# BEARING HOUSING REPLACEMENT— 48" HYDROCUSHION MACHINES



## Symptoms of Impending Bearing Failure and How to Avoid It

The bearings on your MILNOR machine are designed for long, trouble-free service under continuous use. Strict adherence to the lubrication schedule is the best way of prolonging service life. Eventually, however bearings and seals may require replacement. Aside from catastrophic bearing failure which will probably cause the machine to seize up, some possible early warning signs of bearing failure are as follows:

- Extract motor overload trips—If this begins to occur with increasing frequency and all other possible causes (such as a dragging clutch tire or improper draining of machine) are ruled out, then suspect the bearings.
- Water constantly flowing or dripping from the bearing housing leak off cavities during operation—indicating that the bearing housing seals are leaking.
- A grinding noise coming from the bearing housing—Even though such a noise probably indicates that the bearings are going bad, their service life might be extended somewhat by greasing the bearings more frequently than called for on the preventive maintenance schedule, especially if this action is found to reduce the grinding noise.
- Bearing housing hotter than normal—It is normal for the bearing housing to heat up during operation. If however, the housing seems much hotter than the hottest bath temperature, suspect a bearing problem.

**Bearing replacement is major maintenance which should only be performed by qualified maintenance personnel experienced in this type of procedure.** If the customer does not have such personnel, it is recommended that the authorized MILNOR dealer perform this maintenance.

The best way to minimize down-time resulting from bearing failure is to perform the bearing changeout before the bearings on your machine catastrophically fail. This means **inspecting your machine regularly** and making all preparations for bearing housing replacement when the symptoms of bearing failure appear, including having the fixtures described herein and replacement housing on hand.

## Synopsis of Changeout Procedures

The recommended procedure for bearing replacement is to replace the entire bearing housing. Replacement housing assemblies and the two fixtures required are available from the MILNOR factory. The fixtures are supplied on a rental basis and returned to the MILNOR factory, along with the old bearing housing after completing the changeout procedure. A credit will be issued for the salvageable parts of the old bearing assembly.

One fixture is mounted to the front of the machine and supports the cylinder once it is detached from the cylinder shaft. **It is not necessary to remove the shell front or cylinder from the machine.** To access the bearing housing, the following components must be removed from the machine:

- Rear HYDRO-CUSHION cylinder.
- Rear intermediate cross brace—some pneumatic lines, water piping, etc., must be disconnected in order to remove this component. Electric boxes need not be removed.
- Main drive belts and pulley.

The other fixture supplied with the changeout kit consists basically of a rail, trolley and hoist. This fixture is mounted to the rear of the machine and is used to support the weight of the bearing housing as it is withdrawn from the shell.

The replacement bearing housing and other components are reinstalled in the reverse order of removal. When withdrawing the old housing and positioning the new one, a maintenance person is required inside the cylinder to help guide and support the housing.

## Bearing Housing Changeout Procedures

### Setup

1. Have a minimum of two qualified maintenance personnel on hand for the entire procedure.
2. Verify that all components of the changeout kit have been provided (refer to kit parts list).
3. The bearing housing replacement procedures require that the cylinder is positioned with one rib at the 12 o’clock position and the door open. Energize the washer and jog the cylinder into position.

**⚠WARNING⚠**

**CRUSHING AND ENTANGLEMENT HAZARDS**

- **Drive belts and other moving parts in this machine can entangle, crush, and sever limbs.**
- **Lock OFF and tag out washer-extractor power at the external disconnect box before continuing this procedure.**

**Gaining Access to Bearing Housing**—Refer to FIGURE 1 and proceed as follows:

1. Remove the rear access panels.
2. Measure and record the distance between the shell rear bracket and the lower cross brace prior to removing the HYDRO-CUSHION cylinder.
3. Remove the rear HYDRO-CUSHION cylinder.

