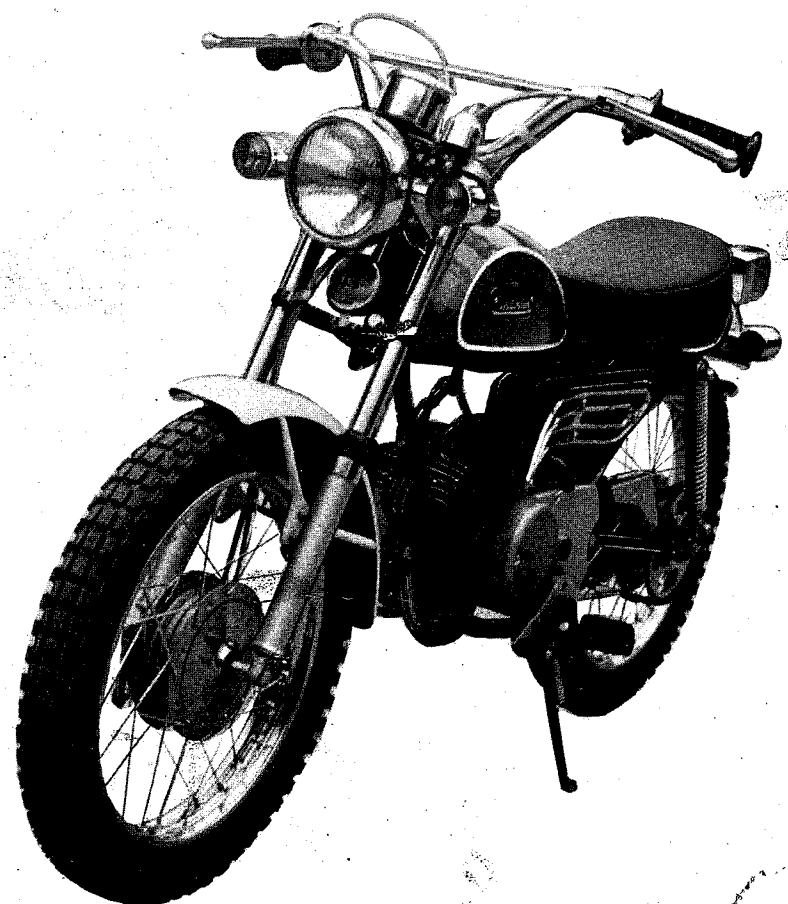
YAMAHA

Supplementary Service Information for Canada Model (Electronical System)

MODEL MINI ENDURO JT1



YAMAHA MOTOR

This 60 JT1 (for Canada) is designed for off-the-road riding, but it is also perfect for on-the-road riding. A complete line of security parts enables the rider to enjoy a full speed drive on highways.

This Supplementary Service Manual is dedicated to the electrical system of the 60 JT1 motorcycles bound for Canada. Accordingly, the combined use of this Supplementary and the general Service Manual is recommended.

Except for the security parts such as the head lamp, tail lamp, flasher lamp and speedometer, this 60 JT1 is the same as the regular JT1. All electrical components are of 6V capacity and power is supplied from a flywheel magneto.

YAMAHA MOTOR CO., LTD.
SERVICE DIVISION

1. **Highly-dependable Yamaha Autolube**

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

2. **Efficient primary kick-starter**

The primary kick starter enable the engine to start both in gear or in neutral.

3. **Powerful Brakes**

Patended water-proof, dust-proof brake drums provide safe, fade-free braking on wet or dusty roads.

4. **Front Fork Design**

The Yamaha Enduro 60 JT1 employs 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.

5. **Tires**

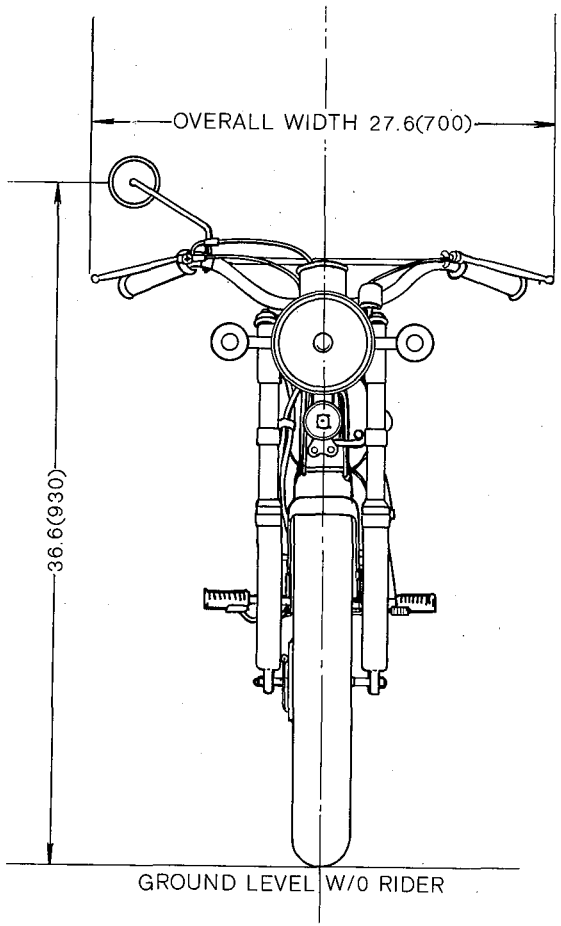
The Yamaha JT1 is fitted with Dunlop Trials Universal tires as standard equipment. This particular tread is one of the most versatile available. It gives maximum trail traction, yet is compatible with road usage.

