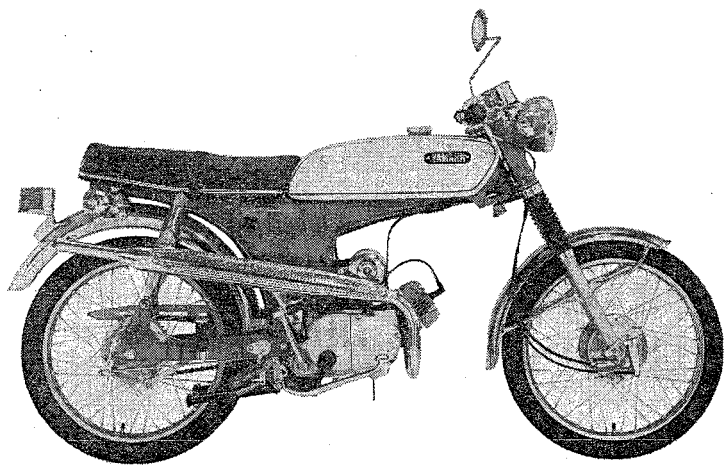
YAMAHA

Supplementary Service Information for New Model

MODEL 50 FS1



YAMAHA MOTOR CO., LTD.

FOREWORD

Yamaha has released a new 50 cc FS1, which is a long-awaited sportster equipped with a 5-speed transmission.

Despite its small-sized engine, the FS1 is superior in high speed performance. In addition, it has numerous features in appearance, such as stream lined fuel tank, separate speedometer, compactly-built engine and increased number of chrome-plated parts.

On the other hand, design emphasis is laid on smooth and safe riding on the streets.

This Supplementary Service Information contains the most essential technical data required for your service and sales activities.

The FS1 is common in many parts with its predecessors F5S and F5C. For details, refer to the Service Manual of the F5 and J5.

YAMAHA MOTOR CO., LTD.

Service Division

I. FEATURES

1. Rotary Valve Engine with 5-speed Transmission

Equipped with a proven compact rotary valve engine and 5-speed transmission, this new Yamaha fifty FS1 gives for greater power more than the 50cc machine. It is superbly agile, with quick acceleration and steady performance.

2. Reliable Yamaha Autolube

Like every other Yamaha model, the Yamaha FS1 also employs the world-renowned Autolube. It automatically meters oil to the engine on demand, depending on speed and load.
Thus, lubrication is extremely thorough and economical.

3. Starter-jet Built-in Carburetor

The starter-jet equipped carburetor makes starting easy even in the coldest season.

4. Convenient Primary Kick Starter

The primary kick starter enables the engine to be started with the transmission in any position. This is a welcome convenience to the rider in heavy traffic.

5. Stable Braking

Waterproof, dustproofbrake drums employed for both front and rear wheels provide stable, fade-free braking on wet or dusty roads.

6. UniqueDesign

The stream lined design, including the fuel tank, compact engine, and separate speedometer, brings a new racer "image" to the street. Adding to a touch of extravagant luxury are the chrome-plated flasher lights, front and rear fenders, and buffed front and rear hubs.

7. Safety Equipment

For the sake of the rider's safety, larger-sized headlight and flahser lights are employed, along with ball-joint back mirror. Another improvement is a symmetrical double-edged key which is desinged to serve a main and steering lock key.

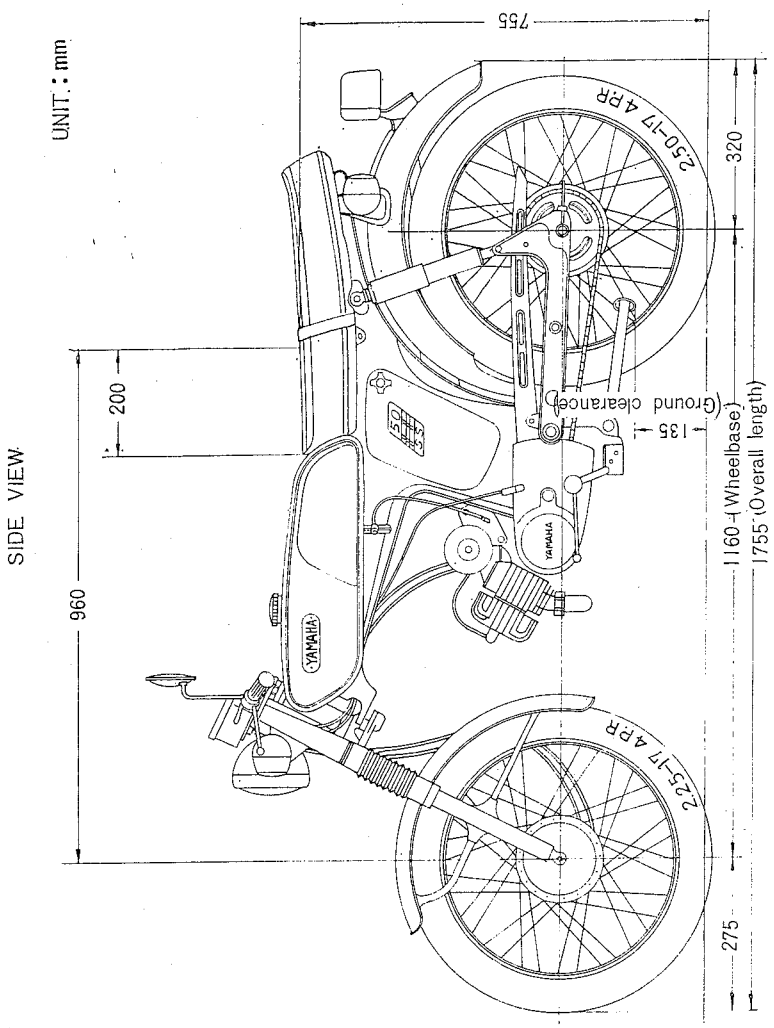
Ⅱ SPECIFICATIONS AND PERFORMANCE

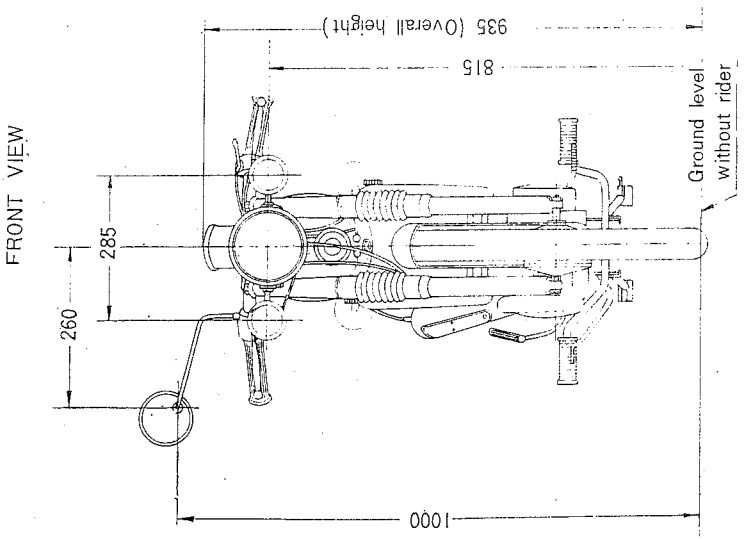
The following data subject to change without notice.