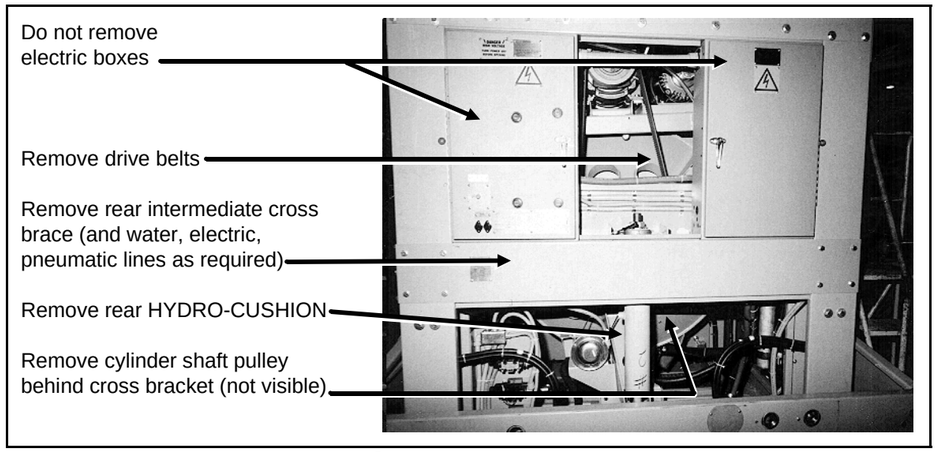


**FIGURE 1** (MSSMA403AE)
**Gaining Access to Bearing Housing**

4. Remove the rear intermediate cross brace. Inspect brace for any pneumatic lines, water piping, hoses, electric lines, etc. Disconnect only those lines that are in the way and **be sure to mark them for proper reconnection.**
5. Remove the drive belts and cylinder shaft drive pulley.

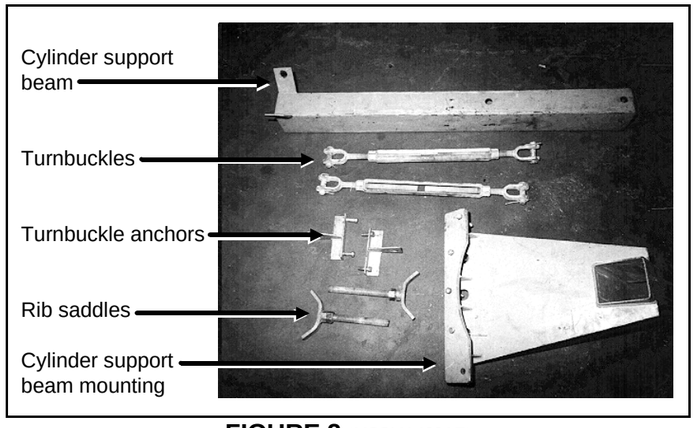


**FIGURE 2** (MSSMA403AE)
**Components of Cylinder Support Fixture**

## Installing the Cylinder Support Fixture

1. Identify the components of this fixture as shown in FIGURE 2.
2. Remove the clamping ring from the shell front.
3. As can be seen in FIGURE 3, this fixture mounts to the shell front using the top 5 shell front mounting bolt holes and 4 holes on the bottom of the shell front (2 pair of holes separated by 3 bolts). Remove these nine bolts from the shell front.
4. Install the following components of the fixture in the order indicated. Use the longer bolts provided with the kit.
   - **a)** Cylinder support beam mounting bracket
   - **b)** Turnbuckle anchors
   - **c)** Cylinder support beam (see FIGURE 3)
   - **d)** Turnbuckles—Tighten to hold the Cylinder Support Beam horizontal.
5. With a cylinder rib in the 12 o'clock position as previously explained, install the rib saddles as shown in FIGURE 4 below, and tighten against the rib until the weight of the cylinder is resting on the support beam.

