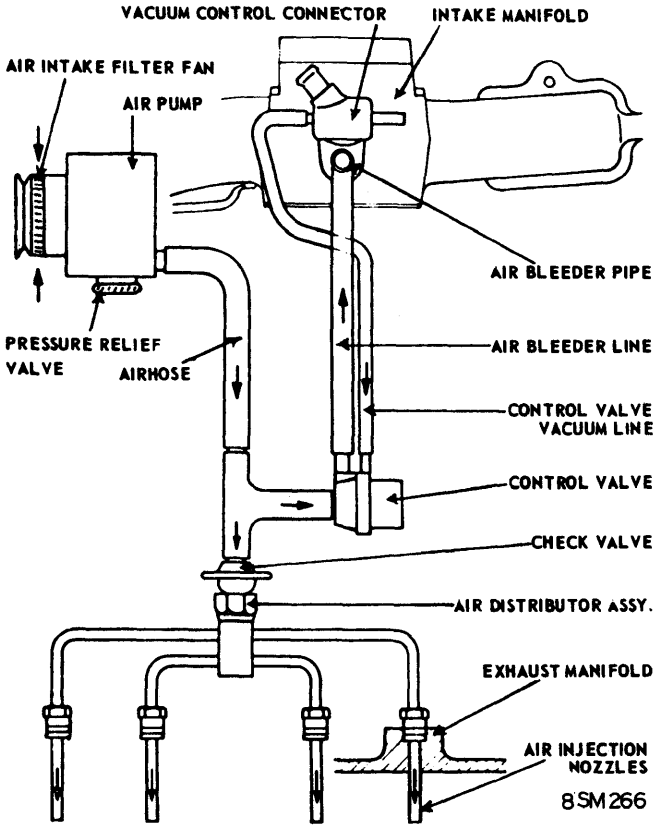
OPEL AIR INJECTION

Opel – All Models (1968-69)

DESCRIPTION

Air Injection Reaction is an exhaust emission control system and is standard equipment on all 1968-69 Opels manufactured for U.S. sales. AIR is an air pollution control system designed to limit amount of unburned hydrocarbons and carbon monoxide expelled into atmosphere by oxidizing these exhaust gases as they pass into exhaust manifold. System consists of an air pump, control valve, check valve (anti-backfire valve), distribution manifold and connecting hoses.



EXHAUST EMISSION COMPONENTS

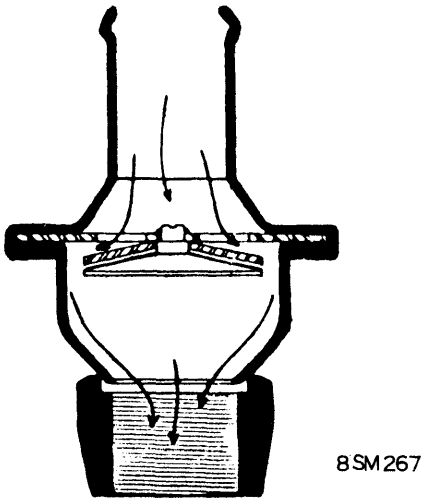
OPERATION

AIR system reduces exhaust emissions by injecting filtered air into exhaust system at each exhaust port. This injected air combines with the hot exhaust gases to complete the burning process.

Anti-backfire Valve – When throttle is closed suddenly after hard acceleration, carburetor air is shut off instantly, but fuel continues to flow momentarily. The resulting rich mixture would burn after air was injected into exhaust system, resulting in a backfire. To prevent this, anti-backfire valve opens to allow pump to inject air into intake manifold whenever throttle is suddenly closed. When anti-backfire valve opens it allows air from pump to flow through air bleeder line into intake manifold, thereby greatly reducing possibility of a backfire, by not allowing a rich mixture to occur.

Pressure Relief Valve – Function of pressure relief valve is to relieve exhaust air flow if pressure exceeds a pre-set value (valve pressure is set for relieving at about 50-55 MPH). Should air pressure increase, the spring loaded valve seat is forced up, opening an orifice and relieving pressure.

One Way Check Valve – A check valve is necessary to prevent backflow of exhaust gases into injection line or into air pump when air pump by-passes at high speed and load. This valve will also prevent backflow of exhaust gases if air pump or drive belt fails.



