Installation Manual

8, 10, 12, 14-Inch Bore
Sheave Pac®
Bearing Assembly

This procedure is to be viewed as a form of general suggestion and as a means of communicating concerns about potential installation issues only. It is not to be viewed as a declaration of installation methods to be followed. Because these instructions are merely suggestions, they may or may not be altered as the customer and/or installer sees fit. Therefore, it is the responsibility of the customer to ensure careful and accurate assembly handling and installation. Any and all damage incurred as a result of the handling and installation procedure shall void all bearing component warranty.
## BEARING ASSEMBLY CHARACTERISTICS

### Suggested Fitting Practice

<table>
<thead>
<tr>
<th>Assembly P/N</th>
<th>Bearing Rating</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>(lb)</td>
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<tr>
<td>NP954426-902A1</td>
<td>25,600</td>
</tr>
<tr>
<td>NP932743-902A1</td>
<td>14,000</td>
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<tr>
<td>NP101986-902A1</td>
<td>44,500</td>
</tr>
<tr>
<td>NP195121-902A1</td>
<td>364,000</td>
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</tbody>
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### Assembly Bore:

- NP954426-902A1: 8 in.
- NP932743-902A1: 10 in.
- NP101986-902A1: 12 in.

### Bearing K-Factor:

- NP954426-902A1: 1.83
- NP932743-902A1: 1.76
- NP101986-902A1: 1.63
- NP195121-902A1: 1.90

### Seal O.D. Under Snap Ring:

- NP954426-902A1: 10.358 in.

### Assembly Bench Endplay (BEP):

- NP954426-902A1: 0.015 in. to 0.020 in.
- NP932743-902A1: 0.024 in. to 0.029 in.
- NP101986-902A1: 0.023 in. to 0.028 in.
- NP195121-902A1: 0.022 in. to 0.027 in.

### Approximate Assembly Weight:

- NP954426-902A1: 40 lbs
- NP932743-902A1: 60 lbs
- NP101986-902A1: 70 lbs
- NP195121-902A1: 105 lbs

### Intended Application:

- Crown/Travelling Block

### Max. Suggested Operating Speed:

- 175 RPM
- 275 RPM
- 300 RPM

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(1) These values may vary depending on actual fitting practice and condition of the sheave bore.
BEARING ASSEMBLY LUBRICATION

A. Initial Lubrication

The Timken® Sheave Pac® assembly is prelubricated, presealed, and unitized at a Timken manufacturing facility. Accordingly, one of the unique features of the assembly is its maintenance free, self-contained design. As a result, regreasing of this assembly is not an option due to the bearing component geometry. Therefore, it is suggested that the grease line ports to sheaves that contain the Sheave Pac assembly be plugged to eliminate any effort to grease these assemblies during operation. Note that the lines to sheaves containing standard assemblies must remain operational for regreasing per the current process. Please contact your Timken representative if specialized equipment is used that may require additional lubricant or subsequent lubricant in service.

NOTE:
This assembly contains the optimum amount of grease from Timken. Grease must not be added or removed.

B. Operating Grease Purge

Please note that although this assembly cannot be regreased once installed, minimal grease will be purged from the assembly during the initial run-in period. This leakage will decrease to a normal “weeping” after this period. This is normal and expected for this kind of assembly during application operation.

SUGGESTED INSTALLATION PROCEDURE

NOTE:
This procedure is to be viewed as a form of general suggestion and as a means of communicating concerns about potential installation issues only. It is not to be viewed as a declaration of installation methods to be followed. Because these instructions are merely suggestions, they may or may not be altered as the customer and/or installer sees fit. Therefore, it is the responsibility of the customer and/or installer to ensure careful and accurate assembly handling and installation. Any and all damage incurred as a result of the handling and installation procedure shall void all bearing Limited Warranty.

NOTE:
Any information and/or guidelines from any oil field governing body should take precedence over and supplement this information for roller bearings operated under the jurisdiction of that governing body.

NOTE:
Typical bearing lifting practices utilizing straps/chain around the bearing must not be employed. Doing so will cause damage to the seal.

NOTE:
Lifting holes have been incorporated into the cup outer diameter (O.D.) to aid in lifting. Please refer to Step 3 of the Mounting of the Bearing into Sheave section for further details.

A. Mounting of the Bearing into Sheave

General Installation Information

A. Installation Methods:

- The preferred method of overcoming the tight fit between the bearing outer diameter and the sheave inner diameter is with press force and appropriate tooling. This document focuses on this method.

