



YAMAHA

YZ80K

**OWNER'S MANUAL
AND SERVICE**

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IMPORTANT NOTICE

THIS MACHINE IS DESIGNED STRICTLY FOR COMPETITION USE ONLY. IT IS ILLEGAL TO OPERATE THIS VEHICLE ON STREET. OFF ROAD USE ON PUBLIC LAND MAY BE ILLEGAL. PLEASE CHECK YOUR LOCAL RIDING AREA REGULATIONS. SUSPENSION ON THIS MACHINE CAN BE ADJUSTED. FOR DETAILS OF TUNING, REFER TO THE RACE PREPARATION AND TUNING MANUAL.

SAFETY WARNINGS:

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

YZ80K

OWNER'S MANUAL AND SERVICE

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TO THE NEW OWNER

This manual will provide you with a good basic understanding of features, operation, and basic maintenance and inspection items of this vehicle.

PLEASE READ THIS MANUAL CAREFULLY AND COMPLETELY BEFORE OPERATING YOUR NEW MACHINE. If you have any questions regarding the operation or maintenance of your machine, please consult a Yamaha dealer.

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

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

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

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

NOTICE

Some data in this manual may become outdated due to improvements made to this model in the future. If there is any question you have regarding this manual or your machine, please consult a Yamaha dealer.

SERVICE DEPT.
INTERNATIONAL DIVISION
YAMAHA MOTOR COMPANY, LTD.

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1 GENERAL INFORMATION

MACHINE IDENTIFICATION

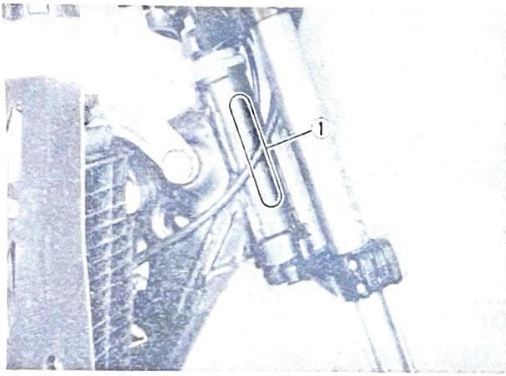
1

There are two significant reasons for knowing the serial number of your machine:

1. When ordering parts, you can give the number to a Yamaha dealer for positive identification of the model you own.
2. If your bike is stolen, the authorities will need the number to search for and identify your machine.

Frame serial number

The frame serial number is stamped into the right of the steering head pipe.



1. Frame serial number

Engine serial number

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



1. Engine serial number

CONTROL FUNCTIONS

WARNING:

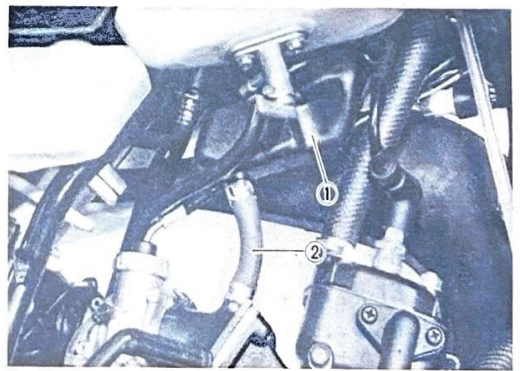
Before riding this machine, become thoroughly familiar with all the operating controls and their functions. If there are any controls which you do not understand, consult a Yamaha dealer.

NOTICE:

This machine is designed strictly for competition use only. It is not equipped with highway approved lighting. Off-road use on public land may be illegal.

Note on handling of the Yamaha Energy Induction System (Y.E.I.S.)

Handle the air chamber and hose with special care. Improper installation or damaged parts will result in poor performance. Replace any cracked or damage parts immediately. No modification of this system in any form is not allowed.

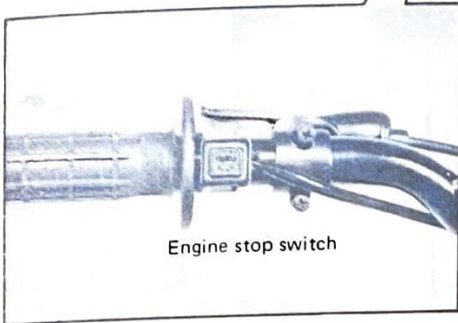
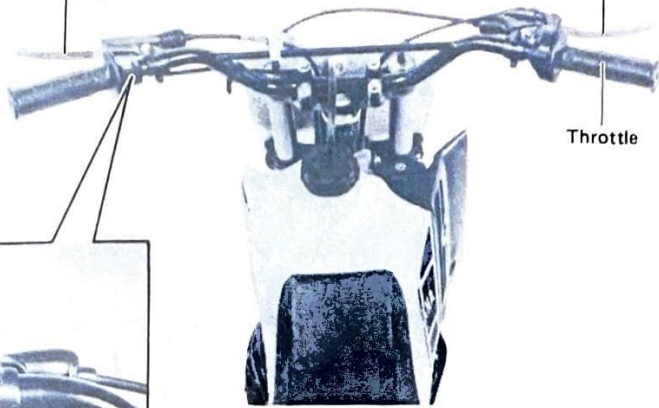


1. Air chamber 2. Hose

Clutch lever

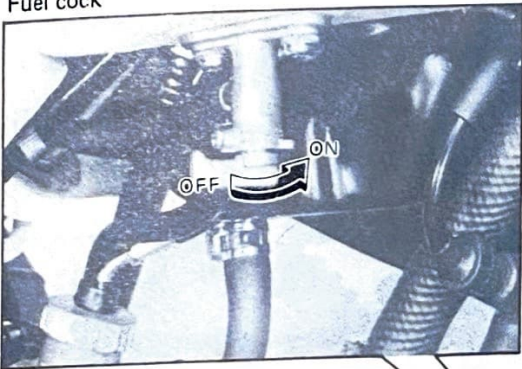
Front brake lever

Throttle



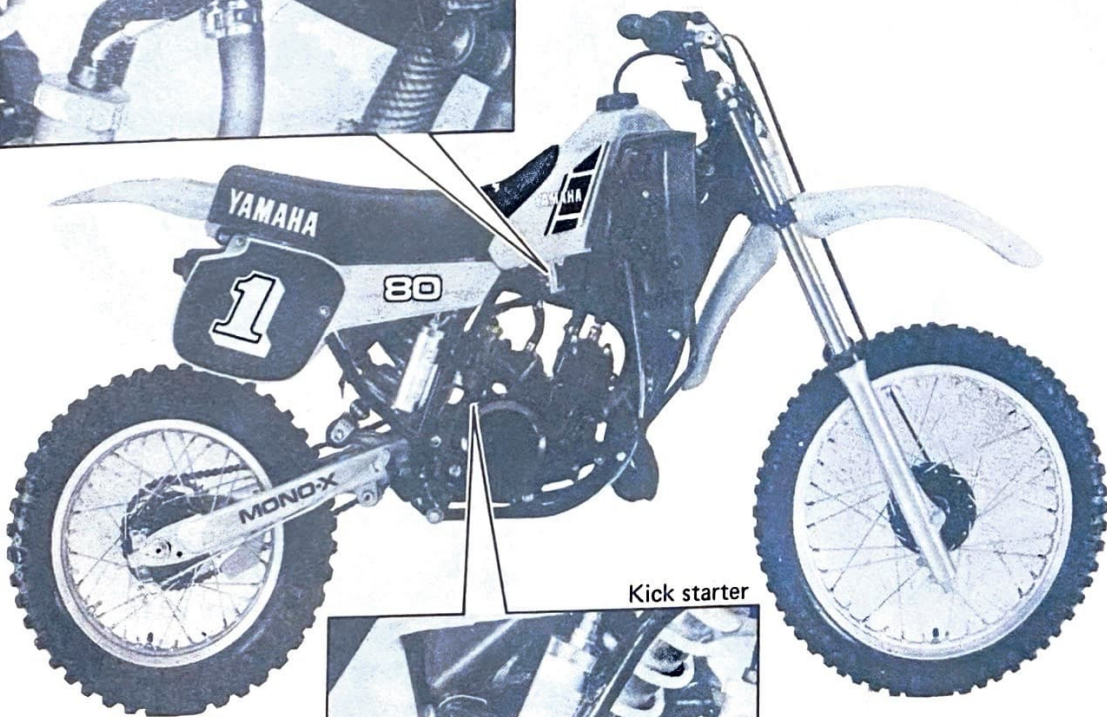
Engine stop switch

Fuel cock

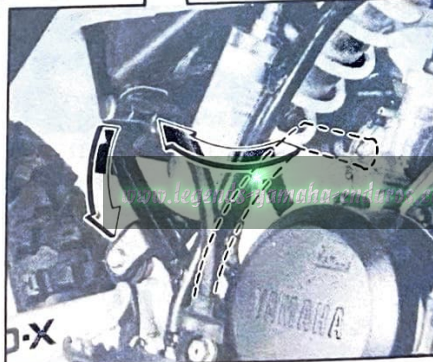


OFF

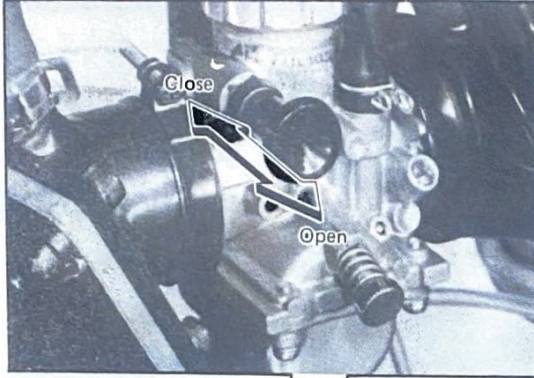
ON



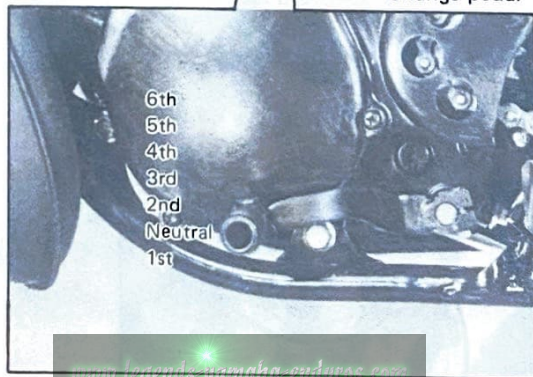
Kick starter



Starter knob



Change pedal



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FUEL, OIL AND COOLANT

Fuel

Recommended fuel:
Premium fuel with an octane rating of at least 90

Fuel tank capacity:
5.0 L (1.1 Imp gal, 1.3 US gal)

Engine mixing oil

Recommended oil:
Yamalube "R"
(Yamalube Racing 2-cycle oil)
Mixing ratio: 24 : 1

If for any reason you should use another type, select from the following list.

Mixing ratio: 20 : 1
* Castrol R30
* Castrol A545

CAUTION:

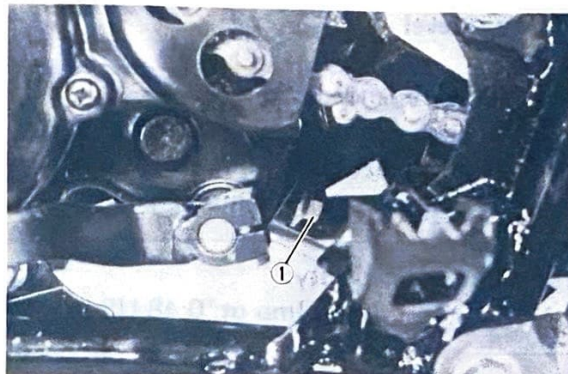
Never mix two types of oil in the same batch; clotting of the oil could result.

Transmission oil

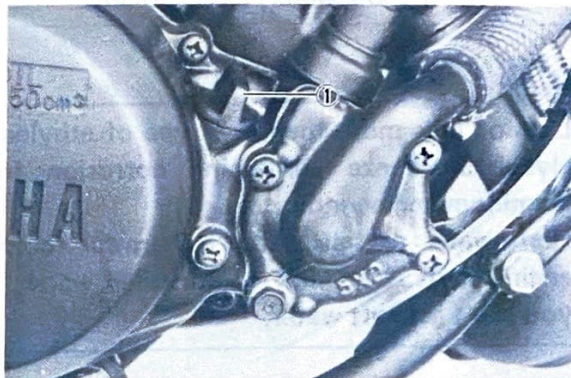
Recommended oil:
Yamalube 4-cycle oil or SAE 10W30 type SE motor oil

Transmission oil capacity:
Periodic oil change:
0.625 ~ 0.675 L
(0.55 Imp qt ~ 0.59 Imp qt,
0.66 US qt ~ 0.71 US qt)
Overhaul:
0.675 ~ 0.725 L
(0.59 Imp qt ~ 0.64 Imp qt,
0.91 US qt ~ 0.77 US qt)

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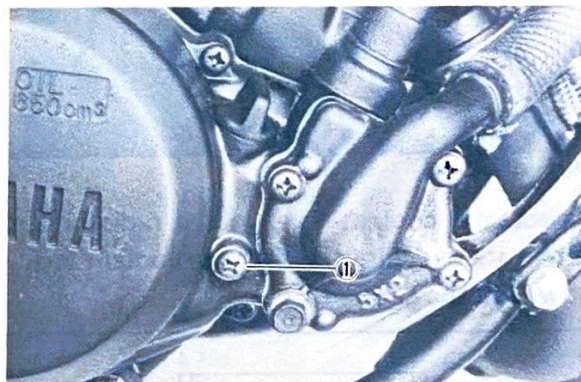
1. Drain plug



1. Filler plug

CHECKING OIL LEVEL

On the right side of the engine there is a checking screw. To check, warm up the engine for 1 minute. Stop engine. Leave the engine as it is for a few minutes and place the machine upright, then remove the oil level checking screw. If oil flows out, the oil level is correct.



1. Checking screw

Coolant level

Recommended coolant:

High quality ethylene glycol antifreeze containing corrosion inhibitors for aluminum engine

Coolant capacity:

0.45 L (0.40 Imp qt, 0.48 US qt)

Coolant and water mixed ratio:

1 : 1 (50% water, 50% coolant)

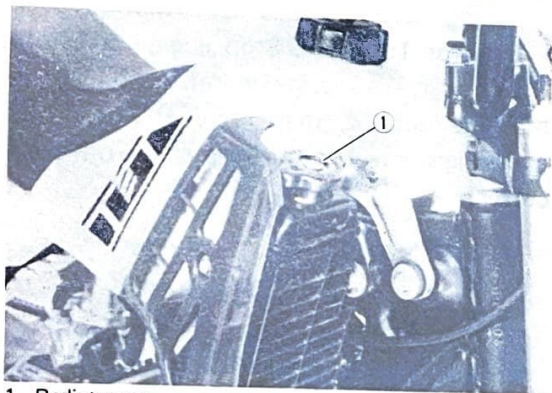
CAUTION:

Do not mix more than one type of ethylene glycol antifreeze containing corrosion inhibitors for aluminum engine.

Hard water or salt water is harmful to the engine parts. You may use distilled water, if you can't get soft water.

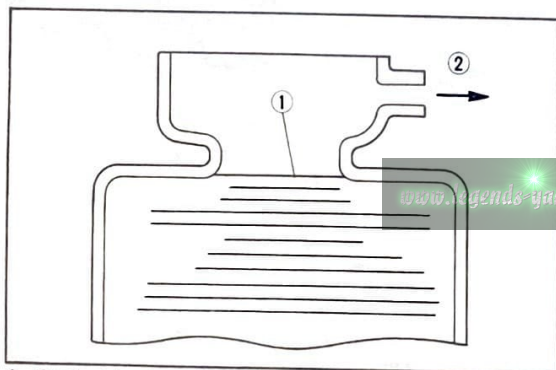
WARNING:

Do not remove the radiator cap when the engine and radiator are hot.



1. Radiator cap

Check the coolant level in the radiator tank when the engine is cold. If the coolant level is low, add the coolant.



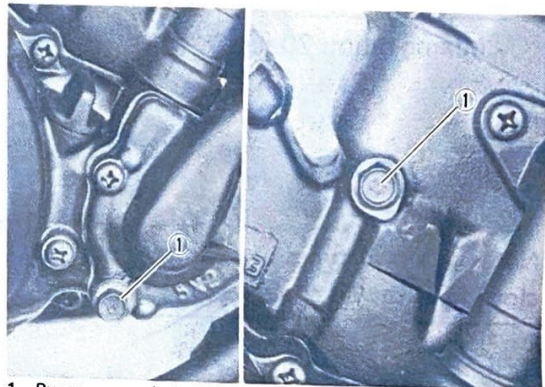
1. Coolant level 2. Breather pipe

Coolant draining

WARNING:

Do not remove the radiator cap, drain bolts and hoses when the engine and radiator are hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury. When the engine has cooled, place a thick towel over the radiator cap, slowly rotate the cap counterclockwise to the detent. This procedure allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning counterclockwise and remove it.

1. Place a container under the engine.
2. Remove the radiator tank cap.
3. Gently loosen the pump cover drain bolt to drain the coolant, and remove the cylinder drain bolt.



1. Pump cover drain bolt 1. Cylinder drain bolt

4. Drain the coolant completely. Thoroughly flush the cooling system with clean tap water.

CAUTION:

Take care so that coolant does not splash on painted surfaces. If it splashes, wash it away with water.

5. Retighten the drain bolts.
If the gasket is damaged, replace it.

Replenishing coolant

NOTE:

Before pouring the coolant into the radiator, check the cooling system for damage, loose joints or leaks.

1. Pour the recommended coolant into the radiator up to the specified level.
2. After starting the engine, race the engine a few times and add the coolant again up to the specified level.
3. When the coolant level becomes stable, stop the engine and tighten the radiator cap.

PREOPERATION CHECKS

Before riding for break-in operation, practice or a race, make sure the machine is in good operating condition.

INSPECTION AND MAINTENANCE

Cooling water

Check that water is filled up to the radiator filler cap.

Fuel

Check that a fresh mixture of oil and gasoline is filled in the fuel tank.

Gear oil

Check that the gear oil level is correct.

Gear shifter and clutch

Check that gears can be shifted correctly in order and that the clutch operates smoothly.

Brakes

Check the play of both front and rear brakes and their braking effect.

Chain

Check chain tension and alignment. Check that the chain is lubricated properly.

Wheels

Is the tire pressure correct?
Check for excessive wear. Check for loose spokes or wheel runout.

Steering

Check that the handlebars can be turned smoothly and have no excessive play.

Front forks and rear shock

Check that they operate smoothly and there is no oil leakage.

Cables (Wires)

Check that the clutch, brake and throttle cables move smoothly. Check that they are not caught when the handlebars are turned or when the front forks travel up and down.

Muffler

Check that the muffler is tightly mounted and it has no cracks.

Sprocket

Check that the rear wheel sprocket tightening bolt is not loose.

Bolts and nuts

Check the chassis and engine for loose bolts and nuts.

Fuel, oil and coolant

Check the fuel tank, fuel cock, carburetor, engine bottom, and cooling system for leakage.

Lead wire connectors

Check that the CDI magneto, CDI unit, and ignition coil are connected tightly.

Settings

Is the machine set suitably for the condition of the racing course and weather or by taking into account the results of test-runs before racing? Is inspection and maintenance completely done?

* The machine should be checked and serviced regularly so that only a simple, minor adjustment of settings is required prior to a race.

STARTING AND BREAK-IN

CAUTION:

Before starting the machine, perform the checks in the preoperation check list.

WARNING:

Never start or run the engine in a closed area. The exhaust fumes are poisonous; they can cause loss of consciousness and death in a very short time. Always operate the machine in a well-ventilated area.

Starting a cold engine

Shift the transmission into neutral. Turn on the fuel cock and raise the starter knob on the carburetor. With the throttle completely closed, kickstart the engine with a smooth, firm stroke. Using the starter knob as required, run the engine at idle or slightly higher until it warms up; this usually takes about one or two minutes. The engine is warmed up when it responds normally to the throttle with the starter knob pushed completely down.

CAUTION:

Do not warm up the engine for extended periods.

Starting a warm engine

Do not raise the starter knob. Open the throttle slightly and kickstart the engine with a smooth, firm stroke.

CAUTION:

Observe the following break-in procedures during initial operation to ensure optimum performance and avoid engine damage.

Break-in procedures

1. Before starting the engine, fill the fuel tank with a break-in oil-fuel mixture of 12 : 1 to 14 : 1.
2. Perform the preoperation checks on the machine.
3. Start and warm up the engine. Check the idle speed, and check the operation of the controls and the engine stop switch.
4. Operate the machine in the lower gears at moderate throttle openings for five to eight minutes. Stop and check the spark plug condition; it will show a rich condition during break-in.
5. Allow the engine to cool. Restart the engine and operate the machine as in the step above for five minutes. Then, very briefly shift to the higher gears and check full-throttle response. Stop and check the spark plug.
6. After again allowing the engine to cool, restart and run the machine for five more minutes.
Full throttle and the higher gears may be used, but sustained full-throttle operation should be avoided. Check the spark plug condition.
7. Allow the engine to cool, remove the top end, and inspect the piston and cylinder; instructions for this are on page 3-6. Remove any high spots on the piston with 600-grit, wet sandpaper. Clean all components and carefully reassemble the top end.
8. Drain the break-in oil-fuel mixture from the fuel tank and refill with the specified mix. Check the entire machine for loose screws, bolts, and nuts.
9. Restart the engine and check the operation of the machine throughout its entire operating range. Stop and check the spark plug condition. Restart the machine and operate it for about 10 to 15 more minutes. The machine will now be ready to race.

CAUTION:

1. After the break-in period is completed, check the entire machine for loose fittings and fasteners. Tighten all such fasteners as required.
2. When any of the following parts have been replaced, they must be broken in.
CYLINDER AND CRANKSHAFT:
About one hour of break-in operation is necessary.
PISTON, RINGS, GEARS:
These parts require about 30 minutes of break-in operation at half-throttle or
Observe the condition of the engine carefully during operation.

CLEANING AND STORAGE

Cleaning

Frequent cleaning of your machine will enhance its appearance, maintain good overall performance, and extend the life of many components.

1. Before washing the machine, block off the end of the exhaust pipe to prevent water from entering, and remove the drain rubber of air cleaner case. A plastic bag secured with a rubber band may be used for this purpose.
2. If the engine is excessively greasy, apply some degreaser to it with a paint brush. Do not apply degreaser to the chain, sprockets, or wheel axles.
3. Rinse the dirt and degreaser off with a garden hose; use only enough pressure to do the job.

CAUTION:

Excessive hose pressure can force water into wheel bearings, front fork seals, brake drums, and transmission seals. Avoid using high-pressure hoses such as those found in coin-operated car washes.

4. After the majority of the dirt has been hosed off, wash all surfaces with warm water and a mild detergent. Use an old toothbrush to clean hard-to-reach places.
5. Rinse the machine off immediately with clean water, and dry all surfaces with a soft towel or cloth.
6. Immediately after washing, remove excess water from the chain with a paper towel and lubricate the chain to prevent rust.
7. Clean the seat with vinyl upholstery cleaner to keep the cover pliable and glossy.
8. Automotive wax may be applied to all painted or chromed surfaces. Avoid combination cleaner-waxes, as they may contain abrasives.
9. After completing the above, start the engine and allow it to idle for several minutes.

Storage

If your machine is to be stored for 60 days or more, some preventive measures must be taken to avoid deterioration. After cleaning the machine thoroughly, prepare it for storage as follows:

1. Drain the fuel tank, fuel lines, and the carburetor float bowl.
2. Remove the spark plug, pour a tablespoon of SAE 10W30 motor oil in the spark plug hole, and reinstall the plug. With the engine stop switch pushed in, kick the engine over several times to coat the cylinder walls with oil.
3. Remove the drive chain, clean it thoroughly with solvent, and lubricate it. Reinstall the chain or store it in a plastic bag tied to the frame.
4. Lubricate all control cables.
5. Block the frame up to raise the wheels off the ground.
6. Tie a plastic bag over the exhaust pipe outlet to prevent moisture from entering.
7. If the machine is to be stored in a humid or salt-air environment, coat all exposed metal surfaces with a film of light oil. Do not apply oil to rubber parts or the seat cover.

NOTE: _____

Make any necessary repairs before the machine is stored.

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2 REGULAR MAINTENANCE AND ADJUSTMENT

MAINTENANCE INTERVALS

The following schedule is intended as a general guide to maintenance and lubrication. Bear in mind that such factors as weather, terrain, geographical location, and individual usage will alter the required maintenance and lubrication intervals. If you are in doubt as to what intervals to follow in maintaining and lubrication intervals. If you are a doubt as to what intervals to follow in maintaining and lubricating your machine, consult a Yamaha dealer.

Item	After break-in	Every race	Every third	Every fifth	As required	Remarks
PISTON:						
Inspect and clean	○	○				Inspect crack Remove carbon
Replace				○	○	
PISTON RING:						
Inspect	○	○				Check ring end gap
Replace			○		○	
PISTON PIN, SMALL END BEARING:						
Inspect				○		
Replace					○	
CYLINDER HEAD:						
Inspect and clean	○	○				Remove carbon
Retighten	○	○				
CYLINDER:						
Inspect and clean	○	○				Seizure wear
Replace					○	
CLUTCH:						
Inspect and adjust	○	○				Inspect friction plate, clutch plate and spring
Replace					○	
TRANSMISSION:						
Replace oil	○			○		Yamalube 4-cycle oil or SAE 10W30 type SE motor oil
Inspect transmission					○	
SHIFT CAM, FORK:						
Inspect					○	Inspect wear
ROTOR NUT:						
Retighten				○		
MUFFLER:						
Inspect	○	○				
Clean				○		
CRANK:						
Inspect and clean				○	○	
CARBURETOR:						
Inspect, adjust and clean	○	○				
Y.E.I.S.:						
Inspect		○				
SPARK PLUG:						
Inspect and clean	○	○				STD plug: N-2C Gap: 0.6 ~ 0.7 mm (0.024 ~ 0.028 in)
Replace					○	
DRIVE CHAIN:						
Lubricate, free play, alignment	○	○				Use chain lube Free play: 30 ~ 35 mm (1.18 ~ 1.38 in)
Replace					○	

Item	After break-in	Every race	Every third	Every fifth	As required	Remarks
COOLING SYSTEM:						
Check coolant level and leakage	○	○				
Check radiator cap operation					○	
Replace coolant					○	
Inspect hoses					○	
OUTSIDE NUTS AND BOLTS:						
Retighten	○	○				
AIR FILTER:						
Clean and oil	○	○				Use Foam air-filter oil
Replace					○	
FRAME:						
Clean and inspect	○	○				
FUEL TANK, COCK						
Clean and inspect	○		○			
BRAKES:						
Adjust free play	○	○				Lining wear limit: 2 mm (0.08 in)
Lubricate pivot point	○	○				
Replace linings					○	
FRONT FORKS:						
Inspect	○	○				Yamaha fork oil 10wt
Replace oil	○			○		
Replace oil seal					○	
REAR SHOCK:						
Inspect and adjust	○	○				Lithium base grease
Lube and retighten	○	○				
CHAIN GUARD AND ROLLES:						
Inspect and replace					○	
SWING ARM:						
Inspect and retighten	○	○				
RELAY ARM, TORQUE ARM:						
Inspect and lube	○	○				Lithium base grease
STEERING HEAD:						
Inspect free play and retighten	○	○				Medium weight wheel bearing grease
Clean and lube				○		
Replace bearing					○	
TIRE, WHEELS:						
Inspect air pressure, wheel run-out, tire wear and spoke looseness	○	○				Medium weight wheel bearing grease
Retighten sprocket bolt	○	○				
Inspect bearings			○			
Replace bearings					○	
Lubricate			○			
THROTTLE, CONTROL CABLE:						
Check routing and connection	○	○				Yamaha cable lube SAE 10W30 motor oil
Lubricate	○	○				
OUTSIDE NUTS AND BOLTS:						
Retighten	○	○				

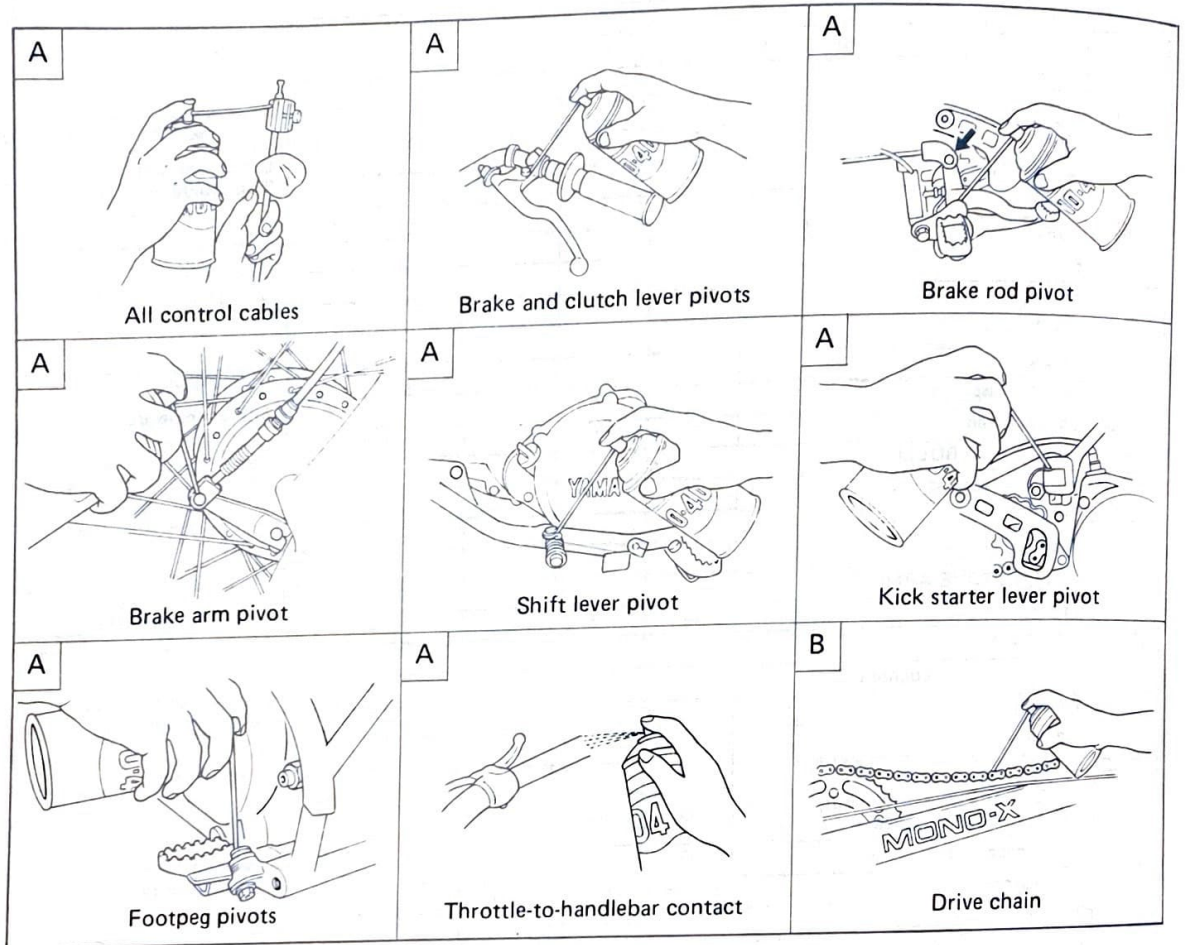
LUBRICATION

To ensure smooth operation of all components, lubricate your machine during setup, after break-in, and after every race.

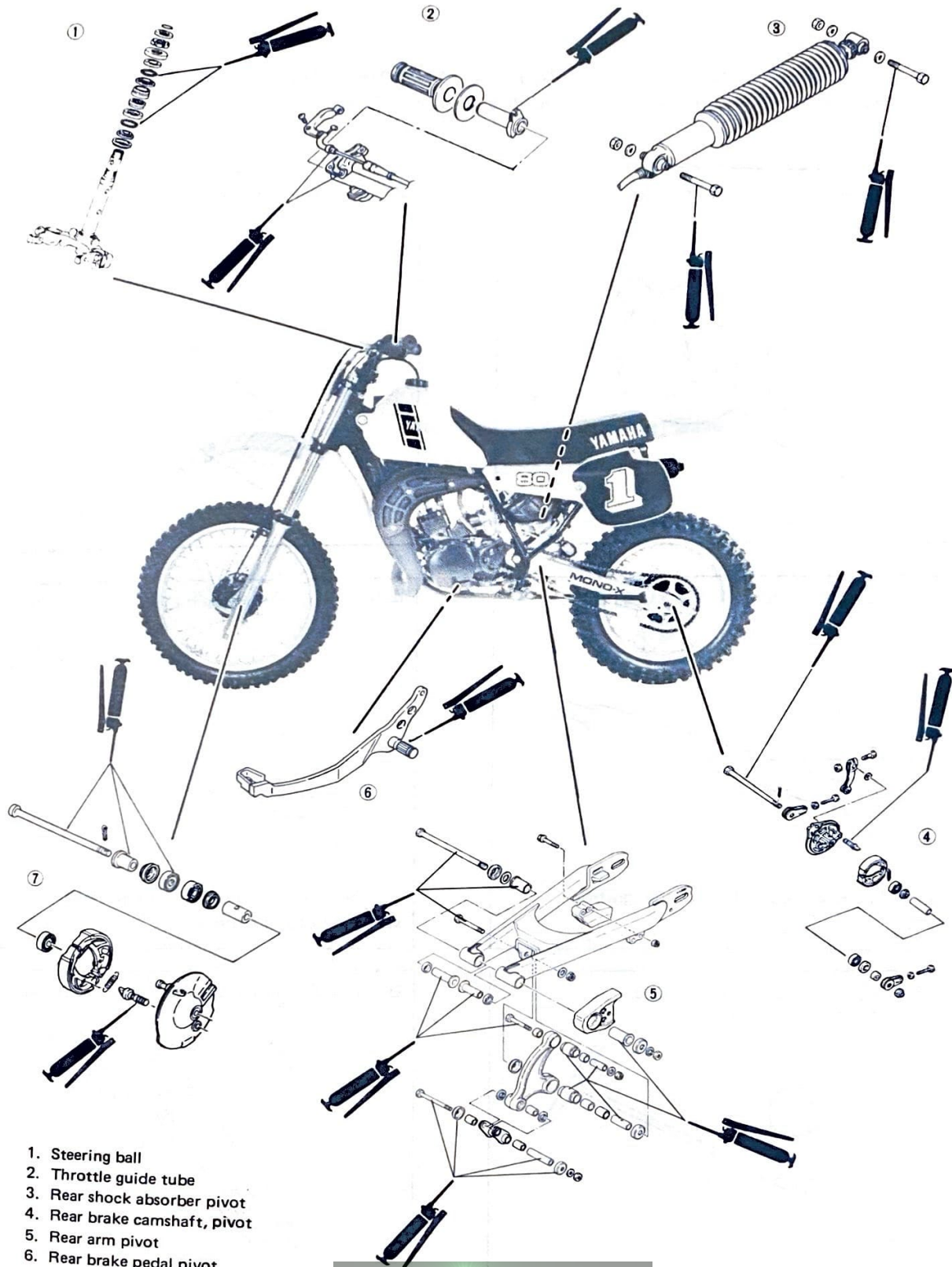
Before lubricate, thoroughly clean the machine of sand, dirt and water.

