



KNOWLEDGE BASE

Article Type: Instructions

SAF-XT & SAFS Pillow Block Bearings, used on Columbia mixers; models, 30, 42, 54, 81, 108, & 135.

Description:

Instructions on “How to” properly maintain and adjust pillow block bearings SAF-XT & SAFS, “Dodge” and generic.

The following procedures will insure good performance and long service life along with basic routine service maintenance. Also included in this document is instruction on installation of seals.

This document is generic and services all manufactures of this style bearing.

WARNING

Never work on, clean or service this unit, control panel or any machine or open or remove any protective cover, guard, grate, door, or maintenance panel until the power or energy sources has been turned off, locked out / tagged out, and all moving parts have come to a complete stop and or blocked to prevent movement. Machinery is dangerous - avoid personal injury and or death by following manufacture, Local, and OHSA safety procedures. Contact Columbia Machine for safety decals, guards, horns and beacons.

INSTRUCTION MANUAL
FOR
DODGE® SAF-XT & SAFS
Pillow Blocks
All Sizes 1¹⁵/₁₆" through 10¹/₂"
2 and 4 Bolt Base



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 failsafe device must be an integral part of the driven equipment beyond the speed reducer output shaft.

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

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 light coating of spindle oil 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 topmost position on both sides. Press these top rollers inward ensuring contact with center guide flange (above 6 1/2" only). Using a feeler gage 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.



Figure 1 — Internal Clearance

3. Install the bearing parts in the following sequence: (refer to Figure 3). **NOTE:** Bearing can only be correctly installed one way. Refer to **Figure 2** on page 4.

a) V-ring Seal — Slide one of the V-ring seals onto the shaft **making sure lip is toward the bearing**. Set aside until step 11. **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 the largest O.D. toward bearing.

c) Adapter — Slide adapter onto the shaft, threaded end outboard to the approximate location of the bearing. Apply light coating of 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, large end of tapered bore first. Locate bearing in proper position on shaft. Before tightening refer to **Figure 2** and Table 4 on page 4.

e) Lockwasher and Locknut—Install the lockwasher (8" and smaller sizes only) on the adapter with inner prong located in the slot and toward the bearing. Install locknut, chamfered face toward bearing.

Tighten locknut using a spanner wrench and hammer until clearance noted in step 2 is **reduced by** amount shown in Table 1. During this step shaft should be supported so all weight is off of the bearing.

Find a lockwasher tab that aligns with a locknut slot and bend tab into slot. If slot is past tab then tighten, not loosen, locknut to meet a washer tab. Sizes larger than 8" require a lockplate bolted 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. Lock plates for only the 9" must be hand fitted on the job.

Table 1 — Internal Clearance Reduction

Shaft Diameter	Reduction in Internal Clearance
1 ¹⁵ / ₁₆ , 2 ³ / ₁₆	.0012/.0015
2 ⁷ / ₁₆ , 2 ¹ / ₂ , 2 ¹¹ / ₁₆ , 2 ³ / ₄	.0015/.0020
2 ¹⁵ / ₁₆ , 3, 3 ³ / ₁₆ , 3 ⁷ / ₁₆ , 3 ¹ / ₂	.0018/.0025
3 ¹⁵ / ₁₆ , 4, 4 ³ / ₁₆	.0020/.0028
4 ⁷ / ₁₆ , 4 ¹ / ₂ , 4 ¹⁵ / ₁₆ , 5	.0025/.0035
5 ³ / ₁₆ , 5 ⁷ / ₁₆ , 5 ¹ / ₂	.0030/.0040
5 ¹⁵ / ₁₆ , 6, 6 ⁷ / ₁₆ , 6 ¹ / ₂	.0030/.0045
6 ¹⁵ / ₁₆ , 7	.0035/.0050
7 ¹ / ₂ , 7 ¹⁵ / ₁₆ , 8	.0040/.0055
8 ⁷ / ₁₆ , 8 ¹ / ₂ , 8 ¹⁵ / ₁₆ , 9	.0045/.0060
9 ⁷ / ₁₆ –10 ¹ / ₂	.0045/.0065

f) **Seal Ring** — Install a second seal 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. See Step 11.




4. Remove any paint, dirt or burrs from the mating surfaces of the housing halves. Thoroughly clean seal grooves on both sides. Set lower half of housing on base with all four cap bolts in place and apply oil to the bearing seats. Apply grease to the seal grooves in the lower housing. **Be sure the housing is positioned as shown in Figure 2 view relative to adapter nut.**

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

6. Place shaft with bearing into lower half while carefully guiding the seal rings into the housing grooves as shown in **Figure 4**.

7. Bolt lower half of the non-expansion bearing housing to the base. Move shaft endwise so that stabilizing ring can be inserted between the bearing outer ring and the lower half shoulder on same side as the locknut. Make all other bearings on same shaft expansion by centering in the middle of their housing seat. Bolt expansion housings to base. **NOTE: Only one bearing per shaft is nonexpansion; other bearings should be expansion.**

Table 2 – Recommended Torque Values, Ft.-Lbs.

Housing Cap Bolt Size	Housing Cap Bolt Size							
	7/16-14	1/2-13	5/8-11	3/4-10	7/8-9	1-8	1 1/4-7	
 Grade 2	28-32	40-50	80-100	140-175	136-170	200-250	400-500	
 Grade 5	40-50	60-75	120-150	208-260	344-430	512-640	880-1100	
 Grade 8	56-70	88-110	168-210	304-380	480-600	728-910	1456-1820	

8. When closed end is required, the end plug supplied should be fit into the center seal ring groove of the housing (see **Figure 4**).

9. Grease the bearing seal grooves in the housing cap and place over the bearing after wiping the mating surfaces. 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.**

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

11. Assure that there is seal running clearance then install V-ring seals onto the seal rings as shown in **Figure 4** and coat V-ring seals with grease.

12. Misalignment of pillow blocks must not exceed values shown on Table 3 below.

Table 3 – Static or Dynamic Allowable Misalignment Degrees Spherical Roller Bearings

SHAFT SIZE	BLOCK SIZE	TRIPLE-TECT SEALS	LER	AUXILIARY SEAL
1 ¹⁵ / ₁₆	511	1°08'	0°52'	0°35'
2 ³ / ₁₆	513	1°01'	0°55'	0°32'
2 ⁷ / ₁₆ -2 1/2	515	0°59'	0°50'	0°28'
2 ¹¹ / ₁₆ -2 3/4	516	0°52'	0°52'	0°26'
2 ¹⁵ / ₁₆ -3	517	0°48'	0°52'	0°25'
3 ³ / ₁₆	518	1°06'	0°51'	0°32'
3 7/16-3 1/2	520	1°03'	0°46'	0°30'
3 ¹⁵ / ₁₆ -4	522	0°55'	0°42'	0°28'
4 ³ / ₁₆	524	0°49'	0°41'	0°27'
4 7/16-4 1/2	526	0°56'	0°44'	0°26'
4 ¹⁵ / ₁₆ -5	528	0°55'	0°40'	0°24'
5 ³ / ₁₆	530	—	0°35'	0°22'
5 7/16-5 1/2	532	0°47'	0°34'	0°22'
5 ¹⁵ / ₁₆ -6	534	0°43'	0°32'	0°22'
6 7/16-6 1/2	536	0°33'	0°23'	0°26'
6 ¹⁵ / ₁₆ -7	538	0°37'	0°27'	0°25'
7 1/2, 7 ¹⁵ / ₁₆ , 8	544	0°31'	0°24'	0°22'
8 7/16-9	048	0°36'	0°25'	0°22'
9 7/16-9 1/2	052	0°26'	0°23'	0°33'
9 ¹⁵ / ₁₆ -10 1/2	056	0°28'	0°16'	0°30'

