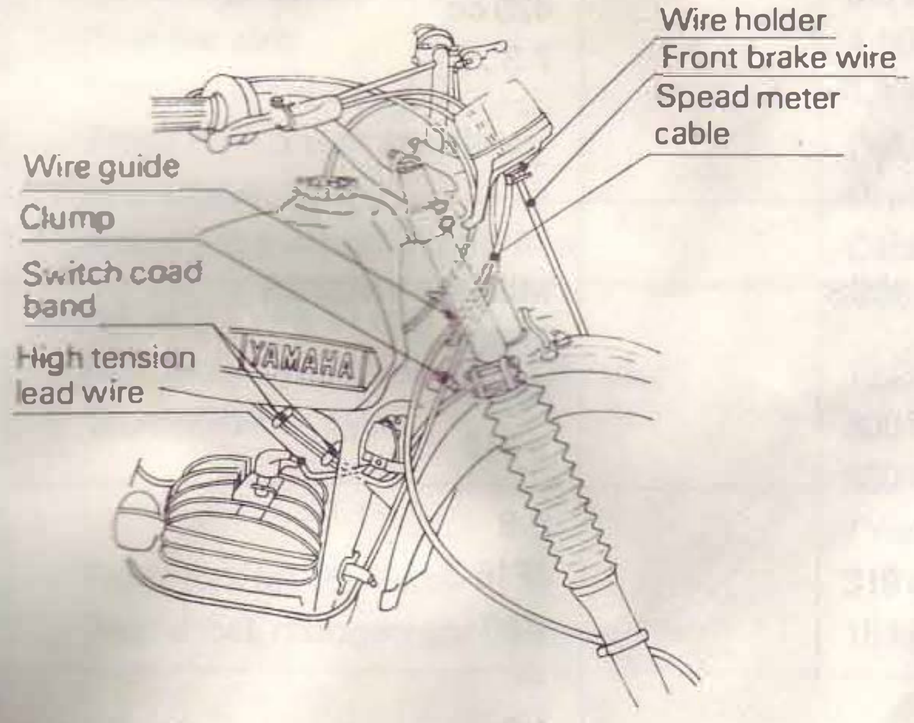
6. Absorber

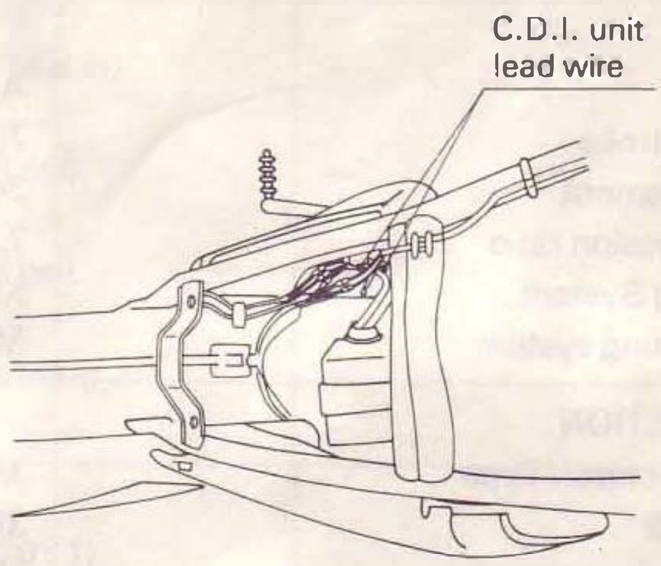


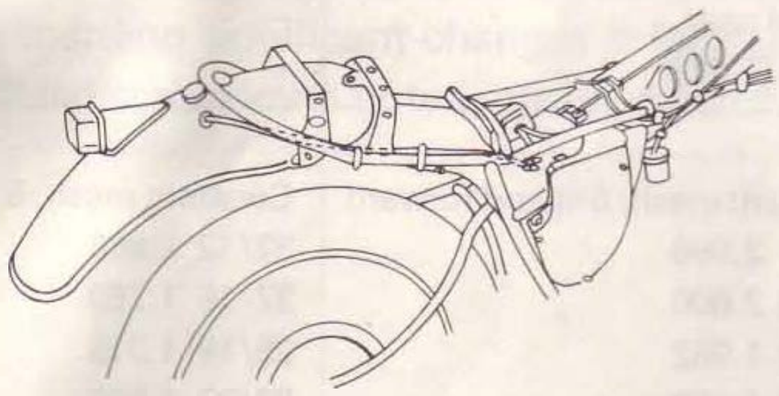
CABLE ROUTING DIAGRAM

