YAMAHA

PW80K

OWNER'S SERVICE MANUAL

LIT-11626-03-70

21W-28199-10

Some data in this manual may become outdated due to improvements made to this model in the future.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

INTRODUCTION

Congratulations on your purchase of the Yamaha PW80K. This model represents the product of many years of Yamaha experience in the production of fine sporting, touring, and pace-setting racing machines. You can now appreciate the high degrees of craftsmanship and reliability that have made Yamaha a leader in these fields.
PLEASE READ THIS MANUAL CAREFULLY AND COMPLETELY BEFORE OPERATING YOUR NEW MACHINE. This manual will provide you with a good basic understanding of the features, operation, and basic maintenance and inspection items of this vehicle. If you have any questions regarding the operation or maintenance of your machine, please consult a Yamaha dealer.

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

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

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

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

PW80K OWNER'S SERVICE MANUAL

1st. Edition, June 1982

Printed in Japan
P/No. LIT-11626-03-70

WARNING:

- READ THIS MANUAL CAREFULLY BEFORE OPERATING.
- OPERATOR ONLY. NO PASSENGERS. WEIGHT LIGHT 40 kg (88 lb)
- DO NOT TOUCH ANY MOVING OR HEATED AREAS.
- INSPECTION REQUIRED BEFORE RIDING. REFER TO PAGE 4.
- WEAR HELMET AND SUITABLE PROTECTIVE CLOTHING.
- ADULT SUPERVISION REQUIRED WHEN CHILDREN OPERATE THIS MACHINE.
- COMPLETION USE ONLY.

IMPORTANT NOTICE

This machine is designed and manufactured strictly for competition use only. It is illegal to operate this machine on street. Off-road use on public land may be illegal.

Suspension on this machine can be adjusted to accomodate differing rider weights and technique, check this manual.

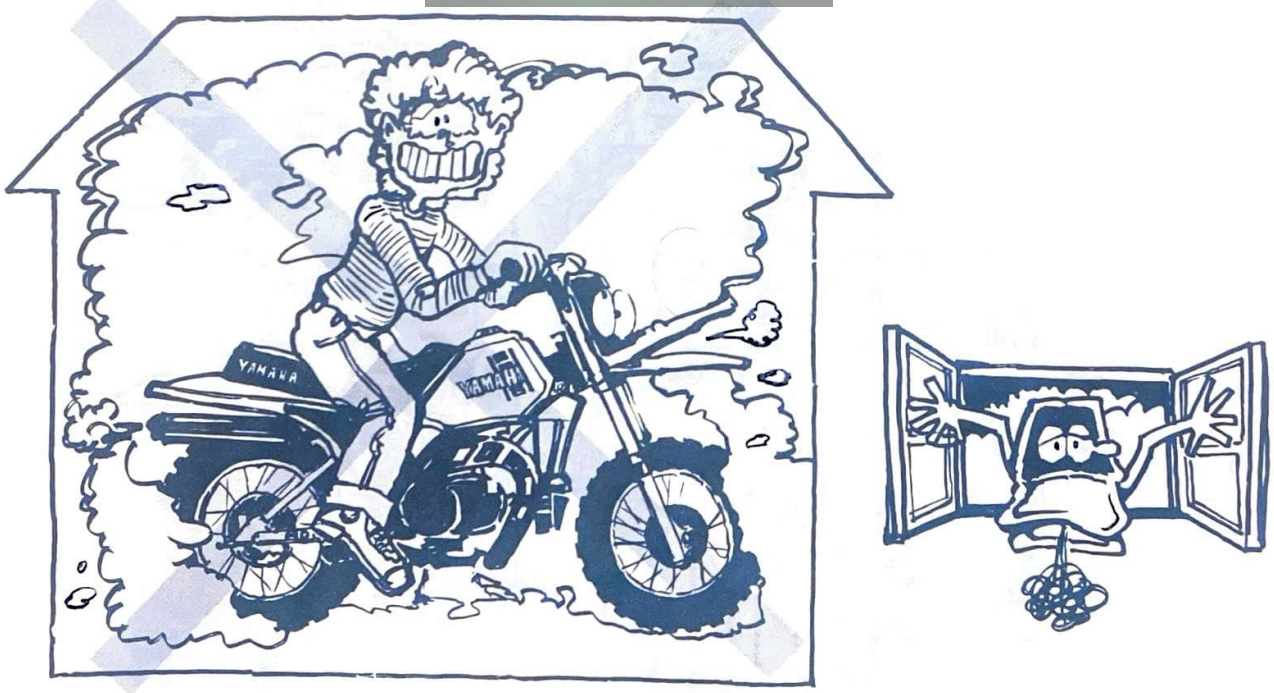
SAFETY WARNINGS:

1. **GASOLINE IS HIGHLY FLAMMABLE:**
   - * **Always turn off the engine when refueling.**
   - * **Take care not to spill on the engine or exhaust pipe/muffler, when refueling.**
   - * **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. **Always turn off the engine before leaving the machine unattended. When parking the machine, note the following:**
   - * **The engine and exhaust pipe(s)/muffler(s) may be hot. 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 may overturn.**
4. **When transporting the motorcycle in another vehicle, be sure it is kept upright and that the fuel cock is turned to the "OFF". 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 may 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, trousers, and jacket for motocross riding.**

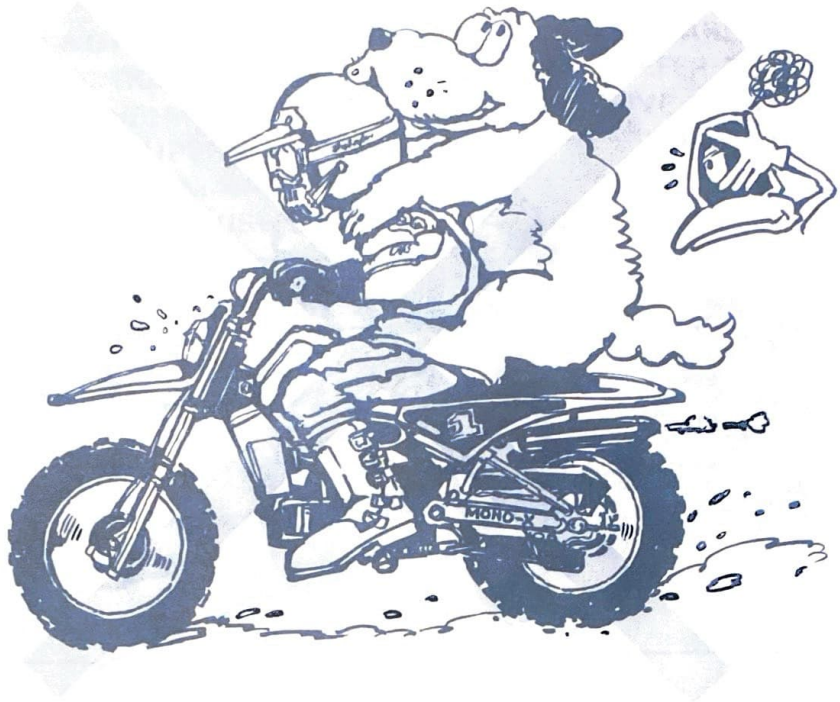
WARNING

1. Don't ride it on the street.

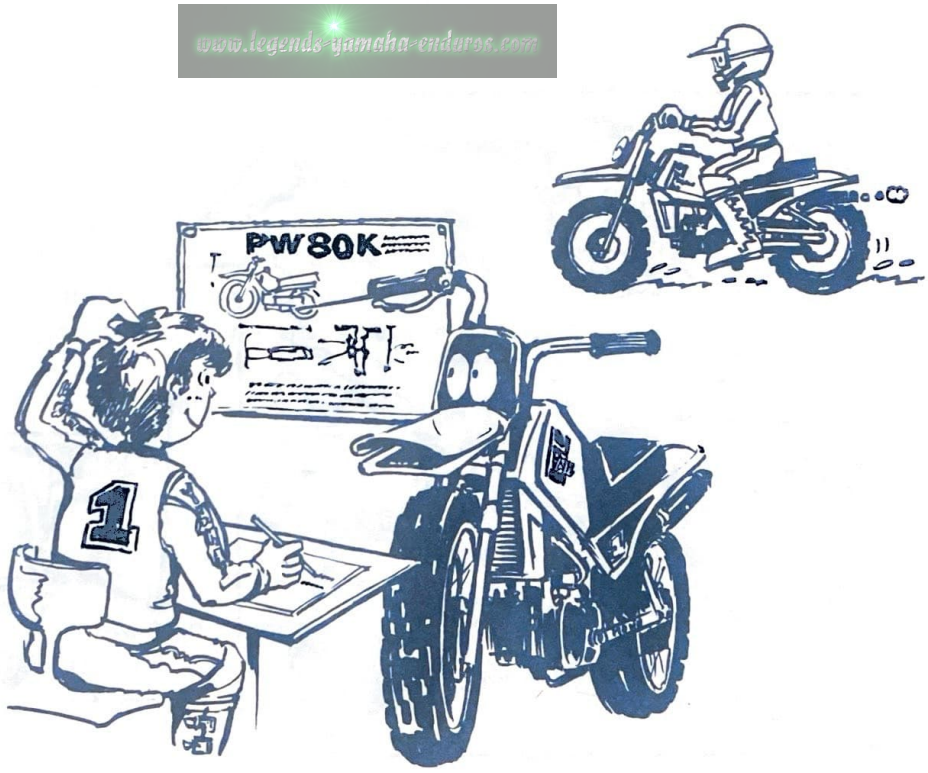
2. Don't run the engine inside a building.



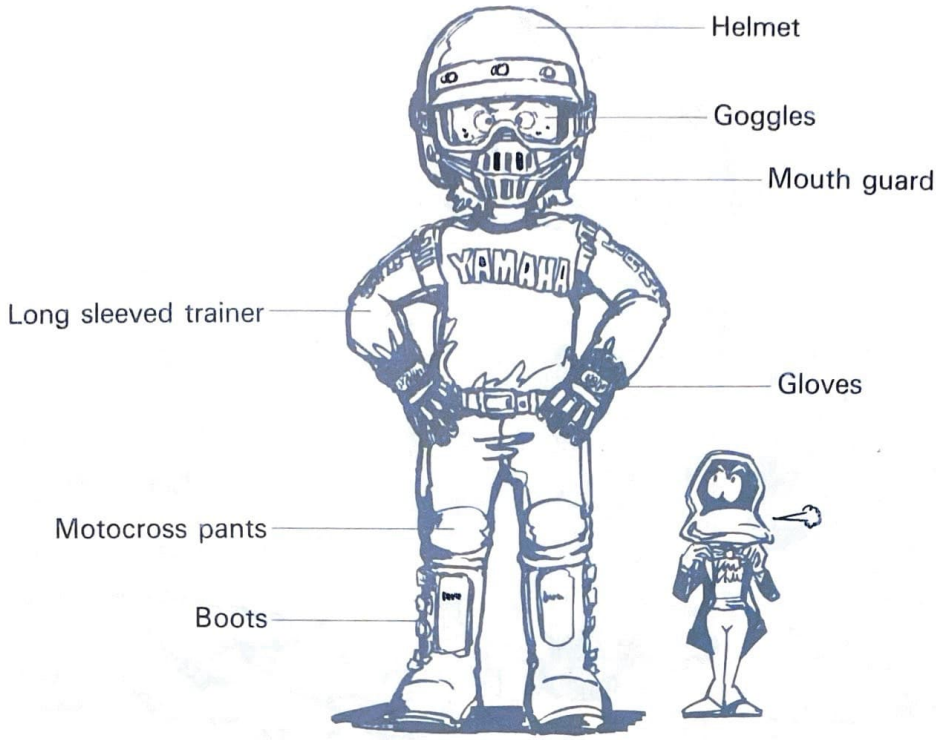
3. This is a one-seater motorbike. Don't give any person a ride.



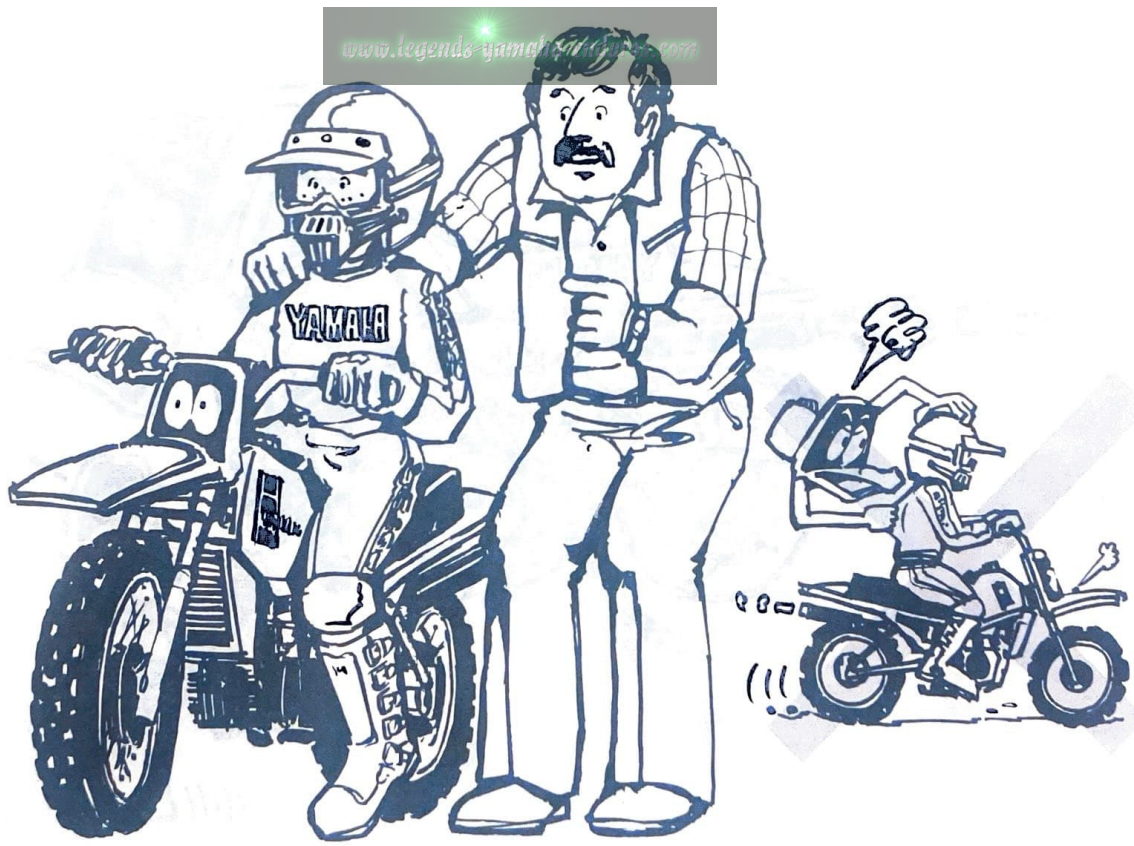
4. Let's learn how to ride properly. Ask your parents for any question.



5. When riding the machine, be sure to wear a helmet as illustrated.

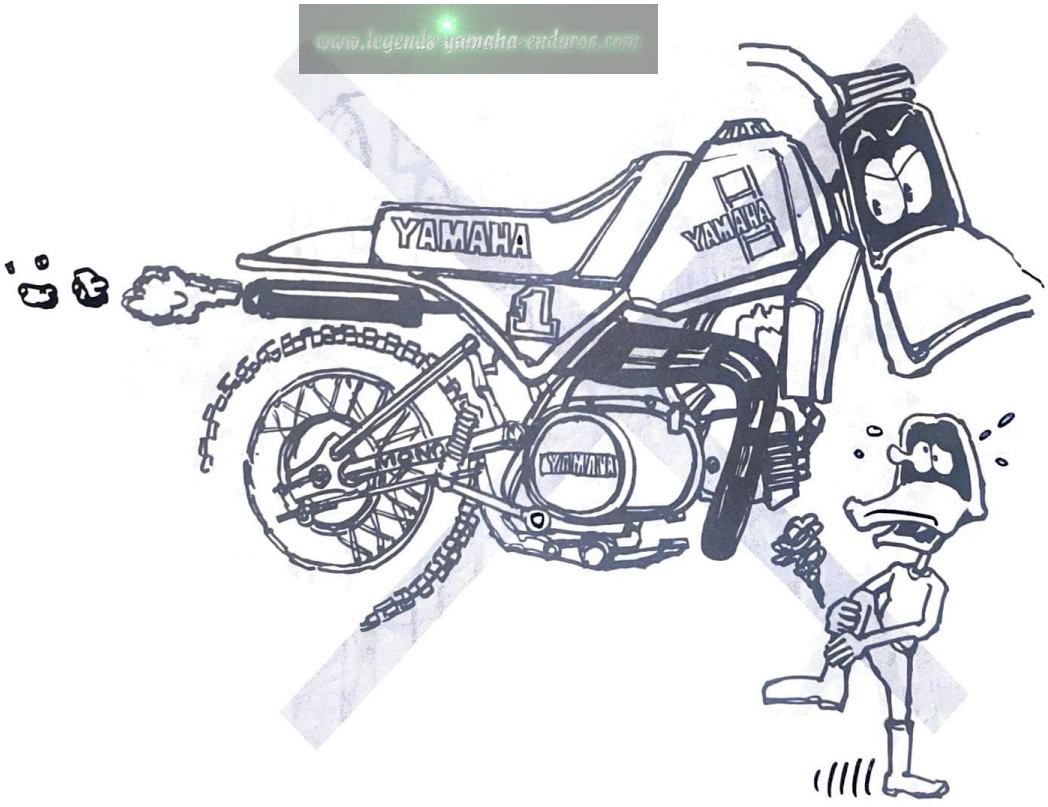


6. When going for riding, be sure to be with your family. Never go alone.

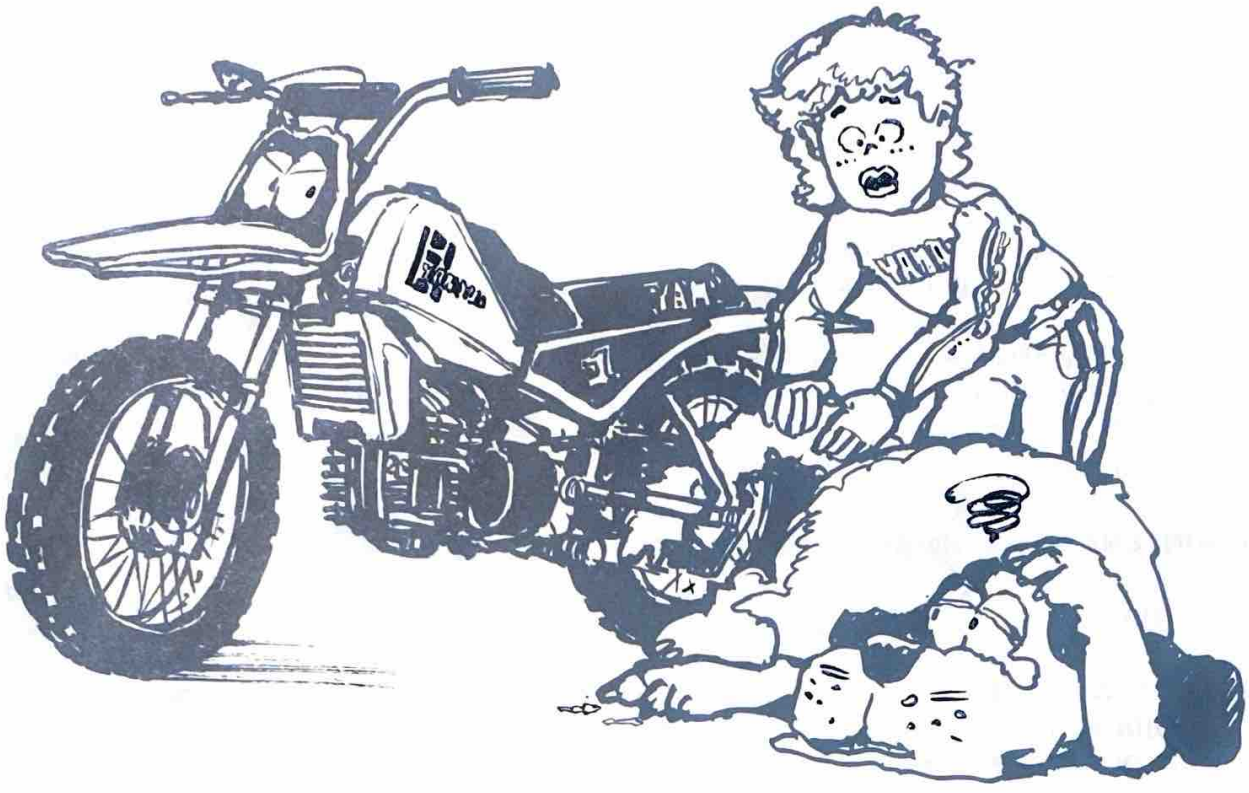


7. Before riding the machine, ask your parents to check the machine very carefully.

8. Don't touch the areas shown below, or you'll get burnt in the hand.



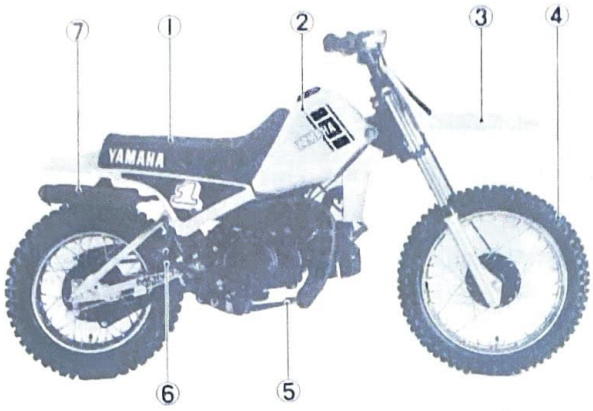
9. Don't touch rotating or moving parts.



