YAMAHA

250 DT-1 DT1-B
SERVICE MANUAL

FOREWORD

This Service Manual for the Yamaha DT1 250c. c. Enduro is directed to acquaint both the owner and mechanic with the operation, service, and maintenance of his machine. The DT1 is Yamaha's first fully street legal motorcycle designed to enable the owner to ride it on the street, use it for trail riding, or convert it with factory available parts into a competition ready scrambler or motocrosser.

This manual and the technical and service information enclosed should be closely followed to insure continuous good performance, long life, and to enable you to properly maintain the machine.

YAMAHA MOTOR CO., LTD.

SERVICE DIVISION

Contents

Chapter I General

I-1 Features of Yamaha Enduro 250 DT-1

1. Single Cylinder 5-Port Engine

Yamaha DT-1 has a 250 c.c. single cylinder engine, which is the first of its kind ever produced by Yamaha.

This iron sleeved aluminum cylinder is of 5-port design and its improved scavenging efficiency result in optimum engine performance in all gears and from 2,500 to 6,000 R.P.M.

2. Convenient and Reliable Yamaha Autolube

Yamaha Autolube—automatic oil injection lubrication system—is well known for its performance and reliability. Like every other Yamaha model, the Yamaha Enduro 250 DT-1 also employs the world-renowned Autolube.

3. 5-speed Close Ratios Transmission

The Yamaha Enduro 250 DT-1 assures steady engine performance, from low speed off-the-road riding to high speed road work, with the close ratio 5-speed transmission.

4. Convenient Primary Kickstarter

The primary kickstarter enables the engine to be started both in gear or in neutral.

5. Easy Riding Position and Superb Maneuverability

The light-weight sturdy frame combined with the component parts are ideal for off-the-road riding. Agile, comfortable and easy riding position, the Yamaha Enduro 250 DT-1 exhibits superb maneuverability and handling over rough terrain.

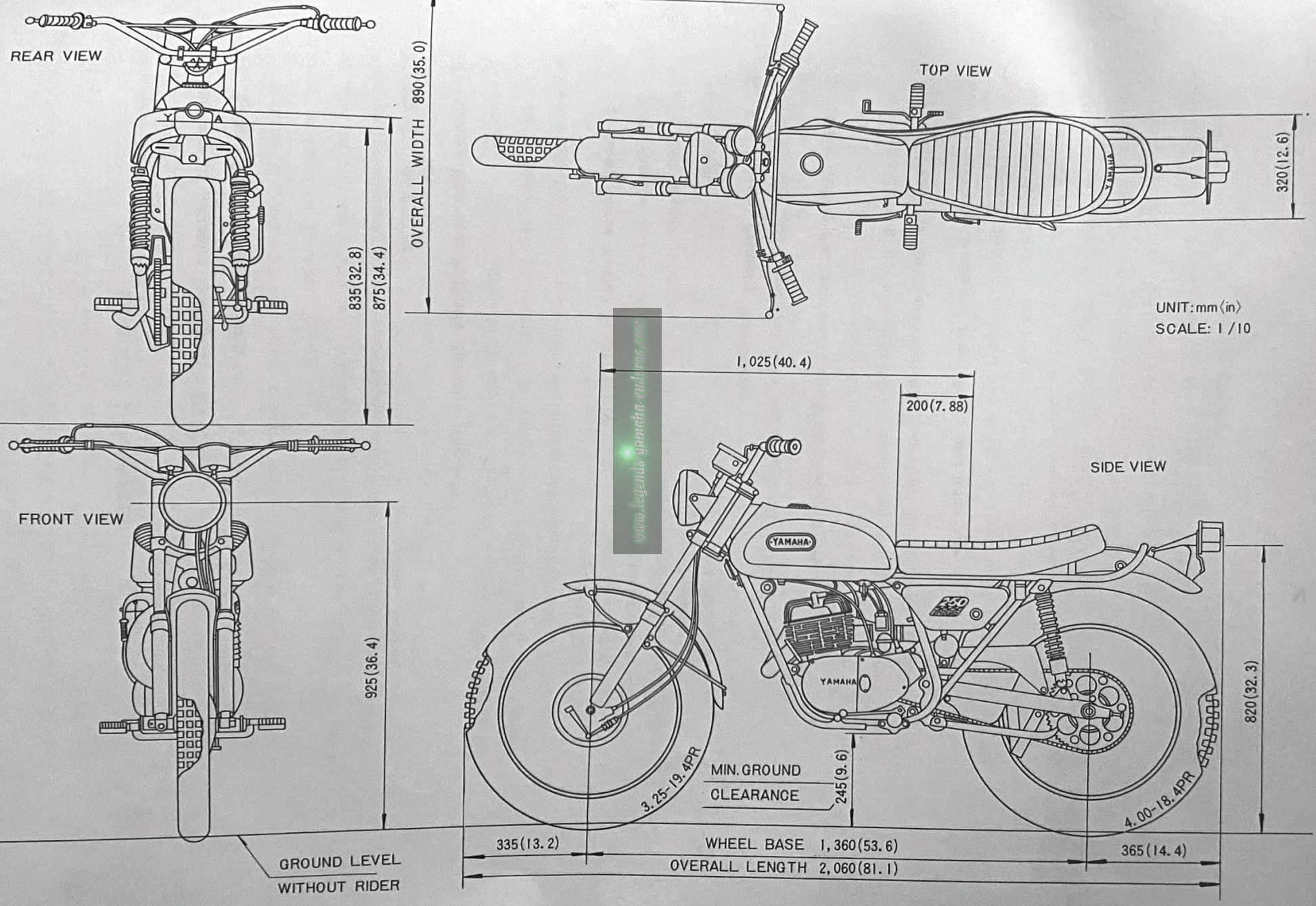
6. Competition Designed Front Forks and Rear Shocks

The Yamaha Enduro 250 DT-1 has telescopic front forks with internal coil springs such as used for competition racers.

The front forks provide excellent handling qualities over the roughest terraine with longer stroke and superb damping capacity. The rear shocks have 3-way adjustable springs with a longer stroke.

This insures stability even under the roughest condition.

DT-1 EXTERNAL VIEW



7. Separate Tachometer and Speedometer with a Reset Odometer for Mileage Calibration.

A separate tachometer is provided to enable the rider to make best use of the engine power.

The speedometer combined with a trip meter allows the rider to set the mileage for enduros.

8. Trails Univesal Tires for Off-the-road and On the Road Riding.

Trails universal tires for off-the-road and on the road riding are epuipped as standard. They are ideal for off-the-road riding as well as on the road riding.

9. Alternate GYT Parts for Competition Riding.

The GYT kit parts for engine tune-up are available. You can convert your DT-1 into a motocrosser by simply installing GYT parts and removing all unnecessary parts.

* Genuine Yamaha Tuning

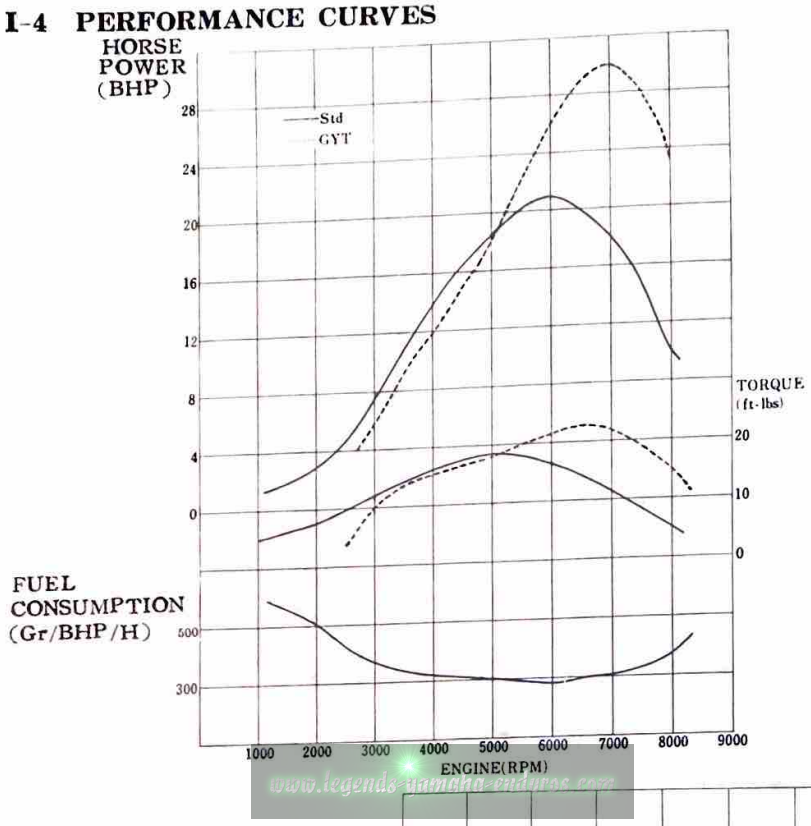
I-3 Specifications & Performance Model DT-1

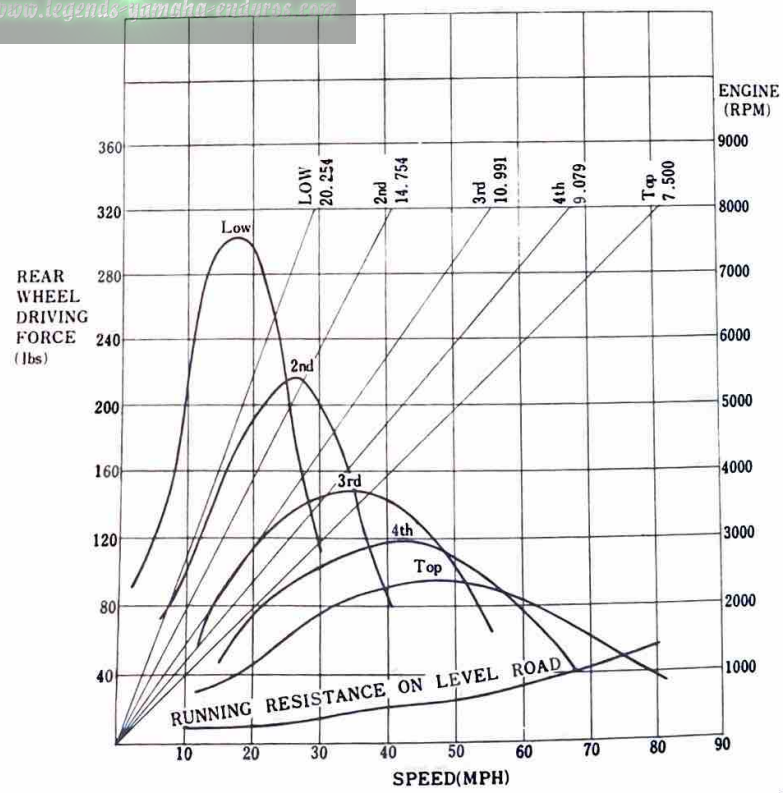
*with GYT kitted

Model:	YAMAHA 250 DT1
Dimensions:	
Overall length	81.1 in.
Overall width	35.0 in.
Overall height	44.5 in.
Wheelbase	53.6 in.
Min. ground clearance	9.6 in.
Weight:	
Net	232 lbs. (*215 lbs.)
Performance:	
Max. speed	70mph or more (std.)
Fuel consumption (on paved level roads)	94 mpg (a) 25 mph
Climbing ability	35 degree
Min. turning radius	82.6 in.
Braking distance	40 ft at 30 mph
Engine:	
Model	DT-1
Type	2 stroke, gasoline
Lubricating system	Seperate lubrication (Yamaha Autolube)
Cylinder	Single, forward inclined, 5 port
Displacement	15 cu. in. (246c. c.)
Bore × Stroke	2.77 × 2.52 in. (70 × 64 mm.)
Compression ratio	6.8:1 (*8.2:1)
Max power	21 BHP/6,000 r.p.m (*30BHP/7,000r.p.m)
Max torque	16.8 ft-lbs/5,000 r.p.m. (*22.4 ft-lbs/6,500r.p.m.)
Starting system	Primary-coupled kick starter system
Ignition system	Flywheel magneto ignition system with secondary ignition coil
Carburetor:	
Type	VM26SH
M. J.	#150 (#160 for models engine No. 2921 and up)
J. N.	5D1-3 stages
Air cleaner:	Dry, Paper filter type
Transmission:	
Clutch	Wet, multiple-disk
Primary reduction system	Helical gear
Primary reduction ratio	3.095(65/21)

Gear Box:	
Type	Constant mesh, 5-speed forward
Reduction ratio 1st	2.231 (Total r. ratio 20.254)
2nd	1.624 (〃 14.754)
3rd	1.211 (〃 10.991)
4th	1.000 (〃 9.079)
5th	0.826 (〃 7.500)
Secondary reduction system	Chain
Secondary reduction ratio	2.933 (44/15)
Chassis:	
Frame	Tubular-Double loop
Suspension system, front	Telescopic fork
Suspension system, rear	Swinging arm
Cushion system, front	Coil spring, oil damper
Cushion system, rear	Coil spring, oil damper
Steering system:	
Steering angle	49° both right and left
Caster	60.5°
Trail	5.12 in.
Braking system:	
Type of brake	Internal expansion
Operation system, front	Right hand operation
Operation system, rear	Right foot operation
Tire size:	
Front	3.25-19-4PR
Rear	4.00-18-4PR
Dynamo:	
Model	FZA-1BL
Manufacturer	Mitsubishi Elec.
Battery:	
Model	MV1-6D
Manufacturer	Nippon Btry.
Capacity	6V 2AH
Lighting:	
Head light	6V 35W/35W
Tail light	6V 5.3W
Stop light	6V 17W
Meter light	6V 3W×2
Tanks:	
Gasoline tank capacity	2.5gals.
Oil tank capacity	1.7qts.

I-4 PERFORMANCE CURVES

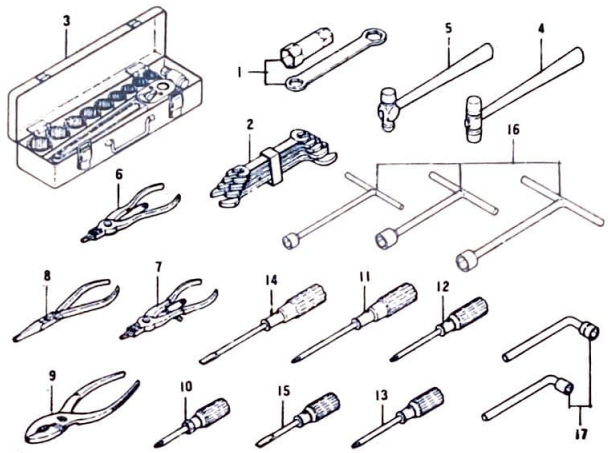




I-5 Tools and Instruments for Shop Service

The following tools and instruments are required to service the DT1.

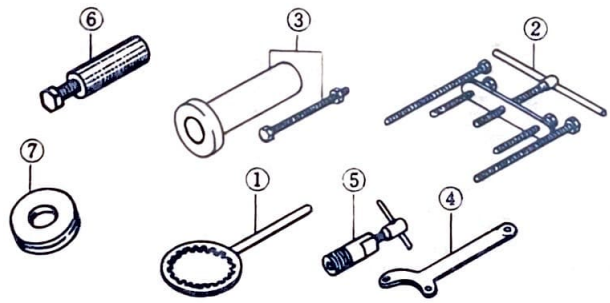
1. General Tools



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

Fig. I-5-1

2. Special Tools and Instruments

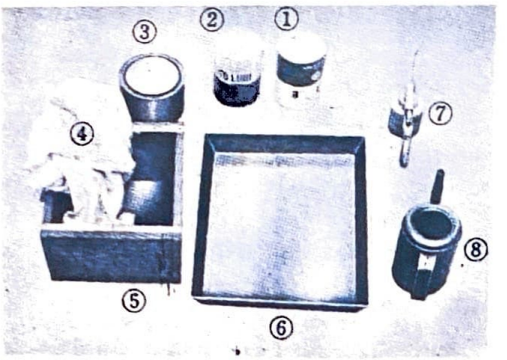


1) Clutch holding tool (for YR1 and YM2)
2) Crankcase disassembling tool
3) Crankshaft assembling tool (for YF1 and YG1)
4) Flywheel magneto holding tool
5) Flywheel magneto puller
6) Dial indicator adaptor
7) Crankshaft puller pot adaptor

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

Fig. I-5-2

3. Other Tools



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

Fig. I-5-3

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

Chapter II. YAMAHA Autolube
(Automatic Separate Lubricating System)

II-1. What is YAMAHA Autolube ?

Conventional 2-stroke engines are lubricated by oil premixed in gasoline, but YAMAHA's Autolube furnishes an automatic, separate lubrication system. That is, the oil in a separate oil tank is automatically regulated by the oil pump and fed to the engine according to engine speed and load.

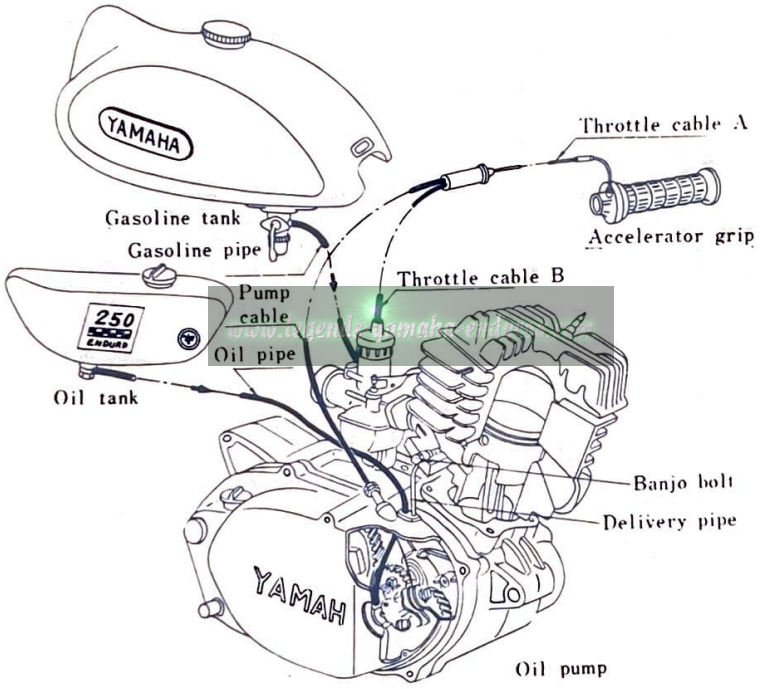


Fig. II-1-1

II-2. Features of YAMAHA Autolube

The oil pump is driven by the engine through a reduction gear, and is connected to the carburetor throttle cable controlled by the accelerator grip.

The oil pump automatically regulates the volume of lubricating oil according to engine speed and throttle valve opening, thus pumping the optimum amount of oil for engine lubrication under any operating condition.

This "automatic separate lubrication" does not merely eliminate disadvantages in

the conventional pre-mix system, but it fruther improves the performance and efficiency of 2-stroke designs by eliminating certain oil-starvation conditions which formerly existed.

A) The Autolube feeds an optimum amount of lubricating oil to the engine under any operating condition, thus featuring:
- Less oil consumption.
- Less carbon accumulation.
- Less exhaust smoke.
- Improved lubricating efficiency.

B) The Autolube simplifies fuel supply, thus featuring:
- Using straight gasoline directly in the gas tank.
- Less fuel contamination.

C) The Autolube improves the reliability of lubrication, thus eliminating:
- Special care concerning oil/fuel mixing ratio.

II-3 Handling the Oil Pump

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

The oil pump is similar in both mechanism and construction to other Autolube system. The only difference is the employment of a 5.5ø plunger because of larger consumption of oil by a 250c.c. single cylinder engine.

II-3-A. Checking Minimum Pump Stroke

1) Checking

a. Fully close the accelerator grip.

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

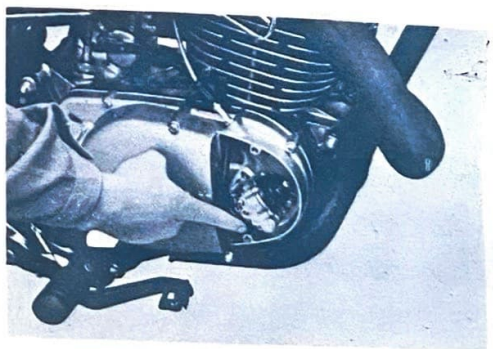


Fig. II-3-1

c. Insert a feeler gauge (0.15 mm.) into the gap.
When the gap allows it to enter
……Stroke is correct.
When the gap does not allow
……Stroke is insufficient.

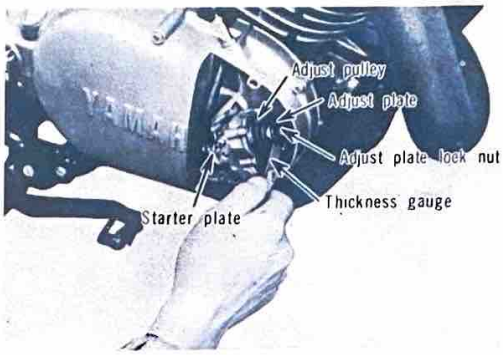


Fig. II-3-2

2) Adjustment

a. Remove the adjustment plate lock nut, and then remove the adjustment plate.

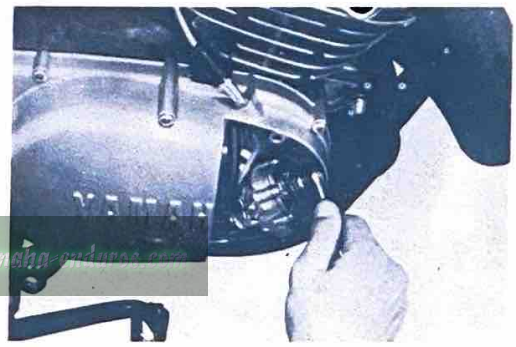


Fig. II-3-3

b. Install a 0.1 mm. adjustment shim where the adjustment plate was.

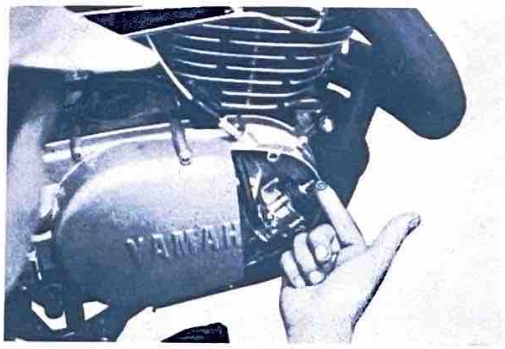


Fig. II-3-4

c. Reinstall the adjustment plate lock nut, and measure minimum stroke.
When the gap allows a 0.20 mm. feeler gauge to enter but does not allow a 0.25 mm, the stroke is correctly adjusted.
Minimum stroke adjustment limit……0.15 mm. or less
Minimum stroke adjustment standards……0.20 to 0.25 mm.

II-3-B. Pump and Carburetor Setting

Take the following steps to check minimum stroke, and adjust it if incorrect. Then adjust the pump and carburetor.

1) Checking

a. Adjust the carburetor with the engine at idle, and remove all slack from the throttle cable B.

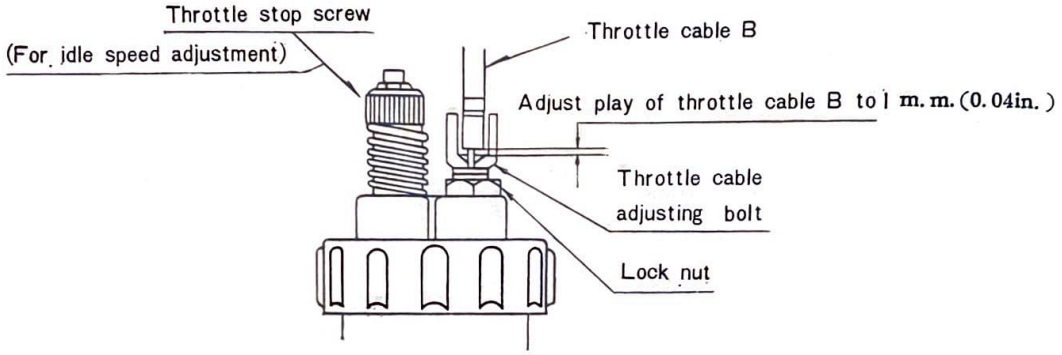


Fig. II-3-5

- To bring the play of the throttle cable to zero, loosen or tighten the throttle cable adjustment screw.
- After this adjustment, pull throttle cable B, and engine speed will slightly increase from idling r.p.m.

b. Next adjust the throttle cable A so that the gap as shown in Fig. II-3-6 below will be between 0.5 and 1.0mm. (0.02~0.04 in.)

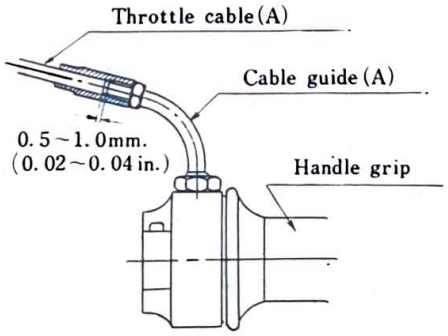


Fig. II-3-6

- While pulling the outer part of the throttle grip and check the play of the throttle cable A. If the play is excessive or insufficent, adjust the

play with the adjustment screw.

c. 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. (When the throttle cable A has a play of 0.5 to 1.0 mm, the accelerator grip will turn lightly. On the other hand, when the cable has no play at all, the accelerator grip will be somewhat tight.) Next, adjust the pump cable so that the marking on the adjustment pulley will be aligned with the guide pin.

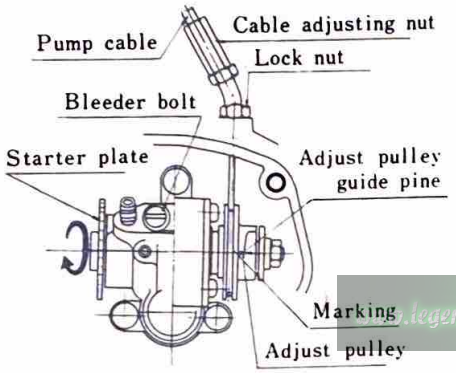


Fig. II-3-7

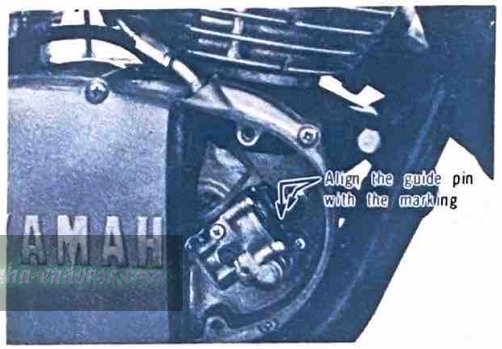


Fig. II-3-8

II-3-C 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 such an irregular flow of oil, bleed the pump in the following manner.

1) Remove the bleeder bolt.

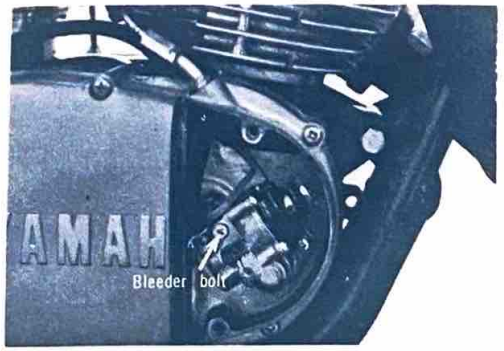


Fig. II-3-9

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 and rotate the starter plate. As the plunger stroke becomes greater, the air can be quickly bled.

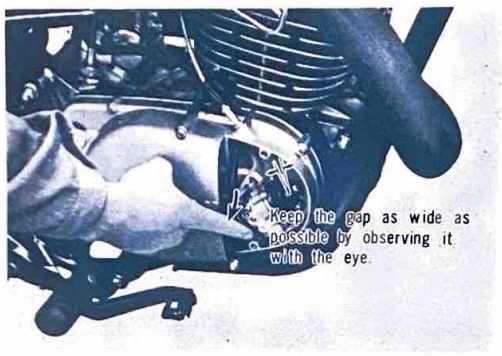


Fig. II-3-10

Chapter III 5-Port Cylinder Induction System

III-1 Description of 5-Port Cylinder Induction System.

The schnuerle loop scavenging system is the most commonly used induction system for the two-stroke engines. In the schnuerle loop system, two 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 the 250c. c. single engine would result in physical design limitations of the engine. The physical limitations of excessive engine width and unattractive appearance restricts such an engine design.

Yamaha's Research and Engineering Departments, therefore, desingned and perfected the five-port cylinder induction system that is used on the DT-1 Enduro. The incorporation of this new five-port system with the incorporation of two additional specially desingned 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 DT1 250c. c. Enduro, will benefit from the five-port system by having increased engine reliability, increased engine performance, and a reduction in gas and oil consumption.

III-2 Construction and Design of the 5-port Induction System

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 arer 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 engine speeds and high engine speeds.

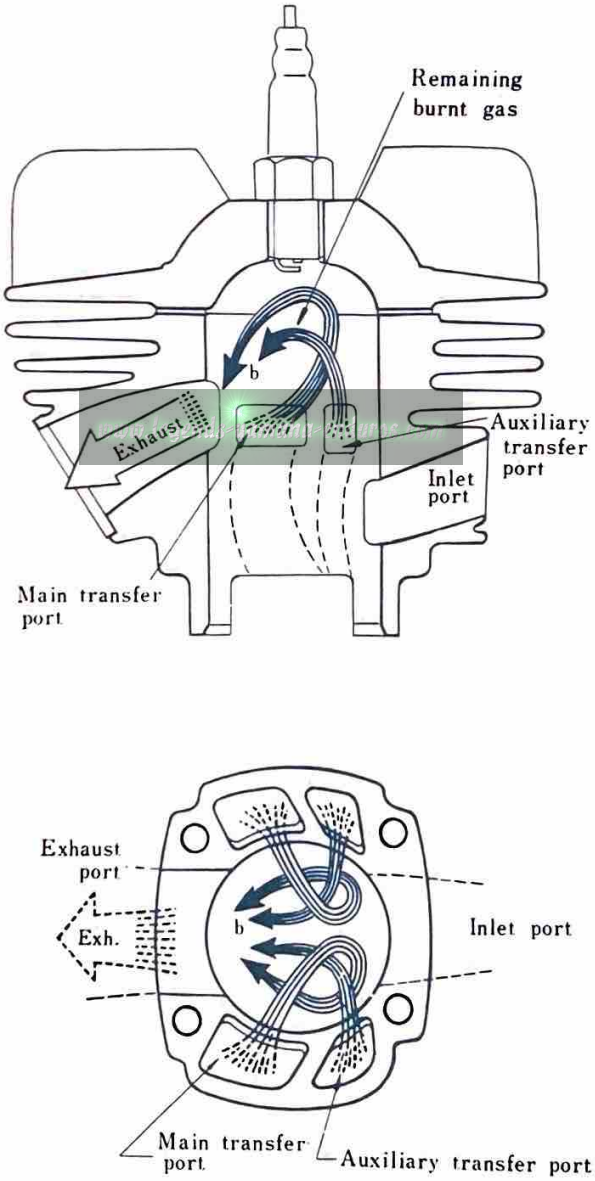
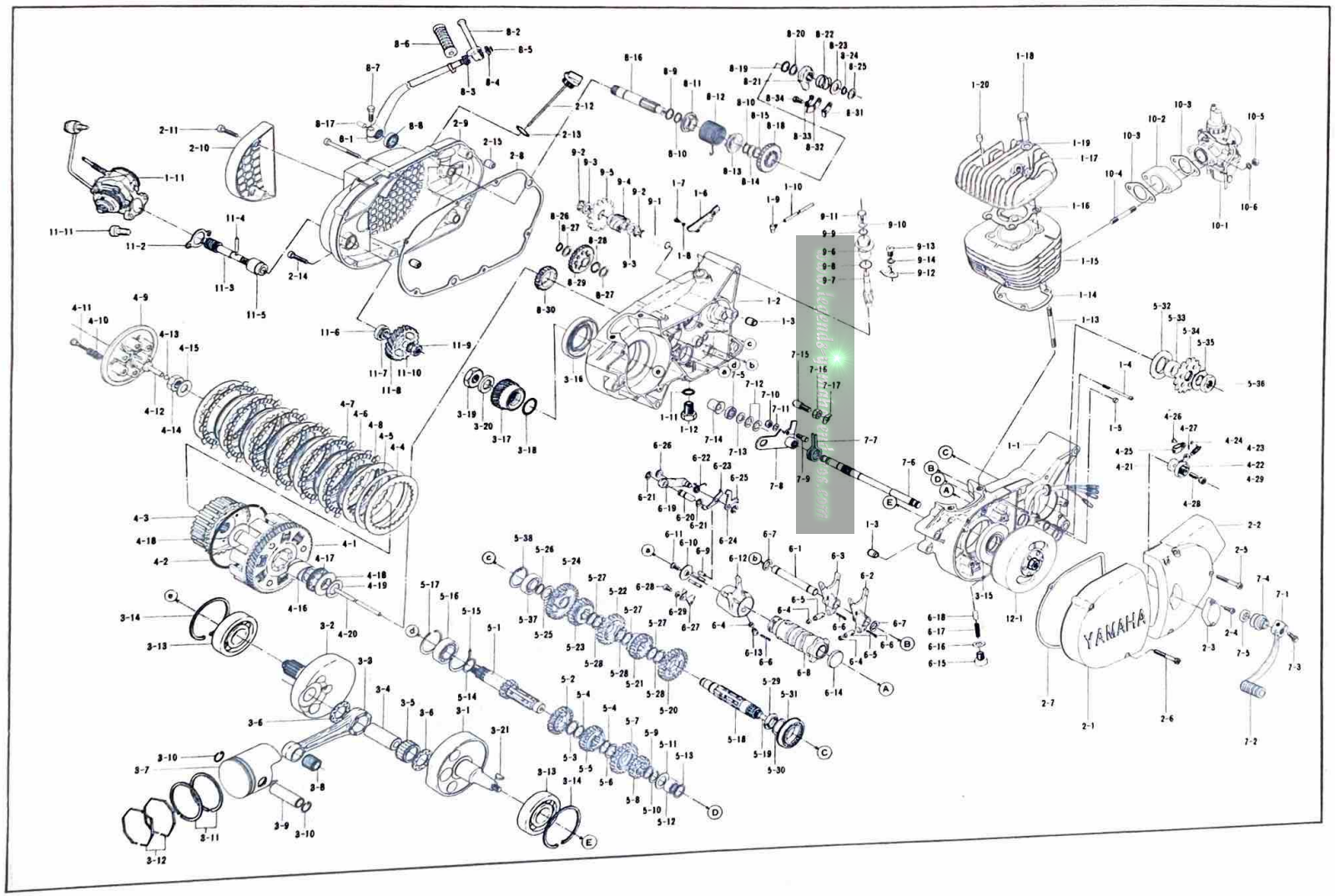


