SUBARU ELECTRONIC CONTROL CARBURETOR

All Models

DESCRIPTION

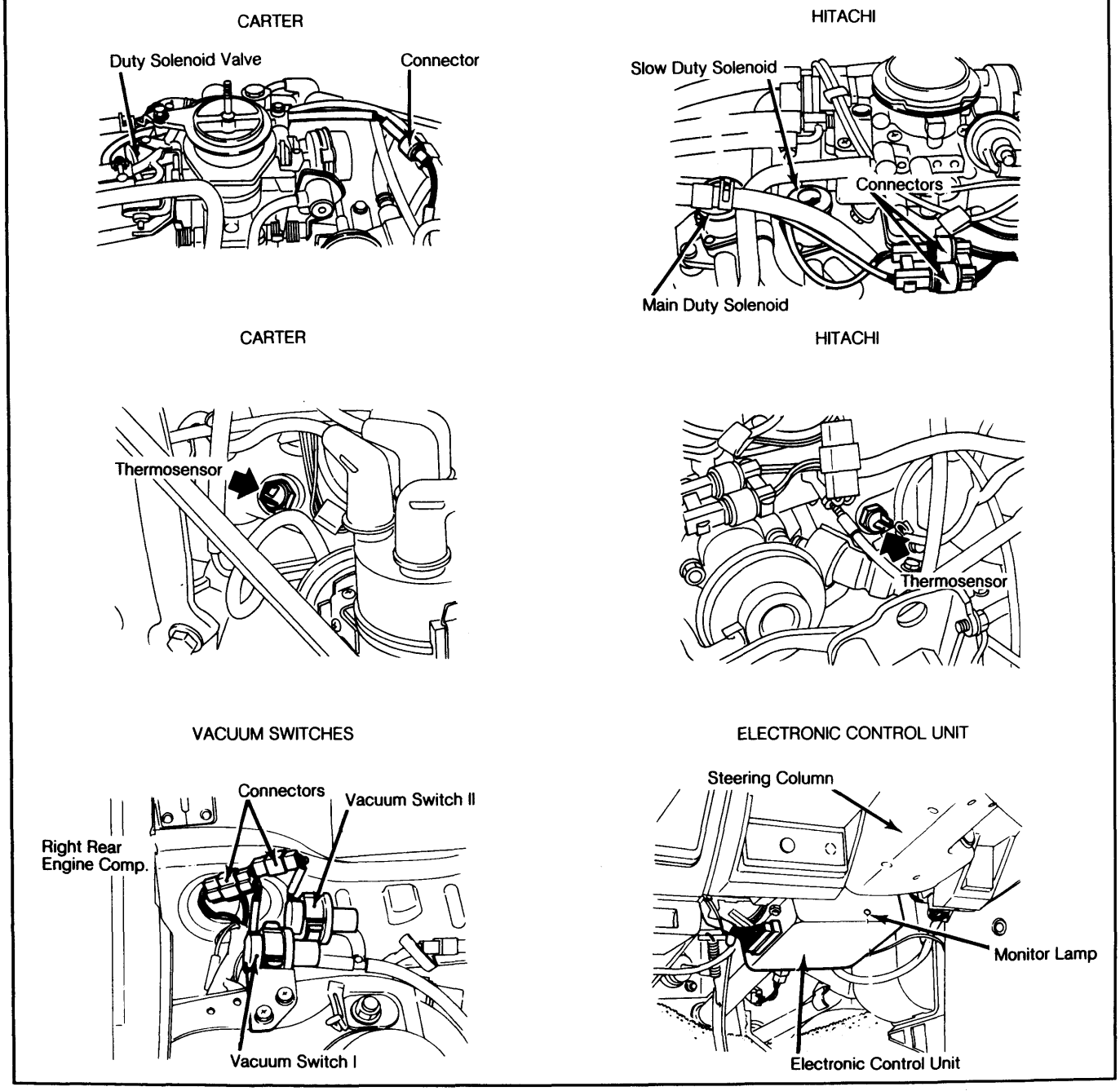
Subaru models are equipped with either a Carter 1-bbl. or Hitachi 2-bbl. electronically controlled carburetor. These carburetors improve driveability while reducing emissions. An oxygen sensor in the exhaust measures the air/fuel ratio. The sensor creates a signal for the electronic control unit to operatethe duty solenoid(s) mounted on or near the carburetor. The system components include: control unit, oxygen sensor, duty solenoid(s), 2 vacuumm switches, a thermal switch and a special carburetor.

OPERATION

FEEDBACK CARBURETOR

The carburetor is equipped with both slow and main metering circuits. Engine speed and load determine

Fig. 1: Subaru Electronic Control Carburetor System Components



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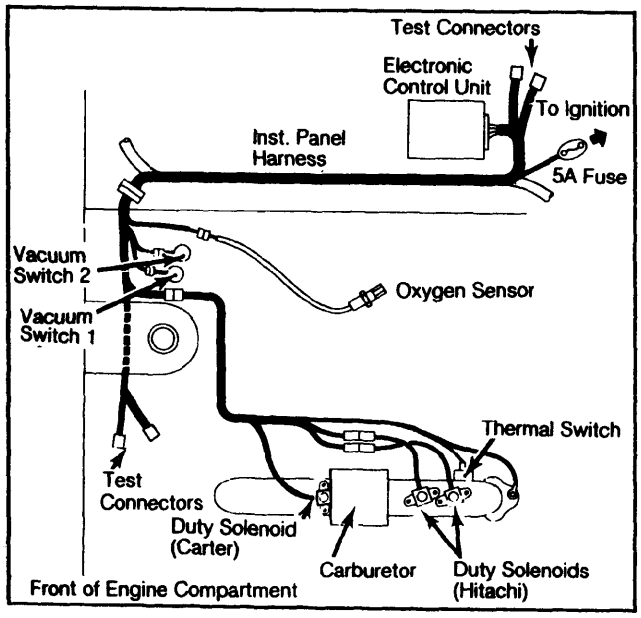
which circuit is used, but both are capable of being adjusted by air bleeds. The air bleeds are connected to duty solenoid(s) which allow or restrict air flow through the bleeds.

DUTY SOLENOIDS

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

The duty solenoids for the 2-bbl. carburetor are located on the intake manifold and are 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. The duty solenoid for the 1-bbl. carburetor is mounted on the air horn of the carburetor.

Fig. 2: Component Locations



THERMAL & VACUUM SWITCHES

The feedback system does not respond quickly enough to provide good driveability under full-load or cold operation. 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 (2-bbl.) or 12 in. Hg (1-bbl.), the thermal switch and one of the vacuum switches signal the electronic control unit to shut the solenoid(s) off. Closed loop operation is also prevented by the second vacuum switch when the engine is warm and vacuum falls below 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. Test connectors shown for the tests are shown in greater detail in the system wiring diagram. Note the following before proceeding with testing:

Equipment Necessary for Testing

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

Test Chart Abbreviations

- C-1 to C-14 — Go to chart number indicated.
- I, II, III, IV — Check connector number.
- C — Carter 1-bbl. carburetor.
- H — Hitachi 2-bbl. carburetor.
- E/G — Engine.
- IG — Ignition.

