

TOYOTA HIGH ALTITUDE COMPENSATION (HAC) SYSTEM

Corolla (Federal)
Land Cruiser
Tercel (Federal)

NOTE — The HAC system is optional on high altitude area vehicles. Not all vehicles will be equipped with this system.

DESCRIPTION

As altitude increases, air pressure becomes less and the air/fuel mixture becomes richer. The HAC system supplies additional air to the high speed circuits of the carburetor to reduce emissions and improve driveability. On Land Cruiser and Tercel models the ignition timing is also advanced for better driveability.

The systems include a high altitude compensation valve and a check valve. Tercel models use a BVSV to eliminate compensation while the engine is cold.

OPERATION

At altitudes over 4000 feet, the HAC valve opens and allows air to bleed through the valve into the carburetor. When the vehicle is at an altitude below 2600 feet, the valve is closed and no air can pass through. The valve may or may not be open between these altitudes. The BVSV on Tercel models is closed when coolant temperature is below 122° F (50° C). This cuts off vacuum from the HAC valve so air can't bleed into carburetor, but still allows vacuum advance.

TESTING

HAC VALVE

Before testing each system, remove hoses or caps from top of HAC valve. Blow into ports on valve. If air passes through, valve is in the high altitude position. If not, valve is in the low altitude position. Replace valve if position does not correspond to test altitude.

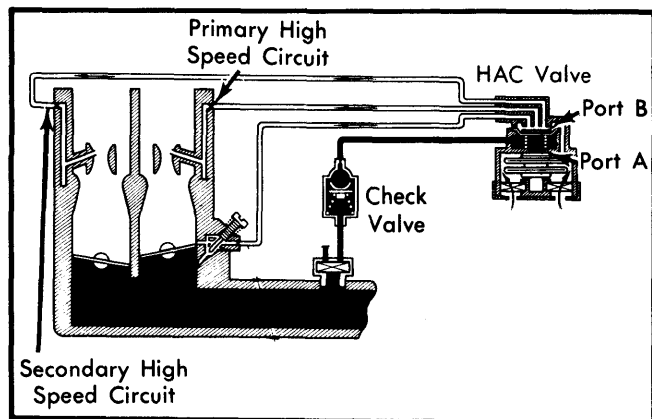


Fig. 1 Corolla High Altitude Compensation

SYSTEM TESTS

Corolla — Disconnect hoses from top of HAC valve and blow through each hose. Air should flow freely to carburetor. Blow through check valve. Air should pass from white to black side, but not in the other direction.

Land Cruiser — 1) If at high altitude, disconnect and plug hose at distributor sub-diaphragm. Ignition timing should be 7° BTDC. Reconnect hose — timing should advance 5°. Disconnect and plug vacuum hose at black side of check valve. Timing should not change for at least one minute.

2) Stop engine and blow through hoses from HAC valve to carburetor. Air should pass freely. Remove check valve and see that air passes from white to black side, but not the other direction.

3) If at low altitude, ignition timing should be 7° BTDC. Pinch hose at HAC valve leading to distributor sub-diaphragm. Timing should advance.

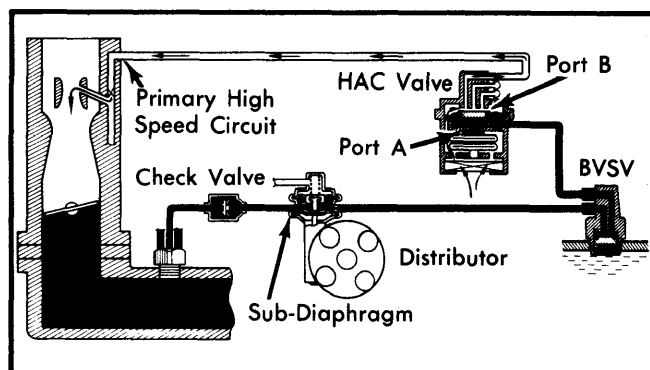


Fig. 2 Tercel High Altitude Compensation

Tercel — 1) Check BVSV to see that air passes through when coolant is below 122° F (50° C). Warm engine and recheck. Air should not pass through.

2) If testing at high altitude position, ignition timing should be 13° BTDC. Disconnect hose at distributor sub-diaphragm and see that timing changes to 5° BTDC. Reconnect hose, then disconnect from black side of check valve. Plug hose end and see that timing does not change for one minute. Disconnect hose from top of HAC and see that air passes freely into carburetor.

3) If testing at low altitude, disconnect hose from BVSV to HAC and plug. Timing should be 13° BTDC. Disconnect and plug hose at black side of check valve. Timing should not change for at least one minute. Reconnect hose to HAC, timing should now be 5° BTDC.

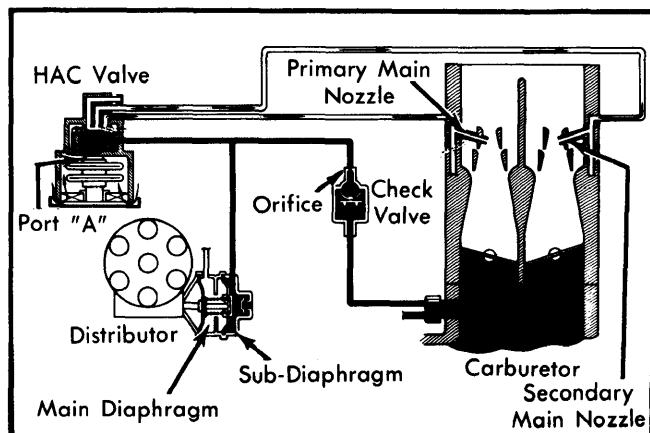


Fig. 3 Land Cruiser High Altitude Compensation