

1-11/16" through 3-7/16" Sleeveoil® Plain-Water Cooled Pillow Blocks Instruction Manual

These instructions must be read thoroughly before installation or operation. This instruction manual was accurate at the time of printing. Please see 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.

CAUTION: Do not scrape, rebabbitt or otherwise alter this product. Such action adversely affects bearing performance and may result in damage to or destruction of equipment.

INSTALLATION

1. Check **mounting structure** making sure it is rigid, level and well supported. Inspect shaft to insure it is smooth (32 micro-inch finish or better), within commercial tolerances and free of burrs or rough spots.
2. Disassemble and thoroughly clean all parts of the pillow block, housing caps and liner caps are matched to their bases and should not be interchanged. Housing and liners should be interchanged as assemblies only.

WARNING: Rust preventatives and solvents can be toxic and/or flammable. Follow directions and safety procedures recommended by their manufacturers.

CAUTION: Liner assembly has critical machined surfaces which are easily damaged. Use care in handling to protect these surfaces. Liner parts should be placed on a soft, clean surface.

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.

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

3. Position **housing base** on pedestal so that oil gauge is in the position specified on the construction drawing. **Do not tighten housing base to pedestal.** Apply oil to the spherical seats in the housing base.
4. Set liner base in housing base and apply oil to liner bearing surface.

CAUTION: Care should be taken when reinstalling coolant pipes. Use pipe sealant and tighten securely. Over tightening may result in liner damage.

5. Apply oil to **shaft** in the bearing area and set shaft in place.
6. **Check alignment** of pillow block by noting clearance between housing and shaft at each end of the housing—clearance should be uniform within 1/32". Shim bearing pedestal where possible, otherwise use full length shims under base as required. Alignment of pillow block should be as accurate as possible. The self-alignment feature of the unit is to compensate for normal shaft deflection and possible setting of the supports.
7. Place **oil rings** around outside of lower liner and over shaft. Secure and tighten screws. Oil ring halves are machined together and match marked. Upper and lower halves should not be changed with components from other oil rings. Make sure rings rotate freely on shaft.
8. Thrust collars, to be used in a fixed (non-expansion) unit, should now be installed. Remove the clamp screws from the split thrust collars and separate. Separating collar halves may require some force. Clean cracked joint with wire brush. Back off set screws to clear inside of collar. Place one collar half on shaft so shaft flinger groove is next to liner base in the non-expansion (fixed) bearing. Rotate collar half around shaft and place other half in position. Bring halves together at joint, making sure match at joint is perfect and insert clamp screws. There should be no offset at collar face. Tap halves together and tighten (Soc Hex) clamp screws alternately and evenly to torque specified in Table 2. Repeat above operation for opposite end of bearing. Assemble two collars on one bearing only. Tap collar up to face of lower liner allowing a total clearance of .006"–.012" on sizes 1–11/16" and 1–15/16", and .008"–.014" on sizes 2–3/16" through 3–7/16", then tighten (Soc Hex) set screw to torque specified in Table 2. Collar should run parallel to end face of liner within .002".

9. Apply oil to bearing surface of liner cap. Locate cap in place on lower liner making sure oil ring is free to rotate.

The Sleeveoil liners 1-11/16" thru 3-7/16" have upper halves that are normally reversible on the lower half. By design, they are not doweled together and therefore not match-marked.

Two modifications which require match-marking of these 'PL-WC' liners, 1-11/16" thru 3-7/16" are:

- **When using full (Type II) Bronze Thrust Plates:** Since liners are doweled together and machined as an assembly, care must be used to insure match marks are adjacent to each other and identical. The match marks will be on the Bronze Thrust Plate halves for b.t.p. face squareness after machining. Since the liner halves are doweled together, a liner with Type II Bronze Thrust Plates is rigid and does not allow the upper half to self-align to the plunger screw. **To compensate for loss of self-alignment, a special plunger screw and plunger screw washer are required. The special loose washer must be positioned on the upper liner plunger screw seat and under the plunger screw. This ensures proper alignment of the liner bore to shaft during operation.**
- **When Liners Have a Cylindrical Bore:** The liners are doweled together and match marked. Rotating liner halves, or switching liner halves from one liner to another, can change the clearances within the liner. These actions can change operating clearances within the liner and adverse machine response can occur.