MODEL	50 FS1
Dimensions:	
Overall length	1,755 mm (69.1 in.)
Overall width	555 mm (21.9 in.)
Overall height	935 mm (36.8 in.)
Wheelbase	1,160 mm (45.7 in.)
Ground clearance	135 mm (5.3 in.)
Weight:	
Net	70 kg (154 lbs.)
Gross	77 kg (170 lbs.)
Performance:	
Max. speed	95 km/h (59 mph)
Fuel consumption	80 km/liter at 30 km/h (188 mpg at 19 mph)
Climbing ability	18 degrees
Minimum turning radius	1,800 mm (70.9 in.)
Braking distance	7 m at 35 km/h (23.0 ft. at 22 mph)
Acceleration performance (0-200 m)	13.15 sec.
Engine:	
Type	2-stroke, air cooled, forward inclined.
Cylinder	Single
Displacement	49 cc (2.99 cu. in.)
Bore × Stroke	40 × 39.7 mm (1.575 × 1.563 in.)
Compression ratio	6.8 : 1
Max. output	6 HP/9,000 rpm
Max. torque	0.5 kg-m/8,000 rpm (3.6 ft-lbs/8,000 rpm)
Starting system	Kick starter
Ignition system	Flywheel magneto
Carburetor:	VM16SC × 1
Air Cleaner:	Dry, paper filter
Transmission:	
Clutch	Wet, multi-disc
Primary reduction system	Helical gear
Primary reduction ratio	3.895 (74/19)

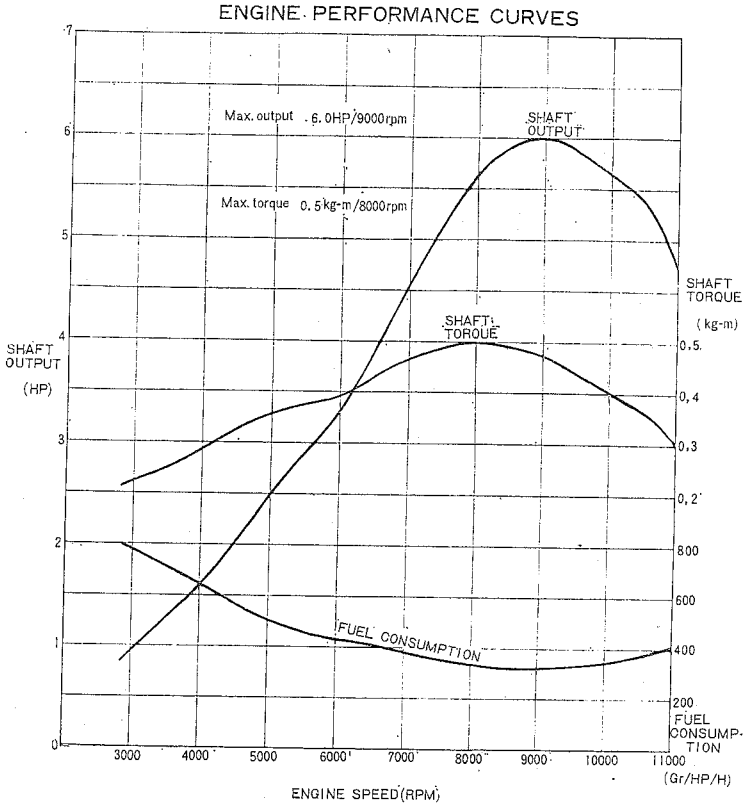
Gear box:	
Type	Constant mesh, 5-speed forward
Reduction ratio 1st	3.417 (41/12), Total reduction ratio-37.070
Reduction ratio 2nd	2.059 (35/17), Total reduction ratio-22.337
Reduction ratio 3rd	1.476 (31/21), Total reduction ratio-16.016
Reduction ratio 4th	1.167 (28/24), Total reduction ratio-12.658
Reduction ratio 5th	1.000 (26/26), Total reduction ratio-10.850
Secondary reduction system	Chain
Secondary reduction ratio	2.786 (39/14)
Chassis:	
Type of frame	Pressed steel back bone
Suspension system, front	Telescopic
Suspension system, rear	Swing arm
Cushion system, front	Coil spring, oil damper
Cushion system, rear	Coil spring, oil damper
Steering system:	
Steering angle	45 degrees both right and left
Caster	68.5 degrees
Trail	75.6 mm (3.0 in.)
Braking system:	
Type	Internal expansion
Operation method, front	Right hand operation, cable actuated
Operation method, rear	Right foot operation, rod actuated
Tire:	
Tire, front	2.25-17-4PR
Tire, rear	2.50-17-4PR
Tank:	
Fuel tank capacity	6.0 liters (1.6 US gals.)
Oil tank capacity	1.4 liters (1.5 US qts.)
Generator:	
Model	FAZ-IQL
Manufacturer	Mitsubishi Elec., Hitachi
Spark plug:	B-8HC
Battery:	
Model	BST2-6
Capacity	6V 4AH
Lights:	
Headlight	6V 15W/15W
Taillight	6V 3W
Stop light	6V 10W
Flasher light	6V 8W×4
Meter light	6V 1.5W
Neutral pilot light	6V 3W

