

# Instruction Manual for Dodge® Metric ISN Unitized Safety Mount Spherical Roller Bearings 80 to 170 mm

These instructions must be read thoroughly before installation or operation. This instruction manual was accurate at the time of printing. Please see [dodgeindustrial.com](http://dodgeindustrial.com) for updated instruction manuals.

**WARNING: To ensure the drive is not unexpectedly started, turn off and lock-out or tag power source before proceeding. Failure to observe these precautions could result in bodily injury.**

**WARNING: All products over 25 kg (55 lbs) are noted on the shipping package. Proper lifting practices are required for these products.**



<https://dodgeindustrial.com/technology-services/>

## Required Tools

- 9mm rod (fits in hole drilled into the OD of the external nut)
- Marker
- Impact hex drive socket
- Drive ratchet
- Dead blow mallet
- Torque Wrench

## Inspection

**WARNING: Because of the possible danger to person(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed. Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions in the instruction manuals must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by Dodge nor are the responsibility of Dodge. This unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risk to persons or property may be involved, a holding device must be an integral part of the driven equipment beyond the speed reducer output shaft.**

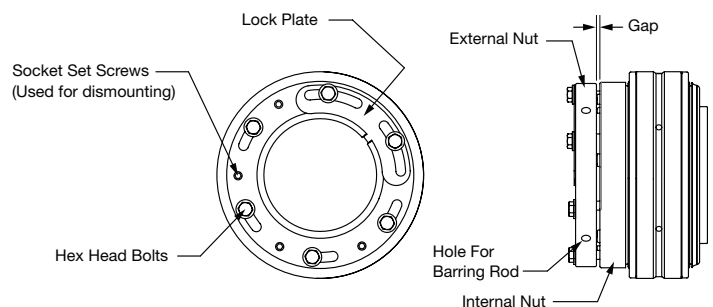
Inspect shaft to ensure it is smooth, straight, clean, and within commercial tolerances.

## Mounting

### Install Non-Expansion Bearing First

The locknut assembly is comprised of an external nut and internal nut. The bearing is shipped such that there is a gap between the two nuts. The two nuts must maintain this gap prior to mounting the bearing. The dual nut configuration prior to installation is shown in Figure 1. Note the position of the external nut slots relative to the hex cap bolts.

The socket setscrews located in the external nut are used only to dismount the bearing. Ensure that they are flush with the outer face of the external nut prior to mounting. They should be positioned this way when shipped from the factory, but their position should be verified. If they protrude into the gap between locknuts during installation, the bearing cannot be mounted correctly.



**Figure 1 - Bearing with dual nut as shipped with gap.**

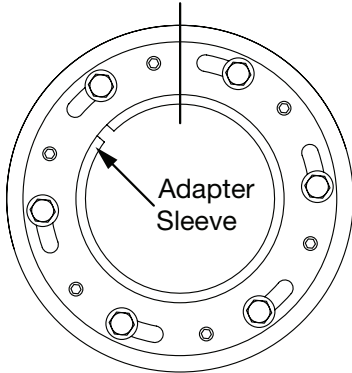
1. Slide bearing assembly onto the shaft. If the bearing will not slide onto the shaft, rotate the nut assembly counter clockwise until the bearing will freely slide onto the shaft.
2. Slide bearing to the desired position on the shaft.

**NOTE: All weight must be removed from the bearing when obtaining the “ZERO Reference Point”.**

3. The “ZERO Reference Point” is defined as the point when the clearance between the adapter sleeve, shaft and bearing bore has been removed. As soon as the “ZERO Reference Point” is reached, the adapter is collapsed around the shaft and you will not be able to move the bearing along on the shaft.