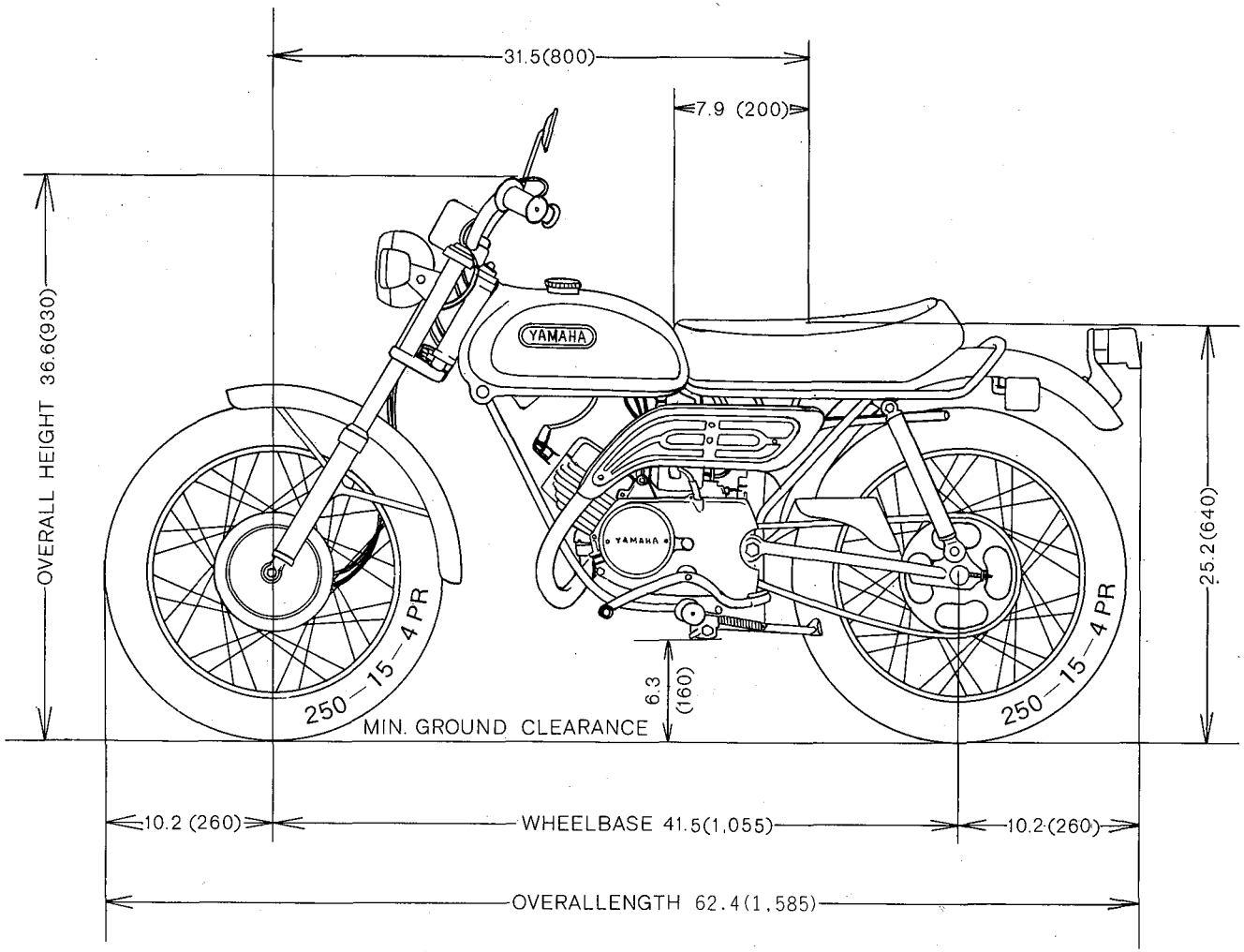
6. **Carburetor Starter Feature**

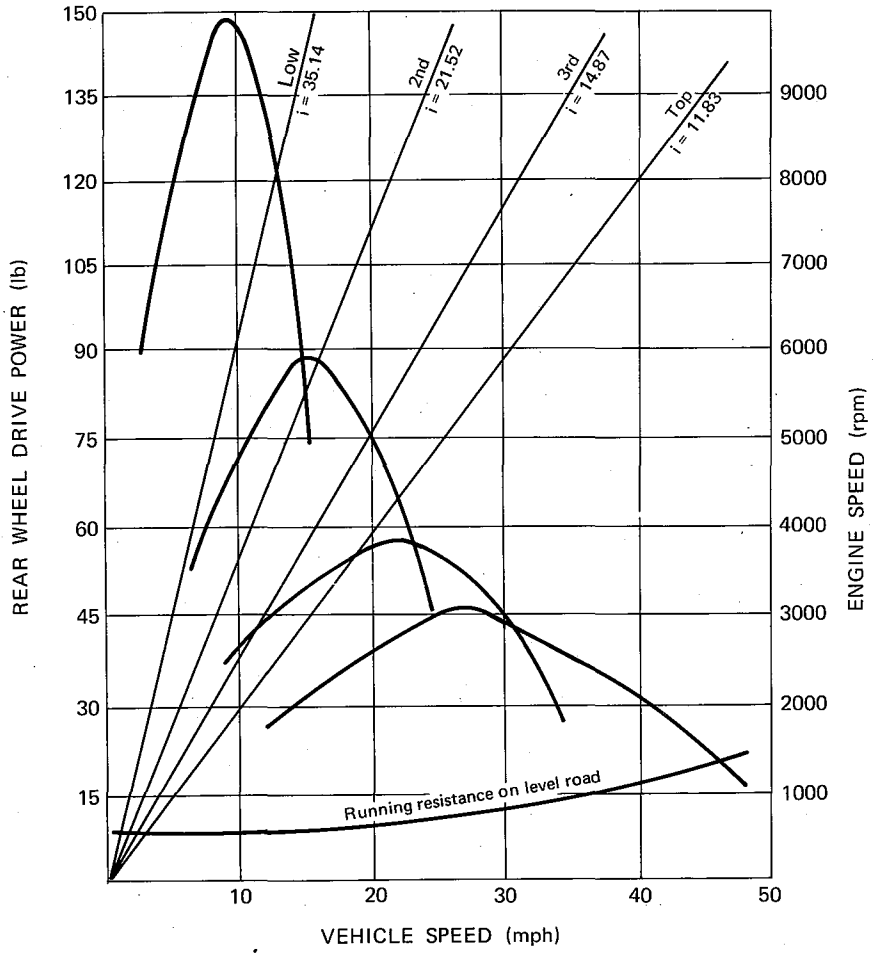
Yamaha's starter feature is already well-known for providing easy starting. Equipped with this unique carburetor, the Yamaha JT1 is quick starting under all conditions.

