YAMAHA

DS6

SERVICE MANUAL
DS6/ DS6C

LIT-11612-47-00

FOREWORD

The Yamaha DS6 is an improved version of the 250 cc YDS5E that has made a big reputation for itself as a true sportster. The DS6 is loaded with many new design features – 5-port induction system, aluminum cylinders with special bonded-in cast iron sleeves, and Yamaha Autolube – the automatic oil injection system pioneered by Yamaha.

Among other design features are a separate speedometer and tachometer, 3-way adjustable rear shocks, and perfect waterproof and dustproof front and rear brakes. The rider can also enjoy long hours of tireless and safe riding pleasure on the smartly designed dual seat. The improved design of the fuel tank and front fender gives the final touch of a true sportster.

As a companion model, the Yamaha DS6C, as marketed. can be distinguished from the DS6 by these features: Upswept mufflers, engine protector, braced handlebar, front and rear tire with universal tread, boot protected front fork and exposed, chrome plated rear shock springs.

This service manual is published to provide the technical information required for Yamaha service dealers as well as for the Yamaha owner. It is sincerely hoped that you will read this manual thoroughly to keep your Yamaha always in top condition.

YAMAHA MOTOR CO., LTD.

SERVICE DIVISION

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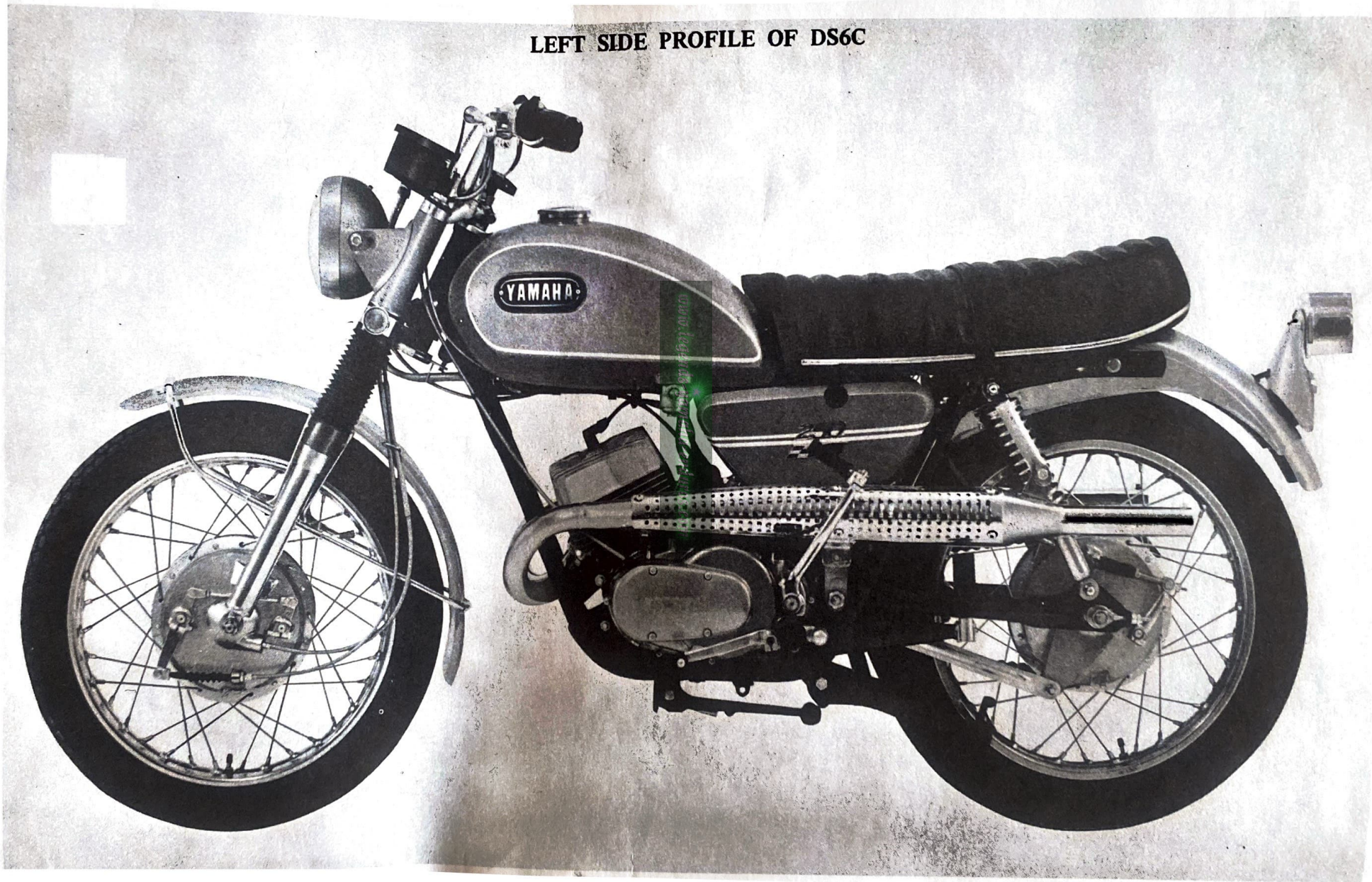
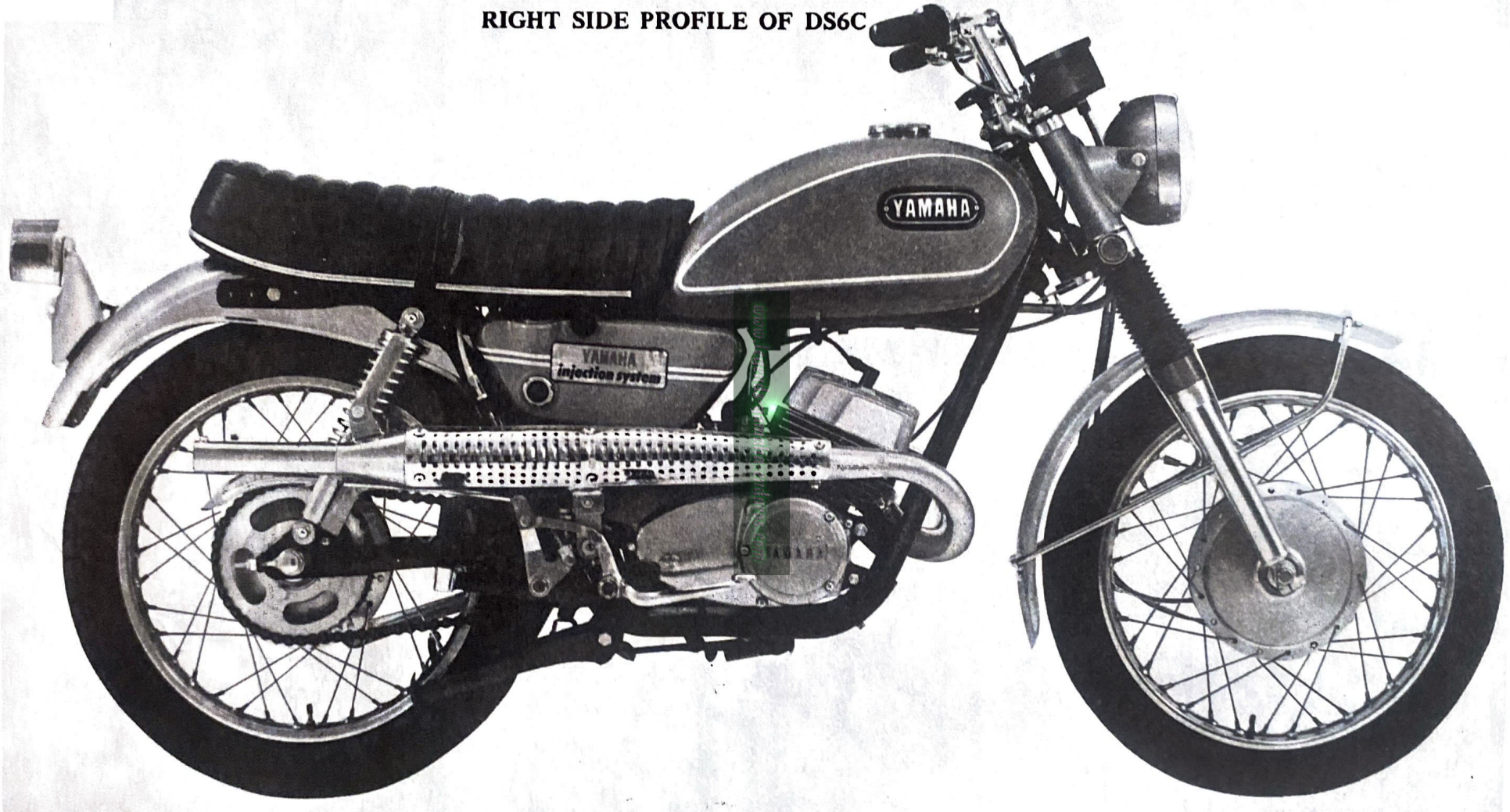
LEFT SIDE PROFILE OF DS6C



RIGHT SIDE PROFILE OF DS6C



CHAPTER 1. GENERAL

1–1 Features

1. **5-port Engine:**
   The DS6 employs a 5-port, aluminum cylinder with special cast iron sleeves. Yamaha's unique 5-port engine is greatly superior in scavenging efficiency, and assures steady performance throughout the entire range of speeds.

2. **Yamaha Autolube:**
   Yamaha Autolube, pioneered by Yamaha, is well known for its high performance and extra reliability. Like every other Yamaha model, the Yamaha DS6 engine is automatically lubricated by the world-renowned Autolube system.

3. **Carburetor with Built-in Starter Jet:**
   The carburetor is equipped with a starter device, thus permitting quick starting in the coldest weather.

4. **Highly Powerful Brakes:**
   Yamaha's unique design, front and rear, features perfect waterproof and dustproof ability. Highly effective braking can be ensured under any road conditions.

5. **Separate Tachometer and Speedometer:**
   To make it easily visible to the rider, a smartly-designed tachometer is provided separately from the speedometer. Both meters are rubber-mounted to reduce shocks from the road.

6. **Three-way Adjustable Rear Cushions:**
   The rear cushions are three-way adjustable, allowing the rider to adjust the spring tension to his choice according to road conditions. Superb riding comfort is assured.

7. **Well-spaced 5-speed Transmission:**
   The close ratio 5-speed transmission provides easy gear shifting, assuring steady engine performance on highways or on hilly lands.

8. **Extra Safety (for USA and CANADA):**
   The DS6 is provided with a front brake operated stop light and side reflectors for the extra safety of the rider.

1–2 Specifications and Performance

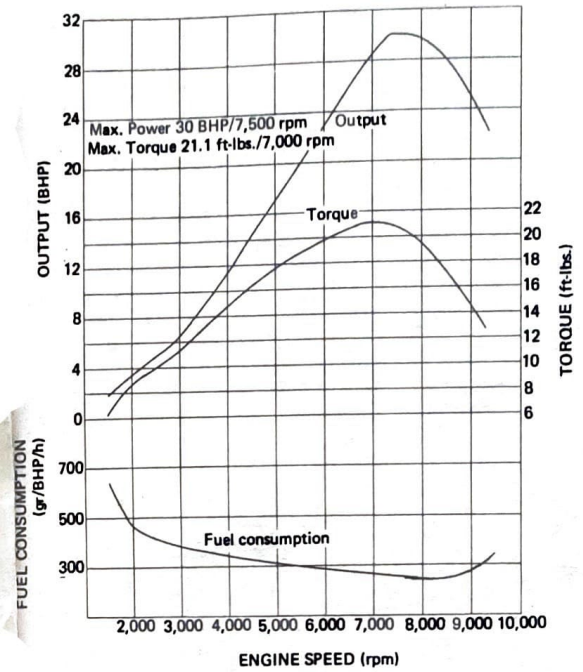
The following data subject to change without notice.

Model	DS6	DS6C
Dimensions:		
Overall length	78.3 in. (1,990 mm)	78.3 in. (1,990 mm)
Overall width	32.9 in. (835 mm)	32.9 in. (835 mm)
Overall height	41.9 in. (1,065 mm)	41.9 in. (1,065 mm)
Wheelbase	50.8 in. (1,290 mm)	50.8 in. (1,290 mm)
Min. ground clearance	6.3 in. (160 mm)	5.9 in. (150 mm)
Weight:		
Net	304 lbs. (138 kg)	309 lbs. (140 kg)
Gross	320 lbs. (145 kg)	331 lbs. (150 kg)
Performance:		
Max. Speed	90 ~ 100 mph (145 ~ 160 km/h)	90 ~ 93 mph (145 ~ 150 km/h)
Fuel consumption	94.1 mpg at 25 mph	94.1 mpg at 25 mph
(on paved level road)	(40 km/liter at 40 km/h)	(40 km/liter at 40 km/h)
Climbing capacity	24 degrees	25 degrees
Min. Turning radius	86.6 in. (2,200 mm)	86.6 in. (2,200 mm)
Braking distance	38 ft. at 31 mph (11.7 m at 50 km/h)	38 ft. at 31 mph (11.7 m at 50 km/h)
Acceleration performance (SS 1/4 mile)	15.0 seconds	15.2 seconds
Engine:		
Type	DS6, 2-stroke, air cooled.	DS6, 2-stroke, air cooled.
Cylinder	Two in parallel, forward inclined, 5-port.	Two in parallel, forward inclined, 5-port.
Lubrication system	Separate lubrication (Yamaha Autolube)	Separate lubrication (Yamaha Autolube)
Displacement	246 cc (15.01 cu.in.)	246 cc (15.01 cu.in.)
Bore & stroke	56 x 50 mm (2.205 x 1.969 in.)	56 x 50 mm (2.205 x 1.969 in.)
Compression ratio	7.3 : 1	7.3 : 1
Max. output	30 BHP/7,500 rpm	30 BHP/7,500 rpm
Max. torque	21.1 ft.lbs./7,000 rpm (2.92 kg-m/7,000 rpm)	21.1 ft.lbs./7,000 rpm (2.92 kg-m/7,000 rpm)
Starting system	Kick starter	Kick starter
Ignition system	Battery ignition	Battery ignition
Carburetor:	VM26SC x 2	VM26SC x 2
Air cleaner:	Dry, paper filter	Dry, paper filter
Transmission:		
Clutch	Wet, multi-disc	Wet, multi-disc
Primary reduction system	Helical gear	Helical gear
Primary reduction ratio	3.250 (65/20)	3.250 (65/20)
Gear box:		
Type	Constant mesh, 5-speed forward	Constant mesh, 5-speed forward
Reduction ratio 1st	2.545 (28/11)	2.545 (28/11)
Reduction ratio 2nd	1.533 (23/15)	1.533 (23/15)
Reduction ratio 3rd	1.167 (21/18)	1.167 (21/18)
Reduction ratio 4th	0.950 (19/20)	0.950 (19/20)
Reduction ratio 5th	0.773 (17/22)	0.773 (17/22)
Secondary reduction ratio	2.733 (41/15)	2.929 (41/14)
Secondary reduction system	Chain	Chain

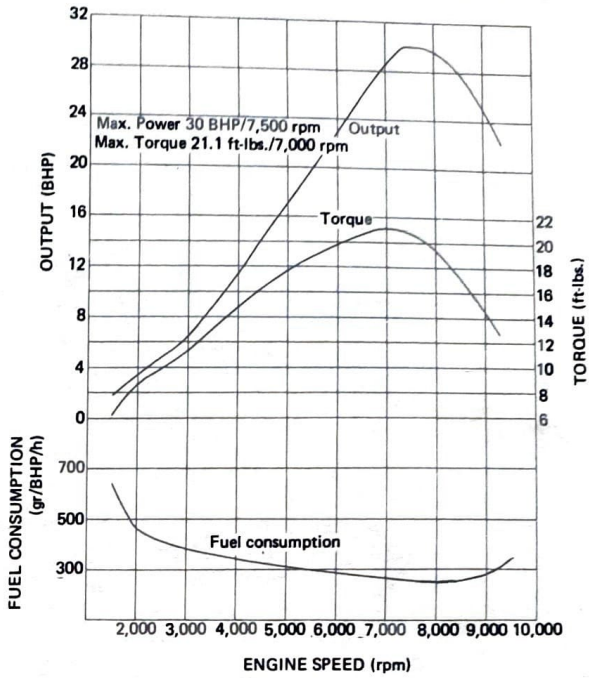
Model	DS6	DS6C
Chassis:		
Type of frame	Double cradle type	Double cradle type
Suspension system, front	Telescopic fork	Telescopic fork
Suspension system, rear	Swing arm	Swing arm
Cushion system, front	Coil spring, oil damper	Coil spring, oil damper
Cushion system, rear	Coil spring, oil damper	Coil spring, oil damper
Steering system:		
Steering angle	38 degrees both right & left	38 degrees both right & left
Caster	63.0 degrees	63.0 degrees
Trail	88.5 mm	88.5 mm
Braking system:		
Type	Internal expansion	Internal expansion
Operation method, front	Right hand operation, cable actuated	Right hand operation, cable actuated.
Operation method, rear	Right-foot operation, cable actuated	Right foot operation, cable actuated.
Tire, front	3.00–18–4PR	3.00–18–4PR
Tire, rear	3.25–18–4PR	3.50–18–4PR
Fuel tank capacity	2.9 US gals. (11 liters)	2.9 US gals. (11 liters)
Oil tank capacity	1.6 US qts. (1.5 liters)	1.6 US qts. (1.5 liters)
Generator:		
Model	DU100-12	DU100-12
Manufacturer	Mitsubishi Elec.	Mitsubishi Elec.
Spark plug:	B-9HC	B-9HC
Battery:		
Model	12N5-3B	12N5-3B
Capacity	12V 5AH	12V 5AH
Lights:		
Headlight	12V 35/25W	12V 35/25W
Taillight	12V 7W	12V 7W
Stop light	12V 23W	12V 23W
Flasher light	12V 8W	12V 8W
Neutral light	12V 3W	12V 3W
Meter lights	12V 3W x 2	12V 3W x 2
High beam indicator light	12V 1.5W	12V 1.5W
Charge light	12V 3W	12V 3W
Flasher pilot light	12V 3W	12V 3W

1–3 Performance Curves

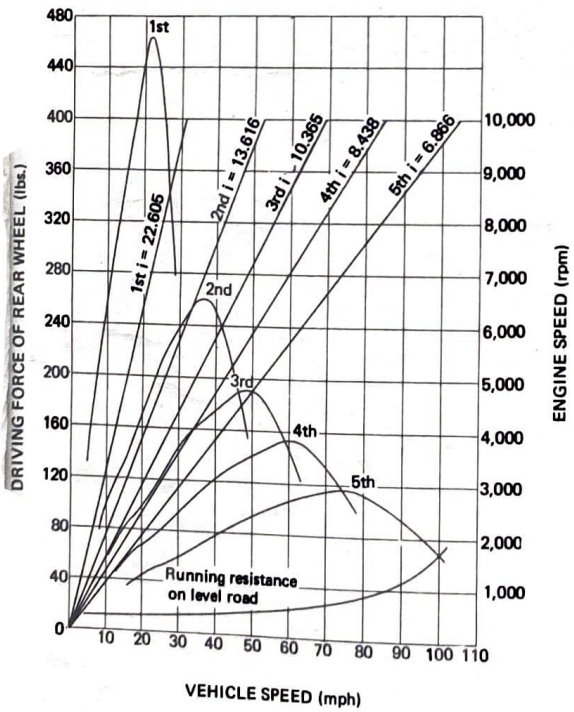
250 DS6 ENGINE PERFORMANCE CURVES



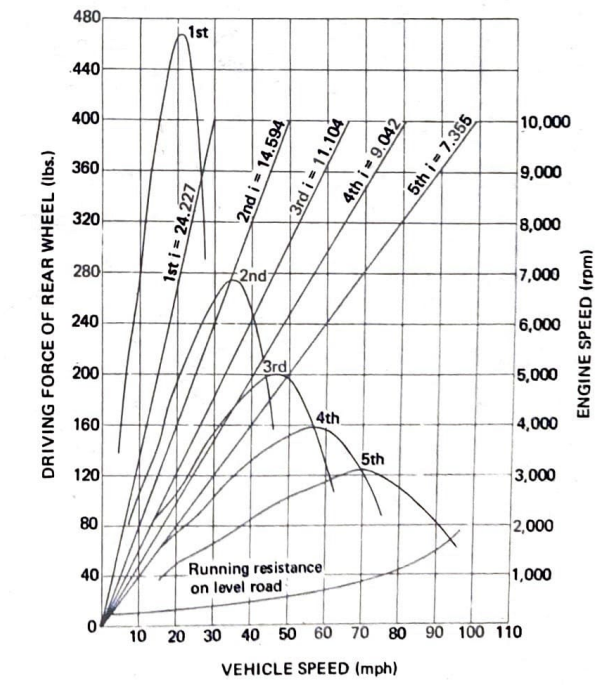
250 DS6C ENGINE PERFORMANCE CURVES



250 DS6 RUNNING PERFORMANCE CURVES



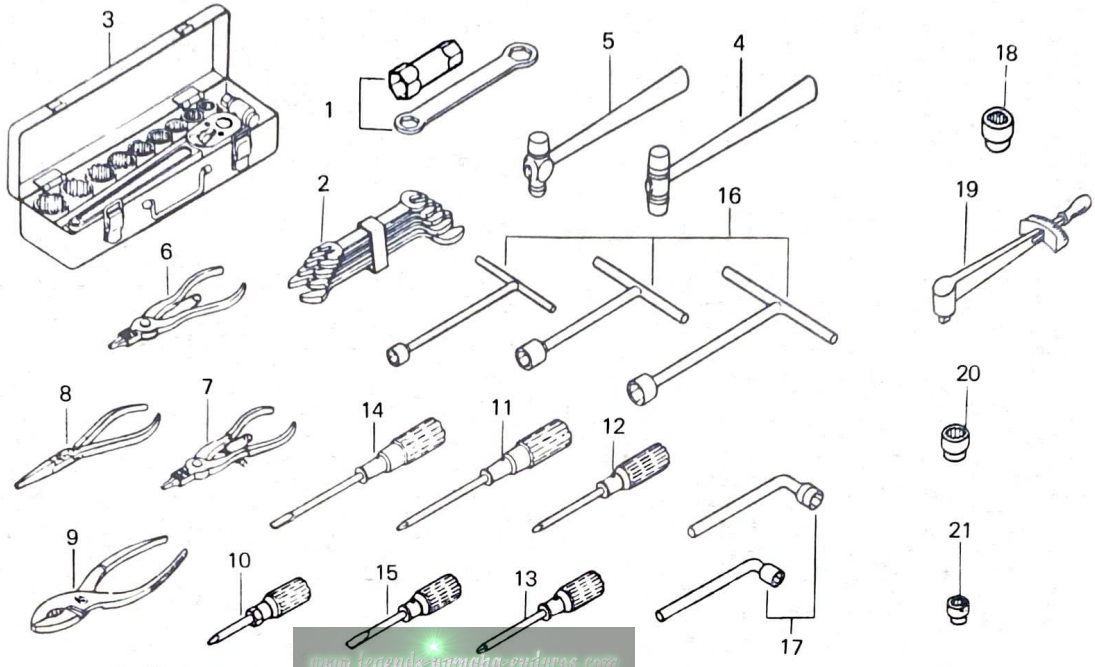
250 DS6C RUNNING PERFORMANCE CURVES



1–4 Service Tools

The following service tools are required to service the YAMAHA 250 DS6.

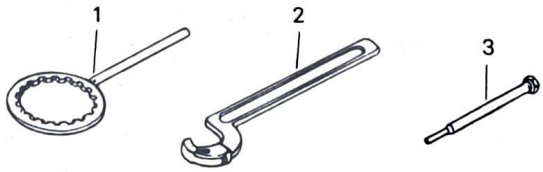
1. Standard Tools



1. Plug wrench
2. A set of open-end wrenches
3. A set of socket wrenches
4. Soft-faced-hammer
5. Steel hammer
6. Circlip pliers (ST type)
7. Circlip pliers (RT type)
8. Needle nose pliers
9. Pliers
10. Phillips-head screwdriver
11. Phillips-head screwdriver (Large)
12. Phillips-head screwdriver (Medium)
13. Phillips-head screwdriver (Small)
14. Slot-head screwdriver (Medium)
15. Slot-head screwdriver (Small)
16. T-type socket wrenches
17. L-type socket wrenches
18. Socket wrench (29 mm)
19. Torque wrench
20. 13 mm Socket (for Torque wrench)
21. 10 mm Socket (for Torque wrench)

Fig. 1-4-1

2. Special Tools

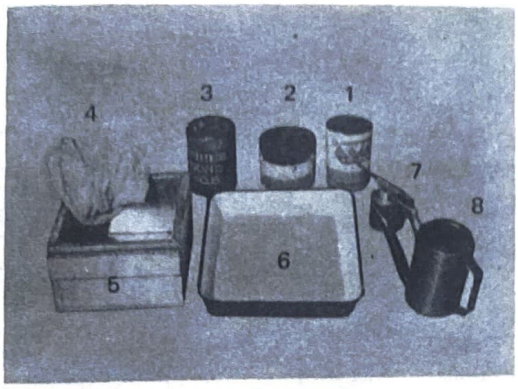


1. 250 DS6 clutch holding tool (similar type to that for R3)
2. Exhaust pipe ring nut wrench
3. Armature puller bolt (Mitsubishi-made)

Fig. 1-4-2

In addition to the above special tools, the YAMAHA electrotester, tachometer (engine speedometer), gravimeter, etc. are required.

3. Other Miscellaneous Tools



1. YAMAHA Autolube oil
2. Grease
3. YAMAHA Bond (No.5)
4. Wiping materials
5. Overhauling stand
6. Parts tray
7. Oil can
8. Oil cup

Fig. 1-4-3

Using a wooden box ((5) as shown in the above photo) will facilitate engine service. Expendable parts (such as gaskets) and replacement parts must also be on hand.

CHAPTER 2. YAMAHA AUTOLUBE
(Separate Automatic Lubrication System)

2–1 What is Yamaha Autolube?

The YAMAHA Autolube is an automatic lubricating device for 2-stroke engines. Developed by the YAMAHA Technical Institute, it meters oil to the engine with respect to engine speed and throttle opening by means of a precision pump. As a result, the YAMAHA engine does not require pre-mixed gas and oil like other 2-stroke engines. Controlled lubrication is automatically applied to the working parts of the engine. This makes YAMAHA Autolube the best lubricating system ever devised for 2-stroke engines. The oil pump is driven by the engine, through a reduction gear system and also connected to the throttle.

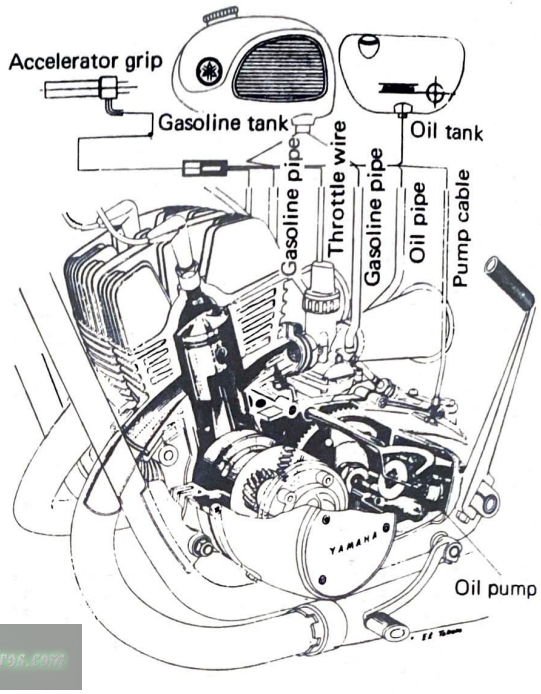


Fig. 2-1-1

2–2 Features of Yamaha Autolube

The YAMAHA Autolube:

1. Eliminates the bother of pre-mixing gas and oil.
2. Maintains optimum lubrication according to both engine speed and throttle opening.
3. Reduces spark plug fouling by injection just enough oil for proper lubrication.
4. Cuts oil consumption to 1/3 that of conventional 2-stroke engines.
5. Reduces exhaust smoke.
6. Lets you use the engine compression as a brake; the oil injection continues according to engine RPM, even though the throttle may be closed.
7. Improves performance; no excess oil to interfer with complete combustion of the gas-air mixture.
8. Prolongs engine life; each injection is clean undissolved #30 wt. detergent oil with high film strength, qualities often lacking in 2-stroke oils.

2–3 Handling of the Oil Pump

The oil pump is a precision-machined assembly. Make no attempt to disassemble it. When you remove the oil pump from the engine, protect it from dust, dirt, etc., and after reinstalling it bleed and adjust the pump correctly. Proper handling will keep the pump free from trouble.

1. Checking Minimum Pump Stroke

a. Checking

1) Fully close the accelerator grip.

2) Turn the oil pump starter plate in the direction of the arrow marked on the plate. Then measure the gap between the adjustment pulley and the adjustment plate. Keep the gap as wide as possible by observing it with the eye.

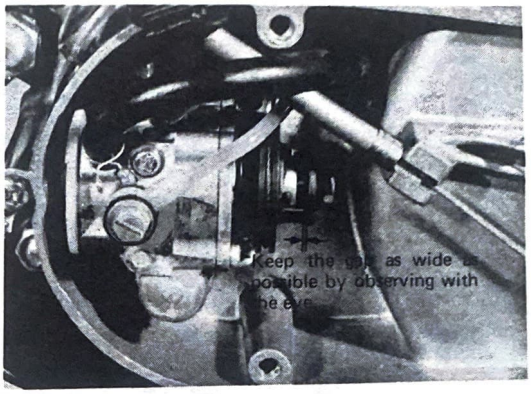


Fig. 2-3-1

3) Use thickness gauges to check the gap width. The correct minimum pump stroke tolerance is 0.20 ~ 0.25 mm (0.008 ~ 0.012 in.).

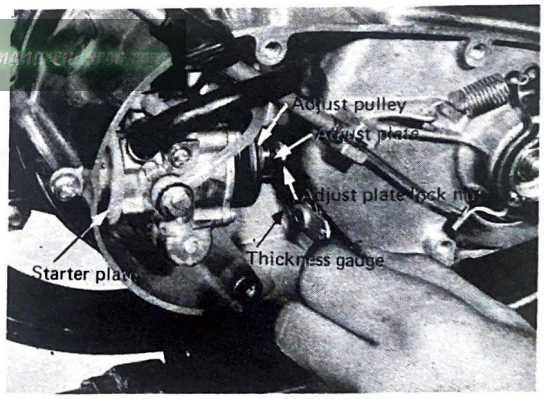


Fig. 2-3-2

b. Adjustment

1) Remove the adjustment plate lock nut and adjustment plate.

2) Add or remove a 0.1 mm adjustment shim (where the adjustment plate was.) to increase or decrease the minimum pump stroke.

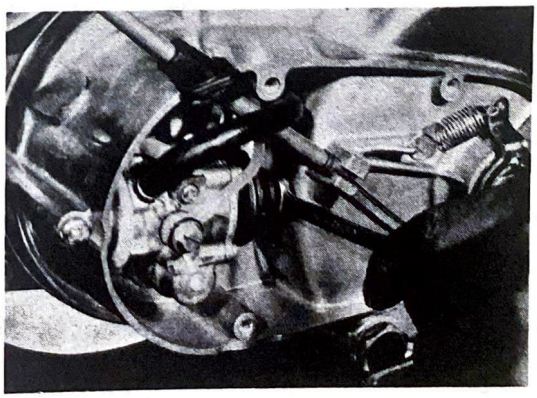


Fig. 2-3-3

3) Reinstall the adjustment plate and lock nut, and measure the minimum stroke for the correct tolerance.

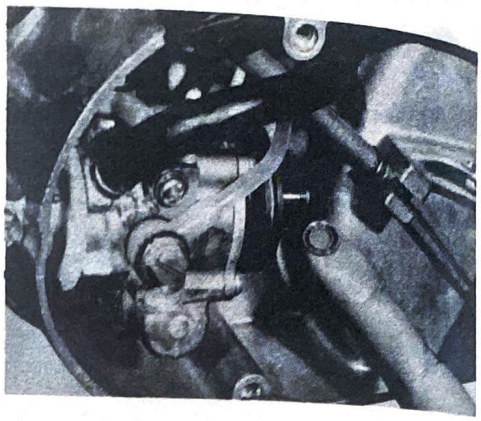


Fig. 2-3-4

2. Pump and Carburetor Setting

Follow the preceding steps to check the minimum stroke, and adjust it if incorrect. Then adjust the pump and carburetors.

a. Checking

1) Adjust the carburetor with the engine at idle, and remove all slack from the two throttle cables (B). (Idling RPM is between 1,100 and 1,300 rpm.)

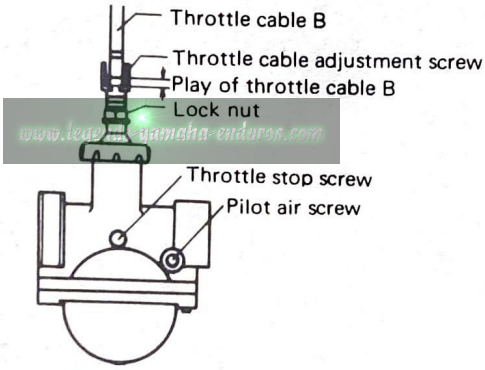


Fig. 2-3-5

- O To bring the play of the throttle cable B to zero, loosen or tighten the throttle cable adjustment screw.
- O After this adjustment, pull both throttle cables (B) alternately, and engine speed will slightly increase from idling RPM.

2) Next, adjust the throttle cable (A) so that the gap as shown in Fig. 2-3-6 will be between 0.5 and 1.0 mm.
   - O While pulling the outer part of the throttle cable (A), turn the accelerator grip and check the play. If the play is excessive or insufficient, adjust the play with the adjustment screw.

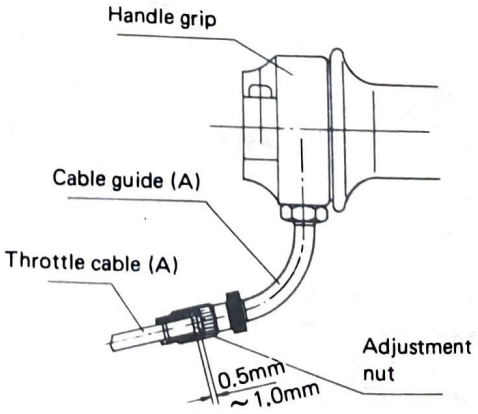


Fig. 2-3-6

3) Adjust the pump cable so that the marking (arrow) on the adjustment pulley is aligned with the guide pin.

○ Fully close the accelerator grip, and slowly turn it so that the play of the throttle cable (A) will be brought down to zero.
Next, adjust the pump cable so that the marking on the adjustment pulley will be aligned with the guide pin.

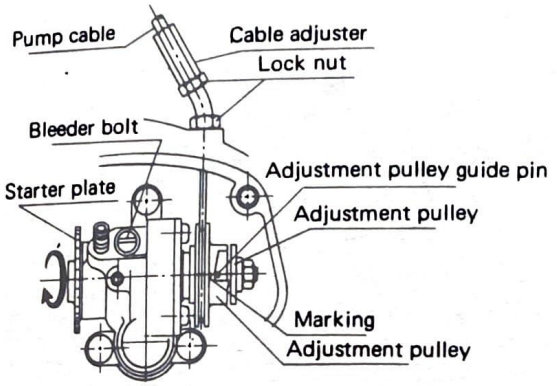


Fig. 2-3-7

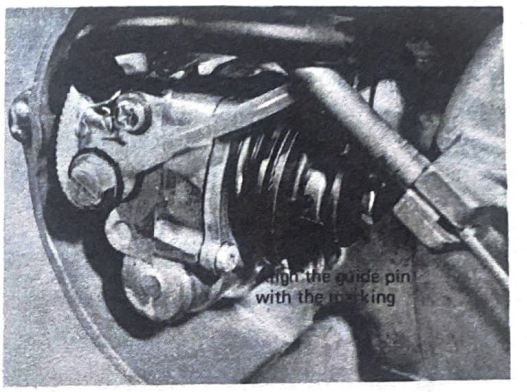


Fig. 2-3-8

3. Bleeding

When the pump has been removed or the Autolube oil has run out, air will enter the pump. The air will cause an irregular flow of oil after the pump is mounted again or the oil is refilled.
In order to prevent an irregular flow of oil, bleed the pump in the following manner.

