1974-79 EXHAUST EMISSION SYSTEMS
Toyota Vacuum Switching Valves

DESCRIPTION

The Vacuum Switching Valve (VSV) contains an electromagnetic coil which is controlled by a speed sensor or computer. When coil is energized, valve is turned on. Vacuum switching valve is used to control fuel evaporation, Throttle Positioner (TP), Transmission Controlled Spark (TCS), mixture control, or EGR systems.

NOTE: For additional information on fuel evaporation, TP, TCS and EGR systems, see applicable exhaust emission system article(s) in this section. Vacuum switching valve may also be called a vacuum solenoid valve in this and other exhaust emission articles.

TESTING

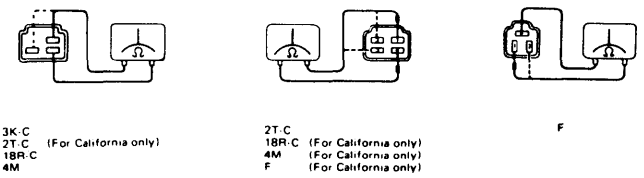
VACUUM SWITCHING VALVE (VSV)

1974 Models - 1) Unplug Vacuum Switching Valve (VSV) connector. Use an ohmmeter to check for shorting between various terminals and VSV body. If any shorting is detected, valve should be replaced.
2) With VSV connector unplugged, use an ohmmeter to measure resistance between VSV positive terminals and terminals No. 1, 2 and 3. Resistance between positive terminal and other terminals should be 53-56 ohms. If not, replace vacuum switching valve.
3) Test VSV vacuum passages by applying voltage to vacuum switching valve terminals as shown. *See Fig. 1 and 2.* If passages fail to open/close voltage applied, replace vacuum switching valve.

1975-77 Models - 1) Disconnect vacuum solenoid valve wiring connector. Check that no continuity exists between any terminals and valve body. If continuity exist, vacuum solenoid valve is defective.
2) Now measure resistance between vacuum solenoid valve positive terminal and each of the other terminals. Resistance between positive terminal and other terminals should be 53-56 ohms (28 ohms on terminal No. 5 for 4M engine). *See Figs. 3 through 5.*
3) Test vacuum passages by blowing air into one vacuum solenoid valve pipe and determining at which pipes the air comes out. Perform test with vacuum solenoid valve on and off. To turn valve on, connect vacuum solenoid valve positive terminal to battery positive terminal and all other terminals to ground. See applicable VACUUM CONTINUITY TEST table.
1979 Celica, Corona & Pickup - 1) Using jumper wires, connect Vacuum Switching Valve (VSV) to battery terminals. Apply air pressure to straight port of VSV and check that air is expelled at perpendicular (90 degree) port of valve. Disconnect jumper wires from vacuum switching valve. Apply air to perpendicular port on valve and check that air is expelled from VSV air filter.
2) 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.

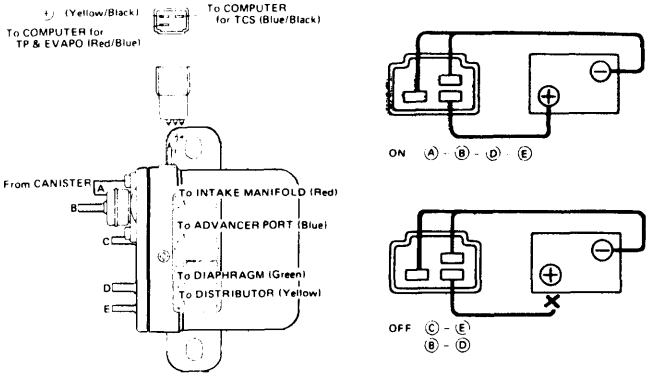
1975 VACUUM CONTINUITY TEST

Application	Vacuum Ports
2T-C	
On	1-3-6-Canister, 04-4, 07-7
Off	1-3, 5-6, 4-7-Canister
20R	
On	4-10-11, 7-9, 0-1-8-Canister
Off	3-8, 0-1, 4-7-11-Canister
4M	
Federal	
On	1-2, 3-5. 4-6-Atmosphere
Off	1-3-Atmosphere, 2-6, 4-5
California	
On	1-2, 3-5-7, 4-6-Atmosphere
Off	1-3-7-Atmosphere, 2-6, 4-5
2F	
On	1-3-6-8-Canister, 5-7
Off	1-3, 8-10, 6-7-Canister

