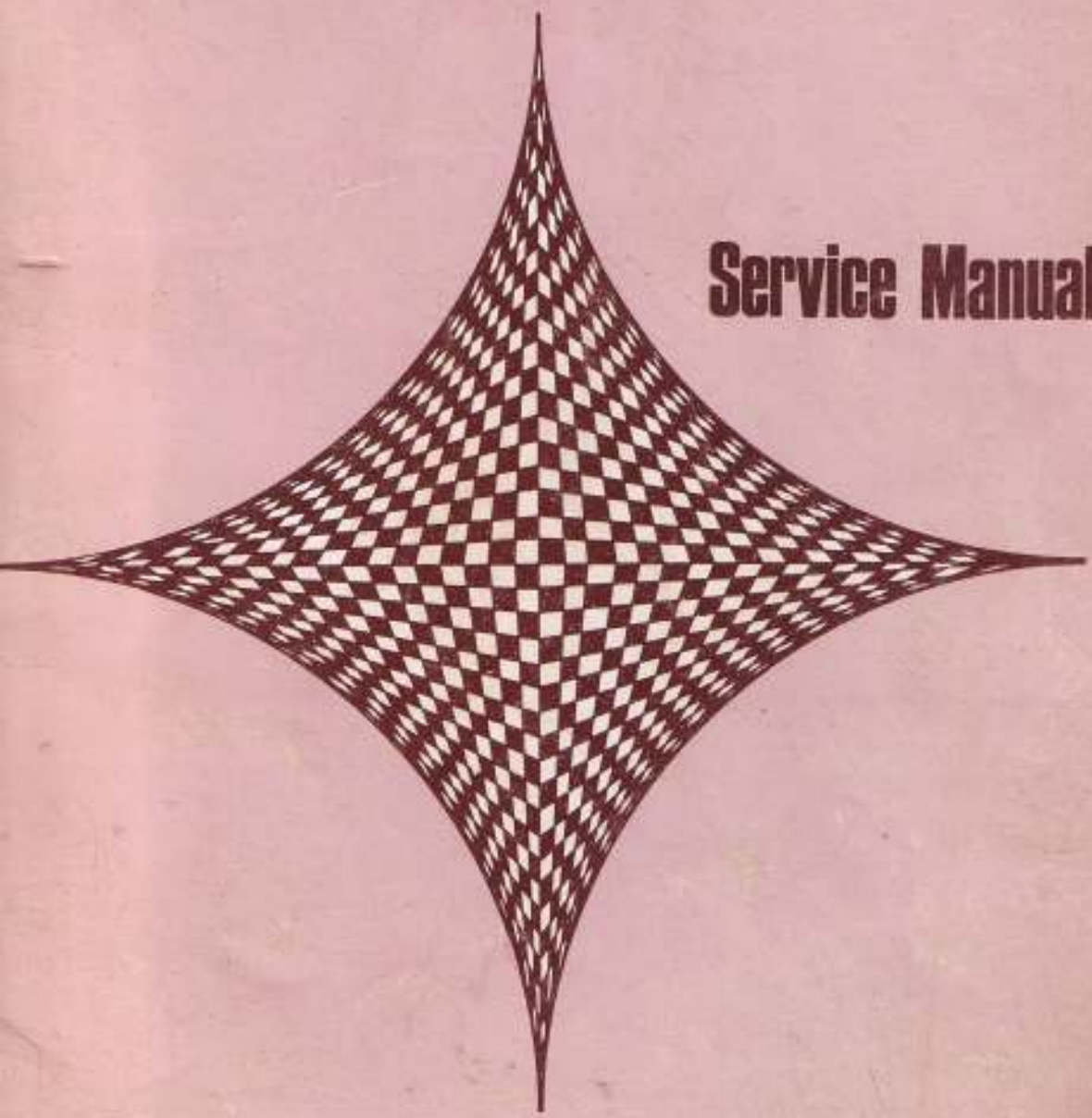
# YAMAHA

# YG1-FD

## Service Manual



YAMAHA MOTOR CO., LTD.

## CONTENTS


CHAPTER 1. GENERAL ..... 1

1– 1 Features ..... 1
1– 2 Specifications ..... 2
1– 3 Tools and Instruments for Shop Service ..... 4

CHAPTER 2. YAMAHA AUTOLUBE ..... 6

2– 1 What is Yamaha Autolube? ..... 6
2– 2 Features of Yamaha Autolube ..... 6
2– 3 Handling the Oil Pump ..... 6

CHAPTER 3. ENGINE ..... 9

3– 1 Removing the Engine ..... 9
3– 2 Cylinder Head ..... 13
3– 3 Cylinder ..... 13
3– 4 Piston Pin ..... 14
3– 5 Piston Rings ..... 15
3– 6 Piston ..... 16
3– 7 Shifter Ass'y ..... 17
3– 8 Crankcase Cover (R) ..... 17
3– 9 Clutch ..... 19
3–10 Primary Drive Gear ..... 22
3–11 Kick Assembly ..... 23
3–12 Rotary Valve ..... 25
3–13 Drive Sprocket ..... 26
3–14 Splitting the Crankcase Halves ..... 27
3–15 Transmission and Shifter ..... 29
3–16 Crankshaft ..... 33
3–17 Bearings and Oil Seals ..... 35
3–18 Carburetor ..... 36
3–19 Air Cleaner ..... 37
3–20 Transmission Oil ..... 37

CHAPTER 4. CHASSIS ..... 38
4– 1 Front Wheel ..... 38
4– 2 Rear Wheel ..... 40
4– 3 Front Fork ..... 42
4– 4 Rear Cushion ..... 46
4– 5 Steering Head ..... 46

CHAPTER 5. ELECTRICAL EQUIPMENT ..... 47
5– 1 Electrical Equipment ..... 47
5– 2 List of Electrical Components ..... 47
5– 3 Connection Diagram ..... 48
5– 4 Ignition System-Function and Service ..... 48
5– 5 Charging and Lighting System-Function and Checking ..... 51
5– 6 Checking the Main Switch (Removed from the Chassis) ..... 53
5– 7 Battery ..... 54
5– 8 Spark Plug ..... 54

# CHAPTER 1. GENERAL

## 1–1 Features

1. **High Performance Rotary Valve Engine with Yamaha Autolube**
   Yamaha's 2-stroke rotary valve engine with the YAMAHA Autolube system provides stable performance at low speed and smooth running at high speed as well as maximum acceleration at all speeds.

2. **Strong Light-Weight Frame**
   The 1.2mm moncoque frame of "back bone" type has been improved in strength and rigidity. Because it is light comparing the powerful engine power, the YG1-FD excels in acceleration and climbing ability.

3. **Larger Lights**
   Larger flasher and tail lights along with the easy-check speedometer insure additional safety for riders in heavy traffic.

4. **Easy Start Feature**
   The starting feature within the carburetor assures easy starting in all types of weather.

5. **Powerful Brake**
   Patented waterproof and dustproof brake drums provide safe, fade-free braking on wet or dusty roads.

6. **Ideal Riding Position and Good Handling**
   The stability is in harmony with the steerage at all times because of the specially designed steering system, suspension, damper, handle bars, saddle, fuel tank and foot rests.

7. **Unique Body Design**
   The body has sporty styling beautifully finished with two-tone colors.

## 1–2 Yamaha YG1-FD Specifications

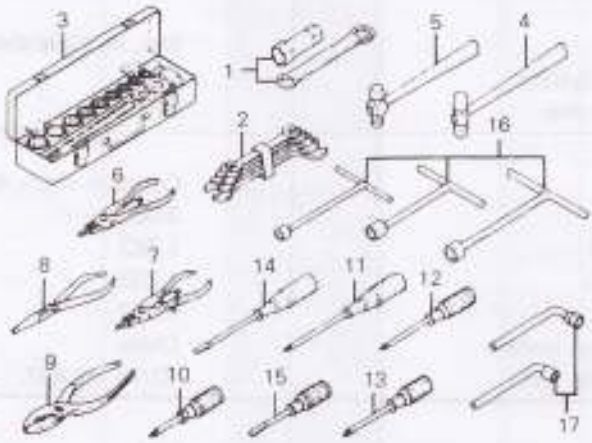
| | | |
|---|---|---|
| NAME: | YAMAHA | |
| MODEL: | YG1 – FD | |
| DIMENSIONS: | | |
| Overall length | 1,815 mm | (71.5") |
| Overall width | 625 mm | (24.6") |
| Overall height | 960 mm | (37.8") |
| Wheelbase | 1,145 mm | (45.1") |
| Minimum ground clearance | 150 mm | (5.9") |
| WEIGHT: | | |
| Netweight: A | 82 kg | (181 lbs.) |
| Seating capacity | 2 | |
| Weight incl. max. load: B | 192 kg | (423 lbs.) |
| Weight distribution in A: front | 37 kg | (82 lbs.) |
| rear | 45 kg | (99 lbs.) |
| Weight distribution in B: front | 57 kg | (126 lbs.) |
| rear | 135 kg | (297 lbs.) |
| PERFORMANCE: | | |
| Maximum speed | 85 km/h | (53 mph) |
| Fuel consumption on paved | 75 km/ℓ | (176 miles/gal.) |
| Level ground | 30 km/h | (19 mph) |
| Climbing ability | 20 | |
| Minimum turning radius | 1,780 mm | (70.1") |
| Braking distance | 7 m (23 ft.) at 35 km/h (22 mph) | |
| ENGINE: | | |
| Model | G1 | |
| Type | 2-cycle, gasoline engine | |
| Cooling system | Air cooled | |
| Number of cylinder | 1, inclined forward | |
| Displacement | 73 cc | (0.014 qt.) |
| Bore x stroke | 47 x 42 mm | (1.85 x 1.65") |
| Compression ratio | 6.8 : 1 | |
| Maximum horsepower | 6.5 ps at 7,000 rpm | |
| Maximum torque | 0.7 kg-m (5 ft-lbs.) at 5,000 rpm | |
| Minimum fuel consumption at full load | 340 gr/ps/h/7,000 rpm | |
| Weight incl. muffler | 21 kg | (46.3 lbs.) |
| Dimensions | 408 x 375 x 255 mm (16 x 15 x 10") | |
| Starting system | Kick starter | |
| IGNITION SYSTEM: | | |
| Ignition system | Magneto ignition | |
| Ignition timing | 1.8 mm (0.071") before upper dead point. | |
| Spark plug | B-7HS | |
| Point gap | 0.30 ~ 0.35 mm (0.012 ~ 0.014") | |
| BATTERY: | | |
| Manufacturer | Furukawa GS | |
| Model | BST2-6 or B31-6 MG-26 | |
| Capacity | 6V 4AH | |
| CARBURETOR: | VM15SC-1 | |

| | |
|---|---|
| AIR CLEANER: | Dry, paper filter type |
| FUEL TANK CAPACITY: | 6.5 |
| LUBRICATION: | YAMAHA AUTOLUBE |
| CLUTCH: | |
| Type | Wet, multiple disk |
| Primary reduction system | Gear |
| Primary reduction ratio | 3.894 |
| TRANSMISSION: | |
| Type | Constant mesh, 4 speeds |
| Gear ratio: 1st | 3.083 |
| 2nd | 1.882 |
| 3rd | 1.333 |
| 4th | 1.000 |
| Secondary reduction system | Chain |
| Secondary reduction ratio | 37/15 = 2.467 |
| FRAME: | |
| Model | Y20 |
| Type | Back bone type monocoque |
| SUSPENSION: | |
| front | Telescopic |
| rear | Swinging arm |
| DAMPER: | |
| front | Coil spring and oil damper |
| rear | Coil spring and oil damper |
| STEERING: | |
| Steering angle | Right and left 45° |
| Caster | 63° |
| Trail | 90 mm (3.54") |
| TIRES: Front | 2.50–17–4PR |
| Rear | 2.50–17–4PR |
| BRAKES: Type | Internal expanding |
| Front | Hand, wire brake |
| Rear | Foot, rod brake |
| LAMPS: | |
| Headlight | 6V 15/15W |
| Taillight | 6V 3/10W |
| Meterlight | 6V 1.5W |
| Flasherlight | 6V 8W |
| Flasher pilotlight | 6V 3W |
| Neutral light | 6V 3W |

## 1–3 Tools and Instruments for Shop Service

The following tools and instruments are required to service the YG1-FD.

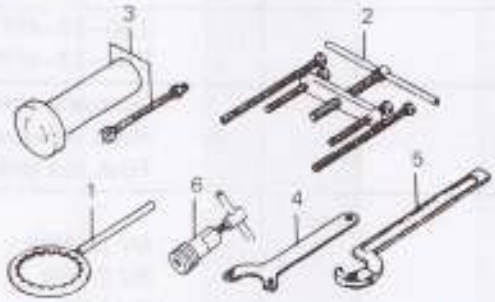
### 1. General Tools




1. Plug wrench 23 x 29mm (0.09 x 0.11")
2. A set of wrenches
3. A set of socket wrenches
4. Plastic tip hammer
5. Steel hammer
6. Circlip pliers (ST type)
7. Circlip pliers (TR type)
8. Needle nose pliers
9. Pliers
10. Phillips-head screwdriver
11. Phillips-head screwdriver (L)
12. Phillips-head screwdriver (M)
13. Phillips-head screwdriver (S)
14. Slot-head screwdriver (M)
15. Slot-head screwdriver (S)
16. T-handle socket wrench
17. L-handle socket wrench

Fig. 1-3-1

### 2. Special Tools and Instruments




1. 100L1 clutch holding tool
2. Crankcase disassembling tool
3. Crankshaft assembling tool
4. Flywheel magneto holding tool
5. New-type exhaust ring nut wrench
6. Flywheel magneto puller

Fig. 1-3-2

In addition, an electro-tester, tachometer (engine rpm meter) hydrometer, etc. will be furnished.

3. Other Tools




1. Grease
2. Autolube oil
3. Yamaha Bond (No. 4)
4. Wiping material
5. Overhauling stand
6. Parts tray
7. Oiler
8. Oil jug

Fig. 1-3-3

The use of a wooden box as shown in the above photo will facilitate engine service and overhaul. Consumable parts (such as gaskets) and replacement parts must also be on hand.

# CHAPTER 2. YAMAHA AUTOLUBE

## 2–1 What is Yamaha Autolube?

Conventional 2-stroke engines are lubricated by motor oil premixed in gasoline, but this premixing has been outdated by the Yamaha Autolube, which is an automatic lubrication device. It stores oil in the oil tank (separated from the fuel tank), and automatically meters oil to the engine by the oil pump.

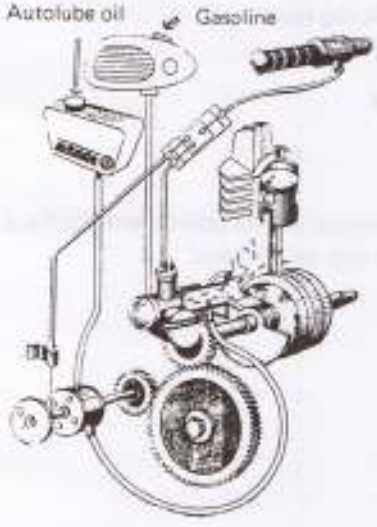



Fig. 2-1-1

## 2–2 Features of Yamaha Autolube

The oil pump is driven by the engine through a reduction gear, and connected to the throttle slide which is controlled by the accelerator grip.
The oil pump automatically regulates the volume of lubricating oil according to both engine speed and throttle opening, pumping a proper amount of oil to the engine under all operating conditions.
This "automatic separate lubrication" eliminates not only many disadvantages of the premixing system, but it furthers the potential efficiency, performance and durability of 2-stroke engines.

A) The Autolube feeds the precise amount of oil required to the engine under all operating conditions.
- Less oil consumption.
- Less carbon build-up.
- Less exhaust smoke.
- Improved lubrication efficiency.

B) The Autolube simplified fuel supply.
- Gasoline supply only.
- Clean engine.

C) The Autolube provides highly dependable lubrication.
- No special care required for oil quantity and fuel-oil premixing ratios.

## 2–3 Handling the Oil Pump

The oil pump is a precision-machined assembly. Make no attempt to disassemble it. When you remove the oil pump from the engine, protect it from dust, dirt, etc. After reinstallation, be sure to bleed and set the pump and oil lines of air bubbles correctly. Proper handling will keep the pump free of trouble.

### 2–3–A Checking and Adjusting the Minimum Pump Stroke

1. Checking
   a. Fully close the accelerator grip. (In this case pump stroke will be at minimum).
   b. Turn the oil pump starter plate in the direction of the arrow marked on the plate. The adjusting plate is pushed up, thus causing a gap between the adjusting plate and the adjusting pulley. In this case, try to keep the gap at maximum. Measure it with your eyes.



Fig. 2-3-1

c. Insert a 0.15 mm (0.006") feeler gauge into the gap. If the gap allows the gauge to enter the pump stroke is normal. If not, the stroke is insufficient. (Adjustment is required.)



Fig. 2-3-2

2. Adjustment Methods

a. Remove the adjusting plate, and insert a 0.1 mm (0.004") adjusting shim.



