MAZDA RX7 IDLE COMPENSATION SYSTEM

DESCRIPTION

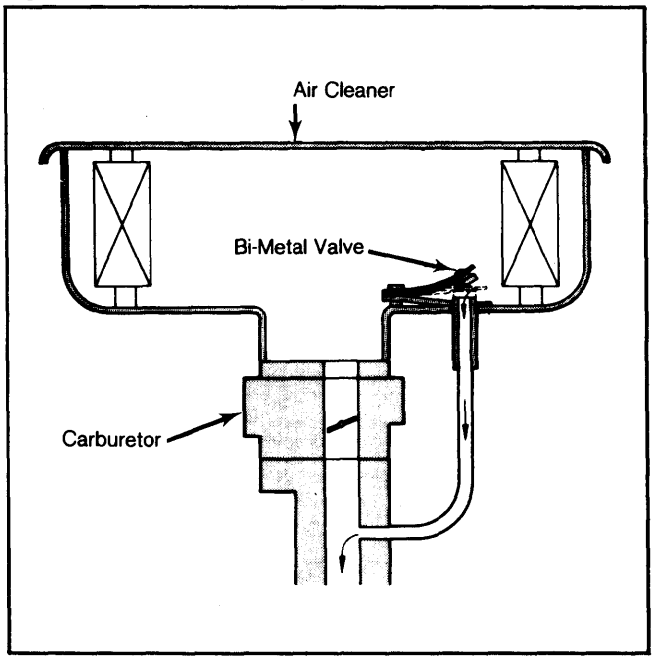
The idle compensation system is installed to control the air/fuel mixture under varying engine operating conditions. The system consists of an idle compensator, altitude compensator and a throttle opener on air conditioned models.

OPERATION

IDLE COMPENSATOR

The idle compensator is a bi-metal valve installed in the air cleaner. The bi-metal valve opens at 149°F (65°C) to supply additional air to intake manifold to lean the air/fuel mixture for more complete burning.

Fig 1: Mazda RX7 Idle Compensator



ALTITUDE COMPENSATOR

The altitude compensator is installed on the carburetor to supply additional air to carburetor during idle mode in high altitude areas. The altitude compensator stabilizes engine operation.

THROTTLE OPENER

Air Conditioned Models

The throttle opener consists of air conditioner switch (relay on manual transmission models), air conditioner solenoid valve, servo diaphragm (throttle opener) and connecting hoses and wires. The throttle opener opens the primary throttle valve when air conditioner is operated at engine speeds of 1000-1200 RPM to maintain smooth engine operation.

TESTING

IDLE COMPENSATOR

Remove air cleaner cover and filter element. When bi-metal temperature is below 149°F (65°C), valve should be closed and no air leakage should exist when vacuum is applied to tube. Bi-metal valve should be open when temperature exceeds 159°F (69°C). If valve does not function as described, replace valve.