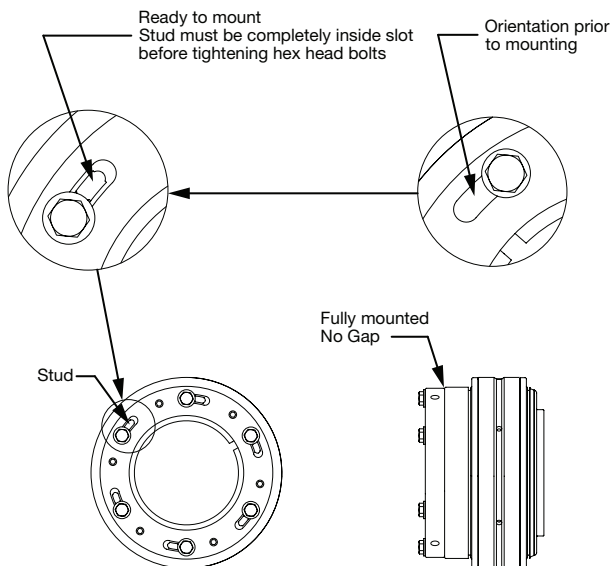
To reach the “ZERO Reference Point”, rotate the locknut clockwise with both hands to tighten. Holes are drilled into the OD of the external nut to be used with a 9mm rod to help tighten the nut. Once the adapter cannot be tightened further by hand, firmly push or pull the locknut along the shaft to test if the “ZERO Reference Point” has been reached. If the adapter sleeve is still able to slide or spin on the shaft, strike the OD of the external nut with a dead blow or rubber mallet, then tighten by hand again. Repeat the push/pull test. Continue to alternate tightening and testing the locknut until the adapter no longer slides axially on the shaft.

4. **Important: Mark a line on the adapter and external nut to be used as a location reference – see Figure 2. This is a critical point and represents the location of the nut assembly before the hex head bolts are tightened.**

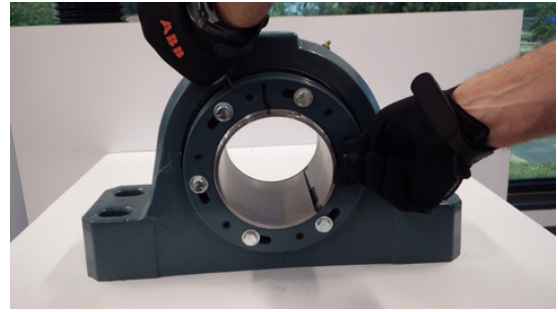


**Figure 2 - Mark face of external nut and adapter.**

5. Loosen but do not remove the hex head bolts. Use 9mm rod to hold external nut in position when loosening the hex head bolts. While holding the external nut with a 9mm rod, grasp one of the hex head bolts, and rotate the internal nut counter clockwise to shoulder the hex head bolts as shown in Figure 3. See Figure 4 demonstrating this step. **If the external nut moves during this step, it is imperative to reposition the nut assembly so that the external nut is positioned with the alignment mark made in step 4 before proceeding to the next step. Make sure the spacing stud is visible in the slot as shown in Figure 3, or the nut will not install correctly.**

