YAMAHA

# IT175J

## OWNER'S MANUAL

## TUNING AND SERVICE

LIT-11626-03-13

5X8-28199-10

# 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 your 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**Some data in this manual may become outdated due to improvements made to this model in the future.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 your Yamaha dealer.**

SERVICE DEPT.
INTERNATIONAL DIVISION
YAMAHA MOTOR COMPANY, LTD.

# 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 REGURATIONS. SUSPENSION ON THIS MACHINE CAN BE ADJUSTED TO ACCOMODATE DIFFERING RIDER WEIGHTS AND TECHNIQUE.

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

IT175J
OWNER'S MANUAL
TUNING AND SERVICE
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# 1 GENERAL INFORMATION


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# 1 GENERAL INFORMATION

## MACHINE IDENTIFICATION

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

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

**Frame serial number**

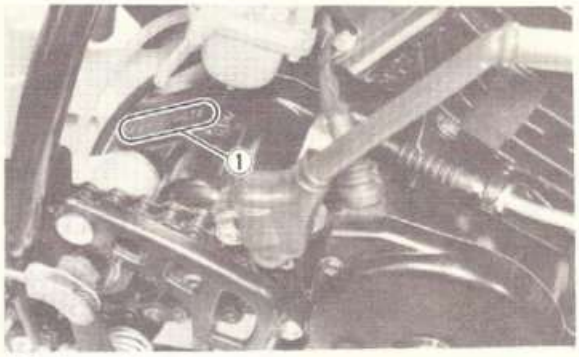
The frame serial number is stamped on the right of the steering head pipe.




1. Frame serial number

**Engine serial number**

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




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 your Yamaha dealer.**

**NOTICE:**

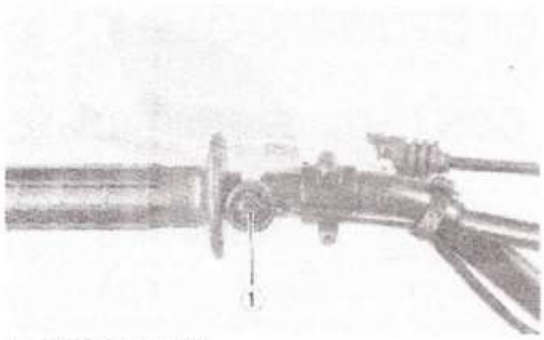
**This machine is designed strictly for competition use only. It is not equipped with highway approved lighting. Off-road use on public land may be illegal.**

**Note on handling of the Yamaha Energy Induction System**

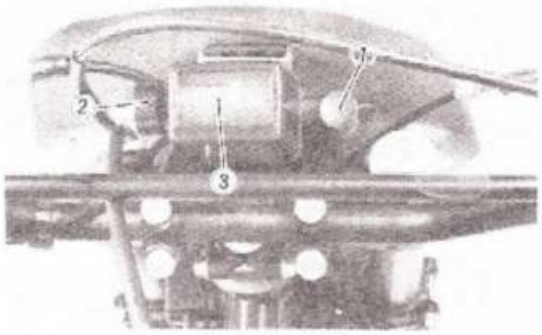
Handle the air chamber and hose with special care. Improper installation or damaged parts will result in poor performance. Replace any cracked or damage parts immediately. No modification of this system in any form is not allowed.



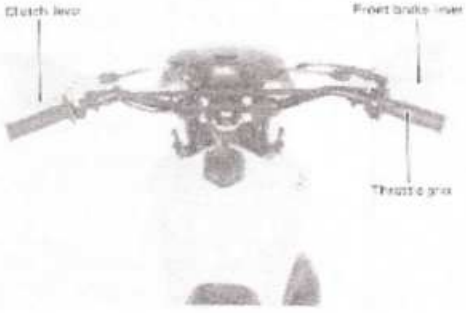

1. Air chamber 2. Hose




1. Engine stop button
   Push the button and hold if to stop the engine.




1. Lighting switch
   When the lighting switch is pulled up, both headlight and taillight come on.
2. Reset knob
   To Change the meter reading pull the knob and turn it as required.
3. Trip-odometer




1. Starter lever







Shift pedal

# FUEL AND OIL

**Fuel**

Use premium fuel with an octane rating of at least 90. Mix oil with the gas at the ratio specified below. Always use fresh, name-brand gasoline, and mix the oil and gas the day of the race. Do not use premix that is more than a few hours old.

Fuel tank capacity:
11 lit (2.4 Imp gal, 2.9 US. gal)

**Engine mixing oil**

Oil must be mixed with the gasoline to lubricate the piston, cylinder, crankshaft bearings, and connecting rod bearings.

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:**

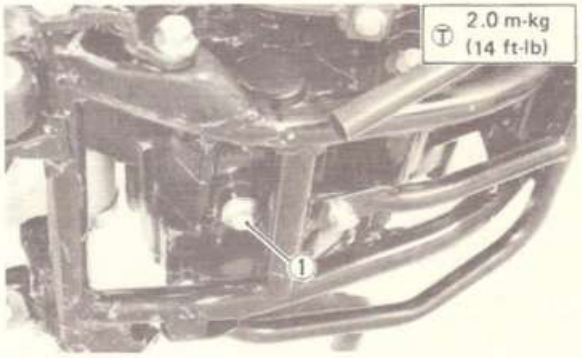
**Never mix two types of oil in the same batch; clotting of the oil could result. If you wish to change oil types, be sure to drain the fuel tank and the carburetor float bowl of old premix prior to filling with the new type.**

**Transmission oil**

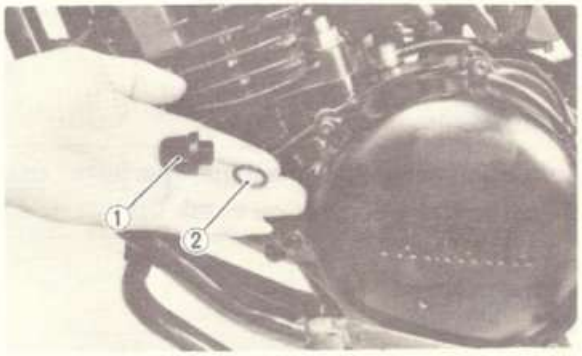
To assure proper lubrication of the transmission, clutch, and primary gears, the transmission oil should be changed after every fifth race. Remove the drain plug and allow the oil to drain for several minutes into a drain pan. Reinstall and tighten the drain plug. Remove the filler plug, refill the transmission, and replace the filler plug.

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

Transmission oil capacity:
Periodic oil change.
600 cm³ (0.53 Imp qt, 0.63 US qt)
Overhaul:
700 cm³ (0.62 Imp qt, 0.74 US qt)




1. Drain plug




1. Filler plug 2. O-ring

CHECKING OIL LEVEL

On the left side of the engine there is a checking screw. To check, warm up the engine for 2~ 3 minutes. Stop engine. Leave the engine as it is for a few minutes and place the machine upright, then remove the oil level check screw. If oil flows out, the oil level is correct. If the oil level is lower than specification, add oil.




1. Checking screw

# PREOPERATION CHECKS

The following items should be checked before each use of the machine. These checks can be accomplished thoroughly in a very short time; the added safety they can assure is well worth the efforts.

| Item | Procedure | Page |
|---|---|---|
| Brakes | Check operation/adjustment | 2-11 |
| Clutch | Check operation/adjustment | 2-11 |
| Fuel tank | Fill with proper fuel/oil mix | 1-3 |
| Transmission oil | Check oil level/Change oil as required | 1-3 |
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| Wheels & Tires | Check pressure/runout/spoke tightness/axle nuts | 2-14 |
| Fittings/fasteners | Check all/Tighten as necessary | – |
| Lights | Check operation | 2-15 |

# STARTING AND OPERATION

**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 petcock and push the starter lever down. With the throttle completely closed, kickstart the engine with a smooth, firm stroke. Using the starter lever 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 lever pulled completely up.

**CAUTION:**

**Do not warm up the engine for extended periods.**

**Starting a warm engine**

Do not push the starter lever down. Open the throttle slightly and kickstart the engine with a smooth, firm stroke.

**WARNING:**

**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 slow 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 4-8. 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. 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 less. Observe the condition of the engine carefully during operation.

# CREANING 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. 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. Clen the seat with a 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 10W/30 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.

# 2 REGULAR MAINTENANCE AND ADJUSTMENT


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# 2 REGULAR MAINTENANCE AND ADJUSTMENT

## MAINTENANCE INTERVALS CHART

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 after the required maintenance and lubrication intervals. If you are in doubt as to what intervals to follow in maintaining and lubricating your machine, consult your Yamaha dealer.

| | After Every Ride | Every 500 km | Every 1,500 km | After Every Event | As Required | Recommended Lubricant type |
|---|---|---|---|---|---|---|
| WASH MACHINE | (This items is also essential to proper performance) | | | | x | |
| PISTON<br>Inspect<br>Clean<br>Replace | | x<br>x | | x<br>x | <br><br>x | |
| PISTON RING<br>Inspect<br>Replace | | x | <br>x | x | <br>x | |
| CYLINDER HEAD<br>Inspect<br>Clean/Retighten | | x<br>x | | x<br>x | | |
| CYLINDER<br>Inspect<br>Head torque<br>Replace | | x<br>x | | x<br>x | <br><br>x | |
| CLUTCH<br>Adjust/Check<br>Replace (Plates) | x | | | | <br>x | |
| TRANSMISSION<br>Oil change<br>Inspect gears/<br>Shift mech.<br>Replace bearings | | x | <br><br>x | x | <br>x<br>x | No. 1 |
| CRANKSHAFT<br>Main bearing check<br>Big end check<br>Small end check<br>Piston pin check | | <br><br>x<br>x | x<br>x | <br>x<br>x | | |
| CARBURETOR<br>Clean, inspect, & adjust | | x | | x | | |
| YEIS<br>Inspect | x | | | | | |
| EXHAUST SYSTEM<br>Inspect & tighten<br>Clean and decarbonize | | x | | x | <br>x | |
| FRAME<br>Clean & inspect | | x | | x | | |
| SWING ARM/<br>RELAY ARM<br>Check/lubricate | | x | | x | | No. 5 |
| CONTROLS & CABLES<br>Check & adjust<br>Lubricate | <br>x<br>x | | | <br>x<br>x | | |

| | After Every Ride | Every 500 km | Every 1,500 km | After Every Event | As Required | Recommended Lubricant type |
|---|---|---|---|---|---|---|
| **BRAKES** | | | | | | |
| Check & adjust | x | | | x | | |
| Replace linings | | | | | x | |
| **WHEELS & TIRES** | | | | | | |
| Check runout | | x | | x | | |
| Check spokes | x | | | x | | |
| Check bearings | | x | | x | | |
| **STEERING HEAD** | | | | | | |
| Check | | x | | x | | |
| Clean, lube & repair | | | x | x (every two events) | | No. 6 |
| **CDI** | | | | | | |
| Check connectors | | x | | x | | |
| **AIR FILTER** | | | | | | |
| Clean & oil | x | | | x | | No. 3 |
| Replace | | | | | x | |
| **SPARK PLUG** | | | | | | |
| Check condition | x | | | | | |
| **DRIVE CHAIN** | | | | | | |
| Clean & lubricate | x | | | x | | No. 2 |
| Check tension | x | | | | | |
| Replace | | | | | x | |
| **FUEL TANK** | | | | | | |
| Clean & flush | | | x | x | | |
| Clean petcock filter | | x | | x | | |
| **REAR SHOCK** | | | | | | |
| Lube | | x | | x | | |
| Clean & inspect | | | | x | | |
| **FRONT FORKS** | | | | | | |
| Clean & change oil | | x | | x | | No. 4 |
| Replace seals | | | | | x | |
| **CLUTCH & BRAKE SHAFT** | | | | | | |
| Lubricate | x | | | x | | No. 5 |

**RECOMMENDED LUBRICANT**

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

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

No. 3 Air filters must be damp with foam-air-filter oil at all times to function properly. Clean and lube every meet and every ride. Do not over-oil. Use foam-air-filter oil.

No. 4 Use Yamaha Fork Oil 10 wt.

No. 5 Use lithium base grease.

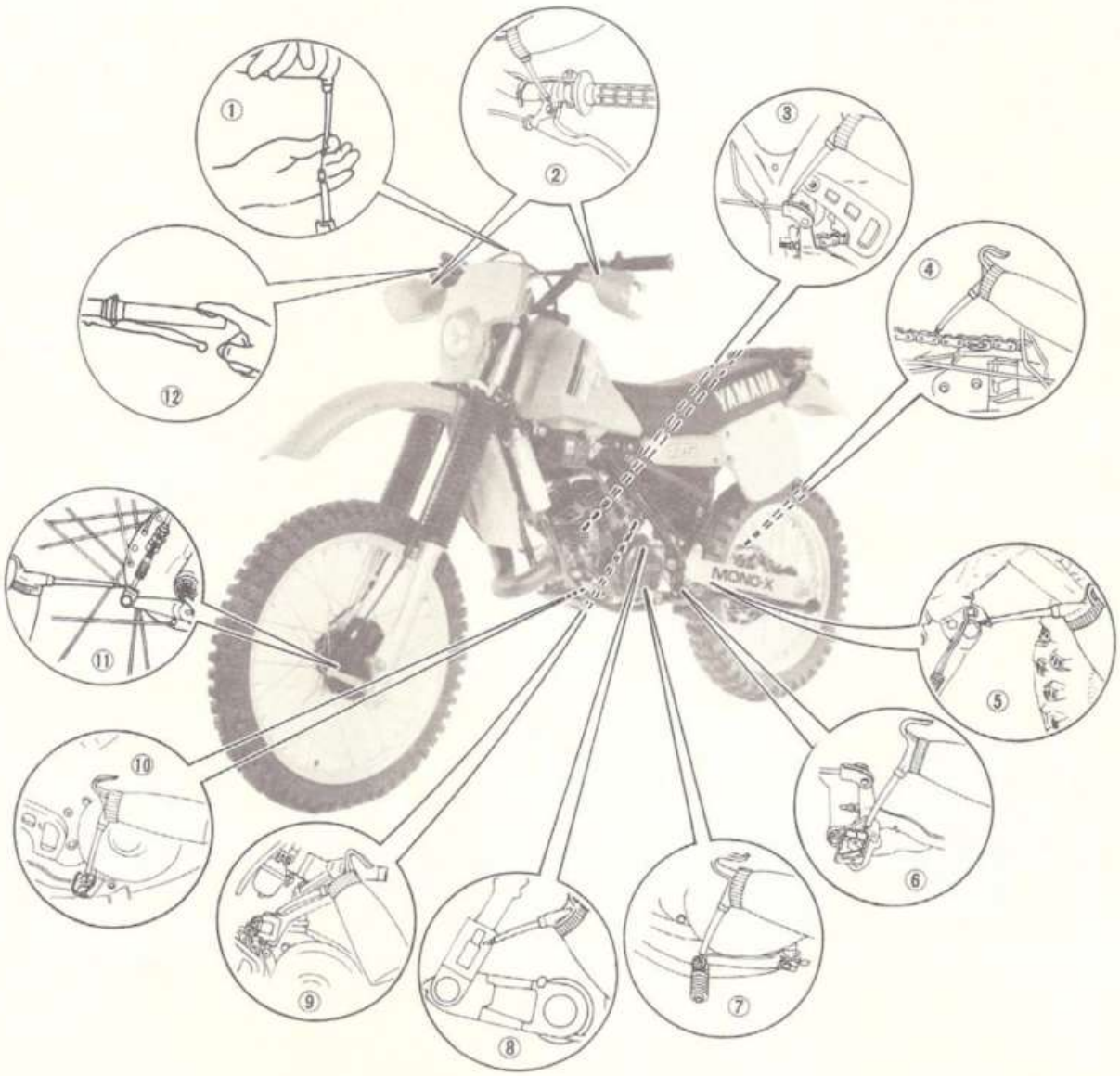
No. 6 Medium-weight wheel bearing-grease of quality manufacturer — preferably waterproof.

# LUBRICATION

To ensure smooth operation of all components, lubricate your machine as follows after every use.

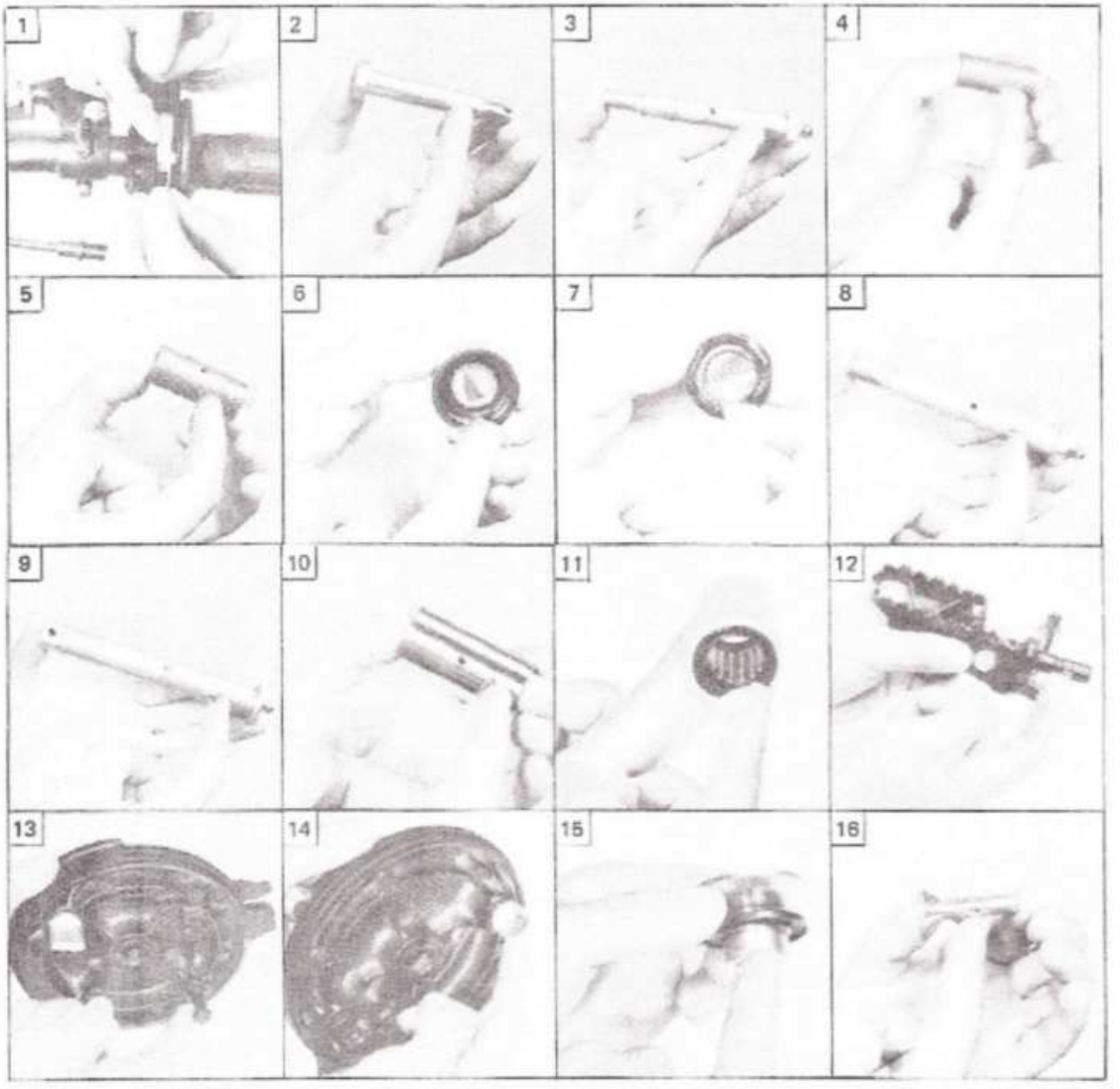
A. Use Yamaha chain and cable lube on these areas:

1. All control cables
2. Brake and clutch lever pivots
3. Brake rod pivot
4. Drive chain
5. Side stand pivot
6. Footpeg pivot
7. Shift lever pivot
8. Clutch push lever pivot
9. Kickstarter lever pivot
10. Brake arm pivot
11. Brake lever pivot
12. Throttle-to-handlebar contact area



B. Lubricate the following areas with lithium base grease.

1. Throttle grip
2. Rear shock upper pivot
3. Rear shock lower pivot
4. Rear shock solid bush (upper)
5. Rear shock solid bush (lower)
6. Rear shock dust cover
7. Razmo bushing
8. I-shape arm pivot (upper)
9. I-shape arm pivot (lower)
10. I-shape arm bushing
11. I-shape arm bearing
12. Brake pedal pivot
13. Brake shoe pivot
14. Brake shoe cam
15. Wheel oil seal lip and axle collar
16. Sprocket fitting bolt



# SPECIAL TOOLS

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

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



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

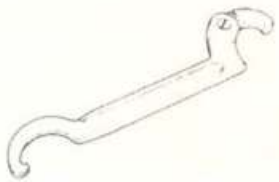


3 Dial gauge extension (T/No. YU-01256-2)



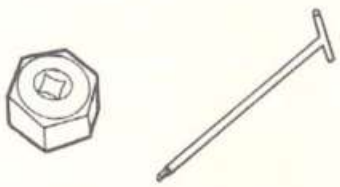
Tools 1, 2, and 3 are used to set the ignition timing.

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



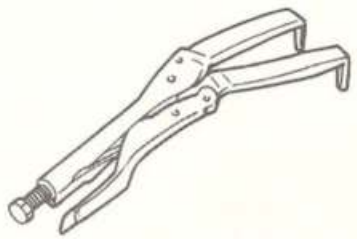
Use these tools to remove and install the fork cylinder.

5 Fork cylinder T-handle and adapter (T/No. YM-01327, YM-01326)



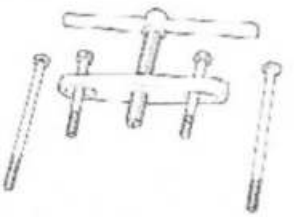
Use this tool to hold the clutch boss while removing or tightening the clutch boss nut.

6 Clutch holding tool (YM-91042)



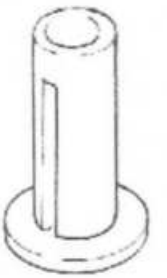
Use this wrench to put the proper tension on the steering head bearings.

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

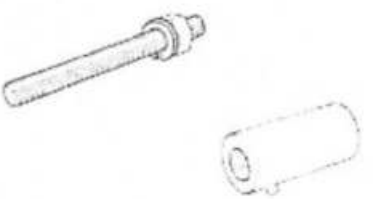


This tool is used to split the crankcase as well as remove the crankshaft from either case.

8 Crankshaft installing tool (T/No. YU-90050)



9 Crankshaft installing bolt and adapter (T/No. YU-90060, YU-90063)



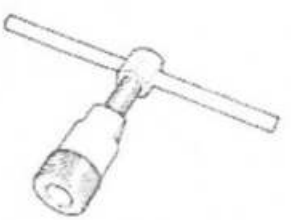
Tools 8 and 9 are used to install the crankshaft.

10 Flywheel holding tool (T/No. YU-01235)



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

11 Flywheel puller (T/No. YM-01189)



This tool is used to remove the flywheel magneto.

12 Timing light (T/No. YU-08037)



Use this tool to check the ignition timing

13 Fork seal and bushing service tool (T/No. YM-08020)

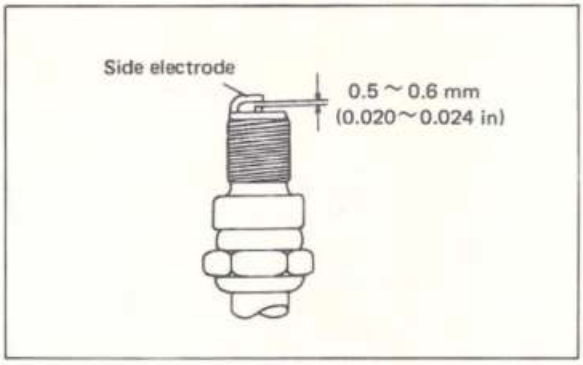


# MINOR MAINTENANCE AND ADJUSTMENT

**Spark plug**

| Standard spark plug: |
| --- |
| N-86 (CHAMPION) |

| Spark plug gap: |
| --- |
| 0.5~ 0.6 mm (0.019~0.024 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 surfaces and threads before installing the spark plug. Torque the plug to specification.

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

3. After running, the porcelain insulator around the center electrode should be a medium-to-light tan color. If it is too light or dark, check the carburetion, ignition timing, and oil-fuel mixture. If the light or dark color persists, a spark plug with a different heat range may be required. Bear in mind, though, that a darker-tan-normal color is not unusual during break-in.

NOTE:

If a torque wrench is not available when you are installing a spark plug, a good estimate of the correct torque is 1/2 to 1/4 turns past finger tight. Have the spark plug torqued to the correct value as soon as possible with a torque wrench.

**Ignition timing**

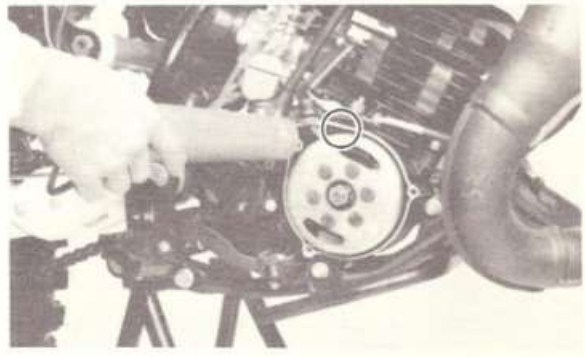
**Checking**

Ignition timing is checked with a timing light by observing the position of the case mark and rotor mark.

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

| Specified speed: 2,000 r/min |
| --- |

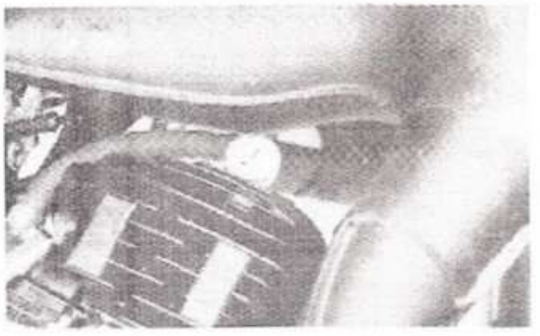
4. While keeping the engine running at a specified speed, check that the rotor mark is aligned with the case mark.
   If they are not aligned, adjust the ignition timing.



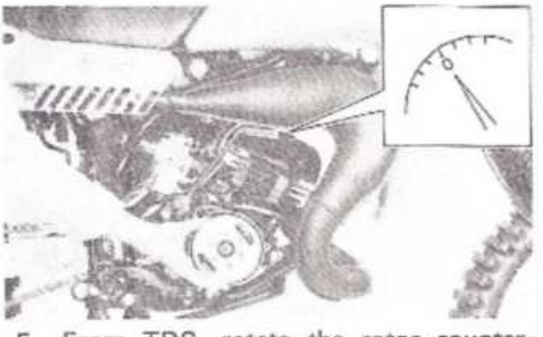
**Adjustment**

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 and the right-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 counterclockwise 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 crankcase should be aligned.

| Ignition timing: |
| --- |
| B.T.D.C. |
| 2.4 ± 0.15 mm (0.094 ± 0.004 in) |

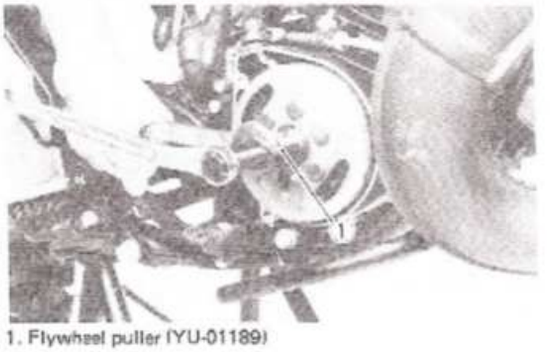


6. If the marks are not aligned, punch a new mark on the crankcase in line with the rotor mark.

7. Remove the flywheel magneto using the magneto holder and flywheel puller.

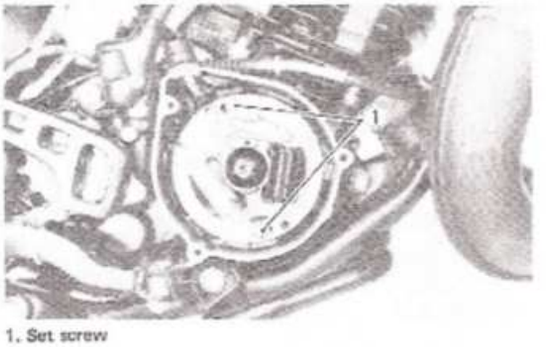


1. Flywheel holding tool (YU-01235)



1. Flywheel puller (YU-01189)

8. Loosen the base set screws and turn the base right or left until the base mark aligns the new mark. And tighten the base set screws.



1. Set screw

9. Reinstall the flywheel and tighten the nut.

| Tightening torque: |
| --- |
| 80 Nm (8.0 m·kg, 56 ft·lb) |

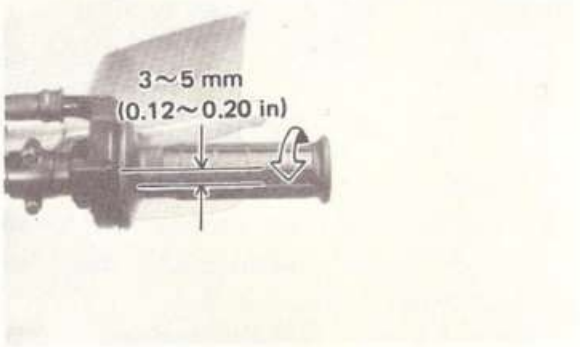
10. Remove the dial gauge assembly and stand, and reinstall the spark plug. Torque the plug to specification.

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

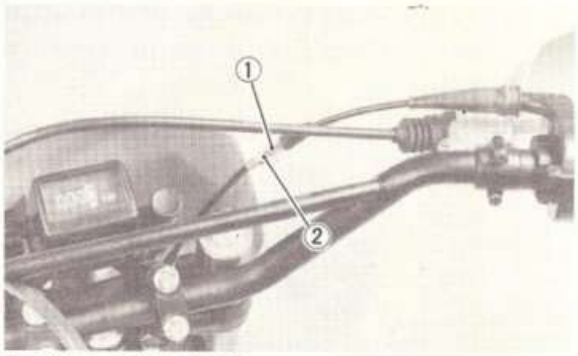
11. Reinstall the right-hand crankcase cover.

**Throttle cable**

1. 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.




2. 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

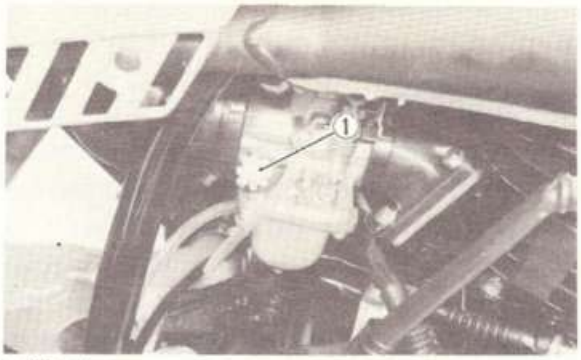



1. Adjuster 2. Lock nut

3. 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 readjusted.

**Idle speed**

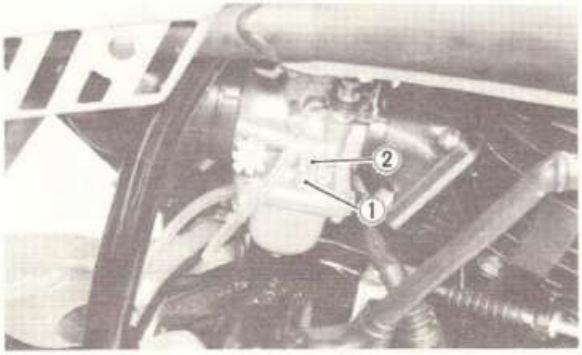
1. Screw in the pilot air screw until it is lightly seated.
2. Back out by the specified number of turns. Start the engine and let it warm up.




1. Pilot air screw

| Pilot air screw setting: 1.0 |
|---|

3. Loosen the lock nut on the throttle stop screw and turn the screw until the idle is at the desired rpm.




1. Throttle stop screw 2. Lock nut

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, and tighten the lock nut.

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.

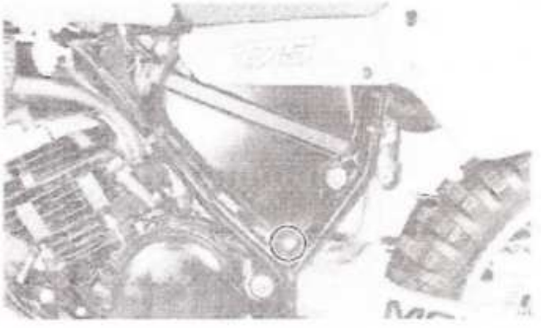
Air filter

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 use engine life will be prolonged and power output will remain consistent.

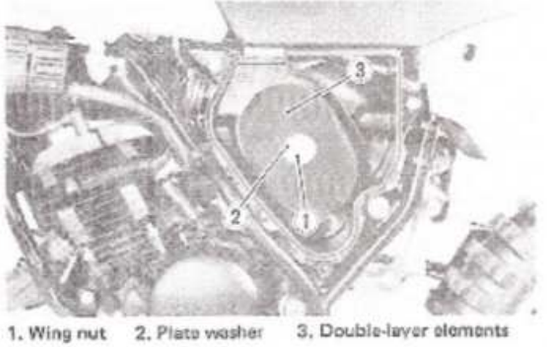
**CAUTION:**

**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.**

1. Remove the band and screw from the filter box.



2. Remove the left-hand side cover from the machine.
3. Remove the wing nut from the air filter box, and remove the air filter element assembly from the box.