Fig. IV-2-1

YAMAHA 250 DT1 Engine Illustration



CASE & CYLINDER

1-1	CASE crank S.H.	1	
1-2	CASE crank D.H.	1	
1-3	PIN, dowel	2	
1-4	SCREW, pan head	13	
1-5	PLUG, timing	1	
1-6	COVER	1	
1-7	SCREW, pan head	1	
1-8	WASHER, spring	2	
1-9	BREATHER	1	
1-10	PIPE, breather	1	
1-11	GASKET, drain plug	1	
1-12	PLUG, drain	1	
1-13	BOLT, cylinder fastening	2	
1-14	GASKET, cylinder	1	
1-15	CYLINDER	1	
1-16	GASKET, cylinder head	1	
1-17	HEAD, cylinder	1	
1-18	NUT, fastening	4	
1-19	WASHER, fastening	4	
1-20	ABSORBER	4	

CRANKCASE COVER

2-1	COVER, crankcase S.H.	1	
2-2	COVER, crankcase S.H. 2	1	
2-3	COVER, cam shaft	1	
2-4	SCREW, pan head	2	
2-5	SCREW, pan head	3	
2-6	SCREW, pan head	2	
2-7	GASKET, crankcase cover S.H.	1	
2-8	GASKET, crankcase cover D.H.	1	
2-9	COVER, crankcase D.H.	1	
2-10	COVER, pump	1	
2-11	SCREW, pan head	2	
2-12	PLUG, oil	1	
2-13	O-RING	1	
2-14	SCREW, pan head	2	
2-15	PIN, dowel	2	

CRANK SHAFT

3-1	CRANK, S.H.	1	
3-2	CRANK, D.H.	1	
3-3	ROD, connecting	1	
3-4	PIN, crank	1	
3-5	BEARING	2	
3-6	WASHER, crank pin	2	
3-7	PISTON, STD	1	
3-8	BEARING	1	
3-9	PIN, piston	1	
3-10	CLIP, piston pin	2	
3-11	PISTON RING SET STD	1	
3-12	EXPANDER	1	
3-13	BEARING B 6306	1	
3-14	CIRCLIP	1	
3-15	OIL SEAL SW30-72-10	1	
3-16	OIL SEAL SW42-72-10	1	
3-17	GEAR primary drive	1	
3-18	O-RING	1	
3-19	NUT, lock	1	
3-20	WASHER, lock	1	
3-21	KEY, woodruff	1	

CLUTCH

4-1	PRIMARY DRIVEN GEAR COMP.	1	
4-2	O-RING	1	
4-3	BOSS, clutch	1	
4-4	PLATE, clutch 1	6	
4-5	RING, bushing	1	
4-6	PLATE, clutch 2	6	
4-7	PLATE, clutch 3	6	
4-8	SPRING, clutch	6	
4-9	SCREW, spring	6	
4-10	CIRCLIP	1	
4-11	BALL	1	
4-12	NUT, lock	1	
4-13	SPRING	1	
4-14	SPACER	1	
4-15	BEARING	1	
4-16	PLATE, thrust 2	1	
4-17	PLATE, thrust 1	1	
4-18	WASHER	2	
4-19	OIL SEAL 306.8.29.4	1	
4-20	PUSH LEVER ASS'Y	1	
4-21	SPRING, return	1	
4-22	SPRING, return	1	
4-23	JOINT	1	
4-24	PIN	1	
4-25	PIN, spring	1	
4-26	SCREW, adjusting	1	
4-27	NUT	1	
4-28			
4-29			

TRANSMISSION GEAR

5-1	GEAR, 4th pinion	1	
5-2	GEAR, 5th pinion	1	
5-3	CIRCLIP	2	
5-4	GEAR, 3rd pinion	2	
5-5	GEAR, 2nd pinion	1	
5-6	WASHER, gear	1	
5-7	GEAR, 1st pinion	1	
5-8	CIRCLIP	1	
5-9	CIRCLIP	1	
5-10	BEARING B 6203	1	
5-11	CIRCLIP	1	
5-12	CIRCLIP	1	
5-13	WASHER, gear	1	
5-14	GEAR, 4th wheel	1	
5-15	GEAR, 5th wheel	1	
5-16	GEAR, 3rd wheel	1	
5-17	GEAR, 2nd wheel	1	
5-18	GEAR, 1st wheel	1	
5-19	CIRCLIP	1	
5-20	CIRCLIP	1	
5-21	WASHER, gear	2	
5-22	BEARING B 6205	1	
5-23	OIL SEAL 30.35.8.4	1	
5-24	COLLAR, retaining	1	
5-25	SPROCKET, drive	1	
5-26	WASHER, lock	1	
5-27	NUT, lock	1	
5-28	BEARING B 6203	2	
5-29	CIRCLIP	1	
5-30			
5-31			
5-32			
5-33			
5-34			
5-35			
5-36			
5-37			
5-38			

SHIFTER (1)

6-1	BAR, shift fork guide	1	
6-2	FORK, shift (2)	1	
6-3	FORK, shift (3)	1	
6-4	ROLLER, cam follower	3	
6-5	PIN, cam follower	3	
6-6	PIN, cam	3	
6-7	CIRCLIP	1	
6-8	CAM, shift	1	
6-9	PIN, dowel	1	
6-10	PLATE, lock	1	
6-11	SCREW, pan head	1	
6-12	FORK, shift (1)	1	
6-13	BOLT, guide	1	
6-14	GASKET	1	
6-15	SPRING, cam stopper	1	
6-16	STOPPER, cam	1	
6-17	BRACKET	1	
6-18	CIRCLIP	2	
6-19	PIN, dowel	2	
6-20	CIRCLIP	2	
6-21	LEVER, change (3)	1	
6-22	LEVER, change (2)	1	
6-23	CIRCLIP	1	
6-24	ROLLER, change lever	1	
6-25	GUIDE, change lever	1	
6-26	SCREW, pan head	1	
6-27	WASHER, ring	1	

SHIFTER (2)

7-1	PEDAL, change	1	
7-2	COVER, change pedal	1	
7-3	BOLT, pin	1	
7-4	BOOT, spring	1	
7-5	OIL SEAL 8.12.6.5	2	
7-6	SHAFT, change	1	
7-7	SPRING, shift return	1	
7-8	LEVER, change (1)	1	
7-9	SCREW, adjusting	1	
7-10	NUT	1	
7-11	WASHER, spring	1	
7-12	CIRCLIP	2	
7-13	WASHER, adjusting	1	
7-14	SCREW, adjusting	1	
7-15	WASHER	1	
7-16	NUT	1	
7-17	WASHER, lock	1	

KICK

8-1	CRANK, kick	1	
8-2	LEVER, kick	1	
8-3	WASHER, kick lever	1	
8-4	CLIP, kick lever	1	
8-5	COVER, kick lever	1	
8-6	BOLT	1	
8-7	OIL SEAL 520.20.7	1	
8-8	SHAFT, kick	1	
8-9	SPRING, kick	1	
8-10	CIRCLIP	2	
8-11	COVER, spring	1	
8-12	SPRING, kick	1	
8-13	WASHER	1	
8-14	WASHER	1	
8-15	WASHER	1	
8-16	AXLE, kick	1	
8-17	PLUG, seal	1	
8-18	GEAR, kick	1	
8-19	WASHER	1	
8-20	CLIP	1	
8-21	WHEEL, ratchet	1	
8-22	SPRING, ratchet wheel	1	
8-23	COVER, spring	1	
8-24	CIRCLIP	1	
8-25	BAND, 1	1	
8-26	BAND, 2	1	
8-27	SPRING	1	
8-28	WASHER, wave	1	
8-29	GEAR, idle	1	
8-30	GEAR, idle	1	
8-31	STOPPER	1	
8-32	SCREW, pan head	1	
8-33	WASHER, wave	1	
8-34	PUSH LEVER, kick guide	1	

TACHOMETER GEAR

9-1	AXLE, drive gear	1	
9-2	CIRCLIP	2	
9-3	GEAR, drive	2	
9-4	GEAR, driven	1	
9-5	HOUSING	1	
9-6	WASHER	1	
9-7	O-RING	1	
9-8	SPRING	1	
9-9	STOPPER	1	
9-10	SCREW, pan head	1	
9-11	WASHER, lock	1	
9-12			
9-13			
9-14			

CARBURETOR

10-1	CARBURETOR ASS'Y	1	
10-2	JOINT	2	
10-3	GASKET	2	
10-4	INTAKE	1	
10-5	NUT	2	
10-6	WASHER, spring	2	

OIL PUMP

11-1	OIL PUMP ASS'Y	1	
11-2	GASKET, pump cover	1	
11-3	SHAFT, worm	1	
11-4	PIN, dowel	1	
11-5	METAL, worm shaft inner	1	
11-6	OIL SEAL 310.22.7	1	
11-7	SPRING	1	
11-8	GEAR, pump drive	1	
11-9	PIN, dowel	1	
11-10	WASHER, lock	1	
11-11	SCREW, pan head	1	

FLYWHEEL MAGNETO

12-1	FLYWHEEL MAGNETO ASS'Y	1	

Chapter IV Engine

The DT1 250c.c. Enduro engine has been designed with emphasis on both low speed trail riding and high speed road riding. The incorporation of the evenly spaced five-speed transmission and five-port induction system insure complete riding versatility for the owner. The width, height, and weight of the engine has been kept at a bare minimum to insure ease of handling in the roughest terrain.

Disassembly and assembly of the engine and its components should be done in the following manner and order. This will insure correct maintenance and service work for the owner and mechanic.

Preparation for disassembly of the engine:

1) All dirt, mud, dust, and foreign material should be thoroughly removed from the exterior of the engine assembly before romoval and disassembly. This will prevent any harmful foreign material from entering the interior of the engine assembly.
2) Before engine removal and disassembly, be sure you have proper tools and cleaning equipment so you can perform a clean and efficient job.
3) During disassembly of the engine, place and clean all parts in trays and in order of disassembly. This will ease and speed assembly time and insure correct installation of all engine parts.

IV-1 Engine Removal

1. Start the engine and warm it up for a few minutes, then turn off the engine and drain the transmission oil. (Fig. IV-1-1)

   Volume of oil: 1,000c.c. (1.0qt.)
   (SAE10W/30)

2. Remove the muffler.
   1) Remove the two springs and two bolts. (Figs. IV-1-2 and 3)
   2) Remove the muffler holding bolts. (Figs. IV-1-4 and 5)

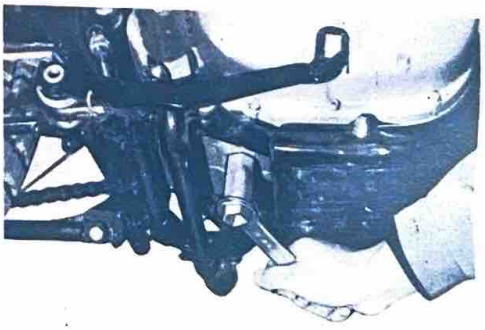


Fig. IV-1-1

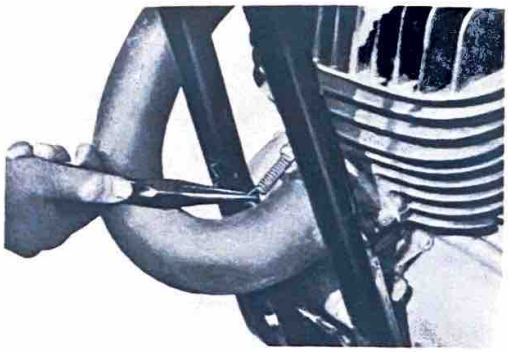


Fig. IV-1-2

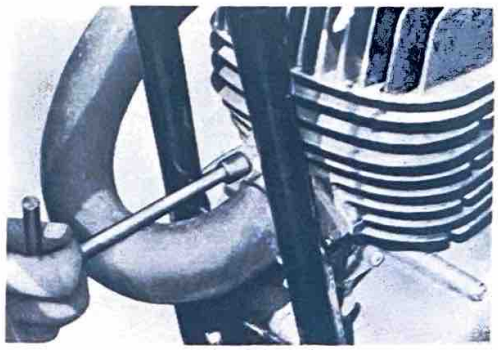


Fig. IV-1-3

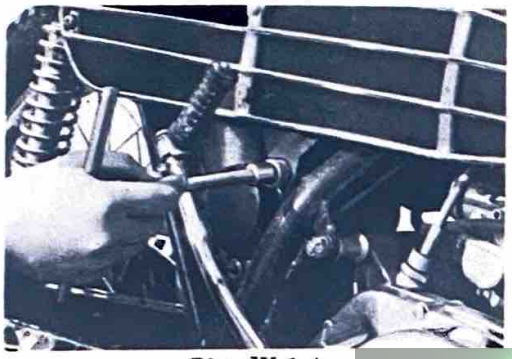


Fig. IV-1-4

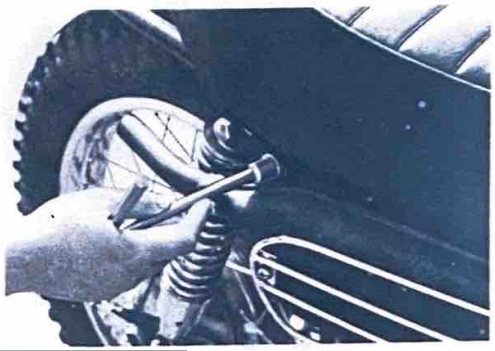


Fig. IV-1-5

3. Remove the change pedal.

Fig. IV-1-6

4. Remove the dynamo cover.

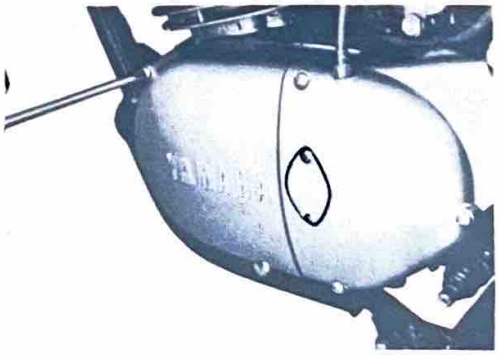


Fig. IV-1-7

5. Remove the chain cover.

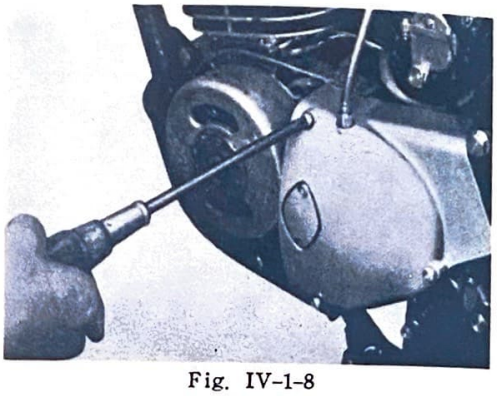
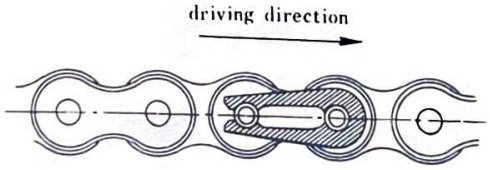


Fig. IV-1-8

6. Disconnect the master link and remove the chain.

Fig. IV-1-9

When jointing, be sure the drive chain master link is facing in the correct direction.



After jointing, adjust the chain free play to 25mm. (1 in.) up and down at the center of the lower section with the rear wheel on the ground.

7. Remove the pump cover and pump cable.

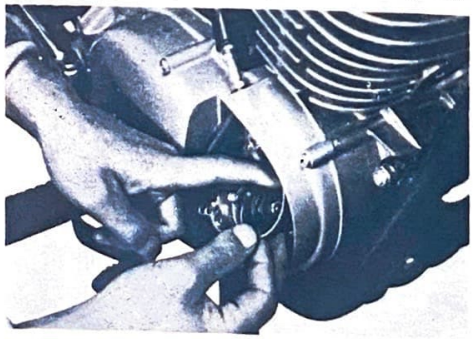


Fig. IV-1-10

8. Remove the tachometer cable.

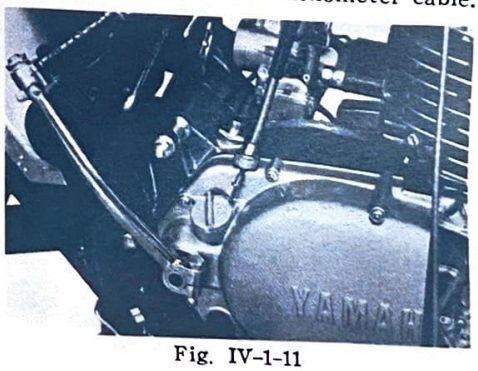


Fig. IV-1-11

9. Remove the carburetor.

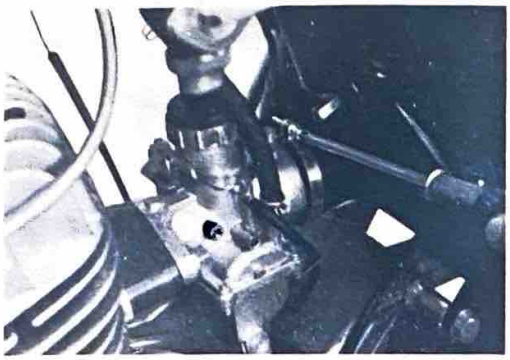


Fig. IV-1-12

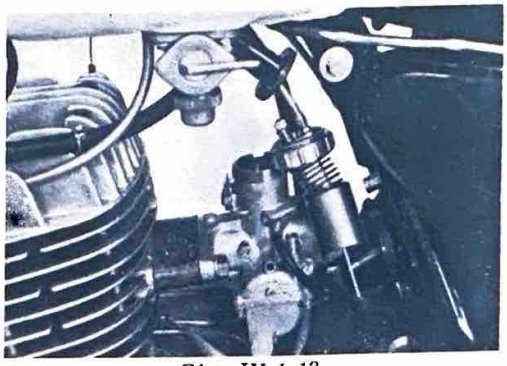


Fig. IV-1-13

10. Disconnect the oil line and be sure to plug the hole to prevent oil from flowing out.

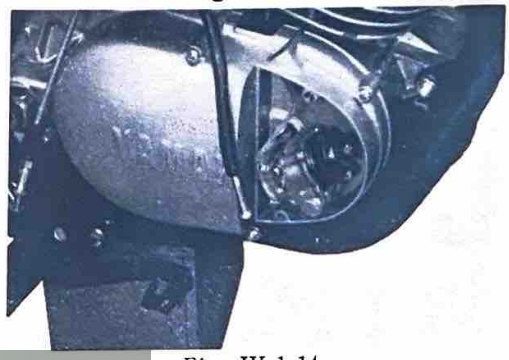


Fig. IV-1-14

11. Disconnect the leads at the bottom of the fuel tank.

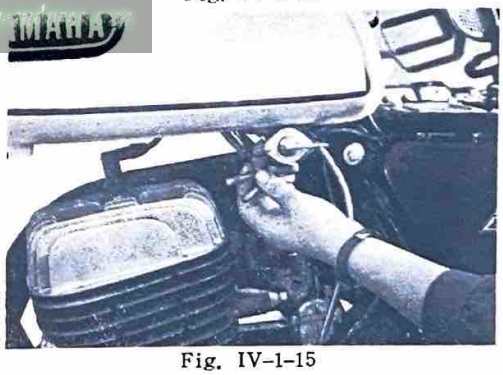


Fig. IV-1-15

12. Remove the four engine mounting bolts.

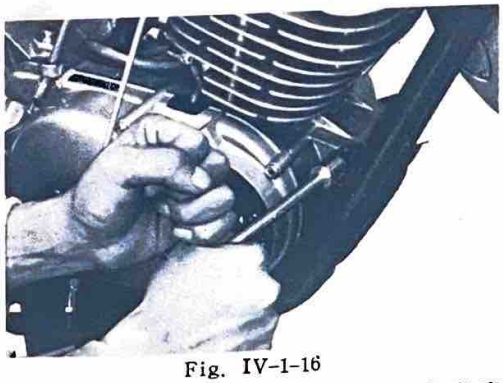


Fig. IV-1-16

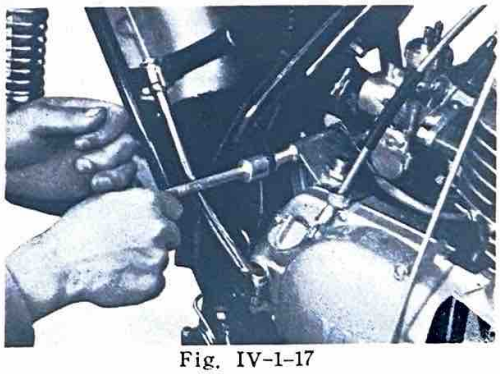


Fig. IV-1-17

13. Remove the engine from the frame.

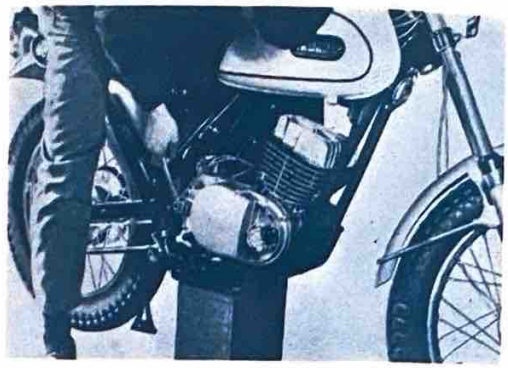


Fig. IV-1-18

IV-2 Cylinder Head

The cylinder head is bolted on the cylinder with special bolts.

A. Removing

Remove the four special nuts from the top of the cylinder head, and head gasket. Reverse the sequence for reinstallation. Replace the gasket, if damaged.

Cylinder head tightening torque is 25.3~28.9 ft-lbs. (3.5~4.0kg-m)

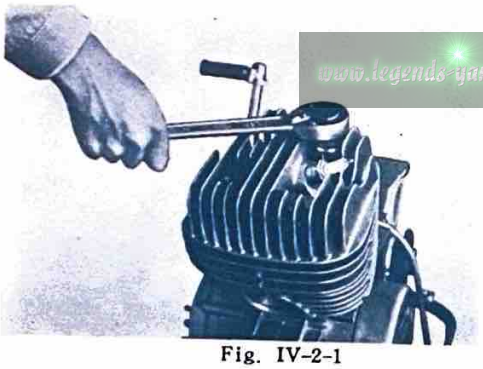


Fig. IV-2-1

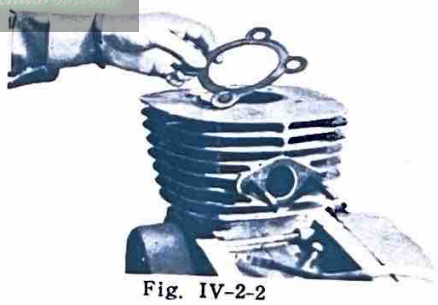


Fig. IV-2-2

B. Removing Carbon Deposits

Carbon deposits inside the cylinder head combustion chamber and top of the piston will result in an increase in the compression ratio, as well as preignition and engine overheating.

Scrape the cylinder head and piston dome clean.

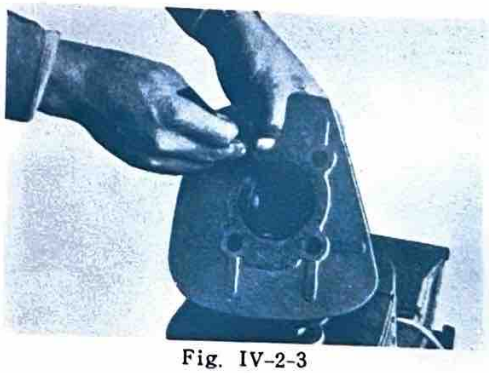


Fig. IV-2-3

VI-3 Cylinder

The DTl Enduro engine is equipped with Yamaha's specially designed aluminum cylinder that incorporates the installation of an iron sleeve that is bonded to the aluminum cylinder by the "metallic bond" process. This special cylinder gives freedom from various problems that occur with ordinary heat fitted iron sleeves and cylinders. There can be no separation of the liner from the cylinder because of expansion co-efficient differences between the 2 metals. Dissipation of heat is greatly increased, therefore, resulting in cooler operating temperatures. The chance of piston seizure is greatly reduced because of the increase in heat dissipation; engine performance is greatly increased through the incorporation of the five-port induction system; engine reliability is at an optimum with the use of Yamaha's Autolube oil injection system.

In order to eliminate the removal of the fuel tank when removing the cylinder, shorter stud bolts are used to secure the cylinder to the crankcase.

A. Removing the Cylinder

1) Remove the oil delivery line banjo bolt from cylinder.

Fig. IV-3-1

2) Remove the cylinder by striking it lightly with a plastic or rubber hammer.

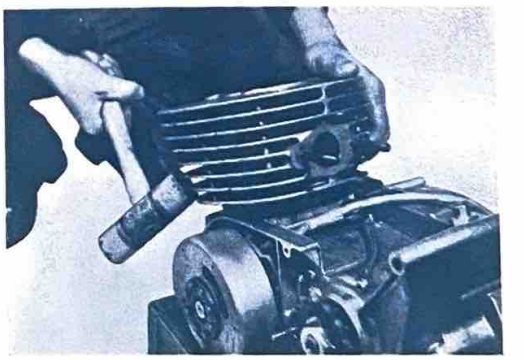


Fig. IV-3-2

3) Always replace the cylinder base gasket when reassembling cylinder.

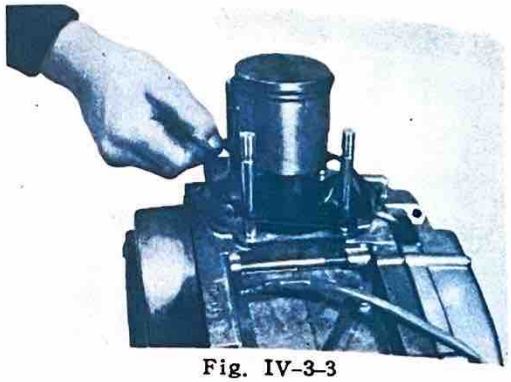


Fig. IV-3-3

B. Checking the Cylinder for Wear

1) Measure the amount of wear of the cylinder wall with a cylinder bore measuring micrometer or cylinder gauge. (Measure it at four depths by positioning the instrument at right angles to the crankshaft.) If the difference between the maximum and minimum diameter exceeds 0.05 mm, (0.0019".) rebore and hone the cylinder.

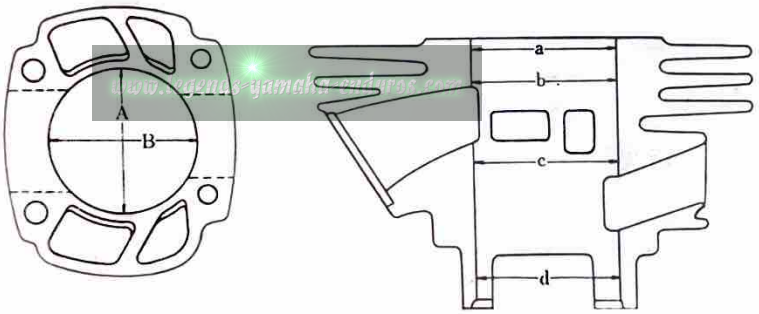


Fig. IV-3-4

2) The minimum clearance between the piston and the cylinder is 0.040-0.045mm. (0.0016" and 0.0018")

C. Cylinder Reconditioning

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

2) Cylinder should be rebored and honed to the diameter of the oversize piston plus the minimum allowable clearance. (IV-3-B-2.)

3) The error between the maximum and minimum diameters after honing should be no more than 0.04 mm. (0.0015″)

D. Removing Carbon Deposits

Scrape off the carbon accumulation in the exhaust port of the cylinder with a screw driver.

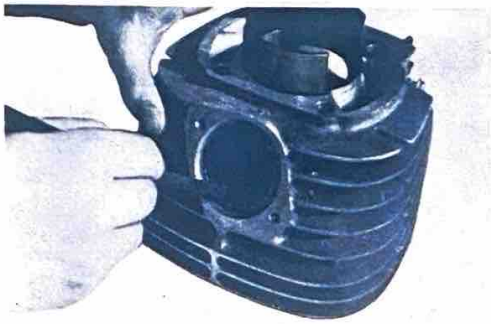


Fig. IV-3-5

E. Installing the Cylinder

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 bottom of the cylinder with the rings.

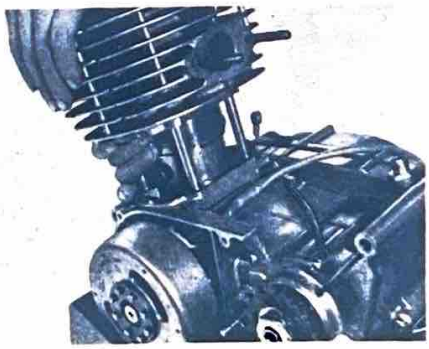


Fig. IV-3-6

VI-4 Piston Pin

A. Pulling out the Piston Pin

Remove the clips at both ends of the piston pin with needle nose pliers, and

press out the piston pin with a finger or a slot-head screw driver.

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

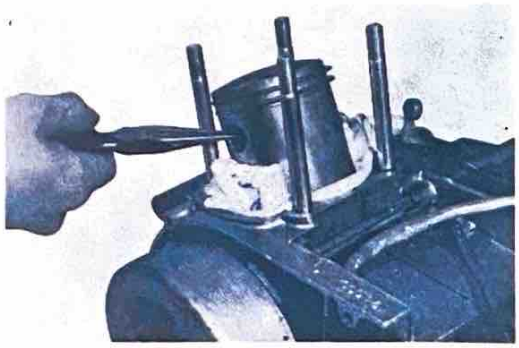


Fig. IV-4-1

B. Piston-to-Piston pin Fit

The piston pin should be snugly fit in its bore so that it drags a little as you turn it. If the piston 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 piston pin. Check the small end of the connecting rod for wear by inserting the piston pin.

Fig. IV-4-2

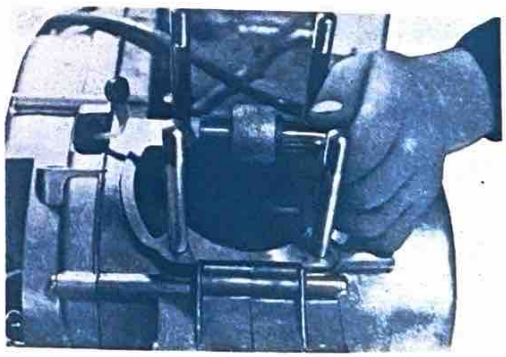


Fig. IV-4-3

IV-5 Piston Ring

A. Removing the Piston Rings

Put your thumbs at each end of the piston ring and let the piston ring ends apart. Remove the ring by moving the ring off the piston on the other side of the ring ends.

Fig. IV-5-1

Fig. IV-5-2

B. Installing the Piston Ring

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

The printing on all rings must face up to position the gap properly at the pin.

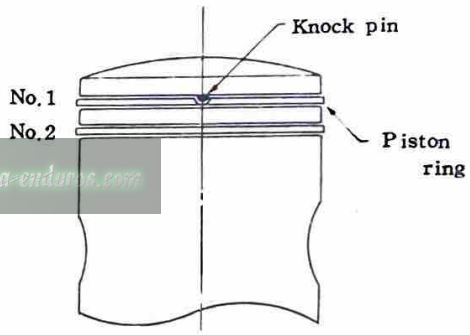


Fig. IV-5-3

C. Checking the Piston Rings

1) Measuring piston ring wear

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

The end gap should be between 0.2 and 0.4 mm. (0.008-0.015 in.) for both No. 1 and No. 2 rings. [0.4~0.5 mm. (0.016~0.019 in.) with GYT kitted.]

Fig. IV-5-4

2) Removing carbon

Carbon on the piston rings and in the ring grooves will made the rings stick in the piston, thus causing gas blow-by.

Remove the rings from the piston, and clean the carbon from the rings and ring grooves.

Note: Clearance between the ring and the ring groove: (Fig. IV-5-5.)

No. 1 ring (Upper) ···0.07~0.11mm. (0.0028~0.0043″)

No. 2 ring (Lower) ···0.03~0.07mm. (0.0012~0.0028″)

[0.04~0.08mm. (0.0016~0.0031″) with GYT kitted]

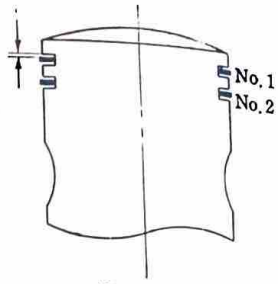


Fig. IV-5-5

IV-6 Piston

The piston is made of a high-silicon aluminum alloy.

A. Checking and Correcting the Piston to Cylinder Wall Clearance

1) Measuring piston clearance

Piston clearance is the difference between the minimum cylinder bore diameter and the maximum outside diameter of the piston. As described in IV-3 Cylinder before piston clearance should be 0.040-0.045 mm. (0.0016-0.0018in.)

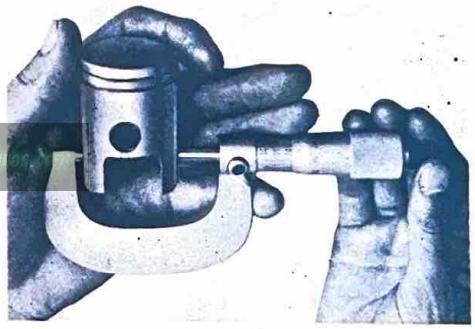


Fig. IV-6-1

To determine the maximum piston diameter, measure the piston with a micrometer at right angles to the skirt 10 mm. (3/8 in.) from its bottom edge. (Fig. IV-6-1)

2) Checking and correcting scratches on the piston

A piston showing sign of seizure will result in noise and loss of engine power. It will also cause damage to the cylinder wall.

