



YAMAHA

SERIES

OWNER'S

MANUAL

1972

250cc - 360cc

ENDUROS AND MX

— INCLUDES —

DT2

RT2

DT2-MX

RT2-MX

LIT 11623-11-99

Notice

Yamaha Motor Company and its U.S. subsidiary, Yamaha International Corporation, are confident you will enjoy your new Yamaha to the utmost. We have made every effort to provide you with a safe, well engineered and constructed product.

This Owner's Manual will acquaint you with several features and maintenance procedures concerning your Yamaha. However, if you are unfamiliar with the product, features or procedures outlined in this booklet we strongly urge you to consult your Authorized Yamaha Dealer for additional information.

DT2 - RT2 SERIES OWNER'S MANUAL

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Yamaha International Corporation
P.O. Box 6600, Buena Park, Cal.

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DT2-RT2 Series Owner's Manual

Congratulations! You are now the owner of a new Yamaha high-performance motorcycle manufactured by the leading manufacturer of motorcycles in Japan. It is designed for competition and road use. It features a rugged, powerful, 2-stroke single cylinder engine, and Autolube, the revolutionary lubricating system developed by Yamaha Technical Research Laboratory and proven in all Yamaha models.

This manual explains some steps necessary for operating and caring for your new motorcycle. Please read it carefully to become thoroughly familiar with all the features and advantages built into your Yamaha.

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I. Features and Specifications

1. Features

(1) Reed Valve employed in Inlet System

Another new type engine has made its debut! The reed valve has been adopted as a new inlet system to Yamaha's **DT2 and RT2**. This, together with the 5-port cylinder, ensures excellence in steady engine performance from low to high speed running.

(2) Highly-dependable Yamaha Autolube

Yamaha Autolube provides superior engine lubrication that extends the service life of the engine.

(3) Easy Starting

The engine can be started by simply disengaging the clutch and kicking the kick pedal without shifting gears back to neutral. This is a valuable convenience to the rider.

(4) Powerful Brakes

Patented waterproof dustproof brake drums provide safe, fade-free braking on wet or dusty roads.

(5) Adjustable Rear Cushion

The rear cushions are adjustable to check positions. The rider can adjust spring tension to compensate for varying weights, speeds, and road conditions.

(6) Front Fork Design

The Yamaha **DT2 and RT2** employ a front fork design well-known for its strength and superior handling characteristics. Its use assures the rider of the ultimate suspension for even the roughest terrain.

(7) Speedometer and Tachometer

A speedometer and tachometer are standard equipment. The individual units are separately mounted for maximum visibility. An additional feature of the speedometer is an odometer which can be reset by tenths to zero for trip or enduro purposes.

(8) Tires

The DT2 and RT2 fitted with Dunlop Trials Universal tires as standard equipment. This particular tread is one of the most versatile available. It gives maximum trail traction, yet is compatible with road usage.

(9) Carburetor with built-in starter jet

Yamaha's carburetor is already well-known for providing easy starting. Equipped with this unique starter jet, the Yamaha is quick starting under all conditions.

II. Yamaha Autolube

What is Yamaha Autolube?

Yamaha Autolube is an automatic lubrication system which obsoletes the conventional two-stroke pre-mixing system. Oil stored in the oil tank is metered automatically to the engine, by an oil pump, with the quantity varying according to engine speed and load.

The heart of the system is the compact, precision-built oil pump. Driven off the engine crankshaft through reduction gears, the varying oil needs are regulated by the pump which feeds the oil directly to the engine. Regulation is controlled through engine rpm's and throttle setting.

Features :

Yamaha Autolube eliminates the lubrication problems peculiar to two-stroke engines with the conventional "pre-mixing" system. Oil is never contaminated by gasoline prior to delivery to the engine, nor is it subject to de-naturing through storage in the gas tank.

1. The Autolube system results in:

- Oil consumption up to $\frac{1}{3}$ LESS than that of previous lubrication systems.
- Greatly reduced carbon build-up.
- Reduced exhaust emission.

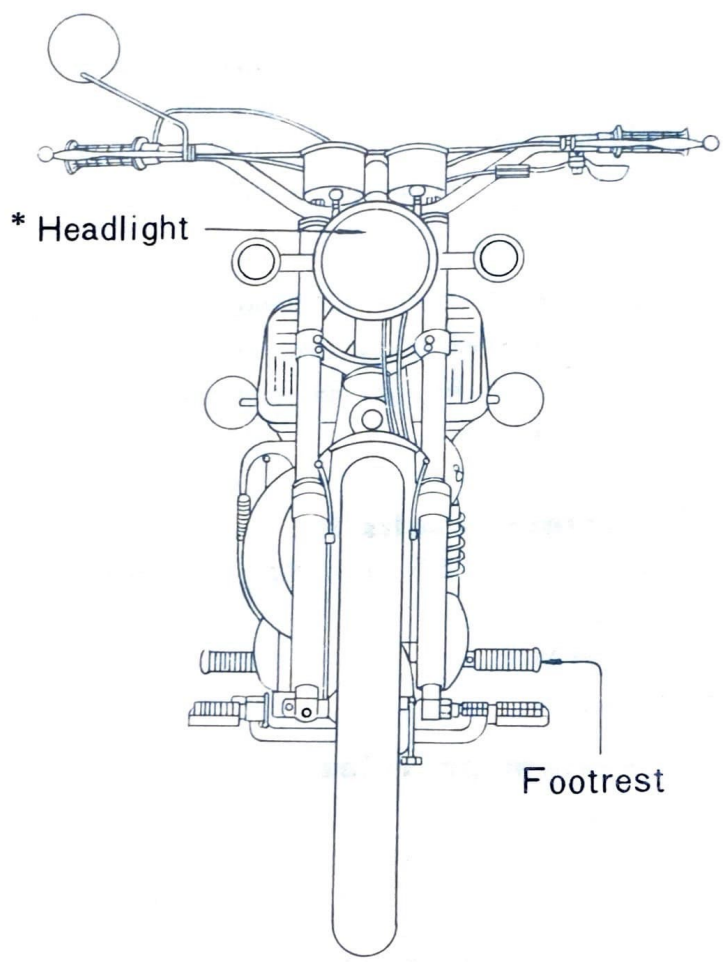
2. The Autolube system provides:

- Fresh oil supply
- Complete lubrication due to large oil particles
- No worries about the compatibility of oil and oil-fuel mixing ratios

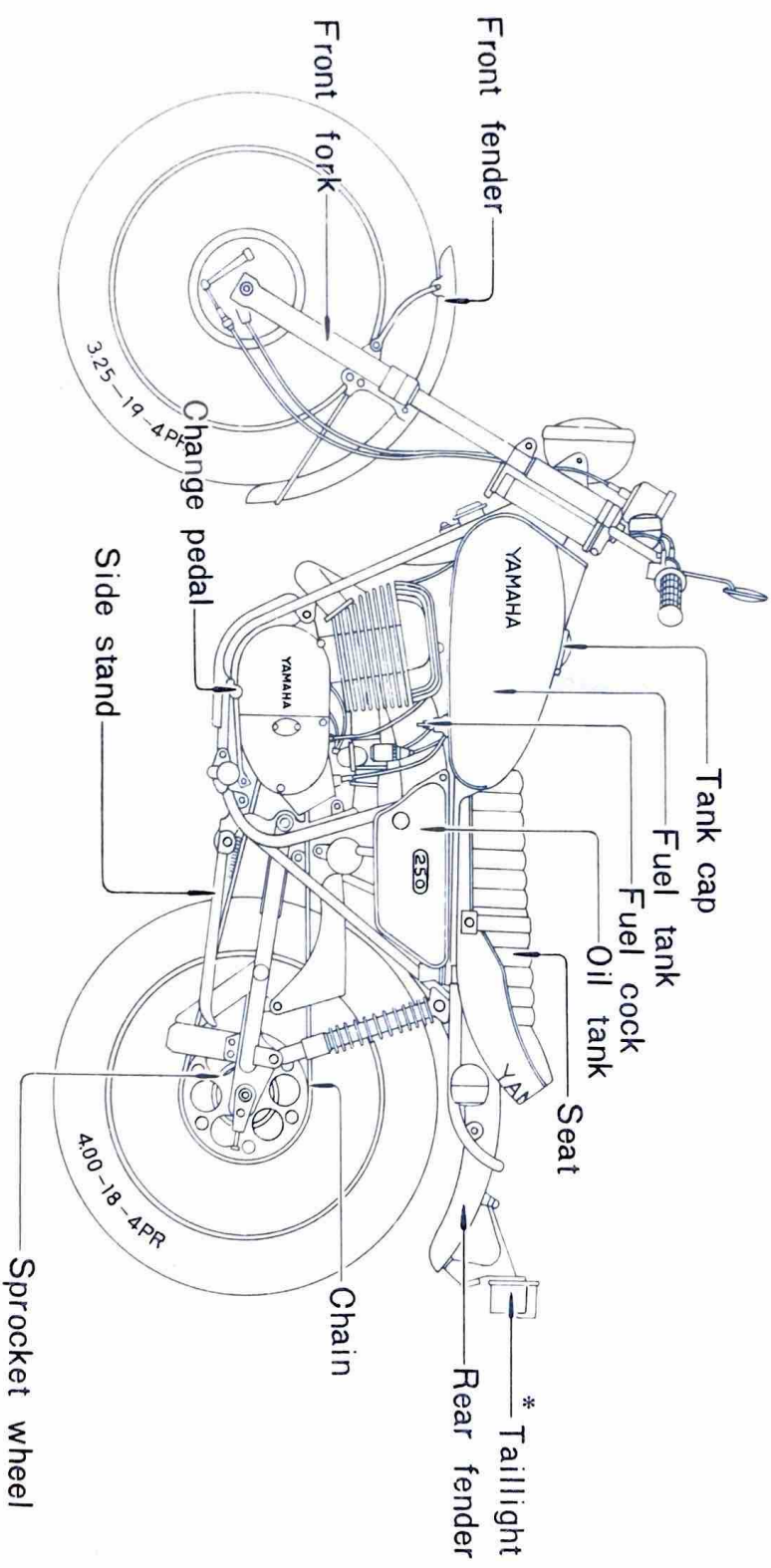
3. The Autolube system means:

- Fuel-"straight" gasoline only
- No pre-mixing of oil and gasoline

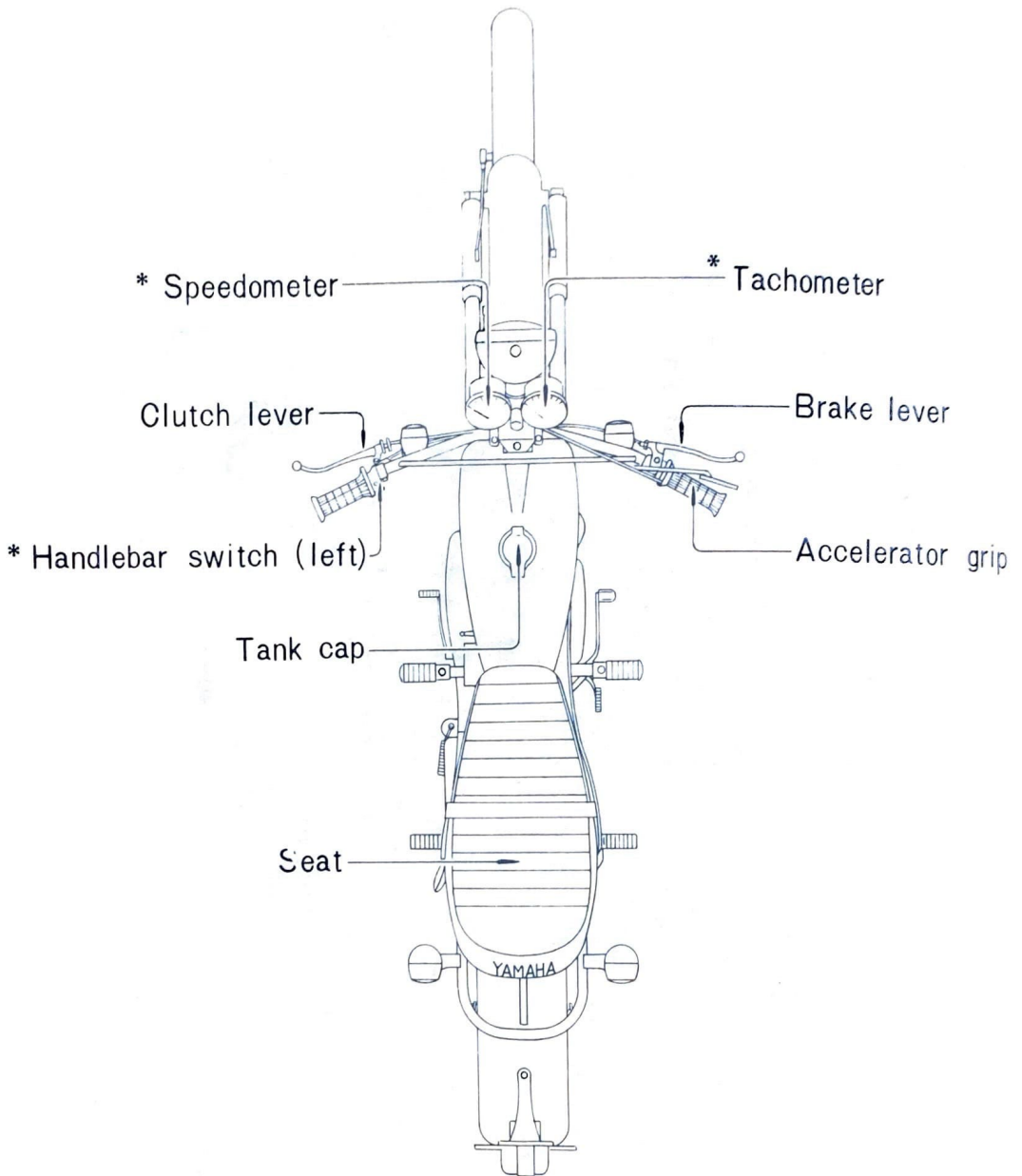
III. Nomenclature



* NOT ON "MX" MACHINES



* NOT ON "MX" MACHINES



* NOT ON "MX" MACHINES

IV. Basic Instructions

1. Gasoline and Oil

NOTE: See "MX" Section for DT2-MX and RT2-MX.

