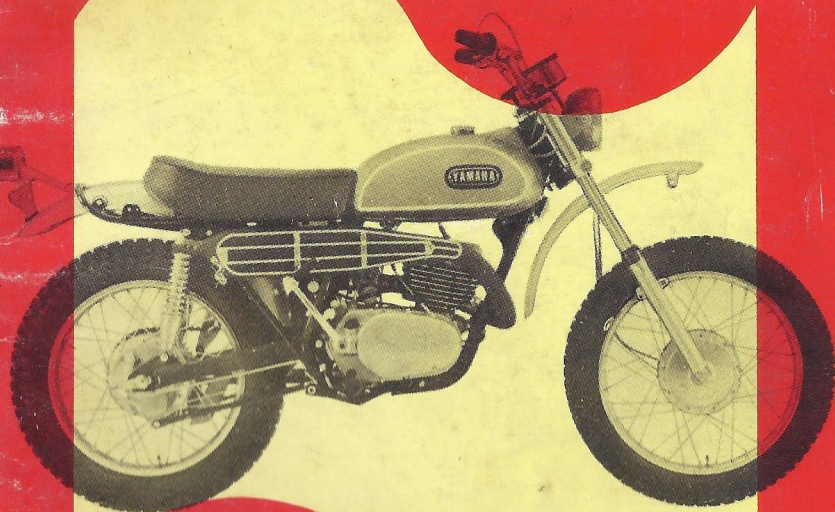


# YAMAHA

## 250 SINGLE ENDURO RIDER'S MANUAL



**YAMAHA MOTOR CO., LTD.**

PRINTED IN JAPAN



**YAMAHA MOTOR CO., LTD.**



### Errata

In the photographs, the front fender is connected with the underbracket by bolts, but take note that in reality the front fender is connected with the front forks by bolts.

The new Yamaha Enduro 250 DT1S is designed as a high-performance motorcycle for street or trail.

One of the most attractive design features is that it is easily converted into a genuine scrambler using alternate parts available from Yamaha.

This manual provides the owner with the technical information essential to the daily service of his machine.

For the owner interested in motocross scrambles and cross country racing, the last few pages of this manual are devoted to converting the DT1S.

The power, high performance, and styling of the DT1S will lead you to a new exciting world wherever you go on the roads, in the woods, or through the fields.



**USE TWO-STROKE OIL ONLY  
IN AUTO LUBE SYSTEM**

## CONTENTS

I. Features and Specifications	3
1. Features	3
2. Specifications	5
3. Performance Curves	8
II. Yamaha Autolube	9
III. Nomenclature	10
IV. Basic Instructions	13
1. Gasoline and Oil	13
2. Familiarization	13
3. Pre-operation Check	19
4. Operation	20
5. Break-in Procedure	23
V. Inspection and Service	24
1. Periodic Inspection Guide	24
2. Inspection and Adjustment	25
VI. Racing	38
1. Conversion of the Yamaha DT1S for racing	38
(1) Engine Modifications	38
(2) Chassis Modifications	38
(3) Service Standards	39
2. Miscellaneous (Racing)	39
(1) Technical Information on Engine Tune-up	39
(2) Check and Service prior to Racing	40
(3) Racing Variables	40
* Wiring Diagram	

## I. Features and Specifications

### 1. Features

#### (1) High-performance Single Cylinder Engine

The Yamaha Enduro 250 DT1S utilizes a powerful two-stroke 250 cc engine. The new five-port cylinder, which is another Yamaha. Technical development greatly improves engine efficiency and is responsible for high output throughout a broad power range.

#### (2) Highly-dependable Yamaha Autolube

Yamaha Autolube not only assures ultra-smooth engine lubrication but also longer service life from 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 for three positions. The rider can adjust spring tension to compensate for varying weight, speed, and road conditions.

#### (6) Front Fork Design

The Yamaha Enduro 250 DT1S employs a front fork design well-known for its strength superior handling characteristics. Its use assures the rider of the ultimate suspension for even the roughest terrain.

#### (7) Speedometer and Tachometer

Both speedometer and tachometer are mounted as standard. Individual units are separately mounted for maximum visibility. An additional feature of the speedometer is an odometer which can be reset to zero for trip or enduro purposes.

USE TWO-STROKE OIL ONLY  
IN AUTO LUBE SYSTEM



### (8) Tires

The Yamaha DT1S is fitted with Dunlop Trials Universal as standard equipment. This particular tread is one of the most versatile available and gives maximum trail traction compatible with road usage.

### (9) Carburetor Starter Feature

Yamaha's starter feature is already well-known for its easy starting. Equipped with this unique carburetor, the Yamaha DT1S is quick starting under all conditions.

## 2. Specifications

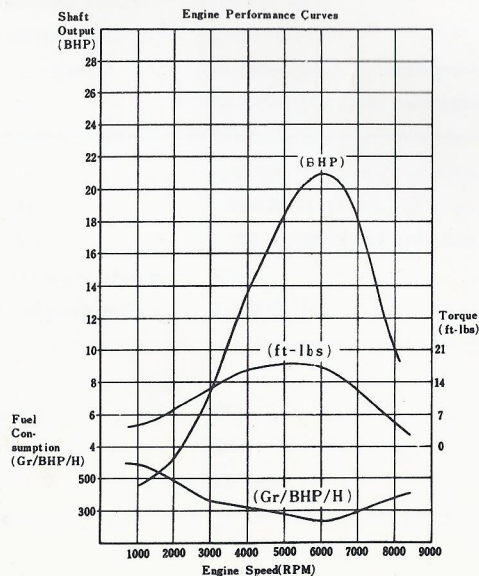
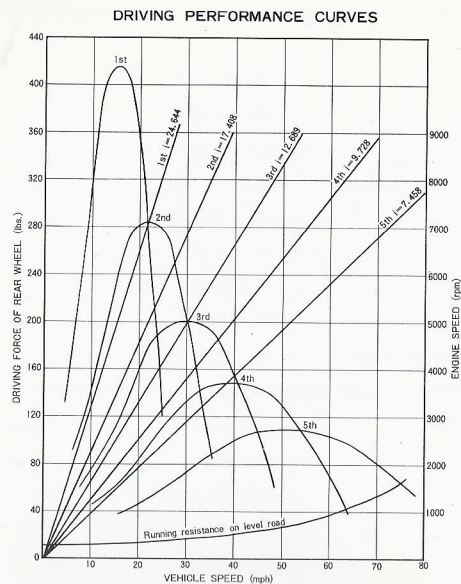
### Performance & Specifications Model DT1S

Dimensions:	
Overall length	81.6 in.
Overall width	35.0 in.
Overall height	44.8 in.
Wheelbase	53.6 in.
Min. ground clearance	9.9 in.
Weight:	
Net	232 lbs.
Performance:	
Max. speed	70 mph plus
Fuel consumption (on paved level roads)	94.1 mpg at 25 mph
Climbing ability	37 degrees
Min. turning radius	82.7 in.
Braking distance	40 ft. @ 30 mph
Engine:	
Model	DT1S
Type	2 stroke, gasoline, air-cooled,
Lubricating system	Separate lubrication (Yamaha Autolube)
Cylinder	Single, forward inclined, 5-port
Displacement	246 cc (15.0 cu. in.)
Bore × Stroke	70 × 64 mm (2.756 × 2.520 in.)
Compression ratio	6.8 : 1
Max. power	21 BHP/7,000 rpm
Max. torque	16.8 ft.-lbs/5,000 rpm
Starting method	Primary-coupled kick starter system
Ignition method	Flywheel magneto ignition system



