15. TRANSISTORIZED IGNITION SYSTEM

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15. TRANSISTORIZED IGNITION SYSTEM

DESCRIPTION

In this system, the distributor breaker point "ON" and "OFF" signals are transformed to transistor switching action inside the igniter, to turn "ON" and "OFF" the primary current. The features of this system are:

- Improves the engine starting and low speed performance because of the capability of maintain higher secondary voltage in the low speed range,
- 2. Improves the durability of the distributor breaker points.

OPERATION

1. At Breaker Point "ON" (when points are closed)

 Since the current flows as shown in the diagram, there is current flowing through the primary side of the ignition coil.

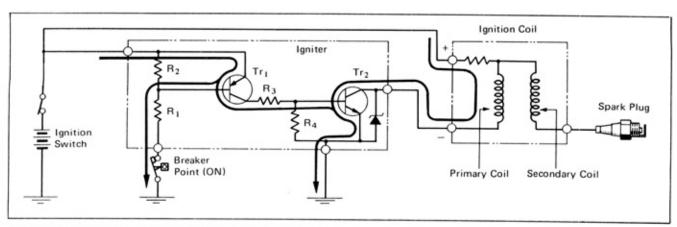


Fig. 15-1 Transistorized Ignition System Operation

2. At Breaker Point "OFF" (when point are open)

- O Since there is no current flowing through the igniter, the ignition coil primary current will be turned off,
- At the instant the primary current is turned off, high voltage is induced in the ignition coil secondary side, to generate spark in the spark plug.
- Only a very small current flowing through R₁ will flow through the breaker points so that the arc loss at the points will be infinitesimal.

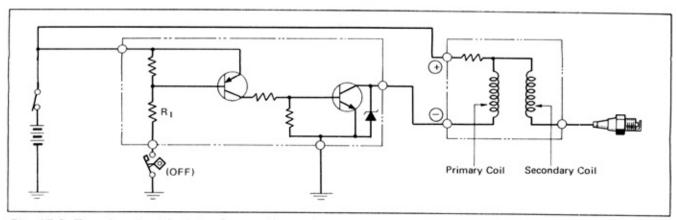


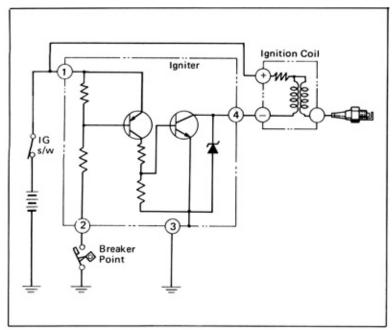
Fig. 15-2 Transistorized Ignition System Operation

INSPECTION PROCEDURE

If the cause for poor engine operation and defective starting is believed to be in the transistorized ignition system, check the system in the sequence outlined below.

 Remove the distributor cap and pull out high tension cord from distributor cap center electrode. Verify to see that the distributor points are closed and turn on ignition switch Bring end of high tension cord to about 3/16" (4 mm) away from engine (ground). O Will spark be produced between end of high tension cord and ground when distributor points are opened and closed with insulated stick? Yes No Check for defect between distributor cap and spark plugs and for trouble other than in ignition system. When ignition is switched on, is there voltage at igniter No Defective wiring. terminal (1)? Yes Defective grounding. Is the igniter properly grounded (3)? No . Yes Disconnect ignition coil (-) terminal and using separate lead wire, ground "ON" and "OFF" ignition coil (-) Ignition coil defective. No: terminal. Is secondary voltage produced in high tension cord at this time? (Ignition switched on) Note: 1. Have connector (1) and (4) unplugged. 2. Have 0.22µF condenser installed on ignition coil (-) terminal. Yes Restore Notes 1 & 2 above to former condition. Switch Igniter defective. No on ignition. Unplug igniter connector from distributor, and ground)'ON" and "OFF" connector terminal. Is Distributor breaker point Yes . secondary voltage produced in high tension cord at defective. this time?

INSPECTION METHODS





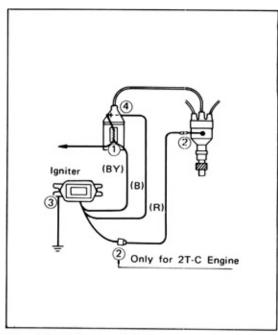


Fig. 15-4 System Wiring Diagram (except for 2F)

In case "no secondardy voltage is produced" in the "Inspection Procedure" section, check by methods described below.

1. Igniter Power Source Voltage Inspection

Check up between battery and ignition coil

 part.

 With the ignition switched on, check to see that there is voltage (V₁) at terminal in the 1 part shown in Fig. 15-6.

