1974-79 EXHAUST EMISSION SYSTEMS
Datsun Throttle Opener Control System

B210, F10, 210, 260Z, 310

DESCRIPTION

The Throttle Opener Control System (TOCS) slightly opens the carburetor throttle valve during deceleration to reduce hydrocarbon (HC) emissions. During deceleration, the intake manifold vacuum rises and the quantity of air/fuel mixture is not sufficient for normal combustion to continue. Thus, a large amount of unburned hydrocarbons is emitted. To prevent this, the throttle opener control valve opens the throttle valve and supplies an adequate amount of air/fuel mixture to maintain proper combustion.

The system consists of a servo diaphragm, vacuum control valve, throttle opener solenoid valve, speed detecting switch and amplifier. On models with automatic transmission, an inhibitor switch and relay are used in place of the speed detecting switch. In addition, some models have an altitude corrector fitted to the vacuum control valve to automatically regulate the operating pressure in response to the altitude at which vehicle is operated.

OPERATION

When the manifold vacuum increases during deceleration, the vacuum control valve opens to transfer vacuum to the servo diaphragm chamber, and the carburetor throttle valve opens slightly. With the throttle valve open, fresh air is sucked into the combustion chamber, allowing for complete burning of the air/fuel mixture and a reduction in HC emissions.

THROTTLE OPENER SOLENOID VALVE

1979 Manual Transmission Models - The throttle opener solenoid valve is controlled by a speed detecting switch, which is actuated by the speedometer needle. With vehicle speed below 10 MPH, the speed switch is activated, sending an electrical signal to the amplifier. The amplifier builds this signal to a degree large enough to actuate the throttle opener solenoid. With the solenoid actuated, the servo diaphragm is opened to the atmosphere and the diaphragm does not operate.

1979 Automatic Transmission Models - With shift lever in "N" or "P", the inhibitor switch on the transmission is turned "ON", and the throttle opener solenoid is actuated. With solenoid actuated, the servo diaphragm is opened to the atmosphere and the diaphragm does not operate.

TESTING

NOTE: Although throttle opener control system is used on 1974 B210 and 260Z models, testing information was not available at time of publication.

THROTTLE OPENER CONTROL SYSTEM

1975-78 Manual Transmission Models - 1) Check for continuity between terminals "A" and "B" of function test connector. *See Fig. 2.* With zero (0) voltage, continuity should exist between terminals.
2) Block front wheels and raise rear of vehicle. Start engine and gradually increase speed to above 10 MPH. Check voltage across terminals "A" and "B" at function test connector.
3) Voltage reading should be zero (0). If continuity and voltage readings are incorrect, check for faulty in-line fuse, poor connections, faulty amplifier, speed switch, or TOCS solenoid.

1975-78 Automatic Transmission Models - 1) Place transmission in Neutral (inhibitor switch on). Check for voltage across terminals "A" and "B" at function test connector. *See Fig. 3.* Reading should be 12 volts.
2) Place transmission in "1", "2", "D" and "R" positions (inhibitor switch off). Check resistance between terminals "A" and "B". Reading should be 25 ohms or less. If voltage and resistance are incorrect, check for poor connections, faulty TOCS solenoid, inhibitor switch or inhibitor relay.

1979 Manual Transmission Models - 1) With ignition switch off, check for continuity between test connector terminals. *See Fig. 4.* If continuity does not exist, replace throttle opener control solenoid.

