1982 Exhaust Emission Systems

TOYOTA SPARK CONTROL SYSTEMS

Celica, Corona, Cressida, Land Cruiser, Pickup (Calif.), Starlet, Supra, Tercel

DESCRIPTION & OPERATION

The spark control systems help reduce HC and CO emissions by delaying vacuum advance and lowering maximum combustion chamber temperatures. Some systems are designed to improve cold engine performance by advancing timing only when the engine is cold. Systems include a distributor with vacuum advance diaphragm(s), delay valve, thermal valve, and hoses. *See appropriate illustration for component usage and layout.*

TESTING

SYSTEM TESTING

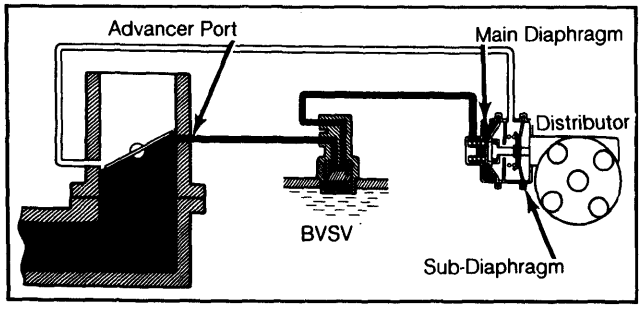
Celica, Corona & Pickup

1) Connect a vacuum gauge to distributor main advance diaphragm hose. Check that coolant temperature is below 104°F (40°C). Start engine. Vacuum gauge should indicate zero when engine is accelerated or running at idle.

2) Warm up engine to normal operating temperature. Check that vacuum gauge fluctuates rapidly when engine is accelerated. Stop engine. Remove vacuum gauge and reconnect hose to distributor.

3) Remove distributor cap and rotor. Apply vacuum to diaphragms checking that vacuum advancer moves. Reinstall rotor and cap. If system performed as described, testing is complete. If not, check individual components as necessary.

Fig. 1: Celica, Corona & Pickup Spark Control System



Cressida

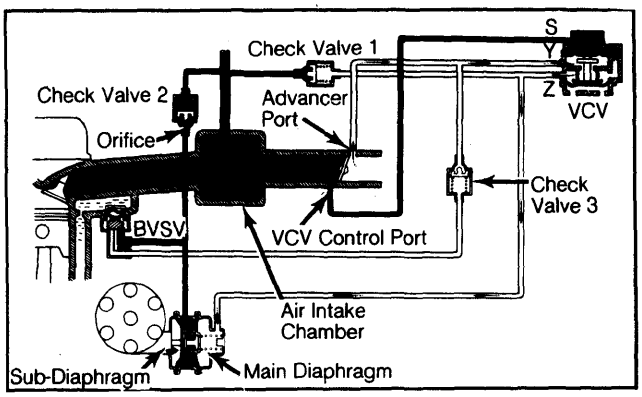
1) Connect vacuum gauge to distributor sub-diaphragm hose. Check that coolant temperature is below 122°F (50°C). Start engine. Vacuum gauge should indicate high vacuum when engine is accelerated or running at idle. If not, check BVSV or check valve.

2) Warm up engine to normal operating temperature. Check that vacuum gauge indicates low vacuum at idle and high vacuum when engine is accelerated. If not, check BVSV. Remove vacuum gauge and reconnect hose.

3) Connect vacuum gauge to distributor main advance diaphragm hose. Set parking brake. Vacuum gauge should indicate high vacuum when power steering is operated, shift lever is shifted to "D" or engine is accelerated. If not, check VCV. Remove gauge and reconnect hose.

4) Remove distributor cap and rotor. Apply vacuum to diaphragms checking that vacuum advancer moves in accordance with vacuum application. If not, repair or replace vacuum advancer. Reinstall rotor and cap. Testing is complete.

