

MAZDA ROTARY ENGINE EXHAUST GAS RECIRCULATION SYSTEM

RX-7 (Calif.)

TESTING

DESCRIPTION

The Exhaust Gas Recirculation system (EGR), recirculates exhaust gases into the combustion chamber to reduce nitrogen oxide (NOx) emissions. The system consists of an EGR valve, EGR solenoid valve and various connecting hoses. Also, additional secondary devices are installed to provide precise control under varying conditions. See "Mazda Rotary Engine Auxiliary Controls" article in this section.

OPERATION

Exhaust gases flow out of exhaust port, through EGR port in thermal reactor to EGR valve. The EGR valve controls the amount of exhaust gas to be recirculated into the intake manifold. Open/Close operation of the EGR valve is directed by the EGR solenoid valve which operates on carburetor vacuum, engine coolant temperature and engine speed. EGR flow occurs only during acceleration modes when engine coolant temperature exceeds 158°F (70°C), engine speed is between 1150 and 3300 RPM and transmission is in a gear selection other than 4th or 5th.

EGR VALVE

- 1) Warm engine to normal operating temperature. Stop engine and disconnect vacuum sensing hose from EGR valve and connect vacuum pump to hose. Start engine and run at idle. Engine should run smoothly.
- 2) Apply 15.7 in. (400 mm) Hg to EGR valve. Engine should run rough or stall. If valve does not function as described, replace EGR valve.

EGR SOLENOID VALVE

- 1) Disconnect vacuum sensing hose from EGR solenoid valve (gray color dot) and vacuum pipe. See Fig. 2. Blow through solenoid valve from vacuum sensing tube. Air should pass through valve and escape at air filter.
- 2) Disconnect solenoid valve electrical coupler and apply battery voltage to solenoid terminals. Blow through solenoid valve from vacuum sensing tube. Air should pass through valve and come out at rear port. If valve does not respond as described, replace EGR solenoid valve.

