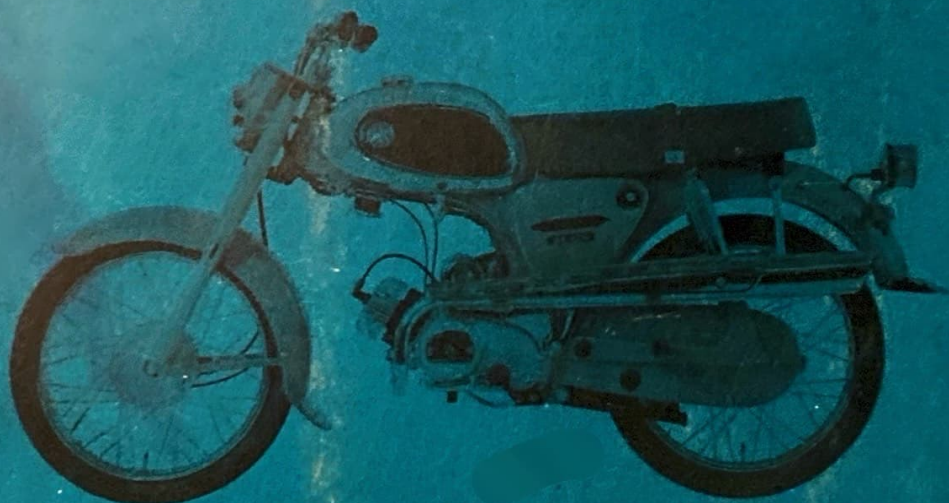


YAMAHA

SERVICE MANUAL

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YF1(50) YJ2(60)



YAMAHA MOTOR CO., LTD.

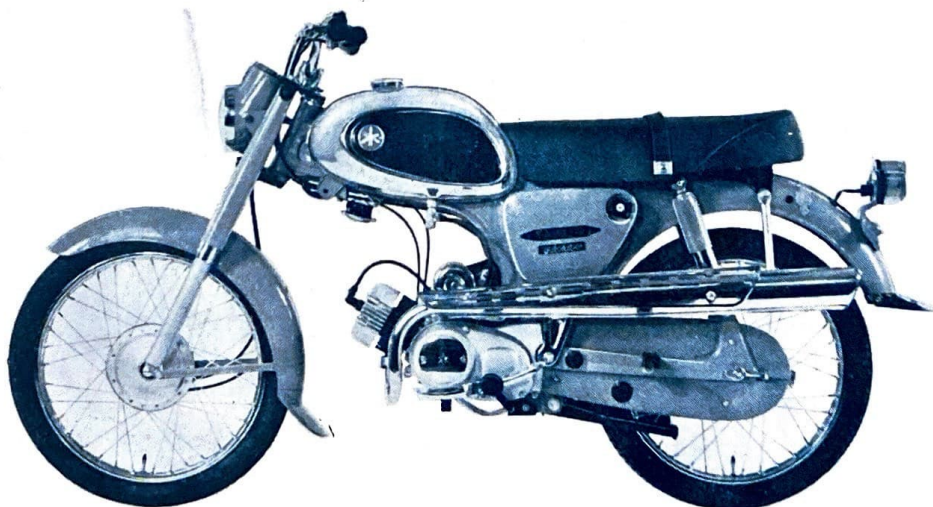
The new Yamaha YJ2 and YF1AK (Yamaha 60/50) designed to meet the requirements of the Yamaha users and dealers, has won the wide reputation for high performance and smart styling as the best of the light-motorcycle since its debut.

All the technical advancements and high-standard mechanism of Yamaha have been built into this model for higher performance, easier handling and minimum maintenance.

Please read this service manual carefully to preserve longer life of the Yamaha 60/50.

YAMAHA MOTOR CO., LTD.

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CHAPTER 1 GENERAL

1—1 FEATURES

1. AUTOLUBE-EQUIPPED, HIGH-PERFORMANCE ENGINE:

Yamaha's unique "separate lubrication system" feeds the engine its oil "apart from the fuel", according to varying engine rpm and load, resulting in reduced oil consumption, exhaust smoke, etc., and in overall improvement of engine performance and durability.

2. ROTARY VALVE:

The Yamaha 50/60 powerplant is a Yamaha Rotary Valve Engine which enjoys a reputation for superb performance, making it perfectly suited for every use.

3. 4-SPEED BALL-LOCK TRANSMISSION

Yamaha's ball-lock transmission enables to shift gears smoothly without any knock or noise at any speed and the 4-speed gear box allows the engine to run properly under any driving conditions.

4. CARBURETOR WITH BUILT-IN STARTER

The entirely new carburetor with built-in starter proven on all the latest models makes it possible to start the engine easily even in cold weather.

5. FINE RIDING COMFORT

The riding position based on years of scientific researches keeps balance perfect all the times even on bad roads or sharp curves. Driving is always smooth and never tiring even on rough roads.

6. LIGHTWEIGHT YET STRONG FRAME

The monocoque construction frame, lightweight yet strong, allows the rotary valve engine to pick up the speed faster. In addition, the handling is very easy.

7. RELIABLE BRAKES

The dust-and-water-proof brake drums assure of having effectively working brakes even on rainy days or dusty roads or even directly after washing the machine.

8. SMART APPEARANCE AND BEAUTIFUL FINISH

The YF1 (YJ2) beautifully finished in lustrous color has been designed on the basis of the model YG1 that was given the Safety and Engineering Award in U.S.A. awarded the best design prize in the Good Design Show, Japan, 1963.

1-2 YJ(F)1 SPECIFICATIONS

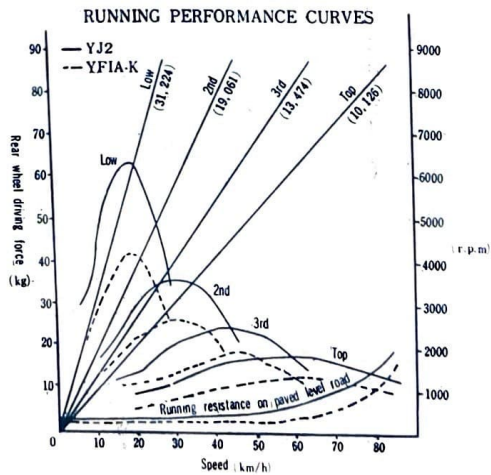
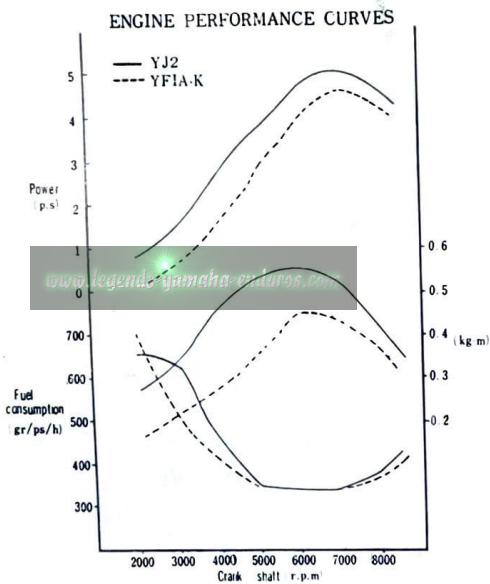
	NAME & MODEL	YAMAHA YF1AK (YJ2)		YF1K YJ2High Speed time
DIMENSIONS	Overall length	1810mm	72.4in	1810mm
	Overall width	635mm	25.4in	635mm
	Overall height	950mm	38.4in	950mm
	Wheelbase	1145mm	45.8"	1145mm
	Min. road clearance	140mm	6.0"	140mm
WEIGHT	Bare weight	78kg	17211ss.	78kg (78) 17211ss.
PERFORMANCE	Maximum speed	80km/h (82km/h)		91km/h (95)
	Fuel consumption	90km per liter at 83km/h (on paved level road)		
	Climbing ability	15° (18°)		
	Min turning radius	1780mm (71.2")		
	Braking distance	3meters at 25km/h (less then 7m at 35km/h)		
ENGINE	Model	F3 (J5)		7.5:1 5.7/8000rpm (5.8/8.500) 0.49/7000rpm (0.25/7.500)
	Type	2-cycle, gasoline		
	Cooling system	Air-cooled		
	Num. of cylinder	Single, oblique		
	Displacement	50c. c. (58c. c.)		
	Bore x stroke	40 x 40 (42 x 42)		
	Compression ratio	7.1:1 (6.8:1)		
	Maximum power	4.5PS/7000rpm. (5.0PS/7000rpm)		
	Maximum torque	0.45kg-m/6000rpm (0.55kg-m/6000rpm)		
	Starting system	Kick starter		
IGNITION	Ignition system	Magneto ignition		1.8±0.15 (2.0±0.15) B-8H (B-8HC)
	Ignition timing	2.0mm(23°) before top dead center		
	Spark plug	B-7HZ (B-7H)		
	Angle advancing device	No		
	Point gap	0.2to 9.4mm		
MAGNETO	Manufacturer	Mitsubishi		
	Model	FAZ-IDL		
	Type	Flywheel magneto		
	Ignition & lighting performance	More than 7mm/500rpm		
	Commutator	Silicone		

BATTERY	Manufacture Model Capacity	Furukawa or Yuasa BST2-6 or B31-6 6V, 4AH	
CARBU RETOR	Model Air cleaner	VM14SC (YF1-AK) (YJ2) Dry, paper-filter	YJ2 YF1K(VM16SC)
GASOLINE & OIL	Fuel tank capacity Oil tank capacity	5.5 liters with spare of 0.75/ 1.1	
CLUTCH	Type	Wet, multiple disk	
TRANSMISSION	Primary reduction ratio Secondary reduc. ratio Gear box Gear ratio Low 2nd 3rd Top	3.894 (74/19), gear 2.786 (39/14), chain Constant mesh, 4-speed 3.083 (37/12) 1.882 (32/17) 1.333 (28/21) 1.000 (25/25)	YF1A-37/14 YJ2-38/15
FRAME	Model Type Suspension Front Rear Shock absorber Front Rear	www.Y22nds-yamaha-enduros.com Backbone-type monocoque telescopic fork Swinging arm Coil spring & oil damper Coil spring & oil damper	
STEERING	Steering angle Caster Trail	45° × 2 63° 80mm	
TIRES	Size Front Rear	2.25-17-4PR 2.25-17-4PR	
BRAKES	Type Front brake Rear brake	Internal expanding Hand, wire Foot, rod	
BULBS	Head lamp Tail & stop lamp Meter lamp Flasher lamp	6V, 15/15W 6V, 3/10W 6V, 1.5W 6V, 8W 6V, 3W	

1-3 YF1/YJ2 PERFORMANCE

The YJ/F rotary valve engine has a capacity of 60 (50cc) making it the most powerful engine in its class as shown below;

Model	Max. Power	Max. Torque	Max. Speed	Pickup	Fuel Consumption
YF1	4.5PS/7000rpm	0.45kg-m/6000rpm	83 km/h	0 to 400m in 25.0 sec.	90km per liter at 30km/h
YJ2	5.0PS/7000rpm	0.55kg-m/6000rpm	83km/h		85km/l at 35km/h

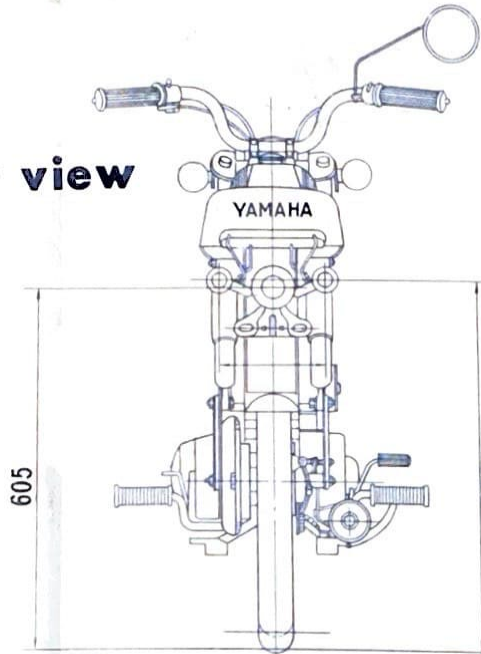


YAMAHA YF1

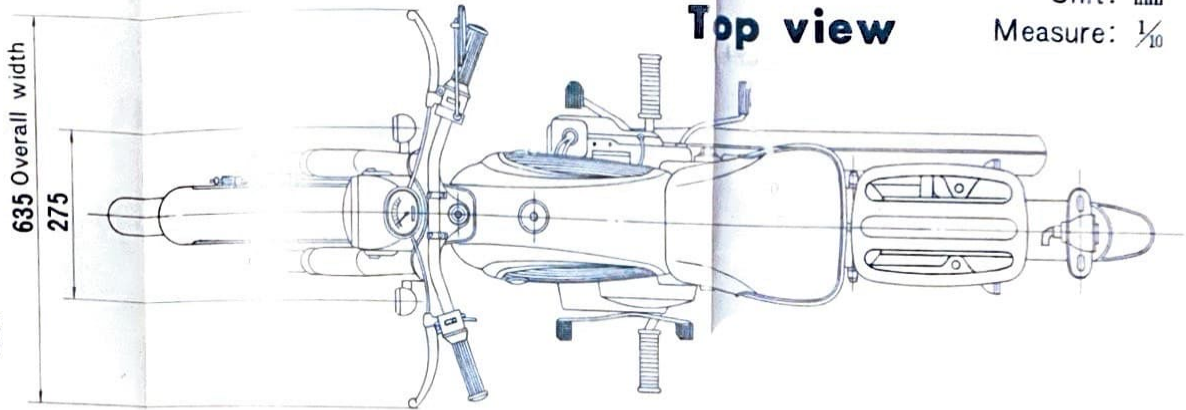
View from four sides

Unit: mm
Measure: 1/10

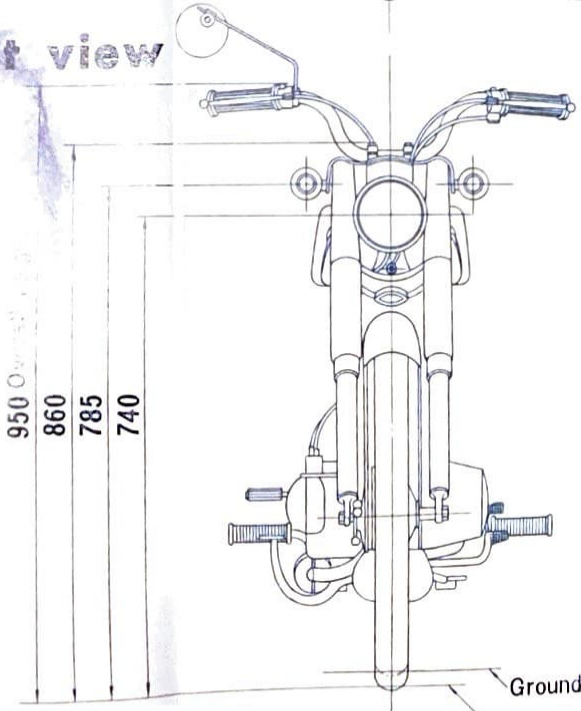
Rear view



Top view

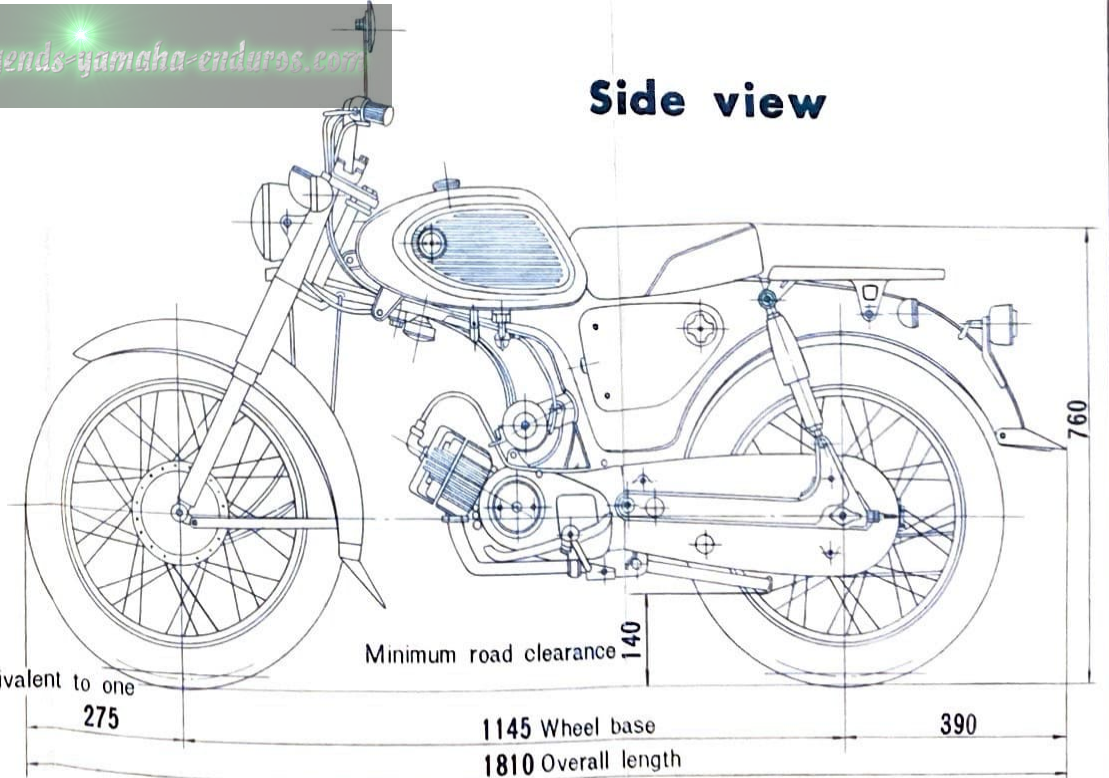


Front view



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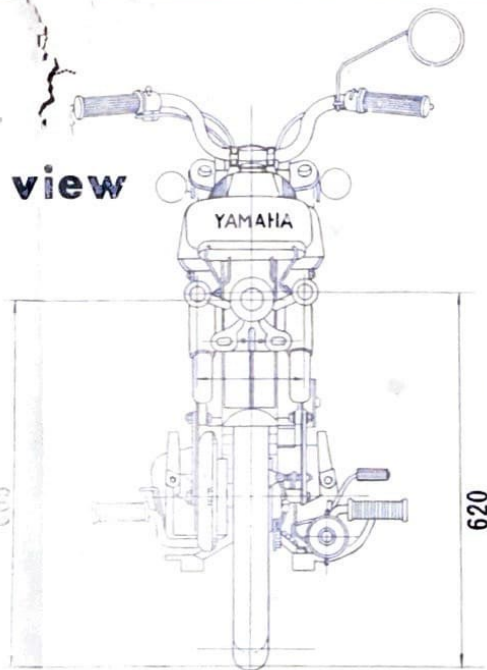
Side view



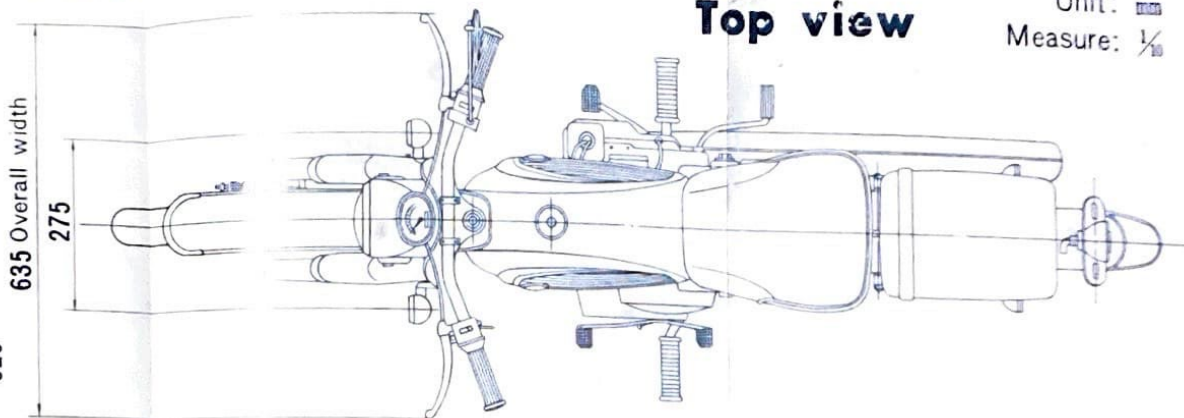
YAMAHA YJ2

View from four sides

Rear view



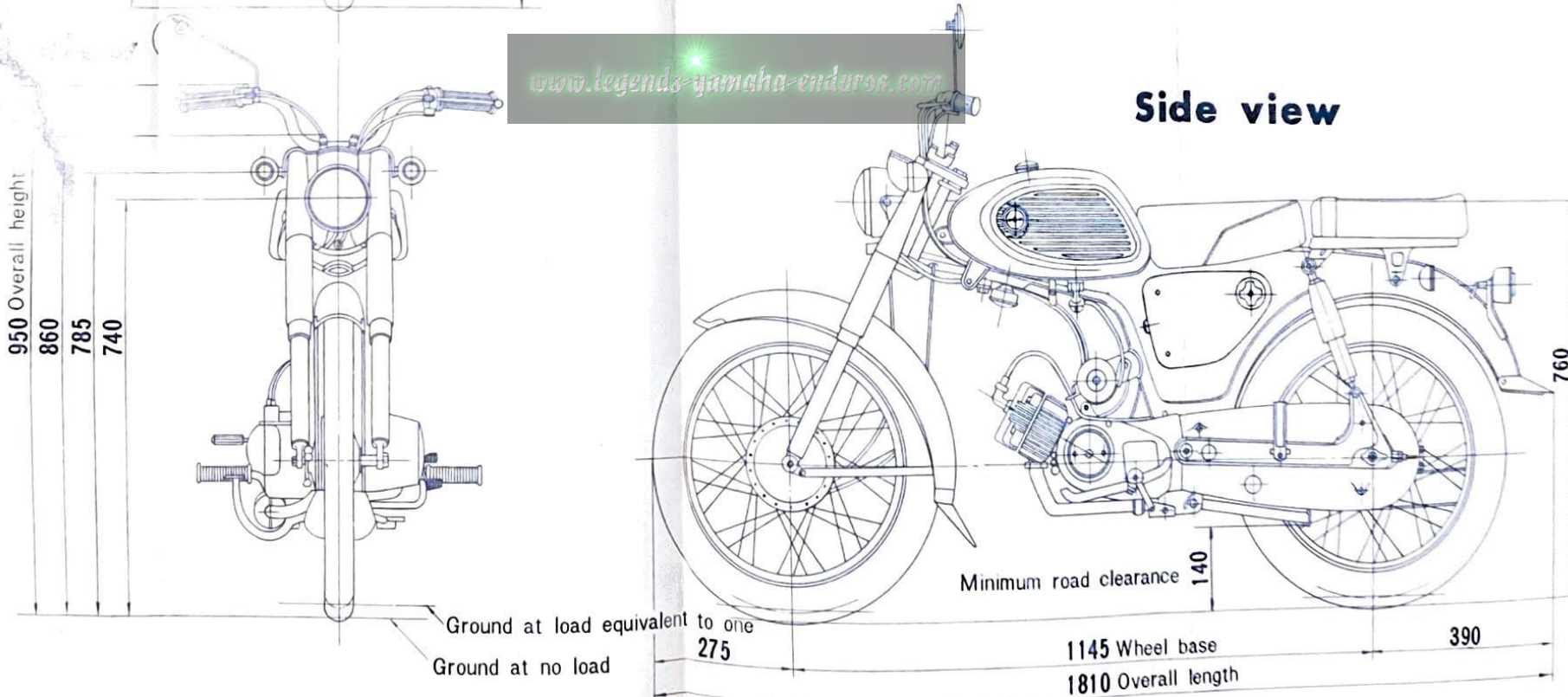
Top view



Unit: mm
Measure: 1/10

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Side view



1-4 YAMAHA AUTOLUBE

1. What is Autolube?

Ordinary two-stroke engines must use pre-mixed gas and oil for lubrication, but Yamaha's Autolube, a separate and automatic lubricating system, needs no gas/oil pre-mixture. Oil and gasoline are stored in separate tanks so oil can bypass the carburetors and be pumped directly to the engine's intake passages. The Autolube pump is a reliable, precision unit developed by Yamaha's engineers.