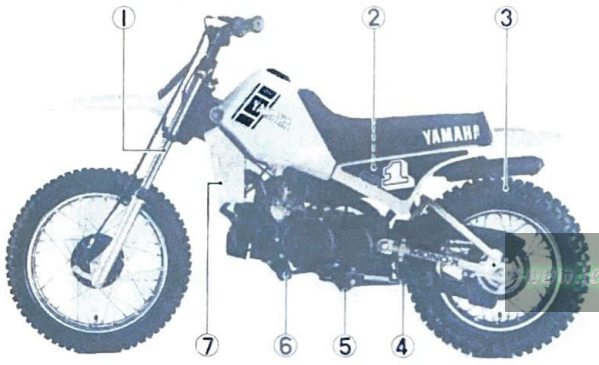
CONTENTS

GENERAL INFORMATION

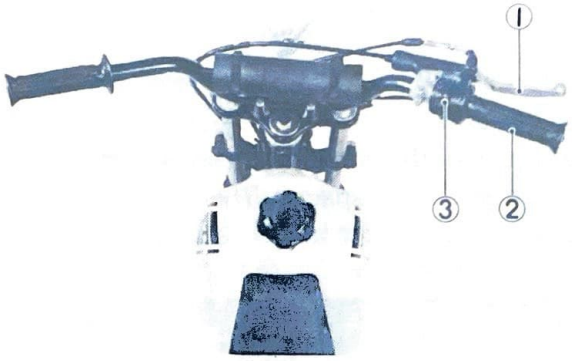
DESCRIPTION



1. Seat
2. Fuel tank
3. Front fender
4. Front wheel
5. Brake pedal
6. Kick starter
7. Muffler



1. Front fork
2. Monocross suspension
3. Rear wheel
4. Sidestand
5. Footrest
6. Change pedal
7. Air filter

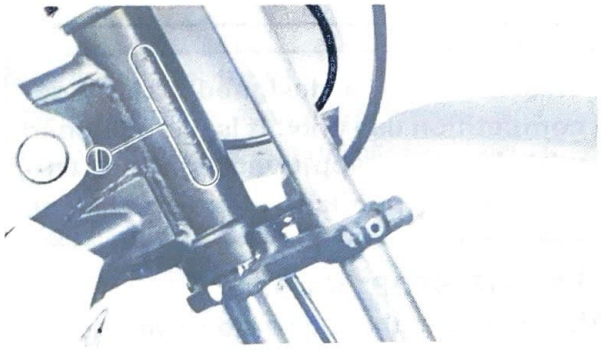


1. Front brake lever
2. Throttle grip
3. Engine stop switch

MACHINE IDENTIFICATION

Frame serial number

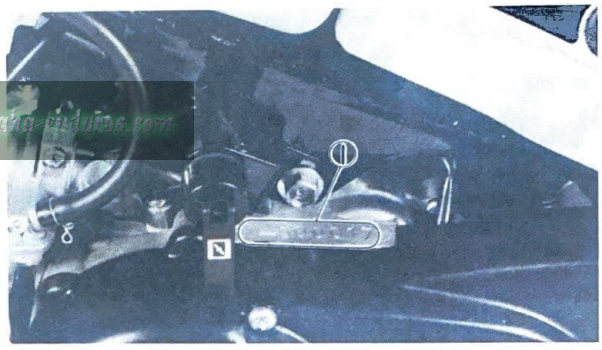
The frame serial number is stamped on the right side of the steering head pipe.



1. Frame serial number

Engine serial number

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



1. Engine serial number

NOTE:

The first digits of these numbers are for model identifications; the remaining digits are the unit production number.
Keep a record of these numbers for reference when ordering parts from a Yamaha dealer.

CONTROL FUNCTIONS

WARNING:

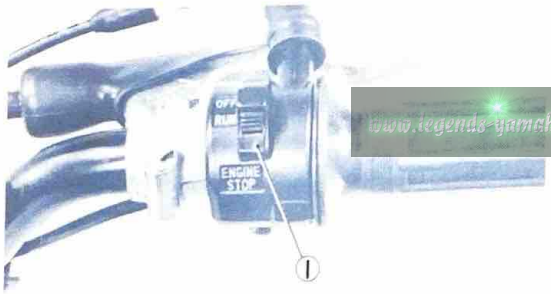
Before riding this machine, become thoroughly familiar with all operatingcontrols and their function.
Consult a Yamaha dealer or other qualified mechanic regarding any control or function you do not thoroughly understand.

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.

"ENGINE STOP" switch

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



1. "ENGINE STOP" switch

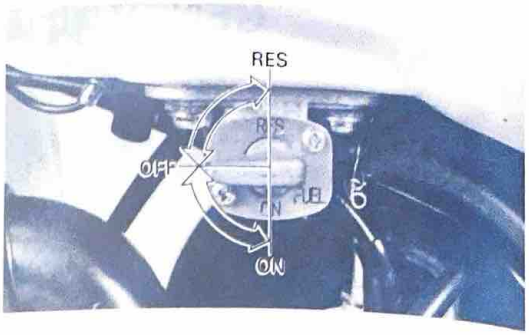
Fuel cock

The fuel cock functions to supply fuel from the tank to the carburetor and also to filter the fuel. The fuel cock has the following two positions:

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

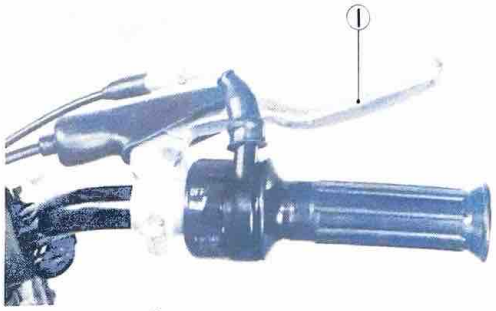
ON: With the lever in this position fuel flows to the carburetor. Normal riding is done with the lever in this position.

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



Front brake lever

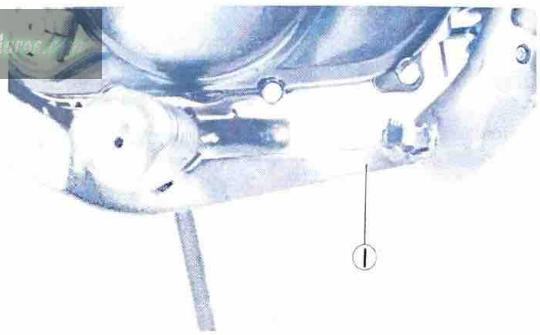
The front brake lever is located on the right handlebar, pull it toward the handlebar to activate the front brake.



1. Front brake lever

Rear brake pedal

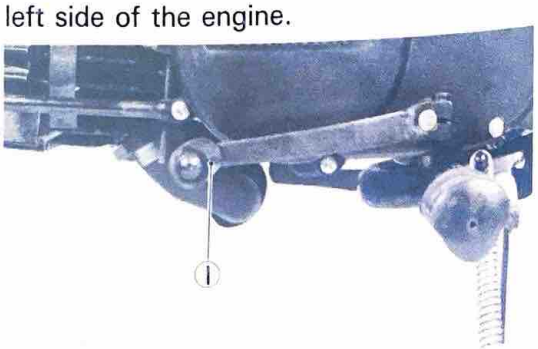
The rear brake pedal is on the right side of the machine. Press down on the brake pedal to activate the rear brake.



1. Rear brake pedal

Change pedal

The gear ratios of the constant mesh 3-speed transmission are ideally spaced. The gears can be shifted by using the change pedal on the left side of the engine.

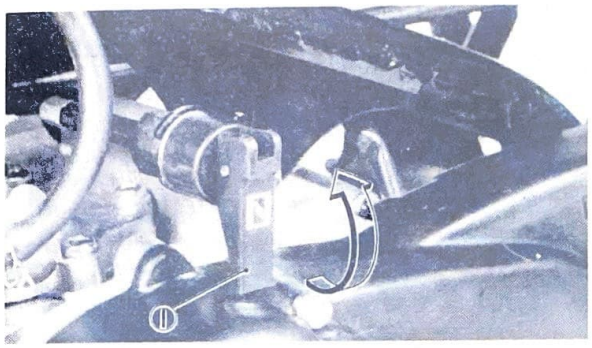


1. Change pedal

Starter lever (choke)

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

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



1. Starter lever

Kick starter

To start the engine, rotate the kick starter, push down lightly with foot until gears engage, and then kick briskly.

1. Kick starter

Fuel tank cap

Then remove the fuel tank cap by tuning counterclockwise.

WARNING:

Do not overfill the fuel tank. Avoid spilling fuel on the hot engine.
Do not fill the fuel tank all the way to the top or it may overflow when the fuel heats up later and expands.

FUEL AND OIL

Fuel

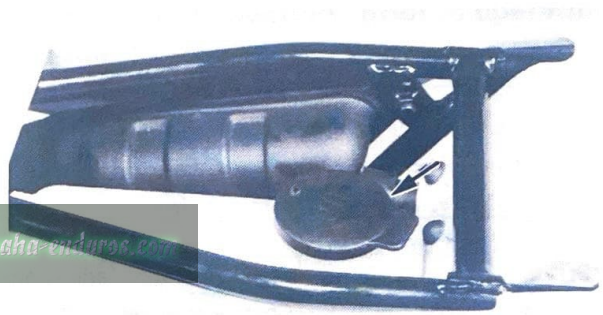
Use regular gasoline. Always use fresh, name brand gasoline.

Recommended fuel: Regular gasoline
Fuel tank capacity:
4.9 L (1.1 Imp gal, 1.3 US gal)

Engine oil (oil tank)

Make sure there is sufficient engine oil in the oil tank. If necessary add oil.

Recommended oil:
Yamalube 2-cycle oil or air-cooled 2-stroke engine oil
Oil tank capacity:
0.95 L (0.84 Imp qt, 1.0 US qt)

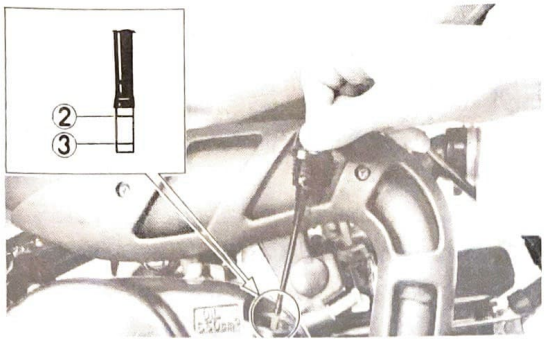


Transmission oil

The only servicing for you to do is to check and fill the transmission lubricating oil. The transmission dip stick is located right above the kick starter. To check the level, warm the engine up for several minutes, screw the dip stick completely out and then just rest the stick in the hole.

NOTE:

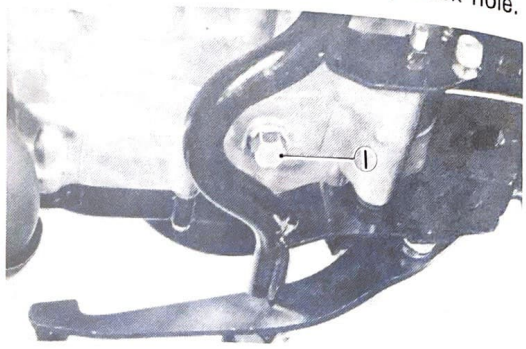
When checking transmission oil level with the dip stick, let the unscrewed dip stick just rest on the case threads. Also, be sure the machine is positioned straight up.



1. Dip stick
2. Maximum level
3. Minimum level

Recommended oil
Yamalube 4-cycle oil
or SAE 10W30 type SE motor oil
Oil capacity:
Total amount:
0.75 L (0.66 Imp qt, 0.79 US qt)
Periodic oil change:
0.70 L (0.62 Imp qt, 0.74 US qt)

The dip stick has a Minimum and Maximum mark, and the oil level should be between the two. If the level is lower, then and sufficient oil to raise it to the proper level.
On the bottom of the engine there is a drain plug. Remove it and drain all the transmission oil out. Reinstall the drain plug (make sure it is tight). And oil through the dip stick hole.



1. Drain plug

NOTE:

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

PRE-OPERATION CHECKS

Item	Routine	Page
Brake	Check operation/adjustment	4, 14
Transmission oil	Change oil as required	3
Drive chain	Check alignment/adjustment/lubrication	14, 15
Spark plug	Check color/condition	10
Throttle	Check for proper throttle cable operation	5, 12
Air filter	Foam type — must be clean and damp w/oil always	11 ~ 12, 31 ~ 34
Wheels and tires	Check pressure/runout/spoke tightness/bead stopper/axle nuts	5, 16, 31 ~ 34
Fittings/fasteners	Check all — tighten as necessary	5, 48

NOTE:

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

WARNING:

If any item in the PRE-OPERATION CHECK is not working properly, have it inspected and repaired before operating the machine.

Brake (Front and rear)

Check for correct play in the brake lever and pedal and make sure they are working properly. Check the brakes at low speed shortly after starting out. If the play is correct, make an adjustment.

Wheel
Check the wheel runout and damage, and check the tightness of spokes.

Tires
Check the tire pressure and check the tires for wear.

Tire pressure

Front	98.1 kPa (1.0 kg/cm², 14 psi)
Rear	98.1 kPa (1.0 kg/cm², 14 psi)

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

Engine stop switch
Start the engine and make sure the engine stop switch functions properly.

Fittings/Fasteners
Always check the tightness of chassis fittings and fasteners before a ride. Use the chart on page 48 to find the correct torque.

STARTING AND OPERATION

CAUTION:

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

WARNING:

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.

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

Starting a warm engine
To start a warm engine, refer to the "Starting a cold engine" section. The starter (choke) lever should not be used. The throttle should be opened slightly.

CAUTION:

See "Break-in Section" prior to operating engine for the first time.

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

WARNING:

Before starting off, be sure to turn up or remove the side stand.
Failure to retract the side stand completely cam result in a serious accident when you try to turn a corner.

Engine break-in
1. Prior to starting, fill fuel tank with gasoline and oil tank with specified oil.
2. Allow engine to warm up. Check engine idling speed. Check operating controls and engine stop switch operation.
3. Operate machine is lower gears at moderate throttle setting for 3~5 minutes. Check spark plug condition.

4. Allow engine to cool. Repeat procedure, running for 5 minutes. Very briefly, shift to higher gears and check full throttle response. Check spark plug condition.
5. Allow engine to cool. Repeat procedure, running for 5 minutes. Full throttle and higher gears may be used, but avoid sustained full throttle operation. Check spark plug condition.
6. Allow engine to cool. Remove top end and inspect. Remove "high" spots on piston with No. 600 grit, wet sandpaper. Clean, and carefully reassemble.
7. Check entire unit for loose or misadjusted fittings/controls/fasteners.
8. Re-start engine and check through entire operating range thoroughly. Stop. Check spark plug condition. Re-start. After 10～15 minutes operation, machine is ready to ride.

PERIODIC MAINTENANCE AND ADJUSTMENT

MAINTENANCE AND LUBRICATION SCHEDULE CHART

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

Lubrication intervals

Item	Remarks	Type	Initial (hour)				Thereafter every (hour)		
			10	20	40	80	40	80	160
Transmission oil change	Warm engine before draining	Yamalube 4-cycle oil or SAE 10W30 type SE motor oil		○	○			○	
Drive chain	Lube/Adjust as required	Yamalube Chain and Cable Lube or SAE 10W30 motor oil	See service notes						
	Remove/Clean/Lube/Adjust				○		○		
Control cables	All apply thoroughly	SAE 10W30 motor oil			○	○		○	
Throttle grip and housing	Apply lightly	Lithium base grease				○		○	
Brake pedal shaft	Apply lightly	Lithium base grease			○			○	
Sttand shaft pivot	Apply lightly	Lithium base grease			○			○	
Front forks	Drain completely	Yamaha fork oil 20 wt or SAE 20W motor oil				○		○	
Steering ball race	Inspect thoroughly/Pack moderately	Medium-weight wheel bearing grease				○			○
Wheel bearings	Do not over-pack yearly or ...	Medium-weight wheel bearing grease				○	○	○	

Periodic maintenance intervals

Item	Remarks	Initial (hour)				Thereafter every (hour)		
		10	20	40	80	40	80	160
Brake system (complete)	Check/Adjust as required — repair as required		○	○		○		
Clutch	Check/Adjust as required		○	○		○		
Spark plug	Inspect/Clean or replace as required	○	○	○		○		
Wheels and tires	Pressure/Runout/Spoke — tension	○	○	○		○		
Fittings and fasteners	Tighten before each trip and/or	○	○	○		○		
Drive chain	Tension/Alignment (No. 1)	○	○	○		○		
Air filter	Wet type — clean/Replace as required (No. 2)		○	○	○	○		
Fuel cock	Clean/Flush tank as required	○		○		○		
Ignition timing	Adjust/Clean or replace as required		○	○	○		○	
Autolube pump	Check/Adjust/Air bleeding	○	○	○		○		
Carburetor adjustment	Check/operation/Timings		○	○	○		○	
Carburetor overhaul	Clean/Repair as required/Refit/Adjust							○
Cylinder compression	Preventive maintenance check		○	○	○		○	
Decarbonize engine	Includes exhaust system			○			○	

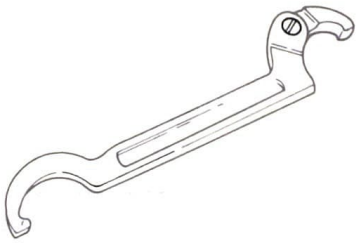
SERVICE NOTES:

No. 1. DRIVE CHAIN: In addition to tension and alignment, chain must be lubricated every 0.5 ~ 1.0 hour. If unit is subjected to extremely hard usage and wet weather riding, chain must be checked constantly. See "Lubrication Intervals" for additional details.

No. 2. AIR FILTER: Remove and clean filter every 20 ~ 40 hours.

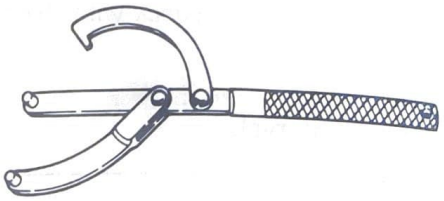
SPECIAL TOOLS

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

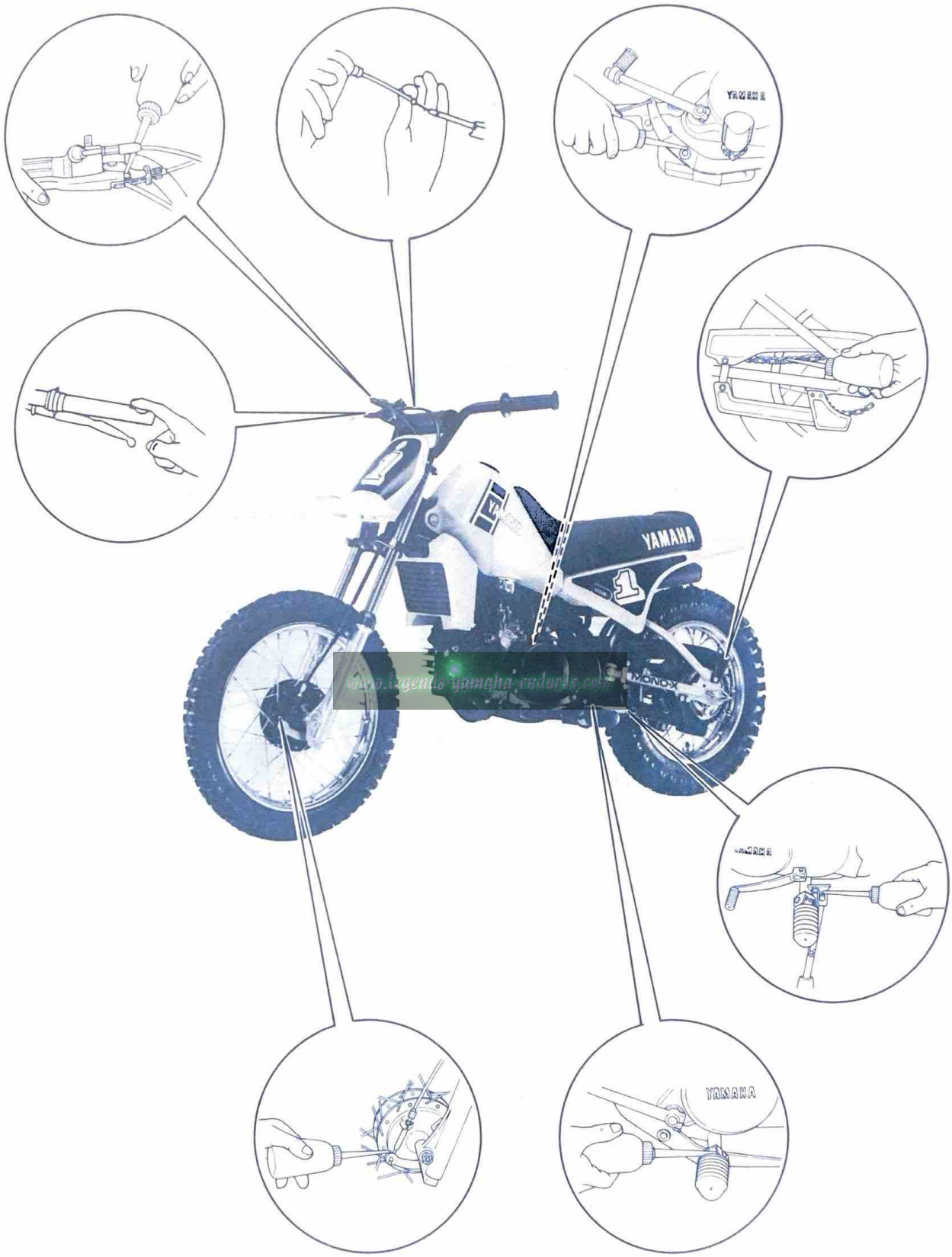


Use this wrench to put the proper tension on the steering head bearings.

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



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



ADJUSTMENT

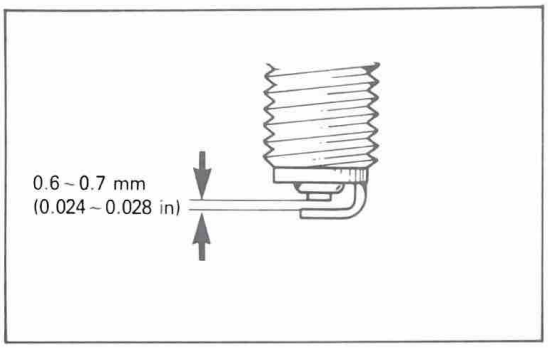
WARNING:

The engine, exhaust pipe(s), and muffler(s) will be very hot after the engine has been run. Be careful not to touch them or to allow any clothing item to contact them during inspection or repair.

