

1975-79 EXHAUST EMISSION SYSTEMS

Ford Motor Co. Decel Throttle Modulator

DESCRIPTION

The decel throttle modulator system, used on some Heavy Duty emissions models, keeps the throttle valves open slightly during deceleration to help reduce emissions. System consists of a speed sensor, solenoid vacuum valve, throttle modulator on throttle linkage, ported vacuum switch, and electrical wiring and vacuum hoses. The system is electrically connected to the "B+" terminal of the ignition switch and to the "+" terminal of ignition coil. See Fig. 1.

OPERATION

Manifold vacuum is routed through a Ported Vacuum Switch (PVS) and a solenoid vacuum valve. The solenoid vacuum valve is normally closed to the vacuum throttle modulator. Power is available to solenoid vacuum valve through an electronic sensor. Electronic sensor ground circuit is normally open. As engine reaches 1850 RPM, ground circuit in sensor is completed allowing solenoid vacuum valve to open. Vacuum pulls throttle modulator diaphragm which pushes throttle to high idle position during deceleration. Engine coolant must be above 125°F before PVS will allow vacuum to reach solenoid vacuum valve.

ADJUSTMENT

NOTE: This adjustment is to be performed when replacing components found defective during testing sequence.

- 1) With engine at normal operating temperature and transmission in Neutral, adjust carburetor to specified curb idle speed. On automatic transmission vehicles, this will be set to 100 RPM higher than specified curb idle speed (as with transmission in Drive), although transmission will remain in Neutral. This is to keep minimum load on engine.
- 2) Disconnect vacuum hose from throttle modulator and plug hose. Connect manifold vacuum source to diaphragm. Allow one minute for engine speed to stabilize. If engine speed is within specifications, the modulator is properly set. Go to step 5).
- 3) If RPM was not within specification, adjust throttle modulator by loosening lock nut and turning until speed is within limits. Retighten lock nut.

NOTE: On Carter 1-barrel carburetors, avoid damage to diaphragm by holding diaphragm shaft with ¼" wrench while turning adjusting screw with ⅜" wrench.

- 4) Detach manifold vacuum hose from modulator and allow engine to return to idle condition. Repeat procedure from step 2) as required until proper function occurs.
- 5) Disconnect manifold vacuum hose from modulator and allow engine to return to normal idle. Remove plug from original hose and reconnect it to throttle modulator fitting.
- 6) On automatic transmission vehicles, reset idle to specifications with transmission in Drive. On all vehicles, stop engine. Install air cleaner assembly.

TESTING

PRE-TEST SET UP

- 1) Check Vacuum Delay Valve (VDV) for proper operation (if equipped). See VACUUM DELAY VALVES article for testing procedures.
- 2) Remove air cleaner and plug vacuum line. Check primary and secondary throttle linkage and choke linkage for freedom of movement. Connect tachometer to engine.

NOTE: Perform testing in sequence given.

THROTTLE MODULATOR DIAPHRAGM CHECK

- 1) Disconnect manifold vacuum hose from solenoid valve at diaphragm unit. Plug end of hose. Using an external vacuum source, apply 19 in. Hg of vacuum to the diaphragm. Check for throttle arm movement.
- 2) If throttle does not move, check linkage and repair or replace as necessary. If vacuum leakage from 19 in. Hg to 12 in. Hg of vacuum takes less than 2 seconds, replace diaphragm unit.
- 3) Check position of adjusting screw on diaphragm housing. Ensure adjusting screw does not interfere with mechanically lock-out movement of throttle linkage.
- 4) Release external vacuum from diaphragm. Diaphragm should retract to original position within 5 seconds. If not, replace throttle modulator. Remove plug from vacuum hose and reinstall on diaphragm.

PORTED VACUUM SWITCH TEST

- 1) Warm engine until normal operating temperature is reached. Ensure choke plates are fully open. Turn off all accessories.
- 2) Disconnect vacuum line from PVS solenoid and connect vacuum gauge to hose.
- 3) With transmission in Park or Neutral, check vacuum gauge for vacuum signal. If no vacuum is present, PVS should be replaced. If vacuum is present, PVS is okay.

SOLENOID VACUUM VALVE TEST

- 1) Check all vacuum hoses for proper routing and connections. Ensure engine is at idle. Disconnect vacuum supply hose at solenoid valve. Place finger over open end of hose. Suction should be felt. If not, repair vacuum source.
- 2) Disconnect wiring from solenoid vacuum valve. Note location of wire leading to ignition switch "B+" terminal. Using a jumper wire, connect "B+" wire to the solenoid vacuum valve.
- 3) Engine RPM should not increase. If an increase is noted, replace solenoid valve. Using a second jumper wire, ground other terminal of solenoid valve. Engine RPM should increase. If not, replace solenoid valve. Reconnect all system-related components to original positions.

