



Operation and Maintenance Manual

PrimeRite™



Moving Water Worldwide - Reliably and Efficiently

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I. Overview of Major Components

A. Flanges

Gaskets are required between the pump housing and the flanges of the mating components. The gasket material needs to be chemically compatible with the fluid to be pumped; neoprene gaskets are supplied.

B. Pump Drive Specifications

MWI PrimeRite™ pumps are equipped with suitable prime movers capable of meeting speed and torque requirements of the pump. Prime mover ratings are determined by the hydraulic conditions of the application: flow capacity, head, and fluid viscosity. As a standard, MWI provides a variable speed diesel engine directly coupled to the pump head through an elastomeric coupling to absorb / cushion torsional and lateral vibration. The operation and maintenance of the engine is not included in this manual, please reference the manufacturer's manual for details on these components.

C. Compressor Drive Specifications

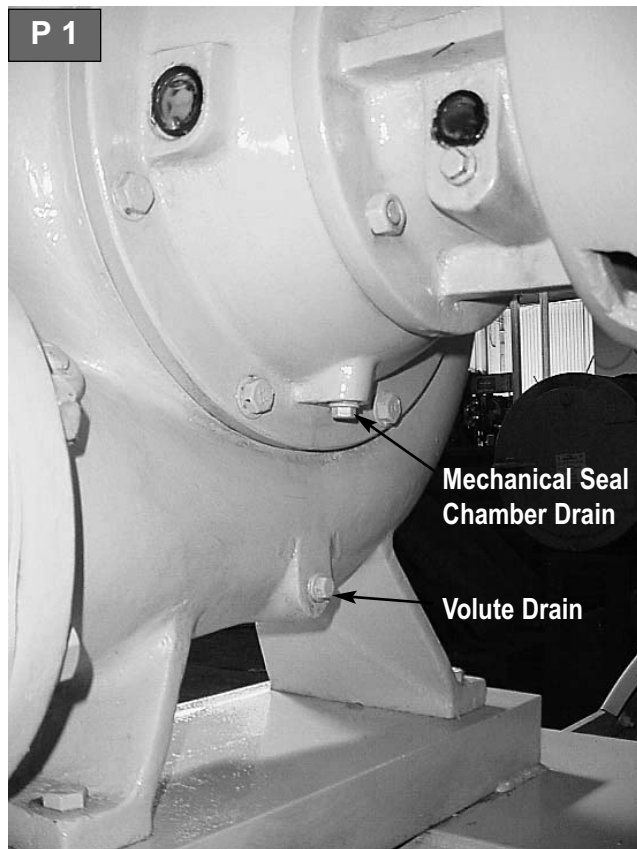
MWI diesel driven PrimeRite pumps are equipped with either engine driven compressors or water pump shaft driven compressors. Both compressor configurations cooled and/or lubricated by the diesel engine's cooling and/or lubrication system(s).

D. Mechanical Seals

The PrimeRite™ utilizes a single spring mechanical seal consisting of a stationary seat and a rotating element, each with a silicon carbide seal face. The mechanical seal is quenched with oil allowing the pump to run dry. Centrifugal and capillary action forces the oil between the seal faces which lubricates the seal faces and removes the developing heat. Pumped fluid is not required to lubricate or cool the mechanical seal. If the mechanical seal is exposed during maintenance, it is recommended to replace the mechanical seal assembly regardless of the seal condition.

II. Disassembly of Pump

- 1) Disconnect the battery
- 2) Loosen front and rear diesel engine mount fasteners. This will help to accomplish step 10.
- 3) Remove volute plug and drain water (P1). Reinstall plug after draining.
- 4) Slide the compressor air delivery line protective fire sleeve up and away from the primer inlet venturi to expose the female JIC swivel hose end (P2). Disconnect the airline from the primer inlet.