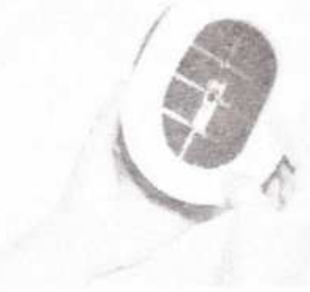



1. Wing nut 2. Plate washer 3. Double-layer elements

4. Separate the two elements from the filter "cage".



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



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

**CAUTION:**

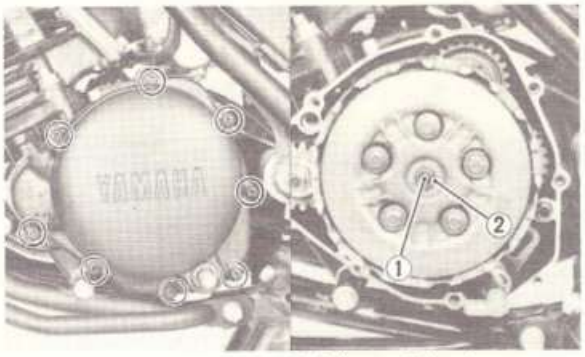
**Do not overtighten the wing nut to avoid distorting the filter element cage.**

9. Reinstall the left-hand side cover.
10. Inspect the air filter joint and intake manifold rubber for tears and cracks. Replace them if any damage is found.

### Clutch

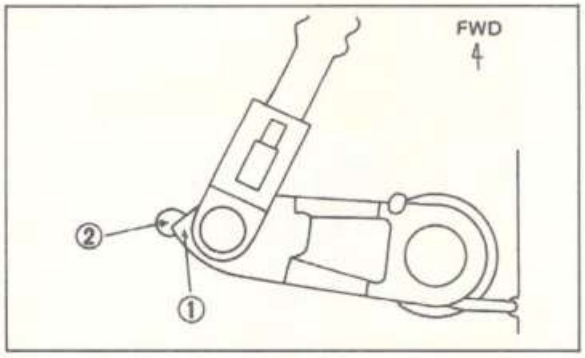
To avoid clutch slipping or dragging, the clutch mechanism and cable must be adjusted correctly.

1. Remove the shift pedal.
2. Drain the transmission oil.
3. Remove the left-hand crankcase cover.
4. Loosen the clutch mechanism adjuster lock nut, and loosen the adjusting screw.



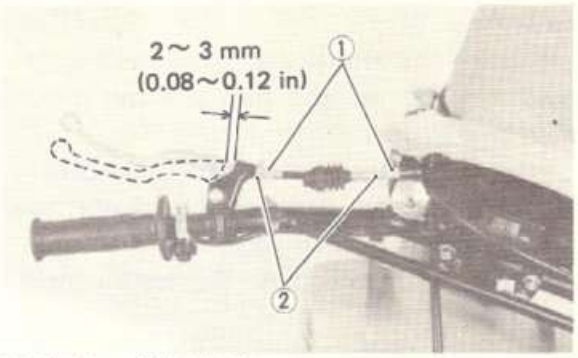

1. Adjuster 2. Lock nut

5. At the handle lever, loosen the cable adjuster lock nut and adjust the cable length to align the match mark on the left-hand crankcase with the edge of the push lever.




1. Point of push lever 2. Case mark

6. Turn the clutch mechanism adjusting screw in until resistance is felt, and tighten the adjuster lock nut.
7. 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.

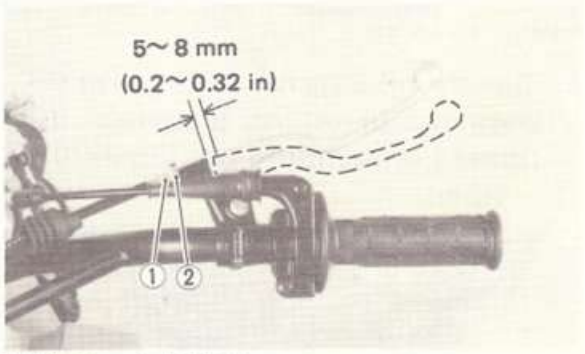



1. Adjuster 2. Lock nut

8. Reinstall the crankcase cover and shift pedal.

### 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. Adjuster 2. Lock nut

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 8 mm of free play at the brake lever pivot. Tighten the lock nut.



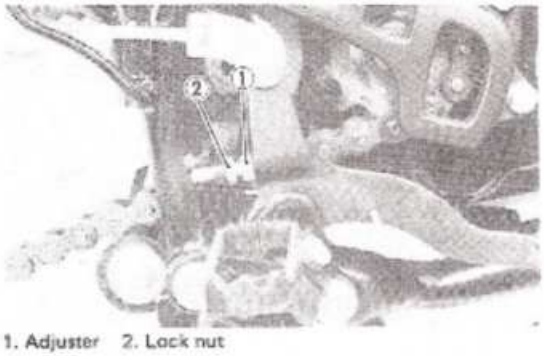

1. Adjuster 2. Lock nut

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

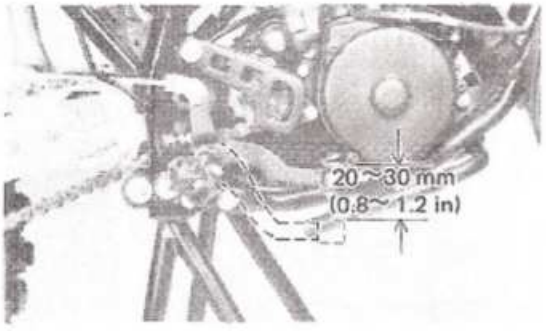
In adjusting the rear brake, the pedal height should first be set and then the free play should be adjusted.

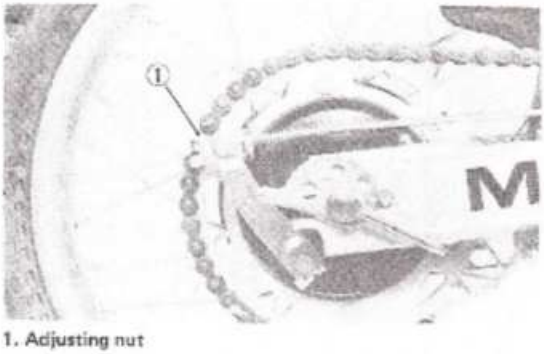
1. Loosen the lock nut on the brake pedal height adjuster, and turn the adjuster to achieve the desired pedal height according to rider preference. Tighten the lock nut.




1. Adjuster 2. Lock nut

2. Turn the adjusting nut on the end of the brake rod in or out to achieve the desired free play within 20~ 30 mm (0.8 ~ 1.2 in).



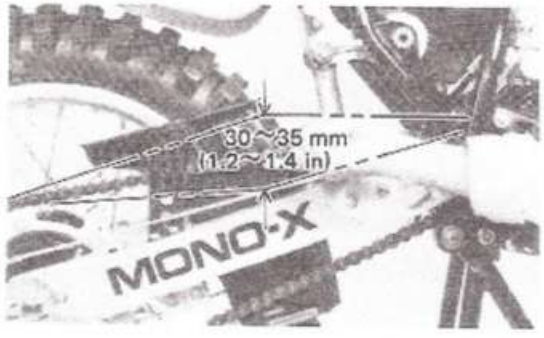




1. Adjusting nut

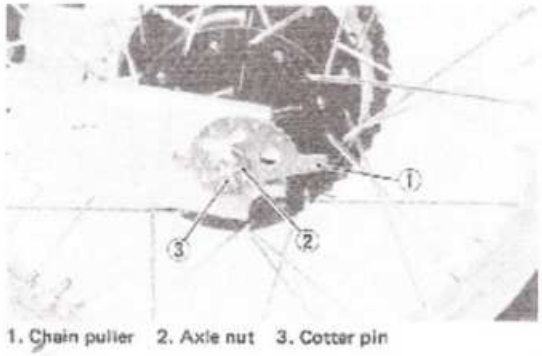
### Drive chain

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 (1.2~ 1.4 in). If the free play exceeds 35 mm (1.4 in), the chain must be adjusted.




2. Loosen the rear brake adjuster.
3. Remove the rear axle cotter pin.
4. Loosen the rear wheel axle nut.
5. Turn chain puller both left and right, until axle is situated in same puller slot position on each side.




1. Chain puller 2. Axle nut 3. Cotter pin

NOTE:

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

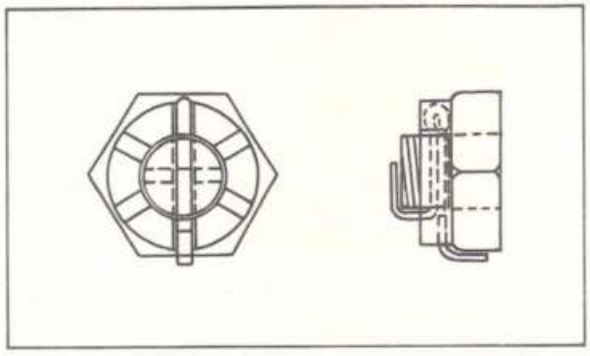
**CAUTION:**

**Do not over tighten the chain. Excessive chain tension will overload the engine and other vital parts; Keep the tension within the specified limits.**

6. Tighten the rear axle nut.

| Axle nut torque: |
| --- |
| 85 Nm (8.5 m·kg, 60 ft·lb) |

7. Insert the new cotter pin into the rear wheel axle nut and bend the end of cotter pin. If the nut notch and pin hole do not match, tighten the nut slightly to match.



8. Check the brake pedal free play.

**WARNING:**

**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.**

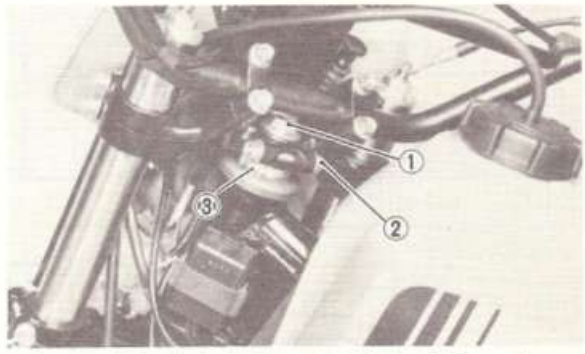
9. After removing any excessive dirt or mud, spray chain lube between both rows of sideplates and on the chain rollers.
10. To clean the chain thoroughly, remove the chain from the machine, place it in solvent, and brush off as much dirt as possible. Then remove the chain from the solvent, dry the chain,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

**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 fork 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 through greasing.



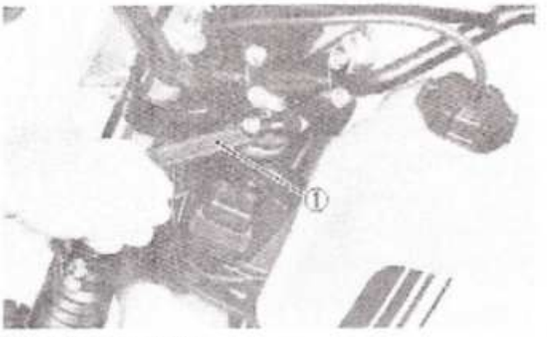
2. To adjust the bearings, loosen the upper stem pinch bolt and the steering fitting bolt.
3. Loosen the fork pinch bolts in the handle crown, and slide the handle crown up.




1. Steering fitting bolt 2. Stem pinch bolt 3. Ring nut

4. 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: 1.0 m·kg (7 ft·lb) |
| --- |




1. Steering nut wrench

5. Tighten fitting bolt and torque to specification.

| Fitting bolt torque: |
|---|
| 50 Nm (5.0 m·kg, 36 ft·lb) |

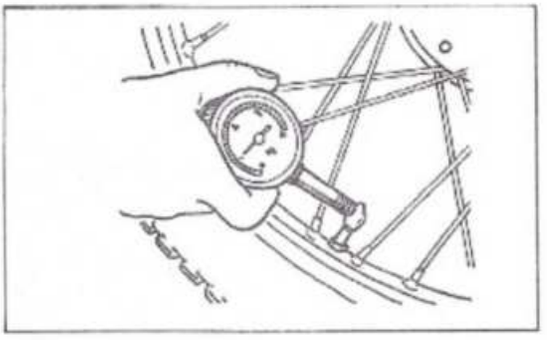
6. Tighten the steering pinch bolt, fork pinch bolts and torque to specification.

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

**Tire air pressure**

Tire pressure affects traction, handling, and the life of the tire. Adjust the tire pressure to suit track conditions and rider preference, but do not stray too far from the recommended pressure.

| Recommended pressure | |
|---|---|
| Front | 100 kPa (1.0 kg/cm², 14 psi) |
| Rear | 100 kPa (1.0 kg/cm², 14 psi) |



**Tuning guidance**

Adjust the tire pressures to suit track conditions.

1. When the trail is wet in the rain, muddy, sandy or slippery, reduce the tire pressure to increase the tire tread.

| 800 ~ 100 kPa<br>(0.8 ~ 1.0 kg/cm², 11 ~ 14 psi) |
|---|

2. When the trail is pebbly or hard, increases the tire pressure to prevent punctures, though tires will become easy to skid.

| 100 ~ 120 kPa<br>(1.0 ~ 1.2 kg/cm², 14 ~ 17 psi) |
|---|

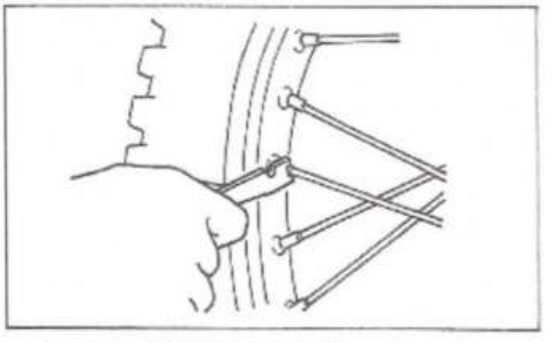
**CAUTION:**

**When the tire pressure is low, a loose rim locks may allow the tire to slip on the rim. Check for loose rim locks.**

**Make sure the valve stem is square in the rim hole. If not square, adjust its position properly.**

**Spokes**

The spokes should be checked after every race.



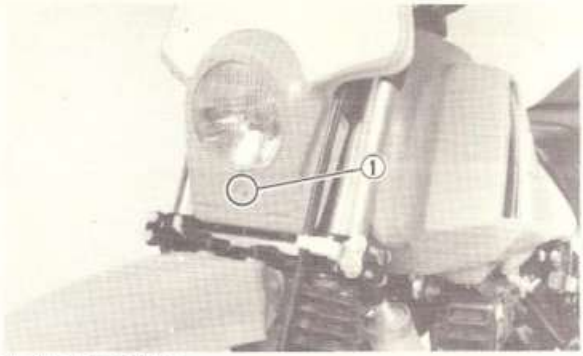
Bent → Replace spokes.
Loosen → Tighten spokes.

**CAUTION:**

**Avoid overtightening the spokes, as the hub may be distorted and braking power diminished.**

**Headlight adjustment**

1. Adjust the headlight beam by tightening or loosening the adjust screw.




1. Adjusting screw

# 3 SUSPENSION TUNING


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# 3 SUSPENSION TUNING

## INTRODUCTION

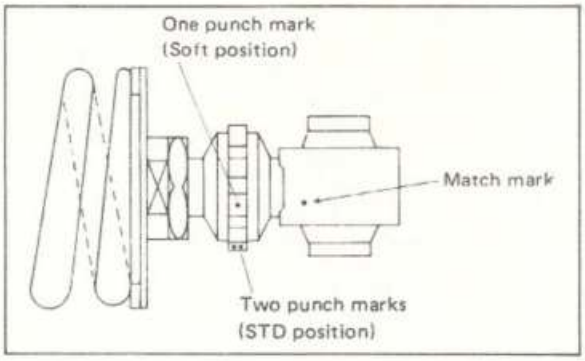
No area of machine maintenance is more critical than proper suspension tuning. An improperly tuned suspension will keep even the best rider from attaining the full benefit of his motorcycle's ability. Hence, follow the instructions in this chapter to adjust the suspension to the rider's specifications and track conditions.

WHILE TUNING THE SUSPENSION, YOU MUST BEAR SOME IMPORTANT POINTS IN MIND:

* If the machine is new, break in the suspension with at least two hours (300 km) of riding before making any setting evaluations or changes.

**Break-in:**

**To afford better riding comfort, the rebound damping is set on a two steps softer side (one punch mark). After the break-in period, return the monocross unit to the standard position (two punch marks). If the standard position does not suit your preference or road condition, make a readjustment or other necessary adjustments.**




* The three major factors which must be considered in suspension tuning are RIDER WEIGHT, RIDER ABILITY, and TRACK CONDITIONS. Additional influences include the RIDER'S STYLE and POSITIONING on the machine.

* If you have any problem, make tests by changing your riding posture or position so that the cause of problem can be found out.

* It is a wise practice to adjust settings so as to best suit to straight lines, corners, or gaps, whatsoever you can most skillfully handle the bike in racing courses.

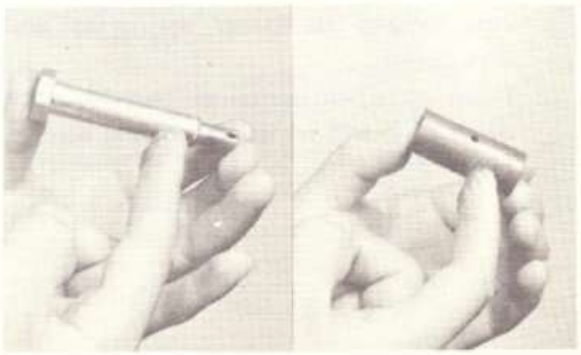
* Make setting changes in small increments; a little bit goes a long way, and it is very easy to overadjust a setting.

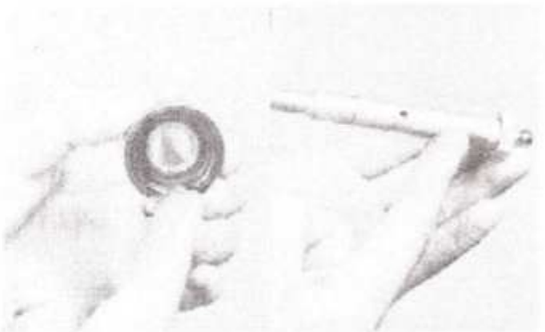
* The front and rear suspension should be balanced, when one is changed, the other might need to be changed similarly.

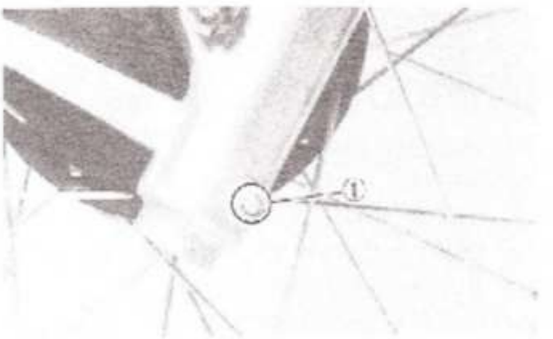
* When evaluating suspension performance, the rider must make every effort to ride consistently and recognize the effects of his imput; such things as changes in rider position and increasing fatigue may lead to incorrect judgements about necessary setting adjustments.

* When the proper settings have been determined for a particular track, they should be written down for reference upon returning to that track.

* Lubricate the bushings in the shock mounting-eye pivots and engine mounting pivot after break-in and after every race to prevent excess friction from affecting suspension performance.





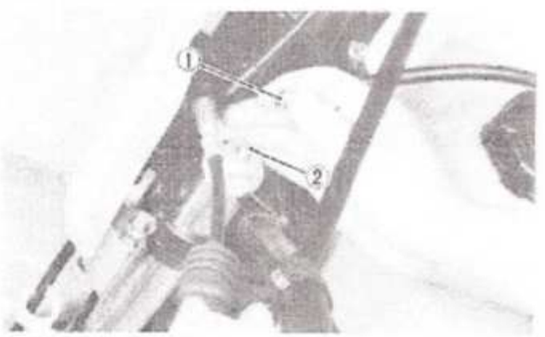



1. Drain screw

# FRONT FORK

**Fork oil replacement**

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




1. Valve cap 2. Valve

3. Using a slotted-head screwdriver, depress the valve to allow the air to escape from the fork legs.

NOTE:

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

4. Remove the cap bolt assembly.
   And remove the spacer, spring seat and fork spring.
5. Place an open container beneath each drain hole and remove the drain screws.
6. After most of oil has drained, slowly raise and lower outer tubes to pump out remaining oil.
7. Install drain screws.
8. 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.

NOTE:

Check gasket, replace if damaged.

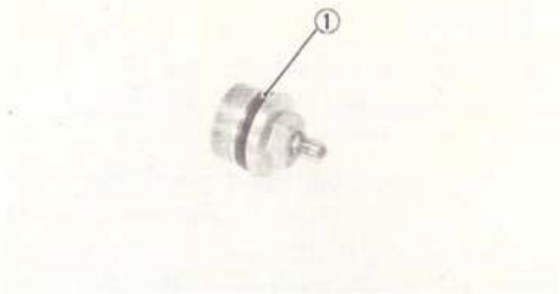
| Recommended oil: |
| --- |
| Yamaha fork oil 10 wt or |
| SAE # 10 motor oil |
| Oil quantity: |
| 440 $cm^3$ (15.5 Imp oz, 14.9 US oz) |

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



| Standard oil level: 169 mm (6.65 in) |
| --- |

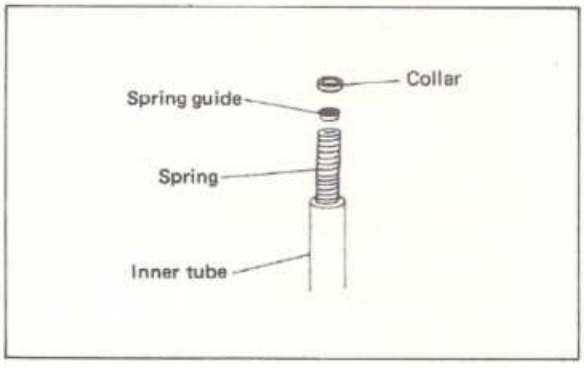
10. Inspect the O-ring on cap bolt and replace if damaged.




1. O-ring

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

| Tightening torque: 23 Nm (2.3 m·kg, 17 ft·lb) |
|---|



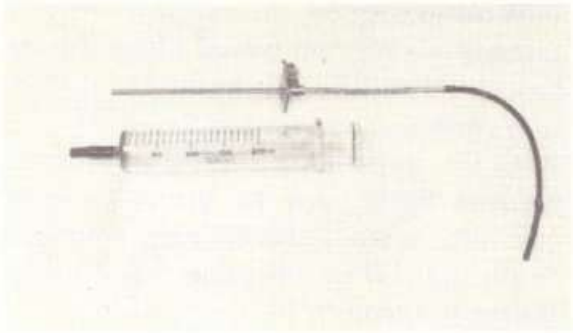

**Fork oil weight**

The weight, or viscosity, of the fork oil can be changed.

* Thicker oil (From #10 to #15): damping is increased, and the fork moves slowly.
* Thinner oil (From #10 to #5): damping is decreased, and the fork moves quickly.

**Fork oil level**

The height of the fork oil in the fork tube can be adjusted. The higher the oil level is, the stiffer the fork will be, etc. Adjust the oil levle in 5 mm (0.2 in) or 10 mm (0.4 in) increments. The oil level is measured from the top of the fork tube, with the springs removed and the forks totally compressed and perpendicular to the ground.



(T/No. YM-59000)



| STD level: 169 mm (6.65 in) |
|---|
| Minimum level (stiff): 130 mm (5.12 in) |
| Maximum level (soft): 200 mm (7.87 in) |

**Fork spring**

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

| Type | Part No. | Spring rate (kg/mm) | I.D. mark |
|---|---|---|---|
| STD | 5X8-23141-L0 | k = 0.302 | – |
| Light duty | 5X8-23141-10 | k = 0.275 | |
| Heavy duty | 5X8-23141-20 | k = 0.325 | |

**NOTE:**

Always check the oil levels before changing or re-installing springs.

* Using the heavy duty spring: Increases the preload; the shock becomes stiffer and rebounds more quickly.
* Using the light duty spring: Decreases the preload; the shock becomes softer and rebounds more slowly.

Fork clamp position

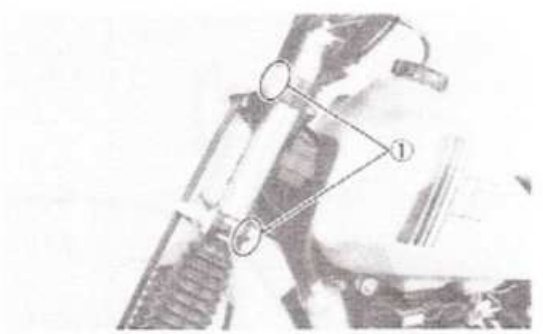
Steering qualities are greatly affected by the fork clamp position (the amount of the inner tube projection over the handle crown).

When the projection is smaller, the front end becomes lighter due to change in weight bias. Also, it tends to under steer in turns and "wash out". When the projection is greater, the result is convers.

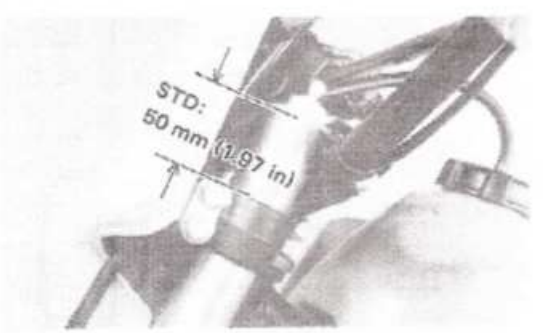
Be sure the front tire doesn't rub the fender when the fork tubes compress fully. Make this adjustment in 5 mm increments.

**CAUTION:**

**The inner tubes, both right and left, should be projected evenly.**




1. Fork pinch bolt




| Maximum length: 70 mm (2.76 in) |
|---|
| Minimum length: 30 mm (1.18 in) |

Air pressure

**CAUTION:**

**For proper spring effects, the air pressure must be maintained at the following levels.**

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

**CAUTION:**

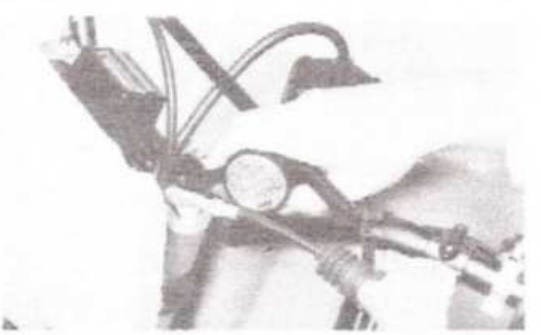
**The gas pressure should not exceed 118 kPa (1.2 kg/cm², 17 psi). Excess gas pressure will cause damage to the forks.**

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

| Recommended air pressure: 0 kPa (0 kg/cm², 0 psi) |
|---|

NOTE:

Each time the air gauge is installed, the air pressure decreases about 4.9 kPa (0.05 kg/cm², 0.007 psi) to 9.8 kPa (0.1 kg/cm², 0.01 psi)



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

**CAUTION:**

**Use only air or nitrogen for filling. Never use any other gas. An explosion may result.**

* Increase air pressure →
  cause initial load to increase, and absorber becomes hard.
* Decrease air pressure →
  cause initial load to decrease, and absorber becomes soft.

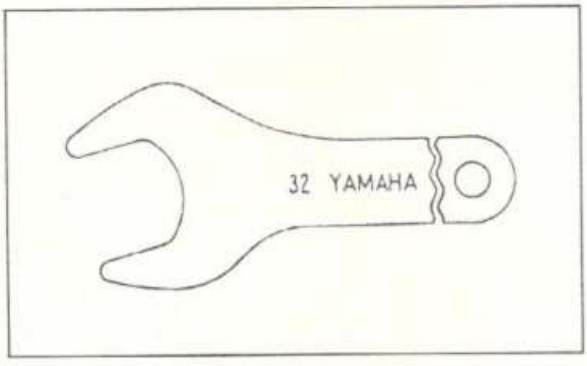
## REAR SHOCK (MONOCROSS SUSPENSION "DECARBON" SYSTEM)

**Spring preload**

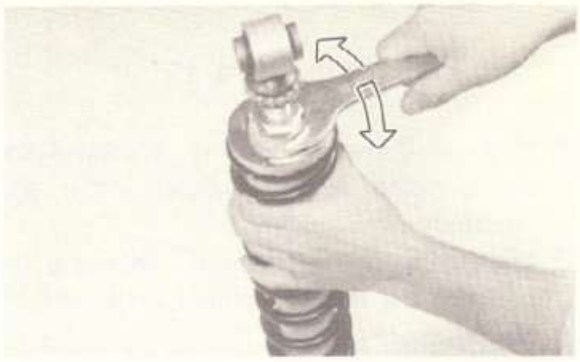
The preload is adjusted by changing the set length of the spring: a shorter set length increases the preload, a longer set length decreases the preload.

1. To adjust the preload, remove the shock absorber and loosen the lock nut.
2. Adjust the spring set length by turning the spring adjuster with the special wrench.






To increase the preload, turn the spring adjuster clockwise. To decrease the preload, turn the spring adjuster counterclockwise.



One complete turn of the adjuster will change the preload 1 mm (0.04 in). Make changes in increments of 2 mm (0.08 in) at a time.

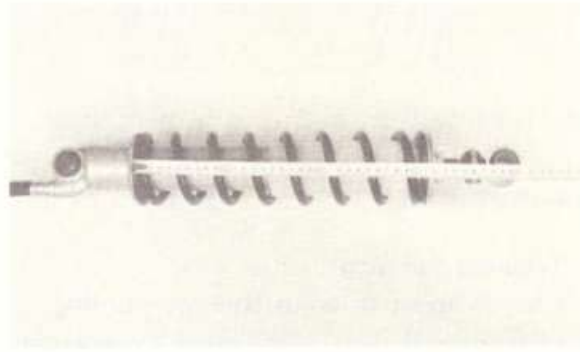



1. Increase preload
2. Decrease preload
3. Adjuster
4. Lock nut

| |
|---|
| Standard Length (installed): 313 mm (12.32 in) |
| Minimum Length (installed): 298 mm (11.73 in) |
| Maximum Length (installed): 318 mm (12.52 in) |

**CAUTION:**

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



**NOTE:**

Always tighten the lock nut against the spring adjuster and torque the lock nut to specification.

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

* Shortening the set length: increases the preload; the shock becomes stiffer and rebounds more quickly.
* Lenghening the set length: decreases the preload; the shock becomes softer and rebounds more slowly.

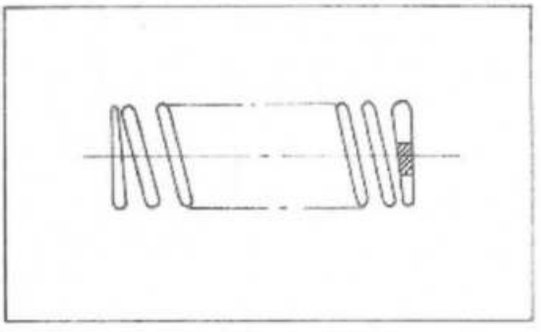
**Shock spring**

In addition to the standard type, hard and soft types of springs are available. If the standard type is improper for your purpose, select a proper one according to the rider's weight or road conditions.

* Using the heavy duty type: the spring rate is higher; the spring is stiffer and rebounds more quickly.
* Using the light duty type: the spring rate is lower; the spring is softer and rebounds more slowly.

| Type | Part No. | Spring rate (kg/mm) | I.D. Color |
|---|---|---|---|
| Light duty ↑ STD ↓ Heavy duty | 5X8-22212-10 | k = 4.8 | White |
| | 5X8-22212-00 | k = 5.3 | Yellow |
| | 5X8-22212-20 | k = 5.8 | Blue |

Identification color is shown on right end of a spring.



**Rebound damping**

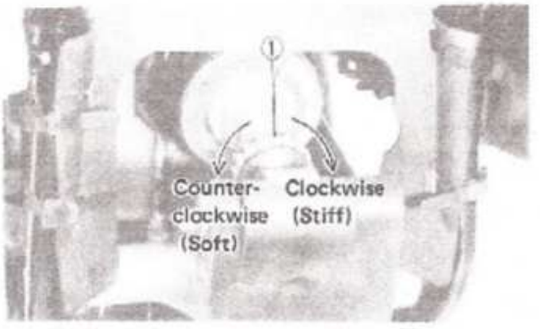
The damping is adjustable by turning the adjusting ring next to the shock's rear mounting bracket.

* Shock rebounds the slowest when the adjusting ring is turned fully clockwise.
* Shock rebounds quickened by turning the adjusting ring counterclockwise.

**CAUTION:**

**Adjust the damping in increments of 2 clicks. And test the performance by riding after adjustment.**

When adjusting, always turn the adjusting ring all the way clockwise and then make the desired adjustment. For reference purposes, always record the settings for a cold shock.




STANDARD SETTING: 15Clicks Out

* To set the standard damping, turn the damping adjuster clockwise until it bottoms, then back it out to the specified setting.

NOTE:
Turn the adjuster until it clicks.
Don't turn it more than 35 clicks from the stiffest position.

**Gas pressure**

The gas pressure in the remote nitrogen chamber can be changed to make fine adjustments in the springing characteristics of the shock; higher pressure stiffness the shock slightly, and lower pressure makes it slightly softer. The adjustment is rarely needed, however, and it requires special equipment. Consult your Yamaha dealer if you wish to change the nitrogen pressure in the shock.

STD pressure: 1,086 kPa (11 kg/cm$^2$, 156 psi)

# DETERMINING THE PROPER SETTINGS

### Standard settings

From the factory, the machine is set up for a rider weighing approximately 65 ~ 70 kg (140 ~ 155 lb) and posessing intermediate riding ability. Hence, if the actual rider weighs considerably more or less than 65 ~ 70 kg (140 ~ 155 lb), or if his riding experience and ability are quite greater or lesser than the intermediate level, it is likely that some rough adjustments can be made to put the suspension "in the ballpark".

1. Course condition

| | |
|---|---|
| Sand | Heavy duty spring |
| Hard | Light duty spring |

2. Rider's experience

| | |
|---|---|
| Beginner | Use light duty spring and increase damping. |
| Experienced | Use heavy duty spring and decrease damping. |

3. Rider weight

| | |
|---|---|
| Light | Light duty spring |
| Heavy | Heavy duty spring |

After making such preliminary adjustments, begin the actual on-track testing and evaluation.

### Remember

1. Always make changes in small increments.
2. Make sure the rider is consistent in his evaluation of improper suspension performance.
3. A change in the front suspension might require a change in the rear, and vice versa.

