

PORSCHE AIR INJECTION

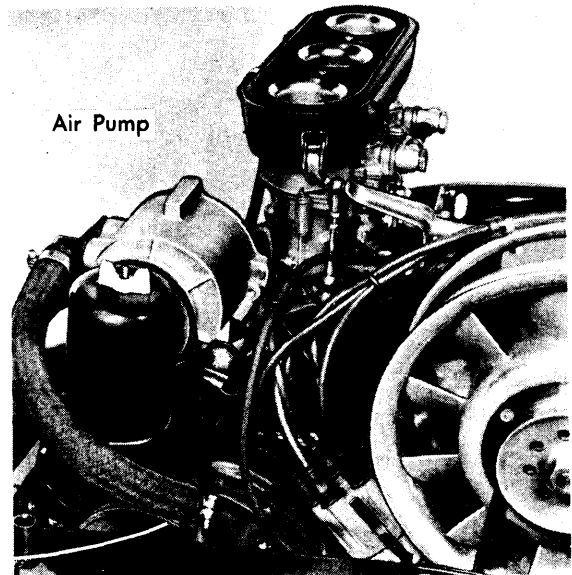
912 (1968)
911 & 911L (1968)

DESCRIPTION

Porsche exhaust emission control system consists of an air injection system. Air injection system contains an air pump, regulating valve, dashpot, vacuum and pressure lines. Regulating valve has two control valves, each of which contain a pressure relief valve and a check valve.

OPERATION

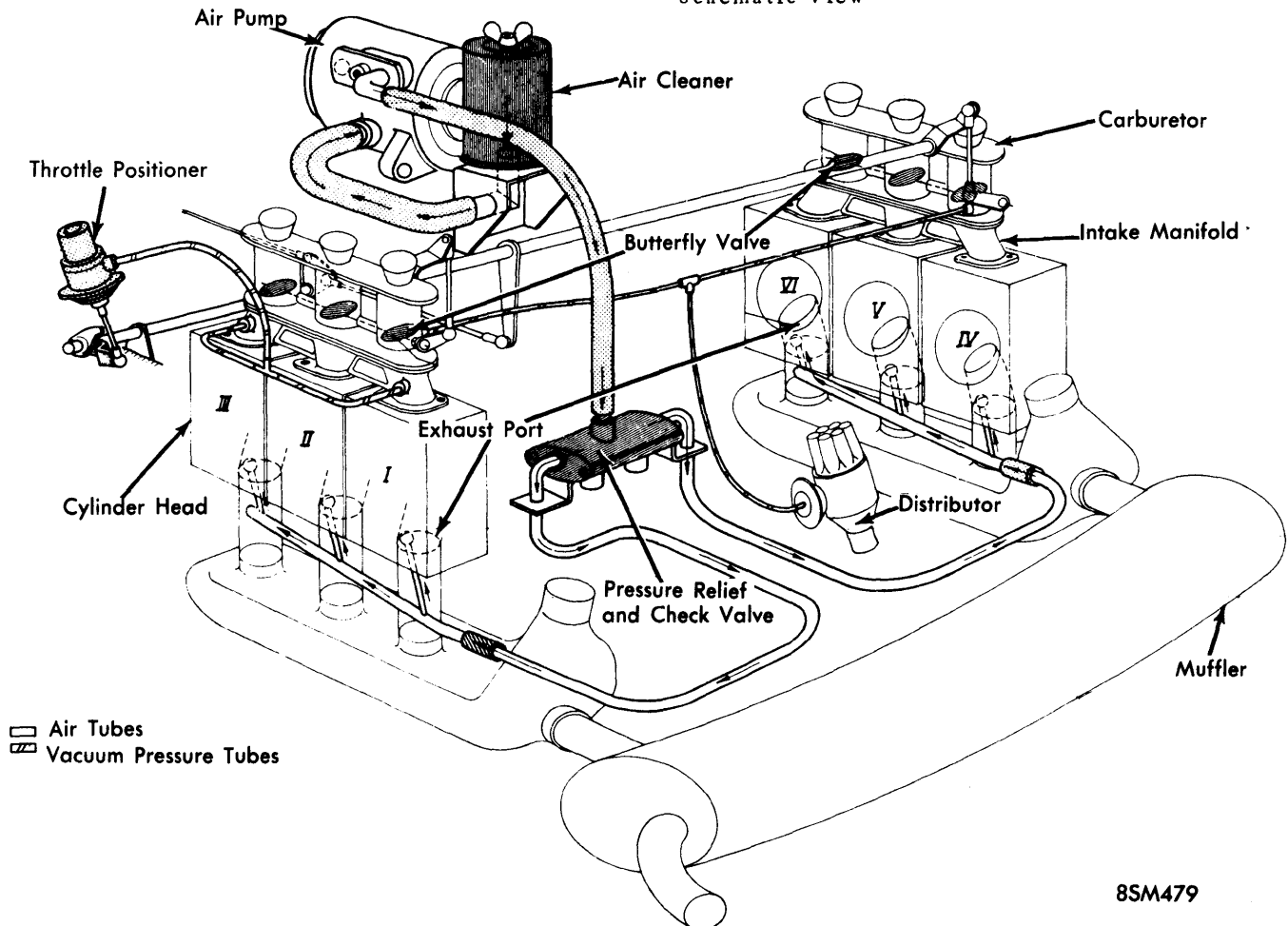
Air enters pump through air filter and is then pumped to regulating valve which channels air to exhaust ports through a ducting system. Volume of air is in proportion to engine RPM. A pressure control valve, contained in regulating valve, is provided for each cylinder bank. Each control valve contains a pressure relief and check valve device. Pressure relief valve releases excess air into atmosphere. Check valve prevents exhaust gases from flowing back into air supply in case air pump stops functioning. A throttle positioner opens throttle valve slightly when engine creates a high vacuum in induction system. Retarded ignition timing permits a wider opening of throttle valves at idle speeds.