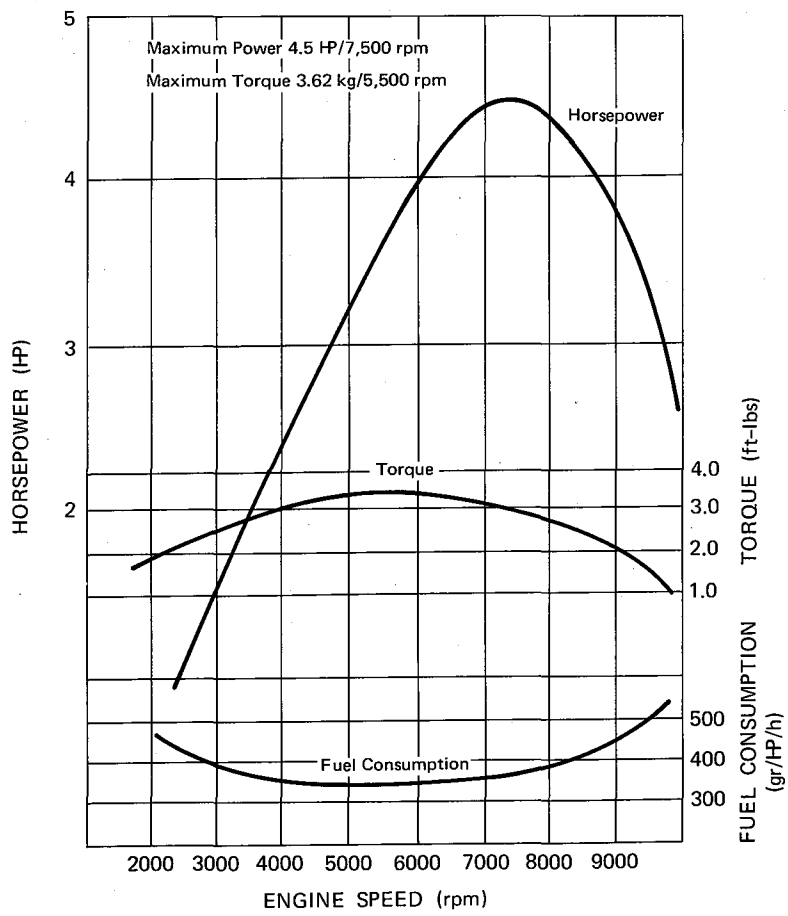
Model	YAMAHA 60 JT1
Dimensions:	
Overall length	62.4 in.
Overall width	27.6 in.
Overall height	36.6 in.
Wheelbase	41.3 in.
Min. ground clearance	6.3 in.
Weight:	
Gross	132 lbs.
Net	143 lbs.
Performance:	
Max. speed	47 mph
Fuel consumption (on paved level roads)	176 mpg @ 19 mph
Climbing ability	20°
Min. turning radius	59.1 in.
Braking distance	24.6 ft at 22 mph
Engine:	
Model	JT1
Type	2 stroke, gasoline
Lubricating system	Separate lubrication (Yamaha Autolube)
Cylinder	Single cylinder, forward inclined
Displacement	3.54 cu. in. (58 cc)
Bore x Stroke	1.654 x 1.654 in. (42 x 42 mm)
Compression ratio	6.4 : 1
Max. power	4.5 hp/7,500 rpm
Max. torque	3.62 ft-lb/5,500 rpm
Starting system	Primary-coupled kick starter system
Ignition system	Flywheel magneto ignition system
Spark plug	B-7HS
Carburetor:	
Type	Y16P
M. J.	#84
J. N.	032-2
Air cleaner:	Dry, Paper filter type
Transmission:	
Clutch	Wet, multiple-disk
Primary reduction system	Gear
Primary reduction ratio	3.894 (74/19)

Model	YAMAHA 60 JT1
Gear Box:	
Type	Constant mesh, 4-speed
Reduction ratio 1st	3.077
2nd	1.889
3rd	1.304
4th	1.038
Secondary reduction system	Chain
Secondary reduction ratio	3.153 (41/13)
Chassis:	
Frame	Tubular-Double loop
Suspension system, front	Telescopic fork
Suspension system, rear	Swinging arm
Cushion system, front	Coil spring, oil damper
Cushion system, rear	Coil spring, oil damper
Steering system:	
Caster	63.5°
Trail	2.7 in.
Braking system:	
Type of brake	Internal expansion
Operation system, front	Right hand operation
Operation system, rear	Right foot operation
Tire size:	
Front	2.50-15-4PR
Rear	2.50-15-4PR
Dynamo:	
Model	F11-L40
Manufacturer	Hitachi Co., Ltd.
Battery:	
Model	6N-2A-3
Manufacturer	Nippon Btry.
Capacity	6V 2AH
Lighting:	
Head lamp	6V 15W/15W
Tail lamp	6V 3W
Stop lamp	6V 10W
Meter lamp	6V 1.5W
Flasher lamp	6V 8W
Tanks:	
Gasoline tank capacity	1.1 gals.
Oil tank capacity	1.1 gals.


OVERALL WIDTH 27.6(700)
36.6(930)
GROUND LEVEL W/O RIDER


31.5(800)
7.9 (200)
OVERALL HEIGHT 36.6(930)
YAMAHA
250-15-4 PR
250-15-4 PR
25.2(640)
6.3
(160)
MIN. GROUND CLEARANCE
10.2 (260)
WHEELBASE 41.5(1,055)
10.2 (260)
OVERALLENGTH 62.4(1,585)


REAR WHEEL DRIVE POWER (lb)
150
135
120
105
90
75
60
45
30
15
Low
i = 35.14
2nd
i = 21.52
3rd
i = 14.87
Top
i = 11.83
Running resistance on level road
9000
8000
7000
6000
5000
4000
3000
2000
1000
ENGINE SPEED (rpm)
10
20
30
40
50
VEHICLE SPEED (mph)


Maximum Power 4.5 HP/7,500 rpm
Maximum Torque 3.62 kg/5,500 rpm
Horsepower
Torque
Fuel Consumption
HORSEPOWER (HP)
5
4
3
2
4.0
3.0
2.0
1.0
TORQUE (ft-lbs)
500
400
300
FUEL CONSUMPTION (gr/HP/h)
2000 3000 4000 5000 6000 7000 8000 9000
ENGINE SPEED (rpm)

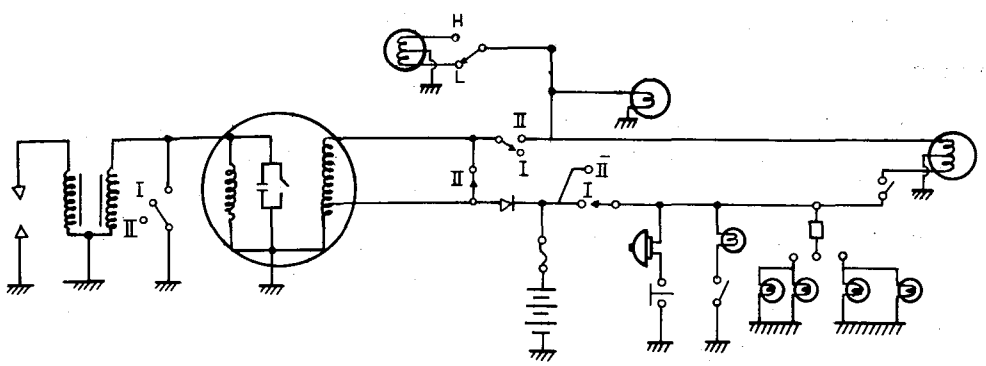
A. Description

The JT1 employs a flywheel magneto for its ignition system.