Spark plug

Standard spark plug: BP6HS (NGK)

1. Measure the electrode gap with a wire thickness gauge.



Adjustment can be made by bending the side electrode.

Electrode gap:
0.6 ~ 0.7 mm (0.024 ~ 0.028 in)

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

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

2. The insulator must be a medium-to-light tan color. If not, check carburetion, ignition timing and gas-oil mixing ratio.
If the porcelain is a very dark brown or black color, then a plug with a hotter heat range may be required.
This situation is quite common during the engine break-in period. However, use the standard plug. If the insulator tip shows a very light tan or white color or is actually pure white or if the electrodes show signs of melting, then a spark plug with a colder heat range is required.

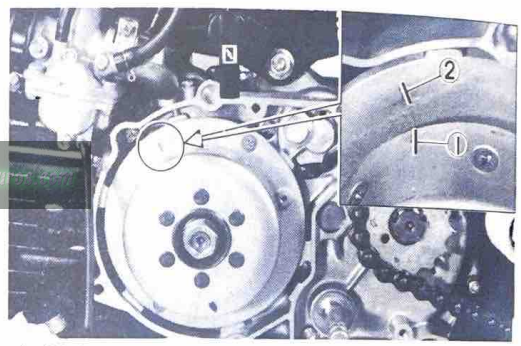
NOTE:

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

IGNITION TIMING

Checking

1. Ignition timing is checked with timing light by observing the position of the stationary pointer marked on the crankcase and the marks on the flywheel magneto.



1. Mark 2. Stationary pointer

2. Checking the ignition timing
Using a timing light, check to see that the stationary pointer and mark on the magneto flywheel, are aligned.
   a. Remove the crankcase cover (L).
   b. Connect the timing light to the spark plug lead wire.
   c. Start the engine and keep it running at the specified speed. Use a tachometer for checking.

d. While running the engine at the specified speed, check to see that the stationary pointer is aligned with the magneto mark. If the marks are out of alignment, check to see that the woodruff key is broken or flywheel assembly is out of alignment.

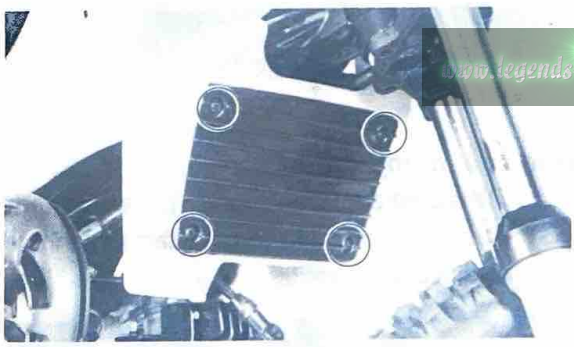
Ignition timing: 26.6°/4,000 r/min

AIR FILTER

Air filter service

The most critical aspect of routine maintenance on a racing machine is proper air filter maintenance. The air filter on a motocross must be serviced after every practice session and moto to ensure maximum engine performance and life. For convenience, many racers prepare two or three spare air filters ahead of time and simply switch filters between practices and motos. Follow these instructions to service foam air filters correctly:

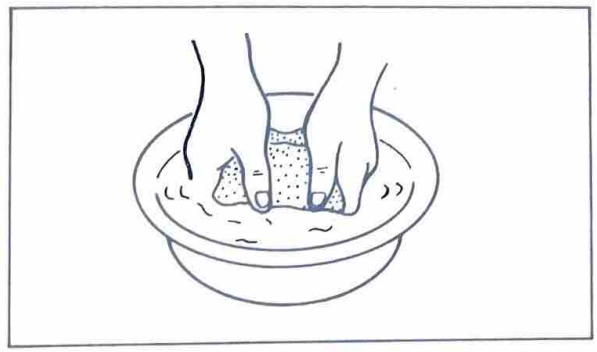
1. Remove the pan head screws from the filter case.



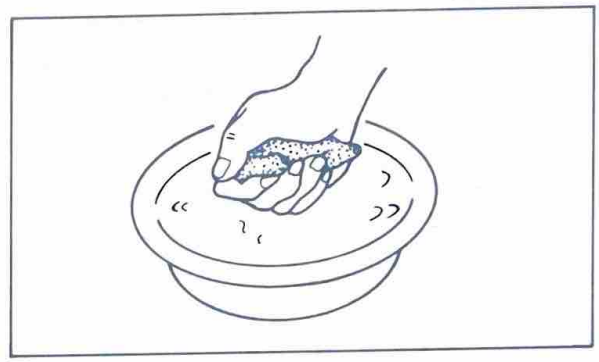
2. Pull out element and guide.

1. Guide 2. Air filter element

3. Using uncontaminated cleaning solvent, thoroughly wash the filter element; wash it gently to avoid damage.



4. Squeeze the solvent from the filter element.

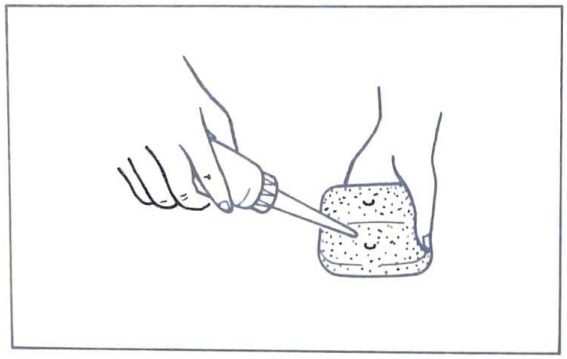


CAUTION:

Do not twist or wring the filter element, as it can easily be torn or otherwise damaged.

5. Using liquid dishwashing detergent and water, again wash the air filter element. Rinse the element with water, squeeze it, and allow the element to dry completely.

6. Pour a liberal amount of high-quality, foam-air-filter oil into a plastic bag. Put the filter element in the bag and thoroughly work the oil into the element.



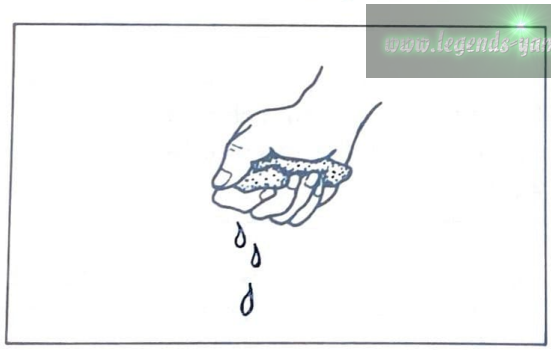
Recommended oil: Foam-air-filter oil

If for any reason you should use another type, air cooled 2-stroke engine oil.

CAUTION:

Never use motor oil on a foam air filter element. Motor oil will not remain suspended in the filter element.

7. Remove the filter element from the plastic bag and squeeze out the excess oil. Again, avoid twisting or wringing the air filter element. The element should be damp, but not dripping, with oil.



8. Reinstall the filter in the machine, and make sure the sealing surface of the filter is seated properly. Complete reassembly of the machine, and check all the fittings for tightness.

NOTE:

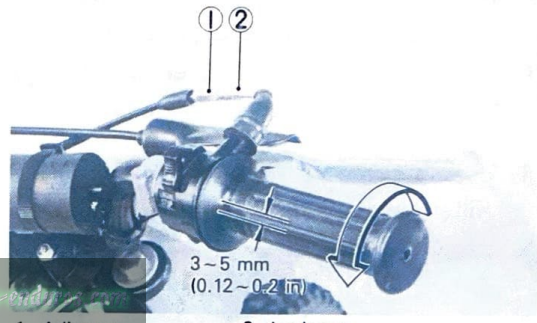
Each time filter element maintenance is performed, check the air inlet to the filter case for obstructions. Check the air cleaner joint rubber to the carburetor and manifold fittings for an air-tight seal. Tighten all fittings thoroughly to avoid the possibility of unfiltered air entering the engine.

CAUTION:

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

Throttle cable adjustment

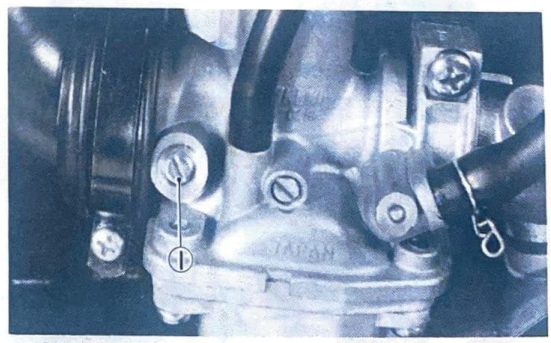
Check play in turning direction of throttle grip. The play should be 3 ~ 5 mm (0.12 ~ 0.2 in) at grip flange, loosen the lock nut and turn the wire adjuster to make the necessary adjustment. Tighten the lock nut.



1. Adjuster 2. Lock nut

Idle speed adjustments

1. Turn pilot air screw in until lightly seated.
2. Back out 1 and 1/2 turns. Start the engine and warm it up.



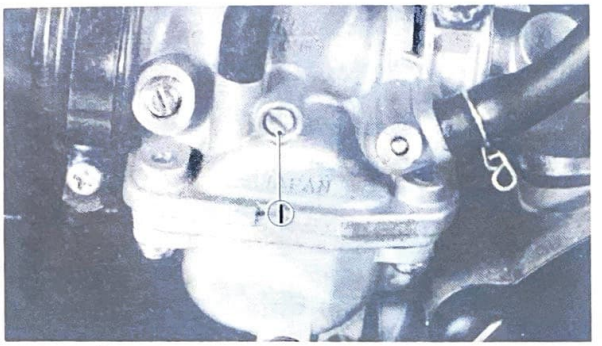
1. Pilot air screw

Pilot air screw:
Back out 1 and 1/2 turns.

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

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

Idle speed:
As desired (S.T.D. 1,700 r/min)



1. Throttle stop screw

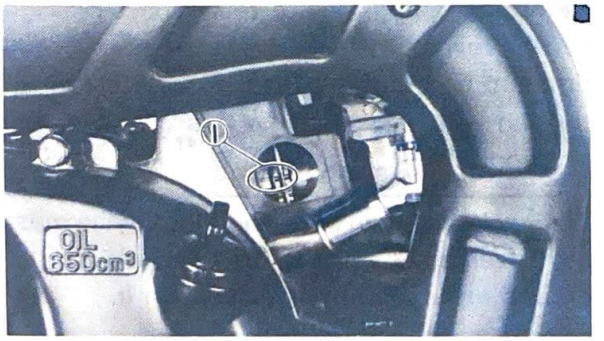
If the engine, when warm, hesitates after adjusting as described, turn the idle air mixture screw in or out in 1/4 turn increments until the problem is eliminate.

NOTE:

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

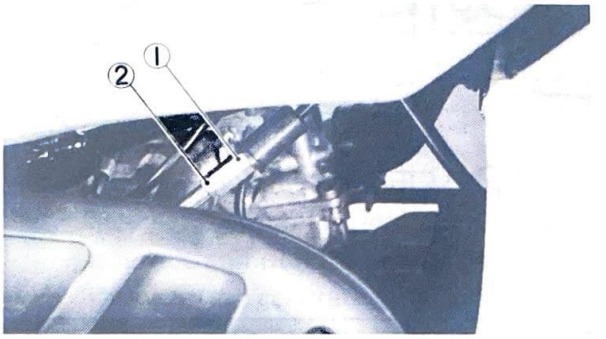
Autolube pump

1. Cable adjustment
   a. Remove the grommet from the oil pump cover.
   b. Adjust throttle cable 2 that it has a play of 1 mm (0.04 in) on the carburetor side. If it is impossible to produce a play of 1 mm (0.04 in), loosen the lock nut and make the necessary adjustment by turning the adjuster.
   c. While keeping a play of 1 mm (0.04 in) on the carburetor side, bring the match mark on the oil pump to align.



1. Set position

   d. If the match mark is not alighned, loosen the pump cable lock nut and adjust by turning the adjuster.

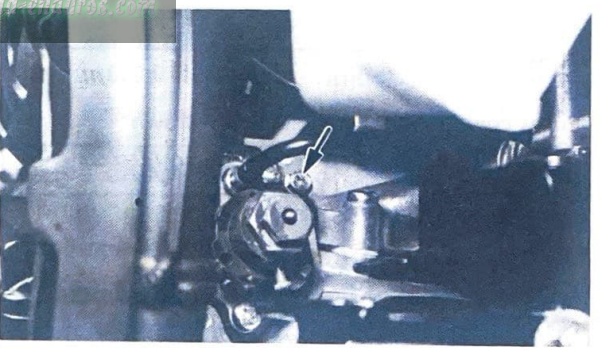


1. Adjuster 2. Lock nut

NOTE:

After adjusting, be sure to tighten the lock nut completely.

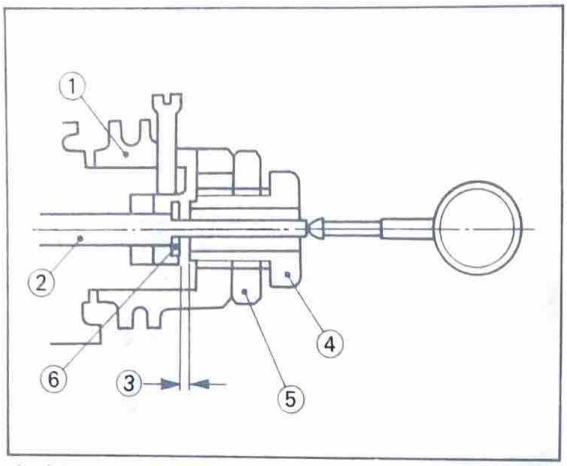
2. Air bleeding
   The oil pump just be bled after the oil pipe or oil pump is reinstalled.
   a. Remove the oil pump comer.
   b. Remove the bleeder bolt.
   c. When the bleeder bolt is removed, oil containing air bubbles flows out. Let the oil flow out until air bubbles completely disappear, and reinstall the bleeder bolt.



NOTE:

- Place a rag or oil can under the engine.
- Add the Autolube oil to the oil tank before bleeding.
- Thoroughly clean the engine exterior of oil.

3. Minimum plunger stroke adjustment
   a. Set the dial gauge as illustrated, and check to see if the plunger stroke is correct while keeping the engine idling.



1. Adjust pulley
2. Plunger
3. Min. stroke
4. Adjusting bolt
5. Lock nut
6. Adjusting plate

b. To adjust the plunger stroke, first loosen the lock nut.

c. Turn the adjusting bolt in or out for proper adjustment.
Turning the adjusting bolt clockwise decreases the plunger stroke; while turning counterclockwise increases the plunger stroke.

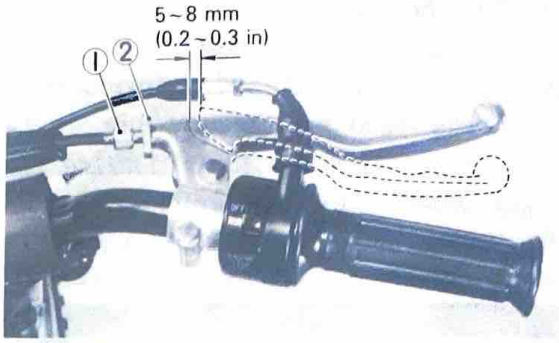
d. When the correct stroke is attained, tighten the lock nut.

Minimum stroke	0.40 ~ 0.45 mm (0.016 ~ 0.018 in)
Maximum stroke	1.00 ~ 1.10 mm (0.039 ~ 0.043 in)
Pulley color code	Brown
Pulley adjust mark	

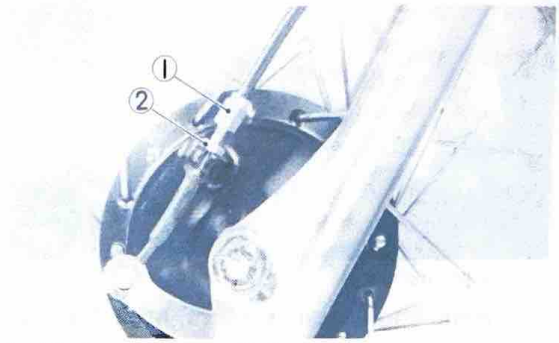
Front brake adjustment

Front brake cable free play can be adjusted to suit rider preference, but a minimum free play of 5 ~ 8 mm (0.2 ~ 0.3 in) should be maintained. Free play can be adjusted at handle bar lever and brake shoe plate.

1. Loosen the adjuster lock nut on the brake lever holder, fully turn the adjuster in.
2. Loosen the lock nut on the shoe plate and turn the adjuster in or out until proper adjustment is achieved.
3. Unless the shoe plate adjuster helps bring a proper play, turn to the lever holder adjuster.
4. Tighten the adjuster lock nut.



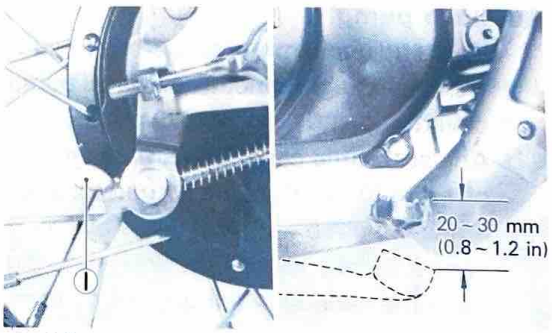
1. Adjuster
2. Lock nut



1. Adjuster
2. Lock nut

Rear brake adjustment

The rear brake should be adjusted so the end of the brake pedal moves 20 ~ 30 mm (0.8 ~ 1.2 in). To adjust, turn the adjuster on the brake rod clockwise to reduce play; turn the adjuster counterclockwise to reduce play; turn the adjuster counterclockwise to increase play.



1. Adjuster

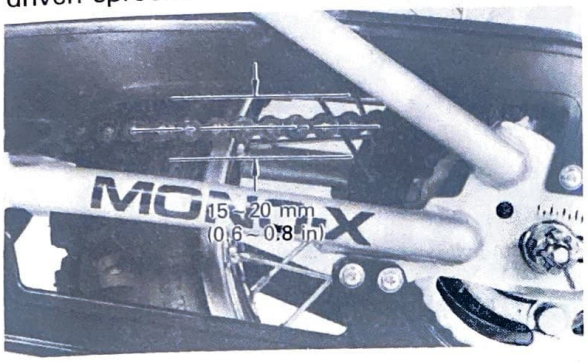
Checking the drive chain tension

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.

To check the chain play, the motorcycle must stand vertically with its both wheels on the ground and without passenger on it.

Then measure the play at the bottom of the chain at a point midway between the drive and driven sprockets.



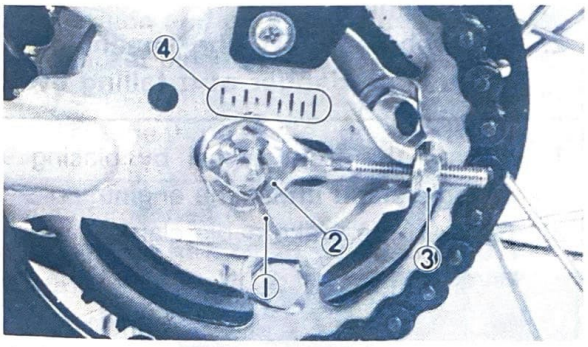
The normal vertical deflection is approximately 15 ~ 20 mm (0.6 ~ 0.8 in). If the chain deflection is not as specified, adjust the chain tension.

Drive chain tension adjustment

CAUTION:

Excessive chain tension will overload the engine and other vital parts; keep the tension within the specified limits.

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

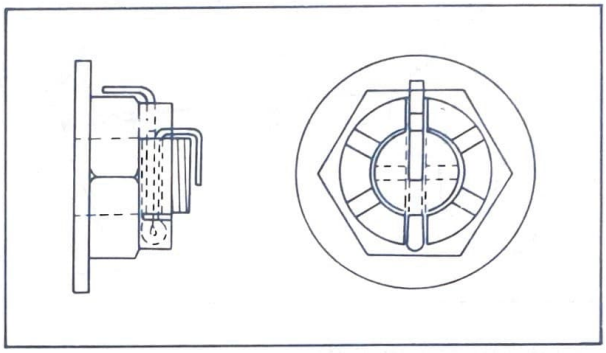


1. Cotter pin
2. Rear wheel axle nut
3. Adjusting nut
4. Marks for alignment

5. After adjusting, be sure to tighten the rear wheel axle nut. (If the nut notch and the cotter pin hole do not match, tighten the nut slightly tomatch.)

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

6. Also tighten the adjusting nuts against the rear arm (about 1/4 turn each).
7. Insert the cotter pin into the rear wheel axle nut and bend the cotter pin end as shown in the illustration. (If the nut notch and cotter pin hole do not match, tighten the nut slightly to match.)



WARNING:

Always use a new cotter pin on the axle nut.

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

Drive chain lubrication

The chain consists of many parts which work against each other. If the chain is not maintained properly, it will wear out rapidly. Form the habit of periodically servicing the chain. This service is especially necessary when driving in dusty conditions.

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

Tire air pressure

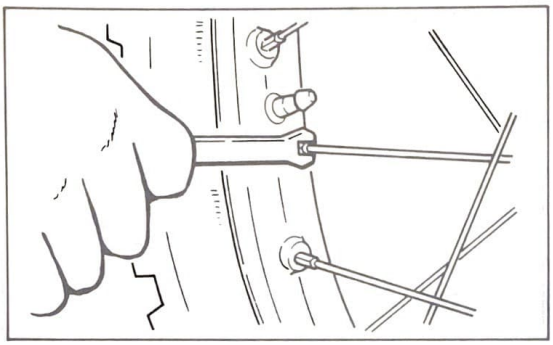
Improper tire pressure affects the smoothness of the tire, traction, handling and the life of the tires. Always maintain the correct tire pressure.

