PRESERVATION

Marine transmissions

MARINE PROPULSION SYSTEMS

1 Commissioning

1.1 Commissioning after an extended downtime

Before the transmission is commissioned again following an extended downtime, perform required measures *(refer to section Corrosion protection and preservation, page 7)*.

2 Storage

2.1 Preservation with ex works delivery

The volume production transmissions as supplied by ZF Friedrichshafen AG are equipped with corrosion protection according to preservation stage I or II *(refer to tab. 1, page 5)*.

The preservation measures for long-term storage must be defined in the transmission order.

Preservation stage	Storage period	Corrosion protection	Packaging type	Implementation/Storage conditions
I	Maximally 12 months until initial operation	Internal preservation: ▪ Anticorrosion oilFuchs Renolin MR 40Z External preservation: ▪ Blank parts with corrosion protection agent Avilub Metacorin, ZF part number: 0671.090.448 ▪ Housing: finished coating or wash priming (on water basis)	▪ Transmission delivered in wooden box, not watertight. This type of packaging is only adequate for indoor storage. ▪ Customer-specific	After having received the goods: ▪ Remove packaging. ▪ Check external preservation. ▪ Repair or replace damaged protective film with specified corrosion protection agent. ▪ Store in a closed room with few temperature fluctuations and low relative humidity. ▪ Protect against dirt and moisture in the period between installation in the ship and initial operation.
II	Maximally 60 months until installation	Internal preservation: ▪ Anticorrosion oilFuchs Renolin MR 40Z External preservation: ▪ Blank parts with corrosion protection agent Avilub Metacorin, ZF part number: 0671.090.448 ▪ Housing: finished coating or wash priming (on water basis)	▪ Packaged according to the desiccant method by a specialized company corresponding to TL 8100-001, packaging stage A. ▪ A moisture indicator that can be read from the outside is attached to the packaging (indicates OK / NOK).	After having received the goods: ▪ Do not open packaging. ▪ Check packaging for damage. ▪ Read the moisture indicator. ▪ Store in a closed room with few temperature fluctuations and low relative humidity. ▪ Read moisture indicator before using the transmission and before the maximum storage period has expired. If the moisture indicator shows NOK, contact the local ZF service branch before the transmission is used. ▪ Protect against dirt and moisture in the period between installation in the ship and initial operation.

Tab. 1 Preservation with ex works delivery

2.2 Preservation of marine transmissions during storage at the customer

After expiration of the corrosion protection, the corrosion protection has to be extended, in case of preservation stage I with preservation stage III and in case of preservation stage II with preservation stage IV *(refer to tab. 2, page 6)*.

This also applies if the transmission is stored at ZF representations or ZF vendors.

The preservation measures as described below may only be implemented by staff authorized by ZF, otherwise the warranty claim shall become void.

Preservation stage	Storage period	Corrosion protection	Packaging type	Implementation/Storage conditions
III	Extension of preservation stage I *(refer to tab. 1, page 5)* by another 12 months. This type of extension can be repeated twice at maximum. If stored for more than 36 months, perform measures of preservation stage II *(refer to tab. 1, page 5)*.	Internal preservation: ▪ Corrosion protection oil according to MIL-PRF-21260E NATO code C-640 or C-642 or TL 9150-0037 according to BAAINBw External preservation: ▪ Blank parts with corrosion protection agent corresponding to MIL-C-16173D Typ 4, K 19 or TL 8030-015, Typ 4 according to BAAINBw ▪ Housing: finished coating or wash priming (on water basis)	▪ Transmission delivered in wooden box, not watertight. This type of packaging is only adequate for indoor storage.	▪ Fill the transmission with the specified corrosion protection oil to the upper measuring mark of the oil dipstick. ▪ Immediately after having filled the corrosion protection oil, perform preservation run for at least 5 min at an engine speed of 500 rpm in enginewise rotation and counter-rotation shift position each. ▪ Check external preservation. ▪ Repair or replace damaged protective film with specified corrosion protection agent. ▪ Store in a closed room with few temperature fluctuations and low relative humidity. ▪ Protect against dirt and moisture in the period between installation in the ship and initial operation. ▪ Observe Shelf Life Extension.
IV	More than 60 months up to 96 months	Internal preservation: ▪ Preservation run without load with corrosion protection oil according to MIL-PRF-21260E NATO code C-640 or C-642 or TL 9150-0037 according to BAAINBw ▪ Completely drain corrosion protection oil. External preservation: ▪ Blank parts with corrosion protection agent corresponding to MIL-C-16173D Typ 4, K 19 or TL 8030-015, Typ 4 according to BAAINBw	New packaging according to preservation stage II *(refer to tab. 1, page 5)*	▪ Visually inspect transmission and replace aged parts. ▪ Store in a closed room with few temperature fluctuations and low relative humidity. ▪ Read moisture indicator before using the transmission and before the maximum storage period has expired. If the moisture indicator shows NOK, contact the local ZF service branch before the transmission is used. ▪ Protect against dirt and moisture in the period between installation in the ship and initial operation. ▪ Observe Warranty Reinstatement Policy.