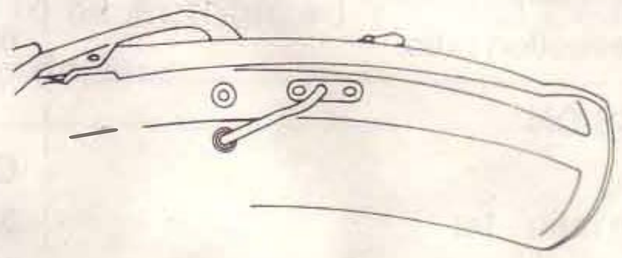


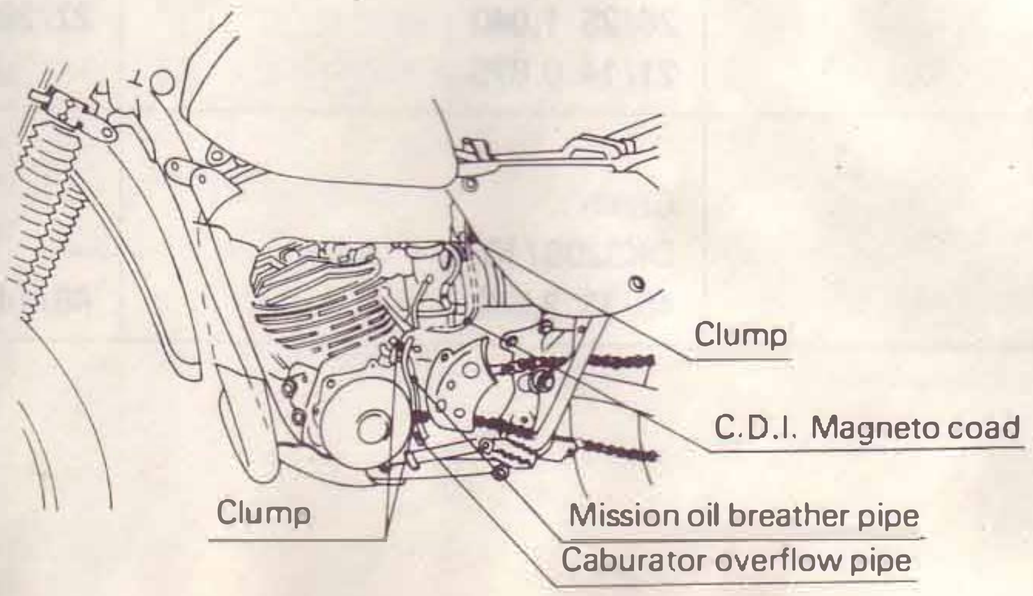












SPECIFICATIONS

GENERAL SPECIFICATIONS

These specifications are for general use.

