YAMAHA

IT250H/IT465H

OWNER'S SERVICE MANUAL

5L4-28199-20

IMPORTANT NOTICE

SAFETY WARNINGS:

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

NOTICE:

Some data in this manual may become outdated due to improvements made to this model in the future.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

TO THE NEW OWNER

This manual will provide you with a good basic understanding of features, operation, and basic maintenance and inspection items of this vehicle.
PLEASE READ THIS MANUAL CAREFULLY AND COMPLETELY BEFORE OPERATING YOUR NEW MACHINE. If you have any questions regarding the operation or maintenance of your machine, please consult your Yamaha dealer.

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

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

SERVICE DEPT.
INTERNATIONAL DIVISION
YAMAHA MOTOR COMPANY, LTD.

IT250H/IT465H OWNER'S
SERVICE MANUAL
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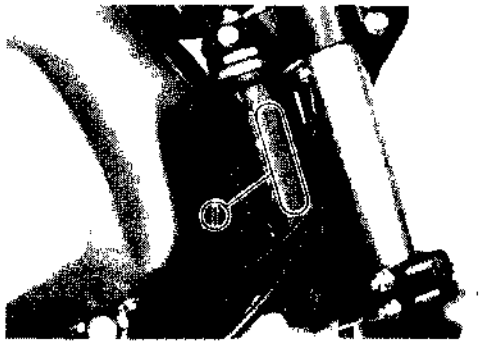
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GENERAL INFORMATION

MACHINE IDENTIFICATION

Frame serial number

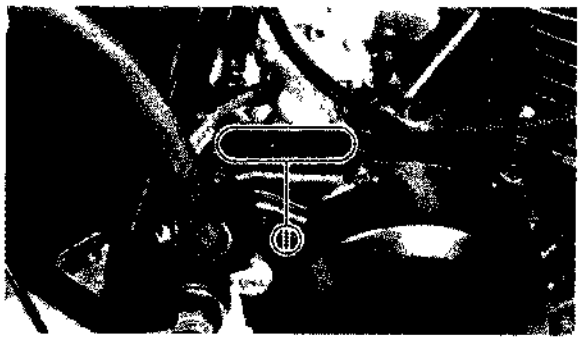
The frame serial number is stamped into the right side of the steering head pipe.



1 Frame serial number

Engine serial number

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



1 Engine serial number

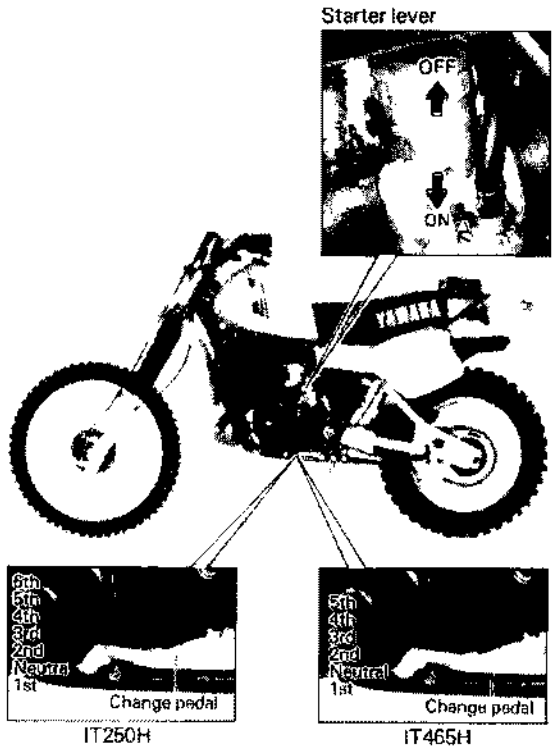
NOTE:

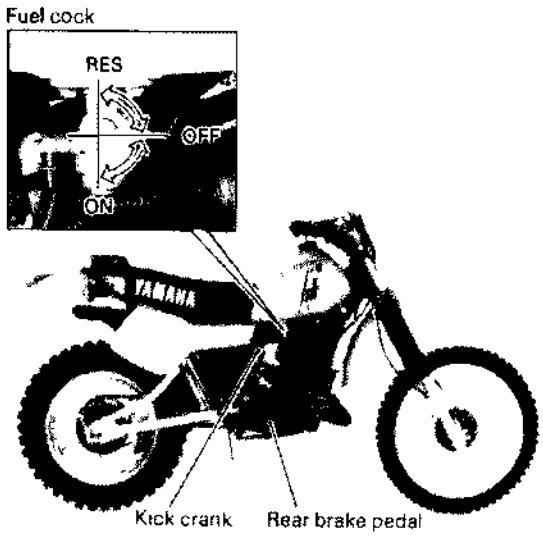
The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.

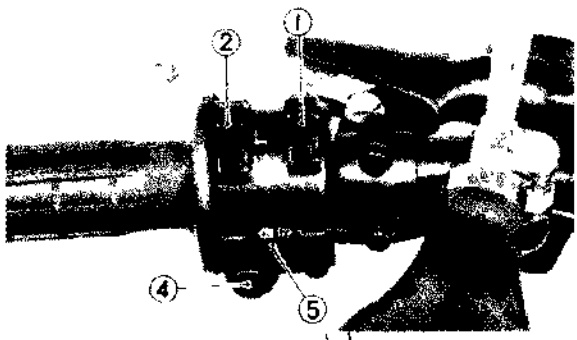
CONTROL FUNCTIONS

WARNING:

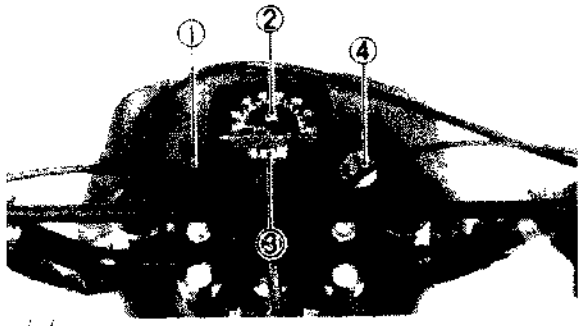
Before riding this machine, become thoroughly familiar with all operating controls and their function.
Consult your Yamaha dealer regarding any control or function you do not thoroughly understand.





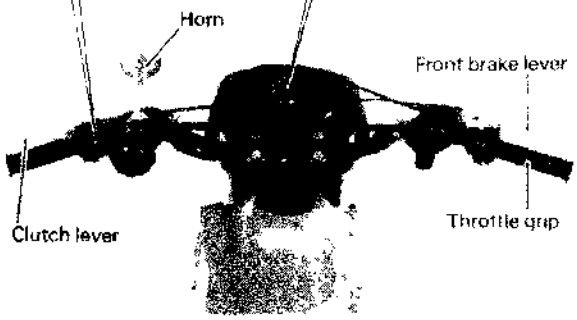


1 Lighting switch
If the light switch is turned forward, headlight and taillight come on
2 Dimmer switch
3 Turn switch
To signal a right (left) hand turn push the switch to the right (left)
4 Engine stop button
Push and hold to stop the engine



1 Reset knob
Turn the knob counter clockwise for resetting the entire place numbers to zeros
2 Speedometer
3 Trip odometer
4 Main switch

ON position	Electrical circuits are switched on The engine can be started
OFF position	All electrical circuits are switched off



PRE-OPERATION CHECKS

Before using this machine please check the following points:

Item	Procedure	Page
Brakes	Check operation/adjustment	13
Clutch	Check operation/adjustment	12
Fuel tank	Fill with proper fuel/oil mix	3
Transmission oil	Check oil level/Change oil as required	3
Drive Chain	Check alignment/adjustment/lubrication	13, 14
Spark Plug	Check color and condition/Replace as required	9
Throttle	Check for proper cable operation	11
Air Filter	Foam type—must be clean and damp with oil always	16, 17
Wheels & Tires	Check pressure/runout/spoke tightness/axle nuts	15
Fittings/Fasteners	Check all/tighten as necessary	—
Lights/Signals	Check headlight/tail-brake lights, flasher lights	—
Battery	Check fluid level, top-up with distilled water if necessary	—

NOTE:

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

FUEL AND OIL

Fuel

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

Fuel tank capacity: 13 lit (2.86 IMP gal)

Engine mixing oil

Recommended oil:
Yamalube "R", Shell Super M,
Castrol R30/A545

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

Mixing ratio: 16 : 1 (Yamalube "R")
20 : 1 (Castrol R30)
20 : 1 (Castrol A545)
20 : 1 (Shell Super M)

Always use the oil of same brand.
Never use any other brand of oil.

Transmission oil

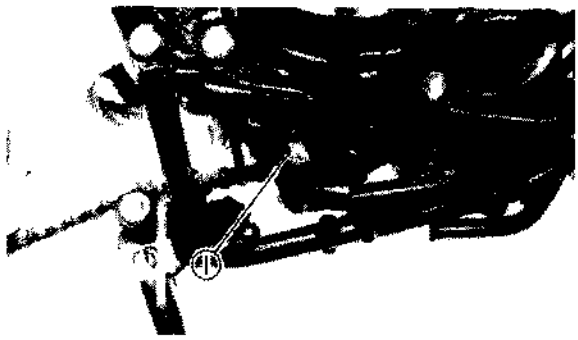
OIL REPLACEMENT

The transmission oil should be drained and refilled every fifth race meet.

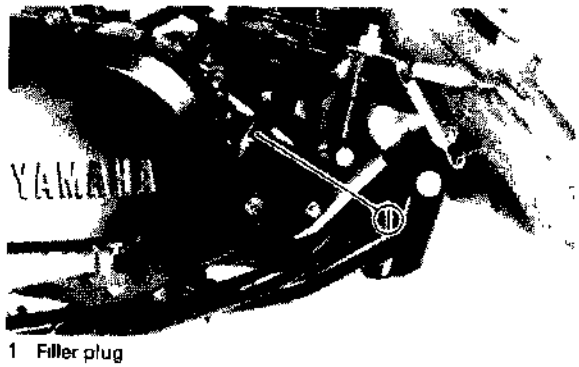
On the bottom of the engine there is a drain plug. Remove it and drain all the oil from the transmission. Reinstall the drain plug (make sure it is tight). Add oil through filler hole

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

Transmission oil capacity:
Periodic oil change:
IT250H: 750 cm³ (0.66 IMP qt)
IT465H: 650 cm³ (0.57 IMP qt)
Overhaul:
IT250H: 800 cm³ (0.70 IMP qt)
IT465H: 700 cm³ (0.62 IMP qt)



1 Drain plug



1 Filler plug

NOTE:

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

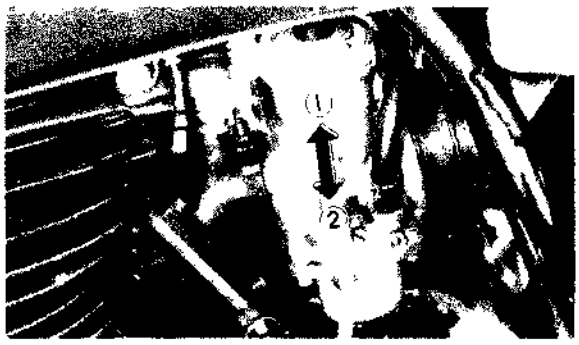
ENGINE STARTING AND OPERATION

CAUTION:

1. **Before riding this machine, become thoroughly familiar with all operating controls and their function. Consult your Yamaha Dealer regarding any control or function you do not thoroughly understand.**
2. **Observe the break-in procedures to preclude mechanical failures.**

Starting a cold engine

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



1 Open 2 Closed

Warming up

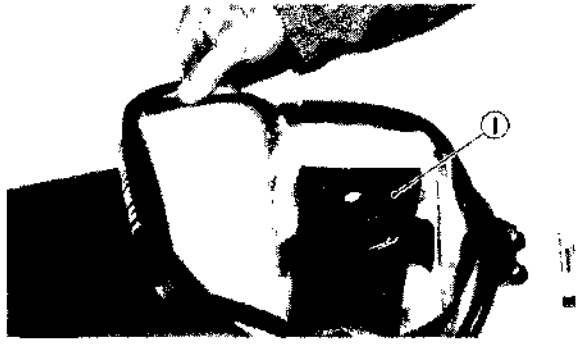
To get maximum engine life, always "warm-up" the engine before starting off Never accelerate hard with a cold engine! To see whether or not the engine is warm, see if it responds to throttle normally with the starter jet (choke) turned off

Engine Break-in

1 Prior to starting, fill tank with a break-in gasoline/oil mixture of 12 1.
2. Allow engine to warm up. Check engine idle speed Check operating controls and engine stop button operation.
3. Operate machine in lower gears at moderate throttle settings for 5 ~ 10 minutes Check spark plug condition.
4. Allow engine to cool. Repeat procedure, running for 10 minutes Very briefly, shift higher gears (4th or 5th) and check full throttle response. Check spark plug condition.
5. Allow engine to cool Repeat procedure, running for 10 minutes Full throttle and higher gears may be used, but avoid sustained full throttle operation. Check spark plug condition.
6. Allow engine to cool. Remove "high" spots on piston with No 600 grit, wet sandpaper. Clean, and carefully reassemble
7. Remove break-in fuel/oil mixture from tank Refill with 20 : 1 operating fuel/oil mixture 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 Restart. After 10 ~ 15 minutes operation, machine is ready for riding.

PERIODIC MAINTENANCE AND ADJUSTMENT

Tool kit
The tools provided in the owner's tool kit are sufficient for periodic maintenance and minor repair purpose, except that a torque wrench is also necessary to properly tighten nuts and bolts.



1 Tool kit

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 than shown on the chart to avoid rust and damage. If you are in doubt as to how closely you can follow these time recommendations, check with the Yamaha dealer in your area.

	After Every Ride	Every 500 km	Every 1,500 km	After Every Event	As Required	Recommended Lubricant type
WASH MACHINE	(This item is also essential to proper performance)				×	
PISTON						
Inspect		×		×		
Clean		×		×		
Replace					×	
PISTON RING						
Inspect		×		×		
Replace			×		×	
CYLINDER						
Inspect		×		×		
Head torque		×		×		
Replace					×	
CLUTCH						
Adjust					×	
Replace (Plates)					×	
TRANSMISSION						
Oil change		×		×		NO 1
Inspect gears/			×			
Shift mech					×	
Replace bearings					×	
CRANKSHAFT						
Main bearing check			×			
Big end check			×	×		
Small end check		×		×		
Piston pin check		×				
CARBURETOR						
Clean, inspect, & adjust		×		×		
EXHAUST SYSTEM						
Inspect & tighten		×		×		
Clean and decarbonize					×	

	After Every Ride	Every 500 km	Every 1,500 km	After Every Event	As Required	Recommended Lubricant type
FRAME						
Clean & inspect		×		×		
SWING ARM		×		×		
Check lubricate			×		×	NO 5
CONTROLS & CABLES						
Check & adjust	×			×		
Lubricate		×		×		NO 2
BRAKES						
Check & adjust		×		×		
Replace linings					×	
WHEELS & TIRES						
Check runout		×		×		
Check spokes	×			×		
Check bearings		×		×		
STEERING HEAD						
Check		×		×		
Clean, lube & repair			×	×	(every two events)	NO 6
CDI						
Check connectors		×		×		
LIGHTS/SIGNALS						
Check connectors		×				
Replace bulb					×	
BATTERY						
Fluid level & breather pipe		×	×	×		
Specific gravity			×			
AIR FILTER						
Clean & oil	×			×		NO 3
Replace					×	
SPARK PLUG						
Check condition	×					
DRIVE CHAIN						
Clean & lubricate	×			×		NO 2
Check tension	×					
Replace					×	
FUEL TANK						
Clean & flush			×	×		
Clean petcock filter		×		×		
REAR SHOCK						
Clean & inspect				×		
FRONT FORKS						
Clean & change oil		×		×		NO 4
Replace seals					×	
CLUTCH & BRAKE SHAFT						
Lubricate		×		×		NO 5

RECOMMENDED LUBRICANT

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

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

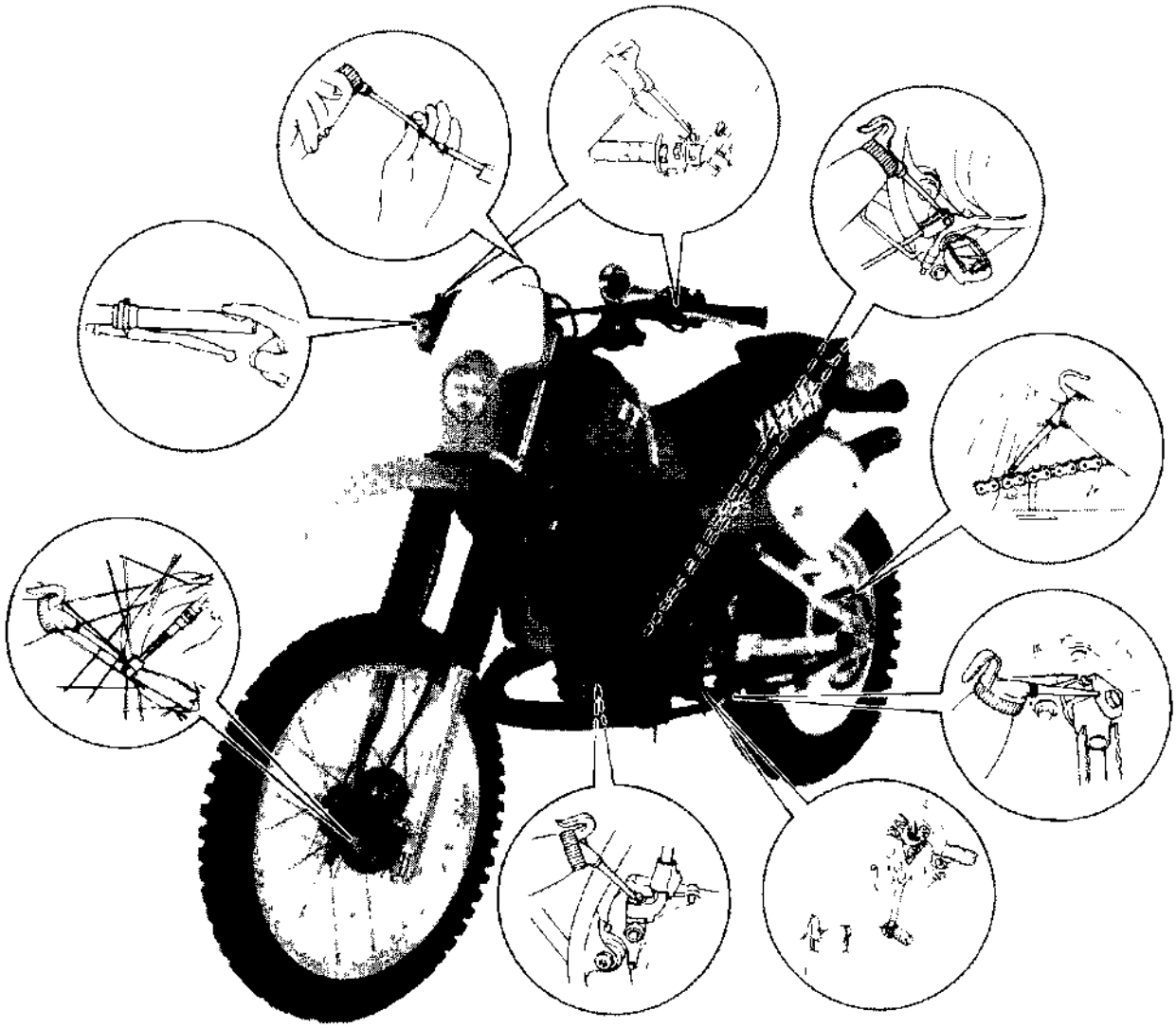
NO. 3 Air filters-foam element air filters must be damp with oil at all times to function properly Clean and lube every meet and every ride. Do not over-oil. Use SAE 10W/30 "SE" motor oil.

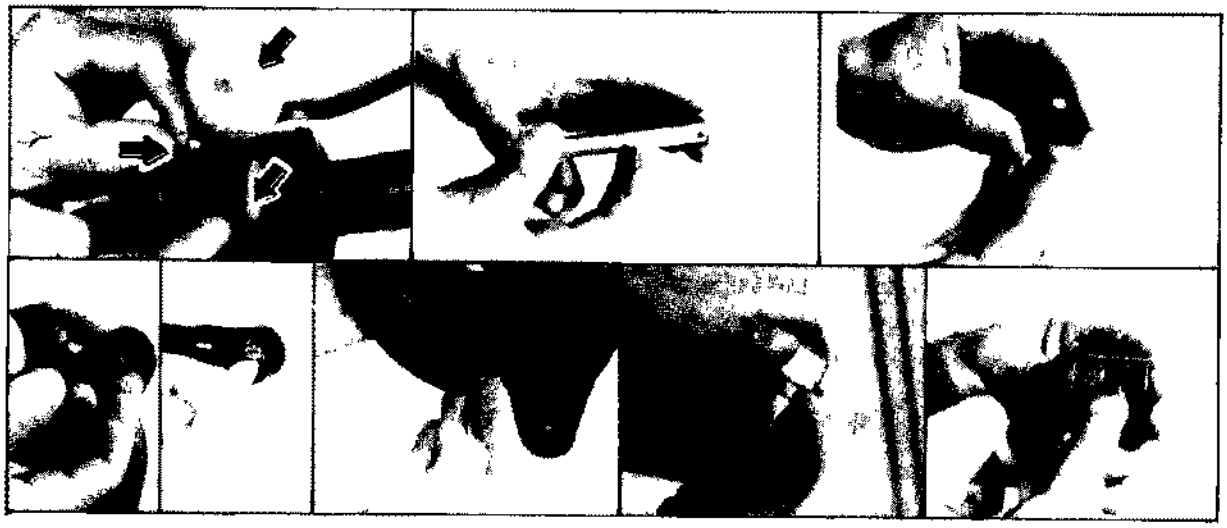
NO. 4 Use Yamaha Fork Oil 10wt.

NO 5 Use lithium base grease

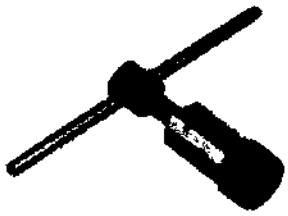
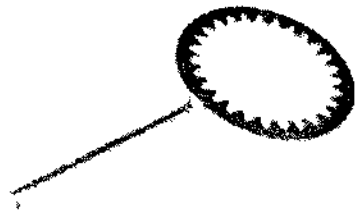
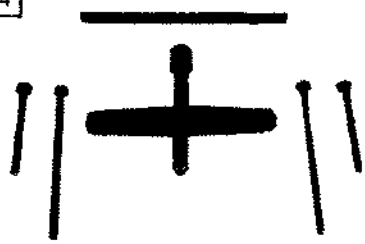
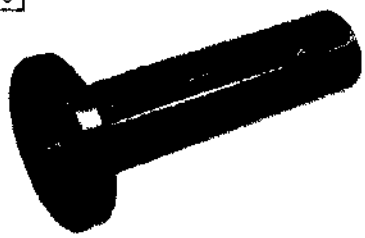
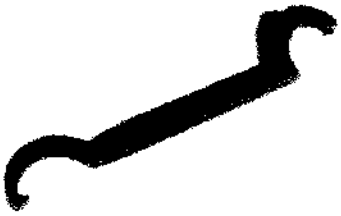
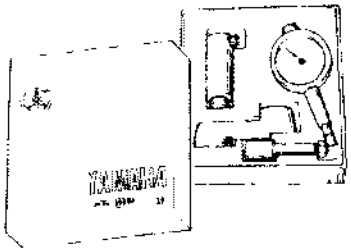
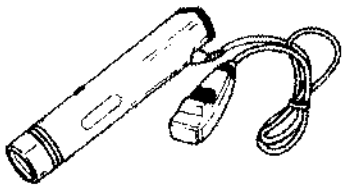
NO. 6 Medium-weight wheel bearing-grease of quality manufacturer — preferably waterproof.

LUBRICATION



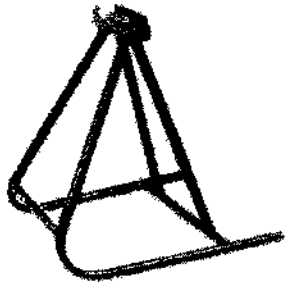


SPECIAL TOOLS

1 	2 	3 
90890 01235 Flywheel holding tool	90890-01189 Flywheel puller	90890-01024 Clutch holding tool
4 	5 	6 
90890 01135 Crankcase separating tool	90890-01016 Spacer	90890-01012 Crankshaft setting pot
7 	8 	9 
90890-01015 Crankshaft setting tool	90890 01051 Steering nut wrench	90890 01252 Dial gauge set
10 		
90890-03109 Timing light		

Machine stand

The machine stand show below will greatly facilitate your service.

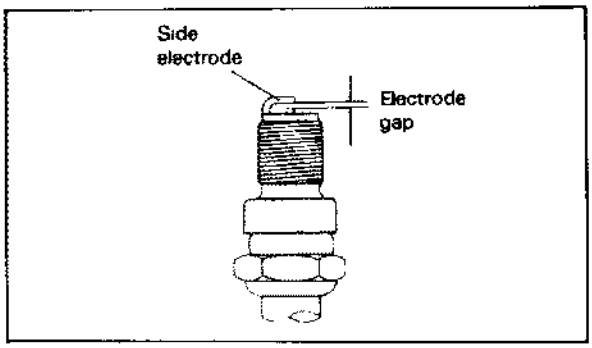


ADJUSTMENTS

Spark plug

Standard spark plug:
IT250H .....N-2G (CHAMPION)
IT465H .....N-3 (CHAMPION)

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



Adjustment can be made by bending the side electrode.