NOTE: Disconnect all wiring harness connectors when measuring component resistance. When measuring voltage, connectors must remain hooked up. Use diagnostic test connectors to make measurements. *See Fig. 3.*

Fig. 3: ECC System Electrical Test Connections

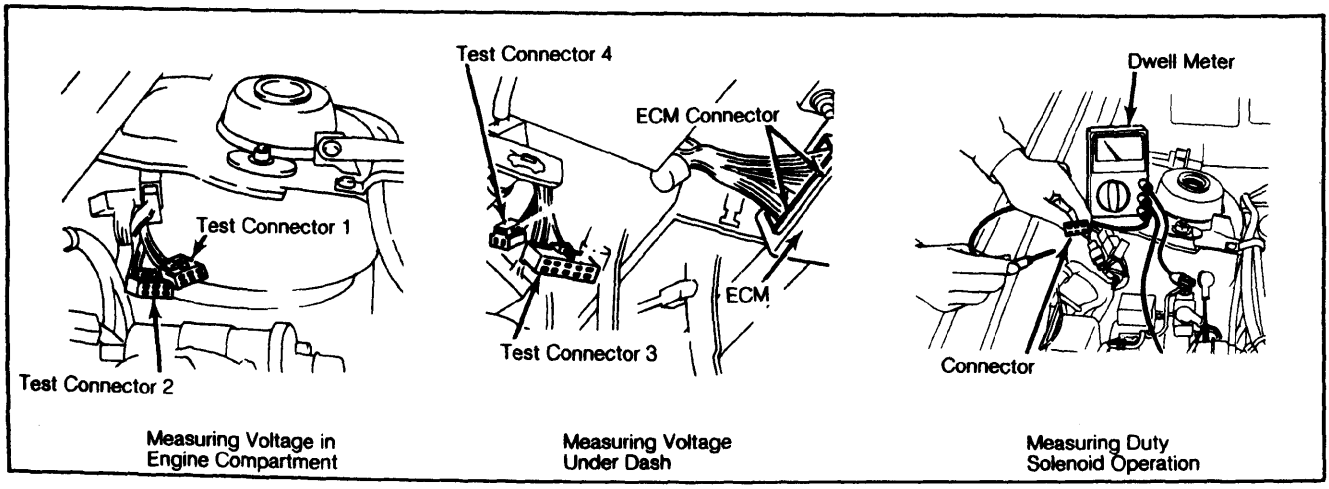


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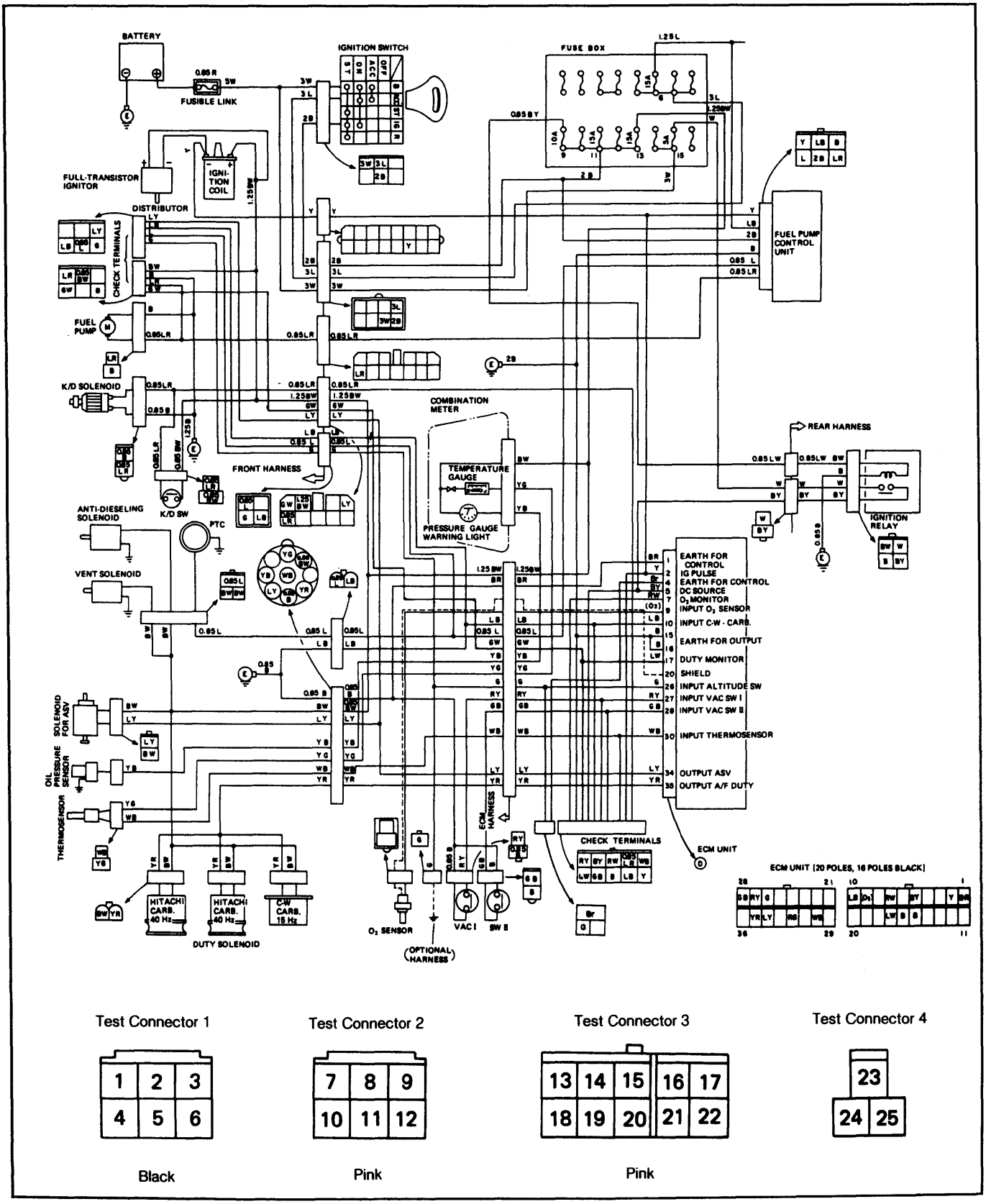
Fig. 4: ECC System Wiring Diagram