The Yamaha DT2 and RT2 series engines equipped with the Yamaha Autolube system, use straight gasoline as fuel.

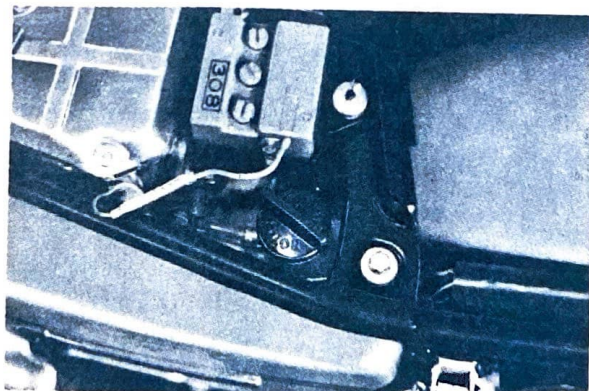
Gasoline: Use gasoline of 90 octane rating or more.

Use fuel with an octane rating of 90+. Some regular fuels and most mid-range have 90+ octane ratings. Ethyl grade fuels usually have octane ratings in excess of 100. In addition, they have considerable tetra-ethyl lead added which can cause spark plug problems. Whenever possible, use fresh, name-brand, gasoline.

Oil:

We recommend that your first choice be YAMALUBE 2-cycle which can be purchased from any 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) Another brand of 30 wt. two-stroke oil designed for air cooled engines labeled "BIA Certified for Service TC-W".
- 2) A 30 wt. two-stroke oil designed for water cooled engines.
- 3) Any 30 wt., detergent type, automotive oil.

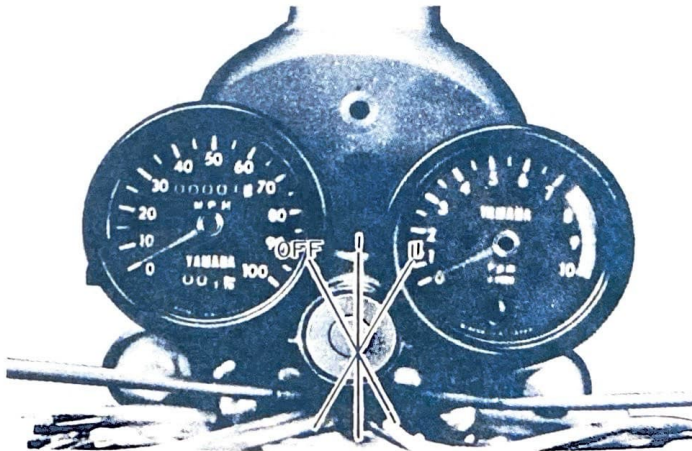


2. Familiarization of Equipment

(I) **Main Switch (DT2 and RT2 only)** See "MX" Section for Engine Stop Button. The main switch has three key positions, OFF, Ignition, and Ignition + Lights.

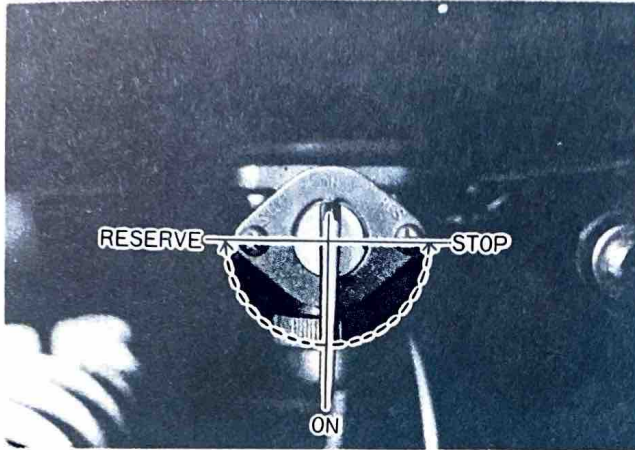
The following chart shows the key positions at which the various system are switched on or off. (The circle (○) denotes "Switch on".)

	OFF	I	II	Instructions
Engine		○	○	To start the engine, kick the kick pedal.
Meterlight			○	The engine is running.
Headlight			○	The engine is running.
Taillight			○	
Stoplight		○	○	The brake is applied.
Horn		○	○	The horn button is depressed.
Flasherlight		○	○	Turn on left handlebar switch.



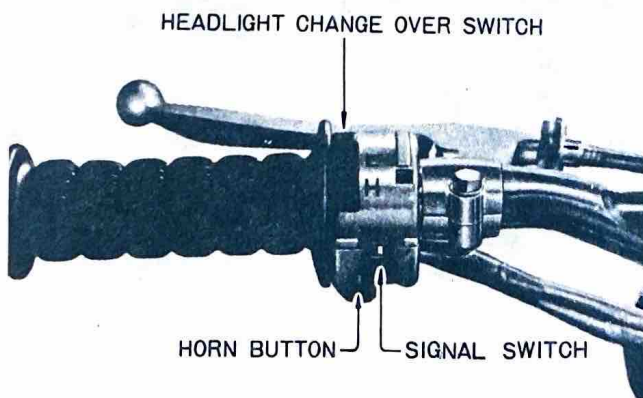
(2) Fuel Petcock

To allow the fuel to flow into the carburetor, turn the fuel petcock lever to ON. Should you run low of fuel while driving, turn it to RESERVE. The reserve gasoline will enable you to drive approximately 25 miles (40 km). When parking, the lever should be turned to STOP.



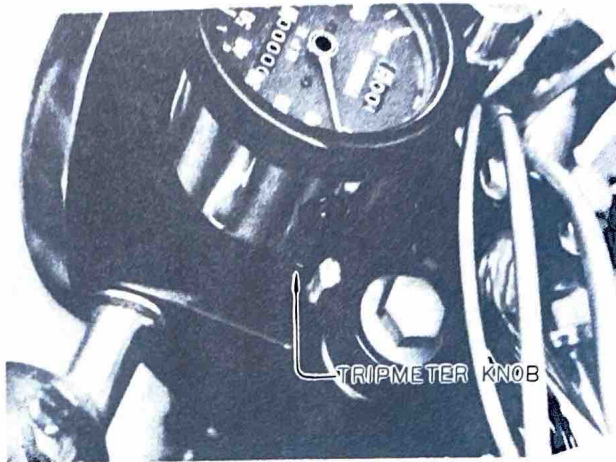
(3) Handlebar Switches (DT2 and RT2 only)

- a. To sound the horn, depress the horn button.
- b. To raise the headlight beam, pull the switch toward. To lower the beam, push the switch toward the front.
- c. To activate the flasherlight, move the turn signal switch on the left handlebar.



(4) Trip Total Meter (DT2 and RT2 only)

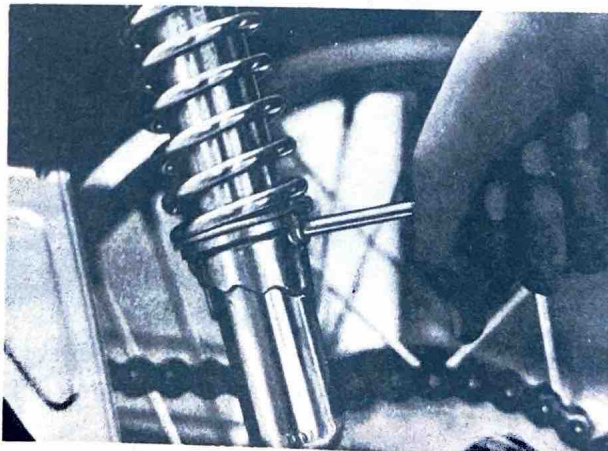
A trip total meter is built in the speedometer. It is designed to show the total mileage of each trip. Before starting a trip, set the trip total meter to the zero position.



(5) Rear Cushions

The rear cushions can be adjusted according to load, road conditions, and rider preference.

- To adjust the rear cushion insert the screwdriver (service tool) buttend of the blade into the adjusting hole and then turn it in order to change the position of the toothed notch.

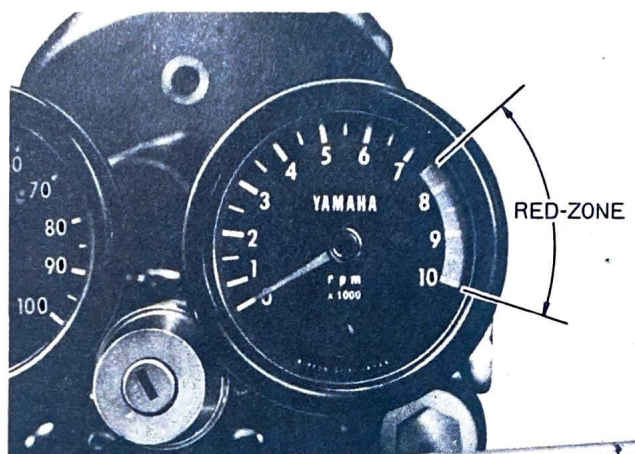


(6) How to Read the Tachometer

A tachometer is provided so that the rider can easily maintain engine RPM sufficient to keep the engine within the power curve.

The standard Yamaha is designed to run best in the power range between 3,000 rpm and 7,000 rpm. (DT2); 2000 rpm~6000 rpm (RT2).

Never lug your engine! It is recommended not to use red-zone 7,500 ~10,000 r.p.m. (DT2); 6,500~10,000 rpm. (RT2).



3. Pre-operation Check

You should check the following points before each usage.

(1) Is there sufficient fuel?

Make sure that there is sufficient fuel for your driving plan. Fill the fuel tank with gasoline only.

(2) Is there sufficient oil?

If the oil is below the center hole on the glass view port, refill the oil tank (See basic instruction for oil to use).



(3) Is the tire pressure correct?

The wrong tire pressure affects the riding comfort, steering, and life of tires.

Correct tire pressure:

Front — 13 lbs/in² (0.9 kg/cm²) } For on-the-road riding.
Rear — 16 lbs/in² (1.1 kg/cm²) }

When the tire pressure is reduced below the specified value because of some reason, the tire may slip around the rim. To prevent this slipping of the tire, bead stoppers should be used.

(4) Do the front and rear brakes work effectively?

Try the brake lever (right handlebar) and the foot brake (on the right side of the engine). Check to see if the stoplight is functioning.

(5) Do the lights and horn function well?

Check the horn, stoplight, headlight, meterlight, etc.

4. Operation

(1) Starting the Engine

The Yamaha DT2 and RT2 engines employ the kick starter system. The carburetor is provided with a starting system to produce the rich air-fuel mixture required for easy starting of the engine. It assures quick starting even in extremely cold weather.

Preparation for Starting

○ Turn the fuel pet cock lever to the "ON" position.

○ Insert the main switch key and turn it to the "Ignition" position.

Make sure the neutral light is on. (DT2 and RT2 only)

The engine is equipped with a primary kick starter.

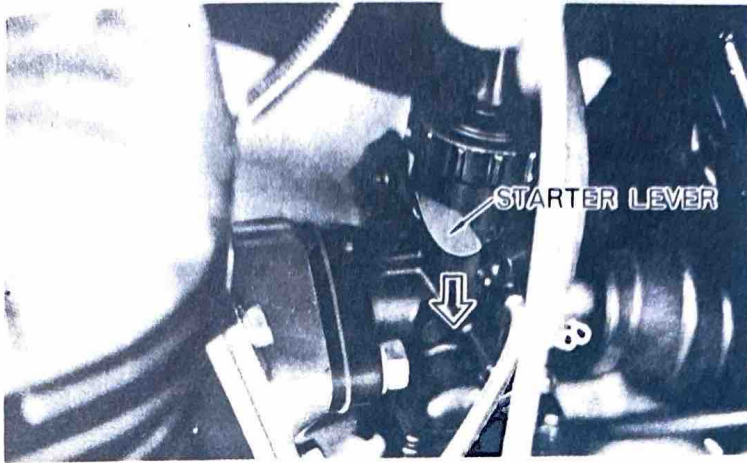
The engine can be started by kicking the kick pedal when the transmission is in neutral or by disengaging the clutch first if the transmission is in gear.

Starting When the Engine is Cold

Most engines are more difficult to start in cold weather. For easiest starting, a richer mixture of gas/air can be obtained by operating the starter lever.

○ Depress the starter lever.

○ Start the engine by kicking the kick pedal with the accelerator grip closed.



Starting When the Engine is Warm

When the engine is still warm from running or in warm weather:

- Don't use the starter lever.
- Slightly open the accelerator grip, and kick the kick pedal.

Warming Up

It is very important to allow a warming-up period of 2 minutes or so after starting the engine.

After the engine has started, the depressed starter lever must be released. Keep the accelerator grip open until the engine begins to run smoothly. Correct engine warm-up, along with periodic inspections, will assure a longer performance life from your engine.

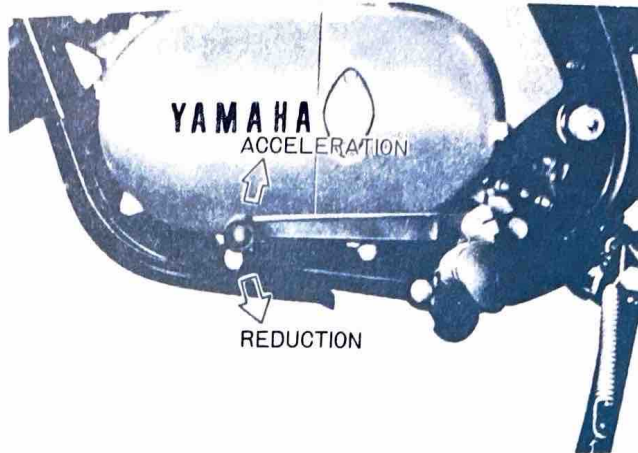
(2) Operation Procedure

Shifting Gears:

The Yamaha DT2 and RT2 are equipped with a foot-operated, 5-speed transmission.

To shift into NEUTRAL, move the toe section of the change pedal downward into 1st and then raise it slightly to the neutral detent. The neutral position is between the First and the Second gear position.

