YAMAHA

RD 60

SERVICE MANUAL

SVM-388-0800-20

* * * * * * * NOTICE * * * * * * *

This manual has been written by Yamaha Motor Company for use by Authorized Yamaha Dealers and their qualified mechanics. In light of this purpose it has been assumed that certain basic mechanical precepts and procedures inherent to our product are already known and understood by the reader.

Without such basic knowledge, repairs or service to this model may render the machine unsafe, and for this reason we must advise that all repairs and/or service be performed by an Authorized Yamaha dealer who is in possession of the requisite basic product knowledge.

Other information is produced by the U.S. distributor, Yamaha International Corporation, and is necessary to provide total technical coverage regarding the product.

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The Research, Service Departments of Yamaha are continually striving to further improve all models manufactured by the company. Modifications are therefore inevitable and changes in specifications or procedures will be forwarded to all Authorized Yamaha Dealers and will, where applicable, appear in future editions of this manual.

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YAMAHA RD60 SERVICE MANUAL
1st Edition
Febrary 1973
SERVICE DEPARTMENT
YAMAHA MOTOR COMPANY
HAMAMATSU, JAPAN

FORWORD

This Service Manual to the Yamaha RD60 technical information as well as maintenance instructions required for servicemen charged with the task of keeping the machine in top condition.
We hope that the information included in this manual will help the rider enjoy many design features-Autolube, torque induction, primary kick starter, and waterproof/dustproof brake drums - which assure long service life of the machine.

YAMAHA MOTOR CO.,LTD.
SERVICE DEPARTMENT

CHAPTER 1 GENERAL

1–1 Features

(1) Employment of "Torque Induction"
Cylinder lined with sleeves of special cast iron of "Torque Induction System" are employed to improve scavenging efficiency. Consequently, the engine performance is superior, and outstanding torque is obtained particularly in the low through intermediate speed ranges.

(2) Highly Reliable Yamaha Autolube Engine
Lubrication of engine is of Yamaha's patented Autolube system. This improved lubrication system ensures the greatest reliability and durability.

(3) 5 speed Transmission
The Yamaha is assured steady engine performance from low speed riding to high speed road work with a 5-speed transmission.

(4) Carburetor with Starting Mechanism To Enable Easy Starting
A single kick is enough to start the engine. The starting mechanism which is incorporated in the carburetor fully exhibits its efficiency, particularly when starting during the cold months.

(5) Highly Effective Brake System
The front brake, which is important in a high speed machine is leading-trailing shoes type drum brake. The patented fully waterproof and dust proof brake drums for both front and rear brakes consistently provide stabilized braking force even when riding in the rain.

(6) Easily Readable Separate Tachometer and Speedometer
The tachometer which is important for fully registering engine's performance is separate from the speedometer to improve functional beauty. Both tachometer and speedometer are installed on brackets in anti-vibration rubber for riding on rough roads.

(7) Employment of Primary Kick
A mechanism is employed that enables kick starting regardless of the position of transmission if the clutch is disengaged. This mechanism conveniently enables quick restarting when the engine stalls while riding or at a crossing.

(8) Light Styling
The slim fuel tank and narrow engine adds to the styling and controllability enabling the rider to travel long distances without fatique.

CONTENTS

Chapter 1. General 3
1–1 Features 3
1–2 Specifications and Performance 6
1–3 Performance Curves 8
1–4 Service Tools 9
1–5 Lubrication Intervals 11
1–6 Periodic Maintenance Interval Chart 12

Chapter 2. Yamaha Autolube (Separate Automatic Lubrication System) 13
2–1 What is Yamaha Autolube? 13
2–2 Features of Yamaha Autolube 13
2–3 Handling of the Oil Pump 13

Chapter 3. Torque Induction 17
3–1 The Torque Induction System 17
3–2 The Yamaha Reed Valve 18
3–3 Operation of the Torque Induction System 19

Chapter 4. Engine 21
4–1 Engine Dismounting Procedure 21
4–2 Reed Valve 25
4–3 Cylinder Head 26
4–4 Cylinder 26
4–5 Piston Pin 28
4–6 Piston Rings 28
4–7 Piston 30
4–8 Crankcase Cover (R) 32
4–9 Clutch 33
4–10 Primary Drive Gear 38
4–11 Kick Starter 39
4–12 Shifter 41
4–13 Drive Sprocket 44
4–14 Splitting the Crankcase 45
4–15 Transmission 47
4–16 Crankshaft 49
4–17 Bearings and Oil Seals 52
4–18 Carburetor 53
4–19 Air Cleaner 56

Chapter 5. Chassis 57
5–1 Front Wheel 57
5–2 Rear Wheel 59
5–3 Front Fork 64
5–4 Rear Cushion 67
5–5 Steering Head 67

Chapter 6. Electrical 68
6–1 Electrical Equipment 68
6–2 List of Electrical Components 68
6–3 Connection Diagram 69
6–4 Ignition System-Function and Service 69
6–5 Charging and Lighting System Function and Checking 71
6–6 Checking the Main Switch (removed from the chassis) 72
6–7 Battery 73
6–8 Spark Plug 74

1–2 Specifications and Performance

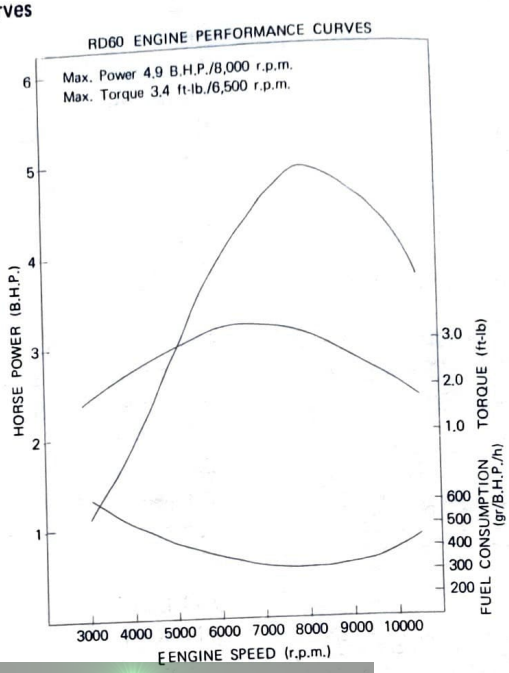
Model	RD60
Dimensions:	
Overall length	71.9 in. (1,825 mm)
Overall width	24.8 in. (630 mm)
Overall height	38.0 in. (965 mm)
Wheelbase	46.7 in. (1,185 mm)
Min. ground clearance	5.9 in. (150 mm)
Weight:	
Net	163 lbs. (74 kg)
Performance:	
Max. speed	50 ~ 53 mph (80 ~ 85 km/h)
Fuel consumption (on paved level road)	188 mpg at 19 mph (80 km/lit. at 30 km/h)
Climbing ability	18°
Min. turning radius	70.9 in. (1,800 mm)
Braking distance	23.0 ft. at 22 mph (7.0 m at 35 km/h)
Engine:	
Model	388, 2 stroke, air cooled. Torque Induction
Type	Single, forward inclined,
Cylinder	Separate lubrication (Yamaha Autolube)
Lubrication system	3.36 cu.in. (55 c.c.)
Displacement	1.654 in. x 1.563 in. (42.0 x 39.7 mm)
Bore & Stroke	6.9 : 1
Compression ratio	4.9 BHP/8,000 rpm
Max. output	3.4 ft.lbs/6,500 rpm (0.47 kgm/6,500 rpm)
Max. torque	Kick starter
Starting system	Magneto ignition
Ignition system	
Carburetor:	VM16SH
Air cleaner:	Wet, Molt plain
Power transmission:	
Clutch	Wet, multi-disc type.
Primary reduction system	gear
Primary reduction ratio	3.578 (68/19)
Gear box:	
Type	Constant mesh, 5-speed forward
Reduction ratio 1st	3.250 (39/12)
Reduction ratio 2nd	2.000 (34/17)
Reduction ratio 3rd	1.428 (30/21)
Reduction ratio 4th	1.125 (27/24)
Reduction ratio 5th	0.961 (25/26)
Secondary reduction ratio	3.500 (42/12)
Secondary reduction system	Chain

Model	RD60
Chassis:	
Model	388
Type of frame	Pipe, diamond
Suspension system, front	Telescopic fork
Suspension system, rear	Swing arm
Cushion system, front	Coil spring, oil damper
Cushion system, rear	Coil spring, oil damper
Steering system:	
Caster	62°
Trail	3.3 in. (85 mm)
Braking system:	
Type	Internal expansion
Operation method, front	Right hand operation
Operation method, rear	Right foot operation
Tire, front	2.50-17-4PR
Tire, rear	2.50-17-4PR
Fuel tank capacity	2.1 gals. (8.0 liters)
Oil tank capacity	1.1 qts. (1.0 liters)
Generator:	
Model	F11-L48
Manufacturer	HITACHI
Spark plug:	B-7HS
Battery:	
Model	6N4A-4D
Capacity	6V, 4AH
Lights:	
Headlamp	6V 15W/15W
Taillamp/Stoplamp	6V 5.3W/25W
Flasherlamps	6V 17W
Meterlamp	6V 1.5W x 2
Flasher pilot lamp	6V 3W
High beam indicator lamp	6V 1.5W

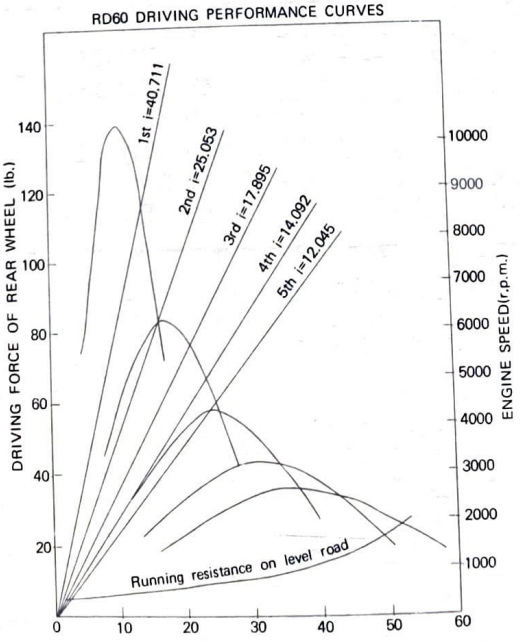
The following data subject to change without notice.

1–3 Performance Curves

Engine Performance Curves



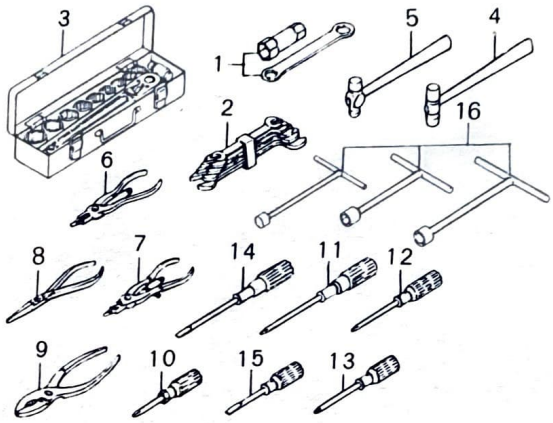
Driving Performance Curves



1–4 Service Tools

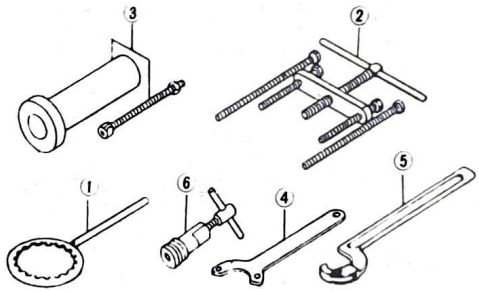
The following tools are required to service the RD60.

1. General Tools



1) Plug wrench 23 x 29 mm
2) A set of open-end wrenches
3) A set of socket wrenches
4) Soft-faced hammer
5) Steel hammer
6) Clip plier (ST type)
7) Clip plier (TR type)
8) Long nose plier
9) Combination Plier
10) Phillips-head screwdriver
11) Phillips-head screwdriver (L)
12) Phillips-head screwdriver (M)
13) Phillips-head screwdriver (S)
14) Slot-head screwdriver (M)
15) Slot-head screwdriver (S)
16) T-type socket wrenches

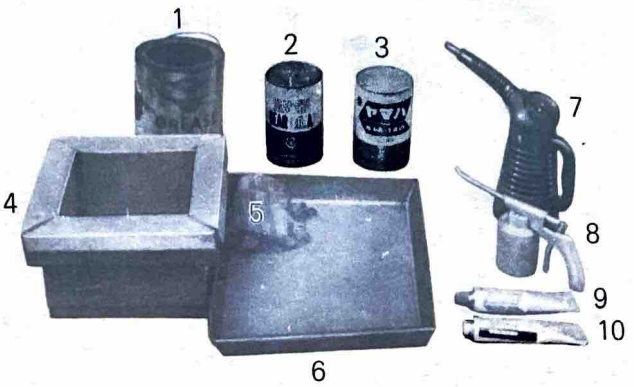
2. Special Tools



1) Clutch disassembling tool
2) Crankcase dividing tool
3) Crankshaft setting tool
4) Flywheel magneto holding tool
5) Ring nut wrench
6) Flywheel magneto puller

In addition, an electro-tester, pocket-tester hydrometer, etc. are required.

3. Miscellaneous



1) Grease
2) Gear oil
3) Autolube oil
4) Overhauling stand
5) Wiping materials
6) Parts tray
7) Oil jug
8) Oiler
9) YAMAHA Bond (No.5)
10) YAMAHA Bond (No.4)

ITEMS		REMARKS	TYPE	PERIOD						
				INITIAL				THEREAFTER EVERY		
				250	500	1000	2000	1000	2000	4000
Autolube	PREOP CHECK	See Service Notes	#1			See Service Notes				
Transmission Oil		Warm engine before draining	#2		2Str.		0	CHK	0	
Drive Chain		Lube/Adjust as required	#3			See Service Notes				
Drive Chain		Remove/Clean/Lube/Adjust	#3				0		0	
Air Filter		Foam Type	#9			See Service Notes				
Control & Meter Cables		All - Apply Thoroughly	#4		0	(0)			0	
Throttle Grip & Housing		Light Application	#5			0			0	
Tach & Speedo Gear Hsgs.		Light Application	#5			0	0			0
Rear Arm Pivot Shaft		Zirc - Apply until shows	#6			0			0	
Brake Pedal Shaft		Light Application	#5			0			0	
Change Pedal Shaft		Light Application	#5			0			0	
Stand Shaft Pivot(s)		Light Application	#5			0			0	
Front Forks		Drain Completely - Ck Specs	#3		CHK		0		CHK	0
Steering Ball Races		Inspect Thoroughly/Med. Pack	#7				0			0
Point Cam Lubr. Wick		Very Light Application	#8			0				0
Wheel Bearings		Do Not Over-Pack	#7				0			0

#1 Check tank level before each ride or every 100 miles. Top off when oil level is at sight glass or before any long trip. Use the following lubricant (in order of preference): Yamalube, or; two-stroke oil labeled "BIA certified for service TC-W".

#2 At ambient temperatures of 30-90°F use 10W-30 "SE" (two-strokes).

#3 Use 10W-30 "SE" motor oil. (If desired, specialty type lubricants of quality manufacture May be used.) Add "DRIVE CHAINS"—Unless and an automatic oiler is incorporated, lube every 200-250 miles.

#4 Use graphite base type (specialty types available—use name-brand quality manufacturer).

#5 Light duty: Smooth, light-weight, "white" grease. Heavy duty: Standard 90 wt. lube grease (do not use lube grease on throttle/housing).

#6 Use standard 90wt. lube grease—smooth, not coarse.

#7 Medium-weight wheel bearing grease of quality mft.—preferably waterproof.

#8 Light-weight machine oil.

#9 AIR FILTERS— Foam element air filters must be damp with oil at all times to function properly. Clean and lube monthly or per mileage. If hard usage, clean and lube daily. Do not over-oil. Use SAE 10W-30 "SE".

1–6 Periodic Maintenance Interval Chart

ITEM		REMARKS	INITIAL				THEREAFTER EVERY	
			250	500	1000	2000	1000	2000
Brake System (Complete)	ALSO PREOPER CHECK	Chk/Adj as req'd - Repair as req'd		0	0			0
Clutch		Check/Adjust as required		0	0			0
Battery		Top-Off/Ck. Spec. Gr. as req'd - monthly - or →	0	0	0		0	
Spark Plug		Inspect/Clean or replace as re'd	0	0	0		0	
Wheels & Tires		Pressure/Spoke Tension/Runout	0	0	0		0	
Fittings & Fasteners		Tighten before each trip and/or →	0	0	0		0	
Autolube		Cable operation/Adjustment	0	0	0			0
Drive Chain		Tension/Alignment	0	0	0		0	
Oil Level Check		Includes Sump/Trans./Oil tank 1 4	0	0	0		0	
Air Filter		Foam Type - See Service Note 2 4	0	0	0		0	
Fuel Petcock		Clean/Flush tank as req'd	0		0			0
Ignition Timing		Adjust/Clean or repl. pts. as req'd		0	0			0
Carburetor Adjustment		Check Operation/Fittings		0	0			0
Carburetor Overhaul		Clean/Repair as req'd/Refit/Adjust				0		8000
Cylinder Compression		Preventive Maintenance Check		0	0			0
Decarbonize Engine		Includes Exhaust System			0	0		0

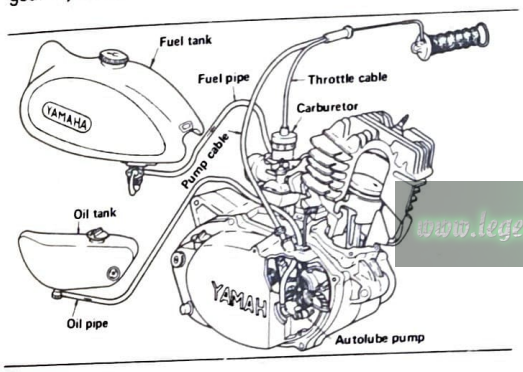
Service Notes:

1. Check oil tank level before each ride or every 100 miles. Top off when oil level shows at the sight glass or before any long trip. See "Lubrication Intervals" for type oil to use.
2. Foam element air filters must be damp with oil at all times to function properly. Remove, clean, and oil filter at least once per month or every 500 - 1,000 miles; more often if possible. (If extremely hard usage, such as dirt riding, clean and lube daily). See lubrication chart for add"l details.
3. Pre-operational checks should be made each time the machine is used. Such an inspection can be thoroughly accomplished in a very short time; and the added safety it assures the rider is more than worth the minimal time involved.
4. For add'l info-drive chain, Transmission level, wet-type air filter; see lube chart.

CHAPTER 2 YAMAHA AUTOLUBE
(Separate Automatic Lubrication System)

2–1 What is Yamaha Autolube?

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



2–2 Features of Yamaha Autolube

The YAMAHA Autolube:

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

2–3 Handling of the Oil Pump

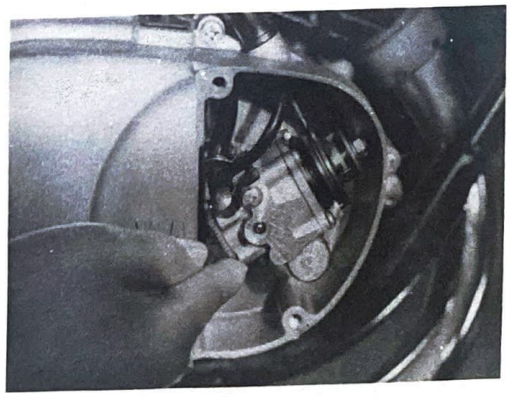
The oil pump is a precision-machined assembly. Make no attempt to disassemble it. When you remove the oil pump from the engine, protect it from dust, dirt, etc., and after reinstalling it, bleed and adjust the pump correctly. Proper handling will keep the pump free from trouble.

1. Checking Minimum Pump Stroke

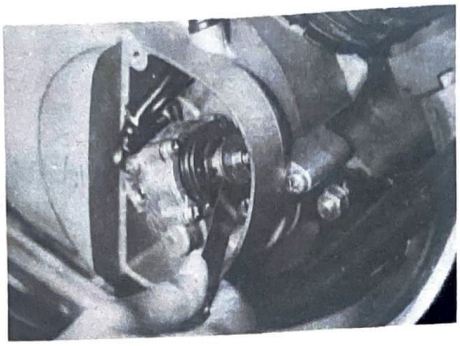
a. Checking

1) Fully close the accelerator grip.

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

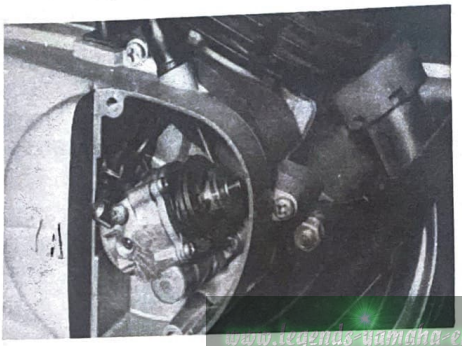


3) Use thickness gauges to check the gap width. The correct minimum pump stroke tolerance is 0.30 ~ 0.35 mm. (0.0118 ~ 0.138")

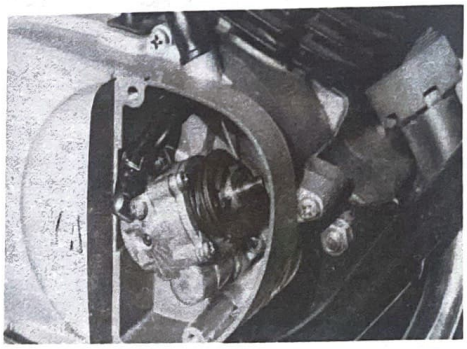


b. Adjustment

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



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



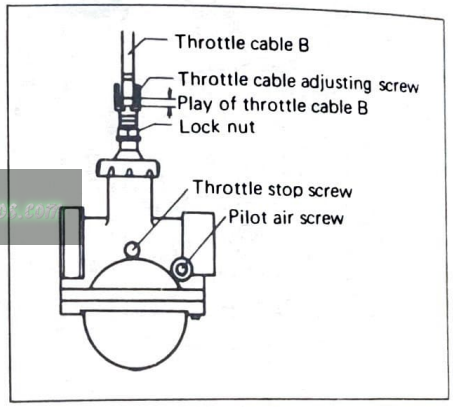
3) Reinstall the adjustment plate and lock nut, and measure the minimum stroke for the correct tolerance.

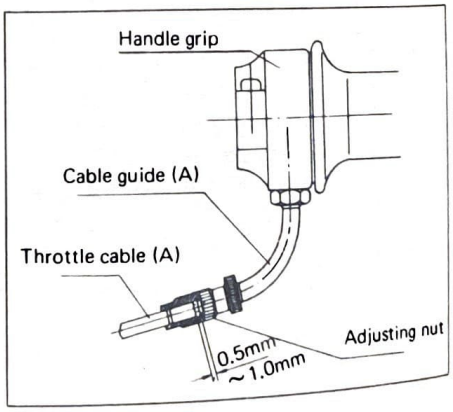
2. Pump and Carburetor Setting

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

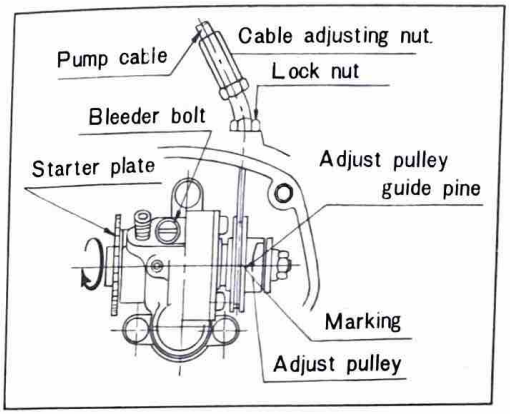
a. Checking

1) Adjust both carburetors so the slides raise and lower simultaneously and the cables have correct slack right at the carburetors. (See carburetor section for details.)
2) Adjust the throttle cable at the throttle grip so it has proper slack (see Fig. 2-3-6)
3) Set the idle mixture screws to 1-3/4 turns out from a lightly seated position.
4) Start the machine, let it warm up, and synchronize the idle speeds so the machine idels at 1,300 rpm.