Fig. 2: Mazda RX7 Altitude Compensator

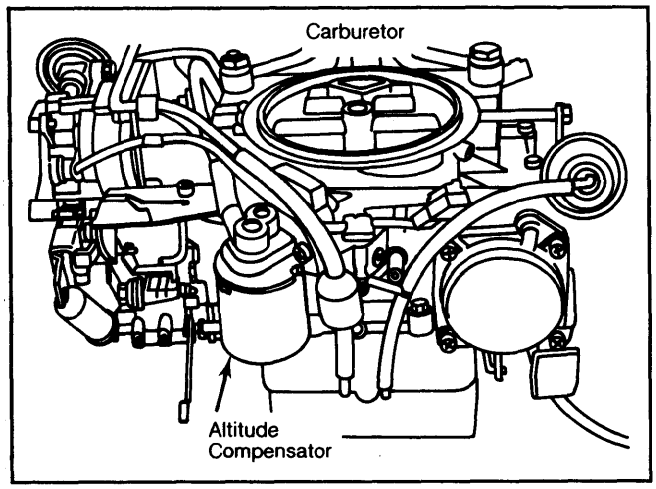
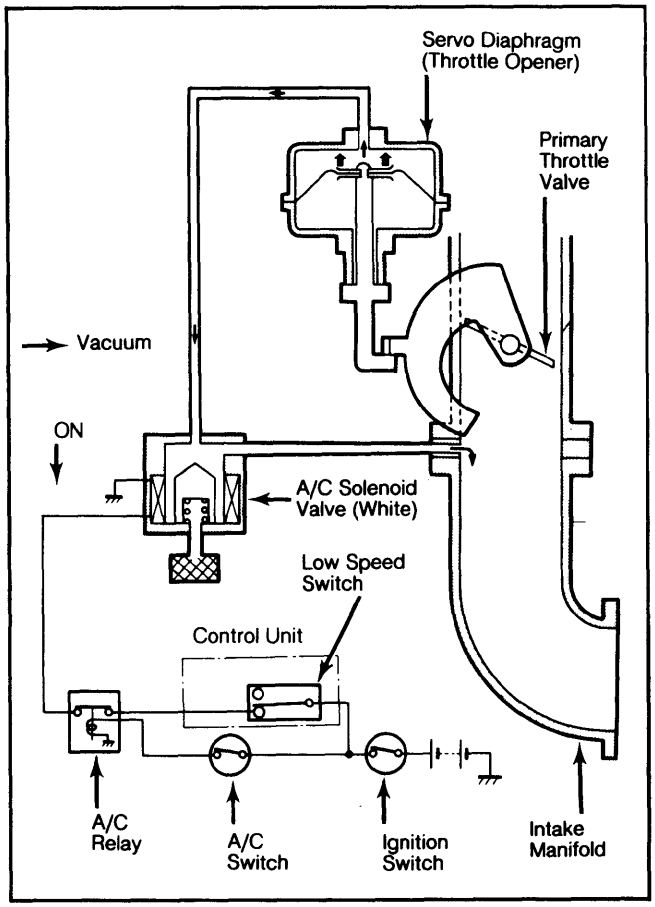


Fig. 3: Mazda RX7 Throttle Opener



ALTITUDE COMPENSATOR

NOTE: Altitude compensator can only be checked at altitudes of 1640-4920 feet.

1982 Exhaust Emission Systems

MAZDA RX7 IDLE COMPENSATION SYSTEM (Cont.)

1) Remove air cleaner and start engine. Engine should idle smoothly. Place finger over slow port inside carburetor bore (located on right side of rear bore). With slow port covered, idle speed should drop.

2) If idle speed does not drop, stop engine and remove compensator valve. With compensator valve removed, blow through drilled passages.

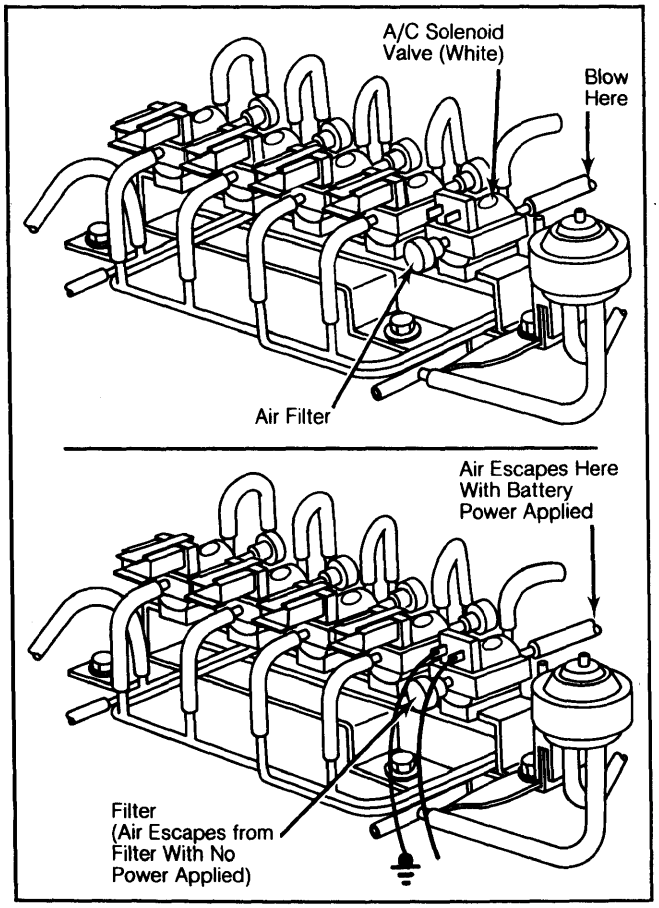
3) Air should pass through valve from both passages at altitudes of 1640-4920 feet. If not, replace altitude compensator valve.

