SUBARU ELECTRONICALLY CONTROLLED CARBURETOR

All Models

DESCRIPTION

Subaru models are equipped with an electronically controlled carburetor that improves driveability while reducing emissions. An oxygen sensor in the exhaust measures the air/fuel ratio, then an electronic control unit adjusts the carburetor with air bleeds controlled by duty solenoids. The system components include: control unit, oxygen sensor, 2 duty solenoids, 2 vacuum switches, a thermal switch, an air cleaner for the duty solenoids and a special carburetor.

OPERATION

FEEDBACK CARBURETOR

The carburetor is equipped with both slow and main metering circuits. Engine speed and load determine which circuit is used, but both are capable of being adjusted by air bleeds. The air bleeds are connected to duty solenoids which allow or restrict air flow through the bleeds.

DUTY SOLENOIDS

The duty solenoids are solenoid valves that are operated by the control unit. They open and close at a constant rate of 40 cycles per second, though the "on" time can vary. When the engine is being monitored by the control unit and oxygen sensor (closed loop), the average "on" time is 30-40%. This time can be measured with a dwell meter and is what determines the air/fuel ratio.

The duty solenoids are located on the intake manifold and connected to the carburetor by air hoses. A small air cleaner is provided to filter the air which enters the carburetor through the duty solenoids.

THERMAL & VACUUM SWITCHES

The feedback system does not operate quickly enough to provide good driveability when the engine is cold or under full load. The thermal and vacuum switches are used to limit closed loop operation under these conditions. When engine coolant is below 140° F (60° C) and manifold vacuum is less than 8 in. Hg (Man. Trans.) or 5 in. Hg (Auto. Trans.), the thermal switch and vacuum switch II signal the electronic control unit, which switches the solenoids off. Closed loop is also prevented by vacuum switch J, which is operated when the engine is warm and vacuum falls below 3.4 in. Hg.

ELECTRONIC CONTROL UNIT

The control unit monitors engine sensors and operation to ensure good driveability and low emissions. It is located underneath the steering column in the passenger compartment. A small light is provided in the control unit to assist in trouble shooting.

TESTING

The system is tested by following a logical sequence to determine which components are inoperative. The procedure begins with the first test chart, which will direct the technician to the proper procedure. The following items are necessary for testing:

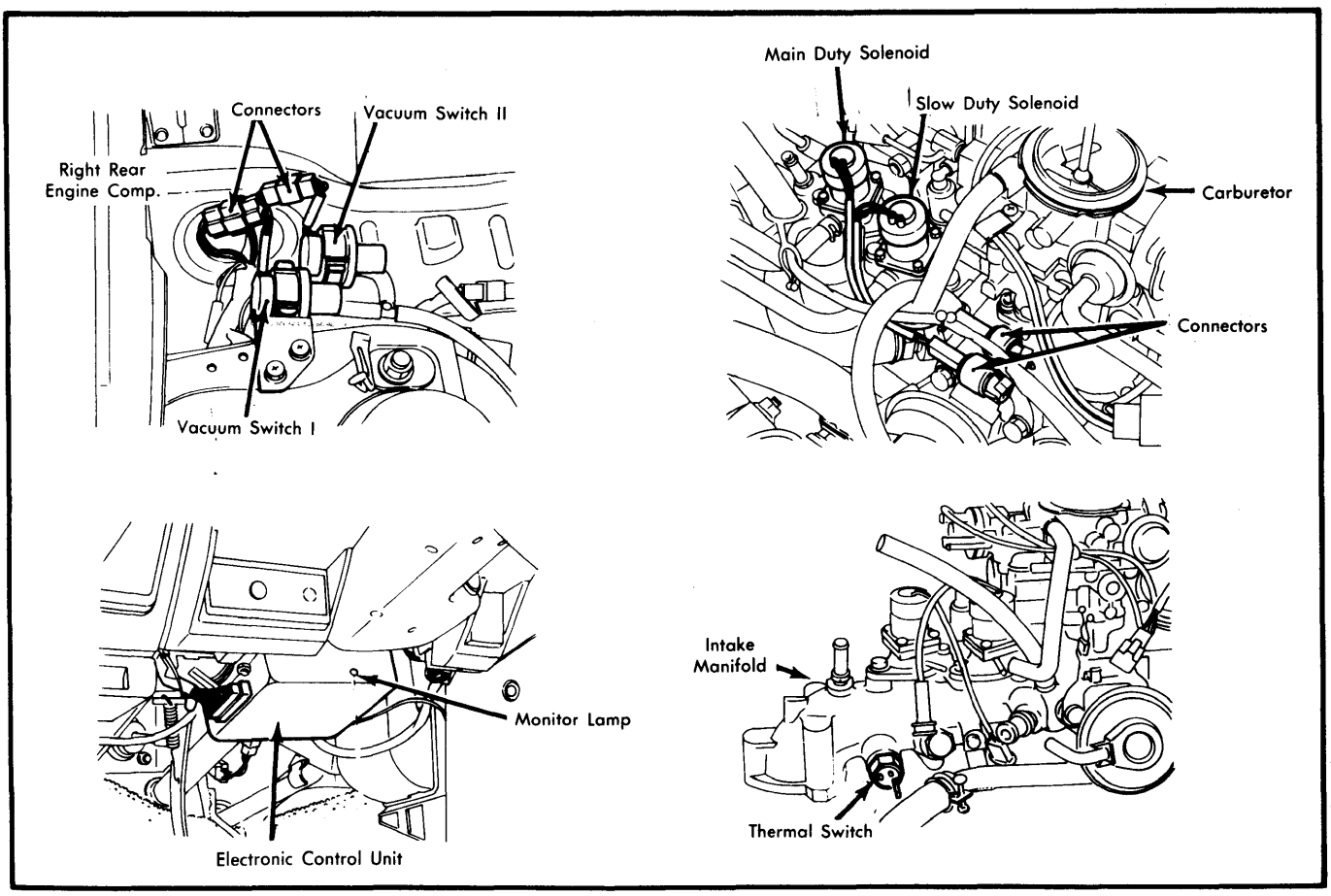


Fig. 1 Electronically Controlled Carburetor System Components

SUBARU ELECTRONICALLY CONTROLLED CARBURETOR (Cont.)

- Dwell Meter set on 4 cylinder scale
- Volt-Ohmmeter
- 1.5V Flashlight Battery
- Stethoscope or listening tube

NOTE – *When checking resistance of components, be sure to disconnect all wiring harness connectors. When measuring voltage, connectors must remain hooked up. Be sure to insert test leads into harness side of connectors. See Fig. 3.*