### Standard setting table

| Front Fork | | |
|---|---|---|
| Spring rate (kg/mm) | | k = 0.302 |
| Collar length (mm) | | ℓ = 130 |
| Oil | Quantity ($cm^3$) | 440 |
| | Level (mm) | 169 |
| | Weight | 10 wt |
| Clamp position (mm) | | 50 |
| Air pressure ($kg/cm^2$) | | 0 |
| **Rear Shock** | | |
| Spring | Rate (kg/mm) | k = 5.3 |
| | Preload (mm) | ℓ = 313 |
| Rebound damping | | 15 |
| Gas pressure ($kg/cm^2$) | | 11 |

### Front and rear compatibility

Use this procedure to determine if the suspension is balanced reasonably well: Hold the bike upright with the sidestand up. While standing next to the machine, lightly pull on the front brake, place one foot on the footpeg closest to you, and push down hard. If the bike maintains its level attitude as the suspension is compressed, the bike is rather well balanced;

Or sit astride the bike and take a riding posture. Next, check to see that the bike is in a horizontal position.

If one end drops noticeably more than the other, however, the front and rear are not compatible and must be readjusted to achieve better balance.

**NOTE:**

After making this adjustment, take a riding posture on the bike and make sure it can keep a horizontal position like a machine with standard settings.

# TROUBLESHOOTING IMPROPER SETTINGS

Listed below are some symptoms of improper suspension settings and the most likely means of correcting them. The proper settings can be achieved by applying the information in this chapter in a scientific, methodical manner; this does not mean, however, that you must be a scientist or trained technician to succeed. Simply take time to think about the changes you believe are necessary, check them against the symptoms and cures described here, make the changes in small increments, and take notes on the changes and their effects.

**General symptoms and remedy**

This is one of the most effective adjustment procedures but suspension settings should vary depending on the condition of racing courses or the rider's preference.

If the setting procedure explained below is found in effective, consult your Yamaha dealer.

1. Front end "knives" or oversteers in turns:
   If the front end tends to inward or oversteer in turns, the fork is not well balanced with the rear shock.

| | Front fork |
|---|---|
| Step 1 | Increase fork oil level 10 mm (0.4 in) |
| Step 2 | Decrease inner tube projection. 5 mm (0.2 in) |

   Heavier or expert riders may need the heavy duty spring.
2. Front end pushers or "wash out" in turns:
   The front wheel tends to climb over berms in corners:
   When a front wheel tends to push outward rather than "bite" in a turn, the fork is probably too stiff.

| | Front fork |
|---|---|
| Step 1 | Decrease fork oil level 10 mm (0.4 in) |
| Step 2 | Increase inner tube projection. 5 mm (0.2 in) |

The softer spring may be required for lighter or less experienced riders.
Check the air pressure to find out any air inhaled into the fork.

3. Front end "searches" at high speed while on the gas:
   Try one of the following;
   a. Increase the front fork oil level 10 mm (0.4 in).
   b. Decrease the inner tube projection. (5 mm (0.2 in)).
   c. Decrease the rear shock spring preload 2 mm (0.08 in).

4. Front fork doesn't respond to small bumps in sweeping turns:
   Try one of the following:
   a. Decrease the fork oil weight by one step. (Standard spring is used.)
   b. Decrease the oil level 10 mm (0.4 in). (Standard oil is used.)
   c. Use light duty springs.

5. Rear end "skitters" when a braking over bumps:
   The shock probably has too much too less rebound damping in this case. Try reducing (increasing) the rebound damping in one or two-click increments.

6. Rear tire won't ""hook up" out of corners:
   A lack of traction coming out of turns indicates that the monoshock may be too stiff;
   a. Decrease the rear shock spring preload approximately 2 mm (0.08 in).
   b. Use light duty springs. (In the case of a light weight rider)

7. Bike lands on the front wheel off high-speed jumps:
   This may be due to an improper riding posture.
   If the bike always or frequently lands on the front wheel, try some of the following in combination:

a. Increase the rebound damping by 2 clicks.
b. Decrease the shock spring preload.

8. Front and rear of the bike bottom off high-speed jumps:
   If this occurs one or twice per lap of the race, both front and rear suspension systems should be harden a little.

| | Front fork | Rear shock |
|---|---|---|
| Step 1 | Increase oil level 10 mm. | Increase spring preload. |
| Step 2 | Use heavy duty springs. | Use heavy duty springs. |

9. Adjustments depending on bottoming condition (Rear shock)

| | Symptom | Remedy |
|---|---|---|
| a | Bottom at low speeds | Use heavy duty springs or increase spring preload. |
| b | Bottom after successive 3 or 4 jumps | Decrease rebound damping. |

NOTE:

The rear suspension on this machine may mislead some riders.

a. The rear shock bottoms when the spring and damping are overcome by the total weight of the machine and rider (due to full stroke).
b. A bottoming sensation may actually be the inability of rider and machine weight to overcome an overly stiff spring or excessive damping.
   Observe the rear end off jumps; if it doesn't approach bottoming try lowering the spring preload and damping.

# 4 ENGINE MAINTENANCE AND REPAIR

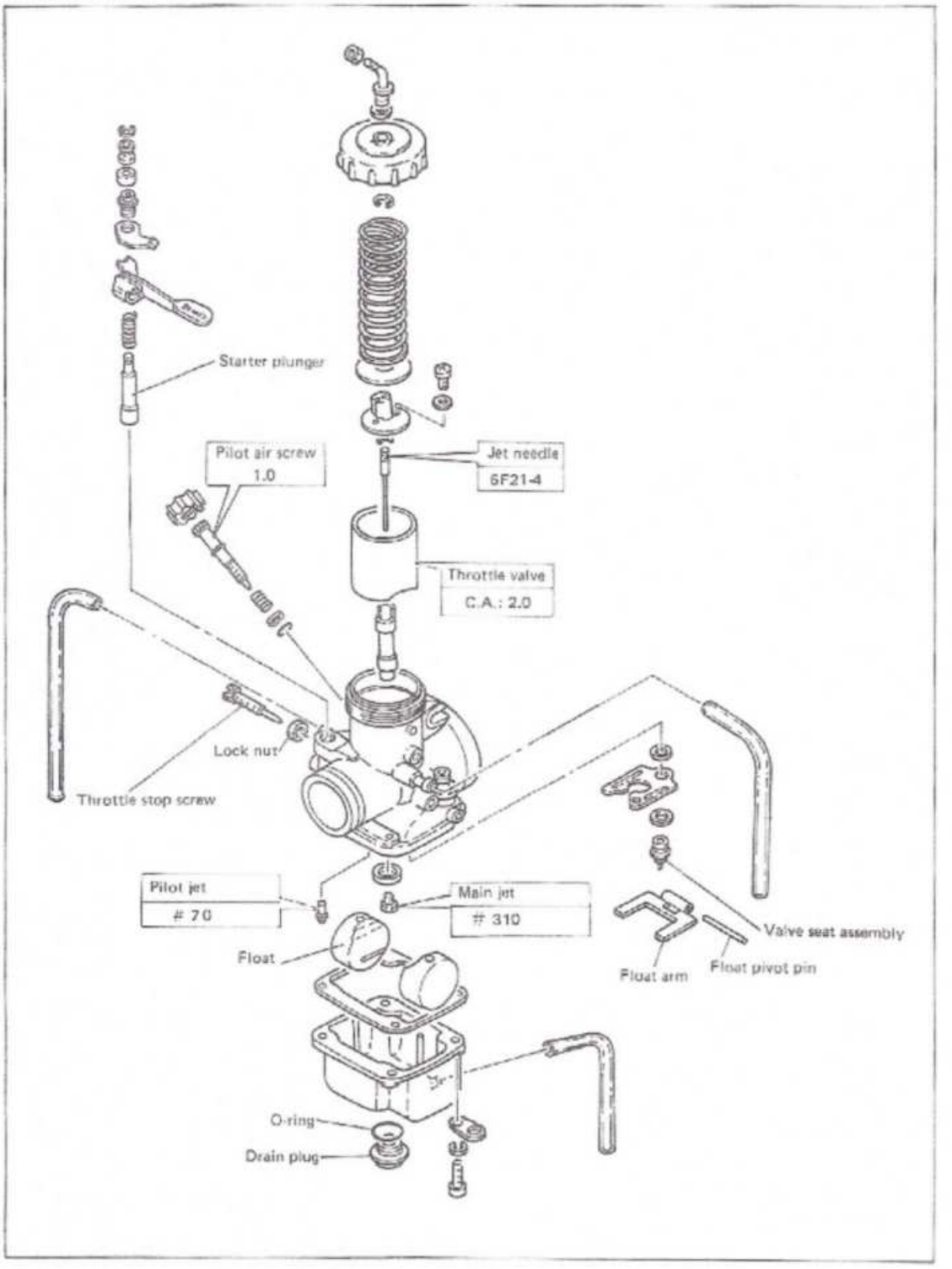
## PREPARATION FOR SERVICE

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.

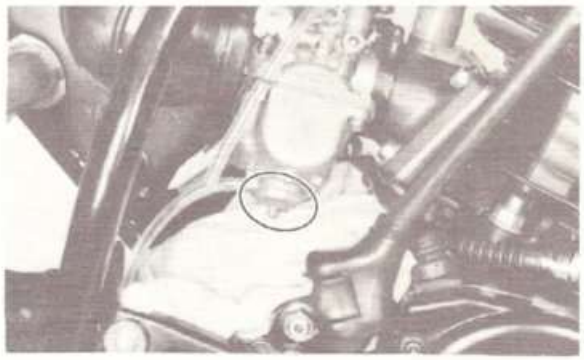
# DISASSEMBLY, INSPECTION AND ASSEMBLY

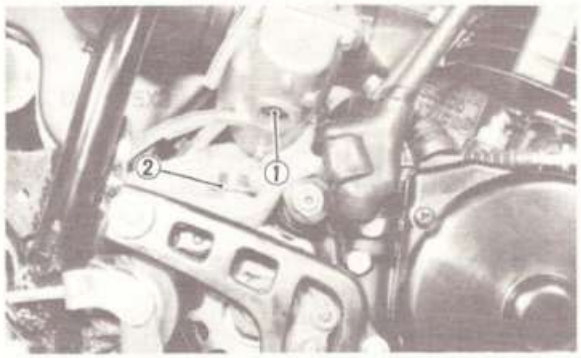
## CARBURETOR



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

| Standard main jet: | # 310 |
|---|---|

**WARNING:**

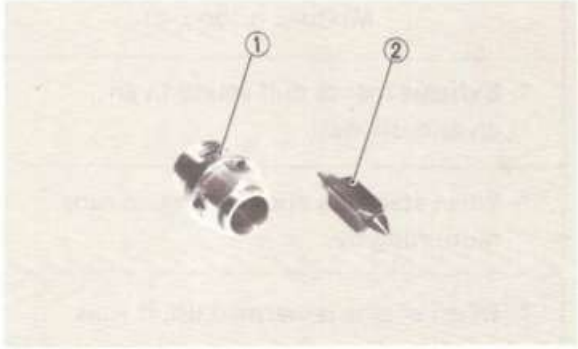
**When the main jet cover bolt is removed, the fuel in the float bowl will drain. Do not remove the bolt when the engine is hot. Place a rag under the carb when removing the bolt to catch the fuel. Remove the bolt in a well-ventilated area, away from any open flame. Always clean and dry the machine after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

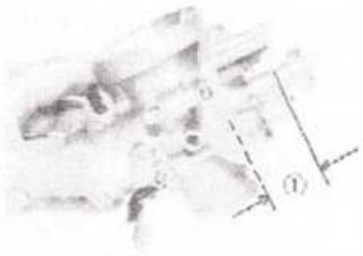
Inspection

1. Examine carburetor body and fuel passages. If contaminated, wash carburetor in petroleumbased solvent. Do not use caustic carburetor cleaning solutions. Blow out all passages and jet 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.




1. Valve seat 2. Float valve

4. Hold the carburetor in an upside down position.
   Incline the carburetor at 60°~70° (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 float arm using a gauge.



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



1. Float arm height

| Float arm height: 23.5 ± 1.0 mm |
|---|

**CAUTION:**

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

## TUNING GUIDANCE

When the carburetor is not set properly for the engine, poor engine performance will result from the following two causes; too rich or too lean mixture.

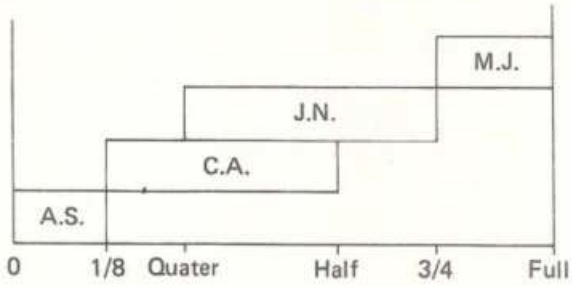
| Mixture is too rich. | Mixture is too lean. |
|---|---|
| * Exhaust makes dull sound in an on-and-off way. | * Engine overheats. |
| * When starter is applied, engine runs more roughly. | * When starter is applied, engine runs smoothly. |
| * When engine is warmed up, it runs roughly. | * Poor acceleration will result. |
| * Spark plug is dark. | * Spark plug is too light. |
| * When cleaner case cover is removed, engine runs smoothly. | * Engine runs roughly and lacks power. |
| * Exhaust is smoky. | |

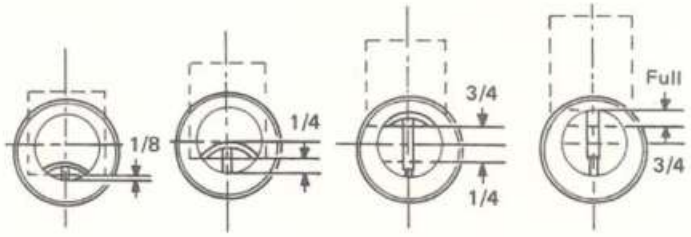
This carburetor is so designed that the parts to be adjusted differ depending on the throttle opening. Therefore, it is necessary to first check whether mixture is too rich or too lean, and then to find out what is the throttle opening.

- Machine speed

| | |
|---|---|
| *Low speed | Air screw, Cutaway |
| *Medium speed | Jet needle-clip position |
| *High speed | Main jet |

- Throttle opening




It is a wise practice to adjust the air screw, jet needle - clip position or main jet to eliminate the causes of trouble.

If the air-fuel mixture is too lean, the engine tends to overheat and seize up, and on the contrary, if too rich, the spark plug easily gets wet, thus causing misfires. The proper strength of the mixture varies depending on atmospheric conditions (pressure, humidity, and temperature). Taking these condition into consideration, adjust the carburetor settings properly.

TEST RUNS

Warm up the engine with the carburetor of the standard settings, and run two or three laps of the course while examining the operating condition of the spark plug.

| Condition of spark plug | |
|---|---|
| Correct | Insulator is dry and light tan color. |
| Too hot | Insulator is whitish. |
| Too cold | Insulator is wet and sooty. |

If spark plug is whitish, the fuel-air mixture is lean.

* Replace the main jet with a one step large type.

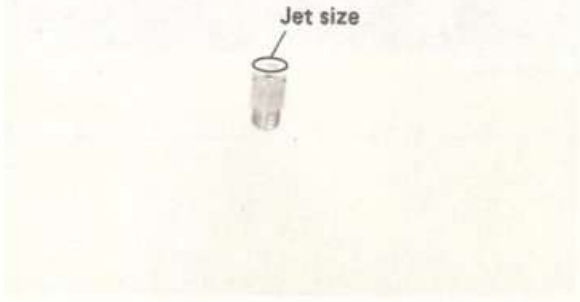
If spark plug is wet, the fuel-air mixture is rich.

* Replace the main jet with a one step smaller type.

MAIN JET (M.J.)

| |
|---|
| Standard setting: # 310 |

The larger the size No., the richer the mixture, and smaller the No., the leaner the mixture.




JET NEEDLE ADJUSTMENT

Jet needle should be changed only when the machine shows poor medium speed performance. If the mixture is too rich or too lean, acceleration will be slow.

- When rich at medium speeds:

The engine runs roughly with slow throttle response.

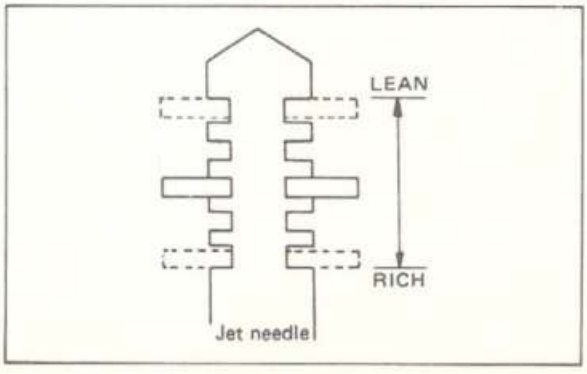
Raise the jet needle clip position one step to make the mixture lean.

- When lean at medium speed:

The engine runs roughly.

Lower the clip position one step to enrich the mixture.

| |
|---|
| Standard setting: 6F21-4 |



## AIR SCREW (A.S.)

| Standard setting: | 1.0 |
|---|---|

Turning in the air screw decreases the air flow and makes the mixture richer, and turning out makes the mixture leaner with an increase in the air flow.



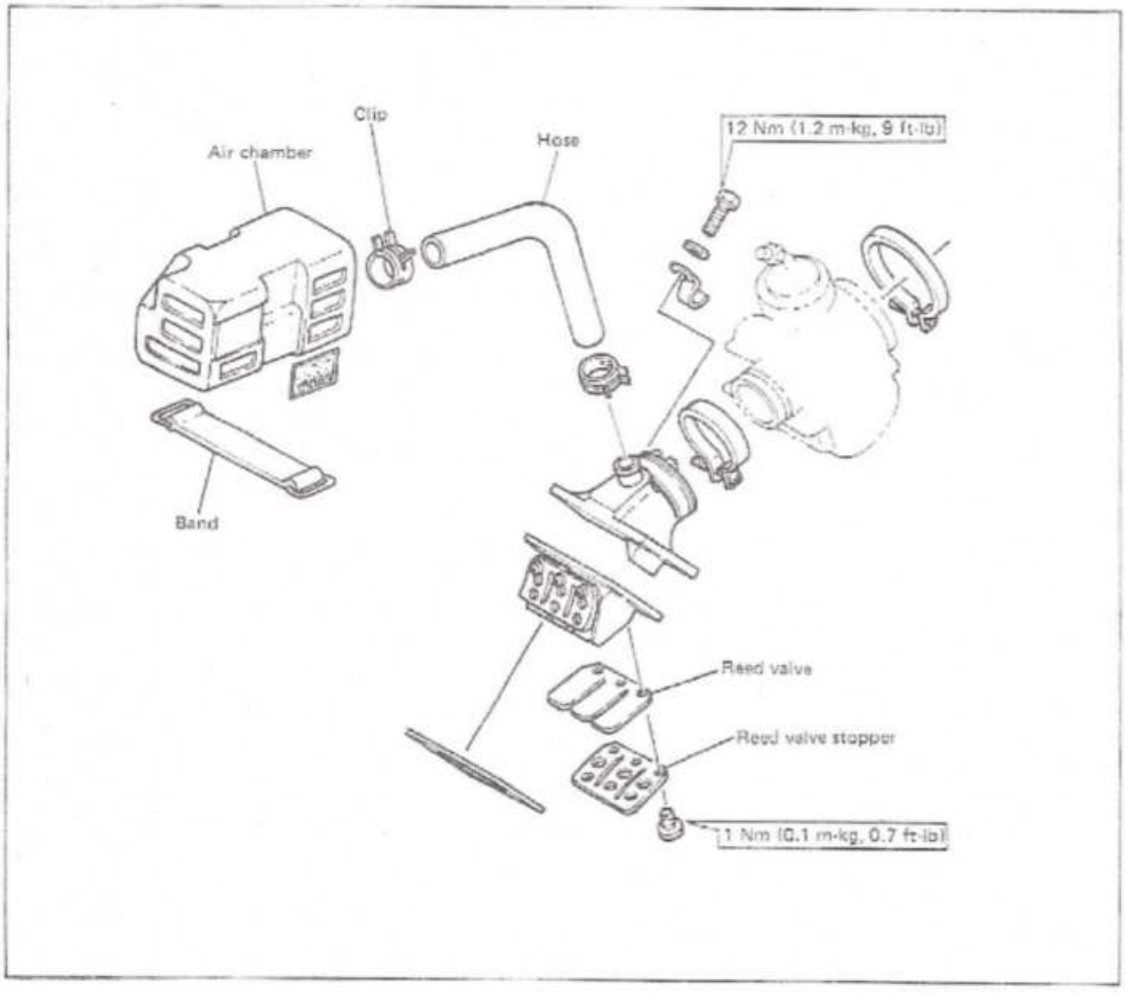
1. Air screw

## 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.



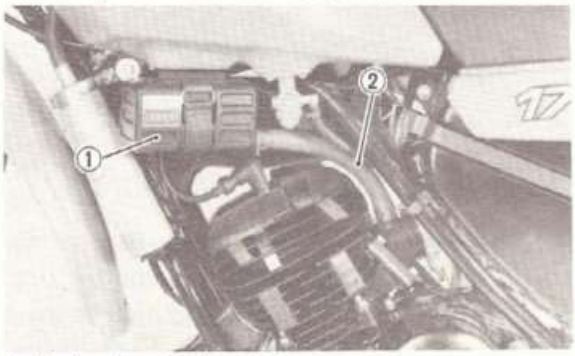
# 4 ENGINE MAINTENANCE AND REPAIR


PREPARATION FOR SERVICE ..... 4-1

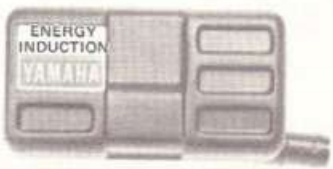
DISASSEMBLY, INSPECTION AND ASSEMBLY ..... 4-2
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**Inspection**

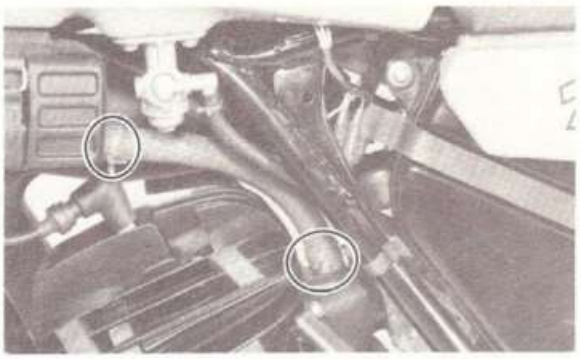
1. Check the hose and air chamber for cracks or any other damage. If there is any cracks or damage, replace them.




1. Air chamber 2. Hose




2. Check the position of hose clips, and refit as required.



**NOTE:**

The fuel tank is provided with the Y.E.I.S. air chamber. When removing the fuel tank, first remove the band holding the air chamber.



## 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. Lekage should be slight to moderate.
3. The valve stopper controls the movement of the valve. Check clearance "a".

| Standard value "a": |
| --- |
| 9 mm (0.354 in) |

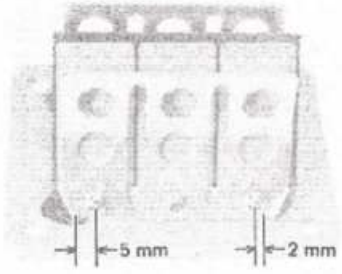
If it is 0.2 mm (0.008 in) more or less than specified, replace the valve stopper.




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

| Reed valve bending limit: |
| --- |
| 1.4 mm (0.055 in) |

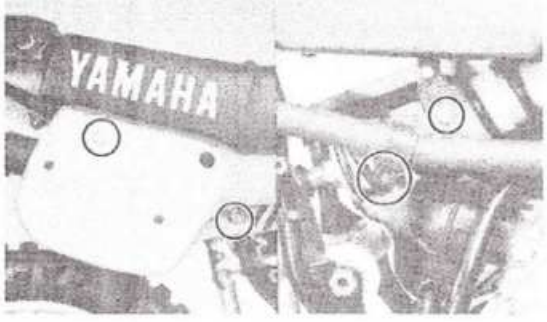
5. During reassembly, note the cut in the lower corner of the reed and stopper plate. Use as aid to direction of reed installation.

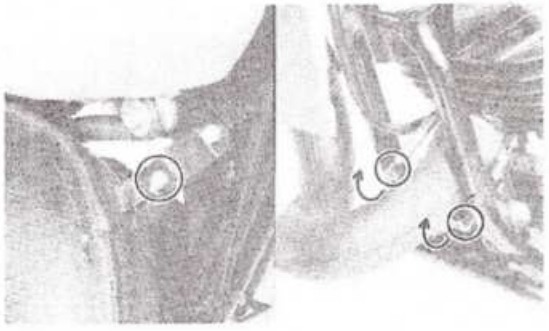



## MUFFLER

### Removal

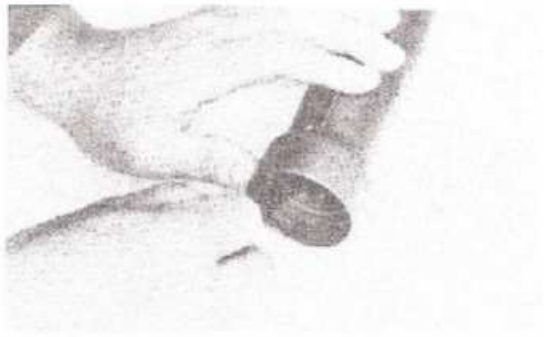
1. Remove the two screws and remove side cover.
2. Remove muffler and silencer mounting bolts and loosen the muffler joint screw.
3. Remove coil springs at muffler to cylinder joint and remove muffler.



### Maintenance

1. Using a rounded scraper, remove excess carbon deposits from manifold area of exhaust pipe.

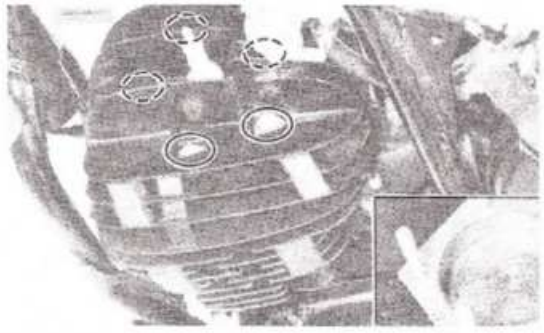


2. Carbon deposits within the silencer may be removed by lightly tapping the outer shell with a hammer and then blowing out with compressed air. Heavy wire, such as a coat hanger, may be inserted to break loose deposits. Use care.
3. Check the exhaust pipe for cracks. If it has excessive cracks, replace it.

## CYLINDER HEAD

### Removal

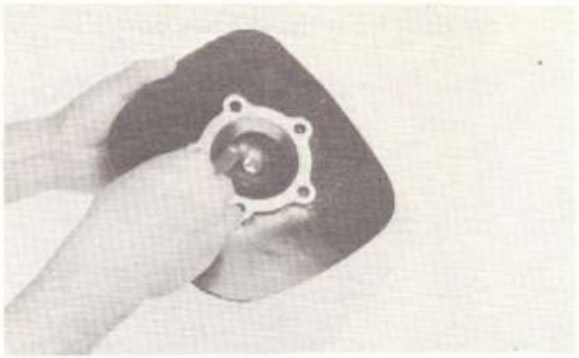
1. Remove the spark plug lead wire from the plug.
2. Loosen the spark plug, but do not remove it.
3. Remove the Y.E.I.S. air chamber and hose.
4. Loosen the five cylinder head nuts a quater turn each in a crisscross pattern, then remove the cylinder head nuts in the same pattern.
   Remove the cylinder head and head gasket, and discard the gasket.



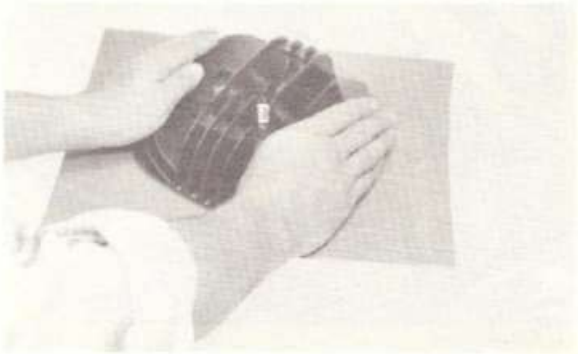
| | |
|---|---|
| Cylinder head nut | 25 Nm (2.5 m·kg, 15 ft·lb) |

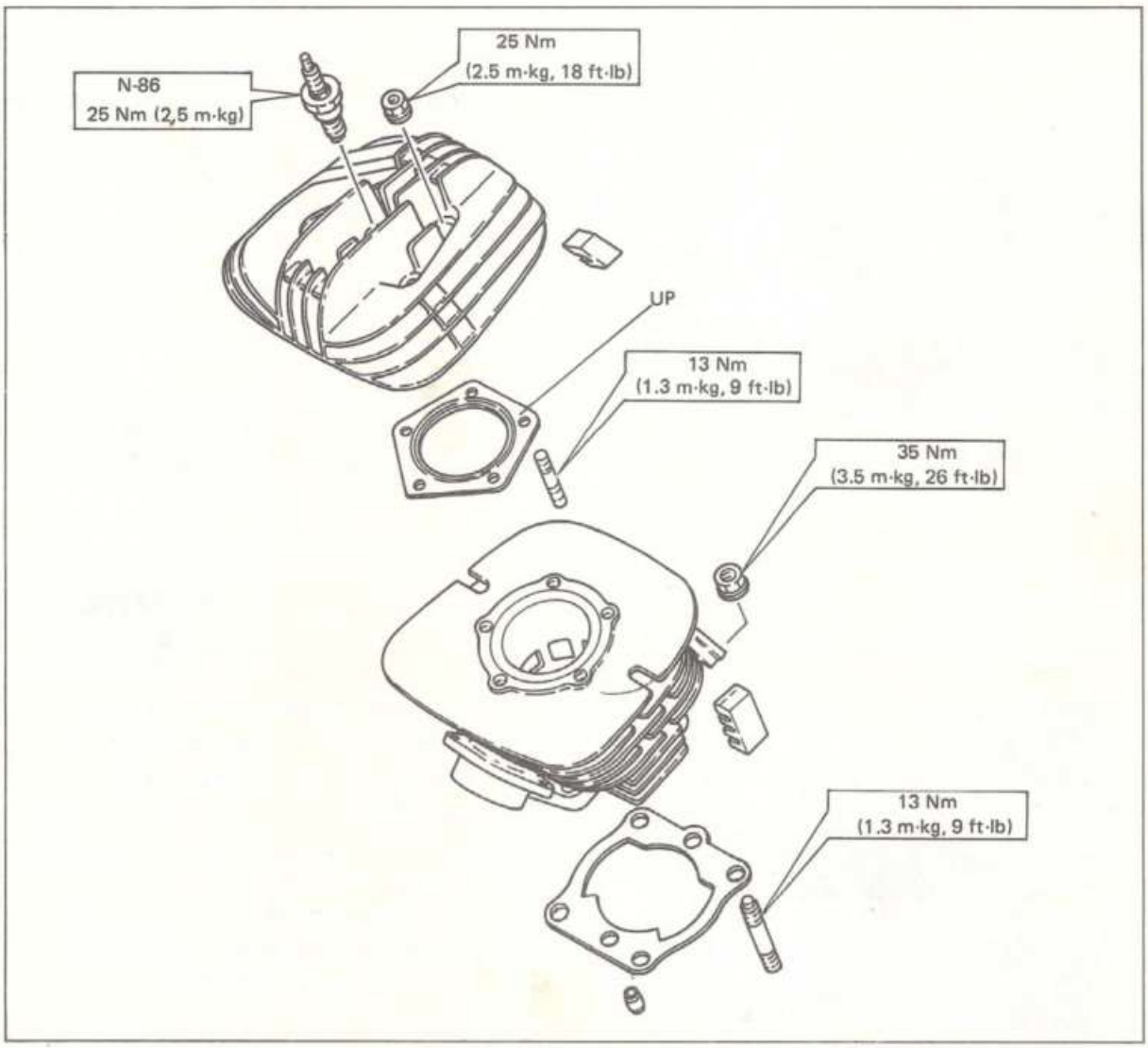
**Maintenance**

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. 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.

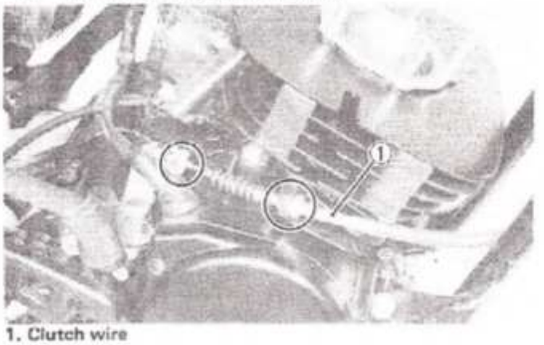




## CYLINDER

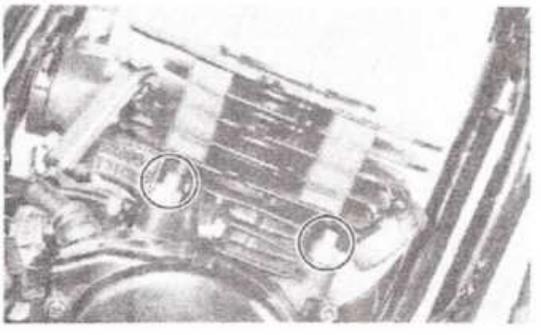
### Removal

1. Remove the carburetor.
2. Disconnect the magneto lead connector from the wire harness.
3. Remove the clutch wire.

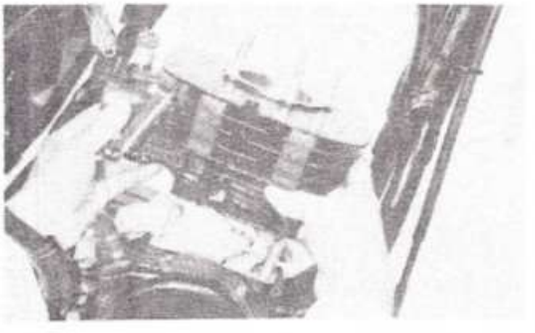



1. Clutch wire

4. Loosen the cylinder holding nuts a quater turn each in a crisscross pattern, and then remove the nuts in the same pattern.



5. 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.



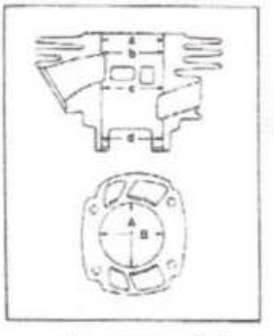
| Cylinder holding nut: 35 Nm (3.5 m-kg, 26 ft-lb) |
|---|

### Maintenance

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



2. 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.
3. Using a cylinder gauge set to standard bore size, measure the cylinder. Measure front-to-rear and side-to-side at top, center and bottom just above exhaust port.