Fig. 2-3-3

b. Reinstall the adjusting plate, and check the minimum stroke with the adjusting shim in place.
If the gap allows a 0.25 mm (0.010") feeler gauge to enter, the adjustment is correct.
Minimum stroke
Adjusting limit
..... 0.15 mm (0.006") or less
Correction standard
0.20 ~ 0.25 mm (0.008 ~ 0.010")

## 2–3–B Checking and Adjusting the Setting of the Pump and Carburetor

After checking and adjusting the minimum stroke, set the carburetor and the pump in the following manner.

1. Checking

a. Adjust the idle adjusting screw in the carburetor, and then adjust the free play of the throttle cable (B) to 1 ~ 2 mm (0.04" ~ 0.08").

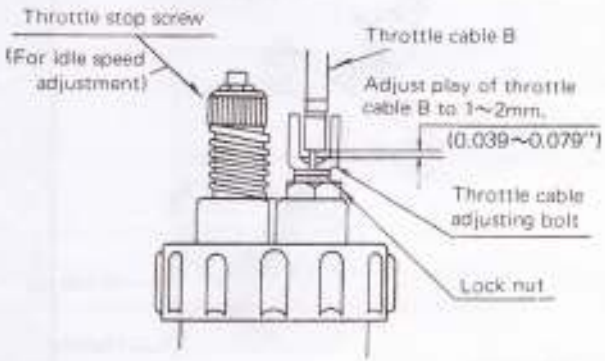



Fig. 2-3-4

b. Slowly open the accelerator grip until the top of the stamped marking (circle) on the throttle valve comes in contact with the top of the main bore (in this case, the carburetor is at half throttle opening), and check to see if the pump guide pin is aligned with the marking on the adjusting pulley.

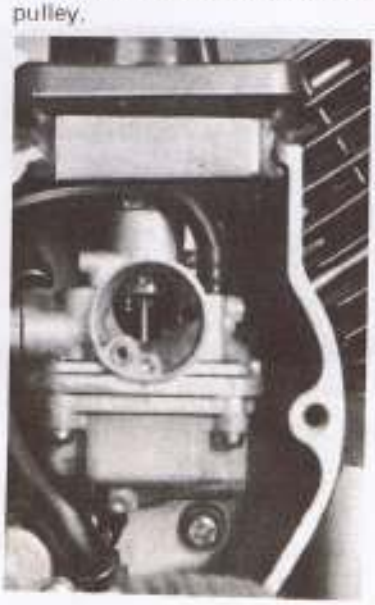


Fig. 2-3-5

2. **Adjustment**
   a. If the marking on the pump guide pin is not aligned with the marking on the adjusting pulley, loosen the lock nut shown in Fig. 2-3-6.
   To align both markings, turn the adjusting screw in or out, and tighten or slacken the pump cable. After this adjustment, fully tighten the lock nut. After adjusting the play of the throttle cable, the pump cable also should be adjusted, if required.

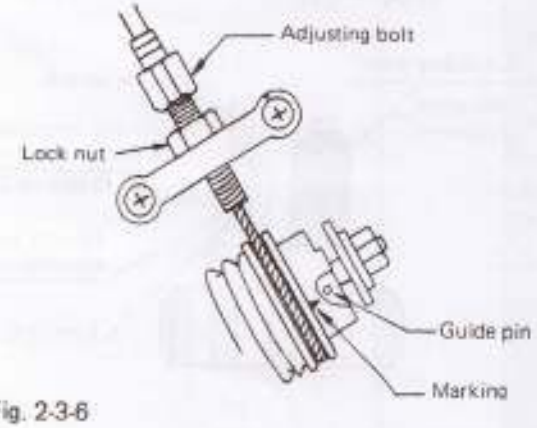



Fig. 2-3-6

## 2–3–C. Bleeding

When the oil pump is removed or when the Autolube oil tank is emptied, air enters the pump case, causing an irregular flow of oil. This is due to air bubbles in the delivery pipe. The pump must be bled.

1) Remove the bleeder bolt.

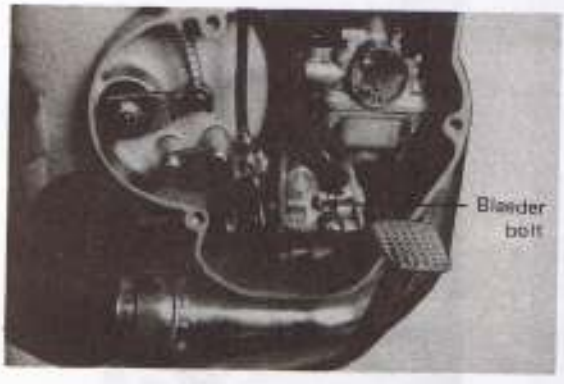



Fig. 2-3-7

2) Next turn the starter plate in the direction of the arrow (to the right facing the pump body) to force out all of the air. Then tighten the bleeder bolt. For this bleeding fully open the accelerator grip and rotate the starter plate, so that pump stroke will become greater and air may be expelled more quickly.

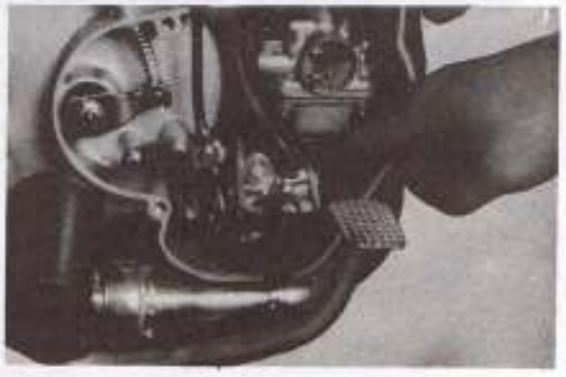


Fig. 2-3-8

# CHAPTER 3. ENGINE

The engine should be disassembled in an orderly sequence for easy and efficient work.

- Caution on Engine Disassembly

1. Before removing the engine from the chassis, clean dirt and dust from the cylinder head, cylinder and crankcase, and keep these components clean during disassembly.
2. Always use clean tools, and use them correctly to avoid damaging parts.
3. Keep the disassembled parts on the parts trays separately in each group.

## 3–1 Removing the Engine

1. Drain the transmission oil after running the engine for 1 to 2 minutes. (Fig. 3-1-1)

Note:

The transmission oil can be quickly drained after 1 to 2 minutes of engine warming up.
Oil amount: 450 ~ 550 cc (0.52 ~ 0.60 qt.)
(SAE 10/30W)



Fig. 3-1-1

2. Remove the exhaust pipe. (Fig. 3-1-2 and 3)



Fig. 3-1-2



Fig. 3-1-3

3. Remove the change pedal after change gear is high in 5th state.(Fig. 3-1-4)



Fig. 3-1-4

4. Remove the crankcase cover (L). (Fig. 3-1-5)



Fig. 3-1-5

5. Remove the shifter ass'y. (Fig. 3-1-6)



Fig. 3-1-6

6. Remove the flywheel magneto. (Fig. 3-1-7)



Fig. 3-1-7



Fig 3-1-8

7. Remove the flywheel magneto base, and hold it to the frame with a string, so that engine removal can be facilitated. (Fig. 3-1-9)



Fig. 3-1-9



Fig. 3-1-10

8. Pry out the woodruff key (segment key) with a slot-head screwdriver. (Fig. 3-1-11)



Fig. 3-1-11

9. Disconnect the chain case (lower), and remove the chain from the joint. (Fig. 3-1-12)



Fig. 3-1-12

10. Remove the carburetor cover. (Fig. 3-1-13)



Fig. 3-1-13

11. Turn the fuel cock to the STOP position, and remove the carburetor. (Fig. 3-1-14)



Fig. 3-1-14

12. Disconnect the oil pipe. (Plug the line to prevent oil from flowing out of the pipe). (Fig. 3-1-15)



Fig. 3-1-15

13. Disconnect the pump cable, together with the adjusting holder. (Fig. 3-1-16)



Fig. 3-1-16

14. Disconnect the clutch cable. (Fig. 3-1-17) (For reinstallation, refer to 3-8 Clutch Adjustment).

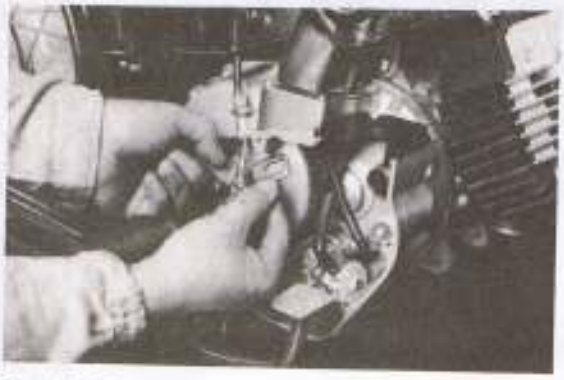


Fig. 3-1-17

15. Remove the air cleaner. (Fig. 3-1-18)



Fig. 3-1-18

16. Pull out the two mounting bolts on the upper part of the engine, and loosen the foot rest mounting bolt. Then tilt the engine forward. (Fig. 3-1-19)



Fig. 3-1-19



Fig. 3-1-20

17. Disconnect the cable from the neutral light switch. (Fig. 3-1-21)

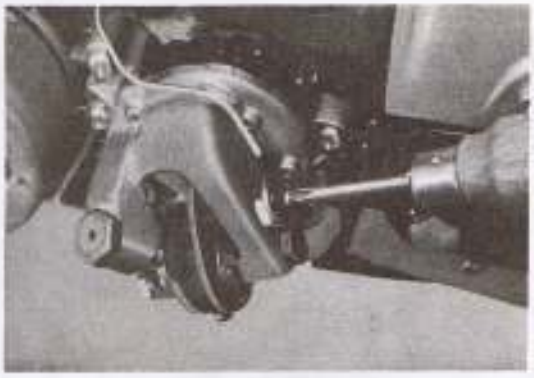


Fig. 3-1-21

18. Pull out the foot rest mounting bolt, and remove the engine from the chassis. (Fig. 3-1-22)



Fig. 3-1-22

## 3–2 Cylinder Head

A. Removal and Reinstallation
Remove the spark plug. Remove the four nuts from the top of the cylinder head, and remove the cylinder head gasket. For reinstallation, reverse the above sequence. Replace any deformed gasket. (Fig. 3-2-1)



Fig. 3-2-1

B. Removing Carbon
Carbon build-up in the combustion chamber of the cylinder head increases the compression ratio, causing pre-ignition, overheating, and greater fuel consumption. Clean the cylinder head. (Fig. 3-2-2)

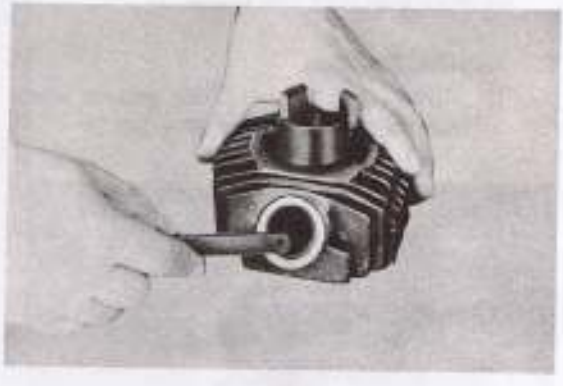


Fig. 3-2-2

## 3–3 Cylinder

A. Checking Cylinder Wear
Measure the cylinder bore diameter at four different depths with a bore measuring micrometer or a cylinder gauge placed parallel with, then at right angles to the crankshaft, for 8 measurements in each cylinder. If the difference between the maximum and minimum diameters measured exceeds 0.05mm(0.002") rebore and hone the cylinder. (Fig. 3-3-1)

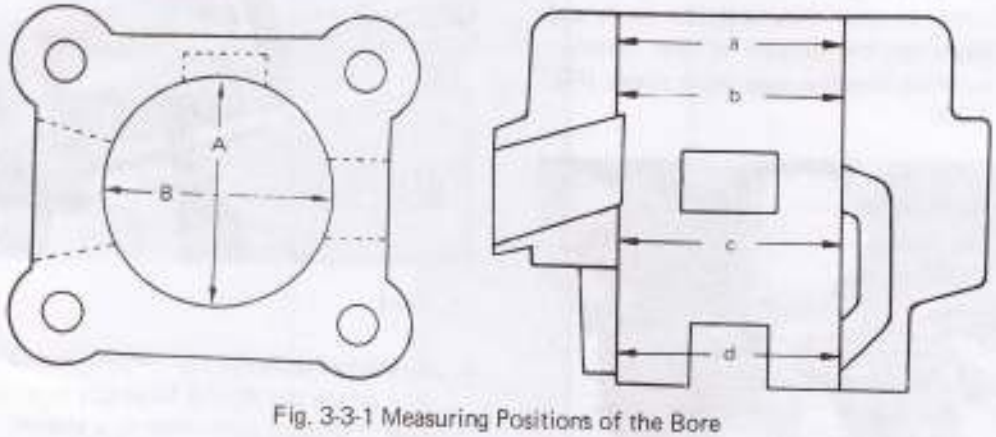



Fig. 3-3-1 Measuring Positions of the Bore

B. Minimum Clearance between Piston and Cylinder
The minimum clearance between the piston and the cylinder should be kept within the range of 0.025 ~ 0.030 mm (0.0010 ~ 0.0012").

Cylinder Reconditioning

The cylinder should be reconditioned in the following manner.

a. Piston are available in 0.25 mm (0.010") and 0.50 mm (0.020") oversizes.

b. Cylinder should be rebored and honed to the diameter of the oversize piston.

c. The error between the maximum and minimum bore diameters after honing should be no more than 0.01 mm (0.004").

C. Installing Cylinders

1) Always use new cylinder gaskets when overhauling the engine. (Fig. 3-3-2)



Fig. 3-3-2

2) When installing the cylinder over the piston, squeeze the piston rings into their grooves (The ring ends should be positioned close on the respective locating pins), so that they will not catch and break on the bottom of the cylinder. (Careless handling may break rings). (Fig. 3-3-3)



Fig. 3-3-3

D. Removing Carbon

Carbon tends to accumulate heavily on the wall of the cylinder exhaust port. Scrape the carbon off with a screwdriver. (Fig. 3-3-4)



Fig. 3-3-4

## 3–4 Piston Pin

A. Driving Out the Piston Pin

Remove the clip at each end of the piston pin, with needle nose pliers, and push the pin out from the piston with a finger or a screwdriver. (Fig. 3-4-1)

Before removing the piston pin clips, cover the crankcase with a clean rag to prevent the clips from entering the crankcase.

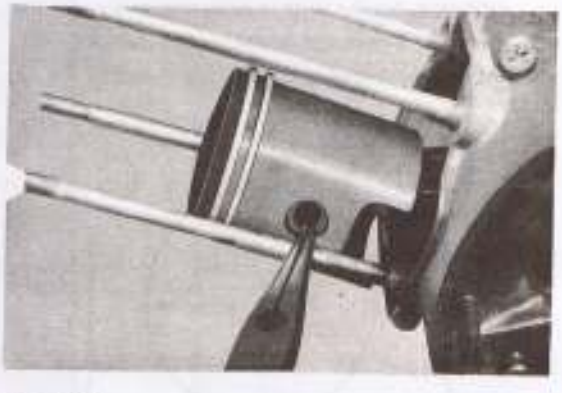


Fig. 3-4-1

B. Piston-to-Piston Pin Fit

The piston pin should fit snugly in its bore so that it drags a little when it is pushed with a finger. If the pin is loose, the pin and/or the piston should be replaced. A pin with step-wear should also be replaced. (In this case, the needle bearing also should be replaced).

## 3–5 Piston Rings

A. Removing Rings

Put both thumbs at each end of the piston ring and pull the piston ring ends apart, and slide it out of the groove on the other side of the ring ends. (Figs. 3-5-1 and 2)



Fig. 3-5-1



Fig. 3-5-2

B. Fitting the Rings

First fit the No. 2 ring (parkerized) over the piston, and then the No. 1 ring (chrome) and align their end gaps with the locating pin in each ring groove. (Fig. 3-5-3)

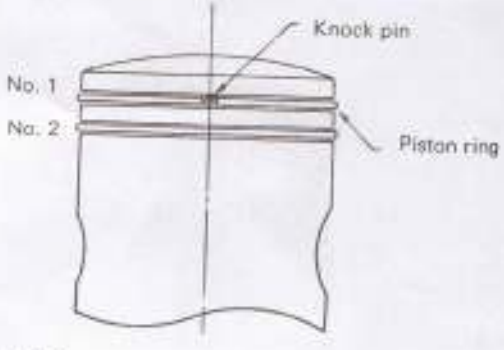



Fig. 3-5-3

C. Checking Piston Rings

1) Measuring Piston Ring Wear

Put each ring into the cylinder so that the ring is parallel with the cylinder bottom, and measure the end gap with a feeler gauge. (Fig. 3-5-4)

Each gap should be between 0.15 mm (0.006") and 0.35 mm (0.014") for both No.1 and No.2 rings.



