

SUBARU AUXILIARY EMISSION CONTROL SYSTEMS

All Models

DESCRIPTION & OPERATION

Secondary Throttle Valve Control – This system includes a thermal switch, relay, timer, solenoid valve and vacuum diaphragm. It vents secondary throttle valve operating vacuum when the engine is below a specified temperature. This keeps the secondary from opening, reduces CO emissions and improves driveability.

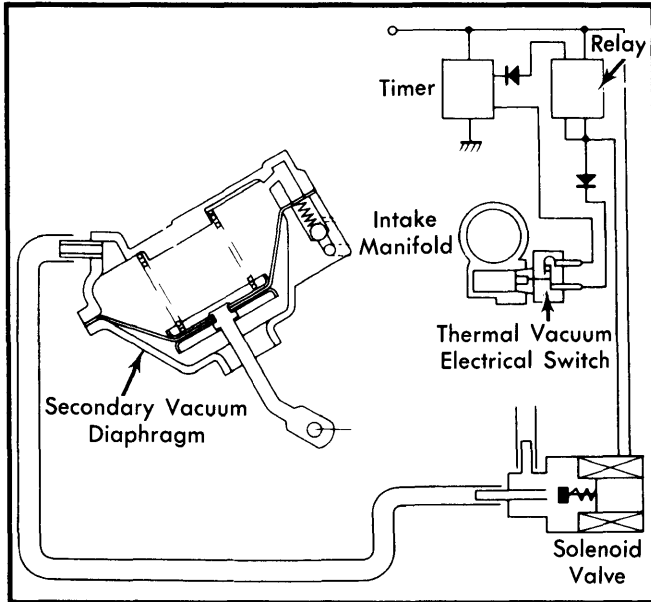


Fig. 1 Subaru Secondary Throttle Valve System

Shift-Up Control System – The shift-up control system is used on automatic transmission vehicles to keep the transmission in second gear until the engine is warm. The system includes a kick-down solenoid and switch, relay, timer and intake manifold thermal switch. When the manifold is below a specified temperature, the transmission is kept in kick-down position for 65 seconds.

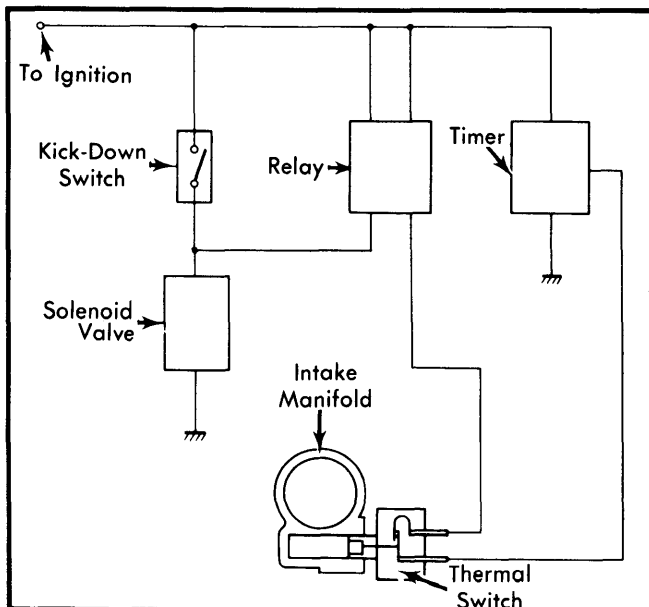


Fig. 2 Subaru Shift-Up Control System

Air Induction System – This system operates during choke use and leans out the mixture slightly to reduce CO emissions. It bleeds a small amount of air from the air cleaner into the intake manifold when the thermal vacuum valve is open.