Spark plug 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: 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 1/2 to 1/4 turns past finger tight. Have the spark plug torqued to the correct value as soon as possible with a torque wrench.

IGNITION TIMING

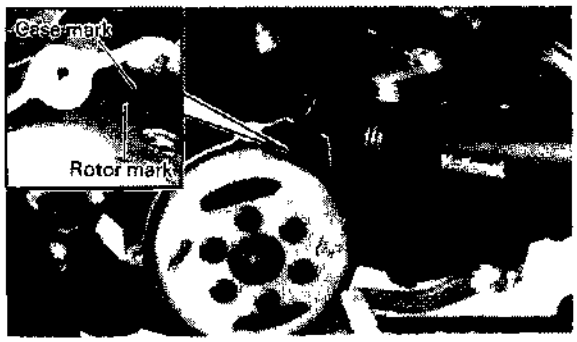
Checking

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

1. Remove the crankcase cover (L).
   When removing, press the shift pedal down.
2. Connect the timing light to the spark plug lead wire.
3. Start the engine and keep it running at the specified speed. Use a tachometer for checking.

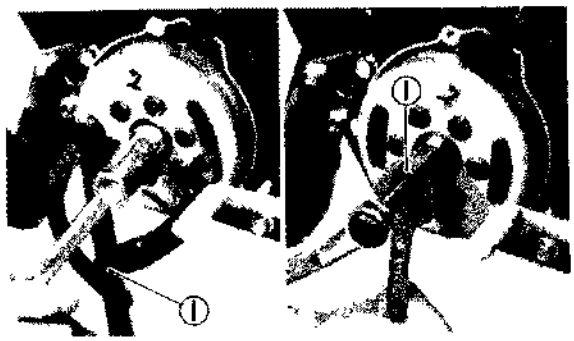
Specified speed:
IT250H: 5,000 r/min
IT465H: 2,000 r/min

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



Adjustment

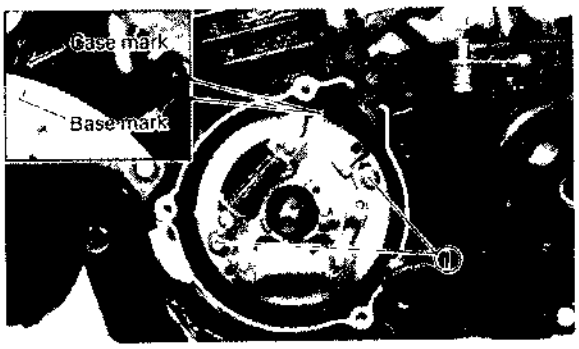
1 Remove the magneto flywheel using the magneto holder and flywheel puller.



1 Flywheel holding tool (90890-01235)

1 Flywheel puller (90890 01189)

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



1 Set screw

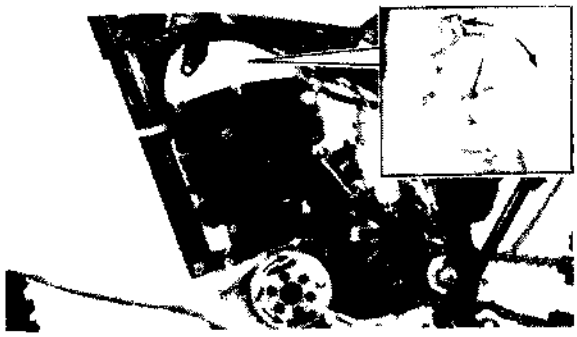
3. Reinstall the flywheel and tighten the nut.

Tightening torque 8 m-kg (56 ft-lb)

Marking of match mark

If a new crankcase is used, provide a match mark on it and proceed as follows:

1. Remove muffler, spark plug and screw Dial Gauge Stand into spark plug hole.
2. Insert Dial Gauge Assembly with a 56 mm (2.2 in) extension (needle) into stand.
3 Remove left engine crankcase cover.
4 Rotate rotor until piston is at top-dead center (T D.C) Tighten set screw on dial gauge stand to secure dial gauge assembly Set the zero on dial indicator face to line up exactly with dial indicator needle Rotate flywheel back and forth to be sure that indicator needle does not go past zero

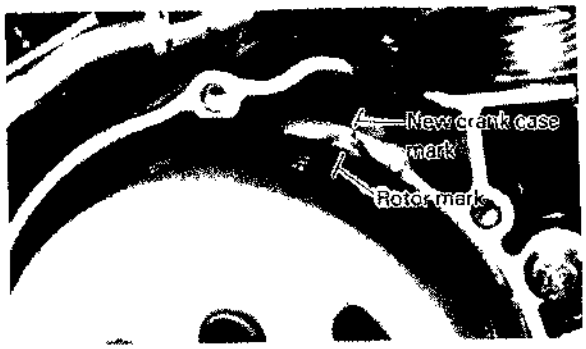


5. Starting at T D C , rotate flywheel clockwise until dial gauge reads approximately 3 needle revolutions before-top-dead-center.
6 Slowly turn flywheel counterclockwise until dial gauge reads ignition advance setting listed in specifications table.

Ignition timing. B.T.D.C	
IT250H	1 65 mm ± 0 1 mm
	(0 065 in ± 0 004 in)
	16.5°/5,000 r p.m
IT465H	2.07 mm ± 0.1 mm
	(0 081 in ± 0 004 in)
	16°/2,000 r p m

7 Punch a new mark on the crankcase matching the one on the flywheel.

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

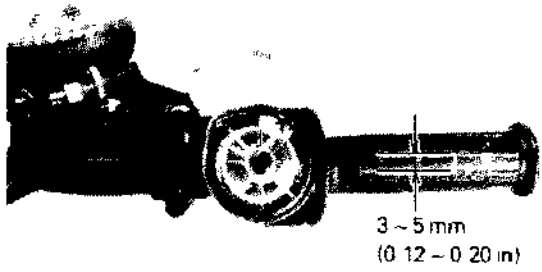


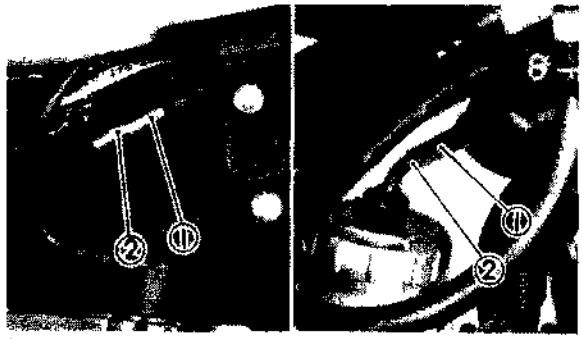
8. Remove the magneto flywheel using the magneto holder and flywheel puller.

9. Loosen the base set screws and turn the base right or left until the base mark aligns the case mark. And tighten the base set screws.
10. Reinstall the flywheel and tighten the nut.
11. Remove the dial gauge assembly and stand. Install the spark plug and muffer.

Spark plug torque: 2.5 m-kg (16 ft-lb)

12. Install the crankcase cover.





1 Adjuster 2 Lock nut

Carburetor

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

- Throttle cable freeplay adjustment.
- Idle mixture/ Idling speed adjustment

Throttle cable adjustment

NOTE:

Idle speed should be set before making this adjustment.

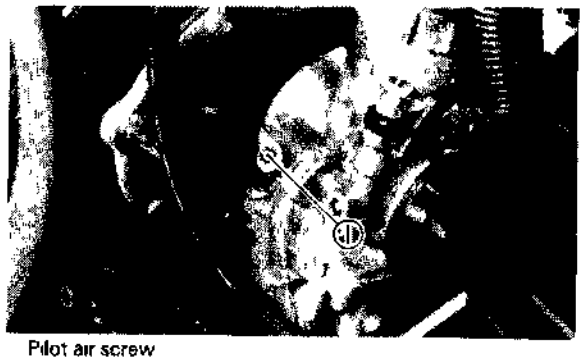
The throttle grip should have a play of 3 ~ 5 mm (0.12 ~ 0.20 in) in the turning direction at the grip flange. If the play is not in this range, take the following steps for adjustment.

1. Loosen the lock nut on the center of the throttle cable, and turn the adjuster in and out so the play is correct. After the adjustment, be sure to tighten the lock nut.
2. If the play is still incorrect after the adjuster is loosened 5 mm (0.20 in), make an adjustment with the adjuster on the carburetor side.

After adjustment, start the engine and check that the throttle grip turns smoothly. Also check if the engine speed increases suddenly when the handlebars are turned to limits in either direction.

Idle speed adjustment

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

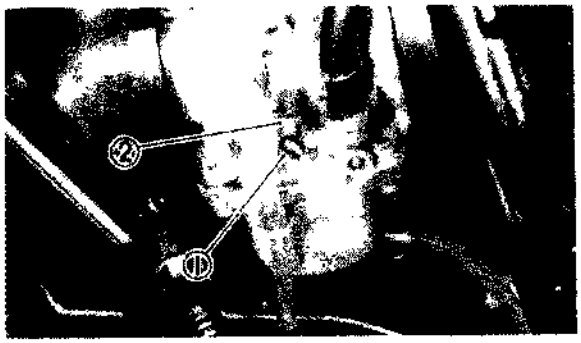

Pilot air screw

Pilot air screw turns out: 1 and 1/2

3. Turn the throttle stop screw until idle is at desired rpm.

NOTE:
A lock nut is incorporated for positive retention of throttle stop screw.

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



1 Throttle stop screw 2 Lock nut

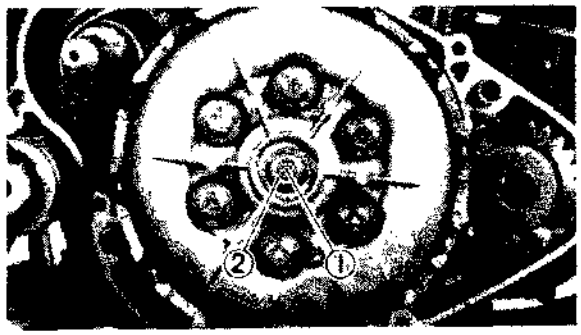
NOTE:
Pilot air and throttle stop screws should be so adjusted that engine response from idle position is rapid and without hesitation.

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 eliminated.

CLUTCH

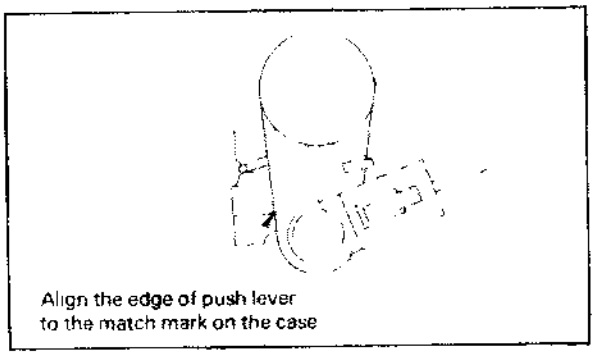
Mechanism adjustment

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



1 Adjuster 2 Lock nut

6. By turning the cable in-line length adjuster bring the edge of push lever to align with the match mark on the case, and tighten the lock nut.



Align the edge of push lever to the match mark on the case

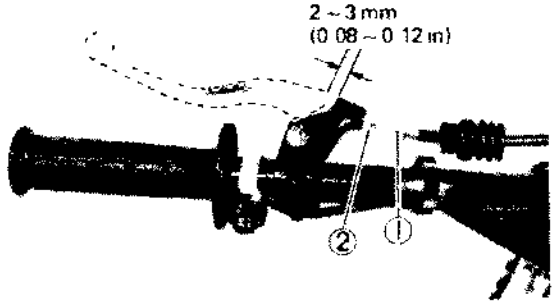
7 Tighten the mechanism adjuster until resistance is felt, and tighten the lock nut.

Tightening torque: 0.8 m-kg (6 ft-lb)

Lever adjustment

The clutch should be adjusted to suit rider preferance within a 2 ~ 3 mm (0.08 ~ 0.12 in) free play at the clutch lever pivot side.

1. Remove the brush guard
2 Loosen the lever adjuster lock nut and turn the lever adjuster either in or out until proper lever free play is achieved Tighten the lock nut

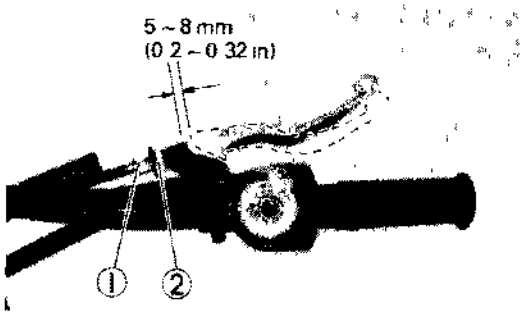


1 Adjuster 2 Lock nut

Front brake

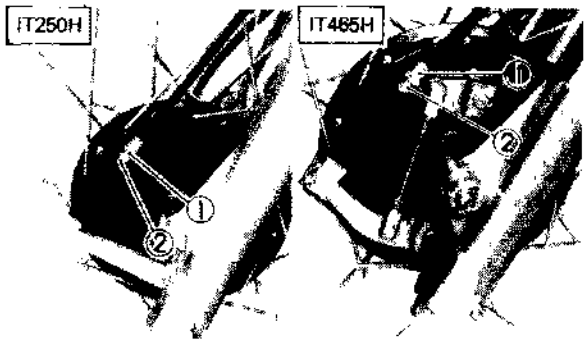
Front brake should be adjusted to suit rider preference within a 5 ~ 8 mm (0.2 ~ 0.32 in) free play at the brake lever pivot side.

1. Remove the brush guard and loosen the adjuster lock nut.
2. Turn the cable length adjuster in or out until adjustment is suitable.
3. Tighten the adjuster lock nut.



1 Adjuster 2 Lock nut

4 When adjusting the cable length on the brake hub side, first screw in the adjuster on the brake lever side and adjust to specification.

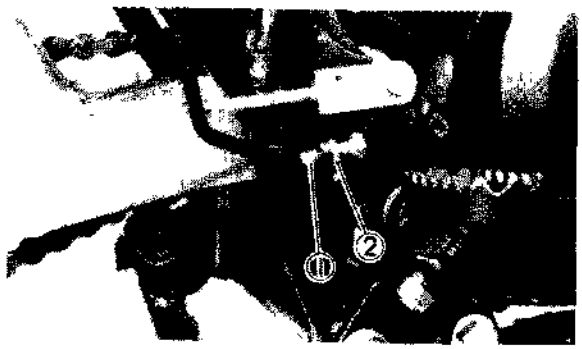


1 Adjuster 2 Lock nut

Brake pedal position adjustment

The position of the rear brake pedal should be adjusted to suit the rider. Loosen the lock nut and adjust the pedal height by turning the adjuster.

After adjusting, check for correct rear brake play. Do not forget to tighten the lock nut



1 Adjuster 2 Lock nut

Rear brake

The rear brake should be adjusted to suit rider preference within a 20 ~ 30 mm (0.8 ~ 1.2 in) free play at the brake pedal end. To adjust, turn the adjuster on the brake rod clockwise to reduce play; turn the adjuster counter-clockwise to increase play.

NOTE:

Rear brake pedal adjustment must be checked whenever chain is adjusted or rear wheel is removed and them re-installed



1 Adjusting nut

Drive chain tension check

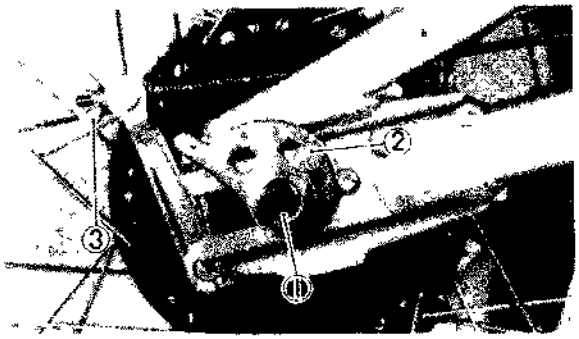
To check the chain play, the machine must stand vertically with its both wheels on the ground and without operater on it.

Check the tension at the position shown in the illustration The normal vertical deflection is approximately 10 ~ 15 mm (0.4 ~ 0.6 in) If the deflection exceeds 15 mm (0.6 in) adjust the chain tension.



Adjustment

1 Loosen the rear brake adjuster
2 Loosen the rear wheel axle nut.
3 Turn chain puller both left and right, until axle is situated in same cam slot position.



1 Axle nut 2 Chain puller 3 Adjusting nut

NOTE:

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

4 Tighten the rear axle nut

Torque: 10.0 m-kg (70 ft-lb)

5 Check brake pedal freeplay

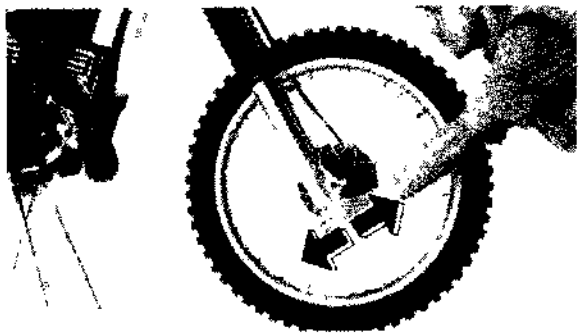
CAUTION:

Whenever the chain is adjusted and/or the rear wheel is removed, always check during reassembly:

1. Rear axle alignments.
2. Brake pedal free play

Steering head adjustment

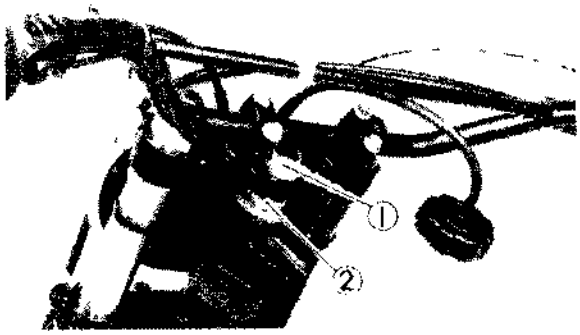
1 With front wheel elevated, grab bottoms of fork legs and gently push and pull to check steering head free play There should be no noticeable free play



NOTE:

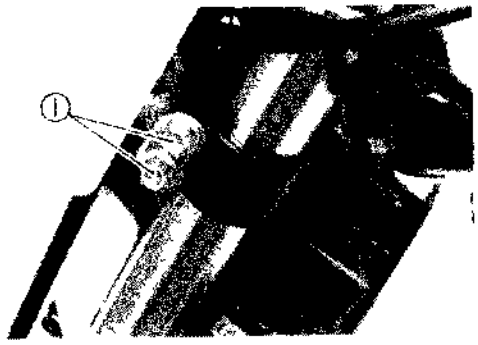
Forks must swing from lock to lock without binding or catching If it is felt, check the bearing or loosening

2 To adjust, first loosen upper stem pinch bolt
3 Loosen steering fitting bolt.



1 Steering fitting nut 2 Ring nut

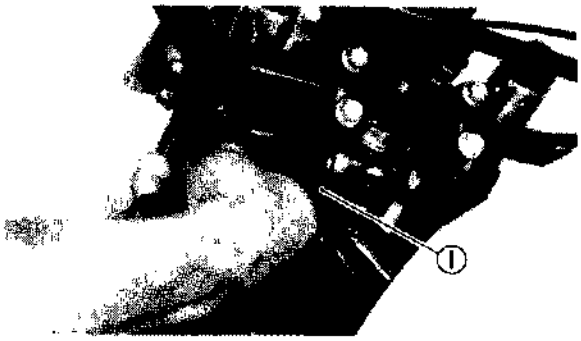
4 Loosen the front fork pinch bolts and slide the handle crown up



1 Fork pinch bolt

5. Use steering nut wrench to tighten ring nut. Tighten until free play is eliminated.

Tightening torque: 0.7 m-kg (5 ft-lb)



1 Steering nut wrench

6. Tighten fitting bolt and torque to specification.

Fitting bolt torque: 9.5 m-kg (86 ft-lb)

7 Tighten pinch bolt at fork crown and torque to specification.

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

8. Tighten fork pinch bolts and torque to specification.

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

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.

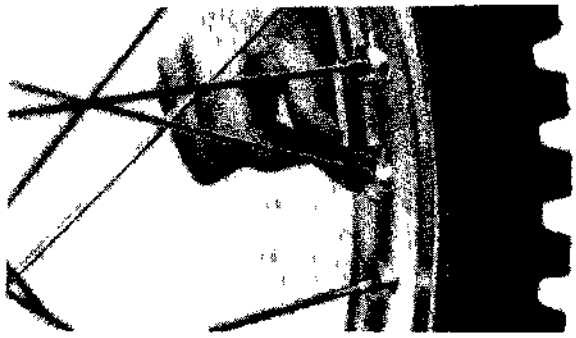


IT250H	Size	Pressure
Front	3.00-21-4PR	1.0 bar (1.0 kg/m², 14 psi)
Rear	5.10-18-4PR	1.0 bar (1.0 kg/m², 14 psi)

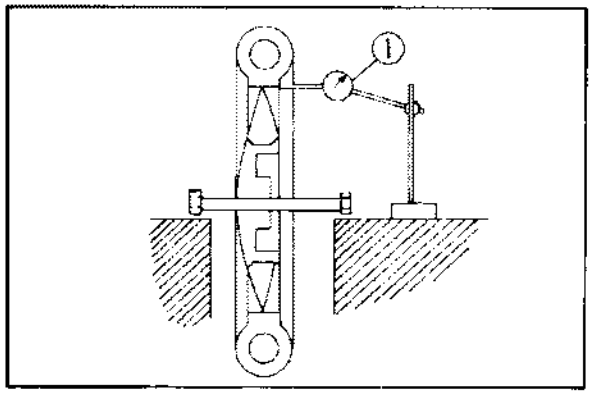
IT465H	Size	Pressure
Front	3.00-21-4PR	1.0 bar (1.0 kg/m², 14 psi)
Rear	5.60-18-4PR	1.0 bar (1.0 kg/m², 14 psi)

Check the spokes and rims

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



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.



1 Dial gauge

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

MAINTENANCE AND MINOR REPAIRS

PREPARATION FOR SERVICE

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

ENGINE

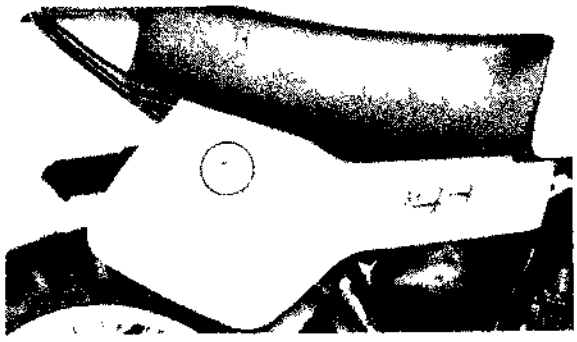
AIR FILTER

The air filter protects the engine from dirt which can enter with the intake air and cause rapid engine wear

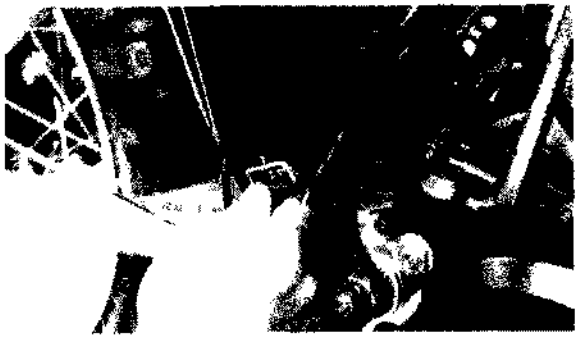
This model uses double layer element should be cleaned at every heat

Removal

1 Remove the screws and remove the right side cover.



2. Remove the element cover.



3 Remove the two wing nuts from the element case and pull out the double-layer element from the case Separate the elements from guide



1 Wing nut 2 Double layer elements



Cleaning

[Element 1]

1. Wash the filter gently, but throughly, in solvent.
2. Squeeze the excess solvent out of the filter and let dry.
3. Reinstall the element 1 to the right side cover

[Double-layer element]

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

NOTE:

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

5. Coat the sealing edges of the filter with light grease. This will provide an air-tight seal between the filter case cover and filter seat.



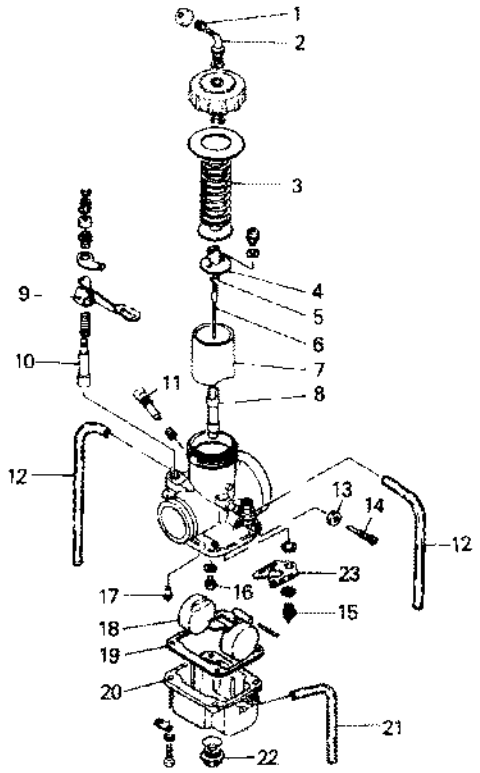
6. Reinstall the filter assembly and parts removed for access.