2. Special features of Autolube

This pump driven by the crankshaft through reduction gears, is a cylindrical plunger that moves in and out of a revolving sleeve or casing.

This rotating casing is filled with oil when a hole in its side aligns with the oil tank line during the plunger's suction stroke (plunger moves out). The casing is emptied of oil when further rotation aligns its hole with the oil delivery line during the plunger's pumping stroke (plunger moves in).

The carburetor throttles are connected to the oil pump, so that increasing the engine's speed by pulling the throttle not only makes the plunger pump faster, but also makes longer its stroke. This dual control by engine RPM and load (throttle opening), maintains optimum lubrication under any operating condition: with the engine pulling (throttle open wide) at low RPM, pulling at high RPM, or even with the throttle closed at high RPM (downhill).

Autolube compensates for many shortcomings in the gas/oil pre-mix system, thereby improving the performance and durability of Yamaha engines.

3. AUTOLUBE

1. eliminates the bother of pre-mixing gas and oil.
2. maintains optimum lubrication according to engine RPM and throttle opening.

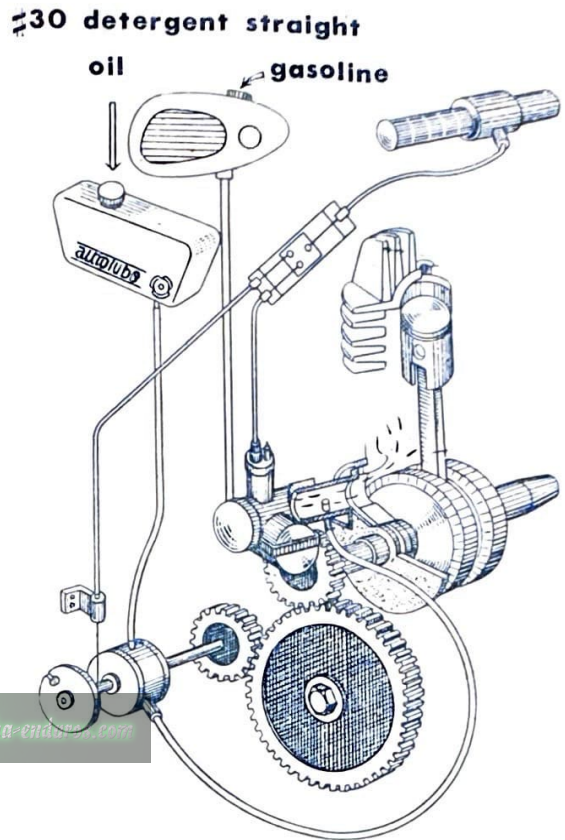


Diagram of Autolube operation

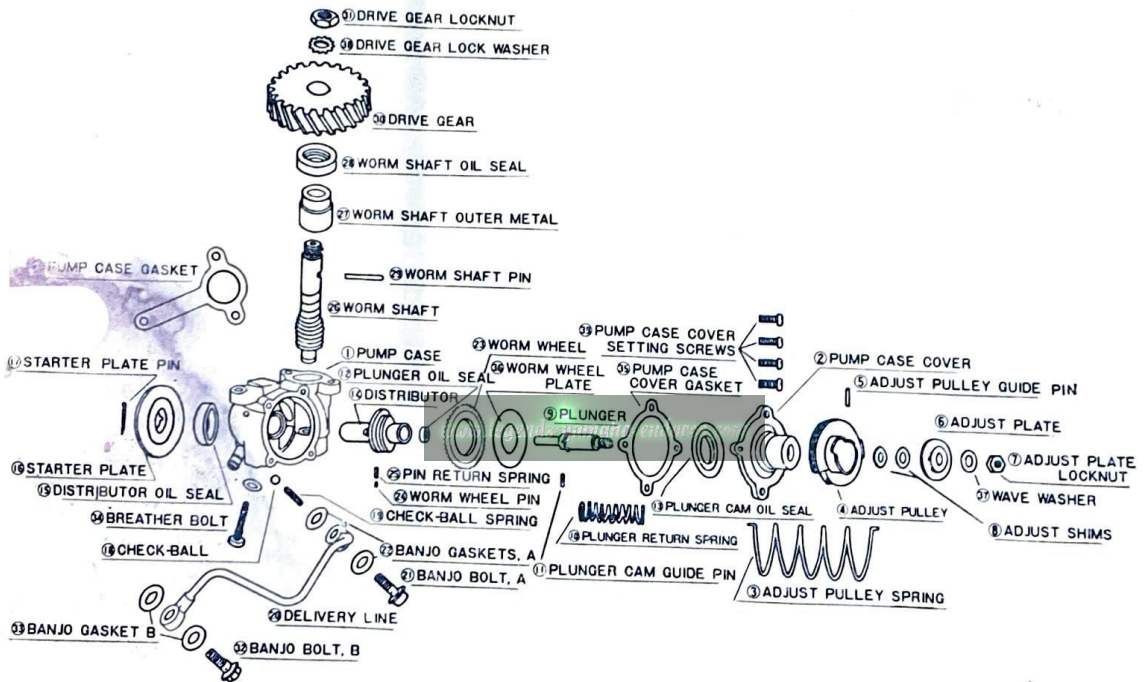
-
3. reduces spark plug fouling by injecting just enough oil for proper lubrication,
 4. can cut oil consumption to 1/3 that of conventional 2-strokes, by pumping a precisely variable oil volume.
 5. reduces exhaust smoke; no excess oil builds up in the combustion chamber because injection is proportional to engine speed and load.
 6. lets you use engine compression as a brake; oil injection continues according to engine RPM, even with the throttle closed.
 7. improves performance; no excess oil interferes with complete combustion of the gas-air mixture.
 8. prolongs engine life; each injection is clean, undissolved, #30 detergent oil with high film strength and other lubricating qualities often lacking in 2-stroke oils.

CHAPTER 2 CONSTRUCTION OF AUTOLUBE PUMP

2-1 PUMP FEATURES

The oil pump is an engine-driven plunger pump coupled with a rotating cylindrical distributor.

- (1) The amount of oil delivered is controlled not only by the engine RPM, but also by the carburetor throttle opening.

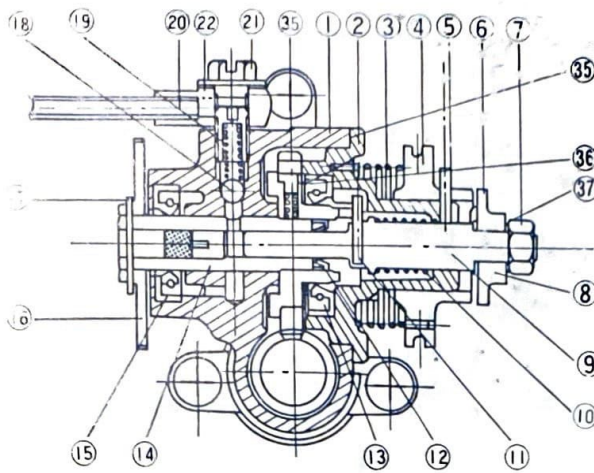


ILLUS 1

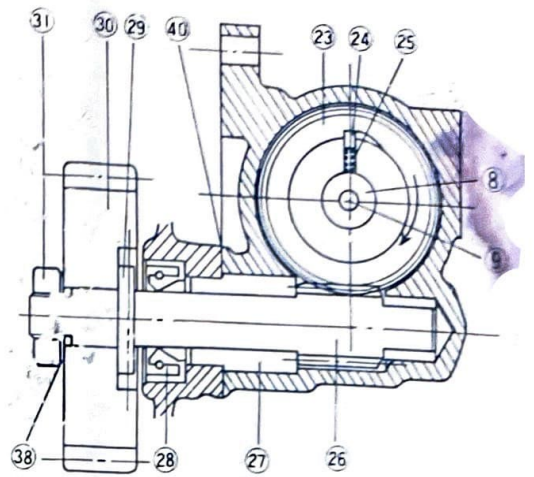
- (2) The amount of oil to be delivered is adjustable micrometrically.
 (3) The oil is delivered not only by the pump but also by hand.
 (4) The air, if entered while piping the unit, can be completely removed.

2-2 PUMP ASSEMBLY

- (1) EXPLODED VIEW OF AUTOLUBE PUMP (Illus. 3)
 (2) SECTIONAL VIEW OF PUMP ASSEMBLY (Illus. 4)
 (3) SECTIONAL VIEW OF PUMP-DRIVING PARTS (Illus. 5)

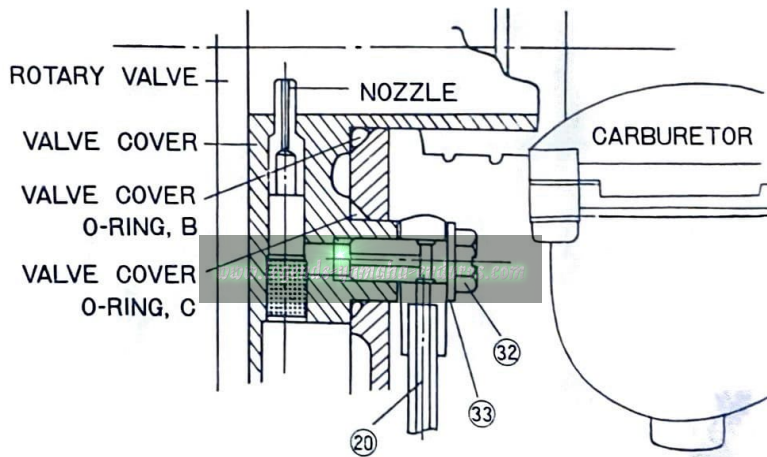


ILLUS 2



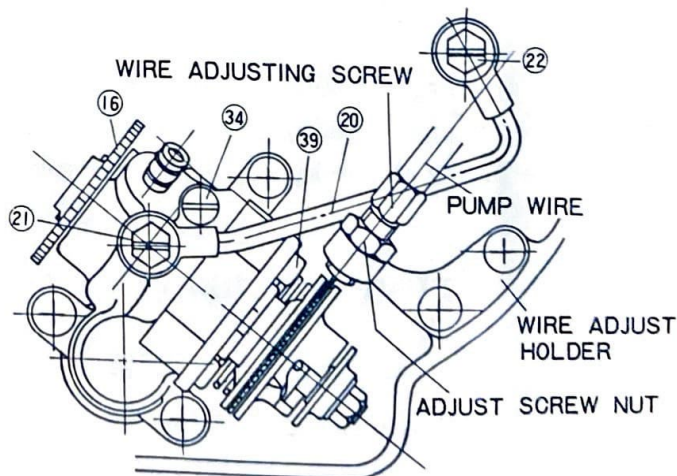
ILLUS 3

(4) SECTIONAL VIEW OF OIL DELIVERY PASSAGES



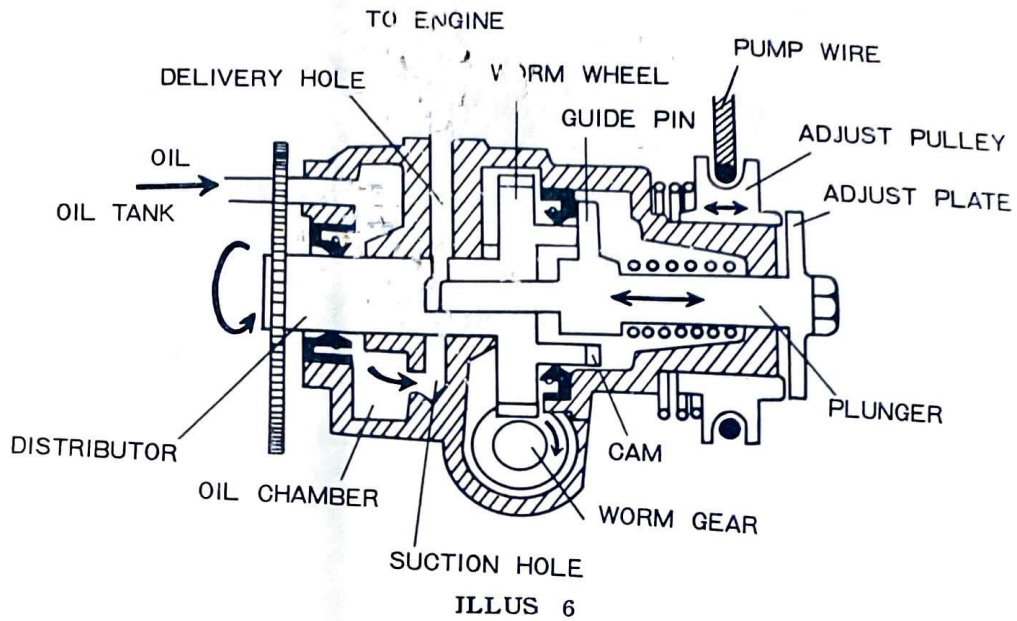
ILLUS 4

(5) PUMP FITTING



ILLUS 5

2-3 PUMP MECHANISM



	PRIMARY REDUCTION RATIO	SECONDARY REDUCTION RATIO	TOTAL R.R
DISPLACEMENT	$\frac{\text{Primary Plinen}}{\text{Primary driveu gear}} \times \frac{\text{Primary driven gear}}{\text{Prime gear}}$	$\frac{\text{Worm shaft}}{\text{Worm wheel}}$	
MF3-D YF(J)-2 50/60 cc	$\frac{19}{74} \times \frac{74}{34} = \frac{19}{34}$	$\frac{1}{62}$	$\frac{1}{111}$

- (1) The driving force is transmitted through reduction gears from the crank shaft of the engine to the worm gear, which rotates the worm wheel and the distributor as a unit.

$$\text{RPM OF DISTRIBUTOR} = \frac{\text{PRIMARY CINION (18)}}{\text{DRIVE GEAR (23)}} \times \frac{\text{WORM GEAR (1)}}{\text{WORM WHEEL (36)}} = \frac{1}{46}$$

- (2) An oil hole in the distributor alternatively opens or closes the suction hole and the delivery hole in the pump case.

- (3) In order to let oil in or out, the plunger moves back and forth by the cylinder cam, which rotates with the distributor.

- (4) The plunger stroke is regulated by the accelerator grip.

As described above, the Auto Lube functions depending not only on the RPM of the engine but also on the turning of the accelerator grip so the oil is always delivered properly under any operating conditions:

$$\text{DELIVERY OF OIL} = (\text{PLUNGER CAPACITY}) \times (\text{PUMP RPM}) \times (\text{PLUNGER STROKE})$$

2-4 MAIN PARTS AND THEIR FUNCTION

(1) OIL PASSAGE

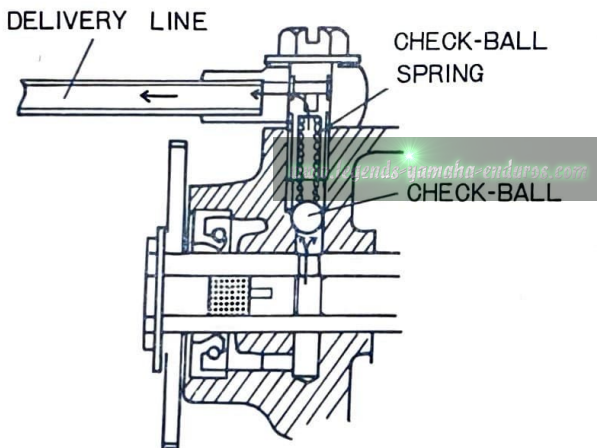
An oil line carries oil from the oil tank into the pump case and, by action of the plunger, it is drawn into the distributor through the suction hole in the pump case.

The oil, to which the plunger pressure is applied, pushes up the check-ball and spring to enter the delivery pipe, which carries it to a nozzle in the intake passage.

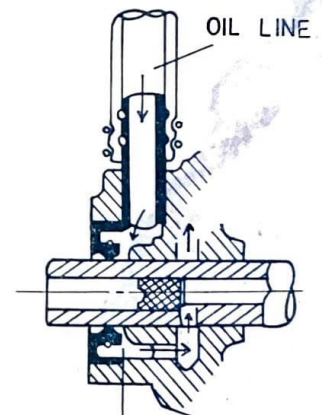
Lastly it is delivered to the suction passage through the nozzle.

(2) CHECK-BALL

The check-ball keeps the delivery pressure of pump constant regardless of the fluctuation of vacuum in the fuel passage, thus stabilizing its performance.



ILLUS 7



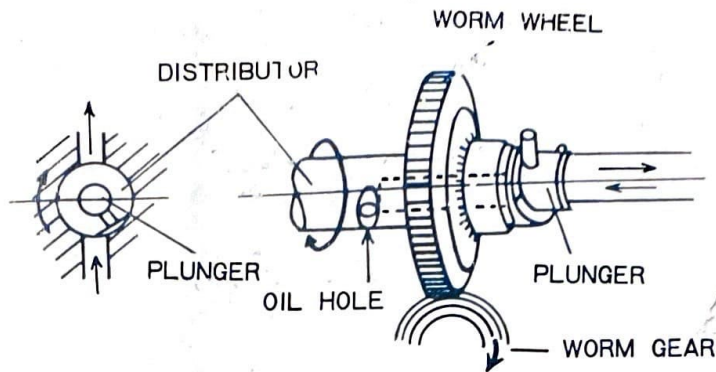
ILLUS 8

While the engine is not running the check-ball prevents any gravity flow of oil through the delivery line.

(3) DISTRIBUTER AND PLUNGER

The distributor is driven and rotated by the worm gear to alternately open and close the suction hole and the delivery hole in the pump case.

The plunger, whose guide pin is pressed against the plunger cam by the plunger return spring, moves alternately back and forth according to the shape of the cam face, with which the distributor rotates as a unit.



ILLUS 9

(4) RELATION BETWEEN THE PLUNGER STROKE AND THE THROTTLE (ACCELERATOR CABLE)

Oil is delivered in proportion to engine RPM and, at the same time, the plunger stroke length is regulated by turning the accelerator grip (opening the carburetor throttle valve).

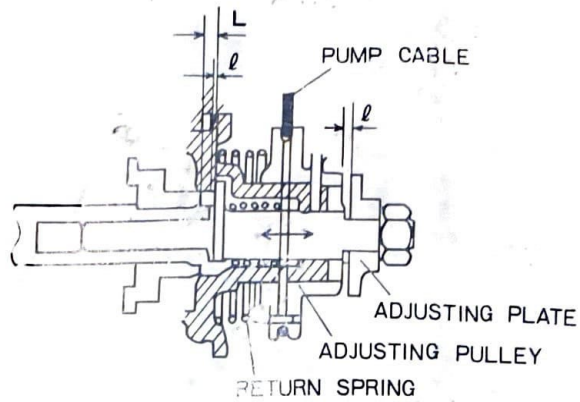
Plunger stroke length is equal to the clearance between the adjusting plate on the right side of the plunger and the adjusting pulley fitted around the pump case cover.

This clearance is controlled by means of the accelerator grip:

- A) The accelerator grip pulls the pump cable;
- B) The pump cable rotates the adjusting pulley;
- C) The adjusting pulley guide pin forces the pulley to the left (by the height of the plunger cam during full stroke) increasing plate-to-pulley clearance on the right and allowing a fuller pump stroke.

