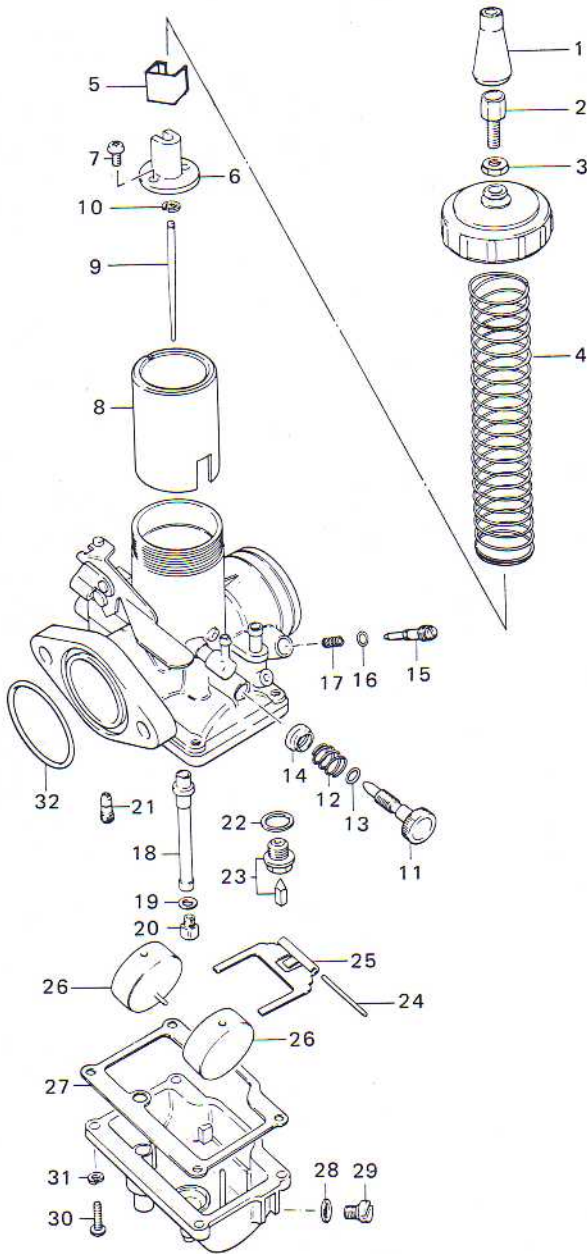


9. CARBURETOR

RL250



- 1. CABLE ADJUSTER COVER
- 2. CABLE ADJUSTER
- 3. NUT
- 4. THROTTLE VALVE SPRING
- 5. CONNECTOR COVER
- 6. CONNECTER
- 7. SCREW
- 8. THROTTLE VALVE CA: 2.0
- 9. JET NEEDLE 5CN6-3
- 10. NEEDLE CLIP
- 11. THROTTLE STOP SCREW
- 12. STOP SCREW SPRING
- 13. O RING
- 14. STOP SCREW COVER
- 15. PILOT AIR SCREW
- 16. O RING
- 17. SPRING
- 18. NEEDLE JET O-6
- 19. WASHER
- 20. MAIN JET # 145
- 21. PILOT JET # 30
- 22. GASKET
- 23. NEEDLE VALVE
- 24. FLOAT PIN
- 25. FLOAT ARM
- 26. FLOAT
- 27. GASKET
- 28. GASKET
- 29. DRAIN PLUG
- 30. SCREW
- 31. LOCK WASHER
- 32. O RING

- OPT. MAIN TET #140
- #150
- #160
- #170

Fig. 9-1. Carburetor exploded view

9-1. Specifications

| | |
|---------------------------|-----------------------|
| Main jet | # 145 |
| Jet needle | 5CN6-3 |
| Needle jet | 0-6 |
| Throttle valve cutaway | # 2.0 |
| Pilot jet | # 30 |
| Pilot outlet | 0.7 mm |
| Pilot air adjusting screw | 1-1/2 turns back open |
| Starter jet | 80 |
| Needle valve seat | 2.5 mm |
| Standard fuel level | 13.7 mm |

9-2. New mechanism

Main jet

The main jet is installed in such a manner as to provide quick and easy replacement from outside by merely removing the jet holder on the under of the carburetor float chamber bottom.

9-3. Overhauling carburetor

In overhauling the carburetor, remove all parts and after washing with clean gasoline, blow about the interior with compressed air. In cleaning out the jets, wire or other sharp objects must never be used as it will disturb the carburetor performance.