B. Table of Component Parts

	Parts	Manufacturer	Model & Type
Engine	Flywheel magneto	Hitachi Ltd.	F11-L40
	Spark plug	N G K	B-7HS
Flame	Battery	Nippon Battery	6N2-2A-3 (6V2AH)
	Main switch	Asahi Denso	
	Rectifier	Fuji Elec.	3A
	Horn	Nikko Kinzoku	GF-6
	Ignition coil	Hitachi Ltd.	CM61-50
	Flasher Relay	Showa Elec.	B9
	Fuse	Osachi Mfg.	10A
	Stop switch	Asahi Denso	
Front	Head lamp	Koito Mfg.	6V 15W/15W
	Speed meter lamp	Nippon Seiki	6V 1.5W
	Front flasher lamp	Imasen Elec.	6V 8W x 2
	Handle switch	Asahi Denso	ACS
Rear	Rear flasher lamp	Asahi Denso	6V 8W x 2
	Tail, Stop lamp	Koito Mfg.	6V 3W/10W

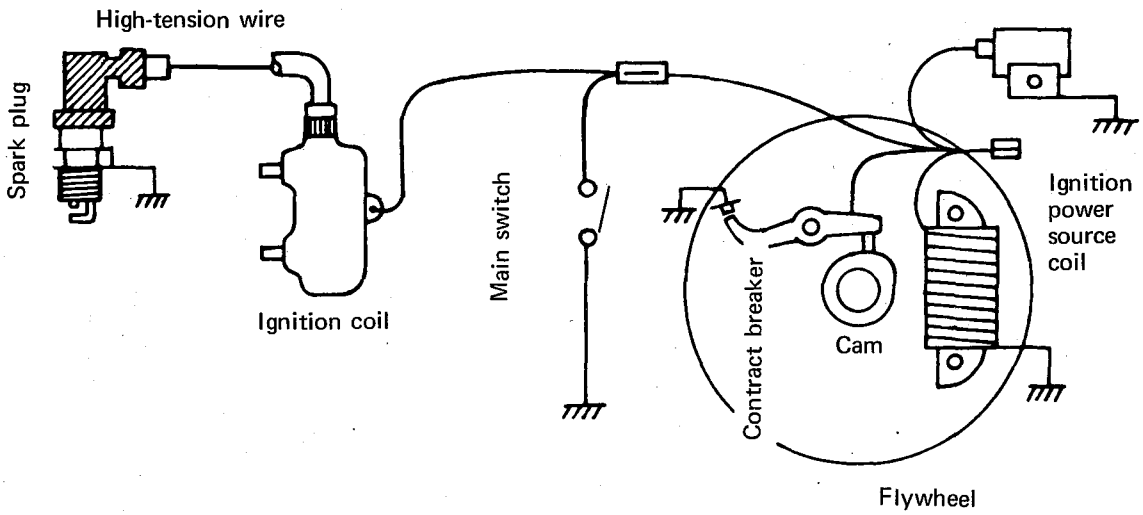
C. Connection Diagram



D. Ignition System—Function and Service

1. Function

The ignition system consists of the components as shown in Fig. 2. As the flywheel rotates, the contact breaker points begin to open and close, alternately. This make-and-break operation develops an electromotive force in the ignition power source coil, and produces a voltage in the ignition coil primary windings. The ignition coil is a kind of transformer, with a 1:50 turn ratio of the primary to the secondary winding. The voltage (150~300V) which is produced in the primary coil, is stepped up to 12,000~14,000V by mutual-induction and the electric spark jumps across the spark plug electrodes.



2. Ignition Timing

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

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

Maximum ignition point gap 0.3 to 0.4 mm. (0.012"—0.015")

3. Ignition Coil

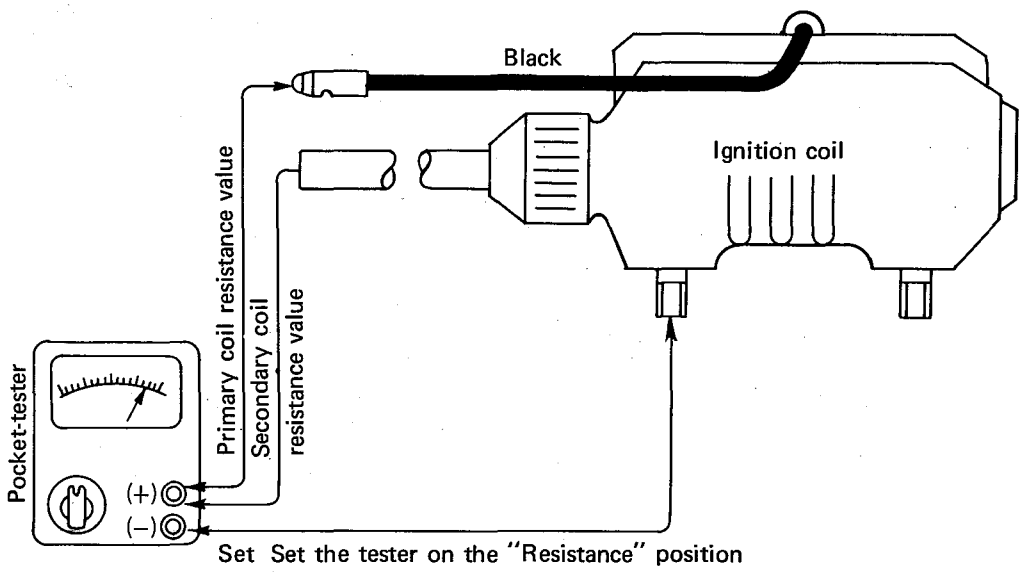
The ignition coil is protected by a resin mold to improve the earthquake proof ability and durability of the coil.

○ Checking

To check the ignition coil for condition, measure the length of spark. As a simple checking method, the condition of the coil can be roughly judged by measuring the inner resistance of the coil. It is advisable, however, to measure the length of spark to accurately diagnose the coil.

Primary coil resistance ..... 4.9 Ω ±10% (20°C)

Secondary coil resistance ..... 11.0KΩ ±20% (20°C)



Spark Test:

Remove the spark plug from the cylinder head and reconnect the high voltage lead. Then hold the spark plug approximately 7 mm away from the head and see if it sparks as you crank the kickstarter.

