

Exhaust Emission Systems

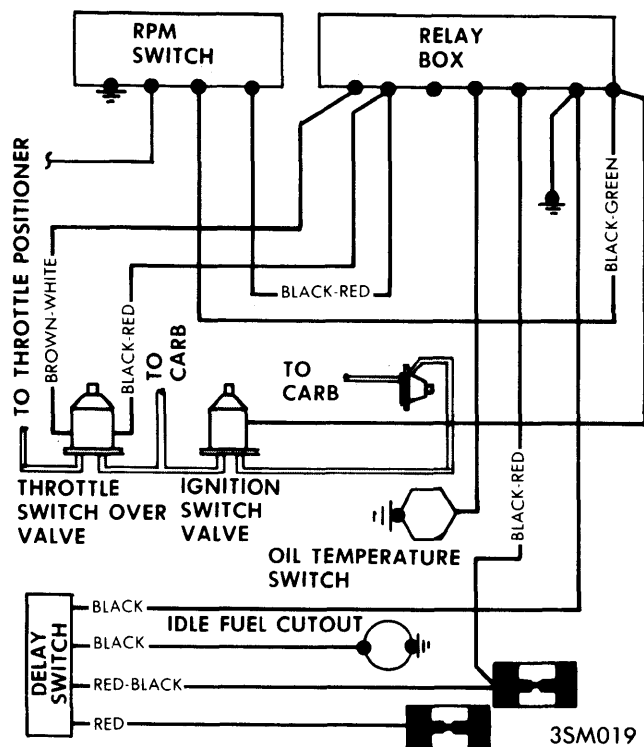
MERCEDES-BENZ 220 ENGINE MODIFICATION

Mercedes-Benz 220 (1973)

DESCRIPTION

Mercedes-Benz 220 engine modification system consists of an RPM switch, an oil temperature switch, an idle fuel cutout valve, a delay switch, a relay box and two switch-over valves, one for ignition changeover and the other for throttle valve lift.

NOTE — Mercedes-Benz 220 also uses 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.



ENGINE MODIFICATION SYSTEM SCHEMATIC

OPERATION

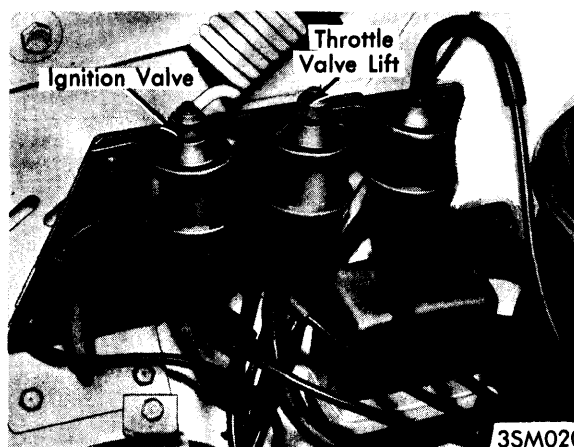
Ignition Changeover — Vacuum chamber for ignition retard is connected directly to carburetor and is controlled by throttle. Vacuum ignition retard is only effective during acceleration. Vacuum chamber for ignition advance, which overpowers ignition retard chamber, will be activated by switch-over valve whenever the following conditions are met: Oil temperature below 77°F will close temperature switch and deactivate switch-over valve. With oil temperature above 77°F and engine speed over 2000 RPM, RPM switch is closed, deactivating switch-over valve.

Throttle Valve Lift — Throttle valve is slightly lifted during coasting by vacuum governor on carburetor. Vacuum governor is controlled by oil temperature switch, switch-over valve and RPM switch. When oil temperature is above 77°F and engine speed over 2000 RPM, switch-over valve will be activated and will vent vacuum governor, thus governor's spring will lift throttle valve. With oil temperature below 77°F (temperature switch closed) or engine speed under 1800 RPM (RPM switch open), switch-over valve will be deactivated and vacuum will be restored to vacuum governor. This will allow throttle valve to return to idle position.

