Instruction Manual
DODGE® Adapter Mounted
USDAF 23000 Series Pillow Blocks (10-15/16” - 15-3/4”)
USDAF 23100 Series Pillow Blocks (9-7/16” - 14”)
USDAF 23200 Series Pillow Blocks (8-15/16” - 12-1/2”)

These instructions must be read thoroughly before installation or operation.

GENERAL INFORMATION

DODGE USDAF bearings conform with all appropriate ABMA standards. They are available in adapter mounting style for 8-15/16” through 15-3/4”. Seals available are TRIPLE-TECT, LER and Auxiliary Taconite. Complete installation, maintenance and modification instructions for adapter mounted units are provided in this manual.

INSPECTION

Inspect shaft. Ensure that the shaft is smooth, straight, clean and within commercial tolerances. Inspect bearing. Do not allow bearing to be exposed to any dirt or moisture. Do not remove slushing compound as it acts as both a protectant and lubricant and is also compatible with standard greases.

INSTALLATION INSTRUCTIONS

WARNING: To ensure that 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.

NOTE: Housing caps and bases are not interchangeable; they must be matched with mating half. Install non-expansion bearing first.

1. Apply a coating of light oil or other rust inhibitor to the adapter area of the shaft.

2. Measure the internal clearance of the bearing before mounting. Place the bearing in an upright position as shown in Figure 1. Seat the inner ring and roller elements by pressing down firmly on the inner ring bore while rotating the inner ring a few times. Position the roller assemblies so that a roller is at the top most position on each side. Press these top rollers inward ensuring contact with center guide flange. Using a feeler gauge measure the clearance for both sides by inserting as far as possible and sliding over top of roller (Figure 1). Write down the measured clearance for use in Step 3d. **NOTE:** Do not rotate bearing when moving feeler between roller and outer ring. Use a sawing motion of feeler to check radial clearance.

NOTE: If LER seals or Auxiliary Taconite seals are used follow instruction manual supplied with the seals. TRIPLE-TECT seal installation is discussed in Step 3.

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 Baldor Electric Company nor are the responsibility of Baldor Electric Company. 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 fail safe device must be an integral part of the driven equipment beyond the speed reducer output shaft.

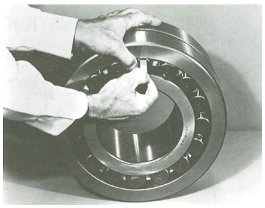

Figure 1 - Measurement of Internal Clearance

3. Install the bearing parts in the following sequence: (refer to parts drawing).

a) V-Ring Seal — Slide one of the V-ring seals onto the shaft, making sure lip is toward the bearing. **NOTE:** Do not install V-ring seal on seal ring until housing cap has been set in place and tightened.

b) Seal Ring — Install a seal ring on shaft with largest O.D. toward bearing.

c) Adapter Sleeve — Slide adapter sleeve onto the shaft, threaded end outboard to the approximate desired location of the bearing. Apply a coating of light oil to sleeve O.D. Do not use grease.

d) Bearing — Make sure that the internal clearance has been written down. Install bearing on adapter sleeve, tapered bore of bearing to match tapered O.D. of adapter sleeve. Locate bearing in proper position on shaft.

e) Tighten locknut by hand followed by light tapping on a bar acting against notches on O.D. of locknut. Using a large spanner wrench or a hydraulic nut, drive the bearing on the adapter sleeve until the proper clearance reduction is achieved (Table 1).

Bolt lockplate to the locknut with the inner prong of the plate located in the slot of the adapter sleeve. If necessary tighten, not loosen, locknut to allow prong to fit in adapter slot. Use supplied wire to fix lock plate bolts in position and prevent backing off due to vibration.

f) Seal Ring — Install second V-ring with large O.D. toward locknut.

g) V-Ring Seal — Slide second V-ring seal onto the shaft, again, making certain lip is toward bearing. **NOTE:** Do not install V-ring seal on seal ring until housing cap has been set in place and tightened.