Fig. 3-5-4

2) Removing Carbon

Carbon on the piston rings and in the ring grooves will make the rings stick to the piston. Remove the ring from the piston, and clean the carbon from the rings and grooves.

## 3–6 Piston

### A. Checking and Reconditioning the Piston

1) Measuring Piston Clearance

Piston clearance mentioned here is defined as the difference between the minimum cylinder bore diameter and the maximum outside diameter of the piston. As described in 3–3 Cylinder, piston clearance should be as shown Fig. 3-3-2. To determine the maximum piston outside diameter, measure it with a micrometer at right angles to the skirt and 10 mm above the bottom edge. (Fig. 3-6-1)



Fig. 3-6-1

2) Checking and Correcting Scratches

Pistons showing signs of seizure are noisy and keep the engine from developing full power. If a piston that has seized up is used again without correction, another seizure will develop at the same point, causing damage to the cylinder. Lightly sand these seizure "high spots" on the piston with #400 sandpaper. (Figs. 3-6-2 and 3)



Fig. 3-6-2



Fig. 3-6-3

3) Removing Carbon

Carbon accumulations on the piston head should be carefully removed with a knife or a other scraper. (Fig. 3-6-4)

Carbon accumulations on the piston ring groove make the ring stick to the piston. Remove the carbon. (Fig. 3-6-5)



Fig. 3-6-4



Fig. 3-6-5

B. Installing the Piston in its Proper Direction

Install piston with the arrow marked on the piston head pointing downward (toward the exhaust port). (Fig. 3-6-6)

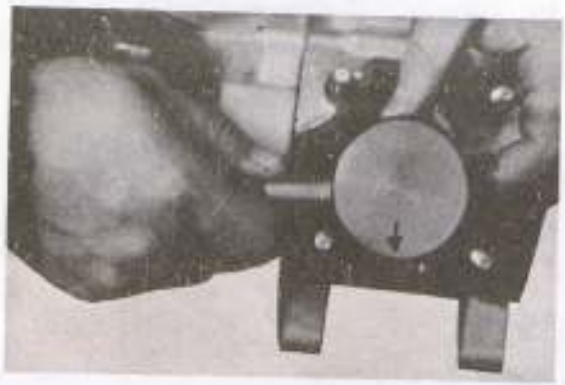


Fig. 3-6-6

## 3–7 Shifter Ass'y

A. Loosen the nut with a 8 mm (0.32") spanner, while holding another end of the rod with a clutch holder.



Fig. 3-7-1

B. Remove the shifter ass'y



Fig. 3-7-2

## 3–8 Crankcase Cover (R)

A. Removal

1) Remove the kick starter crank clamping bolt, and remove the kick starter crank. (Fig. 3-8-1)



Fig. 3-8-1

2) Remove the banjo bolt from the pump delivery pipe valve cover. (Fig. 3-8-2) (The crankcase cover can be removed without removing the oil pump).



Fig. 3-8-2

3) Remove the pan-head screws from the crankcase cover (R), and take off the cover. (Figs. 3-8-3 and 4)



Fig. 3-8-3

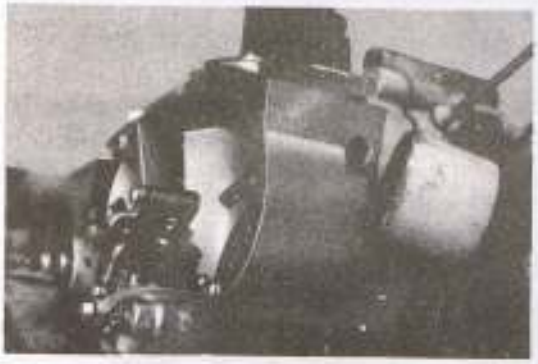


Fig. 3-8-4

4) Replace the crankcase cover gasket, if damaged. (Fig. 3-8-5)



Fig. 3-8-5

B. Reinstallation

Apply the crankcase (R) sealing surface with gasket paste (Yamaha bond No. 4); and place the crankcase cover gasket upon it, and then install the crankcase cover. (Fig. 3-8-6)
Be sure to apply Yamaha Bond No. 4 to prevent oil leakage.



Fig. 3-8-6

## 3-9 Clutch

The clutch is a wet, multi-disc type, consisting of four molded cork friction plates and four clutch plates in the clutch housing mounted on the transmission main axle.
The clutch housing is integrated with the large reduction gear (primary driven gear), which is driven by the small reduction gear (primary drive gear).
The primary drive gear and the primary driven gear have 19 and 74 teeth respectively, so that the primary drive reduction ratio is 3.894 : 1 (74/19 = 3.894).

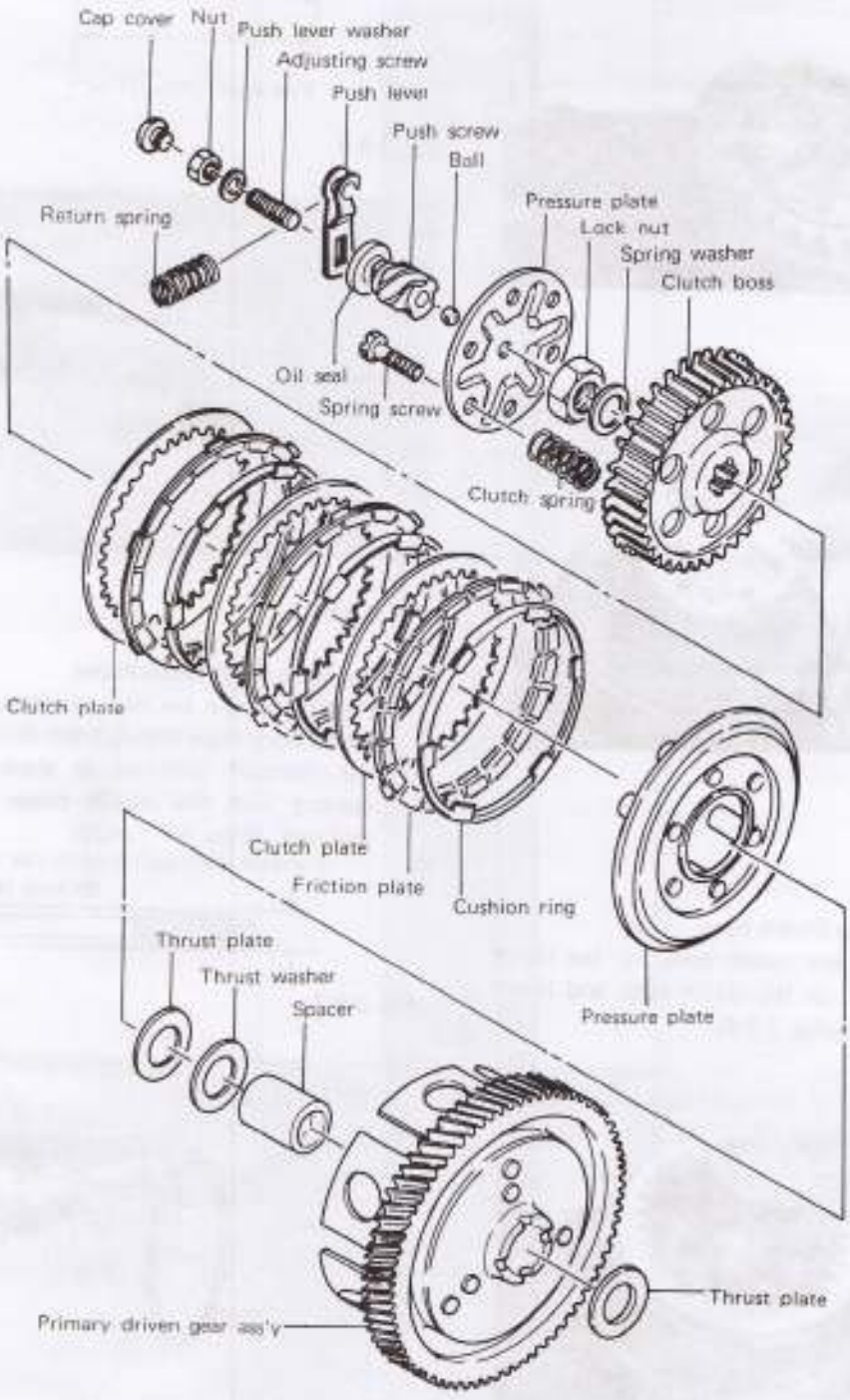



Fig. 3-9-1

A. Removing the Pressure Plate

Remove the six clutch spring holding screws, and remove the pressure plate 1. (Figs. 3-9-2 and 3)



Fig. 3-9-2



Fig. 3-9-3

B. Removing the Clutch Boss

To remove the clutch boss, fit the clutch holding tool on the clutch boss, and loosen the lock nut. (Fig. 3-9-4)



Fig. 3-9-4

C. Checking Clutch Springs

Measure the free length of each clutch spring, and replace any spring more than 1 mm shorter than the standard free length. (Figs. 3-9-5 and 6)

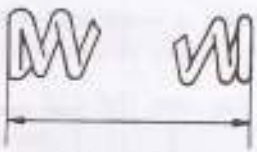



Fig. 3-9-5

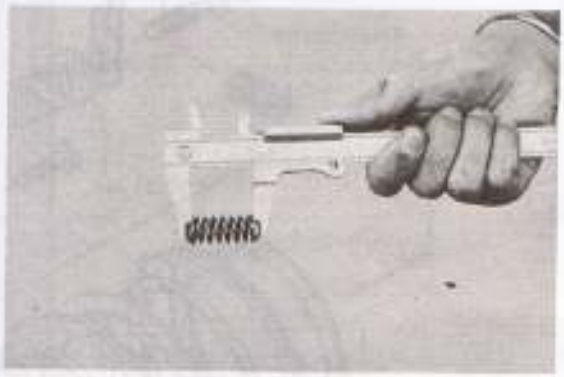


Fig. 3-9-6

D. Checking the Friction Plates

Friction plates are not everlasting, so that plates worn more than 0.3 mm (0.012") under the standard thickness or showing uneven contact with the clutch plates should be replaced. (Figs. 3-9-7 and 8)




Fig. 3-9-7

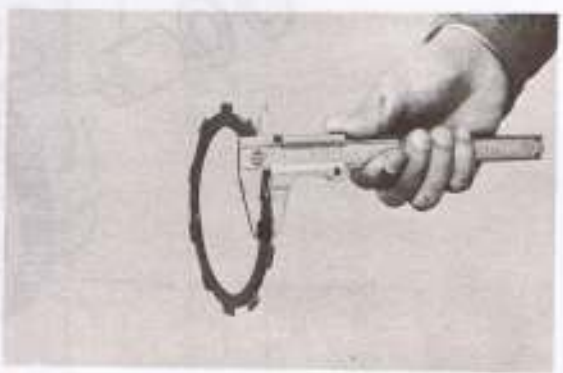


Fig. 3-9-8

E. Clutch Housing Ass'y (Integrated with the Primary Driven Gear)

A rubber thrust cushion O-ring is fitted between the clutch housing and the primary driven gear to eliminate the transfer of gear noise at low speed revolution.

1) Checking

Insert the primary gear retaing collar in the primary driven gear boss, and check it for radial play and scratch that could cause noise. If any scratch is found, smooth it out with an oil stone or fine grain sandpaper, because it will impair clutch action. If the play is excessive, replace the gear retaining collar because it will cause excessive noise. (Fig. 3-9-9)

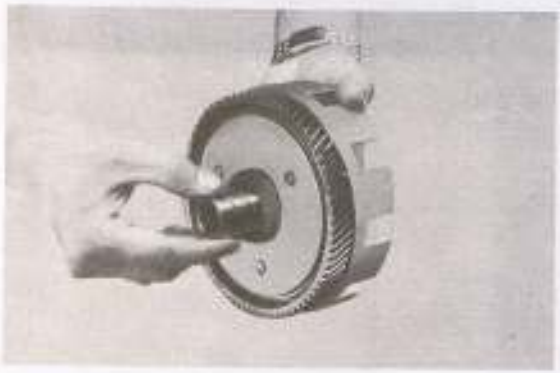


Fig. 3-9-9

F. Checking the Primary Gear Spacer

Place the primary gear retaining collar around the main axle, and again check it for radial play. If play exists, replace the gear retaining collar.

Replace any collar with step-wear on its outer surface. (Fig. 3-9-10)



Fig. 3-9-10

G. Caution on Reassembling the Clutch

On both ends of the primary gear spacer are thrust washers. If these washers are incorrectly installed, or omitted, the clutch boss will directly contact with the primary driven gear, impairing clutch actions.

Before fitting the clutch boss, install the clutch plates, friction plates, and then install the clutch boss. For this installation, the markings painted should be aligned.

H. Adjusting the Clutch

1) Remove the rubber cap and loosen the push screw lock nut.

Fasten the push screw to a lightly seated position, and back it off 1/4 turn to set the screw. Then fully tighten the lock nut. (Fig. 3-9-11)



Fig. 3-9-11

2) Adjusting Clutch Cable Tension

The clutch cable becomes slackened after being used for a long time. Adjust the cable so that the play of the clutch handle is from 2 to 3 mm. (1/16 ~ 1/8") (Fig. 3-9-12)




Fig. 3-9-12

3) Adjustment (Fig. 3-9-13)
   a. Loosen the lock nut (a) fitted on the crankcase cover (L).
   b. To reduce lever play, loosen the adjusting screw, and tighten it to increase play.
   c. After the adjustment, tighten the lock nut.

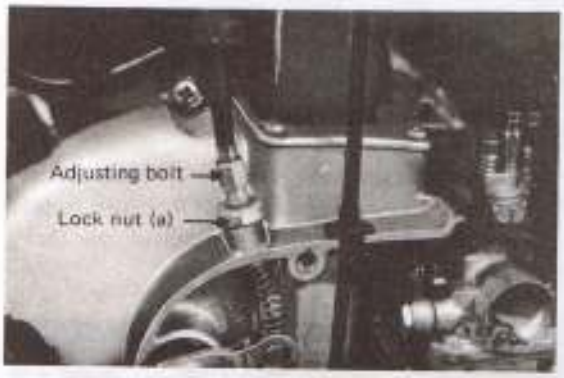



Fig. 3-9-13

## 3–10 Primary Drive Gear

1) Removal
   Feed a rolled-up rag between the teeth of the primary drive gear and primary driven gear to lock them, and loosen the primary drive gear lock nut. (Fig. 3-10-1)



Fig. 3-10-1

## 3–11 Kick Assembly

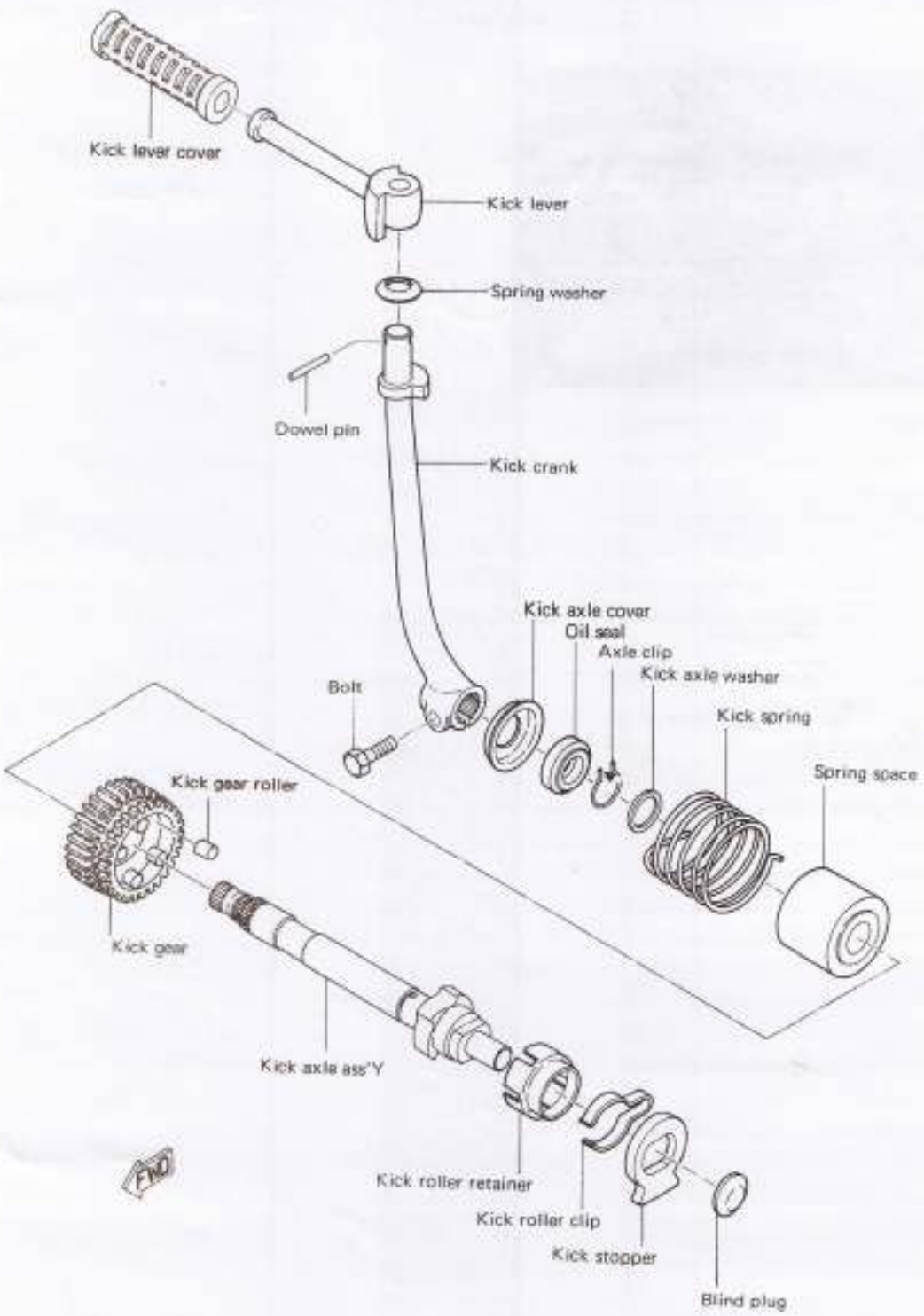



Fig. 3-11-1

1) Remove the clip and kick spring.
2) After splitting the crankcase, remove the kick ass'y.