Tire pressure:

Front	98.1 kPa (1.0 kg/cm², 14 psi)
Rear	98.1 kPa (1.0 kg/cm², 14 psi)

Check the spokes

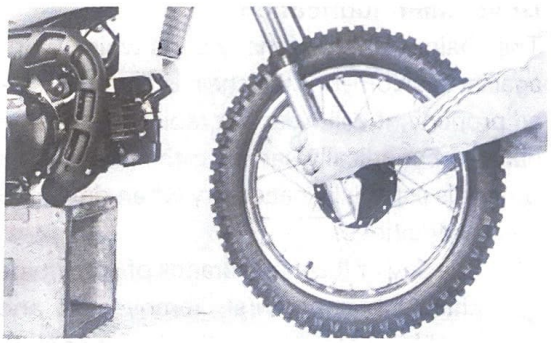
If they are loose or bent, tighten or replace them. The spokes should be checked before each use.



Steering inspection

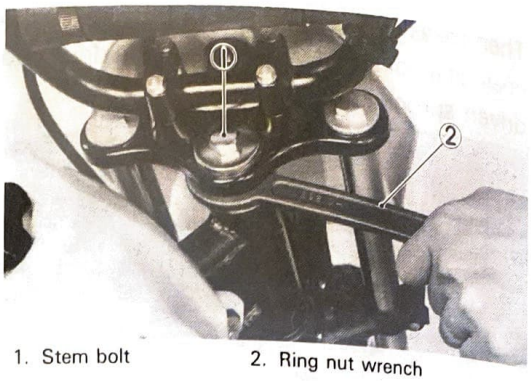
Periodically inspect the condition of the steering. Worn out or loose steering bearings may be dangerous.

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



Steering adjustment

1. To adjust, loosen the stem bolt.
2. Use the ring nut wrench to tighten the ring nut.



1. Stem bolt
2. Ring nut wrench

CAUTION:

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

3. Tighten stem bolt.

Tightening torque:
40 Nm (4.0 m·kg, 29 ft·lb)

NOTE:

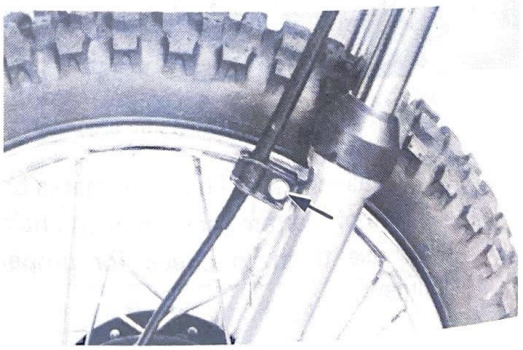
Steering head disassembly must be performed by a Yamaha dealer or other qualified mechanic.

Front fork oil change

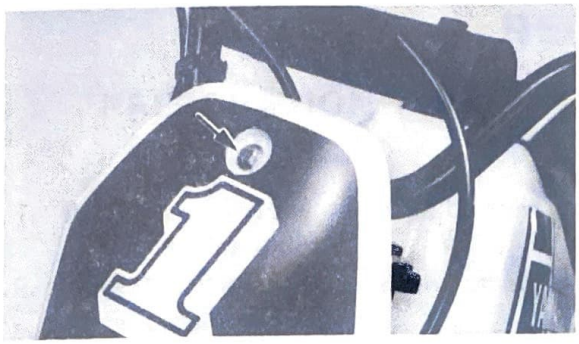
WARNING:

1. **Fork oil leakage can cause loss of stability and safe handling. Have any problem corrected before operating the machine.**
2. **Securely support the machine so there is no danger of it falling over.**

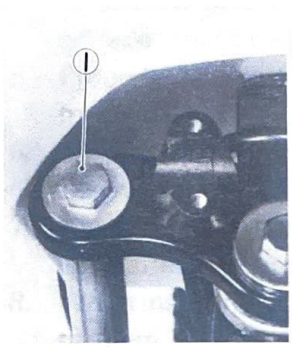
1. Elevate the front wheel by placing a suitable stand under the engine.
2. Remove the brake cable clamp.



3. Remove the bolt from the No. plate.



4. Remove the handlebar.
5. Remove the cap bolts from the inner tubes.
6. Loosen the pinch bolts.



1. Cap bolt

1. Pinch bolt

7. Remove the cotter pin from the front wheel axle and remove the axle nut.
8. Remove the front wheel axle and front forks.
9. Drain the oil from fork.
10. Installing the front forks on the frame.
    Bring up the front forks to the correct position and partially tighten the under-bracket pinch bolt.
    Pour specified amount of oil into the inner tube through the upper end opening.

Recommended oil: Yamaha fork oil 20 wt or SAE 20W motor oil Capacity per leg: 60 cm^3 (2.1 Imp oz, 20 US oz)

Pinch bolt torque: 33 Nm (3.3 m · kg, 24 ft · lb)

NOTE:

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

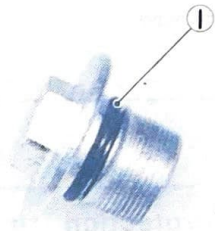
11. After filling, slowly pump the outer tubes up and down to distribute the oil.

NOTE:

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

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

Fork cap bolt torque: 40 Nm (4.0 m · kg, 29 ft · lb)



1. O-ring

Rear shock absorber (monocross suspension "De Carbon" system)

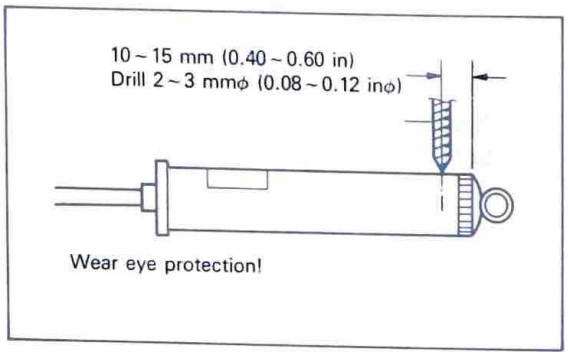
WARNING:

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

1. **Do not tamper with or attempt to open the cylinder assembly. Injury may result.**
2. **Do not subject shock absorber to an open flame or other high heat. This may cause the unit to explode due to excessive gas pressure.**

3. **Do not deform or damage the cylinder in any way. Cylinder damage will result in poor damping performance.**
4. **Handle it with great care, for a score or scratch in the piston rod sliding portion will cause oil leakage.**

Notes on disposal (Yamaha dealers only)
Gas pressure must be released before disposal of shock absorber. To do so, drill a 2 ~ 3 mm (0.08 ~ 0.12 in) hole through the cylinder wall at a point 10 ~ 15 mm (0.4 ~ 0.6 in) above the bottom of the cylinder.



CAUTION:

Wear eye protection to prevent eye damage from escaping gas and/or metal chips.

WARNING:

To dispose of a damage or wornout shock absorber, take the unit to a Yamaha dealer or other qualified mechanic for this disposal procedure.

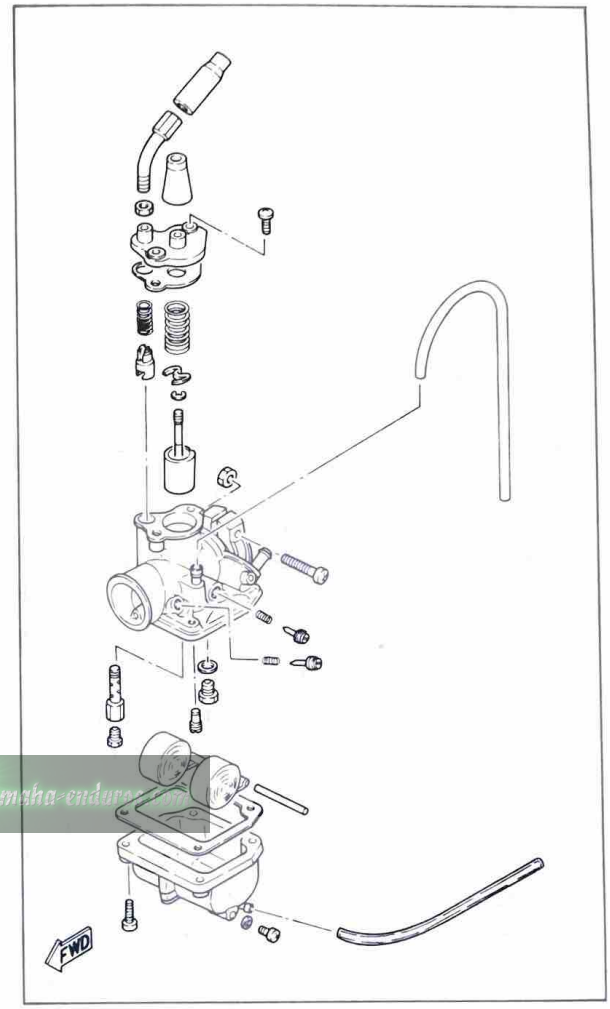
MAINTENANCE AND MINOR REPAIRS

PREPARATION FOR SERVICE

1. Before servicing the machine, be sure to clean machine exteriors.
2. Place the removed parts, always on a tray in the order of removal.
3. When replacing parts, always use genuine Yamaha parts to maintain better performance, durability and safety.
4. All gaskets and seals should be replaced when an engine is overhauled. All gasket surfaces must be cleaned.
5. Properly oil all mating engine and transmission parts during assembly.
6. All circlips should be inspected before assembly. Replace distorted circlips.
7. Always replace cotter pins and piston pin clips after one use.
8. When installing parts, apply grease or oil to them, as required, and following the torque chart. (Refer to "Maintenance and Lubrication Schedule Chart.")
9. For assembly, reverse the procedure for removal.

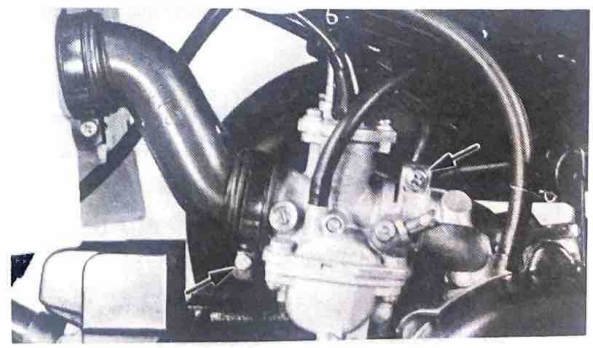
ENGINE

CARBURETOR

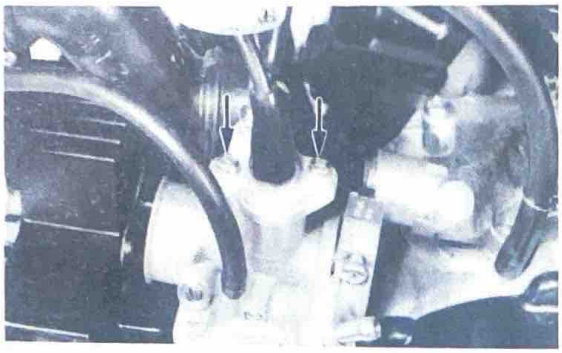


Replacement of main jet

1. Turn fuel cock lever to the "OFF".
2. Disconnect the fuel hose and oil delivery pipe.
3. Loosen the pan head screw from the manifold and air cleaner joint screw.



4. Rotate the carburetor, remove the mixing chamber top, and carburetor assembly.



5. Remove the float chamber body and main jet.

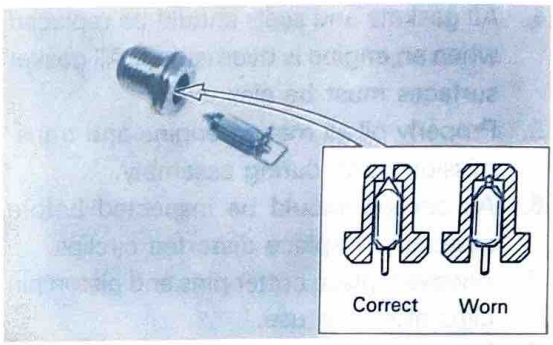
Standard main jet: #125

IMPORTANT:

The PW80K Carburetor has been set for normal sea level conditions. The standard setting is the result of extensive testing and does not usually require changing. However, under conditions of high atmospheric pressure or heavy load (deep sand or mud) the standard main jet should be replaced with another main jet. If the carburetor requires any other setting changes to suit local conditions of altitude, weather, etc., the change must be made with great care. Improper carburetor setting changes will cause poor engine performance and possible engine damage.
Please consult a Yamaha dealer or other qualified mechanic about any carburetor setting changes before actually going about them.

Inspection

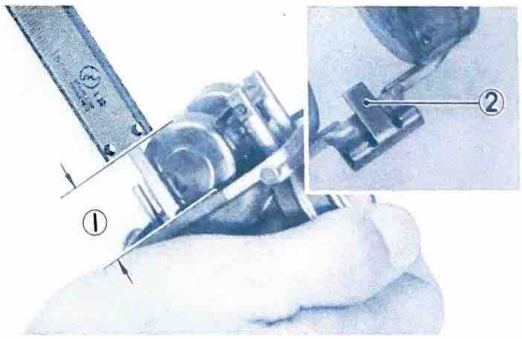
1. Examine carburetor body and fuel passages. If contaminated, wash carburetor in petroleum based solvent. Do not use caustic carburetor cleaning solutions. Blow out all passages and jets with compressed air.
2. Examine condition of floats. If floats are leaking or damaged, they should be replaced.
3.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



Adjustment

1. Float height
   a. Checking
      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) and carburetor to the top of the float arm using a gauge.

Float height:
23.0 ± 1 mm (0.91 ± 0.039 in)
Level with carburetor base



1. Float height 2. Tang

b. Adjustment

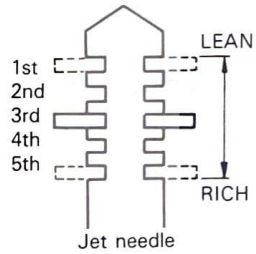
CAUTION:

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

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

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

Jet needle type: 3E3-3
Clip position: No. 3 Groove



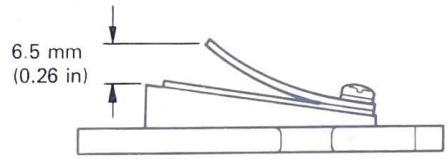
REED VALVE

Inspection

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

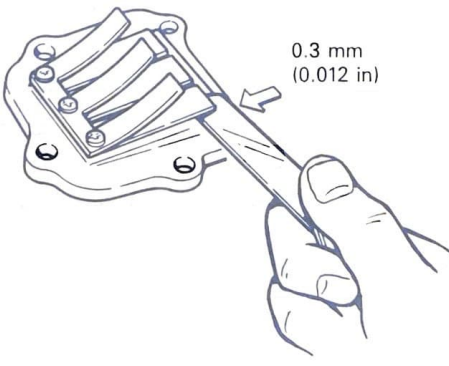
Standard valve "a": 6.5 mm (0.26 in)

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



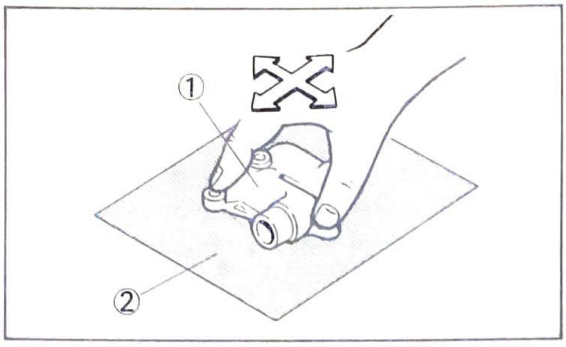
4. Check reed valve for bending. If beyond tolerance, replace reed valve.

Reed valve bending limit:
0.3 mm (0.012 in) orless



5. Manifold:
Check the distortion of manifold surface. If the distortion is out of limit, resurface it on the #600 wet. sandpaper.

Distortion limit: 0.1 mm (0.004 in)



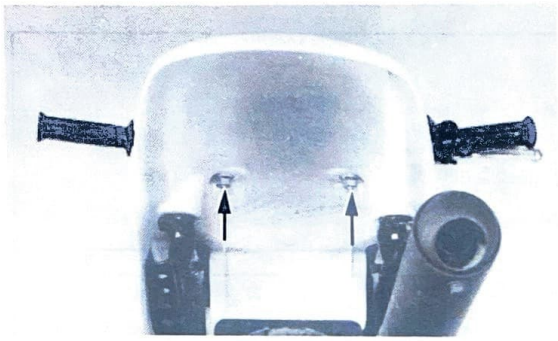
1. Manifold 2. Standpaper (#600)

MUFFLER

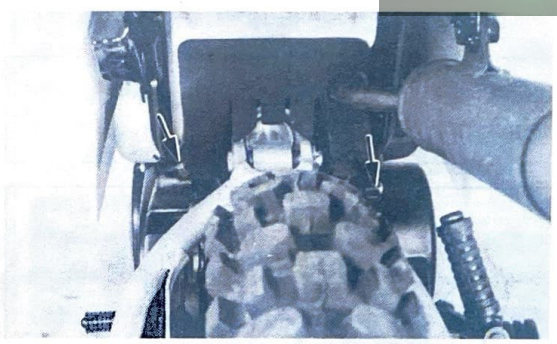
With the carburetor removed, proceed as follows:

Removal

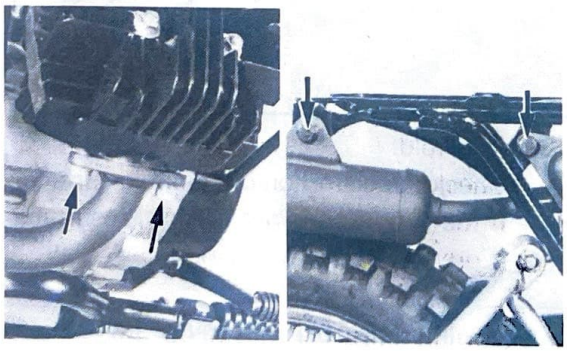
1. Remove the two nuts and remove seat.



2. Remove the three bolts from the side cover assembly and two bands.



3. Remove the bolts holding muffler to cylinder and remove the muffler mounting bolts.



Maintenance

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

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.

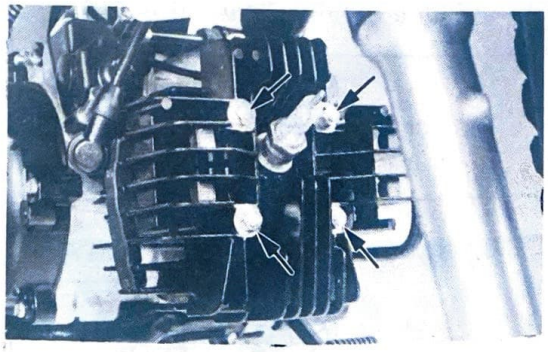
TOP END

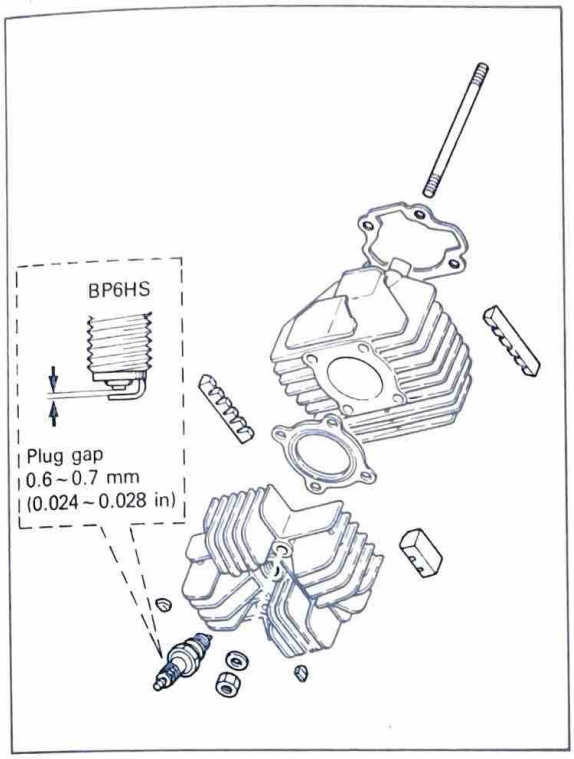
Removal

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

NOTE:

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

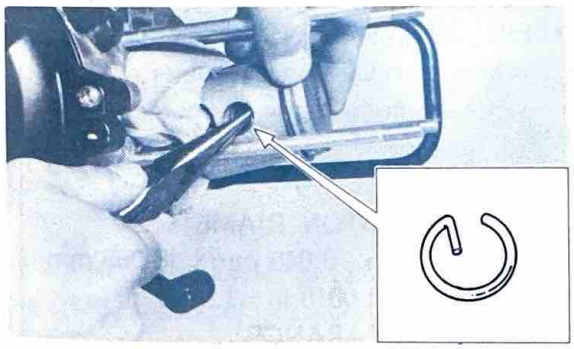


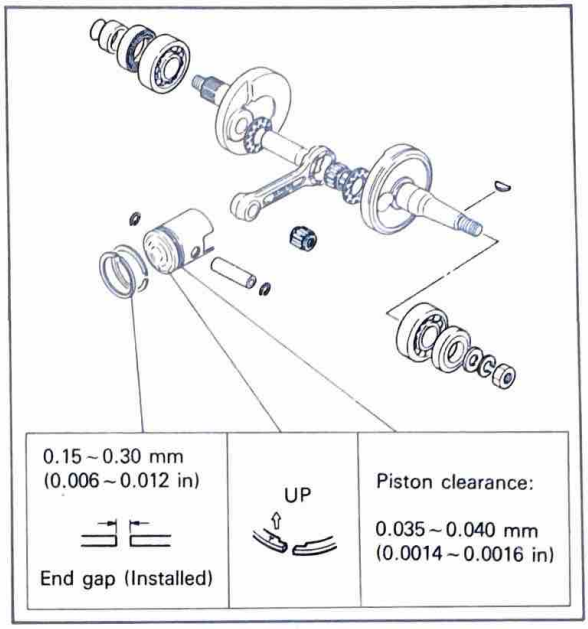


3. With the piston at top dead center, rise the cylinder until the cylinder skirts clear crankcase. Stuff a clean shop rag into crankcase cavity, around rod, to prevent dirt and other foreign particles from entering. Remove cylinder.
4. Remove the piston pin clip from the piston. Push the piston pin 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.