Table 1 - Internal Clearance

Shaft Diameter (in.)	Reduction in Internal Clearance *(in.)
8-15/16 - 9	.0045 - .0060
9-7/16 - 10-1/2	.0045 - .0065
10-15/16 - 11	.0050 - .0075
11-7/16 - 12-1/2	.0060 - .0085
12-7/16 - 12-1/2	.0065 - .0090
13-15/16 - 13-1/2	.0065 - .0090
15	.0065 - .0090
15-3/4	.0080 - .0105

* Amount of clearance to be removed from clearance measured in step 2.

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4. Remove any paint, dirt or burrs from the mating surfaces of the housing halves. Thoroughly clean seal grooves on both sides. Set tower half of housing on base and apply oil to the bearing seats.

5. Apply grease to the bearing and seals. The lubricant should be smeared between the rolling elements (see Grease Lubrication section).

6. Place shaft with bearing into lower housing half while carefully guiding the seal rings into the housing grooves.

7. Bolt lower half of the non-expansion bearing to the base using grade 8 base bolts. Move shaft endwise so that spacer ring can be inserted as shown on drawing. Center all other bearings on same shaft in their housing seats. **NOTE:** Only one bearing per shaft is non-expansion, other bearings should be expansion.

8. Shaft extension should not be beyond adapter to ensure no rubbing with housing on cast closed end.

9. A bead of silicone sealant should be applied between the cap and the base.

10. Grease the bearing seal grooves in the housing cap and place over the bearing. The two dowel pins will align the cap with the lower housing half. **NOTE:** Each cap must be matched with its mating lower half, as these parts are not interchangeable.

11. Tighten cap bolts to the recommended torque in Table 2.

12. Assure that there is running clearance at TRIPLE-TECT seal rings.

13. Misalignment of pillow blocks must not exceed ±1/3 degree.

14. Follow steps 1-13 for the expansion bearing except do not insert spacer ring. Locate expansion bearing in the center of the housing.

Table 2 - Recommended Torque Values

	Size	1-3/8–6	1-1/2–6	1-3/4–5	2–4-1/2
Torque (ft.-lbs.)	Grade 2	650	870	1370	2060
	Grade 5	1470	1950	2290	3440

15. It is recommended that shear bars be used with these large bore size pillow blocks.

MAINTENANCE

WARNING: To ensure that 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. Remove the housing cap in order to inspect bearing and grease.

GREASE LUBRICATION

USDAF bearings are specifically designed for dirty, dusty or wet environments. In order to properly protect bearings during installation, pack the bearing insert 100% full immediately after having properly mounted bearing on the shaft.

If the RPM of the application falls between 20% and 80% of maximum RPM (Table 5), pack the lower half of the housing one third to one half full. If the RPM on the application is less than 20% of maximum RPM, pack bearing housing cavity 100% full. If the RPM exceeds 80% of maximum RPM, do not add grease in the lower half of the housing nor in the cap.

WARNING: Regreasing requires rotating parts to be exposed. Exercise extreme care during such operations. Failure to observe these precautions could result in bodily injury.

At each regreasing cycle, for applications up to 80% of maximum RPM, slowly add grease until fresh grease is seen purging at the seals. Regreasing should be done while running. Remote regreasing lines should be added to avoid endangering personnel.

If the RPM is greater than 80% of maximum RPM, add 32 strokes of a handgun at each regreasing cycle. For units running above 80% of maximum RPM, running temperature should be monitored. If a drastic change in running temperature is noted, it is recommended to remove the used grease completely and recharge with fresh grease per the above instructions.

Select a grease with a viscosity at operating temperature which will provide full film lubrication (see Table 3). Use a 50°F to100°F increase in bearing temperature above ambient, depending on RPM and load. Use Table 4 as a general guide for regreasing the bearings. A small amount of grease at frequent intervals is preferable to a large amount of grease at infrequent intervals. For special applications involving high speeds or high temperatures, consult Baldor Electric Company, DODGE Engineering, Greenville, SC.

Table 3 - Viscosity of Oil in the Grease

Δ DN [Bore Diameter (ins). × RPM]	Viscosity for Average Loads * (SUS @ Operating Temperature)
100	3500
200	3150
300	2750
400	2375
500	2000
600	1750
700	1500
800	1300
900	1075
1000	900
1400	625
1600	525
1800	450
2000	400
3000	300
4000	200
5000	150
6000	130
7000	110
8000	100

* For loads above 18% of dynamic capacity an EP grease with the above viscosity is recommended.