If a piston that has seized is used again without correction, another seizure will develop at the same

Fig. IV-6-2

area. Lightly sand the seizure "high spot" on the piston with #400 sandpaper until smooth. (Fig. IV-6-2)

3) Removing Carbon

Remove carbon accumulations on the piston head, with a screw driver or a saw-blade. (Fig. IV-6-3)

Carbon and gum accumulations in the piston groove will result in piston ring seizure. Remove them from the ring groove. (Fig. IV-6-4)

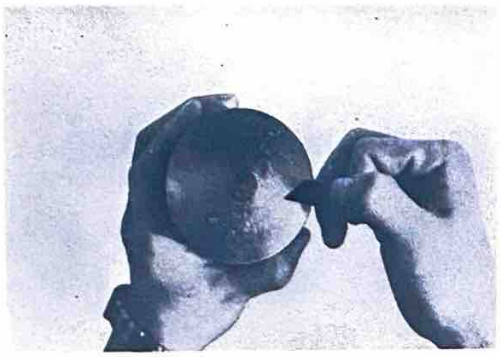


Fig. IV-6-3

Fig. IV-6-4

B. Piston Installation Direction

Install the piston with the arrow mark on the head pointing forward (toward the exhaust port of the cylinder).

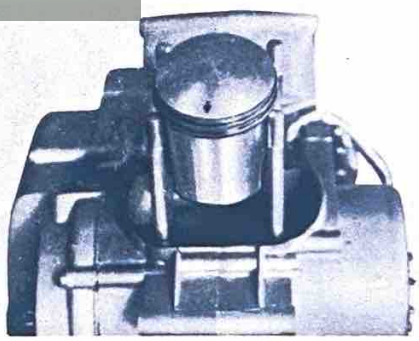


Fig. IV-6-5

IV-7 Flyweel Magneto

A. Remove the nut using a flywheel magneto holding tool.

Fig. IV-7-1

B. Install the flywheel magneto puller. Then turn it left and the flywheel magneto will break loose.

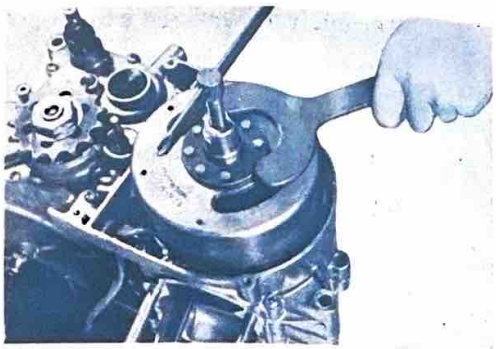


Fig. IV-7-2

C. Remove the two screws holding the flywheel magneto base to the crankcase, and remove the flywheel magneto base.

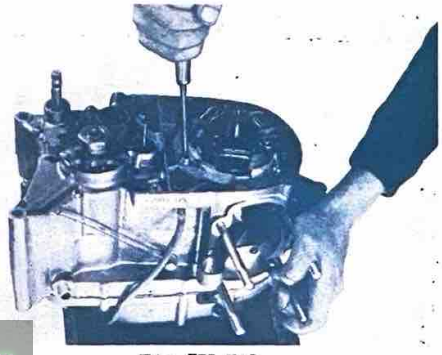


Fig. IV-7-3

D. Remove the woodruff key.

It is advisable to place the woodruff key on the flywneel magnets (using its magnetic force) while the key is removed for engine service.

IV-8 Crankcase Cover (R. H.)

A. Removal

1) Remove the kick crank mounting bolt and the crank.

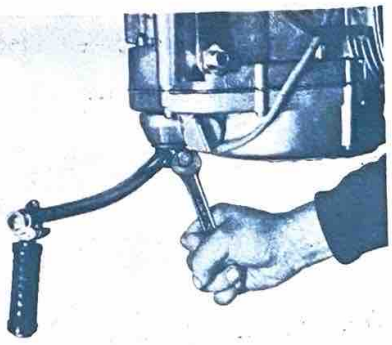


Fig. IV-8-1

2) Remove the pan head screws holding the crankcase cover, and then remove the case cover. (The cover can be removed without taking off the oil pump.)

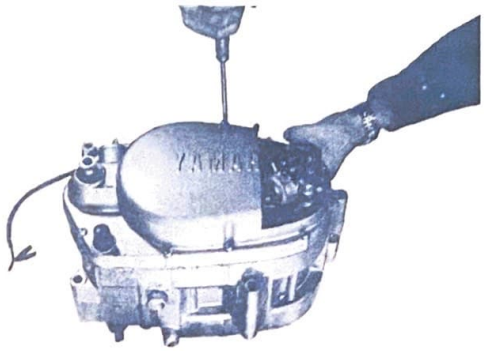


Fig. IV-8-2

3) Remove the crankcase cover gasket. And replace it, if damaged.

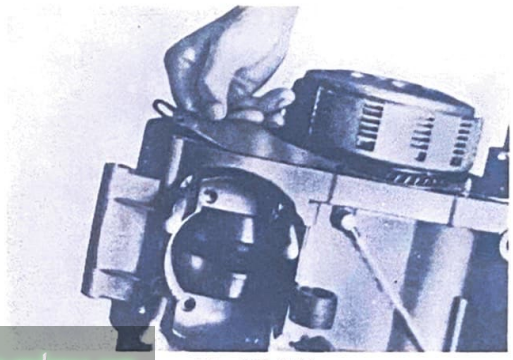


Fig. IV-8-3

B. Installation

Spread YAMAHA Bond No.5 over the mating surface of the crankcase R. Place the crankcase cover gasket on the crankcase and apply Yamaha Bond No.5 and replace the crankcase cover R. Be sure to apply YAMAHA Bond No.5 to the mating surface; otherwise, the crankcase will leak.

Note: When installing the crankcase cover(R), make sure that the pump drive gear (made from synthetic resin) is correctly engaged with the primary drive gear.

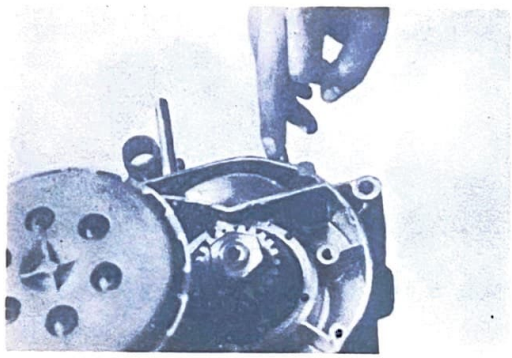


Fig. IV-8-4

IV-9 Clutch

The clutch is a wet, r lti-disc type, consisting of six molded cork friction plates

and eight clutch plates in the clutch housing mounted on the transmission main axle. To disengage the clutch, an inner push rod system is employed. The primary driven gear coupled with the clutch housing is meshed with a kick pinion gear allowing starting by kicking the starter with the clutch disengaged or engaged.
A shock absorber consisting of coil springs is between the primary driven gear and the clutch housing.
The primary drive gear has 21 teeth, and the primary driven gear 65 teeth. (Primary reduction ratio……65/21=3.095)

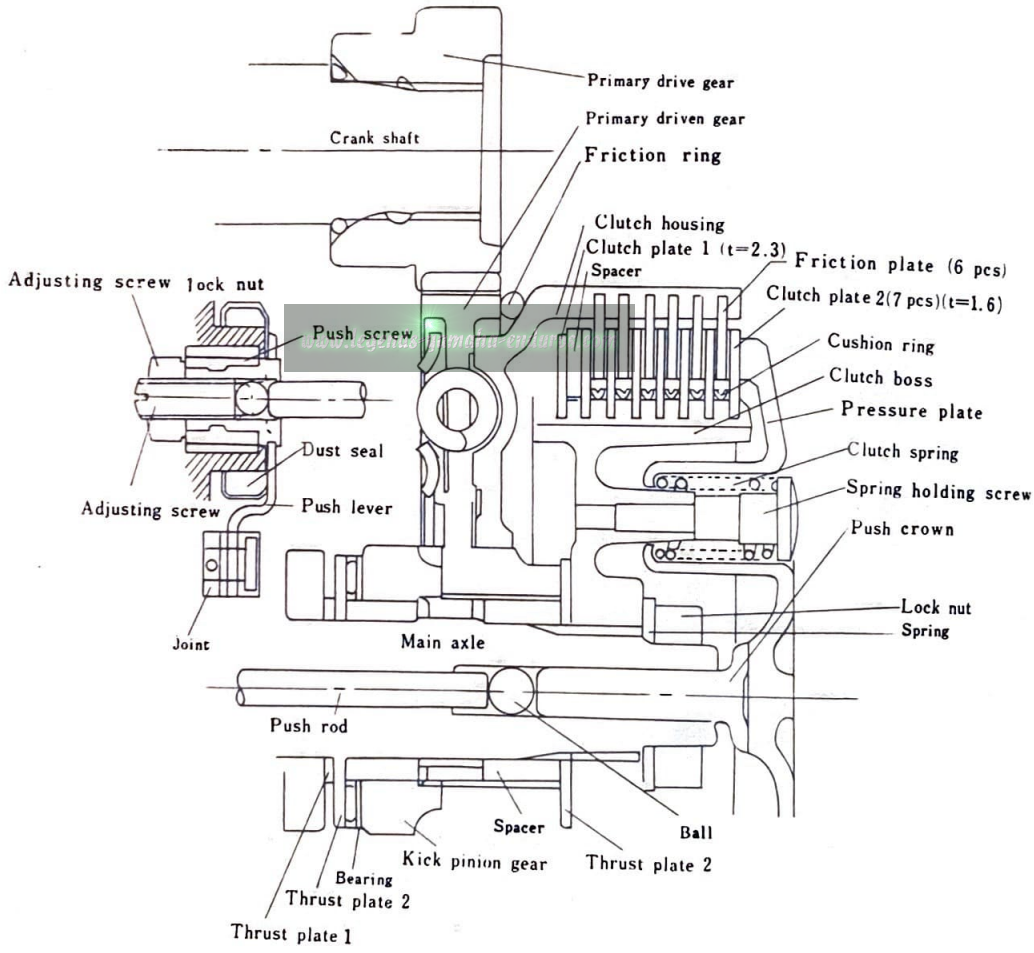
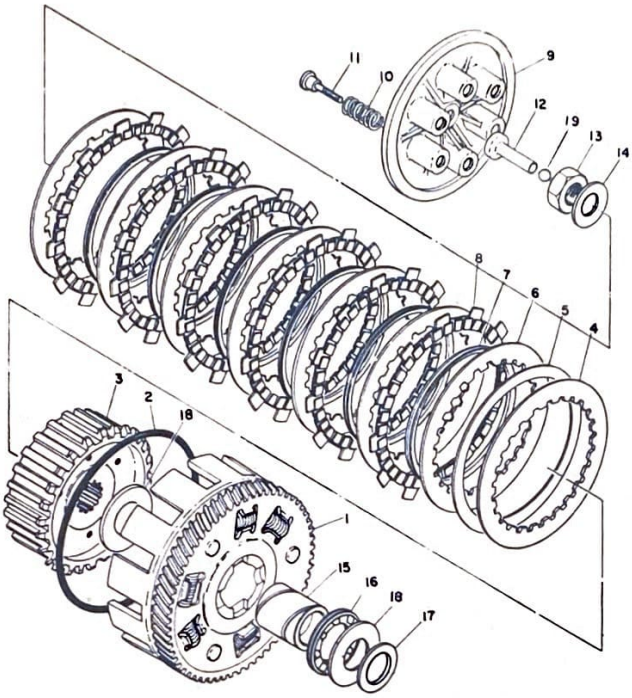


Fig. IV-9-1



1. Primary driven gear complete
2. Oring (Friction ring)
3. Clutch boss
4. Clutch plate 1
5. Spacer
6. Clutch plate 2
7. Cushion ring
8. Friction plate
9. Pressure plate
10. Clutch spring
11. Spring screw (Spring holding screw)
12. Push crown
13. Lock nut
14. Spring
15. Spacer
16. Thrust bearing
17. Thrust plate 2
18. Thrust plate 1
19. Ball

Clutch ass'y exploded view

Fig. IV-9-2

A. Removing the Pressure Plate

Remove the six clutch spring holding screws. and take out the pressure plate and push crown.

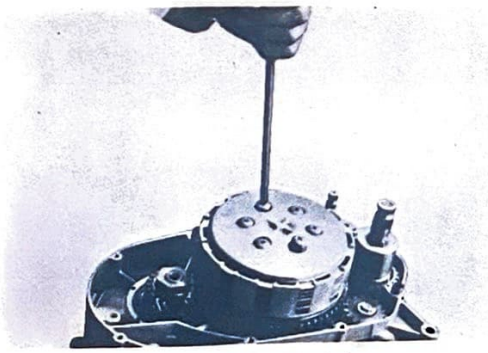


Fig. IV-9-3

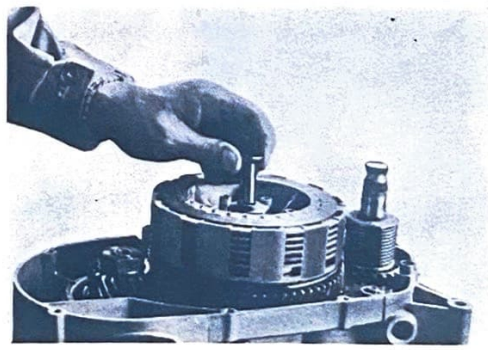


Fig. IV-9-4

B. Removing the Clutch Boss

Install the clutch holding tool (same as YR1, YDS5, YM2) on the clutch boss. Loosen the lock nut, and then remove the cluch boss.

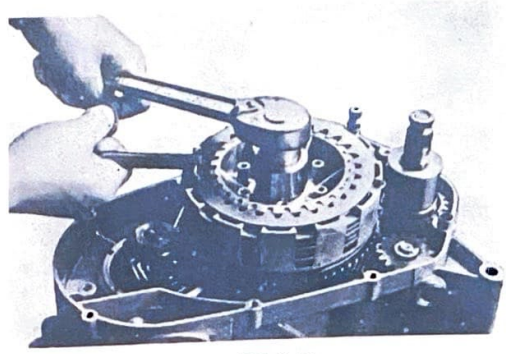


Fig. IV-9-5

C. Checking the Clutch Spring

If the free length of the spring is 1 mm. (0.04 in.) or more shorter than the standard free length, replace it.

Free length 36.4mm. (1.433 in.)

Fig. IV-9-6

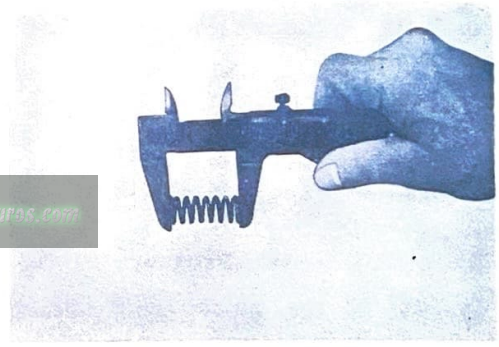


Fig. IV-9-7

D. Checking the Friction Plates

Inspect the friction plates for wear. Replace them if they show 0.3mm. (0.012in.) or more uneven contact.

Standard thickness 3.0mm. (0.118 in.)

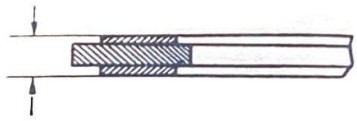


Fig. IV-9-8

Fig. IV-9-9

E. Clutch Housing Assembly(integrated with the primary driven gear).

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

1) Inspection

Insert the primary gear retaining collar (spacer) in the primary driven gear boss and check it for radial play.

If any scratches are found, replace it so it will not impair clutch action.

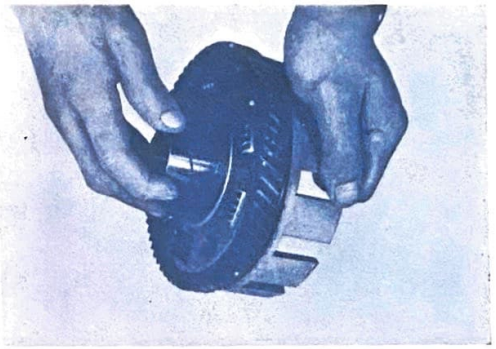


Fig. IV-9-10

If the play is excessive (allowable clearance is between 0.009~0.048mm.), replace the gear retaining collar because it will cause excessive noise.

F. Checking the Primary Gear Retaining Collar (Spacer)

Place the primary gear retaining collar around the main axle and again check it for radial play. If play exists (allowable clearance is between 0.020~0.062mm.) replace the gear retaining collar.

Replace any collar with step-wear on its outer surface.

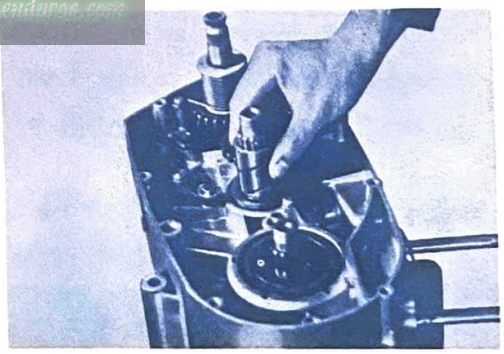


Fig. IV-9-11

G. Fitting Cushion Rings

A cushion ring is installed between each of the clutch bosses and the friction plates to insure even engagement and complete disengagement of the plates. When fitting cusion rings, be sure they are flat and not twisted.

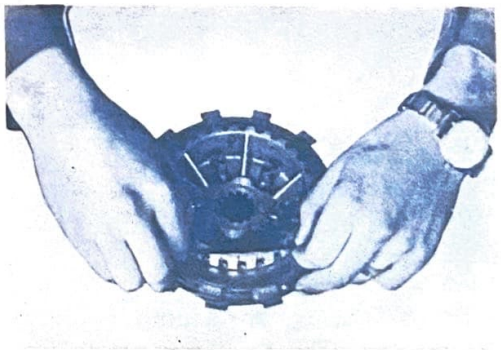


Fig. IV-9-12

H. Checking the Push Rod

Remove the push rod and roll it over a surface plate. If the rod is bent, straighten or replace it.

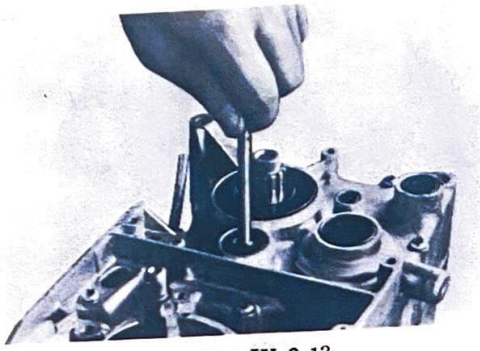


Fig. IV-9-13

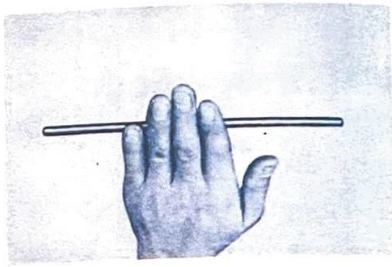


Fig. IV-9-14

I. Caution on Re-assembling the Clutch

On both ends of the primary gear spacer are thrust washers and thrust bearings. If these washers and bearings are incorrectly installed, or omitted, the clutch boss will directly contact with the primary driven gear, impairing clutch action. The thrust bearing assembly fits on the primary retaining collar, but it may slip out of place when installing clutch boss.

Therefore, apply grease to both surfaces of the bearing to make it stick to the gear retaining collar.

Before fitting the clutch boss, install the clutch plates, friction plates, etc., and then install the clutch boss.

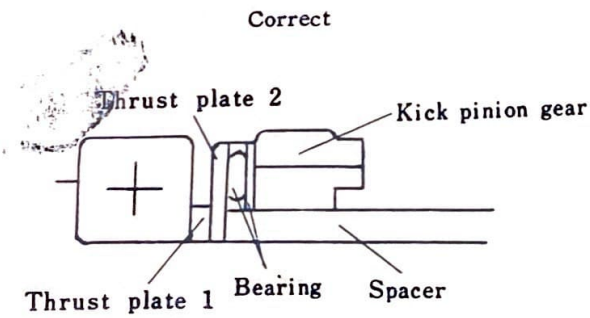


Fig. IV-9-15

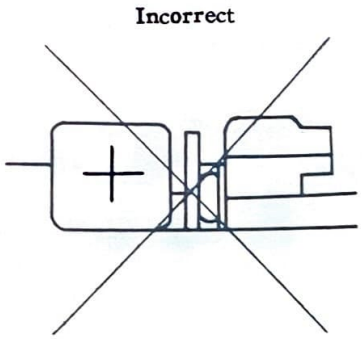


Fig. IV-9-16

J. Adjusting the Clutch

1) Adjusting the Push Screw

Remove the clutch cover and loosen the push screw lock nut. Fasten the push screw to a lightly seated position, and back it off 1/4 turn to set the screw. Then fully tighten the lock nut.

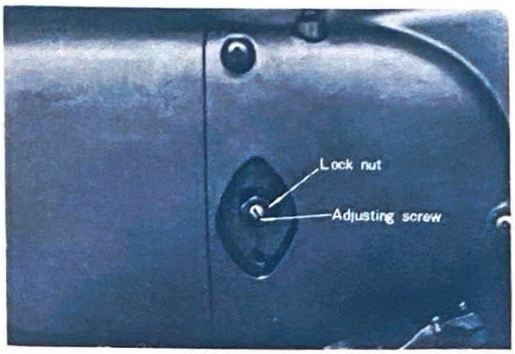


Fig. IV-9-17

2) Adjusting the Clutch Cable Tension

The clutch cable becomes slackened after being used for a long time.

Adjust the cable so that the play of the clutch handle is from 2 to 3 mm. (1/16-1/8 in.)

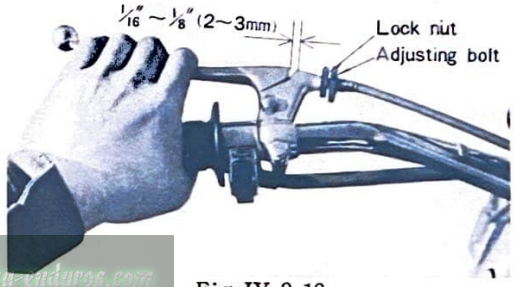


Fig. IV-9-18

IV-10 Primary Drive Gear

A. Removal

Feed a rolled-up rag between the teeth of the primary drive gear and the primary driven gear to lock them, and loosen the primary drive gear lock nut.

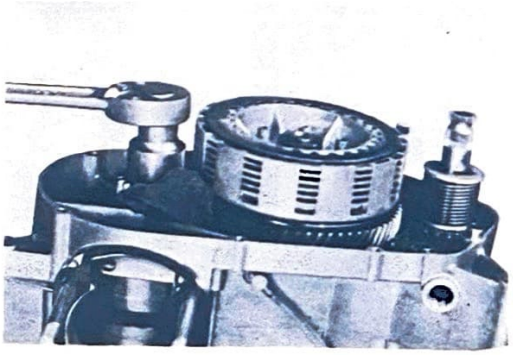


Fig. IV-10-1

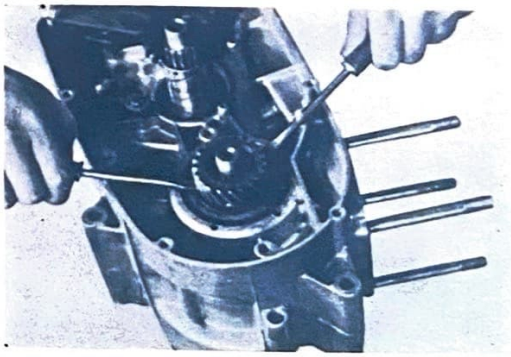


Fig. IV-10-2

IV-11 Kick Starter Mechanism

The kickstarter employs the primary kick system. To start the engine, you just

kick the starter with the clutch disengaged or engaged. The ability to start the engine with the clutch disengaged can be a great advantage when racing. The kick gear is driven the same way the YR1. When take kick shaft rotates, the racket wheel is disengaged from the rachet wheel guide and meshes with the kick gear. The rotation of the kick gear is transmitted through the idler gear to the kick pinion that is engaged with the primary driven gear.

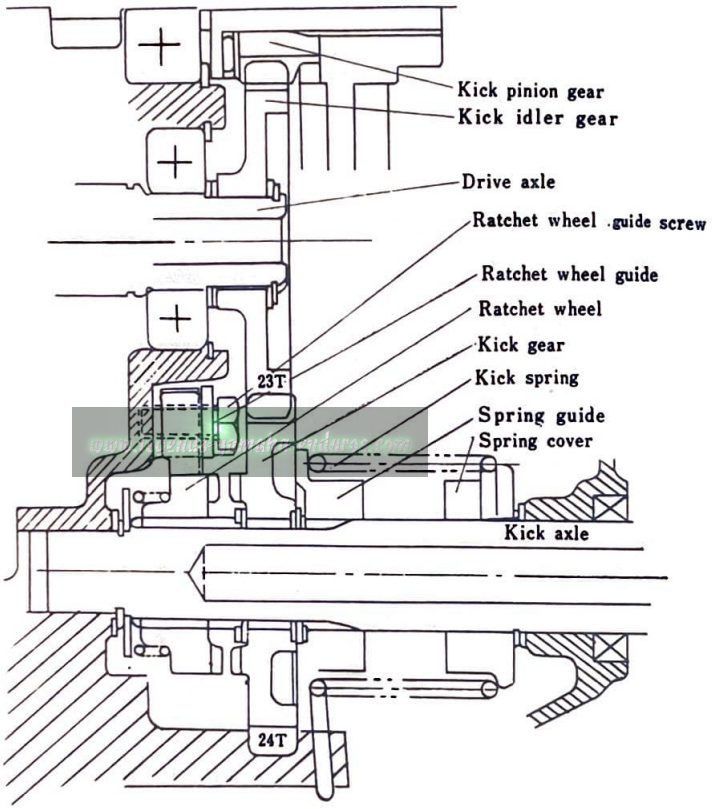
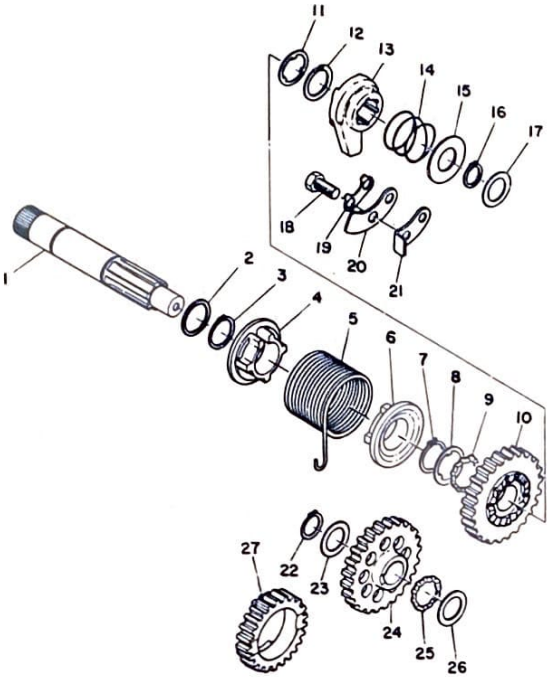


Fig. IV-11-1



1. Kick axle
2. Shim 2
3. Circlip
4. Spring cover
5. Kick spring
6. Spring guide
7. Circlip
8. Washer
9. Wave washer
10. Kick gear
11. Washer
12. Clip
13. Rachet wheel
14. Rachet wheel spring
15. Spring cover
16. Circlip
17. Shim 1
18. Rachet wheel guide screw
19. Lock washer
20. Rachet wheel guide
21. Stopper
22. Circlip
23. Shim
24. Kick idler gear
25. Wave washer
26. Shim
27. Kick pinion gear

Fig. IV-11-2

A. Removal

1) Remove the kick spring

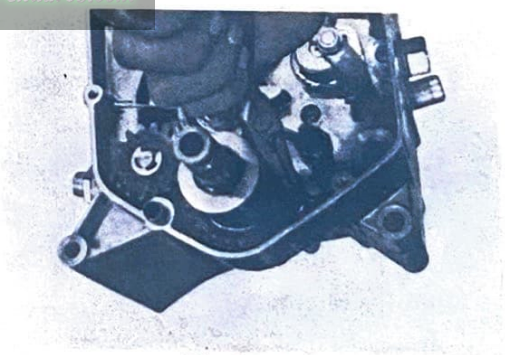


Fig. IV-11-3

2) Then remove the kick starter assembly

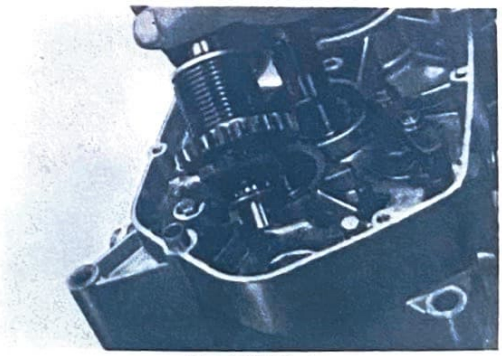


Fig. IV-11-4

B. Reverse the sequence for reinstallation.

Notes on Assembling

1) Align the marking on the kick starter axle with that of the racket wheel.

2) When installing the kick starter ass'y in the crank case, slide the rachet wheel pawl over the racket wheel guide toward the stopper attached to the case. Make sure that the pawl is in close contact with the stopper. Then pull the spring forward and hook it on the stopper.

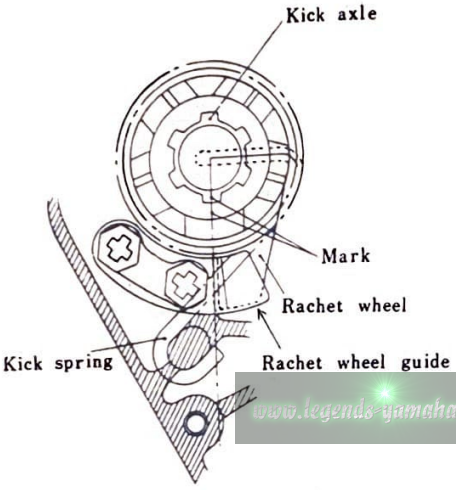


Fig. IV-11-5

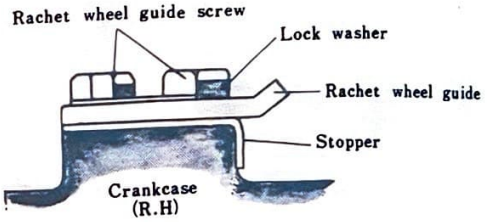


Fig. IV-11-6

C. Removing the Kick Idler Gear

Remove the circlip with clip pliers, and then the kick idler gear can be easily removed.

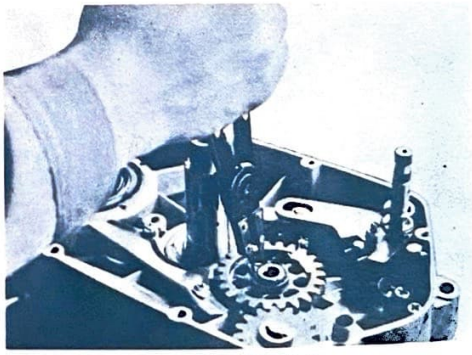


Fig. IV-11-7

D. Removing the Tachometer Drive Gear

The tachometer drive gear is engaged with the kick idler gear to convey the revolutions per minute of the crankshaft to the tachometer through the tachometer cable.

Remove the clip with pliers and the tachometer drive gear can be removed.

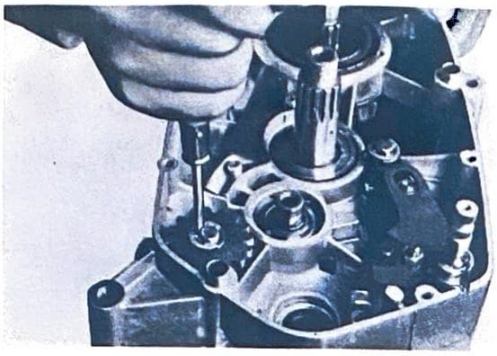


Fig. IV-11-8

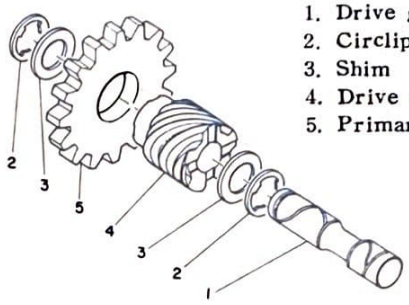


Fig. IV-11-9

IV-12 Shift Mechanism

The DT1 Enduro has been designed to allow the owner to convert it to an optimum output competition machine by installing Yamaha's GYT parts. Therefore, the machine in standard form has been constructed to assure smooth and accurate gear shifting by using an already proven shifting mechanism.

The shift cam drum has one shift fork and two other shift forks are installed on a guide bar located parallel to the cam drum. These three shift forks slide back and forth in the slotted guides that are grooved in the shift drum. A safety device has been provided to prevent the shifter from by-passing the next gear when a quick or hard shift is made. This provides dependability and assurance for correct shifting for the desired gear even under the roughest conditions such as competition racing. A see-saw type shifting arrangement is used that enables the rider to shift quickly and easily down for the lower gears and up for the higher gears. Neutral position is located between first and second gears.

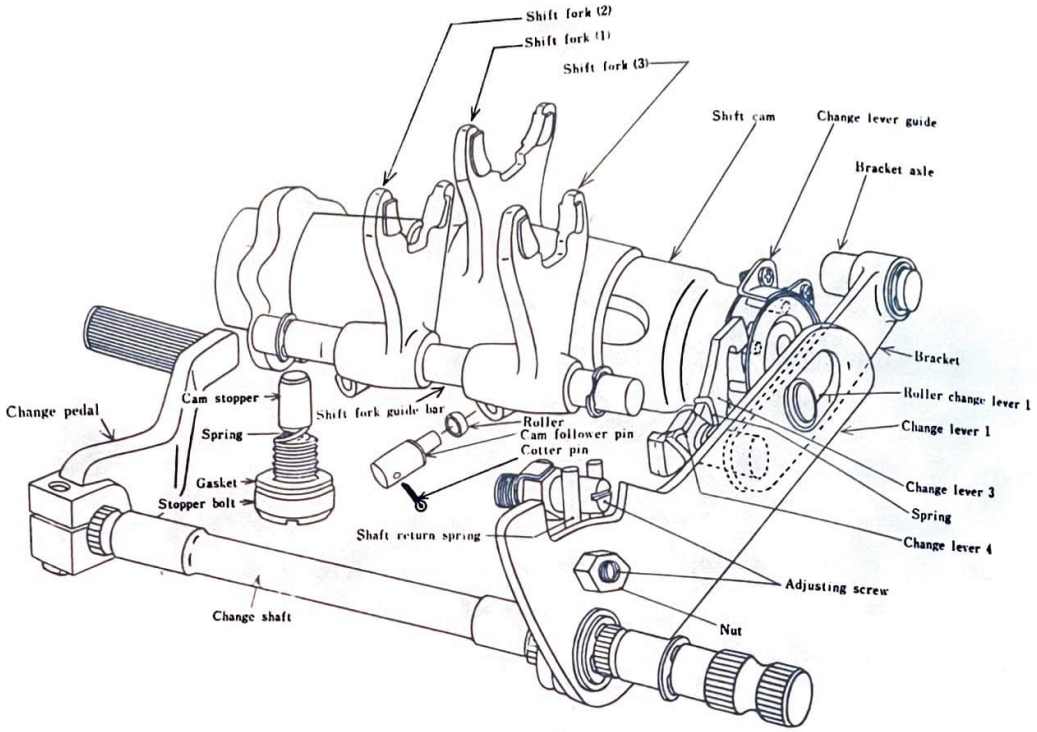


Fig. IV-12-1

A. Removing the Change Axle Assembly

1) Remove the change axle sealing boot.

