

# YAMAHA

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**Supplementary Service**

**Information for New Model DT1-MX**

# DT1 -MX



**YAMAHA MOTOR CO., LTD.**

## FOREWORD

*The New YAMAHA 250 DT1-MX is designed as a high-performance motocrosser for racing. The DT1-MX is converted into a fully-equipped motocrosser through the use of DT1-E G.Y.T. kit parts and a few, slight, changes in the running gear. You are kindly requested to use this supplementary information together with the DT1-E service manual to effectively Service the model.*

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YAMAHA MOTOR CO., LTD.  
SERVICE DIVISION

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## 1. Features

### (1) High Performance Single Cylinder Engine

The YAMAHA 250 DT1-MX utilizes a powerful two-stroke 246 cc engine. The new five port cylinder, which is another Yamaha technical development, greatly improves engine efficiency and is responsible for high power output throughout a broad RPM range.

### (2) Highly Dependable Yamaha Autolube

Yamaha Autolube provides superior engine lubrication that extends the 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. The DT1-MX is equipped with a magneto which decreases crankshaft inertia and increases high rpm ignition performance.

### (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 five different positions. The rider can adjust spring tension to compensate for varying weights, speeds, and course conditions.

### (6) Front Fork Design

The YAMAHA 250 DT1-MX employs an oil damper for better driving stability. The front fork design is well-known for its strength and superior handling characteristics.

### (7) Tires

The DT1-MX is fitted with tires having a knobby type tread pattern for more improved poor surface traction.

### (8) Carburetor Starter Feature

Yamaha's starter feature is already well-known for its easy starting.

Equipped with this unique carburetor, the DT1-MX is quick starting under all conditions.

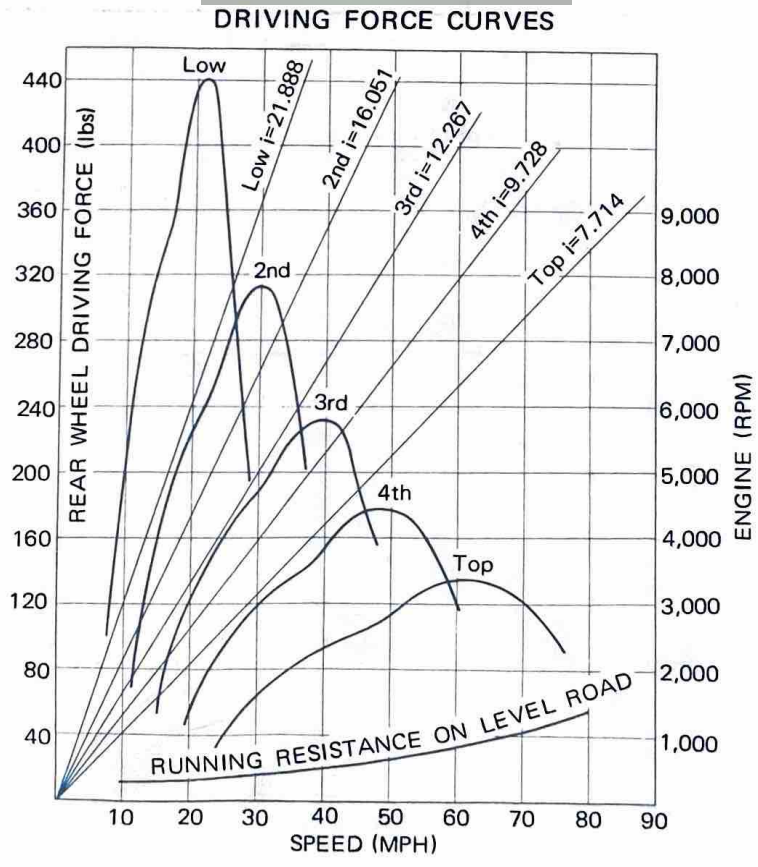
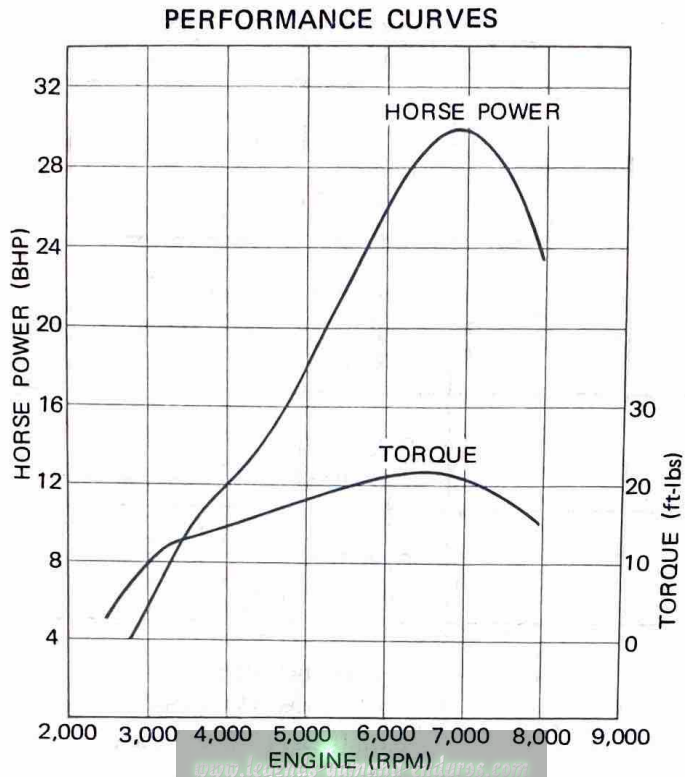
## Specifications

