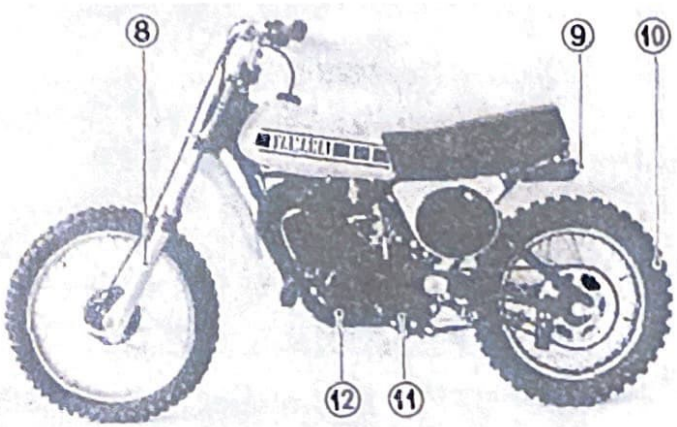
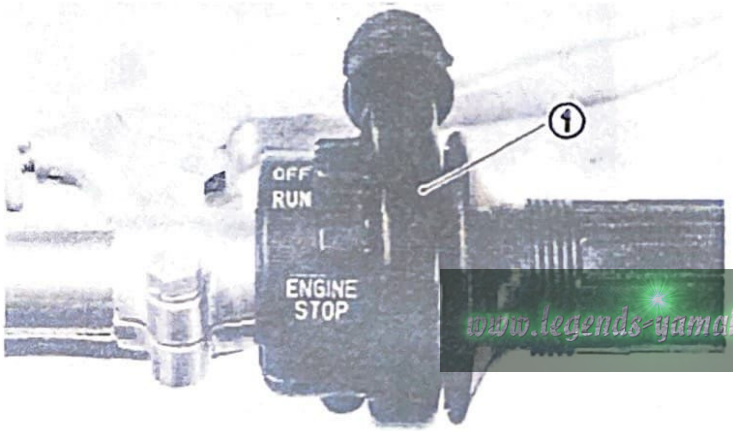
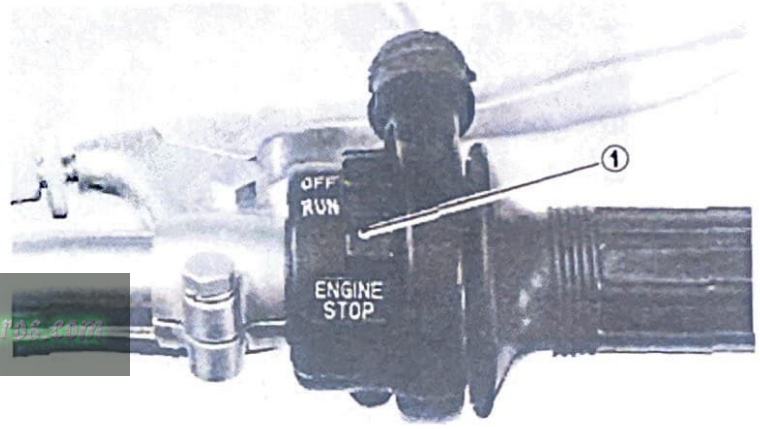
YAMAHA

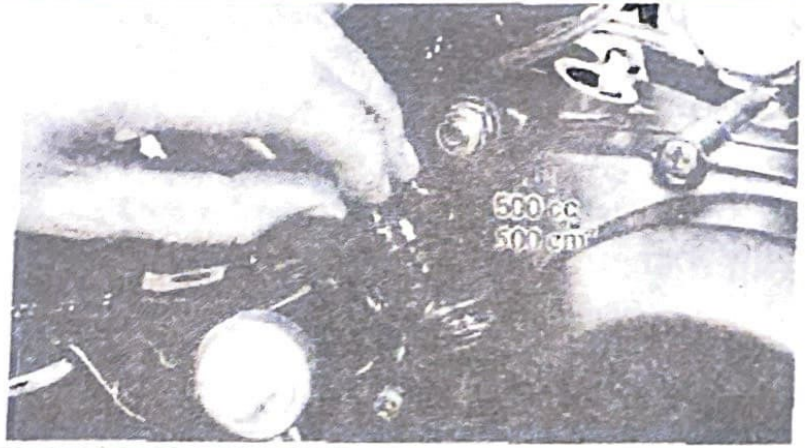
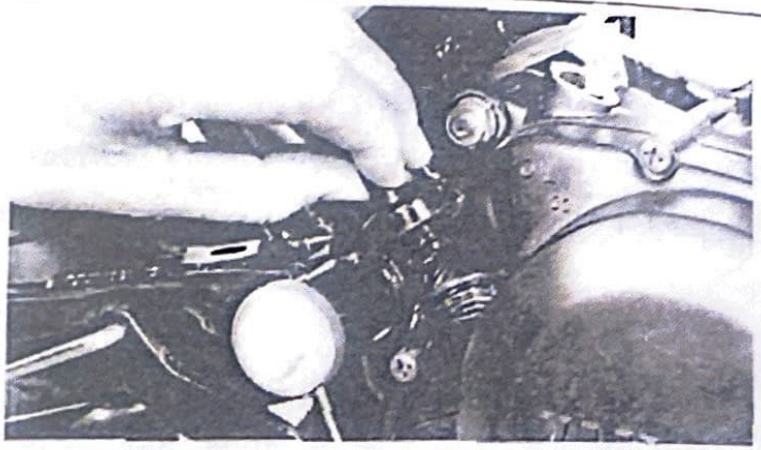
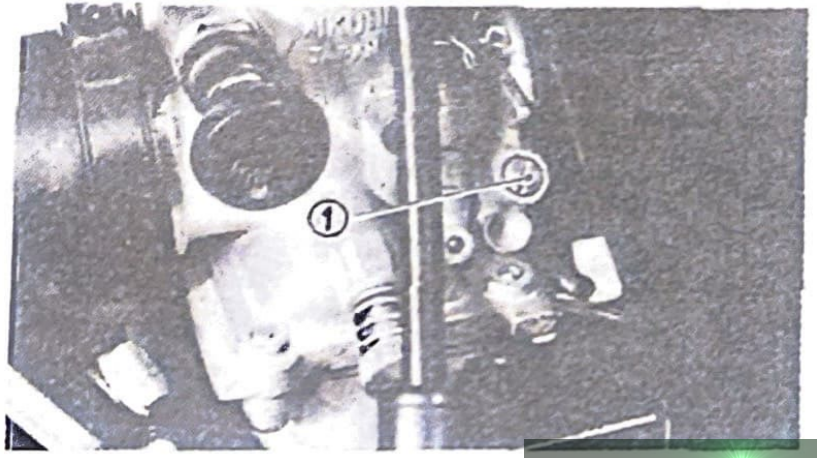
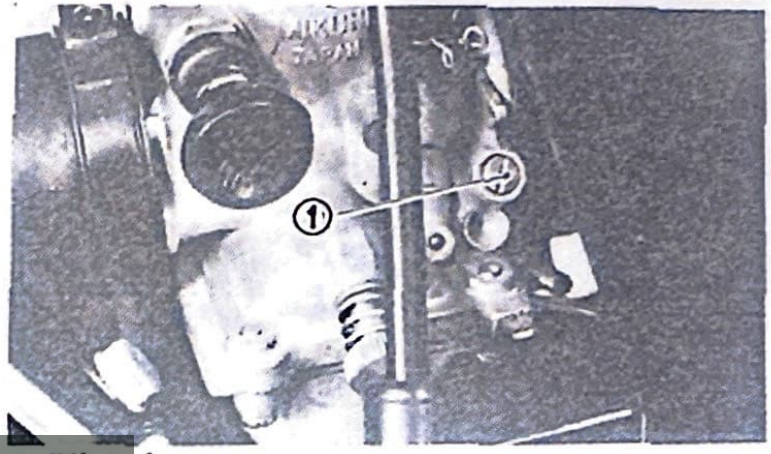
YZ80E

OWNER'S SERVICE MANUAL

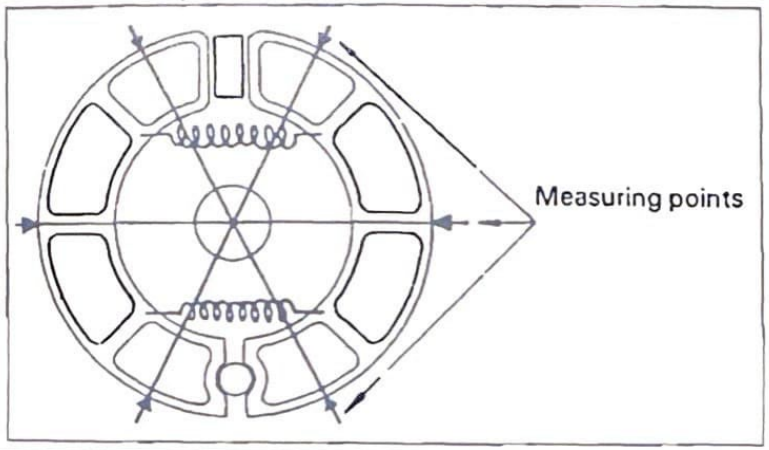
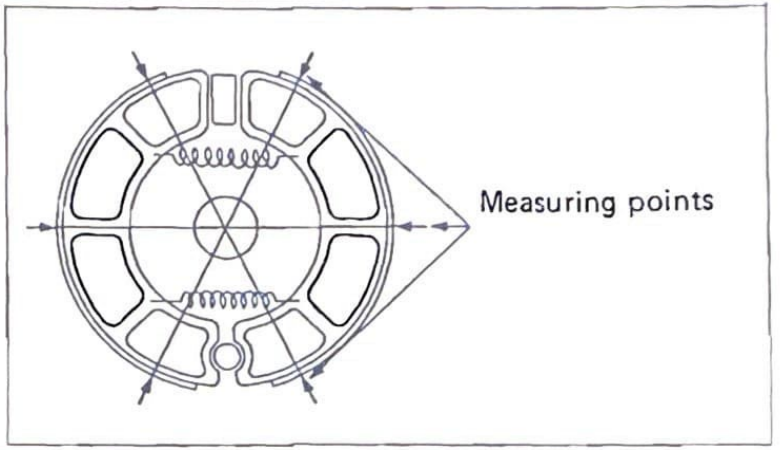
2J5-28199-10

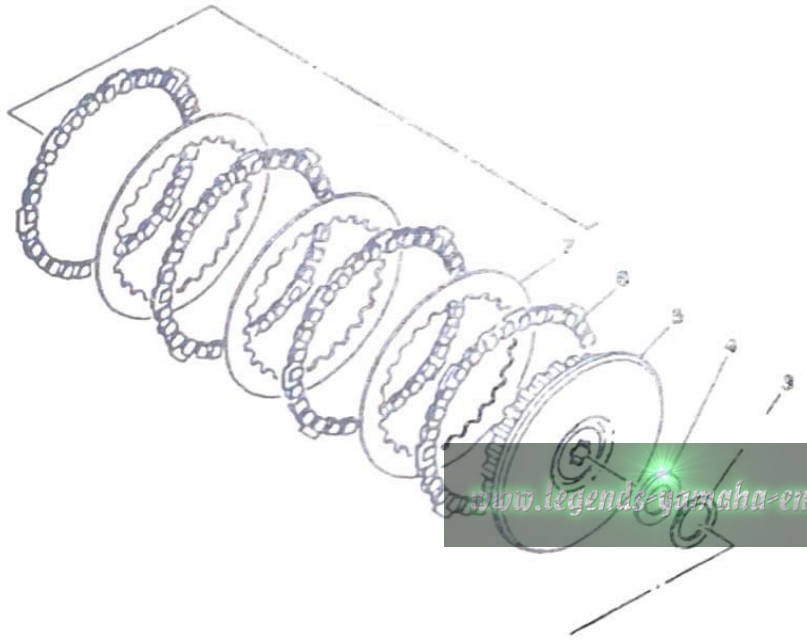
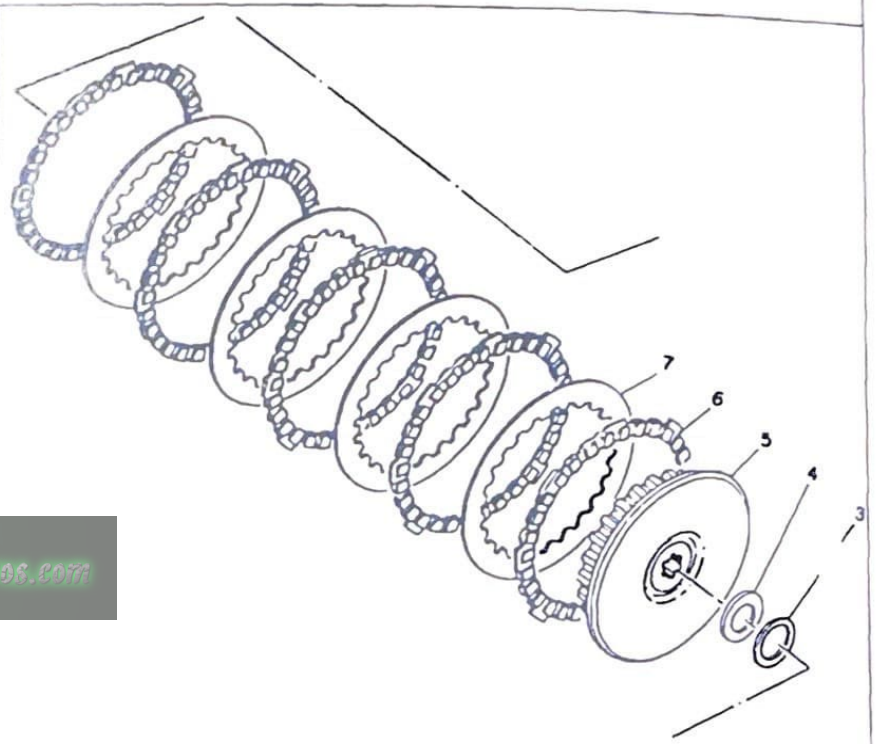
YZ80E Owner's manual correction

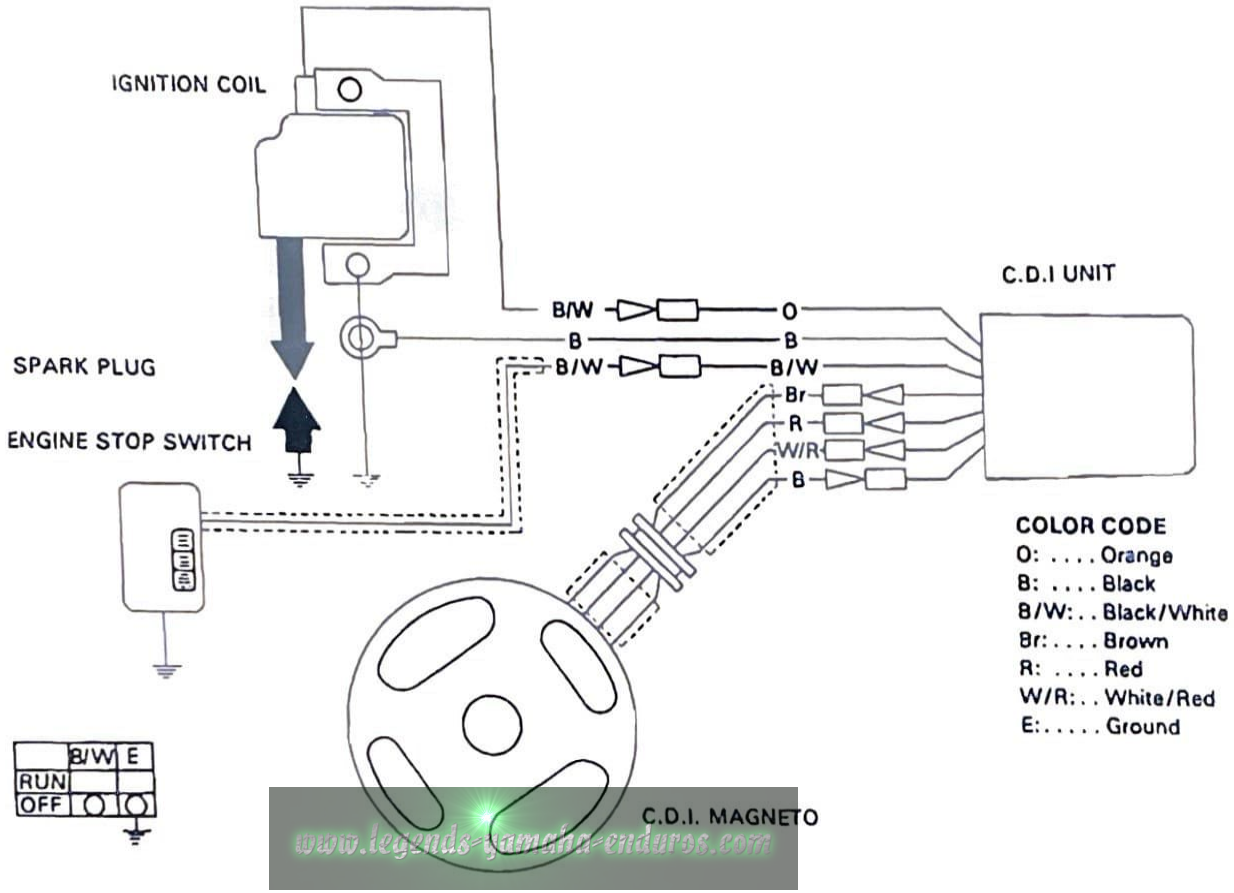
Page	Error	Correct
1	 9. Rear shock absorber	**9. Muffler**
3		

Page	Error	Correct
20		
25		

1 Pilot air screw

Page	Error	Correct
41	<table><tr><th></th><th>Front</th><th>Rear</th></tr><tr><td>Brake shoe diameter</td><td>89 mm (3.5 in)</td><td>102 mm (4.0 in)</td></tr><tr><td>Replacement limit</td><td>86 mm (3.4 in)</td><td>98 mm (3.86 in)</td></tr></table>	<table><tr><th></th><th>Front</th><th>Rear</th></tr><tr><td>Brake shoe diameter</td><td>**95 mm (3.7 in)**</td><td>**110 mm (4.3 in)**</td></tr><tr><td>Replacement limit</td><td>**92 mm (3.6 in)**</td><td>**106 mm (4.2 in)**</td></tr></table>
		
92	<table><tr><td>Caster/trail</td><td>28° 30'/85 mm (3.35 in)</td></tr></table>	<table><tr><td>Caster/trail</td><td>28° 30'/85 mm (3.35 in)</td></tr></table>
94	CHASSIS Front brake shoe diameter 89 mm (3.5 in) Front brake shoe replacement limit 86 mm (3.4 in) Rear brake shoe diameter 102 mm (4.0 in) Rear brake shoe replacement limit 98 mm (3.9 in) Wheel run-out limit (vertical) 2 mm (0.008 in) Wheel run-out limit (lateral) 2 mm (0.008 in) Front fork spring free length 490.6 mm (19.3 in)	CHASSIS **Front brake shoe diameter 95 mm (3.7 in)** **Front brake shoe replacement limit 92 mm (3.6 in)** **Rear brake shoe diameter 110 mm (4.3 in)** **Rear brake shoe replacement limit 106 mm (4.2 in)** **Wheel run out limit (vertical) 2 mm (0.008 in)** **Wheel run out limit (lateral) 2 mm (0.008 in)** **Front fork spring free length 553.6 mm (21.8 in)**

Page	Error	Correct
71	Ring end gap installed (top and 2nd): 0.4 ∼ 0.5 mm (0.016 ∼ 0.02 in)	Ring end gap installed (top and 2nd): TEIKOKU PISTON 0.2 ∼ 0.4 mm (0.008 ∼ 0.016 in) NIPPON PISTON 0.4 ∼ 0.5 mm (0.016 ∼ 0.02 in)
71		Delete the first photograph of page 71
77	 6. Friction plate 7. Clutch plate	 Add a piece of clutch plate and friction plate.

Page	Correct
97	

INTRODUCTION

Thank you for buying the Yamaha YZ80E

This model is the product of many years of Yamaha experience and strict Yamaha quality control. The resultant ease of handling, high performance and reliability promise you full pride of ownership.

This model is a completely new design for rigorous motocross racing.

The assembly and inspection of each unit is performed in accordance with strict standards.

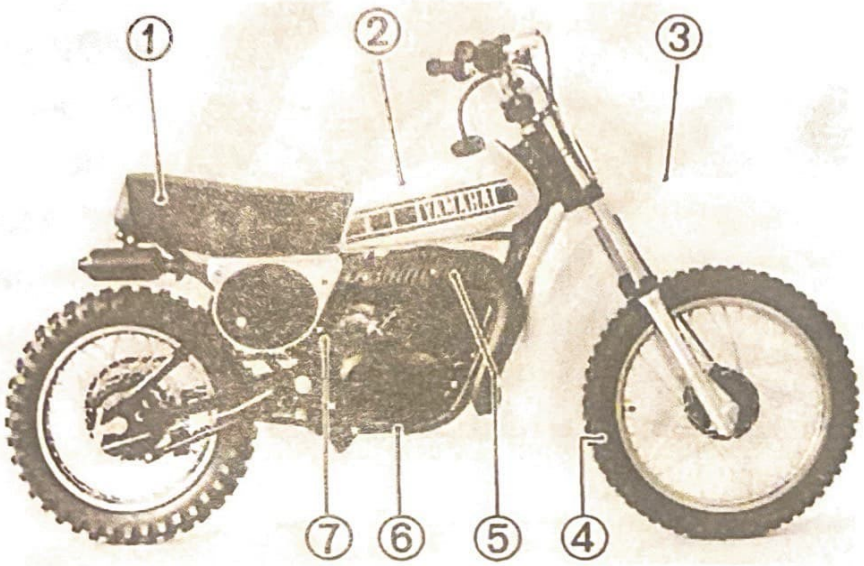
In this owner's service manual you will find information concerning basic handling, maintenance and minor repairs. Before operating the vehicle, please read this manual completely and carefully for a good understanding of proper usage and safety.

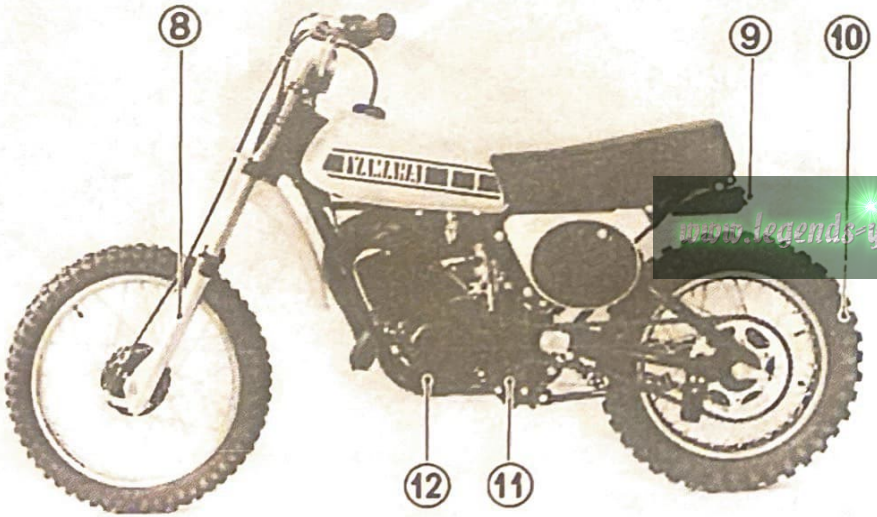
NOTICE:

Some data in this manual may become outdated due to improvements made to the machine in the future. If there is any question concerning this manual, consult your nearby Yamaha dealer.

CONTENTS

NOMENCLATURE





1. Seat
2. Fuel tank
3. Front fender
4. Front wheel
5. Muffler
6. Rear brake pedal
7. Kick crank
8. Front fork
9. Rear shock absorber
10. Rear wheel
11. Footrest
12. Change pedal
13. Clutch lever
14. Front brake lever
15. Throttle grip

NOTE:

The motorcycle that you have purchased differs partly in design and specifications from that shown in this photo.

MACHINE IDENTIFICATION

Frame number

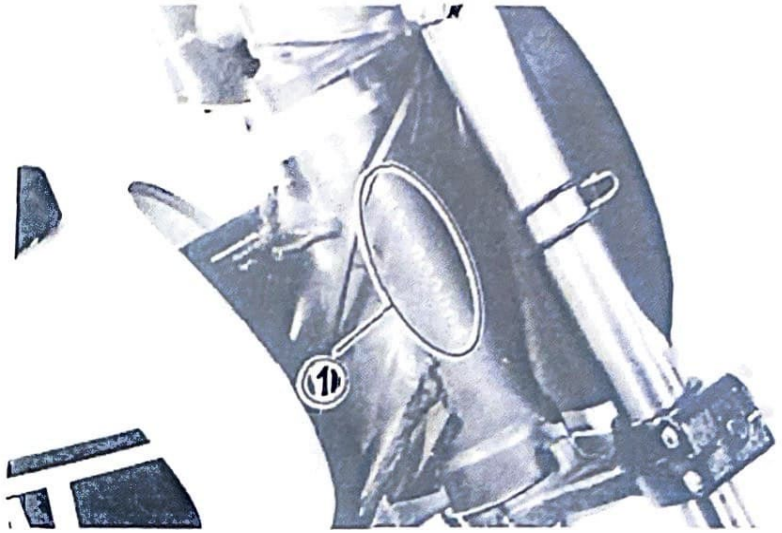
The frame number is stamped on the right side of the steering head stock.

Engine number

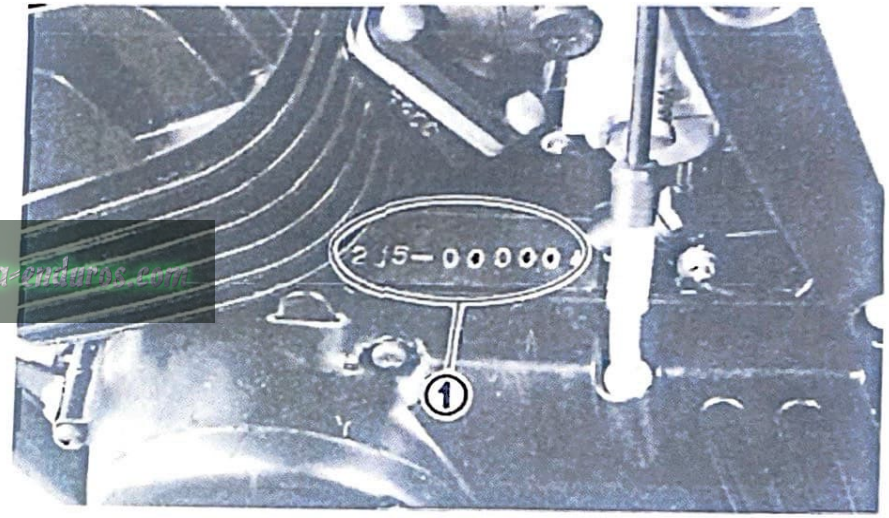
The engine serial number is stamped into the left side of the engine on top of the crankcase.

NOTE:

The first three digits of these numbers are for model identifications; the remaining digits are the unit production number. The engine and frame serial numbers are usually identical but they may sometimes be 2 or 3 numbers apart.