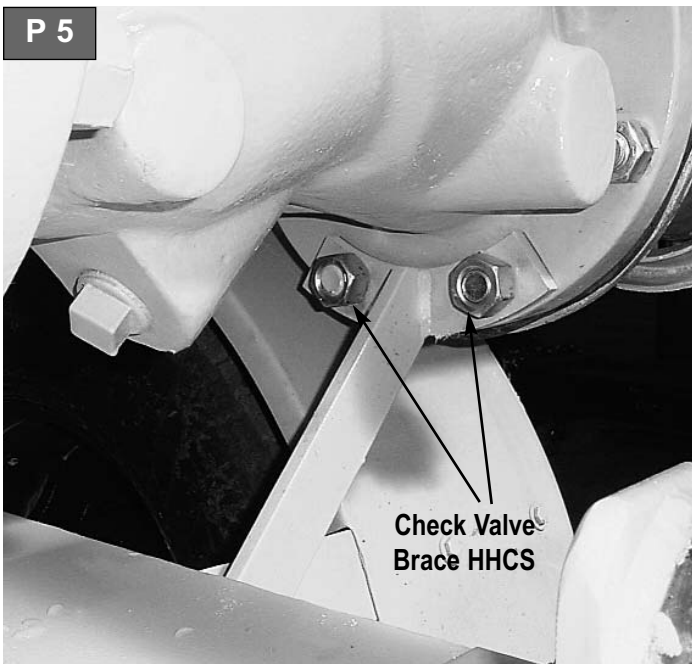
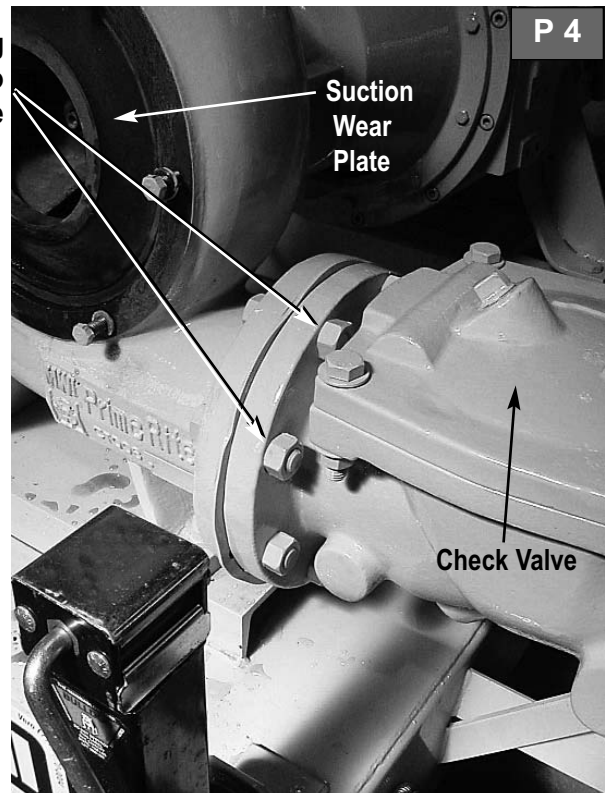
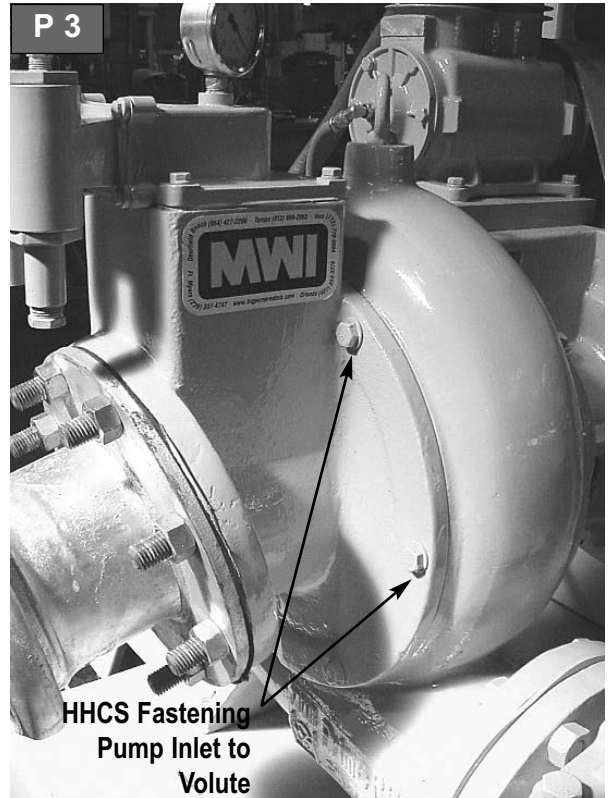


NOTE: The following steps require the use of a lifting device in order to remove the heavier components.

