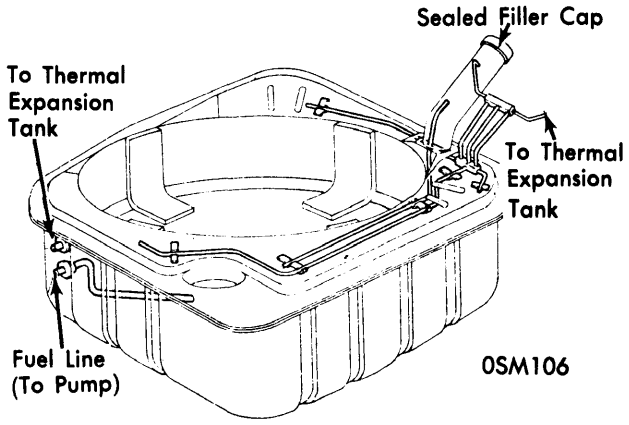
Fuel Evaporation

1970-71 TOYOTA

DESCRIPTION

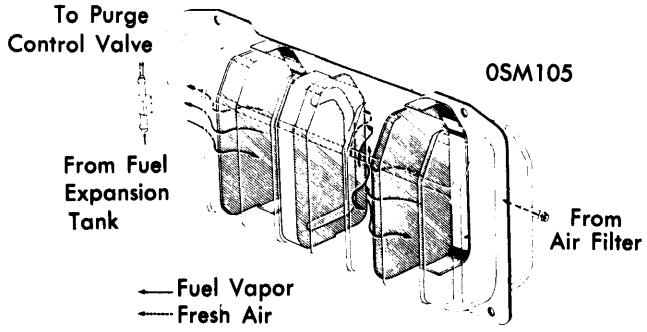
The Toyota Case Storage System is designed to reduce hydrocarbon emissions from the fuel system by use of a modified fuel tank, a sealed filler cap, and a venting system consisting of; a Thermal Expansion Tank, a Fuel Vapor Storage Case (one or more as required), a Purge Control Valve (Engines with Air Injection), or Vacuum Switching Valve (used on models with Engine Modification system), a Breather Valve (used on 1971 Corolla 1200 models with Air Injection), and an Air Filter. *NOTE – For particular model, see schematic illustrations for individual systems.*

Fuel Tank & Thermal Expansion Tank – Fuel tank is connected to thermal expansion tank by two lines. Line from top of fuel tank (with several pick-up points in tank) is connected to top of thermal expansion tank to vent fuel vapors and provide for fuel overflow caused by thermal expansion in main tank. A return line, connected to bottom of thermal expansion tank, will allow liquid fuel to return to main tank when temperature decreases or fuel level is drawn down. A vapor vent line connected to the top of the thermal expansion tank is connected to the Fuel Vapor Storage Case to provide a vapor vent line for the system.



MODIFIED FUEL TANK

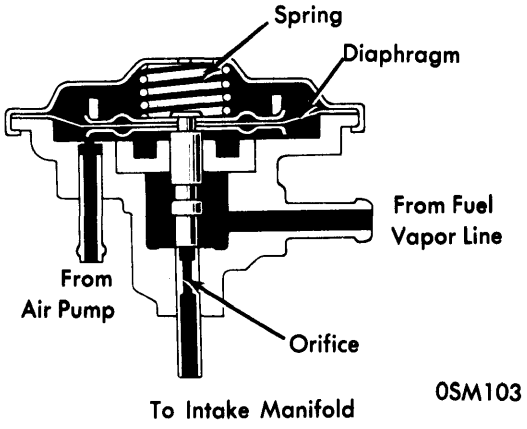
Fuel Tank Filler Cap (1971) – Filler cap is sealed type incorporating a safety valve. Valve opens when vacuum pressure in fuel tank exceeds .43-1.0 psi preventing damage to fuel tank, thermal expansion tank and vapor storage case.