FIFTH
FOURTH
THIRD
SECOND
NEUTRAL
FIRST



Shifting and Acceleration

Pull in the clutch lever to disengage the clutch. Press down on the toe section of the shift lever to engage first gear. Slowly twist the accelerator grip (engine speed begins to increase) and gently release the clutch lever.

Done properly, the machine will accelerate smoothly.

After starting off, accelerate to approximately 15 mph. Next, to shift into second gear, perform these steps simultaneously:

1. Disengage the clutch while twisting the accelerator grip to the closed position.
2. Shift into second gear by raising the toe section of the shift lever one full position (in this case, the neutral position is bypassed).
3. Increase engine speed slowly while gradually releasing the clutch lever. Accelerate to approximately 30 mph. To shift into third gear, repeat the same procedure. Use this procedure each time you want to shift into a higher gear.

You can also use the drag of the engine to slow down. Decelerating is accomplished by reversing the above procedure. Twist the throttle to the closed position, disengage the clutch, and depress the shift lever. Then slowly release the clutch.

Note: When shifting gears always remember that the tachometer is your guide to keep from over-revving and possibly damaging the engine. Keep the rpm's in the 3,000-6,500 rpm range except during break-in, which will be explained later.

Off-the-road Riding

When you ride your motorcycle over rough land, safety parts may break or fall off due to shocks from the ground or due to accidents such as falling, and breakage or loss of parts may result. It is advisable to remove all safety parts before you start riding.

Parts to be removed: Headlight, taillight, speedometer, tachometer, and side stand.

Caution on Riding over Paved Roads at High Speeds:

The DT2 and RT2 are equipped with tires having a block pattern. As a result, the area where the tire contacts the ground is smaller compared with other types of tires. Therefore, take care to avoid slipping your motorcycle when you are cornering at high speeds and at sharp angles.

Driving on Hills

a. Going Uphill

When starting to climb a gentle grade, open the throttle little by little to avoid losing engine speed and power.

When climbing a steep grade, shift down from THIRD to SECOND or from SECOND to FIRST as required.

b. Going Downhill

On a long down grade or sharp descent, don't rely on the brakes alone, but use the engine compression as a brake: shift into THIRD or SECOND as required by the grade and close the throttle.

CAUTION: Never attempt to turn off the ignition switch on a long hill.

This will only cause the spark plugs to foul.

Stopping

There are several ways to stop.

Pulling in the clutch lever and twisting the throttle grip in the closed direction will permit you to gradually glide to a stop.

Downshifting through the gears, using the drag of the engine to slow down is another. However, the best method, and the one most universally used, is to use both engine compression (downshifting through the gears as the machine slows) and the front and rear brakes.

When stopping, gradually apply the rear brake while twisting the throttle

grip in the closed direction. After the rear brake starts to take hold, gradually apply the front brake.

As the machine continues to slow, shift down through the gears, using engine compression to aid the slowing effect. When shifting down, watch the tach to see that the engine does not over-rev.

Note: During periods of Inclement weather, ice snow, rain, sleet, or ice, or on poor road surfaces where traction is minimal, or in a sharp corner, IT IS NOT ADVISABLE TO FIRMLY APPLY THE FRONT BRAKE. While it is true that the front brake supplies the greater portion of braking power, it is also true that stability can be upset very easily if it is used incautiously under the above conditions.

5. DT2/RT2 Break-in Procedure

NOTE: See "MX" Section for DT2-MX and RT2-MX

THERE IS NEVER A MORE IMPORTANT PERIOD IN THE LIFE OF YOUR DT2 OR RT2 THAN THE PERIOD BETWEEN ZERO AND SIX HUNDRED MILES. For this reason we ask that you carefully read the following material.

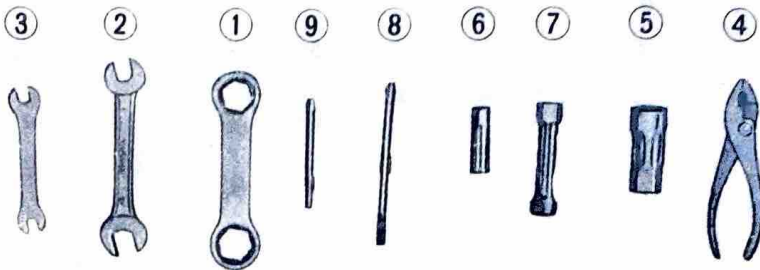
Because the engine is brand new, you must not put an excessive load on it during the first several hours of running. You could look at it in this manner: During the first 600 miles the various parts in the engine wear and polish themselves to the correct operating clearances. During this period prolonged full throttle operation, or any condition which might result in excessive head and cylinder temperatures, must be avoided. However, momentary full throttle operation (2~3 seconds maximum) does not harm the engine. Each full throttle acceleration sequence should be followed with a substantial 'rest period' for the engine by cruising at lower rpm's so the engine can rid itself of the temporary build up of heat. The method for breaking in a DT2 or RT2 is quite simple.

1. Zero to 200 miles:

Avoid operation above 4,500 rpm. Allow a cooling off period of five to ten minutes after every hour of operation. Vary the speed of the motorcycle from time to time. Do not operate it at one, set, throttle position.

2. 200 to 400 miles:
Avoid prolonged operation above 5,000 rpm. Allow the motorcycle to rev freely through the gears but do not use full throttle at any time.
3. 400 to 600 miles:
Avoid prolonged full throttle operation. Avoid cruising speeds in excess of 6,000 rpm.
4. 600 miles and beyond:
Avoid prolonged full throttle operation. Avoid cruising speeds in excess of 8,000 rpm's. Vary speeds occasionally.

V. Service Tools



- ① 22×26 mm. Double-ended Spanner
- ② 13×17 mm. Spanner
- ③ 8×10 mm. Spanner
- ④ Plier
- ⑤ 17×21 mm. Socket wrench
- ⑥ 10 mm. Socket wrench
- ⑦ Screwdriver handle and 13 mm. socket wrench.
- ⑧ ⊕ ⊖ Screwdriver
- ⑨ ⊕ Screwdriver

VI. Inspection and Service

This chart should be considered strictly as a guide to general lubrication and maintenance periods. You must take into consideration that weather, terrain, geographical locations, and a variety of individual uses all tend to demand that each owner alter this time schedule to match his environment. If the motorcycle is continually operated in an area of high humidity, then all parts must be lubricated much more frequently than shown on the chart to avoid the ravages of water on metal parts. If you are in doubt as to how closely you can follow these time recommendations, check with the dealer in your area.

Greasing and Oiling

			300 miles	1,000 miles	2,000 miles	every 2,000 miles	every 4,000 miles
1	Brake cam shaft	G		○	○	○	
2	Wheel bearing	G			○		○
3	Brake wire	M/O		○	○	○	
4	Clutch wire	M/O		○	○	○	
5	Tacho, speedometer cable	G			○	○	
6	Meter gear unit	G			○	○	
7	Steering ball race	G					○
8	Front fork oil	M/O	○		○	○	
9	Brake pedal shaft	G		○	○	○	
10	Change pedal shaft	M/O, G			○	○	
11	Axle grip	G		○	○	○	
12	Transmission oil	M/O	○	○	○	○	
13	Dynamo lubricator	G					○
14	Stand shaft	M/O, G					○
15	Rear arm pivot shaft	G			○	○	
16	Drive chain	M/O		○	○	○	

Check Point Periodic Inspection Guide

		Pre-operation check	300 miles	1,000 miles	2,000 miles	every 2,000 miles	every 4,000 miles
1	Front and rear brake adjustment (F. R)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
2	Clutch adjustment		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
3	Transmission oil replacement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
4	Front fork oil replacement		<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	
5	Grease up			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
6	Battery electrolyte refilling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
7	Spark plug cleaning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
8	Ignition timing adjustment			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
9	Fuel pet cock cleaning		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
10	Carburetor adjustment			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
11	Carburetor cleaning						<input type="radio"/>
12	Air cleaner cleaning	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
13	Cylinder, piston cleaning			<input type="radio"/>		<input type="radio"/>	
14	Silencer muffler cleaning			<input type="radio"/>		<input type="radio"/>	
15	Drive chain adjustment, oiling		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
16	Autolube pump adjustment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
17	F. R wheel inspection	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
18	Bolt, Nut retightening		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
19	Spoke, Rim inspection			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Be sure to check the above points before long-distance touring.

2. Inspection and Adjustments

The methods of inspection and adjustment are discussed below. This information will be of value in your daily inspections.

Front Brake Cable Maintenance:

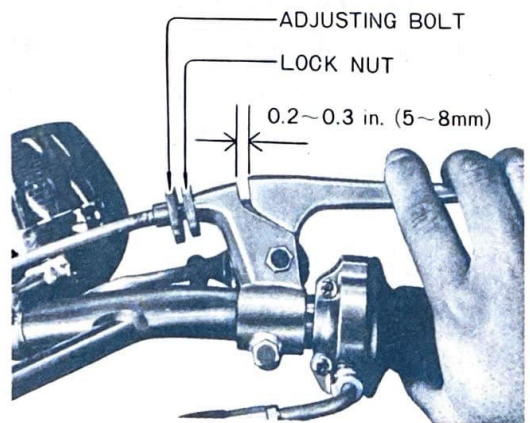
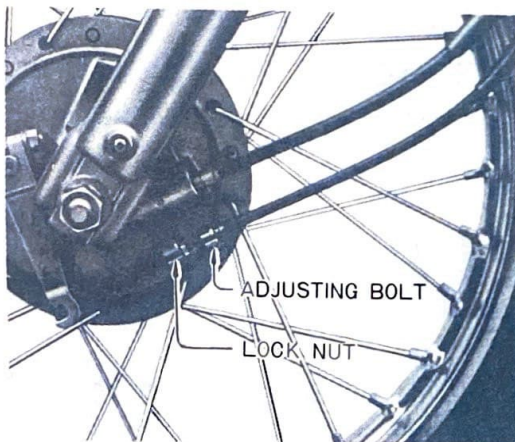
This cable needs periodic lubrication. To release one end of the cable for lubrication, follow the same procedures as listed in the CLUTCH CABLE MAINTENANCE section.

Removal of the front brake cable requires that you must first disconnect the cable at the lever, as was just explained. To disconnect it at the front hub, you have to screw the cable adjuster in so that there is plenty of cable slack right at the brake. Line up the slots in the adjuster, lock nut, and hub housing, and slip the cable out of the adjuster and out through the slots.

Front Brake Adjustment:

As with the clutch, there are also two adjustments to check.

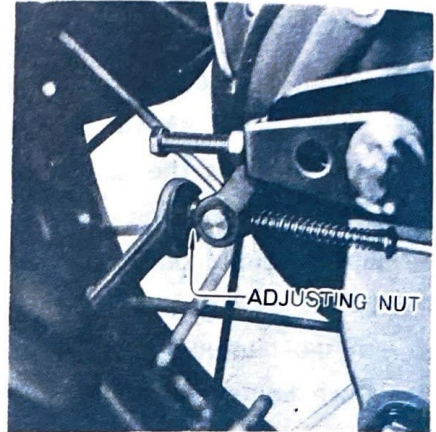
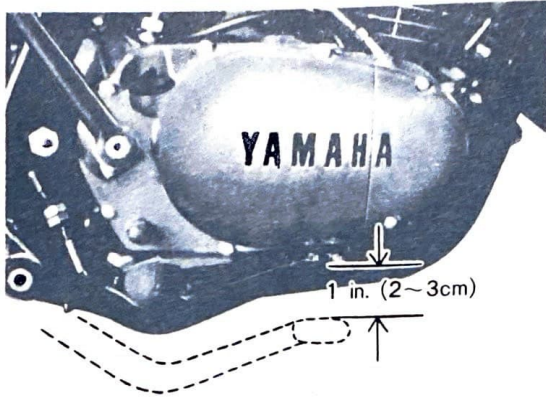
These two adjustments are located at the brake lever and at the front hub. In this situation though, only one brake adjustment is necessary, using either of these two places to make the adjustment. Preferably, it is much easier to make it at the brake lever. This is done by loosening the lock nut, and screwing the adjuster in or out until you have 3/16" free play.



Rear Brake adjustment:

The free correct play of the rear brake pedal is approximately 1 in. (25 mm). To adjust the play, turn the adjusting nut attached to the rear brake cable end one-half turn at a time.

After the adjustment, check the stoplight to see if it functions properly.



Note: This adjustment must be checked any time the chain is adjusted or the rear wheel is removed.

Checking the Brake Lining:

Disassemble the wheel assembly every 2,000 miles (3,000 km), check it for wear and clean the brake shoe and brake drum. Take care not to get any oil on the lining friction surface.

Clutch Cable:

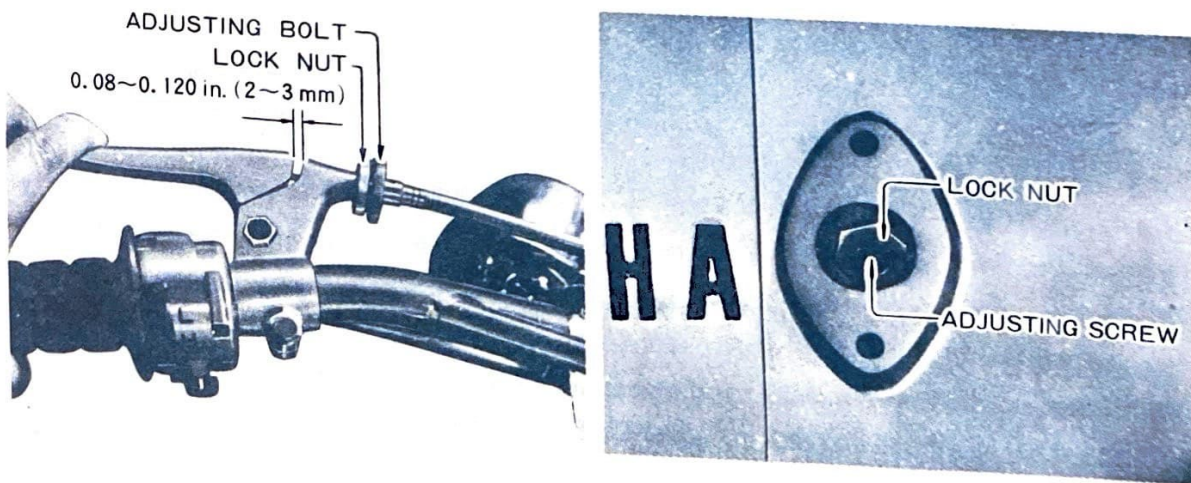
The clutch cable requires periodic lubrication to prevent the cable strands from rusting or hanging up in the casing. First, disconnect the cable from the clutch lever by screwing the adjuster all the way back to the cable casing. This will provide enough free play in the cable for you to slip the cable out of the lever holder through the slot in the lock nut, adjuster, and holder. Hold the cable upright and allow several drops of liquid graphite to flow down the cable. Hold the cable upright for several minutes to permit complete lubrication.