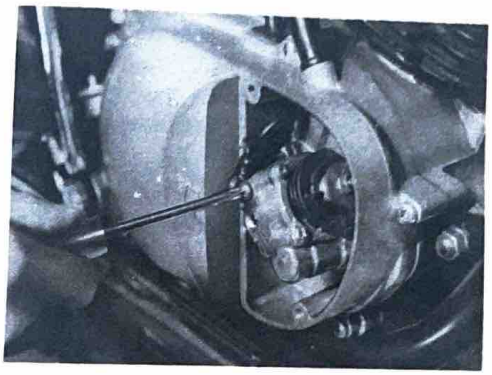




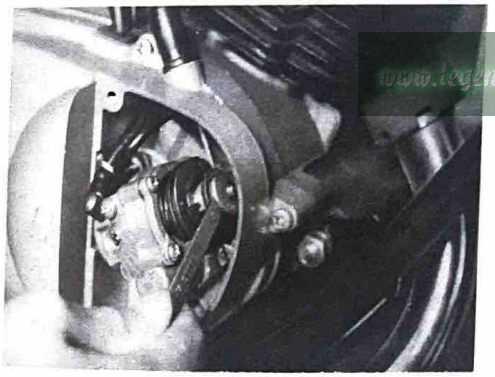
5) Close the throttle grip completely, then twist it open until all cable slack is removed, but stop before the slides start to lift.
6) Adjust the pump cable so the raised mark on the pump pulley lines up with the guide pin (adjustor located at bottom end of cable, screwed into top of right case).

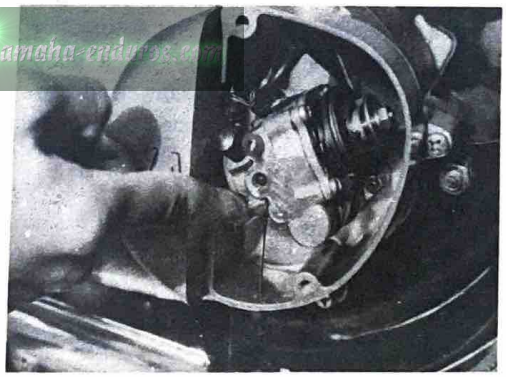


1) Removed the bleeder bolt.



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





3. Bleeding

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

3) Prior to installation of the cover, check the pump guide pin. It should not strike the raised boss at either end of the cable pulley (at idle or full throttle). Additionally, check to see that the cover does not pinch any delivery lines when tightened down.

4. Recommended Oil

It is recommended that your first choice be YAMALUBE, which can be purchased from any Authorized Yamaha dealer. If for any reason you use another type of oil, choose from the following list, which is in descending order of preference.

1) Any major brand of two-stroke oil labeled as "BIA certified for service TC-W."
2) Another brand 30 wt. two-stroke oil designed for air cooled engines.
3) A 30 wt. two-stroke oil designed for water cooled engines.
4) A 30 wt. SE "MS" name-brand, detergent type automotive oil.

NOTE:

The Autolube system, due to its superior metering capabilities, will help any automotive type oil (such as L4 above) do a good lubricating job. However, we recommend two-stroke oil due to the extra, added protection it offers; particularly YAMALUBE.

5. Temperature

Oil delivery to the Autolube pump is via gravity feed. YAMALUBE remains nonviscous to well below the freezing point. In the event temperatures drop to, and stay at, levels well below freezing, use the following formula:

Below 15°F use MS SE 10W-30
Below -10°F use MS SE 5W-20

CHAPTER 3. TORQUE INDUCTION

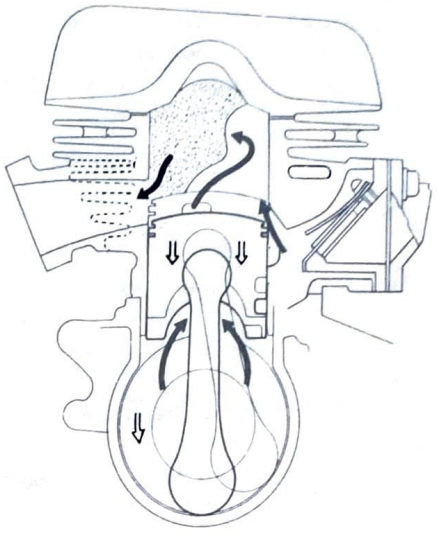
3–1 The Torque Induction System

Over six years ago, the engineers at the Yamaha Research Institute took on a problem that has long plagued many riders: how to get more effective horsepower. Riders who buy motorcycles on the basis of advertised high RPM horsepower often find that overall performance is poor. Under heavy loads, many bikes stutter and stall . . . spark plugs foul. The bikes may have high peak horsepower running flat-out, but they lack effective performance overall.

After a thorough study of this problem, Yamaha engineers confronted a fundamental fact: if you want better overall performance, you need a better breathing engine. By "better breathing" we mean the ability of the engine to get the fuel/air mixture it needs when it needs it. Engineers call an engine's breathing process "induction."

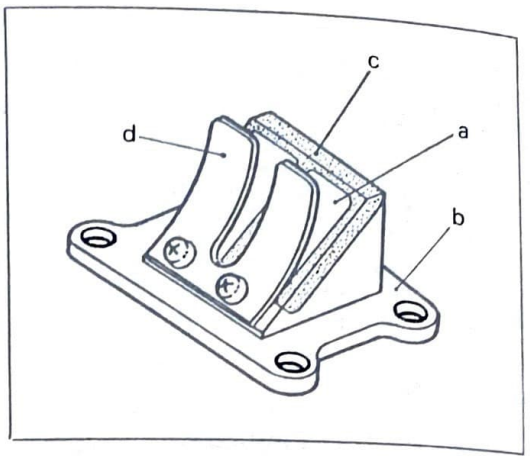
Yamaha's answer for "better breathing" is Torque Induction (R). Torque Induction is a unique method for supplying the fuel/air mixture to the engine, based on engine demand rather than an arbitrary mechanical induction system such as the piston skirt or a crankshaft-mounted rotary valve. With Torque Induction, Yamaha added a unique new 5th port that gives you bike more muscle at the top end. The 5th port improves performance by (1) allowing more fuel/air mixture to be "rammed" into the combustion chamber and (2) by simultaneously improving the "scavenging," or removal, of exhaust gases. The blast of cool fuel/air mixture directly from the carb into the combustion chamber helps cool the engine, and greatly extends piston life.

With Torque Induction, your Yamaha runs cooler and breathes better over its entire RPM range, for roaring response in the dirt and greater peak power on the street.



3–2 The Yamaha Reed Valve

Yamaha has designed a unique stainless steel reed valve located between the carburetor and cylinder. The valve works independently on a demand basis. There's no mechanical device, such as a rotary valve or piston skirt to govern its opening and closing.



1. Construction of the Reed Valve

a. Valve
The valve is made of special flexible stainless steel and designed to open and close the inlet port.

b. Case
The case is made of a die-cast aluminum alloy.

c. Gasket
Made of heat-and oil-resisting rubber, the gasket is "welded" to the case by heat.

d. Valve Stopper
The valve stopper is made of highly-durable cold-rolled stainless steel plate, and controls the movement of the valve.

2. Handling of the Reed Valve

As explained earlier, the reed valve is operated by changes in the crankcase pressure and by the inertia effect of the fuel-air mixture stream. It is a high-precision work, and therefore, it must be handled with special care.

a. Storage
The reed valve must be stored in a clean and dry place and must not be exposed to the sun. Particularly, it must be kept free from salt. Avoid allowing your hand to touch the valve.

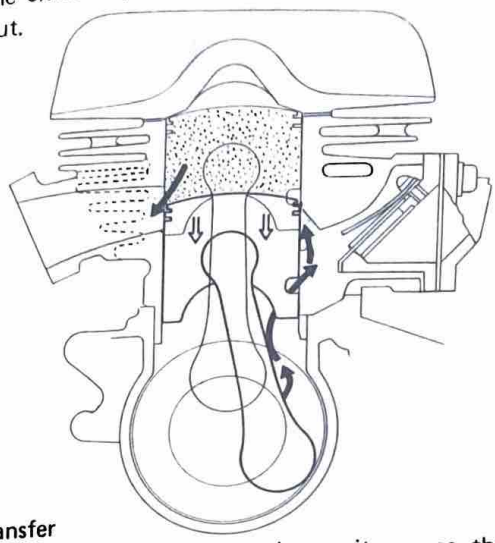
b. Inspection
1) Valve
Check the valve for cracks and breakage.
2) Valve Stopper
The valve stopper limits the movement of the reed valve.
3) Set-screw
The valve and valve stopper should be fastened with the set-screw. Tightening torque should be correct; otherwise, the valve and valve stopper will be deformed.
Correct tightening torque: 8.0 kg-cm
4) Gasket
The gasket is "welded" to the case by heat. It should be checked for separation from the case. If the gasket becomes loose, it may fail to achieve a good seal with the valve.

c. Valve Service
The reed valve can not be perfect, if any of its components-valve, valve stopper, gasket case and set-screw is faulty. If so, it is advisable to replace the whole assembly, instead of replacing a faulty part.

3–3 Operation of the Torque Induction System

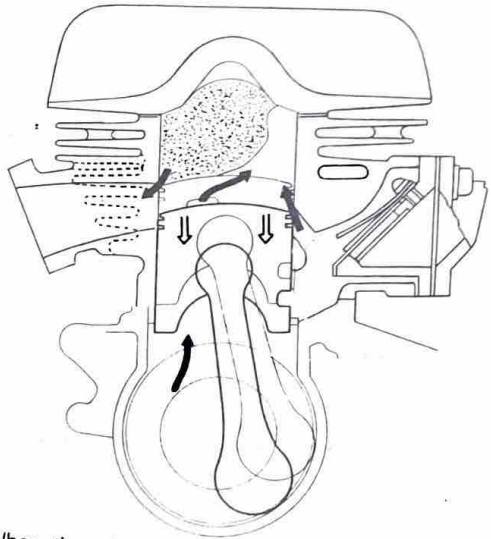
1. Ignition Power and Exhaust

The piston approaches top dead center, and the spark plug fires. Combustion pressure forces the piston down. As the piston head passes the exhaust port, exhaust gases begin to flow out.



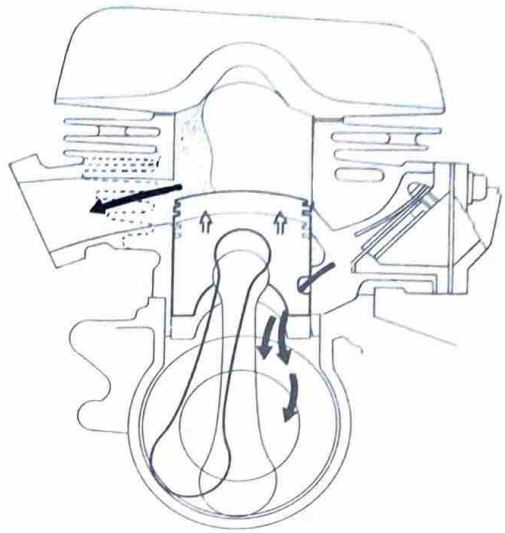
2. Transfer

As the piston continues down, it passes the transfer ports, opening them. They allow the compressed fuel/air mixture in the crankchamber to flow into the combustion chamber. All the remaining exhaust gases within combustion the chamber are pushed out by this transfer action.



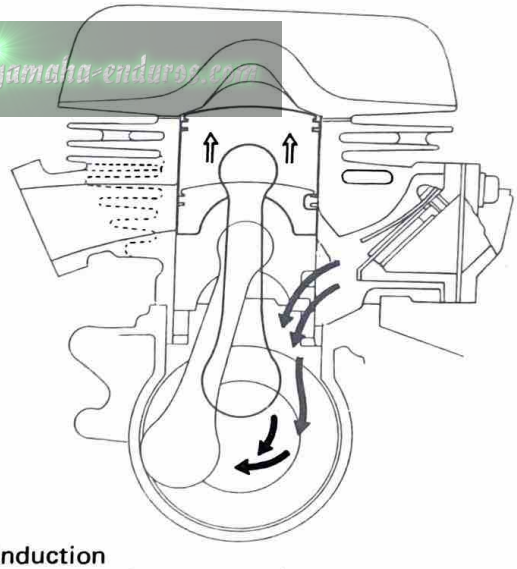
3.

When the piston starts up, it creates a vacuum within the crankchamber. Atmospheric pressure forces the Torque Induction valve open, and a fresh fuel/air charge is rammed into the crankchamber.



4. Compression

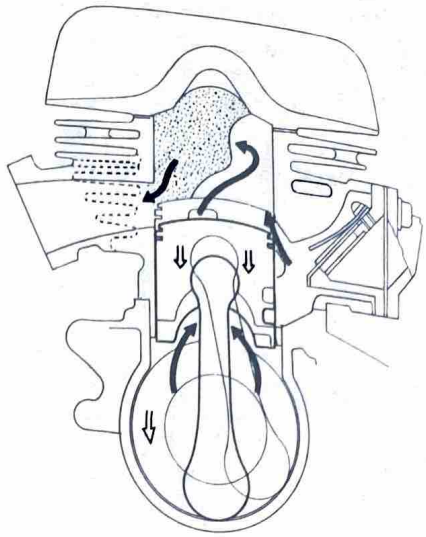
The piston starts up, closing all ports. As it moves up, it compresses the fuel/air charge for ignition. At the same time, the upward movement of the piston creates a suction effect or "demand" in the crankchamber.



5. Induction

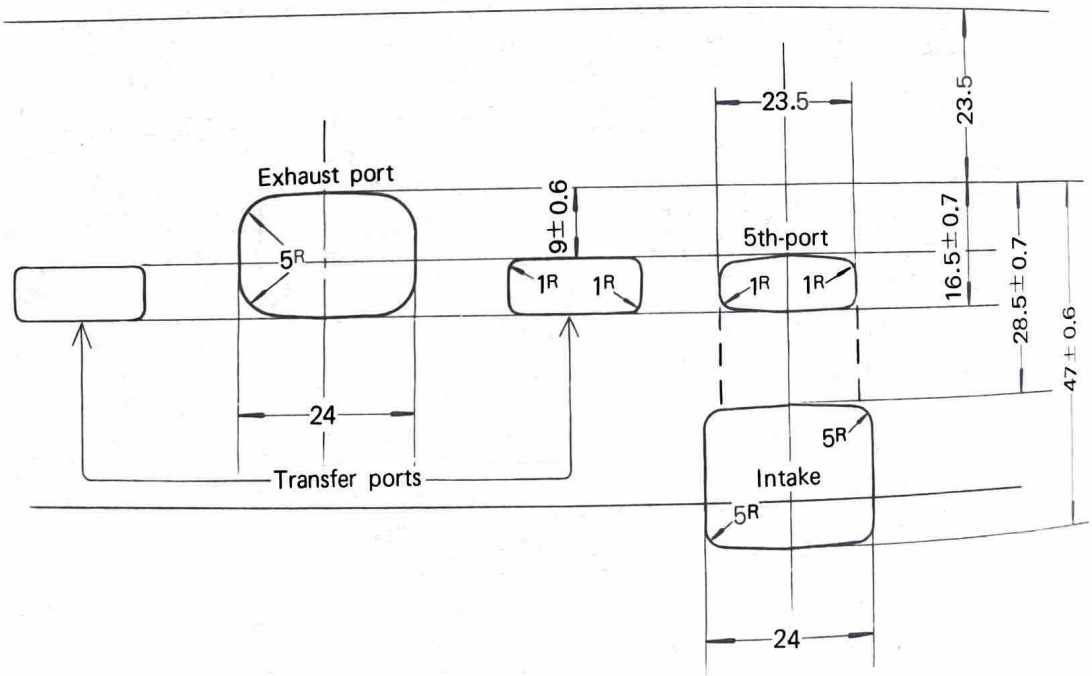
The "demand" created by the piston traveling upward causes atmospheric pressure to "ram" air into the crankchamber. The reed valve opens to allow the fuel/air mixture in. This is the real secret behind Torque Induction. There is no mechanically-governed device to arbitrarily open the crankcase-sometimes at the wrong time. The fuel/air mixture from the carb comes in only when it is wanted.

6. Scavenging by the 5th Port Cylinder with Reed Valve Engine



On the 5-port cylinder, the auxiliary transfer ports are positioned on the same level as the main transfer ports. As the piston lowers to the position as illustrated the fuel-air mixture in the crankchamber is compressed and is going to stream into the cylinder through the main and auxiliary transfer ports. On the 5-port cylinder with reed valve engine, too, the compressed mixture is about to stream into the crankchamber through the inlet port of the piston.

As the piston moves down further, the main trancer ports and 5th port are cleared and the fuel-air mixture enters the cylinder in streams. In this case, the inertia effect of the streams causes the reed valve to open, and the fuel-air mixture passing through the reed valve flows directly into the cylinder through the 5th port (the mixture does not enter the crank chamber), thereby forcing the burned gases out of the cylinder. This is the scavenging action of the 5th port.



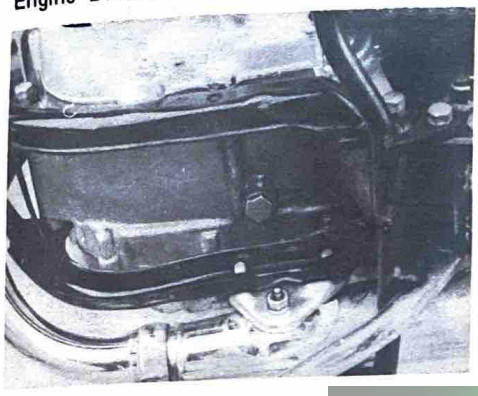
CHAPTER 4 ENGINE

Description

When disassembling and reassembling the engine, work in such sequence to facilitate later working process.

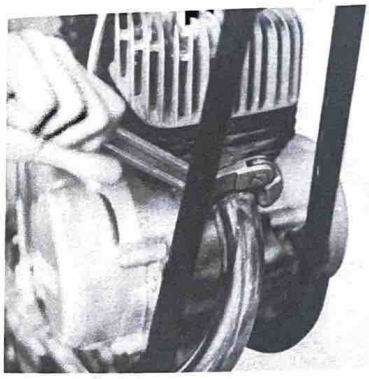
* Precautions for Engine Disassembly
  (1) Make sure to remove dust around cylinder head, cylinder and crankcase prior to dismounting the engine, to prevent dust entering into the engine interior during disassembly.
  (2) Always use clean tools in proper manner exercising care not to damage the motorcycle components.
  (3) Place removed parts in parts tray in groups so as not to mislay any of them.

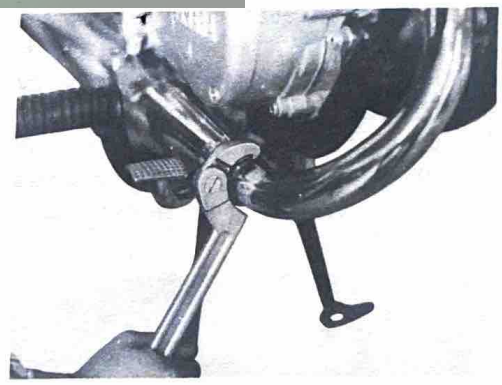
4–1 Engine Dismounting Procedure



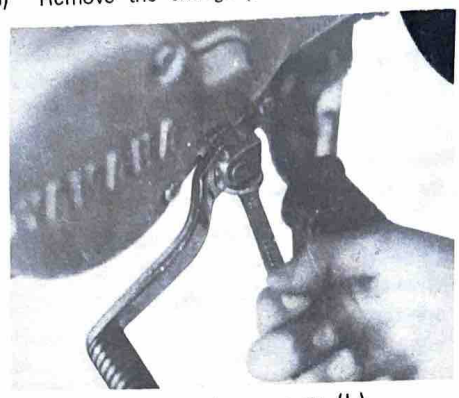
(1) Drain transmission oil after running the engine for 3~5 minutes.
Recommended transmission oil
Type: SAE 10W-30 ("SE")
Amount: 0.47 qt. (500cc)

(2) Remove the exhaust pipe.

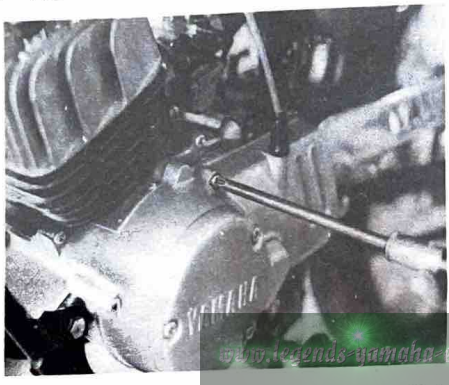




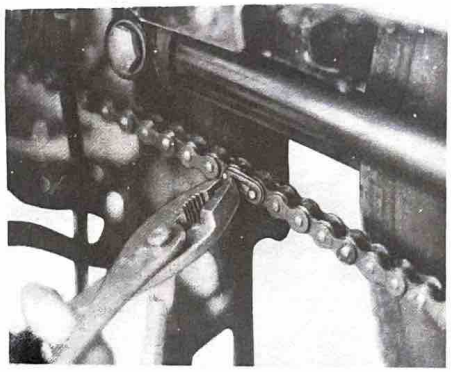
(3) Remove the change pedal.



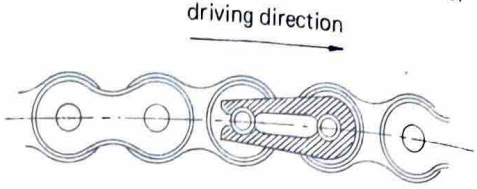
(4) Remove the crankcase cover (L).



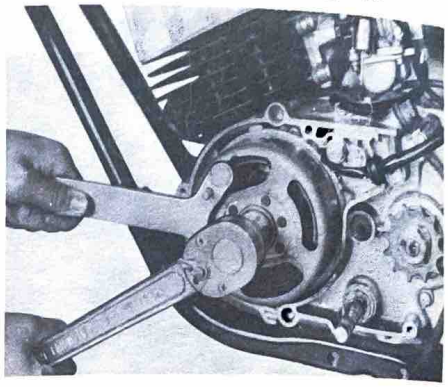
(5) Remove the drive chain at the master link. During installation the drive chain should be connected. After connecting the chain, have the rider sit on the motorcycle. Measure the up-and-down movement of the chain at the center of the lower chain run, and adjust it so that the total up-and-down movement of the chain is about 0.8 in (20 mm).

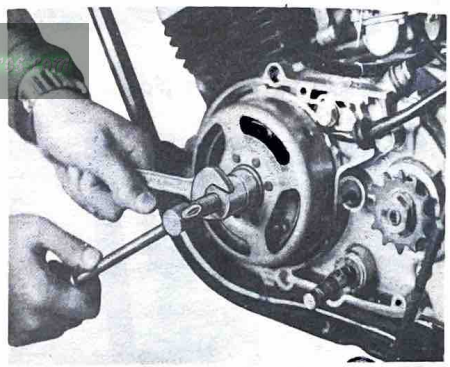


Whenever installing the chain, always install the master link retaining clip so that the rounded closed end faces the direction of travel.

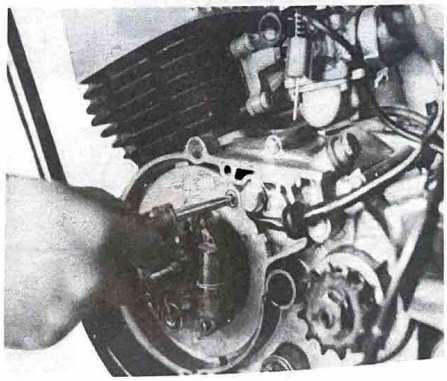


(6) Remove the flywheel magneto.

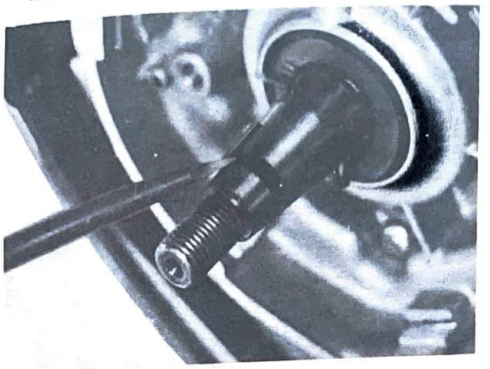




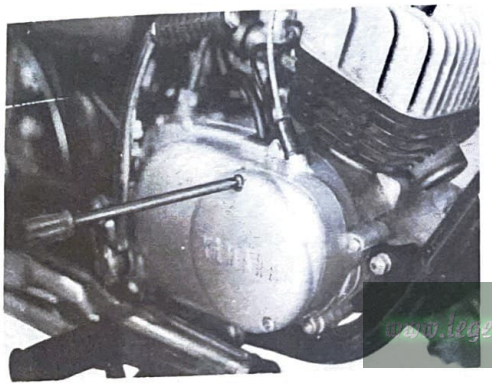
(7) Remove the flywheel magneto base.