NOTE:

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

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.

CARBURETOR



1	Cable adjusting nut	13	Lock nut
2	Cable guide tube	14	Throttle screw
3	Throttle valve spring	15	Valve seat ass y
4	Clip	16	Main jet
5	Connector	17	Pilot jet
6	Needle	18	Float
7	Throttle valve	19	Float chamber gasket
8	Main nojle	20	Float chamber body
9	Starter lever	21	Over flow pipe
10	Starter plunger	22	Screw plug
11	Air adjusting screw	23	Plate
12	Air vent pipe		

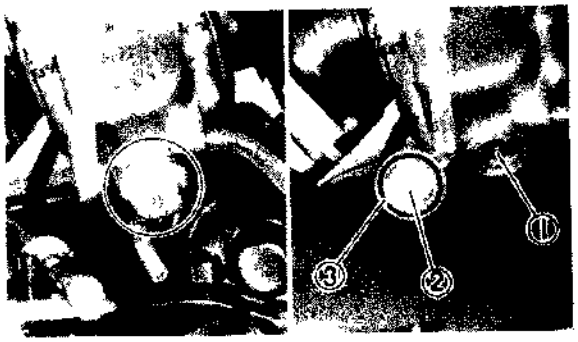
Replacement of main jet

1. Turn fuel cock lever to the "OFF" position
2. Disconnect the fuel hose.
3. Loosen the manifold and inlet joint bands (hose clamps)
4. Rotate carburetor, exposing main jet cover bolt
   Remove bolt. Main jet is located directly behind bolt
5. Remove the main jet. Change as required. Reinstall cover bolt and reassemble, reversing steps 1 through 3

Standard Main Jet Size	
IT250H	#400
IT465H	#380

WARNING:

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



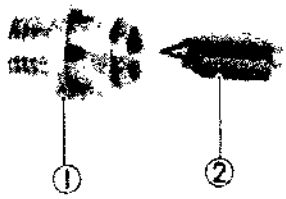
1 Main jet 2 Cover bolt 3 O ring

IMPORTANT:

The 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 changes must be made with great care. Improper carburetor setting changes will cause poor engine performance and possible engine damage. Please consult your YAMAHA dealer about any carburetor setting changes before actually going about them.

Inspection

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



1 Valve seat 2 Float valve

Adjustment

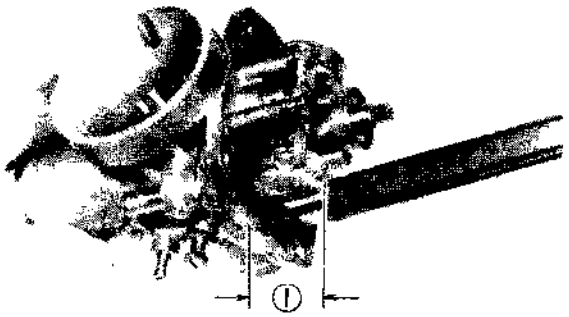
1. Float height

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) to the top of the float using a gauge.

Float height:
IT250H. . 18.1 ± 1 mm (0.7 ± 0.04 in)
IT465H. . . 27 ± 1 mm (1.1 ± 0.04 in)

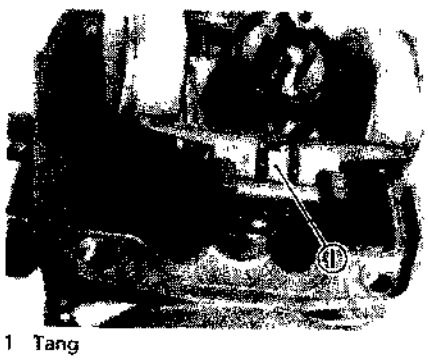


1 Float height

b. Adjustment

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

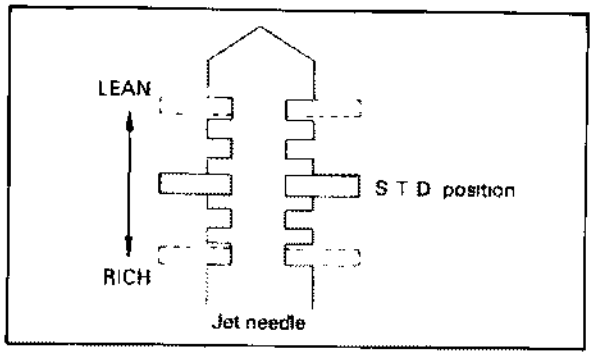
Make the adjustment by bending the tang on the float arm.



1 Tang

2. Jet needle adjustment

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 midrange air/fuel mixture characteristics of the machine, the jet needle position may be changed. Move the jet needle up for a leaner condition or toward the bottom position for a richer condition.



Troubleshooting

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

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

NOTE:

See MECHANICAL ADJUSTMENTS for additional carburetor adjustments.

Pilot air screw
Turning the screw in decreases the air supply, giving a richer mixture.

Pilot jet
Changing the jet to one with a higher number supplies more fuel to the circuit giving a richer mixture.

Throttle valve (slide)
Throttle valves are numbered according to the angle of the cutaway. The higher the number, the more cutaway, the leaner the mixture

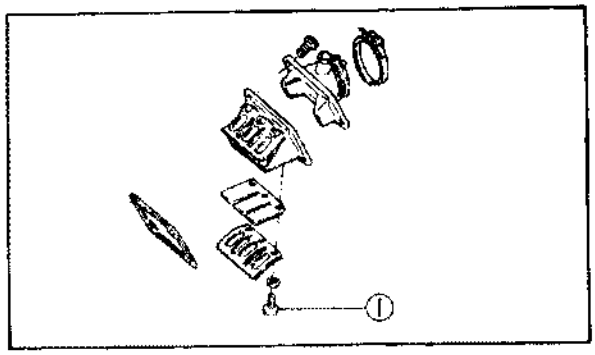
Jet needle
Moving the needle clip from the first, or top groove, through the fifth, or bottom groove, will give a correspondingly richer mixture.

Main jet
Changing the jet to one with a higher number supplies more fuel to the main nozzle giving a richer mixture.

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

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

REED VALVE

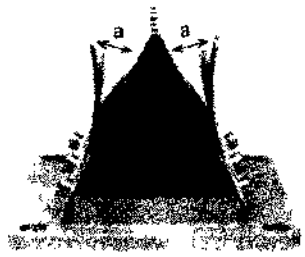


Inspection

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 value "a". 12 mm (0.472 in)

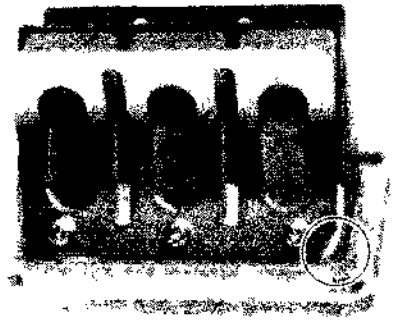
If it is 0.2 mm (0.008 in) more or less than specified, replace the valve stopper



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

Reed valve bending limit· 0 6 mm (0.024 in)

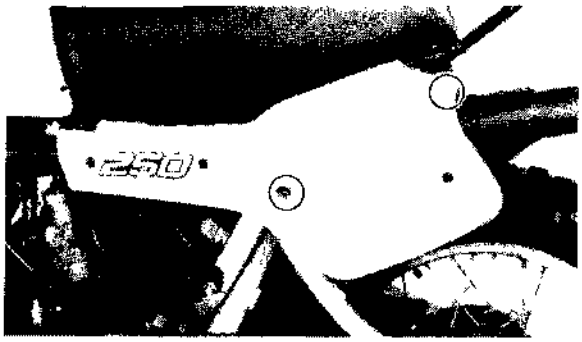
5 During reassembly, note the cut in the lower corner of the reed and stopper plate Use as aid to direction of reed installation

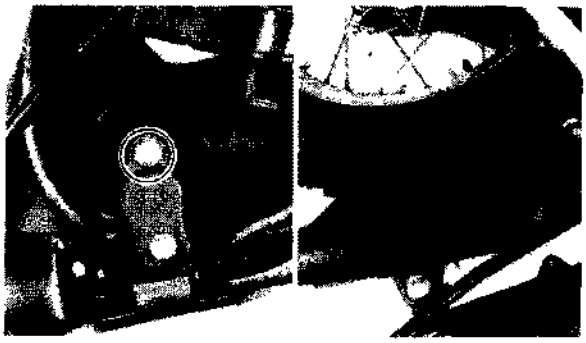


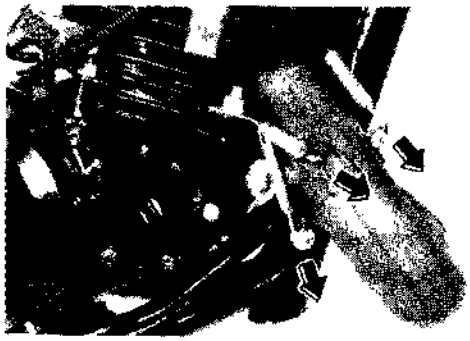
MUFFLER

Removal

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







Maintenance

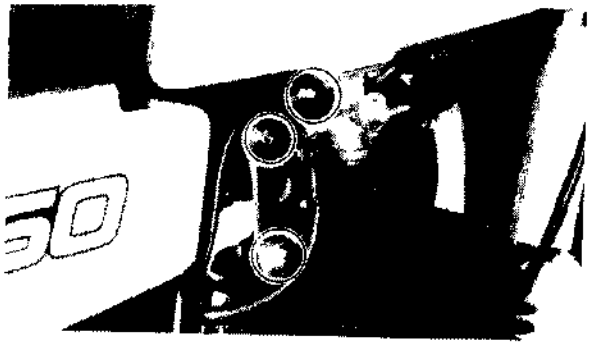
1. Using a rounded scraper, remove excess carbon deposits from manifold area of exhaust pipe.
2. Carbon deposits within the silencer may be removed by lightly tapping the outer shell with a hammer and then blowing out with compressed air. Heavy wire, such as a coat hanger, may be inserted to break loose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

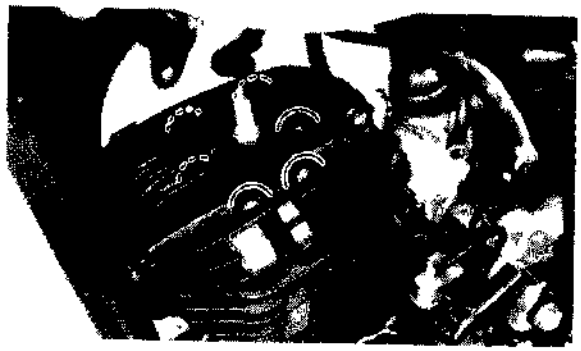
TOP END

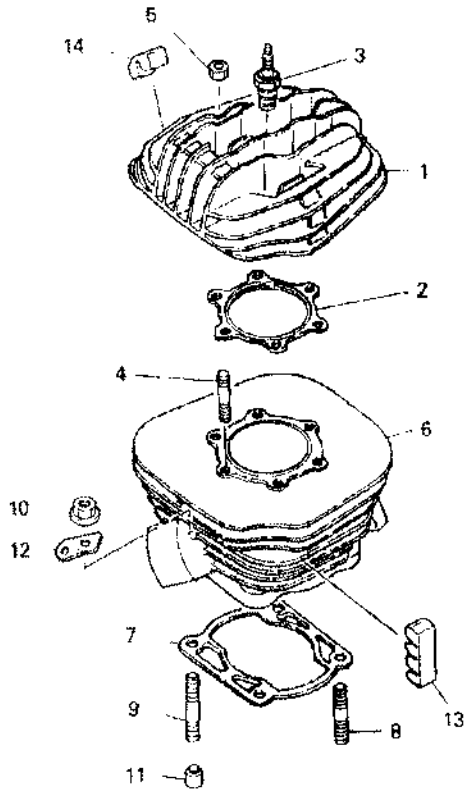
Removal

1. Remove the Y.E.I.S. air chamber and hose.
2. Remove the spark plug lead wire. Loosen, but do not remove spark plug.
3. Remove the cylinder head holding bracket. And remove nuts securing cylinder head (6 nuts) Remove cylinder head and gasket.

Upper	Bracket to frame Bracket to head	2.0 m-kg (14 ft-lb) 3.0 m-kg (22 ft-lb)
Cylinder head nut		2.5 m-kg (18 ft-lb)







1 Cylinder head
2 Cylinder head gasket
3 Spark plug
4 Stud bolt
5 Nut
6 Cylinder
7 Cylinder gasket
8 Stud bolt
9 Stud bolt
10 Flange nut
11 Dowel pin
12 Hook bracket
13 Absorber
14 Absorber

4. Remove the cylinder holding nuts (4). 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 and base gasket

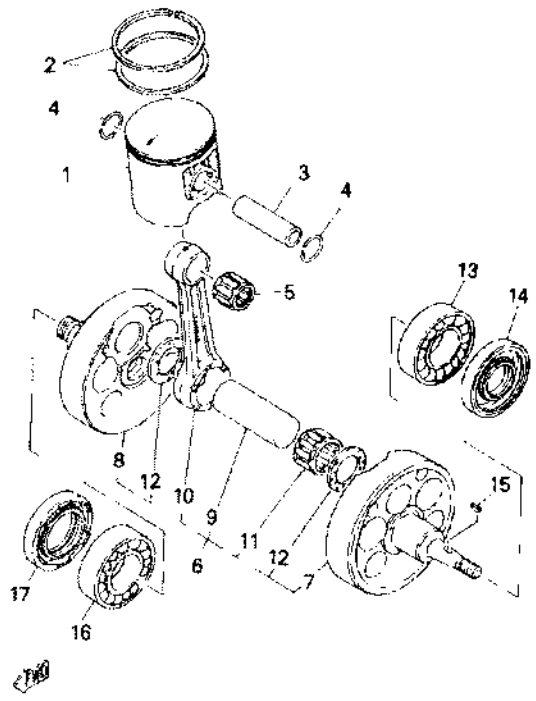
Cylinder holding nut: 6.0 m-kg (43 ft-lb)

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



NOTE:

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

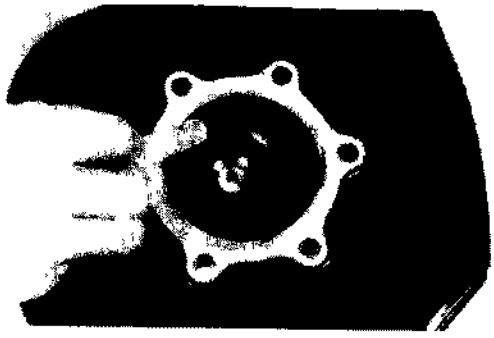


1	Piston	10	Connecting rod
2	Piston ring	11	Cylindrical bearing
3	Piston pin	12	Washer
4	Circlip	13	Bearing
5	Cylindrical bearing	14	Oil seal
6	Crankshaft assy	15	Woodroff key
7	Crank	16	Bearing
8	Crank	17	Oil seal
9	Crank pin		

MAINTENANCE

Cylinder head

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



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



Cylinder

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

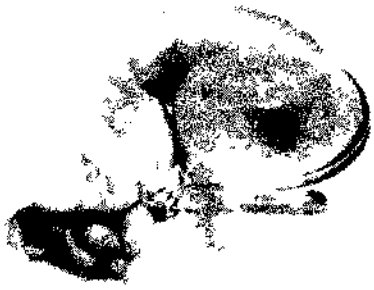


2. Check cylinder bore. Using a cylinder hone, remove any scoring. Hone lightly, using smooth stones. Hone no more than required to avoid excess piston clearance

Ring end gap (installed)
0.3 ~ 0.5 mm (0.012 ~ 0.020 in)

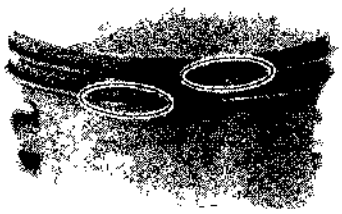


2. Holding cylinder towards light, check for full seating of ring around bore. If not fully seated, check cylinder If cylinder is not out-of-round, replace piston ring.
3. Fit the piston rings in the grooves, and measure the side clearance. If it measures more than 0.1 mm, replace both piston and piston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



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

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



Piston pin, bearing

1. 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.
2. During reassembly, apply a liberal coating of two-stroke oil to the piston pin and bearing. Apply several drops of oil to the connecting rod big end. Apply several drops of oil into each crankshaft bearing oil delivery hole.

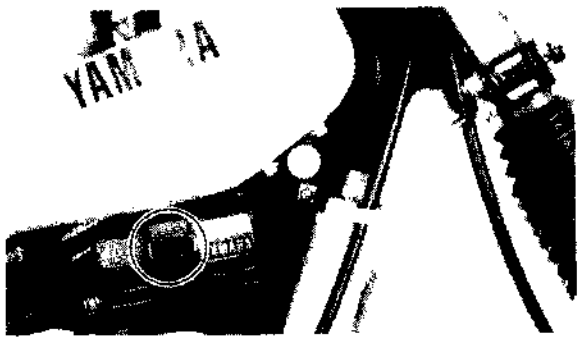


Yamaha Energy Induction System (Y.E.I.S.) (IT250H)

Never attempt to modify the Yamaha Energy Induction System.

The air chamber and hose should be handled with special care
Any imperfect connection or installation of these parts or damaged parts will have an adverse effect on the performance of the system Check parts, and be sure to replace any defective one

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



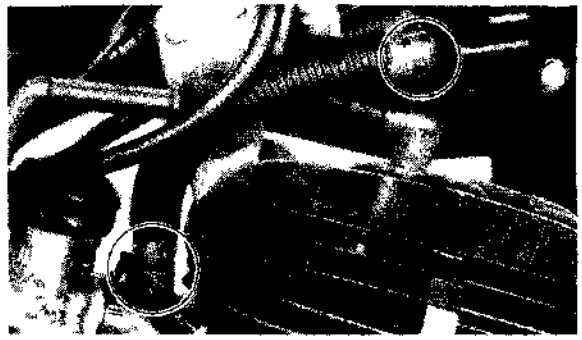


Inspection

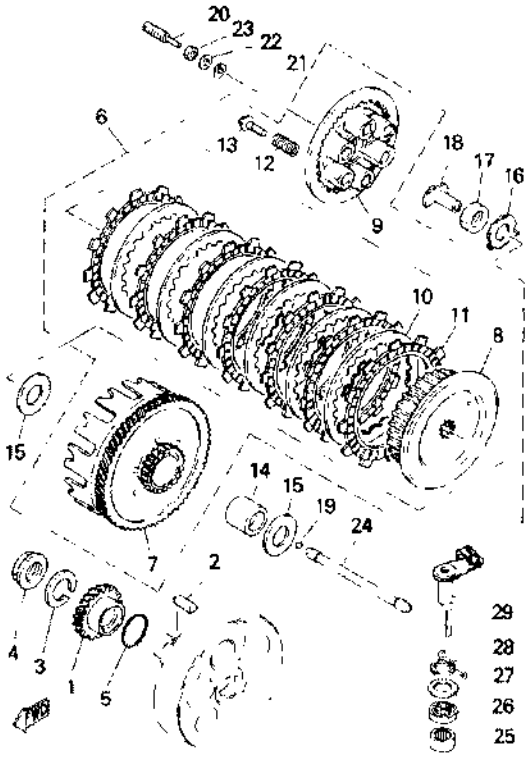
1. Check the hose and air chamber for cracks or any other damage. If there is any cracks or damage, replace them.



2. Check the tightness of hose clip, and retighten as required.



CLUTCH



1 Primary drive (24T) gear
2 Straight key
3 Spring washer
4 Nut
5 O ring
6 Clutch assy
7 Primary driven gear comp (63T)
8 Clutch boss
9 Pressure plate
10 Clutch plate
11 Friction plate
12 Compression spring
13 With washer screw
14 Spacer
15 Thrust plate
16 Lock washer
17 Nut
18 Push rod
19 Ball
20 Screw
21 Spring washer
22 Plate washer
23 Nut
24 Push rod
25 Cylindrical bearing
26 Oil seal
27 Plate washer
28 Torsion spring
29 Push lever assy

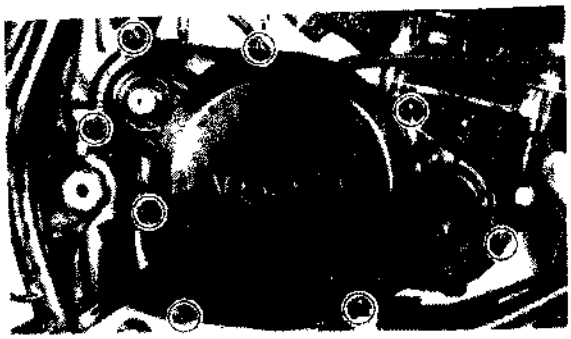
NOTE:
Clutch adjustment is covered in "Adjustments and Maintenance".

Removal

1. Remove the oil plug and drain plug, and drain the transmission oil
2. Remove the right side engine guard.



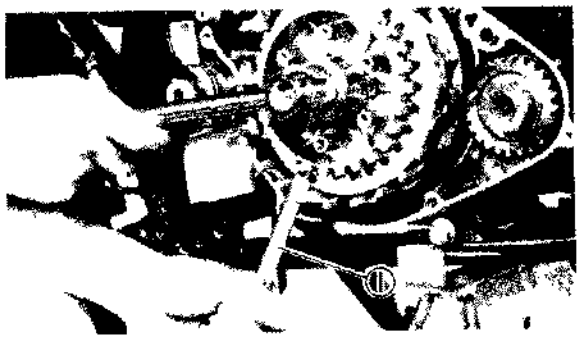
3. Remove the rear brake adjuster and remove the footrest. Remove the kick starter.



4. Remove the allen bolts holding the side cover in place and remove the cover. Note the position of the dowel pins.
5. Remove the phillinps screws (6) holding the pressure plate. Remove the clutch springs, pressure plate and push rod. Remove the clutch plates and friction plates

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

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

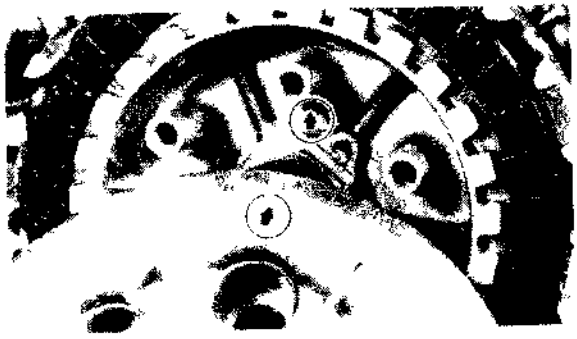


1 Clutch holding tool (90890 01024)

Clutch lock nut torque	7.5 m-kg (54 ft-lb)

Primary drive gear nut torque	7.5 m-kg (54 ft-lb)

6. If the clutch housing spacer remains on the transmission main shaft, remove it. Remove the thrust plate and thrust plate spacers
7. When installing the clutch pressure plate, align arrow mark on clutch boss and pressure plate mark



Troubleshooting

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

	New	Wear limit
Friction plate thickness	3.0 mm (1.12 in)	2.7 mm (0.106 in)



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

NOTE:

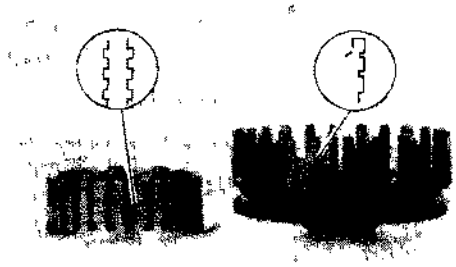
For optimum performance, if any plate requires replacement, it is advisable to replace the entire set.

3. Check each clutch plate for signs of heat damage and warpage. Place on surface plate (plate glass is acceptable) and use feeler gauge as illustrated. If warpage exceeds tolerance, replace.



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

4. Check dogs on driven gear (clutch housing). Look for cracks and signs of galling on edges. If moderate, deburr. If severe, replace.

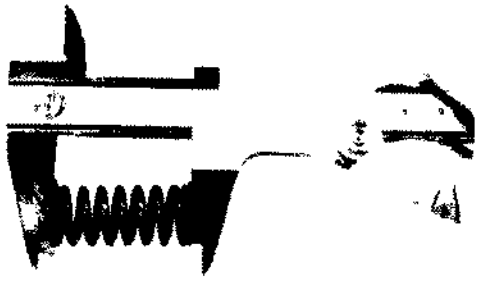


5. Measure each clutch spring. If beyond tolerance, replace.

		New	Min.
Clutch spring free length	IT250H	36.4 mm (1.43 in)	35.4 mm (1.41 in)
	IT465H	36.0 mm (1.42 in)	35.0 mm (1.38 in)

NOTE:

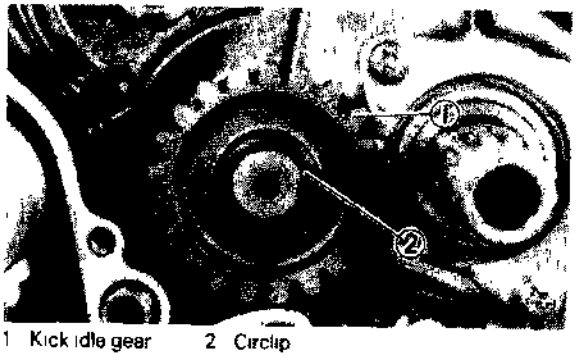
For optimum clutch operation it is advisable to replace the clutch springs as a set if one or more are faulty.