If the cable needs to be replaced, then perform the steps above and disconnect the cable at the lever. Next, disconnect the cable at the engine. Begin by taking off the cover that houses the clutch activating mechanism (left side of the engine). Looking at the inside of this cover, you will see the clutch actuating arm. Push the arm up and lift the cable end off. Removing the old cable and hooking up the new one will take but a few moments.

Clutch Cable Adjustment :

There are two clutch adjustments. The first, located at the handlebar clutch lever, is used to take up slack from cable stretch and to provide sufficient free play so that the clutch engages and disengages completely. The picture below illustrates all the parts involved in making the adjustment.

1. First, loosen the lock nut. Then turn the adjuster either in or out depending on which direction is necessary to arrive at 2-3 mm (1/16"-1/8") free play.
2. The second adjustment is located behind the clutch adjust cover. Removing the cover will expose the adjusting set screw and lock nut. Loosen the lock nut, rotate the set screw in until it lightly seats against a clutch push rod that works with the set screw to operate the clutch. Back the set screw out 1/4 turn and tighten the lock nut. This adjustment must be checked because heat and clutch wear will affect this free play, possibly enough to cause incomplete clutch operation.

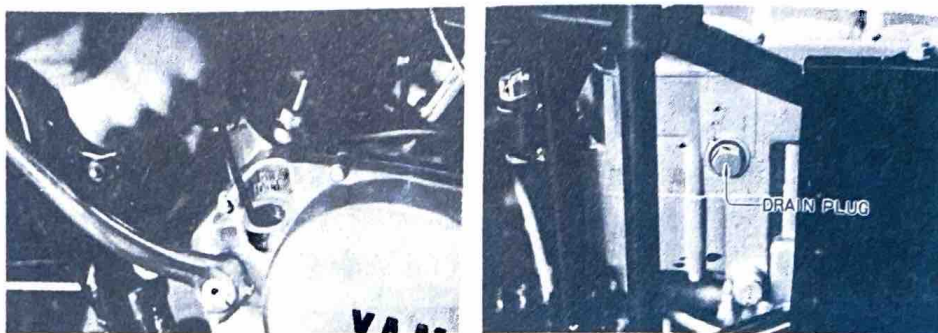


Replacing the Gear Oil

During the break-in period, replace the gear oil after 30 days from the date of purchase or after 300 miles (500 km) running.

After the first time, See page 21. Transmission oil replacement.

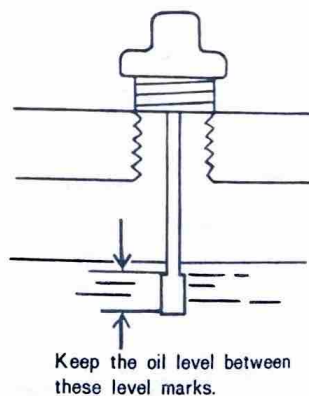
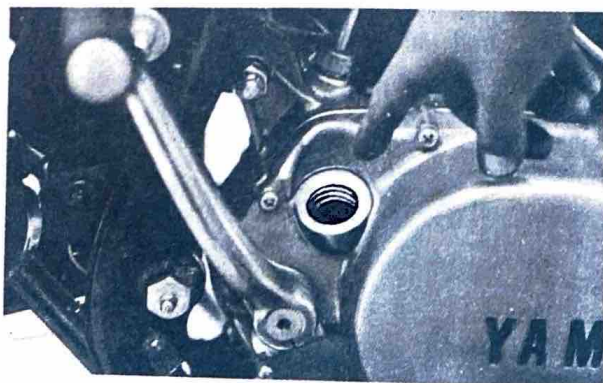
To drain the oil from the bottom of the crankcase, remove the oil drain plug.



After draining the oil, fully tighten the oil drain bolt, and fill with the specified amount of new oil.

Oil Yamalube 4-Cycle or SAE "SE" 10W/30 MOTOR OIL

Oil Amount 1.0 quarts (1.0 litres)



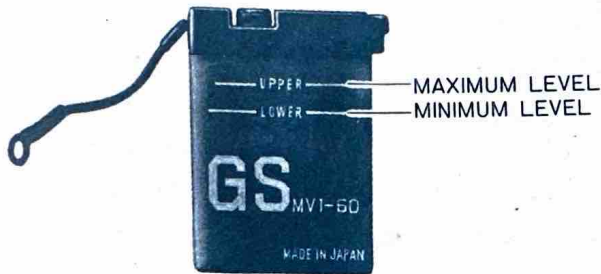
When checking transmission oil level, with the dip stick, let the unscrewed dip stick just rest on the case threads. Also, be sure the machine is positioned straight up and on both wheels. The oil level should indicate on the stick between the minimum and maximum marks.

Note: DO NOT ADD ANY CHEMICAL ADDITIVES. TRANSMISSION OIL ALSO LUBRICATES THE CLUTCH AND ADDITIVES COULD CAUSE THE CLUTCH TO SLIP.

Checking the Battery electrolyte

The life of your battery depends greatly on how well you keep it serviced. In order to service it completely and correctly, there are certain facts that you must know.

1. Always keep the battery fluid level between the "Maximum" and the "Minimum" level. It should be checked at least once a month, and more often during hot weather. If the battery needs filling, use distilled water. Do not use tap water as it usually contains minerals that can be harmful to the life of the battery.



2. If for any reason the battery has become discharged, and you are going to charge it yourself, use a "trickle charger" that has no more than a one amp per hour rating. Also, make sure that all the battery caps have been taken off and that the rubber battery breather tube is not clogged or pinched shut. A charging battery creates gas, and pressure could build up in the battery if all the outlets were plugged up.
3. If the motorcycle is to be stored for more than a month, then remove the battery, have it fully charged, and store it in a cool dry storage area. If storage time is going to be lengthy, it is best to leave the battery with your dealer with specific instructions to recharge the battery every month or so. This procedure is necessary to insure maximum battery life.
4. When reinstalling the battery, be sure to hook up the RED lead to the positive terminal and the BLACK lead to the negative terminal (the polarity of each is stamped just below each terminal).

Checking the Spark Plug

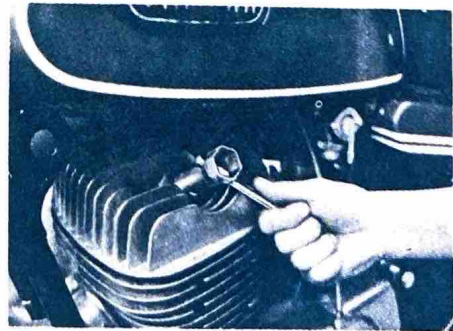
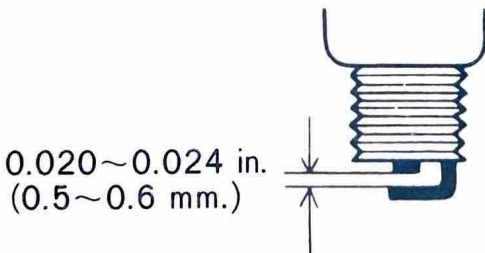
The spark plug in your machine can tell you a great deal as to how the engine is operating when you know how to “read” the plug. If the engine is operating correctly, and if it is being ridden correctly, then the tip of the white insulator in the spark plug will be a light tan color (standard plug is NGK B-8ES). If, when you remove the spark plug, it is very dark brown or black, then a plug with a hotter heat range might be needed. The situation is quite common during the engine break-in period. If the insulator tip shows a very light tan color, or is actually white, or if the electrodes begin to melt, then a spark plug with a colder heat range is required. Again, if the spark plug insulator tip does not have a light tan color, have your dealer install a spark plug with a different heat range to correct the situation. Do not attempt to experiment with different heat range spark plugs yourself, as it takes an experienced eye to gauge which spark plug to use, and to gauge if the spark plug is actually at fault. It is all right though for you to replace the standard plug. Engine conditions can cause any spark plug to slowly break down. If deposits begin to build up, or if the electrodes finally become too worn, or if for any reason you believe the spark plug to not be functioning correctly, replace it. Be sure, when replacing the plug, that you always clean the gasket surface, that you use a new gasket, and that the spark plug is torqued to

19–21 ft/lbs. Also wipe off any grime that might be present on the surface of the spark plug. The plug can be taken out to be cleaned and gapped. As long as deposit build-up on the insulator is not extreme, you can use a spark plug cleaner to quickly remove the deposits.

Use a wire type feeler gauge to set the electrode gap at 0.020”-0.024”

(0.5 mm-0.6 mm.)

Standard spark plug B-8ES

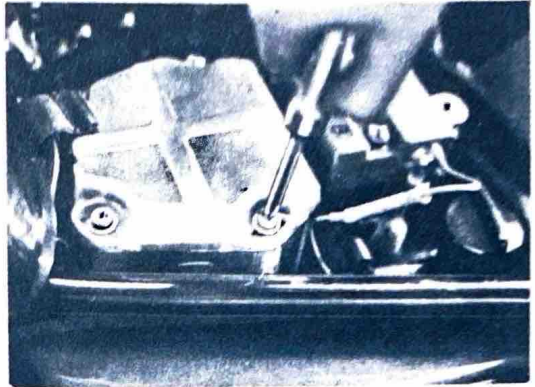


Air Filter (DT2 and RT2 only)

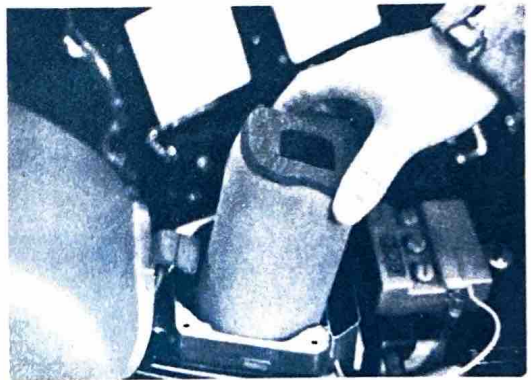
NOTE: See "MX" Section for additional data for DT2-MX and RT2-MX.

This model is equipped with a reuseable, oil impregnated, foam air filter. It must be removed and cleaned at least once a month, more often if the motorcycle is ridden mainly in the dirt—preferably each time after you spend an entire day in the dirt (8-10 hours operation).

- a) Remove the air cleaner case cap



- b) The cleaner element can be pulled out.



Carburetor adjustments

NOTE: See "MX" Section for additional data for DT2-MX and RT2-MX.

Each carburetor is set by the factory after careful tests.

Except for the following, do not change the carburetor setting without consulting your local Yamaha dealer.

1. Idle mixture

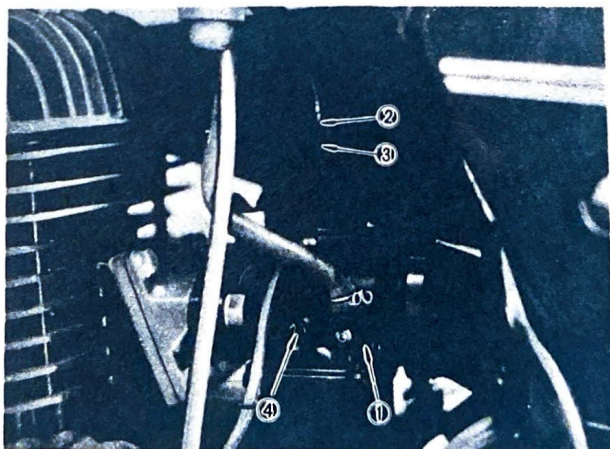
To set the idle mixture you must turn the idle mixture screw (#1) in until it lightly seats, then back it out $1\frac{3}{4}$ turns—no more or no less. This is a factory setting that can be set with the engine stopped, and no further adjustment is required.

2. Idle speed

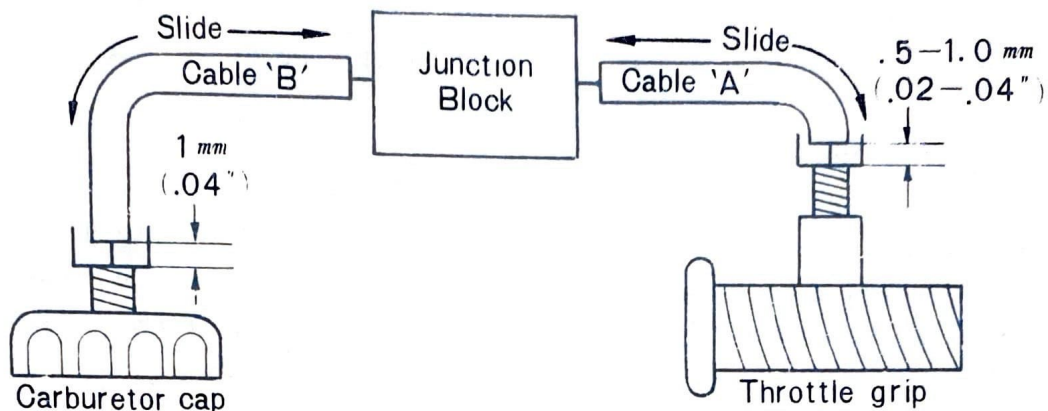
Start the engine and let it warm up. Next, screw the idle speed screw (#4) in or out, whichever direction is necessary for the engine to idle between 1,300 and 1,400 rpm (check tachometer).