Carburetor:	
Type	VM26SH
M. J.	#160
J. N.	5D1-3 stages
Air cleaner:	Dry paper filter
Spark plug:	B-7E
Chassis:	
Frame	Tubular-Double loop
Suspension, front	Telescopic
Suspension, rear	Swinging arm
Transmission:	
Clutch	Wet, multiple-disc
Primary reduction system	Helical gear
Primary reduction ratio	3.095 (65/21)
Gear shifting type	Constant mesh, 5 speed
Gear ratio 1st	2.533(38/15)(Total reduction ratio 24.644)
2nd	1.789(34/19)(Total reduction ratio 17.408)
3rd	1.304(30/23)(Total reduction ratio 12.689)
4th	1.060(26/26)(Total reduction ratio 9.728)
5th	0.766(23/30)(Total reduction ratio 7.458)
Secondary reduction system	Chain
Secondary reduction ratio	3.143(44/14)
Steering:	
Steering angle	49°
Caster	60.5°
Trail	137 mm

Tire size:	
Front	2.75-21-4PR
Rear	4.00-18-4PR
Lighting:	
Headlight	6 V 35 W / 35 W
Taillight	6 V 5.3 W
Stop light	6 V 17 W
Meter lights	6 V 3 W×2
High beam indicator light	6 V 1.5 W
Battery:	
Model	MV1-6D
Capacity	6V 2 AH
Dynamo model:	FZA-IBL
Tanks:	
Gasoline tank capacity	2.5 US gals.
Oil tank capacity	1.6 US qts.



## II. Yamaha Autolube

### What is Yamaha Autolube?

Yamaha Autolube is an automatic engine lubrication system, which obsoletes the conventional 2-stroke pre-mixing system. Oil stored in the oil tank is metered automatically by an oil pump to the engine on demand, depending on speed and load.

### Function of the Yamaha Autolube

The heart of the system is the compact precision oil pump developed by Yamaha engineering staff. It is driven by the engine through the reduction gear, functioning according to the carburetor throttle (accelerator grip). The flow of oil is varied depending on the engine RPM (speed) and load (throttle opening). The proper amount of oil is fed to the engine thus assuring optimum lubrication at all times.

### Features of the Yamaha Autolube

The Yamaha Autolube eliminates lubrication problems peculiar to 2-stroke engines with the conventional "pre-mixing" system, and improves many inherent advantages of 2-stroke engines.

#### 1. The Autolube system results in:

- Decreasing oil consumption by  $\frac{1}{3}$  of the amount required by a conventional 2-stroke engine.
- Decreased carbon build-up
- Reduced exhaust smoke

#### 2. The Autolube system provides:

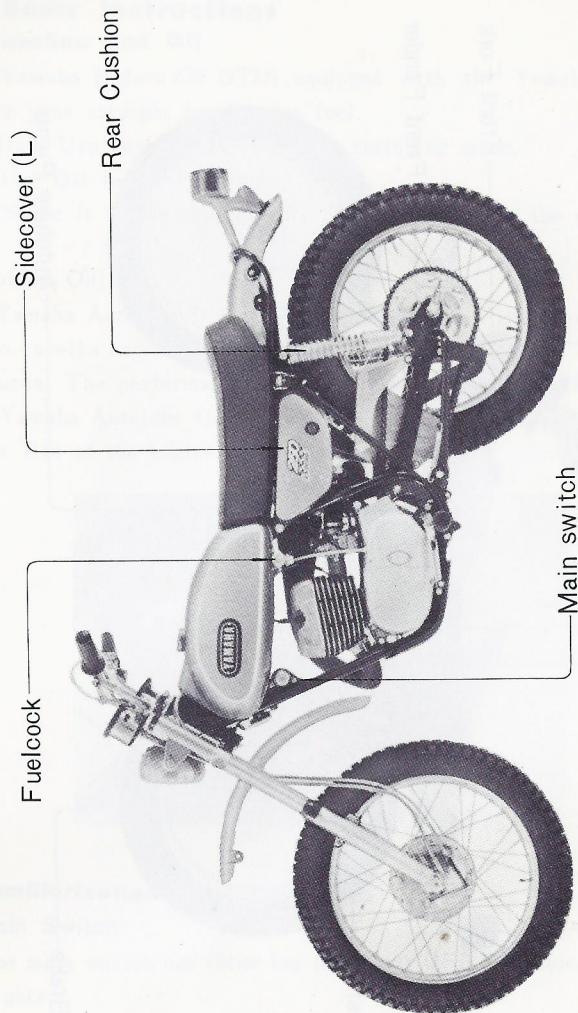
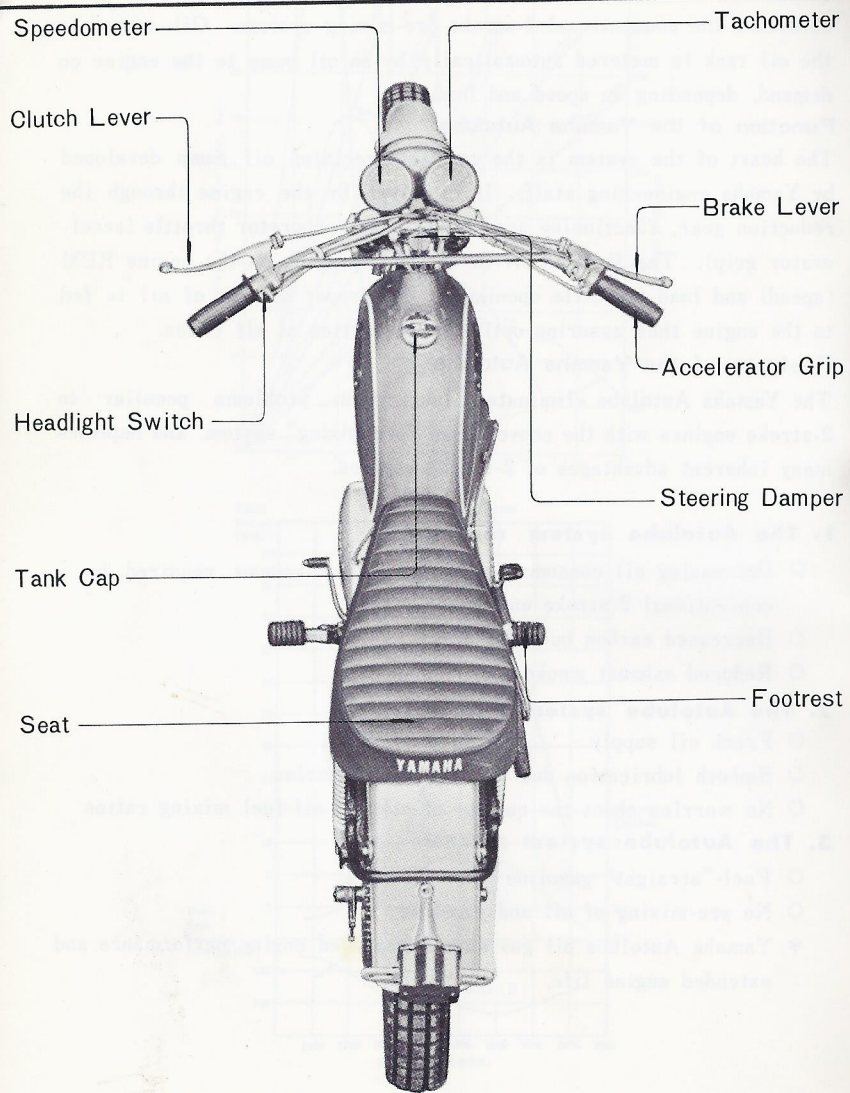
- Fresh oil supply
- Smooth lubrication due to large oil particles
- No worries about the quality of oil and oil-fuel mixing ratios