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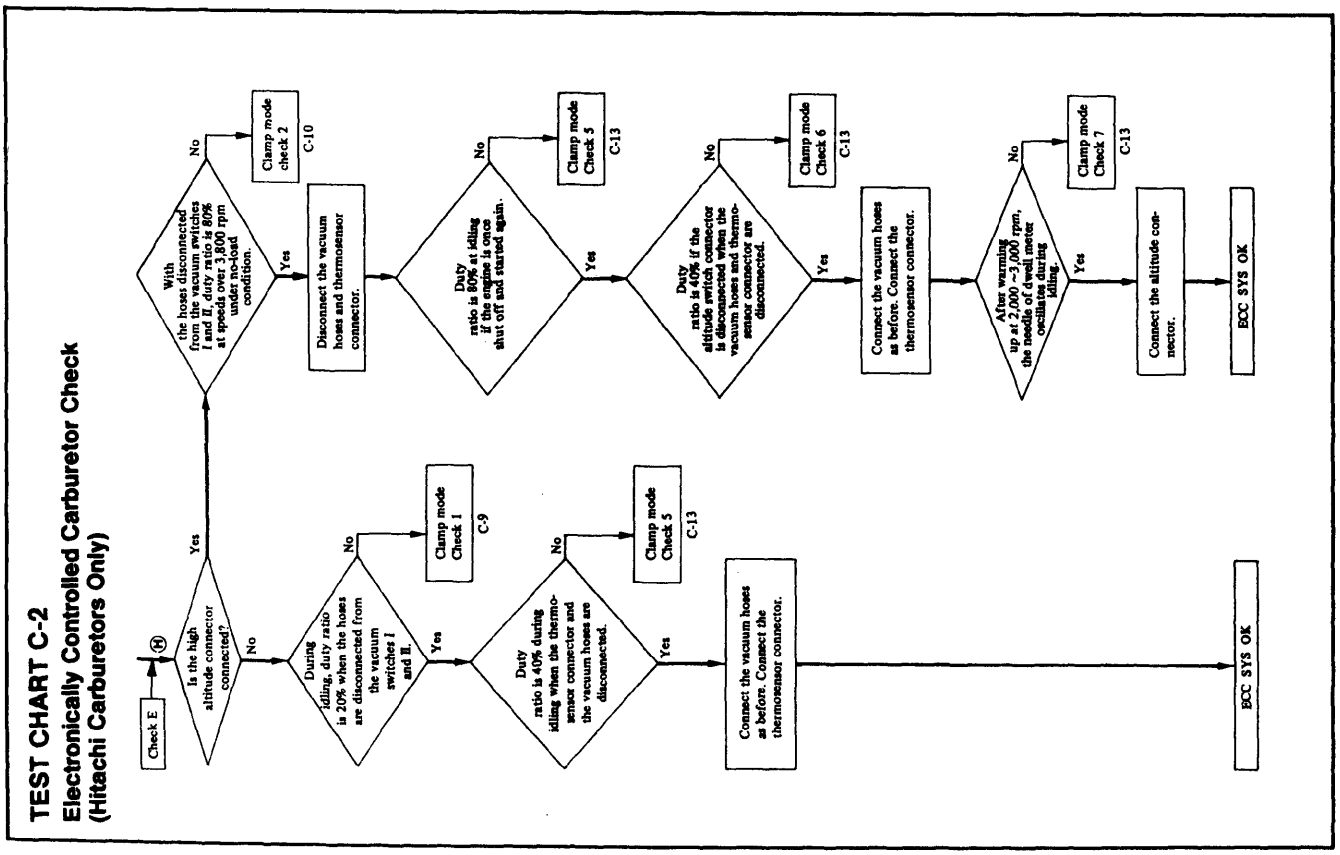