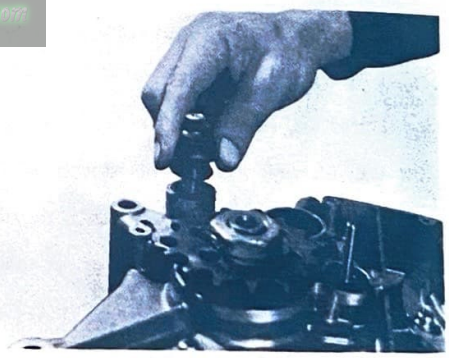


Fig. IV-12-2

2) Pull out the change shaft assembly.

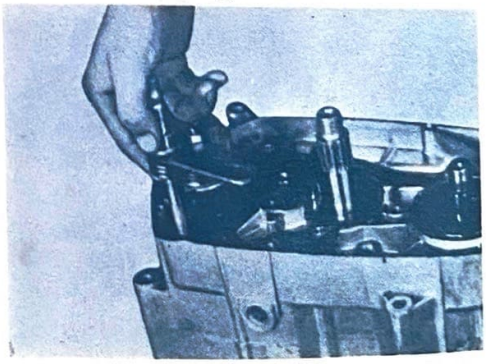


Fig. IV-12-3

B. Checking the Gear Shift Parts

1) Check the gear shift return spring. A broken or fatigued gear shift return spring will impair the return action of the shifting mechanism.

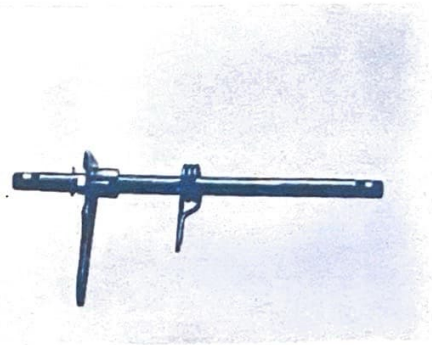


Fig. IV-12-4

C. Removing the Change Lever 3 and 4

Remove the clip with slot-head screw driver, and the change lever can be removed.

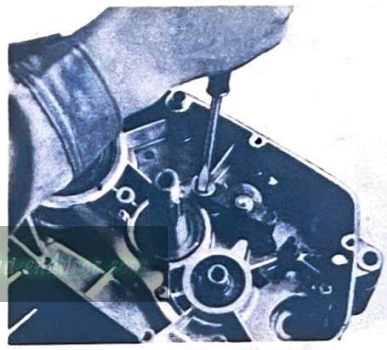


Fig. IV-12-5

D. Checking the Change Lever Spring

Check for a fatigued or broken change lever spring. A faulty change lever spring may result in an improper shifting sequence.

E. Gear Change Adjustment

1) Fully remove the gear change lever up and down and turn the adjusting bolt (eccentric bolt) on the case so that the clearance (a) will become even with the clearance (a'). (a) is the clearance between the bent part of change lever 3 and the stopper (shaded area in the drawing) and (a') is the clearance between the bent part of the stopper is a device for preventing the shifter from overrunning the correct position. After the adjustment, lock the adjusting bolt with the lock nut.
2) Next turn the adjusting bolt (eccentric bolt) on change lever 4 so that the clearance (b) will become even with the clearance (b') on each gear position.

(b) is the clearance between the pin and change lever 4. After the adjustment, lock the adjusting bolt with the lock nut.

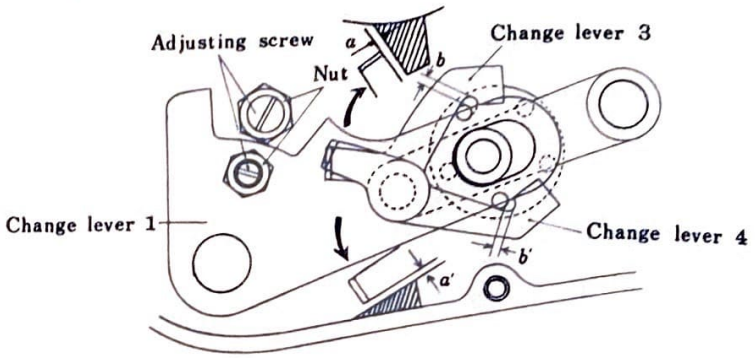


Fig. IV-12-6

IV-13 Drive Sprocket

A. Removal

1) Straighten the bent edge of the lock washer with a screw driver.

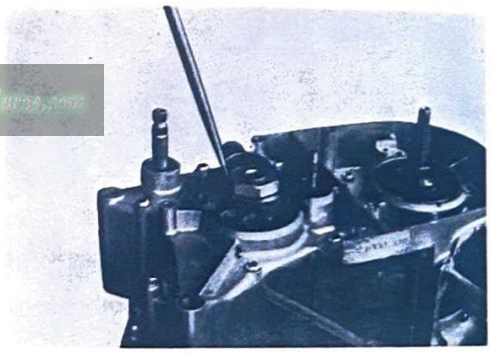


Fig. IV-13-1

2) Keep the drive sprocket from turning with the flywheel magneto holding tool, and remove the sprocket nut.

If the flywheel magneto puller is not available, shift the transmission to low gear, and fit a monkey wrench on the sprocket nut. Then tap the handle of the wrench with a hammer and the shock will loosen the nut.

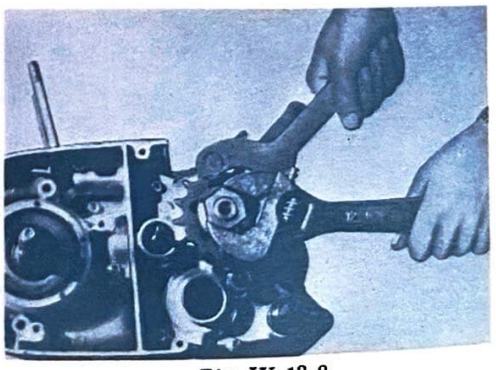


Fig. IV-13-2

3) Remove the distance collar with pliers. (When reinstalling distance collar, apply grease to the oil seal lip groove.)

Fig. IV-13-3

B. Inspection

A worn drive sprocket will result in excessive chain noise, and shorter the life of the chain. Check the sprocket for worn teeth, and replace if they are worn.

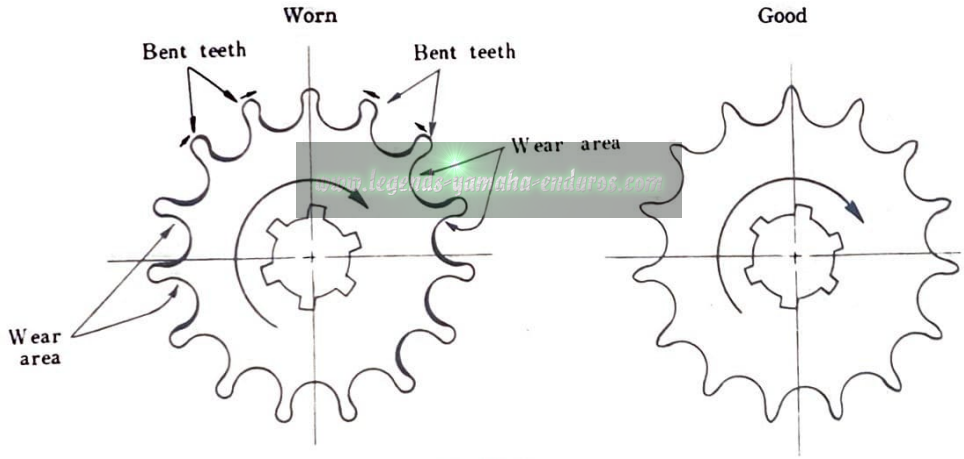


Fig. IV-13-4

IV-14 Crankcase

A. Separating

1) Remove neutral stopper.

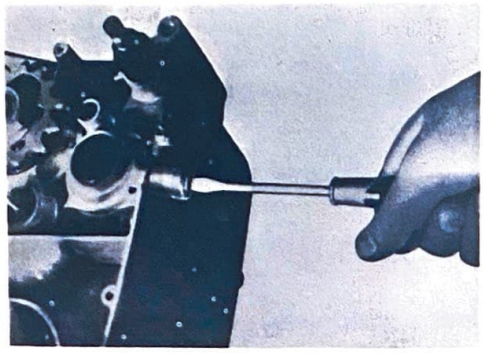


Fig. IV-14-1

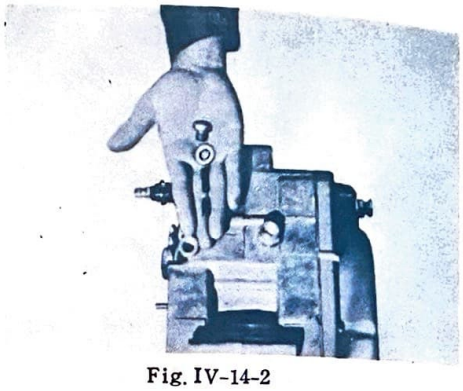


Fig. IV-14-2

2) Remove the change lever guide.

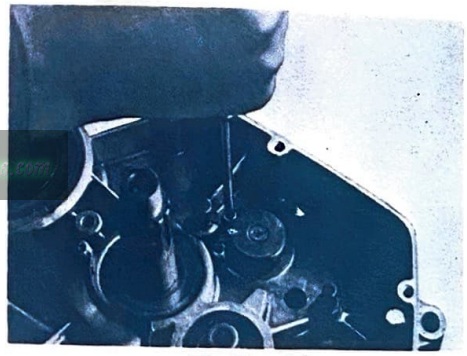


Fig. IV-14-3

3) Remove the pan head screws from the left crankcase.

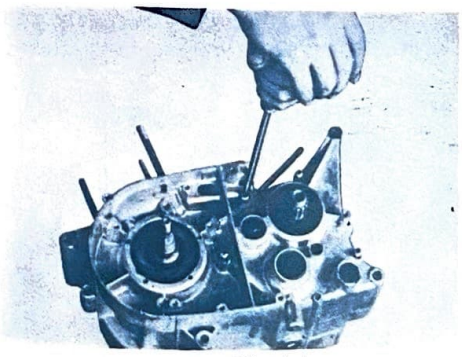


Fig. IV-14-4

4) Install the crankcase separating tool on the right crankcase. Divide the crankcase while tapping the main axle and the crankcase alternately with plastic tip hammer.

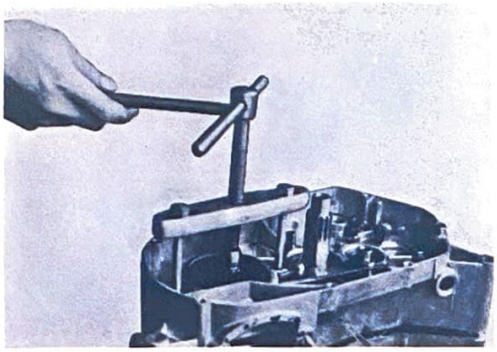


Fig. IV-14-5

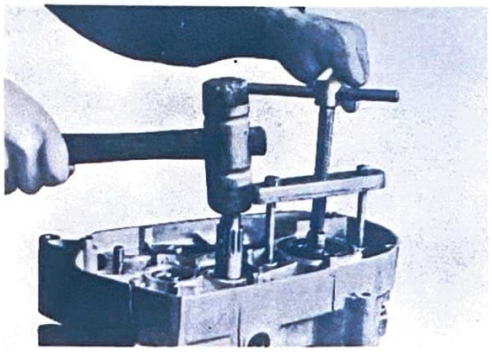


Fig. IV-14-6

Note: Fully tighten the bolts of the crankcase dividing tool, and keep the tool in a horizontal position.

The crankcase is designed to split into tow halves, right and left. To prevent the creep of the boss, in which the crankshaft is supported, a cast-iron insert is fitted in the boss. Only one drain plug is provided for both the transmission and clutch housings. Both housings can be drained at the same time by removing the drain plug.

B. Reassembling

When reassembling the crankcase, be sure to apply YAMAHA BOND No. 5 to the mating surfaces of both halves.

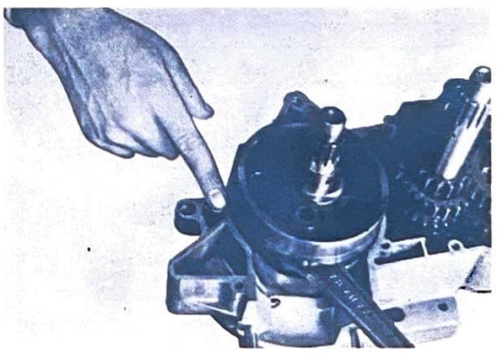


Fig. IV-14-7

IV-15 Transmission Assembly

The constant mesh close ratio 5-speed transmission makes it possible to fully utilize the steady performance of the engine throughout the entire speed range from low to high. The top pinion is similar in type to the third gear wheel, and the third gear pinion is to the top gear wheel.

For layout of the transmission and related parts, refer to Fig. IV-15-1 and 2. The primary reduction ratio is 65/21=2.933. Therefore the total retuction radios will be;

Primary reduction ratio × Transmission gear reduction × Secondary reduction ratio = Total reduction radio.

1st	65/21	× 29/13 × 44/15	= 20.254
2nd	〃	× 26/16 × 〃	= 14.754
3rd	〃	× 23/19 × 〃	= 10.991
4th	〃	× 21/21 × 〃	= 9.079
5th	〃	× 19/23 × 〃	= 7.500

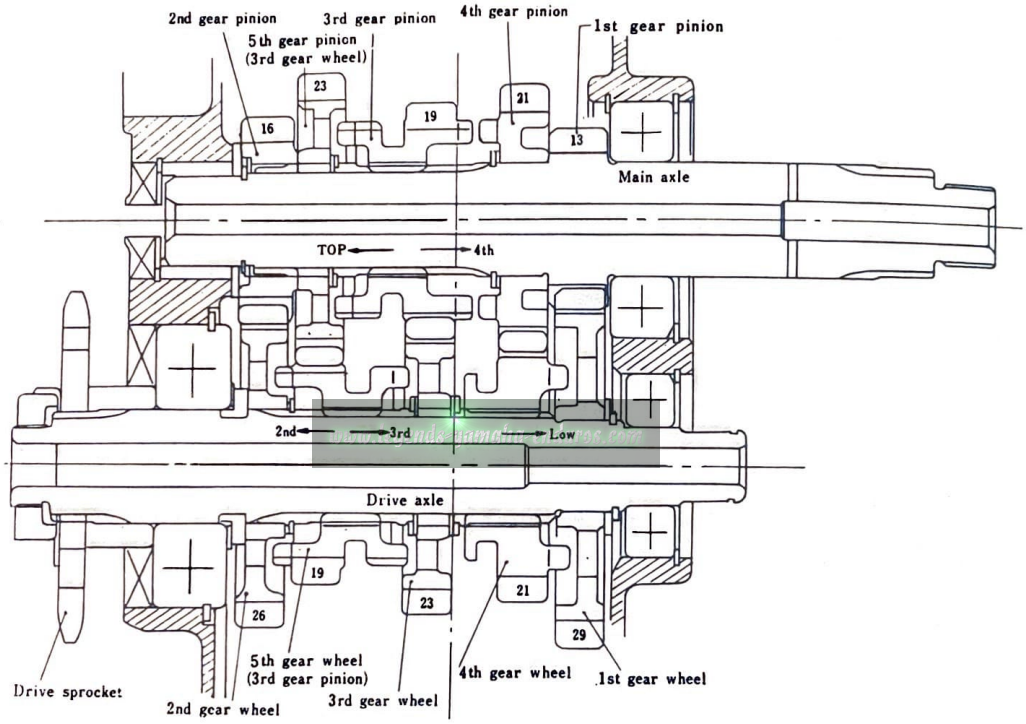
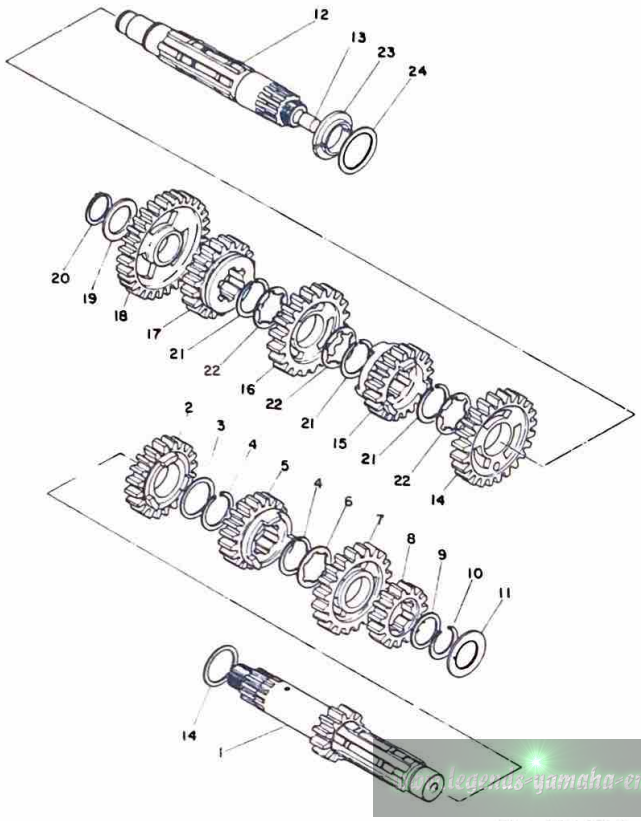


Fig. IV-15-1



Component parts of transmission gear

1. Main axle
2. 4th pinion gear
3. Gear holding washer
4. Circlip
5. 3rd pinion gear
6. Gear holding washer
7. 3rd wheel gear
8. 2nd pinion gear
9. Gear holding washer
10. Circlip
11. Shim
12. Drive axle
13. Blind plug
14. 2nd wheel gear
15. 3rd pinion gear
16. 3rd wheel gear
17. 4th wheel gear
18. 1st wheel gear
19. Gear holding washer
20. Circlip
21. Circlip
22. Gear holding washer
23. Drive anle spacer
24. Drive axle shim

Fig. IV-15-2

A. Removal

Remove the transmission and shifter as a unit. (Fig IV-15-3)

B. Reinstallation

Reinstall the transmission and shifter as a unit in the left crankcase half after they are sub-assembled. They can not be installed separately. The transmission unit must be in neutral during installation.

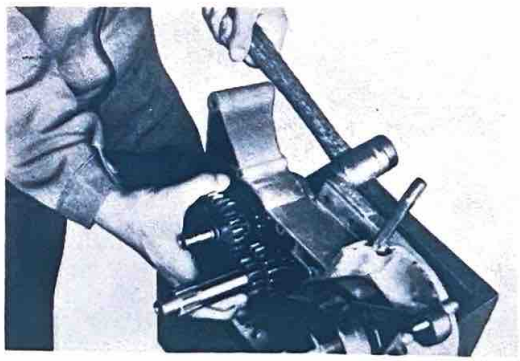


Fig. IV-15-3

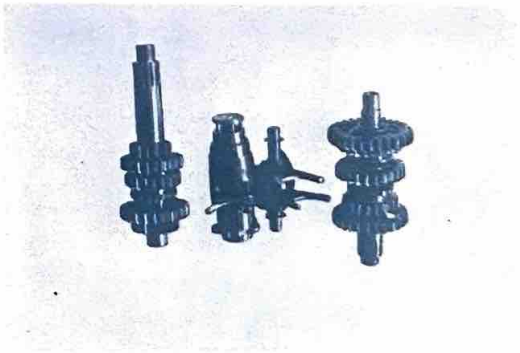


Fig. IV-15-4

IV-16 Crank Shaft

The crank shaft requires the highest degree of accuracy in engineering and servicing of all the engine parts.

The crank shaft is also more susceptible to wear, and therefore, it must be handled with special care.

To increase the inertia force of the crank, the diameter of the crankshaft is increased to 30 mm. (1.18 in.) the thickness of the flywheel to 26 mm. (1.02 in.) and its diameter to 110 mm. (4.33 in.)

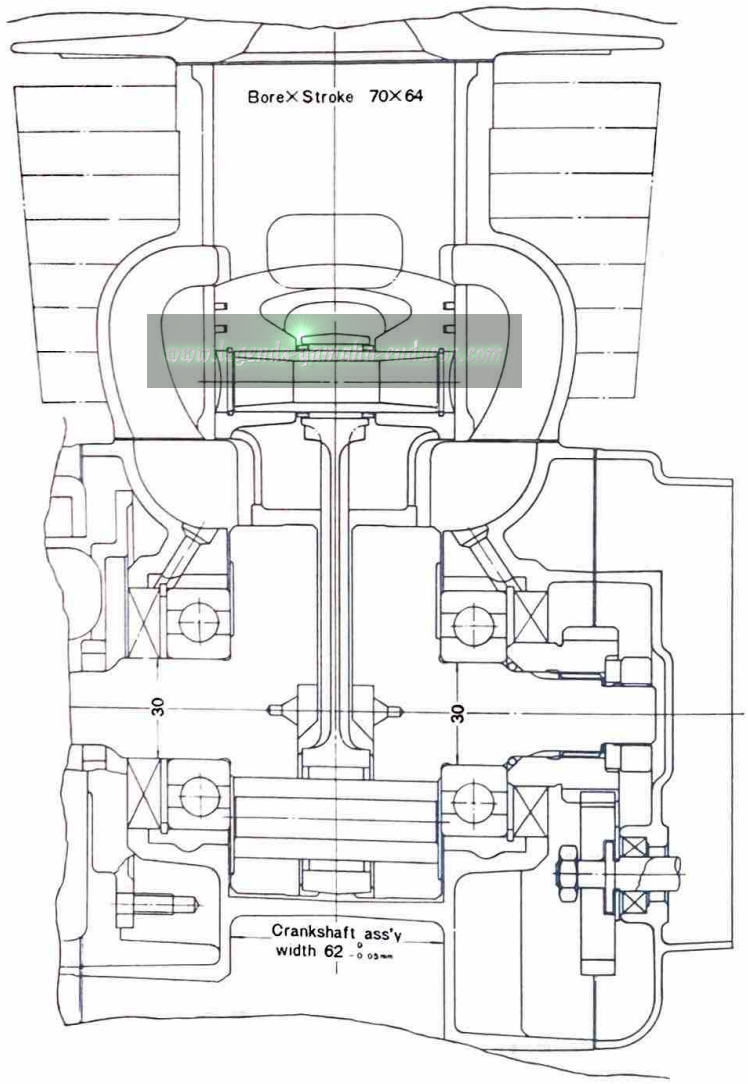
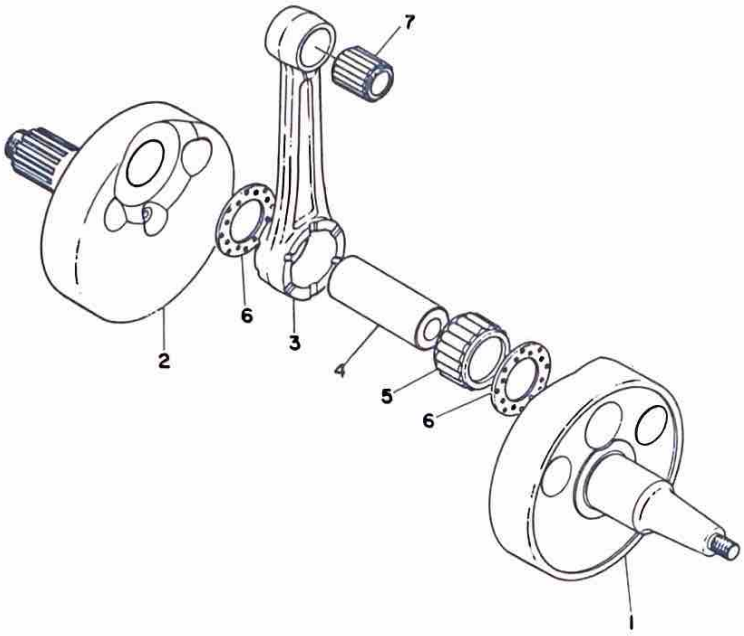


Fig. IV-16-1



1. Crank (L.H.)
2. Crank (R.H.)
3. Connecting rod
4. Crank pin
5. Bearing
6. Crank pin washer
7. Bearing

Crankshaft component parts

Fig. IV-16-2

A. Removing the Crank Shaft Assembly

Remove the crank shaft assembly with the crankcase separating tool.

Note: Fully tighten the bolts of the crankcase dividing tool, and keep the tool in parallel with the crankcase sarface.

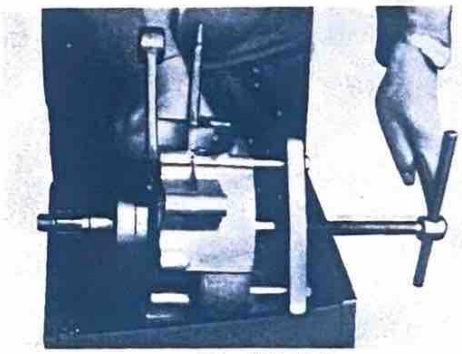


Fig. IV-16-3

B. Installing the Crank Shaft Assembry

Install the crank shaft assembly by using the crank shaft setting tool and the crank fitting spacer.

Hold the connecting rod at top dead center with one hand while turning the handle of the setting tool with the other.

Note: 1) The crank shaft setting tool is same as those used for YG1, and YF1.

2) The crank fitting spacer is required because the crank shaft is larger in diameter. The oil seal is larger in outside diameter than the crank shaft setting tool body.

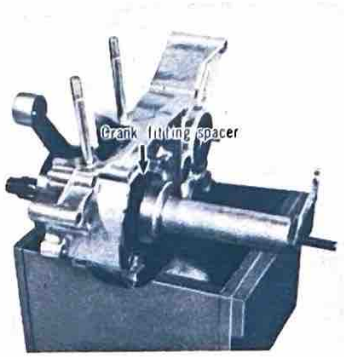


Fig. IV-16-4

C. Inspection and Servicing

1) Checking the crankshaft components

Check connecting rod axial play at small end (to determine the amount of wear of crank pin and bearing at large end) (Fig. IV-16-5)	Small end play should not exceed 2mm. (0.078 in.)	If small end play exceeds 2mm, disassemble the crank shaft, check connecting rod crank pin and large end bearing. Replace defective parts. Small end play after reassembly should be within 0.8–1.0 mm. (0.031~0.04 in.)
Check the connecting rod for axial play at large end. (Fig. IV-16-6)	Move the connecting rod to one side and insert a feeler gauge. Large end axial play should be within 0.4–0.5mm. (0.019 in.)	If excessive axial play is present, (0.6mm or more) disassemble the crank shaft and replace any worn parts.
Check accuracy of the crank shaft ass'y runout. (Misalignment of parts of the crank shaft) (Fig. IV-16-7)	Dial gauge readings should be within 0.03mm. (0.0012 in.)	Correct any misalignment by tapping the flywheel with a brass hammer and by using a wedge.

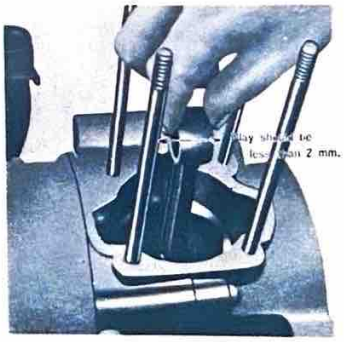


Fig. IV-16-5

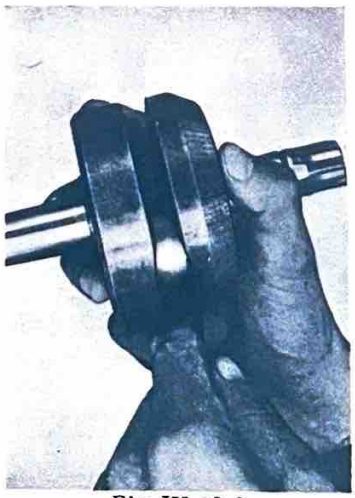


Fig. IV-16-6

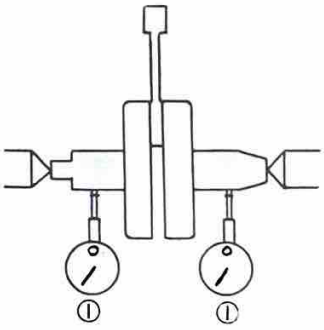
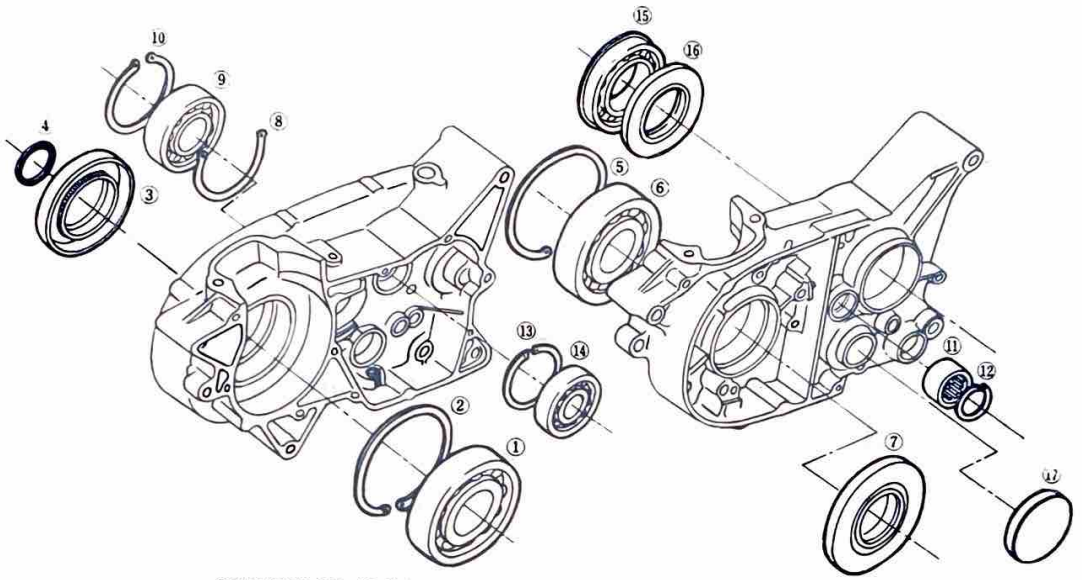


Fig. IV-16-7

VI-17 Bearings and Oil Seals



1. Bearing 6306
2. Circlip R-72
3. Oil seal SW42-72-10
4. O-ring 3.2-24.5
5. Circlip R-72
6. Bearing 6306
7. Oil seal SW30-72-10
8. Circlip 25.1-31-0.3
9. Bearing 6205
10. Circlip
11. Bearing 20-26-16
12. Circlip 25.1-31-0.1
13. Circlip
14. Bearing 6203
15. Bearing 6305NR
16. Oil seal SD-35-62-6

Fig. IV-17-1

1. Removal and Installation

1) Removal

a. Pry the oil seals out of place with a slot head screw driver. Always replace the oil seals when overhauling the engine.

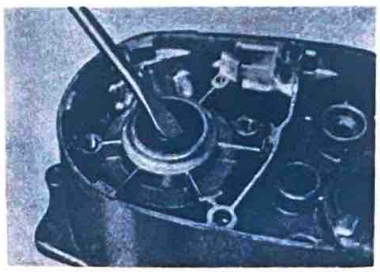


Fig. IV-17-2

b. Remove the bearing with a bearing puller.

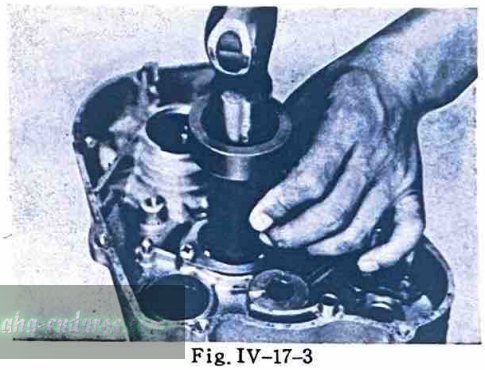


Fig. IV-17-3

2) Installation

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

When installing bearings pack them with grease.

The crankshaft bearing circlip should be installed so that the circlip end gap is aligned with the arrow marked on each of the crankcase halves.