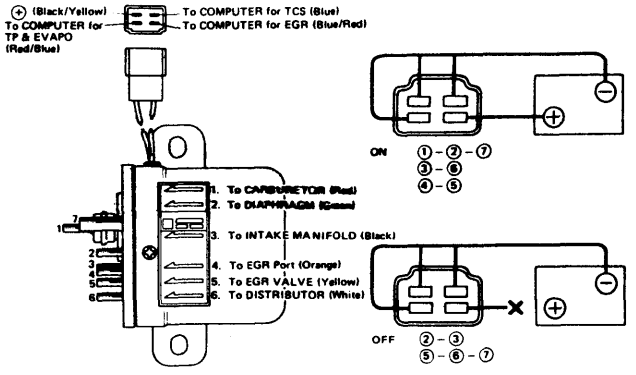


SPECIFIED RESISTANCES

Engine Family	+ to 1	+ to 2	+ to 3
3K-C	56	56	-
2T-C	56	56	56
2T-C (For California only)	56	-	56
18R-C	56	56	-
18R-C (For California only)	56	56	56
4M	56	56	-
4M (For California only)	56	56	56
F	56	56	-
F (For California only)	56	56	56



VACUUM PASSAGE TEST (3K-C & 18R-C ENGINES)



VACUUM PASSAGE TEST (F ENGINE CALIF.)

Fig. 1: 1974 Vacuum Switching Valve (VSV) Tests

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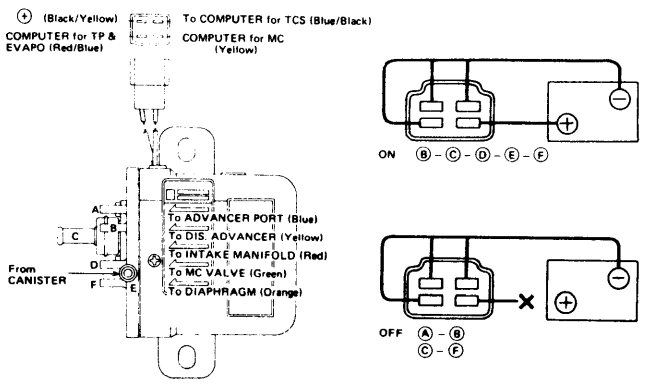
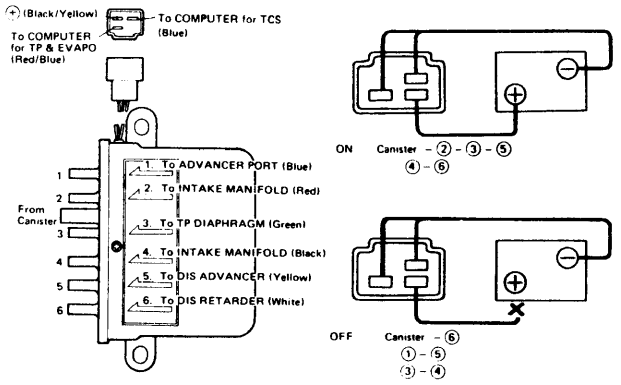
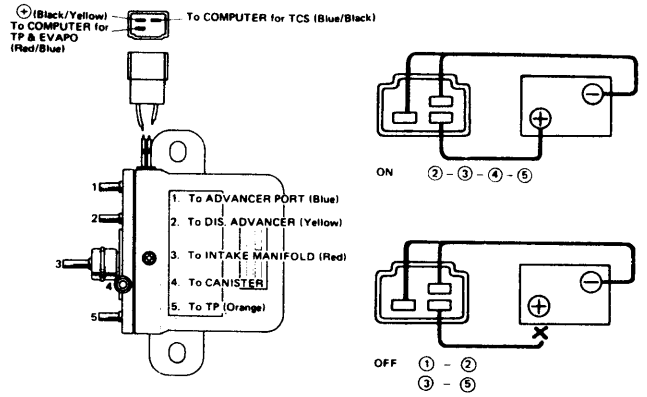
1974-79 EXHAUST EMISSION SYSTEMS
Toyota Vacuum Switching Valves (Cont.)