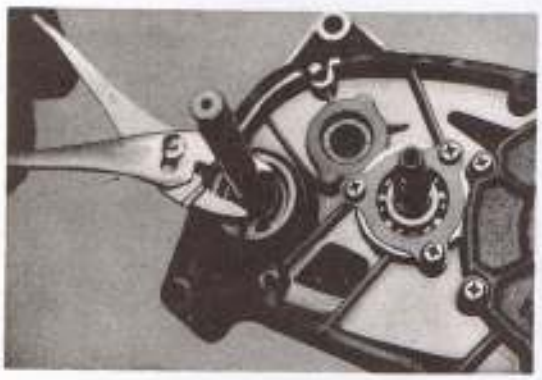


Fig. 3-11-2

## 3–12 Rotary Valve

A. Removal

1) Remove the valve cover mounting bolts and remove the valve cover. (Fig. 3-12-1)

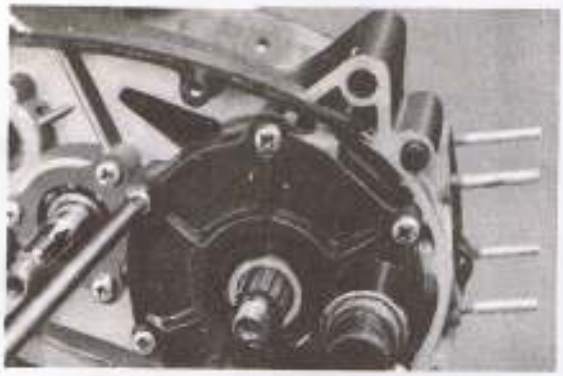


Fig. 3-12-1

2) Removing the Valve Knock Pin
As shown in Fig. 3-12-1, push out the valve knock pin from the other side, with a nail or wire. Be careful not to damage the crankcase surface. (Fig. 3-12-2)

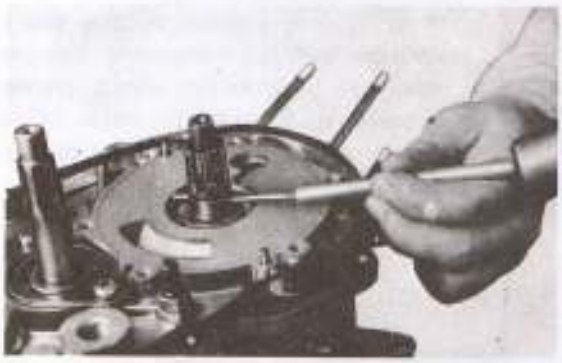


Fig. 3-12-2

B. Checking

1) Valve and Valve Unit Collar
Fit the valve over the valve unit collar and check for play. If play is excessive, replace the valve. (Fig. 3-12-3)



Fig. 3-12-3

If the valve unit collar is worn with step, replace it.

2) Valve Cover O-ring
O-rings tend to stretch slightly after being used for a long time. A stretched O-ring will not fit in the groove perfectly, and should be replaced. When installing the O-ring, grease it so that it sticks to the valve cover, thus facilitating the installation. (Fig. 3-12-4)

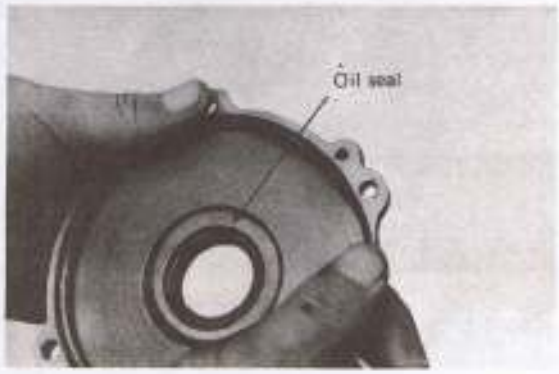



Fig. 3-12-4

3) Crankshaft O-ring
The crankshaft O-ring may easily get scratched when it is installed in the valve unit collar. Replace it if damaged.
When installing the valve unit collar, take care not to scratch the O-ring. For this purpose, grease the O-ring before installation. (Fig. 3-12-5)



Fig. 3-12-5

4) Valve Cover Oil Seals
Apply grease of good quality to the lip surface when replacing the oil seal. (Fig. 3-12-6)

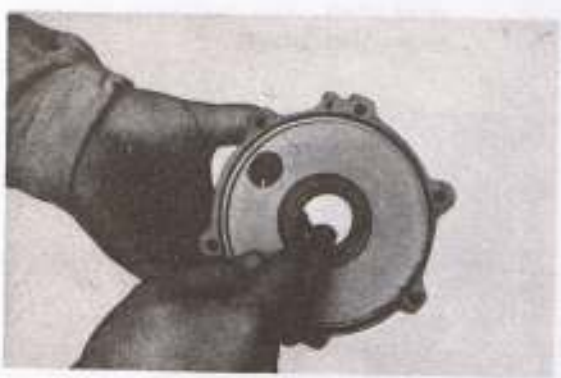


Fig. 3-12-6

## 3–13 Drive Sprocket

A. Removal

1) Straighten the bent edge of the lock washer, with a chisel. (Fig. 3-13-1)



Fig. 3-13-1

2) Lock the drive sprocket with the flywheel magneto holding tool, and loosen the sprocket nut. (Fig. 3-13-2)
If no flywheel magneto holding tool is available, shift the transmission into low gear, and fit a socket wrench on the sprocket nut. Then tap the holder of the wrench with a hammer so that the nut can be loosened.



Fig. 3-13-2

B. Checking the Drive Sprocket

Any worn drive sprocket may result in excessive noise and shorten the life of the chain. Check the sprocket, and replace it if worn. (Fig. 3-13-3)

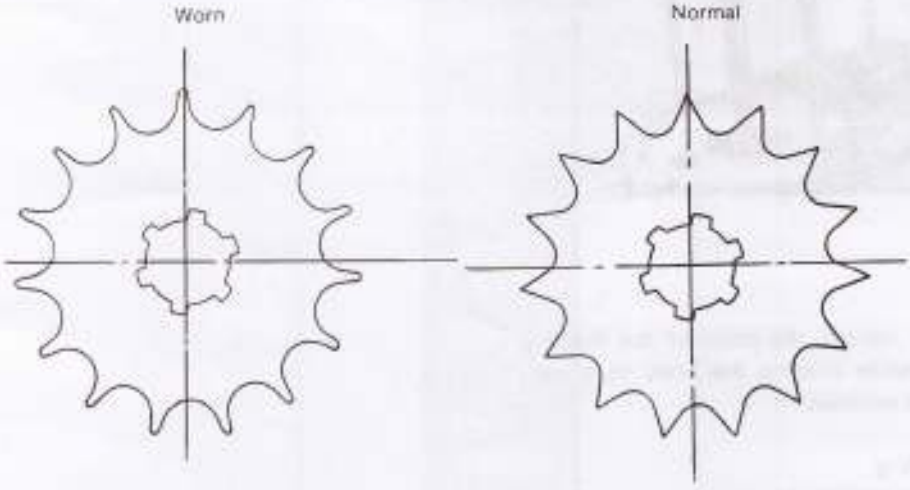



Fig. 3-13-3

## 3–14 Splitting the Crankcase Halves

A. Splitting

The crankcase may be split from either side, but to facilitate the subsequent servicing operations, the dividing tool should be installed the right half of the crankcase.

1) Remove the pan-head screw from the left side half of the crankcase. (Fig. 3-14-1)

2) Install the crankcase dividing tool on the right half of the crankcase, and alternately tap the transmission main axle and the side of the right half with a plastic tip hammer, so that the crankcase can be divided into two halves. (Figs. 3-14-2 and 3)



Fig. 3-14-1

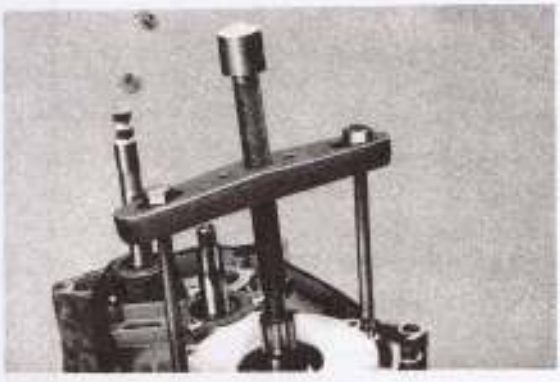


Fig. 3-14-2



Fig. 3-14-3

Note:

Fully tighten the bolts of the dividing tool while keeping the body in a horizontal position.

B. Reassembling

When reassembling the crankcase, be sure to apply Yamaha Bond No. 4 to the mating surfaces of the crankcase. (Fig. 3-14-4)



Fig. 3-14-4

## 3–15 Transmission and Shifter

The transmission and shifter mechanism is of the same "ball lock" type as on the YG1 model. The Yamaha YG1-FD, however, has been fitted with the 4-speed gear box with the improved shifter given below.

**Exploded view of the transmission and shifter**

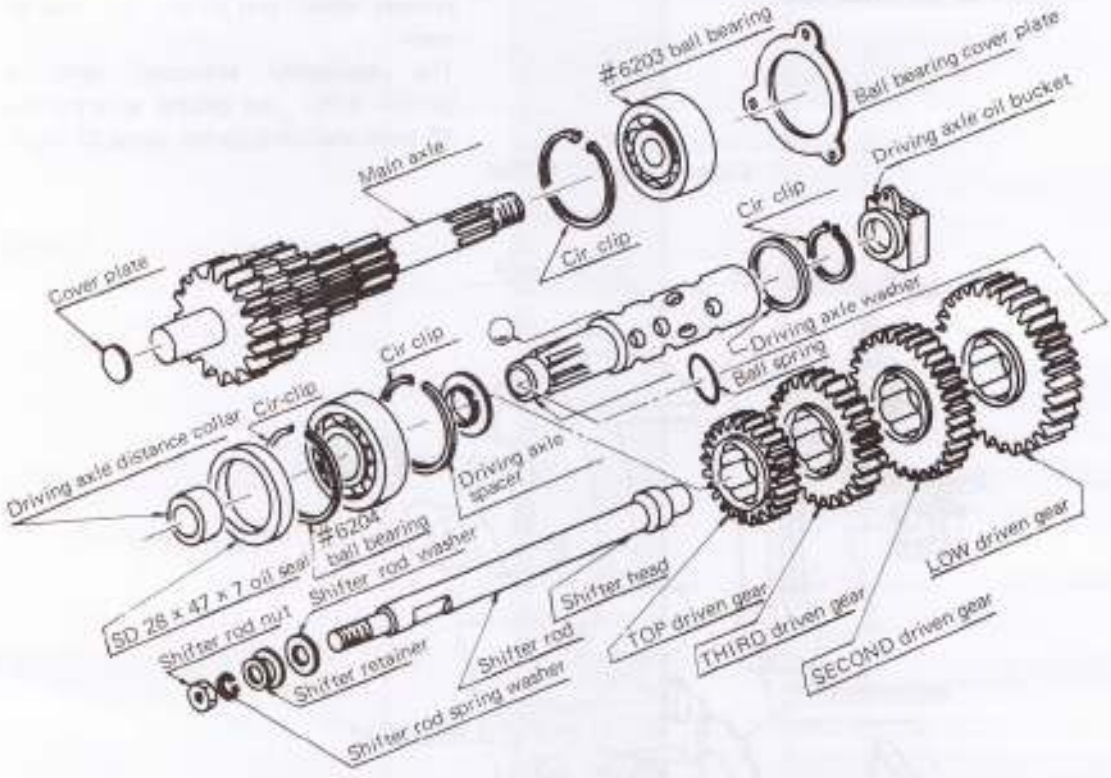



Fig. 3-15-1

## A. Components

1) Transmission
The transmission is composed of the main axle, driving axle, 4 driven gears, 16 steel balls and shifter rod.
The TOP driving gear and the main axle have been burned together. The steel ball size is 9/32" (5/16" for MF2).

2) Shifter
The shifter assembly is composed of the shifter, rod, cam plate and others.
The shifter cam plate changes the vertical motion of the lever A to the horizontal motion for the shifter rod.

## B. Mechanism

1) Transmission
The transmission works as follows (see Illustration). The shifter head pushes up one group of steel balls to lock the corresponding driven gear. The gear is connected with the driving axle to revolve. The revolution is transmitted to the chain through the sprocket located at the left end of the driving axle, and then from the chain to the rear wheel.
The primary reduction ratio is 74/19 = 3.894: the primary driving gear on the crank shaft has 19 teeth and the primary driven gear on the main axle 74 teeth.
The secondary reduction ratio is 37/15 = 2.467: the driving sprocket has 15 teeth and the sprocket wheel 37 teeth.

Exploded view of shifter

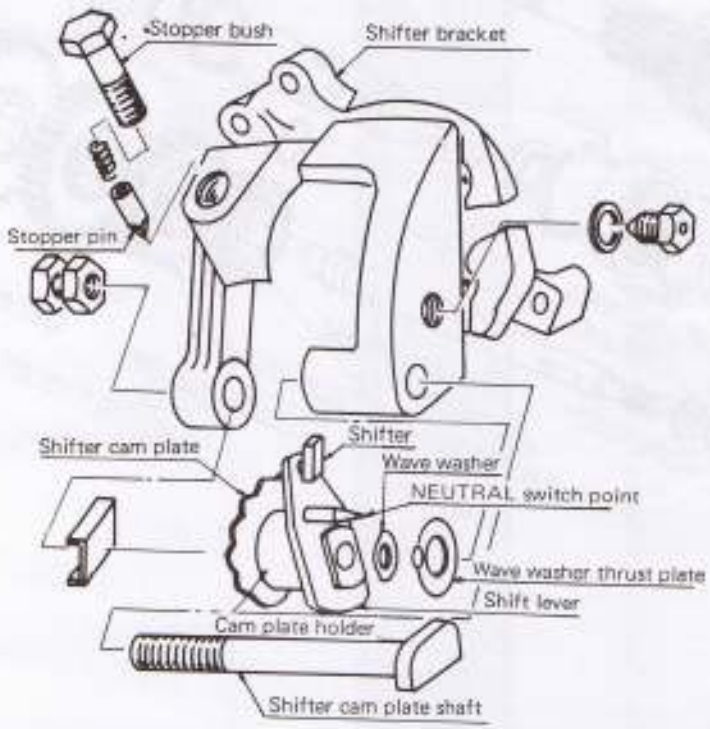



Fig. 3-15-2

Overall reduction ratio

| | Primary reduction x Transmission reduction ratio x Secondary reduction ratio = Overall reduction ratio |
|---|---|
| Low | 74/19 x 37/12 x 37/15 = 29.622 |
| Second | 74/19 x 32/17 x 37/15 = 18.084 |
| Third | 74/19 x 28/21 x 37/15 = 12.809 |
| Top | 74/19 x 25/25 x 37/15 = 9.607 |

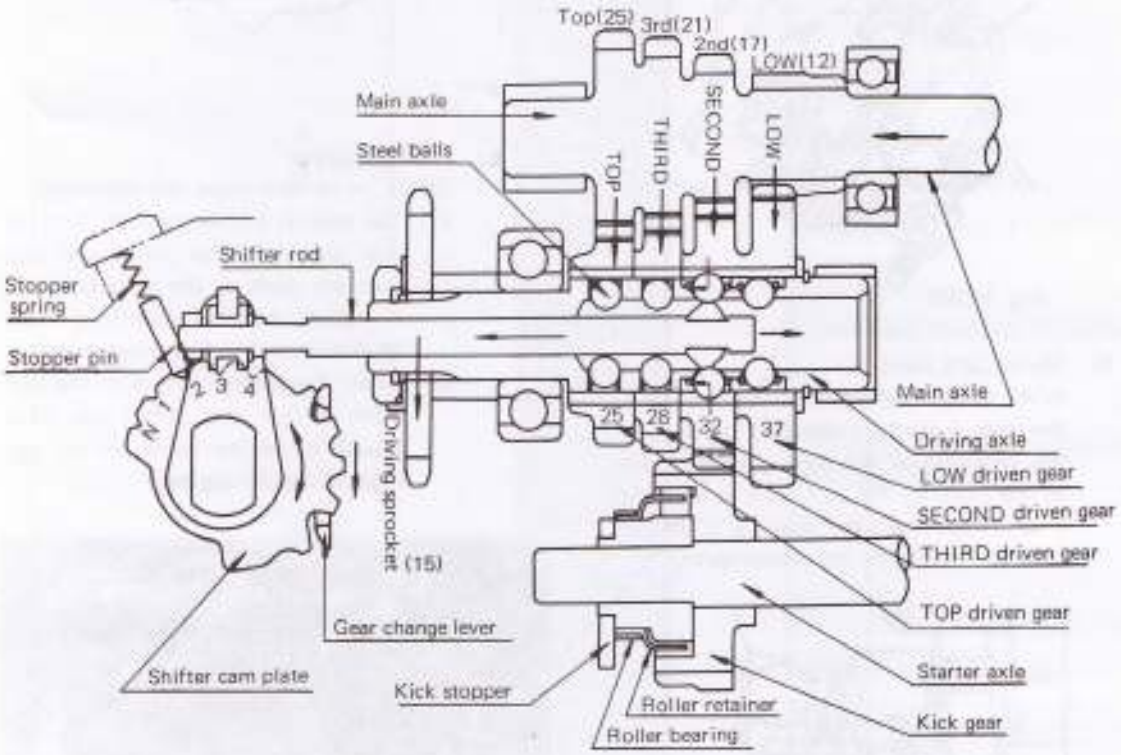



Fig. 3-15-3

2) Shifter rod

The shifter rod is moved forward and backward at regular intervals to push up one group of steel balls, which locks the corresponding driven gear on the driving axle.

