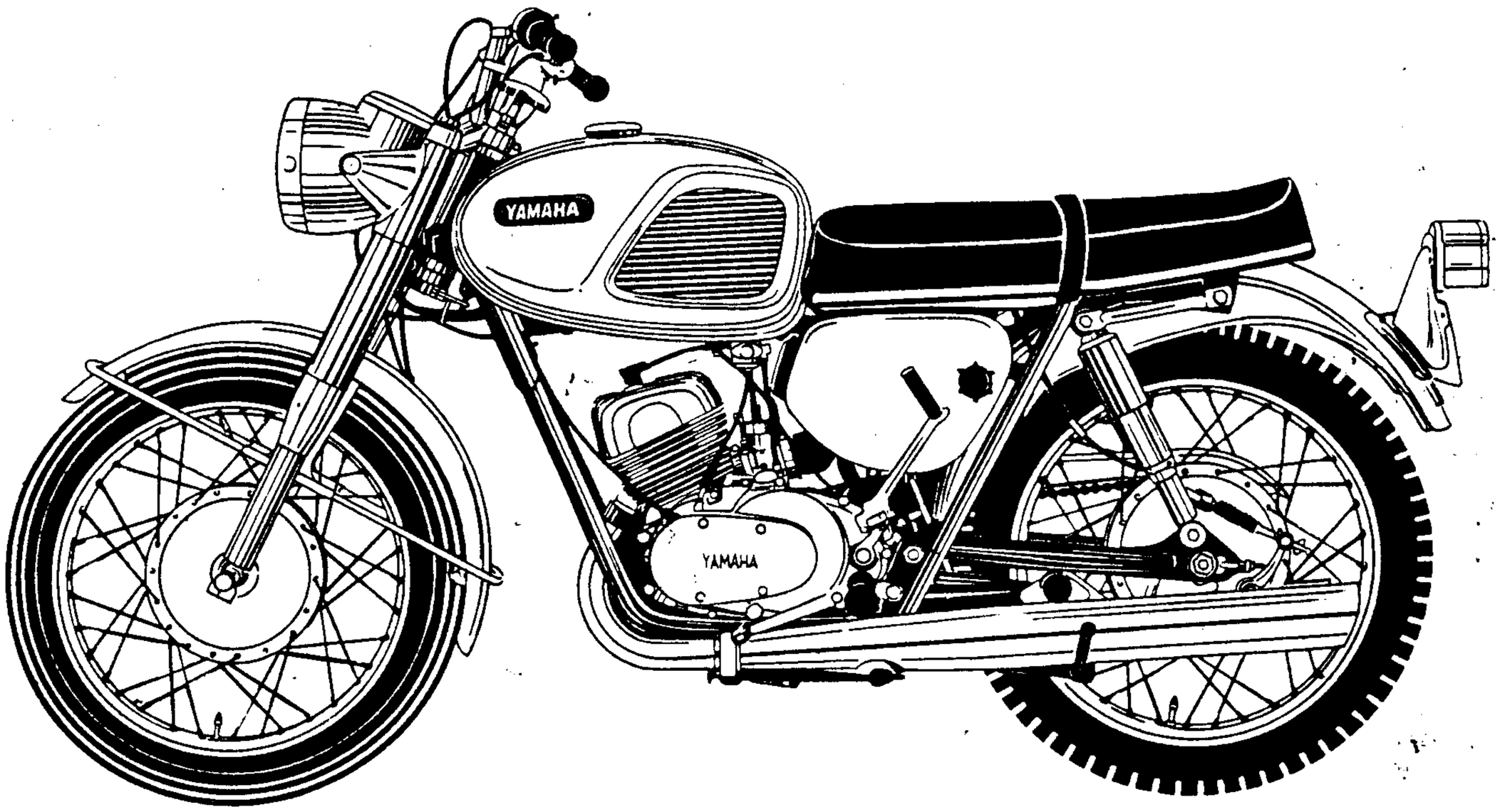
YAMAHA

SERVICE MANUAL



Page	Index	Error	Correction
CONTENTS			
Chapter 6-2		intervols	intervals
Chapter3-3-5		anc mechaism	and mechanism
3		306 YM-2	305 YM-2
22	3-7-b	Fig. 8-12	Fig. 3-12
23	3-8-e	(Refer to page)	(Refer to page 47)
23	3-9-h	Fig. 4-48	Fig. 3-43
29	3-2-a	Standard length mm	Standard length 3 mm
29	3-2-b	Standard length (_mm)	Standard length (44 mm)
29	3-2-b	Standard 25.5 mm	Standard size 44 mm
37	Fig. 4-1-1	(decaration)	(decoration)
38	2-1-a	Steeding	Steel
39	4	Battercy Box	Battery Box
47	1-1-a-1	Fig. 5-2	Fig. 5-4
	1-1-a-3	Fig. 5-3	Fig. 5-4
47	3	Descriptian	Description
52	2-2-a	aldo	load
250 YDS-5 Circuit			
		Condition	Use
		Joining	Connection
59	3-3-a	(Refer to page)	(Refer to page 55)
	3-3-b	(Refer to page)	(Refer to page 47)

YAMAHA SPORT

YDS5-250 YM2C-305

SERVICE MANUAL

FOREWORD

This manual has been prepared as a source of service data for the new YDS series. These sport models, the YDS5 250, YM2 305 (not exported to USA.) and the YM2C 305, are much more than standard touring machines. The newest engineering and styling developments have been incorporated into these units with emphasis on performance, maneuverability, and sefety. All are equipped with the dependable YAMAHA AUTOLUBE SYSTEM. This unique automatic lubrication feature has been proven successful in over 500,000 units already sold by YAMAHA in all parts of the worldwide dealer network. AUTOLUBE is but one facet of YAMAHA'S engineering supremacy.

We would like to express our appreciation to all YAMAHA dealers and agents for their cooperation in rendering prompt, efficient service work for YAMAHA owners everywhere.

YAMAHA 250(305) YDS5(YM2C) SERVICE MANUAL

CONTENTS

Introduction

Chapter 1. General Description 1

1. Features of Yamaha 250(305) 1
2. Specifications of 250(305) 2
3. Performance Curve 4

Chapter 2. Yamaha Auto Lube 5

1. What is Yamaha Auto Lube 5
2. Features of Yamaha Autolube 5
3. Handling the oil pump 5
   - A. Bleeding 6
   - B. Adjusting the oil pump 7
   - C. Oil pump service standards 7
   - D. Checking the operation of the oil pump 8

Chapter 3. Engine 9

1. Outline of Yamaha 250 & 305 Engine 9
2. Disassembling and assembling the engine 9
   1. Fixtures necessary to engine disassembly & assembly 9
   2. Engine disassembly 11
   3. Assembly 17
3. Description of the mechanism 24
   1. Crankshaft 24
   2. Cylinder, piston and piston ring 25
   3. Clutch 28
   4. Transmission, Kick starter 31
   5. Shifting mechaism 33
   6. Carburetor 35
   7. Miscellaneous 36

Chapter 4. Body ····· 37

1. General description of the Chassis ····· 37

1—1 Main features ····· 37

2. Assembly the frame ····· 38

1. Main frame ····· 38

2. Rear arm ····· 38

3. Wire harness, Ignition Coils ····· 39

4. Battery box ····· 39

5. Oil tank ····· 39

6. Rear fender ····· 39

7. Rear cushion and chain case ····· 39

8. Wheel assembly ····· 39

9. Front fork assembly ····· 39

10. Headlight unit assembly ····· 40

11. Steering handle and damper ····· 40

12. Wire harness, main switch and meter cable in the headlight unit ····· 40

13. Front fender ····· 40

14. Front wheel assembly ····· 40

15. Fuel tank ····· 40

16. Seat ····· 40

3. Checking and Servicing of the main component parts ····· 41

1. Frame ····· 41

2. Rear arm (swing arm) ····· 41

3. Front fork ····· 42

Chapter 5. Electrical equipment ····· 44

1. General description electric equipment ····· 44

2. Main component parts ····· 44

2—1 Components of the electrical equipment ····· 44

2—2 List of main component parts ····· 45

2—3 Connecting diagram ····· 46

3. Descriptions of the electrical equipment ····47
1. Dynamo ····47
2. Regulator····51
3. Ignition coil ····53
4. Spark plug ····54
5. Battery ····55

Chapter 6. Major inspection and maintenance····56
1. Periodic inspection and maintenance ····56
1. Significance of the periodic inspection ····56
2. Time intervols anc items for periodic inspection ····56
3. Major inspection and adjustment····57

Chapter 1

General Description

FEATURES of YAMAHA 250(305)

1. Engine

The high performance 2-stroke twin-cylinder engine is equipped with the YAMAHA AUTOLUBE, an ideal lubricating system. The employment of the YAMAHA AUTOLUBE has resulted in improvements in acceleration and high-speed performance, both vital factors to all sports motorcycles.

2. Transmission

The 5-speed transmission is specially designed to permit easy, efficient shifting, permitting maximum performance under all riding conditions.

3. Carburetor

Each carburetor employs a starter feature which assures easy starting even in cold weather. There are no easier starting motorcycles in the world than those units provided with the YAMAHA electric starter dynamo. (YDS5 only)

4. Handling, Comfort, and Convenience

Frame design and material contribute to stability and control at all times. Rear cushions are adjustable for various road and weight combinations. The front wheel brake is of twin leading shoe design for highest efficiency and effortless operation. All brake lining material, both fronth and rear, is of semi-metallic material which insures smooth, safe, braking even after repeated abuse. Brake drum design protects the friction surfaces from dust and water. Riding comfort through design is particularly noticable in the positioning of controls, footrests, and handlebars, as well as the seat itself. Speedometer, neutral, and high beam indicator lights are designed to be easily read and are of highest quality and dependability.

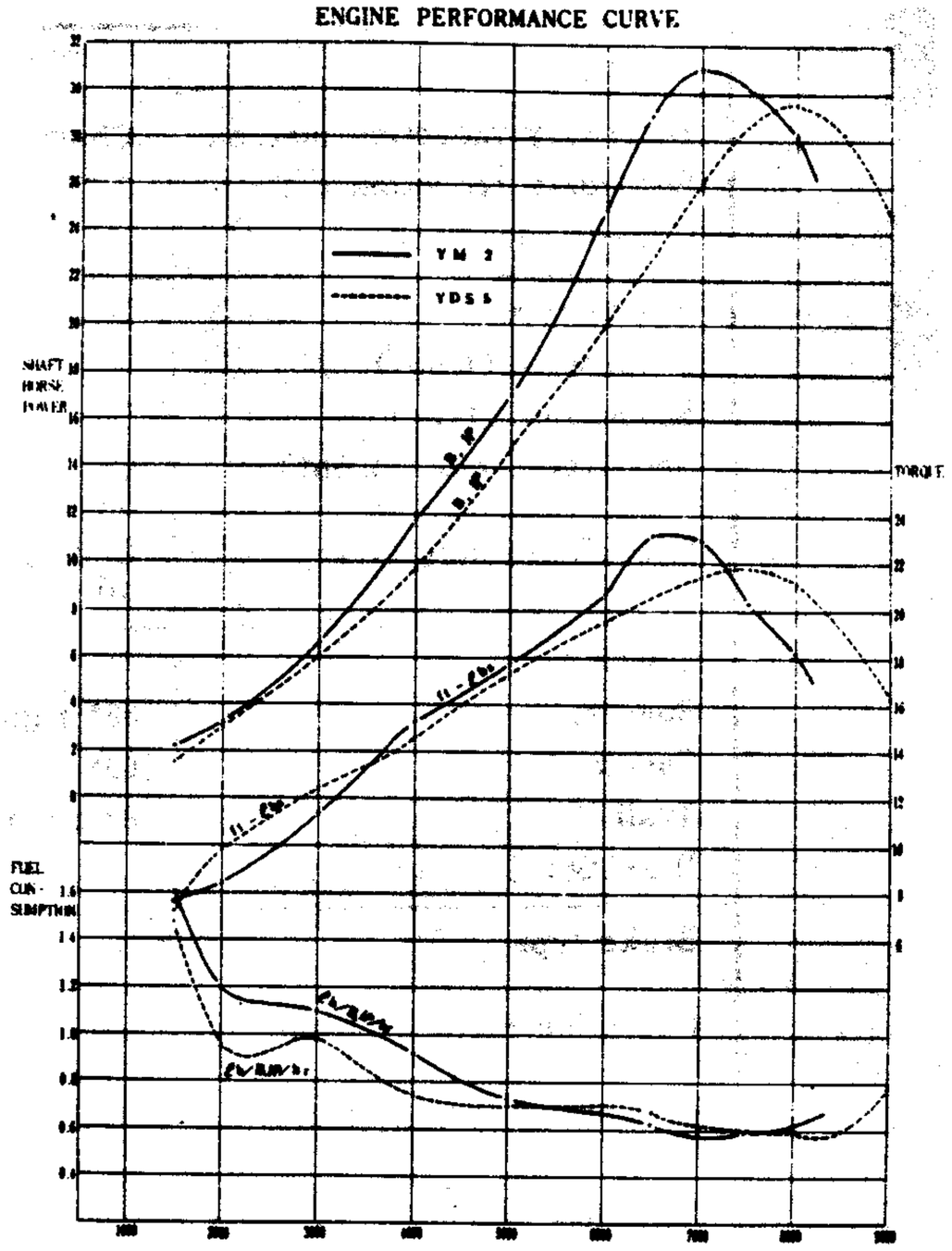
250 YDS5 and 305 YM2 (YM2-C)

Main Specfications

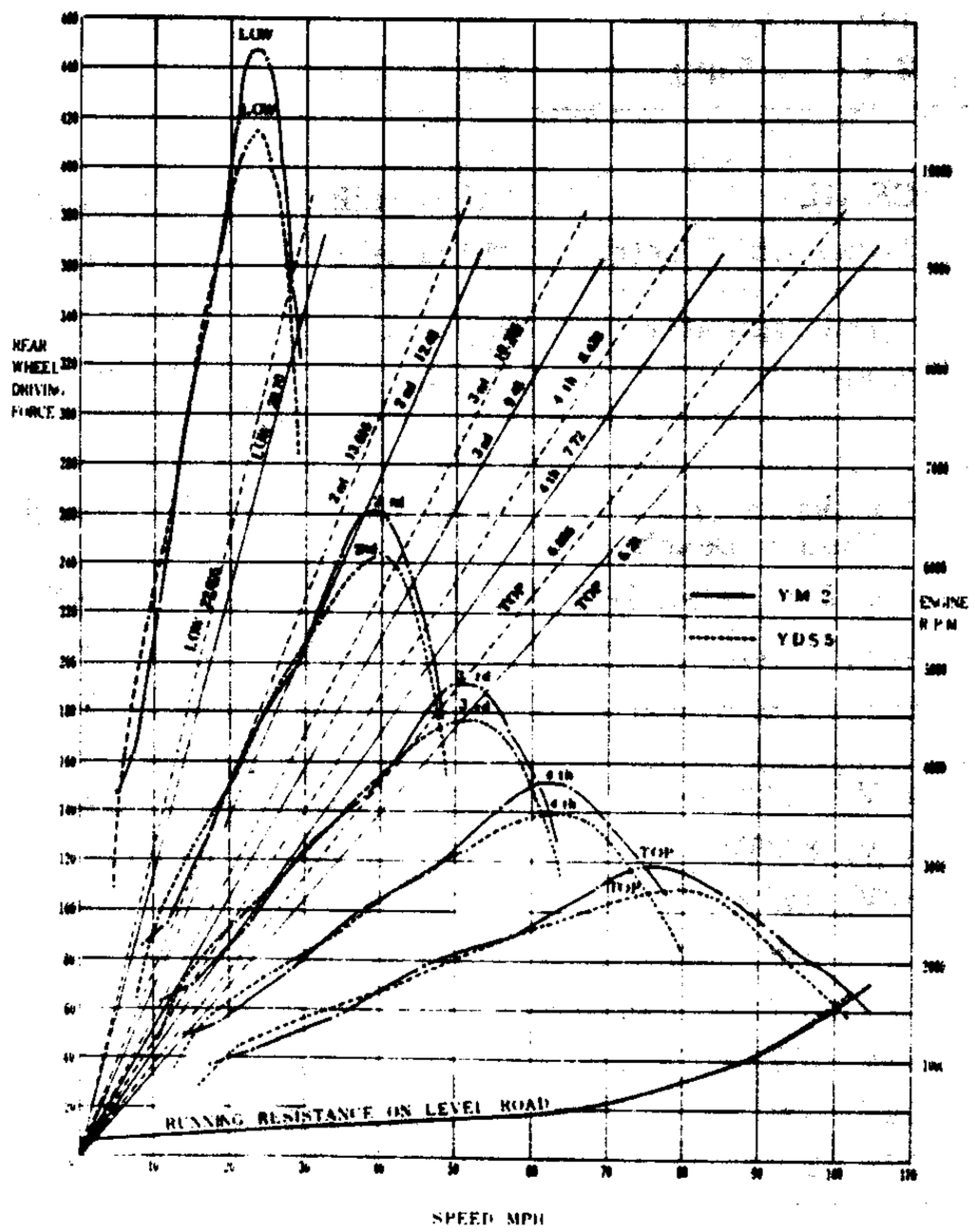
Spec. \ Models	250 YDS5	305 YM2	305 YM2-C
Dimensions :			
Overall length	1990 mm - 78.4 in	1990 mm - 78.4 in	1990 mm - 78.4 in
Overall width	770 mm - 30.3 in	775 mm - 28.9 in	780 mm - 30.7 in
Overall height	1050 mm - 41.4 in	1000 mm - 39.4 in	465 mm - 38 in
Wheelbase	1290 mm - 50.8 in	1290 mm - 50.8 in	1290 mm - 50.8 in
Min. ground clearance	155 mm - 6.1 in	155 mm - 6.1 in	155 mm - 6.1 in
Gross weight	**148 kg**	**146 kg**	**148 kg**
Performance :			
Max. speed	160 km/h-100 mph	165 km/h-103 mph	150 km/h-94 mph
Fuel consumption (on level, paved roads)	40 km/ℓ (40 km/h)-114 mpg (35 mph)	40 km/ℓ (40 km/h)-114 mpg (35 mph)	40 km/ℓ (40 km/h)-114 mpg (35 mph)
Climbing ability	23.5°	23.5°	28°
Min. turning radius	2,200 mm - 90.7 in	2,300 mm - 90.7 in	2,300 mm - 90.7 in
Braking distance	13 m (50 km/h) - 42.5 ft (31 mph)	13 m (50 km/h) - 42.5 ft (31 mph)	13 m (50 km/h) - 42.5 ft (31 mph)
Engine type	2-stroke gasoline	2-stroke gasoline	2-stroke gasoline
Lubrication method	Separated lubrication(Yamaha oil)	Seprated lubrication(Yamaha oil)	Separated lubrication(Yamaha oil)
No. of cylinders & arrangement	2 cylinders in parallel	2 cylinders in parallel	2 cylinders in parallel
Cylinder displacement	246 cc	305 cc	305 cc
Bore x stroke	56×50 mm	60×54 mm	60×54 mm
Compression ratio	7.5 : 1	7.5 : 1	7.5 : 1
Max. output	29.5 ps/8000 rpm	31.0 ps/7000 rpm	30.5 ps/7000 rpm
Max. torque	2.72 kg-m/7500 rpm	3.20 kg-m/6500 rpm	3.20 kg-m/6500 rpm
Starting method	Electric & Kick	Kick	Kick
Ignition system	Battery ignition	Battery ignition	Battery ignition
Air cleaner	**Dry paper filter**	**Dry paper filter**	**Dry paper filter**
Power transmission :			
Clutch	Wet multi-disc	Same as left	Same as left
Primary reduction method	Gear		
Primary reduction ratio	3.250		
Gear shifting:			
Type	Constant meshing 5-speed (forward & reverse)	Same as left	Same as left
Gear ratio - 1 st	2.545		
2 nd	1.533		
3 rd	1.167		
4 th	0.950		
5 th	0.773		

Spec. \ Models	250 YDS5-E	306 YM2	305 YM2-C
Secondary reduction method	**Chain**	**Chain**	**Chain**
Secondary reduction ratio	2.733 (41/15)	2.500 (40/16)	2.500 (40/16)
Chassis construction :			
Frame type	**Double cradle**	**Same as left**	**Same as left**
Suspension (front)	Telescopic		
Suspension (rear)	Swig arm		
Shock absorbing (front)	Coil spring and oil dumper		
Shock absorbing (rear)	**Coil spring and oil dumper**		
Steering :			
Steering angle	38° right and left	Same as left	Same as left
Caster	63°		
Trail	88.5 mm-34.8 in		
Braking :			
Brake type	**Internal expansion**	**Same as left**	**Same as left**
Operation method (front)	Right hand operated		
Operation method (rear)	Right foot operated		
Tire size (front)	3.00-18-4 P.R.	3.00-18-4 P.R.	3.00-18-4 P.R.
Tire sine (rear)	3.25-18-4 P.R.	3.25-18-4 P.R.	3.25-18-4 P.R.
Fuel tank capacity	15 ℓ (4.0 gal)	15 ℓ (4.0 gal)	15 ℓ (4.0 gal)
Oil tank capacity	2.4 ℓ (2.5 qt)	2.4 ℓ (2.5 qt)	2.4 ℓ (2.5 qt)
Generator :			
Model	CE-GL	DU100/12BL	DU100/12BL
Manufacturer	Mitsubishi Electric	Mitsubishi Electric	Mitsubishi Electric
Voltage regulating method	**Tirril regulator**	**Same as left**	**Same as left**
Spark plug	**B-8HC**	**B-8HC**	**B-8HC**
Battery :			
Maker	Furukawa or Nippon Denchi	Furukawa	Furukawa
Model	BAT5-12 or MP5-12	BST3-12	BST3-12
Capacity	12V, 11AH	12V, 5.5AH	12V, 5.5AH
Lights :			
Head light	12V, 35/25W	Same as left	Same as left
Tail/stop light	12V, 8/25W		
Flasher light	12V, 8W×4		
Neutral light	12V, 3W		
Meter light	12V, 3W		
Flasher pilot light	12V, 3W		
High beam indicator	12V, 3W		
Charging light	12V, 3W		

ENGINE PERFORMANCE CURVE



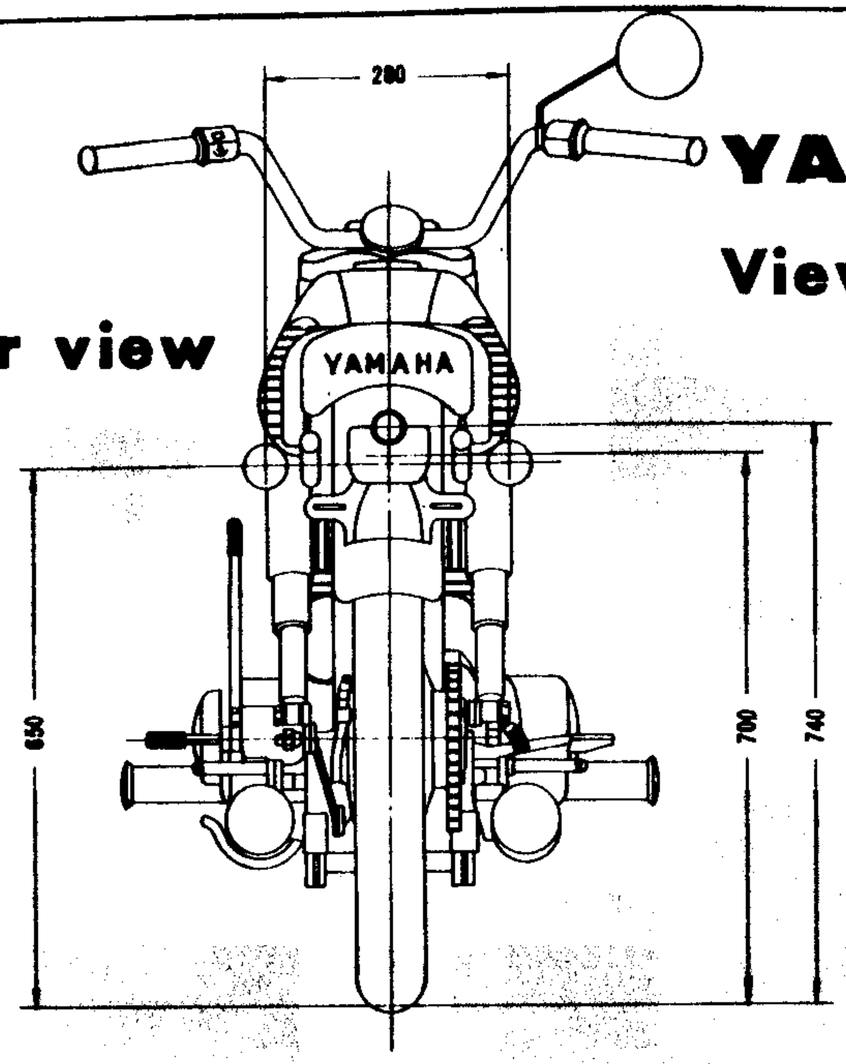
RUNNING PERFORMANCE CURVE



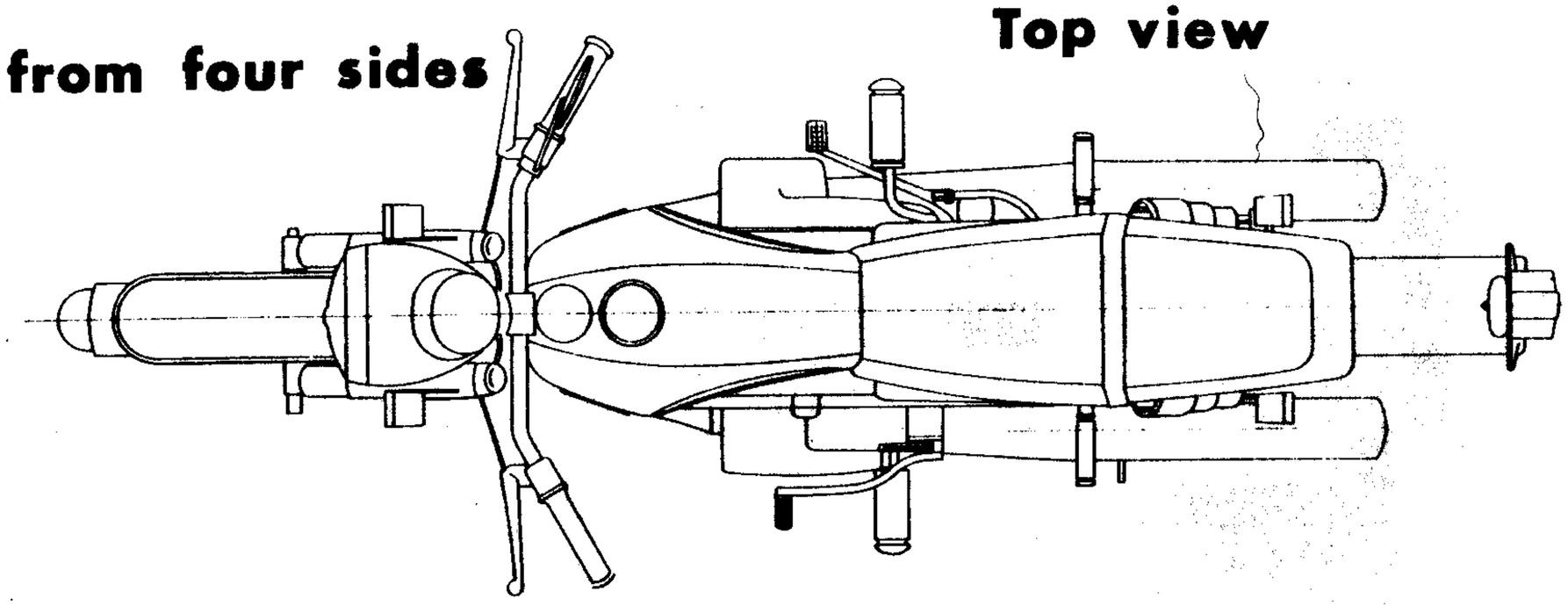
YAMAHA YDS-5／YM-2

View from four sides

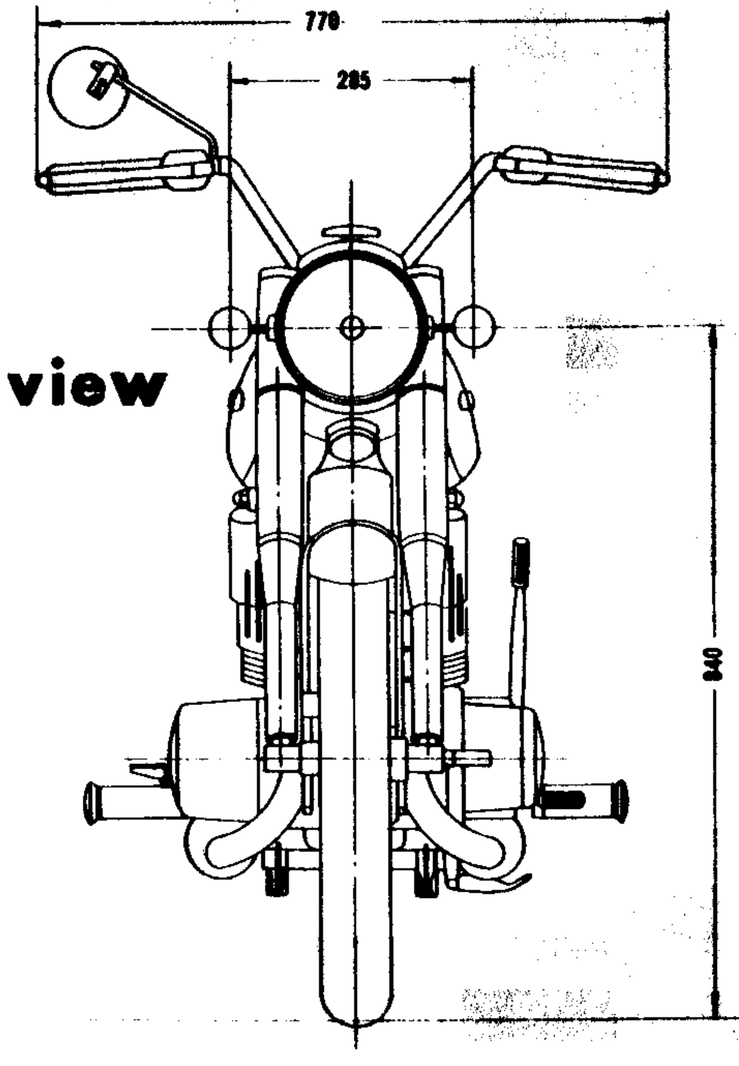
Rear view



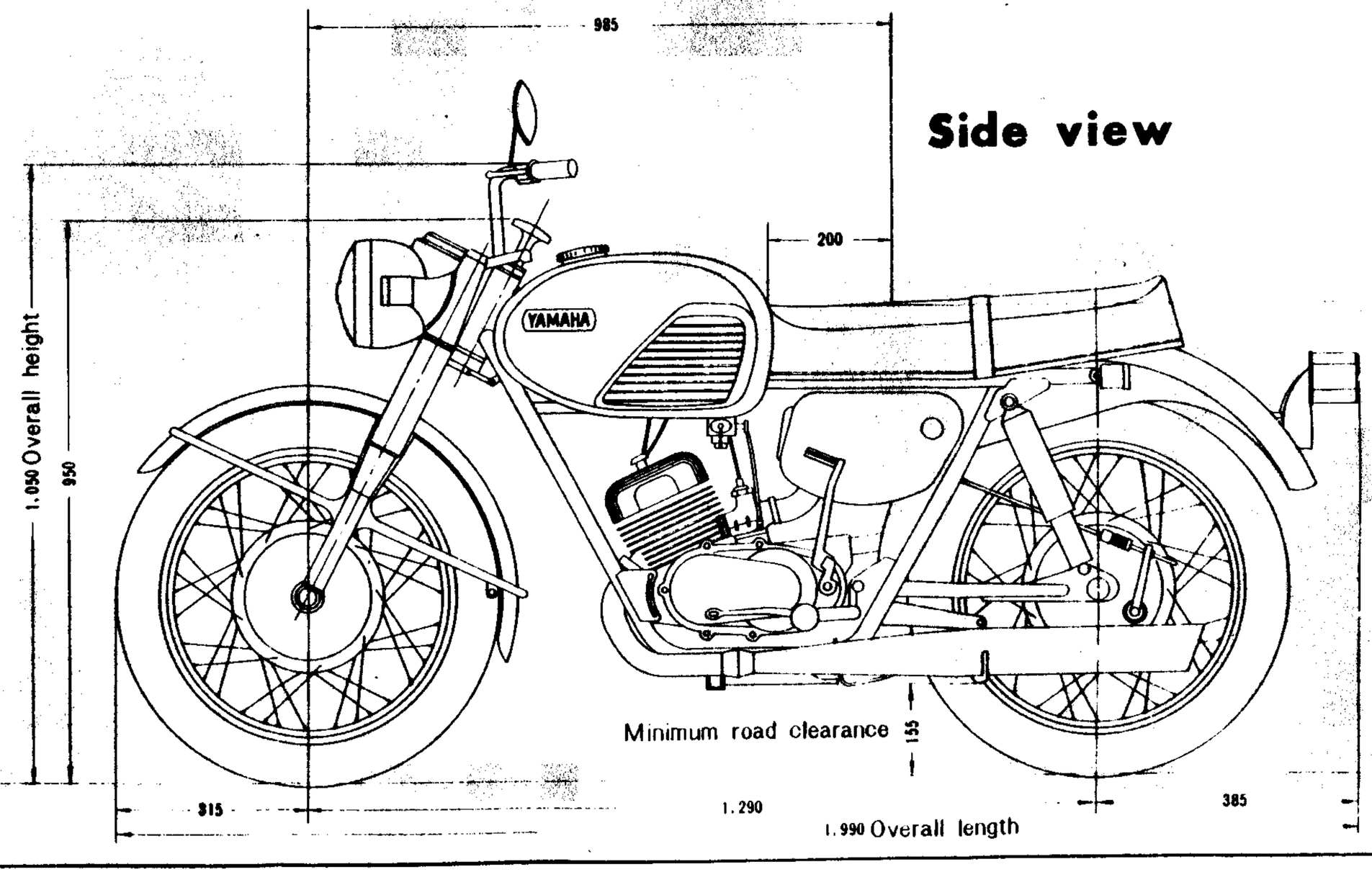
Top view



Front view



Side view



Chapter 2

YAMAHA AUTOLUBE

(Automatic Lubrication System)

1. What is YAMAHA AUTOLUBE

Conventional 2-stroke engines are lubricated by motor oil pre-mixed in gasoline, but YAMAHA employs the most modern development in lubrication--the autolube system. YAMAHA'S AUTOLUBE system uses a separate oil tank to provide oil for the engine in an automatically regulated quantity from the pump.

