

Dodge® ISAF/ISNX mounted hydraulic bearings: avoiding misalignment

The Dodge Hydraulic ISAF/ISNX spherical roller bearing is a superb addition to the already outstanding line of Dodge bearing products. The ease of mounting and dismounting makes this bearing unmatched in the industry. With the ease of installation one may overlook one very important aspect of the bearing mounting procedure; misalignment. Alignment is critical for the Hydraulic ISAF/ISNX running properly and lasting. The bearing has the capability of $\pm 1/2^\circ$ of misalignment. Exceeding this value will cause the LOR seal to collide with the housing. An LOR seal is positioned on the OD of both the mount and dismount nut and centered in the seal groove of the housing. This collision results in resistance on the mount or dismount nut which in turn can back a nut off the adapter. The opposing nut could in turn bind and damage the adapter sleeve threads.

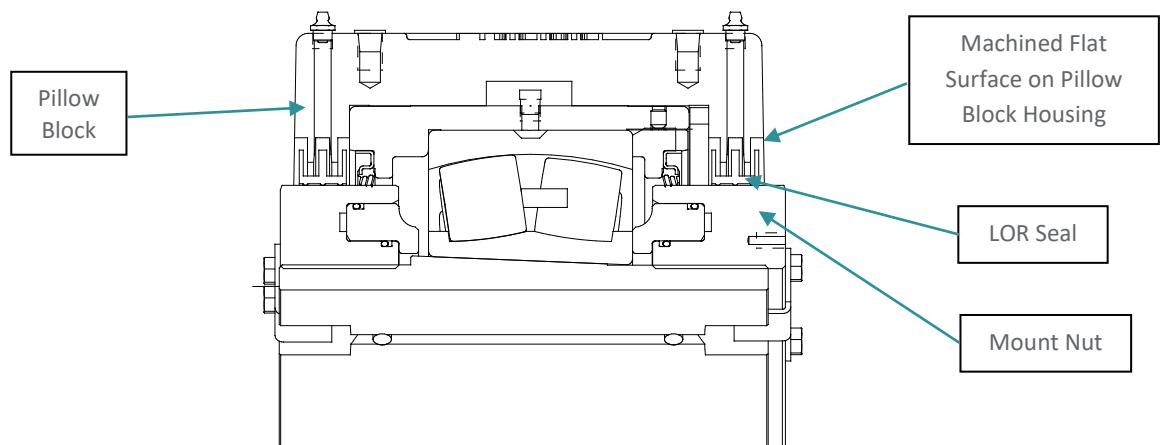


Figure 1. Cross-section of Hydraulic ISAF/ISNX



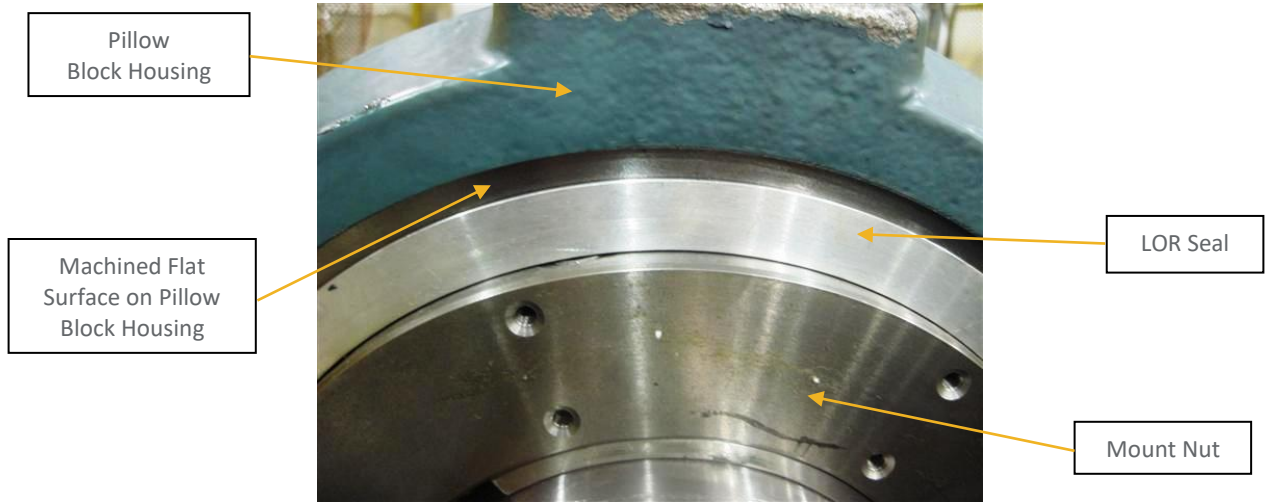


Figure 2. Mounting side of bearing

There are a few simple steps that can be taken when mounting to avoid this issue of misalignment. One step is to use a depth micrometer to measure the distance from the face of the mount or dismount nut to the machined face on the housing. The measurements should be taken at the 12 o'clock (12 o'clock is top dead center of the housing) and 6 o'clock positions and then at the 3 o'clock and 9 o'clock positions. The difference in the two position measurements should fall between the $\pm 1/2^\circ$ difference shown in **Table 1** per the bearing size and series. If the differences of the measurements fall under the values in **Table 1**, the bearing is within the $\pm 1/2^\circ$ of misalignment capability and is ready to run. If the measured value is above the figures in **Table 1**, the housing will need some additional alignment. If the value exceeds the 12 and 6 o'clock position, make sure the base the bearing is sitting on is flat and does not have any debris or material that is cocking the housing. Also, shims can be used to align the housing. If the value exceeds the 3 and 9 o'clock positions, simply tapping the pillow block in the correct direction will align the housing. The below pictures show an example of a 5-7/16 inch Hydraulic ISAF bearing and how a depth micrometer can be used to align the housing at the 3 and 9 o'clock positions. Using the value from **Table 1** for the 5-7/16 inch bearing, the alignment needs to be within .080 inches.





Figure 3. Depth Micrometer

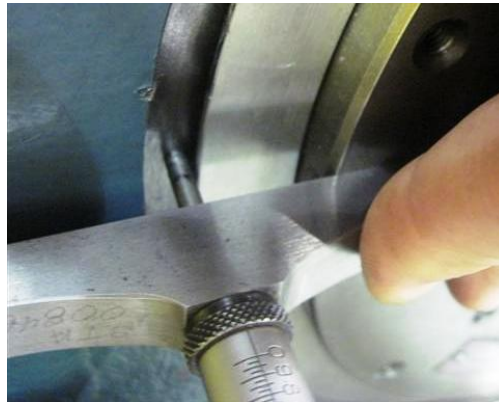


Figure 4. Depth Micrometer at 9 o'clock position



Figure 5. Depth Micrometer at 3 o'clock position

