

1974-79 EXHAUST EMISSION SYSTEMS

Datsun Spark Timing Control

All STC Equipped Models

DESCRIPTION

The Spark Timing Control (STC) system is designed to control distributor vacuum advance during rapid acceleration in order to reduce HC and NOx emissions. On 1977-78 models, the system consists of a thermal vacuum control valve, vacuum switching valve, a spark delay valve, and various connecting hose and wiring.

On 1979 models, the vacuum delay valve is installed in the vacuum line between the carburetor and the distributor on 210 and Pickup models, or throttle chamber and distributor on 280ZX and 810 models. In addition, 210 models are equipped with a thermal vacuum valve to prevent full vacuum advance when engine coolant temperature is between 64-122°F (18-50°C).

OPERATION

1974-76 MODELS

The spark timing control system is used only on 280Z models. Some models, however, are equipped with a dual pick-up coil distributor. On dual pick-up distributors, phase difference is 7 crankshaft degrees (6 degrees on 1975-76 models).

When coolant temperature is below 88-104°F (31-41°C) on 1974-76 models or 135-145°F (57-63°C) on 1976 models, the coolant temperature switch is on, relay is off, and spark timing is advanced. With coolant temperature above specified range, the coolant temperature switch is off, relay is on, and spark timing is retarded.

1977 MODELS

The STC system will allow full spark timing only when carburetor throttle valve vacuum port is exposed to manifold vacuum, the thermal vacuum control valve is closed, vacuum switching valve is on, top gear switch is on, and when coolant temperature is below 53°F (12°C) or above 140°F (60°C).

When these conditions are met, atmospheric pressure to the distributor is cut off so that manifold vacuum can act to advance spark timing. When carburetor throttle plate is above vacuum port on carburetor body, manifold vacuum is applied to the distributor vacuum chamber. See Fig. 1. This allows partial advance of spark timing whenever vehicle is accelerating or when cold starting.

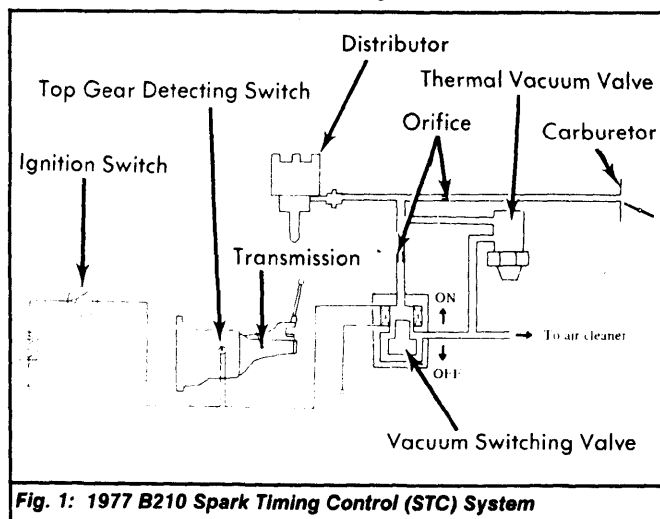


Fig. 1: 1977 B210 Spark Timing Control (STC) System

1978 MODELS

The STC system allows full spark advance when coolant temperature is below 41-64°F (5-18°C) or when coolant temperature above 122-145°F (50-63°C). During these conditions, atmospheric pressure to distributor vacuum chamber is shut-off, allowing manifold vacuum to advance spark timing.

1979 MODELS

When the throttle valve in the carburetor or throttle chamber is opened rapidly, the Vacuum Delay Valve (VDV) restricts the air flow in the line to reduce the rate of vacuum change. See Fig. 2. The reduced rate of vacuum change provides the vacuum advance unit with some delay time. When vacuum from the vacuum source decreases, the vacuum advance unit responds normally because a one-way function is provided by the valve.

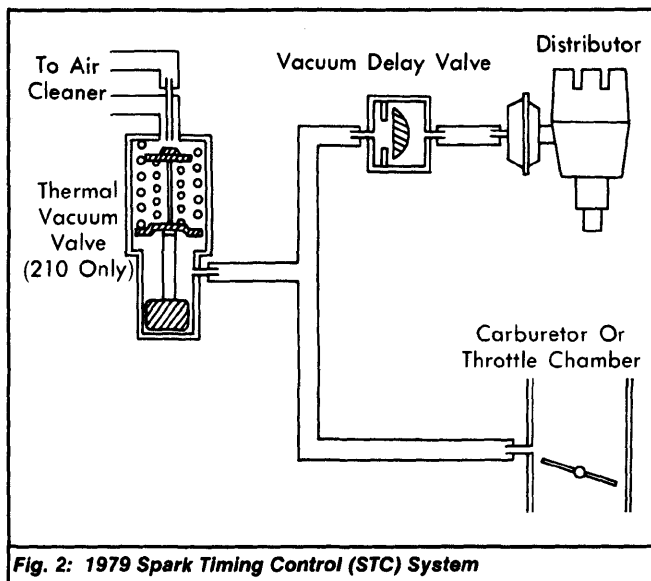


Fig. 2: 1979 Spark Timing Control (STC) System

TESTING

SPARK TIMING CONTROL SYSTEM

NOTE: Spark timing control system testing for 1977-78 models not available at time of publication.