**Table 4 — Bearing \odot to Housing \odot Offset — “S” Dimension
(Expansion brg. located at center of expansion)**

Size	Non-Expansion	Expansion	Size	Non-Expansion	Expansion
1 ¹⁵ / ₁₆	19/64	3/16	5 ³ / ₁₆	3/4	9/16
2 ³ / ₁₆	25/64	1/4	5 ⁷ / ₁₆ –5½	49/64	37/64
2 ⁷ / ₁₆ –2½	17/64	5/32	5 ¹⁵ / ₁₆ –6	25/32	37/64
2 ¹¹ / ₁₆ –2¾	3/8	3/16	6 ⁷ / ₁₆ –6½	3/4	35/64
2 ¹⁵ / ₁₆ –3	3/8	3/16	6 ¹⁵ / ₁₆ –7	13/16	5/8
3 ³ / ₁₆	31/64	19/64	7½	29/32	23/32
3 ⁷ / ₁₆ –3½	9/16	3/8	7 ¹⁵ / ₁₆ –8	29/32	23/32
3 ¹⁵ / ₁₆ –4	35/64	3/8	8 ⁷ / ₁₆ –9	25/32*	25/32
4 ³ / ₁₆	39/64	27/64	9 ⁷ / ₁₆ –9½	45/64*	45/64
4 ⁷ / ₁₆ –4½	41/64	29/64	9 ¹⁵ / ₁₆ –10½	7/8*	7/8
4 ¹⁵ / ₁₆ –5	11/16	½			

* One spacer on each side of bearing

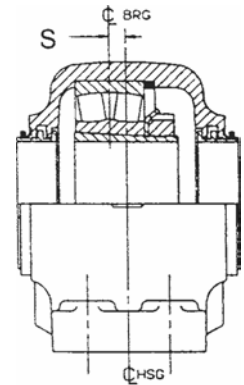


Figure 2

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 housing cap in order to inspect bearing and grease. Before reassembly it is important that the

V-ring seals be removed. This will ensure that seal lip will not be damaged while setting cap in place. Reassemble per installation steps 9 thru 11 above.

Seal Replacement — When removing bearing it is recommended that V-ring seals and seal rings be replaced.

Auxiliary Seals — Install per instruction sheet #499665.

GREASE LUBRICATION

SAF-XT and SAFS 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 7), pack the lower half of the housing one-third to one half full. If the RPM of the application is less than 20% of maximum RPM, pack bearing housing cavity 100% full. If the RPM exceeds 80% of maximum RPM, pack 1/3 of the lower half of the housing.

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.

WARNING

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

If the RPM is greater than 80% of maximum RPM add 4 strokes of a grease gun at each regreasing cycle for bores up to 2". For bores greater than 2" up to 5" add 8 strokes of a handgun at each regreasing cycle. For bores greater than 5" up to 101/2" add 16 strokes of a grease gun 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

Table 5 – Viscosity of Oil in the Grease

DN ▲	Viscosity for Loads Up To 18% of Dyn. Cap.* (SUS @ operating temp.)	DN ▲	Viscosity for Loads Up To 18% of Dyn. Cap.* (SUS @ operating temp.)
100	3500	1400	625
200	3150	1800	450
300	2750	2000	400
400	2375	3000	300
500	2000	4000	200
600	1750	5000	150
700	1500	6000	130
800	1300	7000	110
900	1075	8000	100
1000	900		

▲ DN = Bore Dia. (ins.) × RPM

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

fresh grease per above instructions.

Select a grease with a viscosity at operating temperature which will provide full film lubrication (see Table 5). Assume 50°-100°F increase in bearing temperature above the ambient, depending on RPM and load.

Use Table 6 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, high temperatures or oil lubrication, consult the factory.

Table 6 – Regreasing Intervals (Months) (Based on 12 hour per day 150°F max.)

Size	RPM									
	250	500	750	1000	1250	1500	2000	2500	3000	3500
1 ¹⁵ / ₁₆	8	6	4	3	2	1	.5	.5	.25	.25
2 ³ / ₁₆	7	5	3	2	1	1	.5	.25	.25	
2 ⁷ / ₁₆ -3	6	4	3	2	1	.5	.25	.25		
3 ³ / ₁₆ -3½	5	3	2	1	.5	.5	.25			
3 ¹⁵ / ₁₆ -4½	4	3	2	1	.5	.25				
4 ¹⁵ / ₁₆ -5½	3	2	1	.5	.25					
5 ¹⁵ / ₁₆ -7	2	1	1	.5						
7½-9	1	1	.5							
9 ⁷ / ₁₆ -10½	1	.5								

Table 7 – Maximum RPM (Grease Lubrication)

SHAFT SIZE	BASIC BEARING DESCRIPTION	MAX. RPM
1 ¹⁵ / ₁₆	22211K	4500
2 ³ / ₁₆	22213K	3600
2 ⁷ / ₁₆ , 2 ¹ / ₈	22215K	3400
2 ¹¹ / ₁₆ , 2¾	22216K	3200
2 ¹⁵ / ₁₆ , 3	22217K	3000
3 ³ / ₁₆	22218K	2600
3 ⁷ / ₁₆ , 3½	22220K	2200
3 ¹⁵ / ₁₆ , 4	22222K	2000
4 ¹ / ₁₆	22224K	1800
4 ⁷ / ₁₆ , 4½	22226K	1700
4 ¹⁵ / ₁₆ , 5	22228K	1600
5 ³ / ₁₆	22280K	1500
5 ⁷ / ₁₆ , 5½	22282K	1400
5 ¹⁵ / ₁₆ , 6	22284K	1300
6 ⁷ / ₁₆ , 6½	22236K	1200
6 ¹⁵ / ₁₆ , 7	22288K	950
7½, 7 ¹⁵ / ₁₆ , 8	22244K	800
8 ⁷ / ₁₆ , 8½	23048K	800
8 ¹⁵ / ₁₆ , 9		
9 ⁷ / ₁₆ , 9½	23052K	750
9 ¹⁵ / ₁₆ , 10	23056K	700
10 ⁷ / ₁₆ , 10½		

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.

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.

REPLACEMENT PARTS FOR SAF-XT PILLOW BLOCKS

NOTE: Large cavity of Pillow Block Housing must be on the same side as the locknut.

NOTE: Spacer required for Non-Expansion Pillow Blocks. See Chart.

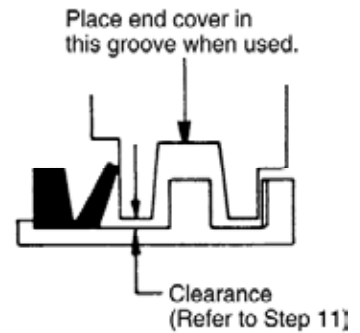
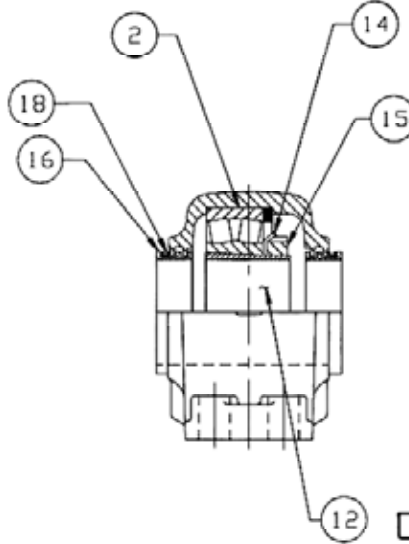
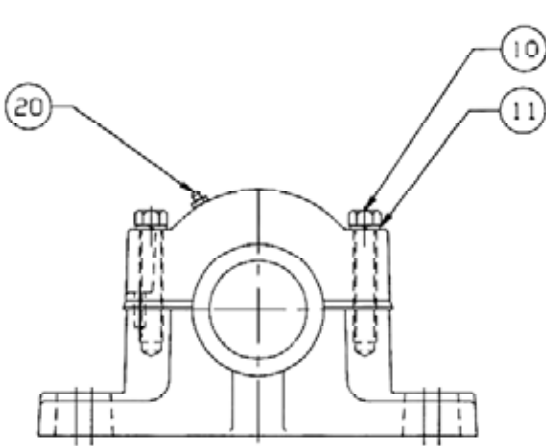


