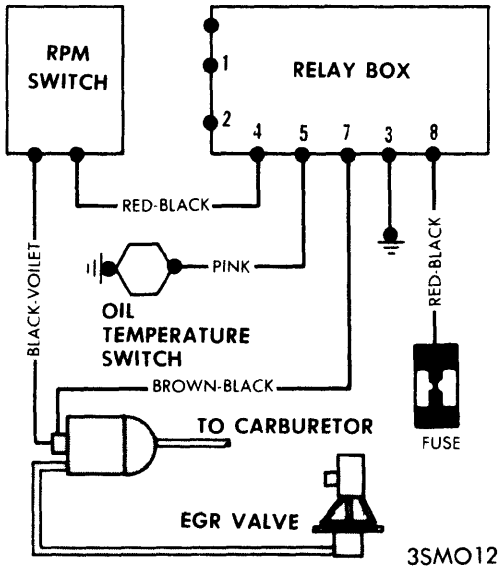
MERCEDES-BENZ EXHAUST GAS RECIRCULATION

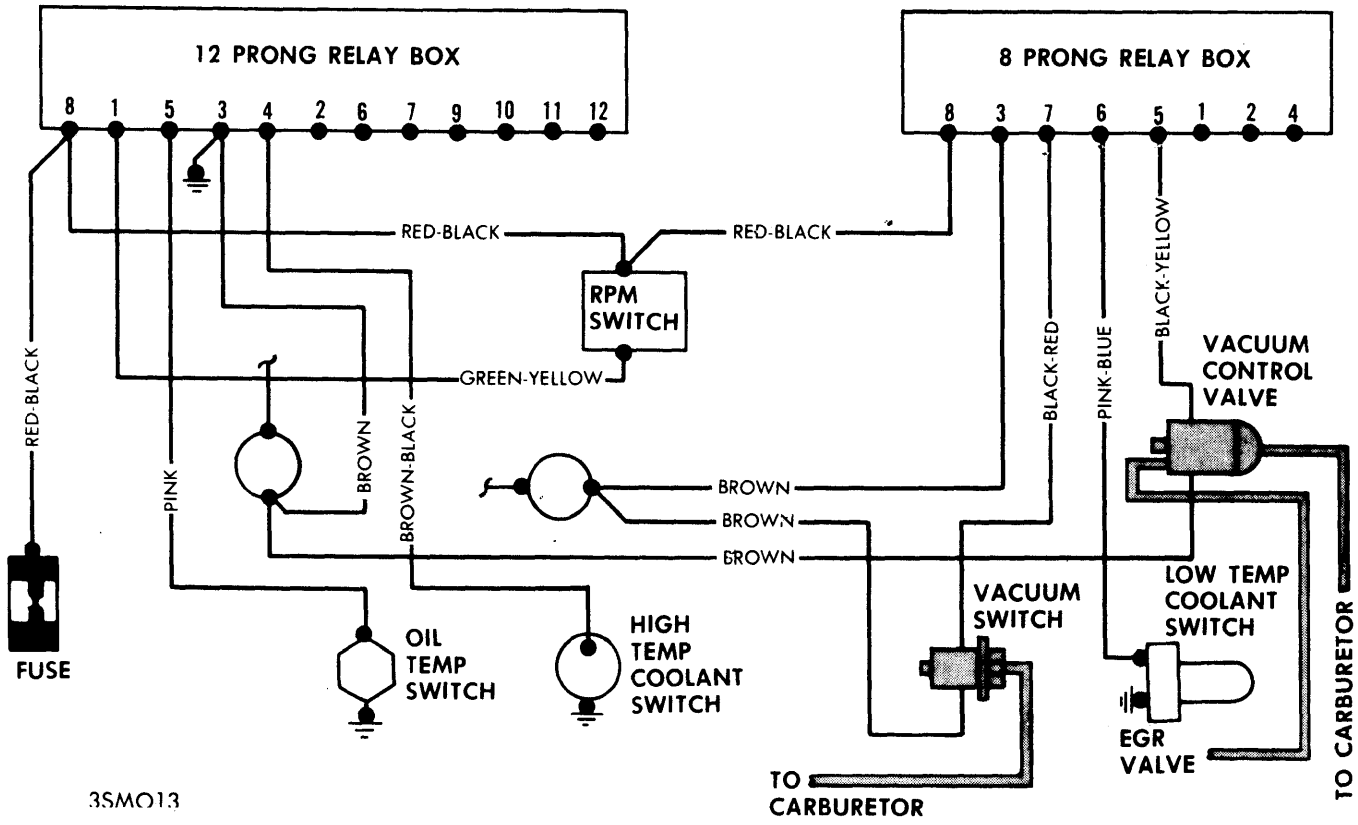
220, 280 & 280 C (1973)

