

SUMMIT PUMP

Horizontal End Suction Pump

Close Coupled and Frame Mounted

Installation, Operation, and Maintenance Manual



WARRANTY

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SUMMIT PUMP, INC.

Green Bay, WI

LIABILITY

Summit Pump, Inc. shall not be liable for personal physical injury, damage or delays caused by failure to follow the instructions and procedures for installation, operation and maintenance contained in this manual.

The equipment is not for use in or with any nuclear facility or fire sprinkler system. Buyer accepts the responsibility for insuring that the equipment is not used in violation and Buyer shall indemnify and hold Seller harmless from any and all liability (including such liability resulting from seller's negligence) arising out of said improper use.

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1. INTRODUCTION

This installation, operation, and maintenance manual is designed to help you achieve the best performance and longest life from your Summit Pump.

This pump is a close coupled / frame-mounted, closed impeller, centrifugal model with end suction / top discharge. The pump is designed for handling water, non-corrosives (cast iron/bronze fitted), and mild corrosives (316 stainless steel).

If there are any questions regarding the pump or its application, which are not covered in this manual or in other literature accompanying this unit, please contact your Summit Pump distributor.

For information or technical assistance on the power source, contact the power source manufacturer's local dealer or representative.

SAFETY

The following message types are used in this manual to alert maintenance personnel to procedures that require special attention for the protection and safety of both equipment and personnel:

WARNING!
Failure to comply with the warnings in this manual could result in personal injury or death.

CAUTION!
Failure to comply with the cautions in this manual could result in destruction of or damage to equipment.

NOTE: <i>Identifies a condition or procedure which is essential to proper equipment operation.</i>

2. RECEIPT AND STORAGE

RECEIVING THE PUMP

WARNING!
Failure to properly lift and move pump could result in serious personal injury.

Immediately upon arrival, carefully inspect the pump for evidence of damage during transit. Immediately report any damage to your Summit Pump Distributor.

STORING THE PUMP

Store the pump in a clean dry place. **Do not remove piping connection covers.** Rotate the pump shaft by hand **at least once per week** to maintain a protective film of oil or grease on the bearings. If you anticipate long-term storage, special treatment is available for purchase from Summit Pump, Inc.

3. INSTALLATION

LOCATION

When choosing a location for the pump, select an area that provides easy access for inspection and maintenance. Locate the pump as close as possible to the source, which will provide NPSH (Net Positive Suction Head) equal to or greater than that required by the pump at any capacity over its expected operating range.

FOUNDATION

Use a foundation that is sufficient enough to support all points of the pump base-plate. Level and grout the base-plate per standard construction practices (see ANSI/HI 1.4.2-1997).

PIPING CONNECTION – SUCTION / DISCHARGE

All piping must be independently supported and accurately aligned to the pump suction and discharge connections.

WARNING!
Lock out driver power before beginning to work on pump.

CAUTION!
Never use force to align piping to the pump suction and discharge.

The suction piping should be equal to, but never less than, the suction nozzle size. If larger, use an eccentric reducer mounted with flat side on top. If suction line is suction lift, the pipe must be free of air leaks. It must be one diameter larger than the pump suction nozzle. The end must be two pipe diameters below the liquid surface. If a foot valve is used, it must be 1.5 times the area of the suction pipe. Elbows must be a minimum of ten diameters from the suction flange.

CAUTION!
Never operate pump with discharge valve closed.

The discharge piping should include isolation and check valves. The check valve prevents the pump from rotating backward. Place the check valve between the pump and isolation valve. The isolation valve is used for priming, starting, and shutting down the system. If you use pipe diameter increasers, place them between the pump and the check valve.

ALIGNMENT – FRAME MOUNTED

The alignment at the pump and drive shaft is one of the most important considerations in the pump installation.

WARNING!

Lock out pump driver. Failure to do so could result in serious personal injury.

■ TO ALIGN THE PUMP

1. Use flexible spacer couplings to achieve proper alignment.
2. Check and adjust the parallel and angular alignment to within .005 inches prior to connecting the coupling halves.
3. Jog the motor to check rotation. Its arrow should match up with the arrow on the pump.
4. Install a coupling guard when the pump is aligned.