MODEL	IT250G	IT425G
DIMENSIONS/WEIGHT		
Overall length	2,205 mm (87.0 in)	←
Overall width	935 mm (36.8 in)	←
Overall height	1,205 mm (47.4 in)	←
Wheelbase	1,430 mm (56.3 in)	←
Minimum ground clearance	300 mm (11.8 im)	←
Seat height (unloaded)	935 mm (36.8 in)	←
Machine net weight	111 kg (244 lb)	113kg (250 lb)
ENGINE		
Type	Air cooled, 2-stroke, single	←
Bore/Stroke	70 × 64 mm	85 × 75 mm
Displacement	246 cc	425 cc
Compression ratio	7.9 : 1	7.3 : 1
Starting System	Kick starter	←
Lubricating system	Mixed gas 20 : 1	←
CARBURETION		
Manufacturer/Type	MIKUNI VM 36SS	MIKUNI VM38SS
I.Dmark	3R700	3R800
Effective venture size	36mm	38 mm
Main jet	#350	#410
Needle jet	P-4	P-8
Jet needle	6F-2	6F16-3
Pilot jet	#70	#60
Air screw (Turns out)	1-1/2	←
Cut away	2.0	4.0
Float level	18.1 ± 1 mm (0.71 ± 0.04 in)	←
CLUTCH		
Type	Wet multiple disc type	←
Primary reduction system	Helical gear	←
Primary reduction ratio	60/23 (2.608)	←
TRANSMISSION		
Type	Constant mesh, 6 speed forward	Constant mesh, 5 speed forward
Reduction ratio 1st	32/12 2.666	32/12 2.666
2nd	30/15 2.000	27/16 1.750
3rd	25/16 1.562	25/19 1.315
4th	25/20 1.250	22/22 1.000
5th	26/25 1.040	22/28 0.785
6th	21/14 0.875	—
SECONDARY DRIVE		
Reduction system	Chain	—
Chain type/size	DK520S/101L + Joint	—
Reduction ratio	48/13 3.692	46/14 3.285

MODEL	IT250G	IT425G
ELECTRICAL		
Magneto type/Manufacturer/Model	C.D.I. Magneto/MITSUBISHI/ F3T35471	C.D.I. Magneto/MITSUBISHI/ F3T35072
Coil/Manufacture	F6T41174/MITSUBISHI	—
C.D.I. unit/Manufacture	F008T01472/MITSUBISHI	F008T01471/MITSUBISHI
Headlight	6V, 25W/25W	—
Taillight	6V, 5.3W	—
CHASSIS		
Frame type	Tubular steel double cradle	—
Front suspension travel	250 mm (9.06 in)	—
Front fork spring free length	593.5 mm (21.00 in)	—
Rear wheel travel	250 mm (8.07 in)	—
Rear cushion spring free length	313 mm (10.98 in)	—
Caster/Trail	29°30′ / 125 mm (4.8 in)	—
Front tire size	3.00-21-4PR	—
Nominal pressure	0.9 kg/cm² (12.8 psi)	—
Rear tire size	4.50-18-4PR	—
Nominal pressure	1.1 kg/cm² (15.6 psi)	—
Tread type (Front and Rear)	Full knobby	—
Brake type	Drum (leading/trailing	—
Actuating method, Front/Rear	Cable/ Link rod	—
VOLUME/TYPE FLUID		
Fuel tank/Type (Gasoline : Oil ratio)	12 lit/premium (20 : 1)	—
Transmission/Type	800 cc (oil change)	—
	850 cc (total)	—
	/Yamalube 4-cycle oil	
Front fork (each) Type	319 cc/Yamaha fork oil 20Wt	—
Rear shock nitrogen gas pressure	15 kg/cm² (227 psi)	—

NOTE:

The Reserch and Engineering Departments of Yamaha are continually striving to further improve all models. Improvements and modifications are therefore inevitable.

In light of this fact, the foregoing specifications are subject to change without notice to the owner. Information regarding significant changes is forwarded to all Authorized Yamaha Dealers as soon as available. If a discripancy is noted, please consult your dealer.