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PORSCHE AIR PUMP

Schematic View

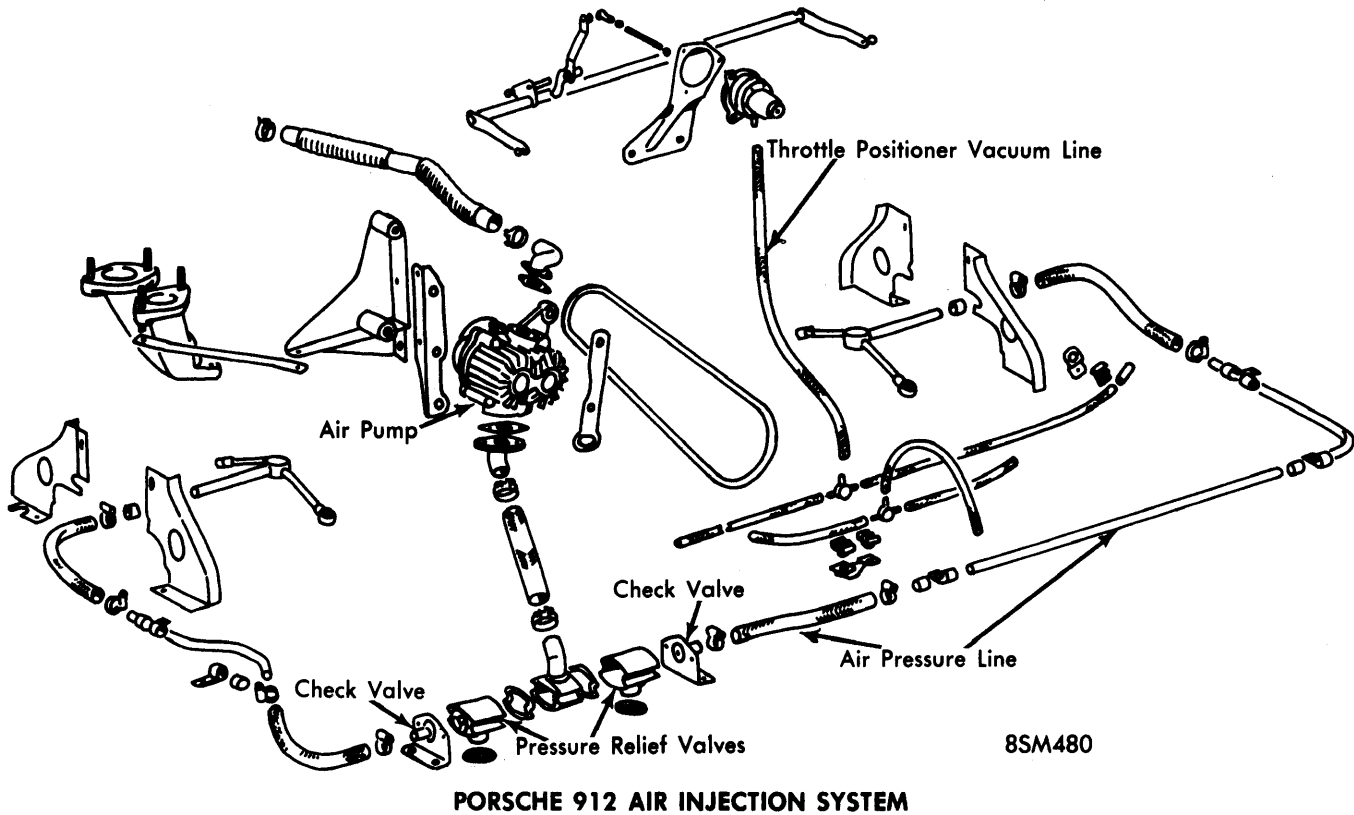


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PORSCHE 911 AIR INJECTION SYSTEM

Exhaust Emission Systems

PORSCHE AIR INJECTION (Cont.)



MAINTENANCE

AIR PUMP

Removal — Loosen hose clamps in vacuum and pressure lines, remove lines from air pump. Remove "V" belt and air pump.

Inspection — Air pump in maintenance free and should not be disassembled. Before installing, make sure pulley rotates freely (counterclockwise), and no drag is evident. If necessary replace air pump.

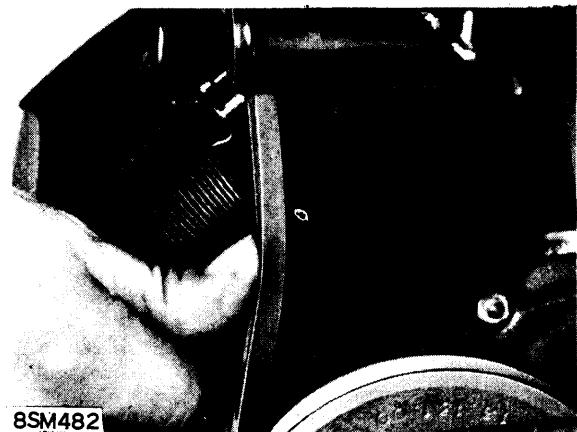
Installation — To install, reverse removal procedure. "V" belt tension should be $\frac{1}{2}$ " deflection at a point between air pump pulley and camshaft.

REGULATING VALVE

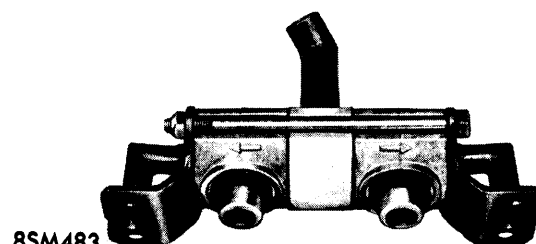
Removal — Loosen hose clamp and remove hose from connection. Remove bolts holding regulating valve to engine shield, remove regulating valve assembly. Remove clamping bolts and disassemble regulating valve.