L, height of plunger cam:
(Length of maximum stroke at full throttle)
l, minimum clearance between adjusting plate and pulley:

	YF1-K	YJ2	YJ2 ^{High speed}
L	Max 1.18 ^{+0.05_m} / _{-0.12_m}	Max 1.18 ^{+0.05_m} / _{-0.02_m}	1.84 ^{+0.07} / _{-0.02}
l	Min 0.24 ± 0.02 _m	Min 0.24 ± 0.02 _m	0.24 ± 0.02



ILLUS 10

NOTE: At minimum stroke the plunger cam guide pin contacts only the high portion l and not the low portion $(L-l)$ of the plunger cam

(5) BREATHER BOLT AND STARTER PLATE

The breather bolt (34) is used to let the air out of the pump. Remove the bolt and the oil will be pumped from the oil chamber into the worm gear case (through the oil hole at the top of the oil chamber) and out through the breather bolt hole.

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The starter plate (16) fitted on the end of the distributor is used to turn the pump by hand.

Turn it in its normal rotation to check oil flow or to prime the lines.

2-5 DISTRIBUTOR-PLUNGER MECHANISM (Single Cylinder)

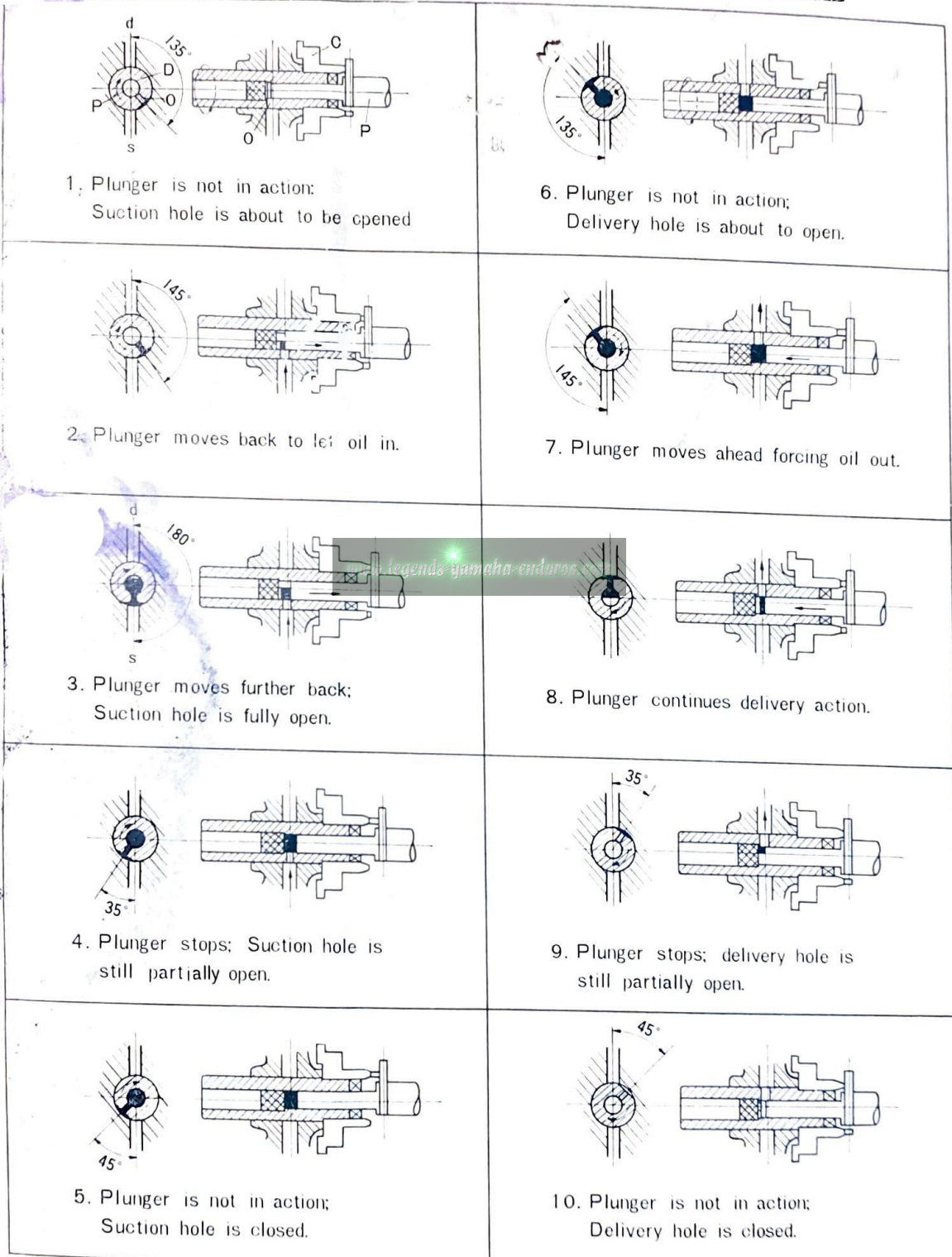
Identification: D: Distributor
O: Oil hole

P: Plunger
S: Suction hole

C: Cylindrical Cam
d: Delivery hole

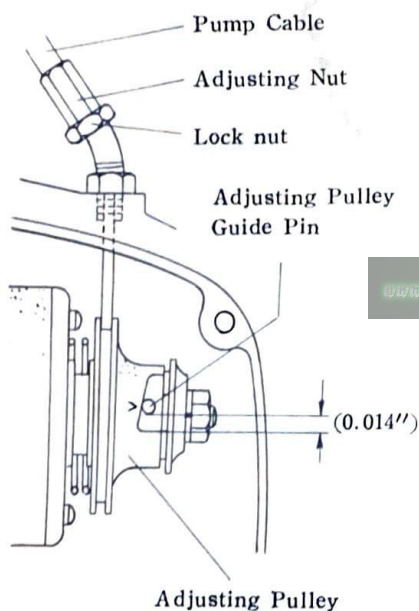
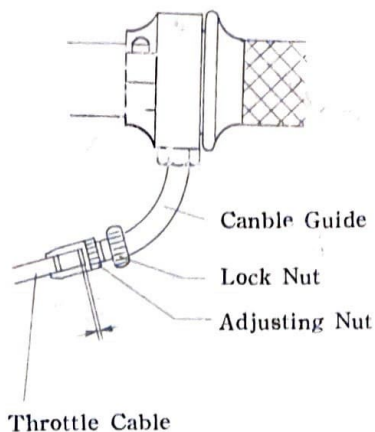
SUCTION STROKE

DELIVERY STROKE

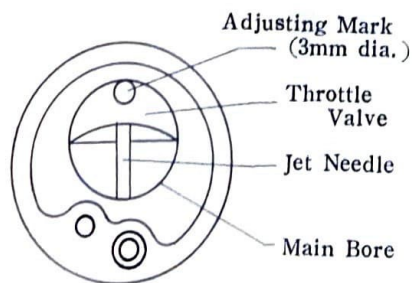


ILLUS 11

2-6 INSPECTION AND MAINTENANCE



ILLUS 14



ILLUS 15

The operation is trouble free, if cared for properly.

The unit should be removed, disassembled, or assembled with special care, because it consists of a number of precision-machined parts.

When mounting it on the engine, be sure to let air out of the pump, adjust the plunger stroke and synchronize it with the throttle as described below:

1. Set the idle:
 - a. Synchronize the throttle slides on a twin, then set the idle as described in the rider's manual.
 - b. To set the idle on a single,
 - (1) fully tighten the pilot airscrew, then turn it out $1\frac{1}{2}$ turns.
 - (2) with the engine running, turn the throttle adjusting screw to a position where the engine runs smoothly at 1200 to 1500 RPM.

2. Adjust play in the throttle cable to $\frac{1}{16}$ " using the two adjusting nuts on the cable guide pipe at the accelerator grip.

3. Check the oil pump's minimum plunger stroke (which was factory set) by turning the starter plate until plate-to-pulley clearance is at its lowest point. This gap (between the adjusting plate and the **small pump** on the adjusting pulley) should measure:

$0.0094'' \pm 0.0008''$ on all models.

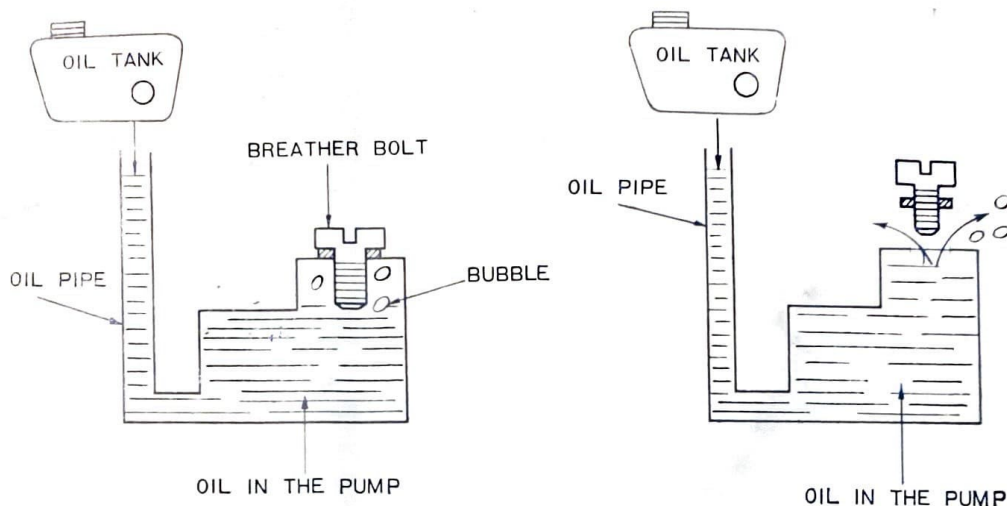
Add or remove adjusting shims to correct improper clearance.

4. Adjust the pump cable in relation to the throttle opening:

- a. After mounting the pump on the engine, connect the pump cable.
- b. Set the throttle at half open position, using the pump-setting tool for early models having no mark on the throttle valve. Later models are at half open position when the top of the

small circle adjusting mark on the slide is touching the main bore of the carburetor.

- c. At $\frac{1}{2}$ throttle use the cable adjusting nut to align the V-mark on the adjusting pulley with the adjusting pulley guide pin.



ILLUS 16

1. DISASSEMBLY AND ASSEMBLY OF OIL PUMP

(1) When disassembling be careful not to scratch the lip of the oil seal, case-to-distributor surfaces, distributor-to-plunger surfaces, plunger cam guide pin or its groove in the pump case cover.

(2) Assembly

(Oil Seal insertion)

A) Apply grease to the lips of oil seals.

The distributor oil seal should be flush with the case end.

The plunger oil seal should be inserted at least (3.2mm) (0.125") beyond the plunger cam face.

The plunger cam oil seal should be flush with the pump case cover.

B) Apply oil to the distributor and pump case. Make sure the distributor turns smoothly.

C) The worm wheel should be attached as illustrated in page 10.
Check the pin proper operation.

D) The plunger cam guide pin should be carefully fitted into the groove in the pump case cover.

E) Do not tighten the adjusting plate locknut too much. Tighten only until the

lockwasher flattens.

- F) After oiling the distributor and plunger apply sealing compound to the pump case surfaces and gasket. Tighten 4 bolts evenly.
- G) Check plunger stroke by turning the starter plate.
- H) Assemble delivery pipe, ball bolt, gasket, check-ball and check-ball spring after cleaning these parts.

(3) Mounting

- A) Apply grease to wormshaft oil seal.
- B) Be careful not to scratch the teeth of the drive gear.
- C) Apply sealing compound to the matching surface of the case and gasket, tighten 3 bolts evenly.
- D) After connecting pump cable and oil line, bleed the pump, and adjust the cable.
- E) To bleed the pump, remove the breather bolt to let air out of the delivery line plate until oil runs out through the breather bolt hole.

2. CHECK POINTS AFTER MOUNTING THE PUMP AND STARTING THE ENGINE

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Start engine and check as follows:

- A) Check for oil leaks.
- B) Check starter plate for slow and smooth rotation.
- C) Check rotation and travel of the adjusting plate as the throttle is turned.
- D) Check oil level in the tank; if below inspection hole add 1 quart (1 l).

3. DESIRABLE OIL CHARACTERISTICS

The Auto-lube oil should have the following characteristics:

- A) Strong oil film, high viscosity index, excellent oiliness.
- B) Low residual carbon content.
- C) Ashless detergent.
- D) Low pour point.

The above oil characteristics are to be found in most major brands of oil on the market. The low residual carbon content refers to the oil itself and its effect is noticeable in the amount of carbon left behind after many miles of operation. By and large, the higher quality oils all conform to these specifications.

The ashless detergent refers to detergent additives present in the oil. These ashless additives are more satisfactory for 2-cycle operation in most cases than the sulfide additives; they maintain cleaner crankcase chambers, pistons and ring, and also

combustion chambers and exhaust outlet passages. These ashless additions are desirable for their cleansing action and does not harm the lubrication characteristics of the oil.

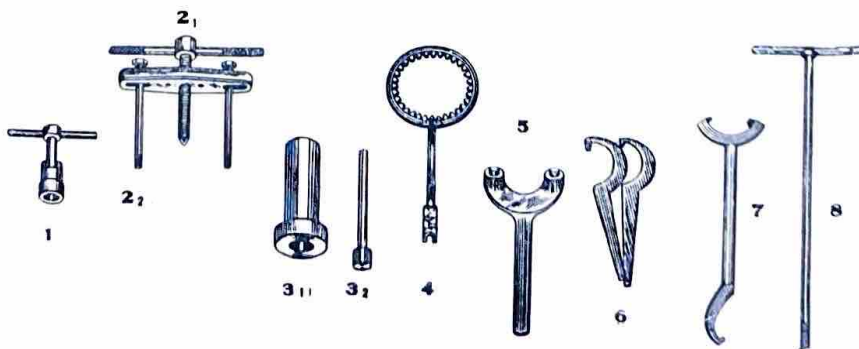
Two stroke oils as such are not only less available, but lose part of their advantages in Autolube (non pre-mix) systems. They have also been designed primarily for out-board engines where different operating temperatures and conditions exist.

Because this oil is fed to the engine apart from the gasoline tank, a low pour point becomes increasingly important for Autolube use, particularly in the cold climates. As an added advantage for the Autolube system, the high viscosity index can be stressed without compromising with easy-mixing qualities necessary in pre-mix oils.

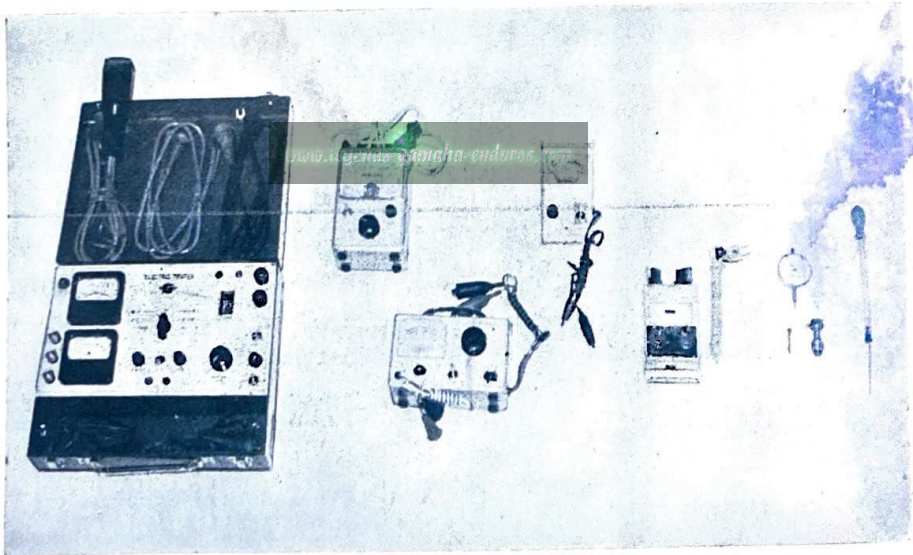
For average climates, SAE #30 motor oil is recommended. For operating conditions below 0°F, 10W-30 is recommended.

4. TOOLS AND TESTERS

No.	Tool Name	Usable in
1	Fly wheel magneto puller	YF1, YJ1 MF(J)2
2	Crankcase disassembling tool Bolts	All models of motorcycle YF1, MF(J) 2-K, YG1
3	Crank fitting tool Bolt	All models of motorcyce YF1, MF(J) 2-K, YG1, YG1K
4	Clutch holder or Shifter rod holder	YF1, YG1, YJ1
5	Fly wheel holder or Sprocket holder	YF1, YG1, MF(J) 2-K, YJ1
6	Steering nut tightening tool	All mopeds
7	Exhaust ring nut tightening tool	All models of motorcycle
8	Fnant fork extracting tool	All models of motorcycle except MF(J)2 YF1/YJ1



No.	Tester Name			
1	Electro-tester	General	and plunger apply sealing Tighten 4 bolts evenly.	
2	Engine speed tester	Engine	turning the starter plate.	
3	Selenium checker	Selenium rectifier	check-bal	
4	Point checker	Point gap	YF1, MFJ 2-K, YJ1	
5	Magnetic-flux meter	Magneto	YF1, MFJ 2-K, YG1 YJ1 Y(J)2	
6	Dial gauge Dial gauge holder	Ignition timing and other measurements	All models	Gauge available in market
7	Hydrometer	Electrolyte	All models	Meter available in market

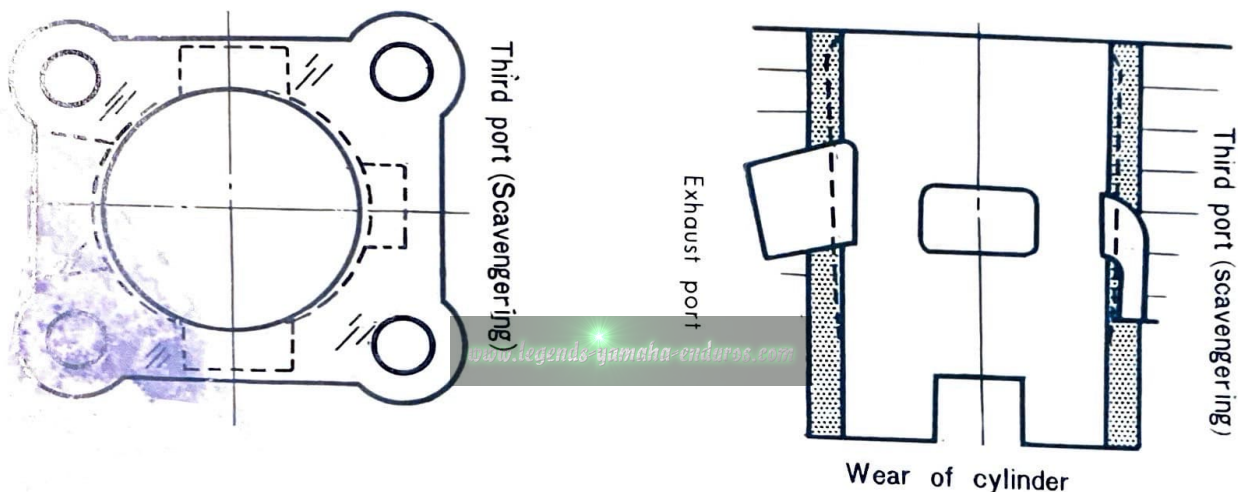


CHAPT let passages. The
s not harm to ENGINE

3-1 CYLIN less availabl PISTON
they have of

The cylinder is made of special cast iron. The location of the intake port has been changed from the cylinder to the crankcase for more engine power and performance. It has the third scavenging port instead. This is one of the exclusive features of the Yamaha rotary valve proven on all single cylinder models.

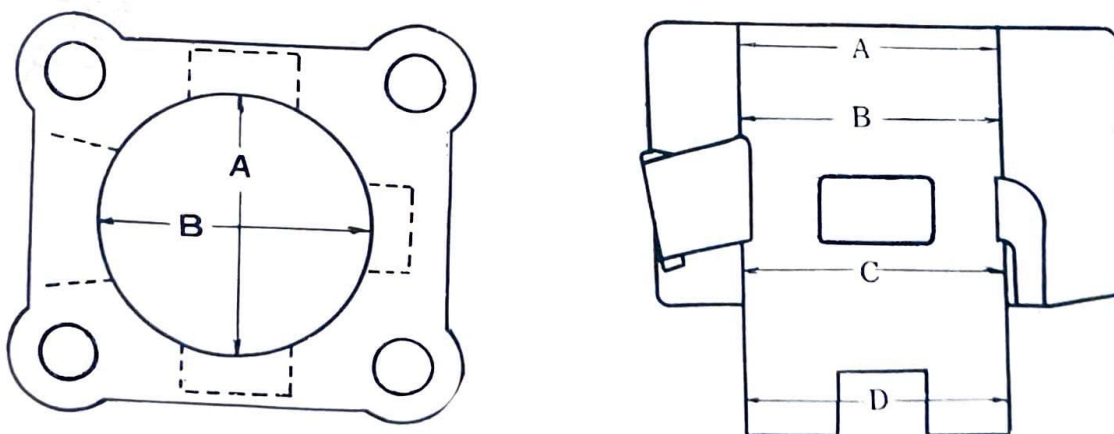
The piston is made of hisilicone. Its bore and stroke is 40×40mm (42×42mm)



INSPECTING AND INSTALLING

The cylinder and piston are the most important parts of the engine.