2. Features of YAMAHA'S AUTOLUBE

The oil pump is driven by the engine through a reduction gear. The effective stroke of the pump is varied according to the throttle opening. The combination of pump speed and stroke regulates the oil quantity exactly to engine requirements under all conditions. The AUTOLUBE eliminates all disadvantages in the conventional pre-mixed lubrication system of 2-stroke engines.

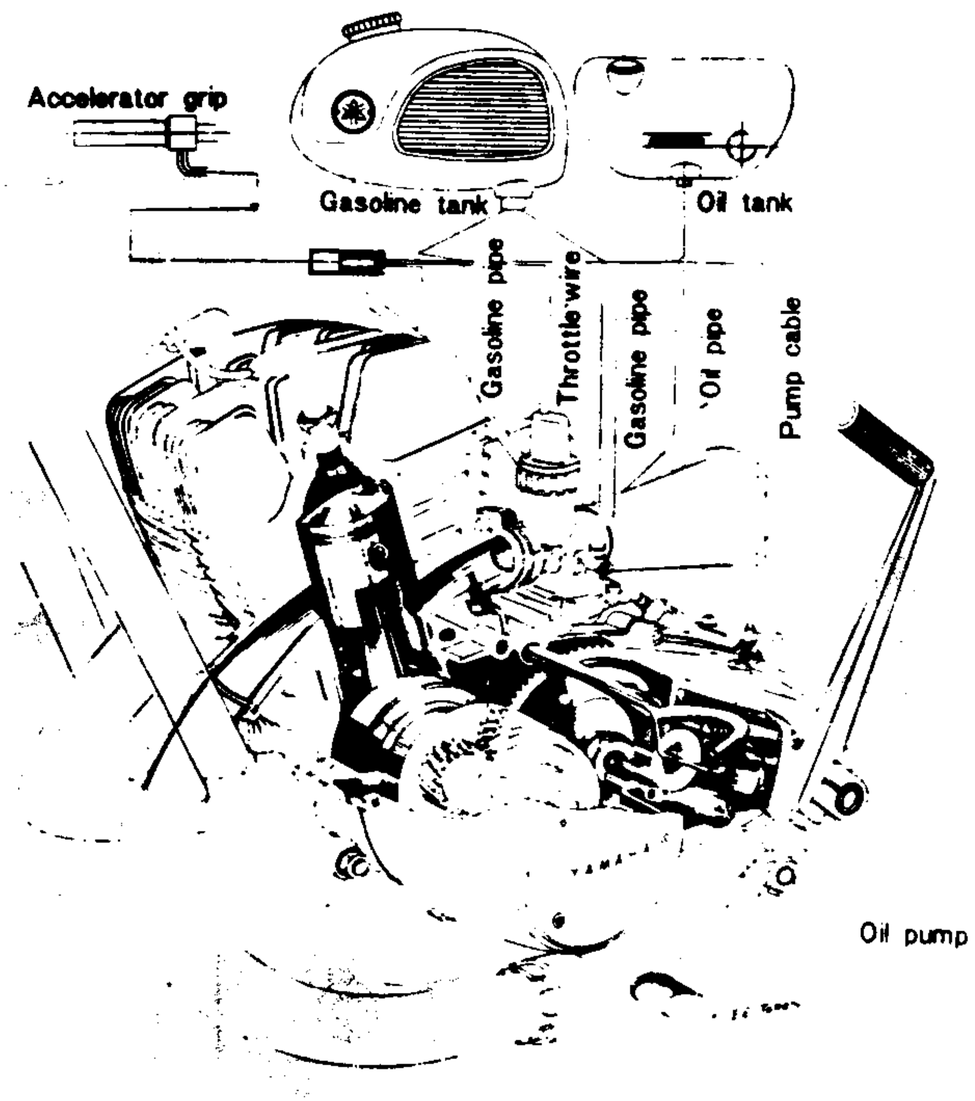


Fig. 2—1

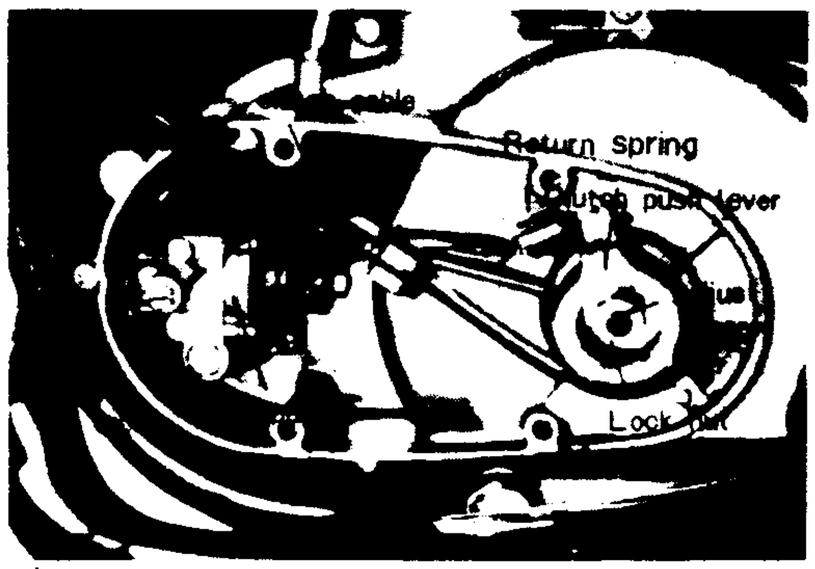


Fig. 2—2

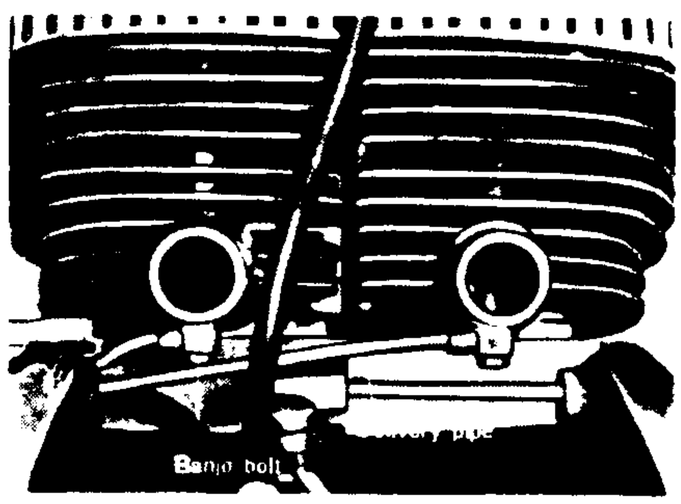


Fig. 2—3

A, The optimum amount of oil is fed to the engine according to driving conditions resulting in;

a. Less oil consumption
b. Less visible exhaust
c. Less carbon deposits
d. Better lubrication

B. Fueling is simplifed

No pre-mixing of oil and gas is required, resulting in less contamination.

C. Lubrication is highly dependable

Oil is placed on all bearing surfaces in large droptets rather than thin, easily penetrated film. Special oils diluted with mixer agents are not required.

NOTE: YAMAHA does recommend YAMAHA AUTOLUBE Oil as it has been developed to provide higher performance and longer service life for air cooled engines.

3. Handling of the oil pump

The oil pump is a precision-machined and factory tested assembly. Make no attempt to disassemble it. When you remove the oil pump from the engine, protect it from dust, dirt, etc. After reinstallation, bleed and adjust the pump dependability and efficiency.

A. Bleeding

When the oil pump has been removed, the oil pipe disconnected, or when there is no oil in the oil tank (on a new machine), air enters the pump case, causing an irregular flow. The pump must be bled.

Remove the bleeder screw and rotate the starter plate (manual feed wheel) counter clock-

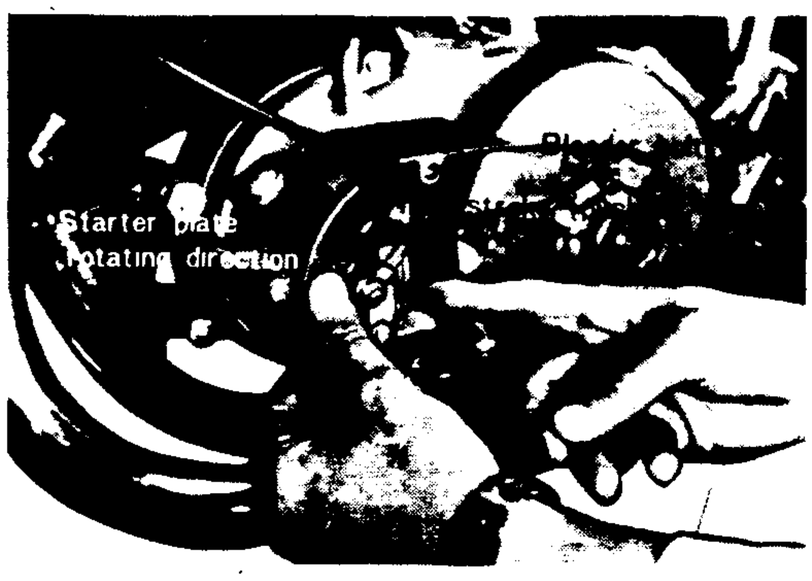


Fig. 2—4

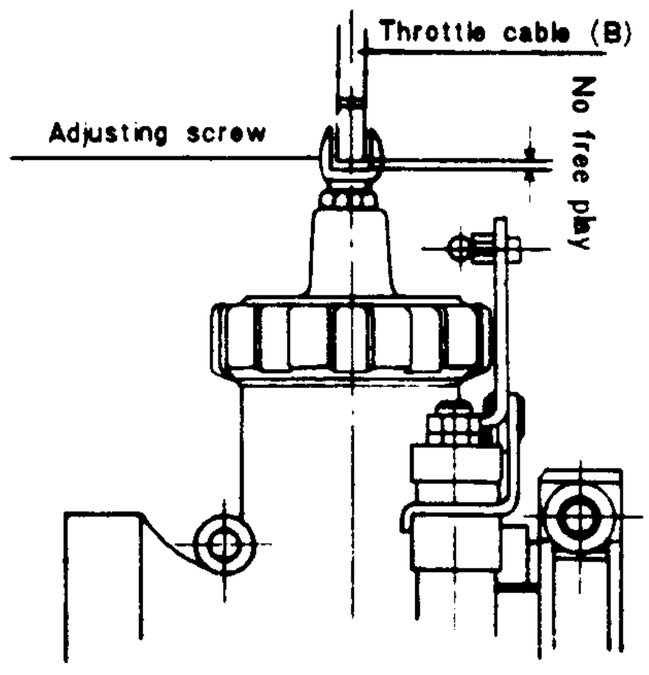


Fig. 2—5

wise to feed oil through the pump. Hold the adjustment pulley back to allow the plunger maximum stroke. Watch the oil flow in the delivery line. Bleeding is complete when air bubbles no longer appear in the line.

B. Adjusting the oil pump

Check the pump stroke; adjust the plunger utilizing the proper adjustment shim so that it will stroke 0.22mm—0.26 mm with fully closed adjustment pulley. (All new pump assembly units have already been completely adjusted)

1. Start the engine.
2. Remove all slack from the two throttle cables B and adjust each so that both throttle valves operate simultaneously.
3. Adjust the throttle stop screws evenly so that the engine idles at 1,000rpm.
4. Obtain 0.5 to 1.0 mm free-play on accelerator cable A by using the proper adjustment screw.
5. Adjust the pump cable so that the guide pin is aligned with the marking on the adjustment pulley or the clearance between the adjustment pulley and the guide pin is 0.35 mm (Fig. 2-6) If proper sequence and attention to detail was maintained, the proper pump adjustment is assured.

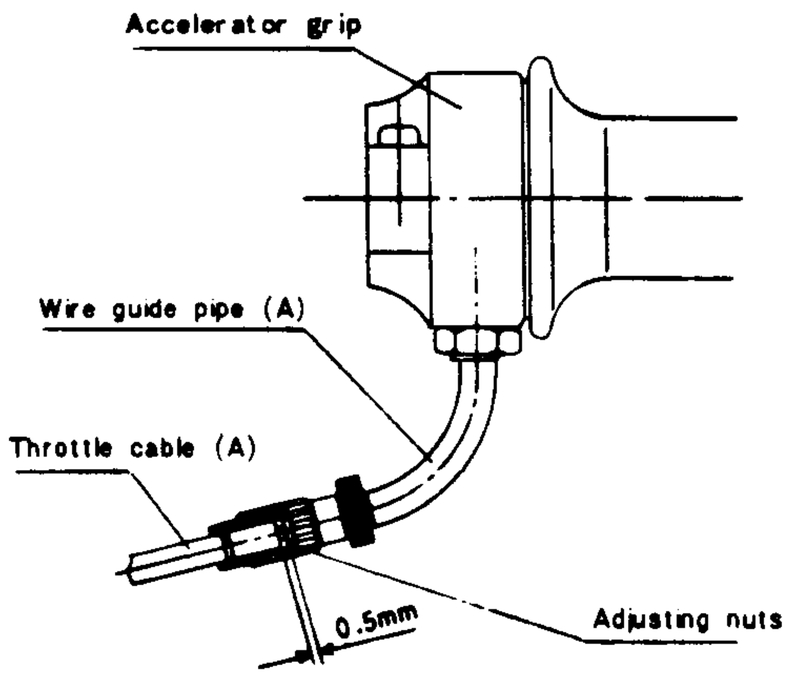


Fig. 2—6

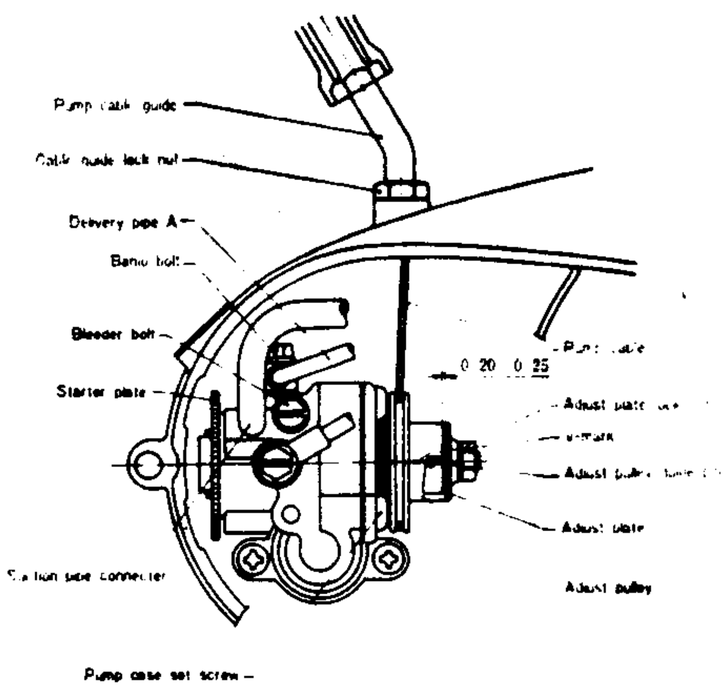


Fig. 2—7

C. Oil Pump Service Standards

a. Minimum stroke (when the clearance between the adjustment plate and the adjustmen. plate and the adjustment pulley is at minimum) 0.20—0.25 mm

b. Maximum stroke 2.05—2.25 mm

c. Setting the oil pump and the carburetor (Refer to Figs. 2—5 and 2—7).

D. Checking the operation of the oil pump

Correctly assemble and mount the oil pump, then check its operation by starting the engine.

a. Check the oil tank to see if it is filled with the AUTOLUBE oil. If the oil level is below tht specified, replenish the oil supply.

b. When the engine has been started, the stater plate should turn slowly.

c. The reciprocal stroke of the plunger should also be noted.

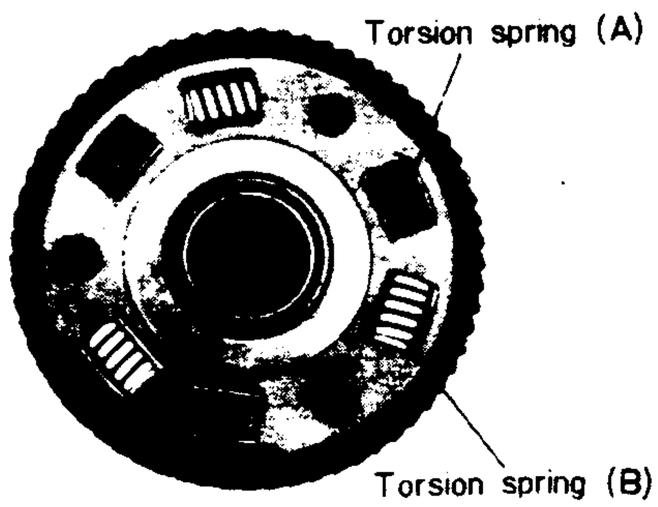
Chapter 3

General Description of YDS5 (YM2C) Engine

1. Outline of Yamaha 250 & 305 Engine

The many improvements introduced in the new series of YDS models have resulted in better performance and durability. The following paragraphs relate these improvements to the YDS 3 predecessor.

a. The mounting position of the YAMAHA AUTOLUBE has been changed.
On the YDS 3, the AUTOLUBE pump was mounted on the transmission main axle and driven by unit. On both YDS 5 and YM2C, the pump is driven directly from the crankshaft and is independent of clutch operation.



(Fig. 3—1)

b. Engine performance and durability have improved. Improved porting and aluminum cylinder fins for better cooling are standardon the new YDS series.

c. The rigidity of the crankshaft has been improved.

d. Both the strength and dependability of the transmission and the clutch have been improved.
On the YDS 3, the clutch is mounted directly on the crankshaft, but on the YDS 5 (YM2C) it is on the main axle in order to improve the clutch operation. A multiple coil spring shock damper is incorporated within the clutch, and impact severity to the transmission is greatly reduced.

e. The air cleaner has also improved to enhance the water proof capability and to reduce air intake noise.

f. In order to increase the horsepower and radiation efficiency of the engine, a special type of aluminium cylinder is employed, to which a cast iron sleeve is bonded.

2. Disassembling and Reassembling the Engine

1. Tools for overhauling the engine

1) General tools

a. Point wrench

b. Open-end wrenches (9, 10, 11, 12, 14, 17, 19, 21)

c. Box wrench

d. Pliers

e. Pliers, needle nose

f. Pliers, circlip

g. Plug wrench

h. Phillips-head screw driver, large

i. Phillips-head screw driver, medium

j. Phillips-head screw driver, small

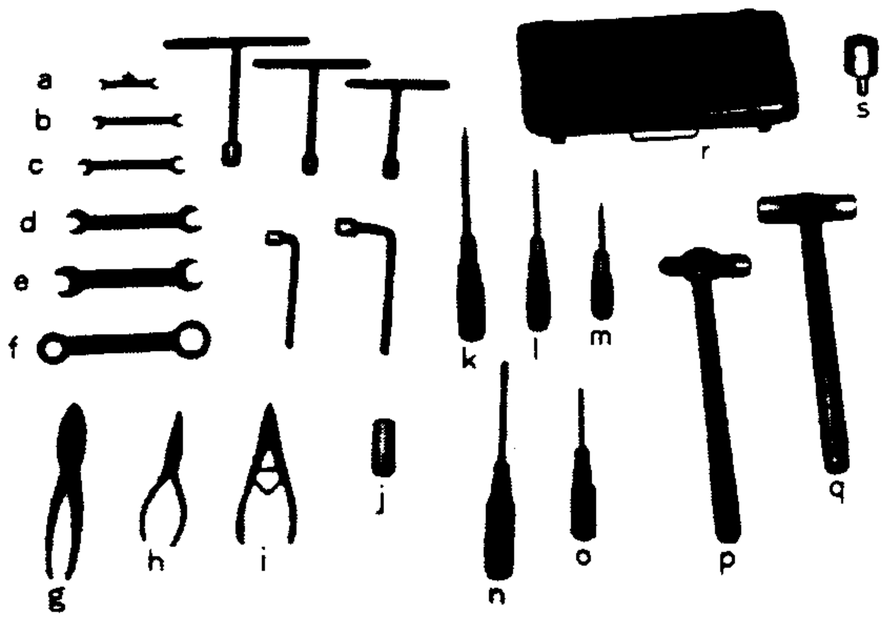
k. Slot-head screw driver, medium

l. Slot-head screw driver, small

m. Steel hammer

n. Soft faced hammer

o. Set of socket wrenches w/ handle (10 mm)



(Fig. 3—2)

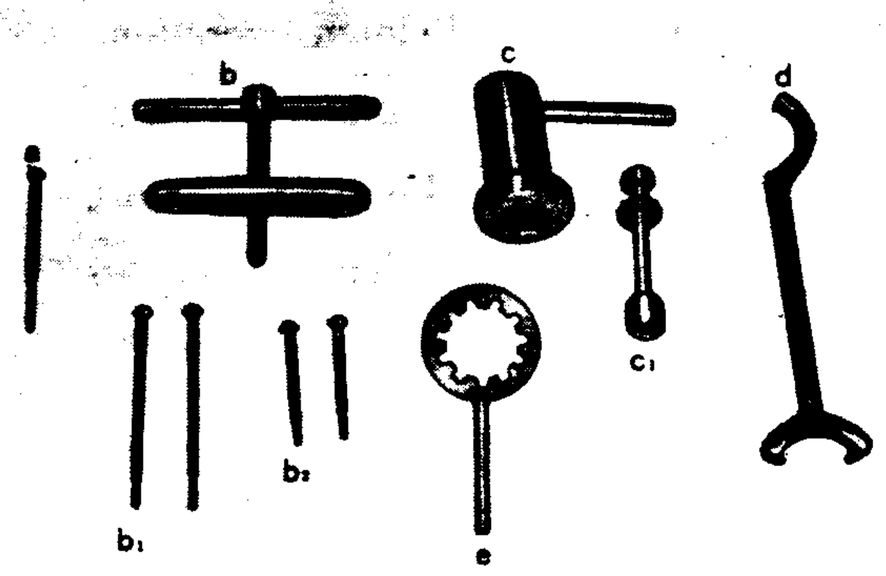
2) Special tools

a. Armature removing bolt (Mitsubishi-made)

b. Crankcase disassembly tool

c. Crankshaft installation tool

d. Ring nut wrench



(Fig. 3—3)

3) Miscellaneous

a. Parts tray

b. Oil pan

c. Oil cup

d. Rags

e. Oil can

f. gear oil

g. Grease

h. Sand paper

i. Engine stand



(Fig. 3—4)

A wooden box as shown in the above picture will facilitate engine disassembly and servicing. Expendable parts (such as gaskets) and replacement parts must also be on hand.

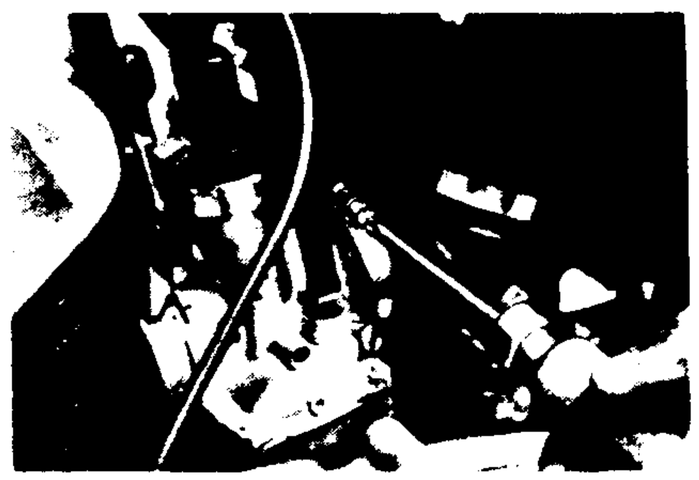
2. Engine Disassembly (Basic)

The engine should be disassembled in an orderly sequence to make your work easier and more efficient. The procedures outlined here are recommended.

a. Clean the dirt and dust from the engine.

b. Use clean tools properly, and take care not to damage ports.

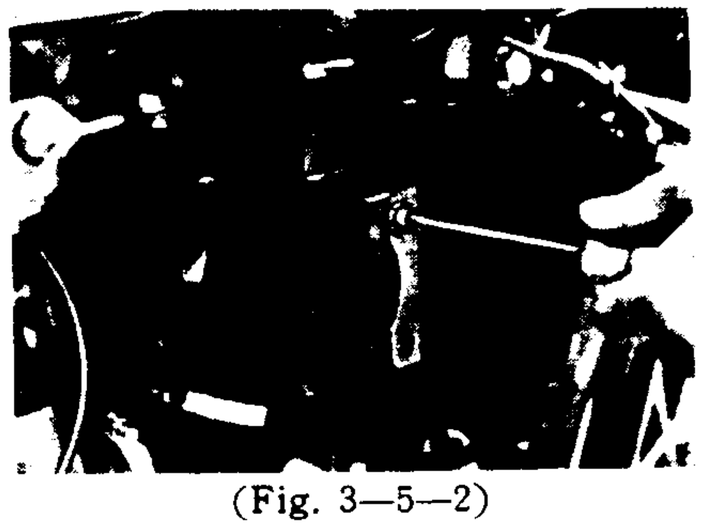
c. Put all removed parts in their respective parts trays so parts relationship will be maintained.


(Fig. 3—5—1)

2-1 Removal of the engine

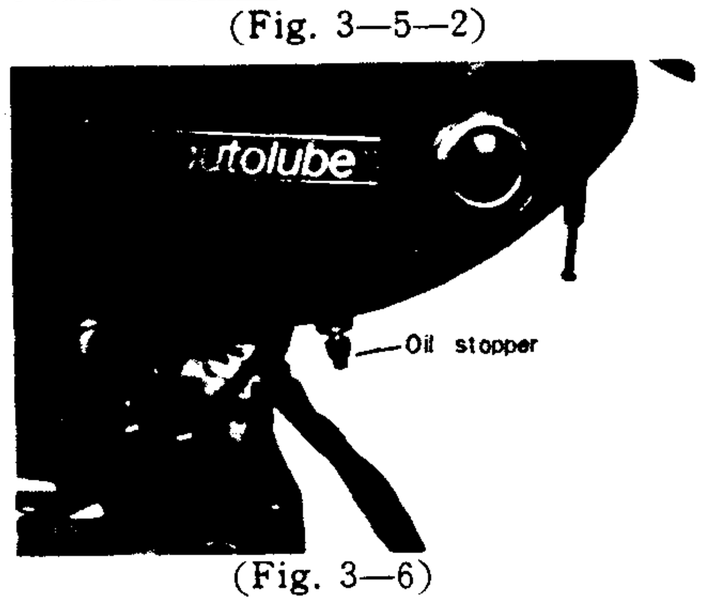
a. Disconnect the clutch cable from the handle lever.

b. Loosen the air cleaner joint band, remove the cleaner case set-screws, and remove the cleaner assembly. (Fig. 3—5—1～2)


(Fig. 3—5—2)

c. Remove the fuel pipe from the carburetor. Detach the throttle cable. Note: In most cases the throttle cable (s) may be left attached to the carburetor slides which are lifted from the carburetor body.

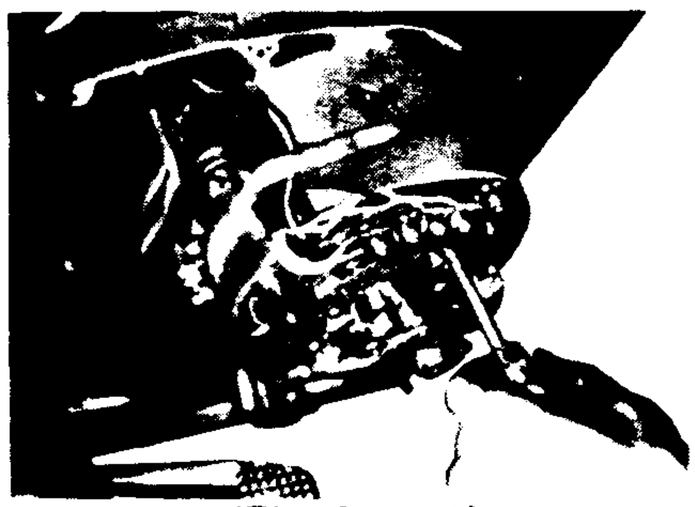
d. Remove the pump cable inside the oil pump from the adjustment pulley, and remove the cable adjuster.



(Fig. 3—6)

e. Remove the oil pipe from the union collar of the oil tank. A plug may be fashioned if the oil is to be left in the tank.

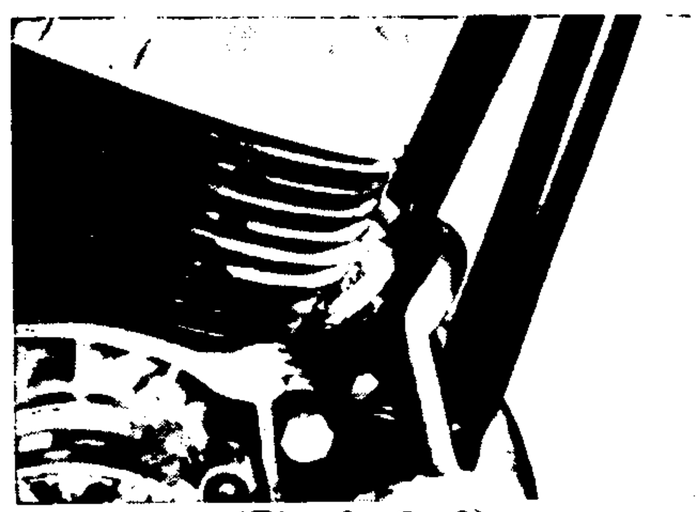
f. Detach the tachometer cable at the engine.


(Fig. 3—7—1)

g. Remove the crakcase cover R, and disconnect the dynamo wiring of the wire harness and the neutral switch connector. (Fig. 3—7—1)

h. Remove the exhaust pipe ring nut, (Fig. 3—7—2)

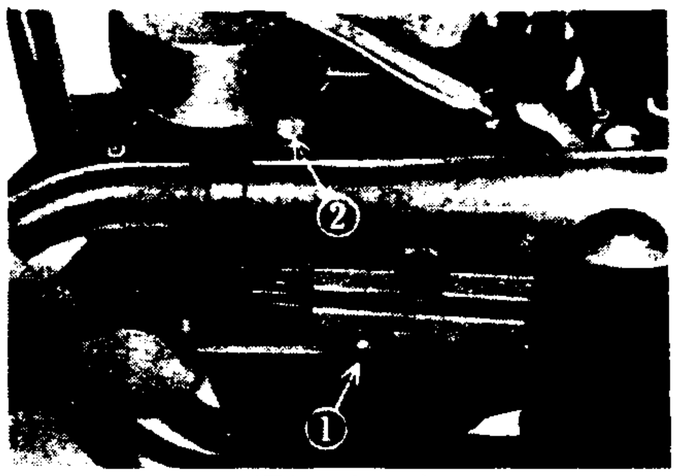
i. Remove the chain.


(Fig. 3—7—2)

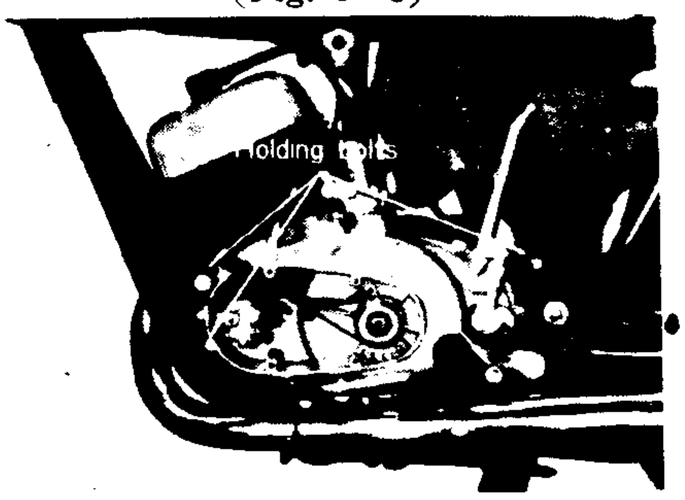
j. Drain the gear oil. (Fig. 3—8)

k. Remove the four engine holding bolts, (First remove the nuts on the left side of the engine, and pull out the bolts while raising the engine slightly.)

l. Remove the foot rest L. With this procedure, all preparations for engine removal are complete. (Fig. 3—9)



(Fig. 3—8)



(Fig.3—9)

Key points on engine removal :

Astride the seat, raise the engine with the left hand under the cylinder fins and, with the right hand holding the kick pedal, slide it rearward, then to the left side.

Keep the engine in a horizontal position this removal procedure.