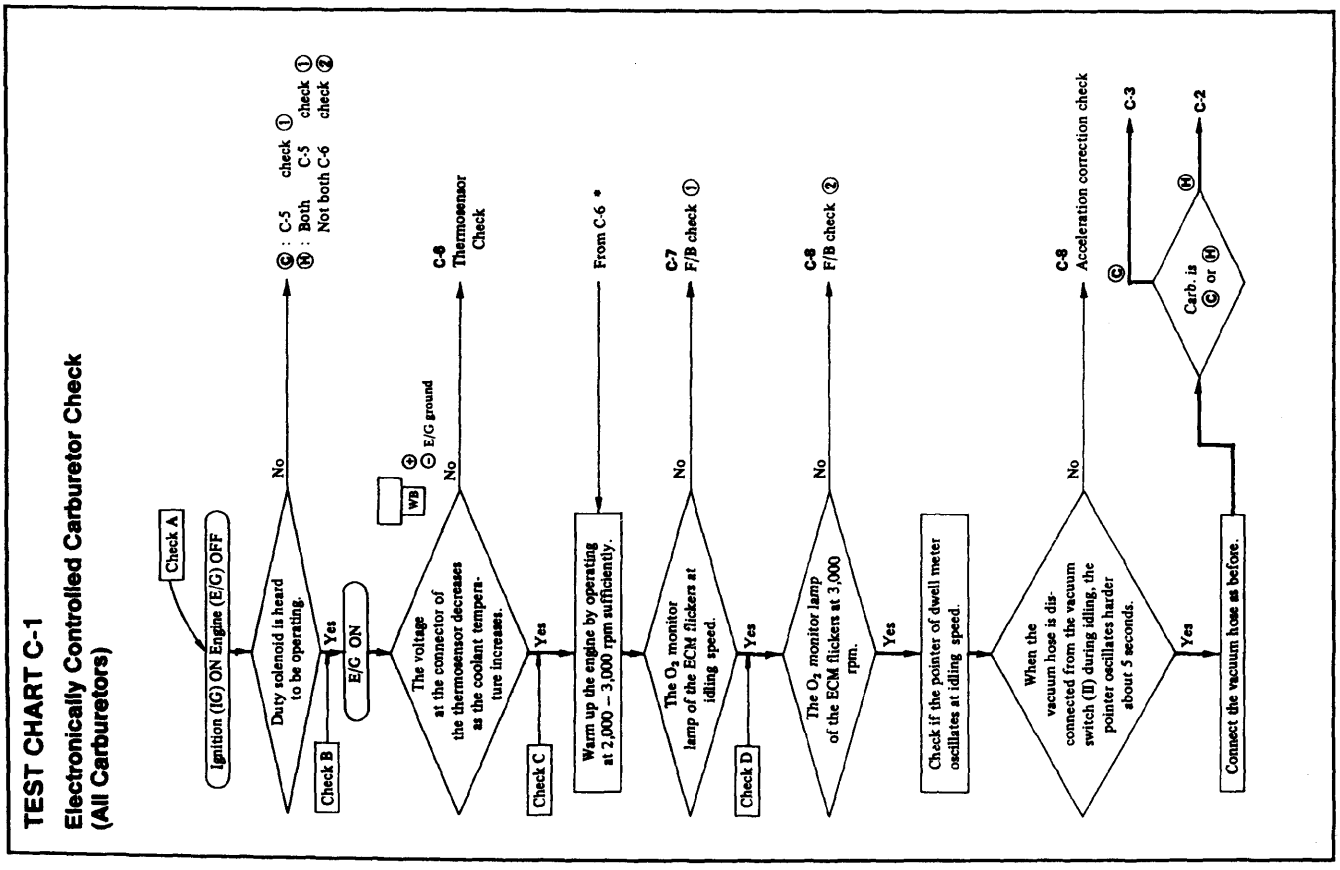

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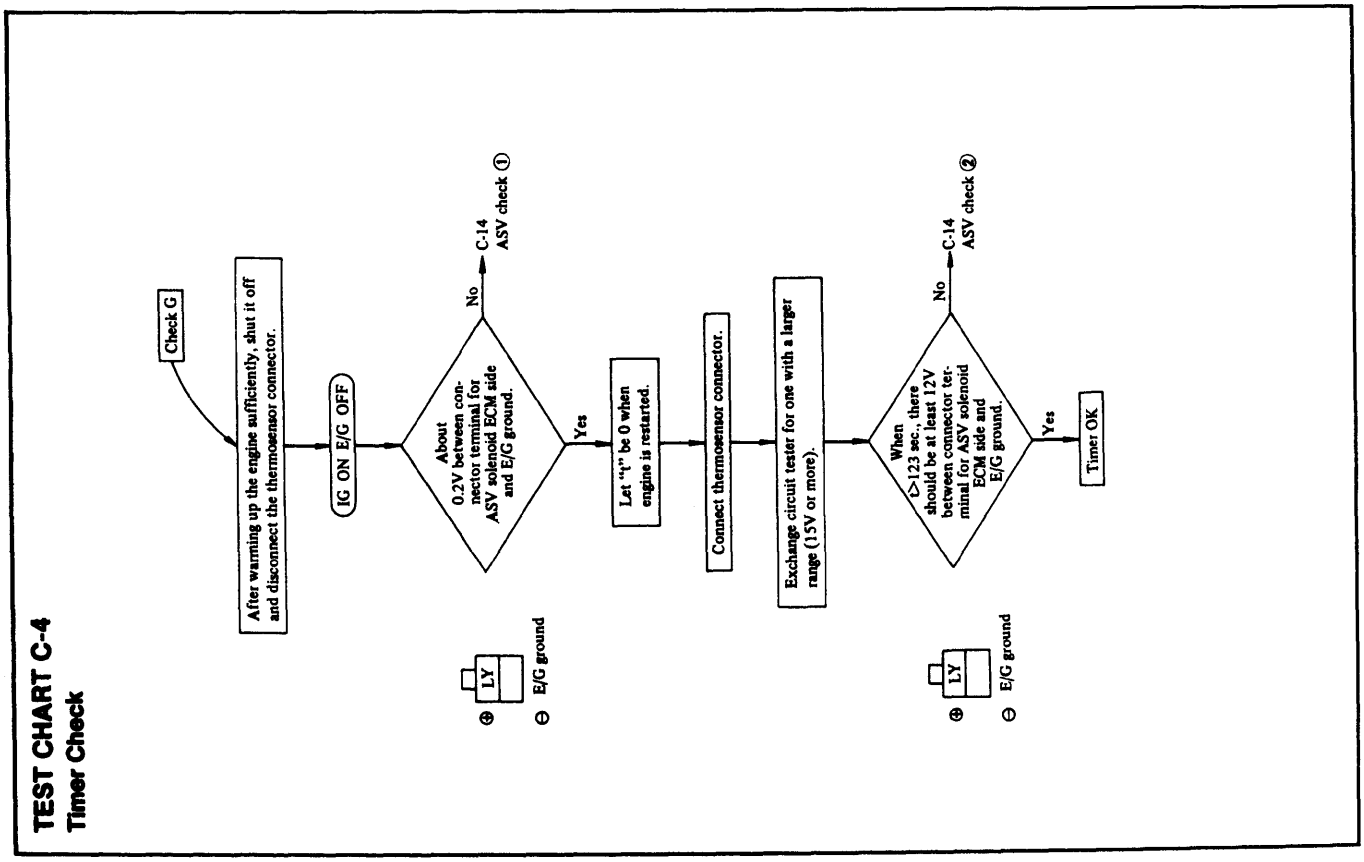