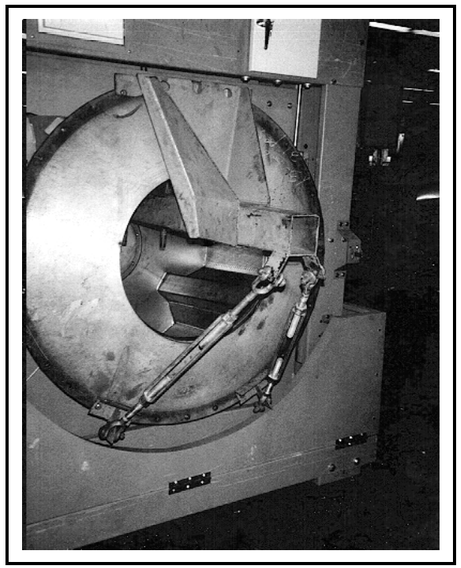

**FIGURE 3** (MSSMA403AE)
**Cylinder Support Fixture in Position**

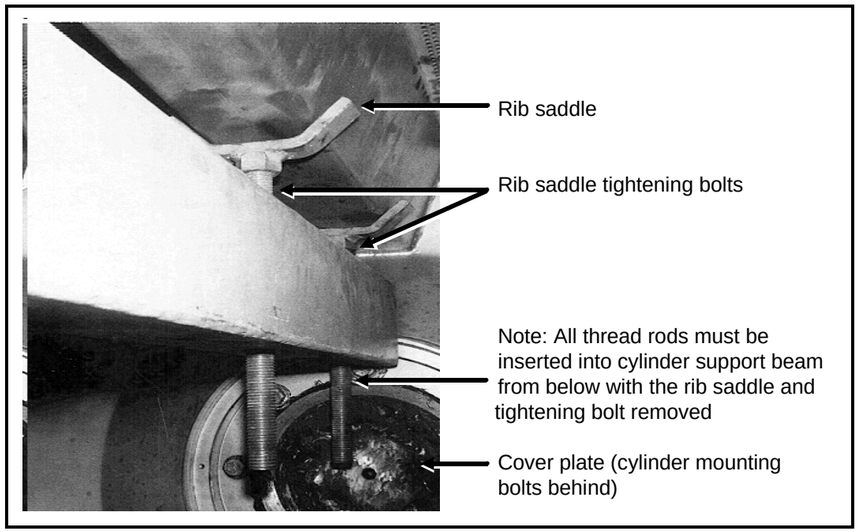


**FIGURE 4** (MSSMA403AE)
**Tightening Rib Saddles Against Rib**

## Dismounting the Cylinder

1. Remove the cover plate from the rear of the cylinder to expose cylinder mounting bolts (refer to FIGURE 4).
2. Remove the cylinder mounting bolts. Note that when these are removed, the cylinder will be supported only by the Cylinder Support Fixture.
3. Install the leverage arm from the Bearing Housing Support Fixture on the end of the bearing housing using the bolts provided.

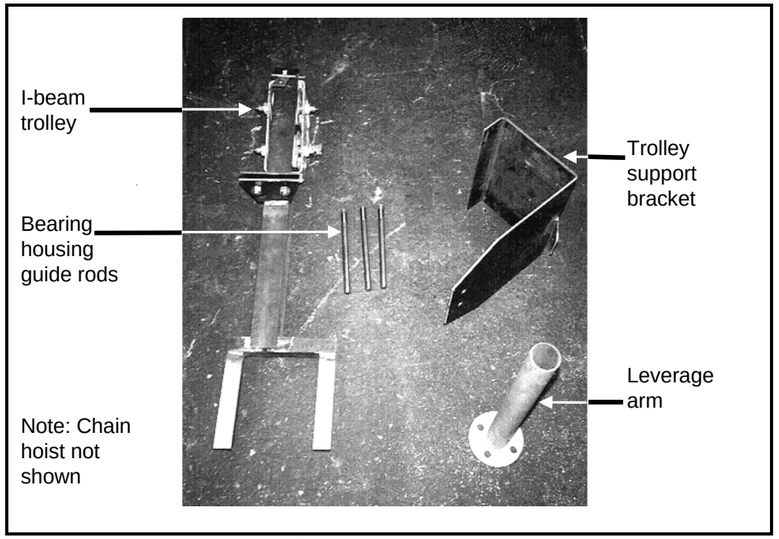


**FIGURE 5** (MSSMA403AE)
**Components of Bearing Housing Support Fixture**

## Installing the Bearing Housing Support Fixture

1. Identify the components of this fixture as shown in FIGURE 5.
2. Install the following components of this fixture in the order indicated, as shown in FIGURE 6 .
   - **a)** I-beam trolley
   - **b)** Trolley support bracket
   - **c)** Chain hoist
3. Remove the top bolt from the bearing housing rear plate, install the 5/8" eyebolt as shown in FIGURE 7, and place the chain hoist hook through this eyebolt, and take up the slack in the chain.