### 2. Specifications

Dimensions:	
Overall length	82.3 in. (2,090 mm)
Overall width	35.0 in. ( 890 mm)
Overall height	46.7 in. (1,185 mm)
Wheelbase	55.1 in. (1,400 mm)
Min. ground clearance	10.0 in. ( 255 mm)
Weight:	
Net	232 lbs. (105 kg)
Performance:	
Min. turning radius	78.7 in. (2,000 mm)
Braking distance	50.5 ft at 31 mph (15.4 m at 50 km/h)
Engine:	
Model	DT-1
Type	2 stroke, gasoline
Lubricating system	Yamaha Autolube and/or Gas/Oil mixture
Cylinder	Single, forward inclined, 5 port
Displacement	15 cu. in. (246 cc.)
Bore x Stroke	2.756 x 2.520 in. (70 x 64 mm)
Compression ratio	7.0 : 1
Max. power	30 BHP/7,000 r.p.m.
Max. torque	22.4 ft-lbs/6,500 r.p.m. (3.1 kg-m/6,500 r.p.m.)
Starting system	Primary-coupled kick starter
Ignition system	Flywheel magneto
Carburetor:	
Type	VM30SH
M.J.	#200
J.N.	5DP7-3 stages
Float level	0.945 in. (24 mm)
Air cleaner:	Wet, foam rubber
Transmission:	
Clutch	Wet, multiple-disk
Primary reduction system	Gear
Primary reduction ratio	65/21 = 3.095
Gear box:	
Type	Constant mesh, 5-speed forward, close ratio
Reduction ratio 1st	36/16 = 2.250
2nd	33/20 = 1.650
3rd	29/23 = 1.260
4th	26/26 = 1.000
5th	23/29 = 0.793
Secondary reduction system	Chain
Secondary reduction ratio	44/14 = 3.142

