



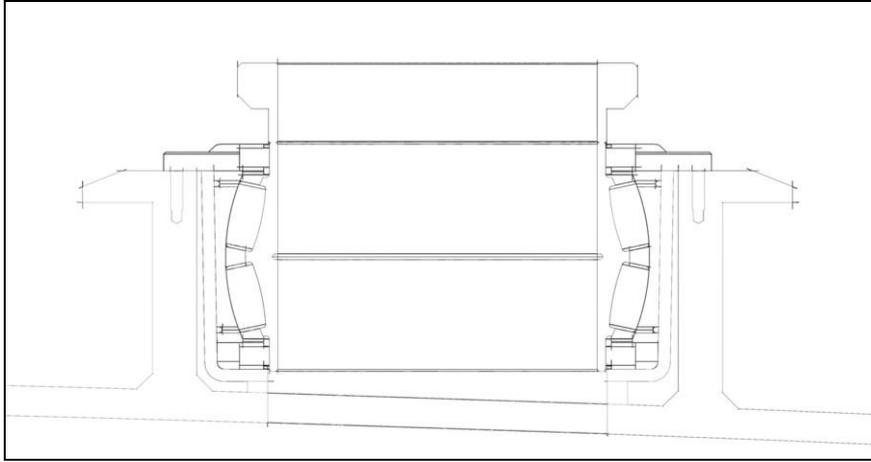
Installation Service INSTRUCTIONS

type 4 rudder bearings

Aluminium hull : p2
Composite hull : p3

Instructions for both versions : p4to 13

TYPE 4 BEARING INSTALLATION IN METAL HULLS



For a new installation the recommended method for installing a Type 4 bearing in a metal hull is in combination with a tapered JP3 composite housing.

These housings are available bearing in two mounting styles, designed for either mount the bearing either internally or externally. Both mounting options use the bearings mounted in a conical tapered housing which is chock fasted into the metal hull structure.

The use of the composite housing between the bearing and the chockfast allows the bearing to be removed for future maintenance.

External Mount

The bearing housing and bearing are installed so the bearing can be removed outwards. The bearing is retained in the hull by fasteners through the composite housing and an extended metal flange from the hull structure.

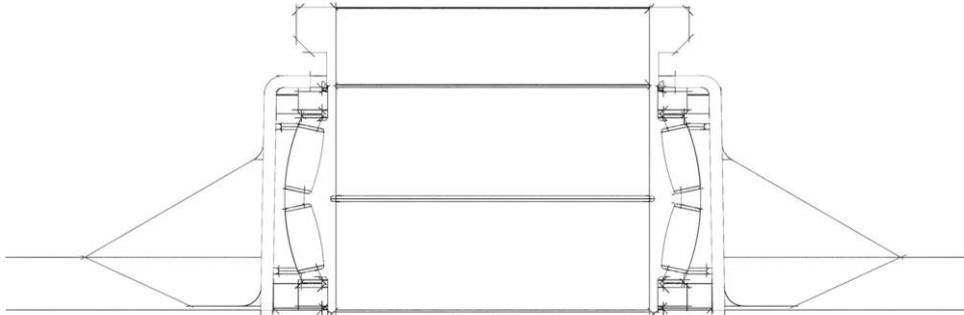
Internal Mount

The bearing housing and bearing are installed so the bearing can be removed inwards into the boat. The bearing is retained in the hull by fasteners in through the external flange into the supporting hull structure.

Metal Stocks

The mounting detail for mounting a rudder with a metal stock is the same as the internal mount.

TYPE 4 BEARING INSTALLATION IN COMPOSITE HULLS.



Our tapered **Type 4** bearings designed to be installed with our GRP housings

These bearings and housings are available in two mounting styles, designed to either mount the bearing externally or internally

External Mount

External mount bearings feature a conical tapered housing.

The bearing housing and bearing are installed so the bearing can be removed outwards. The bearing is retained in the housing by fasteners in through the return flange.

Internal Mount

Internal mount bearings feature the same a conical tapered housing with the addition of an external flange.

The bearing housing and bearing are installed so the bearing can be removed inwards into the boat. The housing is bonded into the hull shell with the external flange up for a lower bearing.

The bearing is retained in the housing by fasteners in through the external flange.

