

# USAF 200/300 Direct Mount Pillow Block Bearings

## 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](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.

**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,

## INSPECTION

Inspect shaft. Ensure it 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 preservative compound as it acts as both a protectant and lubricant and is also compatible with standard greases.

## INSTALLATION

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

### Direct Mounted Bearings

1. Measure the internal clearance of the bearing before mounting. Place the bearing in a upright position as shown in Figure 1.

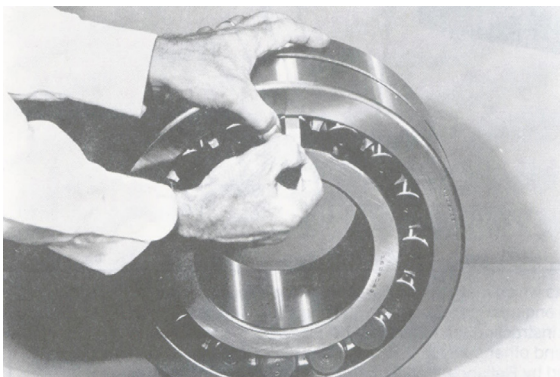


Figure 1 - Internal clearance

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 rollers are at the top-most positions on each side. For bore sizes above 6-1/2", press these top rollers inward insuring contact with center guide flange. Using a feeler gauge measure the clearance for each side by inserting feeler as far as possible and sliding over top of roller. Write down the measured clearance and compare with specifications (Table 1).

**NOTE:** Do not rotate bearing when moving feeler between roller and outer ring.

Table 1 - Radial Internal Clearance in Self-Aligning Roller Bearings  
(Values in .0001 inches)

Bore Diameter (mm)		With Cylindrical Bore	
Over	Incl.	Low	High
14	24	14	18
24	30	16	22
30	40	18	24
40	50	22	30
50	65	26	36
65	80	32	44
80	120	39	53
120	140	57	75
140	160	65	87
160	180	71	95
180	200	79	103
200	225	87	114

2. Install the bearing parts in the following sequence:

**NOTE:** TRIPLE-TECT seals are standard seals up to 10" (220 mm) bore. For assistance in installing seals, use seal instruction manual MN3020 (which replaced 499799).

- 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. **Bearing** — Make sure the internal clearance has been written down. Install bearing. Bearings with cylindrical bore up to 2-3/4" (70 mm) may be cold mounted on the shaft. Apply coat of light oil to the shaft and bearing bore, then press the bearing on by using a mechanical or hydraulic device or use the mounting nut to drive the bearing onto the shaft. Bearings with cylindrical bore above 2-3/4" (70 mm) are heated for mounting on shaft. Bearings, heated in oil between 200°F - 215°F, when still in a heated condition, should have the bore wiped dry with a clean cloth. The bearing should be rapidly pushed on the shaft and positioned squarely against the shoulder. A slight turning motion during fitting facilitates mounting. It is advisable to use gloves. Large bearings are generally handled with a hoist or crane. For cylindrical bore direct mounted bearings, it is not necessary to check internal clearance after mounting. It is, however, important to verify the shaft diameters (Tables 2, 4 & 5) and to measure the unmounted internal clearance to ensure conformance to specifications (Table 1).

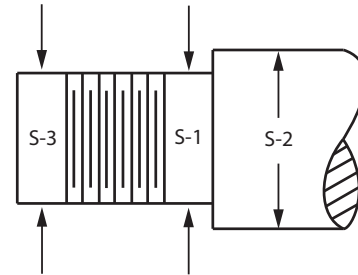
- d. **Lockwasher and Locknut** — Install the lockwasher with inner prong located in the slot of the shaft, angled away from bearing. Install locknut, chamfered face toward bearing. Tighten locknut using a spanner wrench. Locate a lockwasher tab that aligns with a locknut slot and bend tab into slot. If slot is past tab, then tighten, not loosen, locknut to meet a washer tab.