Table 4 - Regreasing Intervals (Months)*
(Based on 12 hours per day 150°F max.)

Size	RPM		
	Up to 250	251-500	501-630
* 8-15/16 - 15-3/4	1	.5	.25

* For continuous operation, 24 hrs/day, decrease greasing interval by 50%.

Table 5 - Maximum RPM

Shaft Size	Maximum RPM - Grease		
	23000K	23100K	23200K
8-15/16 - 9	–	–	700
9-7/16 - 9-1/2	–	670	630
10 - 10-1/2	–	630	600
10-15/16 - 11	630	600	560
11-7/16 - 11-1/2	600	–	–
11-15/16 - 12	600	530	530
12-7/16 - 12-1/2	560	500	480
12-15/16 - 13	530	–	–
13-7/16 - 13-1/2	530	480	–
13-15/16 - 14	500	450	–
15	450	–	–
15-3/4	450	–	–

LONG-TERM STORAGE OF PRE-ASSEMBLED BEARINGS

Applications such as conveyor pulleys and fans are shipped to a job site with bearings already mounted to the shafts. Since these units may be stored for long periods of time in unprotected areas subject to rain, dust, etc., bearings should be packed 100% full and so tagged at bearing assembly to prevent contamination or corrosion of the bearings. Rotate shaft at least once a month.

Prior to installation on the structure, if the application RPM is greater than 20% of catalog maximum speed, excess grease must be removed to the levels outlined previously. Removal of excess grease must be done in a clean, protected environment.

FIGURE 2 – ADAPTER MOUNT

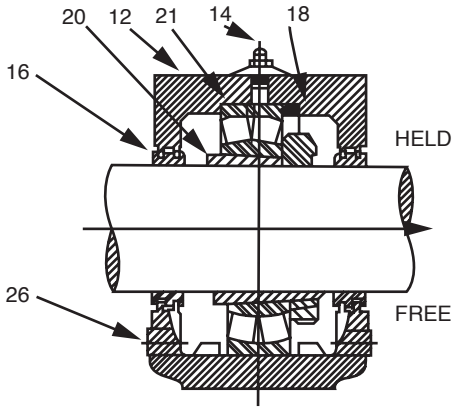

FIGURE 3 – PATENTED TRIPLE-TECT SEAL

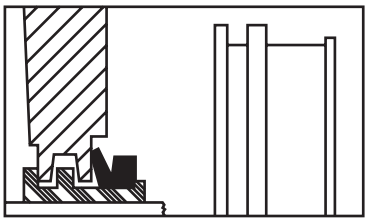

Table 6 - 23000 Series Replacement Parts

Ref.	Name of Part	Qty.	10–15/16	11	11–7/16	11–1/2	11–15/16	12	12-7/16	12-1/2	12-15/16	13	13-7/16	13-1/2	13-15/16	14	15	15-3/4
12	4-Bolt Base (Standard)	1	422580	422580	422502	422502	422529	422529	035183	035183	044164	044164	044165	044165	044166	044166	035417	035943
	4-Bolt Base (Cast Closed)	1	037426	037426	037427	037427	037428	037428	035185	035185	037429	037429	037430	037430	037431	037431	035418	035944
21	Roller Bearing	1	422582	422582	422531	422531	422531	422531	421282	421282	422036	422036	422036	422036	422054	422054	421283	421284
16	Seals																	
	TRIPLE-TECT*	2	047942	047943	047944	047945	047946	047947	047948	047949	047950	047951	047952	047953	047954	047955	047956	047957
	LER*	2	042037	422588	042038	042039	042040	422535	046498	046499	042090	042091	042092	042093	042094	042095	050474	047566
	Auxiliary*	2	045781	044440	045784	045787	045790	045793	046567	046568	045796	045799	045802	045805	045808	046569	046570	046572
18	Non-Expansion Spacer	1	422587	422587	422553	422553	422553	422553	422829	422829	042323	042323	042323	042323	042324	042324	422500	422847
20	Adapter Sleeve Assy (SNP)	1	043581	422576	043582	043583	043584	422525	047632	047635	043635	043636	043637	043638	043639	043640	040830	047638
14	Lubricating Fitting	1	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015
26	Drain Plug	2	430033	430033	430033	430033	430033	430033	430033	430033	430033	430033	430033	430033	430033	430033	430033	430033

***** Only two seals per bearing are needed of any one type. For cast closed end blocks, ony one seal per block is needed.

