

Rexroth oil aging test rig RFT-OA



- Test rig test for rating the aging behavior of hydraulic fluids

Rexroth oil aging test rig

By means of the RFT-OA oil aging test bench, the aging behavior of different hydraulic fluids can be tested under defined and reproducible conditions. In this way, different hydraulic fluids can be compared with regard to their aging behavior. This supports both, the user in the selection of suitable operating fluids and the manufacturer in the testing of new lubricants.

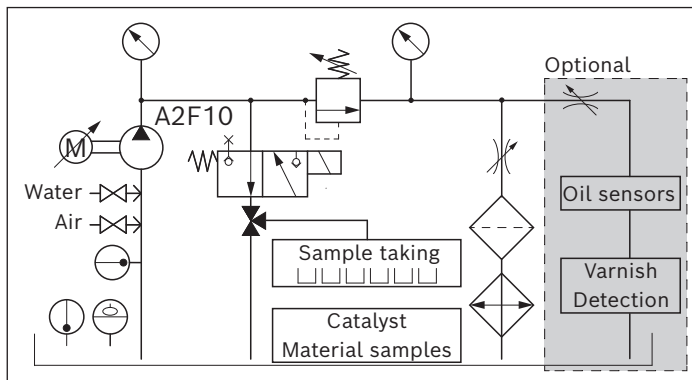
Contents

| | |
|-------------------------------|---|
| Functional description | 2 |
| Technical data | 3 |
| Rexroth oil aging test RFT-OA | 3 |

Functional description

The axial piston pump A2FO10 sucks in the hydraulic fluid to be tested from the reservoir. In the suction pipe, the temperature can be measured and air as well as water can optionally be added. A pressure relief valve is used to set the load pressure. Afterward, the fluid returns into the reservoir via a line filter and a hydraulic oil cooler. Optional, a small bypass can be used for a sensor path or for varnish detection. In the reservoir, there is the possibility to store catalysts and material samples such as non-ferrous metals or sealing materials. Using the neutral circulation, fluid samples can be taken in a fully automatic manner without test rig standstill.

▼ Schematic hydraulic circuit diagram of RFT-OA



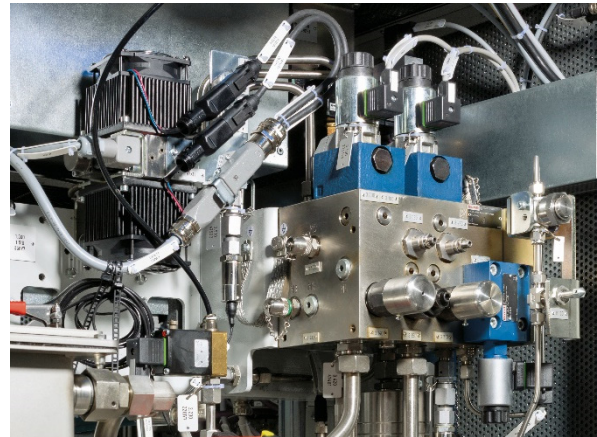
Features of the oil aging test

- ▶ Standardized test rig with very good repeatability and reproducibility
- ▶ Fully automatic sample taking allows for uninterrupted test operation



- ▶ Accelerated oil aging under practical conditions in a hydraulic circuit
- ▶ A tried and tested cleaning and flushing procedure guarantees neutral start conditions at the beginning of the test
- ▶ If necessary the test parameters can be individually adjusted to the customer requirements

- ▶ Possibility to store catalysts and material samples (e.g. seals and non-ferrous metal) in the reservoir
- ▶ A valve equipped with Peltier coolers offers the possibility of online varnish detection



- ▶ Variable speed electric motor up to 3000 rpm



- ▶ Fulfills the requirements of JCMAS P045 as well as of Bosch Rexroth
- ▶ Examination of the aging behavior under the influence of air and water via an automatic dosing system in the suction line
- ▶ A separate residual oil tank allows for simple and fast working at the test rig, especially in the test preparation

Technical data

| | |
|-------------------------------|---|
| Maximum rotational speed | 3000 rpm |
| Maximum working pressure | 400 bar |
| Maximum reservoir temperature | 100 °C |
| System filling | 8 ... 16 l |
| Tempered air dosing | 0 ... 1.9 l/h |
| Water dosing | Up to 100 ml/h |
| Sample taking | 6 samples with a maximum of 300 ml each |

Rexroth oil aging test RFT-OA

The aging test for hydraulic fluids is carried out using a bent axis pump A2FO10 and a pressure relief valve DBDS 10 K1X/400V as load at high temperatures. The test takes place under the influence of air and a copper catalyst. This procedure allows for an accelerated aging rate using a real hydraulic component.