(Fig.3—9—2)

2-2 Dynamo and drive sprocket

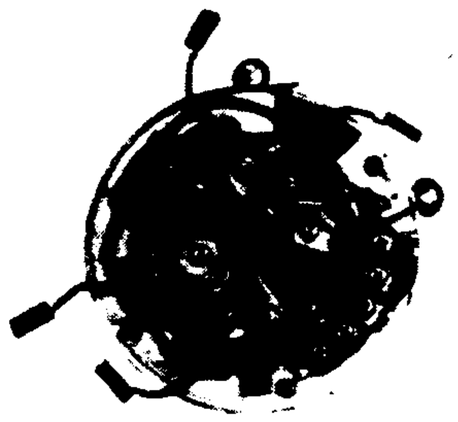
a. Remove the cam holding bolt, then the cam.

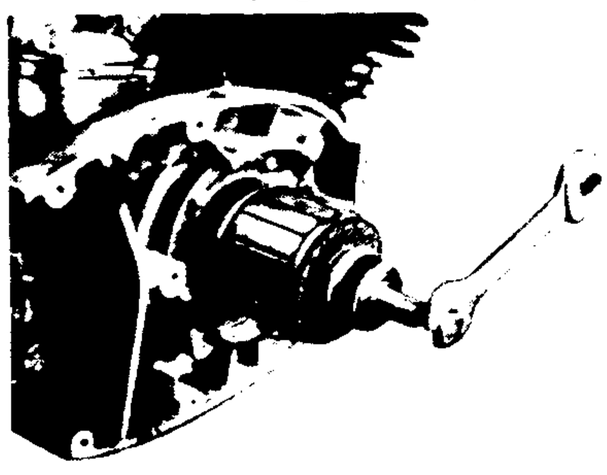
b. Remove the yoke assembly. Remove the brush spring from the brush, and withdraw the brush.

c. Remove the armature with the armature pulling bolt.

d. Pull out the crankshaft key. (Fig. 3—10)

e. Remove the drive sprocket. Place the transmission in 5 th gear and flatten the bent edge of the lock washer. Loosen the lock nut with a special wrench (32 mm) by tapping it with a steel hammer. (Fig. 3—11)


(Fig.3—10—1)


(Fig.3—10—2)

2-3 Crankcase cover (L) and primary reduction gear

a. Remove the kick crank change arm.

b. Remove the eight case cover holding bolts, and remove the case cover. (To detach the cover, tap it lightly with a soft hammer)

c. Unscrew the six clutch holding screws.

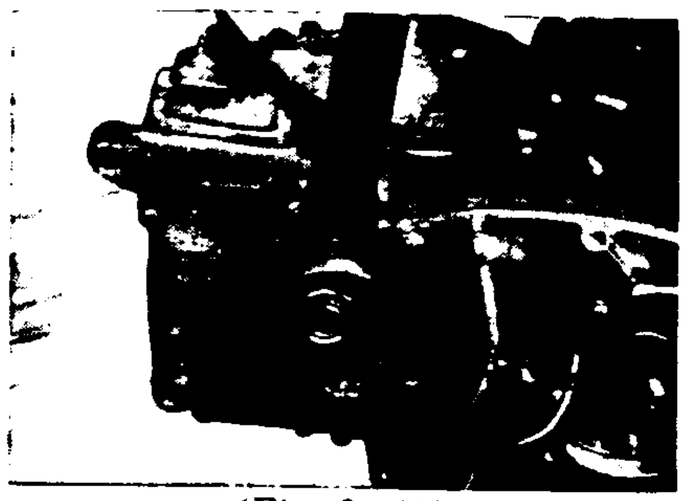
d. Insert a rag between the drive gear and the driven gear to prevent rotation. (the special YAMAHA holding tool can also used if available)

e. Remove the clutch lock (Fig.3—13)

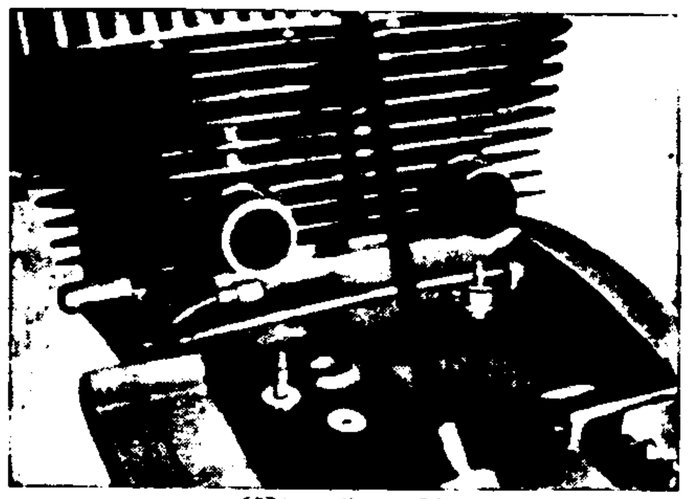
f. Remove the lock nuts of the pump drive gear and the primary pinion. (26 mm) (Fig.3—14)

Note :

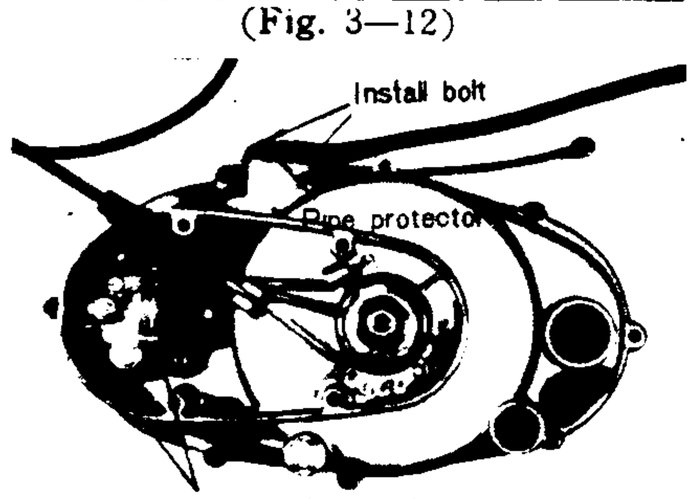
(All these procedures as specified above can be done before removing the engine if preferred.)



(Fig. 3—11)



(Fig. 3—12)



(Fig. 3—12—2)

2-4 Carburetor and oil pump

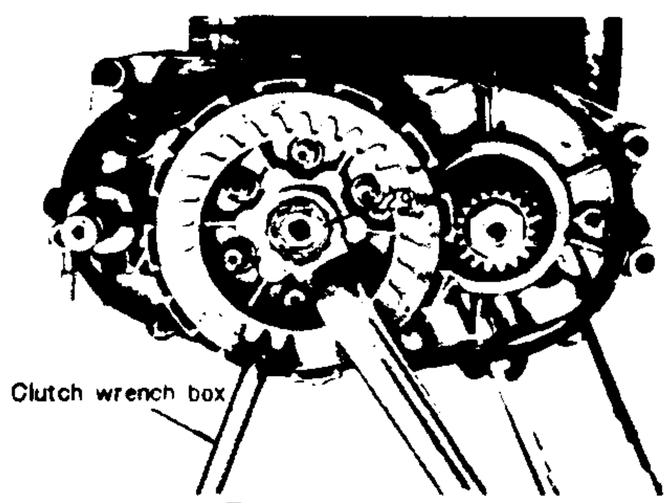
a. Remove the starter lever connecting rod, then remove the carburetor by unscrewing the carburetor set-screws.

b. Remove the banjo bolt B (oil discharge nozzle) located under the cylinder manifold. (Fig.3—12)

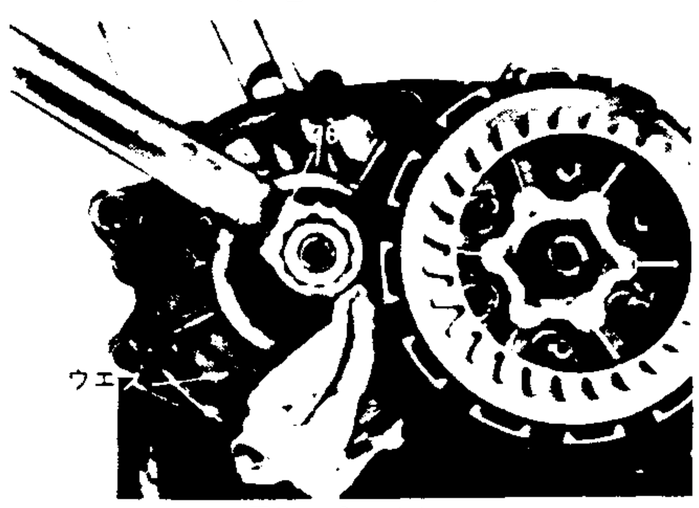
c. Remove the two grommets on top of the case cover.

d. Remove the two oil pump set-screws.

e. Pull the oil pipe toward you, and remove the oil pipe grommet. (Fig.3—43), Then, remove the pump assembly by pulling it slowly toward you.



(Fig. 3—13)



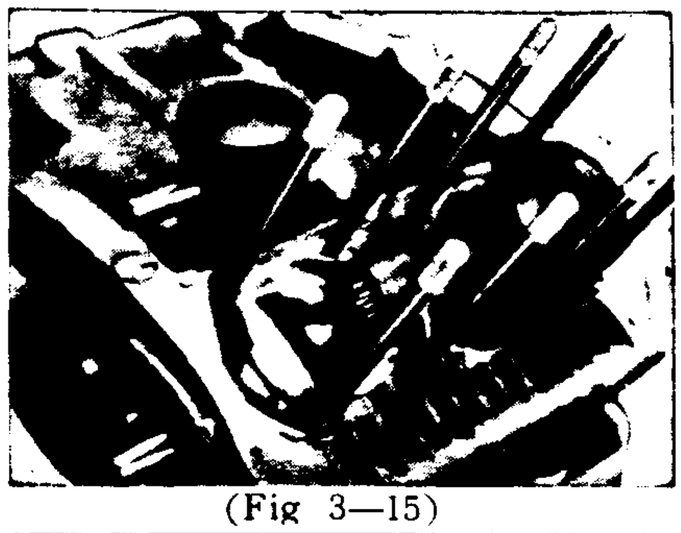
(Fig. 3—14)

2-5 Cylinder head, cylinder and piston

a. Remove the cylinder head.

b. Remove the cylinder.

c. Remove the piston pin circlip, pull out the piston pin, and remove the piston. At the same time, remove the small end bearing. (Fig.3—15)



(Fig 3—15)

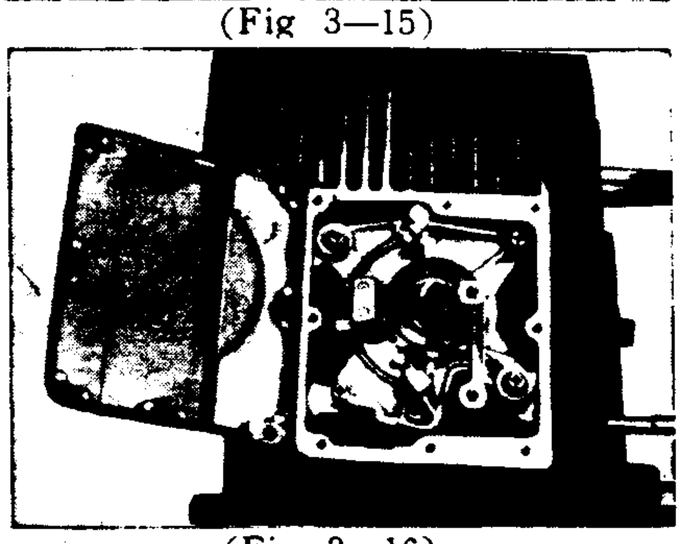
2-6 Shifter

a. Remove the shifter cover, (Fig.3—16)

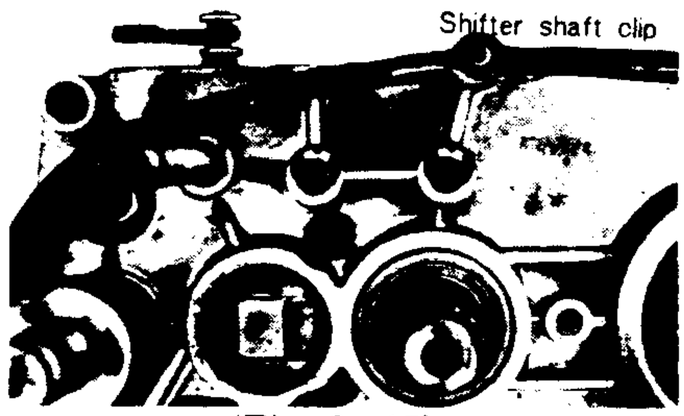
b. Disconnect both the change link and change lever.

c. Disconnect the shifter cam assembly.

d. Remove the shifter shaft circlip, and pull out the shifter shaft. Remove the shift fork. (When removing the shifter shaft circlips, remove the one on the external side of the case, then press the shaft inward.) Next, remove the other circlip on the inner side of the case. (Figs.3—17, 3—39, and 3—38)



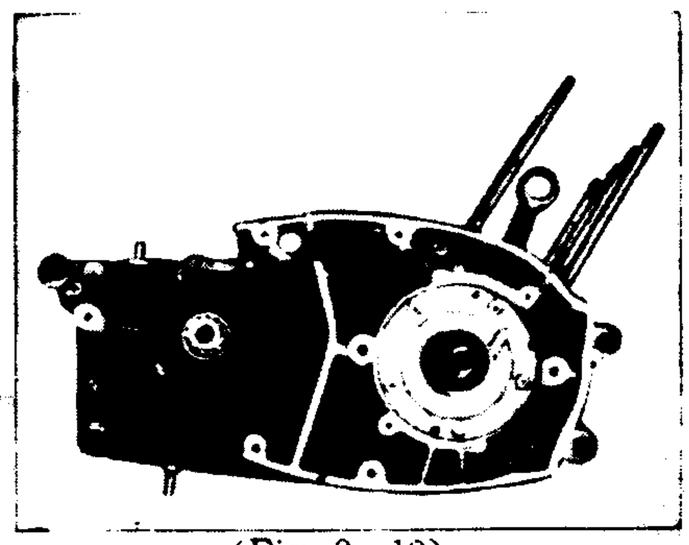
(Fig. 3—16)



(Fig. 3—17)

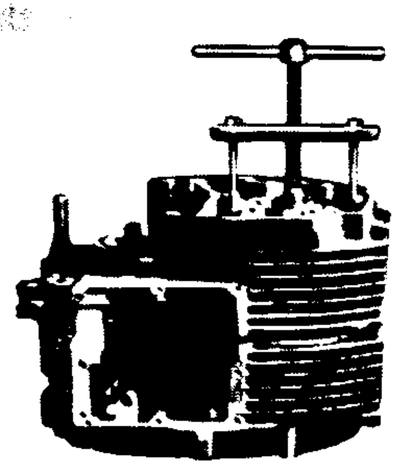
2-7 Splitting the crankcase

a. Remove the twelve clamp screws on the crankcase R. (Loosen these bolts one by one alternately on both sides of the crankcase and the transmission.) (Figs.3-18) Note that two of these bolts are provided with a rubber cap.



(Fig 3—18)

b. Split the case R from the case L with the crankcase disassembly tool. (Fig.3—20)



(Fig. 3—19)

1. Fully tighten the bolts attached to the special tool and maintain the tool bodv in a parallel position.
2. Turn the handle of the tool while keeping the connecting rod in the top dead center position so that it does not thrust against the case.
8. When splitting the crankcase, use a plastic-head hammer. Tap lightly the tool on the crankcase side and the drive shaft. Work the cases apart evenly to avoid binding and possible damage to components.

2-8 Crank and transmission

a. Remove the oil bucket from the drive axle. Next, remove the transmission assembly by tapping both driving and main axles alternately with a plastic-head hammer. (Fig.3—21)

b. Press out the crank assembly with the crankcase disassembly tool (with shorter bolts). (Fig.3—22)
Turn the handle of the tool, while keeping the connecting rod in the top dead center position, so that it will not thrust against the case. With this procedure, disassembly of the major parts is completed.

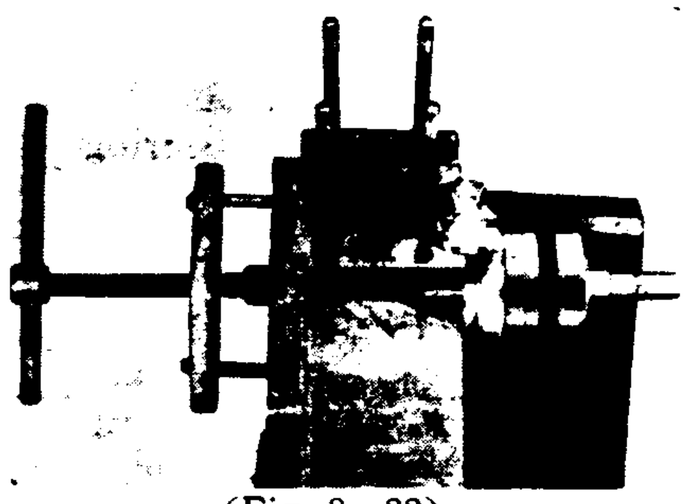
2-9 Components of the crankcase L

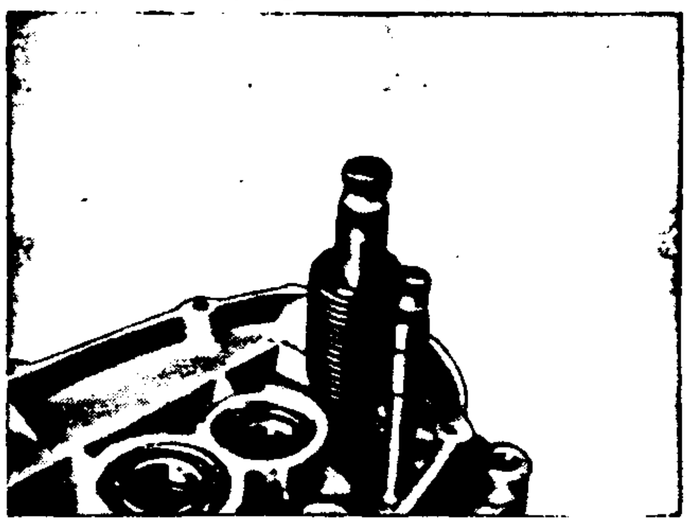
a. Remove the gear unit assembly.

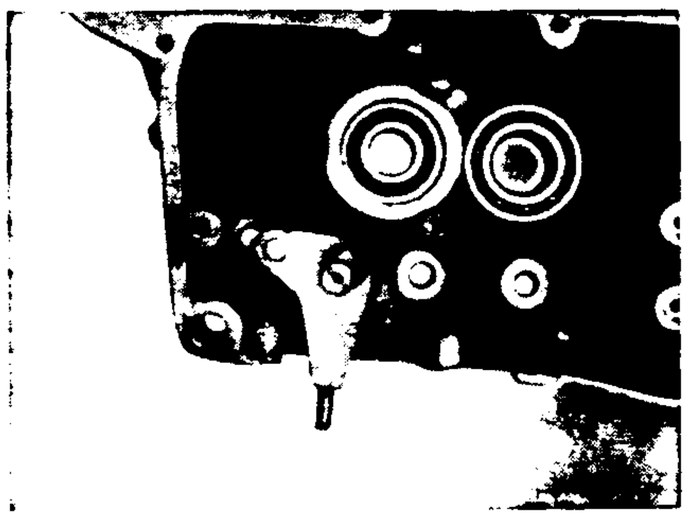
b. Remove the kick shaft assembly. (Fig.3—23)
Unhook the kick spring from the kick shaft for removal.
After removing the kick shaft clip, slide the kick shaft assembly toward the inside of the case.

c. Remove the change shaft assembly. (Fig.3—24)
To pull out the change shaft, remove the change lever clip.


(Fig. 3—21)


(Fig. 3—22)


(Fig. 3—23)


(Fig. 3—24)

2-10 **Remove the bearings, oil seals, and clips from the crankcase R and L.**

a. Remove the oil seals utilizing a flat washer, seal remover, or socket of the proper size. (Exercize care not to damage the seal if it is used again.)



(Fig. 3—25)

b. Removing the clip Remove the clip with a clip pliers.

c. Removing the bearing.

1. Pull out the bearing from the outer side of the crankcase toward the inside.
2. Press out the bearings, located in to rows, toward the outsides, respectively. For this procedure, use a small tube and tap it with a steel hammer. (Note: Perform this operation on a flat stand with special care so that the mating surface of the case will not be damaged.)

(Fig. 3—25)

3. Assembly (Basic)

For assembly, reverse the sequence of disassembly as outlined above.

a. Thoroughly clean all component parts and check them for wear and damage. Repair or replace defective parts. (For checking bearings, oil seals, and clips, refer to page.)

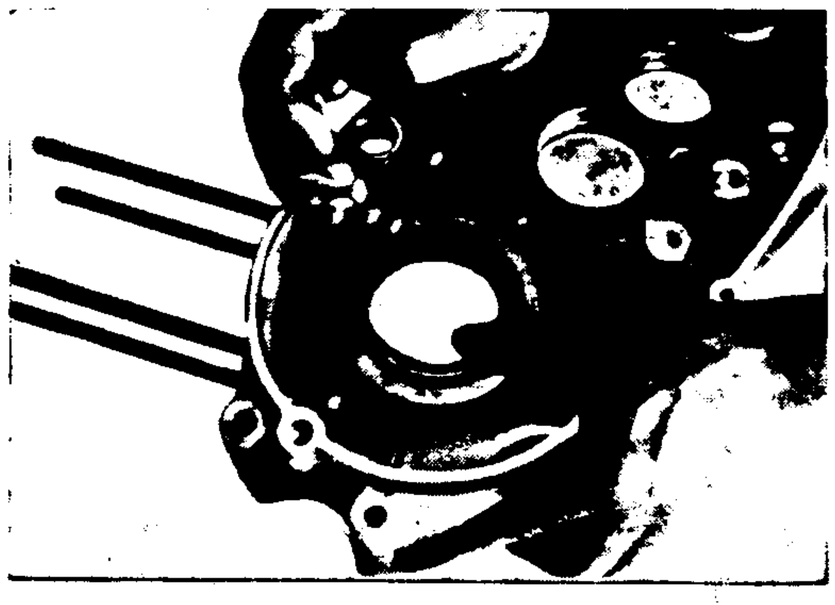
b. Check the mating surfaces of the crankcases R and L, the case R and the case cover R, and the shifter cover and the case (R & L) for flaws, scratches, or burrs. Repair with the use of a surface plate and compound if necessary.

c. Always use new packings, gaskets, O rings, etc. for repairs. To obtain complete sealing apply a gasket compound (non-hardening).

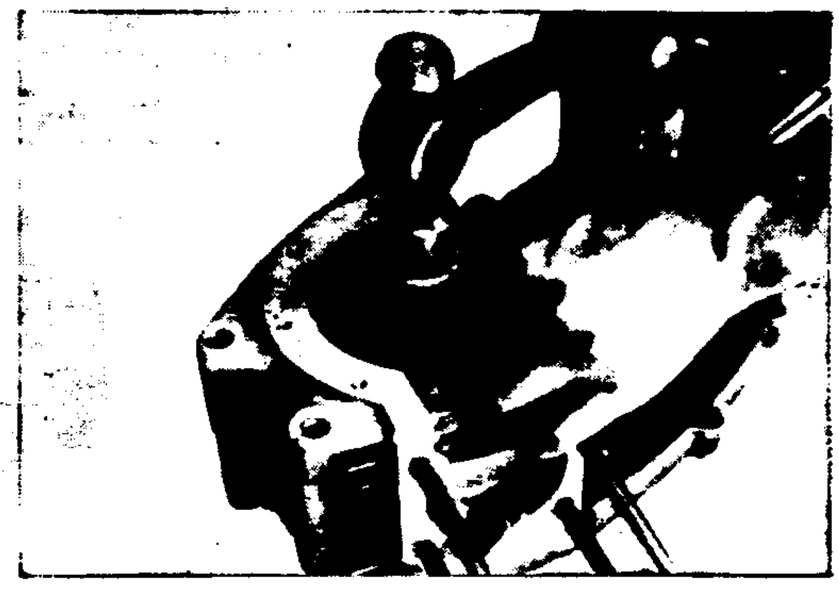
3-1 Assembling the crankcases R and L

a. Installing bearings, oil seals, and clips

1. If possible, heat the crankcase up to 100°~120°C before pressing the bearing into the case.
2. If circumstances do not allow the heating operation, take care to align the bearing, and install it with a press or hammer.



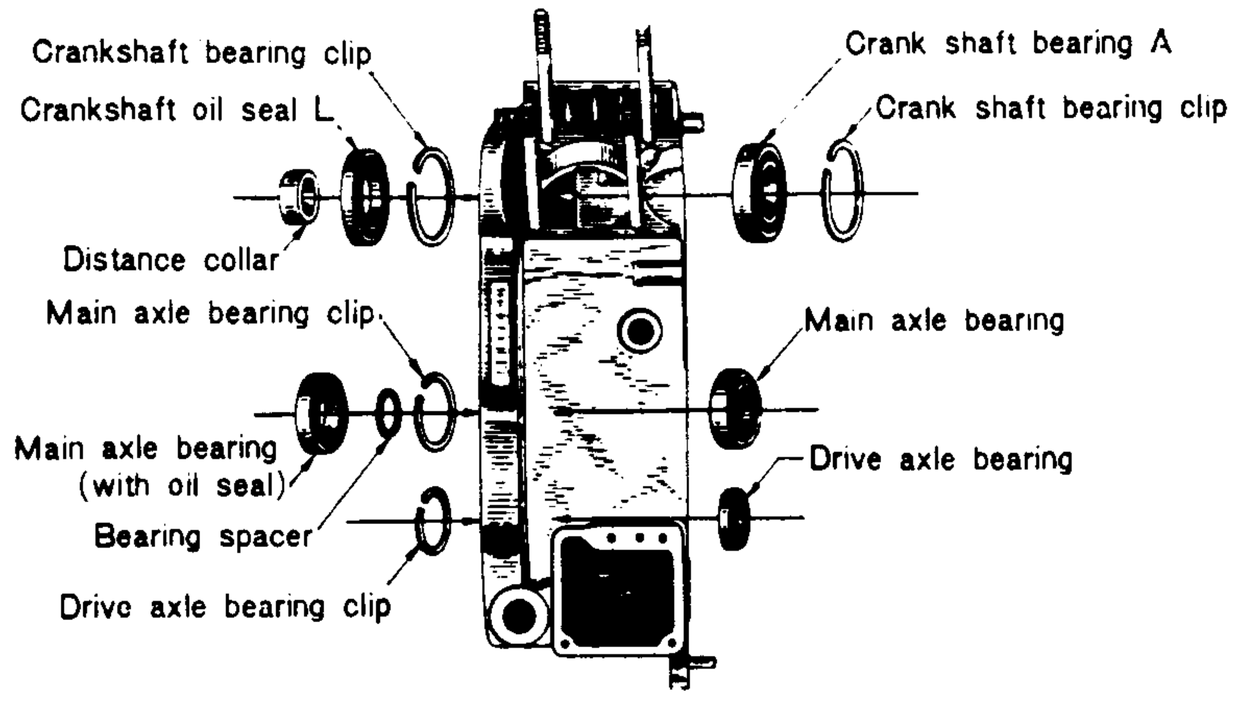
(Fig. 3–26)



(Fig. 3—25)

Crankcase L

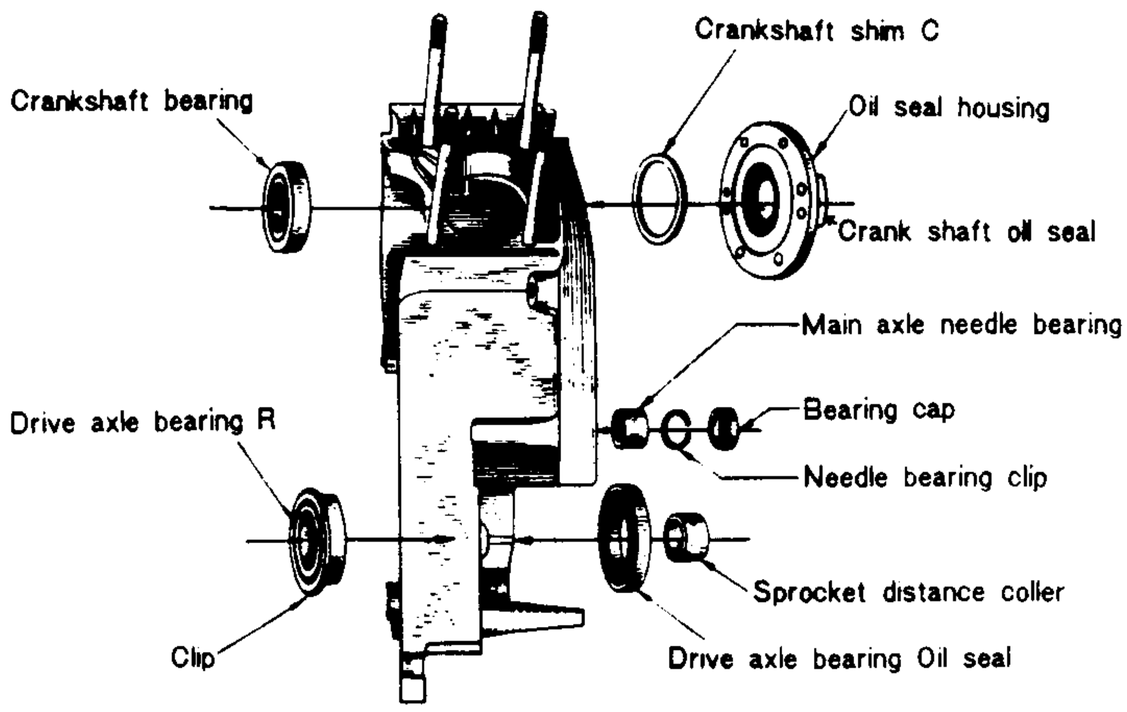
Remarks
With the marked surface inside, the case, press the bearing until it contacts the clip.
With the marked surface outside, press the bearing until it contacts the clip.
With the marked surface inside, press the bearing until it contacts the lip in the center.
With the marked surface on the outside, press the bearing until it contacts the clip.



(Fig. 3—27)

Crankcase R

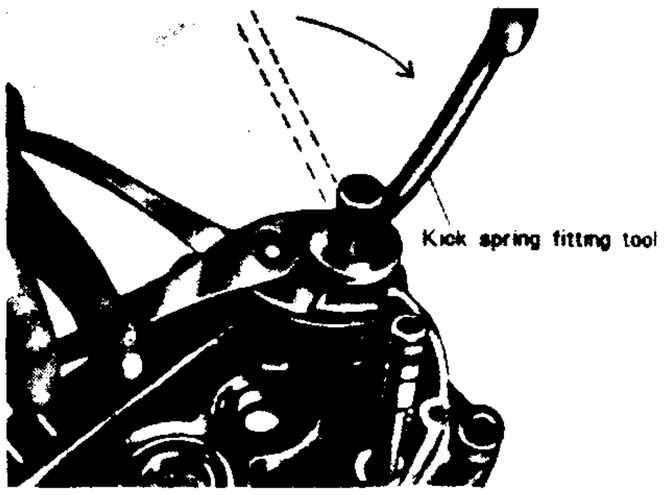
Remarks
With the marked surface inside, press the bearing until it reaches the same level as the inner surface of the crankcase.
Press the oil seal into the oil seal housing until it reaches the same level as the inner surface of the housing, and install the resultant assembly in the crankcase together with the crankshaft shim C.
Press the bearing into the case from inside until it contacts the clip.
Press the bearing until the clip contacts the case. With the marked surface outside, press the oil seal until it contacts the bearing.



(Fig. 3—28)

b. Apply grease to the oil seal lip, then a small quantity of motor oil to the cleaned crankcase bearing.

c. Install the kick shaft and change shaft in the crankcase L. (Fig. 3—29)



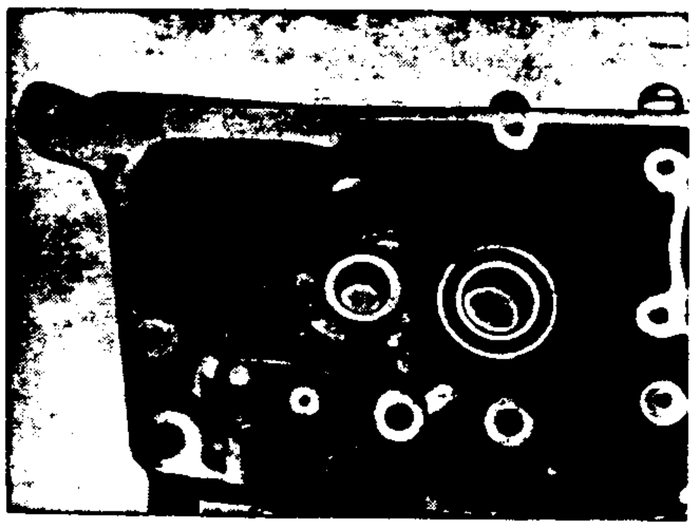
(Fig. 3—29)

1. Install the kick shaft assembly (with kick gear) and secure it with a clip.
2. Insert the kick spring, and turn it with the kick spring fitting tool, then hook it in the kcikshaft spring hole.
3. Install the kick spring retainer.
4. Insert the change shaft into the case from its inner side and install the return spring change lever, then secure it with a clip.