9-4. Adjusting carburetor

9-4-1. Idling adjustment

This adjustment must not be performed until the engine has been fully warmed up. First close the pilot air screw fully and at this state, adjust the throttle stop screw so that the engine will be maintaining its lowest speed. Next open the pilot air screw gradually from its fully closed position. This will cause the engine speed to rise, and when the engine reaches its highest speed, set the pilot air screw at this position. Then, drop the engine speed by turning the throttle stop screw, after which turn the pilot air screw and set it at the position where the engine rises once more to the highest speed. By repeating this operation two or three times, proper idling will be obtained.

9-4-2. Air-fuel mixture adjustment

When the air and fuel are not in proper mixture ratio, the engine will develop following symptoms:

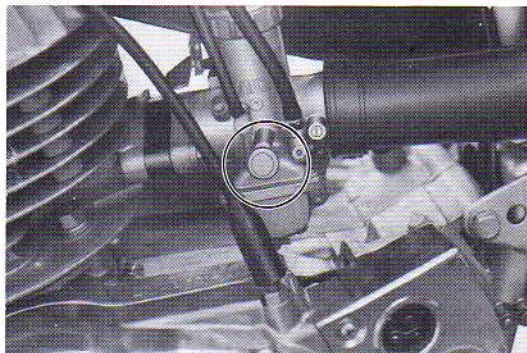


Fig. 9-2. Adjusting throttle valve adjusting screw

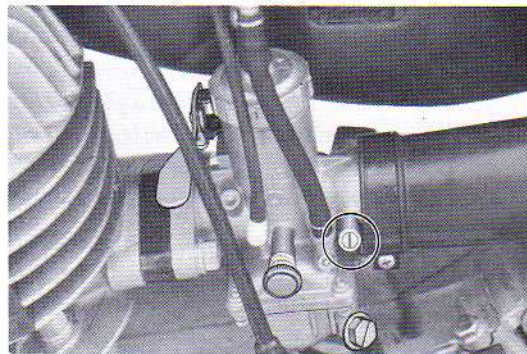


Fig. 9-3. Adjusting pilot air adjusting screw

| Case of Excessive Fuel | Case of Excessive Air |
|---|---|
| Continuance of heavy engine noise Exhaust gas becomes thicker | Engine tends to overheat Engine condition improves when carburetor starter is operated |
| Engine does not revolve smoothly Spark plug fouled to black color Engine runs better with air cleaner removed | Engine r.p.m. fluctuates even if the throttle grip is held steady Spark plug tends to burn out |

After checking whether the mixture is too rich or too lean by observing the engine running condition, examine by means of the throttle grip just the part of the throttle valve opening where the condition is bad. Since carburetor mechanism is such that each function of the carburetor inner parts change in accordance with the throttle valve opening, it is possible by the above method to narrow down on the possible location of the maladjustment and thereby, make adjustment easier.

The causes for improper carburetion and adjustment methods shall be explained by dividing the throttle valve opening into four parts.

(1) Throttle valve opening 0—1/8 (idling speed)

At this opening the fuel metered by the pilot jet mixes with the air adjusted by the pilot air screw and forms a rich mixture, which discharges from the pilot outlet and mixes with the small amount of air flowing through the main bore, and supplied to the engine. The pilot jet is of fixed size, the richness of mixture being controlled by the pilot air screw adjusting the amount of air drawn in, and therefore, the correct adjustment of the pilot air screw becomes the most important point. Clogging by dirt will have many effects on carburetion. The mixture will become too rich if the pilot air inlet, the air passage to pilot jet, or pilot jet bleed hole should become clogged. The mixture may also become too lean if the pilot jet or pilot outlet should become clogged.

In case of clogging, the general correction method would be to wash with clean gasoline and then blow about with compressed air. In removing and installing the pilot jet, use a suitable small plain screwdriver. In cleaning out the jet inside, wire or similar object must never be inserted.

(2) Throttle valve opening 1/8—1/4 (low speed)

At this opening, the slow system and main system operate half and half. The slow system operates in manner similar to that described above, the fuel metered by the pilot jet is mixing with the air adjusted by pilot air screw and discharged from pilot outlet.

In the main system, the amount of fuel discharge is determined by the clearance between the jet needle and needle jet and the size of throttle valve cut-away. Causes of improper carburetion at this opening must be checked at two sources since the fuel is supplied from two different system.

In the main system, the amount of fuel discharge is determined by the clearance between the jet needle and needle jet and the size of throttle valve cut-away.

Inspect the slow system by the same procedure described in (1) above. In the main system, dirt getting into the main jet or needle jet may cause the mixture to become too lean and create poor performance. Possible causes for the mixture becoming too rich and creating poor performance are clogging of air jet and its passage, clogging of needle jet bleed hole, and excessive clearance between needle jet and jet needle due to wear. In case of clogging, correct in same manner as described in (1) above, by washing with gasoline and blowing out with compressed air. If the needle jet and jet needle are worn, try changing the number of clips determining the jet needle position or replace.