Inspection — Inspect check valves and pressure relief valves for wear or damage, replace where necessary. Replace rubber diaphragm in flowback check valve, if its edges are torn or cracked.

Installation — To install, reverse removal procedure. When assembling regulating valve use new gaskets. Arrows on both valve housings must point outward, and pressure relief valves must point downward.

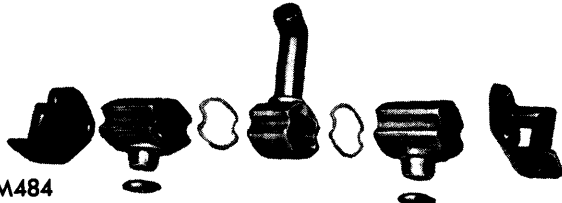


V-BELT TENSION CHECK



REGULATING VALVE

PORSCHE AIR INJECTION (Cont.)



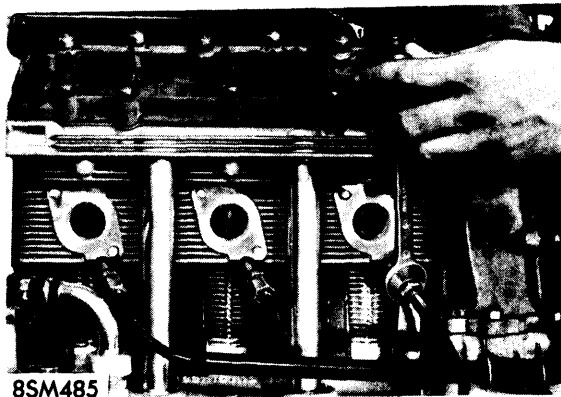
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REGULATING VALVE DISASSEMBLED

PRESSURE LINES

Removal — Remove bolts holding control valve to rear engine shield. Remove heat exchanger (connector hoses and heater hoses). Unscrew coupling nuts and remove connecting lines. Unscrew threaded body piece from exhaust port.

Installation — To install, reverse removal procedure. Use new gaskets. Make sure lines do not rub against other parts.



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PRESSURE LINES

VACUUM LINES

A vacuum line connects throttle positioner to a "T", from there to connections in intake ducts on number one and three cylinders. A second vacuum line (connected to vacuum control unit at distributor) is connected to carburetor flanges on number two and four cylinders, through a "T" connection.

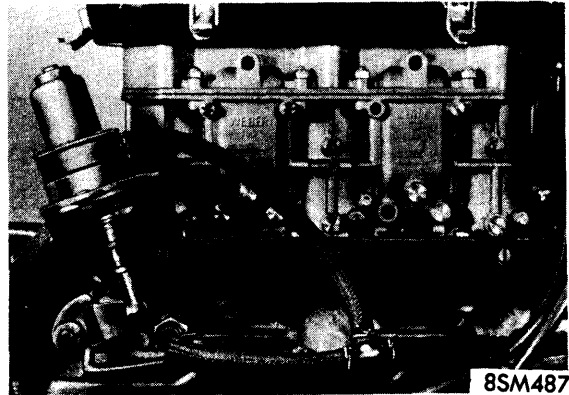
THROTTLE POSITIONER

Removal — Remove vacuum hose from throttle positioner. Remove ball joint socket from connecting link at pressure rod. Remove bolts holding positioner assembly to mounting bracket. Remove throttle positioner. To install reverse removal procedure.

IGNITION TIMING

Before adjusting ignition timing, check contact breaker points and adjust dwell to $38^\circ \pm 3^\circ$.

1) With engine at normal operating temperature, connect timing light to number one cylinder. Loosen distributor plate, direct timing light at crankshaft pulley. Adjust by rotating distributor.

