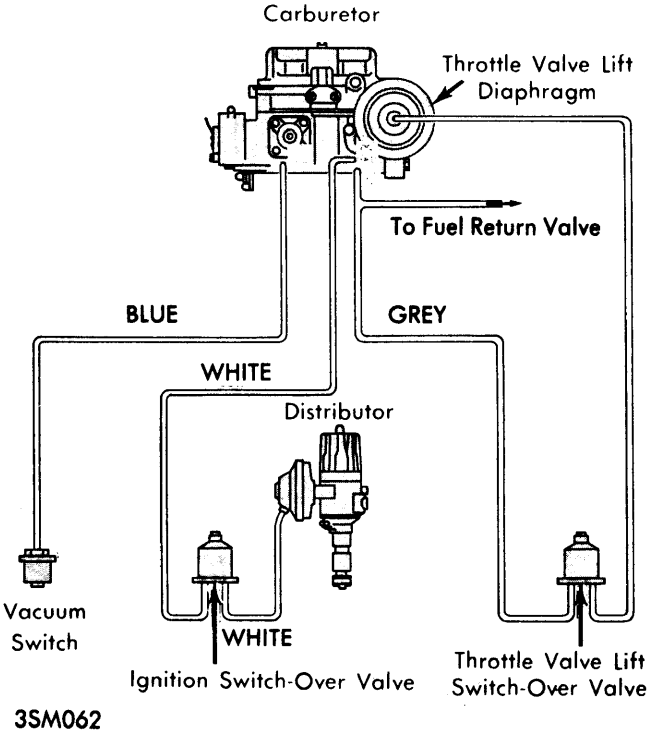
MERCEDES-BENZ 280 & 280C ENGINE MODIFICATION

280 & 280 C (1973)

DESCRIPTION

Mercedes-Benz 280 and 280C engine modification system consists of the following components: Two RPM switches, one set at 3200 RPM and the other at 2000 RPM. An engine oil temperature switch which operates at 62°F. An engine coolant temperature switch which operates at 212°F. A Transmission oil pressure switch which senses fourth gear operation. A vacuum switch, connected to carburetor, which operates at 5.8 in. Hg. A throttle lift valve which prevents throttle from closing completely under certain operating conditions. Two relay boxes, one with an 8 prong connector and the other with a 12 prong connector. Two switch-over valves, one for ignition switch-over and the other for throttle valve lift control.

NOTE — Mercedes-Benz 280 and 280C models also use exhaust gas recirculation. Some components of engine modification system are common with exhaust gas recirculation system. ***For additional information, see appropriate story in this section.***



VACUUM SYSTEM SCHEMATIC

OPERATION

Ignition Switch-Over — Vacuum ignition retard is in effect between 62°F oil temperature and 212°F coolant temperature up to an engine speed of 3200 RPM. Whenever switch-over valve is activated by relay boxes, vacuum ignition retard will be cancelled. Whenever any of the following conditions occur, switch-over valve will be activated: Below 62°F oil temperature, oil temperature switch will close. Above 212°F coolant temperature, coolant temperature switch will close. With engine speeds over 3200 RPM, RPM switch will activate switch-over valve. Whenever transmission is in fourth gear, transmission oil pressure switch will close. When vacuum is between zero and 5.8 in. Hg, vacuum switch will close. Also, when air conditioner is switched on (if equipped), vacuum ignition retard will be eliminated as compressor clutch shares power with switch-over valve.

NOTE — On later production models, ignition change over speed was increased from 3200 RPM to 3400 RPM.

Throttle Valve Lift — Throttle valves will be slightly opened by vacuum governor on carburetor when engine is coasting with oil temperature over 62°F, engine speed in excess of 2000 RPM and coolant temperature below 212°F. Whenever governor is not subjected to vacuum, throttles will be held slightly open. Whenever switch-over valve is deactivated, vacuum will be supplied to governor and throttle valve will return to idle position. This will occur under the following conditions: Below 62°F oil temperature, oil temperature switch will close. Above 212°F coolant temperature, coolant temperature switch will close. With engine speed below 1800 RPM, RPM switch will open.

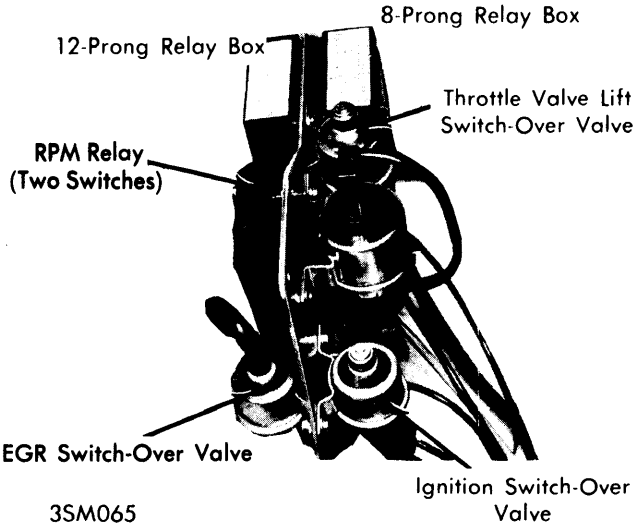
TESTING

Ignition switch-over and throttle valve lift systems are tested as follows; Tests should be done in sequence listed and with engine at normal operating temperature.