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

○ Sparking (in combination with flywheel magneto)

7 mm or more at 500 rpm

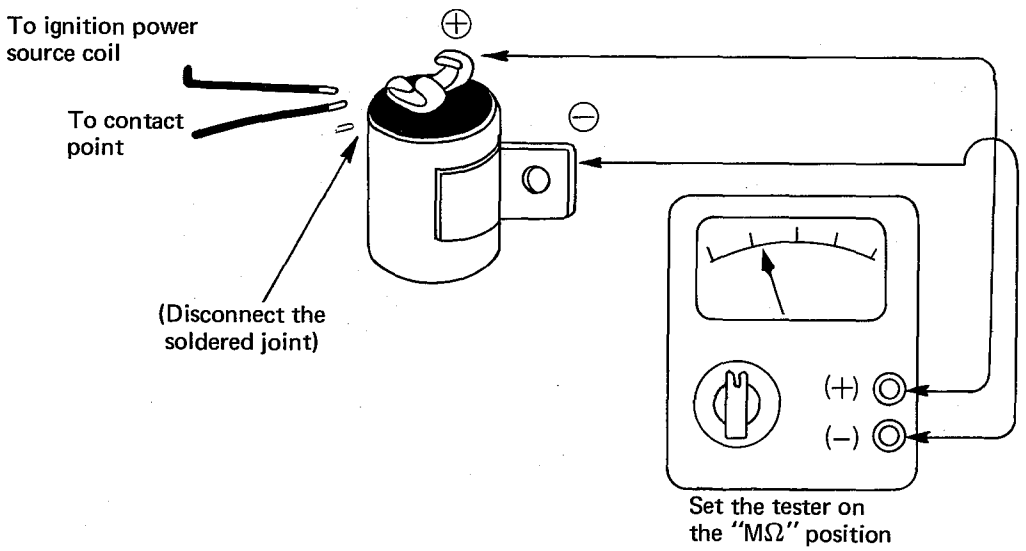
8 mm or more at 5000 rpm

4. Condenser

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

Burned contact points greatly affect the flow of current in the primary winding of the ignition coil. If the contact points show excessive wear, or the spark is weak (the ignition coil is in good condition), check the condenser.

Insulation resistance tests should be conducted by connecting the tester as shown in Fig. 4. If the pointer swings fully and the reading is more than 3MΩ, the insulation is in good condition. If the insulation is faulty, the pointer will stay pointing at the uppermost reading, indicating very little resistance.



Note:

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

Capacity tests can be performed by simply setting the tester to the condenser capacity. The tester should be connected with the condenser in the same way as in the case of the insulation resistance test. Before this measurement, be sure to set the tester correctly. If the reading is within 0.22 μF ±10%, the condenser capacity is correct.

E. Charging System

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

1. Flywheel Magneto

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

This half-wave current charges the battery.

- Day-time charging capacity

  (6V-2AH battery full charge, silicon rectifier in use)

  0.5A or less at 2500 rpm (Battery voltage : 6.5V)

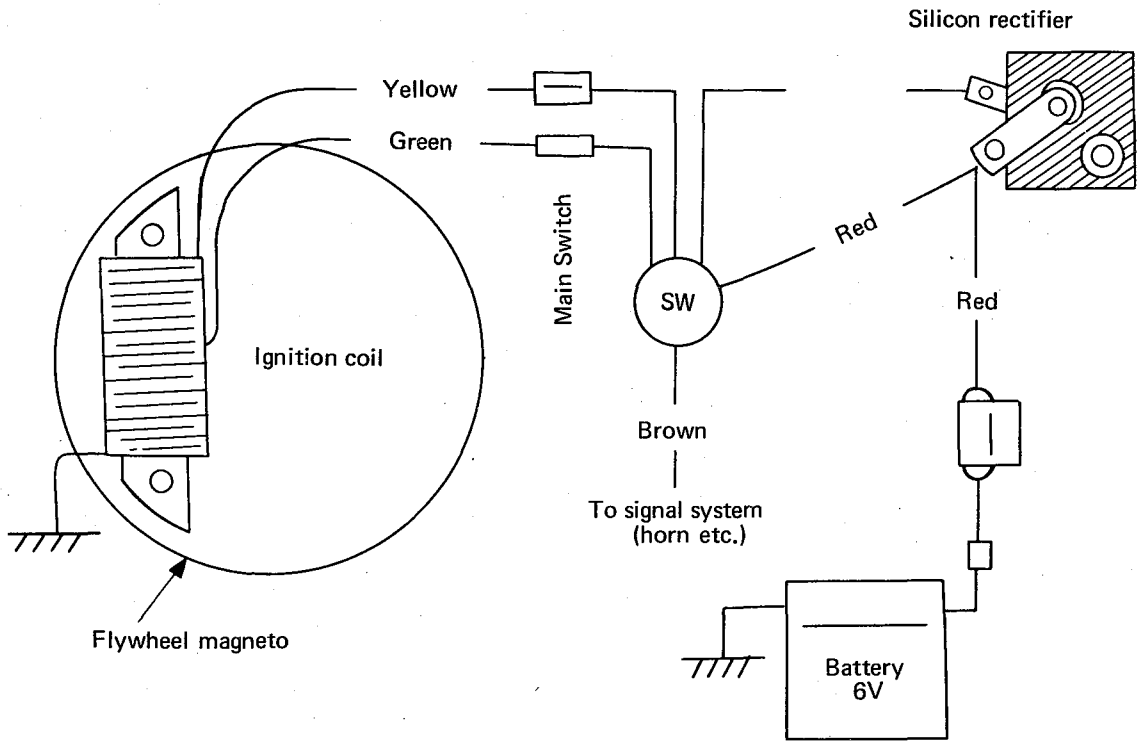
  4.0A or less at 8000 rpm (Battery voltage : 8.5V)

- Night-time lighting capacity (19.5W load in use)

  6.0V or more at 2500 rpm (Battery voltage : 6.5V or less)

  8.7V or more at 8000 rpm (Battery voltage : 7.0V or more)