1) Remove the bleeder bolt.

2) Next, rotate the starter plate in the direction of the arrow marked on the plate.
Continue turning the plate until no air remains, and tighten the bleeder bolt. To facilitate this bleeding, fully open the accelerator grip. As the plunger stroke becomes greater, the air can be quickly bled.

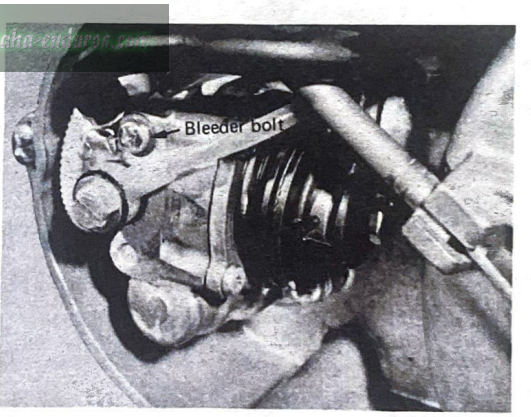


Fig. 2-3-9

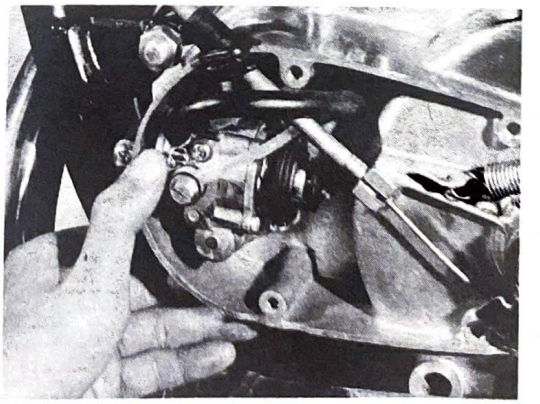


Fig. 2-3-10

CHAPTER 3. 5-PORT CYLINDER

3–1 Description of 5-Port Cylinder

The schnuerle loop scavenging system is the most commonly used induction system for the two-stroke engines. In the schnuerle loop system, transfer ports on the right and left sides of the cylinder are employed to transfer 2 streams of fresh fuel in the loop design that had proved to be the most effective induction system until the innovation of Yamaha's five-port cylinder. This conventional schnuerle loop system had a design limit in that the transfer ports could not be made large enough to completely clear the combustion chamber of exhaust gases because of the position of the intake and exhaust ports. This would result in a portion of exhaust gas remaining in the central area of the combustion chamber that would contaminate the fresh fuel charge.

The rotary valve induction system incorporates the use of a 3rd transfer port at the back of the cylinder that directs a fresh fuel charge to the dead area containing the remaining exhaust gases. But to incorporate the rotary valve system into this physical limitations of excessive engine width and unattractive appearance restricts such an engine design.

Yamaha's Research and Engineering Departments, therefore, designed and perfected the five-port cylinder induction system that is used on the DS6. This new five-port system with the incorporation of two additional specially designed transfer ports completely removes all the exhaust gases previously left in the dead area of the cylinder.

The engine performance is greatly increased with the use of this five-port system. You, as the owner and rider of the DS6, will benefit from the five-port system by having increased engine reliability, increased engine performance, and a reduction in gas and oil consumption.

3–2 Construction and Features (Refer to Figs. 3-2-1, 2 and 3)

The 2 additional transfer passages are placed to the immediate rear of the standard transfer ports. These two additional ports run from the bottom of the cylinder up into the same height as the standard transfer ports. These additional ports are designed to direct the fresh charge at the area containing the remaining exhaust gases. As the fresh fuel charge enters the combustion area, the remaining exhaust gas is forced out the exhaust port leaving the combustion area with an uncontaminated full fresh fuel charge. Therefore, these additional transfer ports perform with equivalent efficiency the task so well done by the additional third port of the rotary valve induction system. This assures constant and equal performance, both at low and high engine speeds.

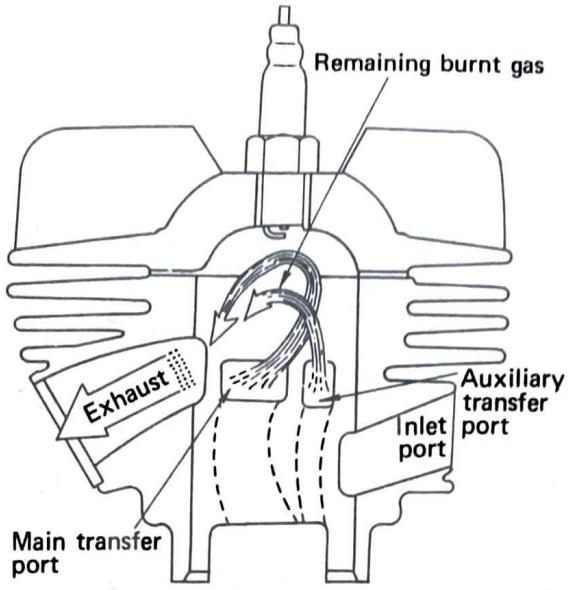


Fig. 3-2-1

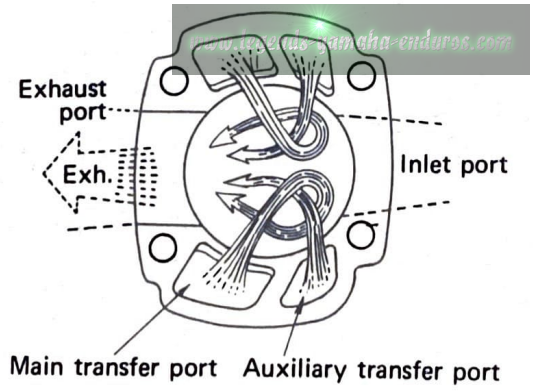


Fig. 3-2-2

5-port Cylinder Exploded View.

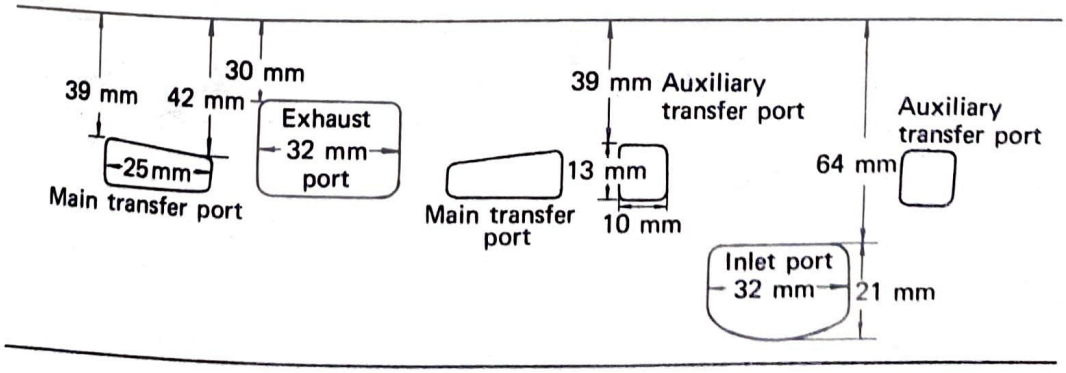


Fig. 3-2-3

CHAPTER 4. ENGINE

The DS6 engine is equipped with Yamaha's specially designed aluminum cylinders featuring a cast iron sleeve bonded in through a special "metallic bond" process. This new design allows for greatly improved heat radiation efficiency. Combined with the 5-port induction system, another Yamaha first, the engine design assures high performance and efficiency at any engine speed.

In addition to the above design features, a polished finish has been given to the cylinder, cylinder head and crankcase covers. This bright finish compliments the overall design of the machine.

The engine should be disassembled and reassembled in an orderly sequence to make the work easier and more efficient. The procedures outlined here are "examples".

○ Caution on engine disassembling.

1) Before dismounting the engine, thoroughly clean the cylinder head, cylinder and crankcase to remove the dirt and dust.
   Exercise care not to allow dust to enter the engine while disassembling it.
2) Always use clean tools in the correct manner. Take care not to damage the parts.
3) Put all disassembled parts in parts trays, in groups, so that no parts will be misplaced.

4–1 Removing the Engine

1. Remove both side covers.

2. Warm up the engine for one minute or so, and then drain the oil from the transmission. (Fig. 4-1-1)

   ○ Warming up the engine will quicken draining the oil.

   ○ The amount of the oil is 1,600 cc (1.7 US qts.). Motor oil SAE 10W/30 should be used.

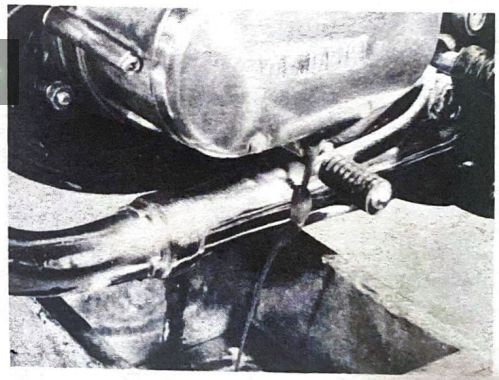


Fig. 4-1-1

3. Remove the exhaust pipe. (Figs. 4-1-2 and 3)

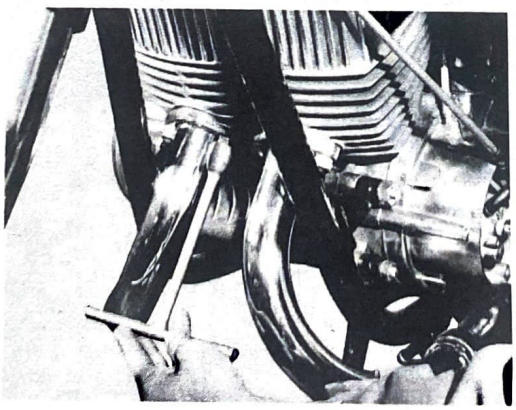


Fig. 4-1-2

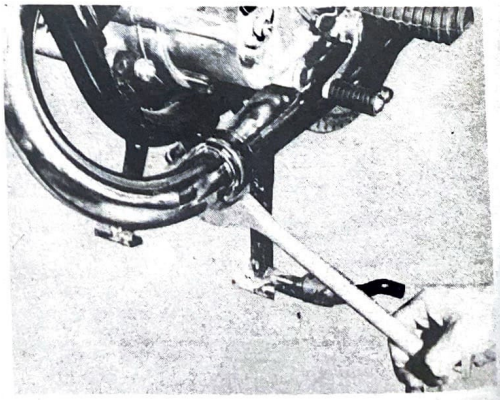


Fig. 4-1-3

4. Remove the gear change pedal and dust seal. (Figs. 4-1-4 and 5)

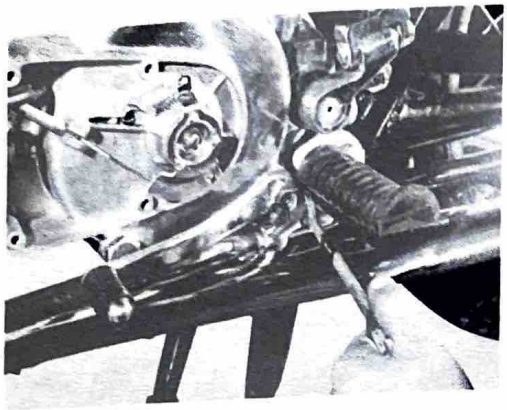


Fig. 4-1-4

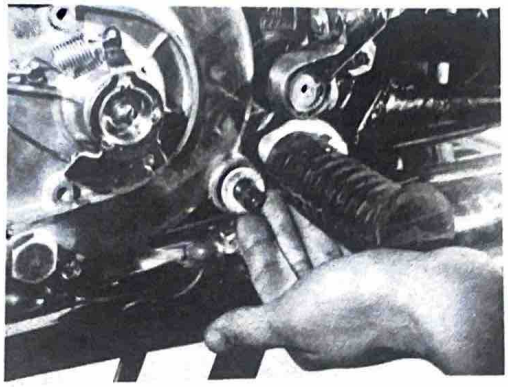


Fig. 4-1-5

5. Remove the dynamo cover. (Fig. 4-1-6)

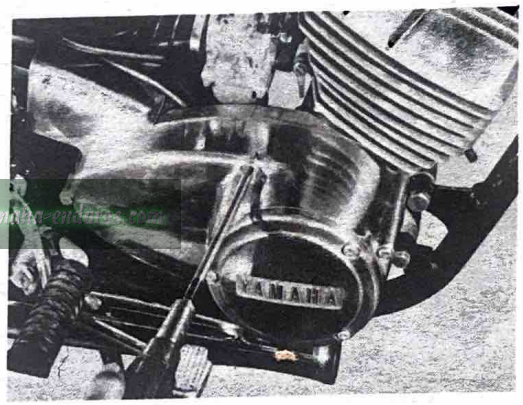


Fig. 4-1-6

6. Remove the dynamo wiring and the neutral switch wire. (Figs. 4-1-7 and 8)

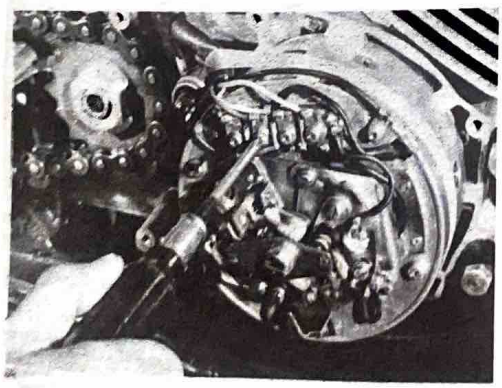


Fig. 4-1-7

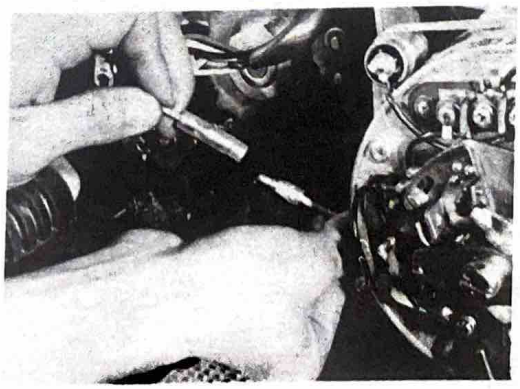


Fig. 4-1-8

7. Remove the armature bolt. (Figs. 4-1-9 and 10)

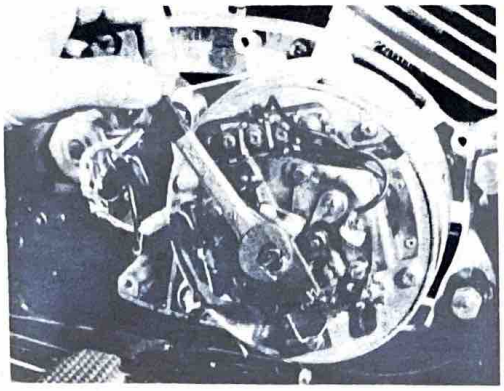


Fig. 4-1-9

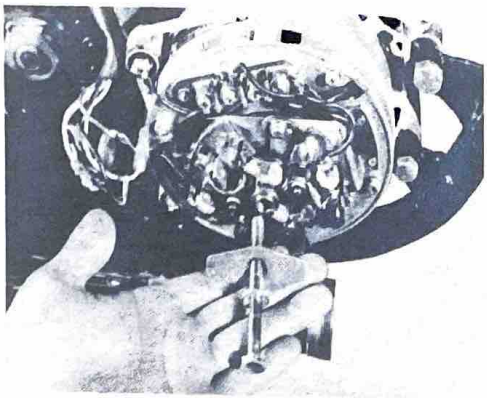


Fig. 4-1-10

8. Remove the yoke mounting screws, and then the yoke assembly. (Fig. 4-1-11)

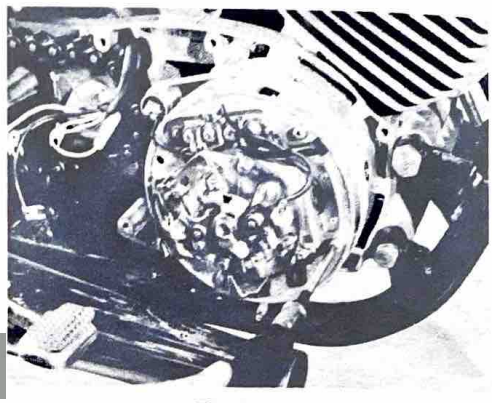


Fig. 4-1-11

9. Pull off the armature with the armature puller bolt or shock puller. (Fig. 4-1-12)

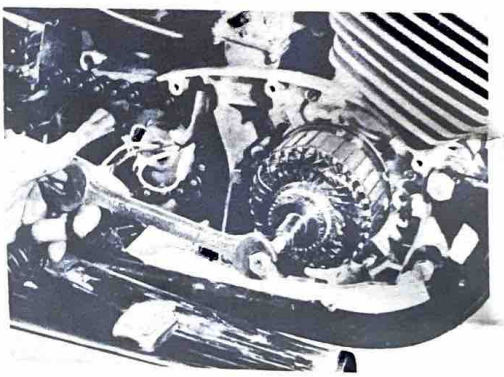


Fig. 4-1-12

10. Remove the woodruff key with a slot head screwdriver. (Fig. 4-1-13)

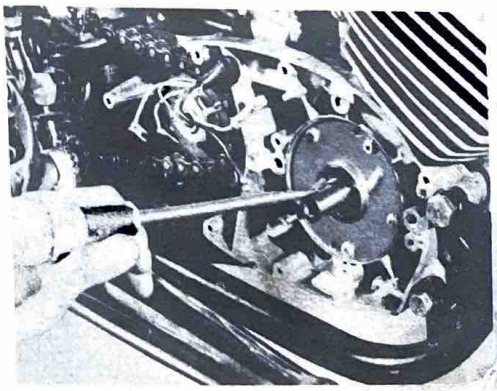


Fig. 4-1-13

11. Disconnect the chain at the master link.
(Fig. 4-1-14)

The drive chain should be connected as shown below. (Fig. 4-1-15)

After connecting the chain, take the motorcycle off the ground so that the rear wheel fully rests on the ground. Measure the up-and-down movement of the chain at the center of the lower chain run, and adjust it so that the total up-and-down movement of the chain is about 0.8 inch (20 mm).

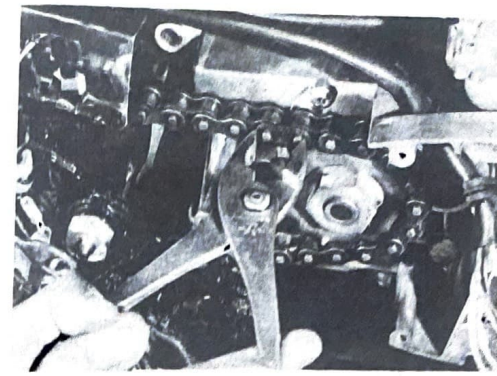


Fig. 4-1-14

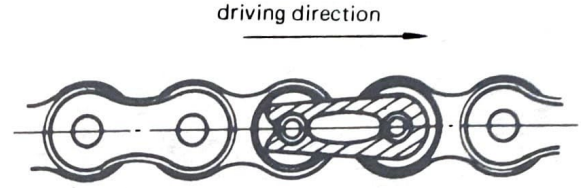


Fig. 4-1-15

12. Remove the oil line (Plug the oil line to prevent oil from flowing out.) (Fig. 4-1-16)

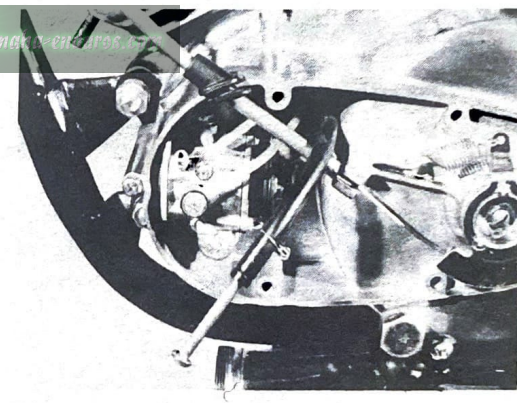


Fig. 4-1-16

13. Remove the pump cover and pump cable.
(Fig. 4-1-17)

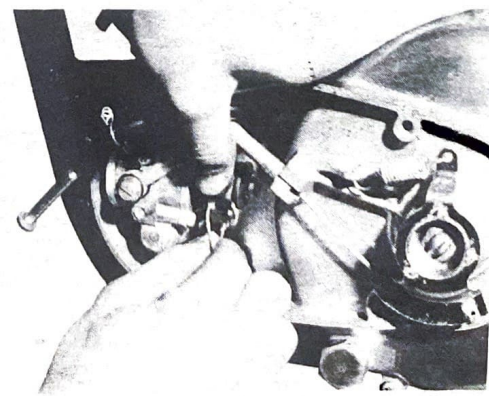


Fig. 4-1-17

14. Disconnect the clutch cable at the handle lever. (Fig. 4-1-18)

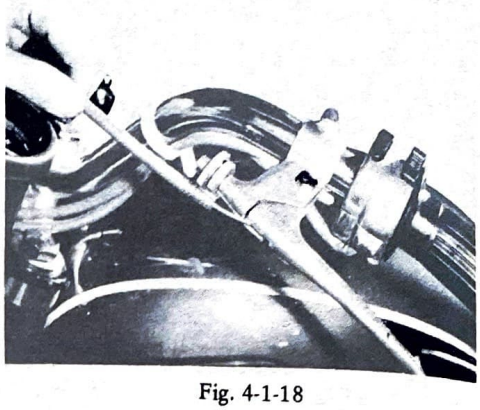


Fig. 4-1-18

15. Remove the clutch cable. (Fig. 4-1-19)

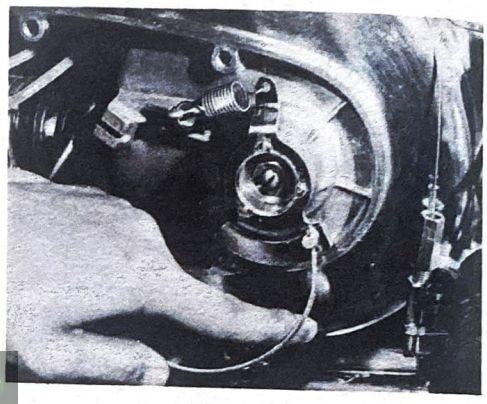


Fig. 4-1-19

16. Loosen the air cleaner clamp screws, and then remove air cleaner rubber. (Fig. 4-1-20)

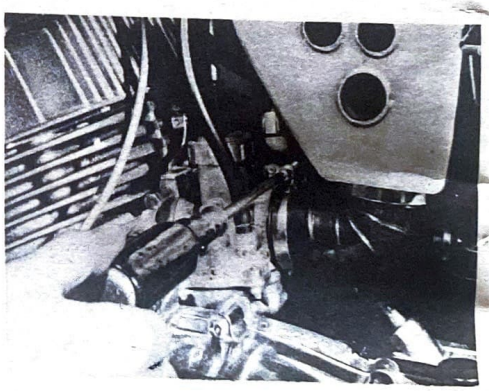


Fig. 4-1-20

17. Turn the fuel cock to "STOP", and disconnect the fuel line (both right and left) from the carburetors. (Fig. 4-1-21)

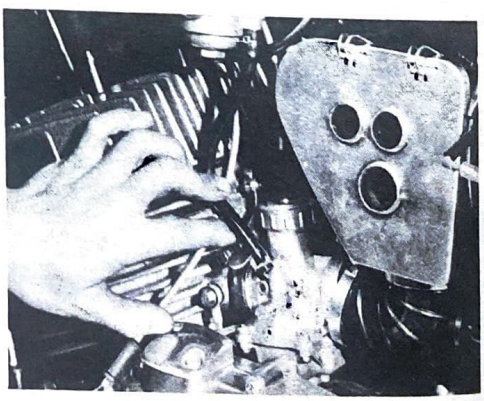


Fig. 4-1-21

18. Loosen the mixing caps, and remove the throttle valves from the carburetors. (Figs. 4-1-22 and 23)

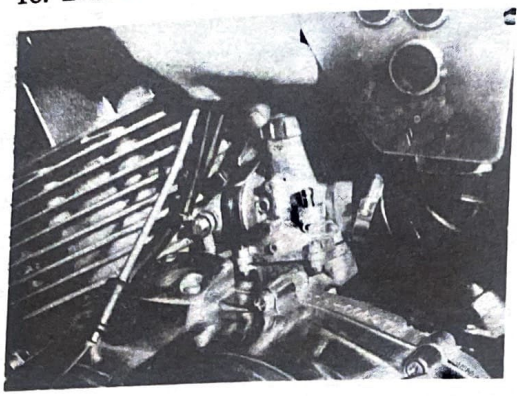


Fig. 4-1-22

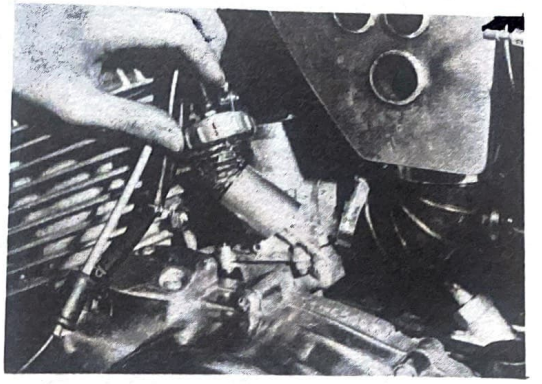


Fig. 4-1-23

19. Disconnect the cable from the tachometer drive. (Fig. 4-1-24)

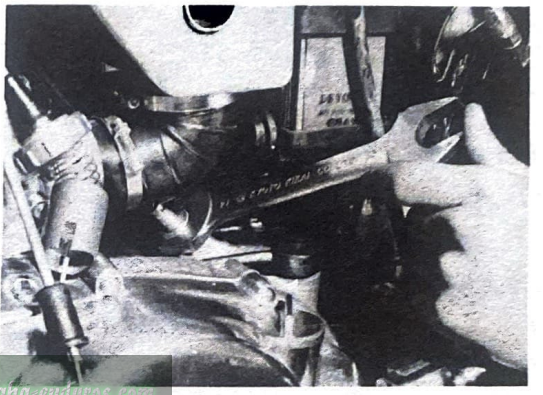


Fig. 4-1-24

20. Remove the left side footrest. (Fig. 4-1-25)

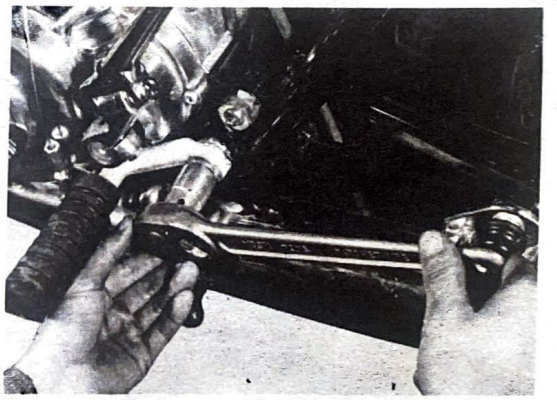


Fig. 4-1-25

21. Remove the four engine mounting bolts. (Fig. 4-1-26)

Engine mounting bolts should be tightened at 10.2 ~ 15.8 ft-lbs (1.4 ~ 2.2 kg-m) for 8ϕ mm, and at 21.8 ~ 34.6 ft-lbs (3.0 ~ 4.8 kg-m) for 10ϕ mm.

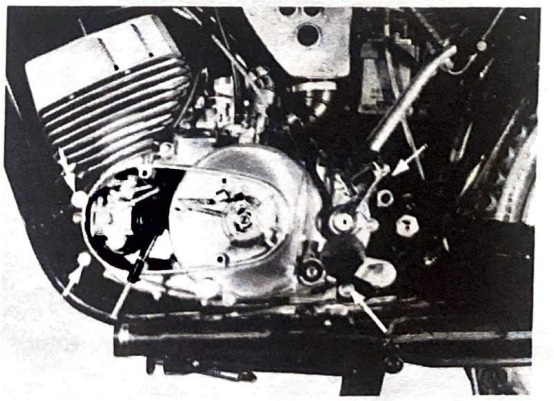


Fig. 4-1-26

22. Dismount the engine from the frame.
(Fig. 4-1-27)

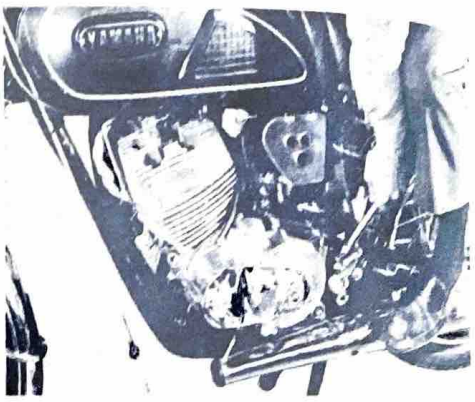


Fig. 4-1-27

4–2 Cylinder Head

1. Removal and Reinstallation

Remove the four nuts from the top of the cylinder head, the cylinder head and then the cylinder head gasket. Reverse the sequence for reinstallation. Replace the gasket, if damaged.
(Figs. 4-2-1 and 2)

Cylinder head nuts should be tightened with a torque of 13 ~ 20 ft-lbs (1.8 ~ 2.9 kg-m).

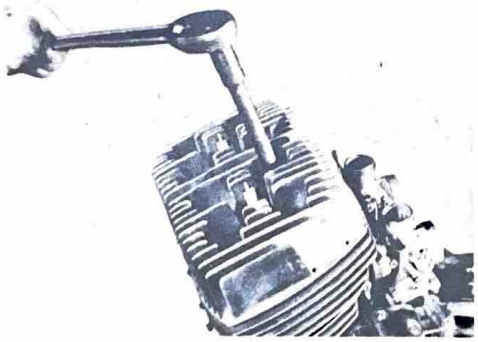


Fig. 4-2-1

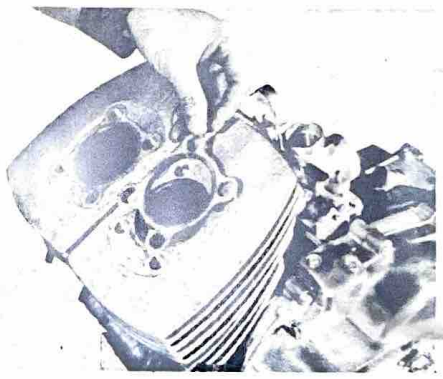


Fig. 4-2-2

2. Removing Carbon Deposits

Carbon deposits inside the cylinder head combustion chamber will result in an increase in the compression ratio, as well as pre-ignition and engine overheating.

Scrape the cylinder head clean. (Fig. 4-2-3)

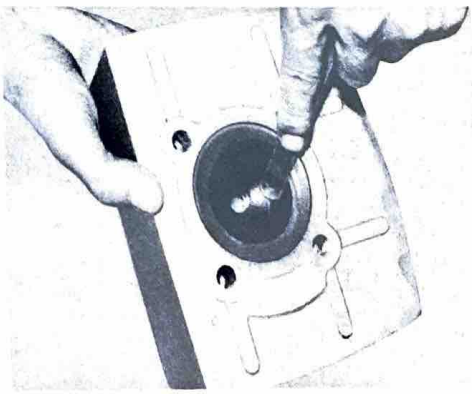


Fig. 4-2-3

4—3 Cylinder

The engine is provided with aluminum cylinders, to which special cast iron sleeves are bonded by means of a metallic bond process. As a result, the new type of cylinder is free from various troubles such as the separation of the liner from the cylinder barrel due to the difference in expansion coefficient between the two metals, and piston burning resulting from a decrease in heat radiation efficiency.

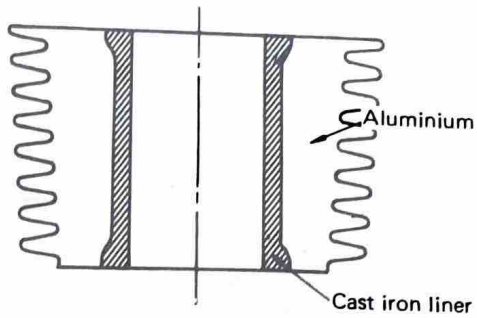


Fig. 4-3-1

The YAMAHA aluminum cylinder features:

a. Light weight.
b. Outstanding radiation efficiency.
c. Longer service life.

1. Removing the Cylinder

1) Remove the delivery pipe banjo bolts from both cylinders. (Fig. 4-3-2)

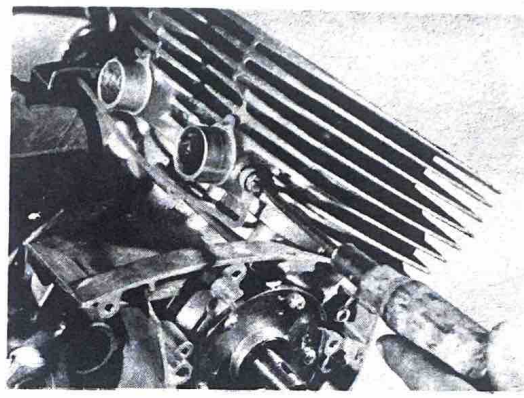


Fig. 4-3-2

2) Remove the cylinders by striking them with a soft-faced hammer. (Fig. 4-3-3)

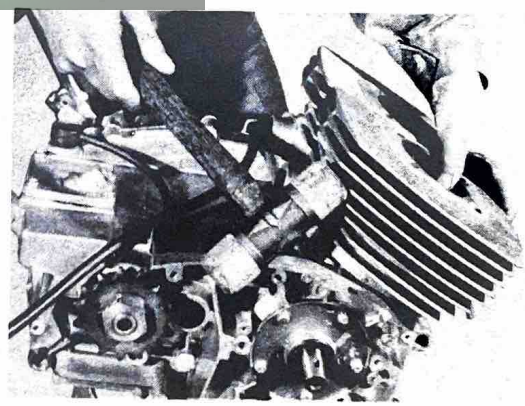


Fig. 4-3-3

3) Replace the cylinder packing. (Fig. 4-3-4)

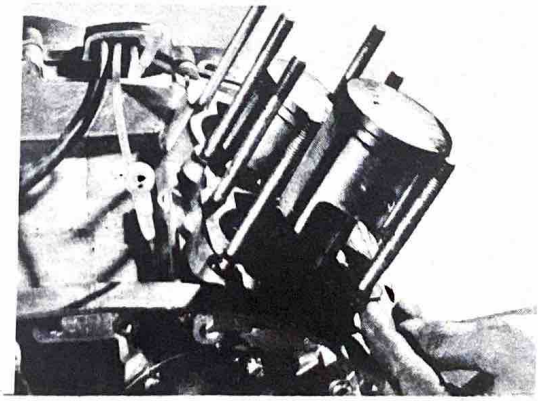


Fig. 4-3-4

2. Checking the Cylinder for Wear

1) In two-stroke engines, the maximum wear usually results in the upper area of the cylinder wall due to the side thrust of the piston, with less wear in the adjacent areas of transfer and exhaust ports. Measure each cylinder's bore diameter at four different depths (a, b, c, d) with a micrometer or a cylinder gauge placed in the direction of A and B. If the difference between the maximum and minimum diameters measured exceeds 0.05 mm (0.0019 in.), rebore and hone the cylinder.

