GENERAL MOTORS THROTTLE RETURN CONTROL SYSTEM

DESCRIPTION

A throttle return control (TRC) system is used on all Heavy Duty emissions models. Upon deceleration, system opens throttle slightly to reduce hydrocarbon emissions. System consists of a throttle lever actuator, a solenoid vacuum control valve and an electronic speed sensor.

OPERATION

Manifold vacuum is routed through the solenoid vacuum valve, which is normally closed, to the throttle lever actuator. Upon vehicle deceleration, electronic speed sensor signals solenoid vacuum valve to open when engine speed is above a preset RPM. When valve opens, manifold vacuum is directed to throttle lever acutator, which extends to open throttle slightly. When engine speed drops below the preset RPM, solenoid valve closes, retracting throttle lever actuator and returning throttle to curb idle position.

TESTING & ADJUSTMENT

SYSTEM OPERATION

1) Connect a tachometer accurate to within ±10 RPM. Start engine and open throttle until tachometer reads 1890 RPM. Throttle lever actuator should be extended at this speed. Decrease engine speed to 1700 RPM. Throttle actuator should be retracted at this speed.

2) If throttle actuator operates at specified engine speeds, system is functioning. If actuator operates outside of RPM limits, replace speed sensor. If actuator does not operate at any speed, proceed with the following steps.

3) Using a voltmeter, check for battery voltage at voltage wire terminal on solenoid valve and speed sensor. If voltage is present at 1 component only, repair wiring harness as required. If no voltage at both components, check engine harness connections at distributor and bulkhead connector and repair as required.

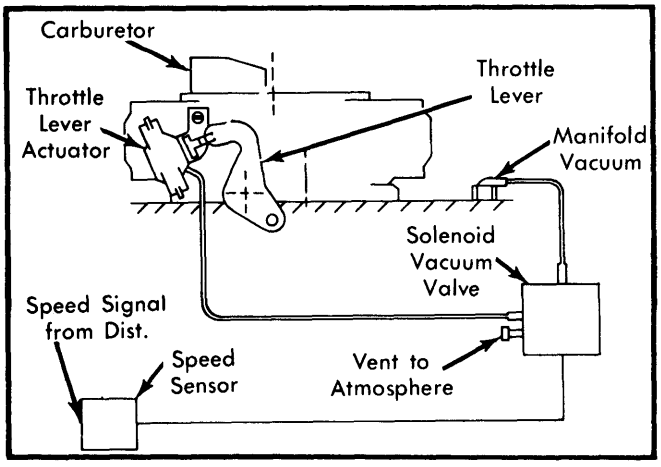

Fig. 1 Schematic of G.M. Throttle Return Control System

4) If battery voltage is present at solenoid valve and speed sensor, start engine and use a jumper wire to ground solenoid-to-speed sensor connecting wire terminal at speed sensor. Throttle actuator should extend.

- If actuator did not extend, remove throttle actuator hose from solenoid and check solenoid orifice for blockage. If orifice is plugged, clean as required. If orifice is clear, replace solenoid.
- If actuator did extend, ground solenoid-to-switch wire terminal at speed switch. If actuator does not extend, repair speed switch-to-solenoid wire. If it extends, ensure speed switch ground wire reads ground with engine running and check speed switch-to-distributor wire connections. If actuator still does not extend with all wires properly connected and engine speed above 1890 RPM, replace speed sensor.

5) If throttle actuator remains extended at all speeds, remove electrical connector from solenoid.

- If actuator remains extended, check actuator vacuum orifice on solenoid valve for blockage. Clean orifice, and reconnect system. If actuator again remains extended, remove solenoid connector. If actuator does not retract, replace solenoid valve.
- If actuator retracts with connector removed, reconnect and then remove speed switch connector. If actuator retracts, replace speed switch. If actuator does not retract, solenoid-to-switch wire is shorted to ground in harness. Repair wire.

THROTTLE LEVER ACTUATOR

1) Disconnect valve-to-actuator hose at valve and connect to an external vacuum supply, with a vacuum gauge installed near the actuator.

2) Apply 20 in. Hg to the actuator and seal off vacuum source. If vacuum gauge reading drops, actuator is leaking and must be replaced.

3) To check actuator for proper operation, first ensure throttle lever, shaft and linkage work without binding. Start engine and run to normal operating temperature. Turn off air conditioner and note idle RPM.

4) Apply 20 in. Hg to the actuator. Manually open throttle slightly and allow it to close against extended actuator plunger. Note engine RPM.

5) Release throttle and reapply 20 in. Hg to actuator and note RPM to which engine speed increases (do not assist the actuator).

6) If RPM as just noted is not within 150 RPM of speed noted in Step **4)**, then actuator plunger is binding. Clean around plunger to see if condition can be corrected. If not, replace actuator.

7) Release vacuum from actuator and engine speed should return to within 50 RPM of idle speed noted in Step **3)**. If not, plunger may be binding and should be cleaned. If problem cannot be corrected, replace actuator.

8) If engine RPM noted in Step **4)** is not to specified TRC speed, actuator must be adjusted.

9) To adjust actuator, apply 20 in. Hg to actuator. Manually, open throttle slightly and allow it to close against extended actuator plunger. Turn hex-end of plunger to obtain specified speed.

NOTE – *See Emission Control Tune-Up decal for throttle lever actuator adjustment speeds.*