Checking Ignition Timing — Connect timing light and tachometer, start engine and let idle. Timing should be 4° ATDC at 800 RPM. If ignition is not retarded at idle, check vacuum connections and oil temperature switch. Replace 12 prong relay box, if required.

Checking Oil Temperature Switch — Disconnect plug of 12 prong relay box and connect voltmeter to terminals 5 and 8. Voltmeter should indicate zero volts with oil temperature above 62°F.

Checking Ignition Switch-Over — Disconnect plug of 212°F coolant temperature switch and connect to ground. Timing should advance 11° and supplementary fan should switch on. If not, check ignition switch-over valve and/or replace 12 prong relay box.

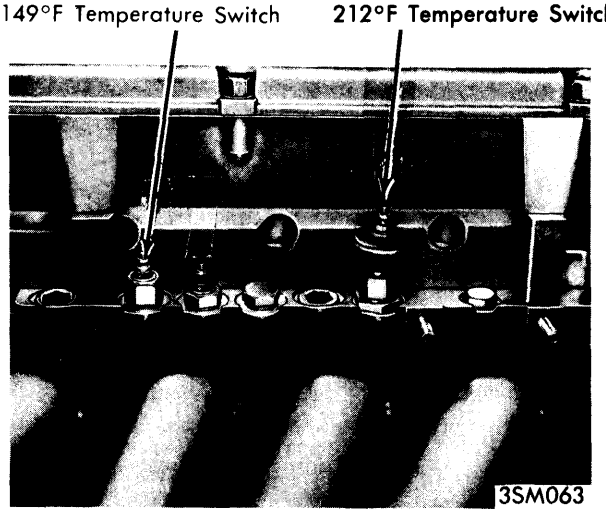


RELAYS & VACUUM CONTROL VALVES

MERCEDES-BENZ 280 & 280C ENGINE MODIFICATION (Cont.)

Checking Ignition Switch-Over Valve – Supply 12 volts to plug of switch-over valve. Valve should noticeably switch.

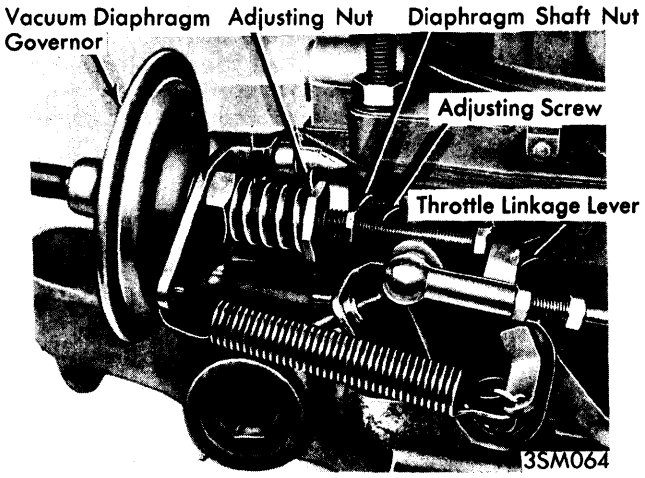
Checking 212° F Temperature Switch – Disconnect plug from 12 prong relay box and connect test light to terminals 4 and 8. Switch on ignition. Test light should be lit above 212°F coolant temperature.



COOLANT TEMPERATURE SWITCHES

Checking Fourth Gear Switch – Disconnect plug from ignition switch-over valve and connect voltmeter. Operate vehicle on dynamometer or road. When transmission switches from third to fourth gear, ignition retard should be cancelled and voltmeter should read 13 volts. When shifting from fourth to third gear when coasting, ignition should be retarded at engine speeds below 3200 RPM and voltmeter reading should return to zero. If no ignition switch-over occurs, disconnect wire from transmission switch and connect to ground. Start engine and check ignition timing. If ignition timing is now cancelled, replace transmission oil pressure switch. If ignition retard is not cancelled, replace 12 prong relay box.

Checking Throttle Valve Lift – Connect tachometer, start engine and increase speed to about 2500 RPM. Release accelerator linkage and observe vacuum governor on carburetor. Adjustment screw should contact linkage lever at speeds above 2000 RPM. With a drop in engine speed below 1800 RPM, vacuum governor diaphragm will be activated, thus moving adjustment screw away from linkage lever. If test fails, check vacuum line connections, RPM switch and throttle valve lift switch-over valve. ***CAUTION – Loosen diaphragm shaft nut prior to setting adjusting screw; hold wrench on machined flats and loosen diaphragm shaft nut.***



THROTTLE VALVE LIFT MECHANISM

Checking RPM Switch – *CAUTION – Use only voltmeter for checking electronic RPM switch. Use of a test light may destroy switch.* Disconnect plug of ignition switch-over valve and connect voltmeter. Voltmeter should indicate 13 volts above about 2000 RPM and return to zero when engine speed drops below about 1800 RPM. If no voltage is indicated, remove plug from 12 prong relay box and connect voltmeter to terminals 2 and 3. If 13 volts is indicated above 2000 RPM, replace relay box. If no voltage is measured, replace RPM switch.

Checking Throttle Valve Lift Switch-Over Valve – If voltage is available on plug of switch-over valve above 2000 RPM, reconnect plug. Valve should noticeably switch.