(Figs. 4-3-5 and 6)

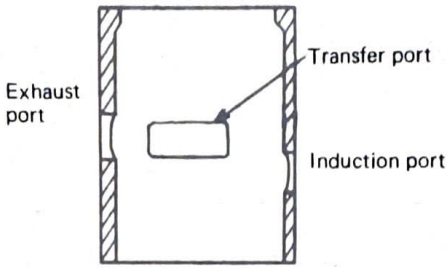


Fig. 4-3-5

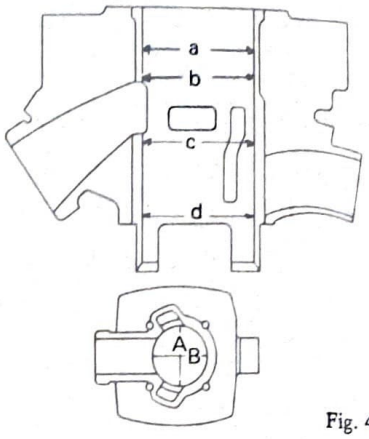


Fig. 4-3-6

2) To make sure that the cylinder boring has been correctly done, measurements should be made as illustrated below.
Measure each cylinder's bore diameter at three different depths (a, b and c) with a micrometer or a cylinder gauge placed at right angles and then in parallel to the crankshaft (A and B). (Fig. 4-3-7)

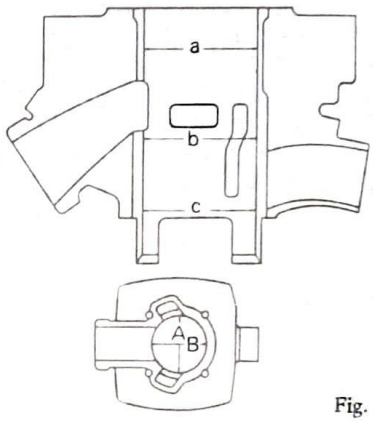


Fig. 4-3-7

3) The minimum clearance between the piston and the cylinder is 0.035 to 0.040 mm.

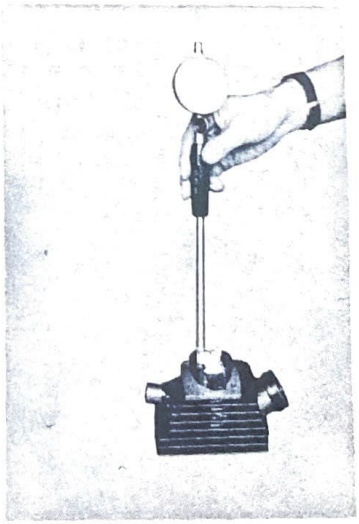


Fig. 4-3-8

Cylinder Reconditioning

a. Pistons are available in 0.25 mm, 0.50 mm, 0.75 mm and 1.00 mm oversizes.
b. Cylinders should be rebored and honed to the diameter of the oversize piston, plus the standard clearance.
c. The error between the maximum and minimum diameters after honing should be no more than 0.01 mm.

3. Carbon Removal

Carbon tends to accumulate at the transfer and exhaust ports of the cylinder, thereby imparing both scavenging and exhausting efficiency. Be sure to remove carbon accumulations whenever necessary.

Avoid the use of files for carbon removal, because the carbon build-up can not be completely removed as shown by the arrow of A, or undesirable cuts may result in these ports. It is advisable to use a carbon scraper (B) and remove the carbon from every corner of the port.

(Fig. 4-3-9)

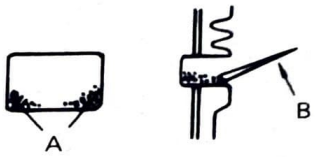


Fig. 4-3-9

4. Installing the Cylinder

1) Put your fingers at each end of the piston ring, and align both ends of the ring with the knock pin in each ring groove. Then insert the piston into the cylinder. Take care not to damage the piston rings with the cylinder.

(Fig. 4-3-10)

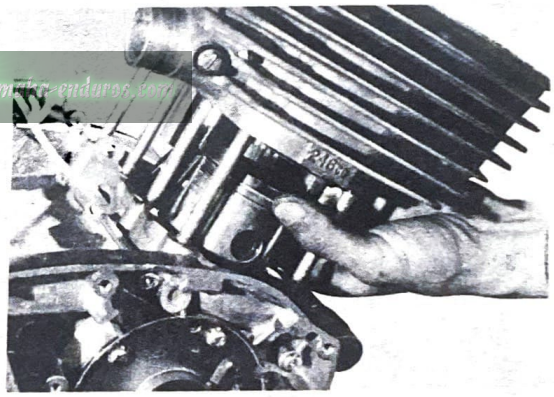


Fig. 4-3-10

4–4 Piston Pin

1. Pulling Out the Piston Pin

Remove the clips at both ends of the piston pin with a needle nose pliers, and press out the piston pin with a finger or a slot-head screwdriver.

(Fig. 4-4-1)

Note: Before removing the piston pin clips, cover the crankcase with a clean rag, so you will not accidentally drop the clips into the crankcase.

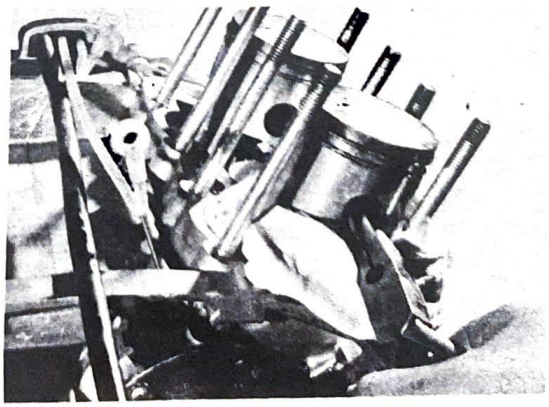


Fig. 4-4-1

2. Piston-to-Piston Pin Fit

The piston pin should fit snugly in its bore so that it drags a little as you turn it. If the pin is loose, replace the pin and/or the piston. If the pin has step-wear in its center, replace the needle bearing as well as the pin. Check the small end of the connecting rod for wear by inserting the piston pin. (Figs. 4-4-2 and 3)

Fig. 4-4-2

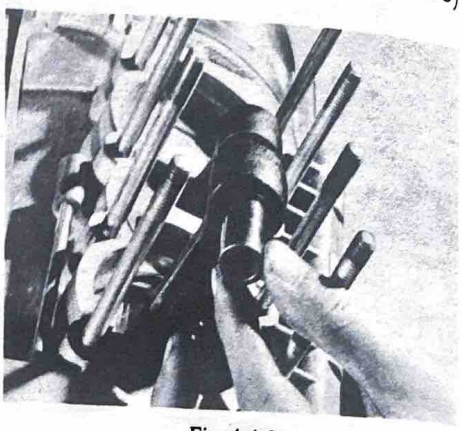
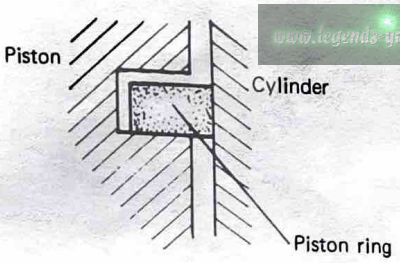


Fig. 4-4-3

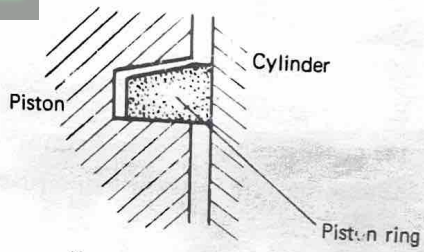
4–5 Piston Ring

1. Keystone Type Piston and Keystone Ring



Plain type piston & ring

Fig. 4-5-1



Keystone type piston & ring

Fig. 4-5-2

A good seal must be maintained between the piston and cylinder wall for effective use of combustion pressures. It is not practical, however, to attempt to secure a perfect seal. With this in mind, importance is placed on effective sealing and prevention of piston ring sticking.

Piston ring sticking is generally caused by gum deposits which are produced through a break down of the fuel and oil from the heat of the combustion process. This gum residue will deposit itself in the ring lands and rings. The subsequent blow-by tends to speed up the accumulation of these gum deposits.

In order to prevent the rings from sticking and to provide more effective sealing of the combustion pressures Yamaha has employed the Keystone piston and ring in its engines. This marks the first time such an application has been made in the history of motorcycle engineering.

The design of the Keystone ring is such that combustion gas pressures force the ring down and out almost simultaneously. This forces the ring tightly against the cylinder wall preventing blow-by. (Fig. 4-5-3)

On the other hand, in the case of the plain ring, combustion pressure first acts on the top of the ring, forcing it down, and then passes between the ring and piston to force the ring against the cylinder wall. This action is considerably slower than that of the Keystone type ring, and will allow more blow-by.

With blow-by, heat cannot be dissipated from the piston ring to the cylinder wall and, as was mentioned earlier, excessive combustion heat will cause the oil film to break down creating additional gum deposits. The Keystone ring allows for much better heat transference than the standard type ring.

The most important advantage of the Keystone type ring is that the piston ring land clearance changes as the piston moves up and down. Figs. 4-5-4 and 4-5-5 show variations in the clearance resulting from the floating action of the piston in the cylinder. This variation in ring land clearance produces a 'scrubbing' effect that reduces the accumulation of gum deposits and thus prevents the ring from sticking in the land.

Lastly, the outer surface of the ring is coated with Teflon (Fig. 4-5-6). The Teflon coating serves as an effective aid during ring 'seating'. In addition, the Teflon coating will follow microscopic irregularities in the cylinder bore more faithfully than previous materials thus providing additional resistance against blow-by.

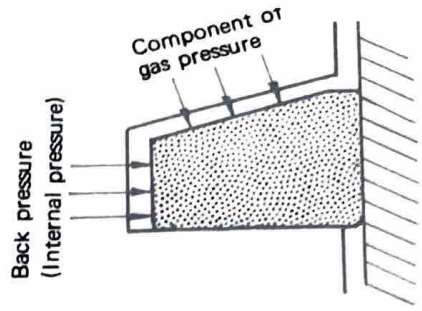
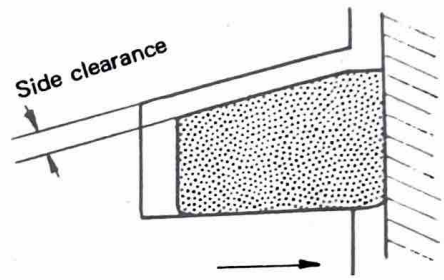
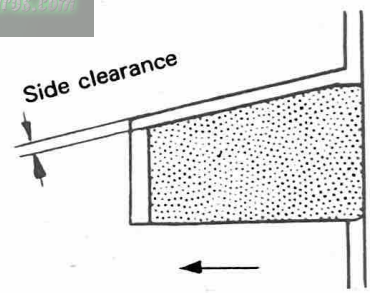


Fig. 4-5-3



Side clearance when piston floats in the direction of the arrow.

Fig. 4-5-4



Side clearance when piston floats in the direction of the arrow.

Fig. 4-5-5

Technical notes on keystone rings

The Keystone ring can be handled in the same manner as conventional rings as far as servicing is concerned. However, the Keystone ring is not interchangeable and must be used as a set with a matching Keystone piston.

The Keystone ring can be identified from the conventional by its unique cross-sectional shape. The conventional ring has a rectangular cross-section where as the Keystone ring employs a 7° slope on the top.

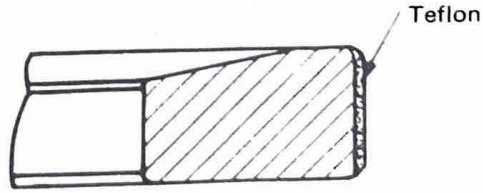


Fig. 4-5-6

Important: The Keystone type piston has the "K" mark stamped after the numerals indicating the piston sizes on its head. On the other hand, the Keystone type piston ring has a symbol such as "1(2)N" or "1(2)T".

(Numeral "1" denotes the 1st ring, and Numeral "2" the 2nd ring.)

2. Removing the Piston Ring

Put your thumbs at each end of the piston ring and pull the piston ring ends apart. Remove the ring by lifting the ring off the piston at the opposite side of the ring ends. (Figs. 4-5-7 and 8)

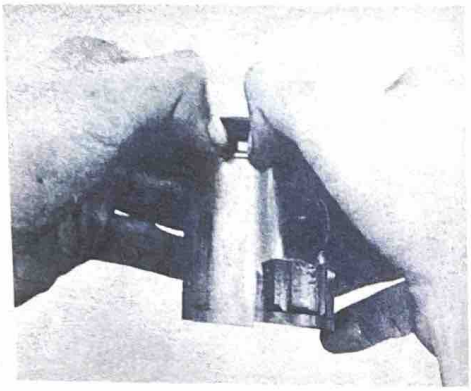


Fig. 4-5-7

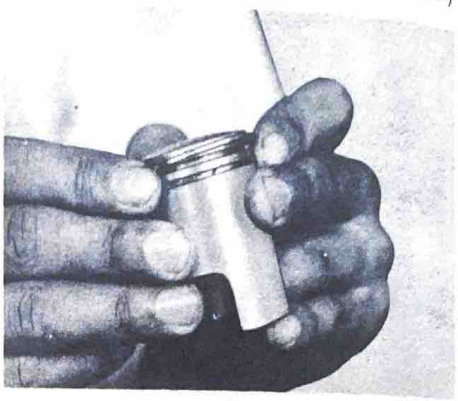


Fig. 4-5-8

3. Piston Ring Installation

It is important to align the piston end gap with the locating pin that is in the ring groove.

Be sure that the marking on the piston ring faces upward.

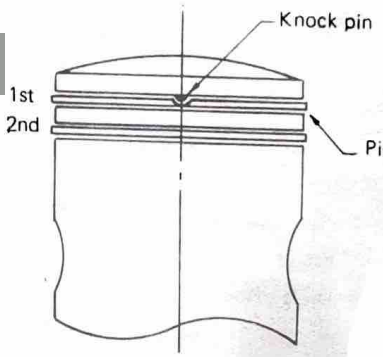


Fig. 4-5-9

4. Checking the Piston Ring

1) Piston Ring Wear

Improper contact between the piston and the cylinder may result in combustion pressure leakage, or scores or spotty wear on the cylinder wall. Therefore, whether the "contact" between the piston rings and the cylinder is proper or not should be checked before the piston is installed.

Fig. 4-5-10 shows an example of methods for checking the contact: Correctly fit the ring in the cylinder, and then check whether or not any gap is seen between the ring and the cylinder wall by using a sheet of white paper as a reflector. If no gap is found, a good sealing between them is maintained.

Fig. 4-5-10

2) Measuring the piston ring for wear

Put the piston ring into the cylinder so that the ring is in parallel with the bottom edge of the cylinder. Then measure the gap between both ends of the ring, with a feeler gauge. (Fig. 4-5-11)

End gap should be between 0.15 mm and 0.35 mm for both No. 1 and No. 2 rings.

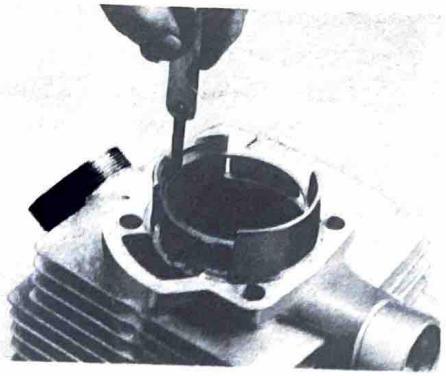


Fig. 4-5-11

3) Removing carbon deposits

Carbon on the piston rings and in the ring grooves will make the rings stick to the piston, thus impairing cylinder performance. Remove the piston ring, and clean the rings and the piston ring grooves.

4–6 Piston

1. Checking and Reconditioning the Piston

a. Piston Shapes

The piston has a slightly tapered ring section when it is cold, as shown in Fig. 4-6-1-A. When it warms up, the expansion of the ring section is greater than that of the skirt because the ring section is exposed to higher temperatures. This decreases the normal clearance between the piston and cylinder wall, as shown in Fig. 4-6-1-B.

When the piston is viewed from the bottom, its diameter at A (at the piston pin bosses) is slightly smaller than at B (right angles to the piston pin). At operating temperatures, the piston assumes a round shape, because the expansion at A (the piston pin bosses) is greater than at B.

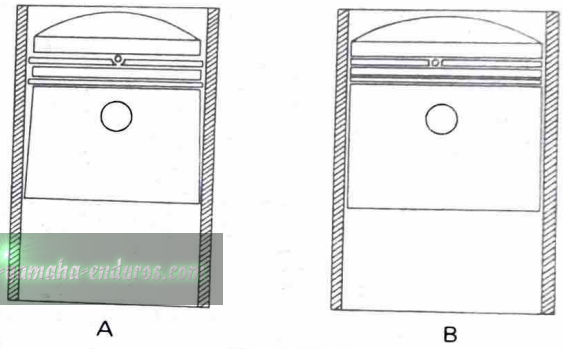


Fig. 4-6-1

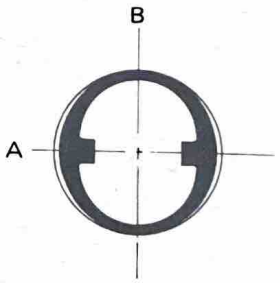


Fig. 4-6-2

b. Piston Clearance Measurement

Piston clearance is the difference between the minimum cylinder bore and the maximum piston diameter. Proper clearance is between 0.035 to 0.040 mm as described in the "Cylinder" section.

To determine maximum piston diameter, measure the piston with a micrometer at right angles to the skirt 10 mm from its bottom edge, as shown in Fig. 4-6-3.

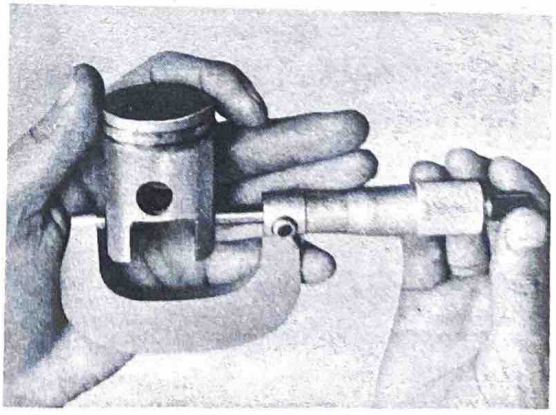


Fig. 4-6-3

c. Checking Piston Condition

Pistons showing signs of seizure are noisy and keep the engine from developing full power. The continued use of a piston that has seized will damage the cylinder wall. A seized piston can be reused only if the seizure marks can be completely removed when lightly sanded with #400 sandpaper. Replace those seized pistons that cannot be corrected in this manner. (Figs. 4-6-4 and 5)

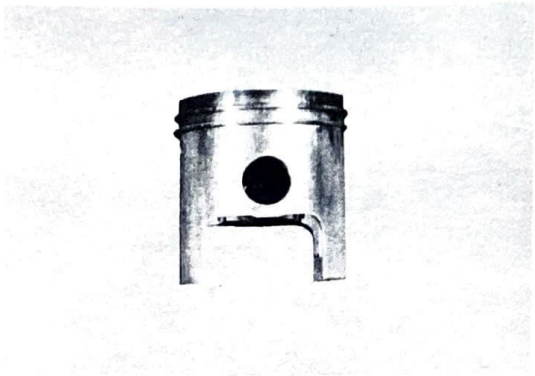


Fig. 4-6-4

Fig. 4-6-5

d. Removing Carbon Deposits

Use a screw driver or saw blade to scrape off the accumulated carbon on the piston head. (Fig. 4-6-6)

Remove the carbon from the piston ring grooves; otherwise, the ring will stick to the piston. (Fig. 4-6-7)

Fig. 4-6-6

Fig. 4-6-7

2. Piston Installation

Install the piston so that the arrow marked on the piston head is in the direction toward the exhaust port. (Fig. 4-6-8)

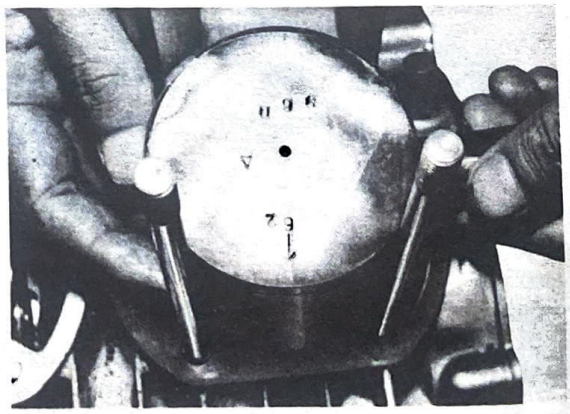


Fig. 4-6-8

4—7 Crankcase Cover (R)

1. Removal

1) Remove the kick crank mounting bolt, the kick crank and the kick crank seal.
(Figs. 4-7-1 and 2)

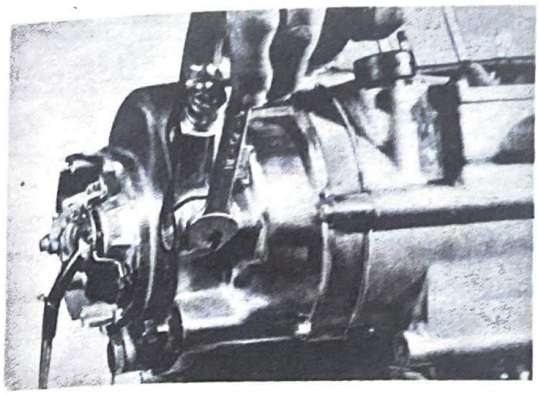


Fig. 4-7-1

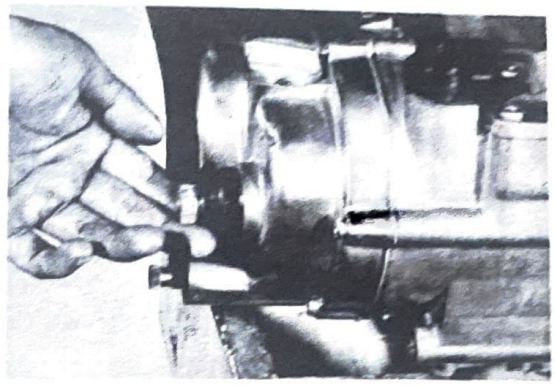


Fig. 4-7-2

2) Remove the phillips-head screws holding the crankcase cover, and then remove the case cover. (Figs. 4-7-3 and 2)
(The cover can be removed without dismounting the oil pump.)

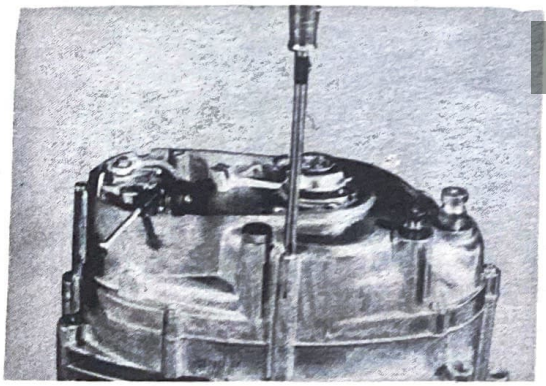


Fig. 4-7-3

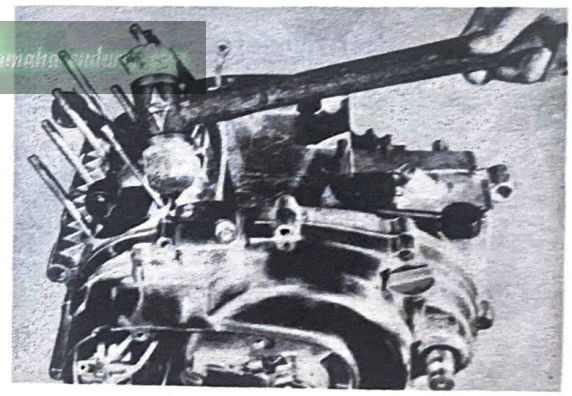


Fig. 4-7-4

3) Remove the crankcase cover gasket if damaged. (Fig. 4-7-6)

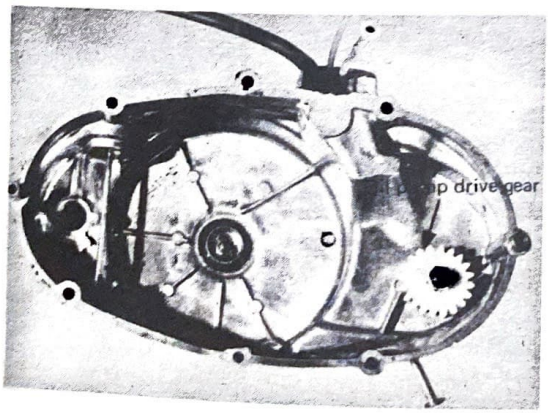


Fig. 4-7-5

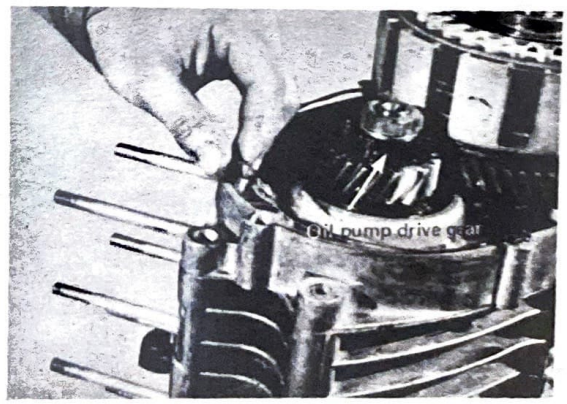


Fig. 4-7-6

2. Installation

Spread YAMAHA Bond No. 5 over the mating surface of the crankcase (R) and place the crankcase cover (R) on the crankcase (R).

Be sure to apply YAMAHA Bond No. 5 to the mating surface; otherwise, the crankcase will leak.

Note: When placing the crankcase cover (R) on the crankcase (R) make sure that the oil pump drive gears are meshing correctly.

4–8 Clutch

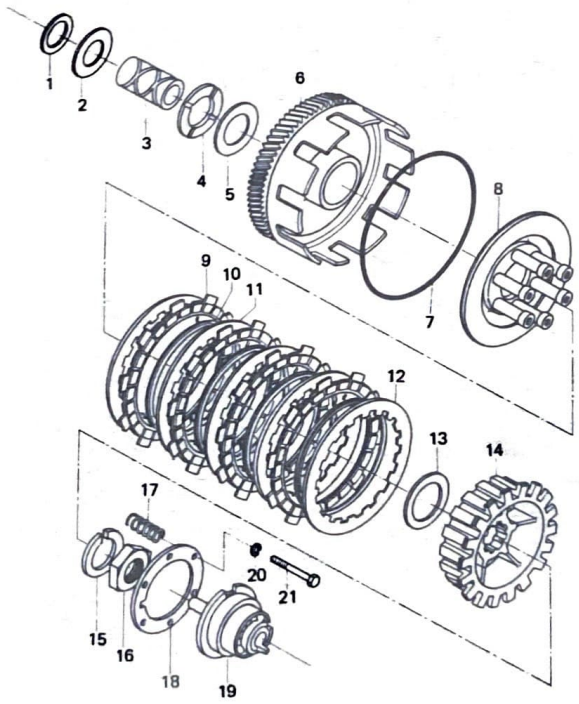
The purpose of the clutch is to permit the rider to couple or uncouple the engine and transmission. The DS6 clutch is a wet multi-disc type, consisting of seven molded cork friction plates and six clutch plates mounted on the main axle of the transmission.

The clutch housing is mounted on the primary driven gear, which in turn is meshed with the primary drive gear mounted on the crankshaft. The primary drive gear has 20 teeth, and the primary driven gear 65 teeth. (Primary reduction ratio . . . . 65/20 = 3.250)

Clutch disengaging mechanism:

Squeezing the handle 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 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.

Disassembled View of the Clutch Assembly



1 Thrust plate 1
2 Thrust plate 2
3 Spacer
4 Thrust bearing
5 Thrust bearing
6 Primary driven gear ass'y
7 Friction ring
8 Pressure plate A
9 Friction plate (7 pcs.)
10 Cushion ring (7 pcs.)
11 Clutch plate B (6 pcs.)
12 Clutch plate A
13 Thrust plate 2
14 Clutch boss
15 Spring washer
16 Nut
17 Clutch spring (6 pcs.)
18 Pressure plate B
19 Push crown ass'y
20 Spring washer (6 pcs.)
21 Bolt (6 pcs.)

Fig. 4-8-1 Clutch Exploded View

1. **Removing the Push Crown**

Remove the push crown ass'y. (Fig. 4-8-2)

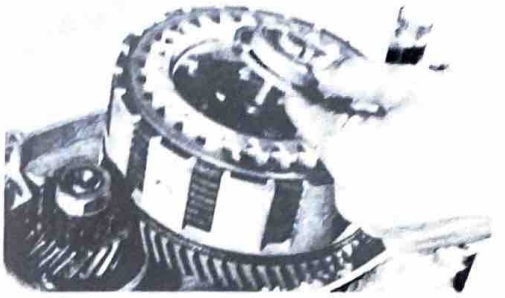


Fig. 4-8-2

2. **Removing the Pressure Plate**

Remove the six clutch spring holding screws, and take out pressure plate B. (Figs. 4-8-3 and 4)

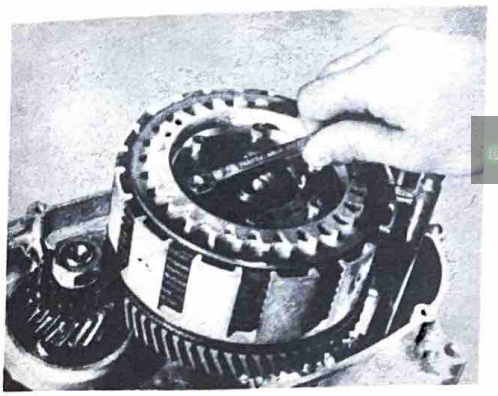


Fig. 4-8-3

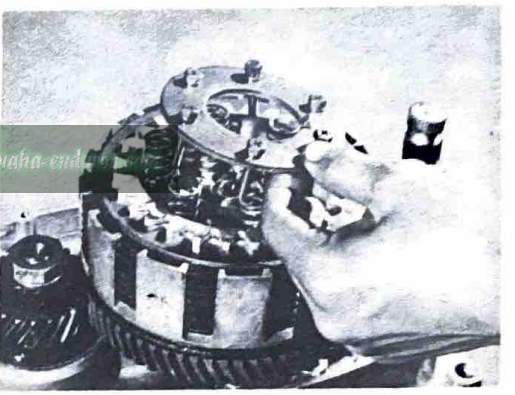


Fig. 4-8-4

3. **Removing the Clutch Boss**

Install the clutch holding tool on the clutch boss, loosen the lock nut, and then remove the clutch boss. (Fig. 4-8-5)

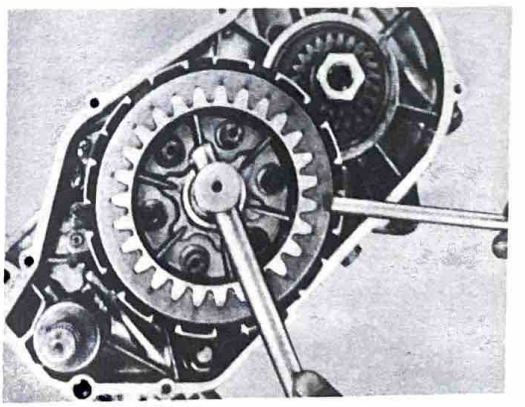


Fig. 4-8-5

4. Checking the Clutch Spring

If the spring is 1 mm or more shorter than the standard free length, replace it.

(Figs. 4-8-6 and 7)

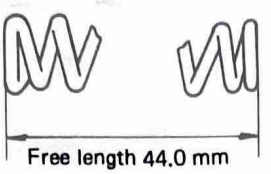


Fig. 4-8-6

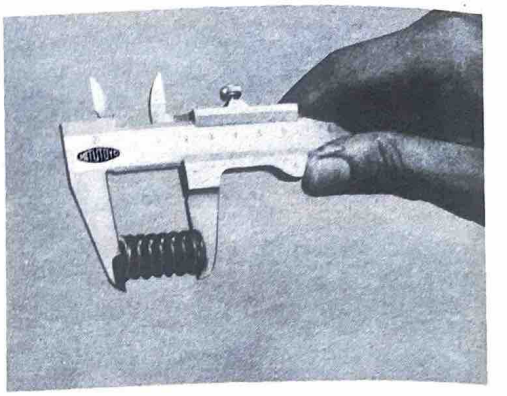


Fig. 4-8-7

5. Checking the Friction Plate

The friction plate is subject to wear. Replace it if it wears 0.3 mm or more or shows uneven contact.

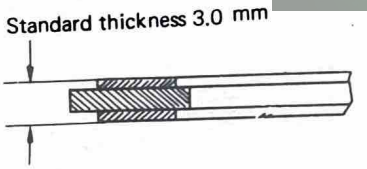


Fig. 4-8-8

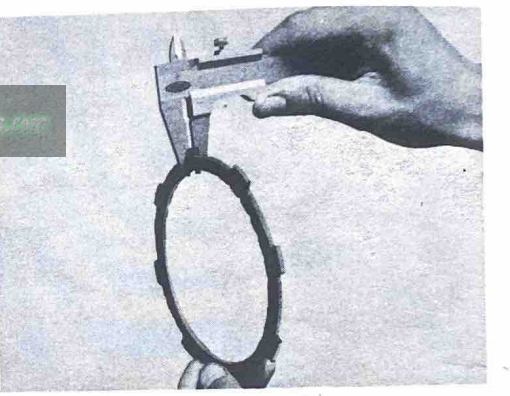


Fig. 4-8-9

6. Checking the Primary Driven Gear Ass'y

The rubber friction ring is placed between the periphery of the primary driven gear and the clutch housing in order to reduce gear noise at low engine speeds.

a. Check for scratches on the slotted surfaces of the boss.
b. Check the tooth surfaces of the primary drive and driven gears for scratches resulting from foreign matter jammed between them.

7. Checking the Spacer

a. Check the inner and outer surfaces of the spacer for scratches.
Scratches on the spacer will impair clutch action. Smooth away any scratches with fine grain sandpaper or with oil stone. If the scratches cannot be removed, replace the spacer.

b. Insert the spacer into the primary driven gear boss, and check for clearance. If the clearance is excessive, noise may result. Replace the spacer and/or primary driven gear. (Fig. 4-8-10)

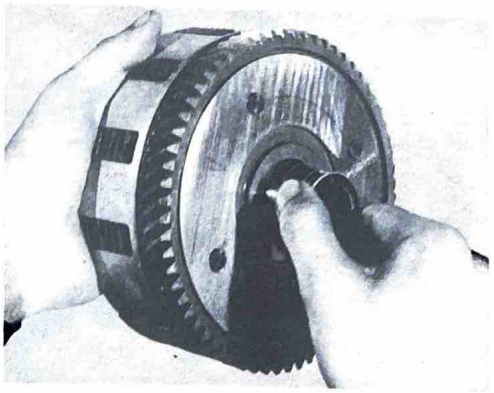


Fig. 4-8-10

c. Mount the spacer on the transmission main axle, and check for play. If the play is excessive, replace the spacer. (Fig. 4-8-11)

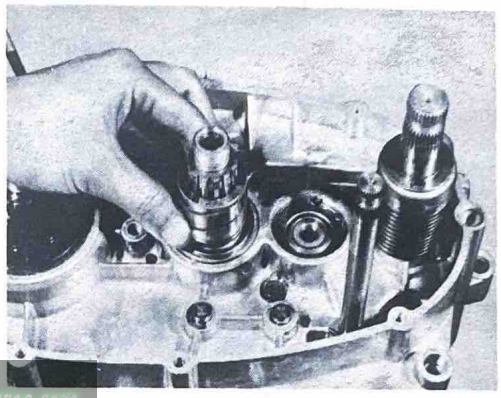


Fig. 4-8-11

8. Installing the Cushion Ring

The cushion ring is placed between the clutch plate and the friction plate to achieve better clutch action.