5) Remove the pump inlet assembly from volute by removing the HHCS securing the assembly to the volute (P3). Note: The pump inlet has a registered fit to the volute making it potentially difficult to remove. CAUTION: The suction side wear plate is sandwiched between the volute and the pump inlet assembly and may fall out when the pump inlet is removed.

6) Remove the suction wear plate if possible (P4). This is a registered fit and if the wear plate does not remove easily, wait until the entire volute is removed to facilitate removal (see step 10).

7) Remove the HHCS securing the check valve assembly to the volute discharge (P4). Remove the check valve support brace HHCS (P5) and remove the check valve assembly.



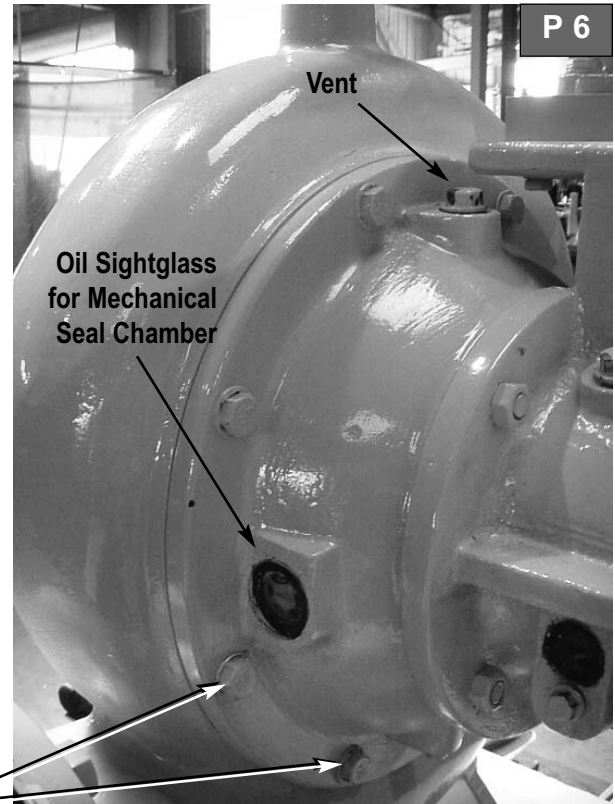
HHCS Fastening Check Valve to Volute

8) Drain the mechanical seal chamber by removing the mechanical seal oil chamber drain plug (P1) and vent (P6). Reinstall the plug after draining and reinstall the vent only hand tight.

9) Remove the HHCS and nuts securing the volute to the c-channel base (P7).

10) Remove the HHCS securing the mechanical seal chamber to the volute (P6). In order to remove the volute, note the following:

- The volute is a registered fit to the upper wear plate and mechanical seal chamber.
- Slightly raise the rear of the diesel engine (flywheel side).
- Use two pry bars to separate the face of the volute from the mechanical seal chamber (P8). “Walk” the pry bars around the developing seam.



P 6

Vent

Oil Sightglass
for Mechanical
Seal Chamber

HHCS Fastening Volute To
Seal Chamber

HHCS Fastening Volute To
C-Channel

Volute Removal
With Pry Bars



P 7

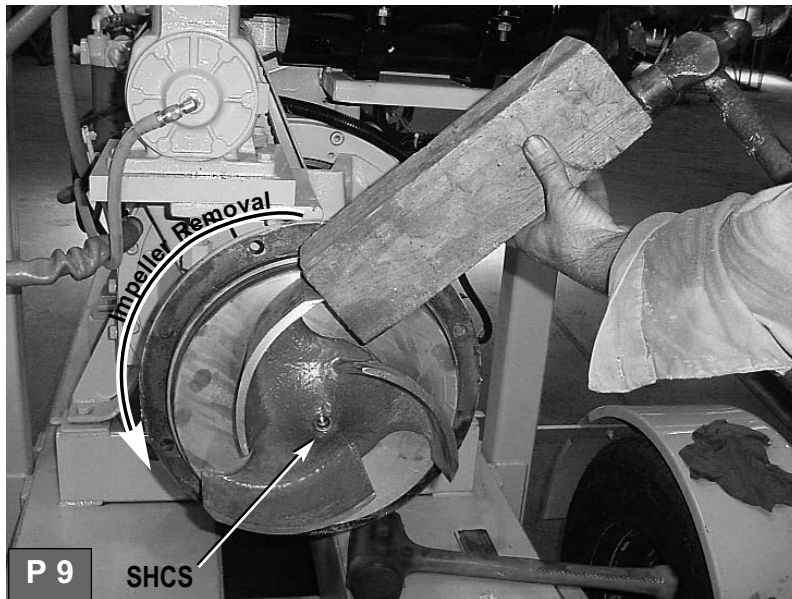


P 8

11) Remove the SHCS located in the center of the impeller (P9).