<p>Chassis:</p> <p>Frame</p> <p>Suspension system, front</p> <p>Suspension system, rear</p> <p>Cushion system, front</p> <p>Cushion system, rear</p>	<p>Tubular-Double loop</p> <p>Telescopic fork</p> <p>Swinging arm</p> <p>Coil spring, Oil damper</p> <p>Coil spring, Oil damper</p>
<p>Steering system:</p> <p>Steering angle</p> <p>Caster</p> <p>Trail</p>	<p>49° both right and left</p> <p>60°30'</p> <p>5.39 in. (137 mm)</p>
<p>Braking system:</p> <p>Type of brake</p> <p>Operation system, front</p> <p>Operation system, rear</p>	<p>Internal expansion</p> <p>Right hand operation</p> <p>Right foot operation</p>
<p>Tire size:</p> <p>Front</p> <p>Rear</p>	<p>2.75-21-4PR</p> <p>4.00-18-4PR</p>
<p>Magneto:</p> <p>Model</p> <p>Manufacturer</p>	<p>FZA-1BL</p> <p>Mitsubishi Elec.</p>
<p>Miscellaneous:</p> <p>Gasoline tank capacity</p> <p>Oil tank capacity</p> <p>Front fork oil capacity</p> <p>Gear box oil capacity</p>	<p>2.5 U.S. gals (9.5 liters)</p> <p>1.7 U.S. qts. (1.6 liters)</p> <p>5.85 fl. oz. (173 cc.) each</p> <p>1.0 U.S. qts. (1.0 liters)</p>

