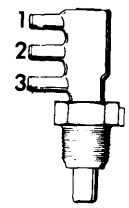
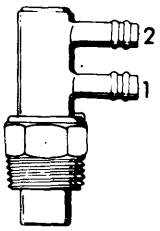
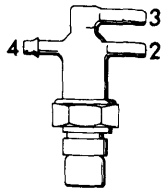
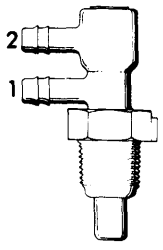
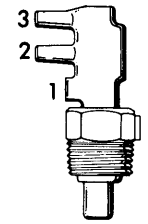
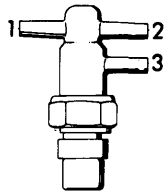
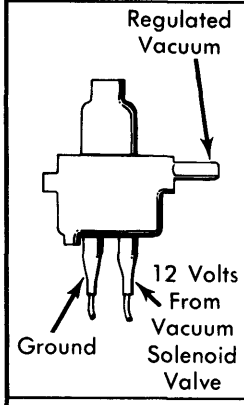
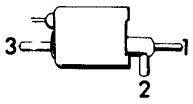
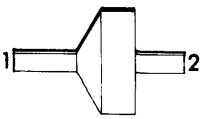
GM EMISSION VALVES, SWITCHES AND SOLENOIDS

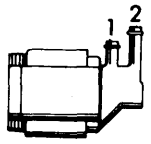
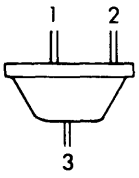
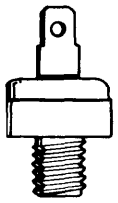
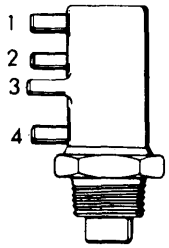
General Motors vehicles use a variety of vacuum and thermal switches, solenoids and valves to control emission systems. Some of the most commonly used of these are listed below. The chart can be used to identify and check operation of the valves and switches, but engine applications listed herein may not be complete. Information included on specific engines, may not apply to use of that engine by all manufacturers. *See APPLICATION TABLES in this book to determine use on specific engines.*

COMPONENT		ACTUATED	OPERATION
	EFE-TVS	Coolant Temperature	Port 1 is manifold vacuum source. Port 2 is an output port to controlled component (no vacuum above switching point). Port 3 may be filtered vent. Switching point is 150° F on 4.3L VIN S and 4.9L VIN W; 70° F on 4.3L VIN F; 90° F on 4.4L V8 engines.
	EGR-CP-TVS CP-TVS EFE-TVS	Coolant Temperature	Port 1 is ported vacuum source. Port 2 is output port to controlled component (no vacuum below calibration value, except 5.0L VIN H EFE-TVS which has no vacuum ABOVE calibration value). Switching point is 130° F for 3.8L (229") V6 EGR-CP-TVS; 170° F for 4.3L VIN F CP-TVS; 100° F for 4.4L VIN J and 5.0L VIN H CP-TVS; and 90° F for 5.0L VIN H EFE-TVS.
	EGR-TVS	Coolant Temperature	Port 2 is ported vacuum source (closed below calibration value). Port 1 is output port to controlled component (no vacuum below calibration value). Switching points are 135° F on 2.5L VIN 5; 125° F on 2.8L VIN X.
	SVB-TVS	Air Temperature	On 2.8L V6 engines, port 2 is manifold vacuum source (closed below calibration value); port 3 is output port to SVB (no vacuum below value); and port 4 is output port to Thermac (no vacuum below value). Switching point is 151° F.
	SVB-TVS	Air Temperature	Port 2 is output port to SVB (no vacuum below calibration); port 3 is manifold vacuum source, and port 4 leads to Thermac (vacuum all times). Switching point is 70° F on 4.3L VIN F and 62° F on 4.3L VIN S and 4.9L VIN W engines.
	DS-TVS	Air Temperature	Used on 3.8L (229") VIN K V6 engine. Port 2 is output port (no vacuum above calibration); port 3 is manifold vacuum source; port 4 leads to Thermac (vacuum all times). No calibration information given by manufacturer.
	CP-TVS	Coolant Temperature	On 4.3L VIN F, 5.0L VIN Y and 4.1L Toronado engines, when coolant temperature is below 170° F, canister purge is controlled by internal orifice in switch; above 170° F, switch opens and purge is controlled by manifold vacuum from carburetor port 1.
	EMR-VS	Vacuum	Terminal is connected to ground when vacuum is above 4 in. Hg. Terminal is disconnected when vacuum falls below 5.75 in. Hg.