As shown in Illustration, the gear change pedal, if depressed, gives a certain turn to the shifter to move the shifter rod, whose head pushes up the steel balls to lock the THIRD driven gear, for example. To prevent to give too much turn to the shifter cam plate, use the lever stopping screw (see "How to inspect", P. 16).




Fig. 3-15-4

3) Important
When using the washer, retainer, spring washer and nut to assemble the shifter rod, the gear change pedal should be in TOP. Tighten the nut with a 12 mm wrench, while holding another end of the rod with a clutch holder.

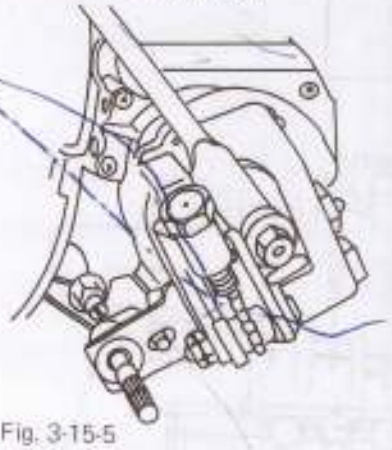


Fig. 3-15-5

4) Shifter cam plate
When the gear change pedal is depressed, the lever A on the pedal shaft is moved in the direction of the arrow, catching one of the teeth on the cam plate to turn one step. After that, the lever A is turned back to its place by the return spring.

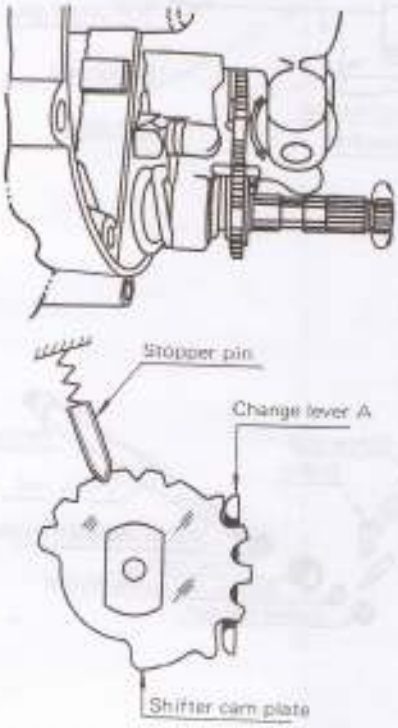



Fig. 3-15-6

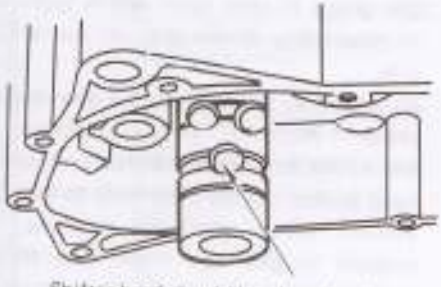


Fig. 3-15-7

5) How to inspect
Check, by shifting gears, the following
a. The lever A should correctly turn the cam plate and the pin should stop the cam plate at the right position. To adjust, turn the lever stop screw (eccentric bolt). See Illustration A.
b. When the stopper pin is in the cam plate groove, the shifter rod head should be in the center of the ball holes in the driving gear.




Fig. 3-15-8



Shifter head should be placed in the center of the ball hole.

Fig. 3-15-9

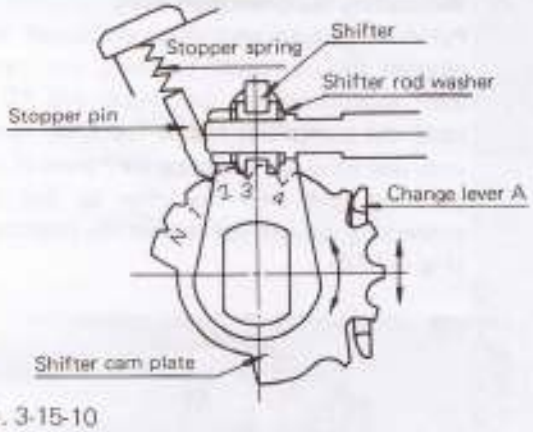



Fig. 3-15-10

## 3–16 Crankshaft

Of all engine parts, the crankshaft requires the highest degree of accuracy in engineering, manufacturing and servicing. The crankshaft is "delicate", so handle it very carefully.

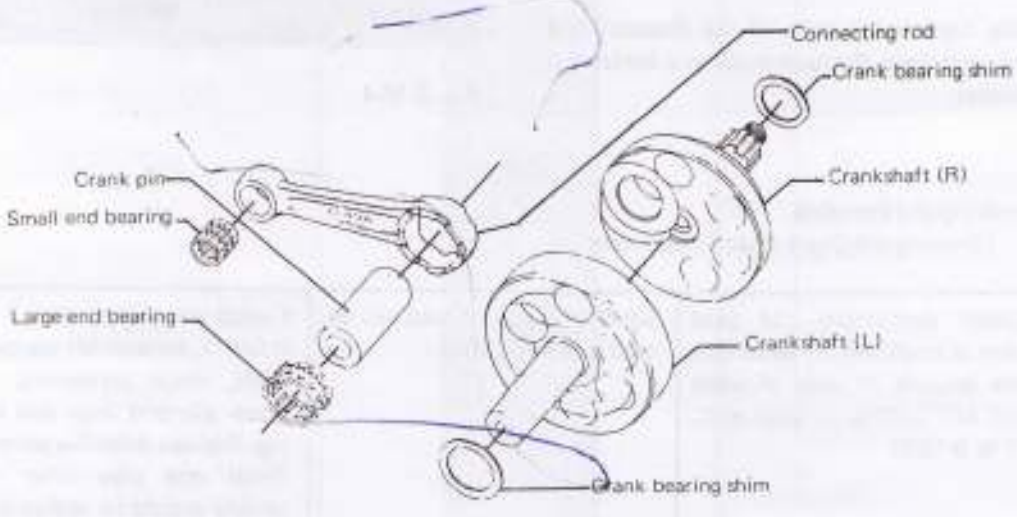



Fig. 3-16-1 Crankshaft Components

### A. Dimensions of Crankshaft Ass'y

| | | A | B | C |
|---|---|---|---|---|
|  | YG1-FD | $45\ ^{-0.05}_{-0.10}$ mm<br>$(1.77\ ^{-0.0020''}_{-0.0039''})$ | 18.5 ± 0.2mm<br>(0.728 ± 0.008") | 200mm<br>(7.87") |

Fig. 3-16-2

B. **Removing the Crankshaft Ass'y**

1) Remove the crankshaft ass'y, with the crankcase disassembling tool. (Fig. 3-16-3)

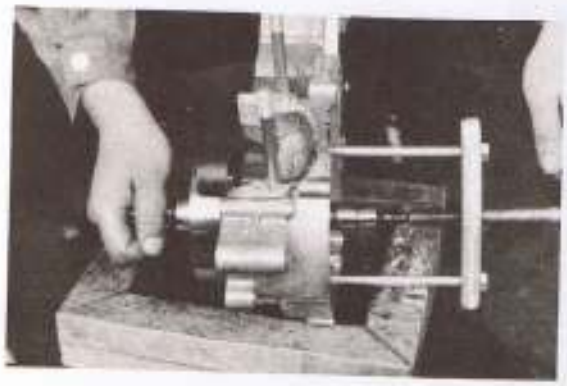


Fig. 3-16-3

Note:

Fully tighten the bolts of the disassembling tool, and keep the tool body in a horizontal position.

C. **Reinstalling the Crankshaft Ass'y**

Put shims on both ends of the crankshaft, and reinstall the crankshaft by using the crankshaft assembling tool (for 50U5 and YG1). Hold the connecting rod at top dead center with one hand while turning the handle of the installing tool with the other so that the connecting rod will not contact the crankcase. (Fig. 3-16-4)

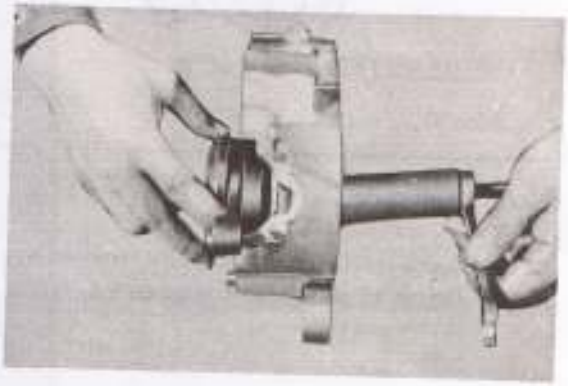


Fig. 3-16-4

D. **Checking and Servicing**

1) Checking the Crankshaft Components

| | | |
|---|---|---|
| Check connecting rod axial play at small end (to determine the amount of wear of crank pin and bearing at large end). (Fig. 3-16-5) | Small end play should not exceed 2 mm (0.079"). | If small end play exceeds 2 mm (0.079"), disassemble the crankshaft, check connecting rod, crank pin and large end bearing. Replace defective parts. Small end play after reassembly should be within 0.8 ~ 1.0 mm (0.032 ~ 0.039"). |
| Check the connecting rod for axial play at large end. (Fig. 3-16-6) | Move the connecting rod to one side and insert a feeler gauge. Large end axial play should be within 0.1 ~ 0.3 mm (0.004 ~ 0.012"). | If excessive axial play is present, disassemble the crankshaft and replace any worn parts. |
| Check accuracy of the crankshaft ass'y. (Misalignment of parts of the crankshaft) | Dial gauge readings should be within 0.03 mm (0.0012"). | Correct any misalignment by tapping the flywheel with a brass hammer and by using a wedge. |

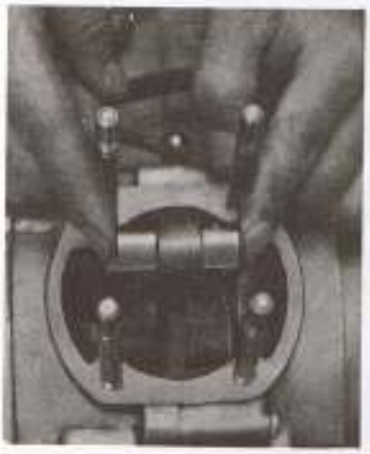


Fig. 3-16-5



Fig. 3-16-6

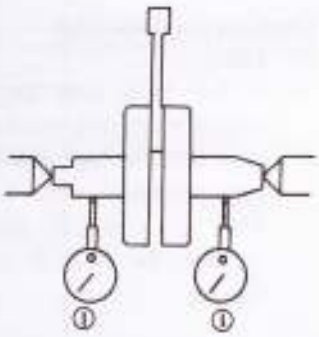


Fig. 3-16-7

## 3–17 Bearings and Oil Seals

A. Removal and Reinstallation

The crankcase should preferably be heated to approximately 120°C (250°F) to remove or install oil seals and bearings, but the following procedure is satisfactory.

1) Removal

a. Pry the oil seals out of place with a slot head screwdriver. (Fig. 3-17-1) Replace the oil seals when overhauling the engine.



Fig. 3-17-1

b. Remove the bearing with a bearing puller. (Fig. 3-17-2)



Fig. 3-17-2

2) Reinstallation

Install bearings and oil seals with their stamped manufacturer's marks or numerals facing outward. (In other words, the stamped letters must be on the exposed-to-view side).

When installing them, grease them fully.

## 3–18 Carburetor

### A. Checking the Carburetor

1) Float

If fuel leaks into the float while the engine is running, the float chamber fuel level will rise and make the combustion chamber fuel mixture too rich. Shake the float to check if gasoline is inside. Replace the float if it is deformed or leaking.

2) Float Valve

Replace the float valve if its seating end is worn with step or scratched. Check the float valve spring for fatigue. Depress the float valve with a finger, and make sure that it properly seats against the valve seat when released. If the float valve spring is weakened, fuel may overflow, flooding the float chamber while the machine is running at certain speeds or under certain road conditions.

3) Overflowing

If fuel overflows, check the carburetor as described in 1) and 2) above. If neither 1) nor 2) cures the overflowing, it may be caused by dirt or dust in the fuel, preventing the float valve from seating properly. If any dirt or dust is found, blow it off. (Figs. 3-18-1 and 2)

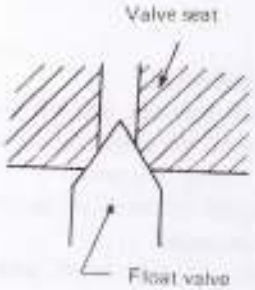



Fig. 3-18-1

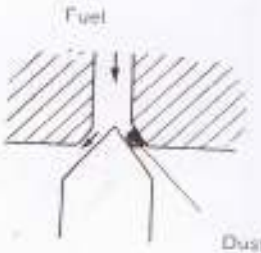



Fig. 3-18-2

4) Cleaning the Carburetor

Disassemble the carburetor, and wash all its parts in clean gasoline. Blow fuel passages in the carburetor with compressed air. All jets and other delicate parts should be cleaned by blowing compressed air through them, because cable or other hard, pointed cleaning tools may damage their precision-machined surfaces. (Fig. 3-18-3)



Fig. 3-18-3

### B. Reconditioning the Carburetor

1) Idle Speed Adjustments

Idle speed adjustments should be performed after the engine is fully warmed up.

a. Fully tighten the air screw, and keep the engine running at the lowest possible speed, and adjust the throttle stop screw. (Fig. 3-18-4)



Fig. 3-18-4

b. Back off the air screw slowly until the engine speed reaches its maximum and set the air screw. (Fig. 3-18-5)

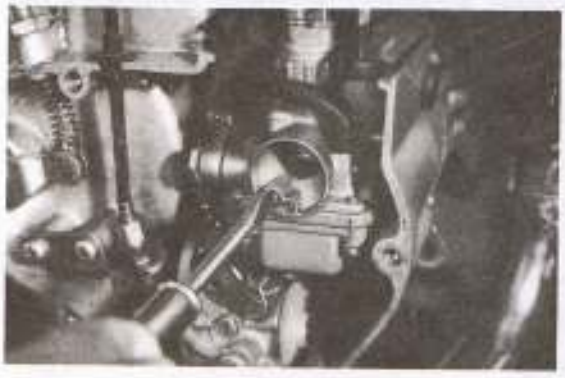


Fig. 3-18-5

c. Turn the throttle stop screw until the engine speed reaches its maximum, and set the screw. Repeat this operation 2 or 3 times until the carburetor is correctly adjusted.

2) Carburetor Setting

| YG1 - FD | Export-except specific area | High lands |
|---|---|---|
| Model | VM16SC | VM16SC |
| Stamped mark | 127A1 | 127H1 |
| Main jet | 100 | 85 |
| Jet needle | 3G9-2 steps | 3G9-2 steps |
| Needle jet | E-2 | E-2 |
| Throttle valve cutaway | 1.5 | 1.5 |
| Pilot jet | 17.5 | 17.5 |
| Air screw back-off | 1-3/4 | 2-1/4 |

## 3–19 Air Cleaner

A. **Removal**

The air cleaner is incorporated in the cleaner case above the engine. To detach the cleaner, remove the cleaner case cover. (Fig. 3-19-1)



Fig. 3-19-1

B. **Cleaning**

Clean the filter element with compressed air. (Fig. 3-19-2)

The element is made of filter paper. It should be kept from water or oil.