10. Tighten **housing base** to pedestal. Torque bolts to value given in Table 3. Shaft should rotate freely.
11. For **size 1-11/16" to 2-15/16"**: Thread **dust seal** and **seal spring** into groove at end of housing base and around shaft. Hook ends of spring together; taking care not to overstress spring when stretching. Permanent set can cause loss of working load and looseness on shaft; resulting in oil leakage during operation.

For size **3-7/16"**, apply oil to the inner diameter of the dust seal. Thread dust seal and seal retainer into groove at end of housing base and around shaft. Slide free end of seal retainer through clasp and pull tightly. Hold clasp with screwdriver and pull free end of retainer as tightly as possible with pliers. If tightened properly, it will be difficult to move seal sideways. Cut off excess material, and discard it so it won't drop in housing bottom. If unit is furnished with auxiliary seals, install a second seal on each end.

If using End Closure, neoprene discs should be installed at this time. **Consult construction drawing for type of seal recommended.**

12. Apply Gasket Eliminator to Sleeveoil housing base along outer contour of joint. Loosen plunger screw and locate housing cap on base taking care not to damage dust seals or housing gasket. **If liner is modified to include Type II Bronze Thrust Plates (bronze thrust faces on both upper and lower liner thrust faces), make sure special plunger screw button is placed on liner plunger screw seat before installing housing cap.**

To reduce chances for leakage, a non-hardening sealant or RTV may be used under cap bolts. Torque housing bolts to value given in Table 4. **The plunger screw must be loose until the housing bolts have been tightened.**

These Sleeveoil 'PL-WC' housings have match marks permanently stamped on the water grommet pad starting in June 1988. These match marks permanently insure that parts stay paired and critical orientation of assemblies is maintained.

Cap Loaded Bearings: Only follow cap loaded tightening procedure on bearings that accept a vertical-upward load in over-hung (bearing-bearing-rotor) fan applications. For center-hung (bearing-rotor-bearing) fan applications proceed to the base loaded tightening procedure.

For cap loaded bearings, tighten the four cap bolts alternately to the torque values given in Table 3 while shaft is held down. The plunger screw should not be making contact with the liner when tightening cap bolts.

Loosen all four cap bolts one turn and loosen shaft hold down so that the shaft rests on the liner cap.

Re-torque all four cap bolts alternately to values given in Table 3.

Remove shaft hold down.

Tighten the plunger screw to torque given Table 1 and tighten the plunger screw locknut.

NOTE: Do not tighten plunger screw on accompanying base loaded bearing until cap loaded bearing has been installed and hold-down removed.

Base Loaded Bearings: Tighten plunger screw to recommended torque given in Table 4 and tighten locknut.

NOTE: Check and re-torque plunger screw to the specified torque after 24 hours of initial start-up and then check and retorquer periodically as required.

13. Install grommet and grommet washer. Snug up grommet nut, not tight. If unit is to be cooled, connect flexible hose to water pipe in pillow block and to supply and drain lines.

Use care to prevent kinks or sharp bends in flexible hose. A valve should be placed ahead of inlet and a sight drain should be used at outlet, if possible. Adjust coolant flow to suit conditions. Under average conditions very little coolant is required.

CAUTION: The water pressure should never exceed 120 p.s.i.

14. The **oil level gauge** may be located any distance from the pillow block by the use of a coupling and pipe of the desired length. The extended pipe must be supported so that it remains straight and perfectly level. Use a spirit level—do not guess. Use pipe sealer on all connections.
15. Remove all pipe plugs and flush liner bore and housing thoroughly with solvent or cleaner. Reinstall pipe plugs using pipe sealer. Tighten securely.
16. Each housing base has predrilled holes for doweling bearing to base plate.