(3) Throttle valve opening 1/4—3/4 (Cruising speed)

At this opening, the air metered by the air jet, enters into the needle jet bleed hole to form a suitable mixture in mixing with the fuel passing through the main jet. The mixture is then controlled in the clearance between the needle jet and jet needle and discharged into the main bore. Possible causes for

improper carburetion are clogging of air jet and its passage, clogging of needle jet bleed hole, wear in jet needle and needle jet, and loose main jet or needle jet, which will make the mixture too rich for proper performance. Poor performance due to mixture being too lean may be caused by the needle jet or main jet been clogged. Repair clogging by washing with gasoline and blowing through with compressed air.

(4) Throttle valve opening 3/4—full open (full speed)

At this opening the fuel is discharged from the needle jet. In (3) above, the fuel was controlled by the clearance between the jet needle and needle jet. But when the throttle valve is nearly full open, the jet needle is pulled up higher accordingly so that the clearance between the jet needle and needle jet becomes larger than the sectional area of the hole provided in the main jet, resulting in the fuel being metered by the main jet. Possible causes for poor performance are the clogging of the main or needle jet, making the mixture too lean for proper performance. Clogging of the air jet and needle jet bleed hole and loosening of main and needle jets would cause the mixture to become too rich and create poor performance. If proper carburetion cannot be attained even after checking up on the clogging and loosening adjust the main jet. If the mixture is too rich, replace with smaller size jet and if too lean replace with larger size jet.

In case the main or needle jet is to be removed and reinstalled for cleaning or other causes, the following precautions should be observed.

(a) In handling the needle jet and main jet, use care not to mar or injure their mounting surfaces. Before installing, inspect the O-ring on the needle jet and the needle seat in the float chamber to see that they are not damaged.

(b) Tighten the needle jet at 30–35 kg-cm torque. Take care not to overtighten as the inside diameter will be deformed and affect the performance.

(c) Tighten the main jet at 10–15 kg-cm torque as there will be danger of damages if tightened too strongly.

9-5. Adjusting fuel level

If the fuel in the float chamber is out of the specified height, the mixture may become too rich or too lean. So it is necessary to check and adjust fuel level if necessary, especially when the float and float arm were replaced. The carburetor fuel level of RL250 is adjusted in the following procedure. Hold the carburetor mixing chamber upside-down, while paying attention so that the float arm pin and the float arm may not come off.

If they should come off, fit float arm correctly as shown in Fig. 9-4.

Under this condition, measure the distance as shown in Fig. 9-4 with slide calipers. This measurement indicates float level, and if it differs from S.T.D. (137 mm, 0.54 in), adjustment is required.

When the distance measured is less than S.T.D., bend the tongue up. If it is greater, bend the tongue down by hand.

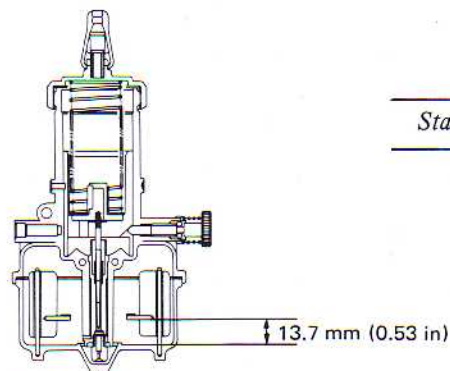


Fig. 9-4. Fuel level

9-6. Inspecting float chamber parts

9-6-1. Float

If gasoline should enter into the float while operating, the fuel level will become higher and will cause improper engine operation. Check the float by holding it in hand and seeing if there is any fuel inside. Replace if defective and also replace if deformed.

9-6-2. Needle valve

Inspect the needle valve visually to see if worn or damaged. If the defect cannot be detected visually hold carburetor mixing chamber body at the same level with its original position and turn it upside down with the needle valve installed and fuel pipe connected to the fuel tank. Allow the valve to close tightly on the valve seat by the weight of valve alone. Under this state, turn the fuel cock lever to "ON" position and if there is no leakage of fuel, the valve is still usable.

9-6-3. Valve spring

If the spring inside the needle should become weakened, gasoline may overflow from float chamber when running at specified speed under specified road conditions. In case such condition arises, replace the needle valve.

9-7. Overflowing

If overflow still continues to develop even after making the checks directed in (9-6.) above, there is a strong chance of dirt being caught between the needle valve and valve seat as shown in Fig. 9-5.

