1974-79 EXHAUST EMISSION SYSTEMS
Toyota Throttle Positioner System

All Models

DESCRIPTION

The throttle positioner system controls exhaust emissions during deceleration by holding the throttle plate at an above-idle position during off-throttle operation. This prevents the fuel mixture from being starved of air and helps control HC and CO emissions. The controlling unit is a throttle positioner diaphragm which is vacuum operated.

On 1975-77 models, system consist of a diaphragm type vacuum actuator which is linked to carburetor throttle valve. On 1976-77 Federal 2T-C engines, throttle positioner is controlled by means of a vacuum control valve. On all other engines, actuator is controlled by a vacuum switching valve which is controlled by vehicle speed. When system is in operation, throttle is prevented from closing completely to reduce emissions during certain periods of deceleration.

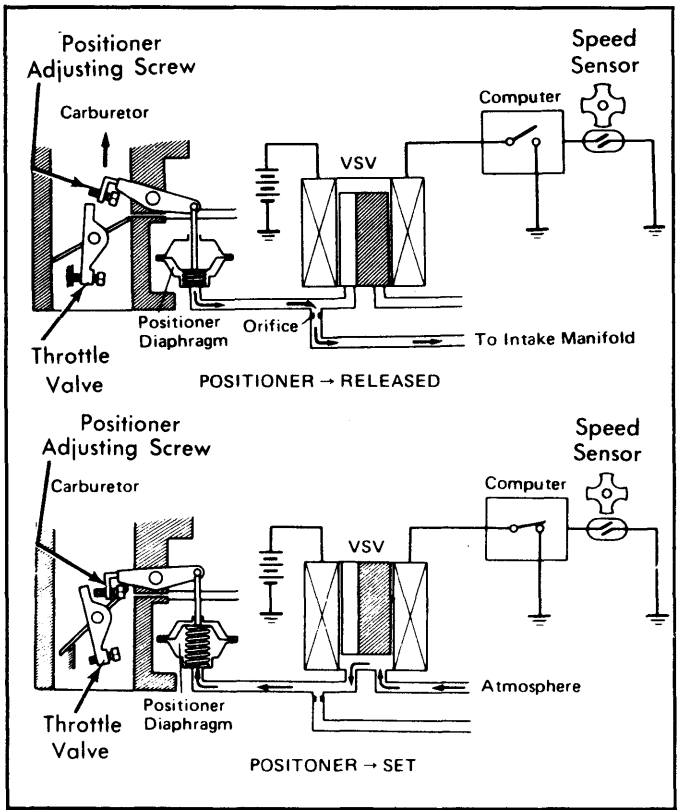

Fig. 1: 1974-77 Throttle Positioner System

OPERATION

1974-77 THROTTLE POSITIONER SYSTEMS

On 1976-77 Federal 2T-C engines, throttle positioner is controlled by vacuum control valve and vacuum check valve. When vehicle is decelerating and manifold vacuum exceeds 22 in. Hg, vacuum control valve opens and bleeds off vacuum from throttle positioner diaphragm. This allows spring in diaphragm to push on positioner linkage and open throttle valve slightly. During idle, vacuum control valve will remain closed and allow carburetor ported vacuum to act on diaphragm through check valve, allowing throttle valve to close completely.

On all other engines, throttle positioner is controlled through speed sensor by Vacuum Switching Valve (VSV). *See Fig. 1.* At low speeds, valve allows atmospheric pressure to act on throttle positioner diaphragm. This sets throttle positioner so that when throttle is released, throttle valve contacts positioner and holds throttle slightly open. When vehicle speed decreases, the vacuum switching valve allows vacuum to reach throttle positioner diaphragm. This releases throttle positioner lever from its set position and allows throttle valve to return to idle position.

1974 THROTTLE POSITIONER OPERATING RANGE

Application	On At MPH [1]	Off At MPH [2]
F Engine	11-15	5-13
2T-C Engine	11-19	9-13
3K-C Engine	11-19	9-13
4M Engine	10-20	9-13
18R-C Engine	11-19	9-13

[1] - Upon acceleration, system turns on.
[2] - Upon deceleration, system turns off.

1975-76 THROTTLE POSITIONER OPERATING RANGE

Application	On At MPH [1]	Off At MPH [2]
2T-C Engine	8-14	2-6
20R Engine	14-20	2-6
2F Engine	7-11	1-5
4M Engine	8-14	2-6

[1] - Upon acceleration, system turns on.
[2] - Upon deceleration, system turns off.