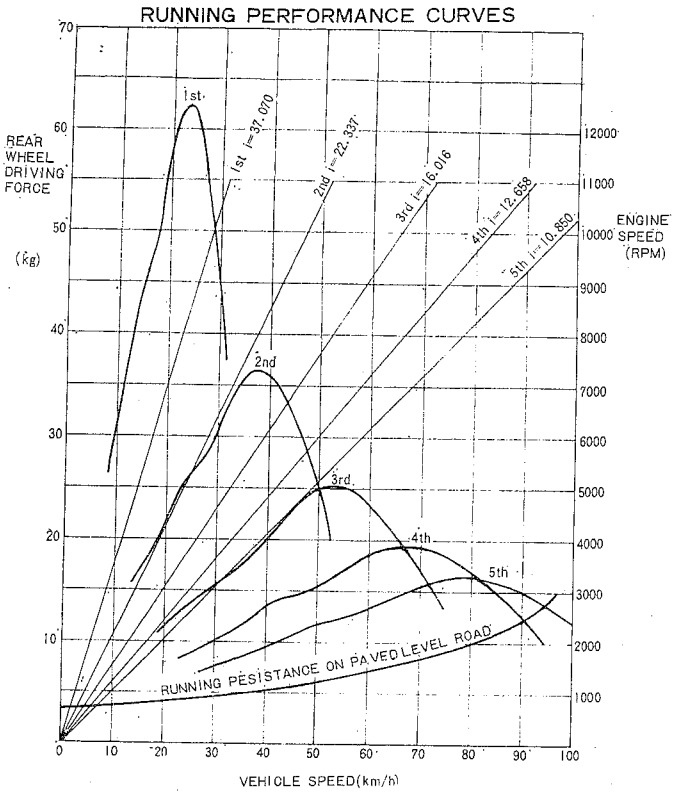
Ⅲ EXTERNAL VIEW





Ⅳ PERFORMANCE CURVES





V PRINCIPAL MODIFICATIONS

V—1. ENGINE

Parts of new design are used at places in the engine to boost its output. To make it easy to handle the engine, the weight is reduced to as light as 18 kg (39.7 lbs.) (F5S-22kg (48.8 lbs.)), while the width to 245 mm (9.65 in.) (F5S-297 mm (11.7 in.))

1. Cylinder & Piston

1) Cylinder Head

The volume of the combustion chamber is changed as follows:

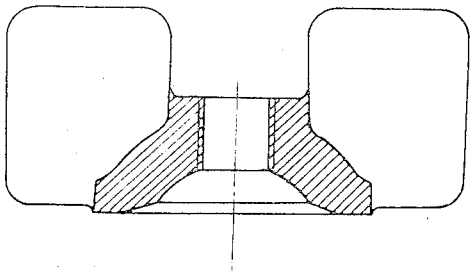


Fig. 5—1—1

Volume of combustion chamber with spark plug mounted

F5S.....6.0 cc

FS1.....5.4 cc

2) Cylnder

The port timing is improved to meet requirements of high speed performance, as compared with the F5S.

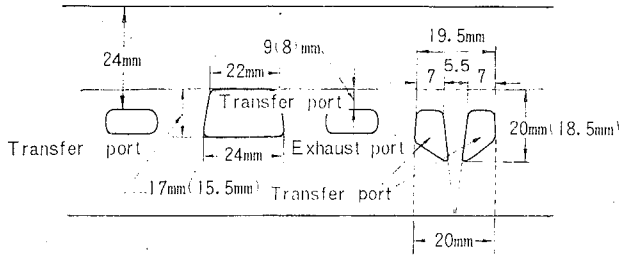


Fig. 5—1—2

The figure in parentheses denotes the port timing of the F5S.

3) Valve

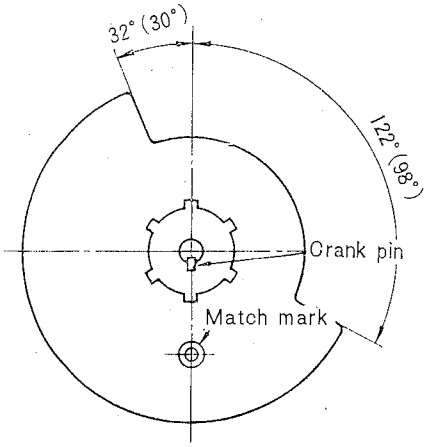


Fig. 5—1—3

The figure in parentheses denotes the port timing of the F5S. The strengthing ring, which was used in the valve where the cranksahft is inserted, is no longer in use. Only bakelite is used.

Note on assembling:

Align the match mark of the valve with the locating pin on the crankshaft as shown in the figure to the left.

4) Piston and Piston Rings

Specially designed for many hours of continuous high speed riding, both piston and rings are of the Keystone type, featuring less carbon build-up.

2. Air Cleaner

The air cleaner is of a cylindrical type, which has already become familiar to Yamaha fans. Except for the length, it is exactly the same as that of the F5S. Length is shorter 15 mm to match the shape of the muffler, and as a result, the air cleaner is not interchangeable with that of the F5S.

3. Crankcase (left) and Crankcase Cover (left)

To make the engine assembly compact, both crankcase (left) and crankcase cover (left) are exclusive parts for the FS1.

4. Muffler and Protector

Because of the narrower width of the engine, the muffler assembly (exhuast pipe is made in one piece assembly with the muffler) differs in profile from those of the F5C and the F5S.

The protector is also new in design.

Both silencer and muffler stay are similar in type to that of the F5C.

5. Kick Starter

The kick starter is designed to engage with the gear only when the kick pedal is kicked, as in the case of the F5S and F5C, and therefore, parts are interchangeable with those for these two models.

The kick crank is the same in type as that of the YL1.