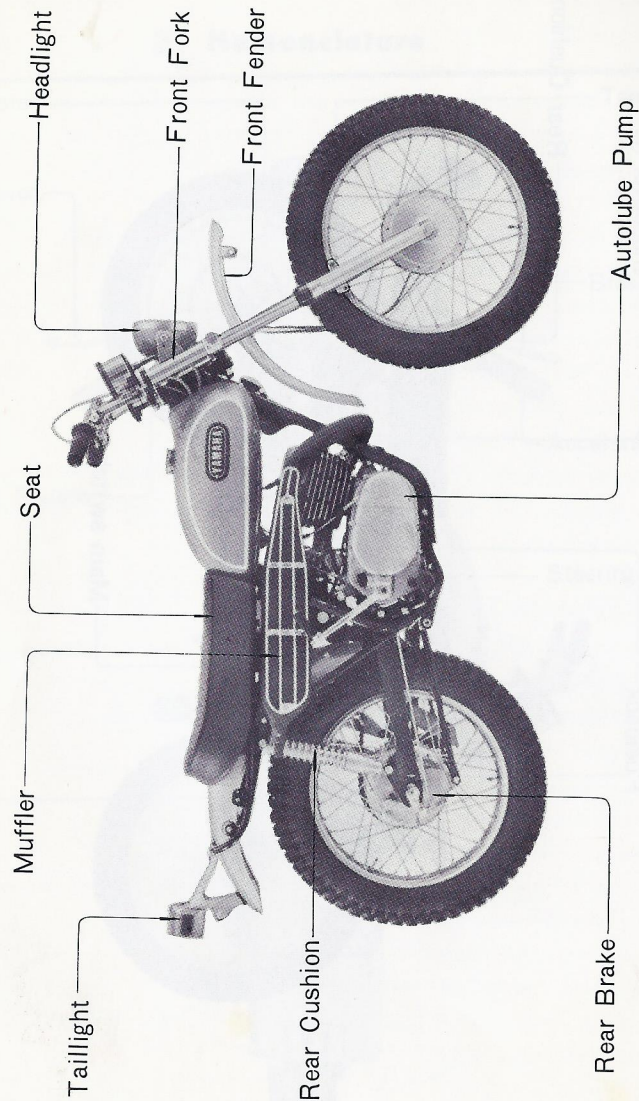
#### 3. The Autolube system means:

- Fuel-"straight" gasoline only
- No pre-mixing of oil and gasoline
- \* Yamaha Autolube oil guarantees improved engine performance and extended engine life.



### III. Nomenclature





## IV. Basic Instructions

### 1. Gasoline and Oil

The Yamaha Enduro 250 DT1S, equipped with the Yamaha Autolube system uses straight gasoline as fuel.

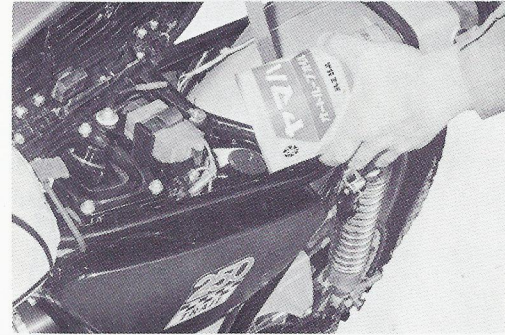
Gasoline: Use gasoline of 90 octane rating or more.

Oil: Use Oil for lubrication.

Store it in the separate oil tank located under the seat.

#### [Autolube Oil]

The Yamaha Autolube Oil, refined especially for this new lubricating device excels in lubrication, cleanliness and liquidity at low temperatures. The performance of the Autolube depends on the quality of oil. Yamaha Autolube Oil is recommended for higher performance and longer life of the engine.



### 2. Familiarization with Equipments

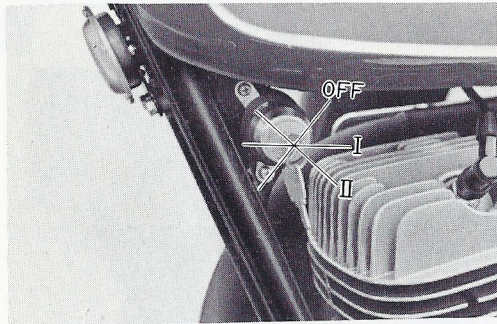
#### (1) Main Switch

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 (o) denotes "Switch on".)

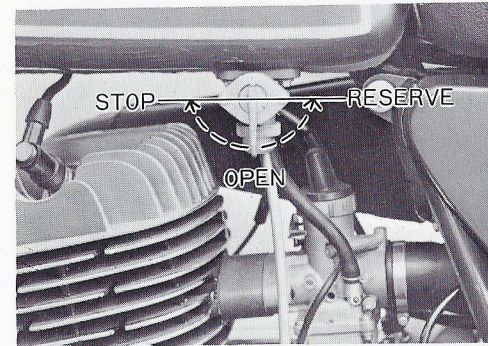


	OFF	I	II	Instructions
Engine		○	○	To starting the engine, kick the kick pedal.
Neutral light		○	○	The change pedal is in neutral.
Meter light			○	The engine is running.
Head light			○	The engine is running.
Tail light			○	The engine is running.
Stop light		○	○	The brake is applied.
Horn		○	○	The horn button is depressed.



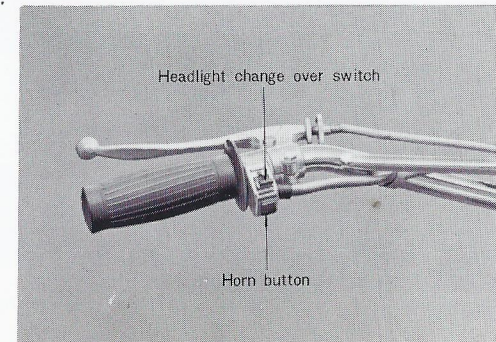
## (2) Fuel Petcock

To allow the fuel to flow into the carburetor, set the fuel petcock lever to OPEN. Should you run low of fuel while driving, turn it to RESERVE. The reserve portion will enable you to drive approximately 50 miles (80 km). When parking, the lever should be turned to STOP.



## (3) Handlebar Switches

- To sound the horn, depress the horn button.
- To lower the head light beam, push the switch toward you. To raise the beam, push the switch toward front.