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

| Max. allowable taper: 0.08 mm (0.0031 in) |
|---|
| Max. allowable out-of-round: 0.05 mm (0.0020 in) |

## PISTON ASSEMBLY

### Removal

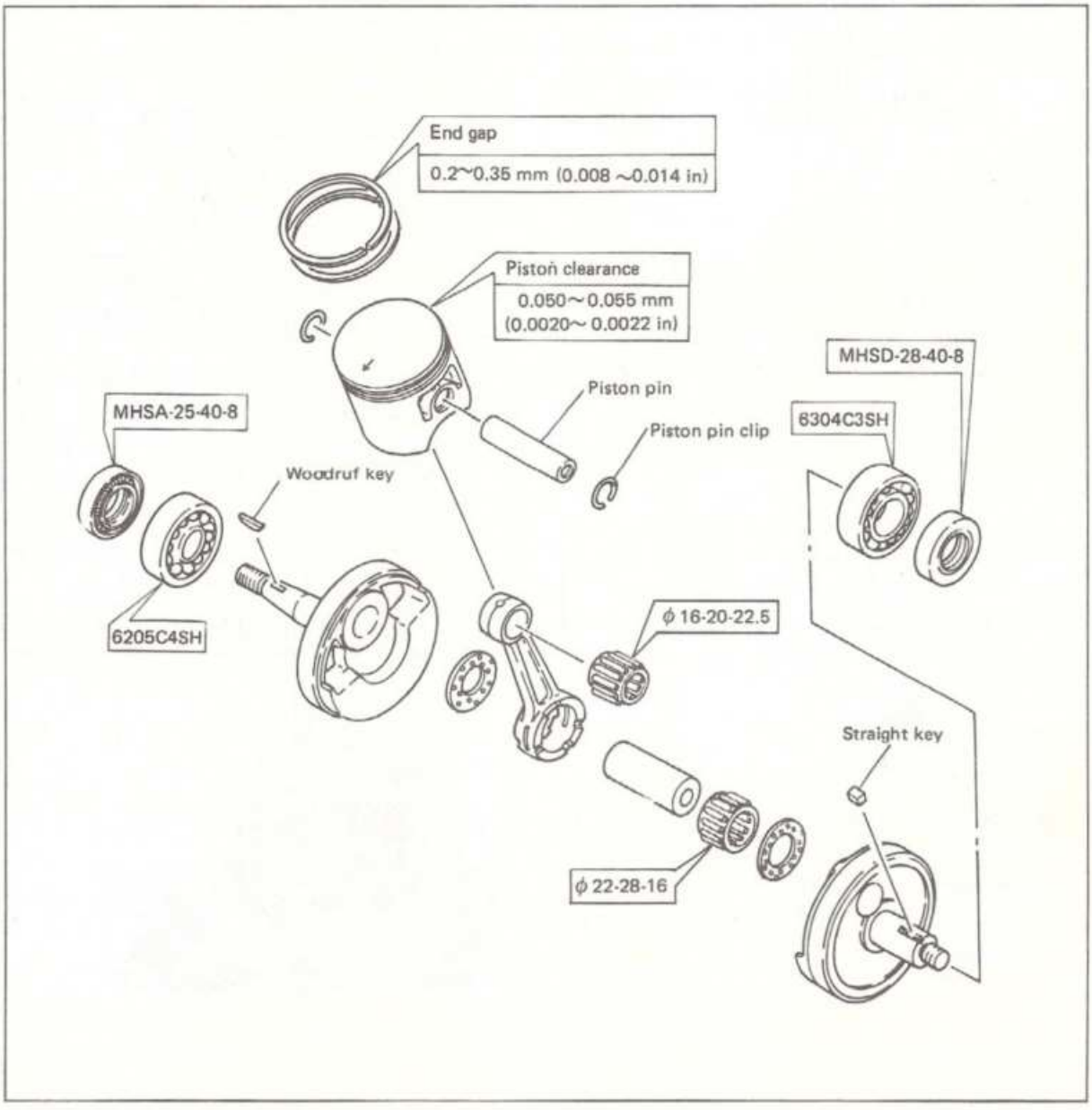
1. Remove the piston clip (1) from the piston. Push the piston pin out from opposite side. Remove the piston.





**NOTE:**

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



**Maintenance**

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

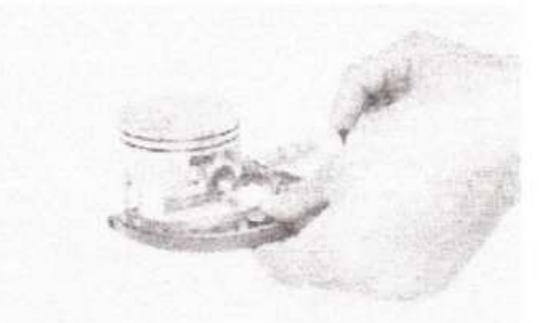




2. Using 400 ~ 600 grit wet sandpaper, lightly sand score marks and lacquer deposits from sides of piston. Sand in crisscross pattern. Do not sand excessively.



3. Using an outside micrometer, measure piston diameter. The measuring point is at right-angles to the piston pin holes, 10 mm (0.39 in) from the bottom of the piston skirts.



4. 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 Maximum |
| Cylinder Diameter – Piston Diameter |
| 66.025 mm (2.599 in) – |
| 65.975 mm (2.597 in) |
| = 0.05 mm (0.0019 in) |

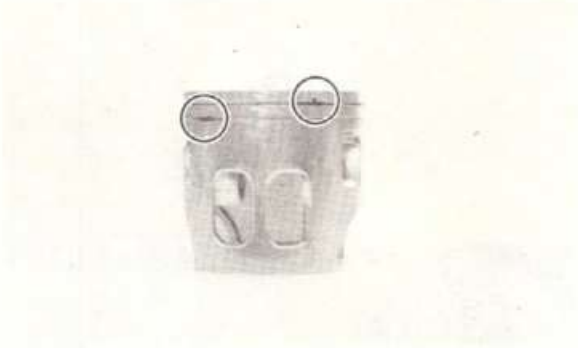
| Nominal piston clearance |
|---|
| 0.050~0.055 mm (0.002 ~0.0022 in) |

5. 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) |
|---|
| 0.2~ 0.35 mm (0.008~ 0.014 in) |



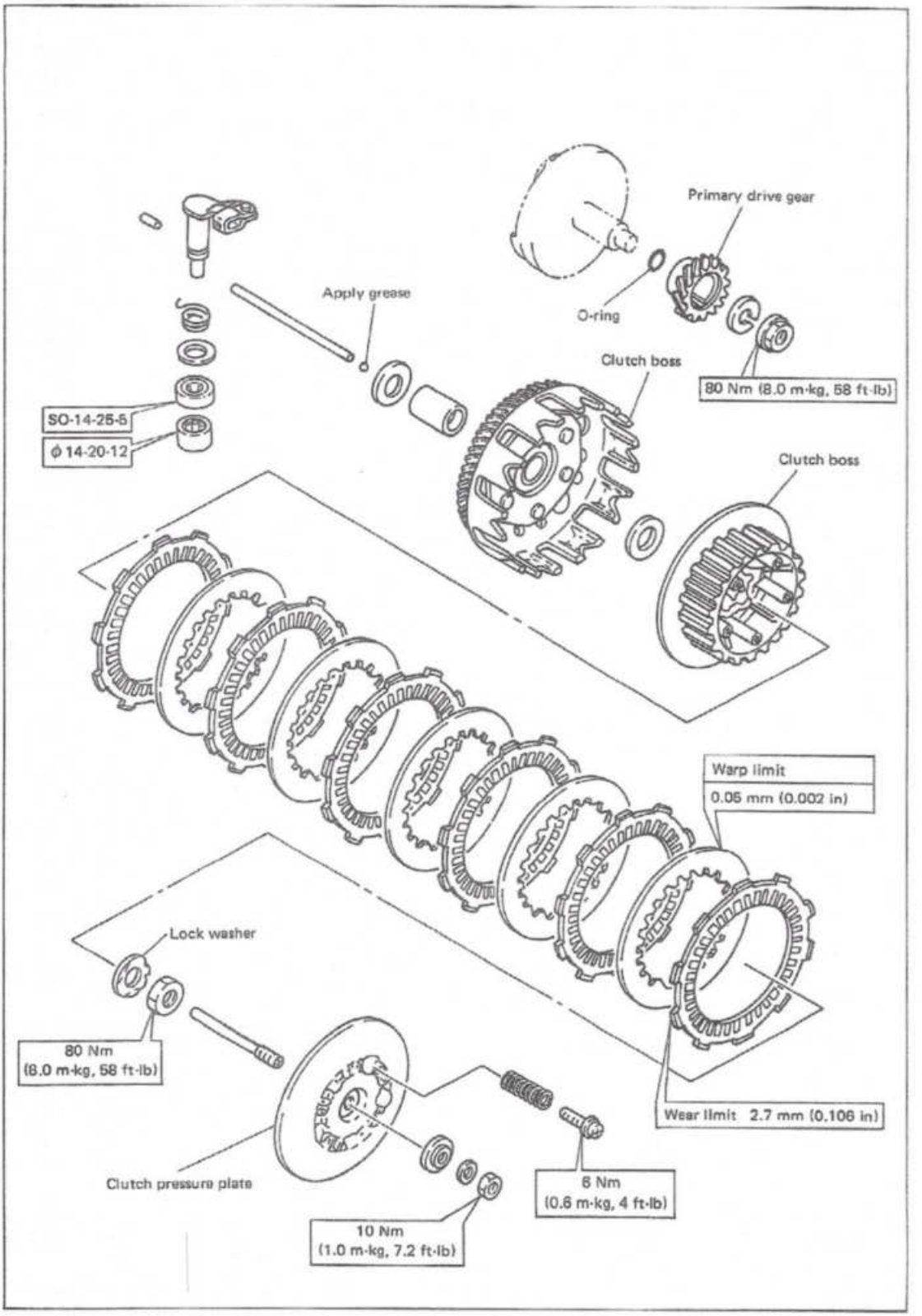
6. Holding cylinder towards light, check for full seating of ring around bore. If not fully seated, check cylinder. If cylinder is not out-of-round, replace piston ring.
7. During installation, make sure ring ends are properly fitted around ring locating pin in piston groove. Apply liberal coating of two-stroke oil to ring.



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

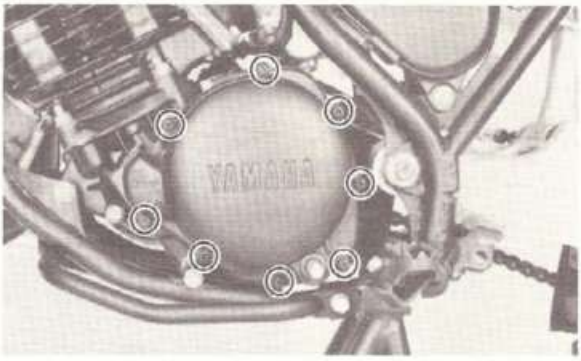
8. Apply a light film of oil to pin and bearing surfaces. Install in connecting rod small end. Check for play. There should be no noticeable vertical play. If play exists, check connecting rod small end diameter for wear. Replace pin and bearing or all as required.

## CLUTCH


Primary drive gear
O-ring
Apply grease
Clutch boss
80 Nm (8.0 m·kg, 58 ft·lb)
SO-14-25-5
φ 14-20-12
Clutch boss
Warp limit
0.05 mm (0.002 in)
Lock washer
80 Nm
(8.0 m·kg, 58 ft·lb)
Wear limit 2.7 mm (0.106 in)
Clutch pressure plate
6 Nm
(0.6 m·kg, 4 ft·lb)
10 Nm
(1.0 m·kg, 7.2 ft·lb)

### Removal

1. Drain the transmission oil.
2. Remove the shift pedal.
3. Remove screws which hold the left-hand crankcase over to the engine, and remove the crankcase cover.

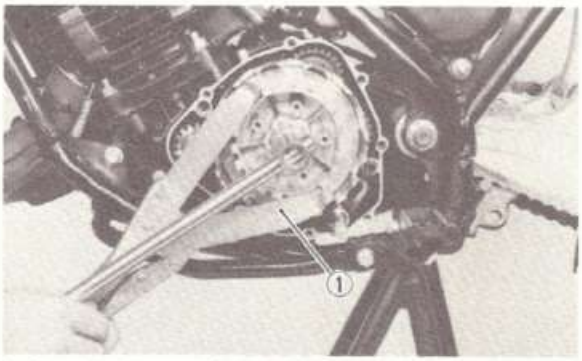


4. Remove the phillips screws holding the pressure plate. Remove the clutch springs, pressure plate and push rod. Remove the clutch plates and friction plates.

**NOTE:**

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

5. Bend lock washer tab down. 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 (TLM-90910-42-00)

| Clutch lock nut torque: 80 Nm (8.0 m·kg, 58 ft·lb) |
|---|

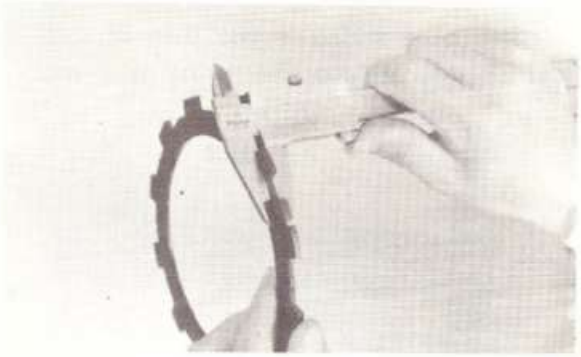
| Primary drive gear nut torque: 80 Nm (8.0 m·kg, 58 ft·lb) |
|---|

6. If the clutch housing spacer remains on the transmission main shaft, remove it. Remove the thrust plate.

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

**NOTE:**

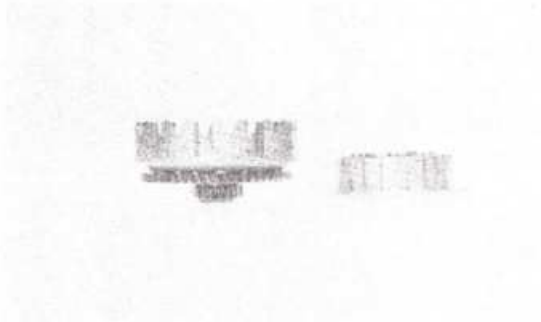
For optimum performance, if any plate requires replacement, it is advisable to replace the entire set.

3. 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.

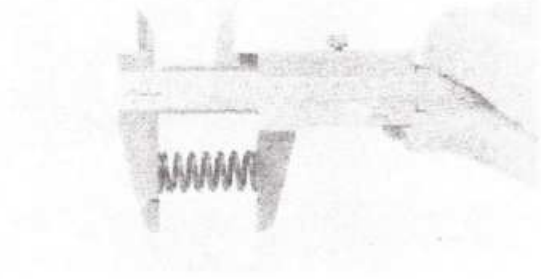


| Clutch plate warpage allowance: 0.05 mm (0.002 in) Maximum |
|---|

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



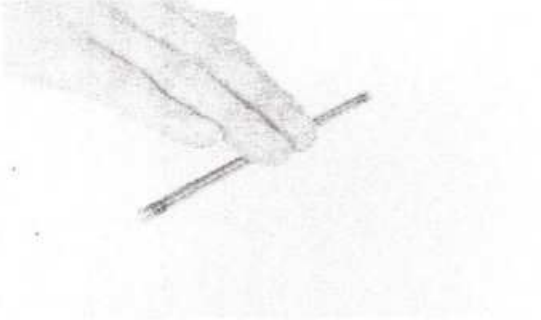
5. Measure each clutch spring; if the free length of a spring is less than 35 mm (1.38 in), replace the spring as a set.



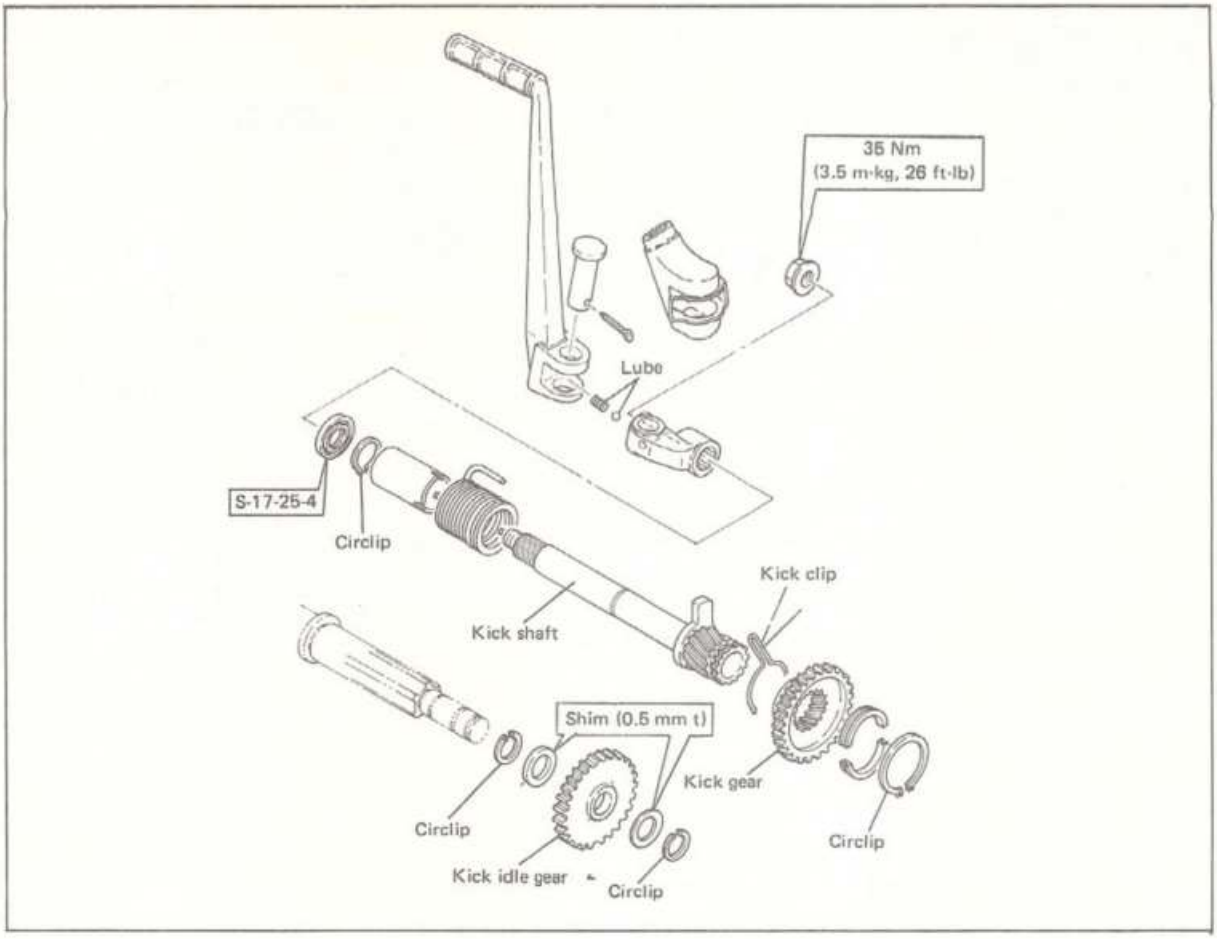
| Spring free length | New | Min. |
|---|---|---|
| | 36 mm (1.42 in) | 35 mm (1.38 in) |

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

| Bend limit: 0.15 mm (0.006 in) |
|---|

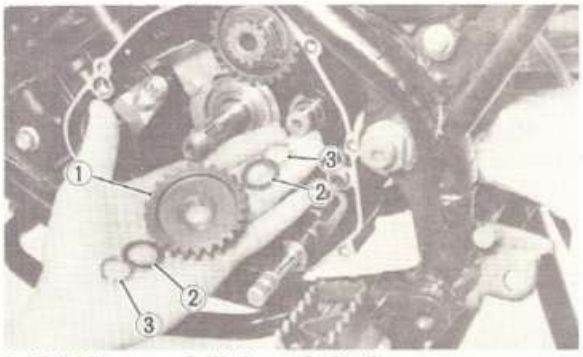


7. Primary drive and drive gears
If primary drive and driven gear produce excessive noise during operation, gear lash may be incorrect. Marks are scribed on the side of each gear.
And in replacement, a gear having the same mark as before must be used.



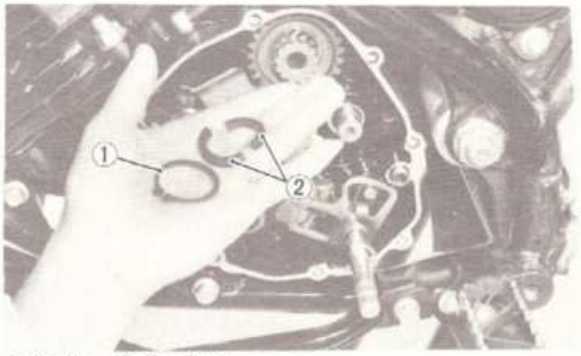

### Removal

1. Remove the circlip, washer and then remove kick idle gear and washer.




1. Kick idle gear 2. Washer 3. Circlip

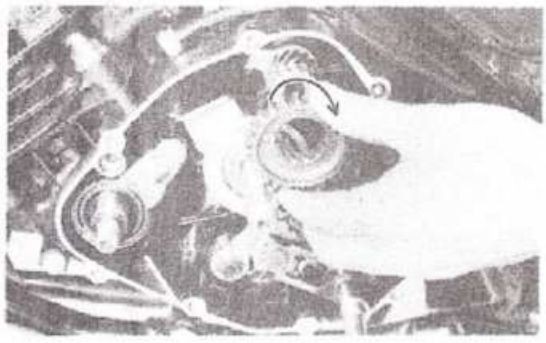
2. Remove the circlip and retainers. Remove the kick gear by rotating the kick crank counterclockwise and then pulling out the gear.

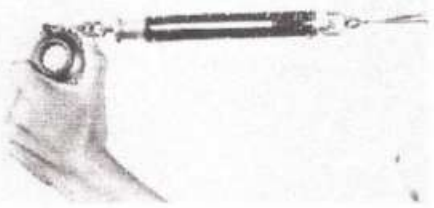



1. Circlip 2. Retainers

### 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.





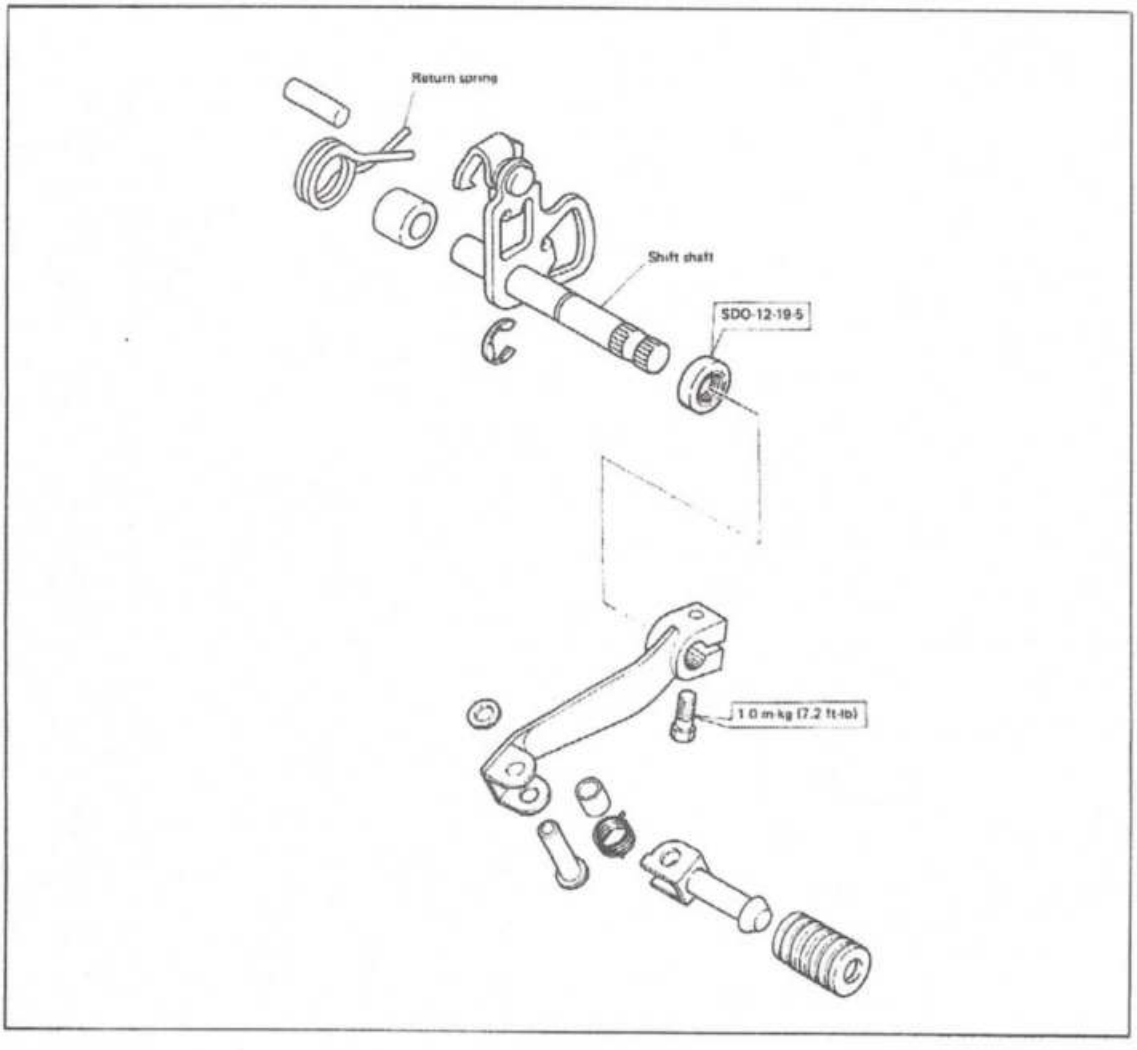
**Reassembly**

1. Engage the kick gear return spring with the slot of the crankcase.
   Check whether the kick starter acts correctly and whether it returns to its home position.
2. After installing, check to make sure the kick gear engages and disengages properly with the idle gear.

## SHIFTER

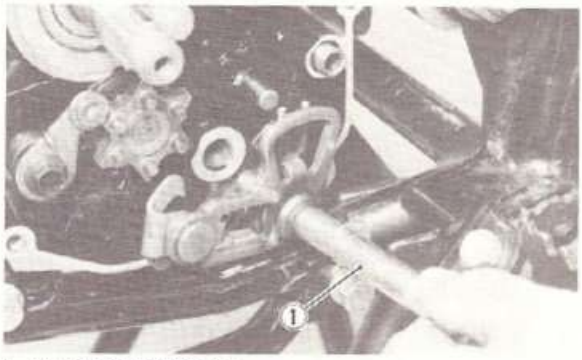
**NOTE:**

Shifter maintenance should be performed with clutch assembly removed.

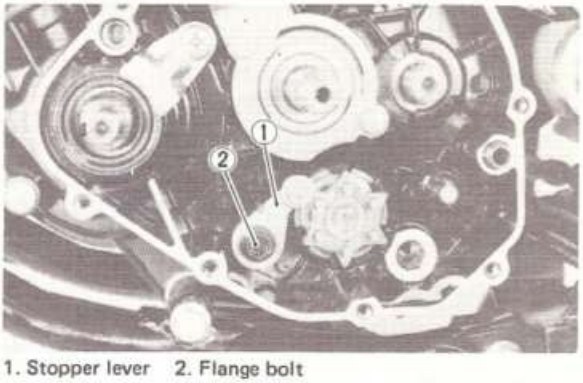


**Removal**

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




1. Change lever assembly




1. Stopper lever 2. Flange bolt

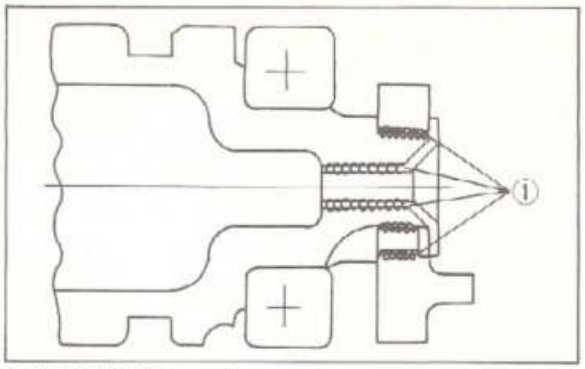
| Tightening torque: |
| --- |
| 14 Nm (1.4 m·kg, 10 ft·lb) |

**Installation**

1. When replacing the shift cam, apply a holding agent, such as "LOCTITE®", to threads of flat head screw, washer and key.

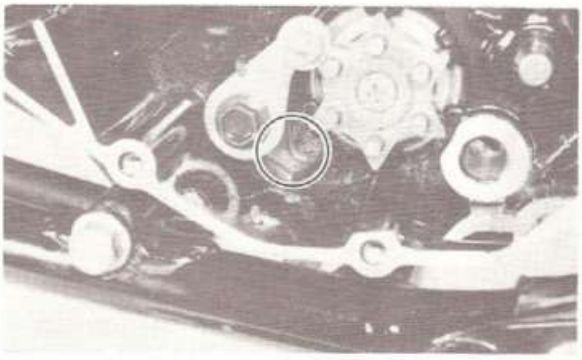
**Inspection**

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.



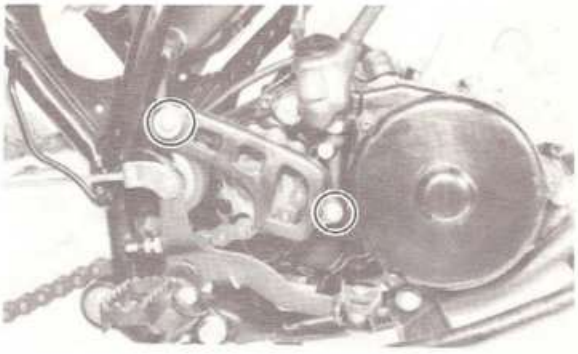

1. Apply a holding agent

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



**Engine removal**

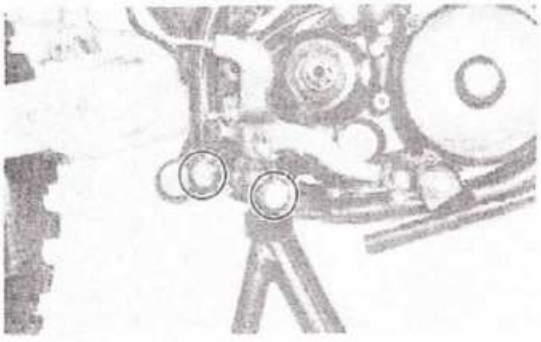
1. Remove the chain cover, drive sprocket nut, lock washer and drive sprocket.



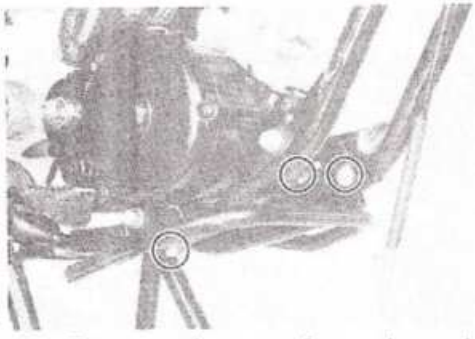
2. Remove the two bolts which hold the footpeg to the frame. Remove the footrest and brake pedal assembly.



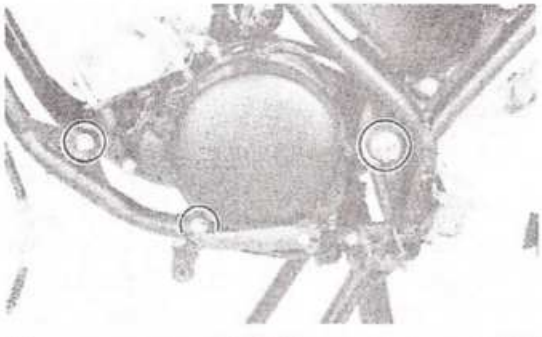
3. Remove the engine guard.

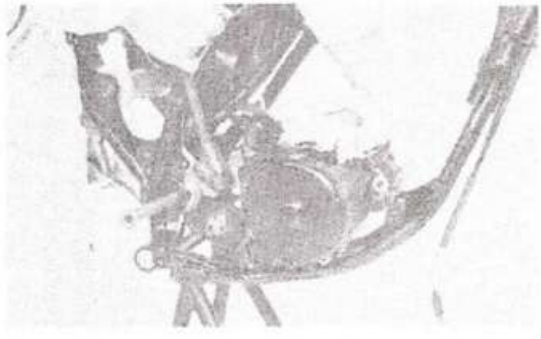


4. Remove the two engine mounting bolts.



5. 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.
6. Remove the engine from right side of frame.



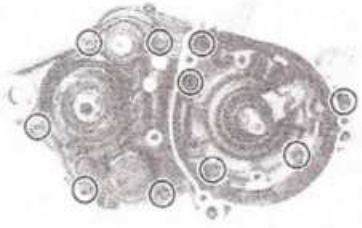


**Crankcase disassembly**

1. Remove the clutch push axle and spring.

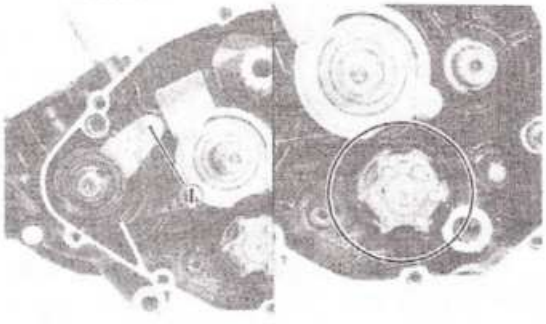


2. Working in a crisscross pattern, loosen panhead screws 1/4 turn each. Remove them after all are loosened.



| Tightening torque: |
| --- |
| 12 Nm (1.2 m·kg, 8.6 ft·lb) |

3. Turn the shift cam to the position show in the figure so that it does not contact the crankcase when separating the case.
4. Remove the oil seal retainer and plug. Install crankcase separating tool as shown.