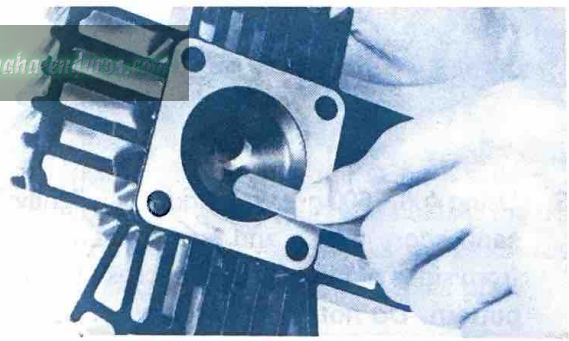




Maintenance

Cylinder head

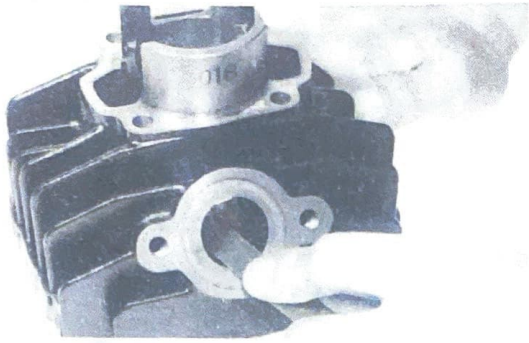
1. Remove spark plug.
2. Using a rounded scraper, remove carbon deposits from combustion chamber. Take care to avoid damaging the spark plug threads. Do not use a sharp instrument. Avoid scratching the metal surface.



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

Cylinder

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

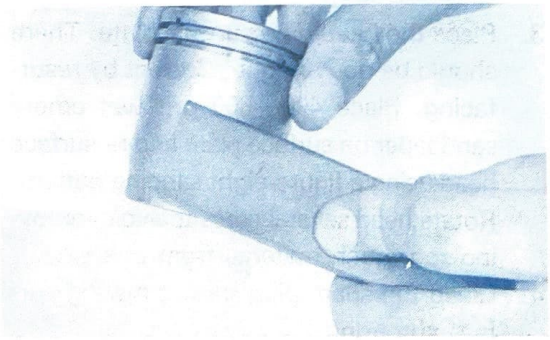


2. Check cylinder bore. Using a cylinder hone, remove any scoring. Hone lightly, using smooth stones. Hone no more than required to avoid excess piston clearance.

Piston

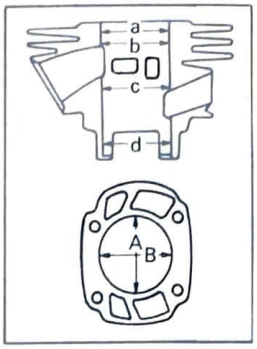
1. Using a rounded scraper, remove carbon deposits from piston crown.
2. Break a used piston ring in two. File end square. De-burr edges to avoid scratching ring groove and clean carbon deposits from ring grooves.

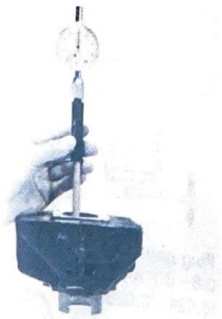
3. Using 400 ~ 600 grit wet sandpaper, lightly sand score marks and lacquer deposits from sides of piston. Sand in cross-hatch pattern. Do not sand excessively.



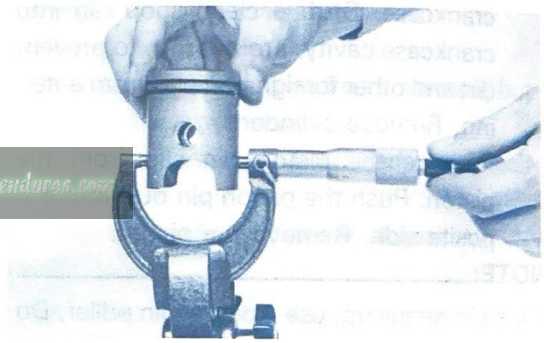
Piston clearance

1. Cylinder bore measurement
   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.





2. Piston outside diameter measurement
   Using an outside micrometer, measure piston diameter. The measuring point is at right-angles to the piston pin holes, about 5 mm (0.2 in) from the bottom of the piston skirts.
3. Make a correct calculation of the piston clearance using the following formula.



- ACTUAL PISTON DIAMETER
  = Measurement + 0.040 mm (0.0016 in)
- PISTON CLEARANCE
  = Minimum Cylinder Diameter
  − Maximum Piston Diameter

EXAMPLE:
ACTUAL PISTON DIAMETER
= 46.925 mm + 0.040 mm = 46.965 mm
(1.8474 in + 0.0016 in = 1.8490 in)
PISTON CLEARANCE
= 47.000 mm − 46.965 mm = 0.035 mm
(1.8504 in − 1.8490 in = 0.0014 in)

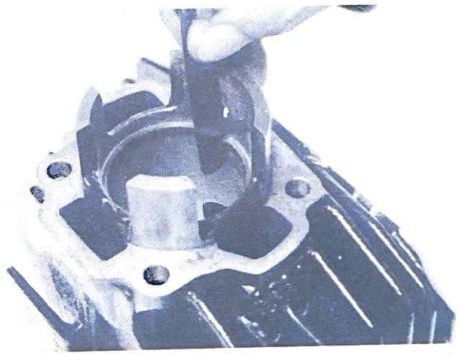
Norminal piston clearance
0035 ~ 0.040 mm (0.0014 ~ 0.0016 in)

If beyond tolerance replace piston or rebore cylinder as required.

Piston rings

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

Ring end gap installed (top and 2nd):
0.15 ~ 0.30 mm (0.006 ~ 0.012 in)



3. With rings installed in grooves, insert feeler gauge between ring and groove. If beyond tolerance, replace ring and/or piston as required.

Ring groove clearance:
0.02 mm (0.0008 in)

4. 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.
5. 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.

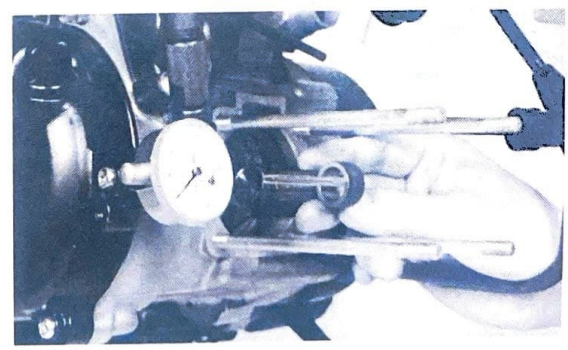
NOTE:

New rings require break-in. Follow first portion of new machine break-in procedure.

Piston pin bearing and connecting rod

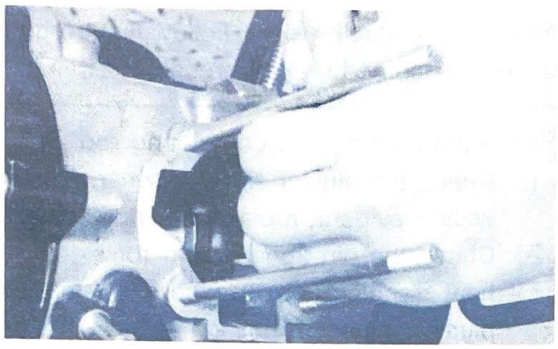
1. Check the pin for signs of wear. If any wear is evident, replace pin and bearing.
2. Check the pin and bearing for signs of heat discoloration. If excessive (heavily blued), replace both.
3. Check the bearing cage for excessive wear. Check the rollers for signs of flat spots. If found, replace pin and bearing.
4. Apply a light film of oil to pin and bearing surfaces. Install in connecting rod small end. Check for play. There should be no noticeable vertical play. If play exists, check connecting rod small end diameter for wear. Replace pin and bearing or all as required.
5. Mount the dial gauge at right angles to connecting rod small end holding the bottom of rod toward the dial indicator, rock top of rod and measure axial play.

Connecting rod axial play:
1.0 mm (0.04 in)

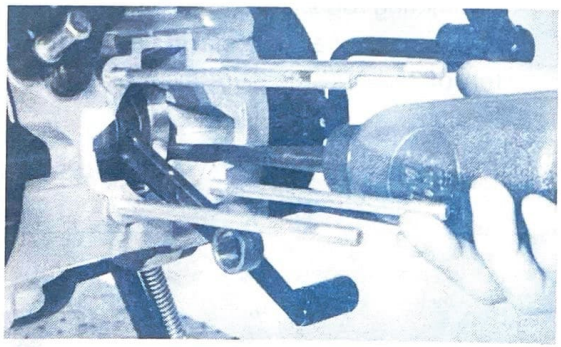


6. Remove the dial gauge and slide the connecting rod to one side. Insert a feeler gauge between the side of the connecting rod big end and the crank wheel. Measure clearance.

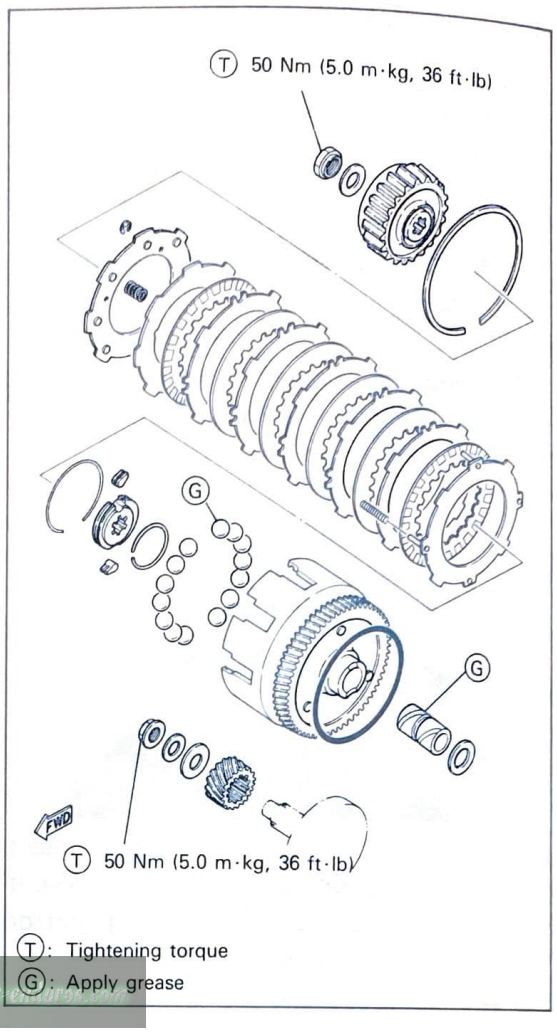
Connecting rod/crank side clearance:
0.3 ~ 0.8 mm (0.012 ~ 0.031 in)



7. If any of the above measurements exceed tolerance, crankshaft repair is required. Take the machine to your authorized dealer.
8. During reassembly apply a liberal coating of two-stroke oil to the piston pin and bearing. Apply several drops of oil to the connecting rod big end. Apply several drops of oil into each crankshaft bearings oil delivery hole.



CLUTCH



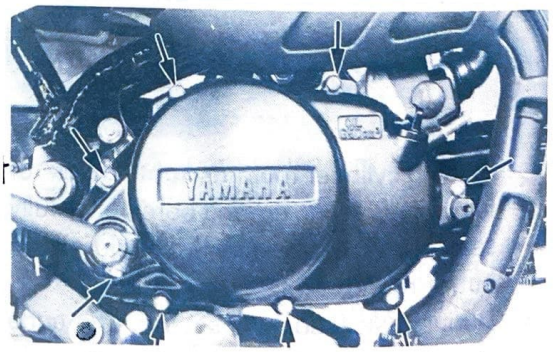
T: Tightening torque
G: Apply grease

Removal

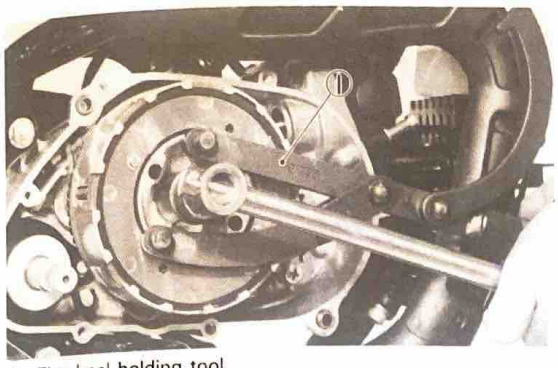
1. Remove the kick starter.
2. Remove the pan head screws holding the case cover in place and remove the cover. Note the position of the dowel pins.

NOTE:

Drain transmission oil before removing cover.

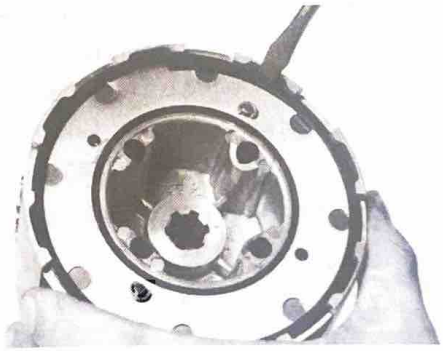


3. Using the flywheel holding tool, remove the clutch securing nut and lock washer. Remove the clutch boss and driven gear (clutch housing).



1. Flywheel holding tool

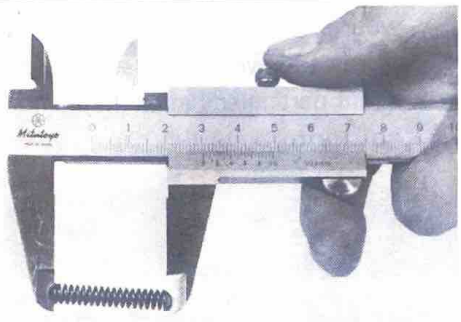
4. Remove the circlip, pressure plate, clutch plates, friction plates, one-way clutch, and clutch boss from the clutch housing.



Inspection

1. Measure each clutch spring and off spring. If beyond tolerance, replace.

	New	Minimum
OFF spring free length	30.5 mm (1.20 in)	28.5 mm (1.12 in)
Clutch spring free length	12.9 mm (0.51 in)	11.9 mm (0.47 in)



2. Check the plates for signs of warpage and heat damage, replace as required.
3. Measure the friction plates at there or four points. If their minimum thickness exceeds tolerance, replace.

	New	Wear limit
Friction plate thickness	3.0 mm (0.12 in)	2.9 mm (0.11 in)

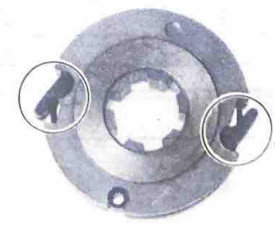
NOTE:

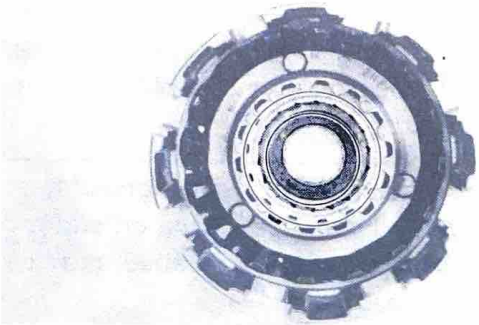
For optimum performance, if any plate requires replacement, it is advisable to replace the entire set.

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

Clutch plate warp allowance:
0.05 mm (0.002 in) maximum

5. Checking the ball
   Check balls for excessive wear or damage. If such wear is found, replace balls.
6. Checking the ratchet mechanism
   Check for damage or wear on each pawl and dog. If damaged or worn to excess, replace it. Check the pawl-spring for damage and tension. If damaged or fatigued to excess, replace it.

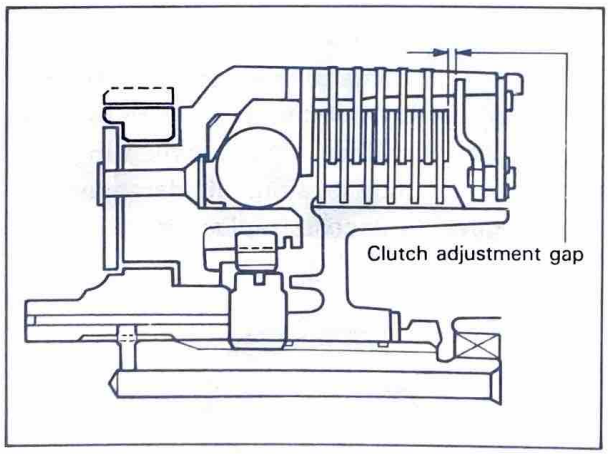


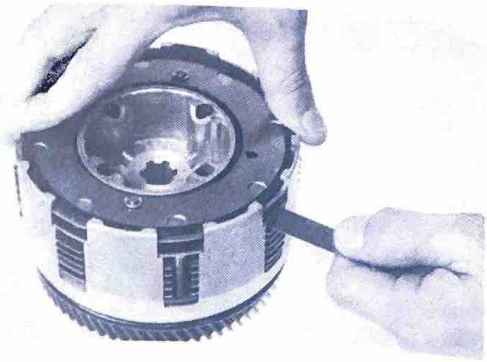


7. Measure the gap between the friction plate and pressure plate with a thickness gauge.
   If the gap is found incorrect, it should be properly adjusted by changing the thickness of the clutch plate.

Thickness:
1.2, 1.4 or 1.6 mm
(0.047, 0.055, 0.063 in)

Clutch adjustment gap:
$1.8^{+0.15}_{-0.20}$ mm ($0.071^{+0.006}_{-0.008}$ in)

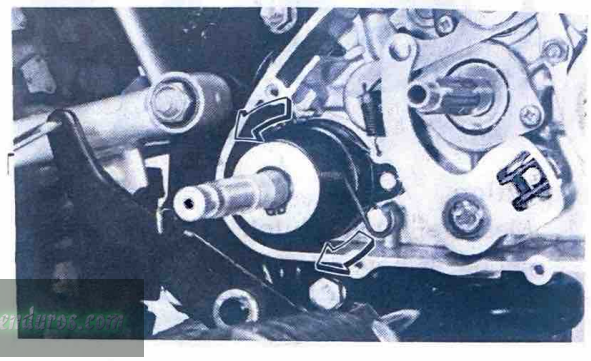




KICK STARTER

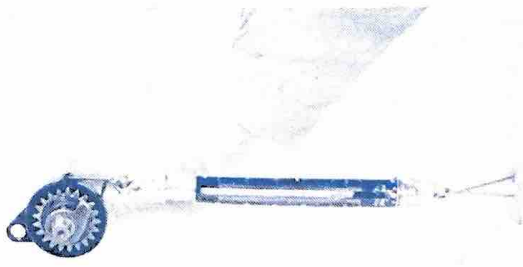
Removal

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



Inspection

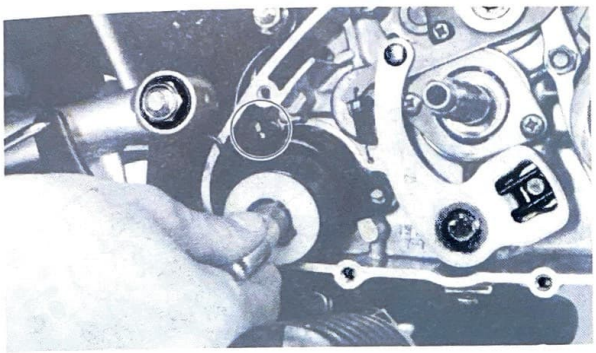
1. The pressure of the kick clip is 1.0 kg (2.2 lb).
   If above pressure is too strong, spring wear and kick starter slipping will result. If it is too weak, the same slippage will occur particularly at low temperatures. Do not try to bend the clip.



2. Check the clip for damage and wear, and determine whether or not, it should be replaced.

Reassembly

1. While keeping the kick stopper upwards, engage the kick axle return spring with the slot on the end of the kick axle.
   And hook the spring to the spring hook.
   Check whether the kick starter acts correctly and whether it returns to its home position.



2. After installing the kick assembly be sure to check wherethere it operates smoothly or not.

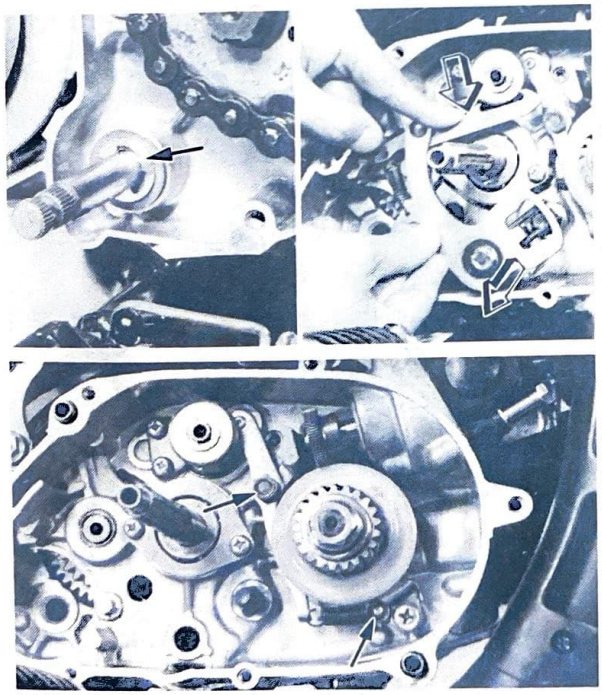
SHIFTER

NOTE:

Shifter maintenance should be performed with clutch assembly removed.

Removal

1. Remove the change lever assembly and stopper lever.

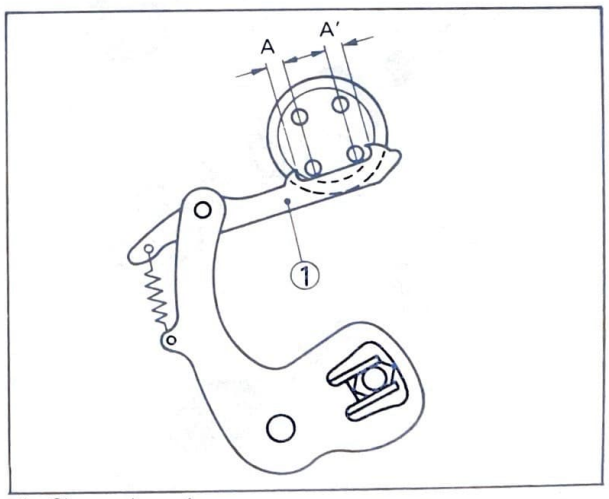


Inspection

1. Check the change shaft for bends.
   If bent excessively replace it.
2. Check the change lever and return spring for fatigue.
   If fatigued excessively, replace it.