FUEL VAPOR STORAGE CASE SCHEMATIC

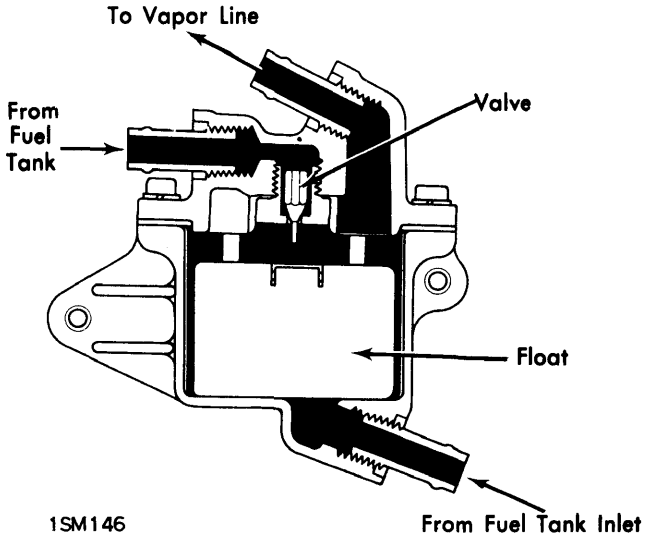
Air Filter – Filter contains a paper element and a steel wool element. On Crown models, filter is built in the fuel vapor storage case. On Land Cruiser models, filter line is connected to carburetor air cleaner and separate filter is not used.

Purge Control Valve (Air Injection Models) – Diaphragm type valve controlled by air injection pump pressure. Valve is connected in line between fuel vapor storage tank and intake manifold to control flow of vapor into engine manifold.



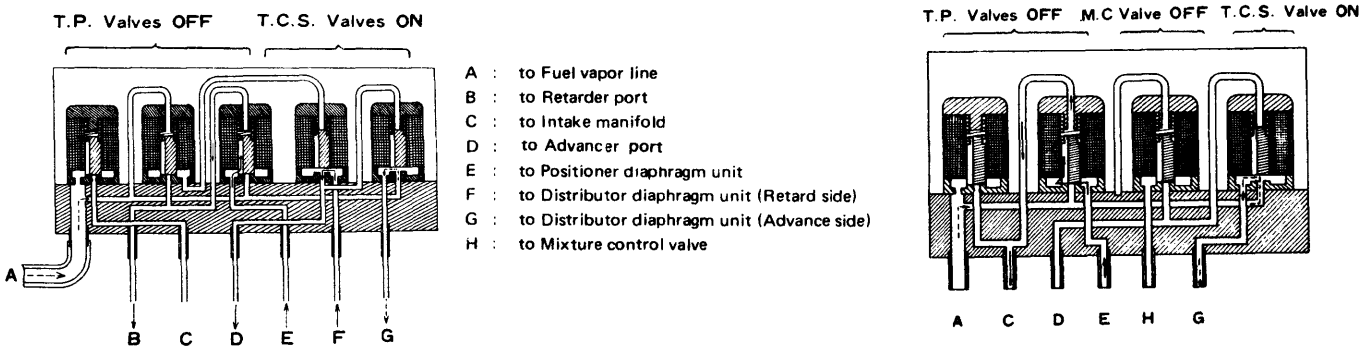
PURGE CONTROL VALVE (SHOWN CLOSED) (FOR AIR INJECTION ENGINES)

Breather Valve (1971 Corolla 1200) – Breather valve is located between fuel tank and vapor vent line (sedan & coupe models) or between fuel tank and thermal expansion tank (station wagons). Valve prevents liquid fuel from passing through system and reaching intake manifold.



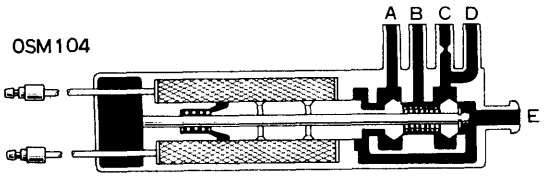
BREATHER VALVE (1971 COROLLA 1200 MODELS ONLY)

1970-71 TOYOTA (Cont.)