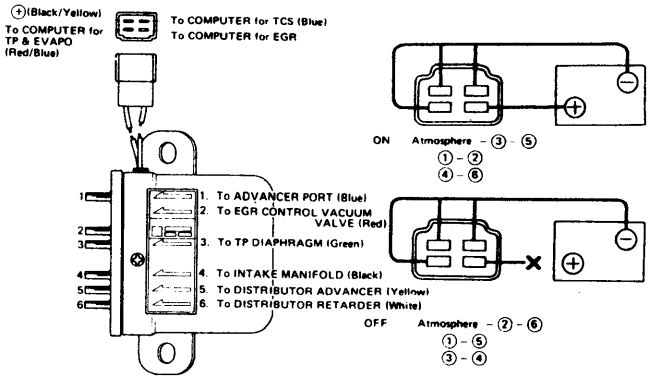
VACUUM PASSAGE TEST (2T-C ENGINE)



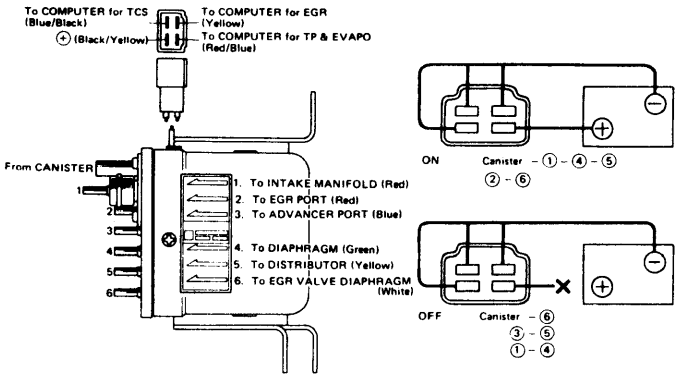
VACUUM PASSAGE TEST (4M ENGINE)



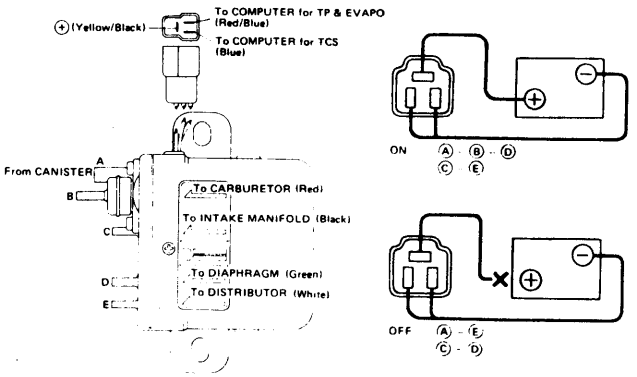
VACUUM PASSAGE TEST (2T-C ENGINE CALIF.)



VACUUM PASSAGE TEST (4M ENGINE CALIF.)



VACUUM PASSAGE TEST (18R-C ENGINE CALIF.)



VACUUM PASSAGE TEST (F ENGINE)

Fig. 2: 1974 Vacuum Switching Valve (VSV) Tests (Cont.)