In such a case, close the fuel cock temporarily and run the engine so the fuel level inside the float chamber will drop. When the fuel level drops, the needle valve will drop correspondingly, causing the clearance between the valve seat and needle valve to grow larger. Under this state re-opening the fuel cock will allow the fuel to flow in through the valve seat with considerable force so that there is a good possibility of the dirt stuck at this part being washed away and the trouble remedied. However, this is merely an emergency measure. If the overflow trouble is to be remedied basically, the dirt must be removed completely from the fuel. At this time, the filter in the fuel cock should also be inspected carefully. Since a large part of the overflow trouble occurs too frequently, the fuel tank interior should be flushed out clean with gasoline.

The users should also be advised to always close the fuel cock whenever the motorcycle is to be parked for any length of time.

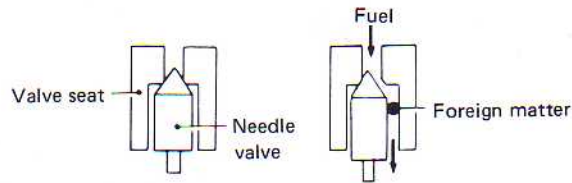


Fig. 9-5. Overflow caused by foreign matter

9-8. Air cleaner

If the air cleaner is clogged with dust intake resistance will be increased with a resultant decrease in output, increase in fuel consumption, and top of the piston and the inside of the cylinder head become dirty with carbon.

- Unscrew the bolts of frame cover and remove it.
- Unscrew the screw and take out the air cleaner cover. Dismantle the cleaner element.
- Take off the polyurethane filter from the element. Wash the filter with gasoline.
- After wringing gasoline out of the filter, soak it into the SUZUKI CCI oil or engine oil with around SEL #30.
- Wring oil out of the filter and then fit it to the element.

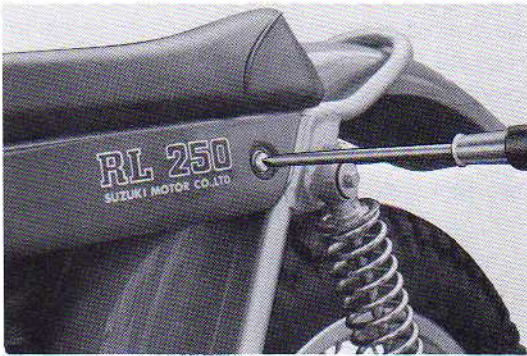


Fig. 9-6. Unscrewing the bolts of frame cover

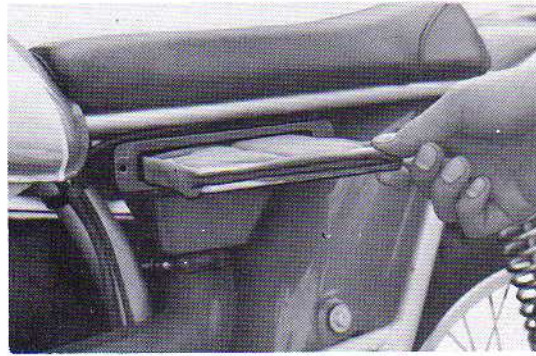


Fig. 9-7. Take off the polyurethane filter from the element.

10. ENGINE ELECTRICAL EQUIPMENT

RL250

10-1. P.E.I. system

A very high voltage is required to produce the spark for igniting the air-fuel mixture compressed in the cylinder, a fact that is known by all. Formerly the method of producing the high voltage was to have the low voltage and current generated in the magneto flow into the primary windings of the ignition coil, and by utilizing the induction effect created by the opening and closing of the contact points, produce high voltage in the secondary side that will cause spark to jump across the spark plug gap. In the newly adopted P.E.I. (Pointless Electronic Ignition) system, the capacitor action has been utilized to replace the above contact points so that this new system is also called C.D.I. (Capacitor Discharge Ignition) system.