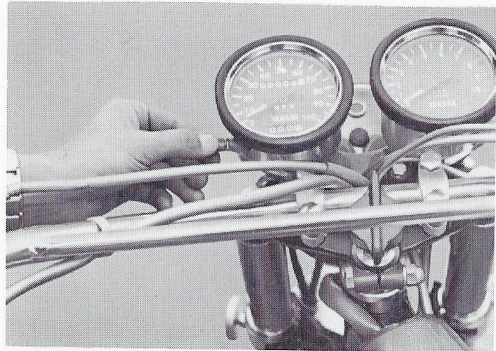




#### (4) Trip Total Meter

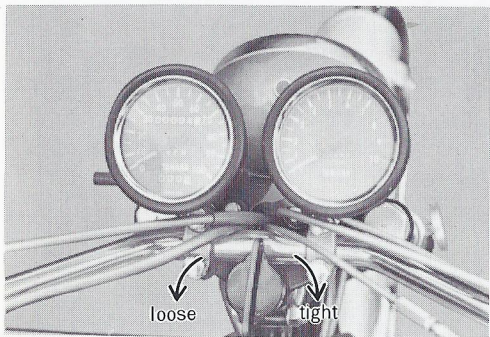
A trip total meter is built in the speedometer. It is designed to total the mileage of each trip. Before starting a trip, set the trip total meter to the zero position.

Don't turn the knob of the trip total meter while running so as not to give bad influence on its function.



#### (5) Steering Damper

The steering damper is adjustable to suit various conditions and rider preference. Turning the damper to clockwise increases the friction loading.



#### (6) Rear Cushions

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

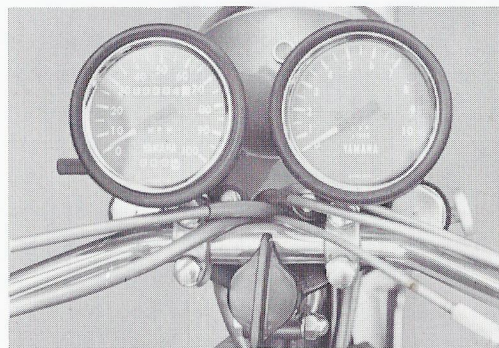
#### ○How to adjust the rear cushion

Insert the screw driver (service tool) into the adjusting hole and then turn it counterclockwise in order to change the position of the toothed notch.



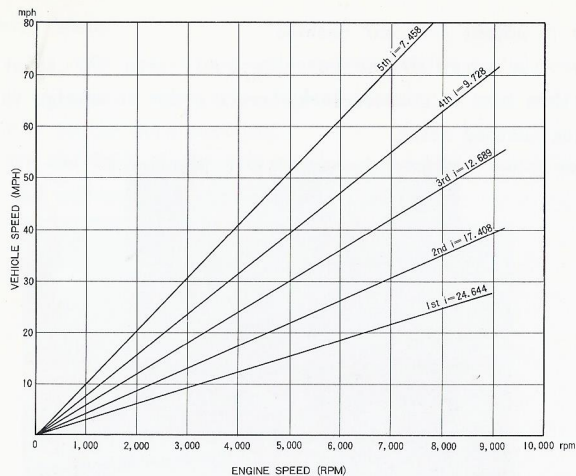
#### (7) How to Read the Tachometer

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 DT1S is designed to run best in the power range between 3,000 rpm and 7,000 rpm.



The relation between the engine RPM and gears is shown in the diagram below.





### 3. Pre-operation Check

You should check the following points before each usage.

(1) Is the fuel sufficient?

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

(2) Is the oil sufficient?

If the oil is below the center hole on the glass view port, refill the oil tank with Yamaha Autolube Oil.



(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/in<sup>2</sup> (0.9 kg/cm<sup>2</sup>)  
 Rear - 16 lbs/in<sup>2</sup> (1.1 kg/cm<sup>2</sup>) } For on-the-road-riding

Front- 8.5 lbs/in<sup>2</sup> (0.6 kg/cm<sup>2</sup>)  
 Rear - 10 lbs/in<sup>2</sup> (0.7 kg/cm<sup>2</sup>) } For off-the-road-riding

(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 rear wheel). Check to see if the stop light is functioning.

(5) Do the lights and horn function well?

Check the horn, flasher light, stop light, head light, meter light, etc.

#### 4. Operation

##### (1) Starting the Engine

The Yamaha Enduro 250 DT1S employs 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

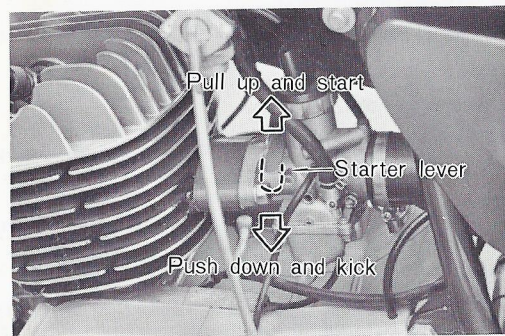
- Turn the fuel cock lever to the "OPEN" position.
- Insert the main switch key and turn it to the "Ignition" position. Make sure the neutral light is on.

The 250 DT1S is equipped with a primary kick starter. The engine can be started by kicking the kick pedal when in neutral or by disengaging the clutch 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.

When the engine is started with the starter lever depressed, release it after starting, and keep the accelerator grip open until the engine begins to run smoothly.

Correct engine warm-up, along with periodic inspection will assure a longer service life for your engine.

##### (2) Operation Procedure

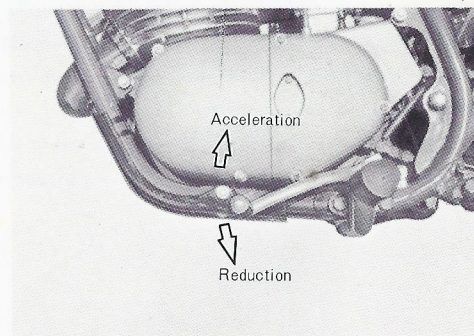
##### Shifting Gears

The Yamaha 250 DT1S is equipped with a foot-operated, 5-speed transmission. The purpose of the transmission is to change the ratio of engine RPM (driving power) and speed by means of the various gear combination available.

To shift into NEUTRAL, move the toe section of the change pedal downward and then raise it slightly to the neutral detent.

The neutral position is between the 1st and the 2nd gear position.

FIFTH  
FOURTH  
THIRD  
SECOND  
NEUTRAL  
FIRST





## Acceleration

- Grip the clutch lever to disengage the clutch.
- Depress the toe section of the change pedal to **FIRST**.
- Slowly open the accelerator grip (the engine speed begins to increase), and release the clutch lever gently. Done properly, the machine will accelerate smoothly.

## Riding on the Road

After starting off, accelerate to approximately 15 mph (20 km/h)

- Disengage the clutch while closing the accelerator grip.
- To shift the gear into **SECOND**, raise the toe section of the change pedal one full position.  
(In this case, the neutral position is bypassed)
- Increase engine speed slowly and release the clutch lever. Accelerate to approximately 30~35 mph (50 km/h), and shift the gear into **THIRD**.
- Decelerate by reversing the above procedure. Close the accelerator grip, disengage the clutch, and then depress the change pedal.

\* Do not run "lug" the engine unnecessarily as the engine may overheat or tend to foul spark plug.

\* In case of riding in the sands where rear wheel may skid extremely or continuous riding with high revolution, two pieces of "Cylinder head packing" are necessary to use.

## Off-the-road Riding

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

Parts to be removed: Head light, tail light, speedometer, tachometer, battery and side stand.