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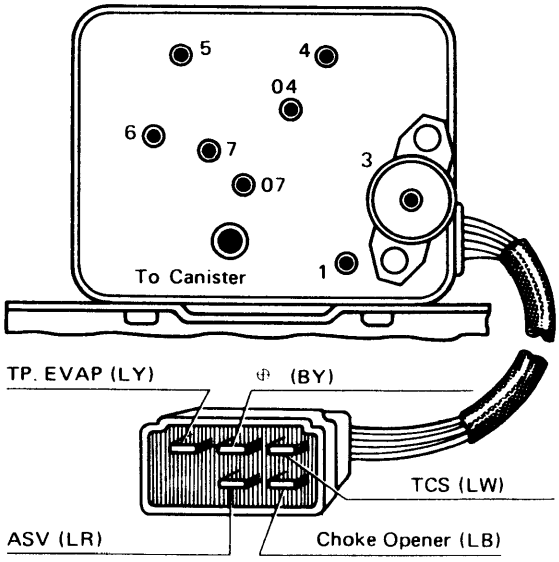
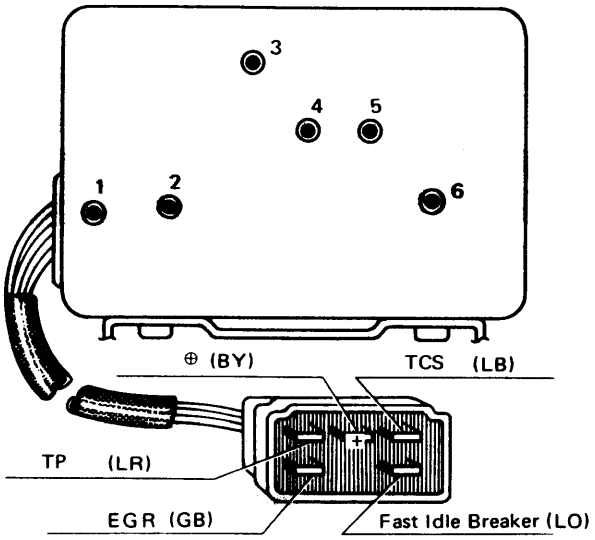
1974-79 EXHAUST EMISSION SYSTEMS
Toyota Vacuum Switching Valves (Cont.)

Engine Family	⊕ to 1	⊕ to 2	⊕ to 3	⊕ to 4	⊕ to 5	⊕ to 6
2T C	56	–	–	–	–	–
2T C (California)	56	–	56	53	53	–
20R	56	56	–	56	56	–
20R (California)	56	56	–	56	56	–
4M	56	56	–	56	28	–
4M (California)	56	56	–	56	28	–
2F	56	56	–	–	56	53

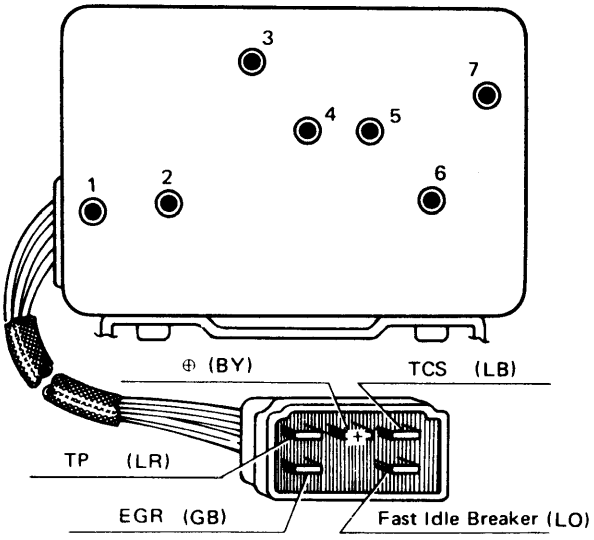
VSV RESISTANCE TABLE



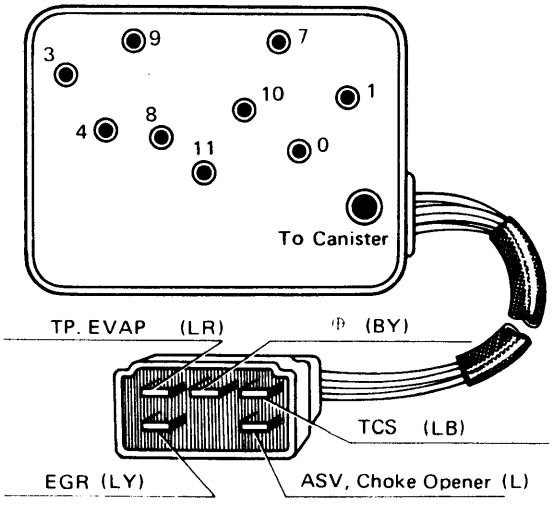
VSV VACUUM PORTS (CALIF. 2T-C)