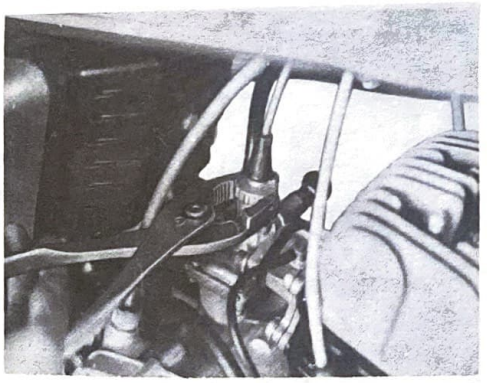
(8) Remove the woodruff key from the crankshaft.



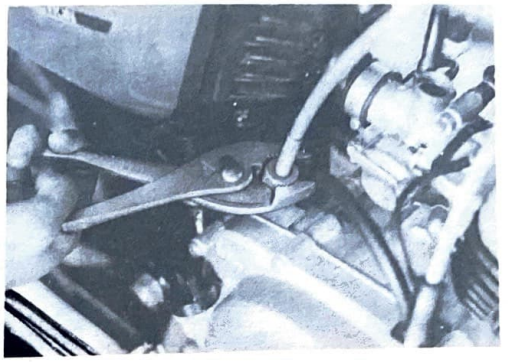
(9) Remove the oil pump cover.

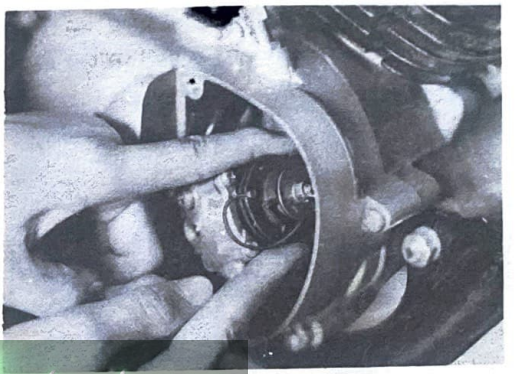


(10) Remove the throttle valve from the carburetor.

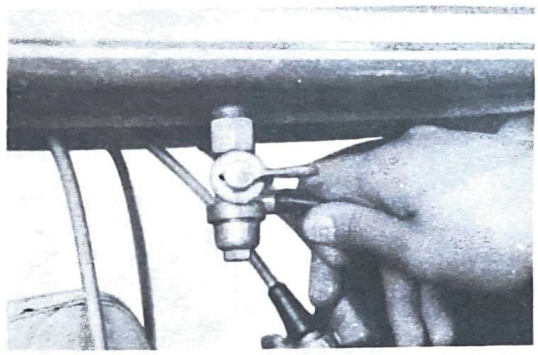


(11) Remove the tachometer cable, and disconnect pumpcable.

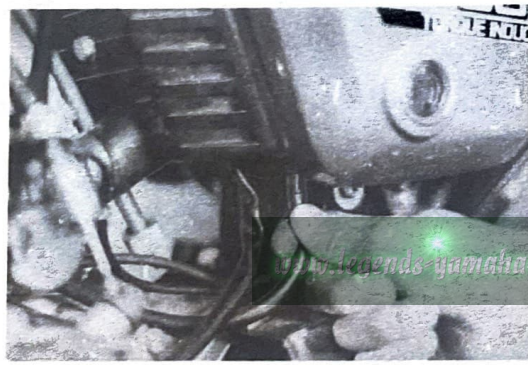




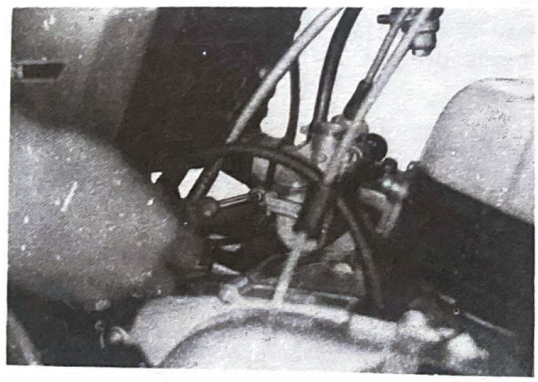
(12) Turn the fuel petcock to "CLOSE", and disconnect the fuel line.



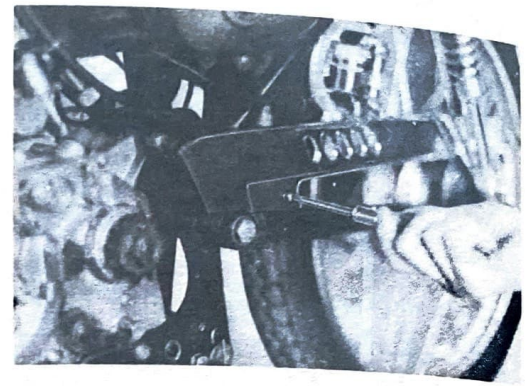
(13) Disconnect the oil line and sure to plug the hole to prevent oil from flowing out.



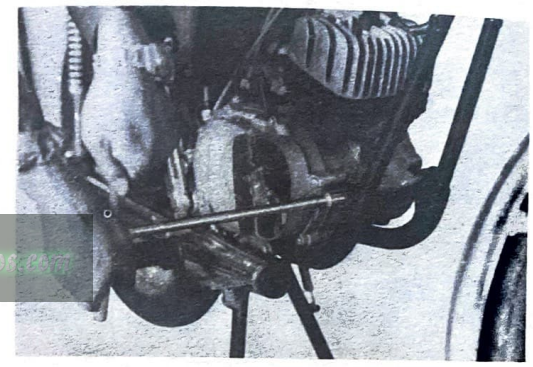
(14) Loosen the air cleaner clamp screw.



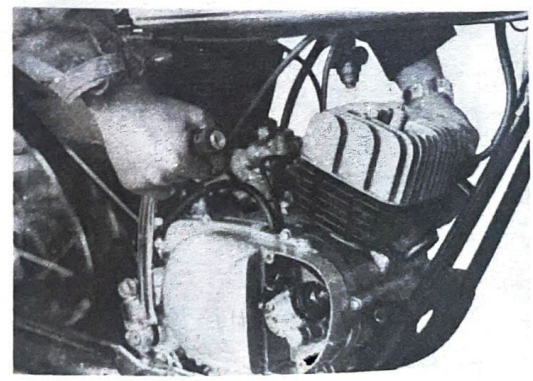
(15) Remove the chain case panhead screw.



(16) Remove the three engine mounting bolts.



(17) Disconnect the engine from the frame.

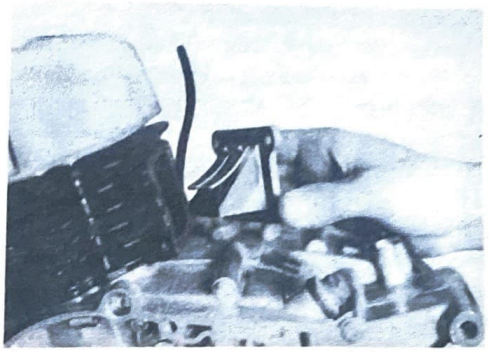


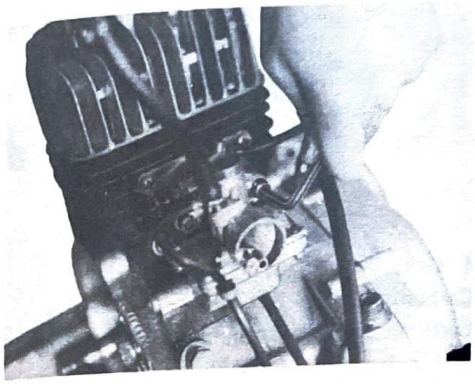
4–2 Reed Valve

The reed valve is located between cylinder and carburetor.

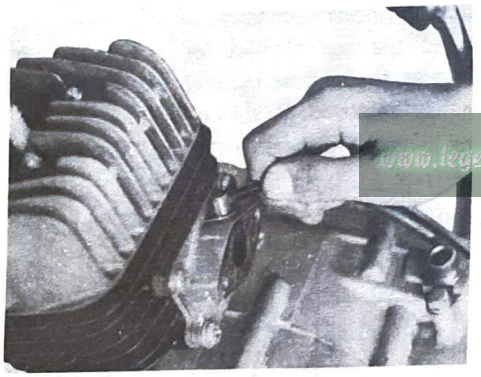
Removing the red valve ass'y.

1) Remove the carburetor by using 6 mm hexagon wrench.

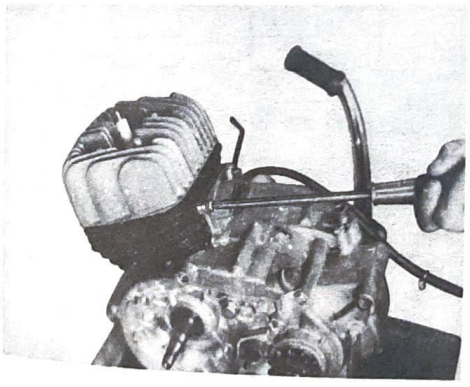




2) Remove the oil delivery pipe.



3) Remove the reed valve ass'y.



4–3 Cylinder Head

1. Removal and Reinstallation

Remove the spark plug. Remove the nuts on the four cylinder stud bolts, in pattern. A half turn at a time, then remove the cylinder head and cylinder head gasket.

NOTE:

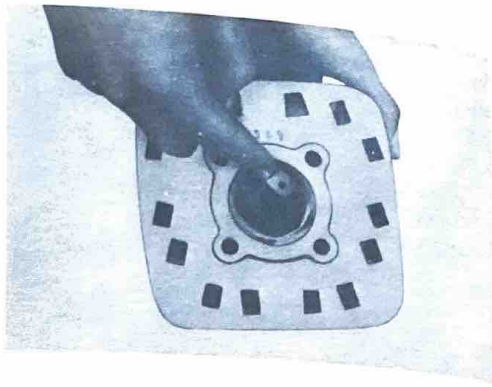
As soon as the cylinder has been lifted high enough, stuff clean rags beneath the piston to prevent dirt or contamination from falling into the engine. If the gasket is damaged or defective, replace it.

2. Removing Carbon

Carbon accumulation inside the cylinder head results in pre-ignition, overheating, and excessive fuel consumption, so scrape the cylinder head clean.

NOTE:

During reassembly the head bolts must be torqued to 15-18ft-lbs. in pattern, and in successive stages. Do not torque a hot engine and for most accurate readings place a small amount of lightweight oil on the threads first.

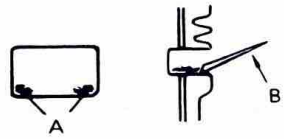


4–4 Cylinder

1. Carbon Removal

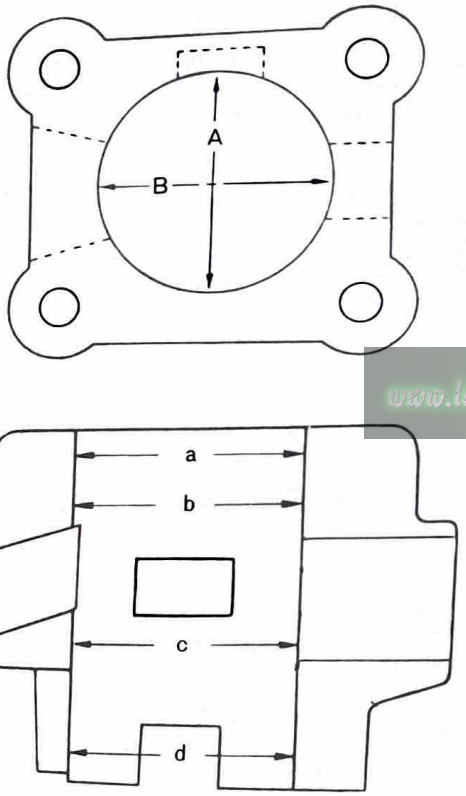
Carbon tends to accumulate at the transfer and exhaust ports of the cylinder, thereby imparing both scavenging and exhausting efficiency. Be sure to remove carbon accumulations whenever necessary.

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



2. Checking the Cylinder for Wear

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



Measuring Points of the Bore

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

3. Cylinder Reconditioning

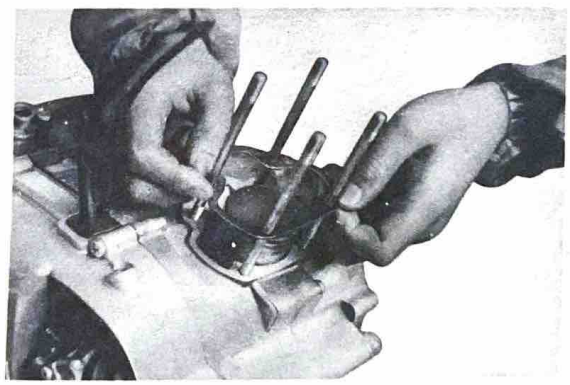
a. Piston are available in 0.25 mm and 0.50 mm over-sizes.

b. Cylinder should be rebored and honed to the diameter of the oversize piston, plus the standard clearance.

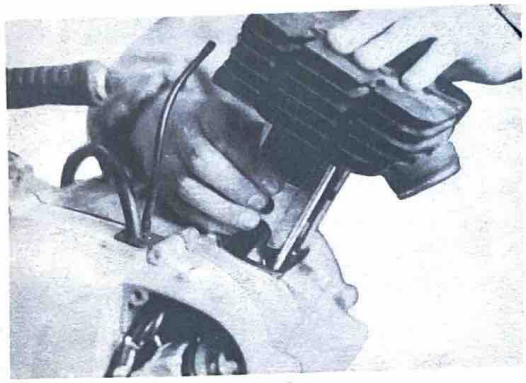
c. The error between the maximum and minimum diameter after honing should be no more than 0.01 mm. (0.0004 in.)

4. Installation

a. Always use new cylinder base gasket when overhauling the engine.



b. When installing the cylinder over the piston, squeeze the piston rings into their grooves (their end gaps should close on the locating pin), so they will not catch and break on the bottom of the cylinder.



4–5 Piston Pin

1. Pulling out Piston Pin

Remove the clip at one end of the piston pin, using a needle nose pliers, and push the pin out from the other side of the piston. Before removing the piston pin clip, cover the crankcase opening with a clean rag so you will not accidentally drop the clip into the crankcase.

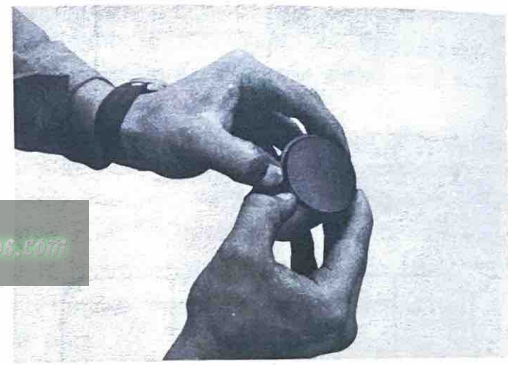
2. Piston-to-Piston Pin fit

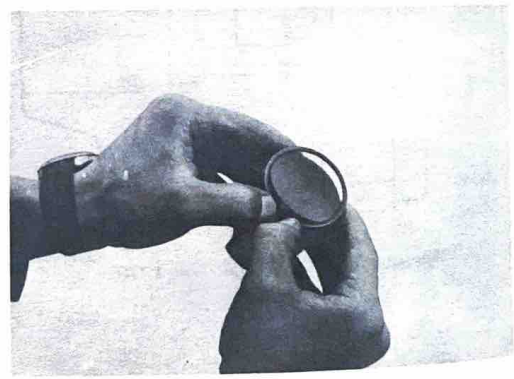
The piston pin should fit snugly in its bore so that it drags a little as you push it. If the pin is loose, the pin and/or the piston should be replaced. A pin with step wear in its center should be replaced, along with the connecting rod small end needle bearing. Check the small end of the connecting rod for wear by inserting the piston pin.

4–6 Piston Rings

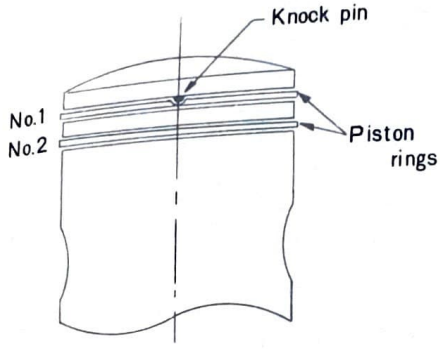
1. Removing the Rings

Put your thumbs at each end of the piston ring and pull the piston ring ends apart. Then slide it out of the groove on the back side of the ring lands.



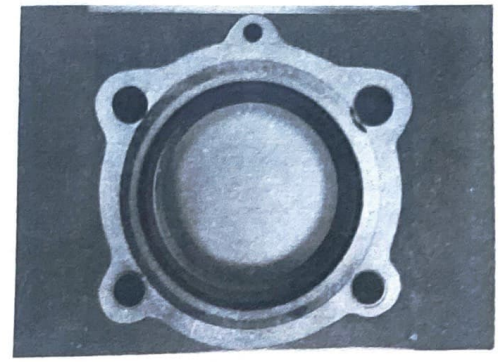


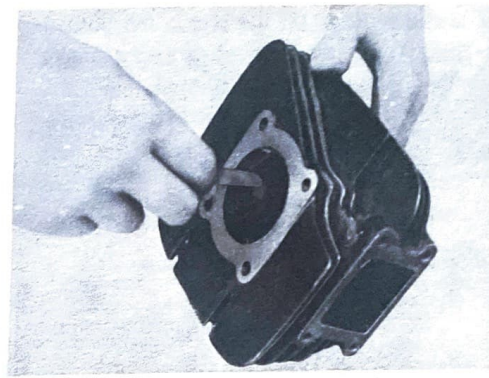
2. Fitting the Rings
Both rings (First and Second) are same type, and teflon coated. When installing the rings, align their ends with the knock pin.



3. Checking the Piston Ring
1) Piston Ring Wear
Improper contact between the piston ring and the cylinder may result in compression leakage, or scores or spotty wear on the cylinder wall. Therefore, correct surface "contact" between the piston rings and the cylinder should be checked before the piston is installed.
Figure shows an example of a method for checking the surface contact:
Correctly fit the ring in the cylinder, and then check whether or not any gap is seen between the ring and the cylinder wall by using a sheet of white paper as a reflector. If no gap is found, a good sealing between them is maintained.

2) Measuring the piston ring for wear
Put the piston ring into the cylinder so that the ring is parallel with the bottom edge of the cylinder. Then measure the gap between both ends of the ring, using a feeler gauge.
End gap should be between 0.15mm and 0.35mm for both First and Second rings.





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

4–7 Piston

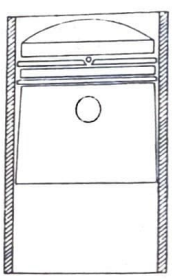
1. Checking and Reconditioning the Piston

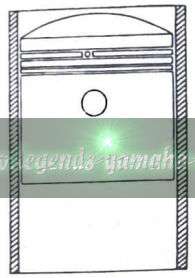
1) Piston Shapes

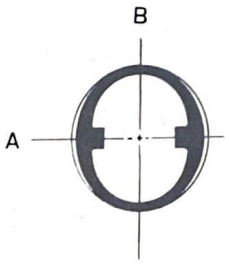
The piston has a slightly tapered ring section when it is cold, as shown in left figure. When it warms up, the expansion of the ring section is greater than that of the skirt because the ring section is exposed to higher temperatures.

This decreases the normal clearance between the piston and cylinder wall.

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

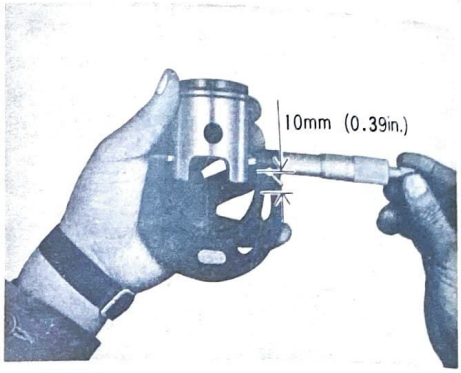






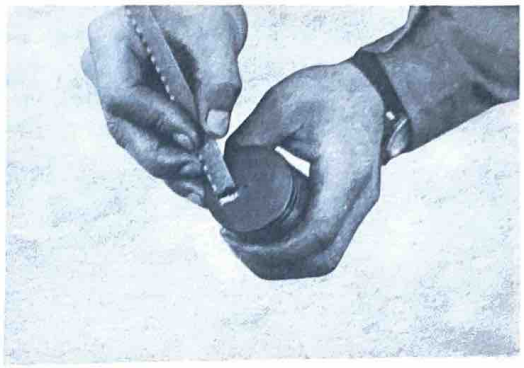
2) Piston Clearance Measurement

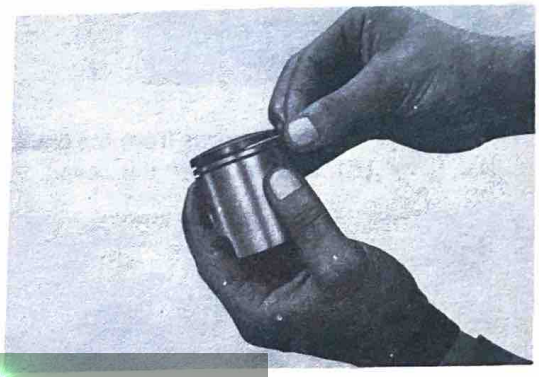
Piston clearance is the difference between the minimum cylinder bore and the maximum piston diameter. Proper clearance is between 0.040-0.045mm (0.0016-0.0018in.) as described in the "Cylinder" section. To determine maximum piston diameter, measure the piston with a micrometer at right angles to the pin bosses 10mm from the piston bottom edge.



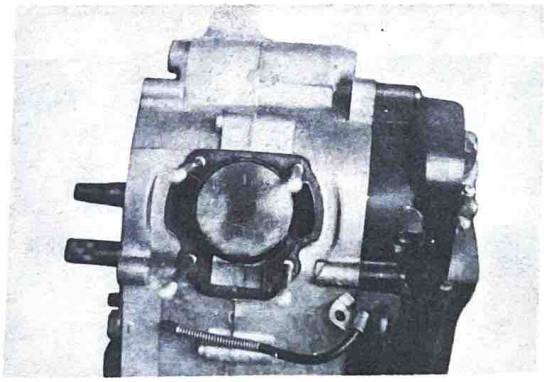
3) Checking and Reconditioning Pistons
Pistons showing signs of seizure are noisy and keep the engine from developing full power. If a piston that has seized is used again without any correction, another seizure will develop at the same point. Lightly sand these seizure area on the piston (areas showing excessive friction) with wet #400 grit sandpaper.
Wash the piston afterwards and then apply a this coat of oil.

4) Removing Carbon
Scrape off carbon accumulation on the top of the piston using a screwdriver or a hacksaw blade.
Take note that the piston is not damaged during this process.
Scrape off carbon accumulation in the piston ring grooves in order to prevent the ring from sticking.





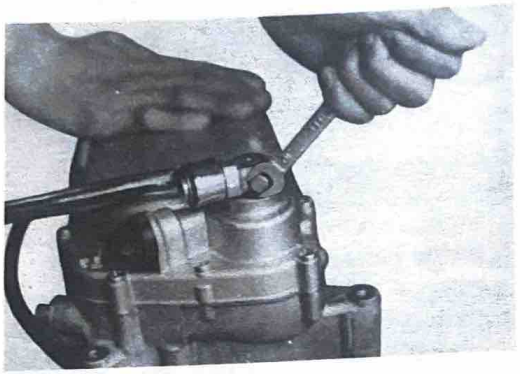
2. Piston Installation Direction
Install each piston with the arrow marked on its head pointing downward (toward the exhaust port of the cylinder).



