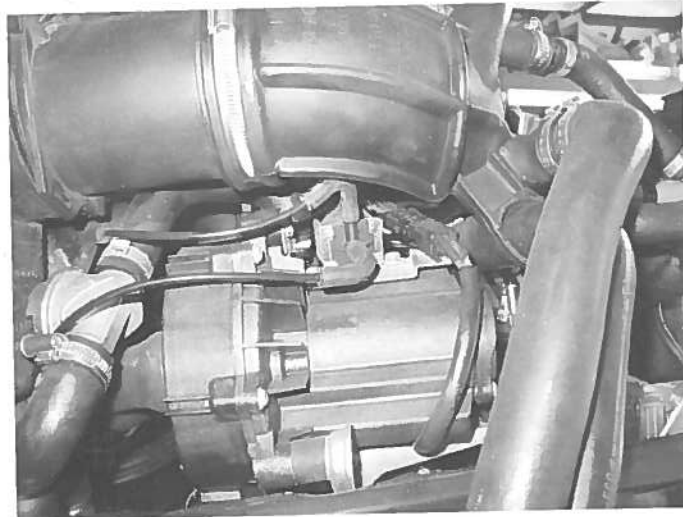
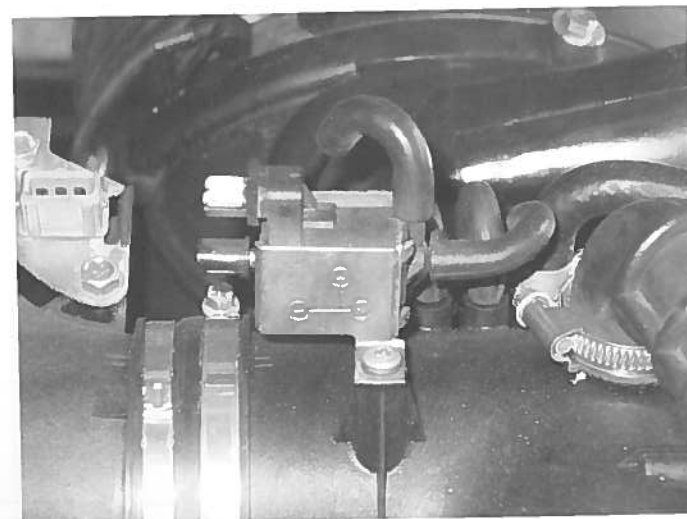
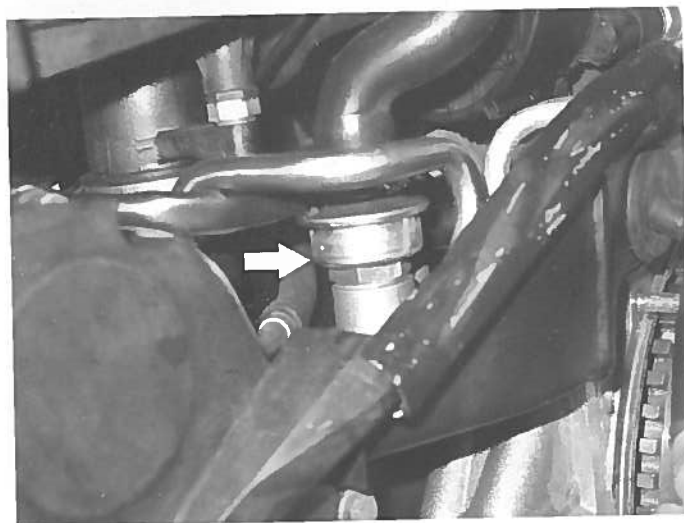


Secondary air injection (SAI)



Normally aspirated secondary air injection pump assembly.



Secondary air injection pump solenoid (change over) valve activated by the DME (ECU).

SAI and the Check engine light (CEL)

The SAI system operation is monitored by the OBDII compliant DME (ECU). The DME (ECU) monitors the impact of the SAI when it is operating, in other words the DME (ECU) knows what should be happening when the air is being injected into the exhaust gases and when this does not happen it flags a fault and turns on the check engine light. Once the CEL is illuminated by this fault, it cannot be reset.

The SAI-triggered fault is usually caused by parts of the system being blocked by burnt oil residue (coke). This problem is often referred to as "coking".

The normally aspirated engines suffer more from this than the turbocharged engines.

The areas that become blocked are:

- Injection ports.
- Check valve and cut off valve of the normally aspirated engines system. Usually the check valve.

☞ The only way to resolve the problem is to replace the check valve and clean out the injection ports.

The check valve for the normally aspirated engines is installed into the air distributor unit located near the forward air intake runner.

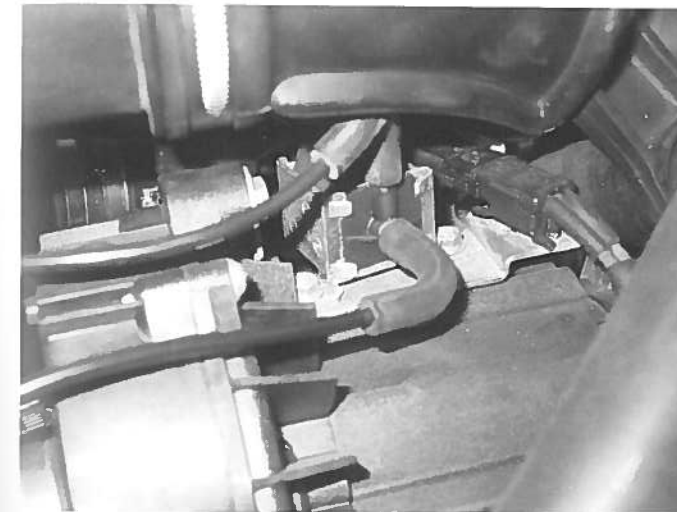
The purpose of the check valve is to stop exhaust gases getting back through the air injection ports and into the air injection pump when it switches off. This is why the coke tends to build up in this valve.

The SAI system is only monitored during the warm up cycle which last 2-minutes from start up and within the temperature range already described.

It is known from research, and reports from 993 owners, that an SAI fault can be logged in the DME (ECU) without triggering the CEL.

It is believed that the cause of this is The DME (ECU) assumes the SAI is not functioning properly based on exhaust gas composition during the warm up cycle and it logs a fault. However it takes a series of readings over many engine starts before it activates CEL. If a fault log readout is carried out during this period it will show the fault logged without the CEL being activated.

Secondary air injection (SAI)



Secondary air injection pump solenoid (change over) activated by the DME (ECU) for the turbocharged engine which is identical to the normally aspirated engine.

The cause of the coking (blocking) problem cannot be pinned down to just one item. Some of the causes are:

- Worn piston rings.
- Burning oil in the engine. All Porsche dry sump engines consume and burn oil. Burnt oil residue is going to end up in the exhaust gases. The system design ensures over time that the air injection ports and the check valve (one-way valve) will become a gathering place of this residue.
- High sulphur content of USA manufactured oils (Saudi oil has a high sulphur content). Coking problems were first identified by Porsche in the late 1980s.

WARNING—

DO NOT pour fluid of any kind into the air intake system to try and remove coking deposits. There has been spurious advice given on various internet forums to pour ATF fluid into the air intake and let it sit for 30 minutes. There are two types of ATF fluid. The mineral based ATF fluid will cause great plumes of smoke and create bigger coking problems. Synthetic ATF will destroy every piece of rubber it comes across.