### 3. Performance Curves

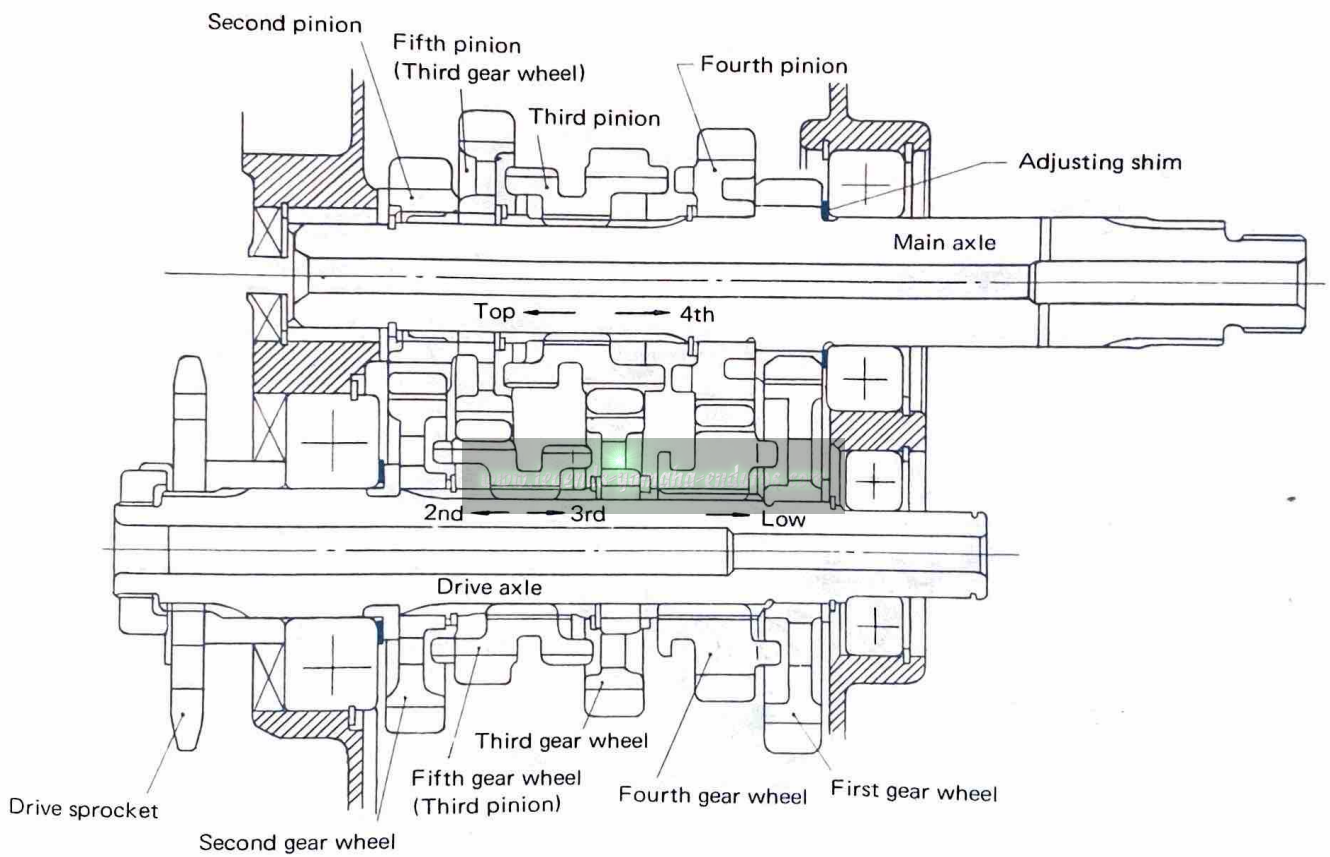




#### 4. Transmission Gear Assembly

The constant mesh, close ratio, 5-speed transmission makes it possible to fully utilize the steady performance of the engine throughout the entire speed range from low to high speed. The transmission gear reduction ratio between gears is closer than the DT1-E.

For layout of the transmission and related parts, refer to Fig. 1 and 2.



Main shaft overall width (Including shims) = 83.5 mm.

Drive axle overall width (Including shims) =  $87.5_{-0.15}^0$  mm.

Fig. 1



## Transmission Gear Assembly

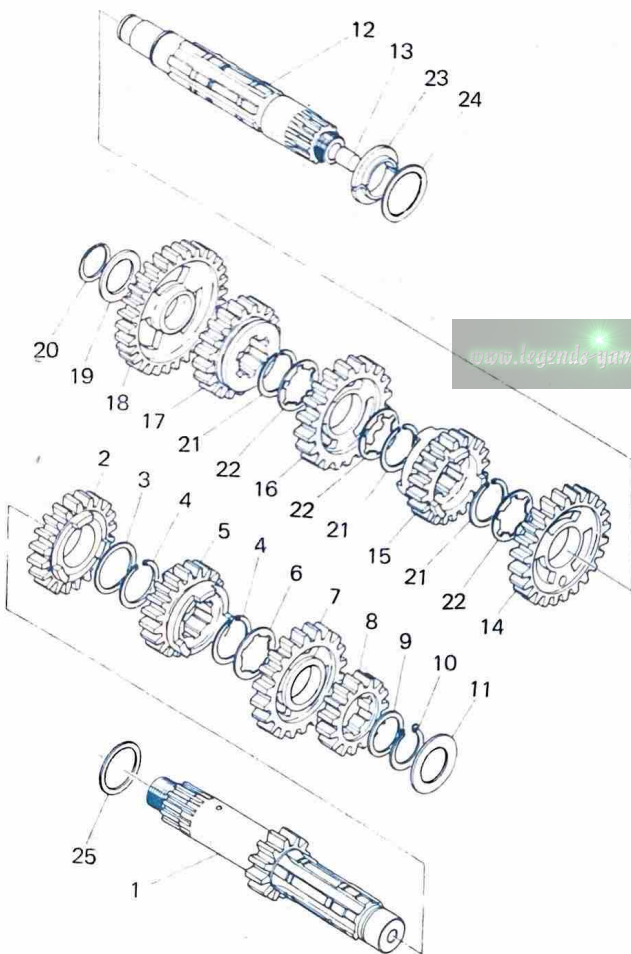
The primary reduction ratio is  $65/21 = 3.095$

The secondary reduction ratio is  $44/14 = 3.142$

Therefore the total reduction ratios will be:

Primary reduction ratio x Transmission gear reduction ratio x Secondary reduction ratio = Total reduction ratio.

