

1974-79 EXHAUST EMISSION SYSTEMS

Datsun Thermostatic Air Cleaners

All Models (Exc. 280Z, 280ZX & 810)

DESCRIPTION

All carbureted models are equipped with an Automatic Temperature Control (ATC) air cleaner assembly. This device maintains the temperature of the air entering the carburetor within a constant range, thereby providing a leaner air/fuel mixture to reduce harmful exhaust emissions. In addition, the ATC air cleaner improves engine warm-up characteristics and helps prevent carburetor icing. The ATC air cleaner assembly consists of an air cleaner housing, vacuum motor, temperature sensor, blow-by gas filter, idle compensator, hot air duct, fresh air duct and various connecting hoses.

OPERATION

The ATC air cleaner is controlled by the inlet air temperature and the load condition of the engine. The inlet air temperature is detected by the temperature sensor, and the vacuum motor is activated by intake manifold vacuum.

COLD ENGINE OPERATION

When engine intake air temperature is below approximately 93°F (34°C), the sensor air bleed valve is closed, allowing intake manifold vacuum to the vacuum motor. With vacuum applied to the vacuum motor, the air control valve attached to the vacuum motor diaphragm is opened, allowing hot air into the air cleaner through hot air duct on the exhaust manifold.

HOT ENGINE OPERATION

When engine vacuum is low, or when engine is under a heavy load, the air control valve opens (regardless of temperature) to allow cold air induction for increased engine power.

IDLE COMPENSATOR

The idle compensator is basically a thermostatic valve which opens to allow the passage of air from the air cleaner assembly directly to the intake manifold to compensate for the overly rich air/fuel ratio present

1976 AIR CONTROL VALVE POSITIONING

Application	Temperature °F (°C)
Valve Closed	
B210	Below 100 (38)
F10	Below 113 (45)
All Other Models	Below 86 (30)
Valve Partially Open	
B210	100-129 (38-54)
F10	113-124 (45-51)
All Other Models	86-129 (30-54)
Valve Full Open	
F10	124 (51)
All Other Models	131 (55)

during high idle temperature. Two idle compensators, having different temperature characteristics are installed. One opens at 140-158°F (60-70°C) and the other at 158-176° (70-80°C).

When the engine intake air temperature is above approximately 130°F (55°C), the sensor air bleed valve opens, shutting off vacuum to the vacuum motor. This closes the vacuum motor air control valve, shutting off the hot air duct and allowing cold air induction.

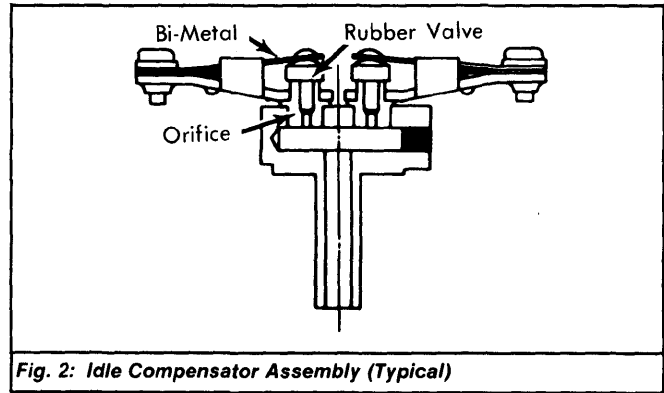


Fig. 2: Idle Compensator Assembly (Typical)