KICK STARTER

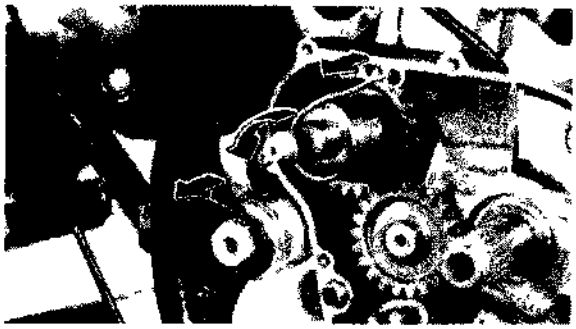
Removal

1. Remove the circlip and then remove kick idle gear and washers.



1 Kick idle gear 2 Circlip

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

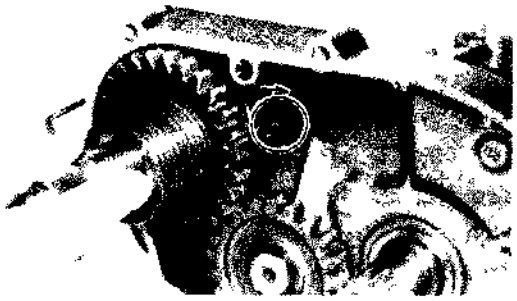


Inspection

1. 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 ass'y be sure to check wherethere it operates smoothly or not

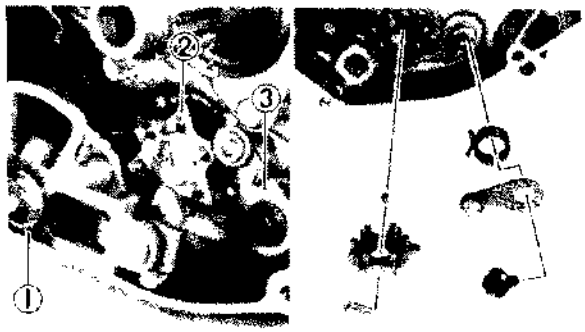
SHIFTER

NOTE:

Shifter maintenance should be performed with clutch assembly removed.

Removal

1 Pull out the change lever assembly.
2 Shift into 2nd gear and unhook the stopper spring
3. Remove the flange bolt, stopper lever and spring.
4 Remove the flat head screw and remove the shift cam, washer and straight key.



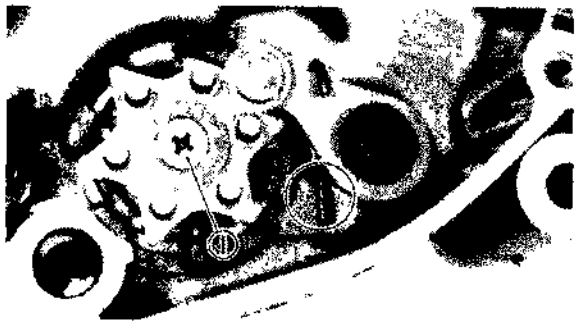
1 Change lever assembly
2 Segment 3 Stopper lever

Inspection

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

Installation

1. Apply a holding agent, such as "Loc-Tite", to threads of flat head screw.
2 Engage the shift return spring with its home position

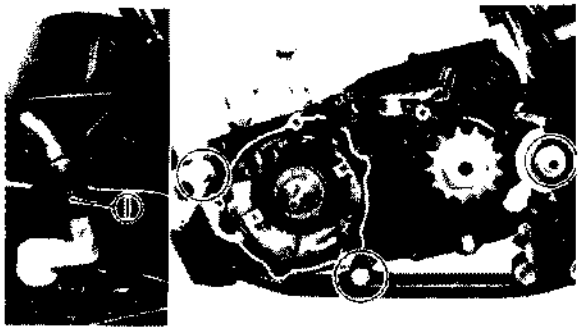


1 Apply a holding agent

CRANKCASE

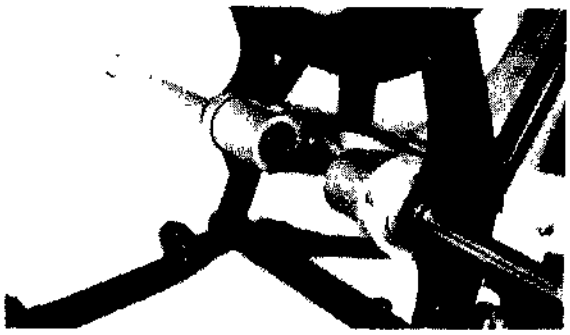
Engine removal

1 Remove the clutch cable.
2. Remove the right side engine guard.
3. Remove the magneto base, change pedal, and chain cover.
4. Remove the chain and two engine mounting bolts.



1 Clutch wire

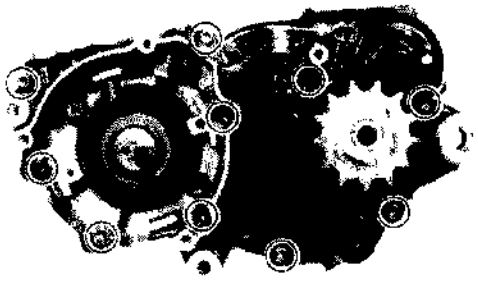
5. Remove the nut and pull out the pivot shaft about 2/3 of its length.



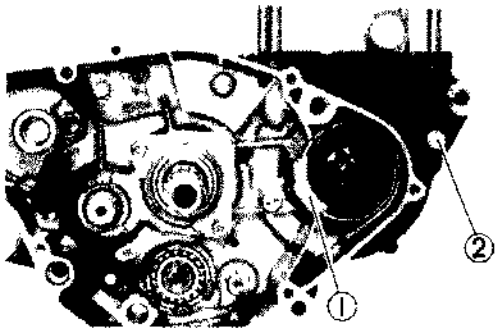
NOTE:

Do not pull it all the way out, or the swing arm will come off the frame.

6. Remove the engine from right side of frame.
7. Working in a crisscross pattern, loosen panhead screws 1/4 turn each. Remove them after all are loosened.



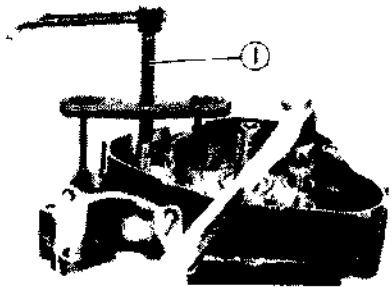
8. Remove the oil seal retainer and plug. Install crankcase separating tool as shown.



1 Retainer 2 Plug

NOTE:

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

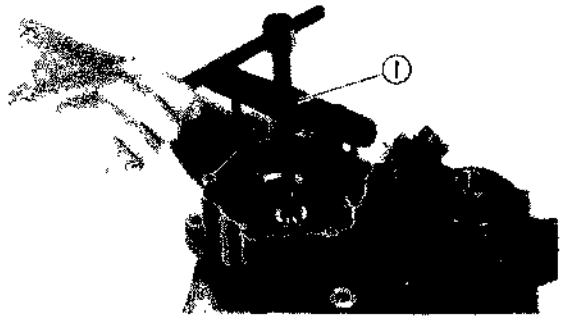


1 Crankcase separating tool

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

Crankshaft

1. Remove crankshaft assembly with crankcase separating tool.



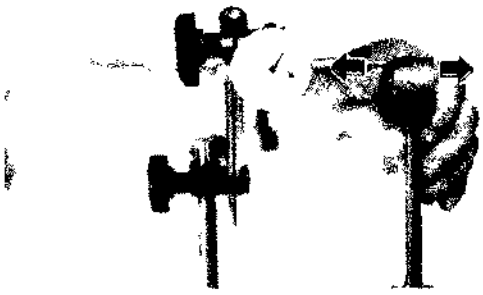
1 Crankcase separating tool

Inspection

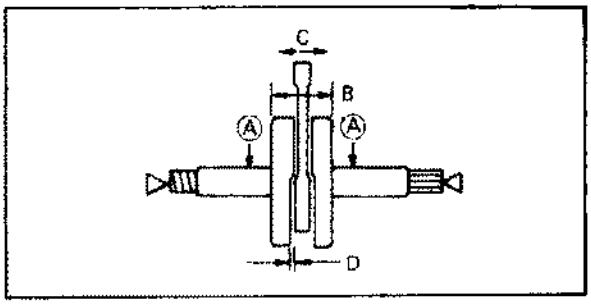
1. The crankshaft requires the highest degree of accuracy in engineering and servicing
2. The crankshaft is susceptible to wear and therefore the crank bearing must be inspected with special care.
3. Check crankshaft components.

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

Connecting rod axial play (C):
0.4 ~ 2.0 mm (0.06 ~ 0.079 in)



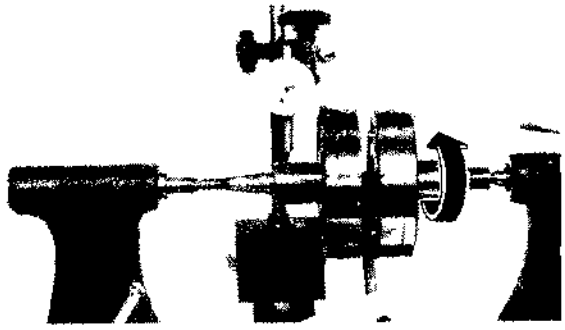
b. Remove the dial gauge and slide the connecting rod to one side. Insert a thickness gauge between the side of the connecting rod big end and the crank wheel. Measure clearance.





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

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



Unit: mm (in)

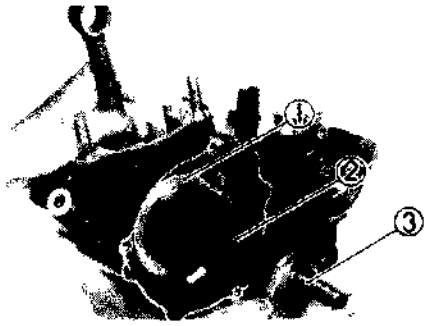
Deflection tolerance (A)		Flywheel width (B)
Left side	Right side	
0.03 (0.0012)	0.03 (0.0012)	IT250H $62^{+0}_{-0.05}$ ($2.44^{+0}_{-0.02}$) IT465H $66^{+0}_{-0.05}$ ($2.59^{+0}_{-0.02}$)

Crankshaft Installation

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

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

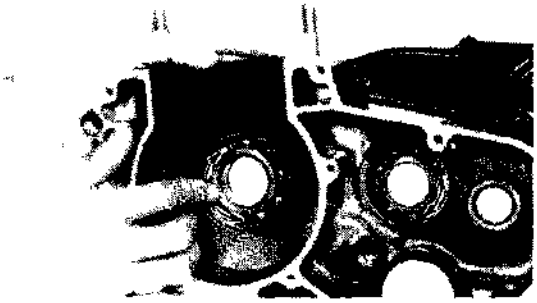
2. Hold the connecting rod at top dead center with one hand while turning the handle of the installing tool with the other. Operate tool until crankshaft bottoms against bearing.



1 Spacer
2 Crankshaft installer pot
3 Crankshaft installer bolt

Bearings and oil seals

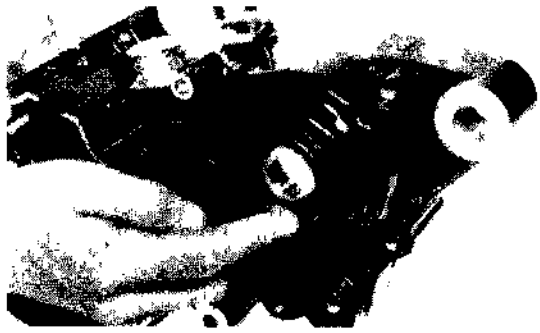
1. After cleaning and lubricating the bearings, rotate inner race with a finger. If rough spots are noticed, replace the bearing.



NOTE:

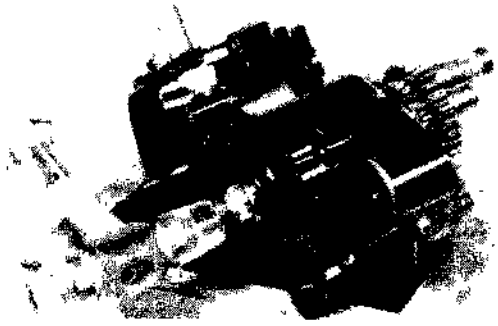
Bearing(s) are most easily removed or installed if the cases are first heated to approximately 90° ~ 120°C (194° ~ 248°F). Bring the case up to proper temperature slowly. Use an oven.

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



Transmission

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



NOTE:

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

Inspection

1. Inspect each shift fork for signs of galling on gear contact surfaces. Check for bending. Make sure each fork slides freely on its guide bar.
2. Roll the guide bars across a surface plate. If any bar is bent, replace.



3 Check the shift cam grooves for signs of wear or damage If any profile has excessive wear and/or any damage, replace cam.

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

5 Check shift cam dowel pins and side plate for looseness, damage, or wear. Repair as required, or replace.

6. Check the shift cam stopper plate, circlip, stopper for wear

7. Check the transmission shafts using a centering device and dial gauge If any shaft is bent, replace

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

9. Check to see that each gear moves freely on its shaft

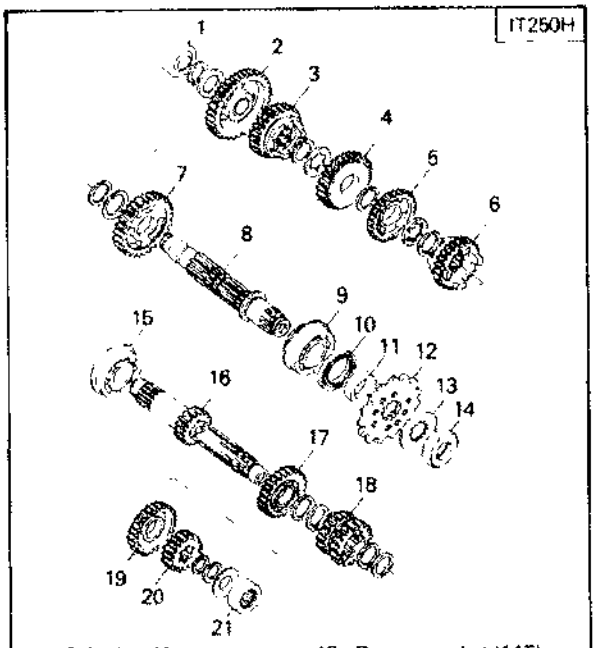
10 Check to see that all washers and clips are properly installed and undamaged. Replace bent or loose clips and bent washers

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

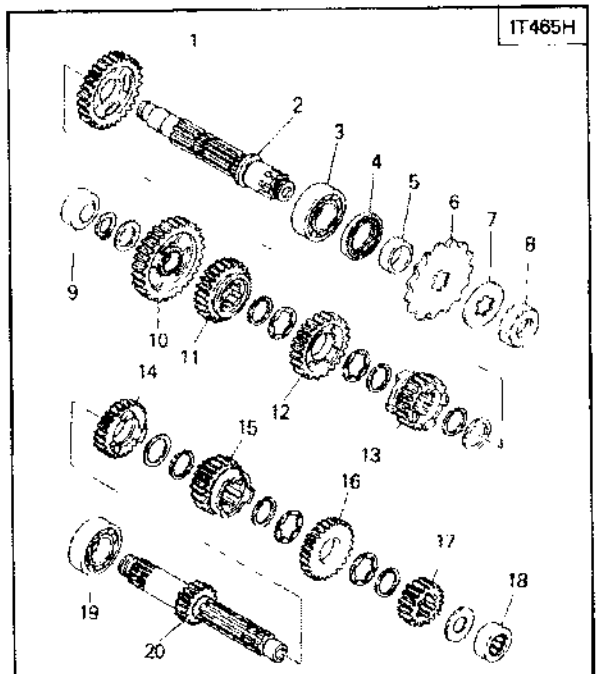
Installation

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

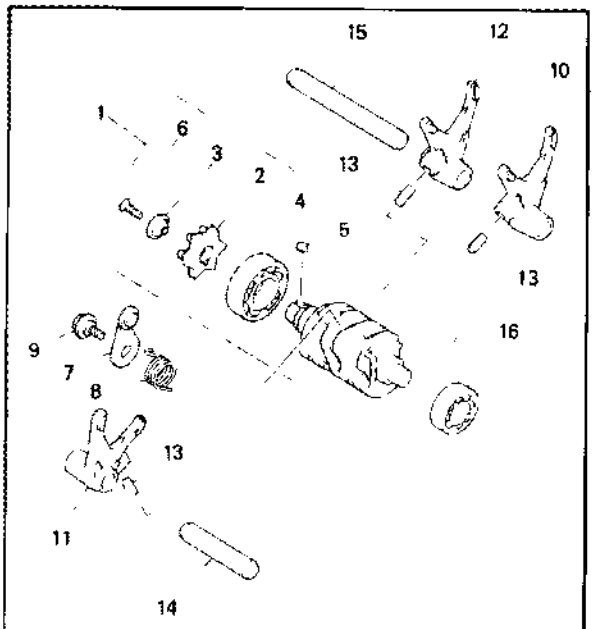




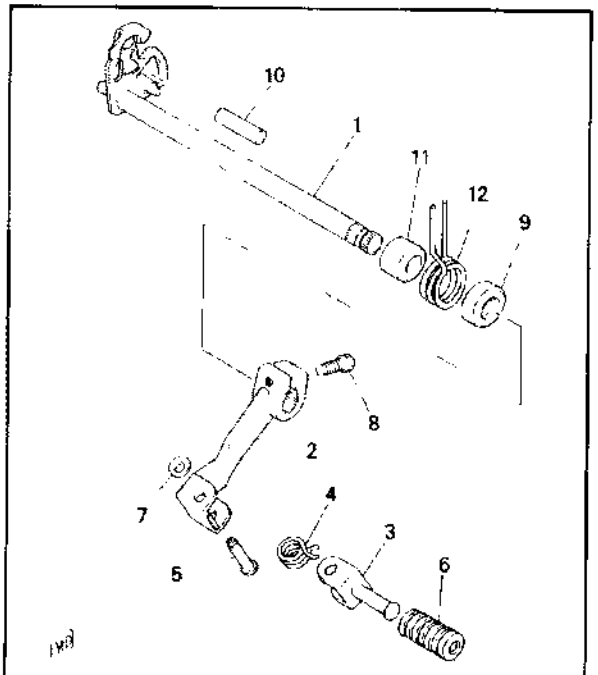
1 Cylindrical bearing
2 1st wheel gear (32T)
3 5th wheel gear (23T)
4 3rd wheel gear (25T)
5 4th wheel gear (25T)
6 6th wheel gear (21T)
7 2nd wheel gear (30T)
8 Drive axle
9 Bearing
10 Oil seal
11 Collar
12 Drive sprocket (14T)
13 Lock washer
14 Nut
15 Bearing
16 Main axle
17 5th pinion gear (22T)
18 3rd pinion gear (16T)
19 6th pinion gear (24T)
20 2nd pinion gear (15T)
21 Cylindrical bearing



1 2nd wheel gear (28T)
2 Drive axle
3 Bearing
4 Oil seal
5 Collar
6 Drive sprocket (14T)
7 Lock washer
8 Nut
9 Cylindrical bearing
10 1st wheel gear
11 4th wheel gear
12 3rd wheel gear (25T)
13 5th wheel gear (22T)
14 4th pinion gear (22T)
15 3rd pinion gear (19T)
16 5th pinion gear (28T)
17 2nd pinion gear (16T)
18 Cylindrical bearing
19 Bearing
20 Main axle



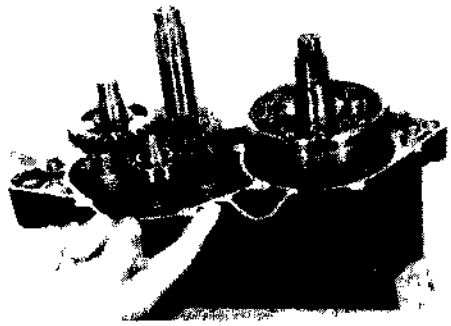
1 Shift cam assy
2 Segment
3 Side plate
4 Bearing
5 Straight key
6 Flat head screw
7 Stopper lever assy
8 Torsion spring
9 Stopper bolt
10 Shift fork
11 Shift fork
12 Shift fork
13 Dowel pin
14 Shift fork guide bar
15 Shift fork guide bar
16 Bearing (B6201)



1 Shift shaft assy
2 Shift pedal
3 Shift pedal
4 Torsion spring
5 Pin
6 Shift pedal cover
7 Plate washer
8 Bolt
9 Oil seal
10 Dowel pin
11 Spacer
12 Torsion spring

Reassembling

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



NOTE:

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

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

Mounting

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

Bolt		Tightening Torque
Front	Bracket to frame	3.0 m-kg (22 ft-lb)
	Bracket to engine	3.0 m-kg (22 ft-lb)
Center, Lower		3.0 m-kg (22 ft-lb)

Pivot shaft nut 8.0 m-kg (58 ft-lb)

2. Install drive sprocket.

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

3. Install flywheel magneto.

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

CHASSIS

FRONT FORKS

CAUTION:

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

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

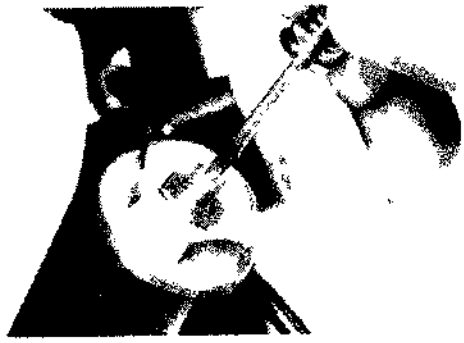
Air pressure maintenance

CAUTION:

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

1 Place a suitable stand under the engine to keep the front of machine raised off the floor. No weight on front wheel.

2 Using a slotted-head screwdriver, press the valve and keep it open from more than 5 seconds so that air can be let out from the inner tube



Standard air pressure: 0 kg/cm² (0 psi)

NOTE:

The difference of air pressure between both right and left tubes should be 0 05 kg/cm (0.7 psi) or less

Fork oil replacement

1 Place a suitable stand under the engine to keep the front of machine raised off the floor

2. Remove the rubber cap and valve cap.



1 Valve

3 Using a slotted-head screwdriver, press the valve and keep it open for more than 5 seconds so that the air can be let out from the inner tube

NOTE:

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

4 Remove the cap bolt assembly.
And remove the spacer, spring seat and fork spring

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



1 Drain screw

6 After most of oil has drained, slowly raise and lower outer tubes to pump out remaining oil

7 Install drain screws

NOTE:

Check gasket, replace if damaged

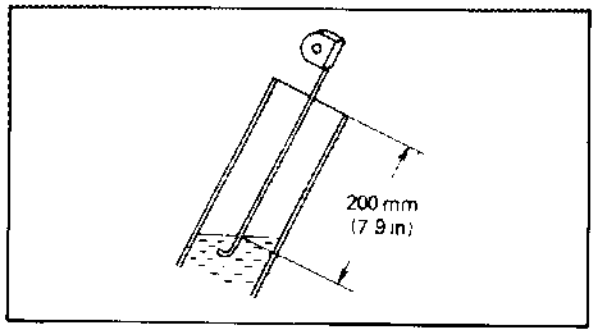
8. Measure correct amount of oil and pour into each leg

Recommended oil: Yamaha fork oil 10 wt or SAE #10 motor oil Oil quantity: 415 cc (14.0 oz)

NOTE:

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

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



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

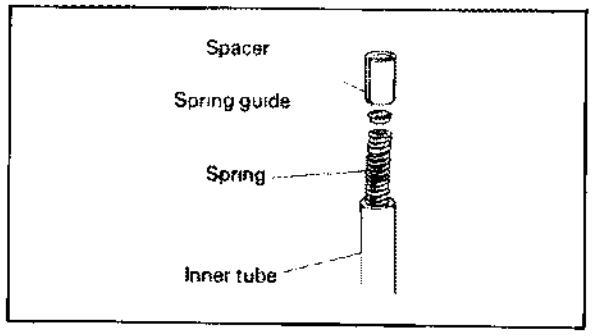


12. Install spacer, spring seat, fork spring and cap bolt and torque to specification.

Tightening torque: 2.3 m-kg (17 ft-lb)

Front fork spring replacement

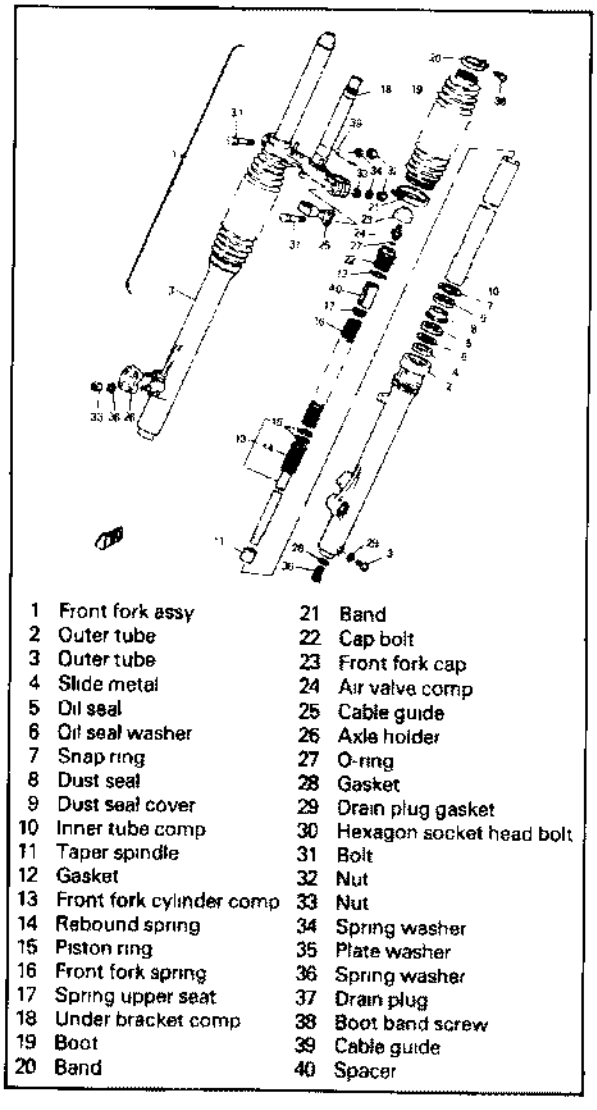
In addition to the standard type, two different type fork spring are sold. A proper spring should be selected according to the conditions of a racing course or the weight of the rider.