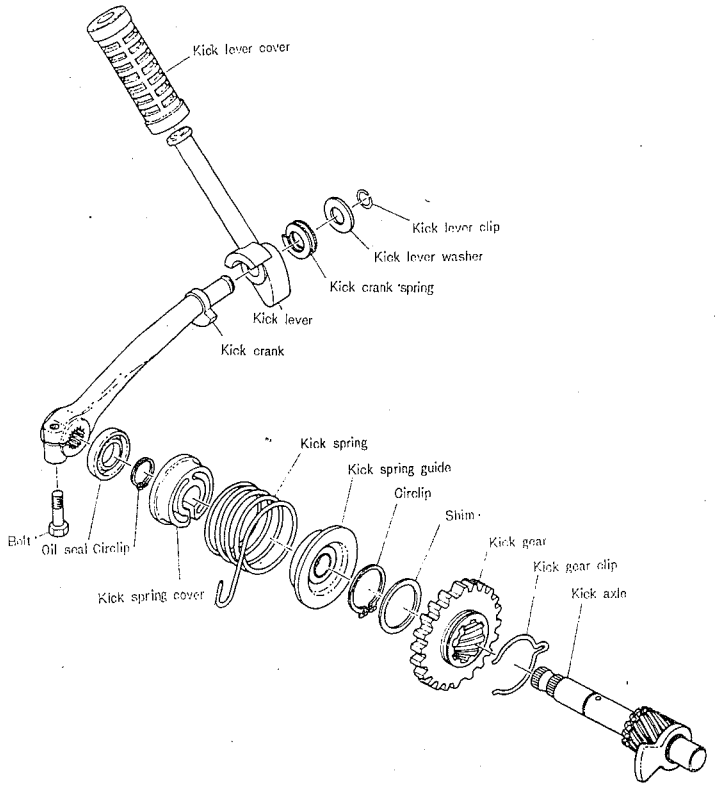


Fig. 5—1—4

6. Transmission Assembly

The transmission is designed for 5-speeds. The employment of new parts permits the engine to be built compactly with this transmission.

To assemble components parts, refer to the following drawing.

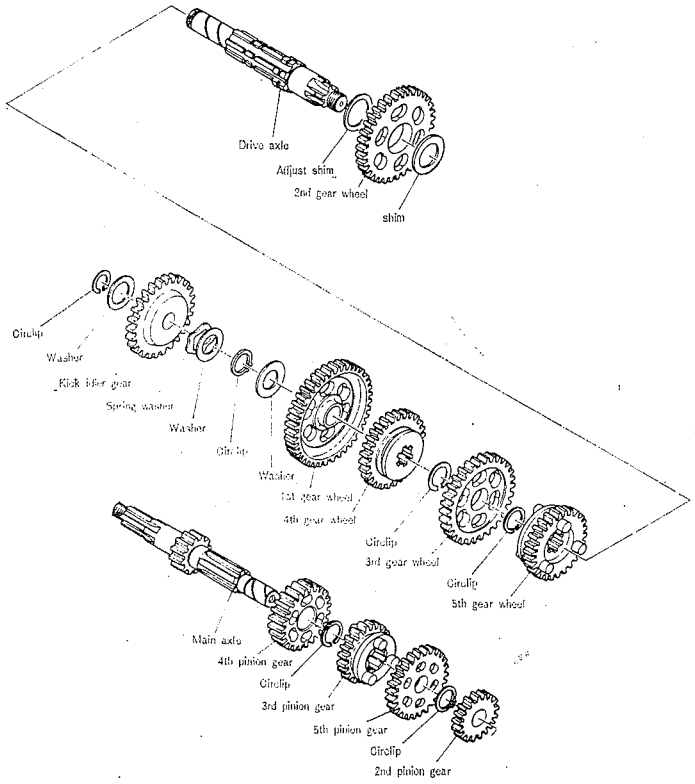


Fig. 5—1—5

7. Shifter Assembly

The drum type shifter allows the smooth shifting of gears.

8. Clutch Assembly

To reduce the weight, the number of component parts is decreased as follows.

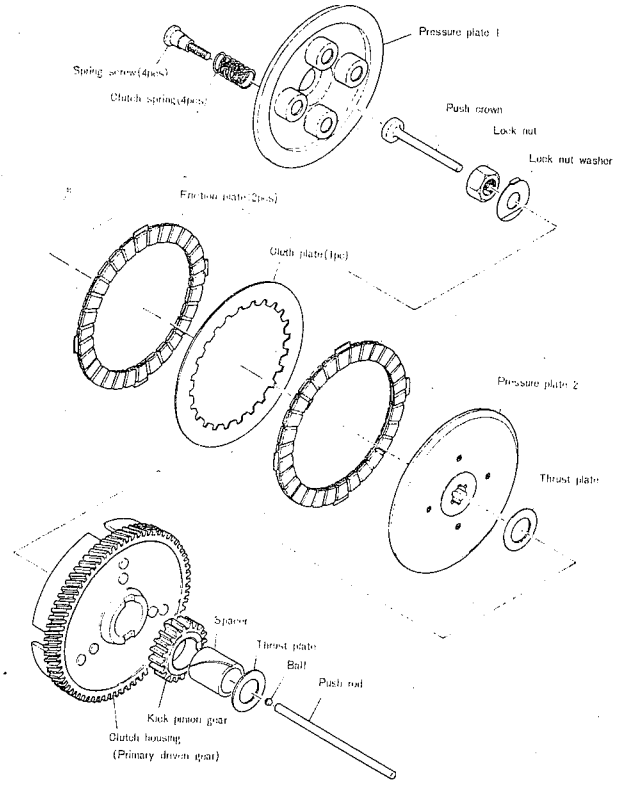


Fig. 5—1—6

V—2. CHASSIS

With the compact design of the engine, improvements are made aimed at ease of handling and riding as well as at a refined sports styling.

1. Front Fender/Rear Fender

Both front and rear fenders are chrome-plated to give deluxe appearance.

They differ in profile from those for the F5C and F5S, and the procedures for installation are also different, but they are interchangeable with those for these models.

(The front fender is a little)(shoter. Some consideration is required when it is used for other model.)

2. Rear Arm and Rear Cushion

Both rear arm and rear cushion are the same in design as those for the F5C. (The tension of the cushion is the same as in the case of the F5 and F5S, but the size of fittings differ.)

3. Chain Case

The chain case is of new design.

4. Fuel Tank and Dual Seat

New design of parts is employed to assure the smart profile as a truly racer.

On the F5C and F5S, the fuel tank and dual seat are installed as a unit assembly.

5. Front Wheel

The front wheel is the same in design as those for the F5 and F5S, and finished with baffing to give a touch of deluxe.

6. Rear Wheel

The rear wheel is the same in design as the F5C, except for the sprocket wheel. The hub is finished with baffing.

7. Main Stand

The main stand is the same in design as the F5.

8. Frame Complete

Because of the engine being smaller in width, the engine bracket is newly designed. The rest is the same as the F5C, but the frame complete is not interchangeable with that of the F5C.

9. Brake Pedal and Foot Rest

Because of the narrower width of the engine, both brake pedal and foot rest are not interchangeable with those for other models.

10. Handle Grips

The handle grips are the same in design as those of the YAS1. The handle bar is available in three types; upswept, semi-up and F5C type with bridge.