Fig. 3-19-2

## 3–20 Transmission Oil

Transmission oil amount . . . . . Motor Oil SAE 10W/30 450 ~ 550cc (0.52 ~ 0.60 qt.)

# CHAPTER 4. CHASSIS

The Yamaha YG1-FD has been designed with an emphasis on improving the running stability and maneuverability. Their performance can well be comparable to conventional 90 cc class motorcycles. The 7-bone style frame assures improved rigidity and longer service life. To simplify servicing the rear wheel components, the separate type hub clutch has been employed. It can be said that they offer much better performance than any other makes of the same class.

## 4–1 Front Wheel

### A. Structure

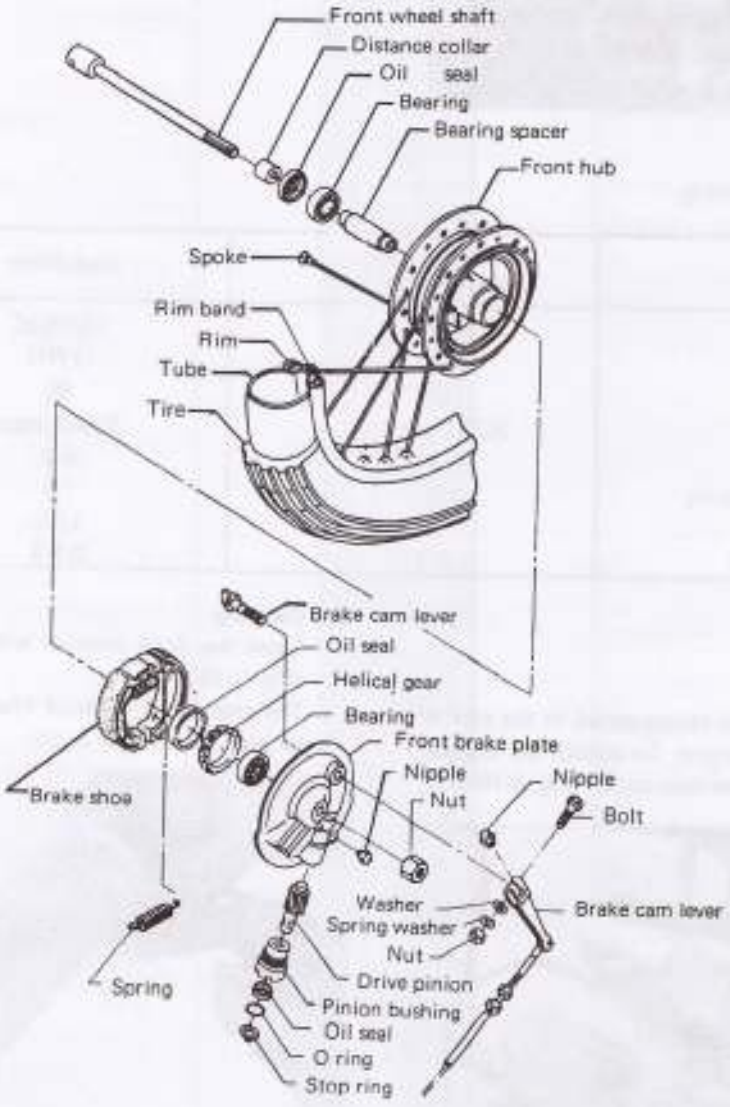



Fig. 4-1-1

B. Removal

1) Disconnect the front brake cable and speedometer cable from the front brake shoe plates. (Fig. 4-1-2)



Fig. 4-1-2

2) Remove the front wheel nut, and pull out the wheel shaft. Then remove the distance collar. (Figs. 4-1-3 and 4)



Fig. 4-1-3



Fig. 4-1-4

When removing the distance collar, take care not to damage the oil seal lip. To remove the distance collar, grease it and turn it gently in or out.

3) Remove the front wheel ass'y. (Fig. 4-1-5)



Fig. 4-1-5

C. Checking

1) Runout of the Rim

As shown in Fig. 4-1-5, measure the runout of the rim with a dial gauge.

Limit of runout . . . 3 mm (0.11") or less less (Fig. 4-1-6)

If necessary, adjust spoke tension or replace the rim.

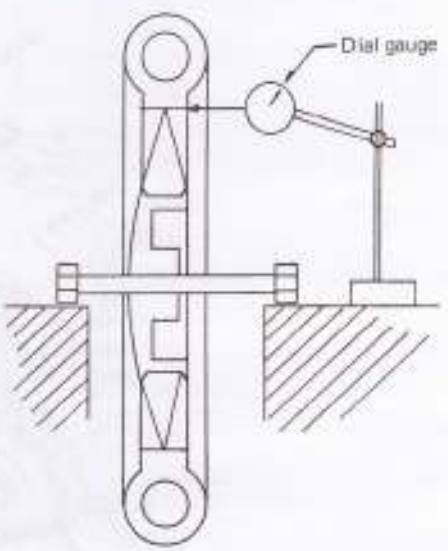



Fig. 4-1-6

2) Brake Shoe
Measure the outside diameter of the brake shoe with slide calipers. If it measures 105 mm (41.4") or less, replace it. (Fig. 4-1-7)

3) Brake Drum
Oil or scraches on the inner surface of the brake drum will result in poor functioning or noise. Clean or smooth out the surface with a rag or sandpaper. (Fig. 4-1-8)

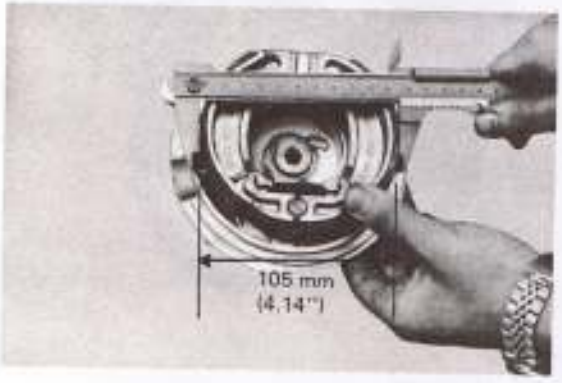



Fig. 4-1-7



Fig. 4-1-8

## 4–2 Rear Wheel

### A. Construction View

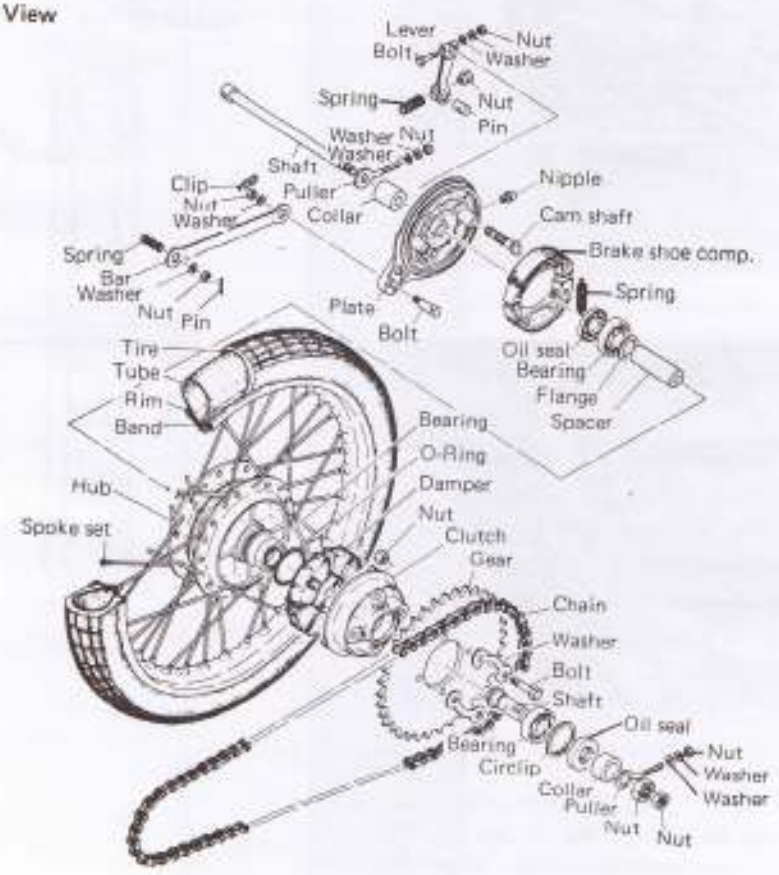



Fig. 4-2-1

B. Removal

1) Remove the anchor bar and brake rod attached to the rear brake shoe plate. (Figs. 4-2-2, 3 and 4)



Fig. 4-2-2

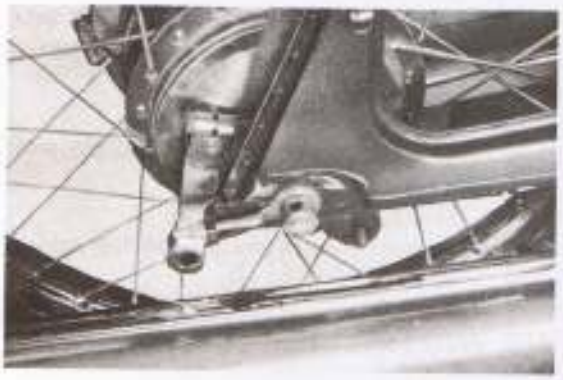


Fig. 4-2-3



Fig. 4-2-4

2) Remove the nut and remove the rear wheel shaft. (Fig. 4-2-5)



Fig. 4-2-5

3) Remove the distance collar. (Fig. 4-2-6)



Fig. 4-2-6

4) Incline the chassis and remove the rear wheel. (Fig. 4-2-7)



Fig. 4-2-7

5) Remove the chain case mounting bolts, and remove the chain. (Figs. 4-2-8 and 9)



Fig. 4-2-8



Fig. 4-2-9

6) Remove the chain.
7) Remove the special hexagon nut and remove the rear clutch ass'y. (Figs. 4-2-10 and 11)



Fig. 4-2-10



Fig. 4-2-11

C. **Checking**

1) Runout of the Rim
   Check the rim for runout in the same manner as the front wheel. Limit of runout . . . 3 mm (0.11") or less.
2) Brake Shoe
   Check the rear brake shoe in the same manner as the front brake shoe. Limit of size . . . 105 mm (41.4") or less.
3) Brake Drum
   Check the rear brake drum in the same manner as the front wheel.
4) Rear Sprocket
   Replace an excessively worn rear sprocket.

## 4–3 Front Fork

Check the front fork for bend and oil leakage, and correct any defect in the following manner.

1) Remove the front fender, and remove the inner tube mounting bolt. (Figs. 4-3-1 and 2)



Fig. 4-3-1



Fig. 4-3-2

2) Loosen the inner tube mounting bolt on the lower bracket and pull off the fork downward. (Figs. 4-3-3 and 4)



Fig. 4-3-3



Fig. 4-3-4

**B. Disassembling the Fork**

1) Drain the oil from the fork.
2) Place a rubber pad or rubber tube around the outer tube nut.
3) Squeeze the outer tube with a strap wrench, and turn it counterclockwise. The inner tube can be separated from the outer.



Fig. 4-3-5

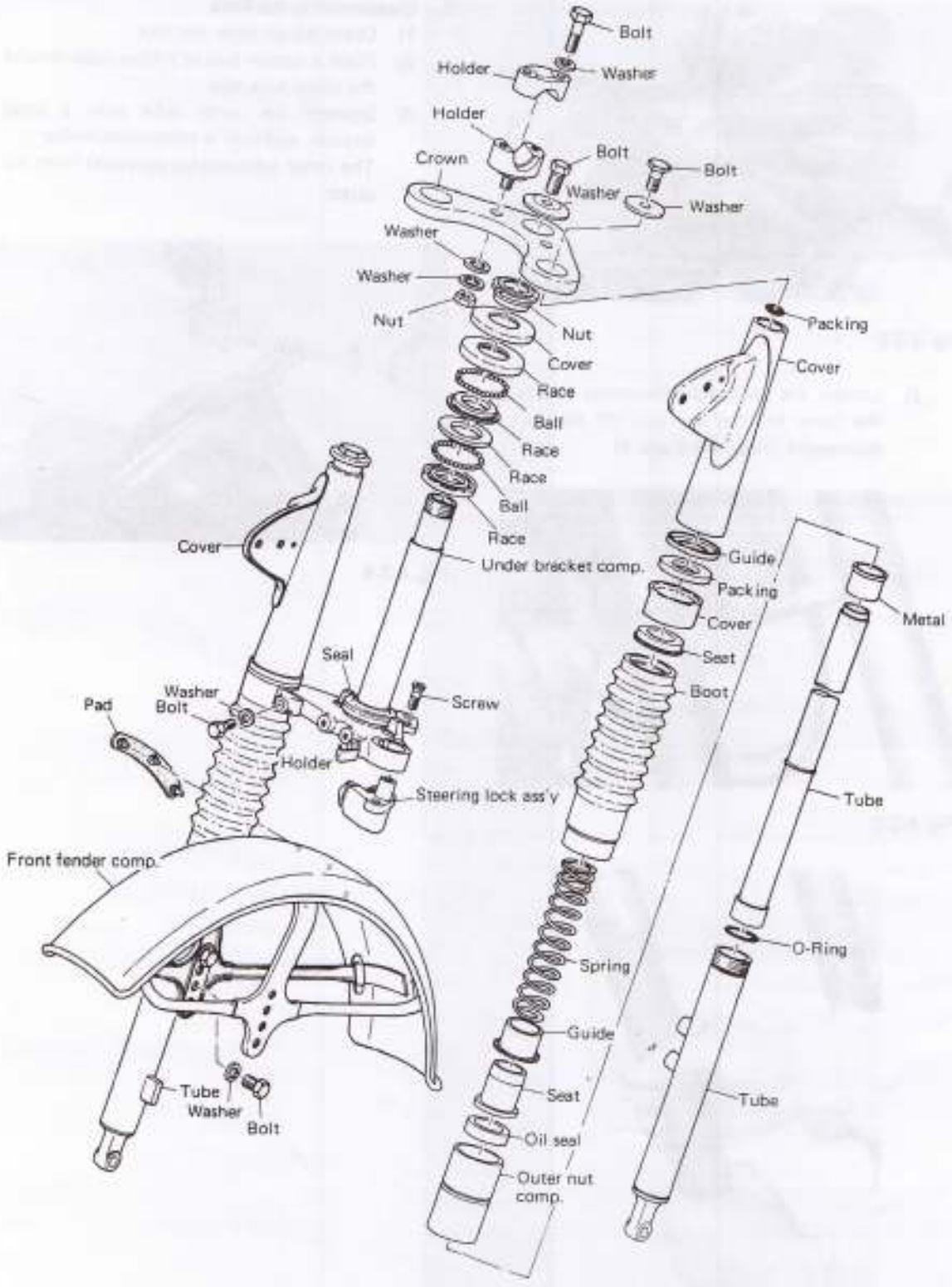

Bolt
Holder
Washer
Holder
Crown
Bolt
Washer
Bolt
Washer
Washer
Washer
Nut
Nut
Cover
Race
Ball
Race
Race
Ball
Race
Cover
Under bracket comp.
Seal
Washer
Bolt
Pad
Screw
Holder
Steering lock ass'y
Front fender comp.
Tube
Washer
Bolt
Packing
Cover
Guide
Packing
Cover
Seat
Boot
Spring
Guide
Seat
Oil seal
Outer nut comp.
Metal
Tube
O-Ring
Tube

Fig. 4-3-6

C. Checking

1) Inner Tube
Check the inner tube for bend and scratch.
Slight bends can be corrected by a press machine, but it is the best to replace the tube.

2) Oil Seal
Be sure to replace the oil seals whenever the front fork is disassembled.

D. Reassembling

1) For reassembling the front fork, reverse the order of disassembly as mentioned above. When fitting the outer tube nut in the inner tube, take care not to damage the oil seal fitted in the outer tube.
Grease the tube and cover the inner tube with a nylon cloth before reassembling. Check the inner tube for smooth sliding after reassembling is done. (Figs. 4-3-7 and 8)



Fig. 4-3-7



Fig. 4-3-8

2) By using a front fork puller, set the front fork in position, and tighten the lower bracket mounting bolt. (Figs. 4-3-9 and 10)



Fig. 4-3-9



Fig. 4-3-10

3) Feed front fork oil into the inner tube through the upper opening. (Fig. 4-3-11)
Oil amount:

Oil amount:
YG1-FD
130 cc (4.4 fl.oz)

Oil:
Motor oil SAE 10W/30
(or a 80 : 20 mixture of motor oil #30 and spindle oil #60)

4) Finally, tighten the inner tube mounting fork.



Fig. 4-3-11

## 4–4 Rear Cushion

The rear cushion can not be disassembled into parts. Therefore, this section will discuss on how to check oil leakage.

### A. Checking Oil Leakage

Occasional oil seepage may be seen on the bottom of the outer cover, as viewed from the outside of the rear cushion. This oil seepage may be often mistaken for an oil leakage of the rear cushion.

