1982 Exhaust Emission Systems

FORD THERMOSTATIC AIR CLEANER

All Models

DESCRIPTION

Fresh air or heated air is made available to the engine by a system of ducting which directs air into air cleaner assembly. Air temperature is controlled by a temperature-sensitive vacuum system that operates duct valve.

The vacuum-operated duct can select cool air from outside through a pickup tube, or warm air from a shroud around the exhaust manifold. The system consists of the shroud, an air cleaner assembly with a vacuum motor, a duct and valve assembly, a temperature sensor, and a cold-weather modulator (some models). *See Fig. 1.*

OPERATION

When engine is cold, air is selected from exhaust manifold shroud, because the heat sensor in air cleaner is cold. In the "open" position, vacuum applied to vacuum motor operates duct valve. *See Fig. 2.* Duct valve shuts off fresh air supply and opens, allowing heated air to enter air cleaner.

As engine warms up, the sensor operates, preventing vacuum from being applied to vacuum motor. In this "closed" position, the duct valve closes off supply of heated air, and allows air from outside to flow through pickup tube into air cleaner. *See Fig. 2.*

A cold-weather modulator on some models, controls operation of duct valve under certain air temperature conditions for improved emission control.

Fig. 2: Open & Closed Operation of Duct Valve

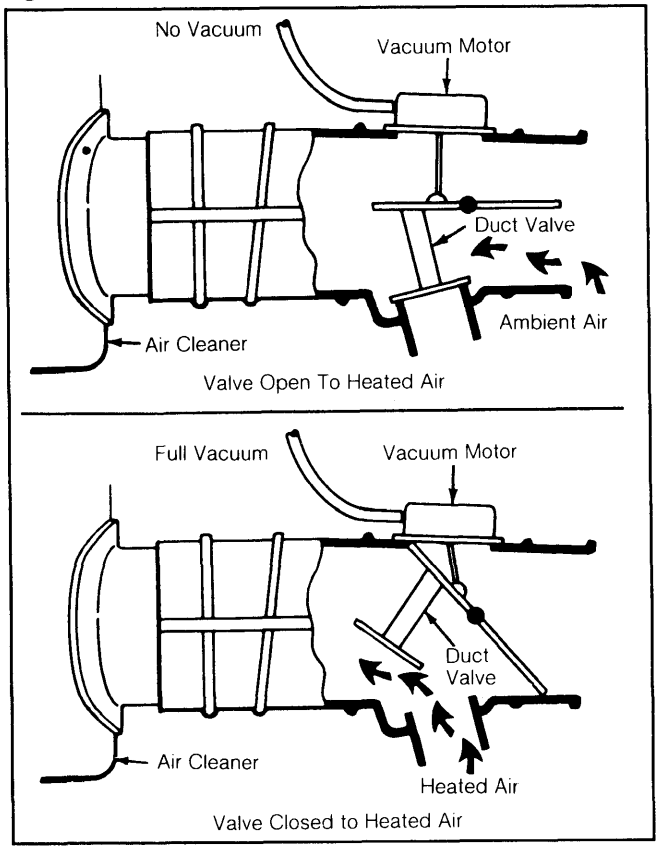
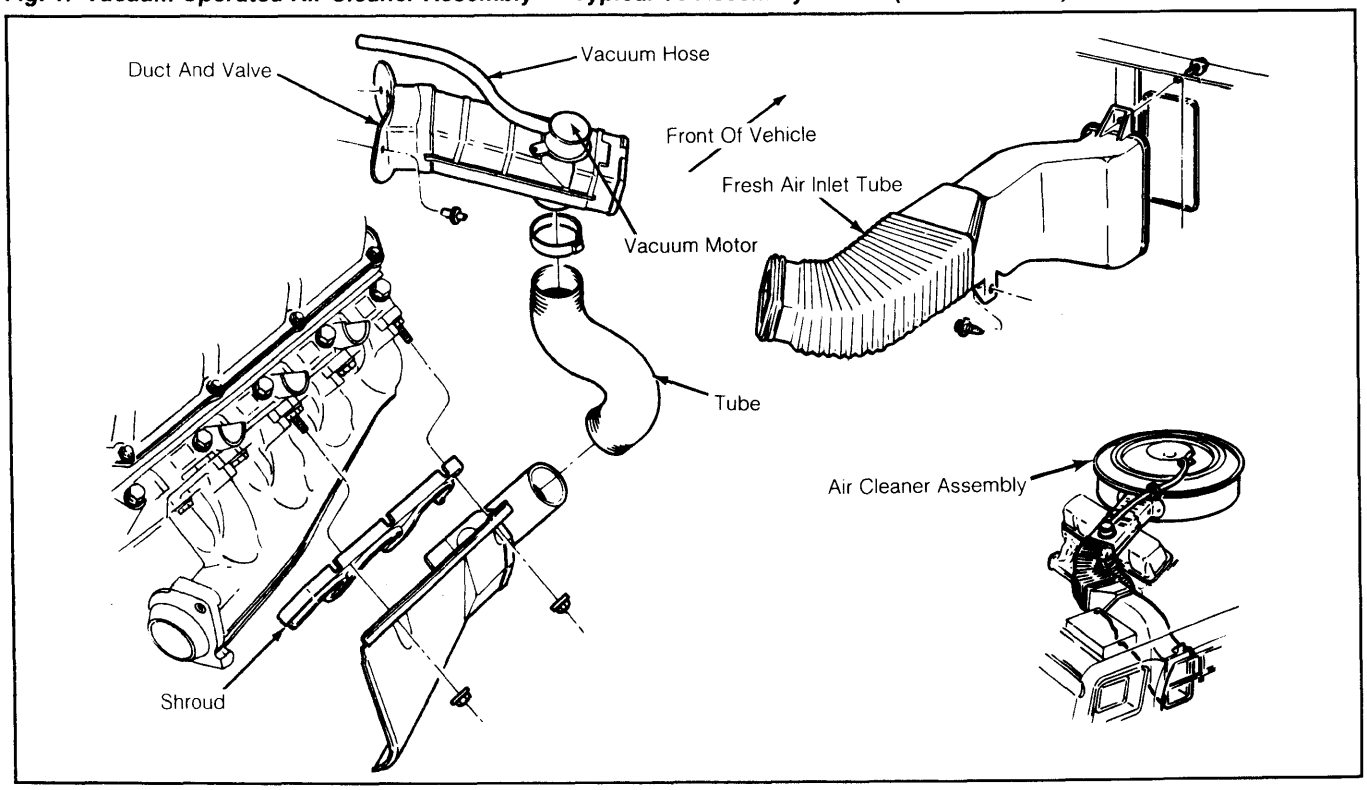