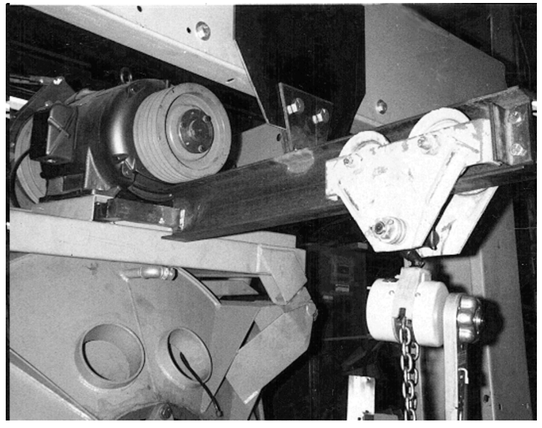

**FIGURE 6** (MSSMA403AE)
**Bearing Housing Support Fixture in Position**

## Removing the Bearing Housing

1. Remove the three grease lines from the bearing housing.
2. Working through the access holes in the rear cone, remove the bearing housing mounting bolts from the center flange of the bearing housing. Refer to FIGURE 7.
3. Remove the bolts from the rear spider flange of the bearing housing.
4. Install the three bearing housing guide rods into three of the bolt holes in the bearing housing center flange and install these bolts into the threaded push- off holes in the center flange, as shown in FIGURE 8.
5. Tighten the three push-off bolts alternately and equally to dismount the housing.

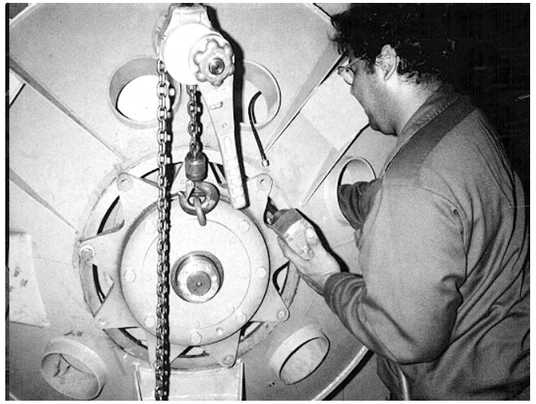

**FIGURE 7** (MSSMA403AE)
**Unbolting the Bearing Housing**

**⚠ CAUTION ⚠**

**Do not attempt to dismount the housing by prying between the cone and the spider plate as this will break the spider plate.**