DESCRIPTION

In order to reduce nitrogen oxide emissions, exhaust gas is recirculated into intake manifold. Components of system are as follows: A vacuum operated exhaust gas recirculation valve (EGR valve), an engine RPM switch and an oil temperature sensing switch. 220 models have a single relay box, while 280 and 280C models have two relay boxes, one with an 8 prong connector and the other with a 12 prong connector. These relay boxes are also connected to other systems. In addition, 280 and 280C models also incorporate both a high and low coolant temperature sensing switch, a vacuum check valve, a vacuum reserve tank and a vacuum sensing switch. Vacuum source on 220 models is a special port in carburetor. On 280 and 280C models, vacuum source is intake manifold. These various control units ensure that exhaust gas recirculation only occurs in certain engine operation modes so that engine operation will not be adversely affected.



EXHAUST GAS RECIRCULATION SYSTEM SCHEMATIC (220 MODELS)

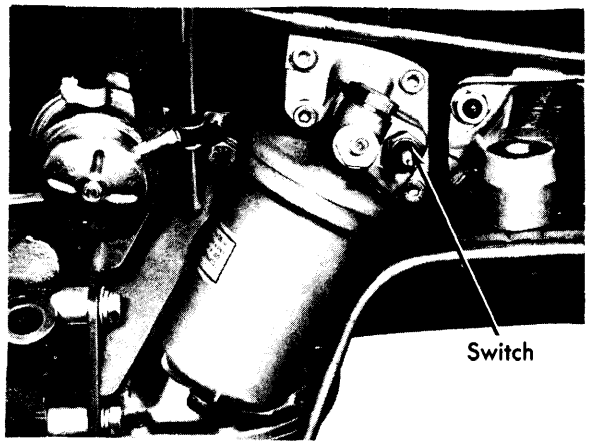


EXHAUST GAS RECIRCULATION SYSTEM SCHEMATIC (280 & 280C MODELS)

MERCEDES-BENZ EXHAUST GAS RECIRCULATION (Cont.)

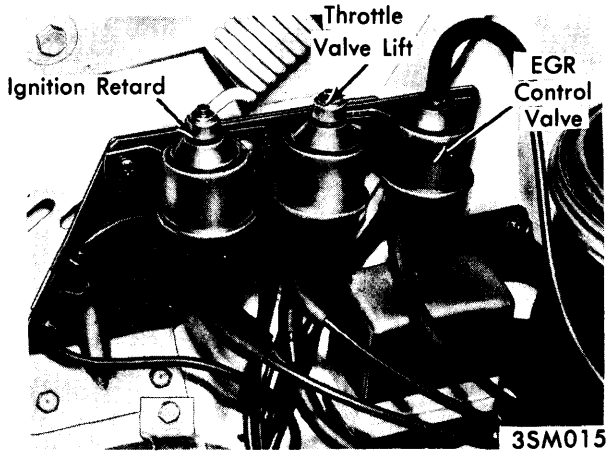
OPERATION

220 Models – Exhaust gas recirculation only occurs when engine is operated above idle speed but below 3600 RPM with oil temperature above 77°F. Various controls operate as follows: At idle speed, vacuum is insufficient to operate EGR valve. At 3600 RPM, RPM switch opens which causes vacuum control valve to close off vacuum to EGR valve. With oil temperature below 77°F, oil temperature switch is closed which causes vacuum control valve to cut off vacuum to EGR valve by means of relay box.



