# 1974-79 EXHAUST EMISSION SYSTEMS
# Mazda Automatic Throttle Release System

### 1976-77 Rotary Engines

## DESCRIPTION

The automatic throttle release system is designed to prevent high exhaust emissions due to vehicle operation with choke knob pulled out. Excessively rich air/fuel mixture results with choke on, and this mixture will not burn completely in combustion chamber. Unburned fuel will then be passed into thermal reactor causing extremely high operating temperatures. The release system forcibly returns choke knob, disengaging choke and prevents extended rich mixture engine operation. System consists of a water temperature switch, No. 2 vacuum switch, No. 2 delay valve (if equipped), choke and full choke switches, a choke relay, and connecting wiring. *See Fig. 1.*

## OPERATION

On 1977 Pickup and RX3 California models, system does not operate within 30 seconds of cold engine starting with choke knob pulled out. A timer built into the control unit, will act to draw choke knob in to disengage choke, opening choke plate in carburetor. On all models, the coolant temperature sensing switch will open above 134-146°F (57-63°C) and will remain closed below that temperature. System will return choke knob to OFF position as coolant temperature rises above 134-146°F (57-63°C).

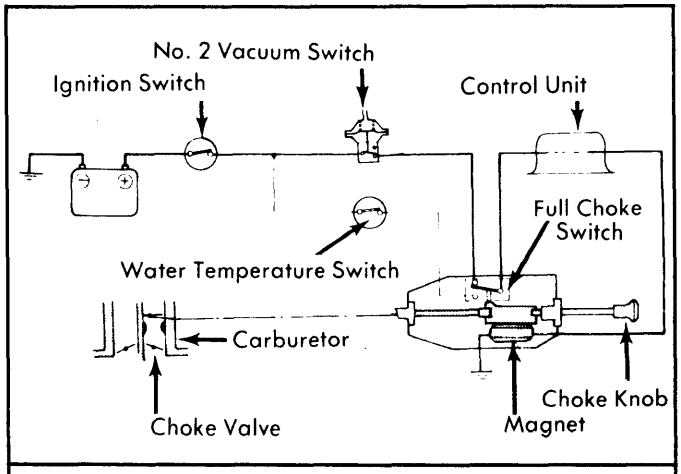


*Fig. 1: Typical Automatic Throttle Release System*

## TESTING

### AUTOMATIC THROTTLE RELEASE SYSTEM

**1976 Models - 1)** With engine off and cold, pull out choke knob fully. Choke knob should return automatically. Connect tachometer to engine. Start engine with choke knob pulled out. Warning light should come on and knob should return automatically to off position within 20-40 seconds of starting.
**2)** Set engine speed at 2000 RPM with choke knob. When temperature reaches range indicated in gauge, choke knob should pull back in automatically. *See Fig. 2.*
**1977 Models - 1)** With engine off and cold, pull out choke knob fully. Choke knob should return automatically. Connect tachometer to engine. On California vehicles, start engine with choke knob pulled out. Knob should return automatically to off position within 20-60 seconds of starting.
**2)** Set engine speed at 2000 RPM with choke knob. When temperature reaches range indicated in gauge, choke knob should pull back in automatically. *See Fig. 2.*

### WATER TEMPERATURE SWITCH

Remove switch from water pump housing. Place switch in container of water and heat water slowly. With ohmmeter connected to switch terminals, check water temperature when continuity no longer exists in switch. Continuity should be broken when temperature reaches 129-151°F (54-66°C). Replace switch if it does not operate within specifications.

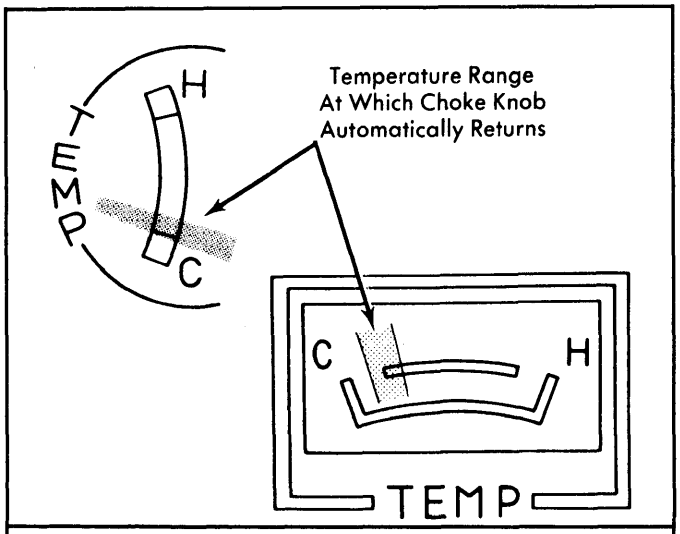


*Fig. 2: Coolant Temperature Gauges*

### DELAY VALVE & VACUUM SWITCH NO. 2

**California Models - 1)** Disconnect No. 2 vacuum switch. Connect ohmmeter to both terminals on switch side. Start and run engine at idle, DO NOT use choke knob.
**2)** Check for continuity at terminals after 20-60 seconds from starting engine. Continuity should not exist after specified time. If switch does not perform as specified, replace switch and repeat test procedure.

### CHOKE SWITCH & FULL CHOKE SWITCH

**1)** Warm engine to normal operating temperature. Disconnect water temperature switch. Disconnect carburetor choke heater lead at connector and connect voltmeter to choke heater lead (from control unit).
**2)** Connect tachometer to engine. On California vehicles, current should flow to choke heater lead, when engine is started with choke knob out. Knob should return after 20-60 seconds from engine starting time.
**3)** Connect jumper wire to both terminals of disconnected carburetor choke heater lead (from control unit). Set engine speed at 2000 RPM with choke knob. Current should flow to choke heater lead. Current should stop flowing when choke knob is completely pushed in.

### RELAYS

**1)** Disconnect wiring from relay. Connect battery positive lead to terminal No. 2 and negative lead to terminal No. 6. *See Fig. 3.* Continuity should exist between terminals No. 1 and 4. No continuity should exist between terminals No. 3 and 4.
**2)** Connect battery positive lead to terminal No. 5 and negative lead to terminal No. 6. Continuity should exist between terminals No. 3 and 4. No continuity should exist between terminals No. 1 and 4. If relay does not test as described, replace it.

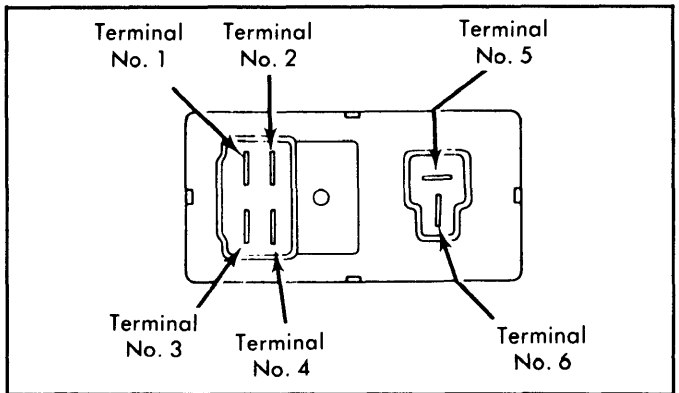


*Fig. 3: Relay Terminal Identification*