	Transmission Gear Reduction Ratio	Total Reduction Ratio
1st	$36/16 = 2.250$	21.887
2nd	$33/20 = 1.650$	16.051
3rd	$29/23 = 1.260$	12.265
4th	$26/26 = 1.000$	9.727
5th	$23/29 = 0.793$	7.715



### Component parts of transmission

1. Main axle
2. 4th pinion gear
3. Gear holding washer (25-32-1)
4. Circlip
5. 3rd pinion gear
6. Gear holding washer
7. 3rd wheel gear
8. 2nd pinion gear
9. Gear holding washer
10. Circlip
11. Shim (20.2-33-1)
12. Drive axle
13. Blind plug
14. 2nd wheel gear
15. 3rd pinion gear
16. 3rd wheel gear
17. 4th wheel gear
18. 1st wheel gear
19. Gear holding washer (20-30-1.5)
20. Circlip
21. Circlip
22. Gear holding washer
23. Drive axle spacer
24. Drive axle shim
25. Main axle shim (25.1-31)

Fig. 2

## 5. Service Data

- Piston clearance . . . . . 0.0018 ~ 0.0020 in. (0.045 ~ 0.050 mm)
- Piston ring end gap . . . . . 0.007 ~ 0.015 in. (0.2 ~ 0.4 mm)  
(when ring is fitted in cylinder)
- Spark plug . . . . . Standard = B-10EN
- Ignition timing . . . . . 2.3 mm B.T.D.C.
- Oil pump
  - Minimum stroke : 0.20 ~ 0.25 mm (0.008 ~ 0.010 in.)
  - Maximum stroke : 1.85 ~ 2.05 mm (0.077 ~ 0.081 in.)
- Fuel mixing ratio
 

The DT1-MX, equipped with Yamaha Autolube system, uses mixed gasoline as fuel. The fuel mixing ratio is 30 : 1 for DT1-MX equipped with a Yamaha Autolube pump, and 15 : 1 when not using the Autolube pump.
- Gasoline and Oil
  - Gasoline: Use high-octane gasoline (more than 98 ~ 100 octane)
  - Oil : Use Shell Super 2-stroke oil or oil of similar quality.
- Transmission oil
  - Volume of oil: 1,000 cc. (1.0 U.S. qt) SEA 10W/30
- Carburetor Setting Table

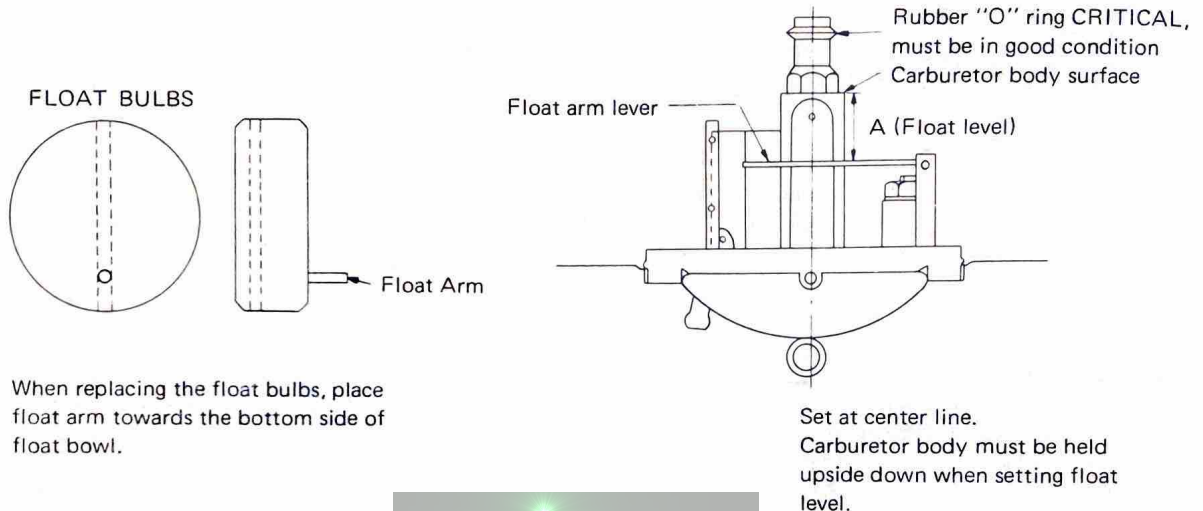
Name of Parts	Abbreviation	Specifications
Main Jet	M. J	#200
Air Jet	A. J	0.5
Jet Needle	J. N	5DP7 - 3 stages
Needle Jet	N. J	O-2
Throttle Valve Cutaway	C. A	#3.5
Bypass Port Diameter	B. P	1.4
Pilot Outlet Diameter	P. O	0.6
Pilot Jet	P. J	#80
Air Screw	A. S	turns out one turn
Valve Seat Diameter	V. S	2.5
Starter Jet	G. S	#60