11. Front Fork Assembly

1) Steering Lock Key

The steering lock key is also usable as the main switch key. (It is double-edged symmetrically.) The key is designed exclusively for the FS1.

2) The pitch (front fork width) differs from the F5S and F5C.

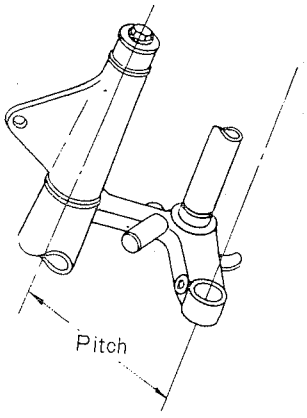


Fig. 5—2—1

FS1 pitch—148.2 mm

F5S pitch—156 mm

V—3. ELECTRICAL EQUIPMENT

1. List of Electrical Parts

Part	Maker	Description	Usable for
Engine:			
Flywheel magneto	Mitsubishi Elec. Hitachi	FAZ-1QL F11-L40 ○Spraking 7 mm or more/500 rpm 8 mm or more/5,000 rpm ○Charging (day time) 0.5 A or more/2,500 rpm (Battery voltage - 6.5V) 4 A or less/8,000 rpm (Battery voltage - 8.5V) ○Ignition 6.0V or more/2,500 rpm (Battery voltage 8.5V) 8.7V or less/8,000 rpm (Battery voltage 7.0V) ○Contact point 0.3-0.4 mm (point gap)	
Spark plug	NGK	B-8HC	
Neutral switch	Asahi Denso	YN-9	YL1
Frame:			
Battery	Furukawa Btry. Yuasa Btry.	BST2-6, 6 V, 4 AH	
Main switch	Asahi Denso	FS1M-002 (OFF, daytime, and night)	
Silicon rectifier	Fuji Elec.	CD2-H/1	F5, J5
Horn	Nikko Metal	MF6	F5, J5
Iginition coil	Mitsubishi Elec. Hitachi	HP-B1 CM61-14B	F5, J5
Flasher relay	Showa Denki	B-9, 6V, 8W×2+3W Flashing 50-120/min.	F5C
Fuse holder	Osachi	10 A, 2 pcs.	F5, J5
Stop switch	Asahi Denso	YS10	F5, J5, G5
Front:			
Headlight	Koito	6V, 15W/15W	
Speedometer	Nippon Seiki	YA127	

Front flasher light	Imasen Elec.	FLF-Y207, 6V, 8W	F5, J5 (chrome-plated)
Handle lever holder (right)	Asahi Denso	YG6H (for YL1 bar handle)	YLI
Handle lever holder (left)	Asahi Denso	YG6H (for YL1 bar handle)	YLI
Rear: Taillight	Stanley	6V, 3W	F5, J5
Stop light	Stanley	6V, 10W	F5, J5
Rear flasher light	Imasen Elec.	FLR-Y207, 6V, 8W	F5, J5 (chrome-plated)

2. Principal Modifications

1) Main Switch Assembly

For convenience of the rider, the main switch key is made usable as the steering lock key, with symmetrical double-edge design. It is exclusively for the FS1.

2) Flasher Light

For additional safety, the flasher lights are made larger, and chrome-plated.

3) Speedometer

The speedometer is mounted separately from the headlight, and at the same time, design consideration is given for functional beauty.

3. Connection Diagram

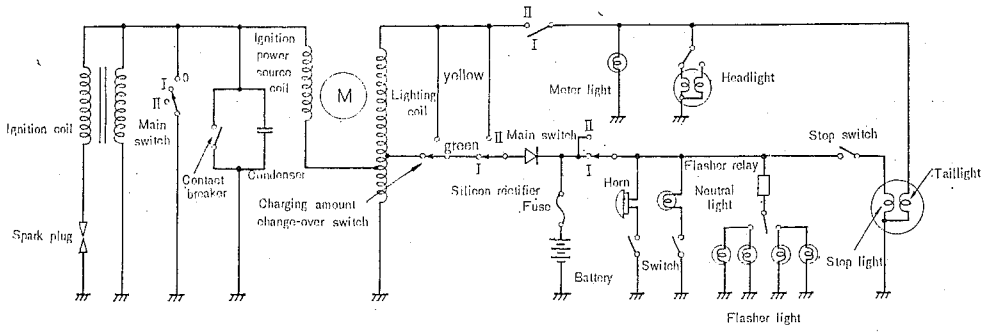


Fig. 5—3—1

4. Checking of Parts

1) Ignition Timing Adjustment

The correct ignition timing can be assured simply by adjusting the maximum point gap to the specified value (0.30 - 0.40 mm).

It is noted that there is another way of adjusting the ignition timing by use of the electrotester timing light and the match markings.

2) Ignition Coil

Ae shown Fig. 5-3-2, connect the wires for checking.

1. Primary ignition coil resistance 0.6Ω ± 10%
2. Secondary ignition coil resistance 5kΩ ± 10%

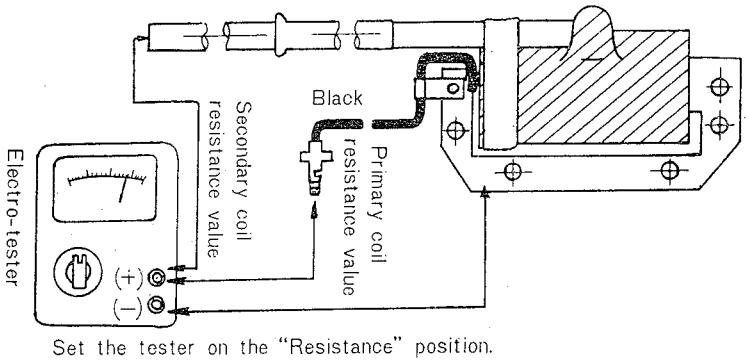


Fig. 5—3—2

Note: If the secondary coil resistance is measured with the plug cap installed, a 5 kΩ of internal resistance (for noise elimination) will be added to the value.

Sparking

Sparks should be 7mm or more, with a battery of 6V capacity.