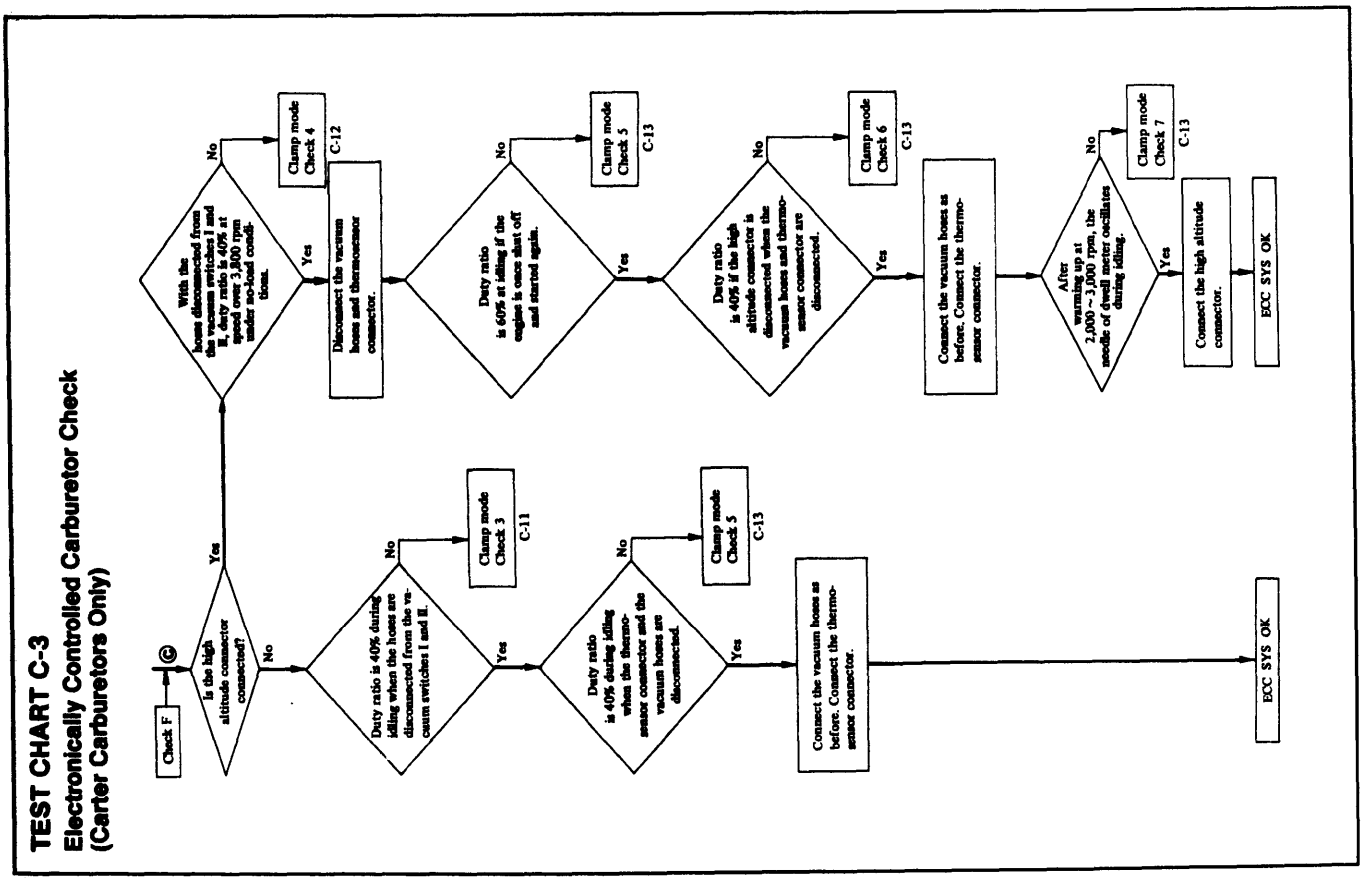

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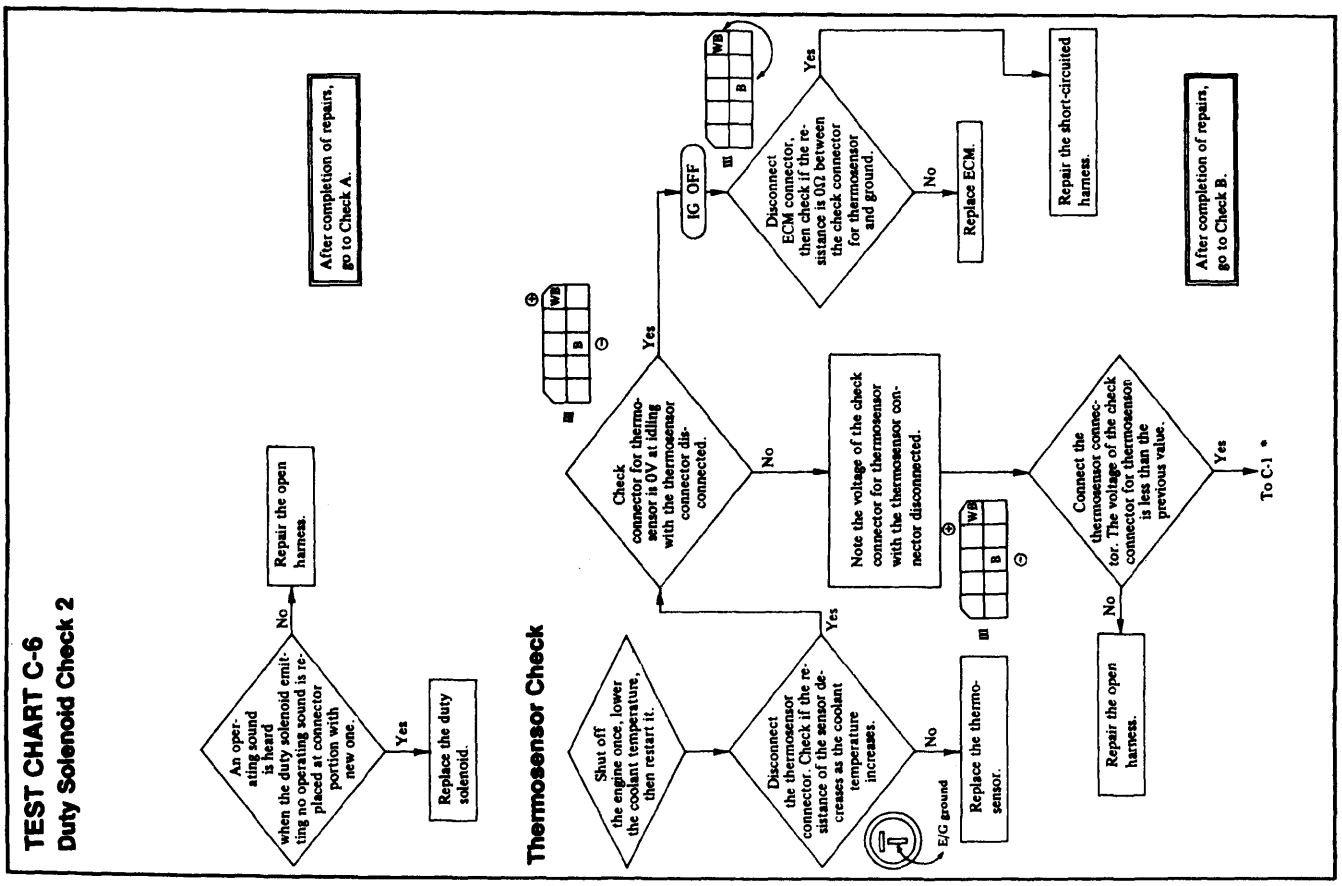