A. Use Yamaha cable lube or WD-40 on these areas.

B. Use racing chain lube.



B. Lubricate the following areas with high-quality, lithium base grease:



1. Steering ball
2. Throttle guide tube
3. Rear shock absorber pivot
4. Rear brake camshaft, pivot
5. Rear arm pivot
6. Rear brake pedal pivot
7. Front brake camshaft, pivot

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CAUTION:

Wipe off any excess grease, and avoid getting grease on the brake shoes.

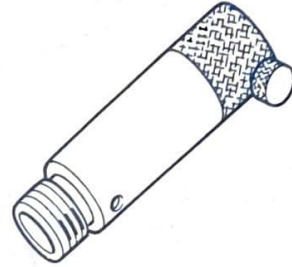
SPECIAL TOOLS

The following special tools are required to perform maintenance, adjustments, and repairs on your machine. These tools can be obtained through a Yamaha dealer.

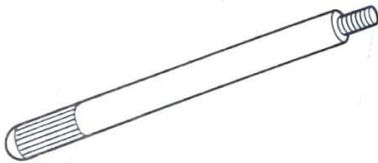
1 Dial gauge (T/No. YU-03097)



2 Dial gauge stand (T/No. YU-01256-1)

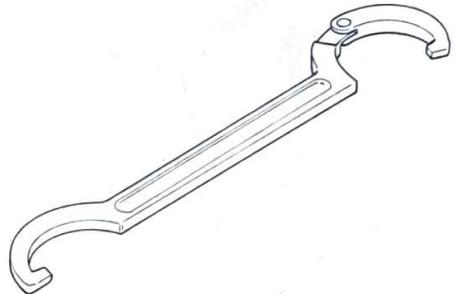


3 Dial gauge extension (T/No. YU-01256-2)



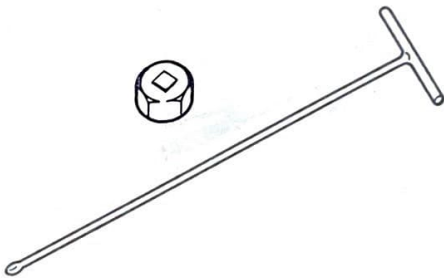
Tools 1, 2, and 3 are used to set the ignition timing.

4 Steering nut wrench (T/No. YU-01268)



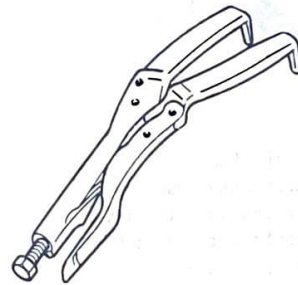
Use this wrench to put the proper tension on the steering head bearings.

5 Fork cylinder holder and adapter (YM-01326, YM-33256)



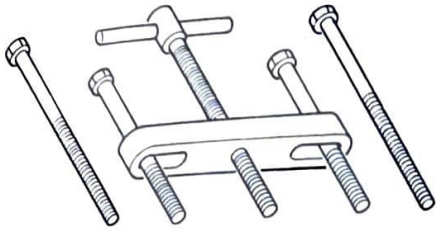
Use these tools to remove and install the [yamaha-enthusiasts.com](http://www.yamaha-enthusiasts.com) fork cylinder.

6 Clutch holding tool (T/No. YM-91042)



Use this tool to hold the clutch boss while removing or tightening the clutch boss nut.

7 Crankcase separating tool (T/No. YU-01135)



This tool is used to split the crankcases as well as remove the crankshaft from either case.

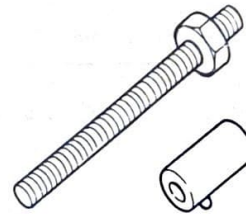
8 Crankshaft installing pot (YU-90058)



9 Pot spacer (YU-90059)



10 Crankshaft installing bolt and adapter (Y/No. YU-90060, YU-90062)



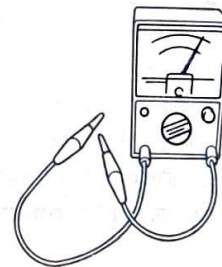
Tools 8, 9, and 10 are used to install the crankshaft.

11 Rotor puller (T/No. YM-55500)



This tool is used to remove the magneto.

12 Poscket tester (YU-03112)



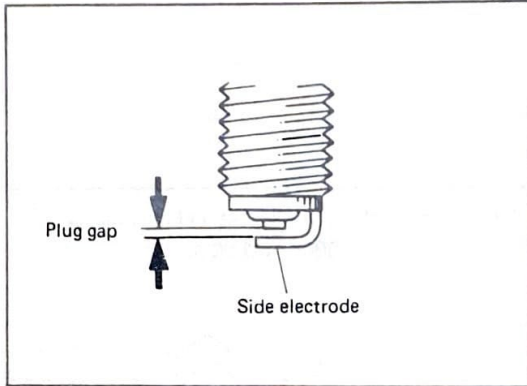
Use this tool to measure the coil resistance, output voltage and amperage.

MINOR MAINTENANCE AND ADJUSTMENTS

Spark plug

Standard spark plug:
N-84 (CHAMPION)

Spark plug gap:
0.5 ~ 0.6 mm (0.020 ~ 0.024 in)



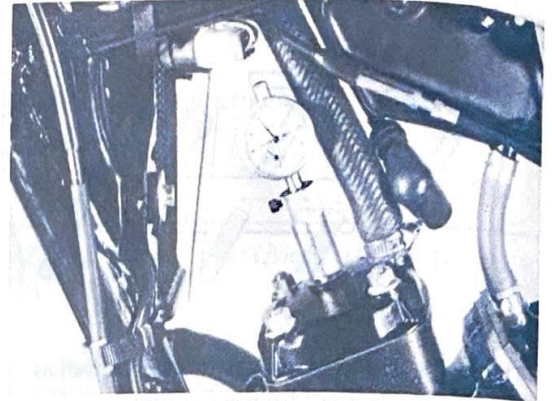
1. Whenever a new spark plug is installed, the gap must be checked and adjusted properly. Use a wire feeler gauge to check the gap, and adjust the gap by bending the side electrode gently.
2. Be sure to clean the gasket surface and threads before installing the spark plug. Torque the plug to specification.

Spark plug torque:
25 Nm (2.5 m·kg, 18 ft·lb)

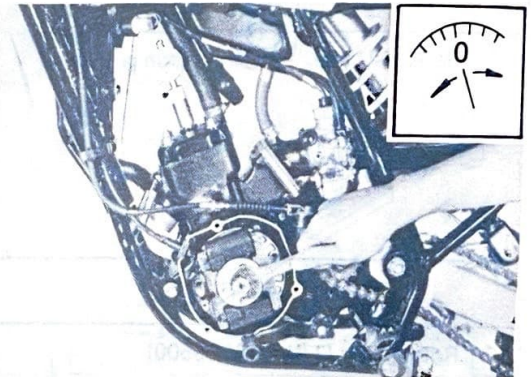
Ignition timing

The ignition timing must be set precisely to ensure that the ignition spark occurs at the proper time to provide optimum engine power.

1. Remove the spark plug, expansion chamber, and the left-hand crankcase cover.
2. Screw the dial gauge stand into the spark plug hole.
3. Install the extension on the dial gauge, and slide the dial gauge assembly into the dial gauge stand.

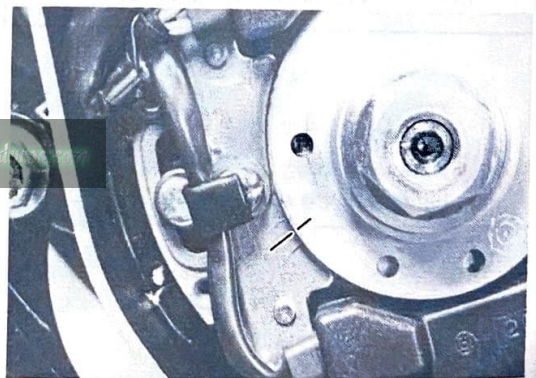


4. Rotate the magneto rotor until the piston reaches top dead center (TDC). When this happens, the needle on the dial gauge will stop and reverse directions even though the rotor is being turned in the same direction. Zero the dial gauge at TDC.

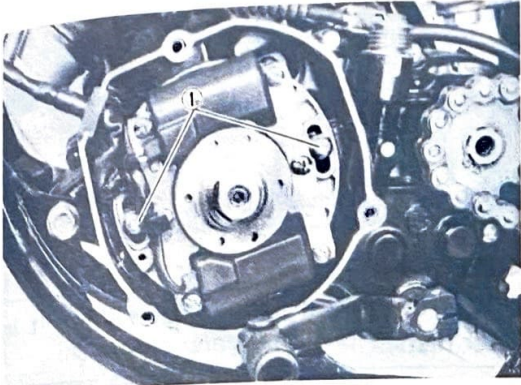


5. From TDC, rotate the rotor clockwise until the dial gauge indicates that the piston is at a specified distance from TDC. At this point, the scribed marks on the rotor and the startor plate should be aligned.

Ignition timing: B.T.D.C.
0.8 ± 0.15 mm (0.031 ± 0.006 in)



- If the marks are not aligned, loosen the two stator retaining screws and rotate the stator until the marks line up. Tighten the screws and recheck the timing marks.



1. Retaining screws

- Remove the dial gauge assembly and stand, and reinstall the spark plug. Torque the plug to specification.

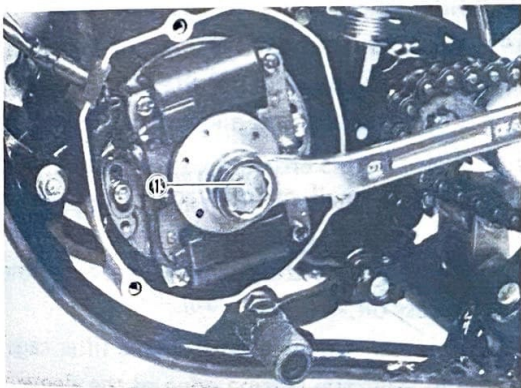
Spark plug torque:
25 Nm (2.5 m·kg, 18 ft·lb)

- Reinstall the left-hand crankcase cover and the expansion chamber.

Rotor removal

When removing the rotor, use the rotor puller.

- Remove the rotor holding nut.
- Install the rotor puller and tighten it.

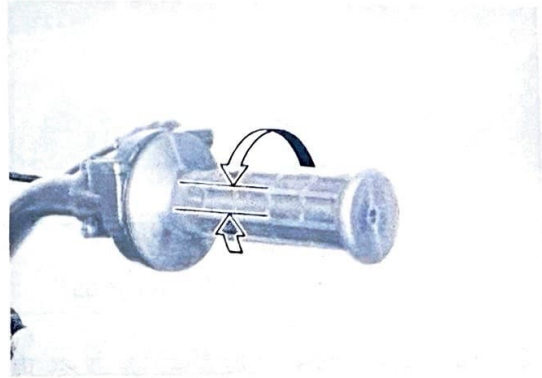


1. Rotor puller (YM-55500)

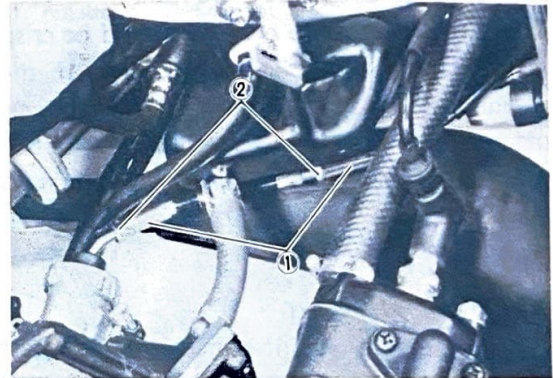
Tightening torque:
35 Nm (3.5 m·kg, 25 ft·lb)

Throttle cable

- Check the free play in the throttle twist grip; the play should be 3 ~ 5 mm (0.12 ~ 0.20 in) at the edge of the inner flange of the grip.



- To adjust the free play, loosen the lock nut on the cable adjuster and turn the adjuster in or out to achieve the proper free play. Retighten the lock nut.



1. Adjuster 2. Lock nut

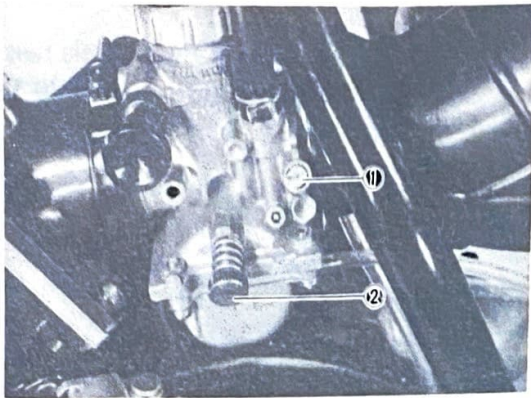
- After adjustment, start the engine and check throttle operation. Turn the handlebars from lock to lock and note if the engine speeds up; if it does, the cable adjustment is too tight and must be re-adjusted.

Idle speed

- Screw in the pilot air screw until it is lightly seated.
- Back out by the specified number of turns. Start the engine and let it warm

up.

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1. Pilot air screw 2. Throttle stop screw

Pilot air screw setting:
1 and 1/2 turns out

3. Turn the screw until the idle is at the desired rpm.
4. Turn the pilot air screw in or out in 1/8-turn increments to achieve the highest rpm with just the pilot screw.
5. Once again, turn the throttle stop screw to attain the desired idle rpm.

The throttle response off idle should be crisp and clean, without any hesitation. If the engine is completely warmed up and hesitates off idle, turn the pilot air screw in or out in 1/8-turn increments until the problem is eliminated.

Air filter

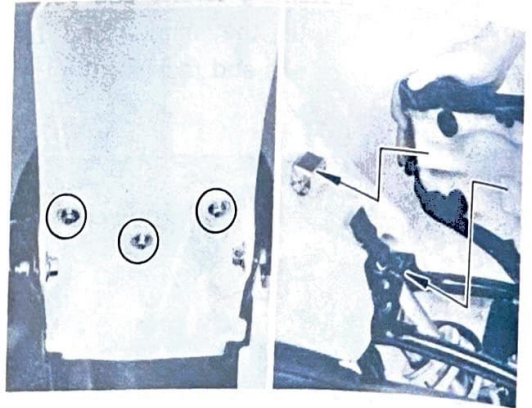
Proper air filter maintenance is the biggest key to preventing premature engine wear and damage. All elements of the air filter system should be maintained after every moto; engine life will be prolonged and power output will remain consistent.

CAUTION:

Never run the engine without the air filter elements in place; this would allow dirt and dust to enter the engine and cause rapid wear and possible engine damage. In addition, carburetor jetting would be significantly affected, with subsequent poor performance and possible overheating.

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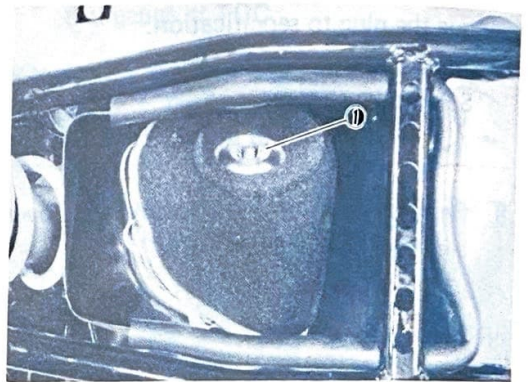
1. Remove the seat from the machine.



NOTE:

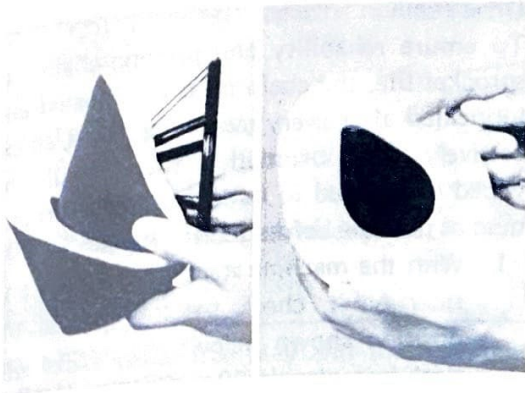
If it is dirty with muddy water, wash it in water first.

2. Remove the wing nut and remove the air filter elements.



1. Wing nut

3. Separate the two elements from the filter cage.
4. Wash both elements gently but thoroughly in solvent, squeeze the solvent out of the elements, and allow the elements to dry.
5. Pour a small quantity of foam-air-filter oil on the elements and work it thoroughly into the foam. Squeeze out the excess oil.
6. Reinstall the elements on the filter cage, and coat the sealing edge of the element assembly with light grease to provide an airtight seal.



7. After checking the air inlet hose for any obstructions, carefully reinstall the element assembly in the air filter box. Reinstall the wing nuts and tighten them.

CAUTION:

Do not overtighten the wing nut to avoid distorting the filter element cage.

8. Inspect the air filter joint and intake manifold rubber for tears and cracks. Replace them if any damage is found.

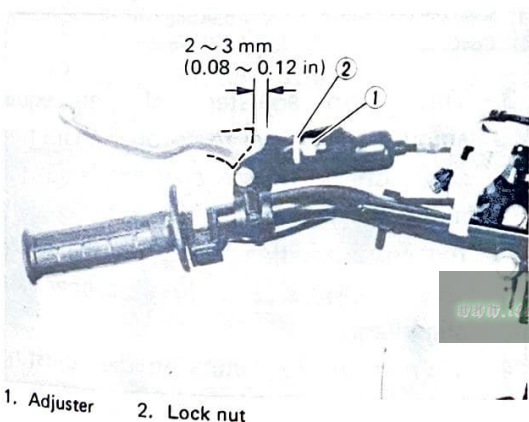
NOTE:

Each time filter element is service check inside air box for any signs of dirt or dust.

Clutch

To avoid clutch slipping or dragging, the clutch mechanism and cable must be adjusted correctly.

1. Adjust the cable adjuster at the handle lever to provide 2 ~ 3 mm (0.08 ~ 0.12 in) of free play at the clutch lever pivot; tighten the lock nut.

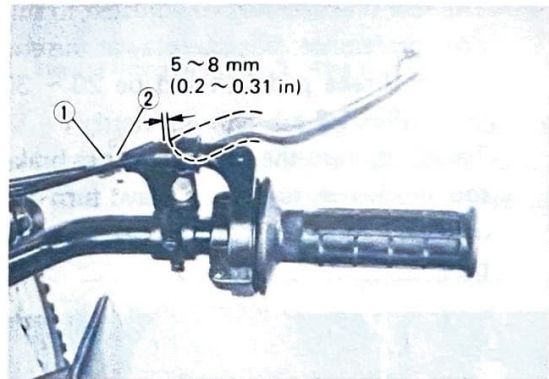


1. Adjuster 2. Lock nut

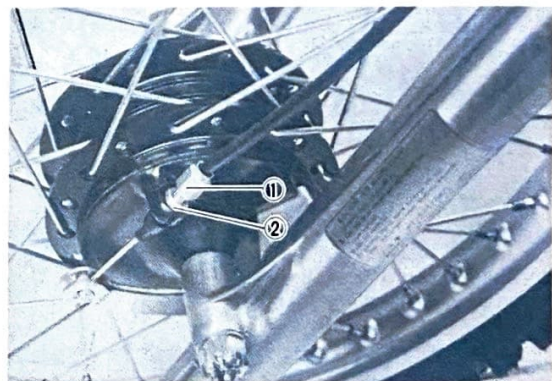
Front brake

The front brake can be adjusted to suit rider preference within a 5 ~ 8 mm (0.2 ~ 0.32 in) free play at the brake lever pivot.

1. Make sure the cable adjuster at the handle lever is screwed all the way in.
2. Loosen the lock nut on the cable adjuster at the brake backing plate, and turn the adjuster in or out to achieve 5 ~ 8 mm (0.2 ~ 0.31 in) of free play at the brake lever pivot. Tighten the lock nut.



1. Adjuster 2. Lock nut



1. Adjuster 2. Lock nut

3. At the handle lever, turn the adjuster out to achieve the desired free play within the specified range. Tighten the lock nut.

Rear brake

WARNING:

For the brake pedal position adjustment, be sure to proceed as follows; (It is advisable to have a Yamaha dealer.)

1. Pedal height:
 - a. Loosen the adjuster lock nut (for pedal height).

- b. By turning the adjuster clockwise or counterclockwise, adjust the brake pedal position so that its top end is flush with the top of the footrest.
- c. Secure the adjuster lock nut.

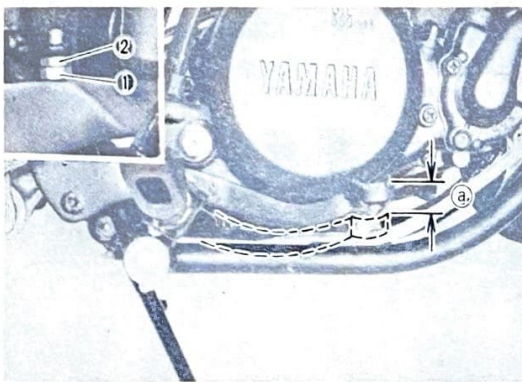
WARNING:

After adjusting the pedal height, the brake pedal free play should be adjusted.

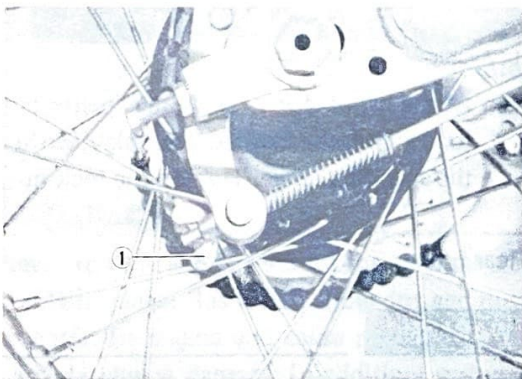
2. Free play

The rear brake should be adjusted to suit rider preference, but free play at the end off the brake pedal should be 20 ~ 30 mm (0.8 ~ 1.2 in).

To adjust, turn the adjuster on the brake rod clockwise to reduce play; turn the adjuster counterclockwise to increase play.



1. Adjuster bolt (For pedal height) 2. Lock nut
a. 20 ~ 30 mm (0.8 ~ 1.2 in)



1. Adjuster

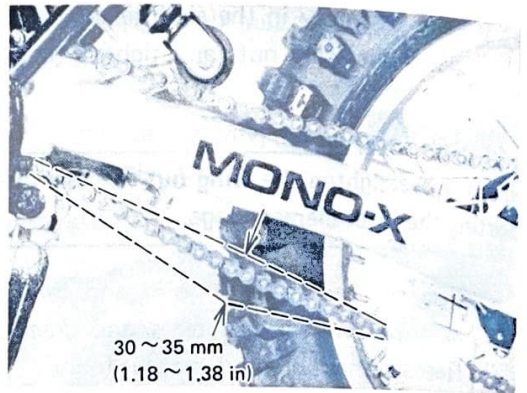
WARNING:

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

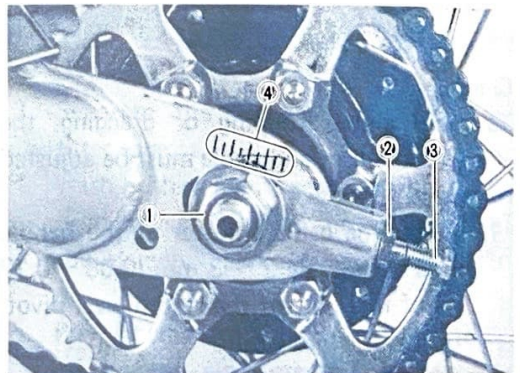
Drive chain

To ensure reliability and prolong chain and sprocket life, the chain must be adjusted and lubricated after every race. In addition, an excessively dirty or muddy chain should be wiped or brushed to remove as much dirt and mud as possible before lubricating.

1. With the machine standing vertically and rider on it, check the free play at the position shown below; the normal vertical free play is 30 ~ 35 mm (1.18 ~ 1.38 in). If the free play exceeds 35 mm (1.38 in), the chain must be adjusted.



2. Loosen the axle securing nut, and loosen both lock nuts on the chain adjuster bolts.



1. Axle securing nut 3. Adjusting bolt
2. Lock nut 4. Adjust mark

3. Turn both adjuster bolts an equal amount to achieve the proper chain free play. Check to see that the adjusting marks on both chain adjusters align with the corresponding marks on the swing arm on each side to ensure proper axle alignment.
4. Tighten the lock nuts on the adjusting bolts.

5. Tighten the axle securing nut to specification.

Tightening torque:
85 Nm (8.5 m·kg, 61 ft·lb)

6. Check the brake pedal free play.

CAUTION:

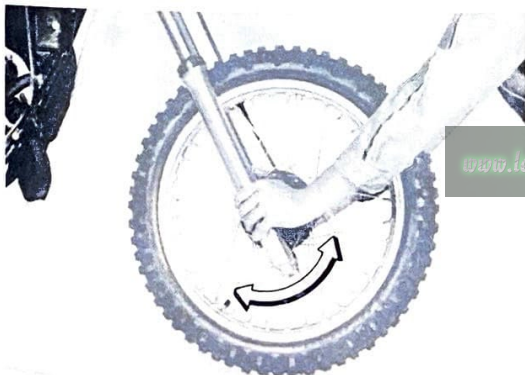
The brake pedal free play and the rear axle alignment must always be checked after the chain is adjusted or the rear wheel is removed.

7. After removing any excessive dirt or mud, spray chain lube between both rows of sideplates and on the chain rollers.
8. To clean the chain thoroughly, remove the chain from the machine, place it in solvent, and brush off as much dirt as possible. Then remove the chain from the solvent, dry the chain, and lubricate it immediately to prevent rust. Reinstall the chain on the machine and adjust it.

* For the maintenance of the sprocket and chain, refer to 4-3.

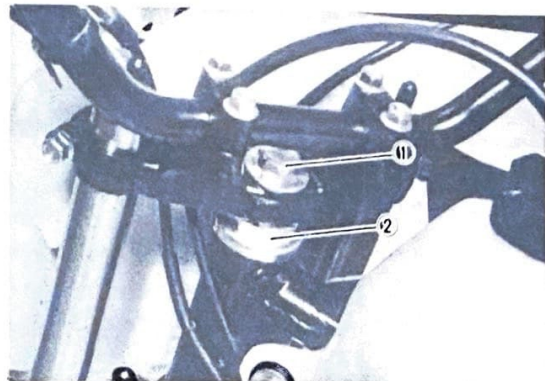
Steering head

1. Block the front wheel off the ground, grab the bottom of the fork legs, and gently push and pull the legs to check for free play in the steering head. If there is any noticeable play in the steering head, the bearings must be adjusted. In addition, check to see that the forks swing from lock to lock without any binding or catching. If any such binding is noticed, the bearings should be cleaned, inspected, and readjusted after thorough greasing.



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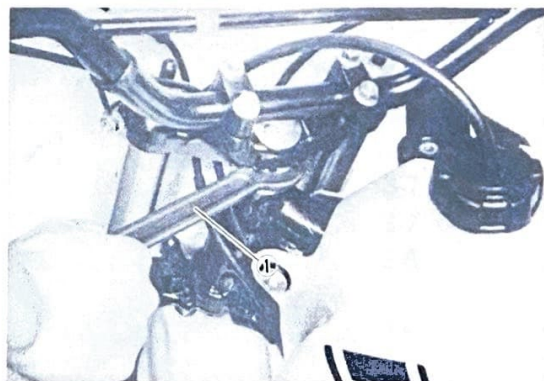
2. To adjust the bearings, first loosen the steering fitting bolt.



1. Steering fitting bolt 2. Ring nut

3. Tighten the ring nut beneath the handle crown with the steering nut wrench until the free play is eliminated and there is no binding.

Tightening torque:
10 Nm (1.0 m·kg, 7.2 ft·lb)



1. Steering nut wrench (YU-01268)

4. Torque the steering fitting bolt to specification.

Fitting bolt torque:
60 Nm (6.0 m·kg, 43 ft·lb)

CAUTION:

After a short running period, check steering head for proper adjustment.

3 ENGINE MAINTENANCE AND REPAIR

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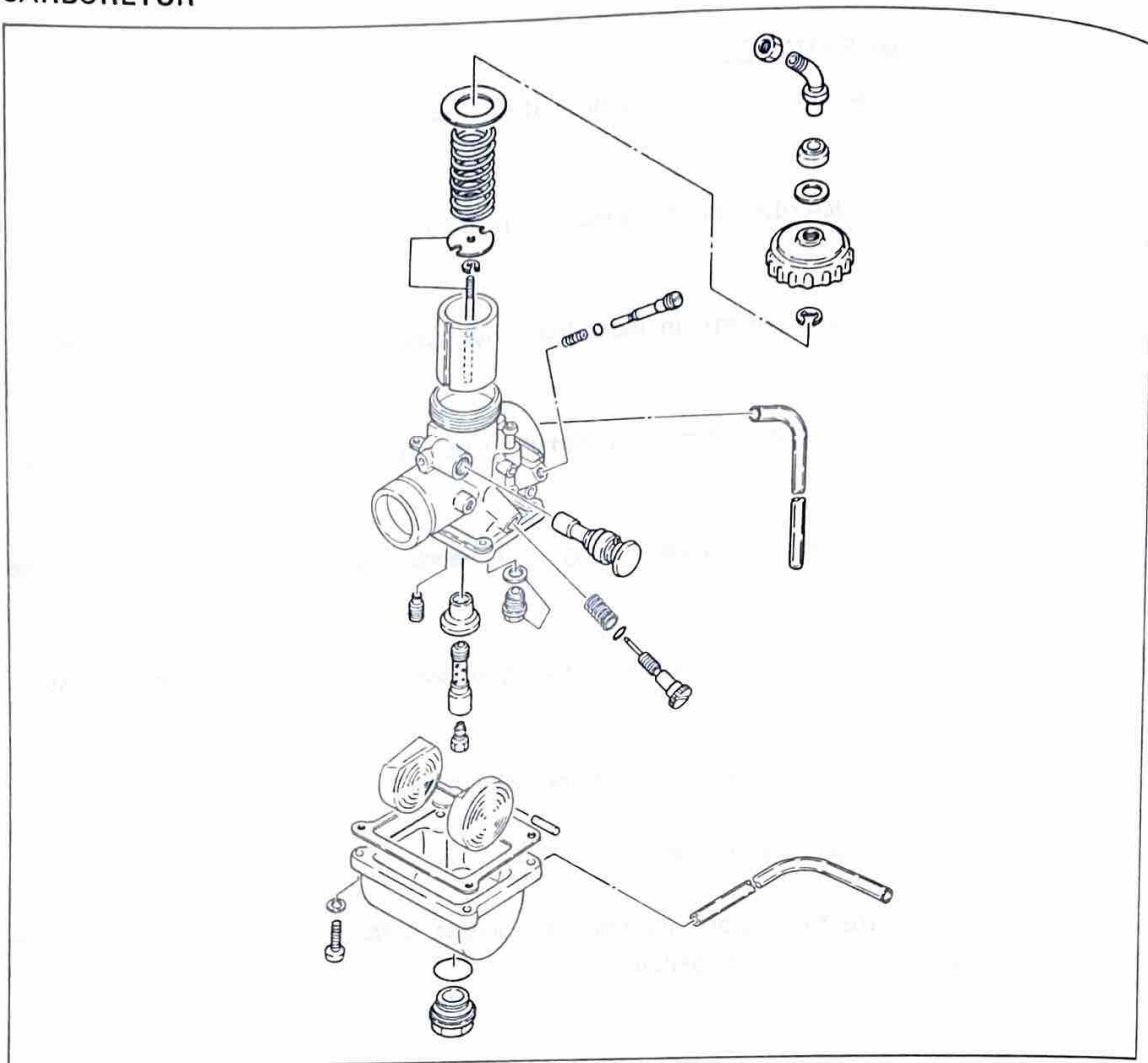
PREPARATION FOR SERVICE

Prior to beginning any work on the engine, take note of the following bits of advice; they will greatly facilitate your engine maintenance and repair:

- Clean your machine as described in the General Information section entitled, "Cleaning and Storage";
- Group the parts of each component on individual trays, and arrange the parts in the order of their removal;
- When replacing parts, always use the genuine Yamaha article to maintain optimum performance, durability, and safety;
- All gaskets and seals should be replaced during engine work, and all gasket surfaces should be clean;
- During assembly, always apply oil or grease to bearing surfaces to protect them upon initial start-up;
- Replace all circlips which are distorted from use or disassembly;
- Always replace cotter pins and piston pin clips after one use;
- Always clean and oil the threads of nuts, bolts, and screws during assembly, and torque them to the proper specifications whenever possible.

