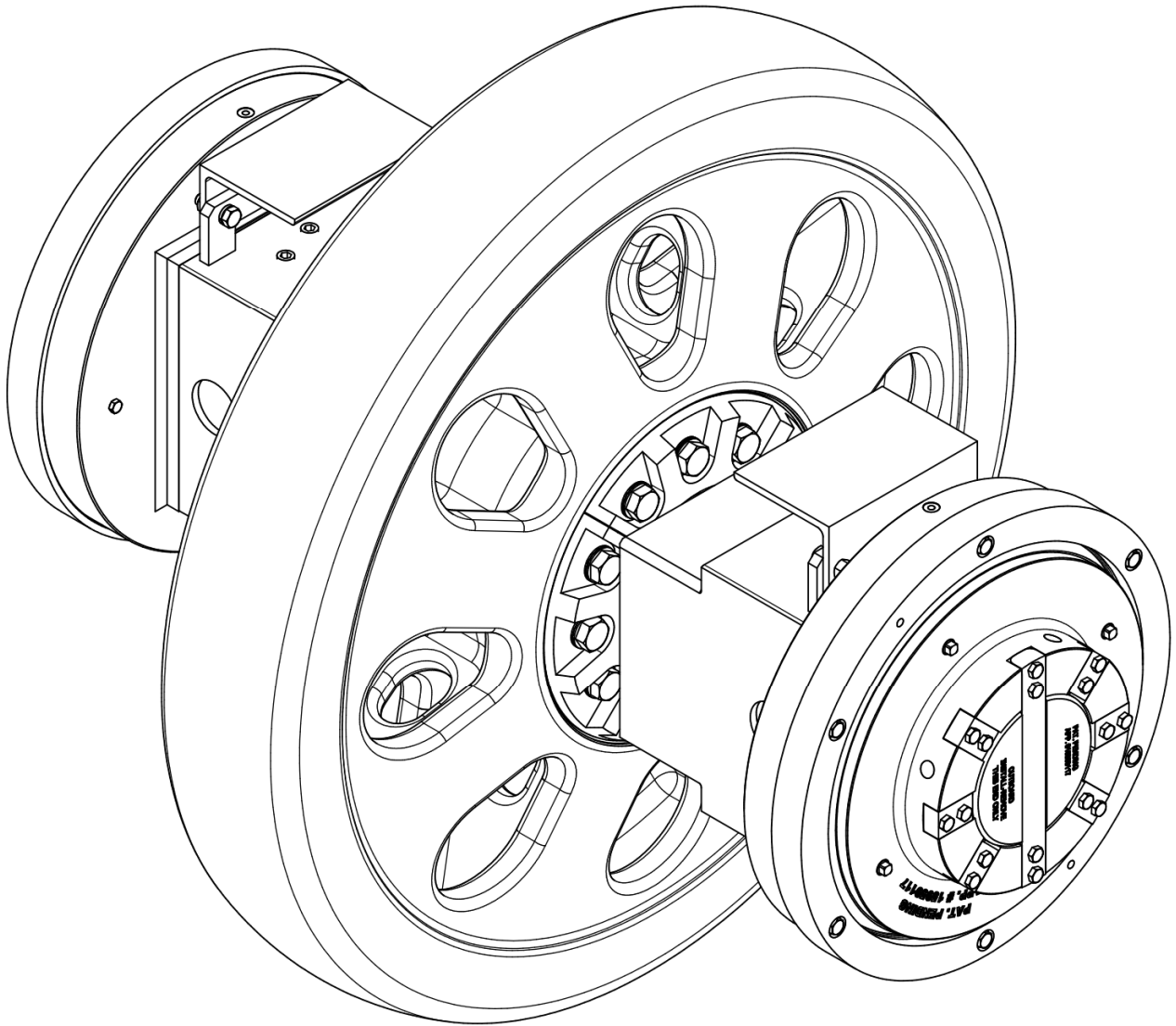


INSTALLATION INSTRUCTIONS
FOR
STRADDLE MOUNT FRONT
IDLER ASSEMBLY
LHMS12300

DATE: 3/20/2020

REV: 000 JTR1





LHMS12300



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1. General Information



The Green note triangle indicates a general warning.



General Warning

The yellow general warning triangle indicates potential hazard to personnel or property.



Low temperature

The yellow general warning triangle with snow flake indicates low temperatures material.



Watch your step

The yellow general warning triangle with falling person indicates tripping hazards.



Danger of jamming
your hands

The yellow general warning triangle with hand indicates pinch points.



General Warning

Be certain everyone servicing the machine is aware of all the safety rules and regulations. Lock out and tag all equipment before any work is performed on the shovel. Contact the company safety representative for other safety procedures and controls.



Figure 1: Pre-shift safety meeting

2. Parts List

Table 1: LHMS12300 Front idler assembly parts list

| Parts List | | | | |
|------------|-------------|-------|-----------------------------------|----------|
| ITEM | PART NUMBER | REQ'D | DESCRIPTION | WT (LBS) |
| 1 | LHMS14142 | 1 | FRONT IDLER, MACHINED (11") | 6351 |
| 2 | LHMS14143 | 1 | FRONT IDLER SHAFT, STRADDLE MOUNT | 2149 |
| 3 | LHMS12289 | 1 | RETAINING PLATE (3 PC) | 86 |
| 4 | LHMS14145 | 1 | KEY, STRADDLE MOUNT | 17 |
| 5 | LHMS12291 | 2 | IDLER BLOCK ASY | 1528 |
| 6 | LHMS12297 | 2 | RETAINER NUT | 406 |
| 7 | LHMS12298 | 2 | LOCKING BAR | 11 |
| 8 | LHMS12299 | 12 | PLACE-HOLDING BLOCK | 2 |
| 9 | LHP20737 | 2 | THRUST PLATE SEAL | 2 |
| 10 | LHMS13996 | 2 | SEAL RETAINER | 77 |
| 11 | LHP4156 | 32 | CAPSCREW, HEX HD. (1/2) | 0 |
| 12 | LHP20242 | 8 | PIPE PLUG 3/4", SQR HD | 0 |
| 13 | LHP20382 | 12 | CAPSCREW, HEX HD. (1-1/4) | 2 |
| 14 | LHP14307 | 13 | NORD LOCK WASHER (1 1/4) | 0 |
| 15 | LHP5227 | 12 | CAPSCREW, HEX HD. (5/8) | 0 |
| 16 | LHP2465 | 12 | WASHER, LOCK (5/8) | 0 |

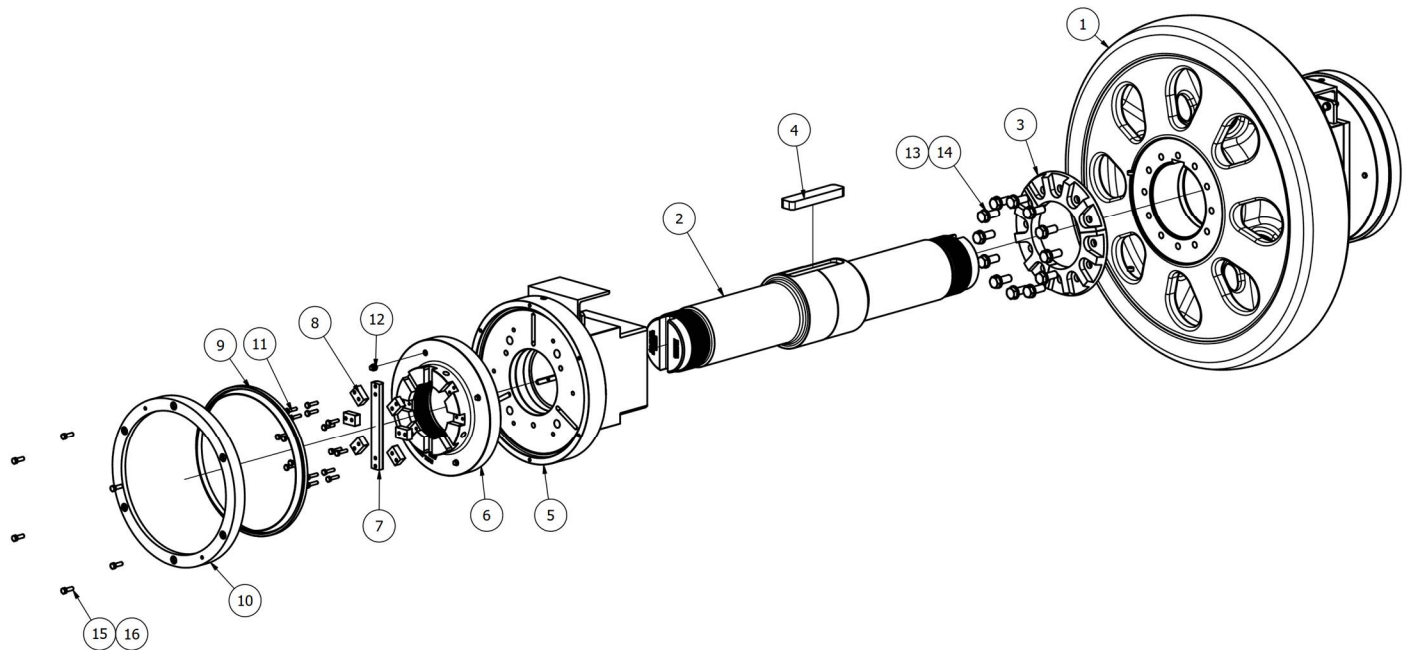


Figure 2: Exploded view of LHMS12300

3. Installation



The following steps will assume the track belt and take-up tumbler components have been removed from the side frame.

- 3.1 Repair all cracks and remove plastic metal flow inside the take up roller bulkhead.

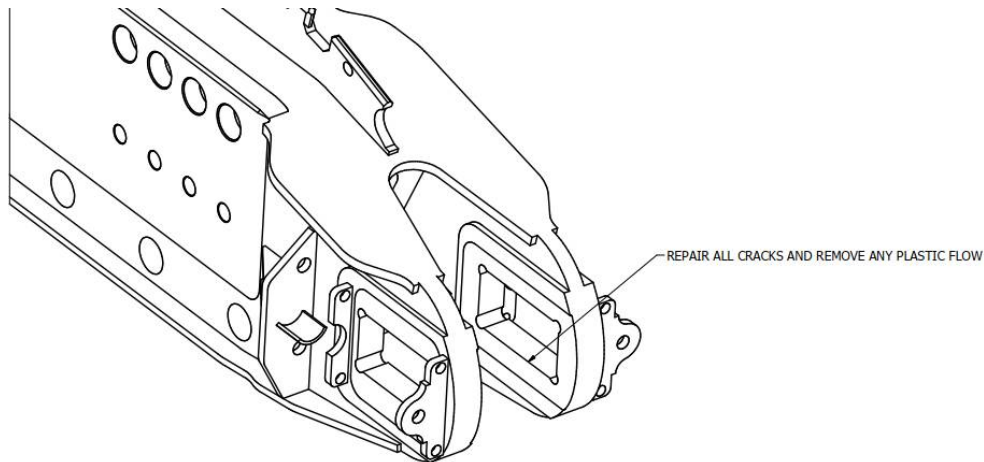


Figure 3: Crawler frame idler pocket

- 3.2 On the right and left inside face of the side frame rail slides, grind off all dirt, and foreign material from the steel surface.
- 3.3 Locate the idler block assemblies (item 5). Block assembly weighs approximately 1528 lbs. and can be handled via an appropriate lifting device as specified below.