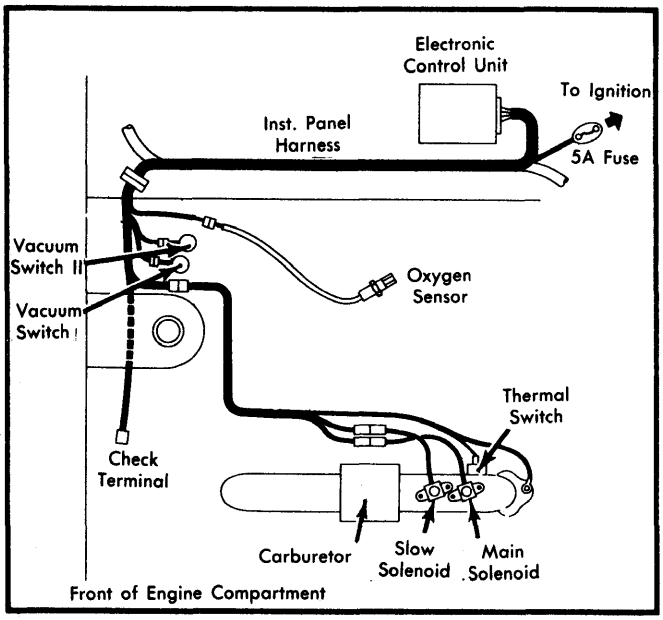


Fig. 2 Component Locations

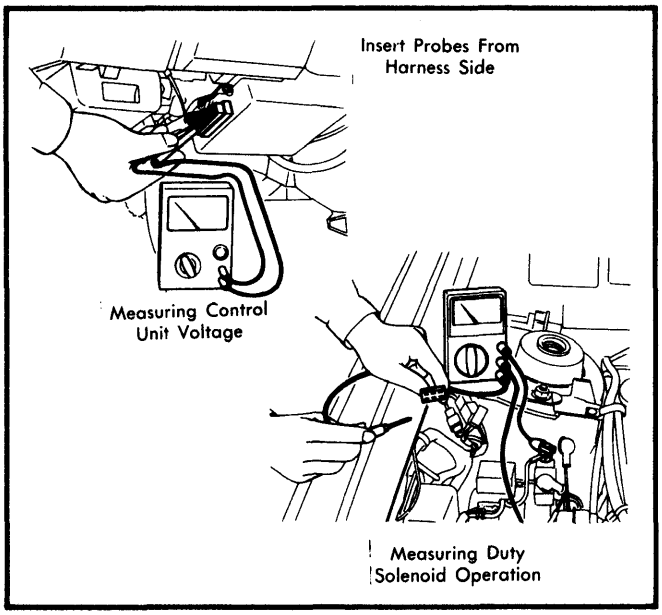


