

INTERMEDIATE SHAFT BEARING

KMFN TYPE

(FORCED LUBRICATION SYSTEM)

I N S T R U C T I O N M A N U A L

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a division of EAGLE INDUSTRY CO., LTD.

This instruction manual is a guidebook for your installation and maintenance works on KEMEL COMPANY KMFN Type Intermediate Shaft Bearings.

A sketch illustration is attached hereto. As to dimensions of every part, please refer to separate assembly drawings.

1. Checks prior to the installation

1-1 A set of KMFN Type Intermediate Shaft Bearing is usually packed in one case. The fitting bolts, chock liners, pressure gauge and etc., like optional items and oil cut ring are to be separately packed, but these are in the same package with Bearing body.

1-2 On unpacking, check if every part is in good order and condition.

1-3 Remove the upper body (2) from lower body (1) and check if the inside of oil tub and the babbitted surface of bearings are clean without dust and other foreign particles.

2. Preparatory arrangement before installation

There are two sorts of practices as to the preparatory arrangement before installation of the Intermediate shaft bearing.

One is to make the arrangement on board, where the intermediate shaft is incorporated with the line shaft bearing put in place.

The other is to do it in factory, where the shaft is assembled with the bearing and then the assembly is moved to the location on board.

In this instruction manual, the latter (in factory) is explained as follows.

2-1 Remove the side covers (10) from the bodies.

2-2 Remove the upper body (2) from the lower body (1), take anti-corrosive paint (NOX-RUST 366) off by thinner or other liquid removers and check if babbitted surfaces and all other interior parts are clean without dust and other foreign particles. Make the babbitted surfaces wet by lube oil.

2-3 Clean the journal of corresponding intermediate shaft and make it wet by lube oil. put the shaft on the lower body (1) of the bearing.

2-4 Put slippery paper like paper-board (1 m/m in thickness, 100 m/m in width, about 100 m/m over babbitt metal length) on the journal to prevent from bearing sliding, when using crane.

2-5 Mount the upper body(2) on the lower body(1) and temporarily fasten it by bolt s.

2-6 Set the side covers (10) in place and temporarily fasten them to the bodies by bolts.

2-7 The bearing and shaft are in a bloc now.
Move the assembly to the location on board using crane.

3. Installation

3-1 Remove the side covers (10) ,upper body (2) and put rubber made oil cut rings (14) on the journal shaft tentatively.

3-2 Apply jack bolts to the corresponding holes of lower body (1) and adjust the height of shaft center line by operating the bolts.

3-3 Adjust the location of bearing against the portside to starboard direction, keeping an even gap between the babbitted surface and the intermediate shaft.

3-4 Set the oil cut rings(14) according to the DWG and fix it on the shaft with spring ring.

3-5 Apply sealant(Non-dry, Oil resistance) to mating surface on lower housing slightly. Then do not flood of the sealant to outside of housing.
Fix the upper body(2) on the lower body(1). Tight them by bolts and reamer bolts.

3-6 Fix the side covers (10) to the body applying gasket packings.
Make sure of even clearance between the intermediate shaft and the inner face of side covers.

3-7 Machine the chock liners to obtain the necessary thickness.

3-8 Machine reamer holes on the lower body (1) and apply the fitting bolts tightly.

3-9 Fix the lube oil pipe in place. Fix the thermometer in place.

3-10 Now the bearing is ready for turning of shaft.
Prior to turning of shaft, it is necessary to feed with the oil.

4. Lube oil piping

4-1 L.O. pipe line for Intermediate shaft bearing is usually branched off from the L.O. line for the main engine.

In this case, the inlet oil pressure to the bearing must be about 0.10 ~0.20 MPa by operating the valve on inlet pipe or having an orifice in the L.O. inlet pipe.

4-2 The size of drain line from intermediate shaft bearing should be bigger or same size compared with flange size of bearing.

4-3 For the purpose of preventing oil leakage from bearing, it is better to install the air vent on the drain line.

5. Lube oil

The same lube oil as main engine oil can be used.

The recommended viscosity is ISO-VG 100/150 or SAE 30/40.

When the lube oil becomes dirty, change it.

In general, renewing of oil every 3000 hours is advisable.

6. Setting the supplied oil pressure

6-1 Oil supply pressure in the Intermediate shaft bearing is to be set by 0.10 ~0.20MPa at MCR condition by operating the valve on the inlet pipe line. This value(0.10~0.20MPa) is based on the lubricating condition and oil leakage in the Line shaft bearing.

Considering cooling and lubricating effect to the Line shaft bearing, It is better to supply much oil to the bearing.