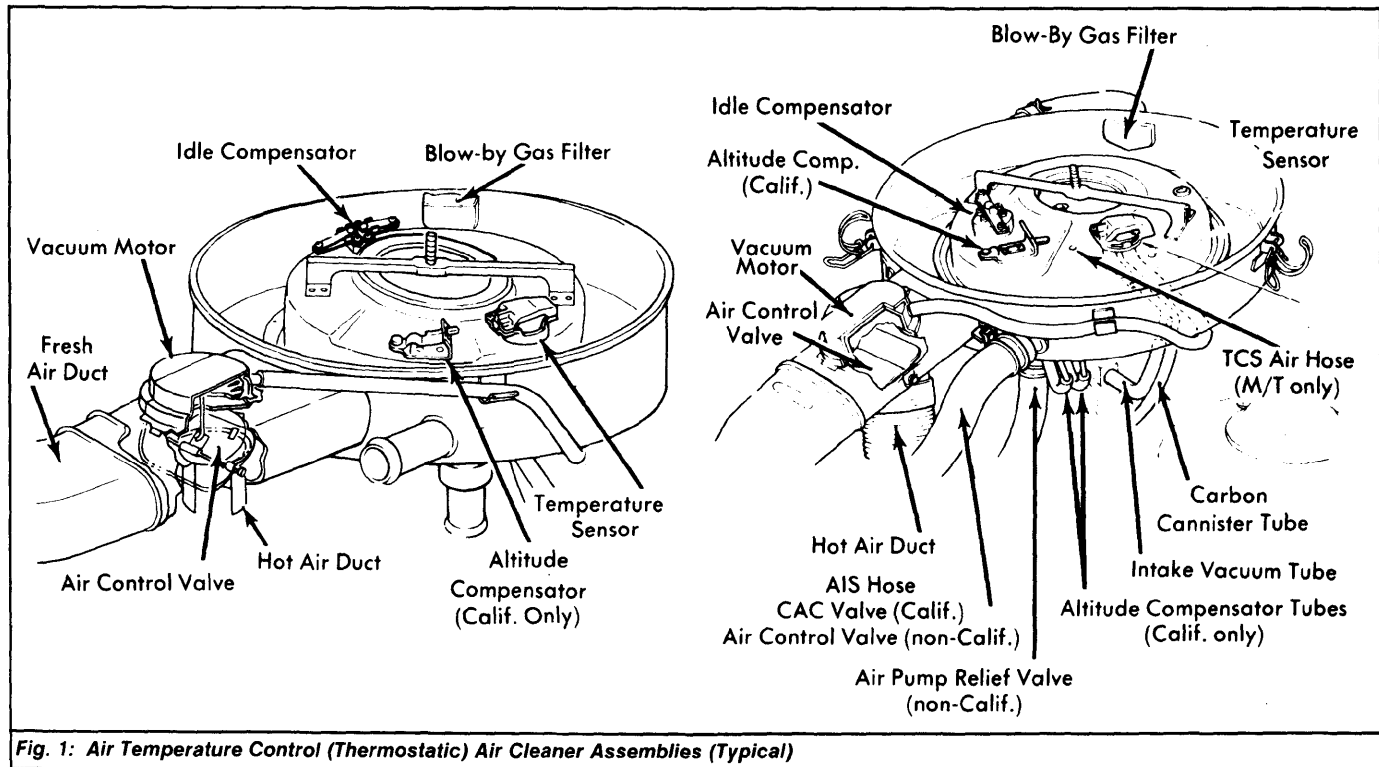


Fig. 1: Air Temperature Control (Thermostatic) Air Cleaner Assemblies (Typical)

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Datsun Thermostatic Air Cleaners (Cont.)

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TESTING

- 1) When this system is not working properly, the vehicle will stall or hesitate, fuel consumption will increase, and engine will seem low on power. Check all vacuum lines for connection, cracks or loose fittings and proper routing. Replace or reroute as necessary.
- 2) To check vacuum motor, stop engine and unhook fresh air duct. Using a mirror, check position of air control valve inside duct. With engine warm, fresh air inlet should be open and hot air duct closed. Check control valve linkage.
- 3) Disconnect vacuum motor inlet vacuum hose. Install another length of hose to inlet and apply vacuum through this hose to vacuum motor. With vacuum applied, again use mirror to check air control valve position. Fresh air inlet should now be closed and hot air inlet open.
- 4) With hot air inlet open (vacuum still applied), pinch vacuum hose to cut off air to vacuum motor. Air control valve should hold position for more than 30 seconds. If force of diaphragm spring overcomes vacuum and opens fresh air inlet in less than 30 seconds, replace vacuum motor assembly.

IDLE COMPENSATOR

- 1) Disconnect hose leading to idle compensator, and connect an external vacuum source to idle compensator hose. Apply vacuum to hose to check for excessive leakage. If leakage is excessive, replace idle compensator as an assembly.

NOTE: *There are 2 idle compensator ports. One must be plugged while checking the other to prevent leakage.*

- 2) Remove idle compensator from air cleaner. Place idle compensator and a thermometer in water. Heat water while watching temperature. At 140-158°F (60-70°C) one of the compensator valves should start opening and be fully open at 158°F (70°C). The other valve should start opening at 158-176°F (70-80°C) and be fully open at 176°F (80°C). If either valve does not operate within specifications, replace idle compensator as an assembly.

TEMPERATURE SENSOR

- 1976 Models** - 1) With engine cold, check that under hood inlet is open and hot air inlet is closed. Start engine and allow to idle. Immediately check that the under hood inlet is closed and hot air inlet is open. As engine warms up, make sure that valve gradually opens to allow under hood air to enter.
- 2) If system does not appear to operate correctly, allow engine to cool. Remove air cleaner cover and install a thermometer in a position so temperature around sensor can be measured. Install air cleaner cover, start engine and watch valve operation.
 - 3) When valve begins to open to allow underhood air to enter, check reading on thermometer. If reading is not within specifications, replace sensor assembly after checking to be sure idle compensator is operating properly.