Fig. 3 ECC System Electrical Test Connections

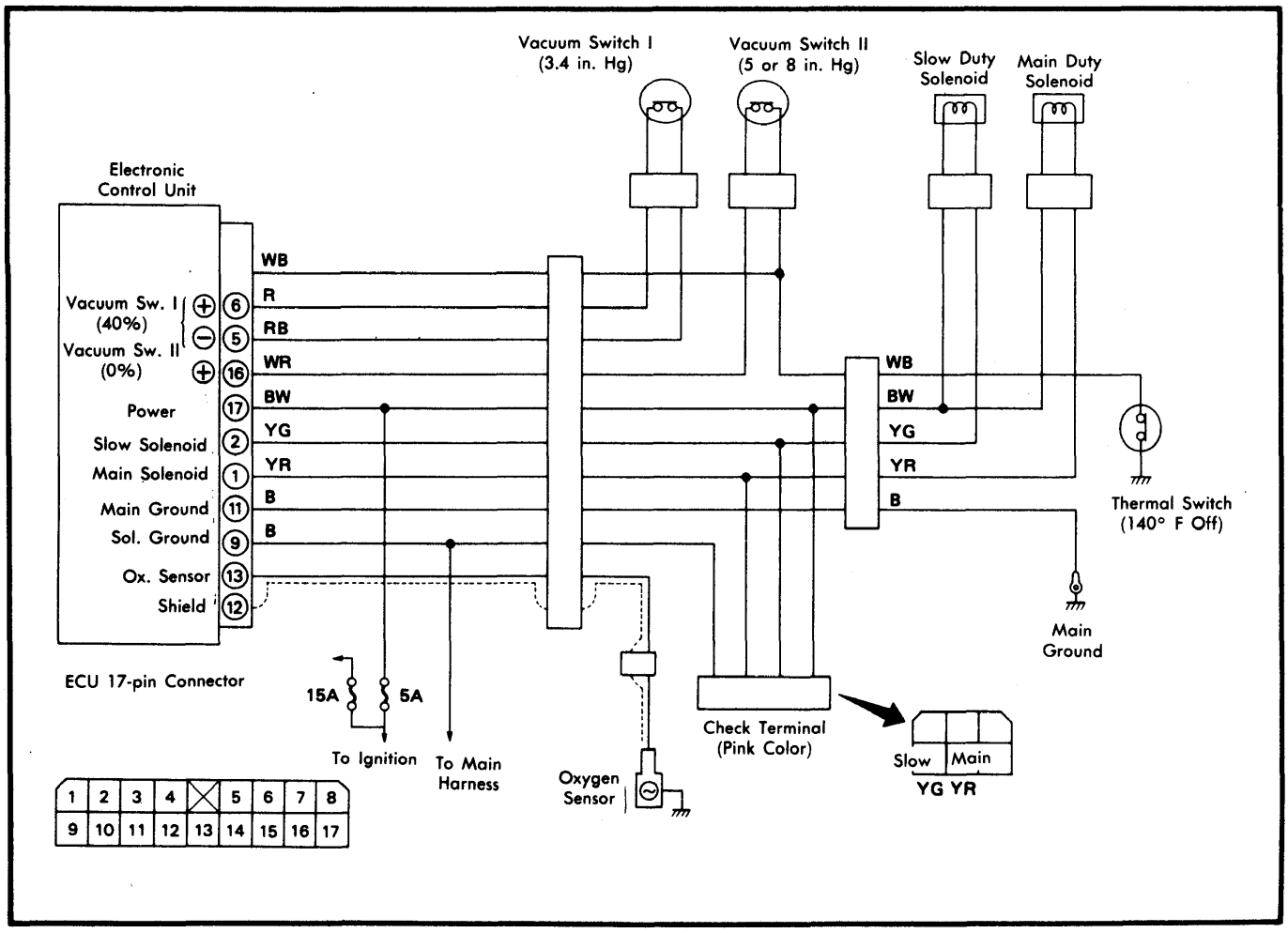