1977 THROTTLE POSITIONER OPERATING RANGE

Application	On At MPH [1]	Off At MPH [2]
2T-C Engine	8-16	7-11
20R Engine	8-16	7-11
2F Engine		
Federal	8-16	7-11
Calif.	15-25	14-20

[1] - Upon acceleration, system turns on.
[2] - Upon deceleration, system turns off.

1978 THROTTLE POSITIONER SYSTEMS

All models, except Cressida (4M engine), use a speed controlled throttle positioner system. A vacuum switching valve responds to speed determined by the speed sensor and computer. The switching valve then allows or cuts off vacuum to the throttle positioner diaphragm. When speed is above approximately 16 MPH and throttle is suddenly closed for deceleration, the throttle positioner holds throttle plate at a slightly open position. When vehicle decelerates below 7 MPH, vacuum is cut off and throttle plate returns to normal idle position.

On Cressida (4M engine), the throttle positioner system is vacuum operated. Vacuum is routed through delay valve to the throttle positioner diaphragm. The delay action of the valve allows throttle plate to return slowly to normal idle position.

1979 THROTTLE POSITIONER SYSTEMS

Corolla 1600 (2T-C Engine) - The system used in these models is vacuum controlled. The operation of the throttle positioner diaphragm is controlled by a vacuum control valve and a delay valve. During deceleration, with intake manifold vacuum above 23 in. Hg, the vacuum control valve is open, allowing vacuum to the throttle positioner diaphragm. With vacuum applied, the diaphragm holds the throttle plate slightly open. When vacuum drops below 22 in. Hg, the vacuum control valve closes, cutting off vacuum to the diaphragm. The action of the delay valve allows the throttle plate to return slowly to normal idle position when vacuum to the diaphragm is cut off.

Cressida (4M Engine) - The system used on Cressida is vacuum controlled. Vacuum is routed through delay valve to the throttle positioner diaphragm. The delay valve prevents vacuum from reaching the throttle positioner diaphragm on initial deceleration, thereby holding the throttle plate slightly open. This allows the throttle plate to return slowly to normal idle position during deceleration.

Celica, Corona & Pickup (20R Engine) - The system used on these models is speed controlled. A vacuum switching valve responds to speed determined by the speed sensor and computer. The switching valve then allows or cuts off vacuum to the throttle positioner

1974-79 EXHAUST EMISSION SYSTEMS
Toyota Throttle Positioner System (Cont.)

diaphragm. When speed is above approximately 7 MPH and throttle is suddenly closed for deceleration, the throttle positioner holds throttle plate at a slightly open position. When vehicle decelerates below this speed, vacuum is cut off and throttle plate returns to normal idle position.

ADJUSTMENTS

THROTTLE POSITIONER SETTING

1975-77 Models - 1) With engine at normal operating temperature, ensure engine idle is correct. Disconnect hose from throttle positioner diaphragm. On 1977 2T-C and 20R engines, accelerate engine and quickly release throttle.
2) On all models, throttle positioner adjusting screw should contact throttle lever and engine should be at specified RPM. See THROTTLE POSITIONER SETTING SPECIFICATIONS table. If not, turn throttle positioner adjusting screw until RPM is correct.

1975-76 THROTTLE POSITIONER SETTING SPECIFICATIONS

Application	RPM
2T-C	
Man. Trans.	1400-1600
Auto. Trans.	1300-1500
2F	1100-1300
20R	
Man. Trans.	1300-1500
Auto. Tans.	950-1150
4M	
Man. Trans.	1200-1400
Auto. Trans.	1100-1300

1977 THROTTLE POSITIONER SETTING SPECIFICATIONS

Application	RPM
2T-C	
Man. Trans.	1300-1500
Auto. Trans.	1100-1300
2F	
Federal	1100-1300
California	1300-1500
20R	
Man. Trans.	1300-1500
Auto. Tans.	950-1150

TESTING

THROTTLE POSITIONER SYSTEM

1975 Models - 1) Visually inspect all hose and wiring. With engine idling, disconnect throttle positioner vacuum hose. Accelerate engine and quickly release throttle. Engine should idle faster than normal idle speed.
2) Connect throttle positioner vacuum hose to intake manifold vacuum. Engine should return to normal idle speed. If not, check throttle positioner diaphragm and linkage.
3) Using "T" fitting, connect vacuum gauge in throttle positioner vacuum hose and position gauge so it may be seen while driving vehicle. Road test vehicle. Throttle opener system should come on/off at specified speeds. See THROTTLE POSITIONER OPERATING RANGE table. If not, check vacuum switching valve and speed sensor.
1976-77 Models - See applicable throttle positioner system diagnostic chart and perform throttle positioner system test as outlined. *See Figs. 2 and 3.*

