



**SI 1150**  
For technical personnel only!  
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# SERVICE INFORMATION

## FAILURE OF SECONDARY AIR PUMP DUE TO JAMMED RELAY

### POTENTIAL COMPLAINTS

- Secondary air pump does not start after a cold start
- The engine compartment smells charred
- Melting traces on the electrical contacts of the secondary air pump
- P0410 "Malfunction"

These conditions indicate that the secondary air pump has failed due to overstressing.

### POSSIBLE CAUSE

The relay via which the secondary air pump is controlled is jammed. As a result, the secondary air pump was supplied with power for an impermissibly long period of time.

During a cold start, the secondary air pump may only be in operation for a maximum of 90 – 120 seconds.

The secondary air pump is not designed for continuous operation!

### INSPECTION

- Identify the respective relay using the circuit diagram.

### WHEN THE VEHICLE ENGINE IS COLD ("COLD START")

- The secondary air pump has to start audibly after a cold start of the engine.
- If the voltage supply of the secondary air pump is fine but the secondary air pump runs with a scraping, whistling or scratching noise – or not at all – the secondary air pump needs to be replaced.
- We recommend replacing the relay as well.
- In such cases, the other secondary air system components should also be checked.

### WHEN THE VEHICLE ENGINE IS WARM

- Start vehicle engine.
- Check electrical contacts of voltage supply to secondary air pump.
- The relay is jammed if voltage is present at the secondary air pump.
- Replace relay and secondary air pump.

### FINAL INSPECTION

- The secondary air pump has to run for about 90 – 120 seconds after a cold start of the engine.

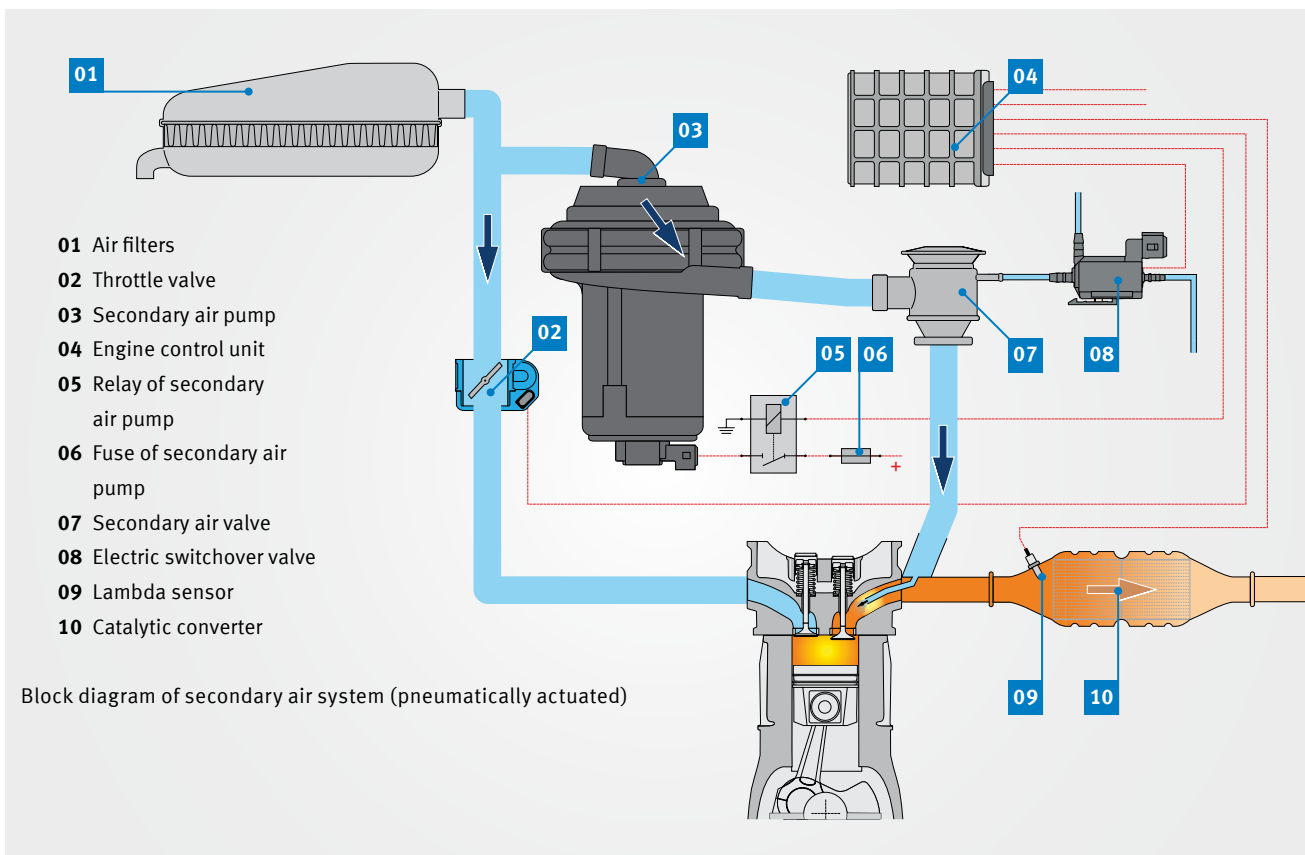


Damage symptoms: Melting traces on the housing (top view into the housing)



Damage symptoms: Melting traces on the electric motor or the electrical contacts

All content including pictures and diagrams is subject to change. For assignment and replacement, refer to the current catalogues or systems based on TecAlliance.



**FAST FACTS: SECONDARY AIR SYSTEM**

A "rich mixture" ( $\lambda < 1$ ), i.e. a mixture with excess fuel, is required for a cold start of a petrol engine. As such, large amounts of carbon monoxide and unburned hydrocarbons are generated during cold starts.

To reduce the level of these pollutants, ambient air with a high oxygen content (secondary air) is injected into the exhaust manifold directly downstream of the exhaust valves during the cold starting phase.

This results in post-oxidation ("afterburning") of the pollutants to form carbon dioxide and water. The heat generated in this process additionally warms the catalytic converter and speeds up the onset of Lambda control action.



View into the secondary air pump (cut) with melting traces