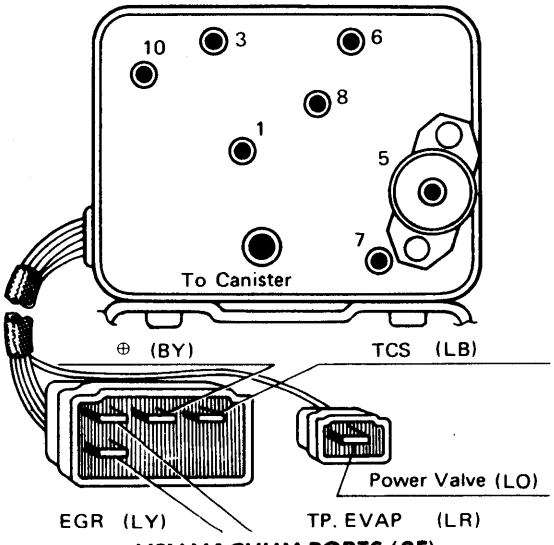
VSV VACUUM PORTS (FEDERAL 4M)



VSV VACUUM PORTS (CALIF. 4M)



VSV VACUUM PORTS (20R)



VSV VACUUM PORTS (2F)

Fig. 3: 1975 Vacuum Solenoid Valve (VSV) Tests

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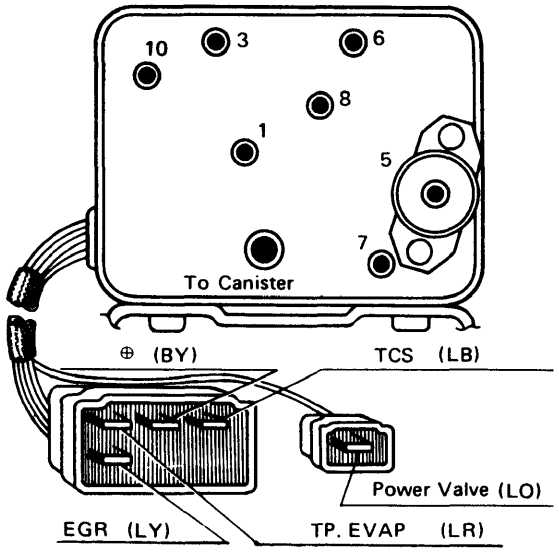
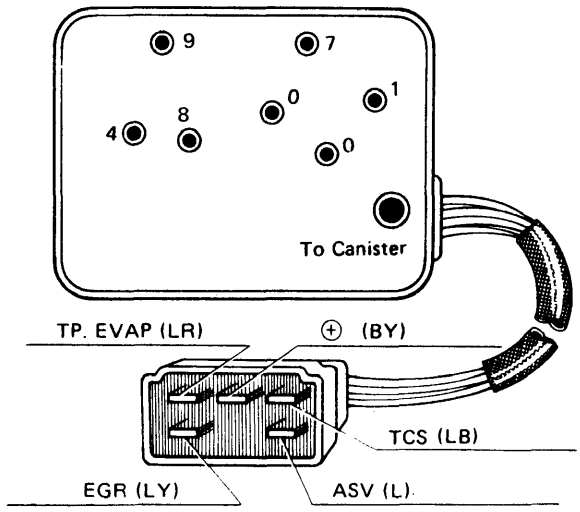
1974-79 EXHAUST EMISSION SYSTEMS
Toyota Vacuum Switching Valves (Cont.)

Engine Family	⊕ to 1	⊕ to 2	⊕ to 3	⊕ to 4	⊕ to 5	⊕ to 6
2T-C (California)	56	–	56	–	53	–
20R	56	56	–	56	56	–
20R (California)	56	56	–	56	56	–
4M	56	56	–	56	28	–
4M (California)	56	56	–	56	28	–
2F	56	56	–	–	56	53