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



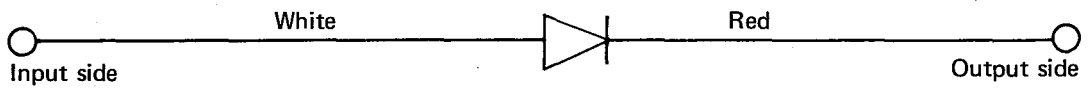
2. Silicon Rectifier

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

Characteristics: Rated output – 3A,

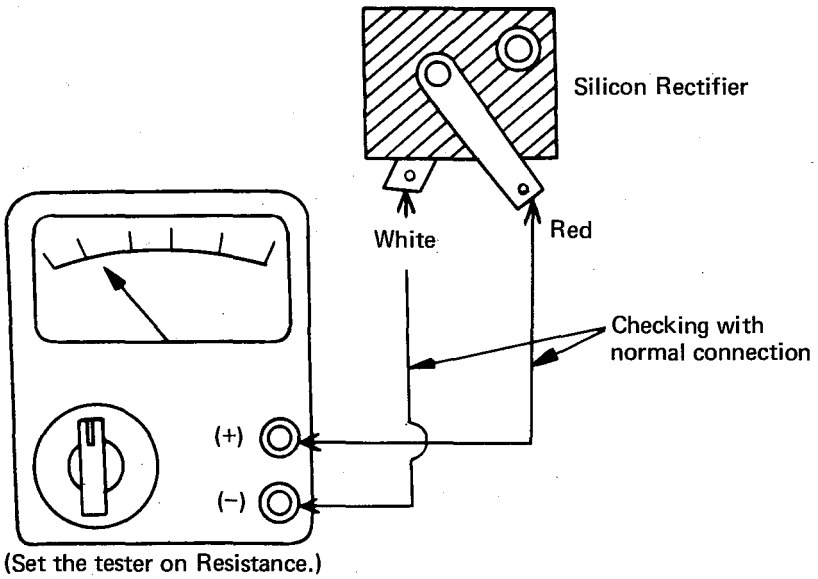
Rated peak inverse voltage 400V

Polarity:



a. Checking the Silicon Rectifier

For measurements, an ohmmeter can be used.



b. Checking with Normal Connection

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

Standard value: 9 ~ 10Ω

If the tester's pointer will not swing back over from the scale, the rectifier is defective.

c. Checking with Reversal Connection

Connect the tester the other way around.

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

If the pointer swings, the rectifier is faulty.

d. Operational Note

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

3. Battery

The battery is a 6 volt–2 AH unit that is the power source for the horn and stoplight. Because of the fluctuating charging rate due to the differences in engine R.P.M.s, the battery will lose its charge if the horn and stoplight are excessively used. The charging of the battery begins at about 2,500 R.P.M. Therefore, it is recommended to sustain engine R.P.M.s at about 3,000 to 4,000 R.P.M. to keep the battery charged properly. If the horn and stoplight are used very often, the battery water should be checked regularly as continuous charging will dissipate the water. If the battery will not retain a charge (and the battery is in good condition) the White/Red wire of the flywheel magneto can be connected to the green wire of the wiring harness. This will increase the charging rate. But if the machine is ridden for long periods of time at high speeds with this wiring connection, the battery may be overcharged and damaged.

a. Checking

1) If sulfation occurs on plates due to lack of battery electrolyte, showing white accumulations, the battery should be replaced.
2) If the bottoms of the cells are filled with corrosive material falling off plates, the battery should be replaced.
3) If the battery shows the following defects, it should be replaced.
   - ○ The voltage will not rise to a specific value even after long hours charging.
   - ○ No gassing occurs in any cell.
   - ○ The 6V battery requires a charging current of more than 8.4 volts in order to supply a current at a rate of 1 amp. per hour for 10 hours.

b. Service Life

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

1) Negligence in re-filling the battery with electrolyte.
2) Battery being left discharged.
3) Over-charging by rushing charge.
4) Freezing.

5) Feeding of water or sulfuric acid containing impurities when re-filling the battery.

c. Storage

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

1) Recharge the battery.

2) Store the battery in a cool, dry place, and avoid temperatures below 0°C (32°F).

3) Recharge the battery before mounting it on the motorcycle.

d. Service Standards

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

4. Checking the Main Switch (removed from the chassis)

Key "O" position (Off)

Black ↔ Switch body

Key "I" position (for day)

Green ↔ White

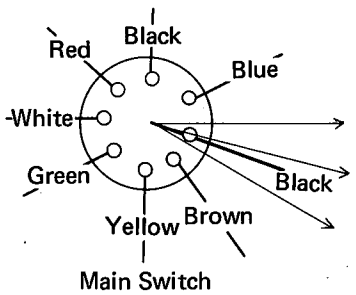
Red ↔ Brown

Key "II" position (for night)

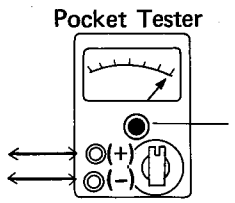
Yellow ↔ White

White ↔ Blue

Red ↔ Brown



Main Switch



(Switch on the tester and use an ohmmeter.)

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

5. Spark Plug

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

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

   a. Best . . . When the porcelain around the center electrode is a light tan color.

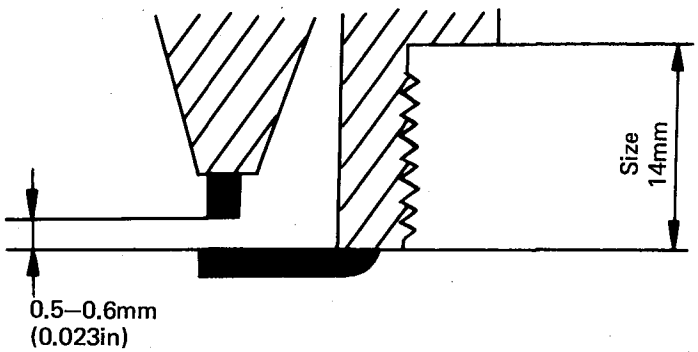
   b. If the electrodes and porcelain are black and somewhat oily, replace the plug with a hotter-type for low speed riding.

   c. If the porcelain is burned white and/or the electrodes are partially burned away, replace the plug with a colder-type for high speed riding.

2) Inspection

   Instruct the rider to:

   Inspect and clean the spark plug at least once a month or every 1,000 km (600 miles). Clean the electrodes of carbon and adjust the electrode gap to 0.5 ~ 0.6 mm (0.023 in.). Be sure to use standard B-7HS plug as replacements to avoid any error in reach.



F. Lighting and Signal Systems

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

1) Head Light

The head light has two 6V, 15W bulbs, and a 6V, 3W neutral pilot light on its top. A beam directing adjusting screw is fitted on the right side of the light rim so that the horizontal direction of the beam can be adjusted (not vertically).

2) Tail Light and Stop Light

A 6V, 3W tail light and a 6V, 10W stop light are mounted. The lens of the tail light is provided with reflectors on its three sides—rear, right and left.

