Technical Messenger

MAHLE

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A/C system leaktightness test using forming gas

If there is no or too little refrigerant in the air conditioning system, the system must be checked and leaks must be fixed before filling the system. Testing with forming gas offers a number of advantages compared to other methods.

Leaks in the refrigerant circuit are one of the most common causes of air conditioning malfunctions. If too little refrigerant is detected, a leaktightness test is required by law before the system can be filled. However, the system may not be filled with refrigerant and a contrast agent (see TM 10/2023). This is one of the many reasons why testing with forming gas is the better choice.

Advantages of a leaktightness test using forming gas

- It is much more efficient and reliable.
- The air conditioning system is tested under realistic pressure ratios.
- Leak detection is easier because the gas is lighter than air and rises upward.
- Forming gas is cheaper than refrigerants and UV dyes (UV contrast agents).
- The gas is not toxic, corrosive, flammable, or harmful to the environment.
- Any residual moisture in the system is absorbed.
- Unlike UV additives, forming gas does not impair the lubricating performance of compressor oil.

This is how the test is carried out

Forming gas test sets can be directly connected to MAHLE ArcticPRO® units. After evacuating the remaining refrigerant, the system is filled with forming gas—a mixture consisting of 95% nitrogen and 5% hydrogen. Due to hydrogen's small atomic size, it penetrates even the smallest leakage points. Leaks can then be easily detected with an electronic leak detector (sniffer). Since hydrogen is lighter than air, the sniffer's sensor must always pass above the area to be tested.

Figure 1: MAHLE leak detection kit

Figure 2: Electronic leak detector (sniffer)

Important!

MAHLE recommends using forming gas when testing the air conditioning system for leaktightness, because this method allows even the smallest leaks in the air conditioning system to be detected—even in places that are difficult to see or in places where there would be no visible leaks of compressor oil and contrast agent.