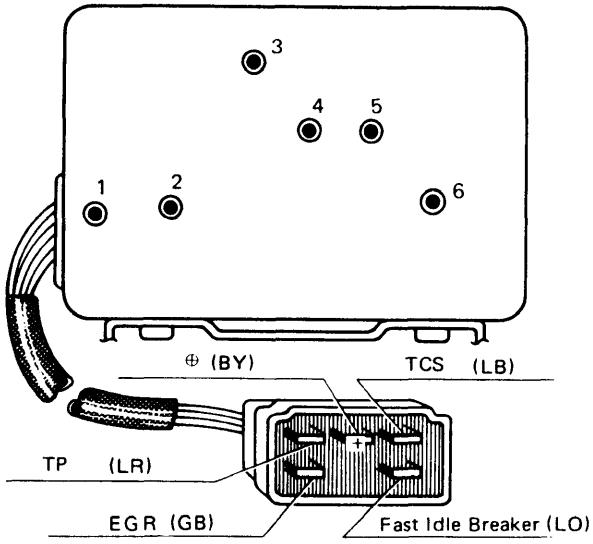
VSV RESISTANCE TABLE



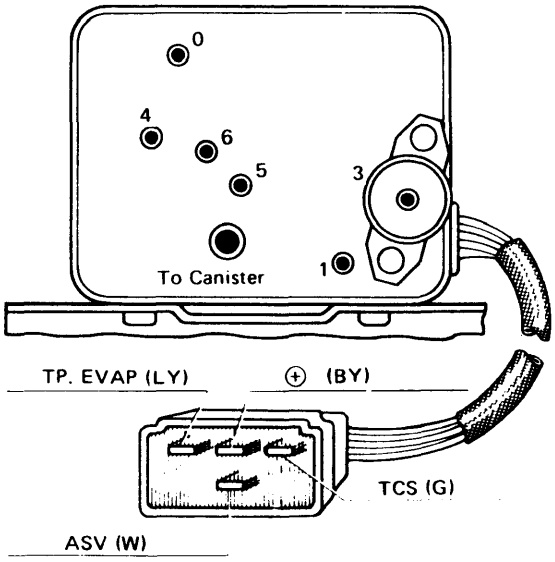
VSV VACUUM PORTS (2F)



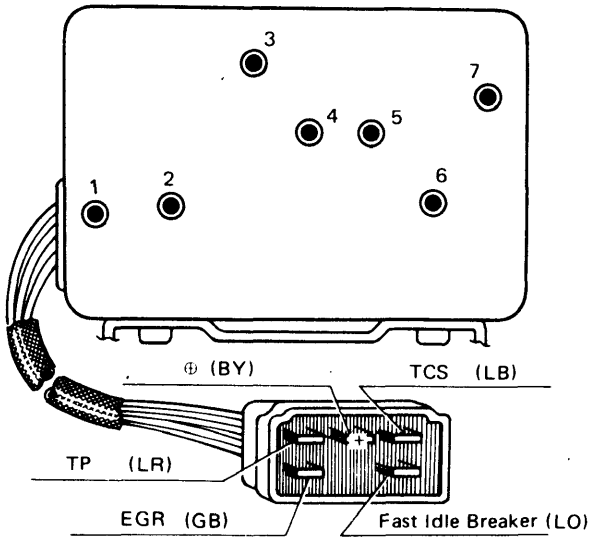
VSV VACUUM PORTS (20R)



VSV VACUUM PORTS (FEDERAL 4M)



VSV VACUUM PORTS (CALIF. 2T-C)



VSV VACUUM PORTS (CALIF. 4M)

Fig. 4: 1976 Vacuum Solenoid Valve (VSV) Tests

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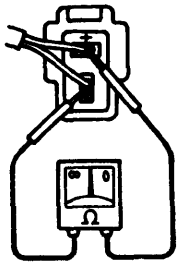
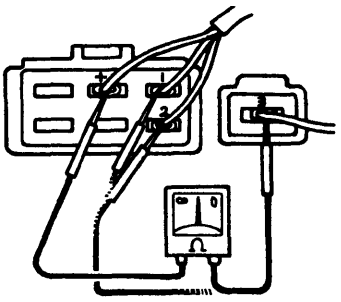
1974-79 EXHAUST EMISSION SYSTEMS
Toyota Vacuum Switching Valves (Cont.)



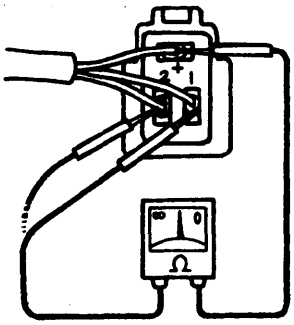
53 ohms

2F (Exc. Calif.)