1978 Models - 1) Warm engine to normal operating temperature. Check and adjust idle speed if required. Allow engine to idle and note that throttle positioner diaphragm releases throttle. Disconnect vacuum hose from throttle positioner diaphragm.
2) Increase engine speed and quickly release throttle. Throttle positioner should now be set. Check engine speed. Engine speed should be as specified in THROTTLE POSITIONER SET SPEED table.
3) If speed is not as specified, correct by turning throttle positioner adjusting screw near throttle valve. On Cressida, correct speed by turning adjusting nut near throttle positioner diaphragm.

1979 Models - 1) Warm engine to normal operating temperature. Check and adjust idle speed if required. Allow engine to idle and note that throttle positioner diaphragm releases throttle.
2) On Corolla and Cressida, disconnect vacuum hose from throttle positioner diaphragm. Throttle positioner should now be activated.
3) On Celica, Corona and Pickup, connect vacuum hose going to throttle positioner directly to intake manifold vacuum. Throttle positioner should now be activated.
4) On all models, with throttle positioner activated, check engine speed. Engine speed should be as specified in THROTTLE POSITIONER SET SPEED table. If speed is not as specified, turn throttle positioner adjusting screw. On Cressida, turn throttle positioner diaphragm.

THROTTLE POSITIONER SET SPEED

Application	RPM
1978 Models	
2T-C & 2F Engines	
Man. Trans.	1400
Auto. Trans.	1200
20R Engine	1050
4M Engine	950
1979 Models	
Corolla 1600	
Man. Trans.	1400
Auto. Trans.	1200
Cressida	950
All Others	1050

DELAY VALVE

1979 Corolla & Cressida - 1) With engine at normal operating temperature, activate throttle positioner by disconnecting vacuum hose from diaphragm.
2) Reconnect hose to diaphragm and check the time it takes for engine to return to normal idle speed. Engine should return to idle in 1.5-5 seconds (within 10 seconds on Cressida). If not, replace delay valve.

VACUUM CONTROL VALVE

1979 Corolla - 1) Using "T" fitting, connect vacuum gauge between intake manifold and vacuum control valve. *See Fig. 4.* With engine at idle, pinch off vacuum hose between control valve and delay valve. Check that throttle positioner is at idle position when vacuum is below 22 in. Hg.
2) Press accelerator to full open position and quickly release it. Check that throttle positioner is activated when vacuum is above 23 in. Hg. If throttle positioner does not operate as described, vacuum control valve is defective and should be replaced.

VACUUM SWITCHING VALVE (VSV)

1979 Celica, Corona & Pickup - 1) Using jumper wires, connect Vacuum Switching Valve (VSV) to battery terminals. Apply air pressure to straight port of VSV ("F"). *See Fig. 5.*
2) Check that air is expelled at perpendicular (90 degree) port of valve ("E"). Disconnect jumper wires from vacuum switching valve. Apply air to perpendicular port on valve and check that air is expelled from VSV air filter.
3) Using an ohmmeter, check continuity between VSV terminals and valve body. There should be no continuity. If continuity exists, replace vacuum switching valve. Measure resistance between VSV terminals. Resistance should be 48-60 ohms. If not, replace vacuum switching valve.

NOTE: Also see TOYOTA VACUUM SWITCHING VALVES article in this section for complete information on vacuum switching valves.

SPEED SENSOR

1974 Models - 1) Disconnect speedometer cable at transmission. Disconnect connector harness from computer. Using a 10 ohm resistor, connect positive lead of ohmmeter to computer connector speed sensor terminal. Connect negative ohmmeter lead to a known good ground.

1974-79 EXHAUST EMISSION SYSTEMS
Toyota Throttle Positioner System (Cont.)