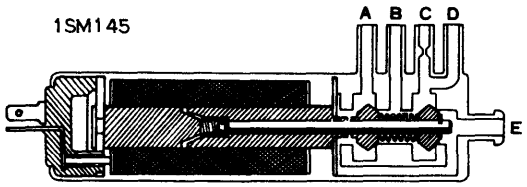


VACUUM SWITCHING VALVE (TYPICAL) (1971 8R-C & 2T-C ENGINES)

Vacuum Switching Valve (Engine Modification Models) – This solenoid type valve operates as a purge control valve and is actuated by a Speed Marker which is part of emission control system on these cars. This same valve is used on all 1970 Engine Modification models. On 1971 models, different valves are used depending on Engine Modification System used (with or without Transmission Controlled Spark). *For additional information, see Toyota Engine Modification in EXHAUST EMISSION – FOREIGN Section.*



VACUUM SWITCHING VALVE (CLOSED POSITION, 1970 MODELS)



VACUUM SWITCHING VALVE (1971 F ENGINES)

OPERATION

When vehicle is idling or running at low speed, purge control valve (used on air injection models) or vacuum switching valve (used on engine modification models) is closed and fuel vapors produced in fuel tank are stored in fuel vapor storage case. Depending on type of Exhaust Emission system used, these vapors are purged into the intake manifold as follows:

Air Injection Models (3K-C, 3R-C, 2M & 2M-B Engines) –

When cruising or during high speed operation, purge control valve is actuated by pressure from air injection pump. This causes fuel vapors (from vapor storage tank) to be drawn into intake manifold with fresh air from air filter where they are burned in the combustion system.

Engine Modification Models (8R-C, 2T-C & F Engines) –

A vacuum switching valve is used to purge fuel vapors from vapor storage case on models with Engine Modification system. Vacuum switching valve is controlled by a Speed Marker. When vehicle speed is below 11 MPH (1971 8R-C & 2T-C engines) or 14 MPH (all 1970 Engine Modification models, and 1971 F engines), vacuum switching valve is de-activated closing off vent line between storage case and intake manifold. At speeds above 11 MPH (1971 8R-C & 2T-C engines) or 14 MPH (all 1970 Engine Modification models, and 1971 F engines), vacuum switching valve opens and fuel vapors are drawn from storage case into intake manifold where they enter combustion system and are burned.

PERIODIC SERVICE

Check following components at indicated intervals. See *MAINTENANCE for procedures.*

Purge Control Valve – Check at first 1,000 miles and then at 3,000 mile intervals.

Vacuum Switching Valve – Check at first 1,000 miles and then at 12,000 mile intervals.

Air Filter – Replace at 12,000 mile intervals.

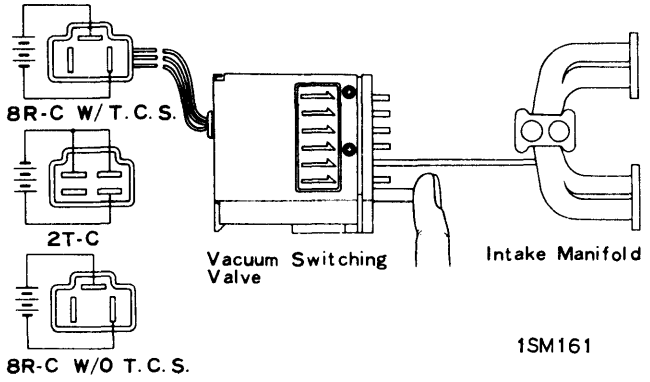
MAINTENANCE

Purge Control Valve – To check for proper operation, disconnect hose from fuel tank. Slowly raise engine speed until it reaches 2500 RPM. Check for suction by holding finger over hose fitting on valve, if there is no suction replace valve.

1970-71 TOYOTA (Cont.)