STUFFING BOX

Mechanical seals are standard.

CAUTION!

Pumps are limited to 150° F maximum pumpage.
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Mechanical Seals

Mechanical seals are standard in the close coupled and frame mounted pumps. The seal is mounted at the factory and needs no further adjustment for operating conditions.

4. OPERATION

LUBRICATION

The close coupled pumps require only grease lubrication per motor manufacture instructions. Frame mounted pumps are grease lubricated.

Good lubrication practice includes:

- Keep lubricant clean in storage and application devices.
- Clean lubricant/grease fitting before re-lubricating.
- Use proper amount of grease. (Too much is just as bad as too little.)
- Use correct grade for operating conditions, use NLG1 grade 2 lithium base or synthetic of equal grade.
- Grease may include:

Table 4-1

Acceptable Greases	
Mobil	Mobil Grease XHP222
Mobil Synthetic	SCH 100
Citgo	Mystic EP2
Citgo	Mystic SX6
Keystone	81EP2

5. MAINTENANCE AND REPAIR

WARNING!

WEAR EYE PROTECTION. Failure to do so can result in serious personal injury.
--

DISASSEMBLY PROCEDURES

(See APPENDIX D for cross-section of corresponding model.)

■ TO DISASSEMBLE YOUR PUMP

1. Lock out pump motor power supply at the motor starter.
2. Close off discharge, suction, and sealing fluid (if used).
3. Drain casing and flush, if needed.

WARNING!

Pump parts are heavy. Use proper lifting methods to avoid personal injury.
--

4. Place lifting sling around pump frame if removing pump. Disconnect drive coupling, suction, discharge and any seal tubing. If pump is close coupled, disconnect wiring from motor. Lift entire component onto transport cart for trip to shop.
5. Secure pump or pump and motor to bench to disassemble.
6. Remove casing bolts (170) holding casing to adapter (71). Pull casing (1) and gasket (73A) away from adapter (71) over impeller (2). Set casing and gasket aside for inspection.
7. Loosen impeller screw (26). Remove impeller screw (26) and washer (24A), hold shaft with suitable tool.
8. Remove impeller (2) from shaft (6)
9. Remove mechanical seal parts (80A, B, C, & D) from shaft sleeve (14).
10. Loosen and remove adapter to frame / motor bolts. Slide adapter away from frame/motor.
11. Remove floating seat (65A) from adapter and set aside with other seal parts for inspection.
12. Slide sleeve (14), sleeve O-ring (130) and deflector (40) from shaft.

Frame Mounted Pumps

13. Loosen and remove bearing cover bolts (170C), and slide bearing cover (37) off shaft. Remove outboard seal (49) from cover (37).
14. Slide shaft assembly, shaft inboard (16) and outboard (18) bearings from bearing frame (19).
15. Remove inboard seal (51) from bearing frame (19)
16. Holding shaft assembly secure, loosen outboard bearing lock nut (22) and remove.
17. Remove inboard bearing (16) and outboard bearing (18). Use an arbor press or bearing puller to facilitate.
18. Inspect all parts for cracks, erosion, pitting, rusting, grooves worn into shaft and / or sleeve. Replace all worn or otherwise damaged parts.
19. If pump is iron, inspect casing rings and replace as necessary.

ASSEMBLY PROCEDURES

■ TO ASSEMBLE YOUR PUMP

1. Clean adapter (71) and frame/motor (19).
2. Install new grease fittings into frame (19) and bearing cover (37).
3. If using a frame assembly, install inboard bearing (16) onto shaft (6). Heat bearings for ease of installation. Install thrust outboard (118) on shaft. Install bearing so shields are toward shaft ends. Tighten bearing locknut (22) on shaft, outboard end. Set aside for inspection.
4. Install bearing cover seal (49) in outboard bearing cover (37).
5. Apply a thin coat of lubricant to the inside of the bearing frame housing (outboard and inboard).
6. Slide shaft assembly into the frame from the outboard end until the snap ring on outboard bearing (18) contacts the frame (19).
7. Slide bearing cap over the shaft end, install 4 ½" x ¾" bolts (170C), and tighten.
8. Slide inboard grease seal (51) over impeller end of shaft into place. Slide deflector (40) into position. Slide sleeve (14) on shaft.
9. Assemble mechanical seal, lubricate O-ring (54B) groove in stationary seat (65A), and seat cavity in adapter (71) with molykote DC No.55 or synthetic lube. Install stationary seat in adapter with lapped surface toward casing side of adapter.