Figure 3

Figure 4

Reference	Name of Part	No. Req'd	Part Numbers															
			1-15/16D	2-3/16D	2-7/16D	2-7/16	2-1/2D	2-1/2	2-11/16D	2-11/16	2-3/4D	2-3/4	2-15/16D	2-15/16	3D	3	3-3/16D	
2	Bearing	1	422123	422124	422001	422001	422001	422001	422003	422003	422003	422003	422005	422005	422005	422005	422005	422007
	HOUSING ASSEMBLY*	1	042100	042103	042106	042109	042106	042109	042111	042114	042111	042114	042116	042119	042116	042119	042119	042121
10	Housing Bolt	4	411625	411637	411240	411240	411240	411240	411240	411240	411240	411240	411240	411240	411240	411240	411240	411240
11	Lockwasher	4	419012	419012	419013	419013	419013	419013	419013	419013	419013	419013	419013	419013	419013	419013	419013	419013
12	Adapter	1	042310	042311	041110	041110	041111	041111	041109	041109	041126	041126	041112	041112	041113	041113	041113	041114
14	Lockwasher	1	419182	419183	419150	419150	419150	419150	419152	419152	419152	419152	419154	419154	419154	419154	419154	419156
15	Lock Nut	1	419164	419135	460901	460901	460901	460901	460902	460902	460902	460902	460903	460903	460903	460903	460903	460904
16	Seal Ring	2	042050	042051	042052	042052	042053	042053	042054	042054	042083	042063	042055	042055	042056	042056	042056	042057
18	V-Ring Seal	2	042225	042226	042227	042227	042227	042227	042228	042228	042228	042228	042229	042229	042229	042229	042229	042230
20	Grease Fitting	1	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015
∅	Stabilizing Ring	1	042315	042316	041174	041174	041174	041174	041172	041172	041172	041172	041175	041175	041175	041175	041175	041175

Reference	Name of Part	No. Req'd	Part Numbers														
			3-3/16	3-7/16D	3-7/16	3-1/2D	3-1/2	3-15/16	4	4-3/16	4-7/16	4-1/2	4-15/16	5	5-3/16	5-7/16	5-1/2
2	Bearing	1	422007	422009	422009	422009	422009	422011	422011	422013	422015	422015	422017	422017	422019	422021	422021
	HOUSING ASSEMBLY*	1	042124	042126	042129	042126	042129	042131	042131	042134	042137	042137	042140	042140	042143	042146	042146
10	Housing Bolt	4	411638	411638	411638	411638	411638	411710	411710	411831	411831	411831	411498	411498	411498	411498	411498
11	Lockwasher	4	419013	419014	419014	419014	419014	419016	419016	419016	419014	419014	419016	419016	419016	419016	419016
12	Adapter	1	041114	041115	041115	041116	041116	041117	041118	041119	041120	041121	041122	041123	041124	041125	042318
14	Lockwasher	1	419156	419158	419158	419158	419158	419160	419160	419162	419164	419164	419166	419166	419168	419170	419170
15	Lock Nut	1	460904	460905	460905	460905	460905	460906	460906	041071	041064	041064	041065	041065	041072	041066	041066
16	Seal Ring	2	042057	042056	042058	042059	042059	042060	042061	042062	042063	042064	042065	042066	042067	042068	042069
18	V-Ring Seal	2	042230	042230	042230	042230	042230	042231	042231	042232	042233	042233	042234	042234	042235	042235	042235
20	Grease Fitting	1	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015
∅	Stabilizing Ring	1	041173	041176	041176	041176	041176	041177	041177	041185	041178	041178	041179	041179	041186	041160	041160

* Housing Assembly consists of cap, base, roll pins, bolts, nuts and spacer(s).
 ∅ Not shown on drawing. 2 required on sizes 8-7/16 and larger.

Δ 2 Bolt Base.
 ‡ Locking plate used instead of lockwasher (not shown).

Sizes 5¹⁵/₁₆ to 10¹/₂ continued on next page.

REPLACEMENT PARTS FOR SAF-XT PILLOW BLOCKS

NOTE: Large cavity of Pillow Block Housing must be on the same side as the locknut.

NOTE: Spacer required for Non-Expansion Pillow Blocks. See Chart.