Check them carefully as follows:



- a. Check the cylinder wall for wear at the measuring points as shown above by using an inside micrometer or cylinder gauge. If it is worn more than 0.05mm, it must be reconditioned by boring.
- b. The minimum clearance between the cylinder and piston is 0.025 to 0.030mm (A: 0.038 to 0.040) at the measuring point 10mm up from the piston skirt boss.
- c. Insert the piston rings into the cylinder horizontally and measure their gap:

	Correct Gap
1st Ring	0.15 to 0.35 mm
2nd Ring	0.15 to 0.35mm

- d. The correct clearance between the piston rings and their grooves is:

1st Ring	0.04 to 0.08mm (0.0015-0.003in)
2nd Ring	0.03 to 0.07mm (0.001-0.0025in)

NOTE ON INSTALLING THE PISTON RINGS

- a. The piston rings must be installed with TP mark up.
- b. Install the 2nd piston ring parkerized and then the 2nd ring (chrome).
- c. Use some waste to prevent the gudgeon pin from slipping off into the crankcase.

REPAIRING THE CYLINDER

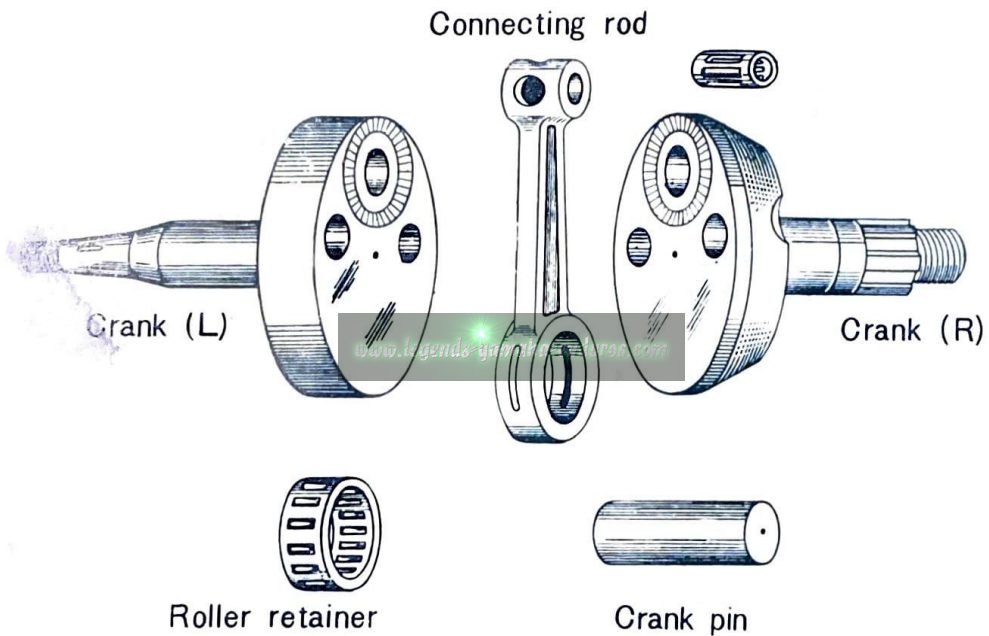
- a. The cylinder must be rebored less than 0.1mm at one time.
- b. After reboring, finish the cylinder wall by honing.
- c. Allowable difference between the inside diameters at different sections should be less than 0.01mm after honing.
- d. The cylinder wall must not be rebored 4mm oversize.

3-2 CRANK AND CRANKCASE

A CRANK ASSEMBLY

The crank and crankshaft are constructed as a unit.
The serial number is marked on both cranks.

EXPLODED VIEW OF CRANK ASSEMBLY



When disassembling the engine, be sure to check the crank assembly as given below:

Check Point	Instructions
Check connecting rod big end for wear by measuring the amount of play in its small end.	If the play is more than 3mm, disassemble the crank and check to replace the connecting rod and crankpin.
Check crankshaft for crank or wear.	If there is any scratch or crank, or if it is worn more than 0.05mm, replace the crank assembly.

When disassembling the crank, be sure to check the crankpin for scratch or wear. If there is any scratch or it is worn more than 0.06mm, replace it.

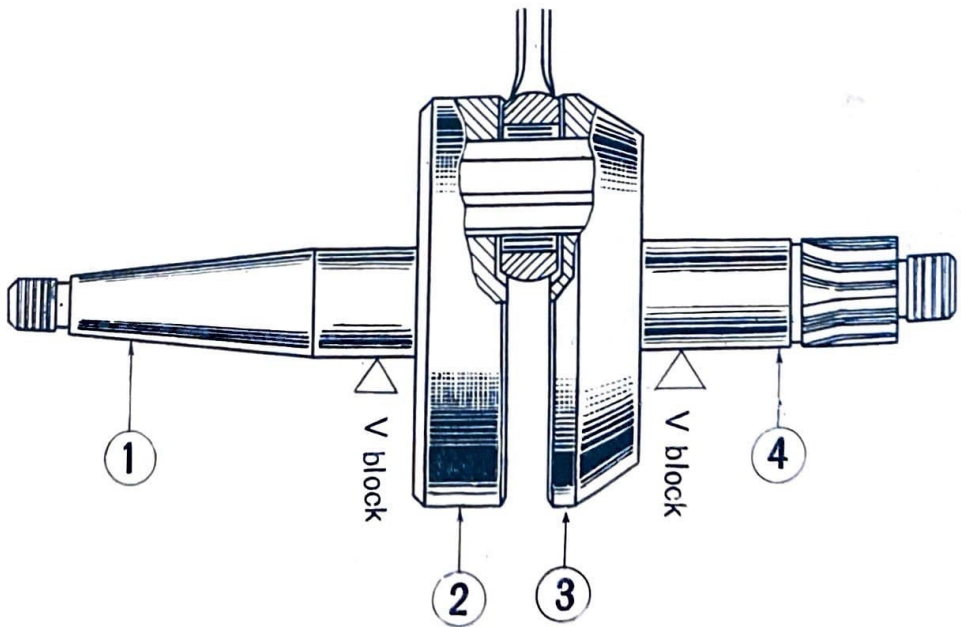
REPAIRING THE CONNECTING ROD

The needle bearing radial play at the connecting rod big end must be kept within the range 0.004 to 0.018mm by using the connecting rod and the crankpin in the proper combination as listed below:

		A	B	C
Connecting rod tolerance: 24ϕ	+0.047 +0.035	+0.047 +0.043	+0.043 +0.039	+0.039 +0.035
Crankpin tolerance: 8ϕ	+0.039 +0.028	+0.039 +0.035	+0.035 +0.031	+0.031 +0.028
Needle roller tolerance: 3ϕ	+0 -0.003	+0 -0.003	+0 -0.003	+0 -0.003
Radial play		-0.018 -0.004	-0.018 -0.004	-0.017 -0.004

NOTE: Combine the connecting rod A with the crankpin A, B with b and C with C.

CHECKING THE CRANK AFTER ASSEMBLING



a. The radial or axial play of the crank must be:

Measuring Point	Dial Gauge Reading
1	below 0.03 mm
2	below 0.06 mm
3	below 0.06 mm
4	below 0.03 mm

- b. The side play at the connecting rod small end must be below 0.03mm.
(Use the dial gauge).
- c. The axial play at the connecting rod big end must be within the range 0.20 to 0.38mm. To measure it, hold the connecting rod against one of the crank and measure the clearance between the connecting rod and another side of the crank by means of the thickness gauge.
- d. The correct width of the crank assembly is $43 \begin{smallmatrix} +0.05 \\ -0.10 \end{smallmatrix}$ mm
The correct width of the crank assembly is 8mm.

NOTE ON ASSEMBLING THE CRANK

- a. Be careful not to use the crank bearing shim.
- b. When installing the connecting rod, place it in the top dead center.

B CRANKCASE

The crankcase is made of die-cast aluminium alloy. The right and left cases are united with Yamaha Bond #5 and bolted together.

INSPECTING

Check the crankcase and its cover for any crack to prevent leakage of oil and compressed air-fuel mixture.

ASSEMBLING

a. Clips Inserted

Where Used	Clip Name	Num. of Clip
Crankcase, left	Crank bearing cir-clip	1
	Drive shaft bearing cir-clip	2
Crankcase, right	Crank bearing cir-clip	3
	Main axle bearing cir-clip	4

b. Bearing and Oil Seal

1) Crankcase, left

Where Used	Name	Standard	Num. of B. or O.S.	Instructions
Crankshaft	Crank bearing, left	#6204C3	1	Make bearing and crankcase even. Install bearing with its numbered side to crank.
	Crankshaft oil seal	SD20 × 47 × 7	1	Install oil seal with its marked face to dynamo.
Drive axle	Drive axle ball bearing	#6204	1	Drive bearing onto shaft until it reaches clip. Use another circlip on it. Install bearing with its numbered side to the inside of case.
	Drive axle oil seal	SD28 × 47 × 7	1	Drive bearing onto axle from secondary chain. Install bearing with its numbered face to chain.

2) Crankcase, right

Where used	Name	Standard	Num. of B. or O.S.	Instructions
Crankshaft	Crank bearing, right	#6204C3	1	Make bearing and crankcase even. Install bearing with its numbered side to crank.
Main axle	Main axle ball bearing	#6203	1	Drive bearing onto axle until it reaches clip. Install bearing with its numbered side to the inside of case.

- Notes: 1) Crankshaft oil seal, right, SW28 × 47 × 9 should be used for the valve cover.
 2) To install the bearings heat them up to 120°C and fit them by means of a press or drive them onto their specified shafts by using a guide metal.

C. DISTANCE FROM SEAM TO BEARINGS

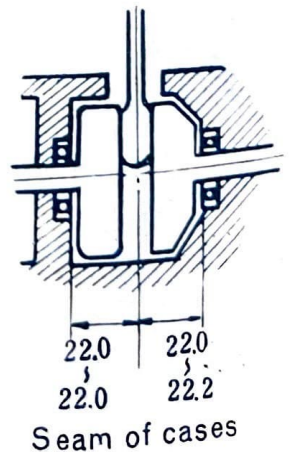
Since it is necessary to newly determine the clearance between the crank and the crankcase when replacing either of them, the distance from the seam to the bearings is given below as a guide:

Distance from seam to left crankcase bearing.....

.....22.00 to 22.20mm;

Distance from seam to right crankcase bearing.....

.....22.00 to 22.00mm.

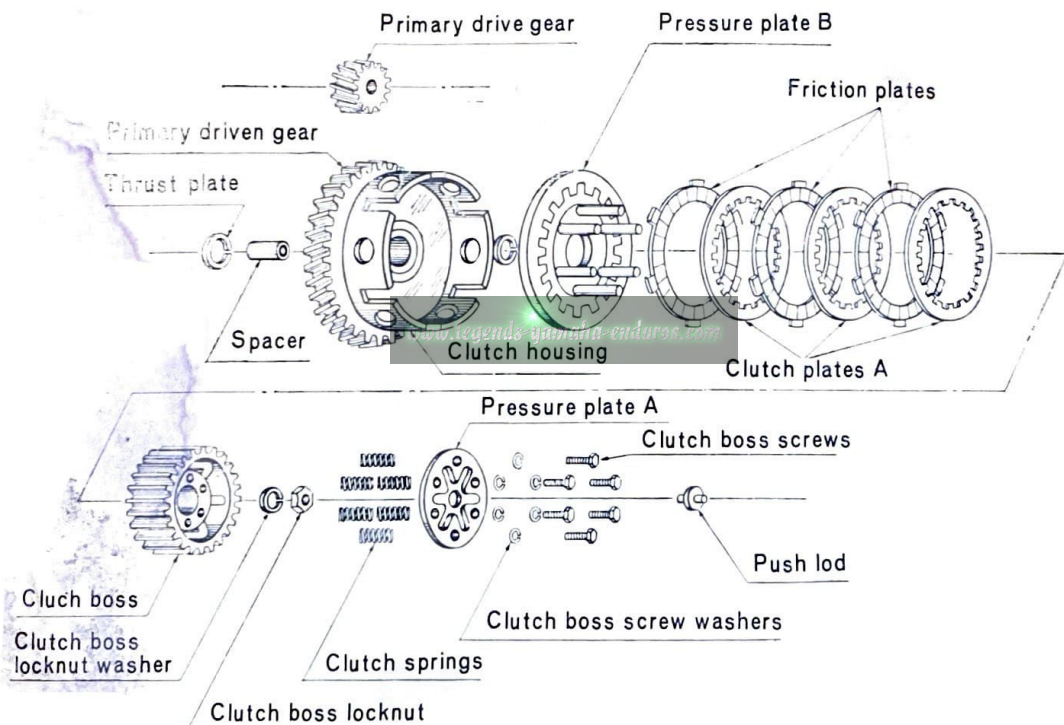


3-3 CLUTCH

The YF1 (YJ2) possesses the wet multiple-disk clutch that consists of three clutch plates and three friction plates of mould cork and is installed to the transmission main shaft.

The clutch housing and the primary driven gear rotates as a unit. The primary drive gear has 19 teeth and the primary drive gear has 74. Therefore, the primary reduction ratio is equal to $74/19=3.80$.

EXPLODED VIEW OF CLUTCH



INSPECTING

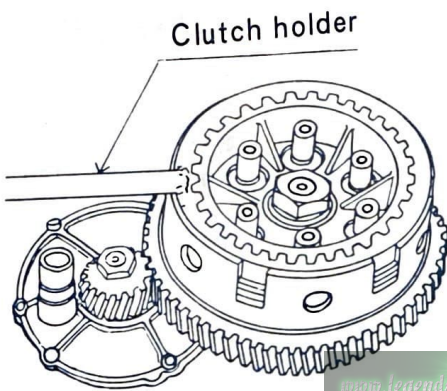
- Check to see that the clutch plates are properly fitted into the splines of the clutch boss and that the friction plates are correctly done into the notches of the clutch housing.

The correct clearance between any friction plate and the housing notches is 0.1 mm. If the clearance becomes 0.4 or 0.5 mm, it makes noises.

- If the friction plate is worn more than 0.5mm, replace it.

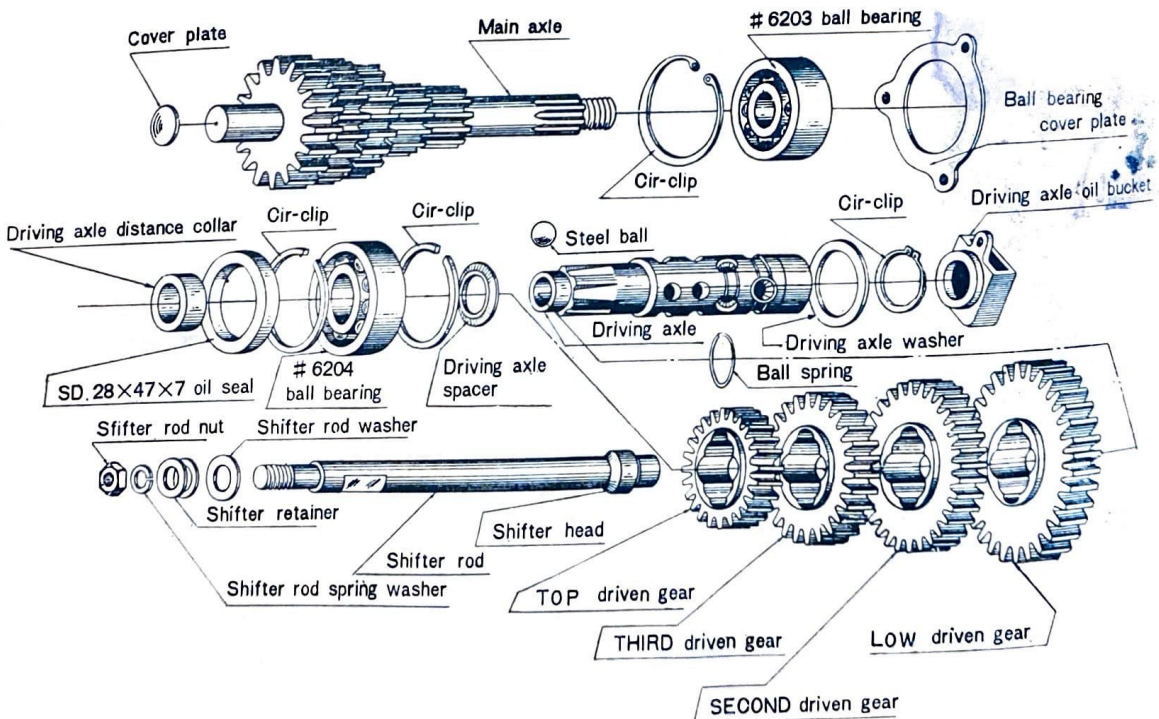
INSTALLING

- When fitting the pressure plate B into the clutch boss splines, use two of six holes of the clutch boss.
- Be sure to use the thrust plate.
- Remove the push lever and the clutch wire. If the wire is removed with the lever left in place, it causes damage to the lever and spring.



3-4 TRANSMISSION AND SHIFTER

The YF1, YJ2 is equipped with the 4-speed ball-lock transmission.



CONSTRUCTION

A TRANSMISSION

The transmission consists of the main axle drive axle, 4 driven gears, 16 steel balls and shifter rod. The top drive gear is shrunk on to the main axle. The steel ball size is $9/32''$.



B SHIFTER

The shifter consists mainly of the (shifter rod driving mechanism) and the shifter cam plate (shifter cam plate driving mechanism).

MECHANISM

A TRANSMISSION

As shown in the sectional view of the transmission, the shifter rod head pushes radially a set of balls to engage the drive axle with the driven gear. The drive axle and the drive sprocket rotates as a unit to transmit the power to the rear wheel through the drive chain.

Primary reduction ratio:

$$74 \text{ (primary driven gear)}$$

$$/19 \text{ (primary drive gear)}$$

$$= 3.894$$

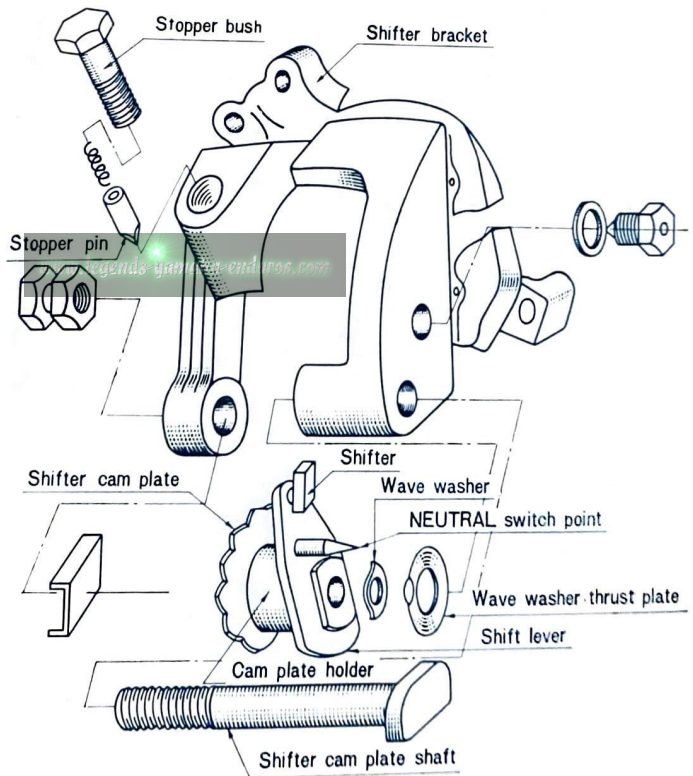
Secondary reduction ratio:

$$36 \text{ (sprocket wheel)} / 15$$

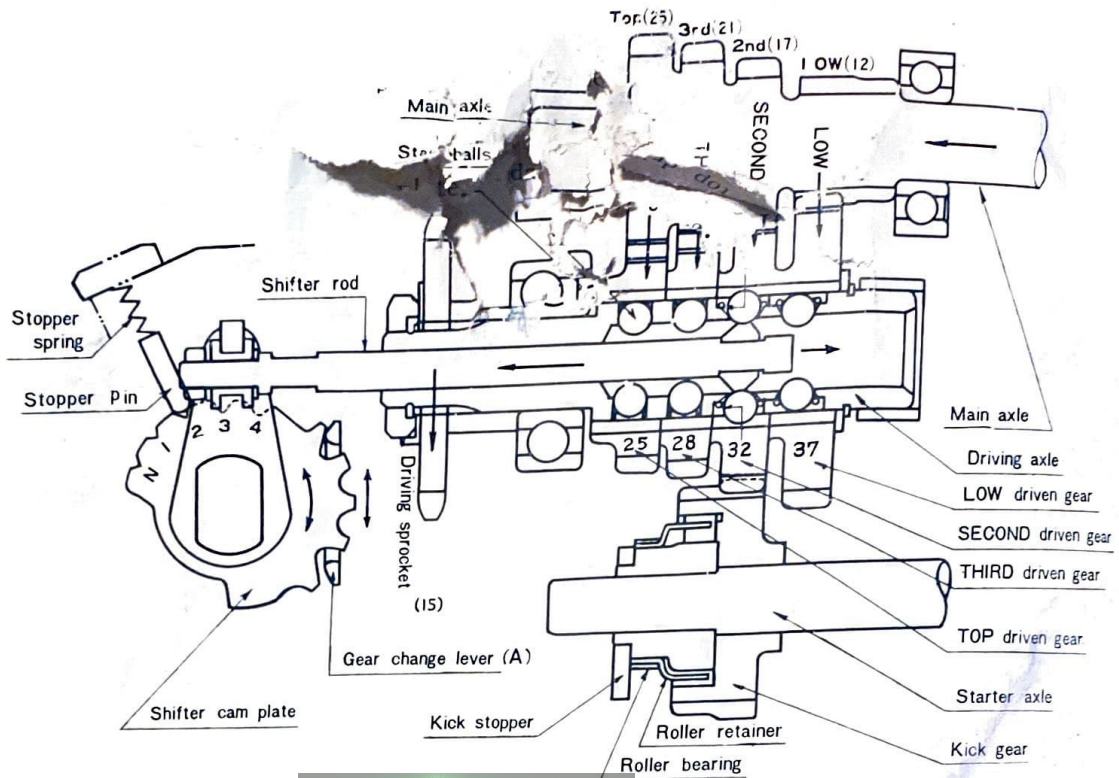
$$\text{(drive sprocket)} = 2.600$$

Total reduction ratio:

Exploded view of shifter



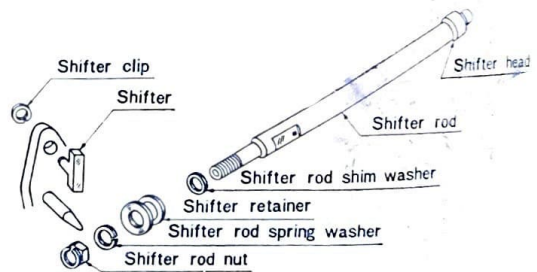
	Prim reduc. ratio × Gear × Sec. reduc. ratio = Total (High Spccd)
Low	$74/19 \times 37/12 \times 39/15 = 31.224$ YJ2 : 38/15
2nd	$74/19 \times 32/17 \times 39/15 = 19.061$
3rd	$74/19 \times 28/21 \times 39/15 = 13.474$ YF1K : 37/14
Top	$74/19 \times 25/25 \times 39/15 = 10.126$



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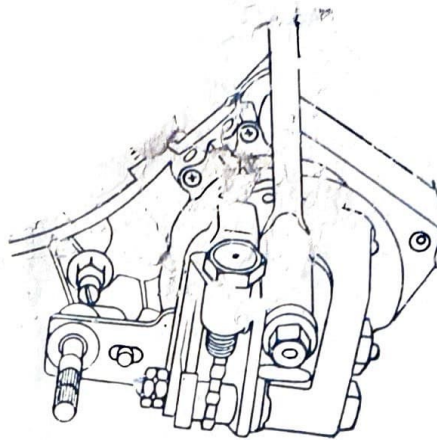
B SHIFTER ROD

When stepped on, the shift pedal rotates the shifter camplate by a given angle. This action is transmitted to the shifter to move the shifter rod back or forth. The illustration shows that the shifter rod head is pushing radially a set of balls for the third driven gear; the gear is in 3rd. The stopper pin prevents the shifter cam plate from turning excessively.