Fig. 2: Cressida Spark Control System



Land Cruiser

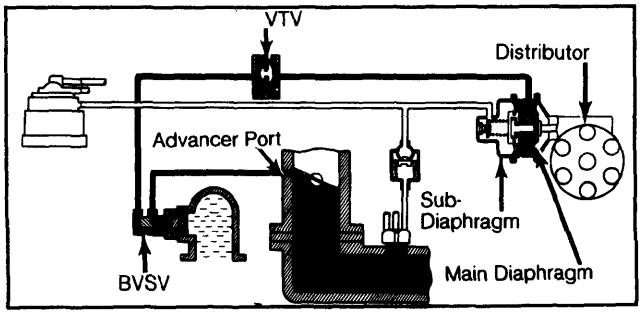
1) Connect a vacuum gauge to distributor main diaphragm hose and another vacuum gauge to distributor sub-diaphragm hose. If equipped with high altitude compensation system (HAC), disconnect lower vacuum hose of HAC valve and connect it to intake manifold.

2) Warm up engine to normal operating temperature. Pinch hose between vacuum pipe and vacuum transmitting valve (VTV). Increase engine speed to 2500 RPM and release hose. Vacuum gauge should indicate high vacuum within 2-5 seconds after releasing hose.

3) Remove hose from VTV on vacuum pipe side. Vacuum gauge reading should drop rapidly to zero. Remove vacuum gauge and reconnect hoses.

4) Remove distributor cap and rotor. Apply vacuum to diaphragms checking that vacuum advancer moves. Reinstall rotor and cap. If system performed as described, testing is complete. If not, check individual components as necessary.

Fig. 3: Land Cruiser Spark Control System



Starlet

1) Connect a vacuum gauge to distributor main diaphragm hose and another vacuum gauge to distributor sub-diaphragm hose. If equipped with high altitude compensation system (HAC), disconnect lower vacuum hose of HAC valve and connect it to intake manifold.

2) Check that coolant temperature is below 106°F (41°C). Start engine. Check that main diaphragm vacuum gauge indicates steady vacuum when engine is accelerated or running at idle.

3) Warm up engine to normal operating temperature. Check that main diaphragm vacuum gauge

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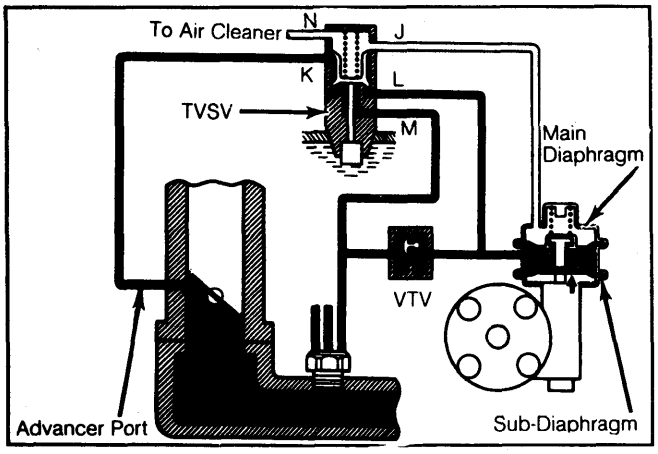
indicates zero at idle and high vacuum when engine is accelerated. Check that sub-diaphragm vacuum gauge indicates high vacuum and fluctuates when engine is accelerated from idle.

4) Remove distributor cap and rotor. Apply vacuum to diaphragms checking that vacuum advancer moves. Reinstall cap and rotor. If system performed as described, testing is complete. If not, check individual components as necessary.

Fig. 4: Starlet Spark Control System



Supra

1) Using a "T" connector, connect a vacuum gauge to hose between distributor main diaphragm hose and pipe. Using another "T" connector, connect another gauge to hose between distributor sub-diaphragm hose and pipe.

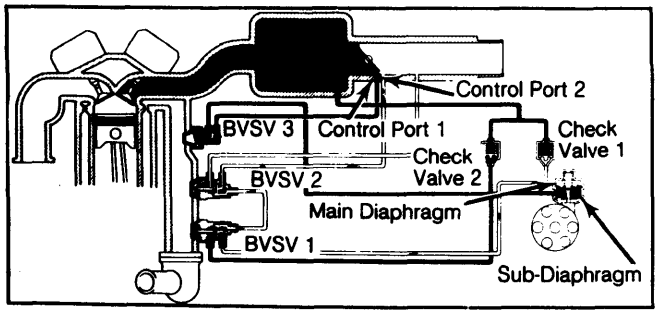
2) Check that coolant temperature is below 113°F (45°C). Start engine. Check that sub-diaphragm gauge indicates steady vacuum when engine is accelerated or running at idle.