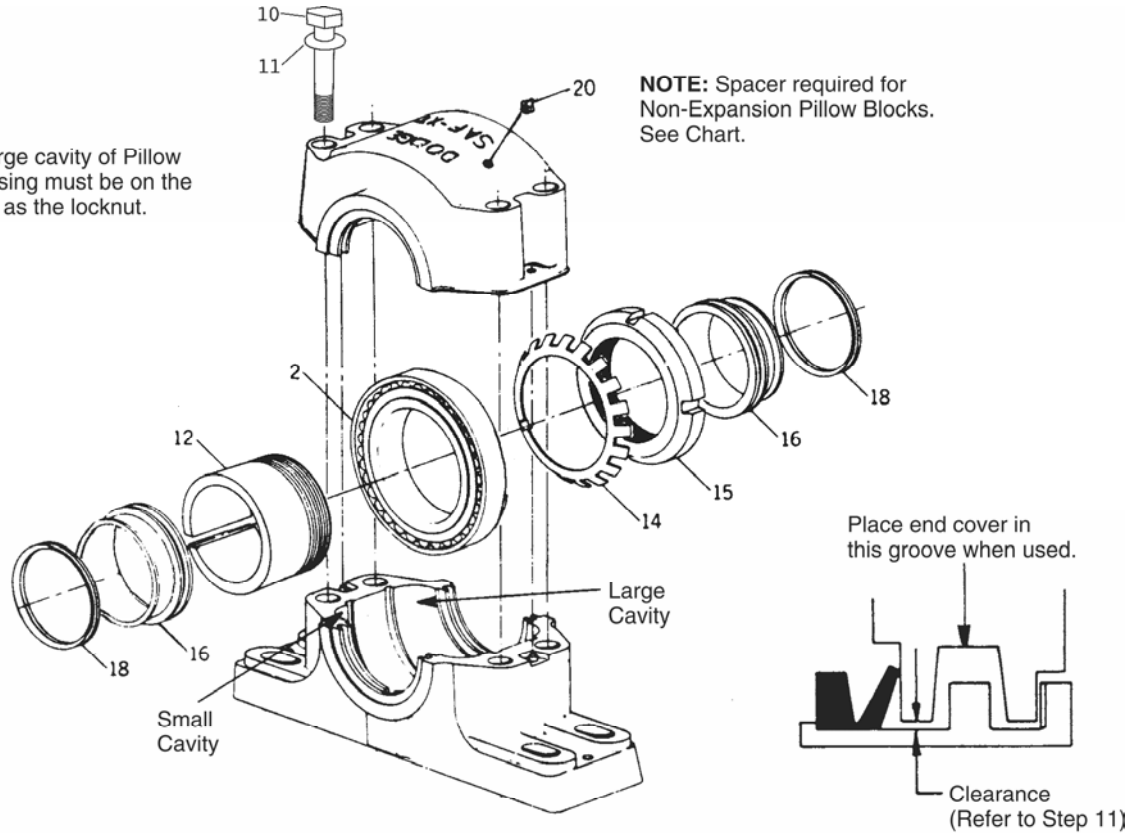


Figure 3

Figure 4

Reference	Name of Part	No. Req'd.	Part Numbers							
			5-15/16	6	6-7/16	6-1/2	6-15/16	7	7-1/2	7-15/16
2	Bearing	1	422023	422023	422025	422025	422027	422027	422029	422029
	HOUSING ASSEMBLY*	1	042149	042149	042152	042152	042155	042155	042167	042158
10	Housing Bolt	4	411381	411381	411381	411381	411381	411381	411860	411860
11	Lockwasher	4	419020	419020	419020	419020	419020	419020	419024	419024
12	Adapter	1	041127	041128	041129	041130	04132	041133	041145	041137
14	Lockwasher	1	419172	419172	419174	419174	419176	419176	419178	419178
15	Lock Nut	1	041067	041067	041070	041070	041068	041068	041069	041069
16	Seal Ring	2	042070	042071	042072	042073	042074	042075	042081	042076
18	V-Ring Seal	2	042236	042236	042237	042237	042238	042238	042239	042239
20	Grease Fitting	1	405015	405015	405015	405015	405015	405015	405015	405015
↓	Stabilizing Ring	1	041181	041181	041184	041184	041182	041182	041183	041183

Reference	Name of Part	No. Req'd.	Part Numbers										
			8	8-7/16	8-1/2	8-15/16	9	9-7/16	9-1/2	9-15/16	10	10-7/16	10-1/2
2	Bearing	1	422029	422031	422031	422031	422031	422543	422543	422030	422030	422030	42203
	HOUSING ASSEMBLY*	1	042158	042161	042161	042161	042161	422555	422555	047378	042164	042379	422572
10	Housing Bolt	4	411860	411860	411860	411860	411860	411860	411860	411864	411864	411864	411864
11	Lockwasher	4	419024	419024	419024	419024	419024	419024	419024	419024	419024	419024	419024
12	Adapter	1	041138	042319	041078	042320	041079	042597	422541	041053	041136	042582	422570
14	Lockwasher	1	419178	419177†	419177†	419177†	419177†	422540‡	422540‡	419179†	419179†	419179†	419179†
15	Lock Nut	1	041069	041074	041074	041074	041074	422539	422539	041073	041073	041073	041073
16	Seal Ring	2	042077	042082	042078	042084	042079	043496	422546	422546	042086†	042036	422573†
18	V-Ring Seal	2	042239	042240	042240	042240	042240	422547	422547	-	042241	-	-
20	Grease Fitting	1	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015	405015
↓	Stabilizing Ring	1	041183	041161	041161	041161	041161	422554	422554	041213	041213	041213	041213

* Housing Assembly consists of cap. base, roll pins, bolts, nuts and spacer(s).

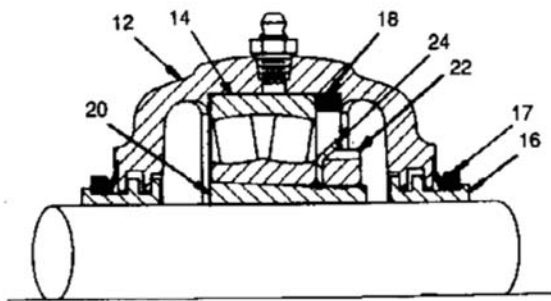
‡ 2 Bolt Base.

† ER Seals

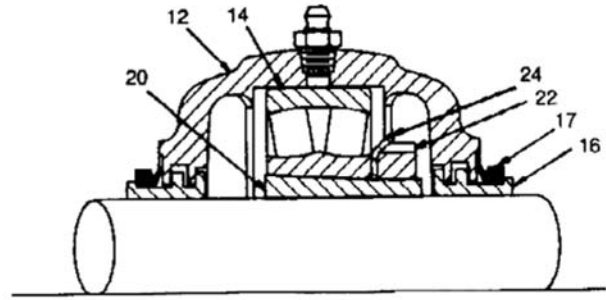
↓ Not shown on drawing. 2 required on sizes 8-7/16 and larger.

‡ Locking plate used instead of lockwasher (not shown).

REPLACEMENT PARTS FOR SAFS PILLOW BLOCKS



**NON-EXPANSION TYPE
SAFS PILLOW BLOCKS**



**EXPANSION TYPE
SAFS PILLOW BLOCKS**

Ref.	Name of Part	# Req'd.	1-7/16	1-11/16	1-15/16	2-3/16	2-7/16	2-1/2	2-11/16	2-3/4	2-15/16	3	3-3/16	3-7/16	3-1/2	3-15/16	4	4-3/16	4-7/16	4-1/2
	2 Bolt Base Housing Assem. *	1	043995	043996	043997	043998	044000	044000	044198	044198	044010	044010	044199	044020	044020	.....	.....	.....	.....	.....
12	4 Bolt Base Housing Assem. *	1	.....	.....	.....	.....	044003	044003	044007	044007	044013	044013	044114	044023	044023	044025	044025	044031	044031	.....
	2 Bolt Base Housing (SAFS) Assem. *		.....	.....	.....	.....	042425	042425	0424231	0424231	042433	042433	042433	042440	042440	.....	.....	.....	.....	.....
12	4 Bolt Base Housing (SAFS) Assem. *		.....	.....	.....	.....	042428	042428	044232	044232	042436	042436	044234	042443	042443	042450	042450	044235	042455	042455
14	Roller Bearing	1	422134	422137	422123	422124	422001	422001	422003	422003	422005	422005	422007	422009	422009	422011	422011	422013	422015	422015
16	Seal Ring	2	043389	043390	042050	042051	042052	042053	042054	042083	042055	042056	042057	042058	042059	042060	042061	042062	042073	042064
17	V-Ring Seal	2	042243	042224	042225	042226	042227	042227	042228	042228	04222	042229	042230	042230	042230	042231	042231	042232	042233	042233
18	Non-Exp. Spacer	1	041987	042335	042315	042316	041174	041174	041172	041172	041175	041175	041173	041176	041176	041177	041177	041185	041178	041178
20	Adapter Sleeve	1	042013	042014	042310	042311	041110	041111	041109	041126	041112	041113	041114	041115	041116	041117	041118	041119	041120	041121
22	Nut	1	419187	419188	419184	419185	460901	460901	460902	460902	460903	460903	460904	460905	460905	460906	460906	041071	041064	041064
24	Lockwasher	1	419180	419181	419182	419183	419150	419150	419152	419152	419154	419154	419156	419158	419158	419160	419160	419162	419164	419164
Ref.	Name of Part	# Req'd.	4-15/16	5	5-3/16	5-7/16	5-15/16	6	6-7/16	6-1/2	6-15/16	7	7-1/2	7-15/16	8	8-7/16	8-1/2	8-15/16	9	
12	4 Bolt Base Housing Assem. *	1	044034	044034	044203	044040	044043	044043	044046	044046	044049	044049	044054	044055	044055	044200	044200	044200	044200	.....
12	4 Bolt Base Housing (SAFS) Assem. *		042460	042460	044236	042465	042469	042469	042468	042468	042472	042472	044237	042477	042477	.....	.....	.....	.....	.....
14	Roller Bearing	1	422017	422017	422019	422021	422023	422023	422025	422025	422027	422027	422029	422029	422029	422031	422031	422031	422031	422031
16	Seal Ring	2	042065	042066	042067	042068	042070	042071	042072	042073	042074	042075	042081	042076	042079	042082	042078	042084	042079	042079
17	V-Ring Seal	2	042234	042234	042235	042235	042236	042236	042237	042237	042238	042238	042239	042239	042239	042240	042240	042240	042240	042240
18	Non-Exp. Spacer	1	041179	041179	041186	041180	041181	041181	041184	041184	041182	041182	041183	041183	041183	041161	041161	041161	041161	041161
20	Adapter Sleeve	1	041122	041123	041124	041125	041127	041128	041129	041130	041132	041133	041145	041137	041138	042319	041078	042320	041079	041079
22	Nut	1	041065	041065	041072	041066	041067	041067	041070	041070	041068	041068	041069	041069	041069	041074	041074	041074	041074	041074
24	Lockwasher	1	419166	419166	419168	419170	419172	419172	419174	419174	419176	419176	419178	419178	419178	419177	419177	419177	419177	419177
Ref.	Name of Part	# Req'd.	9-7/16	10	10-1/2															
12	4 Bolt Base Housing Assem. *	1	422542	422560	044201															
12	4 Bolt Base Housing (SAFS) Assem. *		.....	.....	.....												
14	Roller Bearing	1	422543	422030	422030															
16	Seal Ring	2	043496	042086	.....														
17	V-Ring Seal	2	422547	042241	.....														
18	Non-Exp. Spacer	1	422554	041213	041213															
20	Adapter Sleeve	1	042597	041136	422570															
22	Nut	1	422539	041073	041073															
24	Lockwasher	1	422540	419179	419179															

