DATSUN AUTOMATIC TEMPERATURE CONTROL AIR CLEANER

210
310
510
Pickup

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, idle compensator, hot air duct, fresh air duct and various connecting hoses.

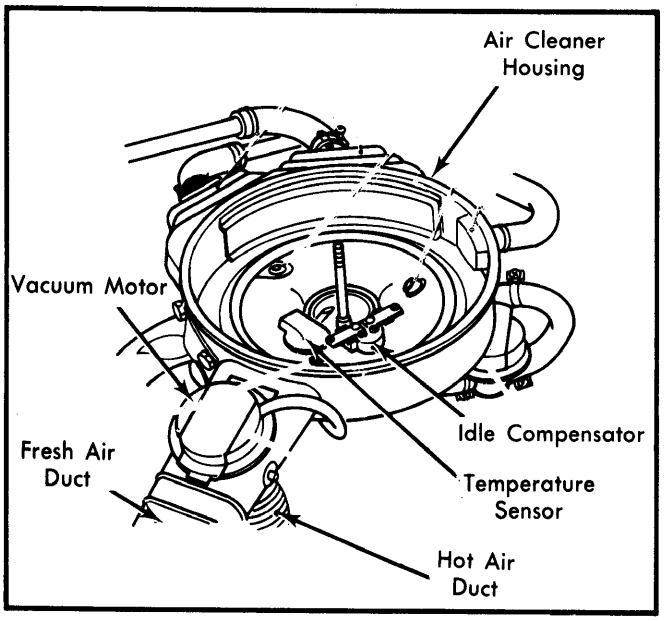

Fig. 1 Typical Air Temperature Control Air Cleaner Assembly

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 100°F (38°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 the 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 a thermostatic valve which opens to allow air directly to the intake manifold to compensate for the overly rich air/fuel ratio present during high idle temperature. Two idle compensators, having different opening temperatures, are used on 210 and 310 models. On 510 and Pickup models, only one idle compensator is used. On 210 and 310 models, first compensator opens at 140-158°F (60-70°C) and second compensator opens at 158-176°F (70-80°C). On 510 and Pickup models, idle compensator opens at 127°F (53°C).

NOTE – *On 510 and Pickup models, idle compensator is mounted on carburetor, not in air cleaner housing as on 210 and 310 models.*

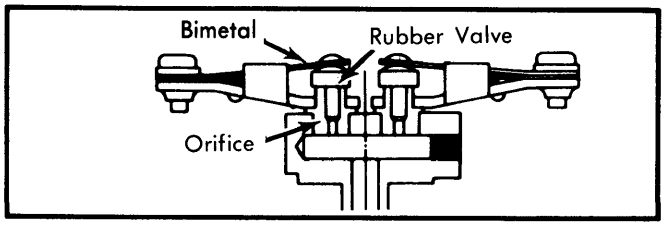

Fig. 2 Idle Compensator Assembly (210 & 310 Models Only)

TESTING

System Check – 1) Check all vacuum lines for connection, cracks or loose fitting 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.

5) To check temperature sensor, start and idle engine. As engine warms up, air control valve should slowly open to admit fresh underhood air.

Idle Compensator – 1) Disconnect vacuum hose at idle compensator and connect vacuum pump to hose. Apply vacuum to hose; if leakage is excessive, replace idle compensator as an assembly.

NOTE – *One of the 2 compensator ports must be plugged while checking the other to prevent leakage.*

2) Remove idle compensator. Place idle compensator and thermometer in water; heat water while watching temperature. At 140°-158°F (60-70°C) one valve 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) on 210 and 310 models. On 510 and Pickup models, valve should fully open at 127°F (53°C). If valve does not operate within specifications, replace idle compensator as an assembly.