Close Coupled

10. Slide adapter (71) over the end of the motor shaft. Align the holes in the adapter with motor holes. Install adapter to motor bolts and tighten.

Frame Mounted

11. Slide adapter (71) over end of pump shaft (6). Align holes in adapter with bearing frame (19) holes. Install adapter to frame bolts and tighten.
12. Lubricate shaft sleeve (14) bore, and bore of rotating assembly (80A). Slide sleeve onto shaft (6). Slide the rotating assembly and rotating sealing washer (not shown) (80D) onto the shaft sleeve. The lapped surface should be facing toward

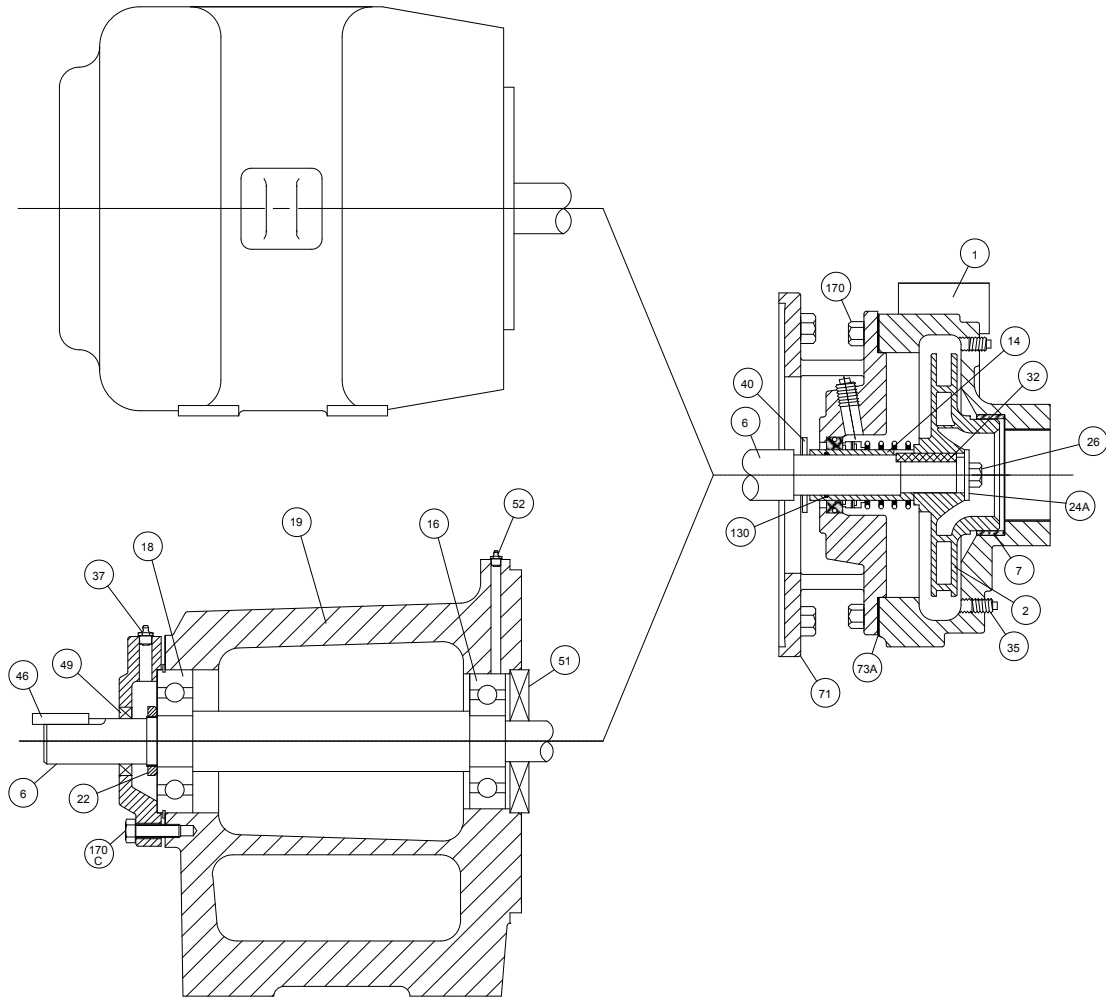
the stationary seat or motor end of the assembly. Install the spring (80B). (It is closest to the impeller.) (Note: The spring retainer (80A) is used on some models – not shown.)