## Service Data

### ○ Float Level Adjustment

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

Carburetor float setting:  
(with needle spring unloaded)



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Fig. 3

- 1) Remove the float chamber body, and turn over the mixing body. Let the float arm rest on the needle valve with the spring fully expanded.
- 2) Then measure the distance "A" from the float arm lever to the float chamber joint surface.  
Standard measurement of A : 24 mm. (0.945 in.)
- 3) When the "A" distance measures is less than the recommended bend the tang up. If it is greater, bend the tang down. (with carburetor body upside down.)

### ○ Cleaning The Air Filter

Wash the foam filter thoroughly in solvent until all dirt has been removed. Squeeze all solvent out. Pour oil onto the filter (any grade of 20 or 30 wt.), work it completely in, and then squeeze out the surplus oil. The filter should be impregnated with oil, but not "dripping" with it.

## 6. Change in Specifications

Participants in racing must change specifications of the machine depending on conditions of the racing course, road surface, soil, length of straightaways, angles of curves, number of curves, slopes, weather, temperature, and skill of the rider.

These factors and conditions must be determined by the rider himself after trial running over the whole race course.

### Main Points to be Modified

#### (1) Carburetor Setting

In addition to the specified Main Jet, the rider should carry with him spares whose size numbers are larger and smaller than specified by increments of 10 respectively.

#### (2) Secondary Reduction Ratio

Consideration should be given to a combination of the drive sprocket and sprocket wheel so that gear shifting to 3rd and 4th is easy and will not cause an undue load on the engine (i.e. lugging).

#### (3) Spark Plug

Change the plug by judging discoloration of the plug. Choose the most suitable one from B-9EN, B-10EN or B-11EN after setting carburetion.

#### (4) Tire Pressure

Adjust the tire pressure according to road conditions and the rider's choice.

#### (5) Front Fork

Adjust the front fork by adjusting the quantity or weight of oil. The oil amount is 5.85 fl. oz. (173 cc). weight is normally SEA #30.

#### (6) Rear Cushions

Adjust the spring setting depending on the rider's choice.

#### (7) Handlebar

Loosen the handle lever holders before racing. This will protect the rider's hands or fingers from getting injured in case of an accidental crash during the race.

(The lever can easily turn when the machine turns over.)



### 7. Adjusting Ignition Timing

#### (1) Tools and instruments for adjusting

Dial gauge (accuracy – 1/100 mm)

Dial gauge stand 2

Continuity testing lamp, YAMAHA electro tester or YAMAHA point checker.