Another easy way to check alignment of the Hydraulic ISAF/ISNX is with a magnetic base dial indicator. The indicator is placed on the shaft and the probe is then placed on the flat machined surface just above the seals of the housing at the 12 o'clock position. Zero the indicator out. Rotate the shaft until the indicator is at the 6 o'clock position. Record the readings from the indicator. If the value on the indicator is less than the value on **Table 1** for the shaft size and series bearing, the assembly is aligned properly. If the reading is larger than the value on **Table 1**, check the base and align the bearing as in the steps in the previous paragraph. The dial indicator alignment should also be checked at the 3 and 9 o'clock positions as well. Using the same steps, zero the indicator at the 3 o'clock position and rotate the shaft to the 9 o'clock position. If the reading on the indicator is less than that of the value in **Table 1** for the proper shaft size and series bearing, the assembly is aligned. If the value is greater follow the same steps for aligning the housing for the 3 and 9 o'clock position in the previous paragraph. The pictures below show an example of a 5-7/16 inch Hydraulic ISAF bearing and how a magnetic base dial indicator can be used to align the housing at the 3 and 9 o'clock positions. Using the value from **Table 1** for the 5-7/16 inch bearing, the alignment needs to be within 0.080 inches.



Figure 6. Magnetic Base Dial Indicator





Figure 7. Dial Indicator at the 9 o'clock Position



Figure 8. Dial Indicator at the 3 o'clock Position



Table 1. Misalignment Capability

H-ISAF/ISNX Maximum Misalignment Capability		
Bore Size: inches (mm)	Housing Series	1/2° Misalignment: inches (mm)*
5-7/16, 5-1/2	532	.080
5-15/16, 6	534	.085
6-7/16, 6-1/2	536	.090
6-15/16, 7	538	.090
7-15/16, 8	544	.105
8-1/2, 9	048	.105
10, 10-7/16, 10-1/2	056	.125
11	060	.130
12-1/2	068	.150
14	076	.160
15	080	.165
(150)	3134	(2.1)
(160)	3136	(2.2)
(170)	3138	(2.3)
(180)	3140	(2.4)
(200)	3144	(2.6)
(220)	3148	(2.6)
9-7/16, 9-1/2 (240)	3152	.110 (2.7)
10, 10-7/16, 10-1/2 (260)	3156	.120 (3.0)
10-15/16, 11 (280)	3160	.130 (3.3)
11-15/16, 12 (300)	3164	.140 (3.5)
12-7/16, 12-1/2 (320)	3168	.145 (3.6)
13-7/16, 13-1/2 (340)	3172	.155 (3.9)
13-15/16, 14 (360)	3176	.160 (4.0)

*Note: The difference between the depth micrometer and dial indicator measurements needs to fall within these values to be aligned.

The default Elastomeric LOR seal is more forgiving than the metallic version. It is important that the metallic seal option is aligned correctly using the above steps. Using these easy checks will help eliminate any problems that could arise from alignment issues on the Hydraulic ISAF/ISNX style bearing. For any questions concerning Dodge brand anti-friction bearings or PT Component parts, contact Dodge C.O. Engineering at 864.284.5700 or email to Engineering@dodgeindustrial.com