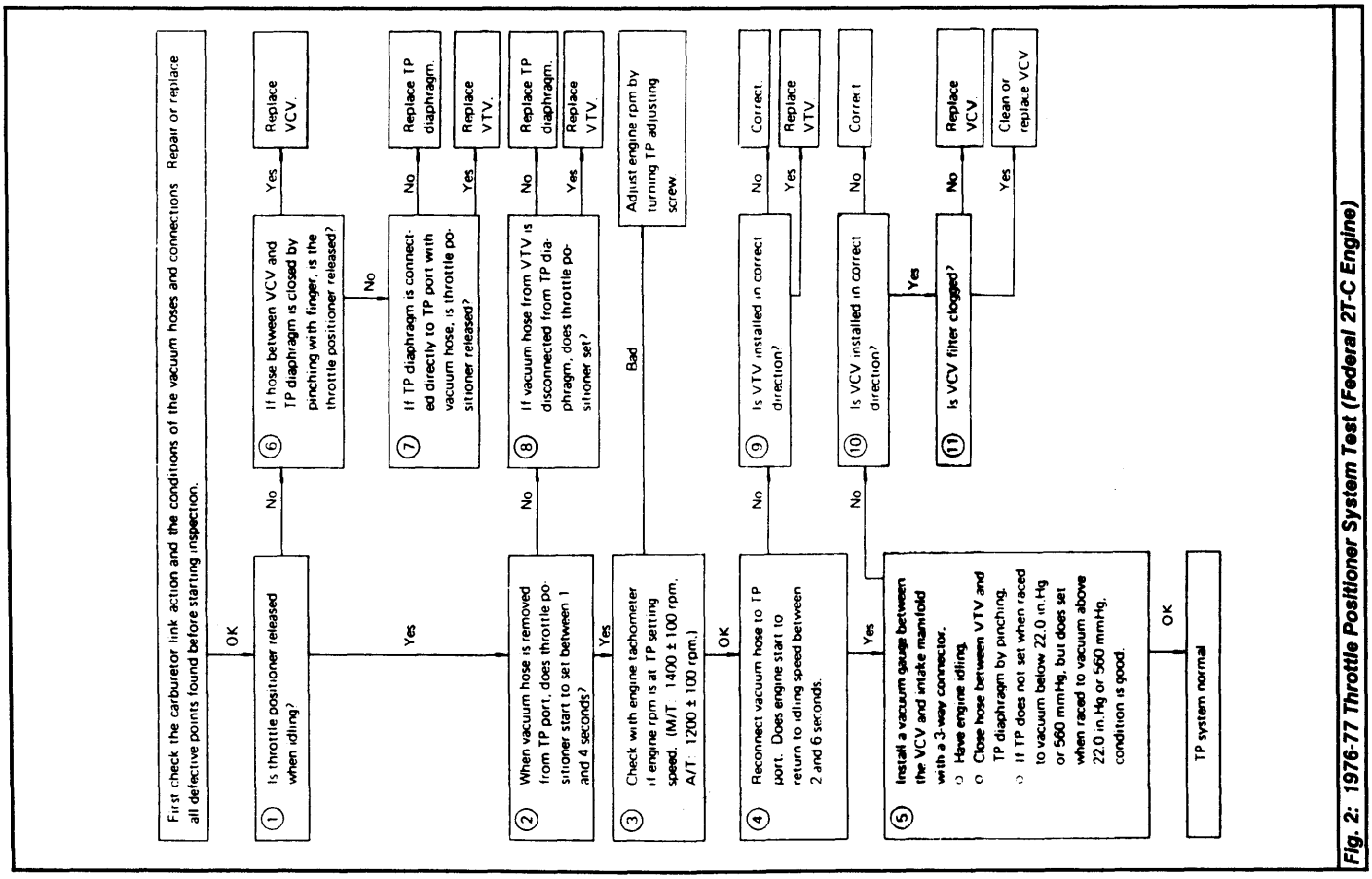

Fig. 2: 1976-77 Throttle Positioner System Test (Federal 2T-C Engine)

Fig. 3: 1976-77 Throttle Positioner System Test (All Except Federal 2T-C Engine)

1974-79 EXHAUST EMISSION SYSTEMS
Toyota Throttle Positioner System (Cont.)

2) Have an assistant turn speedometer cable by hand and count number of needle sweeps at ohmmeter. Four needle sweeps should occur for every one revolution of speedometer cable.

1974 SPEED SENSOR OPERATING RANGE

Application	Sensor On At MPH [1]
F Engine	13-41
2T-C Engine	
Federal	31-41
California	
Man. Trans.	16-41
Auto. Trans.	24-65
3K-C Engine	11-36
4M Engine	16-65
18R-C Engine	
Federal	16-62
California	11-41

[1] - Acceleration speeds given. Deceleration speeds are 31-9 MPH (26-9 MPH for California models).