3) Warm up engine to normal operating temperature. Check that both gauges indicate zero vacuum.

4) Increase engine speed to 1500 RPM. Check that sub-diaphragm vacuum gauge indicates high vacuum. Fully open throttle. Check that both gauges indicate high vacuum. Remove gauges and reconnect hoses.

5) Remove distributor cap and rotor. Apply vacuum to diaphragms checking that vacuum advancer moves. Reinstall cap and rotor. If system performed as described, testing is complete. If not, check individual components as necessary.

Fig. 5: Supra Spark Control System



Tercel

1) Connect a vacuum gauge to distributor main diaphragm hose and another vacuum gauge to BVSV port leading to carburetor. If equipped with high altitude compensation system (HAC), disconnect lower vacuum hose of HAC valve and connect it to intake manifold.

2) Check that coolant temperature is below 122°F (50°C). Start engine. Check that both gauges indicate zero. Warm up engine to normal operating temperature. Check that BVSV vacuum gauge indicates high vacuum.

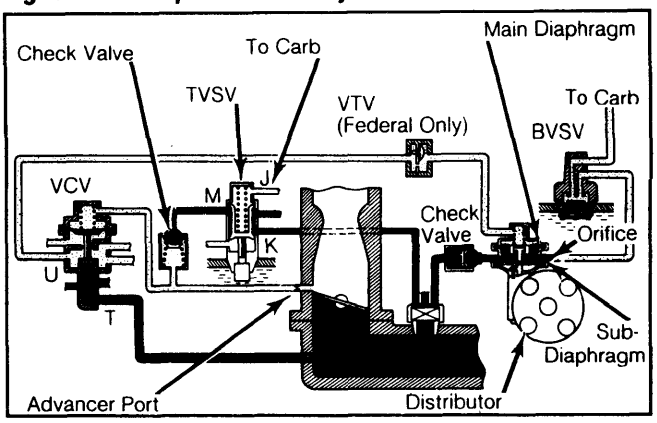
3) On Federal models, pinch hose between vacuum pipe and vacuum transmitting valve (VTV). Increase engine speed to 2500 RPM and release hose.

4) Check that main diaphragm vacuum gauge indicates high vacuum within 1-5 seconds. Return engine to idle speed checking that main diaphragm vacuum gauge returns to zero.

5) On Calif. models, check that main diaphragm vacuum gauge fluctuates when the engine is accelerated and returned to idle. On all models, remove gauges and reconnect hoses.

6) Remove distributor cap and rotor. Apply vacuum to diaphragms checking that vacuum advancer moves. Reinstall rotor and cap. If system performed as described, testing is complete. If not, check individual components as necessary.

Fig. 6: Tercel Spark Control System



COMPONENT TESTING

Bimetal Vacuum Switching Valve (BVSV)

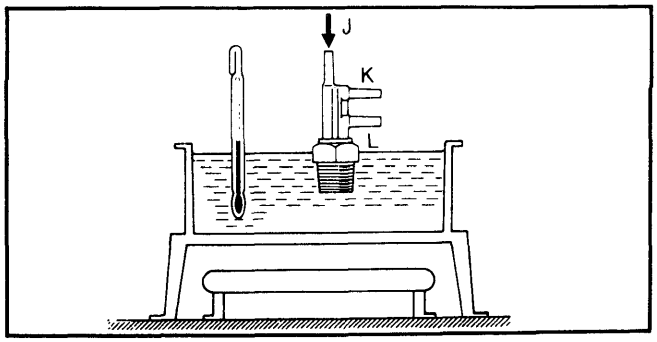
Supra

BVSV 1

1) Drain coolant from radiator into container. Remove BVSV 1 and immerse in coolant. Using ice, lower coolant temperature to below 14°F (-10°C). Check that air flows from pipe "J" to pipe "L". *See Fig. 7.*

2) Heat coolant to above 39°F (4°C). Check that air flows from pipe "J" to pipe "K".

