TOYOTA SPARK CONTROL SYSTEMS

All Models

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 and Pickup – Connect a vacuum gauge to distributor main advance diaphragm hose. Start engine, and pinch hose on carburetor side of VTV. Increase engine speed to 2000 RPM and release hose. Vacuum should rise to more than 4 in. (100 mm) Hg in .5-2 seconds. Disconnect hose between VTV and advancer port. Vacuum should drop quickly. Remove distributor cap and apply vacuum at advance diaphragms and check for movement of base plate.

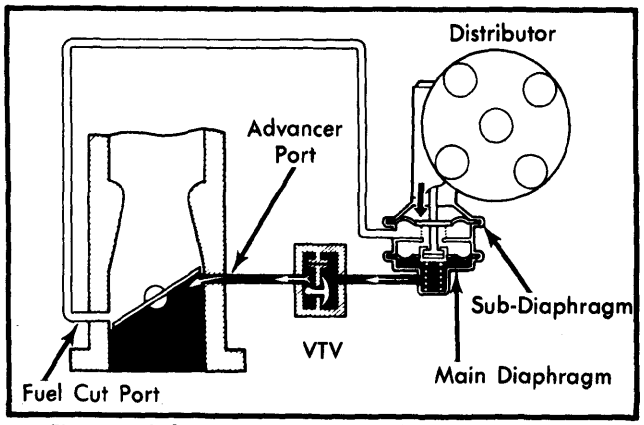

Fig. 1 Celica, Corona and Pickup Spark Control (Federal)

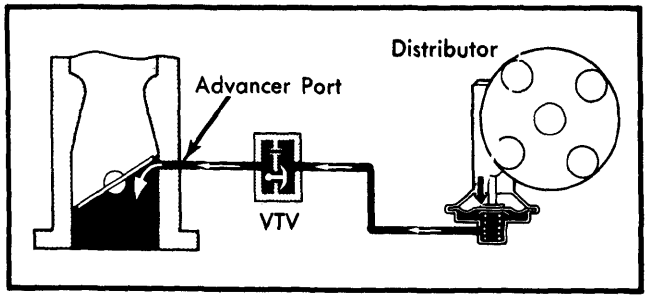

Fig. 2 Celica, Corona and Pickup Spark Control (Calif.)

Celica Supra and Cressida – With engine idling and coolant temperature less than 122°F (50°C), connect a vacuum gauge to hose at distributor sub-diaphragm. Gauge should show high vacuum. If not, check BVSV or check valve. When engine is warm, gauge should read low vacuum. If not, check BVSV. Apply vacuum to both distributor diaphragms and check for proper movement.

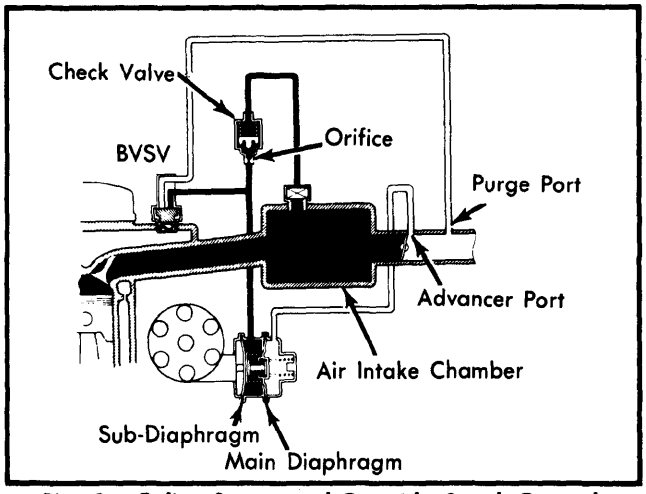

Fig. 3 Celica Supra and Cressida Spark Control

Corolla (Without Cold Advance Option) – Connect a timing light to engine. With engine idling, timing should be about 18° BTDC. Disconnect hose from distributor sub-diaphragm and plug end. Timing should change to 10° BTDC. Stop engine and apply vacuum to both diaphragms and check for proper movement. Reconnect hoses.

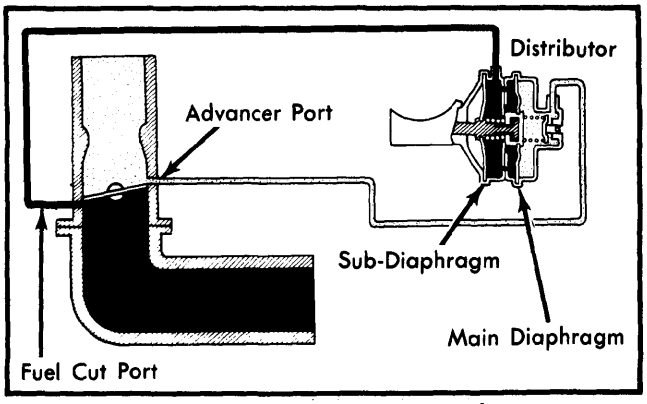

Fig. 4 Corolla Spark Control (Without Cold Advance)

Corolla (With Cold Advance Option) – 1) Connect a timing light and start engine. With coolant below 86°F (30°C), disconnect and plug top hose at BVSV. Ignition timing should be about 18° BTDC at idle. Disconnect hose from black side of check valve. Ignition timing should remain at 18° BTDC for at least one minute.