† Not shown on drawing.
 * Housing assembly consists of cap, base, roll pins, bolts, nuts and spacers.
 ‡ Locking plate used instead of lockwasher (not shown).
 • Two required for these sizes.



World Headquarters
 P.O. Box 2400, Fort Smith, AR 72902-2400 U.S.A., Ph: (1) 479.646.4711, Fax (1) 479.648.5792, International Fax (1) 479.648.5895

Baldor - Dodge
 6040 Ponders Court, Greenville, SC 29615-4617 U.S.A., Ph: (1) 864.297.4800, Fax: (1) 864.281.2433

www.baldor.com



INSTALLATION OF SEALS IN DODGE® USAF, USN & SAF-XT PILLOW BLOCK HOUSINGS

DODGE Sealing Systems Installation Instructions

For use on USAF, USN, or SAF-XT Pillow Blocks

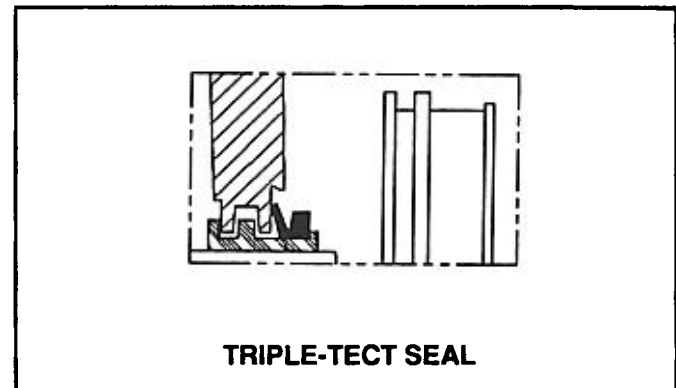
GENERAL INFORMATION

DODGE offers a variety of sealing systems for SAF type pillow blocks. Keeping your bearings properly sealed is critical in getting the most life from your new DODGE USAF, USN, or SAF-XT pillow block. By now you have selected one of the following seals for your application:

*Conventional LER type labyrinth seals are all metal and well-suited for high operating temperatures. See instructions on page 3.

*TRIPLE-TECT seals combine a non-metallic labyrinth and a rubbing seal. These provide better sealing than the conventional LER type between seal and shaft as well as seal to housing. A special tool shown on the following pages will help make seal installation easier. See page 4 for instructions.

*DROP IN TRIPLE-TECT seals with neoprene V-rings seals offer even better sealing than standard TRIPLE-TECT seals. The patent pending drop in feature allows simple installation without the need for special tools. See page 6 for instructions.



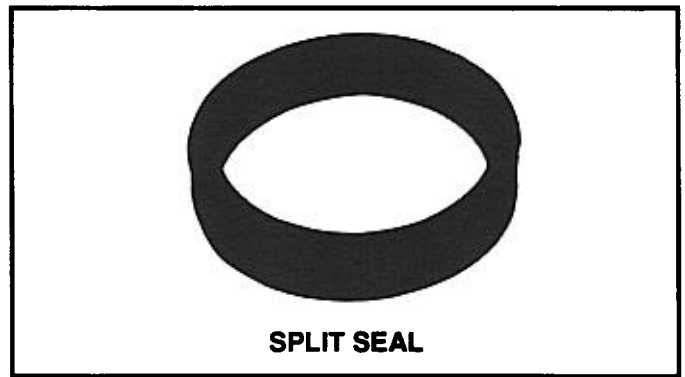
WARNING: Because of the possible danger to person(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed. Products must be used in accordance with the engineering information specified in the catalog. Proper installation, 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 Rockwell Automation nor are the responsibility of Rockwell Automation. 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.

DODGE / P.O. Box 499 / 6040 Ponders Court / Greenville, S.C. 29602-0499 / 864-297-4800

© 1998, Rockwell International Corporation
DODGE and TRIPLE-TECT are trademarks of
Rockwell Automation.

 **Rockwell Automation**
Dodge

*SPLIT non-metallic seals offer labyrinth sealing similar to the conventional LER type. These seals are intended primarily for use with DODGE Split Sphere Bearings. See page 7 for instructions.



*AUXILIARY (taconite) seals are offered for applications where severe operating conditions require a grease pack and purge system combined with the labyrinth. See page 7 for instructions.



OTHER SEALING SYSTEMS NOT SHOWN IN THIS MANUAL BUT AVAILABLE FROM DODGE INCLUDE:

*End covers

*Cast closed end housings

Nomenclature used on DODGE seals includes:

A shaft size code, for example: 107 = 17/16" shaft
050M = 50 mm shaft

A type reference, for example: TT = TRIPLE-TECT
LER = Conventional labyrinth

NOTE:

All instructions assume housings with two open ends are used. For cast-closed end housings, disregard all references to the "second seal assembly or second seal ring."



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.

CONVENTIONAL LER LABYRINTH SEAL:

1. Slide one of the seal rings onto the shaft.
2. Mount bearing on shaft using appropriate bearing mounting instructions.
3. Slide second seal ring onto the shaft.
4. Thoroughly clean seal grooves and mating surfaces on both housing halves. Mount housing base to framework and place shaft with bearing in housing base using appropriate instructions. Guide seal rings into housing grooves. Before assembling cap to base, grease entire seal ring grooves. Tighten cap base.
5. Assure there is adequate running clearance between seal rings and housing grooves by rotating shafts. If seal ring binds up, realign pillowblock.

TRIPLE TECT™ SEAL:

(If no installation tools available, see tool drawing page 5)

1. Slide one of the V-ring seals onto the shaft making sure lip is toward the housing. Install seal ring onto the shaft with relation to housing as shown. **NOTE: Do Not Install V-ring seal on seal ring at this time.** (For direct mount, large V-ring is installed first.)
2. Mount bearing on shaft using appropriate bearing mounting instructions.
3. Install second seal ring onto the shaft with relation to housing as shown on Figure 1.
4. Slide second V-ring seal onto the shaft again making sure lip is toward the housing. **NOTE: Do Not Install V-ring seal on seal at this time** (see Figure 1A).
5. Thoroughly clean seal ring grooves and mating surfaces on both housing halves. Mount housing base to framework. Pack seal grooves with grease.