1. Retainer 2. Plug

**NOTE:**

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

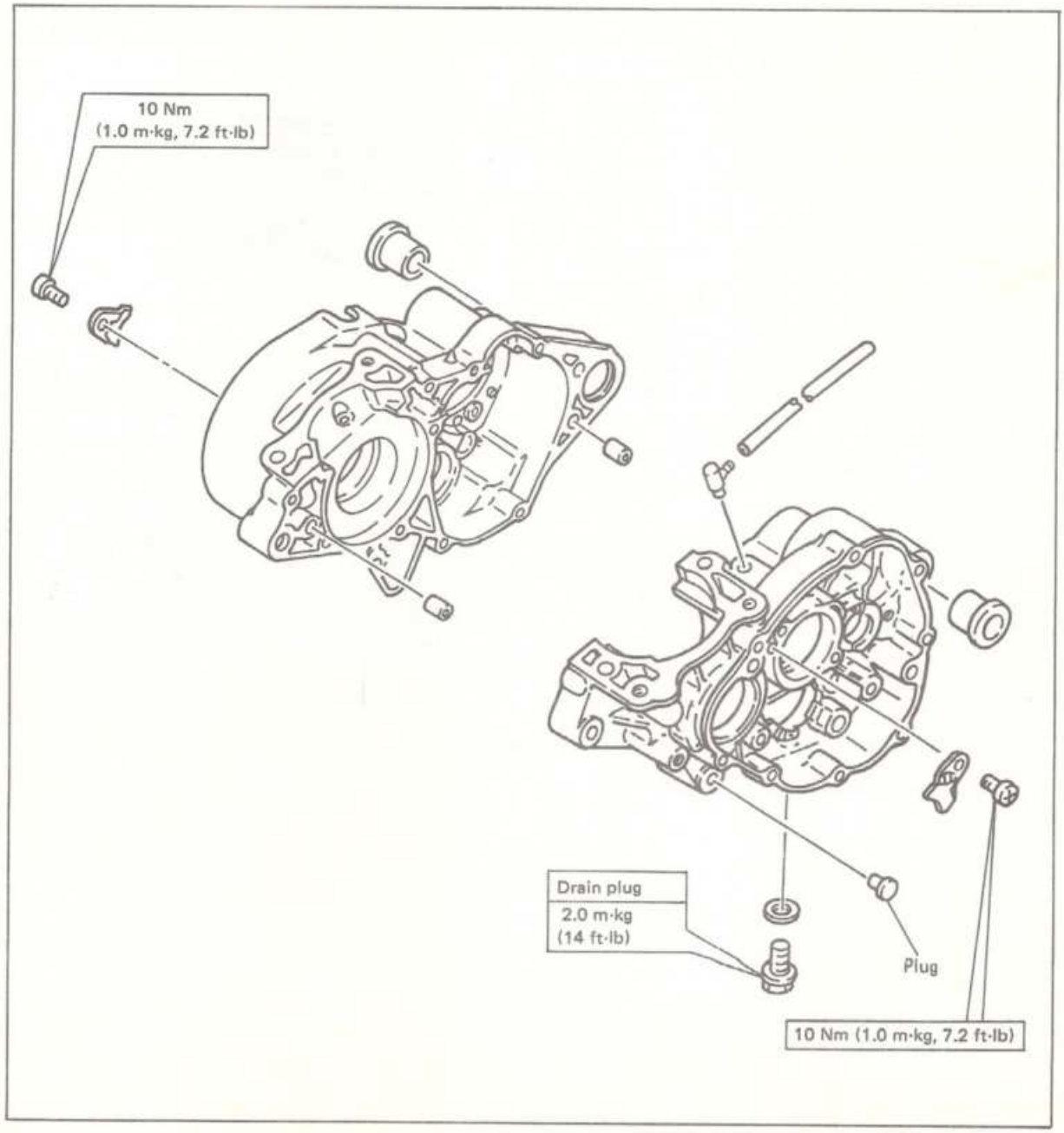



1. Crankcase separating tool

**CAUTION:**

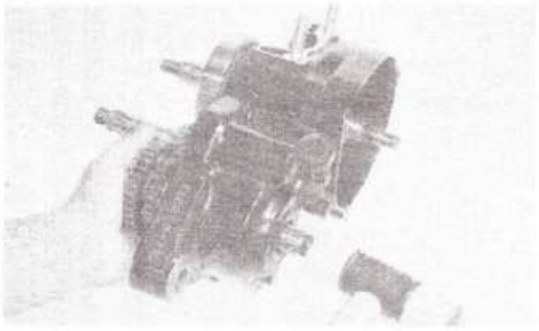
Use a soft hammer to tap on the case half. Tap only on reinforced portions of case. Do not tap on gasket mating surface. Work slowly and carefully. Make sure the case halves separate evenly. If one end "hangs up", take pressure off the push screw, realign and start over. If the halves are reluctant to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

## CRANK CASE



## TRANSMISSION

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

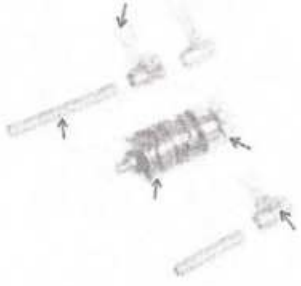


**NOTE:**

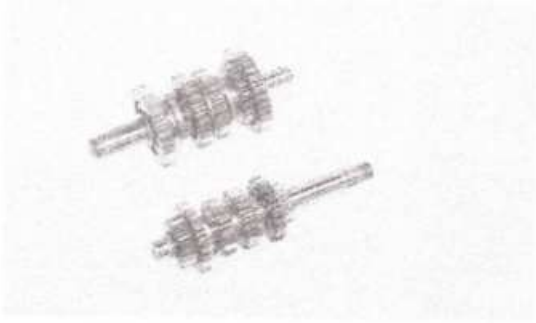
Remove assembly carefully. Note the position of each part. Pay particular attention to the location and direction of shift forks.

### Inspection

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

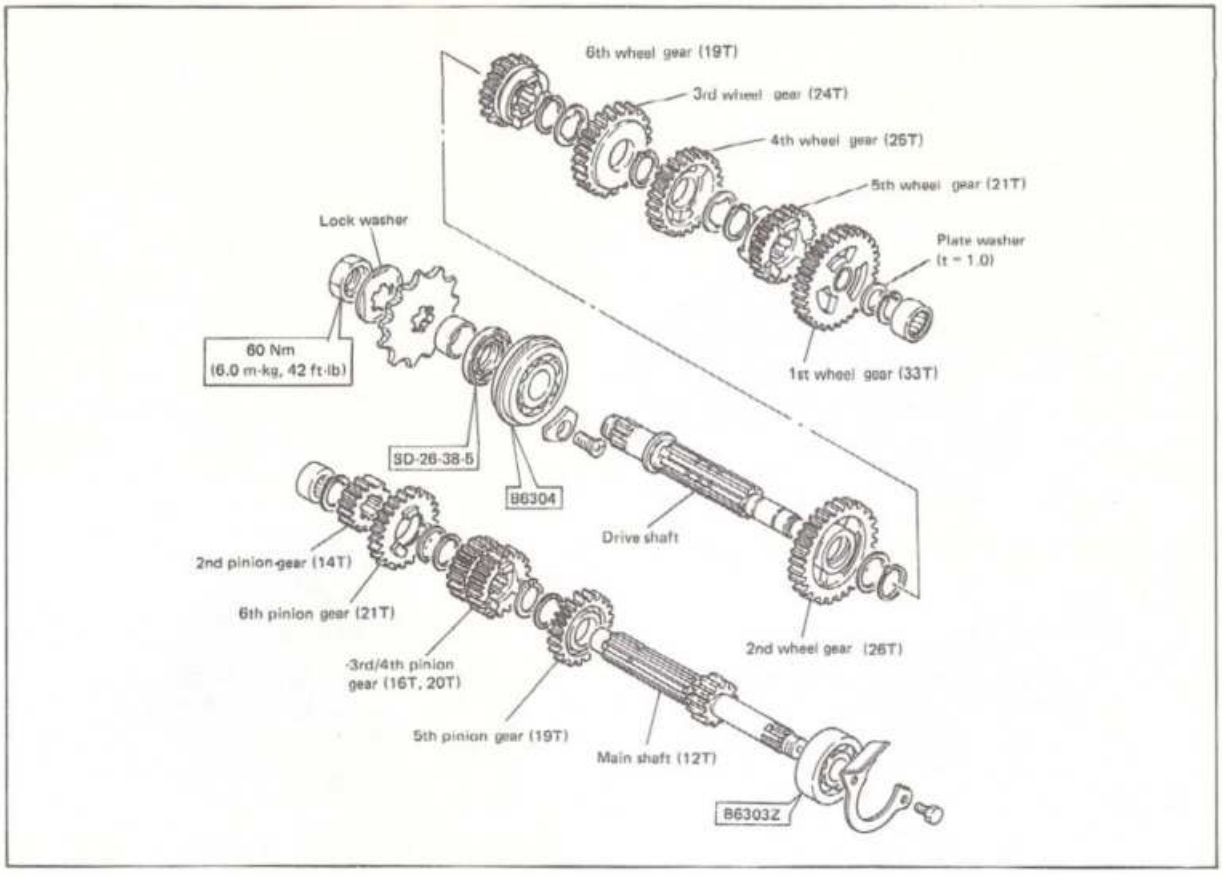


5. Check shift cam dowel pins and side plate for looseness, damage, or wear. Repair as required, or replace.
6. Check the shift cam stopper plate, circlip, stopper for wear.
7. Check the transmission shafts using a centering device and dial gauge. If any shaft is bent, replace.
8. Carefully inspect each gear. Look for signs of obvious heat damage (blue discoloration). Check the gear teeth for signs of pitting, galling, or other extreme wear. Replace as required.
9. Check to see that each gear moves freely on its shaft.

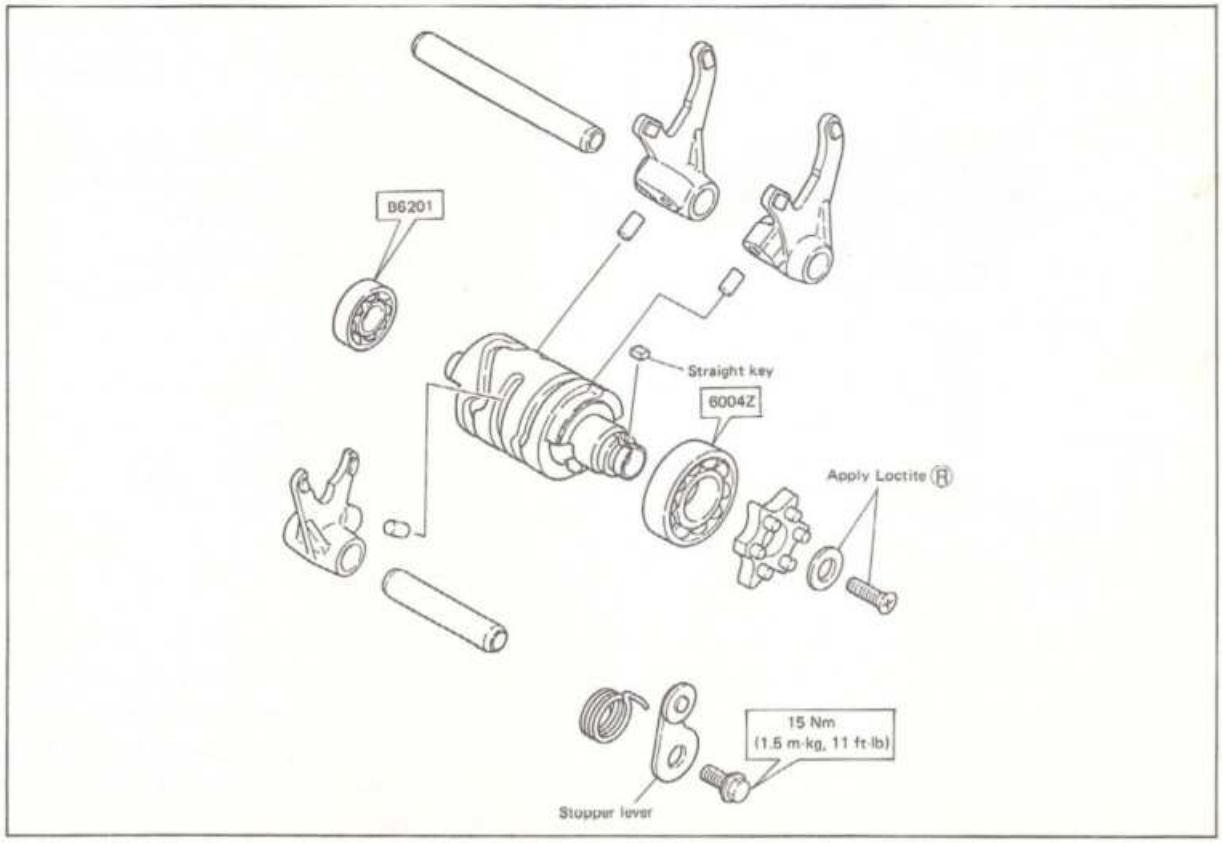


10. Check to see that all washers and clips are properly installed and undamaged. Replace bent or loose clips and bent washers.
11. Check to see that each gear properly engages its counterpart on the shaft. Check the mating dogs for rounded edges, cracks, or missing portions. Replace as required.

## TRANSMISSION




## CRANKSHAFT



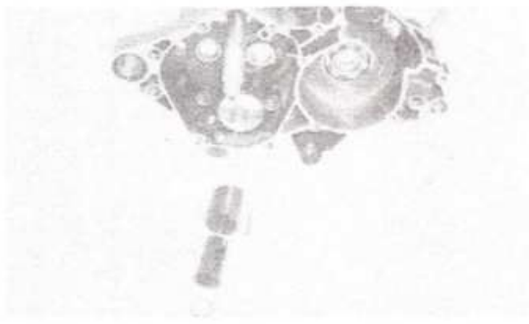
### Kick axle

1. Remove the circlip and unhook the torsion spring from its post in the crankcase. Then remove the torsion spring. Pull out the kick axle assembly from other side.





2. Inspect the kick stopper on the end of kick axle; if it is damaged, replace the axle.



3. When installing the kick axle assembly, hook the torsion spring end to the hole of crankcase.



### CRANKSHAFT

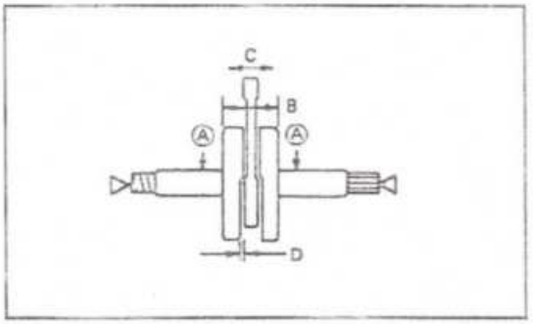
1. Remove crankshaft assembly with crankcase separating tool.




1. Crankcase separating tool (YU-01135)

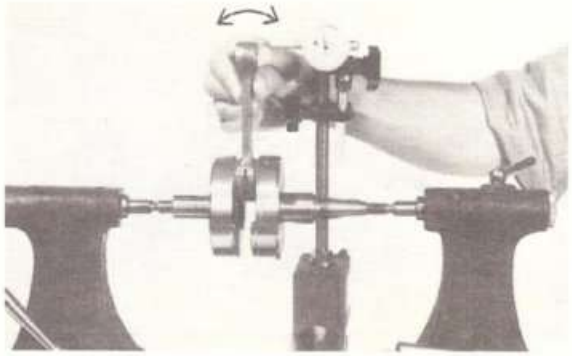
### Inspection

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




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

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

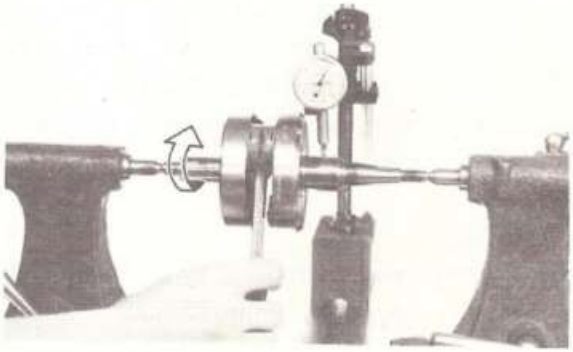


b. Remove the dial gauge and slide the connecting rod to one side. Insert a thickness gauge between the side of the connecting rod big end and the crank wheel. Measure clearance.



Connecting rod/crank side clearance (D):
0.2~ 0.7 mm (0.008 ~ 0.028 in)

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



Unit: mm (in)

| Deflection tolerance (A) | | Flywheel width (B) |
|---|---|---|
| Left side | Right side | |
| 0.03 (0.0012) | 0.03 (0.0012) | $56^{-0.05}_{-0.10}$ ($2.205^{-0.002}_{-0.004}$) |

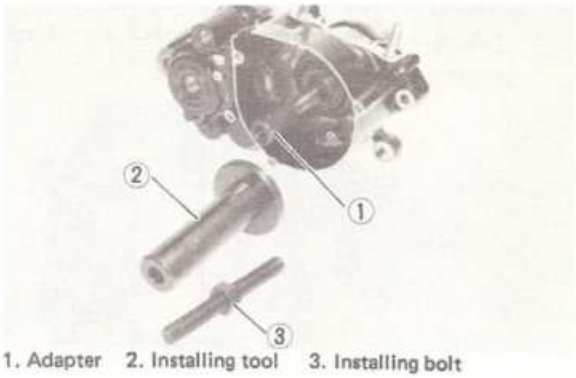
**Crankshaft installation**

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.

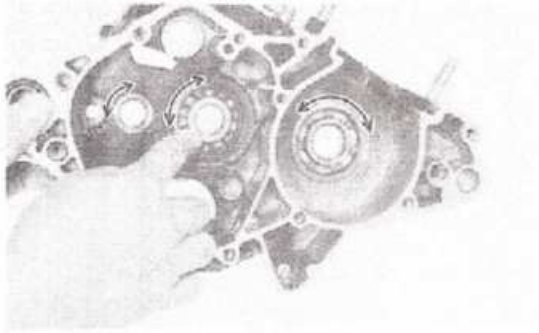



1. Adapter 2. Installing tool 3. Installing bolt



## BEARING AND OIL SEALS

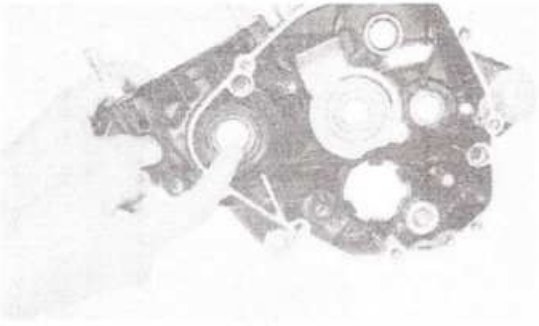
1. After cleaning and lubricating the bearings, rotate inner race with a finger. If rough spots are noticed, replace the bearing.



**NOTE:**

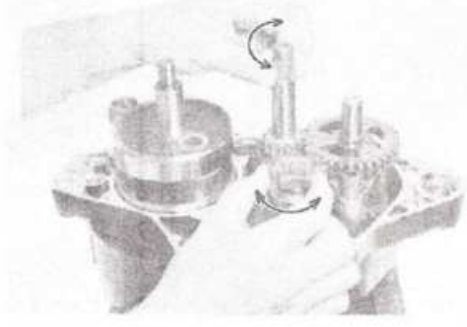
Bearing(s) are most easily removed or installed if the cases are first heated to approximately 90° ~ 120°C (194° ~ 248°F). Bring the case up to proper temperature slowly. Use an oven.

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).

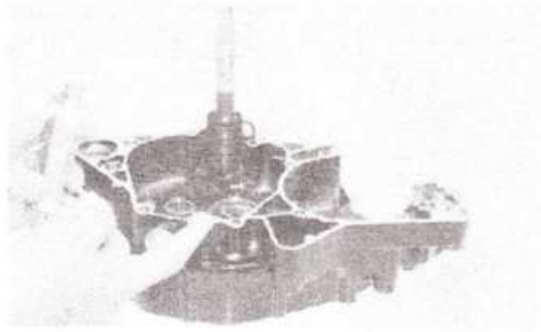


**Transmission installation**

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

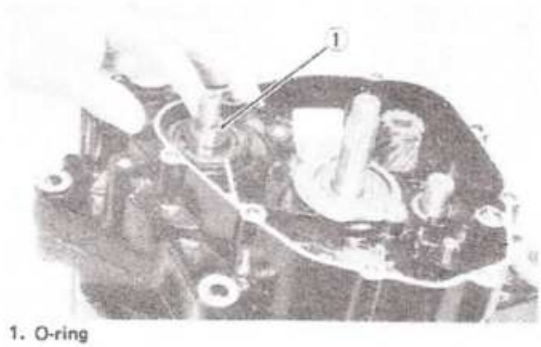


2. Apply YAMAHA BOND #4 to the mating surfaces of both case halves.



**NOTE:**

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




1. O-ring

3. Check crankshaft and transmission shafts for proper operation and freedom of movement.
4. After reassembly, apply a liberal coating of two-stroke oil to the crank pin and bearing and into each crankshaft bearing oil delivery hole.
5. While squeezing the rings, slip the cylinder down over the piston; the cylinder should slide easily onto the piston. Do not force the cylinder onto the piston, as the rings may be bent or broken easily.

**Mounting**

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

| Engine mounting bolt: |
| --- |
| 30 Nm (3.0 m·kg, 22 ft·lb) |

| Pivot shaft nut:<br>85 Nm (8.5 m·kg, 60 ft·lb) |
|---|

2. Install drive sprocket.

| Drive sprocket nut torque:<br>60 Nm (6.0 m·kg, 42 ft·lb) |
|---|

3. Install flywheel magneto.

| Rotor nut torque:<br>80 Nm (8.0 m·kg, 56 ft·lb) |
|---|

# 5 CHASSIS MAINTENANCE AND REPAIR


WHEEL ASSEMBLIES, SPROCKETS AND CHAIN ..... 5-1
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- Rear wheel removal ..... 5-3
- Wheel installation ..... 5-3
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REAR SHOCK ..... 5-11
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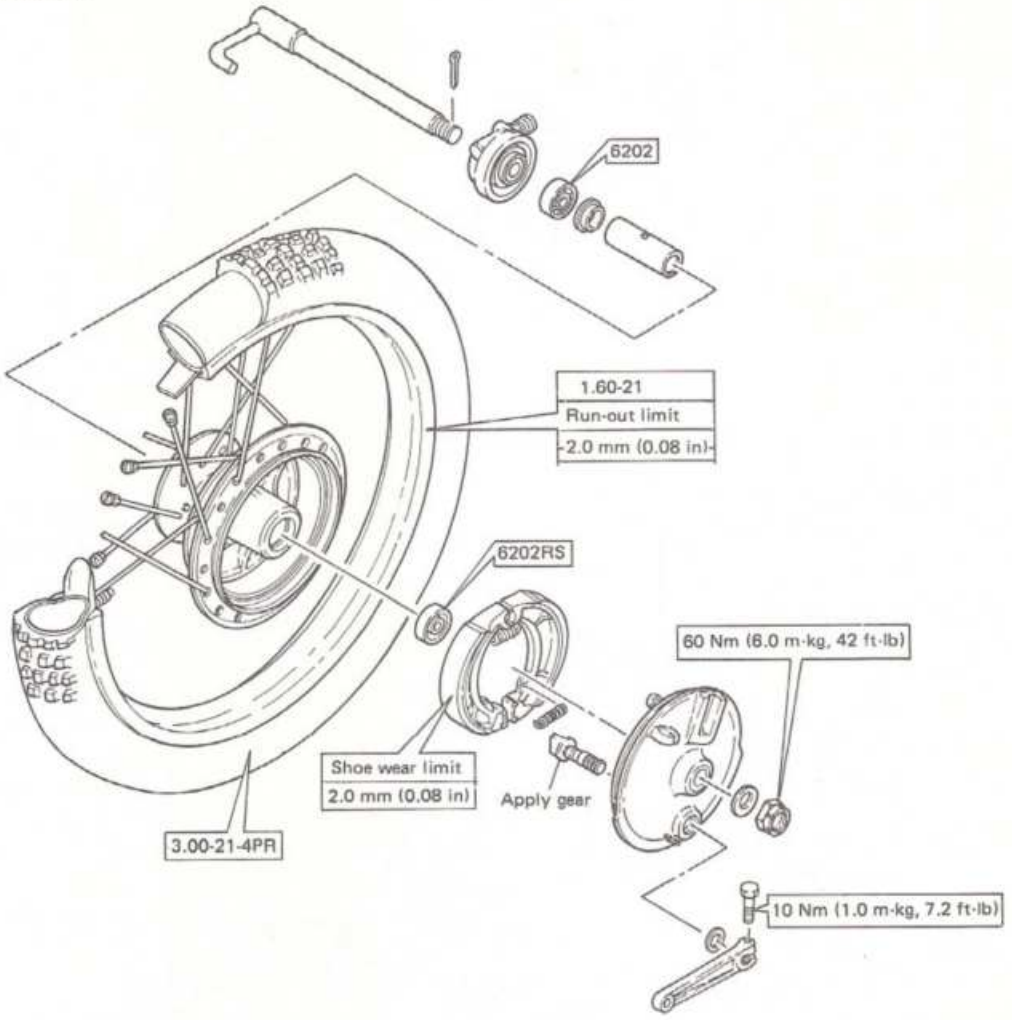
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# 5 CHASSIS MAINTENANCE AND REPAIR

## 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.

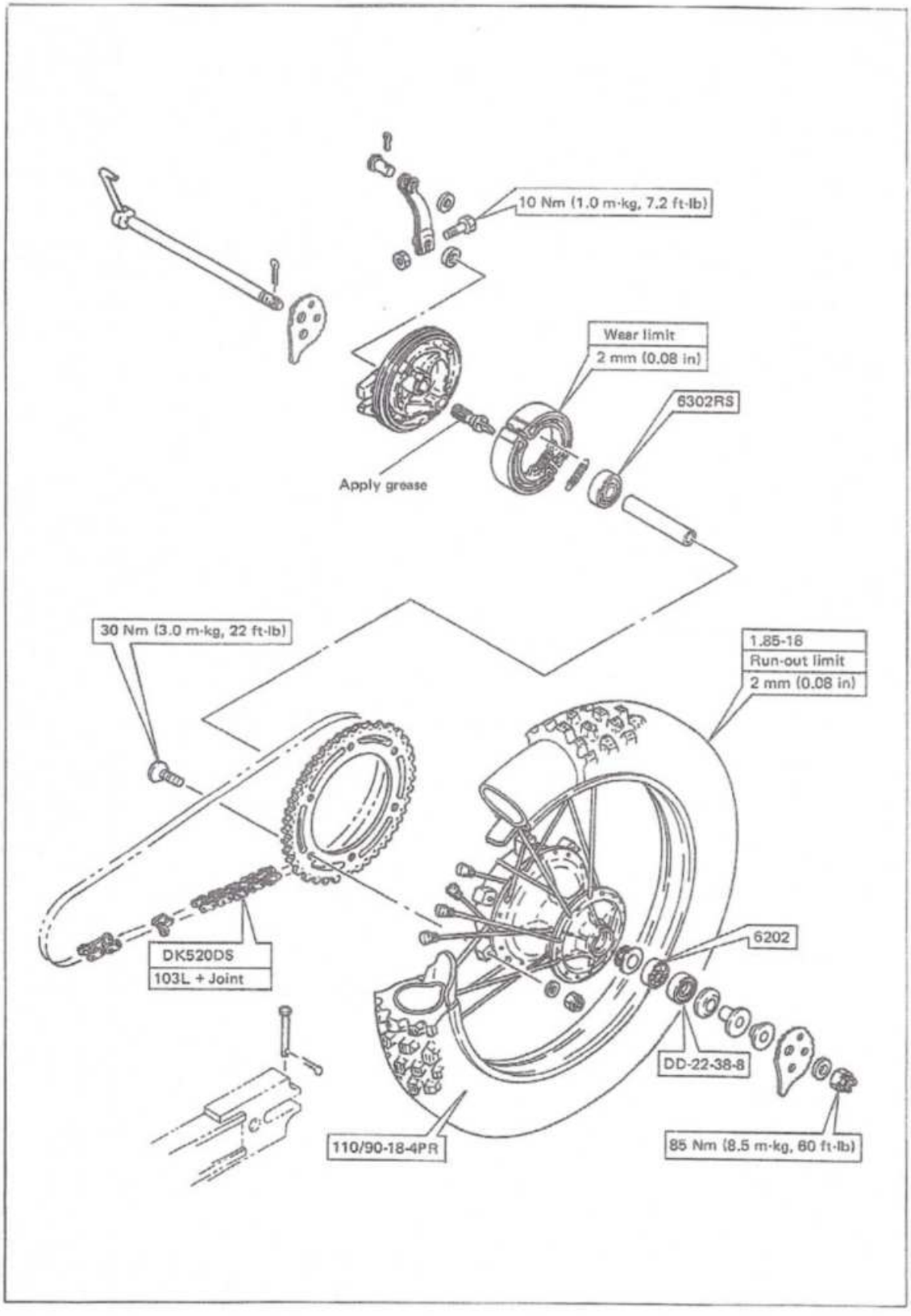
FRONT WHEEL




**Front wheel removal**

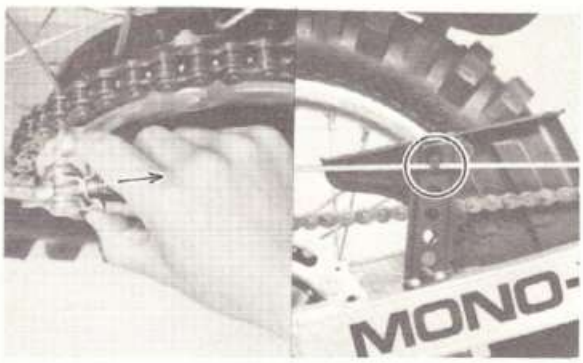
1. To remove the front wheel, first place a suitable stand under the machine to keep it stable while the front wheel is removed.
2. Remove the cotter pin and axle nut.
3. Loosen the axle holder nuts.
4. Pull the axle from the left-hand fork leg, and support the front wheel while removing the axle.
5. Remove the front wheel from the forks, pull the brake backing plate assembly from the wheel, and remove the wheel.

## REAR WHEEL

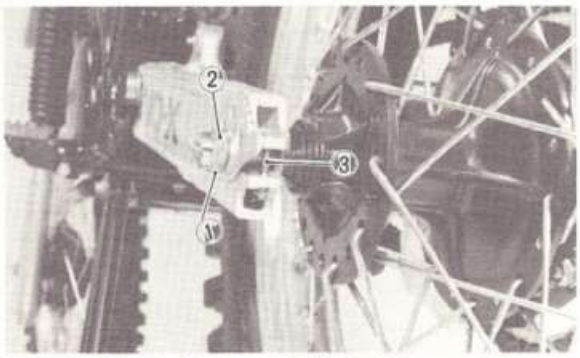

10 Nm (1.0 m·kg, 7.2 ft·lb)
Wear limit
2 mm (0.08 in)
6302RS
Apply grease
30 Nm (3.0 m·kg, 22 ft·lb)
1.85-18
Run-out limit
2 mm (0.08 in)
DK520DS
103L + Joint
6202
DD-22-38-8
110/90-18-4PR
85 Nm (8.5 m·kg, 60 ft·lb)

**Rear wheel removal**

1. To remove the rear wheel, place a suitable stand under the machine to keep the machine stable while the rear wheel is removed.
2. Remove the wing nut, and remove the rod from the brake cam lever.



3. Remove the cotter pin from the axle nut and loosen the axle nut.
4. Remove the cotter pins (left and right) and remove the clevis pins.



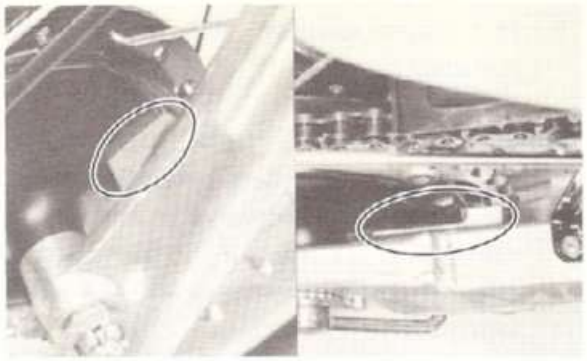

1. Cotter pin 2. Axle nut 3. Clevis pin

5. Move the wheel forward and remove the chain from the sprocket. Support the rear wheel and remove the wheel from the machine.

**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 wheel axle collar
   *The meter gear
2. Check for proper engagement of the boss on the outer tube (swing arm) with the locating slot on the brake shoe plate.



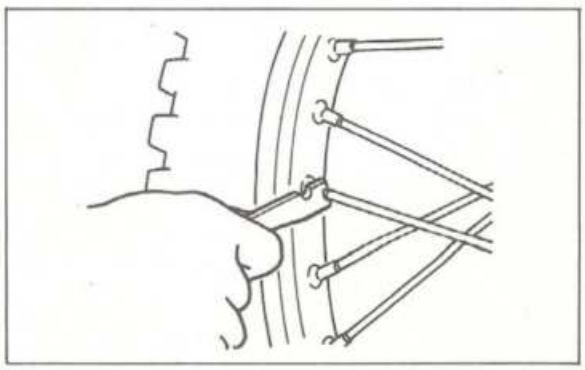
3. Always use a new cotter pins. Old pins should be discarded.
4. Make sure nuts are properly tightened.

| |
|---|
| Front wheel axle:<br>60 Nm (6.0 m·kg, 42 ft·lb)<br>Axle holder nuts:<br>10 Nm (1.0 m·kg, 7 ft·lb)<br>Rear wheel axle:<br>85 Nm (8.5m·kg, 60 ft·lb) |

5. Be sure to adjust the tension of the chain. (Refer to "Drive chain tension adjustment".)
6. Adjust the plays 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 (0.080 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**

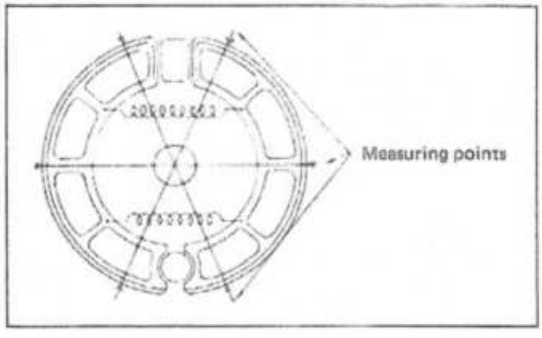
1. To inspect the wheel bearings, try to move the wheel sideways in relation to the fork in the front or the frame in the rear. If any movement is felt, the bearings must be replaced.
2. Block the wheels off the ground and spin each wheel. If the wheels do not spin freely with the brakes disengaged,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

**Brake shoe inspection**

Measure the outside diameter of the brake shoe set with slide calipers.