**Steps e. and f. are not necessary if pillow block housing is a cast closed style.**

- e. **Seal Ring** — Install second seal ring with large O.D. toward locknut.
- f. **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.**

3. Remove any paint, dirt or burrs from the mating surfaces of the housing halves. Thoroughly clean seal grooves on each side. Set lower half of housing on base and apply oil to the bearing seats.



**Figure 2**

**Table 2 -- Shaft Bearing Seat Diameters for Cylindrical Bore Mounted Pillow Blocks**

Bearing Bore Diameter			Normal Load (M6)			High Load		
MM	Inches		Shaft Diameter (S-1)		MEAN	Shaft Diameter (S-1)		MEAN
Nom.	Max.	Min.	Max.	Min.	FIT	Max.	Min.	FIT
40	1.5748	1.5743	1.5758	1.5752	.0009T	1.5761	1.5655	.0012T
45	1.7717	1.7712	1.7727	1.7721		1.7730	1.7724	
50	1.9685	1.9680	1.9695	1.9689	.0011T	1.9698	1.9693	.0014T
55	2.1654	2.1648	2.1666	2.1658		2.1669	2.1662	
60	2.3622	2.3616	2.3634	2.3626		2.3637	2.3630	
65	2.5591	2.5585	2.5603	2.5595		2.5606	2.5599	
70	2.7559	2.7553	2.7571	2.7563		2.7574	2.7567	
75	2.9528	2.9522	2.9540	2.9532		2.9543	2.9536	
80	3.1496	3.1490	3.1508	3.1500	.0014T	3.1511	3.1504	.0015T
85	3.3464	3.3457	3.3479	3.3470		3.3483	3.3474	.0019T
90	3.5433	3.5426	3.5447	3.5438		3.5452	3.5443	
100	3.9370	3.9362	3.9384	3.9375		3.9388	3.9379	
105	4.1338	4.1331	4.1353	4.1344		4.1357	4.1348	
110	4.3307	4.3299	4.3321	4.3312		4.3325	4.3316	
120	4.7244	4.7236	4.7258	4.7249		4.7262	4.7253	
125	4.9212	4.9203	4.9229	4.9219	.0016T	4.9233	4.9224	.0022T
130	5.1181	5.1171	5.1197	5.1187		5.1201	5.1192	
140	5.5118	5.5108	5.5134	5.5124		5.5138	5.5129	
150	5.9055	5.9045	5.9071	5.9061		5.9075	5.9066	
160	6.2992	6.2982	6.3008	6.2998		6.3012	6.3003	
170	6.6929	6.6919	6.6945	6.6935		6.6949	6.6940	
180	7.0866	7.0856	7.0882	7.0872		7.0886	7.0877	
190	7.4803	7.4791	7.4821	7.4810	.0019T	7.4827	7.4815	.0026T
200	7.8740	7.8728	7.8758	7.8746		7.8772	7.8760	.0032T
220	8.6614	8.6602	8.6632	8.6620		8.6646	8.6634	

These fits apply to roller bearings with inner ring rotation under radial and thrust loads.


Bearing Bore Diameter  
Up to 220 mm

Normal Load  
P/C = 0.10 to 0.15

High Load  
P/C > 0.15

Where:  
P = Equivalent Radial Load on the Bearing (lbs.)  
C = Basic Dynamic Load Rating of Bearing (lbs.)

**Table 3 -- Recommended Cap Bolt Torque Values (ft -lbs)**

Size	3/6 - 16	7/16 - 14	1/2 - 13	5/8 - 11	3/4 - 10	7/8 - 9	1 - 8	1-1/4 - 7	1-1/2 - 6
Housing Series	308	309 310 311	215 312	216 217 218 313 314 315 316	220 222 224 317 320	226 322	228 230 232 234 236 324 326 328 330	238 240 332 334	244 338
Grade 5 	24-30	40-50	60-75	120-150	208-260	344-450	512-640	896-1120	1560-1950
Stainless Steel L (316)	12-15 16-20	21-24 25-30	30-38 35-45	60-75 75-90	105-131	101-128 165-200	150-188 240-290	435-540	745-930

4. Apply grease to the bearing and seal rings. The lubricant should be smeared between the rolling elements. This step and the first sentence of Step 8 do not apply for oil lubricated bearings.
5. Place shaft with bearing into lower half while carefully guiding the seal rings into the housing grooves.
6. Bolt lower half of the non-expansion bearing to the base. Move shaft endwise so spacer ring can be inserted. Center all other bearings on same shaft in their housing seats.