Type		Part No	Spring rate (kg/mm)	I.D. mark
Light duty	Spring	4V5-23141-10	$K_1 = 0.277$ $K_2 = 0.314$	
STD	Spring	4V5-23141-L0	$K_1 = 0.308$ $K_2 = 0.350$	
Heavy duty	Spring	4V5-23141-20	$K_1 = 0.339$ $K_2 = 0.385$	

NOTE:

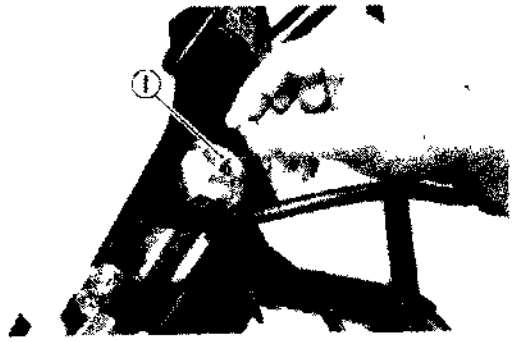
Always check the oil levels before changing or re-installing springs.



1	Front fork assy	21	Band
2	Outer tube	22	Cap bolt
3	Outer tube	23	Front fork cap
4	Slide metal	24	Air valve comp
5	Oil seal	25	Cable guide
6	Oil seal washer	26	Axle holder
7	Snap ring	27	O-ring
8	Dust seal	28	Gasket
9	Dust seal cover	29	Drain plug gasket
10	Inner tube comp	30	Hexagon socket head bolt
11	Taper spindle	31	Bolt
12	Gasket	32	Nut
13	Front fork cylinder comp	33	Nut
14	Rebound spring	34	Spring washer
15	Piston ring	35	Plate washer
16	Front fork spring	36	Spring washer
17	Spring upper seat	37	Drain plug
18	Under bracket comp	38	Boot band screw
19	Boot	39	Cable guide
20	Band	40	Spacer

Disassembly

1. Remove the rubber cap and valve cap, and extract the air completely by pushing the air valve.

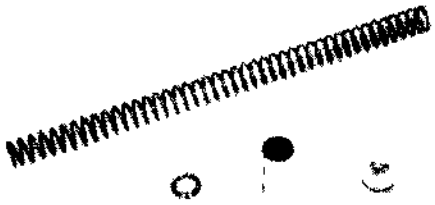


1 Valve

2 Loosen the cap bolt.

3. Remove the front fork assembly from the frame

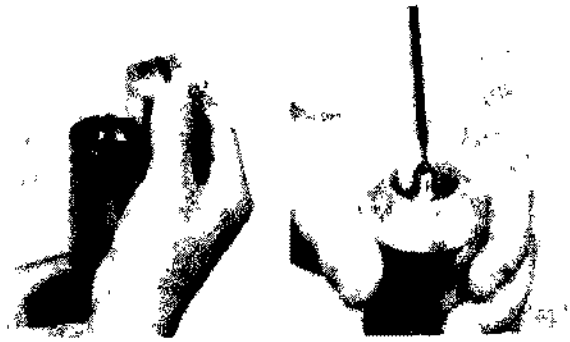
4 Remove the cap bolt assembly, spacer spring seat, and main spring.



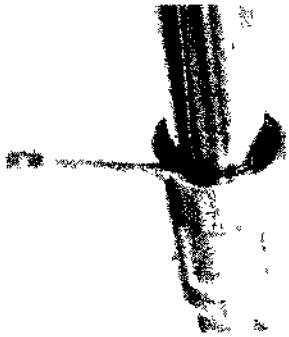
5. Stretch the inner tube, and fill with the front fork oil, then install the cap bolt.

NOTE:

After installing the cap bolt, bleed the air completely until oil flows out of the air valve.

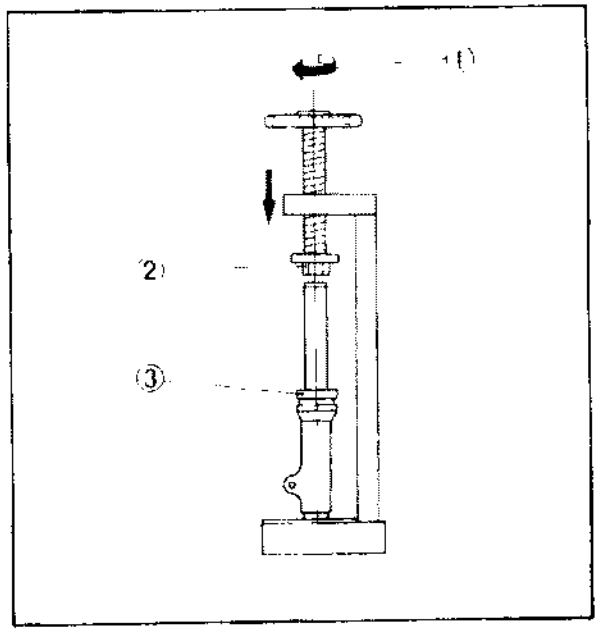


6 Remove the snap ring on the top end of the outer tube.



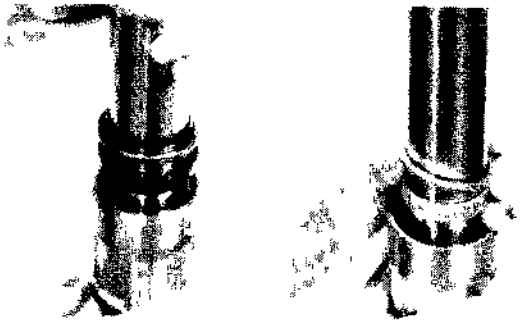
7 As illustrated, gently grip the top of the cap bolt with a hand press. Place the spacer on the cap bolt so that no load is imposed on the air valve

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

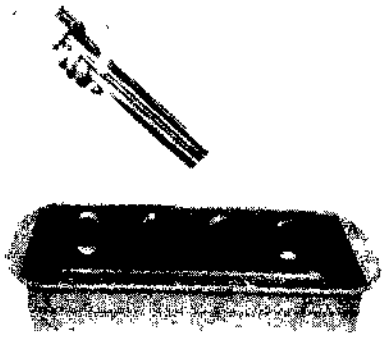


1 Turn slowly
2 Spacer
3 Wrap with rag

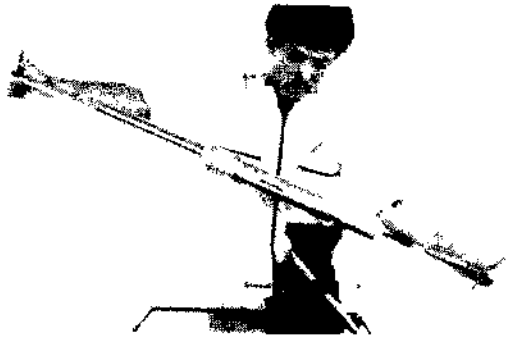
8. Remove the dust seal, oil seal, washer and slide metal.



9. Remove the cap bolt and drain the oil away. Remove the drain screw and drain the oil, too. When most of the oil is drained, slide the inner up and down so that remaining oil can be drained.



10. Contract the inner tube to its limit, and remove the cylinder holding bolt using the cylinder guide wrench.



11. While keeping the inner tube in the maximum contracted position, invert it and pull out the cylinder complete.

Keep the inner tube in the maximum contracted position so that the oil hole plug does not come off from the piston.

Reassembly

The assembly procedure is the reverse of the disassembly procedure.

1. Make sure all components are clean before assembly. Always install a new fork seal. Do not re-use a seal.



2. Contract the outer tube and inner tube complete to its limit, and insert the cylinder complete into it.

Never insert the cylinder complete while holding the inner tube vertically. If you do so, the cylinder complete will fall down quickly, thus damaging the valve inside.



3. When the cylinder fits over the oil hole plug, temporarily tighten the cylinder holding bolt.
4. Slip the slide metal, washer, oil seal, dust seal and dust seal cover over the inner tube, in that order, and then push the oil seal gently over the inner tube. The seal cover should be pushed down beyond the snap ring groove.

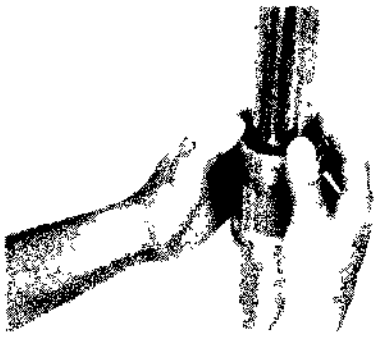
NOTE:

If the parts are pushed down too much, seals could be deformed and oil leakage may result.



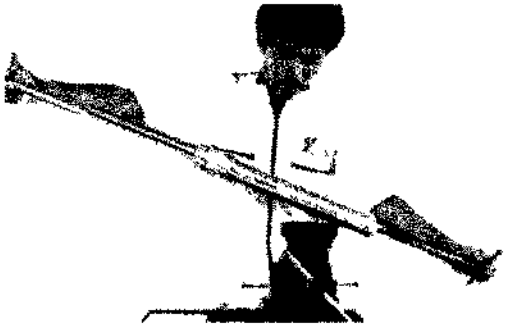


5. Install the snap ring on the groove around the inner tube.



6. Grip the outer tube in a vise and tighten the cylinder holding bolt to specification using the cylinder guide wrench.

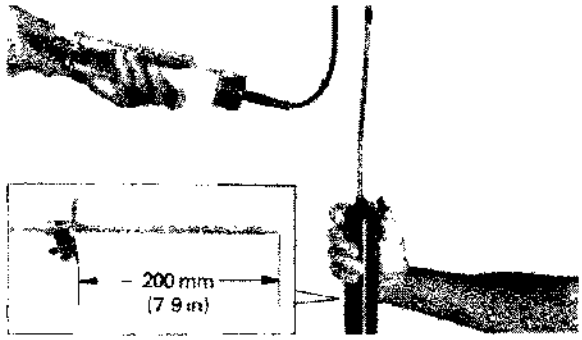
NOTE:
Apply a holding agent, such as "Loctite" to threads of cylinder holding bolt.



7 Install the drain screw and packing onto the outer tube.
8 Fill the fork with a specified amount of fork oil



To check the oil level, contract the inner tube to its maximum, and if the oil level from the top end of the inner tube is 200 mm, the oil level is correct.



9 Install the spring, spring seat, spacer, and install the cap
10 Remove the air valve cap, and check the air pressure to specification.

Standard air pressure: 0 kg/cm² (0 psi)

REAR SHOCK ABSORBER (MONO-CROSS SUSPENSION "DE CARBON" SYSTEM)

This shock absorber is provided with a separate type tank filled with high-pressure nitrogen gas. To prevent the danger of explosion, read and understand the following information before handling the shock absorber.
The manufacturer can not be held responsible for property damage or personal injury that may result from improper handling.

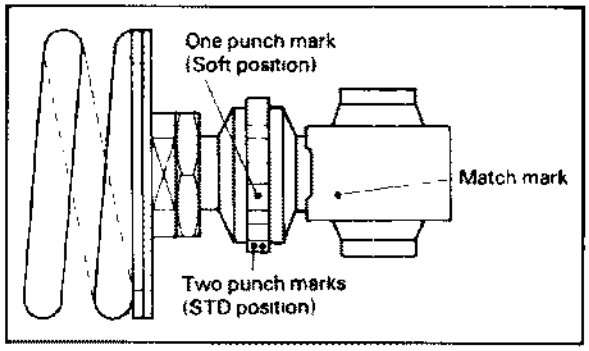
1. **Never tamper or attempt to disassemble the cylinder or the tank. Never tamper with the nut securing the hose to the cylinder assembly; otherwise, oil will spurt from the cylinder due to the high pressure in the nitrogen gas tank.**
2. **Never throw the shock absorber into an open flame or other high heat. The shock absorber may explode as a result of nitrogen gas expansion and/or damage to the hose.**
3. **Be careful not to damage any part of the gas tank. A damaged gas tank will impair the damping performance or cause a malfunction.**
4. **Use care not to damage any part of the hose. Any break in the hose may result in a spurt of oil under high pressure.**
5. **Take care not to scratch the contact surface of the piston rod with the cylinder; or oil could leak out.**
6. **Never attempt to remove the plug at the bottom of the nitrogen gas tank. It is very dangerous to remove the plug.**
7. **When scrapping the shock absorber, follow the instructions on disposal.**

ADJUSTMENT

This machine's suspension is adjustable to best suit the rider's preference or road conditions. (For adjustment, refer to "Suspension Tuning".

Break-in:

For the first 300 km (200 mi) of operation, this suspension unit should be broken in. To afford better riding comfort, the monocross unit is set on a two steps softer side (one punch mark). After the break-in period, return the monocross unit to the standard position (two punch marks). if the standard position does not suit your preferance or road condition, make a readjustment or other necessary adjustments.
***The monocross unit is originally set so as to suit the standard rider.**

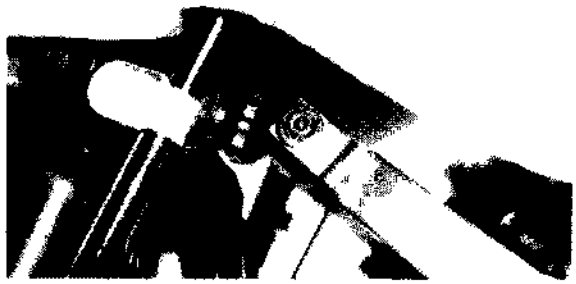


Damping performance

This adjustment can be done in 24 steps without removing the rear shock absorber.

* To make it stiffer, tighten the adjuster. (As illustrated, turn it clockwise.)
* To make it softer, loosen the adjuster. (Turn it counterclockwise.)

Adjustment should be made notch by notch and test it by riding after each adjustment.



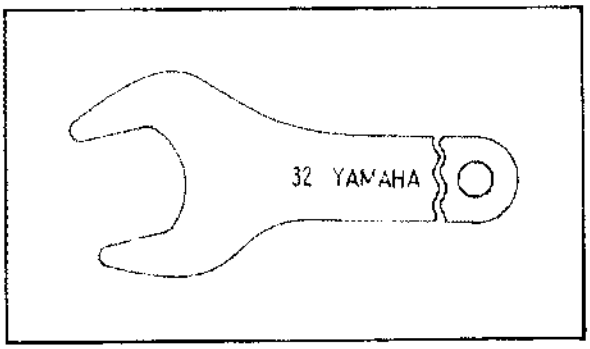
NOTE:

Turn the adjuster until it clicks.

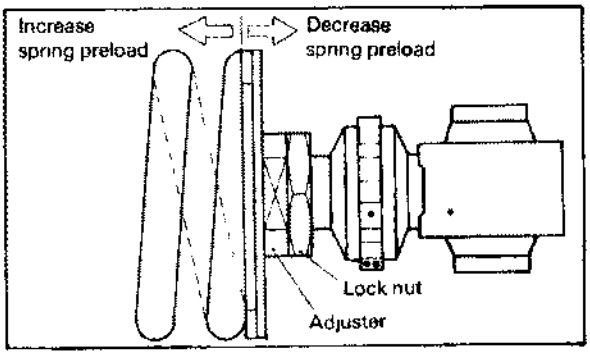
Stop turning the adjuster when it suddenly becomes heavy or light. Do not give any father turns. The adjustable range covers approximately 14 notches on stiffer side from the standard position.

Spring pre-load

To make an adjustment of the spring preload, use the special wrench (contained in the owner's tool kit).



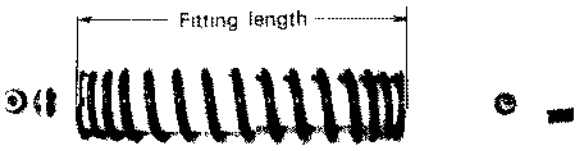
1 Loosen the adjuster lock nut.
2 To increase the spring pre-load, tighten the adjuster. To decrease, loosen the adjuster



NOTE:

Adjustment should be made by tightening or loosening the adjuster 2 mm each time.

Standard Length (installed)	347 mm (13.66 in)
Minimum Length (installed):	332 mm (13.07 in)
Maximum Length (installed):	347 mm (13.66 in)



BE SURE THAT ADJUSTMENT IS WITHIN THE ABOVE RANGE

3. After adjustment, tighten the lock nut

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

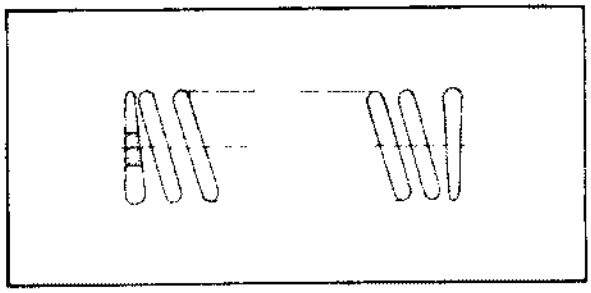
Spring replacement

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

	Type	Part No	Spring rate (kg/mm)	I D color
IT250H	Light duty	4V5 22212 10	K_1=2 7 K_2=6 69	Yellow/ Purple
	Standard	4V5-22212 00	K_1=2 4 K_2=6 1	Yellow/ Red
	Heavy duty	4V5-22212 20	K_1=3 1 K_2=7 71	Yellow/ White

	Type	Part No	Spring rate (kg/mm)	I D color
IT465H	Light duty	4V5-22212 10	K_1=2 7 K_2=6 69	Yellow/ Purple
	Standard	4V6-22212 00	K_1=2 9 K_2=7 25	Yellow/ Pink
	Heavy duty	4V5-22212 20	K_1=3 1, K_2=7 71	Yellow/ White

Identification color is shown on right end of a spring

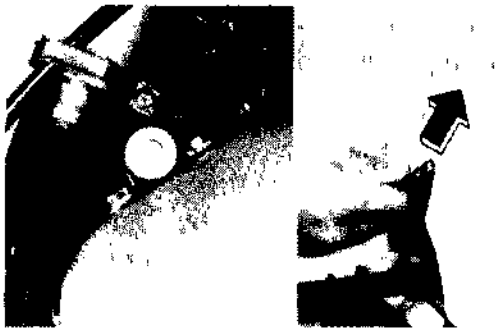


Gas pressure adjustment

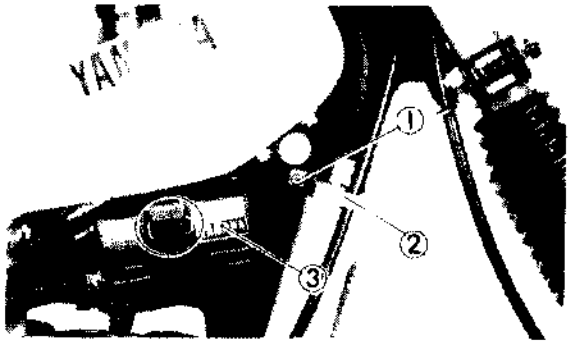
The nitrogen gas pressure is adjustable. For this adjustment, take the unit to your Authorized Yamaha dealer.

Absorber removal

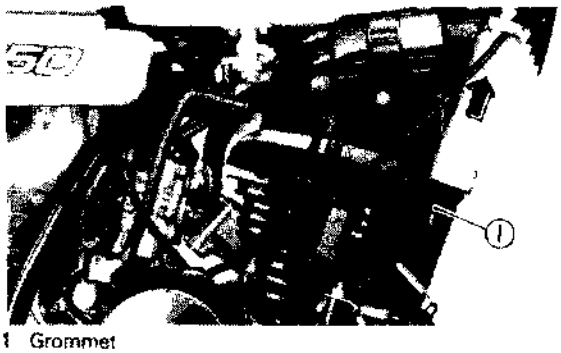
1. Place a suitable stand under the engine to raise the rear wheel off the ground.
2. Remove the seat and Y.E.I.S. air chamber (IT250H) and then remove the fuel tank (place the fuel petcock lever to "OFF" and disconnect fuel hose).



3. Remove the screw and remove the band holding the gas tank Next, remove the gas tank from the grommet

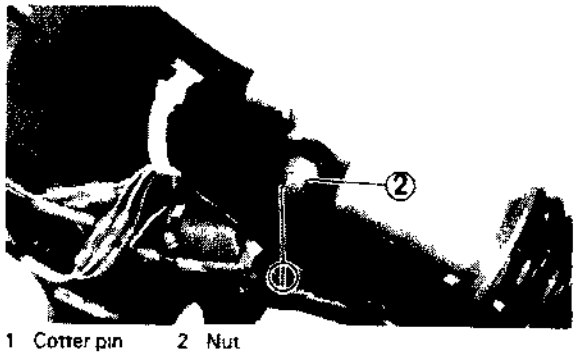


1 Fitting screw 2 Holder 3 Y I E S air chamber (IT250H)



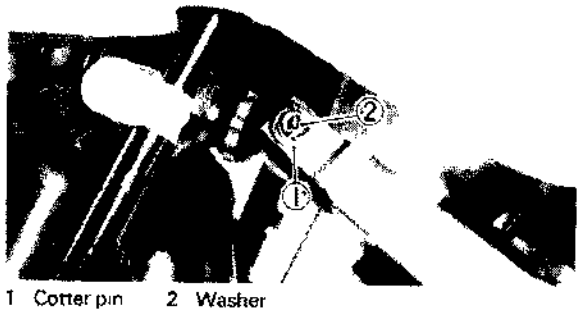
1 Grommet

4. Remove the cotter pin and nut from the bolt securing the upper part of shock absorber, and remove the bolt



1 Cotter pin 2 Nut

5 Remove the cotter pin and washer from the pin securing the lower part of the shock absorber, and pull out the pin. (Be carefull so that the thrust washer is not lost.)



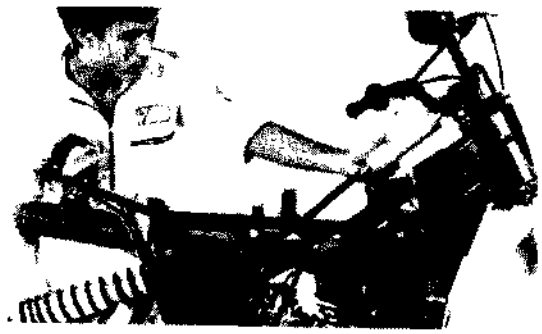
1 Cotter pin 2 Washer

6. Remove the shock absorber from the frame.

NOTE:

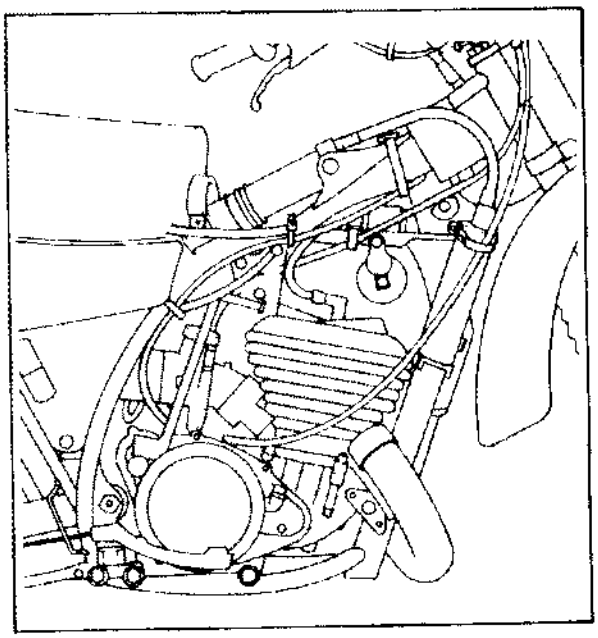
When removing the shock absorber, take the following precations:

a. Take care not to damage the gas tank.
b. Do not damage the rubber hose.



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

a. Be sure that the shock absorber is installed as illustrated



b. Installing the shock absorber, make sure the locating damper is securly in place.

c Always use a new cotter pin.

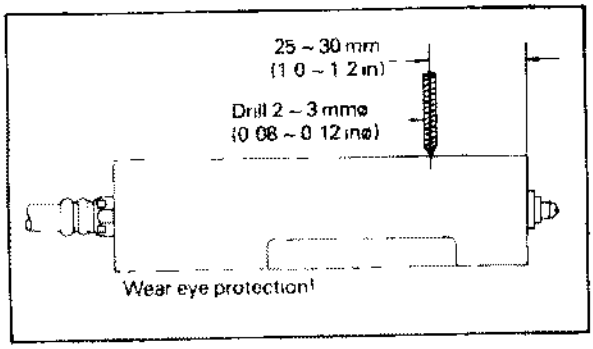
d Grease the PIN and thrust washer

e. Tighten the nut to specification.