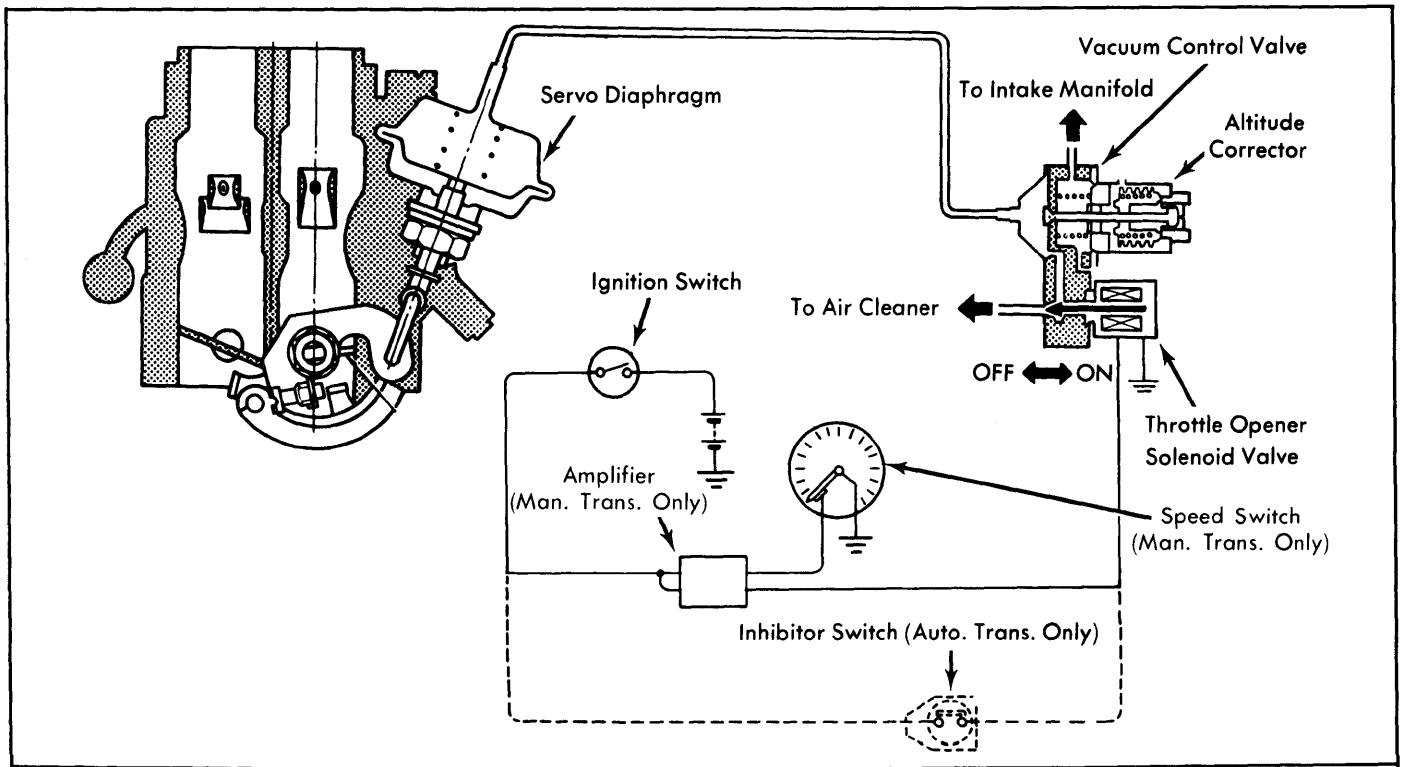

Fig. 1: Throttle Opener Control System Schematic (Typical)

Datsun Throttle Opener Control System (Cont.)

2) Turn ignition switch on and check voltage across the same terminals. Voltmeter should show battery voltage (12 volts). If not, check fuse and amplifier. Replace defective part.

NOTE: On 1979 models, test connector is located on driver's side kick panel, above fuse/relay panel (next to hood release handle).

3) With ignition on, disconnect speedometer cable from instrument cluster. Spin the speedometer by hand and note voltmeter reading. Voltmeter should show 12 volts with speedometer below 10 MPH and then drop to zero (0) volts with speedometer above 10 MPH. If not, check amplifier and speed detecting switch. Replace defective part.

1979 Automatic Transmission Models - 1) With ignition off, check continuity between test connector terminals. *See Figs. 4.* If continuity does not exist, replace throttle opener control solenoid.

2) Turn ignition on. Check voltage across the same two terminals, while shifting transmission selector lever through all positions. Voltmeter should show zero (0) volts with selector lever in Neutral, 12 volts with lever in all other positions. If not, replace inhibitor switch.

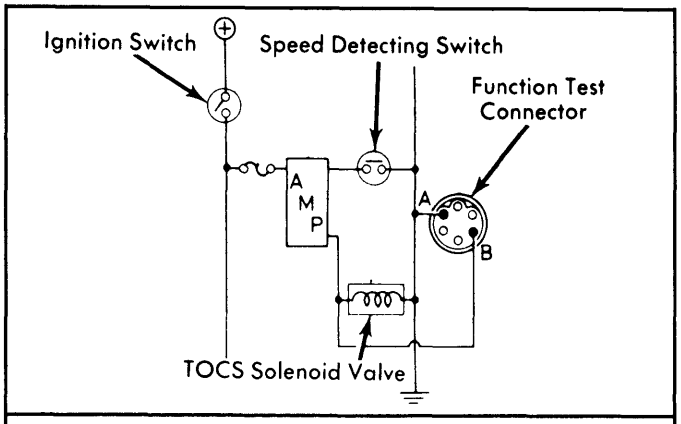

Fig. 2: 1977 TOCS System Schematic (Man. Trans.)