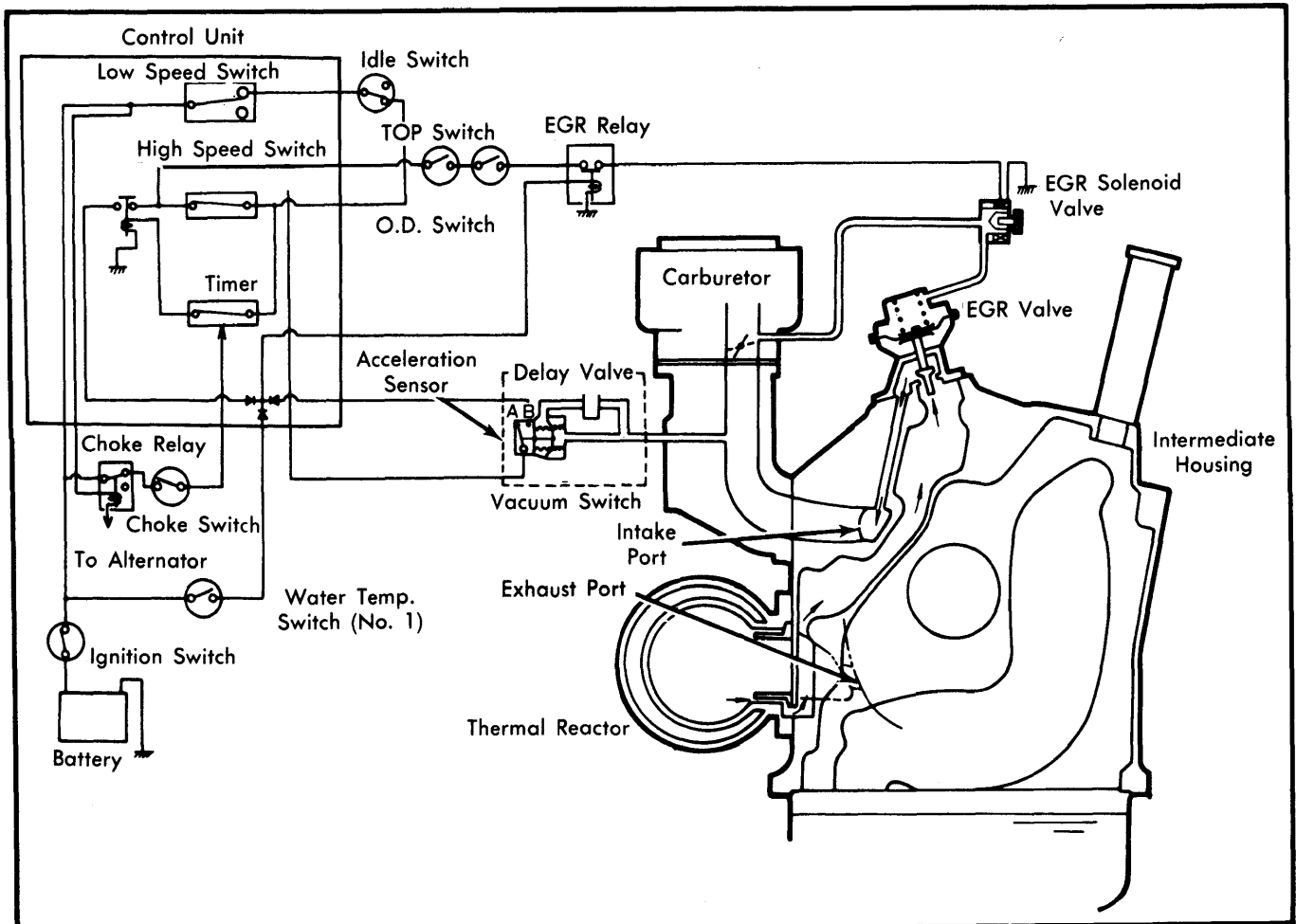


Fig. 1 Schematic of Mazda RX-7 EGR System

1980 Exhaust Emission Systems

MAZDA ROTARY ENGINE EXHAUST GAS RECIRCULATION SYSTEM (Cont.)