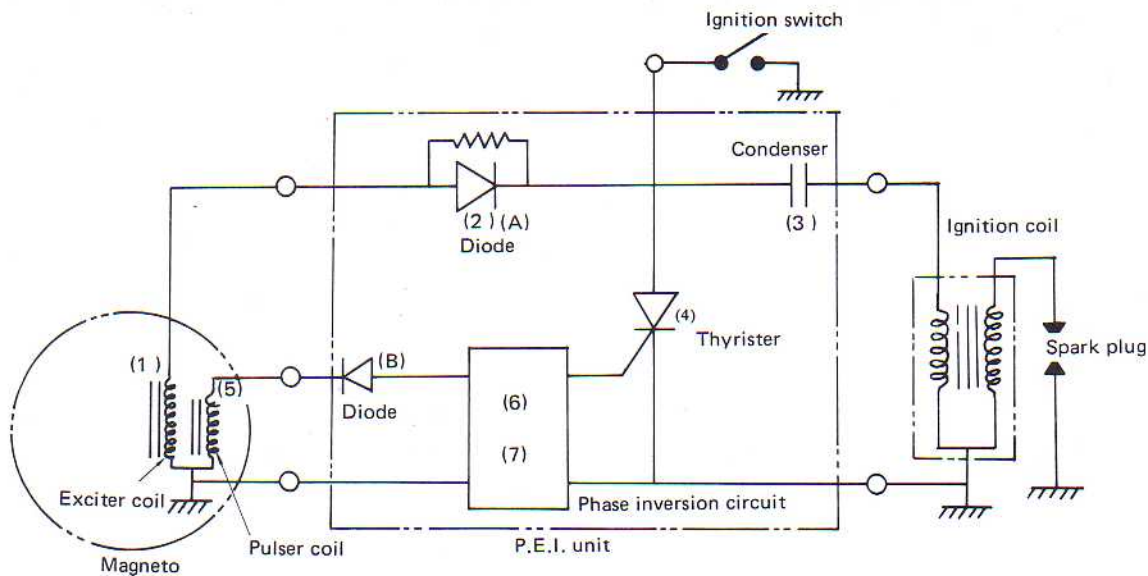


Fig. 10-1. P.E.I. schematic diagram

10-1-1. Features of P.E.I. system

- 1) Possible to leave system unattended for long time.
Due to absence of contact points, maintenance and adjustment work concerned with contact points are no longer required.
- 2) Improved sparking performance
Due to smaller voltage drop, the increased sparking energy makes it more advantageous as far as plug fouling is concerned.
- 3) Improved starting performance
Since the ignition timing has been provided with the characteristic of advancing in relation to engine speed, starting becomes easier and moreover, ignition timing to match high speed operation can be obtained.
- 4) Outstanding durability
High durability due to simplicity of construction and no wearing parts through elimination of contact points.

10-1-2. Basic circuit and construction of P.E.I. system

- 1) Exciter coil
Generates voltage and current that serves to produce the spark.
- 2) Diode
Rectifies the exciter coil generated voltage (AC) into DC to enable charging the condenser (capacitor).
- 3) Condenser
Stores the current (100–300 V) rectified by the diode and discharges it rapidly at the required ignition time to the primary side of the ignition coil.
- 4) Thyristor
Has the special property that in order to make the current flow in forward direction, a specified voltage must be impressed on the gate, otherwise the current will not start flowing. This is the same as a switch that works by so-called signal voltage.
- 5) Pulser coil
Generates the signal voltage for opening the thyristor gate.
- 6) Phase inversion circuit
Consists essentially of silicon control rectifier, zenner diode which works as breaker and condenser which serves to store the electricity generated by the pulser coil. Enough current flows to open the thyristor gate when the pulser coil generated voltage reaches the Zenner diode passage voltage. At this time, the condenser storing the exciter coil generated energy starts to discharge and causes current to flow rapidly through the ignition coil primary side.
- 7) Zenner diode
Has the same properties as ordinary diode, but has in addition the special property of allowing the required current to flow in reverse direction when the voltage impressed in reverse direction reaches a certain value (Zenner voltage).

10-1-3. Principles of operation

When the magneto rotates, alternating current is generated in the exciter coil. This current is rectified by the diode (A) and charges the condenser to 100–300 V. At this time, the thyristor is in OFF state. Alternating current is also generated simultaneously in the pulse coil and this flows through the diode (B) and phase inversion circuit, this current differing in phase to that charging the condenser.

When this current reaches the voltage (Zenner voltage) that will actuate a phase inversion circuit, the thyristor gate is opened as a result and current flows in the thyristor gate. The thyristor which had been in OFF state is now turned ON so that the current charged in the condenser discharges rapidly through the thyristor to the ignition coil primary side. This discharge current creates inductive action between the ignition coil primary and secondary sides so that high voltage is produced in the secondary winding to force spark to jump across the spark plug gap.

The signal current flows through the thyristor gate for extremely short time so that the thyristor is able to return to OFF state when the sparking is completed. The above action is repeated to allow the engine to keep running.