Vacuum Switching Valve (1971 F Engine & all 1970 Models) – Disconnect both wires at vacuum switching valve lead connectors, connect fully charged 12 volt battery to these leads. Disconnect hose from fitting "E" on end of valve. Turn engine over to supply vacuum and check for suction by holding finger over hose fitting on end of valve. If no suction noted, replace valve. For further checking of vacuum switching valve, see *Toyota Improved Combustion System in EXHAUST EMISSION – FOREIGN Section.*

Vacuum Switching Valve (8R-C & 2T-C 1971) – Connect a source of electricity to vacuum switching valve terminals as shown in illustration for testing valve. With valve actuated, disconnect hose from vapor line. Turn engine over and check for vacuum at fitting from vapor line. If vacuum not present, replace vacuum switching valve.

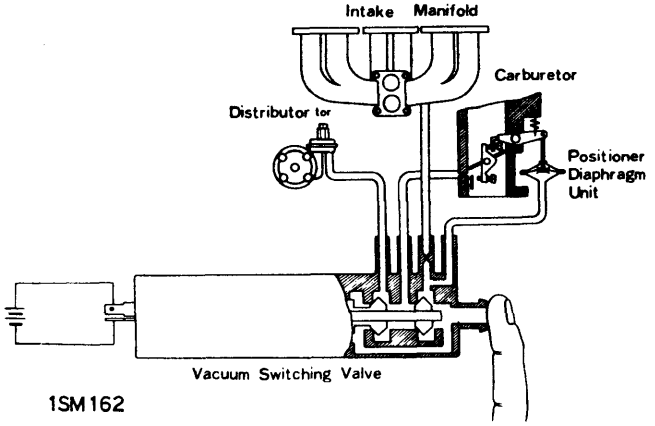


VACUUM SWITCHING VALVE TESTING (1971 8R-C & 2T-C ENGINES)

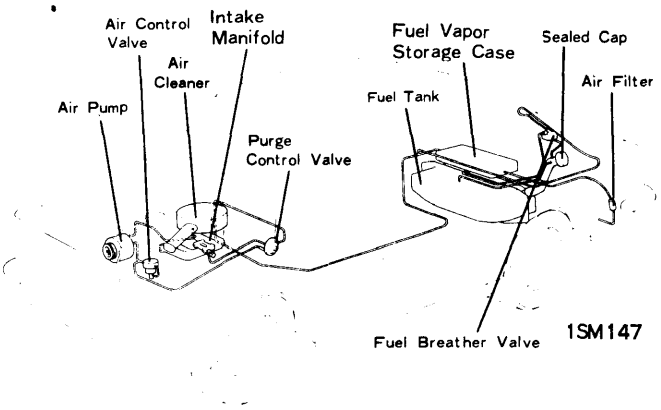
TROUBLE SHOOTING

Rough Engine Idle – Purge control valve or vacuum switching valve malfunction. Check valve operation and replace as required.

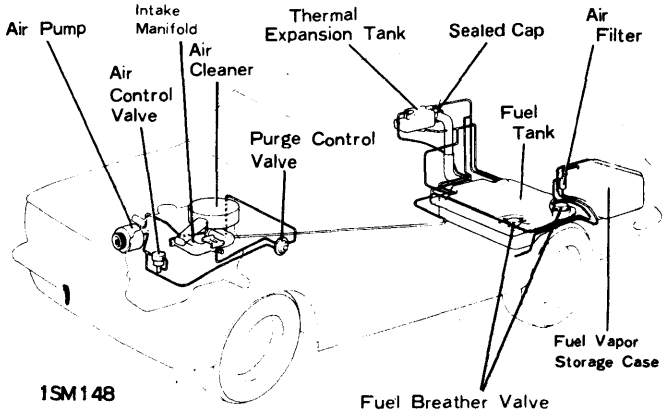
Fuel Odor In Car – Disconnected or cracked fuel vapor line or defective components in case storage system. Check all lines and fittings and check operation of system.