Features of the aging test

The hydraulic fluid is checked for its aging behavior under laboratory conditions at high load. Using this procedure, fluid samples with different age conditions can be produced for further analysis.

Results

Using the fluid samples, different aging mechanisms can be examined after a test in the laboratory. For example:

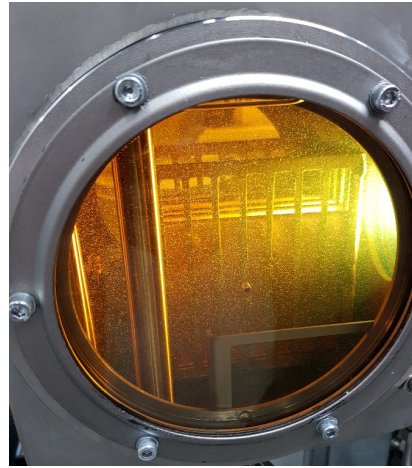
- ▶ Additive degradation
- ▶ Base oil oxidation
- ▶ Varnish formation

Depending on the base oil group and the additivation, the individual analysis procedures have to be coordinated individually.

Preparation of the test rig

Before the beginning of an aging test, the test rig must be cleaned and afterwards be flushed with the test fluid. After ideally complete draining of the system, a new filter element is installed and the system is filled with 8 l oil, ensuring the most exact weighing possible.

▼ Air bubbles and copper catalyst in the reservoir at the beginning of the test



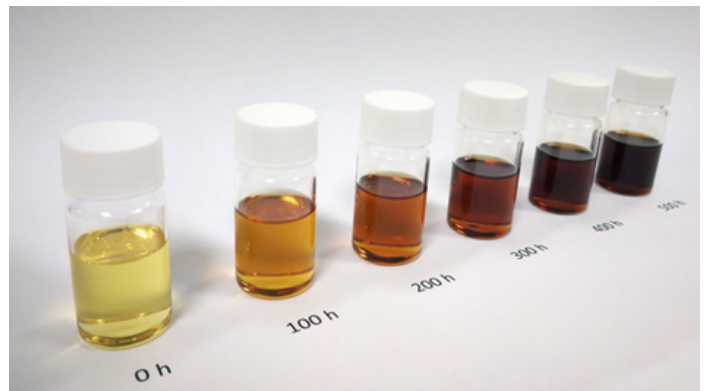
▼ Test conditions

| | |
|---------------------------------|---|
| Rotational speed | 2600±1 rpm |
| Working pressure | 350±10 bar |
| Temperature in the suction pipe | 90±1 °C |
| Air dosing | 0.1 l/h (at 20 °C) |
| Case volume (complete system) | 8 l ±40 ml |
| Catalyst | Polished copper sheet, surface 0.3 m ² |
| Operating time | 300 h |

▼ Oil sampling (time and quantity)

| Time [h] | Quantity [ml] | (Alternative) [ml] |
|----------|---------------|--------------------|
| 1 | 250 | 155 |
| 30 | 60 | 155 |
| 60 | 250 | 155 |
| 90 | 60 | 155 |
| 120 | 250 | 155 |
| 150 | 60 | 155 |
| 180 | 250 | 155 |
| 210 | 60 | 155 |
| 240 | 250 | 155 |
| 270 | 60 | 155 |
| 300 | 250 | 155 |

▼ Oil samples of an aging test



Bosch Rexroth AG

An den Kelterwiesen 14
72160 Horb a.N.
Germany
Phone +49 7451 92-0
info.ma@boschrexroth.de
www.boschrexroth.com

© Bosch Rexroth AG 2022. All rights reserved, also regarding any disposal, exploitation, reproduction, editing, distribution, as well as in the event of applications for industrial property rights. The data specified within only serves to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.