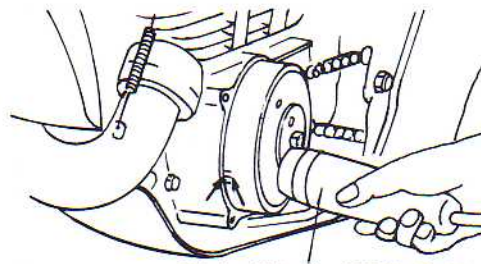
10-1-4. Checking ignition timing

In this engine, the ignition timing is set by the pulser coil generated voltage so that the ignition timing cannot be checked in static state as in the former contact breaker points type ignition system. To check the ignition timing, start the engine and hold the engine speed at 4,000 rpm. With timing light (use Suzuki service tester), verify the ignition timing by observing whether the line stamped on the flywheel rotor (center line out of the three lines) aligns with the marks on the crankcase

If the aligning marks fail to match, that is, if ignition timing adjustment is required, proceed as follows.

Loosen the three stator mounting screws and move the stator base so that the stamped line on stator (Fig. 10-2.) and the centerline of stator mounting screw hole will be in line. Then tighten the mounting screws. Start the engine again and maintain it at 4,000 rpm. Check once more with timing light to see if the line stamped on flywheel rotor is aligned with the matching mark on the case.

Note: The ignition timing has been accurately adjusted during the engine manufacturing process. Therefore, just aligning the line stamped on the stator with the centerline of stator mounting screw hole as described above should virtually ensure perfect timing.



Timing light No. 09900-28103

Fig. 10-2. Checking with timing light

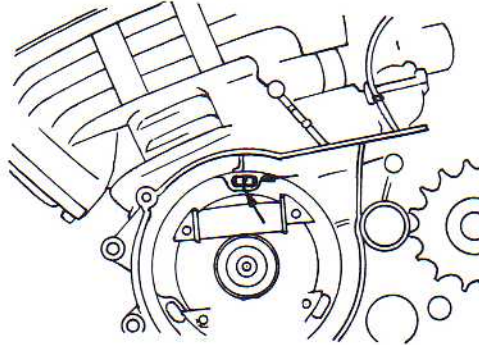


Fig. 10-3. Timing marks

10-1-5. Inspecting

If the engine fails to start or misfires, check the following places.

1) Stator

a) Exciter coil

Measure the resistance between the exciter coil lead wire (black/red) and coil plate. Normal state Approx. 200 ohm

b) Pulser coil

Measure the resistance between the pulser coil lead wire (red/white) and coil plate.

Normal state Approx. 37 ohm

2) Ignition coil

The ignition coil can be checked by two different methods, one by using an ignition coil tester (new equipment) and the other by measuring the resistances of the primary and secondary windings.

a) When using ignition coil tester

Make the coil test by using the new P.E.I. ignition coil tester. This new tester has been made available because the ignition coil in the P.E.I. system cannot be checked with the former SUZUKI Service Tester.

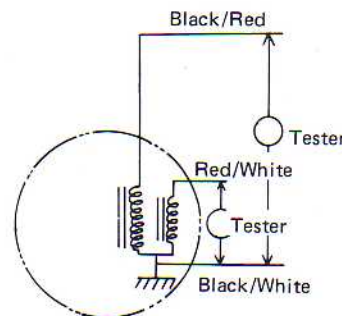


Fig. 10-4. Measuring the resistance of exciter and pulser coil

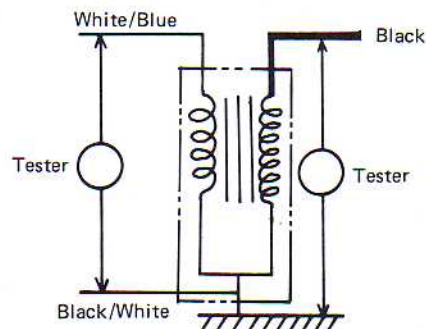


Fig. 10-5. Measuring the resistance of ignition coil

10-1-6. P.E.I. UNIT

Check the P.E.I. unit by using the Suzuki Service tester (09900-28103).

CHECKING BY Suzuki Service Tester

- * An external power source is required.
- * Make sure that the power switch is in the 'OFF' position.
- * Place the test selector knob in the 'P.E.I.' position.
- * Connect the P.E.I. test lead plug (KOKUSAN) into the plug receptacle on the tester and connect the leads to the P.E.I. unit to be tested by color code.
- * Place the power switch in the 'ON' position and note the P.E.I. indicator lamp. The lamp should illuminate and remain lit if the P.E.I. unit is in satisfactory condition.
- * After testing always place the power switch in the 'OFF' position.