If the oil supply pressure rises by the increase of oil supply, pay attention to oil leakage from the Intermediate shaft bearing and adjust oil pressure.

7. Check Point during operation

7-1 Though depending on atmosphere temperature, the expected normal temperature of the bearing is 30°C to 60°C, during the rotating of shaft.

In the case of temperature exceeding 60 °C, check if the lube oil supply is all right, or if there is any increase of bearing load due to a change of bearing alignment including hull deformation.

7-2 Others

1) Prior to every turning of shaft, confirm oil feed in the pipe line.

2) In case oil leaks through the clearance between side cover(10) and shaft, the following possibility is thought :

A) Reversed air flow is generated in oil return pipe to sump tank.

B) Amount of oil supply is too much and oil is overflowed from oil cut ring(14)

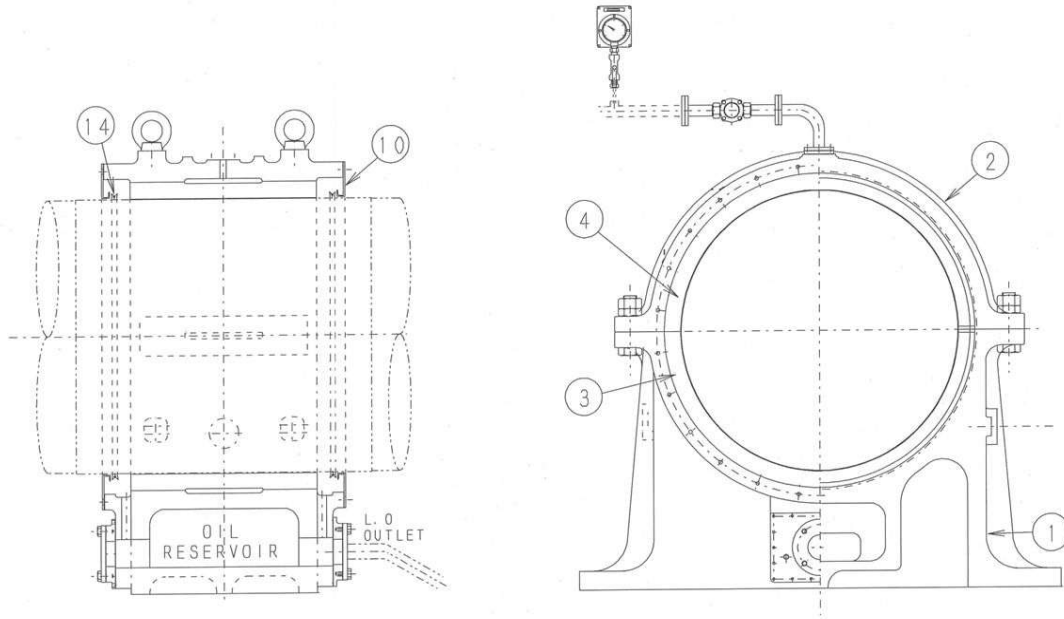
For A), following methods are effective;

① Install Air vent pipe on oil return pipe to sump tank

② Install U-tube for oil return pipe to sump tank

③ Soak the tip of return pipe into sump tank

For B), lower the oil supply amount by adjusting oil supply pressure at first. (Please pay attention the increase of bearing temp.)



