



Type: All
Mailing list SSO: all
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Model:
Assembly group:

Date: 2007-05-07
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Topic: Instructions on the Implementation of Tests “Proof for Glycol in Transmission Fluid” (Glycol Test) by Means of “Test Kit Hanna HI 3859” (ZF no.: 1P95 208 485)

The objective of the present instructions is to provide a transparent overview on the number of work steps to be effected. The instructions constitute a supplement to the operator’s instructions and do not replace these.

**Chemicals set: HANNA HI 3859
(ZF no.: 1P95 208 485)**

Manufacturer:

**HANNA Instruments Deutschland GmbH
Lazarus-Mannheimer-Str. 2 – 6
D - 77694 Kehl am Rhein**



1. Purpose:

The glycol test is carried out in order to provide evidence for at least 250 mg/l glycol in the transmission’s oil. This corresponds to approx. 10 ml cooling water per 30 l transmission oil. These statements are based on laboratory tests made at ZF. The tests found out that the detection limits are worse than those stated by the manufacturer (statement by manufacturers: 30 mg/l).

2. Requirements:

- ◆ Use suitably qualified personnel for sample assessment. Particularly important: Acuteness of vision and capability to distinguish between colors.
- ◆ The test location must be clean and properly light.

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3. Preparation;

- 3.1 Remove sealing cover with oil dipstick of the transmission filler tube.
- 3.2 Drain oil sample (5 to 10 ml) via the oil filler tube e.g. with an oil sample device E501 (ZF no. 0667 419 500) and, if necessary, cool down to ambient (room) temperature.

Note:

For carrying out the test, the oil sample must not be hot.

Supplement to Safety Instructions given in the operating instructions:

In the case of HI 3859A-0 reagent, you are dealing twelve-percent sulfuric acid. It has an irritating impact on eyes and skin. After unintended skin contact, wash off respective skin areas with lots of cold water. In the case of eye contact, open lid under flowing, cold water. Clean eye thoroughly. If necessary, arrange for appointment with ophthalmologist.



Avoid eye and skin contact. Wear safety goggles!

When carrying out tests, do not eat, drink, or smoke.

4. Implementation of tests:

Caution! Danger of mixing-up test elements.

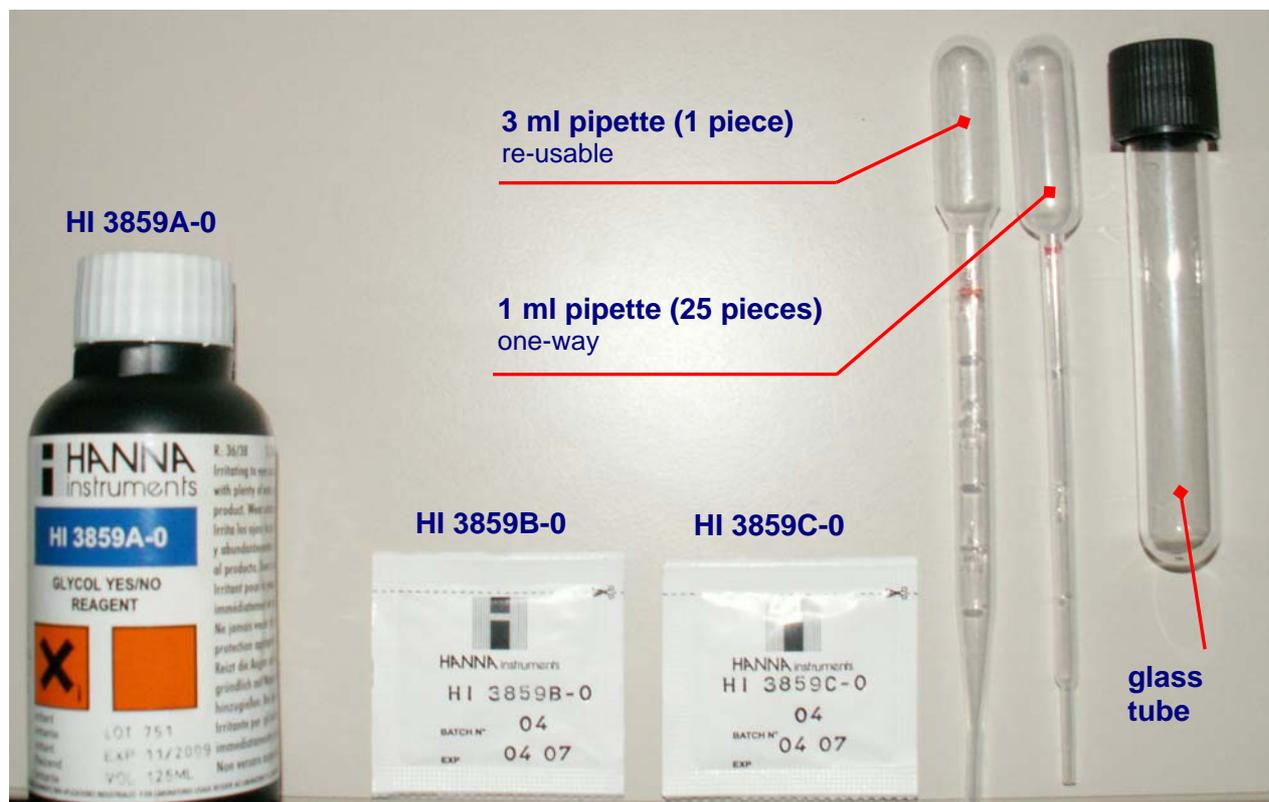
The test kit contains 2 different pipettes:

- 1 piece, pipette 3 ml (larger diameter) re-usable.
- 25 pieces, pipette 1 ml (smaller diameter) only one-way.

- 4.1 Introduce **5ml** of the reagent **HI 3859A-0** with the **3ml pipette** into one of the glass tubes.
- 4.2 Introduce **0.5ml** of the **sample** (transmission fluid) with the **1ml pipette** into the glass tube that contains the reagent. (Dispose of this pipette after use.)

- 4.3 Add the **contents of the bag HI 3859B-0** to the glass tube with the sample.
- 4.4 Close the glass tube and shake lightly until the bag's contents dissolve in the reagent.
- 4.5 Leave the sample at ambient (room) temperature for 20 to 25 minutes; or, alternatively, for at least 5 minutes in hot water (approx. 80°C) until a reaction takes place.
- 4.6 Now, add the **contents of the bag HI 3859C-0** to the glass tube with the sample.
- 4.7 Close the glass tube and shake lightly until the bag's contents dissolve in the reagent.
- 4.8 Leave the sample at ambient (room) temperature for 75 minutes; or, alternatively, for at least 20 minutes in hot water (approx. 80°C) until a reaction takes place.

Contents of chemicals set: HANNA HI 3859



5. Evaluation of the test:

Possibly existing glycol is indicated by discoloration. In the case of minor glycol contents, the color seems to vanish partially. Best period for evaluation: Approx. 1 hour before adding HI 3859-C-0.

mg/l	Color
0 to 30	yellow-brown
30 to 75	light reddish
> 75	strong red / purple

Please, always wait until the final color has been established. Changes in color may range from:

Yellow to almost transparent to lightly reddish (at lower glycol contents).
Orange to gray / green to strong red / purple (at higher glycol contents).

Test result:

Glycol content per
liter transmission oil
0 ml

Glycol content per
liter transmission oil
0.5 ml

Glycol content per
liter transmission oil
5 ml

**Note:**

Prior to using a new test, all containers used must be cleaned with a brush, water, and soap.



6. Storage / Disposal:

- ◆ The test kit must be stored in a cool and dry location.
- ◆ Reagent **HI 3859A-0** and the **samples are special waste** and must be disposed off in line with local legal provisions.
- ◆ Reagents HI 3859B-0 and HI 3859C-0 are to be disposed off in line with normal waste disposal procedures.

7. Comment:

Find descriptions in the first section of the "Operating Instructions", under "Comment", for the use of HANNA HI 3859-0/ Standard (see image) for creating a reference. Creating a reference is not part of the test as such and therefore, can be left aside.



Validity:

This Service Information is valid as of Feb. 07, 2007 for an unlimited period.