

KES

Testing Method of Fuel Filters for Automobile Diesel Engines

KES T – L241

(EST.) 1989 – 06 – 21

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1. Scope of Application

This standard shall specify mainly a performance testing method of fuel filters(Filters hereinafter) for automobile diesel engines.

2. Definition of Terminology

Definitions for terminologies used in this standards are following.

(1) Rated flow rate

It means an oil flow rate or designated oil flow rate agreed between concerned parties of transfer, and expressed in ℓ / min

(2) Slurry

Mixture of testing oil and testing contaminant.

(3) Amount of captured contaminant

It is an amount of contaminant captured by fuel filters until increase of loss of pressure is reached to specified value, and expressed in g.

(4) Loss of pressure

It is an absolute difference of pressures at the entrance and exit of filters, and expressed in $\text{kg f} / \text{cm}^2 \{ \text{MPa} \}$ or in mercurial column $\text{mm Hg} \{ \text{MPa} \}$.

(5) Degree of purity

It is an amount of contaminant in 1 ℓ of testing oil that passed through the filters, is expressed in mg / ℓ .

(6) Degree of water separation

It is an amount of water in 1l of testing oil that passed through the filters, is expressed in mg / ℓ .

3. Test Item

Test items for the filters are as following.

- (1) Loss of pressure test
- (2) Bubble test
- (3) Test for amount of captured contaminant and degree of purity
- (4) Strength of element test
- (5) Pressure resistance test
- (6) Impulse test
- (7) Vibration test
- (8) Water separation test

4. Apparatus

4.1 Apparatus for the loss of pressure, the amount of captured contaminant and degree of purity consist of an oil tank, a pump with a small pulsation⁽¹⁾, a main circuit⁽²⁾, a bypass circuit, a special nozzle, flow rate gauge, a test extraction pipe, etc., and it is as shown in additional figure1. An example is shown in the additional figure 1 and 2.

Note ⁽¹⁾ : It is recommended to have an exhaust pressure of the pump to be above 2 kg f / cm² { 0.2 MPa }, and the amount of exhaustion to be about 19 ℓ / min.

⁽²⁾ : Inside of the main circuit must be smooth and the cross section shall be circular, and be structured and shaped when piping so that contaminants will not stick on connection parts during test.

4.2 Apparatus for bubble test

For the apparatus, follow the additional table 1 of 4.1 (2) in KS B 9140 (Test method for filters for automobile lubricants).

4.3 Apparatus for strength of element

For the apparatus, follow Figure 1 of 4.1 (1) in KS B 9140.

4.4 Apparatus for pressure resistance

For apparatus, follow Additional table 4 principally.

4.5 Apparatus for impulse test

The apparatus shall principally be as shown in additional figure 5. In addition, high-efficiency filters must be able to separate water like an air filter.

5. Test Conditions

5.1 Temperature and humidity

If the temperature and the humidity in the test room is not especially indicated, follow room temperature and room humidity as shown in KS A 0006 (Standard conditions for test sites).

5.2 Testing oil

If the testing oil is not specially designated, use Number 2 of KS M 2610 (Diesel oil). However, solids in the testing oil (Non-solved petroleum ether) is recommended to be less than 2 mg / l.

5.3 Testing contaminant

If the testing contaminant is not specially designated, use specimen 8 of KS A 0090 (Dust for test use).

5.4 Slurry

Slurry shall be a mixture of 100 ml of testing oil and 4 g of testing contaminant.

6. Test Method

6.1 Using the apparatus shown in the loss of pressure test additional figure 1, while flowing oil from 0 to 100 % of the rated flow rate, measure the loss of pressure at stages of 20, 40, 60, 80 and 100 % for the rated flow rate.

Conduct the measurement of the loss of pressure within a range of 5 ~ 7 times of inner diameter of pipe, from the entrance and the exit of the filters.

However, the temperature of the oil at the entrance of the filter shall be at 38 ± 3 °C.