1975-79 EXHAUST EMISSION SYSTEMS
Thermostatic Air Cleaners

All Manufacturers

DESCRIPTION

All light trucks use a system for preheating the air entering the carburetor. This device is part of the air cleaner and maintains the air temperature at a point where the carburetor can be calibrated much leaner to reduce hydrocarbon (HC) and carbon monoxide (CO) emissions. This air temperature control also improves warm-up operations and reduces carburetor icing.

Two different systems are used. Some pre-1979 vehicles are equipped with a thermostat controlled air cleaner operated by a thermostat unit connected to the air door. The vacuum controlled systems consists of an air cleaner assembly, air control door, vacuum control temperature sensor, vacuum motor, heat shroud (on exhaust manifold) with connecting pipe and vacuum hoses. Some models use additional controls, such as vacuum traps and cold weather modulators.

OPERATION

Thermostat Type - A spring attached to the air door pulls door shut (no outside air). As thermostat unit warms from heated air, thermostat unit link arm extends to overcome spring, and open air door to outside air. As outside air is blended with heated air, thermostat unit will modulate air door to maintain proper air cleaner temperature. *See Fig. 1.*

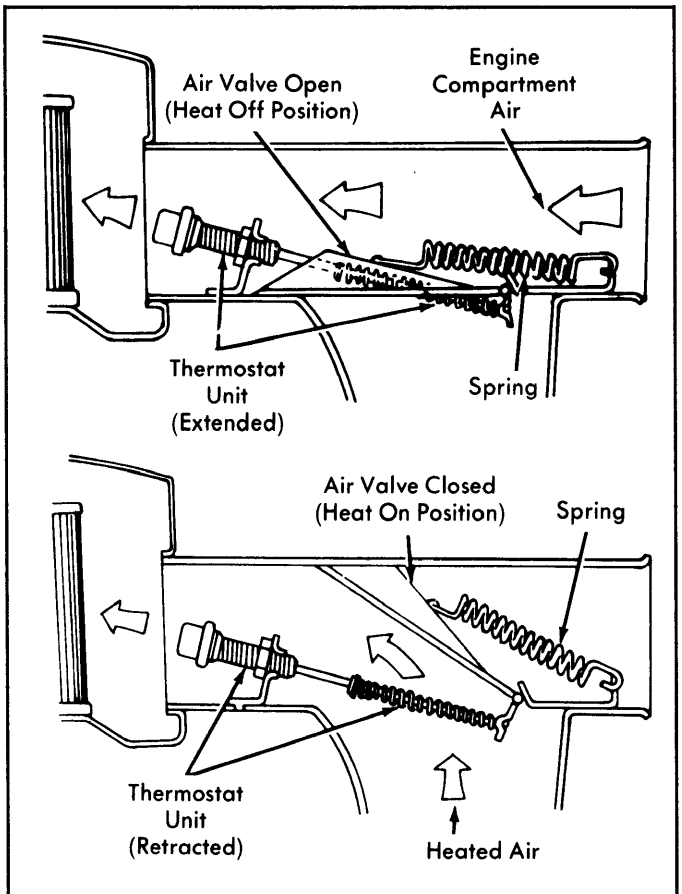

Fig. 1: Typical Thermostat Type Air Cleaner Assembly

Vacuum Type - When temperature of air entering air cleaner is colder than the calibration of the temperature sensor, sensor closes vacuum bleed to allow engine vacuum to close air door to outside air. Air is then drawn from around exhaust manifold, through heat shroud and into air cleaner. As air inside air cleaner warms, sensor valve begins to bleed off vacuum to vacuum motor. As vacuum to vacuum motor drops, air control door begins to open, allowing outside air to enter air cleaner. *See Figs. 2 and 3.* When air entering air cleaner reaches a specified temperature, air control door opens completely, thus closing off heated air from around exhaust manifold.