DISASSEMBLY, INSPECTION AND ASSEMBLY

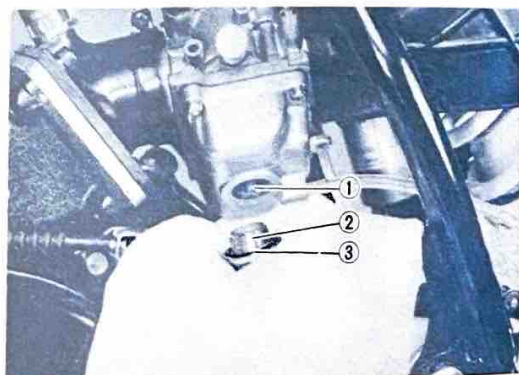
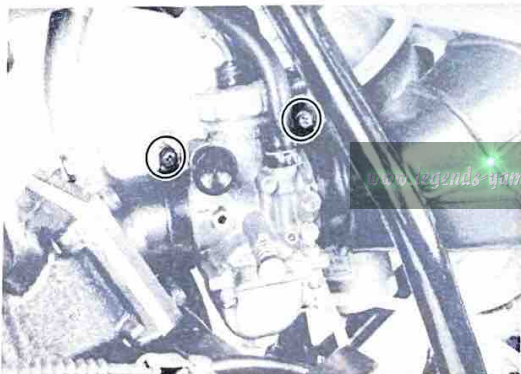
CARBURETOR



Main jet replacement

NOTE: _____

It is not necessary to remove the carburetor to replace the main jet: Loosen the hose clamps on the manifold and air cleaner joint, rotate the carb, and remove the main jet cover bolt from the float bowl. The main jet can thereby be removed and replaced.



1. Main jet 2. Cover bolt 3. O-ring

Standard main jet size: #250

WARNING:

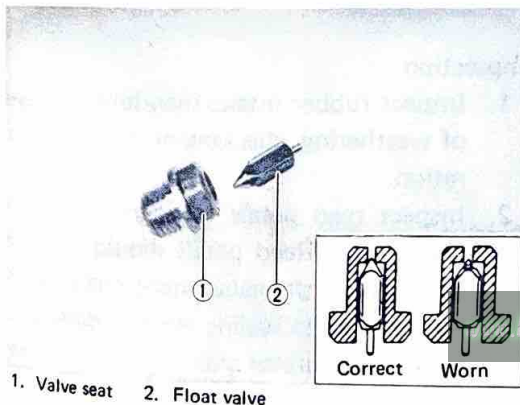
When the main jet cover bolt is removed, the fuel in the float bowl will drain. Do not remove the bolt when the engine is hot. Place a rag under the carb when removing the bolt to catch the fuel. Remove the bolt in a well-ventilated area, away from any open flame. Always clean and dry the machine after completing main jet changes.

IMPORTANT:

The carburetor has been set for operation at or near sea level; in most instances, it will not require changes. Some conditions, however, do demand carb setting changes to maintain performance. If this is the case, make the changes in small increments and check the results with a spark plug check. Improper settings can lead to poor performance or possible engine damage. If you are in doubt as to what setting changes to make, consult a Yamaha dealer.

Inspection

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

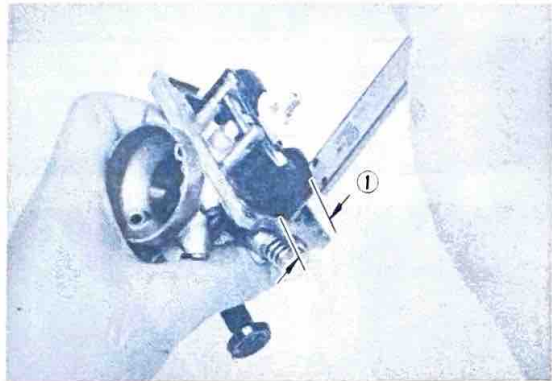


Float height

1. Hold the carburetor in an upside down position. Incline the carburetor at $60^\circ \sim 70^\circ$ (so that the end of the float valve does not hang down of float weight), and measure the distance from the mating surface of the float chamber (gasket removed) to the top of the float using a gauge.

Float height:

21.0 ± 1.0 mm (0.83 ± 0.04 in)
Level with carburetor base

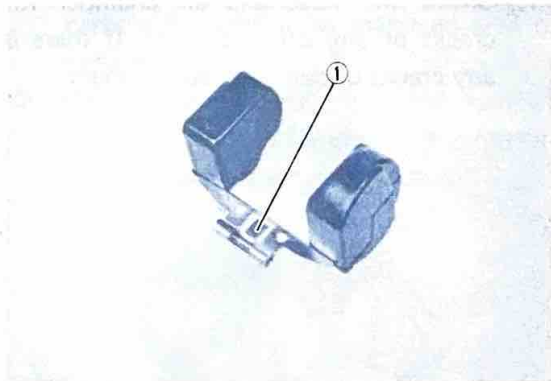


1. Float height

CAUTION:

Check the float valve and valve seat for wear before adjustment.

2. Make the adjustment by bending the tang on the float arm.



1. Tang

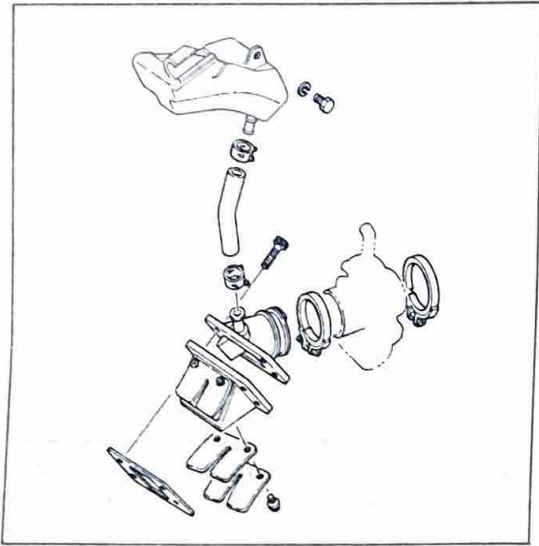
YAMAHA ENERGY INDUCTION SYSTEM (Y.E.I.S.)

CAUTION:

Never attempt to modify the Yamaha Energy Induction System.

The air chamber and hose should be handled with special care.

Any imperfect connection or installation of these parts or damaged parts will have an adverse effect on the performance of the system. Check parts, and be sure to replace any defective one.

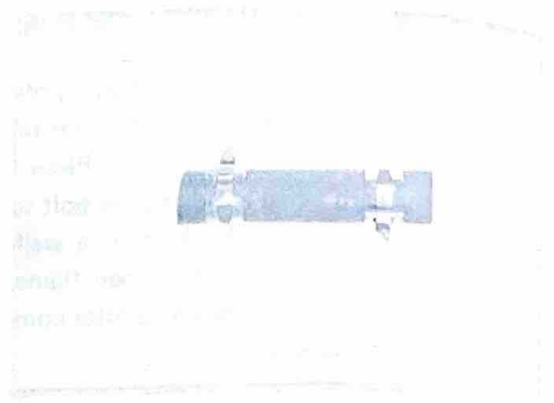


Inspection

1. Check the hose and air chamber for cracks or any other damage. If there is any cracks or damage, replace them.



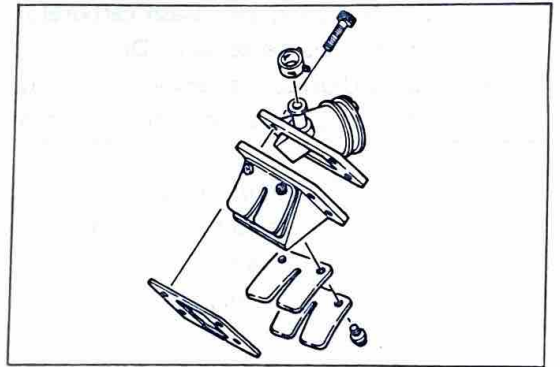
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2. Check the tightness of hose clip, and re-tighten as required.



REED VALVE



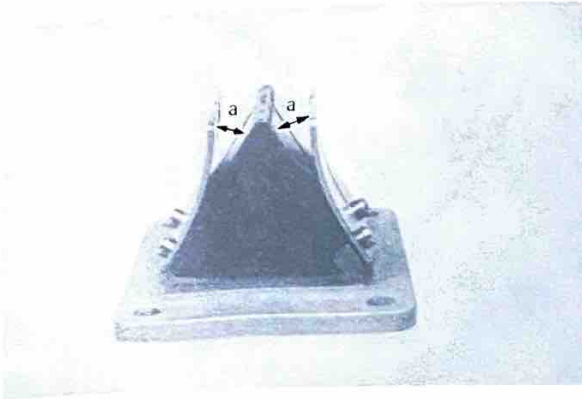
Inspection

1. Inspect rubber intake manifold for signs of weathering, checking or other deterioration.
2. Inspect reed petals for signs of fatigue and cracks. Reed petals should fit flush or nearly flush against neoprene seats. If in doubt as to sealing ability, apply suction to carburetor side of assembly. Leakage should be slight to moderate.

3. The valve stopper controls the movement of the valve. Check clearance "a".

Standard valve "a": 10.3 mm (0.41 in)

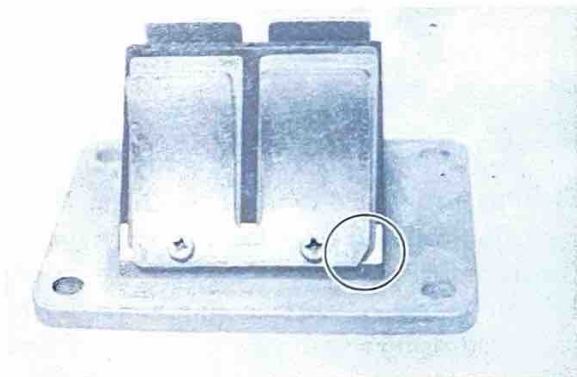
If it is 0.5 mm (0.02 in) more or less than specified, replace the valve stopper.



4. Check reed valve for bending. If beyond tolerance, replace reed valve.

Reed valve bending limit:
0.3 mm (0.012 in)

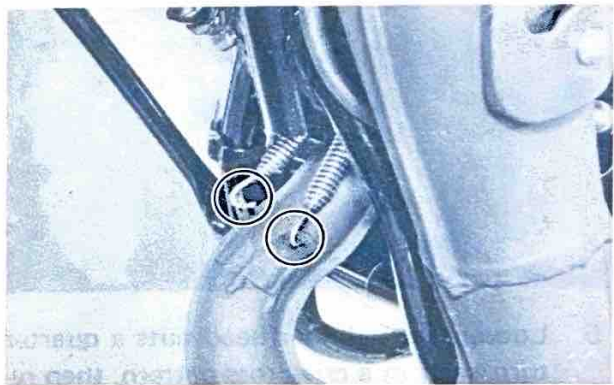
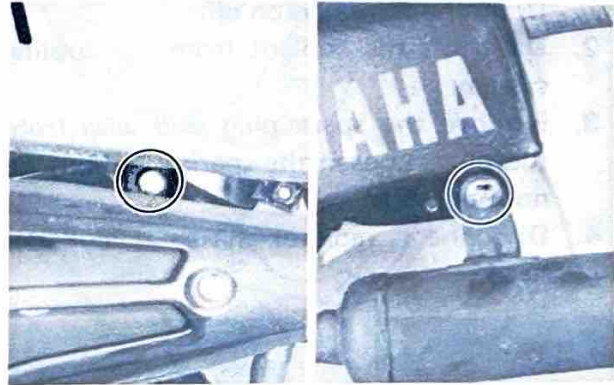
5. During reassembly, note the cut in the lower corner of the reed and stopper plate.



MUFFLER

Removal

1. Remove the panhead screws and remove side cover.
2. Remove muffler mounting bolts.
3. Remove coil springs at muffler to cylinder joint and remove muffler.



Maintenance

1. Using a rounded scraper, remove excess carbon deposits from manifold area of exhaust pipe.
2. Check the exhaust pipe and muffler mounting bracket for cracks. If it has excessive cracks repair or replace it.

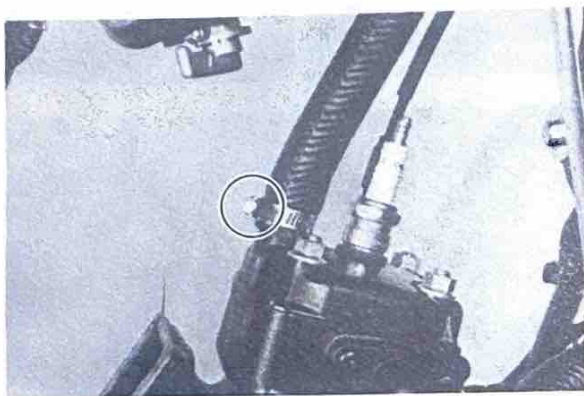
CYLINDER HEAD

Removal

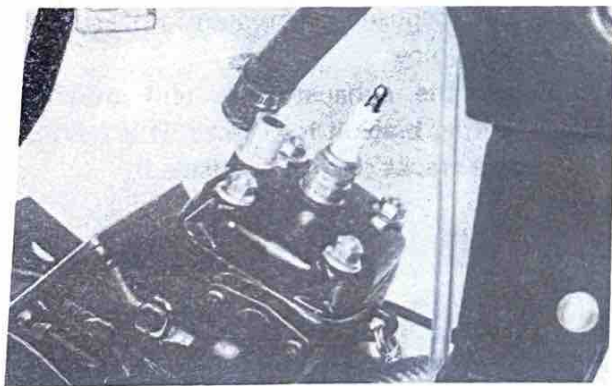
NOTE:

Before servicing the engine (disassembling of the cylinder head, cylinder, and clutch), thoroughly drain the coolant.

1. Place the machine on machine stand. Drain the transmission oil.
2. Drain off the coolant from the cooling system.
3. Remove the spark plug lead wire from the plug. Loosen the spark plug, but do not remove it.
4. Disconnect radiator hose at cylinder head.



5. Loosen the cylinder head nuts a quarter turn each in a crisscross pattern, then remove the cylinder head nuts in the same pattern. Remove the cylinder head.



Cylinder head nut:

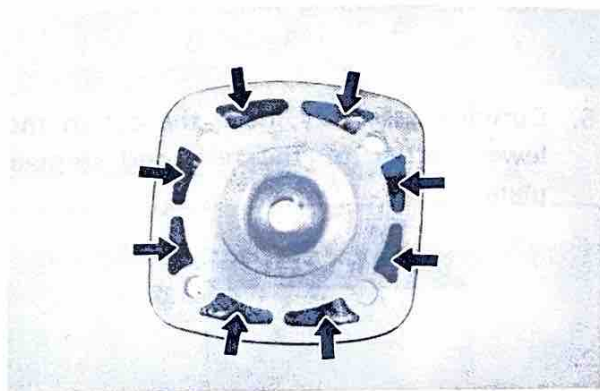
25 Nm (2.5 m·kg, 18 ft·lb)

Maintenance

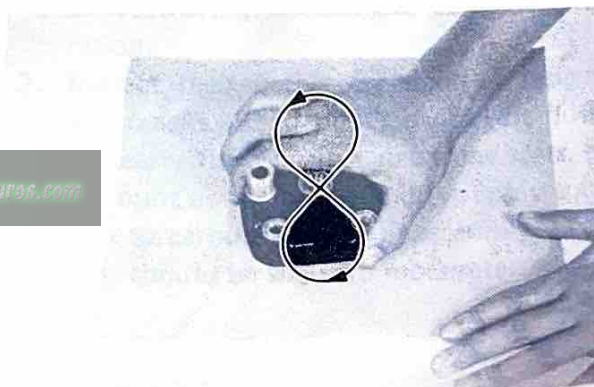
1. Using a rounded scraper, remove carbon deposits from combustion chamber. Take care to avoid damaging the spark plug threads. Do not use a sharp instrument. Avoid scratching the metal surface.

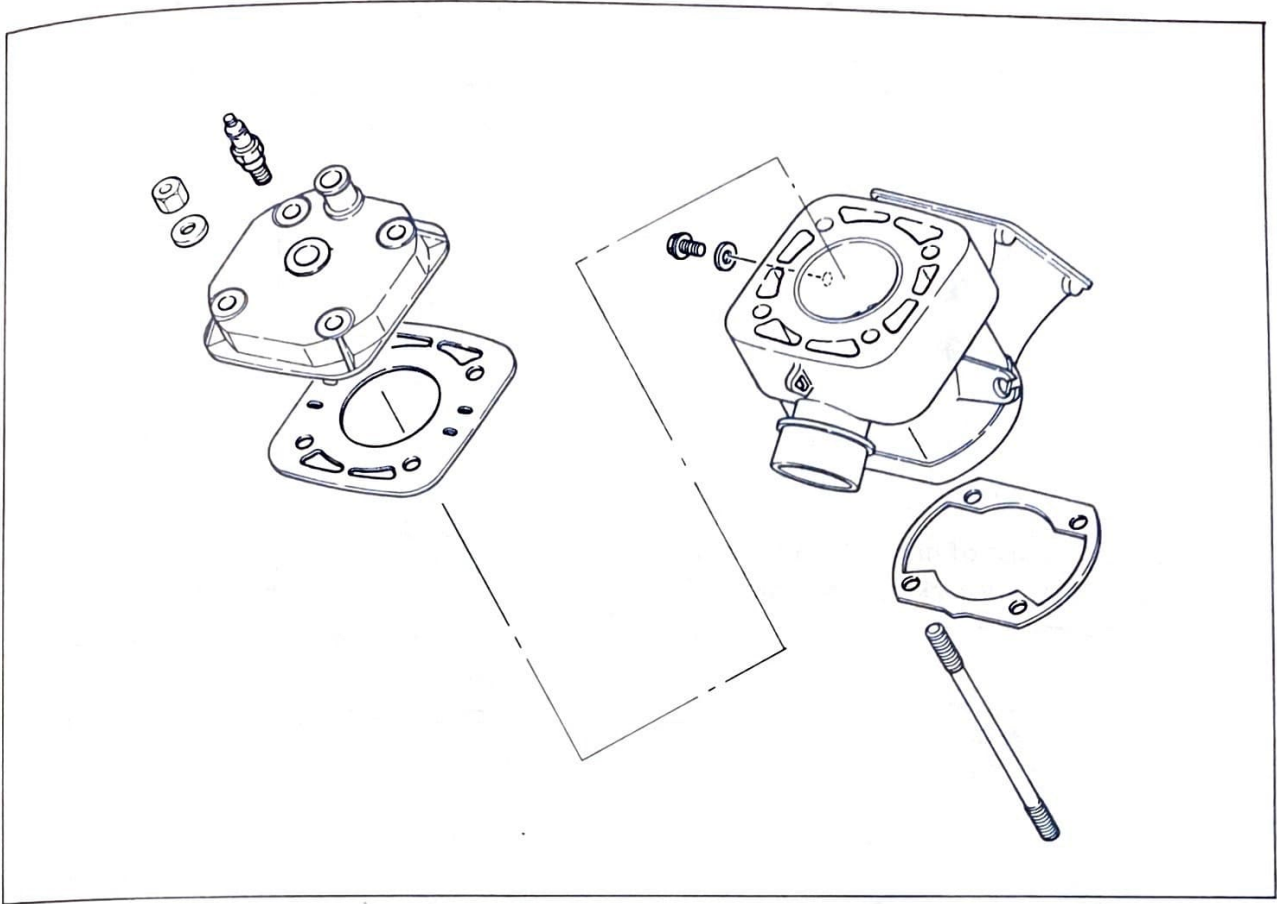


2. Check for a crust of minerals and rust in the cylinder head water jacket, and remove if necessary.



3. Place the head on a surface plate. There should be no warpage. Correct by resurfacing. Place 400 ~ 600 grit wet emery sandpaper on surface plate and resurface head using a figure-eight sanding pattern. Rotate head several times to avoid removing too much material from one side.

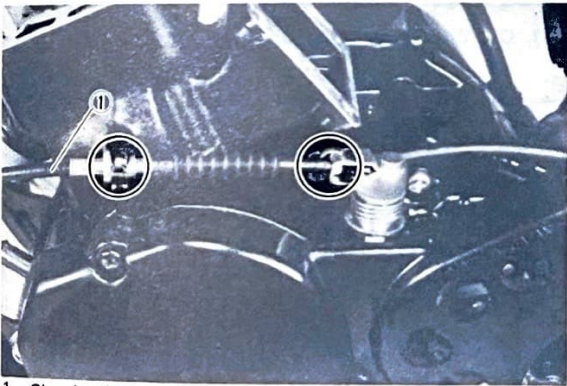




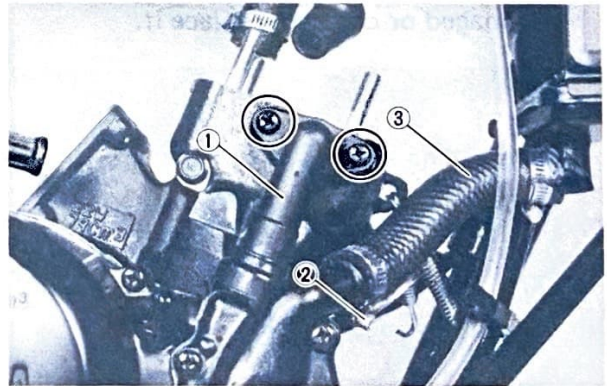
CYLINDER

Removal

1. Remove the clutch wire.



1. Clutch wire



1. Joint 2. Radiator hose joint 3. Radiator hose

2. Remove the bolt securing the pipe joint to the cylinder and remove the pipe joint from the pump cover. Loosen the radiator hose joint and remove the radiator hose from the housing cover.

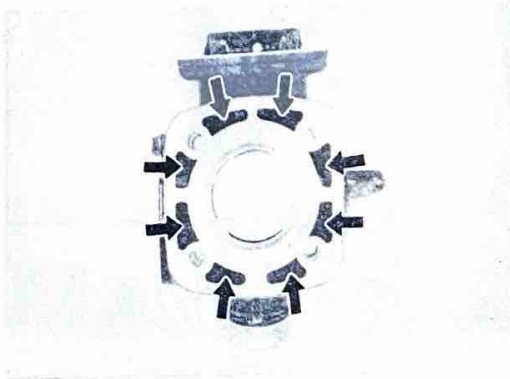
3. With the piston at top dead center, raise the cylinder just enough to stuff a clean shop towel into the crankcase around the connecting rod; this will prevent dirt from entering the crankcase. Remove the cylinder and base gasket and discard the gasket.

Maintenance

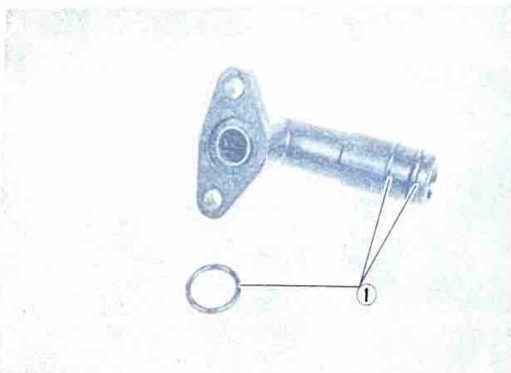
1. Using a rounded scraper, remove carbon deposits from the exhaust port.



2. Check for a crust of minerals and rust in the cylinder water jacket, and remove if necessary.



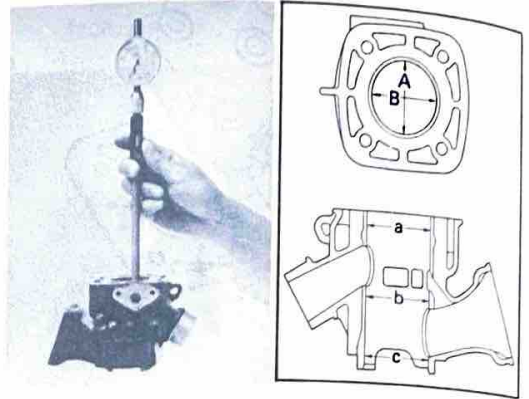
3. Check the pipe joint O-ring, and if damaged or cracked, replace it.



1. O-ring

4. 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.

5. 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.



6. Compare minimum and maximum measurements. If over tolerance and not correctable by honing, rebore to next over-size.

Max. allowable taper:

0.08 mm (0.0031 in)

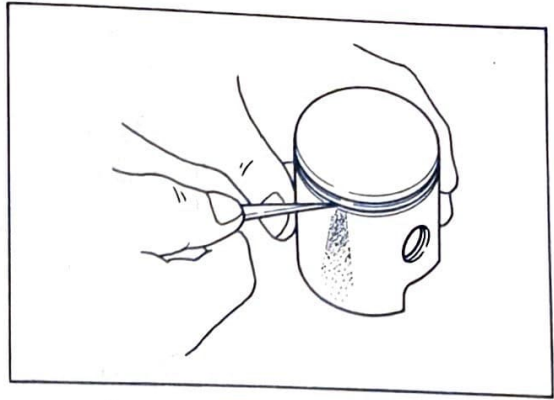
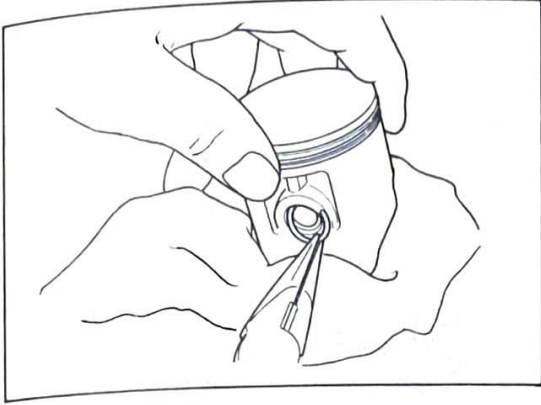
Max. allowable out-of-round:

0.05 mm (0.0020 in)

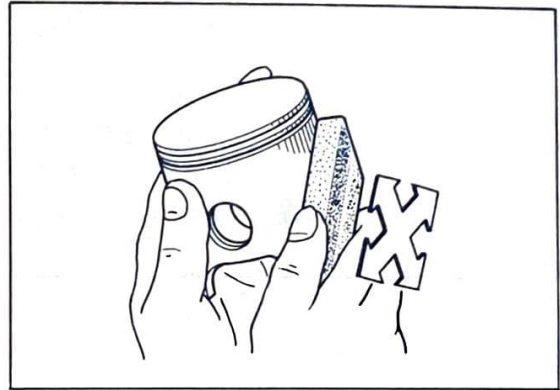
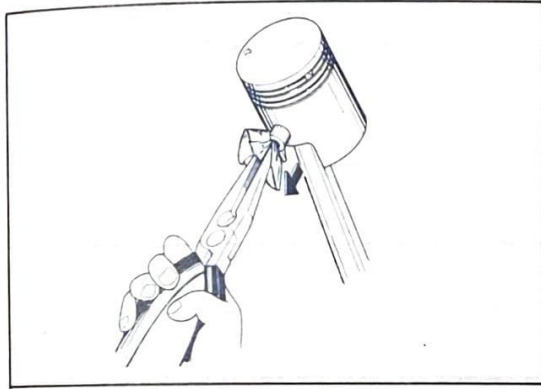
PISTON ASSEMBLY

Removal

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



2. Using 400 ~ 600 grit wet sandpaper, lightly sand score marks and lacquer deposits from sides of piston. Sand in crisscross pattern. Do not sand excessively.

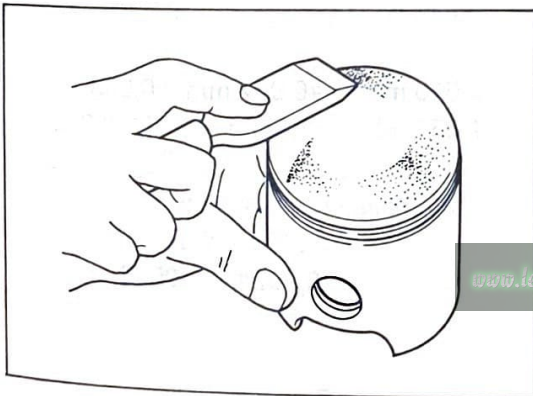


NOTE:

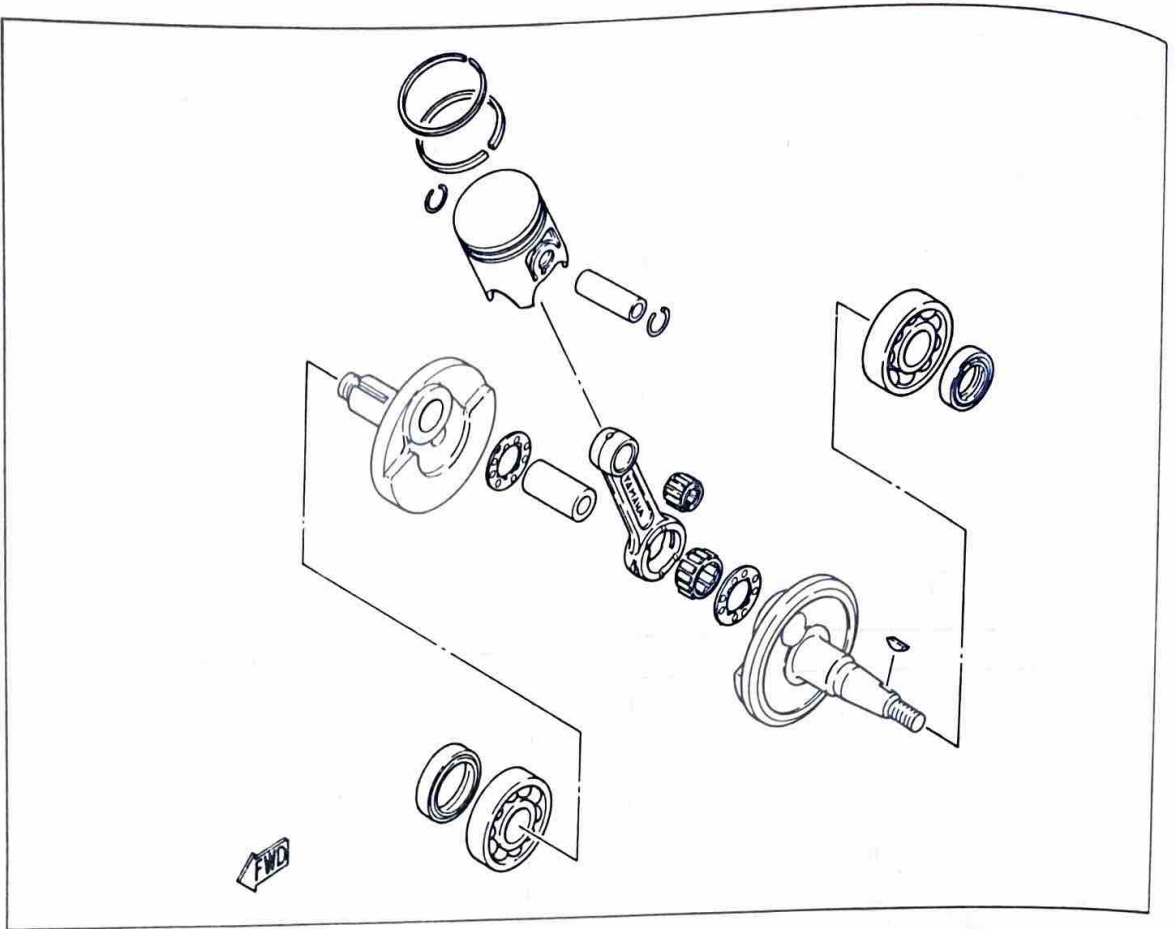
If the pin hangs up, use a piston pin puller. Do not hammer on pin as damage to rod, piston and bearing will result.

Maintenance

1. Using a rounded scraper, remove carbon deposits from piston crown and ring grooves.

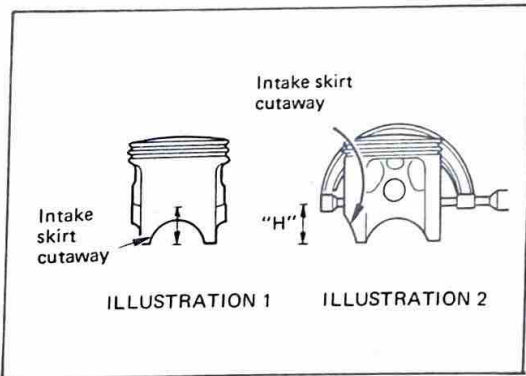


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Piston outside diameter measurement

1. To measure a cutaway piston, measure across the skirts at height "H" (just above the intake skirt cutaway) as shown in illustrations 1 and 2. Record this partial measurement.



2. Add to this Partial Measurement (PM) the Adjustment Amount (AA) in the following table (PM + AA = piston diameter). The result will be the piston diameter. Use this figure to compute piston-to-cylinder clearance.

HEIGHT "H"	ADJUSTMENT AMOUNT (AA)
26.4 mm (1.04 in)	0.01 mm (0.0004 in)

3. To determine the piston-to-cylinder clearance, subtract the piston diameter from the minimum cylinder diameter. If the nominal piston clearance is not within tolerance, replace the piston or bore the cylinder as required.

PISTON CLEARANCE =	
Minimum Cylinder Diameter	Maximum Piston diameter
-	

$$47.015 \text{ mm} - 46.952 \text{ mm} = 0.063 \text{ mm}$$

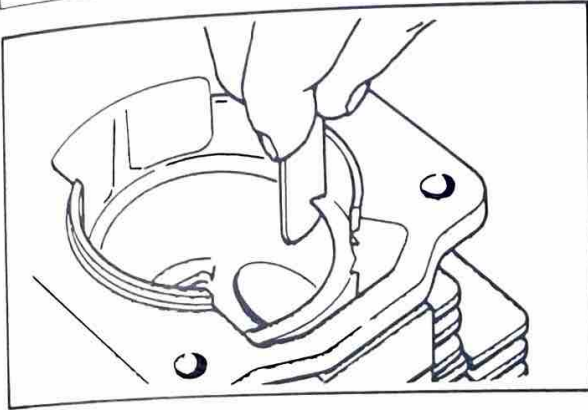
$$(1.851 \text{ in}) \quad (1.849 \text{ in}) \quad (0.002 \text{ in})$$

Nominal piston clearance: 0.060 ~ 0.065 mm (0.0024 ~ 0.0026 in)

Piston rings

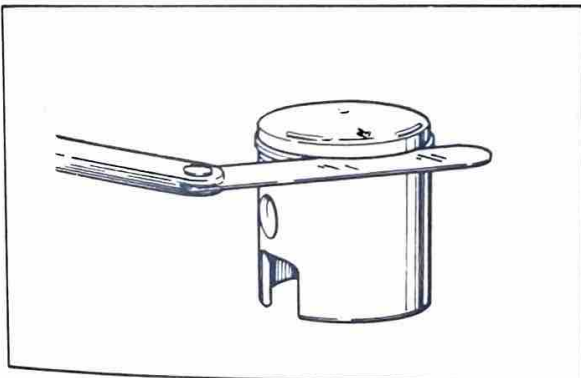
1. Insert ring into cylinder. Push down approximately 20 mm (0.787 in) using piston crown to maintain right-angle to bore. Measure installed end gap. If beyond tolerance, replace.