- Installation methods that do not use press force need to be reviewed by Timken before use. Press force is the preferred method. Other methods can damage Sheave Pac bearing assemblies.

B. Required Equipment:

- Press capable of handling sheave and providing the required assembly installation force (see tables on pg. 2).

- Size-specific assembly installation tooling.

- Crane/hoist and lifting/handling fixture designed to safely handle Sheave Pac assembly to ensure that no contact is present with the entire seal.

C. General Cautions:

- Sheave Pac assembly must not be cooled to facilitate installation unless process is reviewed by Timken. Contact your Timken representative to facilitate this review.

- Sheave must not be heated to facilitate installation unless the customer and/or end user utilizes a procedure that verifies no damage has been inflicted upon the sheave components.

- If customer selects sheave heating as an option, the sheave bore must not exceed 200º F (93.3º C).

- Special care must be used during the removal of the bearing packaging. Use of sharp objects may cause damage to the assembly components. Particular care must be taken to ensure no seal damage results from the use of sharp objects or cutting tools.

- Typical bearing lifting practices utilizing straps/chain around the bearing must not be employed. Doing so will cause damage to the seal. For additional details, refer to Step 3 of the section entitled Mounting of the Bearing into Sheave.

- Overcoming the interference fit between the bearing and sheave by use of impact process (hammer/drift/etc.) is not suggested. Doing so will cause damage to the seals.

Step 1

Ensure that the sheave bore, lead-in chamfers and snap ring grooves are in acceptable dimensional condition and free of sharp corners, raised material, dents, nicks, burrs, gouges, and corrosion.

NOTE:
Any surface imperfections on the sheave bore must be carefully filed and/or stoned down completely prior to assembly. These imperfections can cause difficulty in assembly, create stress risers during application loading, as well as cause excessive installation damage to the seal outside diameter (O.D.), which may directly increase the chance of contamination ingress and cause premature damage to both the bearing assembly and the sheave.
**Step 2**

With the sheave resting with the bore axis in the vertical direction, arrange the sheave on the press table/support.

**NOTE:**

The overall width of the Sheave Pac assembly is wider than the sheave inner hub; therefore, the sheave must be securely supported while allowing the Sheave Pac assembly to be installed correctly without 'bottoming out' on the press table/support. Options for this include, but are not limited to, supporting the sheave on adequate blocks or a support ring or utilizing an opening in the press table/support itself to allow the Sheave Pac assembly to be completely and correctly installed in one step.

**NOTE:**

Ensure that all of the lifting equipment including, but not limited to, the crane and lifting fixtures meet any necessary hoisting regulations for this lifting and handling operation, prior to beginning the next step.

**Step 3**

The pregreased, presealed and unitized Sheave Pac assembly must be installed as a complete assembly. A lifting fixture may be designed/produced to accommodate the handling and installation procedure. Utilizing this potential fixture, carefully remove the bearing assembly from the container and packaging. Straps/chains must not be used around the bearing for lifting. Doing so will lead to seal damage.

**NOTE:**

Any and all lifting fixture(s)/mechanism(s) shall be designed to ensure no damage is done to the assembly or its components. Particular care must be taken with the entire seal to ensure that no contact or interaction is present between the lifting fixture(s)/mechanism(s) incorporated into the procedure and the seal. Please see diagram below, and refer to page 8 for a graphical representation of a typical cone bore lifting fixture(s)/mechanism(s).

**Step 4**

Complete any necessary measurements of the bearing assembly, snap ring grooves, sheave, etc., for aid in the installation of assembly to the center of the sheave.

**NOTE:**

It is suggested that the bearing assembly is centered in the sheave to ensure uniform loading across each of the bearing rows during operation.

**Step 5**

Evenly apply general purpose, lithium complex grease to assembly O.D. with particular care to coat each seal O.D. to aid in the installation of the assembly as well as minimize potential seal damage.

**Step 6**

Carefully lower the assembly to rest at the entrance of the sheave bore using special caution not to damage the bearing and/or seal components.

**Step 7**

With the bearing resting on the sheave bore entrance, remove any lifting equipment that may interfere with continued installation and carefully (using human force) apply enough installation pressure to insert the bottom seal O.D. portion of the assembly into the sheave until the cup
NOTE:
The Sheave Pac assembly must remain carefully aligned with the sheave bore throughout this step in order to decrease the potential for seal O.D. damage.