1. Frame number

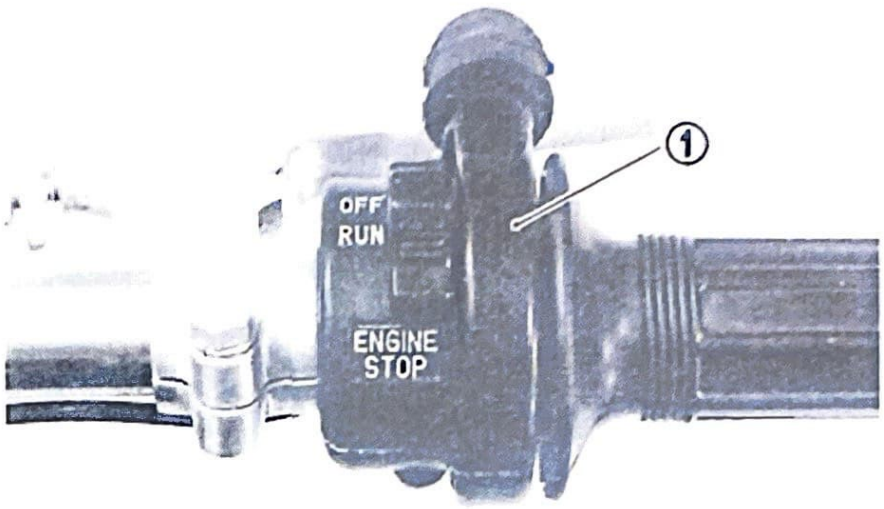


1. Engine number

CONTROL FUNCTIONS

"ENGINE STOP" switch

Make sure that the engine stop switch is positioned to "RUN" position. The engine switch has been equipped to ensure safety in an emergency such as when the motorcycle is upset or trouble takes place in the throttle system. The engine will not start or run when the engine stop switch is turned to "OFF".



1. "ENGINE STOP" switch

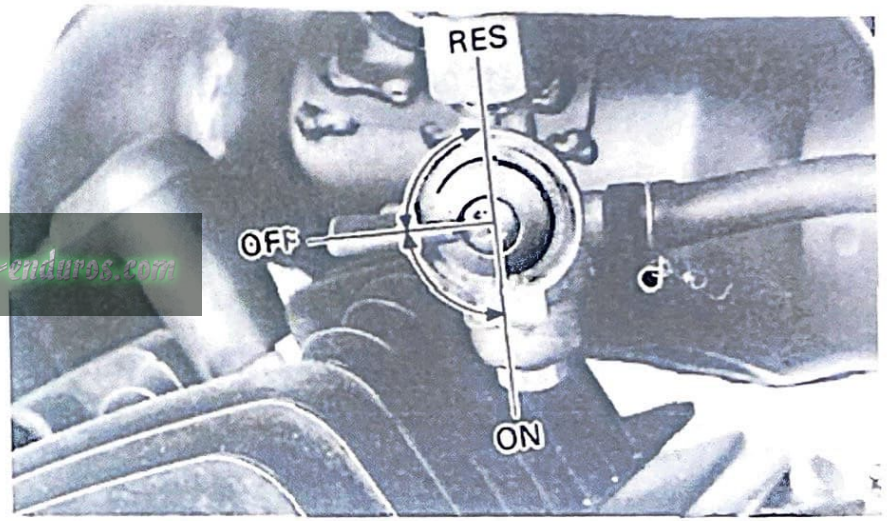
Fuel petcock

The fuel petcocks function to supply fuel from the tank to the carburetor and also to filter the fuel.

The fuel petcocks have the following three positions:

OFF: With the lever in this position fuel will not flow. Return the lever to this position when the engine is not running.

ON: With the lever in this position fuel flows to the carburetor. Normal riding is



done with the lever in this position.

RES: This indicates "RESERVE". If you run out of fuel while riding, move the lever to this position. Then, fill the tank at the first opportunity.

Front brake lever

The front brake lever is located on the right handlebar; pull it toward the handlebar to activate the front brake.

Rear brake pedal

The rear brake pedal is on the right side of the motorcycle. Press down on the brake pedal to activate the rear brake.

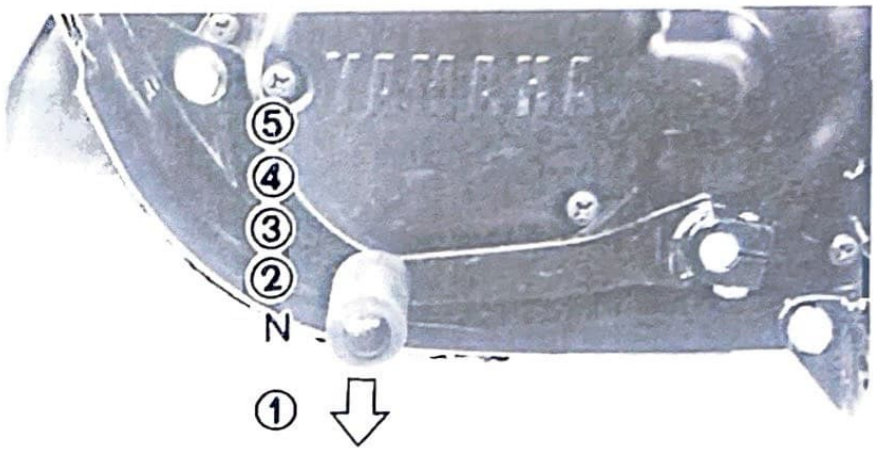
Clutch lever

The clutch lever is located on the left handlebar and disengages or engages the clutch. Pull the clutch lever to the handlebar to disengage the clutch and release the lever to en-

gage the clutch. The lever should be pulled rapidly and released slowly for smooth starts.

Gear shifting

The gear ratios of the constant mesh 5-speed transmission are ideally spaced. The gears can be shifted by using the change pedal on the left side of the engine.

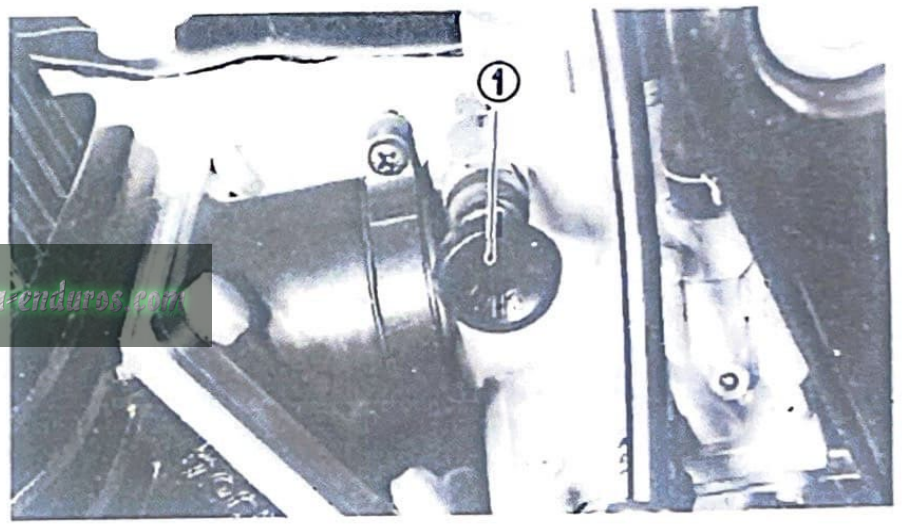


N. Neutral

Starter jet knob (choke knob)

When cold, the engine requires a richer fuel mixture for starting. A separate starter circuit, which is controlled by the starter jet knob, supplies this mixture.

Pull the knob out to open the circuit (for starting) and push the knob in to close the circuit.

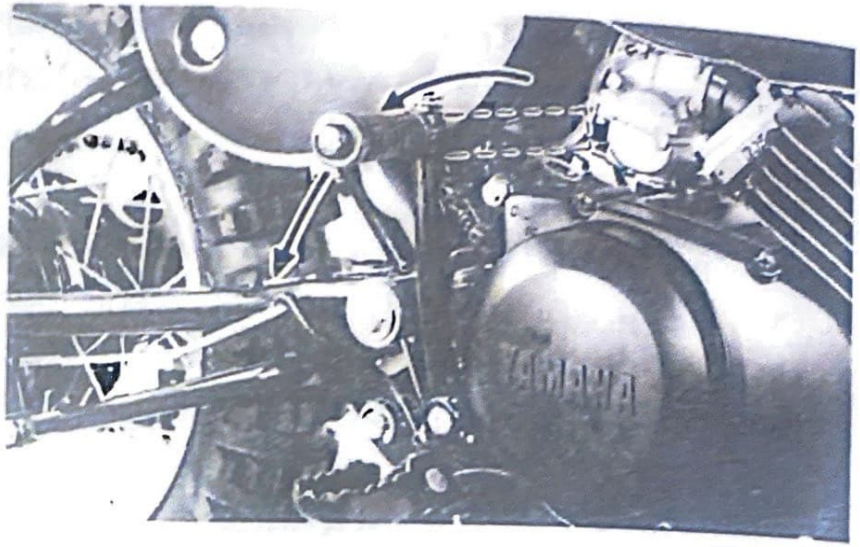


1. Starter jet knob

Kick starter

To start the engine, rotate the kick crank, push down lightly with foot until gears engage, and then kick with full strength. This model has the primary kick starter so the en-

gine can be started in any gear if the clutch is disengaged. As normal practice, however, shift to neutral before starting.



PREOPERATION CHECKS

Item	Routine	Page
Brake	Check operation/adjustment	30
Clutch	Check operation/lever adjustment	29
Transmission	Change oil as required	20
Drive chain	Check alignment/adjustment/lubrication	31
Spark plug(s)	Check color/condition	21
Throttle	Check for proper throttle cable operation	8
Air filter	Foam type — must be clean and damp w/oil always	23
Wheels and tires	Check pressure/runout/spoke tightness/axle nuts	8
Fittings/fasteners	Check all — tighten as necessary	—

NOTE:

Pre-operation checks should be made each time the 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.

Fuel

Always mix a fresh batch of fuel the morning of the race and do not retain a mixed batch overnight.

Recommended fuel:
Premium gasoline (95 octane)
mixed with recommended oil
Gasoline/oil mixing ratio: 20 : 1
Fuel tank capacity: 4.6 lit (1.13 US.Gal)

Recommended oil:

Yamalube R or Castrol R30 (vegatable base) oil. If for any reason you should use another type, the oil should meet or exceed BIA certification "TC-W". Check the container top or label for service specification and mixing ratios.

Tires

Check the tire pressure and check the tires for wear.

Tire pressure

Front	1.0 kg/cm² (14 psi)
Rear	1.0 kg/cm² (14 psi)

Throttle grip

Turn the throttle grip to see if it operates properly and if the play is normal. Make certain the throttle springs are closed when released.

OPERATION

CAUTION:

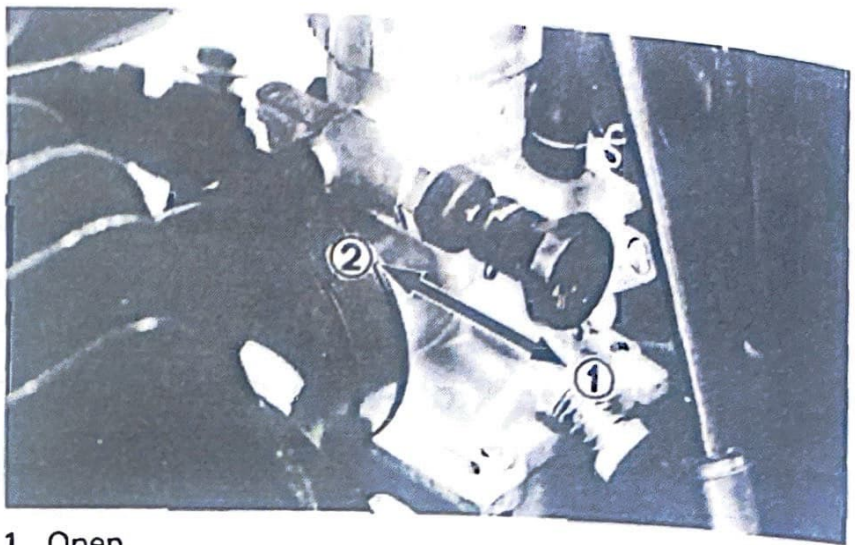
Before riding this motorcycle, become thoroughly familiar with all operating controls and their function. Consult your Yamaha dealer regarding any control or function you do not thoroughly understand.

WARNING:

This model is not equipped with highway approved lighting. This model is designed solely for competition use and should not be used on a street or highway at any time. In most instances, it is illegal to drive this model on any public street or highway.

Starting a cold engine

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



1. Open
2. Closed

Starting a warm engine

To start a warm engine, refer to the "Starting a cold engine" section; the starter jet (choke) knob should not be used, but with the throttle opened slightly.

CAUTION:

See "Break-in Section" prior to operat-

ing engine for the first time.

Warming up

To get maximum engine life, always "warm-up" the engine before starting off. Never accelerate hard with a cold engine! To see whether or not the engine is warm, see if it responds to throttle normally with the starter het (choke) turned off.

Engine break-in

1. Prior to starting, fill tank with a break-in gasoline/oil mixture of 15:1.
2. Allow engine to warm up. Check engine idling speed. Check operating controls and engine stop switch operation.
3. Operate machine in lower gears at moderate throttle setting for 3-5 minutes. Check spark plug condition.
4. 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.
5. Allow engine to cool. Repeat procedure, running for 5 minutes. Full throttle and higher gears may be used, but avoid sustained full throttle operation. Check spark plug condition.
6. Allow engine to cool. Remove top end and inspect. Remove "high" spots on piston with No. 600 grit, wet sandpaper. Clean, and carefully reassemble.
7. Remove break-in fuel/oil mixture from tank. Refill with 20:1 operation fuel/oil mixture. Check entire unit for loose or mis-adjusted fittings/controls/fasteners.
8. 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 race.

PERIODIC MAINTENANCE AND MINOR REPAIR

CAUTION:

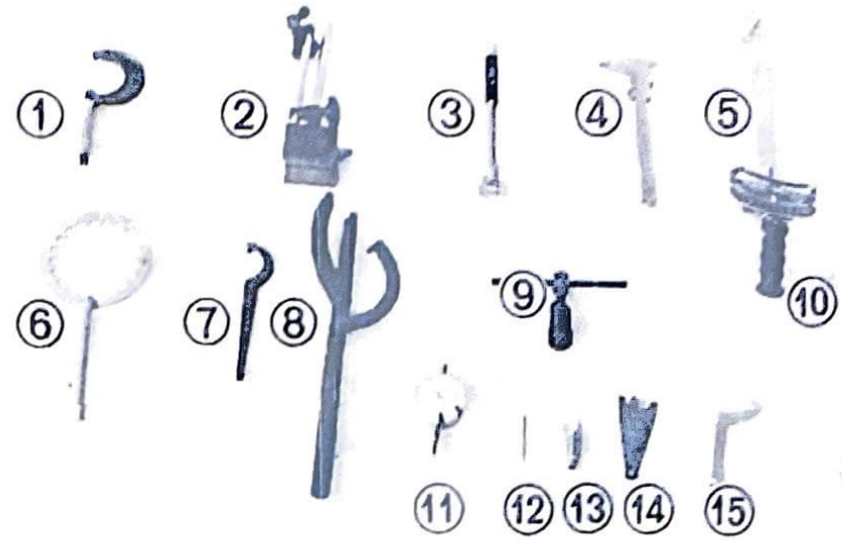
The following sections provide information for the disassembly, troubleshooting and maintenance of various components of the motorcycle. If you do not have the necessary tools and an understanding of the mechanical principles involved, please refrain from attempting repairs. The use of improper tools and/or procedures can cause major damage to the unit with resultant additional repair costs.

SPECIAL TOOL

The maintenance procedures outlined within this manual require special tools and instruments. A comprehensive list of the special tools is given below.

NOTE:

These items marked with an asterisk(*) available from YAMAHA.



1. Outside micrometer (25—50 mm)
2. Magnetic base
3. Cylinder gauge (35—60 mm)
4. Vernier caliper (0—150 mm)
5. Torque wrench (0—10 m-kg)
*6. Clutch holding tool
*7. Steering nut wrench
*8. Flywheel holding tool
*9. Flywheel puller
10. Measuring cylinder (0—250 cc) (0—15.3 cu. in)
*11. Dial gauge
*12. Needle (56 mm) (2.2 in)
*13. Dial gauge stand
14. Thickness gauge
15. Special wrench

PERIODIC MAINTENANCE

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 motorcycle 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 to how closely you can follow these time recommendations, check with the Yamaha dealer in your area.

MAINTENANCE AND LUBRICATION SCHEDULE CHART

Item	Recommended lubricant type	Race/Meet Interval					
		Every meet	Every second	Every third	Every heat (moto)	Every 6 months of racing	As required
PISTON • Inspect • Clean • Replace		○ ○					○
PISTON RINGS • Replace			○				
CYLINDER • Inspect (Compression Check) • Clean • Replace • Check head bolt torque		○ ○ ○					○
CLUTCH • Adjust • Replace (Plates)		○					○
TRANSMISSION • Change oil • Inspect gears • Replace bearing • Inspcet shift forks	No. 1		○			○ ○ ○	

Item	Recommended lubricant type	Race/Meet Interval					
		Every meet	Every second	Every third	Every heat (moto)	Every 6 months of racing	As required
ENGINE MAIN BEARNINGS • Replace						○	
CONNECTING ROD • Check bearings • Replace big end bearing • Replace small and bearing		○				○	(○) ○
CARBURETOR • Check/Adjust/Tighten • Clean and Inspect					○ ○		
PISTON PIN • Inspect • Replace		○					○
EXHAUST SYSTEM • Inspect					○		
FLYWHEEL NUT • Torque		○					
KICK STARTER • Inspect idler gear • Replace						○	○
FRAME • Clean and Inspcet		○					

Item	Recommended lubricant type	Race/Meet Interval					
		Every meet	Every second	Every third	Every heat (moto)	Every 6 months of racing	As required
SWING ARM • Check					○		
CONTROLS AND CABLES • Check and Adjust • Lubricate	No. 2	○			○		
BRAKES • Clean/Check/Adjust • Replace		○			○		○
WHEELS AND TIRES • Check pressure • Check runout • Check spoke tension • Check bearings • Replace bearings		○ ○			○ ○		○
STEERING HEAD • Check • Clean and repack	No. 3			○	○		
IGNITION WIRING • Check connections		○					
AIR FILTER • Clean and oil • Replace	No. 5	○					○

Item	Recommended lubricant type	Race/Meet Interval					
		Every meet	Every second	Every third	Every heat (moto)	Every 6 months of racing	As required
SPARK PLUG • Replace							○
DRIVE CHAIN • Clean and lubricate • Check tension and alignment • Replace	No. 2				○ ○		○
FITTINGS AND FASTENERS • Tighten					○		
FUEL TANK • Clean/Flush • Clean petcock filter		○ ○					
FRONT FORKS • Drain and refill • Replace seals	No. 6			○			○
CLUTCH AND BRAKE PIVOTS • Lubricate	No. 7	○					
FOOT PED. AND KICK CRANK • Lubricate	No. 2	○					
POINT CAM LUBRICATOR • Lubricate	No. 4					○	
THROTTLE GRIP/HOUSING • Lubricate	No. 7			○			(○)

RECOMMENDED LUBRICANT

No. 1 Use SAE 10W/30 "SE" motor oil.
Do not use "additives" in oil.

No. 2 Use SAE 10W/30 "SE" motor oil. (If desired, specialty type lubricants of quality manufacture may be used.)

No. 3 Medium-weight wheel bearing grease of quality manufacturer — preferably water proof.

No. 4 Light weight machine oil.

No. 5 Air filters — foam element air filters must be damp with oil at all times to function properly. Clean and lube every heat (MOTO). Do not over oil. Use SAE 10W/30 "SE" motor oil.

No. 6 Use SAE 20W "SE" motor oil.

No. 7 Use lithium base grease.

Transmission oil

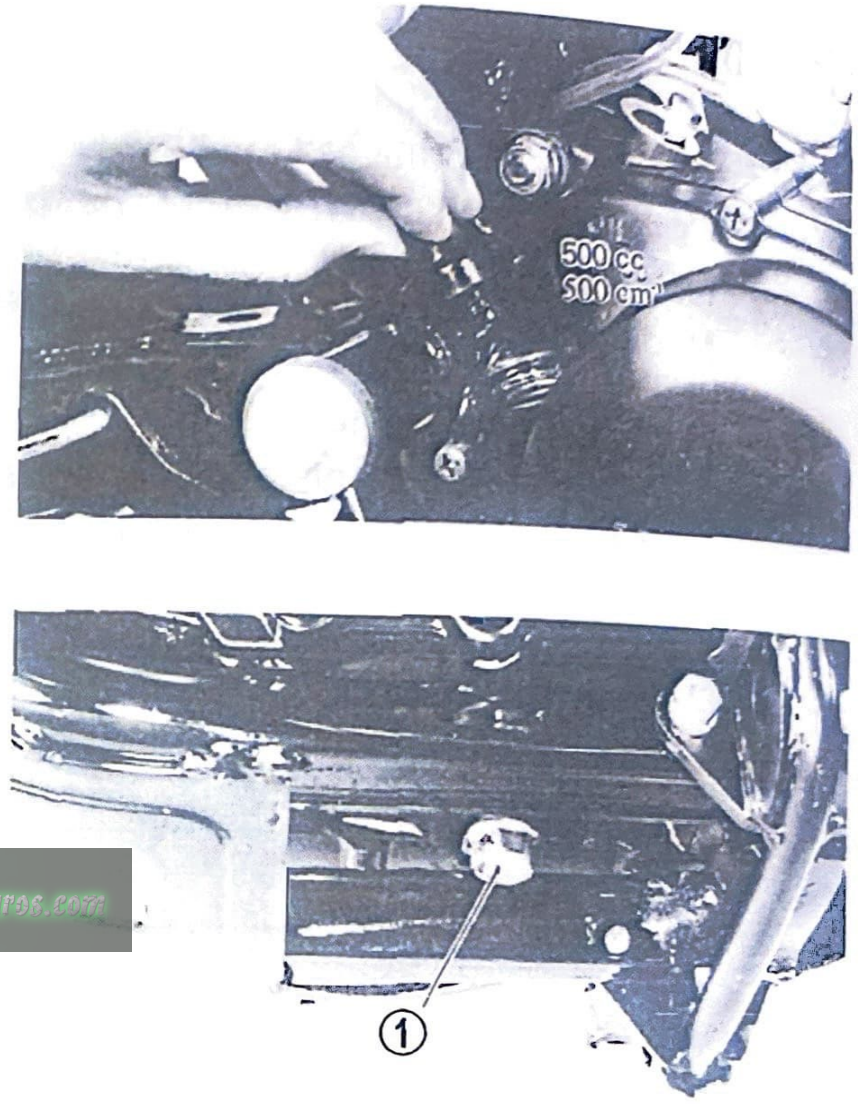
The oil filler cap is located right above the kick starter.

Recommended oil:
SAE 10W/30 "SE" motor oil

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

Transmission oil capacity:
Oil change: 600 — 650 cc
(0.63 — 0.69 US.qt)
Total: 650 — 700 cc
(0.69 — 0.74 US.qt)

The transmission should be drained and re-filled every second race meet.



1. Drain plug

NOTE:

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

Spark plug inspection

The spark plug is an important engine component and is easy to inspect. The condition of the spark plug can indicate something of the condition of the engine. Normally, all spark plugs from the same engine should have the same coloration on the white porcelain insulator around the center electrode. The ideal coloration at this point is a medium to light tan color for a machine that is being ridden normally. If one spark plug shows a distinctly different color, there could be something wrong with the engine.

For example, a very white center electrode porcelain color could indicate an intake air leak or carburetion problem for that cylinder. Do not attempt to diagnose such problems yourself. Instead, take the machine to your Yamaha dealer.

You should periodically remove and inspect the spark plug because heat and deposits will cause any spark plug to slowly break down and erode. If electrode erosion becomes excessive, or if carbon and other deposits are excessive, you should replace the spark plug with one of the proper types.

Standard spark plug:
N-2 (CHAMPION) or B-8ES (NGK)

Spark plugs are produced in several different thread lengths. The thread length (reach) is the distance from the spark plug gasket seat to the end of the threaded portion. If the reach is too long, overheating and engine damage may result.

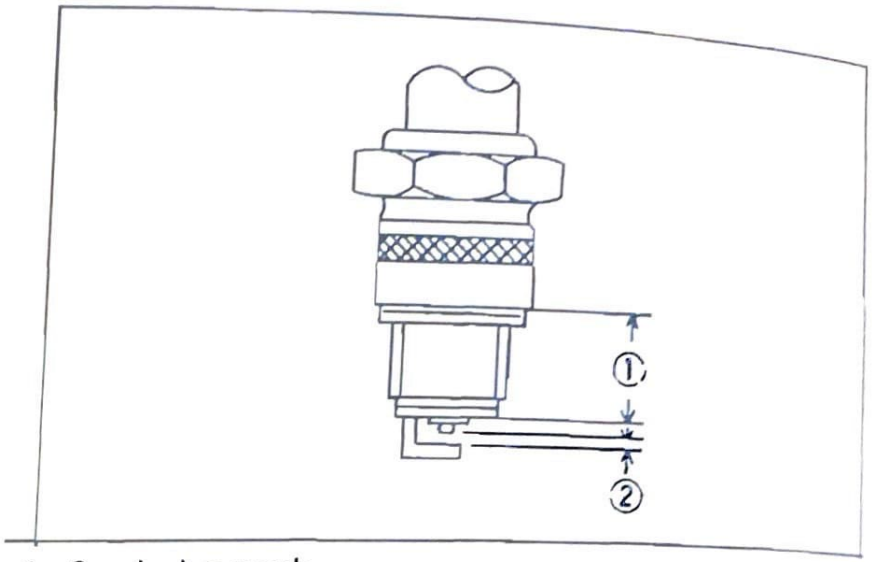
If the reach is too short, spark plug fouling

and poor performance may result: also, carbon will form on the exposed threads resulting in combustion chamber hot spots and thread damage. Always use a spark plug with the proper reach.

Spark plug reach: 19 mm (0.7 in)

Before installing any spark plug, measure the electrode gap with a wire thickness gauge and adjust to specifications.

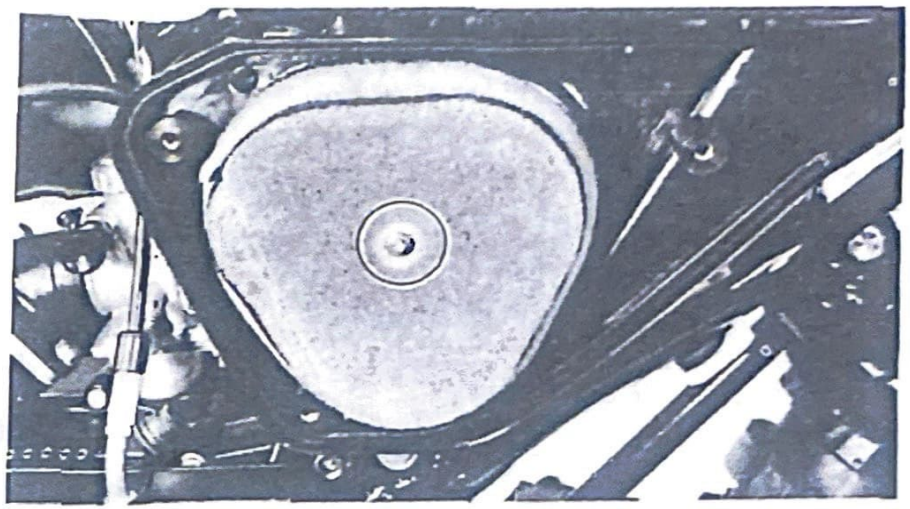
Spark plug gap: 0.5 — 0.6 mm (0.02 — 0.024 in)



1. Spark plug reach
2. Spark plug gap

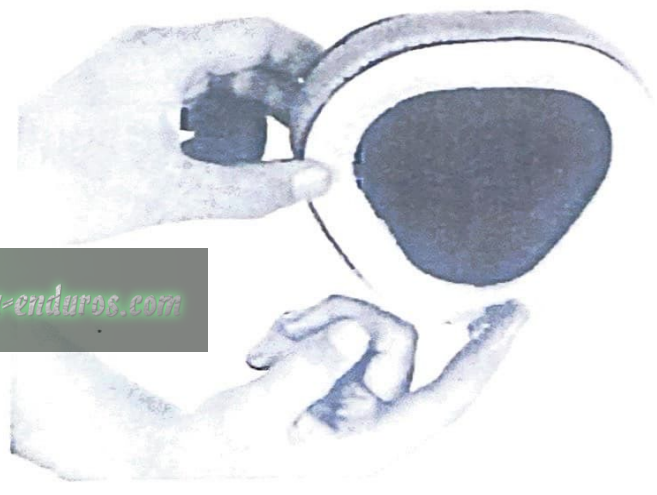
When installing the plug, always clean the gasket seat surface and use a new gasket. Wipe off any grime from the threads and torque the spark plug properly.