## Caution on Riding over General Paved Roads at High Speeds:

The DT1S is equipped with tires having a block pattern. As a result, the area where the tire contacts with the ground is smaller as compared with other types of tires. Therefore, take care not to slip your motorcycle when you are cornering at high speeds and at sharp angles.

## (3) Stopping

To stop the machine, gradually reduce speed by closing the throttle and apply the front and rear brakes simultaneously.

Remember to apply the front and rear brakes together when running at high speeds. Applying only one brake may cause skidding or overturning.

## 5. Break in Procedure

To secure a longer life of your Yamaha 250 DT1S, a certain period of breaking-in operation is very important.

During the first 600 miles (1,000 km), the various parts of the engine wear and polish themselves to the optimum operating clearances. It is important to avoid prolonged full throttle operation on any condition which might result in excessive heating during this critical period. Care taken at this time will result in longer life, better dependability and higher performance.

**USE TWO-STROKE OIL ONLY  
IN AUTO LUBE SYSTEM**

## V. Inspection and Service

Regular inspection and maintenance will keep your motorcycle in top condition.

Daily or periodic inspection by yourself or your Yamaha dealer not only assures a longer life of your motor cycle but prevents any machine trouble. This is "physical checkup" of your machine.

Remember to have the periodic inspection by your Yamaha dealer; otherwise, your machine will not be entitled to the Yamaha warranty plan.

It is advisable, in addition to the periodic inspection at your Yamaha dealer according to the Periodic Inspection Card, you check the machine parts listed below every 30~60 days.

### 1. Periodic Inspection Guide

	Check point	Instructions	P.Ref.
1	Front and rear brake	Adjustment	25,26
2	Clutch	Adjustment	27
3	Gear oil	Level and replacement	29
4	Battery electrolyte	Refilling	30
5	Spark plug	Cleaning	31
6	Air cleaner	Checking and cleaning	32
7	Carburetor	Cleaning	33
8	Drive chain	Adjustment and oiling	34
9	Muffler	Cleaning	36
10	Cylinder head and piston	Cleaning	36
11	Screws, bolts and nuts	Retightening	37

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

### 2. Inspection and Adjustments

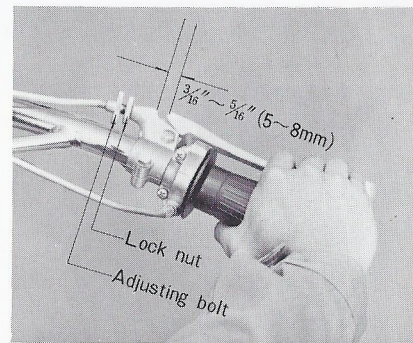
The methods of inspection and adjustments are discussed below. This information will be of value in your daily inspections.

#### Adjusting the Brakes

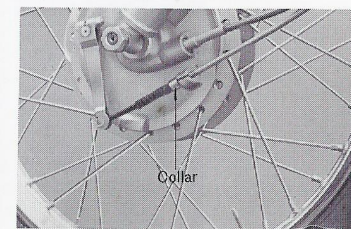
The correct free play of the front brake lever is 0.2 to 0.3 in. (5 to 8 mm.). To adjust, turn the adjusting bolt located at the lever. After adjustment, be sure to tighten the lock nut fully. When the front brake cannot be correctly adjusted by the adjusting bolt attached to the lever holder exactly as instructed above, either of the following adjustment measures or the both measures should be taken.

- Reinstall the collar on the brake cable end.
- Reinstall the cam shaft lever.

※After the adjustment, check the stop light to see if it functions properly.



[Normal position]



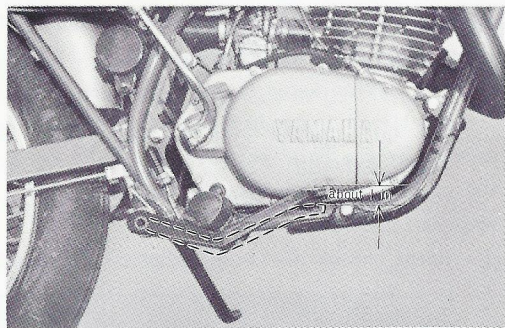
[Adjustment is not satisfactory]



### Rear Brake:

The correct free 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 half turn at a time.

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



### Checking the Brake Lining:

Disassemble the wheel assembly every 3,000 miles (5,000 km), and check it for wear and clean the brake shoe and brake drum. Take care not to get any oil on the lining friction surface.

### Adjusting the Clutch

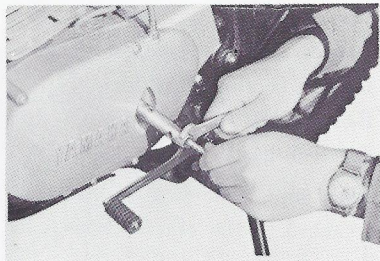
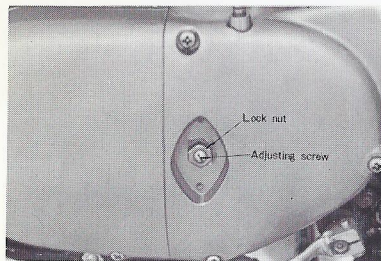
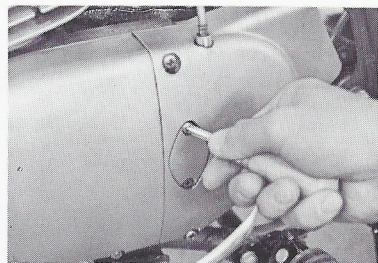
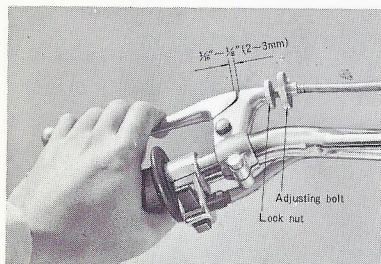
The clutch lever should have free play of .080 to .120 in. (2 to 3mm) to maintain full pressure against the clutch facing. If the play is excessive, clutch actions will be impaired. If the play is insufficient, the clutch will slip.

#### How to Adjust the Clutch:

To adjust the clutch, turn the adjusting bolt attached to the clutch lever holder. After the adjustment, fully tighten the lock nut.

#### Precision Adjustment Method:

- a. Remove the clutch adjusting cover from the left side of the crankcase cover.
- b. Loosen the clutch adjusting screw (turn it to the left), and then tighten it slowly by turning it clockwise.
- c. Back it off  $\frac{1}{4}$  turn from a lightly seated position, and lock it with the lock nut.
- d. Then adjust the play of the clutch cable with the adjusting bolt attached to the clutch lever holder.

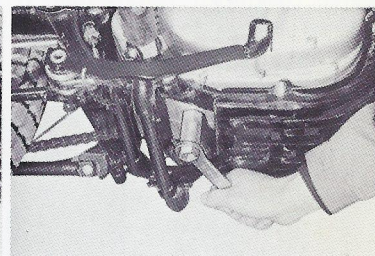
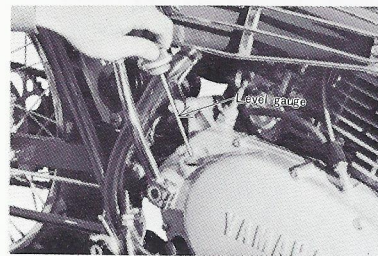


### Replacing the Gear Oil

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

After the first replacement, replacement should be made at least every three months or every 1,200 miles (2,000 km).

