1974-79 EXHAUST EMISSION SYSTEMS
Datsun Exhaust Gas Recirculation

All Models

DESCRIPTION

The Exhaust Gas Recirculation (EGR) system, recirculates exhaust gases into the combustion chamber to reduce combustion temperature. The reduction in temperature acts to reduce oxides of Nitrogen (NOx) emissions. Typical EGR system components include an EGR valve, EGR solenoid, coolant temperature sensor, thermal vacuum valve, Back-Pressure Transducer (BPT), vacuum delay valve, and various connecting hoses and tubes.

OPERATION

On 1974-76 models, exhaust gases flow out of exhaust manifold through EGR tube into EGR valve. From EGR valve, the exhaust gases enter the intake manifold. The EGR valve is controlled by intake vacuum, coolant temperature switch (thermal vacuum valve), and EGR solenoid (if equipped). When coolant temperature is below a specified range, the EGR system is not operational. When coolant temperature is above 145°F (63°C) on most models, coolant temperature switch and EGR solenoid are off, allowing manifold vacuum to reach EGR valve.

On 1977-79 models, exhaust gases flow out of exhaust manifold through EGR tube and into EGR control valve. The BPT valve, if equipped, monitors exhaust pressure in order to control intake manifold vacuum applied to EGR control valve. *See Fig. 1.* The EGR control valve regulates actual amount of exhaust gas to be recirculated into the intake manifold. Operation of the EGR control valve is directed by the thermal vacuum valve which operates on carburetor vacuum and engine coolant temperature. The EGR system does not operate at idle or under full throttle (heavy load) conditions, when coolant temperature is low (thermal vacuum valve closed), or when exhaust pressure is low.

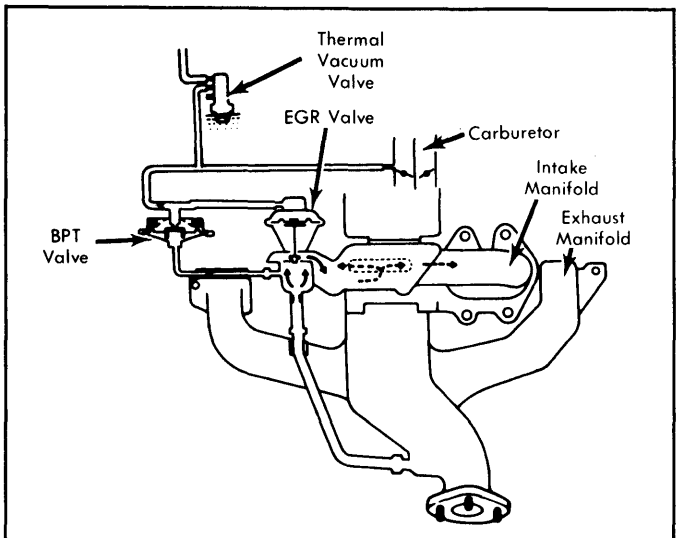

Fig. 1: Exhaust Gas Recirculation System (Typical)

TESTING

EGR SYSTEM

1974-78 Models - Visually inspect entire EGR control system and clean as needed. Replace hoses that are damaged. With engine coolant temperature below 104°F (40°C), raise engine speed to 3000-3500 RPM. The EGR valve should remain closed. With engine coolant temperature above 134-145°F (57-63°C), EGR valve should open and allow exhaust gas recirculation at 3000-3500 RPM.

1979 Models - **1)** With engine stopped, visually inspect entire EGR system and clean as necessary. Replace hoses that are cracked or broken. Inspect EGR valve for signs of binding or sticking by moving valve diaphragm upwards with finger.

2) With engine running, check operation of EGR valve and thermal vacuum valve by placing finger on diaphragm of EGR valve and checking diaphragm movement.

3) With engine coolant temperature below closed value shown in EGR SYSTEM TEST SPECIFICATIONS table, increase engine speed to 3000-3500 RPM. The EGR valve should remain closed.