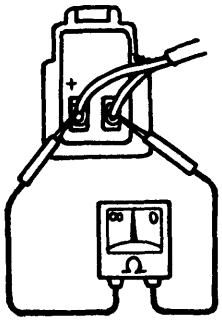
+ to 1 : 56 ohms
+ to 2 : 56 ohms
+ to 3 : 53 ohms

2F (Calif.)



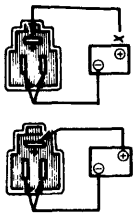
+ to 1 : 56 ohms
+ to 2 : 56 ohms

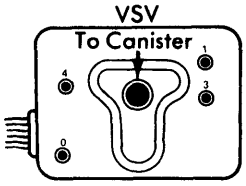
2T-C



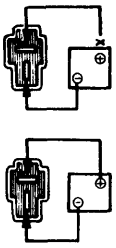
53 ohms

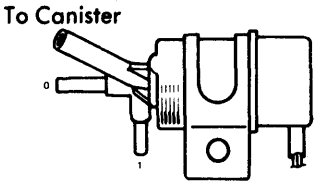
20R



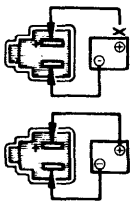


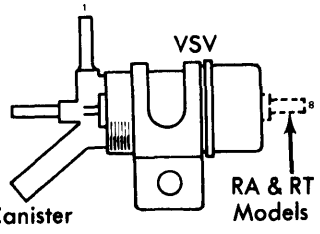
VACUUM PASSAGE TEST
(CALIF. 2-T-C ENGINE)



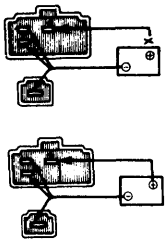


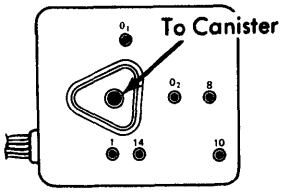
VACUUM PASSAGE TEST
(FEDERAL & HIGH ALT. 2F)



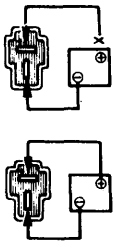


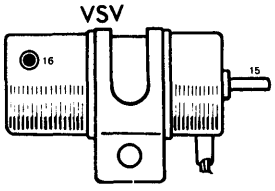
VACUUM PASSAGE TEST
(20R ENGINE)



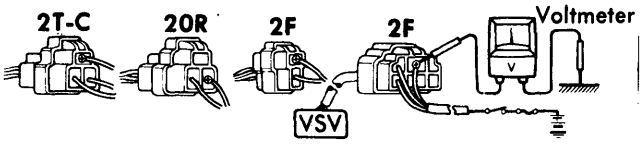


VACUUM PASSAGE TEST
(CALIF. 2F ENGINE)





VACUUM PASSAGE TEST
(FEDERAL 2F ENGINE)



VSV POWER SOURCE TEST

Fig. 5: 1977 Vacuum Solenoid Valve (VSV) Tests

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1974-79 EXHAUST EMISSION SYSTEMS
Toyota Vacuum Switching Valves (Cont.)

1976 VACUUM CONTINUITY TEST

Application	Vacuum Ports
2T-C	
On	1-3-4-Canister, 5-6
Off	1-3, 0-4, 6-Canister
20R	
On	7-9, 0-1-4-8-Canister
Off	0-1, 4-Canister, 7-Atmosphere
4M	
Federal	
On	1-2, 3-5, 4-6-Atmosphere
Off	1-3-Atmosphere, 2-6, 4-5
California	
On	1-2, 3-5-7, 4-6-Atmosphere
Off	1-3-7-Atmosphere, 2-6, 4-5
2F	
On	1-3-6-8-Canister, 5-7
Off	1-3, 8-10, 7-Canister, 6-Atmosphere

BIMETALLIC VACUUM SWITCHING VALVE (BVSV)

1977 Models - 1) Place BVSV sensing portion in cold water. Check whether valve is closed or open. Heat water and repeat test. With BVSV heated to engine operating temperature, whether valve is closed or open. See BVSV OPERATING TEMP. SPECIFICATIONS table.