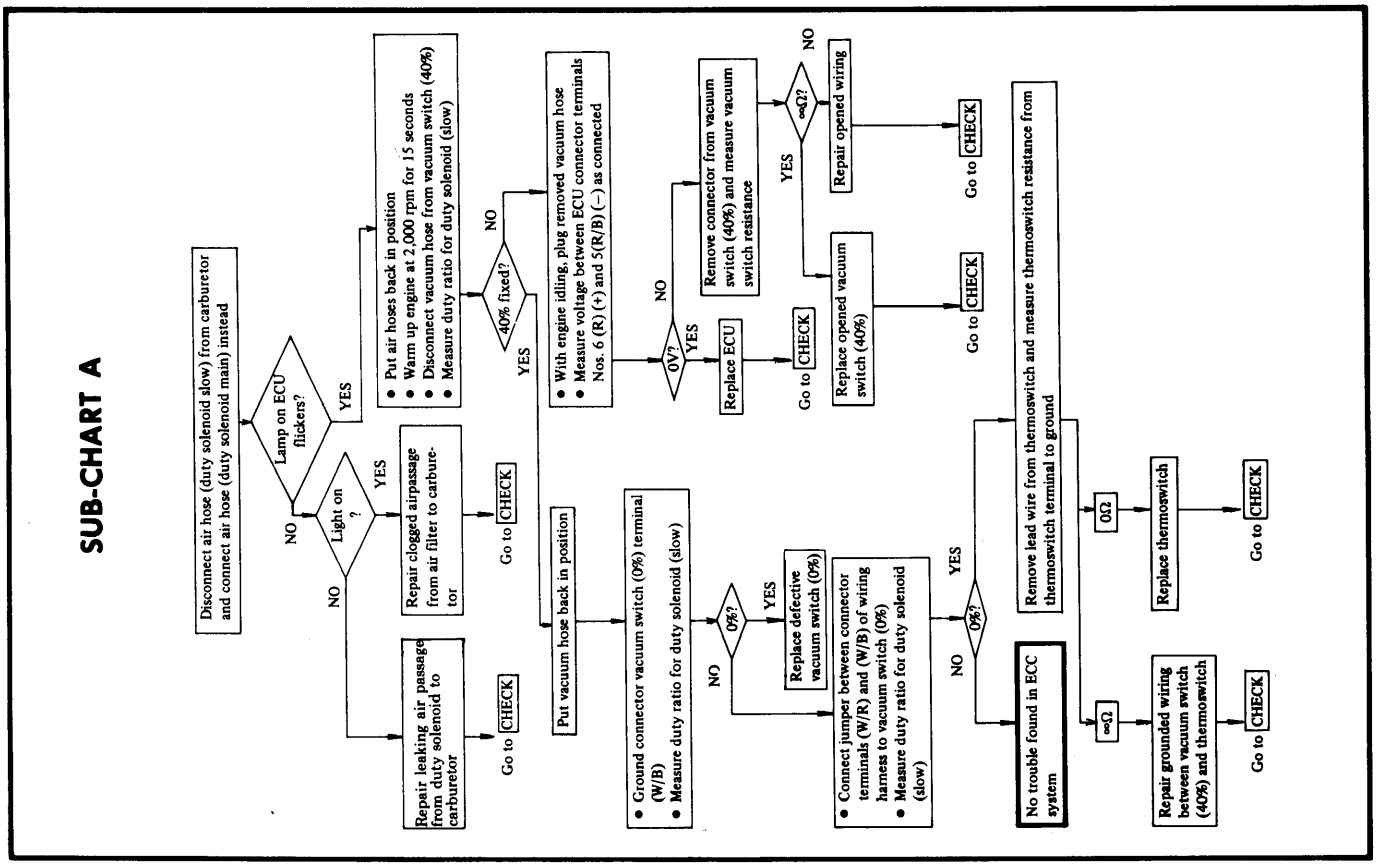
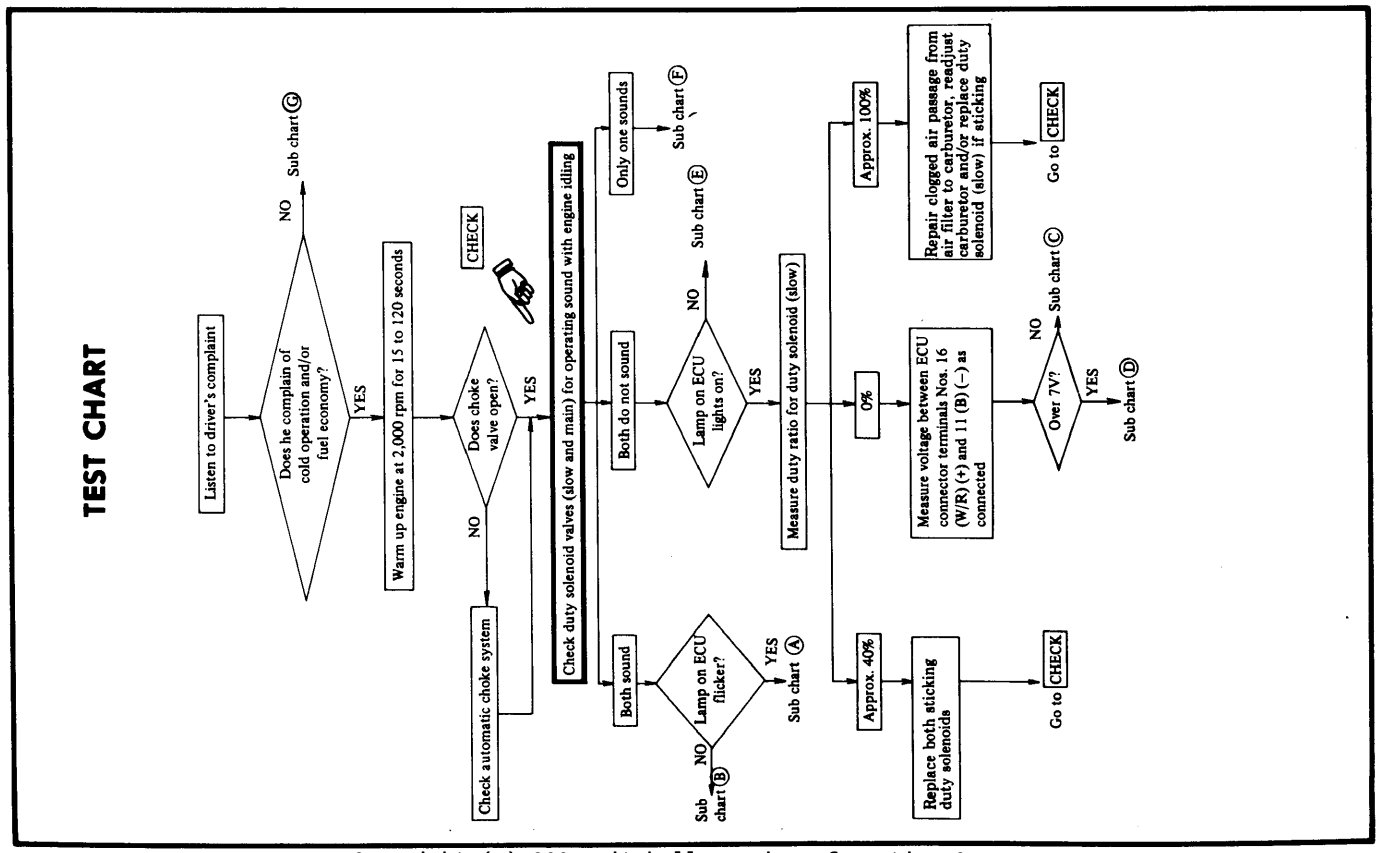