Idler block assembly (LHMS12291) should be fully assembled with the bushing LHMS12293, housing LHMS12294, and thrust washer LHMS12295 as shown below:

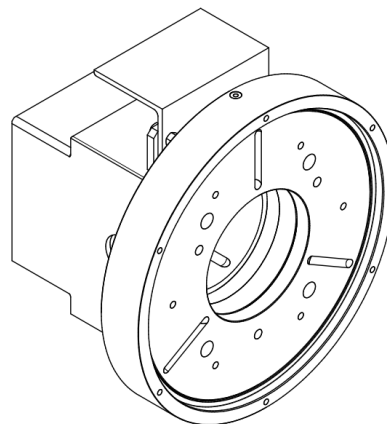


Figure 4: Idler block assembly

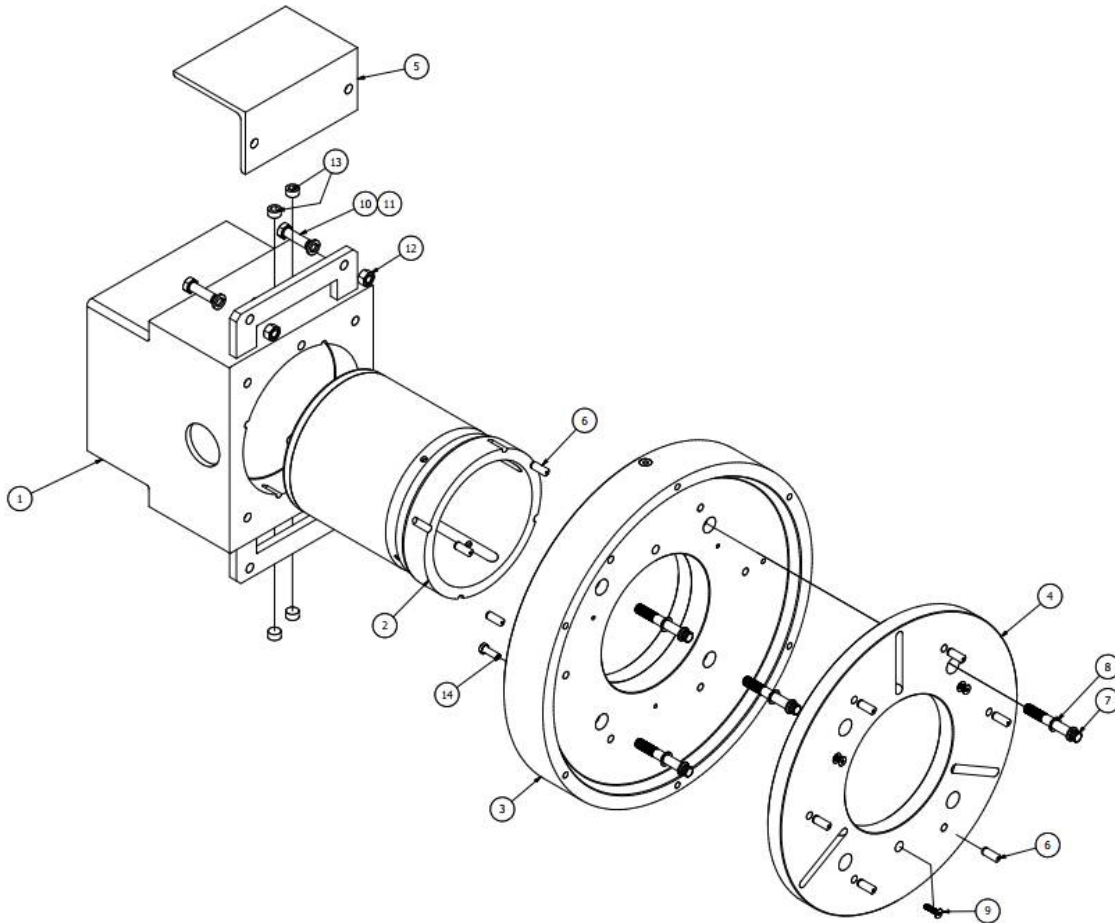


Figure 5: Exploded view of LHMS12291 idler block assembly

Table 2: LHMS12291 Idler block assembly parts list

| PARTS LIST | | | | |
|------------|-----|-------------|---------------------------------|------------|
| ITEM | QTY | PART NUMBER | DESCRIPTION | MASS |
| 1 | 1 | LHMS12292 | TAKE UP BLOCK | 653 lbmass |
| 2 | 1 | LHMS12293 | TAKE UP BUSHING | 141 lbmass |
| 3 | 1 | LHMS12294 | THRUST PLATE HOUSING | 505 lbmass |
| 4 | 1 | LHMS12295 | THRUST WASHER | 199 lbmass |
| 5 | 1 | LHMS12296 | GREASE GUARD | 24 lbmass |
| 6 | 10 | LHP20738 | DOWEL PIN (.625 X 1.5) | 0 lbmass |
| 7 | 4 | LHP20587 | CAPSCREW, 12 POINT HD. (3/4) | 1 lbmass |
| 8 | 4 | LHP6812 | WASHER, SERRATED CONICAL (M20) | 0 lbmass |
| 9 | 3 | LHP20736 | CAPSCREW, FLAT HD. SOCKET (3/8) | 0 lbmass |
| 10 | 2 | LHP5248 | CAPSCREW, HEX HD. (3/4) | 0 lbmass |
| 11 | 2 | LHP5276 | WASHER, LOCK (3/4) | 0 lbmass |
| 12 | 2 | LHP3680 | NUT, HEX (3/4) | 0 lbmass |
| 13 | 4 | LHP6854 | PIPE PLUG, RECESSED (3/4 NPT) | 0 lbmass |
| 14 | 2 | LHP5295 | CAPSCREW, HEX HD. (1/2) | 0 lbmass |



It's important to check that bushing lube port is aligned in the block and bushing. Check that both are clear of obstructions and grease has a clean, clear path through the block/bushing to the shaft (see Section D-D). Similarly, check that the lube port for the thrust washer is aligned between the block and thrust washer so that lube can be provided to the thrust washer via the block (see Section C-C). When handling block assembly, an appropriately rated strap can be wrapped around the angle iron which is the approximate COG of the block assembly.

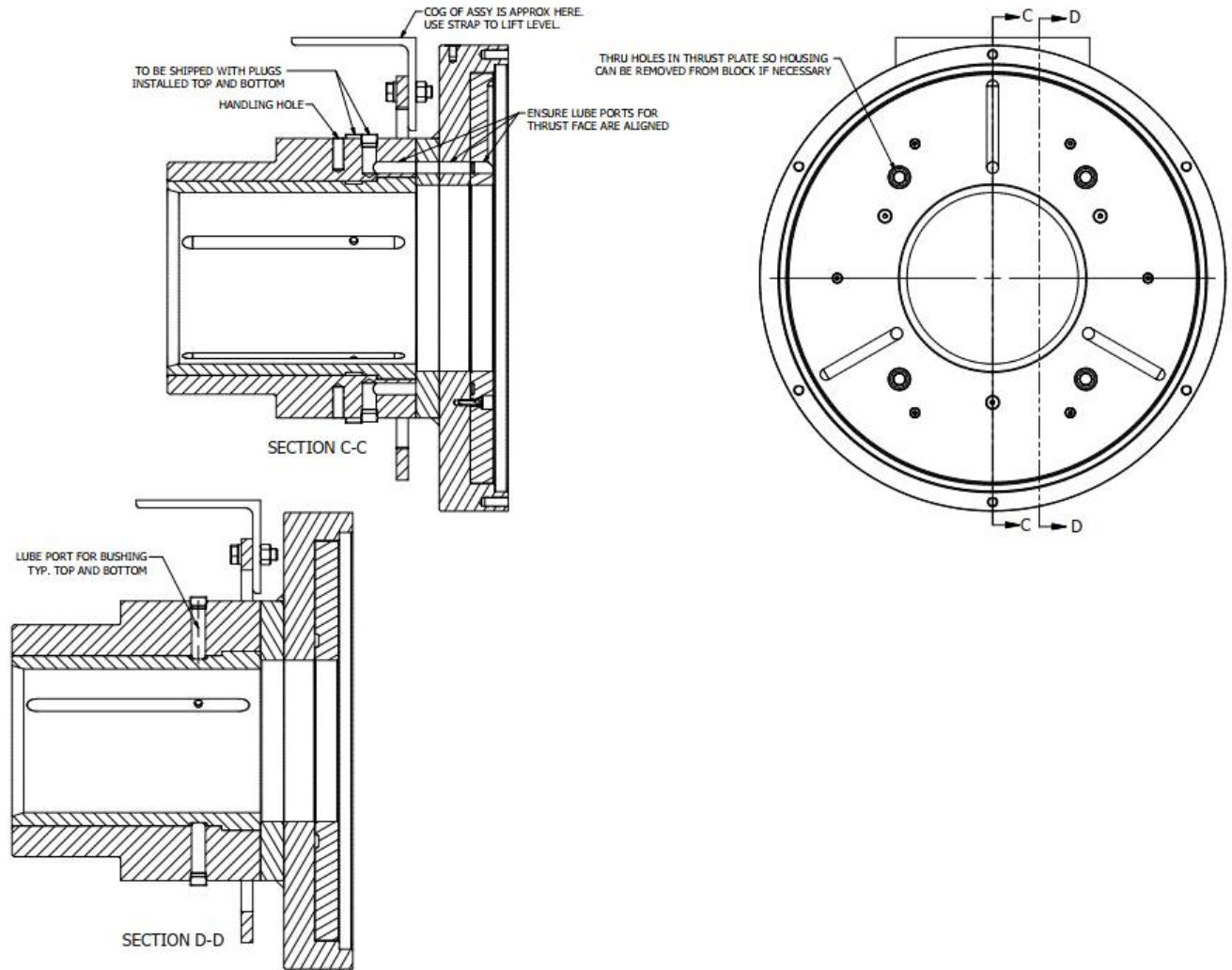


Figure 6: Idler block port map



The thrust washer is intended to last the life of the block assembly. However, if removal of the thrust washer housing (item 3) from the block is necessary, there are holes through the thrust washer which will allow a socket to fit onto the 12 pt. capscrews (item 7). See below:

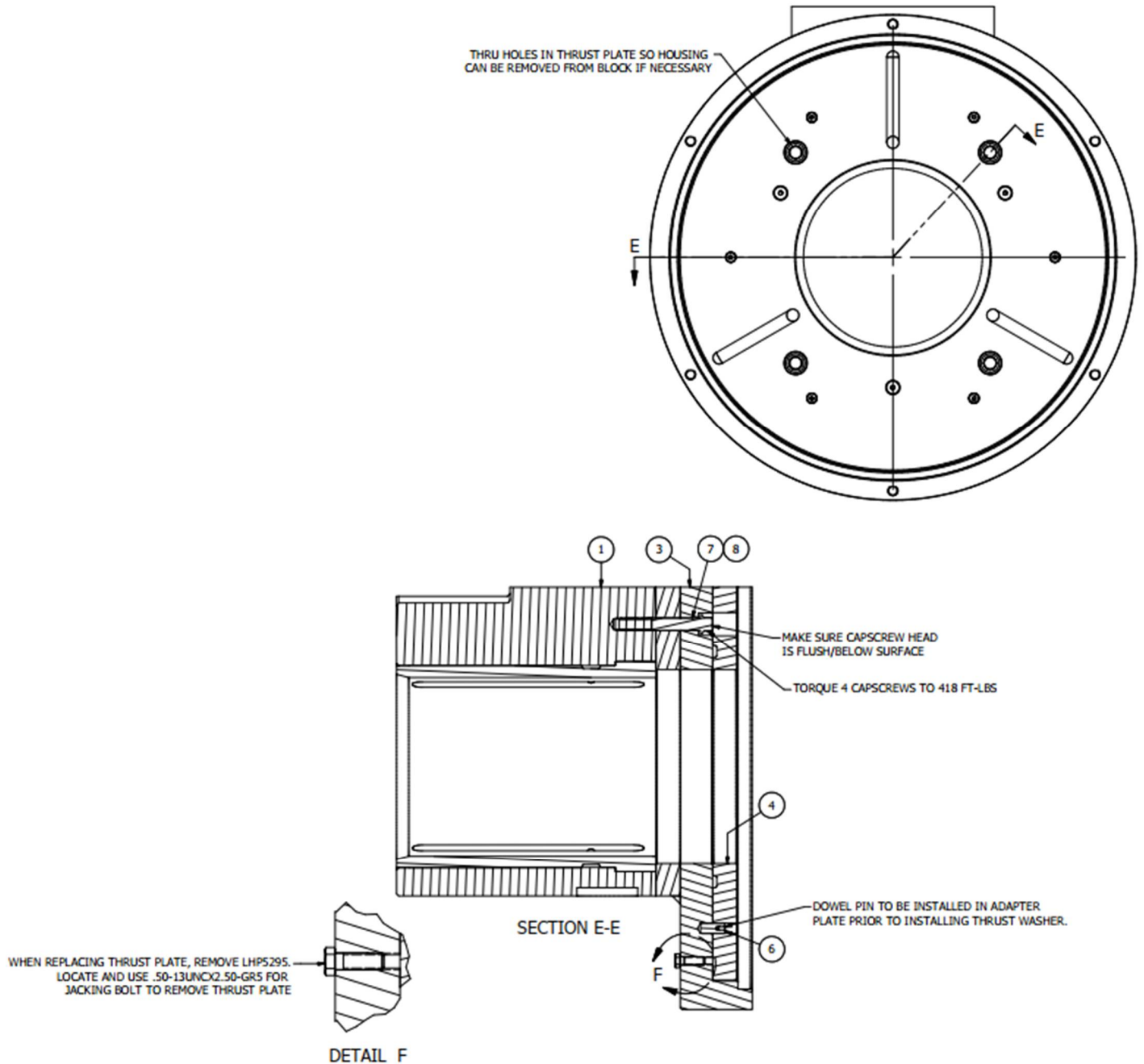


Figure 7: Removal instructions for thrust plate if necessary

If removal of the thrust washer (item 4) from the housing (item 3) is necessary, refer to Detail F above.

- 3.4 Locate the idler shaft (item 2) and place key (item 4) into keyway of shaft. Apply a film of anti-seize on all surfaces of the shaft.

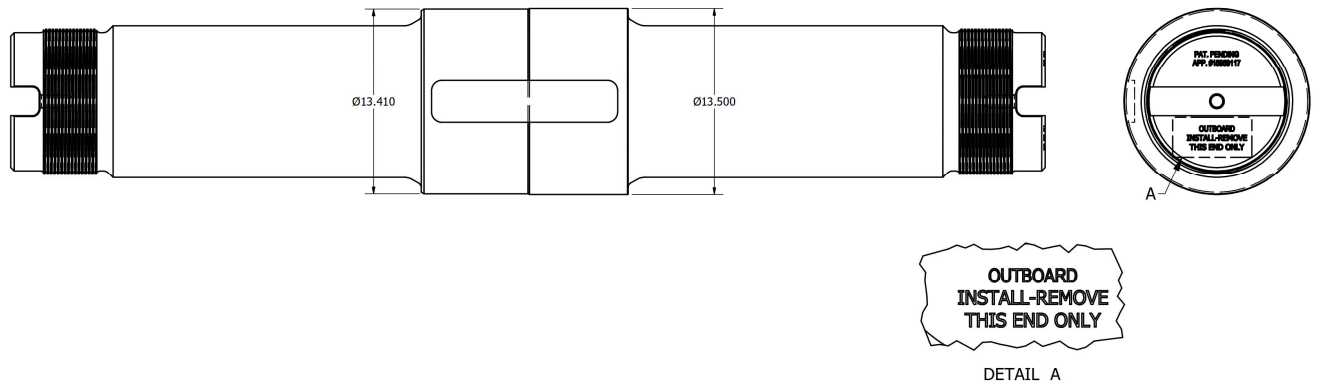


Figure 8: LHMS14143 idler shaft



LHMS14143 keyed front idler shaft has a step in the center of the shaft. One end measures an outside dimension of $\text{Ø}13.500''$ and the adjacent side measures $\text{Ø}13.410''$. When installing the shaft into the LHMS14142 idler wheel, the outside dimension $\text{Ø}13.500''$ should be installed in the outboard side of the idler wheel first, from the outboard side of the side frame. The shaft should be stamped with "OUTBOARD INSTALL - REMOVE THIS END ONLY" on the appropriate end.

- 3.5 Using a suitable lifting device, lift idler wheel (item 1) into position over the front idler pocket in the crawler frame as shown in Figure 9. Lower wheel into place and center between the frame. Be sure the keyway is aligned with the keyway in the shaft (item 2), and the large bore in the idler is positioned toward the outboard side of the frame.



When handling the idler shaft (item 2), care must be taken with the threads on both ends as to not damage or harm them.

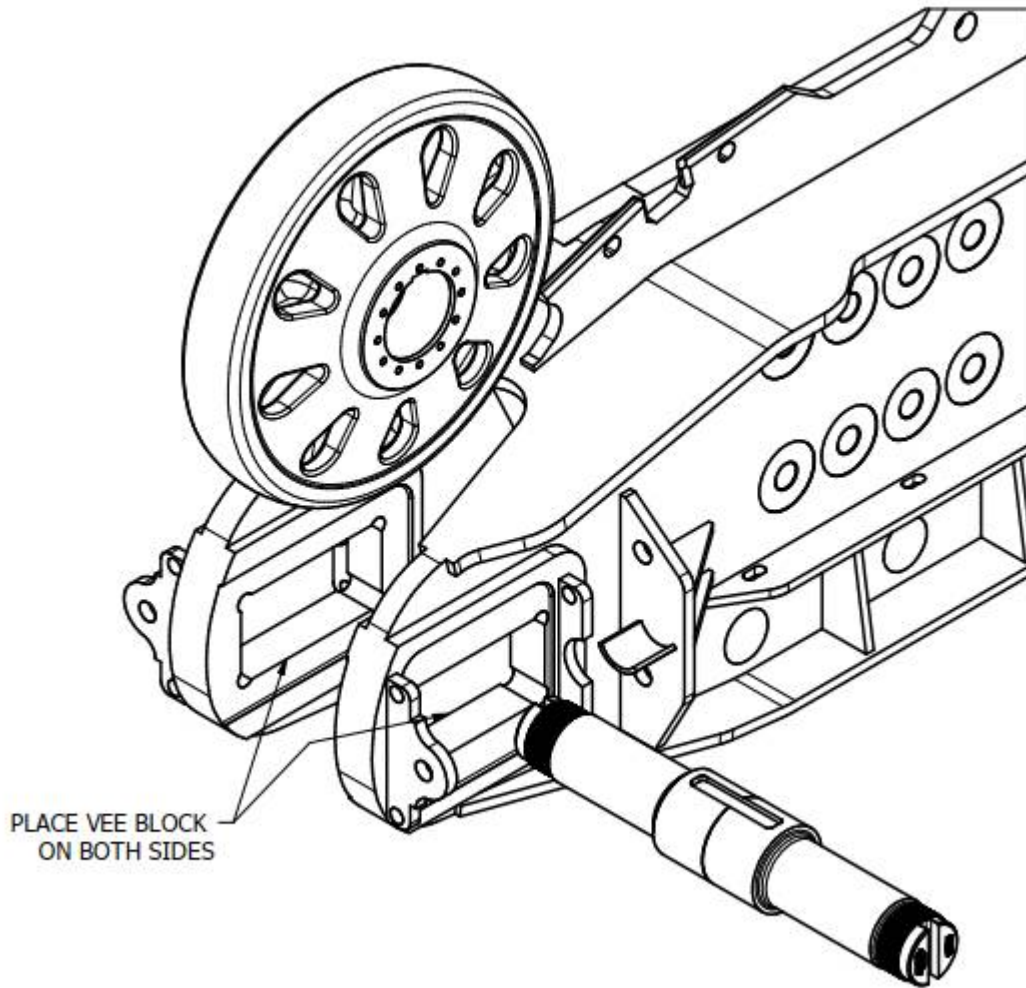


Figure 9: Idler and shaft installation

- 3.6 With a suitable lifting device placed in the center of the shaft (item 2), lift and begin to insert the shaft (item 2) into the idler wheel (item 1). Be sure the key (item 4) is aligned with the keyway on the both the idler wheel (item 1) and the shaft (item 2). Be sure the shaft (item 2) is being installed with the outboard markings outwards. Place vee blocks on both crawler windows for the shaft (item 2) to rest on once installed on the wheel (item 1). Install until shaft (item 2) shoulders out inside idler wheel (item 1).



The lifting device for the shaft (item 2) can be removed, but maintain the lifting device for the wheel (item 1) in place. It will be required to rotate the wheel for installation of the retaining plate (item 3).

- 3.7 Once the shaft (item 2) is installed into the idler wheel (item 1) and is supported by vee blocks, locate the three-piece retaining plate (item 3). Each piece weighs 30 lbs. and is shown below:

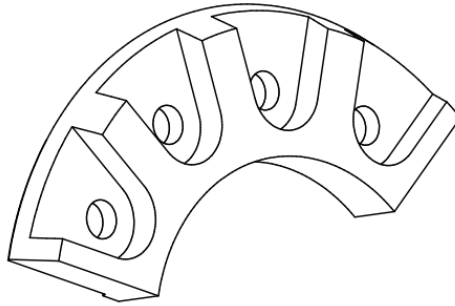


Figure 10: Individual segment of LHMS12289

- 3.8 Place each segment of LHMS12289 onto the wheel through the window in the crawler frame, using the capscrews and washers (items 13 and 14) to secure each piece. Only tighten capscrews to SNUG until all three segments are installed. A star pattern tightening procedure will be used to tighten all capscrews once installed. The wheel (item 1) will need to be rotated via the lifting device to install each of the segments (item 3) and hardware (items 13 and 14).