**NOTE: Only one bearing per shaft is non-expansion, other bearing should be expansion.**

7. When closed end is required and the block is not a cast closed, the end plug supplied should be fit into the center seal ring groove of the housing. Shaft should not extend beyond end of locknut to ensure no rubbing with end plug.
8. 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. Cap and base have serial numbers stamped at joint. The serial numbers should line up.**

9. Tighten cap bolts to the recommended torque in Table 3.
10. Assure there is running clearance at seal ring.

**Table 4 - Shaft Diameters S-2 and S-3 (inches)**

Bearing Bore Diameter, mm (inches)	S-2	S-3
40 (1.5748)	1-15/16	1-7/16
45 (1.7717)	2-1/8	1-11/16
50 (1.9685)	2-3/8	1-7/8
55 (2.1654)	2-9/16	2-1/16
60 (2.3622)	2-7/8	2-1/4
65 (2.5591)	3-1/16	2-7/16
70 (2.7559)	3-1/4	2-5/8
75 (2.9528)	3-7/16	2-13/16
80 (3.1496)	3-5/8	3
85 (3.3465)	3-15/16	3-3/16
90 (3.5493)	4-1/8	3-3/8
100 (3.9370)	4-1/2	3-13/16
110 (4.3370)	4-7/8	3-3/8
120 (4.7244)	5-5/16	4-9/16
130 (5.1181)	5-7/8	4-15/16
140 (5.5118)	6-1/4	5-5/16
150 (5.9055)	6-5/8	5-3/4
160 (6.2992)	7	6-1/16
170 (6.6929)	7-7/16	6-7/16
180 (7.0866)	7-13/16	6-7/8
190 (7.4803)	8-3/8	7-1/4
200 (7.8740)	8-3/4	7-5/8
220 (8.6614)	9-9/16	8-5/16

Table 5 - Tolerance

Shaft Diameter (S-2 & S-3)		Tolerance
Over	Including	
1-1/2" (40mm)	4" (100mm)	+ .000 to -.004
4" (100mm)	6" (150mm)	+ .000 to -.005
Over 6" (150mm)		+ .000 to -.006

## 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 if TRIPLE-TECT seal installation tools are not available. If available, do not remove seals and follow cap installation outlined in the seals instruction manual.

## GREASE LUBRICATION

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

USAF bearings are specifically designed for dirty, dusty or wet environments. In order to properly protect bearings during installation, pack the bearing insert 100% full of grease immediately after having properly mounted bearing on the shaft. If the RPM of the application falls between 20% and 80% of maximum RPM (Table 8), pack the lower half of the housing one third to half full. If the RPM of the application is less than 20% of maximum RPM, pack 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.

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 4 strokes of a handgun at each regreasing cycle for bores up to 55 mm. For bores greater than 55 mm and up to 140 mm, add 8 strokes of handgun at each regreasing cycle. For bores greater than 140 mm and up to 220 mm, add 16 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 an operating temperature viscosity which provides full film lubrication (Table 6). Operating temperature, depending on RPM and load, will be 50°F - 100°F above ambient. Use Table 7 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

Dodge Engineering, Greenville, SC.

Successful operation is dependent upon adequate lubrication. Precaution should be taken during handling and recycling grease, oil or water glycol mixtures.