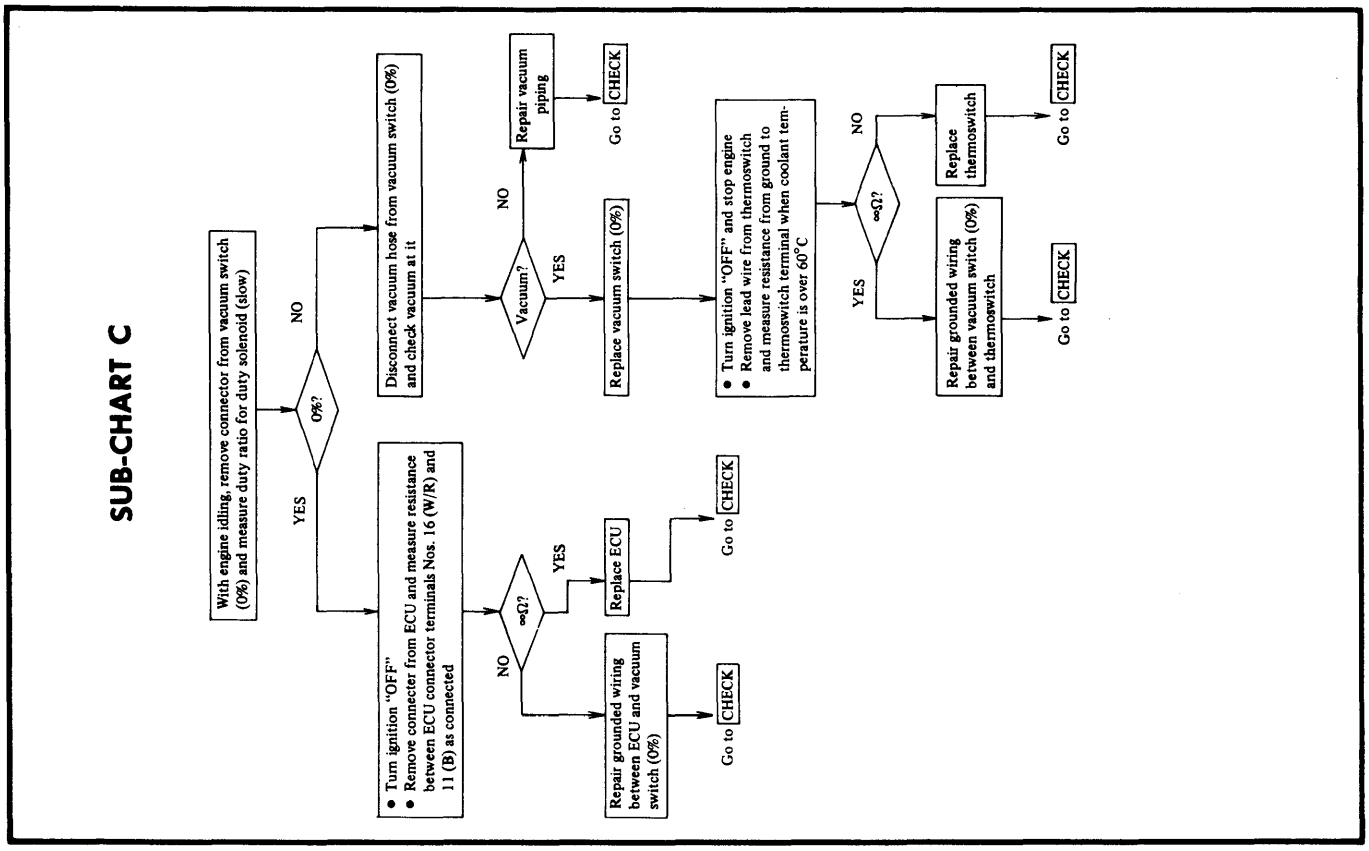
Fig. 4 ECC System Wiring Diagram

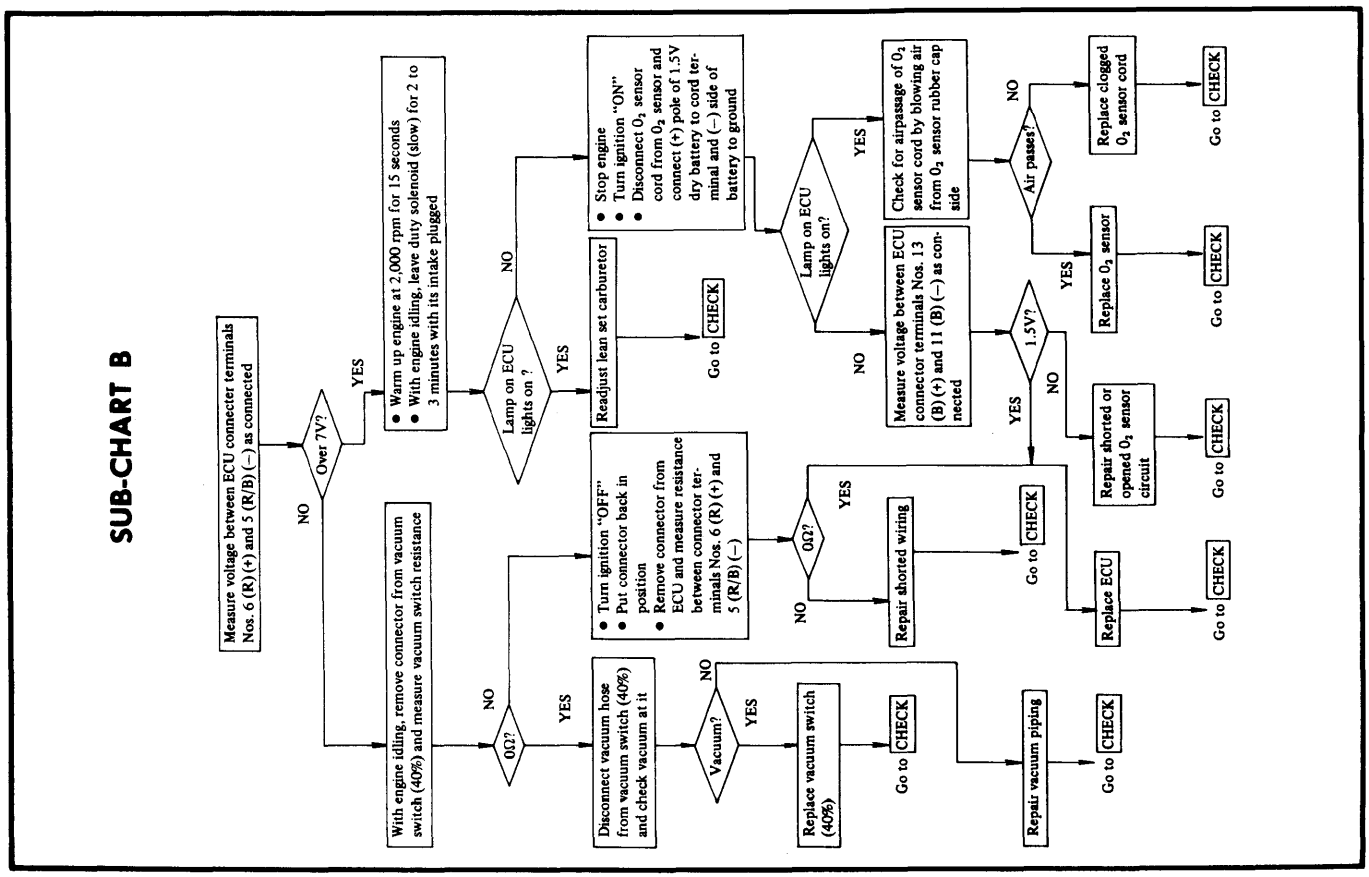
SUBARU ELECTRONICALLY CONTROLLED CARBURETOR (Cont.)