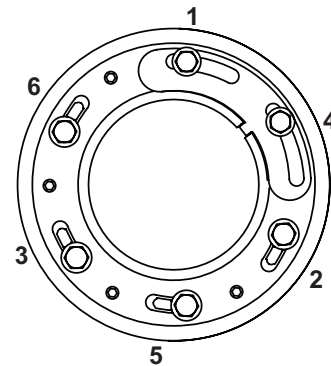


**Figure 3 - Nut rotated and ready for installation**



**Figure 4 - Holding external nut with rod and rotating internal nut C-Clockwise using hex head bolt**

6. At this point the machined studs used to create the gap have been positioned inside the elongated slots, and the two nuts can be pulled together, which installs the bearing on the shaft. **If the external nut moves during this step, it is imperative to reposition the nut assembly so that the external nut is positioned with the alignment mark made in Step 4 before proceeding to the next step.** Gradually tighten the hex head bolts in a star pattern, as shown in Figure 5, until the external nut firmly seats against the internal nut and the gap is completely closed as shown in Figure 3 (Not yet full torque).
7. Remove two hex head bolts nearest to the slot in the adapter. A slight gap may appear between the two nuts when these two hex head bolts are removed. This is a normal occurrence and the gap will close up when the two hex head bolts are reinstalled. Install the lock plate so that the tab fits into the adapter slot. If the lock plate does not line up with the two holes, it can be flipped over to fit as shown in Figure 1. Reinstall the two hex head bolts to secure the lock plate. **Using a star pattern, as shown in Figure 5, torque the hex head bolts to the values shown in Table 1.** It is considered a best practice to initially tighten the hex head bolts to 50% of full torque, then tighten again to 100% full torque (using the star pattern both times).



**Figure 5 - Correct installation star pattern**

**Table 1 - Installation hex head bolt size and torque ratings**

Shaft Size (mm)	Hex HD Bolt Size & Grade	Torque (max)		Socket Size (mm)
		ft-lbs	N-m	
80 – 85	M6-1.0 X 30, CL 10.9	9	12	10
90 – 100	M8-1.25 X 35, CL 10.9	20	25	13
110	M10-1.5 X 40, CL 8.8	30	40	17
115 – 125	M10-1.5 X 45, CL 8.8	30	40	17
135	M12-1.75 X 45, CL 8.8	50	65	19
140 – 150	M16-2.0 X 45, CL 8.8	120	165	24
160 – 170	M16-2.0 X 50, CL 8.8	120	165	24

8. Bolt down pillow block to structure.

## Install Expansion Unit

1. Turn locknut counter clockwise until it will freely slide onto the shaft.
  - a. If the locknut is facing away from the non-expansion bearing: Align housing and snug the mounting bolts. Push the insert as far as possible in the direction of the non-expansion bearing
  - b. If the locknut faces the non-expansion bearing: Align housing and snug the mounting bolts. Position the insert in the middle of the expansion travel. This is necessary because the insert shifts toward the nut during installation.

**NOTE: All weight must be removed from the bearing when obtaining the “ZERO Reference Point”.**

2. Follow steps 3 through 8 under mounting of the non-expansion bearing.

## Dismounting

1. Remove weight from bearing with slings or jacks.
2. Remove the hold down bolts securing the bearing to the pedestal.
3. Loosen the hex head mounting bolts so that a 9.5 mm gap is present between all of the hex head bolts and external nut. Tighten the socket set screws in a star pattern to dismount the bearing. The setscrews drive against the internal nut which pushes the bearing off the adapter. Make sure the hex head mounting bolts are loose during dismounting. If the external nut contacts the hex head mounting bolts, the bearing can no longer be loosened. If the hex head mounting bolts become tight during dismounting, loosen them again to create a gap with the internal nut. Continue to tighten the socket set screws until the bearing fully dismounts and can be freely removed from the shaft. Socket set screws and hex sizes are shown in Table 2.

Table 2 - Wrench sizes for socket set screws

Shaft Size (mm)	Soc Set Screw Size	Hex Key Size mm
80 – 85	M8-1.25	4
90 – 100	M8-1.25	4
110	M10-1.5	5
115 – 125	M10-1.5	5
135	M12-1.75	6
140 – 150	M16-2.0	8
160 – 170	M16-2.0	8

## Reassembly after dismount

To set up the dual nut assembly after dismounting the bearing, follow the steps below

1. With the bearing still on the shaft, back out socket setscrews until they are flush with the outer face of the external nut.
2. Loosen the hex head mounting bolts and position the external nut so that it is seated on top of the raised tabs, which creates the gap between the external and internal nuts. The external nut should be rotated counter clockwise so that the bolts are shouldered against the side of slot as shown in Figure 6. Thread the hex head bolts into the internal nut through each one of the slots on the external nut about 3 turns.