Ring end gap installed:
0.20 ~ 0.40 mm (0.008 ~ 0.016 in)



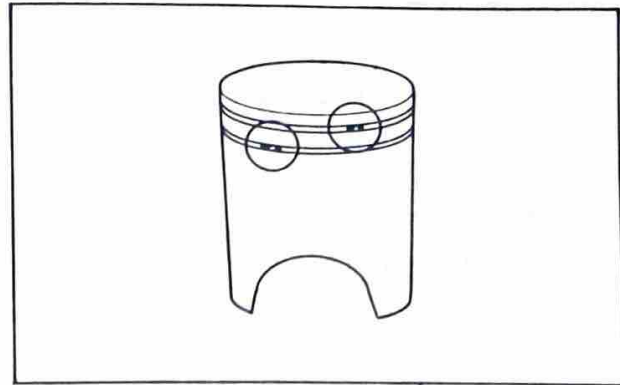
2. Holding cylinder towards light, check for full seating of ring around bore. If not fully seated, check cylinder. If cylinder is not out-of-round, replace piston ring.
3. With rings installed in grooves, insert feeler gauge between ring and groove. If beyond tolerance, replace ring and/or piston as required.

Ring groove clearance:
0.04 ~ 0.08 mm (0.0016 ~ 0.0031 in)



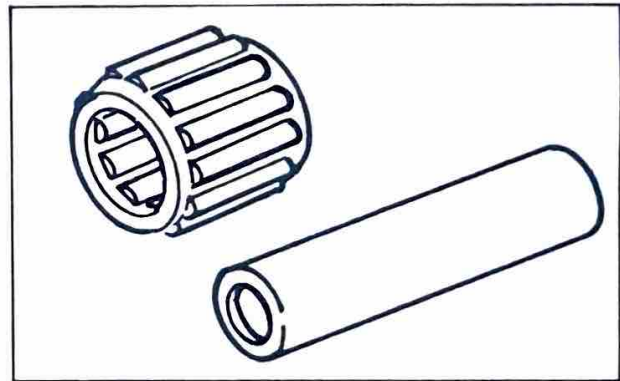
4. During installation, make sure ring ends are properly fitted around ring locating pin in piston groove. Apply liberal coating of two-stroke oil to ring.

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



Piston pin, bearing

1. Check the pin for signs of wear. If any wear is evident, replace pin and bearing.
2. Check the pin and bearing for signs of heat discoloration. If excessive (heavily blued), replace both.
3. Check the bearing cage for excessive wear. Check the rollers for signs of flat spots. If found, replace pin and bearing.



Reassembling

1. During reassembly, always use a new cylinder base gasket and cylinder head gasket.

NOTE: _____
Be sure to tighten the cylinder head bolts to specification.

Tightening torque:
25 Nm (2.5 m•kg, 18 ft•lb)

2. During reassembly, coat the piston skirt areas liberally with two-stroke oil.
3. Install new piston pin circlips and make sure they are fully seated within their grooves.

4. Take care during installation to avoid damaging the piston skirts against the crankcase as the cylinder is installed.

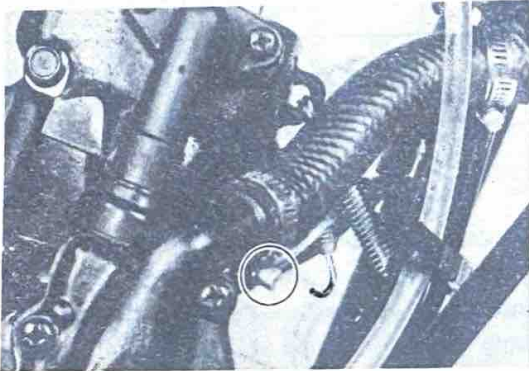
NOTE: _____
The arrow on piston dome must face forward.

5. Add the transmission oil and coolant to specification.

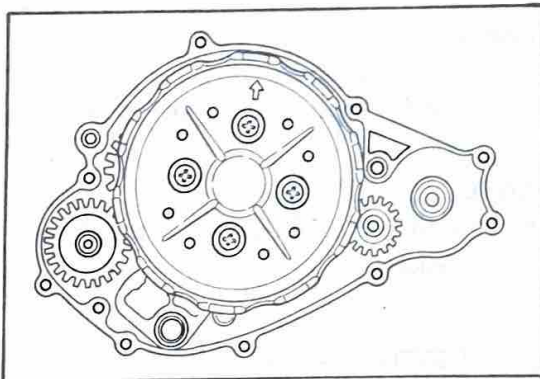
CRANKCASE COVER AND WATER PUMP

Removal

1. Loosen the brake pedal adjuster and remove the footrest assembly.
2. Remove the kickstart lever.
3. Drain off the transmission oil and coolant.
4. Loosen the hose clamp and disconnect the hoses.



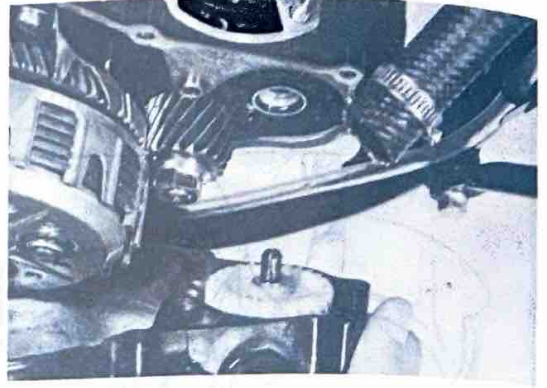
5. Remove the right hand crankcase cover.



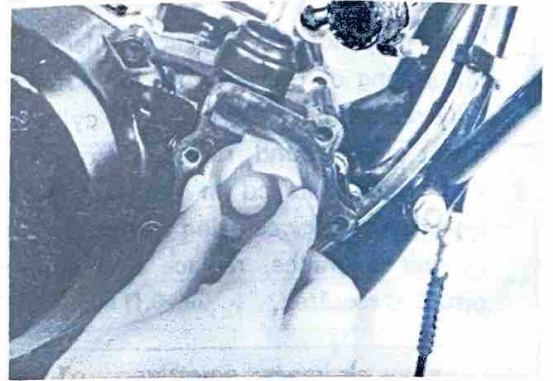
Reassembly

For reassembly, reverse the procedure for disassembly while taking the following care:

1. Bring the serrations of the governor shaft and drive gear to align.



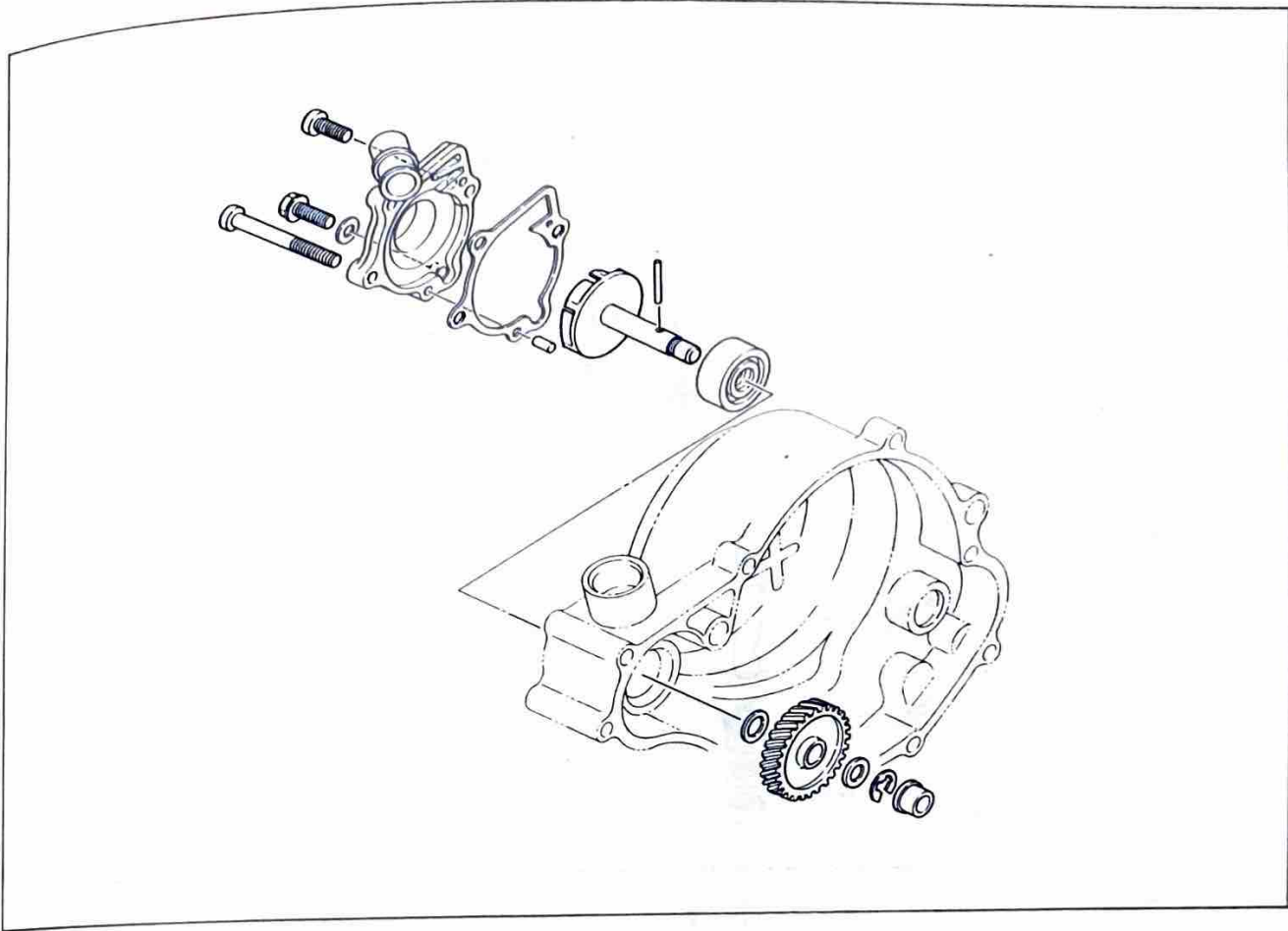
2. Engage the serrations of the pump drive gear and driven gear by turning the impeller by hand.



WATER PUMP

Disassembly

NOTE: _____
It is necessary to disassembly the water pump, unless there is no abnormality such as excessive change in coolant level, discoloration of coolant, or milky transmission oil.



Inspection

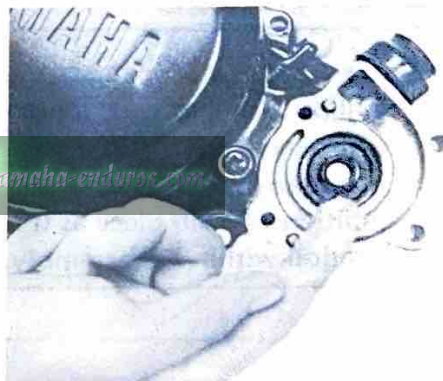
1. Remove the deposits from the impeller and water pump housing.
2. Check the impeller for cracks and damage. Replace if necessary.
3. Check for wear of the impeller, and replace it as required.
4. Check the oil seal and bearing for damage and wear. If damaged or worn excessively, replace the oil seal and bearing as a set.

NOTE:

When installing the oil seal, with the "WATER SIDE" mark is on the outside.

NOTE:

Take care so that the oil seal lip is not damaged or the spring does not slip off its position.

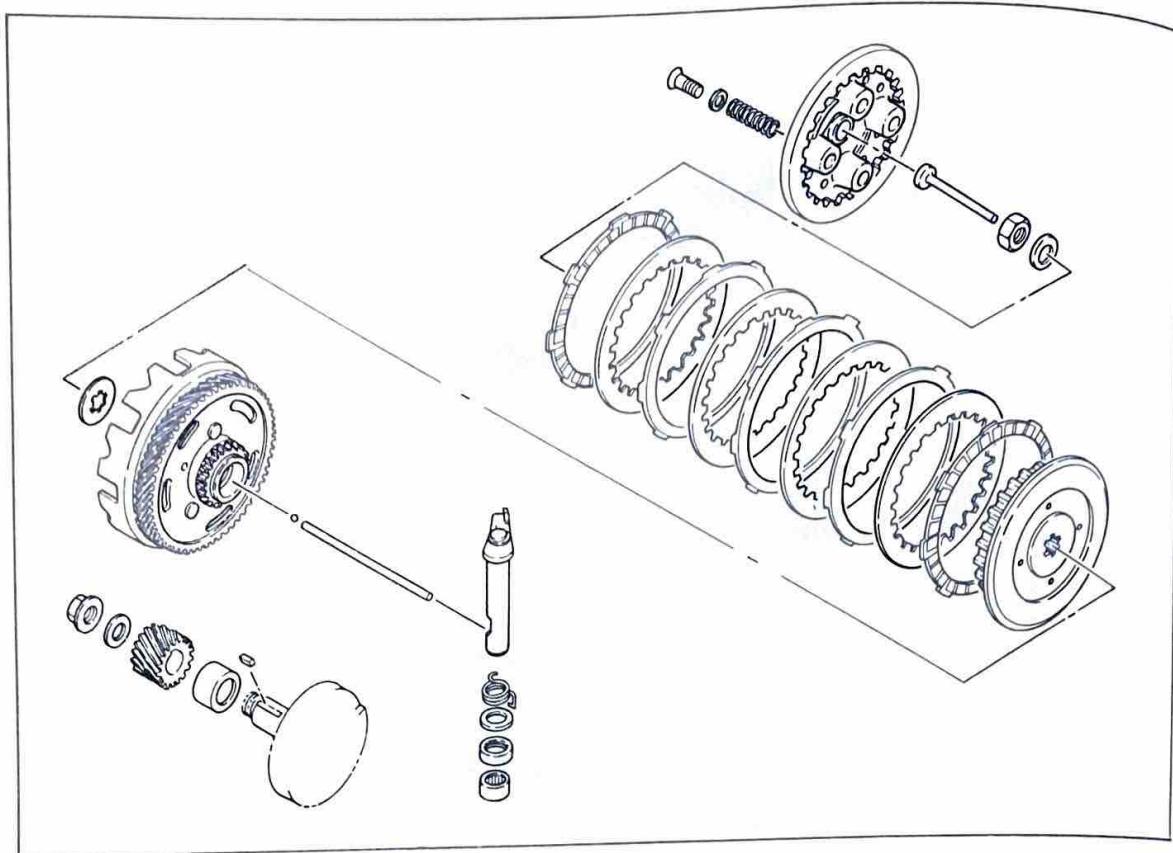


Reassembly

For reassembly, reverse the procedure for disassembly while taking the following care:

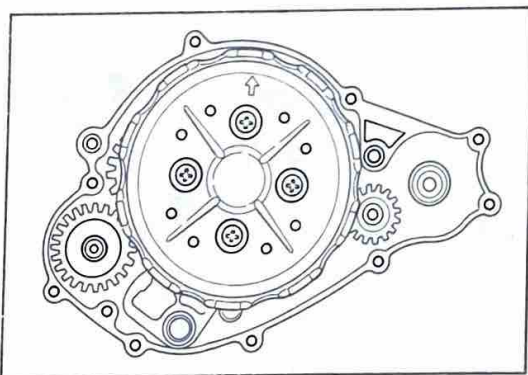
1. When installing the impeller shaft, apply a grease to oil seal and impeller shaft. And install the shaft while turning it.

CLUTCH



Removal

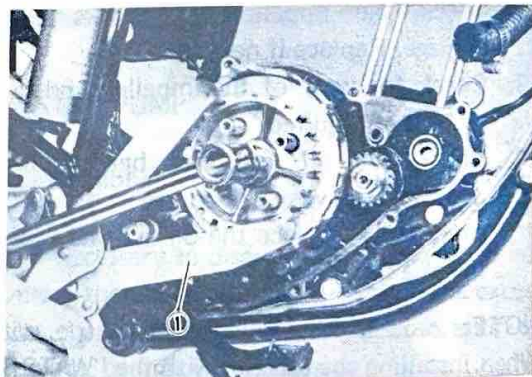
1. Remove the phillips screws (4) holding the pressure plate. Remove the clutch springs, pressure plate and push rod. Remove the clutch plates and friction plates.



NOTE:

When removing phillips spring screws, loosen each screw in several stages working in a criss-cross pattern to avoid any unnecessary warpage. Note the condition of each piece as it is removed and its location within the assembly.

2. Using the clutch holding tool, remove the clutch securing nut and lock washer. Remove the clutch boss and driven gear (clutch housing).



1. Clutch holding tool (YM-91042)

Clutch lock nut torque:
55 Nm (5.5 m·kg, 40 ft·lb)

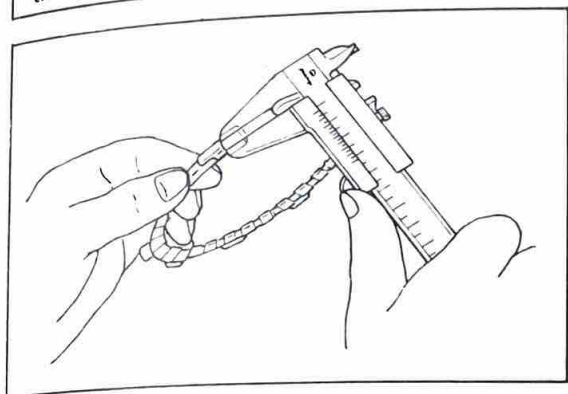
Primary drive gear nut torque:
68 Nm (6.8 m·kg, 49 ft·lb)

3. Remove the primary drive gear and water pump drive gear.

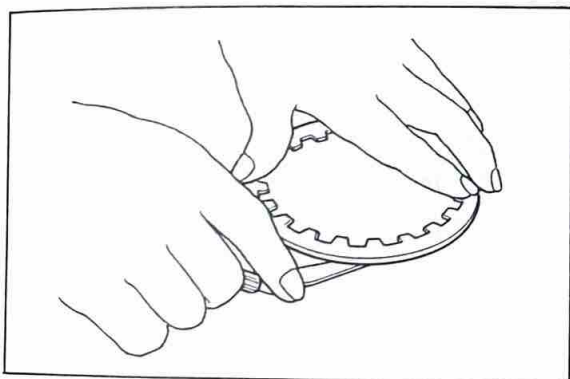
Maintenance

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

	New	Wear limit
Friction plate thickness	3.0 mm (0.12 in)	2.7 mm (0.106 in)

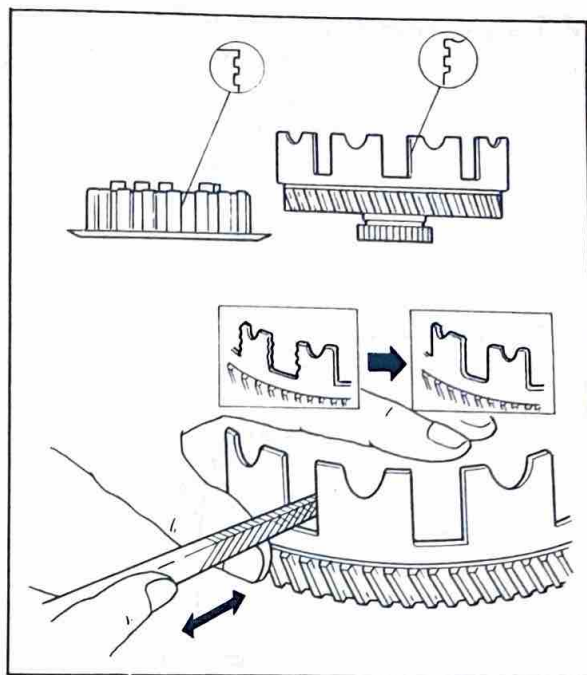


2. Place each clutch plate on a surface plate and check for warpage with a feeler gauge; if warpage exceeds 0.05 mm (0.002 in), replace the clutch plate.

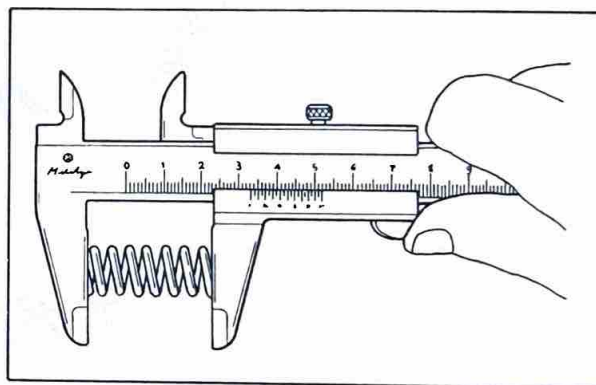


Clutch plate warpage allowance:
0.05 mm (0.002 in) Maximum

3. Inspect the clutch hub and the outer clutch for wear as shown; if the wear is excessive, replace the component.

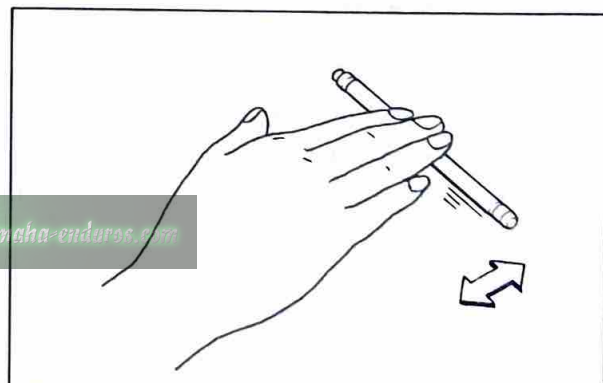


4. Measure each clutch spring; if the free length of a spring is less than 35.4 mm (1.39 in), replace the spring as a set.



	New	Minimum
Clutch spring free length	32.0 mm (1.26 in)	31.0 mm (1.22 in)

5. Roll the push rod across a surface plate. If rod is bent, replace.

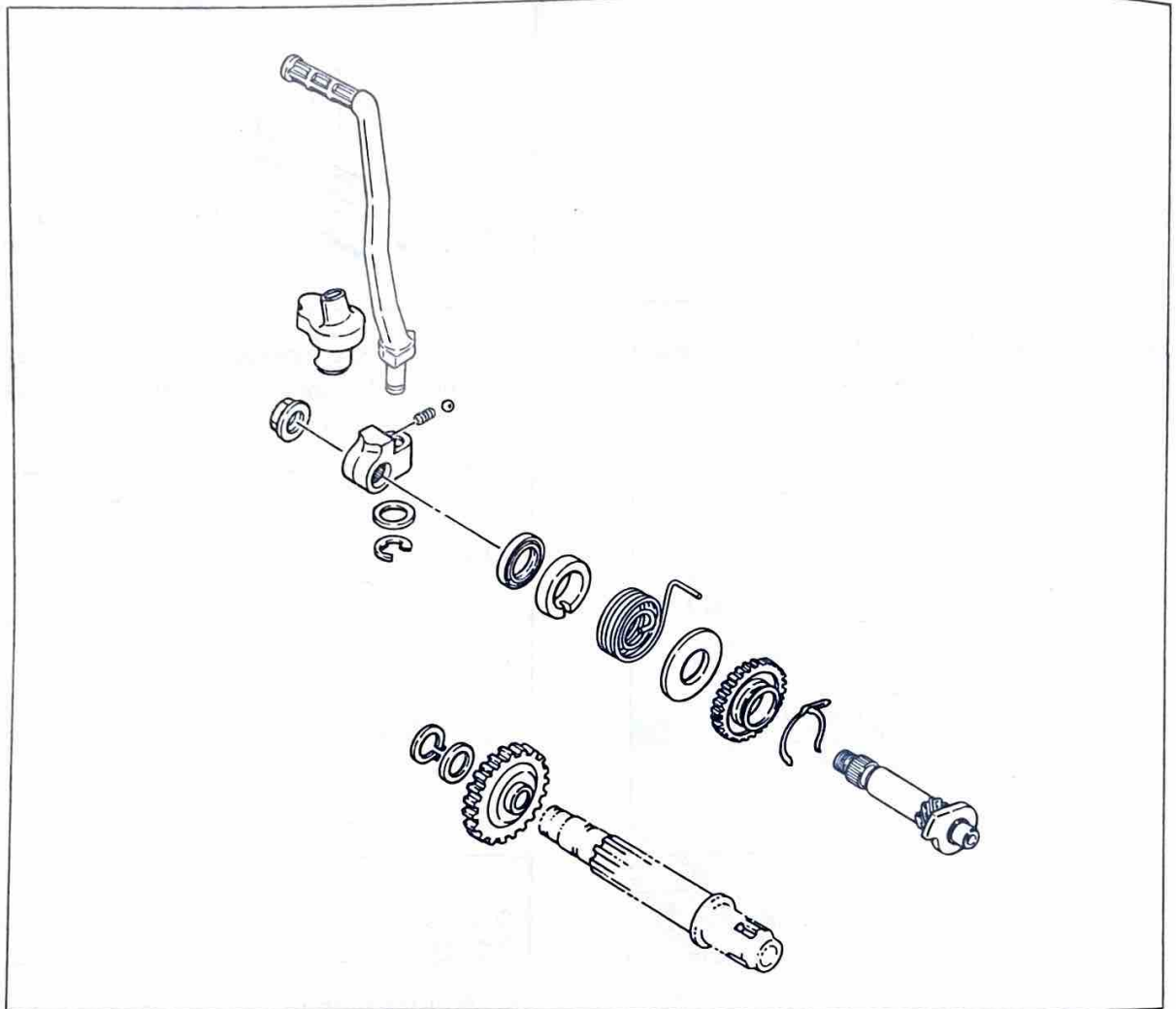


Primary drive and driven gears

If primary drive and driven gear produce excessive noise during operation, gear lash may be incorrect. Marks are scribed on the side of each gear.

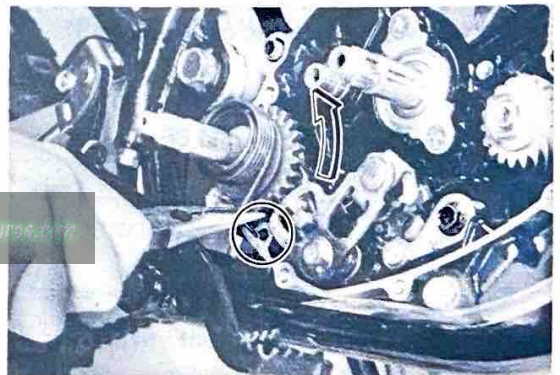
And in replacement, a gear having the same mark as before must be used.

KICK STARTER



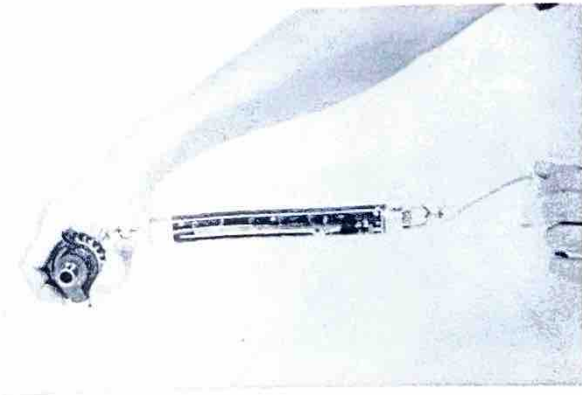
Removal

1. Remove the circlip, kick idle gear and washers.
2. Unhook the kick spring from its post in the crankcase. Allow it to relax. Then remove the kick axle assembly by rotating the shaft counterclockwise and then pulling out the entire assembly. Check the gear teeth for wear and breakage.



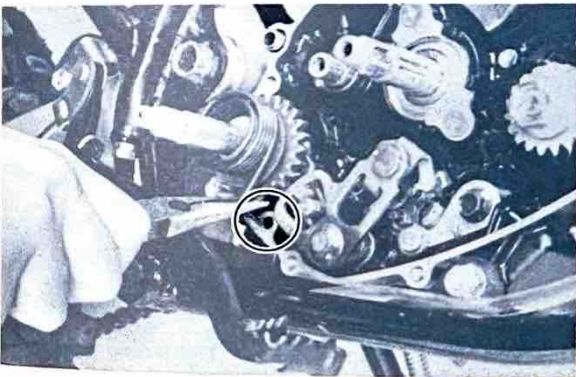
Inspection

1. Inspect the teeth of the idle and kick gears for wear or damage, replace the gear if wear or damage is found.
2. The pressure required to move the kick clip on the kick gear should be about 1.0 kg (2.2 lb). If the pressure required is more or less than this amount, the kick starter will malfunction; the kick clip must be replaced.



Reassembly

1. Slide the shaft into the case; make sure the kick clip fits into its boss in the crankcase.

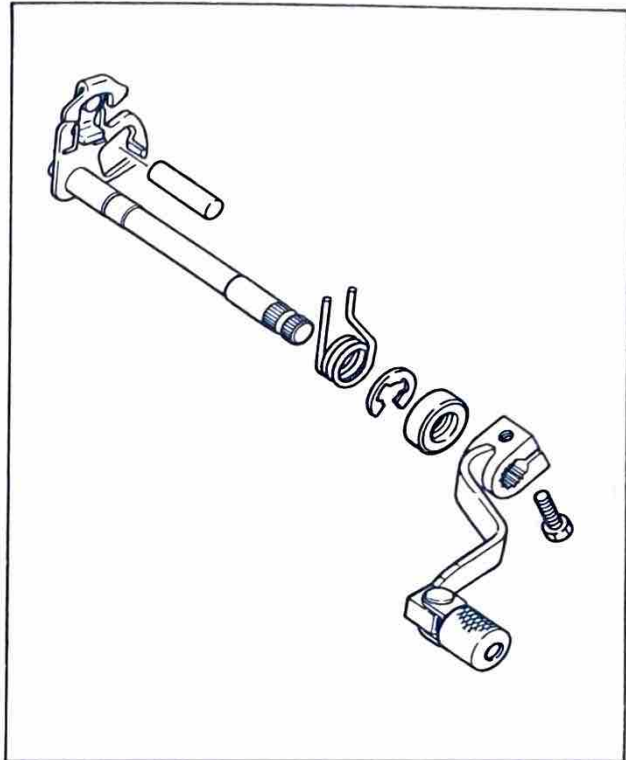


2. Turn the kick starter return spring clockwise and insert the hook into the proper hole in the crankcase.
3. After installing, check to make sure the kick gear engages and disengages properly with the idle gear.

SHIFTER

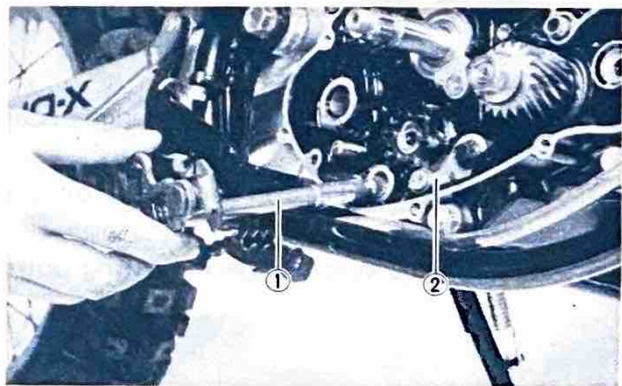
NOTE:

Shifter maintenance should be performed with clutch assembly removed.



Removal

1. Pull out the change lever assembly.
2. Remove the flange bolt, stopper lever and spring.



1. Change lever assembly

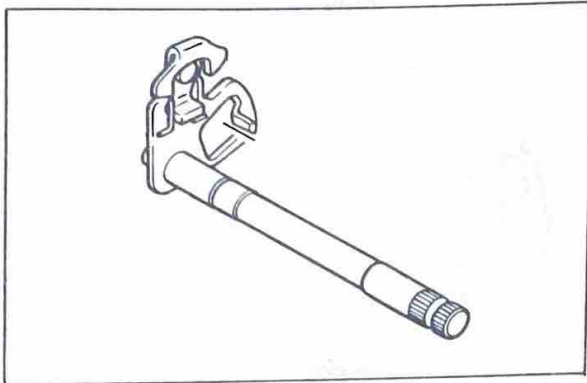
2. Stopper lever

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Inspection

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

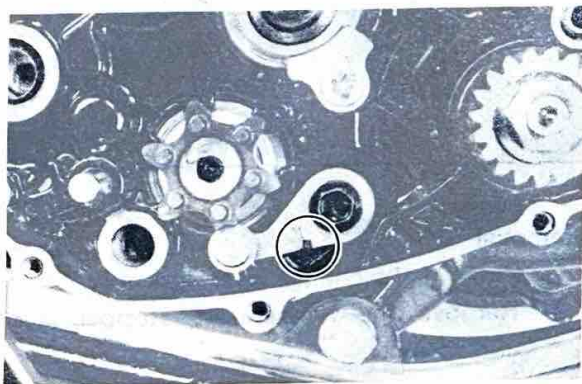
2. Inspect change shaft assembly for bending of shaft, worn or bent spline, and broken or worn shift arm spring. A bent shaft will cause hard shifting.



3. Inspect the segment for wear or damage, replace as required.

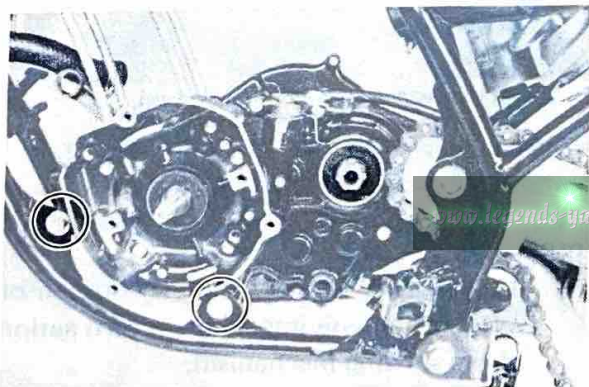
Installation

1. Engage the shift return spring with its home position.

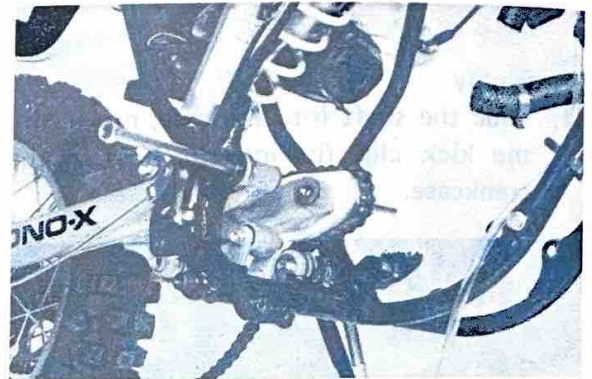
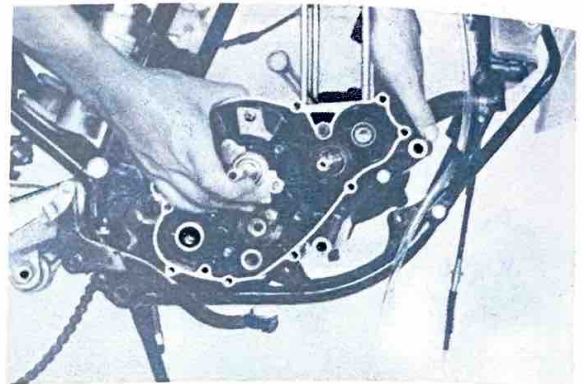


Engine removal

1. Remove the magneto base change pedal, and chain cover.
2. Remove the chain and sprocket from the machine.
3. Remove the two engine mounting bolts.