AIR CONDITIONER SOLENOID VALVE

1) Disconnect vacuum sensing tubes from solenoid valve and vacuum port (rear of valve). Blow through vacuum hose and ensure air passes through valve and escapes from air filter. *See Fig. 4.*

2) Disconnect solenoid valve electrical connector and apply battery power to terminals. Blow through hose again. Air should pass through valve and escape from rear port. *See Fig. 4.* If valve does not respond as outlined, perform signal check.

Fig. 4: Testing Air Conditioner Solenoid Valve



AIR CONDITIONER SOLENOID VALVE SIGNAL CHECK

1) Warm engine to normal operating temperature. Stop engine and connect tachometer. Disconnect electrical connector from air conditioner solenoid valve (White color dot) and connect voltmeter to solenoid terminals. Start engine and turn air conditioner on.

2) On automatic transmission models, current should flow to solenoid valve at any engine speed. On manual transmission models, increase engine speed to 2000 RPM with throttle.

3) Slowly decrease engine speed and watch voltmeter. Current should flow to solenoid valve when engine speed is 1000-1200 RPM. If valve does not respond as outlined, replace air conditioner solenoid valve.

NOTE: Before replacing air conditioner solenoid valve, check auxiliary control unit as outlined in "Mazda RX7 Auxiliary Control Device," article in this section.

AIR CONDITIONER RELAY

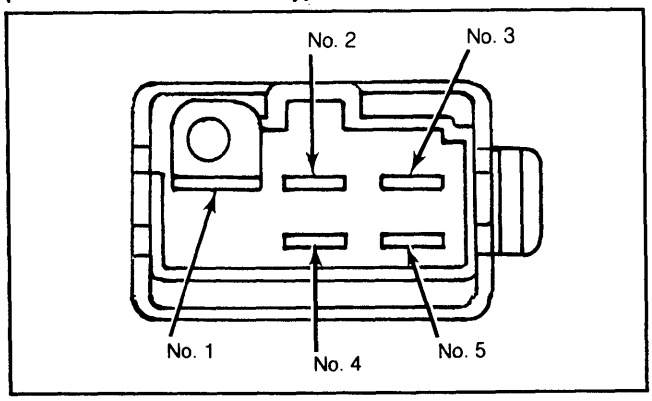
Man. Trans. Only

1) Disconnect electrical connector from air conditioner relay. Using an ohmmeter, check continuity between terminals.

2) With engine off and no power applied, there should be continuity between No. 1 and No. 5. There should be no continuity between No. 1 and No. 3.

3) Connect a wire from battery positive post to terminal No. 2 and battery negative post to terminal No. 4. There should be continuity between No. 1 and No. 3. There should be no continuity between No. 1 and No. 5.

Fig. 5: Air Conditioner Relay Terminals (Manual Transmission Only)



THROTTLE OPENER

1) Switch off all accessories. Remove fuel filler cap. Disconnect and plug idle compensator tube at air cleaner. Connect tachometer to engine and warm engine to normal operating temperature.

2) Disconnect electrical connector from switching solenoid valve (Gray color dot). Disconnect and plug vacuum sensing tubes from vacuum control units on distributor (except Calif. Man. Trans.). Turn air conditioner off. Disconnect electrical connector from air conditioner solenoid valve and connect battery power to solenoid terminals.

3) With battery power applied to solenoid terminals, throttle opener should increase engine speed from idle to 1150-1250 RPM (in Neutral). If engine speed is not within specification, turn adjusting nut on throttle opener arm until engine speed is within specification.