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

| | |
|---|---|
| Brake shoe diameter | 130 mm (5.12 in) |
| Replacement limits | 126 mm (4.96 in) |

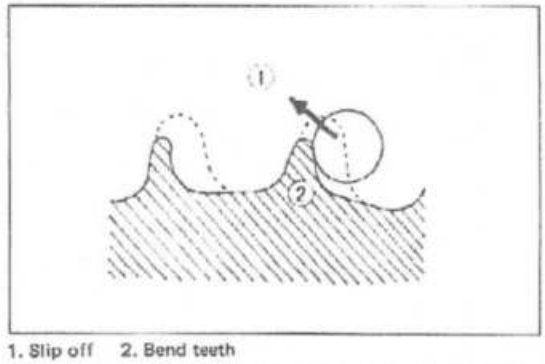



**Brake drum**

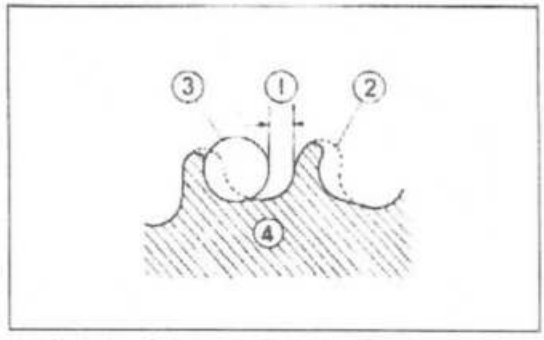
Inspect the brake drum; if there is any oil or dirt on the inner surface, wipe the drum clean with a rag dampened with lacquer thinner or solvent. If the drum is deeply grooved, the drum must be replaced.

**Sprockets and chain (Adjustment begins on page 2-12)**

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.

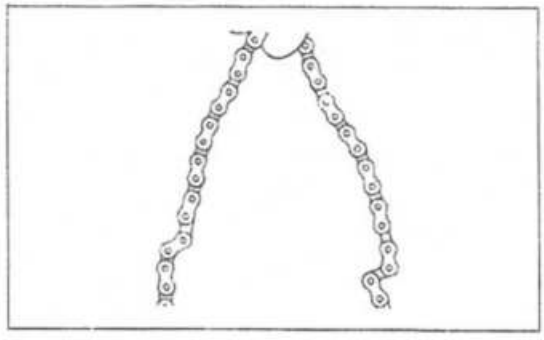


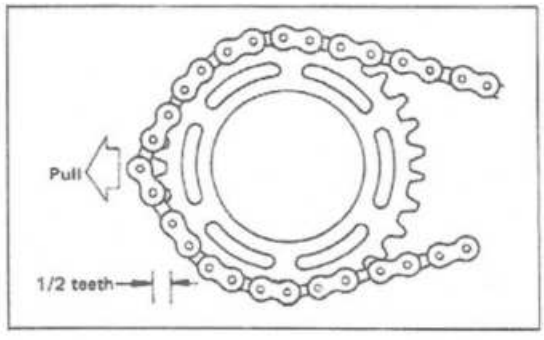

1. Slip off 2. Bend teeth




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.





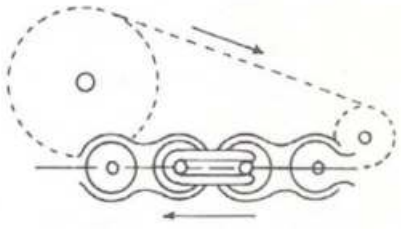
| Drive sprocket securing nut torque: 60 Nm (6.0 m·kg, 42 ft·lb) |
|---|

| Driven sprocket securing nut torque: 30 Nm (3.0 m·kg, 22 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:**

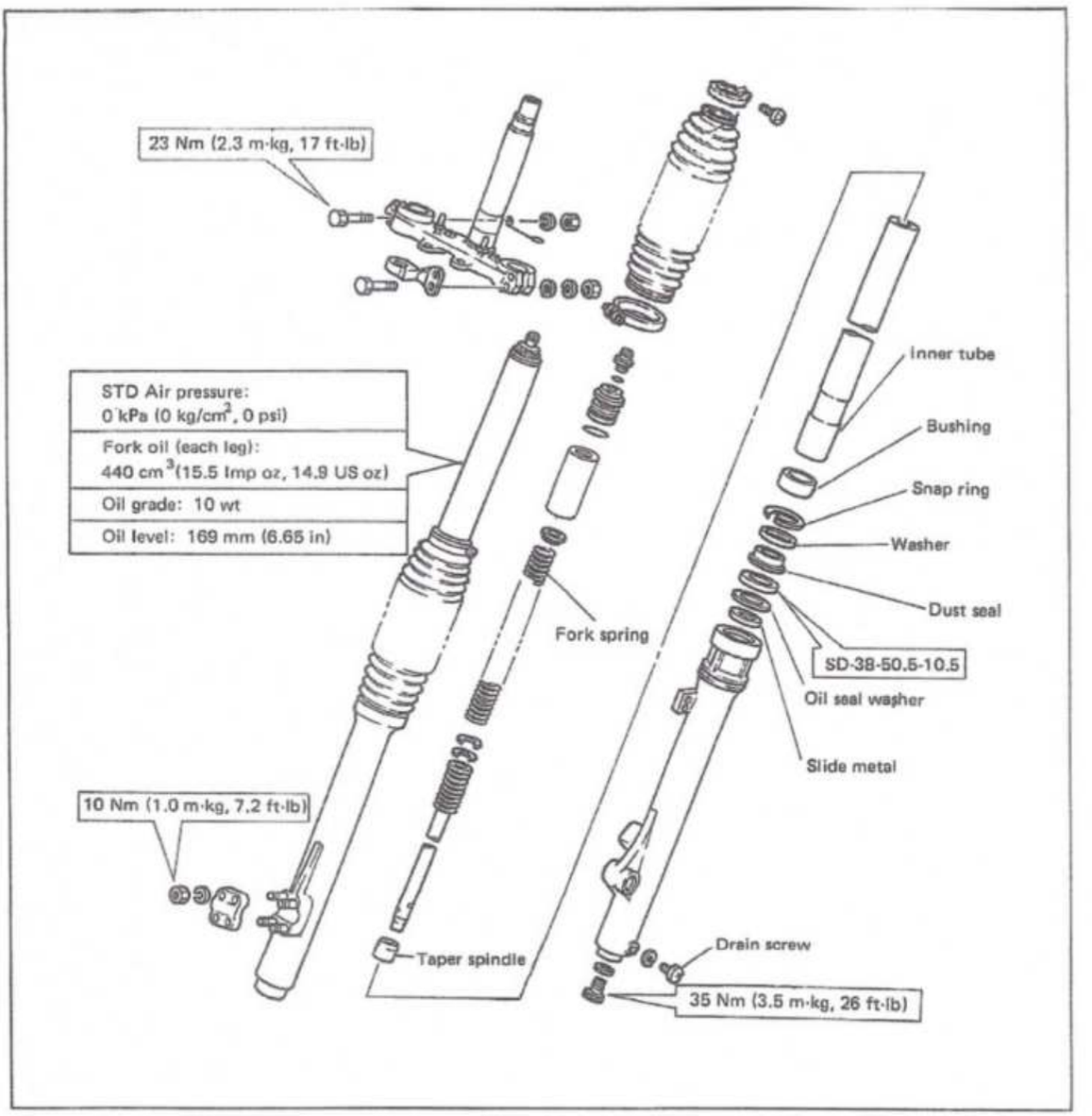
The chain should be cleaned and lubricated after every use of the machine.



Turning direction

# FRONT FORK

(Tuning begins on chapter 3)



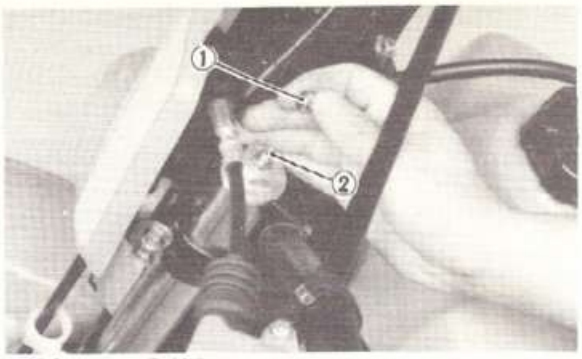

**CAUTION:**

**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 front fork, be sure to extract the air from the air chamber completely.**

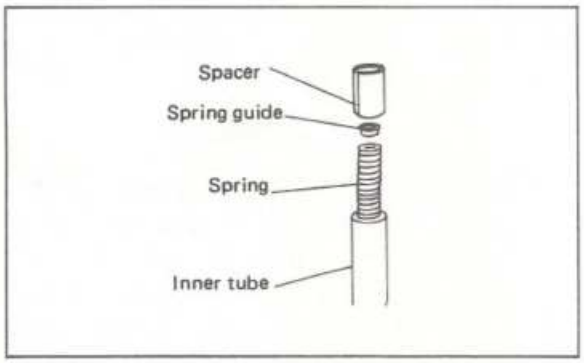
**Disassembly and inspection**

1. Place the machine on a suitable stand to keep it stable while the front wheel and forks are removed.
2. Remove the valve caps from the top of the fork legs, and depress the air valve to allow the air to escape from the fork legs.



1. Valve cap 2. Valve

3. Loosen the cap bolts on each fork leg, but do not remove them yet.
4. Remove the front wheel.
5. Loosen the pinch bolts in the triple clamps, and slide the fork legs down and out of the clamps. Perform the following disassembly, and assembly procedures on one fork leg at a time.
6. Remove the cap bolt, spacer, spring guide, and spring from the fork tube.



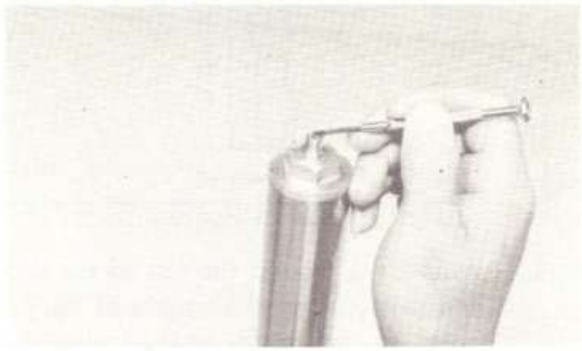

7. Inspect the O-ring on the cap bolt; if it is cut or otherwise damaged, replace the O-ring.



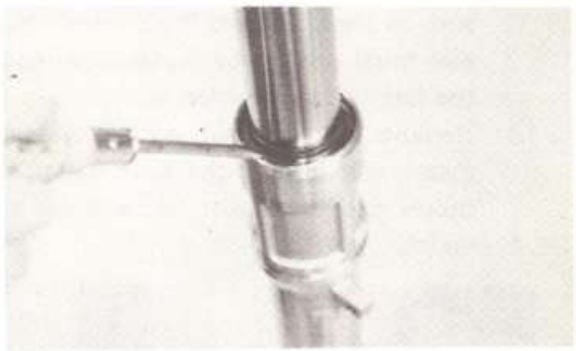
1. O-ring

8. 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.





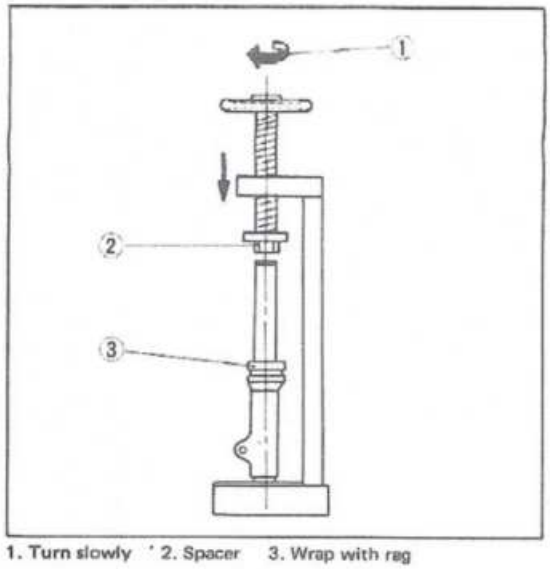
9. Remove the snap ring from the top of the slider.



10. 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.

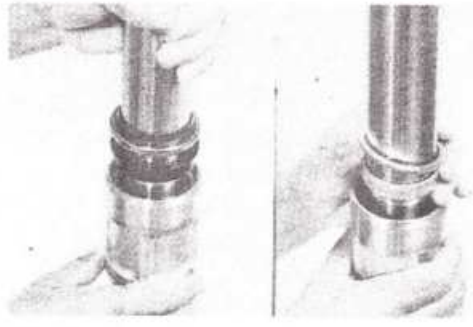
**CAUTION:**

**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.**

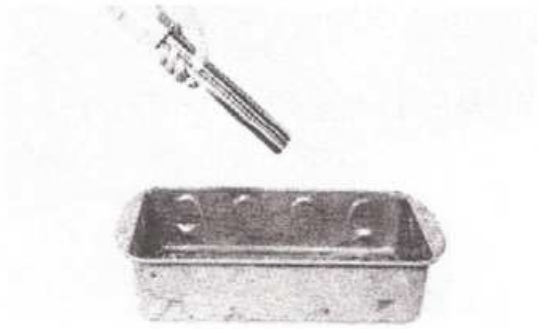



1. Turn slowly 2. Spacer 3. Wrap with rag

11. 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.
12. Remove the dust seal cover, dust seal, and oil seal. Discard the oil seal, as the seal must always be replaced whenever the fork is disassembled.
13. Remove the oil seal washer and slide metal, and inspect the slide metal; if it shows excessive wear, replace the slide metal.



14. Remove the cap bolt and drain the oil into a drain pan; pump the fork to remove all the oil.



15. Clamp the axle lug in a vise, and push the inner tube all the way into the slider.
16. Use the damping-cylinder holding tool to remove the holding bolt from the bottom of the slider.

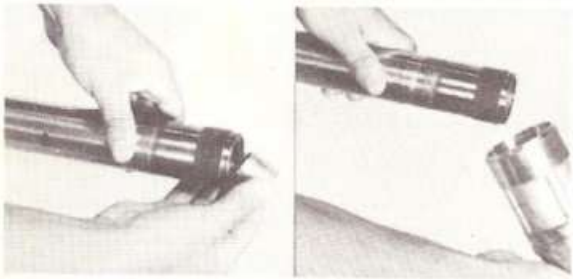


17. Remove the fork leg from the vise and hold it parallel to the ground while removing the slider from the inner tube.
18. Remove the tapered spindle from the end of the inner tube, and tilt the inner tube to allow the damping cylinder to slide out of the other end. Be sure to prevent the cylinder from dropping on the ground.
19. Inspect the O-rings on the damping cylinder, and replace them if they are damaged.
20. Inspect the bushing on the bottom end of the inner tube; if it is excessively worn, replace 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. Hold the inner tube parallel to the ground, and insert the damping cylinder into the tube. Tilt the tube slightly to allow the cylinder to slide slowly down to the end of the tube. Do not hold the inner tube vertically while inserting the damping cylinder, as the cylinder and valve might be damaged.
3. While holding the inner tube parallel to the ground, install the tapered spindle on the damping cylinder and install the slider on the inner tube. Screw the holding bolt into the bottom of the slider, but do not tighten it at this time.



4. Clamp the axle lug of the fork leg into a vise so the fork leg is vertical.
5. Install the slide metal, oil seal washer, and oil seal. Carefully tap around the oil seal until it is at the proper depth in the slider.
6. Install the dust seal, dust seal cover, and snap ring.
7. Remove the holding bolt from the bottom of the slider, apply Loctite to the threads of the bolt, and reinstall the bolt.
8. Using the damping-cylinder holding tool, torque the holding bolt to specification.

| Holding bolt torque: |
| --- |
| 35 Nm (3.5 m·kg, 25 ft·lb) |

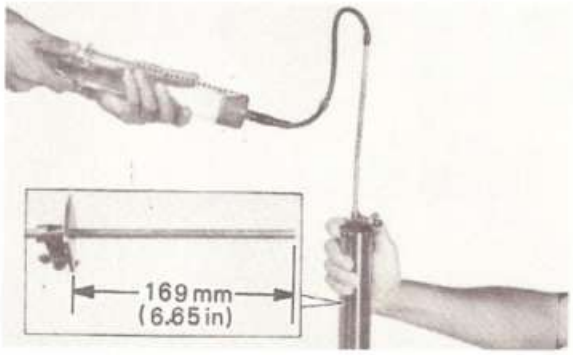


9. Pour the specified amount of fork oil into the fork leg, and pump the inner tube up and down to remove all air from the valving mechanism.

| Recommended oil: |
| --- |
| Yamaha fork oil 10wt or |
| SAE #10 motor oil |

| Standard oil quantity: |
| --- |
| 440 cm³ (15.5 Imp oz, 14.9 US oz) |

10. Use the fork oil level tool to attain the proper oil level with the tube pushed down.




| Standard oil level: 169 mm (6.65 in) |
| --- |

11. Pull the inner tube all the way up, and install the fork spring, spring guide, spacer, and cap bolt. Torque the cap bolt to specification.

| Cap bolt torque: |
| --- |
| 23 Nm (2.3 m·kg, 16.5 ft·lb) |

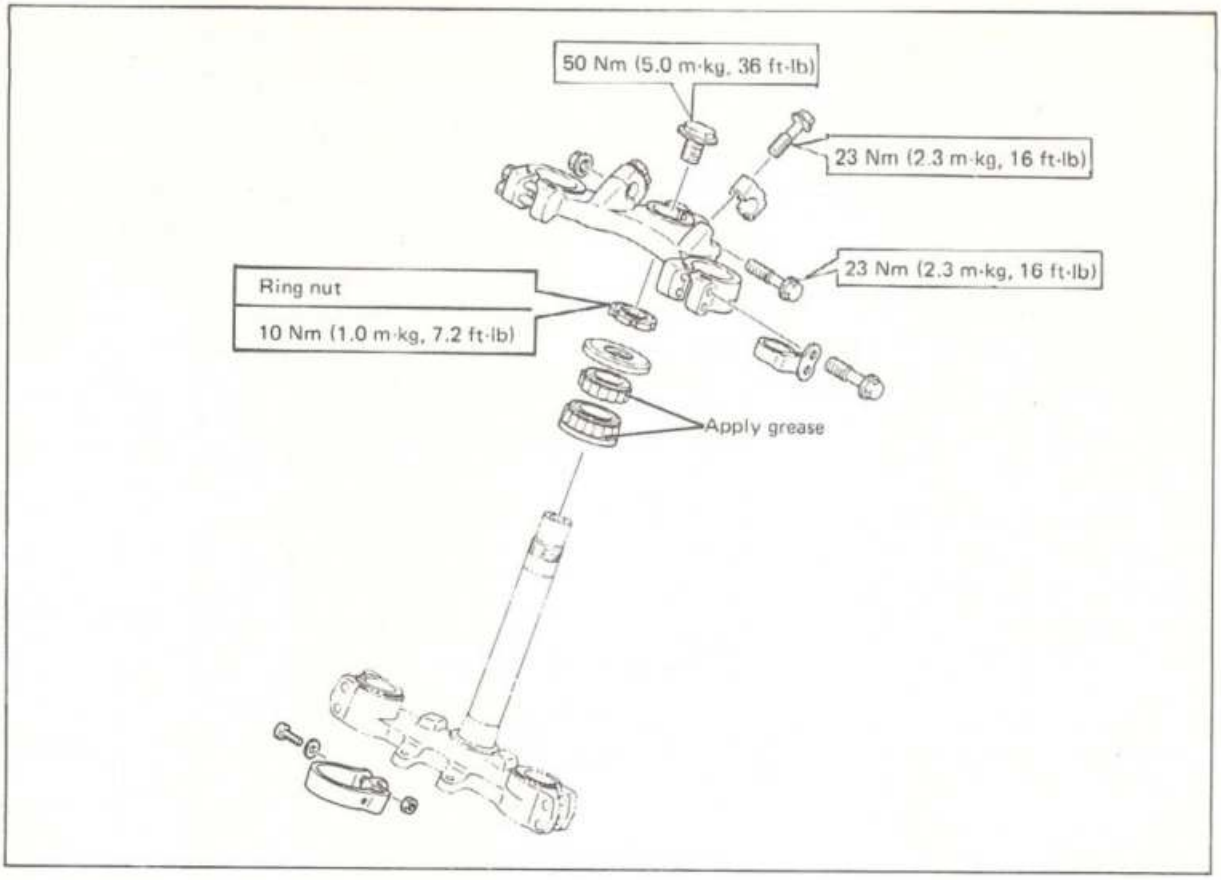
12. Install the fork boot and boot bands.
13. Check the air pressure in the fork, and set it to specification.

| Standard fork air pressure: |
| --- |
| 0.0 kg/cm² (0.0 psi) |

14. Install the fork legs in the trimple clamps, and torque the pinch bolts to specification.

| Pinch bolt torque: |
| --- |
| 23 Nm (2.3 m·kg, 16.5 ft·lb) |

15. Reinstall the front wheel, taking care to compress the forks several times before tightening the axle pinch bolts; this will center the fork legs properly on the axle.




**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, replaces 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.

# REAR SHOCK

## MONOCROSS SUSPENSION "DE CARBON" SYSTEM

**(Tuning begins on page 3-5 of chapter 3.)**

**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.**

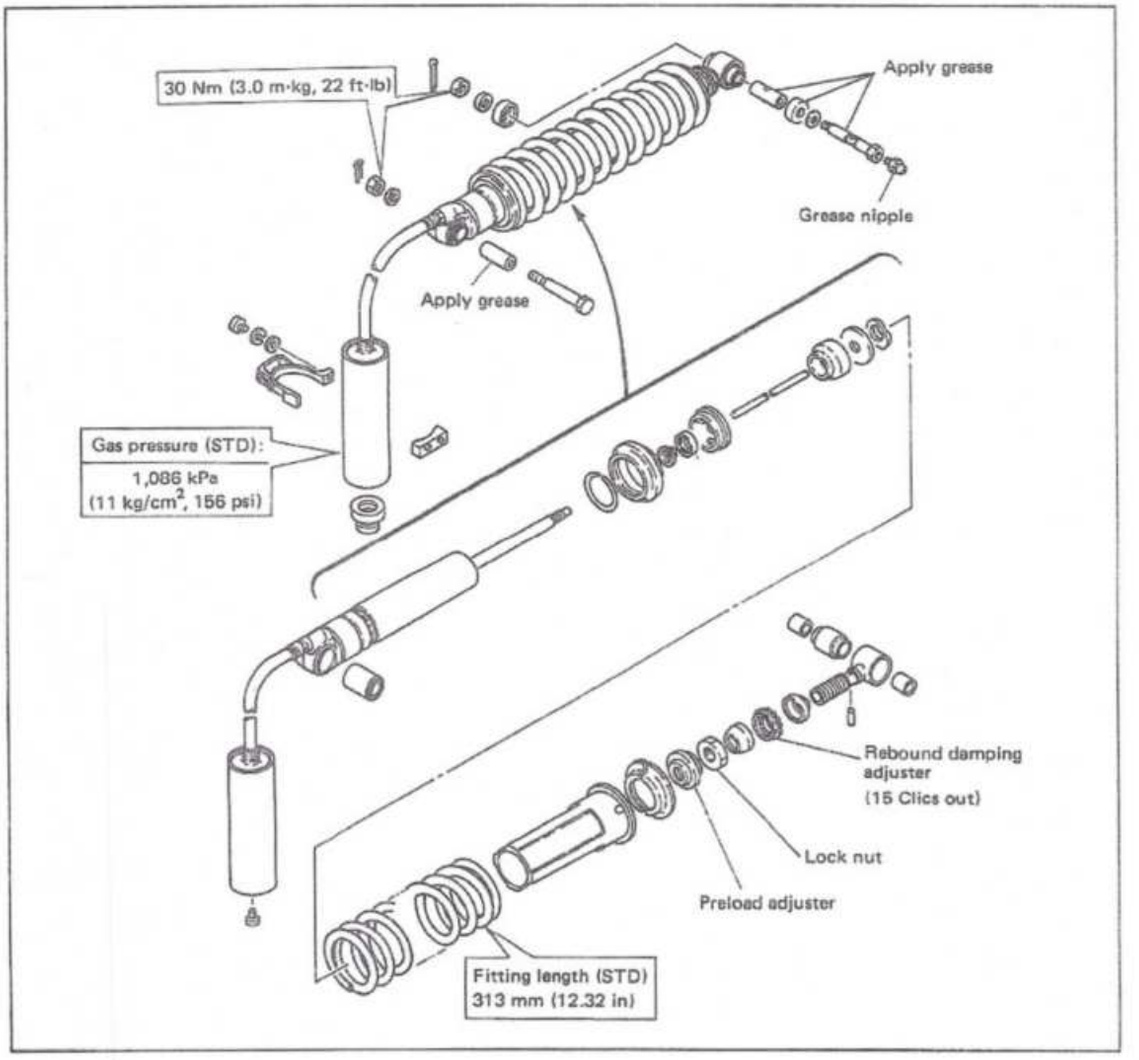
1. **Never tamper or attempt to disassemble the cylinder or the tank. Never tamper with the nut securing the hose to the cylinder assembly; otherwise, oil will spurt from the cylinder due to the high pressure in the nitrogen gas tank.**

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.

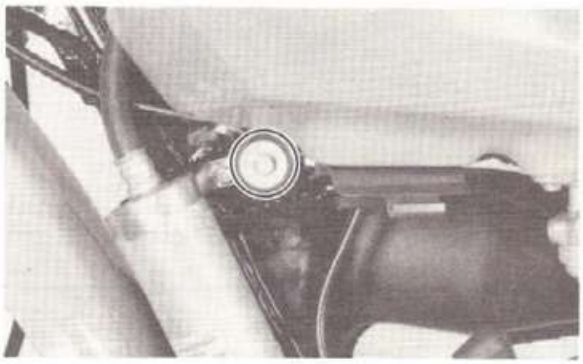
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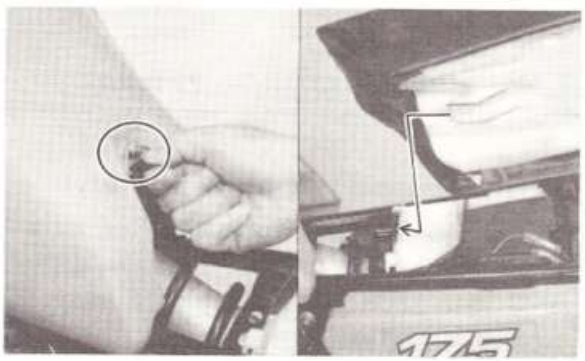
Removal and installation

1. To remove the shock absorber, first place the machine on a suitable stand to keep the bike stable.

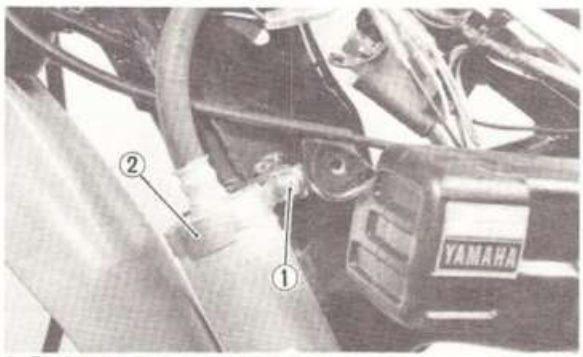


2. Remove the seat and fuel tank; be sure to remove the YEIS air chamber from beneath the fuel tank, and turn the petcock off before removing the fuel line.

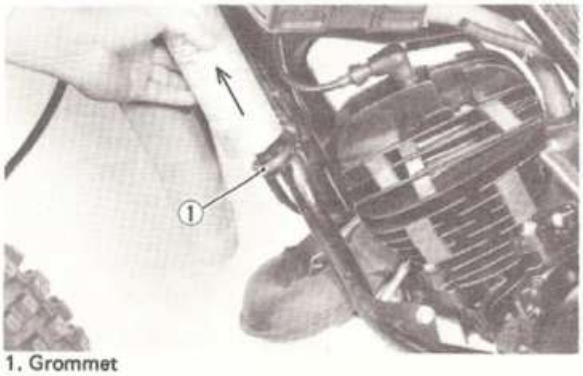




3. Remove the clamp holding the top of the remote shock reservoir to the frame, and pull the reservoir out of the grommet.

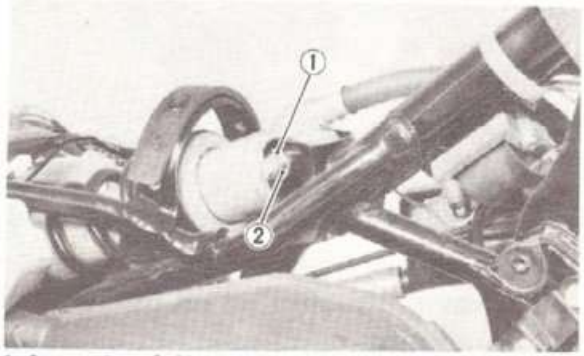



1. Fitting screw 2. Holder



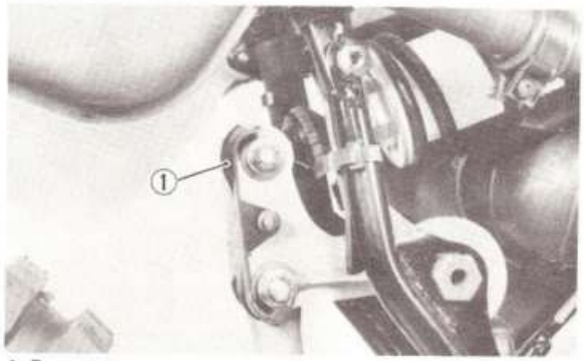

1. Grommet

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

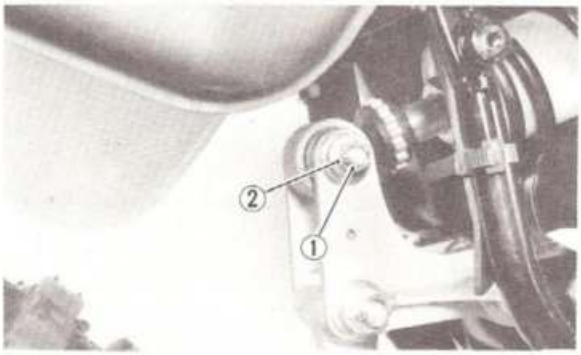



1. Cotter pin 2. Nut

5. Remove the panhead screws and remove the protector.
6. Remove the cotter pin, nut and washer holding the lower shock pivot bolts, and remove the bolt and washer, take care not to lose the thrust washers.

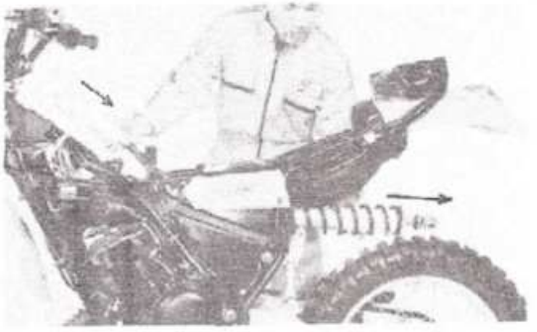



1. Protecter

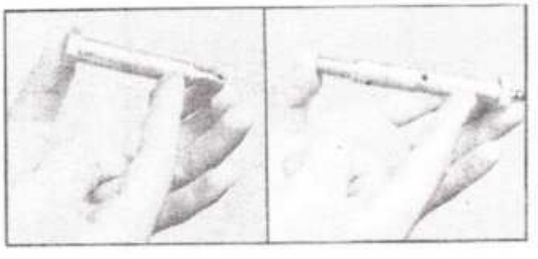


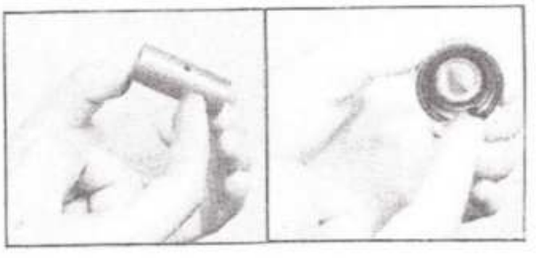

1. Cotter pin 2. Nut

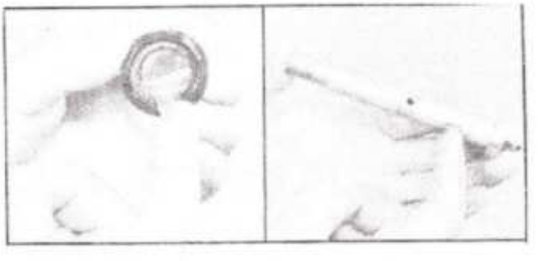
7 Carefully remove the shock absorber from the frame; take care to avoid damaging the rubber hose or the shock reservoir.

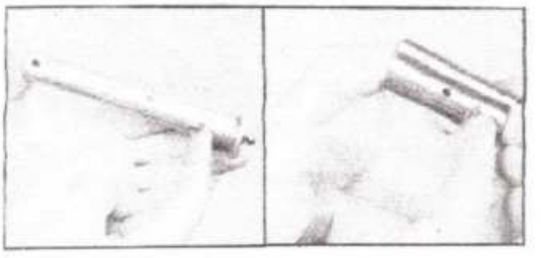


8. For assembly, reverse the procedure for disassembly while taking the following precautions:
   a. Always use a new cotter pin.
   b. Make sure the thrust covers and washers are positioned as illustrated.
   c. Before installing, lubricate the following areas with lithium base grease.