LUBRICATION AND OPERATION

Since the satisfactory operation of the pillow block depends almost entirely on the oil film being maintained between the shaft and liner bearing surface, it is recommended that a high grade straight mineral oil with rust and oxidation (R & O) inhibitors and anti-foam agents be used. Check equipment specifications for specific recommendations of oil viscosity by equipment manufacturer. Oil viscosity is determined by the equipment manufacturer and normally specified on the construction drawing

Table 1

Sleevoil Size Standard	Oil Cap. Fl.-Oz.	COLLAR			
		CLAMP SCREW		SET SCREW	
		Screw Size (Soc Hex)	Wrench Torque (In.-Lbs.)	Screw Size (Soc Hex)	Wrench Torque (In.-Lbs.)
1-11/16	8	1/4-20NC	160	5/16-18NC	100
1-15/16	8	1/4-20NC	160	5/16-18NC	100
2-3/16	10	5/16-18NC	325	7/16-14NC	245
2-7/16	15	5/16-18NC	325	7/16-14NC	245
2-11/16	18	3/8-16NC	580	1/2-13NC	420
2-15/16	18	3/8-16NC	580	1/2-13NC	420
3-7/16	33	1/2-13NC	1425	5/8-11NC	840

Fill the pillow block with oil approximately two-thirds of the way up to the oil level gauge. After placing into operation, remove inspection covers and check to make sure oil rings are bringing up oil. Operation should be checked frequently during the first few days. After some running of base loaded bearings only, loosen plunger screw 1/4 turn, then retighten as specified. This will allow the liner to align with the shaft. For cap loaded bearings, follow installation procedure. If noise develops, check alignment of housing, collar runout, plunger screw and all operating parts. Check all points and make sure all screws and nuts are tightened after several days operation. Maintain oil level above bottom of center circle at all times while unit is in operation.

OIL MAINTENANCE SCHEDULE

Drain, flush, and refill with oil after 2 to 3 weeks of initial break-in operation. Since the satisfactory operation of the bearing depends entirely on an oil film being maintained between the shaft and the bearing liner surface, it is recommended that an oil analysis be performed at these regular intervals.

- Every 3 months for 24 hour/day service
- Every 6 months for 8 hour/day service

Acceptability of oil should be referred to the lubricant manufacturer. If oil quality is acceptable then repeat this procedure in three month intervals. Visually check oil for contamination between oil analysis checks. Oil service life depends upon several factors such as ambient conditions, operating temperature and frequency of bearing starts and stops. It is recommended that the oil be changed at least once per year for unfiltered static applications. Removing contaminants through the use of either the OLF-2 (Oil Level and Filtration) unit, Cool Lube 2, or a circulating oil system can extend oil service life. Consult equipment manufacturer for more information.

Oil film temperature in liner during operation should not exceed 180 °F. If in doubt, consult equipment manufacturer.

NOTE: The minimum oil temperature at start-up is 70 °F.

Any question on installation, maintenance, or arrangement of coolant connection inlets and outlets should be referred to the original equipment manufacturer.

PILLOW BLOCK MATERIAL DETAILS

Housing:	Class 30 Gray Cast Iron
Liner:	Class 30 Gray Cast Iron
Babbitt:	Lead or Tin Based Babbitt
Oil Rings:	Bronze
Dust Seal:	HNBR Rubber with Stainless Steel Retainer
Aux. Seal:	HNBR with Stainless Steel Retainer
Grommet:	Synthetic Rubber
Grommet Plate:	Carbon Steel
Pipe Nipple:	Carbon Steel
Pipe Elbow:	Brass
Oil Gauge:	Stainless Steel, Polypropylene
Hardware:	Carbon Steel
Plunger Screw:	Carbon Steel
Gasket Eliminator:	LOCTITE 515 Sealant

This Sleeveoil pillow block could contain lead in the bearing Babbitt material, please exercise proper precautions in the use, installation, dismantling and recycling of this unit.

CAUTION: This product is not to be used for person moving applications.