Such oil seepage mostly results from the melted grease on the inner spring, and will not impair the function of the rear cushion.

For checking oil leakage, the following measure should be taken.

1) Remove the rear cushion, and depress it with your hand two or three times. If the spring quickly restores half-way, and gradually stretches for the last 10 mm (2/5"), the cushion is considered to be in good condition. If the spring restores entirely with quick motion, there may be oil leakage. In this case, replace the whole rear cushion ass'y. (Fig. 4-4-1)



Fig. 4-4-1

## 4–5 Steering Head

### A. Checking

1) Ball Races and Steel Balls

Full checking is required for a motorcycle which has been in use for a long time. Balls having uneven wear or cracks will impair the maneuverability. Therefore, if such defects are found, replace the balls and ball races.

Replace any ball having scratches or streaks resulting from wear.

**Note:**

Do not use a combination of new balls and used races or vice versa. If any of these is found defective, replace the whole ball and race assembly.

# CHAPTER 5. ELECTRICAL EQUIPMENT

## 5–1 Electrical Equipment

Yamaha YG1-FD is provided with electrical parts of 6 volt capacity and a flywheel magneto designed to provide easy access for checking and servicing. The flywheel magneto supplies electricity required for the ignition system, battery and lights. Even at low engine speeds, it provides a sufficient electricity, assuring better spark and greater charging current.

## 5–2 List of Electrical Components

| Name of Part | Name of Manufacturer | Model and Specification |
|---|---|---|
| **Engine:** | | |
| Flywheel magneto | Mitsubishi Elec.<br>Hitachi | FBH-1B1L<br>F11-L17<br>Sparking<br>6 mm or more/500 r.p.m.<br>8 mm or more/5,000 r.p.m.<br>Charging<br>Charging begins under 2,000 r.p.m.<br>and is less than 2.5A at 8,000 r.p.m.<br>Lighting<br>More than 5.8V at 2,500 r.p.m.<br>less than 9V at 8,000 r.p.m. |
| Neutral switch | Asahi Elec. | YNS type |
| **Frame:** | | |
| Battery | Furukawa Battery<br>Yuasa Battery<br>G.S. | 6N4A-4 |
| Main switch | Asahi Elec. | |
| Silicon rectifier | Fuji Elec. | YBM6 PH16 |
| Horn | Imasen Elec.<br>Nikko | SM3, 6V<br>YP6, 6V |
| Ignition coil | Mitsubishi Elec. | HP-B1 |
| Flasher relay | Showa Elec.<br>Mitsuba Elec. | B-9 |
| Fuse holder | | 10A, 3 pcs. |
| **Front Eng:** | | |
| Head light | Koito Elec. | 6V, 15 W/D |
| Speedometer | Nippon Seiki | Neutral light 6V, 3W<br>Meter light 6V, 1.5W |
| **Rear End:** | | |
| Tail light | Imasen Elec. | 6V, 3W/10W |
| **Swing Arm:** | | |
| Stop switch | Asahi Elec. | YS10 |

## 5–3 Connection Diagram

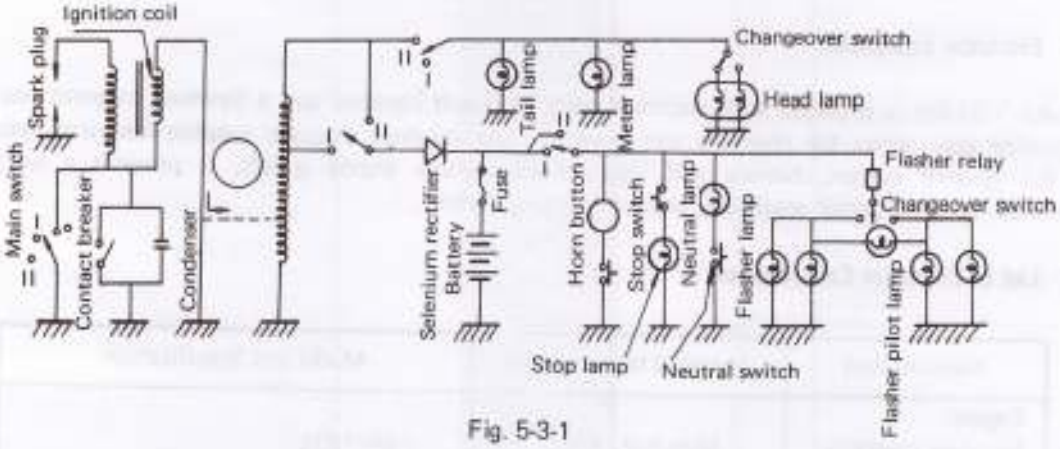



Fig. 5-3-1

## 5–4 Ignition System-Function and Service

### A. Function

The ignition system consists of the components as shown in Fig. 5-4-1. As the flywheel rotates, the contact breaker points begin to open and close, alternately. This make-and-break operation develops an electromotive force in the ignition power source coil, and produces a voltage in the primary coil. The ignition coil is a kind of transformer, with a 1 : 50 turn ratio of the primary to the secondary winding. The voltage (150 ~ 300V) which is produced in the primary coil, is stepped up to 7,000 ~ 10,000V by mutual-induction, and the electric spark jumps across the spark plug electrodes.

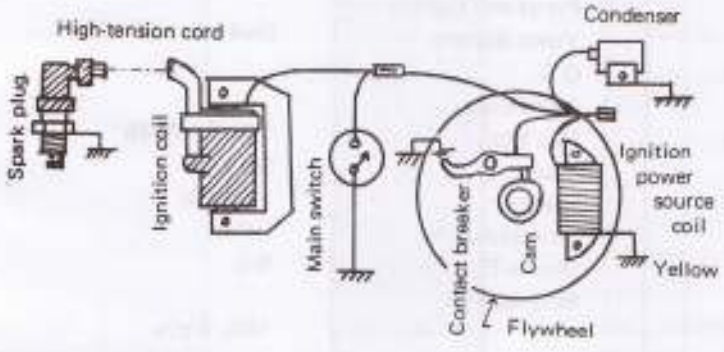



Fig. 5-4-1

B. Service Standards

1) Ignition Timing & Point Gap

2.0 ± 0.15 mm (0.079 ± 0.006") B.T.D.C. at 0.30 ~ 0.35 mm (0.012 ~ 0.014").

Ignition timing can be correctly adjusted by simply setting the maximum point gap to the specified value.

Smooth away any roughness on the point surface with fine grain sandpaper (#400 ~ #600). Clean greasy points with a rag damped with gasoline.

2) Ignition Coil

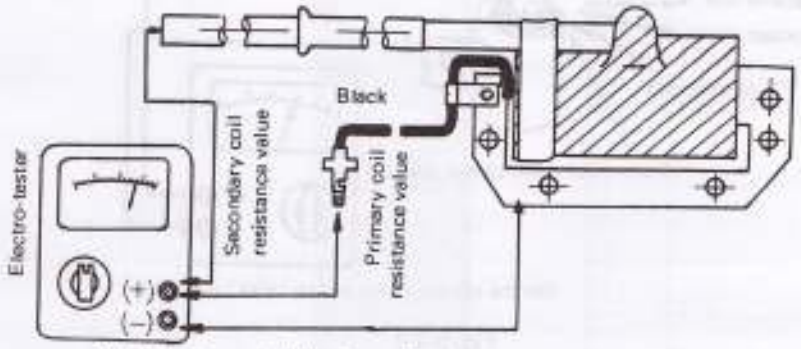
Primary coil resistance value

0.6Ω ± 10%

Secondary coil resistance value

5KΩ ± 10%

(For measuring methods, refer to Fig. 5-4-2)




Set the tester on the "Resistance" position.

Fig. 5-4-2

**Note:**

When measuring the secondary coil resistance value, disconnect the plug cap. Otherwise, the resistance of the 5KΩ noise suppressor incorporated in the plug will be added to the tester reading.

Sparking:

6 mm (0.236") or more (between 3 points)

Remove spark plug from cylinder head and reconnect the high voltage lead.

Then ground the spark plug and see if it sparks as you crank the kickstarter.

If it sparks 6 mm or so and has powder blue, the ignition coil should be considered to be in good condition.

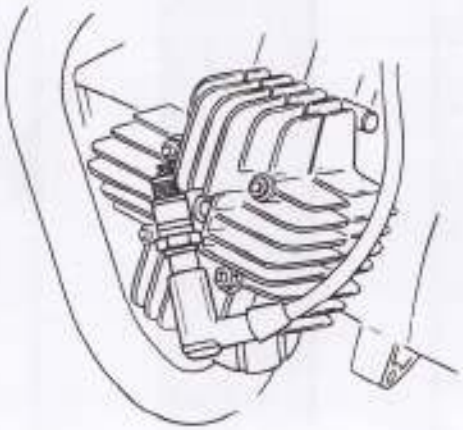


Fig. 5-4-3

3) Condenser

The condenser instantly stores a static electric charge as the contact breaker points separate, and the energy stored in the condenser discharges instantly when the points are closed. If it were not for the condenser, a heavy electric are would take place across the separating contact points, causing them to burn.

The condenser minimizes the burning of the contact points greatly affecting the flow of current in the primary winding of the ignition coil.

If the contact points show excessive wear or the spark is weak (the ignition coil is in good condition), check the condenser.

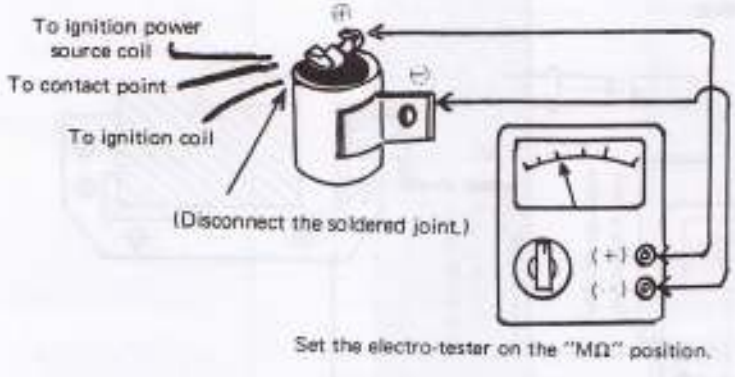



Fig. 5-4-4

Insulation resistance tests should be conducted by connecting the tester as shown in Fig. 5-4-4. If the pointer swings fully and the reading is more than 3MΩ, the insulation is in good condition. If the insulation is punctured, the pointer will stay pointing the uppermost reading.

**Note:**

After this measurement, the condenser should be discharged by connecting the positive and negative sides with a thick lead wire.

Capacity tests can be performed by simply setting the tester to the condenser capacity. The tester should be connected with the condenser in the same way as in the case of the insulation resistance test. Before this measurement, be sure to set the tester correctly.

If the reading is within 0.22μF ± 10%, the condenser capacity is correct.

## 5–5 Charging and Lighting Systems-Function and Checking

### A. Function of the Charging System

According to the same theory as the ignition coil, an electromotive force of A.C. current is developed in the lighting coil (brown) of the flywheel magneto. As the main switch circuit is closed, the A.C. current flows to the silicon rectifier, by which the current is rectified into a half-wave current and charged to the battery.

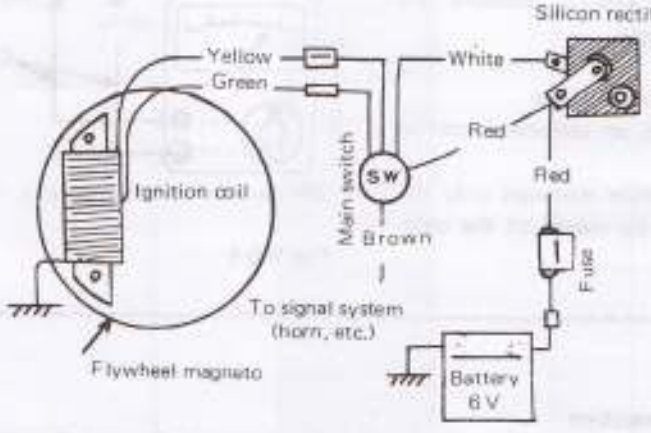



Fig. 5-5-1

### B. Checking the Charging System

Motorcycles, which usually travel in urban areas or at low speed, requires such special connection as shown in Fig. 5-5-2 so that the battery can be sufficiently charged even during day-time travelling. In this case, the battery should be checked once a month and refilled with electrolyte.

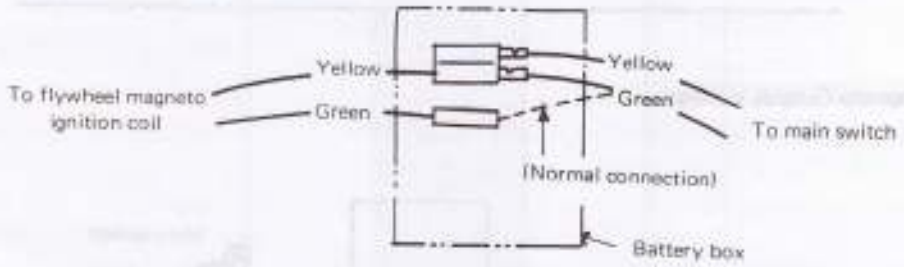



Fig. 5-5-2

1) Measuring the Charging Current
(Use an ammeter with a full scale of 5A)
As shown in Fig. 5-5-3 hook up the tester and measure the current with specific engine r.p.m. The figure in parentheses denotes the battery voltage.
0.5A or more/2,500 r.p.m.
0.2A or more/2,000 r.p.m.
4A or less/8,000 r.p.m.

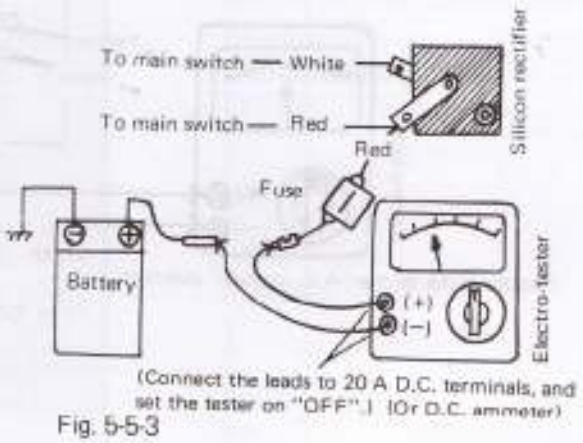



Fig. 5-5-3

Note:

The measurement should be performed under no load, with the main switch set on the "night" position. (The lights including neutral light are not lit up). If the battery voltage does not agree with the figure in parentheses, the charging current reading will be incorrect. Before the measurement, be sure to measure the voltage of the battery.

2) Checking the Silicon Rectifier

For measurements, an ohmmeter can be used.

However, this section discusses only the checking method by means of the ohmmeter.

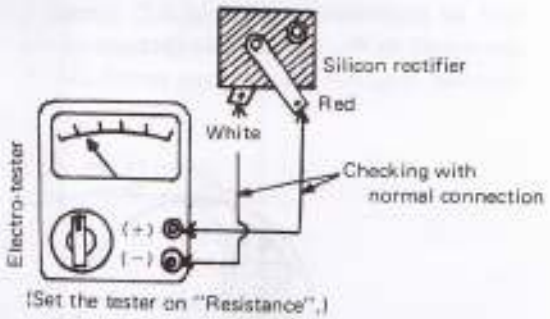



Fig. 5-5-4

**Checking with Normal Connection**

Connect the tester's red lead (+) to the silicon rectifier's red terminal, and connect the tester's black lead (−) to the rectifier's white terminal.

Standard value: 9 ~ 10Ω

If the tester's pointer will not swing back from the over scale, the rectifier is defective.

**Checking with Reversal Connection**

Connect the tester the other way round.

Standard Value:

If the pointer will not swing, the rectifier is in good condition. If the pointer swings, the rectifier is faulty.