Check whether the cushion ring is in place and not twisted. (Fig. 4-8-12)

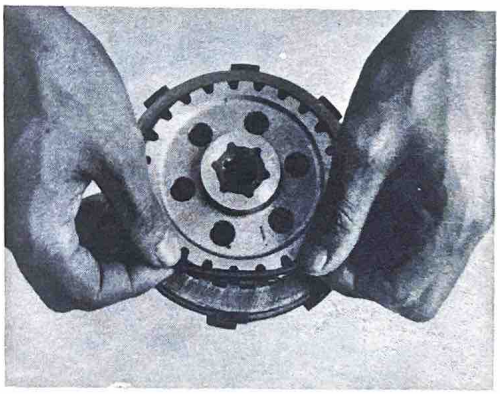


Fig. 4-8-12

9. Note for Reassembling the Clutch

Fiber thrust plates are installed on each side of the spacer. If the fiber thrust plates are incorrectly installed or omitted, the clutch boss will directly contact the primary driven gear, impairing clutch action.

The washer is placed around the peripheral surface of the spacer. If the washer is incorrectly installed, it tends to slip out of place. Greasing both surfaces of the washer will facilitate this installation work.

Prior to installing the clutch boss, both clutch plate and friction plate should be installed. (The marking painted on the clutch plate should be aligned with that on the friction plate.)

10. Adjusting the Clutch

1) Adjusting the Push Screw

Remove the pump cover, and loosen the push screw lock nut. To set the push screw, fully tighten it and then back off a 1/4 turn. Install the lock nut and tighten it.

(Fig. 4-8-13)

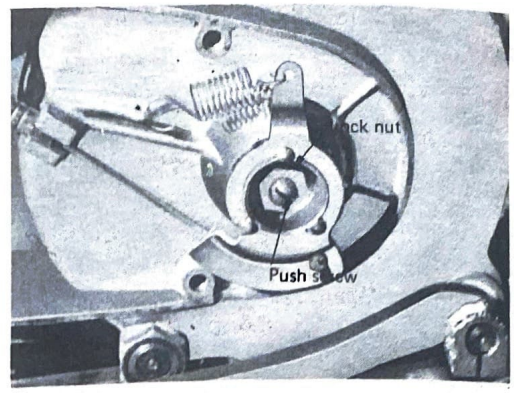


Fig. 4-8-13

2) Clutch Cable Tension Adjustment

The clutch cable should be adjusted after a long period of use. Adjust the cable so that the handle lever has a play of 0.080 ~ 0.012 in. (2 ~ 3 mm).

Any excessive cable play may result in poor clutch action. Or, if the cable is too tight, clutch slippage may result. (Fig. 4-8-14)

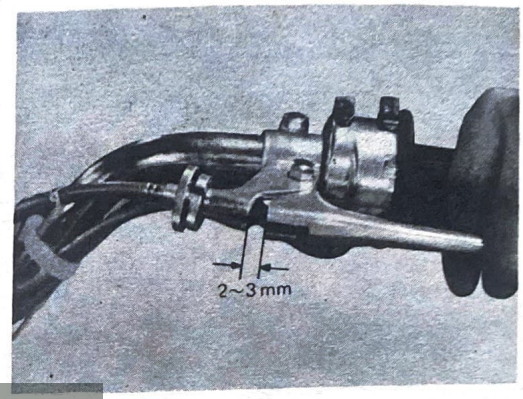


Fig. 4-8-14

3) Adjustment Sequence of the Clutch Cable

(1) Loosen the lock nut.

(2) To increase the play of the lever, loosen the adjusting screw; to reduce the play, tighten the adjusting screw.

(3) After adjustment, fully tighten the lock nut.

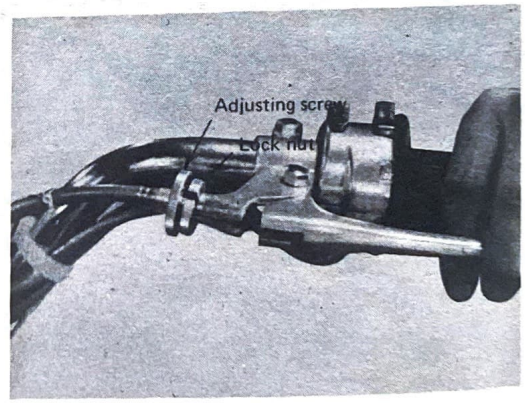


Fig. 4-8-15

4–9 Primary Drive Gear

When loosening the primary drive gear lock nut, a rag should be placed between the primary driven and drive gears so that these gears will not rotate. (Fig. 4-9-1)

If the primary drive gear is so tightly splined to the crankshaft that the gear will not slide off smoothly, use two screwdrivers as shown in Fig. 4-9-2. Afterward check the tooth surfaces.

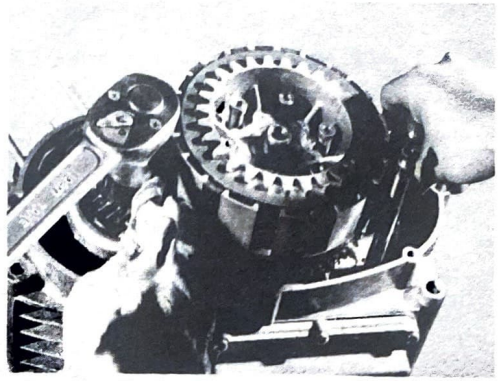


Fig. 4-9-1

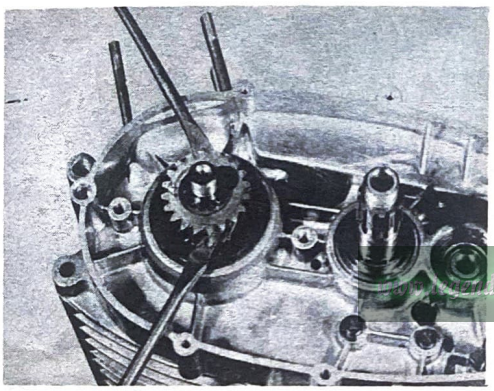


Fig. 4-9-2

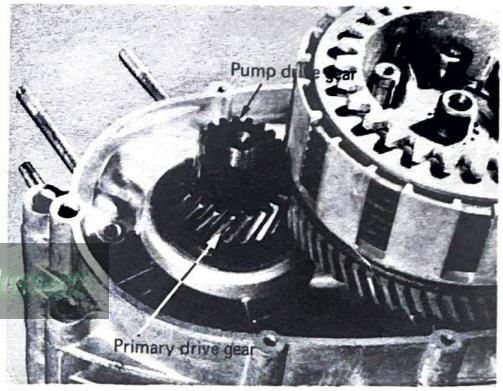


Fig. 4-9-3

4–10 Drive Sprocket

1. Removal

1) Straighten the lock washer with a chisel or a screwdriver. (Fig. 4-10-1)

Fig. 4-10-1

2) Lock the drive sprocket and loosen the nut. (Before removing the engine, shift the transmission in to "FIRST" and remove the sprocket, or use a tool to lock the sprocket.) (Fig. 4-10-2)

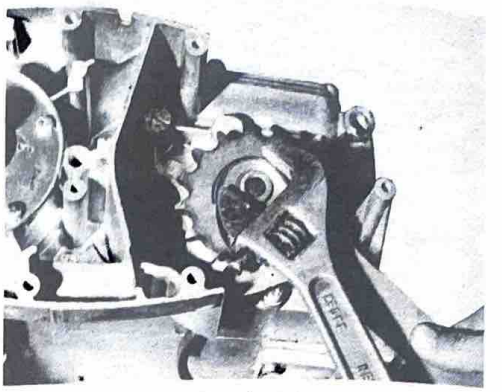


Fig. 4-10-2

3) Remove the sprocket, the felt seal, and then the distance collar. (Figs. 4-10-3, 4 and 5)

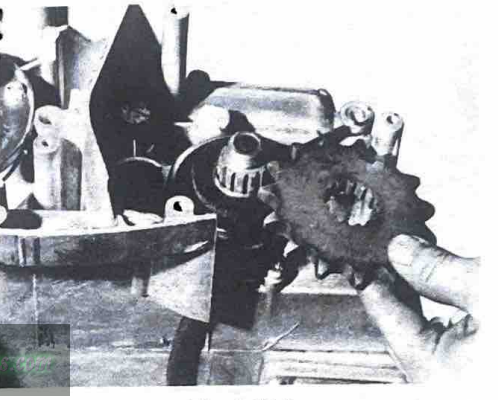


Fig. 4-10-3

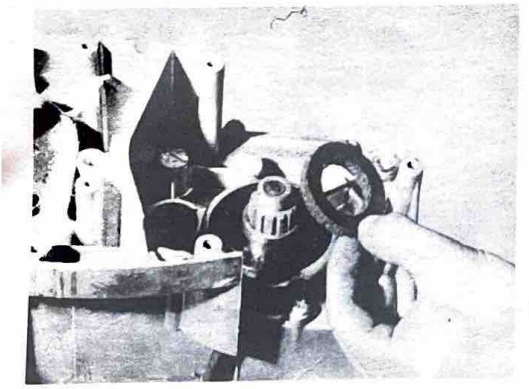


Fig. 4-10-4

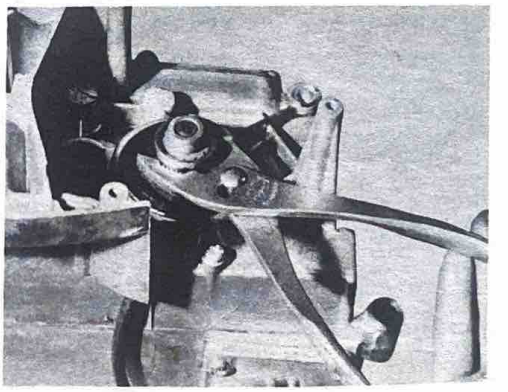


Fig. 4-10-5

2. Checking the Drive Sprocket

A worn drive sprocket may result in abnormal noise, and shorten the life of the chain. Check the teeth of the sprocket teeth for wear and deformation.

Checking the Chain and Drive Sprocket for Meshing:

Drive sprocket wear can be checked by inspecting the teeth only, but it can more easily be checked by observing the meshing of the sprocket with the chain.

Whether the drive sprocket is worn or not can be determined by using a new drive chain. If there is excessive play between the sprocket and the new chain, replace it. (Figs. 4-10-6 and 7)

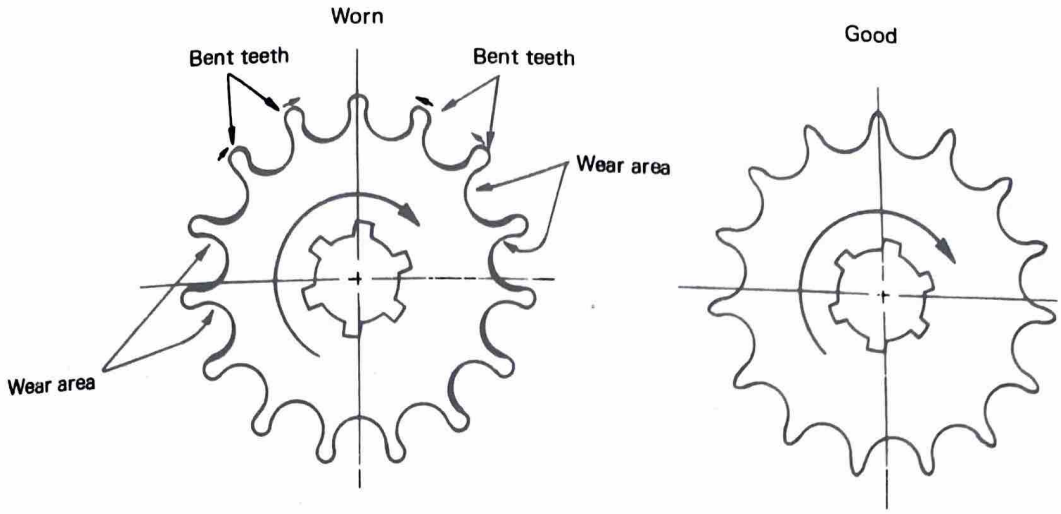


Fig. 4-10-6

Clean the chain with solvent before checking it. Then hold the chain in your fingers, as shown in Fig. 4-10-8 and check whether the chain bends without curring.

Next, suspend the chain as shown in Fig. 4-10-9. If the chain exhibits curvatures, (A, B and C) as shown in Fig. 4-10-10, it is defective. Replace it.

Curvatures may often result from lack of lubrication, dirt attached, or rust. In this case, reclean the chain and repeatedly bend it back and forth in detergent oil, then again check it for defects.

Another good test for wear is to mesh the chain with a new sprocket and check for excessive slack. The chain is bad if you can pull it away from the curvature of the sprocket a distance of more than a 1/2 link.

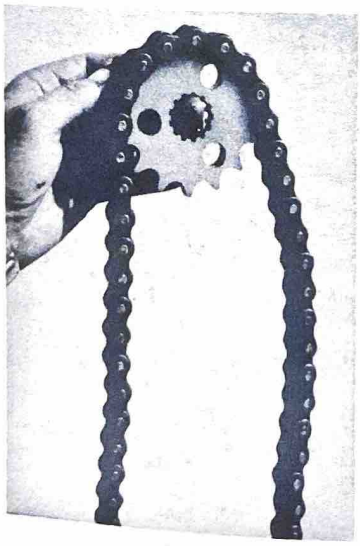


Fig. 4-10-7

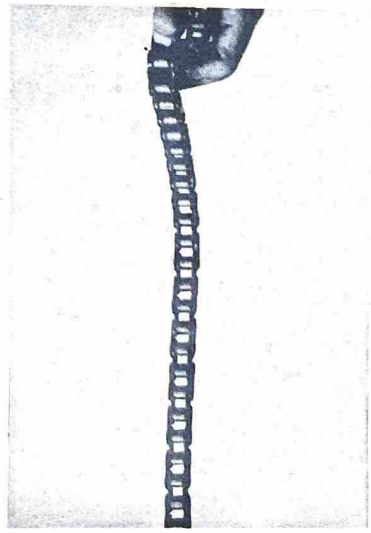


Fig. 4-10-8

Fig. 4-10-9

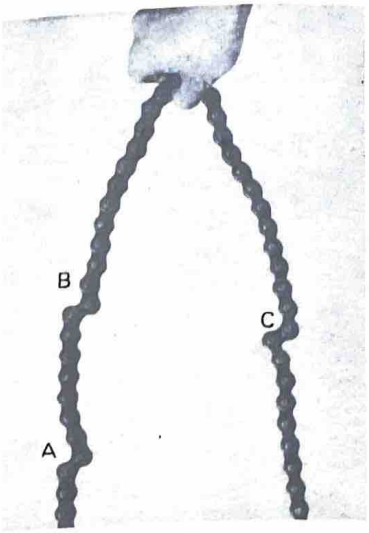


Fig. 4-10-10

4–11 Tachometer Gear Unit Housing

1. Removing

1) Remove the four pan-head screws and the tachometer gear unit housing can be removed.

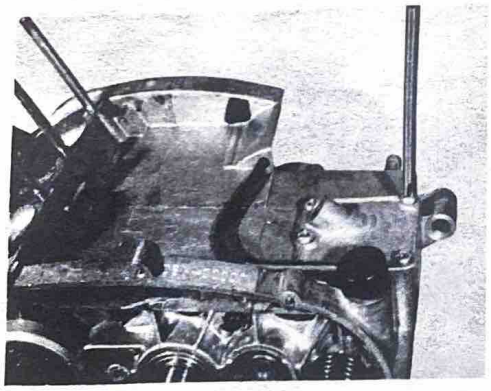


Fig. 4-11-1

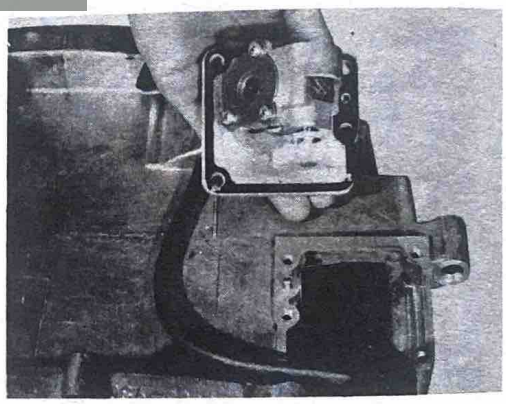
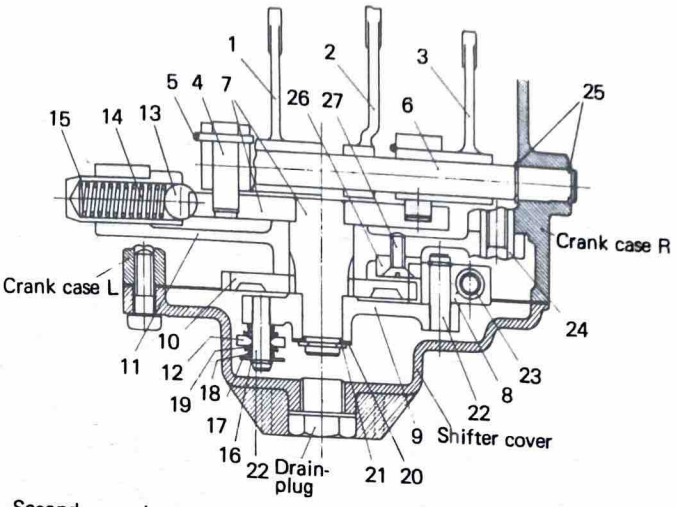


Fig. 4-11-2

4–12 Shifting Mechanism

1. Construction



1. Second gear wheel shift fork
2. Third and 5th 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

Fig. 4-12-1

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

(Figs. 4-12-2, 3 and 4)

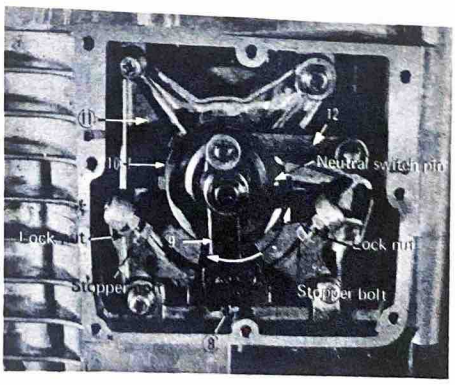


Fig. 4-12-2

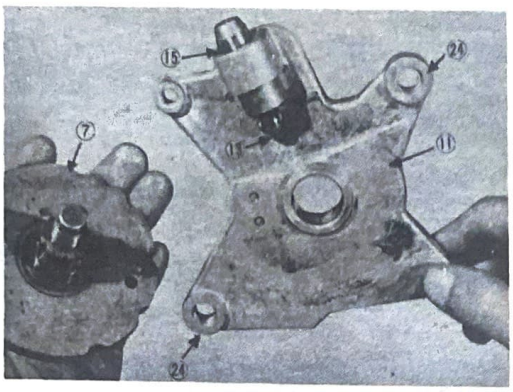


Fig. 4-12-3

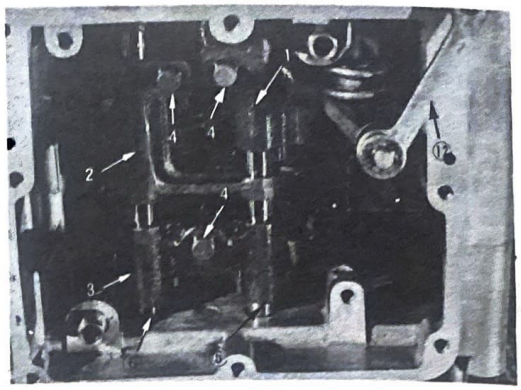


Fig. 4-12-4

3. Removing

1) Remove the shifter cover.

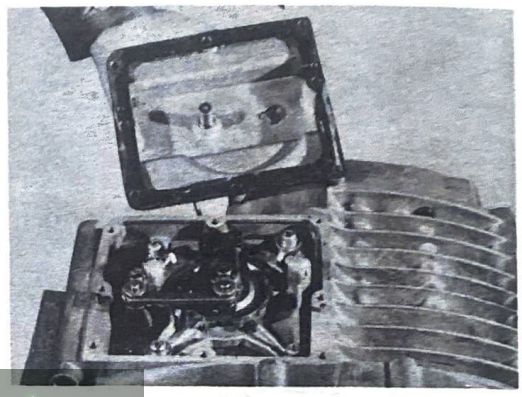


Fig. 4-12-5

2) Disconnect both the change link and change lever.
In this case, cover the crankcase with a clean rag, so you will not accidentally drop the clips into the crankcase. (Fig. 4-12-6)

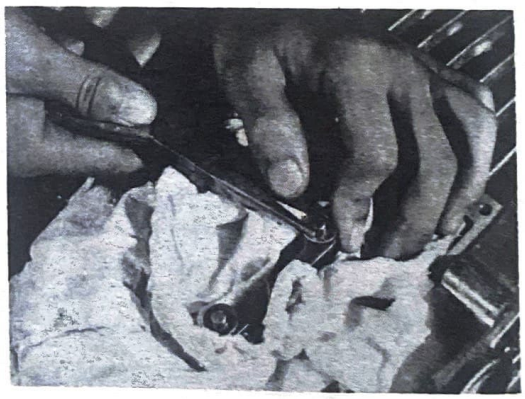


Fig. 4-12-6

3) Remove the shifter cam assembly.
(Fig. 4-12-7)

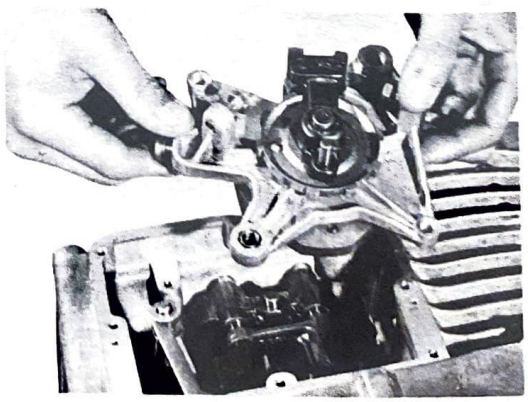


Fig. 4-12-7

4) 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. (Fig. 4-12-8)

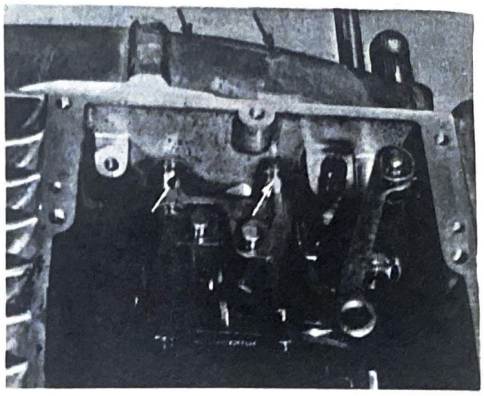


Fig. 4-12-8

4. Reassembling

1) 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. (Fig. 4-12-9)

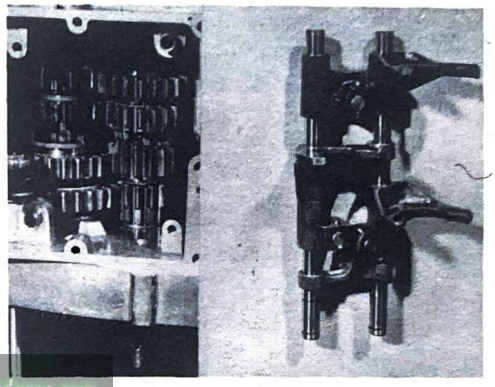


Fig. 4-12-9

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

3) Install the shifter cam assembly.

4) Install the change link and check the shifting. Install the change pedal and by turning the drive axle, test the gear shifting. If the gears will not shift correctly, adjust the stopper adjustment bolt. (Fig. 4-12-10)

5) Install the shifter cover together with the shifter cover packing (Apply Yamaha Bond No. 5).

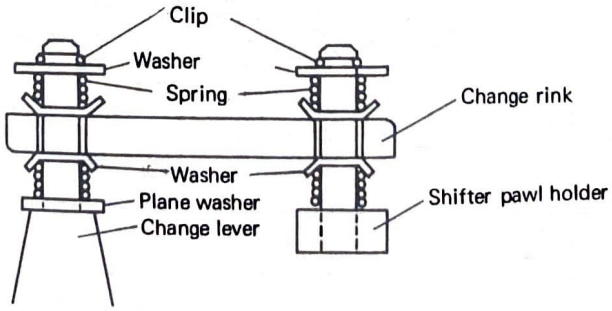


Fig. 4-12-10

Checking and Servicing the Shift Gears:

A. Caution on reassembling:

1) Spline the gear shift cam to the shifter working plate by aligning the markings. (Fig. 4-12-11)

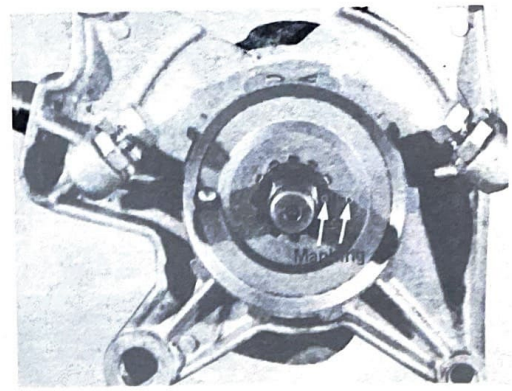


Fig. 4-12-11

2) Check the shift fork for wear. (After reassembling, examine whether the transmission is operating smoothly.)

3) During assembly, make sure that the transmission is in neutral.

4) Set the shifter cam stopper in the neutral position.

5. 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.

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

(Gears will not mesh with each other if movement is insufficient. Excessive movement will result in skipping over to another speed position.)

1) Make sure that the shifter ball (ball holder) returns to the center of the working plate.

2) Check the transmission for smooth operation and shifting.

A. 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. (Fig. 4-12-12)

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.

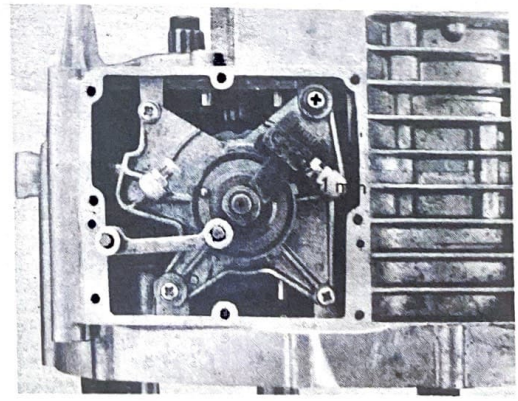


Fig. 4-12-12

4–13 Splitting the Crankcases

a. Remove the pan-head screws on the crank case R. Note that two of these bolts are provided with a rubber cap. (Figs. 4-13-1 and 2)

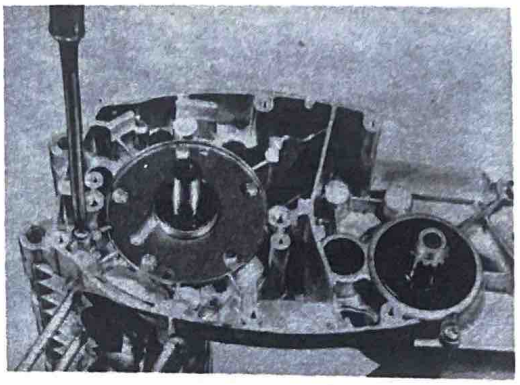


Fig. 4-13-1

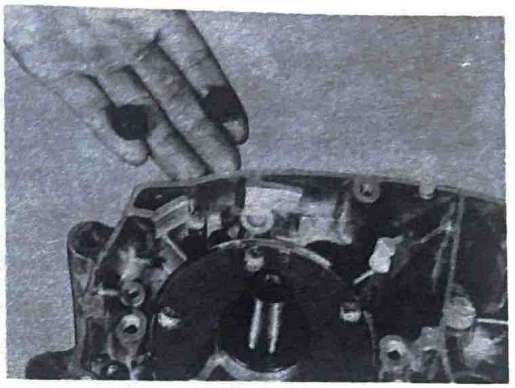


Fig. 4-13-2

b. Split the case R from the case L with the crankcase disassembly tool. (Fig. 4-13-3)

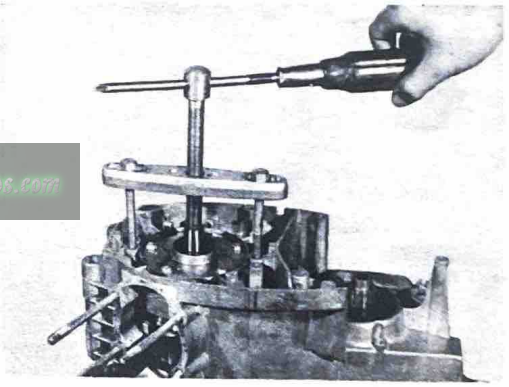


Fig. 4-13-3

Note: Fully tighten the bolts attached to the special tool and maintain the tool body in a parallel position.

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. When splitting the crankcase, use a soft-head hammer. Tap lightly with the tool on the crankcase side and the drive axle. Work the cases apart evenly to avoid binding and possible damage to components.

4–14 Assembling the Crankcases

1) Apply Yamaha Bond No. 5 to the mating surface of the crankcase L and the crank cover seal.

2) Apply Yamaha Bond No. 5 evenly to the mating surface of the crankcase R.

3) Place the crankcase R on the crankcase L and put these two together by tapping them with a soft-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, and keep the rod at TDC.)

4) Clamp the two crankcases tightly with the pan-head screws. First, lightly tighten the screws evenly. Then retighten alternately on the top and bottom sides of the crankcase.

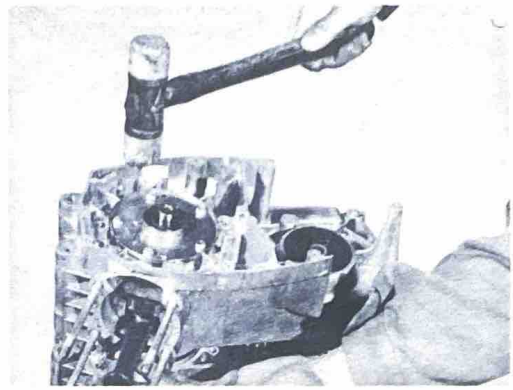


Fig. 4-14-1

4–15 Transmission

Figs. 4-15-1 and 2 show the layout and details of the transmission assembly. The primary and the secondary reduction ratios are 65/20 (3.250) and 41/15 (2.733), respectively. Accordingly, both transmission gear ratios for each gear position are as follows:

(All dimensions are given in mm.)

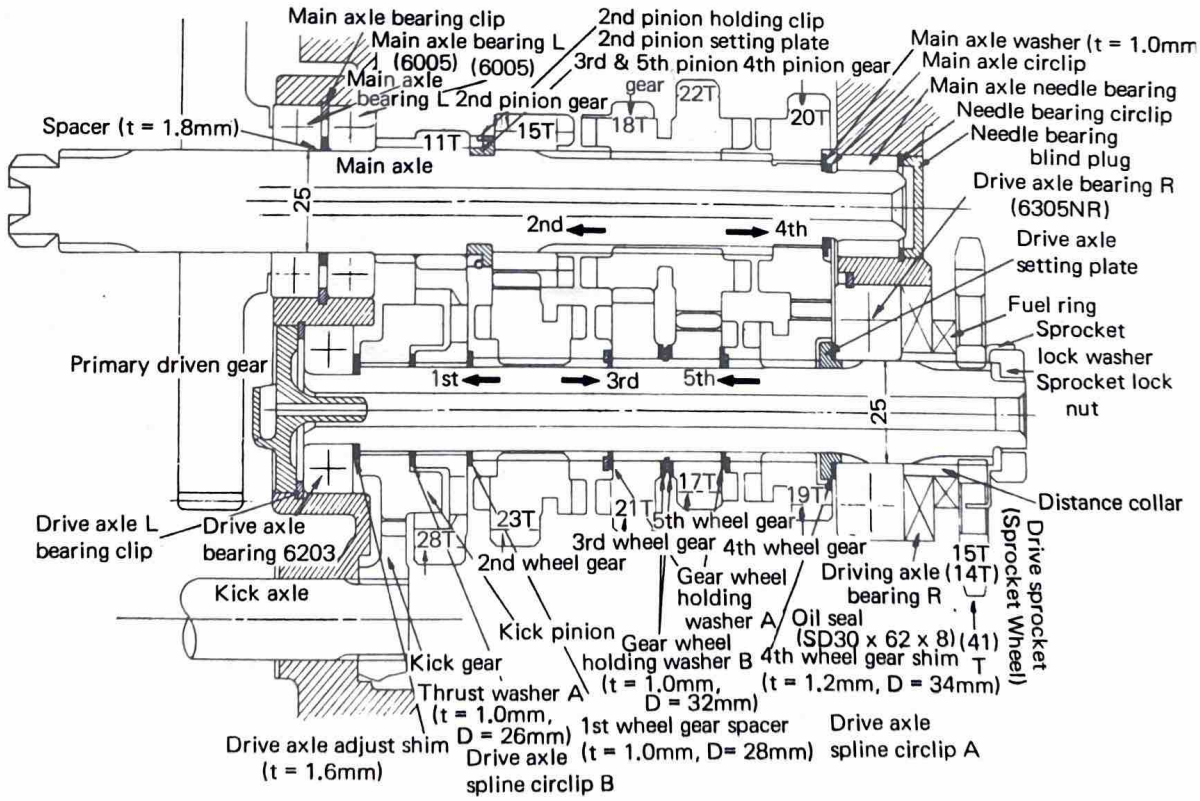
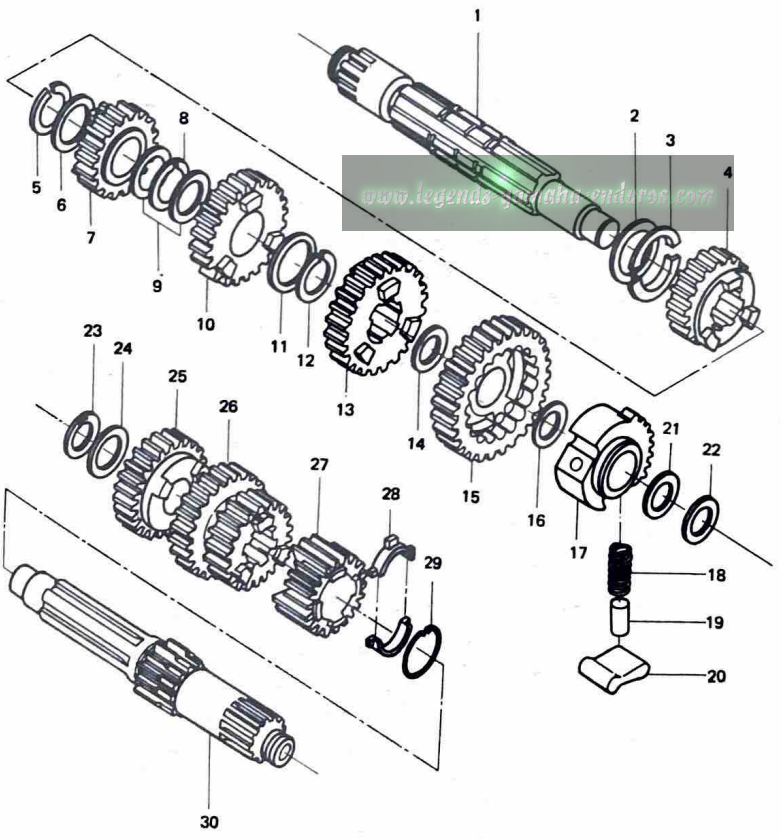


Fig. 4-15-1

Primary Reduction Ratio 65/20=3.250				
Secondary Reduction Ratio 41/15=2.733 (DS6), 41/14=2.929 (DS6C)				
	Transmission gear reduction	Total transmission gear reduction	DS6 total reduction ratio	DS6C total reduction ratio
1st	28/11=2.545	8.273	22.605	24.227
2nd	23/15=1.533	4.983	13.616	14.594
3rd	21/18=1.167	3.792	10.365	11.104
4th	19/20=0.950	3.088	8.438	9.042
5th	17/22=0.773	2.511	6.866	7.355



1 Drive axle
2 4th wheel gear shim
3 Drive axle setting plate
4 4th wheel gear
5 Drive axle spline circlip A
6 Wheel gear holding washer A
7 5th wheel gear
8 Drive axle spline circlip
9 Wheel gear holding washer B
10 3rd wheel gear
11 Wheel gear holding washer A
12 Drive axle spline circlip
13 2nd wheel gear
14 1st wheel gear spacer
15 Kick gear
16 Thrust washer A
17 Kick pinion gear
18 Pawl spring
19 Kick pawl pin
20 Kick pawl junk
21 Drive axle adjust shim
22 Drive axle adjust shim
23 Main axle circlip
24 Main axle washer
25 4th pinion gear
26 3rd and 5th pinion gear
27 2nd pinion gear
28 2nd pinion setting plate
29 2nd pinion holding clip
30 Main axle

Fig. 4-15-2 Transmission Exploded View

1. Removal

Remove the transmission assembly by tapping both drive and main axles alternately with a plastic-head hammer. (Fig. 4-15-3)

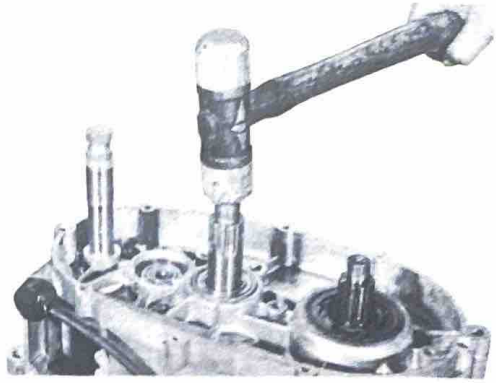


Fig. 4-15-3

2. Assembling

1) Install the washers in a correct manner.