3. Check the plate stopper for wear. If worn to excess, replace it.

4. After installation of the change shaft, check the clearances A and A' (between the prongs of shift lever 1 and shift drum pins) are equal.

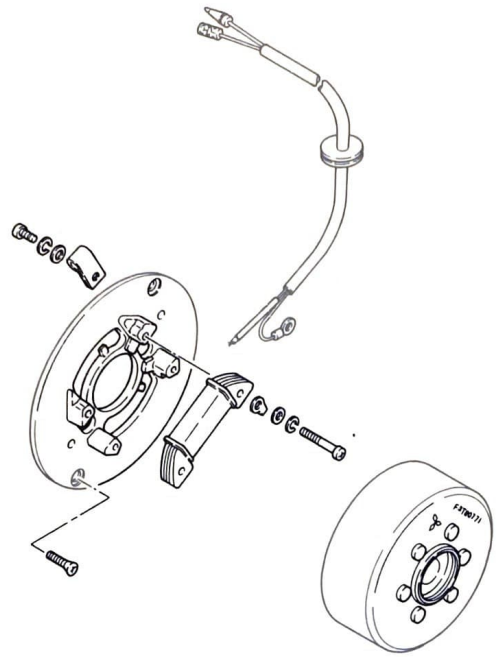


1. Change lever 1

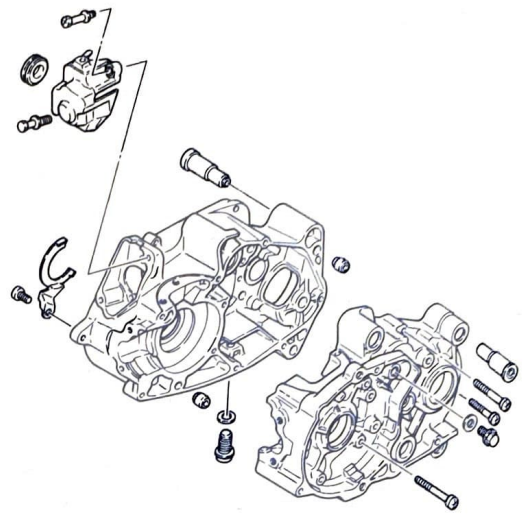
Installation

1. Before installation, grease the change shaft oil seal.
2. Be sure to install the stopper plate first, and then change shaft assembly.

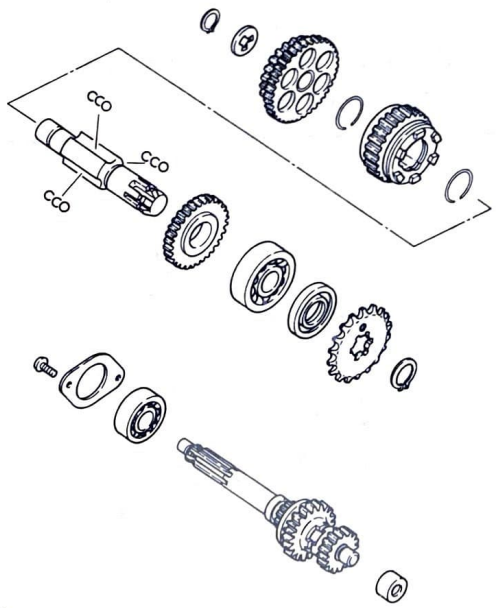
C.D.I MAGNETO



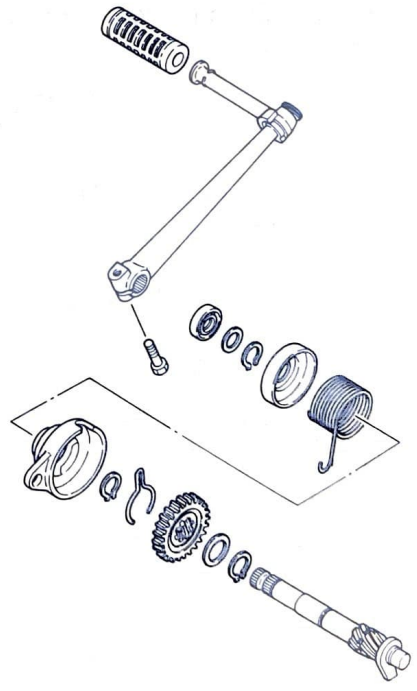
CRANKCASE



TRANSMISSION

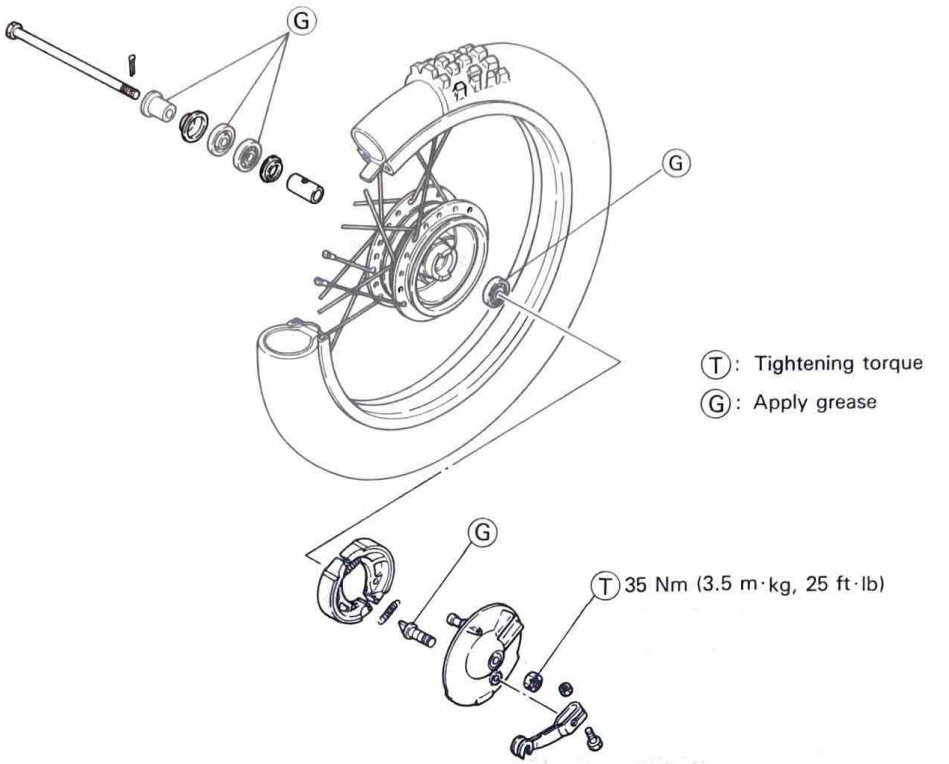


KICK STARTER

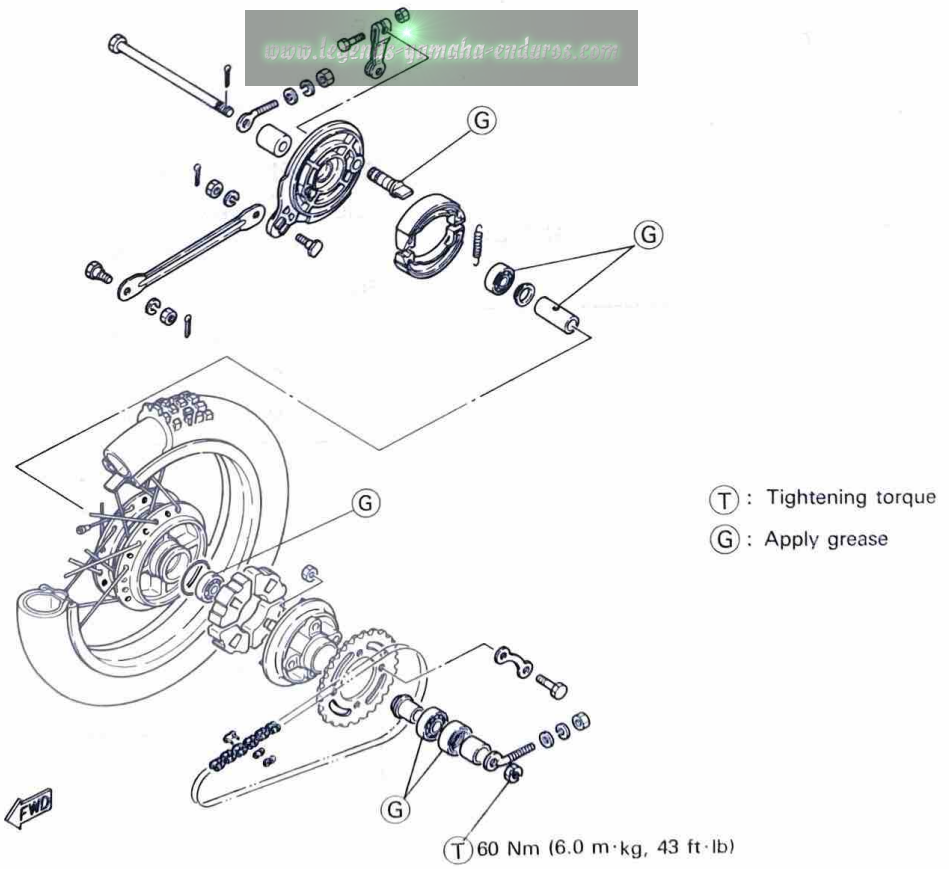


CHASSIS

FRONT WHEEL

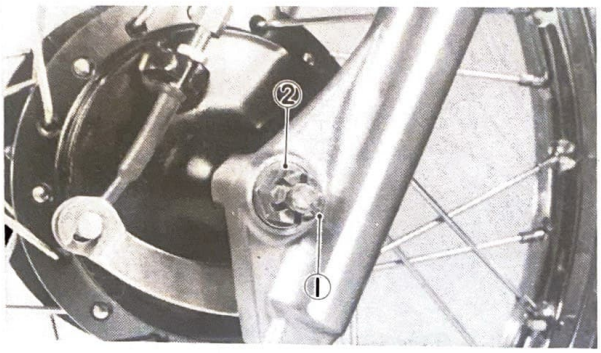


REAR WHEEL



Front wheel removal

1. Elevate the front wheel by placing a suitable stand under the engine.
2. Remove brake cable: Loosen all cable adjuster screws and remove cable from handle lever holder. Then remove cable from cam lever at front brake shoe plate.
3. Remove cotter pin from front wheel axle and remove axle nut.



4. Turn and pull out the front wheel axle; the wheel assembly can now be removed.

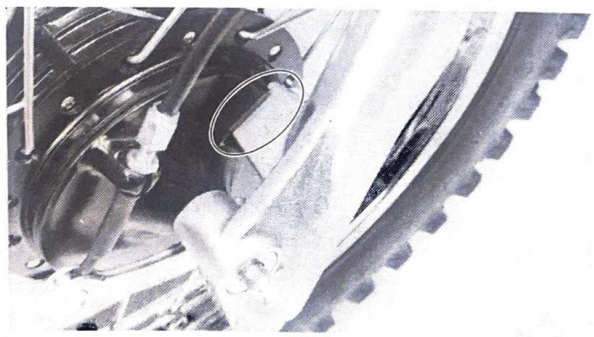
Front wheel installation

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

1. Check for proper engagement of the boss on the outer fork tube with the locating slot on the brake shoe plate.
2. Insert the new cotter pin into the front wheel axle nut.

WARNING:

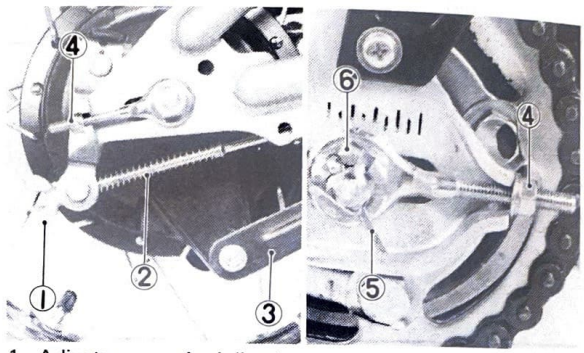
Always use a new cotter pin on the axle nut.



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

Rear wheel removal

1. Elevate the rear wheel by placing a suitable stand under the engine.
2. Remove the tension bar and the brake rod from the brake shoe plate. The tension bar can be removed by removing the cotter pin and nut from the tension bar bolt. The brake rod can be removed by removing the adjuster.
3. Disconnect the drive chain.
4. Loosen the chain tension adjusting nuts on both sides.
5. Remove the axle nut cotter pin and axle nut. Discard the old pin.



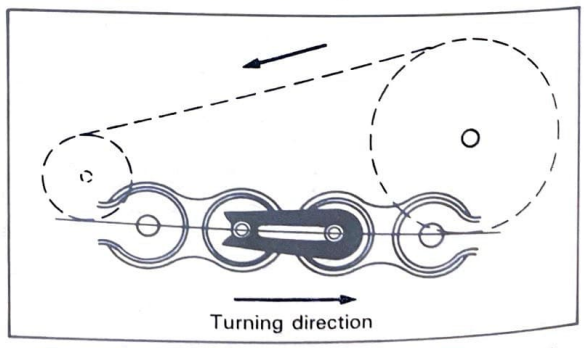
1. Adjuster
2. Brake rod
3. Tension bar
4. Adjusting nut
5. Cotter pin
6. Axle nut

6. The rear wheel assembly, the collar, the chain puller(s), etc., can be removed from the motorcycle by pulling the wheel axle.

Rear wheel installation

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

1. When connecting the chain, make certain closed end of master link clip is facing direction of rotation.



2. Be sure to adjust the tension of the chain. (Refer to "Drive chain tension adjustment".)

3. Insert the new cotter pin into the rear wheel axle nut.

WARNING:

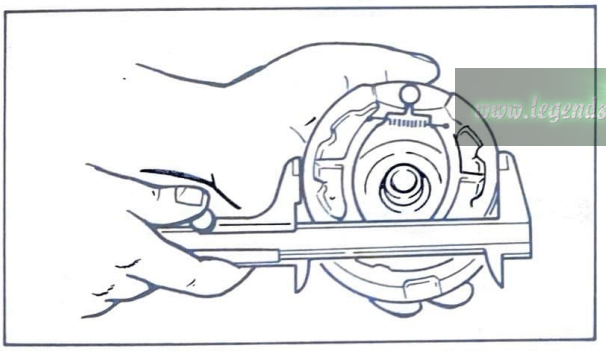
Always use a new cotter pin on the axle nut.

Axle nut torque:
60 Nm (6.0 m · kg, 43 ft · lb)

Brake shoe inspection

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

	Front	Rear
Brake shoe diameter	95 mm (3.74 in)	110 mm (4.33 in)
Replacement limit	93.5 mm (3.68 in)	108.5 mm (4.27 in)



Brake drum inspection

Check the inner surface of the brake drum and remove any scratches with emery cloth. Remove any oil with a cloth dipped in solvent. If damage is more extensive, have a Yamaha dealer or other qualified mechanic replace the wheel the hub.

Tire removal and tire repair

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

NOTE:

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

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

Inspection

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

CAUTION:

Always use a cloth to avoid cutting your hand.

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

Reassembly

1. Install one tire bead on the rim using tire irons and lubricant and then install the tube.
2. Inflate tube wire air to about one-third the specified pressure. Hit the outer circumference of the tire with a soft hammer to make certain the tube is not caught between tire and rim. Release air from tube.
3. Inspect rim band and replace if damaged.
4. Install second tire bead starting opposite the valve stem using the irons and tire mounting lubricant.
5. Inflate tire to approximately 294 kPa (3 kg/cm^2, 42 psi) and then reduce pressure to specified setting.

CAUTION:

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

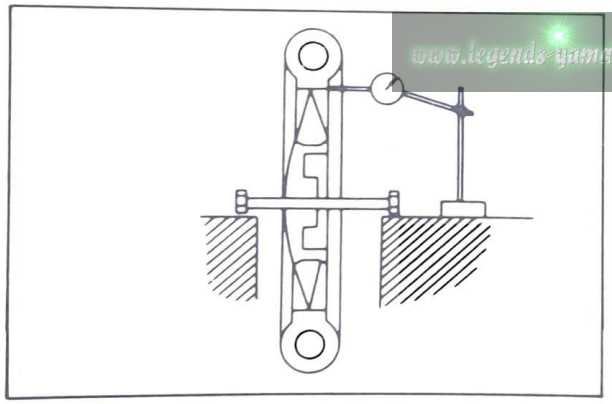
Replacing wheel bearings

If the bearings allow excessive play in the wheel or if it does not turn smoothly have your dealer replace the wheel bearings.

Checking rim

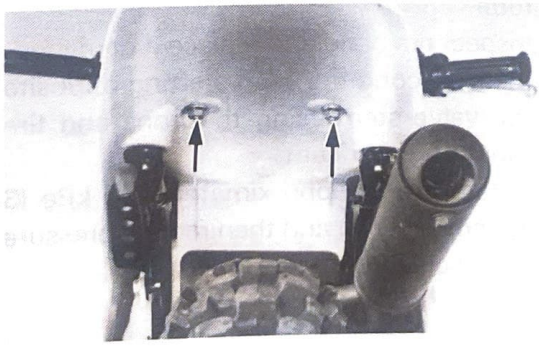
1. Check for cracks, bends or warpage of rim. If a rim is deformed or cracked, it must be replaced.
2. Check wheel run-out
   If deflection exceeds tolerance, check wheel bearing or replace wheel as required.

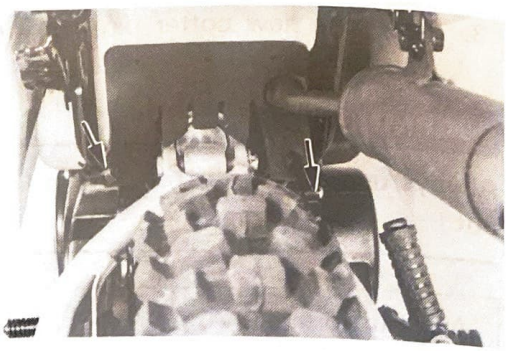
Rim run-out limits:
Vertical — 2.0 mm (0.08 in)
Lateral — 2.0 mm (0.08 in)



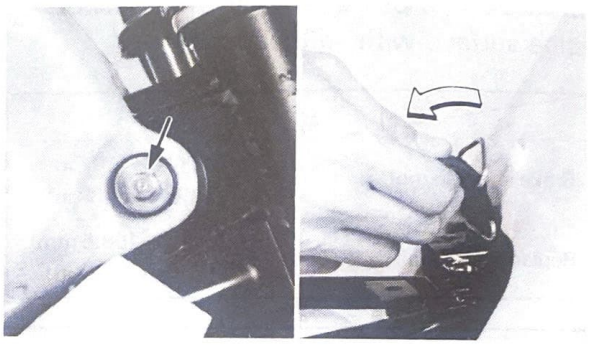
Rear shock absorber (Monocross suspension) Removal

1. Remove the seat and side cover assembly.

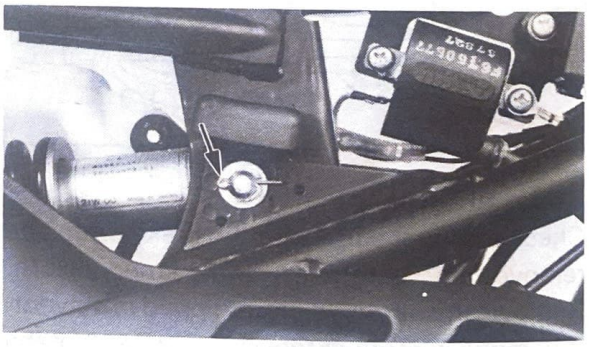




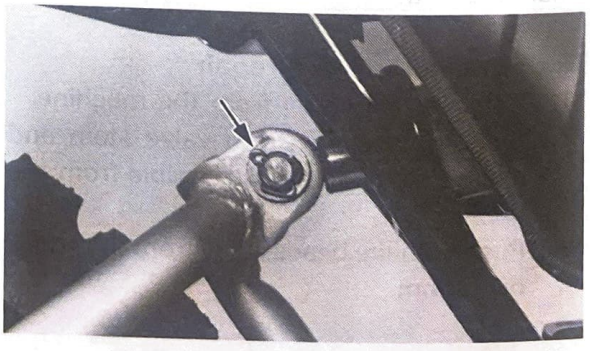
2. Turn the fuel cock to "OFF" and disconnect the fuel pipe.
3. Remove the securing bolt and holding band from fuel tank. Lift rear of the fuel tank up and pull back to clear frame mounts. Remove tank.



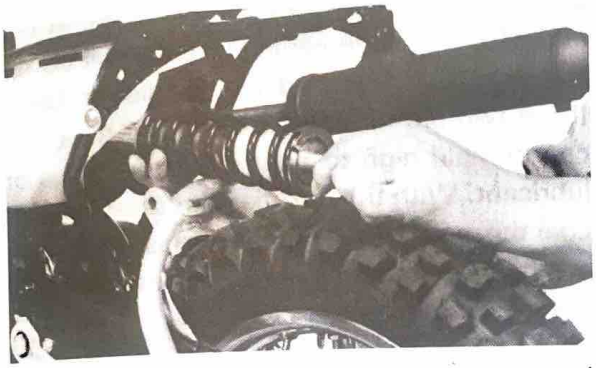
4. Elevate rear wheel by placing a suitable stand under the engine.
5. Remove the cotter pin. And remove the pin securing the upper bracket to frame.