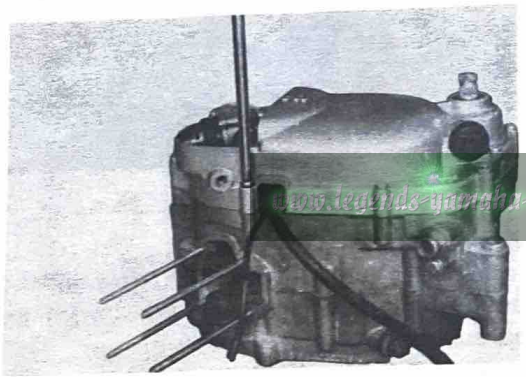
4–8 Crankcase Cover (R)

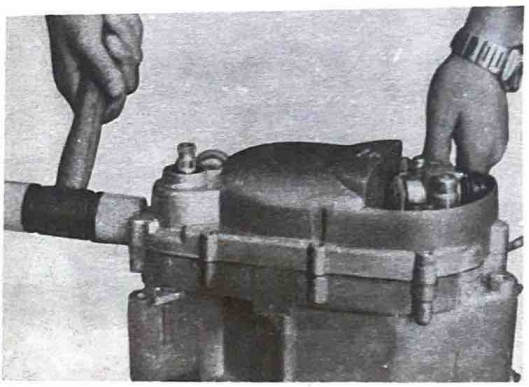
1. Removal

a) Remove the kick crank securing bolt, and remove the crank.

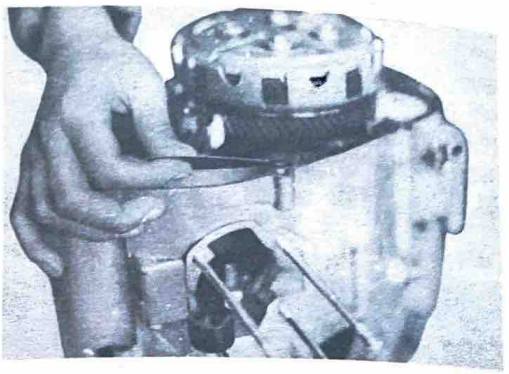


b) Remove the pan-head screws from the crankcase cover (R), and take off the cover.





c) Remove the crankcase cover gasket and replace it during reassembly.



2. Installation

Spread YAMAHA Bond No.5 over the mating surface of the crankcase (R) and replace the crankcase cover (R) on the crankcase (R) with a gasket.

NOTE:

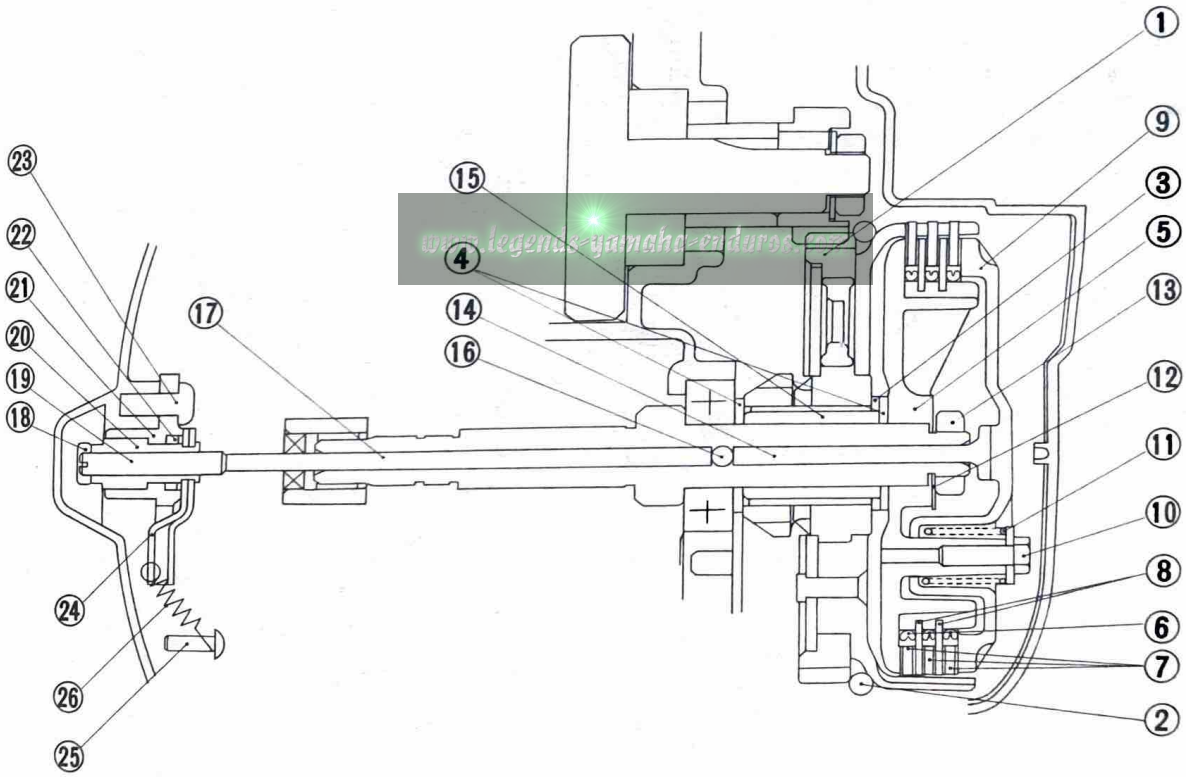
When installing the crankcase cover, make sure that the oil pump drive gear correctly meshes with the primary driven gear.

4–9 Clutch

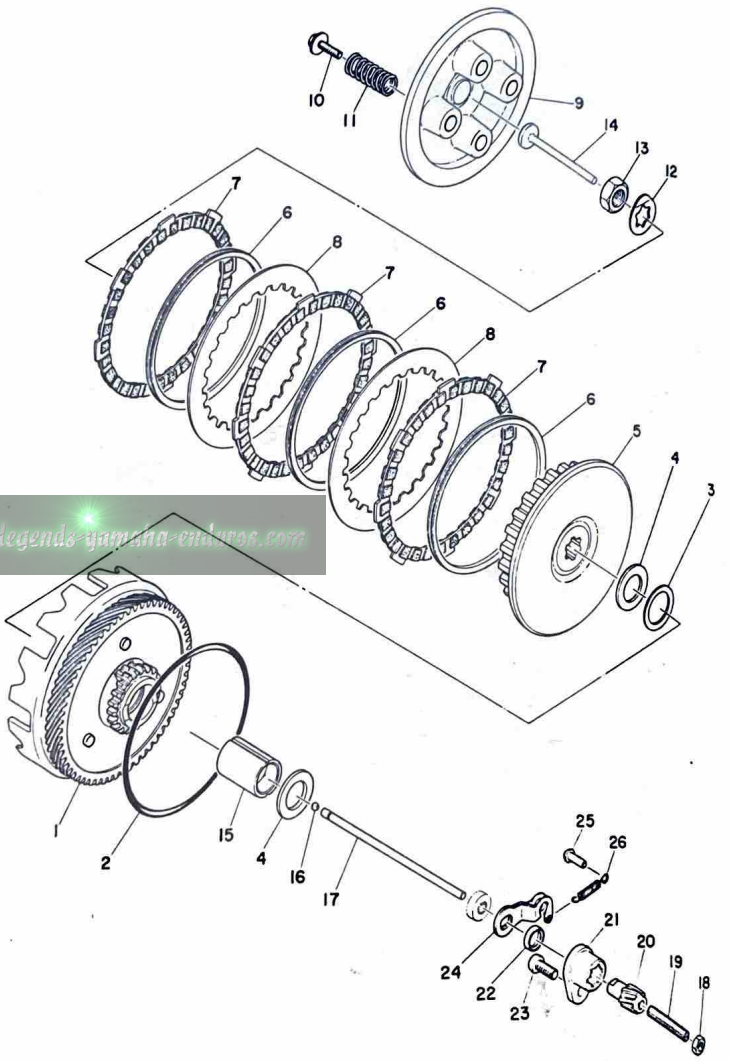
The purpose of the clutch is to permit the rider to couple or uncouple the engine and transmission. The RD60 clutch is a wet multi-disc type, consisting of three molded cork friction plates and two clutch plates mounted on the main shaft of the transmission.

The clutch housing is mounted on the primary driven gear, which in turn is meshed with the primary drive gear mounted on the crankshaft. The primary drive gear has 19 teeth, and the primary driven gear 68 teeth. (Primary reduction ratio. . . . . .68/19 = 3.578)

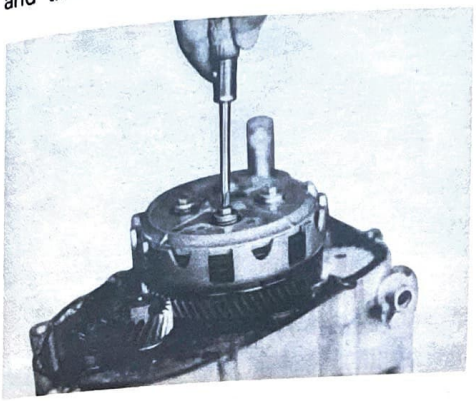
Sectional View of the Clutch Assembly

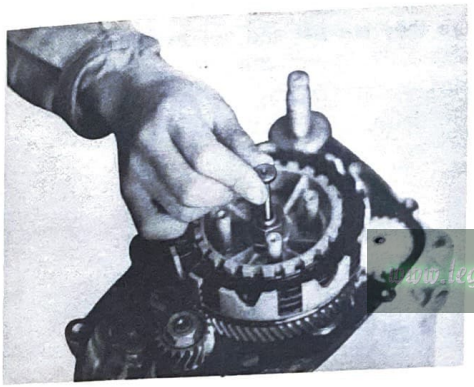


1. Primary driven gear comp
2. O-ring
3. Plate thrust
4. Plate thrust
5. Boss clutch
6. Ring cushion
7. Plate friction
8. Plate clutch
9. Plate pressure
10. Bolt hexagon with washer
11. Spring clutch
12. Washer lock
13. Nut clutch boss
14. Rod push 1
15. Spacer
16. Ball
17. Rod push 2
18. Nut
19. Screw adjusting
20. Screw push
21. Housing push screw
22. Oil seal
23. Screw panhead
24. Lever push
25. Fook spring
26. Spring lever return

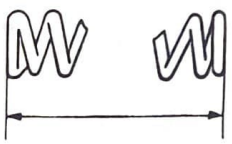


1. **Removing the Pressure Plate**
Remove the four hexagon bolts with washer, and then the pressure plate and push rod.

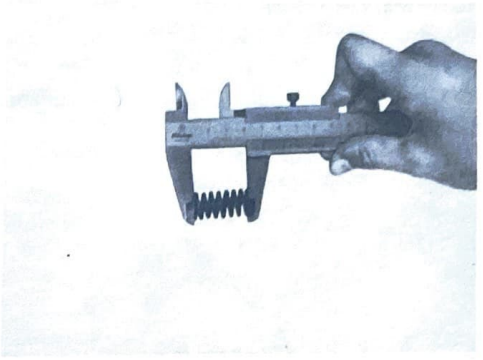




2. **Checking the Clutch Spring**
Measure the free length of each clutch spring, and replace any spring more than 1.0mm shorter than the standard free length.

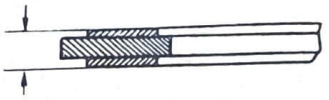


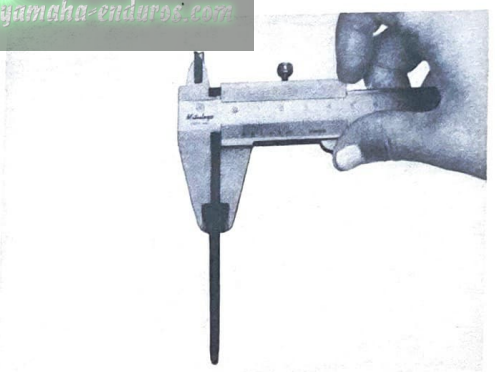
Standard free length 31.5mm



3. **Checking the Friction Plate**
Plates worn more than 0.3mm under the standard thickness or showing uneven contact with the clutch plates should be replaced.

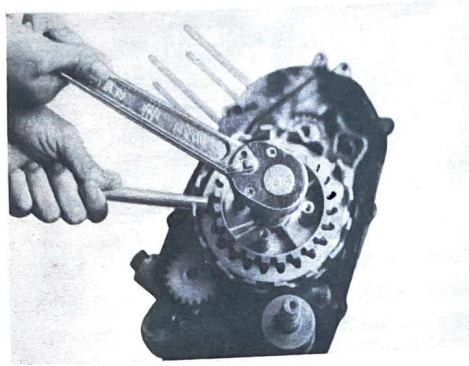
Standard thickness 3.5mm





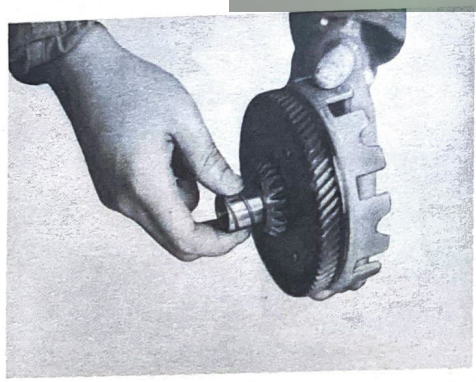
4. Removing the Clutch Boss

Straighten the bent edges of the clutch boss locking washer. Fit the clutch holding tool over the clutch boss, remove the nut, and then the boss itself.



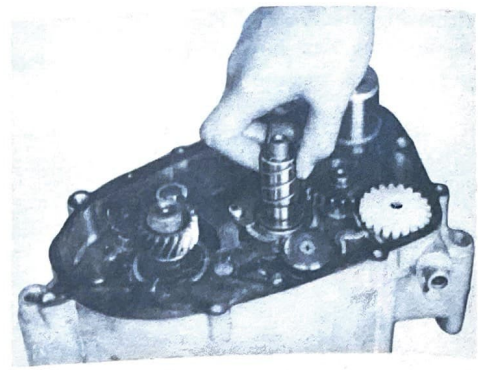
5. Checking the primary Driven Gear Ass'y

Insert the spacer in the primary driven gear boss, and check it for radial play or scratches that could impair clutch action and result in excessive noise. Remove the scratches with an oil-stone or fine sandpaper.



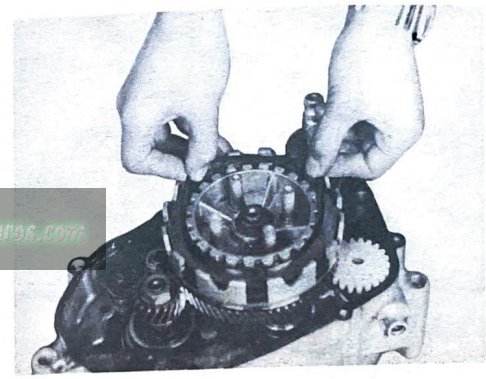
6. Checking the Spacer

Place the spacer on the main axle, and check it for radial play. If paly exist replace the spacer.



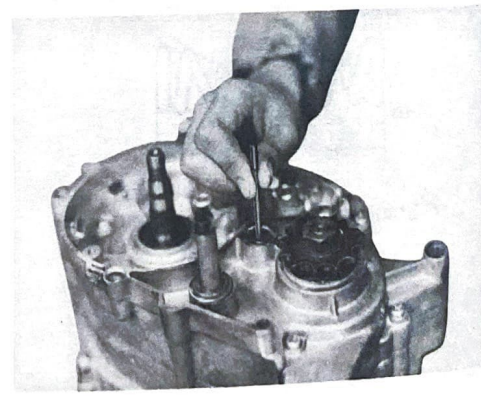
7. Fitting Cushion Rings

The cushion rings is installed between each clutch plate pair to insure even engagement of the plates. When fitting cushion be rings, sure they are flat and not twisted.



8. Checking the Push Rod

Remove the push rod and steel roll. If the rod is bent, straighten or replace it.



9. **Caution on Reassembling the Clutch**

On the clutch side of the primary driven gear there is a thrust plate and a thrust bearing. If the thrust plate and thrust bearing are incorrectly fitted, or omitted, the clutch boss will ride against the outer clutch housing and prevent smooth clutching. Be sure the thrust bearing and plate are correctly installed when reassembling the clutch.

The thrust bearing is placed around the primary gear spacer. When installing the clutch boss, exercise care not to slip the thrust bearing from the spacer.

Grease the surface of the thrust bearing that goes against the outer housing to hold the bearing in place.

IMPORTANT NOTE:

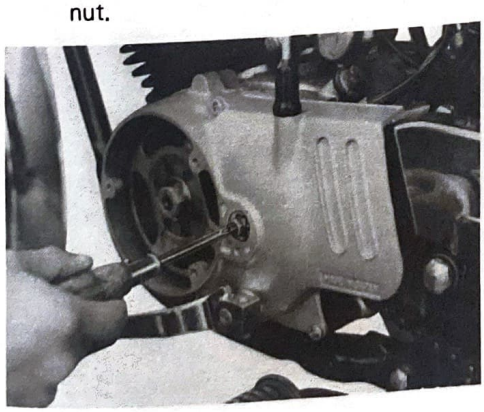
The clutch boss fits into the clutch housing only one correct way. Both parts are color-coded with yellow paint to aid installation.

10. **Clutch Adjustment**

The friction plate and clutch plate, which are component parts of the clutch, are liable to wear after years of use. The wear of these parts results in poor clutch action or clutch slippage. Replace or correct them if worn.

(1) Adjusting the Adjusting Screw

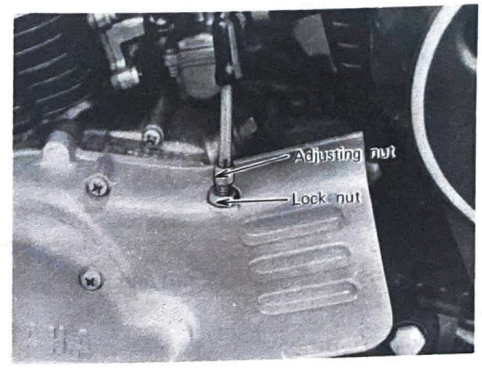
a. Remove the dynamo cover located on the left side of the crankcase cover.
b. Loosen the adjusting screw lock nut.
c. Slowly tighten the adjusting screw until resistance is felt. This means that the play of the push rod is removed. Then, back it out 1/4 turn. Tighten the lock nut.

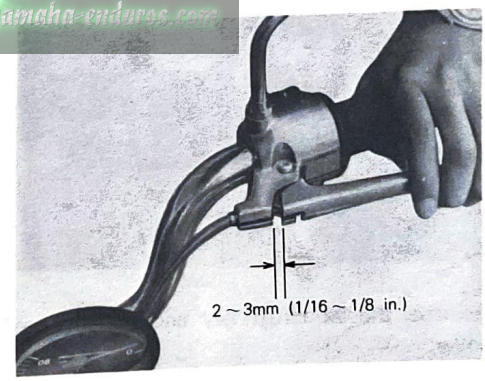


(2) Adjusting the Clutch Cable

This adjustment is made on the left upper part of the left crankcase cover.

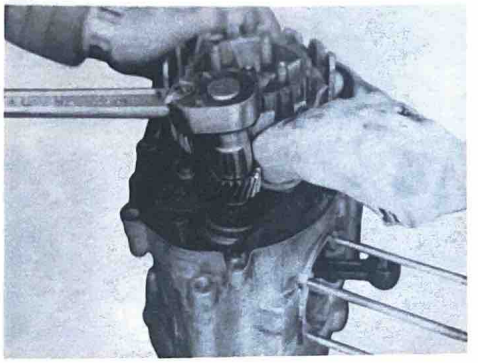
a. Loosen the lock nut fitted on the crankcase cover (L).
b. To reduce the play of the cable, loosen the adjusting nut and to increase the play, tighten the screw. Adjust clutch lever free play to 2 ~ 3mm (1/16 ~ 1/8 in.).
c. Fully tighten the lock nut.



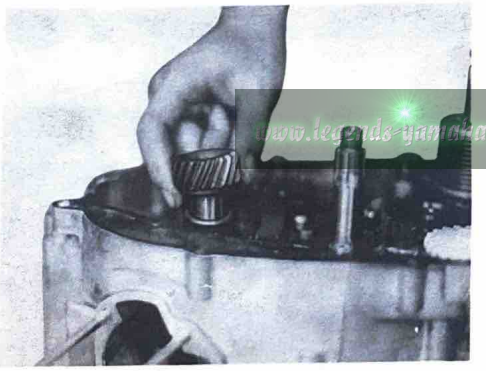


4–10 Primary Drive Gear

When loosening the primary drive gear lock nut, a rag should be placed between the primary driven and drive gears so that these gears will not rotate. Fold rog carefully so it will not be drown between the gears.

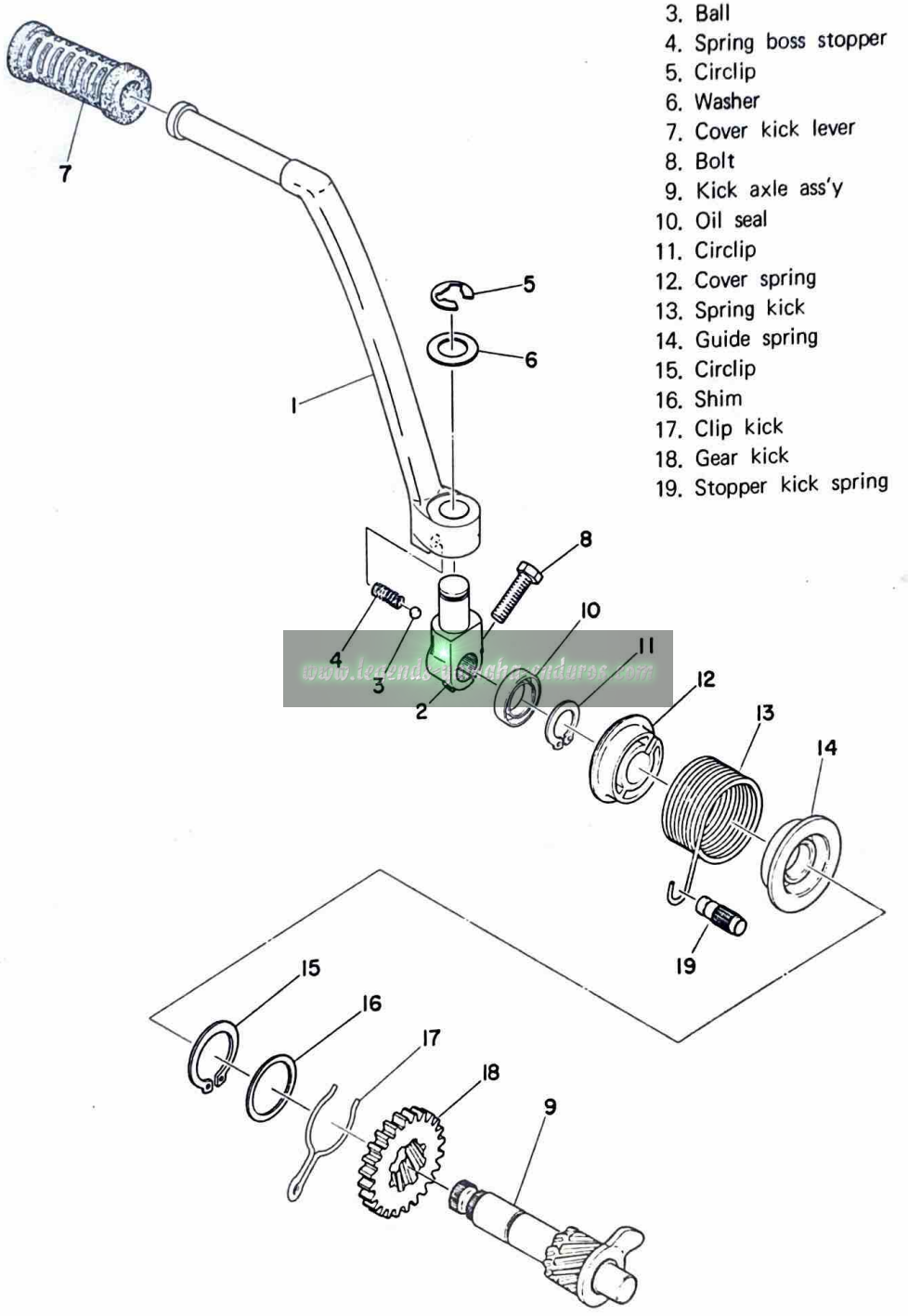


a) Remove the drive gear lock nut and drive gear.



b) Remove the woodruff key and the distance collar.