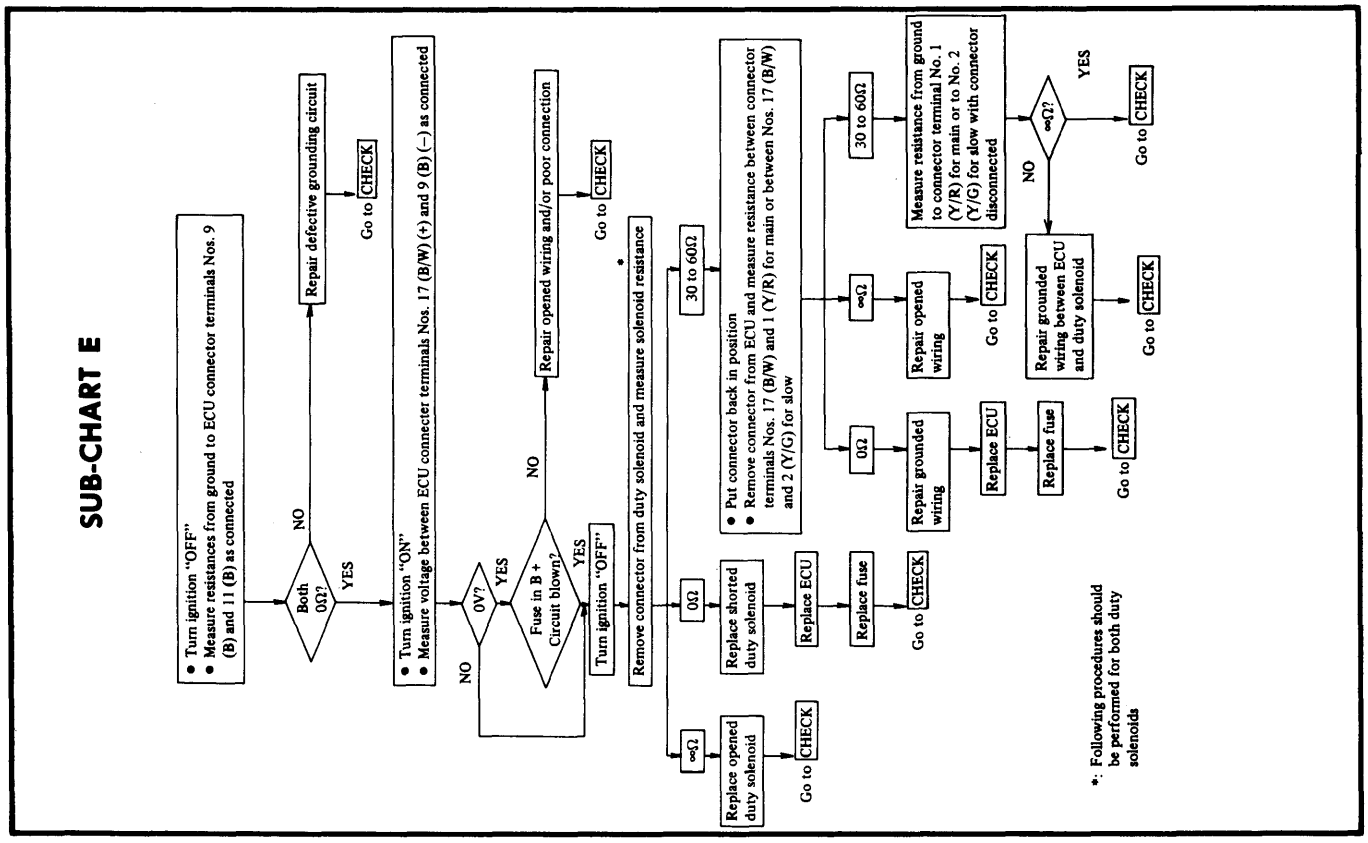


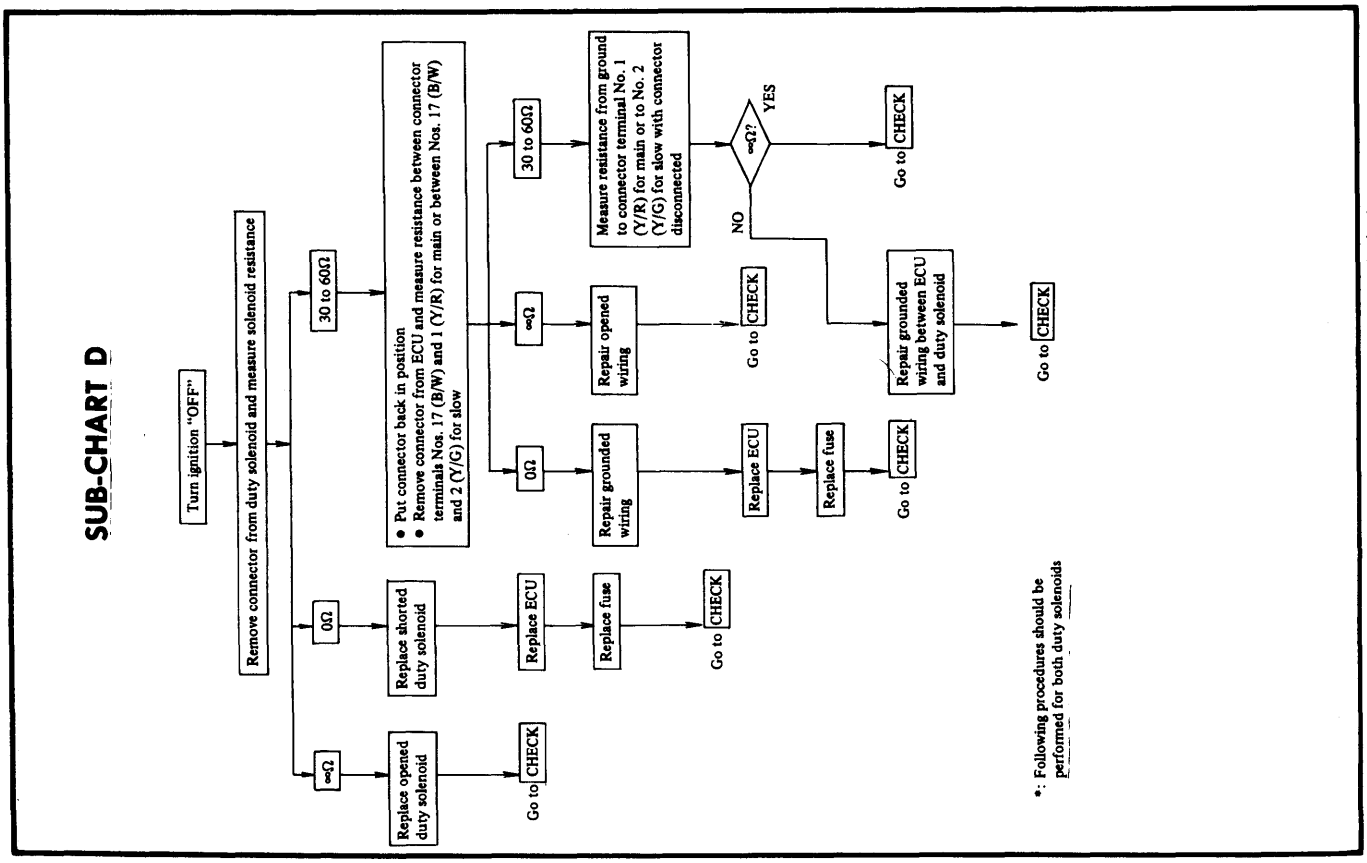
SUBARU ELECTRONICALLY CONTROLLED CARBURETOR (Cont.)





SUBARU ELECTRONICALLY CONTROLLED CARBURETOR (Cont.)





SUBARU ELECTRONICALLY CONTROLLED CARBURETOR (Cont.)