Spark plug torque:
2.5 — 3.0 m-kg (18 — 22 ft-lbs)



Cleaning the air filter element

The air filter protects the engine from dirt which can enter with the intake air and cause rapid engine wear. This dirt is filtered from the air by the air filter element. This model uses a cartridge type air filter element which consists of foam rubber moistened with oil. When this filter element becomes dirty it should be cleaned with solvent and reoiled.



Cleaning method

1. Remove the two bolts and remove the side cover (L.H.).
2. Remove the air filter element from its case, remove element from core and clean with solvent. After cleaning, remove the remaining solvent by squeez-

ing the foam rubber.

3. Then apply SAE 30W motor oil to the entire surface and squeeze out the excess oil. Foam should be wet but not dripping. Then coat the sealing edges of the filter element with lithium base grease.
4. When installing the air filter element in its case, be sure its sealing surface matches perfectly the sealing surface of the case so there is not air leakage.

CAUTION:

The engine should never be run without the air cleaner element installed; overheating and piston damage may result.

Carburetor adjustment

The carburetor is a vital part of the engine and requires very sophisticated adjustment. Most adjustments should be left to a Yamaha dealer who has the professional knowledge and experience to do so. However, the following three points may be serviced by the owner as part of his usual maintenance routine.

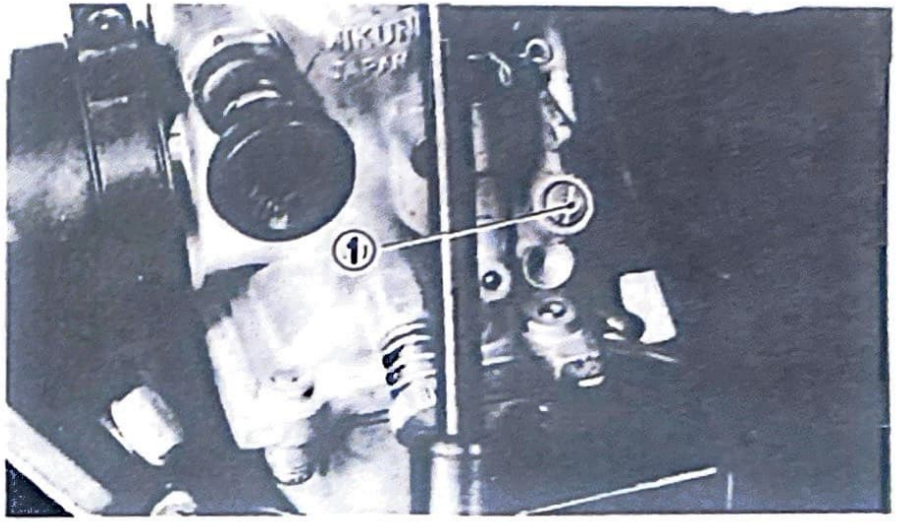
1. Idle mixture adjustment
2. Idling speed adjustment
3. Throttle cable play adjustment

CAUTION:

The carburetor was set at the Yamaha factory after many tests. If the settings are disturbed without having technical knowledge, poor engine performance and damage may result.

Idle mixture adjustment

The idle mixture adjustment controls the amount of mixture to the engine at low rpm. The idle mixture also insures smooth transition to the main circuit with no power loss or misfire; so it does affect mid-range performance.

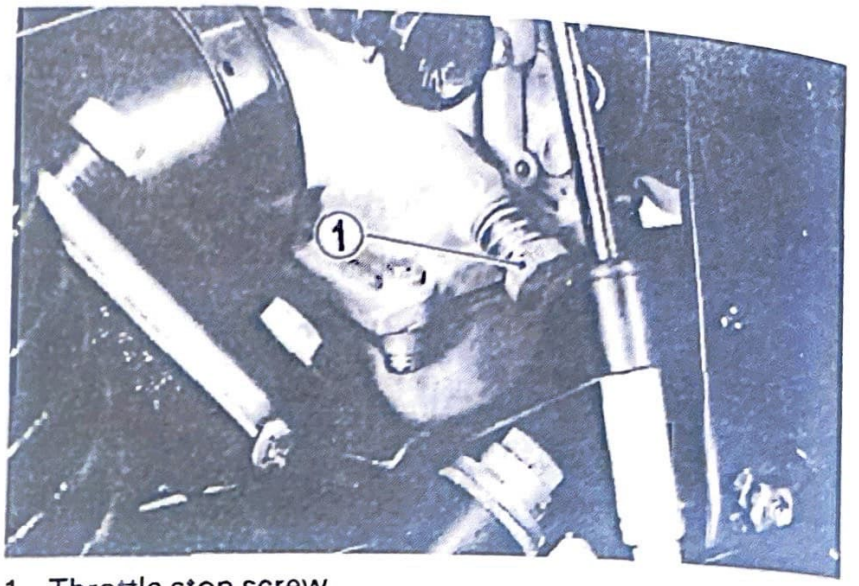


Make this adjustment as described below: Tighten the pilot air screw until it lightly touches the seat; then back the screw out as specified (see illustration). This should be done with the engine stopped.

Standard pilot air screw setting (number of turns out): 1-1/2

Idling rpm adjustment

Start the engine and warm it up for a few minutes. The warm up is complete when the engine responds quickly without dying. Normally 1 to 2 minutes is required; 2 to 3 minutes in cold weather. Turning the throttle stop screw counterclockwise lowers the engine speed. One clockwise turn from the engine stall position is considered to be the specified idling position.



1. Throttle stop screw

Idling rpm: As desired

Carburetor inspection

In addition to the above adjustment, check the following periodically:

1. Are the carburetor holding bolts tight?
2. Is the cleaner joint secure?
3. Is the overflow pipe or air vent pipe in place?

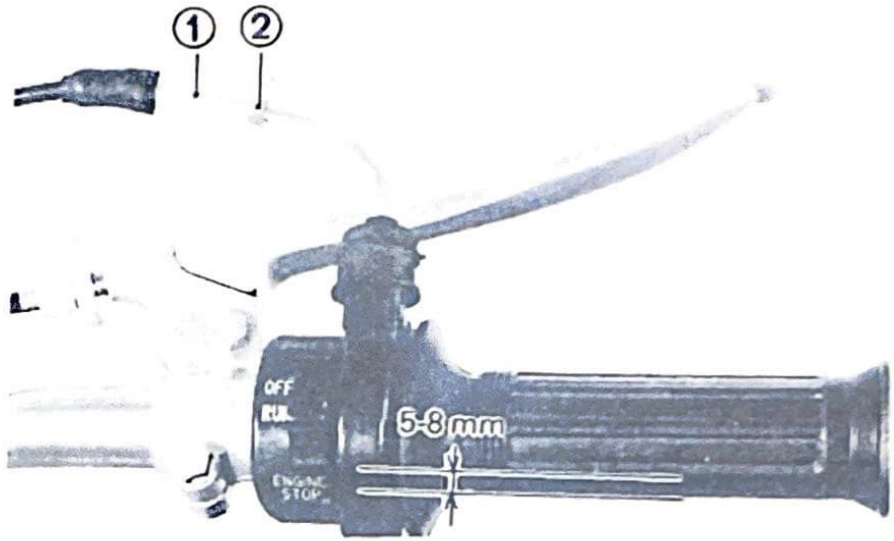
4. Is the mixing chamber top tight?

Throttle cable play adjustment

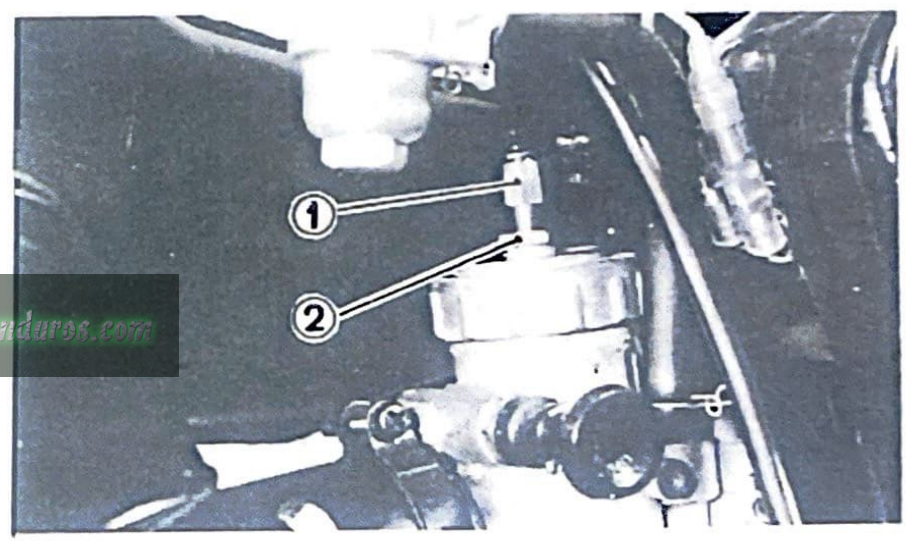
1. Slide the rubber cover off the top of the carburetor.
2. Check play in turning direction of throttle grip. The play should be 5 — 8 mm (0.2 — 0.3 in) at grip flange, loosen the locknut and turn the adjuster to make the necessary adjustment. After adjusting, be sure to tighten the locknut properly.
3. Reinstall the rubber cover.

Fuel petcock inspection and cleaning

The fuel petcock has a built-in filter to remove any particles before they reach the carburetor. If the filter becomes blocked, the fuel cannot enter the carburetor. To prevent this, inspection and cleaning should be done at recommended intervals.

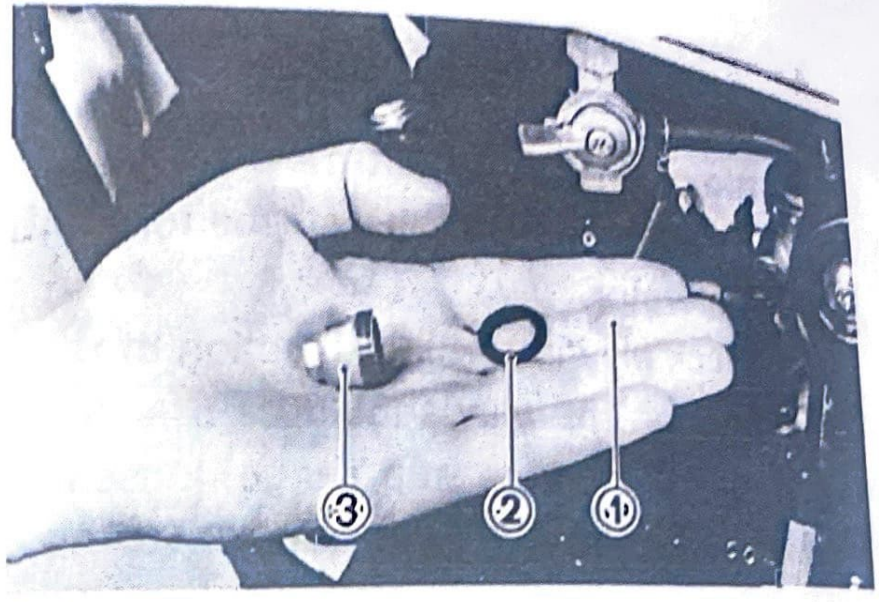


1. Adjuster
2. Locknut

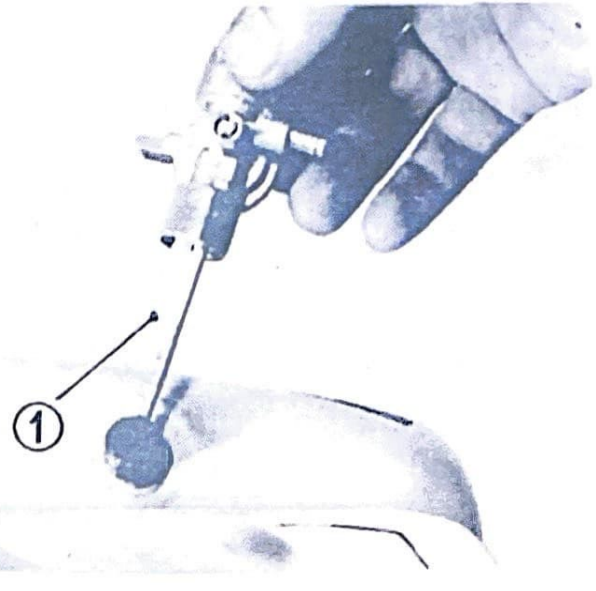


1. Adjuster
2. Locknut

1. Filter screen
   a. First, turn the petcock lever to the "OFF" position; then remove the filter cup and clean the bottom of the cup with solvent.
   b. After removing the filter cup, remove and clean the filter screen. At the same time, you should examine the condition of the filter gasket. Replace if damaged.
   c. When reassemblying, be careful not to clamp the filter cup too tightly as this may cause the filter gasket to become unseated, resulting in fuel leakage.
2. Sub strainer
   a. Drain the fuel into the fuel tank.
   b. Remove the fuel petcock assembly.
   c. Clean the sub strainer.



1. Filter screen
2. Filter gasket
3. Filter cup

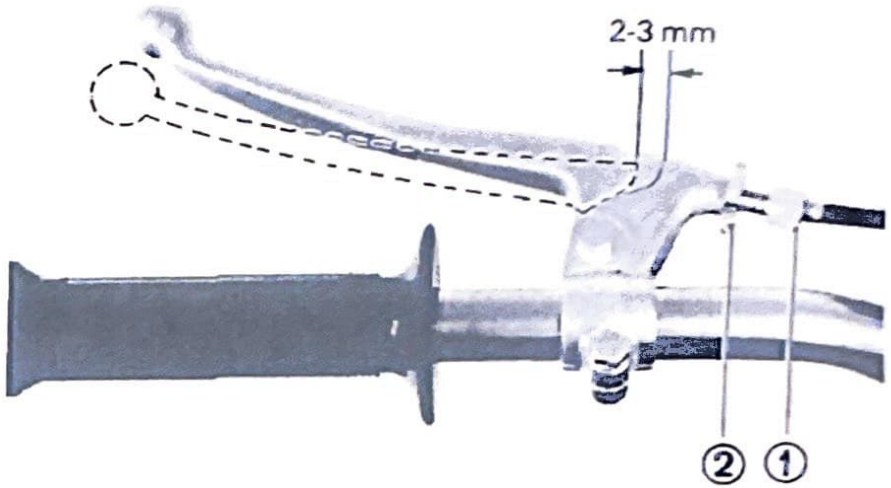


1. Sub strainer

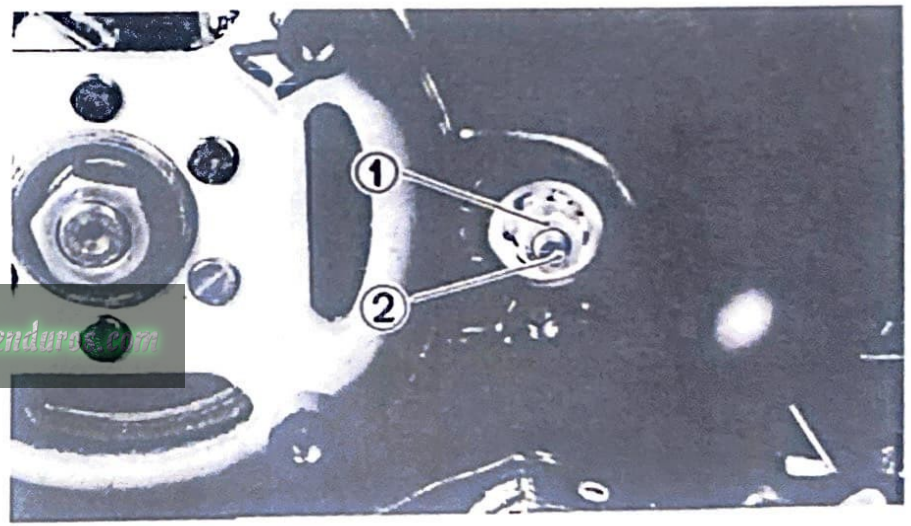
Clutch adjustment

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 free play 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 free play at the clutch handle hever.

1. Free play adjustment
   Loosen either the handle lever adjuster locknut or the cable in-line length adjuster locknut. Next, turn the length adjuster either in or out until proper lever free play is achieved.

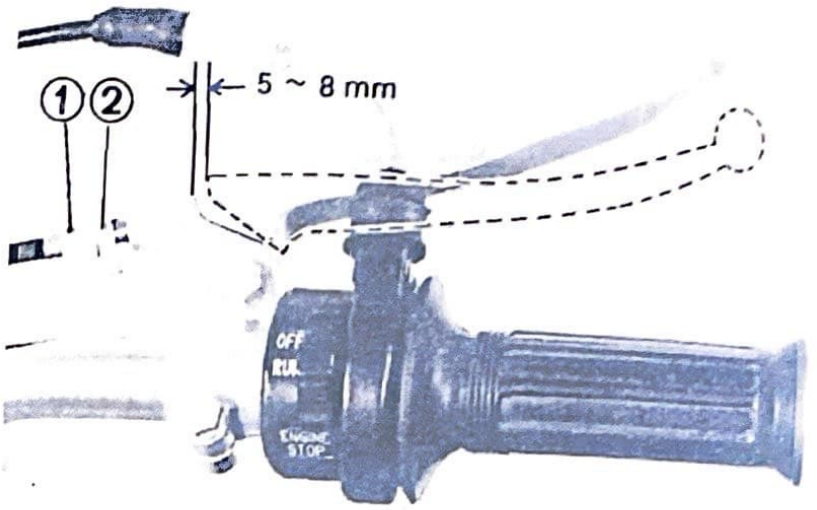


1. Adjuster
2. Locknut



1. Locknut
2. Adjusting screw

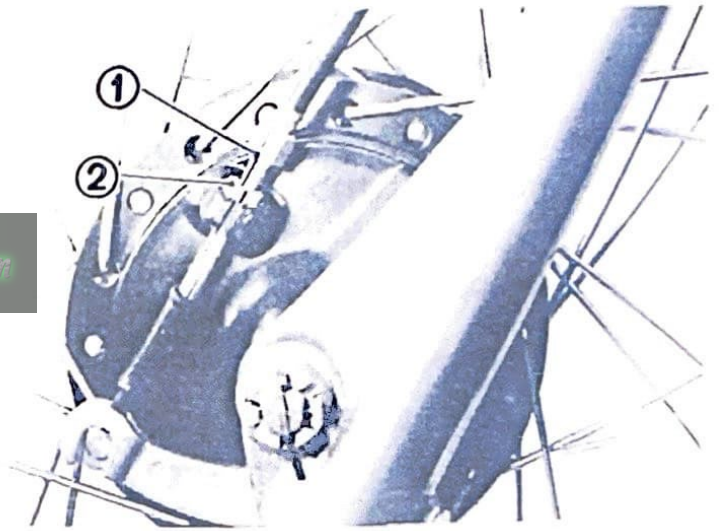
2. Mechanism adjustment
   a. Remove left side crankcase cover and loosen adjuster locknut.
   b. Slowly tighten the adjusting screw until resistance is felt. This means that the play of the push rod is removed. Then, back it off 1/4 turn. Tighten the locknut.



1. Adjuster
2. Locknut

Front brake adjustment

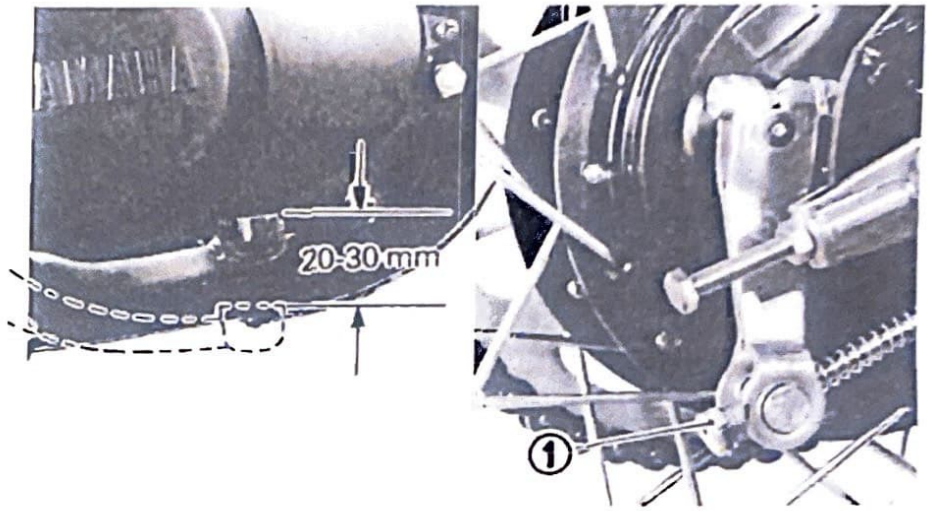
The front brake can be adjusted in two ways; (1) using the adjust screws at the front brake lever or (2) at the front brake shoe plate. Adjustment at the front brake lever is normally recommended. Loosen the locknut and turn the adjuster to adjust the brake lever. As shown in the illustration, the clearance between the brake lever and the brake lever holder should be 5 — 8 mm (0.2 — 0.3 in). After adjusting be sure the locknut is tightened firmly.



1. Adjuster
2. Locknut

Rear brake adjustment

The rear brake should be adjusted so the end of the brake pedal moves 20 — 30 mm (0.8 — 1.1 in). To adjust, turn the adjuster on the brake rod clockwise to reduce play; turn the adjuster counterclockwise to increase play.



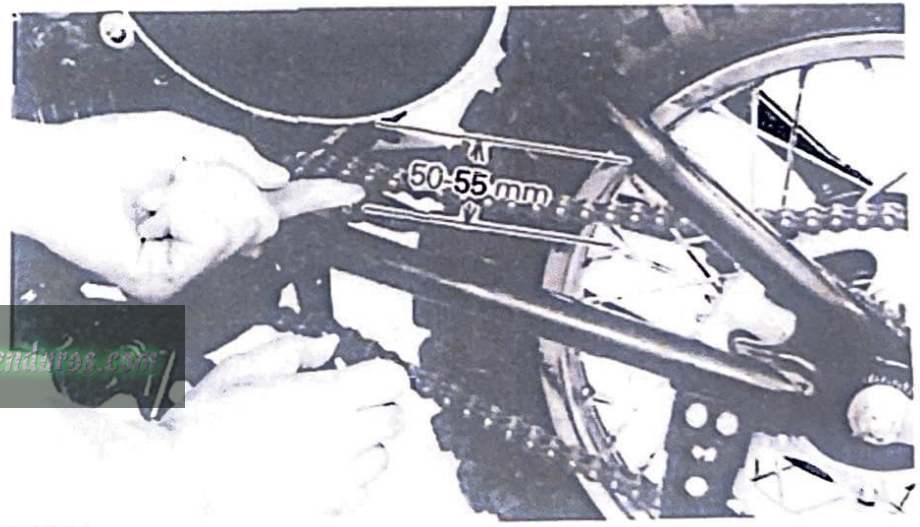
1. Adjuster

Drive chain tension check

Check the drive chain tension with both tires on the ground and without passenger on the rear seat.

As shown in the photo, push the chain tensioner all the way down, and if the slack in the chain is 50 — 55 mm (2.0 — 2.16 in) at the top of the chain, the chain tension is correct.

If the deflection is more or less than the above, adjustment is necessary.



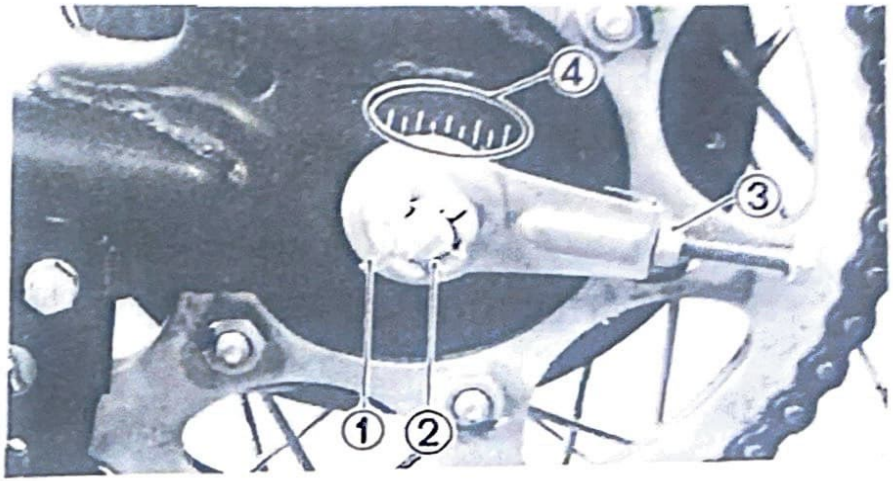
Drive chain tension adjustment

1. Loosen the rear brake rod adjuster.
2. Remove the cotter pin of the rear wheel axle nut with pliers.
3. Loosen the rear wheel axle nut.
4. To tighten chain turn chain puller adjuster nuts clockwise. To loosen chain turn adjuster nuts counterclockwise and push wheel forward. Turn each nut exactly the same amount to maintain correct axle alignment. (There are marks on each side of rear arm and on each chain puller; use them to check for proper alignment.)

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.

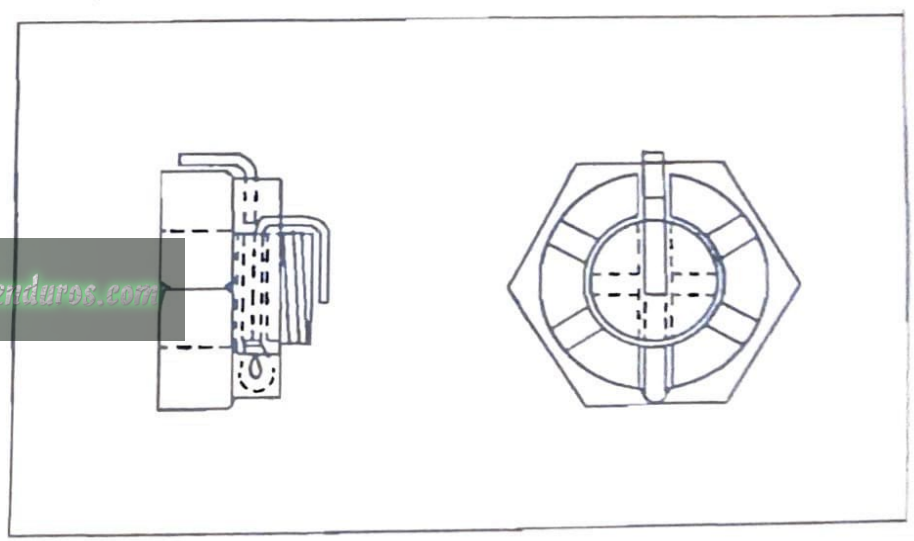
5. After adjusting, be sure to tighten the rear wheel axle nut.
6. Also tighten the adjuster nuts against the rear arm (about 1/4 turn each).
7. Insert the cotter pin into the rear wheel axle nut and bend the cotter pin end as shown in the illustration (if the nut notch and the cotter pin hole do not match, tighten the nut slightly to match).
8. In the final step, adjust the play in the brake pedal.