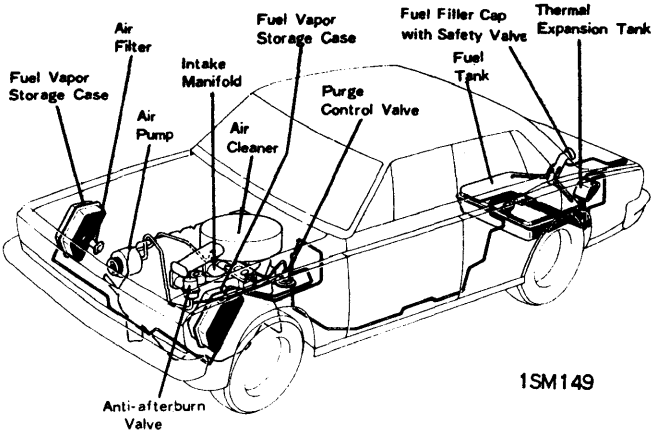
VACUUM SWITCHING VALVE TESTING (ALL 1970 MODELS & 1971 F ENGINES)



CASE STORAGE SYSTEM (COROLLA SEDAN & COUPE) (1200 ENGINE)

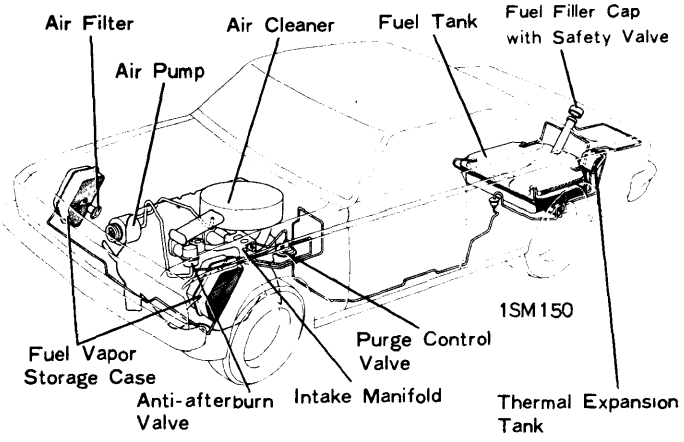


CASE STORAGE SYSTEM (COROLLA STATION WAGON) (1200 ENGINE)

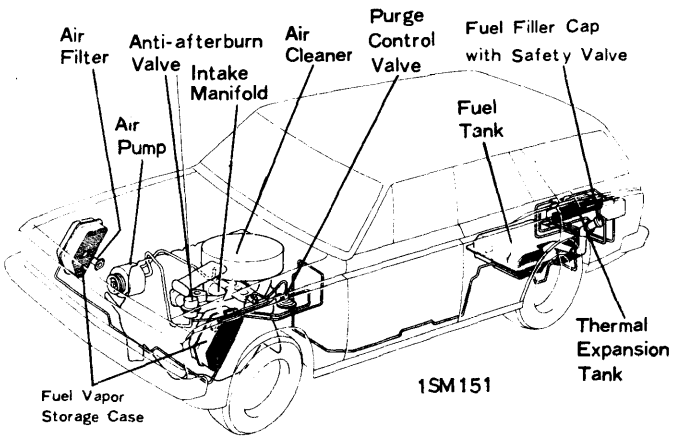


CASE STORAGE SYSTEM (CROWN SEDAN)

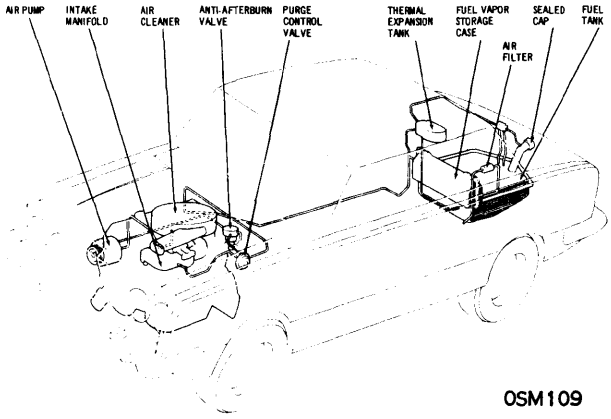
1970-71 TOYOTA (Cont.)