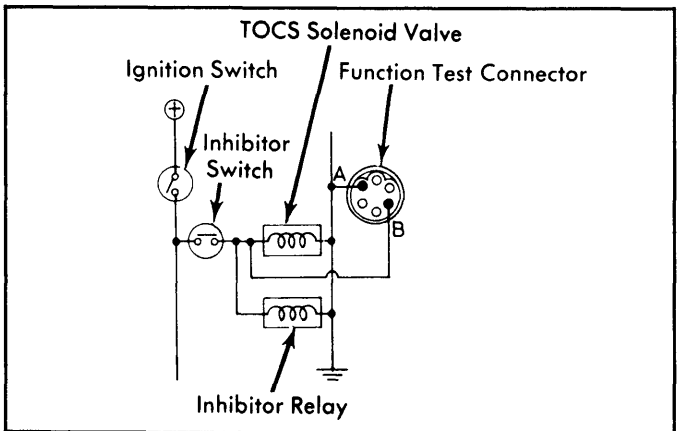

Fig. 3: 1977 TOCS System Schematic (Auto. Trans.)

THROTTLE OPENER OPERATING PRESSURE

1977-78 Models - 1) Start engine and allow it to reach normal operating temperature. Check and adjust engine idle speed. Disconnect throttle opener control solenoid electrical connector. Connect a vacuum gauge to intake manifold vacuum to check operating pressure.

2) Run engine under no load and note operating pressure shown on vacuum gauge. Increase engine speed to 3000-3500 RPM, quickly close throttle valve, and note vacuum gauge reading.

3) Manifold vacuum should quickly increase to at least 24 in. Hg, then gradually decrease to level noted at idle. Operating pressure (vacuum) at idle should be as shown in TOCS OPERATING PRESSURE CHART. *See Fig. 5.*

4) To read table, find matching atmospheric pressure on right side of chart. Trace a line following arrow-line "A" to find the correct operating pressure. If altitude is known, find matching altitude at bottom of table. Trace a line following arrow-line "B" to find the correct operating pressure.

5) If necessary, turn adjusting screw on end of vacuum control valve clockwise to increase pressure and counterclockwise to decrease pressure. *See Fig. 6.* After each adjustment increase engine RPM and recheck operating pressure.

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2) Run engine under no load and note operating pressure shown on vacuum gauge. Increase engine speed to 3000-3500 RPM, quickly close throttle valve, and note vacuum gauge reading.

3) Manifold vacuum should quickly increase to at least 24 in. Hg, then gradually decrease to level noted at idle. Operating pressure (vacuum) at idle should be as specified in THROTTLE OPENER OPERATING PRESSURE table.

4) If necessary, turn adjusting nut on end of vacuum control valve clockwise to increase pressure and counterclockwise to decrease pressure. *See Fig. 6.*