4. Remove the nut from the swingarm pivot shaft, and pull the shaft out about two-thirds of its length; if the shaft is pulled all the way out, the swingarm will come loose. If possible, insert a shaft of similar diameter into the other side of the swingarm to support it.
5. Remove the engine from right side of frame.



Mounting

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

Bolt	Tightening torque		
	Nm	m·kg	ft·lb
Front	40	4.0	29
Under	40	4.0	29

Pivot shaft nut:
53 Nm (5.3 m·kg, 38 ft·lb)

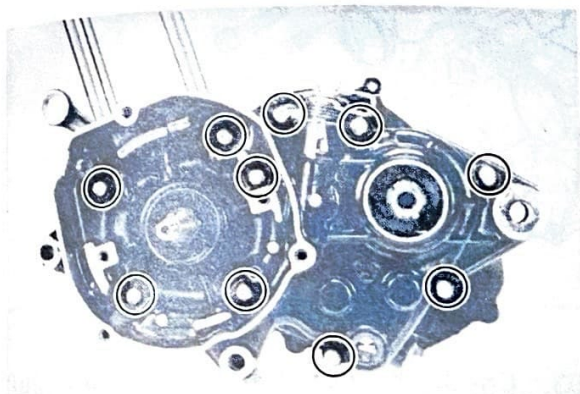
When installing the drive sprocket, grease the pivot shaft.

2. Install drive sprocket.
3. Install flywheel magneto.

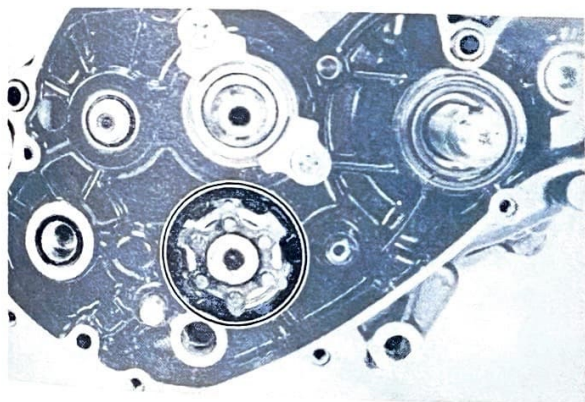
Rotor nut torque:
35 Nm (3.5 m·kg, 25 ft·lb)

Crankcase disassembly

1. Working in a crisscross pattern, loosen panhead screws 1/4 turn each. Remove them after all are loosened.



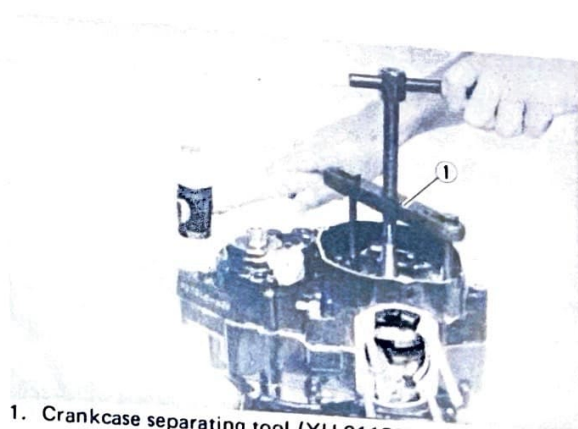
2. Before separating the crankcase, turn the segment to the position shown in the figure so that it does not contact the crankcase.



3. Install crankcase separating tool as shown.

NOTE:

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

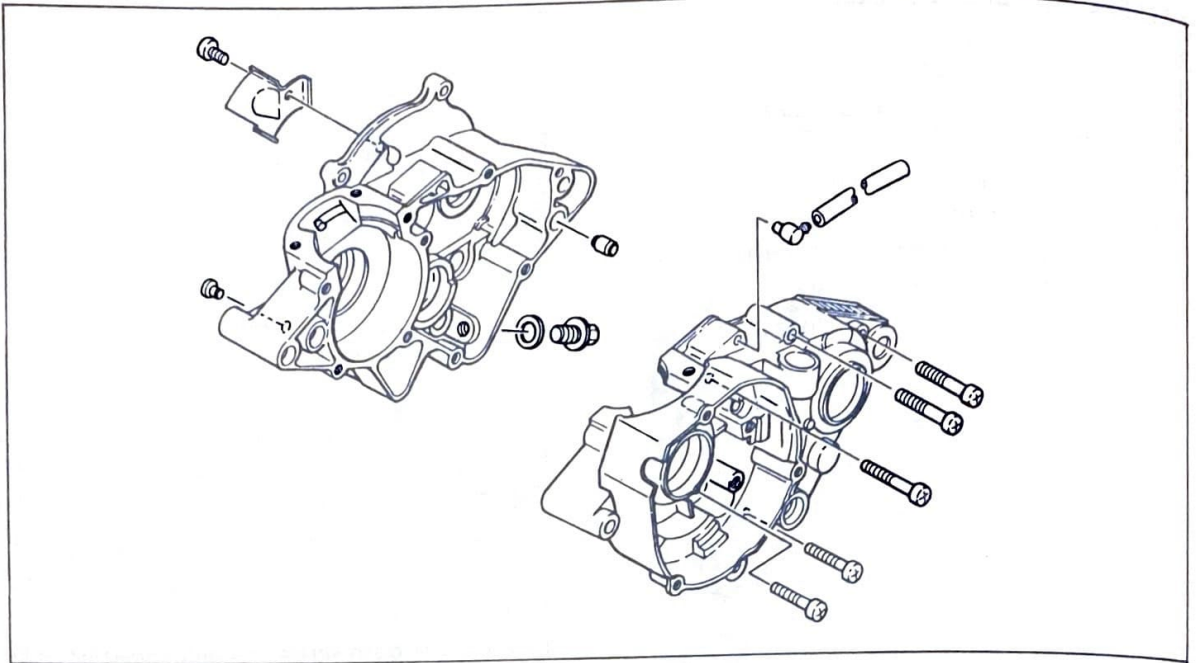


1. Crankcase separating tool (YU-01135)

CAUTION:

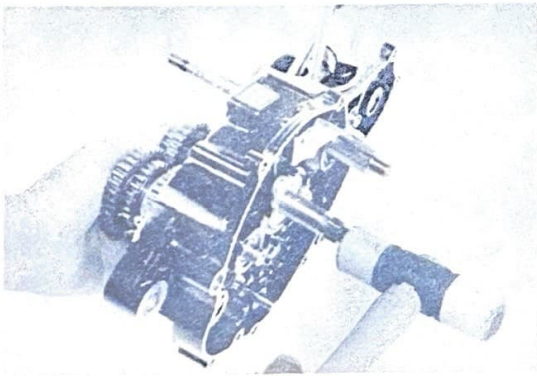
Use a soft hammer to tap on the case half. Tap only on reinforced portions of case. Do not tap on gasket mating surface. Work slowly and carefully. Make sure the case halves separate evenly. If one end "hangs up", take pressure off the push screw, realign and start over. If the halves are reluctant to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

CRANKCASE



Transmission and shifter

1. Tap lightly on the transmission drive shaft with a soft hammer to remove.



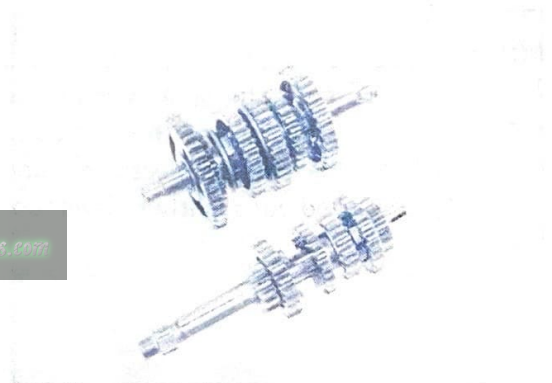
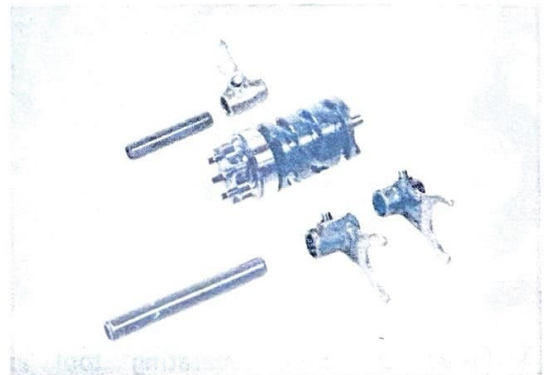
NOTE:

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

Inspection

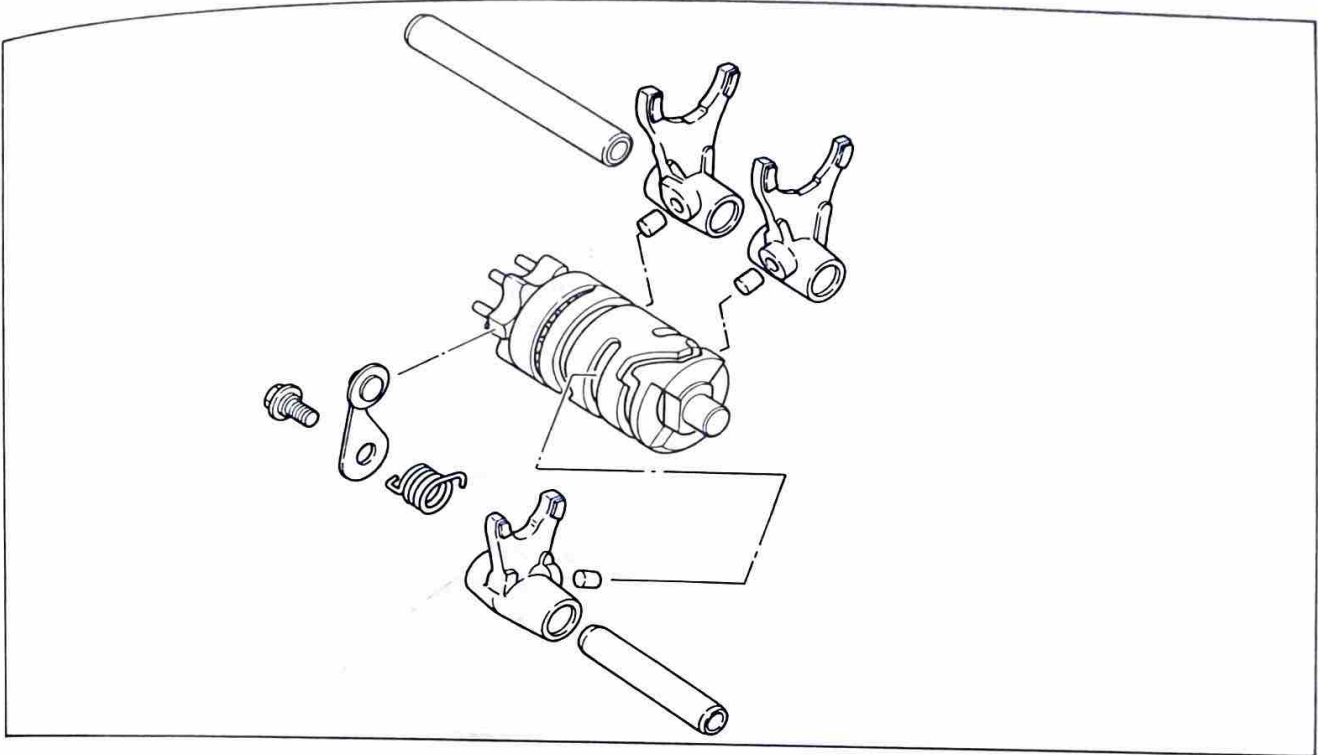
1. Inspect each shift fork for signs of galling on gear contact surfaces. Check for bending. Make sure each fork slides freely on its guide bar.
2. Check the shift cam grooves for signs of wear or damage. If any profile has excessive wear and/or any damage, replace cam.

3. Check the cam followers on each shift fork for wear. The follower should fit snugly into its seat in the shift fork, but should not be overly tight. Check the ends that ride in the grooves in the shift cam. If they are worn or damaged, replace.

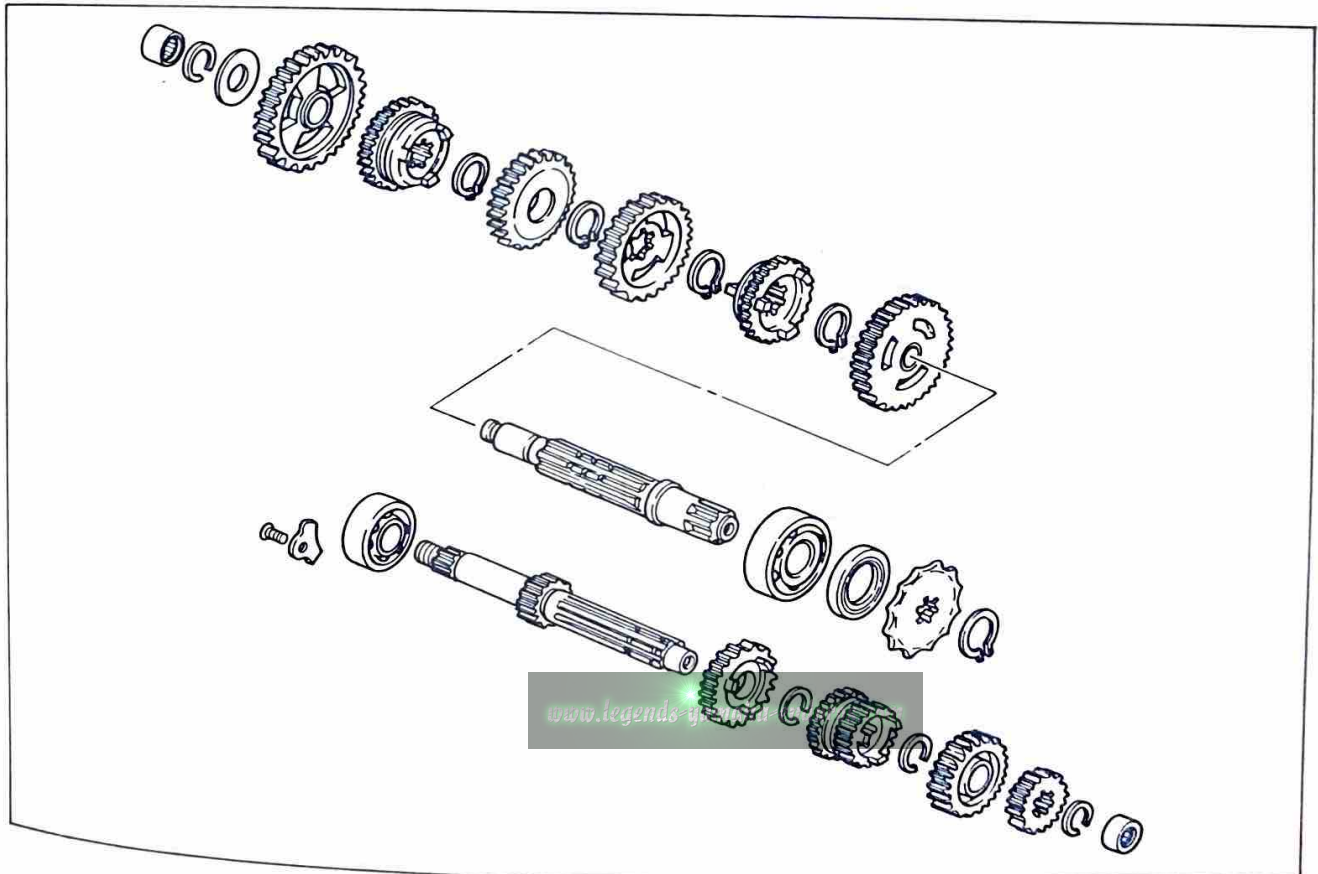


4. Carefully inspect each gear. Look for signs of obvious heat damage (blue discoloration). Check the gear teeth for signs of pitting, galling; or other extreme wear. Replace as required.

5 Check to see that each gear properly engages its counterpart on the shaft. Check the mating dogs for rounded edges, cracks, or missing portions. Replace as required.

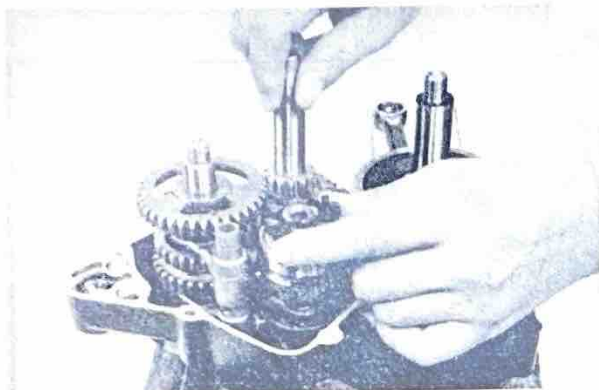


TRANSMISSION

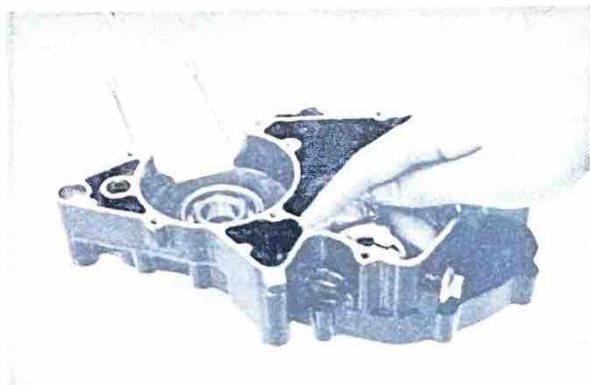


Transmission installation

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



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

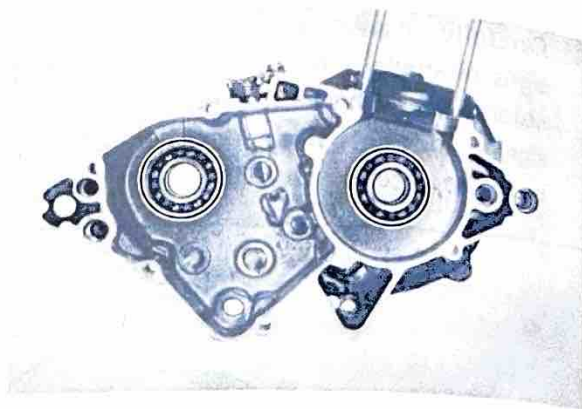


NOTE:

- a. Do not tap on machined surface or end of crankshaft.
 - b. Before installing the crankshaft, check the crankshaft O-ring for damage.
-
3. After reassembly, apply a liberal coating of two-stroke oil to the crank pin and bearing and into each crankshaft bearing oil delivery hole.
 4. Check crankshaft and transmission shafts for proper operation and freedom of movement.

Bearings and oil seals

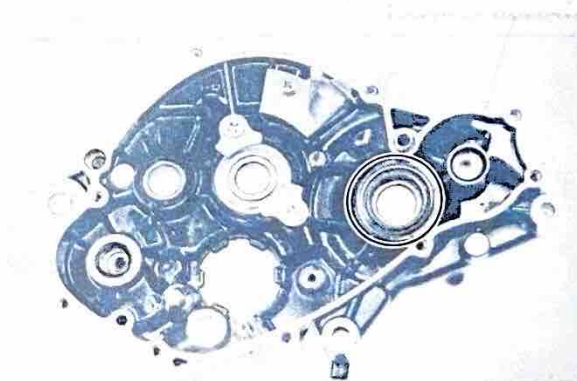
1. After cleaning and lubricating the bearings, rotate inner race with a finger. If rough spots are noticed, replace the bearing.



NOTE:

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

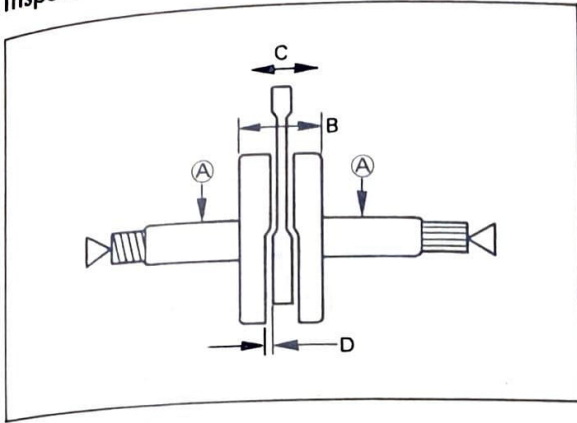
2. Check oil seal lips for damage or wear. Replace as required.
3. Always replace crankshaft oil seals whenever the crankshaft is removed.
4. Install bearing(s) and oil seal(s) with their manufacturer marks or numbers facing outward. Before installation, apply grease to oil seal lip(s) and bearing(s).



Crankshaft

1. Remove crankshaft assembly with crank-case separating tool.

Inspection



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

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

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

Connecting rod/Crankside clearance (D):
0.2 ~ 0.7 mm (0.08 ~ 0.028 in)

Unit: mm (in)

Deflection tolerance		Flywheel width
Left side	Right side	
0.03 (0.0012)	0.03 (0.0012)	45 ^{-0.05} _{-0.10} (1.77 ^{-0.002} _{-0.004})

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

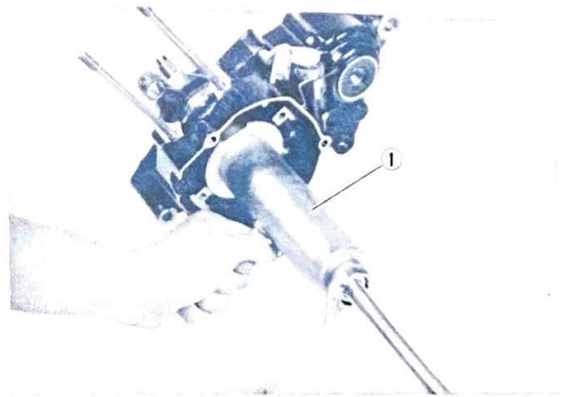
Crankshaft installation

1. Set the crankshaft into left case half and install crankshaft installing tool.

CAUTION:

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

2. Hold the connecting rod at top dead center with one hand while turning the handle of the installing tool with the other. Operate tool until crankshaft bottoms against bearing.



1. Crankshaft installing pot (YU-90058)

4 CHASSIS MAINTENANCE AND REPAIR

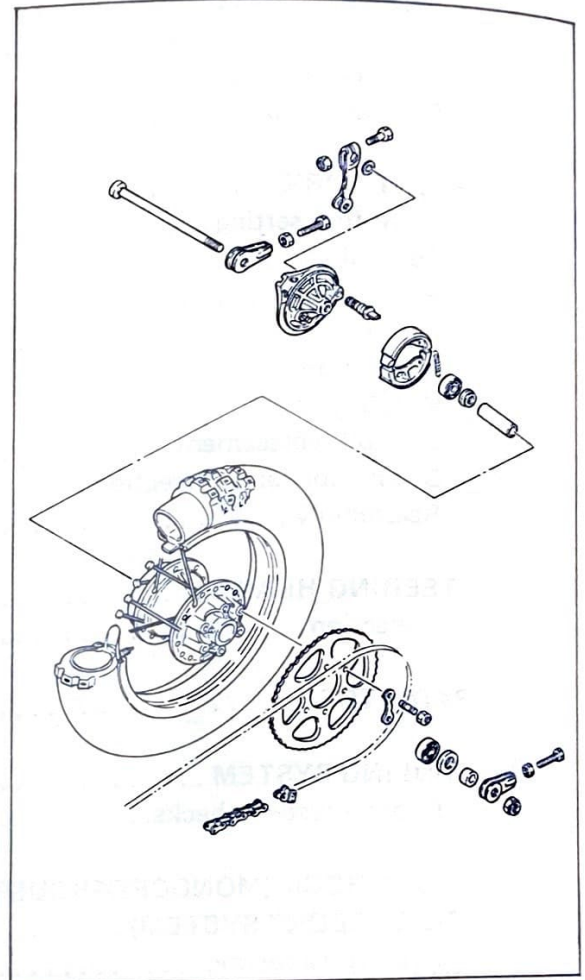
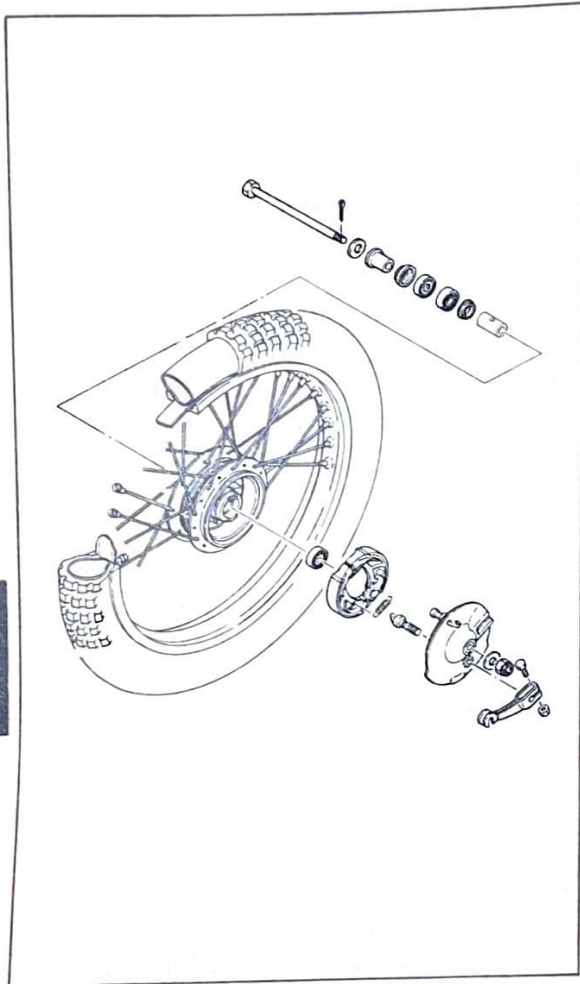
WHEEL ASSEMBLIES, SPROCKETS AND CHAIN	4-1
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4 CHASSIS MAINTENANCE AND REPAIR

WHEEL ASSEMBLIES, SPROCKETS AND CHAIN

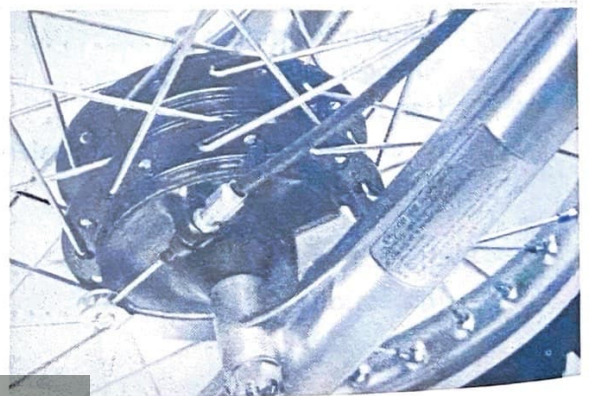
Whenever performing chassis work, always take extra care and double-check each step of each procedure. The wheels, brakes, suspension, steering, and frame must all be in top condition to provide optimum performance, reliability, and safety.



Wheel installation

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

1. Lightly smear grease on:
 - The shafts
 - The bearings and oil seal lips
 - The O-ring and dust cover interior for the rear brake shoe plate
 - The oil seal and collar outer circumference from the torque arm.
2. Check for proper engagement of the boss on the outer tube with the locating slot on the brake shoe plate.
3. Make sure nuts are properly tightened.



Front wheel axle:
74 Nm (7.4 m·kg, 53 ft·lb)
Rear wheel axle:
85 Nm (8.5 m·kg, 61 ft·lb)

NOTE:

- a. After installing the wheel, rotate it freely and apply the brake.
- b. With the brake applied, tighten the axle nut.
- c. Drive the front forks several times, and while keeping them dived, tighten the axle pinch bolt.

4. Always use new cotter pins. Old pins should be discarded.

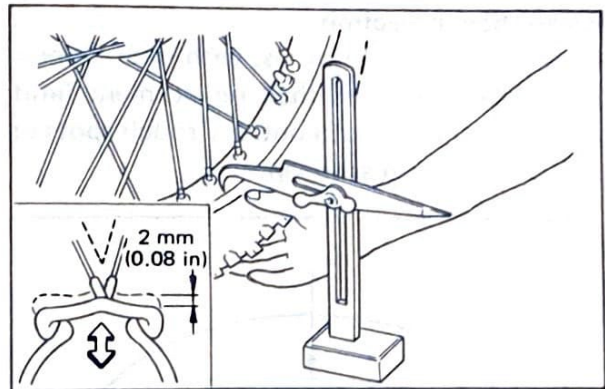
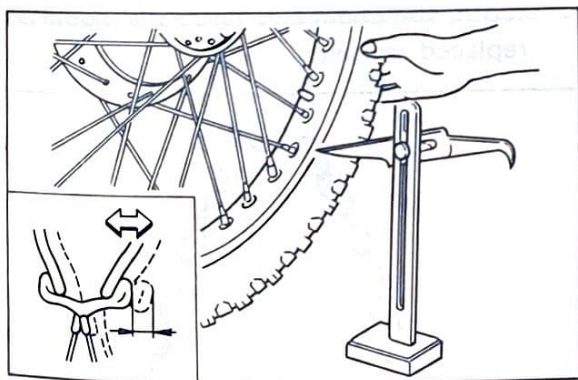
WARNING:

Always use a new cotter pin on the axle nut.

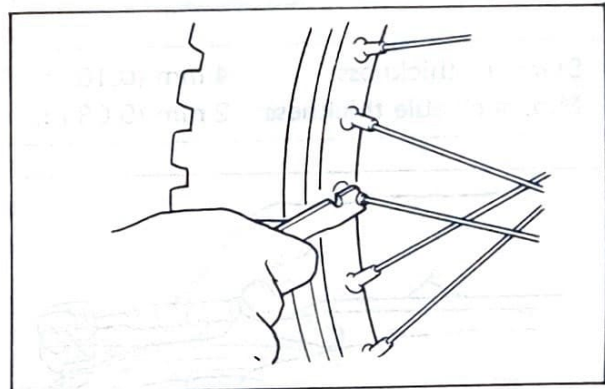
5. Be sure to adjust the tension of the chain. (Refer to "Derive chain tension adjustment".)
6. Adjust the play in the brake lever and pedal.

Rims and spokes

1. Block the wheels off the ground.
2. Spin the wheels and observe the amount of runout.
3. If the runout exceeds 2.0 mm (0.08 in), true the wheels.



4. Tap each spoke with a spoke wrench to determine if any spokes are loose; tighten all loose spokes and replace bent spokes.



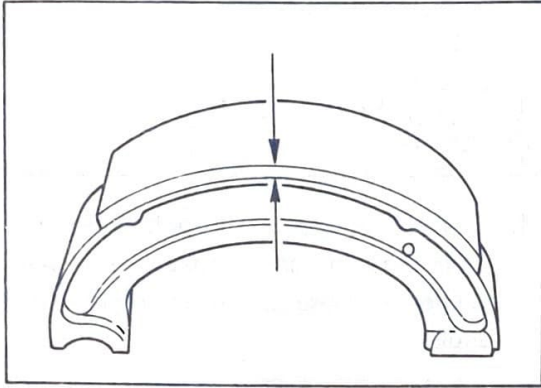
5. If a rim is severely "dinged" or bent, replace the rim.

Bearings

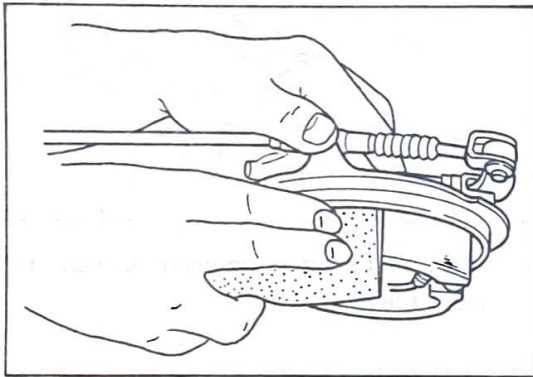
1. To inspect the wheel bearings, try to move the wheel sideways in relation to the fork in the front or the frame in the rear. If any movement is felt, the bearings must be replaced.
2. Block the wheels off the ground and spin each wheel. If the wheels do not spin freely with the brakes disengaged, the bearings must be replaced. If bearings need replacement, take the wheels to a Yamaha dealer for this service.

Brake shoe inspection

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



Standard thickness: 4 mm (0.16 in)
Min. allowable thickness: 2 mm (0.08 in)

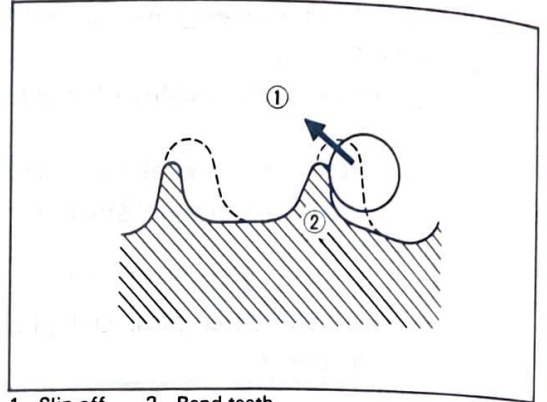


Brake drum

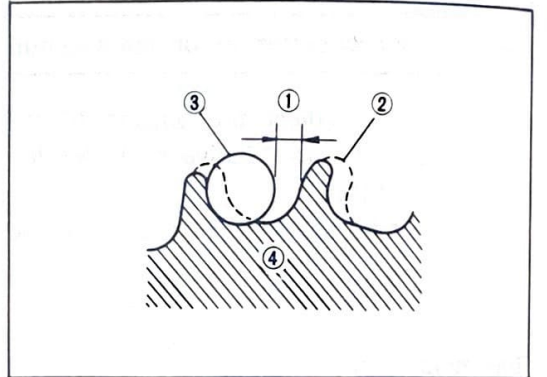
Inspect the brake drum; if there is any oil or dirt on the inner surface, wipe the drum clean with a rag dampened with lacquer thinner or solvent. If the drum is deeply grooved, the drum must be replaced.