TRIPLE TECT SEAL:

(If installation tools available)

1. Install a V-ring seal on each seal ring with the lip on V-ring facing the large OD of the seal ring (see Figure 2a).
2. Slide one of the seal assemblies on the shaft to the proper location for assembly into the housing. The lip of the V-ring seal must face the bearing (see Figure 2a).
3. Mount bearing in its proper position on shaft using appropriate mounting instructions.
4. Slide the second seal assembly, if required, on the shaft to the proper location. The lip of the V-ring seal must face the bearing.

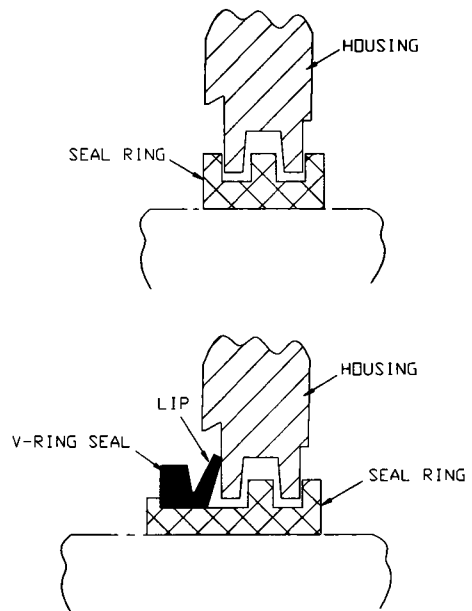


Figure 1

Place shaft with bearing in housing base using appropriate instructions. Guide seal rings into housing grooves. Before assembling cap to base, grease cap seal grooves and the seal rings. Tighten cap to base.

6. Assure there is adequate running clearance between seal rings and housing groove. Rotate shaft. If there is binding, realign pillowblock. Install V-ring seals on seal rings and against housing as shown. **NOTE: V-ring seal lips must not be turned under inside of housing bore. If they are, remove and reinstall.**
7. Apply a thick coat of grease to any exposed surface of the V-ring seal.

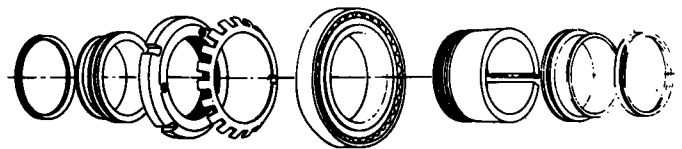


Figure 1a

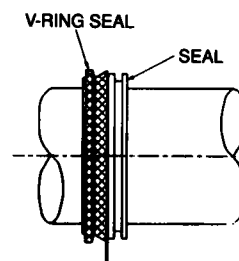


Figure 2a

TRIPLE-TECT SEAL:

(If installation tools available, Cont'd.)

5. Place one of the installation tools between the lip of the V-ring seal and the center ring on the seal ring (Figure 2b). Repeat the procedure for the second seal assembly. Rotate the tool(s) to the lower position to facilitate assembly of the bearing and seal(s) into the housing base (Figure 2b).
6. Thoroughly clean seal grooves and mating surfaces on both housing halves. Mount housing base to framework. Pack seal grooves with grease.
7. Locate the bearing and seal assembly(ies) into the housing base (Figure 2c). Make sure the seal assembly(ies) turns freely in the base by rotating shaft. See bearing mounting instructions for proper grease fill of bearing insert and housing.
8. Move the installation tool(s) to the top position to facilitate the assembly of the housing cap to the base (Figure 2d).
9. Pack the housing cap seal grooves with grease, then install on base. Hand tighten the cap bolts. Rotate the shaft to make sure the seal assembly(ies) seat properly in the housing. Remove the installation tool(s) and tighten cap bolts to the proper torque value (Figure. 2d).
10. Apply a thick coat of grease to any exposed surface of the V-ring seals.

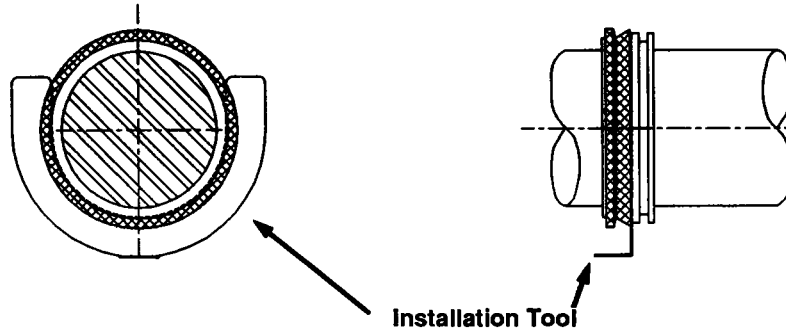


Figure 2b

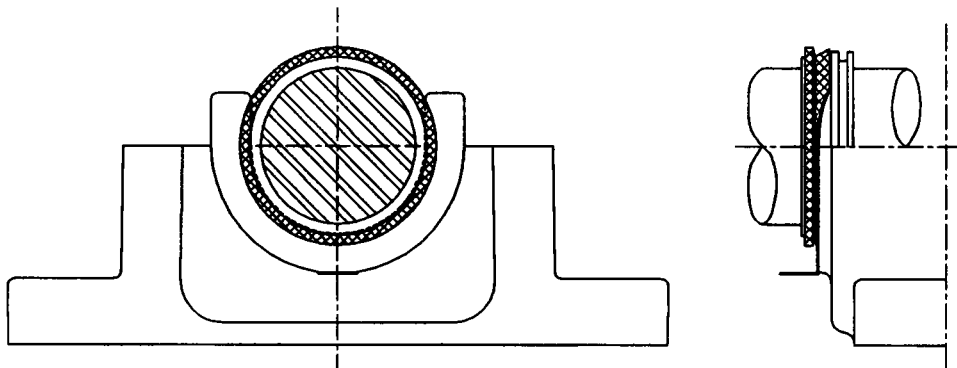


Figure 2c

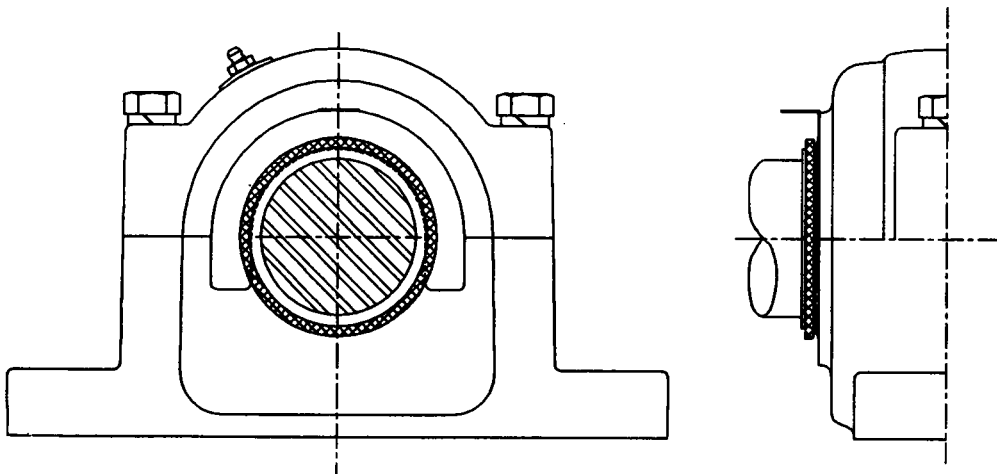
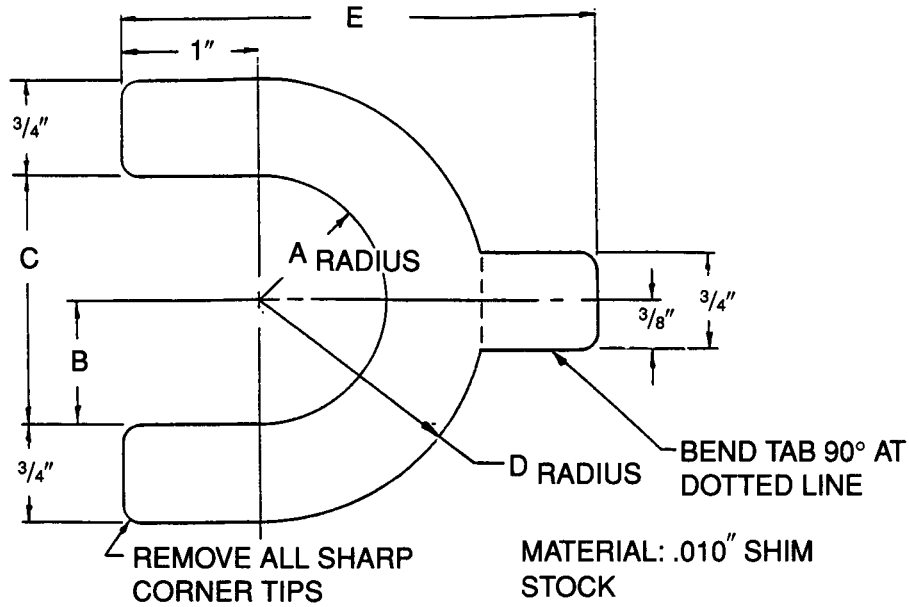