INSTALLATION

Three typical Installation Layouts are shown on pages 4-7

Lower Bearing External Mount

Lower Bearing Internal Mount

Top Bearing

G.R.P HOUSINGS

Remove peel ply from GRP housing and position the housing on the hull or deck.

Laminate the bearing and supporting structure in accordance with the designer's specification.



When laminating the housing, it is recommended that you place the rudder bearing into the housing to make sure the housing keeps its original shape.



Only laminate on the sides of the housing, making sure **NO laminate (especially carbon fiber)** comes in contact with the bolts that fix the bearing in the housing.

BEARING INSTALLATION.

Type 4 bearings leave the factory lubricated and ready to install.

Once the housing is laminated in place. Lightly grease the external surface of the bearing especially in way of the external o-ring



It is recommended a small bead of silicon sealant is applied in the upper corner edge of the housing. For an external mount bearing this should be applied in the upper internal corner of the housing. For an internal mount bearing on the inner edge of the upper flange, inside the ring of bolts

Slide the rudder bearing in the housing and tighten the fixing bolts.

SEALING THE BEARING IN THE HOSUING

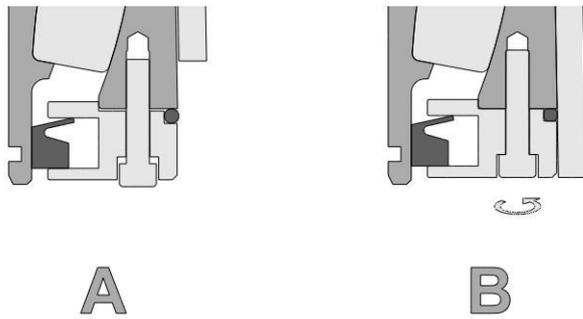
The Type 4 bearings are sealed in the housing by one of two systems.

TYPE 4

The original Type 4 series external mount bearings are fitted with an o-ring just above the lower seal carrier. The bearings are shipped with the fasteners that hold the seal carrier on the opposite side of the fixing bolts loose (As shown in Picture A)

These fasteners also clamp and expand the outer o-ring seal making the bearing watertight.

After installing the bearing into the housing, tighten all the bolts of the seal carrier to squash the o-ring (As shown on picture B).



A

B

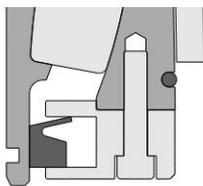
TYPE 48

The new Type 48 series have two o-ring grooves machined in the outer race. While there are two grooves only the groove nearest the hull (or deck) should have an o-ring fitted.

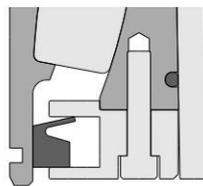
Ensure the outer surface of the bearing is lightly greased and O-ring and groove is well greased before installation (As shown in Picture C)

The action of fitting the bearing into the tapered housing provides the o-ring. (As shown in Picture D)

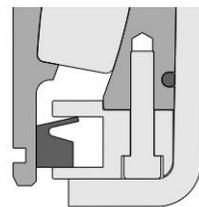
For a bearing mounted internally crush is provide in the same way. The o-ring will be as shown in Picture E.



C



D



E



Do not paint or antifoul the seals.



Do not use any resin, gel coat or any sort of glue or paint on the upper and lower plates of the type 4 rudder bearings.



Please note the bearings are adjusted in our workshop. Do not dismantle them.

RUDDER STOCK SLEEVES

Remove peel ply from Rudderstock sleeve.



Make sure the rudderstock sleeve is fitted with the chamfered edges up

Laminate the sleeve in accordance with the designer's specification.



When gluing the sleeve, it is recommended that you place the sleeve in the rudder bearing make sure the sleeve keeps its original shape.

RUDDER INSTALLATION.

Lightly grease the surface of the stock before fitting in order not to damage O-rings.

Fit the rudder retaining rings as the rudder is fitted, adjust rudder height and clamp.

MAINTENANCE

While no further immediate maintenance is required the rudder bearings like all moving parts will require cleaning and maintenance. This can easily be scheduled around other work and haul outs.

We recommend the following schedule as a minimum.

ANNUALLY

When the boat is hauled for underwater maintenance such as the antifouling the rudder bearing should be inspected externally and for movement.

EVERY SECOND YEAR

When the rudder is removed is a good time to also remove and inspect the rudder bearing.