Sprockets and chain (Adjustment begins on page 2-11)

1. Inspect the teeth on the rear sprocket; if they are worn as shown in the illustrations below, replace the sprockets and chain as a set.

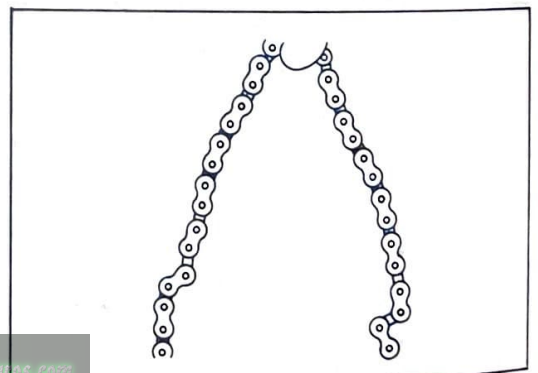


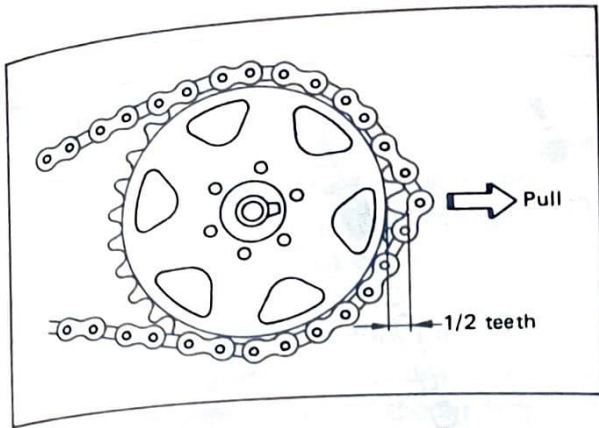
1. Slip off 2. Bend teeth



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

2. If the chain stays bent or kinked after cleaning and lubrication, or if the chain can be pulled away from the sprocket more than 1/2 the length of a sprocket tooth, the chain and sprockets should be replaced as a set.



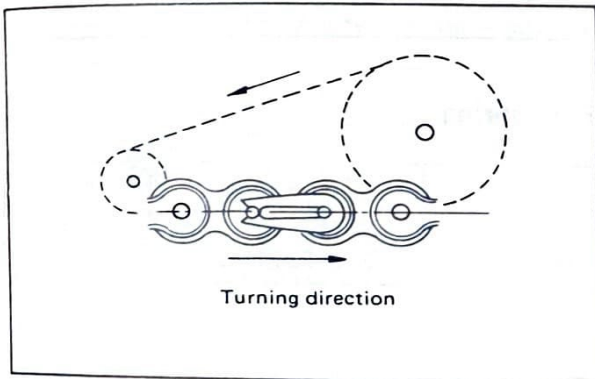


Driven sprocket securing nut torque:
26 Nm (2.6 m·kg, 19 ft·lb)

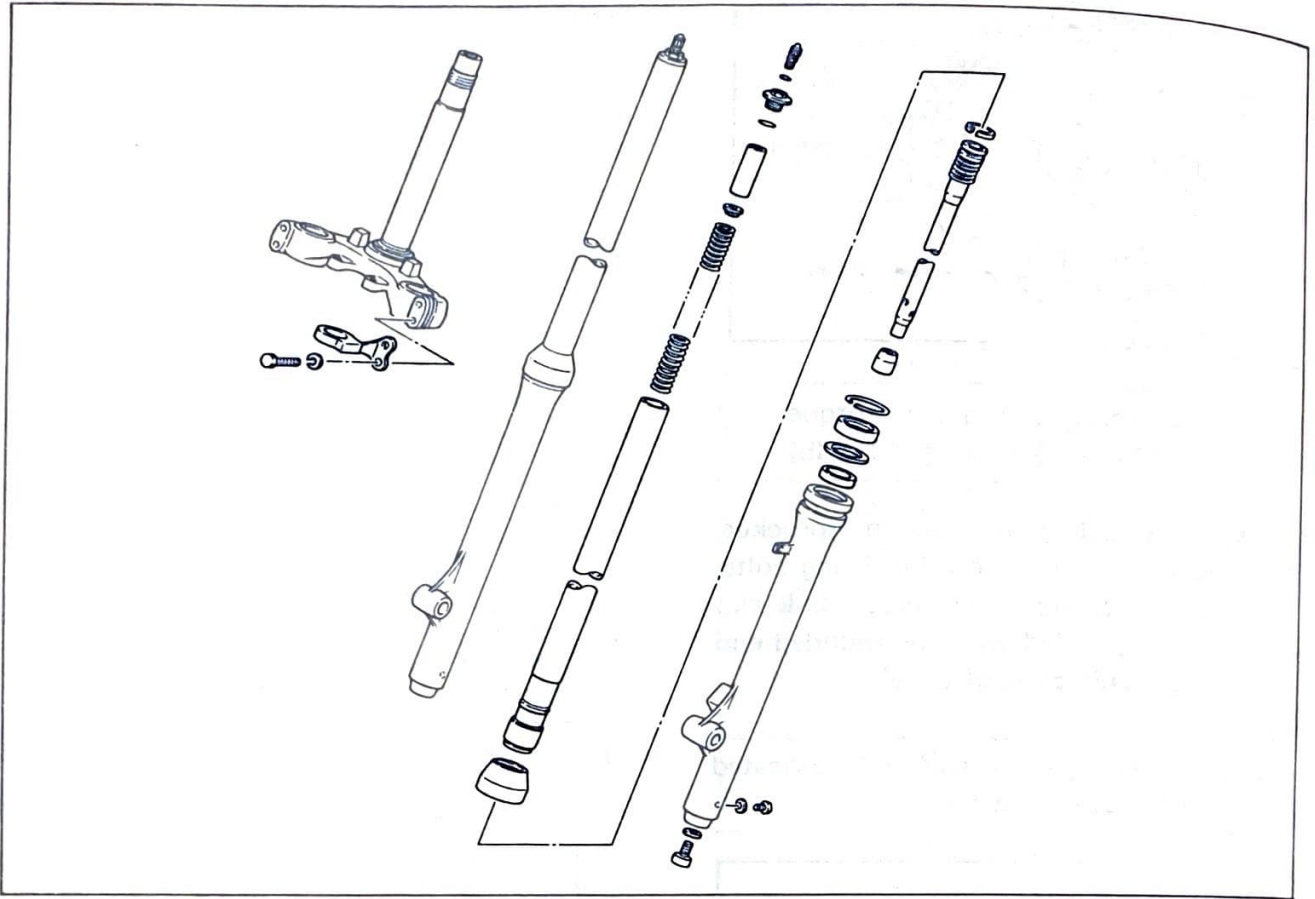
3. When installing the driven sprocket, lightly smear grease on the fitting bolts.
4. During reassembly, the master link clip must be installed with the rounded end facing the direction of travel.

NOTE:

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



FRONT FORK



Front fork setting

For details of front fork setting, refer to the **Race Preparation and Tuning Manual**. It is advisable to take a note of the standard setting data and specified range of adjustment.

Fork spring

Type	Part number	I.D. mark
STD	22W-23141-L0	No slit
HEAVY	22W-23141-20	2 slits

Fork oil

Recommended oil: Yamaha fork oil 10wt or SAE 10W motor oil
Oil quantity: 260 cm ³ (9.2 Imp oz, 8.8 US oz)
Oil level: STD.173 mm (6.81 in) MIN.105 mm (4.13 in) MAX.200 mm (7.87 in)

Fork tube height

STD:	15 mm (0.59 in)
MAX:	20 mm (0.80 in)
MIN:	10 mm (0.39 in)

Air pressure

STD:	0 kPa (0 kg/cm ² , 0 spi)
Maximum:	117.7 kPa (1.2 kg/cm ² , 17 psi)

Handling note

CAUTION:

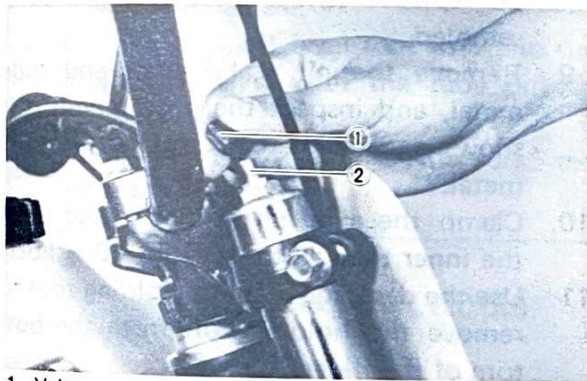
To prevent an accidental explosion of air, the following instructions should be observed:

1. Use only air or nitrogen for filling. Never use any other gas. An explosion may result.
2. Never throw the front fork into fire.
3. Before removing the cap bolts or front forks, be sure to extract the air from the air chamber completely.

1. After running over a dusty or sandy course, remove the dust around the forks. This cleaning will protect the fork oil seals against damage.
2. Before removing the front forks, put the marks, R and L, on the tops of cap bolts, so you will not be confused when re-installing the front forks.

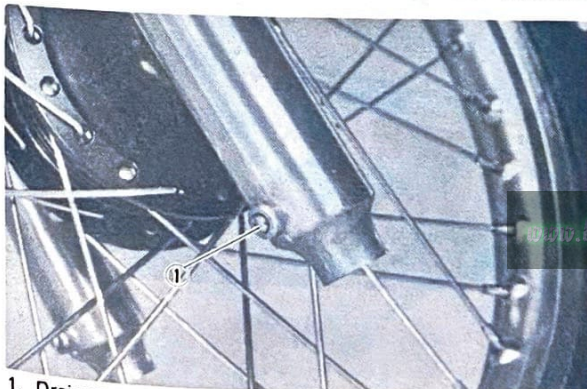
Fork oil replacement

1. Remove the valve cap and depress the air valve to allow the air to escape from the fork legs.



1. Valve cap 2. Valve

2. Place an open container beneath each drain hole and remove the drain screws.



1. Drain screw

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

NOTE:

Check gasket, replace if damaged.

5. Place a suitable stand under the engine to keep the front of machine raised off the floor.
6. Remove the cap bolt assembly. Remove the spring seat and fork spring.
7. Measure the correct amount of oil and pour it into each leg. After filling, allow it a few minutes and slowly pump the inner tube up and down 2 or 3 times so that air can be extracted from the oil.

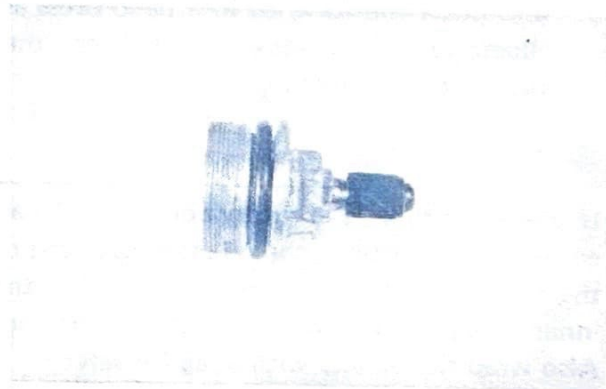
Recommended oil:

Yamaha fork oil 10wt or
SAE 10W motor oil

Oil quantity:

260 cm³ (9.2 Imp oz, 8.8 US oz)

8. Inspect the O-ring on the cap bolt; if it is cut or otherwise damaged, replace the O-ring.



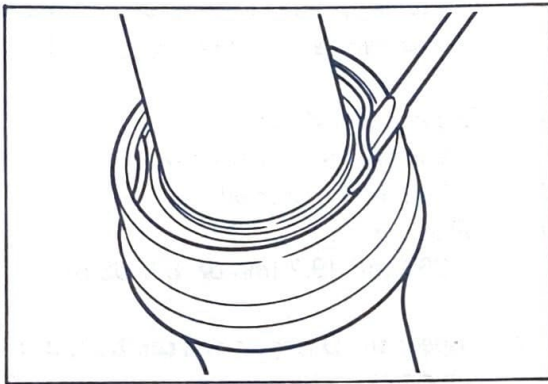
9. Install spring seat, fork spring and cap bolt and torque to specification.

Tightening torque:

23 Nm (2.3 m·kg, 17 ft·lb)

Disassembly and inspection

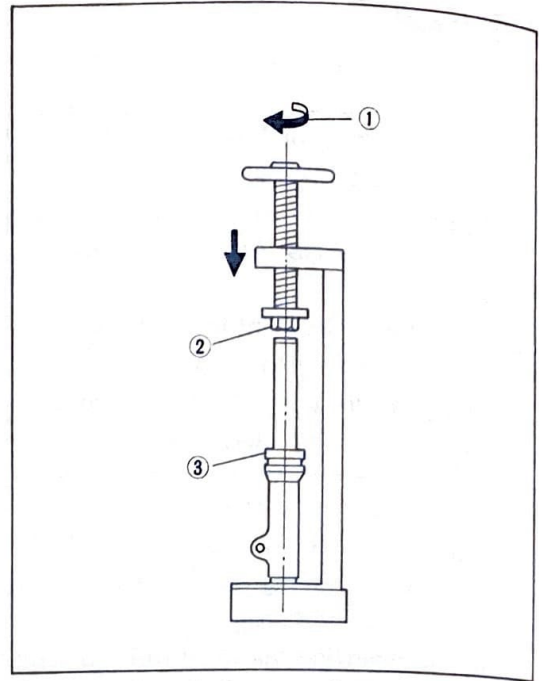
1. Place the machine on a suitable stand to keep it stable while the front wheel and forks are removed.
2. Let the air out of the forks, and loosen the cap bolts slightly.
3. Remove the front wheel, loosen the fork tube pinch bolts, and remove the forks.
4. The oil seal in the fork leg must be removed hydraulically. Fill the fork completely with fork oil and reinstall the cap bolt. Depress the air valve until oil flows out.
5. Remove the snap ring from the top of the slider.



6. Place a socket on top of the cap bolt, and place the fork leg in a hand press as illustrated. The socket will keep the press from contacting the air valve.

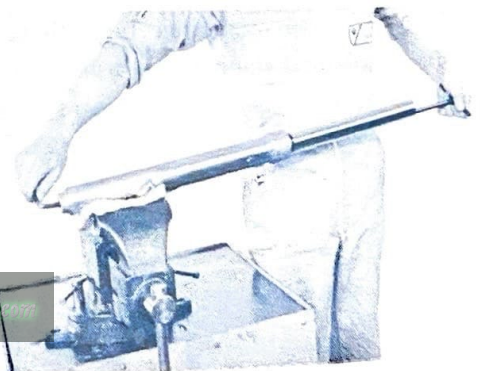
CAUTION:

If the inner tube is abruptly contracted or air enters the inner tube, the oil may spurt out or the oil seal may spring out. Never touch the inner tube during disassembling operation. Also wrap the oil seal with a rag for safety.



1. Turn slowly
2. Spacer
3. Wrap with rag

7. Wrap a rag around the top of the slider, and slowly turn the handle of the press until the oil seal is pushed out of the slider.
8. Remove the dust seal, and oil seal. Discard the oil seal, as the seal must always be replaced whenever the fork is disassembled.
9. Remove the oil seal washer and slide metal, and inspect the slide metal; if it shows excessive wear, replace the slide metal.
10. Clamp the axle lug in a vise, and push the inner tube all the way into the slider.
11. Use the damping-cylinder holding tool to remove the holding bolt from the bottom of the slider.



NOTE:
The holding bolt is locked with LOCTITE®.
To remove it, tap it with a hammer several times so that it can be loosened.

12. Remove the fork leg from the vise and hold it parallel to the ground while removing the slider from the inner tube.

Reassembly

The assembly procedure is the reverse of the disassembly procedure.

1. Make sure all components are clean before assembly. Always install a new fork seal. Do not re-use a seal.
2. Apply Loctite to the threads of the bolt, and reinstall the bolt. Using the damping-cylinder holding tool, torque the holding bolt to specification.

Holding bolt torque:

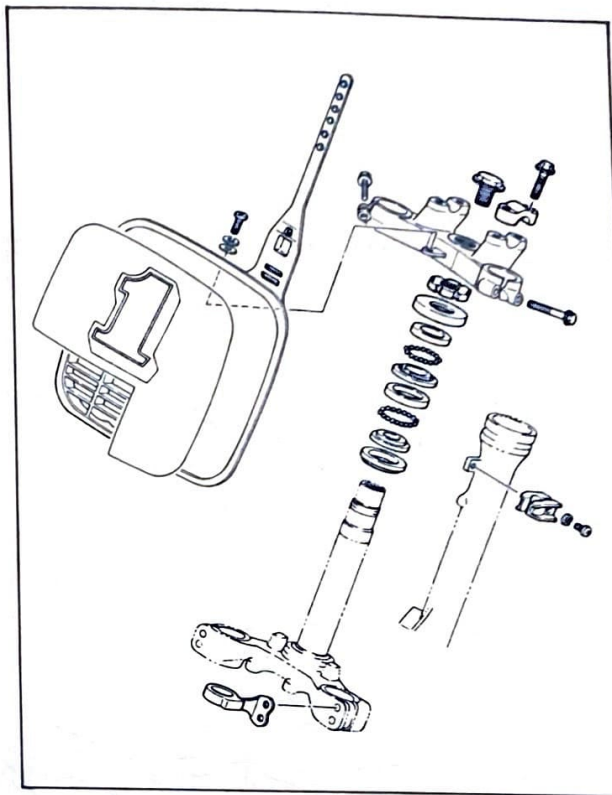
23 Nm (2.3 m·kg, 17 ft·lb)

3. Pour the specified amount of fork oil into the fork leg, and pump the inner tube up and down to remove all air from the valving mechanism.
4. Use the fork oil level tool to attain the proper oil level with the tube pushed down.
5. Check the air pressure in the fork, and set it to specification.

Standard for air pressure:

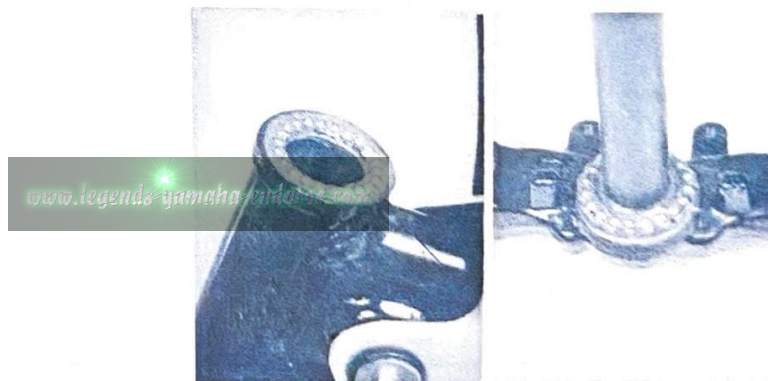
0 kPa (0.0 kg/cm², 0.0 psi)

STEERING HEAD (Adjustment begins on page 2-12 of chapter 2.)

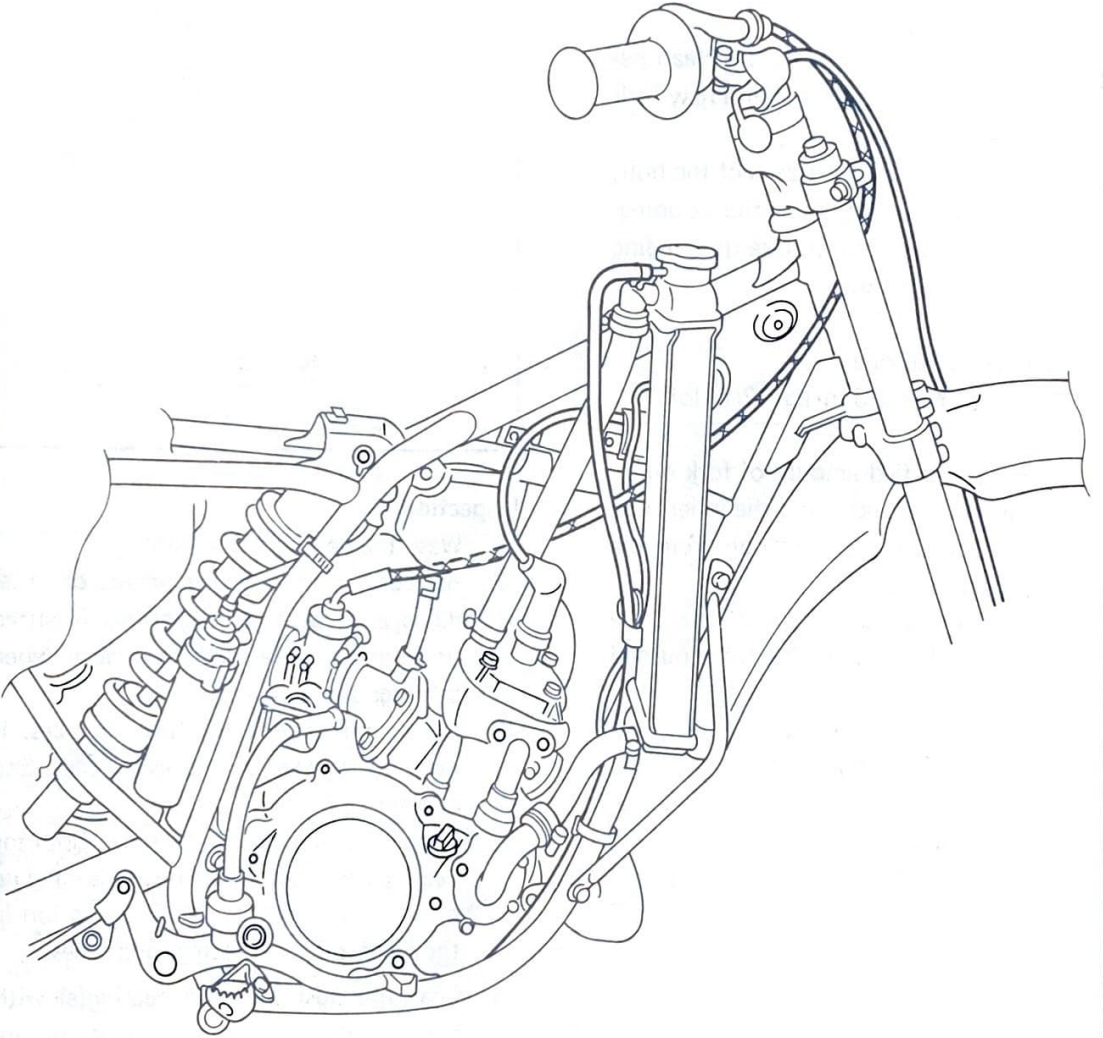


Inspection

1. Wash the bearings in solvent.
2. Inspect the bearings for pitting or other damage. Replace the bearings if pitted or damaged. Replace the races when bearings are replaced.
3. Clean and inspect the bearing races. If races are damaged, replace the races and bearings.
4. Install the bearings in the races. Spin the bearings by hand. If the bearings hang up or are not smooth in their operation in the races, replace bearings and races.
5. Coat the dust seal and bearing(s) with high quality, lithium base grease before installing.



RADIATOR

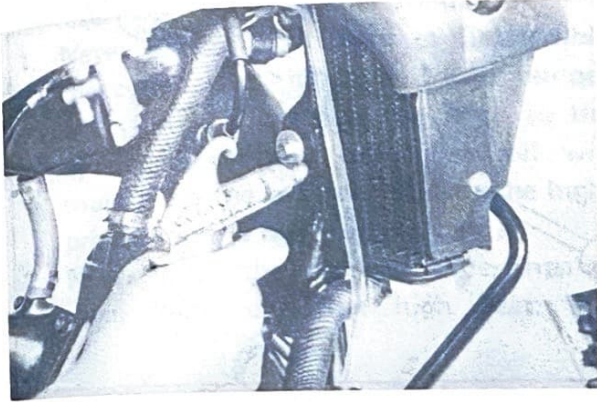


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COOLING SYSTEM

Cooling system checks

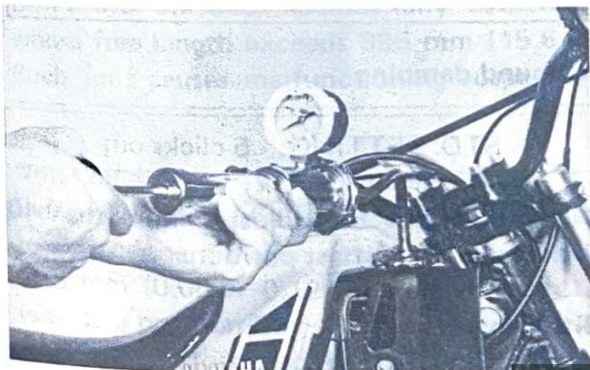
1. Check the radiator core for clogged or flattened fins. If more than 20% of the radiator core area is flattened, repair or replace the radiator core.
If the radiator is clogged, clean it by blowing it from its rear (engine side) with compressed air.



2. Check the coolant hoses for cracks and damage. Replace as required.
3. Inspect the cooling system for leaks. Attach the cap tester to the radiator and pump it to the specified pressure. If the pressure gauge drops, inspect all hoses, fittings and radiator for an external leak. If leakage is found, repair or replace defective parts.

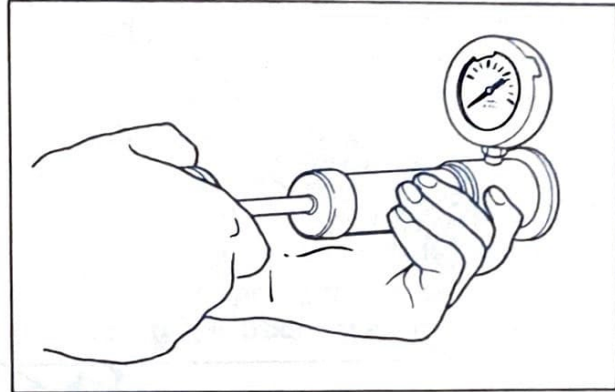
Pressure:

98.1 kPa (1.0 kg/cm², 14.2 psi)



4. Using the cap tester, check that the radiator cap vacuum valve and pressure valve operate correctly. Measuring with a tester, apply the specified pressure for 10 seconds, and make sure there is no pressure drop.

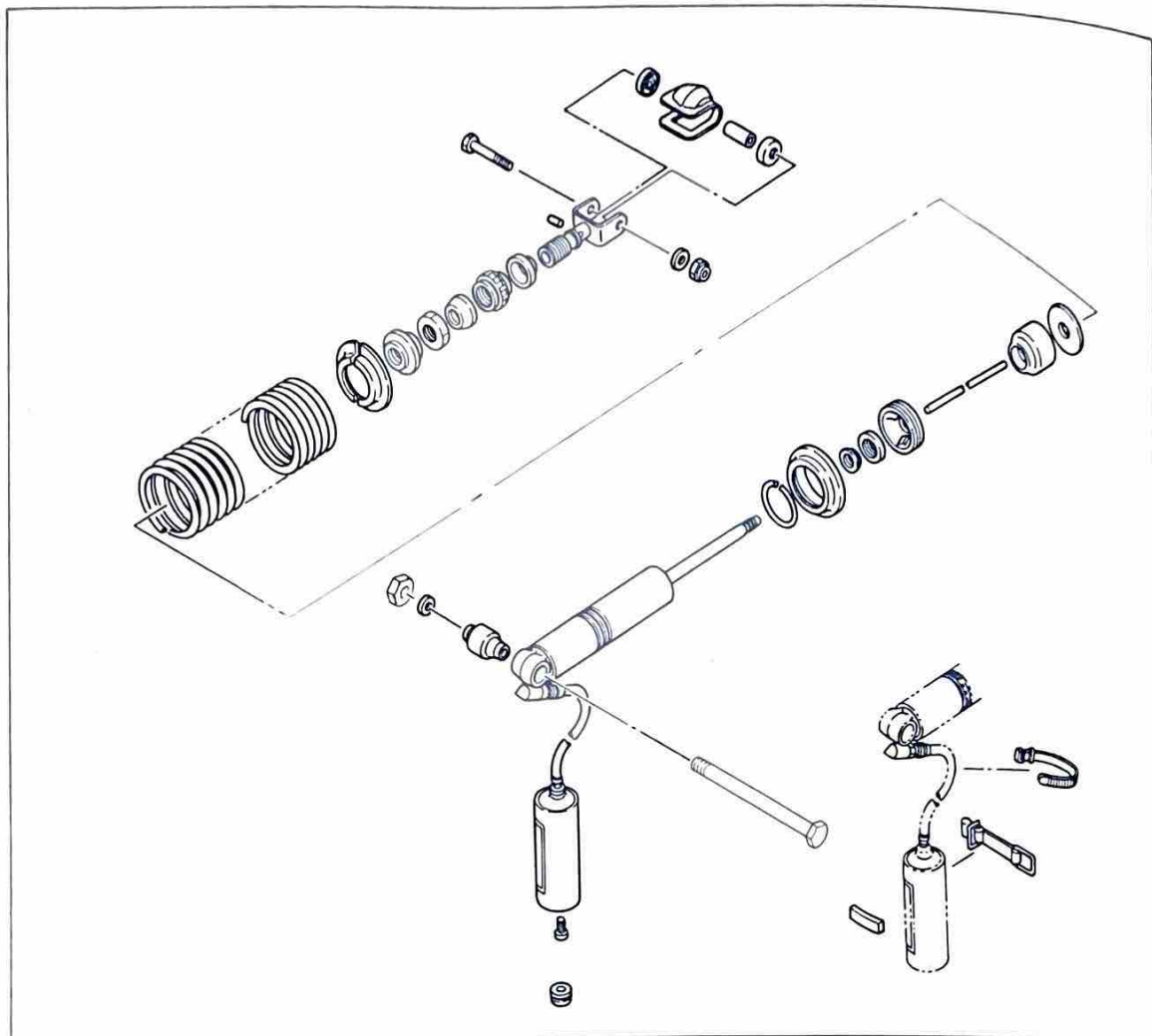
If the air pressure shows a drop, replace the radiator filler cap.



Valve opening pressure:

88.3 kPa (0.9 kg/cm², 12.8 psi)

REAR SHOCK (MONOCROSS SUSPENSION "DE CARBON" SYSTEM)



Rear shock setting

For details of rear shock setting, refer to the Race Preparation and Tuning Manual. It is advisable to take a note of the standard setting and specified range of adjustment.

Spring preload (installed length)

STD. 220 mm (8.66 in)
 MIN. 212 mm (8.35 in)
 MAX. 232 mm (9.13 in)

Adjuster 1 revolution = 1 mm

CAUTION:

Never attempt to turn the adjuster beyond the maximum or minimum setting.

Tightening torque:
 55 Nm (5.5 m·kg, 40 ft·lb)

Shock spring

Type	Part number
STD	22W-22212-00
HEAVY	22W-22212-20

Rebound damping

STD. SETTING: 5 clicks out

Don't turn out the adjuster more than 10 clicks from the stiffest position.

Nitrogen gas

STD. . . . 1,177 kPa (12 kg/cm², 171 psi)
 MIN. . . . 1,079 kPa (11 kg/cm², 156 psi)
 MAX. . . . 1,373 kPa (14 kg/cm², 199 psi)

Handling notes

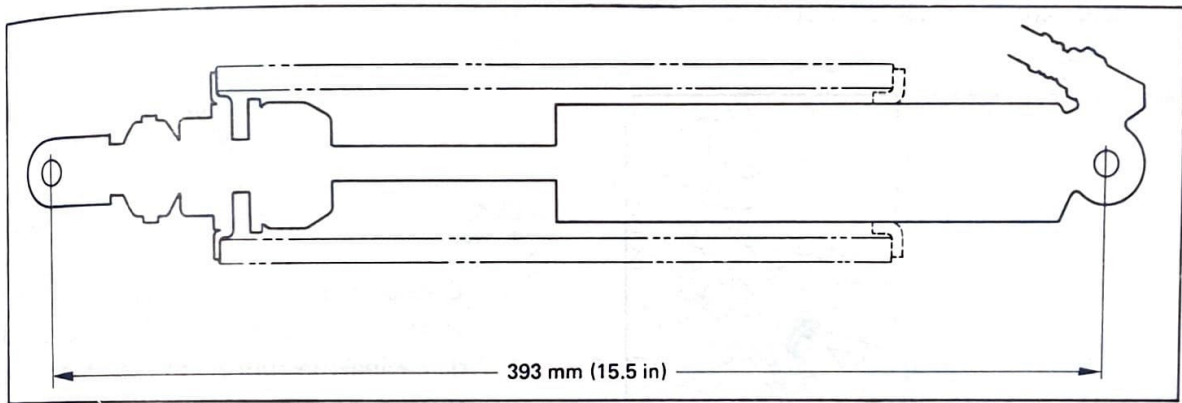
WARNING:

This shock absorber is provided with a separate type tank filled with high-pressure nitrogen gas. To prevent the danger of explosion, 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. Never tamper or attempt to disassemble the cylinder or the tank. Never tamper with the nut securing the hose to the cylinder assembly; otherwise, oil will spurt from the cylinder due to the high-pressure in the nitrogen gas tank.
2. Never throw the shock absorber into an open flame or other high heat. The

shock absorber may explode as a result of nitrogen gas expansion and/or damage to the hose.

3. Be careful not to damage any part of the gas tank. A damaged gas tank will impair the damping performance or cause a malfunction.
4. Use care not to damage any part of the hose. Any break-in the hose may result in a spurt of oil under high-pressure.
5. Take care not to scratch the contact surface of the piston rod with the cylinder; or oil could leak out.
6. Never attempt to remove the plug at the bottom of the nitrogen gas tank. It is very dangerous to remove the plug.
7. When scrapping the shock absorber, follow the instructions on disposal.