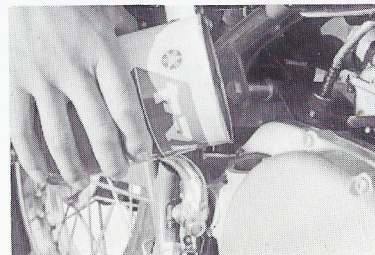
To drain the oil from the bottom of the crankcase, remove the oil drain plug.



After draining the oil, fully tighten the oil drain bolt, and fill with new oil up to the specified level.

Oil.....Yamaha Gear Oil

Oil Amount..... 0.264 US gal.(1 litre)





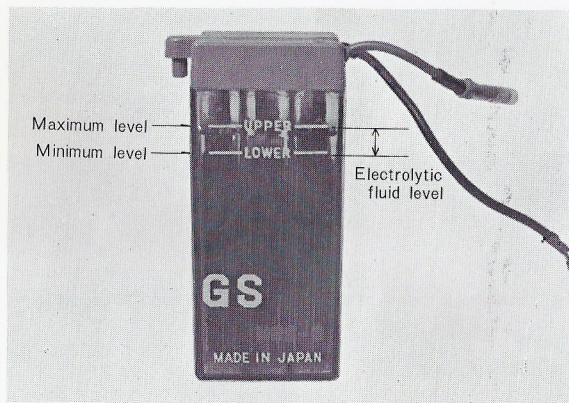
### Checking the Battery electrolyte

If the battery electrolyte is below the minimum level, remove the battery and add distilled water.

Check the overflow pipe for clogging or deformation.

If your motorcycle will not be used for several months, remove the battery and keep it in dry, cool place or have it keep in a service shop.

If stored for more than 60 days, it should receive an occasional recharge. Before reinstallation, it should be fully charged.



### Checking the Spark Plug

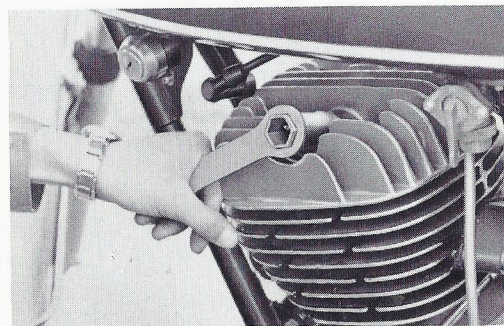
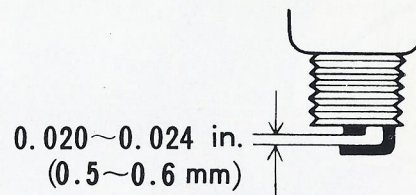
A spark plug ignites the air-fuel mixture in the cylinder. A dirty plug causes hard starting, engine misfiring and other problems.

Clean carbon from the electrodes and adjust the point gap.

- Remove carbon build-up, with a wire brush or a wire.
- Adjust the spark plug point gap to 0.020~0.030 in. (0.5~0.6 mm).

Standard Spark Plug : B-7E

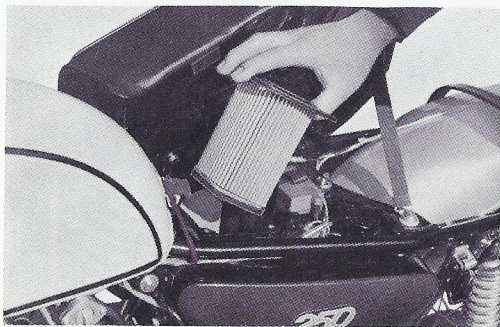
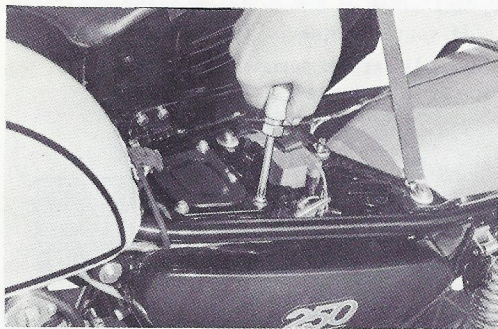
- Porcelain around the center electrode should be a light tan color.
- Replace the spark plug if the electrodes and porcelain are eroded or cracked. If your machine is frequently ridden at low speeds, the spark plug will become somewhat oily and sooty. Replace it with a hotter type.



## Cleaning the Air Cleaner

An air cleaner filters grit and other impurities from the air. If you drive often on dusty roads, be sure to clean it at least once a month. To remove the air filter open the seat cover and remove the air cleaner mounting screw. The element can then be removed.

The DTIS's air cleaner is easily cleaned. Wash it in gasoline and then soak it in a mixture of gas/oil (approximately 20:1). Squeeze all surplus fluid from the filter before reinstallation.



## Checking the Carburetor

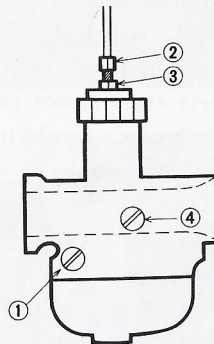
Each carburetor is set by the factory after careful tests.

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

### a. Idling Speed Adjustments

- Fully tighten the pilot air screw (1), and back off it  $1\frac{1}{2}$  turns.
- Slightly loosen the adjusting screw of the throttle cable A connected to the accelerator grip, and start the engine.
- After warming up the engine, turn the throttle stop screw (4) so that the engine increases to 1,300 rpm.

After this adjustment, loosen the lock nut (3) to adjust the play of the throttle cable B to 0.02~0.04 in. (0.5~1.0 mm); and turn the throttle cable adjuster (2) while pulling the throttle cable B for the adjustment. Then lock the throttle cable B with the lock nut.



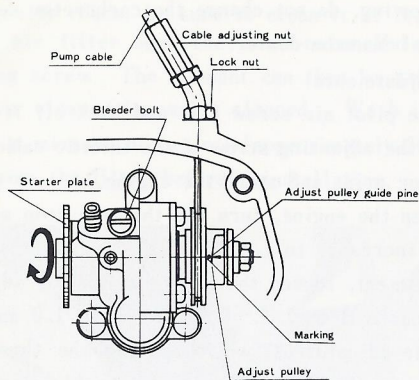
### b. Adjusting the Pump Cable

After adjustment of the carburetor, adjust the pump cable coupled with the throttle valve.

- Slightly turn the accelerator grip from the closed position so that free play of the accelerator grip is nil. (In other words, the throttle valve is ready to open only another slight turning of the throttle.)



- Turn the pump cable adjusting nut so that the marking on the adjusting pulley is aligned with the guide pin.