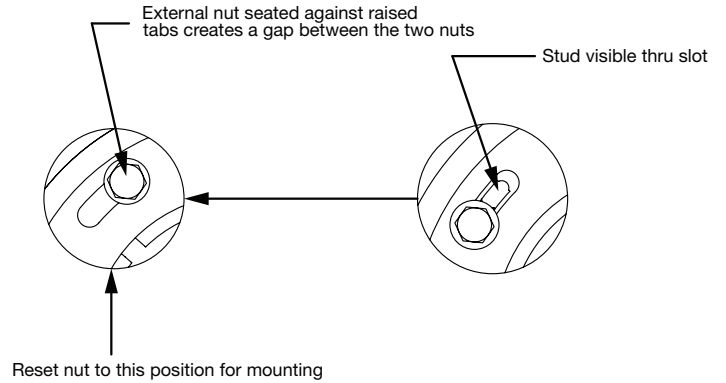


Figure 6 - External nut position for installation

3. Rotate the nut assembly 3 turns counter-clockwise.
4. Hand tighten each hex head bolt first and then torque the screws to 27-40 Nm, using a star pattern.

## Field Conversion of a Non-Expansion Bearing into an Expansion Bearing

1. Move snap ring opposite locknut side, to the outer snap ring groove. See Figure 7.
2. Remove non-expansion name plate and relabel as an expansion bearing.

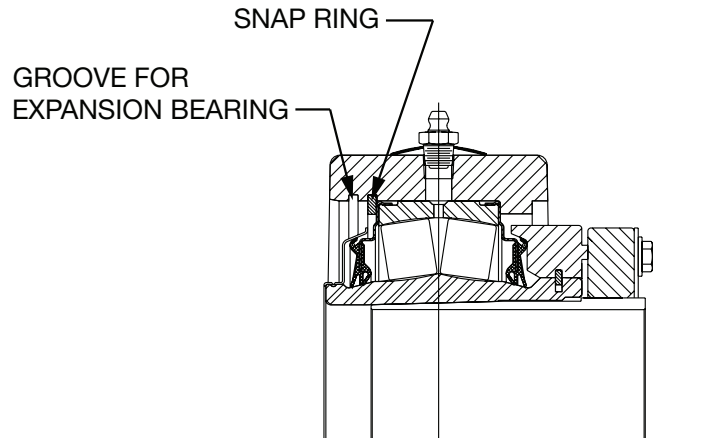


Figure 7 - Conversion from non-expansion to expansion

## Grease Lubrication

DODGE IP, ISAF, and ISN bearings are pre-packed with NLGI-2 Lithium Complex Grease. For re-lubrication select a grease that is compatible with a #2 Lithium Complex grease. Re-lubricate in accordance with Table 3.

## Storage or Special Shutdown

If exposed to wet or dusty conditions, or to corrosive vapors, extra protection is necessary. Add grease until it shows at the seals; rotate the bearing to distribute grease; cover the bearing.

**Table 3 - Relubrication Intervals (Months) Based on 12 hours per day, 150°F**

Shaft Size		RPM									
mm	inch	250	500	750	1000	1250	1500	2000	2500	>3000	1500
30 - 50	1 1/8 - 2	4	3	2	2	1	0.5	0.25	0.25	0.25	0.25
55	2 3/16 - 2 1/4	3.5	2.5	1.5	1	0.5	0.5	0.25	0.25	0.25	0.25
60 - 75	2 3/8 to 3	3	2	1.5	1	0.5	0.25	0.25	0.25	0.25	
80 - 85	3 3/16 - 3 1/2	2.5	1.5	1	0.5	0.25	0.25	0.25	0.25		
90 - 110	3 11/16 - 4 1/2	2	1.5	1	0.5	0.25	0.25	0.25			
115 - 135	4 15/16 - 5 1/2	1.5	1	0.5	0.25	0.25	0.25				
140 - 150	5 15/16 - 6	1	0.5	0.5	0.25	0.25	0.25				
160 - 170	6 7/16 - 7	1	0.5	0.25	0.25	0.25					

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