TOYOTA AIR SUCTION

Pickup (Federal)
Starlet
Tercel

DESCRIPTION

The Air Suction system uses exhaust gas pulses to draw air into the exhaust manifold which helps to complete oxidation of emissions. This system includes an air suction (AS) valve (2 on Tercel), an air intake filter (2 on Tercel), various hoses and a restrictor (Tercel only). Federal Pickups also use a vacuum control valve (VCV), vacuum switching valve (VSV), air switching valve (ASV), check valve, thermal switch, catalytic converter temperature sensor and a control computer.

OPERATION

Air is drawn through the air filter(s) and air suction valve(s) into the exhaust ports of all cylinders on Pickup and Starlet, and into cylinders 3 and 4 on Tercel. The Pickup uses a system of control and switching valves and a computer to delay air suction during rapid deceleration, while the Tercel uses a restrictor to accomplish the same purpose. This prevents engine backfiring on deceleration.

TESTING

PICKUP

1) Check condition of all hoses and tubes. Disconnect air suction hose from air cleaner and start cold engine. Listen at air suction hose. As engine warms up, a "bubbling" noise should be heard at idle. No noise should be heard when engine is cold.

2) Disconnect and plug vacuum hose located between check valve and vacuum pipe bracket at check valve. "Bubbling" noise should still be heard. Race engine and quickly close throttle. "Bubbling" noise should stop.

3) With engine running at idle, connect a jumper wire to both terminals of the catalytic converter temperature sensor. "Bubbling" noise should stop. Disconnect wire. If system performed correctly, testing is complete. If not, test individual components in steps in that follow.

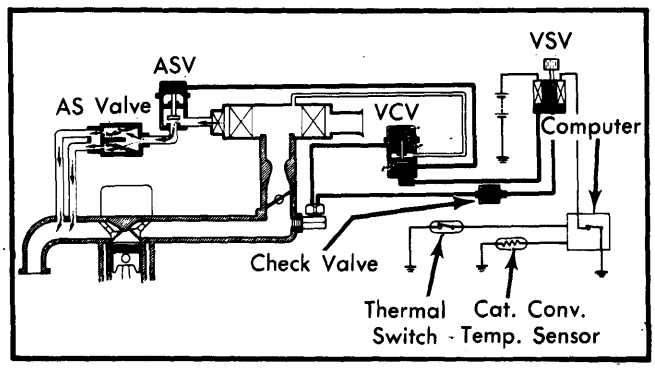

Fig. 1 Air Suction System (Pickup)

4) Remove air suction (AS) valve. Blow air into pipe(s) on each side of valve checking that air flows from air cleaner side to outlet side and does not flow from outlet side to air cleaner side.

5) Remove air switching valve (ASV). Apply vacuum to ASV diaphragm. Blow into upper valve pipe checking that air flows out lower pipe. Remove vacuum from diaphragm while blowing. Air flow should stop.

6) Remove check valve and blow air into each pipe. Air should flow from Orange pipe to Black pipe, but not from Black pipe to Orange pipe. Replace or reinstall valves as necessary.

7) Check vacuum control valve by disconnecting vacuum hose from port "Z". Using another hose, connect port "Z" to intake manifold. Disconnect vacuum hose from port "S" and "X". See *Fig. 2*.

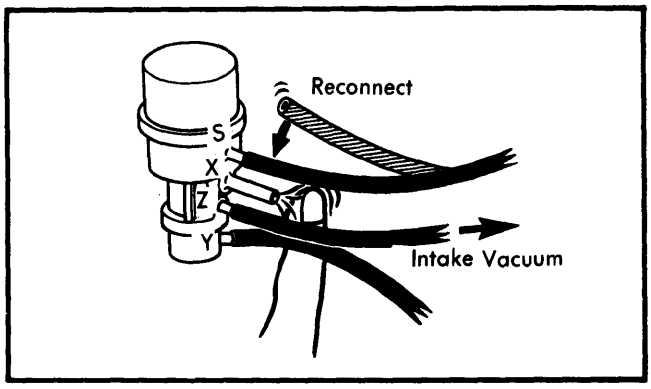

Fig. 2 Testing Vacuum Control Valve

8) Run engine at idle. Plug port "X" with finger checking that no vacuum is felt. Reconnect hose to port "S". Vacuum should be felt momentarily. Replace or reinstall valve as necessary.

9) Remove vacuum switching valve (VSV). Connect valve to battery as shown in *Fig. 3*. Blow into pipe "5", checking that air comes out pipe "#". Disconnect battery. Blow into pipe "5", checking that air comes out air filter.