Tab. 2 Measures at the customer to extend the ex works corrosion protection before installation in the ship

3 Decommissioning

3.1 Corrosion protection and preservation

The corrosion protection measures required in the event of extended breaks in operation for a transmission installed in the ship depend on:

- Temperature fluctuations
- Atmospheric humidity
- Air salt content in the machine room

The recommended actions and time information therefore only represent rough reference values.

NOTICE

Property damage due to uncontrolled movement of the ship during preservation run possible.

⇨ Ensure sufficient free space around the ship.

⇨ Moor ship.

⇨ Mechanically separate output from transmission.

Preservation stage	Downtime period	Corrosion protection	Implementation/Storage conditions
V	Up to maximally 12 months	No special corrosion protection required. The transmission oil may remain in the transmission.	▪ Start the engine every 10 to 20 days and, for lubrication purposes, allow the transmission to run for at least 5 min at engine idle speed or at a slightly increased engine speed. In doing so, the transmission can be in neutral, enginewise rotation or counter-rotation shift position. ▪ Prior to recommissioning, check the oil for condensate. This test must take place immediately after switching off the engine. The oil may not be opaque. ▪ Adhere to oil change intervals *(refer to Section Maintenance work 141: Changing the oil)* in the corresponding operating instructions.
VI	12 months to maximally 36 months	Internal preservation: ▪ Corrosion protection oil according to MIL-PRF-21260E NATO code C-640 or C-642 or TL 9150-0037 according to BAAINBw External preservation: ▪ Blank parts with corrosion protection agent corresponding to MIL-C-16173D Typ 4, K 19 or TL 8030-015, Typ 4 according to BAAINBw ▪ Housing: finished coating or wash priming (on water basis)	▪ Fill the transmission with the specified corrosion protection oil to the upper measuring mark of the oil dipstick. ▪ Immediately after having filled the corrosion protection oil and every 12 months, start the engine and let transmission run for at least 5 min at engine idle speed or at slightly increased engine speed in enginewise rotation and counter-rotation shift position each. ▪ Check external preservation. ▪ Repair or replace damaged protective film with specified corrosion protection agent. ▪ Protect against dirt and moisture. ▪ Prior to recommissioning, completely drain the corrosion protection oil and fill the transmission with the specified oil grade and oil quantity *(refer to Section Maintenance work 141: Changing the oil)* in the corresponding operating instructions.

Tab. 3 Measures at customer before and after a downtime

Preservation stage	Downtime period	Corrosion protection	Implementation/Storage conditions
VII	36 months to maximally 60 months	Internal preservation: ▪ Corrosion protection oil according to MIL-PRF-21260E NATO code C-640 or C-642 or TL 9150-0037 according to BAAINBw External preservation: ▪ Blank parts with corrosion protection agent corresponding to MIL-C-16173D Typ 4, K 19 or TL 8030-015, Typ 4 according to BAAINBw ▪ Housing: finished coating or wash priming (on water basis)	▪ Visually inspect transmission and replace aged parts. ▪ Check external preservation. ▪ Repair or replace damaged protective film with specified corrosion protection agent. ▪ Protect against dirt and moisture. ▪ Fill the transmission with the specified corrosion protection oil to the upper measuring mark of the oil dipstick. ▪ Immediately after having filled the corrosion protection oil and every 12 months, start the engine and let transmission run for at least 5 min at engine idle speed or at slightly increased engine speed in enginewise rotation and counter-rotation shift position each. Do not perform the following four steps in case of labyrinth seals and chamber seals. ▪ Completely fill the transmission with the specified corrosion protection oil. ▪ Close opening of oil dipstick. ▪ Remove breather. ▪ Seal all openings. ▪ Prior to recommissioning, completely drain the corrosion protection oil and fill the transmission with the specified oil grade and oil quantity *(refer to Section Maintenance work 141: Changing the oil)* in the corresponding operating instructions.

Tab. 4 Measures at customer before and after a downtime (continued)

4 Annex

4.1 Subject index

4.2 Overview of revisions

Date of issue	Initiator	Chapter	Comment
2017-05	–	–	First edition

Tab. 5 Overview of revisions

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