4) With engine coolant temperature above open value shown in EGR SYSTEM TEST SPECIFICATIONS table, increase engine speed to 3000-3500 RPM. The EGR valve should open and allow exhaust gas recirculation.

5) If EGR valve does not operate as indicated, disconnect EGR valve-to-thermal vacuum valve vacuum hose at EGR valve. Increase engine speed to 3000-3500 RPM and check for vacuum at end of disconnected hose.

6) If vacuum is present, replace EGR valve. If vacuum is weak or not present at all, replace thermal vacuum valve.

EGR SYSTEM TEST SPECIFICATIONS

Application	Valve Closed °F (°C)	Valve Open °F (°C)
210 & 310	122 (50)	145 (63)
280ZX & 810	[1]	[2]
All Others	104 (40)	127 (53)

[1] - Below 117°F (47°C) and above 208°F (98°C).
[2] - Between 122°F (50°C) and 203°F (95°C).

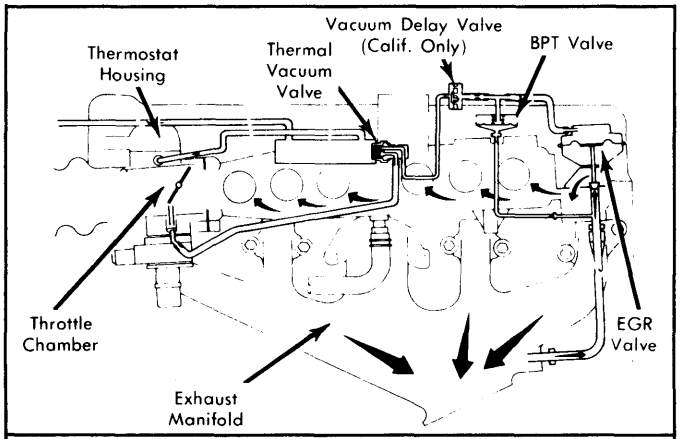

Fig. 2: 1978-79 280ZX & 810 EGR System

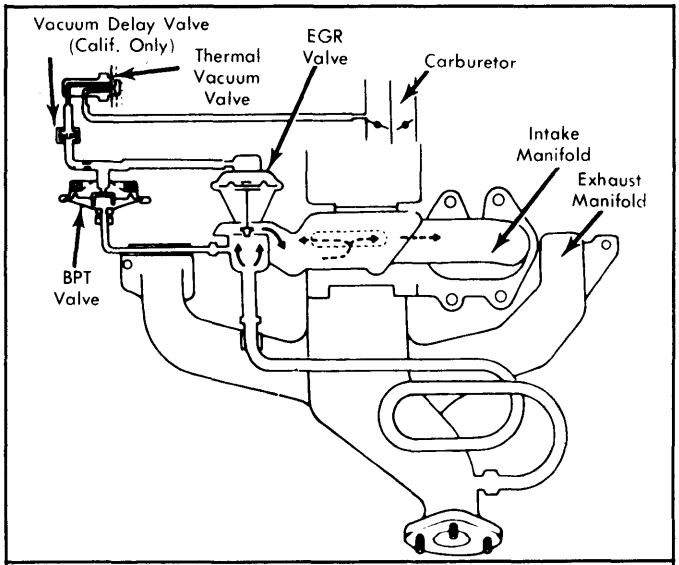

Fig. 3: 1978-79 200SX, 510 & Pickup EGR System

1974-79 EXHAUST EMISSION SYSTEMS
Datsun Exhaust Gas Recirculation (Cont.)

EGR VALVE

1) Remove EGR valve from engine and inspect it for damage. Apply vacuum to EGR valve and watch diaphragm movement. Diaphragm should move to full open position and should remain in this position for at least 30 seconds after vacuum is shut off.
2) Before reinstalling EGR valve, clean mating surface with a wire brush and compressed air, and remove foreign matter from around valve and port.

EGR SOLENOID

1974 Models & 1975-76 280Z - Connect ohmmeter to EGR solenoid leads and check for continuity. If continuity does not exist, replace EGR solenoid. If continuity exists, connect EGR solenoid to battery. Make and break electrical connection while listening for a "clicking" sound. If clicks are heard, EGR solenoid is okay. If not, replace EGR solenoid.