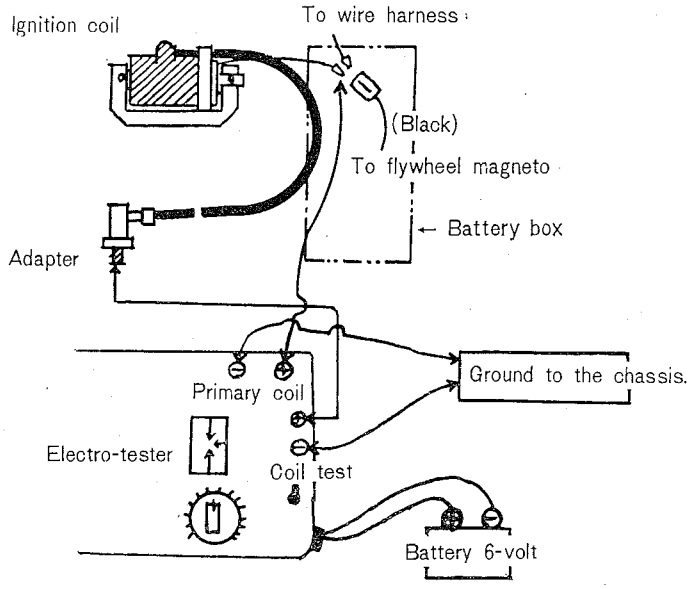


Fig. 5—3—3

Note: When the coil (removed from the machine) is tested for sparking, connect the negative wires on the primary and secondary sides of the tester to the core bar of the ignition coil. The power source for this test should be a 6-volt battery.

3) Condenser

a. Insulation resistance test

As shown in the figure below, hook up the tester. If the needle fully swings and swing back to stay at 3MΩ, the condenser is in good condition.

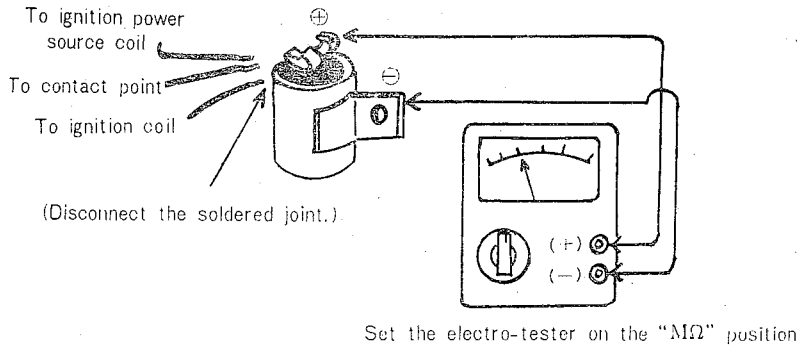


Fig. 5—3—4

Note: After measurement, connect the positive terminal to the negative by a thick lead wire so that the condenser will be discharged.

b. Capacity Test

To test the capacity of the condenser, hook up the tester as shown in the above figure, and then set the tester knob on the same value as the capacity of the condenser.

If the measured value is at 0.22 μF ±10% the condenser is in good condition.

4) Measuring Charging Current

As shown in the figure below, hook up the tester, and measure the charging current with the specified rpm.

0.5 A or more/2,500 rpm. (battery voltage - 6.5V)

4 A or less/8,000 rpm. (battery voltage - 8.5V)

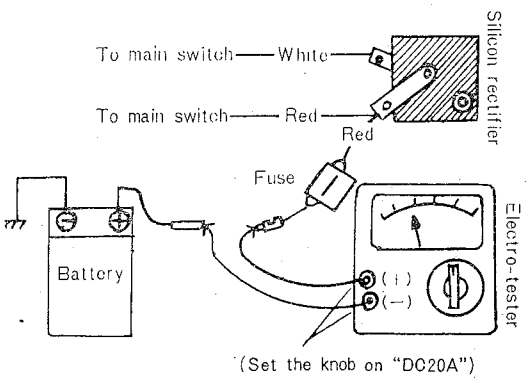


Fig. 5—3—5

Note: The measurement should be conducted with the main switch being set on "daytime," that is, no load, such as neutral pilot light, is consuming electricity.

If the battery voltage differs from the value in parethesis, the charging current will be affected. Therefore, the battery charge should be meaured and adjusted to the specific value before the test.

5) Checking the Silicon Rectifier

Checking with normal connection

As shown in the figure below, hook up the tester for measurement.

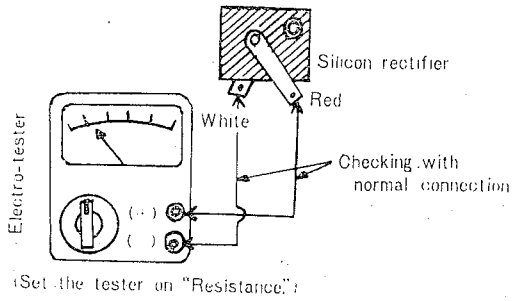


Fig. 5—3—6

Standard Value·····9 - 10Ω

If the needle will not swing at all or not swing back from the over scale, the rectifier is defective.

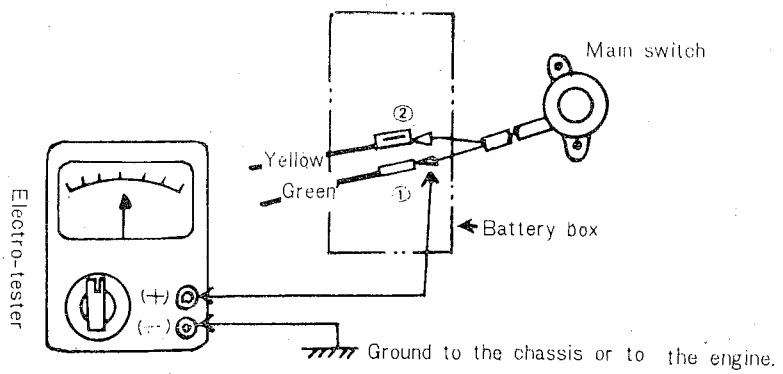
Checking with reversal connection

Check the rectifier with reversal connection.

If the needle will not swing, the rectifier is in good condition.

If the needle will swing, the rectifier is defective.

6) Magneto Output Voltage



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

Fig. 5—3—7

To measure the output voltage during the day time, connect the positive wire of the tester to the green connector in parallel as in the figure above (do not disconnect the connector), and make sure that any voltage can be afected with the switch set on "day-time".

To measure the night-time output voltage, connect the positive wire of the tester with the yellow connector in parallel, and make sure that the voltage is 5.8 volts or more with the engine running at 2,500 rpm.

Be sure that the main switch is set on "night," and no extra light is turned on.