OIL TEMPERATURE SWITCH (TYPICAL)

280 & 280C Models – Exhaust gas recirculation only occurs when coolant temperature is between 149°F and 212°F with oil temperature above 62°F, manifold vacuum between 0 and 5.8 in. Hg and engine speed below 3200 RPM. If any of the following conditions are met, vacuum control valve will be deactivated, by means of relay boxes, which will cut off vacuum to EGR valve: Oil temperature below 62°F will cause oil temperature switch to close. Coolant temperature below 148°F or above 212°F will cause coolant temperature switches to open. Vacuum greater than 5.8 in. Hg will cause vacuum switch to open. Engine speed greater than 3200 RPM will cause RPM switch to close.

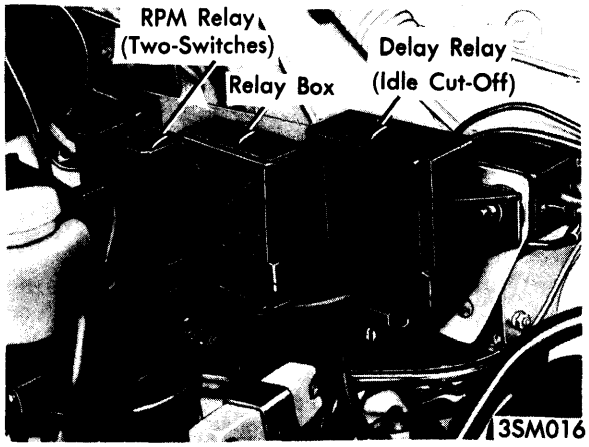


VACUUM CONTROL VALVES (220 MODELS)

TESTING

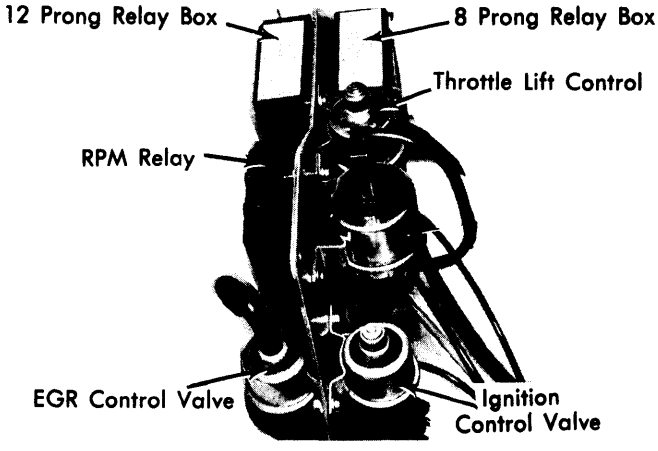
NOTE – Exhaust gas recirculation system components should be tested in the sequence listed.

Electrical Test – Connect tachometer to engine. Disconnect plug from vacuum control valve and connect voltmeter. Start engine and increase speed. Voltmeter should indicate about 13 volts up to 3600 RPM (220 models) or 3200 RPM (280 & 280C models). If no voltage is measured, check all components individually.