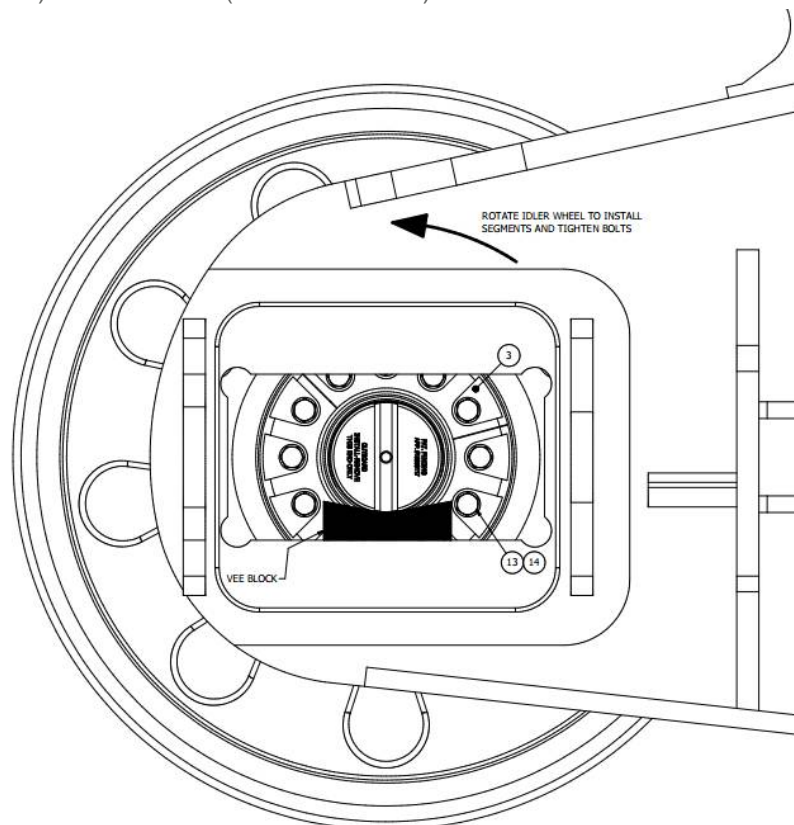


Figure 11: Retaining plate segments (item 3) installed through crawler window



Danger of harming
your hands

Keep hands and feet clear of pinch points

- 3.9 Ensure washers (item 14) are installed under each capscrew (item 13). Using a star pattern, torque capscrews (item 13) to 1120 ft-lbs. (dry) or 840 ft-lbs.(lubricated). The idler wheel (item 1) will need to be rotated via the suitable lifting device.
- 3.10 Using the suitable lifting device, take the weight off the vee blocks by lifting the idler (item 1) which is now coupled to the shaft (item 2). Remove vee blocks. Apply anti seize to both cylindrical surfaces of the shaft (item 2).
- 3.11 Locate one idler block assembly (item 5) and apply anti seize to the inner diameter of the bushing. With a suitable lifting device, lift the inboard block assembly (item 5) into place and slide onto shaft (item 2).

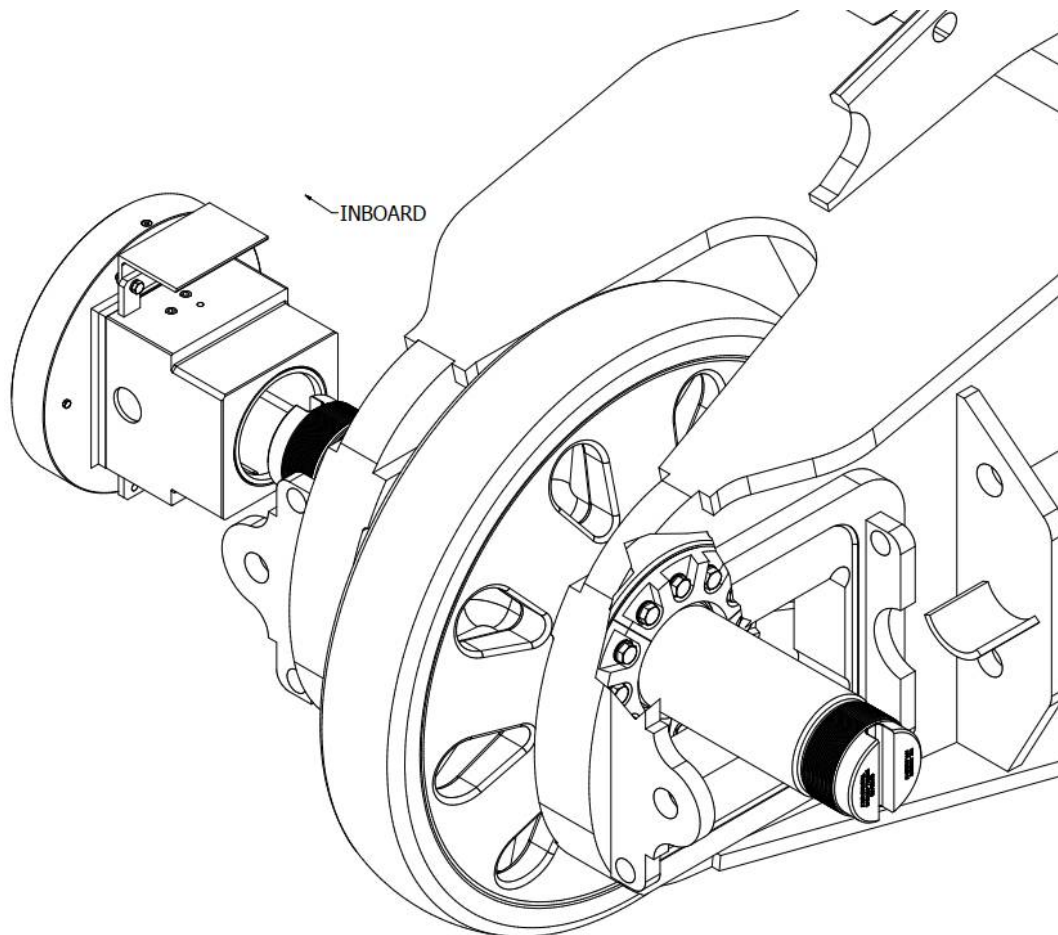


Figure 12: Installing inboard block assembly onto shaft



When positioning the block assembly (item 5) onto the shaft (item 2), care must be taken with the threads on both ends as to not damage or harm them. Also take care with the bushing surface as to not scratch or damage it.

- 3.12 Locate second idler block assembly (item 5) and repeat the above procedure for installing the outboard idler block assembly (item 5) onto shaft (item 2).

- 3.13 Before installing retainer nut (item 6), be sure the wheel is centered between the opening in the crawler frame as shown below. There should be a nominal $\frac{3}{4}$ " gap between the hub of the idler wheel (item 1) and the frame. Once the idler wheel (item 1) is centered into the crawler frame opening, the lifting device on the idler wheel (item 1) can be removed.

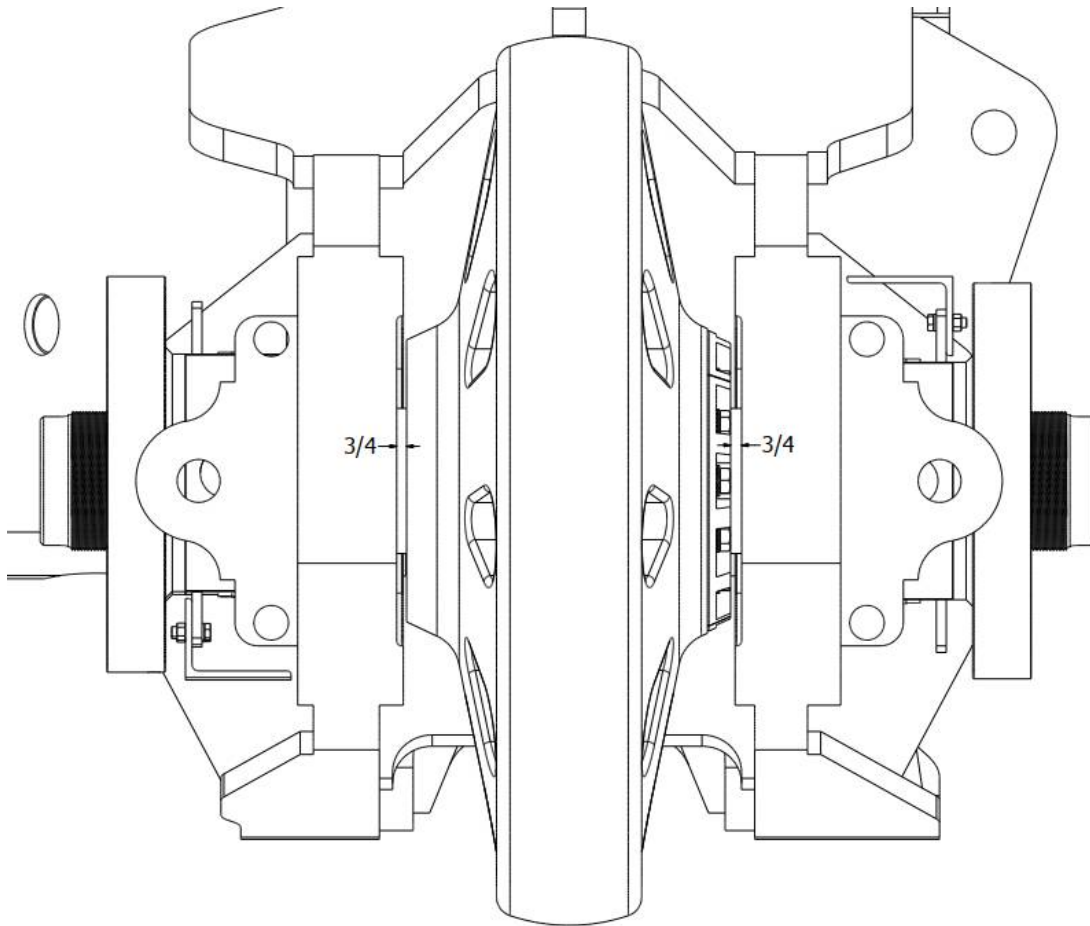


Figure 13: Center wheel in frame

- 3.14 Locate one retainer nut (item 6) and apply anti seize onto the internal threads. Using a suitable lifting device, lift the retainer nut (item 6) into position on the shaft (item 2) via the register on the nut. The retainer nut (item 6) may need to be rotated CCW slightly to get the threads started.