13. Install impeller key (32), making sure that the key goes into the notch on the shaft sleeve (14). Slide impeller (2) on, guiding the seal spring onto the impeller shoulder or into the spring retainer (80A).
14. Tighten impeller screw (26), with impeller washer (24A) in place. Rotate assembly to ensure there is no binding and that assembly turns freely.
15. Install new casing gasket (73A). Slide casing (1) over impeller. Align adapter holes with casing holes to put discharge outlet in its proper orientation. Install adapter to casing blots (170) and tighten. Check all drain plugs (35) to ensure all are in place and tight.
16. If close coupled, reinstall or take to spares storage.
17. If frame mounted, install coupling key (46) and tape in place. Reinstall or take to spares storage.

6. PUMP CROSS SECTION AND PARTS LIST

CC AND FRAME MOUNTED PARTS ASSEMBLY

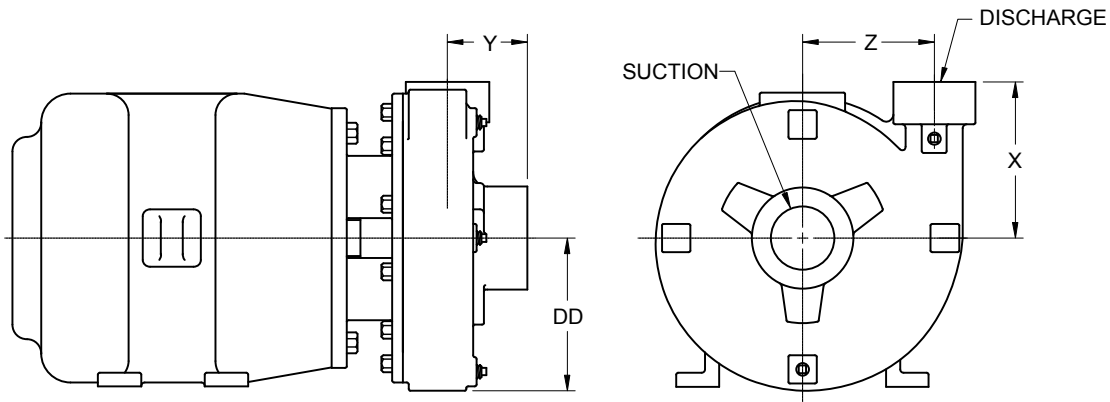
Cross Section



Parts List

Item #	Description	Item #	Description
1	Casing	37	Bearing Cover, Outboard
2	Impeller	40	Deflector
6	Shaft	46	Key Coupling
7	Casing Ring (iron pumps only)	49	Bearing Cover Seal, Outboard
13	Packing	51	Grease Seal Inboard
14	Shaft Sleeve	52	Grease Fitting
16	Bearing, Inboard	53	Case Support (not shown)
18	Bearing, Outboard	65	Mechanical Seal, Stationary Element
19	Frame	71	Adapter
22	Lock Bearing Nut	73A	Casing Gasket
24A	Impeller Washer	80	Mechanical Seal, Rotating Element
26	Screw Impeller	130	Shaft Sleeve O-Ring
27	Adapter Ring	170	Bolt, Casing
32	Key Impeller	170B	Bolt, Frame to Adapter (not shown)
35	Plug Drain	170C	Bolt, Bearing Cap