3. Throttle cable slack

After engine idle speed has been set, then loosen the cable adjuster lock nut (#3) and turn the adjuster (#2) on top of the carburetor until there is 1mm (.04") of slack in throttle cable 'B'. Retighten the lock nut. Make the second throttle cable slack adjustment right at the throttle grip. There is a lock nut and adjuster where cable 'A' meets cable guide 'A'. Loosen the lock nut and turn the adjuster until there is .5-1.0 mm (.02-.04") slack in throttle cable 'A'. Retighten the lock nut.

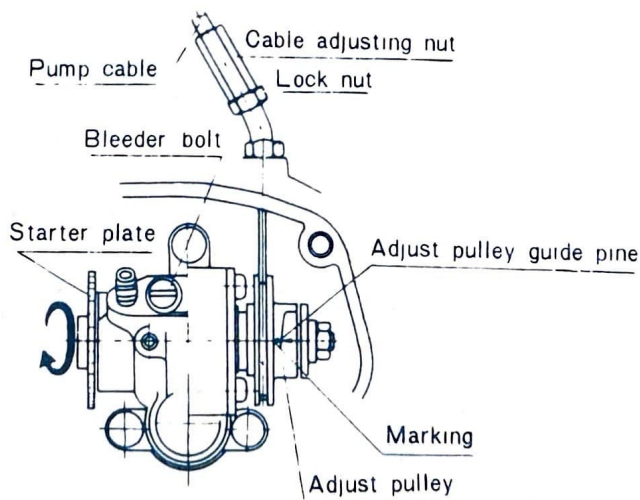


Note: To measure the amount of cable slack, slide the cable back and forth over the throttle wire, and see how much end gap exists between the cable end and top of the carburetor (or cable guide 'A' if checking throttle cable 'A' slack).



Autolube Cable Adjustment

- a. Adjust the pump cable so that the marking (arrow) on the Autolube pump adjustment pulley is aligned with the guide pin. Begin by fully closing the accelerator grip, then slowly turning it back again so that the slack in the throttle cable is completely taken up. Next, adjust the pump cable so that the marking on the pump adjustment pulley will be aligned with the guide pin. The point of adjustment is at the end of the cable, just before it enters the case. Loosen the lock nut and screw the adjustor in or out, whichever direction is necessary to obtain the correct adjustment.



Important Note:

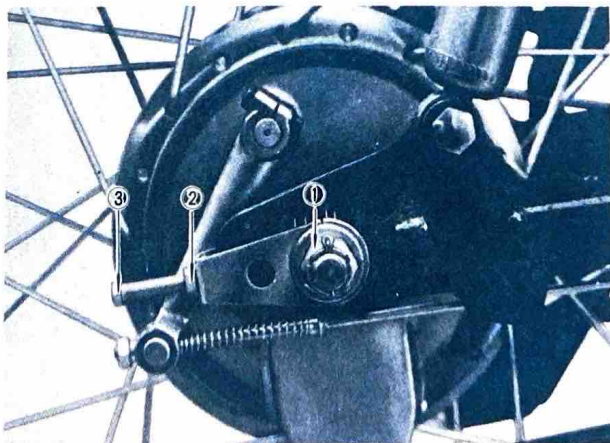
If the pump runs out of oil, the pump must be bled to release air trapped in the pump. Remove the Phillips-head bleed screw, twist the throttle to full open position (turns the Autolube pump to maximum stroke), and rotate the plastic manual starter pump plate until only oil comes out the bleed hole (air stops coming out with the oil). Reinstall and tighten the bleed screw.

Adjusting the Drive Chain

The drive chain should have approximately 1¼ in. (30 mm) up and down play at the center of the lower section with the rear wheel on the ground. Since a dirty chain causes excessive sprocket wear, apply oil at regular intervals. In addition, wash it in gasoline before oiling at every periodic inspection.

Adjusting Chain Tension:

- a. Loosen the rear brake adjusting screw.
 - b. Loosen the tension bar nuts.
 - c. Loosen the rear axle nuts ①.
 - d. Loosen the chain adjusting bolt lock nuts ②, and shift the wheel shaft so that both ends of the wheel shaft are positioned evenly by utilizing the marks on the swing arms.
 - e. After adjusting, tighten the tension bar lock nuts ②, and axle nut ①.
 - f. Adjust the play of the brake pedal.
- *After these adjustments, check the play of the brake pedal and stop-light operation.

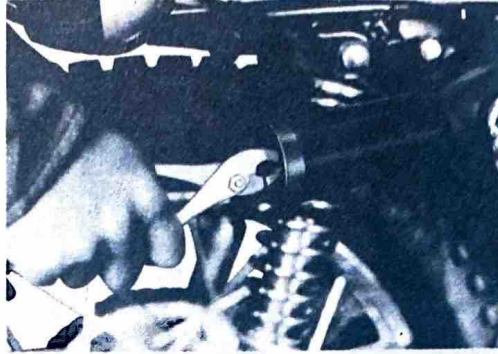


Decarbonization (DT2 and RT2 only)

To remove the inner cylinder from the muffler, remove the set screw and pull out the tail pipe.

Remove carbon with a wire brush.

Check the inner bore for carbon. If it is clogged, clean it with a wire.



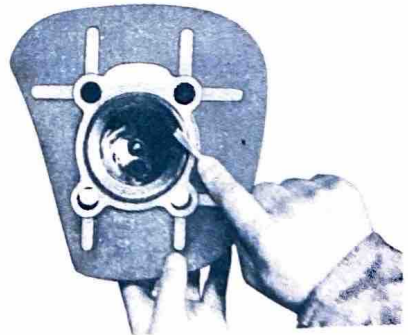
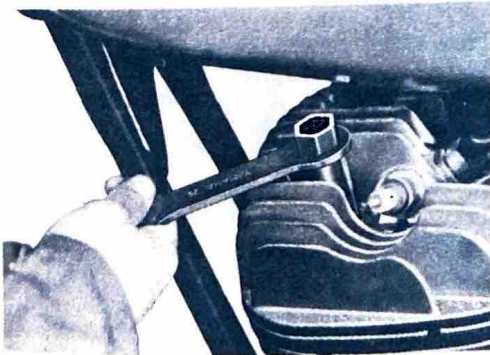
Cleaning the Combustion chamber and Piston

Carbon accumulation covering the combustion chamber and piston will result in loss of power, engine knock, overheating, and other problems.

- a. Remove the cylinder head and remove carbon from the combustion chamber.
- b. Remove carbon from the piston head.

To clean them, use a scraper and rags dampened with solvent.

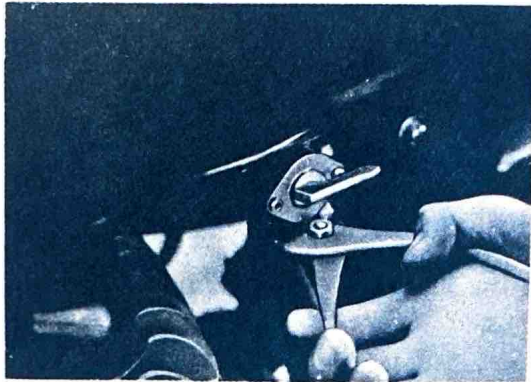
- c. The head bolts must be torqued when the head is reinstalled. Torque the bolts in pattern to a setting of 300 in/lbs.



Cleaning the Fuel Pet Cock Filter

The fuel pet cock filter removes impurities from gasoline before they flow into the carburetor. A dirty filter clogs the system, and as a result, the engine will not run properly. Clean it from time to time. Remove the cup from the fuel cock and remove the filter.

Wash it carefully in gasoline and reinstall.



Maintenance (Trips):

Prior to starting out on a major trip, or at intervals of one month or 1,000 miles, all of the fittings on the motorcycle should be checked for tightness.

These include:

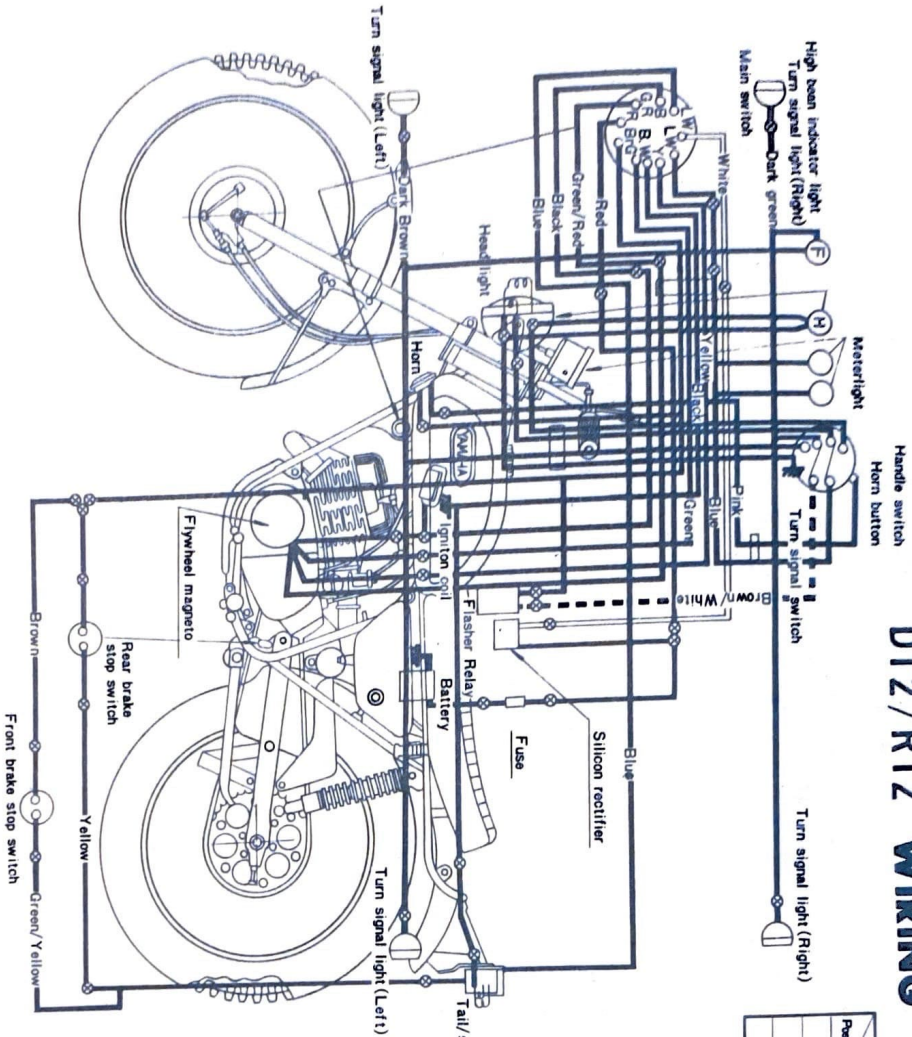
1. Chain adjust bolt lock nuts.
2. Headlamp, front fork and front axle nuts.
3. Speedometer and tachometer fittings.
4. Carburetor clamp screws.
5. Side cover and air cleaner securing screws.
6. Engine mounting bolts.
7. Foot peg and exhaust system securing bolts.
8. Crankcase cover Allen screws.
9. Rear axle securing nut.
10. Front and rear fender mounting bolts.
11. Taillight and license plate mounting bolts.

TORQUE:

All fittings require a minimal amount of torque during tightening to keep them from vibrating loose. Excessive tightening will only lead to stripped threads and broken studs. As a rule of thumb, use the following tightening chart:

STUD SIZE	TORQUE
6 mm	90 in/lbs.
7 mm	135 in/lbs.
8 mm	180 in/lbs.
10 mm	300-350 in/lbs.
12 mm	350-400 in/lbs.
14 mm	400-450 in/lbs.
Axle Nuts	500-600 in/lbs.
14 mm	(Aluminum head)

DT2/RT2 WIRING DIAGRAM



Color	E	B	R	B1	L	G	W	GR	LW	Y
Position										
OFF	○	○								
I			○	○	○	○	○	○	○	○
II										

Chart of wire colors

Daytime charging circuit	Green
Night time charging circuit	Green/Red
Battery (+) circuit	Red
Ground circuit	Black
Front brake stop light circuit	Green/Yellow
Rear brake stop light circuit	Yellow
Tail light circuit	Blue
Head/Master light circuit	Blue (L.W)
Common circuit	Brown
Head light main circuit	Yellow
Head light sub circuit	Green
Horn circuit	Pink
Rectifier circuit	White
Turn signal light (Right) circuit	Dark green
Turn signal light (Left) circuit	Dark Brown
Turn signal relay circuit	Brown/White

Stopping Distance

This figure indicates braking performance that can be met or exceeded by the vehicles to which it applies, without locking the wheels, under different conditions of loading and with partial failures of the braking system. The information presented represents results obtainable by skilled drivers under controlled road and vehicle conditions, and the information may not be correct under other conditions.

Description of vehicles to which this table applies: **Yamaha motorcycle DT2**

A. Fully Operational Service Brake

Load

Light

185

Maximum

200

0 100 200 300

Stopping Distance in Feet from 60 mph.

Acceleration and passing ability

This figure indicates passing times and distances that can be met or exceeded by the vehicles to which it applies, in the situations diagrammed below.

The low-speed pass assumes an initial speed of 20 mph and a limiting speed of 35 mph. The high-speed pass assumes an initial speed of 50 mph and a limiting speed of 80 mph.

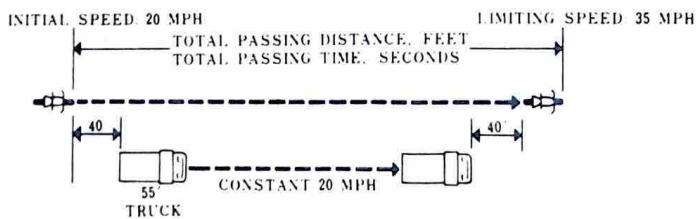
NOTICE: The information presented represents results obtainable by skilled drivers under controlled road and vehicle conditions, and the information may not be correct under other conditions.