Fig. 1: Vacuum-Operated Air Cleaner Assembly — Typical V8 Assembly Shown (Others Similar)



Duct valve switches from heated air to fresh air.

FORD THERMOSTATIC AIR CLEANER (Cont.)

TESTING

DUCT & VALVE ASSEMBLY WITHOUT VACUUM OVERRIDE

NOTE: This check must be performed with an outside temperature of at least 60°F (16°C). If vehicle is equipped with a cold-weather modulator or vacuum delay valve, by-pass these systems by connecting the 2 vacuum lines together.

1) Check to see that duct door is open with engine not running. If door is closed, check for binding. Place a magnetic thermometer as close as possible to temperature sensor on air inlet side.

2) Start engine. If duct door is closed, proceed to step **3)**. If duct door is open, turn off engine and cool temperature sensor by spraying it with R-12 refrigerant.

CAUTION: Do not spray R-12 on sensor with engine running. Heated R-12 vapors produce poisonous phosgene gas. Always perform this step in well-ventilated area.

3) Start engine. Observe how long it takes duct door to open. It should open within 5 minutes. If not, check thermometer temperature. If greater than 110°F (43°C), replace sensor. If less than 110°F (43°C), warm engine again to correct temperature. If door still fails to open, replace sensor.

DUCT & VALVE ASSEMBLY WITH VACUUM OVERRIDE

1) Disconnect duct and valve assembly from air cleaner. Check door for free operation. With outside temperature less than 73°F (23°C), connect an external vacuum source to vacuum motor.

2) At zero vacuum on vacuum motor, door must be within .060" (1.52 mm) or less of heat-off position. If door does not close to this position within 10 minutes, replace duct and valve assembly.

3) Apply 1-5 in. Hg vacuum to vacuum motor. Duct door should start to move to heat-on position. If not, replace or repair as required.

4) Apply 7-12 in. Hg vacuum to vacuum motor. Duct door should be in the heat-on position. If door does not move to this within 1 minute, repair or replace as necessary.

VACUUM MOTOR

Disconnect vacuum hose from vacuum motor connector tube. Apply 16 in. Hg vacuum and trap. Vacuum motor should remain closed for 60 seconds. If not, replace duct and valve assembly.