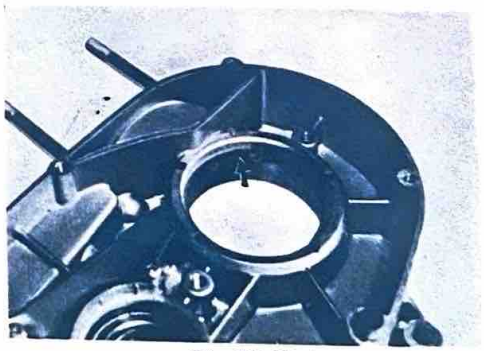
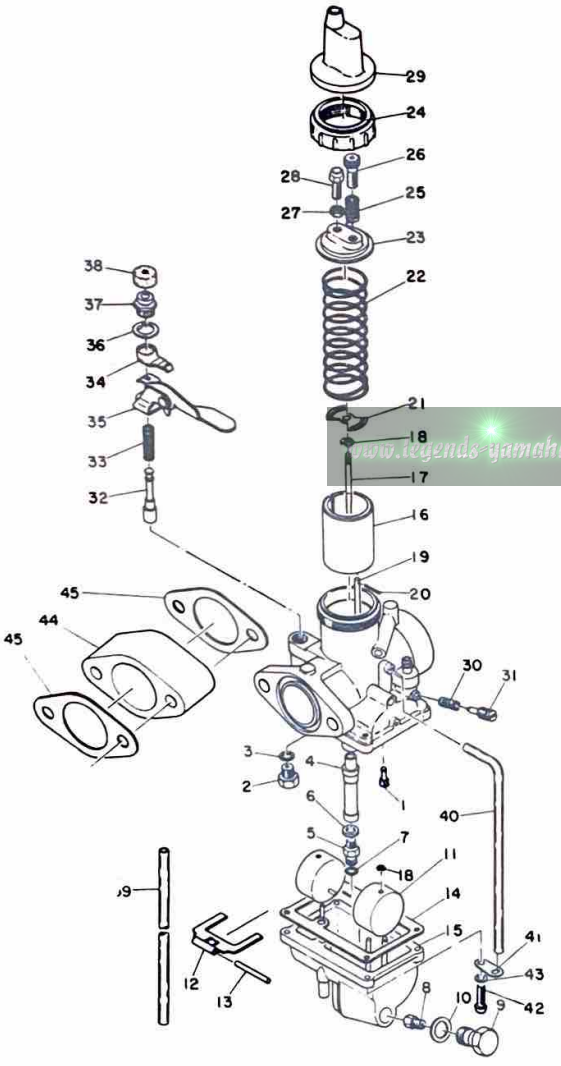


Fig. IV-17-4

IV-18 Carburetor

The standard DT1 is equipped with a VM 26SH 26mm. carburetor that is equipped with a built-in starter jet.

The carburetor is bolted to a 30 mm. thick bakelite insulator that is between the carburetor and cylinder. This insulator provides more than adequate heat insulation. The carburetor floats have been specially designed to keep the float level from fluctuating due to vibration or shock. The main jet is installed in such a manner to provide quick and easy replacement from the outside by merely removing the jet holder on the bottom left side of the carburetor float bowl.



1. Pilot jet
2. Valve seat ass'y
3. Valve seat washer
4. Main nozzle
5. Needle jet setter
6. Needle jet washer
7. O ring
8. Main jet
9. Banjo bolt
10. Gasket
11. Float
12. Float arm
13. Float pin
14. Float chamber gasket
15. Float chamber body
16. Throttle valve
17. Needle
18. Clip
19. Throttle bar
20. Cotter pin
21. Spring seat
22. Throttle valve spring
23. Mixing chamber top
24. Mixing chamber cap
25. Throttle stop spring
26. Throttle screw
27. Wire adjusting nut
28. Wire adjusting screw
29. Cap
30. Air adjusting spring
31. Air adjusting screw
32. Starter plunger
33. Plunger spring
34. Starter lever plate
35. Starter lever
36. Starter lever washer
37. Plunger cap
38. Plunger cap cover
39. Overflow pipe
40. Air vent pipe
41. Plate
42. Pan head screw
43. Spring washer
44. Joint
45. Gasket

Explosion diagram of carburetor

Fig. IV-18-1

A. Checking the Carburetor

1) Float

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

2) Float valve

Replace the float valve if its seating end is worn with a step or if it is scrached. Check the float valve spring for fatigue. Depress the float valve with your finger, and make sure that it properly seats against the valve seat when released. If the float valve spring is weakened, fuel will overflow, flooding the float chamber while the gas is on.

3) Over flowing

If fuel overflows, check the carburetor as described in 1) and 2) above. If neither 1) nor 2) cures the overflowing, it may be caused by dirt or dust in the fuel preventing the float valve from seating properly. If any dirt or dust is found, clean the carburetor, petcock and gas tank.

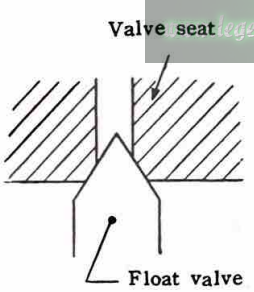


Fig. IV-18-2

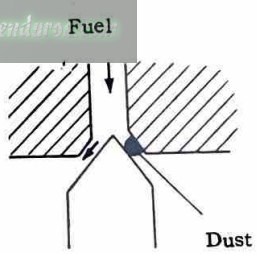


Fig. IV-18-3

4) Cleaning the carburetor

Disassemble the carburetor, and wash all its parts in clean gasoline. Then blow all the parts off with compressed air. All jets and another delicate parts should be cleaned by blowing compressed air through them.

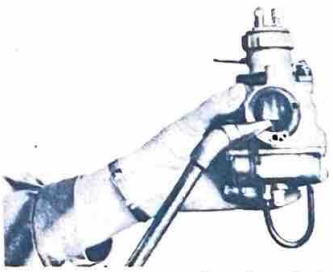


Fig. IV-18-4

B. Float Level Adjustment

The carburetor float level is checked by the Yamaha factory during assembly and testing. But rough riding, worn needle valve, or bent float arm can cause the float level to fluctuate. If the float level raises, this will cause a rich fuel/air mixture that can cause poor performance and spark plug fouling. If the float level decreases, this can cause a lean fuel/air mixture that can result in engine damage. If the machine is subjected to continuous rough riding or many miles of travel, the float level should be checked and set regularly and in the following manner.

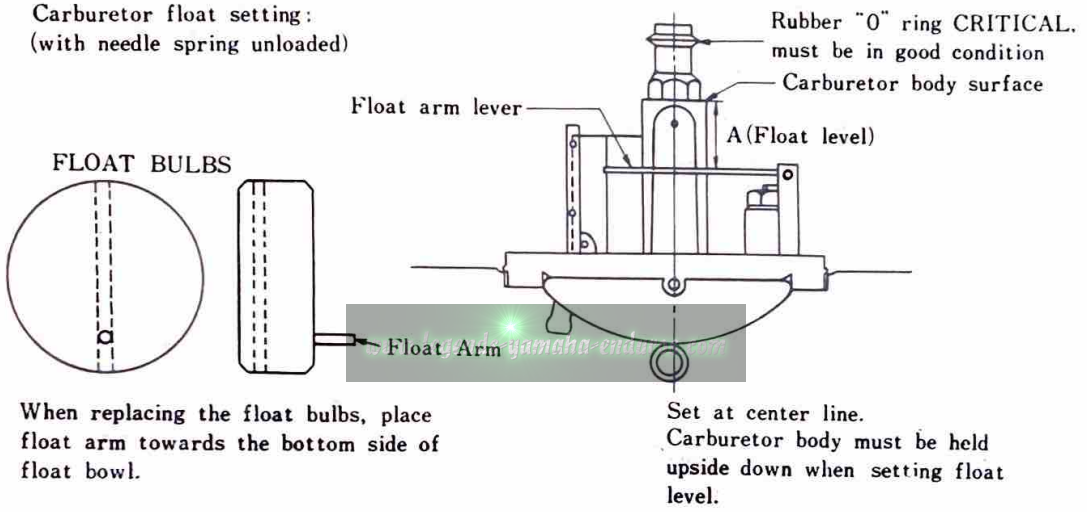


Fig. IV-18-5

1) Remove the float chamber body, and turn over the mixing body. Let the float arm rest on the needle valve with the spring fully expanded.
2) Then measure the distance "A" from the float top to the float chamber joint surface.

   Standard measurement of A:14:1 mm
3) When the A distance measured is less than the recommended bend the tang up. If it is greater, bend the tang down. (with carburetor body up side down.)

C. Idle-speed Adjustment

Warm-up the engine before starting idle-speed adjustment.

1) Start the engine.
2) Turn the throttle stop screw in, and slightly increase engine speed.
3) Back out the pilot air screw slowly to increase the engine speed. Set the pilot air screw, when the engine speed is raised to maximum.

4) Back out the throttle stop screw to decrease the engine speed. Turn the pilot air screw in or out, and set it when the engine speed is at maximum. Repeat this operation twice or so, and the correct idling speed can be obtained.

D. Carburetor Setting Table

Name of Parts	Abbreviation	Specifications
Main jet	M.J.	150(Eng. ♯2921 up use♯160M. J.)
Needle jet	N. J.	0-2
Jet needle	J. N.	5D1-3 stages
Pilot jet	P. J.	35
Starter jet	G. S.	60
Throttle valve cut away	C. A.	2.5
Air screw setting	A. S.	1½
Idlilng speed	—	1,300±100 r. p. m

IV-19 Air Cleaner

A. Removal

To remove the air filter, open the seat cover and remove four air cleaner mounting screws. Then the element can be removed.

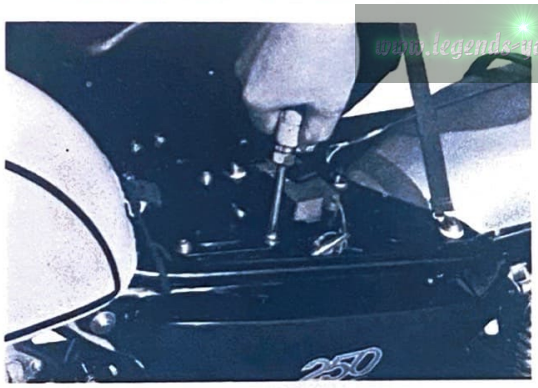


Fig. IV-19-1

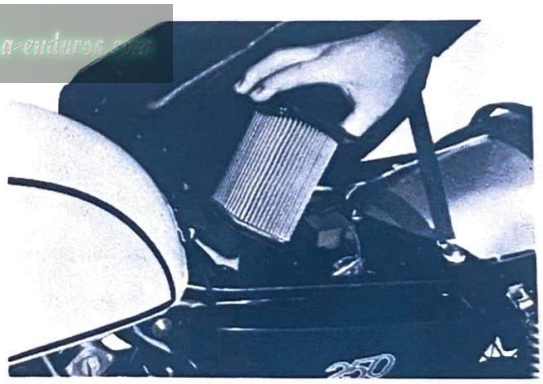


Fig. IV-19-2

B. Cleaning

Clean the filter element with compressed air.

The element is made of filter paper. Keep it from water or oil. An excessive dirty element may be cleaned in gasoline.

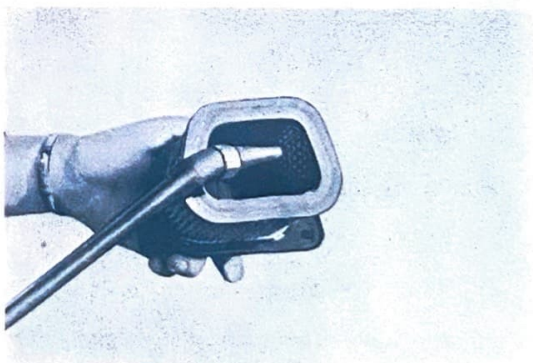


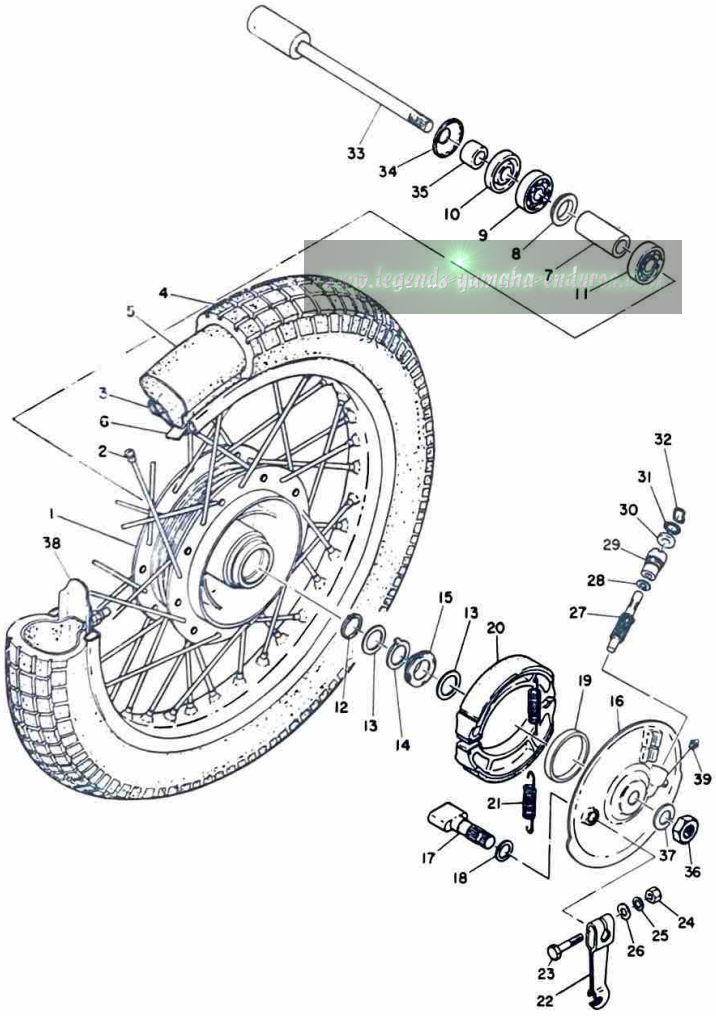
Fig. IV-19-3

Chapter V Chassis

The Yamaha DT1 has been designed for versatility and a combination of uses. It is equipped with all necessary street legal equipment to insure pleasurable road or street riding. This machine can be quickly converted to a competion machine and therefore has been engineered to have a minimum weight factor. Yet with the reduction in weight; rigidity, strength, and safety have been incorporated in the design of the frame to provide an unexcelled competition machine.

V-1 Front Wheel

The 19″ front wheel is equipped standard with a 3.25-19" Trials Universal tire,



Construction

1. Hub
2. Spoke set
3. Rim
4. Front tire
5. Tube
6. Rim band
7. Bearing spacer
8. Spacer flange
9. Bearing
10. Oil seal
11. Bearing
12. Circlip
13. Thrust washer 2
14. Meter clutch
15. Drive gear
16. Brake shoe plate
17. Shaft cam
18. Cam shaft shim
19. Oil seal
20. Brake shoe complete
21. Brake shoe return spring
22. Cam shaft lever
23. Bolt
24. Nut
25. Spring washer
26. Plane washer
27. Meter gear
28. Thrust washer 1
29. Bushing
30. Oil seal
31. O ring
32. Stop ring
33. Wheel shaft
34. Hub dust cover
35. Wheel shaft collar
36. Shaft nut
37. Spring washer
38. Bead spacer
39. Grease nipple

Fig. V-1-1

This tire gives the rider assurance of maximum performance and safety for both road riding and trail riding. To insure against tire slippage on the rim, a tire bead lock had been installed in the wheel. The front wheel brake size is 150mm. ×30mm. (5.9×1.18 in.) A labyrinth seal is installed between the wheel hub and brake plate to provide a seal against dust and water.

A. Removal

1) Disconnect the brake cable at the front brake lever.

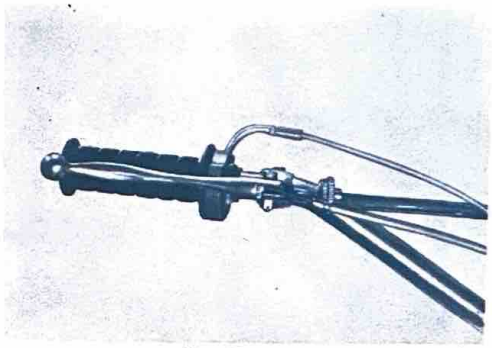


Fig. V-1-2

2) Disconnect both the brake cable and speedometer cable from the front wheel hub plate.

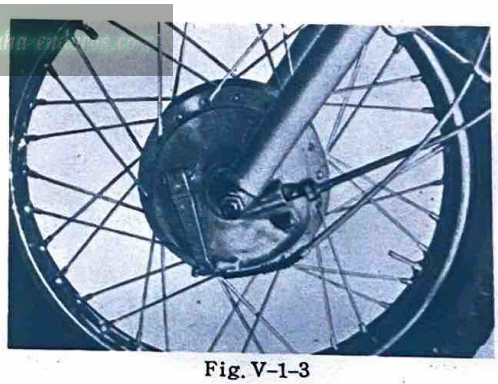


Fig. V-1-3

3) Loosen the front wheel axle lock bolt.

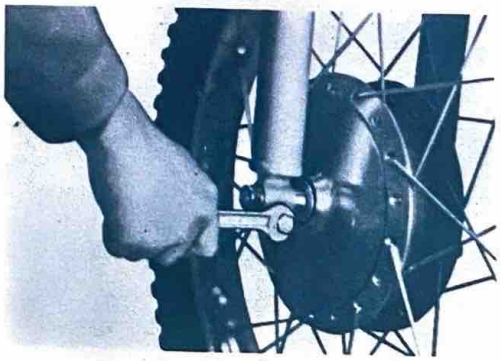


Fig. V-1-4

4) Remove the front wheel nut.

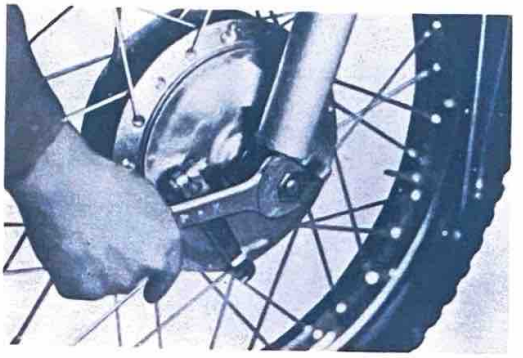


Fig. V-1-5

5) Pull out the front wheel axle by turning it.

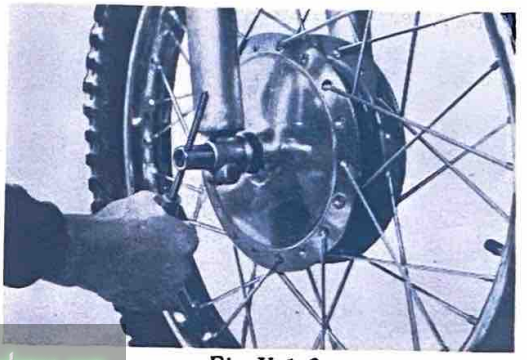


Fig. V-1-6

6) Raise the front of the machine and set it on a box. Then remove the wheel assembly.

Fig. V-1-7

B. Checking

1) Run out of the rim

As show in Fig. V-1-8, measure the runout of the rim with a dial gauge. Runout limits : 2mm. (0. 07 in.) or less.

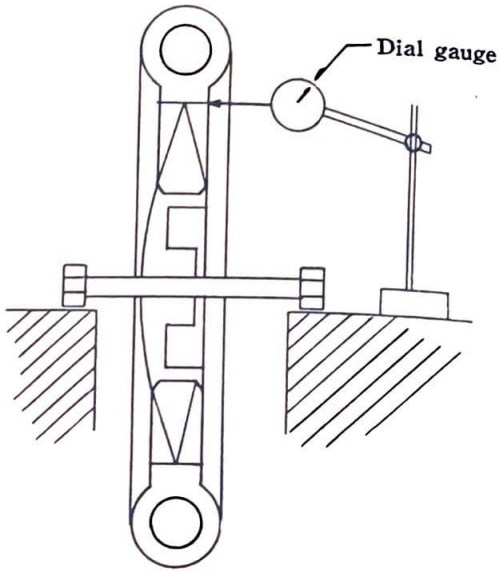


Fig. V-1-8

2) Brake shoe

Measure the outside diameter at the brake shoe with slide capilers. If it measures less than 146 mm. (5.75 in.), replace it. Smooth out a rough shoe surface with sand-paper or with a file.

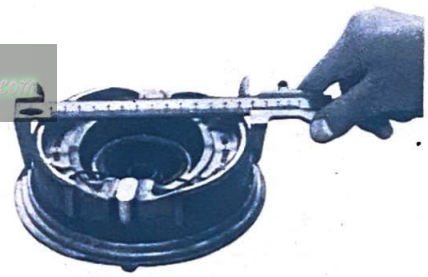


Fig. V-1-9

3) Brake drum

Oil or scratches on the inner surface of the brake drum will impair braking performance or result in abnormal noises. Clean or smooth out the surface with a rag soaked in laquer thinner or with sandpaper.

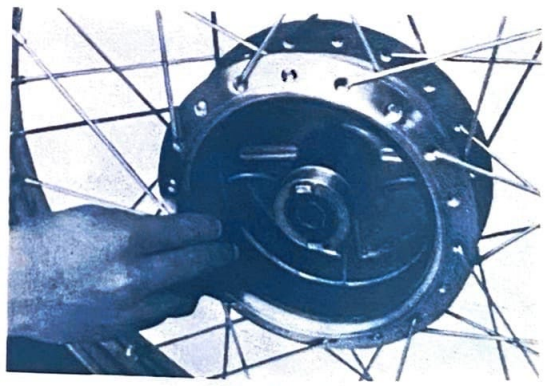


Fig. V-1-10

4) Check the spokes. If they are loose or bent, replace or tighten them. If the machine is ridden in rough country of ten or raced the spokes should be checked

regularly.

5) Repairing the brake shoe
If the brake shoe has uneven contact with the brake drum or scratches, smooth out the surface with sandpaper or hand file.

Fig. V-1-11

6) If the tire is excessively worn replace the tire.
7) Check the tires for damage regularly.
8) If the bearings allow excessive play in the wheel or if it does not turn smoothly, replace the bearing.

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. V-1-13) into the hole located in the center of the bearing spacer, and drive the spacer out from 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. Then 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.).

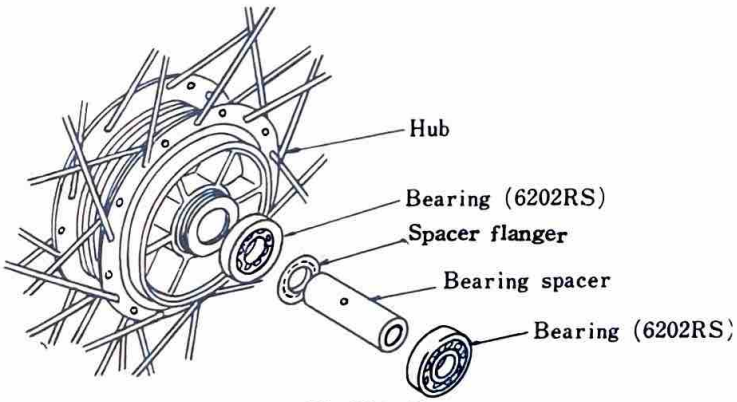


Fig. V-1-12

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

Fig. V-1-13

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. Push out the clutch hub bearing toward the sprocket side by the use of the bearing fitting tool.

f. To install the clutch hub bearing, reverse the above sequence. Before installation, grease the bearing and oil seal.

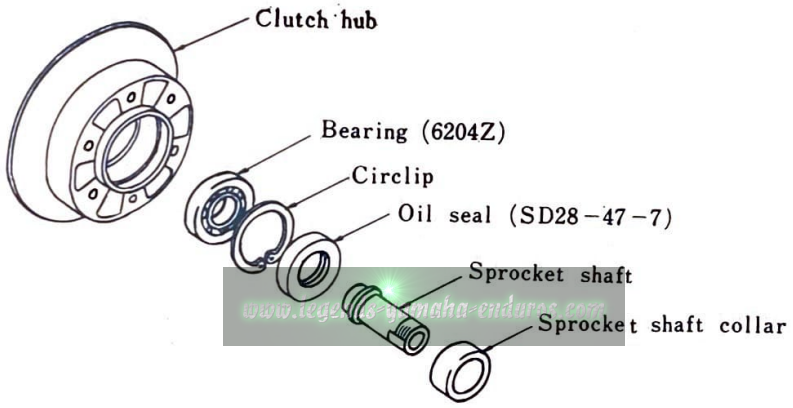


Fig. V-1-14

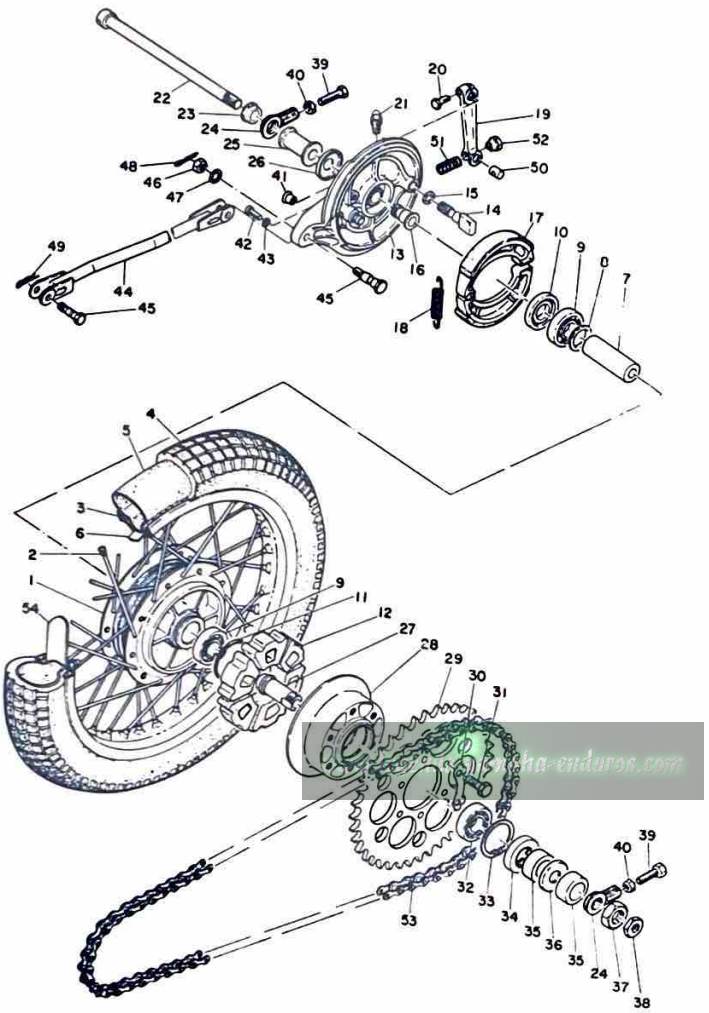
9) Replace a bent or damaged front wheel axle.

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

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

V-2 Rear Wheel

The rear wheel is 18-in. size, and the rear tire is the 4.00-18 Trials Universal. It is also good for road riding. Two rim locks are provided to prevent tire slippage in the rim. The leading trailing type brake is of the 150mm. ×30mm. size. A labyrinth seal between the wheel hub and the brake plate is provided to prevent water and dust leakage. The brake tension bar is of link design to minimize the shifting of the brake cam lever position when the rear swing arm is moving up and down. The rear fender is steel, and rubber mounted on the frame. It is also wide enough to protect the engine unit from dust and water.



1. Hub 2. Spoke set
3. Rim 4. Rear tire
5. Tube 6. Rim band
7. Bearing spacer
8. Spacer flanger
9. Bearing 10. Oil seal
11. O ring
12. Clutch damper
13. Brake shoe plate
14. Shaft cam
15. Cam shaft shim
16. Shaft bushing
17. Brake shoe complete
18. Return spring
19. Cam shaft lever
20. Bolt 21. Grease nipple
22. Wheel shaft
23. Shaft collar
24. Chain puller
25. Wheel shaft collar
26. Plate dust cover
27. Sprocket shaft
28. Hub clutch
29. Sprocket wheel gear
30. Lock washer
31. Fitting bolt
32. Bearing 33. Circlip
34. Oil seal
35. Sprocket shaft collar
36. Dust cover
37. Sprocket shaft nut
38. Shaft nut
39. Chain puller bolt
40. Nut 41. Blind plug
42. Pan head screw
43. Spring washer
44. Tension bar
45. Tension bar bolt
46. Nut 47. Spring washer
48. Cotter pin
49. Tension bar clip
50. Clevis pin
51. Rod spring
52. Adjusting nut
53. Chain 54. Bead spacer

Fig. V-2-1 Rear Wheel Construction

A. Removal

1) Remove the tension bar and brake rod from the rear shoe plate.

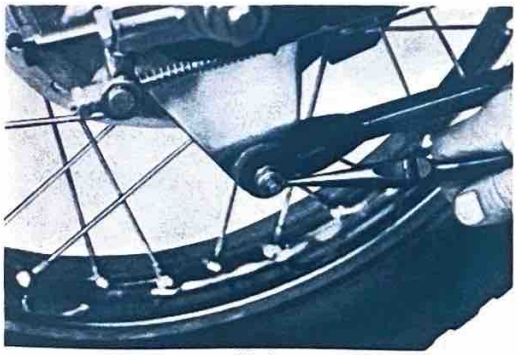


Fig. V-2-2

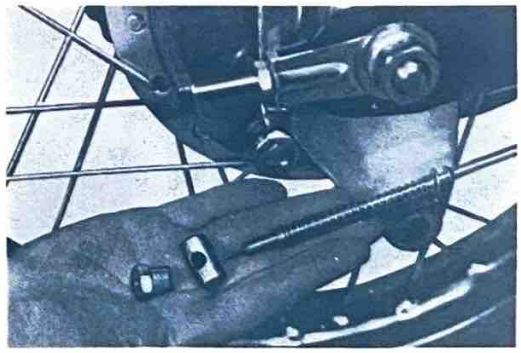


Fig. V-2-3

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

Fig. V-2-4

3) Remove the rear wheel shaft nut.

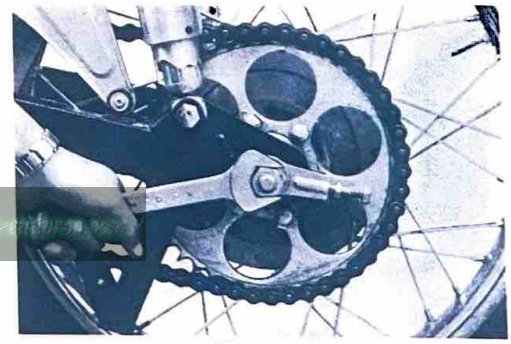


Fig. V-2-5

4) Pull out the rear wheel shaft by striking it with a plastic tip hammer.

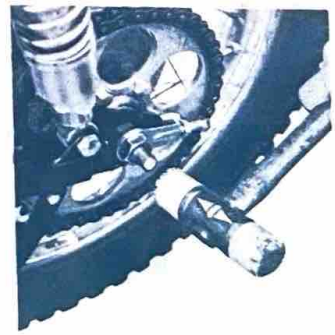


Fig. V-2-6

5) Remove the right-hand chain puller and distance collar.

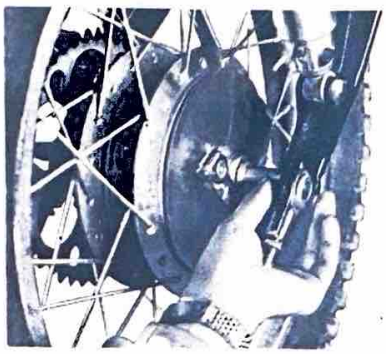


Fig. V-2-7

6) Remove the rear brake plate.

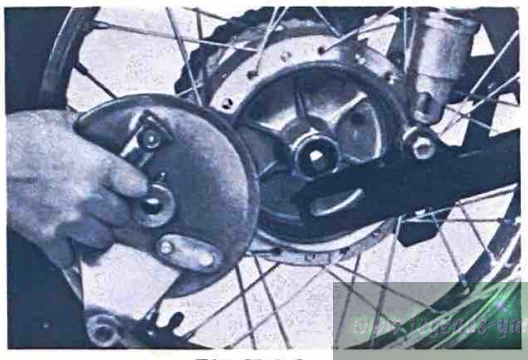


Fig. V-2-8

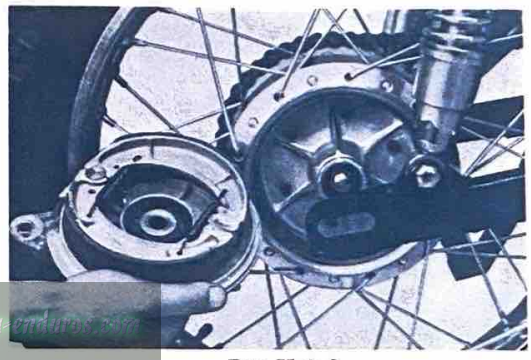


Fig. V-2-9

7) Lean the machine to the left and remove the rear wheel assembly.

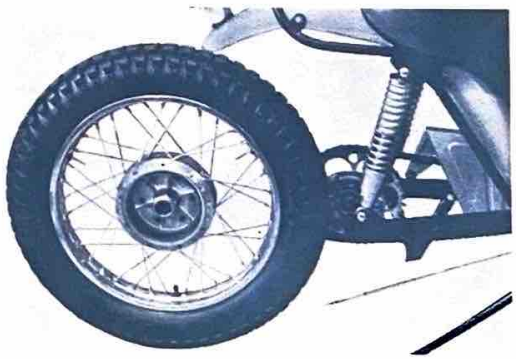


Fig. V-2-10

Replacing Tires

1) Removal

a. Remove the valve cap and lock nut (12 mm.) from the tire valve, and deflate the tire.

b. Loosen the lock nut (10mm.) from the bead spacer. Two bead spacers are provided for the rear wheel, and one is for the front wheel.

c. Push the bead spacer into off the wheel rim.

d. 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.)
It is noted that to remove the inner tube, one side of the tire should be pried out of the wheel rim.

2) Installation

a. Pull the bead spacer toward the wheel rim flange.

b. 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.
Install the tube in over the same side of the rim that the tube is removed from.

c. 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.

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

e. Tighten the bead spacer lock nut.

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

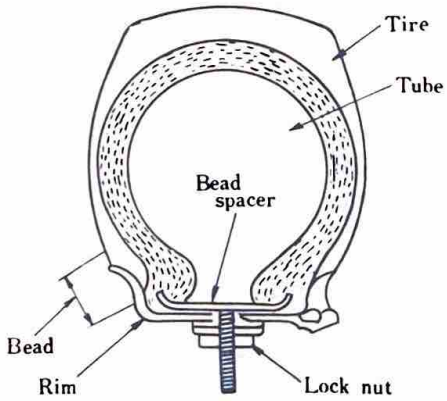


Fig. V-2-11

B. Inspection

1) Runout of the rim

Check the rim for runout in the same way as the front wheel. Maximum limit of runout……2mm. (0.07in.) or less.

2) Brake shoe

Check the brake shoe in the same way as the front wheel. Minimum limit ……140mm. (5.75 in.)

3) Brake drum

Check the brake drum in the same way as the front wheel.

4) The spokes are measured in the same way as the front wheel. A loose spoke should be tightened.