Table 6 - Viscosity of Oil in the Grease

DN Δ	Viscosity for Loads Up to 18% of Dynamic Capacity (SUS @ Operating Temp)*	DN Δ	Viscosity for Loads Up to 18% of Dynamic Capacity (SUS @ Operating Temp)*
2,500	3500	35,000	625
5,000	3150	40,000	525
7,500	2750	45,000	450
10,000	2375	50,000	400
12,500	2000	75,000	300
15,000	1750	100,000	200
17,500	1500	125,000	150
20,000	1300	150,000	130
22,500	1075	175,000	110
25,000	900	200,000	100

Δ DN = Bore Diameter (mm) x RPM

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

Table 7 - Regreasing Intervals (Months)\*  
(Based on 12 hours per Day 150°F Max.)

Size, mm	RPM									
	250	500	700	1000	1205	1500	2000	2500	3000	3500
40-60	8	6	4	3	2	1	.5	.5	.25	.25
65	7	5	3	2	1	1	.5	.25	.25	
70-85	6	4	3	2	1	.5	.5	.25		
90-100	5	3	2	1	.5	.5	.25			
110-130	4	3	2	1	.5	.25				
140-160	3	2	1	.5	.25					
170-190	2	1	.5	.25						
200-220	1	.5	.25							

\* For continuous operation, 24 hours/day, decrease greasing interval by 50%. For other speeds, consult Dodge Engineering, Greenville, SC.

LONG-TERM STORAGE OF  
PRE-ASSEMBLED BEARINGS

When pre-assembled bearings must be stored for long periods, the bearings should be packed 100% full of grease, and so tagged.

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.

OIL LUBRICATION

USAF bearings are specifically designed to handle either grease or oil lubrication. Oil lubrication is normally required at high speeds, high loads or whenever heat from an external source is flowing into the bearing. Oil lubrication may be static or circulating. With static oil, fill the bearing cavity with oil up to the center line of the lower roller. The dimension is identified as “W” (Tables 11 and 12). Mount an oil sight gauge in one of the drilled and tapped drain holes on the side of the pillow block for visual indication of this level. The oil level may drop or rise during operation depending on the rotation of the bearing. Oil should only be added when the bearing is not operating. Both the static oil level and the running oil level should be marked on the oil sight gauge and properly identified.

For circulating oil, the flow rate, and size of return drains are shown in Tables 11 and 12.

Table 8 - Maximum RPM (Direct Mount)

Shaft Size, mm	300 Series		200 Series	
	Grease	Oil	Grease	Oil
40	4300	5300		
45	3800	4800		
50	3400	4300		
55	3200	4000		
60	2800	3600		
65	2600	3400		
70	2400	3200		
75	2200	3000	3400	4300
80	2200	3000	3200	4000
85	2000	2800	3000	3800
90			2600	3400
100	1700	2200	2200	3000
110	1500	1900	2000	2800
120	1400	1800	1900	2400
130	1300	1700	1800	2200
140	1200	1600	1700	2200
150	1100	1500	1600	2000
160	1000	1400	1500	1800
170	950	1300	1300	1700
180	900	1100	1300	1600

Table 8 - Maximum RPM (Direct Mount)

Shaft Size, mm	300 Series		200 Series	
	Grease	Oil	Grease	Oil
190	850	1100	1200	1300
200			1100	1200
220			950	1000