Table 7 - 23100 Series Replacement Parts

Ref.	Name of Part	Qty.	9-7/16	9-1/2	10-7/16	10-1/2	10-15/16	11	11-15/16	12	12-7/16	12-1/2	13-7/16	13-1/2	13-15/16	14
12	4-Bolt Base (Standard)	1	037461	037461	037432	037432	037434	037434	037436	037436	035945	035945	037438	037438	037440	037440
	4-Bolt Base (Cast Closed)	1	037462	037462	037433	037433	037435	037435	037437	037437	035946	035946	037439	037439	037441	037441
21	Roller Bearing	1	421294	421294	421285	421285	421286	421286	421287	421287	052081	052081	421288	421288	421289	421289
16	Seals															
	TRIPLE-TECT*	2	043538	422545	047940	047941	047942	047943	047946	047947	047948	047949	047952	047953	047954	047955
	LER*	2	042510	422594	042036	422573	042037	422588	042040	422535	046498	046499	042092	042093	042094	042095
	Auxiliary*	2	040900	040901	045778	042396	045781	044440	045790	045793	046567	046568	045802	045805	045808	046569
18	Non-Expansion Spacer	1	037463	037463	422587	422587	423378	423378	042323	042323	422846	422846	422500	422500	422847	422847
20	Adapter Sleeve Assy (SNP)	1	047630	047631	045431	047637	047638	045464	047639	050531	047641	047642	047643	045434	047644	047645
14	Lubricating Fitting	1	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015
26	Drain Plug	2	430033	430033	430033	430033	430033	430033	430033	430033	430033	430033	430033	430033	430033	430033

***** Only two seals per bearing are needed of any one type. For cast closed end blocks, ony one seal per block is needed.

Table 8 - 23200 Series Replacement Parts

Ref.	Name of Part	Qty.	8-15/16	9	9-7/16	9-1/2	10-7/16	10-1/2	10-15/16	11	11-15/16	12	12-7/16	12-1/2
12	4-Bolt Base (Standard)	1	037464	037464	037442	037442	037444	037444	037447	037447	037449	037449	037451	037451
	4-Bolt Base (Cast Closed)	1	037465	037465	037443	037443	037446	037446	037448	037448	037450	037450	037452	037452
21	Roller Bearing	1	422511	422511	421290	421290	421291	421291	421292	421292	422844	422844	421293	421293
16	Seals													
	TRIPLE-TECT*	2	043571	043572	043538	422545	047940	047941	047942	047943	041946	047947	047948	047949
	LER*	2	042544	042545	042510	422594	042036	422573	042037	422588	042040	422535	046498	046499
	Auxiliary*	2	040899	040995	040900	040901	045778	042396	045781	044440	045790	045793	046567	046568
18	Non-Expansion Spacer	1	037463	037463	422553	422553	423378	423378	042323	042323	422846	422846	423377	423377
20	Adapter Sleeve Assy (SNP)	1	047628	047629	047646	047647	047648	047649	047678	047679	047680	422843	047681	047682
14	Lubricating Fitting	1	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015
26	Drain Plug	2	430033	430033	430033	430033	430033	430033	430033	430033	430033	430033	430033	430033

***** Only two seals per bearing are needed of any one type. For cast closed end blocks, ony one seal per block is needed.