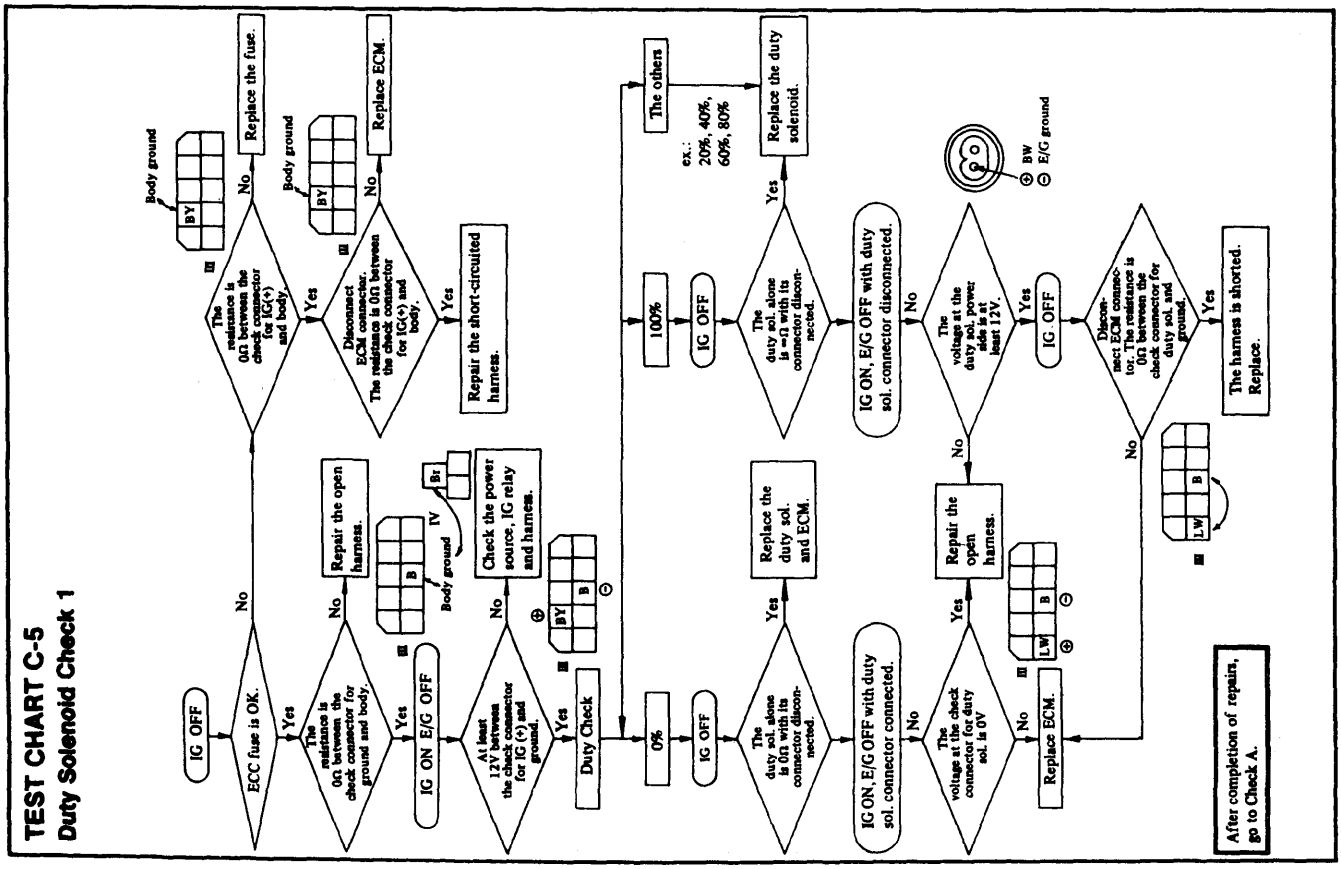

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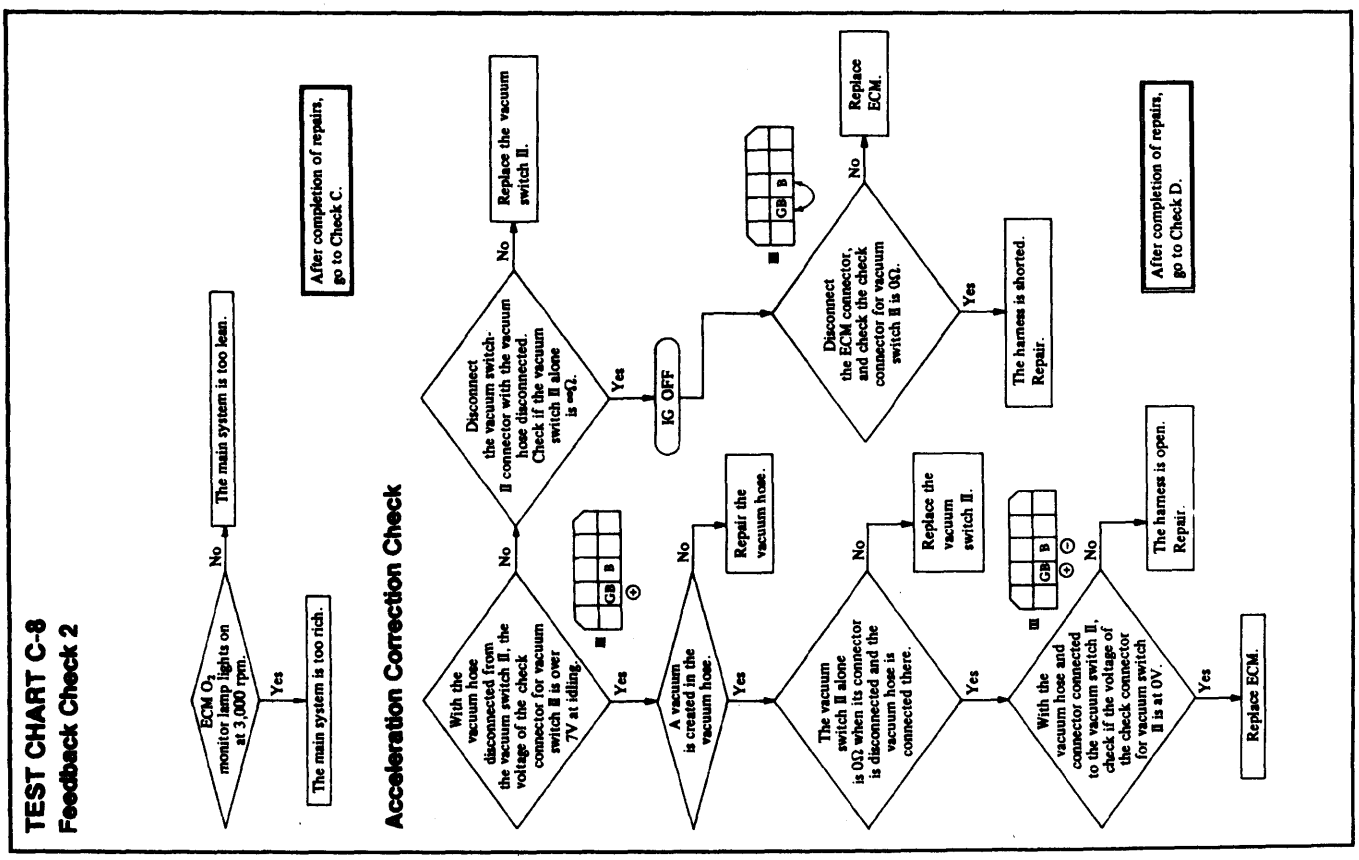