1. Cotter pin
2. Rear wheel axle nut
3. Adjuster nut
4. Marks for alignment

NOTE:

Excessive chain tension will overload the engine and other vital parts; keep the tension within the specified limits. Also, replace the rear axle cotter pin with a new one.



Drive chain lubrication

The chain consists of many parts which work against each other. If the chain is not main-

tained properly, it will wear out rapidly. Form the habit of periodically servicing the chain. This service is especially necessary when driving in dusty conditions.

1. Use any of the many brands of spray type chain lubricant. First, remove dirt and mud from the chain with a brush or cloth and then spray the lubricant between both rows of side plates and on all center rollers.
2. To clean the entire chain, first remove the chain from the motorcycle, dip it in solvent and clean out as much dirt as possible. Then take the chain out of the solvent and dry it. After drying, lubricate the chain to prevent the formation of rust.

Cable inspection and lubrication

1. Damage to the outer housing of the various cables, may cause corrosion and often free movement will be obstructed. An unsafe condition may result so replace as soon as possible.
2. If the inner cables do not operate smoothly, lubricate or ask your Yamaha dealer to replace them.

Recommended lubricant:
SAE 10W/30 type "SE" motor oil

Throttle cable and grip lubrication

The throttle twist grip assembly should be greased at the time that the cable is lubricated, since the grip must be removed to get at the end of the throttle cable. Two screws clamp the throttle housing to the handlebar. Once these two are removed, the end of the cable can be held high to pour in several drops of lubricant. With the throttle grip disassembled, coat the metal surfaces of the grip assembly with a suitable all-purpose grease to cut down friction. (See lubrication chart.)

Lubrication of levers, pedals, etc.

1. Lubricate the pivoting parts of the brake and clutch levers with motor oil SAE 10W/30.
2. Lubricate the shaft of the brake pedal with lithium base grease.

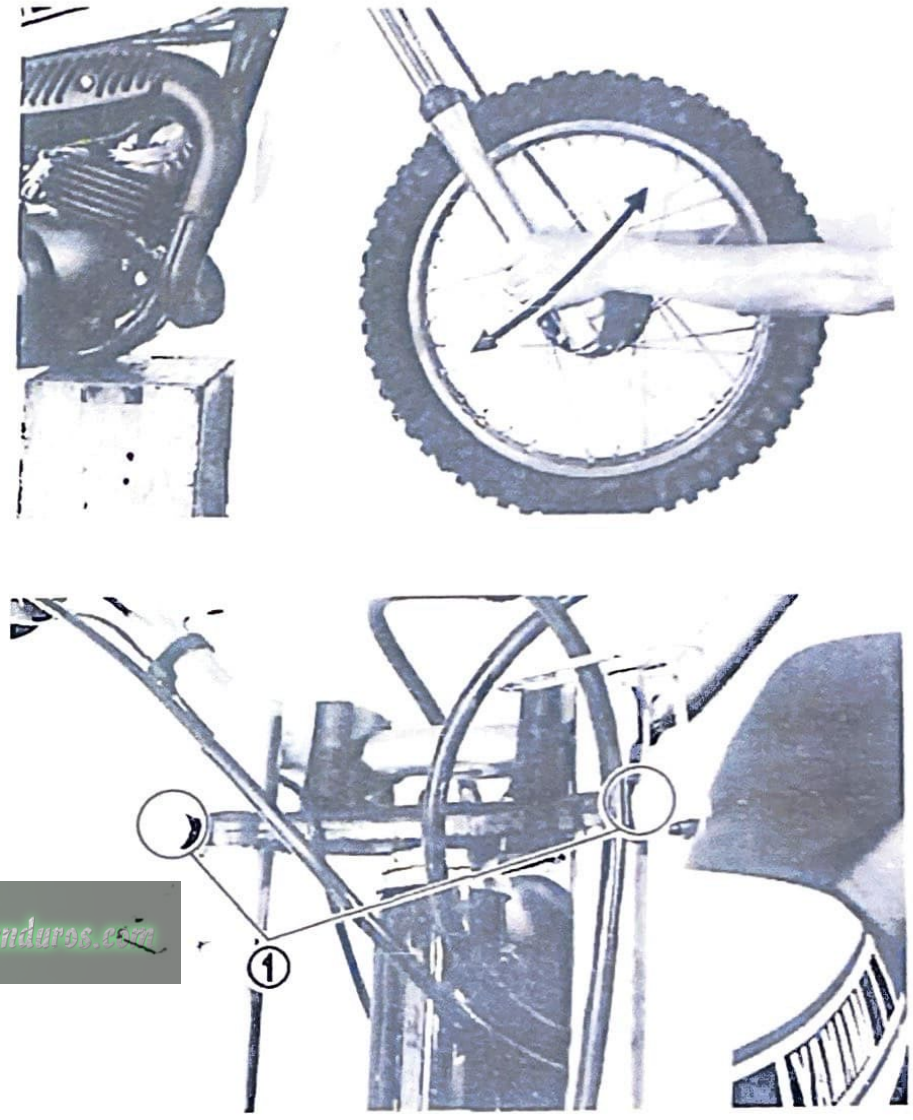
Steering inspection

Periodically inspect the condition of the steering. Worn out or loose steering bearings may be dangerous.

Place a block under the engine to raise the front wheel of the motorcycle off the ground; then hold the lower end of the front fork and try to move forward and backward.

Steering adjustment

1. To adjust, first loosen upper stem pinch bolt. Then loosen stem bolt.
2. Use ring nut wrench to tighten ring nut.



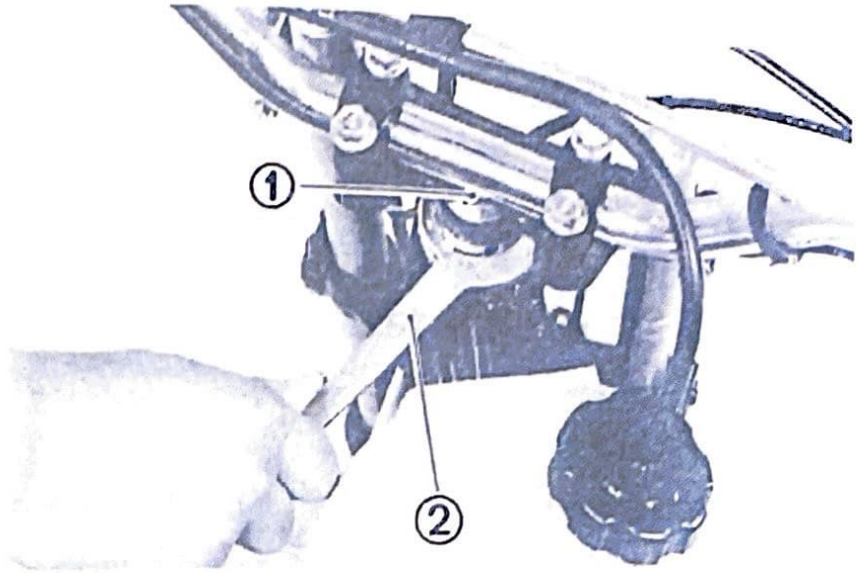
1. Stem pinch bolt

CAUTION:

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

3. Tighten stem pinch bolt and stem bolt.

Tightening torque:
Stem pinch bolt: 2.5 m-kg (18 ft-lbs)
Stem bolt: 6.0 m-kg (43 ft-lbs)



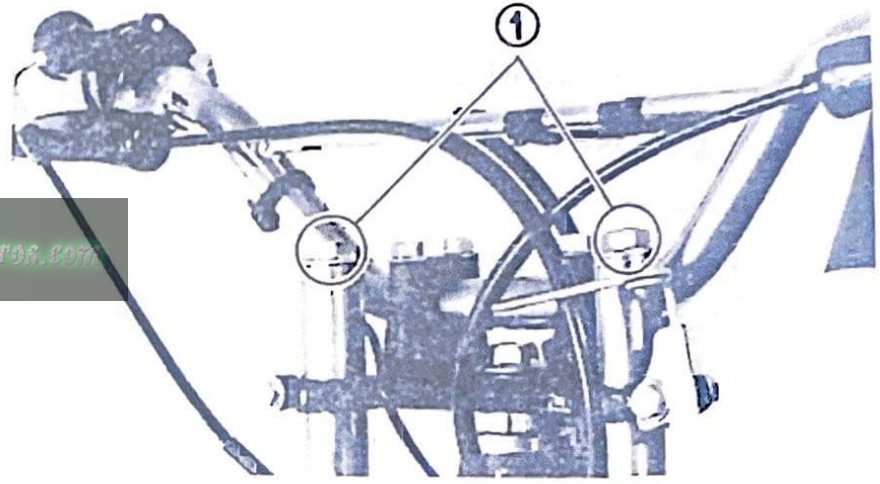
1. Stem pinch bolt
2. Ring nut wrench

NOTE:

Steering head disassembly must be performed by your Yamaha dealer.

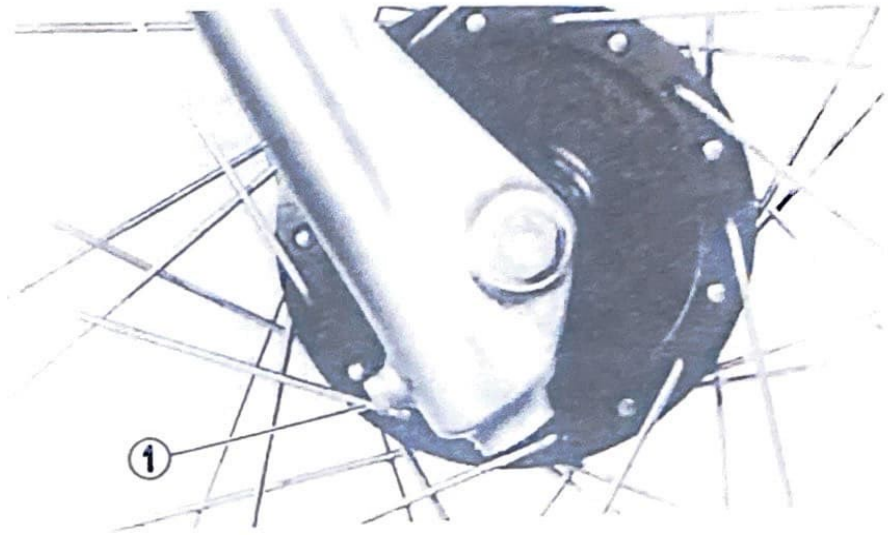
Front fork oil change

1. Elevate front wheel by placing a suitable stand under the engine.
2. Remove cap bolts from inner fork tubes.



1. Cap bolt

3. Remove drain bolt from each outer tube with open container under each drain hole.
4. After most of oil has drained, slowly raise and lower outer tubes to pump out remaining oil.
5. Replace drain bolt.



1. Drain bolt

NOTE:
Check gasket, replace if damaged.

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

Recommended oil:
SAE 20W "SE" motor oil
Quantity per leg: 83 cc (2.8 oz)

NOTE:

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

7. After filling, slowly pump the outer tubes up and down to distribute the oil.

NOTE:

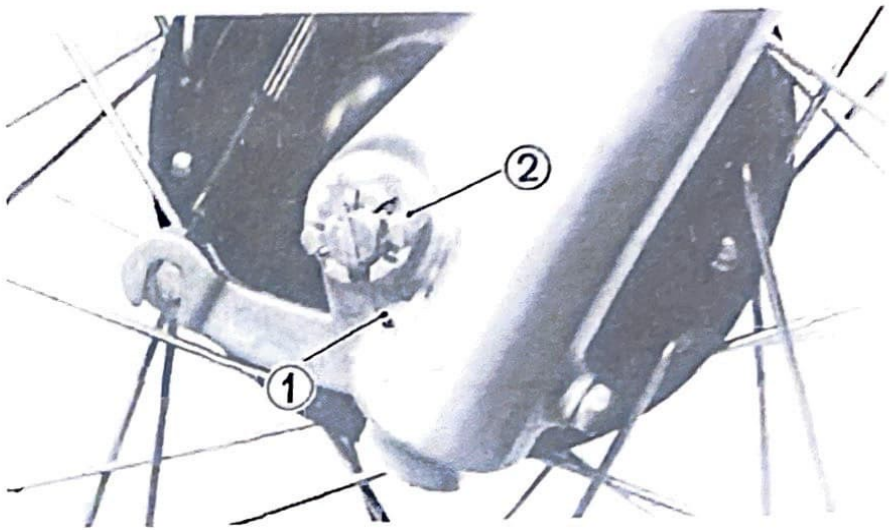
Adjust the oil levels in both right and left front forks so they are even.

8. Inspect O-ring on fork cap bolts and replace if damaged.
   Install the fork cap bolts and torque to specification.

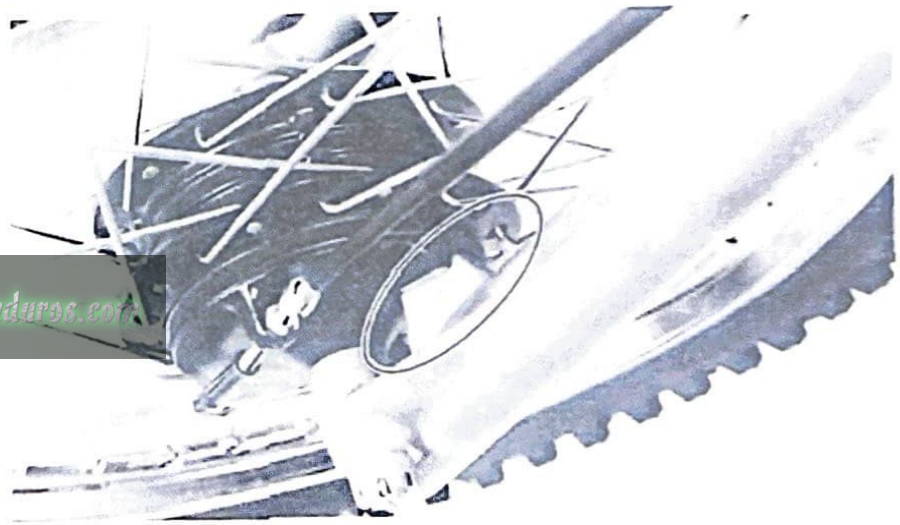
Fork cap bolt torque:	2.0 m-kg (14.5 ft-lbs)

Front wheel removal

1. Elevate the front wheel by placing a suitable stand under the engine.
2. Remove brake cable: Loosen all cable adjuster screws and remove cable from handle lever holder. Then remove cable from cam lever at front brake shoe plate.
3. Remove cotter pin from front wheel axle and remove axle nut.
4. Turn and pull out the front wheel axle; the wheel assembly can now be removed.



1. Cotter pin
2. Axle nut



Front wheel installation

When installing front wheel, reverse the removal procedure taking the following steps:

1. Check for proper engagement of the boss on the outer fork tube with the locating slot on the brake shoe plate.
2. Always secure the front wheel axle as follows:

a. Tighten the front axle with an open-end wrench.
b. Torque the front axle nut.

Axle nut torque:	6.0 m-kg (43.4 ft-lbs)

Rear wheel removal

1. Remove the tension bar and the brake rod from the brake shoe plate. The tension bar can be removed by removing the cotter pin and nut from the tension bar bolt. The brake rod can be removed by removing the adjuster.
2. Loosen the locknuts of the right and left chain pullers and loosen the adjustor bolts.
3. Remove the master link clip and master link and remove the chain from the rear sprocket.
4. Remove the cotter pin from the wheel axle and remove the rear wheel axle nut.
5. The rear wheel assembly, the collar, the chain puller(s), etc., can be removed from the motorcycle by pulling the wheel axle.

Rear wheel installation

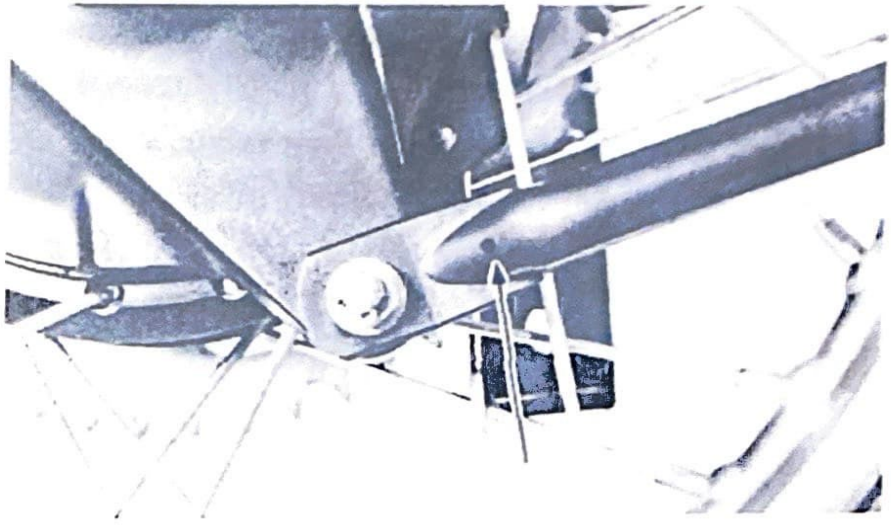
The rear wheel can be installed by reversing the removal procedure. Take the following steps.

NOTE:

As shown in the photo, the tension bar must be so installed that its drain hole on the brake shoe plate side faces outward.

1. When connecting the chain, make certain closed end of master link clip is facing, direction of rotation.
2. Be sure to adjust the tension of the chain. (Refer to "Drive chain tension adjustment".)

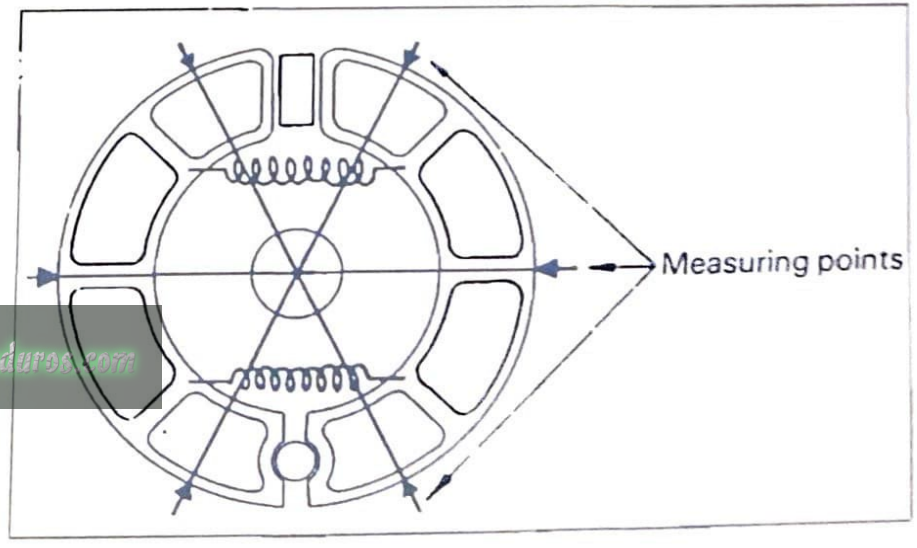
3. Always use a new cotter pin. Old pins should be discarded.



Brake shoe inspection

Measure the outside diameter of the brake shoe set with slide calipers.
If they measure less than replacement limit, replace them. Smooth out any rough spots on shoe surface with sandpaper.

	Front	Rear
Brake shoe diameter	89 mm (3.5 in)	102 mm (4.0 in)
Replacement limit	86 mm (3.4 in)	98 mm (3.86 in)



Brake drum inspection

The friction between the inner surface of the brake drum and the brake lining provides the energy to stop the motorcycle. If these become damaged or if oil contacts the drum, noise may occur and brake performance will suffer. Check the inner surface of the brake

drum and remove any scratches with emery cloth. Remove any oil with a cloth dipped in solvent. If damage is more extensive, have a Yamaha dealer replace the wheel hub.

Tire removal and tire repair

1. Remove the wheel from the motorcycle.
2. Remove locknut from valve stem and release as much air as possible from the tire.
3. Push both tire beads away from the edges of the rim.
4. Starting opposite the valve stem on one side, use two round-ended tire irons to work the bead off the rim.

NOTE:

Use a tire removal lubricant and be careful not to pinch the tube with the tire irons.

5. Remove the valve stem from its hole and remove the tube.
6. If the tire is to be changed, remove the second bead from the rim using the tire irons and tire lubricant.

Inspection

1. Use a cloth to check for nails or other sharp objects in the tire.

CAUTION:

Always use a cloth to avoid cutting your hand.

2. Check for faults in the side wall. If there is any fault, the tire should be replaced as a damaged tire may burst at high speeds, which is extremely dangerous.
3. Inflate the tube with air and check the valve stem and the tube for damage and leakage replace as required. Some leaks can be patched in an emergency, but it is best to replace tube.

Reassembly

1. Install one tire bead on the rim using tire irons and lubricant and then install the tube.
2. Inflate tube with air to about one-third the specified pressure. Hit the outer circumference of the tire with a soft hammer to make certain the tube is not caught between tire and rim. Release air from tube.
3. Inspect rim band and replace if damaged.
4. Install second tire bead starting opposite the valve stem using tire irons and tire mounting lubricant.
5. Inflate tire to approximately 2.0 kg/cm² (28 psi) and then reduce pressure to specified setting.

NOTE:

Check the valve stem; it must be pointing directly at center of wheel hub. If angled in any direction, release air and adjust tube position.

Tire air pressure

Improper tire pressure affects the smoothness of the tire, traction, handling and the life of the tires. Always maintain the correct tire pressure.

Rim and spokes

There are checks that you can perform to determine if wheel work is necessary for your dealer to do. First, check for any loose spokes. This can be checked by bracing the front end off the ground so that the front wheel can spin free. Slowly revolve the front wheel and at the same time let the metal shaft of a fairly heavy screwdriver bounce off each spoke. 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. While you have the front end up in the air, you should check that the front wheel does not have too much run-out. "Run-out" is the amount of the front wheel deviates from a straight line as it spins. Secure the front forks from turning, spin the front wheel, and solidly anchor some sort of a pointer about 3 mm (0.12 in) away from the side of the rim.

As the wheel spins, the distance between the pointer and the rim should not change more than 2 mm total. Any greater fluctuation means that you should have your dealer remove this rim warpage by properly adjusting the spokes.

Replacing wheel bearings

If the bearings allow excessive play in the wheel or if it does not turn smoothly, replace the bearing as follows:

1. First clean the outside of the wheel hub.
2. Insert the bent end of the special tool into the hole located in the center of the bearing spacer, and drive the center of the bearing spacer, and drive the spacer out from the hub by tapping the other and of the special tool with a hammer. (Both bearing spacer and space flange can easily be removed.)
3. Push out the bearing on the other side.
4. To install the wheel bearing, reverse the above sequence. Be sure to grease the bearing before installation.
5. Check the lips of the seals for damage or warpage. Replace if necessary.

REAR SHOCK (MONOCROSS SUSPENSION "DE CARBON" SYSTEM) AND SWING ARM

WARNING:

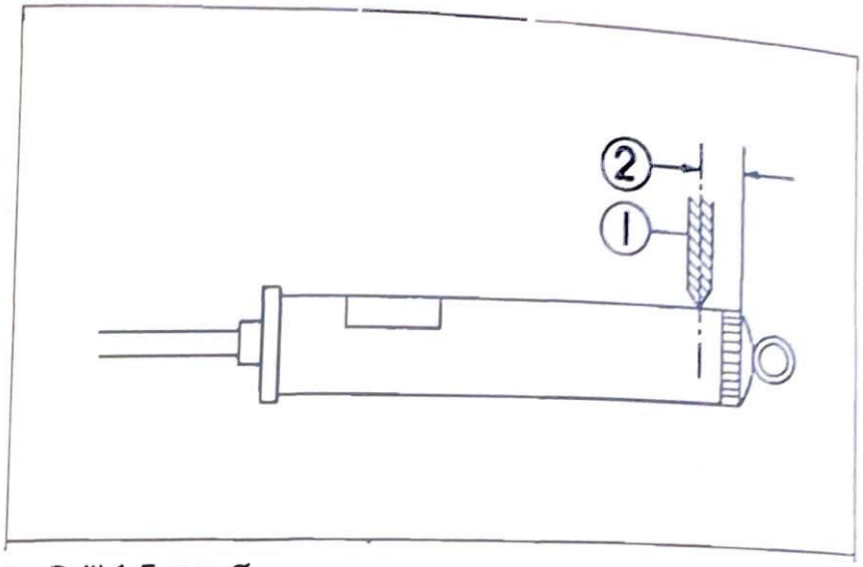
This shock absorber contains highly compressed nitrogen gas.
Read and understand the following

information before handling the shock absorber. The manufacturer can not be held responsible for property damage or personal injury that may result from improper handling.

1. Do not tamper or attempt to open the cylinder assembly.
2. Do not subject shock absorber to an open frame or other high heat. This may cause that nuit 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 disporsing of shock absorber. To do so, drill a 1.5 mm (0.06 in) hole through the cylinder wall at a point 8 — 10 mm (0.3 — 0.4 in) above the bottom of the cylinder. At this time, wear eye protection to prevent eye damage from, escaping gas and/or metal chips.



1. Drill 1.5 mm ø
2. 8 — 10 mm (0.3 — 0.4 in)

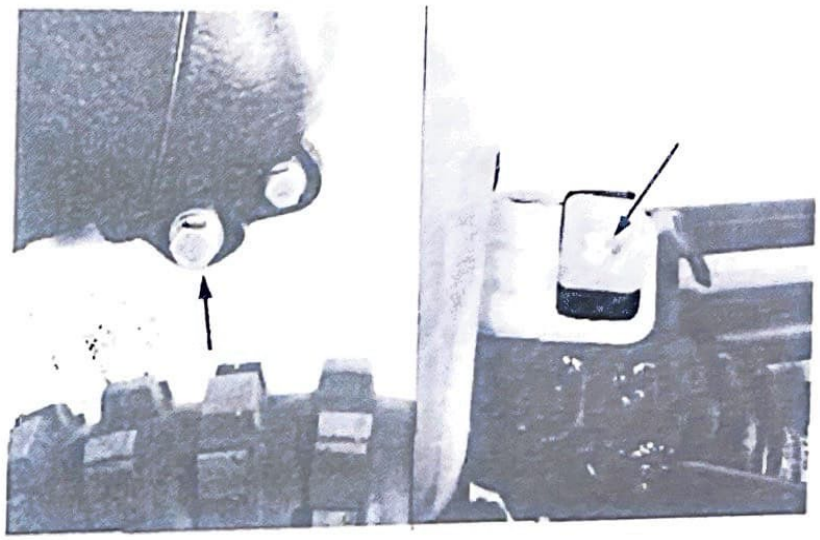
WARNING:

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

Wear eye protection

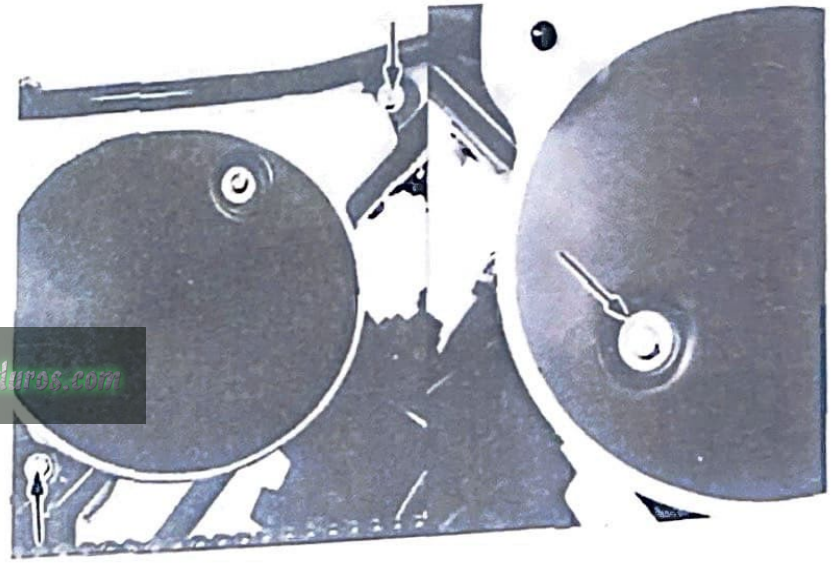
Rear shock absorber (Monocross suspention) Removal

1. Remove the two bolts holding the seat, and remove the seat and fuel tank (fuel cock must be placed in OFF). Remove both right and left side covers.
2. Remove the cotter pin
   And remove the bolt securing the upper bracket to frame.