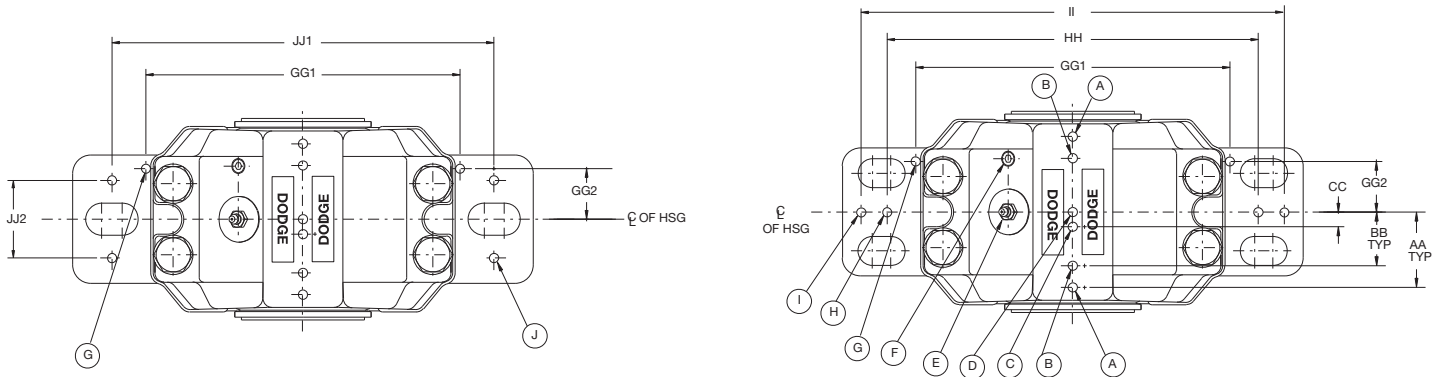
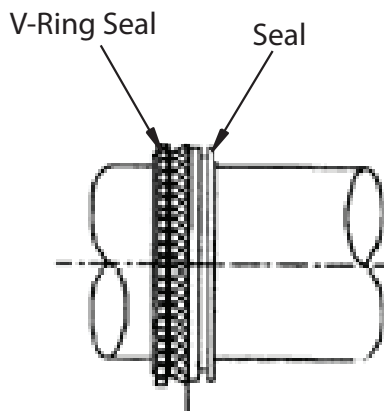


Figure 3 - USAF Parts Description

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 Tap Location for Vent or Side Lubrication for Bearing without W33 Groove
G	Dowel Pin Location for Metric Plummer Blocks
H	Drilling Location for Two Bolt Mounting or Optional Dowel Pin Location
I	Optional Location for Dowel Pin Location
J	Drilling Location for Four Bolt Mounting or Optional Dowel Pin Location



**Figure 4 - Hole Positions**

**Table 9 - USAF 200 Series Pillow Block Dowel Pin, Lubrication & Mounting Hole Positions**

HSG Series	BRG Series	AA	BB	CC	GG1	GG2	G Max Dia	HH	H		II	JJ1	JJ2	J	
									Hole Size	Bolt Size				Hole Size	Bolt Size
215	22215	1-7/8	1-7/32	23/64	7-1/2	1-1/4	5/16	9-1/16	11/16	5/8	10-1/4	8-21/32	1-7/8	9/16	1/2
216	22216	2-1/32	1-3/8	5/16	8-19/32	1-3/8	5/16	10-1/4	13/16	3/4	11-19/32	9-15/16	2-1/16	11/16	5/8
217	22217	2-1/16	1-15/32	13/32	8-19/32	1-3/8	5/16	10-1/4	13/16	3/4	11-19/32	9-15/16	2-1/16	11/16	5/8
218	22218	2-3/8	1-1/2	7/16	9-7/16	1-29/64	5/16	11-13/32	13/16	3/4	12-5/8	11-1/32	2-9/32	11/16	5/8
220	22220	2-11/16	1-23/32	17/32	10-1/4	1-39/64	5/16	12-19/32	15/16	7/8	14-23/64	11-13/16	2-19/32	13/16	3/4
222	22222	2-13/16	1-15/16	19/32	11-1/32	1-25/32	15/32	13-25/32	15/16	7/8	15-1/2	12-19/32	2-29/32	13/16	3/4
224	22224	3-1/8	1-29/32	11/16	11-27/64	1-25/32	15/32	13-7/8	15/16	7/8	15-7/8	13	2-29/32	13/16	3/4
226	22226	3-1/4	2-3/32	3/4	12-25/32	2-3/64	15/32	14-31/32	11/16	1	17-3/8	14-9/16	3-5/32	15/16	7/8
228	22228	3-31/64	2-17/32	3/4	13-19/32	2-5/32	15/32	16-17/32	15/16	1-1/4	18-11/16	15-3/4	3-5/8	1-1/16	1
230	22230	3-27/32	2-17/32	13/16	14-3/4	2-3/8	15/32	17-23/32	15/16	1-1/4	19-1/2	16-15/16	3-15/16	1-1/16	1
232	22232	4-3/32	2-9/16	29/32	15-9/16	2-23/64	15/32	18-1/2	15/16	1-1/4	20-9/32	17-23/32	3-15/16	1-1/16	1
234	22234	4-1/8	3	1	-	-	-	20-1/2	19/16	1-1/4	23-3/8	-	-	-	-
236	22236	4-5/16	3	1	-	-	-	22-1/4	19/16	1-1/2	25-1/4	-	-	-	-
238	22238	4-1/2	3-1/8	1-1/8	-	-	-	23	19/16	1-1/2	26-5/8	-	-	-	-
244	22244	5-13/64	3-5/8	1-3/16	-	-	-	26-5/6	11-3/16	1-3/4	30-3/4	-	-	-	-