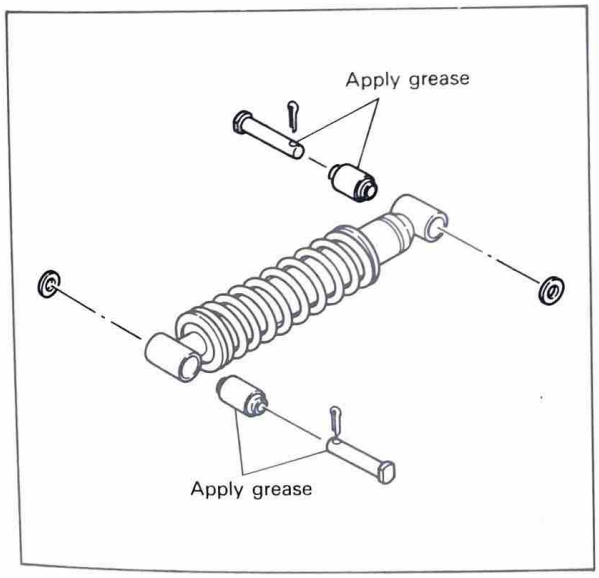
6. Remove the cotter pin and remove the pin from the lower bracket.



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



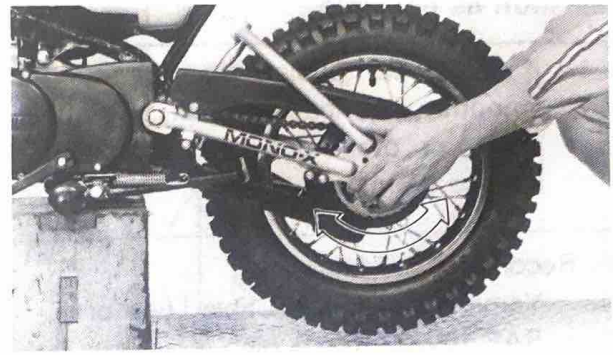
8. When reassembling, reverse the removal procedure taking care of the following points:
   a. Always use new cotter pins.
   b. Grease the pin and thrust cover lip.

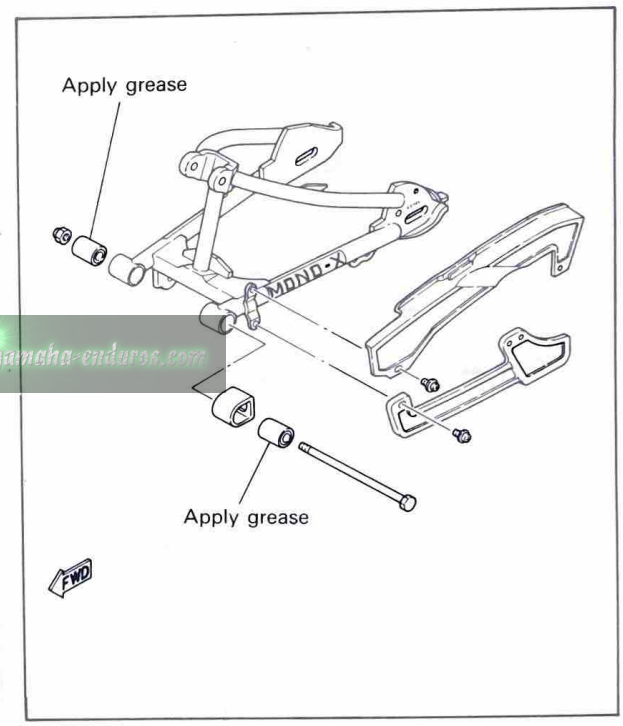


Swing arm inspection

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

Swing arm free play: 1.0 mm (0.040 in)





Lubrication of lever, pedals, etc.

1. Lubricate the pivoting parts of the brake lever with Yamaha Chain and Cable Lube or SAE 10W30 motor oil.
2. Lubricate the shaft of the brake pedal with lithium base grease.

Cable inspection and lubrication

CAUTION:

Damage to the outer housing of the various cables, may cause corrosion and often free movement will be obstructed. An unsafe condition may result so replace as soon as possible.

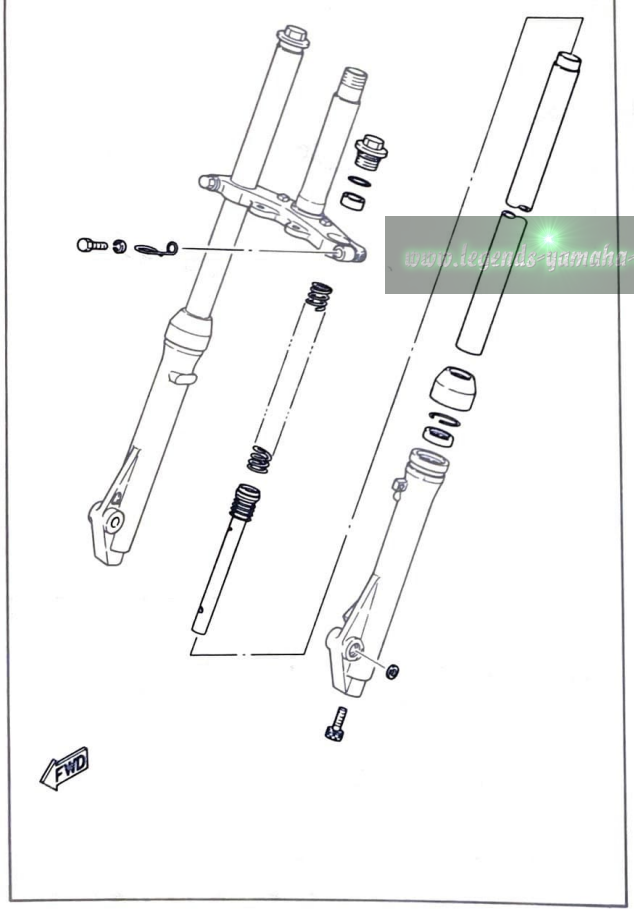
1. If the inner cables do not operate smoothly, lubricate or ask a Yamaha dealer or other qualified mechanic to replace them.

Recommended lubricant:
Yamaha Chain and Cable Lube or
SAE 10W30 motor oil

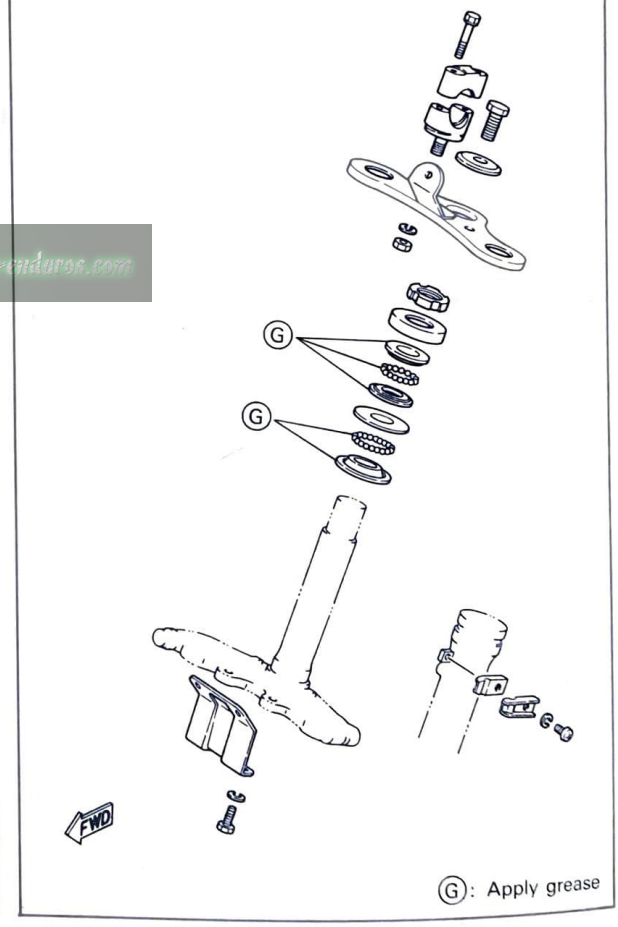
Throttle cable and grip lubrication

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

FRONT FORK



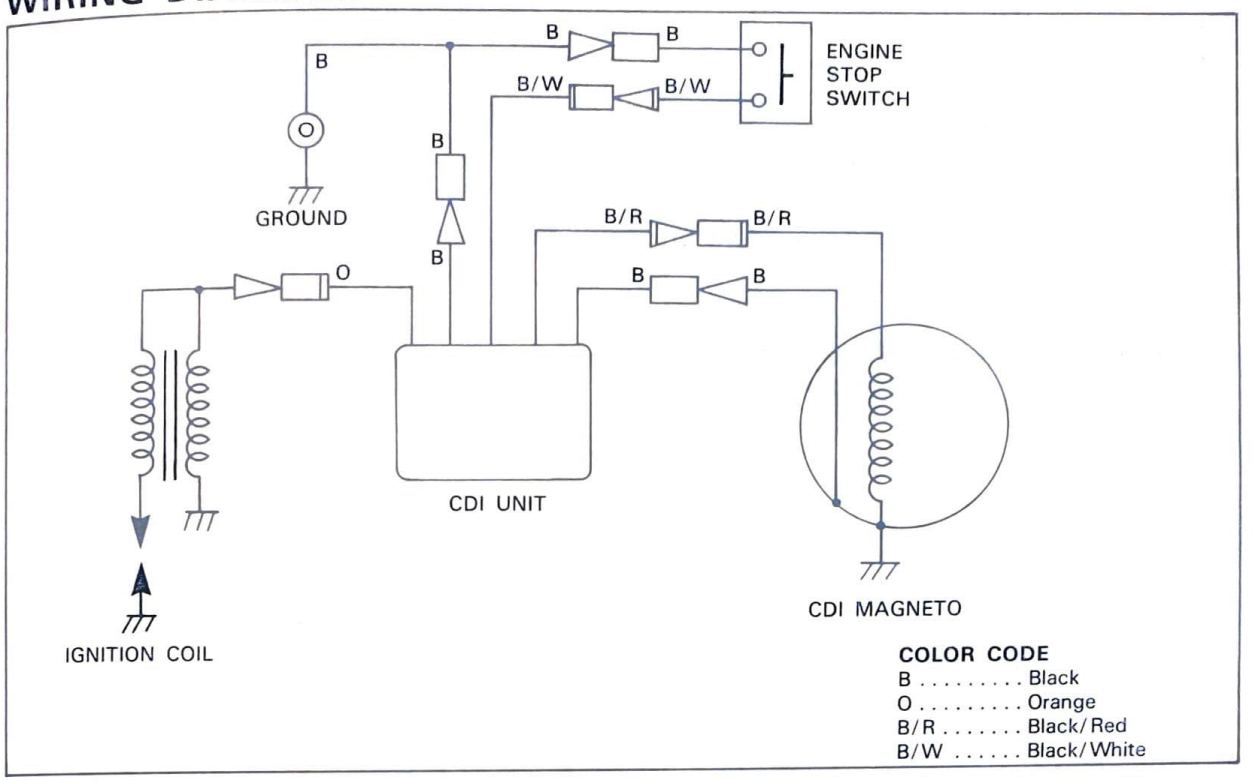
STEERING



G: Apply grease

MISCELLANEOUS

WIRING DIAGRAM



1. CDI CHECK-UP
   If engine malfunction is apparently attributable to the C.D.I. system, perform check ups as per following procefure and order.

Check spark plug → Faulty → Clean or replace
↓ Good
Check connector/wiring → Faulty → Correct
↓ Good
Check ignition coil (Measure primary/secondary winding resistance) → Faulty → Replace
↓ Good
Check magneto (Measure charge/signal coil resistance) → Faulty → Correct or replace
↓ Good
Check C.D.I. unit (Check continuity between terminals) → Faulty → Replace

NOTE:

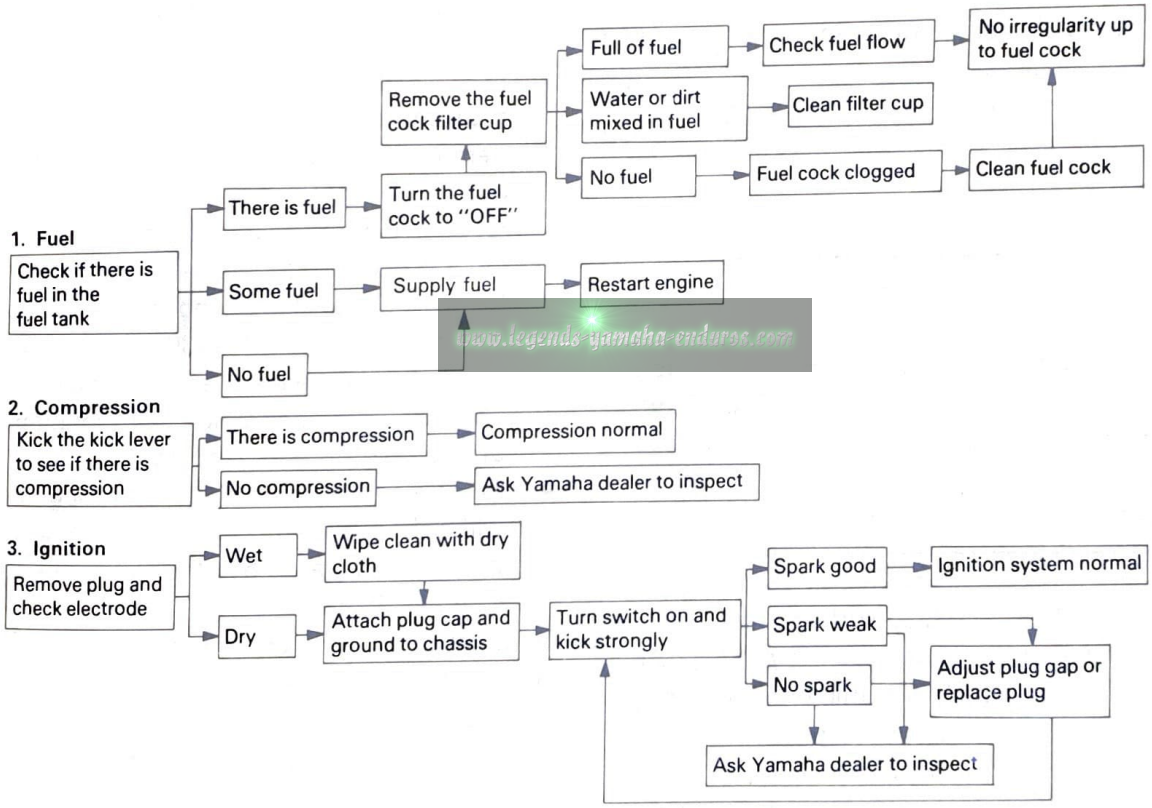
In the absence of sparking despite nothing wrong with the C.D.I. magneto, wiring, ignition coil, or spark plug, replace with a NEW C.D.I. unit and check.

2. CONNECTORS CHECK-UP
   a. Check the connectors and couplers for looseness of joining ends.
   b. Keep the connectors and couplers from dirt or rust.
   c. For secure and firm joining, take care to hold the connectors and couplers, not the wire portions, in attaching or separating them.

TROUBLESHOOTING

Although Yamaha machine are given a rigid inspection before shipment from the factory, trouble may occure in operation. If this happens check the machine in accordance with the procedures given in the trouble-shooting chart below. If repair is necessary, ask a Yamaha dealer.

The skilled technicians at a Yamaha dealer provide excellent service. For replacement parts, use only genuine Yamaha parts. Imitation parts are similar in shape but often inferior in quality of materials and workmanship; consequently, service life is shorter and more expensive repairs may be necessitated. Any fault in the fuel, compression or ignition system can cause poor starting or loss of power while riding. The troubleshooting chart describes quick and easy procedures for checking these systems.



CLEANING AND STORAGE

Cleaning

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

1. Before cleaning the machine:
   a. Block off end of exhaust pipe to prevent water entry; a plastic bag and strong rubber band may be used.
   b. Remove air cleaner or protect it from water with plastic covering.
   c. Make sure spark plug(s), fuel tank cap, transmission oil filler cap are properly installed.
2. If engine case is excessively greasy, apply degreaser with a paint brush. Do not apply degreaser to chain, sprockets, or wheel axles.
3. Rinse dirt and degreaser off with garden hose, using only enough hose pressure to do the job.

CAUTION:

Excessive hose pressure may cause water seepage and contamination of wheel bearings, front forks, brakes, and transmission seals. Many expensive repair bills have resulted from improper high pressure detergent applications such as those available in coin-operated car washers.

4. Once the majority of the dirt has been hosed off, wash all surfaces with warm water and mild, detergent-type soap. An old tooth brush or bottle brush is handy to reach hard-to-get-to places.
5. Rinse machine off immediately with clean water and dry all surfaces with a chamois, clean towel, or soft absorbent cloth.
6. Immediately after washing, remove excess moisture from chain and lubricate to prevent rust.
7. Chrome-plated parts such as handlebars, rims, spokes, forks, etc., may be further cleaned with automotive chrome cleaner.
8. Clean the seat with a vinyl uphostery cleaner to keep the cover pliable and glossy.
9. Automotive-type wax may be applied to all painted and chrome-plate surfaces. Avoid combination cleaner-waxes. Many contain abrasive which may mar paint or protective finish on fuel and oil tanks.
10. After finishing, start the engine immediately and allow to idle for several minutes.

NOTE:

Water may enter the air cleaner case during washing the machine. Be sure to remove the grommet attached to the lower left part of the case and drain the water, as required.

Storage

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

1. Drain fuel tank, fuel lines, and carburetor float bowl(s).
2. Remove the empty fuel tank, pour a cup of SAE 10W30 oil in tank, shake the tank to coat inner surfaces thoroughly and drain off excess oil. Reinstall the tank.
3. Remove spark plug(s), pour about one tablespoon of SAE 10W30 oil in spark plug hole(s) and reinstall spark plugs. Kick engine over seceral times (with ignition off) to coat cylinder walls with oil.
4. Remove drive chain. Clean thoroughly with solvent and lubricate. Re-install chain or store in a plastic bag (tie to frame for safe-keeping).
5. Lubricate all the control cables.
6. Block up frame to raise both wheels off ground.
7. Tie a plastic bag over exhaust pipe outlet(s) to prevent moisture from entering.
8. If storing in humid or salt-air atmosphere, coat all exposed metal surfaces with a light film of oil. Do not apply oil to rubber parts or seat cover.

NOTE:

Make any necessary repairs before storing the machine.

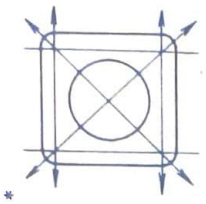
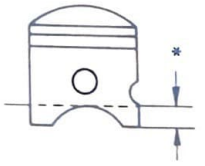
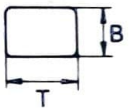
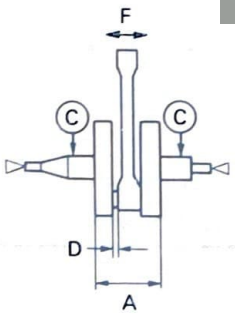
SPECIFICATIONS

General

Item	PW80K
Model:	
Code Number	21W
Frame Starting Number	21W-000101
Engine Starting Number	21W-000101
Dimensions:	
Overall Length	1,540 mm (60.6 in)
Overall Width	640 mm (25.2 in)
Overall Height	880 mm (34.6 in)
Seat Height	635 mm (25.0 in)
Wheelbase	1,055 mm (41.5 in)
Minimum Ground Clearance	185 mm (7.3 in)
Basic Weight:	
With Oil and Full Fuel Tank	61 kg (134 lb)
Engine:	
Engine Type	Air cooled 2-stroke, gasoline, torque induction
Cylinder Arrangement	Single
	Forward inclined
Displacement:	79 cm^3 (4.82 cu.in)
Bore × Stroke	47 × 45.6 mm (1.85 × 1.80 in)
Compression a Ratio	6.6 : 1
Starting System	Kick starter
Lubrication System:	Separate system (Yamaha Autolube)
Engine Oil:	
Oil Tank Capacity	0.95 L (0.84 Imp qt, 1.0 US qt)
Oil Grade	Yamalube 2-cycle oil or air-cooled 2-stroke engine oil
Transmission Oil:	
Periodic Oil Change	0.70 L (0.62 Imp qt, 0.74 US qt)
Total Amount	0.75 L (0.66 Imp qt, 0.79 US qt)
Oil Grade	Yamalube 4-cycle oil or SAE 10W30 type SE motor oil
Air Filter:	Wet type element
Fuel:	
Type	Regular gasoline
Tank Capacity	4.9 L (1.1 Imp gal, 1.3 US gal)
Carburetor:	
Type	VM15SC
Manufacturer	MIKUNI

Item	PW80K
Spark Plug:	
Type	BP6HS
Manufacturer	NGK
Gap	0.6 ~ 0.7 mm (0.024 ~ 0.028 in)
Clutch Type:	Wet, centrifugal automatic
Transmission:	
Primary Reduction System	Helical gear
Primary Reduction Ratio	66/12 (3.143)
Secondary Reduction System	Chain drive
Secondary Reduction Ratio	32/15 (2.133)
Transmission Type	Constant mesh, 3-speed, Cam drum
Operation	Left foot operation
Gear Ratio: 1st	39/12 (3.250)
2nd	29/16 (1.812)
3rd	22/17 (1.294)
Chassis:	
Frame Type	Tubular backbone
Caster Angle	26°
Trail	62 mm (2.44 in)
Tire:	
Type	With tube
Size (F)	2.50-14-4PR
Size (R)	3.00-12-4PR
Tire Pressure:	
Front	98.1 kPa (1.0 kg/cm², 14 psi)
Rear	98.1 kPa (1.0 kg/cm², 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 (Monocross suspension)
Shock Absorber:	
Front Shock Absorber	Coil spring, Oil damper
Rear Shock Absorber	Gas, Coil spring, Oil damper
Wheel Travel:	
Front Wheel Travel	110 mm (4.4 in)
Rear Wheel Travel	95 mm (3.8 in)
Electrical:	
Ignition System	C.D.I. Magneto
Generator System	Flywheel magneto