Figure 2d

TABLE 1 — TRIPLE-TECT SEAL INSTALLATION TOOL — to be made by customer per specs below. Two are required for installation of bearing with two

seals. This tool keeps the lip of the seal back so it does not get crimped and damaged between the housing halves.



Shaft Diameter	Housing Size	A & B	C	D	E
1 ⁷ / ₁₆	509	.82	1.64	1.6	3.5
1 ¹¹ / ₁₆	510	.95	1.90	1.7	3.5
1 ¹⁵ / ₁₆	511	1.08	2.16	1.8	3.5
2 ³ / ₁₆	513	1.21	2.42	2.0	3.5
2 ⁷ / ₁₆ , 2 ¹ / ₂	515	1.34	2.68	2.1	4
2 ¹¹ / ₁₆ , 2 ³ / ₄	516	1.53	3.06	2.3	4
2 ¹⁵ / ₁₆ , 3	517	1.65	3.30	2.4	4
3 ³ / ₁₆	518	1.80	3.60	2.6	4.5
3 ⁷ / ₁₆ , 3 ¹ / ₂	520	1.86	3.72	2.6	4.5
3 ¹⁵ / ₁₆ , 4	522	2.11	4.22	2.9	4.5
4 ³ / ₁₆	524	2.25	4.50	3.0	5
4 ⁷ / ₁₆ , 4 ¹ / ₂	526	2.40	4.80	3.2	5
4 ¹⁵ / ₁₆ , 5	528	2.62	5.24	3.4	5
5 ³ / ₁₆	530	2.82	5.64	3.6	5.5
5 ⁷ / ₁₆ , 5 ¹ / ₂	532	2.88	5.76	3.6	5.5
5 ¹⁵ / ₁₆ , 6	534	3.18	6.36	3.9	5.5
6 ⁷ / ₁₆ , 6 ¹ / ₂	536	3.38	6.76	4.1	6
6 ¹⁵ / ₁₆ , 7	538	3.67	7.34	4.4	6
7 ¹ / ₂ , 7 ¹⁵ / ₁₆ , 8	544	3.95	7.90	4.7	6.5
8 ⁷ / ₁₆ , 8 ¹ / ₂ , 8 ¹⁵ / ₁₆ , 9	048	4.65	9.30	5.4	7
9 ⁷ / ₁₆ , 9 ¹ / ₂	052	5.00	10.00	5.8	7.5
9 ¹⁵ / ₁₆ , 10, 10 ⁷ / ₁₆ , 10 ¹ / ₂	056	5.17	10.34	5.9	7.5

DROP-IN TRIPLE TECT SEAL: *

(NOTE: For use only with USAF & USN products.)

DROP-IN TRIPLE TECT seals are pre-assembled at the factory. The DROP-IN TRIPLE TECT seal assembly consists of a seal ring, a V-ring seal, and a metal seal with rubber bead (see Figure 3a).

Installation

1. Slide one of the DROP-IN TRIPLE TECT seal assemblies on the shaft to the proper location for assembly into the housing. The lip of the V-ring seal must face the bearing (Figure 3a).
2. Mount bearing in its proper position on shaft following appropriate bearing mounting instructions.
3. Slide the second DROP-IN TRIPLE TECT seal assembly, if required, on the shaft to the proper location. The lip of the V-ring seal must face the bearing.
4. Thoroughly clean seal grooves and mating surfaces on both housing halves. Mount housing base to framework. Pack seal grooves with grease.
5. Make sure that the central circular rib of each seal ring aligns with each central circular groove in the base.
6. While lowering the shaft bearing and seal assembly(ies) into the base, guide the metal seals with rubber bead so they line up with the outboard "V"-shaped base grooves (Figure 3b). See bearing mounting instructions for proper grease fill of bearing insert and housing.
7. Pack housing cap seal grooves with grease then install on base. While lowering the cap into the base make sure the metal seals with rubber bead line up with the outboard "V"-shaped cap grooves (Figure 3c). Tighten cap bolts to the proper torque value. The rubber bead forms a positive seal in the "V"-shaped outer groove of the housing.
8. Apply a thick coat of grease to any exposed surface of the V-ring seals.

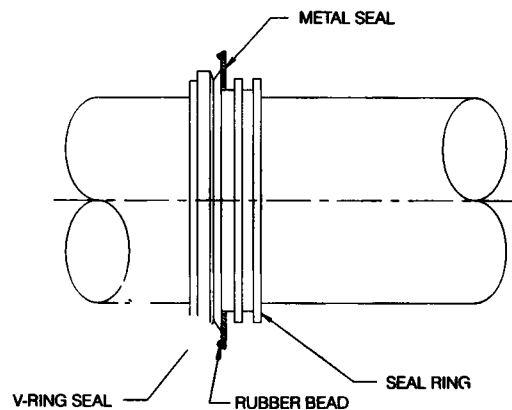


Figure 3a

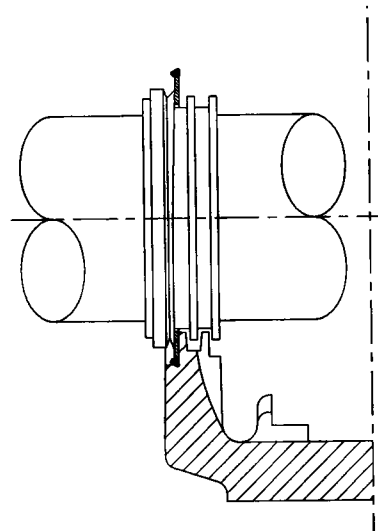


Figure 3b

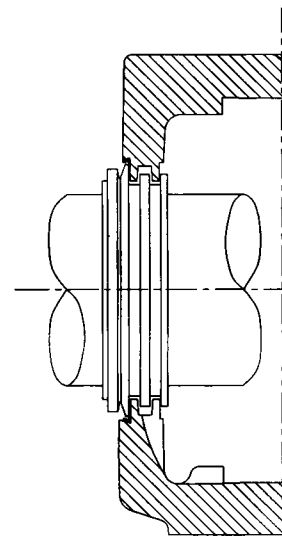


Figure 3c

SPLIT SEAL:

Clean seal grooves and mating surfaces on both housing halves. Position split seal into lower housing grooves. Locate split at top of shaft. Thread tie-strap down through relieved hole in notched end of seal and up through small hole in rounded end of seal (Figure 4). With tie head seated in the hole, draw tie across split, through tie head and pull tightly (Figure 5) so seal cannot rotate on shaft. Cut away excess tie. Rotate shaft slowly and position seal so it does not rub against housing grooves. Before assembling cap to base, grease cap seal grooves and the exposed surfaces of the split seals. Tighten cap base.