Upper bracket tightening torque:
4.0 m-kg (28.92 ft-lb)

3. Remove the cotter pin and remove the bolt from the lower bracket.



NOTE:

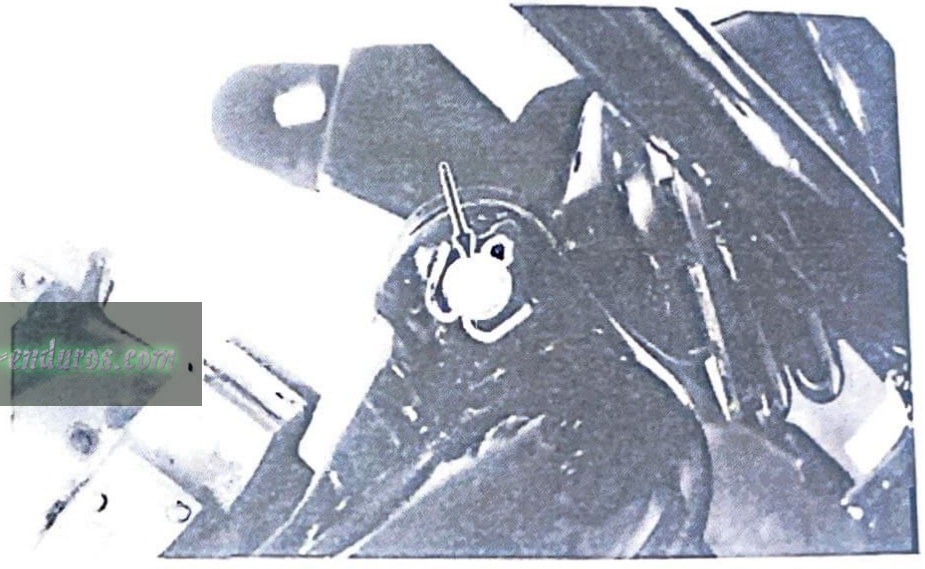
Always use a new cotter pin.

Lower bracket tightening torque:
4.0 m-kg (28.92 ft-lb)

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

NOTE:

When remove the shock absorber, be careful not to bend the absorber rod.

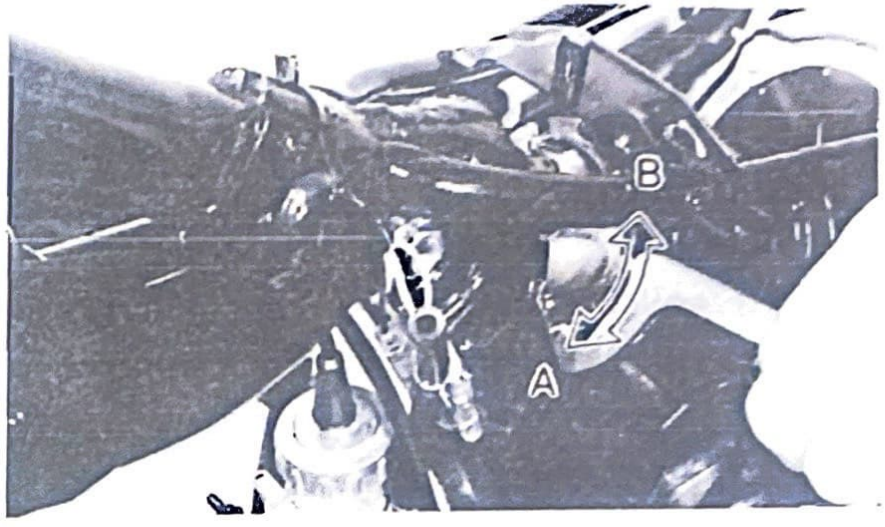


Adjustment

The spring preload of the rear shock absorber can be adjusted to suit driver's preference and driving conditions.

As shown in the photo, using the special wrench contained in the standard service tool bag, turn the adjuster so that the spring can be properly adjusted. The spring is adjustable in five stages.

If the spring seat is raised, the spring becomes softer and if lowered the spring becomes stiffer.

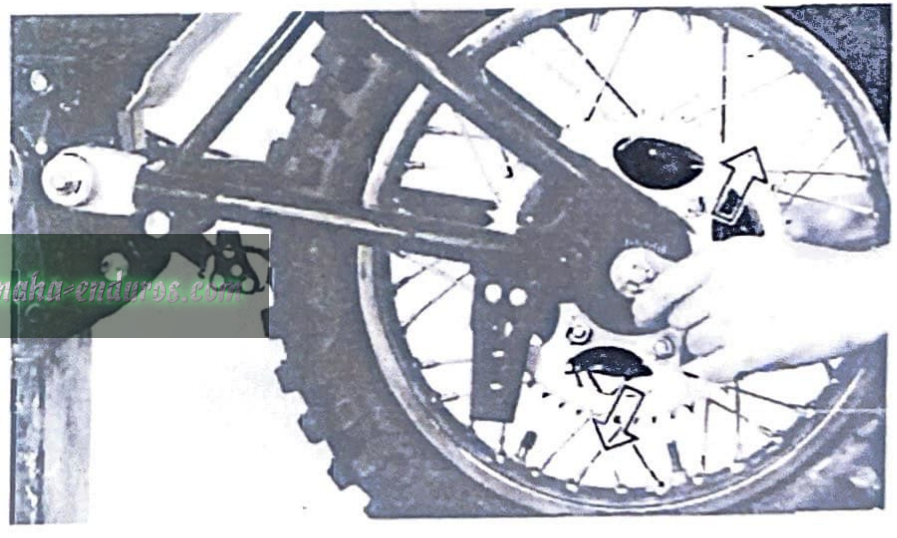


A. Softer
B. Stiffer

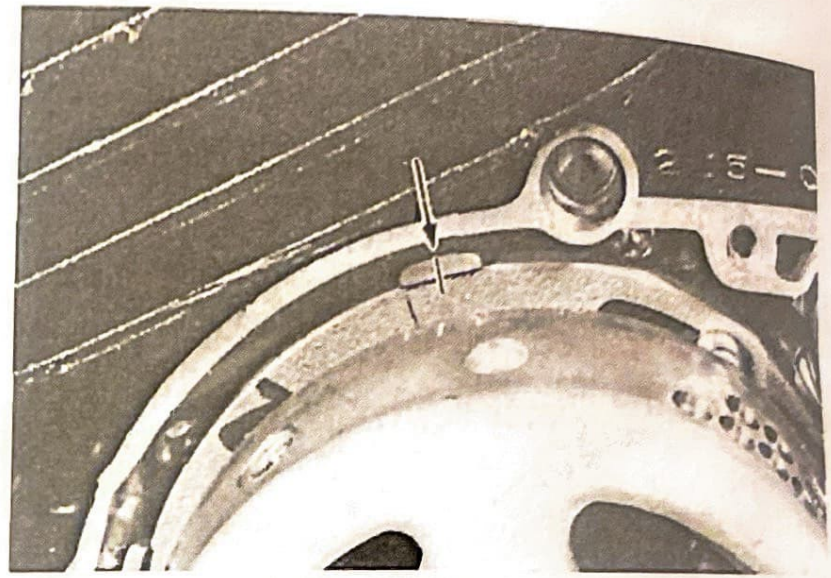
Swing arm inspection

1. With rear wheel and shock absorbers removed, grasp the ends of the arm and move from right to left to check for free play.

Swing arm free play: None



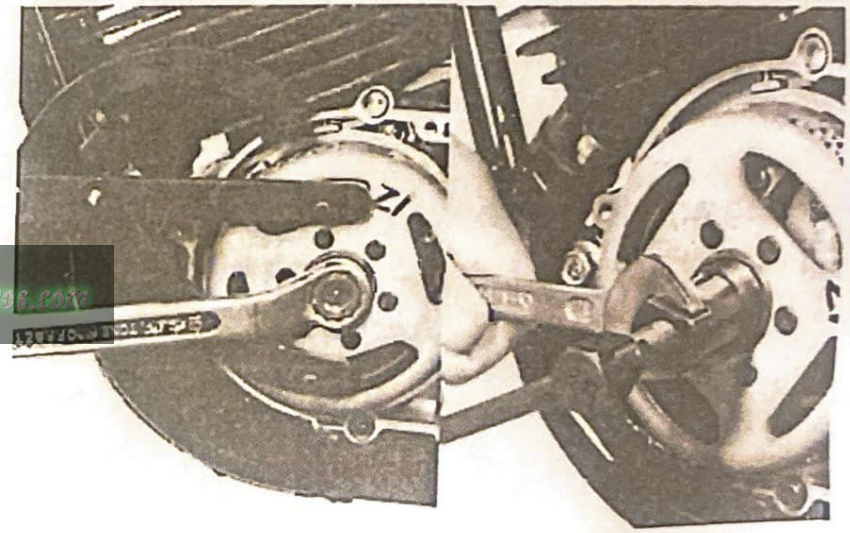
2. If freeplay is excessive, remove swing arm and replace swing arm bushing.



Ignition timing

1. Remove spark plug
2. Remove left engine crankcase cover
3. Check to see that the rotor timing mark aligns with the stator and crankcase (L) timing mark.

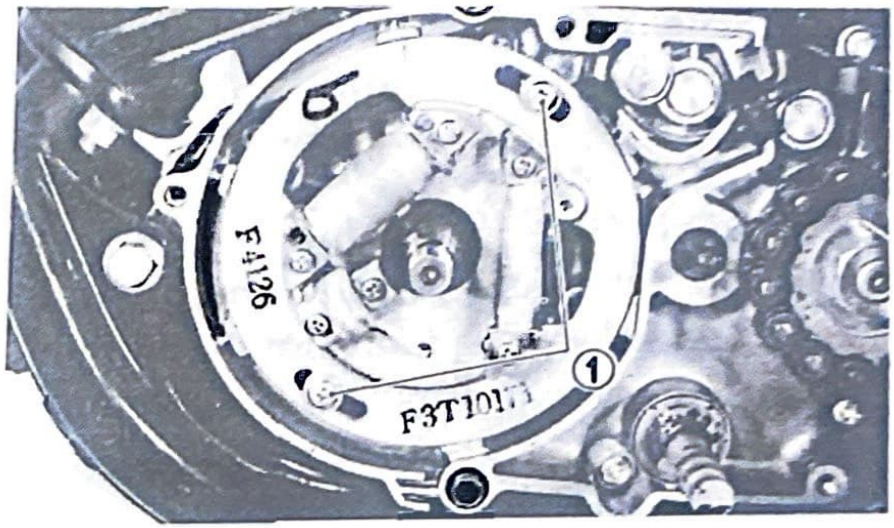
4. To adjust, remove the rotor and loosen the two stator retaining screws and rotate the stator. Tighten screws. Replace the rotor.



5. Remove dial gauge assembly and stand. Replace spark plug.

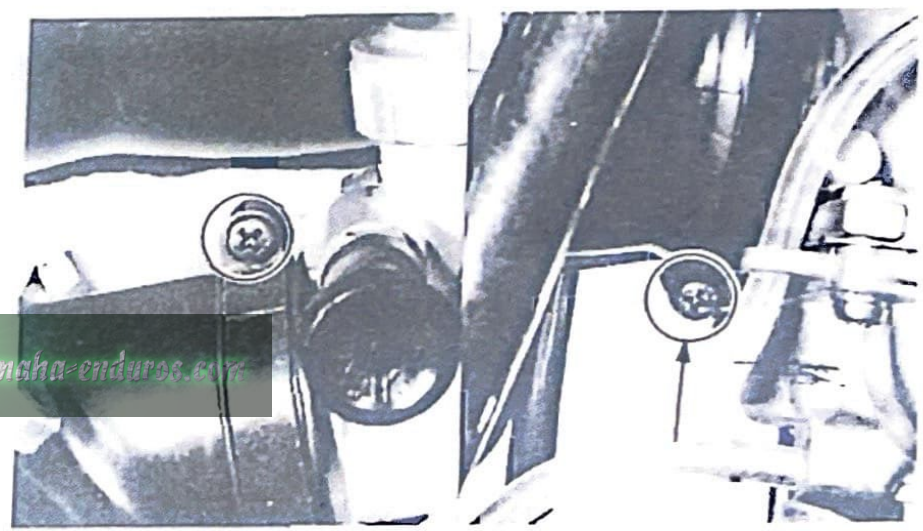
Spark plug torque:	2.5 m-kg (18 ft-lbs)

6. Replace engine crankcase cover.



Carburetor

1. Carburetor removal
   a. Turn the fuel petcock to the "OFF" position.
   b. Remove the gasoline tank fuel line from the fitting at the carburetor.
   c. Loosen the manifold and inlet joint bands.



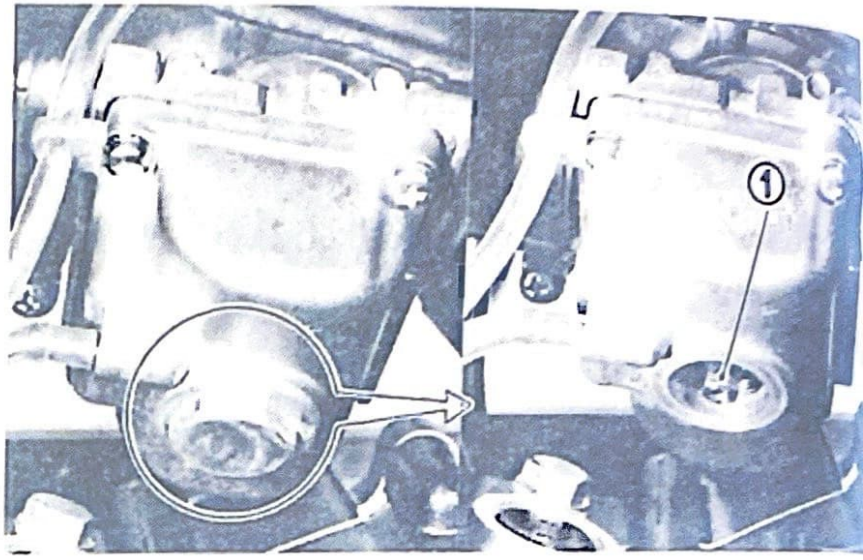
NOTE:

For carburetor main jet replacement only, follow steps "a" through "c" then:

1) Rotate carburetor, exposing main jet cover bolt (screw plug).
2) Remove main jet cover 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 the machine after reassembly.



1. Main jet

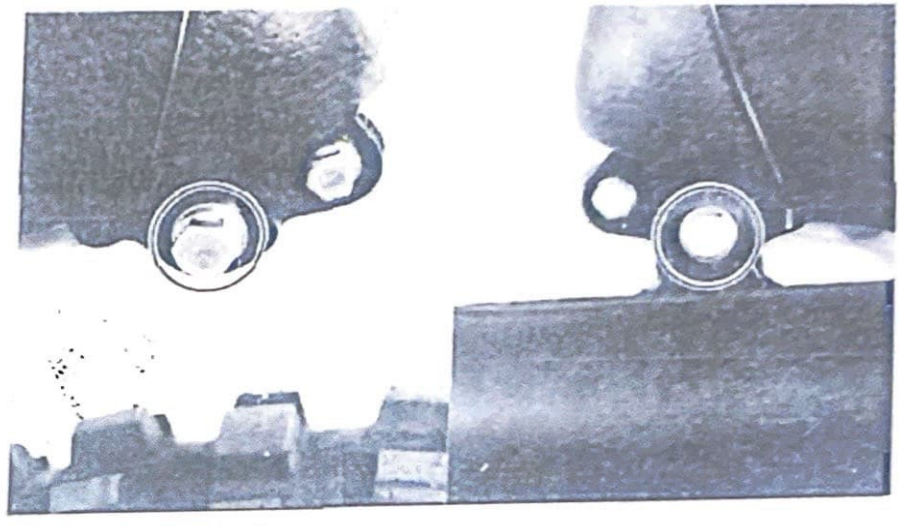
3) Using a open-end wrench (6 mm), remove the main jet. Change as required. Reinstall cover bolt and reassemble, reversing steps 1 through 3.

Main jet: #170

IMPORTANT:

The YZ80E Carburetor has been set for normal sea level conditions. The standard setting is the result of extensive testing and does not usually require changing. However, under conditions of high atmospheric pressure or heavy load (deep sand or mud) the standard main jet should be replaced with another main jet. If the carburetor requires any other setting changes to suit local conditions of altitude, weather, etc., the change must be made with great care. Improper carburetor setting changes will cause poor engine performance and possible engine damage.

Please condult your Yamaha dealer about any carburetor setting changes before actually going about then.

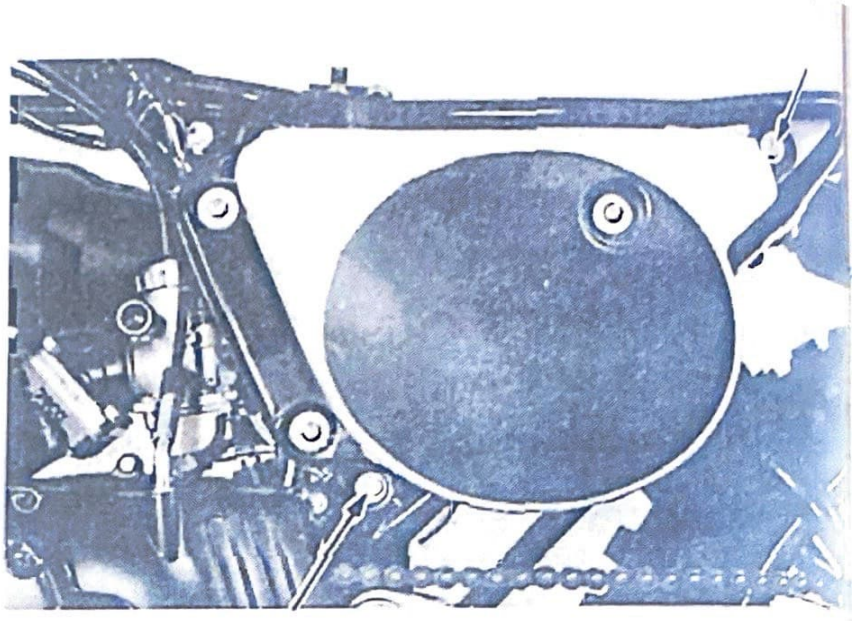


d. Remove the side cover (L.H.).
e. Remove the two bolts and seat.

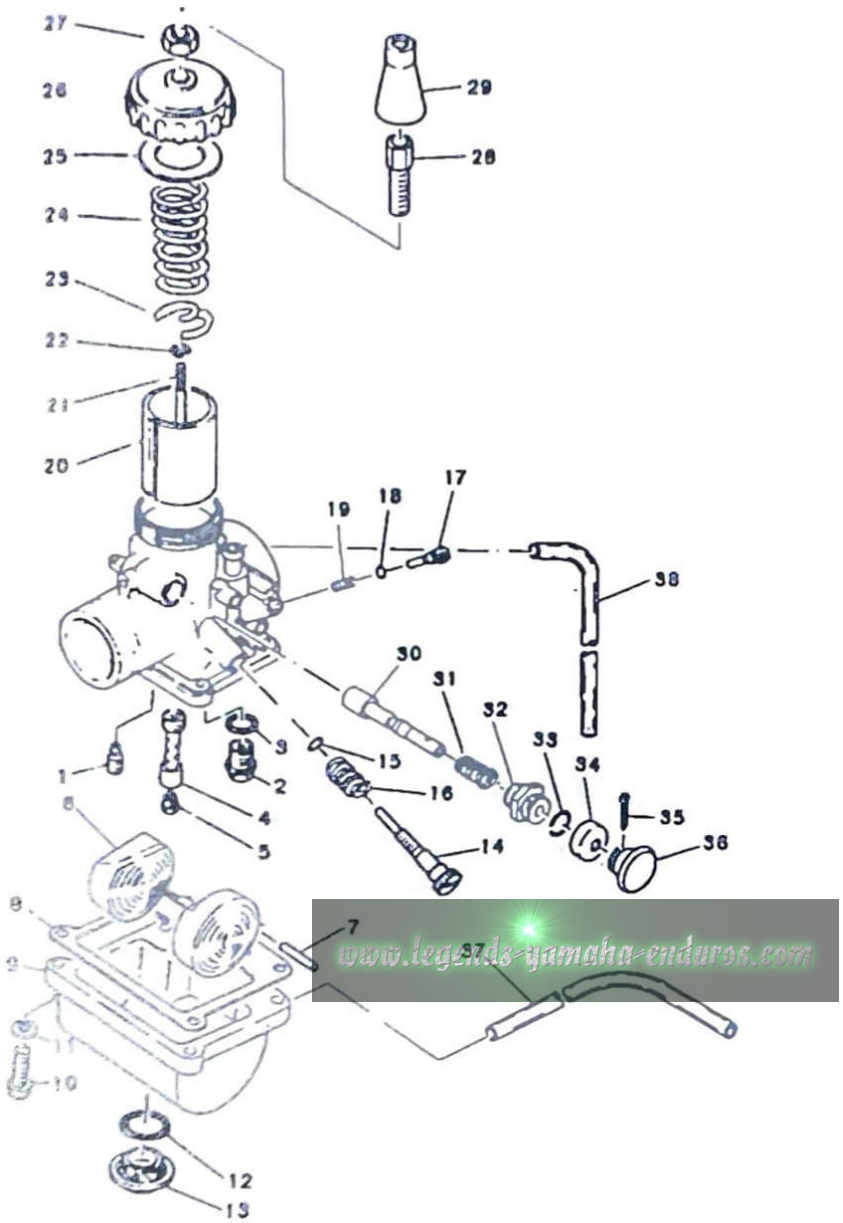
f. Remove the air filter case fitting bolts. Push the air filter joint off the carburetor inlet and remove the air filter assembly.

g. Rotating the carburetor body, work it off the cylinder manifold joint.

h. Noting the presence, location and routing of air vent and overflow pipes, pull the carburetor toward you.



CARBURETOR



1. Pilot jet
2. Valve seat
3. Valve seat washer
4. Main nozzle
5. Main jet
6. Float
7. Float pin
8. Float chamber gasket
9. Float chamber body
10. Pan head screw
11. Spring washer
12. O-ring
13. Screw plug
14. Throttle stop screw
15. O-ring
16. Throttle stop spring
17. Pilot air screw
18. O-ring
19. Pilot air screw
20. Throttle valve
21. Needle
22. Clip
23. Spring seat
24. Throttle spring
25. Packing
26. Mixing chamber top
27. Locknut
28. Wire adjusting screw
29. Cap
30. Starter plunger
31. Plunger spring
32. Plunger cap
33. Clip
34. Cap
35. Cotter pin
36. Holder
37. Over flow pipe
38. Air vent pipe

2. Carburetor disassembly and cleaning
Remove, in order, the following components:

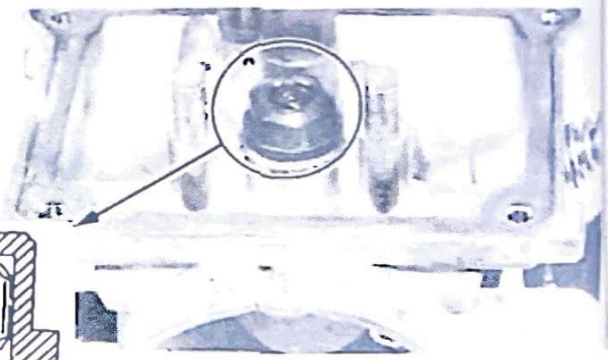
a. Unscrew the mixing chamber top. Remove the throttle valve and needle assembly.

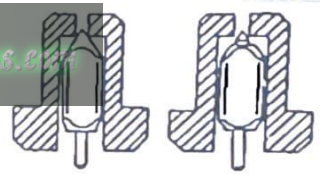
b. Remove the Phillips screws (4) holding float bowl to body. Remove float bowl.

c. On the carburetor body, remove the pin securing the float arm.

d. Remove float assembly. If a pin is loose or missing, or if the float is damaged in any fashion, replace them.

e. Remove the inlet needle directly. Inspect the needle and seat for signs of excessive wear or attached foreign particles. Replace as required. Replace inlet needle and inlet valve seat as an assembly.





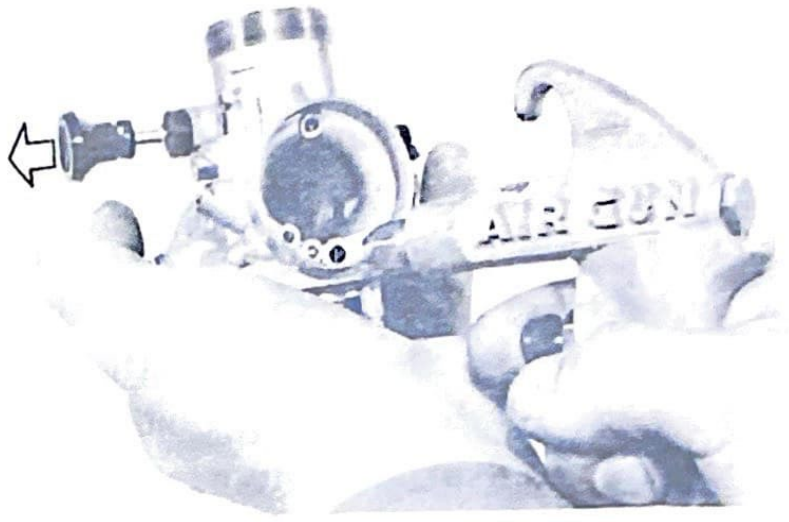
Correct

Worn

f. Remove, in order, the following components.

1) Pilot jet
2) Main nozzle
3) Throttle stop screw (idle speed screw)
4) Pilot air screw (idle mixture screw)

g. Actuate the starter jet control to open the circuit.
h. Wash the carburetor in mild solvent. Wash all associated parts.



NOTE:

It is rarely necessary to "boil" the carburetor in a warm or hot carburetor bath. If deposits warrant this procedure, remove the starter jet assembly to avoid damaging the jet's neoprene valve seat.

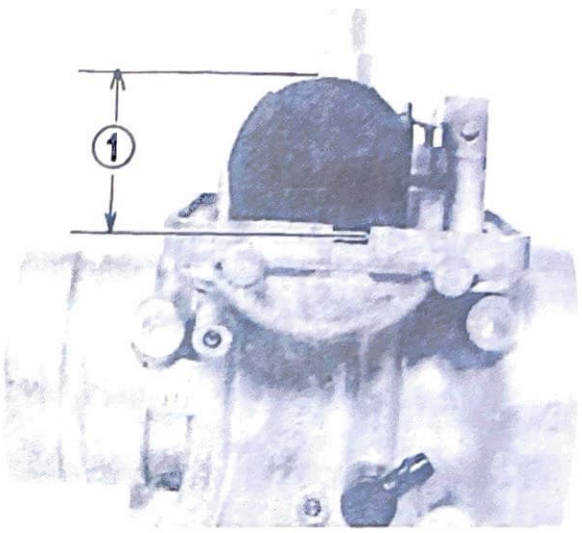
i. Using high pressure air, blow out all passages and jets.

j. Reinstall all components, with the exception of the float bowl.