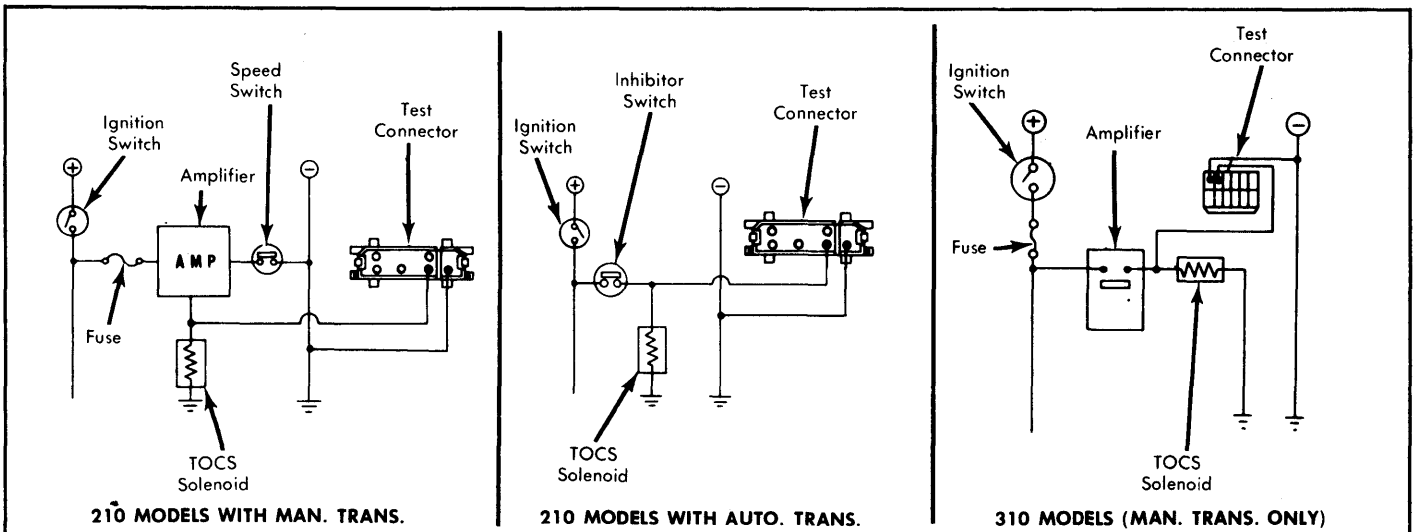

Fig. 4: 1979 Throttle Opener Control System Schematics

1974-79 EXHAUST EMISSION SYSTEMS
Datsun Throttle Opener Control System (Cont.)

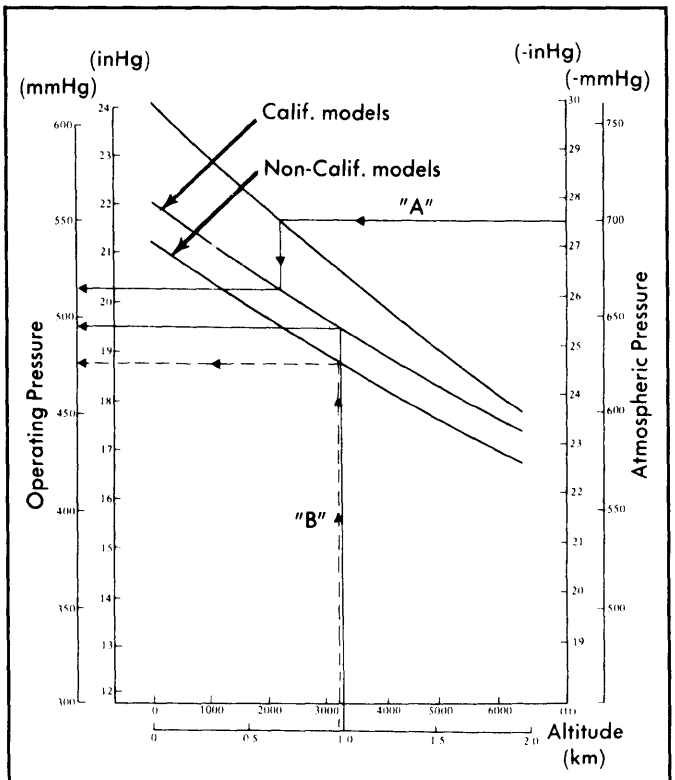

Fig. 5: 1977-78 TOCS Operating Pressure Chart

NOTE: When adjusting throttle opener operating pressure, turn adjusting nut in or out with lock spring in place. Always set lock spring properly to prevent changes in pressure.

THROTTLE OPENER OPERATING PRESSURE

Application	Vacuum (In. Hg)
All Models	
Federal	19-21
Calif.	21-23

SERVO DIAPHRAGM

1977-78 Models - 1) Connect tachometer to engine. Warm engine to normal operating temperature. Disconnect hose between servo diaphragm and vacuum control valve. connect hose to intake manifold. *See Fig. 7.*

2) Servo diaphragm is working properly if engine speed is 1650-1850 RPM (1900-2100 RPM on California models). If necessary, turn adjusting screw clockwise to raise engine RPM. *See Fig. 8.* Turn screw counterclockwise to lower engine RPM.

1979 Models - 1) Connect a tachometer to engine, then start engine and allow it to reach normal operating temperature. Disconnect servo diaphragm-to-vacuum control valve vacuum hose at vacuum valve and connect it directly to intake manifold vacuum.

2) Servo diaphragm is operating properly if engine speed increases to 1650-1850 RPM (1900-2100 RPM on California models) when intake manifold vacuum is applied to servo diaphragm.

3) If necessary, adjust servo diaphragm adjusting screw to obtain specified RPM. *See Fig. 8.* Turn adjusting screw clockwise to increase engine speed and counterclockwise to decrease engine speed.