Thickness gauge

Slot-head and Phillips-head screw driver

#### (2) Adjust ignition timing

- a) Set the point gap at 0.30 ~ 0.35 mm (0.012 ~ 0.014 in.). Inspect the breaker points for any pittings. Excessive pitting should be smoothed off with sandpaper (#400 ~ 600), and wiped off with hard, clean, white paper.
- b) Remove the spark plug and screw the dial gauge stand 2 into the plug hole. (On the DT1-MX head the spark plug hole is centered and parallel to the cylinder bore).  
Next, insert the dial indicator into the gauge stand 2. Bring the piston up to T.D.C. and set the zero on the dial face to line up exactly with the dial indicator needle.  
Connect the positive (+) tester lead to the primary ignition terminal. Connect the negative (–) lead to the engine case (ground).
- c) Turn the crankshaft back well past 2.3 mm, to eliminate play in the gears, and then bring the piston up to exactly 2.3 mm B.T.D.C.
- d) Loosen the breaker plate holding screws and turn the breaker plate. When the points just start to open (the testing lamp lights up) tighten the holding screws. (Do not fully loosen the breaker plate holding screw as the breaker plate tends to shift its position).  
Turning the breaker plate in the engine rotation direction causes ignition timing to retard, and turning it in the opposite direction advances ignition timing.
- e) After tightening the set screw, recheck timing.

## 8. Checks and Service Prior to Racing

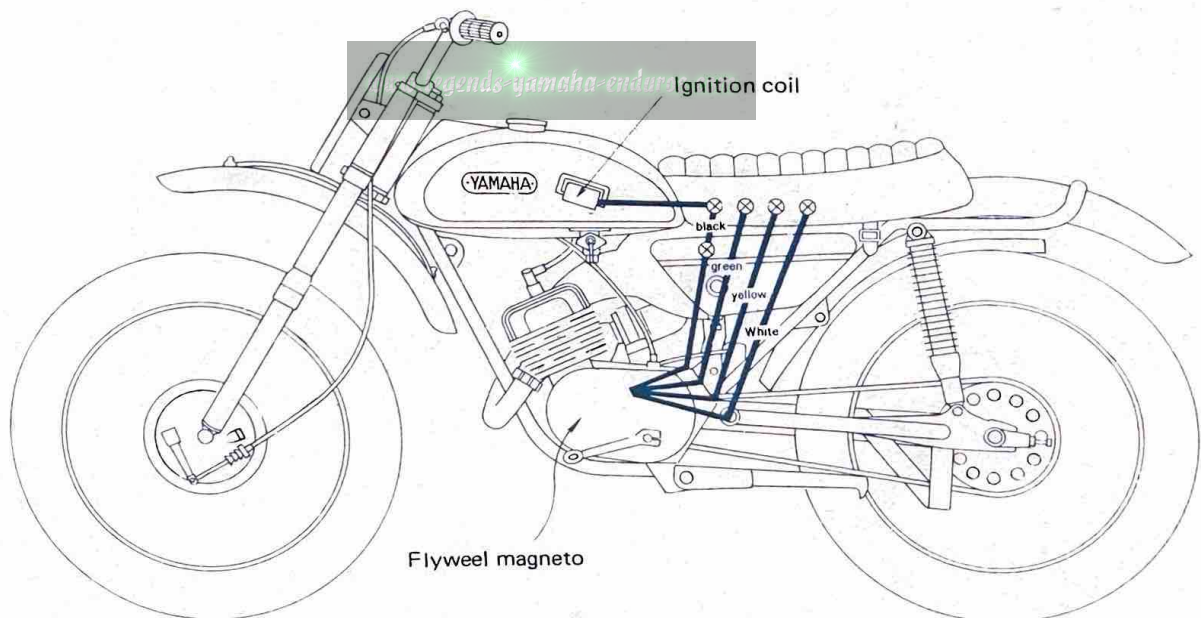
The following items should be checked and serviced before racing.

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

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

The racer should devote the maximum possible time to inspection and service of the machine prior to racing. "Thorough inspection and service are the first step to victory."

## 9. WIRING DIAGRAM



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