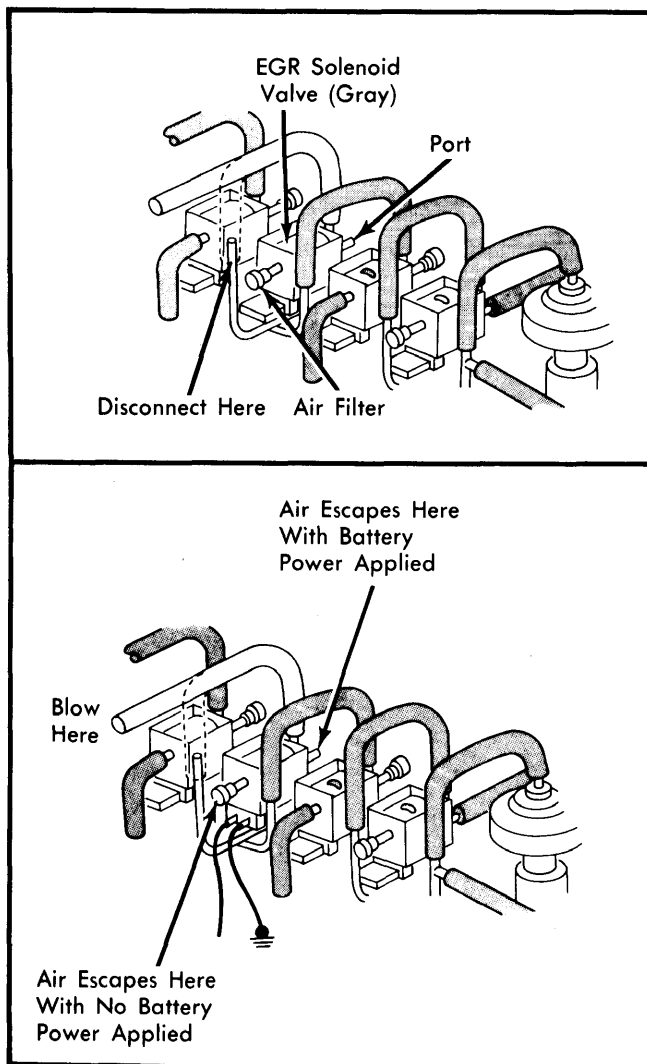


Fig. 2 Schematic Showing Hose Disconnection for Checking EGR Solenoid Valve

EGR SOLENOID VALVE SIGNAL CHECK

- 1) Warm engine to normal operating temperature. Connect tachometer to engine. With voltmeter connected to good ground, insert other probe into brown/yellow wire terminal of EGR solenoid valve connector (do not detach connector).
- 2) Start engine and quickly increase engine speed to 2500 RPM, using throttle. Check that current flows to terminal for a few seconds and then stops. Disconnect vacuum switch electrical coupler and place a jumper wire on connector terminals. See Fig. 3.
- 3) Increase engine speed with throttle and check to ensure current stops flowing to solenoid terminal when engine speed exceeds 2700-3300 RPM (3000-3600 RPM for Auto. Trans.).
- 4) Increase engine speed to 2000 RPM, using throttle. Slowly decrease engine speed and note speed at which current stops flowing to terminal. It should be 1050-1250 RPM.

5) Slowly increase engine speed from idle and note engine speed at which current begins flowing to terminal. Difference between this speed and speed noted in previous step (1050-1250), should be 80-220 RPM.

6) On Man. Trans. models, increase engine speed to 2000 RPM, using throttle. Check to ensure current stops flowing to terminal when idle switch lever (on carburetor) is fully pushed up to idle position.

7) On all models, disconnect No. 1 water temperature switch electrical coupler and connect a jumper wire to terminals of wiring harness. Current should not flow to EGR solenoid valve terminal at any engine speed.

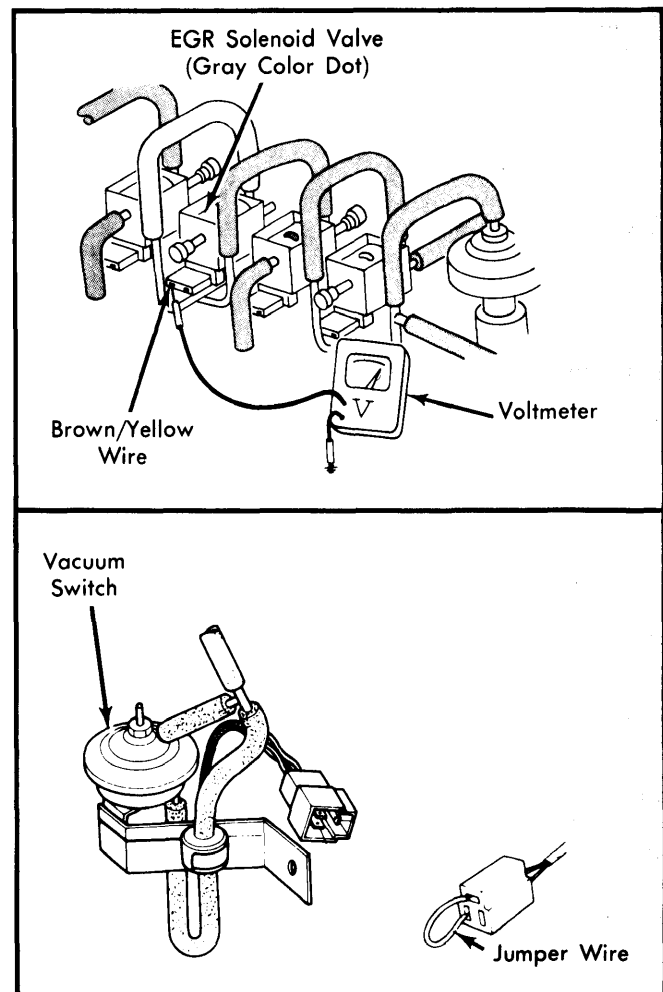


Fig. 3 Testing EGR Solenoid Valve Signal

8) Stop engine. Start engine with choke knob fully pulled out. Set engine speed to 2000 RPM, using choke knob. Current should flow to EGR solenoid valve terminal 1½-2 minutes after starting engine.

9) On Man. Trans. models, set engine speed to 2000 RPM, using throttle. Depress clutch pedal and move shift lever into 4th or 5th gear position. Current should stop flowing to terminal.