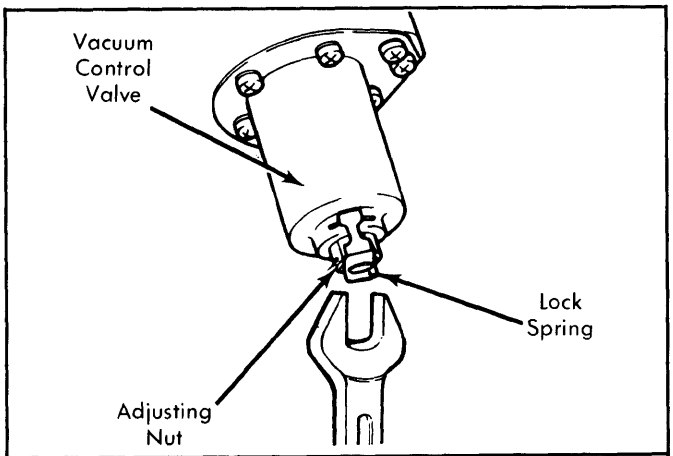

Fig. 6: Adjusting Throttle Opener Operating Pressure

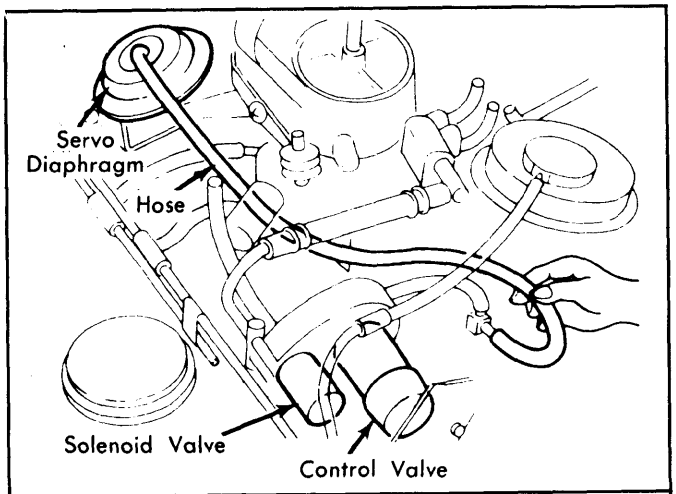

Fig. 7: 1977-78 Servo Diaphragm Test

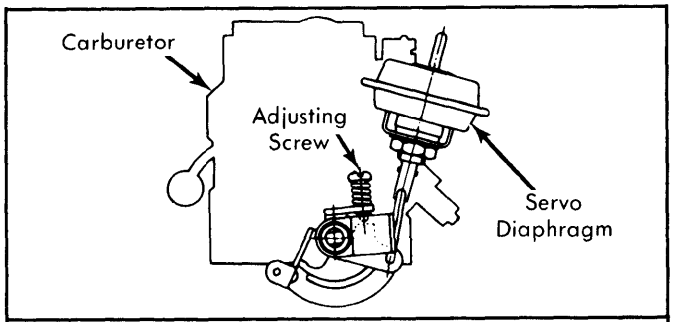

Fig. 8: Adjusting Servo Diaphragm

THROTTLE OPENER SOLENOID

1977-78 Models - Turn ignition on, but DO NOT start engine. A click should be heard whenever ignition key is turned on. If no click is heard, check solenoid for continuity. If no continuity exist, replace throttle opener solenoid.

AMPLIFIER

1977-78 Models - 1) Locate amplifier at rear of speedometer. Set circuit tester on DC range and connect test leads between amplifier and throttle opener solenoid. *See Fig. 9.*

2) Turn ignition on. Tester pointer should deflect when ignition is turned on. If pointer does not deflect, and solenoid and speed detecting switch circuits are okay, replace defective amplifier.

Datsun Throttle Opener Control System (Cont.)

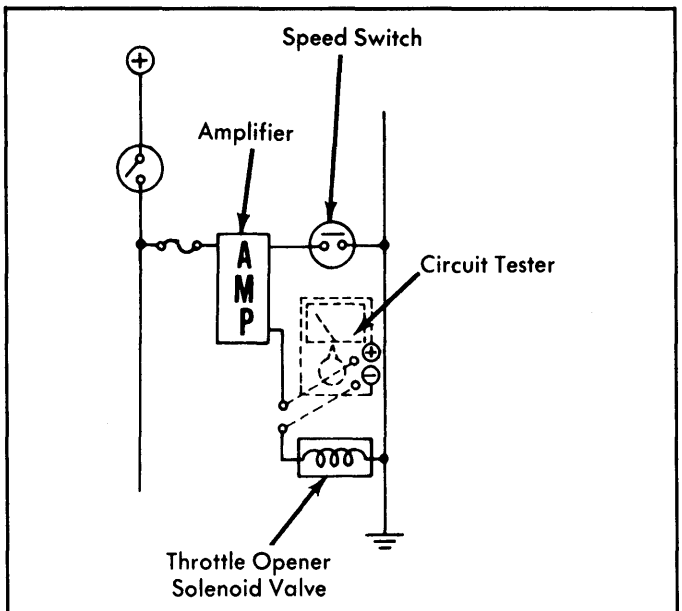

Fig. 9: 1977-78 Amplifier Circuit Test