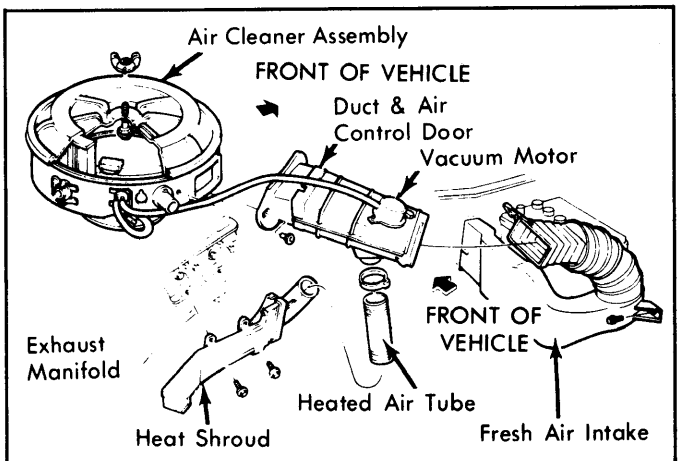

Fig. 2: Typical Vacuum Type Air Cleaner Assembly

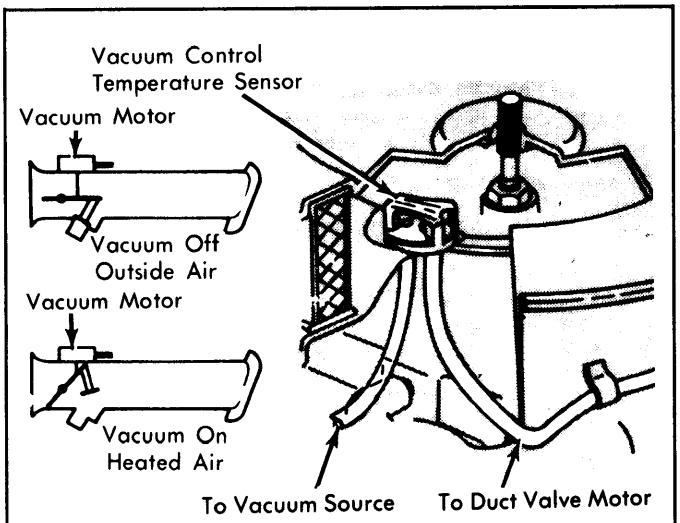

Fig. 3: Vacuum Type Air Cleaner Assembly Controls

COLD WEATHER MODULATOR

Ford Motor Co. - Some Ford Motor Co. vehicles have a vacuum modulator located in the air cleaner. During engine operations in cold weather, it prevents the air cleaner duct door from opening to non-heated intake air. When available outside air is above 55°F, the cold weather modulator does not operate.

TESTING

VACUUM CONTROL TEMPERATURE SENSOR TEST

1) Tape a thermometer close to the vacuum control temperature sensor, located inside the air cleaner. Leave wing nuts off of top of air cleaner so top can be removed quickly to check thermometer while performing tests.

2) With a cold engine, temperature below vacuum control temperature sensor specifications, check air control door in air cleaner. It should be in the full heated air position (closed to outside air) with engine running.

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3) With engine running at fast idle, observe air control door. When door reaches full open position (outside air only), quickly remove air cleaner top and read thermometer. Compare thermometer reading with specifications. See VACUUM CONTROL TEMPERATURE SENSOR SPECIFICATIONS table. If reading is not to specifications, perform VACUUM MOTOR TEST. If vacuum motor tests okay, replace sensor.

VACUUM CONTROL TEMPERATURE SENSOR SPECIFICATIONS

Application	Air Door Closing Temp. (°F)	Air Door Opening Temp. (°F)
Chrysler Corp.	60	90
Ford Motor Co.		
Sensor Color Code		
Brown	60	90
Black or Pink	60	100
Blue or Yellow	60	115
General Motors	80	80-120
IHC	60	90
Jeep	83	90

VACUUM MOTOR TEST

1) With engine not running, air cleaner may be removed for this test. Disconnect vacuum hose from vacuum motor.
2) Connect an external vacuum pump to vacuum motor. Apply specified vacuum for door fully open. See AIR CONTROL DOOR OPENING VACUUM table. Air control door should remain open to outside air (closed to heated air).
3) Next, apply specified vacuum for door fully closed. See AIR CONTROL DOOR OPENING VACUUM table. Air control door should close to outside air (heated air position).
4) Apply 20 in. Hg to vacuum motor and pinch off hose. Vacuum should not leak down more than 10 in. Hg in 5 minutes. If vacuum motor fails any of these checks, replace motor.

AIR CONTROL DOOR OPENING VACUUM

Application	[1] Door Fully Open Less Than In. Hg	[2] Door Fully Closed Max. In. Hg
Chrysler Corp.	5.5	8.5
Ford Motor Co.	.....	.....
General Motors	.....	7
IHC	.....	9

[1] – Closed to heated air (outside air position).
[2] – Closed to outside air (heated air position).

COLD WEATHER MODULATOR

Ford Motor Co. – 1) Ensure temperature of cold weather modulator is below 40°F. Connect an external vacuum source between modulator and a vacuum gauge, using a 24" length of ¼" I.D. vacuum hose.
2) Apply a minimum of 16 in. Hg to vacuum motor side of modulator. Modulator must not leak down to less than 5 in. Hg in 30 seconds. If it does, replace the modulator.
3) Warm modulator to at least 70°F (for Blue color modulator) or 80°F (for Green color modulator). If vacuum holds at this temperature, modulator is not functioning and must be replaced.

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