NOTE: Care has been taken to keep instruction manuals accurate and timely. The most recent version of the instruction manual can be found on our website: www.dodgeindustrial.com

Table 2

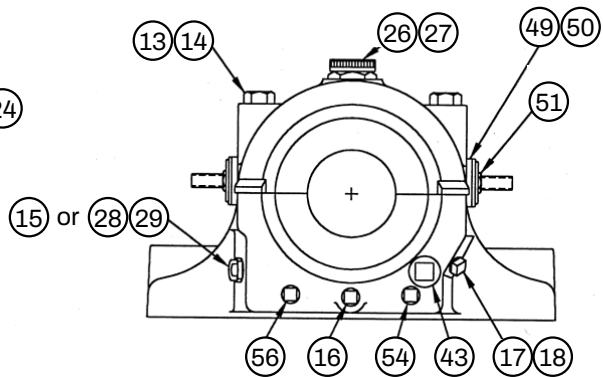
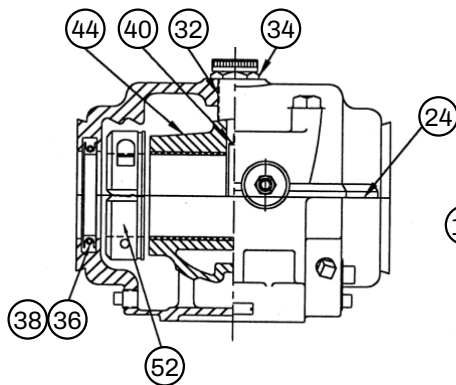
Sleevoil Size Standard	Housing/Pedestal Bolts	
	Thread Size	Torque (In-Lbs)
1-11/16 1-15/16	5/8 5/8	1200 1200
2-3/16 2-7/16	3/4 3/4	2100 2100
2-11/16 2-15/16	7/8 7/8	2040 2040
3-7/16	3/4	2100

Table 3

Sleevoil Size Standard	Plunger Screw		Housing Cap Bolts	
	Wrench Size (Soc Hex)	Torque (In-Lb)	Thread Size	Torque (In-Lb)
1-11/16 1-15/16	5/8 5/8	300 300	7/16-14 7/16-14	360 360
2-3/16 2-7/16	5/8 5/8	350 400	1/2-13 1/2-13	600 600
2-11/16 2-15/16	5/8 5/8	450 450	5/8-11 5/8-11	1080 1080
3-7/16	5/8	500	3/4-10	1920

Table 4 - Weight of STD and STL PL-WC Pillow Blocks

R-series shaft size	Approximate Weight (lbs.)		
	Non- Expansion Pillow Block	Expansion Pillow Block	Liner Assembly
1-11/16	33	31	6
1-15/16	34	32	7
2-3/16	51	48	12
2-7/16	71	66	12
2-11/16	105	97	27
2-15/16	100	92	22
3-7/16	156	144	50