3. Float level adjustment

a. Float level is set according to the design of the carburetor and float bowl chamber. Under no circumstances should float level be altered in an attempt to correct a performance problem. Look for the problem in related components or carburetor circuits.

b. Using a vernier caliper, measure distance of the float from the top of the float chamber gasket seat (gasket removed) to the float.

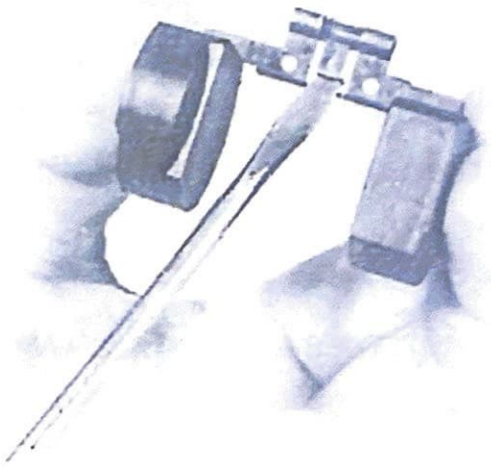


1. Float level

Float level: 24 ± 2.5 mm (0.94 ± 0.098 in)

NOTE:

The float should be just resting on, but not depressing, the spring loaded inlet needle.



c. To correct float level, remove the float and bend the tang slight amount as required. Both the right and left sides of the float should measure identically. Correct as required.

4. Carburetor assembly
   a. Install the float bowl.
   b. Remove throttle valve from throttle wire and remove the needle from the throttle valve (slide). Inspect for bending or scratches. Replace as required.
   c. Check needle clip position. Clip position is counted starting with the first clip groove at the top of the needle. Replace clip if loose.

Jet needle type: 4J13 Clip position: No. 3 groove

d. Check throttle valve (slide) for signs of wear. Insert into carburetor body and check for free movement. If slide, or body, is out of round causing slide to stick, replace as required.
e. Install throttle valve and needle assembly in carburetor. Tighten mixing chamber top as tight as possible by hand.
f. Install the all overflow and vent tubes. Reinstall carburetor. Check tightness of all fittings.

NOTE:

After installation, check throttle cable adjustment and check to ensure that slide is free-play by turning and releasing throttle.

5. Troubleshooting

   A motocross machine requires immediate, predictable throttle response over a wide operating range. Cylinder porting, combustion chamber compression, igni-

tion timing, muffler design, and carburetor size and component selection are all balanced to achieve this goal. However, variations in temperature, humidity and altitude, to name a few, 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 the pilot 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 "cut-away") 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 nozzle outlet giving it a richer mixture. There are five circlip grooves at the top 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

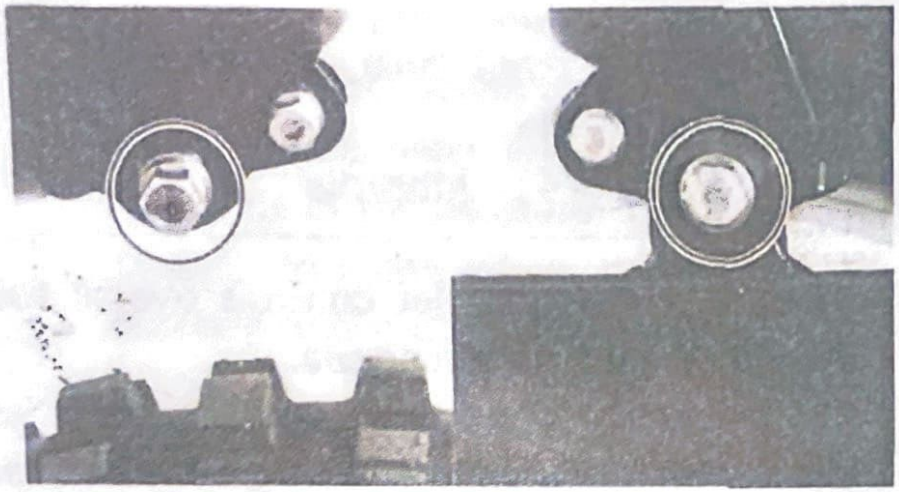
Main jet: The main jet controls overall fuel flow through the main nozzle.
Changing the jet to a one step higher supplies more fuel to the main nozzle giving a richer mixture.

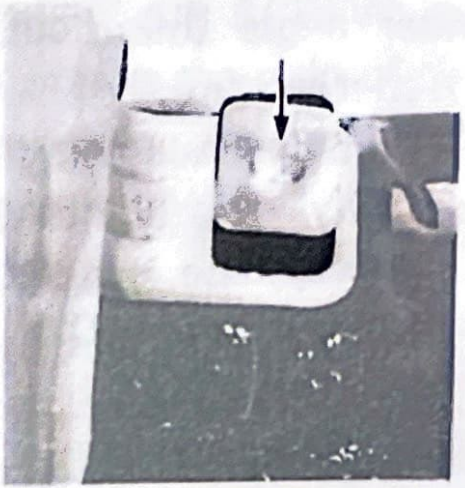
Operating range most affected by the main jet:
3/4 to full throttle

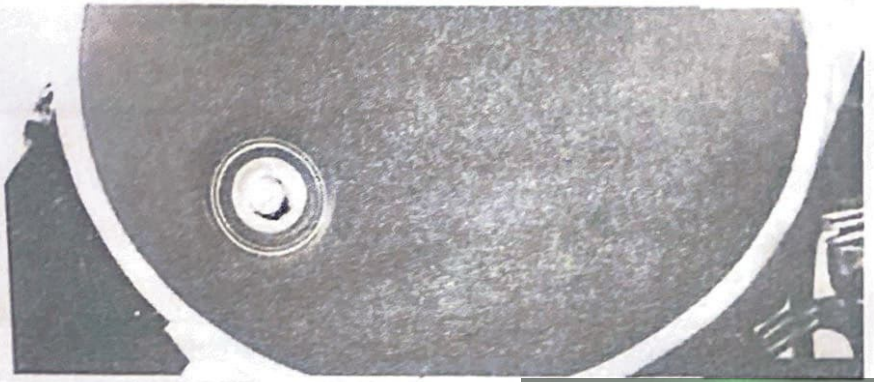
NOTE:
Excessive changes in main jet size can affect performance at all throttle positions.

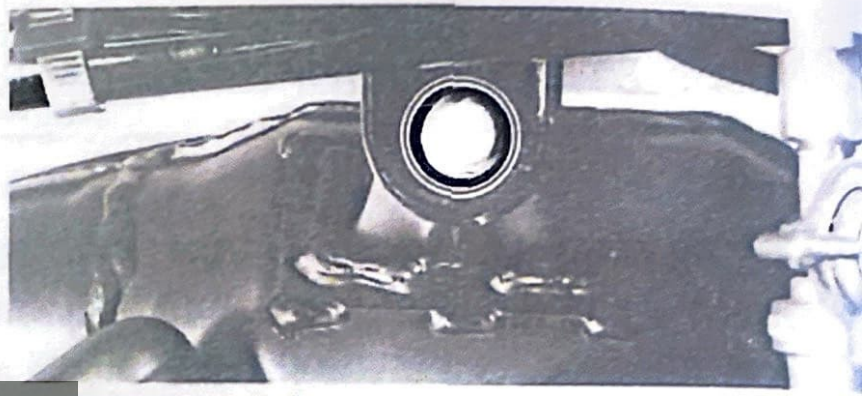
CAUTION:
The fuel/air mixture ratio is a governing

Remove the muffler









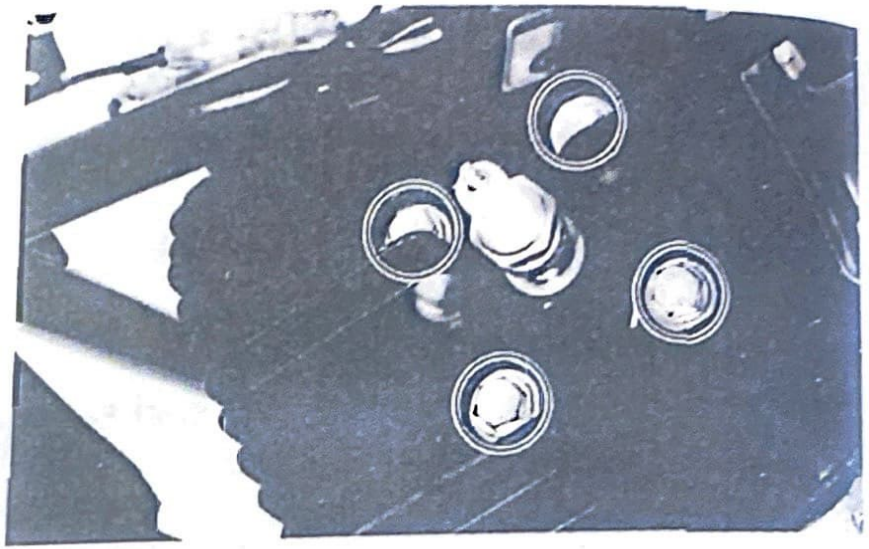
factor upon engine operating temperature. Any carburetor charges, whatsoever, must be followed by a thorough spark plug test.

Top end and muffler

With the carburetor removed, proceed as follows:

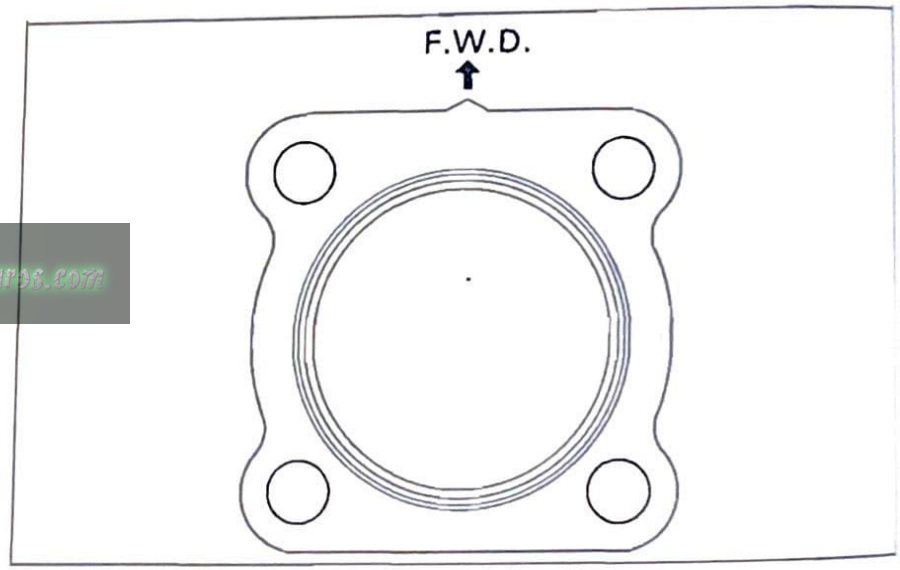
1. Muffler and cylinder head removal
   a. Remove the two bolts and remove seat.
   b. Remove the securing bolt from fuel tank.
   c. Lift rear of fuel tank up and pull back to clear frame mounts. Remove tank.
   d. Remove the side cover (R.H.).
   e. Remove the nuts holding muffler to cylinder and remove the muffler mounting bolts.

f. Remove spark plug lead wire. Loosen, but do not remove spark plug.
g. Remove nuts securing cylinder and head (4 nuts).
Remove cylinder head and gasket.



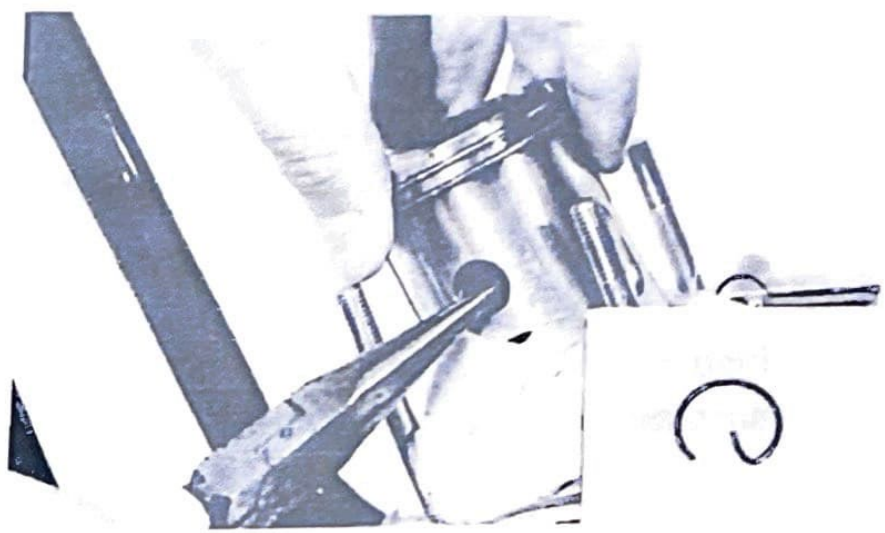
NOTE:
Break each nut loose (1/4 turn) prior to removing.

NOTE:
The cylinder head gasket must be installed with the projection facing frontward.



2. Cylinder removal
a. With the piston at top dead center, rise 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.

b. Remove the piston pin clip (1) from the piston. Push the piston pin out from opposite side. Remove the piston.



NOTE:

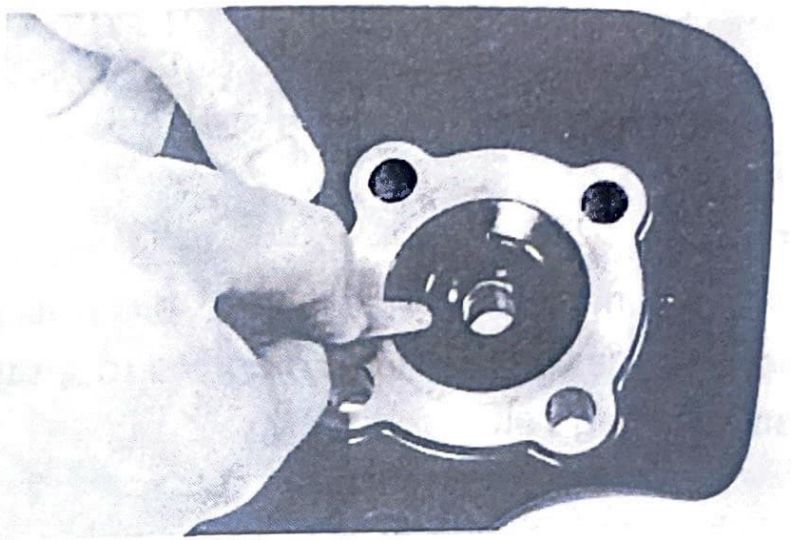
If the pin hangs up, use a piston pin puller. Do not hammer on pin as damage to rod, piston and bearing will result.

3. Exhaust pipe maintenance
   a. Using a rounded scraper, remove excess carbon deposits from manifold area of exhaust pipe. Check muffler gasket condition. The gasket seat is located around the cylinder exhaust port.
   b. 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.
   c. Reinstall muffler.

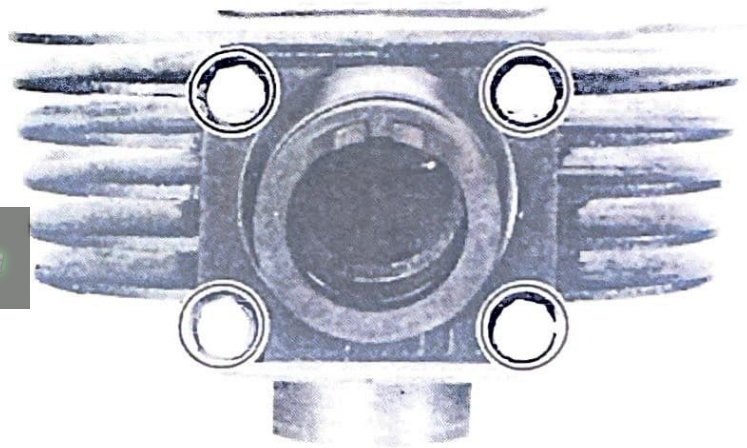
4. Maintenance — Cylinder head

a. Remove spark plug.

b. Using a rounded scraper, remove carbon deposits from combustion chamber. Take care to avoid damaging the spark plug threads. Do not use a sharp instrument. Avoid scratching the metal surface.



c. 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.



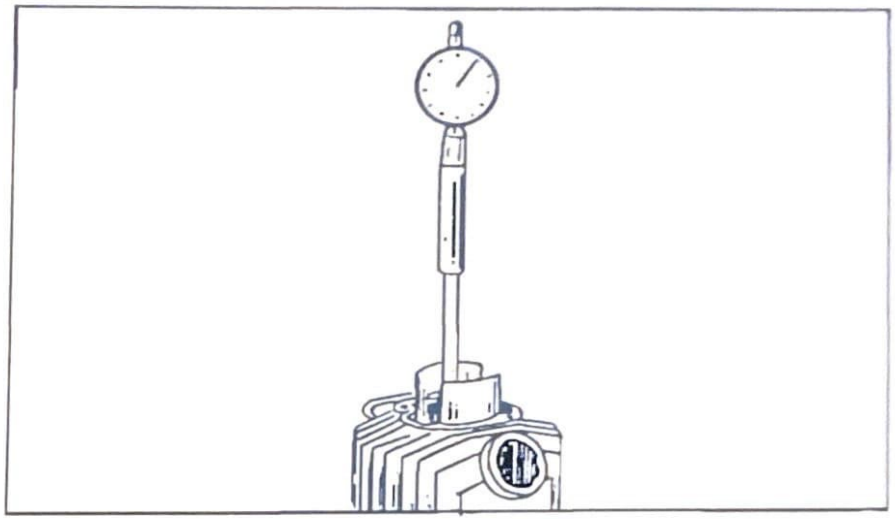
d. Clean the spark plug gasket mating surface thoroughly.

e. Wash the head in solvent and wipe dry.

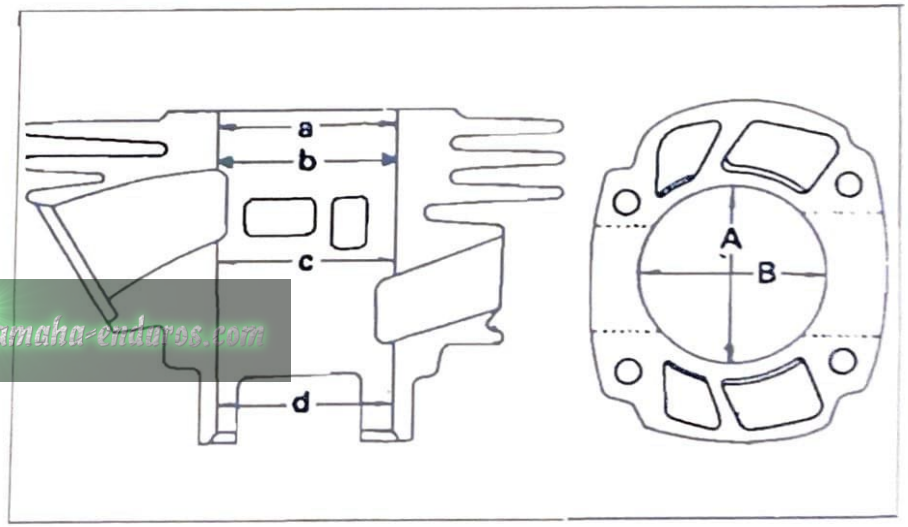
f. Install new cylinder head gasket during reassembly.

Cylinder head nut torque: 1.4 m-kg (10 ft-lbs)

5. Maintenance — Cylinder
   a. Remove reed valve assembly.
   b. Using a rounded scraper, remove carbon deposits from exhaust port.



   c. Remove cylinder base gasket and clean gasket seat on cylinder and crankcase thoroughly.
   d. Check cylinder bore. Using a cylinder hone, remove any scoring. Hone lightly, using smooth stones. Hone no more than required to avoid excess piston clearance.
   e. Using a cylinder gauge set to standard bore size, measure the cylinder. Measure front-to-rear and side-to-side at top, center and bottom just above exhaust port. Compare minimum and maximum measurements. If over toler-



ance and not correctable by honing, re-bore to next over-size.

Standard bore: 49 mm (1.9 in)
Max. allowable taper: 0.05 mm (0.0020 in) Max. allowable out-of-round: 0.01 mm (0.0004 in)

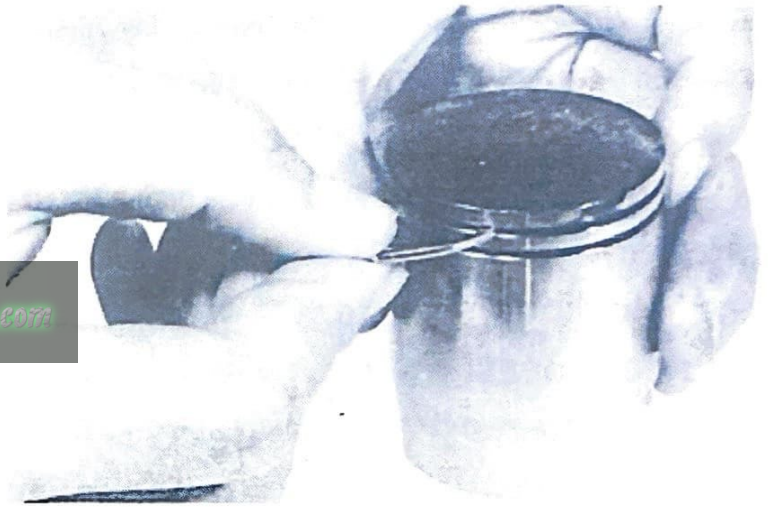
f. Clean cylinder in solvent, then wash with hot soapy water. Dry. Coat walls with light oil film.

g. During re-assembly, always use a new cylinder base gasket.

6. Maintenance — Piston

a. Using a rounded scraper, remove carbon deposits from piston crown.

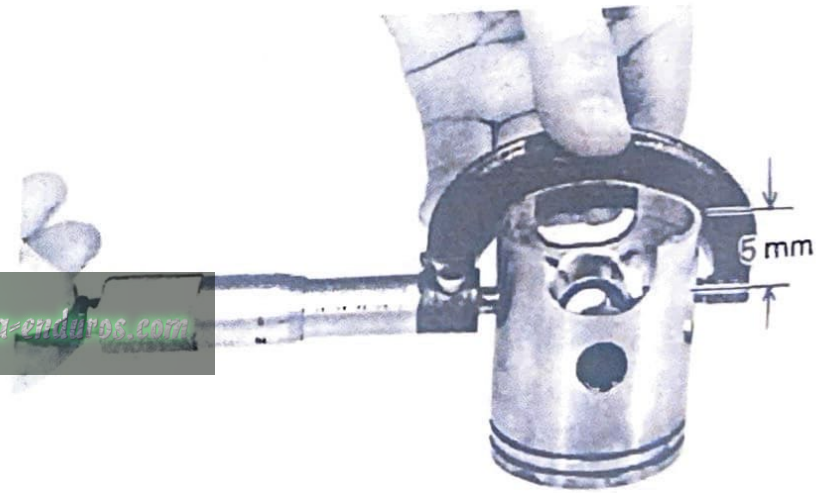
b. Break a used piston ring in two. File end square. De-burr edges to avoid scratching ring groove and clean carbon deposits from ring grooves.



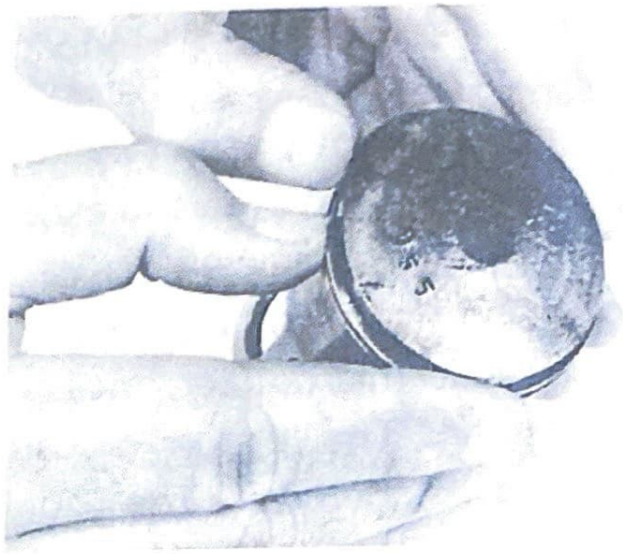
c. Using 400 — 600 grit wet sandpaper, lightly sand score marks and lacquer deposits from sides of piston. Sand in cross-hatch pattern. Do not sand excessively.

d. Wash piston in solvent and wipe dry.

e. 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 about 5 mm bottom of the piston skirt. Compare piston diameter to cylinder bore measurements (bottom two neasurements at right angles to piston pin line).
Piston maximum diameter subtracted from minimum cylinder diameter gives piston clearance. If beyond tolerance replace piston or bore cylinder as required.



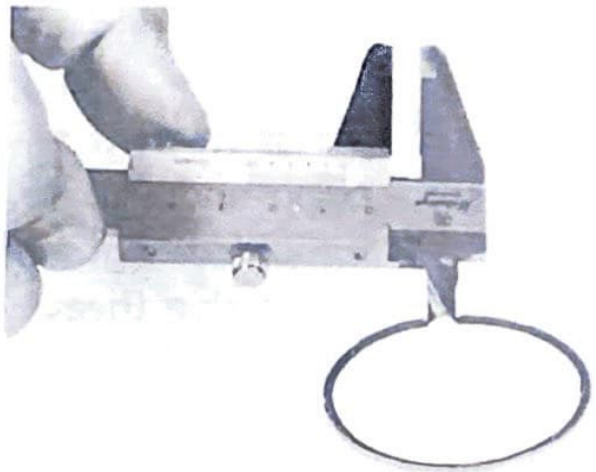
Nominal piston clearance:
0.035 — 0.040 mm
(0.0014 — 0.0016 in)
maximum wear limit:
0.1 mm (0.004 in)



f. During re-assembly, coat the piston skirt areas liberally with two-stroke oil.
g. Install new piston pin circlips and make sure they are fully seated within their grooves.
h. Take care during installation to avoid damaging the piston skirts against the crankcase as the cylinder is installed. Note the arrow mark on piston dome must face forward.
i. Make sure the rings are properly seated as the cylinder is installed.

7. Maintenance — Piston rings
a. Remove ring from piston.

b. 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 end gap installed (top and 2nd):
0.4 — 0.5 mm (0.016 — 0.02 in)

c. Holding cylinder towards light, check for full seating of ring around bore. If not fully seated, check cylinder. If cylinder not out-of-round, replace piston ring.

d. During installation, make sure ring ends are properly fitted around ring locating 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.

8. Maintenance — Piston pin, bearing and connecting rod

a. Check the pin for signs of wear. If any wear is evident, replace pin and bearing.

b. Check the pin and bearing for signs of heat discoloration. If excessive (heavily blued), replace both.

