



Durco[®] Mark[™] 3 ASME (ANSI) Pumps

► Maintenance Checklist

! DANGER

Read User Instructions (UI) **before** installing, operating or maintaining this pump.
Copies may be obtained from a Flowserve pump representative or flowserve.com.

Recommended Lubricants:

- Mineral Oil:** Quality mineral oil with rust and oxidation inhibitors.
ExxonMobil DTE Heavy/Medium ISO VG 68
- Synthetic Oil:** Royal Purple or Conoco SYNCON 68
Some synthetic lubricants require Viton O-rings.
- Grease:** Horizontal – ExxonMobil Polyrex EM (or compatible)
In-Line – Lithium Complex with mineral oil Unirex N3

Amount of Oil Required

Pump Size	Shaft Size		Mark 3A Amount ²
	Seal	Coupling ¹	
Group 1	1.375 in	0.875 in	8.5 oz
Group 2	1.875 in	1.125 in	32 oz
Group 3	2.625 in	2.375 in	48 oz
Group 3 HD	3.000 in	2.375 in	34 oz

1. 4 x 3R-13, 6 x 4-10 and 6 x 4R-13: 1.500 in.
2. Approximate. For Mark 3 bearing housing, see values in UI.

Oil Viscosity Grades

Max. Temp	ISO VG	Min. Visc. Index
Up to 160°F	46	95
160–175°F	68	95
175–200°F	100	95

Relubrication Intervals³

Lubricant	External Housing Temperature ⁴		
	Under 160°F	160–175°F	175–200°F
Mineral Oil	6 mo.	3 mo.	1.5 mo.
Synthetic Oil ⁵	18 mo.	18 mo.	18 mo.
Grease	6 mo.	3 mo.	1.5 mo.

3. Assuming good maintenance and operation practices and no contamination.
4. Bearing temperature up to 30°F higher than housing temperature.
5. May be increased to 36 months with ANSI 3A™ Power End.

Maximum Recommended External Housing Temperature^{6,7}

Lubrication	Temperature
Oil bath	180°F
Oil mist	180°F
Grease	200°F

6. Synthetic oil and grease will allow for higher or lower (-20°F to -100°F) temperatures.
7. Cooling required above indicated temperatures.

Temperature of Fluid Pumped

	Group 1	Group 2	Group 3
Without Modifications	-20°F to 300°F	-20°F to 300°F	-20°F to 300°F
With Modifications ⁸	> -20°F to -100°F	> -20°F to -100°F	> -20°F to -100°F
	> 300°F to 700°F	> 300°F to 700°F	> 300°F to 700°F

8. Subject to low/high temperature modifications referenced in UI.

For sales and product information, go to www.flowserve.com.

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Impeller Clearance Settings^{9, 10, 11}

Temperature	Clearance, in
< 200°F	0.018 ± 0.003
200 to 250°F	0.021
250 to 300°F	0.024
300 to 350°F	0.027
350 to 400°F	0.030
400 to 450°F	0.033
> 450°F	0.036

- For 3x1.5-13 and 3x2-13 at 3500 rpm, add 0.003 in.
- Rotation of bearing carrier from center of one lug to the center of the next results in axial shaft movement of 0.004 in.
- Reverse vane impeller set to cover, open impeller to casing.

Vibration:

Maximum vibration level 0.25 in/sec peak velocity (measured on bearing housing surface)

Shaft Data

Max. shaft deflection at seal chamber	0.002 in
Max. shaft runout at seal chamber	0.001 in
Max. shaft end play (axial movement)	0.002 in

Alignment:

Recommend that pump and motor shaft be aligned to within 0.002 in parallel F.I.M. and 0.0005 in/in angular F.I.M.