COOLANT TEMPERATURE SWITCH

1974 Models & 1975-76 280Z - Place switch in water below 77°F (25°C) on 1974 models, below 122°F (50°C) on 280Z. Connect ohmmeter to switch leads. Ohmmeter reading should be close to zero. Raise water temperature to 88-106°F (31-41°C) on 1974 models, to 134-145°F (57-63°C) on 280Z. Ohmmeter reading should be infinity. If not, replace coolant temperature switch.

THERMAL VACUUM VALVE

1975-78 Models (Except 1976 280Z) - Drain engine coolant and remove thermal vacuum valve from engine. Submerge valve in a container of water. Apply vacuum to top port of valve and check that valve is closed with water temperature between 104-134°F (40-57°C) and open when temperature is above 145°F (63°C). If not, replace thermal vacuum valve.

1979 Models - Drain engine coolant and remove thermal vacuum valve from engine. Submerge valve in a container of water. *See Fig. 4.* Apply vacuum to top port of valve and check that valve opens and closes according to water temperature specified in THERMAL VACUUM VALVE TEST SPECIFICATIONS table. If not, replace thermal vacuum valve.

NOTE: A 3-port thermal vacuum valve may be used on some models. The bottom port of the 3-port valve is used with the Transmission Controlled Spark system.

THERMAL VACUUM VALVE TEST SPECIFICATIONS

Application	Valve Closed °F (°C)	Valve Open °F (°C)
210 & 310		
2-Port Valve	Below 104 (40)	Above 145 (63)
3-Port Valve	Below 122 (50	Above 145 (63)
280ZX & 810	[1]	[2]
All Others	Below 104 (40)	Above 127 (53)

[1] - Below 117°F (47°C) and above 208°F (98°C).
[2] - Between 122°F (50°C) and 203°F (95°C).

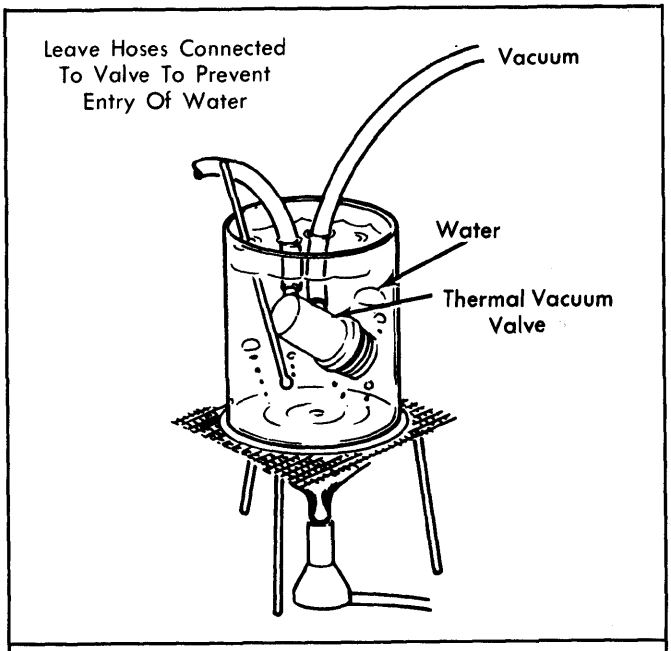

Fig. 4: Thermal Vacuum Valve Test (2-Port Valve)

BACK-PRESSURE TRANSDUCER

1977-79 Models - Remove back-pressure transducer from engine. Apply slight pressure to one port of valve and a slight suction to the other port. If any leakage is noted, replace valve.

VACUUM DELAY VALVE

1977-79 Calif. Models - Remove vacuum delay valve. Apply air pressure to EGR valve side of vacuum delay valve. Air should flow through valve. When air pressure is applied to thermal vacuum valve side of delay valve (Brown side), resistance should be felt. Vacuum delay valve must be installed with Brown side toward thermal vacuum valve.