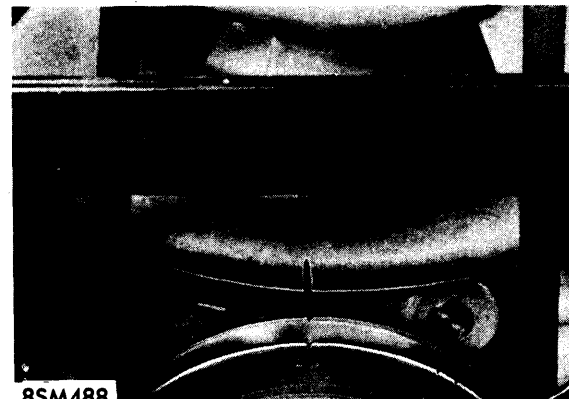


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THROTTLE POSITIONER

2) On 911 six cylinder, run engine at 6000 RPM, line up 30° BTDC mark with mark on blower housing by turning distributor.

3) On 912 four cylinder, run engine at 650 RPM. Set timing at 3° BTDC by turning distributor.



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IGNITION TIMING MARK

DISTRIBUTOR VACUUM CONTROL UNIT (911)

Vacuum control unit is connected to carburetors of number one and four cylinders. Connecting hoses are connected to a point below throttle valves, so that vacuum is active only in idle speeds. This in effect, resets ignition timing by vacuum control unit to 3° ATDC when engine is idling.

1) Mark crankshaft pulley to show 3° ATDC. Allow engine to idle.

2) Direct timing light to crankshaft pulley. 3° ATDC mark on crankshaft pulley must align with mark in blower housing. Permissible tolerance is $2-5^\circ$ ATDC. If not within specified tolerance, a correction of $\pm 2^\circ$ maximum may be made at 6000 RPM.

PORSCHE AIR INJECTION (Cont.)

THROTTLE POSITIONER (911)

Throttle valve positioner is adjusted properly, when following condition exists: When throttle valves are suddenly closed at 3000 RPM, engine speed should drop to approximately 1000 RPM within 4-6 seconds.

- 1) Loosen set screw, set adjusting screw to a return lag of 4-6 seconds, turning clockwise lengthens time and counterclockwise shortens time. After adjusting, tighten set screw.
- 2) After adjustment, check if backfiring occurs when throttle is quickly shut. If so, recheck adjustment of throttle positioner and carburetors, readjusting when necessary to minimize backfiring as much as possible.

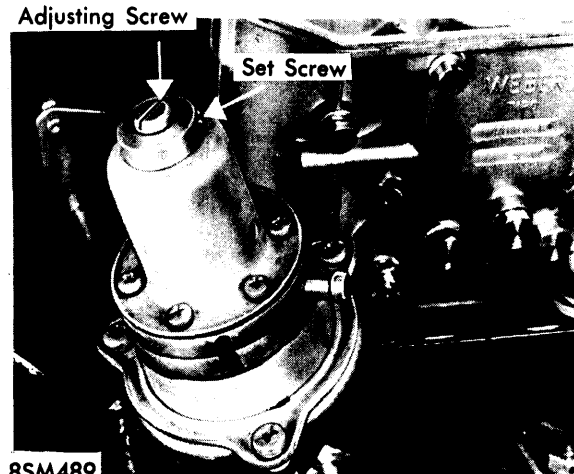
THROTTLE POSITIONER (912)

Adjustment – With engine running, push throttle positioner actuating lever up, until stop collar of connecting link rests against body of throttle positioner. If engine speed rises too high, lengthen throttle positioner actuating arm, if engine speed is too low, shorten link.

TESTING EXHAUST EMISSION CONTROL SYSTEM

- 1) Check ignition timing and adjustment of throttle positioner. Adjust carburetors, remove air pump control valve connecting hose.

- 2) Connect suitable exhaust gas analyzer, CO content at idle speed should be approximately 4.5%.
- 3) Reconnect connecting hose between air pump and control valve assembly, recheck CO reading. At idling speed, CO content should now be approximately 1-1.5%.



THROTTLE POSITIONER ADJUSTING SCREW