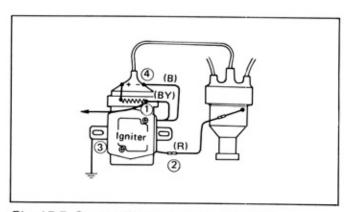


Fig. 15-5 System Wiring Diagram (for 2F)

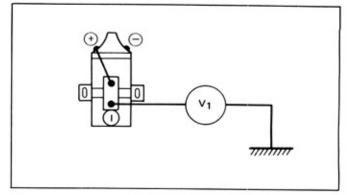


Fig. 15-6 Ignition Coil Inspection

2. Ignition Coil Inspection

- Inspection while on vehicle
 - Unplug the connector from the igniter.
 - Attach a condenser (0.22μF) to the (–) terminal.
 - 3) Switch on the ignition.
 - Connect a lead wire to the (-) terminal and ground it "ON" and "OFF" as illustrated,
 - At this time, check the high tension cord to see if secondary voltage is produced. If not produced, make unit inspection.

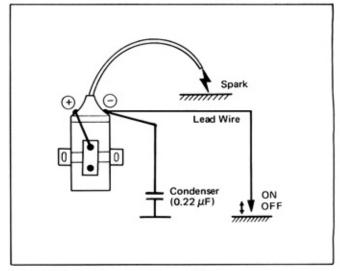


Fig. 15-7 Ignition Coil Inspection

(2) Unit inspection.

Using a circuit tester and megger, measure the resistances of the various parts. If defective, replace the ignition coil.

- Primary coil resistance
 - 1.3 to 1.5 ohms 2T-C, 20R
 - 1.3 to 1.6 ohms 4M, 2F
- 2) Secondary coil resistance
 - 6.5 to 10.5 Kilo-ohms 2T-C, 20R
 - 9.5 to 14.5 Kilo-ohms 4M, 2F
- Insulation resistance between terminal and case.

10 megohm minimum (Measured with 500V megger)

4) External installed resistance

1.3 to 1.7 ohms

13 ω 15 Ω ω 16 Ω ω 16

Fig. 15-8 Ignition Coil Resistance Inspection

3. Distributor Inspection

- Disconnect the wiring from the igniter.
- Switch on the ignition.
- Ground "ON" and "OFF" the wiring disconnected in 1) above.
- Check to see that secondary voltage is produced in the high tension cord at this time. (Condenser not required)
- Secondary voltage is not produced →

Igniter defective.

Secondary voltage is produced →

Distributor breaker point defective.

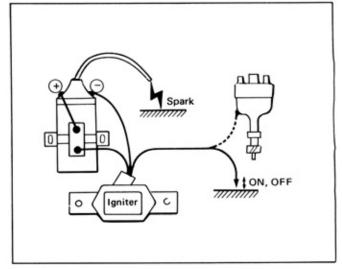


Fig. 15-9 Distributor Inspection

PRECAUTION ON USAGE AND HANDLING

- Be sure not to make mistakes in the connections or battery polarities. Any incorrect connections will damage the igniter as the semiconductors used are electrically unidirectional.
- Do not disconnect the battery terminals while the engine is running. This could produce injurious sparks that will have danger of damaging the transistors.
- When washing the vehicle, do not allow water to get on the igniter unit.
- If by chance the igniter should break down, the vehicle can still be used in emergency by making the connections shown in the following diagram and installing a condenser.

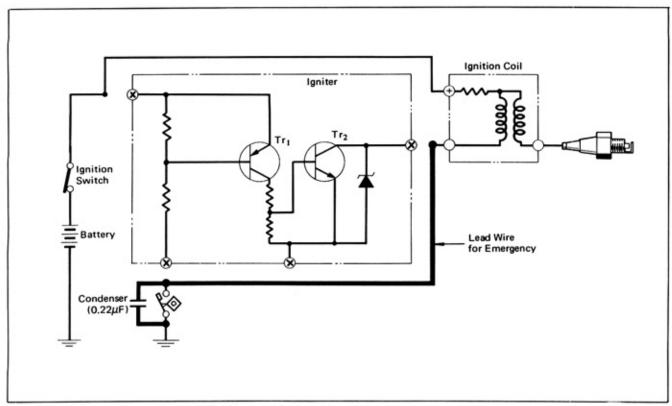


Fig. 15-10 Emergency Measure in Case of Igniter Trouble

 In case a tachometer is to be connected to the system, connect the tachometer (+) terminal to the ignition coil (-) terminal.

Caution:

Do not connect to the distributor side,

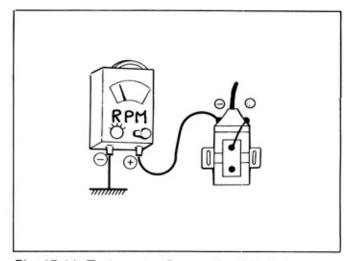


Fig. 15-11 Tachometer Connection Method