2) Engage the kick pinion with the kick gear. (Fig. 4-15-4)

3) Install the main axle assembly by tapping it with hammer.

4) Install the drive axle assembly, meshings it with each gear of the main axle.

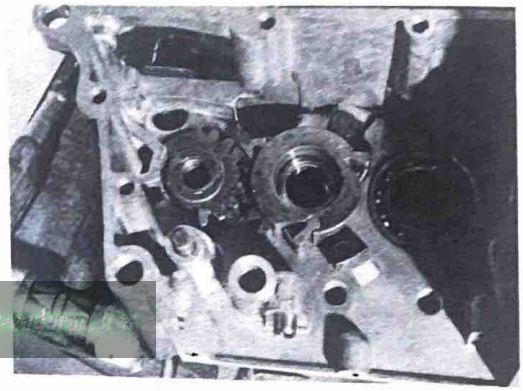


Fig. 4-15-4

5) Install both axles by tapping with a plastic-head hammer alternately, meanwhile meshing gears correctly. (Fig. 4-15-5)

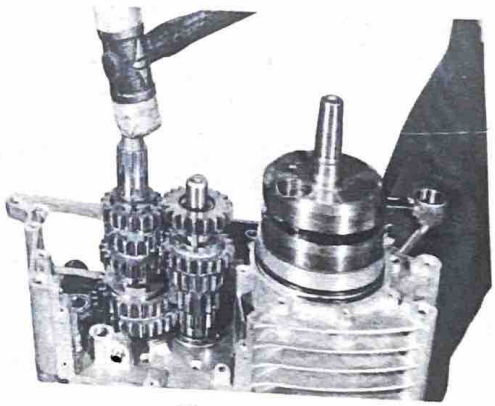


Fig. 4-15-5

4–16 Kick Starter

1. Removal

1) Remove the kick spring cover. (Fig. 4-16-1)

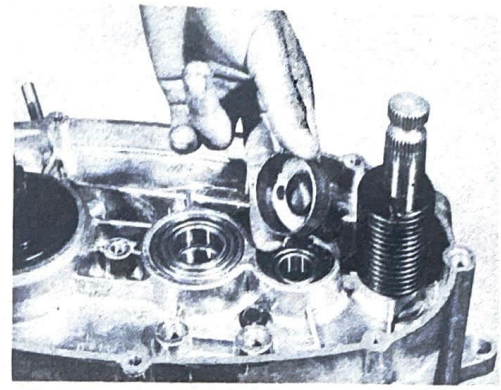


Fig. 4-16-1

2) Unhook the kick spring from the kick shaft. (Fig. 4-16-2)

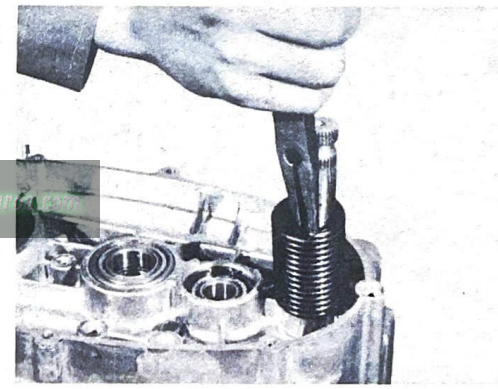


Fig. 4-16-2

3) After removing the kick shaft clip, slide the kick shaft assembly toward the inside of the case. (Figs. 4-16-3 and 4)

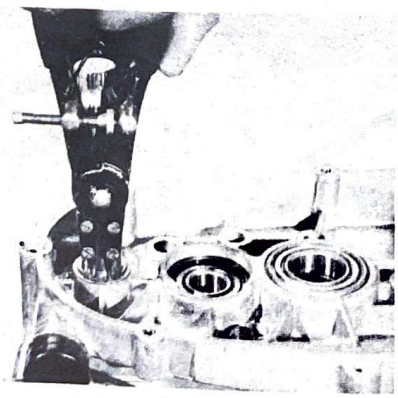


Fig. 4-16-3

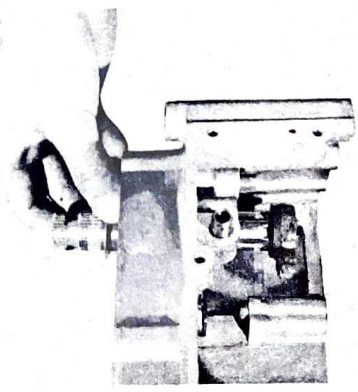


Fig. 4-16-4

2. Assembling

A. Assembling the kick shaft and kick gear.

Both kick shaft and kick gear are press-fitted after heating to 130 ~ 150°C (266 ~ 302°F).

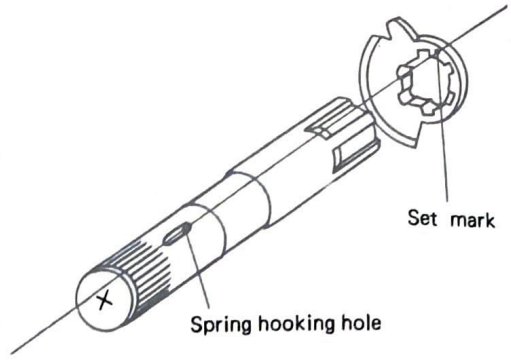


Fig. 4-16-5

B. Installing the kick shaft

1) Insert the kick shaft into the case from the inner side and secure it with the clip.

2) 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. Install the kick spring cover in position using pliers and soft hammer.

C. Function

The kick gear is in constant mesh with the kick pinion of the 1st 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 1st gear wheel and causes it to rotate.

The rotary motion of the 1st gear wheel is transmitted to the main axle, clutch, primary drive gear and crankshaft.

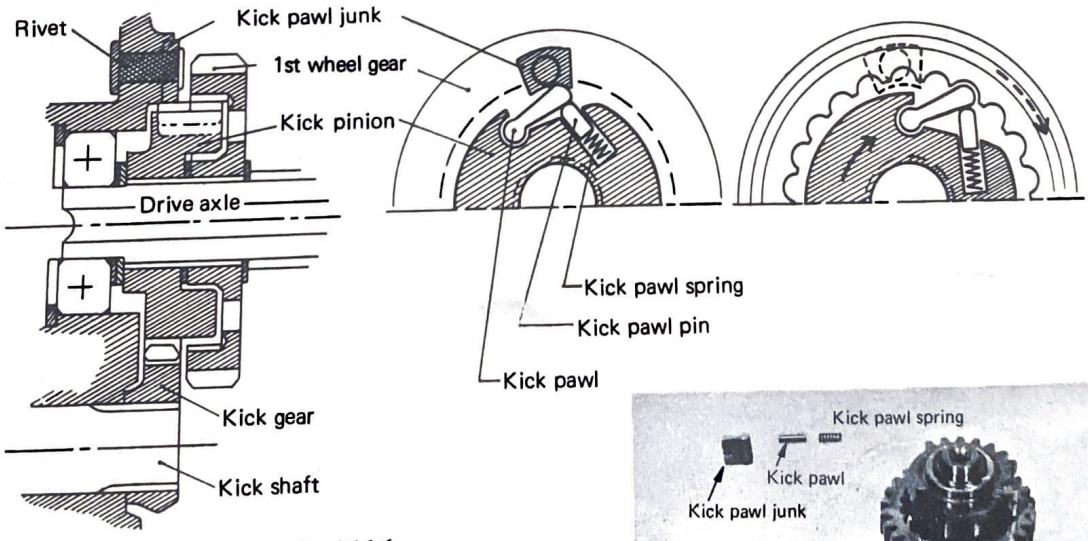


Fig. 4-16-6

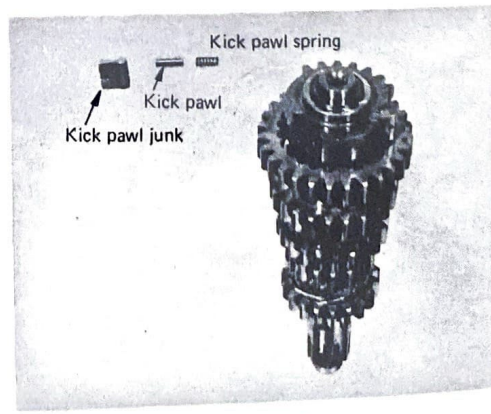


Fig. 4-16-7

4–17 Change Shaft

1. Removing

To pull out the change shaft, remove the change lever clip. (Fig. 4-17-1)

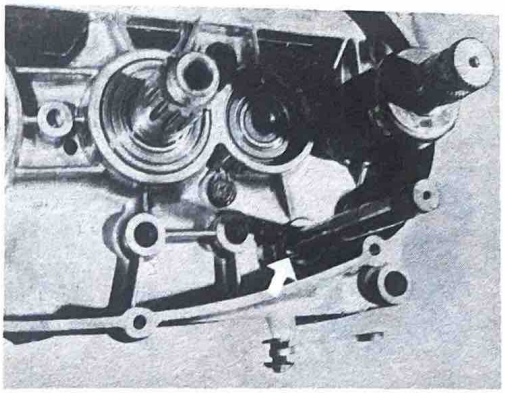


Fig. 4-17-1

2. Installing

Insert the change shaft into the case from its inner side and install the return spring change lever, then secure it with a clip. (Fig. 4-17-2)

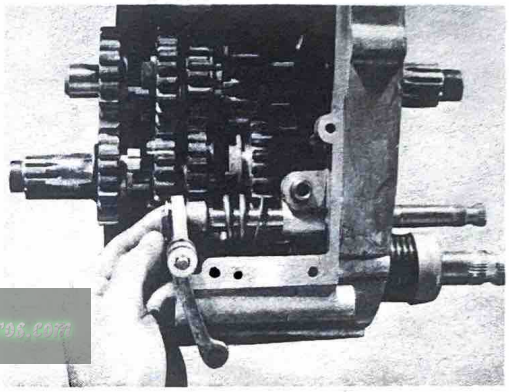


Fig. 4-17-2

4–18 Crankshaft

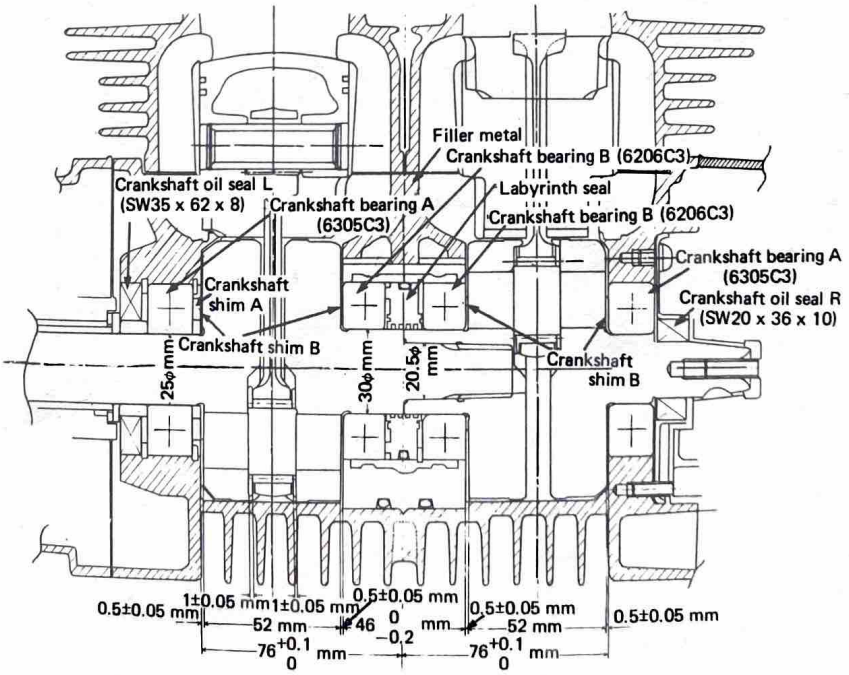
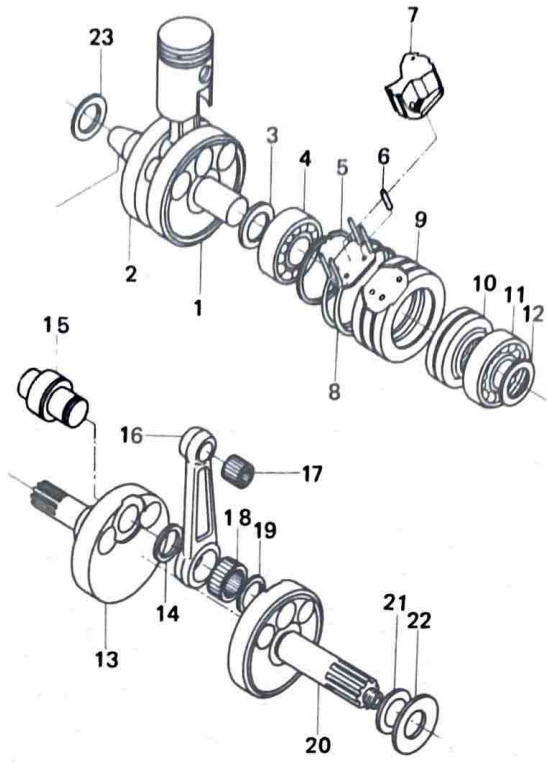


Fig. 4-18-1 Crankshaft Assembly Dimensions



1 Crank (2) (L.H.)
2 Crank (2) (R.H.)
3 Crankshaft shim B
4 Crankshaft bearing B (6206C3)
5 Circlip
6 Dowel pin
7 Filler metal
8 Crank cover seal
9 Crank cover
10 Labyrinth seal
11 Crankshaft bearing B (6206C3)
12 Crankshaft shim B
13 Crank (1) (R.H.)
14 Crank pin washer
15 Crank pin
16 Con-rod
17 Small end bearing
18 Large end bearing
19 Crank pin washer
20 Crank (1) (L.H.)
21 Crankshaft shim B
22 Crankshaft shim A
23 Crankshaft shim B

Fig. 4-18-2 Crankshaft Assembly Components

1. Removing

Press out the crank assembly with the crankcase dividing tool. 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. (Fig. 4-18-3)

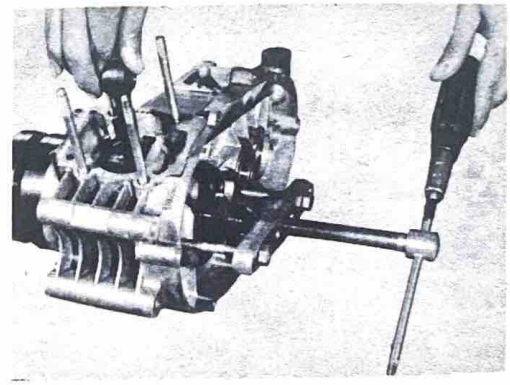


Fig. 4-18-3

2. Installing

1) Apply Yamaha Bond No. 5 to the crankcover seal.

2) Insert the crank assembly into the case and install the crank assembling tool. (Fig. 4-18-4)

3) 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.

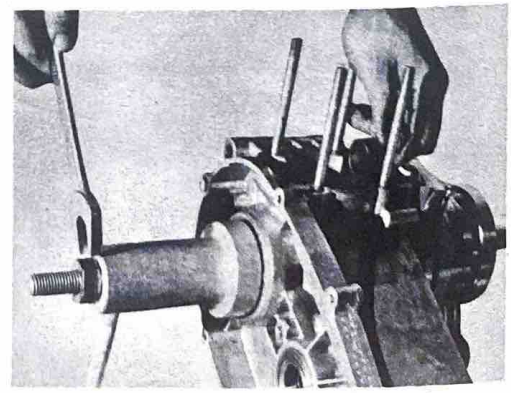


Fig. 4-18-4

3. Checking and Adjustment

1) Checking the Crankshaft Assembly

Check connecting rod axial play at the small end (to determine the amount of wear in the large end, crank pin, and large end bearing.) (Fig. 4-18-5)	Small end play should be not more than 2 mm.	If small end play exceeds 2 mm, disassemble the crankshaft, check the connecting rod, crank pin, and bearing for wear and other defects. Replace worn parts so that small end play is within 0.8 ~ 1.0 mm after reassembling.
Check the connecting rod for large end side play. (Fig. 4-18-6))	Shift the connecing rod to one side, and measure the clearance between the edge of large end and the crankweb, with a feeler gauge. Side play should be within 0.1 ~ 0.3 mm.	If side play exceeds 0.3 mm, disassemble the crankshaft assembly, and replace worn parts.
Accuracy of the crankshaft assembly: Check the crankshaft for runout at the two points as shown in Fig. 4-18-7	Dial indicator reading at each point should be 0.03 mm or less.	If excessive runout exists, align the crank flywheel, with a brass hammer and wedge. (Strike the flywheel lightly with the hammer.)

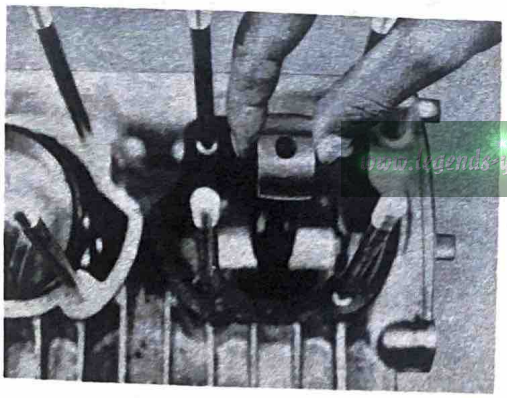


Fig. 4-18-5

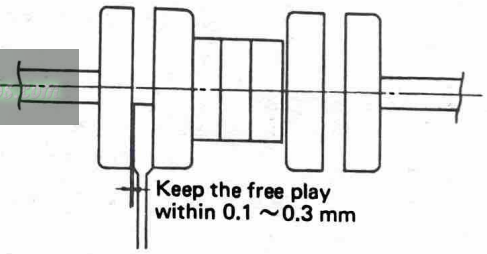


Fig. 4-18-6

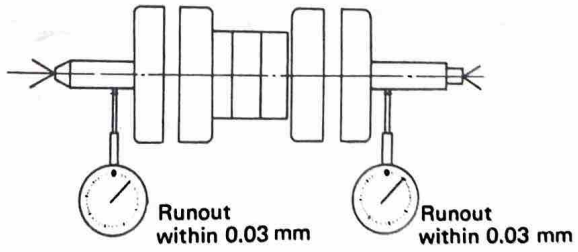


Fig. 4-18-7

4–19 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. Bearing

Replace any worn bearing causing abnormal noise, having a scratched race, 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 pressure is applied to both outer and inner races. It must also be kept in a horizontal position. Use a press when one is available. (Fig. 4-19-1)

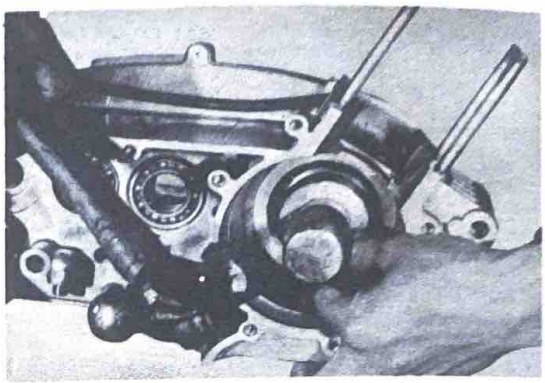


Fig. 4-19-1

b. Oil Seal

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 grease to the sealing surfaces of the lip and the shaft. Grease the lip inner surface.

Apply grease 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. Clip

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 by rotating it slightly after installation. (Fig. 4-19-2)

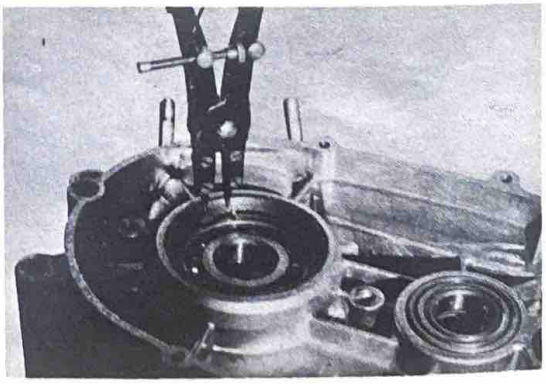
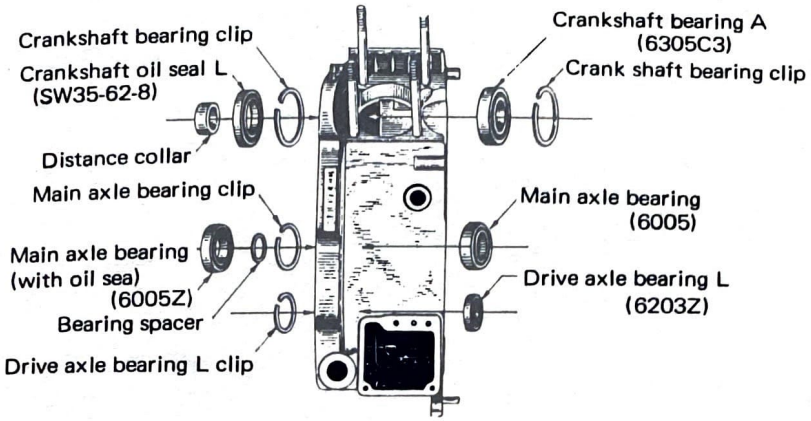
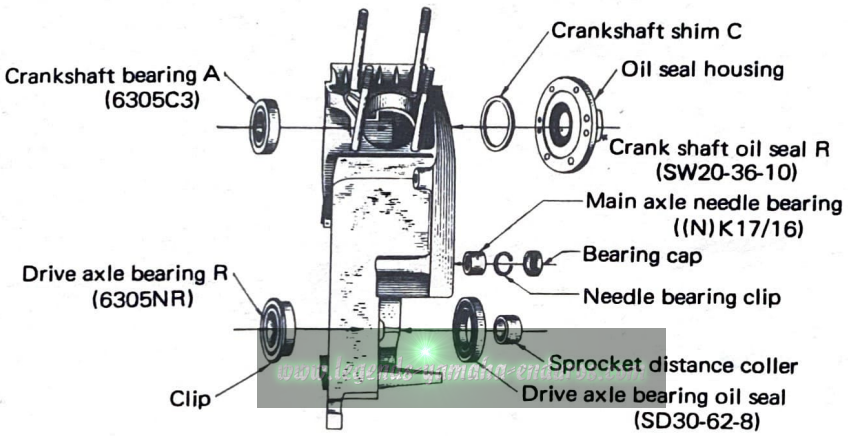


Fig. 4-19-2



Crankcase L.H.



Crankcase R.H.

Fig. 4-19-3

4–20 Carburetor

The YAMAHA 250 DS6 employs two AMAL type VM26SC carburetors in order to meet the requirements of better acceleration and higher speed operation.

1. Removing

1) Loosen the screw and disconnect the starter lever rod. (Fig. 4-20-1)

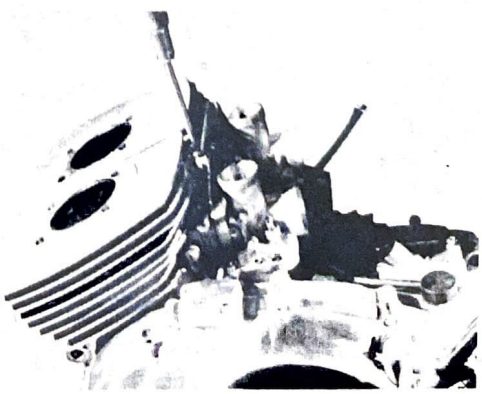


Fig. 4-20-1

2) Loosen the both clamp bolts. (Fig. 4-20-2)

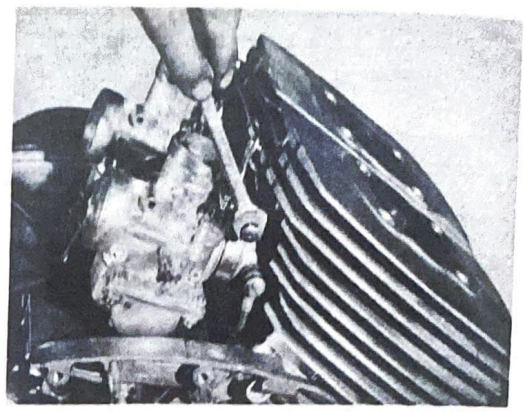


Fig. 4-20-2

3) Then remove the carburetors. (Fig. 4-20-3)

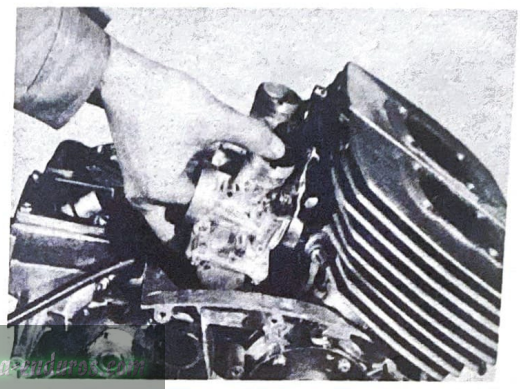


Fig. 4-20-3

2. Checking the Carburetor

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

2) Float Valve

Check the float valve for seating. If the seat is worn or scratched, replace the valve. If the float valve spring weakens, fuel may overflow, flooding the float chamber when the machine is running at certain speed or certain conditions. Depress the float valve with your finger, and make sure that it properly returns to the original position after released.

3) Overflowing

If fuel overflows, check the carburetor in the manner as specified in 1) and 2) above. If nothing is found to be wrong, the overflowing is considered to be caused by dust or dirt located between the float valve and the valve seat. Clean out the dust or dirt. Drain the fuel, rinse out the fuel tank with clean gasoline, and clean all other parts of the fuel system, including the float valve and the valve seat, with compressed air. (Figs. 3-20-4 and 5)

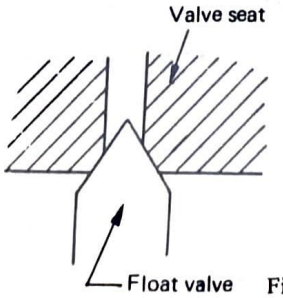


Fig. 4-20-4

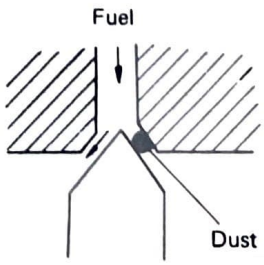


Fig. 4-20-5

4) Cleaning the Carburetor

Disassemble the carburetor, and wash all its parts in a suitable solvent or carburetor cleaner.

Blow all air and fuel passages in the carburetor with compressed air.

All jets and other delicated parts should be cleaned by blowing compressed air through them. When using wires or other hard pointed cleaning tools, take care not to damage or scratch their precision-machined surfaces.

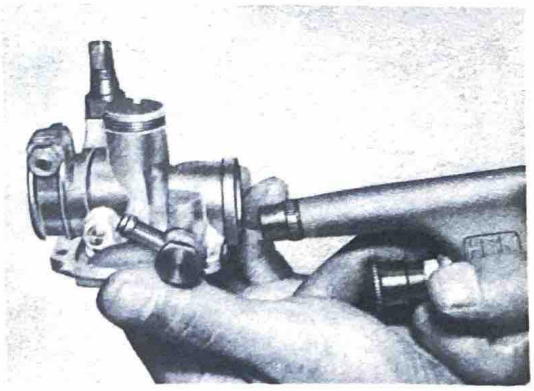


Fig. 4-20-6

5) Adjusting the Fuel Level

The fuel level is checked by YAMAHA before delivery, but it may fluctuate due to a worn needle valve or deformed float arm. The higher the fuel level, the richer the air-fuel mixture. The lower the fuel level, the leaner the mixture. If the fuel level is not proper, adjust it in the following manner.

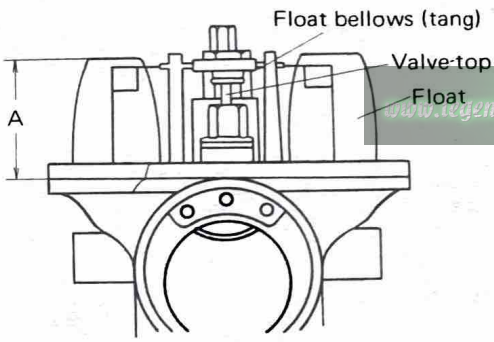


Fig. 4-20-7

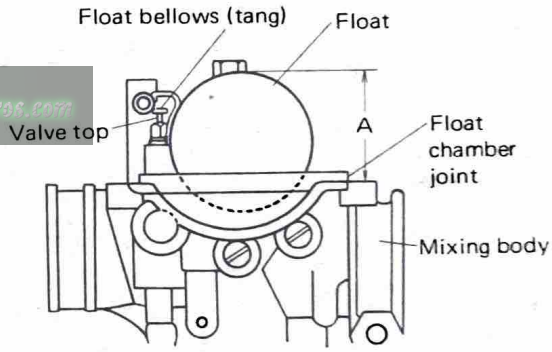


Fig. 4-20-8

(1) Remove the float chamber body, and turn over the mixing body. Slowly push the float downward, with your finger, and when the float tang comes to contact with the upper end of the needle valve, stop and set the float. Do not allow the tang to depress the needle spring.

(2) Then measure the distance "A" from the float top to the float chamber joint surface. Standard measurement of A: 25.7 mm.

(3) When the A distance measured is less than the standard, bend the tang out. If it is greater, bend the tang in.

2. Carburetor Setting

a. Idling adjustment.

1) Set the idle air screw to the factory recommended setting.
There should be no reason to experiment for a better setting. (Fig. 4-20-9)

2) Turn the throttle stop screw until the engine reaches its 1,100 ~ 1,300 r.p.m.

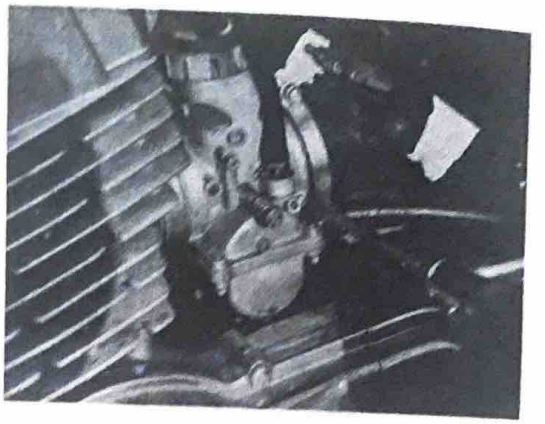


Fig. 4-20-9

b. Carburetor Settings

1	M.	J.	(Main jet)	#110
2	N.	J.	(Needle jet)	N - 8
3	J.	N.	(Jet needle setting the step where J. N. clip is fitted)	4D3 - 3 stages
4	C.	A.	(Throttle valve cutaway)	2.0 (8)
5	P.	J.	(Pilot jet)	#30
6	A.	S.	(The number of turns the A.S. is backed off from a lightly seated position)	1-1/2
7	G.	S.	(Starter jet)	#40
8	V.	S.	(Valve seat)	2.0

4–21 Air Cleaner

1. Removal

The air cleaner is housed in the cleaner case on the top of the engine. Remove the air cleaner case cover and then the air cleaner.
(Figs. 4-21-1 and 2)

Fig. 4-21-1

2. Cleaning

The air cleaner should be cleaned by blowing with compressed air, or by lightly tapping the filtering paper so that the dust may be removed.

Excessively dirty air cleaners should be cleaned in a container of gasoline.

As the element is made of paper, it should be kept away from water and oil. If possible, the element should be replaced every 3,000 miles (5,000 km).

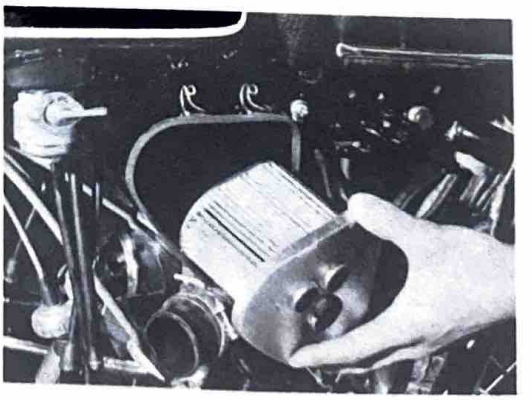


Fig. 4-21-2

CHAPTER 5. CHASSIS

5–1 Front Wheel

The front tire is 3.00–18–4 PR in size. The brake is a two-leading shoe type, sized at 7.10 x 1.18 inches (180 x 30 mm), and is water and dust proof.

1. Removal

1) Disconnect the brake cable and speedometer cable from the front shoe plate.