WARNING:

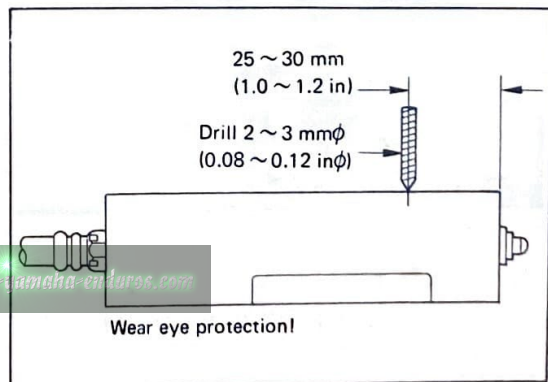
Don't use on this machine any suspension whose free length exceeds 395 mm (15.6 in). Such unit causes malfunctioning suspension.

WARNING:

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

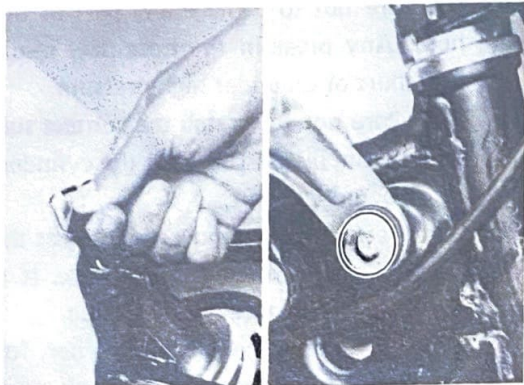
Notes on disposal (Yamaha dealers only)

Before disposing the shock absorber, be sure to extract the nitrogen gas. To do so, drill a 2 or 3 mm (0.08 or 0.12 in) hole through the tank at a position 25 ~ 30 mm (1.0 ~ 1.2 in) from the bottom end of the tank. At this time, wear eye protection to prevent eye damage from escaping gas and/or metal chips.

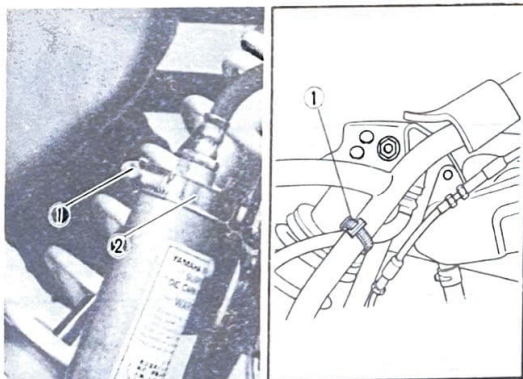


Removal

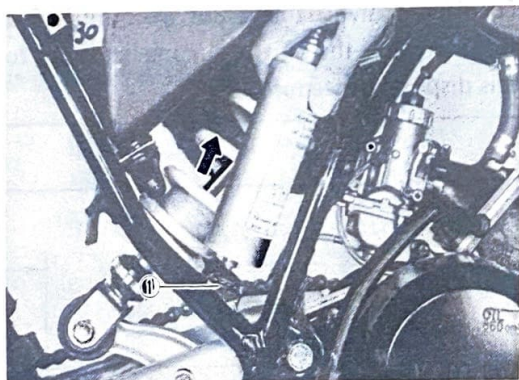
1. To remove the shock absorber, place the machine on a suitable stand to keep the bike stable while the shock absorber is removed.
2. Remove the seat and fuel tank, turn the cock off before remove the fuel line.



3. Remove the clamp holding the top of the remove shock reservoir to the frame, and pull the reservoir out of the grommet.

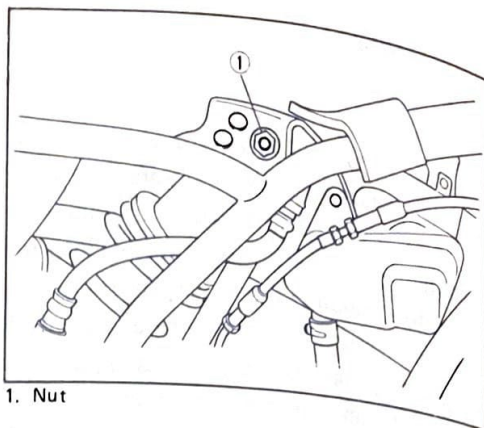


1. Fitting screw 2. Band 1. Band



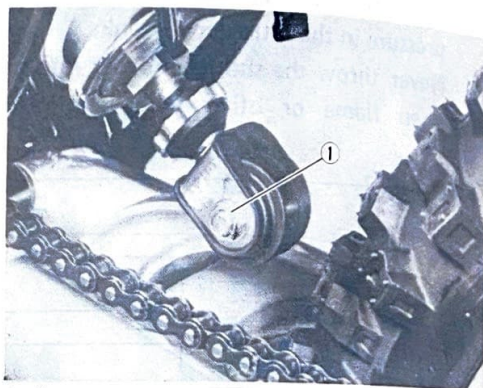
1. Grommet

4. Remove the nut and washer holding the upper securing bolt to the frame, and remove the bolt.



1. Nut

5. Remove the nut and washer holding the lower shock pivot bolt to arm, and remove the washers and bolt; take care not to lose the thrust covers.



1. Nut

6. Carefully remove the shock absorber from the frame; take care to avoid damaging the rubber hose or the shock reservoir.



7. For assembly, reverse the procedure for disassembly while taking the following precautions:

- a. Make sure the hose and reservoir are positioned.
- b. The following areas must be lubricated during setup, use a high-quality, lithium-base grease.

1. Swingarm pivot
2. Lower rod pivot
3. Upper rod pivot
4. Arm pivot
5. Lower shock mounting pivot
6. Wheel axle

c. Tighten the nut to specification.

Upper bolt:

32 Nm (3.2 m·kg, 23 ft·lb)

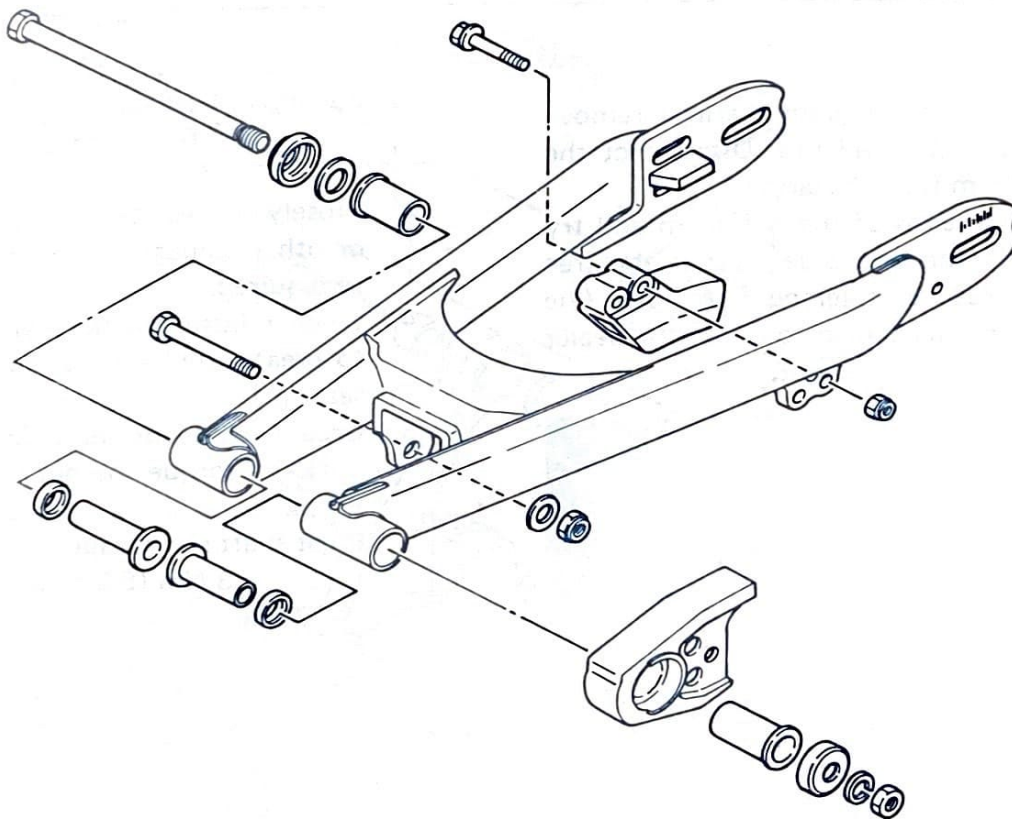
Lower bolt:

32 Nm (3.2 m·kg, 23 ft·lb)

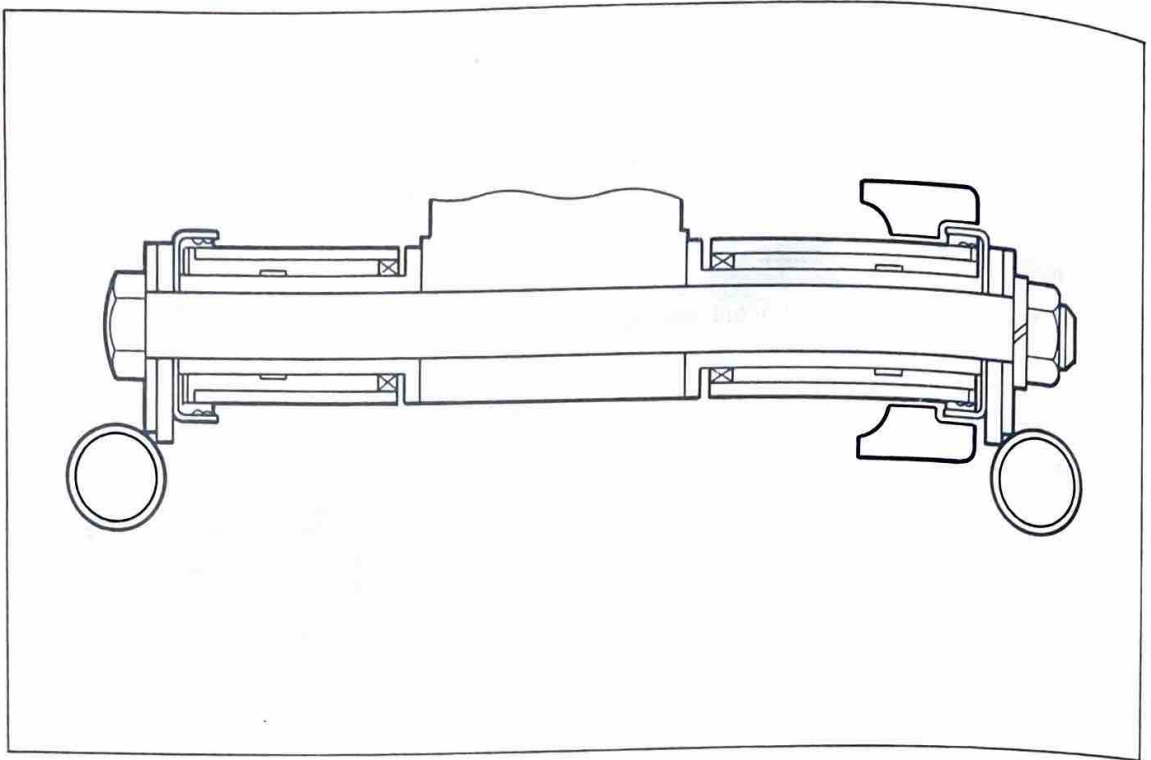
CAUTION:

Wipe off any excess grease, and avoid getting grease on the brake shoes.

SWINGARM

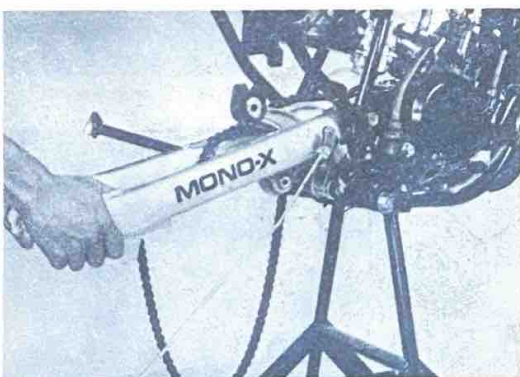


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Inspection

1. To check the swingarm bearings, remove the cotter pin and pin. Disconnect the shock from the swingarm.
2. Grasp the ends of the swingarm and try to move the arm sideways; if the free play exceeds tolerance, remove the swingarm and take it to a Yamaha dealer for bearing replacement.



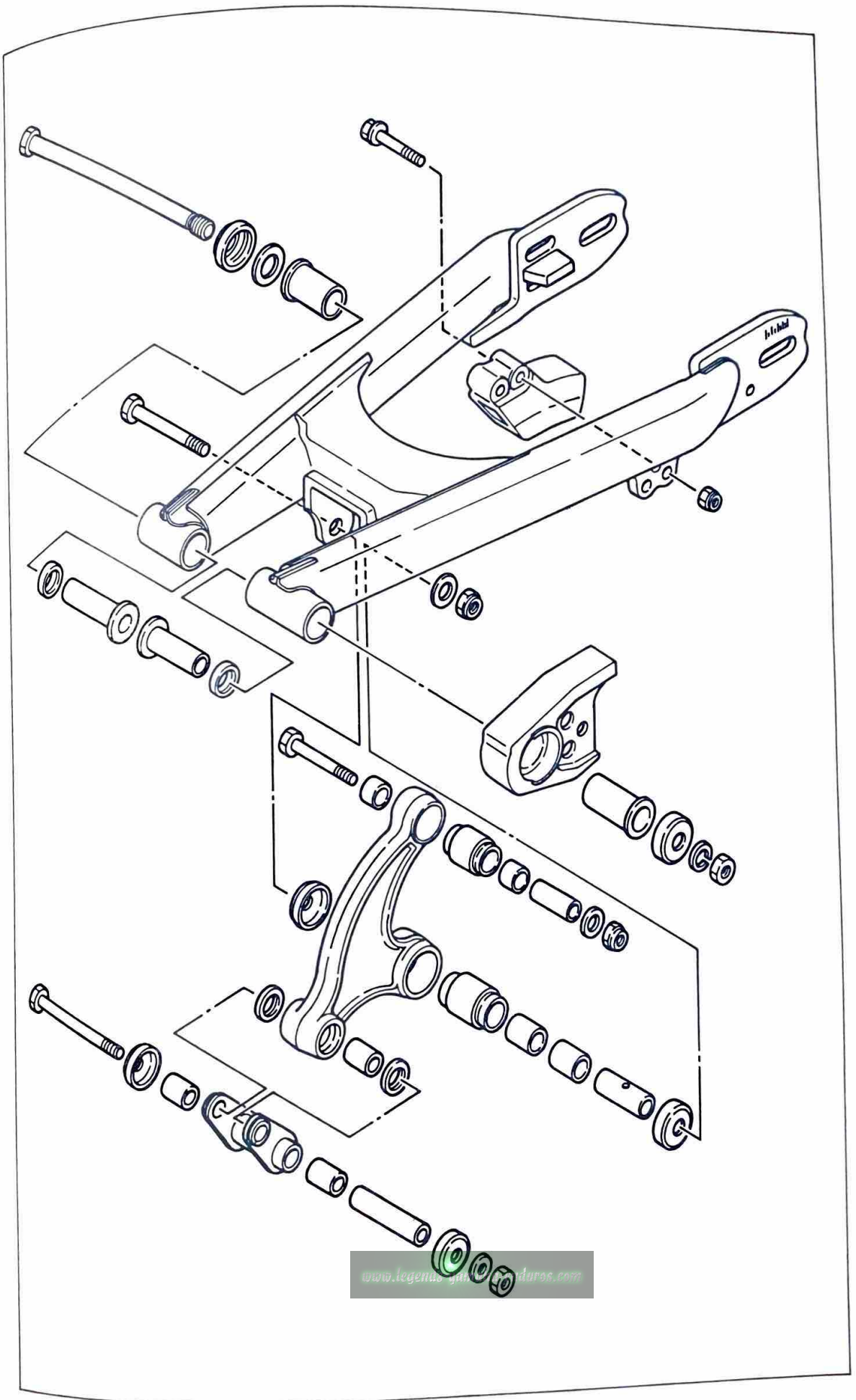
Swingarm free play:

0 ~ 1 mm (0 ~ 0.04 in)

3. Closely inspect the swingarm for cracks or other damage, and repair or replace it as required.
4. When reinstalling the swingarm, be sure to grease the bearings, bushings, and oil seal lips.
5. Grease the pivot shaft, install it and its nut, and torque the nut to specification.

Pivot shaft nut torque:

53 Nm (5.3 m·kg, 38 ft·lb)



5 ELECTRICAL TROUBLESHOOTING

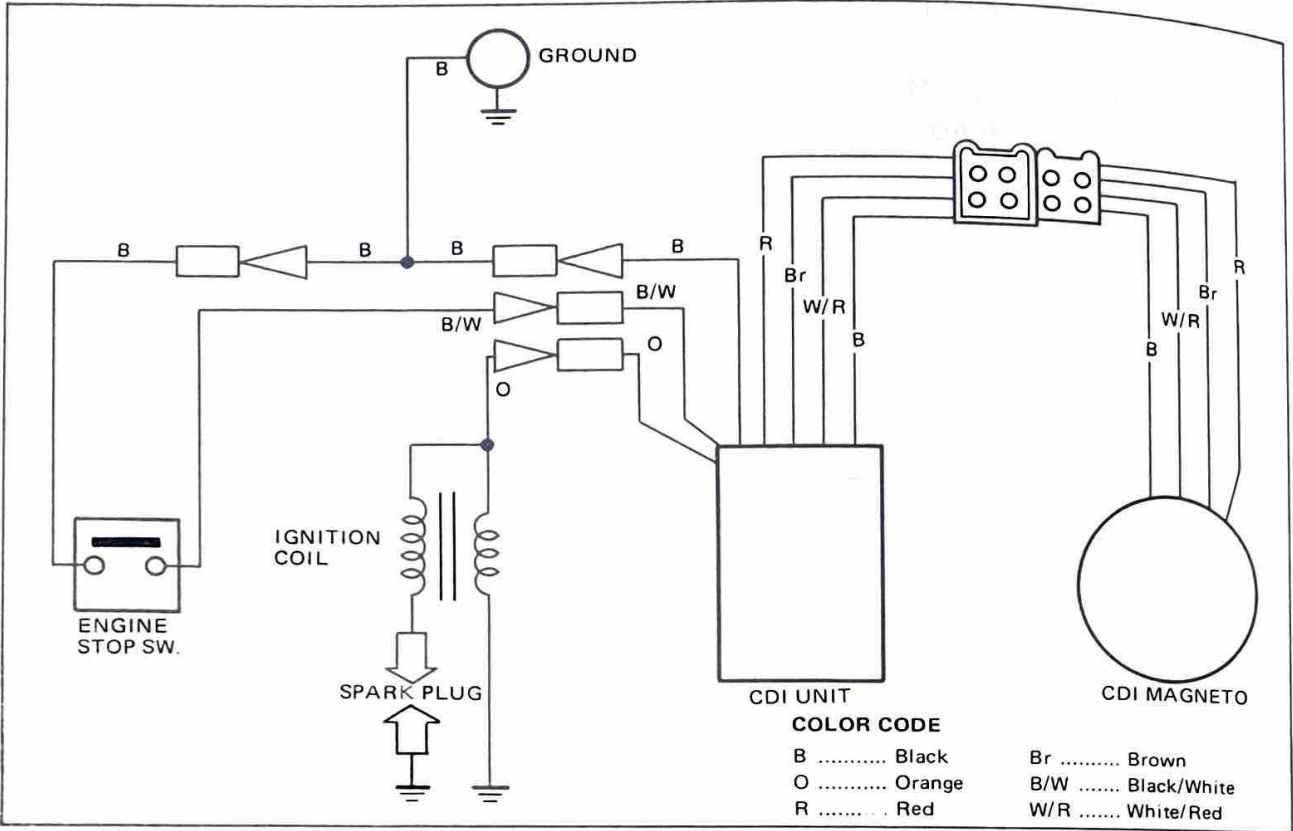
WIRING DIAGRAM 5-1

IGNITION SYSTEM 5-2

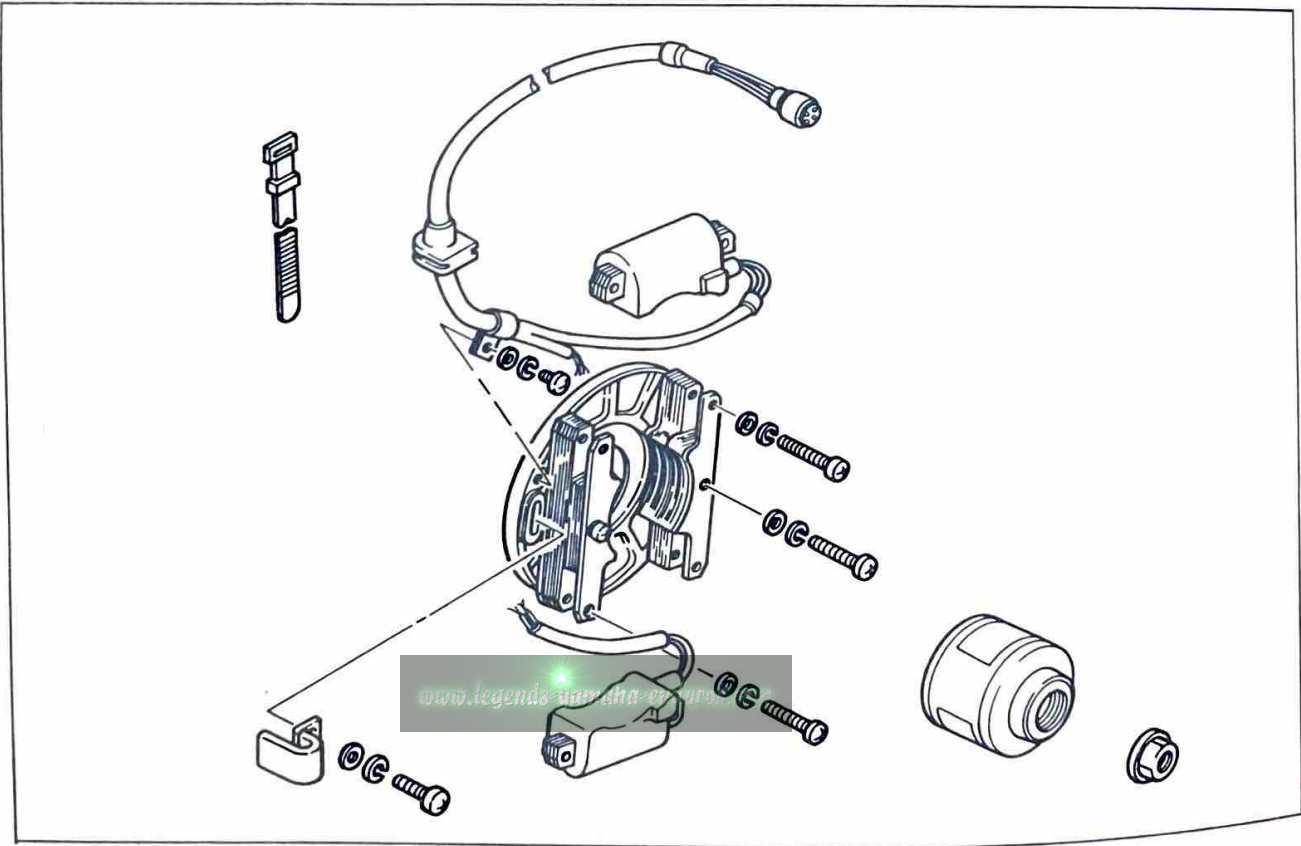
 Troubleshooting 5-2

5 ELECTRICAL TROUBLESHOOTING

WIRING DIAGRAM



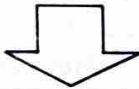
5



IGNITION SYSTEM

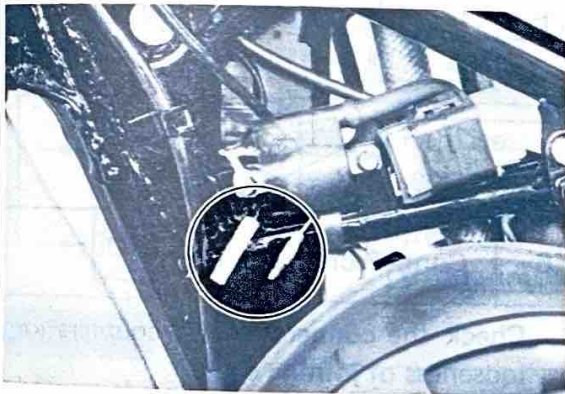
Troubleshooting

If the ignition spark is of poor quality or if there is no spark at all, use the following procedure, to locate and repair the problem.



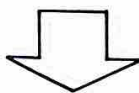
1 Engine stop switch

Disconnect the Black/White lead of engine stop switch at C.D.I. unit.



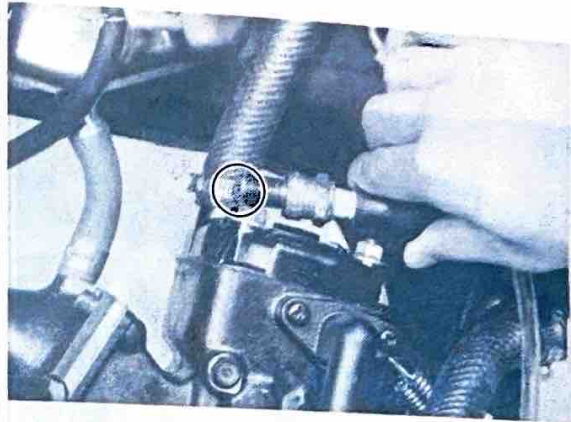
If start, engine stop switch shorted.

Engine does not start



2 Spark plug test

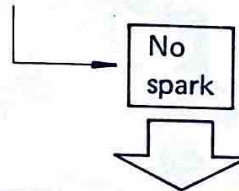
Remove the spark plug and check the spark.



Ground the spark plug to the cylinder head, and kick the starter.

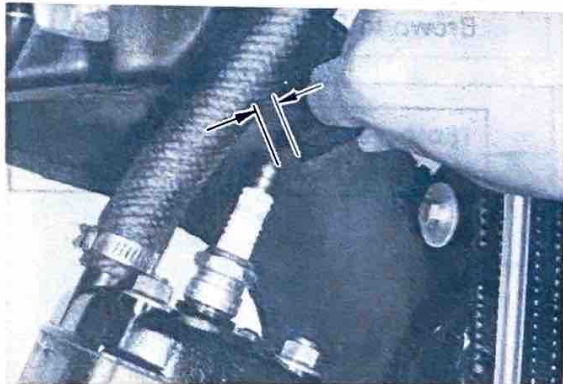
NOTE:

If the spark plug is oily or has carbon deposits, clean or replace it.



3 Spark gap test

Remove the spark plug cap and check the spark.

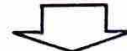


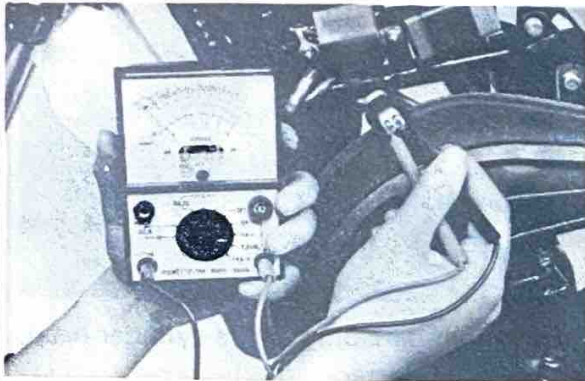

Hold the high tension lead 5 mm (0.20 in) from the head, and kick the engine through.

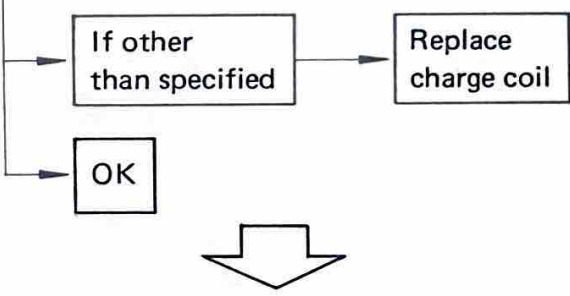
Good spark

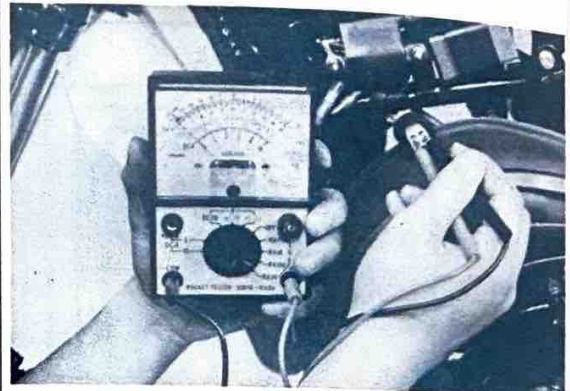
Check plug cap.

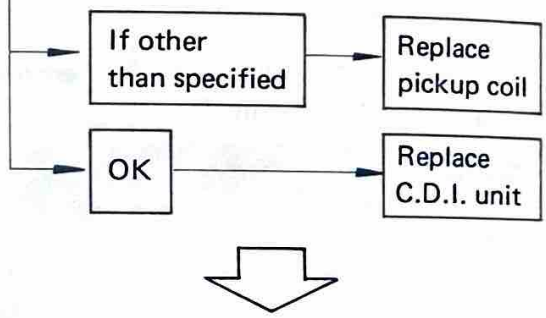
No spark



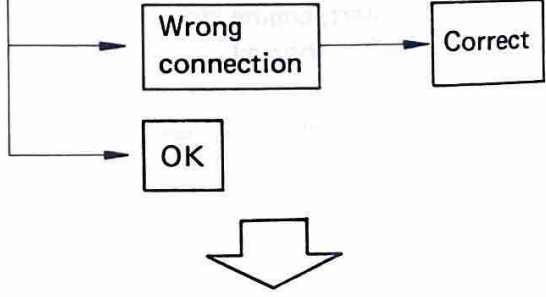
4	C.D.I. Magneto (Charge coil) test
<p>Disconnect the magneto leads, and use the pocket tester to check the resistance of the magneto coils.</p>	
	
	
<p>Charge coil resistance: Brown to Red: $1,437\Omega \pm 10\%$,</p>	



5	C.D.I. Magneto (Pickup coil) test
<p>Disconnect the magneto leads, and use the pocket tester to check the resistance of the pickup coil.</p>	
	
<p>Pickup coil resistance: Red to White/Red: $500\Omega \pm 10\%$</p>	



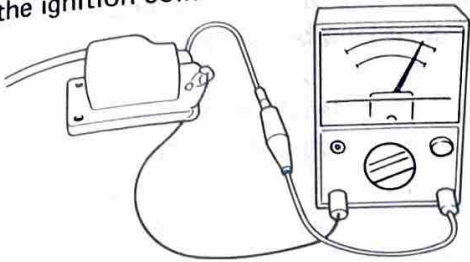
6	Connectors check-up
<ol style="list-style-type: none"> 1. Check the connectors and couplers for looseness of joining ends. 2. Keep the connectors and couplers from dirt or rust. 	



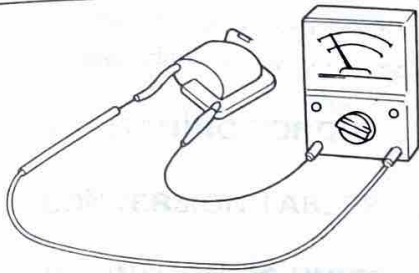
7

Ignition coil test

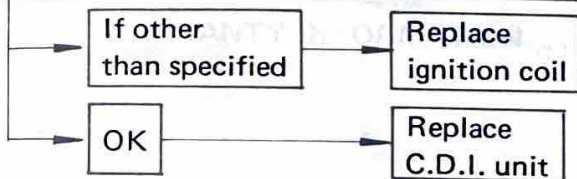
Use the pocket tester to check the resistance of primary and secondary windings of the ignition coil.



Primary coil resistance:
 $0.22\Omega \pm 10\%$



Secondary coil resistance:
 $4.4\text{ k}\Omega \pm 20\%$



CAUTION:

Make sure the wire harness is in a position it will not make contact with exhaust pipe, which could short out C.D.I. unit.