ELECTRONIC SPEED SENSOR TEST

- 1) If equipped with electric lead to ported vacuum switch, disconnect lead from PVS and ground to chassis. Verify that harness connector at speed sensor is firmly attached.
- 2) Check for proper operation by slowly accelerating engine to above 1950 RPM. Throttle modulator should activate at about 1850 RPM (increasing engine speed) and deactivate at about 1600 RPM (decreasing engine speed). If not, proceed to next step.
- 3) Disconnect harness at speed sensor. Turn ignition switch on. Connect one lead of a voltmeter to terminal No. 1 and other lead to ground. Battery voltage should be indicated. If not, repair or replace wiring as necessary. Repeat voltage test on terminal No. 4.

NOTE: Terminals are numbered 1 through 6, starting at key side. Terminal No. 2 is blank.

- 4) Connect one voltmeter lead to terminal No. 6, and other lead to ground. Voltmeter should indicate a minimum of 12 volts. If not, repair or replace wiring as necessary.
- 5) Turn ignition off. Connect one ohmmeter lead to terminal No. 3 of connector, and other lead to terminal No. 1. Ohmmeter should read continuity. If not, repair or replace wiring. Repeat test on terminals No. 5 and 1.
- 6) If throttle modulator does not actuate, or readings are not as indicated, speed sensor is faulty and must be replaced. Reconnect all wiring to original positions.

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Ford Motor Co. Decel Throttle Modulator (Cont.)

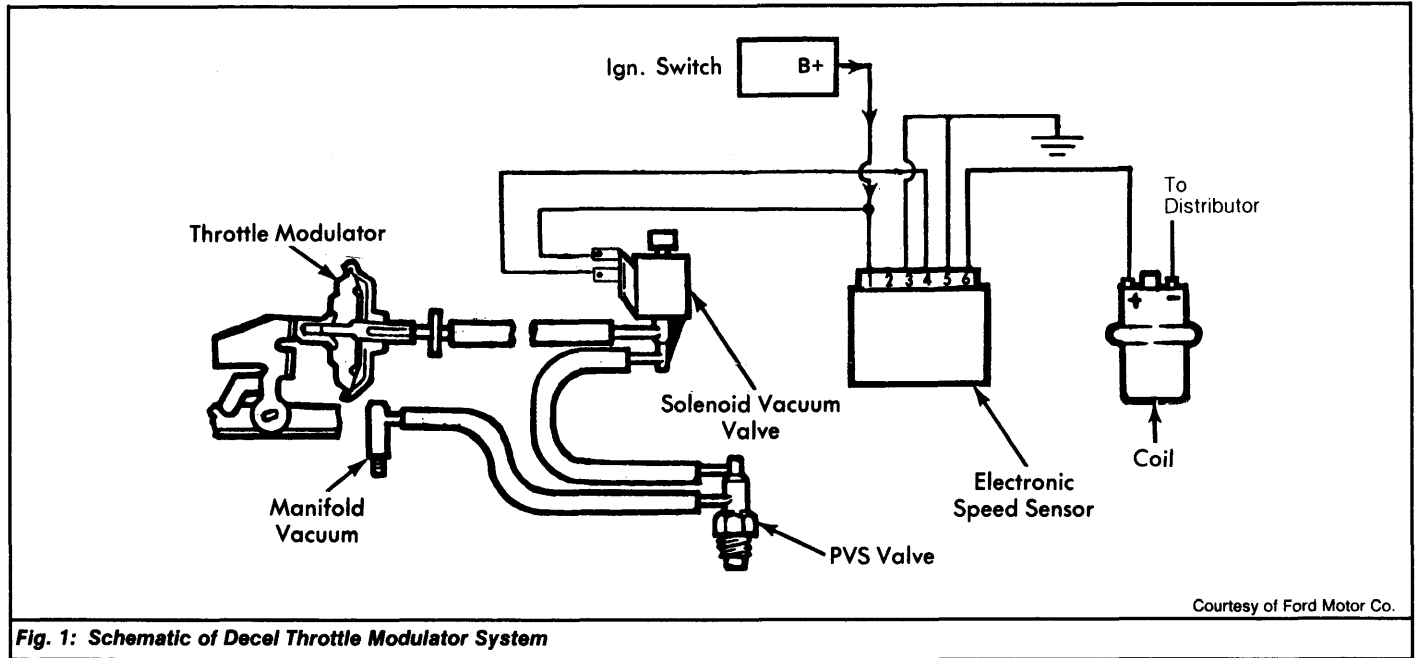


Fig. 1: Schematic of Decel Throttle Modulator System