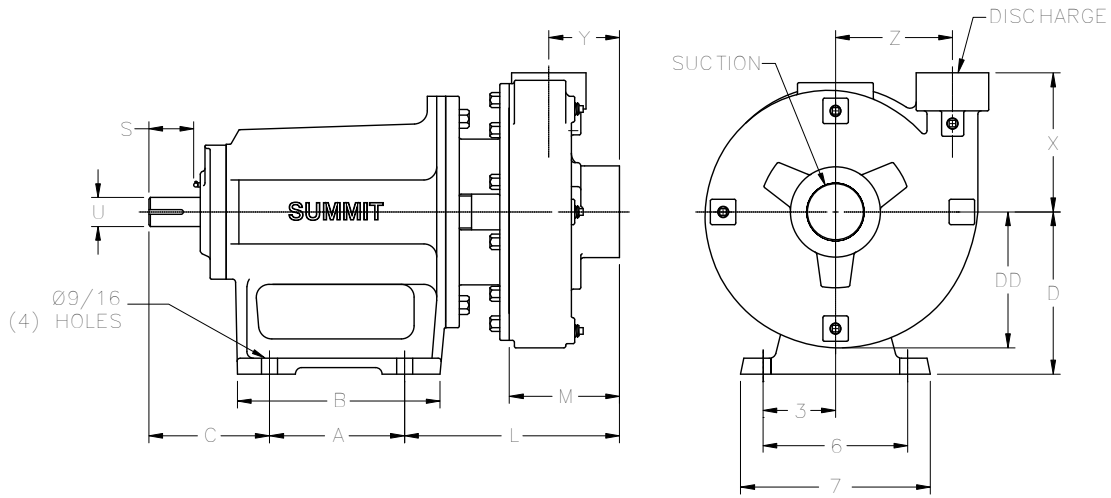
CC DIMENSIONAL DATA



Close coupled pump dimensions in inches

Type	Disch.	Suct.	X	Y	Z	DD
1X2-6	1 NPT	2 NPT	4 3/4	2 5/8	3 3/8	4 1/4
1.5x2-6	1 1/2 NPT	2 NPT	5	2 3/4	3 5/8	4 3/8
2x2.5-6	2 NPT	2 1/2 NPT	5 3/8	3 1/4	3 5/8	4 1/2
4x5-7	4 Flg	5 Flg	7 3/8	2 41/64	5 1/2	7 1/4
1x2-8	1 NPT	2 NPT	5 1/8	2 3/4	4 3/8	5 1/4
1.5x2-8	1 1/2 NPT	2 NPT	5 1/2	2 3/4	4 1/2	5 3/8
2x2.5-8	2 NPT	2 1/2 NPT	6	3 1/8	4 5/8	5 1/2
2.5x3-8	2 1/2 Flg	3 Flg	7 1/4	2 1/4	4 7/8	5 3/4
3x4-8	3 Flg	4 Flg	7 1/2	2 1/8	5 1/4	6 1/2
4x5-8	4 Flg	5 Flg	7 3/8	3	6	7 1/4
2x2.5-10	2 Flg	2 1/2 Flg	7	2 1/2	5 7/8	6 7/8
2.5x3-10	2 1/2 Flg	3 Flg	7 1/2	2 1/4	5 7/8	7
3x4-10	3 Flg	4 Flg	7 1/2	2 1/8	6 1/4	7 1/2
4x5-10	4 Flg	5 Flg	8	2 7/8	7	8 1/8
5x6-10	5 Flg	6 Flg	9	3 1/4	7 1/8	8 3/4
2,5x3-11	2 1/2 Flg	3 Flg	8 1/16	2 5/16	6 1/8	7 3/16
4x5-11	4 Flg	5 Flg	9	2 5/8	6 1/2	7 3/4
1.5x2-12	1 1/2 NPT	2 NPT	7 1/2	3	6 3/4	7 1/2
2x2.5-12	2 Flg	2 1/2 Flg	7 3/4	2 1/8	6 13/16	7 7/8
3x4-12	3 Flg	4 Flg	9	2 1/4	7 1/8	8 3/8
4x5-12	4 Flg	5 Flg	9	2 7/16	7 1/2	9
5x6-12	5 Flg	6 Flg	9 3/8	3 1/2	8	9 3/4
6x8-12	6 Flg	8 Flg	8 7/8	6 5/16	9 7/8	13 1/16
2.5x4-14	2 1/2 Flg	4 Flg	8 5/8	2 7/8	7 3/4	8 1/2
3x4-14	3 Flg	4 Flg	8 5/8	2 7/8	8	9
4x5-14	4 Flg	5 Flg	10	2 7/8	8 1/2	9 1/2