**Table 10 - USAF 300 Series Pillow Block Dowel Pin, Lubrication & Mounting Hole Positions**

HSG Series	AA	BB	CC	GG1	GG2	G Max Dia	HH	H		II	JJ1	JJ2	J	
								Hole Size	Bolt Size				Hole Size	Bolt Size
308	1-17/32	5-7/64	1-7/64	5-5/16	29/32	1-5/64	–	–	–	–	6-5/16	1-11/32	7/16	3/8
309	1-21/32	1	9/32	6-11/16	1-1/16	5/16	–	–	–	–	7-7/8	1-9/16	9/16	1/2
310	1-27/32	1	11/32	6-49/64	1-1/16	5/16	–	–	–	–	7-7/8	1-9/16	9/16	1/2
311	1-27/32	1-9/16	11/32	7-1/2	1-1/4	5/16	91/16	11/16	5/8	10-1/4	8-21/32	1-7/8	9/16	1/2
312	1-7/8	1-7/32	23/64	7-1/2	1-1/4	5/16	91/16	11/16	5/8	10-1/4	8-21/32	1-7/8	9/16	1/2
313	2-1/32	1-3/8	5/16	8-19/32	1-3/8	5/16	10 ¼	13/16	3/4	11-19/32	9-15/16	2-1/16	11/16	5/8
314	2-1/16	1-15/32	13/32	8-19/32	1-3/8	5/16	10 ¼	13/16	3/4	11-19/32	9-15/16	2-1/16	11/16	5/8
315	2-3/8	1-1/2	7/16	9-7/16	1-29/64	5/16	11-13/32	13/16	3/4	12-5/8	11-1/32	2-9/32	11/16	5/8
316	2-17/32	1-5/8	17/32	9-7/16	1-29/64	5/16	11-13/32	13/16	3/4	13	11-1/32	2-9/32	11/16	5/8
317	2-11/16	1-23/32	17/32	10-1/4	1-39/64	5/16	12-19/32	15/16	7/8	14-23/64	11-13/16	2-19/32	13/16	3/4
320	3-1/8	1-29/32	1-1/16	11-27/64	1-25/32	15/32	13-7/8	15/16	7/8	15-7/8	13	2-29/32	13/16	3/4
322	3-1/4	2-3/32	3/4	12-25/32	2-3/64	15/32	14-31/32	1-1/16	1	17-3/8	14-9/16	3-5/32	15/16	7/8
324	3-27/32	2-17/32	13/16	14-3/4	2-3/8	15/32	17-23/32	1-5/16	1-1/4	19-1/2	16-15/16	3-15/16	1-1/16	1
326	4-3/32	2-9/16	29/32	15-9/16	2-23/64	15/32	18-1/2	1-5/16	1-1/4	20-9/32	17-23/32	3-15/16	1-1/16	1
328	4-1/8	3	1	–	–	–	20-1/2	1-9/16	1-1/2	23-3/8	–	–	–	–
330	4-5/16	3	1	–	–	–	22-1/4	1-9/16	1-1/2	25-1/4	–	–	–	–
332	4-1/2	3-1/8	1-1/8	–	–	–	23	1-9/16	1-1/2	26-5/8	–	–	–	–
334	4-55/64	3-7/32	1-1/8	–	–	–	23-3/4	1-9/16	1-1/2	27-1/4	–	–	–	–
338	5-13/64	3-5/8	1-3/16	–	–	–	26-5/6	1-13/16	1-3/4	30-3/4	–	–	–	–