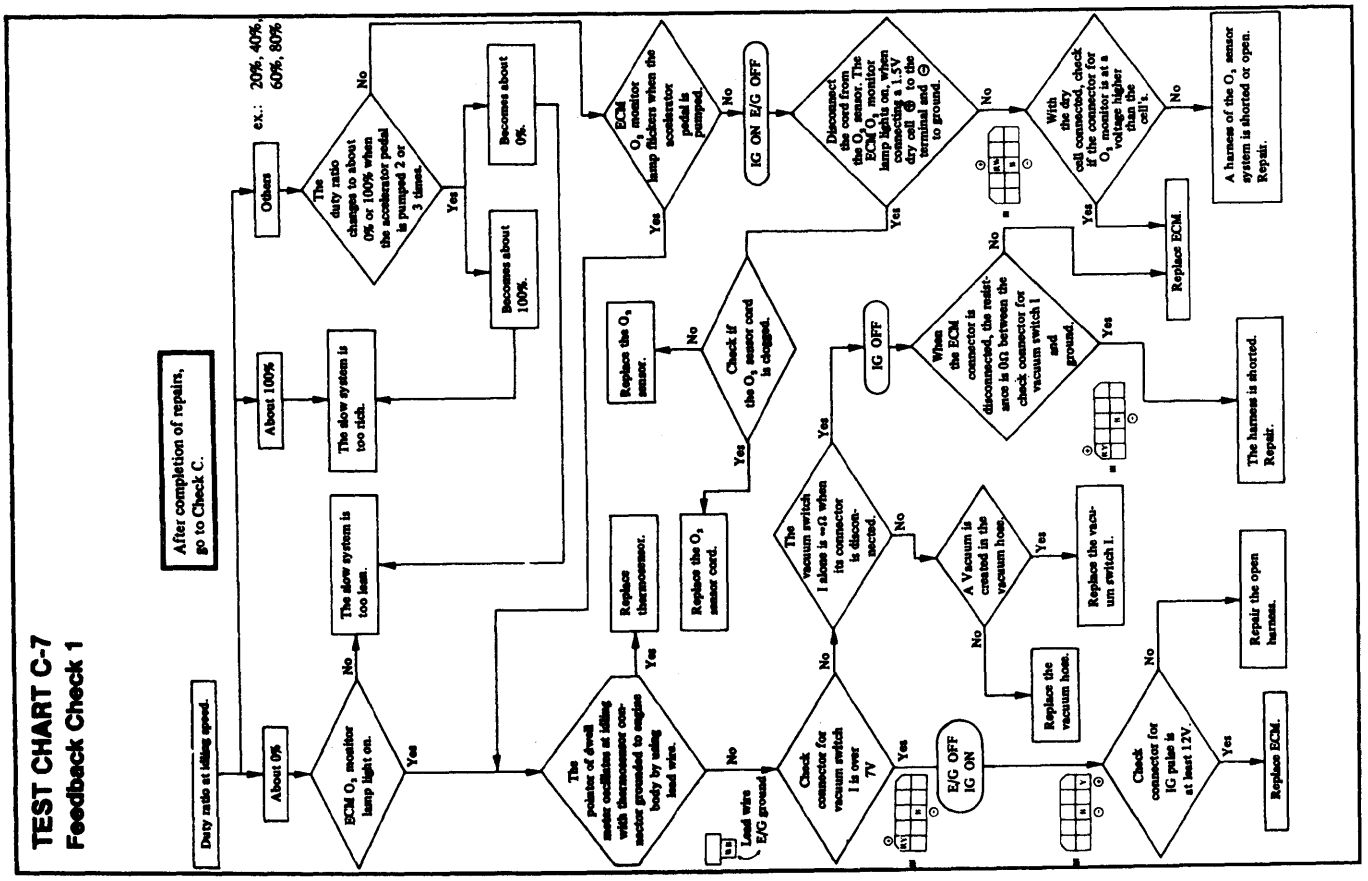

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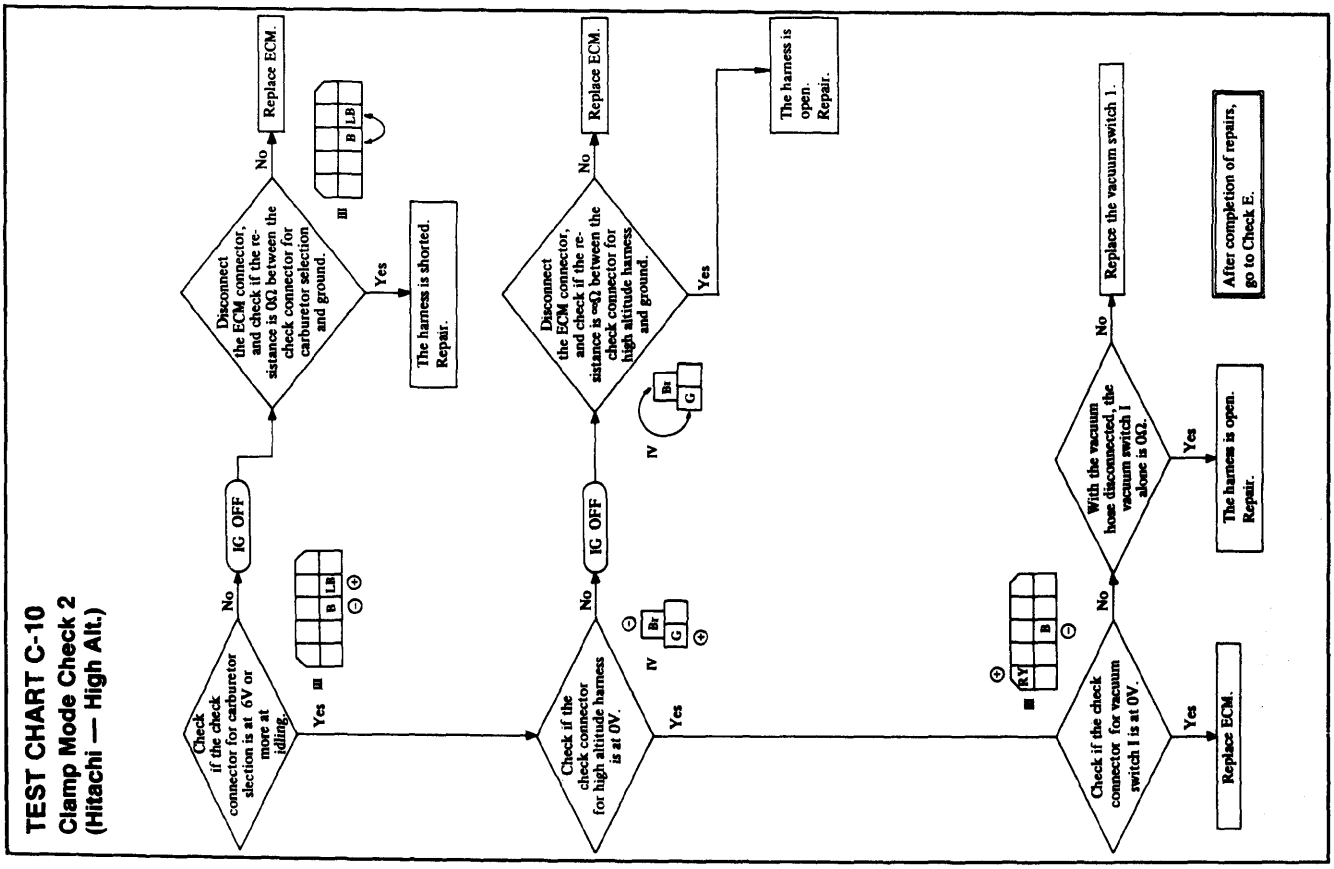