GM EMISSION VALVES, SWITCHES AND SOLENOIDS (Cont.)

COMPONENT		ACTUATED	OPERATION
	EFE-TVS	Coolant Temperature	Port 1 is filtered vent; port 2 leads to EFE valve and port 3 is manifold vacuum source. On some 4.3L VIN F engines, manifold vacuum is directed through ports 2 and 3 below 70° F 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.
	CVB-TVS	Air Temperature	Below 70° F, CVB-TVS gives richer choke operation. Port 1 leads to thermostatic air cleaner temperature sensor; port 2 to manifold vacuum source; and port 3 to choke vacuum break. Below 70° F, port 1 and 2 are connected and port 3 is blocked; above 70° F, port 1 and 3 are connected to port 2.
	EGR-VS	Vacuum	Switch contacts are open when vacuum is below 8 in. Hg; closed (connected) when above 8 in. Hg. Used on 350" VIN N Calif. Diesel engines.
	EPR Switch	Vacuum	When Vacuum Regulator Valve regulated vacuum is above 12 in. Hg, EPR switch closes circuit, energizing solenoid, allowing full vacuum pump vacuum to EPR valve. EPR valve is then closed. When vacuum is below 12 in., switch opens. Vacuum to solenoid is blocked and EPR valve is vented, opening EPR. Used on 350" VIN N Federal Diesel engines.
	EGR Vacuum Solenoid	Electrical	When torque converter clutch (TCC) is engaged, an electrical signal energizes solenoid portion of EGR control assembly, allowing vent port 1 to open. Vacuum is applied to port 3. When solenoid is not energized, vacuum passes to port 2 and is blocked from port 1. When solenoid is energized, port 3 (to VRV regulated vacuum source) is blocked and port 1 and 2 are connected. Used on 350" VIN N Federal Diesel engine (except Toronado).
	EPR Vacuum Solenoid	Electrical	When VRV regulated vacuum is above 12 in. Hg, EPR switch closes circuit, energizing solenoid, allowing full vacuum pump vacuum to be directed to EPR valve (ports 1 and 2 connected). EPR valve is then closed. When vacuum is below 12 in. Hg, switch opens, blocking vacuum to solenoid, and EPR valve is vented, opening EPR (ports 1 and 3 connected). Used on 350" VIN N Federal Diesel engines.
	EFE Check Valve	Vacuum	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.

GM EMISSION VALVES, SWITCHES AND SOLENOIDS (Cont.)

COMPONENT		ACTUATED	OPERATION
	Vacuum Regulator Valve	Mechanical	Vacuum is supplied at port 1 and reduced at port 2 as throttle is opened. At closed throttle, vacuum at port 2 is 15 in. Hg; at wide open throttle, vacuum is zero. Vacuum from VRV port 2 is directed to EGR vacuum switch. Used on 350" VIN N Diesel engines.
	EGR Vacuum Reducer	Vacuum	Port 1 is connected to EGR solenoid, port 2 to EGR valve and port 3 to Vacuum Regulator Valve. To check operation, leave port 1 open, connect a vacuum pump to port 3, and draw 15 in. Hg vacuum. Reading of gauge at port 2 should be 12.5 in. Hg. Used on 350" VIN N Federal Diesel engines, except Toronado.
	Engine Temperature Switch	Block 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 350" VIN N Diesel engines.
	EFE-DIST-TVS	Coolant Temperature	Port 1 is connected to manifold vacuum source. Port 2 is output port to EFE valve (no vacuum above 90° F). Port 3 is ported vacuum source port. Port 4 is output port to Distributor Spark VRV (no vacuum below 90° F). Used on 3.8L (229") engine.