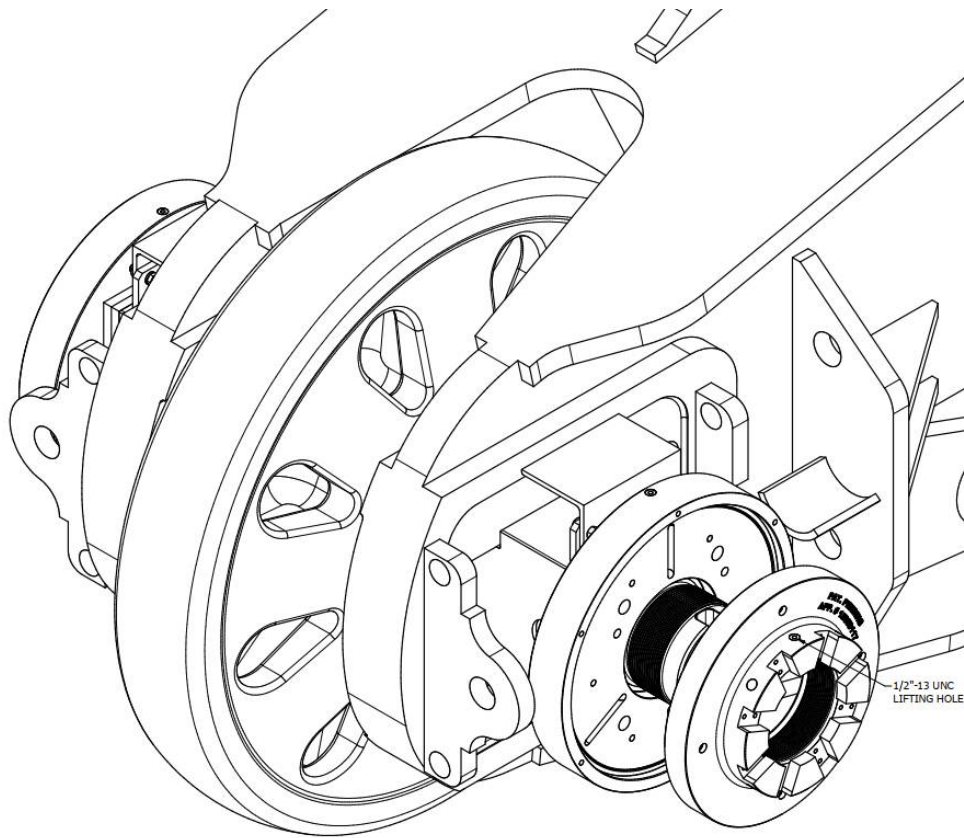


Figure 14: Installing retainer nut onto shaft



Keep hands and feet clear of pinch points. Do not release from lifting device until retainer nut (item 6) is threaded onto shaft (item 2) and feet are clear from underneath.

Available options for installing retainer nut:

1. FIX3657 snatch block (5 lbs.) can be used with 2" continuous strap (6' or 4' long).



**FIX3657
SNATCH BLOCK USED WITH STRAP
FOR LIFTING/TURNING RETAINER NUT**

The lifting eye in the snatch block is to be supported by a suitable lifting device, and the strap is to be cradled around the retainer nut (item 6). The roller in the snatch block allows the strap to rotate around it as the nut (item 6) is turned onto the threads of the shaft (item 2) while the weight is supported by the lifting eye.

2. Alternatively, a forklift (or similar) can be used to lift and position the retainer nut (item 6), however the internal threads of the nut **MUST** be sufficiently protected from damage by the forks.



Keep hands and feet clear of pinch points. Do not release from lifting device until retainer nut (item 6) is threaded onto shaft (item 2) and feet are clear from underneath.

□ 3.15 Using a suitable pry bar or similar, turn the retainer nut (item 6) via the 1" holes on the diameter as shown below. Rotate retainer nut (item 6) until it is snug with the thrust plate within the idler block assembly (item 5) which should result in the retainer nut (item 6) being flush with the end of the shaft (item 2).

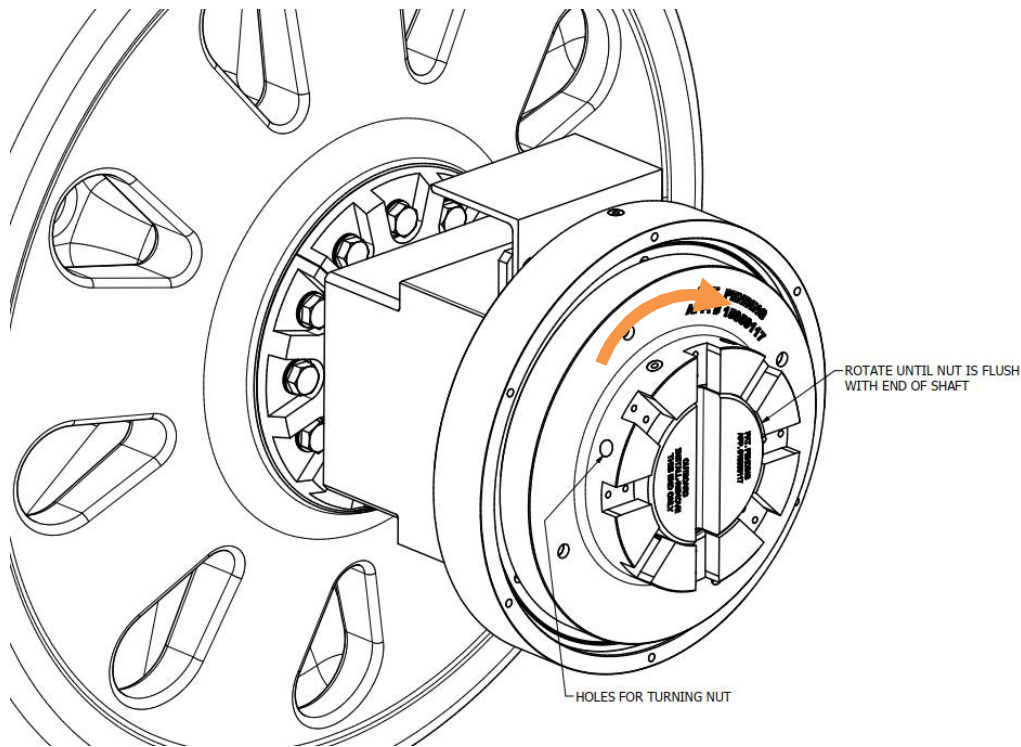


Figure 15: Threading nut onto shaft

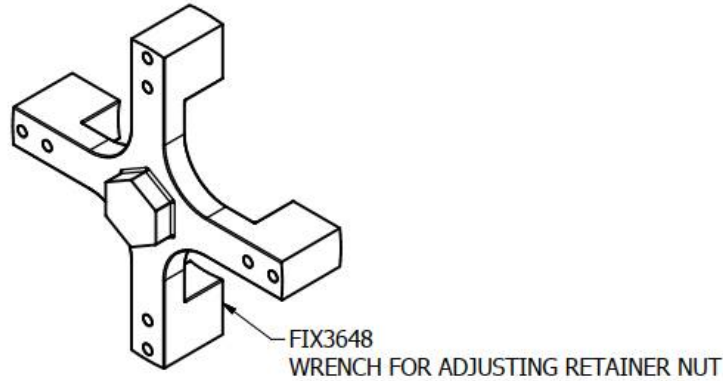


Ensure the threads of the retainer nut (item 6) engage the shaft (item 2) properly as to not cross thread them. As long as the threads on the shaft and nut are at least moderately lubricated the nut should spin easily by hand or with the use of the pry bar.

□ 3.16 Each revolution of the retainer nut will result in .25" of axial adjustment. **ONLY TIGHTEN UNTIL RETAINER NUT IS SNUG TO THRUST PLATE.** Once snug, back the retainer nut (item 6) counter-clockwise two slots on the retainer nut (approximately 45 to 90 degrees) and align the nearest slot on the retainer nut (item 6) to the groove in the shaft (item 2). This will result in approximately .06" axial clearance between the retainer nut (item 6) and thrust plate.

Available options for threading retainer nut:

1. FIX3648 wrench (39 lbs.) can be used with ½"-13 X 4.50" LG GR5 capscrews (qty 8).



If necessary, the FIX3648 wrench is to be installed in the grooves of the retainer nut (item 6) and fastened in place via the capscrews to prevent the wrench from falling out. Using a 1" impact wrench, hystorc wrench, or similar, tighten the retainer nut (item 6) via the hex on the wrench. Remove FIX3648 wrench once nut is snug to the idler block assembly (item 5) and store for future use. As mentioned above, the wrench should only be required if the retainer nut (item 6) cannot be turned by hand or with the use of a bar.

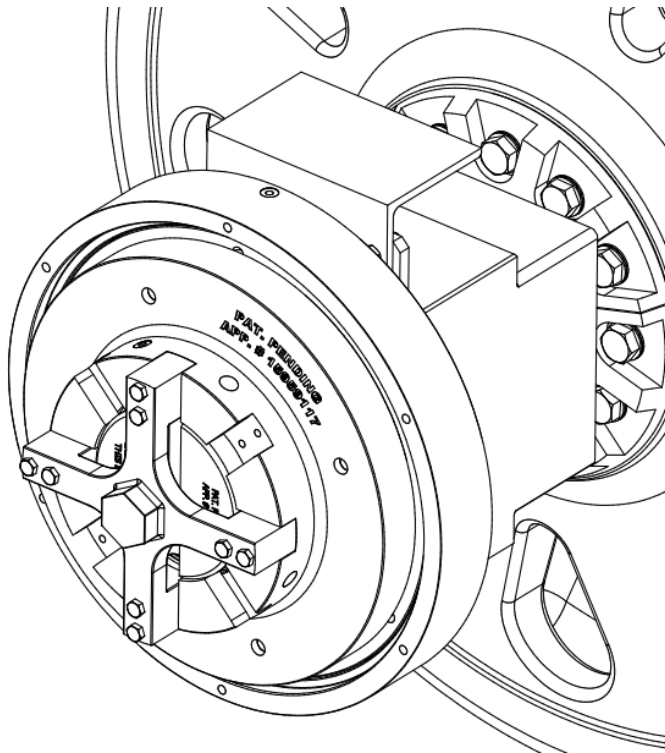


Figure 16: FIX3648 wrench installed on retainer nut



Each revolution of the retainer nut will result in .25" of axial adjustment. ONLY TIGHTEN UNTIL RETAINER NUT IS SNUG TO THRUST PLATE. Once snug, back the retainer nut off two slots on the retainer nut (approximately 45 to 90 degrees) and align the nearest slot on the retainer nut to the groove in the shaft. This will result in approximately .06" clearance between the retainer nut and thrust plate.

- 3.16 Install the locking bar (item 7). Apply thread locking compound (blue) to capscrews (item 11) and torque to 75 ft-lbs. Ensure that pipe plugs (item 12) are installed in the retainer nut. These are used as access ports to measure thrust washer wear and axial gap.