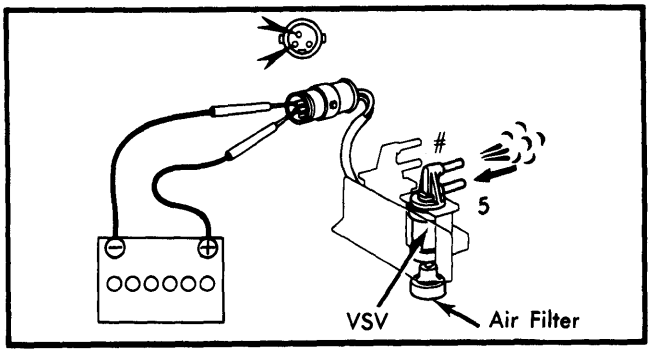

Fig. 3 Testing Vacuum Switching Valve

Copyright (c) 2001 Mitchell Repair Information Company

TOYOTA AIR SUCTION (Cont.)

10) Using an ohmmeter, check that there is no continuity between positive terminal and VSV body. Measure resistance between positive terminal and other terminals. Resistance should be 38-43 ohms. Replace or reinstall valve as necessary.

11) Drain coolant from radiator. Remove thermal switch from intake manifold. Cool switch in ice water to below 43°F (6°C). Using an ohmmeter, check that there is continuity between switch connector tab and switch body.

12) Using hot oil, heat switch to 64-208°F (18-98°C). Check that there is no continuity. Continue heating switch to above 230°F (110°C). Check that continuity returns. Replace or reinstall switch as necessary. Refill radiator.

13) Unplug catalytic converter temperature sensor under driver's seat. Insert ohmmeter probe from REAR side of connector only and measure resistance while running engine at idle. Resistance should measure 2,000-200,000 ohms. Replace or reinstall sensor as necessary. Check for loose connections.

STARTLET

Remove, check, clean and reinstall air filter. Check condition of all hoses and tubes. Disconnect air suction hose from air suction (AS) valve. Start engine and run at idle speed. Listen to AS valve. A "bubbling" noise should be heard. If system operates properly, test is complete. If not, replace AS valve.

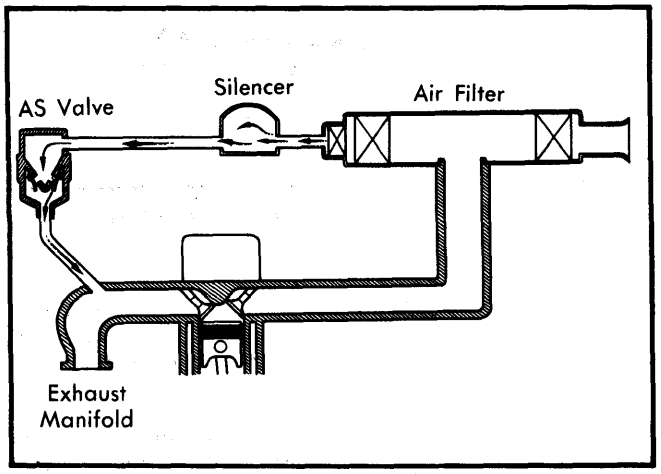

Fig. 4 Air Suction System (Starlet)

TERCEL

1) Check condition of all hoses and pipes. Remove small vacuum hose from air suction valve "B" and plug hose end. With engine idling, a "bubbling" sound should be heard when air cleaner lid is removed.

2) Replace vacuum hose on valve "B". A noise should be heard from inlet pipe of valve within 2-5 seconds after replacing hose. If system operates properly, test is complete. If not, check air suction valve.

3) Remove filter and valve from air cleaner housing. No air should pass when blowing into valve pipe. Air should pass if sucking through valve pipe. Reinstall valve and filter.

4) Remove air suction valve "B". Check valve by blowing into pipes. With vacuum applied to valve diaphragm, air should flow from filter side to air cleaner side and not the other way. With no vacuum, air should not flow from filter side to outlet side. Reinstall valve.

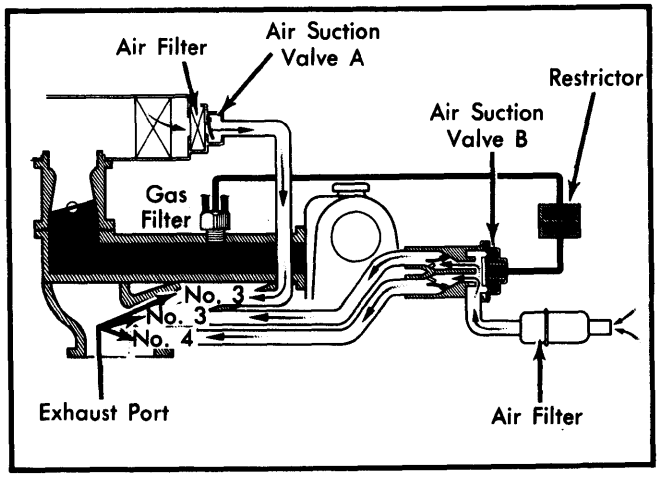

Fig. 5 Air Suction System (Tercel)

Copyright (c) 2001 Mitchell Repair Information Company