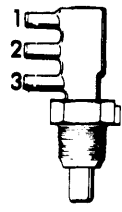
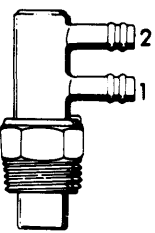
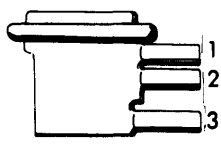
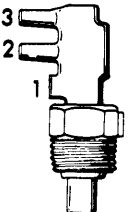


GM EMISSION VALVES, SWITCHES AND SOLENOIDS

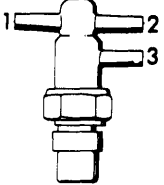
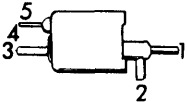
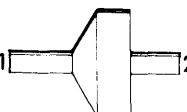
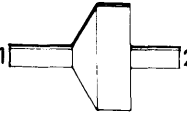
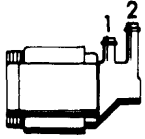
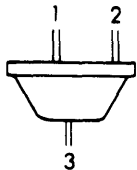
General Motors vehicles use a variety of vacuum and thermal switches, solenoids and valves to control emission systems. Some of the most commonly used of these are listed below, although actual valve designs may vary from those shown. The chart can be used to identify and check operation of the valves and switches.

Emission Control Application Tables, located in the beginning of this book, will help to determine component usage on specific engines. Where calibration temperature has not been indicated, this information may be found stamped on the base of the component. Abbreviations used below are defined at the end of the chart.

COMPONENT	ACTUATED	OPERATION
	<p>EFE-TVS</p> <p>Coolant Temperature</p>	<p>Port 1 is manifold vacuum source. Port 2 is output port to controlled component. Port 3 may be filtered vent. Below 70°F, manifold vacuum is directed through ports 2 and 3 to EFE actuator which closes EFE valve. Above switching point, port 3 is blocked and EFE actuator vents to atmosphere through port 1. Used on 4.3L VIN 8 engines.</p>
	<p>CP-TVS EFE-TVS EGR-TVS</p> <p>Coolant Temperature</p> <p>Coolant Temperature</p>	<p>Port 1 is ported vacuum source. Port 2 is output port to controlled component. On VIN Codes 4 and A, vacuum is metered below calibration valve. On 5.0L V8 VIN H, there is no vacuum above 90°F. Below 80°F, on VIN H engines, both ports are open.</p> <p>Ports 1 and 2, ported vacuum source and output to controlled component, are open above 130° F. Below 120° F, both ports are closed. Used on VIN 1 engines.</p>
	<p>VMV</p> <p>Vacuum</p>	<p>VMV helps regulate EGR valve opening. VMV allows increase in vacuum to EGR valve as throttle closes, up to VMV switching point. To test VMV, connect vacuum gauge to port 1. With port 3 closed, vacuum reading at port 1 and 2 should be same, about 15" Hg. With port 3 open, vacuum reading at 1 should drop to about 11" Hg. Used on VIN N engines.</p>
	<p>EFE-TVS</p> <p>Coolant Temperature</p>	<p>Port 1 is filtered vent; port 2 leads to EFE valve and port 3 is manifold vacuum source. Below 70° F, on some 4.3L VIN 8 engines, manifold vacuum is directed through ports 2 and 3 to EFE actuator, which closes EFE valve. Above 70° F, port 3 is blocked and EFE vacuum actuator is vented to atmosphere through port 1.</p>

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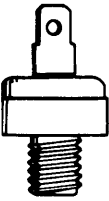
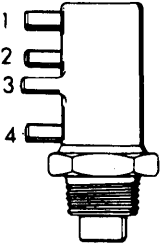
GM EMISSION VALVES, SWITCHES AND SOLENOIDS (Cont.)

COMPONENT	ACTUATED	OPERATION
	<p>CVB-TVS</p> <p>Air Temperature</p>	<p>Port 1 is to Thermanc temperature sensor; port 2 leads to manifold vacuum and port 3 to choke vacuum break. Below 70° F, ports 1 and 2 connect and port 3 is blocked, resulting in richer choke operation. Above 70° F, ports 1 and 3 connect with port 2, pulling choke to leanest position. Port 1 is always open to port 2. Used on VIN Y and 4.3L VIN 8 engines.</p>
	<p>TCC Solenoid</p> <p>Electrical</p>	<p>Port 1 is vent; port 2 is to EGR valve; port 3 leads to RVR valve; 4 is to VRV-TCC switch and port 5 is to transmission governor pressure switch. When TCC is engaged, ports 1 and 2 are connected. When de-energized, port 1 is closed, while 2 and 3 connect. Used on VIN N engines.</p>
	<p>Brake Switch Solenoid</p> <p>Electrical</p>	<p>Port 1 leads to VRV; port 2 to VMV; port 3 is vent; port 4 is ground and port 5 connects to brake switch. Solenoid is energized when ports 1 and 2 connect. Solenoid is de-energized when port 1 is sealed and ports 2 and 3 connect. Used on VIN N engines.</p>
	<p>EFE-CV</p> <p>Vacuum</p>	<p>Port 1 is vacuum and port 2 leads to EGR solenoid. Vacuum applied at tapered end, port 1, goes straight through valve. Vacuum applied at squared end, port 2, should not pass through or leak down in less than 60 seconds. Used on VIN 4 and A engines.</p>
	<p>VRV</p> <p>Mechanical</p>	<p>Vacuum is supplied at port 1 and reduced at port 2 as throttle is opened. At closed throttle, vacuum at port 2 is 15" Hg; at wide open throttle, vacuum is zero. Vacuum from VRV port 2 is directed to EGR vacuum switch. Used on VIN N engines.</p>
	<p>RVR</p> <p>Vacuum</p>	<p>Port 1 is connected to EGR solenoid, port 2 to EGR valve and port 3 to VRV. To check operation, leave port 1 open, connect vacuum pump to port 3, and draw 15" Hg vacuum. Reading of gauge at port 2 should be 12.5" Hg. Used on VIN N engines.</p>

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GM EMISSION VALVES, SWITCHES AND SOLENOIDS (Cont.)

COMPONENT		ACTUATED	OPERATION
	ETS	Block Temperature	Engine temperature switch has 2 electrical terminals, one to 12 volt supply, other to fast idle solenoid and housing pressure cold advance solenoid on injection pump. Switch contacts close below 125° F, turning on solenoids. Contacts open above 125° F, shutting off solenoids. Used on VIN N and V engines.
	EFE-DIST-TVS	Coolant Temperature	Port 1 is connected to manifold vacuum source. Port 2 is output port to EFE valve. Port 3 is ported vacuum source and port 4 is output to distributor spark VRV.

CP - Canister Purge
CV - Check Valve
CVB - Choke Vacuum Break
DIST - Distributor
EFE - Early Fuel Evaporation
EGR - Exhaust Gas Recirculation

ETS - Engine Temperature Switch
RVR - Response Vacuum Reducer
TCC - Torque Converter Clutch
TVS - Thermal Vacuum Switch
VMV - Vacuum Modulator Valve
VRV - Vacuum Regulator Valve