6 APPENDICES

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6 APPENDICES

TROUBLESHOOTING GUIDE

Engine is hard to start or does not start

Ignition System	
Possible Cause	Remedy
<ol style="list-style-type: none"> 1. Spark plug is wet. 2. Ignition coil is faulty. 3. C.D.I. unit is faulty. 4. C.D.I. magneto is faulty. (Pulser coil, source coil) 5. Ignition timing is incorrect. 6. Wire is broken, shorted or disconnected. 7. Engine stop switch is shorted. 	<ul style="list-style-type: none"> • Clean or replace • Replace • Replace • Replace • Adjust • Repair, replace or connect • Repair or replace
Compression System	
Possible Cause	Remedy
<ol style="list-style-type: none"> 1. Piston rings are sticking or worn. 2. Cylinder or piston is worn or scratched. 3. Compression leaks passing cylinder head gasket. (Head is distorted.) 4. Crankshaft side oil seal is faulty. 5. Air leaks through crankcase sealing surfaces. 	<ul style="list-style-type: none"> • Replace • Repair or replace • Replace (or repair) • Replace • Repair
Air/Fuel System	
Possible Cause	Remedy
<ol style="list-style-type: none"> 1. Carburetor pilot jet is clogged. 2. Fuel cock or pipe is clogged. 3. Float valve is faulty. (Float height is too high or too low.) 4. Reed valve is broken or deformed. 5. Fuel tank filler cap or carburetor breather pipe is clogged. 6. Air screw is improperly adjusted. 7. Fuel is deteriorated. 8. Oil-gas mixing ratio is incorrect. 9. Air leaks through carburetor joints. 	<ul style="list-style-type: none"> • Clean • Clean • Replace (remove gasoline from crankcase) • Replace • Clean • Adjust • Replace • Replace • Retighten or replace gasket

Poor high speed performance

Ignition System	
Possible Cause	Remedy
<ol style="list-style-type: none"> 1. Spark plug is dirty or plug gap is too narrow. 2. C.D.I. unit is faulty. 3. C.D.I. magneto is faulty. 4. Ignition coil is faulty. 5. Ignition timing is incorrect. 6. Loose wire connection. 	<ul style="list-style-type: none"> • Clean, repair or replace • Replace • Replace • Replace • Adjust • Repair
Compression System	
Possible Cause	Remedy
<ol style="list-style-type: none"> 1. Piston rings are sticking or worn. 2. Cylinder or piston is worn or scratched. 3. Compression leakage through crankcase sealing surfaces or crankshaft side oil seal. 4. Carbon deposits in combustion chamber (Piston, Cylinder head.) 5. Power valve malfunctions. 	<ul style="list-style-type: none"> • Replace • Repair or replace • Repair or replace • Decarbonize • Repair
Air/Fuel System	
Possible Cause	Remedy
<ol style="list-style-type: none"> 1. Clogged carburetor jets. 2. Improperly adjusted main jet. (High speed) 3. Improperly adjusted jet needle. (Medium speed) 4. Incorrect fuel lever 5. Dirty or clogged air cleaner element 6. Clogged fuel tank filler cap or carburetor breather pipe. 7. Clogged fuel cock or kinked fuel pipe. 8. Deteriorated fuel. 9. Improper oil-gas mixing ratio. 10. Cracked or broken exhaust pipe. (Leakage of exhaust gases.) 	<ul style="list-style-type: none"> • Clean • Adjust • Adjust • Adjust • Clean • Clean • Clean or repair • Replace • Replace • Replace

Overheat

Possible Cause	Remedy
<ol style="list-style-type: none">1. Incorrect air-fuel mixture.2. Air leaks through carburetor joint.3. Incorrect ignition timing.4. Carbon builds up in cylinder head or on piston head.5. Improper spark plug heat range (too hot)6. Fuel is deteriorated or oil-gas mixing ratio is incorrect.7. Coolant of inferior quality.8. Coolant level is low.9. Water pump is faulty.10. Cooling passage is clogged.11. Radiator is clogged.	<ul style="list-style-type: none">• Adjust• Repair or replace• Adjust• Decarbonize • Replace• Replace • Replace with specified type• Add upto specified line• Repair or replace• Clean passage• Clean radiator

Low coolant level

Possible Cause	Remedy
<ol style="list-style-type: none">1. Radiator is leaky.2. Hose is damaged or joint is loose.3. Water pump cover is leaky.	<ul style="list-style-type: none">• Repair or replace• Replace hose or retighten joint• Repair or replace

Transmission and shifter

Trouble	Possible Cause	Remedy
Gears slip off	<ol style="list-style-type: none"> 1. Gear dogs are worn. 2. Shift forks are bent. (burnt or worn) 3. Shift cam stopper spring is fatigued. 	<ul style="list-style-type: none"> • Replace • Replace • Replace
Gear shifts skipping over the next.	<ol style="list-style-type: none"> 1. Shift cam stopper spring is fatigued. 2. Shift forks are bent. (burnt or worn) 	<ul style="list-style-type: none"> • Replace • Replace
Gear does not select	<ol style="list-style-type: none"> 1. Shift cam is worn. (broken) 2. Change shaft is bent. 3. Shift arm spring is broken. 4. Gear are broken. 	<ul style="list-style-type: none"> • Replace • Replace • Replace • Removal (Replace)
Shift pedal does not return.	<ol style="list-style-type: none"> 1. Change return spring is broken. 2. Change shaft bent. 	<ul style="list-style-type: none"> • Replace • Replace

Clutch

Trouble	Possible Cause	Remedy
Clutch slips	<ol style="list-style-type: none"> 1. Friction plate is worn. 2. Clutch plate is worn. 3. Clutch spring is fatigued. 4. Pressure plate is deformed. 5. Clutch adjustment is incorrect. 6. Match marks of clutch boss and pressure plate does not aligned. 	<ul style="list-style-type: none"> • Replace • Replace • Replace • Replace • Adjust • Reassemble
Clutch drags	<ol style="list-style-type: none"> 1. Clutch plate is warped. 2. Clutch lock nut is loosen. 3. Friction plate is broken. 4. Clutch play is too much. 5. Oil viscosity is incorrect. 	<ul style="list-style-type: none"> • Replace • Replace • Replace • Adjust • Replace

Chassis

Steering head is loose		
Possible Cause		Remedy
<ol style="list-style-type: none"> 1. Roller is worn. 2. Steering lock nut is loose. 		<ul style="list-style-type: none"> • Replace • Retighten
Wheels have excessive run-out		
Possible Cause		Remedy
<ol style="list-style-type: none"> 1. Bearing is worn. 2. Rim has dent. 3. Spokes are loose (or broken). 4. Axle nut is loose. 		<ul style="list-style-type: none"> • Replace • Repair or replace • Retighten or replace • Retighten
Brakes		
Trouble	Possible Cause	Remedy
Faulty	<ol style="list-style-type: none"> 1. Brake shoes are worn. 2. Brake is improperly adjusted. 3. Brake drum contains water. 4. Lining is greasy. 	<ul style="list-style-type: none"> • Replace • Adjust • Clean • Degrease or replace
Not return smoothly	<ol style="list-style-type: none"> 1. Wire is starved for oil. 2. Camshaft is starved for grease. 3. Return spring or brake shoe spring is broken. 4. Brake pedal axle is starved for grease. 	<ul style="list-style-type: none"> • Grease or replace • Grease • Replace • Grease
Frame and Swingarm		
Possible Cause		Remedy
<ol style="list-style-type: none"> 1. Frame is cracked. 2. Rear arm is bend. 3. Rear arm is cracked. 4. Bushing is worn. 5. Bushing lacks oil. 		<ul style="list-style-type: none"> • Weld, reinforced or replace • Repair or replace • Replace • Replace • Lubricate

SPECIFICATIONS

General

Model	YZ80K
Model: I.B.M. No. Frame I.D. & Starting number Engine I.D. & Starting number	22W 22W-000101 22W-000101
Dimension: Overall length Overall width (standard) Overall height (standard) Seat height Wheelbase Minimum ground clearance	1,790 mm (70.5 in) 765 mm (30.1 in) 1,050 mm (41.3 in) 790 mm (31.1 in) 1,230 mm (48.4 in) 280 mm (11.0 in)
Weight: Net weight	62 kg (137 lb)

Engine

Model	YZ80K
Discription: Engine type Engine model Displacement Bore x Stroke Compression ratio Starting system Ignition system Lubrication system	Water cooled 2-stroke gasoline, torque induction 22W 79 cm ³ (4.82 cu.in) 47 x 45.6 mm (1.850 x 1.795 in) 8.0 : 1 Primary kick Capacitor discharge ignition Mixed gasoline (Yamalube "R"; 24 : 1, Castrol R30, A545; 20 : 1)
Cylinder head: Combustion chamber volume	6.25 cm ³ (0.38 cu.in)
Cylinder: Material Bore size Taper limit Out of round limit	Cast iron sleeve with aluminum alloy 47 mm (1.850 in) 0.05 mm (0.0020 in) 0.01 mm (0.0004 in)
Piston: Piston skirt clearance Measuring point Adjustment amount Piston over size	0.060 ~ 0.065 (0.0024 ~ 0.0026 in) 26.4 mm (1.04 in) 0.01 mm (0.0004 in) 47.25, 47.50, 47.75, 48.00 mm (1.860, 1.870, 1.880, 1.890 in)
Piston rings: Piston ring design (Top/Second) Ring end gap (installed) (Top/Second) Ring groove side clearance (Top/Second)	Plain 0.30 ~ 0.45 mm (0.012 ~ 0.018 in) 0.04 ~ 0.08 mm (0.0016 ~ 0.0031 in)
Small end bearing: Type	Needle bearing (12-16-14.8)
Big end bearing: Type	Needle bearing (18-24-14)

Model	YZ80K
Crankshaft: Crankshaft assembly width (F) Crankshaft deflection (A) Connecting rod big end side clearance (C) Connecting rod small end deflection (S) Crank bearing type: Left Right Crank oil seal type: Left Right	45 ^{-0.05} _{-0.10} mm (1.772 ^{-0.002} _{-0.004} in) 0.03 mm (0.0012 in) 0.2 ~ 0.7 mm (0.008 ~ 0.028 in) 0.5 ~ 1.2 mm (0.020 ~ 0.047 in) <<2 mm (0.08 in)>> 6204 6204 SD20 x 40 x 8 - GS MHSD 28 x 40 x 8
Clutch: Clutch type Clutch operating mechanism Primary reduction ratio & Method Friction plate – Thickness/Quantity – Wear limit Clutch plate – Thickness/Quantity – Warp limit Clutch spring – Free length/Quantity – Wear limit Clutch housing – Thrust clearance – Radial clearance Push rod bending limit	Wet, multiple disc type Inner push type, cam axle 68/19 (3.579), helical gear 3.0 mm (0.12 in)/5 pcs. 2.7 mm (0.106 in) 1.2 mm (0.047 in)/4 pcs. 0.05 mm (0.0020 in) 32.0 mm (1.26 in)/4 pcs. 31.0 mm (1.22 in) 0.1 ~ 0.35 mm (0.004 ~ 0.014 in) 0.022 ~ 0.051 mm (0.0009 ~ 0.0020 in) 0.15 mm (0.008 in)
Transmission: Type Gear ratio (Teeth) (Ratio): 1st 2nd 3rd 4th 5th 6th Transmission gear oil quantity & Type Bearing type: Main axle: Left Right Left Right Drive axle oil seal type Secondary reduction method Secondary reduction ratio	Constant mesh 6 speed, return 36/13 (2.769) 33/16 (2.062) 31/19 (1.631) 28/21 (1.333) 23/20 (1.150) 25/24 (1.042) Total: 650 cm ³ (0.57 Imp qt, 0.69 US qt) Exchange: 700 cm ³ (0.62 Imp qt, 0.74 US qt) Yamalube 4-cycle oil or SAE 10W30 SE motor oil Needle bearing (19 x 12 x 12) 6203 6204 Needle bearing (22 x 15 x 12) SD 20 x 38 x 5 Chain 42/12 (3.500)
Shafting mechanism: Type Oil seal type Shift fork finger thickness/Limit	Guide bar type SDO 12 x 19 x 5 4.85 mm/4.45 mm (0.191 in/0.175 in)
Intake: Air cleaner – Type – Oil grade Reed valve, type Bending limit Valve lift	Oiled foam rubber Foam-air-filter oil "V" type 0.3 mm (0.012 in) 10.3 mm (0.41 in)
Carburetor: Type & Manufacturer/Quantity I.D. mark	VM26, MIKUNI/1 pc. 22W00

Model	YZ80K
Main jet (M.J.)	#250
Air jet (A.J.)	φ1.0
Jet needle-clip position (J.N.)	4H16-4
Needle jet (N.J.)	O-6
Cutaway (C.A.)	2.0
Pilot jet (P.J.)	#45
Air screw turns out (A.S.)	1 1/2
Starter jet (G.S.)	#40
Fuel level (F.L.)	21 ± 1.0 mm (0.83 ± 0.04 in)
Cooling:	
Radiator core size:	
Width	85 mm (3.35 in)
Height	280 mm (11.0 in)
Thickness	32 mm (1.26 in)
Radiation capacity	5,000 kcal/h
Radiator cap opening pressure	0.9 kg/cm ²
Coolant capacity (Total)	0.45 L (0.40 Imp qt, 0.48 US qt)
Water pump:	
Type	Single-suction centrifugal pump
Bearing type	B6001
Oil seal type	FLJ12-31-13.5GS
Reduction ratio	28/19 (1.474)

Chassis

Model	YZ80K
Frame:	
Frame design	Tubular steel semidouble cradle
Steering system:	
Caster	26°
Trail	80 mm (3.15 in)
Bearing type	Ball bearing
Lock to lock angle	90°
Front suspension:	
Type	Telescopic fork
Damper type	Coil, air spring, oil damper
Front fork travel	240 mm (9.45 in)
Front fork springs:	
Free length	554 mm (21.81 in)
Spring constant	K = 2.1 N/mm (0.21 kg/mm, 11.76 lb/in)
Inner tube outside diameter	33 mm (1.30 in)
Front fork oil quantity & Type	260 cm ³ (9.2 Imp oz, 8.8 US oz), Fork oil 10wt
Oil level	173 mm (6.81 in)
Air pressure	0 kPa (0 kg/cm ² , 0 psi)
Rear suspension:	
Type	Monocross suspension
Gas pressure	1,177 kPa (12 kg/cm ² , 171 psi)
Gas properties	Nitrogen gas
Absorber stroke	90 mm (3.54 in)
Wheel travel	250 mm (9.84 in)
Compression spring:	
Free length	240 mm (9.45 in)
Set length	220 mm (8.66 in)
Spring constant	K = 32.5 N/mm (3.25 kg/mm, 182 lb/in)

Model	YZ80K
Swing arm free play Pivot shaft – outside diameter	1 mm (0.04 in) 12 mm (0.47 in)
Fuel tank: Capacity	5.0 L (1.1 Imp gal, 1.3 US gal)
Wheel: Tire size: Front Rear Tire pressure (Std.): Front Rear Rim size: Front Rear Rim run out limit (Front/Rear): Vertical Lateral Secondary drive chain type: Type Number of links Chain free play	2.75-17-4 PR 4.10-14-4 PR 98.07 kPa (1.0 kg/cm ² , 14 psi) 98.07 kPa (1.0 kg/cm ² , 14 psi) 1.4-17 1.6-14 2 mm (0.08 in) 2 mm (0.08 in) DK 428 109L + Joint 30 ~ 35 mm (1.18 ~ 1.38 in)
Brake: Front brake: Type Drum diameter Lining thickness/Wear limit Rear brake: Type Drum diameter Lining thickness/Wear limit	Leading trailing 95 mm (3.74 in) 4 mm/2 mm (0.16 in/0.08 in) Leading trailing 95 mm (3.74 in) 4 mm/2 mm (0.16 in/0.08 in)

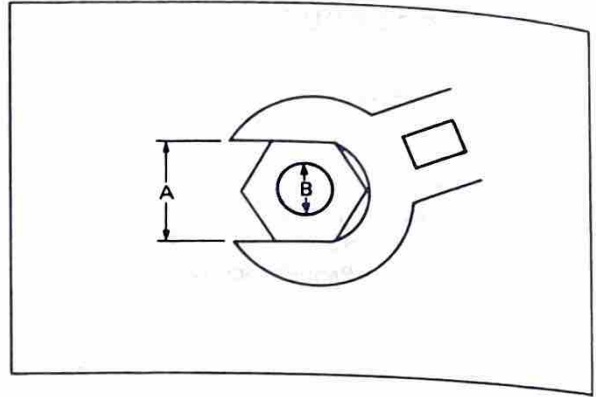
Electrical

Model	YZ80K
Ignition system: Type Model/Manufacturer Charge coil resistance Pulser coil resistance	Capacitor Discharge Ignition M100-30A/HITACHI 1,437Ω ± 10% (Red – Brown) 500Ω ± 10% (Red – White/Red)
Ignition timing:	B.T.D.C. 14.5°/11,000 r/min, 0.83 mm (0.32 in)
Ignition coil: Model/Manufacturer Spark gap Primary winding resistance Secondary winding resistance	CM61-29/HITACHI 6 mm (0.24 in) or more 0.22Ω ± 10% 4.4 kΩ ± 20%
Spark plug: Type/Manufacturer Spark plug gap	N-84/CHAMPION 0.6 ~ 0.7 mm (0.024 ~ 0.028 in)
C.D.I. unit: Type/manufacturer	T1A01-26A/HITACHI

TIGHTENING TORQUE

Part to be tightened	Thread size	Tightening torque		
		Nm	m·kg	ft·lb
Engine:				
Spark plug	M14	25	2.5	18
Cylinder head nut, stud	M8	25	2.5	18
Cylinder drain bolt	M6	10	1.0	7.2
Housing cover — Panhead screw	M6	10	1.0	7.2
— Bolt	M6	10	1.0	7.2
Intake manifold	M6	12	1.2	8.7
Crankcase	M6	10	1.0	7.2
Crankcase cover	M6	10	1.0	7.2
Joint	M6	10	1.0	7.2
Air cleaner case	M6	12	1.2	8.7
Bearing cover plate	M6	10	1.0	7.2
Air chamber	M6	10	1.0	7.2
Muffler	M6	10	1.0	7.2
Plate	M6	10	1.0	7.2
Oil drain bolt	M12	20	2.0	14
Kickstarter lever	M10	35	3.5	18
Primary drive gear	M12	68	6.8	49
Clutch	M10	55	5.5	40
Clutch spring	M5	6	0.6	4.3
Shift pedal	M6	10	1.0	7.2
Stopper lever	M6	14	1.4	10
Magneto rotor	M10	35	3.5	25
Magneto backing plate	M6	8	0.8	5.8
Chassis:				
Engine mounting bolt	M8	40	4.0	29
Handle crown:				
Inner tube	M8	23	2.3	17
Steering shaft	M14	60	6.0	43
Handle holder	M8	27	2.7	19
Front wheel axle	M12	74	7.4	53
Front fender	M6	6	0.6	4.3
Rear wheel axle	M14	85	8.5	61
Rear hub	M8	30	3.0	22
Fuel tank stay	M6	7	0.7	5.1
Fuel tank	M6	7	0.7	5.1
Fuel cock	M6	7	0.7	5.1
Side stand	M8	20	2.0	14
Side stand bracket	M10	48	4.8	35
Rear fender	M8	17	1.7	12
Pivot shaft	M12	53	5.3	38
Sprocket wheel	M8	25	2.5	18
Rear shock — L arm	M10	32	3.2	23
L arm — Rear arm	M10	32	3.2	23
— Conrod	M10	32	3.2	23
Frame — Conrod	M10	32	3.2	23
Footrest bracket	M10	45	4.5	32
Brake cam lever	M6	10	1.0	7.2

A (Nut)	B (Bolt)	Torque specification		
		Nm	m•kg	ft•lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11.0
14 mm	10 mm	30	3.0	22.0
17 mm	12 mm	55	5.5	40.0
19 mm	14 mm	85	8.5	61.0
22 mm	16 mm	130	13.0	94.0



DEFINITION OF UNITS

Unit	Read	Definition	Measure
mm cm	millimeter centimeter	10^{-3} meter 10^{-2} meter	Length Length
kg N	kilogram Newton	10^3 gram $1 \text{ kg} \times \text{m}/\text{sec}^2$	Weight Force
Nm $\text{m} \cdot \text{kg}$	Newton meter Meter kilogram	$\text{N} \times \text{m}$ $\text{m} \times \text{kg}$	Torque Torque
Pa N/mm	Paskal Newton per millimeter	N/m^2 N/mm	Pressure Spring rate
L cm^3	Liter Cubic centimeter	—	Volume or Capacity
r/min	Rotation per minute	—	Engine speed

CONVERSION TABLES

METRIC TO INCH SYSTEM			
	KNOWN	MULTIPLIER	RESULT
TORQUE	$\text{m} \cdot \text{kg}$	7.233	ft·lb
	$\text{m} \cdot \text{kg}$	86.80	in·lb
	$\text{cm} \cdot \text{kg}$	0.0723	ft·lb
	$\text{cm} \cdot \text{kg}$	0.8680	in·lb
WT.	kg	2.205	lb
	g	0.03527	oz
FLOW/DISTANCE	km/lit	2.352	mpg
	km/hr	0.6214	mph
	km	0.6214	mi
	m	3.281	ft
	m	1.094	yd
	cm	0.3937	in
	mm	0.03937	in
VOL./CAPACITY	cc (cm^3)	0.03382	oz (US liq)
	cc (cm^3)	0.06102	cu.in
	lit (liter)	2.1134	pt (US liq)
	lit (liter)	1.057	qt (US liq)
	lit (liter)	0.2642	gal (US liq)
MISC.	kg/mm	56.007	lb/in
	kg/cm^2	14.2234	psi (lb/in^2)
	Centigrade ($^{\circ}\text{C}$)	$9/5 (^{\circ}\text{C}) + 32$	Fahrenheit ($^{\circ}\text{F}$)

INCH TO METRIC SYSTEM			
	KNOWN	MULTIPLIER	RESULT
TORQUE	ft·lb	0.13826	$\text{m} \cdot \text{kg}$
	in·lb	0.01152	$\text{m} \cdot \text{kg}$
	ft·lb	13.831	$\text{cm} \cdot \text{kg}$
	in·lb	1.1521	$\text{cm} \cdot \text{kg}$
WT.	lb	0.4535	kg
	oz	28.352	g
FLOW/DISTANCE	mpg	0.4252	km/lit
	mph	1.609	km/hr
	mi	1.609	km/hr
	ft	0.3048	km/hr
	yd	0.9141	m
	in	2.54	m
	in	25.4	mm
VOL./CAPACITY	oz (US liq)	29.57	cc (cm^3)
	cu.in	16.387	cc (cm^3)
	pt (US liq)	0.4732	lit (liter)
	qt (US liq)	0.9461	lit (liter)
	gal (US liq)	3.785	lit (liter)
MISC.	lb/in	0.017855	kg/mm
	psi (lb/in^2)	0.07031	kg/cm^2
	Fahrenheit ($^{\circ}\text{F}$)	$5/9 (^{\circ}\text{F}) - 32$	Centigrade ($^{\circ}\text{C}$)

CABLE ROUTING DIAGRAM

1. Throttle wire

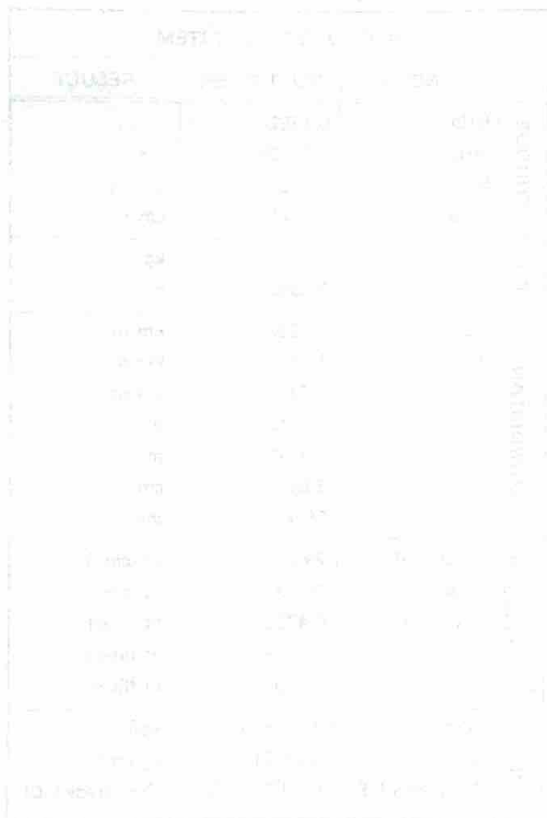
Grip cap → Behind the brake wire and number plate → Right side of number plate → Right side of head pipe → Inner side of radiator → Outer side of flywheel magneto lead → Inner side of radiator hose 1 → Inner side of Y.E.I.S. hose → Carburetor

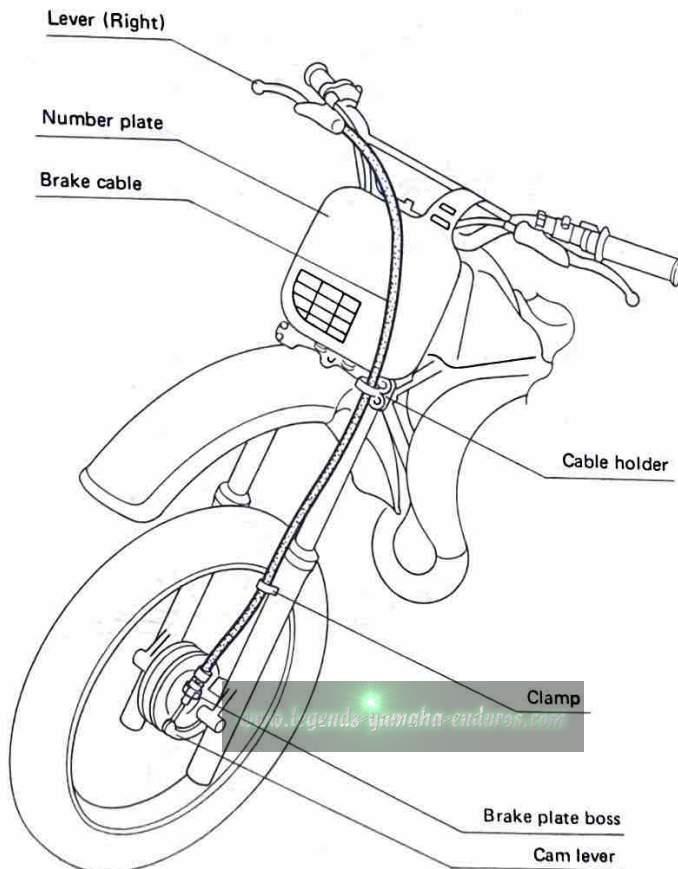
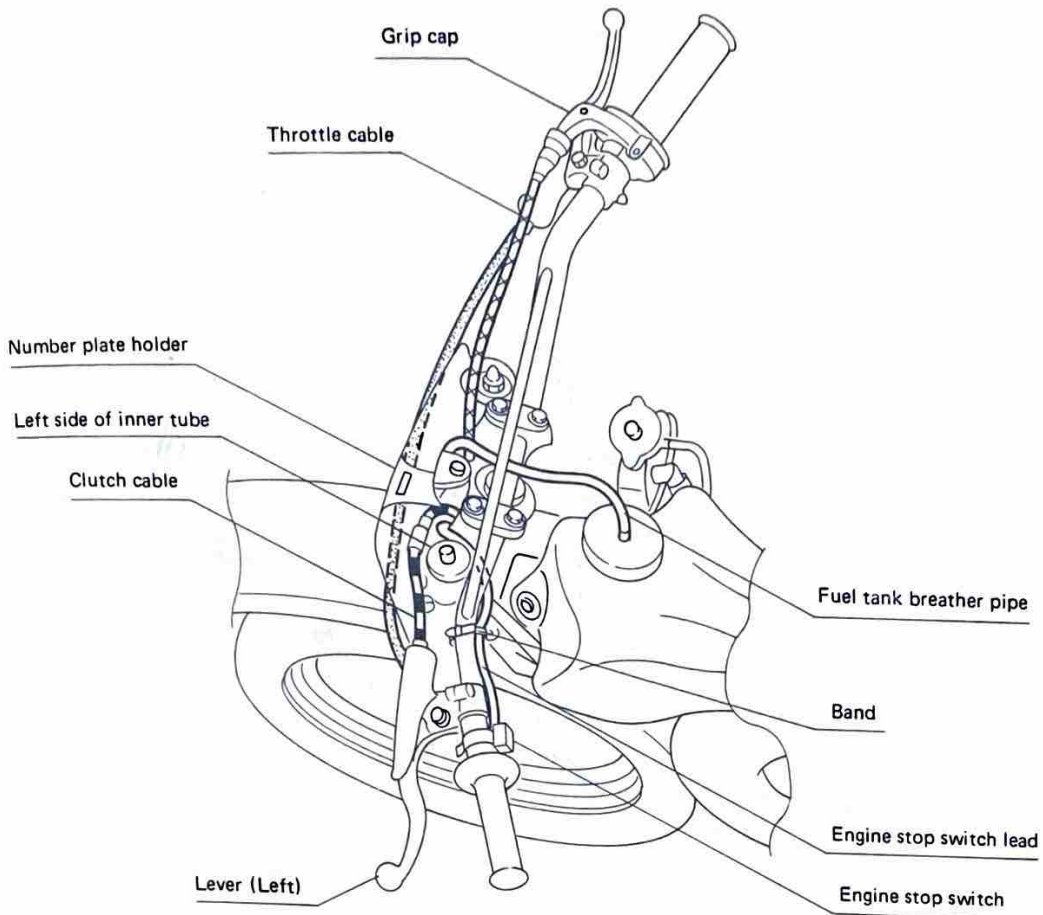
2. Front brake wire

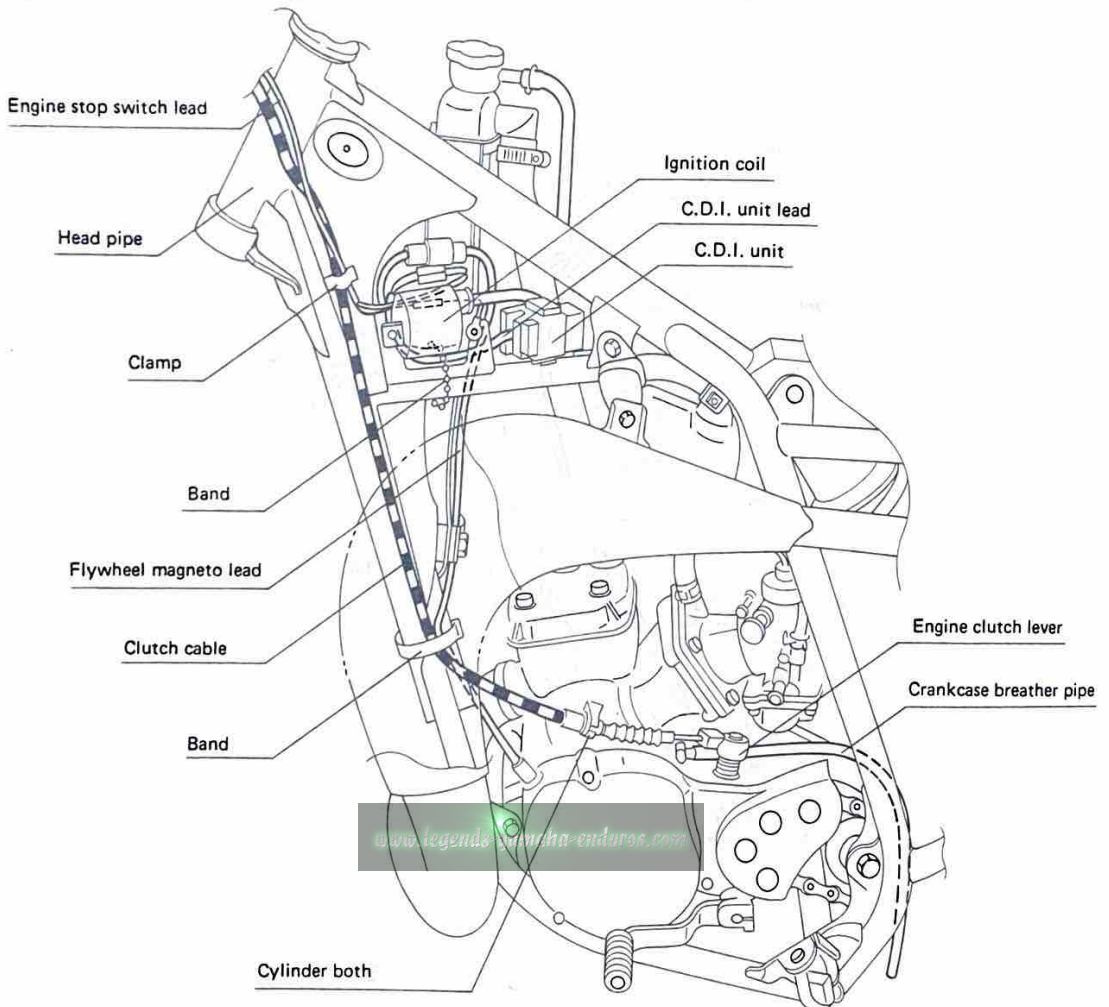
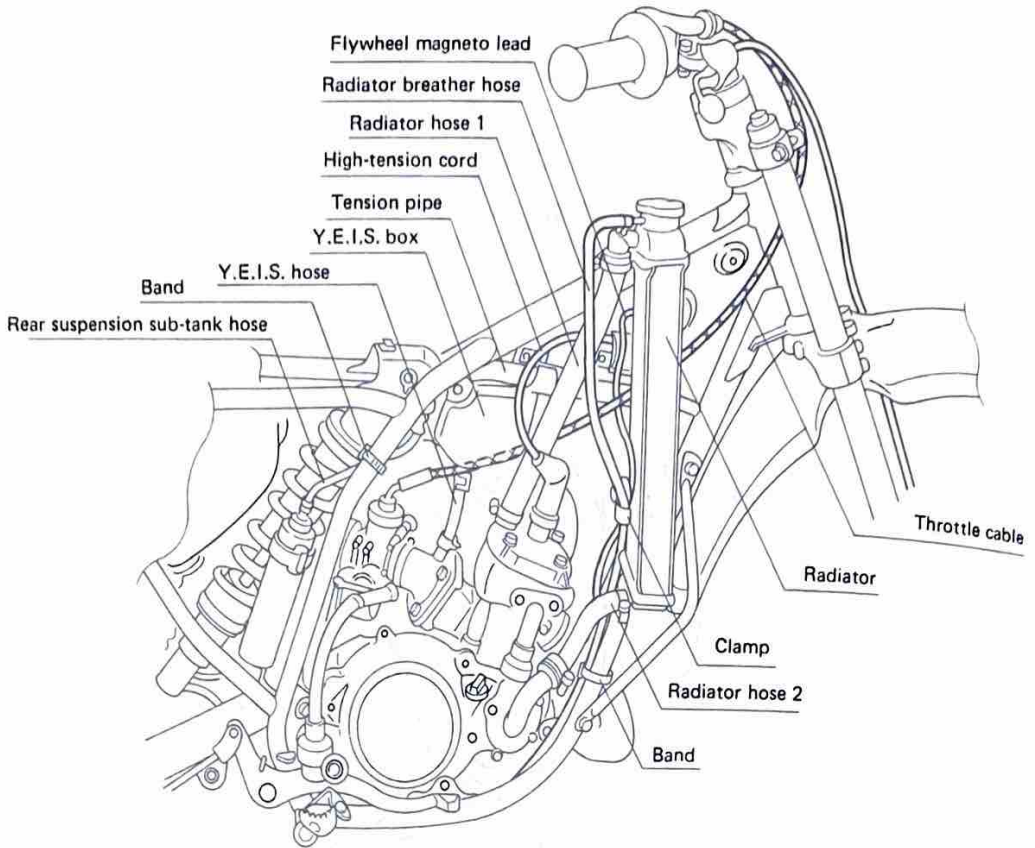
Lever (right) → In front of number plate → Wire holder (left side of underbracket) → Clamp and tighten the screw (outer tube) → Camshaft lever

3. Clutch wire

Lever (left) → Inner side of number plate → Left side of head pipe → Band (under the downtube) → Both cylinder → Clutch lever axle







WARRANTY INFORMATION

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/REPAIR.



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