5) If the bearing has a excessive play or it does not turn smoothly, replace it.

6) If the tire or the pattern is worn out, replace the tire.

7) If the lip of the oil seal is damaged or warped, replace it.

V-3 Rear Wheel Sprocket

A. Removal

1) Disconnect the master link of the chain and remove the chain.

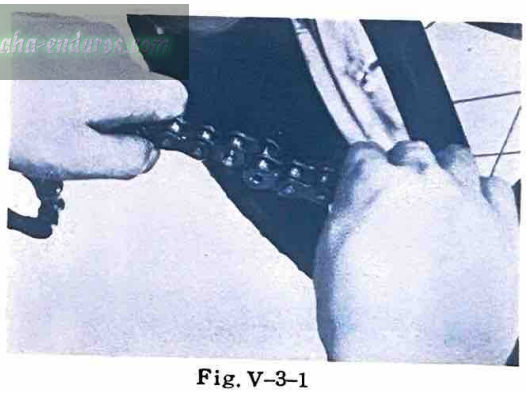


Fig. V-3-1

2) Remove the sprocket shaft nut, and then the sprocket.

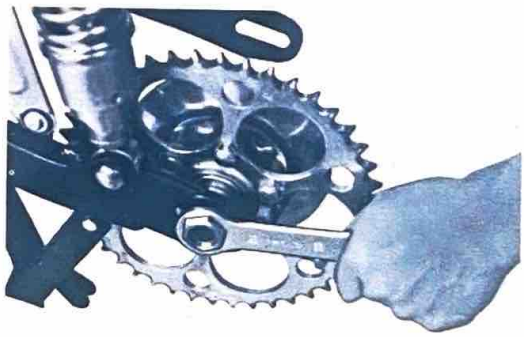


Fig. V-3-2

B. Checking and Adjustment

The rear wheel sprocket is installed on the clutch hub. To replace the sprocket, take the following steps.

1) Removing the sprocket

a. Bend the lock washer ears flat.

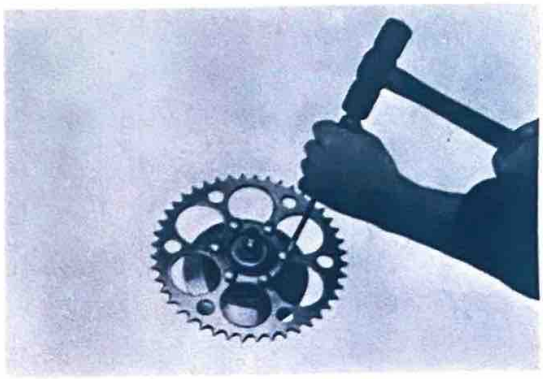


Fig. V-3-3

b. Remove the sprocket mounting bolts.

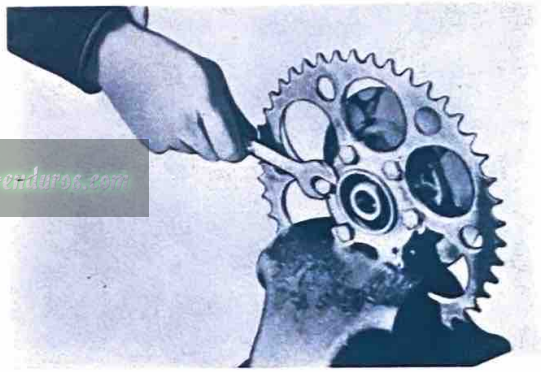


Fig. V-3-4

2) Checking

Check the lock washer and hexagonal bolt for breakage and damage. If the lock washer is not bent over the hexagon bolt head or broken, or the bolt is loose, the sprocket can become loose. Make sure that both lock washers and the mounting bolts are tight.

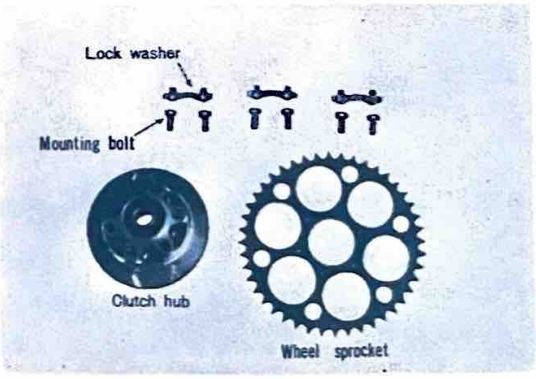


Fig. V-3-5

V-4 Tires and Tubes

1) Normal tire pressure

Though tire pressure is the rider's choice, the standard tire pressure is as

follows.

a. On-the-road riding

Front·····13 lbs. /in². (0.9kg. /cm².)

Rear ·····16 lbs. /in². (1.1kg. /cm².)

b. Off-the-road riding

Front·····8.5lbs. /in². (0.6kg. /cm².)

Rear ·····10 lbs. /in². (0.7kg. /cm².)

V-5 Front Forks

The DT1 Enduro is equipped with competition designed telescopic double dampening front forks. These specially designed front forks provide excellent riding comfort along with handling superiority. The maximum stroke travel is almost 7 inches (175mm.)

The combination of fork stability and long stroke travel provides safety and handling ease for the rider over even the roughest of terrain. This front fork design also reduces weight, eases maintenance, and gives functional and attractive appearance. The simplicity and dependability of the front forks is provided by the installation of the fork spring inside of the fork tube.

The smoothness of the ride desired can be adjusted with the incorporation of the adjustable air valve on the fork cap bolt. Should a softer ride be desired, the cap bolt air pin should be pushed in and the forks compressed to let air out of the fork tubes. Should a stiffer ride be desired, the cap bolt air pin should be pressed in and the forks extended to their full length and then the air valve released.

A. Removal

1) Remove the front fender

The light-weight aluminum front fender is rubber-mounted on the stay.

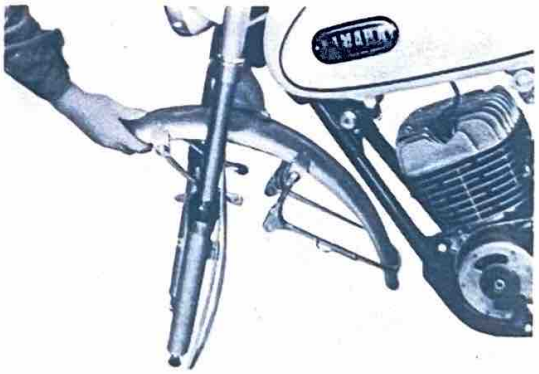


Fig. V-5-1

2) Remove the inner tube cap bolt. Loosening the arrow marked bolt will ease the cap bolt removal.

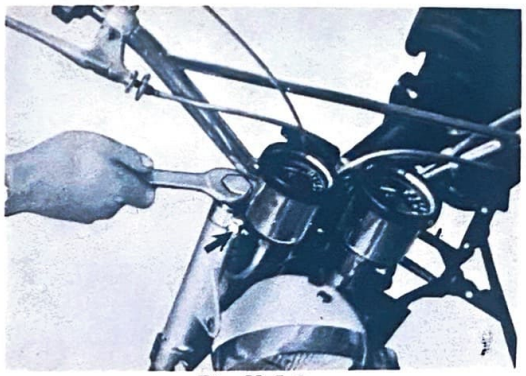


Fig. V-5-2

3) Loosen the inner tube damping bolt on the underbracket.

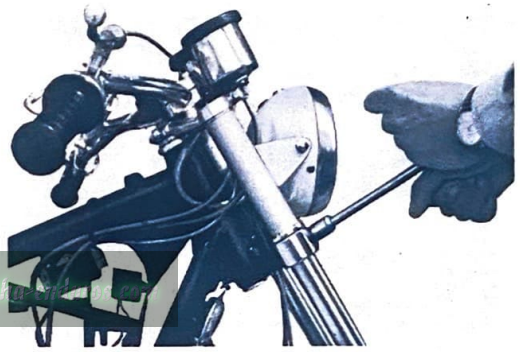


Fig. V-5-3

4) Pull the outer tube downward

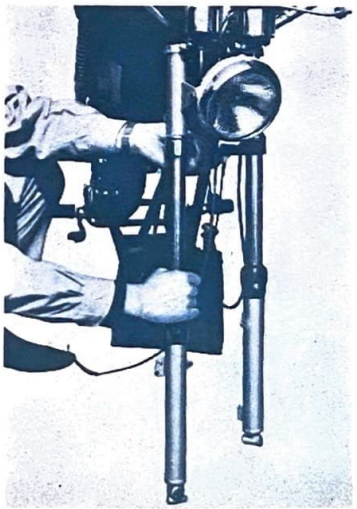


Fig. V-5-4

B. Disassembling the Inner and Outer Tubes

1) Drain the oil from the fork.

Fig. V-5-5

2) Remove the special bolt (arrow marked) from the bottom of the outer tubes.

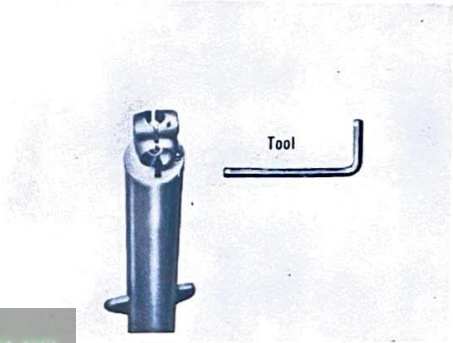


Fig. V-5-6

3) Place a rubber sheet or tire tube around the outer tube nut, and clamp it with a vise.

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

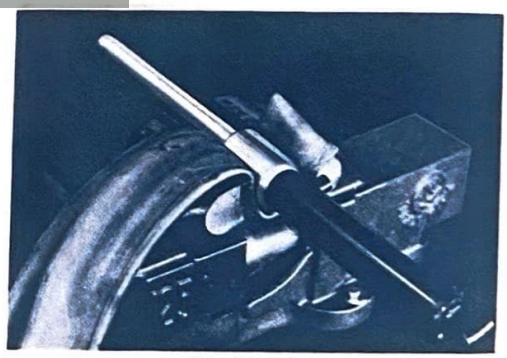


Fig. V-5-7

4) Fit the front wheel shaft in the outer tube, and turn it counter-clockwise. The inner tube can be separated from the outer.

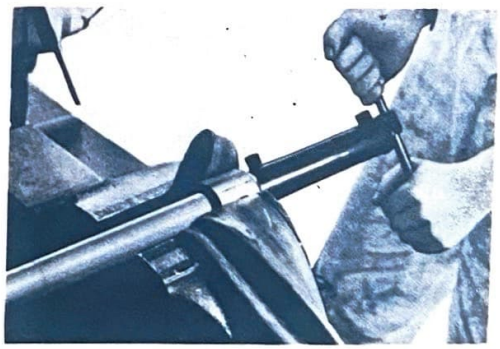
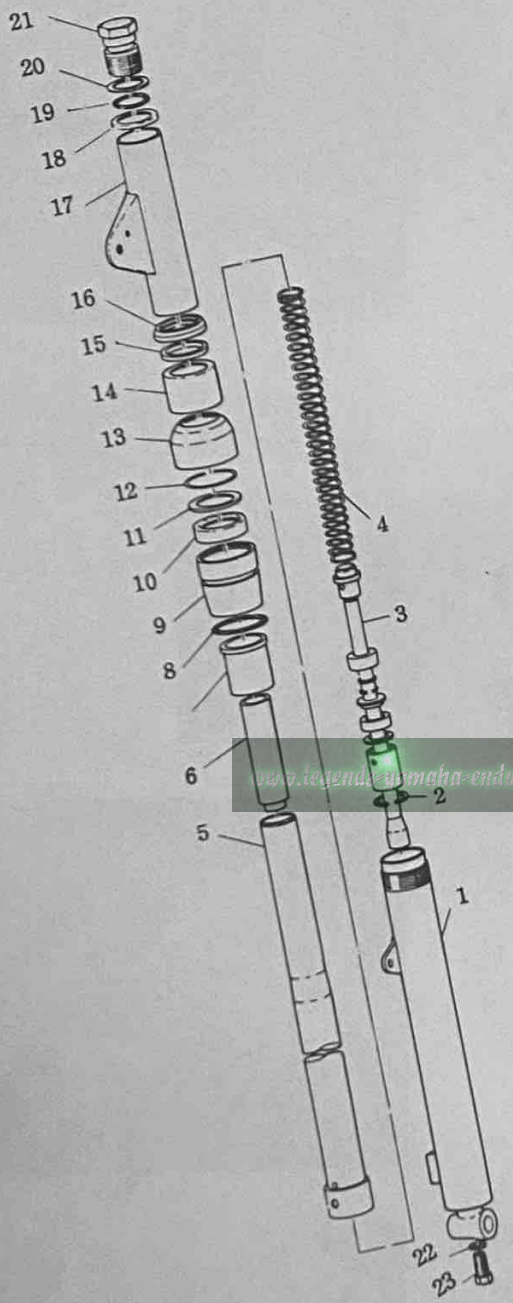


Fig. V-5-8



1. Outer tube
2. Circlip
3. Cylinder complete
4. Fork spring
5. Inner tube
6. Spacer
7. Slide metal
8. O Ring
9. Outer nut
10. Oil seal
11. Oil seal washer
12. Oil seal clip
13. Dust seal
14. Outer cover
15. Packing (lamp stay)
16. Cover under guide
17. Upper cover (L. H.)
18. Cover upper guide
19. Packing (O ring)
20. Cap washer
21. Cap bolt
22. Bolt
23. Packing

Fig. V-5-9 Front Fork Exploded View

C. Checking

1) Inner tube

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

2) Oil seal

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

D. Assembling

1) For assembling the front fork, reverse the order of disassembling. Check if the inner tube slides in and out smoothly.

2) Installing the front fork on the frame

a. Bring up the front fork to the correct position and tighten the under bracket mounting bolt.

Fig. V-5-10

b. Feed front oil into the inner tube through the upper end opening. Front fork oil : Motor oil 10W/30 210c.c. (7.1 oz.) per fork leg.

c. Install the cap bolt.

V-6 Rear Shocks

The rear shocks have a maximum stroke of 90 mm. (3.54in.) The rear cushion features superb damping and 3-position adjustable springs, that allow the rider to adjust the rear shocks to suit any riding condition.

A. Checking the Condition of the Damping Units.

1) Remove the rear shock assembly.

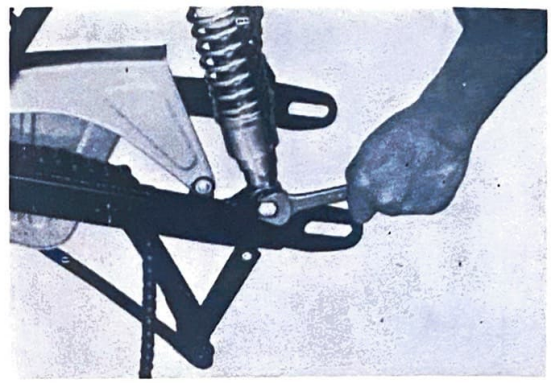


Fig. V-6-1

2) Compress the shocks by applying weight as shown in Fig. V-6-2, and release it.

If the shocks quickly restores halfway and then slowly returns to the original position after it reaches 10mm. (3/8in.) before the original position, the rear shocks are in good condition. But if the cushion returns quickly to the original position, check the cushion for oil leakage, and replace the assembly if the oil leaks.

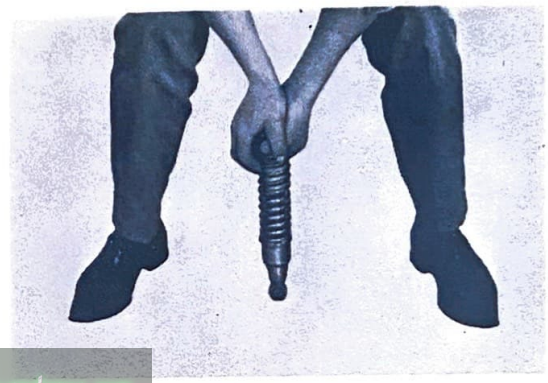


Fig. V-6-2

V-7 Gas Tank

The gas tank has been shaped so that the rider can freely change his riding position. The front of the tank is bolted to the tank stay and the rear is held by rubber band. Tank capacity 9.5 litres (2.5 gals.)

A. Removing

1) Set the petcock lever at "Stop" position and disconnect the fuel line at the petcock.

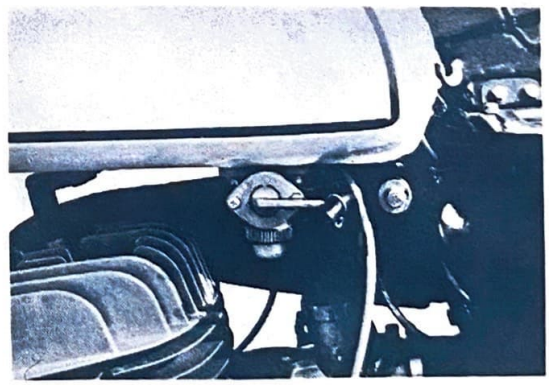


Fig. V-7-1

2) Open the seat.

Fig. V-7-2

3) Remove the bolts from the gas tank stay.

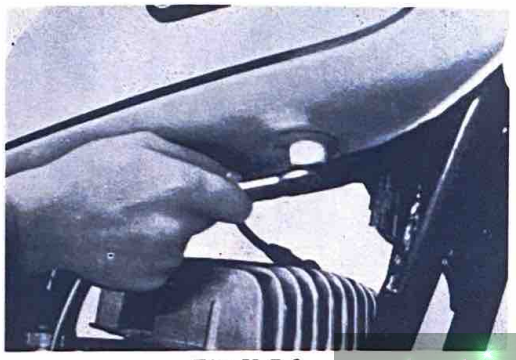


Fig. V-7-3

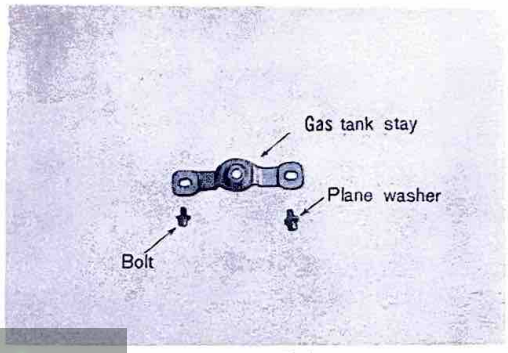


Fig. V-7-4

4) Remove the rubber band.

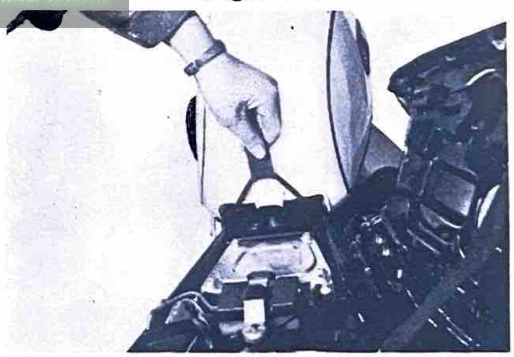


Fig. V-7-5

5) Remove the gas tank.

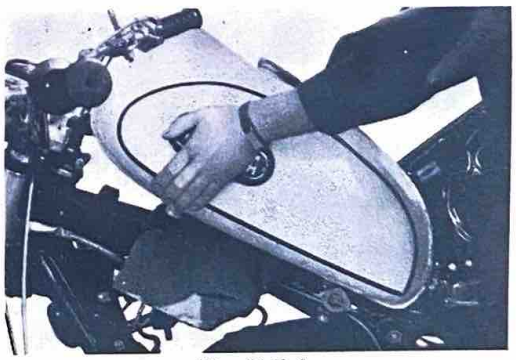


Fig. V-7-6

V-8 Rear Swing Arm

The rear swing arm is made of square steel tube that improves the strength and tortional rigidity. The pivot employs permanent lubrication bearings.

A. Removing

1) Remove the chain case mounting bolts.

Fig. V-8-1

2) Remove the rear swing arm shaft nut, pull out the shaft, and remove the rear swing arm.

Fig. V-8-2

B. Checking

1) Check the play of the rear swing arm by shaking it as shown in Fig. V-8-4, with the rear swing arm installed. If the play is excessive, replace the rear swing arm bushing or the rear swing arm shaft.
2) Insert the bushing as indicated in Fig. V-8-4, and check it for play. It the play is excessive, replace the bushing.

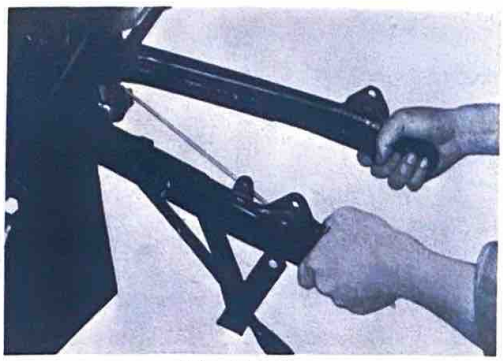


Fig. V-8-3

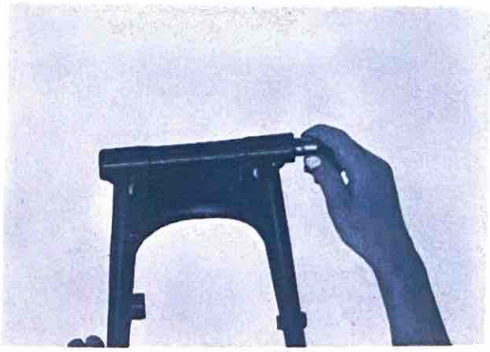


Fig. V-8-4

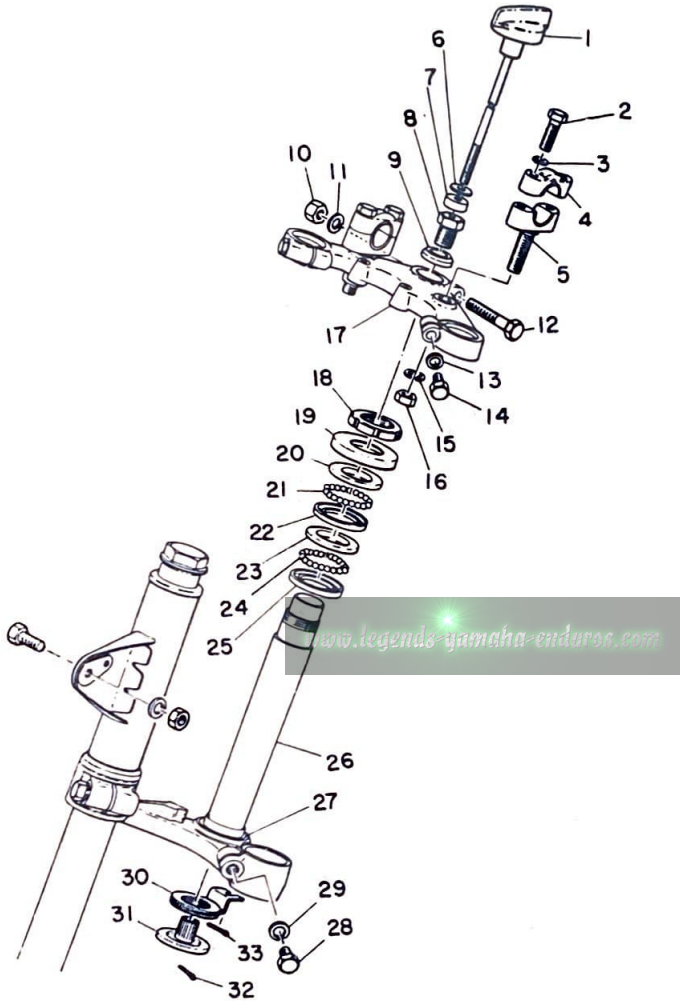
3) Grease the rear arm shaft periodically.

Replacing Rear Swing Arm Bushings

On motorcycles being habitually used for on-the-street riding, rear swing arm bushings should be replaced every 10,000 km. (6,000 miles) of trip. 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 tramp,) or upon request of the customer.

V-9 Steering Head

A. Sectional View of the Steering Head



1. Damper shaft
2. Bolt
3. Spring washer
4. Handle upper holder
5. Handle under holder
6. Special washer
7. Washer
8. Steering fitting bolt
9. Crown washer
10. Nut
11. Spring washer
12. Bolt
13. Spring washer
14. Bolt
15. Spring washer
16. Nut
17. Handle crown
18. Fitting nut
19. Ball race cover
20. Ball race 2
21. Ball
22. Ball race 1
23. Ball race 2
24. Ball
25. Ball race 1
26 Under bracket complete
27. Dust seal
28. Under bracket bolt
29. Spring washer
30. Damper plate (1)
31. Damper plate (2)
32 Cotter pin
33. Cotter pin

Fig. V-9-1

B. Checking

1) Ball Races and Steel Balls

Check the ball races and steel balls for pitting or wear. Check them very carefully if the machine has been in long use. If they are worn or cracked, replace all of them, because deffective ball races or steel balls adversely affect the maneuavarability of the machine. Replace any ball race having scratches or streaks resulting from wear. Clean and grease the balls a races periodically.

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

V-10 Oil Tank, Battery Box and Tool Box

The oil tank is located under the seat on its left side. It is designed to be as narrow as possible so that it will not contact the rider's lower limbs when he stands upright on the footrests. To fill the autolube oil tank lift the seat and the tank cap will be exposed. Oil tank capacity……1.6 litres. (1.7qts.)

The battery box and the air cleaner case is located right under the seat.

V-11 Frame

The double cradle-type frame is made of high tension steel tubes with giving strength, rigidity and light weight. Other dimensional features include higher ground clearance, narrower width, longer wheelbase and longer suspension stroke. The engine is bolted to the frame at four position. The caster is measured at 60.50°.

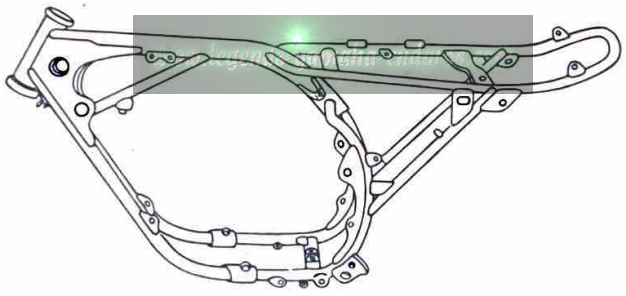


Fig. V-11-1

V-12 Handlebars

The upswept type longer handlebars are ideal for motocross events and provided with deep-cut pattern grips to prevent hand slippage. The lever holder is provided with an adjusting screw for the play of clutch cable and brake cable.

The meter bracket is mounted on the ends of the handle crown, to carry the speedometer on its left side and the tachometer on its right side.

V-13 Miscellaneous

The footrest is made of a single steel tube extending under the lower part of the frame, and bolted to the frame. The engine guard is bolted to the frame to protect the entire crankcase……covering from the exhaust system to the drain plug.

Chapter VI Electrical System

VI-1 Description

The Yamaha DT1 Electrical System is designed to facilitate lightweight, functional operation and simplicity.

Yet with these features, the Ignition System and Lighting System facilitate dependable engine operation and all necessary lighting equipment. A 6 volt battery is used in conjunction with the flywheel magneto. All of the light bulbs have been increased in size to insure sufficient visibility night riding.

VI-2 Table of Component Parts

Parts	Manufacturer	Model & Type
Flywheel magneto Spark plug	Mitsubishi Elec. NGK	FZA-1BL B-7E (N)
Head light Speedometer Tachometer Handle switch	Koito Mfg. Nippon Seiki Nippon Seiki Asahi Denso	6V, 35W/35W ACS
Main switch Ignition coil Horn	Asahi Denso Mitsubishi Elec. Nikko Kinzoku	TIM HP-E MF-6
Battery Rectifier Fuse	Nippon Battery Mitsubishi Elec. Osachi Mfg.	MV1-6D DS10HJ1 10A
Stop switch	Niles Parts	SH40E
Tail light	Stanley Elec.	6V, 5.3W/17W

VI-3 Connection Diagram

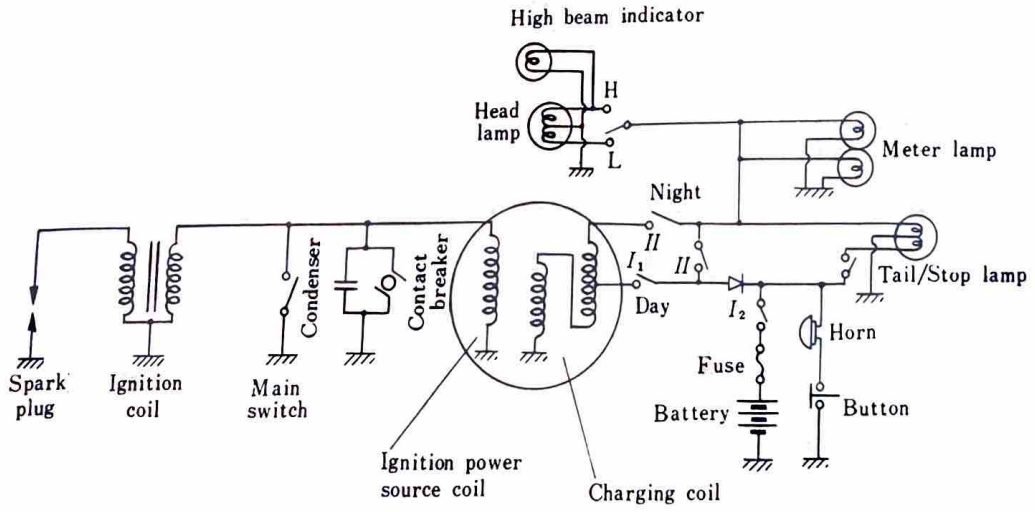


Fig. VI-3-1

VI-4 Ignition System—Function and Service

1. Function

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

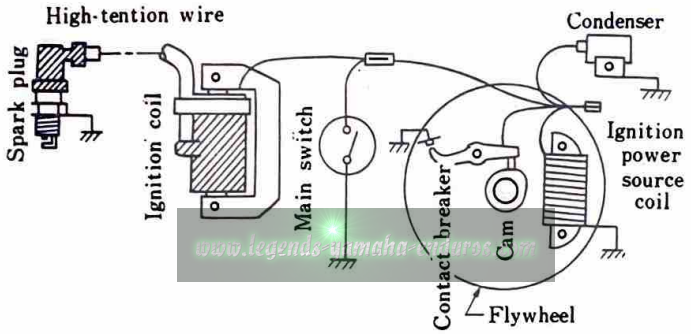


Fig. VI-4-1

VI-5 Ignition Timing

The DT1 cylinder head studs and cap nuts are of a different design because of the size and function of the cylinder. The cap nuts used have a large diameter and therefore a special adaptor is required to facilitate use of the dial indicator for ignition timing on the standard model. The cylinder head must be removed and the special dial indicator adaptor attached to the dial indicator stand.

The piston should be brought to T. D. C. and the dial indicator set at this position. The crankshaft should then be turned in reverse and the piston brought down below 3.2 mm. below T. D. C. The flywheels should then be rotated forward until the piston reaches 3.2 mm. below T. D. C. At this point the ignition points should just be opening. A low resistance point checker (100 Ohms or less) should be used to determine an opening and closing position of the ignition points.

Ignition Timing, 3.2 mm. B. T. D. C.

Maximum ignition point gap 0.3 to 0.4 mm. (0.012″-0.015″)

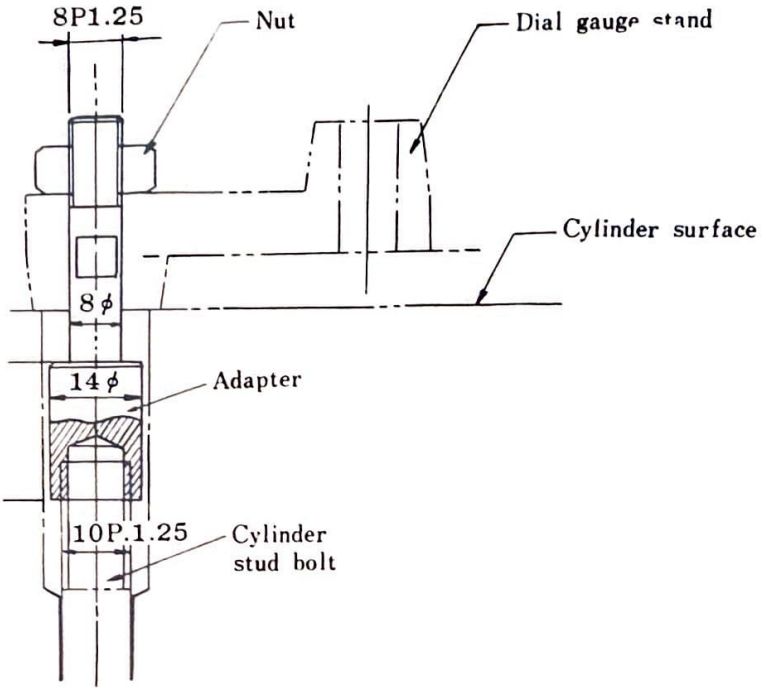


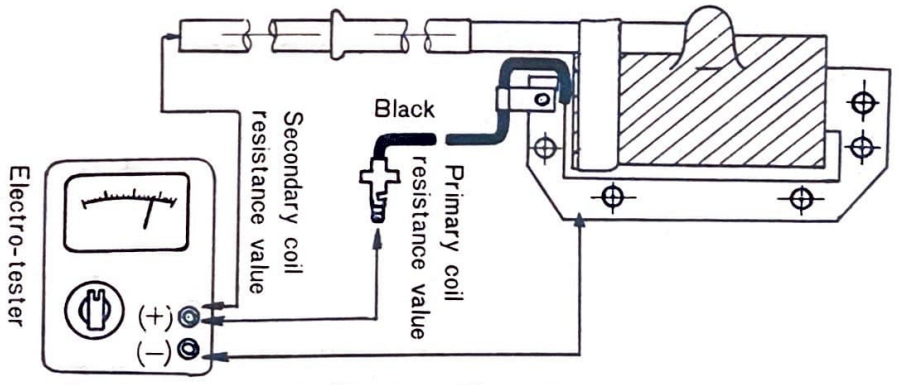
Fig. VI-5-1

VI-6 Ignition Coil

Primary coil resistance value ·····0.6Ω ±10% (20°C or 68°F)

Secondary coil resistance value·····5.8Ω ±10% (20°C or 68°F)

(For measuring methods, refer to Fig. VI-6-1)



Set the tester on the "Resistance" position.