(Figs. 5-1-1, 2, 3, 4 and 5)

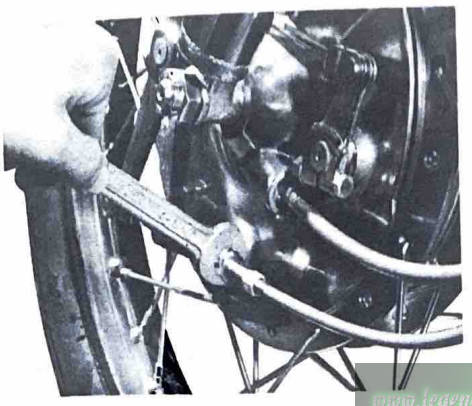


Fig. 5-1-1

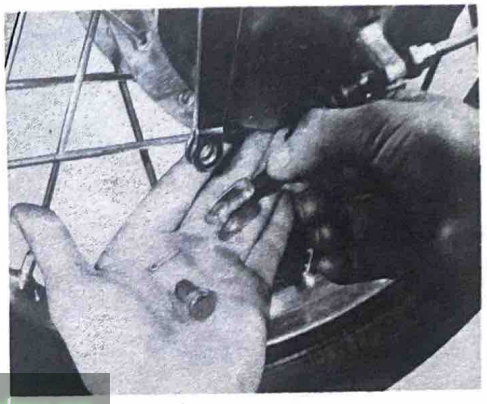


Fig. 5-1-2

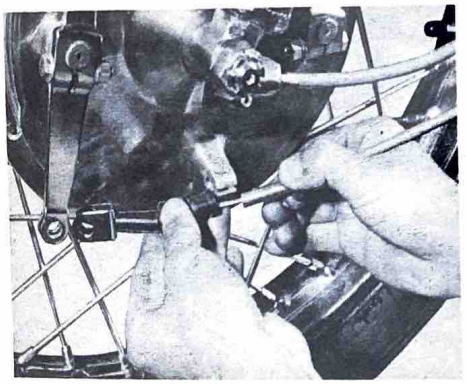


Fig. 5-1-3

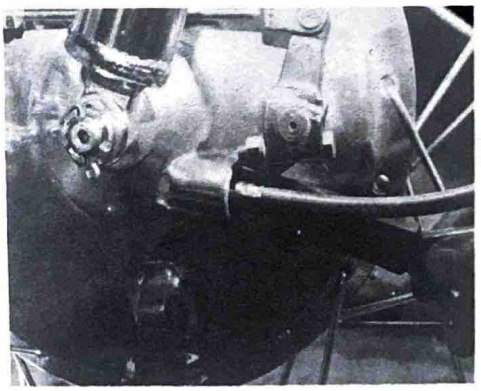


Fig. 5-1-4

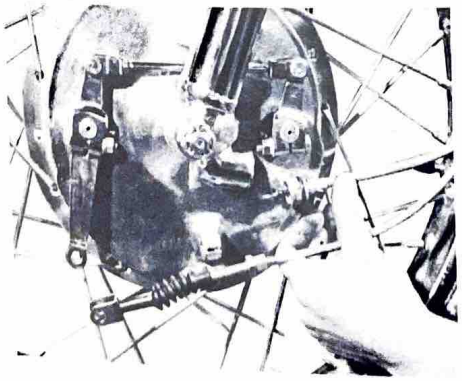


Fig. 5-1-5

2) Loosen the front wheel shaft lock bolt. (Fig. 5-1-6)

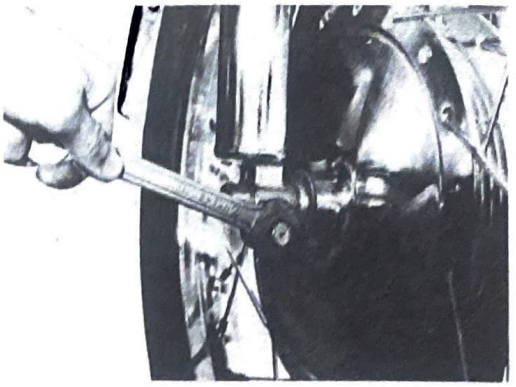


Fig. 5-1-6

3) Remove the cotter pin. (Fig. 5-1-7)

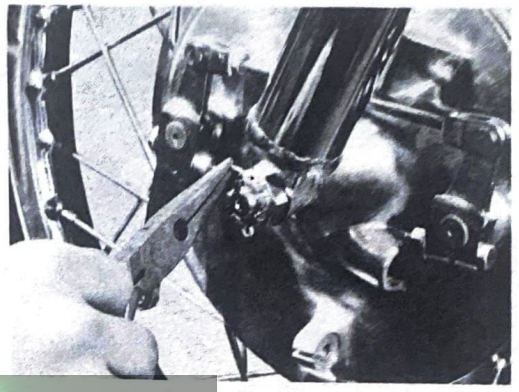


Fig. 5-1-7

4) Loosen the front wheel shaft nut. (Fig. 5-1-8)

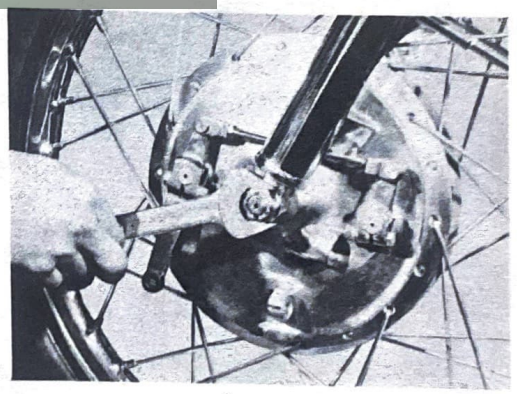


Fig. 5-1-8

5) Pull out the front wheel shaft. (Fig. 5-1-9)

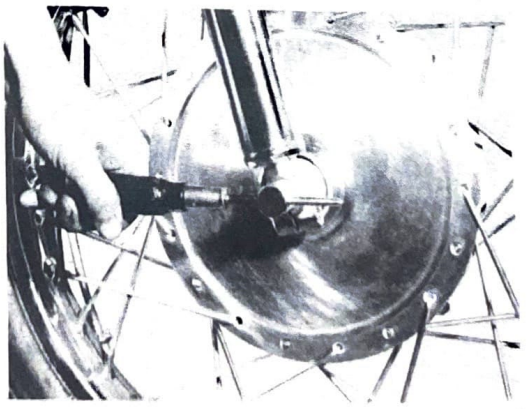


Fig. 5-1-9

6) Raise the front of the chassis, and remove the wheel assembly. (Fig. 5-1-10)

Fig. 5-1-10

2. Checking and Adjustment

1) Checking the Runout of the Rim:
Anchor the front wheel as shown in Fig. 5-1-11, and measure the runout of the rim with a dial gauge.
Runout limits: 0.07 in. (2 mm)
Excessive runout of the rim may cause steering difficulties while riding the machine, which may lead to an accident.
Excessive runout may result from a deformed rim or loosen spoke nipple.

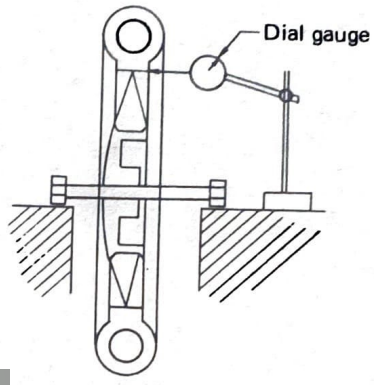


Fig. 5-1-11

2) Spokes

a. Replacing Spokes:
Any bent or faulty spoke should be quickly replaced because it will adversely affect other neighboring spokes, imposing extra loads on them.
The bent end of the spoke is inserted into the hub, the threaded end is locked to the nipple. (See Fig. 5-1-12) To remove the spoke, completely unscrew the nipple and remove the bent end from the hub.

Fig. 5-1-12

b. Adjusting the Spoke Tension
Any loosened spoke or uneven spoke tension may cause the rim to warp. This may also adversely affect the spoke itself. Spokes tend to become loose after many miles. This is particularly true with a new machine. Therefore, the spokes should be retightened periodically.
Retightening should be performed by giving each nipple one turn, beginning with one side of the hub and then the other side.
Spoke nipple tightening torque: 15 kg-cm (Fig. 5-1-13)

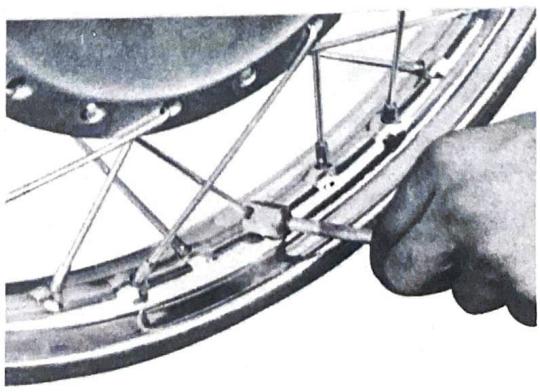


Fig. 5-1-13

3) Brake Shoe

Set the brake shoe, and measure the outer diameter of the shoe, with a slide calipers, as shown in Fig. 5-1-14.

If the shoe is less than 175 mm (6.9 in.), replace it.

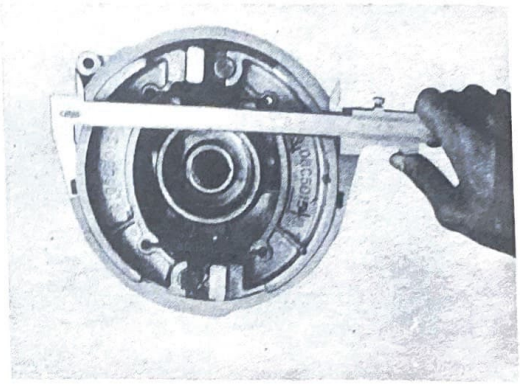


Fig. 5-1-14

4) Brake Drum

Oil, dust or scratches on the inner surface of the brake drum will result in abnormal noise or a malfunction of the brake. Clean or smooth out the surface with a rag or sandpaper. (Fig. 5-1-15)

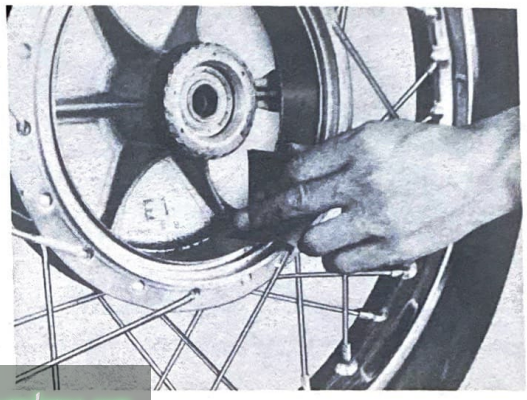


Fig. 5-1-15

5) Repairing the Brake Shoe

If the brake shoe has scratches or uneven contact with the brake drum, smooth out the surface with sandpaper or hand file. (Fig. 5-1-16)

Fig. 5-1-16

6) Replacing the Clutch Hub Bearing

a. First remove the sprocket shaft by pushing it out toward the other side.
b. Remove the sprocket shaft collar. (It can easily be pulled out with your hand.)
c. Remove the oil seal. Exercise care not to damage the oil seal.
d. Remove the circlip.
e. Use the bearing fitting tool to push out the clutch hub bearing toward the sprocket side.
f. To install the clutch hub bearing, reverse the above sequence. Before installation, grease the bearing and oil seal.

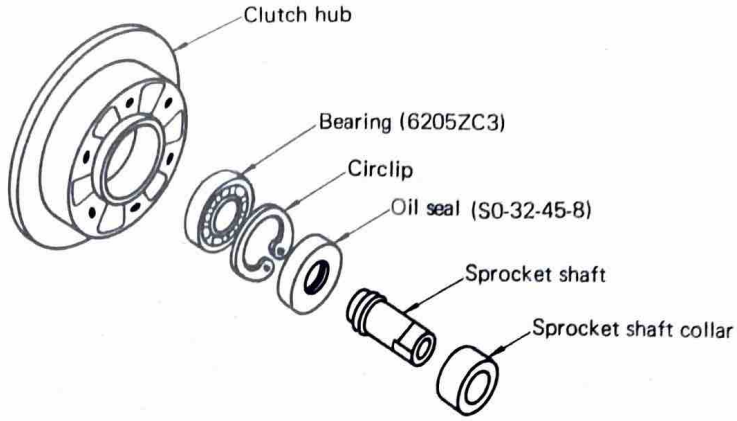


Fig. 5-1-17

7) Replacing the Wheel Bearing

a. First, clean the outside of the wheel hub.

b. Insert the bent end of the special tool (as shown in Fig. 5-1-19) into the hole in the center of the bearing spacer, and drive the spacer out of the hub by tapping the other end of the special tool with a hammer. (Both bearing spacer and spacer flange can easily be removed.)

c. Push out the bearing on the other side.

d. To install the wheel bearing, reverse the above sequence. Be sure to grease the bearing before installation and use the bearing fitting tool (furnished by Yamaha).

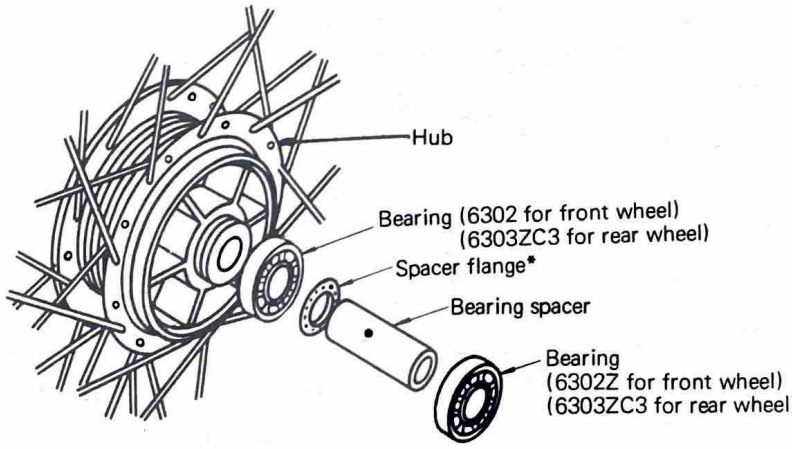
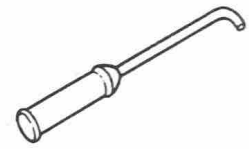


Fig. 5-1-18



Insert the bent end of the special tool into the hole in the center of the bearing spacer.

Fig. 5-1-19

*Note: No spacer flange is employed in the front wheel.

8) Replace a bent or damaged front wheel axle.

9) If the tooth surface of the helical speedometer drive gear is excessively worn, replace it.

10) Check the lips of the seals for damage or warpage. Replace if necessary.

5–2 Rear Wheel

1. Removal

1) Remove the rear brake and anchor bar from the rear brake plate.

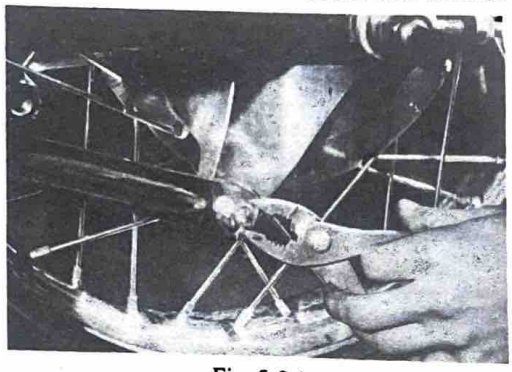


Fig. 5-2-1

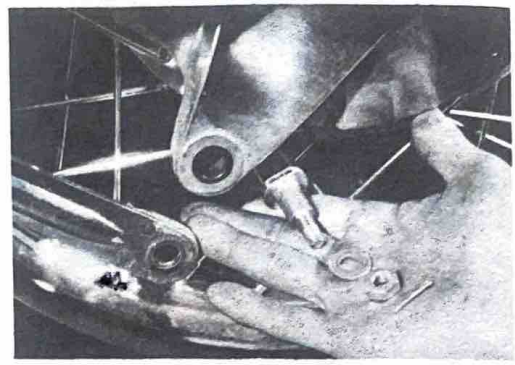


Fig. 5-2-2

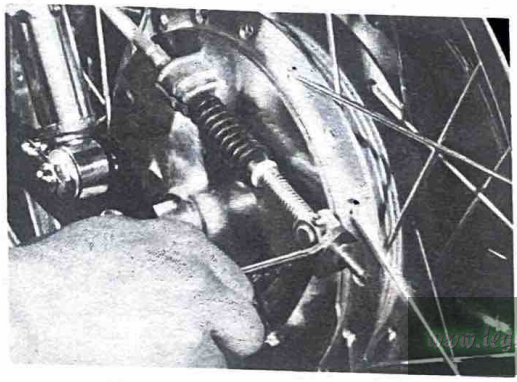


Fig. 5-2-3

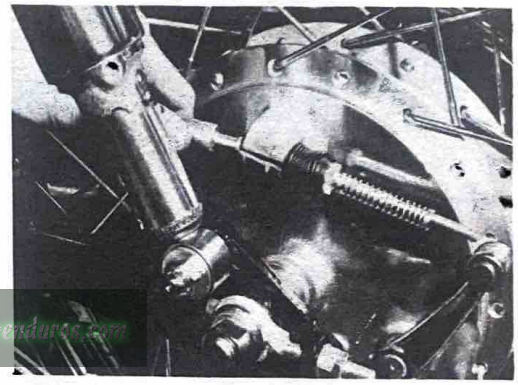


Fig. 5-2-4

2) Loosen the chain tension adjustment nuts and bolts on both right and left sides.

(Fig. 5-2-5)

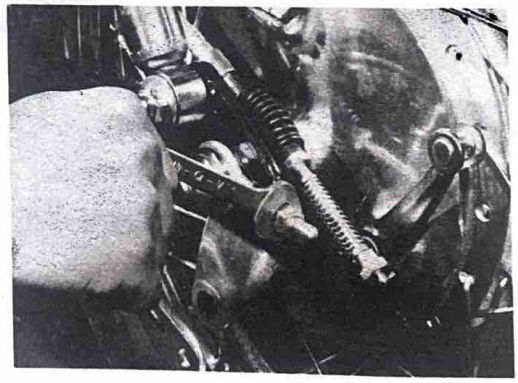


Fig. 5-2-5

3) Remove the rear wheel shaft nut.

(Fig. 5-2-6)

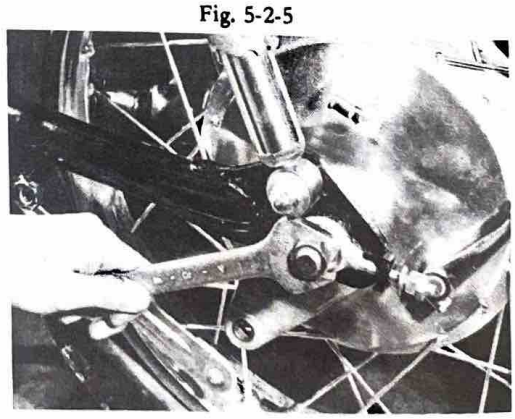


Fig. 5-2-6

4) Pull out the rear wheel shaft by striking it with a soft-faced hammer. (Fig. 5-2-7)

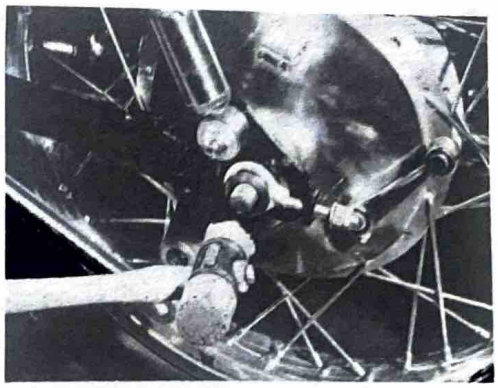


Fig. 5-2-7

5) Remove the right-hand chain puller and distance collar. (Fig. 5-2-8)

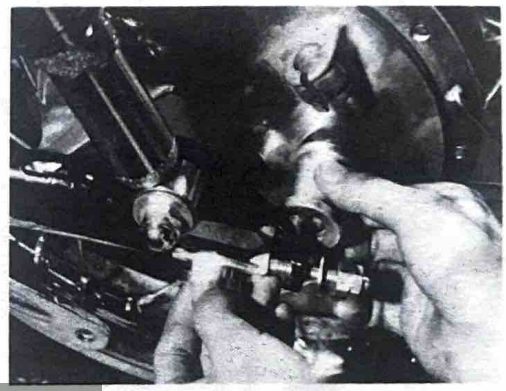


Fig. 5-2-8

6) Remove the rear brake plate. (Figs. 5-2-9 and 10)

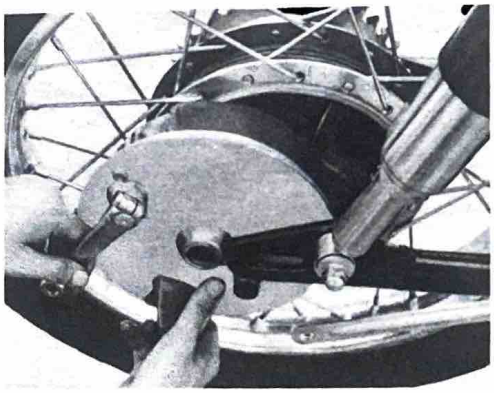


Fig. 5-2-9

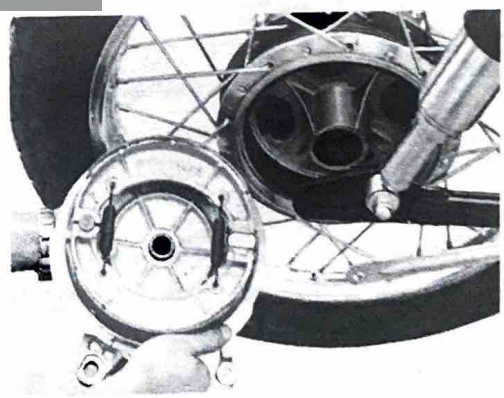


Fig. 5-2-10

7) Incline the chassis toward the left side, and remove the rear wheel assembly. (Fig. 5-2-11)

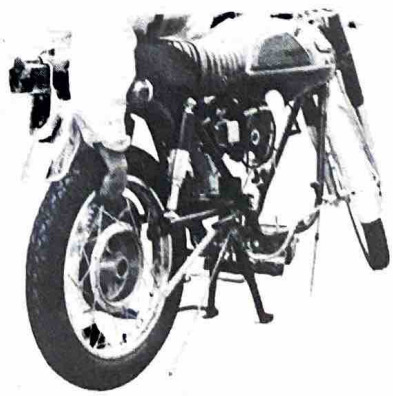


Fig. 5-2-11

2. Checking and Adjustment

1) Runout of the Wheel Rim

Measure the runout of the wheel rim in the same manner as in the case of the front wheel.

Runout limits . . . 2 mm or less (0.07 in. or less)

2) Brake Shoe

Follow the same procedure as in the case of the front wheel.

Minimum diameter . . . 175 mm (6.9 in.)

3) Brake Drum

Check and recondition the brake drum in the same manner as in the case of the front wheel.

4) Repairing the Brake Shoe

Repair the brake shoe in the same manner as in the case of the front wheel.

5–3 Replacing Tires

1) Removal

a. Remove the valve cap and lock nut from the tire valve, and deflate the tire.

b. Remove the tire from the wheel rim by the use of two tire levers. (Exercise care to avoid damaging the inner tube with the levers.)

2) Installation

a. Replace the tube between the tire and the wheel rim, and inflate the tube half. Be sure that the valve stem is directed toward the wheel shaft.

b. Mount the tire on the wheel rim by the use of tire levers. For this operation, it is advisable that the bead on one side of the tire be pushed in toward the rim flange.

c. To avoid pinching the tube between the tire and the rim, tap the tire with a hammer.

d. Tighten the tire valve lock nut, and inflate the tire to the recommended pressure, then install the valve cap.

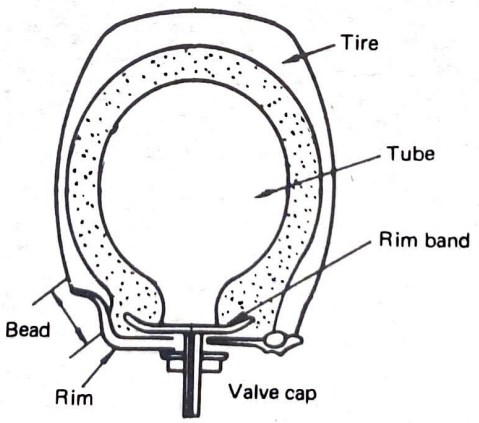


Fig. 5-3-1

5–4 Rear Sprocket Wheel

1. Removal

1) Disconnect the chain joint and remove the chain. (Fig. 5-4-1)

Fig. 5-4-1

2) Remove the sprocket shaft nut, and then the sprocket. (Fig. 5-4-2)

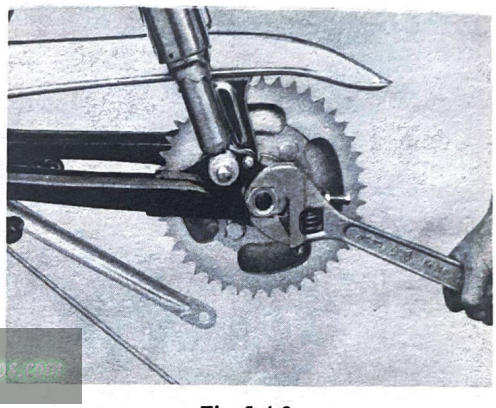


Fig. 5-4-2

2. Checking and Adjustment

The rear sprocket wheel is installed on the clutch hub. To replace the sprocket, take the following steps. (Fig. 5-4-3)

1) Removing the sprocket.

a. Flatten the lock washers.

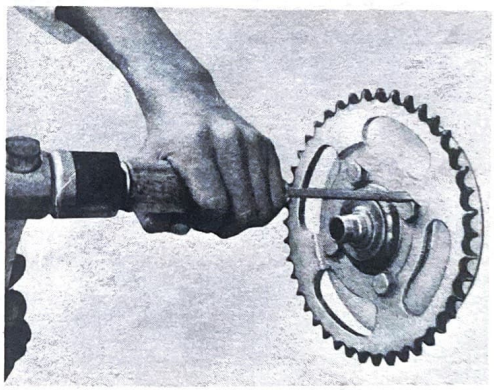


Fig. 5-4-3

b. Remove the sprocket mounting bolts. (Fig. 5-4-4)

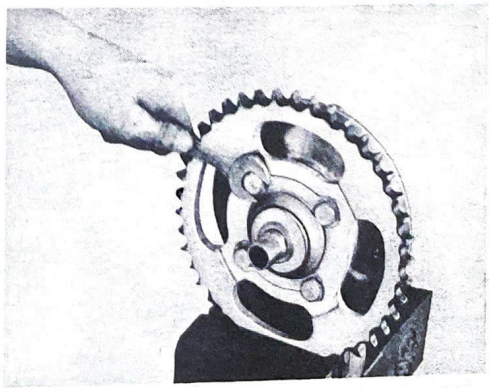


Fig. 5-4-4

2) Checking

Check the lock washers and hexagonal bolts for breakage and damage. If the sprocket wheel lock washer is damaged or not bent to lock the hexagon bolt, the bolt may come loose while travelling, and cause an accident. Therefore, the bolt should be fully tightened and secured by the lock washer.

The sprocket wheel should be checked for wear in the same manner as in the case of the drive sprocket. (See page 35.)

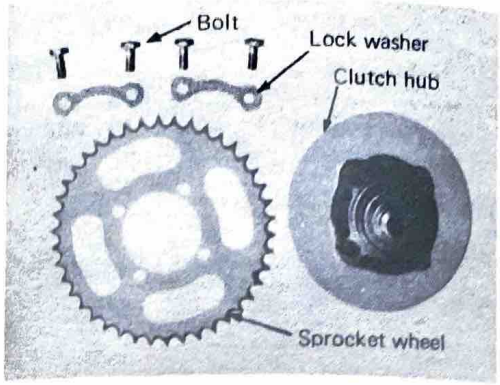


Fig. 5-4-5

5–5 Tire Inflation

The standard tire pressure is as follows.

Front wheel	1.6 kg/cm²	(22 ~ 23 lbs/in.²)
Rear wheel	2.0 kg/cm²	(28 ~ 30 lbs/in.²)

5–6 Front Fork

Check the front fork for bends and oil leakages resulting from an accident, and repair it in the following manner.

1. Removal

1) Remove the front fender. (Fig. 5-6-1)

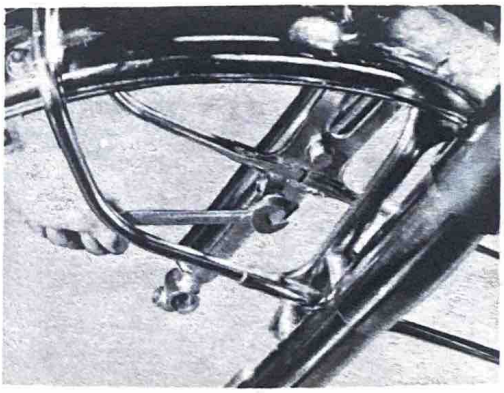


Fig. 5-6-1

2) Remove the inner tube cap bolt. (Fig. 5-6-2)

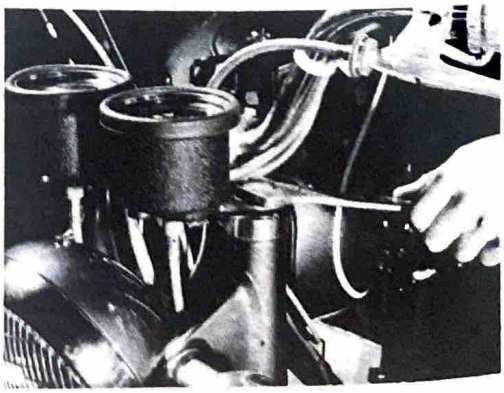


Fig. 5-6-2

3) Loosen the underbracket bolt. (Fig. 5-6-3)

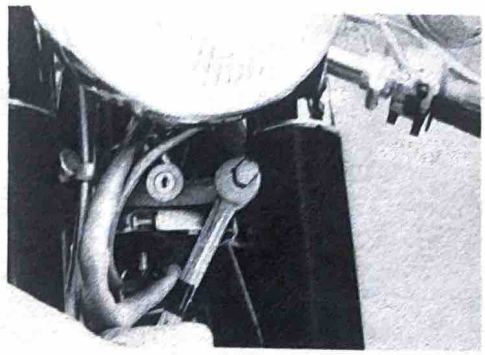


Fig. 5-6-3

4) Pull out the inner tube. (Fig. 5-6-4)

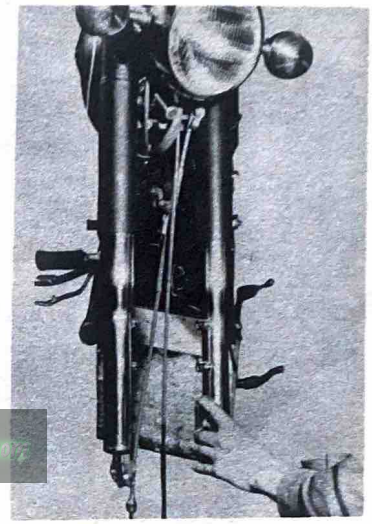


Fig. 5-6-4

2. Disassembling the Inner and Outer Tubes

1) Drain the oil from the fork. (Fig. 5-6-5)

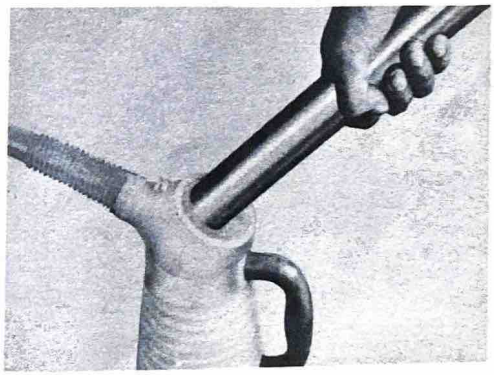


Fig. 5-6-5

2) Place a rubber sheet or tire tube around the outer tube nut, and clamp it with a vise. (Fig. 5-6-6)

Note: Take care not to deform the outer tube when clamping it with the vise.

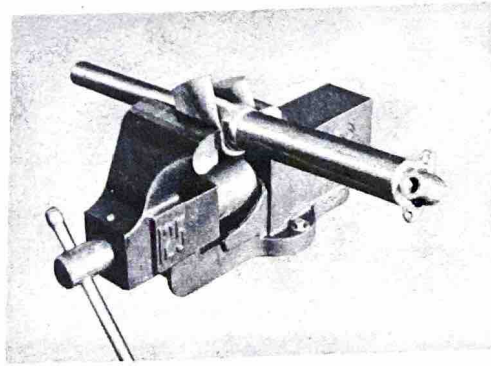


Fig. 5-6-6

3) Fit the front wheel shaft in the outer tube, and turn it counterclockwise. The inner tube can be separated from the outer. (Fig. 5-6-7)

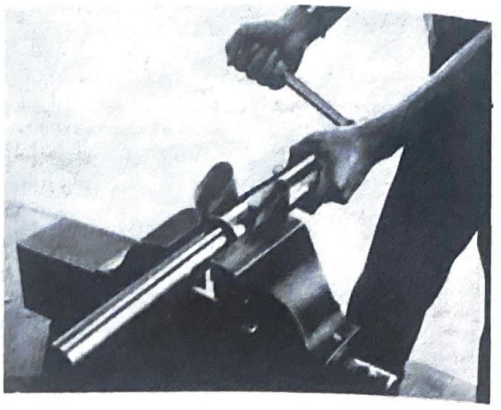


Fig. 5-6-7

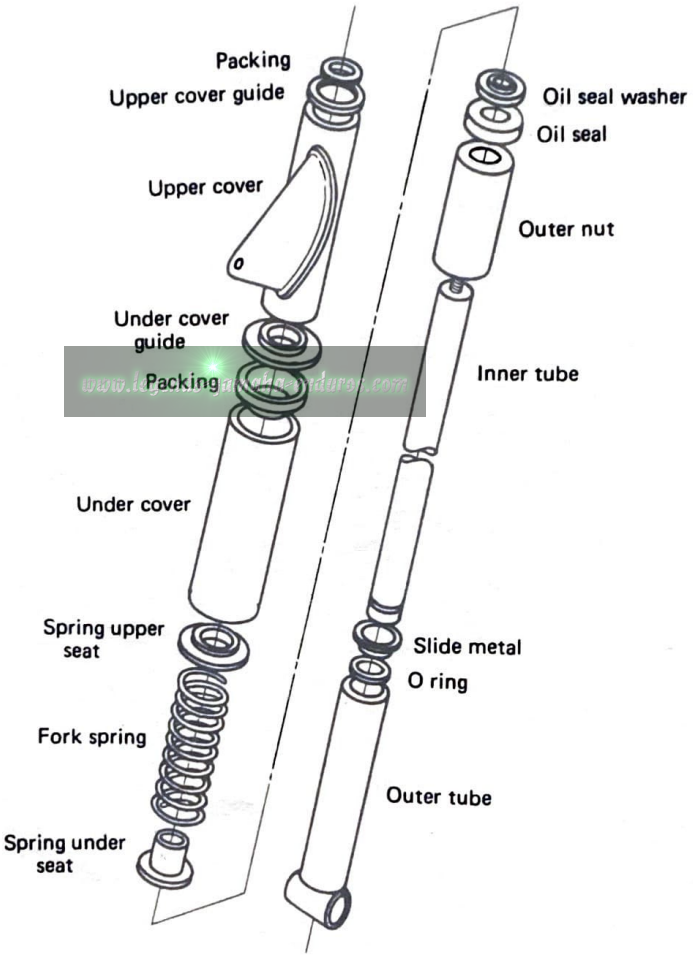


Fig. 5-6-8 Front Fork Components

3. Checking

1) Inner Tube

Check the inner tube for bends or scratches. If the bend is slight, it can be corrected with a press. It is recommendable, however, to replace the tube whenever possible.

2) Oil Seal

When disassembling the front fork, replace the oil seal in the outer tube nut.

4. Assembling

1) For reassembling the front fork, reverse the order of disassembling. Make sure the inner tube slides in and out smoothly. (Fig. 5-6-9)

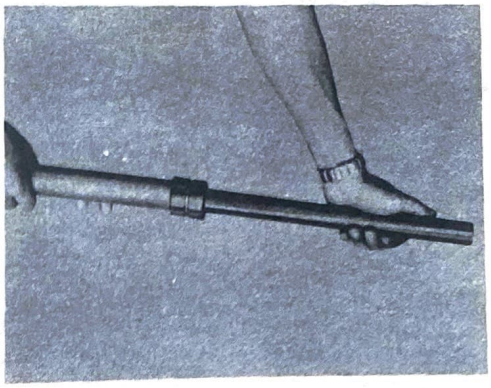


Fig. 5-6-9

5. Installation

1) Pull the front fork in to the uppermost position with the front fork holding tool (identical with that for the YDS3), and tighten the underbolt on the underbracket. (Figs. 5-6-10 and 11)

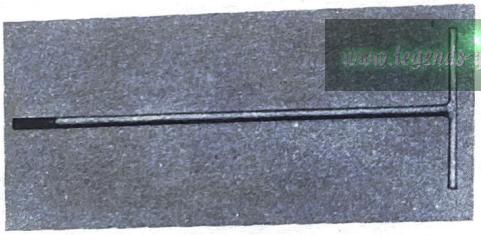


Fig. 5-6-10 Inner Tube Holding Tool

Fig. 5-6-11

2) Fill the front fork with oil through the end of the inner tube.