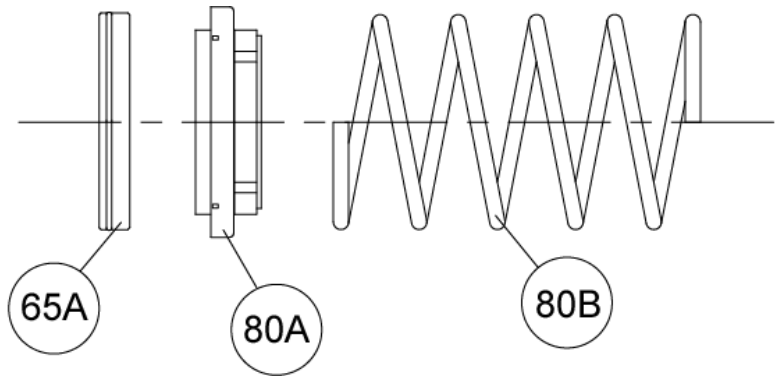
FRAME MOUNTED DIMENSIONAL DATA



Frame mounted pump dimensions in inches

Size & Frame	Dis	Suc	A	B	C	D	DD	L		M	S	U Dia*	X	Y	Z	WEIGHT IN LBS
								Style P	Style M							
1x2-6 F1	1 NPT	2 NPT	5 1/4	8	6 3/16	5 5/16	4 1/4	11	8	4 1/8	2 3/4	1 1/8	4 3/4	2 5/8	3 3/8	95
1.5x2-6/J F1	1 1/2 NPT	2 NPT	5 1/4	8	6 3/16	5 5/16	4 3/8	11 1/4	8 1/4	4 3/8	2 3/4	1 1/8	5	2 3/4	3 5/8	96
2x2.5-6 F1	2 NPT	2 1/2 NPT	5 1/4	8	6 3/16	5 5/16	4 1/2	11 3/4	8 3/4	4 7/8	2 3/4	1 1/8	5 3/8	3 1/4	3 5/8	97
4x5-7 F1	4 Flg	5 Flg	5 1/4	8	6 3/16	5 5/16	7 1/4	11 1/2	8 1/2	4 41/64	2 3/4	1 1/8	7 3/8	2 41/64	5 1/2	150
4x5-7 F2	4 Flg	5 Flg	5 1/4	8	6 3/16	6 5/16	7 1/4	13	10 1/4	4 41/64	2 3/4	1 1/4	7 3/8	2 1/16	5 1/2	168
1x2-8/G F1	1 NPT	2 NPT	5 1/4	8	6 3/16	5 5/16	5 1/4	11 1/8	8 1/8	4 1/8	2 3/4	1 1/8	5 1/8	2 3/4	4 3/8	138
1x2-8/G F2	1 NPT	2 NPT	5 1/4	8	6 3/16	6 5/16	5 1/4	12 1/2	9 3/4	4 1/8	2 3/4	1 1/4	5 1/8	2 3/4	4 3/8	138
1.5x2-8 F1	1 1/2 NPT	2 NPT	5 1/4	8	6 3/16	5 5/16	5 3/8	11 1/8	8 1/8	4 1/4	2 3/4	1 1/8	5 1/2	2 3/4	4 1/2	140
1.5x2-8 F2	1 1/2 NPT	2 NPT	5 1/4	8	6 3/16	6 5/16	5 3/8	12 5/8	XXX	4 1/4	2 3/4	1 1/4	5 1/2	2 3/4	4 1/2	140
2x2.5-8 F1	2 NPT	2 1/2 NPT	5 1/4	8	6 3/16	5 5/16	5 1/2	11 5/8	8 5/8	4 3/4	2 3/4	1 1/8	6	3 1/8	4 5/8	145
2x2.5-8 F2	2 NPT	2 1/2 NPT	5 1/4	8	6 3/16	6 5/16	5 1/2	13 1/8	10 1/4	4 3/4	2 3/4	1 1/4	6	3 1/8	4 5/8	145
2x2.5-8 F1	2 1/2 Flg	3 Flg	5 1/4	8	6 3/16	5 5/16	5 3/4	10 3/4	7 3/4	3 7/8	2 3/4	1 1/8	7 1/4	2 1/4	4 7/8	150
2.5x3-8 F2	2 1/2 Flg	3 Flg	5 1/4	8	6 3/16	6 5/16	5 3/4	12 1/4	9 1/2	3 7/8	2 3/4	1 1/4	7 1/4	2 1/4	4 7/8	150
