

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.

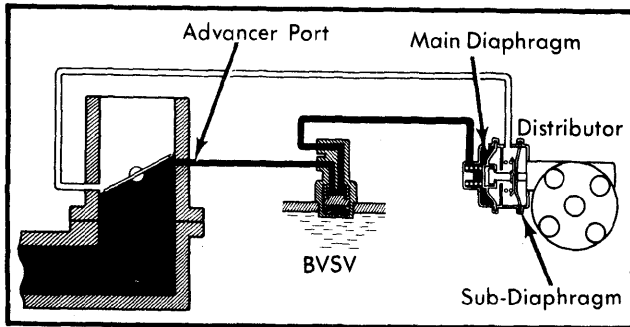


Fig. 1 Spark Control System
(Celica, Corona & Pickup)

Cressida & Supra – 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 BSV 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 BSV. 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.

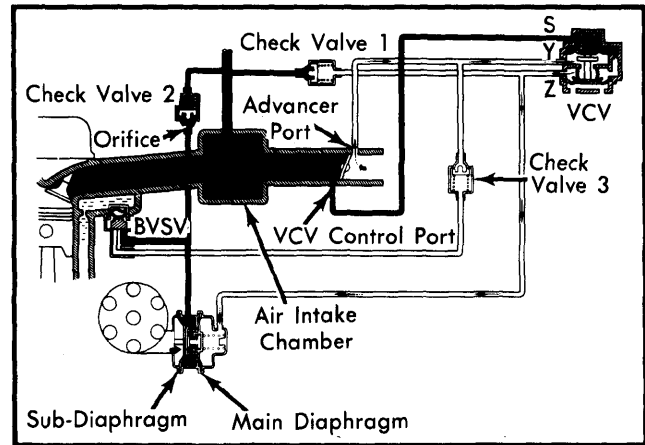


Fig. 2 Spark Control System
(Cressida & Supra)

Land Cruiser – 1) Connect a vacuum hose to distributor main advance diaphragm hose. Check that coolant temperature is below 86°F (30°C). Start engine. Vacuum gauge should indicate zero when engine is accelerated or running at idle.

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.

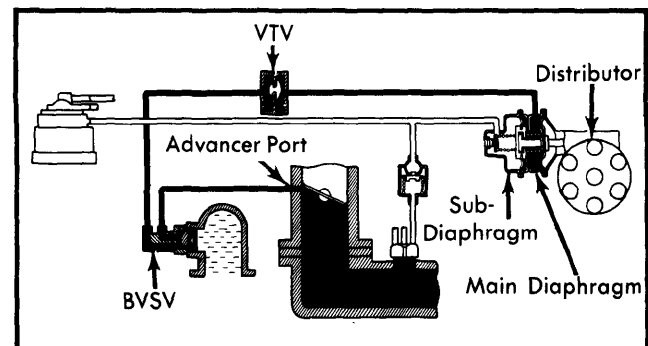


Fig. 3 Spark Control System
(Land Cruiser)

Starlet – 1) Connect a vacuum gauge to distributor main diaphragm hose and another vacuum gauge to distributor sub-diaphragm hose.

TOYOTA SPARK CONTROL SYSTEMS (Cont.)

NOTE — If your vehicle is equipped with high altitude compensation system (HAC), disconnect lower vacuum hose of HAC valve and connect it directly to intake manifold before testing spark control system.

2) Check that coolant temperature is below 106°F (41°C). Start engine. Check that main diaphragm vacuum gauge indicates zero and sub-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 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.