NOTE: The tie is self-locking and once the seal is pulled tight, the excess tie strap should be cut away.

AUXILIARY TACONITE SEAL:

1. Insert felt seals in the bore groove of the seal cartridges. Locate "O" rings on the seal cartridge as shown.
2. For bore sizes over 7", slide one collar onto the shaft.
3. Slide one of the V-ring seals onto the shaft making sure lip is toward the housing. Install seal cartridge onto the shaft with relation to housing as shown on Figure 6.
4. Mount bearing on shaft using appropriate bearing mounting instructions.
5. Install second seal cartridges onto the shaft with relation to housing as shown on Figure 6.
6. Slide second V-ring seal onto the shaft again making sure lip is toward the housing.
7. For bore sizes over 7", slide 2nd collar onto the shaft.
8. Thoroughly clean seal grooves and mating surfaces on both housing halves. Mount housing base to framework and place shaft with bearing in housing base guiding seal cartridge into housing grooves. See bearing mounting instructions for proper grease fill of bearing insert and housing. Before assembling cap to base, grease cap seal grooves and the seal cartridge. Tighten cap to base.
9. Install V-ring seals against seal cartridge as shown.
10. Apply a thick coat of grease to any exposed surface of the V-ring seal.
11. Locate collar (above 7" bore) at the side of each seal cartridge as shown on Figure 7. Tighten set screw to 120 in.-lbs.
12. Using a grease gun, grease cavity of seal cartridge until grease is seen purging at the seal.

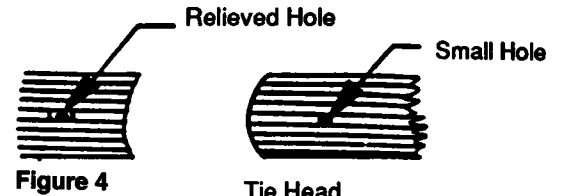


Figure 4

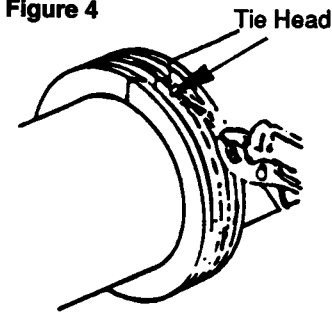


Figure 5

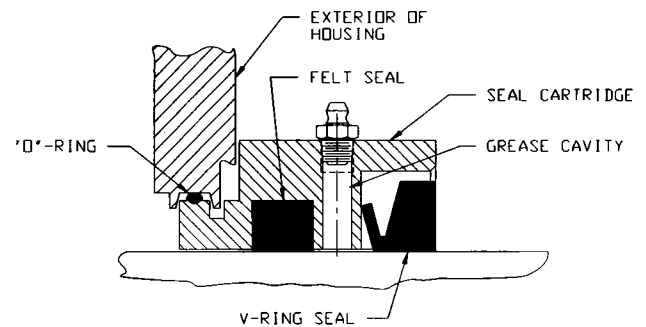


Figure 6

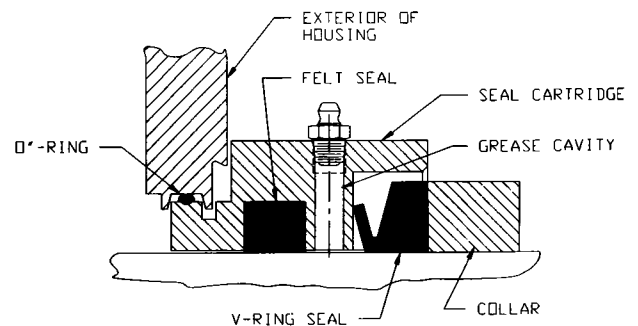


Figure 7

COLD BONDING OF THE V-RING SEALS

In the event a V-ring seal is inadvertently damaged or excessively worn and needs replacing, the following

procedure may be used without the need to remove bearings or other accessory equipment.

NECESSARY TOOLS

- Heavy Twine
- Masking Tape
- Loctite 415, 416, 405 or Black Max 380
- Emery Cloth
- Methylethylketon (MEK) or alcohol
- 400 – 600 grit emery cloth

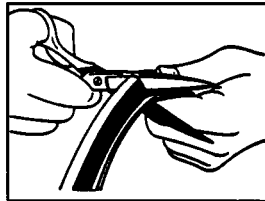


Figure 8

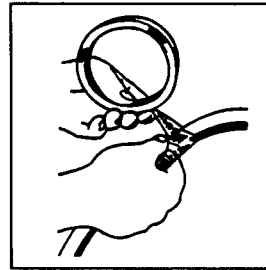


Figure 9

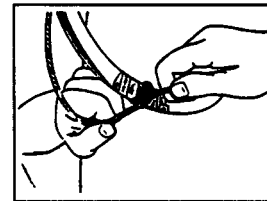


Figure 10

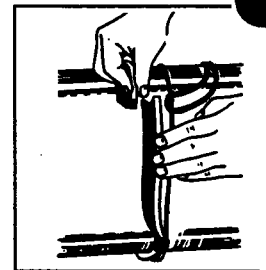


Figure 11

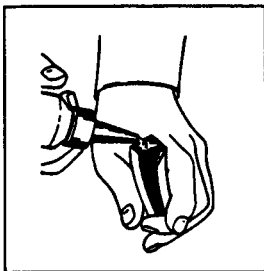


Figure 12



Figure 13

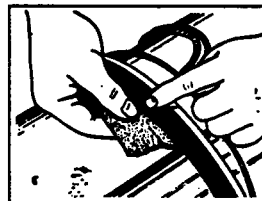


Figure 14

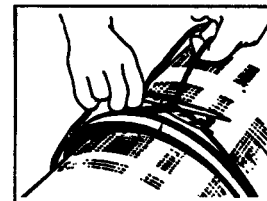


Figure 15

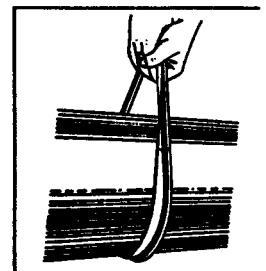


Figure 16

PROCEDURE:

1. Cut the V-ring seals so that the cross section surfaces are even. The cut should be made with a large pair of sharp scissors or a sharp knife (band saw for E profile). Prior to the cutting procedure, clean the cutting blade with MEK (Figure 8).
2. Wind a 2-inch-wide layer of masking tape approximately 4 inches from either end of the cut V-ring seal (Figure 9).
3. Tie pieces of string to the taped portions of the V-ring seal approximately 1 inch from cut (Figure 10).
4. Place the V-ring seal around the shaft and stretch it so that the ends overlap slightly. Tie the string together to hold the V-ring seal in this position (Figure 11).
5. Abrade mating surfaces with fine emery cloth for extra strength.
6. When the V-ring seal is in position around the shaft, clean the ends with MEK or alcohol and allow to dry completely (approximately 10 minutes). Apply a thick layer of adhesive to one of the ends, taking care not to touch the surface when applying the adhesive (Figure 12).
7. Bring the two ends together and adjust them to the proper alignment. Hold them in this position for approximately 60 seconds (Figure 13).
8. Finishing of the joint may be started after 15 minutes. Remove excess adhesive from the vicinity of the joint with emery cloth. Ensure that the joint surfaces of the lip and the surface in contact with the shaft are flush (Figure 14).
9. Remove the string and tape (Figure 15).
10. Test the joint by stretching (Figure 16).