EVERY FIVE YEARS - SERVICE

The rudder bearing is removed and returned to the factory for a full service.

Typically this will involve disassembly, a full clean and reassembly with new seals. JP3 has a large dealer network and in a lot of locations a local agent can service bearings.

The exact schedule of when a bearing may need servicing is very dependent on usage and the need to service the may vary.

SERVICING.

It is preferable that Type 4 / 48 bearings are serviced by the factory or a JP3 agent. The main reason for this is there may be parts needed, other than the seal kit, that are not always obvious from an external inspection and these need to be made at the factory.

However to service the Type 4 / 48 bearings it is a relatively simple process. Prior to disassembly and servicing contact the JP3 factory for the appropriate service kit for your bearing.

SERVICE KITS.

A service for each bearing is available from the factory or a JP3 Agent. You will need to the bearing part number, i.e. 48.22.30.

These kits contain

- Bearing Seals
- Internal and external O-rings
- A tube of grease
- Silicon oil for lubricating the outer race
- Special tool for in situ lubrication of the bearing if needed.

DISASSEMBLY.

Remove the seal carrier from each side of the bearing by loosening and removing retaining Hex Head screws.

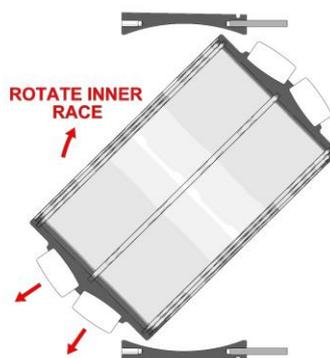
The seal carriers may be tight on the main outer race as a result of age. The carriers are fitted with threads plastic plugs to allow for jacking screws to be fitted to help separate the parts.



Before you continue, count the number of rollers visible in the outer row and note this down.

While the two roller bearings have an equal number of rollers in each row, the three roller bearings do not and there are more rollers in the middle row. Counting the number of rollers in the outer will record this for reassembly.

Place the bearing on it's side and rotate inner race so the rollers fall out.



The inner race can now be removed.

CLEANING AND INSPECTION

Thoroughly inspect and clean all the parts with a solvent cleaner such as 'Wax & Grease Remover'.

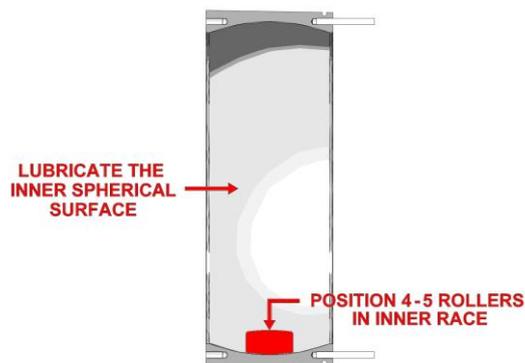
If there are any signs of corrosion, contact the factory for advice.

When cleaning take special care not to damage the surface. DO NOT USE any sharp scrapers such as chisels.

RE-ASSEMBLY.

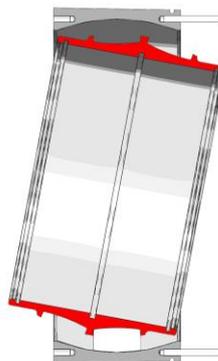
Prior to reassembly, lubricate the inner spherical surface of the outer race with the silicon oil supplied in the service kit.

Position 4-5 rollers in the inner race aligned with the rolling direction.



Fit the inner race inside the outer race so that it is sitting on the row of 4-5 rollers.

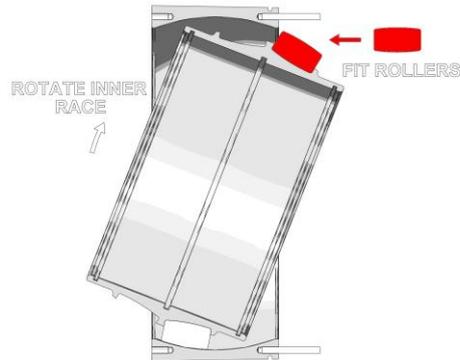
If you are servicing a three roller bearing position the inner race so the 4-5 rollers are in the middle roller track.



Rotate the inner race and 4-5 rollers so the opposite side of the roller track that has the first 4-5 rollers in it just exposed at the upper edge and a roller can be placed in the track.