3) Horn

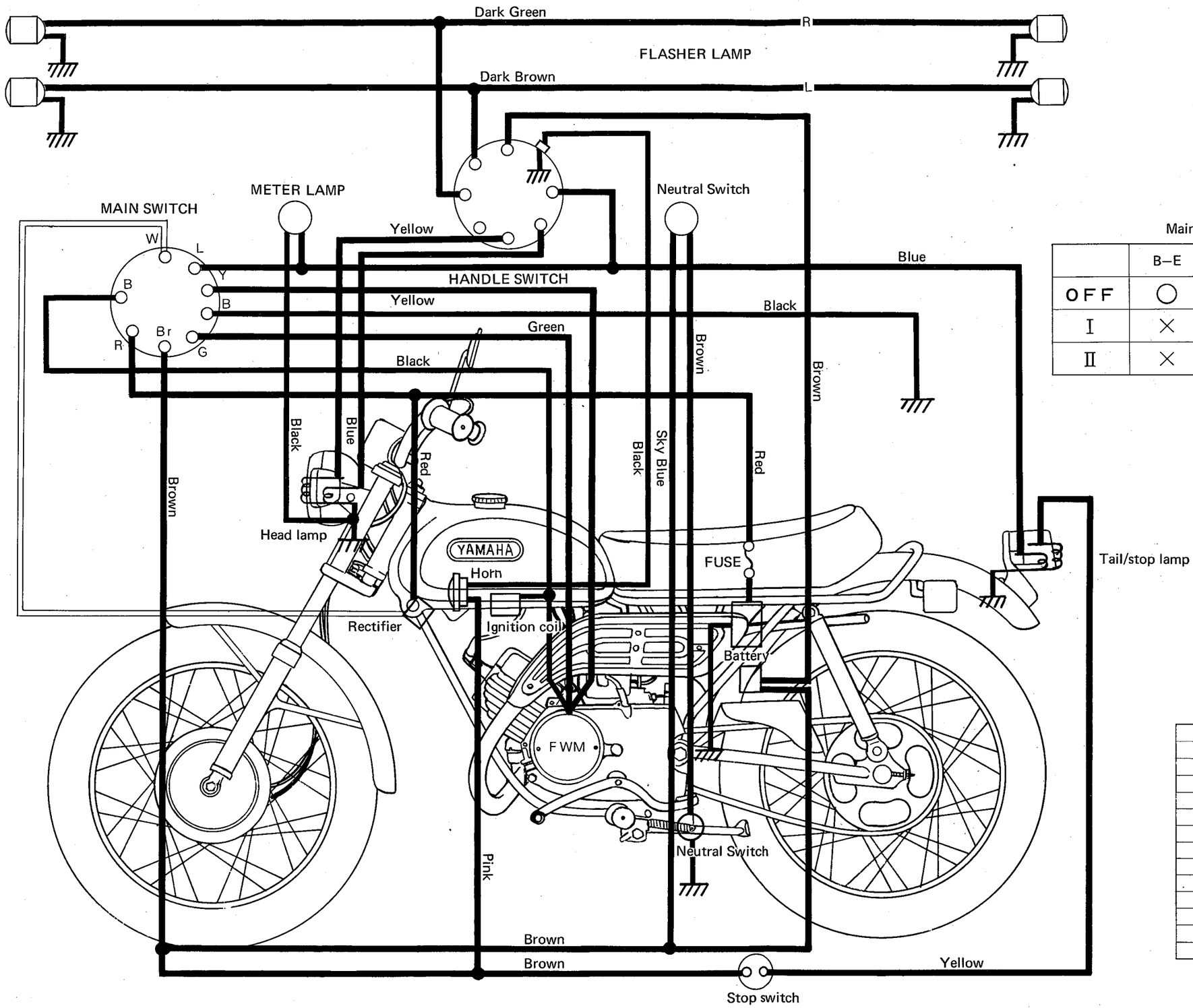
The horn is a 6V, flat type, and has a tone-volume adjusting nut on its back.

After adjustment is made, apply paint or lacquer to the nut for water proofing purposes.

4) Speedometer

A circular type speedometer is mounted on the bracket. For illumination, a 6V, 1.5W bulb is provided.