7) Inspecting Wiring and Switch Connection

As shown in the figure below, hook up the tester. If the voltage measured is 5.8 votls or more with engine speed at 2,500 rpm, both wiring and main switch are in good condition. This is applicable for both daytime and night.

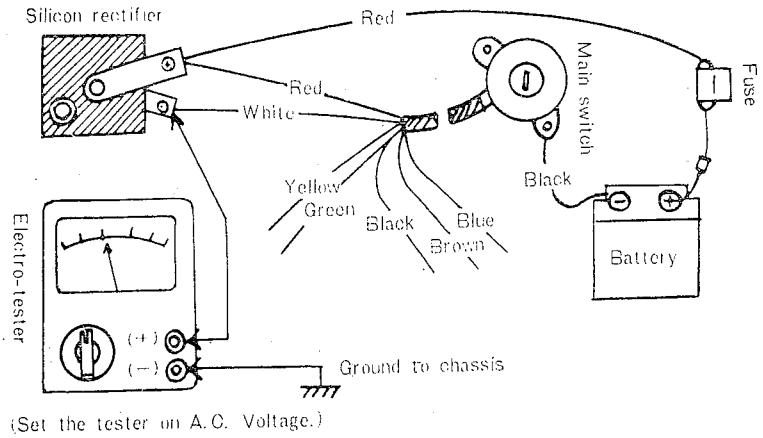


Fig. 5—3—8

8) Checking the Main Switch Removed from the Chassis

Key in "O" (Off.)

Black ←→Switch body

Key in "I" (daytime)

Green ←→White

Red ←→Brown

Key in "II" (night)

Yellow←→White

White ←→Blue

Red ←→Brown

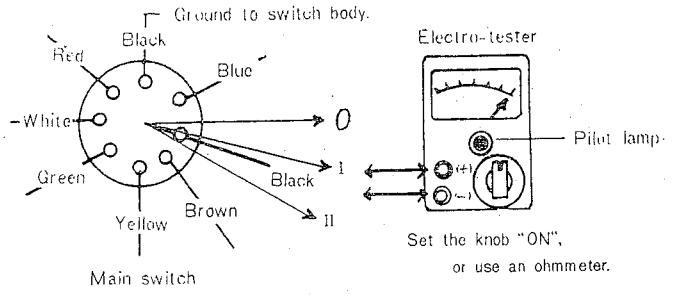


Fig. 5—3—9

The measured resistance at the above six places should be nearly OΩ, and complete insulation should be maintained between terminals, and between each lead wire and switch body.

9) Battery Service Data

Battery model:	BST2-6, 6 V, 4 AH	
Maker:	Furukawa Battery or Yuasa Battery	
Electrolyte specific weight	1.26 - 1.28	When fully charged.
Electrolyte volume	170 cc	
Initial charging current	25 hours at 0.4 A	New machine
Charging current (afterwards)	13 hours at 0.4 A (Charge so that the specific gravity of electrolyte will be 1.26–1.28.)	When discharged.
Water to added	Ditilled water (Fill so that the level will reach the maximum.)	Monthly

Ⅵ SERVICE DATA

1. Piston Clearance

0.035—0.040 mm

2. Crankshaft

Crankshaft assembly service data

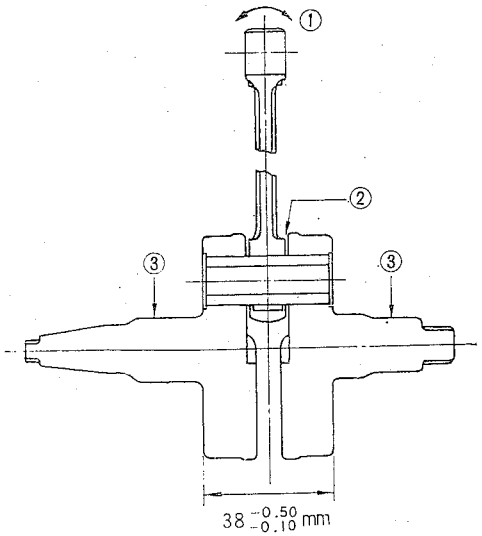


Fig. 6—6—1

1) Axial play at small end of connecting rod

(In order to measure the wear of crank pin and needle bearing at large end)

0.8—1.0 mm

If more than 2.0 mm, replace worn parts.

2) Axial clearance at large end of connecting rod

0.4—0.5 mm

If more than 0.6 mm, replace worn parts.

3) Runout of crankshaft

0.05 mm or less

3. Gear Box Oil

1) Oil: Motor oil SAE 10W/30

2) Oil quantity: 600—650 cc (0.65 US qt.)

4. Oil Pump

1) Minimum stroke: 0.20—0.25 mm (If less than 0.15 mm, adjust with shim.)

2) Adjusting pump and carburetor

The pump adjust pelley guide pin should be aligned with the match mark on the adjusting pulley, when the throttle opens half.

5. Ignition System

1) Spark plug ·····NGK—B-8HC, (Champion—L57R, Bosch—W270T16)

2) Spark plug gap ·····0.5—0.6 mm (0.020—0.024 in.)

3) Ignition timing·····1.8±0.15 mm BTDC

4) Point gap·····0.3—0.4 mm

6. Front Fork

1) Oil: Motor oil SAE 10W/30 or 8:2 mixture of mobile oil #30 spindle oil #60

2) Quantity: Left—135 cc (3.98 f l. oz.) Right—140 cc (4.14 f l. oz.)

7. Caburetor Setting

Model	VM16SC
Marking	260E1
M. J. (Main jet)	160
J. N. (Jet needle)	3G9-3
N. J. (Needle jet)	E-2
C. A. (Throttle valve cut-away)	2.0
P. J. (Pilot jet)	25
A. S. (Air screw backing off)	1.0
G. S. (Starter jet)	60
V. S. (Valve seat)	1.2
Gas level	23.0±1.0 mm
Idling RPM	1,250-1,350 rpm