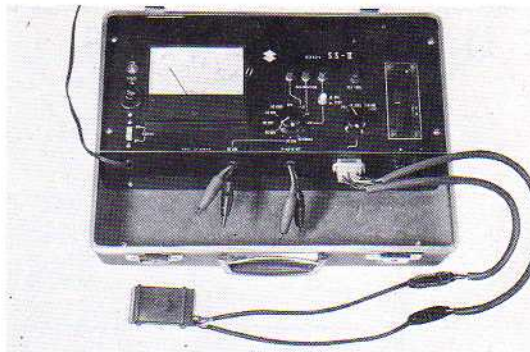


Fig. 10-6. Checking P.E.I. unit

11. FRONT FORKS

RL250

11-1. Description

The RL250 front fork, with the stroke of 180 mm (7.08 in) is light in weight and high in radiation.

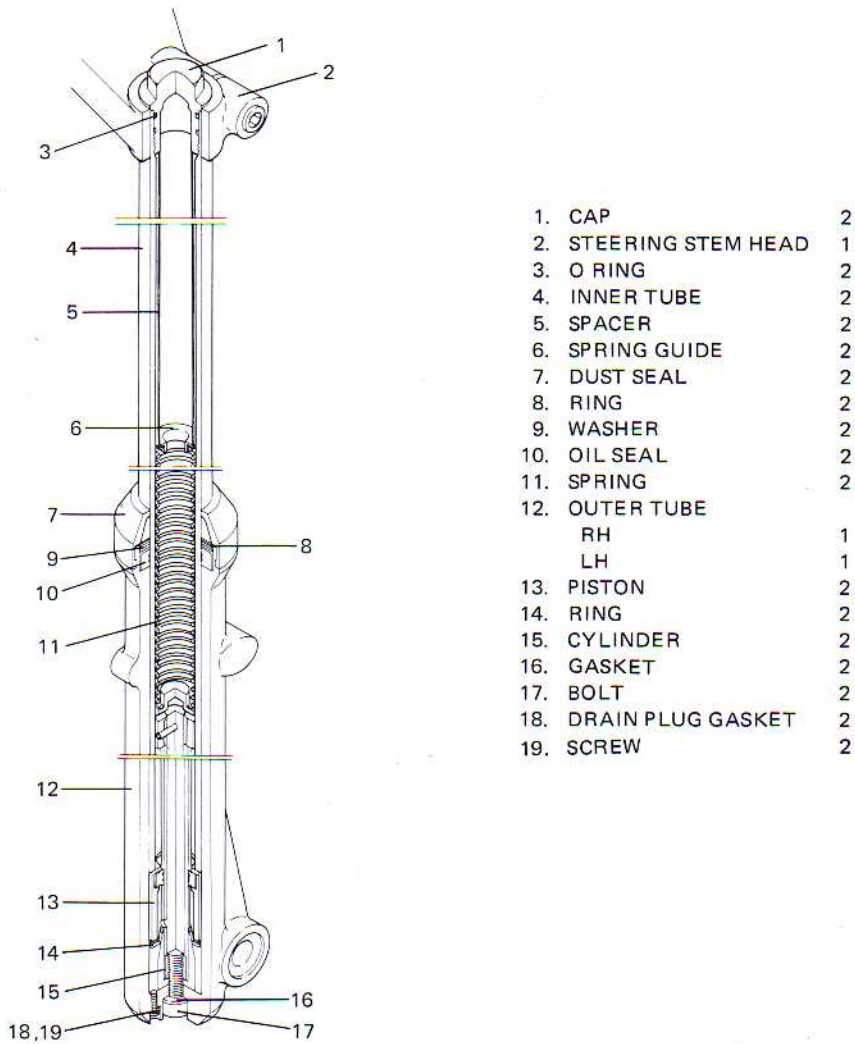


Fig. 11-1.

Removing the fork inner tube cap bolt loosened beforehand and take the fork spring out of the inner tube.



Fig. 11-2. Removing the fork inner tube cap bolt

After removing the front fork spring, take off the fork dust seal with a driver as shown in Fig. 11-3.

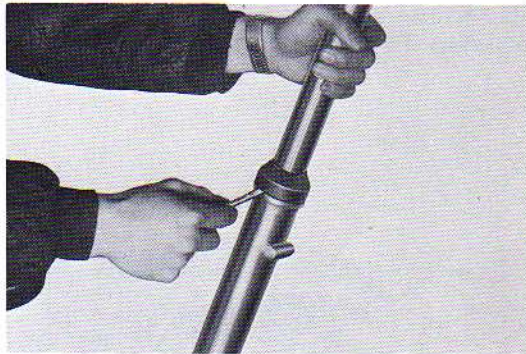


Fig. 11-3. Removing fork dust seal

Then take out the oil seal circlip with the sharp end tool such as a small screw driver. After checking if front fork oil does not remain in the outer tube, (It is a good practice to keep the outer tube upside-down for a while), heat the outer tube around the oil seal carefully with touch or soaking it into boiling water, so as to take out the oil seal twisting by hand. The front fork oil should be SAE 10W/30 motor oil or A.T.F. (Automatic Transmission Fluid). Replenish or change the oil, if necessary. The standard front fork oil amount is 236 cc per each leg.