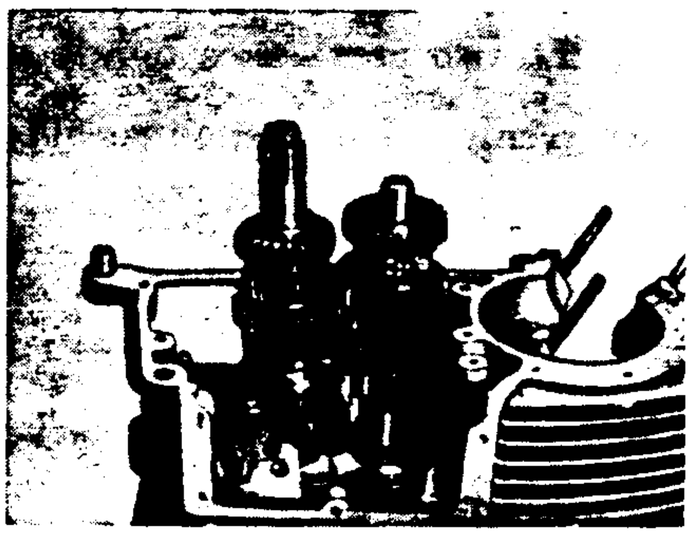
3-2 Installing the transmission and crankcase assemblies.

a. Installing the transmission assembly.

1. Install the washers in a correct manner.
2. Engage the kick pinion with the kick gear.
3. Install the main axle assembly by tapping it with a hammer.
4. Install the drive axle assembly, meshing it with each gear of the main axle.
5. Install both axles by tapping with a plastic-head hammer alternately, meanwhile meshing gears correctly.



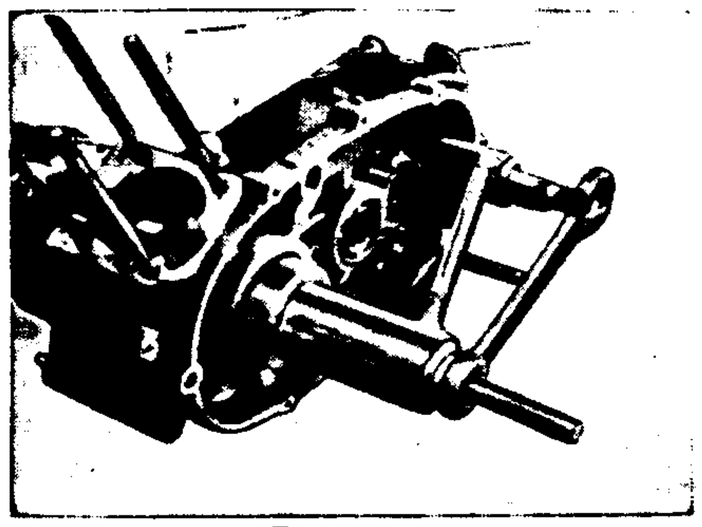
(Fig. 3—30)



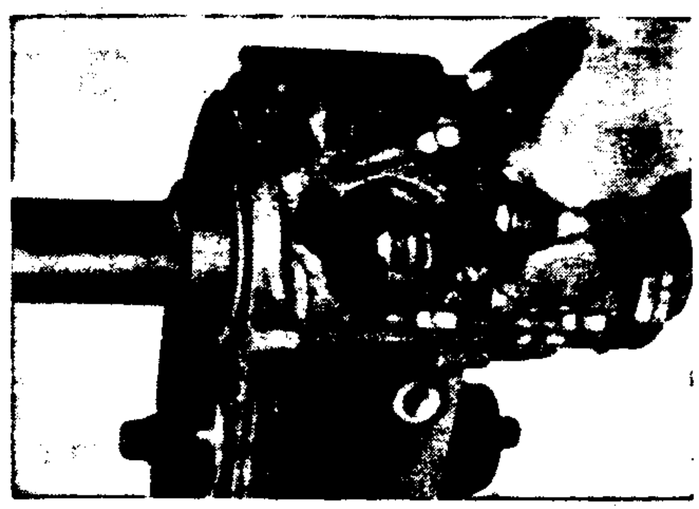
(Fig. 3—31)

b. Installing the crank assembly

1. Insert the crank assembly into the case from its inner side and install the crank mounting tool on the outside. (Use the crank shaft shims A and B.)
2. Turn the nut of the tool, and pull the crankshaft into the case with the center filler block facing upward. Hold the block to prevent it from rotating. Then pull the crank all the way into the case taking care so as not to let the crank scrape on the case. (Fig.3—32)
3. Loosen the nut and remove the tool when the crank is firmly bottomed against the bearing.
4. Apply gasket compound to the crankcover filler metal gasket.



(Fig. 3—32)



(Fig. 3—33)

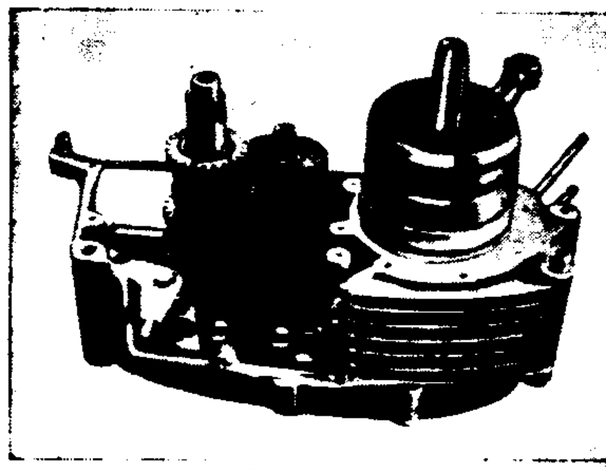
3-3 Assembling the crankcases R and L

a. Apply gasket compound to the mating surface of the crankcase L and the crank cover filler metal gasket.

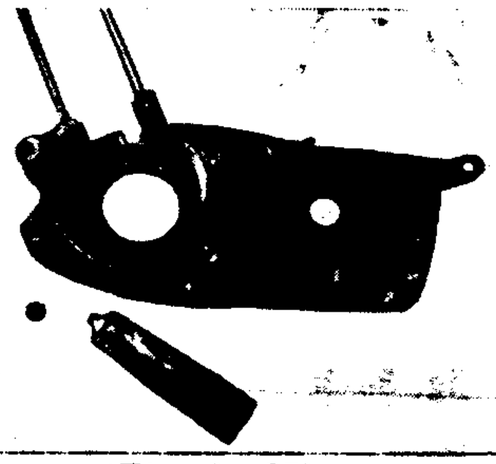
b. Apply gasket compound evenly to the mating surface of the crankcase R.

c. Place the crankcase R on the crankcase L and put these two together by tapping them with a plastic-head hammer. (Strike both crank and transmission sides alternately with the hammer so that they will join parallel with each other. Make sure that the filler metal gasket is positioned properly during assembly.

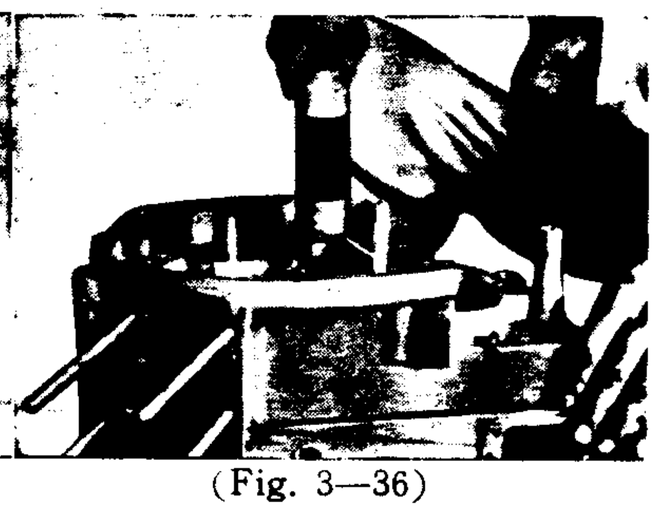
d. Clamp the two crankcases tightly with the 12 clamping screws. First, lightly tighten screws evenly. Then retighten alternately on the top and bottom sides of the crankcase.



(Fig. 3—34)



(Fig. 3—35)



(Fig. 3—36)

3-4 Installing the shifter

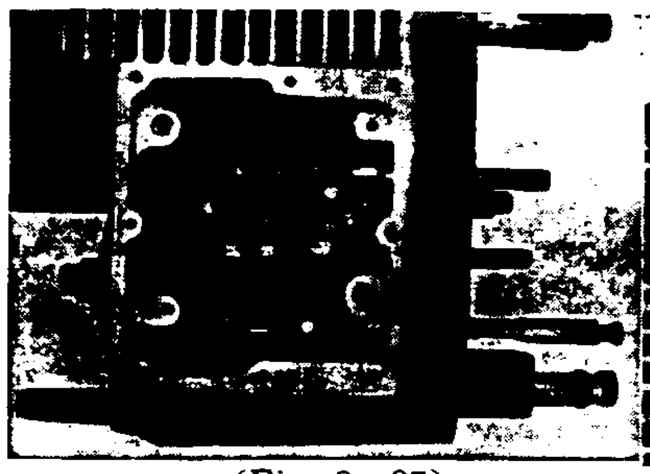
a. Install the three shift forks on their respective transmission gears, and insert the shifter shaft. Then secure the forks with clips, first on the inside and then on the outside (Figs. 3—39 and 3—18)

b. Move each shift fork and set the transmission in the neutral position.

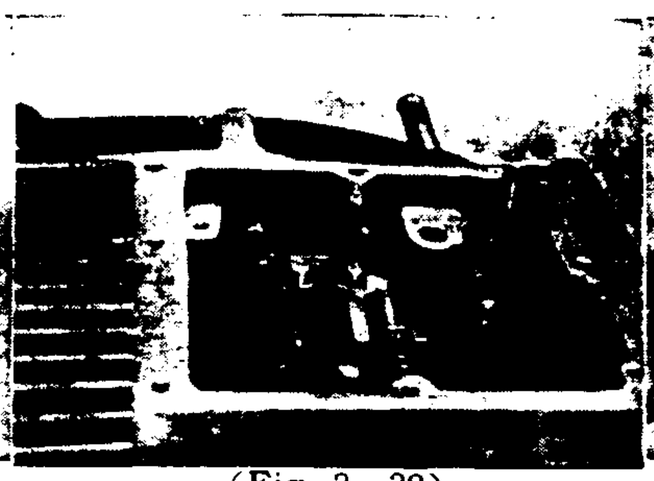
c. Install the shifter cam assembly.

d. Install the change link and check the shifting. Install the change pedal and by turning the driving axle, test the gear shifting. If the gears will not shift correctly, adiust the stopper adjustment bolt. (Refer to page .)

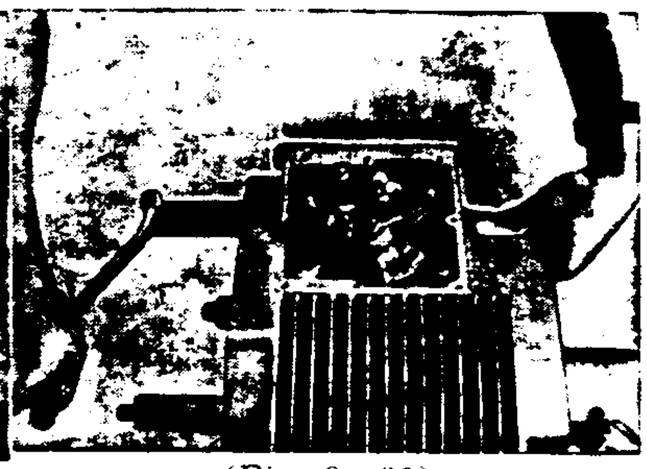
e. Install the shifter cover together with the shifter cover packing (Apply gasket compound)



(Fig. 3—37)



(Fig. 3—38)



(Fig. 3—39)

3-5 Installing the piston, cylinder, and cylinder head

a. Install the needle bearing in the small end of the connecting rod and carefully install the piston and piston pin. Secure the pin with the piston pin clip.

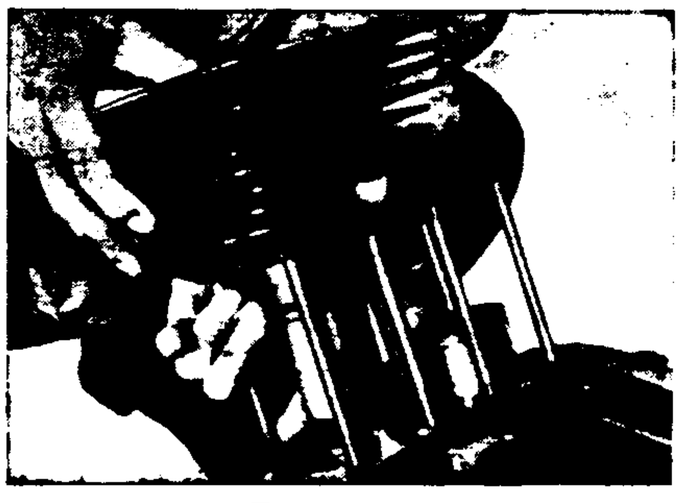
1. Always watch that parts are not accidentally dropped into the crankcase.
2. Install the cylinder base gasket.
3. Oil the rings lightly

b. Insert the piston into the cylinder, being careful to fit the rings correctly in the ring groove with relation to the set-pin. Do not use undue force as ring breakage may result.

1. Install the cylinder head gasket.

c. Install the cylinder head.

1. Tighten all nuts evenly.
2. Install the spark plug.



(Fig. 3—40)

3-6 Installing the primary reduction gear and C/C cover L.

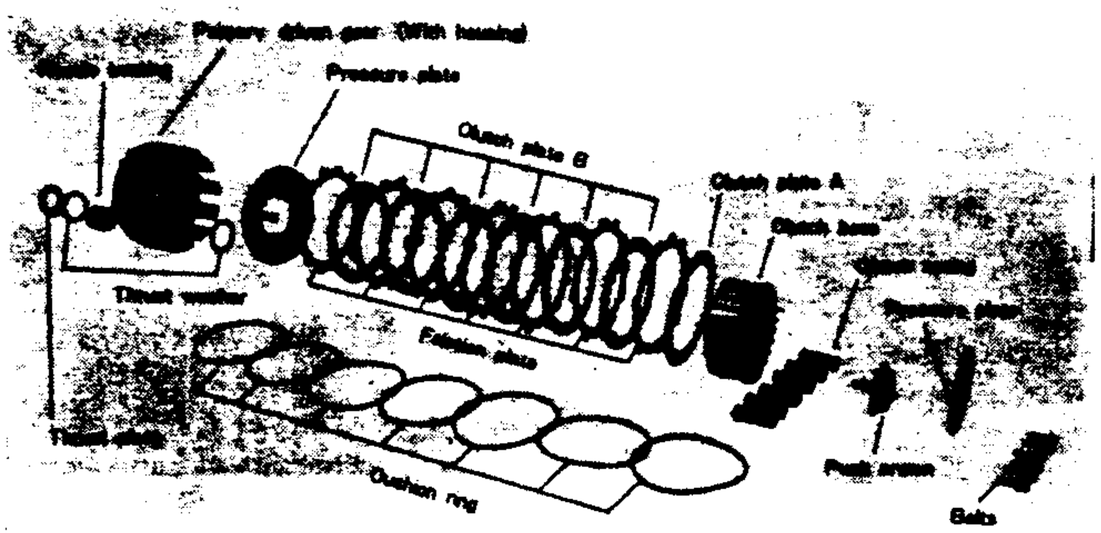
a. Install the primary drive gear and the pump idle gear on the crankshaft L, and temporarily tighten the lock nut (Apply grease to the oil seal lip.)

b. Install the thrust plate, needle bearing, inner collar, and thrust washer, in proper sequence, on the main axle. Install the primary driven gear (a part of the housing unit) and the thrust washer.

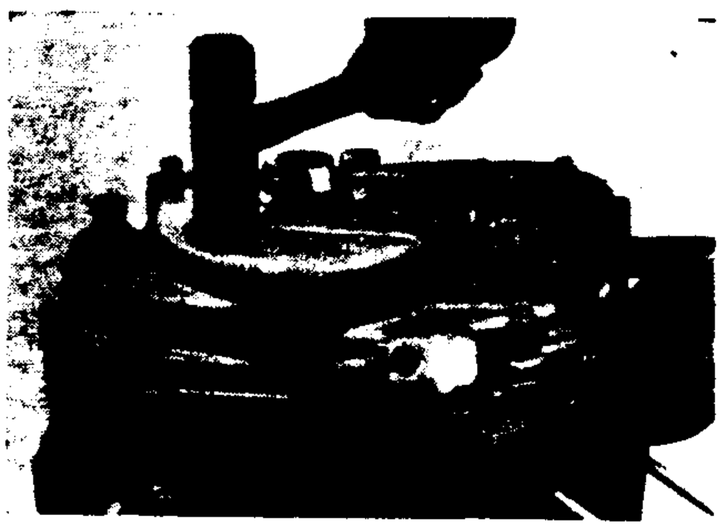
c. Install the clutch plate A, cushion ring, friction plate, and clutch plate B, in proper sequence, on the clutch boss. Install the pressure plate A. (Note that there are alignment markings on both clutch boss and pressure plate A.)

d. Install the assembly in the housing and secure it with a lock nut (29 mm).

e. Fit the six clutch springs in the clutch boss, and place the pressure plate B on them. Secure the plate to the boss with set-screws. Install the push crown on the pressure plate.



(Fig. 3—41)



(Fig. 3—42)

f. Put a rag between the primary driven gear and the drive gear, and tighten the drive gear lock nut (26 mm). (The special YAMAHA holding tool may be used if available.)

g. Place the case cover gasket between the housing and the case, and bolt the case to the housing.

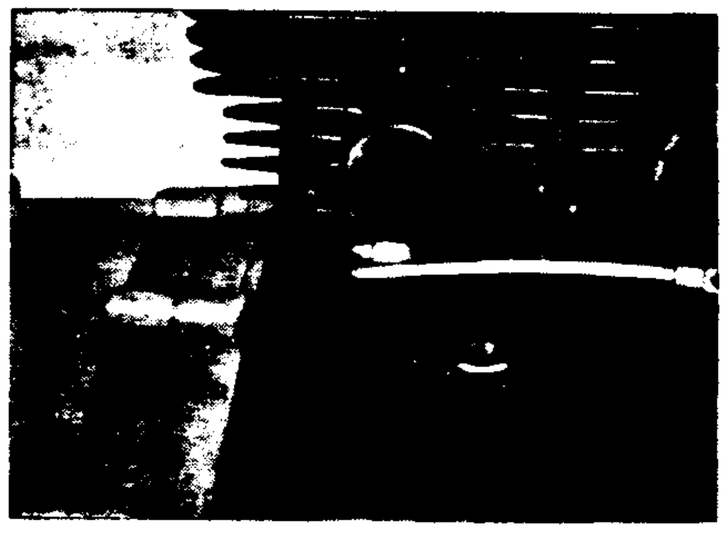
3-7 Installing the oil pump

a. Apply gasket compound to the pump gasket and install it on the pump assembly. Apply the compound also to the surface of the gasket which contacts the case cover.

b. Insert the delivery pipe into the hole on the case and install the pump assembly. (Fig 8-12)

c. Insert the oil pipe into the hole, position the two delivery pipes and the oil pipe, and secure them to the pump assembly with the grommet. (Fig. 3-43)

d. Secure the delivery pipe to the cylinder with the banjo bolt. (Put the deliver pipe through the banjo gasket B) (Fig. 3-12)



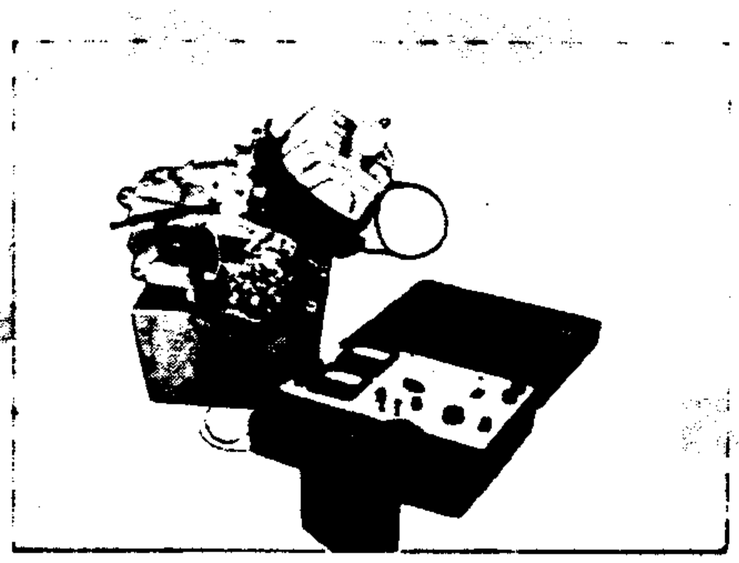
(Fig. 3—43)

3-8 Installing the carburetors, sprocket, and dynamo.

a. Install the carburetors R and L, and connect the starter lever to them. (Be sure the starter jets are fully closed when installation is completed.)

b. Install the drive sprocket using cloth and secure the sprocket with lock washer and lock nut. (Fig. 3-11)

c. Shift the transmission to low gear. Hold the lock nut with a special wrench. Tighten the nut by hitting the handle of the wrench with a



(Fig. 3—44)

hammer.

d. Installing the dynamo assembly.
   1. Insert the crank shaft key, and install the armature.
   2. Secure the yoke assembly with the mounting bolt.
      Mount the cam and secure it with a 7 mmϕ bolt.
   3. Hook the brush spring on the brush.

e. Set ignition timing. (Refer to page.)
   1. 1.8 mm before top dead center. (The procedure, as specified in 3-9 may be performed after the engine in mounted on the frame.

3-9 Installing the engine and related parts.

a. For installing the engine, reverse the removal sequence.
   1. Install the kick arm, and temporarily rest the engine on the left side of the frame.
   2. Sitting astride the frame, raise the engine and slide it rearward. Move the engine to the right side and position it in the center, then lower it by sliding it forward.
   3. Secure the engine to the frame with the four engine mounting bolts.

b. Place the gasket under the exhaust pipe ring nut, and tighten the nut.

c. Install the chain and adjust it to the correct tension.

d. Install the wiring on the dynamo, and attach the neutral switch connector to the proper wire.

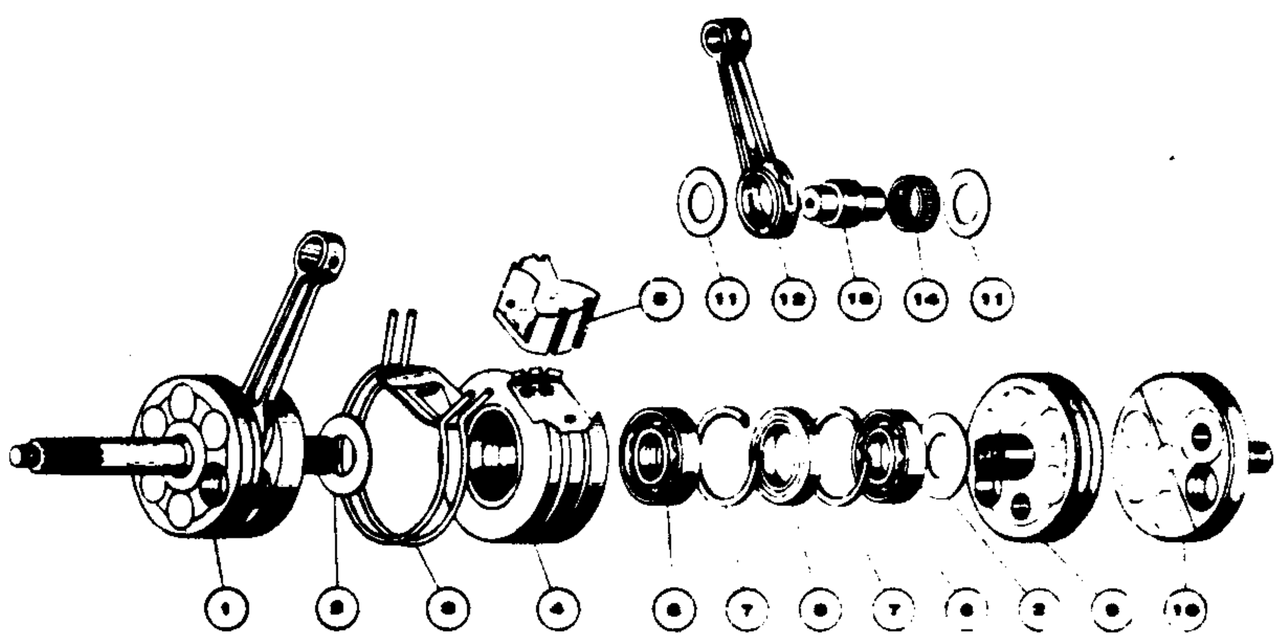
e. Connect the oil pipe with the union bolt.

f. Connect the tachometer cable to the gear unit.

g. Connect the fuel pipe to the carburetor. Complete the installation of the throttle cables at the carburetor.

h. Connect the pump cable to the adjustment pulley through the case cover hole. (Fig. 3-48)

i. Install the air cleaner assembly.



1 Crank (L) Assembly
2 Crank shaft shim D (30 - 44 - 0.5)
3 Filler metal gasket
4 Crank cover
5 Filler metal
6 Crank shaft bearing B (6206)
7 Crank shaft bearing clip
8 Crank shaft oil seal C SW30--62 10
9 Crank shaft (L)
10 Crank shaft (R)
11 Crank pin shim
12 Connecting rod
13 Crank pin
14 Connecting rod large end bearing

(Fig. 3—45)

j. Connect the clutch cable to the handle lever.

1. Adjust the play of the clutch cable with the adjusting screw. (Refer to page.)

k. Fill the transmission with gear oil. (1600cc of 10W/30 or 20W/40)

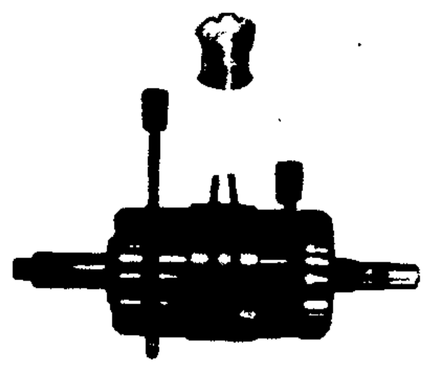
l. Bleed the oil system (Refer to Bleeding on page.) After starting the engine, adjust the idle to approximately 1,000 rpm. Warm up the engine at 2,000—3,000 rpm for three minutes while checking the oil pump, clutch and gear shifting condition. Make sure that both throttle cable and pump cable are in good working condition and that the throttle valve and adjustment pulley are properly syncronized.

3. General Description of Mechanism

1. Crank Assembly

The crank assembly consists of many individual components, each of which required special machining, grinding and polishing. The rigidity and alignment of the assembly is determined by the condition of cach of those parts. Therefore, special care should be exercised when handling component parts transmssion. (Fig. 3—45)

1-1 Crank Component Parts

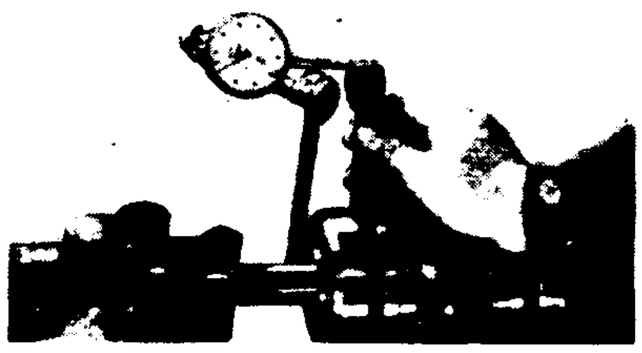


(Fig. 3—46)

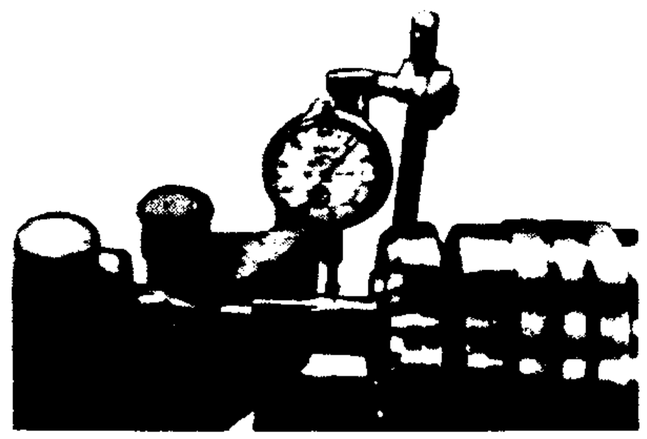
Checking and Servicing

a. Checking the crank assembly

Check the fit of the piston pin bearing and the piston pin	Check whether the piston pin can be pressed in smoothly.	Replace the needle roller piston pin when the fit is too loose
Check connecting rod axial play at the small end (to determine the amount of wear in the big end, crank pin, and bearing	Small end play should not exceed 2mm. Move the connecting rod to TDC & measure the small end deflectian with a dial gauge.	If small end play exceeds 2mm, disassemble the crankshaft, check the connecting rod, crank pin, and big end bearing for wear or other defects. Replace worn parts. After reassembly, small end play should be within 0.8–1.0mm.
Check the connecting rod for big end axial play.	Pry the connecting rod to one side & insert a feeler gauge between the edge of the big end & the crank web. Big end axial play should be within 0.1–0.3mm.	If the play is excessive, disassemble the crank and replace worn parts.
Check the crankshaft for run-out the six points shown in the diagram below.	Dial indicator reading at each point of measurement should not exceed 1. 0.03mm 2. 0.06mm 3. 0.06mm 4. 0.06mm 5. 0.06mm 6. 0.03mm	If run-out exceeds the limits, correct it by striking the flywheel with a special hammer.



(Fig. 3—47)



(Fig. 3—48)

b. Crankshaft component inspection :

• Crank pin

Flaws on the roller raceway·····Replace.

Wear is more than 0.05 mm ·····Replace.

Standard diameter ·····24ϕ+0.013

• Connecting rod (big end)

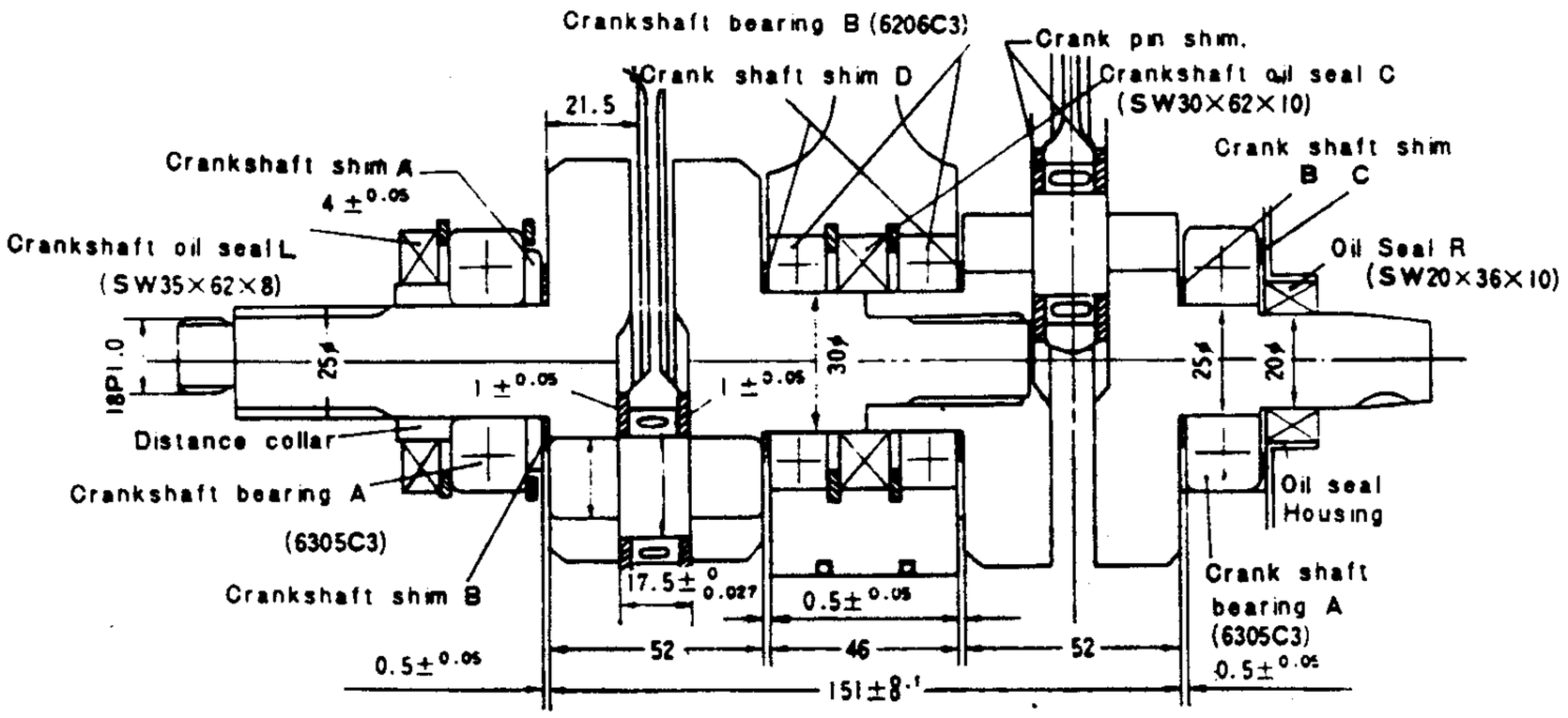
Flaws on the roller raceway·····Replace.

Wear is more than 0.05 mm ·····Replace.