12) Remove the impeller from the shaft; removal is CCW rotation. Use a block of wood to prevent impeller blade tip damage and strike the block to loosen the impeller (P9).

13) Remove the end plate.



14) Remove the mechanical seal chamber by removing the four hex nuts that secure the seal chamber to the bearing box (P11).

15) Reassemble the Pump in reverse order. Inspect all seals and replace if required.

16) Fill the mechanical seal chamber through the vent plug to the top of the sightglass (P6) with hydraulic oil conforming to ISO (SAE) Viscosity Grade 68.



III. Removing Pump Head from Prime Mover

NOTE: The following steps require the use of a lifting device in order to remove the heavier components.

1) Separate the bushing from the drive coupling mounted on the flywheel by removing the two Allen screws on bushing. Reinstall one of the Allen screws into the bushing tapped hole and tighten the screw to serve as a Jack screw and bear the grip of the bushing. (S1)

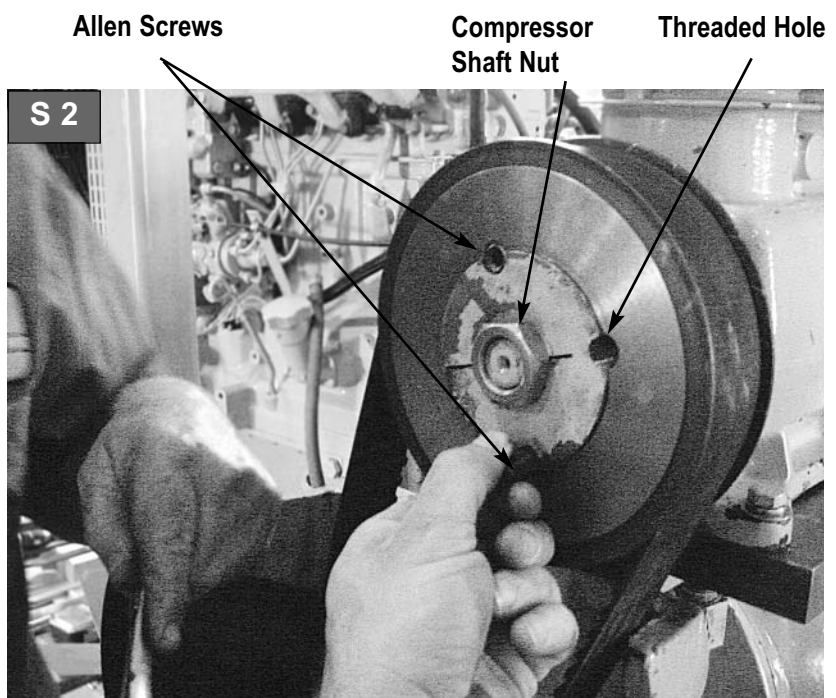
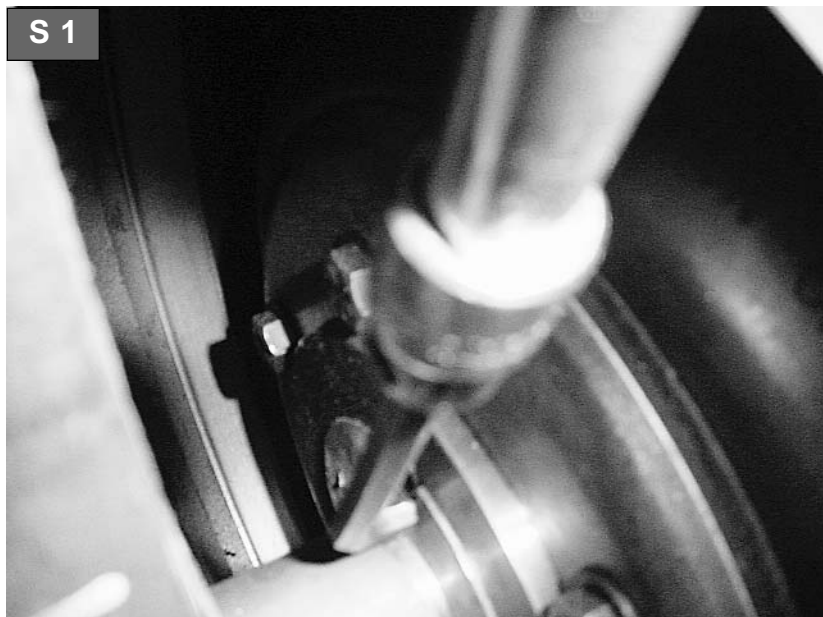
2) After the drive coupling bushing is loose remove the fasteners securing the pump head to the flywheel housing and remove the pump head.