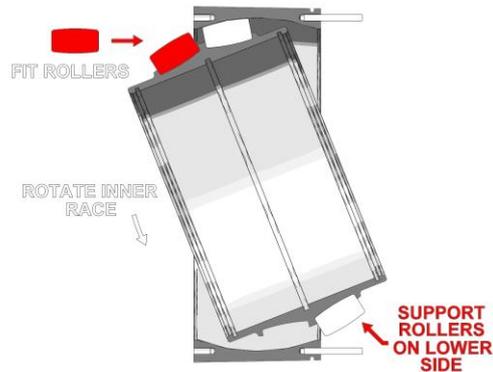
Fit the rollers in the track and slide these down until the track is filled.

Remember if you are re-assembling a three roller bearing the middle track will have more rollers than the outer tracks. Refer to the number of rollers you counted prior to disassembly.

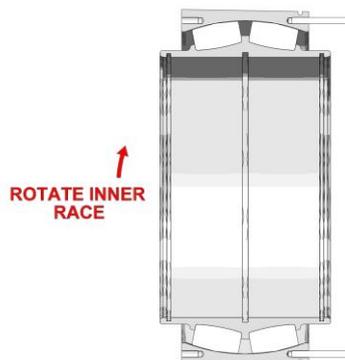


Rotate the inner race and the first track of roller in opposite direction so the other roller track is just exposed at the upper edge and a roller can be placed in the track.

NOTE: Rotating the inner race like this will allow the rollers in the first track to fall out. You must hold these rollers in the track. This can be done with a cupped hand.

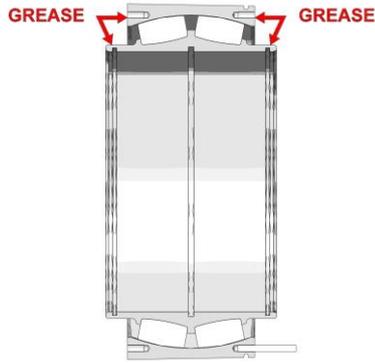


With rollers fitted to both (or all three) tracks rotate the inner race straight and check the bearing operation. The bearing should run freely and align easily.



Before the seal and seal carriers are fitted there are number of surfaces that need to be lightly greased to assist with the sealing on the V-ring seals and seal carrier.

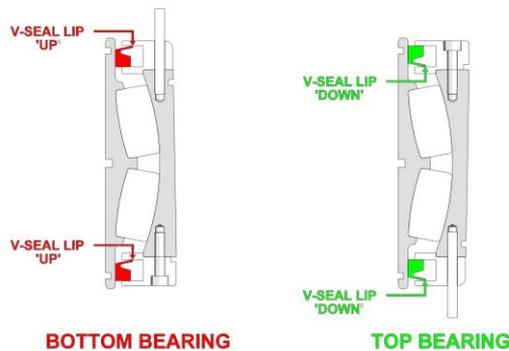
Lightly Grease the inside surfaces of the seal carriers where the V Seals rim.



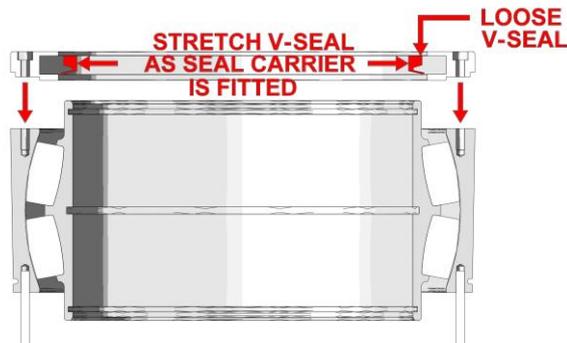
Fit each V-seal and seal carrier.

SEAL ORIENTATION.

The lips of BOTH seals should be away from the water so the water pressure pushes in the seal lip.



The un-stretched V-Seal has a smaller internal diameter than the matching surface so it needs to be stretched and worked onto the inner race.