NOTE: When installing the shifter rod washer, retainer, spring washer, and nut, the gear must be in Top.
To tighten the shifter rod nut, use a 12mm spanner and the opposite end of the clutch holder to hold the shifter rod.

CAUTION: Never attempt to remove any ball retainer spring from the drive axle, without removing it, the shifter can be disassembled.

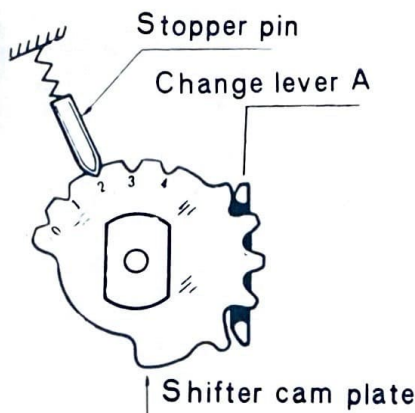
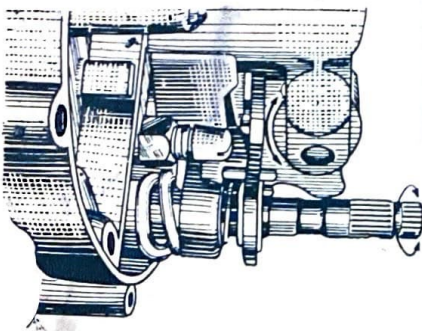


SHIFTER

C SHIFTER CAM DRIVING MECHANISM

When stepped on, the shift pedal gives a rotary motion to the change shaft. The change lever A bult into the change shaft moves in the arrow direction as shown below, catching the cam plate pawl. And the cam plate rotates by a given turn. Finally, the return spring moves the change lever A back to the original position.

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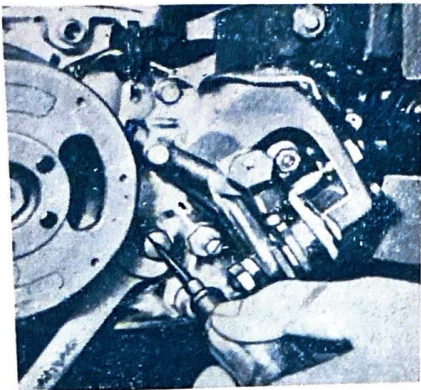
Shifter cam plate

INSPECTING AND ADJUSTING

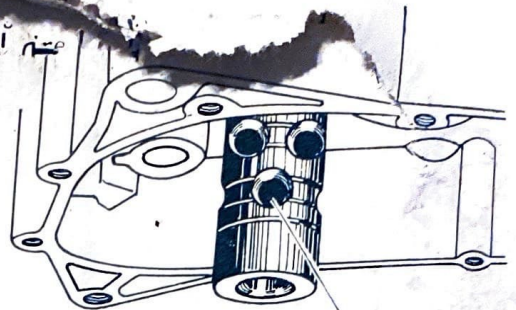
Install the drive axle, shifter rod and then shifter assembly. After temporarily attaching the change shaft and pedal, try to shift gears to check whether the shifter rod and cam plate work properly.

If the change lever A drives the cam plate to rotate too much or too little, adjust it by means of the change lever stop screw (eccentric bolt).

When the stopper pin is in the cam plate notch, the shifter rod head must be located at the center of the ball hole in the drive axle (Illus. B). To adjust, use the most proper of the shifter rod washers (0.7, 1.0 and 1.3mm).



B



Shifter head must be located at center of ball hole

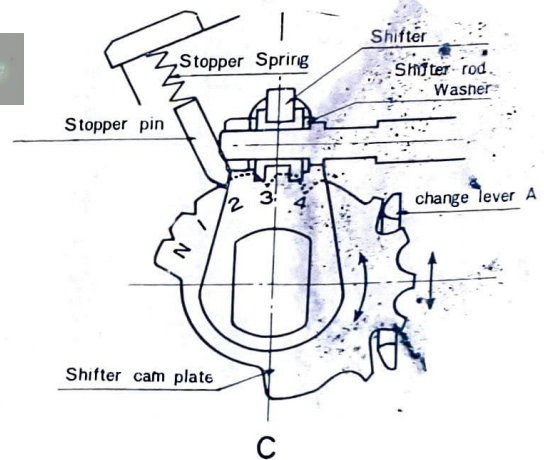
B

3-5 CARBURETOR AND AIR CLEANER

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A CARBURETOR

The YF1 (YJ2) possesses the Yamaha's exclusive carburetor with built-in starter proven on all the latest Yamaha motorcycles. Just push the lever on the handlebar, and it makes richer mixture gas necessary for starting on cold weather. The conventional tickler and choke are out-of-date.



C

CARBURETOR SETTING GUIDE, MODEL VM14E, VM16SC

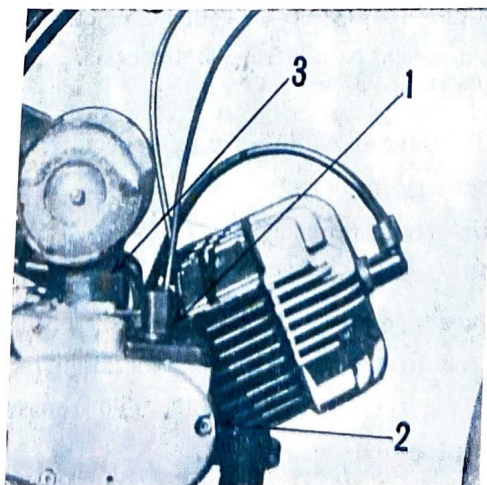
	Y F 1	Y J 2	VM16SC
Main jet	#95	#100	#80
Air jet	0.5		
Jet needle	15F	G1-2stage	3D1-3
Needle jet	E-0	"	E-0
Cut away (throttle valve)	#1.3	#1.5	#1.5
Pilot jet	#15	#17.5	17.5
Starter jet	#30	"	#15
Air screw	1½ ± ¼	"	1½

B AIR CLEANER

The YF1 (YJ2) air cleaner has been installed on the outside of the engine to increase its filtering capacity.

CATION: The carburetor must be always kept air-tight. Check the following points with a special care:

- 1) Carburetor cap;
- 2) Carburetor fitting bolt cap;
- 3) Air cleaner joint rubber;
- 4) Drain cleaner;
- 5) Other rubber caps.



CHAPTER 4 FRAME

4-1 FRAME

As on the YG1, the frame is of a backbone type and made of pressed steel plate. A series of Yamaha frames on the YG1 YA5 and YD3, strong yet lightweight, are fruits of years of experience and researches of Yamaha's technical staff.

To the head of the frame is welded the head pipe whose top and bottom are fitted with ball races and steel balls.

The battery, main switch, silicone rectifier and other electrical parts are compacted under the left sidecover and, on the other hand, the ignition coil and service tools under the right sidecover in the central section of the frame that vibrates least.

The engine mounting pipe is newly welded to the central section of the frame for more fresh air to the air cleaner.

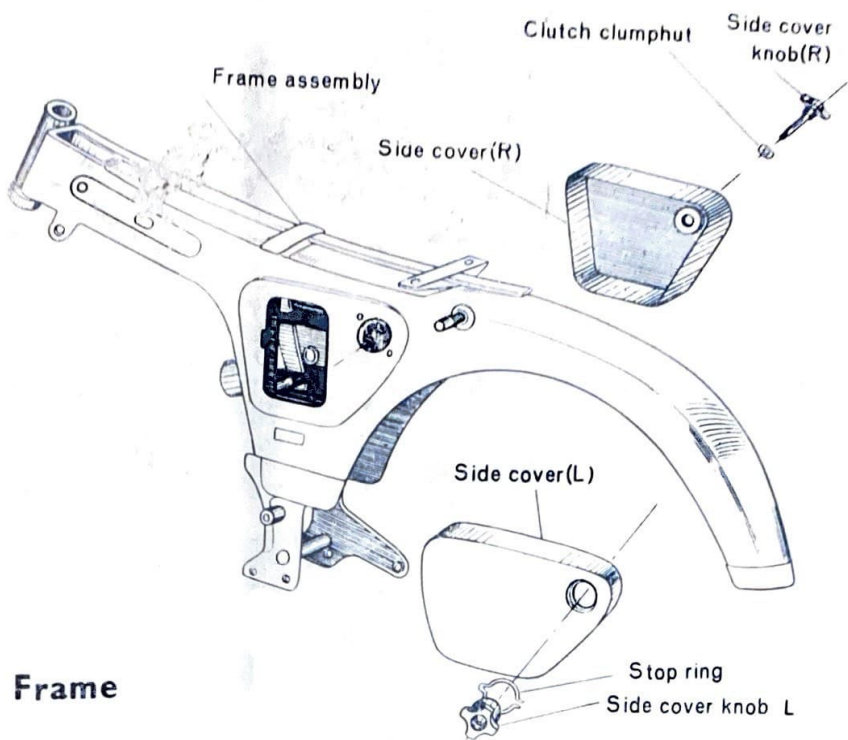
As on the YG1 the rear fender and the frame is built as a unit for more rigidity.

INSPECTING

- 1) Check every welded joint of the frame for crack.
Check every pipe and pressed part of the frame for crack and distortion.

NOTE: A motorcycle that has a record of collision or other major accident must be checked with a special care at regular intervals.

- 2) If the steering is ill-balanced while driving, check the frame (or the head pipe) for distortion or eccentricity.
If it is seriously distorted, replace it.
- 3) Check the ball races and steel balls especially on a long-used motorcycle with heavy steering. If one of the ball races or the steel balls is worn out or cracked, Never use the new together with the old. To remove the ball race, insert a stick into the head pipe and push it out.



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INSTALLING

- 1) When installing the ball races, clean carefully and apply new grease to them. Number of the steel balls are 22 for the top of the head pipe and 19 for the bottom.

CAUTION: These must be cleaned with a special care, because a particle of sand may cause damage to them.

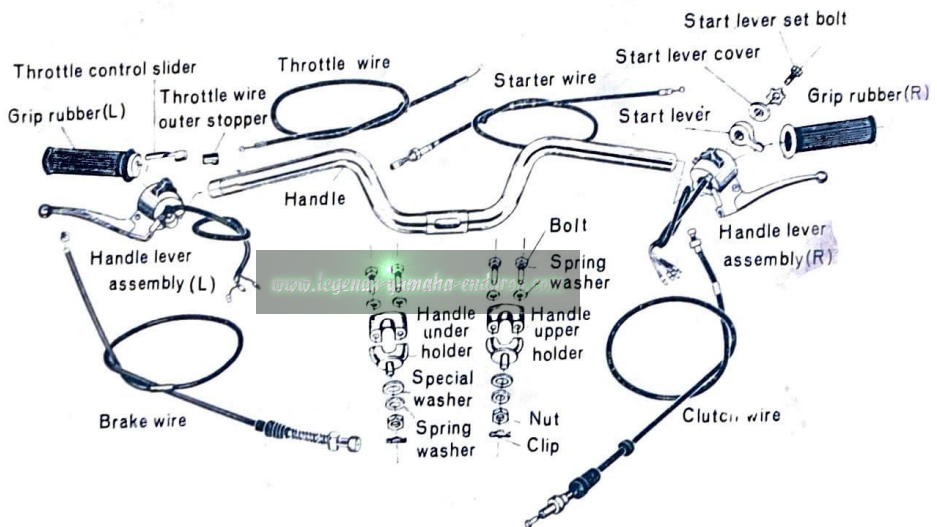
- 2) When installing the front fork to the frame, tighten fully the steering handle fitting nut and then loosen it by 1/6 turns.

4—2 STEERING HANDLE AND CABLES

The YF1 (YJ2) steering handle is made of a pipe. The clutch lever is on the left handlebar; on the other hand, the throttle grip and the front brake are on the right handlebar. All the wires except the throttle cable can be greased up. The brake cable is of the same type as on the MF1 and is adjusted by means of the outer wire.

REMOVING

- a. To remove the handlebars together with the cable;
- 1) Disconnect the cables for clutch, throttle, front brake and starter;
 - 2) Remove the headlight rim and then the cable connector;
 - 3) Remove 4 bolts holding the handlebars.
- b. Removing the cables:
- 1) The front brake cable, clutch cable and starter cable can be easily removed;
 - 2) To remove the throttle wire, remove the clip end by loosening a countersunk screw, pull out the clip metal, and remove the throttle wire out stopper and then the throttle control slider.



Handle assembly

INSPECTING

- 1) If the insulator of each wire is worn out or defective, repair it with adhesive tape or replace it.
- 2) If the outer wire is bent or broken, affecting the action of the inner wire, replace it.
- 3) Be sure to check the throttle control slider.

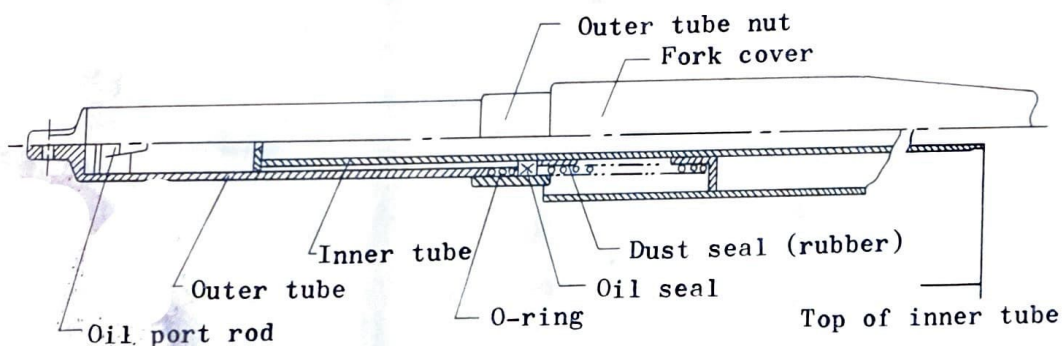
INSTALLING

After greasing up the throttle control slider and the wires, install them in the reverse order of removing.

4-3 FRONT FORK

1. New suspension system:

The adoption of the telescopic front fork allows more comfortable riding because it absorbs high frequency vibration and road shock. The new models offer not only attractive design, but also improved maneuverability and stability. The fork combines springs with an oil damper mechanism to provide excellent buffer action. It has dust seal on top of the oil seal to improve the durability and operation of the whole fork assembly. An oil port rod is provided in the bottom of the left outer tube on models J and F, so the left inner tube hold different amounts of oil.



DISASSEMBLY:

- Front fork disassembly should be done with the fork in a vertical or slightly tilted position, to prevent any oil leakage from the inner tube.
- Remove the handle crown.
- Loosen the underbracket and remove all parts installed under the inner tube.
- Remove the spring and place the axle in a vice. Loosen the outer tube and pull out the axle.
- Remove the inner tube from the outer tube.

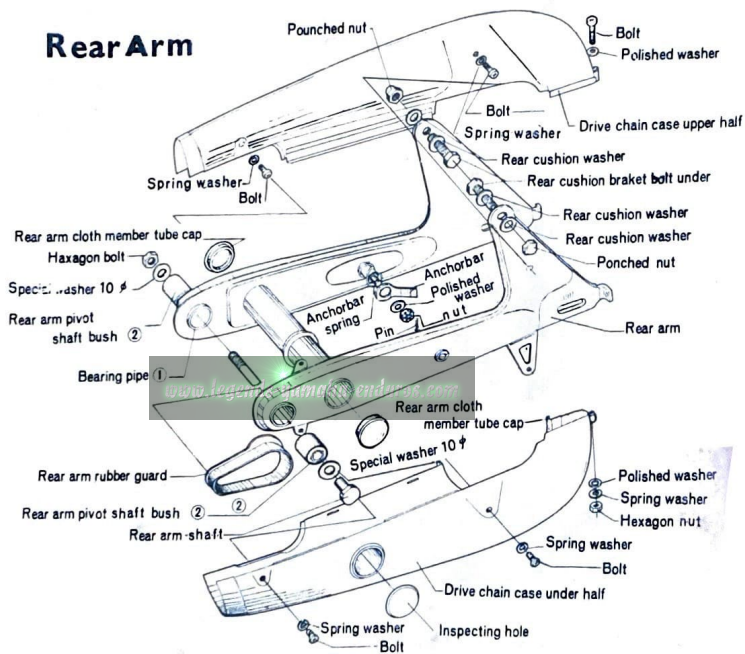
ASSEMBLY:

Perform assembly in the reverse order of the above, paying attention to the following directions:

- Wash and clean every part.
- When installing the oil seal, use care not to damage the oil seal lip, and attach the spring guide to the inner tube.
- Put 150-160cc of #30 oil into the right tube and 120-130cc in the left.
- Unlike YA6 and YG1, the o-ring has a rectangular cross section to fit the space available. When re-assembling, always install new o-rings if the fork showed oil leakage.

INSPECTION:

- a. Check the outer tube for any oil leakages. Insufficient oil will cause noise. A new front fork may show oil seepage under the outer tube. This is probably due to changes in temperature during horizontal storage and is not a sign of seal failure.
- b. Make sure the specified amount of oil is in the fork. The oil level should be about 300 mm. Below the top of the inner tube when the fork springs are extended to their full length. The oil level should be the same for right and left tubes.



4-4 REAR CUSHION UNIT

The rear cushion unit consists of the shock absorber and the vibration damper. Its appearance is the same as the YG1 but the cushion capacity is the same as the MF2. If harder cushion is demanded, use the YG1 rear cushion unit. To do this, change the lower rubber bush collar to the 12mm collar:

Model	Upper Collar, mm	Lower Collar, mm
YF1/YJ2	12	10
YG1	12	12
MF2	10	10

CONSTRUCTION

The rear cushion unit is bolted to the frame through the upper and lower rubber bushes.

The vibration caused by the unevenness of roads is damped first by the shock absorber and next by the cushion rubber.

The action of spring is enough to absorb the average shock. If the shock is too big, the cushion rubber acts as a subspring.