* Verify that the pump mount fasteners on the volute base have been removed.

3) Remove the compressor drive pulley nut. Separate the compressor drive pulley from the bushing as described in step 1. (S2).

4) Remove the compressor drive pulley and belt.

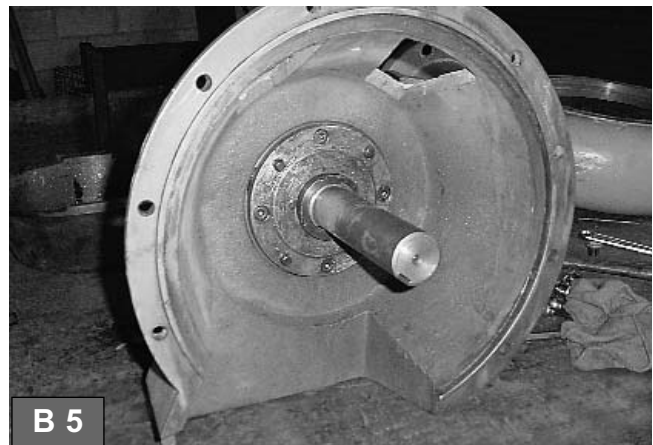
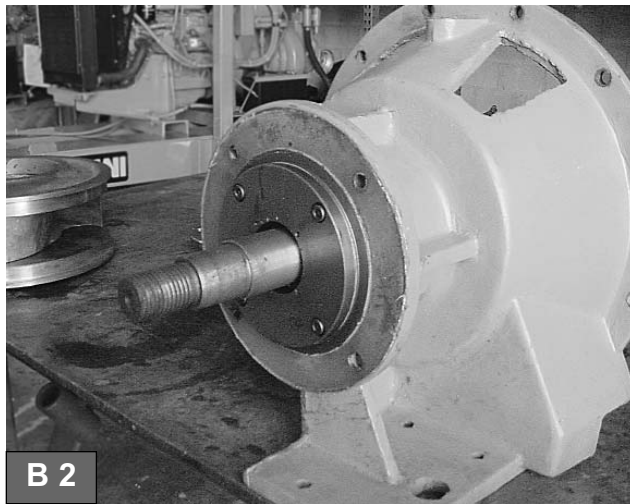
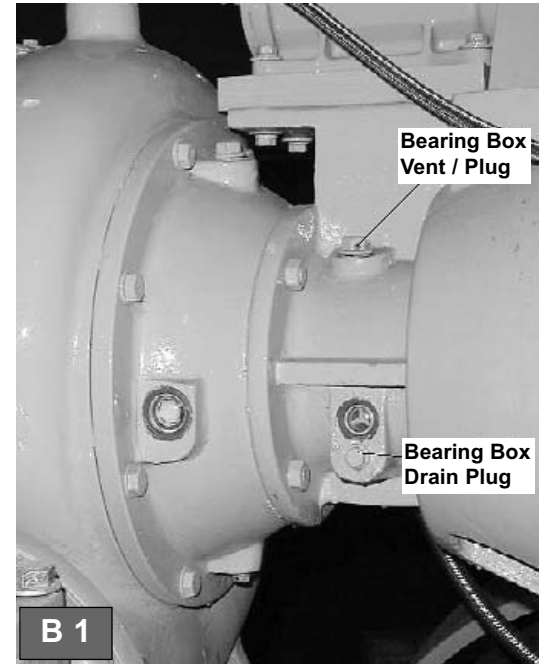
5) Remove shaft drive pulley from the pump shaft by separating the pulley from the bushing as described in step 1.