PARTS LIST

ITEM	DESCRIPTION
1	LOWER BODY
2	UPPER BODY
3	LOWER BEARING
4	UPPER BEARING
10	SIDE COVER
14	OIL CUT RING

OIL CUT RING POSITION

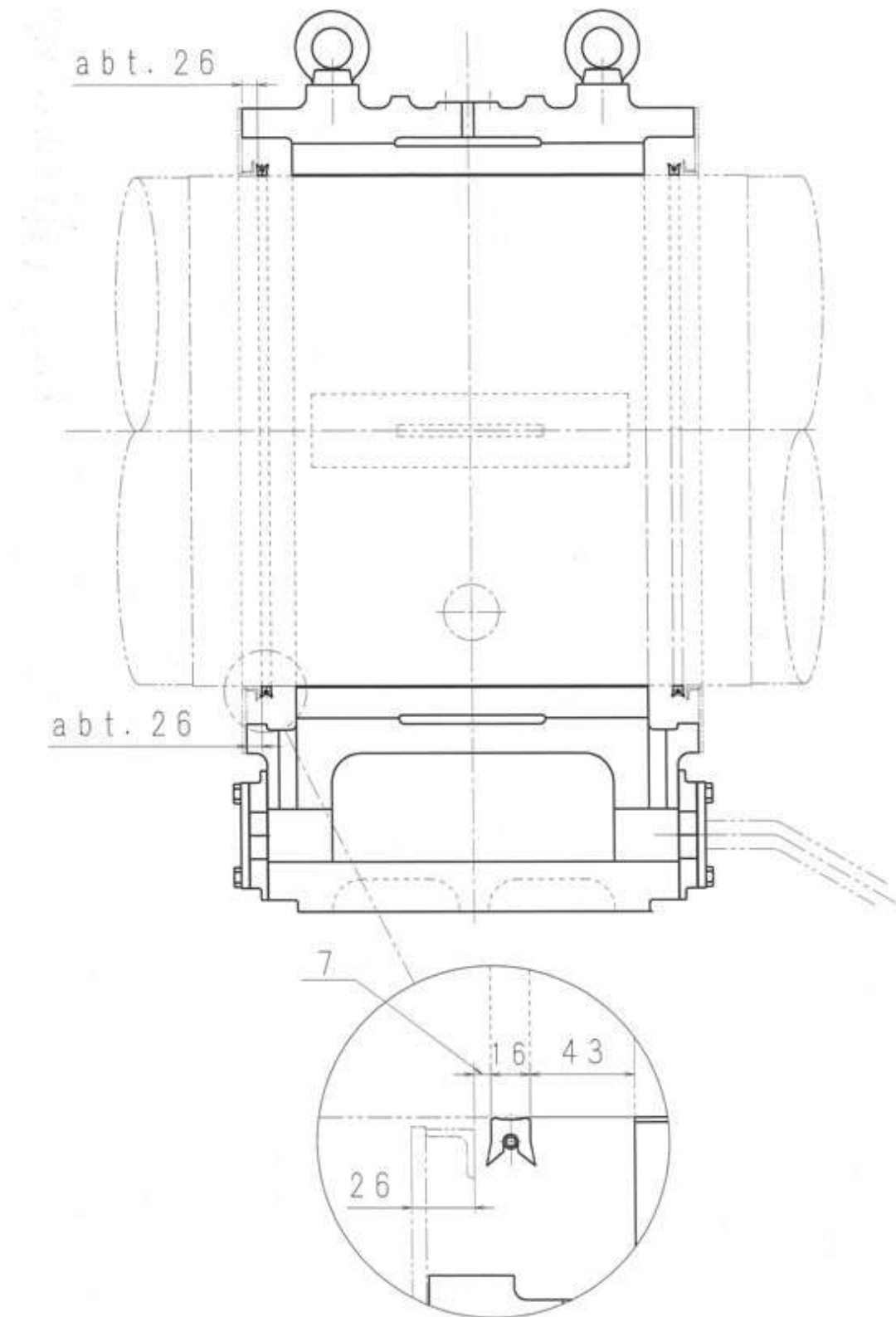


Table.1 Trouble shooting of intermediate shaft Bearing
(Forced Lubrication Type)

Trouble	Possible cause	Countermeasures
Oil leakage from side cover	<ul style="list-style-type: none"> • Too much amount of supply oil • Blockage in the outlet pipe from intermediate shaft bearing • Not in good order position of oil cut rings • Oil mist from side cover 	<ul style="list-style-type: none"> • Reduce the oil pressure within the range. • In case the valve is installed on outlet pipe, check the condition of it. If closed, open the valve. • Adjust the position of oil cut ring in accordance with the DWG • Install air vent or U-tube on return pipe to sump tank • Soak the tip of return pipe into sump tank
Oil leakage from the clearance between upper and lower body	<ul style="list-style-type: none"> • High pressure of supply oil • Loose the foundation bolts for upper and lower body • Some foreign particles caught on mating surfaces of upper and lower body • The defective contacting of flanges 	<ul style="list-style-type: none"> • Adjust the valve on the inlet pipe and reduce the oil supply pressure by 0.10~0.20MPa at MCR. (See chapter 6 in this instruction.) • Tighten the bolts of upper and lower body. • Open the upper body. Clean the surfaces of split parts. • Put a sealant slightly on the surface.
Increase of bearing temp	<ul style="list-style-type: none"> • Defect of thermo sensor • Shortages of lube oil • Increase of bearing load due to a change of bearing alignment 	<ul style="list-style-type: none"> • Check the thermo sensor. • If the bearing temp. does not increase suddenly and is kept less than 60 °C, there is not any problem. If the bearing temp. rises by 60 °C, increase the amount of supply oil by adjusting the valve on the inlet pipe. • In case of high temp. due to miss-alignment, it is necessary to inspect the shaft alignment by shipyard.