3x4-8 F1	3 Flg	4 Flg	5 1/4	8	6 3/16	5 5/16	6 1/2	10 3/4	7 3/4	3 7/8	2 3/4	1 1/8	7 1/2	2 1/8	5 1/4	162
3x4-8 F2	3 Flg	4 Flg	5 1/4	8	6 3/16	6 5/16	6 1/2	12 1/8	9 3/8	3 7/8	2 3/4	1 1/4	7 1/2	2 1/8	5 1/4	162
4x5-8 F1	4 Flg	5 Flg	5 1/4	8	6 3/16	5 5/16	7 1/4	12 3/8	9 3/8	5 7/16	2 3/4	1 1/8	7 3/8	3	6	173
2x2.5-10 F1	2 Flg	2 1/2 Flg	5 1/4	8	6 3/16	5 5/16	6 3/4	11 1/8	8 1/8	4 1/4	2 3/4	1 1/8	7	2 1/2	5 7/8	149
2.5x3-10 F1	2 1/2 Flg	3 Flg	5 1/4	8	6 3/16	5 5/16	7 1/8	11 1/4	8 1/4	4 1/8	2 3/4	1 1/8	7 1/2	2 1/4	5 7/8	142
3x4-10 F1	3 Flg	4 Flg	5 1/4	8	6 3/16	5 5/16	7 1/2	11 1/4	8 1/4	4 3/4	2 3/4	1 1/8	7 1/2	2 1/2	6 1/4	161
4x5-10 F2	4 Flg	5 Flg	5 1/4	8	6 3/16	6 5/16	8 1/8	13 1/4	10 1/2	5	2 3/4	1 1/4	8	2 7/8	7	220
5x6-10 F2	5 Flg	6 Flg	5 1/4	8	6 3/16	6 5/16	8 3/4	14 1/2	11 3/4	6 1/4	2 3/4	1 1/4	9	3 1/4	7 1/8	244
2.5x3-11 F1	2 1/2 Flg	3 Flg	5 1/4	8	6 3/16	5 5/16	7 3/16	10 7/8	8 1/8	4 7/16	2 3/4	1 1/8	8 1/16	2 5/16	6 1/8	160
2.5x3-11 F2	2 1/2 Flg	3 Flg	5 1/4	8	6 3/16	6 5/16	7 3/16	12 5/16	XXX	4 7/16	2 3/4	1 1/4	8 1/16	2 5/16	6 1/8	180
4x5-11 F2	4 Flg	5 Flg	5 1/4	8	6 3/16	6 5/16	7 3/4	12 5/8	9 7/8	4 3/4	2 3/4	1 1/4	9	2 5/8	6 1/2	227
4x5-11 F3	4 Flg	5 Flg	6 3/8	9	8 1/2	7 1/16	7 3/4	12 9/16	XXX	4 3/4	4 13/16	1 7/8	9	2 5/8	6 1/2	282
1.5x2-12 F2	1 1/2 NPT	2 NPT	5 1/4	8	6 3/16	6 5/16	7 1/2	12 9/16	9 15/16	4 15/16	2 3/4	1 1/4	7 1/2	3	6 3/4	140
2x2.5-12 F2	2 Flg	2 1/2 Flg	5 1/4	8	6 3/16	6 5/16	7 7/8	11 11/16	8 7/8	4 1/16	2 3/4	1 1/4	7 3/4	2 1/8	6 13/16	140
3x4-12 F2	3 Flg	4 Flg	5 1/4	8	6 3/16	6 5/16	8 3/8	11 15/16	9 3/16	4 5/16	2 3/4	1 1/4	9	2 1/4	7 1/8	317