MAINTENANCE SPECIFICATIONS

MODEL	IT250G	IT425G
C.D.I. IGNITION		
Ignition coil resistance (Primary)	1.0Ω10%/20°C	←
(Secondary)	5.9KΩ ± 20%/20°C	←
Ignition timing (Advanced)	2.3 mm (0.09 in)	3.1 mm (0.122 in)
Spark plug (Normal conditions)	N2G Champion	N3 Champion
Spark plug gap	0.7 mm	←
ENGINE-TOP END		
Piston clearance	0.045-0.050 (0.008-0.0020 in)	0.050-0.055 mm (0.0020-0.0022 in)
Piston wear limit	0.1 mm (0.004 in)	←
Ring end gap (Installed)	0.3-0.5 mm (0.012-0.020 in)	0.4-0.55 mm (0.016-0.022 in)
Connecting rod/ Axial play	0.4-2.0 mm (0.016-0.079 in)	←
Connecting rod/ Crank side clearance	0.25-0.75 mm (0.01-0.03 in)	←
ENGINE-CLUTCH		
Friction plate thickness/ Q'ty	3.0 mm (0.12 in) × 5 (2.7 mm minimum)	3.0 mm (0.12 in) × 7 ←
Clutch plate warp allowance	0.05 mm (0.002 in)	←
Clutch spring free length	36 mm (1.42 in) (35 mm minimum)	← ←
CHASSIS		
Front brake shoe diameter	130 mm (5.12 in)	←
Front brake shoe replacement limit	126 mm (4.96 in)	←
Rear brake shoe diameter	160 mm (6.3 in)	←
Rear brake shoe replacement limit	156 mm (6.14 in)	←
Wheel run-out kimits vertical	2.0 mm (0.08 in)	←
Wheel run-out limits lateral	2.0 mm (0.08 in)	←

TORQUE VALUES		
Cylinder head	M8	2.5 m-kg (18 ft-lb)
Cylinder	M10	3.5 m-kg (25 ft-lb)
Clutch boss	M20	7.5 m-kg (55 ft-lb)
Primary drive gear	M18	7.5 m-kg (55 ft-lb)
Drive sprocuet	M20	7.5 m-kg (55 ft-lb)
C.D.I. rotor	M10	4.0 m-kg (30 ft-lb)
Engine mounting bolt (front, upper)	M8	3.0 m-kg (22 ft-lb)
(front bracket)	M8	1.5 m-kg (11 ft-lb)
Engine mounting bolt (front lower)	M8	3.0 m-kg (22 ft-lb)
Engine mounting bolt (rear, bracket and engine)	M8	3.0 m-kg (22 ft-lb)
Engine mounting bolt (engine mount boss and bracket)	M8	1.5 m-kg (11 ft-lb)
Handle crown and inner tube	M8	2.3 m-kg (17 ft-lb)
Handle crown and steering shaft pinch bolt	M8	2.3 m-kg (17 ft-lb)
Steering stem bolt	M14	9.5 m-kg (68 ft-lb)
Handle crown and handle holder	M8	2.3 m-kg (17 ft-lb)
Under bracket and inner tube	M8	2.5 m-kg (18 ft-lb)
Under bracket and steering shaft	M10	2.0 m-kg (15 f t-lb)
Front fork cap bolt	M34	2.5 m-kg (18 ft-lb)
Front wheel axle	M15	6.0 m-kg (45 ft-lb)
Pivot shaft	M16	8.0 m-kg (58 ft-lb)
Rear wheel axle	M16	8.0 m-kg (58 ft-lb)
Driven sprocket	M8	3.0 m-kg (22 ft-lb)
Rear hub stud bolt	M8	3.0 m-kg (22 ft-lb)
Rear suspension ass'y (frame)	M8	3.0 m-kg (22 ft-lb)
(Adjuster lock nut)	M32	5.5 m-kg (40 ft-lb)

CLEANING AND STORAGE

Cleaning

Frequent through cleaning of your motorcycle will not only enhance its appearance, but will improve general performance and extend the useful life of many components.