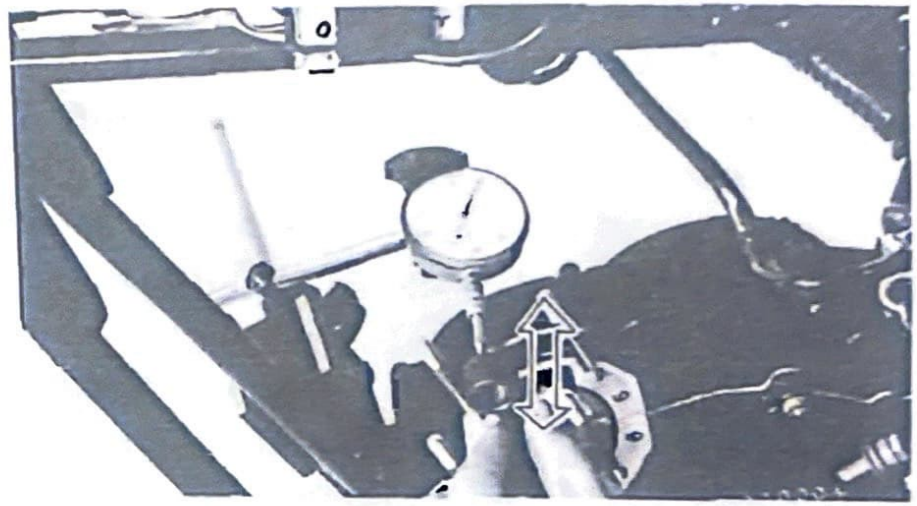
c. Check the bearing cage for excessive wear. Check the rollers for signs of flat spots. If found, replace pin and bearing.

d. 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 for wear. Replace pin and bearing or all as required.

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

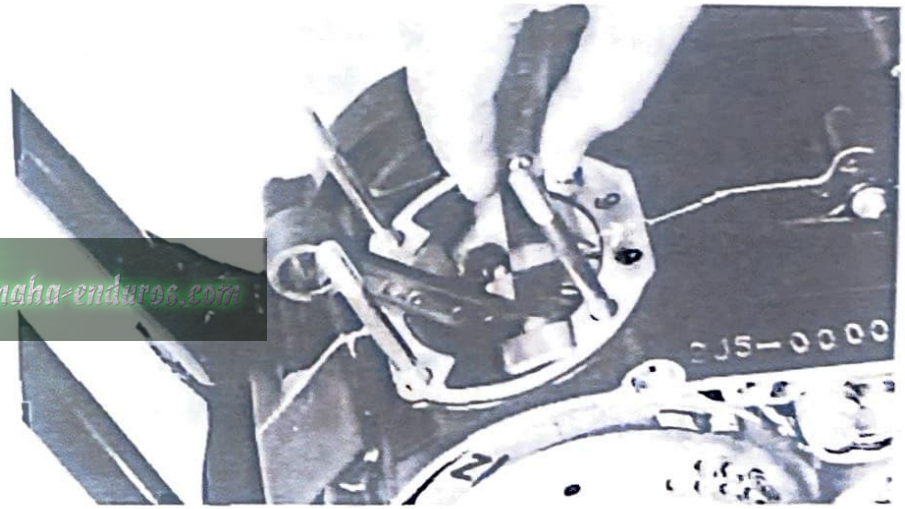
Connecting rod axial play:
0.8 — 2.0 mm
(0.031 — 0.079 in)

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



Connecting rod/crank side clearance:
0.2 — 0.7 mm
(0.008 — 0.027 in)

g. If any of the above measurements exceed tolerance, crankshaft repair is required. Take the machine to your authorized dealer.



h. 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.

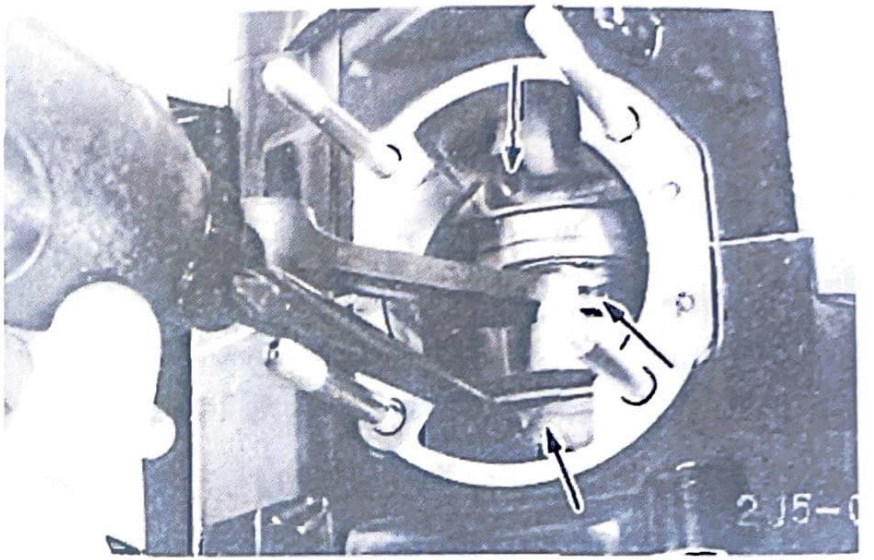
9. Reed valve

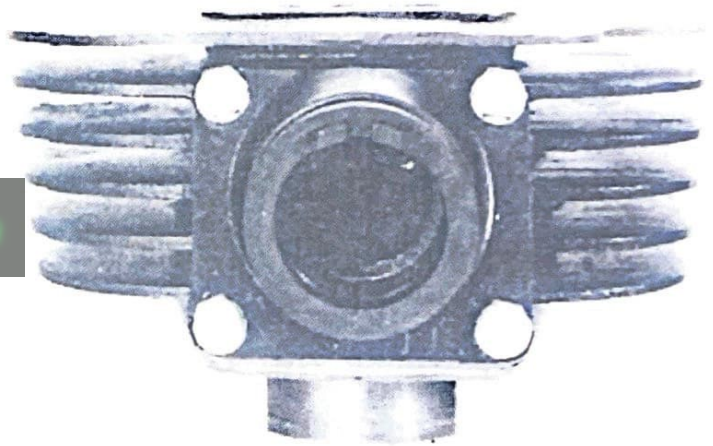
a. With carburetor, top end, and muffler removed, remove the four (4) bolts holding the intake manifold and reed valve assembly to the cylinder. Remove the assembly.

b. Inspect reed petals for signs of fatique 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.

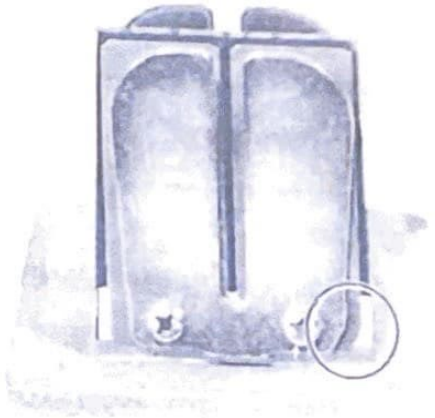
c. If disassembly of the reed valve assembly is required, proceed as follows:

1) Remove Philips screws (2) securing stopper plate and reed to reed 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.





2) During reassembly, clean reed block, reed, and stopper plate thoroughly. Apply a holding agent, such as "Loc-Tite", to threads of Philips screws. Tighten each screw gradually to avoid warping. Tighten the screws thoroughly.



CAUTION:

Do not over-tighten securing screws. Stopper plates may warp.

Securing screw torque: 8.0 cm-kg (0.9 in-lb)

NOTE:

During reassembly, observe the cut in the lower corner of the reed and stopper plate. Use as aid to direction of reed installation.

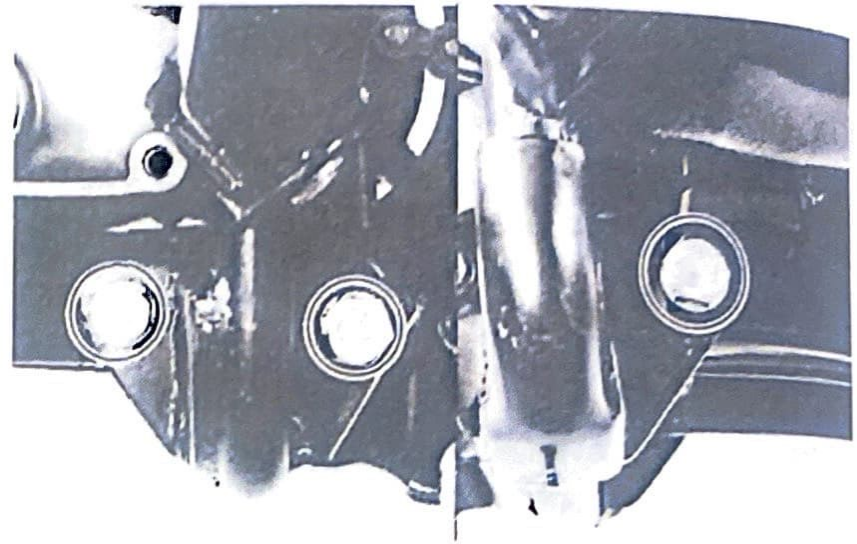
d. During reassembly of the reed valve assembly and manifold, install new gaskets and torque the securing bolts gradually and in pattern.

Clutch, shifter and kick starter

NOTE:

Clutch adjustment is covered in Section "Mechanical adjustments".

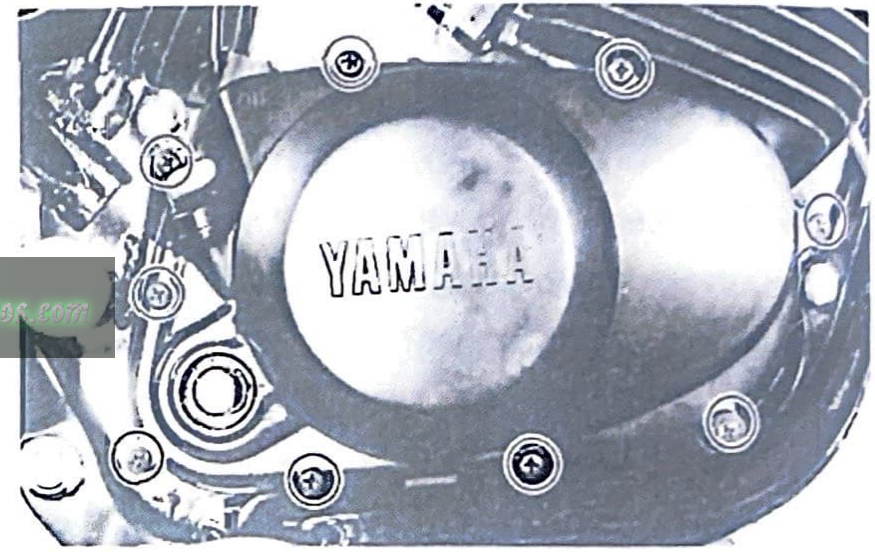
1. Clutch removal
   a. Remove the kick starter lever.
   b. Remove the right crank case cover 1.
   c. Loosen the rear brake adjustor.
   d. Remove the foot rest retaining bolt and remove the foot rest.



NOTE:

Before removing the foot rest, place a suitable stand under the engine, so that the machine does not fall over.

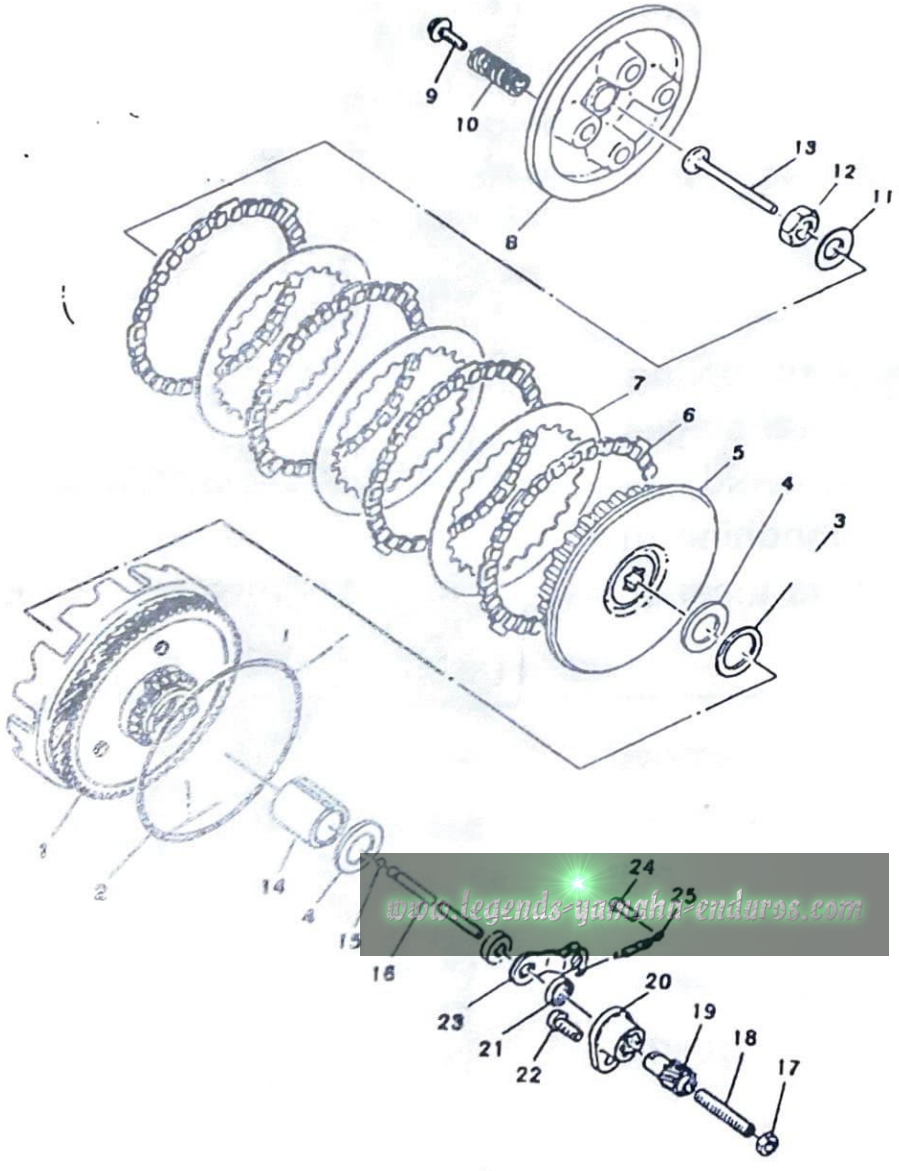
   e. Remove the pan head screws holding the case cover in place and remove the cover. Note the position of the dowel pins.



NOTE:

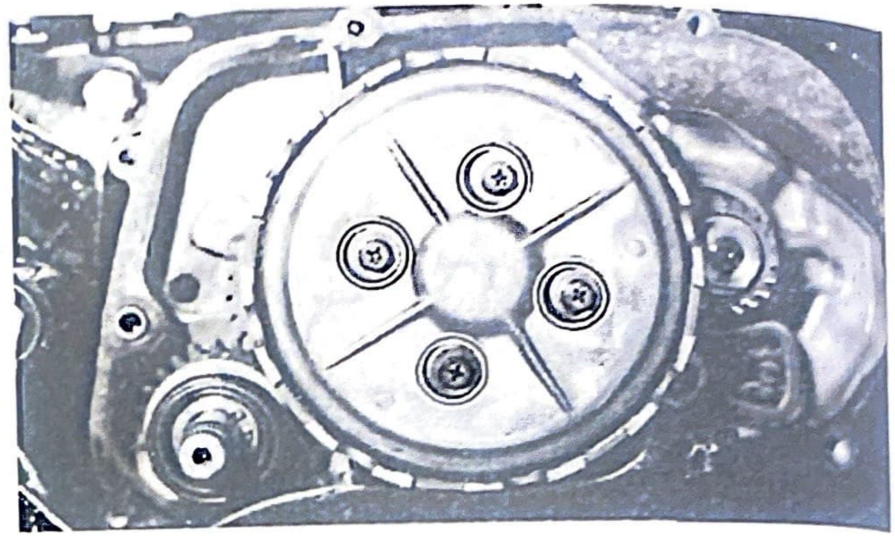
Drain transmission oil before removing cover.

CLUTCH



1. Driven gear comp.
2. O-ring
3. Plate washer
4. Thrust plate
5. Clutch boss
6. Friction plate
7. Clutch plate
8. Pressure plate
9. Bolt
10. Clutch spring
11. Clutch boss washer
12. Clutch boss nut
13. Push rod 1
14. Spacer
15. Ball
16. Push rod 2
17. Nut
18. Adjusting screw
19. Push screw
20. Push screw housing
21. Oil seal
22. Pan head screw
23. Push lever
24. Spring hook
25. Lever return spring

f. Remove the Philips (hexagon) screws (4) holding the pressure plate. Remove the clutch springs (4) pressure plate and push rod. Remove the clutch plates and friction plates.

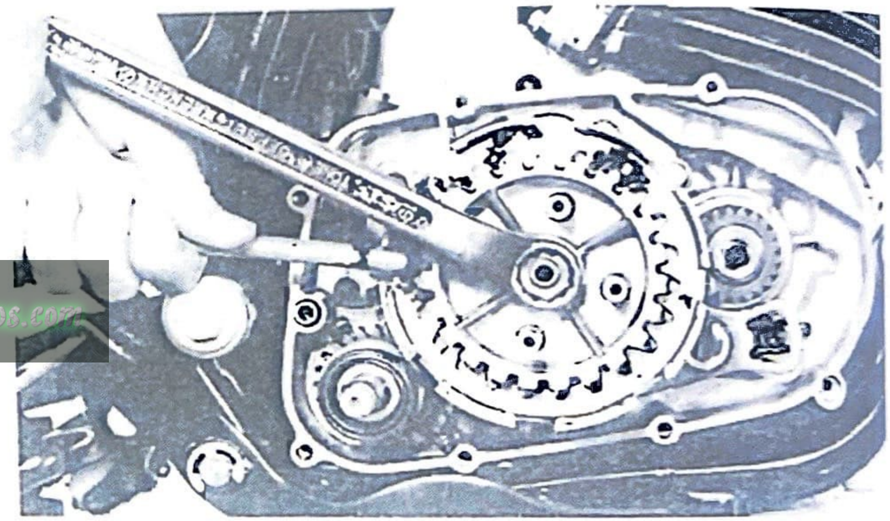


NOTE:

When removing Phillips (hexagon) spring screws, loosen each screw in several stages working in a cross-hatch pattern to avoid any unnecessary warpage. Note the condition of each piece as it is removed and its location with the assembly.

---

g. Using the clutch holding tool, remove the clutch securing nut and lockwasher. Remove the clutch boss and driven gear (clutch housing).



2. Troubleshooting — Clutch assembly

a. Measure each clutch spring. It beyond tolerance, replace.

	New	Minimum
Clutch spring free length	34.0 mm (1.34 in)	33.0 mm (1.30 in)

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

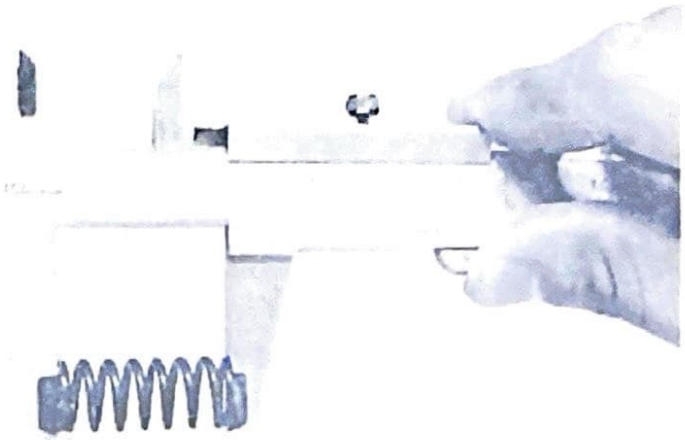
c. Check the plates for signs of warpage and heat damage, replace as required.

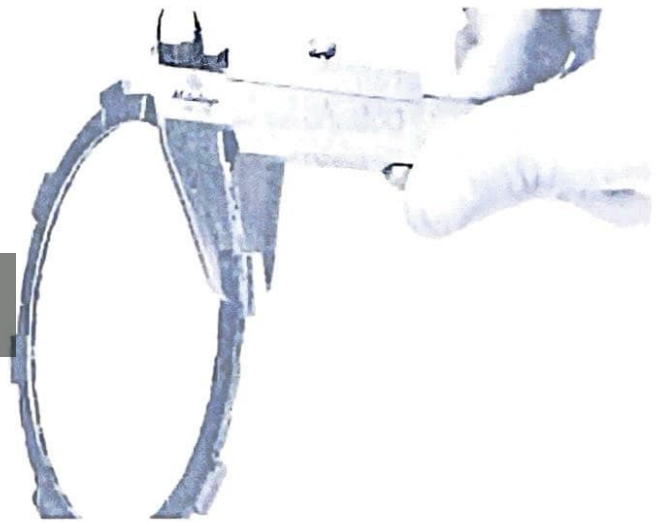
	New	Wear limit
Friction plate thickness	3.0 mm (0.118 in)	2.7 mm (0.106 in)

NOTE:

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

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

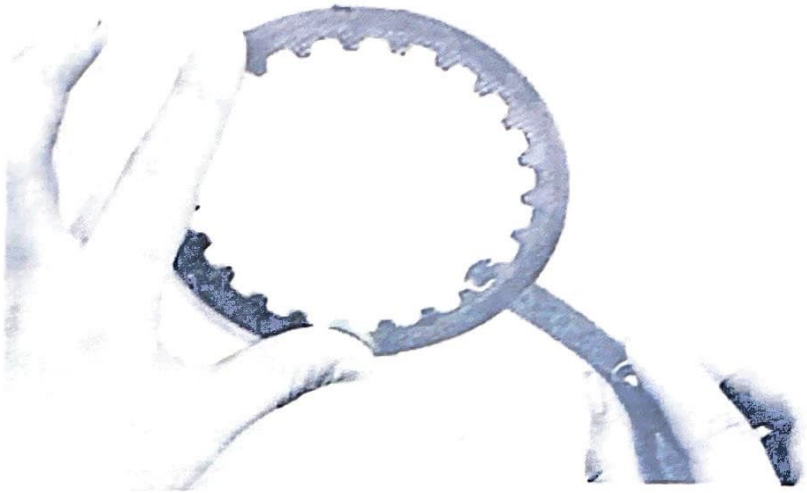




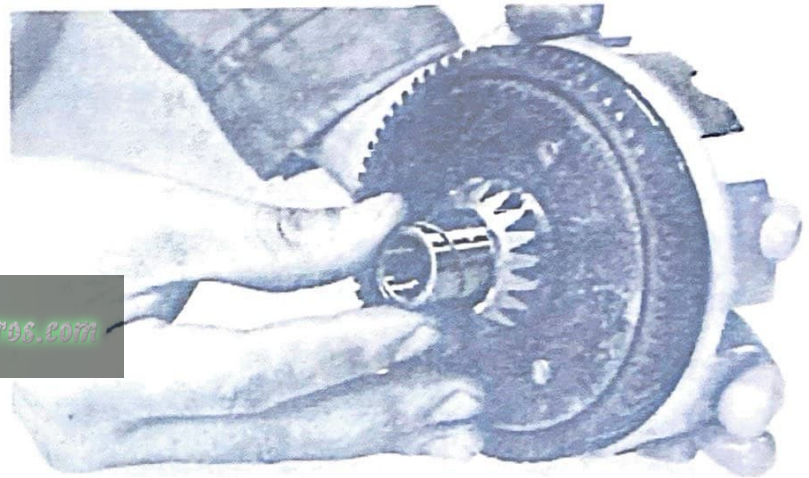
feeler gauge.

Clutch plate warp allowance: 0.05 mm (0.02 in) maximum

Inspection:
Insert the primary gear retaining collar (spacer) in the primary driven gear boss and check it for radial play. If the play is excessive, replace the gear retaining collar because it will cause excessive noise. If any scratches are found, replace the spacer to avoid impaired clutch action.



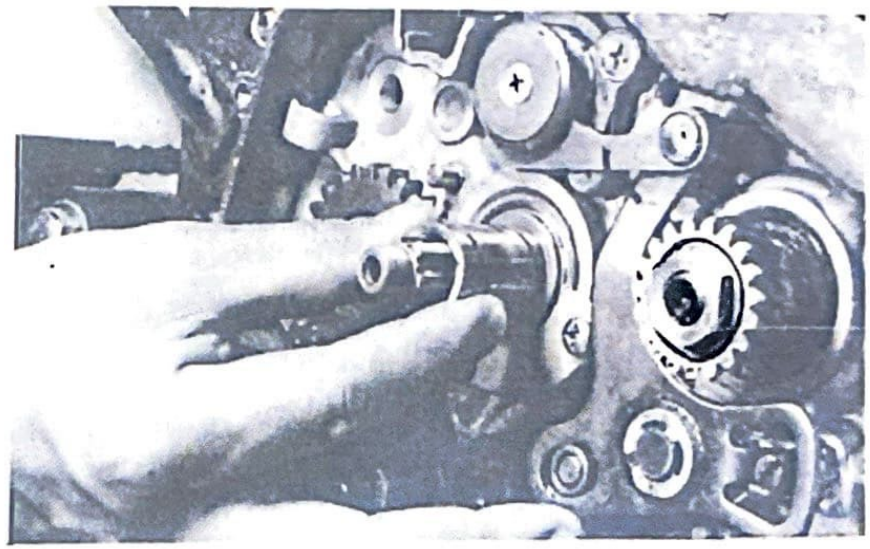
f. Checking the primary gear retaining collar (spacer).
Place the primary gear retaining collar around the main axle and again check it for radial play. If play exists, replace the gear retaining collar.
Replace any collar with step-wear on its outer surface.

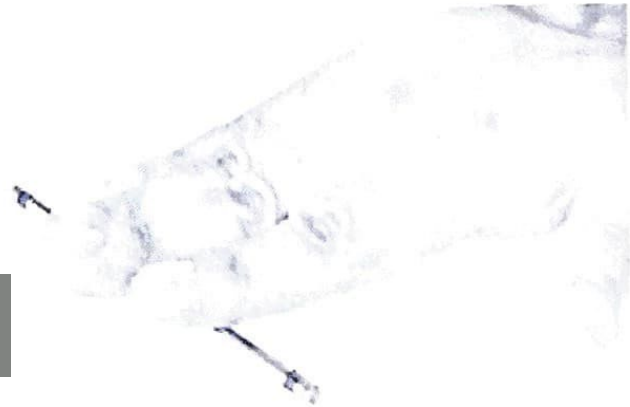


g. Checking the push rod
Remove the push rod and roll it over a surface plate. If the rod is bent, straighten or replace it.

h. Caution on re-assembling the clutch

* On both ends of the primary driven gear spaces are plate washer and thrust plates. If these washer and plates are incorrectly installed, the clutch boss will rub directly on the driven gear, impairing clutch action.
* The thrust plate fits on the primary retaining collar, but it may slip out of place when installing clutch boss. Therefore, apply grease to both surfaces of the plate to make it stick to the gear retaining collar.
* Before installing the clutch plate, friction plate, etc., install the clutch boss on the main axle.





3. Kick starter removal

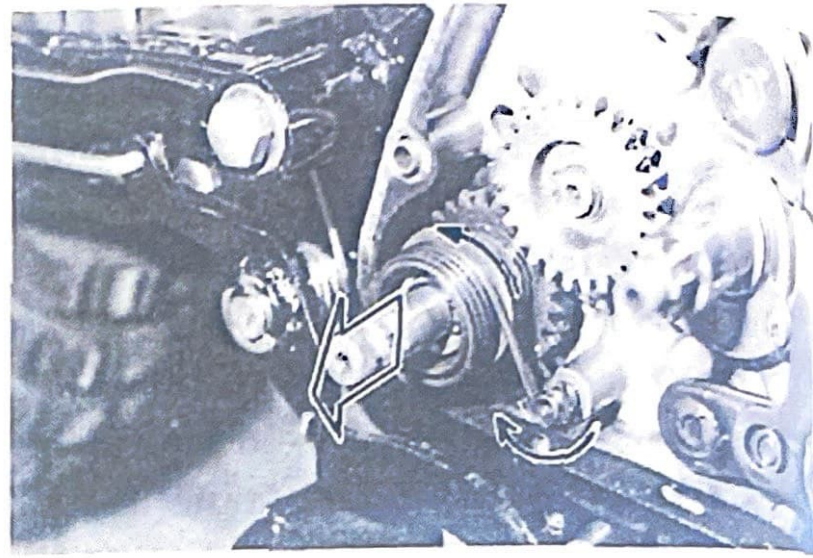
a. Unhook kick spring from its post in crankcase.
Allow it to relax. Then remove kick axle assembly by rotating the shaft counter-clockwise and then pulling out the entire assembly.

b. Check to see that the kick gear spirals freely on the worm shaft. Check the gear teeth for wear and breakage.

c. Install the kick starter assembly.