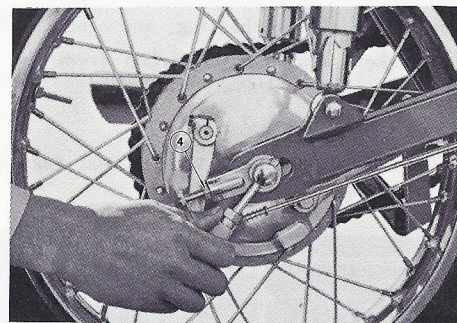
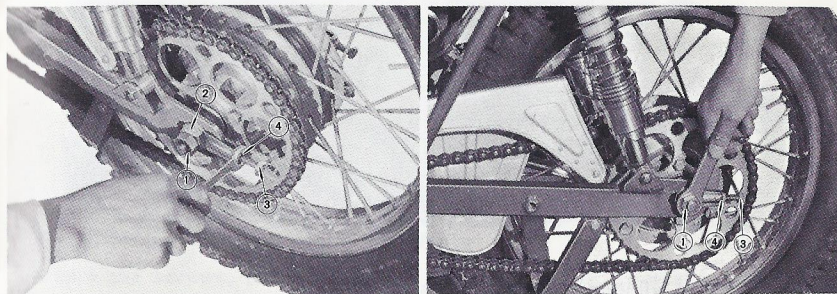


### Adjusting the Drive Chain

The drive chain should have a play of approximately 1.0 in. (25 mm) up and down at the center of the lower section with the rear wheel on the ground. Since a dirty chain causes gauling and eventual seizing, apply oil at regular intervals. In addition, wash it in gasoline before oiling at every periodic inspection.

#### Adjusting Chain Tension:

- Loosen the rear brake adjusting screw.
  - Loosen the tension bar nuts.
  - Loosen the rear wheel outside (1) and inside (2) nuts
  - Loosen the chain adjusting bolt lock nuts (4) and shift the wheel shaft so that both ends of the wheel shaft are positioned evenly by utilizing the marks on the swing arms.
  - After adjusting, tighten the tension bar nuts.
  - Adjust the play of the brake pedal.
- \* After these adjustments, check the play of the brake pedal and function of the stop light.



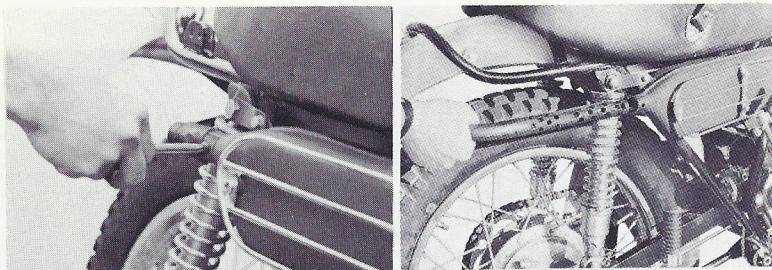


### Cleaning the Muffler

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 cylinder bore for clogging. If clogged, clean it with a wire.



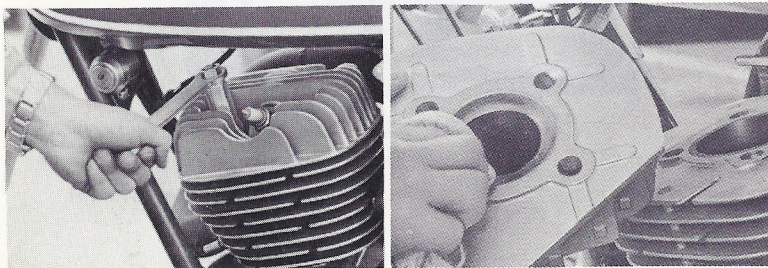
### Cleaning the Cylinder Head and Piston

Carbon accumulations around the cylinder head 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.

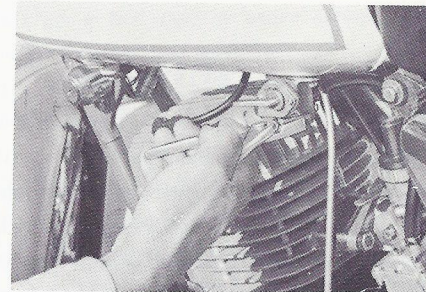
b. Remove carbon from the piston head.

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



### Cleaning the Fuel Cock Filter

The fuel 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 work 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.



### Retightening Screws, Bolts and Nuts

Check the screws, bolts and nuts in the parts listed below and retighten them if necessary.

Front and rear wheels

Foot rests

Swing arm shaft

Muffler

Side stand

Engine mountings

Carburetor

Air cleaner cover

Exhaust ring nuts

Rear cushion

Handlebars

### Greasing and Oiling

	Parts to be lubricated	Distance of driving at 1st lubr., miles	Lubrication interval, miles	Type of Lubricant
1	Front brake cam shaft	600	2,000	cup grease
2	Rear brake cam shaft	600	2,000	„
3	Front brake cable	600	2,000	„
4	Rear brake cable	600	2,000	„
5	Accelerator grip	600	2,000	„



6	Stand shaft	600	2,000	cup grease
7	Brake linkage	600	2,000	“
8	Drive chain	300	600	motor oil
9	Gear oil	300	1,200	
10	Swinging arm shaft	600	2,000	cup grease

## VI. Racing

### 1. Conversion of the Yamaha DT1S for racing

The Yamaha Enduro 250 DT1S is easily converted into a high-performance motocrosser using alternate Yamaha parts.

\* It is suggested that when you desire to make this conversion you enlist the services of your local Yamaha dealer.

#### ○ List of Alternate Parts

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

No.	Parts No.	Parts Name	Quantity	Remarks
1	214-11111-70	Head, cylinder	1	
2	94700-00016	Plug, spark	1	NGK B-9E(N)
3	214-11311-70	Body, cylinder	1	
4	214-11631-70	Piston	1	
5	214-11611-70	Ring, piston	1	
6	214-14101-70	Carburetor ass'y	1	VM30SH
7	161-15426-00	Cover, oil pump	1	
8	214-17819-10	Cap, housing	1	
9	214-17461-40	Sprocket, drive	1	14 Teeth
10	214-25446-10	Gear, sprocket wheel	1	46 Teeth
11	214-25448-10	Gear, sprocket wheel	1	48 Teeth
12	214-14610-70	Muffler	1	
13	94132-19609	Tire, front	1	3.25-19.4PR
14	94140-18070	Tire, rear	1	4.00-18.4PR

### (1) Engine Modifications

- First, remove all standard parts which are to be replaced with alternate parts. (Muffler, carburetor, cylinder head, cylinder, piston, etc.)

After removing these standard parts, check all other parts of the engine and install optional parts. Particularly, check the crank shaft ass'y for wear or other defects. Be sure to replace all packings, O rings and gaskets.

- Carefully install the tuning parts in the proper manner.

### (2) Chassis Modifications

- The modification of the chassis requires only the removal of those parts which are unnecessary for racing.
- All lighting may be easily removed.  
The speedometer and tachometer may be removed.
- Select sprocket wheels which are most suitable for the racing course conditions. A variety of sprockets are available.

### (3) Service Standards (Racing Parts)

- Piston clearance: 0.040~0.050 mm
- Spark plug: Standard B-9E(N)
- Ignition timing: B.T.D.C. 2.3 mm
- Secondary reduction: Chain
- Carburetor setting: Main jet #210  
Needle jet 0-4  
Pilot jet #80  
Cut away 3.5  
Number of turns backed off-Air screw 1/2
- Fuel mixing ratio: 15:1 (Without oil pump.)  
35:1 (With oil pump.)

## 2. Miscellaneous(Racing)

### (1) Technical Information on Engine Tune-up

The engine must withstand severe operating conditions during a race. This requires the highest degree of durability. As a result, it is vital to check and service every part of the engine with special care.

Even a slight defect in the engine may result in serious troubles. Therefore, early detection of defects as well as complete servicing must be done carefully.