Standard diameter ·····24ϕ+0.013

Note : If the play of the connecting rod small or big end is excessive, or the noise is excessive due to worn parts, replace the crank pin, connecting rod, needle bearing and crank pin shims at the same time.

c. Dimensions of the crankshaft assembly :

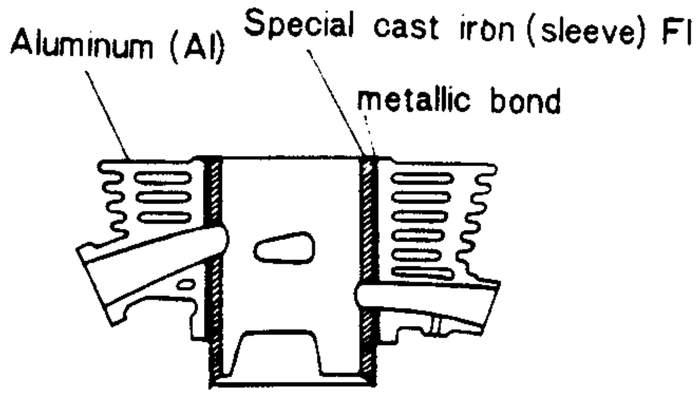


(Fig. 3—49)

2. Cylinder, Piston and Piston Rings :

The cylinder incorporates a special cast iron sleeve which is bonded to the aluminum cylinder barrel by menas of a special method called the "metallic bond process." As a result, all problems found with conventional aluminum cylinders have been completely

solved, e. g., separation of the cast iron sleeve from the aluminum cylinder due to the difference in expansion coefficient between these two metals and related overheating problems. The piston ring is similar in type to that of the YDS3 (YM1). Handle it with special care because it is a precision part.



(Fig. 3—50—1)

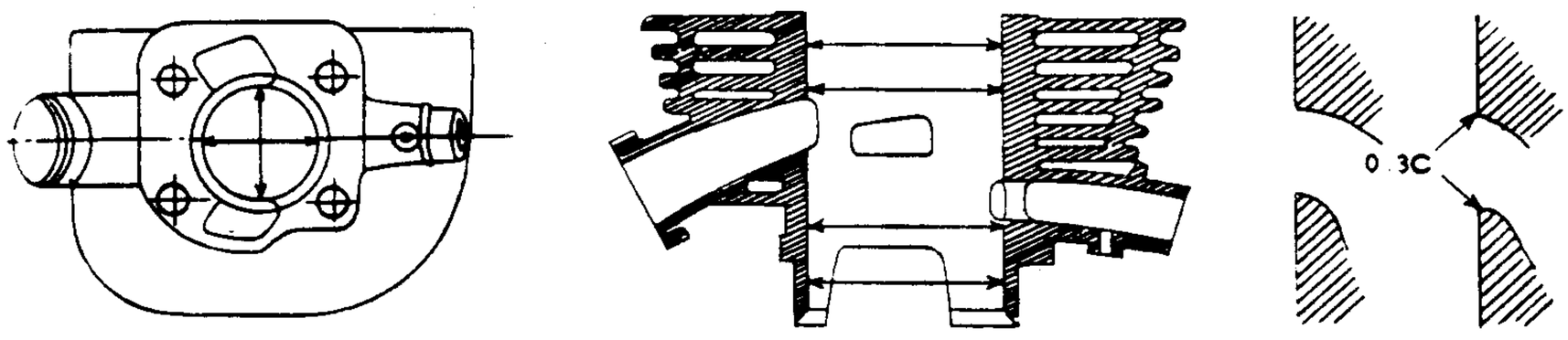
2-1. Checking and Servicing :

Checking and servicing should be carried out in the following manner : When engine output decreases and/or engine noise becomes excessive, service intervals vary according to the quality of oil and fuel as well as to running load and speed conditions. Periodic checking and servicing, such as carbon deposit, removal and air cleaner servicing, reduce the wear of parts. This will assure a longer service life for the engine.

a. Cylinder service :

Measure each cylinder's bore diameter at four different depths with a bore measuring micrometer or cylinder gauge to determine the wear of the cylinder, as shown in Fig. 50-2.

- If the difference between the maximum and minimum bore diameters is more than 0.05 mm, hone the cylinders.
- If the wear or deformation of the cylinder is excessive, or if any flaw or scratch is found on the cylinder wall, bore and then hone to proper finish and tolerance.
  Note : The minimum piston-to-cylinder clearance of .035–040 mm should be added to the oversize piston diameter before the cylinder boring bar is set for the operation.
- The tolerance between maximum and minimum bore diameter measurements after honing should be within 0.01 mm
- Finally, chamfer each exhaust port.



(Fig. 3—50—2)

b. Piston :

- Standard piston size : 55.96, 97.98 and 99. Piston oversize 56.00, 56.25, and 56.50. (Size is shown on the piston head.)

Note : Measure the piston size at a point 10 mm. about the skirt/bottom at 90° from the wrist pinhole with a micrometer.

c. Piston Ring :

When the cylinder is rebored or the piston is replaced with an oversize, replace the piston rings with new or oversize types.



(Fig. 3—51)

• Ring Gap :

Upper ring·····0,15-0.3 mm

Lower ring·····0.10-0.2 mm

Measure the gap with a feeler gauge.

• Piston ring size :

In addition to standard types, oversize piston rings are available in 0.25 and 0.5.

Upper ring·····The outer surface is chrome plated. Lower ring·····The outer surface is treated by parkerizing.

2-2. Installation :

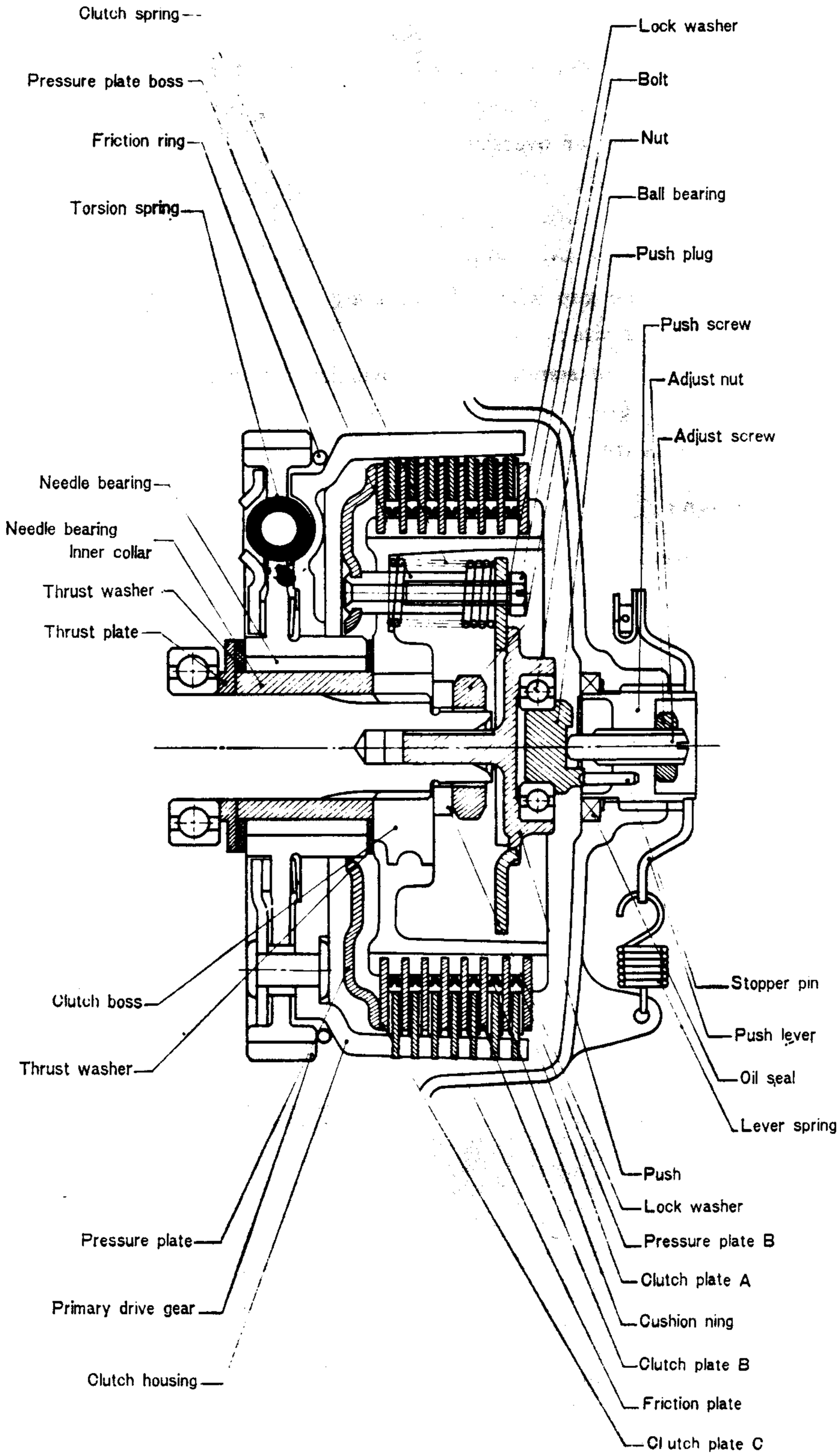
• Fit the lower ring in the groove first, then install upper ring.
(Be sure to face the maker's name and size marking upward.)

• Insert the piston pin clip into one of the piston pin holes, and install the piston on the connecting rod with the piston pin bearing and piston pin. Secure the piston pin to the connecting rod with the piston pin clip. Install the piston with the arrow marking facing forward toward the exhaust port.

• Align the ends of the piston ring over the ring set-pin, and insert the piston into the cylinder. Be careful to work the rings into position so that they are not broken during installation.

3. Clutch :

3-1. Construction of the Clutch



(Fig. 3—52)

Clutch assembly--The clutch is of the wet multiple disc type. The clutch assembly consists of seven friction plates, seven clutch plates and other component parts. It is mounted on the main shaft, together with the primary drive gear, by means of the clutch boss.

Power transmission--The primary drive gear is mounted on the crankshaft (L), and transmits engine power to the main shaft via the driven gear which (then the clutch) is connected to the transmission's main axle.

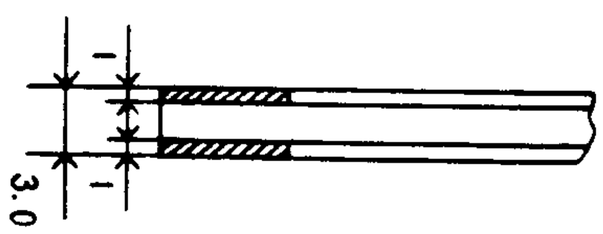
Clutch disengaging mechanism--Squeezing the handle bar lever causes the push lever to move within the engine assembly. When the push screw (which is connected to the push lever) begins to move, it pushes the pressure plate B through the push plug and push crown. This causes the clutch plates to operate from the friction plates. At this time, the transmission of engine power to the transmission is interrupted.

3-2. Checking and Servicing :

a. Friction plates :

The friction plate is a replaceable part. Replace any friction plate whose wear is more than 0.3 mm. ( )

Note : Standard length : mm

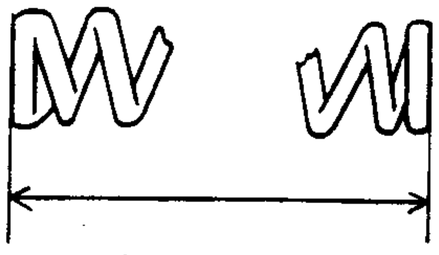




(Fig. 3—53)

b. Clutch springs :

Replace any clutch spring when its free length is 2 mm shorter than the standard length. (mm)



Standard size
25.5 mm.



(Fig. 3—54)

2. Adjusting the clutch

The clutch lever should be adjusted to have 2 or 3mm play so the clutch spring can apply sufficient pressure to the clutch facing.

If there is too much play, the clutch lever may not function well; if there is no play, it cause slipping. (Fig. 3—55)

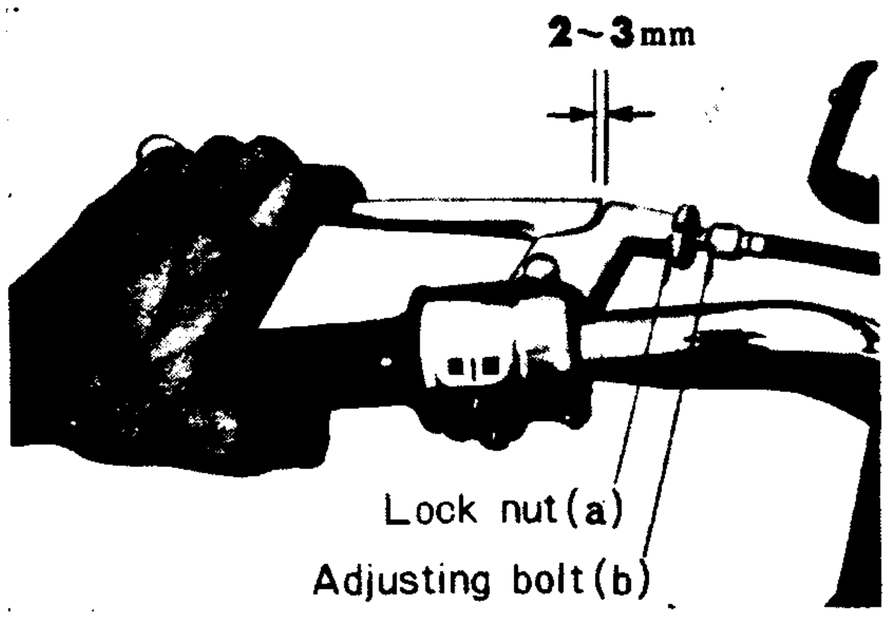


Fig. 3—55.

1. Adjust by turning the adjusting lock bolt, and don't forget to foster the lock nut firmly.
2. More strictly
   a Remove the clutch cover from the left crankcase cover.
   b Loosen the clutch adjusting screw locknut with 14 mm box and 19×21 mm spanners.
   c Adjust by turning the clutch adjusting screw with screwdriver. (Fig. 3—56)
   d To reduce the play, loosen the adjusting nut; To increase the play, tighten the adjusting nut. (Fig. 3—57)
   f After adjusting, tighten the locknut firmly.

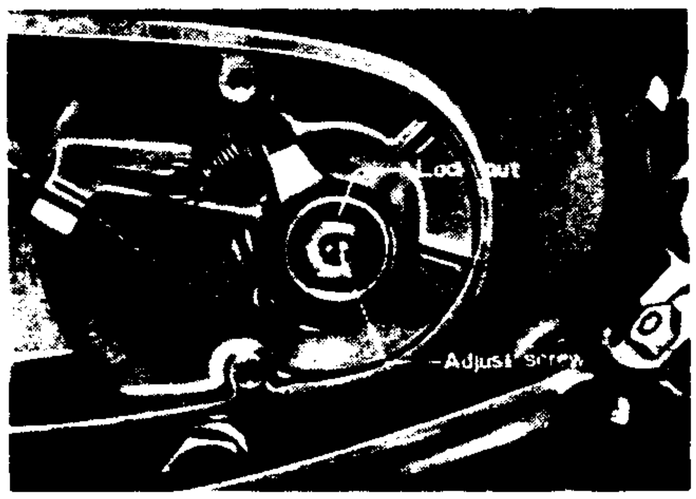
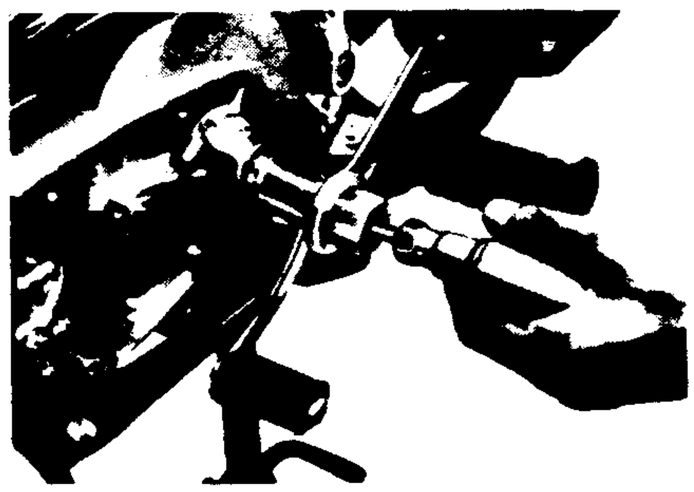


Fig.3—56

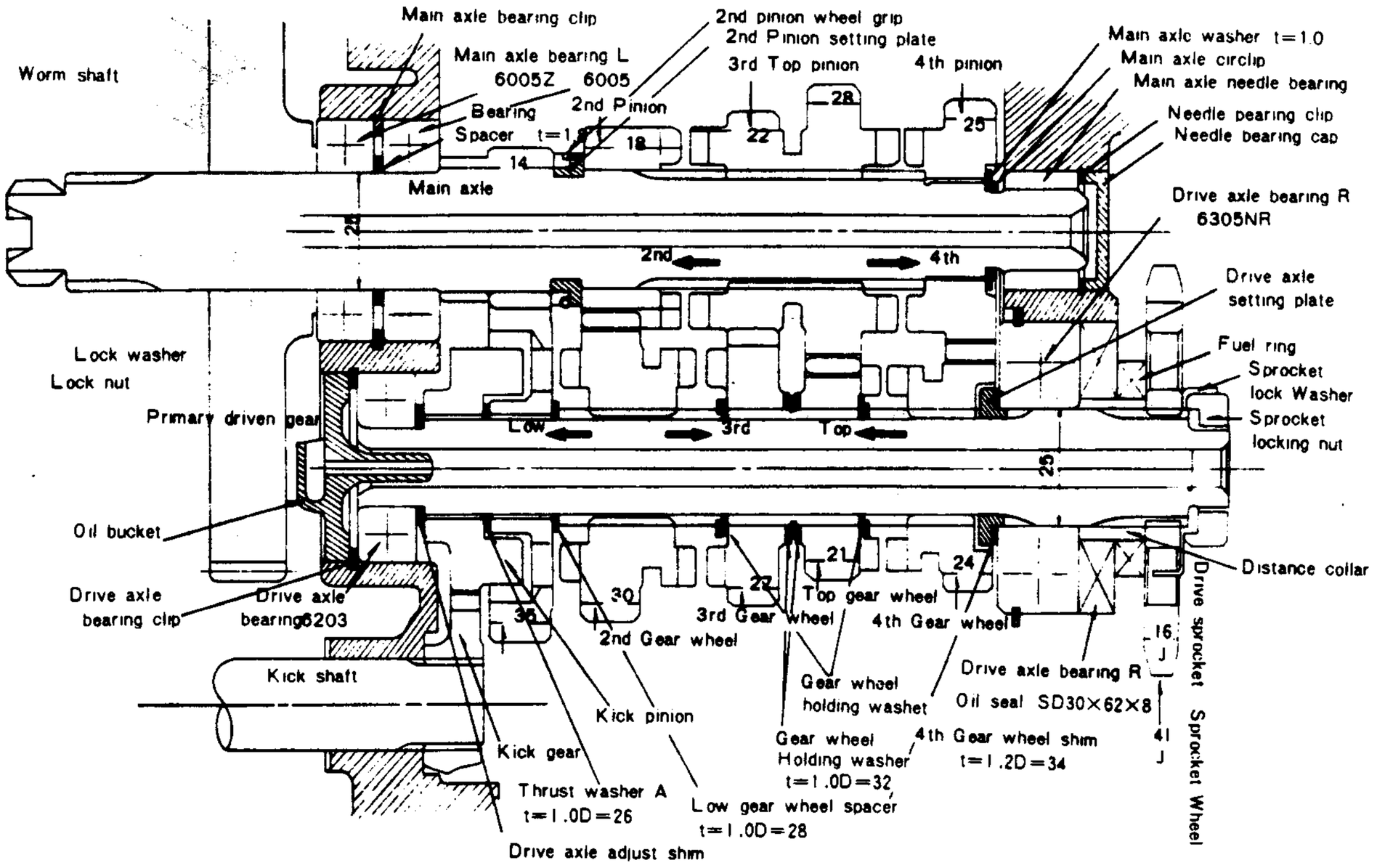


Fig, 3—57

4. Transmission and Kick starter :

4-1. Construction of the Transmission :

The transmission of the new YDS series is of a constant mesh, 5-speed type, and both primary reduction gear and transmission gear ratios are different from those of the YDS3.



(Fig. 3—58)

Primary reduction gear ratio : Primary driven gear/primary drive gear 65/20=3.250
Secondary reduction gear ratio : Sprocket wheel/drive sprocket 41/15=2.733 (YDS5)
40/16=2.500 (YM2)

	Transmission gear ratio	Total reduction ratio		
		not Exported to U.S.A. YM2	YDS5	YM2C
Low	28/11=2.545	20.70	(22.605)	
2nd	23/15=1.533	12.48	(13.616)	
3rd	21/15=1.167	9.48	(10.365)	
4th	19/20=0.050	7.72	(8.438)	
Top	17/22=0.733	6.28	(6.866)	

(Total reduction ratio=Primary reduction gear ratio × transmission gear ratio × secondary reduction ratio)

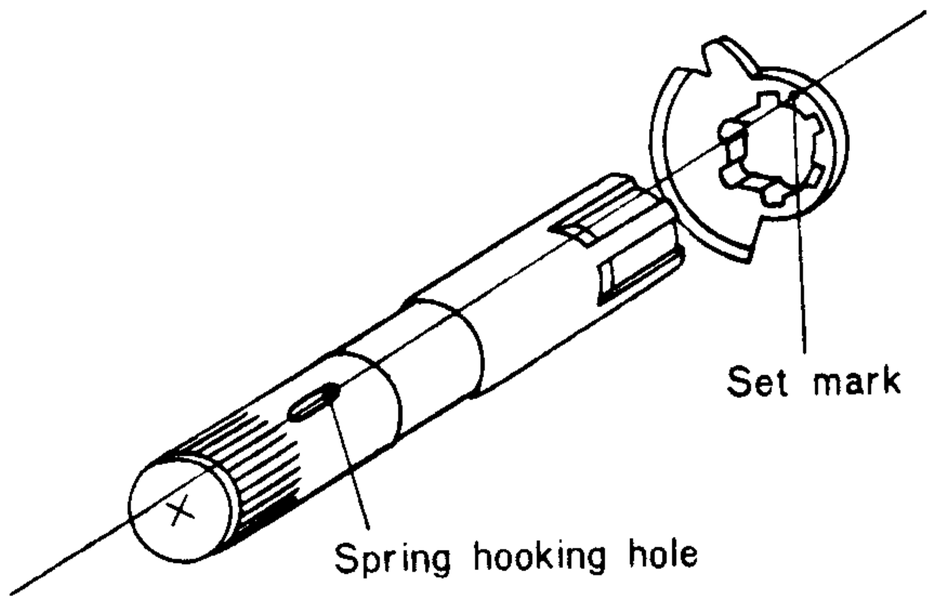
4-2. Kick Starter

a. Assembling the kick shaft and kick gear.

- Both kick shaft and kick gear are press-fitted after heating to 130-150°C.

b. Installing the kick shaft

- Insert the kick shaft into the case from the inner side and secure it with the clip.
- Insert the kick spring into the hole in the case, and hook one end of the spring into the spring hole on the kick shaft by turning it 120 degrees with the spring hooking tool.

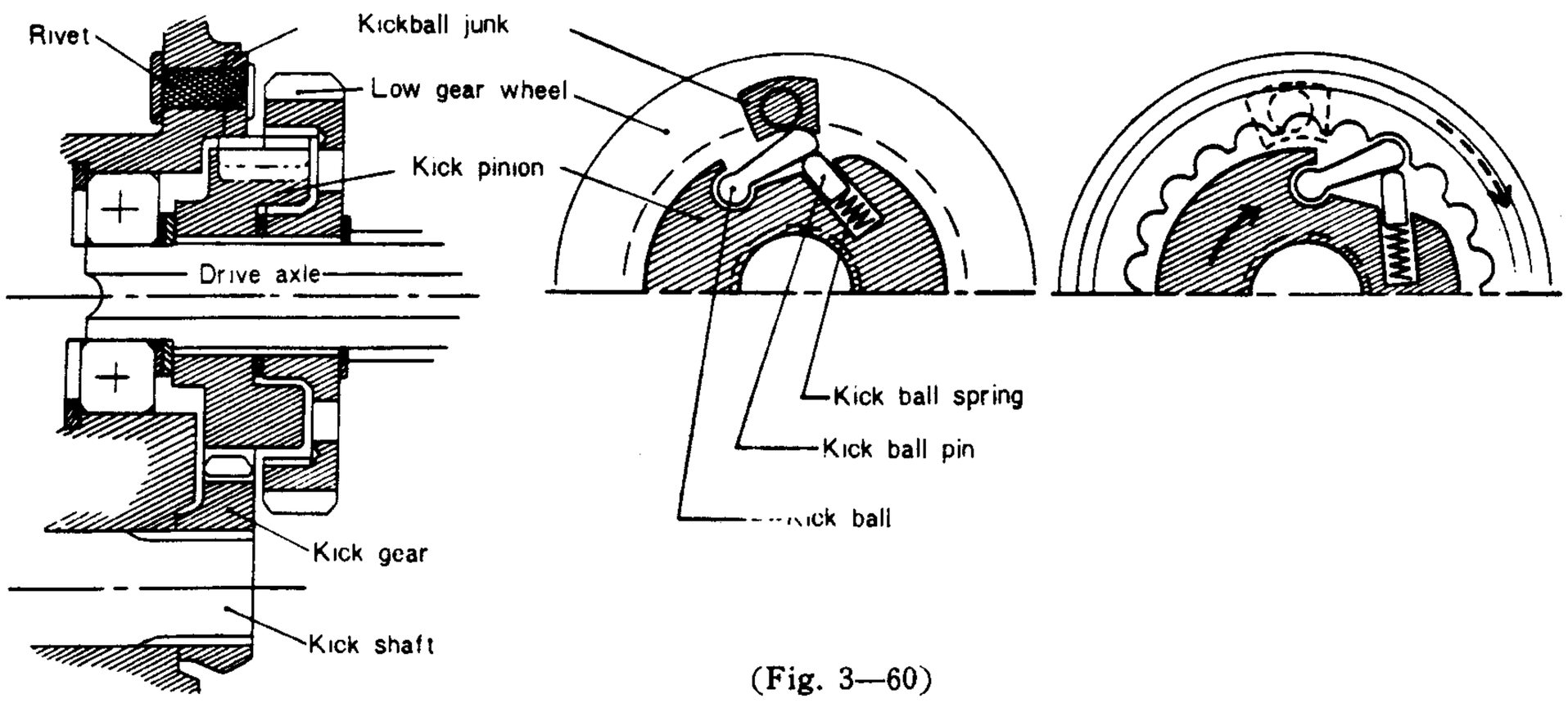


(**Fig.** 3—59)

- Fit the kick shaft in the case securely using pliers and soft hammer.
- Install the spring retainer in position over the spring.

c. Function of the kick starter:

- The kick gear is in constant mesh with the kick pinion of the low gear wheel.
- When the kick gear is released, the kick pawl attached to the kick pinion is depressed by the pawl arrester riveted to the case.
- When the starter is kicked, the pinion is turned by the kick gear, and the pawl is released by the kick pawl arrester. Then, the pawl pushed outward by the kick pawl spring engages the groove cut on the low gear wheel and causes it to rotate.
- The rotary motion of the low gear wheel is transmitted to the main axle, clutch, primary gear and crankshaft.

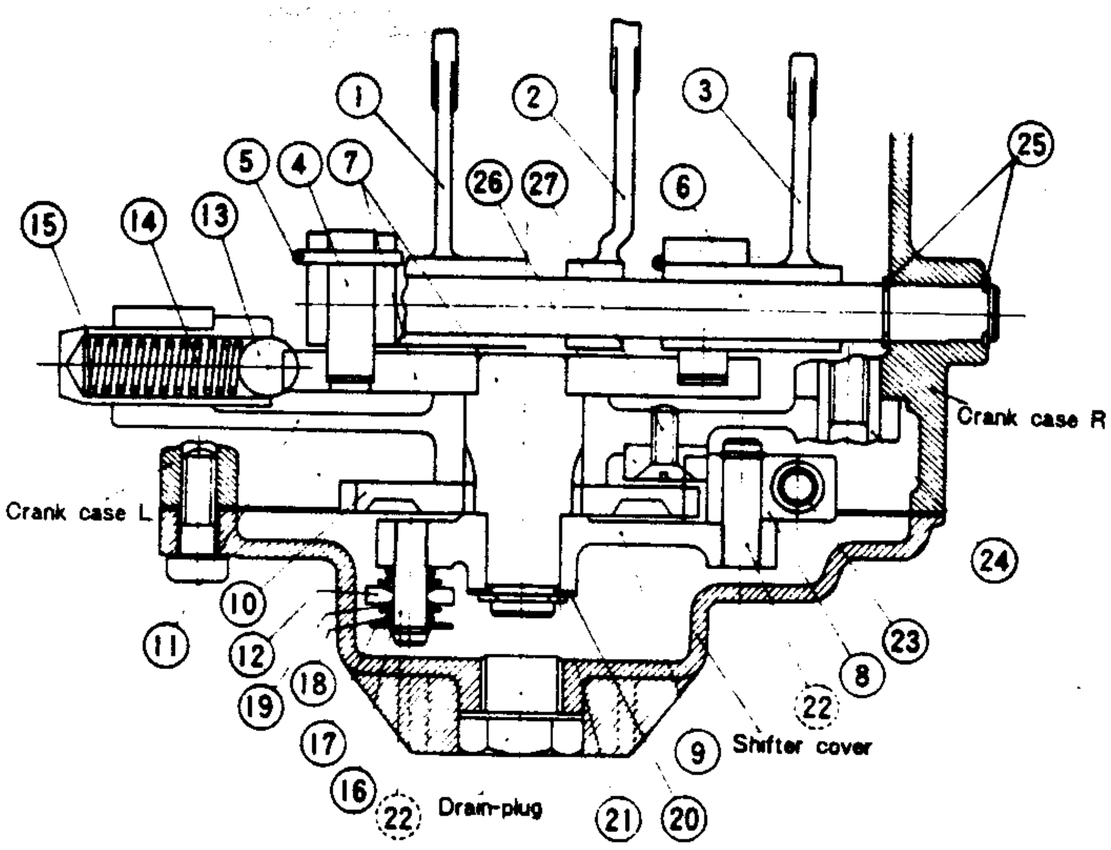


(**Fig.** 3—60)

5. Shifting Mechanism :

5-1. Shifter

a. Construction :

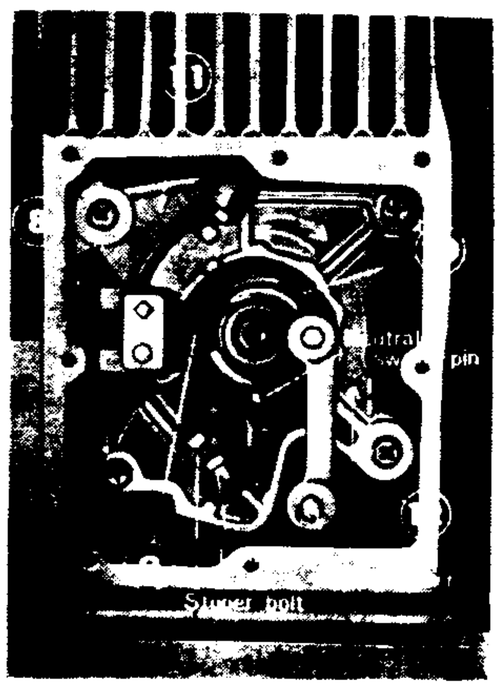


(Fig. 3—61)

No.	Name of the parts
1.	Second gear wheel shift fork
2.	Third top pinion shift fork
3.	Fourth gear wheel shift fork
4.	Shifter rotor
5.	Rotor stopper pin
6.	Shifter shaft
7.	Gear shift cam
8.	Shifter pole
9.	Shifter pole holder
10.	Shifter working plate
11.	Shift cam setting plate
12.	Change link
13.	Cam stopper ball
14.	Cam stopper spring
15.	Cam stopper bush
16.	Shifter pole shaft clip
17.	Change link plane washer
18.	Change link spring
19.	Change link ball washer
20.	Shift cam shim
21.	Shift cam clip
22.	Shifter pole shaft
23.	Shifter pole spring
24.	Shift cam setting plate pipe knock
25.	Shifter shaft clip
26.	Shifter pole free plate
27.	Free plate set screw

b. Operation :

- The motion of the change arm is transmitted to the change lever through the change shaft, and then to the change link (9) and the shifter pawl holder (12)
- The shifter pawl (8) is fitted to the holder into which the shifter pawl shaft (22) is pressed and rotates the shifter working plate (10).
- The working plate is splined to the gear shift cam (7), and rotates it.
- The gear shift cam is provided with slots which cause the shifter forks to move.



(Fig. 3—62)

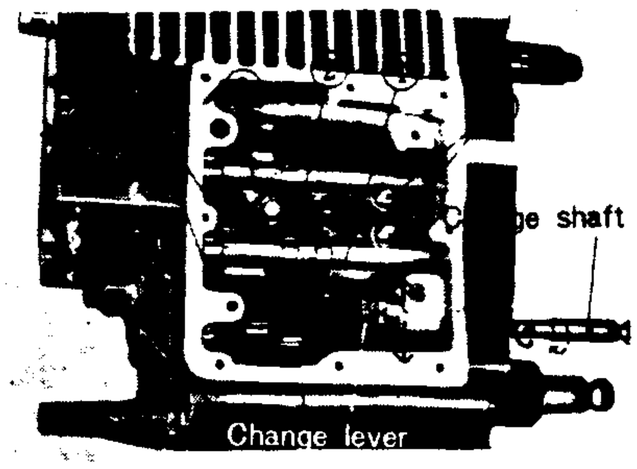
- The shifter forks position the gears. Various settings and combinations allow 5 ratios and one neutral position.