YAMAHA MINI ENDURO 60JT1 CIRCUIT DIAGRAM

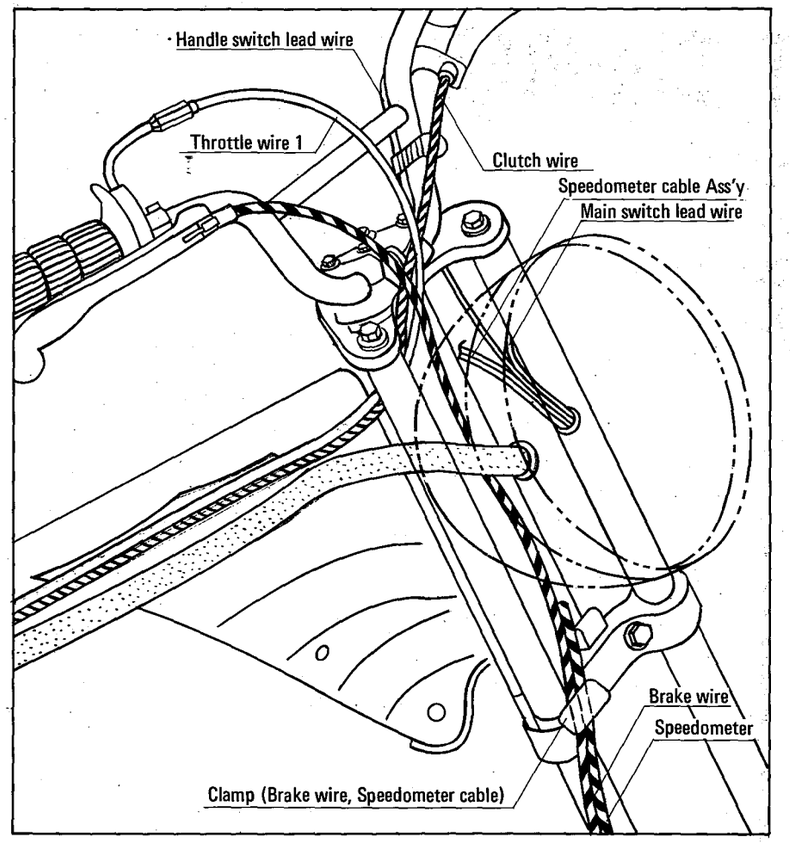


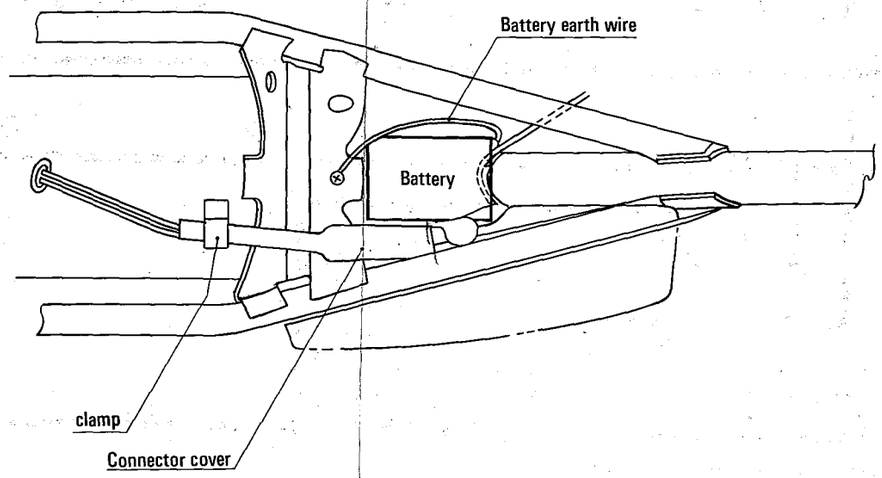
Main Switch connecting

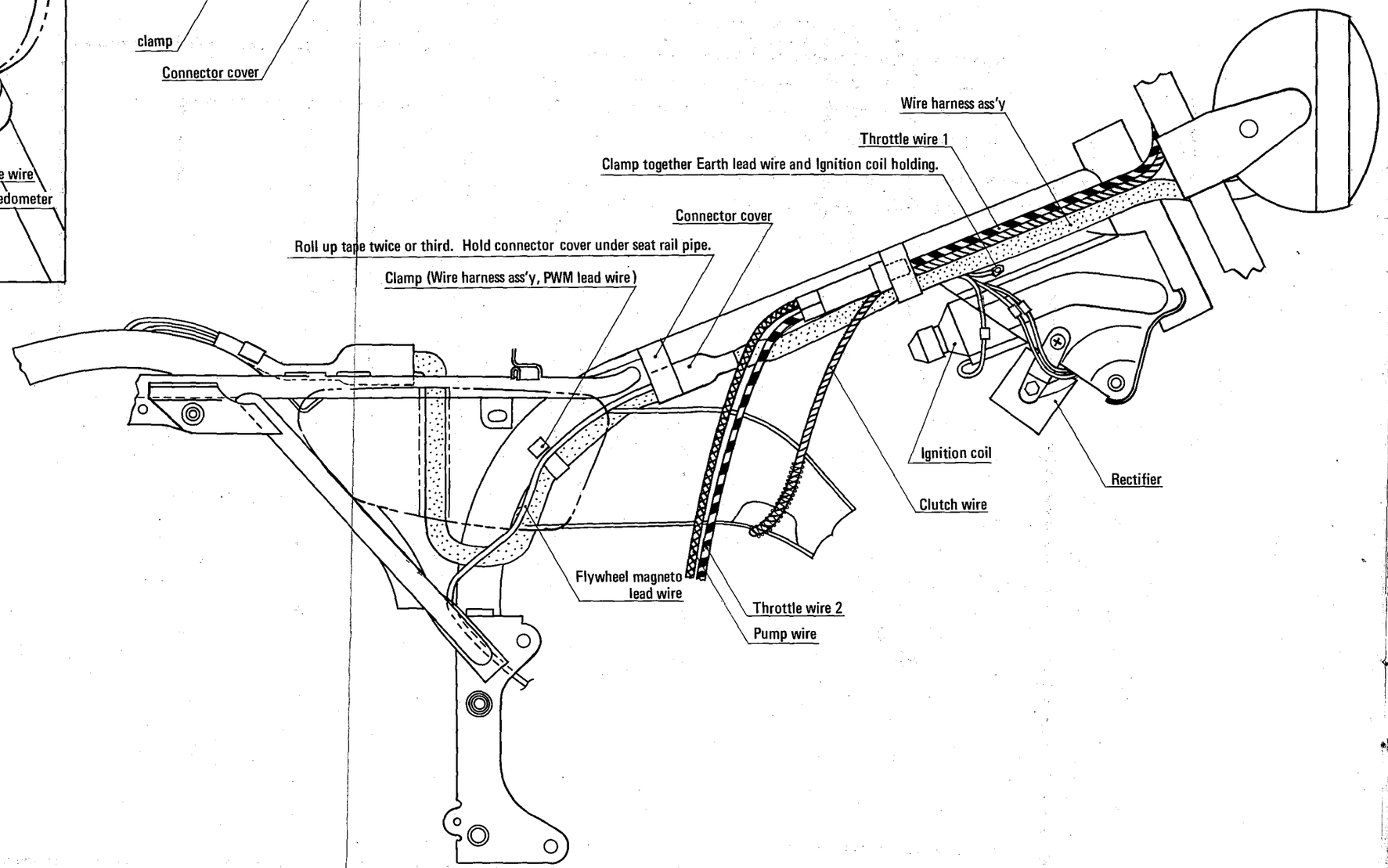
	B–E	R–Br	G–W	W–Y–Bl
OFF	○	×	×	×
I	×	○	○	×
II	×	○	×	○

chart of wire colors

Head lamp main circuit	Yellow
Magneto nighttime charging circuit	Yellow
Stop lamp circuit	Yellow
Lighting circuit	Blue
Tail lamp circuit	Blue
Common circuit	Brown
Earth circuit	Black
Ignition primary circuit	Black
Magneto daytime charging circuit	Green
Battery (+) circuit	Red
Horn circuit	Pink
Flasher lamp (Right) circuit	Dark Green
Flasher lamp (Left) circuit	Dark Brown
Newtral lamp circuit	Sky Blue


Handle switch lead wire
Throttle wire 1
Clutch wire
Speedometer cable Ass'y
Main switch lead wire
Brake wire
Speedometer
Clamp (Brake wire, Speedometer cable)


Battery earth wire
Battery
clamp
Connector cover


Wire harness ass'y
Throttle wire 1
Clamp together Earth lead wire and Ignition coil holding.
Connector cover
Roll up tape twice or third. Hold connector cover under seat rail pipe.
Clamp (Wire harness ass'y, PWM lead wire)
Ignition coil
Rectifier
Clutch wire
Flywheel magneto lead wire
Throttle wire 2
Pump wire

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