Description of vehicles to which this table applies: Yamaha motorcycle DT2

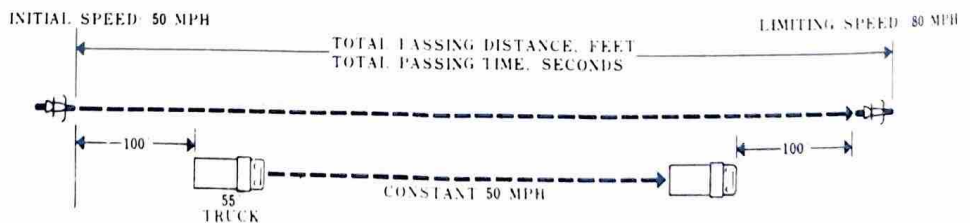
Summary table:

Low-speed pass..... 350 feet; 7.2 seconds
 High-speed pass..... 1370 feet; 15.6 seconds

LOW-SPEED



HIGH-SPEED



Stopping Distance

This figure indicates braking performance that can be met or exceeded by the vehicles to which it applies, without locking the wheels, under different conditions of loading and with partial failures of the braking system. The information presented represents results obtainable by skilled drivers under controlled road and vehicle conditions, and the information may not be correct under other conditions.

Description of vehicles to which this table applies: Yamaha motorcycle RT2

A. Fully Operational Service Brake

<u>Load</u>	
Light	185
Maximum	200

0 100 200 300

Stopping Distance in Feet from 60 mph.

VII

DT2-MX

and

RT2-MX

ALL DATA IN THIS SECTION PERTAINS EXCLUSIVELY TO THE OPERATION OF DT2-MX AND RT2-MX MOTO-CROSS MODELS. ANY INFORMATION NOT FOUND IN THIS SECTION IS COMMON TO THE OPERATION AND MAINTENANCE OF THE DT2 AND RT2 ENDURO MODELS AND MAY BE FOUND IN PREVIOUS SECTIONS OF THIS MANUAL.

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PROFILE

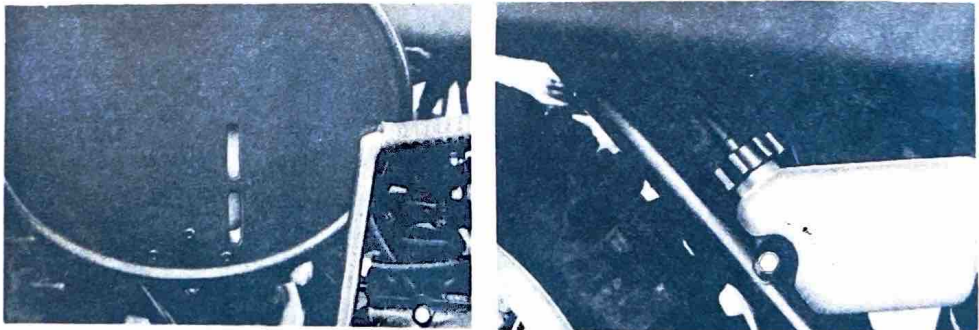


1. Gasoline and Oil

For the DT2MX and RT2MX, a gas-oil mixture should be used. The recommendable gas and oil and mixing ratios are as specified below:

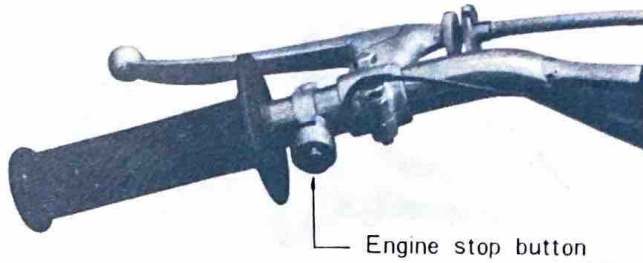
Gasoline	High octane gasoline
Oil	YAMALUBE 2-cycle or 2-stroke oil labeled "BIA Certified for Service TC-W"
Mixing ratio	With Autolube pump used: 30 : 1 With Autolube pump removed: 15 : 1

Note: The pre-mixed gasoline-oil mixture will become inferior in lubricating property 24 hours after preparation. Avoid using any mixture remaining in the fuel tank.



2. Engine Stop Button

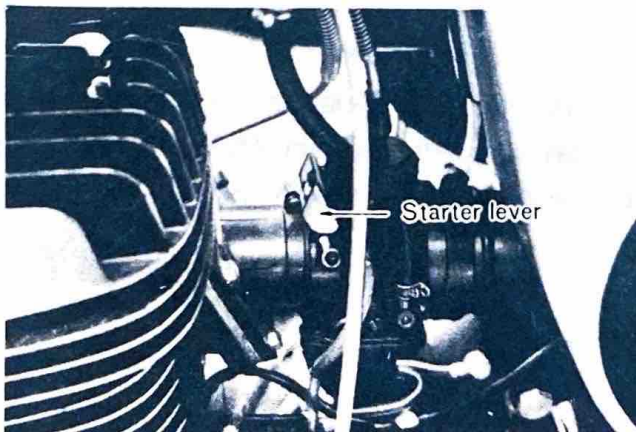
This safety device is used when your machine is upset or when you need to stop the engine quickly.



3. How to Start the Engine

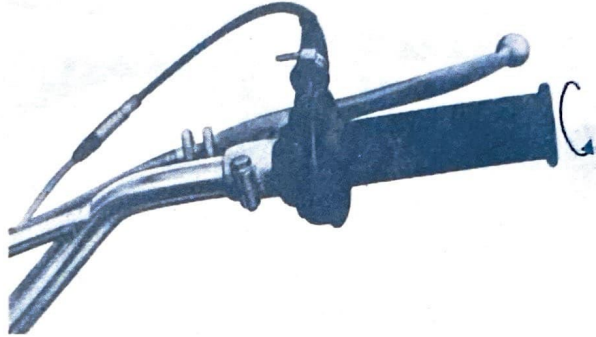
(When the engine is cold)

- a. Replace the spark plug with a hotter type (B-7ES or 8ES) for warming up.
- b. Open the fuel cock.
- c. Push down the starter lever, and fully close the throttle valve. Then, kick the kick crank hard.
- d. After starting the engine, keep it run for a few minutes for warming up. Then, replace the spark plug with the regular type.



(When the engine is warm)

- a. Slightly twist the accelerator grip, and kick the starting lever hard. It is unnecessary to replace the spark plug.



4. How to Stop the Engine

The motorcrosser is not equipped with the main switch, but the DT2MX and RT2MX are provided with the engine stop button. By depressing the **engine stop** button, the engine can be stopped, whenever required.

Besides, you can stop the engine without using the engine stop button. First, disengage the clutch, and apply the rear brake at any gear position (except neutral). Release the clutch lever, and the engine will come to stop.

Note: When stopping the engine, take care so that the spark plug will not get wet with the fuel. Make it your habit to close the fuel cock after stopping the engine.

5. Break-in

Your brand new machine has to be broken in at least for 10 miles. If breaking in the machine is improper, the result may be: (1) Engine noise, (2) Engine seizure, (3) Engine power loss, and (4) Shorter engine service life. After observing the break-in in a correct manner, the machine should be checked for frictional contact between the piston, piston rings and the cylinder. You will end up with a smooth-running, trouble-free machine.

How to Break-in the Machine

Operation:

0 you should keep the throttle opening below
↓ half in each of the gears.
10 miles,

Checking:

Remove the cylinders, and check the cylinder walls, pistons and piston rings for scratches and contacts between them. If any high spot or any scratch is found, it should be smoothed out with sandpaper (#600). If the scratch by a ring is excessive, replace the ring.

Operation:

10 miles, the machine can be run with full throttle.
↓

6. Checking and Service Racing

To keep the machine running a race in top condition, routine check-ups and service are very important. Before a race, the following check-ups should be made:

1. Check and adjust the brakes.
2. Check and adjust the clutch.
3. Clean the air cleaner element.
4. Check and adjust the ignition timing.
5. Remove the carbon from the cylinders, cylinder heads and pistons, and check the cylinder walls for scratches and high spots.
6. Check the gear oil, and if necessary, replace it.
7. Check the spokes for looseness, and if necessary, adjust them.
8. Lubricate the drive chain, etc.
9. Retighten bolts and nuts.

7. Setting to be made at a Racing Circuit

Whether you will win a race or not depends on your driving skill and your machine performance. It will not be easy for you to snatch a victory in any race, because the performance of your machine will be affected to a large extent by conditions of the racing course, weather and the like.

To keep your machine run at best condition, the machine must be so adjusted as to best suit to the racing course.

- a. Selection of spark plugs
- b. Carburetor adjustment
- c. Selection of secondary reduction ratio
- d. Tire pressure adjustment
- e. Rear cushion adjustment

A. Selection of Spark Plugs

Standard spark plugs are recommended, but you may have to change the spark plugs depending on the conditions of running and racing circuits.

Remember that for warming up the engine, hotter type spark plugs should be used, and a few minutes of warming up is needed.

After the warming up, replace the spark plugs with those you have selected.

Colder type. If the standard type spark plug is found running too hot and white, replace it with a colder type.



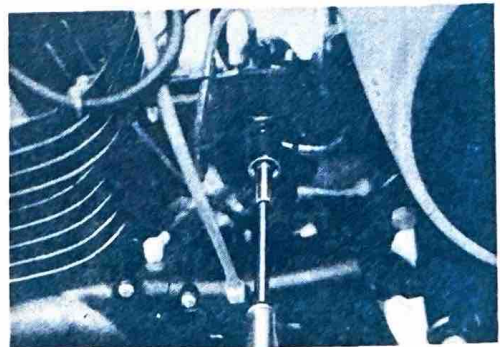
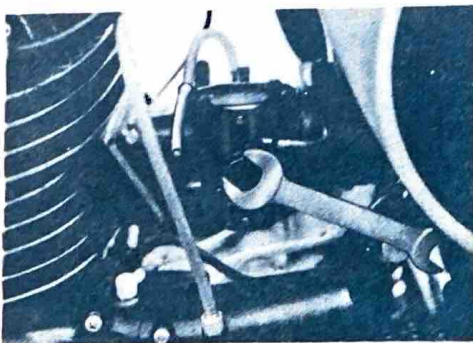
Hotter type If the standard type spark plug is found sooty and oily, replace it with a hotter type.

Heat Range	NGK	Champion	AC	Autolite	Bosch	KLG	Lodge	Marchal
Hot ↑ ↓ Cold	B-4E	N21 N18	47XL	AG9		FE20	BL14	
					W95T2	FE30	BLN	
	B5ES	N8	46XL,46N	AG7	W125T2 W145T2	FE50	CL14,CLN CLNH	
		N84		AG5				
	B6ES	N6	45XL,45N	AG4	W160T2	FE70	HBLN	36HS
		N5	44XL,44N	AG3	W175T2		HL14,HLNP	35H
			C44N		W200T27			35HS
	B7ES		C44XL		W215T28			
		N4	43XL,43N	AG2	W225T2 W225T28	FE75	HF2HL 2HL,HLN	34HS
	B8ES	N3	42XL		AG901	W240T28 W250P21	FE80 FE100	2HLN
	B9ES		41XL	AG701	W260T2		3HLN	
	B10ES							

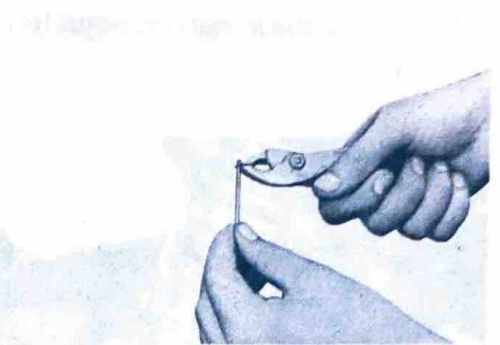
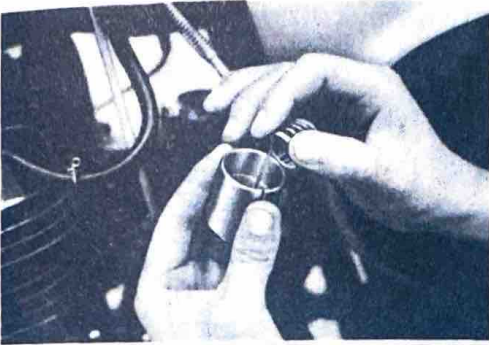
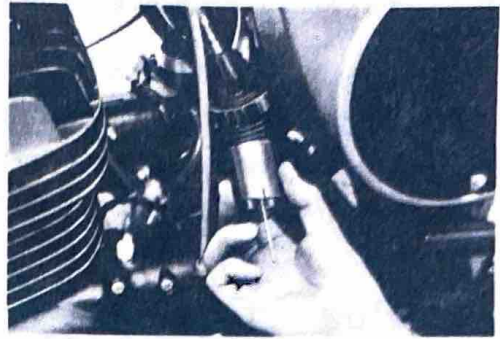
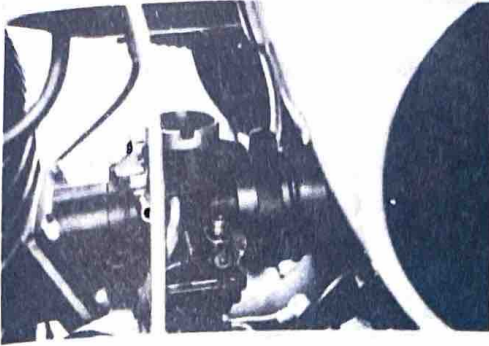
B. Carburetor Adjustment

Carburetor settings should be determined according to the burning condition of the spark plug. Generally speaking, a motocrosser is run with full-throttle, and therefore, the carburetor main jet greatly affects the performance of the engine.

- When the spark plug is in a tan color:
Best. That is, the carburetor settings are the most suitable for the condition of the racing circuit, weather, and operation.
- When the electrodes are white:
The spark plug runs too hot. In this case, the main jet should be replaced with a larger one.
- When the electrodes are sooty and oily:
If the electrodes are sooty and oily, the main jet should be replaced with a smaller one.
- * The larger the main jet calibration No., the more the gasoline is supplied. The calibration Nos. are designated as follows:
 - Up to No.100 Calibrated by 5
 - Over No.100 Calibrated by 10



After replacing the main jet, check the engine operating condition in the following manner. Rapidly open the throttle valve, and observe the increase of the engine speed. If the speed will not increase smoothly, showing irregularity, the position of the jet needle must be changed.