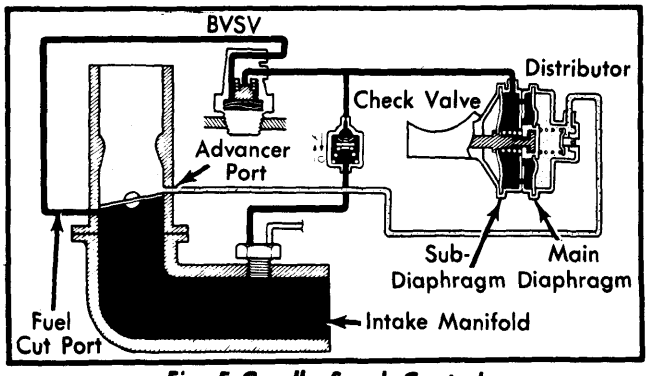

Fig. 5 Corolla Spark Control (With Cold Advance)

TOYOTA SPARK CONTROL SYSTEMS (Cont.)

2) Reconnect all hoses and allow engine to warm up. Ignition timing should be 18° BTDC at idle. Disconnect and plug top hose at BVSV. Timing should now be 10° BTDC. Stop engine and apply vacuum to both distributor diaphragms, checking for proper operation.

Tercel – **1)** Connect vacuum gauge to distributor main diaphragm hose. Connect a second vacuum gauge to top port of BVSV (2). Start engine and see that both gauges indicate zero vacuum when coolant is below 122°F (50°C).

2) With warm engine, second vacuum gauge should show high vacuum whether throttle is open or closed. Pinch hose on VCV side of VTV with engine idling, then raise speed to 2500 RPM. Release hose and check for high vacuum at first vacuum gauge within 1-5 seconds. Return to idle, watching for smooth decrease in vacuum on first gauge.

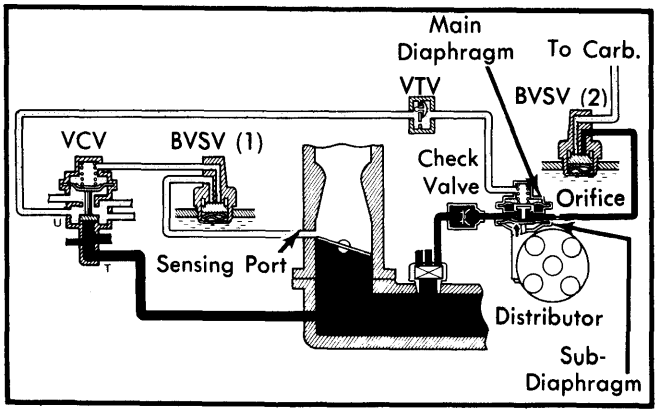

Fig. 6 Tercel Spark Control

Land Cruiser – Connect a vacuum gauge to distributor main diaphragm hose. With engine warm and idling, pinch hose between vacuum pipe and vacuum transmitting valve. Raise engine speed to 2500 RPM and release hose. Gauge should indicate high vacuum within 2 – 5 seconds after releasing hose. Remove hose from VTV on vacuum pipe side. Gauge reading should drop quickly to zero.

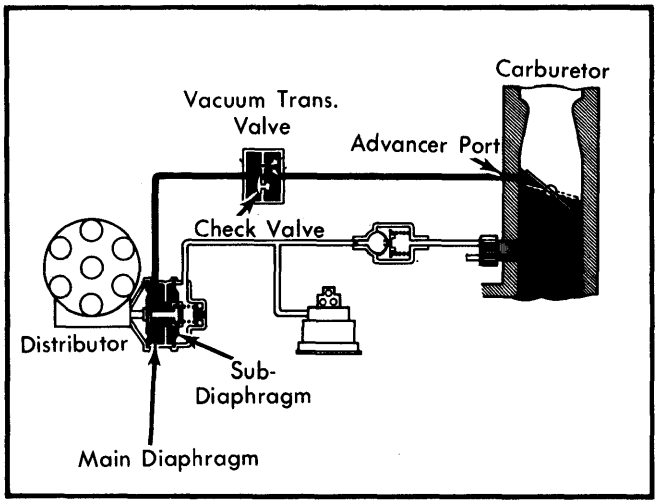

Fig. 7 Land Cruiser Spark Control

COMPONENT TESTING

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.

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.

Bimetal Vacuum Switching Valve (BVSV) – Valve should be closed when coolant temperature is below 86°F (30°C) on Corolla, or below 122°F (50°C) on all other models. Valve should be open above 111°F (44°C) on Corolla, or above 147°F (64°C) on all other models.

Vacuum Control Valve (VCV) – Apply more than 3.5 in. (90 mm) Hg vacuum to port "S". Plug ports "R" and "Y", then blow air into port "T". Air should flow out "U", "W" and "Z". With no vacuum at "S", no air should flow.