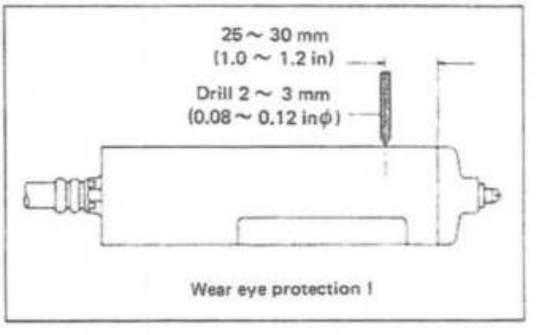


d. Tighten the nut to specification.

| |
|---|
| Upper bolt:<br>30 Nm (3.0 m·kg, 22 ft·lb) |
| Lower bolt:<br>30 Nm (3.0 m·kg, 22 ft·lb) |

**Notes on disposal (Yamaha dealers only)**

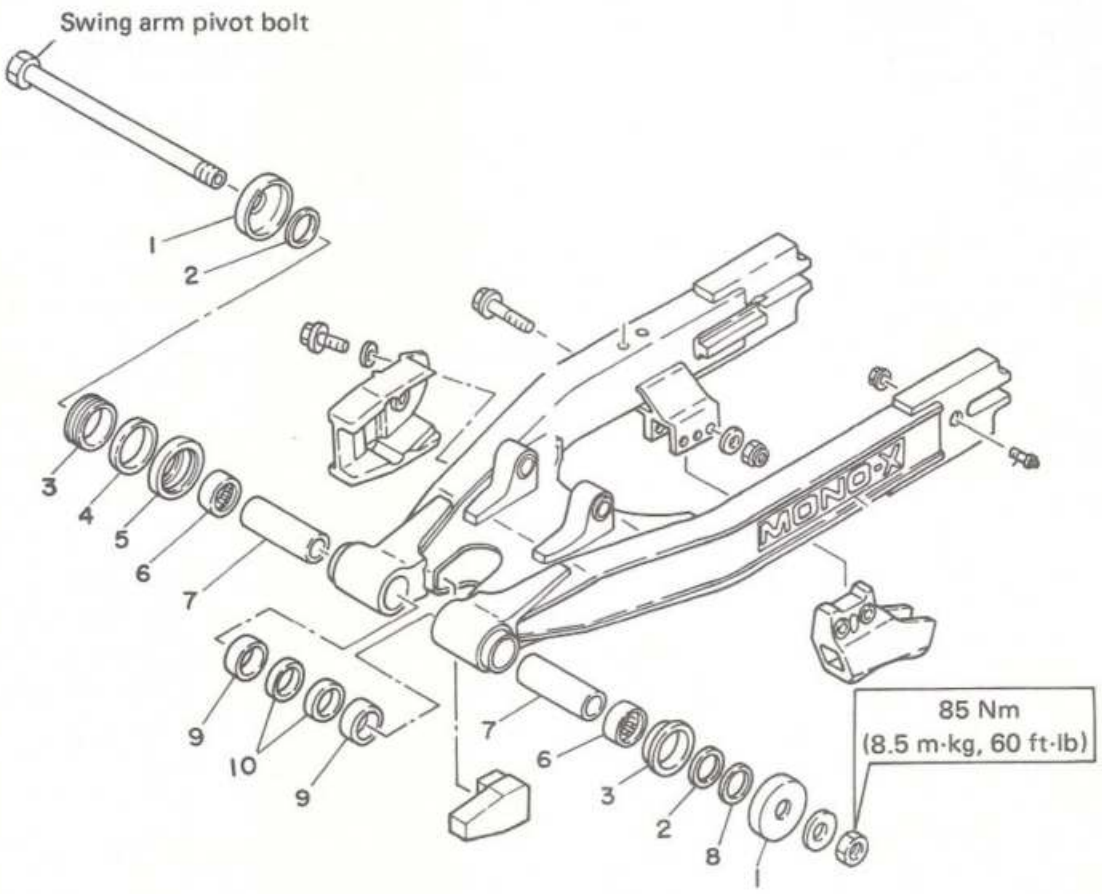
Before disposing the shock absorber, be sure to extract the nitrogen gas. To do so, drill a 2 or 3 mm (0.08 ~ 0.12 in) hole through the tank at a position 25 ~ 30 mm (1.0 ~ 1.2 in) from the bottom end of the tank. At this time, wear eye protection to prevent eye damage from escaping gas and/or metal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



**WARNUNG:**

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

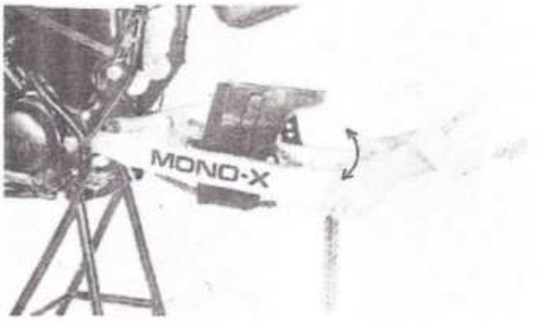
## SWINGARM




1. Thrust cover
2. Plate washer
3. Oil seal
4. Collar
5. Guard seal
6. Bearing
7. Solid bushing
8. Shim
9. Bushing
10. Oil seal

**Inspection**

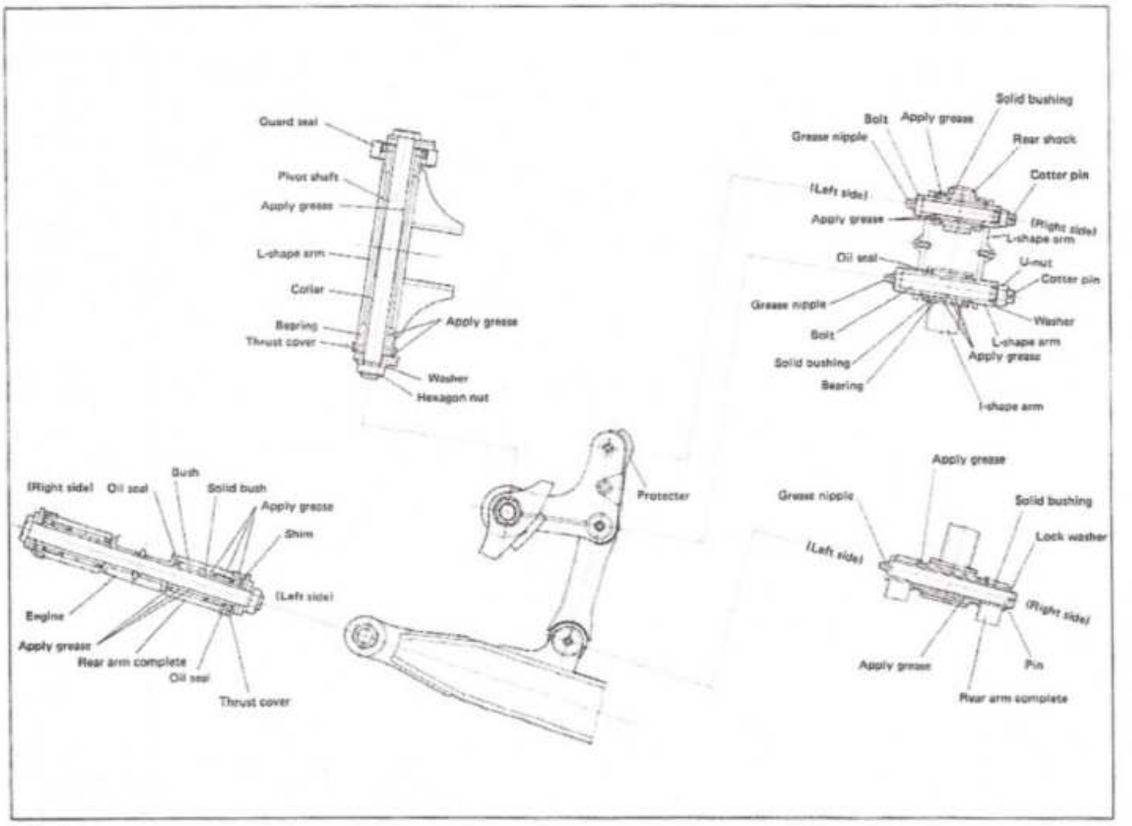
1. To check the swingarm bearings, remove the rear wheel and disconnect the connecting rod from the swingarm.
2. Grasp the ends of the swingarm and try to move the arm sideways; if the free play exceeds tolerance, remove the swingarm and take it to your Yamaha dealer for bearing replacement.

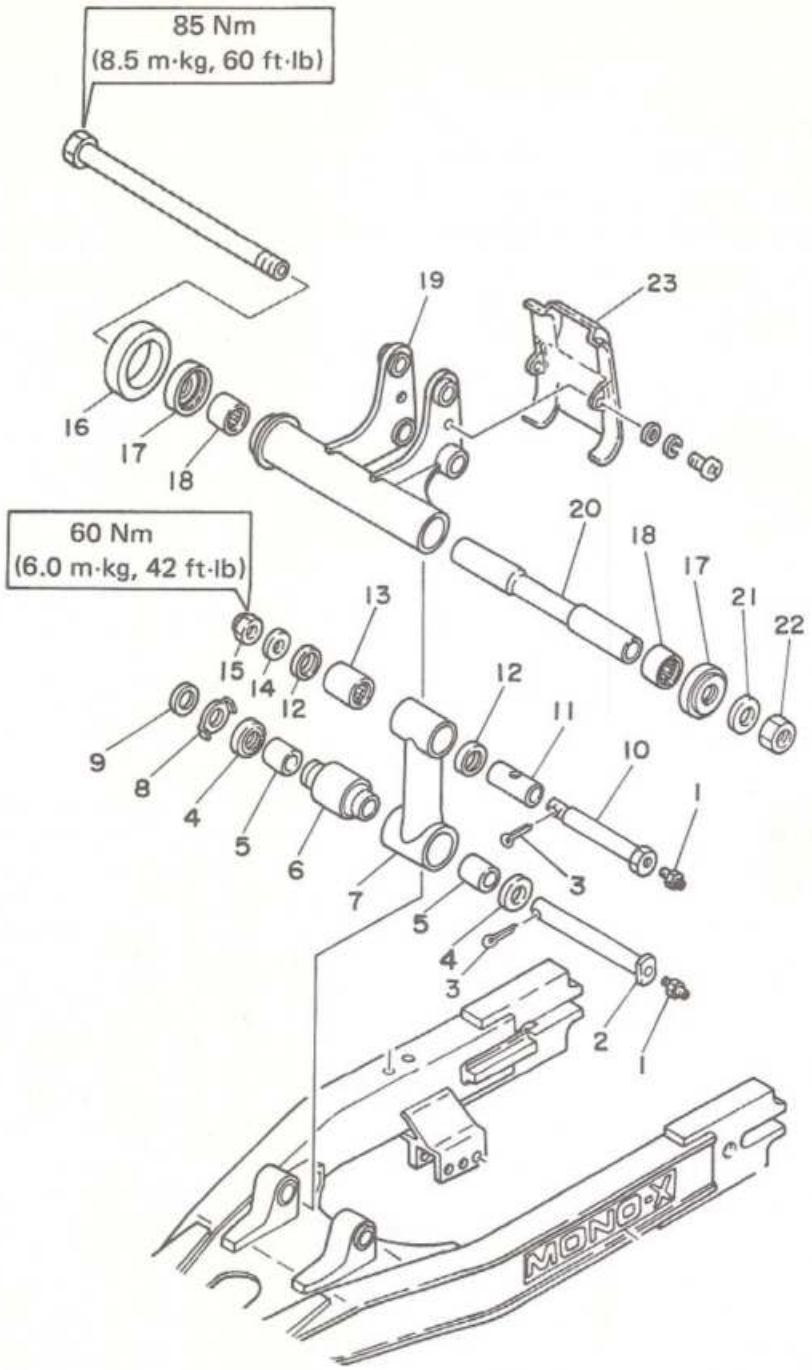



| Swingarm free play: |
| --- |
| 0 ~ 1 mm (0~ 0.04 in) |

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: |
| --- |
| 85 Nm (8.5 m·kg, 60 ft·lb) |






1. Grease nipple
2. Pin
3. Cotter pin
4. Dust cover
5. Bimetal bushing
6. Bushing
7. I-shaped arm
8. Lock washer
9. Plate washer
10. Bolt
11. Solid bushing
12. Oil seal
13. Bearing
14. Plate washer
15. Self locking nut
16. Guard seal
17. Thrust cover
18. Bearing
19. L-shaped arm
20. Collar
21. Plate washer
22. Nut
23. Protecter

# 6 ELECTRICAL TROUBLESHOOTING

IGNITION SYSTEM ..... 6-1
LIGHTING SYSTEM ..... 6-3
WIRING DIAGRAM ..... 6-5

# 6 ELECTRICAL TROUBLESHOOTING

## 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 Spark gap test**

Remove the spark plug cap and check

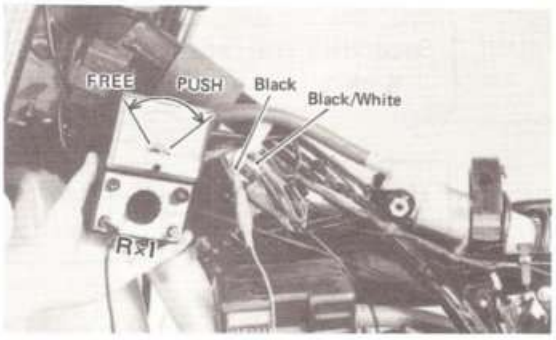


Hold the high tension lead 5 mm (0.20 in) from the head, and kick the engine through.

- Good spark → 1. Check plug cap. 2. Check spark plug.
- No spark →

**2 Connectors check-up**

1. Check the connectors and couplers for loseness of joining ends.
2. Keep the connectors and couplers from dirt or rust.
3. Check the engine stop switch and ground lead.

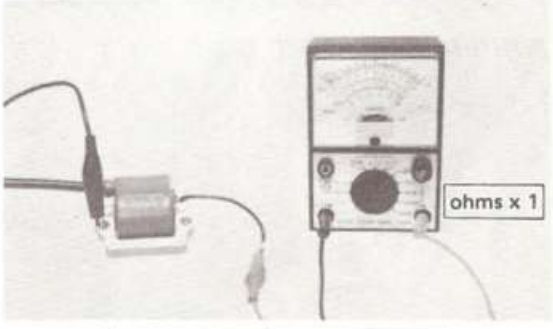



Connect the pocket tester leads as shown, and check switches for continuity.

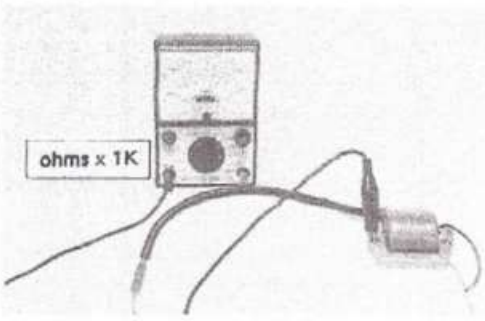
- Broken or no continuity → Replace switch
- OK →

**3 Ignition coil test**

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




Primary coil resistance:
1.0Ω ± 15%



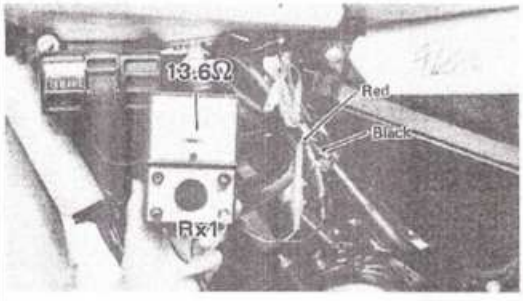

Secondary coil resistance:
5.9KΩ ± 15%

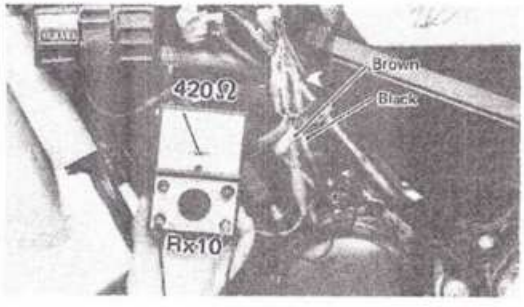
If other than specified → Replace ignition coil

OK

| 4 | C.D.I. Magnet (Charge coil) test |
|---|---|

Disconnect the magneto leads, and use the pocket tester to check the resistance of the magneto coils.




High-speed charge coil resistance:
Black to Red:
13.6Ω ± 10%

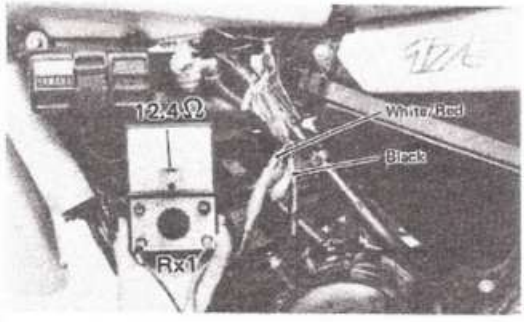
Low-speed charge coil resistance:
Black to Brown:
420Ω ± 10%

If other than specified → Replace pulser coil

OK

| 5 | C.D.I. Magneto (Pulser coil) test |
|---|---|

Disconnect the magneto leads, and use the pocket tester to check the resistance of the magneto coil.




Pick-up coil resistance:
Black to White/Red:
12.4Ω ± 10%

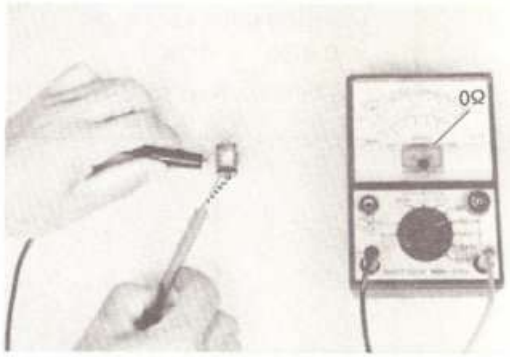
If other than specified → Replace charge coil

OK → Replace C.D.I. unit

# LIGHTING SYSTEM

## 1 CHECK BULB

Check the condition of bulb.

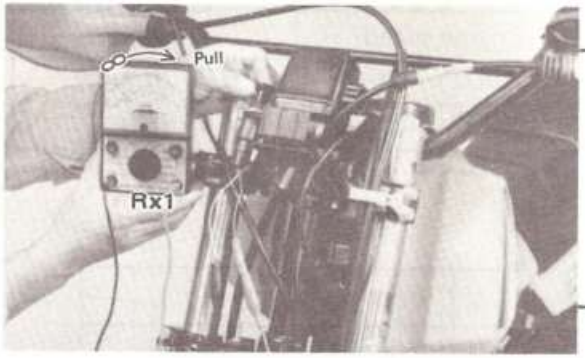



→ OK

→ If burn out or wrong wattage → Replace bulb

## 2 CHECKING SWITCHES

Check the operation of the switch.



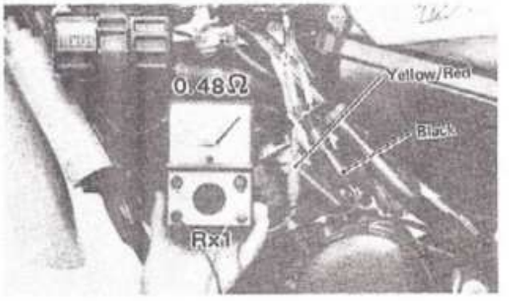

→ OK

→ Broken or no continuity → Replace switch assembly

Connect the pocket tester leads as shown, and check switches for continuity.

| 3 | FLYWHEEL MAGNETO |
|---|---|

*Check the lighting coil resistance*

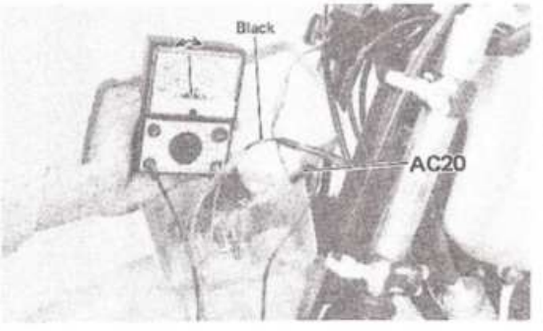



Lighting coil resistance:
0.48Ω ± 10%
(Yellow/Red to Black)

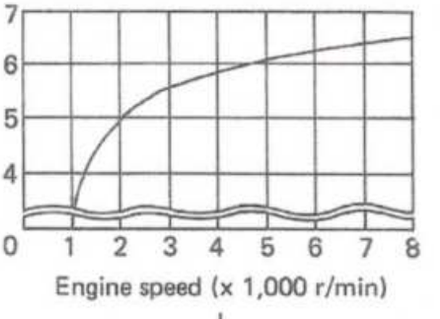
If other than specified → Replace lighting coil

OK

Check the out-put voltage.



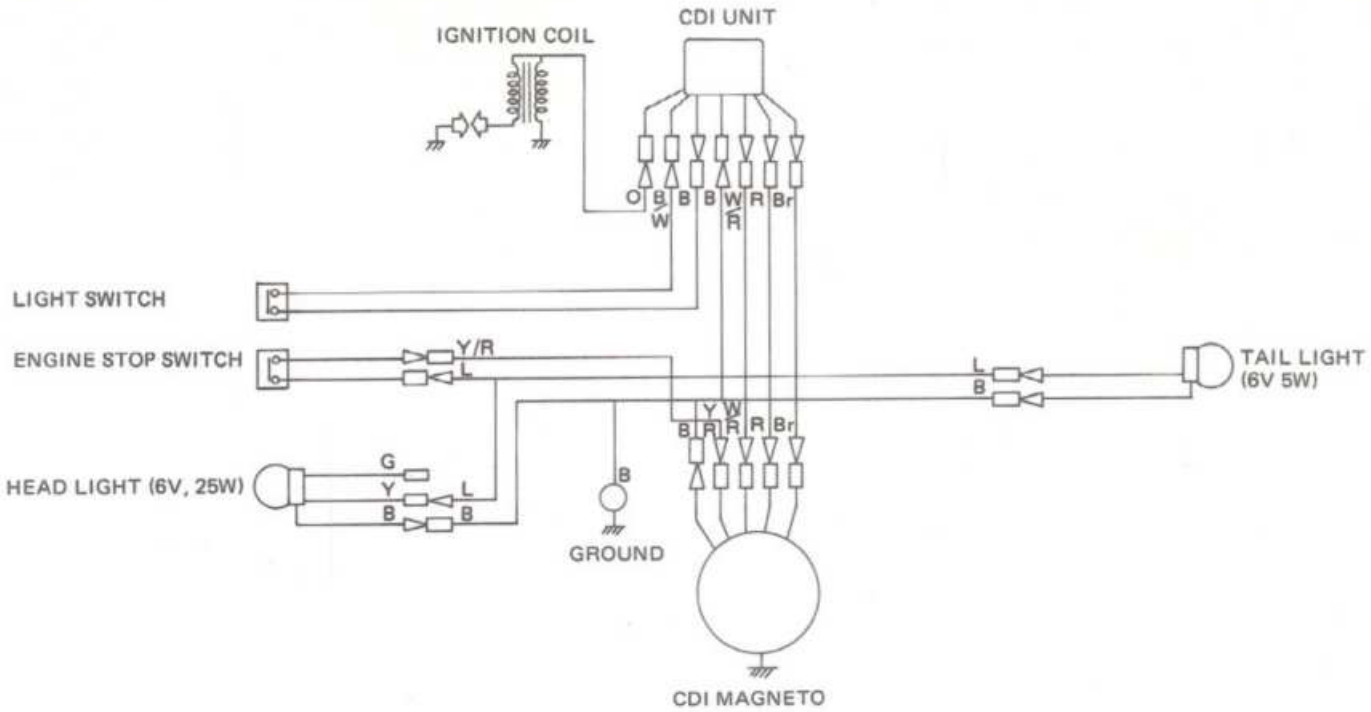

| Engine speed | Voltage |
|---|---|
| 2,500 r/min | 5.0V or more |
| 8,000 r/min | 7.0V or less |

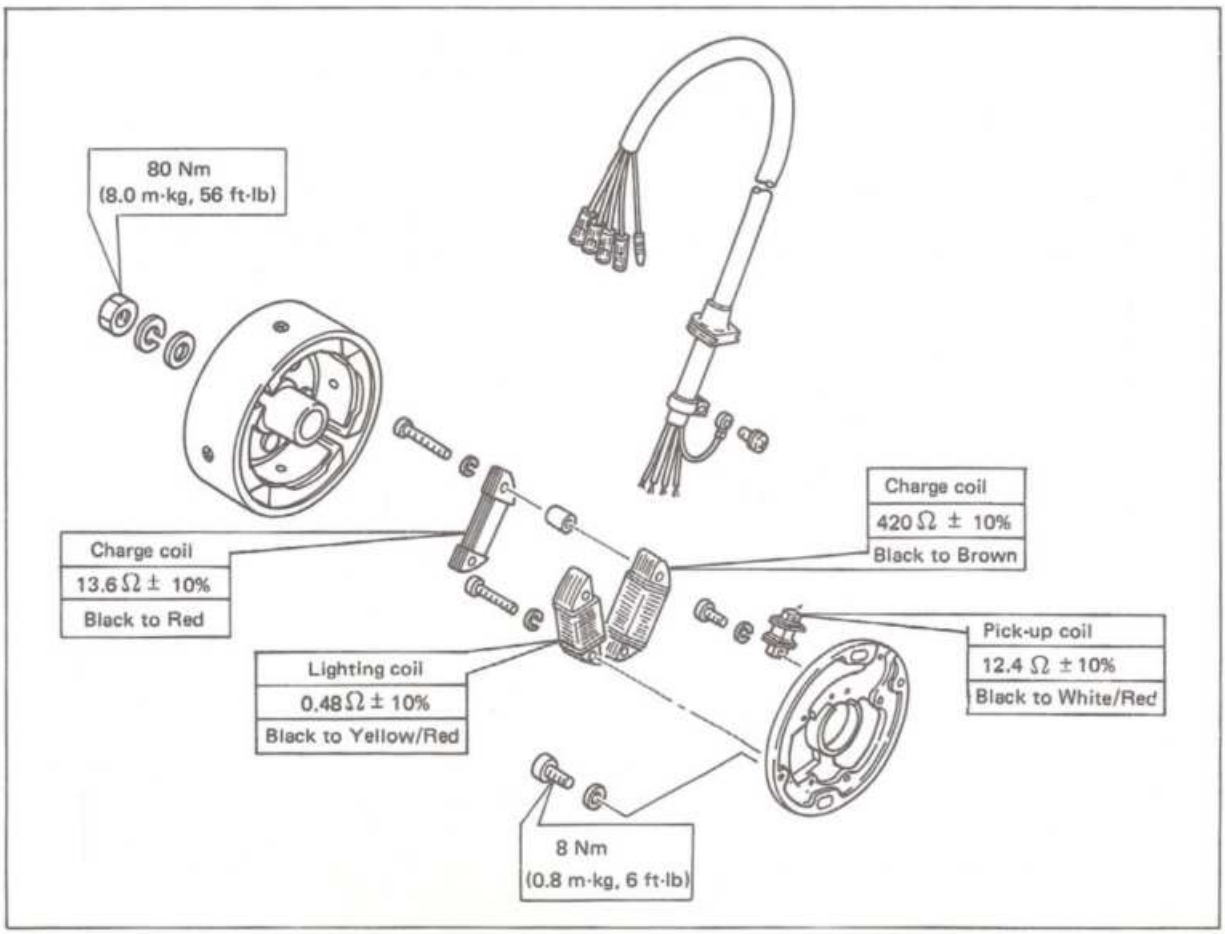



No voltage → Replace Lighting coil

OK

# WIRING DIAGRAM



# 7 APPENDICES


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- Poor high speed performance ..... 7-2
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- Transmission and shifter ..... 7-3
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# 7 APPENDICES

## TROUBLESHOOTING GUIDE

**Engine is hard to start or does not start.**

| Ignition System | |
|---|---|
| Possible Cause | Remedy |
| 1. Spark plug is wet. | •Clean or replace |
| 2. Ignition coil is faulty. | • Replace |
| 3. C.D.I. unit is faulty. | • Replace |
| 4. C.D.I. magneto is faulty (Pulser coil, source coil) | • Replace |
| 5. Ignition timing is incorrect. | • Adjust |
| 6. Wire is broken, shorted or disconnected. | • Repair, replace or connect |
| 7. Engine stop switch is shorted. | • Repair or replace |
| **Compression System** | |
| Possible Cause | Remedy |
| 1. Piston rings are sticking or worn. | • Replace |
| 2. Cylinder or piston is worn or scratched. | • Repair or replace |
| 3. Compression leaks passing cylinder head gasket. (Head is distorted.) | • Replace (or repair) |
| 4. Crankshaft side oil seal is faulty. | • Replace |
| 5. Air leaks through crankcase sealing surfaces. | • Repair |
| **Air/Fuel System** | |
| Possible Cause | Remedy |
| 1. Carburetor pilot jet is clogged. | • Clean |
| 2. Fuel petcock or pipe is clogged. | • Clean |
| 3. Float valve is faulty. (Float height is too high or too low.) | • Replace (remove gasoline from crankcase) |
| 4. Reed valve is broken or deformed. | • Replace |
| 5. Fuel tank filler cap or carburetor breather pipe is clogged. | • Clean |
| 6. Air screw is improperly adjusted. | • Adjust |
| 7. Fuel is deteriorated. | • Replace |
| 8. Oil-gas mixing ratio is incorrect. | • Replace |
| 9. Air leaks through carburetor joints. | • Retighten or replace gasket |

**Poor high speed performance**

| Ignition System | |
|---|---|
| Possible Cause | Remedy |
| 1. Spark plug is dirty or plug gap is too narrow. | Clean, repair or replace |
| 2. C.D.I. unit is faulty. | Replace |
| 3. C.D.I. magneto is faulty. | Replace |
| 4. Ignition coil is faulty. | Replace |
| 5. Ignition timing is incorrect. | Adjust |
| 6. Loose wire connection. | Repair |
| **Compression System** | |
| Possible Cause | Remedy |
| 1. Piston rings are sticking or worn. | Replace |
| 2. Cylinder or piston is worn or scratched. | Repair or replace |
| 3. Compression leakage through crankcase sealing surfaces or crankshaft side oil seal. | Repair or replace |
| 4. Carbon deposits in combustion chamber (Piston, Cylinder head). | Decarbonize |
| **Air/Fuel System** | |
| Possible Cause | Remedy |
| 1. Clogged carburetor jets. | Clean |
| 2. Improperly adjusted main jet (High speed) | Adjust |
| 3. Improperly adjusted jet needle (Medium speed) | Adjust |
| 4. Incorrect fuel lever | Adjust |
| 5. Dirty or clogged air cleaner element | Clean |
| 6. Clogged fuel tank filler cap or carburetor breather pipe. | Clean |
| 7. Clogged fuel petcock or kinked fuel pipe. | Clean or repair |
| 8. Deteriorated fuel. | Replace |
| 9. Improper oil-gas mixing ratio | Replace |
| 10. Cracked or broken exhaust pipe (Leakage of exhaust gases). | Replace |

**Overheating**

| Possible Cause | Remedy |
|---|---|
| 1. Incorrect air-fuel mixture | • Adjust |
| 2. Air leaks through carburetor joint. | • Repair or replace |
| 3. Incorrect ignition timing | • Adjust |
| 4. Carbon builds up in cylinder head or on piston head. | • Decarbonize |
| 5. Improper spark plug heat range (too hot) | • Replace |
| 6. Fuel is deteriorated or oil-gas mixing ratio is incorrect. | • Replace |

**Transmission and shifter**

| Trouble | Possible Cause | Remedy |
|---|---|---|
| Gears slip off | 1. Gear dogs are worn. | • Replace |
| | 2. Shift forks are bent. (burnt or worn) | • Replace |
| | 3. Shift cam stopper spring is fatigued. | • Replace |
| Gear shifts skipping over the next. | 1. Shift cam stopper spring is fatigued. | • Replace |
| | 2. Shift forks are bent. (burnt or worn) | • Replace |
| Gear does not select | 1. Shift cam is worn. (broken) | • Replace |
| | 2. Change shaft is bent. | • Replace |
| | 3. Shift arm spring is broken. | • Replace |
| | 4. Gears are broken. | • Removal (Replace) |
| Shift pedal does not return. | 1. Change return spring is broken. | • Replace |
| | 2. Change shaft is bent. | • Replace |

**Clutch**

| Trouble | Possible Cause | Remedy |
|---|---|---|
| Clutch slips | 1. Friction plate is worn. | • Replace |
| | 2. Clutch plate is worn. | • Replace |
| | 3. Clutch spring is fatigued. | • Replace |
| | 4. Pressure plate is deformed. | • Replace |
| | 5. Clutch plug is too small. | • Adjust |
| | 6. Clutch adjustment is incorrect. | • Adjust |
| | 7. Match marks of clutch boss and pressure plate does not aligned. | • Reassemble |
| Clutch drags | 1. Clutch plate is worped. | • Replace |
| | 2. Clutch lock nut is loosen. | • Replace |
| | 3. Friction plate is broken. | • Replace |
| | 4. Clutch play is too much. | • Adjust |
| | 5. Oil viscosity is incorrect. | • Replace |

## Chassis

| Steering head is loose | |
|---|---|
| Possible Cause | Remedy |
| 1. Roller is worn.<br>2. Steering lock nut is loose. | • Replace<br>• Retighten |

| Wheels have excessive run-out | |
|---|---|
| Possible Cause | Remedy |
| 1. Bearing is worn.<br>2. Rim has dent.<br>3. Spokes are loose (or broken).<br>4. Axle nut is loose. | • Replace<br>• Repair or replace<br>• Retighten or replace<br>• Retighten |

| Brakes | | |
|---|---|---|
| Trouble | Possible Cause | Remedy |
| Faulty | 1. Brake shoes are worn.<br>2. Brake is improperly adjusted.<br>3. Brake drum contains water.<br>4. Lining is greasy. | • Replace<br>• Adjust<br>• Clean<br>• Degrease or replace |
| Not return smoothly | 1. Wire is starved for oil.<br>2. Camshaft is starved for grease.<br>3. Return spring or brake shoe<br>4. spring is broken.<br>4. Brake pedal axle is starved for grease. | • Grease or replace<br>• Grease<br>• Replace<br><br>• Grease |

| Frame and Swing Arm | |
|---|---|
| Possible Cause | Remedy |
| 1. Frame is cracked.<br>2. Rear arm is bend.<br>3. Rear arm is cracked.<br>4. Bushing is worn. | • Weld, reinforce or replace<br>• Repair or replace<br>• Replace<br>• Replace |