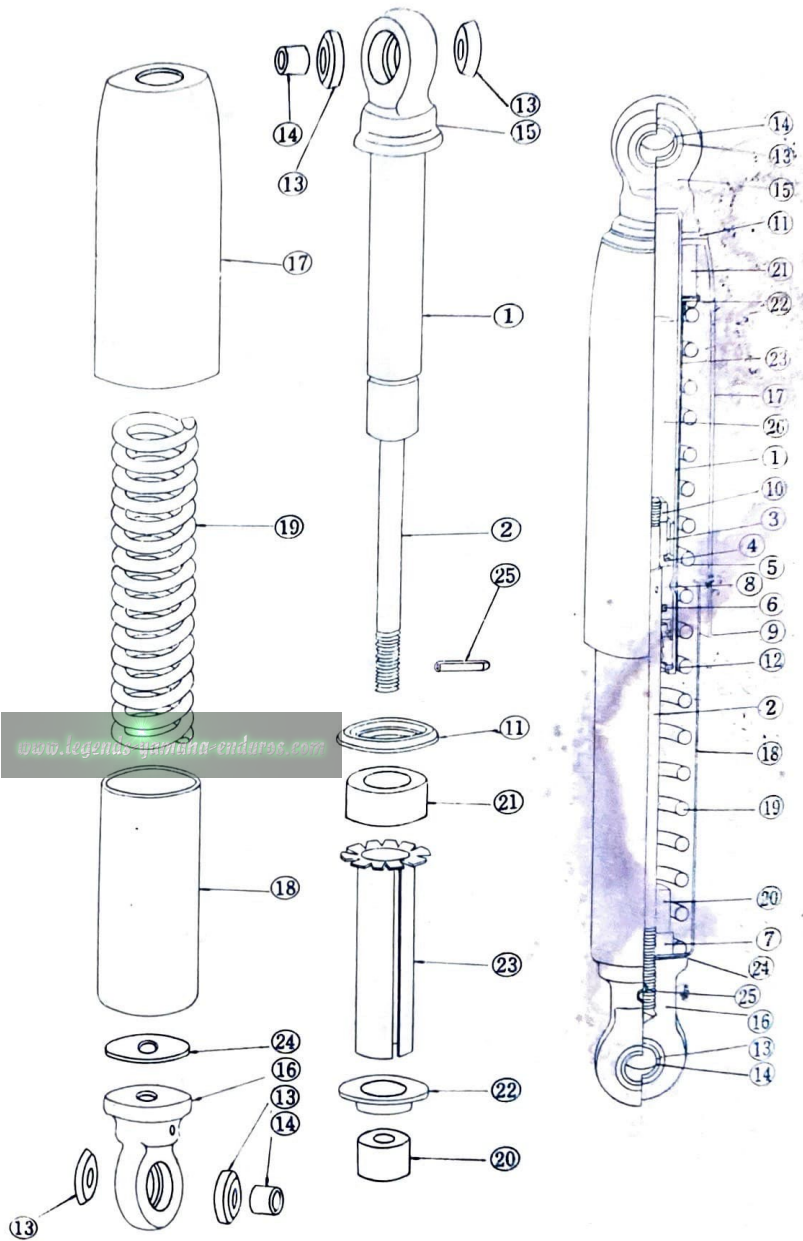
- b. The shock absorber consists of the cylinder, piston, valve mechanism, piston rod, oil seal and others,
- c. When the unit is forced to contract, the valve is opened to let oil flow from the front into the back of the piston.
- d. When the unit is forced to extend, the valve is closed to let the oil flow back to the front of the piston through an orifice made at the center of the piston rod. The orifice controls the flow of oil to prevent the bearing from being brought into contact with the piston. This also prevents the cushion noise and helps absorb big shocks when the unit is in the full extension.

DISASSEMBLING

The rear cushion unit must not be disassembled except when it is necessary to check the spring, cushion rubber or other built-in parts.

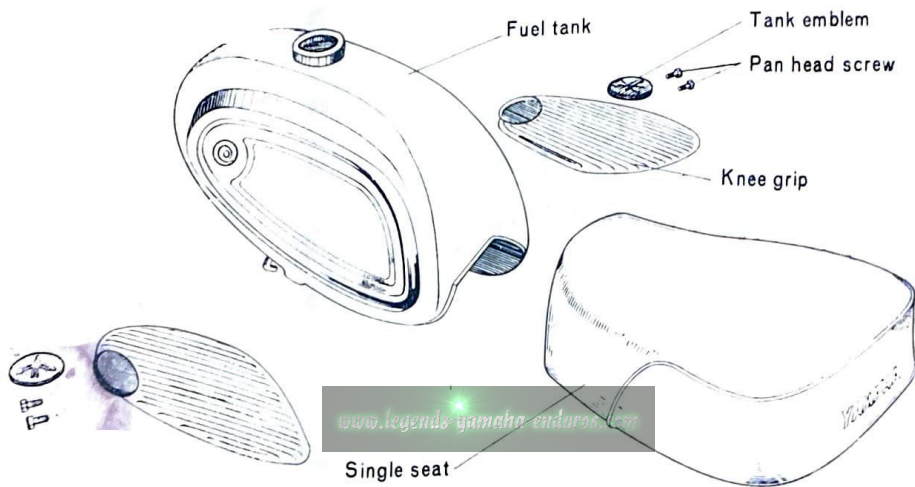
- a. Remove the roll pin.
- b. Holding the under-cover carefully, remove the bracket by turning it counterclockwise.
- c. Holding the piston rod, turn the under-cover counterclockwise. And the unit is disassembled.

No.	Part Name
1	CYLYNDER
2	PISTON ROD
3	PISTON
4	NON-RETURN VALVE
5	VALVE STOPPER
6	O-RING PACKING
7	NUT
8	BEARING
9	OIL SEAL
10	NUT
11	WASHER
12	WASHER
13	RUBBER BUSH
14	RUBBER BUSH COLLAR
15	UPPER BRACKET
16	UNDER BRACKET
17	UPPER COVER
18	UNDER COVER
18	SPRING
20	CUSHION
21	RUBBER SPACER
22	SPRING GUIDE
23	SPRING GUIDE
24	SHEET PACKING
25	ROLL PIN
26	OIL



4-5 FUEL TANK AND SEAT

The fuel tank is mounted on the frame, its front being supported with a bracket welded to the frame and the rear being secured under the seat. The front of the seat is also supported with a bracket welded to the frame and the rear is fastened to the frame with 2 bolts.



INSPECTING

- 1) If the fuel tank, fitting grommet is defective, replace it.
- 2) If fuel is leaking from the tank, repair it by soldering or replace it.
- 3) If the tank cap packing is defective, replace it.

4-6 FOOT RESTS, CENTER STAND, SIDE STAND AND BRAKE PEDAL

Since the YF1, YJ2 foot rests, center stand, side stand and brake pedal are different from the YG1 in the way of fitting, these are not interchangeable.

DISASSEMBLING

- 1) To remove the side stand, remove the locknut, fitting bolt and spring from the back side.
- 2) To remove the center stand, remove the main stand spring and then the main stand bolt.
- 3) To remove the brake pedal, remove the E-type snap ring and washer.

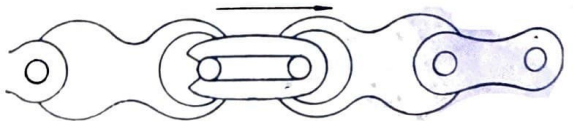
When assembling, clean and grease up then carefully (especially their moving parts)

4-7 DRIVE CHAIN

The drive chain transmits the engine power from the rear wheel driving sprocket to the sprocket wheel, which, bolted directly to the rear drum, rotates the rear wheel. The chain case prevents dust from entering this space ranging from the rear wheel driving sprocket to wheel.

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Direction in which the chain moves



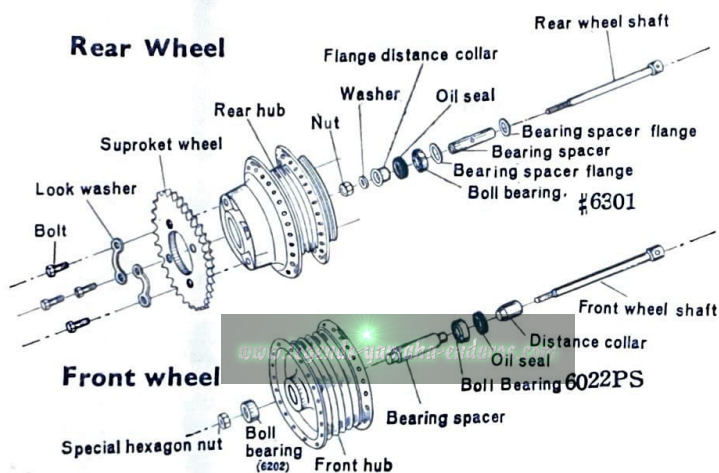
INSPECTING AND ADJUSTING

- a. The chain is composed of 98 links (DK420). If the chain is too much extended it is adjusted by means of the chain adjuster, remove one link from it. If the removal of link is needed again, replace the chain. Never attempt to remove two links to adjust. When replacing the chain, the joint clip must be used as shown above.
- b. Check the sprocket for wear.
- c. Check the ball bearing (6004D) for wear.
- d. Check the oil seal lip (SD26-42-8) for wear.

4-8 FRONT AND REAR WHEELS

Front and rear tires	2.25-17-4PR
Front and rear rims	Square rim of seam-welded steel plate
Front spokes	#12, straight
Rear spokes	#10×#11, single, 36 spokes in sets of 4

NOTE: To retighten the spokes, use a nipple spanner. All the spokes must have the same tension. The front drum on YF1 (YJ2) is interchangeable with that on YG1. Other parts of the front and rear wheels are not interchangeable.



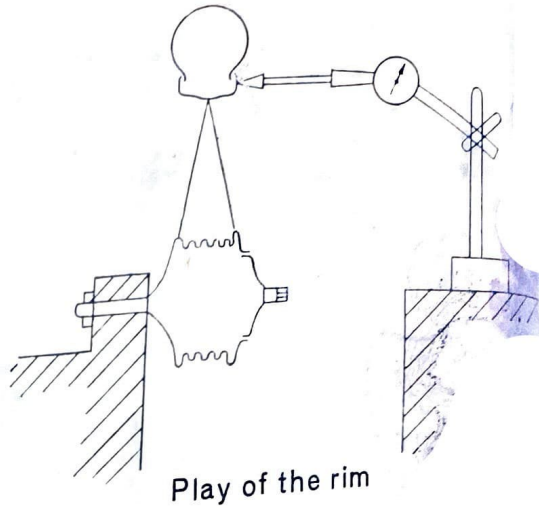
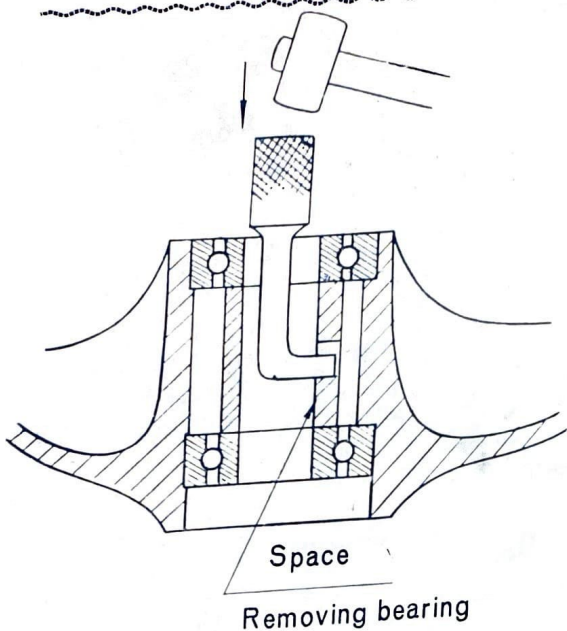
REMOVING AND INSPECTING

A FRONT WHEEL

- To remove the ball bearings (6202 and 6202RS), use the spacer removing tool as shown right.
- Check the swing of the rim allowable swing: 3mm.
- Check the tire pattern and the meter unit helical gear for wear.
- Check the tire for wear, the front axle for bent, and the spokes for looseness.
- Check the bearings (6206 and 6202RS) and the oil seals (SD-20-35-7), (OS52-5-42-7 and SD7-14-4) for wear.

B REAR WHEEL

- Remove and check as described above.
The bearings are 6301 and the oil seal is DD20-37-8.



C TIRE TUBES

- When replacing the tire tube, be sure to use the correct size of tube.
- The correct tire pressure is given below:

Tire	Tire Pressure, lb/in. sq.
Front	23 (1.6kg/cm ²)
Rear	26 to 34 (1.8 to 2.4kg/cm ²)

NOTE: The rear tyre pressure varies depending on the weight of load.

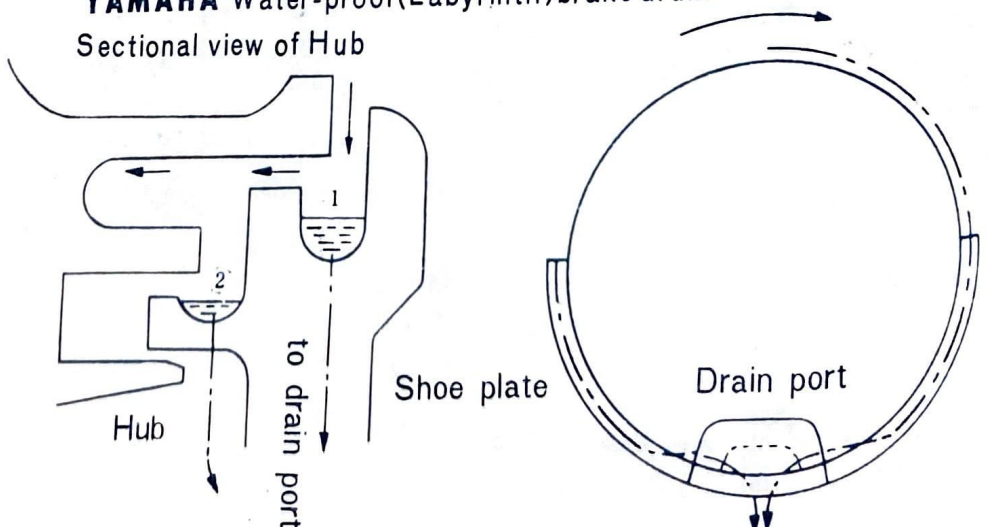
D BRAKES

Front brake	Internal-expanding, wire
Rear brake	Internal-expanding, rod

The YF1 (YJ1) is equipped with the 110φ water-proof brake drums that assures of having effectively working brakes even rainy days. As shown below, double drain grooves are made in the shoe plate and the drum to prevent water from entering the drum. The reliability of the brakes has been proven on all the latest Yamaha motorcycles.

YAMAHA Water-proof(Labyrinth)brake drum

Sectional view of Hub



CHAPTER 5 ELECTRICAL SYSTEM

5-1 GENERAL DESCRIPTION

The Yamaha YF1 (YJ2) features:

- 1) The new flywheel magneto proven on the MF (J) 2-K and YG1;
- 2) The new AC ignition system allowing to change the location of the ignition coil from the flywheel magneto to the right case under the seat for perfect insulation and easier inspection;
- 3) The new silicone rectifier and the charge subswitch that is used to change the amount of charging current depending on the driving conditions;
- 4) The left case under the seat containing the main switch, silicone rectifier, battery fuse, subswitch, flasher relay for easier inspection.

The operating voltage of the YJ2 (YF1) electrical system is 6v.

CAUTION:

- 1) Since the lamps are connected in parallel with the lighting coil, any burnt-out bulb shortens the life of the other lamps due to the excessive voltage. Replace or repair any defective bulb or switch immediately after checking.
- 2) The bulbs must have the voltage and wattage specified in the sub-section 4-2 "PARTS LIST" If either of them is improper, the bulb may be burnt out or does not proper light.
- 3) When starting the engine, be sure to check to see the battery is in the good connection. If the engine is started with the battery disconnected, this causes damage to the other electrical parts shortens their life.
- 4) Check to replenish the electrolyte once a month in addition to the periodical inspection (more often than on the motorcycle with starter-dynamo).

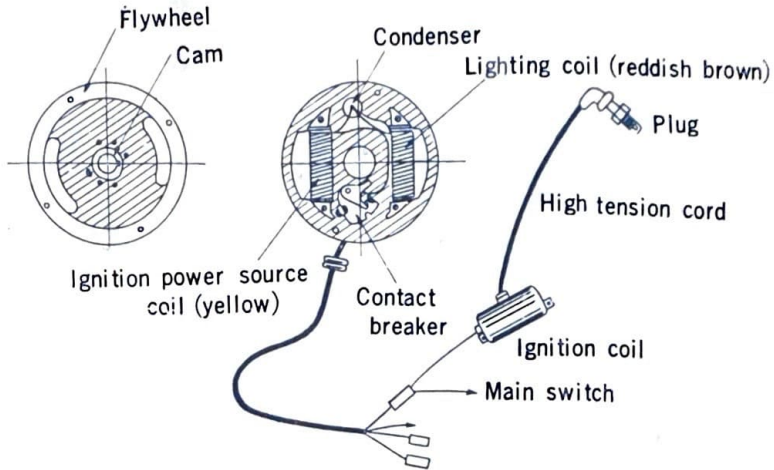
The correct specific gravity of the electrolyte at full charge is 1.25 to 1.27 at 20 C.

5-2 PARTS LIST

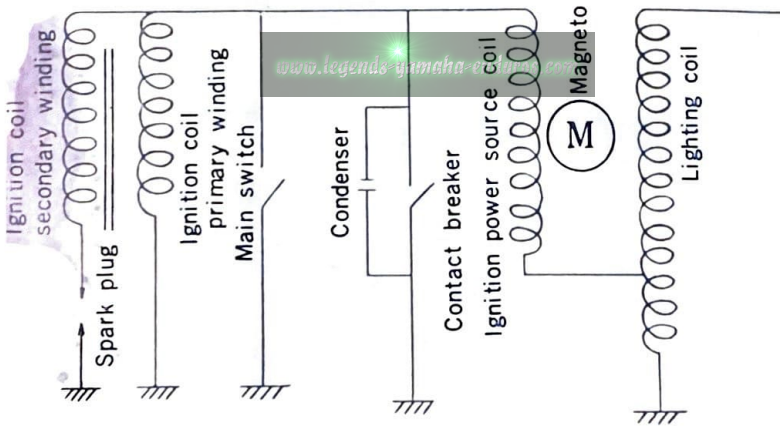
Where Attached	Parts Name	Manufacturer	Model	Standard
Engine	Flywheel magneto	Mitsubishi	FAZ-IDL	SPark: more than 7mm at 500rpm Battery charge (during day driving): 0.4A at 2,500rpm (battery 6.5V); less than 4A at 8,000rpm (battery 8.4V) Lighting performance lamp load: 68V, 15+3+15W): more than 5.8V at 2,500 rpm: less than 9V at 8,000rpm
	Spark plug	NGK	B-7HZ	
	Neutral switch	Asahi	YNS	
Frame	Battery	Furukawa Yuasa	BST2-6 B31-6	6V, 4AH 6V, 4AH 10A × 3 6V Used to change the charging current
	Main switch	Asahi	YBM-8	
	Silicone rectifier	Yuasa	SZ-3A	
	Fuse holder	Taiko		
	Horn	Kinsen	SM-3	
	Subswitch	Asahi	YL-3	
	Ignition coil	Mitsubishi	HM-1/12D	
	Flasher relay	Toshin	6TR-4	
Front	Head lamp	Koito	S9985	6V, 15W 6V, 8W × 2
	Speedmeter	Nihon		
	Front flasher lamp	Seiki	FLF-YF1	
	Handle switch, R	Kinsen	YG8 (R)	
	Handle switch, L	Asahi	YG8 (L)	
Rear	Tail lamp	Kinsen	TL-YF1	6V, 3W/10W 6V, 8W × 2
	Rear flasher lamp	Kinsen	FLR-YF1	
Swinging arm	stop switch	Asahi	YS10	

5-3 IGNITION AND CHARGING SYSTEM

1. Structure and function of the flywheel magneto: (Fig. 5-1)



IGNITION SYSTEM DIAGRAM



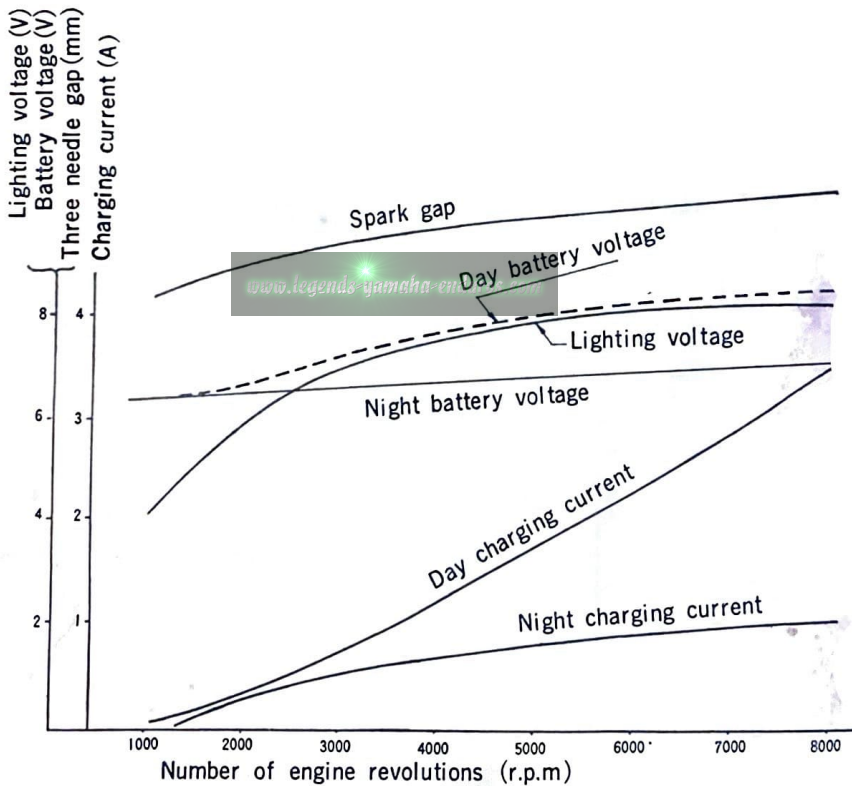
5-1

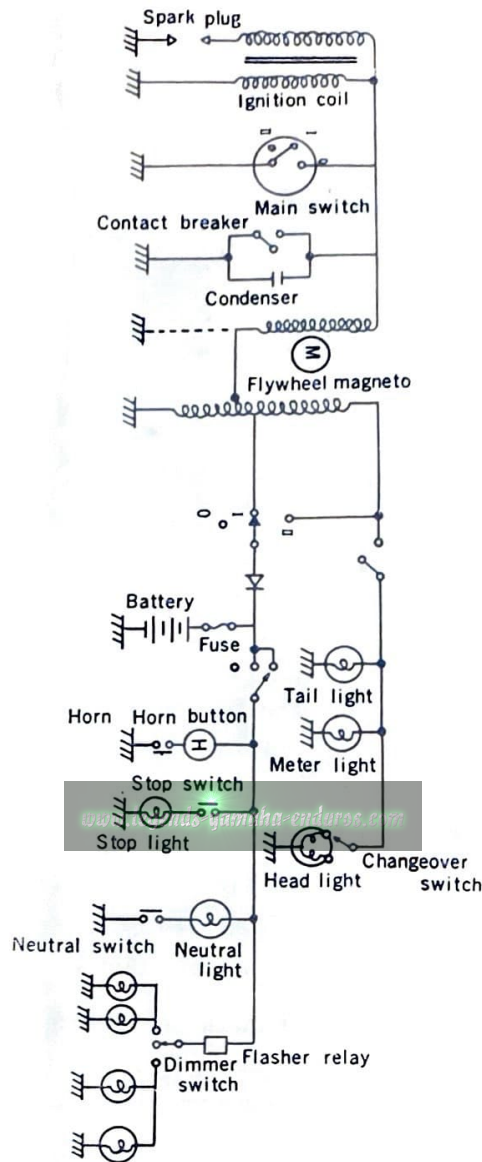
The flywheel magneto consists of an ignition power source coil supplying current to the ignition coil which produces voltage necessary to jump the sparkplug gap, a lighting power source coil which produces the necessary voltage to light bulbs and charge the battery, and a cam and contact breaker which interrupt the primary current flowing through the ignition coil.