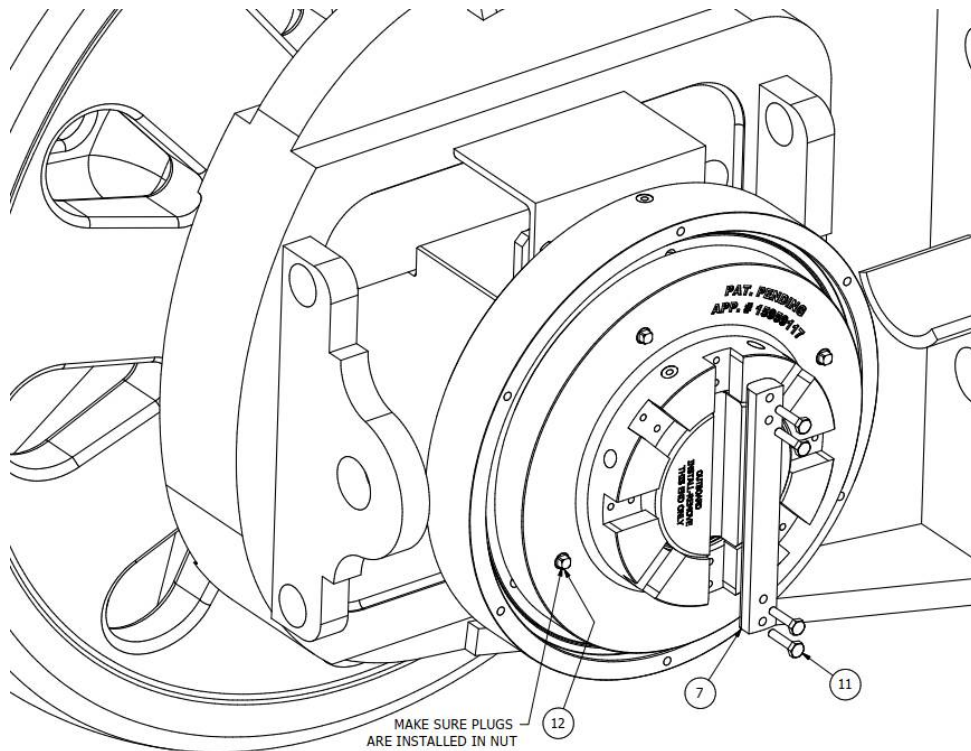


Figure 17: Install locking bar

- 3.17 Similar to the previous step, install the (6) place-holding blocks (item 8) and capscrews (item 11). Apply thread locking compound (blue) and torque capscrews (item 11) to 75 ft-lbs.

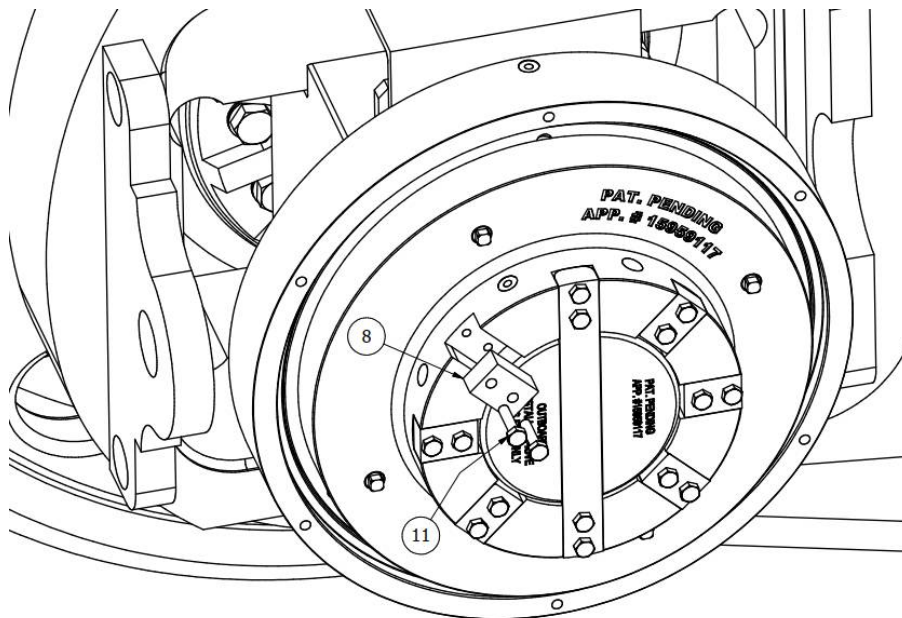


Figure 18: Install place-holding blocks

- 3.18 Locate thrust place seal (item 9), seal retainer (item 10), and appropriate hardware (items 15,16). Install seal over retaining nut, be sure the lip is facing outwards and be careful not to damage the seal by pinching or tearing it in any way. Carefully tap the seal (item 9) in place evenly around the diameter and ensure it's fully seated in the idler block assembly (item 5).

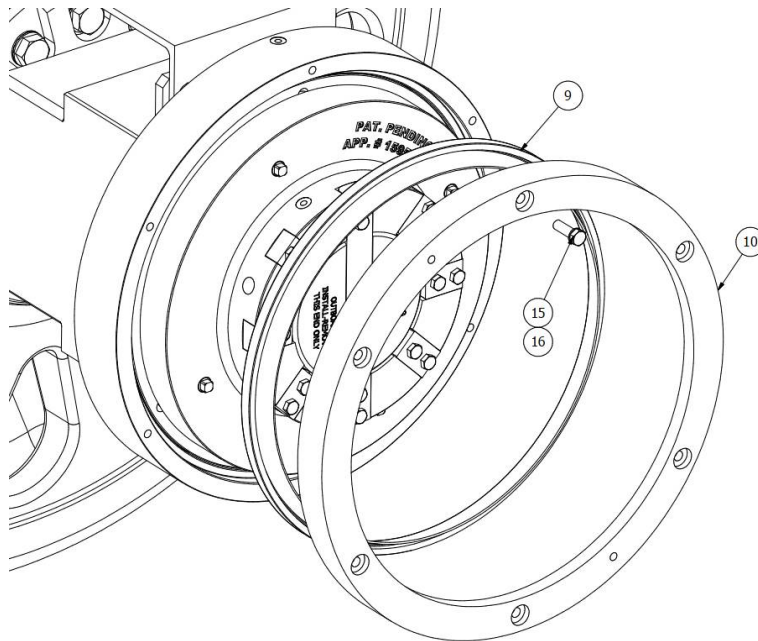


Figure 19: Install seal and seal retainer

- 3.19 Once the seal (item 9) is fully seated in the idler block housing (item 5), install the seal retainer (item 10) by torquing (6) capscrews (item 15) to 150 ft-lbs. Use thread locking compound (blue) and ensure washers (item 16) are used. Tighten capscrews using a star pattern to ensure equal pressure is applied around the diameter.
- 3.20 Repeat the above steps 3.11 through 3.19 for installing the opposite side retaining nut (item 6), locking bar (item 7), place-holding blocks (item 8), seal (item 9), seal retainer (item 10) and appropriate hardware.

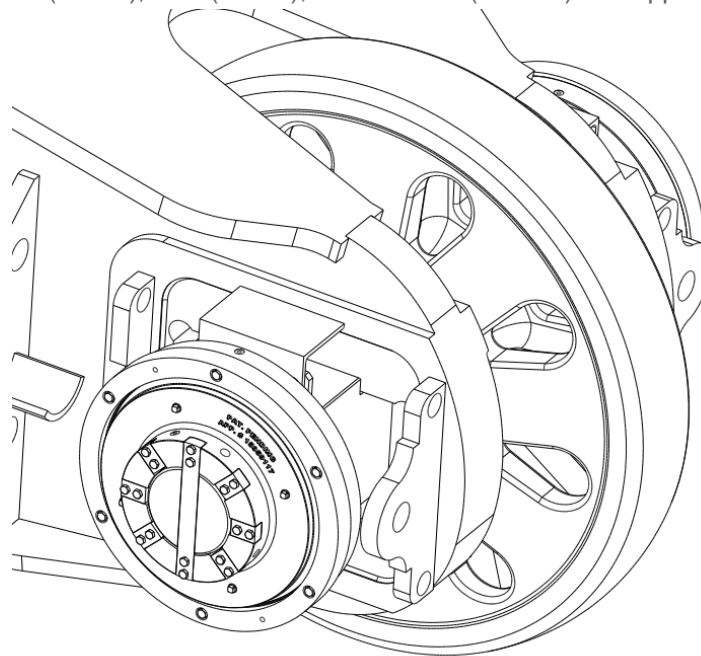


Figure 20: Repeat for opposite side. Fully assembled view

□ 3.21 It is the customer's responsibility to provide and install lubrication hoses when the Straddle Mount Idler assembly is installed. The Straddle Mount Idler Assembly (LHMS12300) needs two lube lines supplied to each idler block as shown in the figure below. One lube hose to each lube port with one injector per hose. 2800 series and 4100A side frames are often equipped with Lincoln SLV injectors on the inside of the side frame near the front of the frame as shown. These will accommodate two hoses to both the inner and outer take up blocks as shown below. There should be one SL11 or two SLV XL injectors per lubrication point. A lubrication kit is available for separate purchase under part number LHMS12428 if the machine isn't equipped with adequate injectors.