4–11 Kick Starter



1. Crank kick
2. Boss kick crank
3. Ball
4. Spring boss stopper
5. Circlip
6. Washer
7. Cover kick lever
8. Bolt
9. Kick axle ass'y
10. Oil seal
11. Circlip
12. Cover spring
13. Spring kick
14. Guide spring
15. Circlip
16. Shim
17. Clip kick
18. Gear kick
19. Stopper kick spring

Mechanism

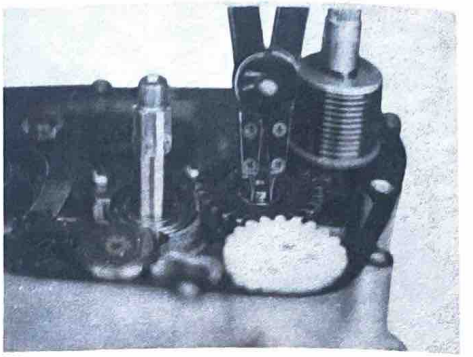
The primary kick-starter system (onetouch kick-starter) is employed. However, a new "non-constant-mesh" mechanism has been introduced into the RD60 kickstarter, instead of the constant-mesh kick gear type, such as the ratchet and roller-lock systems.

That is, the kick gear meshes with idler gear only when the kick-starter pedal is kicked. After the engine is started, the kick gear is disengaged from the idler gear. This mechanism not only eliminates noise resulting from the constant mesh of the kick gear with the idler gear, but also greatly contributes to the durability of the kick starter assembly.

As the kick starter axle is turned, the kick gear splined to the kick axle, having spiral splines on its surface is pushed outward along the axle. (In this case, the kick gear.) moves only axially without rotating because of the kick gear clip fitted in the kick gear.) When the kick gear moves outward teeth of the kick gear may clash against teeth of the idler gear. (Although there will be possibility of smooth meshing without clashing.) The kick gear clip is designed to absorb the impact of clashing, and at the same time cause the kick gear to rotate so that the kick gear with will smoothly come into mesh with the idler gear. After the kick gear has meshed with the idler gear, the kick gear is further slid outward without rotating. At the instant that the back of the kick gear conducts the circlip, the thrust load is imposed on the kick gear, thereby giving it turning force and rotating the crankshaft to start the engine.

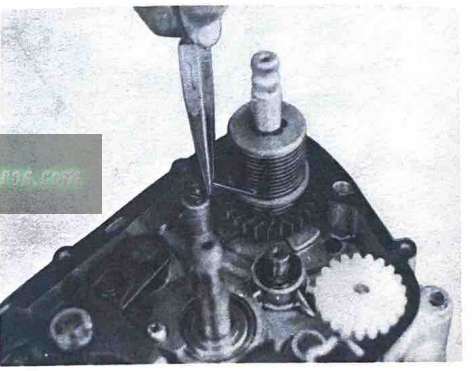
1. **Removing the Kick Idler Gear**

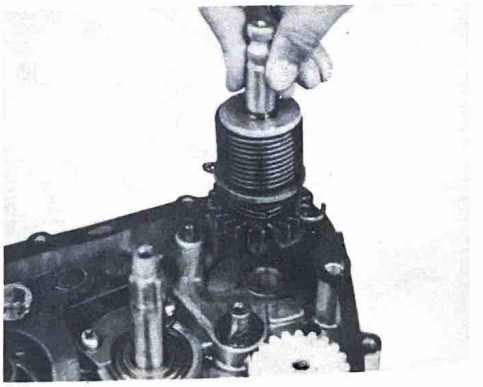
Remove the circlip retaining the idler gear with clip plier. Remove the thrust washer, and then slide the gear off the drive axle.



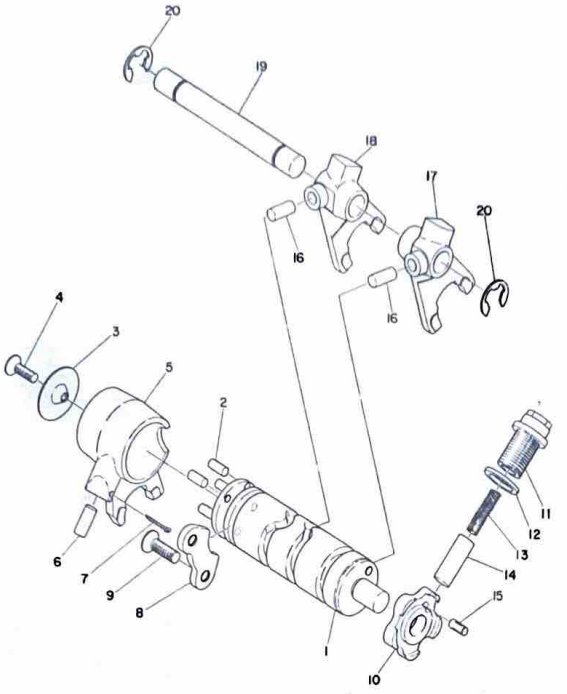
2. **Removal**

The kick starter system can be removed as an assembly.

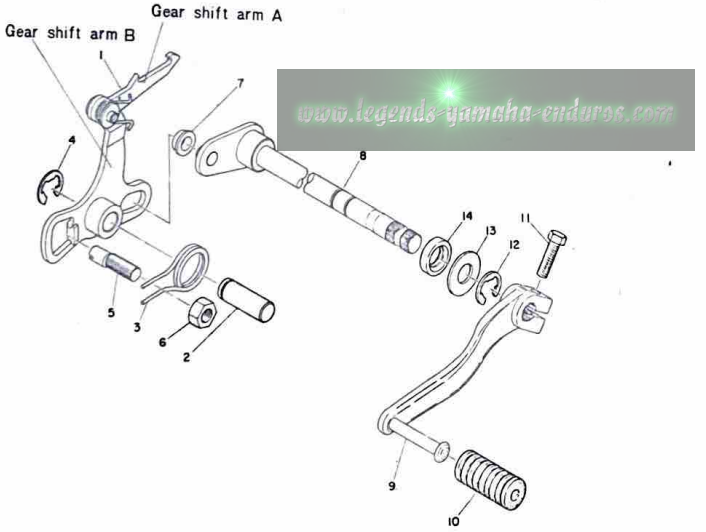




4–12 Shifter



1. Cam shift
2. Pin dowel
3. Plate side
4. Screw flathead
5. Fork shift 1
6. Pin dowel
7. Pin cotter
8. Plate stoper 2
9. Screw flathead
10. Plate stopper
11. Screw spring
12. Gasket drain plug
13. Spring cam stopper
14. Stopper cam
15. Pin dowel
16. Plug blind
17. Fork shift 2
18. Fork shift 3
19. Bar shift fork guide
20. Circlip



1. Change lever ass'y
2. Shaft
3. Spring shaft return
4. Circlip
5. Screw adjusting
6. Nut
7. Roller change lever
8. Change shaft ass'y
9. Pedal change
10. Cover change pedal
11. Bolt
12. Circlip
13. Washer change axle
14. Oil seal

When the gear shift lever is depressed, the gear shift moves gear shift arm B back and forth, which in turn causes, gear shift arm A to push the gear shift drum pins mounted on the gear shift drum, thus turning the gear shift drum.

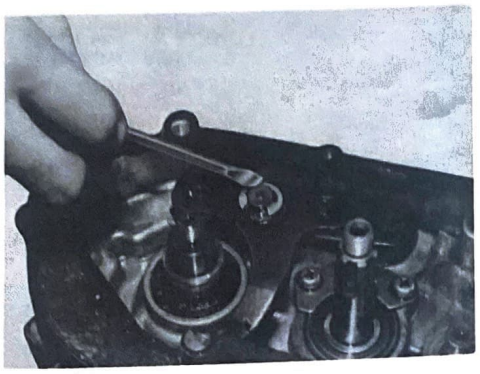
The gear shift drum is equipped with five gear shift drum pins, and is designed to make 1/5 of a turn each time the gear shift lever is depressed. In other words, one full turn of the drum will shift the transmission through five stages first, second, third, fourth and fifth. The gear shift pins are held by the disc so that the stopper plate may secure each position of the five stages.

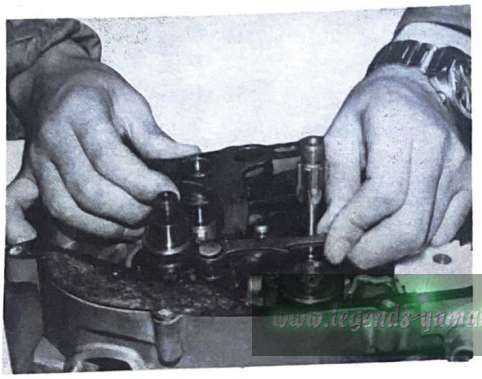
The outer surface of the gear shift drum is provided with slots, along which the shift forks travel back and forth when shifting gears.

The neutral position is located between the first and second gear shift drum pins, and the stopper mechanism is located on the left side of the shift drum.

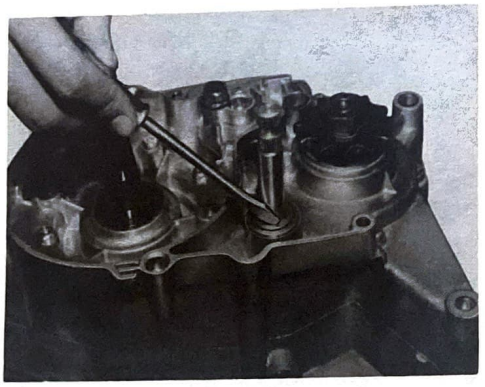
1. Removing the Gear Shift Shaft Ass'y

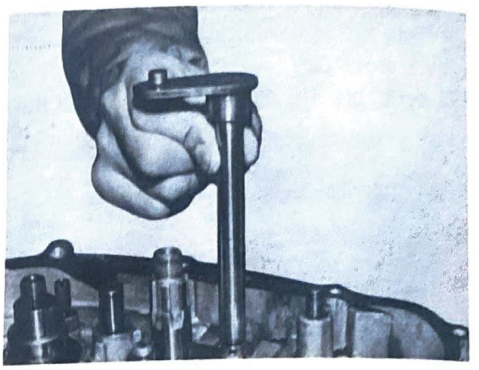
a) Remove the change lever ass'y.





b) Remove the change shaft ass'y.

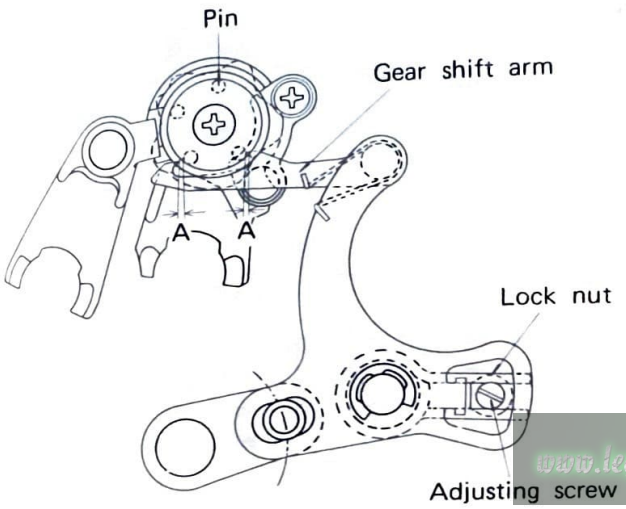




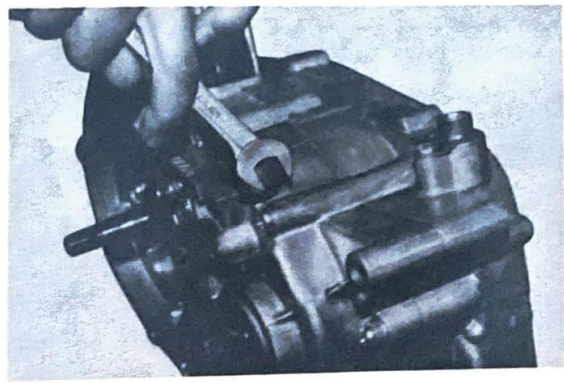
Inspection

1. Check the gear shift pedal return spring for insufficient tension and failure, as weak or broken spring causes poor return of gear shift arm.
2. Check gear shift arm return spring for insufficient tension and failure, as weak or broken spring makes gear shifting difficult.

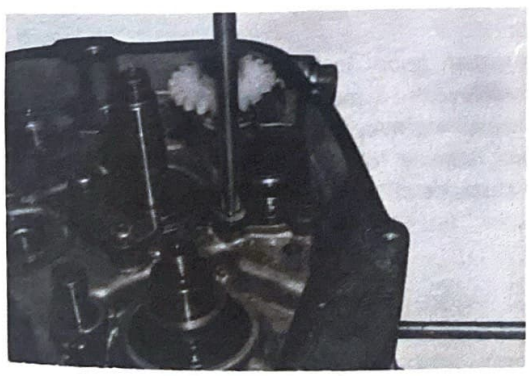
Adjusting the gear shift arm
Adjusting or correcting the travel of the gear shift arm to prevent improper shifting progression (excess feed or insufficient feed of the gear shift arm) is accomplished by turning the gear shift return spring stop screw (eccentric bolt) in or out. Adjust the eccentric bolt until distances A & A' are equal.



b) Remove the change stopper.



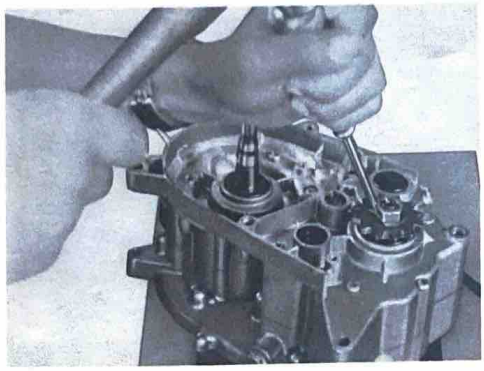
2. Removing the change stopper
a) Remove the stopper plate.



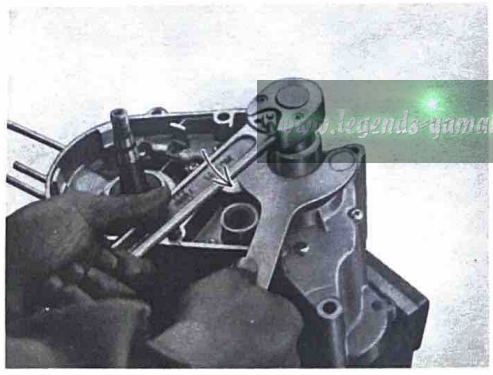
4–13 Drive Sprocket

1. Removal

a. Straighten the bent edge of the locking washer with a chisel.



b. Keep the drive sprocket from turning with the flywheel magneto holding tool, then loosen the sprocket nut.



c. If no flywheel magneto holding tool is available, shift the transmission to 1st gear, fit a socket wrench on the sprocket nut, and hit the handle of the wrench with a hammer so the impact will loosen the nut.

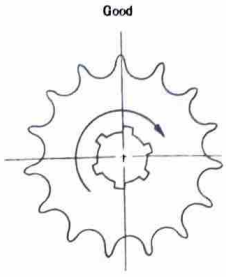
2. Checking the Drive Sprocket and Drive Chain

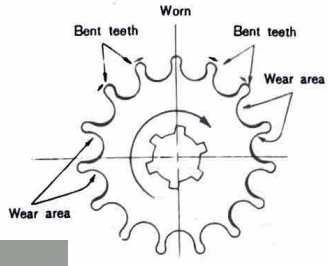
A worn drive sprocket may result in abnormal noise, and shorten the life of the chain. Check the teeth of the sprocket teeth for wear and deformation.

Checking the Chain and Drive Sprocket for meshing:

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

Whether the drive sprocket is worn or not can be determined by using a new drive chain. If there is excessive play between the sprocket and the new chain, replace it.

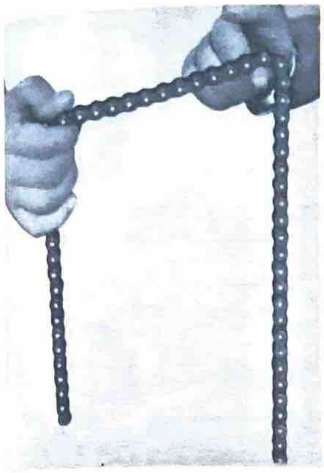


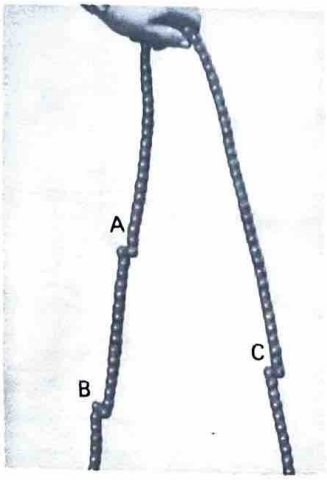


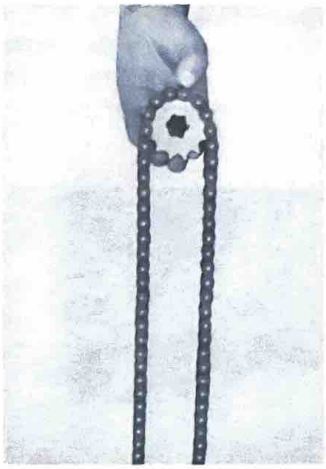
Clean the chain with solvent before checking it. Then hold the chain in your fingers and check whether the chain bends without kinking. Next, suspend the chain. If the chain exhibits curvatures, (A, B and C) is defective. Replace it. It could be defective. Replace it, if it will not free up with cleaning.

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

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





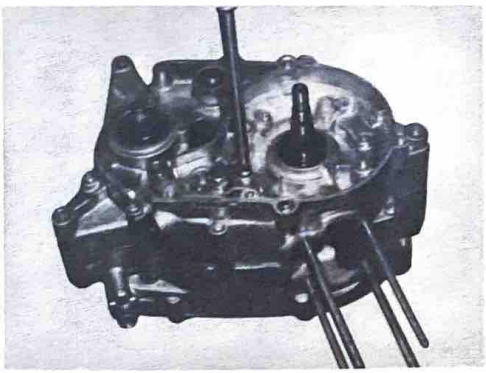


4–14 Splitting the Crankcase

1. Splitting

The crankcase may be split from either the left or right side. However, to facilitate the subsequent servicing operations, the splitting tool should be installed on the right half of the crankcase.

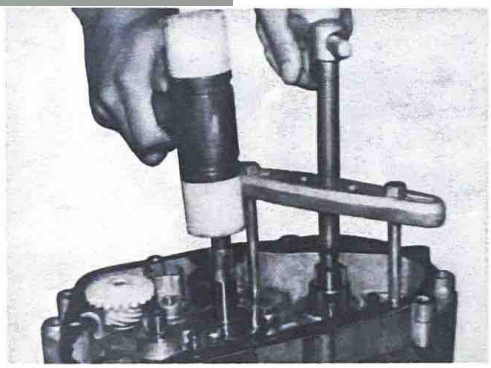
a. Remove the pan-head screws on the left side crankcase.



b. Install the crankcase dividing tool on the right crankcase, and tap the transmission main axle with a soft faced hammer, as you carefully operate the splitting tool, so that right half eventually separates completely from the left half.

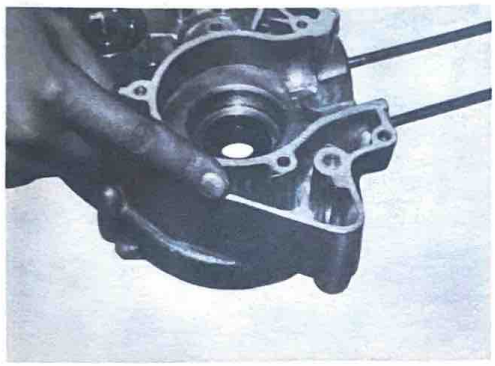
NOTE:

1. Fully tighten the bolts of the crankcase dividing tool, while keeping the body horizontal.
2. Position the connecting rod at top dead center to prevent the rod from contacting the case half.

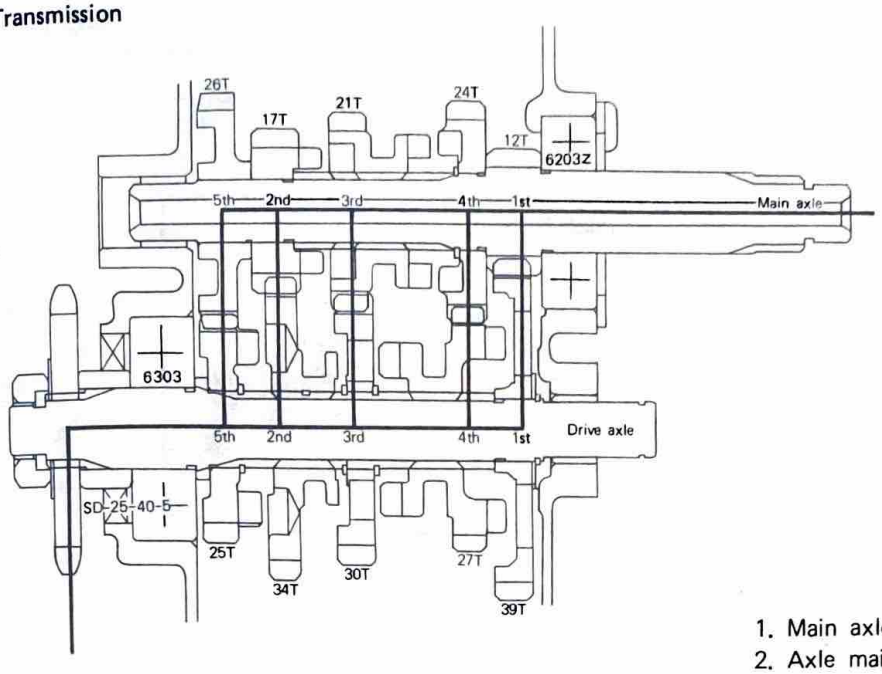


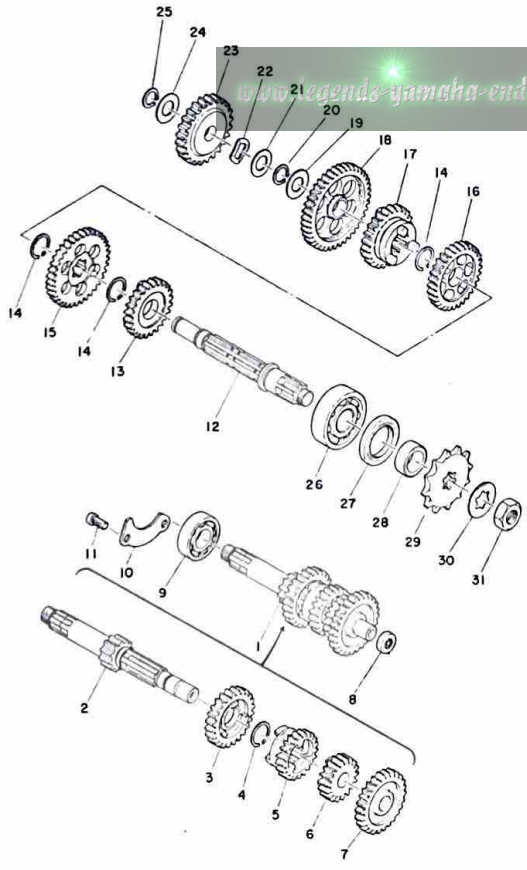
2. Reassembling

When reassembling the crankcase, be sure to clean the mating surface throughly and then apply Yamaha Bond No.4 to the mating surface of the crankcase.