Table 9 - Cast Dimple Chart for USDAF Housings

Housing	Bearing Series	"AA" (in.)	"BB" (in.)	"CC" (in.)	"HH" (in.)	"H" Hole Size (in.)	"H" Bore Size (in.)	"II" (in.)
3248	23248K	6.22	4.34	1.66	30	1-3/4	1-5/8	33
3152	23152K							
3252	23252K	6.81	4.63	1.44	33.50	1-3/4	1-5/8	36.25
3156	23156K							
3256	23256K							
060	23060K							
3160	23160K							
064	23064K							
064L	23064K							
068	23068K	6.59	4.25	1.64	34	2	1-7/8	37
3260	23260K	7.17	4.44	1.31	36.50	2	1-7/8	39.75
3164	23164K							
072	23072K							
072L	23072K							
076	23076K							
3264	23264K	7.72	5.22	2.00	38.25	2-1/8	2	41.58
3168	23168K							
3268	23268K	7.75	5.25	1.50	40.75	2-1/8	2	44
3172	23172K							
3176	23176K							
080	23080K							
084	23084K							

Table 10 - Figure 4 Drawing Descriptions

Item	Description
A	Optional Seal Grease Location
B	Optional Location for Vent, Vibration Pickup and/or Grease Location for Non W33 Grooved Bearing
C	Position for Thermocouple Location
D	Position for Lubrication of Bearing with W33 Groove
E	Lubrication Port for W33 Groove Groove Bearing Drilled Standard on Pillow Blocks
F	Pre-drilled and Tapped Location for Vent or Side Lubrication for Bearing without W33 Groove
G	Dowel Pin Location for Metric Plummer Blocks
H	Drilling Location for Optional Six-Bolt Mounting or Optional Dowel Pin Location
I	Optional Location for Dowel Pin Location

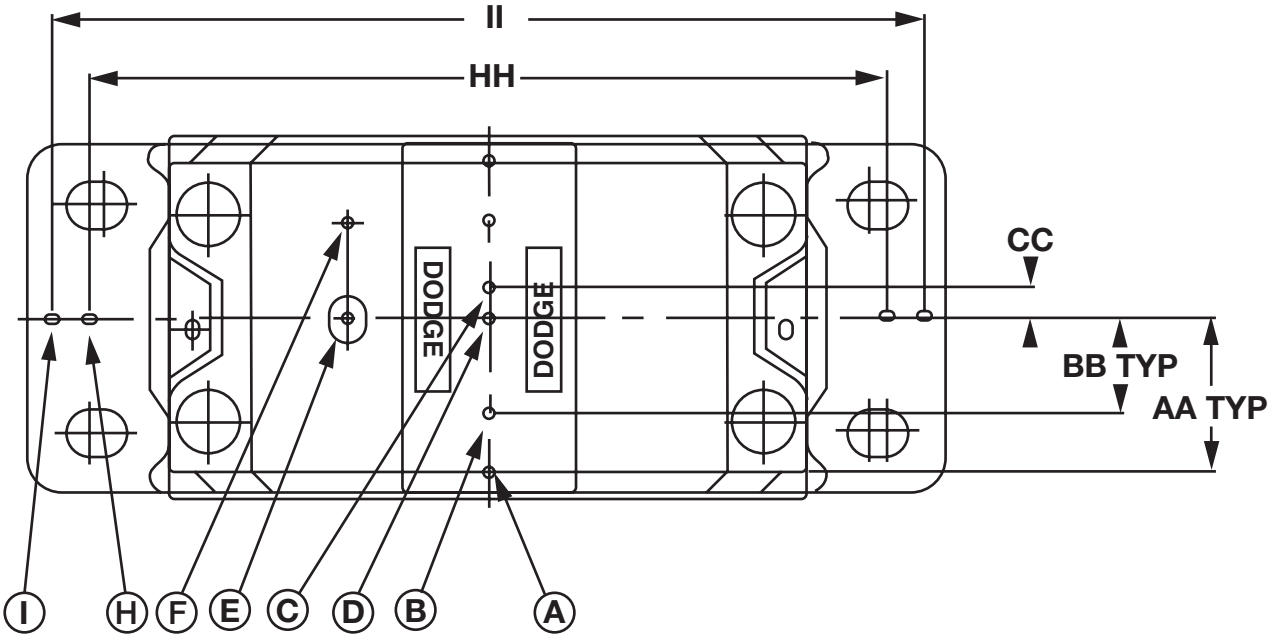

Figure 4 - USDAF Housing Dimensional and Descriptive Drawing

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