The position of the jet needle affects the increase of the engine speed in the range of medium to high.

Note: When you select the carburetor main jet, start with a larger one for testing. Do not begin with a smaller one.

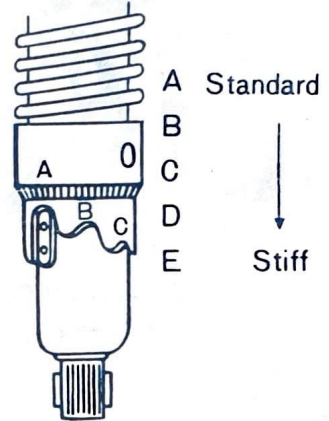
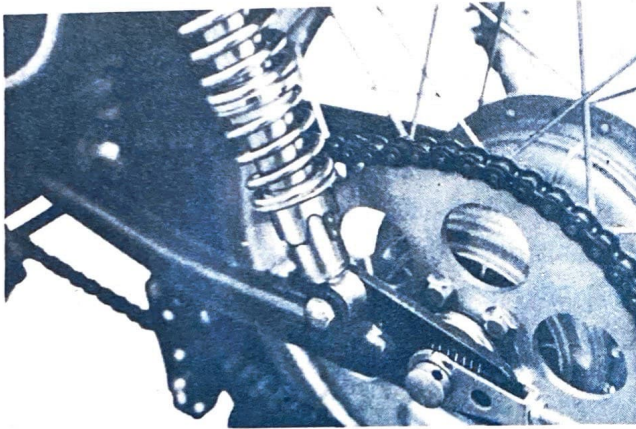
8. Tire Pressure Adjustment

Tire pressures are determined depending on the condition of the racing circuit and the choice of the rider.

If the racing course is rough with many pebbles, low tire pressures will result in damage to the tire rims.

9. Rear Cushion Adjustment

The rear cushion can be adjusted in five ways according to the rider's choice.



10. Selection of Secondary Reduction Ratio

The secondary reduction ratio must be selected according to the racing circuit condition-bumpy or smooth.

To enable the rider to select the most suitable reduction ratio, a variety of drive sprockets and sprocket wheels are available.

Drive sprocket	Sprocket wheel
214-17461-30 13T	322-25451-00 51T
214-17461-40 14T	
214-17461-50 15T	
214-17461-60 16T	

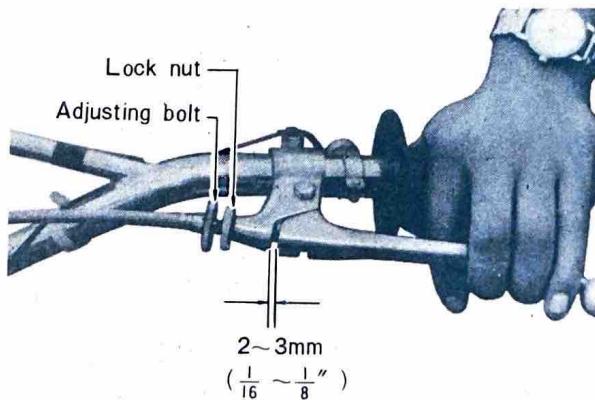
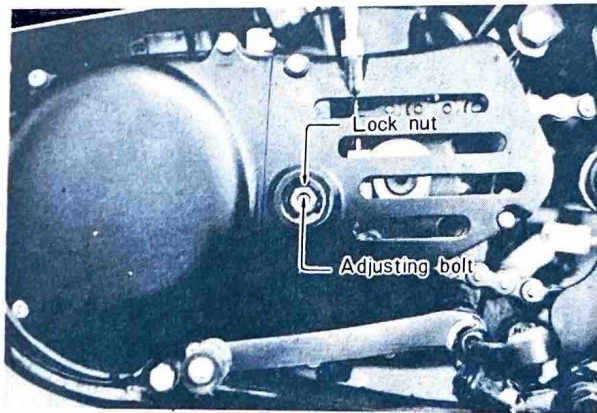
Inspection and Adjustment

1. Clutch

If the clutch is adjusted improperly, it may drag or slip. It should be adjusted periodically (particularly before racing).

Adjustments

- Fully tighten the adjusting screw attached to the clutch lever.
- Remove the clutch adjusting cover.
- Loosen the lock nut, and gently tighten the adjusting screw. From a lightly seated position, back it out $\frac{1}{4}$ turn, and tighten the lock nut.
- Adjust the play of the clutch lever to 2-3 mm by turning the clutch lever adjusting screw.
- After the adjustment, tighten the lock nut.



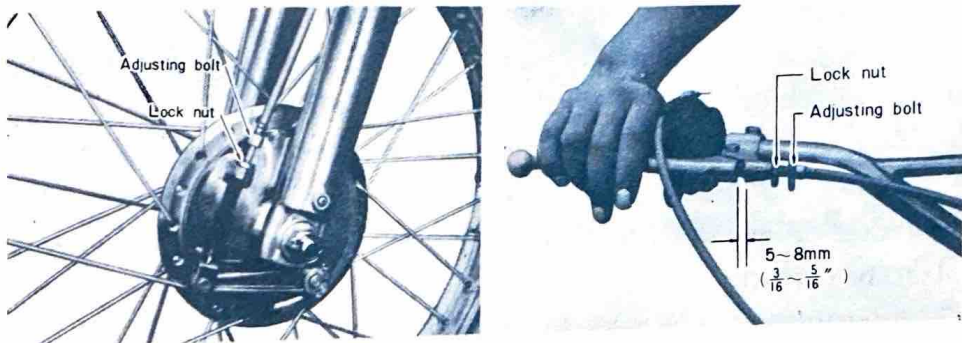
2. Brake Adjustment

To allow the brakes to operate effectively and accurately, the front brake lever should have a play of 5-8 mm, while the rear brake pedal play is 20-25 mm.

How to Adjust the Brakes

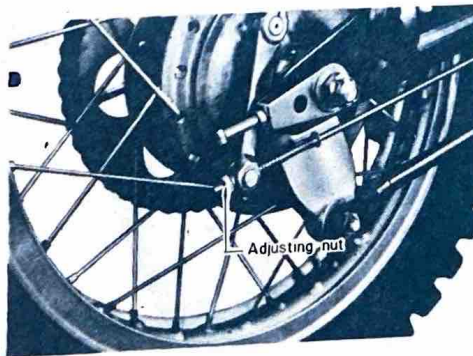
Front Brake

- Adjust the brake lever to 5-8 mm by turning the brake adjusting bolt.
- For easy adjusting, the front brake can be adjusted by brake lever adjusting bolt.
- After the adjustment, be sure to tighten the lock nut.



Rear Brake

- Adjust the brake pedal with the rear brake adjusting nut so that the pedal will have a play of 20-25 mm.



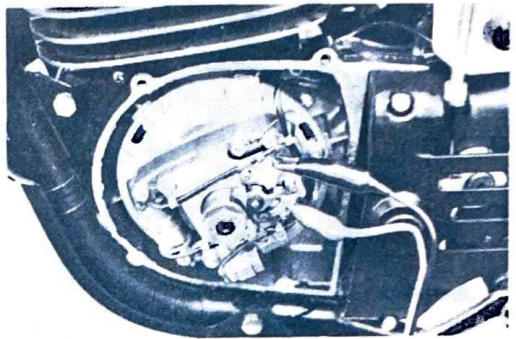
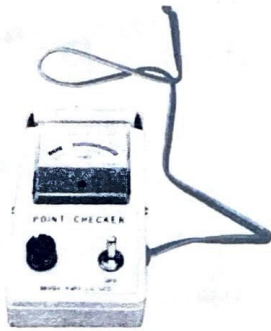
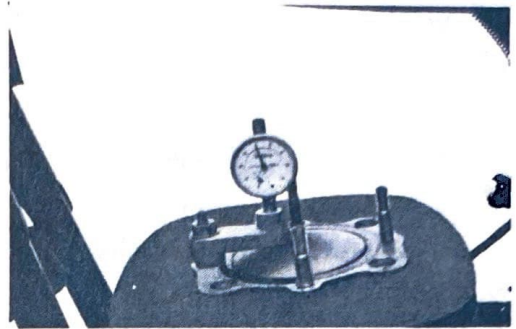
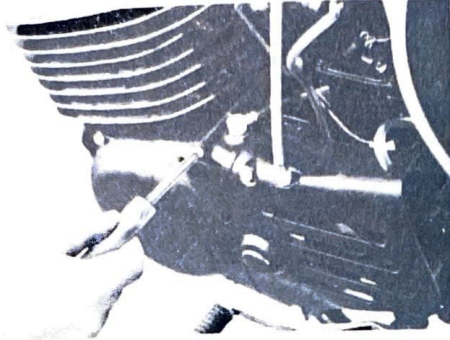
3. Adjusting the Ignition Timing

The DT2MX uses the flywheel magneto for ignition, while the RT2MX employs the C.D.I.

DT2MX (Magneto ignition)

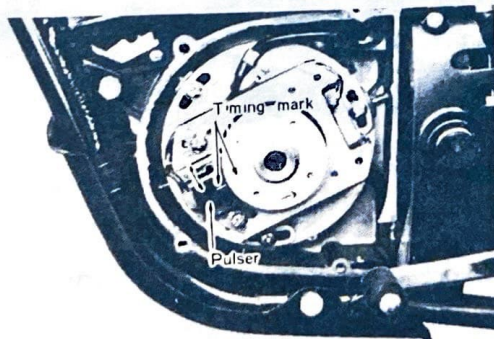
1. Remove the spark plug, and install a dial gauge in the spark plug hole.
2. Turn the crankshaft to the left and locate TDC.
(When the dial gauge pointer begins to turn in reverse, the piston is at about TDC.)
3. When TDC is located, turn the dial and set "O" to the pointer.
4. Connect the contact breaker to the red lead wire of the point checker, and ground the other to the frame.
5. Turn "ON" the switch of point checker, and make sure that the needle points to "OPEN".
6. Turn the crankshaft to the right. When the dial gauge pointer indicates 2.3 mm before TDC, watch the point checker needle. If it moves from OPEN to CLOSE, the ignition timing is considered to be correct.
7. Adjustment can be made by moving the contact breaker.

Note: Before adjusting the ignition timing, check the breaker point surfaces. If points are roughened, or not in full contact, smooth them out with # 600 sandpaper, and then adjust so that they are in full contact with each other.



RT2MX (C.D.I.)

1. Follow the procedures, 1, 2 and 3 above.
2. Turn the crankshaft to the right, and when the dial gauge pointer indicates 2.5 mm before TDC, check to see if the mark on the rotor aligns with the mark on the pulser. If they aligns with each other, the ignition timing is correct.
3. Adjustment can be made by moving the pulser.



4. Cleaning the Air Cleaner Element

If the air cleaner element is clogged with dust, the performance of the air cleaner will be greatly reduced. Particularly, the air cleaner on a motocrosser tends to be dirty quickly. It should be cleaned as often as possible.

Removing the Air Cleaner Element

1. Remove the seat and cleaner case cap.
2. Take out the element.



5. Washing

The element removed should be washed thoroughly with an oil mixture and installed after fully squeezed.

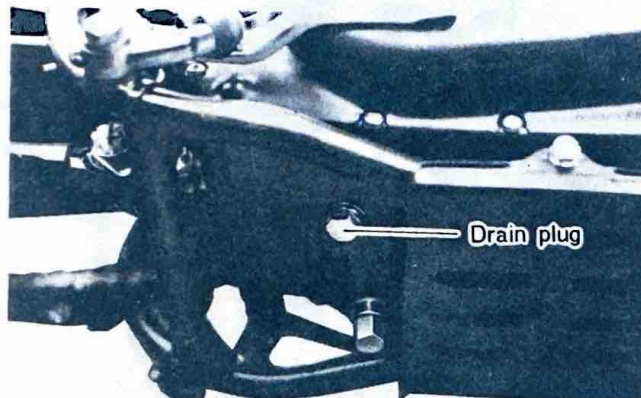
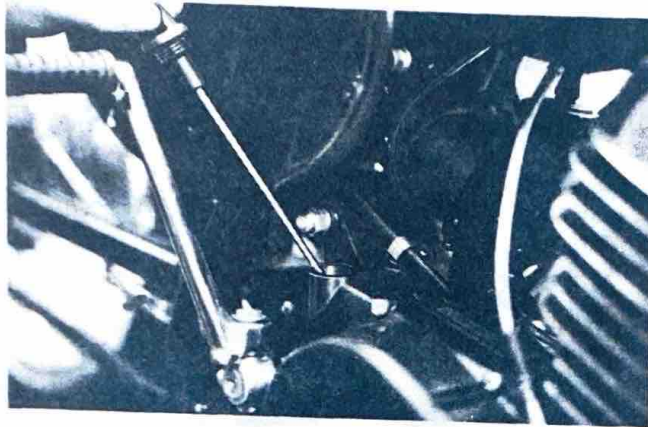
6. Checking and Replacing the Gear Oil

Check the gear oil for its level. It should be within the specified range of levels.

Gear oil: YAMALUBE 4-CYCLE OR 10W/30 SAE "SE"

Amount: 1000cc

The gear oil tends to deteriorate after a long time of use. It is advisable to replace the gear oil for each race, because the engine will be placed under severe operating condition.