Fig. VI-6-1

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

Sparking: 7mm or more

Remove spark plug from cylinder head and reconnect the high voltage lead. Then ground the spark plug and see if it sparks as you crank the kickstarter.

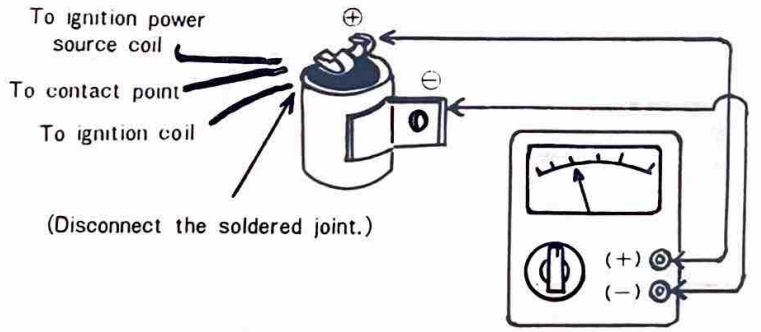
If it sparks 7 mm. or so and has white blue, the ignition coil should be considered to be in good condition.

VI-7 Condenser

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

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

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



Set the electro-tester on the "MΩ" position.

Fig. VI-7-1

Insulation resistance tests should be conducted by connecting the tester as shown in Fig. IV-7-1. If the pointer swings fully and the reading is more than 3MΩ, the insulation is in good condition. If the insulation is punctured, the pointer will stay pointing the uppermost reading.

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

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

If the reading is within 0.22 μF$\pm$10%, the condenser capacity is correct.

VI-8 Charging System

The charging system consists of the flywheel magneto (charging and lighting coils), rectifier, and battery.

1. Flywheel Magneto

As the flywheel rotates, an alternate current is generated in the charging and lighting coils and converted to a half-wave current by means of a silicon rectifier. This half-wave current is charged to the battery.

Charging Capacity (Daytime)

Green lead: Charging beings at 2,500 r. p. m.
2.0 A or less at 8,000 r. p. m.

White lead: 0.15 A or more at 2,500 r. p. m.
4.0 A or less at 8,000 r. p. m.

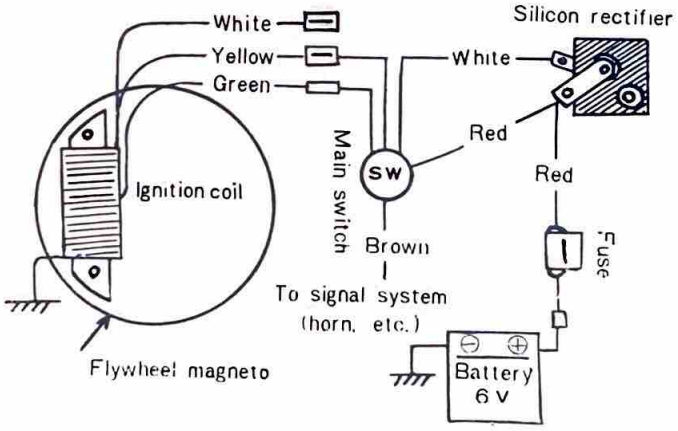


Fig. VI-8-1

Lighting Capacity (Night time)

(With normal loads and normal wiring.)

5.8 V or more at 2,000 r. p. m.

8.5 V or less at 8,000 r. p. m.

*The charging and lighting capacity is obtained when the battery is fully charged. If the battery is in a low state of charge and low in voltage, the charging rate will be not exactly the same as above. However, it is desirable that the figures are as close as possible.

How to Increase Charging Capacity

The flywheel magneto's green lead wire is connected to the wire harness' green lead. But if the battery is in a low state of charge connect the magneto's white lead to the wire harness' green lead. This will increase the charging rate.

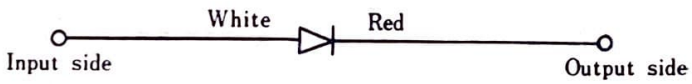
2. Silicon Rectifier

The alternate current, which is generated by the flywheel magneto, is rectified and charged to the battery. For this rectification, a single-phase halfwave silicon rectifier is employed.

Characteristics: Rated output—4A,

Rate peak inverse withstand voltage 400V

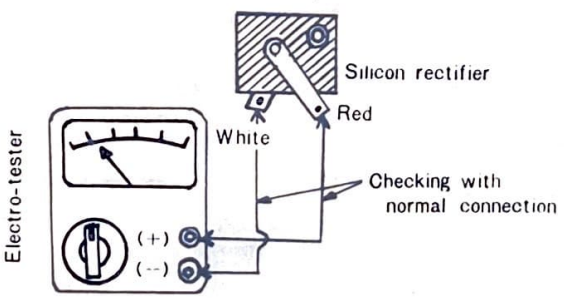
Polarity:



a. Checking the Silicon Rectifier

For measurements, an ohmmeter can be used.

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



(Set the tester on "Resistance.")

Fig. VI-8-2

Checking with Normal Connection

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

Standard value: 9—10Ω

If the tester's pointer will not swing back from the over

scale, the rectifier is defective.

Checking with Reversal Connection

Connect the tester the other way round.

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

3 Operational Nut

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

VI-9 Battery

The battery is a 6 volt—2 AH unit that is the power source for the horn and stoplight. Because of the fluctuating charging rate due to the differences in engine R. P. M. s, the battery will lose its charge if the horn and stoplight are excessively used. The charging of the battery begins at about 2,500 R. P. M. Therefore, it is recommended to sustain engine R. P. M. s at about 2,500 to 3,500 R. P. M. to keep the battery charged properly. If the horn and stoplight are used very little, the battery water should be checked regularly as the continuing charging will dissipate the water.

If the battery will not retain a charge (and the battery is in good condition) the white wire of the flywheel magneto can be connected to the green wire of the wiring harness. This will increase the charging rate but if the machine is ridden for long periods of time with this wiring connection, the battery can be overcharged and damaged.

1. Checking

1) If sulfation occurs on plates due to lack of the battery electrolyte, showing white accumulations, the battery should be replaced.
2) If the bottoms of the cells are filled with corrosive material falling off plates, the battery should be replaced.
3) If the battery shows the following defects, it should be replaced.
   ○ The voltage will not rise to a specific value even after long hours charging.

○ No gassing occurs in any cell.

○ The 6 V battery requires a charging current of more than 8.4 volts in order to supply a current at a rate of 1 amp. per hour for 10 hours.

2. Service Life

The service life of a battery is usually 2 to 3 years, but lack of care as described below will shorten the life of the battery.

1) Negligence in re-filling the battery with electrolyte.
2) Battery being left discharged.
3) Over-charging by rushing charge.
4) Freezing.
5) Feeding of water or sulfuric acid containing impurities when re-filling the battery.

3. Storage

If any motorcycle is not used for a long time, remove the battery and have it stored by a battery service shop. The following instructions should de observed by shops equipped with chargers.

1) Recharge the battery.
2) Store the battery in a cool, dry place, and avoid temperatures below 0°C. (32°F)
3) Recharge the battery before mounting it on the motorcycle.

4. Service Standards

Battery: MV1-6D (Nippon Battery)

Battery Spec.	6V-2AH	
Electrolyte-Specific gravity and quantity	1.26–1.27, 110c.c.	At full charge
Initial charging current	0.2 A for 25 hours	Brand new motorcycle
Charging current	0.2 A for 13 hours (Charge until specific gravity reaches 1.26-1.27)	When discharged
Refilling of electrolyte	Distilled water up to the max. level line.	Onca a month

VI-10 Checking the Main Switch (removed from the chassis)

Key "O" position (Off)
Black↔Switch body
Key "I" position
(for day)
Green↔White
Red↔Brown
Key "II" position
(for night)
Yellow↔White
White↔Blue
Red↔Brown

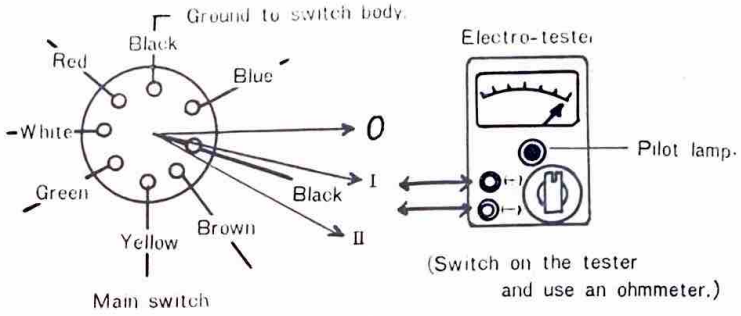


Fig. VI-10-1

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

VI-11 Spark Plug

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

1. How to "read" spark plug (condition)

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

2. Inspection

Instruct the rider to:

Inspect and clean the spark plug at least once a month or every 1,000km. (500

miles) Clean the electrodes of carbon and adjust the electrode gap to 0.5-0.6mm. (0.023in.) Be sure to use standard B-7E(N) plug as replacements to avoid any error in reach.

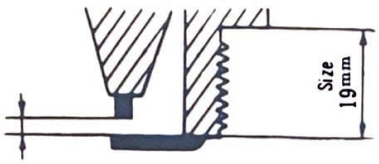


Fig. VI-11-1

VI-12 Lighting and Signal Systems

The lighting and signal systems consist of the horn and stop light (power source-battery) and the head light, tail light, meter lamps, high beam indicator, speedometer and tachometer (power source-flywheel magneto).

1. Head Light

The head light has two 6V, 35W bulbs, and a 6V, 1.5W high beam indicator on its top. A beam direction adjusting screw is fitted on the right side of the light rim so that the beam can be adjusted of its direction horizontally (not vertically).

2. Tail Light and Stop Light

A 6 V. 5.3W tail light and a 6V, 17W stop light are mounted. The lens of the tail light is provided with reflectors on its three sides—rear, right and left.

3. Horn

The horn is a 6V, flat type, and has a tone-volume adjusting nut on its back. After adjustment is made, apply paint or lacquer to the nut for water proofing purposes.

4. Speedometer

A circular type speedometer is rubber-mounted on the bracket. It has a built-in trip meter and a odometer. For illumination, a 6V, 3W bulb is provided.

5. Tachometer

An independent tachometer is mounted separately from the speedometer. The revolutions per minute of the crankshaft are conveyed from the kick idler gear through the gear unit to the tachometer. The meter lamp is of the 6V, 3W type.

Note: Use bulbs of the correct capacity for the head light, tail light, meter lamp and high-beam indicator which are directly connected to the flywheel magneto. If large capacity bulbs are used, the voltage will drop, giving a poor light. On the contrary, if smaller capacity bulbs are used, the voltage will rise, shortening the life of bulbs. Avoid the use of a 12V bulb, because shorter service life will result.

When the head light beam switch is operated to change the beam from one to another, the head light is designed to keep its two bulbs turn on, and the beam is changed. This is to protect other light bulbs—meter lamps, tail light, etc., from burning out as a result of turning off the head light, though temporarily. If one of these light bulbs is burnt out while the machine is running, it will put other bulbs under overload condition, thus shortening their service life. In this case, it is necessary to reduce the engine speed and replace the burnt bulb as quickly as possible.

Chapter VII Conversion for Competition

The Yamaha Enduro 250 DT-1 is easily converted into a high performance competition machine by using GYT parts.

GYT: Genuine Yamaha Tuning

VII-1 List of GYT Parts

The following alternate parts for racing are available through authorized Yamaha dealers.

No.	Parts No.	Parts Name	Quantity	Remarks
1	● 214-11111-70	Head, cylinder	1	
2	▲ 94700-00016	Plug, spark	1	NGK B-9E(N)
3	● 214-11311-70	Cylinder	1	
4	● 214-11631-70	Piston	1	
5	● 214-11611-70	Ring, piston	1	
6	● 214-14101-70	Carburetor ass'y	1	
7	▲ 161-15426-00	Cover, oil pump	1	
8	▲ 214-17819-10	Cap, housing	1	
9	● 214-17461-40	Sprocket, drive	1	14 Teeth
10	▲ 214-25446-10	Gear, sprocket wheel	1	46 Teeth
11	▲ 214-25448-10	Gear, sprocket wheel	1	48 Teeth
12	● 214-14610-70	Muffler	1	
13	● 214-14763-01	Spacer, rubber	1	
14	● 214-14764-00	Spacer, rubber	1	
15	● 214-14793-61	Plate, outer	1	
16	152-25139-00	Plug, blind	1	
17	94127-21071	Tire, front	1	2.75-21-4PR
18	94227-21031	Tube	1	〃
19	94327-21024	Band, rim	1	〃
20	94416-21038	Rim	1	〃
21	214-25196-10	Spork, inner	1set	〃
22	214-25197-10	Spork, outer	1set	〃
23	214-25101-70	Front wheel ass'y	1set	3.25-19-4PR

● Included in GYT Kit ▲ Not included in GYT Kit

●▲ The above parts are also sold individually.

VII-2 GYT Competition Parts

Installation of the Yamaha GYT Parts and removal of unnecessary equipment, such as lighting, quickly transforms the DT1 Enduro into a competition proven racing machine. Even after installation of the highly tuned GYT parts, the DT1 engine will still retain maximum low end performance as well as gain optimum output at midrange and top end.

A. Specifications (comparison of GYT Parts to standard parts).

1) Cylinder Head. Volume and shape of combustion chamber changed to increase top end performance. Spark plug hole moved to center of the head.
2) Cylinder. Chrome plate cylinder liner inside of aluminum cylinder body. Port timing changed to increase performance. Intake port diameter increase.
3) Piston. Material changed to Lowex for increased reliability. One cast iron piston ring. Design of piston changed to match port timing of cylinder.
4) Carburetor. Size increased to 30mm. venturi (VM 30SH). Main jet size increased to 210.
5) Exhaust System. Tuned exhaust (expantion chamber) to give maximum performance.
6) Spark plug. Heat range and type of plug changed to B-9E(N).
7) Oil Pump. Removed to facilitate installation of GYT cylinder.

B. Check engine condition before installation of GYT Parts.

After installation of the GYT parts, the engine will be set-up for optimum output. Therefore, to insure reliability, performance, and engine safety, the critical engine components should be checked and set to recommended standards before installation of GYT parts.

1) Remove the engine from the frame and disassemble engine. (Refer to section IV Engine.)
   a. Check the crankshaft assembly, crank bearing, connecting rod, connecting rod big end and small end bearings, and set to recommended standards or replace faulty parts as necessary.
   b. Oil seals. It is suggested to replace all of the oil seals upon engine disassembly for installation of GYT parts to insure against the slightest possible leakage.
   c. Replace all gaskets and O rings upon assembly of the engine and use

recommended sealant.

C. Installation of GYT Parts.

1) Installing a cap housing cover over the tachometer drive opening in the right hand crankcase if the tachometer is removed from the machine.
2) Assemble cylinder head, cylinder, and piston with new gaskets.
3) Assemble VM 30SH carburetor with 10mm. thick insulator on cylinder.

Carburetor Specifications

Name of Part	Abbreviation	Specifications
Main jet	M. J.	#210
Needle jet	N. J.	0-4
Jet needle	J. N.	5D5-3 stages
Throttle valve cut away	C. A.	3.5
Air screw setting	A. S.	1/2
Starter jet	G. S.	#60

4) If the oil pump is removed, install an oil pump cover plate on the crankcase, installing a 6mm. bolt in the inlet hole on the cylinder intake port. Follow the oil manufacturer's recommendation for fuel/oil ratio.

A 15:1 fuel/oil ratio should be mixed in the gas tank when the Autolube pump is removed.

If the oil pump is retained, a 35:1 fuel/oil ratio should be mixed in the gas tank in conjunccion with the Autolube pump.

5) Secondary sprocket ratio will have to be determined by the owner as to the type of riding or competition conditions to be encountered. The gearing should be reduced if the machine is to be raced on a short or extremely rough course. If the secondary drive sprocket is changed, be sure to bend the lock washer ears up after installation of the gear.
6) Break-in. After installation of the GYT parts and thoroughly checking of the condition of the engine components, the engine should be considered in new condition. Start the engine and run between 4,000 and 5,000 R. P. M. for 5 to 10 minutes. Let the engine cool and repeat this procedure several times.

Remove the spark plug and make a reading as to the spark plug heat range, main jet size and jet needle position. Adjust as necessary and take the machine for a trial run. Remove the spark plug again and make another reading for spark plug heat range, main jet size, and a jet needle position.

Vll-3 Additional Modification

All of the unecessary equipment such as lighting, mirrors, etc., should be removed if the machine is to be raced. Removal of the speedometer and/or tachometer will be optional with the rider and dependent the type of riding to be done.

Further modification, such as gear ratio, tire changes, suspension changes or modification, installation of 21" front wheel, etc., is part of personalization and up to the owner.

Vll-4 Specifications (GYT)

Piston Clearance:	0.040-0.050mm.
Spark plug:	Standard B-9E(N)
Ignition Timing:	B.T.D.C. 2.3mm.
Secondary reduction:	Chain
Carburetor setting:	Main Jet #210
	Needle Jet 0-4
	Pilot Jet #80
	Cut away 3.5
	Number of turns backed off-air screw 1/2
Fuel Mixing ratio:	Follow oil manufacturer's recommended fuel/oil ratio (premix)
Gear Oil amount:	1,000c.c.
Oil Pump	
Minimum stroke:	0.20-0.25mm.
Maximum stroke:	1.85-2.05mm.

Vll-5 Setting the Ignition Timing

1) Install the dial gauge in the cylinder head.

   Note: On the special racing head the spark plug hole is centered and parallel to the cylinder bore.

2) Roughly align the red mark on the rotor with the pointer attached to the stationary plate.

3) Check to see if the points are clean and not pitted. They can be smoothed with 400 sandpaper or with an oil stone.

4) Connect a tester to the pointer and ground so that the exact opening and closing of the points can be measured.

5) Rotate the rotor so that the piston will be lowered 2.3 mm. B.T.D.C. At this point, loosen the breaker plate setting. Screw and adjust the breaker plate so that the points just close. Then tighten the breaker plate.

VII-6 Check and Service prior to Racing

The following item should be checked and serviced before racing.

1. Check the cylinder, piston, and crankshaft ass'y for any defects.
2. Make sure that the carburetor is clean and correctly set.
3. Check for ignition timing, lead wire connect on, and insulation.
4. Retighten screws, bolts and nuts in all parts.
5. Check for the cables.
6. Clean the gas tank and petcock.
7. Adjust the chain tension and oil it.

   Adjust the drive chain so that it has free play of approximately 1 in. (25mm.) up and down at the center of the lower section with the rear wheel on the gronnd.

CONVERSION TABLES

LENGTHS

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

WEIGHTS

Kilograms (kg.)	2.205	Pounds	Grams (g.)	.03527	Ounces
Pounds (lbs.)	.4536	Kilograms	Ounces (oz.)	28.35	Grams

VOLUMES

Cubic centimeters (c.c.)	.061	Cubic inches	Imperial gallons	277.274	cu. in.
Cubic inches (cu. in)	16.387	c.c.	Liters (l.)	1.057	Quarts
Liters (l.)	.264	Gallons	Quarts (qt.)	.946	Liters
Gallons (gal.)	3.785	Liters	Cubic centimeters (c.c.)	.0339	Fuid ounces
U.S. gallons	1.2	Imperial gals.	Fluid ounces (fl.oz.)	29.57	c.c.
Imperial gallons	4.537	Liters			

OTHERS

Metric horsepower (ps.)	1.014	bhp.	Foot-pounds (ft-lbs)	.1383	kg-m
Brake horsepower (bhp.)	.9859	ps.	Kilometrs per liter (km/l)	2.352	mpg
Kllogram-meter (kg-m)	7.235	Foot-pounds	Miles per gallon (mpg)	.4252	km/l

GAS (FUEL) TO OIL RATIO CHART

Gas/Oil Ratio	12:1	16:1	20:1	24:1	28:1	32:1	36:1	40:1
Oil (qt.) per 1 Gal. Gas	0.33	0.25	0.2	0.17	0.14	0.13	0.11	0.1
Oil (oz.) per 1 Gal. Gas	10.7	8.0	6.4	5.3	4.6	4.0	3.6	3.2
Oil (qt.) per 5 Gal. Gas	1.66	1.25	1.0	0.84	0.72	0.63	0.55	0.5
Oil (oz.) per 5 Gal. Gas	53.5	40.0	32.0	26.6	22.8	20.0	17.8	16.0

(U.S. Gallons)

YAMAHA

Supplementary Service Information for New Model Change

MODEL SINGLE ENDURO DT-1B

YAMAHA MOTOR CO., LTD.

FOREWORD

Many improvements have been introduced to the new Yamaha Single Enduro DT-1B. which has been the center of interest for all young Yamaha fans. The new design features include the new coloring of the fuel tank and side cover, additional safety parts, large-sized tachometer and improved handlebar grips.

Emphasis of this Supplement is on the comparable descriptions of the major differences in the former and new models. We hope that all Yamaha dealers will make full use of this booklet in fulfilling their service activities.

YAMAHA MOTOR CO., LTD.
SERVICE DIVISION

I. FEATURES

1. Highly-reliable Engine Performance

The Yamaha Single Enduro DT-1B assures steady engine performance throughout the entire range of speed from low to high, with the 5-port cylinder. It also incorporates Yamaha's high level of technology that developed Yamaha Autolube, the world's first of its kind, and the metallic bond iron-sleeved aluminum cylinder with outstanding radiation efficiency. Equipped with the primary kick stater system, this machine allows the rider to start the engine with the gears in any engagement.

2. Large-sized Tachometer

To offer a way to make full use of the engine power, the tachometer has been increased in diameter from 65 mm to 80 mm, the same size as the speedometer, thus providing an easy check for engine speed.

3. Employment of Reflex Reflectors

The reflex reflectors are installed on both sides of the front fork, with the aim of increasing the safety of the rider. They are designed to easily draw the attention of on-coming cars on the road, thus assuring extra safety for night riding.

4. Front Brake Stop Light

Applying the front brake makes the stop light turn on. It is a welcome device for protecting the rider.

5. Improved Handlebar Grips

The new grips, having an axially curved surface, provide an easier grip for the rider, so that a long trip will be more enjoyable and less tiresome.

6. Superior Riding Comfort

The front fork with the built-in-spring, along with the three-way adjustable rear suspension, assures the rider of superb riding comfort even on rough roads. Among other features are the light-weight, sturdy frame and knobby tires which are perfect for off-the-road riding

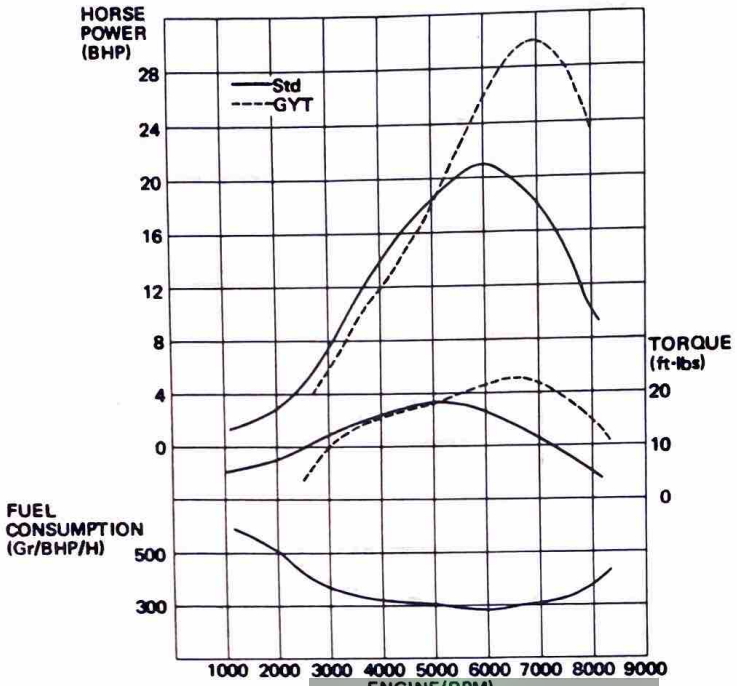
II. SPECIFICATIONS & PERFORMANCE MODEL DT-1B

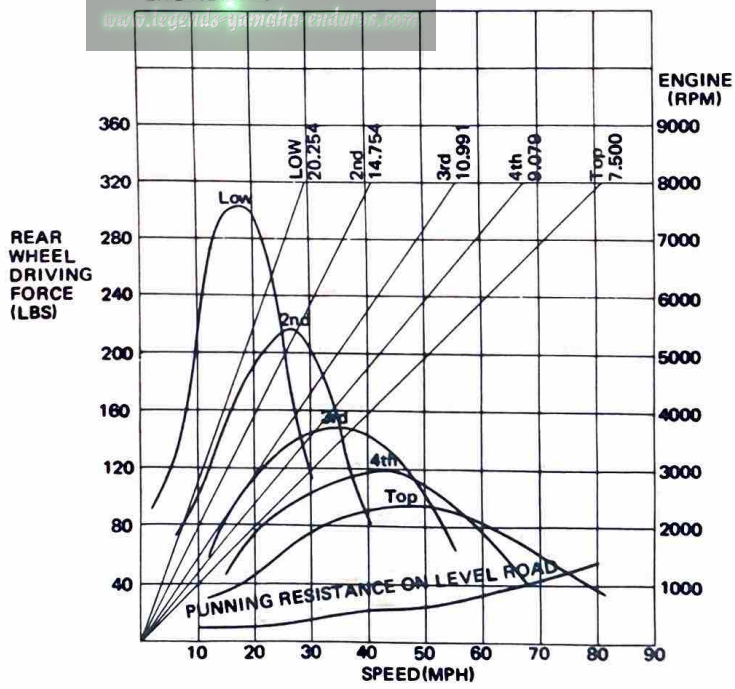
* with GYT kit

Model	YAMAHA 250 DT-1B
Dimensions:	
Overall length	81.1 in.
Overall width	35.0 in.
Overall height	44.5 in.
Wheelbase	53.6 in.
Min. ground clearance	9.6 in.
Weight:	
Net	232 lbs. (*215 lbs.)
Performance:	
Max. speed	70mph or more (std.)
Fuel consumption (on paved level roads)	94 mpg @ 25 mph
Climbing ability	35 degrees
Min. turning radius	82.6 in.
Braking distance	40 ft at 30 mph
Engine:	
Model	DT-1
Type	2 stroke, gasoline
Lubricating system	Separate lubrication (Yamaha Autolube)
Cylinder	Single cylinder, vertical, 5 port
Displacement	15 cu. in. (246 c.c.)
Bore x Stroke	2.77 x 2.52 in. (70 x 64 mm.)
Compression ratio	6.8:1 (*8.2:1)
Max. power	21 BHP/6,000 r.p.m. (*30BHP/7,000 r.p.m.)
Max. torque	16.8 ft-lbs/5,000 r.p.m. (*22.4 ft-lbs/6,500 r.p.m.)
Starting system	Primary-coupled kick starter system
Ignition system	Flywheel magneto ignition system with secondary ignition coil
Carburetor:	
Type	VM26SH
M. J.	# 160
J. N.	5D1-3 stages
Air cleaner:	Dry, Paper filter type
Transmission:	
Clutch	Wet, multiple-disk
Primary reduction system	Helical gear
Primary reduction ratio	3.095 (65/21)

Model	YAMAHA 250 DT-1B
Gear Box:	
Type	Constant mesh, 5-speed forward
Reduction ratio 1st	2.231 (Total r. ratio 20.254)
2nd	1.624 (Total r. ratio 14.754)
3rd	1.211 (Total r. ratio 10.991)
4th	1.000 (Total r. ratio 9.079)
5th	0.826 (Total r. ratio 7.500)
Secondary reduction system	Chain
Secondary reduction ratio	2.933 (44/15)
Chassis:	
Frame	Tubular-Double loop
Suspension system, front	Telescopic fork
Suspension system, rear	Swinging arm
Cushion system, front	Coil spring, oil damper
Cushion system, rear	Coil spring, oil damper
Steering system:	
Steering angle	49° both right and left
Caster	60.5°
Trail	5.12 in.
Braking system:	
Type of brake	Internal expansion
Operation system, front	Right hand operation
Operation system, rear	Right foot operation
Tire size:	
Front	3.25-19-4PR
Rear	4.00-18-4PR
Dynamo:	
Model	FZA-1BL
Manufacturer	Mitsubishi Elec.
Battery:	
Model	MV1-6D
Manufacturer	Nippon Btry.
Capacity	6V 2AH
Lighting:	
Head light	6V 35W/35W
Tail light	6V 5.3W
Stop light	6V 17W
Meter light	6V 3W x 2
Tanks:	
Gasoline tank capacity	2.5 gals.
Oil tank capacity	1.7 qts.

III. PERFORMANCE CURVES





IV. DESCRIPTION

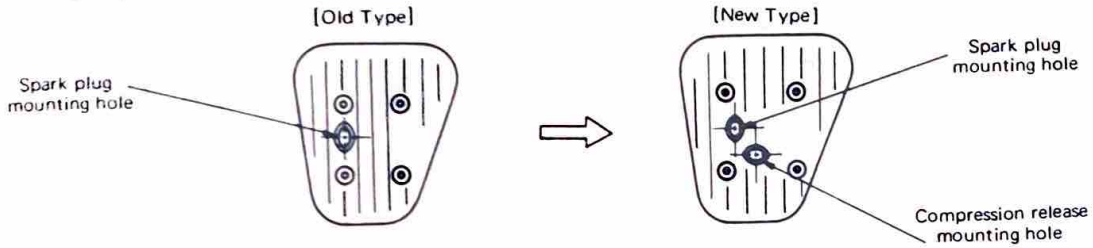
1. Engine

Description will be given as to the differences in the engines between the former and new models.

1) Cylinder Head

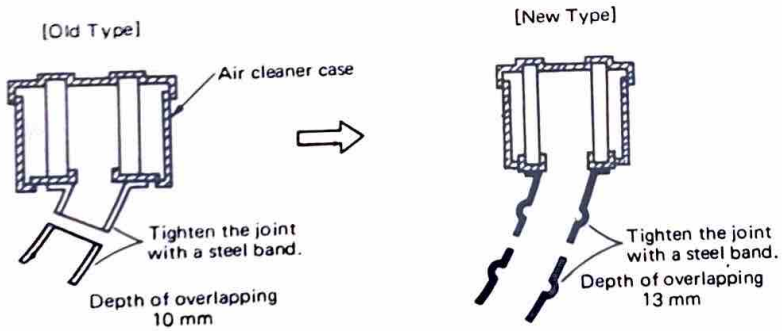
A hole is added for bitting a compression release or another spark plug. On marketed models, the hole is filled with a blind plug and gasket.

(The compression release used should be 19 mm reach in length. Do not use any other size.)

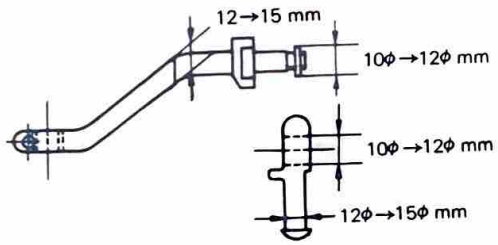


2) Air Cleaner

In order to improve both sealing and dust proofing effects, the element and joint rubber are made into one unit. The joint rubber is designed to be connected in a manner such that the raised portion of the upper joint rubber is fitted into the recessed portion of the lower joint.



3) Kick Crank and Kick Lever

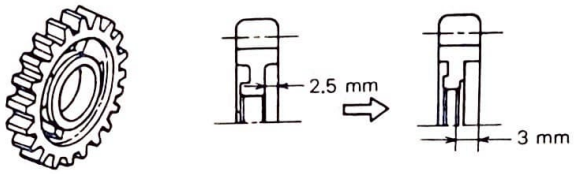


4) 3rd Wheel, 3rd Pinion, 5th Wheel and 5th Pinion

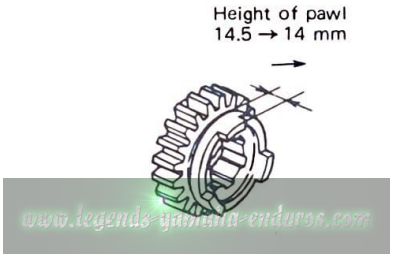
Some dimensions of these parts have been changed as shown below. Be sure that the mounting direction of the 3rd wheel is correct or improper engagement will result. Note that the modified parts are marked with the letter "N", and care must be taken in making sure that mating gears are both so marked.

Interchangeability is the same as before in 3rd wheel is interchangeable with 5th pinion and 3rd pinion is interchangeable with 5th wheel.

3rd wheel
(5th pinion)

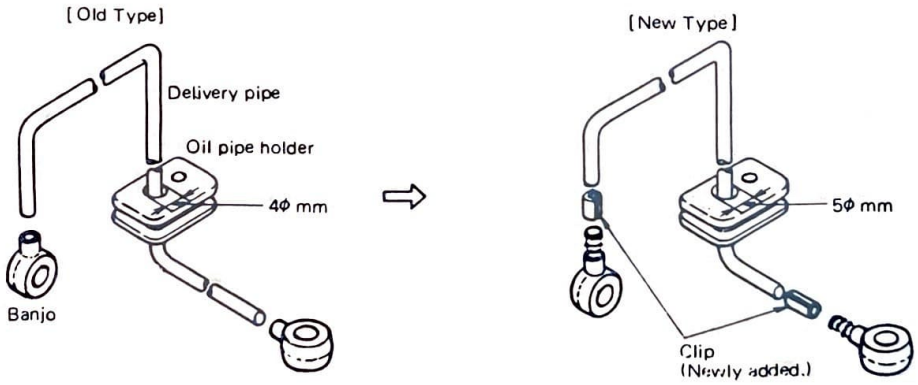


3rd pinion
(5th wheel)



5) Delivery Pipe and Related Parts

The material of the oil delivery pipe has been changed from Nylon to rubber. With this change, the oil pipe holder has been modified. The banjo is connected to the delivery pipe by means of a clip.