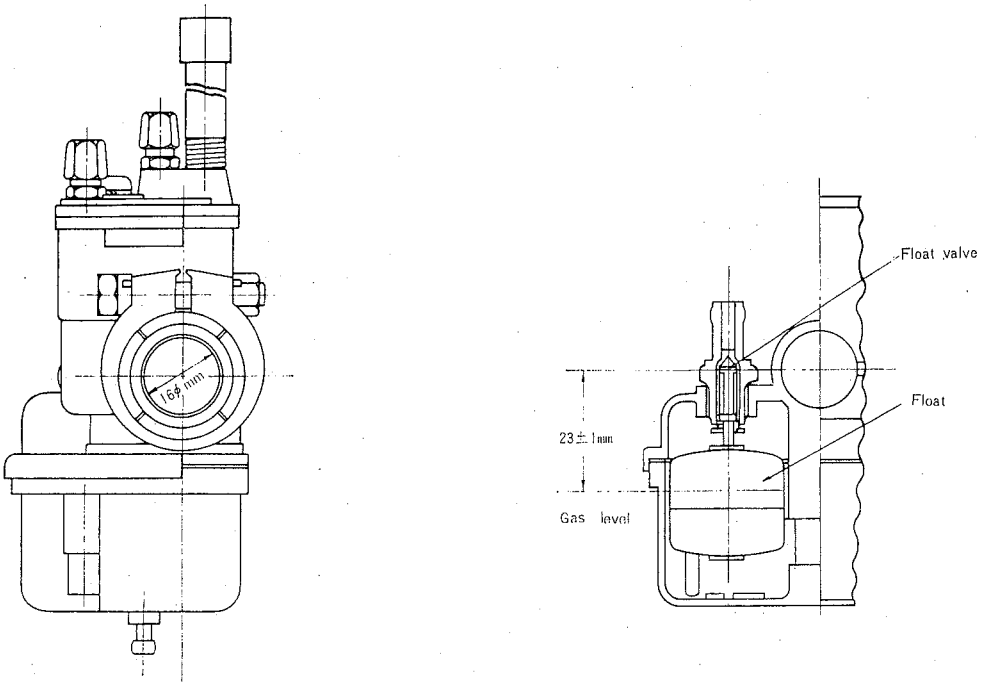
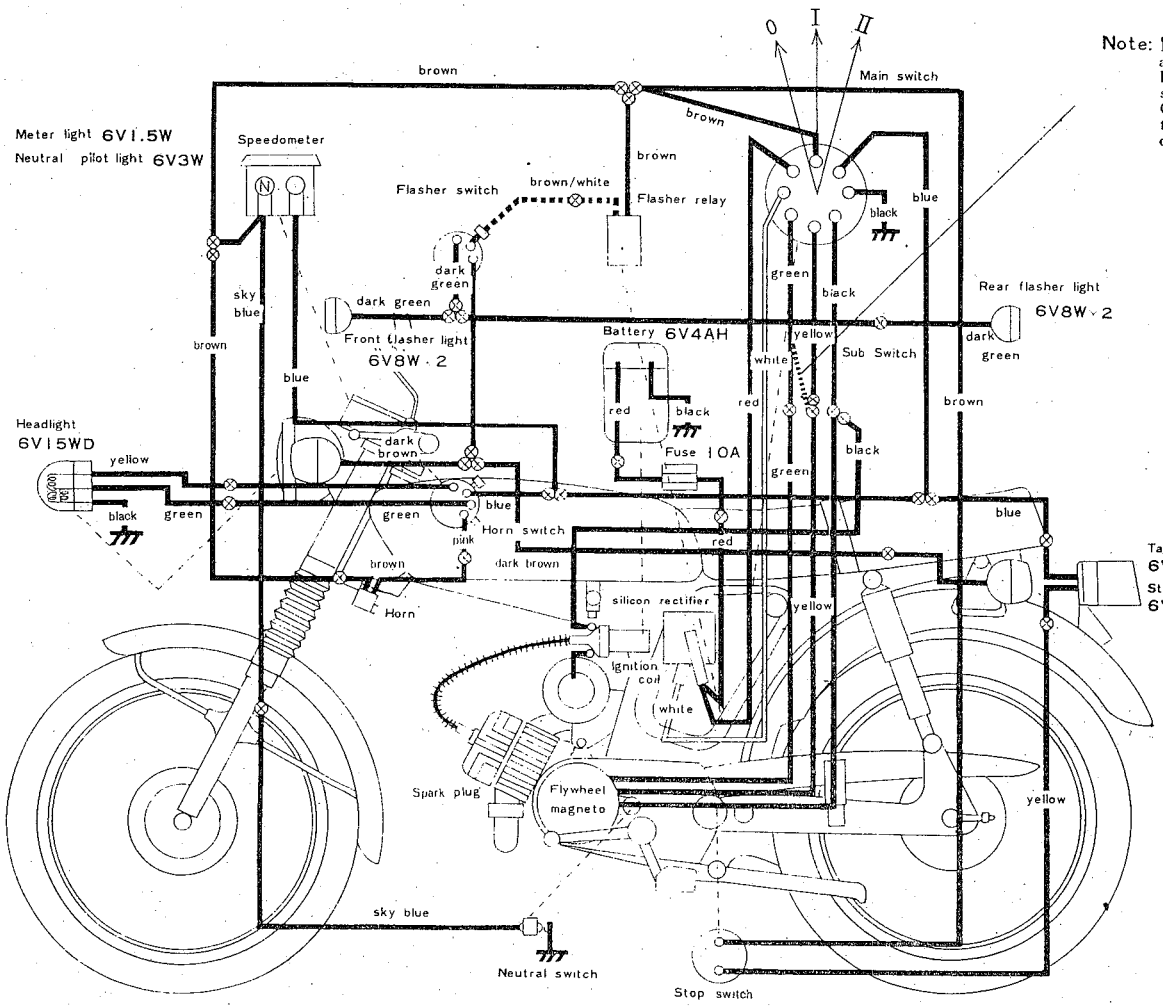


Fig. 6—6—2

Ⅶ WIRING DIAGRAM



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

Circuit connected by main switch

color / position	black-earth	green-white	yelow-white	yellow-blue	Red-brown
0	○	×	×	×	×
I	×	○	×	×	○
II	×	×	○	○	○

Chart of wire colors

Engine Stop Circuit	black
Magnet (for day driving) Circuit	green
Magnet (for night driving) Circuit	yellow
Battery (+) Circuit	red
Earth Circuit	black
Silicon Circuit	white
Stop Light Circuit	yellow
Neutral Light Circuit	sky blue
Light Circuit	blue
Flasher (R) Circuit	dark green
Flasher (L) Circuit	dark brown
Common Circuit	brown
Headlight Main Circuit	yellow
Headlight Sub Circuit	green
Horn Circuit	pink
Flasher Relay Circuit	white /brown



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