



# CO<sub>2</sub> LEAK TESTER

## Preparation:

Pull the chambers apart while turning slightly (1). Fill the center and lower chambers with fresh test fluid (approx. 10 to 12 mm) up to the mark (2). When reconnecting the chambers, hold the opening (4) at the rubber collar closed. Perform a sensitivity test to adjust the fluid to a higher reaction sensitivity (discoloration point) **at the same time:** The tester with **blue-green** fluid is then ready for use.

## Sensitivity Test:

Set the tester down vertically on the palm of your hand and breathe into the intake opening: exhale deeply and slowly, actuating the suction ball once or twice only.

The CO<sub>2</sub> content of your breath should cause **both chambers** to turn yellow after a few seconds. Finally, by actuating the suction ball several times and taking in fresh air, **regenerate the fluid in both chambers until it turns blue-green (enhanced reaction sensitivity).** **Should the fluid during the sensitivity test with breath and during regeneration with fresh air discolor only slightly, or after a long time delay, the fluid in both chambers must be replaced.**

**Always store the tester horizontally in the storage case.**

## Performing the test:

Keep the tester ready with the fluid adjusted **blue-green**. If possible, perform the test when the engine is warm (Attention! Allow the engine to cool down briefly in order to relieve the pressure in the cooling system. In case of prolonged cooling time any possibly present exhaust gases will be diluted by the ingested fresh air).

1. Open the lid of the expansion tank of the cooling system and insert the tester immediately in order to prevent the escape of any combustion gases that may be present.

Attention: do not draw in any coolant !

2. Examine the cooling system for the presence of increased CO<sub>2</sub> content by pumping the suction ball about 5 times. Closely **observe the color change in the center chamber.**

3. **Discoloration in the center chamber:**

**If the air pocket contains combustion gas (increased CO<sub>2</sub> content), the test fluid will be discolored towards yellow (= leak).**

**Even yellow-green indicates the possibility of a leak!**

**Should the fluid not be discolored towards yellow, there is no leak between the cooling system and the combustion chamber.**

## Function Principle:

- Combustion gases that have entered the cooling system through a leak (damaged gasket, crack in cylinder head or engine block) can be detected in the air pocket above the cooling water level.
- During the test, if an increased CO<sub>2</sub> content is present, the test fluid in the CO<sub>2</sub> Tester is discolored from blue-green to green to yellow.
- This increased CO<sub>2</sub> content may be caused by a leak between the combustion chamber and the cooling system.
- A CO<sub>2</sub> leak test takes only about 2 or 3 minutes and can be performed anytime, with a warm or cold engine. If the engine is warm, allow it to cool off briefly to relieve the pressure in the cooling system.
- The CO<sub>2</sub> tester is also able to detect leaks that only occur at high combustion pressure (above 30 bar), while a so-called pressure test can only be performed at approx 1 bar test pressure.

## Important! Only the discoloration in the center chamber is indicative for the diagnosis:

The fluid in the center chamber indicates an increased CO<sub>2</sub> content by discoloration, while intensive discoloration may also occur in the lower chamber – due to alkaline reaction. These are absorbed in the lower chamber and do not enter the center chamber during the CO<sub>2</sub> test.

**In case of intensive blue discoloration the fluid in both chambers must be replaced immediately.**

## Attention:

**Should the test fluid be contaminated, for instance by inadvertent drawing-in of coolant, the tester must be cleaned and the test fluid must be replaced.**

**After the completion of a CO<sub>2</sub> leak test,** the used test fluid should be disposed of, even if the test result was negative. Never pour the test fluid back into the bottle. **The fluid must be used only once.**

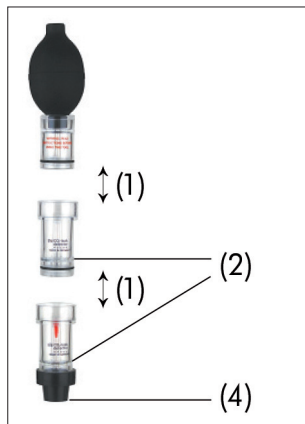
## Cleaning:

Separate the individual chambers, also pull off the valve tube from the lower chamber. Thoroughly rinse the chambers and valve tube with fresh tap water and eject the water. Do not dry the inside with a cloth or tissue. Do not use detergents or distilled water.

**Note:** The used test fluid is harmless, not flammable, acid-free and can be disposed of without any special precautions.



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## Sensitivity Test:



Set the tester down vertically on the palm of your hand and breathe into the intake opening: exhale deeply and slowly, actuating the suction ball once or twice only.



The CO<sub>2</sub> content of your breath should cause **both chambers** to turn yellow after a few seconds.



Finally, by actuating the suction ball several times and taking in fresh air, regenerate the fluid in both chambers until it turns blue-green (enhanced reaction sensitivity).

## Performing the test:



Keep the tester ready with the fluid adjusted **blue-green**. Open the lid of the expansion tank of the cooling system and insert the tester immediately in order to prevent the escape of any combustion gases that may be present. Examine the cooling system for the presence of increased CO<sub>2</sub> content by pumping the suction ball about 5 times.

**Attention: Do not draw in any coolant!**

If necessary, tilt the tester slightly. The rubber collar should be seated loosely in order not to create a vacuum.



If the air pocket contains combustion gas (increased CO<sub>2</sub> content), the test fluid will be discolored towards **yellow (= leak)**.

**Even yellow-green indicates the possibility of a leak!**

Should the fluid not be discolored towards yellow, there is no leak between the cooling system and the combustion chamber.

**Important! Only the discoloration in the center chamber is indicative for the diagnosis.**

**Note:** Diesel engines operate with a high content of excess air at low loads and the combustion gas contains a high content of unused air. Therefore, run Diesel engines prior to a CO<sub>2</sub> leak test under a high load by driving or by briefly revving the engine several times.