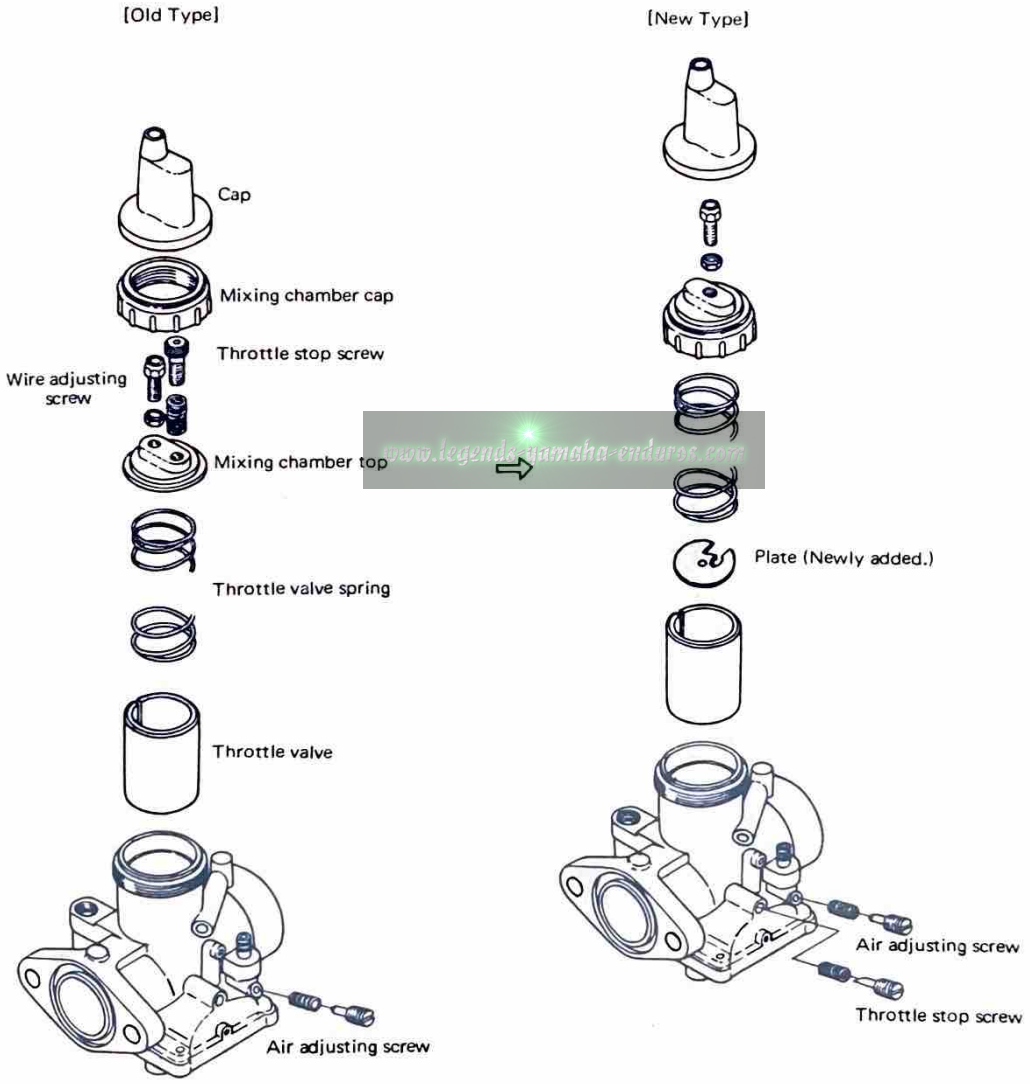
6) Carburetor

1 The idle speed adjustment screw (throttle stop screw) is installed in a horizontal position, instead of the vertical position.

2 Following the change in 1 above, both mixing chamber top and mixing chamber cap are made into one unit.

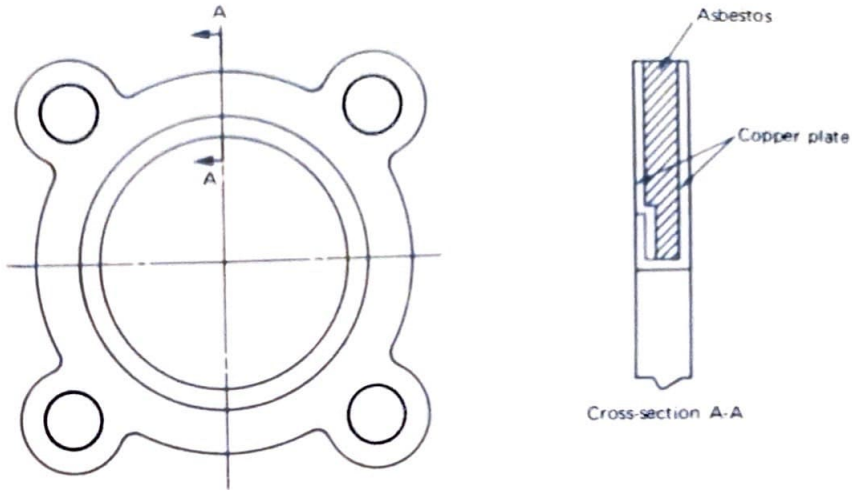
3 To prevent the mixing chamber cap from becoming loose, a rubber patch is bonded to the cap surface which is in contact with the throttle valve.

4 To tightly secure the throttle wire to the throttle valve, a plate is added.



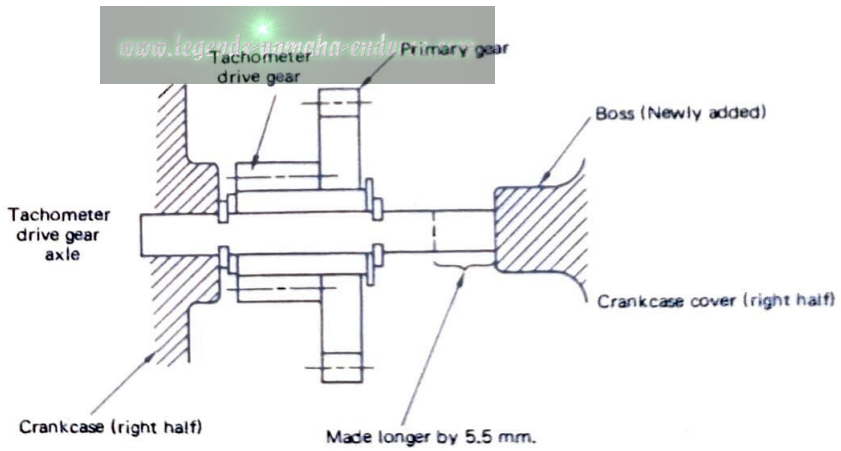
7) Cylinder Head Gasket

Asbestos is used for better airtightness of the combustion chamber of the cylinder.



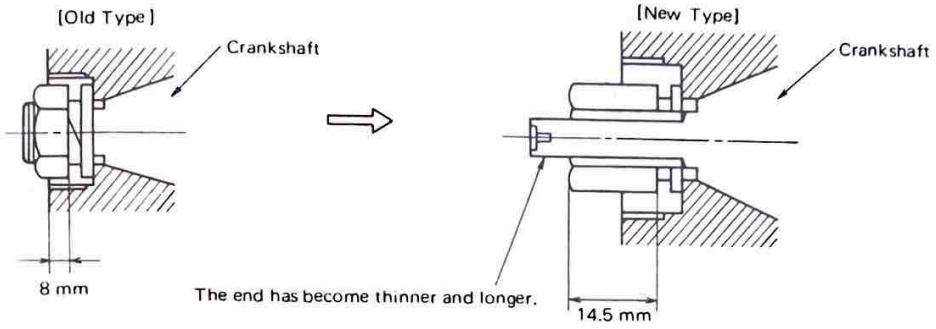
8) Tachometer Drive Gear Axle

To prevent the tachometer drive gear axle from becoming loose, a boss is provided for the crank case cover (right half).



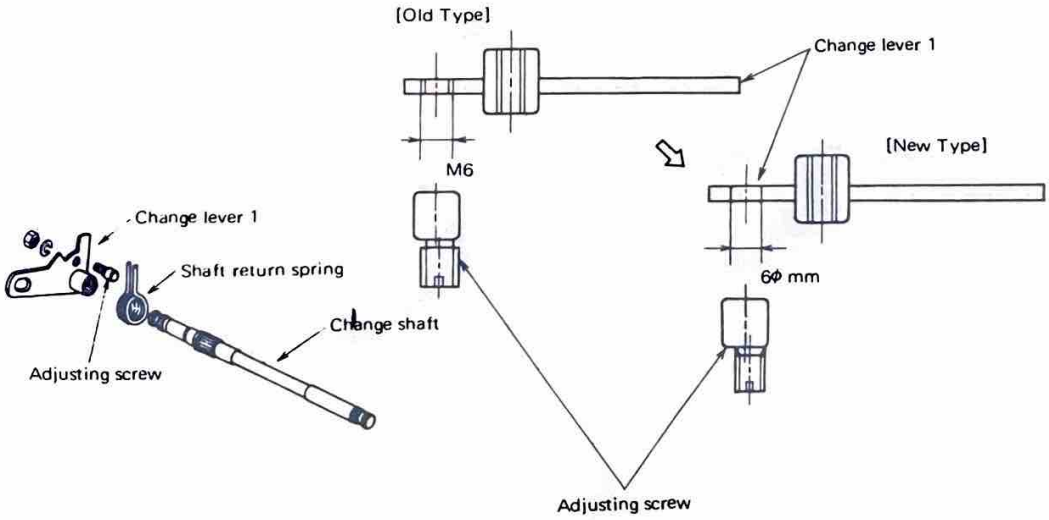
9) Flywheel Magneto Mounting on Crankshaft

To keep the flywheel magneto secured to the crankshaft, improvements have been introduced to these components, and at the same time, the threaded portion has been treated with hardening.



10) Change Lever 1 and Adjusting Screw

The adjusting screw hole tapped in the change lever 1 is no longer in use. No machined portions will be provided for both the 6-mm hole and the screw in order to increase tightness of the screw.

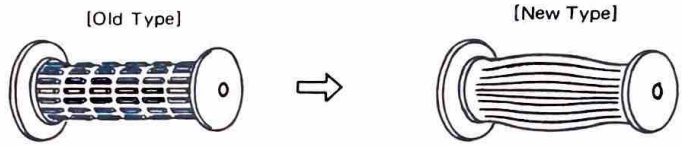


2. Chassis

Aimed at providing greater accessibility for service as well as simplicity of maneuverability, many improvements have been introduced, including flasher light brackets and modified handlebar grips.

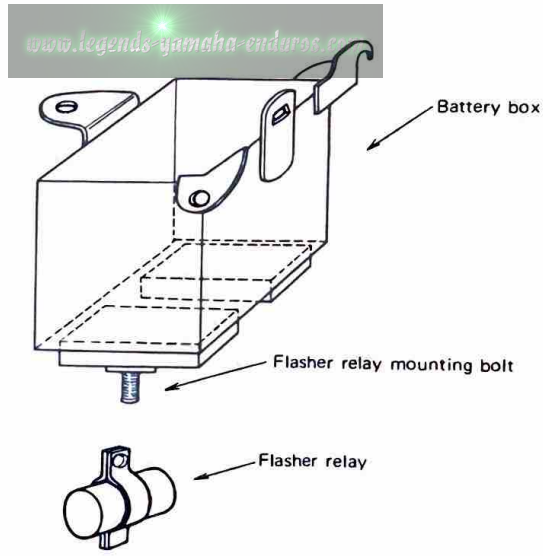
1) Crips

The handlebar grips are modified so that the rider may grip them more firmly. (A curved surface is provided as shown in the figure below.)



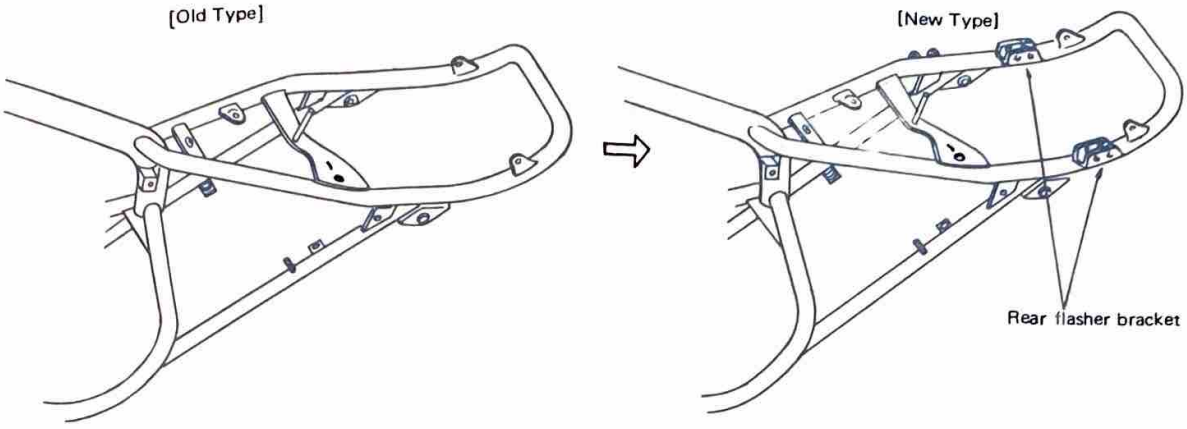
2) Battery Box

The battery box is provided with a flasher relay bracket.



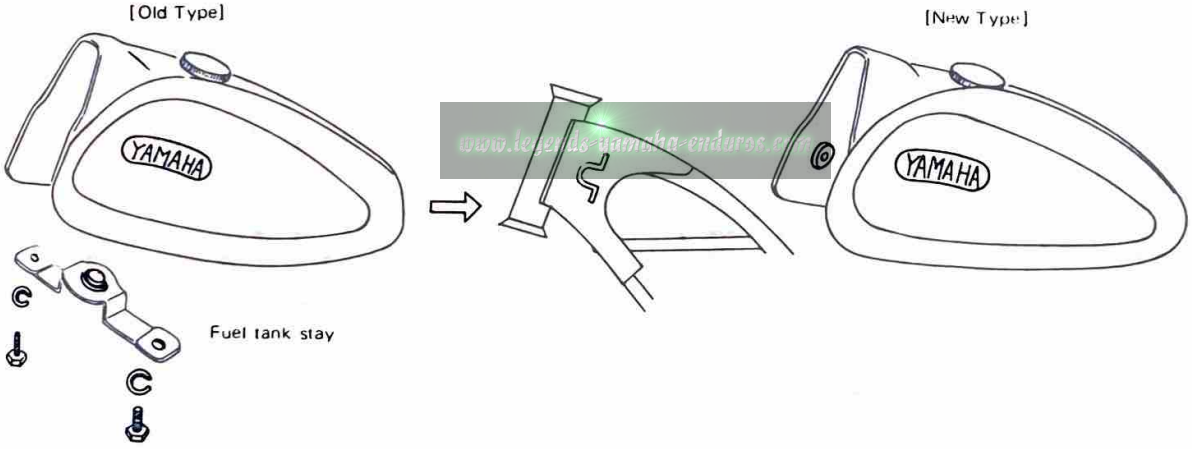
3) Frame

Two flasher light brackets are installed, one each on the right and left side.



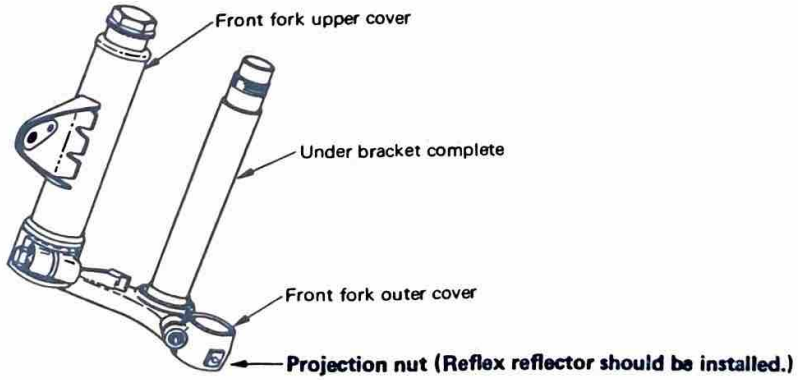
4) Fuel Tank Installation

This change in fuel tank installation had been introduced for some previous models before the new model are produced.



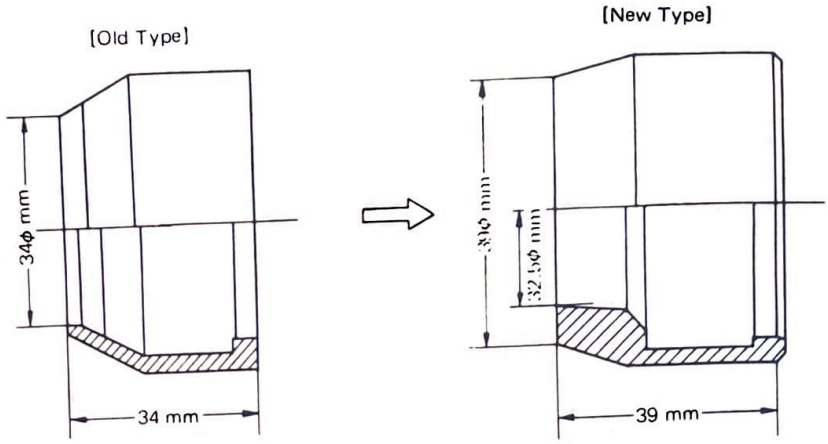
5) Front Fork Outer Covers (right and left)

Nuts are welded in place for mounting the reflex refleters.



6) Front Fork Dust Seal

Modification has been introduced to the shape of the dust seal for better airtightness of the front fork.

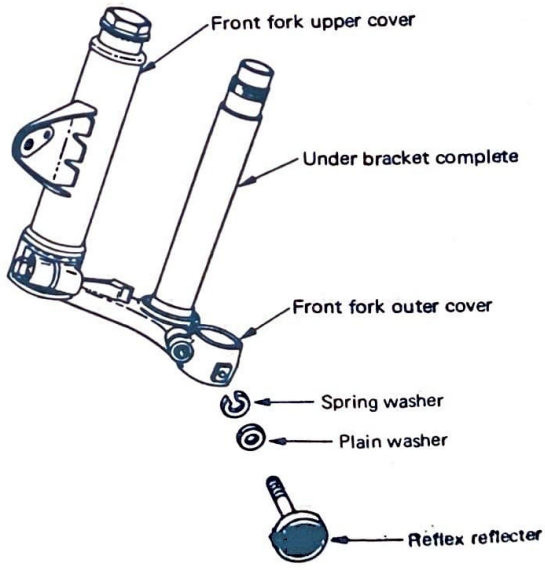


3. Electrical Equipment

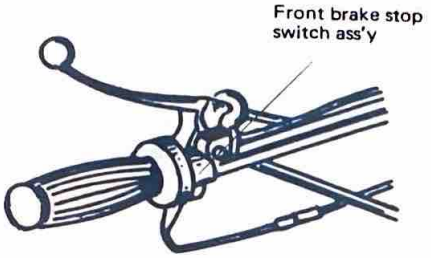
With the aim of improving the service life of light bulbs and additionally securing the additional safety of the rider, the Enduro DT-1B is equipped with new safety oriented electrical components.

1) Reflex Reflector

To draw extra attention from on-coming vehicles, reflex reflector are newly installed so that the rider may enjoy night driving with greater safety.



2) Front Brake Stop Switch Ass'y



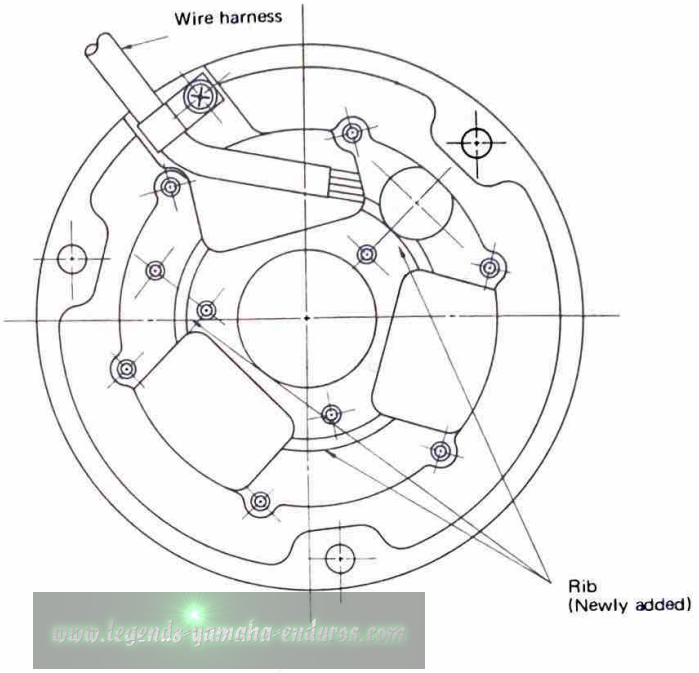
3) Tachometer

The tachometer has been increased in diameter from 65 mm to 80 mm, the same size as the speedometer.

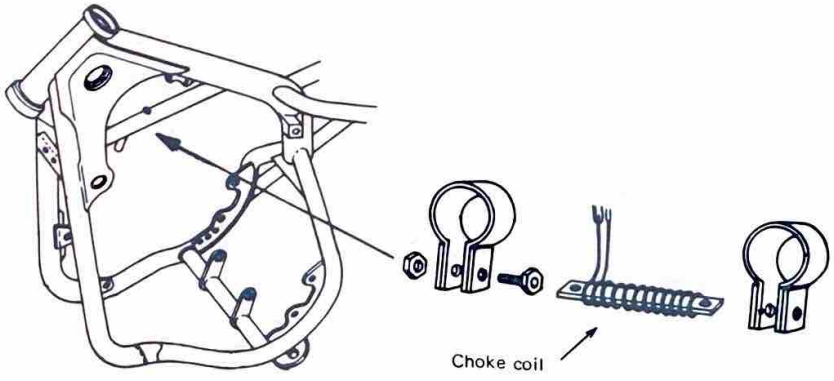
4) The wire harness has been modified with the addition of a choke coil and front brake stop switch.

5) Flywheel Magneto Assembly

To prevent the oil seal from coming off the crankshaft, three ribs are provided for the flywheel magneto base.

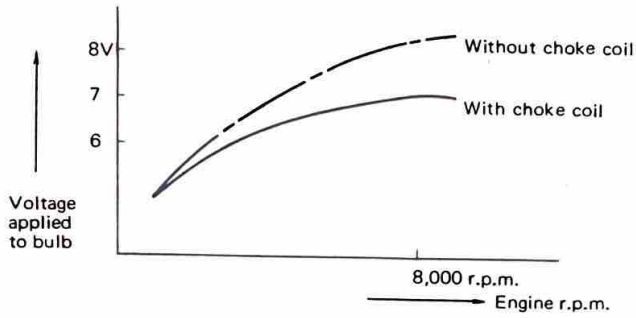


6) Choke Coil



As portrayed in the figure below the voltage induced to the head light and tail light tends to rise as the engine speed increases. Excessive in voltage will result in shorter life of light bulbs.

In order to control the voltage (generated by the flywheel magneto) which is delivered to the lights, a choke coil is provided between the flywheel magneto and the bulbs. The bulbs can thus be protected from the heavier voltages generated by the flywheel dynamo while the engine is running at high speeds, thereby securing longer service life.



Checking the Choke Coil

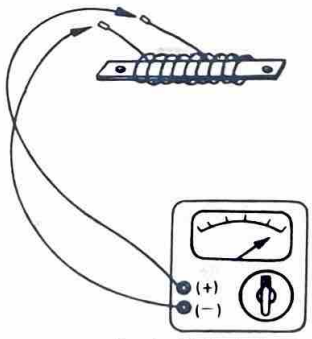
(1) Conductivity Test

Conductivity test should be conducted by connecting the tester with each end of the choke coil as shown in the figure below. If the pointer will not swing, replace the choke coil.

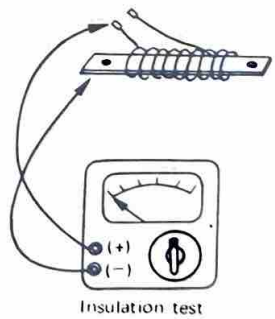
(If the choke coil is faulty, no light will turn on.)

(2) Insulation Test

Insulation test should be performed by connecting the tester with the coil and coil plate as shown in the figure below. If insulation is faulty, replace the choke coil.



Conductivity test



Insulation test

V. SERVICE DATA

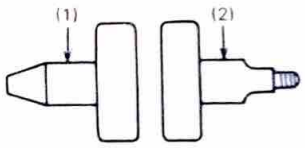
1) Clearance between the piston and the cylinder

0.040–0.045 mm. (0.0016–0.0018 in.)

0.040–0.050 mm. (0.0016–0.0019 in.) with GYT Kit.

2) Crankshaft assembly

Run-out at (1) and (2) should be less than 0.03 mm measured with a dial gauge.



3) Gear box oil

Grade	Motor oil SAE 10W/30
Quantity	1,000 c.c. (1.0 qt.)

4) Autolube pump

Minimum plunger stroke	0.20 - 0.25 mm. (0.0078 - 0.0098 in.)

5) Ignition system

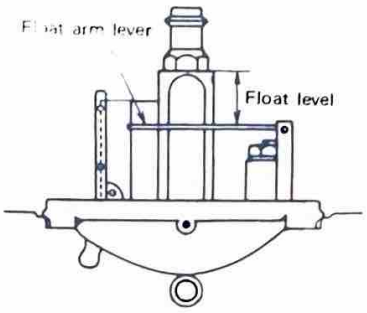
a. Spark plug	B-8E(N) (B-9E(N) with GYT Kit)
b. Spark plug gap	0.5 - 0.6 mm. (0.020 - 0.024 in.)
c. Ignition timing	3.2 mm. B.T.D.C. (2.3 mm. B.T.D.C. with CYT Kit.)
d. Maximum ignition point gap	0.3-0.4 mm. (0.012 - 0.015 in.)

6) Front fork

Grade	Motor oil SAE 10W/30
Quantity	210 c.c. (7.1 oz.)

7) **Carburetor Specifications (Same as before.)**

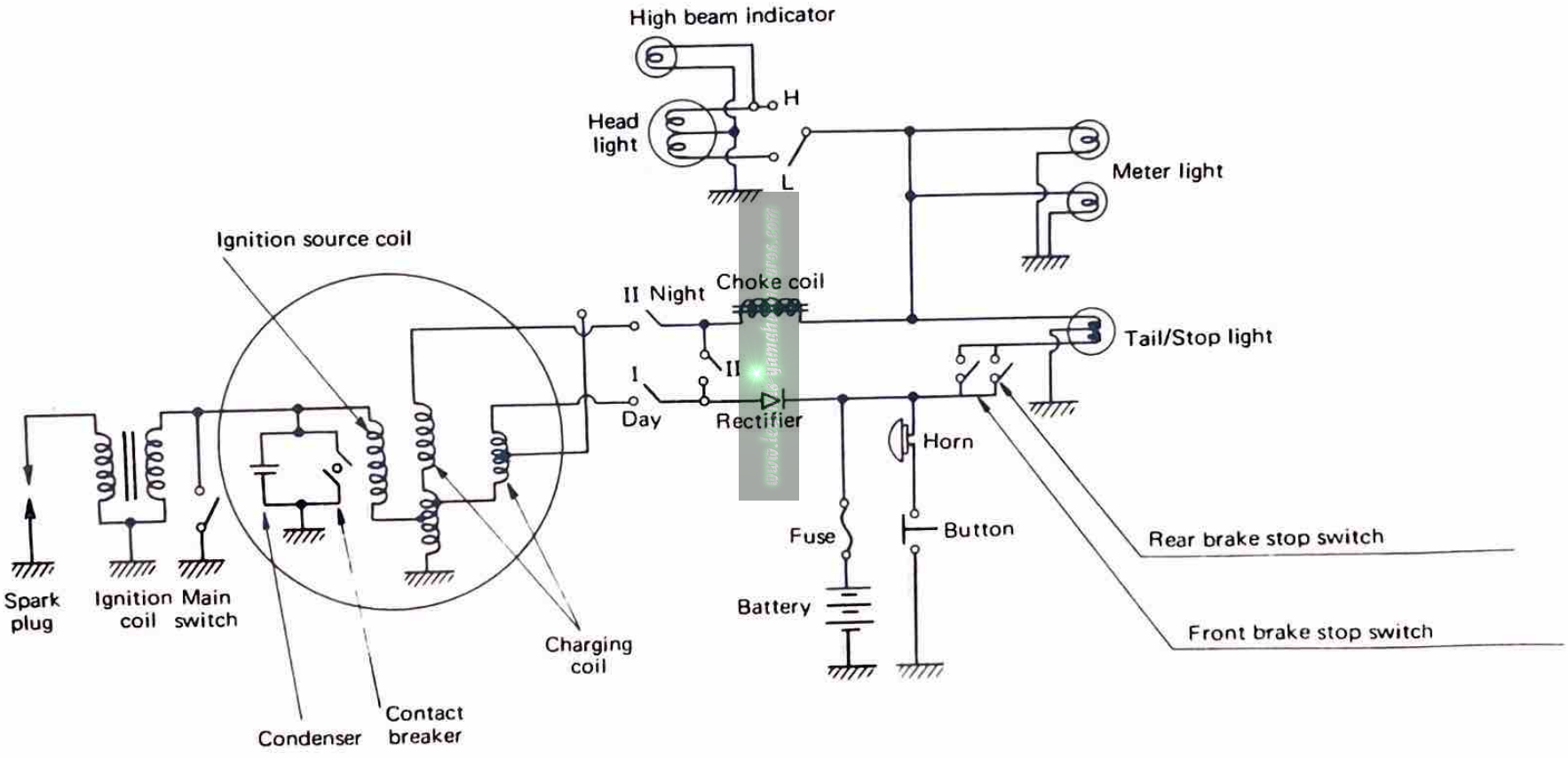
	Standard	With GYT Kit*
Type	VM26SH	VM30SH
M.J.	160	210
N.J.	0-2	0-4
J.N.	5D1-3 stages	5D5-3 stages
C.A.	2.5	3.5
P.J.	35	80
A.S.	1-1/2	1/2
Idling	1,300 ±100 r.p.m.	–
Float level	14.1 mm.	14.1 mm.



* NOTE A 15:1 fuel/oil premix ratio should be used in the gas tank when the Autolube pump is removed.

If the oil pump is retained, a 35:1 fuel/oil premix ratio should be used in the gas tank in conjunction with the Autolube pump.

VI. CONNECTION DIAGRAM



VII. WIRING DIAGRAM

Position \ Color	E	B	R	Br	G	W	Y	L
OFF	○	○						
I			○	○	○	○		
II			○	○		○	○	○

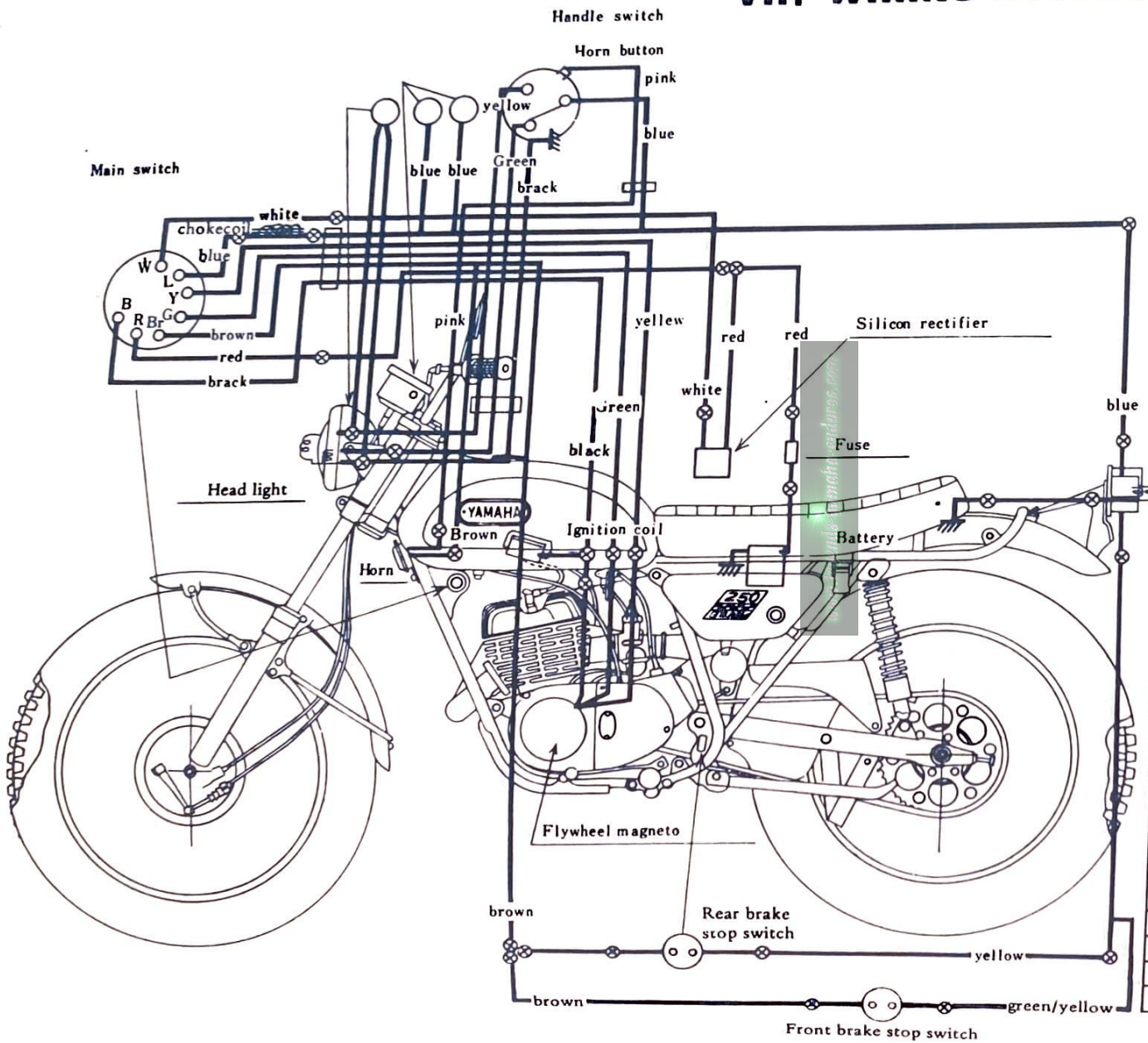


Chart of wire colors

Daytime charging circuit	Green
Night time charging circuit	Yellow
Battery (+) circuit	Red
Ground circuit	Black
Front brake stop light circuit	Green/Yellow
Rear brake stop light circuit	Yellow
Light circuit	Blue
Common circuit	Brown
Head light main circuit	Yellow
Head light sub circuit	Green
Horn circuit	Pink
Rectifier circuit	White

MEMO

YAMAHA MOTOR CO., LTD.