Upper bolt 3 0 m-kg (22 ft-lb)

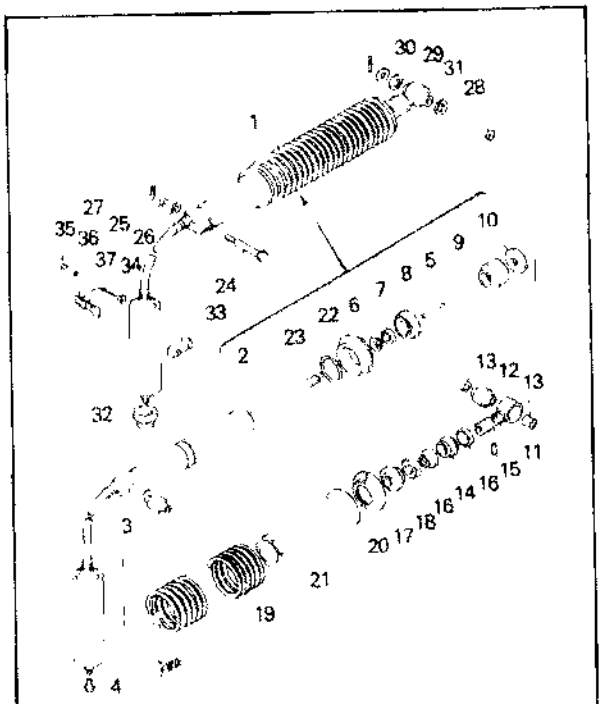
Notes on disposal (Yamaha dealers only)

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



WARNING:

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



1	Rear shock absorber assy	20	Spring guide
2	Dumper sub assy	21	Spring guide
3	Rear shock absorber bush	22	Spring lower seat
4	Pan head screw	23	Circlip
5	Push rod	24	Bolt
6	Dust seal	25	Nut
7	Seal ring housing	26	Plate washer
8	Case cap	27	Cotter pin
9	Stop bumper	28	Clevis pin
10	Bump stop support	29	Plate washer
11	Upper bracket sub assy	30	Cotter pin
12	Shock absorber lower bush	31	Thrust cover
13	Solid bush	32	Grommet
14	Adjusting nut	33	Sub tank damper
15	Dowel pin	34	Sub tank holder
16	Cover	35	Pan head screw
17	Spring upper seat	36	Spring washer
18	Nut	37	Washer
19	Spring	38	Wave washer

SUSPENSION TUNING

WARNING:

READ AND UNDERSTAND ALL INSTRUCTIONS DEALING WITH SUSPENSION COMPONENTS. FAILURE TO FOLLOW INSTRUCTIONS AND GUIDELINES MAY RESULT IN DAMAGE TO MACHINE AND/OR INJURY TO A MECHANIC OR USER.

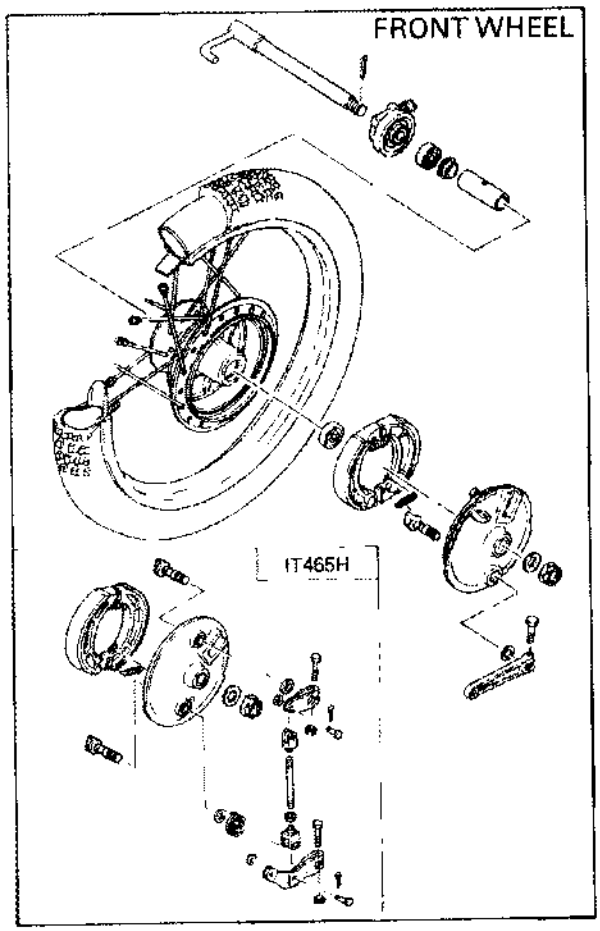
To solve any of the following problems perform step 1, then test ride. If further improvement is needed, perform step 2 and follow it with a test ride. Proceed to step 3 if necessary.

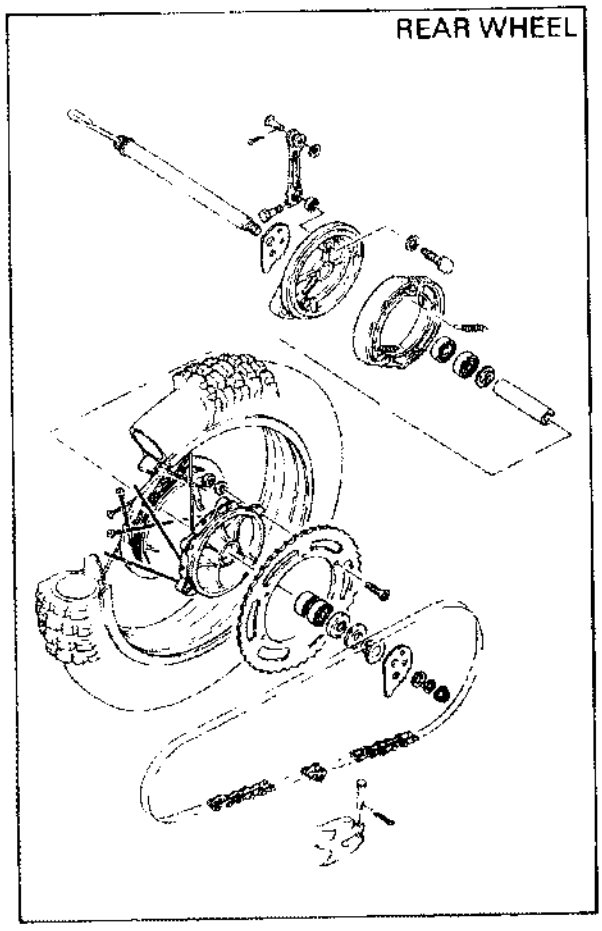
FRONT FORKS

Problem	Step 1	Step 2	Step 3
Bottoming	Increase air pressure	Use harder spring	–
Too soft	Increase air pressure	Increase oil viscosity (10 wt to 15 wt)	Use harder spring
Too hard	(Decrease air pressure)	Decrease oil viscosity (10 wt to 5 wt)	Use softer spring
GUIDELINES AND LIMITS			
(1)	Oil: STANDARD: 10 wt fork oil	ALTERNATE: 5 wt, 15 wt	
(2)	AIR PRESSURE:	MINIMUM: 0 kg/cm² (0 psi) MAXIMUM: 1.2 kg/cm² (17.0 psi) INCREASES: steps of 0.1 kg/cm² (1.5 psi)	

REAR SHOCK ABSORBER

Problem	Step 1	Step 2	Step 3
Bottoming	Shorten the spring set length	Increase damping force	Use harder spring (4V5-22212-20)
Too soft	Increase damping force	Shorten the spring set length	Use hard spring (4V5-22212-20)
Too hard	Decrease damping force	Extent the spring set length	Use softer spring (4V5-22212-10)
GUIDE LINES AND LIMITS			
1. SET LENGTH	MINIMUM: 332 mm (13.07 in) MAXIMUM: 347 mm (13.66 in) INCREASE: steps of 2 mm (0.08 in)		
2. DAMPING FORCE	Adjust by 1 or 2 clicks. Do not jamp over many clips at a time; it may give the rider a misleading suspension feeling.		





Front wheel removal

1 Elevate the front wheel by placing a suitable stand under the engine
2 Remove brake cable. Loosen the cable adjuster screws at the handle lever holder Then remove cable from cam lever at front brake shoe plate
3. Loosen front axle holder nuts
4 Remove the front wheel axle
5. Remove the front wheel assembly.

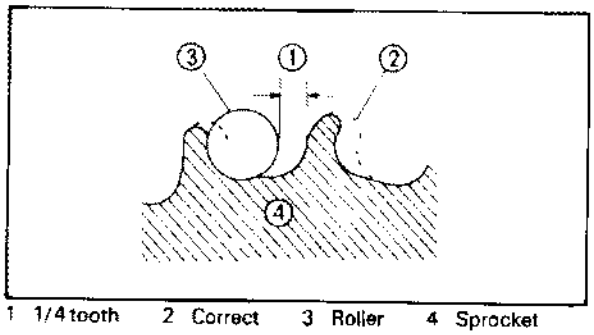
Rear wheel removal

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. Remove the rear wheel axle nut.
4. Pull out the rear wheel axle.
5. Remove the chain from the rear sprocket
6 Remove the cotter pins (left and right) from clevis pins. Then remove the clevis pins
7 Remove the rear wheel assembly

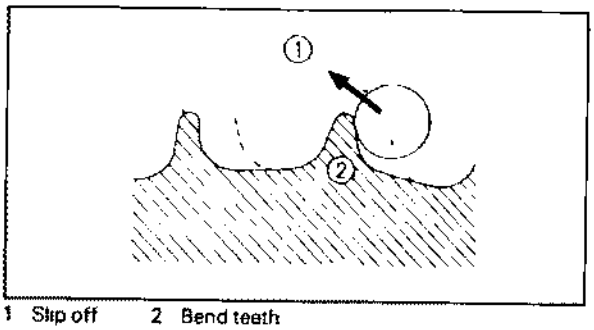
Wheel installation

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

1 Lightly smear grease on·
   * The shafts
   * The bearings and oil seal lips
   * The O-ring and dust cover interior for the rear brake shoe plate
   * The oil seal and collar outer circumference from the tension bar
2. Check for proper engagement of the boss on the outer tube with the locating slot on the brake shoe plate.



1 1/4 tooth 2 Correct 3 Roller 4 Sprocket



1 Slip off 2 Bend teeth

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

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

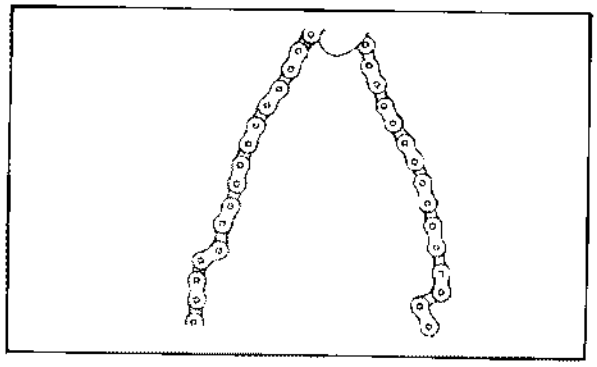
3. When installing the driven sprocket, lightly smear grease on the fitting bolts.

Chain

NOTE:

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

1. Check the chain for stiffness. If stiff, soak in solvent solution, clean with medium bristle brush, dry with high pressure air.
   Oil chain thoroughly and attempt to work out kinks. If still stiff, replace.

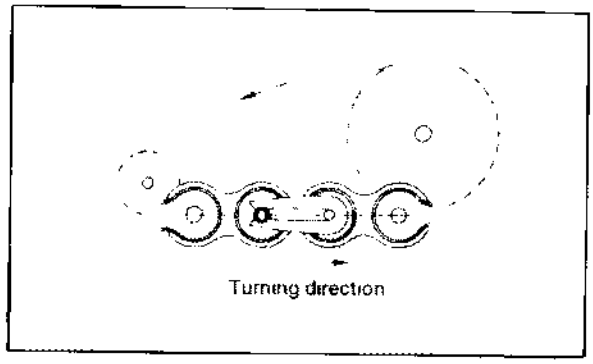


2. Check the side plates for visible wear. Check to see if excessive play exists in pins and rollers. Check for damaged rollers. Replace as required.

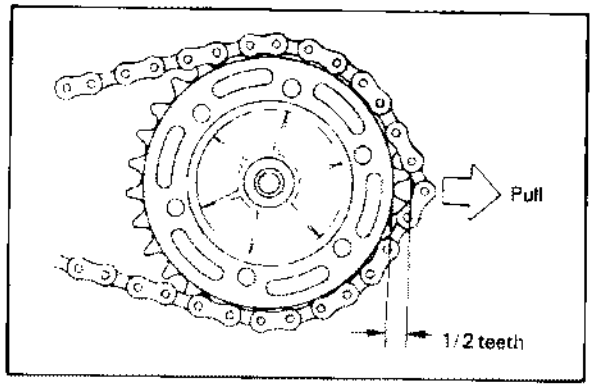
3 During reassembly, the master link clip must be installed with the rounded end facing the direction of travel.

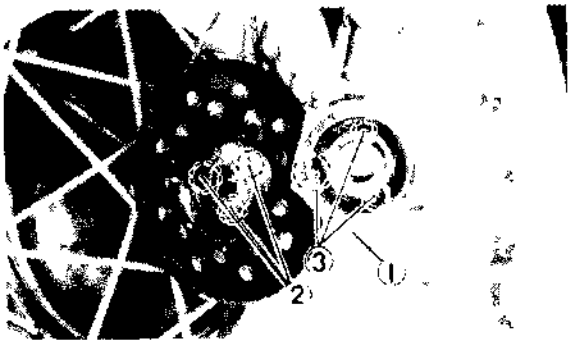
NOTE:

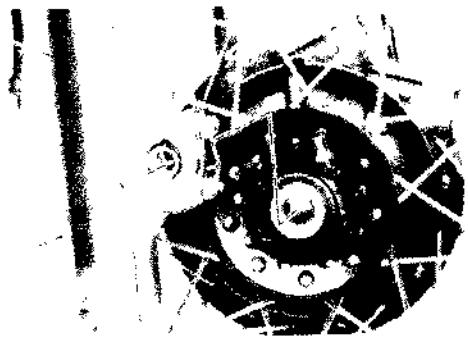
The chain should be cleaned and lubricated after every use of the machine.

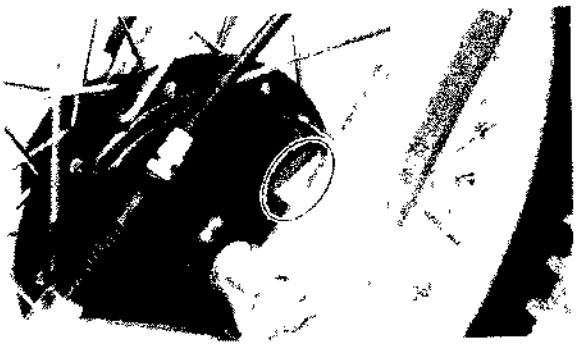


4. With the chain installed on the machine, excessive wear may be roughly determined by attempting to pull the chain away from the rear sprocket. If the chain will lift away more than one-half the length of the sprocket teeth, remove and inspect
   If any portion of the chain shows signs of damage, or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









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

Front wheel axle:	6.0 m-kg (43 ft-lb)
Axle holder nut:	1.0 m-kg (7.2 ft-lb)
Rear wheel axle.	10.0 m-kg (72 ft-lb)
Tension bar:	2 3 m-kg (17 ft-lb)

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

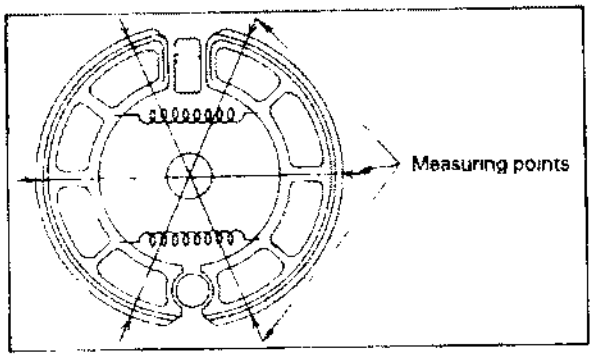
Check the wheel bearings

Hold the top of the rear wheel with one hand and the frame with the other hand, and check the play of the wheel by shaking it sideways. If the bearings allow excessive play in the wheel or if it does not turn smoothly have your dealer replace the wheel bearings.

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	130 mm (5 12 in)	150 mm 5 9 in)
Replacement limit	126 mm (4 96 in)	146 mm 5 75 in)



Brake drum

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

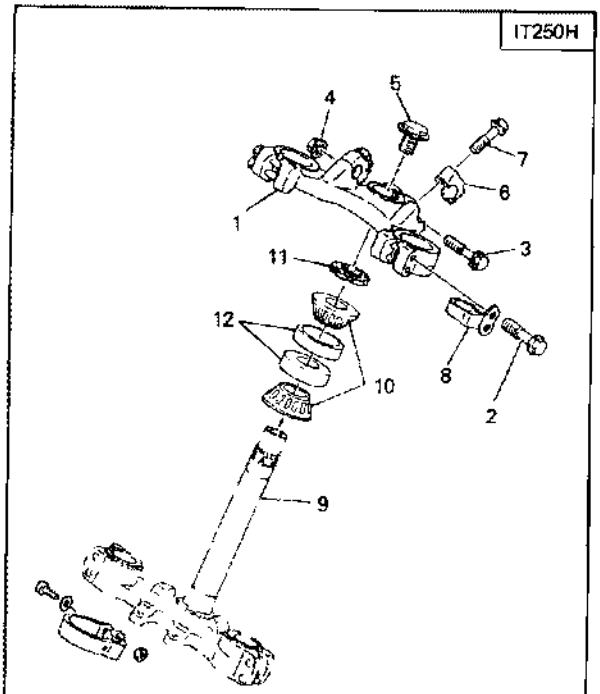
Sprockets

NOTE:

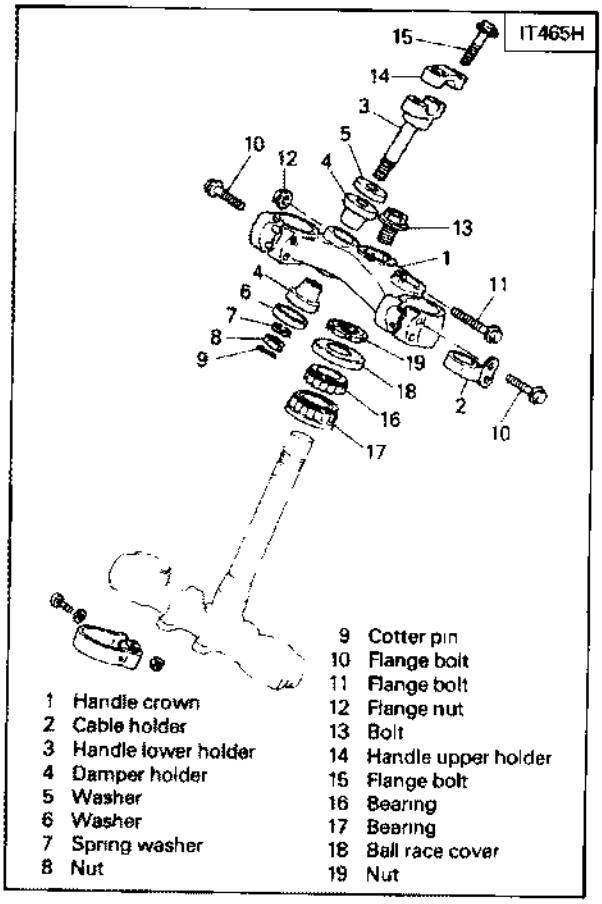
Please refer to Maintenance Intervals and Lubrication Intervals charts for additional information.

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

STEERING HEAD



1 Handle crown
2 Flange bolt
3 Flange bolt
4 Nut
5 Bolt
6 Handle upper holder
7 Flange bolt
8 Cable holder
9 Under bracket comp
10 Bearing
11 Nut
12 Baring race cover



1 Handle crown
2 Cable holder
3 Handle lower holder
4 Damper holder
5 Washer
6 Washer
7 Spring washer
8 Nut
9 Cotter pin
10 Flange bolt
11 Flange bolt
12 Flange nut
13 Bolt
14 Handle upper holder
15 Flange bolt
16 Bearing
17 Bearing
18 Ball race cover
19 Nut

Inspection

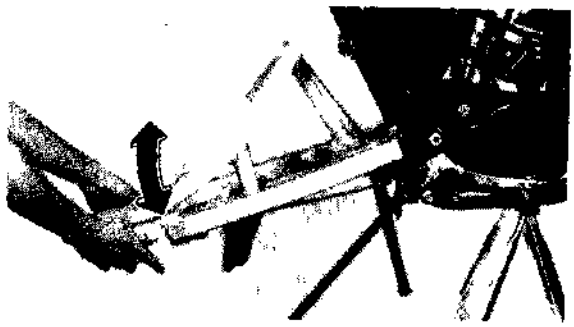
1. Wash the bearings in solvent.
2. Inspect the bearings for pitting or other damage. Replace the bearings if pitted or damaged. Replace the races when bearings are replaced.
3. Clean and inspect the bearing races. If races are damaged, replaces the races and bearings.
4. Install the bearings in the races. Spin the bearings by hand. If the bearings hang up or are not smooth in their operation in the races, replace bearings and races.

Swing arm inspection

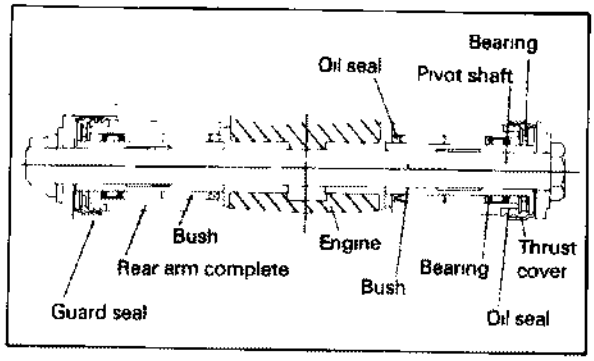
1. With rear wheel and shock absorber removed, grasp the ends of the arm and move from right to left to check for free play.

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

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



3. Check the swing arm for cracks. If there is any crack, repair or replace the swing arm, as required
4. For installation, refer to the figure below



NOTE:

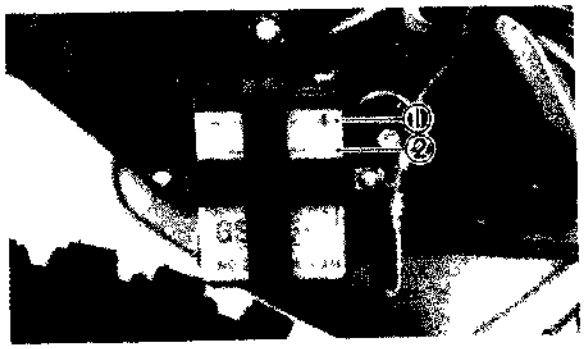
When assembling, grease the following points

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

ELECTRICAL

Battery

Check the level of the battery fluid and see if the terminals are tight. Add distilled water if the fluid level is low



1 Upper level
2 Lower level

WARNING:

Battery fluid is poisonous and dangerous, causing severe burns, etc. Contains sulfuric acid. Avoid contact with skin, eyes or clothing. Antidote: EXTERNAL—Flush with water. INTERNAL—Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil. Call physician immediately.
Eyes: Flush with water for 15 minutes and get prompt medical attention. Batteries produce explosive gases. Keep sparks, flame, cigarettes, etc. away. Ventilate when charging or using in enclosed space. Always shield eyes when working near batteries.
KEEP OUT OF REACH OF CHILDREN.

Replenishing the battery fluid

A poorly maintained battery will deteriorate quickly. The battery fluid should be checked at least once a month.

1 The level should be between the upper and lower level marks. Use only distilled water if refilling is necessary

CAUTION:

Normal tap water contains minerals which are harmful to a battery; therefore, refill only with distilled water.

2 When the motorcycle is not to be used for a month or longer, remove the battery and store it in a cool, dark place. Completely recharge the battery before reusing

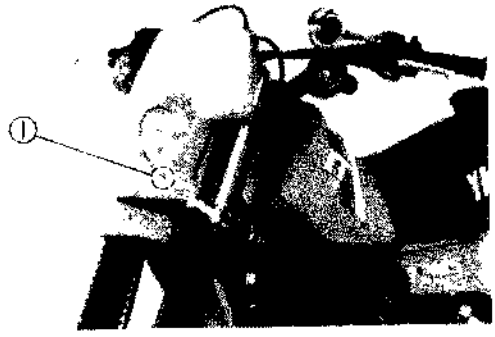
3 If the battery is to be stored for a longer period than the above, check the specified gravity of the fluid at least once a month and recharge the battery when it is too low.