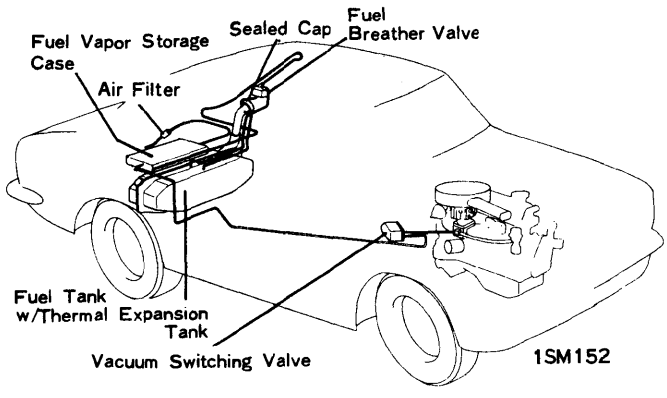
CASE STORAGE SYSTEM (CROWN HARDTOP)



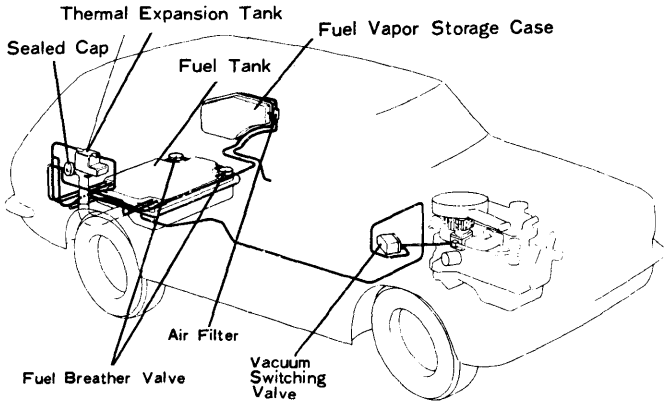
CASE STORAGE SYSTEM (CROWN STATION WAGON)



CASE STORAGE SYSTEM (1970 CORONA SEDAN & HARDTOP)



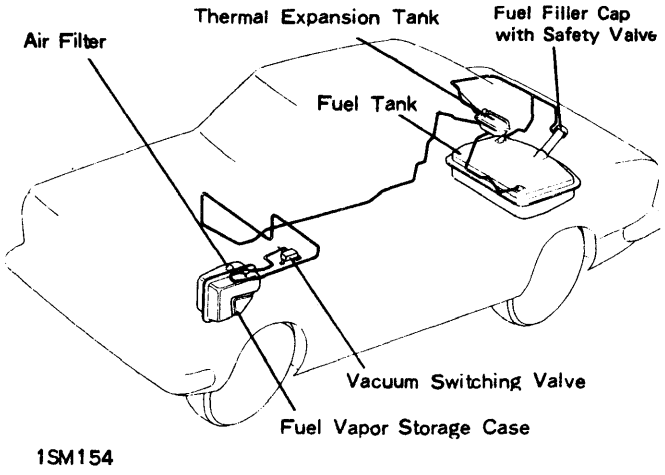
CASE STORAGE SYSTEM (COROLLA SEDAN & COUPE) (1600 ENGINE)