Idle Fuel Cutout — Delay switch activates idle fuel cutout valve for approximately 4-8 seconds after shutting off ignition. No fuel is supplied to engine while unit is activated.

TESTING

Ignition Changeover — Connect timing light and tachometer. Start engine and idle, timing should be 10° BTDC. If timing is off, check oil temperature switch and vacuum connections before resetting timing. Disconnect both red and white vacuum lines at distributor, timing should be 42-48° BTDC at 4500 RPM. Reconnect white vacuum line, timing should be 32-42° BTDC at 4500 RPM. Now disconnect white line and reconnect red line, timing should be 48-58° BTDC at 4500 RPM. If specified values are not obtained, check vacuum connections, RPM switch and switch-over valve.



SWITCH-OVER VALVES

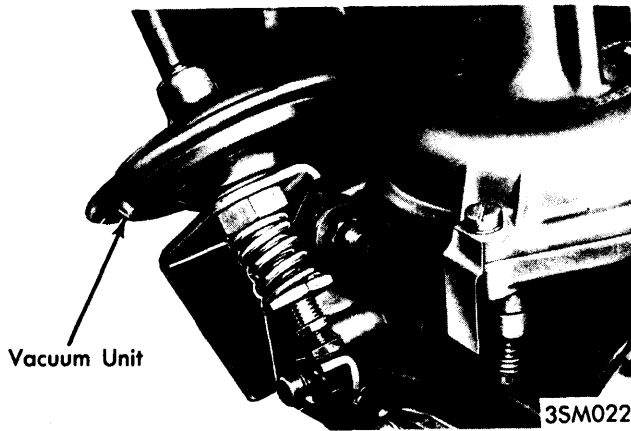
Throttle Valve Lift — Connect tachometer, start engine and increase engine speed to about 2500 RPM. Release accelerator and observe vacuum governor on carburetor. Above 2000 RPM, adjustment screw should contact operating lever of carburetor. Below 1800 RPM, diaphragm should be retracted by vacuum and adjustment screw should not touch lever. If no throttle valve lift is effected during this test, check vacuum connections, RPM switch and switch-over valve.

RPM Switch — **CAUTION** — Use only voltmeter for checking RPM switch. Use of a test light might damage RPM switch. Back out 2 prong plug on switch-over valve and connect voltmeter. Start engine and increase speed. Voltmeter should read 13 volts up to about 2000 and zero volts above 2000 RPM. If test fails, repeat test with new relay box and/or new RPM switch.

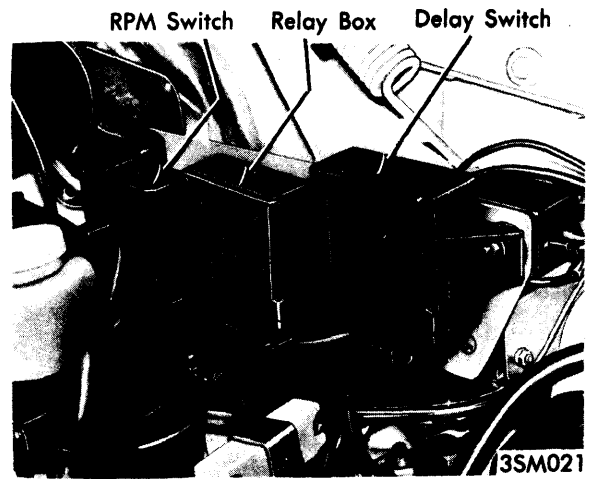
Switch-Over Valves — Start engine and increase speed. At about 2000 RPM, listen or feel for valve to operate.

MERCEDES-BENZ 220 ENGINE MODIFICATION (Cont.)

Temperature Switch — Remove plug from relay box and connect test light to terminals 5 and 8. Test light should be lit above 77°F oil temperature.



THROTTLE LIFT VACUUM GOVERNOR



RELAY & SWITCH LOCATIONS