1975-79 EXHAUST EMISSION SYSTEMS
General Motors Throttle Return Control System

DESCRIPTION

A Throttle Return Control (TRC) system is used on all Heavy Duty emission models. On deceleration, TRC system opens throttle slightly to reduce hydrocarbon emissions. The 1975-78 system consists of a vacuum control valve and a throttle lever actuator. The 1979 system consists of a throttle lever actuator, a solenoid vacuum control valve and an electronic speed sensor.

OPERATION

The 1975-78 TRC system is not controlled electrically. On engine deceleration, increased manifold vacuum opens the vacuum control valve. As vacuum control valve opens, vacuum is applied to throttle lever actuator opening carburetor throttle valve slightly. When manifold vacuum returns to normal, vacuum control valve closes allowing throttle lever actuator to retract.

On 1979 TRC system, manifold vacuum is routed through the normally closed solenoid vacuum valve to the throttle lever actuator. On vehicle deceleration, electronic speed sensor signals solenoid vacuum valve to open when engine speed is above a preset RPM. When solenoid vacuum valve opens, manifold vacuum is directed to throttle lever actuator and throttle is opened slighlty. When engine speed drops below the preset RPM, solenoid valve closes, retracting throttle lever actuator and returning throttle to curb idle position.

TESTING

VACUUM CONTROL VALVE

1975-78 Models - 1) Disconnect control valve-to-carburetor hose at control valve. Connect an external vacuum source and vacuum gauge to control valve. *See Figs. 1 and 2.*

2) Apply a minimum of 25 in. Hg vacuum to control valve and quickly seal off test hose and vacuum gauge. Vacuum gauge should drop slightly, then stabilize at control valve set point. See TRC VALVE SET POINT table.

3) If vacuum drops faster than 1 in. Hg per second, control valve must be replaced. If vacuum gauge reading is not within .5 in. Hg set point, adjustment is required.

4) Carefully pry plastic cover from control valve. Loosen jam nut (hold larger nut while turning smaller nut). Turn large nut clockwise to raise set point or counterclockwise to lower set point. Repeat test.

5) If control valve tests okay, hold larger nut and tighten smaller nut into large nut. Replace plastic cover.

TRC VALVE SET POINT

Application	Valve Color	Set Point (In. Hg)
292"	Maroon	22.5
305"	Orange	22.5
350" & 400"	Black	21.5
454"	Green	23.0

1979 Models - 1) Connect a tachometer to engine. 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 okay. If actuator operates outside of RPM limits, replace speed sensor. If actuator does not operate at any speed, go to next step.

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

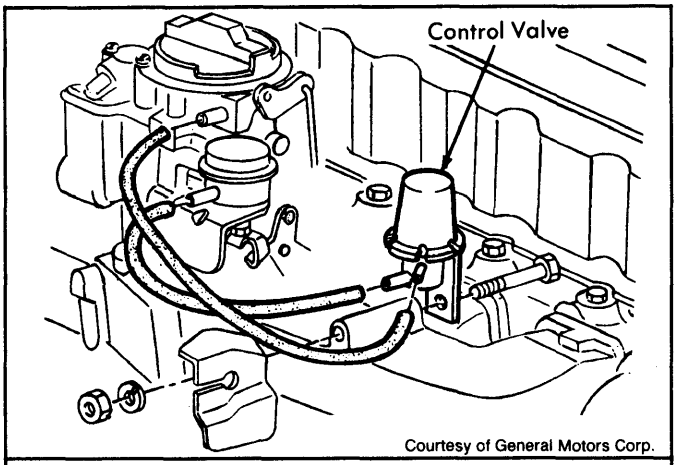

Fig. 1: 1975-78 Throttle Return Control System (6-Cylinder)

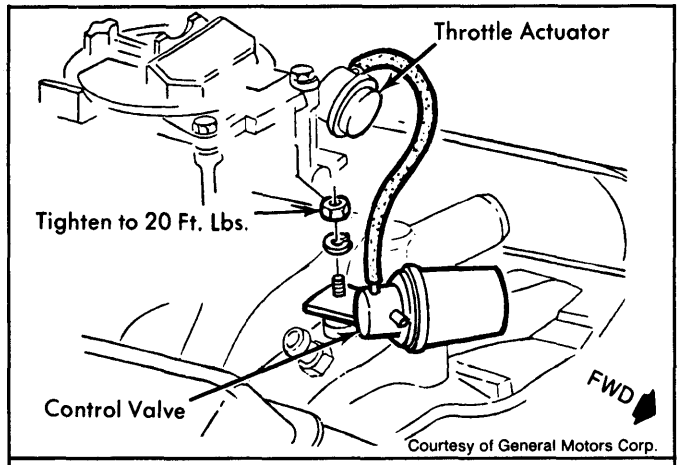

Fig. 2: 1975-78 Throttle Return Control System (V8)

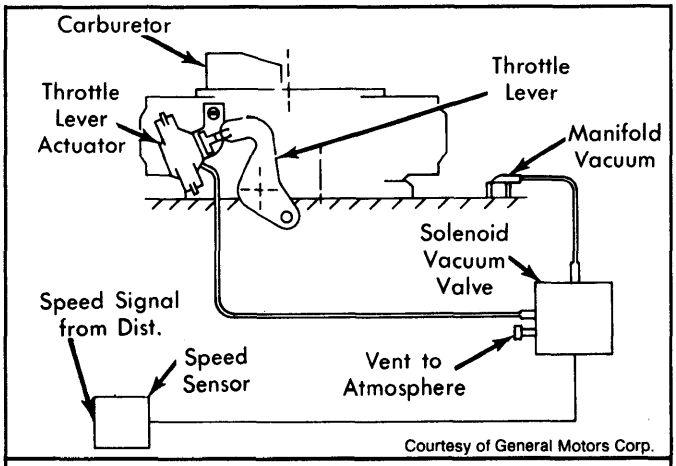

Fig. 3: 1979 Throttle Return Control System

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.

5) 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.

6) If actuator did extend, ground solenoid-to-sensor wire terminal at speed sensor. If actuator does not extend, repair speed sensor-to-

General Motors Throttle Return Control System (Cont.)

solenoid wire. If it extends, ensure speed sensor ground wire is okay. Check speed sensor-to-distributor wire connections. If actuator still does not extend with all wires properly connected and engine speed above 1890 RPM, replace speed sensor.

7) 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.

8) If actuator retracts with connector removed, reconnect and then remove speed sensor connector. If actuator retracts, replace speed sensor. If actuator does not retract, solenoid-to-sensor wire is shorted to ground in harness. Repair wire.

THROTTLE LEVER ACTUATOR

1975-79 - 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 vacuum 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 and warm engine to normal operating temperature. Turn off air conditioner and note idle RPM.

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

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 in step **5)** is not within 150 RPM of speed noted in step **4)**, 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.