**Table 11 - USAF 200 Series Circulating Oil Flow Rates, Drain Hole Sizes, Thermocouple Location and Vibration Sensor Location**

HSG. Series	Bearing Seat MM	Circulating Oil Flow*		Static Oil Level/In.	Drain Hole Dry Sump			Thermocouple Hole		Vibration Sensor Hole	
		Amount Sufficient for Normal Lubrication	Maximum Amount for Heat Dissipation Due to External Heat Source		Location		Size	Location	Wall Thick	Location	Wall Thick
		Gal./Min.	Gal./Min.		W**	X		Y	A	B	C
215	75	.0060	.175	1-5/32	1-25/32	7/8	1/4-18	23/64	5/8	2-1/4	1-3/16
216	80	.0065	.195	1-1/4	1-31/32	61/64	1/4-18	5/16	1/2	2-9/32	1-33/64
217	85	.0075	.20	1-3/8	2-1/8	1-1/16	3/8-18	13/32	43/64	2-1/2	1-7/16
218	90	.0080	.25	1-15/32	2-1/4	1-1/8	3/8-18	7/16	39/64	2-23/32	1-29/64
220	100	.011	.35	1-41/64	2-5/8	1-1/4	3/8-18	17/32	45/64	3-5/64	1-43/64
222	110	.015	.42	1-51/64	2-7/8	1-11/32	3/8-18	19/32	17/32	3-23/64	1-23/32
224	120	.0175	.48	1-27/32	3-3/16	1-3/8	1/2-14	11/16	49/64	3-3/8	1-55/64
226	130	.019	.55	2-11/32	3-5/16	1-5/8	1/2-14	3/4	1	4-1/32	2-5/32
228	140	.023	.60	2-1/32	3-5/8	1-15/32	1/2-14	3/4	57/64	4-1/32	2-5/32
230	150	.025	.75	2-1/32	3-19/32	1-23/64	1/2-14	13/16	7/8	4-11/32	2-1/4
232	160	.030	.80	2-3/32	4-1/32	1-21/64	1/2-14	29/32	59/64	4-33/64	2-7/32
234	170	.035	.85	2-3/16	4-5/32	1-21/64	1/2-14	1	1-25/64	4-31/32	2-45/64
236	180	.037	.875	2-27/64	4-7/32	1-5/8	1/2-14	1	1-21/64	5-1/4	2-3/4

**Table 11 - USAF 200 Series Circulating Oil Flow Rates, Drain Hole Sizes, Thermocouple Location and Vibration Sensor Location**

HSG. Series	Bearing Seat MM	Circulating Oil Flow*		Static Oil Level/In.	Drain Hole Dry Sump			Thermocouple Hole		Vibration Sensor Hole	
		Amount Sufficient for Normal Lubrication	Maximum Amount for Heat Dissipation Due to External Heat Source		Location		Size	Location	Wall Thick	Location	Wall Thick
		Gal./Min.	Gal./Min.		X	Y		A	B	C	D
238	190	.039	1.0	2-17/32	4-3/4	1-39/64	1/2-14	1-1/8	1-1/4	5-1/4	3-3/32
244	220	.050	1.4	3-1/4	5-7/16	2-1/32	1/2-14	1-3/16	1-1/4	6-5/8	3-23/64