1) Set the kick gear clip in the groove of crankcase.

2) Rotate kick spring clockwise and hook it on kick spring stopper.



NOTE:

Make sure that the kick stopper is stopped at projection of crankcase.

3) Check whether the kick starter acts correctly and whether it returns to its home

position.

4. Shift mechanism

NOTE:

Shifter maintenance and adjustment should be performance with clutch assembly removed.

a. Removing the change shaft assembly.

1) Remove the circlip and washer from the change axle (left side crankcase).

2) On the otherside of the machine, pull out the change shaft assembly.

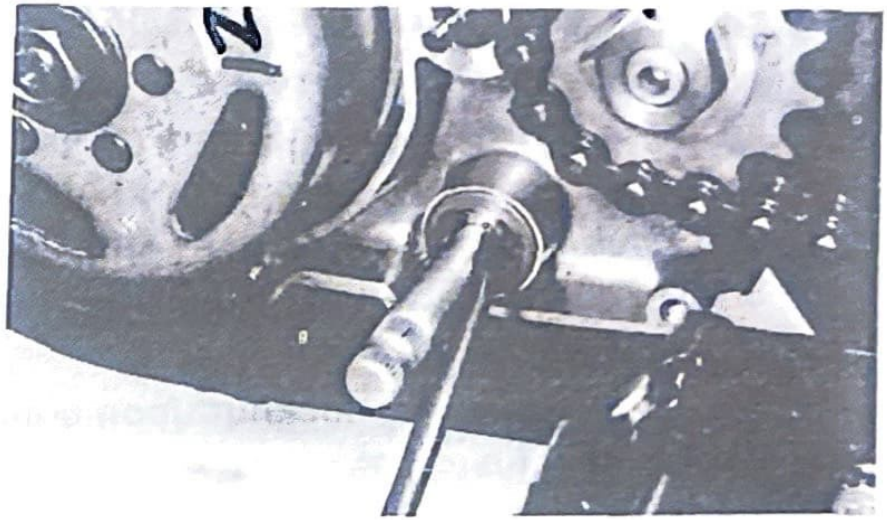
b. Checking the change shaft assembly

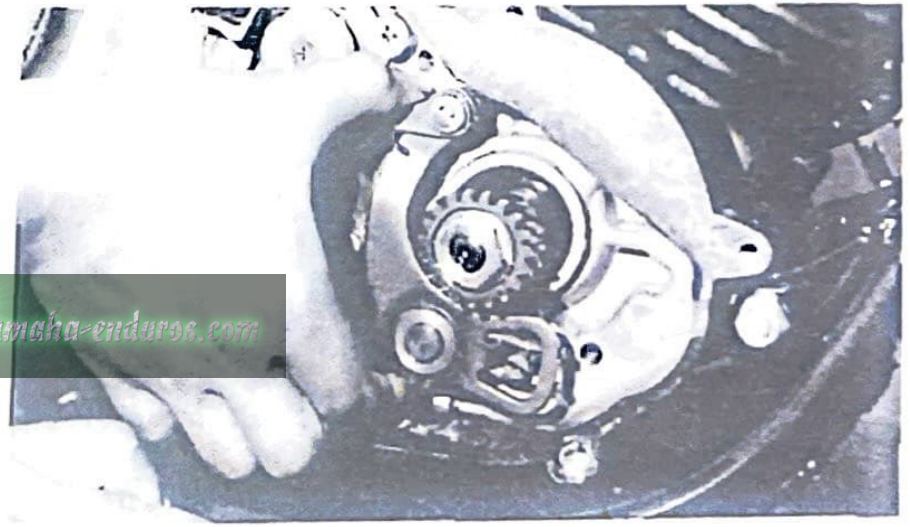
1) Inspect shift return spring. A broken or worn spring will impair the return action of the shifting mechanism.

2) Inspect change shaft assembly for bending of shaft, worn or bent splines and broken or worn shift arm spring.

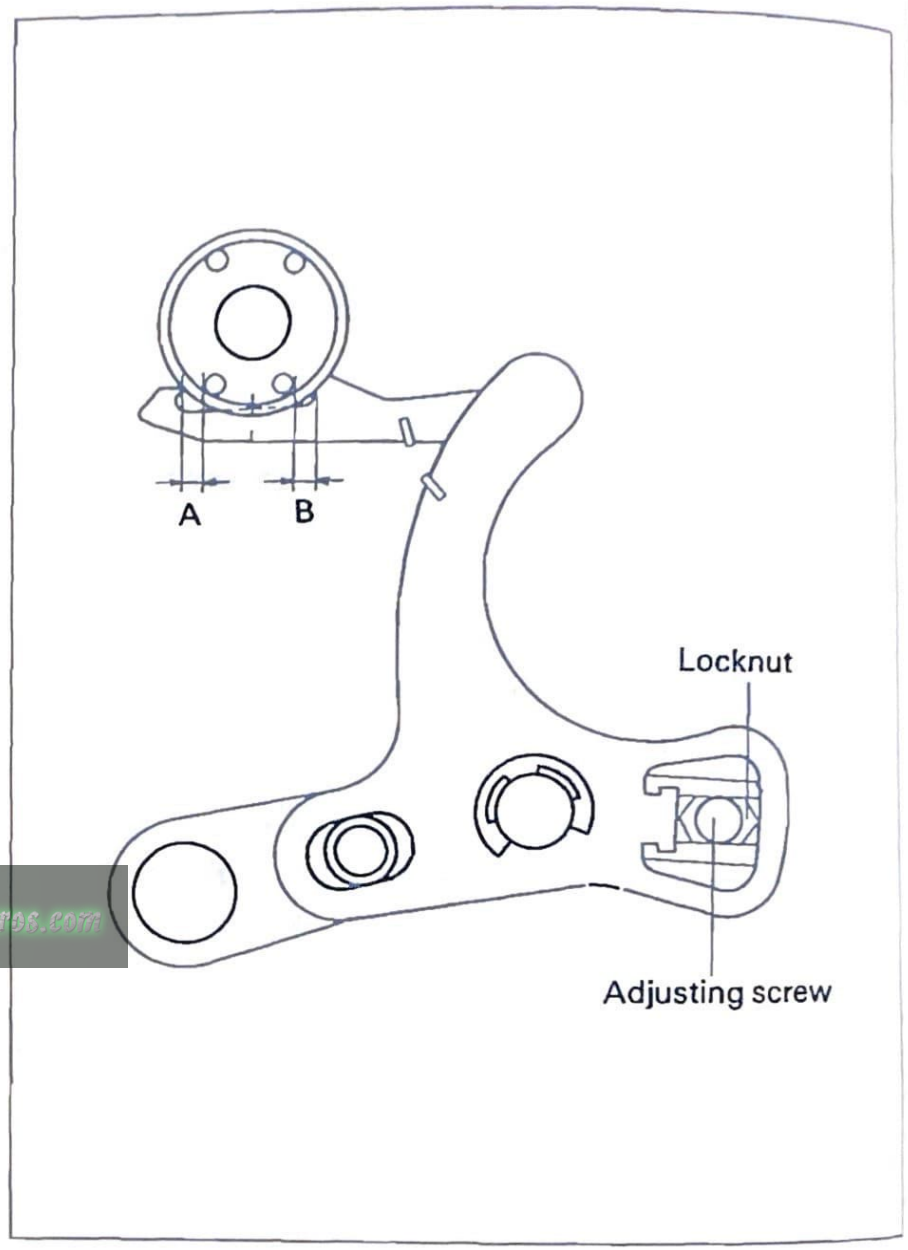
c. Adjustment

If over-shifting (excessive turning of





shift cam) or short-shifting (insufficient turning of shift cam) occurs, make adjustment of the gear shift arms by turning the stop screw (eccentric bolt) at the gear shift arm return spring. Shift the gear to second, the make adjustment so that "A" becomes identical to "B".
Make sure to tighten locknut upon completion of adjustment.

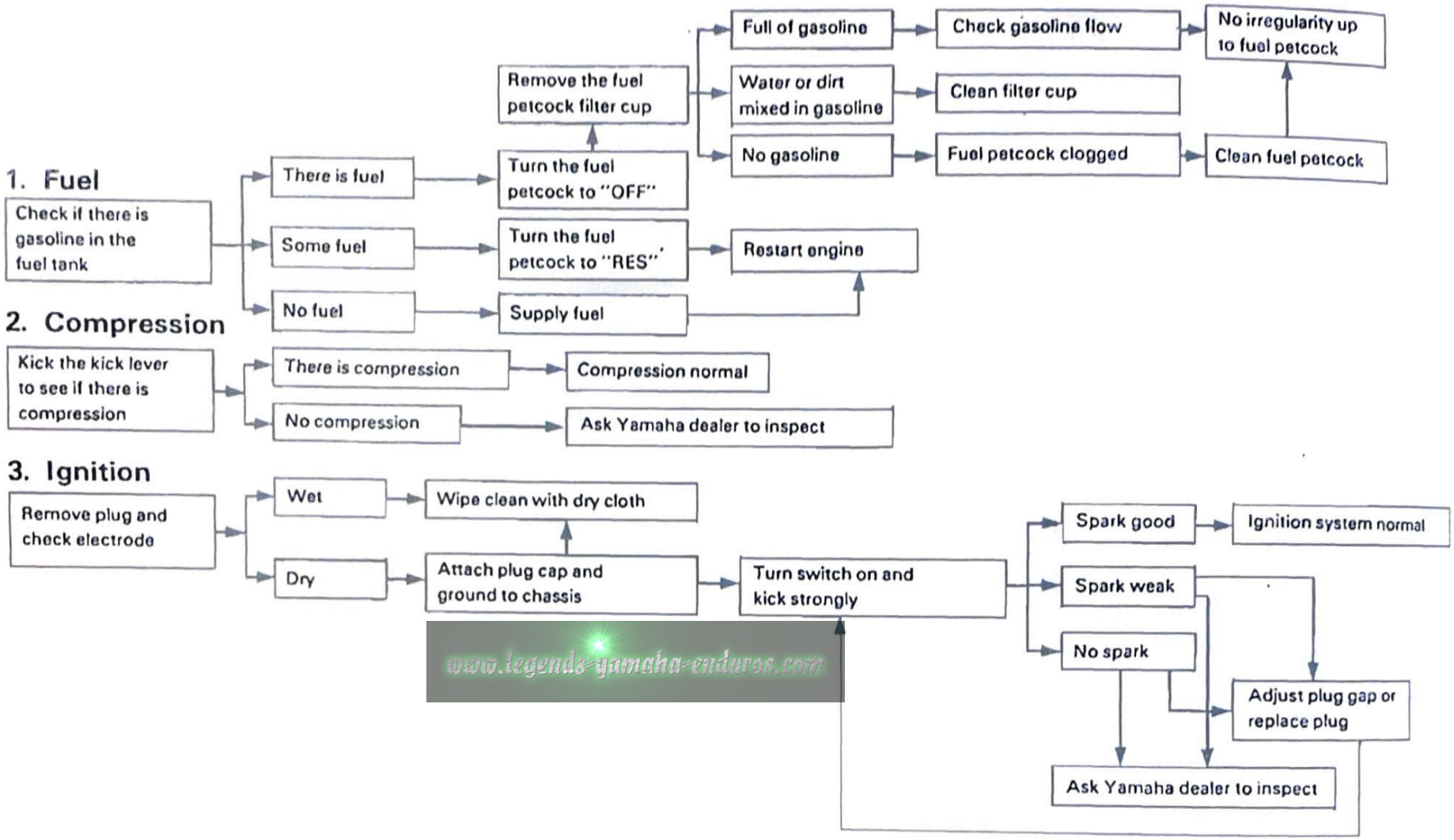


Troubleshooting

Although Yamaha motorcycles are given a rigid inspection before shipment from the factory, trouble may occur in operation. If this happens check the motorcycle in accordance with the procedures given in the troubleshooting chart below. If repair is necessary, ask your Yamaha dealer.

The skilled technicians at your Yamaha dealer provide excellent service. For replacement parts, use only genuine Yamaha parts. Imitation parts are similar in shape but often inferior in quality of materials and workmanship; consequently, service life is shorter and more expensive repairs may be necessitated.

Any fault in the fuel, compression or ignition system can cause poor starting or loss of power while riding. The troubleshooting chart describes quick and easy procedures for checking these systems.



CLEANING AND STORAGE

A. CLEANING

Frequent thorough cleaing 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:
   a. Block off end of exhaust pipe to prevent water entry; a plastic bag and strong rubber band may be used.
   b. Remove air cleaner or protect it from water with plastic covering.
   c. Make sure spark plug(s), fuel tank cap, oil tank cap, transmission oil filler cap are properly installed.
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 washers.
4. Once the majority of the dirt has been hosed off, wash all surfaces with warm water and mild, detergent-type soap. An old tooth brush or bottle brush is handy to reach hard-to-get-to places.
5. Rinse machine off immediately with clean water and dry all surfaces with a chamois, clean towel, or soft absorbent cloth.
6. Immediately after washing, remove excess moisture from chain and lubricate to prevent rust.

7. Chrome-plated parts such as handlebars, rims, spokes, forks, etc., may be further cleaned with automotive chrome cleaner.
8. Clean the seat with a vinyl upholstery cleaner to keep the cover pliable and glossy.
9. 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 on fuel and oil tanks.
10. After finishing, start the engine immediately and allow to idle for several minutes.

B. STORAGE

Long term storage (30 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(s).
2. Remove empty fuel tank, pour a cup of SAE 10W/30 oil in tank, shake tank to coat inner surfaces thoroughly and drain off excess oil. Re-install tank.
3. Remove spark plug(s), pour about one tablespoon of SAE 10W/30 oil in spark plug hole(s) and re-install spark plugs. Kick engine over several times (with ignition off) to coat cylinder walls with oil.
4. Remove drive chain. Clean thoroughly with solvent and lubricate. 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. (Main stands can be used on machine.)
7. Tie a plastic bag over exhaust pipe outlet(s) to prevent moisture from entering.

8. 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.

Remove battery and charge. Store in a dry place and re-charge once a month. Do not store battery in an excessively warm or cold place less than 0°C (32°F) or more than 32°C (90°F).

NOTE:

Make any necessary repairs before storing the motorcycle.

MISCELLANEOUS

General specifications

These specifications are for general use. For a more complete list, refer to Maintenance Specifications.

DIMENSIONS/WEIGHT	
Overall length	1,705 mm (67.0 in)
Overall width	785 mm (30.9 in)
Overall height	975 mm (38.4 in)
Wheel base	1,170 mm (46.1 in)
Minimum ground clearance	195 mm (7.68 in)
Seat height (unloaded)	710 mm (30.0 in)
Net weight	66 kg (145.5 lbs)
ENGINE	
Type	Air cooled, 2-stroke, forward-incline, single
Bore/stroke	49 x 42 mm (1.93 x 1.65 in)
Displacement	79 cc (4.82 cu.in)
Compression ratio	7.05 : 1
Starting system	Primary kick starter
Lubrication system	Mixed gas (20:1)
CARBURETION	
Manufacturer/type	MIKUNI/VM26SS

Effective venturi size	26 mm (1.02 in)
Main jet	#170
Needle jet	O-O
Jet needle	4J13-3
Pilot jet	#35
Air screw (turns out)	1-1/2
Cut away	1.5
Air cleaner type	Oiled foam rubber
CLUTCH	
Type	Wet, multiple disc
Primary reduction method	Herical gear
Primary reduction ratio	66/21 (3.143)
TRANSMISSION	
Type	Constant mesh, 5-speed
Reduction ratio	1st 36/15 (2.400) 2nd 33/18 (1.833) 3rd 31/21 (1.476) 4th 28/23 (1.217) 5th 26/25 (1.040)
Secondary reduction ratio and method	51/14 (3.643) Chain
ELECTRICAL	
Ignition system	Magneto ignition
Ignition coil resistance (Primary)	1.0Ω ± 15% at 20°C

Ignition coil resistance (Secondary)	5.9kΩ ± 15% at 20°C
Ignition timing (B.T.D.C.)	2.0 mm (0.08 in)
Spark plug	
Normal	B-8ES (NGK) or N-2 (CHAMPION)
Spark plug gap	0.5 — 0.6 mm (0.020 — 0.024 in)
CHASSIS	
Frame design	Double cradle type
Front suspension/travel	Telescopic fork/140 mm (5.5 in)
Rear suspension/travel	Swing arm/120 mm (4.7 in)
Caster/tail	28°30'/85 mm (3.35 in)
Front tire size	2.50-16-4PR
Rear tire size	3.60-14-4PR
Nominal pressure	Front: 1.0 kg/cm² (14 psi)
	Rear: 1.0 kg/cm² (14 psi)
Front brake type	Drum
Actuating method	Cable
Rear brake type	Drum
Actuating method (rear)	Link lod
VOLUMES/TYPE FLUID	
Gasoline tank/type (ratio)	4.6 lit./Mixed gas (20:1)
Transmission/type	Total: 650 — 700 cc (0.63 — 0.69 US.qt)
	Exchange: 600 — 700 cc (0.69 — 0.74 US.qt)

Front fork (each)/type	SAE 10W/30 "SE" motor oil 83 cc (2.8 oz), SAE 20W "SE" motor oil

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 changes is forwarded to all Authorized Yamaha dealers as soon as available. If a descrepancy is noted, please consult your dealer.

Maintenance specifications

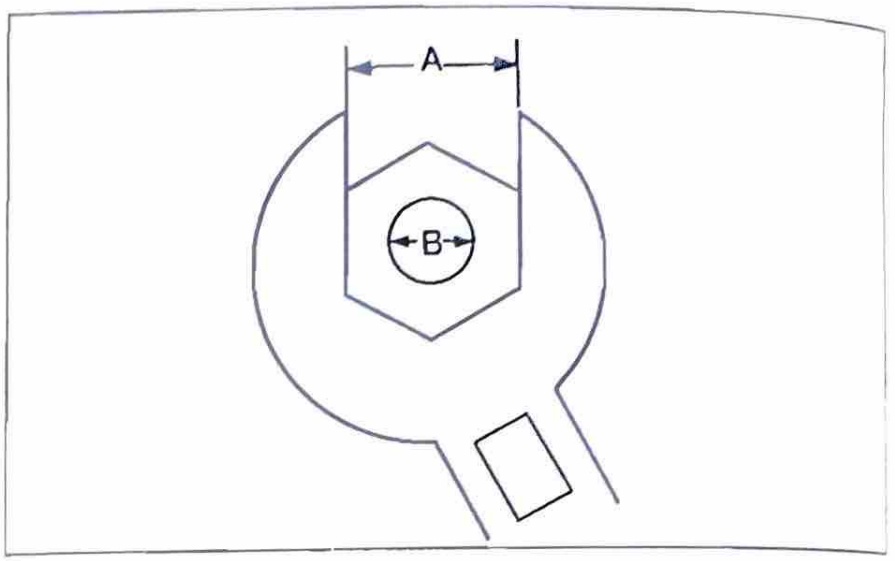
ENGINE TOP END	
Piston clearance	0.035 — 0.040 mm (0.0014 — 0.0016 in)
Piston wear limit	0.1 mm (0.004 in)
Ring end gap (installed)	0.4 — 0.5 mm (0.016 — 0.02 in)
Connecting rod/ crank side clearance	0.2 — 0.7 mm (0.008 — 0.028 in)
ENGINE CLUTCH	
Friction plate thickness	3.0 mm (0.118 in)
Clutch spring free length	34 mm (1.34 in)
Clutch plate warp allowance	0.05 mm (0.002 in)
CHASSIS	
Front brake shoe diameter	89 mm (3.5 in)
Front brake shoe replacement limit	86 mm (3.4 in)
Rear brake shoe diameter	102 mm (4.0 in)
Rear brake shoe replacement limit	98 mm (3.9 in)
Wheel run-out limit (vertical)	2 mm (0.008 in)
Wheel run-out limit (lateral)	2 mm (0.008 in)
Front fork spring free length	490.6 mm (19.3 in)
TORQUE VALUES	
Cylinder head holding nut	7 mm 1.4 m-kg (10 ft-lbs)
Flywheel securing nut	12 mm 6.0 m-kg (43.4 ft-lbs)

Primary drive gear securing nut	12 mm	6.5 m-kg (47 ft-lbs)
Spark plug	14 mm	2.8 m-kg (20 ft-lbs)
Drive sprocket securing nut	12 mm	6.0 m-kg (43.4 ft-lbs)
Clutch boss securing nut	12 mm	6.0 m-kg (43.4 ft-lbs)
Front wheel shaft securing nut	12 mm	6.0 m-kg (43.4 ft-lbs)
Under bracket securing bolt	8 mm	2.4 m-kg (17.4 ft-lbs)
Handle crown pinch bolt	8 mm	2.4 m-kg (17.4 ft-lbs)
Steering shaft stem bolt	14 mm	5.8 m-kg (42 ft-lbs)
Handlebar securing bolt	8 mm	2.0 m-kg (14.5 ft-lbs)
Engine mounting nut (front)	8 mm	2.4 m-kg (17.4 ft-lbs)
Engine mounting nut (rear upper)	8 mm	2.4 m-kg (17.4 ft-lbs)
Engine mounting nut (rear under)	8 mm	3.5 m-kg (25 ft-lbs)
Foot rest securing bolt	8 mm	2.0 m-kg (14.5 ft-lbs)
Pivot shaft securing nut	12 mm	4.3 m-kg (31 ft-lbs)
Rear wheel shaft securing nut	12 mm	7.0 m-kg (51 ft-lbs)
Tension bar and brake plate	8 mm	1.8 m-kg (13 ft-lbs)
Tension bar and rear arm	8 mm	1.8 m-kg (13 ft-lbs)
Rear shock absorber securing nut (upper)	10 mm	3.9 m-kg (28 ft-lbs)
Rear shock absorber securing nut (lower)	10 mm	3.9 m-kg (28 ft-lbs)
Driven sprocket securing bolt	8 mm	2.4 m-kg (17.4 ft-lbs)

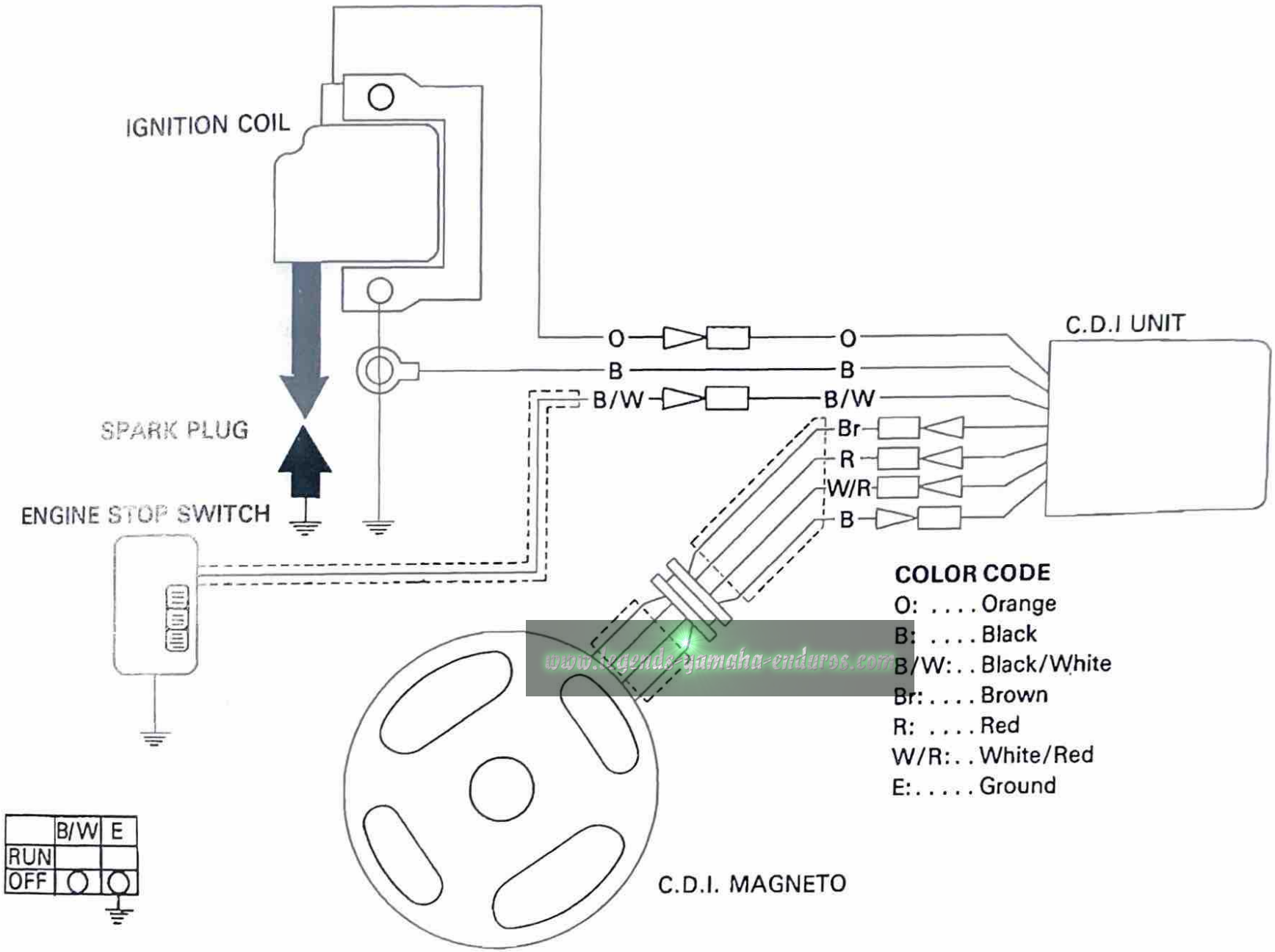
TORQUE CHART

The following torque specifications must be adhered to on every machine. Components with several studs should be tightened in gradual stages and in a pattern that will avoid warpage to the item being secured.

Torque settings are for dry, clean threads. Torquing should always be done to the nut, never the bolt head.



A (Nut)	B (Bolt)	Torque Specifications		
		m-kg	ft-lb	in-lb
10 mm	6 mm	1.0	7.2	85
12 mm	8 mm	2.0	15	175
14 mm	10 mm	3.5 – 4.0	25 – 29	300 – 350
17 mm	12 mm	4.0 – 4.5	29 – 33	350 – 400
19 mm	14 mm	4.5 – 5.0	33 – 36	400 – 440
22 mm	16 mm	5.6 – 6.5	41 – 49	480 – 570
24 mm	18 mm	5.8 – 7.0	42 – 50	504 – 600
27 mm	20 mm	7.0 – 8.3	50 – 60	600 – 700



STATEMENT OF PURCHASER'S RESPONSIBILITY

This (model) Yamaha motorcycle is sold AS IS, WITHOUT ANY WARRANTIES EXPRESSED OR IMPLIED, REGARDLESS OF THE INTENDED USE.
THE PURCHASER OF THIS MOTORCYCLE, which is intended for competition purposes, IS RESPONSIBLE FOR ALL COSTS OF SERVICE AND/OR REPAIR.

LIT-11626-00-88