12. TIGHTENING TORQUE FOR BOLTS AND NUTS

RL250

The following is the list of the tightening torque for bolts and nuts fitting the most important parts of motorcycle for the safety.

Be sure to check the tightening torque on the list at every periodical inspection, that is initial 1st month and every 3 months afterwards.

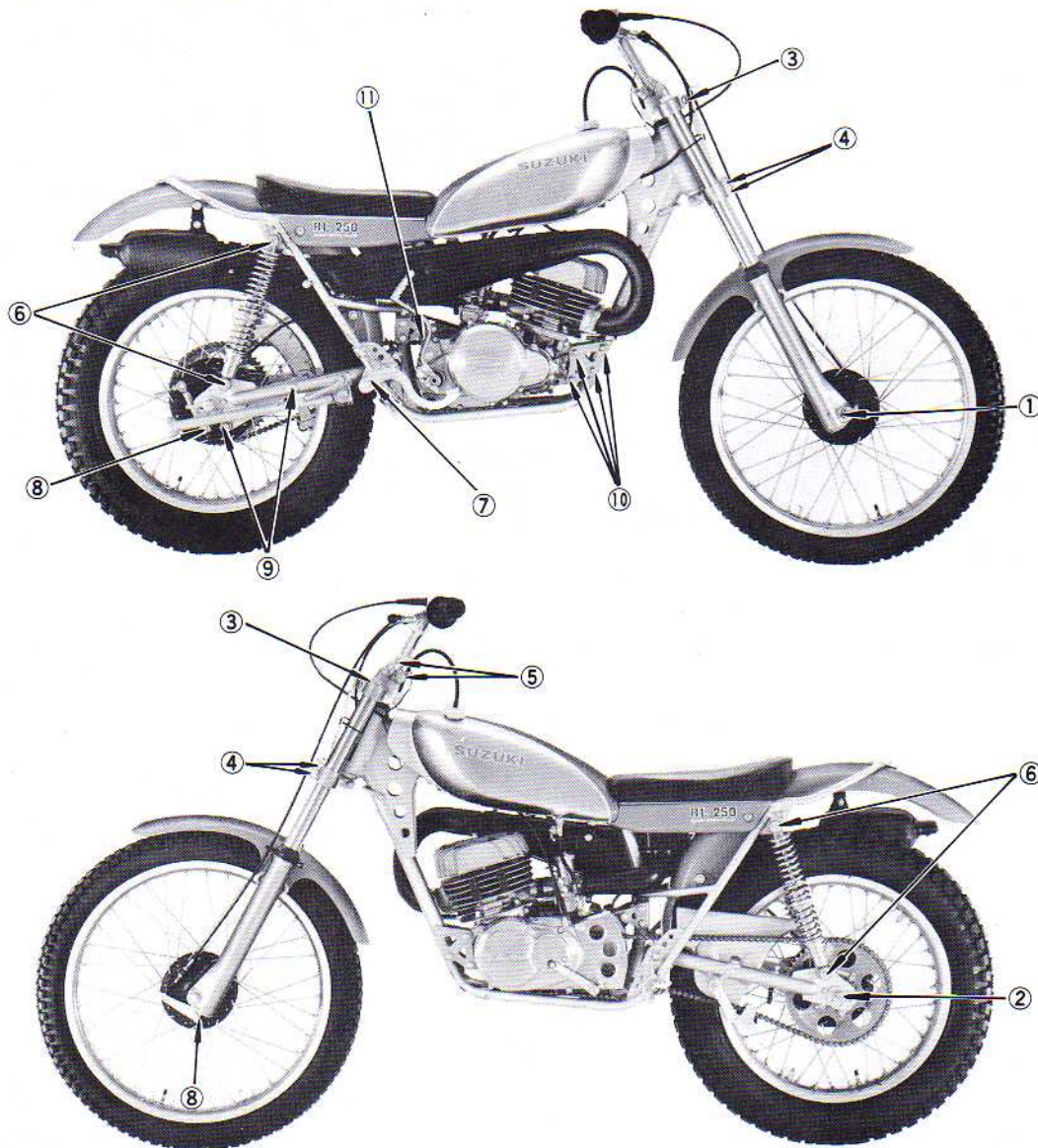


Fig. 12-1. Points to retightened