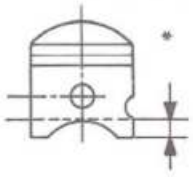
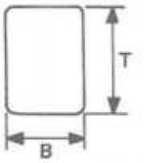
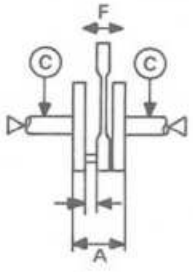
# SPECIFICATION

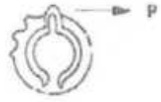
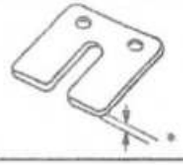
## GENERAL

| Item | IT175J |
|---|---|
| Model: | |
| Code Number | 5X8 |
| Frame Starting Number | 5X8-000101 |
| Engine Starting Number | 5X8-000101 |
| Dimensions: | |
| Overall Length | 2,125 mm (83.66 in) |
| Overall Width | 860 mm (33.86 in) |
| Overall Height | 1,210 mm (47.64 in) |
| Seat Height | 910 mm (35.83 in) |
| Wheelbase | 1,430 mm (56.30 in) |
| Minimum Ground Clearance | 335 mm (13.19 in) |
| Basic Weight: | |
| With Oil and Full Fuel Tank | 96 kg (212 lb) |
| Engine: | |
| Engine Type | Air cooled 2-stroke, gasoline, torque induction |
| Cylinder Arrangement | Single<br>Forward inclined |
| Displacement: | 171 $cm^3$ |
| Bore x Stroke | 66 x 50 mm (2.60 x 1.97 in) |
| Compression Ratio | 7.7 : 1 |
| Starting System | Primary kick starter |
| Lubrication System: | Premix (24 : 1) (Yamalube R)<br>Premix (20 : 1) (Castrol R30, A545) |
| Transmission Oil: | |
| Oil Type | Yamalube 4-cycle oil or SAE 10W30 type SE motor oil |
| Periodic Oil Change | 600 $cm^3$ (21.2 Imp oz, 20.3 US oz) |
| Total Amount | 700 $cm^3$ (24.6 Imp oz, 23.7 US oz) |
| Air Filter: | Wet type element |
| Fuel: | |
| Type | Premium gasoline |
| Tank Capacity | 11.0 L (2.9 US gal) |
| Reserve | 1.5 L (0.39 US gal) |
| Carburetor: | |
| Type | VM34SS |
| Manufacturer | MIKUNI |
| Spark Plug: | |
| Type | N-86 |
| Manufacturer | CHAMPION |
| Gap | 0.5~ 0.6 mm (0.020~ 0.024 in) |

| Item | IT175J |
|---|---|
| Clutch Type: | Wet, multiple-disc |
| Transmission: | |
| Primary Reduction System | Helical gear |
| Primary Reduction Ratio | 52/17 (3.06) |
| Secondary Reduction System | Chain drive |
| Secondary Reduction Ratio | 44/12 (3.67) |
| Transmission Type | Constant mesh, 6-speed |
| Operation | Left foot operation, Return |
| Gear Ratio: 1st | 33/12 (2.750) |
| 2nd | 26/14 (1.857) |
| 3rd | 24/16 (1.500) |
| 4th | 25/20 (1.250) |
| 5th | 21/19 (1.105) |
| 6th | 19/21 (0.904) |
| Chassis: | |
| Frame Type | Semi double cradle |
| Caster Angle | 28.5° |
| Trail | 125 mm (4.92 in) |
| Tire: | |
| Type | With tube |
| Size (F) | 3.00-21-4PR |
| Size (R) | 110/90-18-4PR |
| Tire Pressure: | |
| Front | 98.1 kPa (1.0 kg/cm$^2$, 14 psi) |
| Rear | 98.1 kPa (1.0 kg/cm$^2$, 14 psi) |
| Brake: | |
| Front Brake Type | Drum brake |
| Operation | Right hand operation |
| Rear Brake Type | Drum brake |
| Operation | Right foot operation |
| Suspension: | |
| Front Suspension | Telescopic fork |
| Rear Suspension | Swingarm (Mo no cross suspension) |
| Shock Absorber: | |
| Front Shock Absorber | Air, Coil spring, Oil damper |
| Rear Shock Absorber | Gas, Coil Spring, Oil damper |
| Wheel Travel: | |
| Front Wheel Travel | 270 mm (10.63 in) |
| Rear Wheel Travel | 270 mm (10.63 in) |
| Electrical: | |
| Ignition System | C.D.I. Magneto |

## ENGINE

| Item | IT175J |
|---|---|
| Cylinder Head<br>Volume | <br>15.9 $cm^3$ |
| Cylinder:<br>Bore Size<br>Taper Limit<br>Out of Round Limit | <br>66 $^{+0.02}_{0}$ mm (2.60 $^{+0.0008}_{0}$ in)<br>0.05 mm (0.0020 in)<br>0.01 mm (0.0004 in) |
| Piston:<br>Piston Size/<br>Measuring Point*<br>Piston Clearance<br>Oversize 1st<br>2nd<br>3rd<br>4th<br>Piston offset | <br>66 $^{-0.05}_{0}$ mm (2.598 $^{-0.002}_{0}$ in)/10 mm (0.4 in)<br>0.050 ~ 0.055 mm (0.0020 ~ 0.0022 in)<br>66.25 mm (2.61 in)<br>66.50 mm (2.62 in)<br>66.75 mm (2.63 in)<br>67.00 mm (2.64 in)<br>0.75 mm (0.03 in), EX-Side |
| Piston Ring:<br>Sectional Sketch<br>End Gap (Installed)<br>Side Clearance (Installed) | Top/2nd Ring<br><br>Plain<br>B = 1.2 mm (0.047 in)<br>T = 2.8 mm (0.11 in)<br>0.2 ~ 0.35 mm (0.008 ~ 0.014 in)<br>0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in) |
| Crankshaft:<br>Crank Width "A"<br>Run Out Limit "C"<br>Connecting Rod Big End Side Clearance "D"<br>Small End Free Play Limit "F" | <br>56 $^{-0.05}_{-0.10}$ mm (2.20 $^{-0.0020}_{-0.0040}$ in)<br>0.03 mm (0.0012 in)<br>0.2 ~ 0.7 mm (0.008 ~ 0.028 in)<br>2.0 mm (0.08 in) |
| Clutch:<br>Friction Plate Thickness/Quantity<br>Wear Limit<br>Clutch Plate Thickness/Quantity<br>Warp Limit<br>Clutch Spring Free Length/Quantity<br>Clutch Housing Thrust Clearance<br>Clutch Release Method<br>Push Rod Bending Limit | <br>3.0 mm (0.12 in) x 6<br>2.7 mm (0.11 in)<br>1.2 mm (0.05 in) x 5<br>0.05 mm (0.002 in)<br>36.0 mm (1.42 in) x 5<br>0.2 ~ 0.25 mm (0.008 ~ 0.010 in)<br>Inner push, cam axle type<br>0.15 mm (0.006 in) |

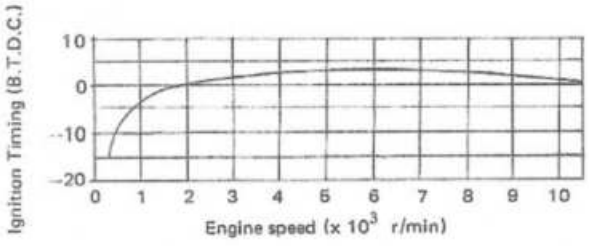
| Item | | IT175J |
|---|---|---|
| Shifter:<br>Shifting Type | | Cam drum |
| Kick Starter Type:<br>Kick Clip Friction Force |  | Kick and mesh type<br>P = 1.0 kg (2.2 lb) |
| Carburetor:<br>Type/Manufacturer/Quantity<br>I.D. Mark<br>Main Jet<br>Air Jet<br>Jet Needle-clip Position<br>Needle Jet<br>Cutaway<br>Pilot Jet<br><br>Air Screw (turns out)<br>Valve Seat Size<br>Starter Jet<br>Float Arm Height<br>Idling speed | <br><br>(M.J.)<br>(A.J.)<br>(J.N.)<br>(N.J.)<br>(C.A.)<br>(P.J.)<br><br>(A.S.)<br>(V.S.)<br>(G.S.)<br>(F.H.) | <br>VM-34SS/MIKUNI/1 pc.<br>5X810<br># 310<br>$\phi$ 2.5<br>6F21-4<br>P-4<br>2.0<br># 70<br>$\phi$ 0.6<br>1.0<br>3.3<br>80<br>23.5 ± 1.0 mm<br>1,500 r/min |
| Reed Valve:<br>Material<br>Thickness*<br>Valve Lift<br>Bending Limit |  | <br>G1N6<br>0.2 mm (0.008 in)<br>9 ± 0.2 mm (0.35 ± 0.008 in)<br>1.4 mm (0.055 in) or less |

## CHASSIS

| Item | IT175J |
|---|---|
| Steering System:<br>Steering Bearing Type | <br>Taper roller bearing |
| Front Suspension:<br>Front Fork Travel<br>Fork Spring Free Length<br>Spring Rate<br>Oil Capacity/Oil Level<br><br>Oil Grade<br>Enclosed Air Pressure | <br>270 mm (10.63 in)<br>533.5 mm (21.0 in)<br>k = 0.302 kg/mm<br>440 $cm^3$ (15.5 Imp oz, 14.9 US oz)/169 mm (6.65 in)<br>(From top of inner tube fully compressed without spring)<br>Yamaha fork oil 10 wt or SAE 10 motor oil<br>0 kPa (0 $kg/cm^2$, 0 psi) |
| Rear Suspension:<br>Shock Absorber Travel<br>Spring Free Length<br>Spring Rate/Stroke<br>Enclosed Gas Pressure | <br>110 mm (4.33 in)<br>323 mm (12.72 in)<br>k = 5.3 kg/mm<br>1471 kPa (15 $kg/cm^2$, 213 psi)<br>1422~ 1520 kPa (14.5~15.5 $kg/cm^2$, 206~ 220 psi) |

| Item | | IT175J |
|---|---|---|
| Rear Arm: | | |
| Swing Arm Free Play Limit | End | 1.0 mm (0.040 in) |
| | Side | 0.2 mm (0.008 in) |
| Wheel: | | |
| Front Wheel Type | | Spoke Wheel |
| Rear Wheel Type | | Spoke Wheel |
| Front Rim Size/Material | | 1.60 x 21/Aluminum |
| Rear Rim Size/Material | | 1.60 x 14/Aluminum |
| Rim Runout Limit | Vertical | 2.0 mm (0.08 in) |
| | Lateral | 2.0 mm (0.08 in) |
| Drive Chain: | | |
| Type/Manufacturer | | DK520DS/DAIDO |
| Number of Links | | 103 + Joint |
| Chain Free Play | | 30 ~ 35 mm (1.2~ 1.4 in) |
| Drum Brake: | | |
| Type (Front/Rear) | | Leading trailing |
| Drum Inside Dia. | | 130 mm (5.12 in) |
| Brake Shoe Wear Limit | | 2 mm (0.08 in) |
| Brake Lever & Brake Pedal: | | |
| Brake Lever Free Play | | 5 ~ 8 mm (0.20 ~ 0.31 in) |
| Brake Pedal Free Play | | 20 mm (0.8 in)<br>(Vertical height below footrest top.) |
| Clutch Lever Free Play: | | 2 ~ 3 mm (0.08 ~ 0.12 in) |

## ELECTRICAL

| Item | IT175J |
|---|---|
| Ignition System:<br>Ignition Timing (B.T.D.C.)<br>Advancer Type | <br>2.4 ± 0.15 mm (0.094 ± 0.006 in)<br>Electrical |
|  | |
| C.D.I.:<br>Model/Manufacturer<br>Pick up Coil Resistance (Color)<br><br>Charging Coil Resistance (Color) | <br>F03T20271/MITSUBISHI<br>12.4Ω ± 10% at 20°C (68°F)<br>(Black – White/Red)<br>High speed: 13.6Ω ± 10% at 20°C (68°F)<br>(Black to Red)<br>Low speed: 420Ω ± 10% at 20°C (68°F)<br>(Black to Brown) |
| C.D.I. Unit – Model/Manufacturer | F8T01172/MITSUBISHI |
| Ignition Coil:<br>Model/Manufacturer<br>Minimum Spark Gap<br>Primary Winding Resistance<br>Secondary Winding Resistance | <br>F6T501/MITSUBISHI<br>6 mm at idle<br>1.0Ω ± 15% at 20°C (68°F)<br>5.9kΩ ± 15% at 20°C (68°F) |
| Lighting System:<br>Output voltage<br><br>Lighting Coil Resistance | Flywheel magneto<br>5V or more at 2,500 r/min<br>7V or less at 8,000 r/min<br>0.48Ω ± 10% at 20°C (Yellow/Red to Black) |
| Valve Wattage:<br>Headlight<br>Taillight | <br>6V, 25W/25W<br>6V, 5W |

## TIGHTENING TORQUE

| Engine | | | Tightening torque |
|---|---|---|---|
| Cylinder head | | M8 | 25 Nm (2.5 m·kg, 18 ft·lb) |
| Spark plug | | M14 | 25 Nm (2.5 m·kg, 18 ft·lb) |
| Cylinder | Nut | M10 | 35 Nm (3.5 m·kg, 26 ft·lb) |
| | Stud | M10 | 13 Nm (1.3 m·kg, 9.4 ft·lb) |
| Primary drive gear | | M12 | 80 Nm (8.0 m·kg, 58 ft·lb) |
| Clutch boss (with lock washer) | | M14 | 80 Nm (8.0 m·kg, 58 ft·lb) |
| Clutch spring | | M5 | 6 Nm (0.6 m·kg, 4 ft·lb) |
| Drive sprocket (with lock washer) | | M16 | 60 Nm (6.0 m·kg, 42 ft·lb) |
| Kick crank | | M10 | 35 Nm (3.5 m·kg, 26 ft·lb) |
| Change pedal | | M6 | 10 Nm (1.0 m·kg, 8 ft·lb) |
| Reed valve | | M3 | 1 Nm (0.1 m·kg, 0.7 ft·lb) |
| Magneto | | M12 | 80 Nm (8.0 m·kg, 58 ft·lb) |
| Starter | | M6 | 8 Nm (0.8 m·kg, 6 ft·lb) |

| Chassis | | Tightening torque |
|---|---|---|
| Front wheel axle | M14 | 60 Nm (6.0 m·kg, 42 ft·lb) |
| Axle holder nut | M6 | 10 Nm (1.0 m·kg, 7.2 ft·lb) |
| Handle crown — Inner tube | M8 | 23 Nm (2.3 m·kg, 16 ft·lb) |
| — Steering shaft | M14 | 50 Nm (5.0 m·kg, 36 ft·lb) |
| — Handle holder | M8 | 23 Nm (2.3 m·kg, 16 ft·lb) |
| — Ring nut | M25 | 10 Nm (1.0 m·kg, 7.2 ft·lb) |
| Engine mounting bolt | M8 | 30 Nm (3.0 m·kg, 22 ft·lb) |
| Rear wheel axle | M14 | 85 Nm (8.5 m·kg, 60 ft·lb) |
| Rear shock — Frame | M10 | 30 Nm (3.0 m·kg, 22 ft·lb) |
| — L shape arm | M10 | 30 Nm (3.0 m·kg, 22 ft·lb) |
| L shape arm — Frame | M16 | 85 Nm (8.5 m·kg, 60 ft·lb) |
| — I shape arm | M12 | 60 Nm (6.0 m·kg, 42 ft·lb) |
| Pivot shaft | M16 | 85 Nm (8.5 m·kg, 60 ft·lb) |
| Footrest — Frame | M10 | 60 Nm (6.0 m·kg, 42 ft·lb) |
| — Frame | M12 | 85 Nm (8.5 m·kg, 60 ft·lb) |
| Brake cam lever | M6 | 10 Nm (1.0 m·kg, 7.2 ft·lb) |
| Sprocket wheel mounting bolt | M8 | 30 Nm (3.0 m·kg, 22 ft·lb) |

# CONVERSION TABLES

| METRIC TO INCH SYSTEM | | | |
|---|---|---|---|
| | KNOWN | MULTIPLIER | RESULT |
| TORQUE | m·kg | 7.233 | ft·lb |
| | m·kg | 86.80 | in·lb |
| | cm·kg | 0 0723 | ft·lb |
| | cm·kg | 0.8680 | in·lb |
| WT. | kg | 2.205 | lb |
| | g | 0.03527 | oz |
| FLOW/DISTANCE | km/ℓ | 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 |
| | ℓ (liter) | 2.1134 | pt (US liq) |
| | ℓ (liter) | 1.057 | qt (US liq) |
| | ℓ (liter) | 0.2642 | gal (US liq) |
| MISC. | km/mm | 56.007 | lb/in |
| | $kg/cm^2$ | 14.2234 | psi ($lb/in^2$) |
| | Centigrade(°C) | 9/5(°C) + 32 | Fahrenheit(°F) |

| INCH TO METRIC SYSTEM | | | |
|---|---|---|---|
| | KNOWN | MULTIPLIER | RESULT |
| TORQUE | ft·lb | 0.13826 | m·kg |
| | in·lb | 0.01152 | m·kg |
| | ft·lb | 13.831 | cm·kg |
| | in·lb | 1.1521 | cm·kg |
| WT. | lb | 0.4535 | kg |
| | oz | 28.352 | g |
| FLOW/DISTANCE | mpg | 0.4252 | km/ℓ |
| | mph | 1.609 | km/hr |
| | mi | 1.609 | km |
| | ft | 0.3048 | m |
| | yd | 0.9141 | m |
| | in | 2.54 | cm |
| | 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 | ℓ (liter) |
| | qt (US liq) | 0.9461 | ℓ (liter) |
| | gal (US liq) | 3.785 | ℓ (liter) |
| MISC. | lb/in | 0.017855 | kg/mm |
| | psi ($lb/in^2$) | 0.07031 | $kg/cm^2$ |
| | Fahreineit(°C) | 5/9(°F−32) | Centigrade(°F) |

# DEFINITION OF UNITS

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

# CABLE ROUTING DIAGRAM

Fig. 1

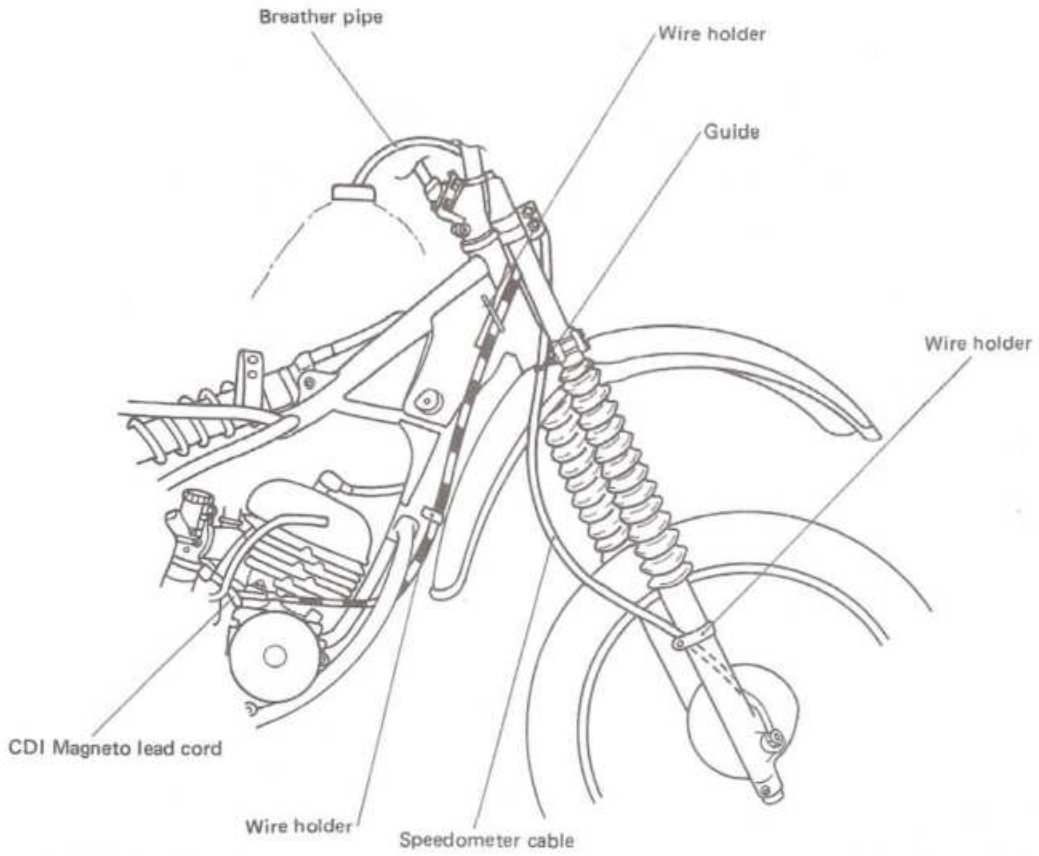


Fig.2

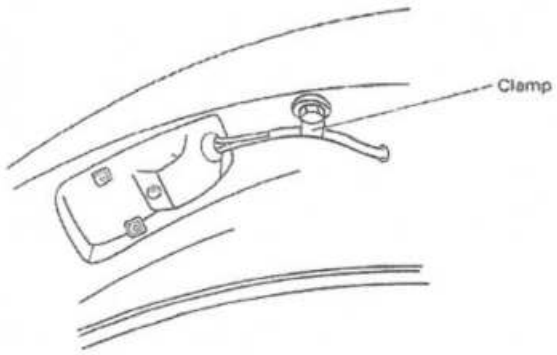

Clamp

Fig.3

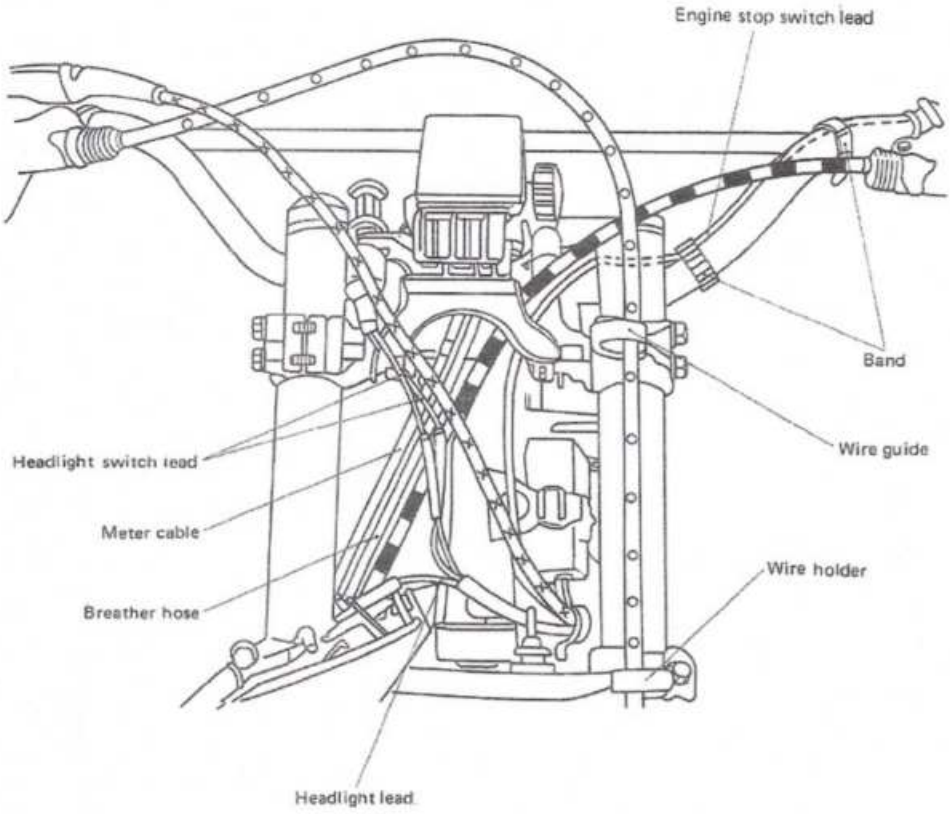

Engine stop switch lead
Band
Wire guide
Headlight switch lead
Meter cable
Breather hose
Wire holder
Headlight lead

Fig.4

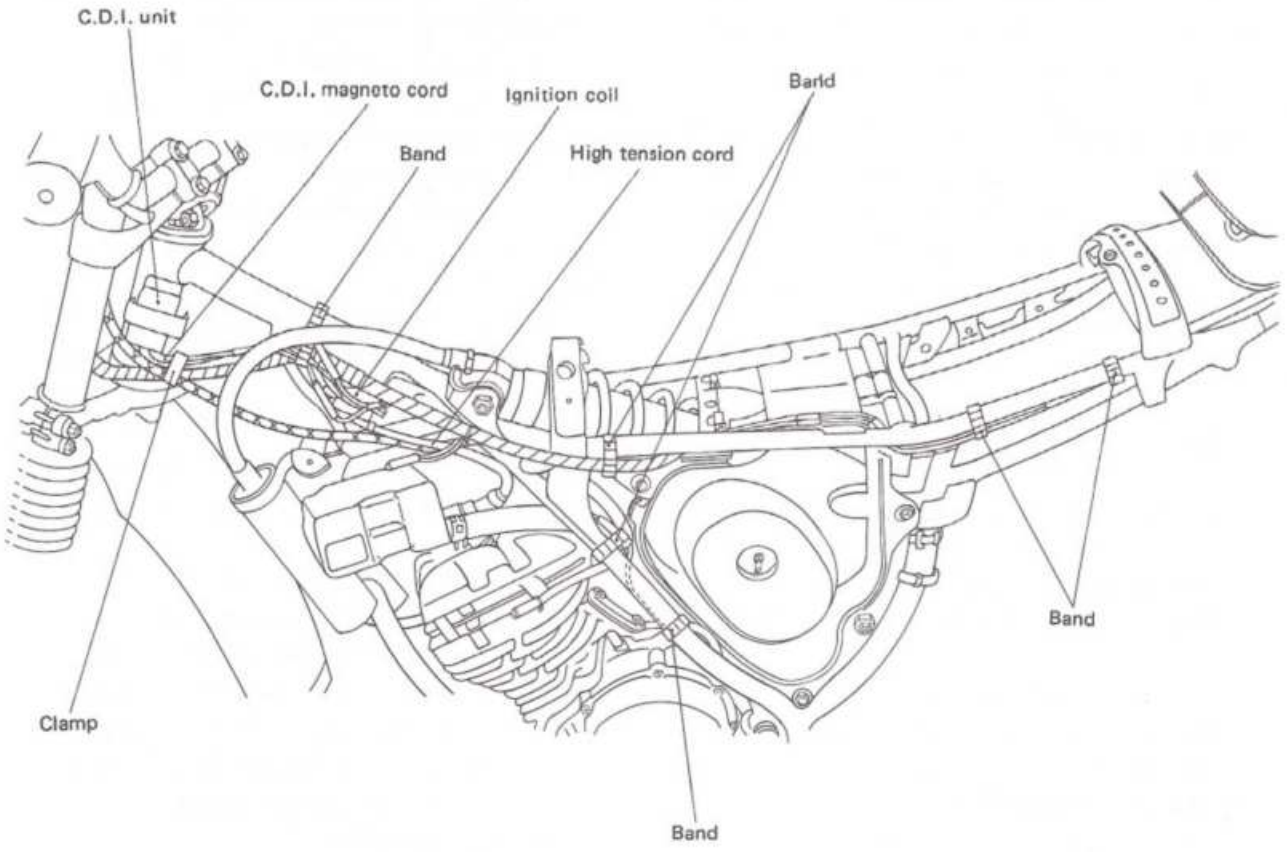
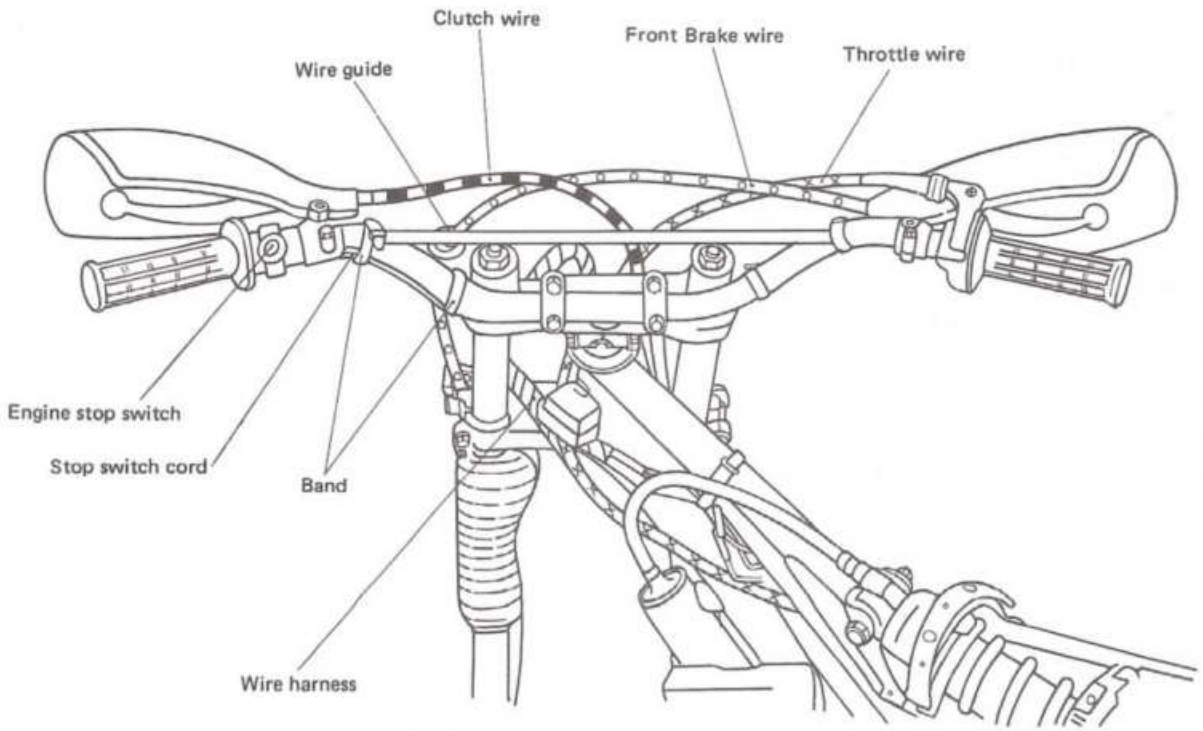

C.D.I. unit
C.D.I. magneto cord
Ignition coil
Band
Band
High tension cord
Band
Band
Clamp
Band

Fig.5


Clutch wire
Front Brake wire
Throttle wire
Wire guide
Engine stop switch
Stop switch cord
Band
Wire harness

Throttle wire (Figs. 5 → 3 → 4)

Cap grip — Front of meter bracket — Left side of head pipe — Clamp — Back of rear cushion sub-tank hose and wire harness — Over the fuel tank bracket — Side of tension pipe — Carburetor

Clutch wire (Figs. 5 → 3 → 1)

Lever (L) — Between handle crown and meter bracket — Right side of head pipe — Wire holder 1 — Down tube — Wire holder 2 — Clutch wire holder on cylinder body — Accelerator push lever

Front brake wire (Figs. 5 → 3)

Lever (R) — Behind the throttle wire and front of clutch wire — Wire guide (left side of handle crown) — Wire holder (left side of handle crown) — Wire holder (left side of underbracket) Secure to the clamp (outer tube in left front fork) — Adjust screw on the brake shoe plate — Camshaft lever

High-tension cord (Fig. 4)

Ignition coil — Left side of tension pipe — Spark plug

Fuel pipe (No figure)

Clip to fuel cock — Clip to left side of carburetor

Tank cap breather pipe (No figure)

Tank cap — Under handle tension pipe — Between handle crown and meter bracket — Left side of head pipe — Pass through the clamp

Engine stop switch cord (Fig. 5 → 3)

Engine stop switch — Handle switch cord (clamp at 2 places) — Over the handle crown (between front forks and handle holder) — Between handle crown and meter bracket — Clamp — Behind the rear cushion hose — Connect to CDI unit lead wire

CDI magneto cord

Outlet hole in grommet on the crankcase (R) — Between carburetor and crankcase and clamp to carburetor joint, then bring to the left side — Hold it to the left back — stay with band (route along behind the back stay) — Connect to wire harness

CDI unit wire (Fig. 4)

CDI unit — Clamp — Connect to branch wires (4 wires) from wire harness — Connect to engine stop switch lead wire

Transmission oil breather (Fig. 4)

Crankcase (L) — Pass between crankcase and rear arm and bring it downward

Carburetor overflow pipe

Pass between crankcase and rear arm and bring it downward

Wire harness (Figs. 3 → 4)

Connect to headlight and headlight switch — Left side of head pipe — Clamp — Hold it with band on front side of cushion bracket, together with CDI lead wire — Lead wire (CDI) — Ground wire — CDI magneto cord — Band (seat rail) — Connect at rear end of air cleaner

Taillight lead wire (Figs. 2 → 4)

Taillight — Clamp (holding the taillight) — Bring it out of the hole in rear fender — Between bracket and fender — Band on left side of seat rail — Band — Route it outer side and inner side of the seat pillar — Connect at the rear of air cleaner

Speedometer cable (Fig. 1)

Speedometer — Cable guide on the wire holder in upper left side of the front fork boot band — Secure to front fork outer tube (wire holder) — Gear unit

# WARRANTY INFORMATION

Please refer to your copy of the Yamaha Owner's Warranty Guide* for details of the warranty offered on your new Yamaha.
The Warranty Guide contains the warranty policy, an explanation of the warranty, and other important information. Becoming familiar with these policies will be to your advantage in making the best use of Yamaha's programs.
These are certain requirements which you must meet in order to qualify for warranty coverage. FIRST, your new Yamaha must be operated and maintained properly, as explained in this manual. If you have any questions about any procedure in this manual, please consult your dealer. ABUSE AND NEGLECTED MAINTENANCE MAY LEAD TO MECHANICAL FAILURES WHICH CANNOT BE COVERED UNDER WARRANTY.
SECOND, IF ANY PROBLEMS OCCUR WHICH YOU FEEL SHOULD BE COVERED UNDER WARRANTY NOTIFY YOUR DEALER IMMEDIATELY. Don't delay, as small problems left unrepaired can become large problems which may not be covered under warranty.
We recommend that the Warranty Guide be used as a folder in which you may keep your registration and other important documents related to your new Yamaha.

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

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