Fig. 7: Bimetal Vacuum Switching Valve 1 & 2 Test



Supra models only.

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BVSV 2

1) Drain coolant from radiator into container. Remove BVSV 2 and immerse in coolant. Check that air flows from pipe "J" to pipe "L" when temperature is below 113°F (45°C).

2) Heat coolant to above 147°F (64°C). Check that air flows from pipe "J" to pipe "K".

BVSV 3

1) Drain coolant from radiator into container. Remove BVSV 3 and immerse in coolant. Valve should be closed when temperature is below 122°F (50°C).

2) Heat coolant to above 147°F (64°C). Check that valve is open.

All Other Models

1) Valve should be closed when coolant temperature is below 104°F (40°C) on Celica, Corona and Pickup, 86°F (30°C) on Land Cruiser, and 122°F (50°C) on all other models.

2) Valve should be open above 129°F (54°C) on Celica, Corona and Pickup, 111°F (44°C) on Land Cruiser, and 147°F (64°C) on all other models.

Check Valve

Valve should close and not allow air to flow while blowing into Black pipe. Air should flow while blowing into the other pipe.

Thermostatic Vacuum Switching Valve

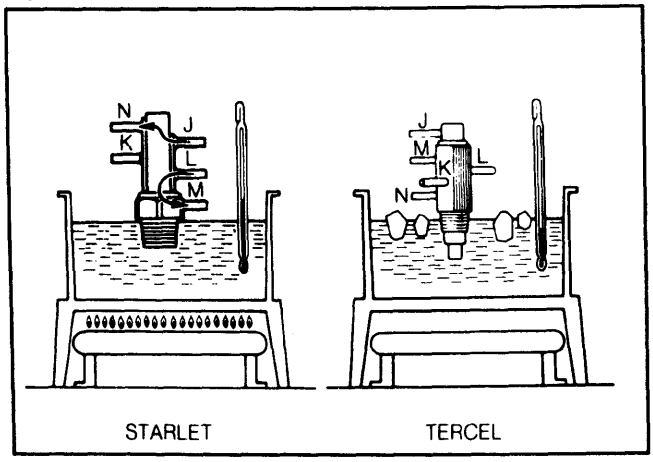
Starlet

1) Drain coolant from radiator and remove TVSV. Immerse threaded end of valve in container of water with thermometer.

2) With water temperature below 106°F (41°C), check that air flows from port "J" to port "N" and from port "L" to port "M". *See Fig. 8.*

3) Heat water to above 131°F (55°C). Check that air flows from port "J" to port "K" and from port "L" to port "M".

Fig. 8: Thermostatic Vacuum Switching Valve Test



Starlet and Tercel models only.

Tercel

1) Drain coolant from radiator and remove TVSV. Immerse threaded end of valve in container of water with thermometer. *See Fig. 8..*

2) Using ice, cool water in container to below 45°F (7°C). Check that air flows from port "J" to port "M" and "L" and from port "K" to port "N". Heat water to 63-122°F (17-50°C). Check that air flows from port "K" to port "N" and "L" and from port "J" to port "M".

Vacuum Control Valve

Cressida

1) Remove VCV. Blow air into port "S" checking that air flows to port "Z". Blow air into port "Y" checking that air does not flow to any other port.

2) Connect a vacuum gauge to hose leading to port "S" and apply more than 16.2 in. Hg. Connect another vacuum gauge to hose leading to port "Z". Check that port "Z" vacuum gauge indicates 9.7-12.6 in. Hg.

3) Increase vacuum to port "S" to more than 18.1 in. Hg. Check that port "Z" vacuum gauge indicates 2.1-4.5 in. Hg.

Tercel

Apply more than 3.5 in. Hg vacuum to port "S". Plug ports "R" and "Y", then blow air into port "T". Air should flow out ports "U", "V", and "Z" and, on Calif. models, "W". With no vacuum at port "S", no air should flow.

Vacuum Transmitting Valve (VTV)

Air should flow with difficulty when blowing from side "A" to "B". Air should flow easily when blowing from side "B" to "A".