IV. Bearing Box Disassembly / Shaft Removal

- 1) Drain the oil from the bearing box by removing the drain plug and the upper vent plug (B1).
- 2) Remove the pump drive / compressor key from the shaft.
- 3) Remove the impeller side bearing retainer fasteners. (B2)
- 4) Remove the impeller side bearing retainer and inspect the impeller side bearing retainer shaft oil seal and replace if necessary. (B3) Remove any remaining sealant between the mating faces. (B4)
- 5) Secure the pump shaft and remove the bearing lock-nut, lock-washer, and drive side bearing inner race retainer.
- 6) Remove the fasteners securing the drive side bearing carrier (B5), use the tapped holes and pusher bolts in the carrier to remove the shaft assembly. (B6)

*Note – depending on pump model the impeller side cylindrical roller bearing rolling element may come out with the shaft and inner race or will remain in the bearing box with the outer race.



7) Drive the cylindrical roller bearing outer race out of the bearing box (B7); the outer race may contain the roller bearing rolling element depending on model.

8) Use snap-ring pliers to remove the drive side bearing carrier internal retainer ring (B8) and spacer; the bearing carrier can now be removed.

9) Inspect the bearing carrier shaft oil seal and the outer o-ring in the bearing carrier and replace if necessary.



10) Use a suitable press to remove the bearings from the shaft – do not misplace the drive side bearing carrier internal retainer ring and spacer, they will be reused.

11) Use a suitable bearing heater and place the replacement angular contact bearings on the shaft.

*Note – the bearings are to be placed in an “O” arrangement (back to back), the lines of action diverge towards the bearing axis.

12) Add the drive side bearing spacer and internal retainer ring on the shaft, the spacer goes between the bearing and the retainer ring.

13) Use a suitable bearing heater and place the replacement cylindrical roller bearing on the shaft.

*Note – the bearing is to be configured with the inner race lip against the shaft shoulder.

14) After the bearings have cooled verify that the shaft oil seal is in the bearing carrier and press the bearing carrier over the replacement angular contact bearings. Secure the bearing carrier by installing the spacer and setting the internal retainer ring.

15) Install the shaft assembly into the bearing box – be careful not to pinch the outer o-ring in the bearing carrier.

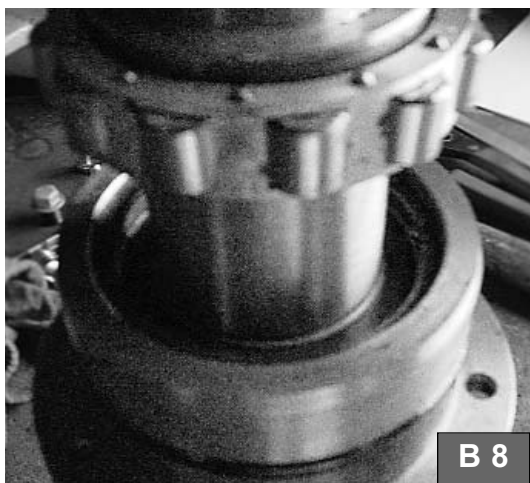
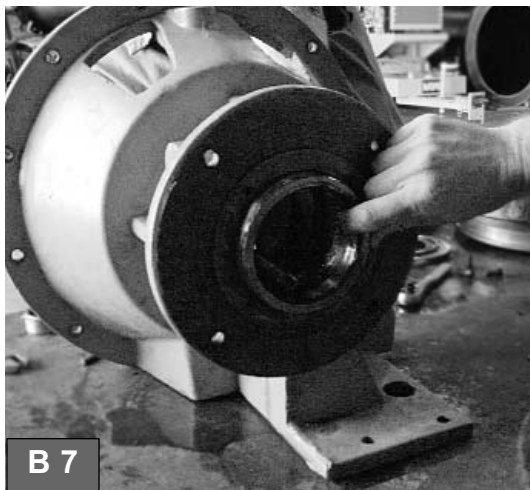
*Note – do not install the fasteners or pusher bolts at this time.

16) Apply a bead of high temperature RTV to the impeller side bearing retainer, the bead should be inboard of the existing bolt circle. Verify that the shaft oil seal is in the impeller side bearing retainer and secure the impeller side bearing retainer to the bearing box.

*Note – Secure the impeller side bearing retainer to the bearing box such that there is zero clearance between the mating faces.

17) Secure the drive side bearing carrier to the bearing box, there may be a gap between the mating faces. Reinstall the bearing carrier pusher bolts into the tapped holes.

18) Install drive side bearing inner race retainer, bearing lock-washer, and lock-nut.