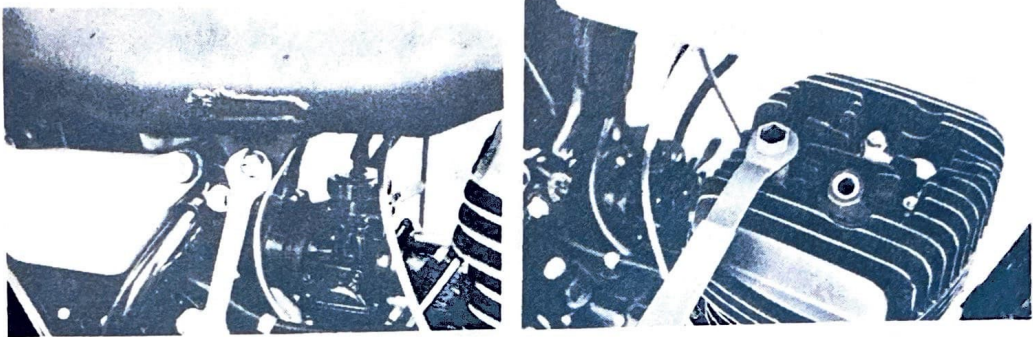


7. Checking the Cylinder and Piston Rings for contact

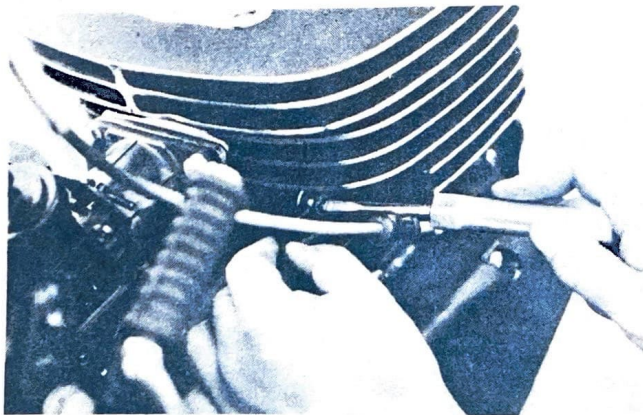
After the first 10 miles of operation, the contact between the cylinder and piston rings should be checked.

If necessary, any irregularity should be corrected.

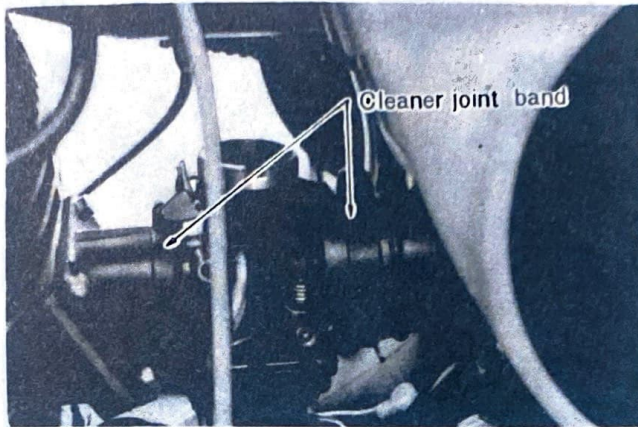
1. Remove the muffler.
2. Remove the cylinder head bolts.



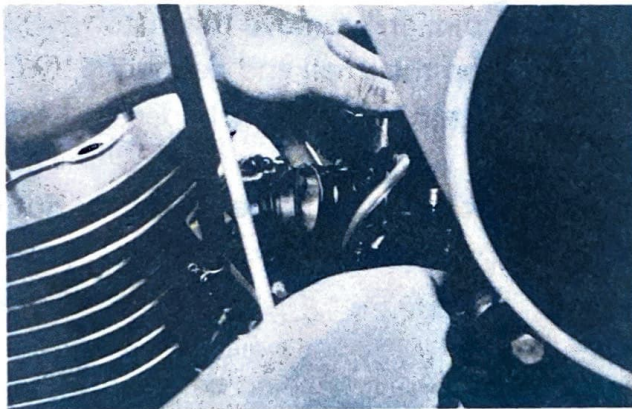
3. Remove the cylinder head.
4. Remove the delivery pipe.



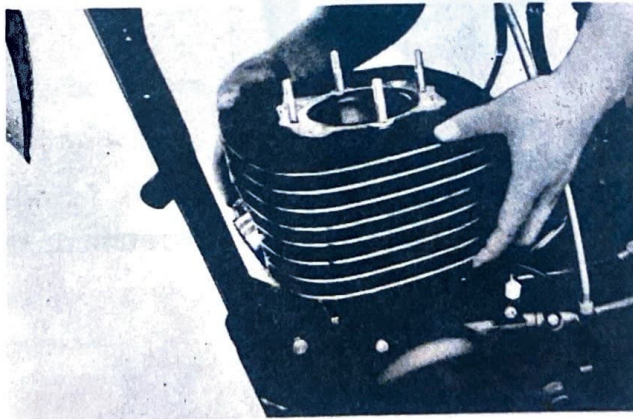
5. Loosen the air cleaner joint band.



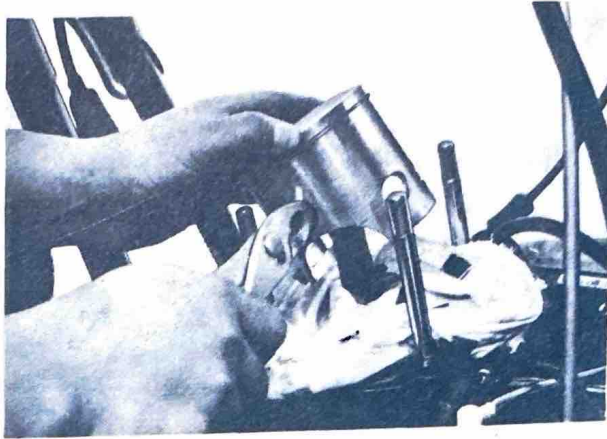
6. Remove the carburetor .



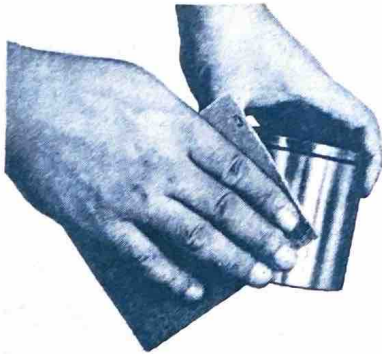
7. Remove the cylinder while tapping around the exhaust port with a soft-face hammer.



8. Cover the crankcase with a cloth, and remove the piston clip with a screwing motion.



9. Push out the piston pin, and remove the piston.
(Take care not to drop the small end bearings.)
10. Check the piston, piston rings and cylinder wall for scratches and high spots.
High spots are bright, and should be smoothed out with oil stone or fine sandpaper.



11. If any piston ring is found stuck or scratched, it should be replaced.

Installation

1. Oil the small end bearings, cylinder, etc.



2. Install the piston with the arrow mark pointing to the exhaust port. (Cover the piston pin drop it.) clip with a cloth so that you will not

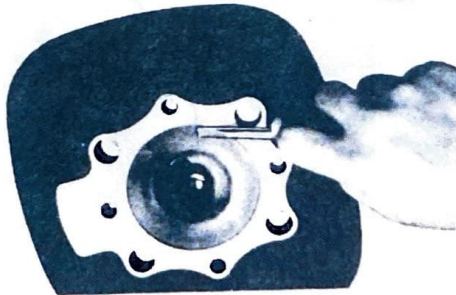


3. Install the piston rings, Make sure that the ring locating pin is between the ends of the ring.
4. Tighten the cylinder head bolt nuts in a cross-pattern and in separate steps. Tightening torque must be correct.

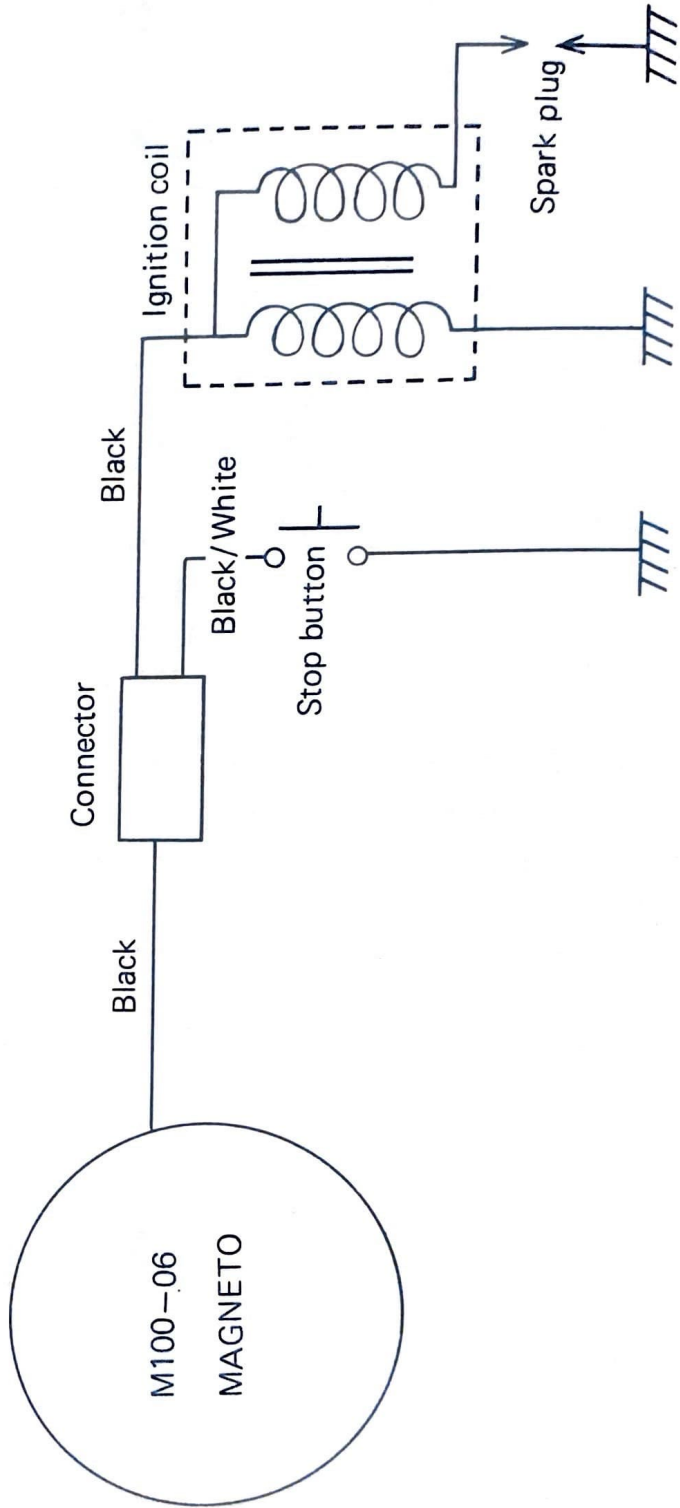
Note: Each time the cylinder is removed, use a new cylinder gasket and cylinder head gasket.

Other gaskets should be thoroughly cleaned.

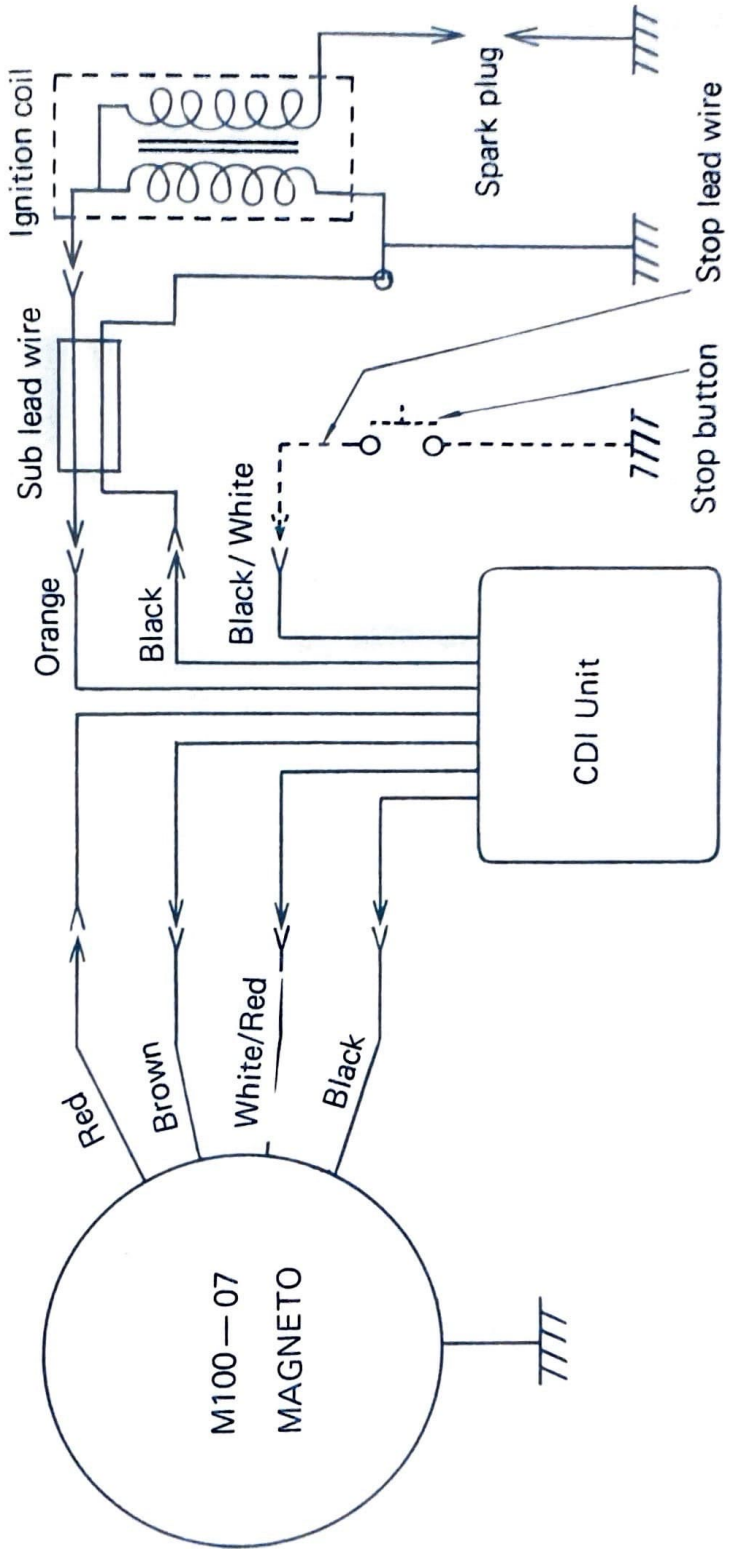
5. Removing the Carbon from Cylinder Head, Cylinder and Piston The cylinder should be disassembled in the manner, as specified above, and the carbon. remove



DT2MX WIRING DIAGRAM



RT2MX WIRING DIAGRAM



MEMO