Battery type	6V, 2AH
Electrolyte	Specific gravity 1.260
Initial charging current	0.2 Amperes/10 hours (New battery)
Re-charging current	0.2 Amperes/10 hours (or until specific gravity reaches 1.26)
Re-fill fluid	Distilled water to maximum level line
Re-fill period	Check once per month or more often as required

4 Always make sure the connections are correct when putting the battery back in the motorcycle. Make sure the breather pipe is properly connected and is not damaged or obstructed

Headlight adjustment

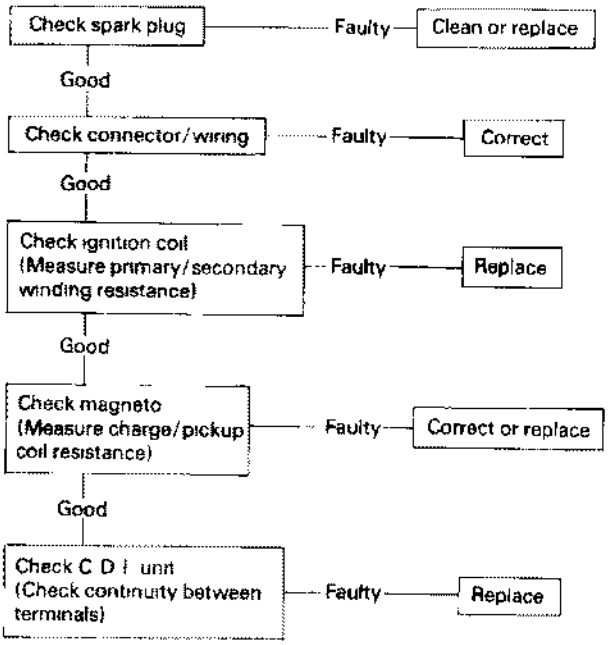
1. Adjust the headlight beam by tightening or loosening the adjust screw



1 Adjust screw

IGNITION SYSTEM

Troubleshooting



NOTE:

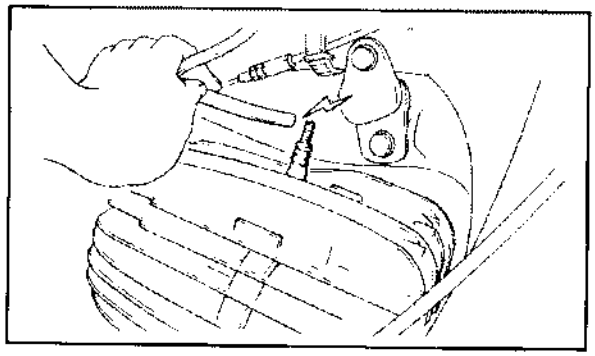
In the absence of sparking despite nothing wrong with the C.D.I. magneto, wiring, ignition coil, or spark plug, replace with a NEW C.D.I. unit and check.

Connectors check-up

1. Check the connectors and couplers for looseness of joining ends.
2. Keep the connectors and couplers from dirt or rust.
3. For secure and firm joining, take care to hold the connectors and couplers, not the wire portions, in attaching or separating them.

Spark gap test

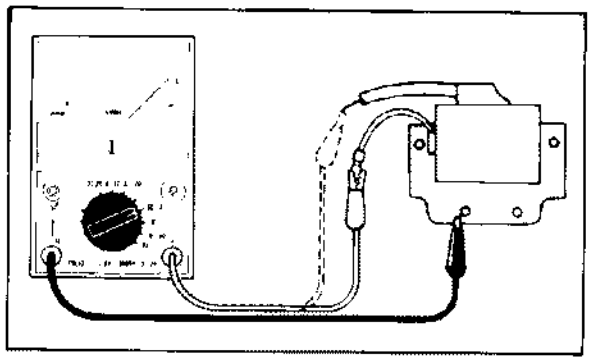
Remove the high tension wire from the spark plug cap, and hold it 5 mm off the plug. Kick the kick crank and check for spark.



Ignition coil test

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

Primary coil resistance Use (Ω × 1) scale	Secondary coil resistance
1.0Ω ± 15% at 20°C	5.9kΩ ± 15% at 20°C

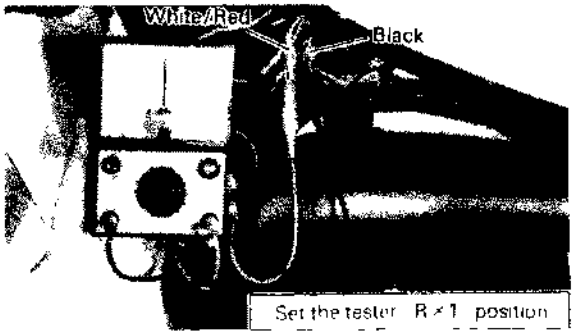


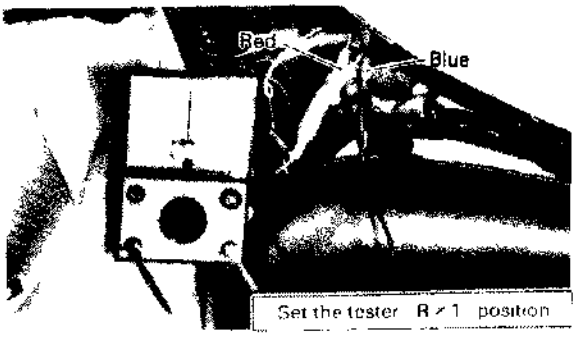
Coil resistance test

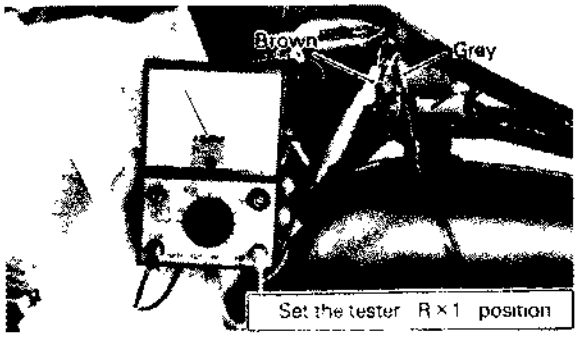
Measure the resistance of the charge coil and pulser coil. If the resistance measured does not match the specification below, the coil is considered to be shorted or to have a broken wire.

Pulser coil
IT250H 9Ω ± 10% Black to White/Red
IT465H. 12 4Ω ± 10% Black to White/Red

Charge coil,
High speed·
IT250H 14.0Ω ± 10% Red to Blue
IT465H· 13 6Ω ± 10% Red to Black
Low speed·
IT250H· 360Ω ± 10% Brown to Gray
IT465H 420Ω ± 10% Brown to Black







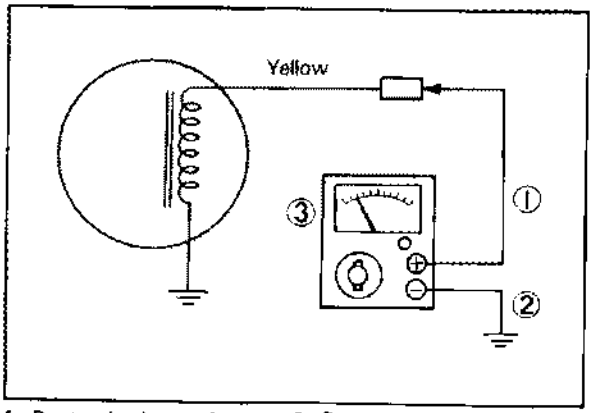
Lighting coil resistance check

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

a. Switch Pocket Tester to "Ω × 1" position and zero meter.

b. Connect positive (+) test lead to red-yellow wire from magneto and negative (−) test lead to black wire from magneto. Read the resistance on ohms scale.

Lighting coil.
0 20Ω ± 10% (Yellow to Black)



1 Positive lead wire of tester
2 Negative lead wire
3 Pocket tester (Set the tester 'Resistance' position) Ω × 1

Voltage regulator (A.C. regulator)

1. Preparation for inspection

a. Instruments required for inspection.
A.C. regulator checker and 12V battery.

b. Connect the red lead wire (for power) of the regulator checker to the positive side and connect the black lead wire to the negative side of the battery terminals.

c. Checking the battery voltage
First, set the switches, both right and left, to "12V, VOLT". If the checker needle points to 10 volts or more, the battery voltage is sufficient.

2 Checking the regulator

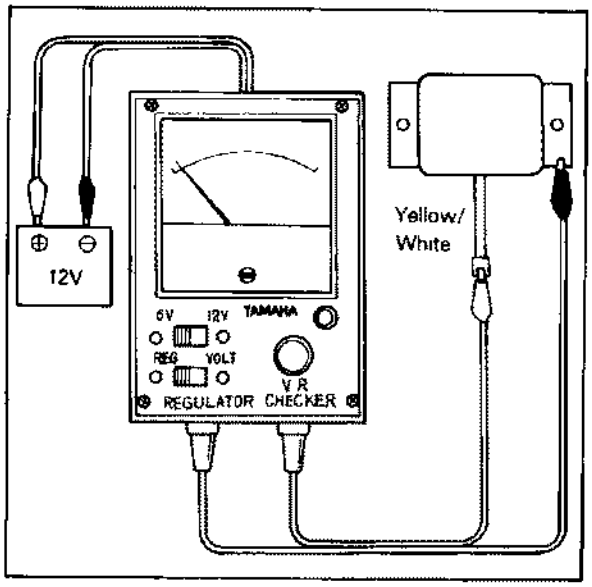
a. Turn the volume (V.R.) of checker full to the counterclockwise.

b. Set the VOLT—REG switch for REG and the 6V—12V switch for 6V.

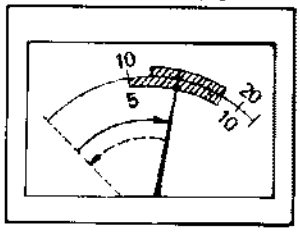
c Connect the pintipped lead wires to the A.C. regulator; black to the regulator body and red to the regulator lead wire (Yellow/White).

d. As the volume (V.R.) is gradually turned clockwise, the meter needle goes up. This needle comes back to zero as the regulator begins to operate.
The regulator functions all right if the needle starts back toward zero within the green belt range on the scale.

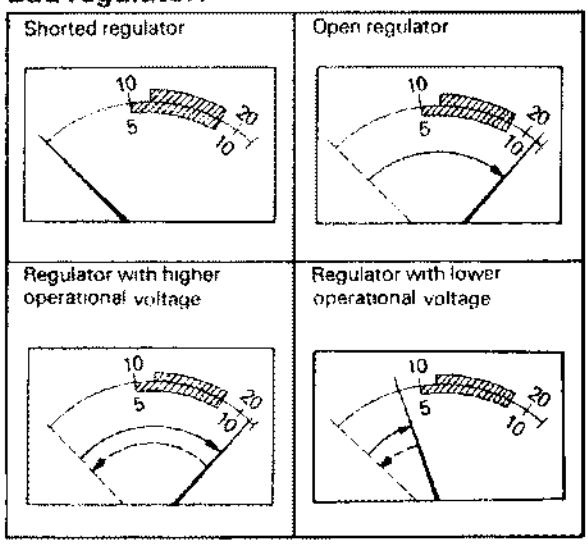
* Good regulator:
The meter needle begins to turn back within the green belt on the meter.



Normal condition

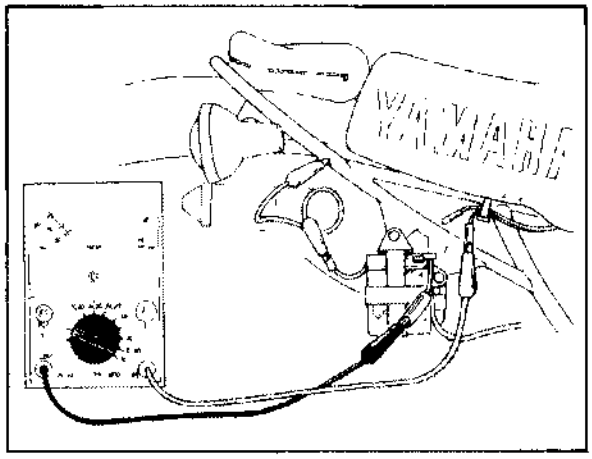


Bad regulator:



Charging amperage test

1 Connect the engine tachometer and start the engine.
2 Disconnect the red wire connection at the battery and connect Pocket Tester. Take amperage readings at specified speed



3 The headlight switch to the on position

Daytime	0.90 ± 0.3A at 3,000 r/min 1.00 ± 0.3A at 8,000 r/min
Nighttime	1.00 ± 0.3A at 3,000 r/min 1.60 ± 0.4A at 8,000 r/min

The battery must be fully charged when measuring the charging output test.

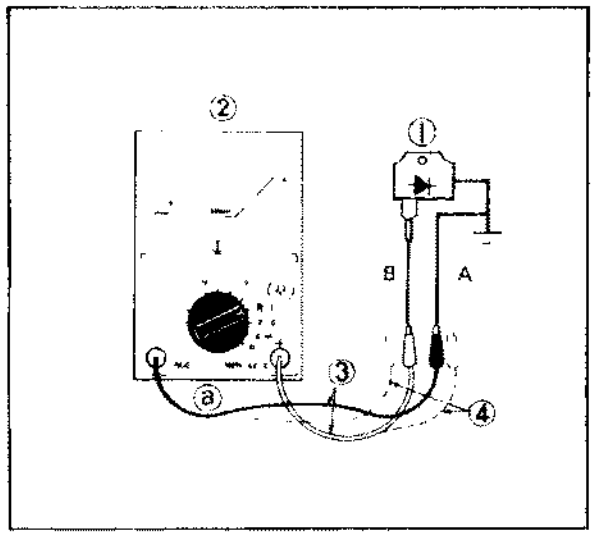
NOTE:

Disconnect the Pocket Tester before stopping the engine

4. If the indicated amperage cannot be reached, perform the next test.

Checking silicon rectifier

1 Checking with normal connection using Yamaha Pocket Tester.
Connect the tester's red lead (+) to the silicon rectifier's terminal, and connect the tester's black lead (−) to the ground.
2. Checking with reversed connection using Yamaha Pocket Tester
Reverse the tester leads.



a Set the tester on the Resistance Ω × 1
1 Silicon rectifier
2 Pocket Tester
3 Checking with normal connection
4 Checking with reversed connection

Result

Checking element	Pocket test connecting point		Good	Replace (element shorted)	Replace (element opened)
	(+) (red)	(−) (black)			
3	A	B	○	○	×
4	B	A	×	○	×

○ Continuity
× Discontinuity (∞)

NOTE:

This rectifier test must be checked both normal and reversed connections.

The silicon rectifier can be damaged, if subject to overcharging. Special care should be taken to avoid a short circuit and/or incorrect connection of the positive and negative leads at the battery. Never connect the rectifier directly to the battery to make a continuity check.

Brake light switch adjustment

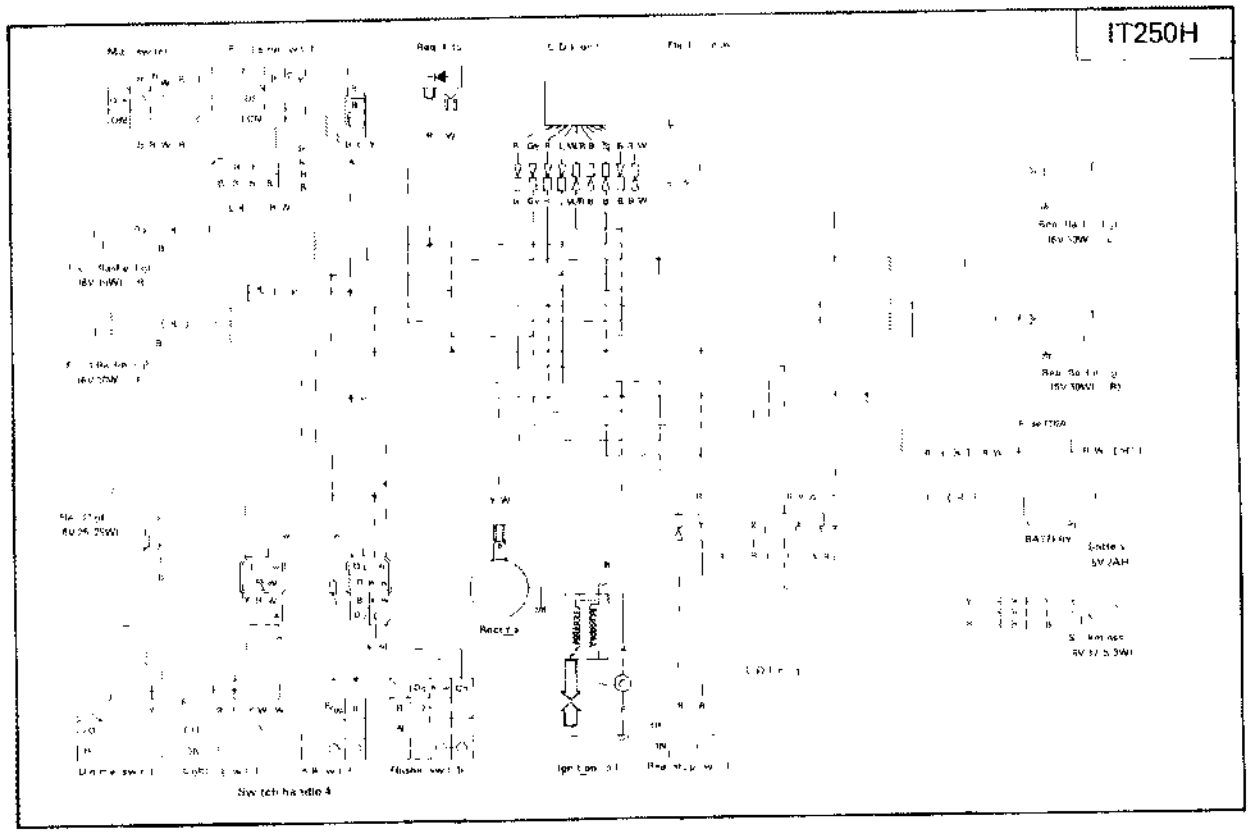
The brake light switch is operated by movement of the brake pedal.

To adjust, hold the main body of the switch with the hand so it does not rotate and turn the adjusting nut Proper adjustment is achieved when the brake light comes on slightly before the brake begins to take effect.

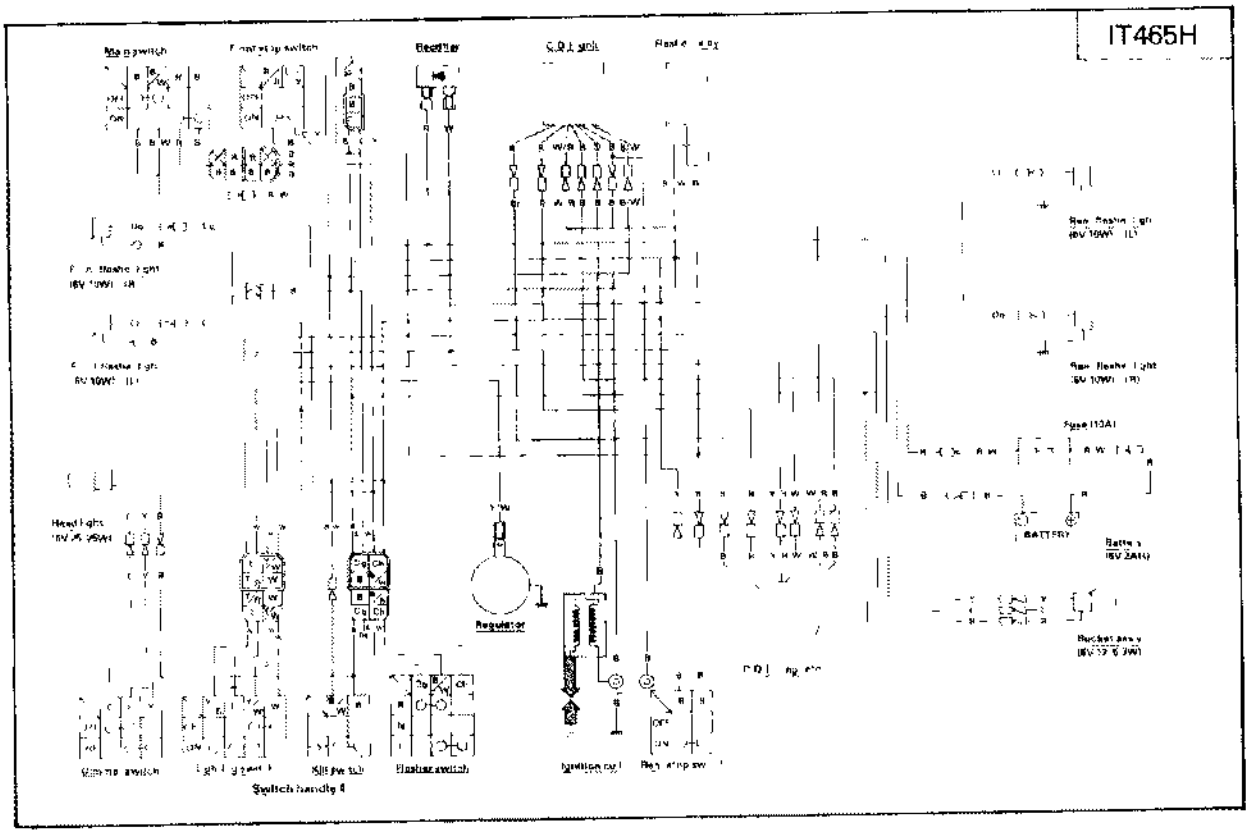
MISCELLANEOUS

WIRING DIAGRAM

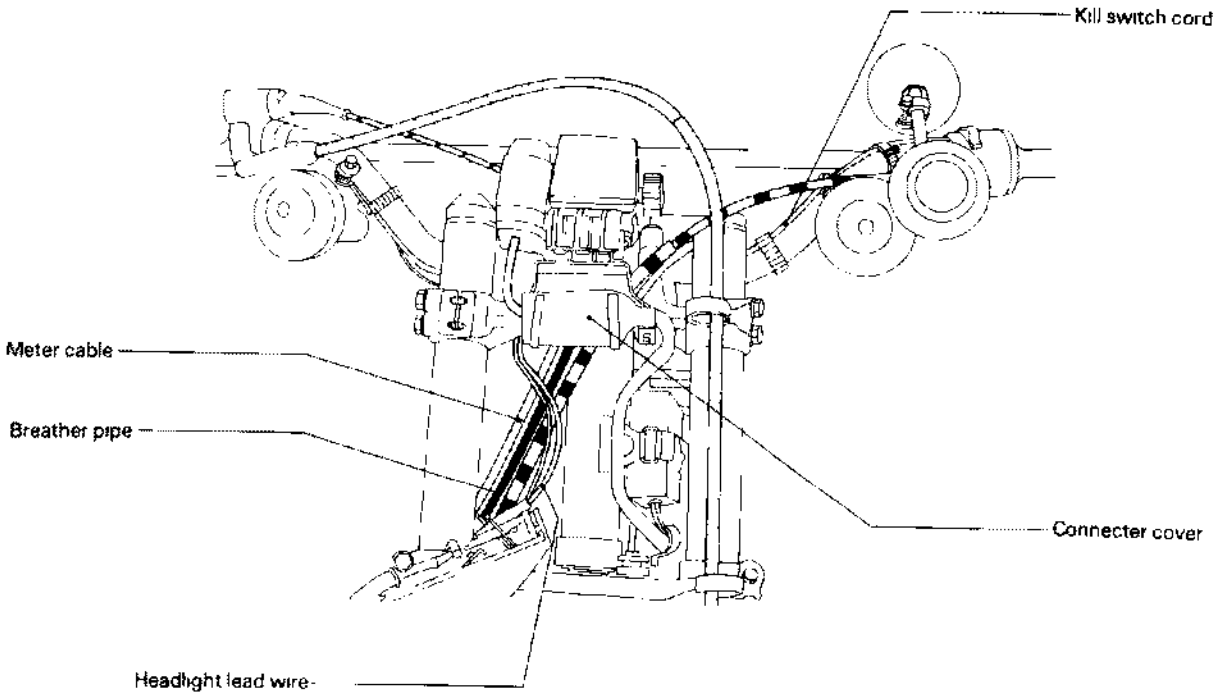
IT250H

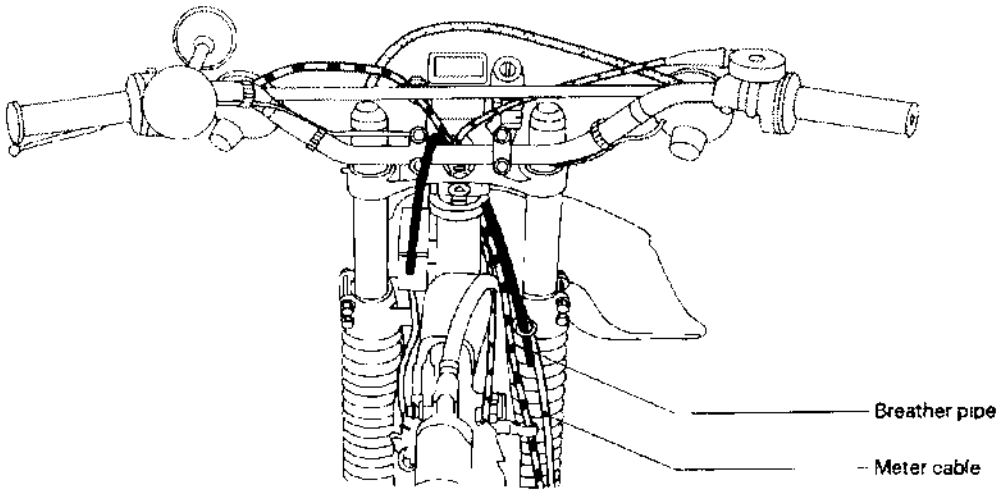


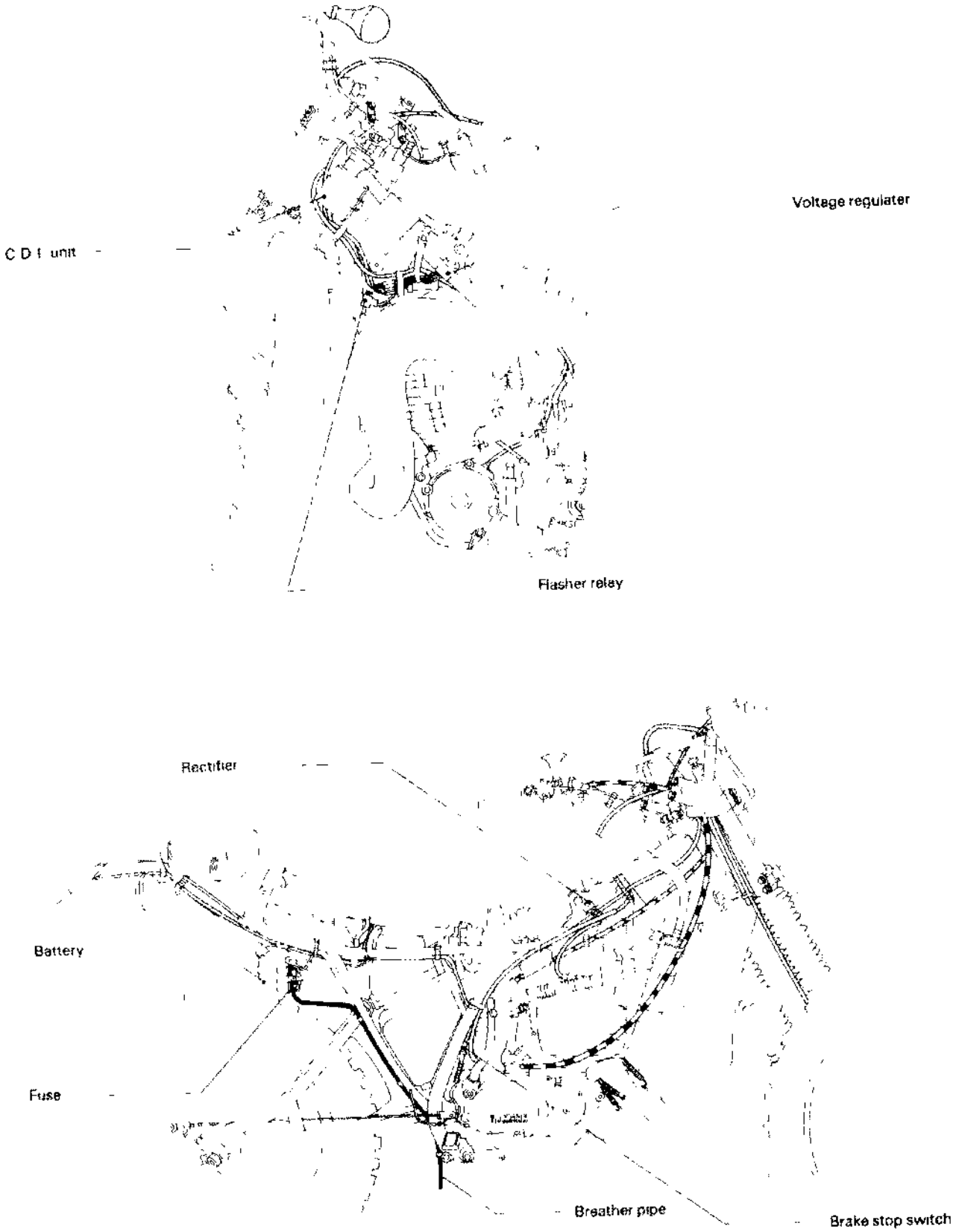
IT465H



CABLE ROUTING DIAGRAM






C D I unit
Voltage regulater
Flasher relay
Rectifier
Battery
Fuse
Breather pipe
Brake stop switch

TROUBLE SHOOTING GUIDE

Engine is hard to start or does not start.

