1972 BMW ENGINE MODIFICATION

BMW Bavaria (1972)
BMW 3.0 CS (1972)

DESCRIPTION

Control of emissions is accomplished through modification of engine components. The intake manifold has been modified to recirculate exhaust gases to the intake manifold where they mix with the air/fuel mixture and are burned in the combustion chambers. A system is also provided to eliminate vacuum advance in the lower speed ranges, during idling, and during deceleration. A speed sensitive relay is used in conjunction with a magnetic switch to cut off vacuum to the vacuum advance unit of the distributor.

OPERATION

Timing Retard – Above 2500 RPM, the speed sensitive relay cuts off current to the magnetic switch. This supplies vacuum to the distributor advance unit, and timing is advanced. During engine operation below 2500 RPM, timing is retarded.

Exhaust Gas Recirculation – A vacuum line, connected above the throttle valve of the carburetor, connects to a diaphragm type control valve. When engine is idling, no vacuum is present and the control valve remains closed. Above 2000 RPM, vacuum is sufficient to open the control valve and exhaust gases are then metered through the valve into the intake manifold. Vacuum reaches the highest level at about 3500 RPM, and at this point the control valve will be open to its maximum extent. A maximum quantity of exhaust gases are allowed to flow into the intake manifold during this time. At speeds greater than 3500 RPM, and at full throttle, the vacuum valve closes and prevents the entry of exhaust gases into the intake manifold.

TESTING

Control Valve – Disconnect exhaust line to carburetor from the control valve. Seal off the end of the line. Increase engine speed to above 2000 RPM, but below 3500 RPM, and check if exhaust gas is blowing out of control valve. This may be done by placing finger by the valve to exhaust line connector. If no blowing of exhaust gas is detected, replace valve. Now allow engine to return to idle and re-check valve. If exhaust gas blows out of valve, replace valve.

ADJUSTMENT

Ignition Timing – With engine at normal operating temperature, connect timing light and tachometer. Disconnect and plug vacuum advance hoses. The timing mark is on the flywheel and is visible through an access hole behind the starter. With engine speed at 1700 RPM set timing so that pointer on housing is indexed with the steel ball on the flywheel.

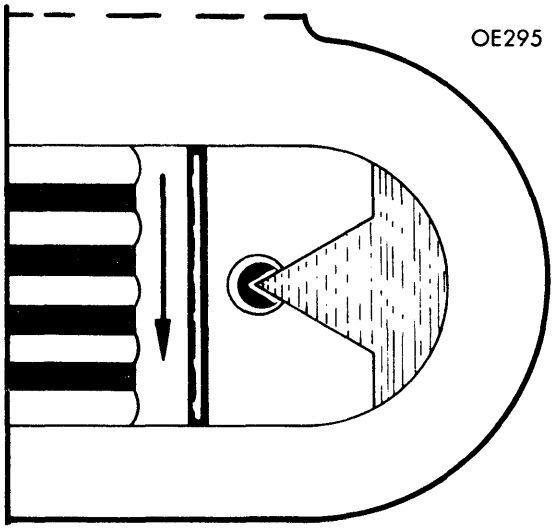
Idle Adjustment – With ignition timing correctly set and engine at normal operating temperature, proceed as follows:

1) Using a CO meter, set CO level to approximately 2%. If this uncorrected idle speed exceeds 1000 RPM, the CO content should be reduced; if idle speed is lower, the CO content should be increased.

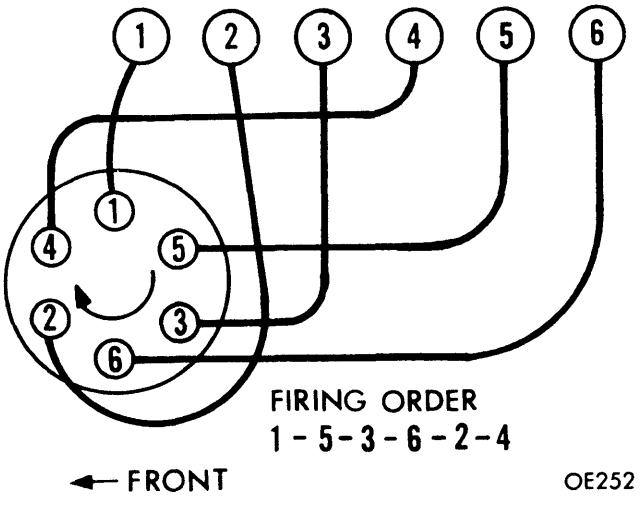
2) Remove air cleaners and housing and using a suitable balance meter (flow meter), adjust the primary throttle plate of each carburetor to equal flow.

3) Reinstall air cleaner and housing. Adjust idle mixture to 1.0-1.5% CO with engine running smoothly at an idle speed of 900-950 RPM.

NOTE – Each exhaust manifold is provided with a connection for sampling of exhaust gas. These connections are closed with a bolt. Remove bolt and sample exhaust gases by inserting probes.



IGNITION TIMING MARK



FIRING ORDER