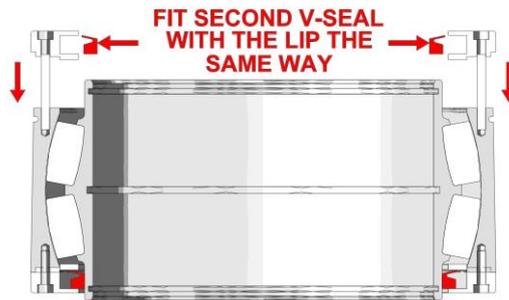


The seal and seal carrier are fitted together. The process to fit the seal is a little like fitting a bicycle tire to a wheel. Fit the seal in the seal carrier and stretch the seal over the inner race at the same time, working your way around the diameter.

Make sure the lip of the seal is inside the groove in the seal carrier. If not the seal will leak and will be damaged. This can be done with a visual check. It is possible to lift the seal carrier enough to see if the seal is correctly located.

Turn the bearing over and repeat the process with the second seal carrier.

Make sure the v seal is the same way as the first seal. Note the seal will be up the other way in the seal carrier as the bearing has been turned over.



Check the seal is correctly located in the seal carrier.

Refit and tighten the fasteners using a Zinc Chromate anti corrosion paste such as Duralac or equivalent.

Check the operation and articulation of the bearing. Depending on the size the bearing may be hard to turn by hand. This is normal

Refit fit the external and internal o-rings. The bearing should be reassembled ready for installation.



LUBRICATION

Type 4 bearings do not need regular lubrication. The bearings are shipped with the outer races from the factory with the outer races pre-lubricated with silicone oil.

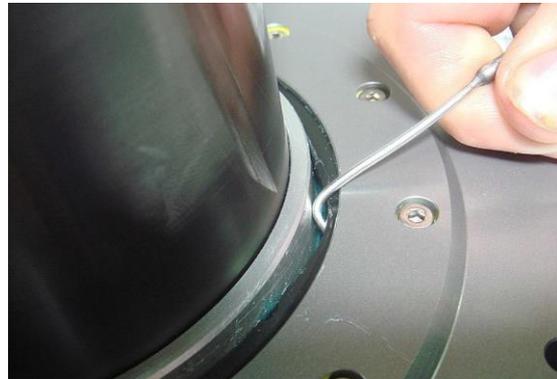
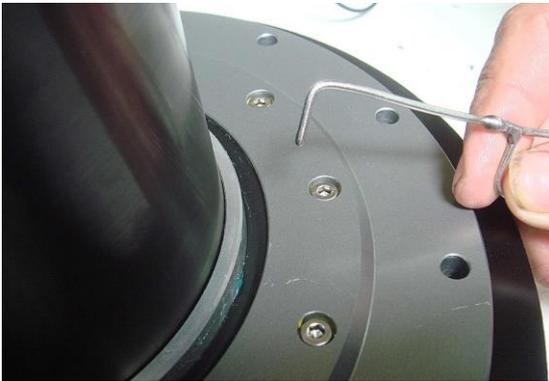
On rare occasions some bearings make a noise which sounds like a large creak. This noise occurs when the rollers are trying slide under load in the outer race as the rudder stock deflects and is more likely to occur the boat is reaching in waves. The rudder loads up the bearing rollers which grip in the outer race and do not always slide. At some point as the rudder deflects the grip 'releases' result in the noise.

This noise can usually be eliminated by adding a small amount of the silicone oil to the bearing in quite a simple procedure. Identify which bearing is

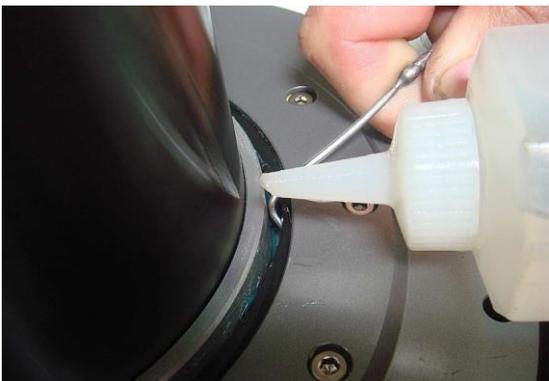
It will be necessary to loosen and lift the rudder retaining ring to provide better access to the top of the bearing.



Make sure the rudder is adequately supported and cannot move.



With the tool supplied, hook the inner edge of the seal to provide access to the rollers



Add a few drops of the silicone oil supplied through the gap in the seal. Rotate the rudder back and forth to help distribute the oil through the bearing. The oil



Be careful to ensure the silicone only goes in the bearing as it can contaminate areas that may need to be painted.

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