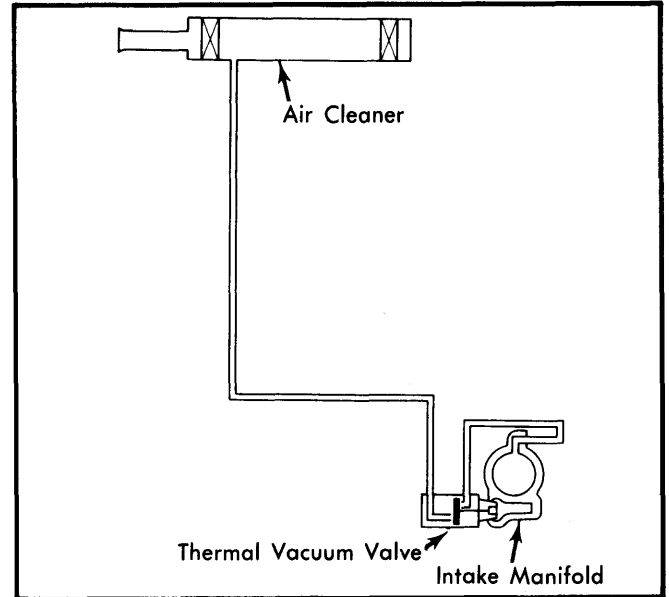


Fig. 3 Subaru Air Induction System

TESTING

SECONDARY THROTTLE VALVE CONTROL

Solenoid Valve – Measure resistance between terminals on solenoid valve. If not between 33-40 ohms, replace valve. Check resistance between valve body and terminals. Resistance should be at least 1 million ohms. Vacuum should pass through valve when current is applied to terminals; no vacuum should pass when current is not applied. Replace valve if defective.

Timer – Make a test circuit as shown in Fig. 4. When voltage is applied at terminals 1 and 2, current should be present across the test resistor. After 245 seconds, current should stop.

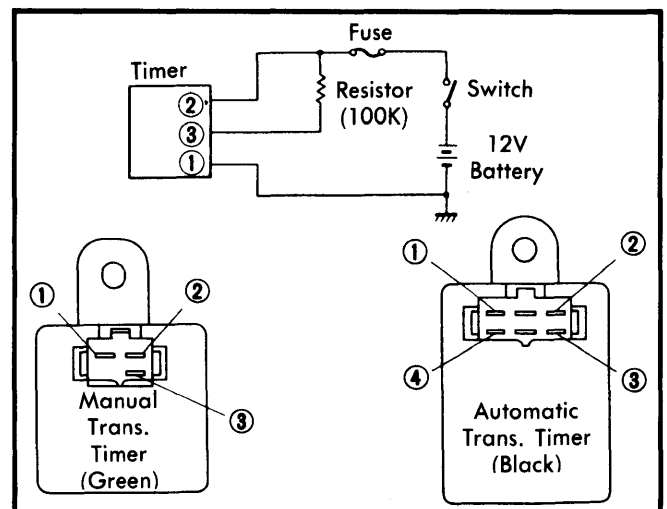


Fig. 4 Secondary Throttle Valve Timer Testing

1981 Exhaust Emission Systems

SUBARU AUXILIARY EMISSION CONTROL SYSTEMS (Cont.)

CAUTION — When voltage is applied to terminals 1 and 2, do not connect terminals 2 and 3 directly.

Thermal Switch — Switch operation can be checked with an ohmmeter or continuity tester. Switch should be open above switching temperature and closed (have continuity) below switching temperature. See "Thermal Switch Operating Temperature" table.

Thermal Switch Operating Temperatures

| Application | Open Above °F (°C) | Closed Below °F (°C) |
|-------------------|-----------------------|-------------------------|
| Man. Trans..... | 104 (40)..... | 88 (31) |
| Auto. Trans. | 114 (45)..... | 97 (36) |

SHIFT-UP CONTROL SYSTEM

Timer — Make a test circuit as shown in Fig. 5. When voltage is applied at terminals 1 and 2, current should be present across test resistor. After 65 seconds, current flow should stop.

CAUTION — When voltage is applied to terminals 1 and 2, do not connect terminals 2 and 4 directly.

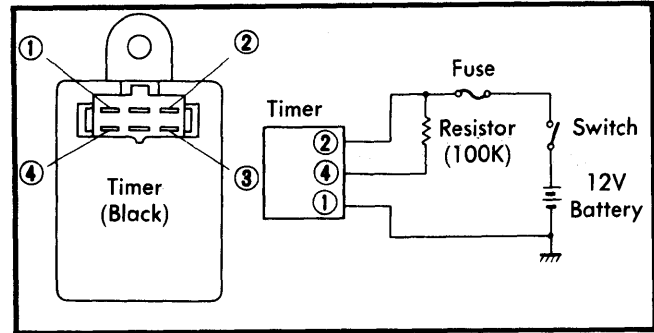


Fig. 5 Subaru Shift-Up Control Timer Testing

Thermal Switch — Switch operation can be checked with an ohmmeter or continuity tester. Switch should be open above switching temperature and closed (have continuity) below switching temperature. See "Thermal Switch Operating Temperature" table.

AIR INDUCTION SYSTEM

Thermal Vacuum Valve — Remove valve from intake manifold. Connect hoses to thermal valve ports and submerge valve in container of water. Valve should be completely open between 64° F (18° C) and 114° F (45° C). Valve should be closed below 50° F (10° C) and closed above 130° F (53° C). If not, replace valve.