NOTE:
Before moving to the next step, ensure that the cup is completely engaged with the sheave, as shown in Figure 2.

Step 8
With the bearing assembly carefully centered and started into the sheave bore entrance, carefully place size-specific installation tooling (manufactured to meet the surrounding seal dimensional requirements shown in Fig. 3, Fig. 4, and Fig. 5) on the top side of cup/seal interface so as not to damage/displace seal components.

Step 9
With the bearing and seal installation initiated manually to engage the metal-to-metal contact between the cup and the sheave, carefully ensure that the sheave/bearing is centered under the press ram.

Step 10
Gradually inch the press ram down until it gently comes into contact with the installation tooling without creating an impact load on the system.

Step 11
With the press ram resting on the installation tooling, gradually increase the applied load to continue the installation of the Sheave Pac assembly into the sheave bore until clearance is available to install the top snap ring behind the assembly.

Step 12
With the bearing assembly installed, remove the load from the press and remove the installation tooling.

Step 13
Install the snap rings into the sheave.

NOTE:
Limited space is available around the seal for snap ring installation. Care must be taken to ensure seal damage is not incurred during this snap ring installation procedure.

Step 14
Repeat Steps 1-13 as necessary for additional sheaves for a complete block build.

B. Mounting of the Bearing/Sheave onto Pin

General Installation Information

A. Required Equipment:
- Crane/hoist and lifting/handling fixture designed to safely handle sheaves containing a Sheave Pac assembly.
B. General Cautions:

- Sheave and bearing assembly should be lifted by means of the sheave to ensure neither the bearing nor the snap rings carry the combined weight of the sheave and bearing assembly.

Step 1

Ensure that the pin O.D. and lead-in chamfers are in acceptable dimensional condition and free of sharp corners, raised material, dents, nicks, burrs, gouges, and corrosion.

**NOTE:**
Any surface imperfections on the pin O.D. must be carefully filed and/or stoned down completely prior to assembly. These imperfections can cause difficulty in assembly, create stress risers during application loading and cause installation damage to the cone bore clip and seals. This may directly increase the chance of contamination ingress and cause premature damage to the bearing assembly.

Step 2

Evenly apply general purpose, lithium complex grease to the Sheave Pac assembly bore to aid in the installation of the assembly and minimize any potential installation damage.

**NOTE:**
During the suggested grease application, it is suggested that the assembler physically ensure that the bore clip is seated into the cone bore grooves.

**NOTE:**
Ensure that all of the lifting equipment including, but not limited to, the crane and lifting fixtures meet any necessary hoisting regulations for this lifting and handling operation, prior to beginning the next step.

Step 3

Utilizing safe lifting/handling practices, carefully locate the sheave and Sheave Pac assembly above the pin for installation. Depending on block design, this step may vary to include carefully locating the pin for insertion through a stack of sheaves resting with axes of rotation in the horizontal direction. Ensure that the sheave and bearing assembly remain perpendicular to the pin for proper installation alignment.

Step 4

Gradually lower the sheave and Sheave Pac assembly onto the pin while ensuring that the sheave and bearing assembly remain level and perpendicular to the pin for improved installation. Depending on block design, this step may vary to include carefully inserting the pin through a stack of sheaves resting with axes of rotation in the horizontal direction. Ensure that the pin remains level and perpendicular to both the sheave and bearing assembly for improved installation.

**NOTE:**
The pin must remain aligned in the assembly cone bores during installation to minimize any potential binding and installation damage to both the bore clip and the seals.

Step 5

Repeat Steps 1-4 as necessary for complete block build.

**NOTE:**
Once sheaves/bearings are installed onto shaft, sheaves need to be rotated several times to ensure lubrication is coating all bearing surfaces and that no binding is experienced.

C. Dismounting of the Bearing

The bearing can be dismounted in the reverse order of mounting.

GENERAL BEARING ASSEMBLY STORAGE & HANDLING

A. General Comments

Multiple cautions and notes of careful attention are also included throughout this suggested installation procedure. This suggested installation procedure includes a number of notes and cautionary statements. It is based on Timken's internal evaluations which cannot anticipate all conditions in the field and there may be other methods of installation that may be more suitable in the judgment and experience of the end user or installer. Because these instructions are merely suggestions, they may or may not be altered as the customer and/or installer sees fit. Therefore, it is the responsibility of the customer and/or installer to ensure careful and accurate assembly handling and installation. Any and all damage incurred as a result of the handling and installation procedure shall void all bearing Limited Warranty.