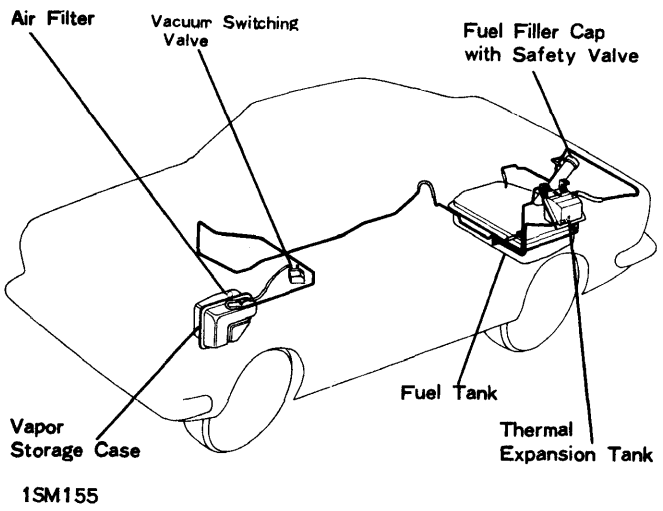
CASE STORAGE SYSTEM (COROLLA STATION WAGON) (1600 ENGINE)

Fuel Evaporation

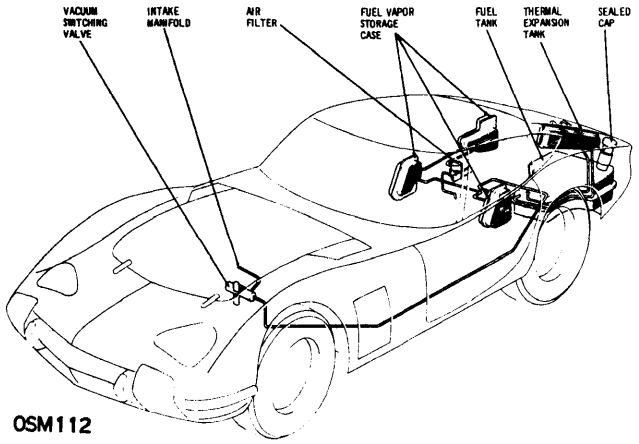
1970-71 TOYOTA (Cont.)



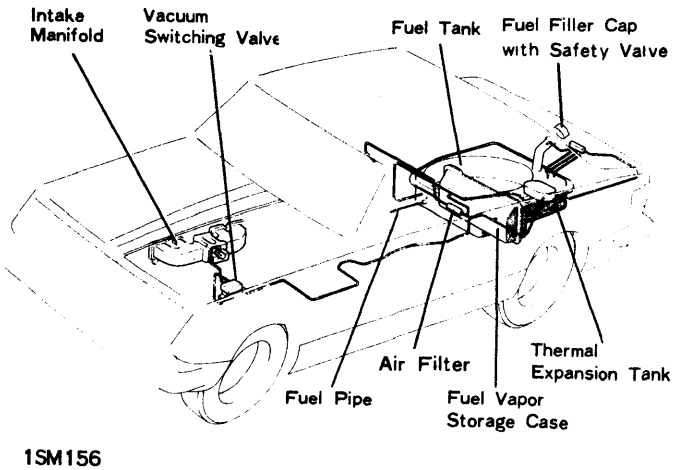
CASE STORAGE SYSTEM (1971 CORONA SEDAN)



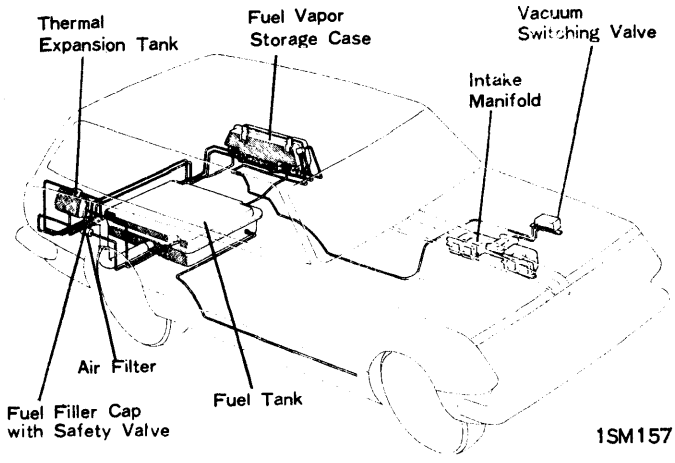
CASE STORAGE SYSTEM (1971 CORONA HARDTOP)



