

# Exhaust Emission Systems

## GENERAL MOTORS THERMOSTATIC AIR CLEANER

### DESCRIPTION

Thermostatically controlled air cleaners are used on all TCS systems. Thermostatic air cleaner is designed to keep air entering carburetor at approximately 100°F when underhood temperatures are less than 100°F. By keeping air at 100°F or more, the carburetor can be calibrated to reduce hydrocarbon emission, minimize carburetor icing, and improve engine warm-up characteristics. System is composed of a special air cleaner and a heat stove. Heat stove is nothing more than a sheet metal case surrounding exhaust manifold that traps heat generated from manifold and uses it to heat air going to carburetor. Air cleaner primarily consists of a body, filter element, sensor unit, vacuum diaphragm assembly, damper door, and connecting vacuum hoses and links.

### OPERATION

When temperature of air entering air cleaner is less than 100°F, sensor closes to allow engine vacuum to operate vacuum diaphragm which closes damper door assembly to outside air. Air is drawn from heat stove, through shroud and into cleaner as heated air. As air inside air cleaner warms, sensor valve begins to open, bleeding off vacuum to vacuum diaphragm. This allows damper to begin to open to outside air. When temperature of air entering air cleaner reaches specified temperature, damper opens completely, closing off heated air inlet. Under full throttle conditions, vacuum cannot hold damper closed and allows only outside air to enter carburetor regardless of temperature.

### MAINTENANCE & TESTING

Check all hoses and fittings at 12,000 miles or 12 month intervals for obstructions, loose connections and malfunction. Replace components as necessary. No maintenance is required for damper assembly, temperature sensor or vacuum diaphragm other than testing for proper operation. To test operation proceed as follows:

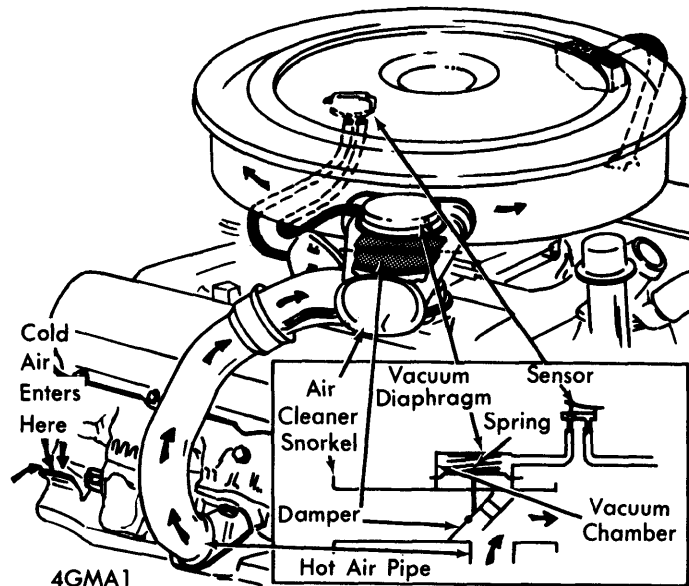
1) Remove air cleaner cover and install temperature gauge as close as possible to sensor. Reinstall cover without wing nut. If temperature at sensor is above 85°F, remove air cleaner assembly and let cool to below 85°F. When temperature drops below 85°F reinstall air cleaner assembly and proceed with test.

2) Observe damper door position through snorkel opening. Damper door should be in such a position that the heat stove passage is covered (snorkel passage open). If not, check for binds in linkage.

3) Start and idle engine. Damper door should initially be in a position that closes off snorkel passage. When damper door begins to open remove air cleaner cover and read temperature gauge. Temperature should be between 85°F and 115°F. If damper door opens before 85°F, replace sensor unit. If damper door does not open at correct temperature, check vacuum diaphragm assembly.

4) To test vacuum diaphragm turn off engine and disconnect diaphragm assembly vacuum hose at sensor unit. Damper door should completely close heat stove passage. Apply 9 inches of vacuum to diaphragm through hose disconnected at sensor unit. Damper door should completely close snorkel passage. If not, check to see if linkage is hooked up properly and look for a vacuum leak.

5) With vacuum applied, bend or clamp hose to trap vacuum in diaphragm assembly. Damper door should remain in position (closed snorkel passage). If it does not, there is a vacuum leak in diaphragm assembly. Replace diaphragm assembly. If vacuum diaphragm check is found satisfactory, replace sensor unit.



THERMAC AIR CLEANER ASSEMBLY (V8 TYPICAL)