1. Before Cleaning the machine:
   Block off end of exhaust pipe to prevent water entry; a plastic bag and strong rubber band may be used.
2. If engine case is excessively greasy, apply degreaser with a paint brush. Do not apply degreaser to chain, sprockets, or wheel axles.
3. Rinse dirt and degreaser off with garden hose, using only enough hose pressure to do the job. Excessive hose pressure may cause water seepage and contamination of wheel bearings, front forks, brake drums, and transmission seals. Many expensive repair bills have resulted from improper high-pressure detergent applications such as those available in coin-operated car washes.
4. Once the majority of dirt has been hosed off, wash all surfaces with warm water and mild detergent-type soap. An old toothbrush or bottle brush is handy to reach those hard-to-get-to places.
5. Rinse machine off immediately with clean water and dry all surfaces with a chamois skin, clean towel, or soft absorbent cloth.
6. Immediately after washing, remove excess moisture from chain and lubricate to prevent rust.
7. Clean the seat with a vinyl upholstery cleaner to keep the cover pliable and glossy.
8. Automotive-type wax may be applied to all painted and chrome-plated surfaces. Avoid combination cleaner-waxes. Many contain abrasives which may mar paint or protective finish.
9. After finishing, start the engine immediately and allow to idle for several minutes.

Storage

Long term storage (60 days or more) of your motorcycle will require some preventive procedures to insure against deterioration. After cleaning machine thoroughly, prepare for storage as follows:

1. Drain fuel tank, fuel lines, and carburetor float bowl.
2. Remove empty fuel tank, pour a cup of 10W to 30W oil in tank, shake tank to coat inner surfaces thoroughly and drain off excess oil. Re-install tank.
3. Remove spark plug, pour about one table-spoon of 10W to 30W oil in spark plug hole and reinstall spark plug. Kick engine over several times (with ignition off) to coat cylinder wall with oil.
4. Remove drive chain. Clean thoroughly with solvent and lubricate with graphite-base chain lubricant. Re-install chain or store in a plastic bag (tie to frame for safe-keeping).
5. Lubricate all control cables.
6. Block up frame to raise both wheels off ground.
7. Deflate tires to 12 lb/in^2 (0.8 kg/cm^2)
8. Tie a plastic bag over exhaust pipe outlet to prevent moisture entering.
9. If storing in humid or salt-air atmosphere, coat all exposed metal surfaces with a light film of oil. Do not apply oil to rubber parts or seat cover.

WARRANTY INFORMATION

Please refer to your copy of the Yamaha Owner's Warranty Guide* for details of the warranty offered on your new Yamaha.

The Warranty Guide contains the warranty policy, an explanation of the warranty, and other important information. Becoming familiar with these policies will be to your advantage in making the best use of Yamaha's programs.

There are certain requirements which you must meet in order to qualify for warranty coverage. FIRST, your new Yamaha must be operated and maintained properly, as explained in this manual. If you have any questions about any procedure in this manual, please consult your dealer. ABUSE AND NEGLECTED MAINTENANCE MAY LEAD TO MECHANICAL FAILURES WHICH CANNOT BE COVERED UNDER WARRANTY.

SECOND, IF ANY PROBLEMS OCCUR WHICH YOU FEEL SHOULD BE COVERED UNDER WARRANTY NOTIFY YOUR DEALER IMMEDIATELY. Don't delay, as small problems left unrepaired can become large problems which may not be covered under warranty.

We recommend that the Warranty Guide be used as a folder in which you may keep your registration and other important documents related to your new Yamaha.

* The Yamaha Owner's Warranty Guide is to be supplied by your Yamaha dealer at the time of purchase. If you did not receive one, or have lost yours, you may obtain extra copies upon request from your Yamaha dealer or by writing to:

YAMAHA MOTOR CORPORATION, U.S.A.
6555 Katella Ave.
Cypress California 90630
Attn: Warranty Department

YAMAHA MOTOR CO.,LTD.

IWATA, JAPAN

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