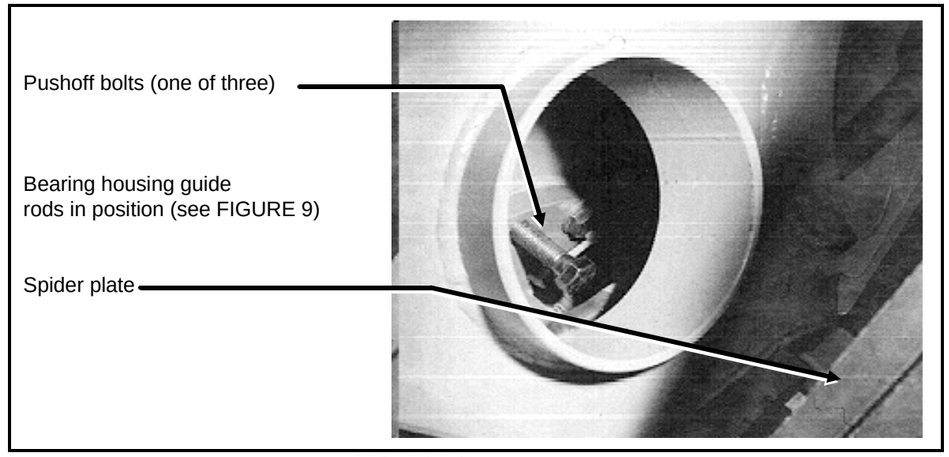


**FIGURE 8** (MSSMA403AE)
**Preparing to Dismount Bearing Housing**

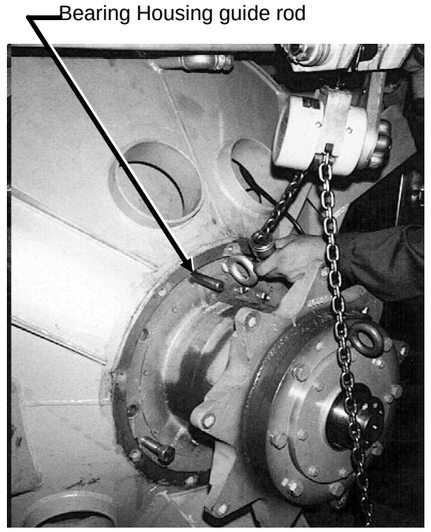


**FIGURE 9** (MSSMA403AE)
**Moving the Eye Bolt for Lifting**

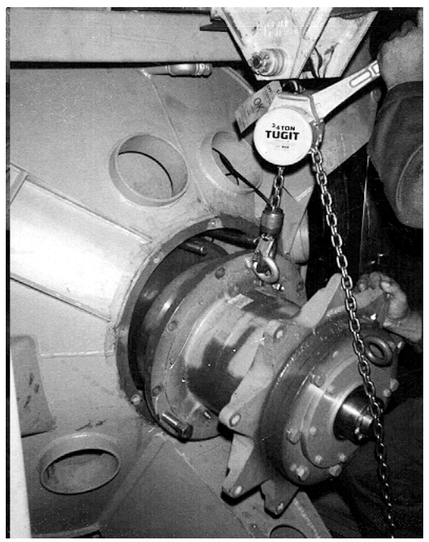


**FIGURE 10** (MSSMA403AE)
**Lifting the Bearing Housing**

6. Once the bearing housing is loose, work it only partially out of the shell with one person pulling from the rear and another person guiding it out with the Leverage Arm from inside the basket.
7. When the center flange of the housing is even with the rear end of the cone as shown in FIGURE 9, install the 1/2" eyebolt in the top push-off hole in the center flange and move the chain hoist hook to this eyebolt.
8. Now remove the bearing housing completely, carefully allowing the weight of the housing to be transferred to the chain hoist as shown in FIGURE 10.

**Installing the New Bearing Housing**—The new housing is installed in the reverse order of disassembly. When installing the new assembly, observe the following precautions:

1. It is essential that the large O-ring supplied with the new housing is in position on the front side of the housing center flange, as shown in FIGURE 11.
2. Three people may be required to insert the bearing housing into the cone—two people to push the housing in and a third to position it with the chain hoist.
3. Use the center flange mounting bolts to tighten down the housing, not the spider flange bolts as the spider flange will break.
4. When remounting the cylinder, align it to the bearing housing by turning the lower nuts on the rib saddles to raise or lower the cylinder.

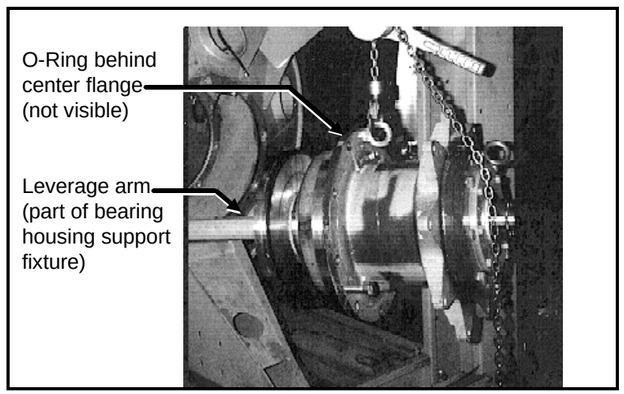


**FIGURE 11** (MSSMA403AE)
**New Bearing Housing**

5. Bolts should be tightened in accordance with the “BOLT TORQUE REQUIREMENTS . . .” in the technical manual.

**Reinstalling the Rear Cross Brace and HYDRO-CUSHION Cylinder**—These components are installed in the reverse order of disassembly. When reinstalling these components, observe the following precautions:

1. When tightening the bolts on the rear intermediate cross brace, refer to “BOLT TORQUE REQUIREMENTS . . .” in the technical manual.
2. When installing the HYDRO-CUSHION cylinder, be sure to adjust the cylinder bolts to achieve the proper hanging angle of the shell. Refer to “SUSPENSION ADJUSTMENTS . . .” in the technical manual.
3. Use care in properly matching any pneumatic water or electric lines that were disconnected when removing the cross brace.