When the flywheel is rotating, the magnetic flux crossing the ignition power source coil changes, and current flows through the coil accordingly.

When this current is interrupted at the contact breaker by the flywheel boss cam, a high frequency, oscillating voltage flows through a circuit composed of the ignition power source coil and the condenser, hooked into the contact breaker in parallel. Voltage then flows through the primary ignition coil winding, is multiplied by the turn ratio on the secondary coil side, follows the sparkplug lead, and jumps the plug gap. Spark intensity varies depending on the frequency and duration of interruption, but generally the discharge voltage increases as engine speed rises.

Characteristic curves of practical load rotation of the flywheel





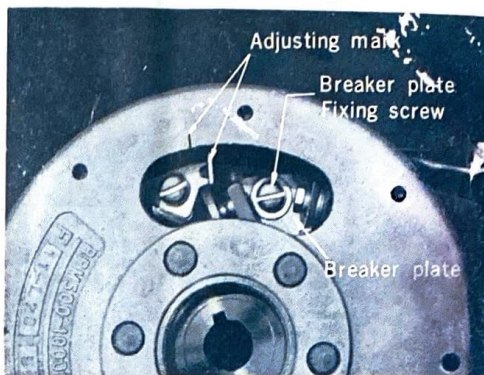
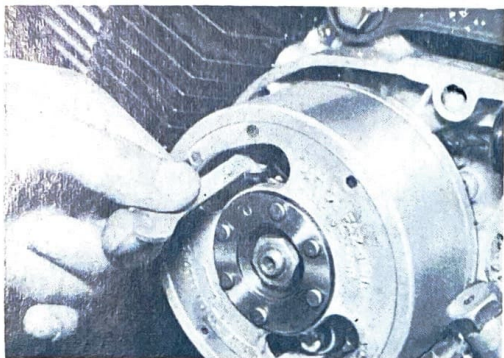
2. Lighting and Charging System:

(Separate sheet, Page A, to be inserted.)

Alternate current flows from the flywheel magneto through the lighting coil each time the magnetic flux crossing the lighting coil is changed by the rotating flywheel. This alternate current lights the taillight, instrument light, and headlight, but is converted to direct current by the rectifier for charging the battery.

Since the lighting coil uses no voltage regulator, lamp voltage rises with RPM, but as RPM increase, the voltage is stabilized by the alternating current resistance of the coil.

To correctly perform the following tests, you should be familiar with standard testing procedures



3. Checking ignition timing:

If the contact breaker point gap in the flywheel magneto is incorrect, the ignition timing will be wrong, affecting not only the performance of the motorcycle, but also shortening the life of the plug and promoting carbon deposition. Regulate the ignition timing by adjusting the point gap.

- a. Set the points so they open when the piston is 0.071 ± 0.006 in. (2.0 ± 0.51 mm) before top dead center (point gap of $0.012 - 0.014$ in $0.03 - 0.35$ mm at top dead center) using a dial indicator and point checker.
- b. The flywheel magneto has a timing mark on its edge, so to check the timing, simply take off the crankcase cover cap (L) and, with the engine running, use a strobe light to make sure the magneto mark lines up with its matching mark on the crankcase.
- c. Smooth away any roughness on the point surfaces with sandpaper, or your feeler gauge measurements will be inaccurate.

5-4 IGNITION COIL

The ignition coil is a kind of transformer: applying the high-frequency oscillating voltage in the ignition power-source coil to the primary coil, the ignition coil changes it to high voltage in proportion to the turn ratio in the secondary coil due to the mutual inductance.

INSPECTING

Method 1 : Connect the high-tension cord with high-tension terminal (+) of the service tester with the magneto left in place; ground another terminal (-); and kick the crank. If the spark is more than 6mm three-pin gap, the ignition coil is good.

Method 2 : To check the ignition coil as a unit apart from the magneto and the engine, do in the same method as the 12v battery ignition. Use the Yamaha service tester and 12v battery.

CAUTION : The primary wire is grounded to the frame by means of the ignition coil fitting bolt. When installing the coil, be sure to clean the bolt.

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5-5 CONDENSER (ATTACHED TO THE MAGNETO)

The condenser absorbs any arc (spark) when the primary current is interrupted, preventing the ignition points from being burnt out.

INSPECTING

The lead wires of the condenser are connected by soldering. When inspecting the condenser, disconnect them at the soldered joints and measure the following:

Item	Tester	Instructions
Insulation	Yamaha service tester	More than $3M\Omega$
Capacity	"	$0.25F \pm 10\%$ or less

5-6 CONTACT BREAKER

When the contact breaker momentarily makes and breaks the electric current in the ignition power-source coil, there appears a high-frequency oscillating voltage, which is applied to the ignition coil to induce high voltage in the secondary coil.

ADJUSTING

To adjust the ignition timing, adjust the point gap. To advance the ignition, widen the point gap. The correct point spring pressure is 650 to 750 gr.

How to adjust the point gap: Adjust it with a dial gauge so that it opens at 2.0 mm (23°) before the top dead center. The view port is located in the flywheel. The point gap should be kept between the range 0.2 to 0.4mm. To check it, use the point checker.

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AN EASY METHOD TO CHECK THE IGNITION TIMING

Check, by using a timing light, whether a mark on the magneto base meets a mark on the flywheel while the engine is in action.

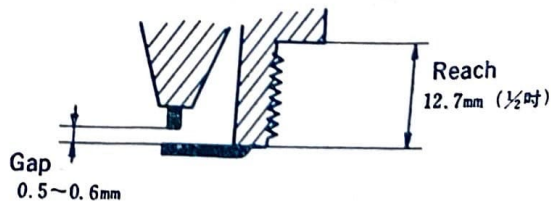
5-7 SPARK PLUG

1. Sparkplug

The specified plug is NGK B-7HZ. For low speed or city riding, a hotter plug such as B-6H will maintain a cleaner combustion chamber. Advise your customers to clean the plug and check its gap at least once a month or after every 500 miles.

Remove carbon deposited at the electrodes, and set the gap to 0.025in. (0.5—0.6mm)

When replacing the plug, be sure to use one with the correct reach (1/2").



2. Selenium Rectifier:

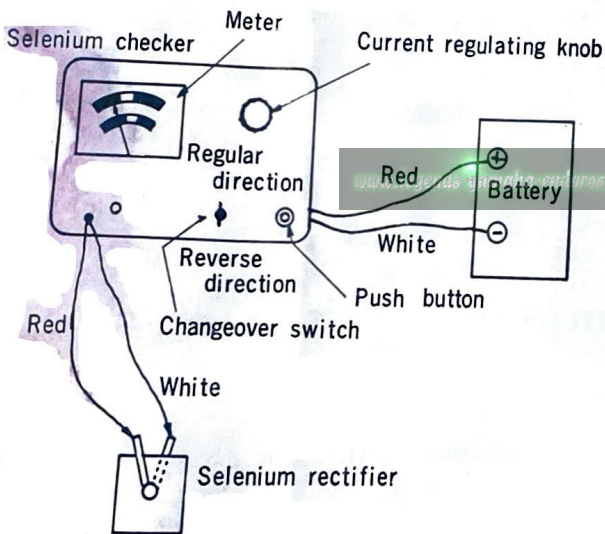
a. Function:

The selenium rectifier is mounted directly behind the ignition coil. It rectifies the alternating current generated in the ignition coil into direct current for charging the battery.

b. Inspection:

Check the electricity flowing from the magneto the battery: Is it uninterrupted, without "leakage," and in the right amount? Testing the selenium rectifier on the frame:

You can run a rectifier voltage check the same way you check a voltage regulator: Hook your tester between the rectifier's red lead and ground. A voltage reading (DC) means the rectifier is O.K. but if you get no reading, the rectifier is bad. To confirm your test use the white lead instead of the red: you should get an A.C. voltage reading with a bad rectifier.



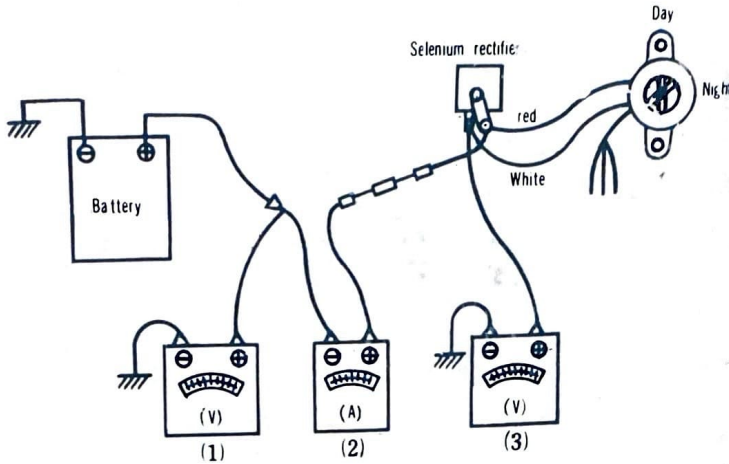
3. Inspection of the Charging System:

To measure the current going to the battery, disconnect the red lead from the rectifier, connect an ammeter (with a full scale of 3A—5A) between the rectifier and battery and start the engine.

Standard Charging Amount:

		Engine revolutions		
		3,000 rpm	5,000 rpm	
Day	Charging current (A)	0.6 (7.1)	1.7 (8.0)	Parenthesized figures denote the battery.
	Charging current (A)	0.4 (6.8)	0.6 (7.5)	
Night	Ignition voltage (V)	7.0~7.3 (6.8)	7.8~8.1 (7.5)	Voltage at the time of measurement.

- (1).....D. C. Voltmeter—Indicates the battery voltage.
- (2).....D. C. Ammeter—Measures day and night charging current.
- (3).....A. C. Voltage—Indicates the ignition voltage (night)



NOTE:

- 1) When measuring the day charging current, be sure the neutral light, and instrument light are off.
- 2) When measuring the night charging current, make sure the head, tail, and instrument light are on.

If either of the flasher lamps is burnt out, the pilot lamp tells it by lighting twice as long as under the normal conditions as shown right.

FLASHER LAMP SPEC. : 6V, 9W; 80+12 times/min.

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5-8 HORN

The horn has the same principle as a DC buzzer. To adjust, turn properly the adjusting screw at the back.

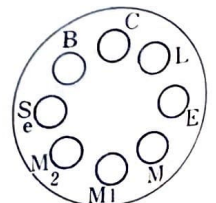
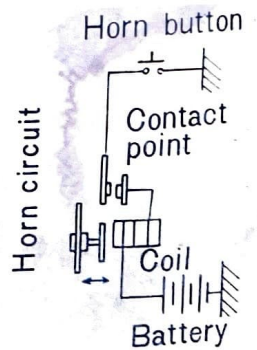
5-9 SWITCHES

1. MAIN SWITCH

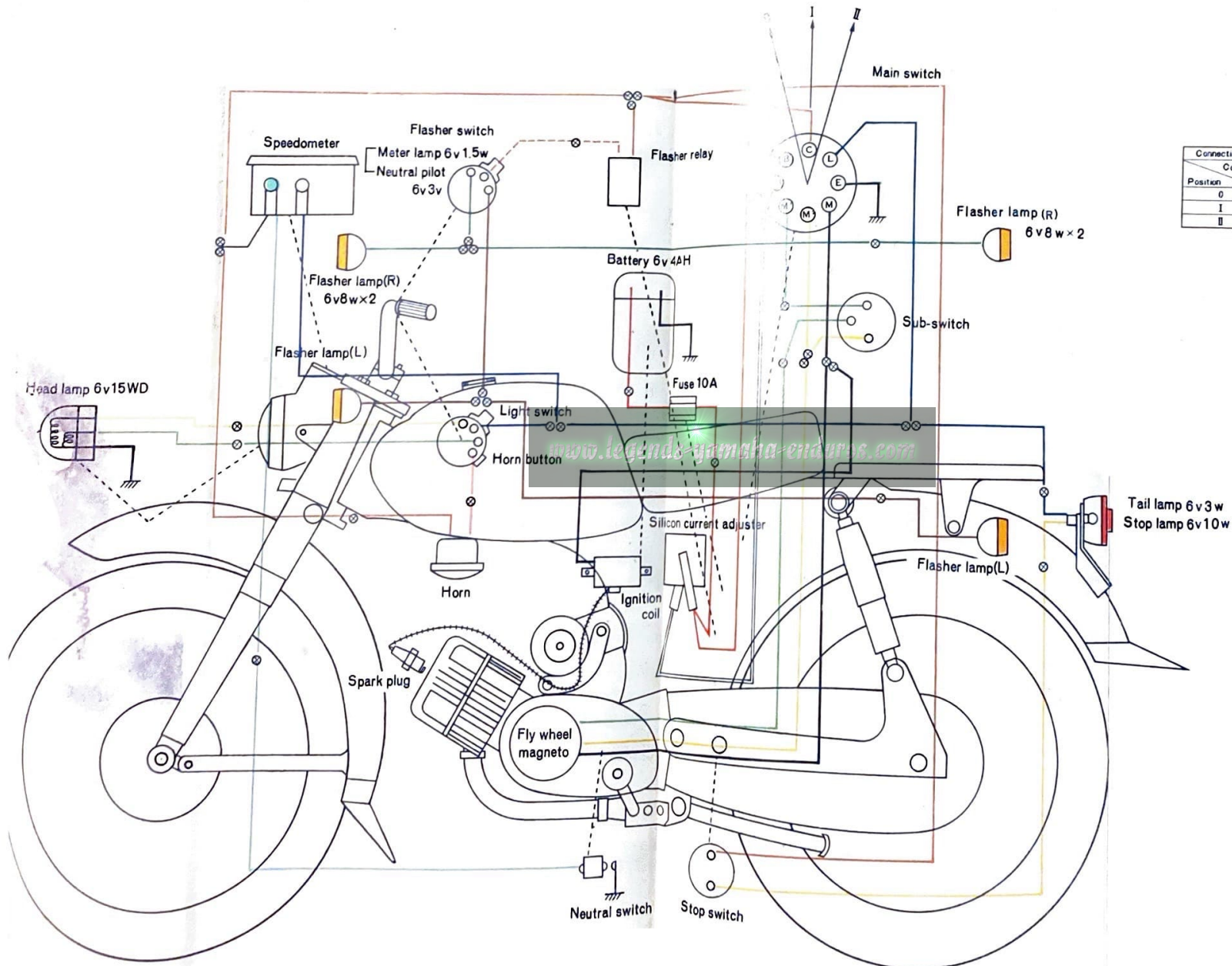
The main switch opens or closes the ignition, battery and lamp circuits as shown below:

KEY POSITION	CONNECTION OF TERMINALS					KEY
	M-E	B-C	M ₁ -Se	M ₂ -Se	M ₃ -L	
0 (stopped)	○	×	×	×	×	removable
1 (day driving)	×	○	○	×	×	not removable
11 (night driving)	×	○	×	○	○	not removable

M terminal-black wire, E terminal-black ground wire,
 C terminal-brown wire, M terminal-green wire, B terminal-red wire
 Se terminal-white wire, L terminal-blue wire, M₂ terminal-yellow wire



YAMAHA MOPED YF1 (YJ-2) CIRCUIT DIAGRAM



Connection of main switch

Connection	M-E	M ₁ -S ₁	M ₁ -S ₂	M ₂ -L	B-C
Colour	Black	Green	White	Yellow	Red
Position	Earth	White	White	Blue	Brown
0	○	×	×	×	×
I	×	○	×	×	×
II	×	×	○	○	○

Chart of wire colours

Stop switch	Black	●
Magneto Harging	Green	●
Magneto lighting	Yellow	●
Battry (+)	Red	●
Earth	Black	●
Silicon (-)	White	○
Stop lamp	Yellow	●
Neutral lamp	Sky-blue	●
Lamp	Blue	●
Flasher lamp (R)	Dark green	●
Flasher lamp (L)	Dark Brown	●
Common	Brown	●
Head lamp, M.	Yellow	●
Head lamp, S	Green	●
Horn	Pink	●
Flasher relay	Light brown	●

2. HANDLEBAR SWITCH, RIGHT

The right handlebar switch is the flasher lamp (direction signal) switch.

3. HANDLEBAR SWITCH, LEFT

The headlight beam switch, horn button and starter lever are on the left handlebar.

4. NEUTRAL SWITCH

When the shifter cam is put into NEUTRAL, the neutral switch turns on the neutral pilot lamp in the meter.

5. STOP SWITCH

When the brake pedal is stepped on, its stroke pulling the chain of the stop switch installed to the rear arm, the stop lamp is turned on.

6. BATTERY

The battery furnishes current to the lighting and signal systems. When riding, the current generated by the flywheel magneto is charged through the selenium rectifier.

a. First charging

Prepare 200cc of dilute sulphuric acid (specific gravity: 1.260 at 20°C).

Remove the three battery plugs and fill each cell up to the maximum level.

For the best results, charge every new battery with about 0.4A current for 10 hours. After charging, gently shake the battery to remove the foam in it.

Again add dilute sulphuric acid or distilled water up to the maximum level to get a specific gravity of 1.26~1.28. Tighten the plugs firmly, clean the terminals and, after wiring, put grease on them.

b. Periodic inspection

Check the solution level at least once a month. If the solution is under the minimum level, add distilled water to the low cell until the fluid reaches maximum level.

c. If the cycle will not be used for a long time,

1. Remove the battery and recharge it;
2. Grease the terminals;
3. Store the battery in cool, dark place;
4. Charge it at least once a month.

Item	Description	Check interval
Electrolyte First charging Low fluid Recharging	Specific gravity: 1.26~1.28 Quantity: 170cc With 0.4A current for more than 10 hrs. Add distilled water up to the maximum level. with 0.4A current for 13 hrs.	Every month when discharged.

CHAPTER 6 INSPECTION AND MAINTENANCE

6-1 PURPOSE

1. The periodic inspection system has been built up for Yamaha owners, because it prevents trouble from developing and keeps their cycles in top condition.
2. The inspection system has been drawn up for Yamaha dealers, because good service will promote sales.

6-2 INTERVALS

No.	ITEM	1st insp. 200 miles	2nd insp. 2000 miles	3rd insp. 4000 miles	Thereafter every 3000miles
1	Adjust front and rear brakes	x	x	x	x
2	Adjust clutch		x	x	x
3	Change gear oil	x	x	x	x
4	Grease		x	x	x
5	Check battery fluid level	x	x	x	x
6	Clean sparkplug	x	x	x	x
7	Adjust ignition timing		x	x	x
8	Adjust carburetor		x	x	x
9	Overhaul carburetor			x	x
10	Clean air cleaner		x	x	x
11	Clean cylinder head and piston		x	x	x
12	Clean muffler		x	x	x
13	Tighten bolts and nuts	x	x	x	x
14	Adjust drive chain	x	x	x	x
15	Check Autolube pump stroke	x	x	x	x

6-3 INSPECTING MAIN PARTS

1. Carburetor — Adjust and clean every 2,000 miles of riding and whenever any trouble occurs. To disassemble, remove the chamber cover, fuel line, throttle cable and starter cable. After removing the carburetor, take it down to:
 1. Float Chamber;
 2. Starter Section;
 3. Mixing Body
 4. Throttle Valve.

Wash them in gasoline and clean out the by-pass with compressed air. To adjust the idle after reassembling and mounting the carburetor, back the air screw off $1\frac{1}{4}$ turns; then start the engine and set the throttle screw where the engine runs smoothly (idle RPM=1,200—1,500).

2. AIR CLEANER —

The efficiency of the air cleaner is important to the life of the engine, and a clogged air cleaner reduces engine performance. Clean it every 1,000 miles in addition to the periodic inspection. Remove the cleaner body, shake the dust off, and then clean it from the inside with compressed air.

3. REMOVING CARBON —

Carbon accumulation impairs engine performance and causes most of the troubles of a long used machine.

- a. Cylinder headClean with wire brush;
- b. Piston headClean with wire brush;
- c. Cylinder exhaust portWash it in solvent and remove carbon with a brush or screwdriver.
- d. Exhaust pipeRemove the pipe and pull a chain through it to knock off crust and scale.
- e. Muffler SilencerRemove the silencer, clean it with a wire brush; then clean out the holes in its end with a piece of wire.

If an abnormal amount of carbon has accumulated:

- a. Fuel ratio is incorrect or quality of oil is bad;
- b. Carburetor setting is incorrect (starter jet plunger not returning to normal position; check starter jet cable.)
- c. Ignition timing is too late or sparkplug is faulty.

4. SPARKPLUG —

The sparkplug affects engine performance much like accumulated carbon. If its electrode is dirty or faulty, it will spark irregularly or not at all. Check at regular intervals:

Is the porcelain around the center electrode a light tan color?

Is the gap correct?