1974 280Z Models - 1) Inspect cap, rotor, and distributor pick-up coil air gap. Clean adjust, or replace components as necessary. Adjust air gap to .008-.016" (.3-.4 mm).

2) To check phase difference on dual pick-up distributors, disconnect Green wire from coolant temperature switch and ground wire. Adjust ignition timing to 15 degrees BTDC at 600 RPM.

3) Install a jumper wire across terminals of coolant temperature switch harness connector. Ignition timing should be 8 degrees BTDC at 600 RPM, which equals a phase difference of 7 degrees. If necessary, turn adjuster plate until correct specifications are obtained. After adjustment, reconnect Red wire to coolant temperature switch.

1975-76 280Z Models - 1) Inspect cap, rotor, and distributor pick-up coil air gap. Clean adjust, or replace components as necessary. Adjust air gap to .008-.016" (.3-.4 mm).

2) To check phase difference on dual pick-up distributors, disconnect Red wire from coolant temperature switch and ground wire. With engine at 800 RPM (700 RPM with auto. trans. in Drive), adjust timing to 13 degrees BTDC.

3) Disconnect Red wire from ground and check ignition timing. Timing should be 7 degrees BTDC at 800 RPM (700 RPM with auto. trans.), which equals a phase difference of 6 degrees.

4) If timing is not as specified, loosen distributor adjuster plate screws and turn adjuster plate until correct specifications are obtained. Each graduation on adjuster plate is equal to 4 crankshaft degrees. After adjustment, reconnect Red wire to coolant temperature switch.

1979 210 Models - 1) Make sure all vacuum hoses are in good condition and that they are properly connected. Place transmission selector lever in "P".

2) Disconnect vacuum hose at the distributor vacuum advance unit. With engine coolant temperature below 122°F (50°C), race engine and check for vacuum at end of the disconnected hose.

1974-79 EXHAUST EMISSION SYSTEMS

Datsun Spark Timing Control (Cont.)

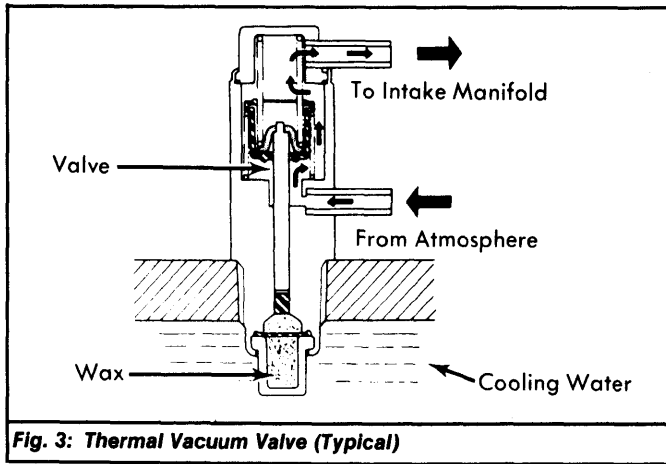
- 3) No vacuum should be felt. If vacuum is felt, check condition of thermal vacuum valve.
- 4) Allow engine to reach normal operating temperature and again check for the presence of vacuum. Vacuum should now be present. If not, check condition of thermal vacuum valve.

THERMAL VACUUM VALVE

1977 Models - Remove thermal vacuum valve from engine. Submerge valve in a container of water, and slowly heat container. Valve should open when water temperature is between 59-134°F (15-57°C). Valve passage should remain closed at all other times.

1979 210 Models - 1) Remove thermal vacuum valve from engine. Submerge valve in a container of water below 41-64°F (5-18°C). Apply vacuum to top port of valve. Valve passage should be closed.

2) Heat water to 65-120°F (18-49°C). DO NOT allow water to enter thermal vacuum valve during test. Apply vacuum to top port of valve. Valve passage should now be open. Now heat water to above 122-145°F (50-63°C), and again apply vacuum to top port of valve. Valve should again be closed.



SPARK/VACUUM DELAY VALVE

1977-78 Models - 1) Remove spark delay valve from distributor vacuum line. Blow air through carburetor side of valve (Brown side), then blow air through distributor side of valve.

2) Resistance should be greater when blowing air from distributor side of valve. If valve is clogged or if air flow in both directions is the same, replace valve.

1979 Models - 1) Remove vacuum delay valve from engine. Blow air into valve from distributor side of valve. Air should pass through valve without resistance. If not, replace valve.

2) Next, blow air through carburetor or throttle chamber side (Brown side) of valve. Air should not pass through valve without resistance. If no resistance is encountered, replace valve.