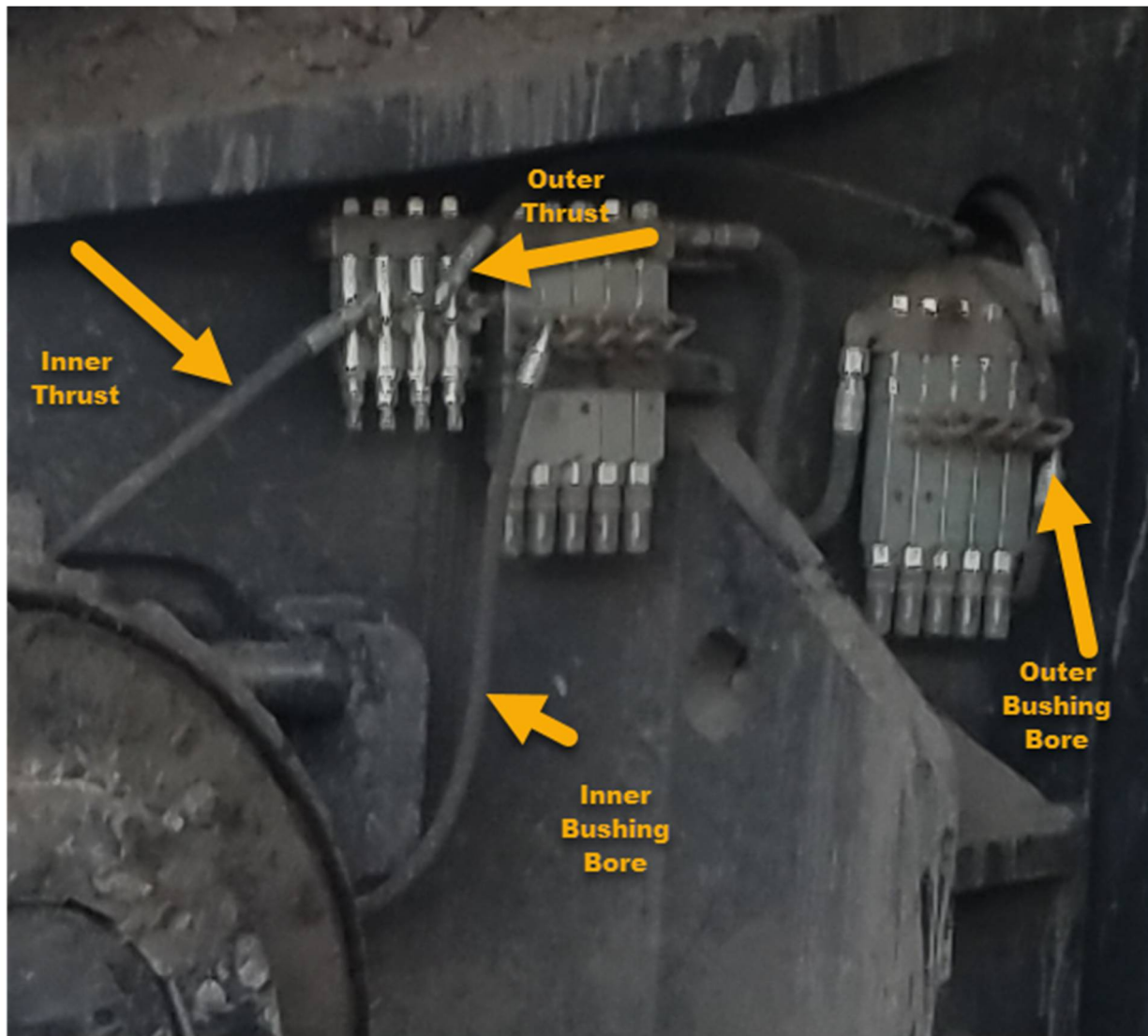


Figure 21: Injectors with two lube lines to each block



Ensure there's sufficient slack in the lube hoses to allow for the front idler block to be shimmed fully to the front of the crawler window without causing tension in the hoses.

- 3.22 Remove the angle iron hose guards from each take up block. Locate the four grease ports on each of the idler blocks (two on top, and two on bottom), make sure that the bottom two holes are plugged and purge the take up blocks with open gear lube. Continue to purge the take up blocks until lube is seen seeping between the idler block and thrust washer.

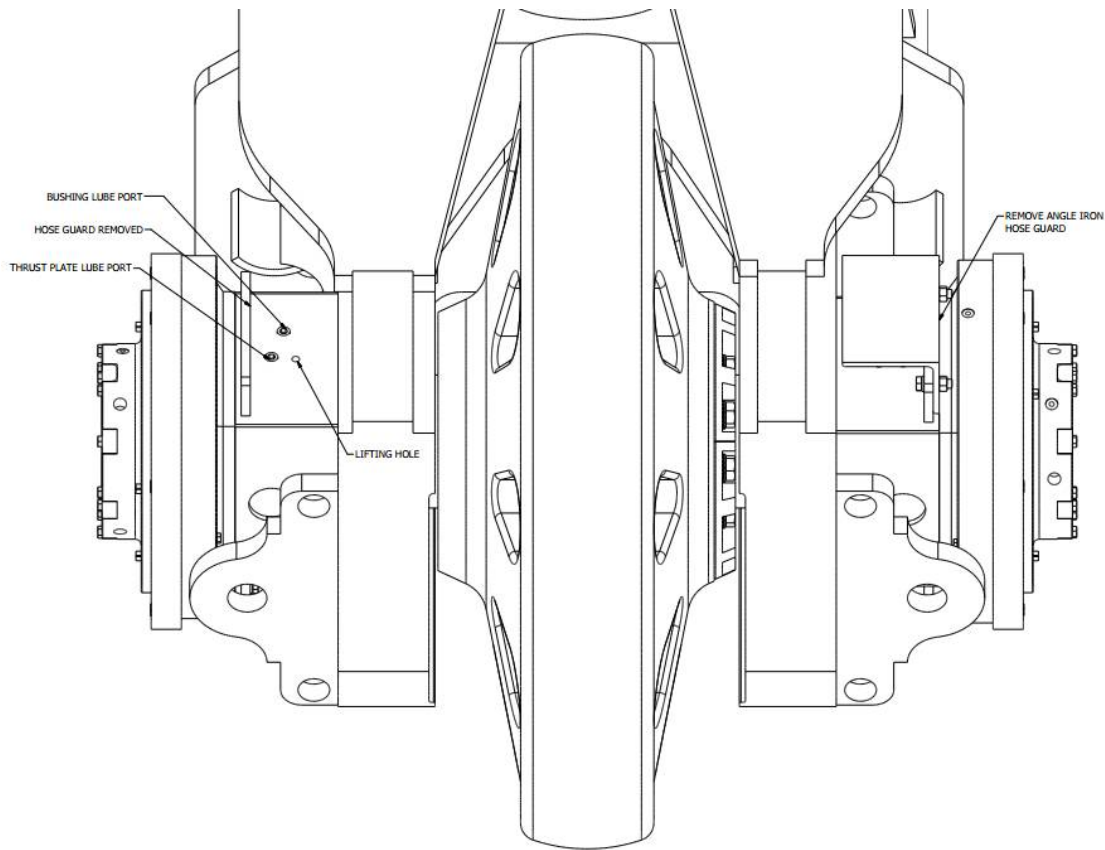


Figure 22: Lube locations



Each port in the idler block is supplied with $\frac{3}{4}$ - 14 NPT threads.

- 3.23 Connect the lube lines to the take up blocks. Reconnect the angle iron hose guards that are supplied with the idler blocks. Test run the lube circuit to the take up block to ensure the lower lube circuit is supplying lube to the straddle mount assembly.
- 3.24 Install shim keeper bars and ensure there is sufficient space around all lube fittings.
- 3.25 The straddle mount assembly is now installed and ready for service. Refer to page 3 and 4 of the LHMS12300 parts page for maintenance and adjustment of the straddle mount assembly.

4. Disassembly



The following steps will assume the track belt has been removed.



Lock and tag out before doing any work on the mining shovel

- 4.1 Locate the inboard and outboard idler block assembly (item 5) to be removed from the crawler frame.
- 4.2 Remove the hose guards and lubrication lines. Tag lube lines for later proper reinstallation.
- 4.3 On the inboard side of the crawler frame, remove the (6) place holding blocks (item 8) and corresponding capscrews (item 11).

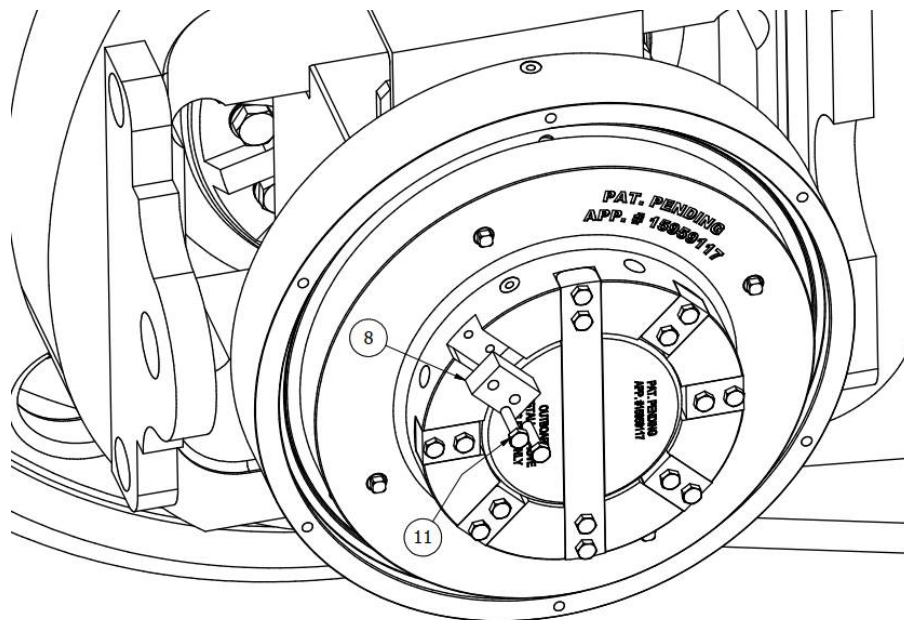


Figure 23: Removal of place-holding blocks

- 4.4 Remove the locking bar and corresponding capscrews (item 11).

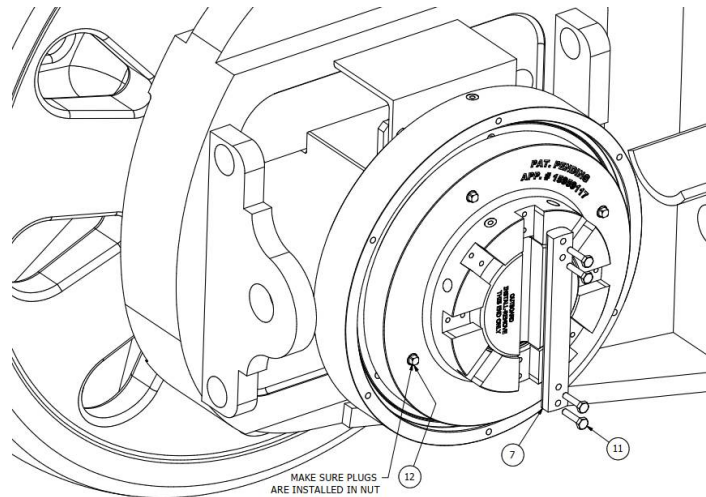


Figure 24: Removal of locking bar

- 4.4 The retainer nut (item 6) can be removed by threading CCW off the idler shaft (item 2). Position a suitable lifting device onto the retainer nut (item 6) before sliding it off the end of the idler shaft (item 2). If the nut does not move freely, the FIX3648 wrench can be used.



Keep hands and feet clear of pinch points. Do not release retainer nut (item 6) from shaft (item 2) until it's fully supported by lifting device and feet are clear from underneath.