Like a brand new engine, any tuned-up engine requires a certain amount of breaking operation. Run the machine at 4,000~5,000rpm for 5 to 10 minutes. Let it cool and repeat several times.

Remove the spark plug and check it for discoloring after a short trial run. After 20 to 30 minutes of operation, remove the cylinder and check for uneven contact of the piston with the cylinder wall. If any "high spot" is found on the cylinder wall, smooth it off with fine grain cloth in gasoline.

### (2) Check and Service prior to Racing

Take your time when servicing your machine prior to a race.

- Check the cylinder, piston, and crankshaft ass'y for any defects.
- Make sure that the carburetor is clean and correctly set.
- Check for ignition timing, lead wire connection, and insulation.
- Retighten screws, bolts and nuts in all parts.
- Check for the cables.
- Clean the fuel tank and fuel cock.
- Adjust chain tension and oil it.
- Clean the air cleaner.
- Replace the gear oil.

### (3) Racing Variables

Some items after of a racing machine will have to be changed by taking into consideration the following factors: straight portions and curves in the course, grade, road surface condition, weather, temperatures, and rider's driving technique.

All these must be determined by the rider himself after a series of trial runs.

#### Main Changes in Specifications

- Carburetor setting: Standard #210  
Select a main jet which results in good full throttle operation.  
Always stay as rich as possible as the motor will run cooler.
- Change in secondary reduction ratio: Standard: 2.933 ( $\frac{44}{15}$ )  
Change the combination of the drive sprocket and sprocket wheel.  
Drive sprockets: 14T, 15T  
Sprocket wheel: 44T, 46T, and 48T
- Change in spark plug: Standard: B-9E(N)  
Select a spark plug by judging its color and condition.  
It is necessary to use B-10E(N) when the engine tends to overheat.  
B-8E(N), B-9E(N), B-10E(N)
- Changing tire pressure: Change the tire pressure depending on the condition of the course.

#### Precautions

- In case of riding in the sands where rear wheel may skid extremely or continuous riding with high revolution, two pieces of "Cylinder head packing" are necessary to use.
- It is needed to use high-octane gasoline for racing.



Setting the ignition timing:

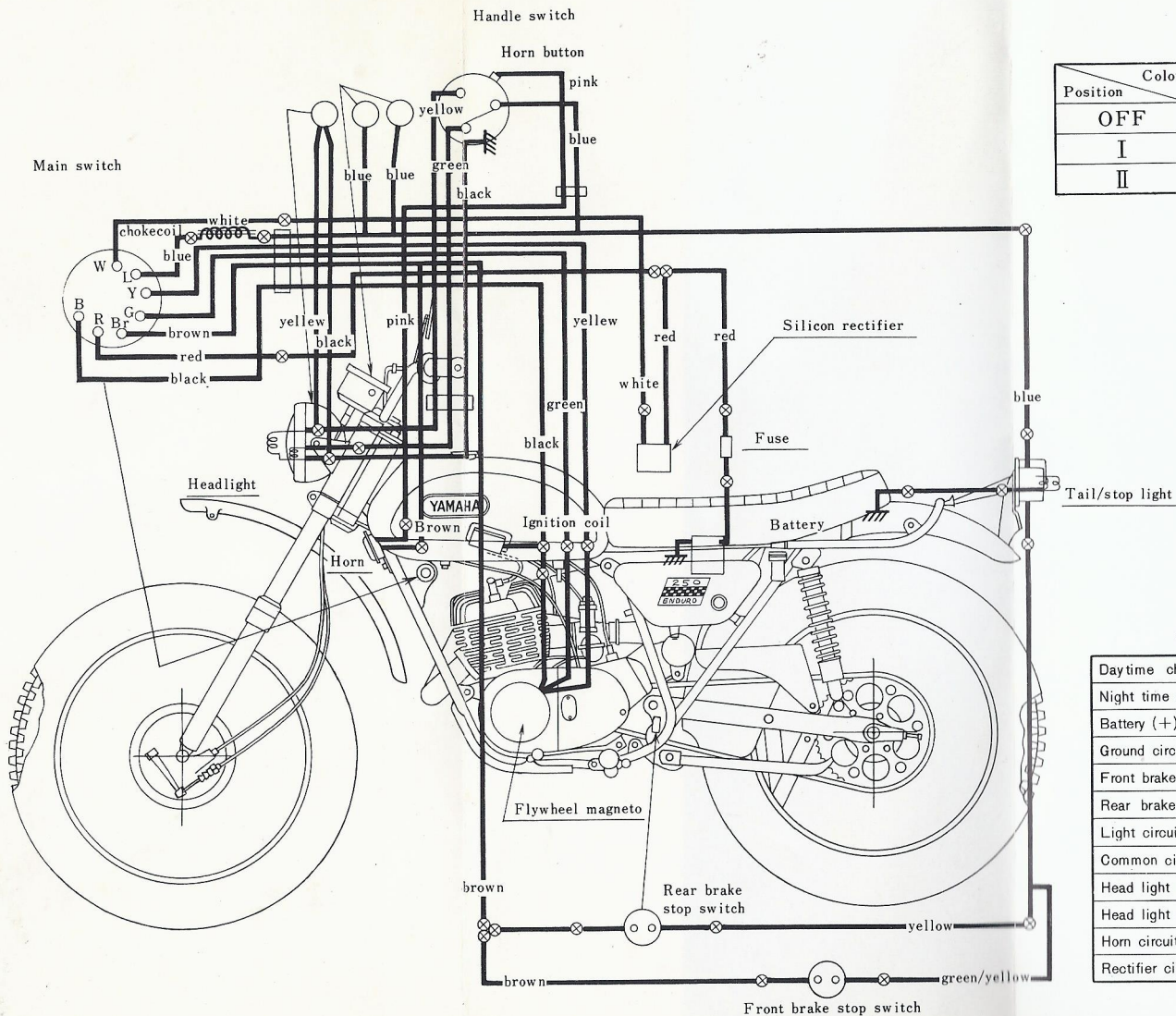
1. Install the dial gauge in the cylinder head.  
Note: On the special racing head the spark plug hole is centered and parallel to the cylinder bore. The standard cylinder head cannot be used to time with the dial gauge spark plug hole adapter.
2. Roughly align the red mark on the rotor with the pointer attached to the stationary plate.
3. Check to see if the points are clean and not pitted. They can be smoothed with 400 sandpaper or with an oil stone.
4. Connect a tester to the pointer and ground so that the exact opening and closing of the points can be measured.
6. Rotate the rotor so that the piston will be lowered 2.3 mm B.T. D.C.. At this point, loosen the breaker plate setting. Screw and adjust the breaker plate so that the points just close. Finally tighten the breaker plate.

In addition to the alternate parts for racing listed in page 38, the followings are also available through authorized dealers.

No.	Parts No.	Parts Name	Quantity	Remarks
1	214-21510-70	Fender, front	1	
2	214-22210-70	Cushion, rear	1	
3	152-25139-00	Plug, blind	1	
4	94127-21071	Tire, front	1	2.75-21-4PR
5	94227-21031	Tube	1	∕
6	94327-21024	Band, rim	1	∕
7	94416-21038	Rim	1	∕
8	214-25196-10	Spork, inner	18	∕
9	214-25197-10	Spork, outer	18	∕

## MEMO

# WIRING DIAGRAM



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

Chart of wire colors

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