5-2. Checking and Servicing the Shift Gears :

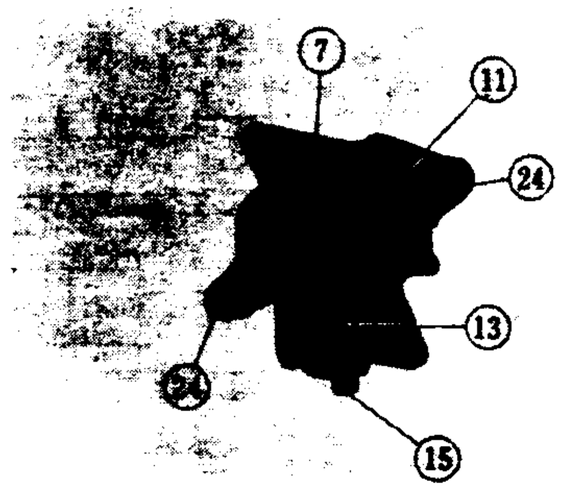
a. Caution on reassembling :

- Spline the gear shift cam to the shifter working plate by aligning the markings.
- Check the shift fork for wear. (After reassembling, examine whether the transmission is operating smoothly.)
- During assembly, set each shift fork in the neutral position. (Make sure that the transmission is in neutral by rotating the main axle.)

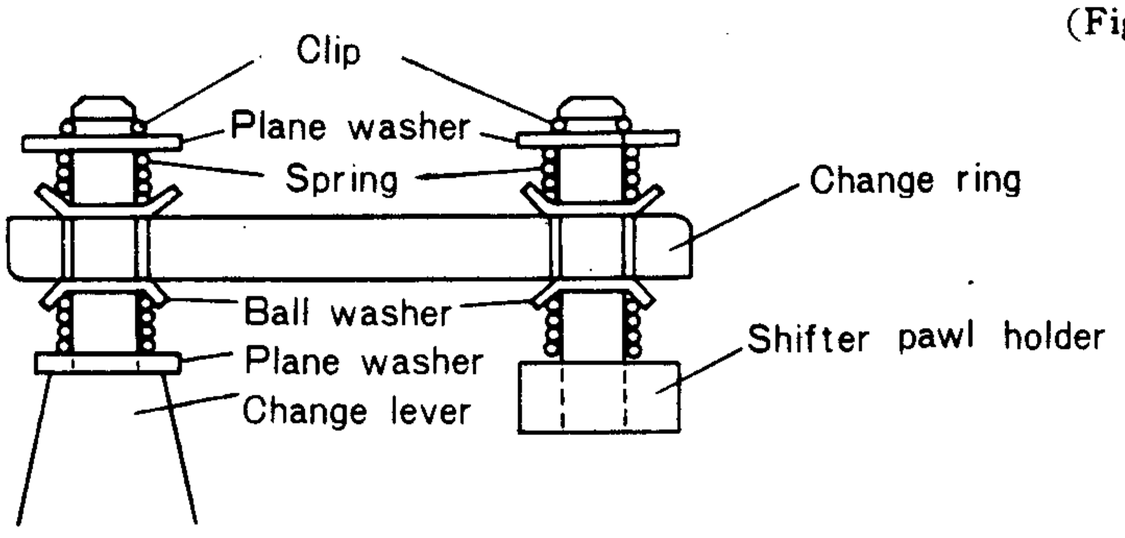
  Set the shifter cam stopper in the neutral position.
- Installing the change link



(Fig. 3—63)



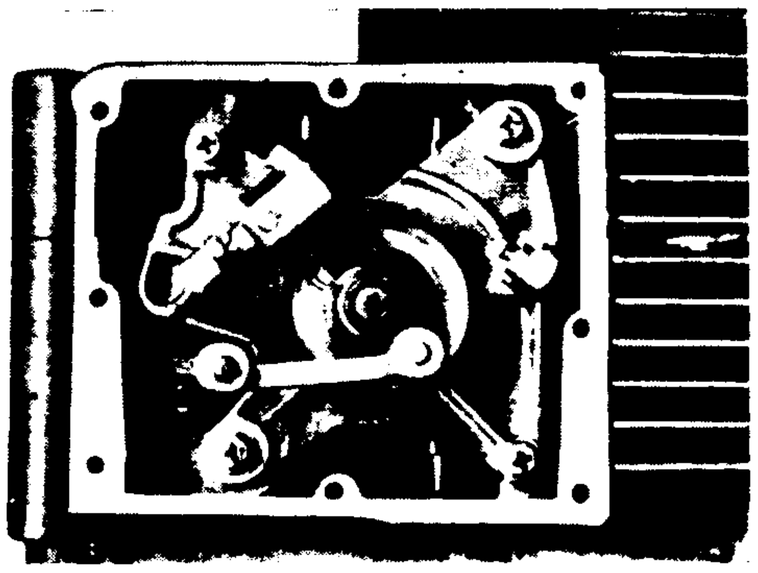
(Fig. 3—64)



(Fig. 3—65)

b. Checking :

After the shifter assembly is installed, install the change arm on the change shaft. Install the shifter cover. Check shifting while turning the main axle or the drive axle.



(Fig. 3—66)

- Make sure that the cam stopper ball engages with the shift cam stopper notches correctly so that the dogs of the transmission gear mesh correctly its compliment.

  (Gears will not mesh with each other if movement is insufficient. Excessive movement will result in skipping over to another speed position.)
- Make sure that the shifter ball (ball holder) returns to the center of the working plate.
- Check the transmission for smooth operation and shifting.

b. Adjustment :

Adjust the shifter by observing the stroke of the shifter pawl arm (shifter pawl) which causes the shifter working plate to rotate.

• Observe the shifter while shifting in each direction.

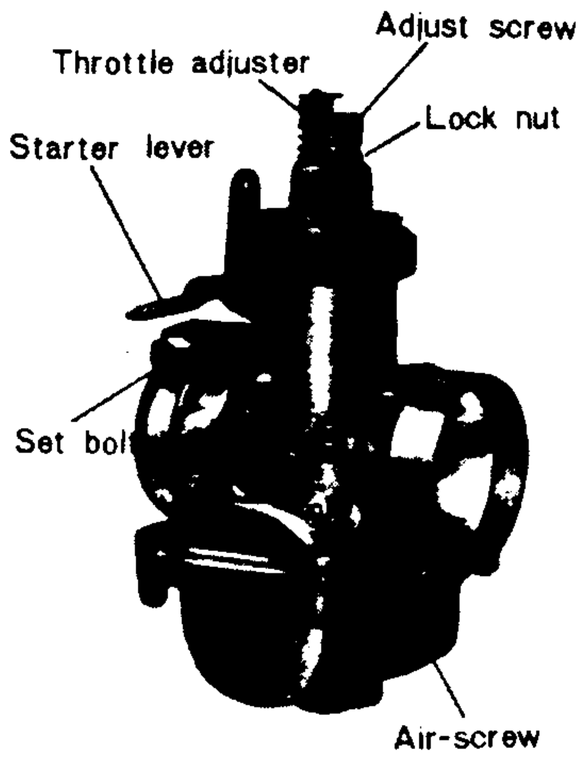
With the stopper ball engaged in the cam stopper notch, adjust the shifter so that the gap between the shifter working plate pawl and the shifter stop is about 1 mm.

6. Carburetor :

The new YDS series motorcycles are provided with a VM26SC carburetor which is larger than the earlier AMAL type VM24SC. This has significantly increased engine power.

6-1. Carburetor Setting :

Model / Part	YDS5-E		YM2C (YM2)	
	Standard	Higher Altitudes	Standard	Higher Altitudes
M.J.	#120	#100	#110	#100
J.N.	4D3-2 Stage	4DS-2 Stage	4DS3-2Stage	4DS-2 Stage
N.J.	0-5	0-5	0-5	0-5
C.A.	2.5	2.5	2.5	2.5
P.J.	#30	#30	#30	#30
A.S.	1^1_2	2.0	1^1_2	2.0
V.S.	2.0	2.0	2.0	2.0
G.S	#40	#40	#40	#40
Idling rpm	1,200 rpm	1,200 rpm	1,200 rpm	1,200 rpm
Carburetor marking	S	SH	M	SH



(Fig. 3—67)

6-2. Idling Adjustment :

• Adjust both throttle cable and pump cable. (Refer to page.)

• Screw the air screw to the bottom then back it off 1.5 turns.

• Start the engine and warm it up at approximately 2,000 rpm for a minute or two.

• Fully close the accelerator grip, and turn the throttle adjuster so that the engine maintains 1,200 rpm.

• Determine if each cylinder is firing and that the idle is regular without missfires.

7. Miscellaneous :

7-1 Checking the Bearing, Oil Seal, and Clip :

These parts are liable to wear, damage, fatigue, etc., after long usage. If any of these becomes defective, it may damage other, more expensive components. Check these parts for defects from time to time, and if found replace with a genuine replacement part.

a Bearings :

Replace any bearing worn, causing abnormal noise, having scratched raceway, damaged cage, or not turning smoothly lubricate bearings before installation.

Note : Refrain from washing new bearings because they are all pre-oiled. When installing the bearing, use a flat metal tool so that both outer and inner races are kept in a horizontal position. Use a press when one is available.

b. Oil Seals :

Replace any oil seal when the rubber on its mating surface is deteriorated or deformed or the lip is damaged or worn. (The edge of the lip is rounded.)

Installation :

- Apply a small amount of oil to the sealing surfaces of the lip and the shaft. Grease the W lip inner surface.
- Apply oil to the outer surface of the oil seal to facilitate installation.
- Exercise care not to damage the lip, shaft end, or spline.
- Install the oil seal by tapping it with a hammer lightly, using a steel tube or flat socket bearing flat against the outer edge of the seal.

c. Clips :

Replace any clip which is cracked, damaged, or weakened.

Removal and Reinstallation :

- Use the clip pliers correctly.
- Make sure that the clip is completely fitted into the groove.

Chapter 4.

Chassis

1. General Description of the Chassis:

As mentioned in the Forward, the YDS series have been designed to serve as high speed touring models with emphasis on stability, durability, and riding comfort.

1-1. Main Features :

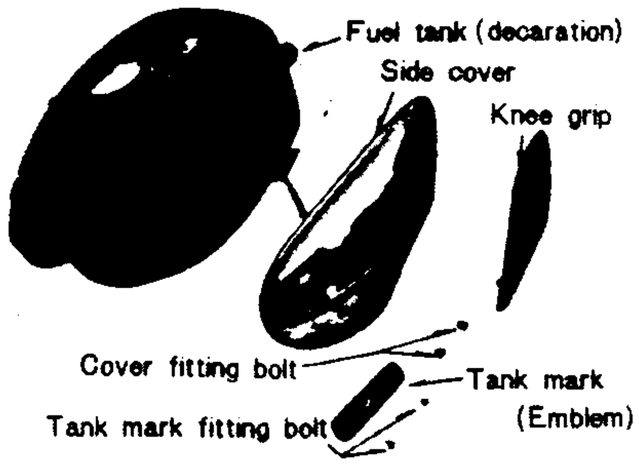
a. The new YDS series differ in many points from the YDS 3 (YM1). The caster, for instance, has been changed from 65° to 63° and accordingly, the trail has become from 76 mm (30 in) to 88.5 mm (35 in).

   In addition to its streamlined styling, the frame has been strengthened to insure safer operation and durability.

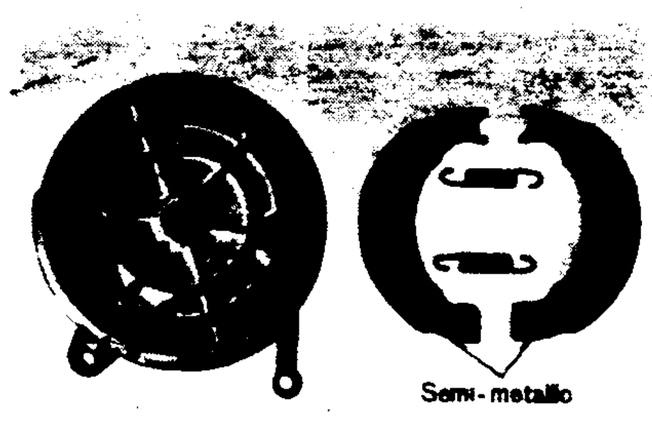
b. The basic fuel tank is made up of two components, that is, the body and the chrome-plated side cover. Damage to the tank body can be minimized in case of an accident. The tank capacity has been increased from 14L to 15L (3.7 - 4.0 gals.) The protection cover is bolted to the tank under the knee grip and behind the emblem.

c. The oil tank capacity has been increased from 1.9L to 2.2L (1.7 - 1.5 qts.)

d. The brake is incorporated in the hub, and lined in the same manner as in the YDS3. However, for the lining, a semi-metallic material is used to improve braking ability.



(Fig. 4—1—1)



(Fig. 4—1—2)

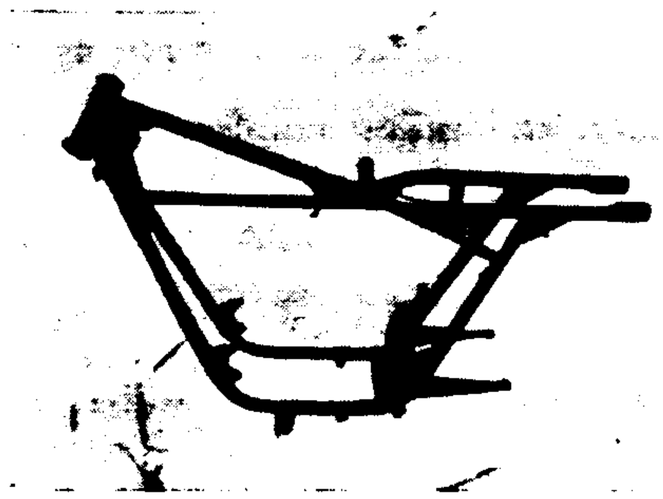
2. Assembling the Frame :

1. Main Frame :

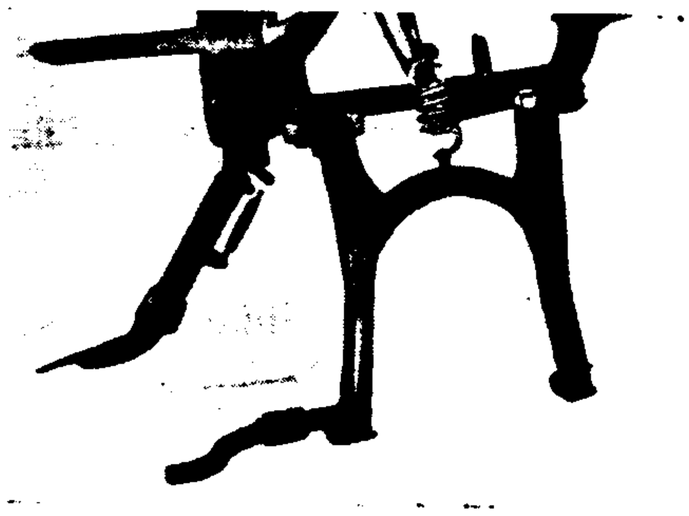
a. Press in the steeding ball race.

b. Install the main and side stands.

c. Install the right foot rest, brake pedal, and braking link.



(Fig. 4—2)

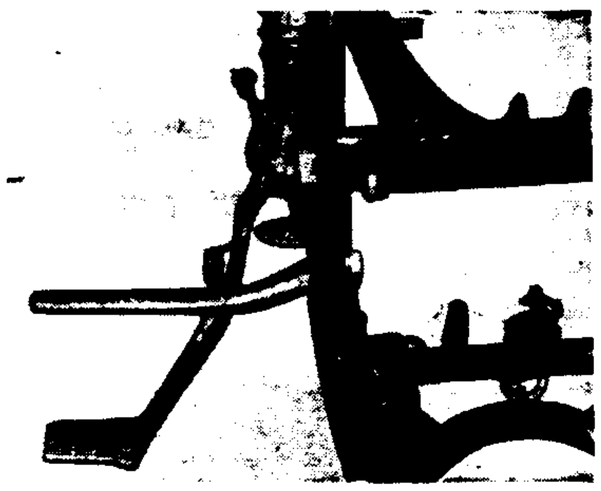


(Fig. 4—3)

2. Rear Arm :

a. Install the rear arm bushings A and B, and distance collar.

b. Attach the rear arm to the frame through the thrust cover by using the rear arm shaft.



(Fig. 4—4)

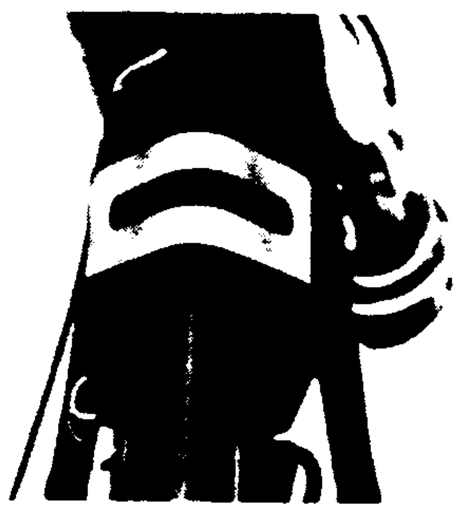


(Fig. 4—5)

3. Wire Harness and Ignition Coil :

a. Mount the wire harness on the frame using wire harness bands.

b. Install the ignition coils.

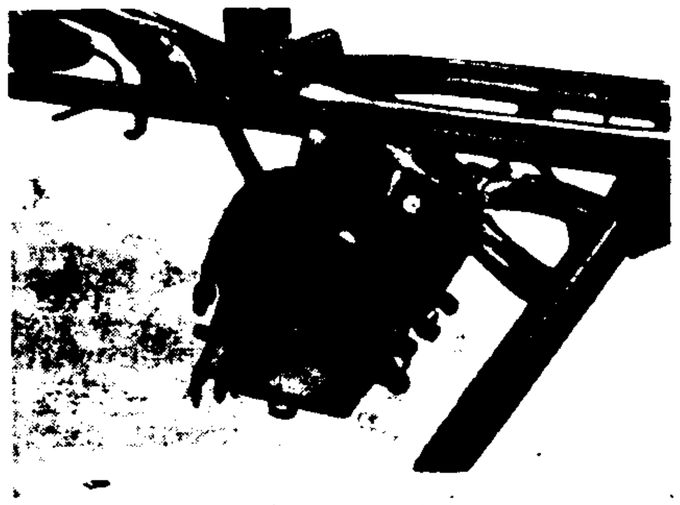


(Fig. 4—6)

4. **Battecy Box :**

a. Mount the battery box.

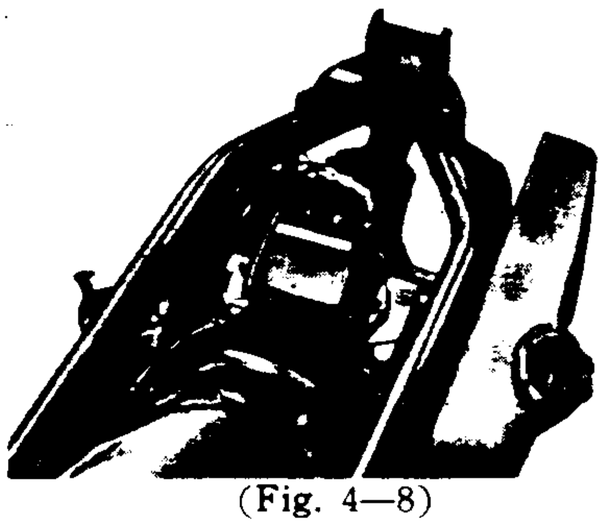
b. Install the regulator, and connect the wire harness wiring.



(Fig. 4—7)

5. **Oil Tank :**

Mount the oil tank using 2 stays on the right side of the frame and one stay under the battery box.



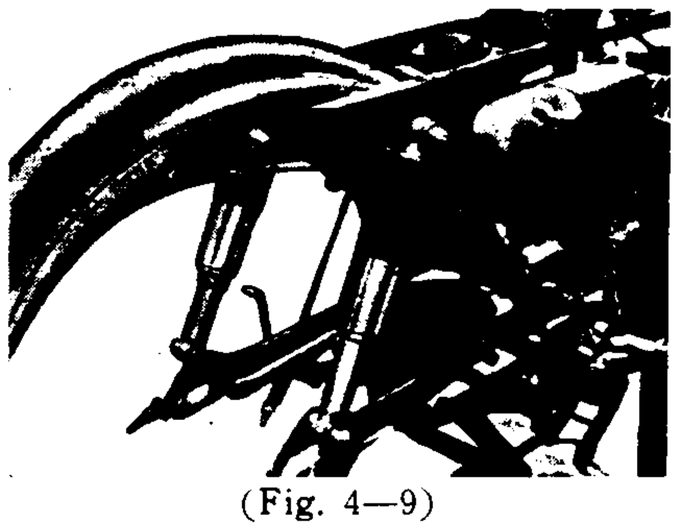
(Fig. 4—8)

6. **Rear Fender :**

Install the rear fender, and connect the tail light wires.

7. **Rear Cushion and Chain Case :**

Install the rear cushion and the chain case.



(Fig. 4—9)

8. **Rear Wheel Assembly :**

Install the tension bar and the rear brake cable.

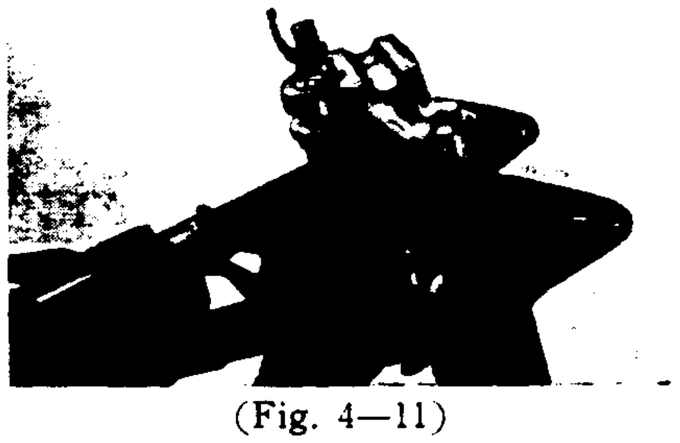
9. **Front Fork Assembly :**

a. Install the front fork assembly on the steering head being careful that all bearings are in place.

b. Secure the front fork assembly with the handle bracket and the steering shaft lock nut.



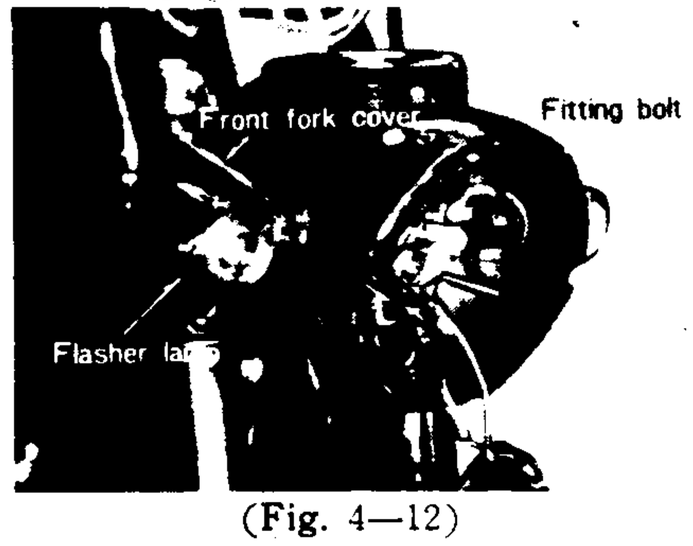
(Fig. 4—10)



(Fig. 4—11)

10. **Head Light Assembly :**

a. Install the assembly on the front fork cover together with the flasher light (if used).



(Fig. 4—12)

11. **Steerring Handleand Damper :**

a. Secure the handle with handle holder.

b. Install the handle damper.

12. **Wire Connection :**

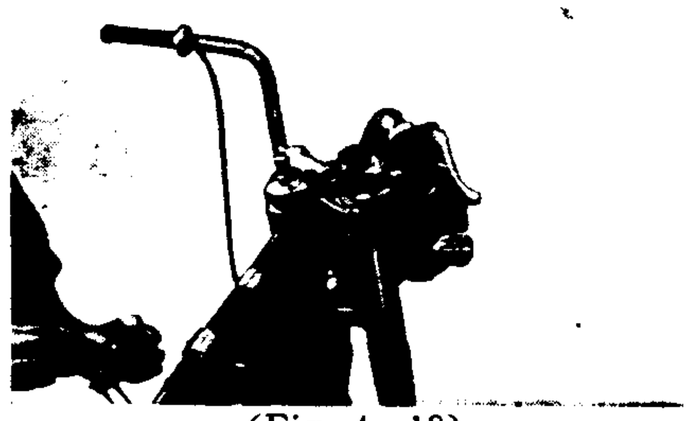
Complete the wirings of the head light, wire harness, and main switch.

13. **Front Fender :**

Install the front fender.

14. **Front Wheel :**

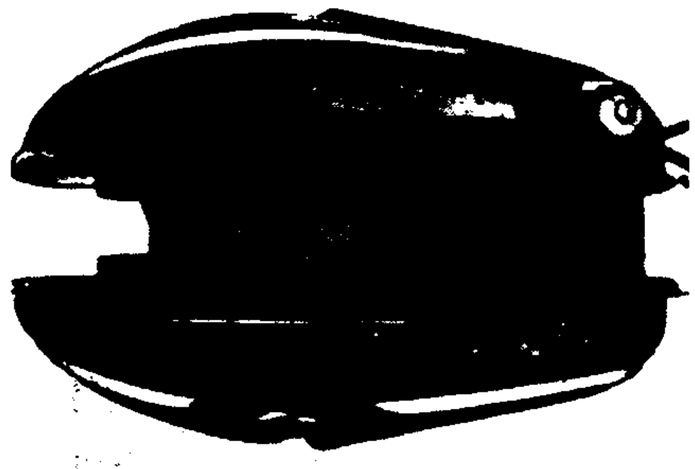
Connect the brake and meter cables.


(Fig. 4—13)

15. **Fuel Tank :**

Install the fuel tank.

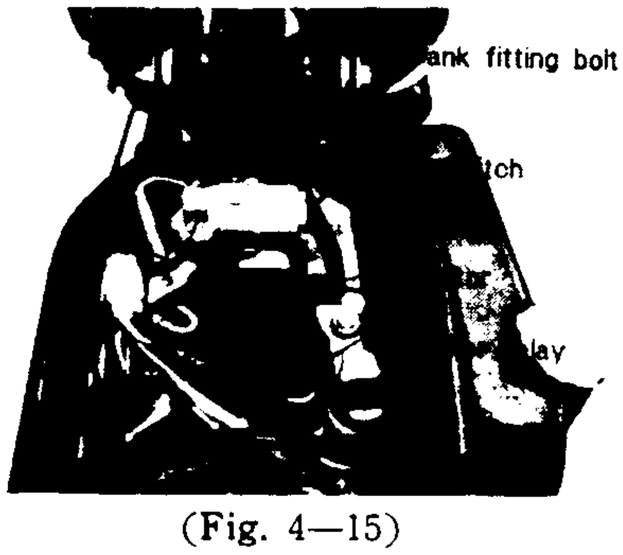
- ○ Insert the front part of the tank into the frame.
- ○ Bolt the rear part of the tank to the pracket in the center of the frame.


(Fig. 4—14)

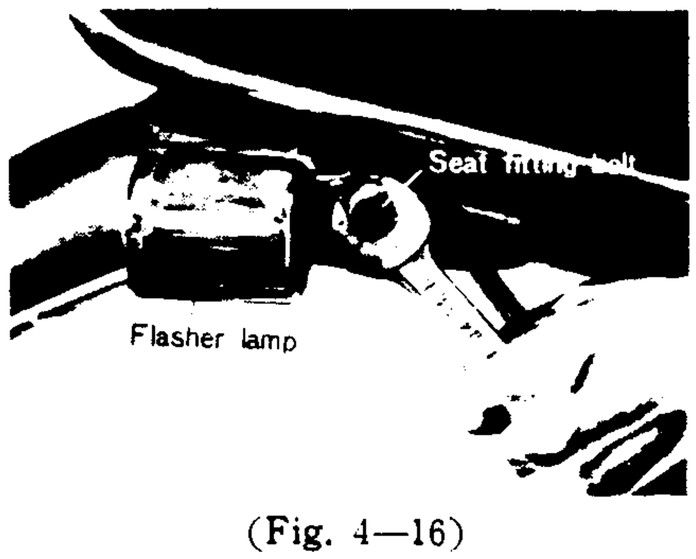
16. **Seat :**

Install the seat.

- ○ Connect the wiring to the rear flasher light.
- ○ Hook the front part of the seat on the bracket on the frame. Attach the rear part to the frame together with the rear fender by using the seat mounting bolt



(Fig. 4—15)



(Fig. 4—16)

3. Checking and Servicing the Main Component Parts

1. Frame

Refer to Fig. 4-2.

a. Checking the welded parts:

It is suggested that if your motorcycle has been involved in an accident, that a thorough inspection be performed on the frame. Check the frame for cracking, distoration and damaged welded componets. Repair or replace defective parts.

b. Checking for torsion or eccentricity.

Any torsion or eccentricity particularly in the fork head adversely affects the maneuverability of the machine.

Repair if possible.

c. Ball races and steel balls

Many of the handling difficulties are due to worn ball races or steel balls.

If either of these are faulty, replace both ball races and steel balls.

Never use old races and balls together with new ones. Before installation, throughly wash and grease them.

Ball race A - Press into the frame head pipe at both top and bottom sides.

Ball race B - Press into the top side of the nuder-bracket.

Balls - 38 balls; 19 each for the upper and lower sides.

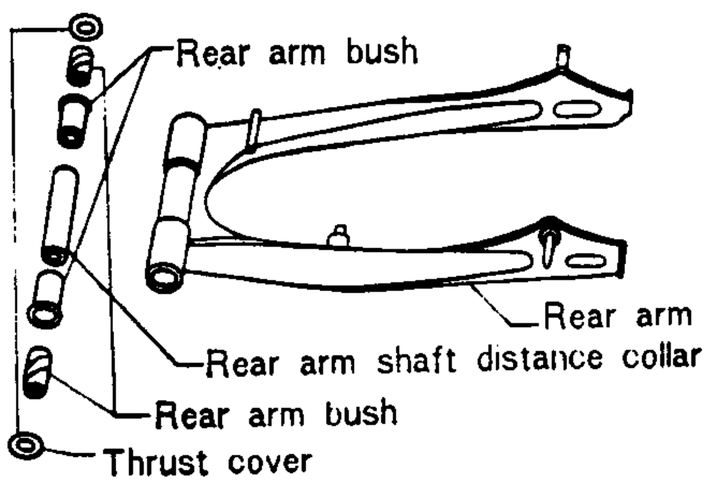
2. Rear Arm (Swing Arm)

a. Checking:

1. Check the rear arm pivot bushing for wear.
2. Remove the rear wheel assembly and the rear cushion.
3. Try to move the rear arm in the axial direction. If it has excessive play, both bushings A and B are worn and should be replaced.

b. Disassembling

1. To pull out the rear arm shaft, remove the double nut. Remove the rear arm bushings A and B from the rear arm shaft holes. When reassembling, lubricate all bearing surfaces.



(Fig. 4—18)

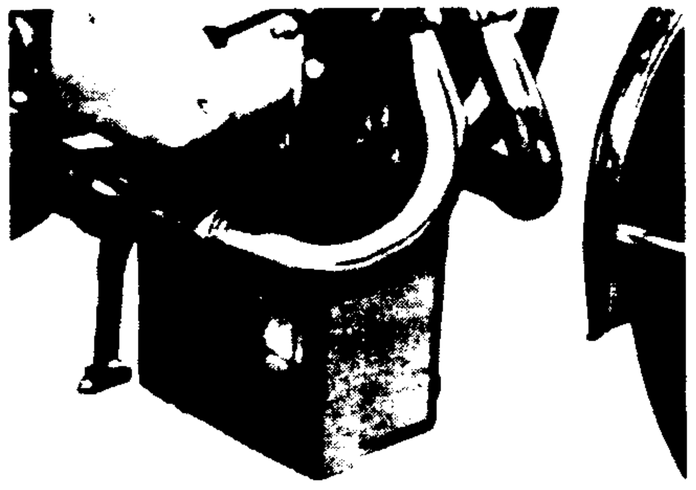


(Fig. 4—18)

3. Front Fork - Disassembling

a. Removing the front fork.

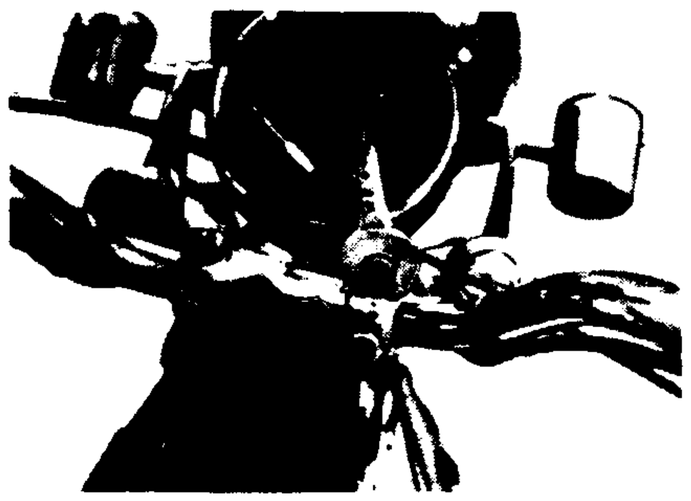
1. Remove the front wheel, front fender, head light, and handle assembly.
2. Remove the handle crown and steering lock nut, and the front fork can be pulled out downward.
3. Exercise care not to dislocate balls in the ball race.