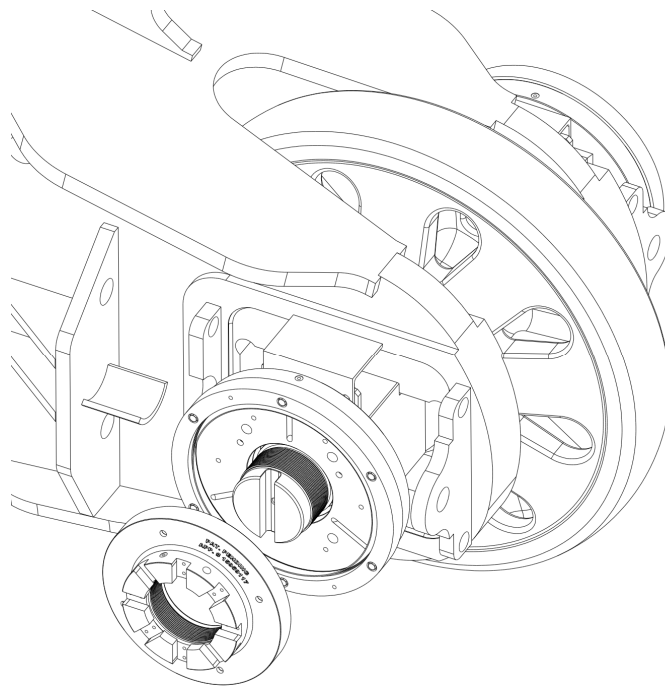


Figure 25: Removal of retainer nut

- 4.5 Using a suitable lifting device, take the weight off of the idler block assembly (item 5) by lifting slightly on the idler wheel (item 1). Remove the idler block assembly (item 5) from the crawler frame. The seal (item 9) and seal retainer (item 10) can remain on the idler block assembly, and be removed separately if necessary. Once the idler block assembly (item 5) has been removed, support the shaft (item 2) by placing a vee block on the crawler frame window.

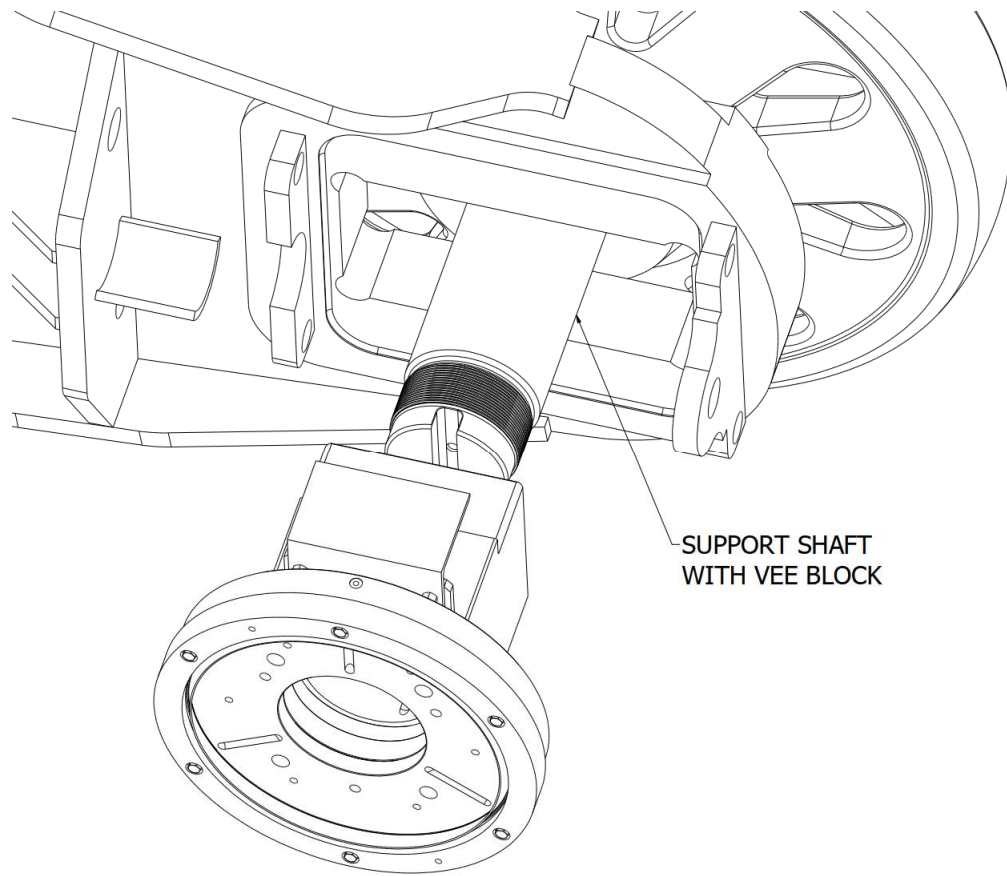


Figure 26: Idler block assembly removal

- 4.6 Repeat steps 4.1 through 4.5 to remove the outboard idler block assembly (item 5).

- 4.7 With both idler block assemblies (item 5) removed and the shaft (item 2) supported by vee blocks on both sides, the capscrews (item 13) for the retainer plate (item 3) can be removed. The wheel (item 1) will need to be rotated via the suitable lifting device to access each of the capscrews (item 13) through the crawler frame window.

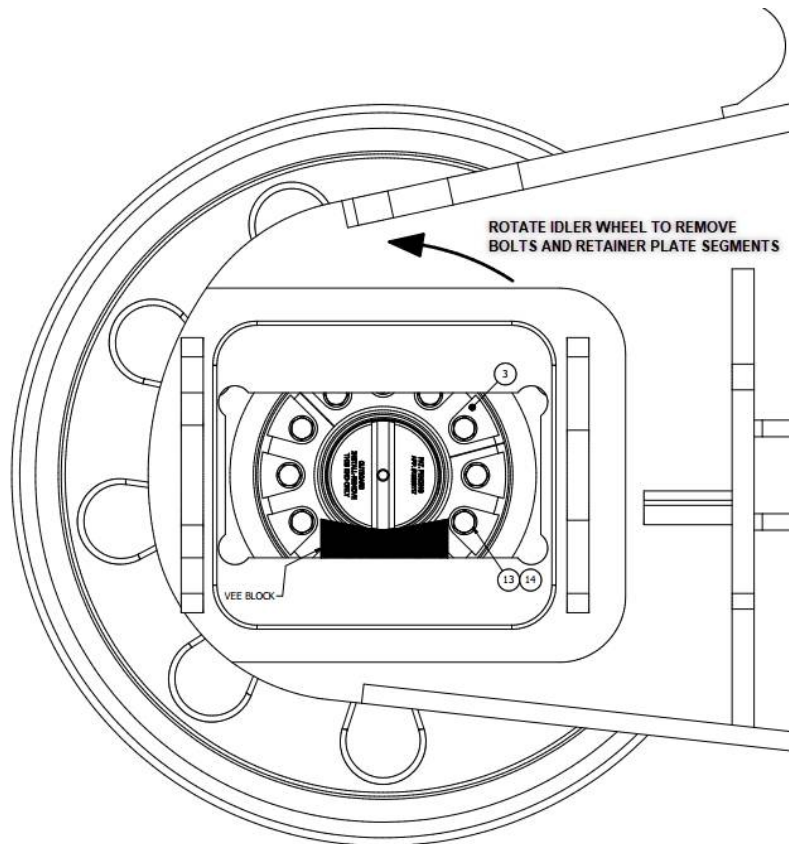


Figure 27: Retainer plate and capscrew removal

- 4.8 Maintain the weight of the idler wheel (item 1) on the suitable lifting device used in the previous steps. Position another suitable lifting device on the idler shaft (item 2) and begin removing it from the OUTBOARD side. The suitable lifting device for the shaft will need to be repositioned as the shaft (item 2) is removed from the idler wheel (item 1) to maintain horizontal balance.



When handling the idler shaft (item 2), care must be taken with the threads on both ends as to not damage or harm them.

- 4.9 Once the shaft (item 2) has been removed, the suitable lifting device attached to the idler wheel (item 1) can be used to remove the idler wheel (item 1) from the crawler frame.

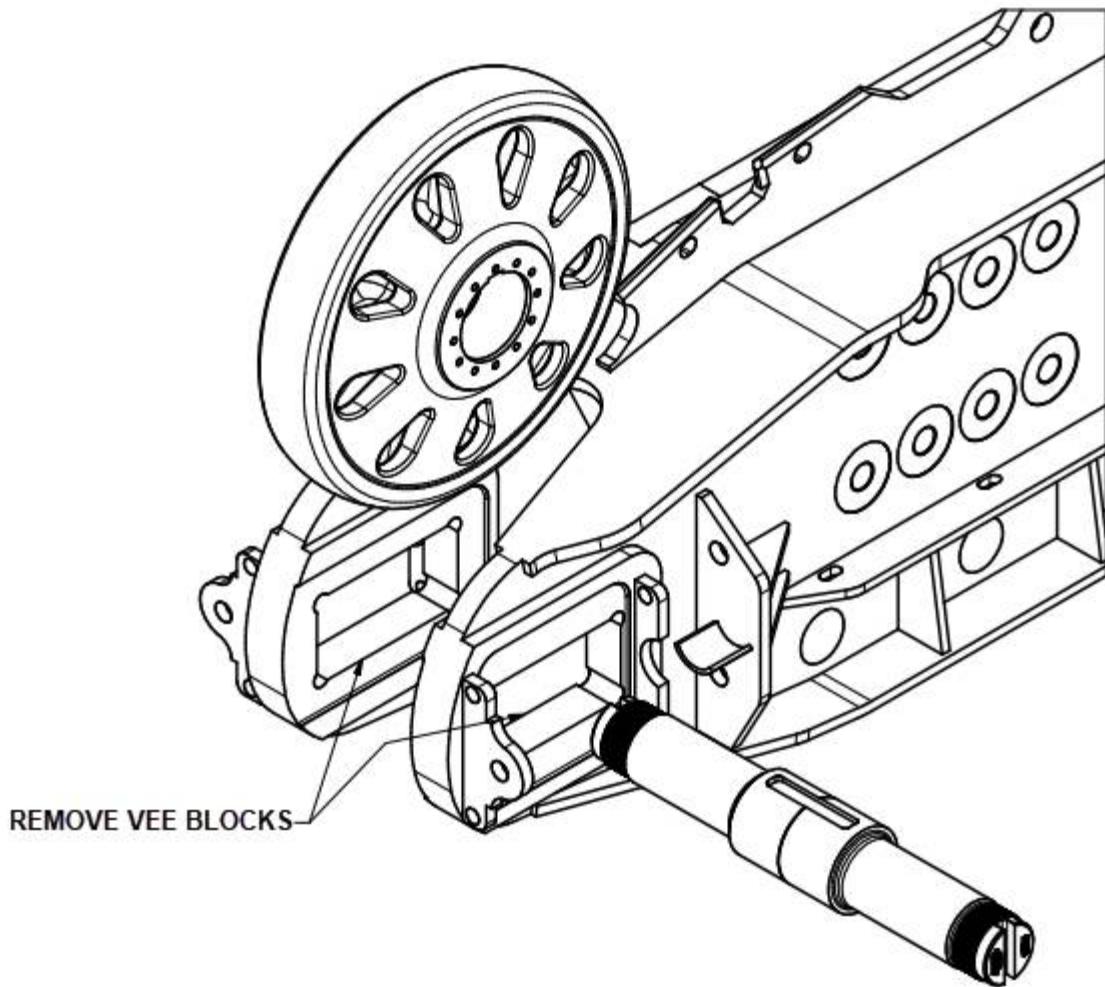


Figure 28: Idler wheel and shaft removal

The front idler assembly has now been disassembled. Refer to the beginning of this document for installation instructions.

5. Inspection

Please see sheets 3 and 4 of LHMS12300 parts list for detailed instructions on how to insure the longest possible life and how to maintain the straddle mount front idler assembly.