CASE STORAGE SYSTEM (1970 2000 GT MODEL)

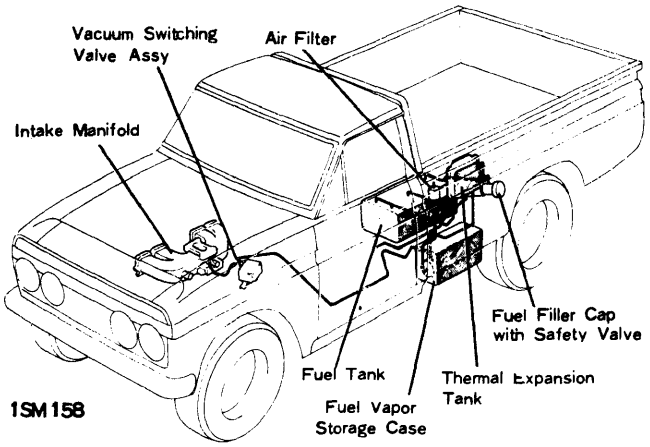


CASE STORAGE SYSTEM (TYPICAL) (CORONA MK II SEDAN & HARDTOP)

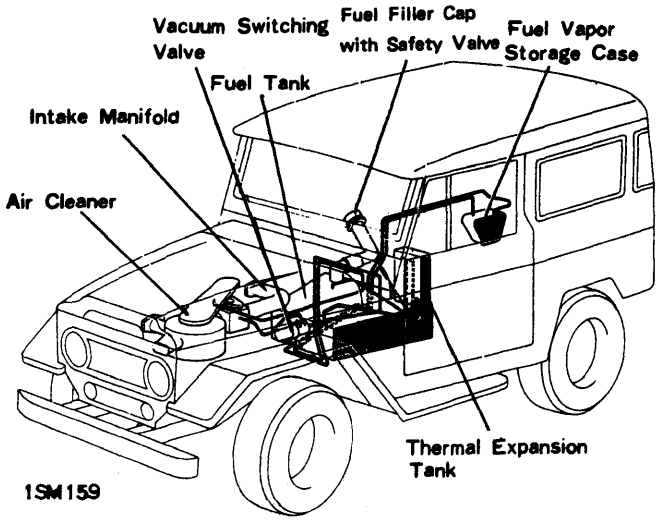


CASE STORAGE SYSTEM (TYPICAL) (CORONA MK II STATION WAGON)

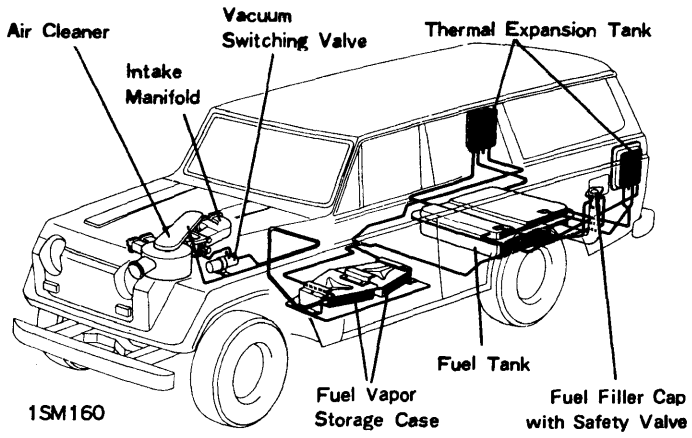
1970-71 TOYOTA (Cont.)



CASE STORAGE SYSTEM (TYPICAL)
(TOYOTA HALF-TON PICK-UP)



CASE STORAGE SYSTEM (TYPICAL)
(LAND CRUISER, HARD & SOFT TOP)



CASE STORAGE SYSTEM (TYPICAL)
(LAND CRUISER, STATION WAGON)