4x5-12 F2	4 Flg	5 Flg	5 1/4	8	6 3/16	6 5/16	9	12 3/16	9 7/16	4 9/16	2 3/4	1 1/4	9	2 7/16	7 1/2	332
5x6-12 F2	5 Flg	6 Flg	5 1/4	8	6 3/16	6 5/16	9 1/2	13 13/16	10 11/16	5 13/16	2 3/4	1 1/4	9 3/8	3 1/2	8	372
6x8-12 F4	6 Flg	8 Flg	6 3/8	9	8 1/2	7 1/16	10 3/4	13 23/64	XXX	7 3/4	4 13/16	1 7/8	12 1/8	4 1/8	8 3/4	346
6x8-12G F2	6 Flg	8 Flg	5 1/4	8	6 3/16	6 5/16	12 3/16	16 5/8	XXX	9	2 3/4	1 1/4	8 7/8	6 5/16	9 7/8	351
6x8-12G F3	6 Flg	8 Flg	6 3/8	9	8 1/2	7 1/16	12 3/16	16 9/16	XXX	9	4 13/16	1 7/8	8 7/8	6 5/16	9 7/8	378
2.5x4-14 F3	2 1/2 Flg	4 Flg	6 3/8	9	8 1/2	7 1/16	8 5/8	12 5/16	9 1/2	5 1/2	4 13/16	1 7/8	8 5/8	2 7/8	7 3/4	279
2.5x4-14 F4	2 1/2 Flg	4 Flg	6 3/8	9	8 1/2	7 1/16	8 5/8	12 5/16	XXX	5 1/2	4 13/16	1 7/8	8 5/8	2 7/8	7 3/4	279
3x4-14 F3	3 Flg	4 Flg	6 3/8	9	8 1/2	7 1/16	9 1/8	12 5/16	9 1/2	5 1/2	4 13/16	1 7/8	8 5/8	2 7/8	8	286
3x4-14 F4	3 Flg	4 Flg	6 3/8	9	8 1/2	7 1/16	9 1/8	12 5/16	XXX	5 1/2	4 13/16	1 7/8	8 5/8	2 7/8	8	286
4x5-14 F3	4 Flg	5 Flg	6 3/8	9	8 1/2	7 1/16	9 5/8	12 5/16	9 1/2	5 1/2	4 13/16	1 7/8	10	2 13/16	8 1/2	292
4x5-14 F4	4 Flg	5 Flg	6 3/8	9	8 1/2	7 1/16	9 5/8	12 5/16	XXX	5 1/2	4 13/16	1 7/8	10	2 13/16	8 1/2	292
6x8-16 F3	6 Flg	8 Flg	6 3/8	9	8 1/2	7 1/16	13 1/8	12 3/4	XXX	7 1/8	4 13/16	1 7/8	14	3 7/16	10 5/8	537
6x8-16 F4	6 Flg	8 Flg	6 3/8	9	8 1/2	7 1/16	13 1/8	12 3/4	XXX	7 1/8	4 13/16	1 7/8	14	3 7/16	10 5/8	537

MECHANICAL SEAL ASSEMBLY



Item #	Description
65A	Stationary Seat
80A	Rotating Assembly
80B	Spring

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