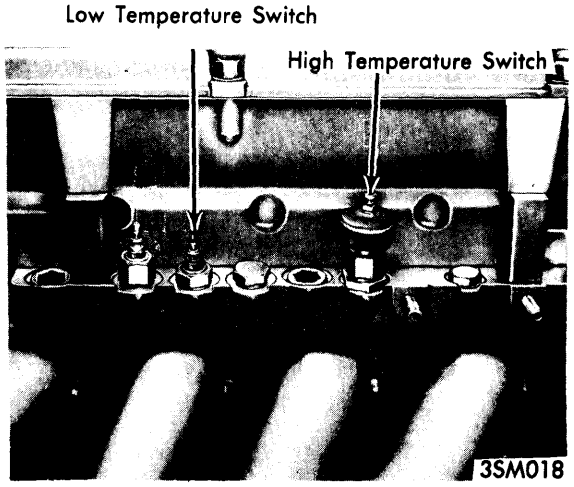
220 MODEL RELAY BOXES

RPM Switch – On 220 models, disconnect 2 prong plug on vacuum control valve and connect voltmeter. On 280 and 280C models, disconnect plug from 8 prong relay box and connect voltmeter to terminals 1 and 3. *CAUTION – Do not use a test light as this may destroy RPM switch.* On 220 models, voltmeter should read 13 volts up to about 3600 RPM and should drop to zero above 3600 RPM. On 280 and 280C models, voltmeter should read zero up to about 3200 RPM. Beyond 3200 RPM, reading should be 13 volts. With RPM decreasing, reading should return to zero at 2800 RPM.



RELAYS & VACUUM CONTROL VALVES (280 & 280 C MODELS)

MERCEDES-BENZ EXHAUST GAS RECIRCULATION (Cont.)



COOLANT TEMPERATURE SWITCHES (280 & 280 C MODELS)

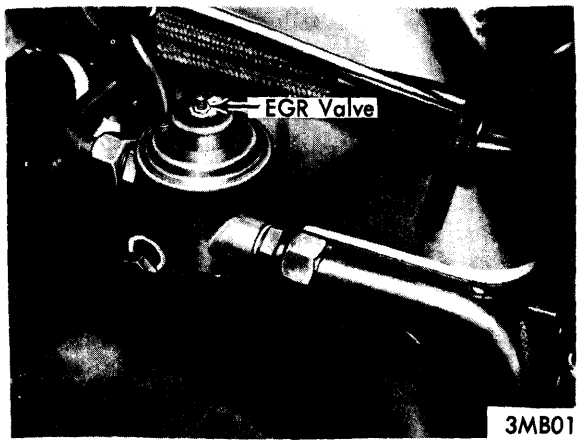
Temperature Switch, 149°F (280 & 280 C Models) – Remove plug from 8 prong relay box and connect a voltmeter to terminals 7 and 8. With engine at idle, voltmeter should indicate 13 volts.

Temperature Switch, 77°F (220 Models) – Disconnect plug from relay box and connect test light to terminals 5 and 8. Test light should come on with oil temperatures above 77°F.

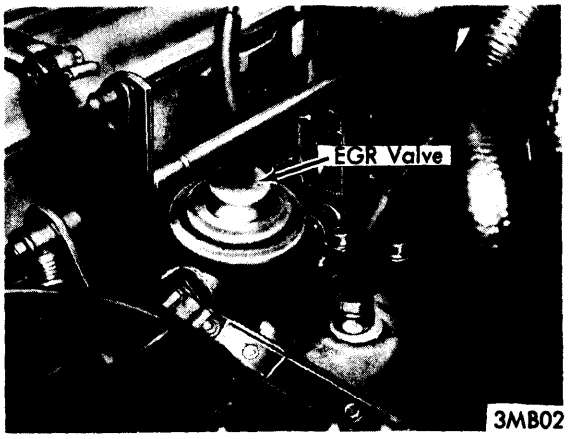
Vacuum Switch – Disconnect plug from 8 prong relay box and connect voltmeter to terminals 7 & 8. With engine idling, voltmeter should read zero volts. Disconnect vacuum line from vacuum switch, reading should now be 13 volts.

Mechanical Test (220 Models) – Start engine and allow to idle. Disconnect brown vacuum line from vacuum control valve and connect to carburetor in place of blue vacuum line. If EGR valve is functioning properly, engine should have a rough and irregular idle and/or stop running. If not, replace valve. Be sure to reconnect vacuum lines properly after test.

Mechanical Test (280 & 280C Models) – With engine idling, disconnect blue vacuum line on carburetor. If EGR system is functioning properly, engine should have a rough and irregular idle and/or stop running. If not, check all connections on intake manifold, vacuum tank, vacuum control valve and check valve and replace EGR valve if necessary.



EGR VALVE (220 MODELS)



EGR VALVE (280 & 280 C MODELS)