(Fig. 4—19)

b. Removing the inner tube.

1. Loosen the handle holder mounting bolt, and pull the handle toward you.



(Fig. 4—20)

2. Loosen the under-bracket mounting bolt.



(Fig. 4—21)

3. Remove the cap nut located on the handle crown.



(Fig. 4—22)

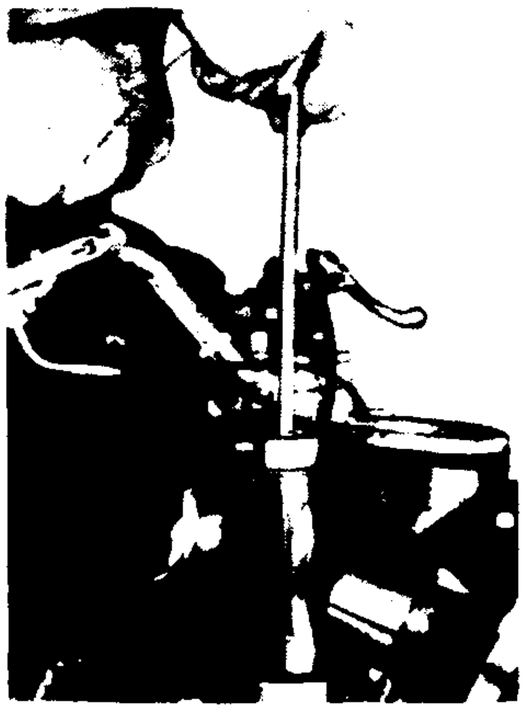
4. Install the front fork puller on the inner tube, and force the front fork downward by striking it with a hammer. (The fork cover and the under-cover will remain in position with the under-bracket, and the inner and outer tubes can be drawn out.)

c. Dissassembling the inner & outer tube assembly

1. Hold the outer tube at the axle hole by using a vice. Unscrew the outer tube nut. (Place the tire tube around the outer tube nut to facilitate the disassembling.)
2. Note that the assembly can be separated into the inner tube, outer tube nut, and outer tube.

Reassembling

a. Throughly wash all component parts. Check the oil seal and O ring for wear and damage. Replace if damaged or worn.
b. Install the slide metal ad O ring in the inner tube, and install the resultant assembly in the outer tube.
c. Install the outer tube nut, and drive the oil seal into the outer tube nut. (Take care not to damage the lip.)
d. Place the dust seal and spriug seat on the oil seal, and install the spring.
e. Fill the inner tube with a 2,000 cc of front fork oil No. 4 (or a 8 : 2 mixture of motor oil #30 and spindle oil #60.
f. Insert the inner and outer tube assembly through the under-bracket. Then force the inner tube upware, pulling on the front fork installation tool. Install and tighten the bolts holding the main tube at the fork crown. Tighten the lock nuts on the under-bracket.



(Fig. 4—23)



(Fig. 4—24)

g. Checking—

1. Check the outer tube nut for oil leakage. Usually oil leaks are caused by a damaged oil seal or O ring. Replace defective parts.
2. Check the cushion for abnormal noise.
3. Replace the oil periodically (every 6,000 km). Refer to page.

Chapter 5.

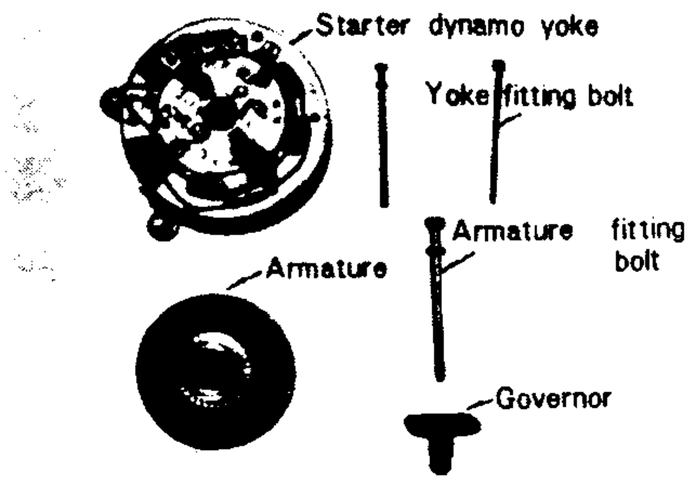
Electrical Equipment

1. General Description of the Electrical Equipment

1. All electrical components are of 12 V capacity as against the former 6 V capacity of the YDS 3.

   In particular, the YDS 5 is equipped with the starter dynamo, so that the engine can be started by simply pushing the starter buttom.

   On the other hand, both YM 2 and YM 2-C are provided with a large-sized ignition dynamo, thereby maintaining the terminal voltage in a constant value, regardless of engine speed.



(Fig. 5—1)

2. Tail, stop and flasher lights

   The lens of the light is larger in its effective area as compared with the former type. The 25 w stop light, along with the 8 W tail and flasher lights, assures the user of safer operation at night.

2. Main Component Parts

2-1. Components of the Electrical Equipment

The components of the electrical equipment is largely divided into the following three systems.

1. Ignition system

   The system starts the engine by way of the spark plug to ignite the fuel-air mixture in the cylinders. The main components are:
   Contact breaker (attached to the dynamo).
   Condenser (attached to the dyanamo), and cam.
   Ignition coil, spark plug, high-tension lead wire, and battery which is the power source is the power source of the primary electric current.

2. Charging system

   This system charges the battery, which is the primary power source for engine starting and all electrical equipment (lights and signal systems).

Main parts of the charging system :
Dynamo (yoek, armature, and brush), regulator (with cutout relay), fuse, and battery.

3. Siganl system

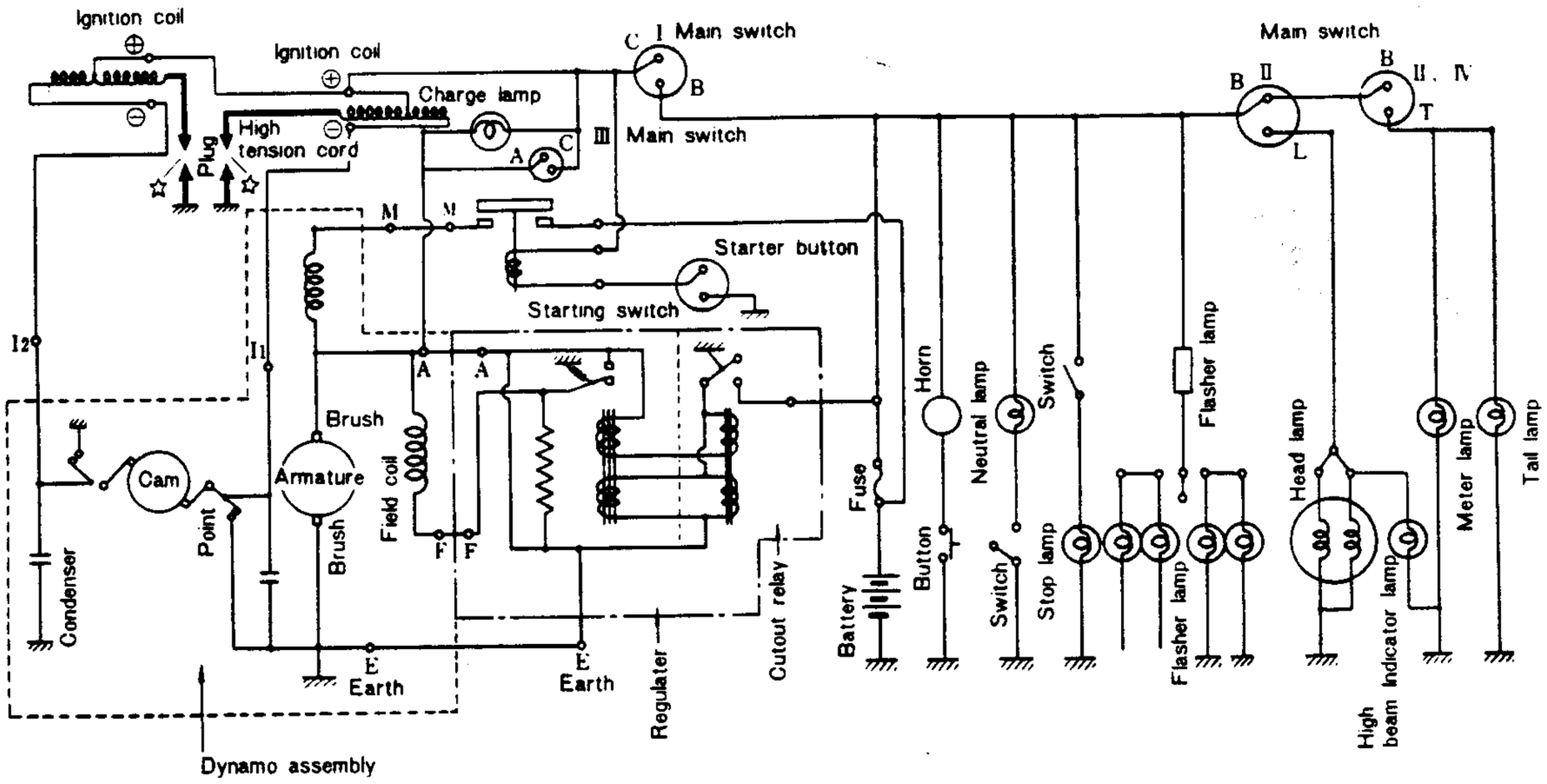
This system consists of signal equipment, meters, switch light (signal system), and lighting equipment for night operation.
Siganl system – Horn, flasher light (flasher relay), charging light, stop light, speedometer, neutral light, and switches,
Lighting system – Head light, tail light, and meter light.

2-2. List of the Main Electrical Component Parts

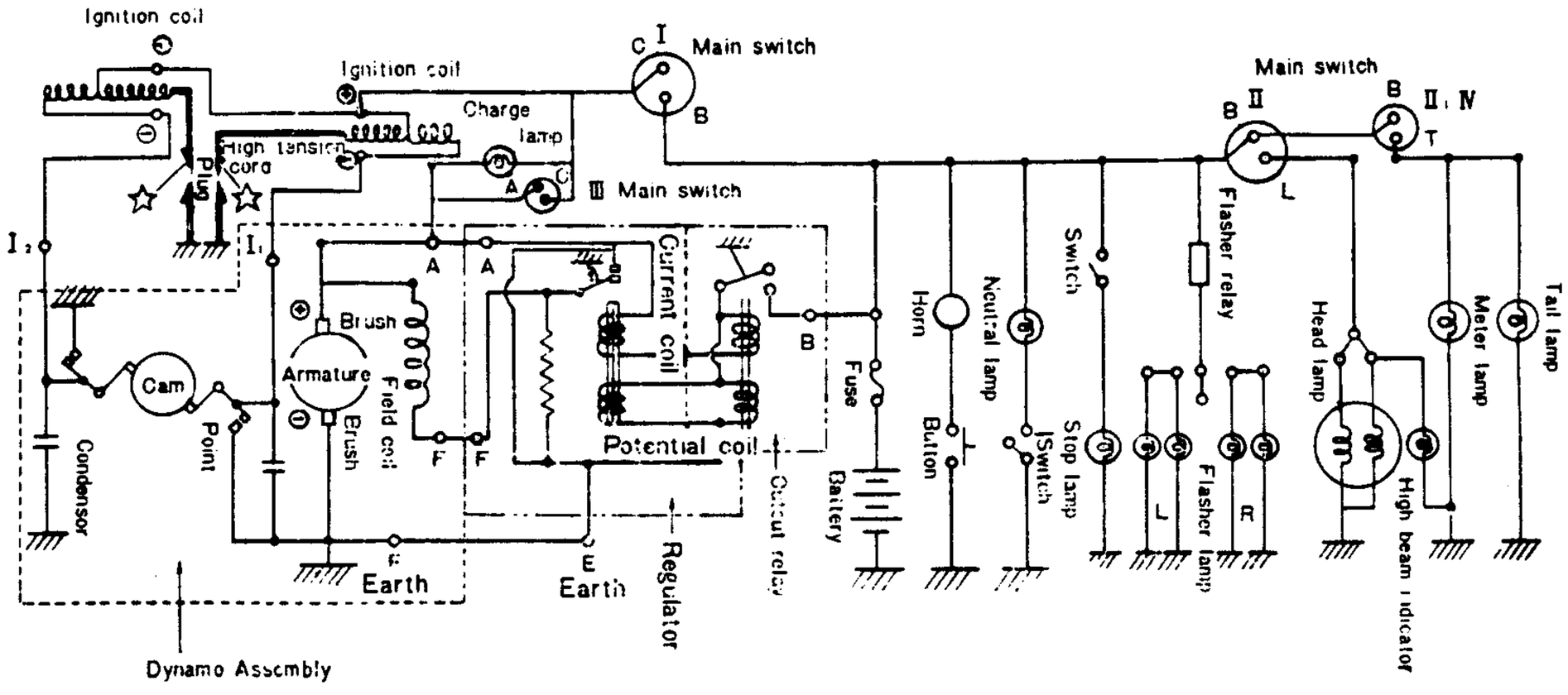
Table of Electrical Parts

Name of Part	Maker	YDS5 Model & Type	YM2 (YM2-C) Model & Type
Engine :			
Ignition dynamo	**Mitsubishi Electric**	**N/A**	**DU100/12AR**
Starter dynamo	〃	CE-GL	N/A
Neutral switch	Asahi Elec.	YN10	YN10
Spark plug	NGK	B-8HC	B-8HC
Frame :			
Regulator	Mitsubishi Electric	RN2225M	RN2226J
Ignition	Diamond Elec.	JO-25	JO-25
Horn	Nikko kinzoku	SPH-12	SPH-12
Battery	Furukawa	BAT5-12 12V11AH	BST3-12 12V, 5.5AH
	Nippon Denchi	MP5-12 12V11AH	
Starting switch		UB-V	N/A
Fuse	Osachi	20A 3 pcs.	20A 3 pcs.
Main switch	Asahi Elec.	YDSM5	YDSM5
Flasher relay	Showa	B7 12V, 8w×2	B7 12V, 8w×2
Front :			
Head light	**Koito Mfg.**	12V, 35/25W	12V, 35/25W
Speedometer	Yasaki Nippon Seiki	Neutral Pilot Meter light High beam 12V, Charging 3W	Same as opposit
Front flasher light	Imasen	12V, 8W×2	Same as ooposit
Handle switch	**Asahi**	**AG8-(L)** **AGS8-(R)**	**AG8-(L)** **AG2-(R)**
Swing arm :			
Stop switch	Imasen		SLS-YR1
	Asahi	YST6	
Rear :			
Tail light	Stanley	12V, 8W (tail) 12V, 25W (stop)	Same as opposit
Rear flasher light	Imasen	12V, 8W×2	

2-3. Connecting Diagram



(Fig. 5—2)



(Fig. 5—3)

3. Descriptian of the Electrical Equipment

1. Dynamo

The dynamo assembly consists of the yoke assembly (field coil, contact breaker, condenser, brush, etc.), the armature assembly (armature coil and commutator) and the cam assembly (cam and timing plate), and serves as the power source of the ignition and charging systems.

1-1. Ignition System

The ignition system consists of the contact breaker, condenser, and cam. The make-and-break mechanism in the primary ignition system induces a high-voltage surge of current in the second ignition coil.

a. Contact breaker

In case of incorrect ignition timing, check the contact breaker.

If ignition timing is wrong, the engine will not readily start, nor will it run smoothly. This will often lead to engine knokcing, abnormal vibration, and overheats, thus shortening engine service life. Check the ignition system periodically.

Adjustment :

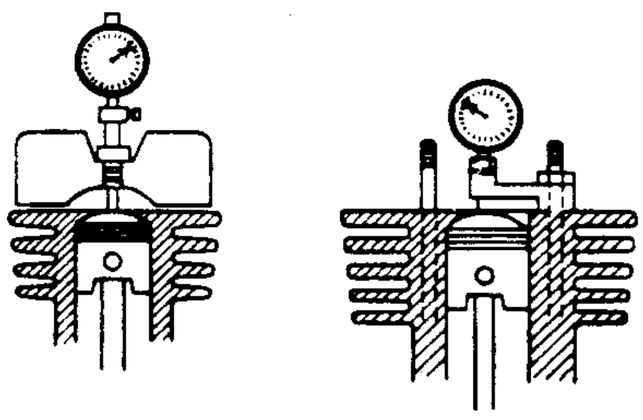
• Tools and measuring instruments for adjustment

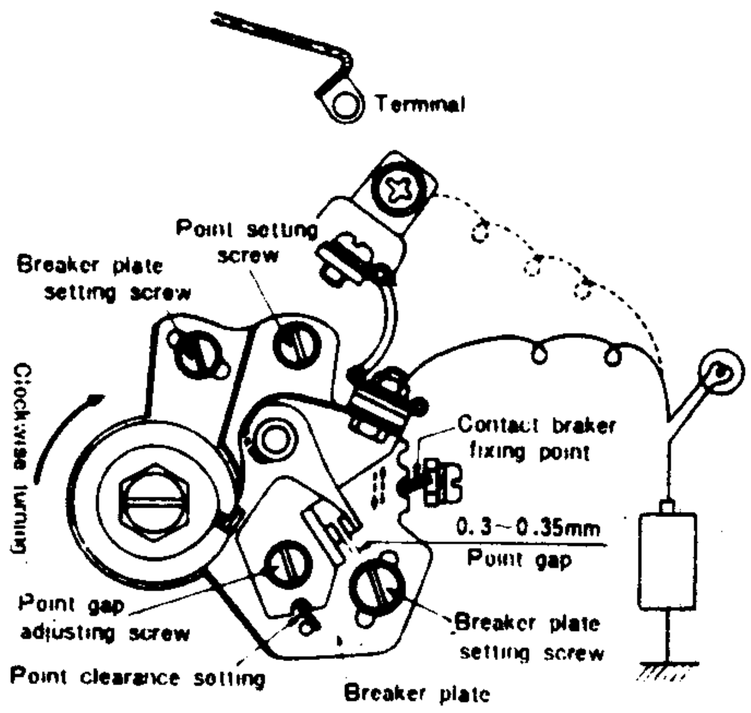
Dial gauge
Dial gauge adapter
Conductivity test lamp or YAMAHA electrotester
Point wrench
Slot head screw driver
12-mm wrench

1. Install the dial gauge in the cylinder head plug hole. Set the "zero" on the dial with the piston top dead center. (Fig. 5-2)
2. Smooth out the rough contact point surface, and wipe off the oil. (Use sandpaper for discolored points, while use an oil stone for extremely rough point surface.
3. Adjust the point gap to 0.3-0.35 mm, (Turn the cam with a wrench or screw driver, and measure the point gap with a feeler gauge when the point widest open. (Fig. 5-3)
4. Install the conductivity test lamp (or YAMAHA electrotester) and make sure that the lamp lights up.
5. Turn the crankshaft in the reverse direction (couterclockwise), and adjust the point gap so that the points close at the moment the piston reaches 1.8 mm B.T.D.C.
   • If the lamp lights-up before the piston reaches 1.8 mm B.T.D.C., ignition timing is slow.
   • If the lamp will not light up when the piston reaches 1.8 mm B.T.D.C., ignition timing is fast.

To adjust the timing, loosen the breaker plate set-screw. If the timing is slow, shift the plate in the direction oposite to its normal rotation. If the timing is fast, shift the plate in the direction of its normal rotation. In this manner, set the breaker plate with the moment the lamp lights up. (As the plate tends to slightly move when tightening the screcw, perform the adjustment with the plate temporarily tightened.)

6. Perform this adjustment for both right and left sides in the same manner. Differerce between both sides must be 3/100 (0.03 mm) or less.
7. When the adjustment is performed with the engine mounted on the frame and with the wire harness connected, disconnect the wires from Terminals I_1 (grey) and I_2 (orange), and connect the conductivity test lamp.

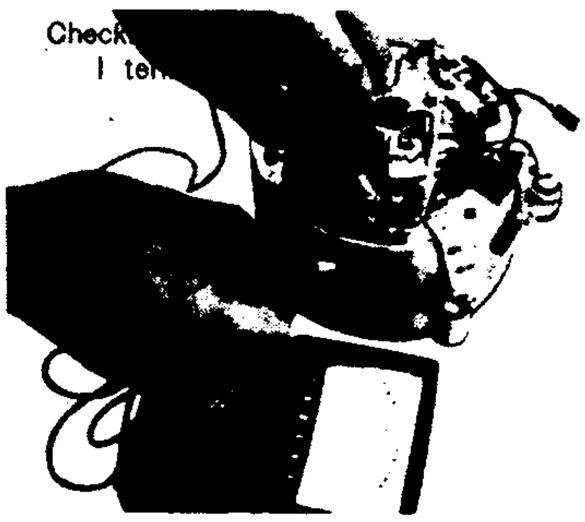




(Fig. 5—4)

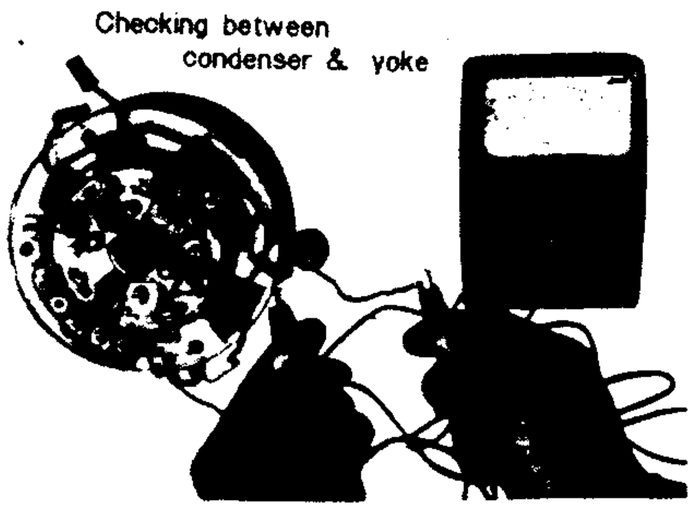
Checking :

If spark will not jump the plug gap, check the conductivity of the breaker unit.
(First check the spark plug and ignition coil.)



(Fig. 5—5)

Checking	Cuation	Cause	Reamedy
1. Movable point (or I terminal) -Yoke	Insert a piece of paper between the points or keep them open.	If not conductive, the parts are in good condition. If conductive, check them in the following manner.	
2. Condenser -Yoke	Disconnect the lead between the points.	If not conductive, the parts are in good condition. If conductive, the condenser is broken.	Replace the condenser.
3. Movable point -Yoke	Disconnect the lead between the movable point, condenser, and I terminal.	If not conductive, the parts are in good condition. If conductive, the point pivot or lead wire terminal is faulty in insulation.	Repair short-circuit.



(Fig. 5—6)

b. Condenser

Function : The condenser stores static electricity at the moment electric pressure is given to its terminals, and discharges it at the moment the terminals come to contact each other. It also serves to curb a temporary increase in voltage when the contact breaker points open (when the primary current is interrupted), thus minimizing possible burning by preventing spark from jumping the point gap, and furthermore, to change the flow of current in the primary ignition coil.

Checking :

Conductivity test--If conductivity is detected between the condenser lead wire and the ground, the condenser is faulty.

Precision test : In insulation test, the insulation resistance value should be 3 MΩ or more, whilein capacity test, the capacity value should be 0.22 μF $\pm$ 10% or less.

1-2. Charging system

The dynamo charging system consists of the yoke assembly (field coil and brush) and the armature assembly (commutator). Alternating current (induced voltage) is generated when the armature coil cuts through the magnetic lines of force around the field coil. The alternating current is picked up as direct current through the brush from the commutator. The induced voltage is kept in a constant value by the function of the regulator, and the direct current is supplied to electrical components, such as the ignition, lighting and signal systems as well as to the battery.

Checking :

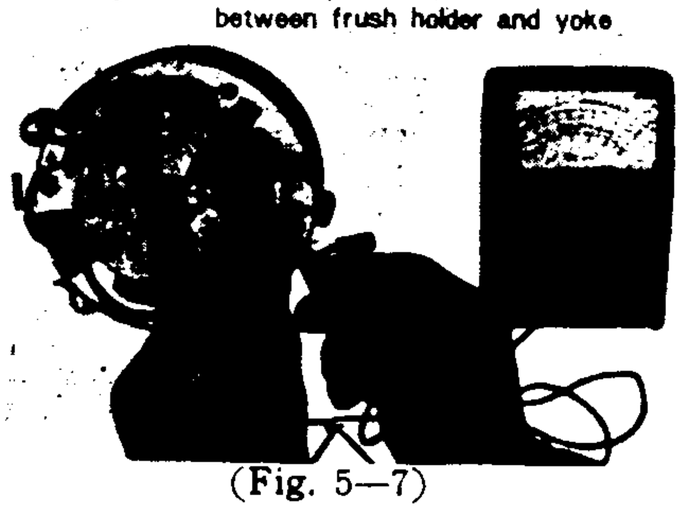
If generating or charging is insufficient, check the regulator is in good condition, check the dynamo.

a. Checking the dynamo

Disconnect the wire harness wiring from the dynamo terminals A and B. Next, ground the F terminal, and install a voltmeter between the A terminal and the ground. Start the engine, and keep it run at 1,400 rpm. As engine speed increases voltage also becomes higher. Exercise care not to damage the coil and lead wires.

If voltage is measured at 5 V or more, the dynamo is in good condition.

Checking the conductivity between frush holder and yoke



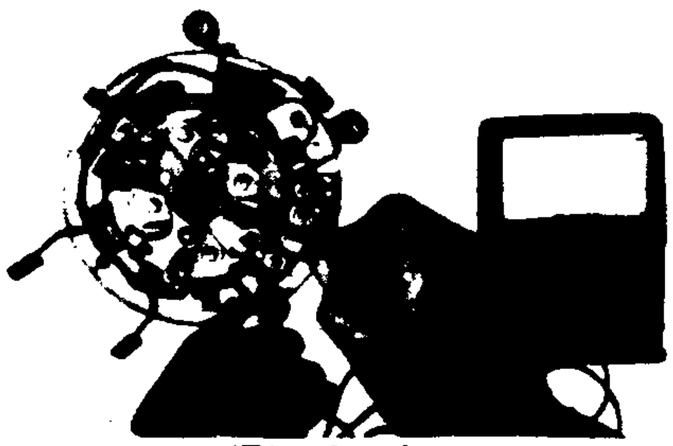
(Fig. 5—7)

b. Checking the yoke assembly

Thoroughly clean the yoke to remove dust, oil, brush power, etc. before checking the yoke.

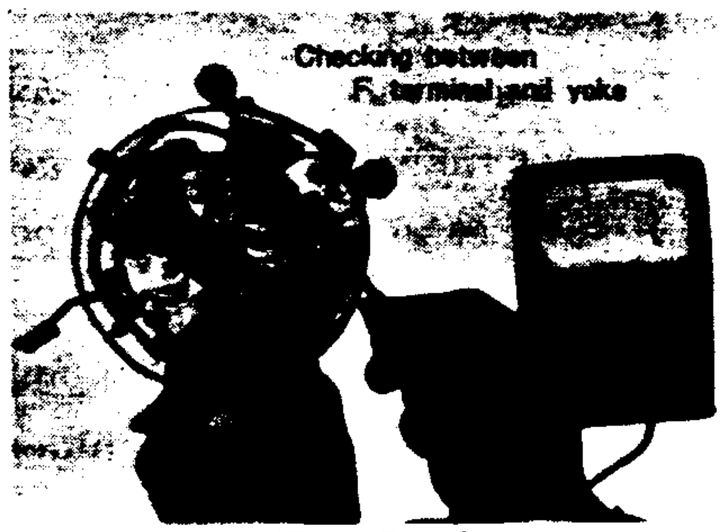
Perform a condutctivity test for wire breakages and faulty insulation.

Checking Between A terminal & F

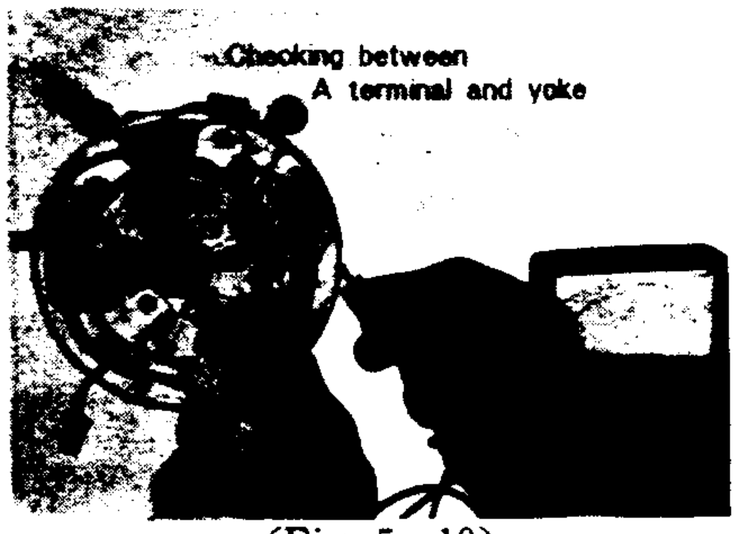


(Fig. 5—8)

Checking	Cuation	Cause	Reamedy
1. +Brush holder -Yoke		If conductive, check the brush holder, field coil A, and F terminal for shorts. Refer to 3.	Repair short-circuit.
2. A terminal -F terminal		If not conductive, check the field coil. Even if conductive, carry out the test as specified in 3.	If a wire outside the coil is broken, repair it. Otherwise, replace the unit.
3. F terminal -Yoke Fig. 5-9 A terminal -Yoke Fig. 5-10	Disconnect the lead of the field coil connected to the A terminal.	If conductive, the field coil or termianl is short-circuit.	Repair short-circuit.



(Fig. 5—9)



(Fig. 5—10)

c. Checking the armature assembly

• Checking the surface of the commutator

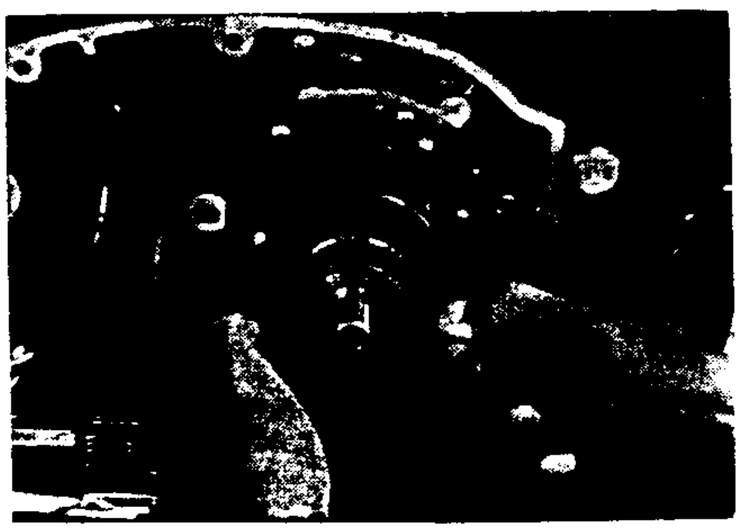
Thoroughly wipe off the oil and dust from the surface of the commutator.

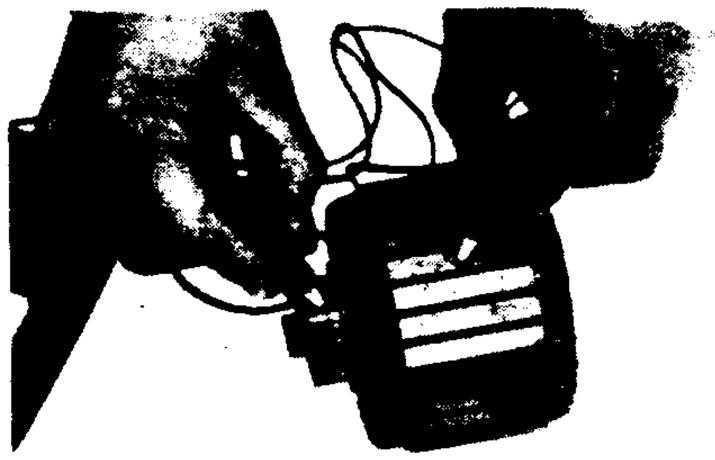
If the surface is rough or covered with brush dust, rub it gently with fine-grain sandpaper. (Fig. 5-7)

Remove brush dust accumulation in the mica-undercut by using a knife or steel wire.

• Conductivity test between the commutator and the shaft (Fig. 5-8)

If conductivity is detected, the armature coil is in short-circuit. Replace the coil.


(Fig. 5—11)


(Fig. 5—12)

• Checking the armature coil

When the yoke and the regulator are both in good condition, but generating is insufficient, the armature coil may be faulty. Replace the coil.