3) Magneto Output Voltage

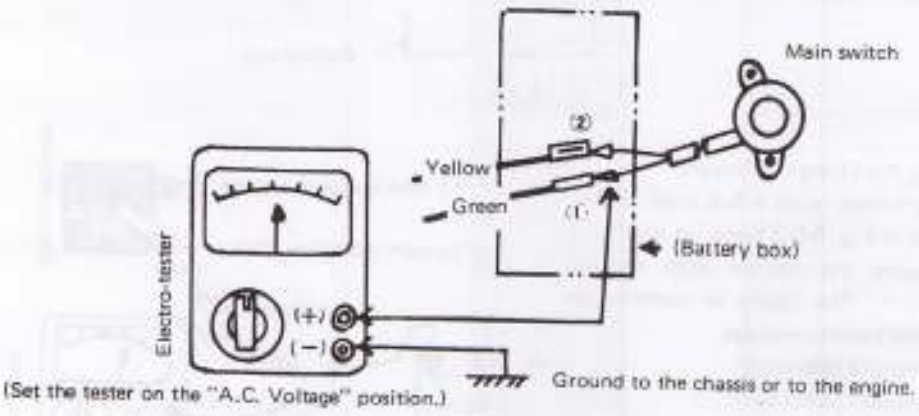
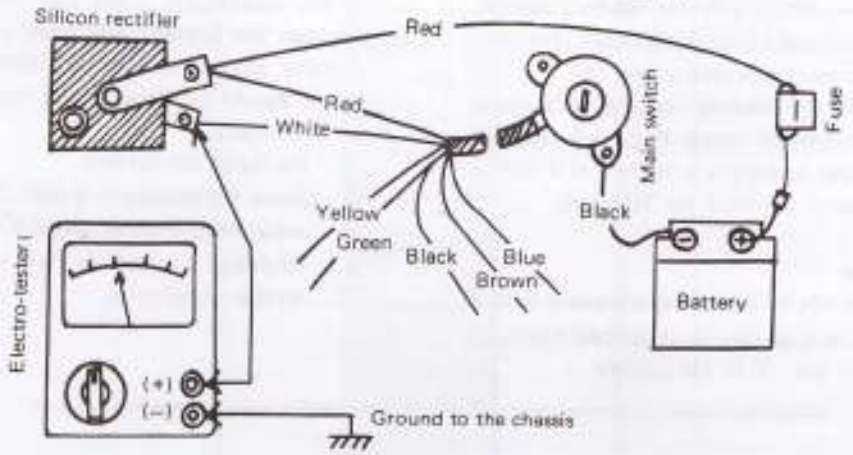



Fig. 5-5-5

The output voltage for day-time should be measured, with the tester **connected in parallel**. In Fig. 5-5-5, the tester positive lead is connected to the green lead's connector (the connector is not disconnected). In this measurement, the main switch is on the Day-time position. If the tester reads any voltage, the magneto output voltage is proper.

The output voltage for night-time should be measured, with the tester **connected in parallel**. In Fig. 5-5-5, the tester positive lead is connected to the yellow lead. In this measurement, the main switch is on the Night-time position. If the tester reads more than 6 volts at 2,500 r.p.m., the magneto output voltage is sufficient.

4) Short-Circuit of Wiring and Switch
Connect the tester as shown in Fig. 5-5-6, and measure the voltage. If the reading is more than 6 volts at 2,500 r.p.m., the wiring and main switch are in good condition.



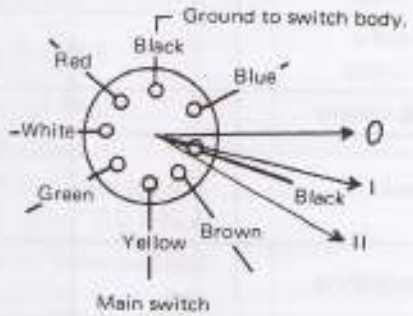

(Set the tester on the A.C. Voltage.)

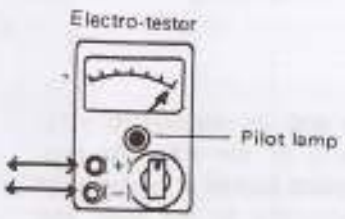
Fig. 5-5-6

## 5–6 Checking the Main Switch (Removed from the Chassis)

Key "0" position (Off)
Black ↔ Switch body
Key "1" position (for day)
Green ↔ White
Red ↔ Brown
Key "11" position (for night)
Yellow ↔ White
White ↔ Blue
Red ↔ Brown

If the readings or the above six measurements are nearly 0Ω, and no short-circuit is noticed between the terminals, as well as between the lead terminal and the switch body, the main switch is in good condition.




(Switch on the tester and use an ohmmeter.)

Fig. 5-6-1

## 5–7 Battery

1. Checking
   a. If sulfation occurs on plates due to lack of the battery electrolyte, showing white accumulations, the battery should be replaced.
   b. If the bottoms of the cells are filled with corrosive material falling off plates, the battery should be replaced.
   c. If the battery shows the following defects, it should be replaced.
      - The voltage will not rise to a specific value even after long hours charging.
      - No gassing occurs in any cell.
      - The 6V battery requires a charging current of more than 8.4 volts in order to supply a current at a rate of 1 amp. per hour for 10 hours.

2. Service Life
   The service life of a battery is usually 2 to 3 years, but lack of care as described following will shorten the life of the battery.
   a. Negligence in re-filling the battery with electrolyte.
   b. Battery being left discharged.
   c. Over-charging by rushing charge.
   d. Freezing.
   e. Feeding of water of sulfuric acid containing impurities when re-filling the battery.

3. Storage
   If any motorcycle is not used for a long time, remove the battery and have it stored by a battery service shop. The following instructions should be observed by shops equipped with chargers.
   a. Recharge the battery.
   b. Store the battery in a cool, dry place, and avoid temperatures below 0°C (32°F).
   c. Recharge the battery before mounting it on the motorcycle.

4. Service Standards
   Battery: 4N4A-4

| Battery Spec. | 6V - 4AH | |
|---|---|---|
| Electrolyte-Specific gravity and quantity | 1.26-1.27, 170cc | At full charge |
| Initial charging current | 0.4A for 25 hours | Brand new motorcycle |
| Charging current | 0.4A for 13 hours (Charge until specific gravity reaches 1.26-1.27) | When discharged |
| Refilling of electrolyte | Distilled water up to the max. level line. | Once a month |

## 5–8 Spark Plug

The life of a plug and its discoloring vary, according to the habits of the rider. At each periodic inspection, replace burned or fouled plugs with suitable ones according to the color and condition of the bad plugs. One machine may be ridden only in urban areas at low speeds, whereas another may be ridden for hours at high speeds, so confirm what the present plugs indicate by asking the rider how long and how fast he rides, and recommend a hot, standard, or cold plug accordingly. It is actually economical to install new plugs every 3,000 km (2,000 miles) since it will tend to keep the engine in good condition and prevent excessive fuel consumption.

1. How to "Read" Spark Plug (condition)
   a. Best . . . When the porcelain around the center electrode is a light tan color.

b. If the electrodes and porcelain are black and somewhat oily, replace the plug with a hotter-type for low speed riding.

c. If the porcelain is burned white and/or the electrodes are partially burned away, replace the plug with a colder-type for high speed riding.

2. Inspection

Instruct the rider to inspect and clean the spark plug at least once a month or every 1,000 km (500 miles). Clean the electrodes of carbon and adjust the electrode gap to 0.5 ~ 0.6 mm (0.023"). Be sure to use standard plug as replacements to avoid any error in reach.

**Standard spark plug B-7HS**

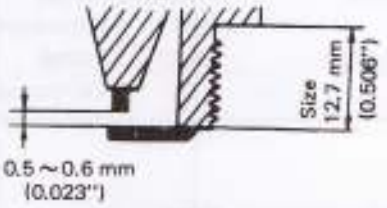



Fig. 5-8-1

## CONVERSION TABLE

### LENGTHS

| Multiply | By | To Obtain | Multiply | By | To Obtain |
|---|---|---|---|---|---|
| Millimeters (mm) | 0.03937 | Inches | Kilometers (km) | .6214 | Miles |
| Inches (in) | 25.4 | Milimeters | Miles (mi) | 1.609 | Kilometers |
| Centimeters (cm) | .3937 | Inches | Meters (m) | 3.281 | Feet |
| Inches (in) | 2.54 | Centimeters | Feet (ft) | .3048 | Meters |

### WEIGHTS

| | | | | | |
|---|---|---|---|---|---|
| Kilograms (kg) | 2.205 | Pounds | Grams (g) | .03527 | Ounces |
| Pounds (lbs) | .4536 | Kilograms | Ounces (oz) | 28.25 | Grams |

### VOLUMES

| | | | | | |
|---|---|---|---|---|---|
| Cubic centimeters (cc) | .06102 | Cubic inches | Imperial gallons | 277.274 | cu.in. |
| Cubic inches (cu.in.) | 16.387 | cc. | Liters (l) | 1.057 | Quarts |
| Liters (l) | .264 | Gallons | Quarts (qt) | .946 | Liters |
| Gallons (gal) | 3.785 | Liters | Cubic centimeters (cc) | .0339 | Fluid ounces |
| U.S. gallons | 1.2 | Imperial gals. | Fluid ounces (fl. oz) | 29.57 | cc. |
| Imperial gallons | 4.537 | Liters | | | |

### OTHERS

| | | | | | |
|---|---|---|---|---|---|
| Metric horsepower (ps) | 1.014 | bhp | Foot-pounds (ft-lbs) | .1383 | kg-m |
| Brake horsepower (bph) | .9859 | ps. | Kilometers per liter (km/l) | .2352 | mpg |
| Kilogram-meter (kg-m) | 7.234 | Foot-pounds | Miles per gallon (mpg) | .4252 | km/l |
| Kilograms/sq.cm ($kg/cm^2$) | 14.22 | Pounds/sq.in. ($lbs/in^2$ or psi) | | | |
| Centigrade (C°) | (C° X 9/5) + 32 | Fahrenheit (F°) | | | |

### TORQUE SPECIFICATIONS

| Stud size | kg-m | In-lbs * |
|---|---|---|
| 6mm | 1.0 | 90 |
| 7 | 1.5 | 135 |
| 8 | 2.0 | 180 |
| 10 | 3.2–4.0 | 300–350 |
| 12 | 4.0–4.6 | 350–400 |
| 14 | 4.6–5.2 | 400–450 |
| 17 | 5.87–7.0 | 500–600 |

* Ft-lbs = In-lbs divided by 12

## Millimeters to Inches

| | 0 | .1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | .0039 | .0079 | .0118 | .0157 | .0197 | .0236 | .0276 | .0315 | .0354 |
| 1 | .0394 | .0433 | .0472 | .0512 | .0551 | .0591 | .0630 | .0669 | .0709 | .0748 |
| 2 | .0787 | .0827 | .0866 | .0906 | .0945 | .0984 | .1024 | .1063 | .1102 | .1142 |
| 3 | .1181 | .1220 | .1260 | .1299 | .1339 | .1378 | .1417 | .1457 | .1496 | .1535 |
| 4 | .1575 | .1614 | .1654 | .1693 | .1732 | .1772 | .1811 | .1850 | .1890 | .1929 |
| 5 | .1969 | .2000 | .2047 | .2087 | .2126 | .2165 | .2205 | .2244 | .2283 | .2323 |
| 6 | .2362 | .2402 | .2441 | .2480 | .2520 | .2559 | .2598 | .2638 | .2677 | .2717 |
| 7 | .2756 | .2795 | .2835 | .2874 | .2913 | .2953 | .2992 | .3031 | .3071 | .3110 |
| 8 | .3150 | .3189 | .3228 | .3268 | .3307 | .3346 | .3386 | .3425 | .3465 | .3504 |
| 9 | .3543 | .3583 | .3622 | .3661 | .3701 | .3740 | .3780 | .3819 | .3858 | .3898 |
| 10 | .3937 | .3976 | .4016 | .4055 | .4093 | .4134 | .4174 | .4213 | .4252 | .4291 |

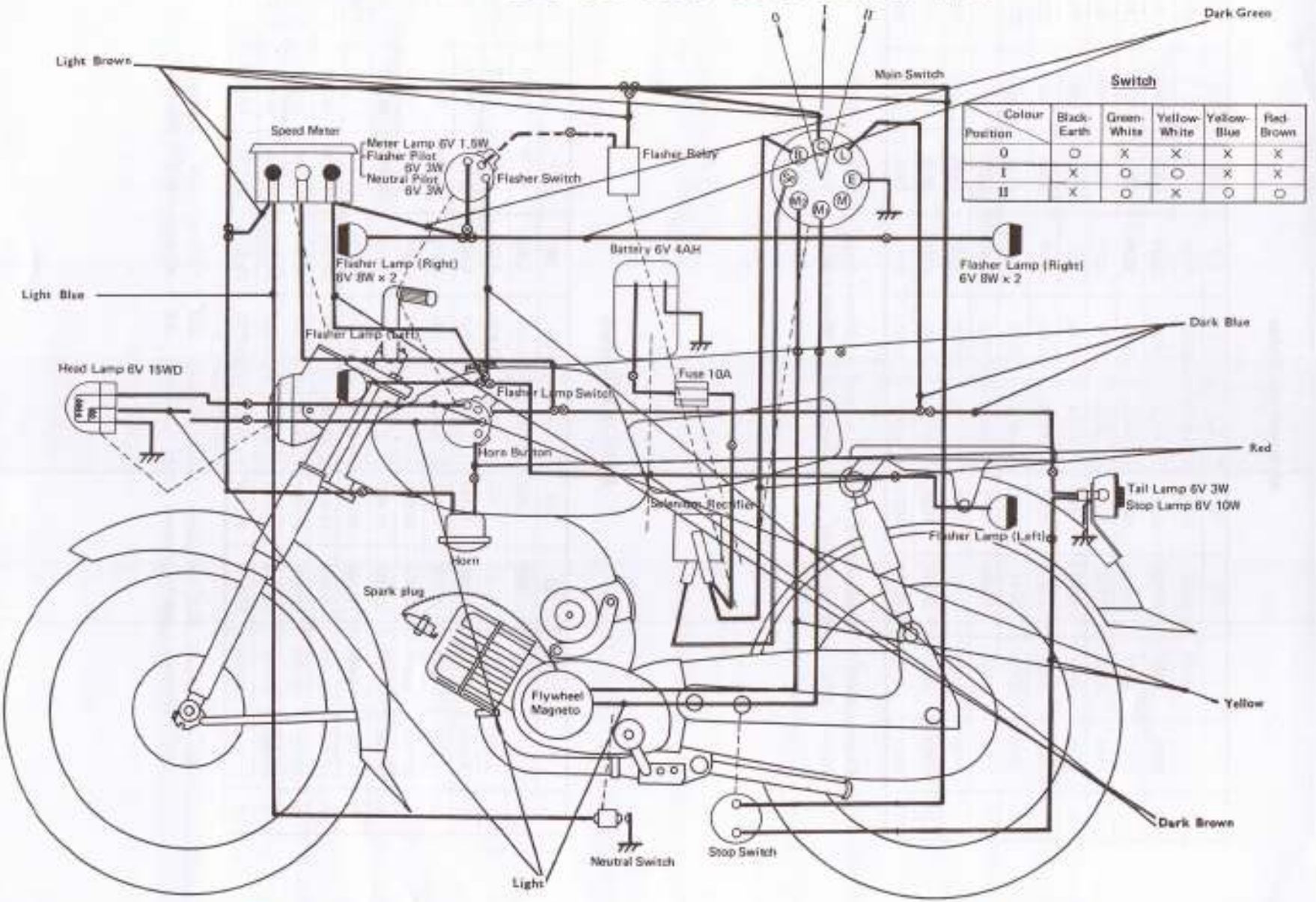
.01mm = .0004" .03mm = .0012" .05mm = .0020" .07mm = .0028" .09mm = .0035"
.02mm = .0008" .04mm = .0016" .06mm = .0024" .08mm = .0031" .10mm = .0039"

## Inches to Millimeters

| | 0 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | .254 | .508 | .762 | 1.016 | 1.270 | 1.524 | 1.778 | 2.032 | 2.286 |
| .1 | 2.540 | 2.794 | 3.048 | 3.302 | 3.556 | 3.810 | 4.064 | 4.318 | 4.572 | 4.826 |
| .2 | 5.080 | 5.334 | 5.588 | 5.842 | 6.096 | 6.350 | 6.604 | 6.858 | 7.112 | 7.366 |
| .3 | 7.620 | 7.874 | 8.128 | 8.382 | 8.636 | 8.890 | 9.144 | 9.398 | 9.652 | 9.906 |
| .4 | 10.160 | 10.414 | 10.668 | 10.922 | 11.176 | 11.430 | 11.684 | 11.938 | 12.192 | 12.446 |
| .5 | 12.700 | 12.954 | 13.208 | 13.462 | 13.716 | 13.970 | 14.224 | 14.478 | 14.732 | 14.986 |
| .6 | 15.240 | 15.494 | 15.748 | 16.002 | 16.256 | 16.510 | 16.764 | 17.018 | 17.272 | 17.526 |
| .7 | 17.780 | 18.034 | 18.288 | 18.542 | 18.796 | 19.050 | 19.304 | 19.558 | 19.812 | 20.066 |
| .8 | 20.320 | 20.574 | 20.828 | 21.082 | 21.336 | 21.590 | 21.844 | 22.098 | 22.352 | 22.606 |
| .9 | 22.860 | 23.114 | 23.368 | 23.622 | 23.876 | 24.130 | 24.384 | 24.638 | 24.892 | 25.146 |
| 1.0 | 25.400 | 25.654 | 25.908 | 26.162 | 26.416 | 26.670 | 26.924 | 27.178 | 27.432 | 27.686 |

.001" = .0254mm .003" = .0762mm .005" = .1270mm .007" = .1778mm .009" = .2286mm
.002" = .0508mm .004" = .1016mm .006" = .1524mm .008" = .2032mm .010" = .254mm

# YG1-FD CIRCUIT DIAGRAM




| Position \ Colour | Black-Earth | Green-White | Yellow-White | Yellow-Blue | Red-Brown |
|---|---|---|---|---|---|
| 0 | ○ | × | × | × | × |
| I | × | ○ | ○ | × | × |
| II | × | ○ | × | ○ | ○ |