Oil
- Oil amount 200 cc (6.79 fl.oz.) for each side.
- Type of oil
- Motor oil SAE 10W/30 or a 4:1 mixture of motor oil #30 and spindle oil #60.

3) Install the cap bolt.

5–7 Rear Cushion

The YAMAHA 250 DS6 rear cushion is adjustable in 3 stages to allow for road and running conditions or the rider's choice.

It is not possible to disassemble the rear cushion, so this chapter only discusses oil leakages.

1. Checking

Sometimes oil seepage appears on the bottom of the cover, but in most cases this is considered to be a mere seepage of the grease applied to the spring inside. Therefore, such grease seepage can be ignored because it is not the rear cushion oil leakage.

To diagnose the oil leakage, take the following steps.

1) Remove the rear cushion. (Fig. 5-7-1)

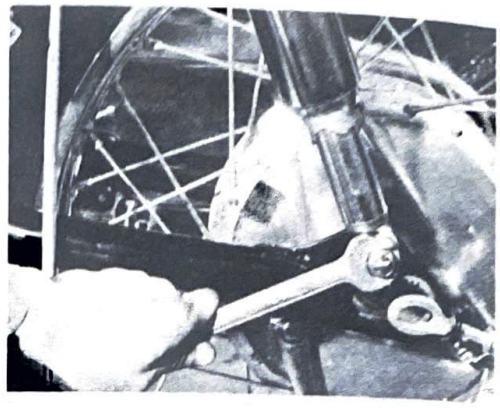


Fig. 5-7-1

2) Depress the rear cushion as shown in Fig. 5-7-2, and release it. If the cushion quickly returns half-way and then slowly returns to the original position, the rear cushion is in good condition.

But if the cushion quickly returns to the original position, check the cushion for very noticeable oil leakages, and replace the whole assembly if the oil leaks. (Fig. 5-7-2)

Fig. 5-7-2

5–8 Fuel Tank

The tank capacity is 11 liters. In addition, a rubber cushion is placed between the frame and the tank in order to absorb road shocks to the tank.

1. Removing the Fuel Tank

1) Drain the fuel tank.

2) Remove the level tube at the tank bottom. (Fig. 5-8-1)

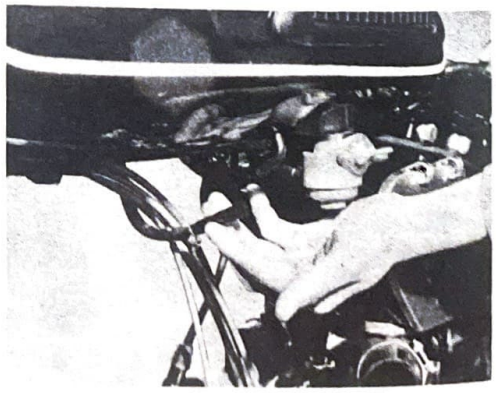


Fig. 5-8-1

3) Remove the seat. (Figs. 5-8-2 and 3)

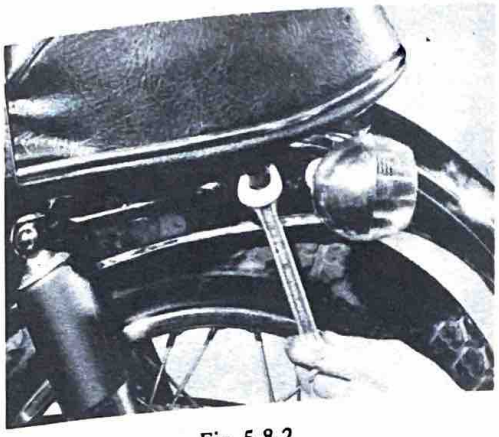


Fig. 5-8-2

Fig. 5-8-3

4) Remove the tank mounting bolts. (Fig. 5-8-4)

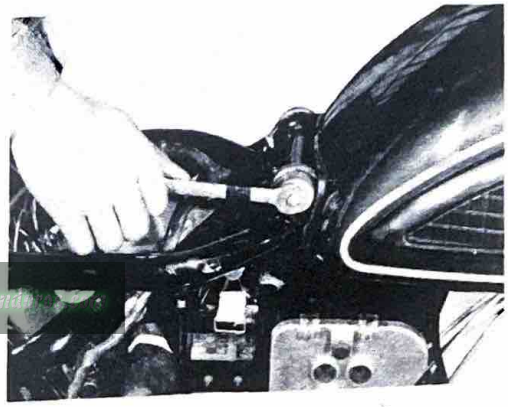


Fig. 5-8-4

5) Raise the rear part of the tank, and slide it rearward to remove the tank. (Fig. 5-8-5)

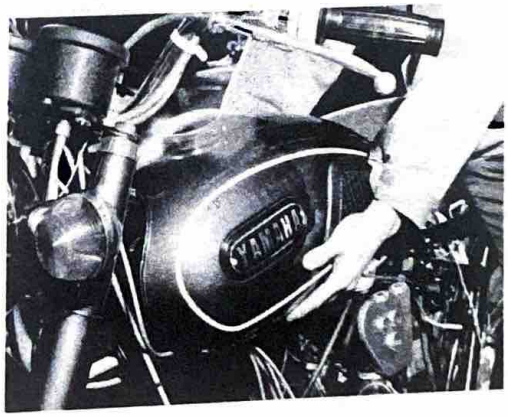


Fig. 5-8-5

5–9 Rear Arm

1. Removal

1) Remove the chain case mounting screws.
(Figs. 5-9-2 and 3)

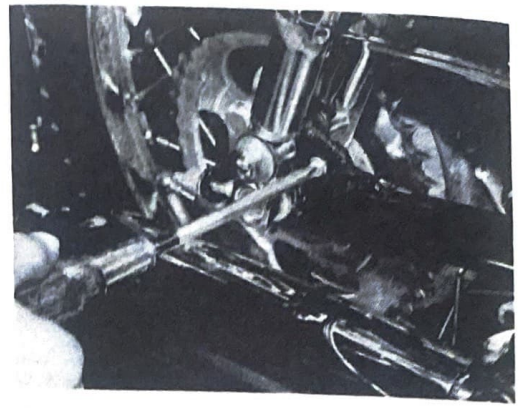


Fig. 5-9-1

2) Remove the rear arm shaft nut, pull out the shaft, and remove the rear arm.
(Figs. 5-9-2 and 3)

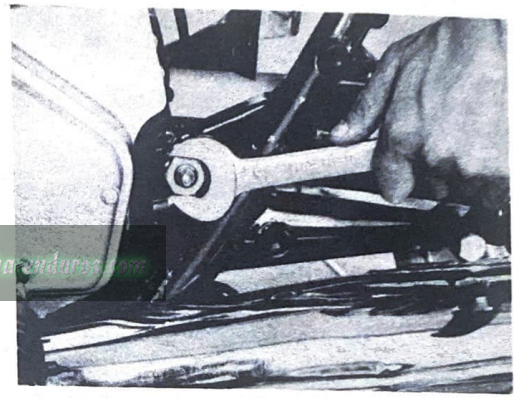


Fig. 5-9-2

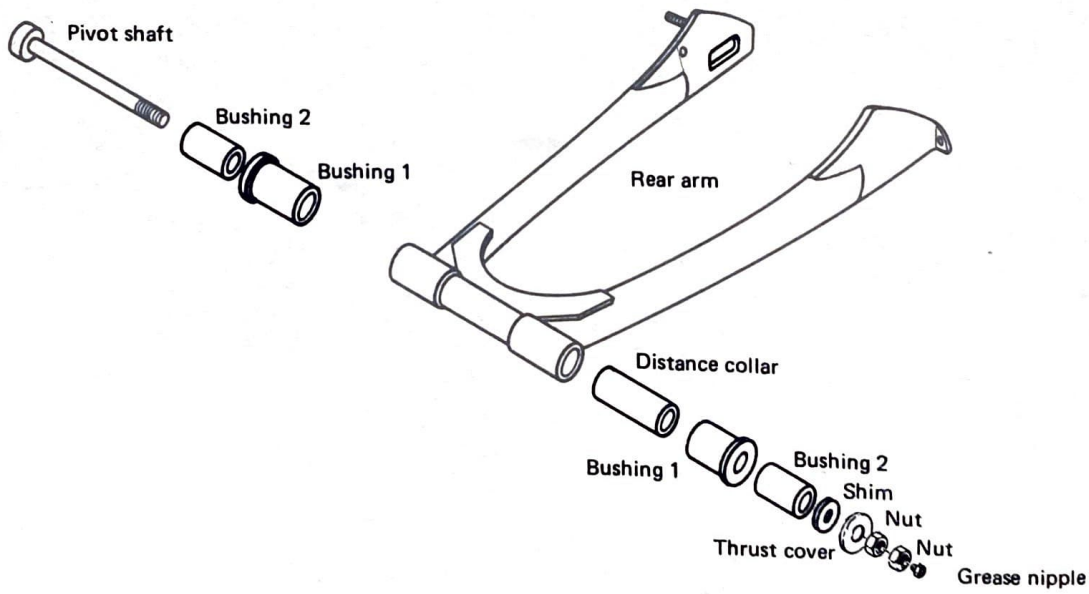


Fig. 5-9-3 Rear Arm Component Parts

2. Checking

1) Check the play of the rear arm by shaking it as shown in Fig. 5-9-4, with the rear arm installed.
If the play is excessive, replace the rear arm bushing or the rear arm shaft, whichever shows the wear. (Fig. 5-9-4)

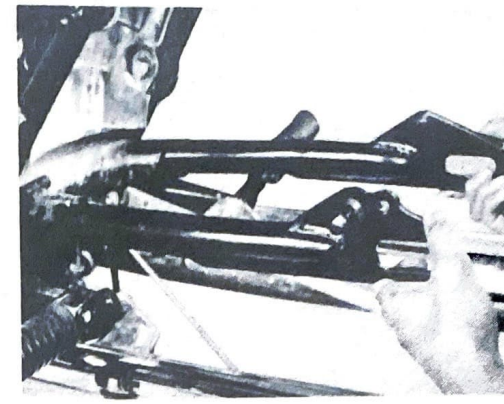


Fig. 5-9-4

2) Insert the bushing as indicated in Fig. 5-9-5, and check it for play. If the play is excessive, replace the bushing. (Fig. 5-9-5)

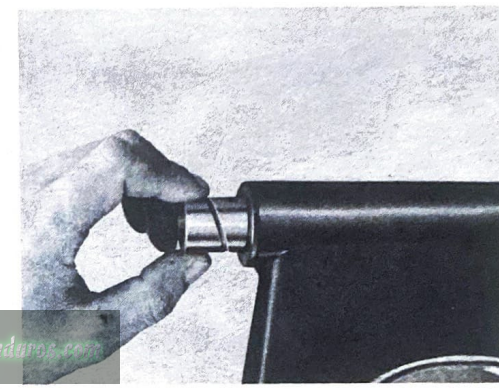


Fig. 5-9-5

3) Grease the rear arm shaft from time to time with grease pump through the grease nipple. (Fig. 5-9-6)

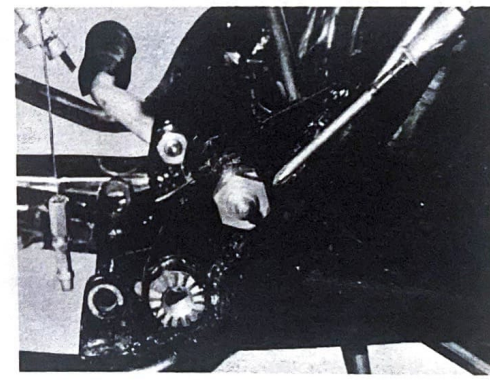


Fig. 5-9-6

Replacing Rear Swing Arm Bushings

On motorcycles habitually used for on-the-street riding, rear swing arm bushings should be replaced every 10,000 km (6,000 miles).

The same may not apply to those used for racing or rough riding. Replacement should be made according to machine condition such as excessive play of the rear swing arm, or hard steering (wander, shimmy or rear wheel hop), or upon request of the customer.

5–10 Steering Head

1. Sectional View of the Steering Head

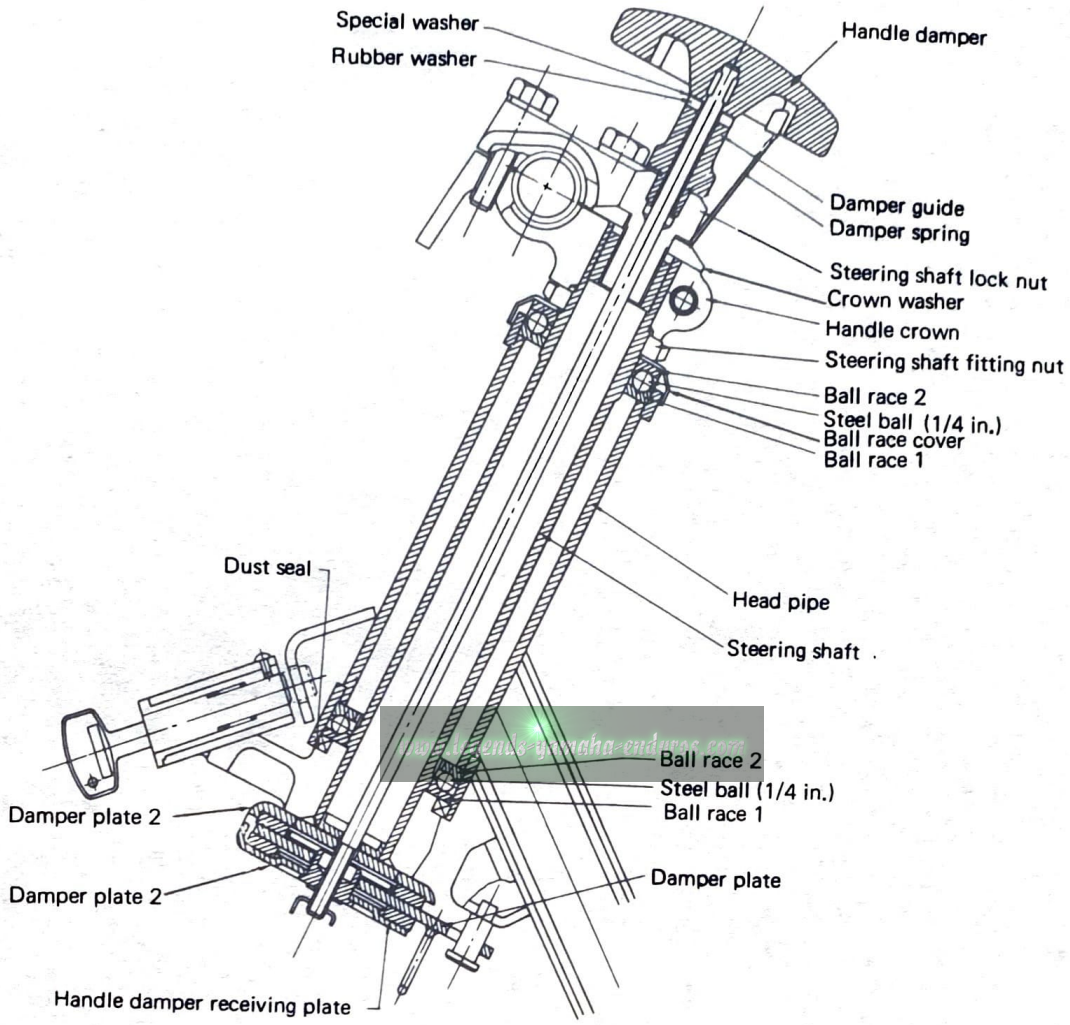


Fig. 5-10-1

2. Checking

1) Ball Races and Steel Balls

Check the ball races and steel balls for wear.

Check them very carefully if the machine has been in long use. If they are found to be worn or cracked, replace all of them because the others may be defective also.

Replace any ball race having scratches or streaks resulting from wear.

CHAPTER 6. ELECTRICAL EQUIPMENT

6–1 Electrical Equipment

In place of the starter dynamo (used for the YDS5E), an ignition dynamo of 12 V capacity has been employed in order to maintain the terminal voltage constant throughout the entire range of speed.

6–2 Main Components

The main electrical components are largely divided into the following three.

1. Ignition System

This system starts the engine by using the spark plug to ignite the compressed air-fuel mixture in the cylinder.

The main parts consist of:

Contact breaker (attached to the dynamo)

Condenser (attached to the dynamo)

Ignition coil, spark plug, high-tension lead, and primary power source battery.

2. Charging System

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

The main parts consist of:

Dynamo (yoke, armature, brushes), regulator (with cutout relay), fuse and battery.

3. Lights

The main parts consist of signals to be used during travel, instruments, switch lights (signal), and lights for night travel.

Signals . . . . . Horn, flasher light (flasher relay), stop light, speedometer, tachometer, neutral light and other switches.

Illumination . . . . Headlight, taillight and instrument lights.

6–3 Electrical Parts List

Name of Part	Maker	Model and Type
Engine:		
Ignition dynamo	Mitsubishi Elec.	DU100-12
Neutral switch	Asahi Denso	
Spark plug	NGK	B-9HC
Frame:		
Regulator	Mitsubishi Elec.	RN2226J3
Ignition coil	Diamond Elec.	TU-29(Y-2)
Horn	Nikko Kinzoku	SPH-12
Battery	Furukawa Denchi	12N5-3B(Y) (12V 5AH)
Fuse holder	Osachi Mfg.	20 A, 2pcs.
Flasher relay	Nippon Denso	Condenser-type, 12V 8W x 2 + 3W
Rear stop switch	Asahi Denso	YGST13S-001
Front:		
Head light	Koito Mfg.	12V, 35/25W
Speedometer	Nippon Seiki	YA114
Tachometer	Nippon Seiki	YA106
Front stop switch	Asahi Denso	YGST3-001
Main switch	Asahi Denso	R3M-001
Front flasher light	Imasen Elec.	12V, 8W
Handle switch	Asahi Denso	AG17-002
Rear:		
Taillight	Stanley Elec.	12V, 23/7W
Rear flasher light	Imasen Elec.	12V, 8W

6–4 Connection Diagram

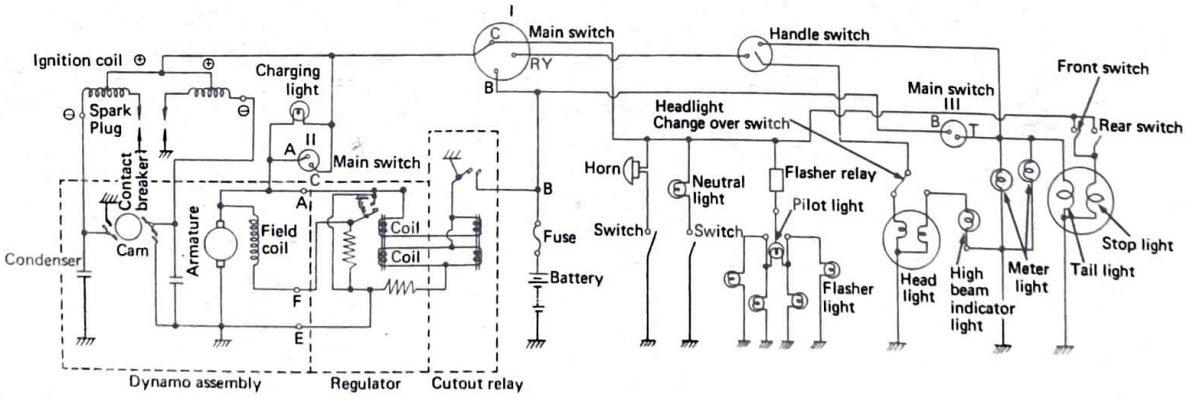


Fig. 6-4-1

6–5 Ignition Dynamo

The ignition dynamo consists of the following assemblies; yoke assembly (field coil, contact breaker, condenser) and cam assembly. The ignition dynamo is the power source for both the ignition and charging systems.

1. Ignition System

The ignition system consists of the contact breaker and condenser, and its purpose is to intermittently break the current flowing through the ignition primary coil to induce a high tension current in the secondary coil.

1) Contact Breaker Assembly

Incorrect ignition timing will result in engine knock or vibration because the engine is not running smoothly.

In addition, the engine will overheat and shorten the engine life. Be sure to periodically check the contact breaker assembly.

2) Condenser

The condenser acts as a reservoir for high voltage static electricity that is rerouted when the points open. It discharges the static electricity when the breaker points close. It prevents sparking between the points, minimizing burning by absorbing the abrupt increase in electricity when the breaker points open. Also it amplifies the effect of the primary ignition coil.

2. Charging System

The charging system of the generator consists of the yoke assembly (field coil and brushes) and the armature assembly (commutator). When the armature coil cuts through the magnetic lines of force, an alternating current is generated, and turned into a direct current through he brushes. The induced voltage is kept at a constant valve by the regulator, and the induced direct current is supplied to each load (ignition system, lighting system, signal system, and battery).

3. Checking and Adjusting the Ignition Dynamo

1) Checking the Dynamo for Voltage Output

a. Disconnect the green wire at terminal F.

b. Hook a jumper wire from terminal F to ground (the chassis).

c. Connect the voltmeter positive lead to terminal A (white), and connect the negative lead to ground (the chassis).

d. Start the engine and keep it running at 2,000 r.p.m. Check the Voltage. If the voltage is 14 V or more, the dynamo is in good condition.

Note: As the engine increases speed, the voltage also increases. Do not run the engine over 2,000 r.p.m., or for more than three minutes because the coil or leads can be damaged.

(Figs. 6-5-1 and 2)

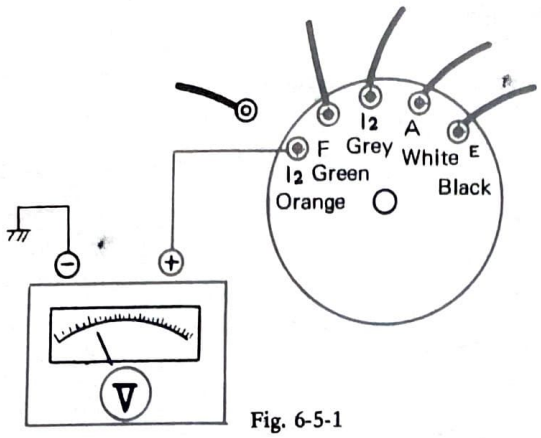


Fig. 6-5-1

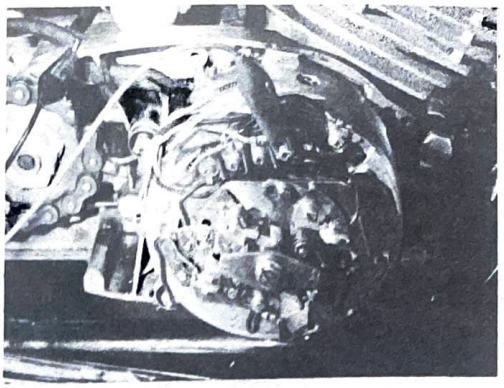


Fig. 6-5-2

2) Checking theYoke Assembly

Before checking the yoke assembly, clean it of dust, oil, carbon dust, etc.

a. Brush insulation tests

The bush on the positive side is insulated from the yoke. Check the insulation between these two parts with a tester as shown in Fig. 6-5-3. If conductivity is detected, check the brush holder or terminal A for shorts.

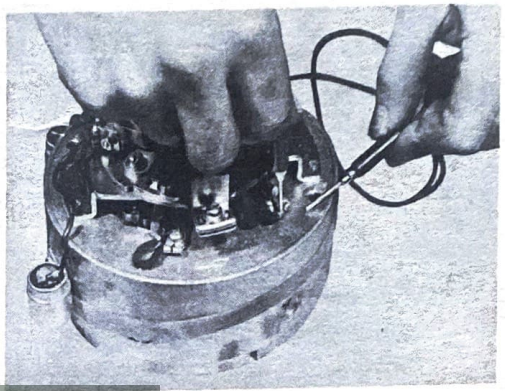


Fig. 6-5-3

Note: The brush on the negative side is not insulated from the yoke.

b. Field coil conductivity tests

Check for conductivity between the terminals F and A. If the resistance value is approximately 5.57Ω, the conductivity is correct. If the conductivity value is not correct, check the field coil for breakage. If the coil is broken inside, replace it with a new york assembly because repairs are difficult.

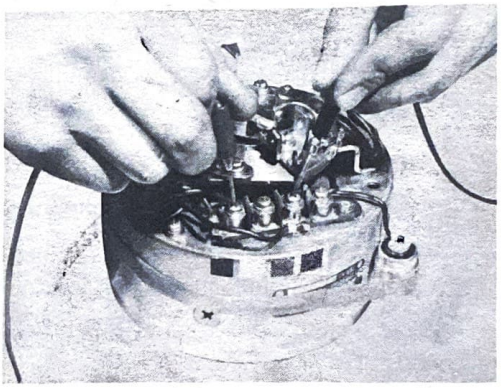


Fig. 6-5-4

c. Field coil insulation tests

If the conductivity is detected between the F terminal and the yoke, the circuit may be grounded. In this case, check the terminal and coil.

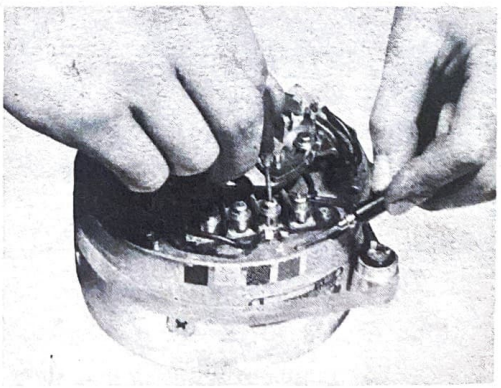


Fig. 6-5-5

d. Checking the Brushes

The brushes are one of the most important parts in the dynamo. Remove the brushes and check their contact surfaces.

Each brush must contact the commutator on more than 3/4 of its surface. If both brush and commutator surfaces are rough, check the crankshaft and the armature for eccentricity. Smooth down any burrs on the edge of the armature tapered bore, and clean it thoroughly. If either brush is worn past the minimum length mark, replace them both with new ones. The use of head and tail lights for many hours with bad brush contact will damage the surface of the commutator and speed up brush wear.

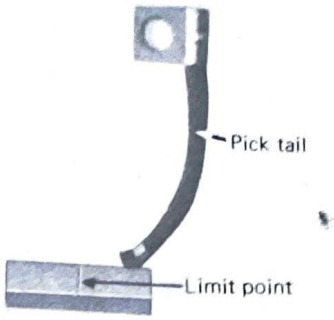


Fig. 6-5-6

e. Handling the Brushes

When replacing the brushes, be sure that the pig tail of the positive side brush will not touch the edge of the breaker plate or brush holder, nor will the lead of the negative side brush touch the positive side brush spring. If they are in contact, the pig tail may vibrate and break its insulation, eventually causing a short-circuit.

3) Checking the Armature Assembly

a. Checking the Surfaces of the Commutator

Thoroughly clean the commutator of oil, dust, etc. If the commutator surface is rough or covered with heavy brush dust, polish it with fine grain sandpaper (#400 ~ 600) as shown in Fig. 6-5-7. Polishing must be done evenly and lightly. Uneven polishing will deform the commutator and shorten brush life.

If the commutator surface is too rough for sandpaper, use a lathe. Do not cut more than 2 mm under the standard 40 mm diameter.

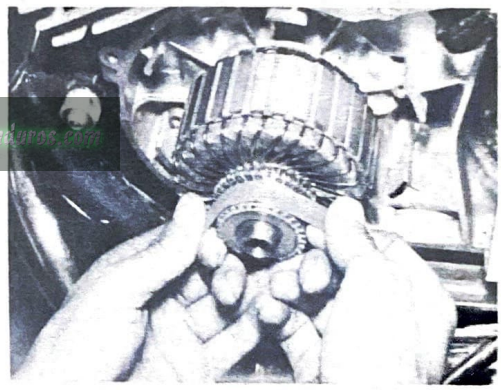


Fig. 6-5-7

b. Checking the Commutator Mica Under-cuts

The commutator has mica under-cuts. If the under-cuts become shallow due to the wear of the commutator, adjust the depth of the under-cuts with a hack saw blade or screwdriver. After this adjustment, remove the metal saw dust from the surface.

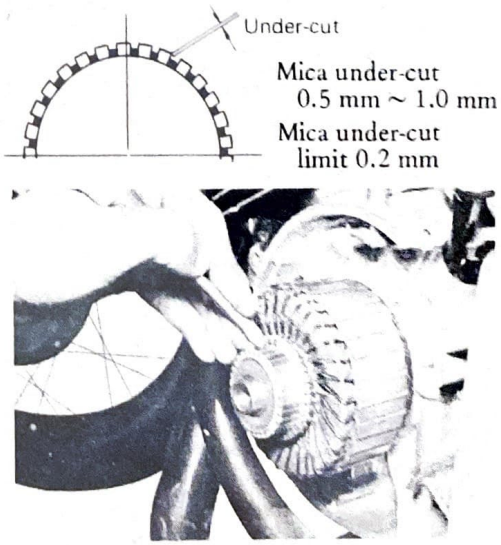


Fig. 6-5-8

c. Checking Armature Insulation

If there is electrical leakage between the commutator and the shaft, replace the entire armature. (Fig. 6-5-9)

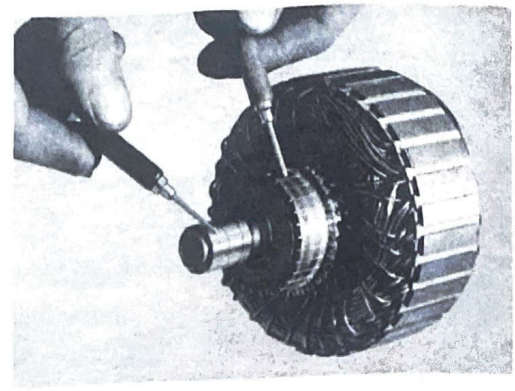


Fig. 6-5-9

4) Checking the Condenser

a. Insulation Test

Set the Electrotester function switch to "Insulation" and attach the tester leads to the condenser terminals.

This test can be performed on the machine by removing the condenser pig tail from the high side of the ignition point assembly to which it is normally attached.

If the tester needle swings once and then returns to the original position the condenser is good. If the needle returns to a position of 3 Meg Ohms or less, replace the condenser.

The condenser is now charged. To remove the charge, ground the pig tail.

(Figs. 6-5-10 and 11)

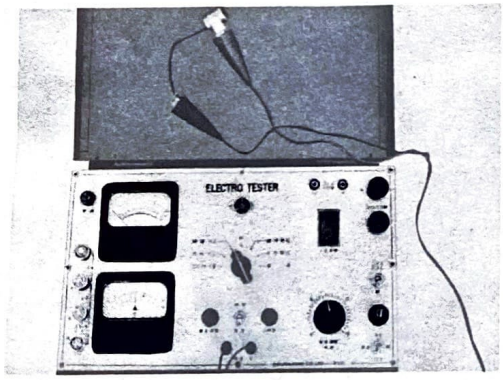


Fig. 6-5-10

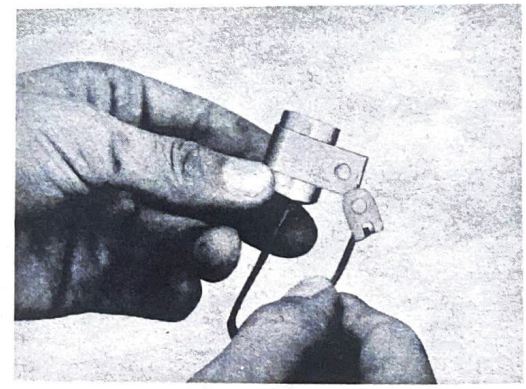


Fig. 6-5-11

b. Capacity Tests

Set the service tester at the condenser capacity position, and connect its terminals to those of the condenser.

The capacity should not be more than $0.22\mu F \pm 10\%$, so before testing the condenser, adjust the capacity of the service tester.

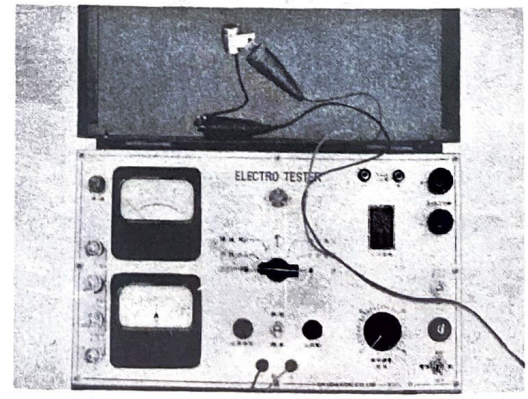


Fig. 6-5-12

5) Contact Breaker

a. Periodically inspect the breaker points and check the point gap.

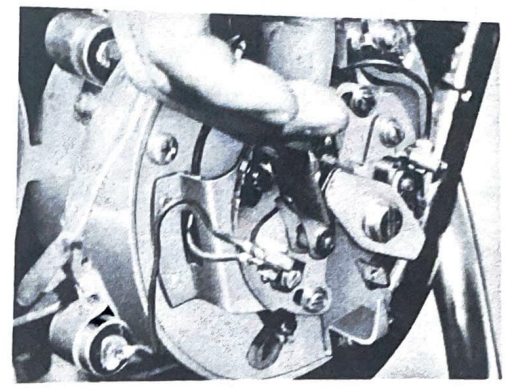


Fig. 6-5-13

b. Smooth out any scratch on the points with fine sandpaper (#400 ~ 600), and then wipe it with dry cloth. (Fig. 6-5-13)

c. Inspect the breaker cam lubricator every 5,000 km (3,000 miles), and grease it.

d. Oil or dust attached to the points will not only impair spark performance but also point life. From time to time, clean the points with dry cloth.

6) Adjusting Ignition Timing

Adjust ignition timing on both cylinders.

O Adjustment with a dial gauge Tools and instruments for adjustment are as follows:

Dial gauge (accuracy 1/100 mm)
Dial gauge adapter
Conductivity test lamp or YAMAHA Point Checker
Point wrench
Slot-head screwdriver 12 mm wrench.

a. Install a dial gauge adapter in the plug hole on the cylinder head, and then install the dial gauge. Set the indicator at zero when the piston is at top dead center. (Fig. 6-5-14)

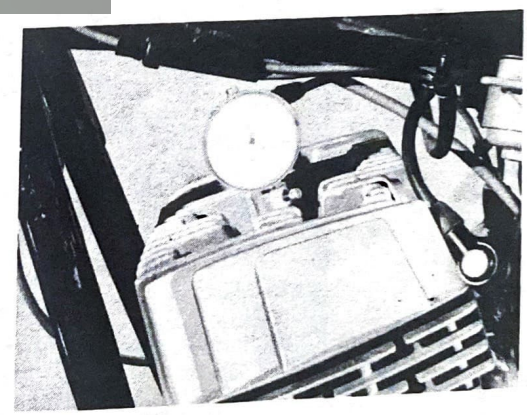


Fig. 6-5-14

b. Set the point gap at 0.30 ~ 0.40 mm (0.010 ~ 0.015 in.) by moving the breaker plate. (Fig. 6-5-15)
When adjusting ignition timing for the right-hand cylinder, adjust the points of the I_1 terminal (grey), while for the left-hand cylinder, adjust the points of the I_2 terminal (orange).