Ignition System	
Possible Cause	Remedy
1. Spark plug is wet.	• Clean or replace
2. Ignition coil is faulty.	• Replace
3. C.D.I. unit is faulty.	• Replace
4. C.D.I. magneto is faulty (Pulser coil, source coil)	• Replace
5. Ignition timing is incorrect.	• Adjust
6. Wire is broken, shorted or disconnected.	• Repair, replace or connect
7. Engine stop switch is shorted.	• Repair or replace

Compression System	
Possible Cause	Remedy
1. Piston rings are sticking or worn.	• Replace
2. Cylinder or piston is worn or scratched.	• Repair or replace
3. Compression leaks passing cylinder head gasket. (Head is distorted.)	• Replace (or repair)
4. Crankshaft side oil seal is faulty.	• Replace
5. Air inhales through crankcase sealing surfaces.	• Repair

Air/Fuel System	
Possible Cause	Remedy
1. Carburetor pilot jet is clogged.	• Clean
2. Fuel petcock or pipe is clogged.	• Clean
3. Float valve is faulty.	• Replace (remove gasoline from crankcase)
4. Reed valve is broken or deformed.	• Replace
5. Fuel tank filler cap or carburetor breather pipe is clogged.	• Clean
6. Air screw is improperly adjusted.	• Adjust
7. Fuel is deteriorated.	• Replace
8. Oil-gas mixing ratio is incorrect.	• Replace
9. Air leakes through carburetor joints.	• Retighten or replace gasket

Poor High Speed Performance

Ignition System	
Possible Cause	**Remedy**
1 Spark plug is dirty or plug gap is too narrow.	• Clean, repair or replace
2. C.D I. unit is faulty.	• Replace
3. C.D.I. magneto is faulty.	• Replace
4. Ignition coil is faulty.	• Replace
5. Ignition timing is incorrect.	• Adjust
6. Loose wire connection.	• Repair

Compression System	
Possible Cause	**Remedy**
1. Piston rings are sticking or worn.	• Replace
2. Cylinder or piston is worn or scratched.	• Repair or replace
3. Compression leakage through crankcase sealing surfaces or crankshaft side oil seal.	• Repair or replace
4 Carbon deposits in combustion chamber (Piston, Cylinder head).	• Decarbonize

Air/Fuel System	
Possible Cause	**Remedy**
1. Clogged carburetor jets.	• Clean
2. Improperly adjusted main jet (High speed)	• Adjust
3. Improperly adjusted jet needle (Medium speed)	• Adjust
4. Incorrect fuel level	• Adjust
5. Dirty or clogged air cleaner element	• Clean
6. Clogged fuel tank filler cap or carburetor breather pipe.	• Clean
7. Clogged fuel petcock or kinked fuel pipe.	• Clean or repair
8. Deteriorated fuel.	• Replace
9. Improper oil-gas mixing ratio	• Replace
10. Cracked or broken exhaust pipe (Leakage of exhaust gases).	• Replace

Overheat

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

Transmission and shifter

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

Clutch

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

Chassis

Steering head is loose

Possible Cause	Remedy
1. Roller is worn.	• Replace
2. Steering lock nut is loose.	• Retighten

Wheels have excessive run-out

Possible Cause	Remedy
1. Bearing is worn.	• Replace
2. Rim has dent.	• Repair or replace
3. Spokes are loose (or broken).	• Retighten or replace
4. Axle nut is loose.	• Retighten

Brakes

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

Frame and Swing Arm

Possible Cause	Remedy
1. Frame is cracked.	• Weld, reinforce or replace
2. Rear arm is bend.	• Repair or replace
3. Rear arm is cracked.	• Replace
4. Bushing is worn.	• Replace

Headlight/Taillight

Trouble	Possible Cause	Remedy
Faulty	1. Burn out bulb.	• Replace
	2. Wire is broken, shorted or disconnected.	• Repair or replace
	3. Lighting coil is faulty.	• Replace
	4. Lighting switch is faulty.	• Replace

Taillight/Brake light

Trouble	Possible Cause	Remedy
Faulty	1. Burn out bulb.	• Replace
	2. Wire is broken, shorted or disconnected.	• Repair or replace
	3. Brake light switch is improperly adjusted.	• Adjust
	4. Brake light switch is faulty.	• Replace
	5. Poor ground or poor connection.	• Repair or replace

Flasher light

Trouble	Possible Cause	Remedy
Faulty	1 Burn out bulb.	• Replace
	2. Wire is broken, shorted or disconnected.	• Repair or replace
	3. Flasher relay is faulty.	• Replace
	4. Poor ground or poor connection.	• Repair or replace
	5. Flasher switch is faulty.	• Replace
	6. Battery is low voltage.	• Add distiled water or re-charge

Headlight

Trouble	Possible Cause	Remedy
Faulty	1. Burn out bulb.	• Replace
	2. Wire is broken, shorted or disconnected.	• Repair or replace
	3. Lighting coil is faulty.	• Replace
	4. Lighting switch is faulty	• Replace
	5. Battery is low voltage.	• Add distiled water or re-charge

CLEANING AND STORAGE

A. 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:
Block off end of exhaust pipe to prevent water entry; a plastic bag and strong rubber band may be used

2 If engine case is excessively greasy, apply degreaser with a paint brush. Do not apply degreaser to chain, sprockets, or wheel axles.

3 Rinse dirt and degreaser off with garden hose, using only enough hose pressure to do the job. Excessive hose pressure may cause water seepage and contamination of wheel bearings, front forks, brake drums, and transmission seals. Many expensive repair bills have resulted from improper high pressure detergent applications such as those available in coin-operated car 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 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 Clean the seat with a vinyl upholstery cleaner to keep the cover pliable and glossy

8 Automotive-type wax may be applied to all painted and chrome-plated surfaces. Avoid combination cleaner-waxes. Many contain abrasives which may mar paint or protective finish

9. After finishing, start the engine immediately and allow to idle for several minutes

B. STORAGE

Long term storage (60 days or more) of your machine 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 spark plug, pour about one tablespoon of SAE 10W/30 oil in spark plug hole(s) and re-install spark plug. Kick engine over several times (with ignition off) to coat cylinder walls with oil.

3 Remove drive chain. Clean thoroughly with solvent and lubricate. Re-install chain or store in a plastic bag (tie to frame for safe-keeping).

4 Lubricate all control cables

5. Block up frame to raise both wheels off ground

6. Tie a plastic bag over exhaust pipe outlet to prevent moisture from entering

7 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

A. General

Model	IT250H	IT465H
Model (I B.M No.)	5L4	5L5
Frame I D & Starting Number	5L4-000101	5L5-000101
Engine I D & Starting Number	5L4-000101	5L5-000101
Dimension:		
Overall length	2,205 mm (86.8 in)	←
Overall width	890 mm (35 0 in)	←
Overall height	1,245 mm (49 0 in)	←
Seat height	925 mm (36 4 in)	←
Wheelbase	1,450 mm (57 1 in)	1,475 mm (58.1 in)
Minimum ground clearance	295 mm (11 6 in)	←
Weight:		
Net weight	109 kg (240 lb)	113 kg (249 lb)

B. Engine

Model	IT250H	IT465H
Description		
Engine type	Air Cooled 2-stroke Gasoline, torque induction	←
Engine model	5L4	5L5
Displacement	246 cm³ (15.0 cu in)	465 cm³ (28.37 cu. in)
Bore × Stroke	70 × 64 mm (2 756 × 2 520 in)	85 × 82 mm (3 346 × 3.228 in)
Compression ratio	6.7 · 1	7 1 1
Starting system	Primary kick	←
Ignition system	Capacitor Discharge Ignition	←
Lubrication system	Mixed Gasoline (Yamalube "R", 16 1, Shell super M, Castrol R30, Castrol A545;20 1)	←
Cylinder head		
Cylinder head volume-with spark plug (N-2G)	21 0 cm³ (1 3 cu in)	49 5 cm³ (3 0 cu in)
Combustion chamber type	1/2 square + Squish	←
Head gasket material/thickness	Copper/1 0 mm (0 04 in)	Copper/1 2 mm (0.05 in)
Cylinder		
Material	Cast iron sleeve with Aluminum alloy	←
Bore size	70 mm (2 756 in)	85 mm (3 346 in)
Wear limit	70.1 mm (2 759 in)	85 1 mm (3 350 in)
Taper limit	0 08 mm (0 003 in)	←
Out of round limit	0 05 mm (0 002 in)	←
Piston		
Piston skirt clearance	0.045 ~ 0 050 mm (0 0018 ~ 0 0020 in)	0 070 ~ 0 075 mm (0 0024 ~ 0 0026 in)
Piston over size	70 25, 70 50, 70 75, 71 00 mm (2 766, 2 775, 2 785, 2 795 in)	85 25, 85.50, 85 75, 86.00 mm (3 356, 3 366, 3 376, 3.386 in)

Model	IT250H	IT465H
Piston rings		
Piston ring design (Top/Second)	Keystone/Plain	←
Ring end gap, installed (Top/Second)	0.3 ~ 0.5 mm (0.012 ~ 0.0197 in)	←
Ring groove side clearance (Top/Second)	0.03 ~ 0.05 mm/ 0.03 ~ 0.05 mm (0.0012 ~ 0.0020 in)/ (0.0012 ~ 0.0020 in)	0.02 ~ 0.06 mm/ 0.06 ~ 0.1 mm (0.0008 ~ 0.0024 in)/ (0.0024 ~ 0.0039 in)
Small end bearing		
Type	Needle bearing (18 × 22 × 22)	Needle bearing (18 × 23 × 22)
Big end bearing		
Type	Needle bearing (25 × 31 × 20)	←
Crankshaft		
Crankshaft width (B)	62 $^{0}_{-0.05}$ mm (2.44 $^{0}_{-0.002}$ in)	66 $^{0}_{-0.05}$ mm (2.60 $^{0}_{-0.002}$ in)
Crankshaft deflection (A)	0.03 mm (0.0012 in)	←
Con-rod small end deflection (C)	0.4 ~ 2.0 mm (0.016 ~ 0.079 in)	←
Big end side clearance (D)	0.25 ~ 0.75 mm (0.010 ~ 0.030 in)	←
Crank bearing type (Left)	6206C4 SPECIAL	83913-9TC4
(Right)	6206C4 SPECIAL	83913-9TC4
Oil seal type (Left)	SD 30 × 55 × 12	FWJ-30 × 55 × 10GS
(Right)	SW 40 × 55 × 12	FWJ-40 × 55 × 10GS
Clutch		
Clutch type	Wet, multiple disc type	←
Clutch push mechanism	Inner push, Cam axle	←
Primary reduction ratio & method	63/24 (2.625), Helical gear	←
Friction plate thickness/limit	3.0 mm/2.7 mm (0.12 in/0.006 in)	←
Clutch plate thickness/warp limit	1.6 mm/0.05 mm (0.059 in/0.0020 in)	←
Clutch spring length/limit	36.4 mm/35.4 mm (1.43 in/1.39 in)	36.0 mm/35.0 mm (1.42 in/1.38 in)
Clutch housing thrust clearance	0.05 ~ 0.25 mm (0.002 ~ 0.0098 in)	←
Push rod bending limit	0.2 mm (0.008 in)	←
Transmission		
Type	Constant mesh 6 speed, Return	Constant mesh 5 speed, Return
Gear ratio, 1st	32/12 (2.666)	←
2nd	30/15 (2.000)	28/16 (1.750)
3rd	25/16 (1.562)	25/19 (1.315)
4th	25/20 (1.250)	22/22 (1.000)
5th	23/22 (1.045)	22/28 (0.785)
6th	21/24 (0.875)	—
Transmission oil quantity & type	Total 0.85 ℓ (0.75 IMP qt) Exchange 0.80 ℓ (0.70 IMP qt) Yamalube 4-cycle oil or SAE 10W/30 "SE" motor oil	Total 0.70 ℓ (0.62 IMP qt) Exchange 0.65 ℓ (0.53 IMP qt) ←
Bearing type Main axle (Left)	Needle bearing (30 × 17 × 13)	Needle bearing (32 × 20 × 12)
(Right)	6205Z	←
(Left)	6205R	←
(Right)	Needle bearing (32 × 20 × 12)	←

Model	IT250H	IT465H
Drive axle oil seal type	SD 32 × 42 × 6	←
Secondary reduction method	Chain	←
ratio	50/13 (3 846)	44/14 (3 142)
Shifting change mechanism:		
Type	Guide bar type	←
Oil seal type	S 12 × 22 × 5	←
Shift fork finger thickness/limit	4 85 mm/4 45 mm (0 191 in/0 175 in)	←
Intake		
Air cleaner, type	Oiled foam rubber	←
Oil grade	SAE 10W/30 motor oil	←
Reed valve, type	"V" type	←
Bending limit	0 6 mm (0 024 in)	←
Valve lift	12 ± 0 2 mm (0 47 ± 0 008 in)	←
Carburetor		
Type & manufacturer	VM36SS, Mikuni	VM38SS, Mikuni
I D mark	4V500	4V600
Main jet (M.J.)	#400	#380
Jet needle-clip position (J.N.)	6F34-3	F36-3
Needle jet (N.J.)	N-8	Q-2
Cutaway (C A.)	2 0	2 5
Pilot jet (P J.)	#50	#35
Air screw turns out (A S.)	1 and 1/2	←
Float height	18 1 ± 1 0 mm (0 7 ± 0 04 in)	27 ± 1 0 mm (1 1 ± 0 04 in)

C. Chassis

Model	IT250H	IT465H
Frame		
Frame design	Tubular steel double cradle	←
Steering system		
Caster	29°	28°30′
Trail	126 mm (4.96 in)	122 mm (4 80 in)
Head pipe bearing type	Taper roller bearing	←
Front suspension		
Type	Telescopic fork	←
Damper type	Coil, air spring, oil damper	←
Fork travel	270 mm (10 6 in)	←
Front fork spring, free length	603 mm (23.7 in)	←
spring rate	K_1 = 0 308 kg/mm (17 25 lb/in)	←
	K_2 = 0.350 kg/mm (19.60 lb/in)	←
Fork oil quantity	415 cm³ (14 oz)	←
type	SAE #10 motor oil	←
Oil seal type	SD-38-50 5-10 5	←
Air pressure	0 bar (0 kg/cm², 0 psi)	←

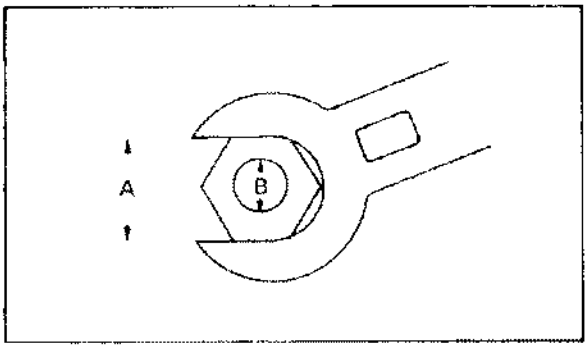
Model	IT250H	IT465H
Rear suspension		
Type	Monocross suspension (De carbon system)	←
Damper type	Gas, coil spring + Oil damper	←
Gas pressure	15 bar (15 kg/cm², 213 psi)	18 bar (18 kg/cm², 256 psi)
Gas propritel	Nitrogen gas	←
Rear shock absorber spring		
Free length	352 mm (13 9 in)	←
Set length	347 mm (13 66 in)	←
Spring rate	K_1 = 2 4 kg/mm (134 lb/in)	K_1 = 2 9 kg/mm (162 lb/in)
	K_2 = 6 1 kg/mm (342 lb/in)	K_2 = 7 25 kg/mm (406 lb/in)
Rear shock absorber travel	142 + 3 mm (56 + 0 12 in) (with rubber bush)	←
Rear wheel travel	270 mm (10 6 in)	280 mm (11 0 in)
Swing arm length	515 mm (20 3 in)	540 mm (21 3 in)
deflection (rear end)	0 ~ 1 0 mm (0 ~ 0 039 in)	←
free play (pivot shaft)	0 ~ 0 2 mm (0 ~ 0 0079 in)	←
Pivot shaft bearing type	Needle bearing + Thrust bearing	←
Fuel tank		
Capacity	13 ℓ (11 4 IMP gal)	←
Wheels		
Tire size (Front)	3 00-21-4PR	←
(Rear)	5 10-18-4PR	5 60 17-4PR
Patern	Nobby	←
Pressure (Normal) (Front)	1 0 bar (1 0 kg/cm², 14 psi)	←
(Rear)	1 0 bar (1 0 kg/cm², 14 psi)	←
Rim size (Front)	1 60-21	←
(Rear)	M T 2 50-18	M T 2 50 17
Run out (vert)		
Front — limit	2 mm (0 08 in)	←
Rear — limit	2 mm (0 08 in)	←
Run out (horiz)		
Front — limit	2 mm (0 08 in)	←
Rear — limit	2 mm (0 08 in)	←
Bearing type and size		
Front wheel (Left)	6202-RS	←
(Right)	6202	←
Rear wheel (Left)	6004 × 2	←
(Right)	6004, 6004-RS	←
Oil seal type and size		
Meter gear (Right)	SDD-40-52-6	←
Rear wheel (Left)	SD-28-47-7	←
Drive chain		
Type	DK520DS	←
Number of links	107L + Joint	←
Chain pitch	15 875 mm (0 625 in)	←
Free play	10 ~ 15 mm (0 4 ~ 0 6 in)	←
Brakes		
Type	Drum brake (Leading trailing/ Leading trailing)	← (TWO leading trailing)
Brake drum I D (F/R)	130 mm (5 12 in) / 150 mm (5.91 in)	← ←

Model	IT250H	IT465H
Brake shoe dia × width		
Front	130 × 22 mm (5 12 in × 0 87 in)	←
Rear	150 × 25 mm (6 3 in × 0 98 in)	←
Lining length (Front/ Rear)	124 mm (4 9 in)/	←
	145 mm (5 7 in)	←
Lining thickness/ wear limit	4 mm/2 mm (0 16 in/0 08 in)	←
Shoe springs free length (F)/ (R)	36 5 mm (1 44 in)/	←
	68 mm (2 67 in)	←

D. Electrical

Model	IT250H	IT465H
Ignition system		
System	Capacitor Discharge Ignition	←
Manufacture	Mitsubishi	←
Model	F3T203	F3T202
Pulser coil resistance	9Ω ± 10% (W/ R — B)	12 4Ω ± 10% (W/ R — B)
Charge coil resistance		
Low speed	360Ω ± 10% (Br — Gy)	420Ω ± 10% (Br — B)
High speed	14Ω ± 10% (R — L)	13 6Ω ± 10% (R — B)
Lighting coil resistance	0 48Ω ± 10% (Y/ R — B)	←
Ignition timing (B T D C)	16 5° at 5,000 r/ min (1 65 ± 0 1 mm (0 065 ± 0 004 in))	16° at 2,000 r/ min (2 07 ± 0 1 mm (0 081 ± 0 004 in))
Ignition coil		
Manufacture	Mitsubishi	←
Model	F6T411	←
Spark gap	6 mm (0 28 in) or more	←
	300 r/ min	
Primary winding resistance	1 0Ω ± 15%	~
Secondary winding resistance	5 9Ω ± 15%	←
Spark plug		
Manufacture and type	Champion N-2G	Champion N-3
Gap	0 6 ~ 0 7 mm (0 024 ~ 0 028 in)	←
C D I unit		
Manufacture	Mitsubishi	←
Model	F8T04571	←
Battery		
Model	6N2 2A-7	
Capacity	6V, 2A	←
Charging rate	0 2A 10 hours	←
Specific gravity	1 26 at 20°C (68°F)	←
Headlight	6V, 25W	←
Tail/ Stoplight	6V, 5 3W/ 17W	←
Flasher light	6V, 17W	←

A (NUT)	B (BOLT)	TORQUE SPECIFICATION		
		Nm	m·kg	ft-lb
10 mm	6 mm	6	0.6	4.5
12 mm	8 mm	15	1.5	11.0
14 mm	10 mm	30	3.0	22.0
17 mm	12 mm	55	5.5	40.0
19 mm	14 mm	85	8.5	61.0
22 mm	16 mm	130	13.0	94.0



E. TIGHTENING TORQUE

Tightening torque	Size	Nm	m-kg
Cylinder head	M8	25	2.5 m-kg
Spark plug	M14	25	2.5 m-kg
Cylinder	M12	60	6.0 m-kg
Primary drive gear	M18	75	7.5 m-kg
Clutch boss	M20	75	7.5 m-kg
Clutch spring	M6	8	0.8 m-kg
Drive sprocket	M20	75	7.5 m-kg
Kick crank	M12	50	5.0 m-kg
Change pedal	M6	10	1.0 m-kg
Reed valve	M3	1	0.1 m-kg
Outer rotor	M12	80	8.0 m-kg
Stater	M6	8	0.8 m-kg
Chassis			
Engine mounting bolt,			
Front upper	M8	30	3.0 m-kg
Front under	M8	30	3.0 m-kg
Rear upper	M10	65	6.5 m-kg
Engine mount stay,			
Front	M8	30	3.0 m-kg
Upper	M8	15	1.5 m-kg
Handle crown,			
Steering shaft	M22	95	9.5 m-kg
Inner tube	M8	23	2.3 m-kg
Handle holder	M8	23	2.3 m-kg
Front fork,			
Cap bolt	M34	23	2.3 m-kg
Under bracket	M8	23	2.3 m-kg
Damper unit	M12	40	4.0 m-kg
Front wheel axle	M14	60	6.0 m-kg
Front wheel axle pinch	M6	10	1.0 m-kg
Pivot shaft	M16	80	8.0 m-kg
Rear wheel axle	M18	100	10.0 m-kg
Sprocket wheel	M8	30	3.0 m-kg
Rear shock absorber	M10	30	3.0 m-kg
Tension bar	M8	23	2.3 m-kg
Camshaft lever (brake)	M6	10	1.0 m-kg
Steering bearing	M25	7	0.7 m-kg
Foot rest	M12	100	10.0 m-kg

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