B. Bearing Assemblies

Bearing assemblies should be stored in a horizontal position (vertical bearing axis) in order to avoid cone or cup ovality. Unmounted assemblies should be stored in their original packaging and kept in a location that is clean and free from moisture and contamination. Periodic inspection of stored bearings should be completed and any undesirable conditions should be corrected immediately. It is suggested that any stored bearing assemblies that show evidence of moisture contamination not be placed into service because their performance potential may be decreased due to contamination and/or corrosion damage.

**NOTE:**
Special care must be used during the removal of the bearing packaging. Use of sharp objects may cause damage to the assembly components. Particular care must be taken to ensure no seal damage results from the use of sharp objects or cutting tools.

It is not necessary to wash new bearings to remove any preservative for rust protection that was applied at the factory. This preservative has very little lubrication value and will not contaminant the lubricant that is used in or around the bearing.

All tools should be clean and in good condition. The work benches and area in which assembly work is done should be kept clean. Assemblies should not be installed near welding booths or machines where chips, dirt or any form of contamination are likely to get on or in the bearings.

Typical bearing lifting practices utilizing straps/chains around the bearing must not be employed. Doing so will cause damage to the seals.
**NOTE:**
M8x1.25 metric threaded lifting holes have been incorporated into the cup O.D. to aid in lifting. Threaded eyebolts or swivel hoists used for lifting must not have a threaded length beyond 12mm for 12” and 14” bore and 10mm for 10” bore. The use of longer thread length will result in internal bearing damage.

**NOTE:**
Use of the lifting holes will require the provided lifting hole plugs to be removed and re-installed in the cup O.D. It is suggested that when the button head cap screw is re-installed, it is torqued to 160 in-lbs for lubricated threads or 200 in-lbs for dry threads.

Please note that any and all lifting fixtures should be designed to ensure no damage is done to the assembly or its components. Particular care must be taken around the entire seal to ensure that no contact or interaction is present between the lifting fixtures incorporated into the procedure and the seal. Upon lifting of the bearing assembly, no impact loading shall be applied to the assembly components during handling, transportation or installation as this may cause bearing performance issues during application operation. At no time shall the bore clip or the seals be removed from the assembly as damage to these components will result.

**C. Sheaves with Bearing Assemblies Installed**

When lifting, transporting and/or storing sheaves with bearing assemblies installed, the method of doing so must be done by means of the sheave to ensure neither the bearing assembly nor the snap rings carry the combined weight of the sheave and bearing assembly. Please note that the overall width of the bearing assembly is greater than that of the typical sheave, therefore anytime the sheave is to be set down, a support between the sheave and the resting surface must be used in order to eliminate any potential for damage to the cone back-face and seal.

**D. Crown / Traveling Block Assemblies with Assemblies Installed**

When transporting travelling blocks for any reason, it is suggested that the block remain in an orientation that allows the bearing assembly axis of rotation to remain in the horizontal plane to minimize water from pooling at the seal location. If the block must be laid upon its side, it is suggested that the bearings be covered/protected from this potential pool of water in an effort to minimize contamination ingress.

**SHELF LIFE AND STORAGE OF GREASE-LUBRICATED BEARINGS AND COMPONENTS**

To help you get the most value from our products, Timken provides guidelines for the shelf life of grease-lubricated ball and roller bearings, components and assemblies. Shelf life information is based on Timken and industry test data and experience.
• The relative humidity should be maintained below 60 percent and the surfaces should be dry.

• The storage area should be kept free from airborne contaminants such as, but not limited to, dust, dirt, harmful vapors, etc.

• The storage area should be isolated from undue vibration.

• Extreme conditions of any kind should be avoided.

Due to the fact that Timken is not familiar with your particular storage conditions, we strongly suggest following these guidelines. However, you may be required by circumstances or applicable government requirements to adhere to stricter storage requirements.

Most bearing components typically ship protected with a corrosion-preventive compound that is not a lubricant. These components may be used in oil-lubricated applications without removal of the corrosion-preventive compound. When using some specialized grease lubrications, we advise you to remove the corrosion-preventive compound before packing the bearing components with suitable grease.

Graphical Representation Of Typical Cone Bore Lifting Fixture.

NOTE: Please contact your Timken representative for additional details and availability of bearing assembly specific lifting fixtures.

Fig. 4

Fig. 5