4–15 Transmission





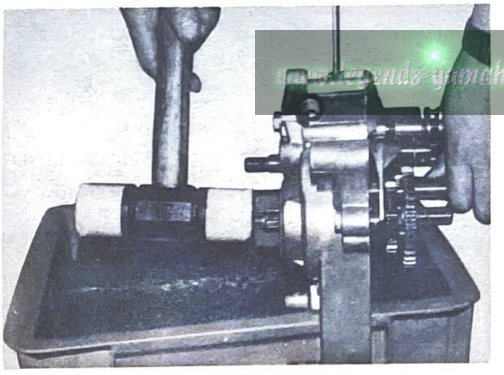
1. Main axle comp
2. Axle main
3. Gear 4th pinion
4. Clip
5. Gear 3rd pinion
6. Gear, 2nd pinion
7. Gear 5th pinion
8. Seal push rod
9. Bearing
10. Plate bearing cover
11. Screw panhead
12. Axle drive
13. Gear 5th wheel
14. Clip
15. Gear 2nd wheel
16. Gear 3rd wheel
17. Gear 4th wheel
18. Gear 1st wheel
19. Shim
20. Circlip
21. Washer thrust
22. Washer wave
23. Gear kick idle
24. Washer change shaft
25. Circlip
26. Bearing
27. Oil seal
28. Collar distance
29. Sprocket drive
30. Washer lock
31. Nut lock

Figs show the layout and details of the transmission assembly. The primary and the secondary reduction ratios are 68/19 (3.578) and 42/12 (3.500), respectively.

Accordingly, both transmission gear ratios and overall reduction ratios for each gear position are as follows:

Primary Reduction Ratio	68/19 = 3.578	
Secondary Reduction Ratio	42/12 = 3.500	
	Transmission gear reduction	Total reduction ratio
1st	39/12 = 3.250	40.711
2nd	34/17 = 2.000	25.053
3rd	30/21 = 1.428	17.895
4th	27/24 = 1.125	14.092
5th	25/26 = 0.961	12.045

a. Remove the transmission and shifter as a unit.



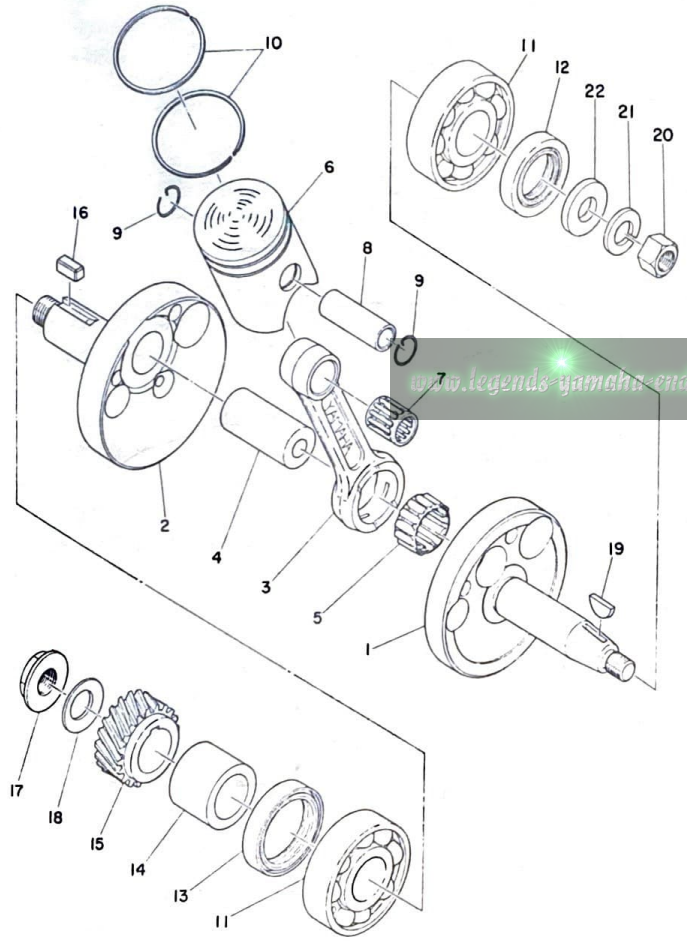
b. Caution on Reassembling the Crankcase
The following measures should be taken to prevent the shift forks from bending.
○Never reassemble the crankcase halves with the transmission in first gear. Otherwise, the fifth pinion dog may wedge against the pinion teeth, and cause the shift fork to bend. Be safe and keep the transmission in neutral during assembly.

1. Caution on Reinstallation

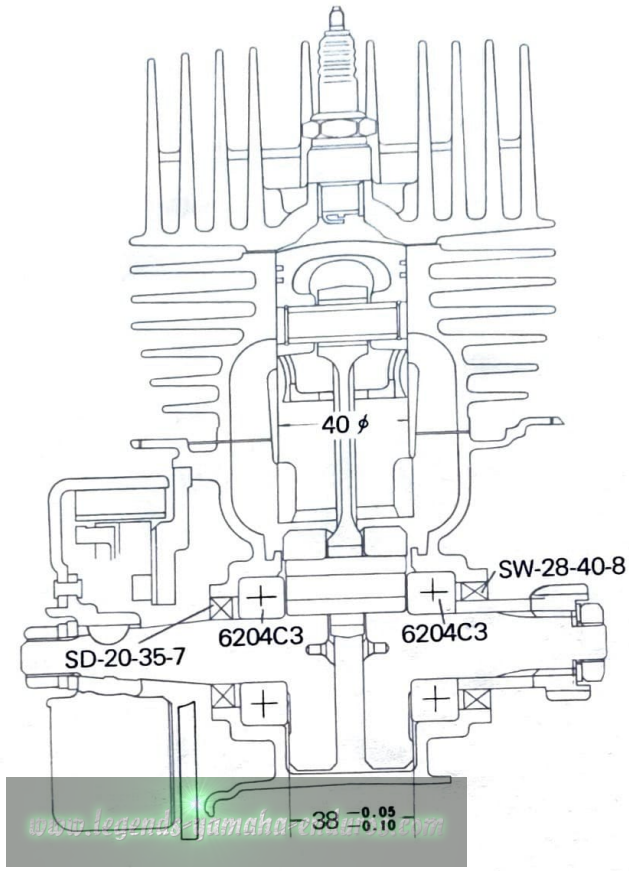
a. Reinstallation the Gear Ass'y and Shifter
Reinstall the transmission and shifter as a unit in the left crankcase half after they are sub-assembled. Remember that the gear ass'y and shifter drum cannot be installed separately.

4–16 Crankshaft

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

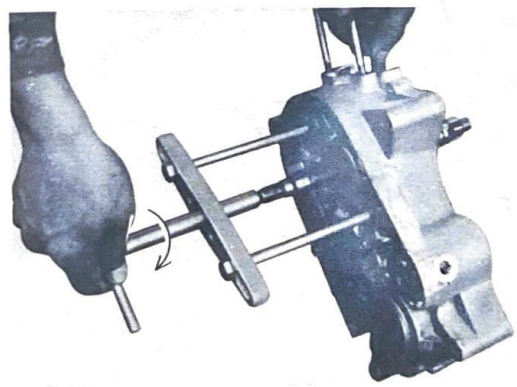


1. Crank left
2. Crank right
3. Rod connecting
4. Pin crank
5. Bearing con-rod big end
6. Piston
7. Bearing, con-rod small end
8. Pin piston
9. Clip piston pin
10. Piston ring set
11. Bearing
12. Oil seal
13. Oil seal
14. Collar distance
15. Gear primary drive
16. Key woodruff 2
17. Nut lock
18. Spring bellevile
19. Key woodruff
20. Nut
21. Washer spring
22. Washer 1

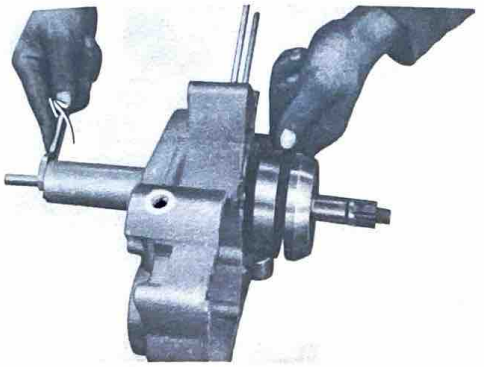


Assembled Crankshaft Dimensions

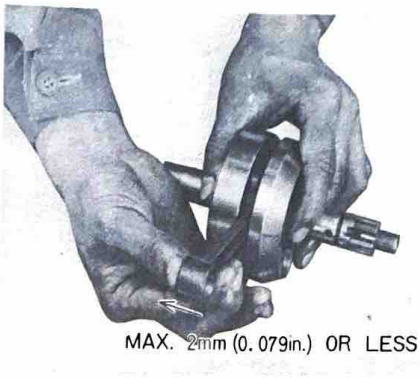
1. **Removing the Crankshaft Ass'y**
   Remove the crankshaft ass'y with the crankcase dividing tool.
   1) Tighten the dividing tool bolts into the crankcase, and keep the crankcase horizontal.
   2) Pull the connecting rod up to top dead center, so it will not hit the crankcase.



2. **Reinstalling the Crankshaft Ass'y**
Put shims on both ends of the crankshaft, and install the crankshaft assembly by using the crankshaft installing tool. Hold the connecting rod at top dead center with one hand while turning the handle of the installing tool with the other.

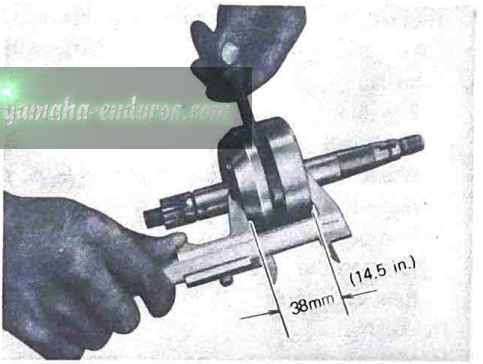


3) Overall Length and Runout of the Crankshaft.
Limits:
(a) Overall length of the Crank
A 38mm (1.45in.)
(b) Runout of the Crankshaft 0.03mm (0.0012in.) or less.

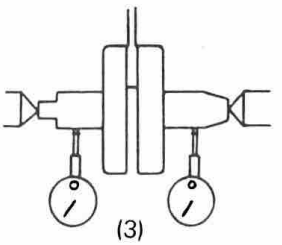


(1)

3. **Accuracy of the Crankshaft Ass'y**
1) Axial Play of the Connecting Rod Small End
(Measure the wear of the crank pin and bearing at the large end of the connecting rod.)
Wiggle the connecting rod small end, and check for axial play.
Axial play limits:
(a) Axial play should be 2mm or less. (Use a dial gauge.) If the play is more than 2mm, disassemble the crankshaft and replace defective parts.
(b) After reconditioning, axial play should be between 0.8mm and 1.0mm.
2) Checking the Connecting Rod for Large End Side Play:
Hold the connecting rod to one side and insert a feeler gauge between the large end and the crank wheel.
Side Play Limits: 0.1mm - 0.3mm



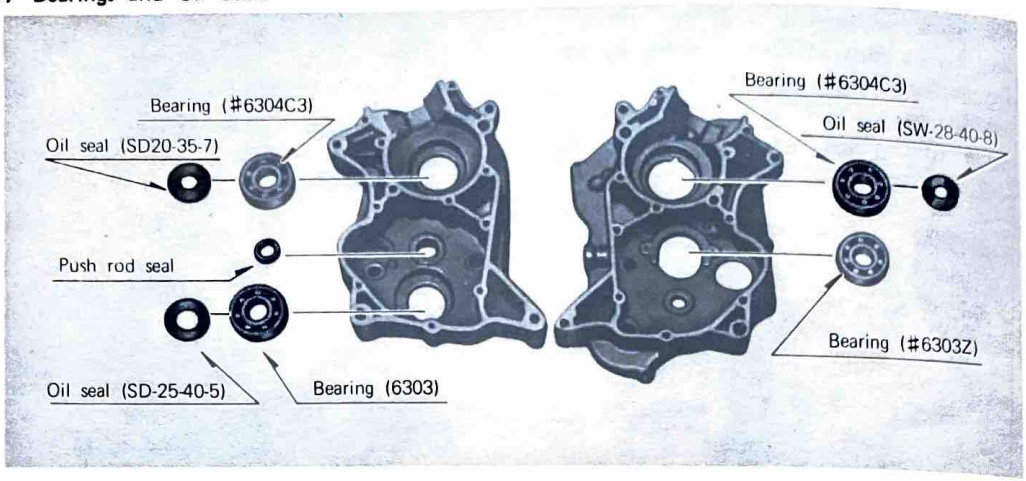
(2)



(3)

0.03mm (0.0012in.) or less

4–17 Bearings and Oil Seals



1. Removal and Reinstallation

Ideally, the crankcase should be heated slowly and evenly to approximately 120°C (238°F) to remove or install oil seals and bearings, but the following procedure is satisfactory.

a. Removal

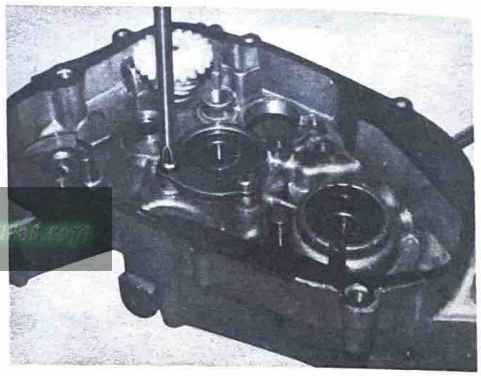
1) Pry the oil seals out of place with a slot head screw driver.
When overhauling the engine, always, replace the oil seals.

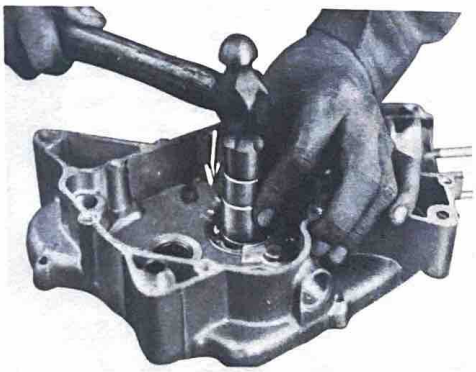
2) Remove the bearing cover plate, and remove the bearings with the bearing removing tool.

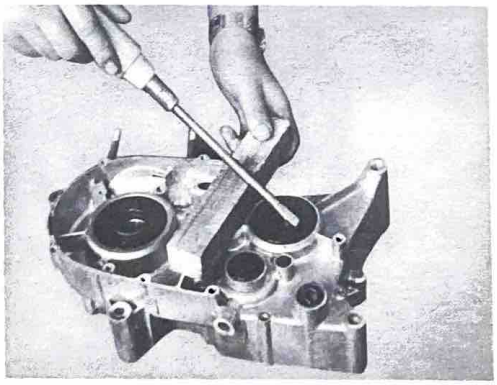
b. Reinstallation

Install all bearings and oil seals, with stamped maker's mark or numbers facing facing outward.

Pack all bearings with an adequate amount of light weight grease before installation.

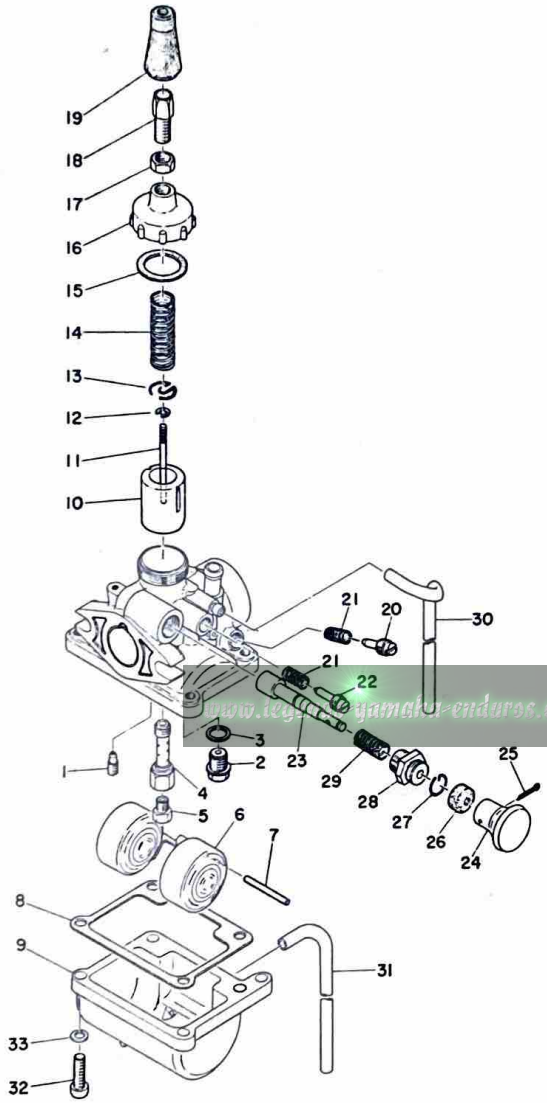






4–18 Carburetor

The RD60 engine is equipped with MIKUNI VM16SH.



1. Jet pilot
2. Valve seat ass'y
3. Washer valve seat
4. Nozzle main
5. Jet main
6. Float
7. Pin float
8. Gasket float chamber
9. Body float chamber
10. Valve throttle
11. Jet needle
12. Clip
13. Seat spring
14. Spring throttle valve
15. Packing
16. Top mixing chamber
17. Nut wire adjusting
18. Screw wire adjusting
19. Cap
20. Screw air adjusting
21. Spring air adjusting
22. Screw throttle
23. Plunger starter
24. Holder
25. Pin cotter
26. Cover plunger cap
27. Clip plunger
28. Cap plunger
29. Spring plunger
30. Pipe air vent
31. Pipe over flow
32. Screw panhead
33. Washer spring

Exploded View of Carburetor

1. Checking the Carburetor

a. Float

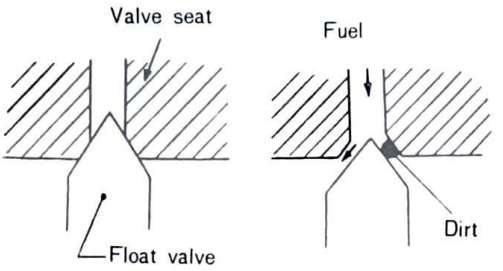
If fuel leaks into the float while the engine is running, the float chamber fuel level will rise and make the combustion mixture too rich. Shake the float so you can feel or hear any gasoline inside. Replace the float if it is deformed or leaking.

b. Float Valve

Replace the float valve if its seating end is grooved or scratched. Check the float valve spring for fatigue. Depress the float valve with your finger, and make sure it properly seats against the valve seat. If the float valve spring is weakened, fuel may over-flow.

flooding the float chamber when the machine is running at certain speeds, or over a certain type of road.

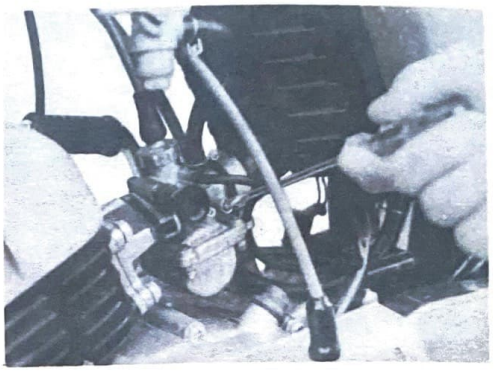
c. Overflowing
If fuel over-flow, check the carburetor as described in a) and b) above. If neither a) nor b) cures the overflowing, it may be caused by dust or dirt in the fuel preventing the float valve from seating properly. Remove the dust or dirt in the fuel.



d. Cleaning the Carburetor
Disassemble the carburetor, and wash all its parts in a suitable solvent. Blow all air and fuel passages in the carburetor with compressed air. All jets and other delicate parts should be cleaned by blowing compressed air through them, because a wire or other hard, pointed cleaning tools may damage their precision-machined surfaces.

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

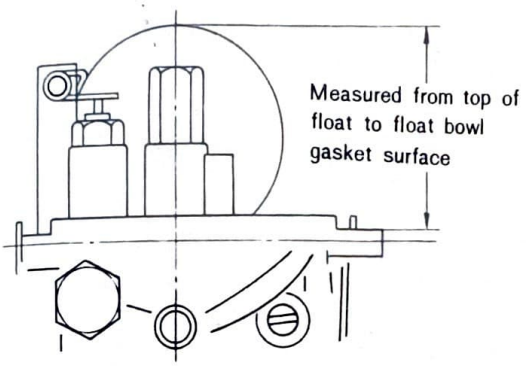
1) Set the idle air adjusting screw at 1-¾ turns out from the lightly seated position. This is a factory setting that requires no further experimentation.
2) Start the engine



3) Adjust the throttle stop screw in, then out. While doing this, take note of the increase and decrease in engine r.p.m. so that the engine idles at approximately 1,300 r.p.m.

f. 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.



1) Remove the float chamber body, and turn over the mixing body. Let the float arm rest on the needle valve without compressing the spring.
2) Then measure the distance from the top of the float to the float bowl gasket surface.
   Important: The gasket must be removed to get an accurate setting.
   Standard measurement 22.5mm (0.89")
3) When the distance measures less than the recommended distance, bend the tang down. If it is greater, bend the tang up. (with carburetor body upside down.)

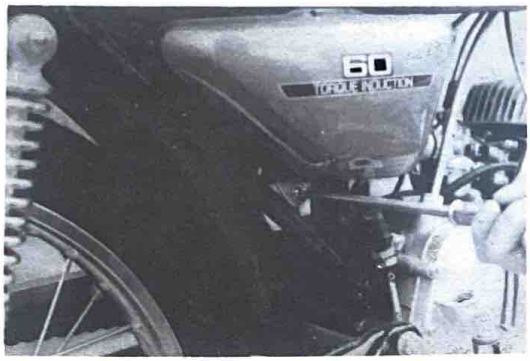
g. Carburetor Specifications

Model	VM16SH
M.J. (Main jet)	# 95
N.J. (Needle jet)	E4
J.N. (Jet needle setting)	3E2-2
C.A. (Throttle valve cutaway)	2.0
P.J. (Pilot jet)	# 20
A.S. (Air screw back-off)	1-3/4
G.S. (Starter jet)	# 30
Stamped mark	388E1
Float level	22.5mm

4—19 Air Cleaner

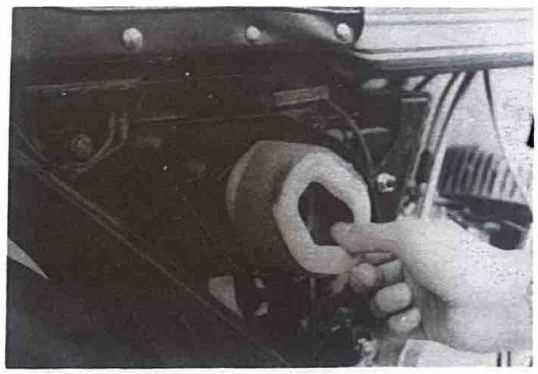
1. Removal

a) Removal the side cover (R).



b) Remove the cleaner case cap.

c) The cleaner element can be pulled out.