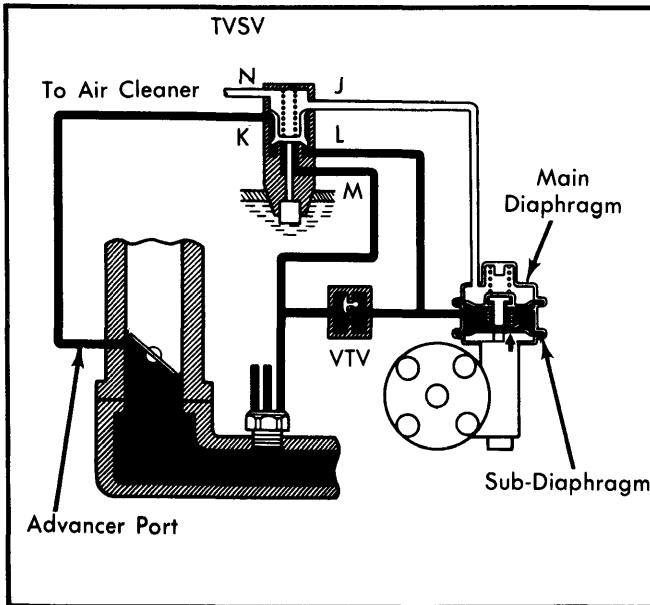


Fig. 4 Spark Control System (Starlet)

Tercel — 1) Connect a vacuum gauge to distributor main diaphragm hose and another vacuum gauge to BSVV port leading to carburetor. Check that coolant temperature is below 122°F (50°C). Start engine. Check that both gauges indicate zero.

2) Warm up engine to normal operating temperature. Check that BSVV vacuum gauge indicates high vacuum. On Federal models, pinch hose between vacuum pipe and vacuum transmitting valve (VTV). Increase engine speed to 2500 RPM and release hose.

3) 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.

4) 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.

5) 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.

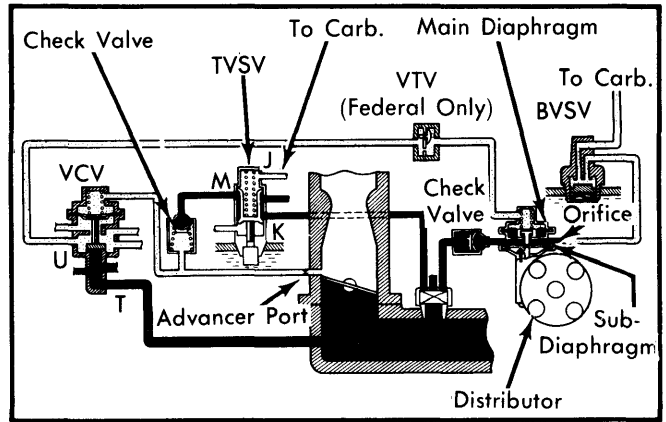


Fig. 5 Spark Control System (Tercel)

COMPONENT TESTING

Bimetal Vacuum Switching Valve (BVSV) — 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. 6. 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.

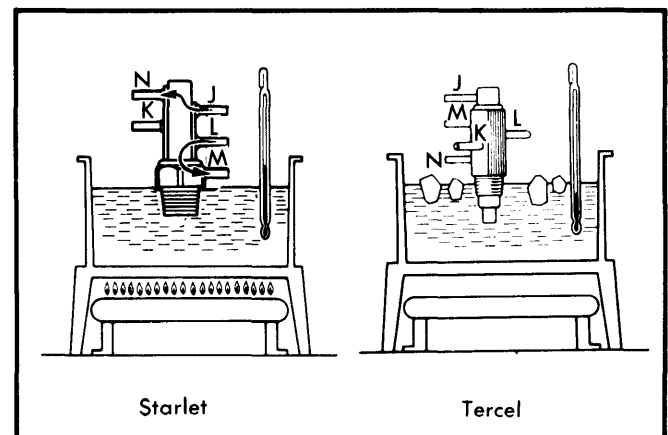


Fig. 6 Testing TVSV

TOYOTA SPARK CONTROL SYSTEMS (Cont.)

Thermostatic Vacuum Switching Valve (Tercel) – 1) Drain coolant from radiator and remove TVSV. Immerse threaded end of valve in container of water with thermometer. See Fig. 6.

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 & Supra) – 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.

Vacuum Control Valve (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, 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.