- a. If the sparkplug is fouling, the trouble source may be:
 - 1) Incorrect fuel ratio (perhaps starter jet plunger not returning to normal position;) check starter jet cable.
 - 2) Incorrect sparkplug gap
 - 3) Ignition timing is late, or points are dirty or faulty.

If the B7H sparkplug still fouls after the above adjustments, check the owners riding habits and try the hotter B6-H plug for mild operating conditions.

b. If the sparkplug porcelain has been burned white, the trouble may be:

- 1) Incorrect fuel (too lean).
- 2) Ignition timing too far advanced

If after cheking 1. and 2. the center porcelain still burns white or the electrodes partially burn away, air is entering from parts other than the carburetor.

5. IGNITION TIMING —

Incorrect ignition timing not only impairs performance, but shortens the life of the sparkplug and promotes carbon accumulation.

6. BATTERY

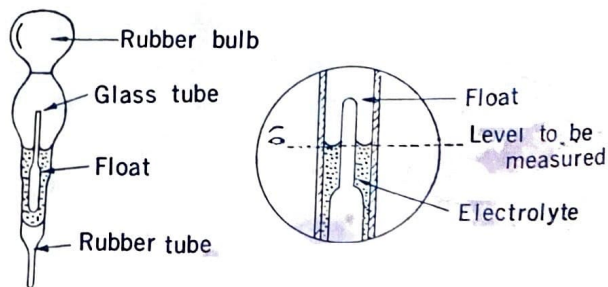
Check the battery at least once a month, because it is the power source for your machine's daytime lighting system (stoplight and neutral light; or anyl ights used when then the engine is not running).

Fluid Check:

- 1) The level of battery solution should always be between the maximum and minimum lines;
- 2) The specific gravity should be 1.26—1.28

When addinf fluid, don't use dilute sulphuric acid; use distilled water.

When measuring the specific gravity, read the hydrometer correctly as illustrated.

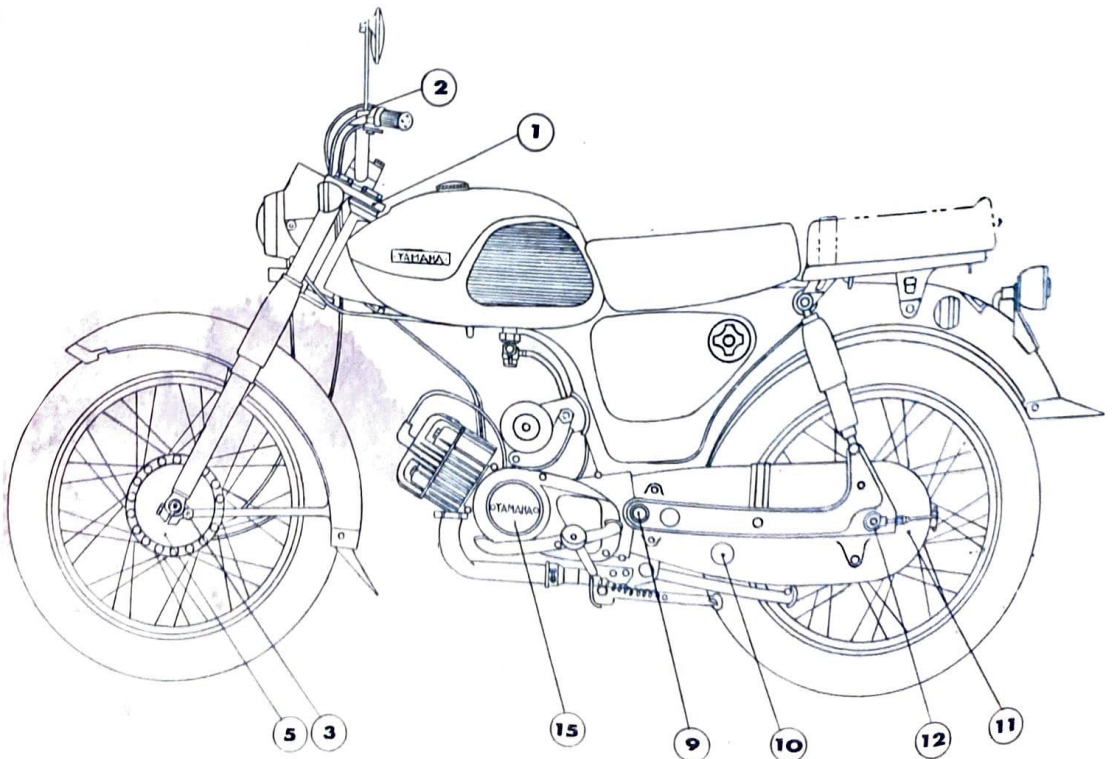
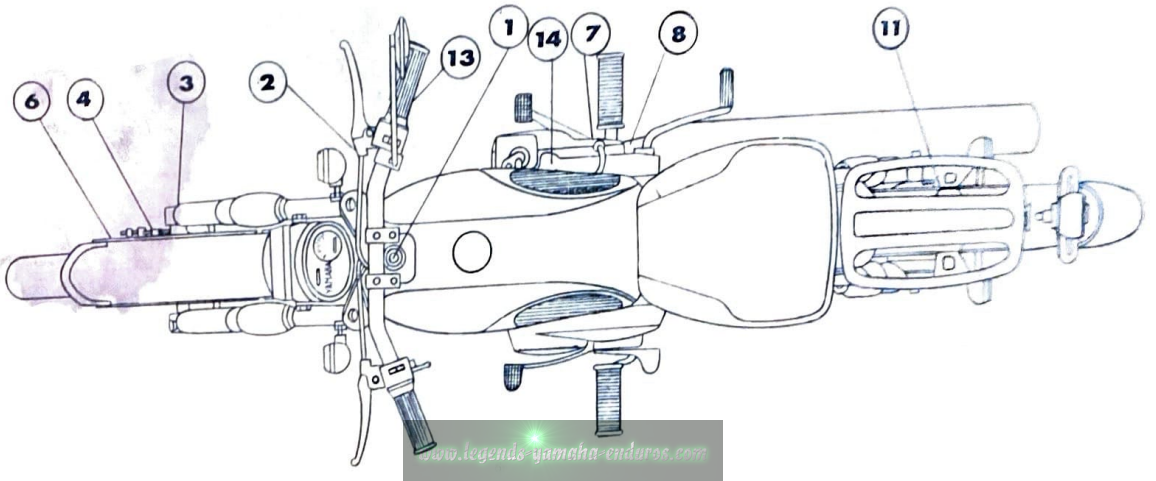


LUBRICATION

The lubricating oil is used in order to reduce friction in the engine and other moving parts and to cool the parts heated by the friction.

The poor lubrication shortens their life and, of course, the machine cannot function effectively. To lubricate the Yamaha YF1 (YJ2) use mobil-oil and grease.

Parts to lubricate and lubrication intervals:



6—4 LUBRICATION

YF1 (YJ2) GREASING AND OILING CHART

No.*	PARTS LUBRICATED	DISTANCE FOR 1st LUBR., Km	LUBRICATION INTERVAL, km	TYPE OF LUBRICANT
1	STEERING BALL RACES	WHEN DISASSEMBLED (mi) (mi)		CUP GREASE
2	BRAKE & CLUTCH WIRES	1,500 (1,000)	EVERY 3,000 ()	CUP GREASE MOTOR OIL
3	METER UNIT	6,000 (4,000)	EVERY 6,000 ()	CUP GREASE
4	FRONT BRAKE CAM	1,500 (1,000)	EVERY 3,000 ()	"
5	FRONT HUB BEARING	6,000 (4,000)	EVERY 6,000 ()	"
6	FRONT SHOE PLATE	6,000 (")	EVERY 6,000 ()	"
7	CLUTCH PUSH SCREW	1,500 (1,000)	EVERY 3,000 ()	"
8	BRAKE PEDAL	1,500 (")	EVERY 3,500 ()	"
9	REAR ARM SHAFT	1,500 (")	EVERY 3,000 ()	"
10	DRIVE CHAIN	500 (300)	EVERY 1,500 ()	MOTOR OIL
11	REAR BRAKE CAM	1,500 (1,000)	EVERY 3,000 ()	CUP GREASE
12	REAR HUB BEARING	6,000 (4,000)	EVERY 6,000 ()	"
13	ACCELERATOR GRIP	6,000 (")	EVERY 6,000 ()	"
14	GEAR OIL	5,000 (3,000)	EVERY 1,500 ()	YAMAHA GEAR OIL B
15	POINT HEEL	1,500 (1,000)	EVERY 9,000 ()	FEW DROPS OF MOTOR OIL

* The correct amount of Yamaha Gear Oil B is 400cc. (0.423 qt.)

CHAPTER 7 YAMAHA 50/60 TROUBLE SHOOTING

When a malfunction is found, its repair is nearly complete because the key to repair is exact location of trouble. This chapter covers symptoms, diagnosis and repair.

7-1 ENGINE WILL NOT START

No.	INSPECTION	TROUBLE SOURCE	REPAIR
1	Check that gasoline runs into the carburetor float (chamber)	If gasoline does not fill the carburetor, trouble may be: a. clogged gasoline; b. clogged gasoline cock; c. clogged or faulty float valve; d. plugged vent hole in fuel tank cap.	Remove parts and clean with compressed air.
2	Remove sparkplug, attach it to its cap, ground it and kick down the starter crank to see if the plug sparks.	If there is no spark, the trouble may be: a. faulty, dirty or wet spark plug; b. dirty or incorrect point gap; c. faulty condenser; d. disconnected or punctured high-tension (sparkplug) wire; e. shortcuted or disconnected ignition coil. f. faulty main switch; g. incorrect ignition timing.	Refer to "ELECTRICAL SYSTEM" a. Clean or replace plug. b. Clean or adjust point gap. c. Check with a tester. d. Replace sparkplug wire. e. Check coil with a tester. f. Check switch with a tester. g. Check with a timing light.
3	Check the compression by kicking down starter crank.	If you feel no compression trouble may be: a. incorrect valve position, or faulty valve; b. Worn cylinder, piston or rings; c. leak in head gasket; d. faulty piston; e. leak in crankcase.	a. If inlet port is open at top dead center and closed at bottom dead center, valve is good. b. Replace. c. Replace gasket. d. Replace piston. e. Repair or replace.

4	Again try start the engine according to operating instructions.	<p>If the engine fails to fire troubles may be:</p> <ul style="list-style-type: none"> a. too much air in gas mixture; b. air screw on carburetor to loose; c. faulty drain cleaner in right crankcase cover; d. faulty rubber carburetor chamber cap; e. incorrect ignition timing. 	<p>a-d. Adjust or replace.</p> <p>e. Adjust ignition timing.</p>
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7-2 POOR ACCELERATION

No.	INSPECTION	TROBLE SOUCE	REPAIR
1	Check engine RPM.	<p>If the engine winds up freely, trouble may be:</p> <ul style="list-style-type: none"> a. clutch is slipping (start engine with bike on center stand, shift into gear from neutral, apply rear brake and rev up the engine. If engine RPM goes up. clutch is slipping). b. heat range of sparkplug is incorrect, 	<ul style="list-style-type: none"> a. Adjust clutch or replace friction plates. b. Use sparkplug of correct heat range.
		<p>If the engine dies, the clutch is good, the trouble may be:</p> <ul style="list-style-type: none"> a. starter jet plunger not returning to normal position; b. dirty air cleaner; c. flow of gasoline restricted; d. clogged vent hole in fuel tank cap; e. clogged muffler or exhaust pipe; f. oil leak in the O-ring at oil line to valve cover connection. 	<ul style="list-style-type: none"> a. Check starter. b. Clean. c. Clean carburetor, fuel line and fuel cock. d. Replace tank cap. e. Clean. f. Replace (OR-2.4-11.8)

When you're sure the above points are o. k, run the machine on a paved level road. If the engine still does not run well:

2	Check ignition timing with a timing light.	Timing too far advanced or retarded.	Adjust.
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No.	INSPECTION	TROUBLE SOURCE	REPAIR
3	Check compression with a compression gauge.	If there's no compression trouble may be: a. scored piston and faulty ring; b. worn or damaged piston and cylinder; c. leak in head gasket; d. compression leak in crank case; e. faulty oil seal in crankcase.	a. Replace piston rings. b. Repair or replace. c. Replace. d. Repair or replace. e. Replace.
4	Check carburetor and adjust all parts.		
5	Make sure the engine is not overheating.	If engine is overheating, trouble may be: a. accumulated carbon in combustion chamber; b. incorrect fuel ratio; c. clutch is slipping; a. leak in oil seals on dynamo side of intake passage and crankshaft.	a. Remove carbon. b. Check oil pump at minimum delivery position. Be sure throttle and pump adjusting pulley are correctly synchronized. c. Adjust play or replace. a. Replace or apply 3 Bond

7-3 ENGINE OVERHEATS

No.	INSPECTION	TROUBLE SOURCE	REPAIR
1	Is compression too high?	If the compression is too high, trouble may be: a. accumulated carbon in combustion chamber; b. faulty cylinder head gasket.	a. Remove carbon. b. Replace
2	Can you feel exhaust pressure with your hand over the muffler	If you feel little or no pressure, carbon may have accumulated on exhaust pipe, muffler or cylinder exhaust port.	Remove carbon.
3	Do piston rings work well? Does the piston drag on the cylinder wall during stroke?	Piston rings maybe sticking in their grooves or over expanded by accumulated carbon.	Clean piston ring grooves.

No.	INSPECTION	TROUBLE SOURCE	REPAIR
4	Is there too much air in gasoline mixture?	Too much air may be caused by; a. faulty gaskets; b. leaky oil seal or loose inlet pipe.	a. Replace. b. Replace oil seal and retighten inlet pipe.
5	Does the clutch disengage and engage completely?	a. friction plate worn thin; b. improper clutch lever adjustment, etc. see (D). below.	a. Replace friction plates. b. Adjust ulay in lever to 1/16-3/32"
6	Is ignition system in good condition?	Check ignition system in order given below: a. condenser use tester b. sparkplug; c. ignition coil (use tester); d. ignition timing; e. sparkplug lead; f. point gap, contactpoints and breaker spring. <small>www.legends-yamaha-enduros.com</small>	a. Replace if faulty. b. Clean it and set electrode gap; replace faulty plug. c. Replace bad. d. Adjust. e. Replace if insulation bad. f. Replace breaker arm, clean contact points, and adjust point gap.

7-4 CLUTCH MALFUNCTION

No.	INSPECTION	TROUBLES OURCE	REPAIR
1	Check for clutch slipage. (See B-1).	Clutch slipping may be caused by: a. weakened cluch springs; b. worn or deformed pressure plate; c. deformed cluch housing d. bad splines on clutch plate.	a. Replace. b. Replace. c. Replace. d. Replace.
2	Check that the clutch disengages completely.	Clutch not disengaged completely may be caused by: a. wrong oil viscotsiy; b. clutch boss too tight; c. worn or warped clutch plate; d. Unbalanced tension of clutch springs; e. weakened springs;	a. Use #30 motor oil. b. Adjust. c. Replace. d-e Replace.

7-5 SHIFTING MALFUNCTION

Check the viscosity and amount of gear oil and make sure the clutch completely engages and disengages. If you find nothing wrong, inspect shifting process itself:

No.	TROUBLE	SOURCE	REPAIR
1	Pedal will not shift gears.	a. Faulty or damaged shifter head.	a. Replace shifter head together with shifter rod.
2	Pedal shifts to wrong gear.	a. Lever stop screw.	a. Adjust screw to get correct lever travel.
3	Pedal misses shifting gears.	a. Loose stopper bushing; b. Faulty shifter head.	a. Replace. b. Replace shifter rod assembly.
4	Pedal does not return.	a. Weak return-spring; b. Gear change shaft has been bent or is binding on crankcase.	a. Replace. b. Repair or replace.

7-6 NOISY ENGINE

Moving parts on an engine produce some sound and vibration inherent in their high-speed motion, but there are abnormal noises caused by trouble in these parts.

Since a noise may be the only sign of trouble, even thoroughly trained service men sometimes make the wrong diagnosis. Some of these noises have been classified:

1. Intermittent noise.
2. Changing noise.
3. Continuous noise.

1. Intermittent Noise:

No.	NOISE	TROUBLE SOURCE	REPAIR
1	Noise is heard during sudden acceleration.	<p>a. Too much clearance between piston rings and grooves.</p> <p>b. Piston rings drag on cylinder wall caused by carbon accumulated in grooves.</p> <p>c. Too much clearance between piston pin and bushing at con-rod small end.</p> <p>d. Too much clearance at con-rod big end.</p> <p>The above noises have a definite metallic character.</p> <p>e. Knocking due to advanced ignition timing.</p>	<p>a. Replace rings and/or piston.</p> <p>b. Remove carbon.</p> <p>c. Replace pin and/or bushing.</p> <p>d. Repair crank.</p> <p>e. Adjust.</p>
2	Noise is heard at slow RPM.	<p>a. Too much clearance between piston and cylinder. (Noise is not heard when opening throttle).</p> <p>b. Piston ring land is not smooth where it contacts the upper and lower edges of the ring.</p> <p>c. Worn-out shock absorber rubber in primary driven gear.</p>	<p>a. Replace piston.</p> <p>b. Smooth ring lands with sandpaper so rings expand freely.</p> <p>c. Replace primary driven gear.</p>

2. Changing Noise:

No.	NOISE	TROUBLE SOURCE	REPAIR
1	Noise is heard when starting.	<p>a. Piston clearance excessive (noise is heard before engine is warmed up).</p> <p>b. Piston ring land is not smooth where it contacts the upper and lower edges of the ring. (Piston will be vibrated when returning accelerator grip).</p>	<p>a. Replace piston.</p> <p>b. Smooth ring land with sandpaper so ring may expand freely.</p>
2	Noise continues after engine is warmed up.	<p>a. Piston clearance is more than 1-a.</p> <p>b. Bent conrod.</p>	<p>a. Replace piston and/or cylinder.</p> <p>b. Overhaul crank.</p>

3. Continuous Noise:

No.	PART	TROUCLES GURCE	REPAIR
1	Crank	Too little clearance between crankcase and crank; crank is riding against crankcase.	Add washer.
2	Bearings	Scrach on ball or race made by dust or carbon.	Replace bearing.

7-7 POOR HANDLING

Make sure the tire pressures are correct and again check the handling:

No.	TROUBLE	SOURCE	REPAIR
1	Handlind feels heavier than normal.	a. Steering nut too tight. b. Frfrctured steering ball bearings.	a. Adjust. b. Replace all ball bear-ings.
2	Handlebars pull to one side.	a. Unbalanced fork. b. Bent fork. c. Bent rear suspension arm. d. Badly fitted front or rear wheel. e. Distorted frame.	a-d. Replace. c. Repair or Replace. d. Reassemble. e. Replace.
3	Play in front or rear wheels.	a. Play in wheel bearing. b. Deformed rim. c. Loose spoke. d. Play in rear arm bushing. e. Caused by loose drive chain.	a. Replace. b. Replace. c. Tighten. d. Replace. e. Tighten wheel, adjust chain.

After making sure that tire pressures are correct, check the suspension units:

No.	TROUBLE	SOURCE	REPAIR
1	Suspesion is too soft.	a. Weak springs. b. Oil leak.	a. Replace. b. Replace. unit or add oil.
2	Suspension is too stiff.	a. Bent piston rod or inner tube.	a. Replace the bad suspension unit.
3	Suspension makes noise.	a. Friction between spring and outer sleeve.	a. Put grease on spring and replace fiber packing.

7-8 BRAKE MALFUNCTION

Make sure play in the brake cables is correct and again check the brakes:

No.	TROUBLE	SOURCE	REPAIR
1	Brake does not work effectively.	a. Front brake cable is binding. b. Play in brake pedal shaft. c. Brake lining worn, or in poor contact with drum. d. Leak in brake drum. e. Oil or grease on lining.	a. Replace. b. Repair. c. Adjust or Replace. d. Repair or Replace. e. Clean.
2	Brake make noise.	a. Worn lining. b. Dirty lining c. Rough surface on drum. d. No grease on cam.	a. Replace. b. Clean. c. Replace. d. Put grease on cam.
3	No space for adjustment.	a. Worn lining. b. Worn brake cam.	a. Replace. b. Change position of cam or replace.

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7-9 POOR CHARGING

The electric current generated by the flywheel magneto is changed into direct current by the selenium rectifier and stored by the battery, which is the electric source for the horn and neutral light. If this light is dim and the horn hardly sounds, the battery should be charged as soon as possible.

No.	TROUBLE	SOURCE	REPAIR
1	There is no charging current.	a. Short circuit in lead wire or faulty connections. b. Faulty wiring. c. Faulty battery. d. Faulty main switch. e. Faulty flywheel magneto.	a. Repair. b. Repair. c. Use a tester, if faulty replace. d. Measure terminal voltage of battery. e. Check generating voltage by running engine with key left in "Night Riding" position.

2	Charging current is much less than standard.	<ul style="list-style-type: none"> a. Faulty wiring. b. Faulty flywheel magneto. 	<ul style="list-style-type: none"> a. Repair. b. Check generating voltage by running engine with key left in "Night Riding" position.
3	Selenium rectifier is faulty.	<ul style="list-style-type: none"> a. Check voltage drop and back current. Use a selenium checker. b. Alloy has been melted. c. There is a blackspot on output side of selenium rectifier. 	<ul style="list-style-type: none"> a. Replace. b. Replace; Or repair short circuit in wiring on output terminal side of rectifier. c. Replace; Or repair wiring on output terminal side of rectifier.

7-10 DIM HEADLIGHT

No.	TROUBLE	SOURCE	REPAIR
1	Head lamp is dim.	<ul style="list-style-type: none"> a. Faulty wiring. b. Incorrect bulb. c. Faulty flywheel magneto. 	<ul style="list-style-type: none"> a. Reppair. b. Use specified bulb. c. Replace.



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