Technical Messenger

MAHLE

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A/C system leaktightness test using a contrast agent

If the air conditioning system doesn't work and there is no or far too little refrigerant in the system, then a leak is usually the cause. The leak will have to be fixed before the system can be refilled.

Legal requirements prohibit the filling of a leaky air conditioning system. Additionally, a leaktightness test may not be done by filling the system with refrigerant and a contrast agent. Testing with ultraviolet light is therefore only permissible if a contrast agent was added before the leakage occurred.

Leaktightness test using a contrast agent

If a contrast agent has been added to the refrigerant, residues that glow brightly under ultraviolet light are left behind at leakage points. To protect your eyes, UV safety goggles should always be worn when performing this test.

Disadvantages of this method

- Reduced lubrication: Contrast agents reduce the lubricating properties of compressor oil, leading to increased wear of all air conditioning system components. It is therefore imperative to get the dosage exactly right. If too much contrast agent is used, it can clog the valves in the compressor or the solenoid valves of the air conditioning service unit, among other things.
- It can only be used as a preventive measure: Only leaktight air conditioning systems may be filled with a contrast agent. It is not permissible to fill the system after it has been damaged.
- Limited reliability: If damage occurs during the cold season, it is often not detected until the following spring or summer. By that time, leaked contrast agent may have long since been washed away, making it impossible to detect leaking points using a UV lamp.

Small leaks, where only very little contrast agent escapes, as well as leaks that are difficult or impossible to see, are virtually undetectable using this method. For example, it will be very difficult to detect a leaky dryer insert on a condenser.

Important!

Due to the above-mentioned disadvantages of contrast agents, we recommend the simpler, more efficient, and more reliable leaktightness test using forming gas (see TM 11/2023).

Figure 1: Piston seizure on the air conditioning compressor due to too much contrast agent

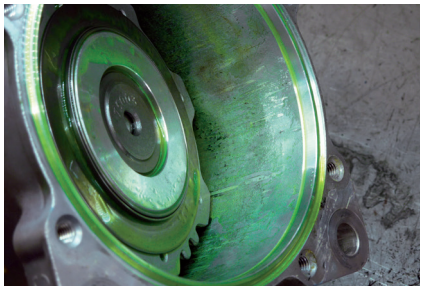

Figure 2: Too much contrast agent in the compressor oil

Figure 3: When using a contrast agent, it is essential to get the dosage right and attach stickers in the engine compartment