Parts for 1-11/16" thru 3-7/16" Sleeve® Plain-Water Cooled Pillow Blocks									
Reference	Name of Part	Number Required	Part Numbers						
			1-11/16	1-15/16	2-3/16	2-7/16	2-11/16	2-15/16	3-7/16
	Expansion. Pillow Block	1	132984	132985	132986	132987	132988	132989	132990
	Modular Housing	1	132941	132942	132943	132944	132993	132994	132996
13	③ Housing Bolt	4	411439	411439	411112	411113	411117	411147	411186
14	③ Washer	4	419194	—	—	—	—	—	—
15	Oil Level Plug	2	430012	430012	430012	430012	430012	430012	430012
16	Drain Plug	2	430008	430008	430008	430008	430008	430008	430008
17	Thermocouple Plug	1	—	—	—	—	430012	430012	430012
18	Thermocouple Adapter Bush	1	—	—	—	—	430081	430081	430081
24	③ Gasket Eliminator	1	427359	427359	427359	427359	427359	427359	427359
26	Inspection Cover ⑤	1	405005	405005	405005	405005	405005	405005	405005
27	Nameplate	1	133267	133267	133267	133267	133267	133267	133267
28	Oil Gauge	1	430139	430139	430139	430139	430139	430139	430139
29	Oil Gauge Gasket	1	418110	418110	418110	418110	418110	418110	418110
32	Plunger Screw	1	422393	422393	422394	422395	422397	422397	422398
34	Plunger Screw Nut	1	133368	133368	133368	133368	133368	133368	133368
①	Dust Seal Kit	1	389821	389822	389823	389824	389825	389826	389827
36	③ Seal	2	—	—	—	—	—	—	—
38	③ Seal Spring / Retainer	2	—	—	—	—	—	—	—
40	Oil Ring	1	135704	135708	135712	135716	135720	135724	135728
43	Circulating Oil Drain Plug	1	—	—	—	—	—	—	430016
44	Liner Assembly ④	1	133583	133584	133585	133586	132959	132950	132951
①	③ Brass Elbow	2	430068	430068	430068	430068	430068	430068	430068
46	③ Water Pipe	2	430158	430158	430162	430162	430162	430162	430162
49	③ Grommet	2	133021	133021	133021	133021	133021	133021	133021
50	③ Grommet Washer	2	133025	133025	133025	133025	133025	133025	133025
51	③ Grommet Nut	2	407254	407254	407254	407254	407254	407254	407254
	Options								
①	Thermostat	1	—	—	—	—	133116	133116	—
①	Heater	1	—	—	—	—	132834	132834	—
①	Heater/Thermostat Combo	1	—	—	—	—	—	—	434719
①	Flex Water Hose Kit	1	133344	133344	133344	133344	133344	133344	133344
①	End Cover ⑥	⑥	133981	133982	133983	133984	133985	133986	133987
①	Split End Plate ⑦	⑦	133124	133125	133126	133125	133128	133129	—
①	End Plate Cap Screw ⑧	4	417044	417044	417044	417044	417044	417044	—
①	Aux Dust Seal Kit	2	—	—	—	—	—	—	132811
①	Housing End Cap Kit	1	—	—	—	—	—	—	132542
52	Split Thrust Collar ⑨	2	133250	133255	133260	133265	133270	133275	133280
54	Thermostat Plug	1	—	—	—	—	—	—	430012
56	Heater Plug	1	—	—	—	—	—	—	430012

① Not shown on drawing

② Includes housing cap and base, and parts listed immediately below

③ The parts marked are furnished with the assemblies under which they are listed

④ Includes liner cap and base, and parts listed immediately below

⑤ Nameplate must be ordered separately

⑥ Neoprene disc for use when desired, or installation where shaft does not extend through housing. 1 required for size 1-7/16" to 2-15/16". 2 required for size 3-7/16", per side

⑦ Auxiliary plate for bolting to one or both ends of housing where conditions are extremely dirty. Requires one additional dust seal kit per bearing. Requires special machining on housing.

⑧ 4 required per end plate

⑨ 2 required for non-expansion pillow blocks only

SLEEVOIL ACCESSORIES

The following accessories are available for Sleeveoil bearing to enhance operation and extend bearing life. For compatibility and technical information contact product support.



OIL LEVEL AND FILTRATION (OLF-2) SYSTEM

- Increase bearing longevity and reliability.
- One OLF-2 system supplies two bearings with a continuous flow of filtered oil.
- The oil is supplied directly to the circulating oil inlets on the bearings, which helps minimize wear during startups and shutdowns.



SLEEVOIL BEARING ISOLATOR

- Fully split multi-labyrinth sealing system.
- Provides outstanding protection in harsh and dirty environments.
- IP56 rated



RTD KIT

- Prevent catastrophes by accurately measuring bearing temperature.
- Features a field-cutable stainless steel probe, a platinum sensing element and a spring-loaded fitting with an oil seal.



COOL LUBE 2

- All the features of the OLF-2 system plus a built-in heat exchanger for continuous oil cooling and adjustable oil flow controls.
- Particularly well suited in applications where bearing operating temperatures and speeds approach the maximum permissible levels.



HEATER/THERMOSTAT

- The bearing sump heater and thermostat have been combined into one user-friendly unit.
- Sump heaters are a necessity to ensure safe startups when bearings are exposed to ambient temperatures below 70 °F.



THERMOMETER

- Dial thermometer for convenient monitoring of the oil sump temperature
- All stainless steel construction with glass face



COOLANT HOSE KIT

- An easy to install solution for connecting coolant lines to your Sleeveoil bearing.
- Durable flexible hoses are composed of a synthetic rubber inner tube reinforced with fiber and steel braids.

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