2) Notches on hexagon part of BVSV indicate whether valve is open or closed when hot. Valves with NO notches are closed when hot. Valves with notches are open when hot. *See Fig. 6.*

BVSV OPERATING TEMP. SPECIFICATIONS

BVSV Color	Operating Temp. °F (°C)
Gray	86 (30)
Blue	122 (50)
Black	140 (60)

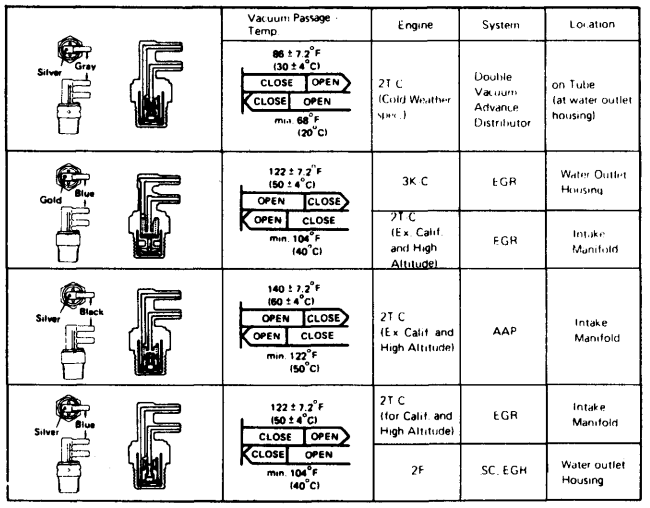

Fig. 6: Testing Bimetallic Vacuum Switching Valve

THERMOSTATIC VACUUM SWITCHING VALVE (TVSV)

1977 Models - 1) Drain coolant and remove TVSV from intake manifold or cylinder head. Place TVSV sensing portion in cold water. With hose attached to TVSV, blow into TVSV. Air should flow as shown in illustration. *See Fig. 7.* With TVSV heated to engine operating temperature, air should flow as shown in illustration.

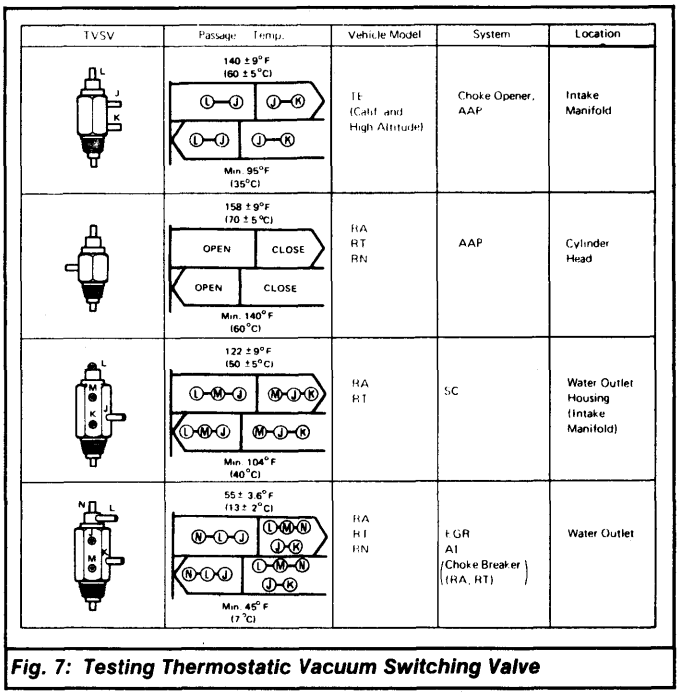

Fig. 7: Testing Thermostatic Vacuum Switching Valve

THERMOSTATIC VACUUM TRANSMITTING VALVE (TVTV)

1977 2T-C Engine - 1) Test vale by applying air pressure to one port with valve body at different temperatures. When temperature of body is below 77°F (25°C), a large amount of air should pass through valve (both sides).

2) With valve body heated to above 95°F (35°C), a large amount of air should flow from metal pipe to plastic pipe. A small amount of air should be allowed to pass in reverse direction.

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