CHECK VALVE

SERVICE PROCEDURE

AIR Pump – Pump has been designed to be relatively service free. It is not recommended that rear housing cover be removed for any reason, since internal components of pump, including pressure relief valve, are not supplied individually. Pump does not require any maintenance, except for adjusting drive belt tension. Tighten air pump belt to 45 lbs. tension.

Ignition Timing – Disconnect all vacuum hoses from distributor and plug hoses. *See Tune-up charts for specifications.*

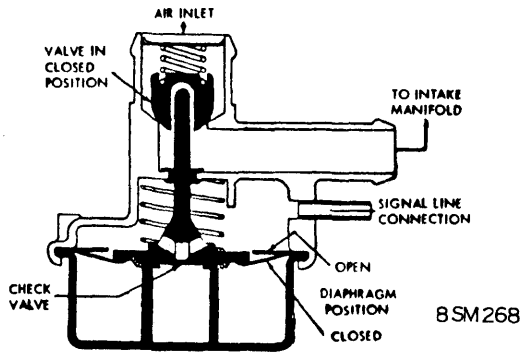
Idle Speed and Mixture Adjustment – *See Tune-up chart for specifications.* To adjust idle speed and mixture of any of the three engines, warm engines to operating temperature, make sure choke valve is open and air cleaner installed. A calibrated tachometer having a full scale reading of 1000 RPM is necessary. Adjust idle speed and mixture as follows:

1) Fully close idle air adjusting screw by turning it in until seated. Carefully adjust idle mixture needle and throttle stop screw at 650-700 RPM to obtain best possible mixture. At this point, throttle valve has been positioned to obtain best low speed performance available. Do not move throttle stop screw from this position. All further changes in idle speed will now be made with idle air adjusting screw. Raise idle speed with idle air (speed) adjusting screw and idle mixture needle to specifications.

2) Whenever idle speed is changed, always make idle mixture needle adjustment last. Adjust idle mixture needle (located in throttle body) to midpoint of highest RPM range.

3) If idle is now too high, reset idle air (speed) adjusting screw as required in step 1.

OPEL AIR INJECTION (Cont.)



CONTROL VALVE

BELT ADJUSTMENT

Tension (Lbs.) With Strand Tension Gauge

Application	New Belt	Used Belt
1968-69 All Models	45	45

TROUBLE SHOOTING

Air Pump Noise – *NOTE – If pump is found to be defective, inspect check valve for possible cause of failure.* To check air pump, proceed as follows:

1) Check drive belt tension. If belt needs tightening, do not pry on housing. Excess belt tension will result in damage to pump.

2) If noise is still present, remove belt and turn pump to check if it is binding or seized. Pump may be noisy when rotating by hand. If rotation is satisfactory, reinstall belt.

3) Make sure all hoses are connected and have not vibrated free. Check that hoses are not touching other parts of vehicle. With pump running, check entire system for leaks in hoses and around clamps. Check may be made with soapy water.

4) Make sure pump mounting bracket is fastened securely. Check relief valve. If air escapes from valve during idle, failure has occured and pump must be replaced. Absence of pressure setting plug in relief valve will result in premature pressure relief and excessive noise.

5) Bearing noise is easily distinguished from vane chirping. Vane chirping is intermittent and noticeable at low speed. Bearing noise is noticeable at all speeds. Sound does not necessarily indicate bearing failure, if bearing noise increases to objectionable level, pump should be replaced.

6) Failure of a rear bearing is identified by a heavy knocking noise. Since bearing is not serviceable, pump must be replaced.

Control Valve – Check for explosion like noises in muffler, especially on a cold engine.

Check Valve – Check for excessively hot or brittle hose (hose connecting check valve to air pump).

TESTING

Control Valve Test – Remove air cleaner, and hose from top of control valve. Start engine and run at idle speed. Pull off hose that goes to manifold vacuum. Look at white valve in control valve housing and wait five seconds, put manifold vacuum line back on valve. White valve should move upward for one to three seconds and then drop down. If white valve stays up for more than five seconds before dropping down, or will not move at all, it indicates a defective valve.

Check Valve Test – Take flashlight and look inside check valve after removing air cleaner and hose on check valve. If the black rubber is burned away or partially burned away, replace valve. If check valve is found defective, check pump for possible damage.