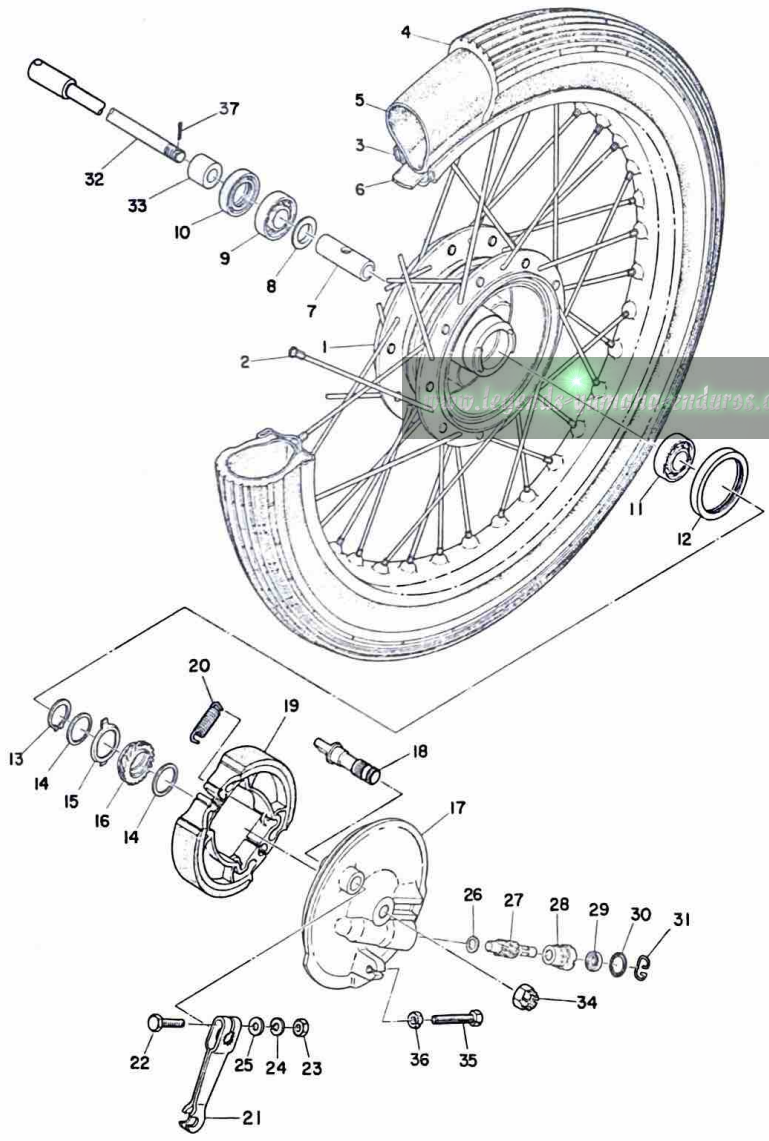
2. Cleaning

Wash the foam filter element thoroughly in solvent until all dirt has been removed. Squeeze all the solvent out. Pour oil onto the filter (any grade of 20 or 30 wt), work it completely in, and then squeeze out the surplus oil. The filter should be completely impregnated with oil, but not "dripping" with it. Under no circumstances should you run the motorcycle without the air filter. First, dirt and dust will be able to pass through into the cylinder. Premature engine failure will be the result. Secondly, more air will flow to the engine and there will not be enough gasoline for all the air. The lean mixture will result in higher engine temperatures and possibly severe engine damage.

CHAPTER 5 CHASSIS

The Yamaha RD60 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 competition 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.

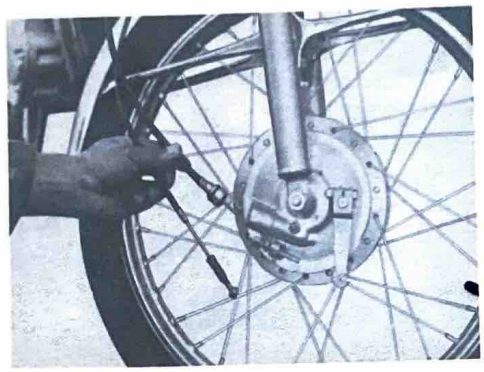
5–1 Front Wheel



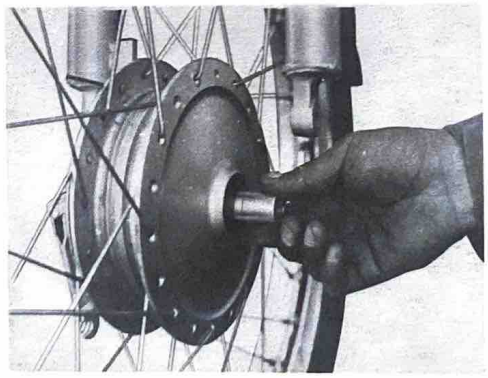
1. Hub front
2. Spoke set
3. Rim
4. Tire front
5. Tube
6. Band rim
7. Spacer bearing
8. Flange spacer
9. Bearing
10. Oil seal
11. Bearing
12. Oil seal
13. Circlip
14. Washer thrust 2
15. Clutch meter
16. Gear drive
17. Plate brake shoe
18. Cam shaft
19. Brake shoe comp.
20. Spring return
21. Lever cam shaft
22. Bolt
23. Nut
24. Washer spring
25. Washer plain
26. Washer thrust 1
27. Gear meter
28. Bushing
29. Oil seal
30. O-ring
31. Ring stop
32. Shaft wheel
33. Collar wheel shaft
34. Nut shaft
35. Bolt wire adjusting
36. Nut wire adjusting
37. Pin cotter

2. Removal

a. Disconnect the front brake cable from the front brake shoe plate, and remove the speedometer cable.



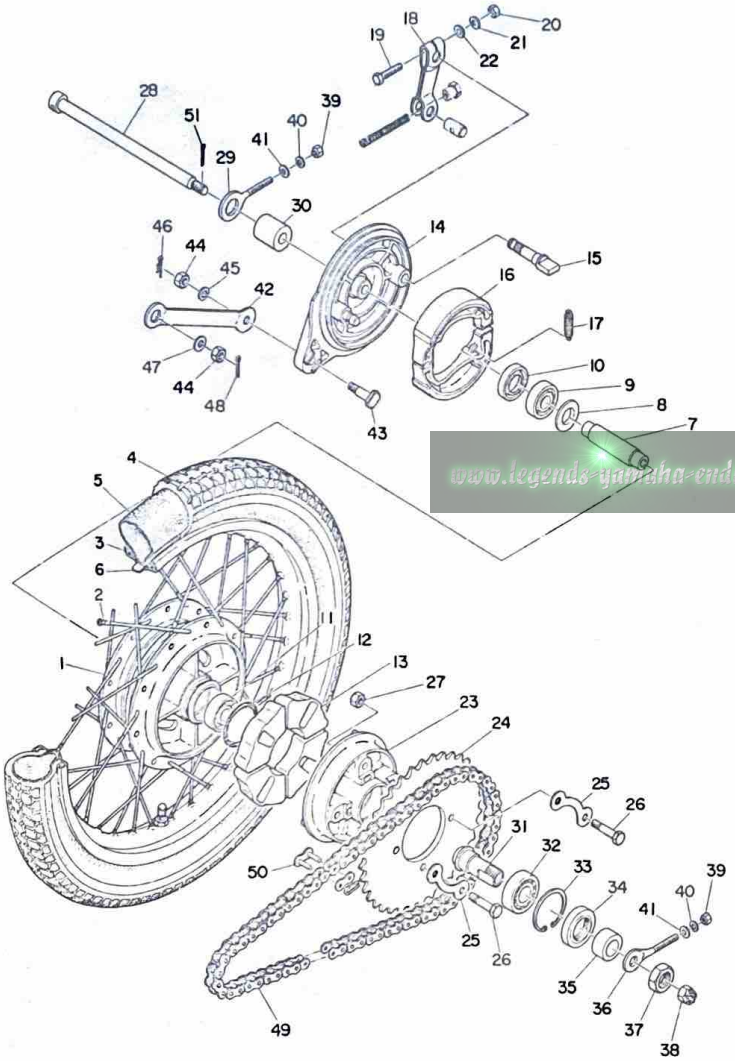
b. Remove the front wheel shaft nut, and pull out the wheel shaft. Then remove the distance collar.
When removing the distance collar, take care not to damage the oil seal lip. To remove the distance collar, grease it and turn it gently in and out.



c. Remove the front wheel ass'y.

5–2 Rear Wheel

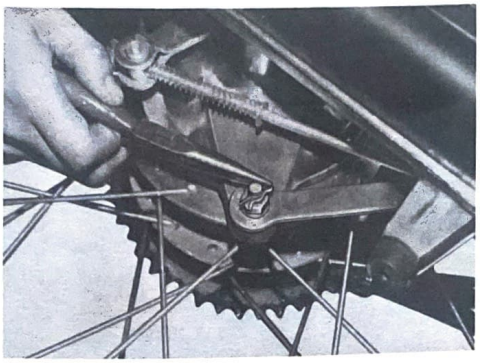
1. Constructional View

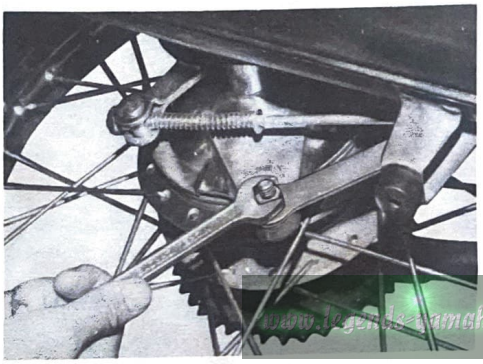


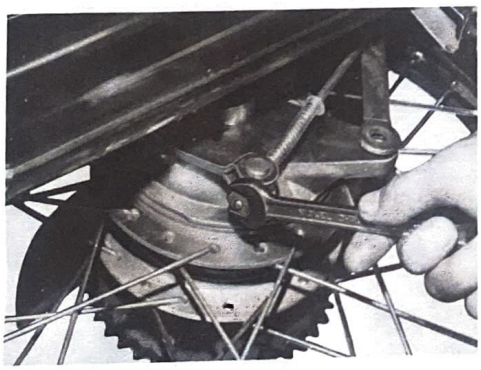
1. Hub rear
2. Spoke set
3. Rim
4. Tire rear
5. Tube
6. Band rim
7. Spacer bearing
8. Flange spacer 1
9. Bearing
10. Oil seal
11. Bearing
12. O-ring
13. Damper clutch
14. Plate brake shoe
15. Cam shaft
16. Brake shoe comp.
17. Spring brake shoe return
18. Lever cam shaft
19. Bolt
20. Nut
21. Washer spring
22. Washer plain
23. Clutch hub
24. Gear sprocket wheel
25. Washer lock
26. Bolt fitting
27. Nut
28. Shaft rear wheel
29. Puller chain right
30. Collar wheel shaft
31. Shaft sprocket
32. Bearing
33. Circlip
34. Oil seal
35. Collar sprocket shaft
36. Puller chain left
37. Nut sprocket shaft
38. Nut shaft
39. Nut
40. Washer spring
41. Washer plain
42. Bar tension
43. Bolt tension bar
44. Nut
45. Washer spring
46. Clip tension bar
47. Washer plain
48. Pin cotter
49. Chain
50. Joint chain
51. Pin cotter

2. Removal

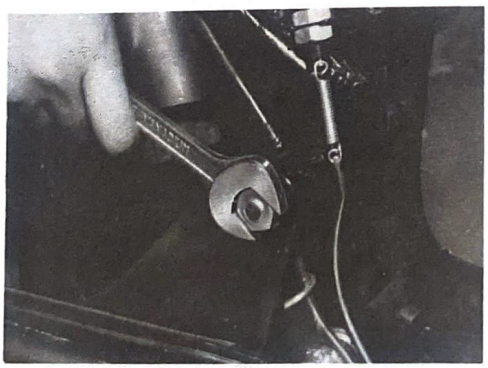
a. Remove the tension bar (anchor bar) and brake rod from the rear brake shoe plate.

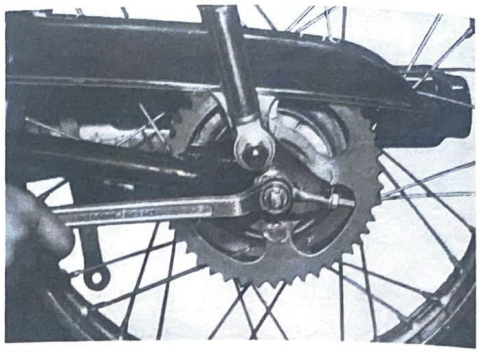


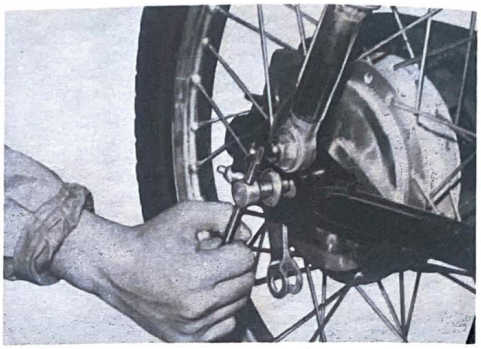




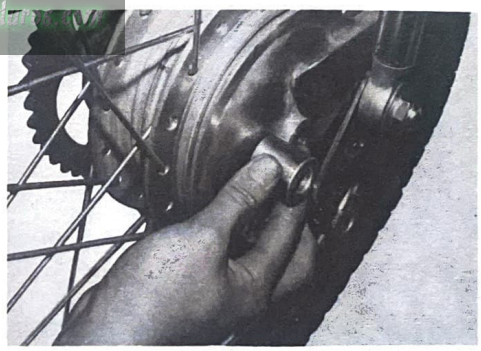
b. Remove the muffler, and remove the rear wheel shaft nut, and pull out the shaft.



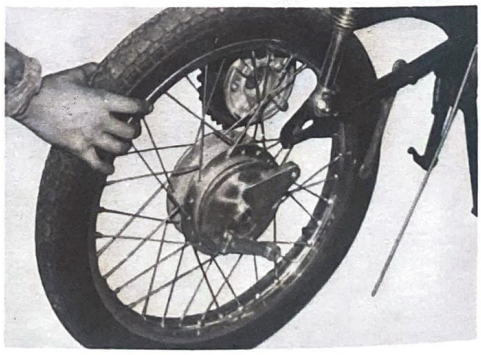




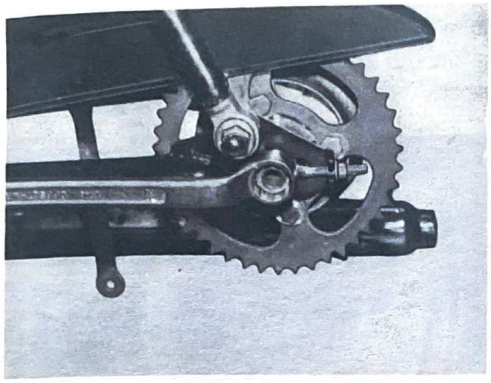
c. Remove the distance collar.

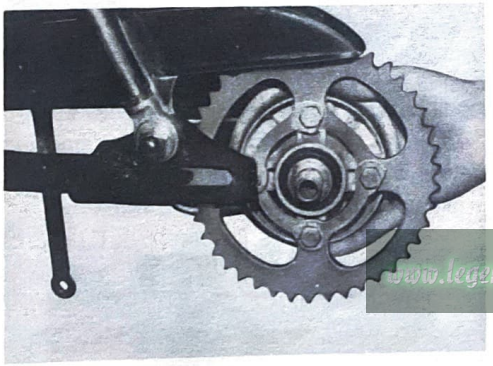


d. Remove the rear wheel ass'y.



e. Pull out the special hexagon nut and remove the rear clutch ass'y.





Checking and Adjustment for front Rear wheel

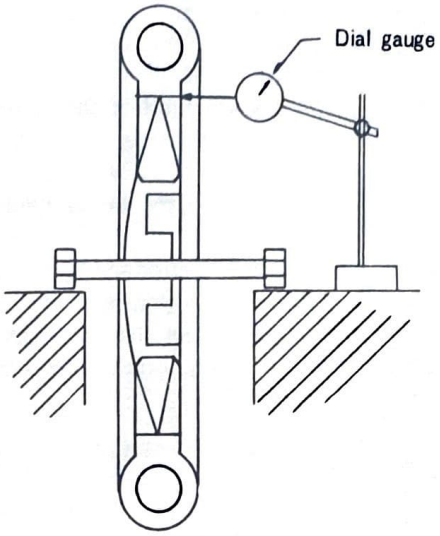
1) Checking the Runout of the Rim

Anchor the front wheel and measure the run-out of the rim with a dial gauge.

Runout limits: 2mm (0.07in.)

Excessive runout of the rim may cause steering difficulties while riding the machine, which may lead to an accident.

Excessive runout may result from a deformed rim or a loose spoke nipple.

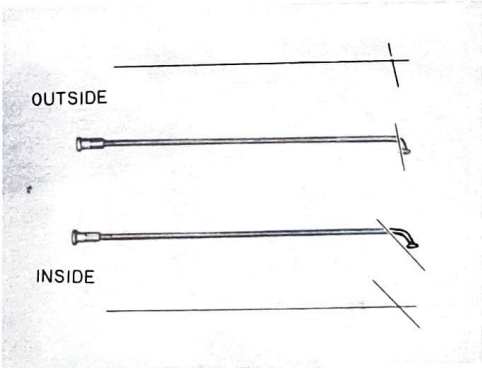


2) Spokes

a. Replacing Spokes:

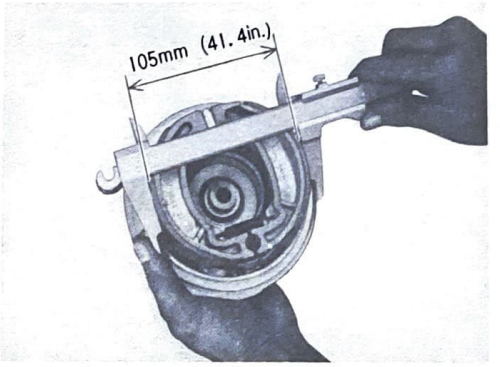
When replaicng a spoke or lacing up a new wheel it must be noted that there are two different spokes used on the rim assembly. "Outside" spoke and right an "inside". When lacing up a new wheel assembly, always install the "inside" spokes first then true the wheel.

After the wheel has been roughly trued, install the outside spokes and align the wheel to final specifications.

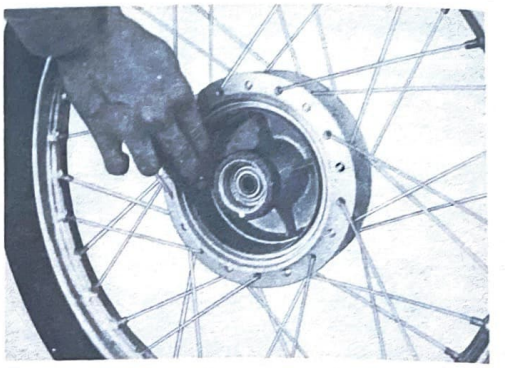


b. Adjusting the spoke tension;
Any loosened spoke or uneven spoke tension may cause the rim to warp.
This may also adversely affect the spoke itself. Spokes tend to become loose after many miles. This is particularly true with a new machine. Therefore, the spokes should be retightened periodically.
Retightening should be performed by giving each nipple one turn, beginning with one side of the hub and then the other side.
Spoke nipple tightening torque; 15kg.cm. (1.1 ft-lb)

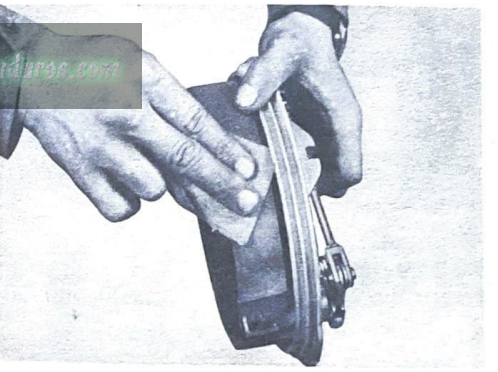
3) Brake Shoe
Set the brake shoe, and measure the outer diameter of the shoe, using a slide calipers, the shoe is less than 105mm (41.4 in.), replace it.



4) Brake Drum
Oil, dust or scratches on the inner surface of the brake drum will result in abnormal noise or a malfunction of the brake. Clean or smooth out the surface with a rag or sandpaper.



5) Repairing the Brake Shoe
If the brake shoe has scraches or uneven contact with the brake drum, smooth out the surface with sandpaper or hand life.



6) Replacing the Wheel Bearing
a First, clean the outside of the wheel hub.
b Insert the bent end of the special tool into the hole in the center of the bearing spacer, and drive the spacer out of the hub by tapping the other end of the special tool with a hammer. (Both bearing spacer and spacer flange can easily be removed.)

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

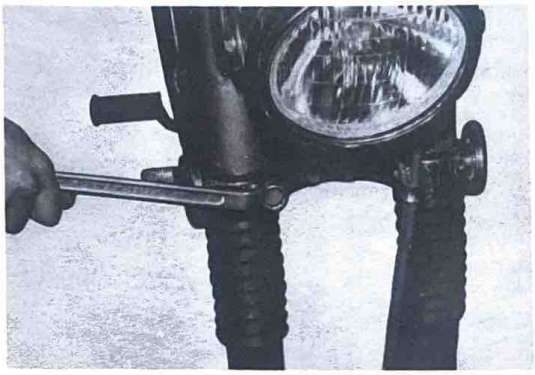
7) Replacing the Clutch Hub Bearing
a First remove the sprocket shaft by pushing it out toward the other side.
b Remove the sprocket shaft collar. (It can easily be pulled out with your hand.)
c Remove the oil seal. Exercise care not to damage the oil seal.
d Remove the circlip.
e Use the bearing fitting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

8) Tire and Tube Removal and Installation
a Whether it is the front tire or the rear tire to be changed, the procedure of tire and tube removal is identical. The explanation that follows is the proper method for both wheels.
b Remove the valve cap, valve stem, and valve stem lock nut. Use two tire irons (with rounded edges) and begin to work the tire bead over the edge of the rim, starting opposite the tube stem. Take care to avoid pinching the tube. After one bend of the tire has been completely worked off the rim, slip the tube out. Be very careful not to damage the stem as it is pushed back out of the rim hole.
c If the tire is to be completely removed, then work the tire off the same rim edge.
d Installing the tire can be accomplished by reversing the disassembly procedure. The one difference in procedure would be to inflate the tube momentarily before both tire edges has been completely slipped onto the rim. This removes any creases that might exist. After tire has been completely slipped onto the rim, check to make sure that the stem is squarely the center of the hole in the rim. Then inflate the tube to 40 + psi several times. Check leaks, and set at prescribed pressure.

5–3 Front Fork

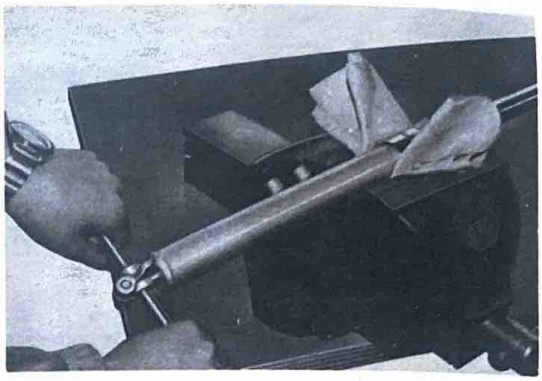
1. Removal

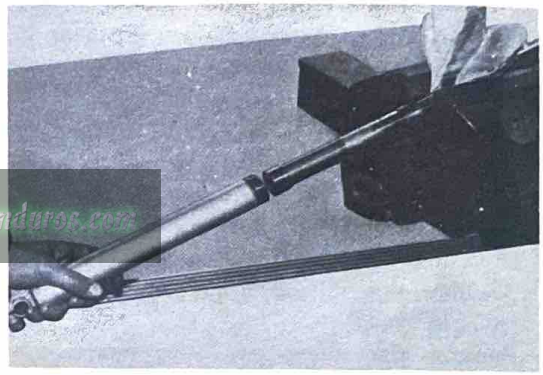
1) Remove the front fender, wheel already removed and remove the inner tube cap bolt.
2) Loosen the inner tube clamping bolt on the underbracket.
3) Draw the outer tube downward to remove the assembly.