Seal Flush Requirements:

- Flush liquid pressure: 10–15 psi minimum differential across seal faces
- Flush liquid flow rate: 1–2 gpm

Impeller Balance Requirements:

- Single plane spin balance
- For 1800 rpm: 0.021 oz in/lb
- For 3600 rpm: 0.011 oz in/lb

Recommended Bolt Torques^{12,13}, size (torque)

Description	Group 1	Group 2	Group 3
Bearing retainer cap screws - standard bearings	n/a	n/a	3/8 in (12 lbf-ft)
Bearing retainer cap screws - duplex bearings	Standard Power End	3/8 in (4 lbf-ft)	3/8 in (12 lbf-ft)
	HD Power End	n/a	1/4 in (8 lbf-ft)
Bearing housing/adaptor cap screws and nuts	n/a	1/2 in (40 lbf-ft)	3/4 in (90 lbf-ft)
Mechanical seal gland studs/nuts, with gasket	3/8 in (12 lbf-ft)	3/8 in (12 lbf-ft) 1/2 in (40 lbf-ft)	1/2 in (30 lbf-ft)
Mechanical seal gland studs/nuts, with O-ring	3/8 in (20 lbf-ft)	3/8 in (20 lbf-ft) 1/2 in (40 lbf-ft)	1/2 in (40 lbf-ft)
Casing studs/nuts	1/2 in (30 lbf-ft)	1/2 in (30 lbf-ft) 3/8 in (60 lbf-ft)	3/4 in (100 lbf-ft) 1/2 in (160 lbf-ft)
Cap screw cover/adaptor (token bolts)	3/8 in (20 lbf-ft)	3/8 in (20 lbf-ft)	1/2 in (40 lbf-ft)
Bearing carrier set screws	3/8 in (12 lbf-ft)	1/2 in (30 lbf-ft)	1/2 in (30 lbf-ft)
Cap screw foot	Standard Power End	1/2 in (40 lbf-ft)	3/4 in (160 lbf-ft)
	HD Power End	n/a	n/a
Cap screws - repeller cover to cover	n/a	3/8 in (12 lbf-ft)	1/2 in (30 lbf-ft)
Cap screw - bearing housing	1/2 in (40 lbf-ft)	1/2 in (40 lbf-ft)	n/a
Bearing Locknut-	Standard Power End	(20 +5/-0 lbf-ft)	(70 +5/-0 lbf-ft)
	HD Power End	n/a	n/a

12. Values given are for lubricated or PTFE-coated threads. For non-lubricated threads, increase the value by 25%.

13. Gasket joint torque values are for unfilled PTFE gaskets. Other gasket materials may require additional torque to seal. Exceeding metal joint torque values is not recommended.

Bearing Size (SKF)

	Inboard	Outboard	Duplex Option
Group 1	6207C3	5306AC3	7306BECBY
Group 2	6310C3	5310AHC3	7310BECBY
Group 3	6314C3	5314AC3	7314BECBY
Group 3 HD	NUP217ECP	7315BECBY	N/A

Bearing Fits, inches

	Group 1	Group 2	Group 3	Group 3 HD	
OB bearing/ shaft	Bearing	1.1811/1.1807	1.9685/1.9680	2.7559/2.7553	2.9528/2.9522
	Shaft	1.1816/1.1812	1.9690/1.9686	2.7565/2.7560	2.9534/2.9529
	Fit	0.0009T/0.0001T	0.0010T/0.0001T	0.0012T/0.0001T	0.0012T/0.0001T
IB bearing/ shaft	Bearing	1.3780/1.3775	1.9685/1.9680	2.7559/2.7553	3.3465/3.3455
	Shaft	1.3785/1.3781	1.9690/1.9686	2.7565/2.7560	3.3472/3.3466
	Fit	0.0010T/0.0001T	0.0010T/0.0001T	0.0012T/0.0001T	0.0013/0.0001T
OB bearing/ housing	Bearing	2.8346/2.8341	4.3307/4.3301	5.9055/5.9047	6.2992/6.2982
	Housing	2.8346/2.8353	4.3310/4.3316	5.9056/5.9067	6.3009/6.2993
	Fit	0.0012L/0.0000L	0.0015L/0.0003L	0.0020L/0.0001L	0.0027L/0.0001L
IB bearing/ housing	Bearing	2.8346/2.8341	4.3307/4.3301	5.9055/5.9047	5.9055/5.9045
	Housing	2.8346/2.8353	4.3310/4.3316	5.9058/5.9065	5.9065/5.9058
	Fit	0.0012L/0.0000L	0.0015L/0.0003L	0.0018L/0.0003L	0.0020L/0.0003L