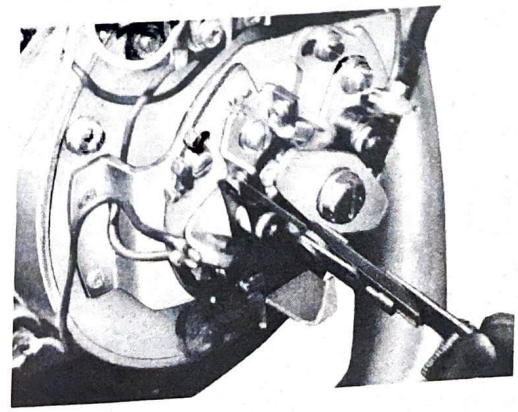


Fig. 6-5-15

c. Remove the lead from the I_1 or I_2 terminal. Connect the positive lead of the point checker to the terminal from which the lead was disconnected. Ground the negative lead of the point checker to the engine or chassis. (Fig. 6-5-16)

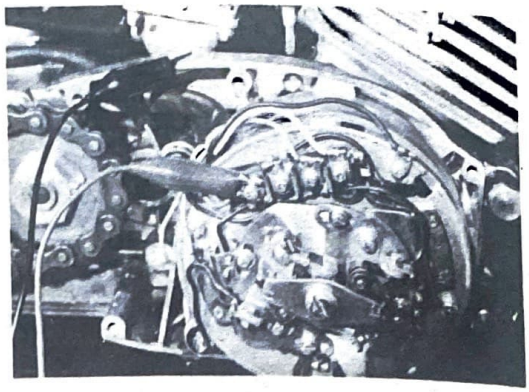


Fig. 6-5-16

d. Loosen the breaker plate setting screw, and move the plate to the right or left with a slot-head screwdriver until the conductivity test lamp lights up at exactly 1.8 mm BTDC. (Do not fully loosen the screw, because the breaker plate tends to move when the screw is retightened.) Turning the breaker plate in the normal rotating direction will delay the ignition timing, while turning it in the reverse direction will advance the ignition timing. (Fig. 6-5-17)

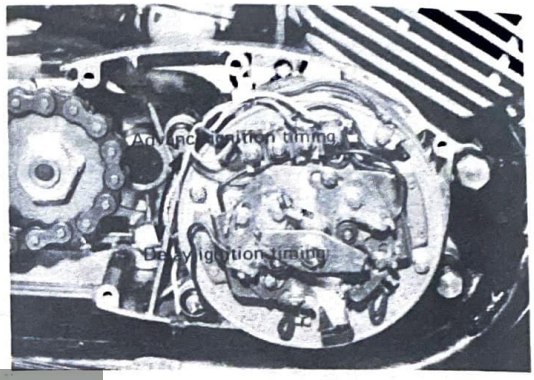


Fig. 6-5-17

7) Generator Service Standards

Part	Description	Service Standards	Inspection
Field	Resistance value (20°C)	5.57Ω at 20°C	When voltage is abnormal
Brush	Material	CG-9RB	Initial 6,000 km (4,000 mi) Every 4,000 km (2,500 mi)
	Number of brushes	2	
	Width x thickness x length	8 x 4.5 x 20 mm	
	Minimum length	8 mm	
	Spring capacity (kg)	0.6 kg (at initial use)	
Commutator	Diameter	40φ mm	
	Minimum diameter	38φ mm	
	Mica undercut	0.5 - 1.0 mm	
	Minimum mica undercut	0.2 mm	
	Difference between max. and min. diam.	0.03 mm	
Breaker	Point gap	0.30 - 0.40 mm	Every 3,000 kg (2,000 mi)
	Point contact pressure	700 g	
	Condenser capacity	0.22μF	High rpm irregular
	Ignition timing	BTDC 20.0° (1.8 mm)	Ignition irregular
Others	Dynamo outer diameter	134φ mm	
	No. of poles	6	
	Core gap	0.4 mm	
	Armature taper	1/10	
	Cut-in rpm	1,500 rpm	
	Rated output rpm	14V, 7A/1,650 rpm	
	Armature outer diameter	92φ mm	

6–6 Regulator (Voltage Regulator)

The generator alone cannot provide stable electric current because fluctuations in engine RPM will affect the voltage. The voltage regulator (also called a voltage relay) stabilizes the generated voltage by breaking the field coil circuit (thereby collapsing the magnetic field) when the voltage exceeds a pre-set level.

A cutout relay (also called a charging relay) is built in to the regulator assembly. It allows stable electric current from the generator to charge the battery. However, when the engine stops, or when its speed is so low that generator output is lower than that of the battery, the cutout relay breaks the circuit to the battery. This stops a reverse flow of current from the battery.

1. Checking and Adjustment

If the regulator becomes defective the battery will be drained or over-charged and all electrical equipment may burn out, so use a good tester when inspecting or adjusting the regulator. (The adjustment is very difficult. It is advised that you learn how to adjust the regulator through technical courses.)

1) Ignition (load) Voltage

a. Checking

○ Hook up a tester (DC voltmeter or electrotester) as shown in Fig. 6-6-1.

○ Start the engine and keep it running at 2,500 rpm. Remove the fuse connector to cut off the current flowing to the battery, and the tester should indicate an output off 15.0 ~ 16.0 V.

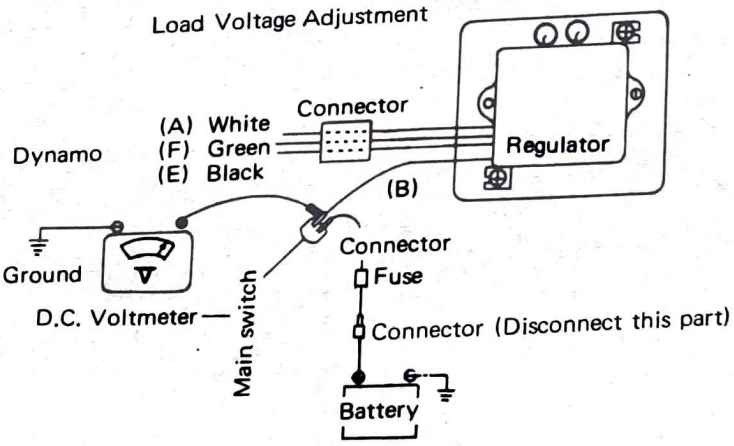


Fig. 6-6-1

b. Adjustment

If the voltage output is incorrect, remove the regulator cover and raise the voltage by lifting or lowering the voltage relay adjusting spring. (When the spring retainer is lowered, the voltage rises, and when the spring retainer is raised, the voltage drops.) The voltage relay has two contact points.

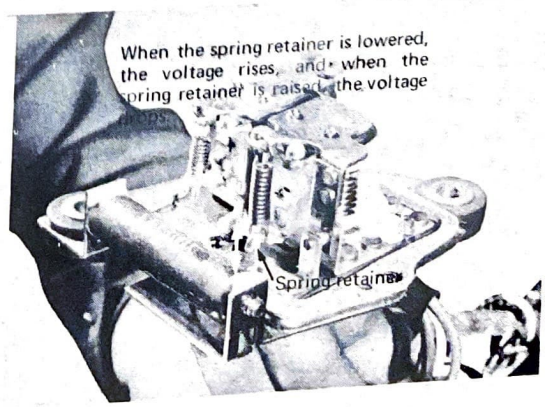


Fig. 6-6-2

2) No-load Voltage

a. Checking

○ Disconnect the wire at terminal B (red) of the regulator. Connect the positive tester lead to terminal B (red), then ground the negative tester lead.

○ Start the engine and keep it running at 2,500 rpm. If the tester reads 15.6 V ~ 16.3 V, the regulator is in good condition.

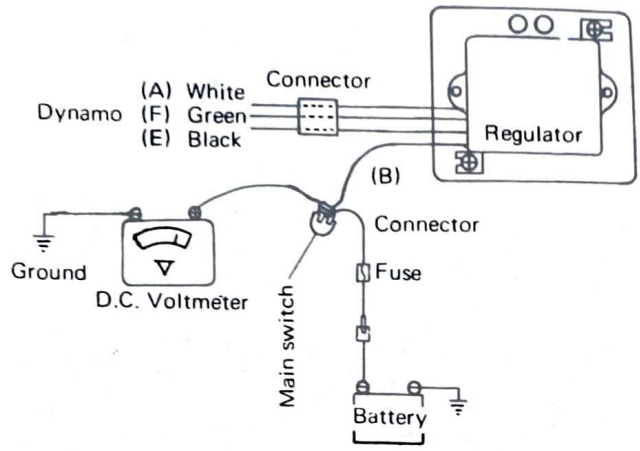


Fig. 6-6-3

b. Adjustment

Perform the adjustment in the same manner as for the load voltage adjustment.

3) Cut-in Voltage of the Cutout Relay

a. Checking

○ Connect the tester to the regulator in the same manner as in the case of the ignition load voltage test.

○ Start the engine and slowly increase its rpm. If the breaker points close between 12.5V and 13.5 V, the cutout relay is correctly set.

b. Adjustment

Adjust the cutout relay by changing its spring tension. In actual practice, there is almost no need to adjust the cutout relay. If the point surfaces of the voltage and cutout relays are worn or pitted, polish them with fine sandpaper (#400 ~ 600) before making an adjustment.

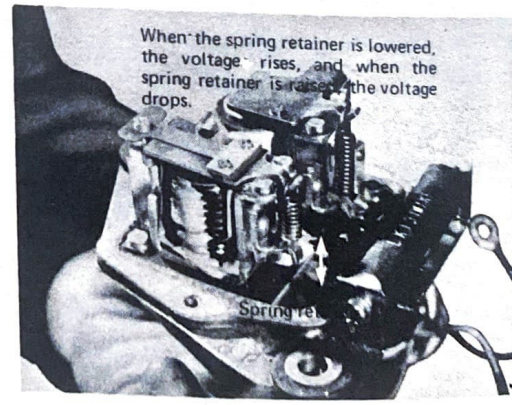


Fig. 6-6-4

2. Regulator Service Standards

	Description	Service Standards	Inspection
Voltage regulator	No-load voltage adjustment value	15.6-16.3 V/2,500 rpm 16.7 V or less/5,000 rpm	If voltage is abnormal
Voltage relay	Ignition coil voltage Voltage coil resistance value Field coil imput resistance Compensation resistance value Core gap Point gap	15.0-16.0 V/2,500 rpm 8.1 Ω/20°C 10 Ω/20°C 16 Ω/20°C 1.0 ~ 1.2 mm 0.3 ~ 0.4 mm	
Cutout relay	Cut-in voltage Voltage coil resistance value Core gap Point gap	13.0 ±0.5V 79.2 Ω/20°C 0.3 ~ 0.5 mm 0.7 ~ 0.9 mm	

6–7 Ignition Coil

The ignition coil is a transformer with approximately 50 times the number of windings in the secondary coil as in the primary. If the electric current supplied to the primary coil (from the battery) is interrupted by a contact breaker, the primary coil will produce a 150 ~ 300 V of current surge by self-induction. This current is boosted to 7,000 ~ 10,000 V by the mutual induction of the larger number of secondary coil windings, thus making a spark jump the gap between the spark plug electrodes.

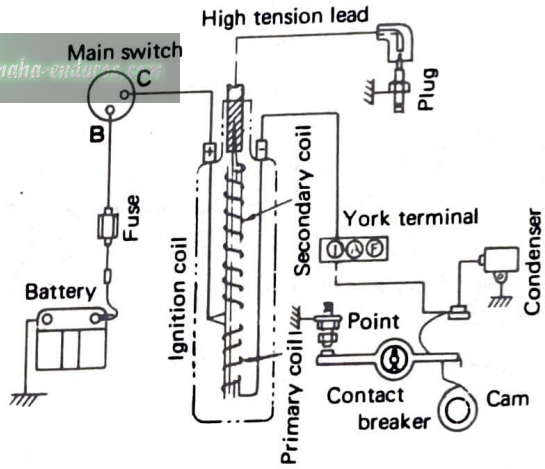


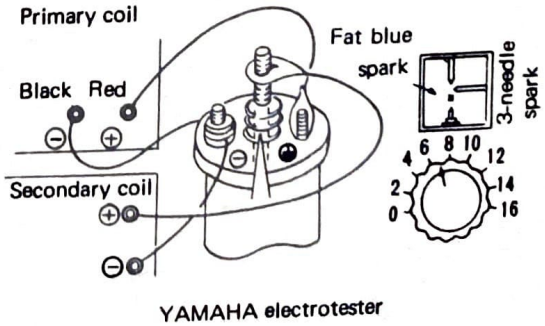
Fig. 6-7-1

1. Checking

If no spark or a rather weak spark jumps the plug gap, inspect the ignition coil as well as the contact breaker.

a. Checking the coil alone (not installed on the chassis)

1) Use a 12 V battery. A spark of 7 mm or more means that the coil is in good condition.



YAMAHA electrotester

Fig. 6-7-2

2) Checking the coil installed on the chassis.

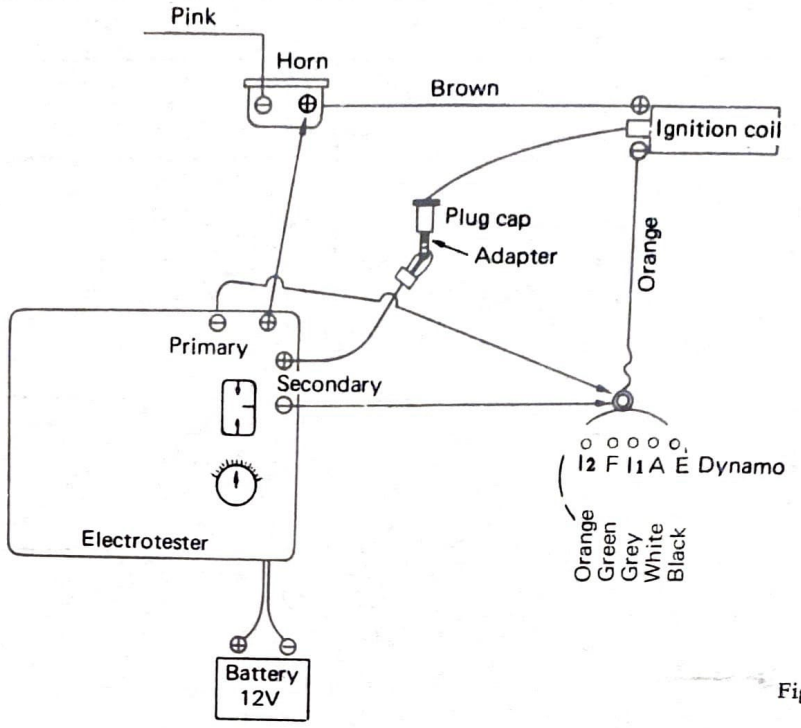


Fig. 6-7-3

- Disconnect the lead from the ignition dynamo I terminal. Connect the electro primary negative lead and secondary negative lead to the I terminal testers.
- Disconnect the high tension lead from the plug, install the adapter (copper or iron wire) to the plug lead cap, then connect the adapter lead to the positive secondary lead of the tester.
- Connect the positive primary lead of the tester to the brown lead terminal of the horn.
- Use a 12 V battery as power source for the tester.
- If the tester shows a spark of 7 mm or more, the coil is in good condition.

6–8 Spark Plug

The plug's life and coloring vary according to the habits of the rider. At each periodic inspection, replace burned or fouled plugs with suitable ones determinated by the color and condition of the bad plugs. One machine may be ridden only in urban areas at slow speeds, whereas another may be used for hours at high speeds, consider what the present plugs indicate, how long and how fast the rider usually travels, and then recommend a cold, standard, or hot type plug, whichever is most suitable. It is actually economical to install new plugs every 3,000 km (2,000 miles), since it will tend to keep the engine in good condition and prevent excessive fuel consumption.

1. How to Read Spark Plug Condition

a. If the porcelain around the center electrode is a light tan color, the plug has the correct heat range.

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

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

2. Checking

Instruct the rider to check and clean the spark plug at least once a month or every 1,000 km (600 miles).

Clean the electrodes of carbon and adjust the electrode gap to 0.5 ~ 0.6 mm (0.020 ~ 0.023 in.). Be sure to use the specified plug B-9HC, when replacing it.

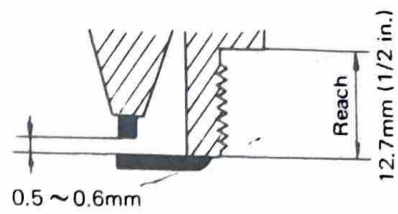


Fig. 6-8-1

6–9 Battery

The battery is the power source for the whole electrical system. When the engine starts or engine RPM is low and the generator supplies very little electricity, the battery supplies power to the ignition system, lights, etc. During riding, the generator supplies electric power and recharges the battery.

1. Before the First Ride

a. Note on the initial use.

○ A new battery should be charged.

1) First, fill each battery cell to the maximum level with dilute sulphuric acid (specific gravity – 1.26 ~ 1.28).

2) Charge it at 0.6 A for 13 hours.

3) After charging, tilt up a corner of the battery to let out air bubbles. If necessary, add distilled water to restore the level to the maximum.
Make sure that the specific gravity is between 1.26 and 1.28, then tighten all the cell caps.

4) Wash the battery off with water to remove any sulphuric acid. Dry it well and then mount it on the frame.

2. Periodic Inspection and Supplementary Charging

○ Inspect the fluid level every month. If the level is below the middle line, instruct the owner to add distilled water to raise the level to the maximum.

○ If the battery seems to be discharged, recharge it at 0.6 A for 13 hours.

3. Maintenance

○ If the motorcycle will not be used for a long time, remove the battery and have a battery service shop or a YAMAHA dealer store it.

○ The following steps are to be taken by shops for proper battery storage.

1) Recharge the battery after it is removed.
2) Store it in a cool, dry place, and avoid temperatures below 0°C (32°F).
3) Recharge the battery once a month and before reinstallation.

CHAPTER 7. DS6 IMPROVEMENTS OVER NEW YDS5E

The difference between the new YDS5E and the DS6 will be discussed below, which will be helpful to your service activities.

7–1 Engine

1. Cylinder Head

In order to increase the cooling efficiency of the cylinder head, it is provided with square-shaped fins (which are polished) instead of the circular fins.

The new cylinder head is not interchangeable with the former type, because the positions of the stud bolt holes are changed.

2. Cylinder

For better engine performance at low and medium speed, the cylinder employs the 5-porting system, but its construction differs from the new YDS5E cylinder.

In other words, it is the same in construction as the DT1 cylinder, and is finished with polishing like the cylinder head.

3. Piston and Piston Ring

Keystone rings are employed to avoid ring seizing-up and assure longer service life. With this change, the piston ring grooves are also modified. (For details of the Keystone ring, refer to page 23).

4. Connecting Rod

For improved durability, the connecting rod large end is provided with cast oil grooves (six each on both sides) instead of machined holes (one each on both sides) as in the DT1 and R3.. It is interchangeable with the former type. (Fig. 7-1-1)

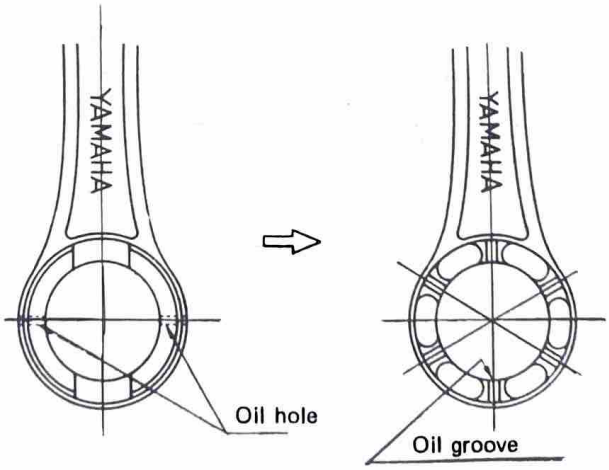


Fig. 7-1-1

5. Clutch

The DS6 has a clutch which is basically the same as that for the new YDS5E. The difference is in the shock absorber incorporated in the primary driven gear assembly. That is, the six coil springs have been replaced with eight rubber dumpers to improve shock absorbing efficiency and reduce noise. (Fig. 7-1-2)

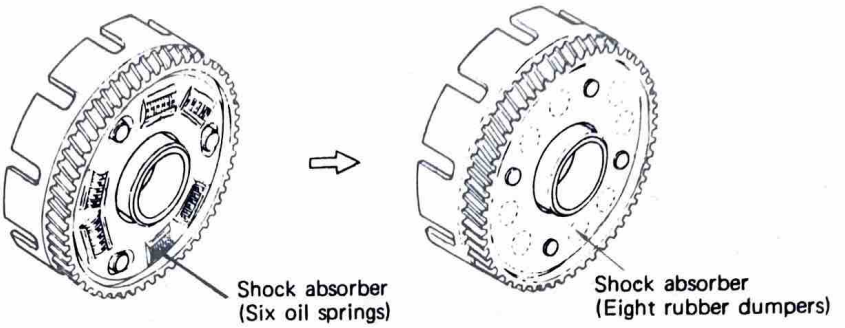


Fig. 7-1-2

6. Air Cleaner

The shape of the air cleaner case and element have been modified to reduced noise and increase water resistance as well as for better service accessibility. (Fig. 7-1-3)

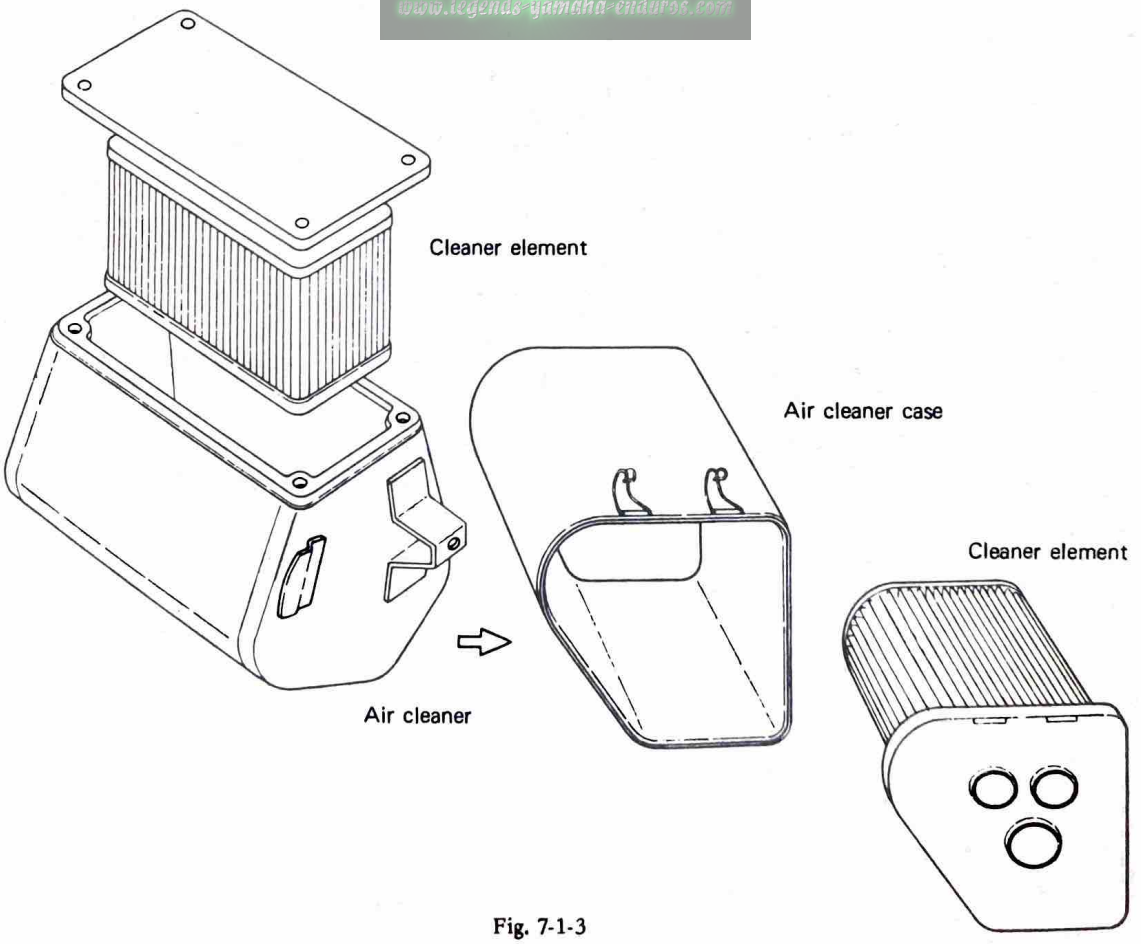


Fig. 7-1-3

7. Muffler

To provide a more refined appearance, the muffler has a shape similar to the megaphone type having a tapered tail.

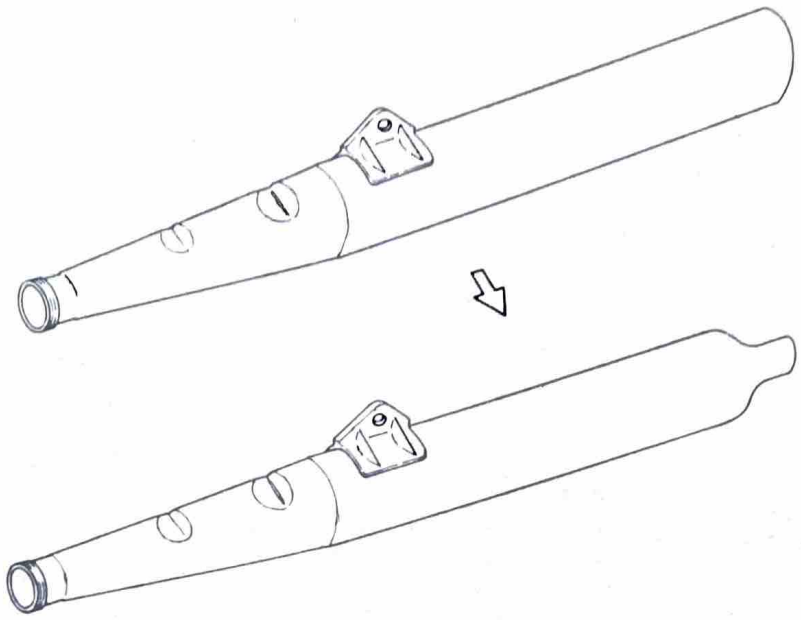


Fig. 7-1-4

8. Oil Pump Cover and Crankcase Cover

Both the oil pump cover and crankcase cover have been given a polished finish.

7–2 Chassis

1. Frame

The frame is basically the same as the YDS5E minor, except for the length of the head pipe, fuel tank rear bracket and battery box.

2. Fuel Tank

The fuel tank is changed in shape, but the mounting method is the same as before.

(Fig. 7-2-1)

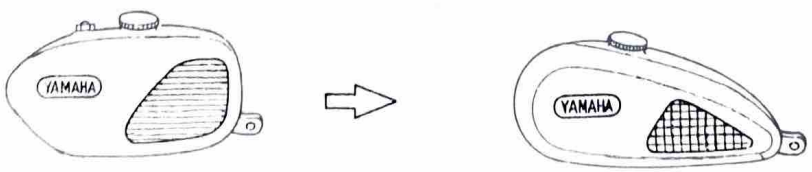


Fig. 7-2-1

3. Front Fender

The shape of the fender stay has been changed to give sporty styling. The fender is interchangeable with that for the R3. (Fig. 7-2-2)

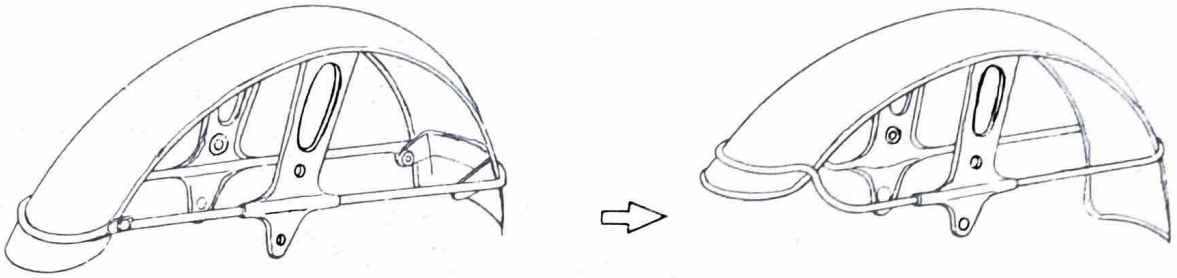


Fig. 7-2-2

4. Side Cover

To facilitate mounting, the lower part of the side cover has been changed.

5. Battery Box

As a result of battery size reduction, a smaller box is employed. A portion the mounting method has been altered also.

6. Front Fork Assembly

The front brake shoe plate has been changed in its position from right to left, and accordingly, the brake shoe plate lock has been moved from right to left. (Fig. 7-2-3)

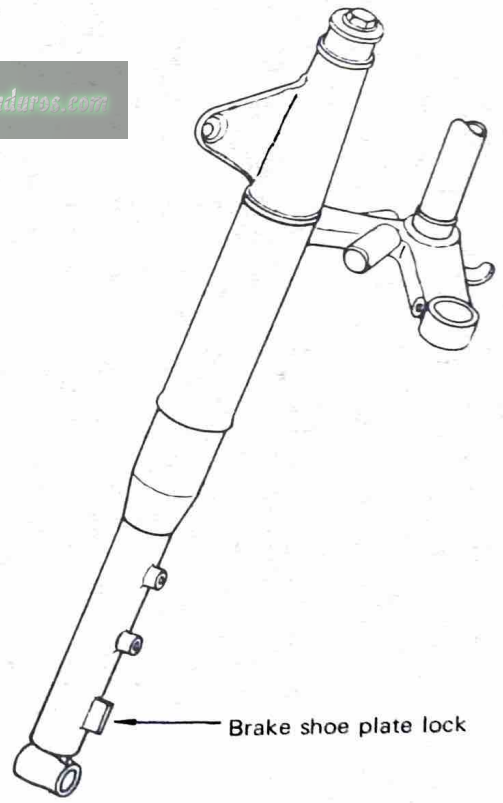


Fig. 7-2-3

7. Dual Seat

A design change has been introduced for smarter styling. (Fig. 7-2-4)

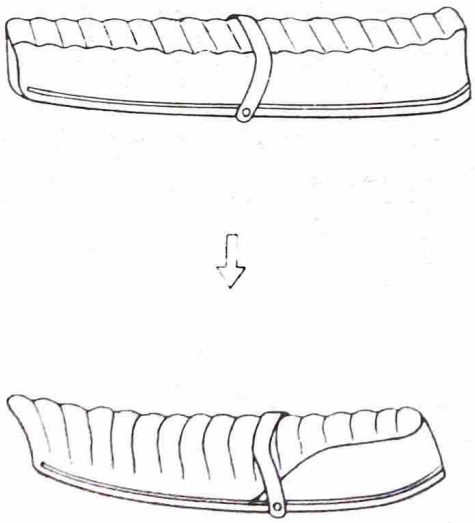


Fig. 7-2-4

8. Front Brake

The brake shoe position has been changed from right to left.

9. Lever Holder

The lever holder has been separated from the handle switch.

7–3 Electrical Equipment

1. Generator

The YDS5E, equipped with an electric starter, employs a starter dynamo. Contrary to this, the DS6 has a kick starter for cranking the engine, and a ignition dynamo is used. As a result, the shape of the dynamo cover has been modified.

2. Battery

No electric starter is used for the DS6 and, accordingly, the battery capacity is reduced from 12 V 11 AH to 12 V 5 AH.

3. Speedometer/Tachometer

On the YDS5E, both the speedometer and tachometer are incorporated in the head light. However, the DS6 has these meters separately rubber-mounted on the meter bracket.

4. Head Light

The shape has been modified.

5. Cables

All cables, including the throttle cable, brake cables, and clutch cables, are coated in white color like the DT1 and R3 instead of black as before.

6. Main Switch Assembly

The main switch assembly is mounted separately from the head light. The night key position is not provided, and the light switches are installed on the left handle bar, including the flasher switch, head light switch, and horn buttons.

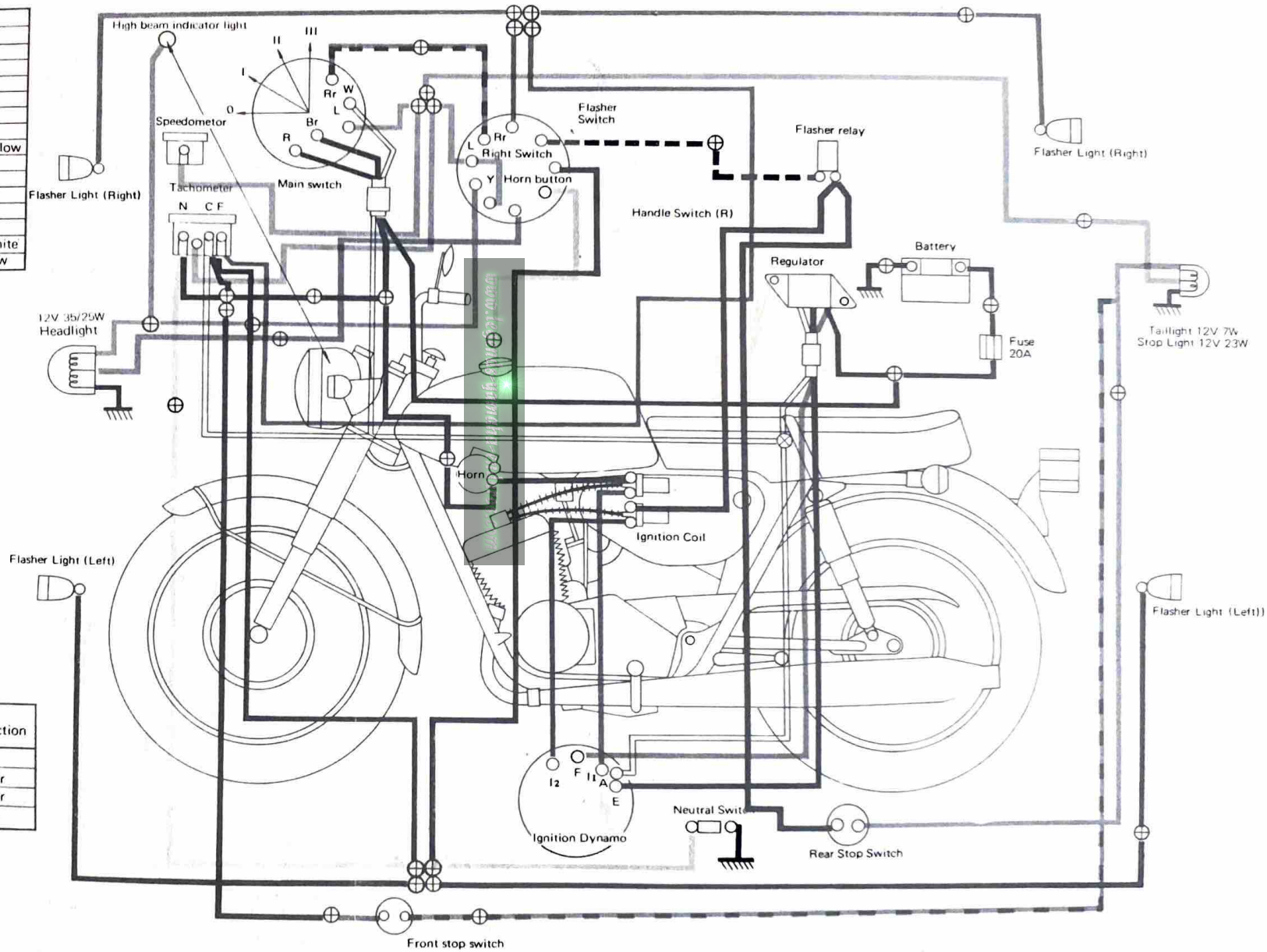
8. Wire Harness Assembly

Following the changes in the main switch and addition of the light switch, the wire harness has also been modified.

YAMAHA DS6/DS6C CIRCUIT DIAGRAM

Chart of wire colors

Armature circuit	White
Field circuit	Green
Common circuit	Brown
Battery (+) circuit	Red
Headlight sub circuit	Green
Horn circuit	Pink
Neutral light circuit	Sky blue
Taillight circuit	Blue
Front brake stop light circuit	Green & Yellow
Rear brake stop light circuit	Yellow
Ignition coil (R) circuit	Grey
Ignition coil (L) circuit	Orange
Flasher (R) circuit	Dark green
Flasher (L) circuit	Dark brown
Flasher relay circuit	Brown & White
Light switch circuit	Red & Yellow



Key Position	Use	Connection
0	Stop	
I	Driving	R + Br
II	Emergency starting	W+ Br
III	Parking	R + L