**Table 12 - USAF 300 Series Circulating Oil Flow Rates, Drain Hole Sizes, Thermocouple Location and Vibration Sensor Location**

HSG. Series	Bearing Seat MM	Circulating Oil Flow*		Static Oil Level/In.	Drain Hole Dry Sump			Thermocouple Hole		Vibration Sensor Hole	
		Amount Sufficient for Normal Lubrication	Maximum Amount for Heat Dissipation Due to External Heat Source		Location		Size	Location	Wall Thick	Location	Wall Thick
		Gal./Min.	Gal./Min.		X	Y		A	B	C	D
308	40	.0030	.09	13/16	1-1/4	13/16	1/8-27	17/64	19/64	1-49/64	31/32
309	45	.0040	.10	19/32	15/16	53/64	1/8-27	9/32	17/32	1-57/64	1-1/8
310	50	.0045	.12	1-3/8	1-17/32	63/64	1/8-27	11/32	35/64	2-3/32	1-1/8
311	55	.0050	.15	1-7/16	1-21/32	25/32	1/8-27	11/32	37/64	2-1/64	1-1/8
312	60	.0060	.175	15/16	1-25/32	7/8	1/4-18	23/64	5/8	2-1/4	1-3/16
313	65	.0065	.195	1-13/32	1-13/32	61/64	1/4-18	5/16	1/2	2-9/32	1-33/64
314	70	.0075	.20	1-15/32	2-1/8	1-1/16	3/8-18	13/32	43/64	2-1/2	1-7/16
315	75	.0080	.25	1-19/32	2-1/4	1-1/8	3/8-18	7/16	39/64	2-23/32	1-29/64
316	80	.010	.26	1-11/16	2-3/8	1-11/64	3/8-18	17/32	21/32	2-47/64	1-15/32
317	85	.011	.35	1-3/4	2-5/8	1-1/4	3/8-18	17/32	45/64	3-5/64	1-43/64
320	100	.0175	.48	2-1/32	3-3/16	1-3/8	1/2-14	11/16	49/64	3-3/8	1-55/64
322	110	.019	.55	2-13/32	3-5/16	1-5/8	1/2-14	3/4	1	4-1/32	2-5/32
324	120	.025	.75	2-3/8	4-19/32	1-23/64	1/2-14	13/16	7/8	4-11/32	2-1/4
326	130	.030	.80	2-7/16	4-1/32	1-21/64	1/2-14	29/32	59/64	4-33/64	2-7/32
328	140	.035	.85	2-9/16	4-5/32	1-21/64	1/2-14	1	1-25/64	4-31/32	2-45/64
330	150	.037	.875	2-5/8	4-7/32	1-5/8	1/2-14	1	1-21/64	5-1/4	2-3/4
332	160	.039	1.0	2-11/16	4-3/4	1-39/64	1/2-14	1-1/8	1-1/4	5-1/2	2-3/4
334	170	.042	1.0	2-3/4	4-29/32	1-17/32	1/2-14	1-1/8	1-1/8	5-13/16	2-27/32
338	190	.050	1.4	3-3/8	5-7/16	2-1/32	1/2-14	1-3/16	1-1/2	6-5/8	3-23/64

**NOTES for Tables 11 and 12:**

\* Based on oil temperature of 130°F-150°F & oil level at center line of lowest roller. For maximum oil flow values, both drains should be used.

Mount block with drain holes on right side of block center line when rotation is CCW, unless cast closed end.

Mount block with drain holes on left side of block center line when rotation is CW.

\*\* Static oil level is measured from bottom of block base to meniscus on oil sight gauge. (Non-rotating mode)

\*\*\* For wet sump, consult Dodge Application Engineering, Greenville, SC.

Dodge Industrial, Inc.  
1061 Holland Road  
Simpsonville, SC 29681  
+1 864 297 4800