1975-77 Models - 1) Check sensor terminals at back of speedometer for proper connections. Block front wheels and jack up one rear wheel off ground. Release parking brake and place transmission in Neutral.

2) Unplug wiring connector from computer. Using a 10 ohm resistor, connect positive lead of ohmmeter to computer connector speed sensor terminal. Connect negative ohmmeter lead to a known good ground.

3) Have an assistant turn rear wheel slowly and observe voltmeter. Ohmmeter should fluctuate near infinity mark. If not, replace speedometer assembly if wiring is not defective.

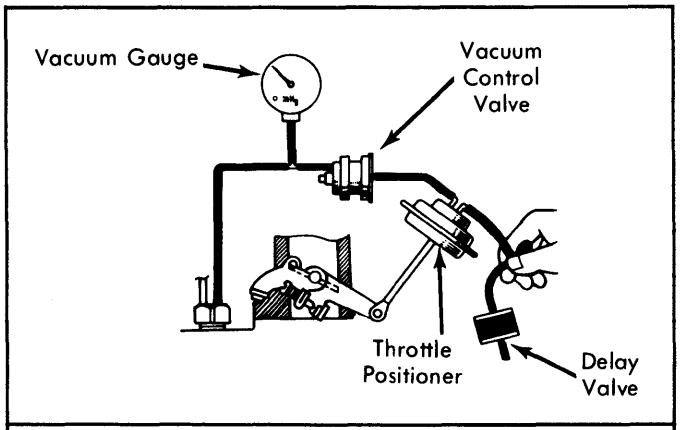

Fig. 4: Vacuum Control Valve Test