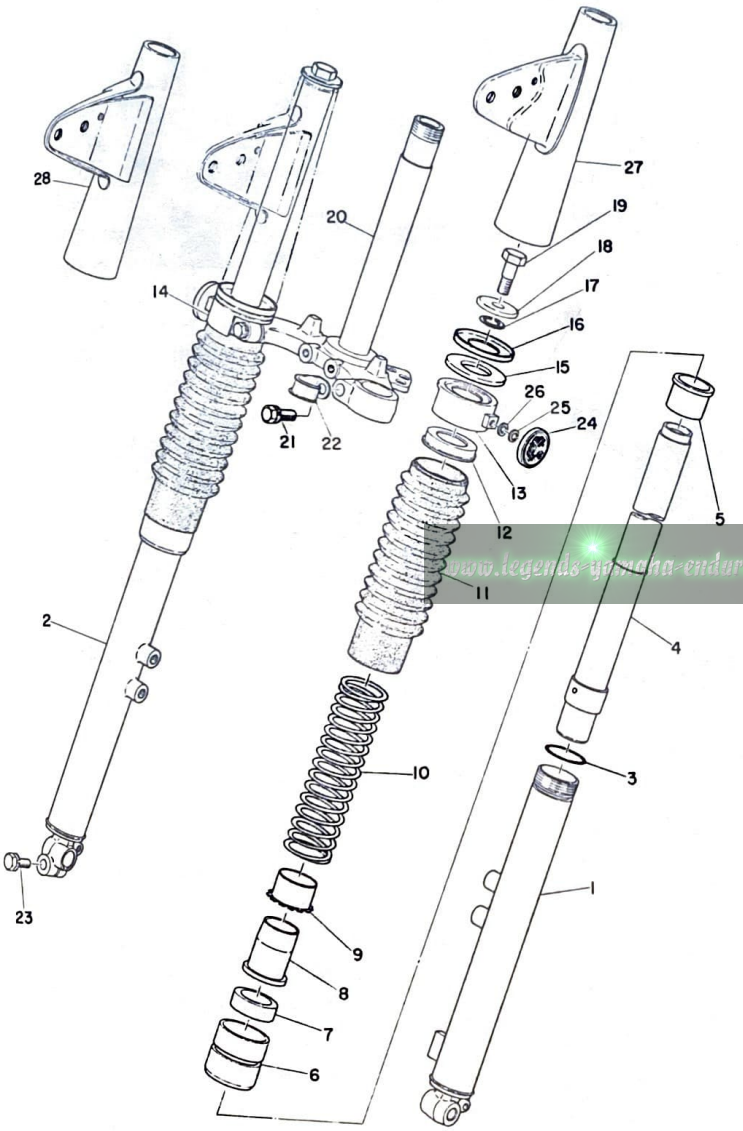


2. Disassembling the Outer and Inner Tubes

a. Wind a rubber sheet or a tire tube around the outer tube nut, and remove the nut. Disassemble the tubes in the manner.



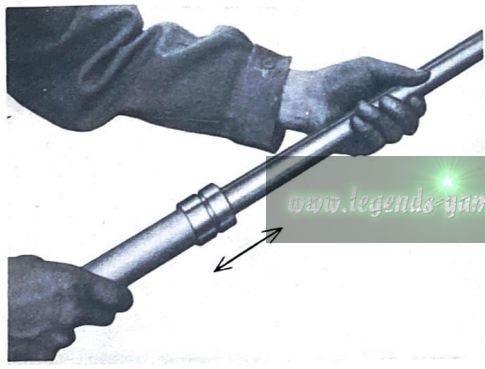




1. Tube outer left
2. Tube outer right
3. O-ring
4. Tube inner left
5. Metal slide
6. Outer nut comp.
7. Oil seal
8. Seat spring under
9. Guide spring
10. Spring fork
11. Boot
12. Seat spring upper
13. Cover outer left
14. Cover outer right
15. Packing
16. Guide cover under
17. Packing
18. Washer cap
19. Bolt cap
20. Under bracket comp.
21. Bolt under bracket
22. Holder wire
23. Bolt
24. Reflector
25. Washer spring
26. Washer plain
27. Cover upper left
28. Cover upper right

3. Checking
   1) Inner Tube
      Check the inner tube for any bend or scratches. A minor bend can be corrected but replacement is preferred if the metal has been scratched radieally.
   2) Oil Seal
      When disassembling the front fork, be sure to replace the oil seal, and "O" ring.

4. Reassembling
   1) Reassembling the Front Fork (without mounting on the chassis)
      To reassemble the front fork, reverse the sequence of disassembling as mentioned above.
      After reassembling, check to see if the inner tube slides smoothly.



   2) Mounting the Front Fork on the Chassis
      a. Pull the front fork upward by using the front fork puller, and tighten the underbracket clamping bolt.

      b. Fill the inner tube with the specified front fork oil, pouring through the top end opening of the tube.
         Oil amount: 135c.c. for right
                     135c.c. for left
         The correct level of the fork oil is 335mm (13.2in.) below the top to the fork.
         Oil . . . . Motor oil SAE 10W/30 ("SE")

      c. Install the inner tube cap bolt, and tighten it.

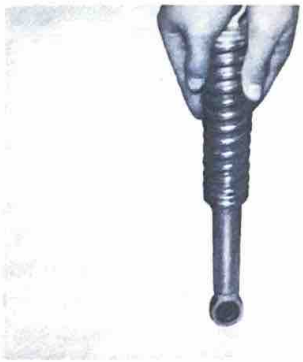
5–4 Rear Cushion

The rear cushion is not designed to be disassembled, so this paragraph discusses how to check for oil leakages.

1. Checking Method of Oil Leakages

When checking the rear cushion, you may often find oil seepage on the lower part of the outer cover. In most cases, however, this results from melting of the grease applied to the spring inside, and this will not impair the function of the rear cushion. Take the following steps to inspect for cushion oil leakages.

1) Remove the rear cushion, and repeatedly depress the cushion a few times. If the spring quickly rebounds half-way, and slowly the last 10mm, the cushion is in good working condition. If the spring quickly rebounds all the way, the cushion must be leaky. Replace it with a new one.



5–5 Steering Head

1. Checking

a. Ball Races and Steel Balls

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

NOTE:

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

CHAPTER 6 ELECTRICAL

6–1 Electrical Equipment

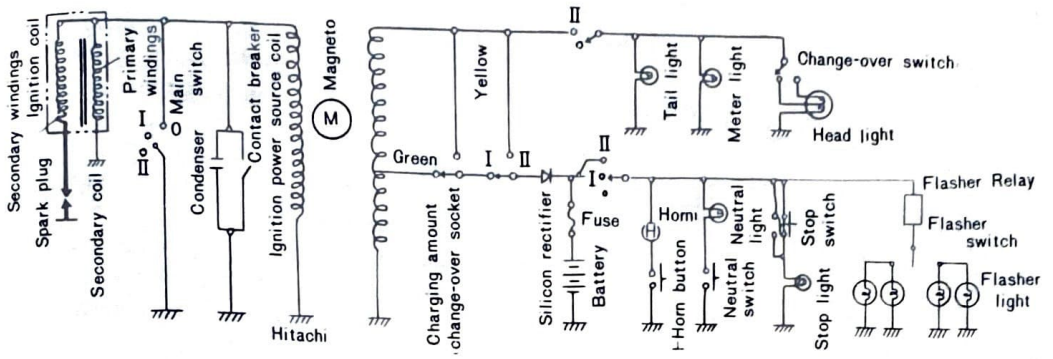
1. Equipment

The Yamaha RD60 is equipped with a flywheel, silicon rectifier and 6-volt, 4 amp/h battery. The flywheel magneto has two terminals which can be selected by the riding to running and/or load conditions.

6–2 List of Electrical Components

Ignition method	Magneto ignition		
Ignition timing (Degrees)		MM BTDC (ADV)	1.8 ± 0.15 ($1.8^{+0.2}_{-0.5}$)
Ignition advance minimum		Maximum	
Breaker point gap	0.30 ~ 0.40mm	Contact pressure	650 ~ 850g
Condenser capacity	0.30 μF	Spark plug & gap	B-7HS, 0.5 ~ 0.6mm
Primary source resistance	1.5 Ω ± 10%	Turns/output	
Ignition coil mfr.	Hitachi	Model number	CM61-20H
Turns/output primary		Secondary	
Resistance primary	1.7 Ω or 20°C	Secondary	6.0K Ω at 20°C
Spark gap test minimum	7mm	RPM	500rpm
Electrical charging method	(type)	Flywheel magneto	
Manufacturer	Hitachi	Model number	F11-L48
Voltage	6V	Maximum output	8V4A/8,000rpm
Lighting coil resistance		Night	0.56 Ω
(Y-E) day	0.38 Ω	Model number	6N4A-4D
Battery manufacturer	GS or F.B	Charge rate	
Capacity	6V4AH	Dimensions (Batt.)	
Fuse rating	10A	Taillight rating	6V5.3W/25W
Headlight rating	6V15W/15W	Meter lights	6V1.5W x 2
Turn signals	6V17W	Turn indicator	6V3W
Rectifier manufacturer	Mitsubishi	Brake warning lamp	
Description (type)	half wave	Miscellaneous	6V1.5W
Resistance	9 ~ 10 Ω	Model number	$DS1H_2M$-8
		Material	
		Reverse resistance	∞

6–3 Connection Diagram



6–4 Ignition System-Function and Service

1. Function

The ignition system consists of the components. 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 ignition coil primary windings. 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, stepped up to 12,000 ~ 14,000V by mutual-induction, and the electric spark jumps across the spark plug electrodes.

2. Service Standards

a. Ignition Timing

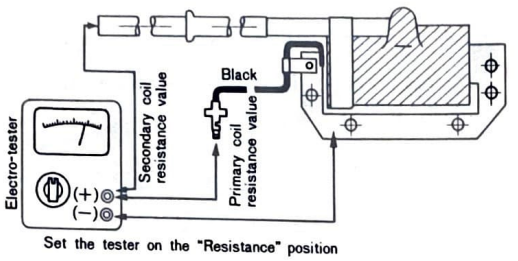
Remove the spark plug and screw the dial indicator holder into the plug hole. Next, insert the dial indicator into the holder. Bring the piston up to T.D.C. and set the zero on the dial face to line up exactly with the dial indicator needle. The crankshaft should then be turned backwards, so that the piston travels down past 2.0mm B.T.D.C. and slowly brought back up to precisely 1.8mm B.T.D.C. (This removes any slack in the gears). Adjust the points so that they are just beginning to open with the piston in this position. A low resistance point checker (100 Ohms or less) should be used to determine the opening and closing of the ignition points.

Ignition Timing, 1.8mm. B.T.D.C.

b. Ignition Coil

Primary coil resistance value . . . . . 1.7 Ω (20°C or 68°F)

Secondary coil resistance value . . . . . 6.0KΩ (20°C or 68°F)



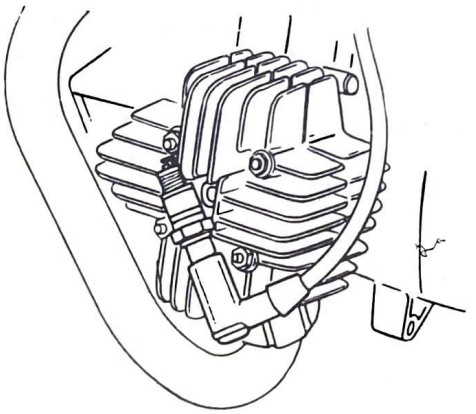
Set the tester on the "Resistance" position

NOTE:

When measuring the secondary coil resistance value, disconnect the plug cap. Otherwise, the resistance of the 6KΩ noise suppressor incorporated in the plug will be added to the tester reading.

SPARK TEST

Remove spark plug from cylinder head and reconnect the high voltage lead. Then hold the spark plug approximately 7mm away from the head and see if it sparks at 7mm or so and has blue white color, the ignition coil should be considered to be in good condition.

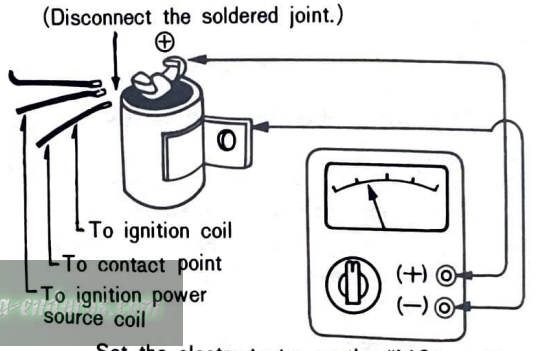


c. Condenser

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, an electric are would jump across the separating contact points, causing then to burn.

Burned contact points greatly affect 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.

Insulation resistance test should be conducted by connecting the tester. If the pointer swings fully and the reading is more than 3MΩ, the insulation is in good condition. If the insulation is faulty, the pointer will stay pointing at the uppermost reading indicating very little resistance.

NOTE:

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

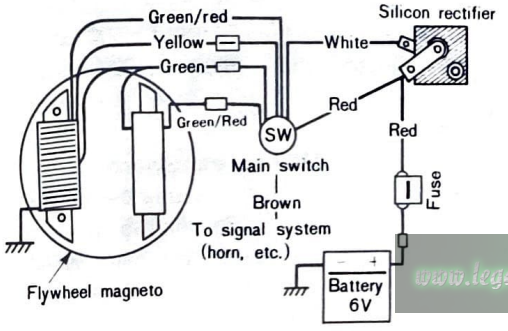
Capacity tests can be performed by simply setting the tester to the condenser capacity. The tester should be connected with the condenser in the same way as in the case of

the insulation resistance test. Before this measurement, be sure to set the tester correctly. If the reading is within 0.30μF the condenser capacity is correct.

6–5 Charging and Lighting System Function and Checking

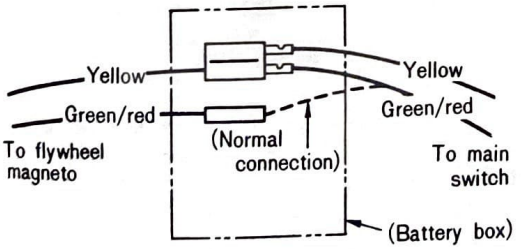
1. Function of the Charging System

The charging system consists of the flywheel magneto (charging and lighting coils), rectifier, and battery. As the flywheel rotates, an alternating 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 charges battery.

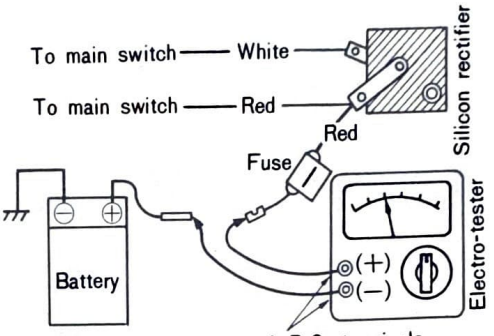


2. Checking the Charging System

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

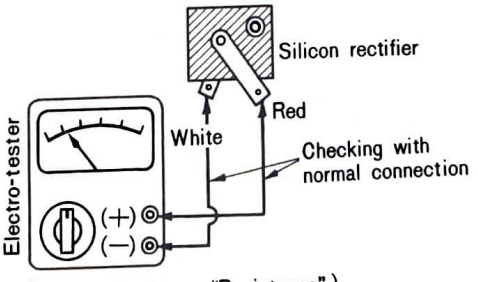


a. Measuring the Charging Current
(Use an ammeter with a full scale of 5A). As shown in Fig. 5-5-3 hook up the tester and measure the current with specific engine r.p.m. The figure in parentheses denotes the battery voltage.
0.5A or more/2,500 r.p.m. (6.5V) 4A or less/8,000 r.p.m. (8.5V)



(Connect the leads to 20 A D.C. terminals, and set the tester on "OFF".) (or D.C. ammeter)

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



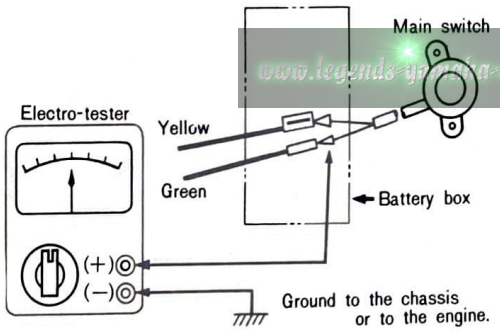
(Set the tester on "Resistance".)

b. Checking the Silicon Rectifier
For measurements, an ohmmeter can be used.

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: 9-10 Ω
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.

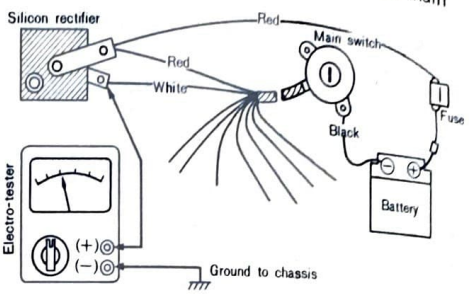
c. Magneto Output Voltage



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

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

The output voltage for night-time should be measured, with the tester connected. The tester positive lead is connected to the yellow lead. In this measurement, the main

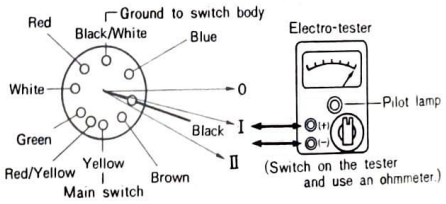


(Set the tester on A.C. Voltage.)

switch is on the Night-time position. If the tester reads more than 5volts at 2,500 r.p.m., the magneto output voltage is sufficient.

d. Short-circuit of Wiring and Switch
Connect the tester, and measure the voltage. If the reading is more than 6 volts at 2,500 r.p.m., the wiring and main switch are in good condition.

6–6 Checking the Main Switch (removed from the chassis)



Key "O" Position (Off) Black⟷Black/White
Key "I" position (for day) Green⟷White.
Red⟷Brown
Key "II" position (for night)
Red ⟷ Brown White⟷Yellow White ⟷Blue
White ⟷ Blue White ⟷ Red/Yellow
Key "III" position Black/White ⟷Black
Red ⟷ Blue

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

6–7 Battery

The battery is a 6 volt-4 AH unit that is the power source for the horn stoplight, and flasher light. Because of the fluctuating charging rate due to the differences in engine R.P.M.s, the bat tery will lose its charge if the horn and stop-light 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. at about 3,000 to 4,000 R.P.M. to keep the battery charged properly. If the horn and stoplight are used very often, the battery water should be checked re-gularly as continuous charging will dissipate the water.

1. Checking

1) If sulfation occurs on plates due to lack of the battery electrolyte, showing white accumulations, the battery should be re-placed.
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 6V battery requires a charging current of more than 8.4volts in order to supply a current at a rate of 1amp. 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) Adding 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 be 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:

6N4A-4D

Battery Spec.	6 V–4 AH	
Electrolyte Specific gravity and quantity	1.26 ~ 1.27, 170 c.c.	At full charge
Initial charging current	0.4A for 10hours	Brand new motorcycle
Charging current	0.4A for 13hours (Charge until specific gravity reaches 1.26 ~ 1.27)	When discharged
Refilling of electrolyte	Distilled water up to the max. level line.	Once a month

6–8 Spark Plug

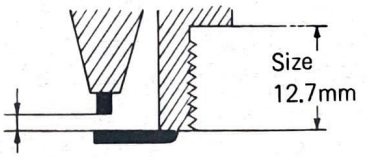
The life of a plug and its discoloring vary according to the habits of the rider. At each periodic inspection, replace burned or fouled plugs with suitable ones determined by the color and condition of the bad plugs. One machine may be ridden only in urban areas at low speeds. Whereas another may be 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 every 3,000 km (2,000 miles) since it will tend to keep the engine in good condition and prevent excessive fuel consumption.

1. How to "read" spark plug (condition)
   a. Best . . . . . When the porcelain around the center electrode is a light tan color.
   b. If the electrodes and porcelain are black and some what oily, replace the plug with a hotter-type for low speed riding.
   c. If the porcelain is burned white and/or the electrodes are partially burned away, replace the plug with a colder-type for high speed riding.

2. Inspection

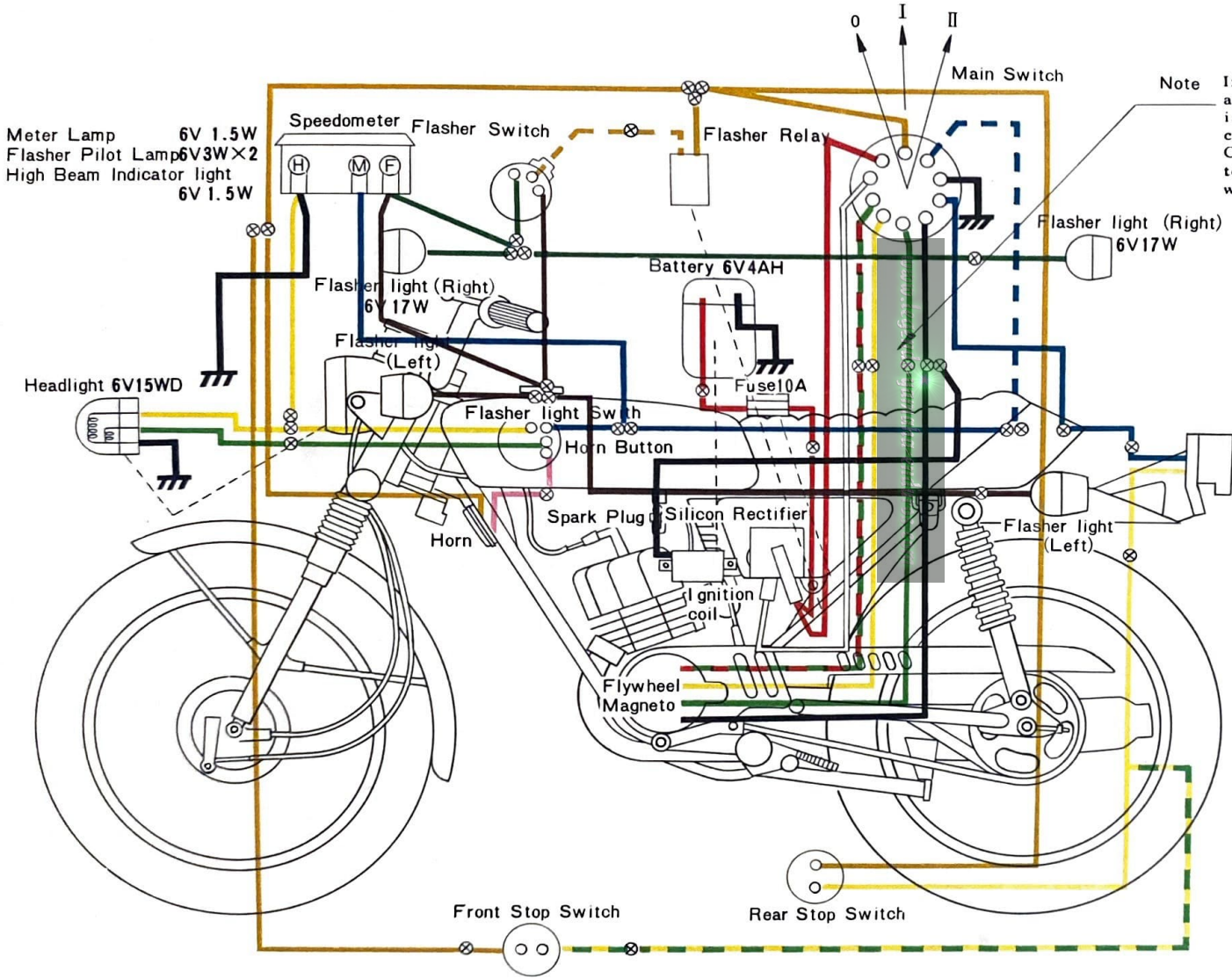
Instruct the rider to:

Inspect and clean the spark plug at least once a month or every 1,000 km (500 miles). Clean the electrodes of carbon and adjust the electrode gap to 0.5 ~ 0.6 mm (0.023 in.). Be sure to use standard B-7HS plug as replacements to avoid any error in reach.



0.5 ~ 0.6mm
(0.023in.)

YAMAHA RD60 CIRCUIT DIAGRAM



Note If you often drive at slow speeds or use the stop lamp and flasher lamp frequently, in other words, if the battery is rather discharged, you can make the following slight change in the circuit for the better charging.
Connect the green lead wire of the main switch to the terminal of the yellow as illustrated in the circuit diagram with a dotted line.

Main switch connecting

position \ color	E	B	G	GR_1	W	Y	LW_1	R	Br	L
0	○—○									
I			○	——	○			○—○		
II				○—○		○—○		○—○—○		

Chart of cable colors

Engine Stop Circuit	Black	●
Magneto Daytime Charging Circuit	Green	●
Magneto Nighttime Charging Circuit	Green/Red	●
Battery (+) Circuit	Red	●
Earth Circuit	Black	●
Silicon Rectifier (−) Circuit	White	○
Front Brake Stoplight Circuit	Yellow/Green	◑
Tail Lighting Circuit	Blue	●
Flasher Light (Right) Circuit	Dark Green	●
Flasher Light (Left) Circuit	Dark Brown	●
Common Circuit	Brown	●
Headlight Main Circuit	Yellow	
Headlight Sub Circuit	Green	●
Horn Circuit	Pink	●
Flasher Relay Circuit	Brown/White	◑
Rear Brake Stoplight Cilcuit	Yellow	
Head Lighting Circuit	Blue/White	◑

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