Checking the inside of the coil requires the use of a special tester. Have your YAMAHA service shop check the coil.

d. Dynamo maintenance standards

		YDS5 (starter dynamo)	YM2 (YM2-C) (ignition dynamo)	Mileage
Field	Resistance value (20°C)			
	Shunt	4.99Ω	57Ω	Abnormal voltage
		0.0148Ω		
Brush	Material	CG-6RI	CG-9RB	Initial 6000km
	Quantity	4	2	Every 4000km
	Width × thickness × length	8×4.5×20 mm	8×4.5×20 mm	
	Minimum length	8mm	8 mm	
	Spring pressure	0.65–0.36 kg (Initail min.length)	0.65–0.36 kg	
Commutator	Diameter of commutator	40ϕ	40ϕ	
	Min. length (wornout)	38ϕ	38ϕ	
	Mica under-cut Depth	0.5 mm	0.5 mm	
	Limit of adjustment	1.0 mm	1.0 mm	
	Diameter of amatuer wire	1.4ϕ 5 turns	1.6ϕ 6 turns	
Breaker	Point gap	0.3–0.35 mm	0.3–0.35 mm	Every 3000 km (when ignition is poor, and high speed rotation is not good)
	Point pressure	700±gr.	700±gr.	
	Condenser capacity	0.22μ		
	Ignition timing	B.T.D.0.1.8mm (19.5°)	B.T.D.0.2.1mm (19.5°)	
	Automatic spark advancer	Initial 1200rpm		
		Final 1600rpm		
		Angle 14.5°		
Miscellaneous	Outer diameter of dynamo york	13.4ϕ	13.4ϕ	
	Outer diameter of amature	100ϕ	100ϕ	
	No. of poles	8	6	
	Core gap	0.45 mm	0.4 mm	
	Amatlre taper	20ϕ×1/10	20ϕ×1/10	
Dyanamo performance	Cut-in rpm	1400rpm	1500 rpm	
	Rated output	14V, 7A/1600rpm		
	generated rpm	2kg-m 150A		

2. Regulator

2-1. Function of the Regulator

The electric current tends to show voltage fluctuations according to engine revolutions. The generator keeps the voltage in a constant value and at the same time controls the flow of current to the field coil. (This is called the voltage relay.)

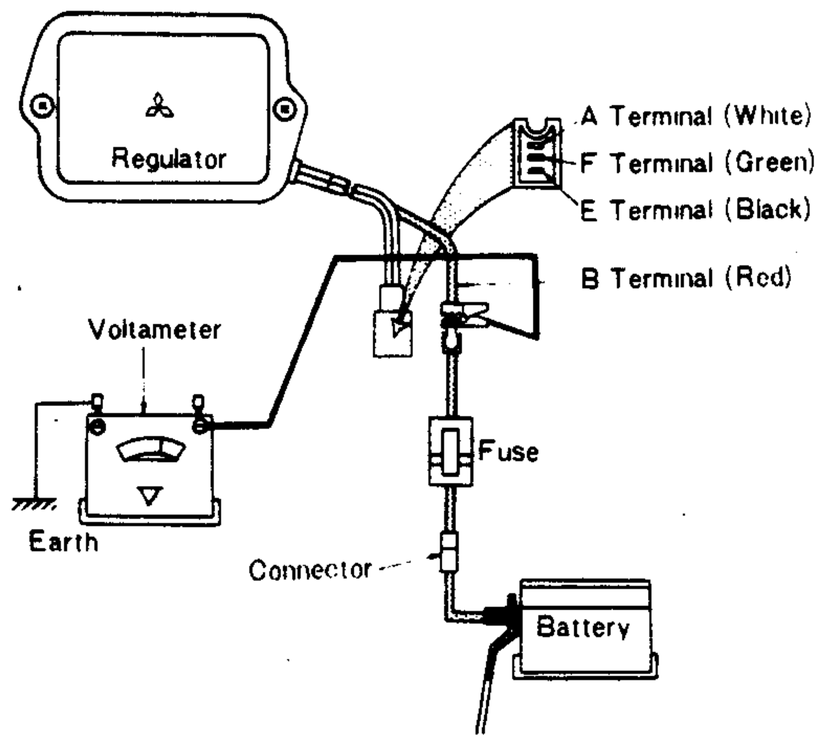
The regulator also incorporates a cutout relay, which is connected to the circuit for charging the battery with a certain amount of electricity from the dynamo, and prevents a reversing flow of current from the battery to the dynamo by breaking the battery circuit. The reversing flow of current occurs when the engine is stopped or when the current from the dynamo is lower in voltage tian the battery due to the engine running at low speed. (This is called the charging relay.)

2-2. Checking and Adjustment

If the voltage regulating function of the regulator goes wrong or stops, it will cause underchaging or overcharging of the battery, and also burning to electrical components. Therefore, use a proper tester in checking and adjustment. (Adjustment requires a very high degree of precision, so learn how to adjust correctly, for instance, through technical training cources.) For this purpose, the nearest authorized service shop is recommended.

a. Ignition aldo voltage

- Connect a tester (direct current voltmeter) as shown in Fig. 5-9.
- Start the engine and keep it run at 2,500 rpm, and remove the fuse connector to interrupt the flow of current from the battery.
- If votage value is between 15.0 V and 15.7 V, the regulator is in good condition.
- When the specified value is not measured, remove the regulator cover and adjust by prying the spring hook with pliers. (Fig. 5-10)

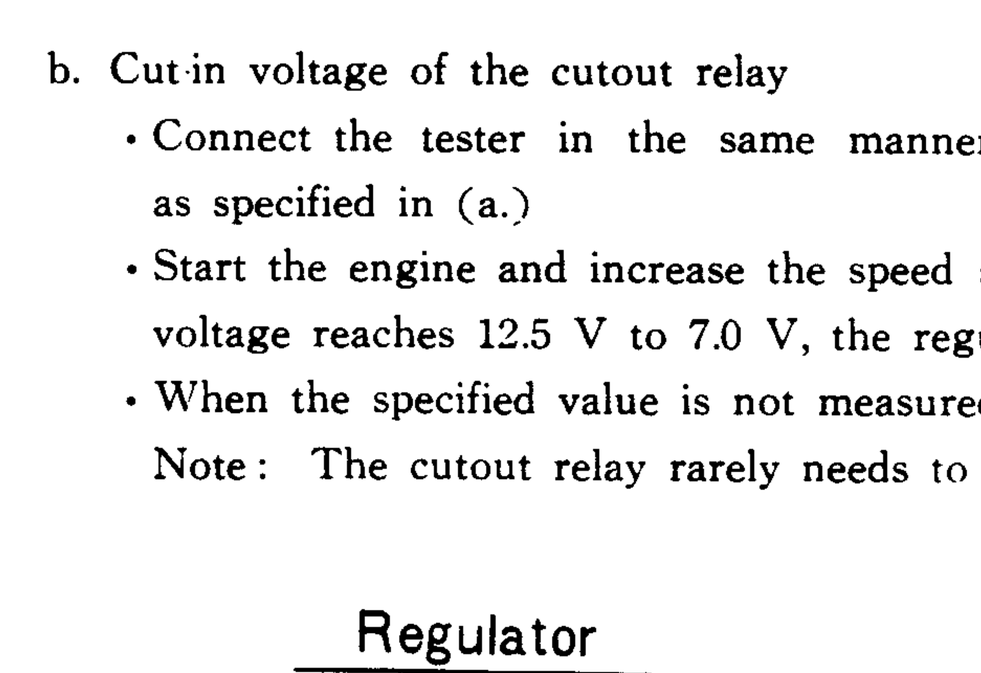


(Fig. 5—13)

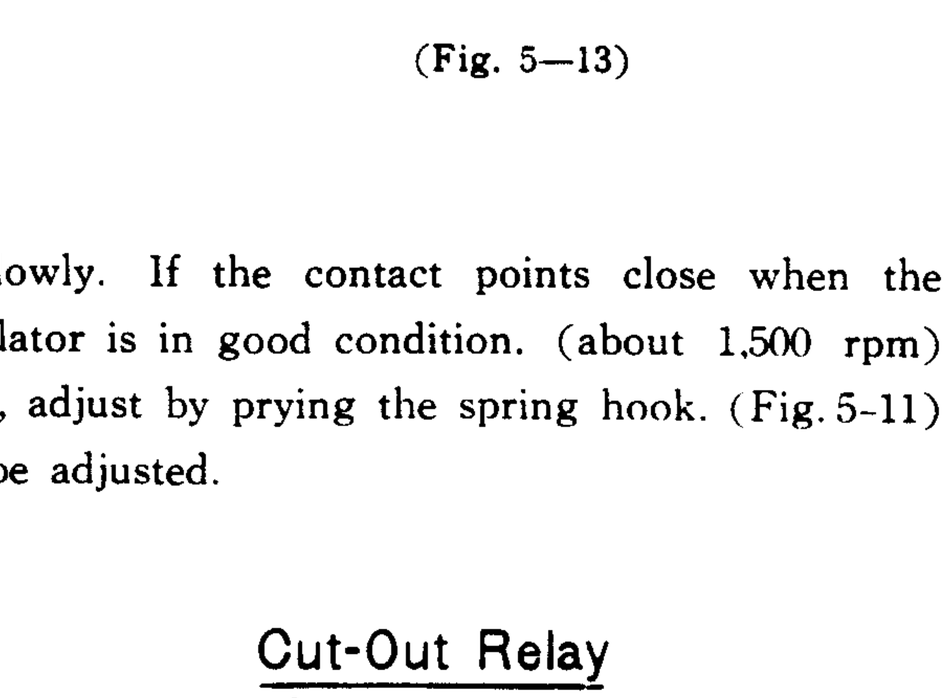
b. Cut-in voltage of the cutout relay

- Connect the tester in the same manner as specified in (a.)
- Start the engine and increase the speed slowly. If the contact points close when the voltage reaches 12.5 V to 7.0 V, the regulator is in good condition. (about 1,500 rpm)
- When the specified value is not measured, adjust by prying the spring hook. (Fig. 5-11)

Note: The cutout relay rarely needs to be adjusted.



(Fig. 5—14)



(Fig. 5—15)

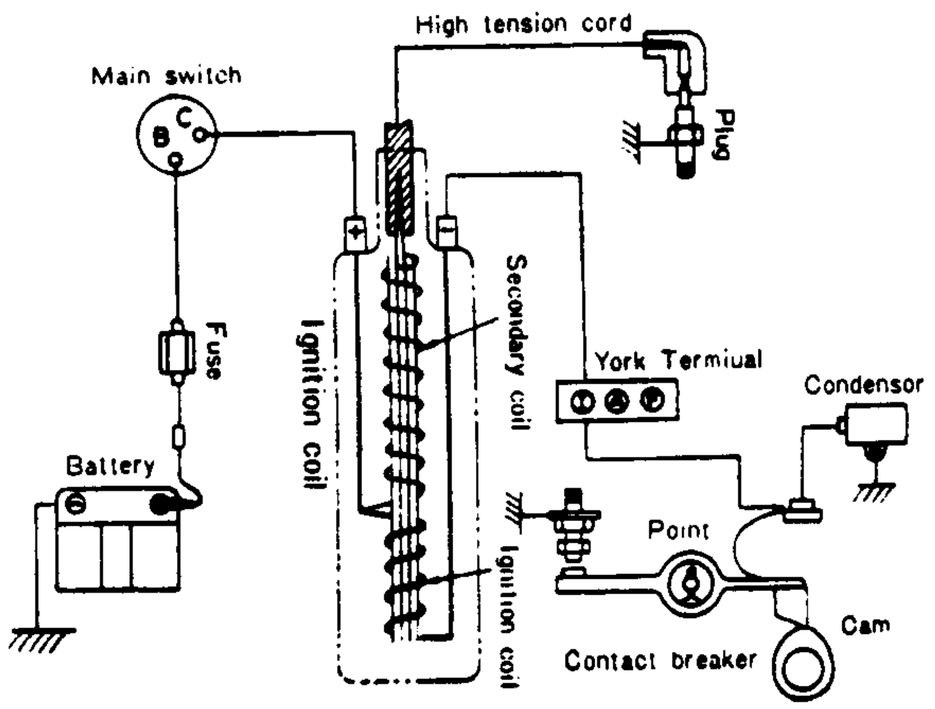
Regulator Maintenance Standard

		Maintenance Standard		Mileage
		YDS5	YM2 (YM2-C)	
Voltage regulator	No-load voltage	15.6–16.3V/2500rpm Under 16.7V/5000rpm	Same as left	
	Ignition coil load voltage	15.0–15.7V/25000rpm	Same as left	Voltage abnormal
	Voltage coil resistance value	8.1Ω/20°C	Same as left	
	Field coil insertion resistance	10	Same as left	
	Compensation resistance value	16	Same as left	
	Core gap	1.0–1.2mm	Same as left	
	Point gap	0.3–0.4mm	Same as left	
Cutout relay	Cut in voltage	12.5–13.5V	Same as left	
	Voltage coil resistance value	79.2Ω/20°C	Same as left	
	Point gap	0.7–0.9mm	Same as left	
	Core gap	0.3–0.5mm	Same as left	
Starting switch	Magnet voltage	Under 8V		
	Closed voltage	Under 4V		
	Point voltage drop	1.2±0.15mm		
	Voltage coil resistance value	4.3Ω/20°C		

3. Ignition Coil

3-1. Function of the Ignition Coil

The ignition coil is a sort of transformer. The ratio of primary coil to secondary coil is about 1 : 50. When the flow of current from the battery in the primary coil is interrupted by the contact breaker, the voltage of the of the primary coil will reach 150–300 V. This voltage will be increased to 7,000–10,000 V or more by the mutual induction of the secondary coil, thus causing sparks to jump the plug gap.



(Fig. 5—16)

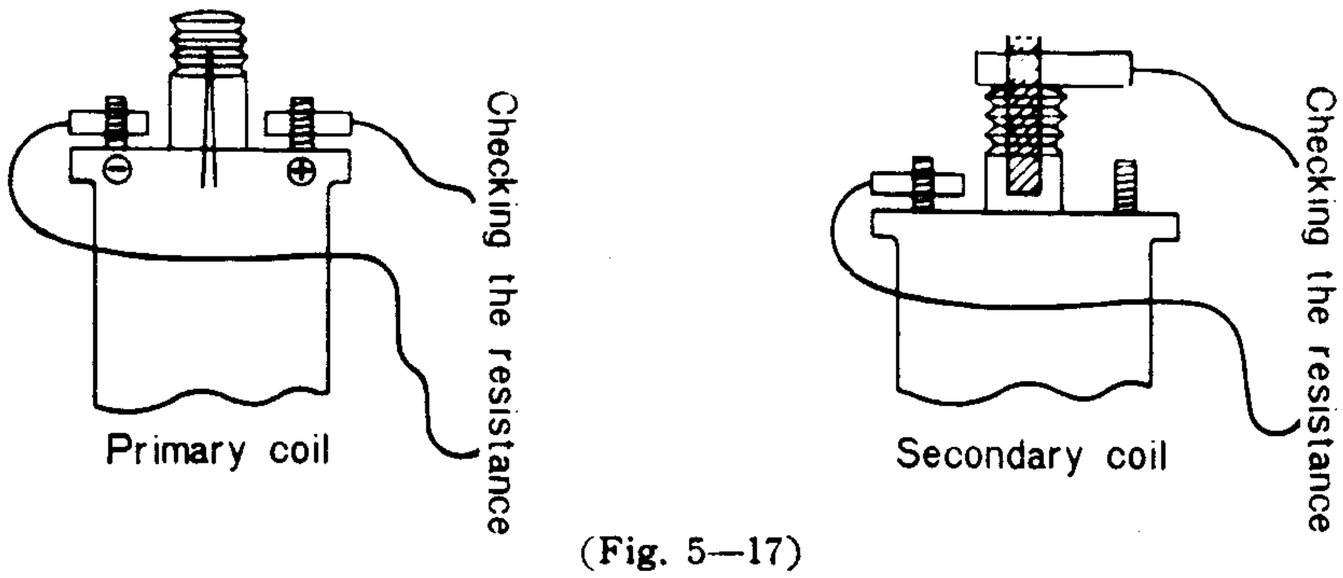
3-2. Checking

When no sparks appear at the plug gap at all or when sparks are weak, check the ignition coil as well as the contact breaker.

a. Conductivity and resistance tests of the primary and secondary coils

Check the coils for breakages.

Replace the coils when no conductivity is detected.

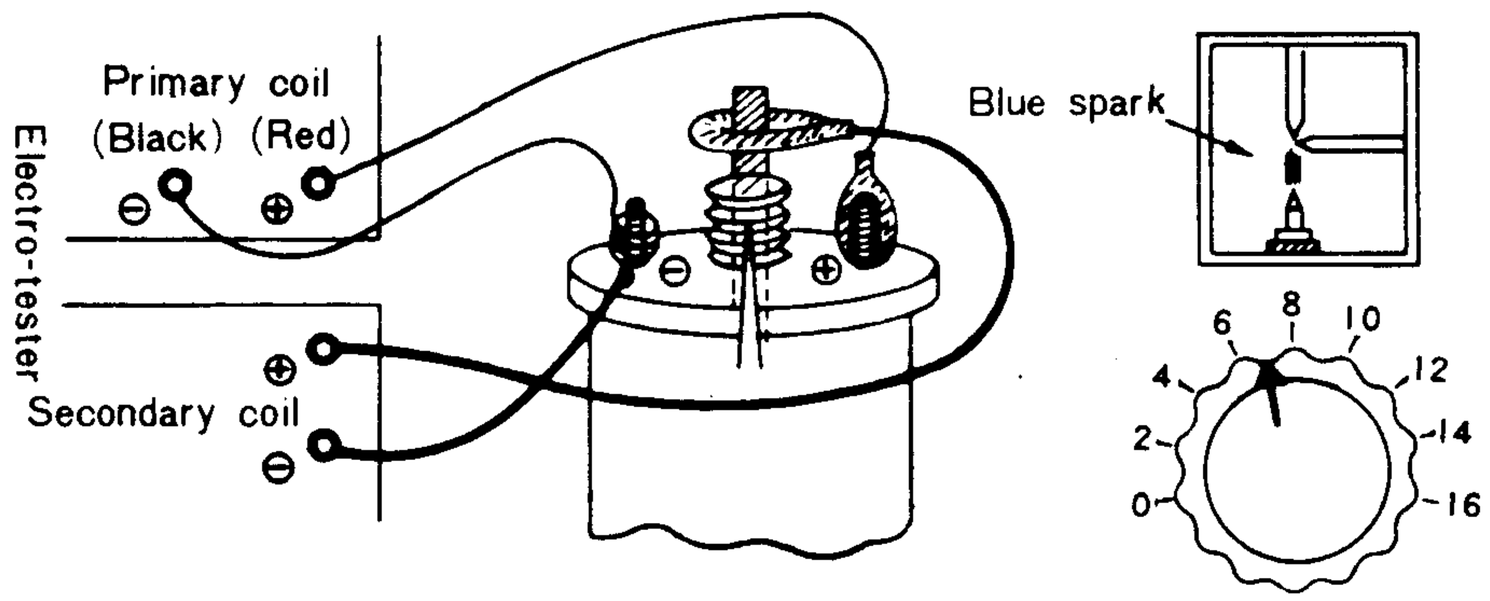


(Fig. 5—17)

b. Spark performance tests

Test the coil alone or the boil by starting the engine.

If spark jumps are measured more than 6 mm, the coil is in good condition.



(Fig. 5—18)

4. Spark Plugs

4-1. Selecting Plugs

a. Standard plugs for YDS series (B-7HZ and B-8HC)

The burning condition and service life of a plug vary according to motorcycles because of the conditions under which they are used. It is necessary, therefore, to choose the optimum plug by judging the burning condition of the plug when it is serviced periodically. This is particularly important for motorcycles engaging in special purposes-e.g., constantly running in urban areas at low speeds or for long hours at high speeds. Every 3,000 km, the plug should be replaced. Not only will it maintain the engine in good condition, but also it will contribute to long-term economy.

b. Determinining the burning condition of the plug.

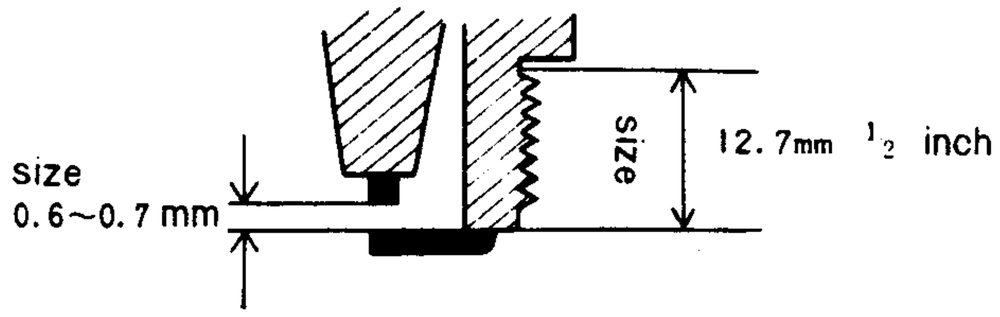
- Best……the porcelain around the center electrode is a light tan color.
- If the electrodes and porcelain are black and oily, replace the plug with a horrer-type for low speed riding.
- If the porcelain is burned white and/or the electrodes are partially burned away, replace the plug with a colder type for high speed riding.

For low speed riding in urban areas·····B-7HZ

For high speed riding for long hours ·····B-8HC

4-2. Checking

It is hoped that all YAMAHA owners will check and clean their spark plugs at least once a month or every 1,000 km run. Remove carbon deposits from the electrode and set the plug gap to 0.6–0.7 mm. Use only the specified spark plug.



(Fig. 5—19)

5. Battery

5-1. Function of the Battery

The battery is the power source for all electrical components.

It supplies power to the ignition and signal systems in place of the dynamo when the engine is started or the engine runs at low speed (dynamo generating power is small). While the motorcycle is running, the unused portion of electric power generated by the dynamo is charged to the battery.

5-2. Handling the Battery

a. Caution on the initial use

Have a specialized battery service shop charge the battery. If you have to do the job yourself, take the following steps.

Method of the initial charging :

First of all, cut off the bleeding pipe on the side of the battery

Prepare a diluted sulphuric acid (specific gravity is 1.26), and pour it into each battery cell so that it reaches the specified maximum level.

Charge it at O.A for 13 hours.

Tilt up the corner of the battery to let out air bubbles.

Refill the battery with the diluted sulphuric acid or distilled water so that it will reach the maximum level and the specific gravity will be at 1.26.

Tighten all the cell caps.

Wash the battery to remove the sulphuric acid attached to the outer surfaces of the battery.

Dry it well and mount it on the frame.

b. Periodic checking and recharging.

Check the electrolyte level every two months, and add distilled water if the level is below the middle line.

When the battery seems to be discharged, recharge it at 0.8 A for 13 hours.

Find out the cause for discharging, and repair it.



(Fig. 5—20)

c. Storing the battery

When the motorcycle is not used for some time, dismount the battery from the frame, and have it stored by a battery service shop.

Note: The following steps should be taken by the battery service shop.

Recharge the battery.

Keep the battery in a cool, dark, dry place. (Temperatures should not be below zero.)

5-3. Maintenance Standards

Item	Maintenance Standards	Checking
Electrolyte Initial charging	Specific gravity – 1.26 (20°C)	When mounted on a new machine.
Recharging	At 0.8 A for 13 hours	When capacity is insufficient.
	Add distilled water up to the specified level.	Every 3 months or 3,000 km (2,000 miles)

Chapter 6.

Major Inspection and Maintenance

1. Periodic Inspection and Maintenance

1. Significance of the Periodic Inspection

The periodic inspection is aimed at accident prevention as well as trouble-free riding.
This care will save a lot of time and labor which are otherwise required for major repairs, thus reducing expense born by the owner and precluding the possibility of claims under warranty coverage.
It is hoped that all YAMAHA owners will check their machines every day before riding, and have them inspected by YAMAHA service shops according to the instructions as specified in the Periodic Inspection Card.

2. Time Intervals and Items for Periodic Inspection

Inspection	300 km 200 mi	3,000 km 2,000 mi	6,000 km 4,000 mi	every 4,000 km
1. Adjusting front & rear brakes	○	○	○	○
2. Adjusting clutch	○	○	○	○
3. Replacing gear oil	○	○	○	○
4. Greasing		○	○	○
5. Checking battery fluid	○	○	○	○
6. Inspecting spark plug	○	○	○	○
7. Inspecting ignition timing		○	○	○
8. Adjusting carburetor		○	○	○
9. Overhauling carburetor			○	
10. Cleaning air cleaner		○	○	○
11. Cleaning cylinder head & piston		○	○	○
12. Cleaning muffler & exhaust pipe		○	○	○
13. Adjusting & greasing drive chain		○	○	○
14. Retightening bolts & nuts		○	○	○
15. Inspecting autolube pump	○	○	○	○

3. Major Inspection and Adjustment

3-1. Engine

a. Removing carbon deposits

Because of the YAMAHA Autolube, the engine will produce comparatively little carbon deposits. However, you should clean the following parts every 2,000 miles in order to keep the engine in good condition.

- Cylinder head, piston head and pin grooves
- Cylinder exhaust port
- Exhaust pipe and silencer

b. Air cleaner

Dirt will shorten the life of the cylinder and piston, and cause a loss of power. When riding on dusty roads, the air cleaner should be cleaned at least every 1,000 km (about 700 miles).

c. Carburetor inspection & cleaning

Hard starting, poor acceleration, rough idling, and over floating, suggest that the carburetor should be overhauled.

- Disassemble the float chamber and float from the mixing body and wash them in clean gasoline.
- Blow dirt out of the bypass holes in the mixing body after cleaning the pilot jet and main jets.
- Assemble the above parts in correct order, mount the carburetors on the engine, adjust the throttle cables and set the idle.
- Check the adjustment of the oil pump.

d. Clutch adjustment

If clutch cable play is excessive, adjust it with the clutch adjusting nut on the left crankcase cover.

e. Gear oil

Change the gear oil about every 1,000 miles (1,500 km) before it becomes too dirty.
Use YAMAHA gear oil (Motor oil 10W/30 or 20W/40)
Quantity 1,600 cc (1.7 quarts)

3-2. Chassis

a. Inspecting front & rear brakes

- Adjust the play in the brake cable and brake pedal
- Remove the wheels and clean the brake shoes and drums of dirt. and grease the wheel bearings every 4,000 miles (6,000 km).

b. Adjusting and oiling the chain

- Periodically adjust chain tension and oil the chain.
- Remove the chain and wash it in solvent every 2.000 miles (3,000 km). Dry it and oil it adequately.

c. Change the front fork oil every 3 months or every 2,000 miles (3,000 km).

d. Inspecting and tightening all bolts and nuts during periodic inspections :

- Axle nuts on front and rear wheels
- Steering system mounting nuts
- Swing arm shaft nuts
- Foot rest and brake pedal
- Main stand and side stand
- Sprocket wheel mounting bolts
- Muffler mounting bolts
- Engine mounting bolts
- Spokes of front & rear wheels

e. Oil and grease

Periodically lubricate or grease all moving parts.

3-3. Electrical system

a. Inspecting and cleaning the plug

Check the appearance of the spark plug, clean it, and adjust the gap between the electrodes. (Refer to page .)

b. Ignition timing

Irregular ignition timing reduces engine power, and causes overheats, knocking, etc. Periodically check the timing with a strobo light, or dial indicator after first cleaning the points and checking point gap. (Refer to page .)

c. Battery fluid

Handle the battery carefully when handling it.

Check the fluid level once a month in summer, once every two months in winter, and add distilled water as required.

d. Inspecting the generator brushes

The life of the brushes is proportionate to the machine's mileage. Begin regular inspection from 4.000 miles (6,000 km) on.

If the brushes wear below the minimum length (12 mm), replace them with new ones.

e. Cleaning the armature commutator

A dirty commutator lowers the charging rate and limits the capacity of the battery. Brush dust tends to collect in the mica undercut, so polish the commutator surface with fine sandpaper and then remove the dust with a knife blade.

f. Inspecting the voltage regulator (Only in case of malfunction)

If the battery is run down or overcharged, or if the generator or regulator is considered to be the cause of irregular voltage, inspect the voltage regulator.

3-4. Autolube system

a. Inspecting, repairing and adjusting cables

- Inspect pump and throttle cables for damage
- Make sure that the cable is working smoothly in the cylinder.
- Make sure that the adjusting pulley returns correctly.
- Make sure that the throttle valves return correctly.

b. Inspecting

Refer to the Carburetor and Pump Setting in page 35.

c. Pump stroke inspection

Measure the minimum plunger stroke with a feeler gauge, while the accelerator grip is closed.

If the stroke is less than 0.15 mm, remove the nut and adjustment plate, and add an adjustment shim of 0.1 mm. to correct the stroke to 0.20-0.25 mm.

b. Inspecting parts

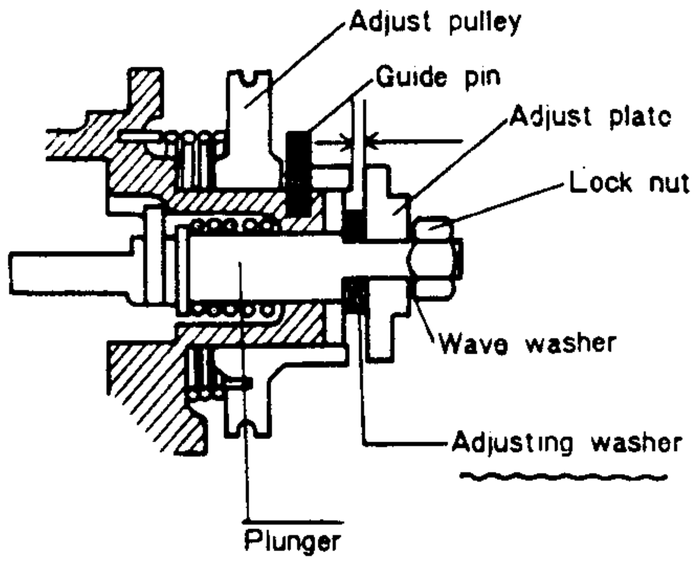
Inspect the pump assembly, banjo bolt, delivery pipe, bleeder bolt, oil line, and union bolt.

- Retighten bolts and nuts.
- Check for oil leakages

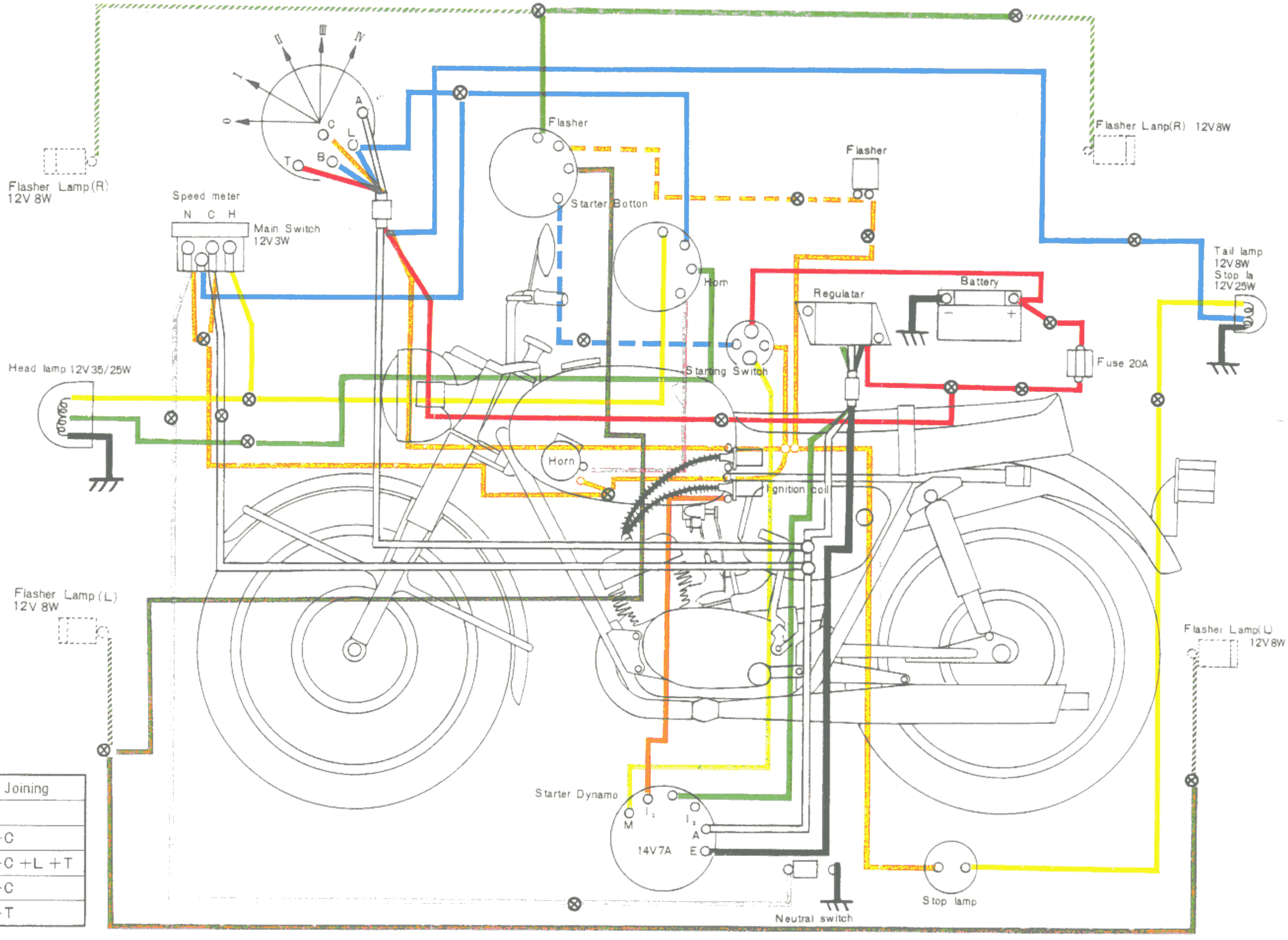
Replace faulty packings (gaskets)

Replace faulty delivery line.

Replace leaky oil pump (Slight oil seapage is not considered to be leakage.)



250 YDS-5 Circuit



	Condition	Joining
0	Stop	
I	Day driving	B +C
II	Night driving	B +C +L +T
III	Emergency starting	A +C
IV	Parking	B +T

Note: ////// no flasher circuit for U.S.A. & Conada

305 YM-2 Circuit

Main switch connecting

Key position	B-C	B-L	B-T	A-C	
0	×	×	×	×	Stop
I	○	×	×	×	Day driving
II	○	○	○	×	Night driving
III	×	×	×	○	Emergency starting
IV	×	×	○	×	Parking