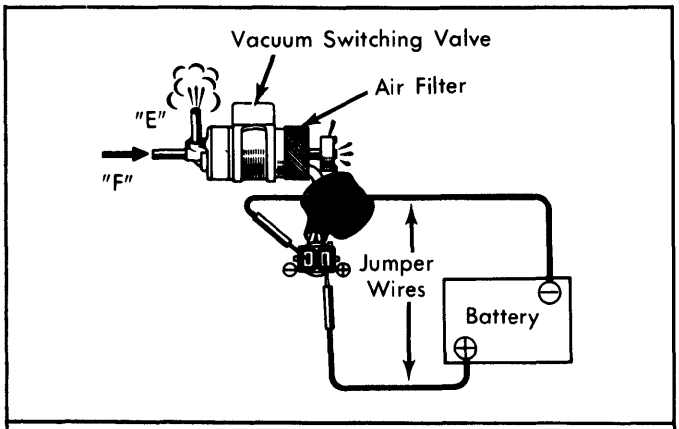

Fig. 5: Vacuum Switching Valve Test

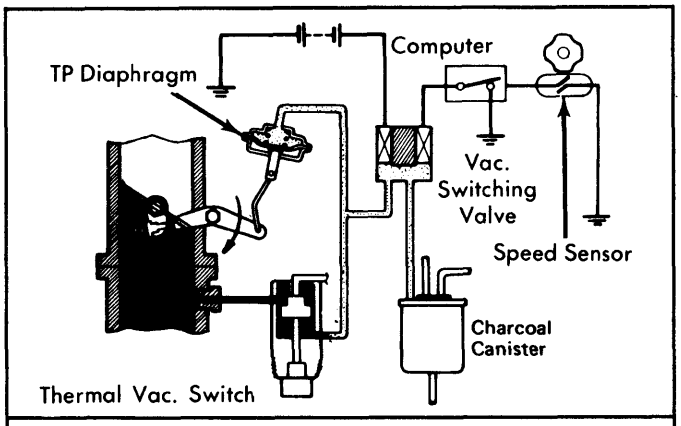

Fig. 6: 1978 20R Engine Throttle Positioner System

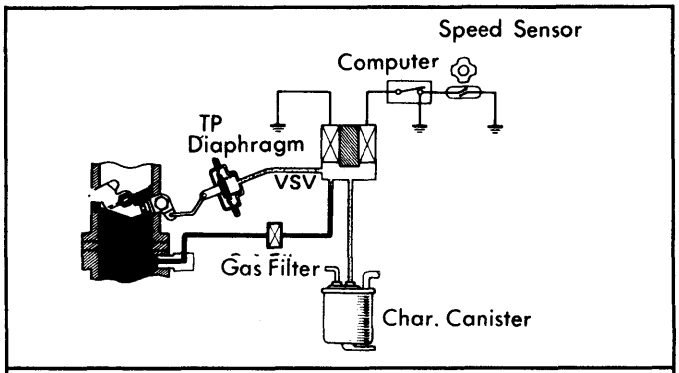

Fig. 7: 1978 2T-C Engine (California & High Altitude) Throttle Positioner System

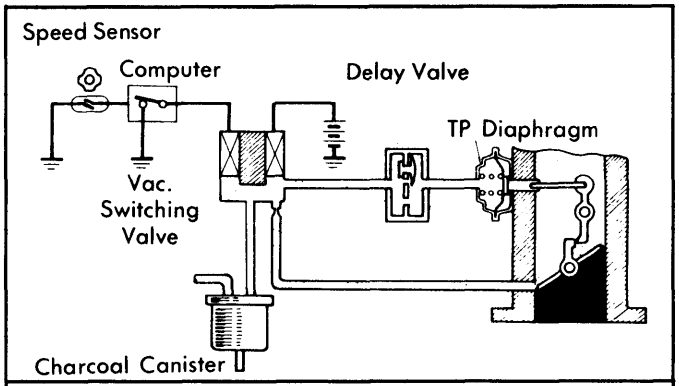

Fig. 8: 1978 2F Engine Throttle Positioner System

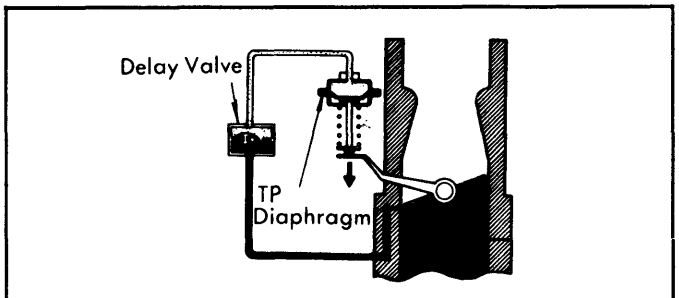

Fig. 9: 1978 4M Engine Throttle Positioner System

1974-79 EXHAUST EMISSION SYSTEMS
Toyota Throttle Positioner System (Cont.)

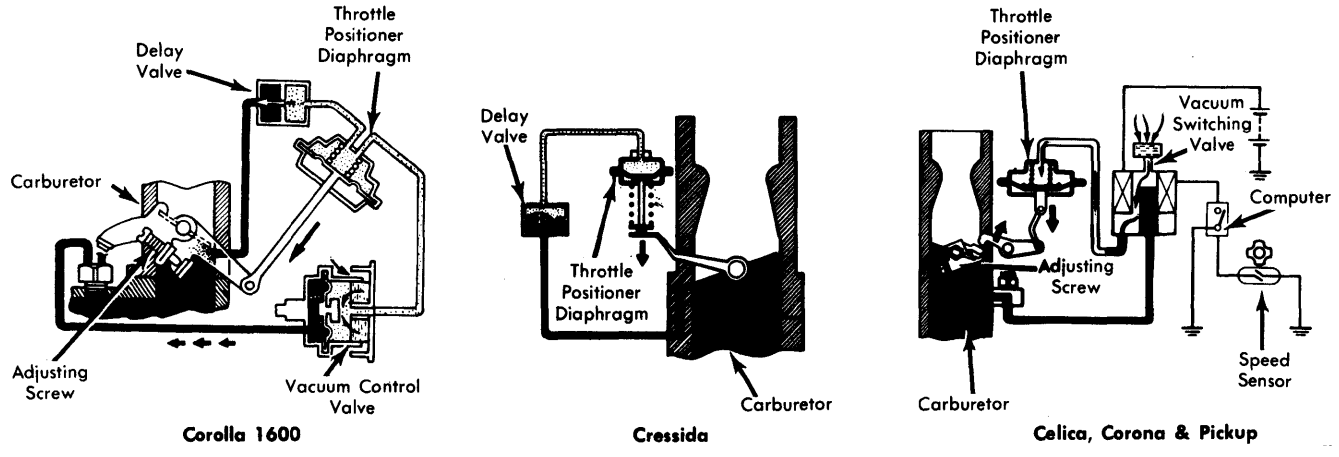

Fig. 10: 1979 Throttle Positioner Systems