Engine

Item		PW80K
Cylinder Head: Warp Limit		0.03 mm (0.0012 in) *Lines indicate straightedge measurement.
Cylinder: Bore Size Taper Limit Out of Round Limit		$47^{+0.02}_{0}$ mm ($1.85^{+0.0008}_{0}$ in) 0.04 mm (0.0016 in) 0.0025 mm (0.0001 in)
Piston: Piston Size/ Measuring Point* Piston Clearance Piston offset		$47^{0}_{-0.06}$ mm ($1.85^{0}_{-0.0024}$ in)/5 mm (0.2 in) 0.035 ~ 0.040 mm (0.0014 ~ 0.0016 in) 0.2 mm (0.008 in), IN-side
Piston Ring: Sectional Sketch End Gap (Installed) Side Clearance (Installed)	 Top Ring/2nd Ring Top Ring/2nd Ring Top Ring/2nd Ring	Keystone B = 1.99 mm (0.078 in) T = 2.0 mm (0.079 in) 0.15 ~ 0.30 mm (0.006 ~ 0.012 in) 0.03 ~ 0.05 mm (0.0012 ~ 0.002 in)
Crankshaft: Crank Width "A"		$48^{-0.05}_{-0.10}$ mm ($1.89^{-0.0020}_{-0.0040}$ in)

Item	PW80K
Run Out Limit "C"	0.03 mm (0.0012 in)
Connecting Rod Big End Side Clearance "D"	0.3 ~ 0.8 mm (0.012 ~ 0.031 in)
Small End Free Play Limit "F"	1.0 mm (0.04 in)
Clutch:	
Friction Plate Thickness/Quantity	3.0 mm (0.12 in) × 6
Wear Limit	2.9 mm (0.11 in)
Clutch Plate Thickness/Quantity	1.4 mm (0.06 in) × 5
Warp Limit	0.05 mm (0.002 in)
Clutch Spring Free Length/Quantity	12.9 mm (0.51 in) × 6
Shifter:	
Shifting Type	Cam drum
Kick Starter Type:	Kick and mesh type
Kick Clip Friction Force 	P = 1.0 kg (2.2 lb)
Carburetor:	
Type/Manufacturer/Quantity	VM15SC/MIKUNI/1 pc.
I.D. Mark	21W00
Main Jet (M.J.)	#125
Main Air Jet (M.A.J.)	ø2.5
Jet Needle-clip Position (J.N.)	3E3-3
Needle Jet (N.J.)	E-4
Cutaway (C.A.)	2.5
Pilot Jet (P.J.)	#15
Pilot Outlet Size (P.O.)	ø0.9
Air Screw (turns out) (P.A.S.)	1 and 1/2
Valve Seat Size (V.S.)	ø1.2
Starter Jet (G.S.)	30
Float Height (F.H.)	23.0 ± 1 mm (0.91 ± 0.04 in)
Reed Valve: 	
Material	G1N6
Thickness*	0.2 mm (0.008 in)
Valve Lift	6.5 mm (0.26 in)
Bending Limit	0.3 mm (0.012 in) or less

Tightening Torque

	Thread Size	Q'ty	Nm	m·kg	ft·lb
Spark plug	M14	1	25	2.5	18
Cylinder head	M7	4	10	1.0	7.2
Primary drive gear	M12	1	50	5.0	36
Clutch boss	M12	1	50	5.0	36
Kick crank	M6	1	12	1.2	8.7
Change pedal	M6	1	10	1.0	7.2
Reed valve	M3	3	0.8	0.08	0.6
Inner rotor	M14	1	50	5.0	36
Stator	M7	2	10	1.0	7.2

Chassis

Item	PW80K
Steering System:	
Steering Bearing Type	Ball bearing
Front Suspension:	
Front Fork Travel	110 mm (4.33 in)
Fork Spring Free Length	425.1 mm (16.74 in)
Spring Rate	K = 3.43 N/mm (0.35 kg/mm, 19.6 lb/in)
Optional Spring	No
Oil Capacity or Oil Level	60 cm³ (2.1 Imp oz, 2.0 US oz)/188.5 mm (4.67 in) (From top of inner tube fully compressed without spring)
Oil Grade	Yamaha fork oil 20wt, SAE 20 motor oil
Rear Suspension:	
Shock Absorber Travel	48 mm (1.89 in)
Spring Free Length	169 mm (6.65 in)
Spring Rate	K = 41.5 N/mm (4.23 kg/mm, 237 lb/in)
Optional Spring	No
Enclosed Gas Pressure	1,961 kPa (20 kg/cm², 284 psi)

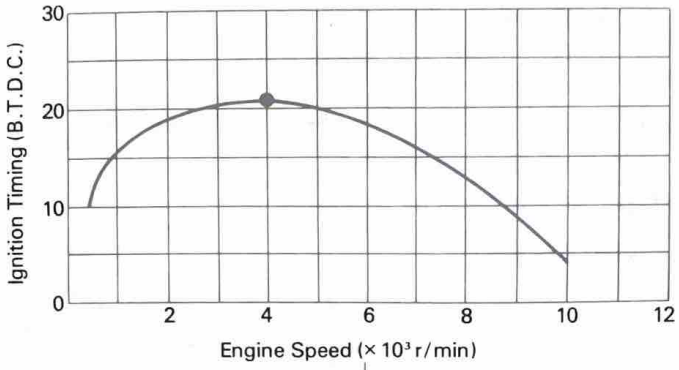
Item		PW80K
Rear Arm:		
Swing Arm Free Play Limit	End	1.0 mm (0.040 in)
Wheel:		
Front Wheel Type		Spoke Wheel
Rear Wheel Type		Spoke Wheel
Front Rim Size/Material		1.40 × 14/ Steel
Rear Rim Size/Material		1.60 × 12/ Steel
Rim Runout Limit	Vertical	2.0 mm (0.08 in)
	Lateral	2.0 mm (0.08 in)
Drive Chain:		
Type/Manufacturer		DK420/ DAIDO
Number of Links		83 links + joint
Chain Free Play		15 ~ 20 mm (0.6 ~ 0.8 in)
Drum Brake:		
Type	Front	Leading trailing
	Rear	Leading trailing
Drum Inside Dia.	Front	95 mm (3.74 in) Limit: 1.5 mm (0.06 in)
	Rear	110 mm (4.33 in) Limit: 1.5 mm (0.06 in)
Brake Lever & Brake Pedal:		
Brake Lever Free Play		5 ~ 8 mm (0.20 ~ 0.31 in)
Brake Pedal Position		3 mm (0.12 in)
Brake Pedal Free Play		20 ~ 30 mm (0.8 ~ 1.2 in) (Vertical height below footrest top.)

Tightening Torque

	Thread Size	Q'ty	Nm	m·kg	ft·lb
Front wheel axle	M10	1	35	3.5	25
Handle crown — Inner tube	M20	2	40	4.0	29
Handle crown — Steering shaft	M10	1	40	4.0	29
Handle crown — Handle holder under	M10	2	40	4.0	29
Handle holder under — Handle holder upper	M6	4	13	1.3	9.4
Steering bearing	M25	1	10	1.0	7.2
Engine mount — Front	M8	1	23	2.3	17
Engine mount — Under	M8	1	26	2.6	19
Engine mount — Center	M8	1	23	2.3	17
Rear wheel axle	M12	1	60	6.0	43
Sprocket wheel	M8	4	26	2.6	19
Footrest — Frame (R)	M8	1	26	2.6	19
Footrest — Frame (L)	M8	1	26	2.6	19
Front brake cam lever	M6	1	10	1.0	7.2
Rear brake cam lever	M6	1	10	1.0	7.2
Rear arm — Frame	M10	1	31	3.1	22
Fuel tank — Frame	M6	2	10	1.0	7.2

Electrical

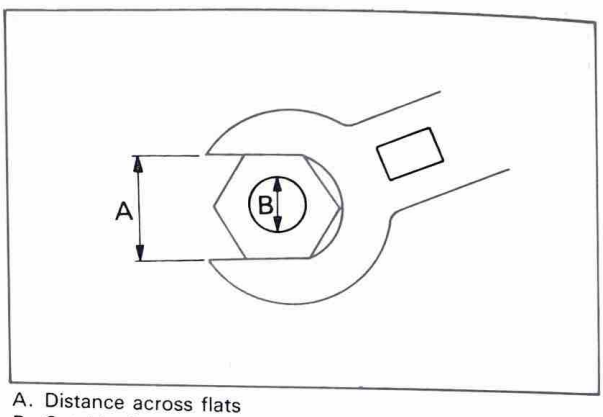
Item	PW80K
Ignition System: Ignition Timing (B.T.D.C.) Advancer Type	20.6° at 4,000 r/min Electrical
C.D.I.: Model/Manufacturer Charging Coil Resistance (Color) C.D.I. Unit-Model/Manufacturer	 F3T8077/MITSUBISHI 400Ω ± 10% at 20°C (68°F) (Black/Red — Black) F8T06471/MITSUBISHI
Ignition Coil: Model/Manufacturer Minimum Spark Gap Primary Winding Resistance Secondary Winding Resistance	 F6T50577/MITSUBISHI 5 mm (0.20 in) 1.0Ω ± 15% at 20°C (68°F) 5.9kΩ ± 15% at 20°C (68°F)
Charging System:	Flywheel magneto



TORQUE SPECIFICATIONS

The list below covers those stud/bolt sizes with standard I.S.O. pitch threads. Torque specifications for components with thread pitches other than standard are given within the applicable chapter. Torque specifications call for dry, clean threads. Components such as the cylinder or cylinder head should be at room temperature prior to torquing. A cylinder head or any other item with several fasteners should be torqued down in a cross-wise pattern in successive stages until torque specification is reached. The method is similar to installing as automobile wheel and will avoid warping the component.

A (Nut)	B (Bolt)	General torque specifications		
		Nm	m · kg	ft · lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13.0	94



A. Distance across flats
B. Outside thread diameter

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/lit	2.352	mpg
	km/hr	0.6214	mph
	km	0.6214	mi
	m	3.281	ft
	m	1.094	yd
	cm	0.3937	in
	mm	0.03937	in
VOL./ CAPACITY	cc (cm^3)	0.03382	oz (US liq)
	cc (cm^3)	0.06102	cu. in
	lit (liter)	2.1134	pt (US liq)
	lit (liter)	1.057	qt (US liq)
	lit (liter)	0.2642	gal (US liq)
MISC.	kg/mm	56.007	lb/in
	kg/cm^2	14.2234	psi (lb/in^2)
	Centigrade (°C)	9/5 (°C) + 32	Fahrenheit (°F)

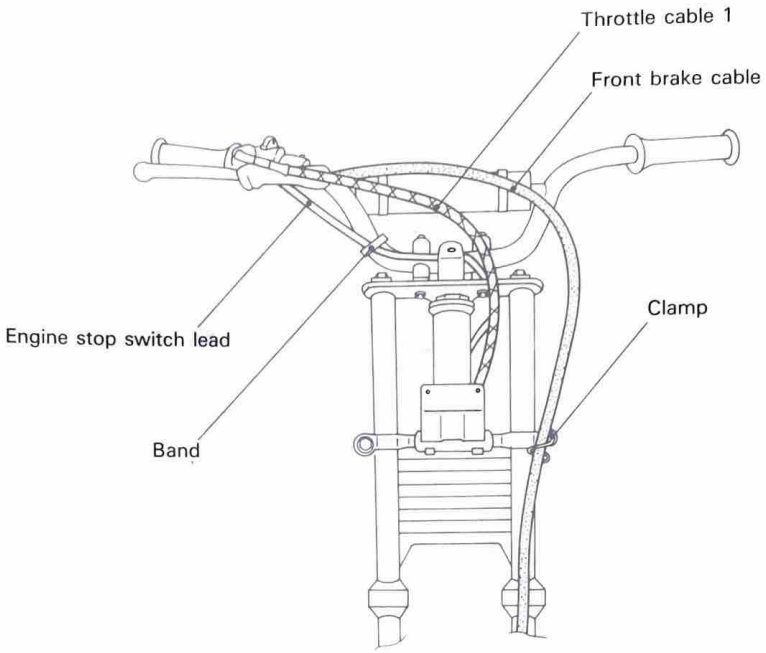
INCH TO METRIC SYSTEM

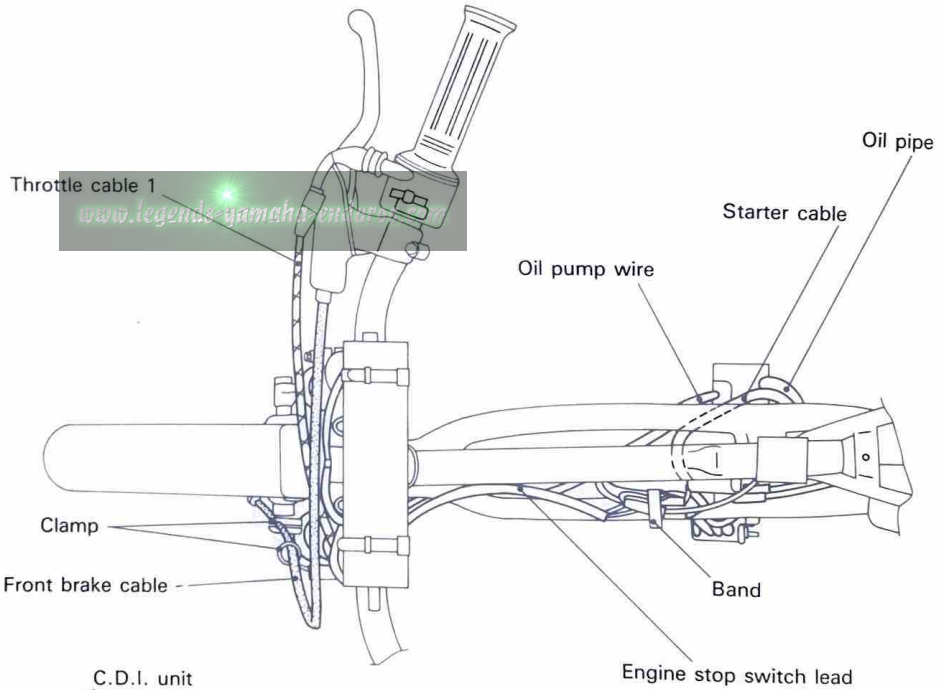
	KNOWN	MULTIPLIER	RESULT
TORQUE	ft · lb	0.13826	m · kg
	in · lb	0.01152	m · kg
	ft · lb	13.831	cm · kg
	in · lb	1.1521	cm · kg
WT.	lb	0.4535	kg
	oz	28.352	g
FLOW/DISTANCE	mpg	0.4252	km/lit
	mph	1.609	km/hr
	mi	1.609	km/hr
	ft	0.3048	m
	yd	0.9141	m
	in	2.54	cm
	in	25.4	mm
VOL./ CAPACITY	oz (US liq)	29.57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

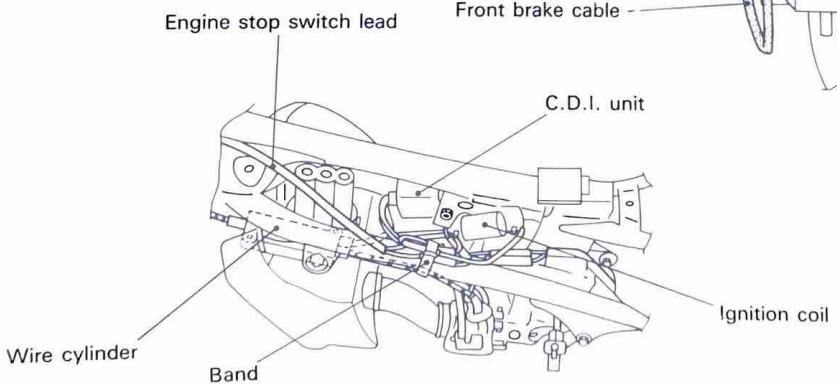
DEFINITION OF UNITS

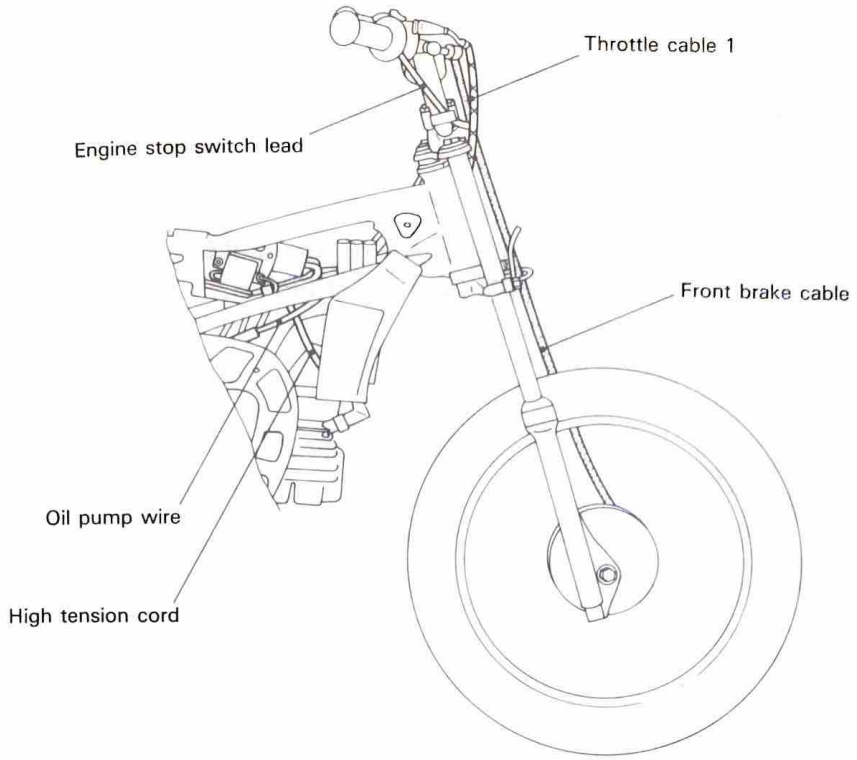
Unit	Read	Definition	Measure
mm cm	millimeter centimeter	10^{-3} meter 10^{-2} meter	Length Length
kg	kilogram	10^{3} gram	Weight
N	Newton	1 kg × m/sec^{2}	Force
Nm m·kg	Newton meter Meter kilogram	N × m m × kg	Torque Torque
Pa N/mm	Pascal Newton per millimeter	N/m^{2} N/mm	Pressure Spring rate
L cm^{3}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

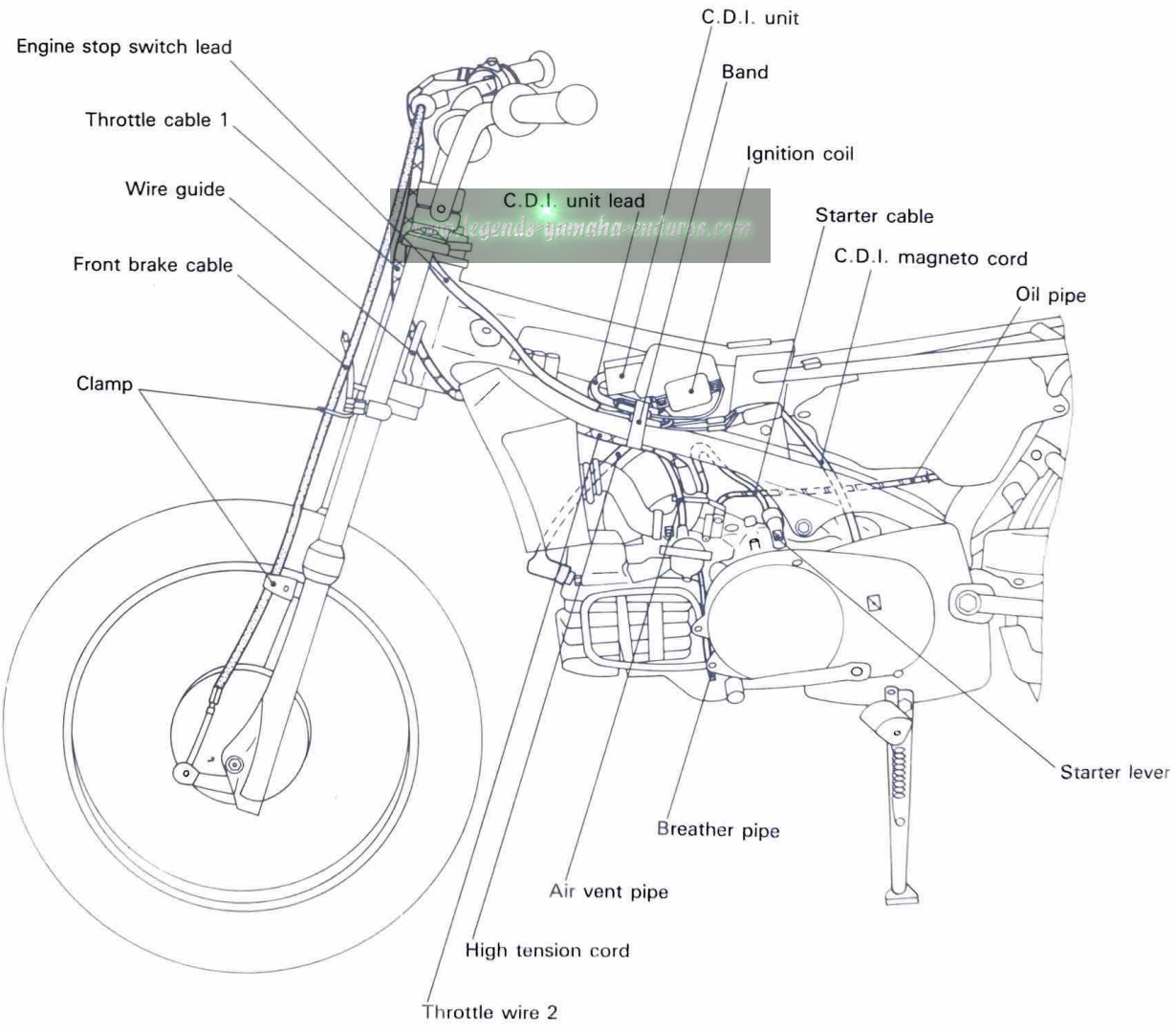
CABLE ROUTING








Throttle cable 1
Engine stop switch lead
Front brake cable
Oil pump wire
High tension cord


C.D.I. unit
Band
Engine stop switch lead
Throttle cable 1
Ignition coil
Wire guide
C.D.I. unit lead
Starter cable
C.D.I. magneto cord
Front brake cable
Oil pipe
Clamp
Starter lever
Breather pipe
Air vent pipe
High tension cord
Throttle wire 2

WARRANTY INFORMATION

STATEMENT OF PURCHASER'S RESPONSIBILITY

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

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