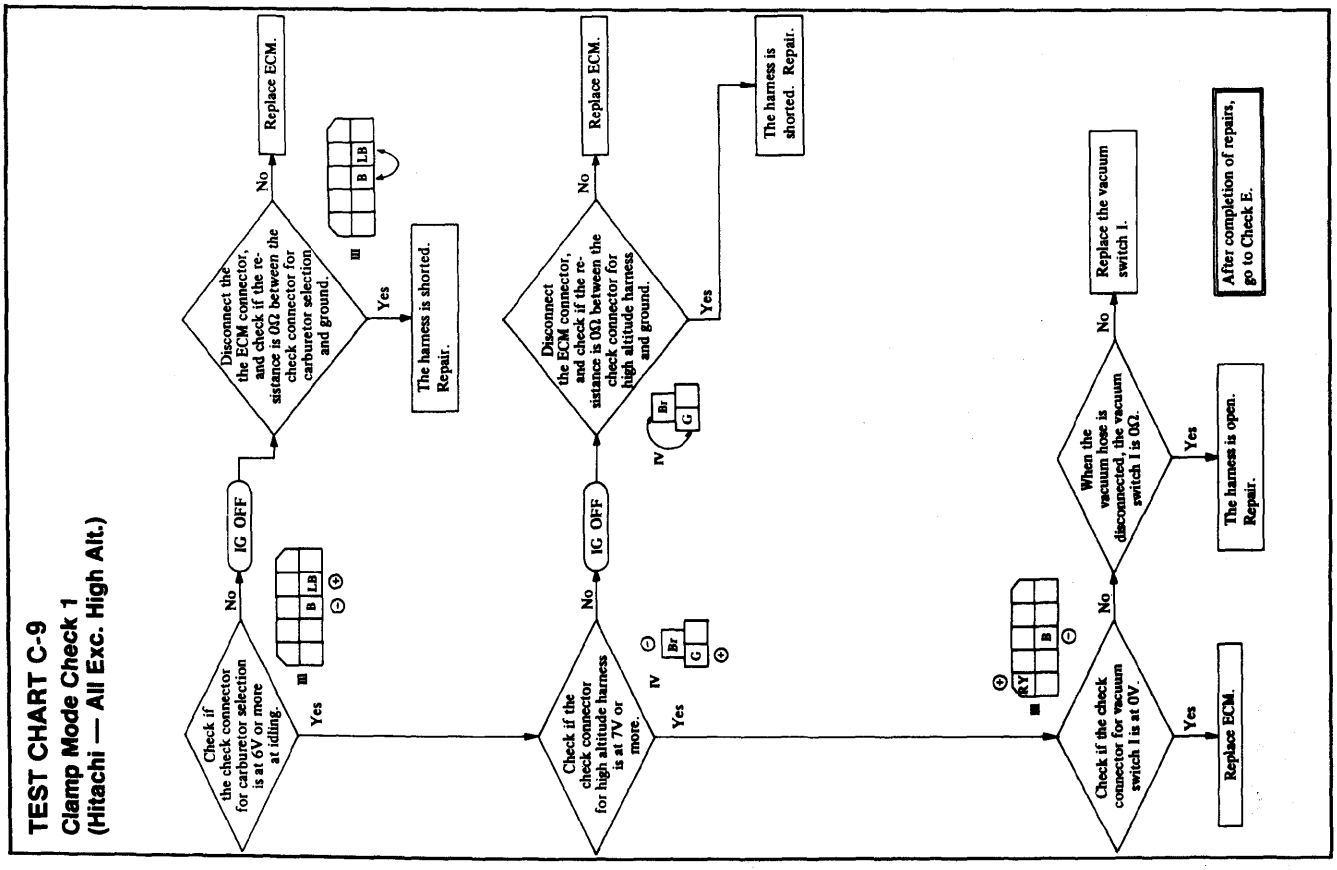

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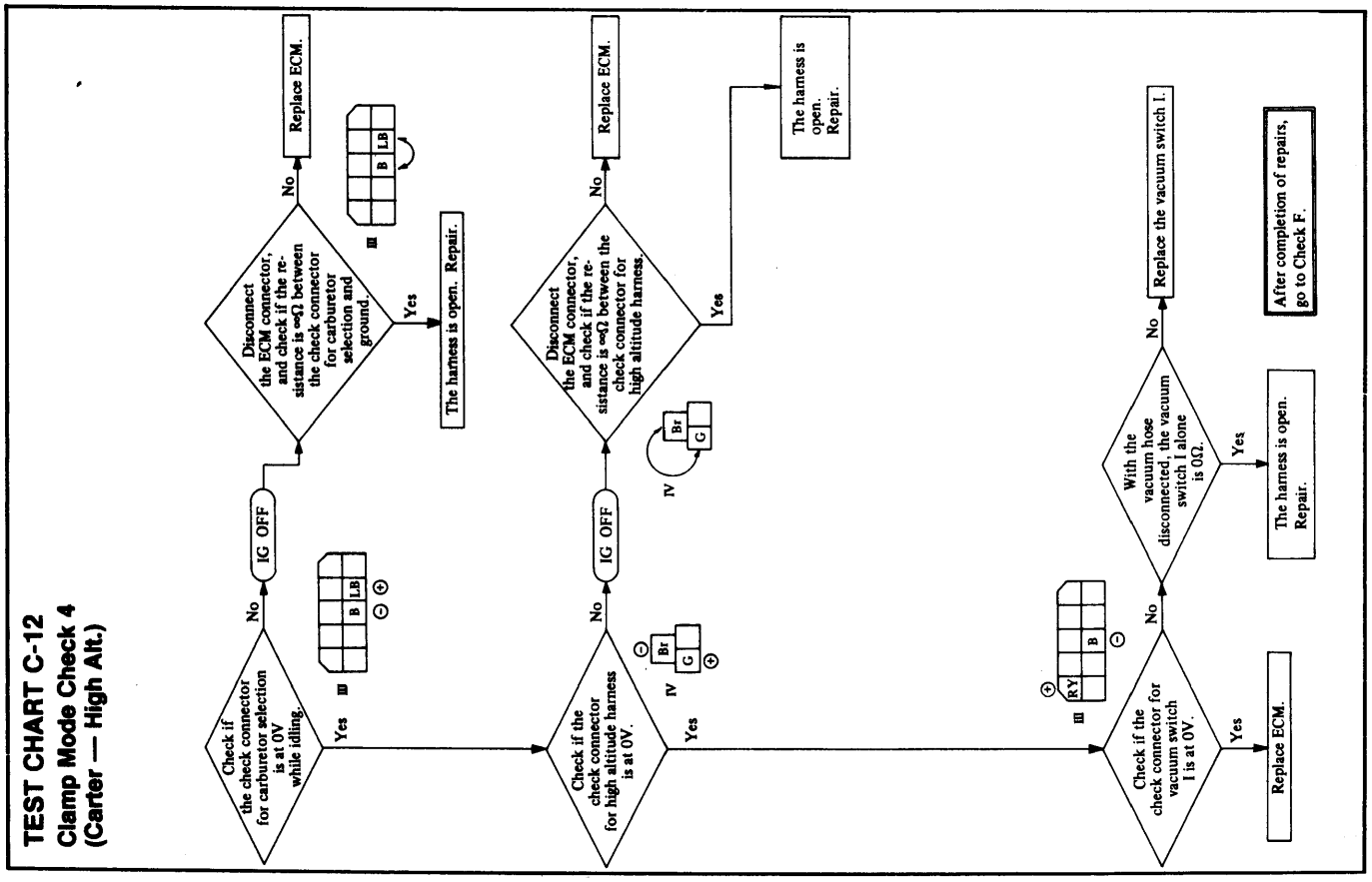

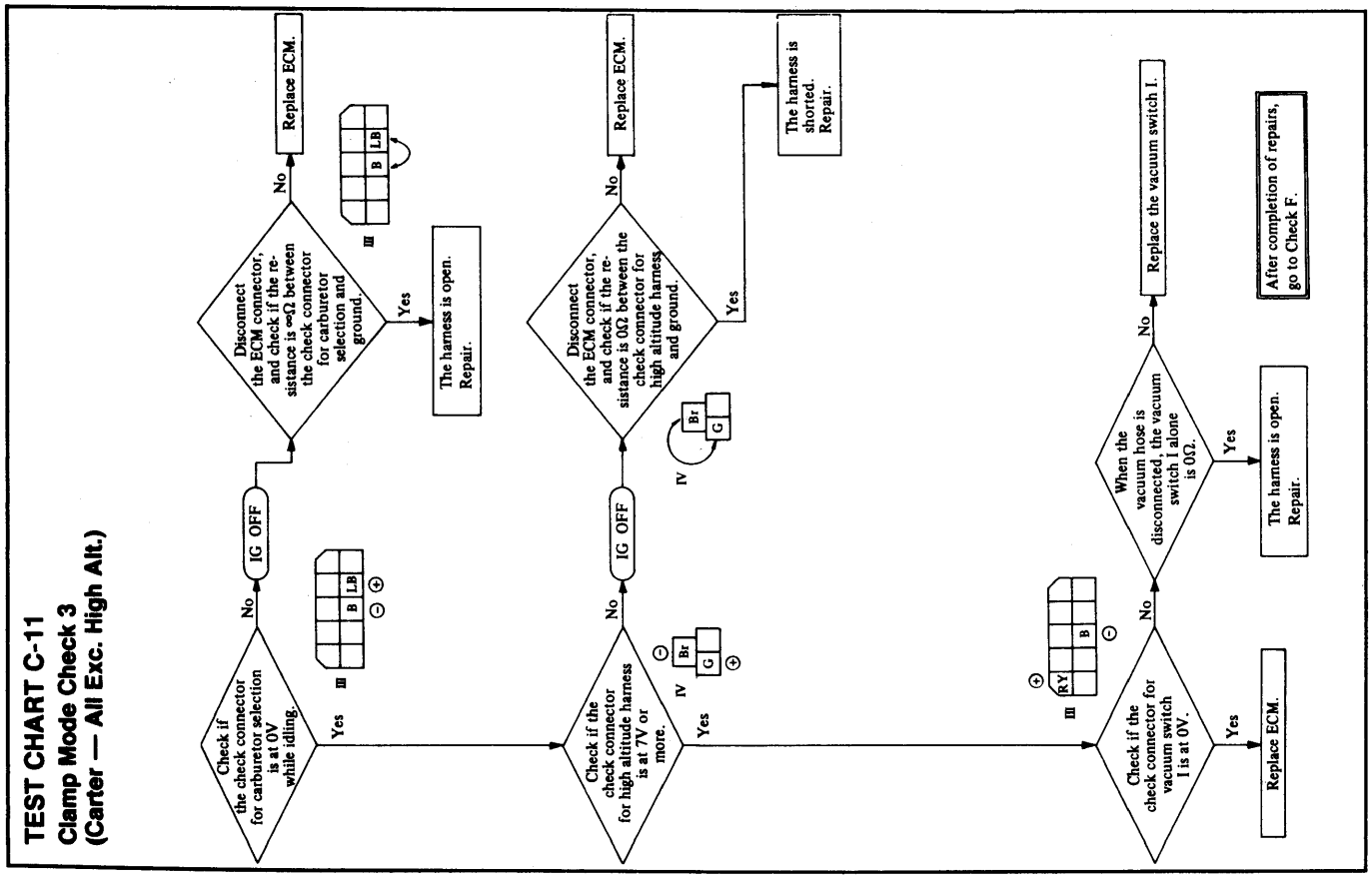

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