19) Install pump drive / compressor key in the shaft

20) Install bearing box drain plug and fill bearing box through the upper vent plug to the top of the sightglass with hydraulic oil conforming to ISO (SAE) Viscosity Grade 68; install the upper vent plug.

V. Installing Pump Head to Prime Mover / Compressor Alignment

1) Install the drive coupling bushing into the coupling with the two Allen screws (V1).

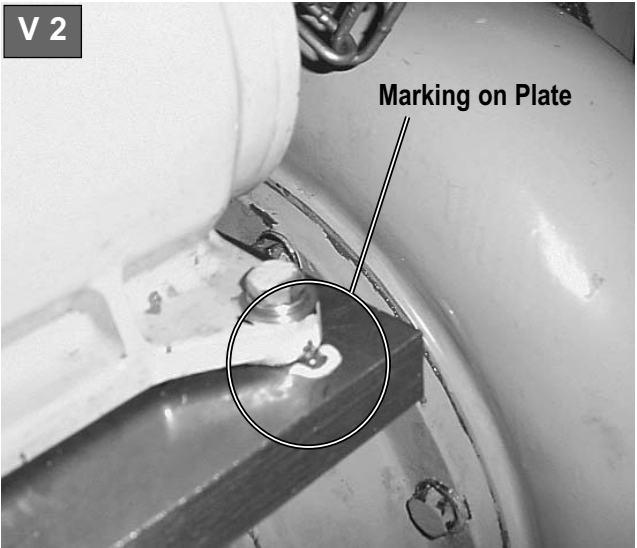
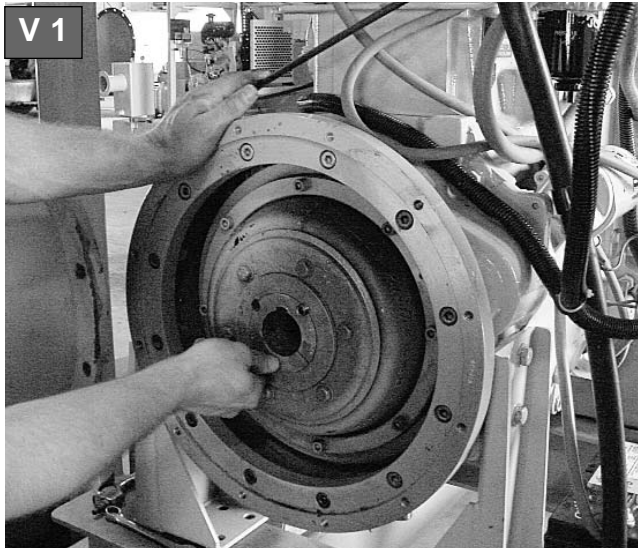
* Do not fully tighten.

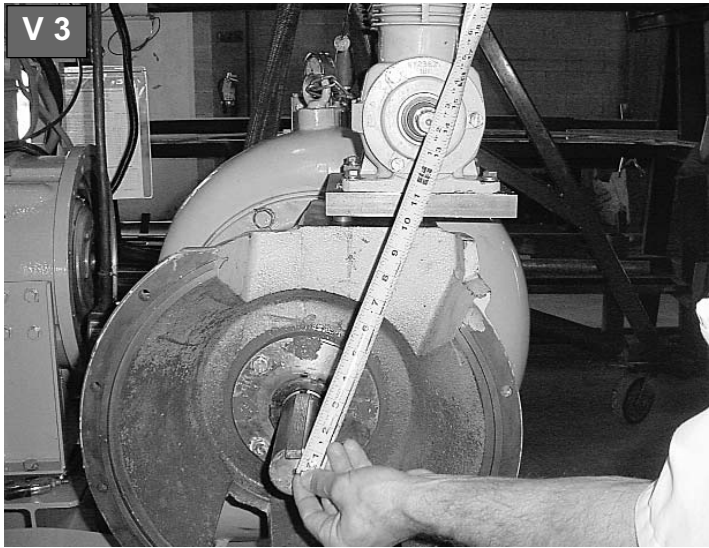
2) If the compressor was removed, realign the compressor with the markings on the compressor plate (V2)

3) The center of the shaft on the compressor and center of the pump shaft must be lined up accordingly. Use a tape measure (V3) to make sure the shafts are aligned according to Table 2. MWI can also provide alignment jigs for this purpose.

**Table 2
Center to Center Distance Between Shafts**

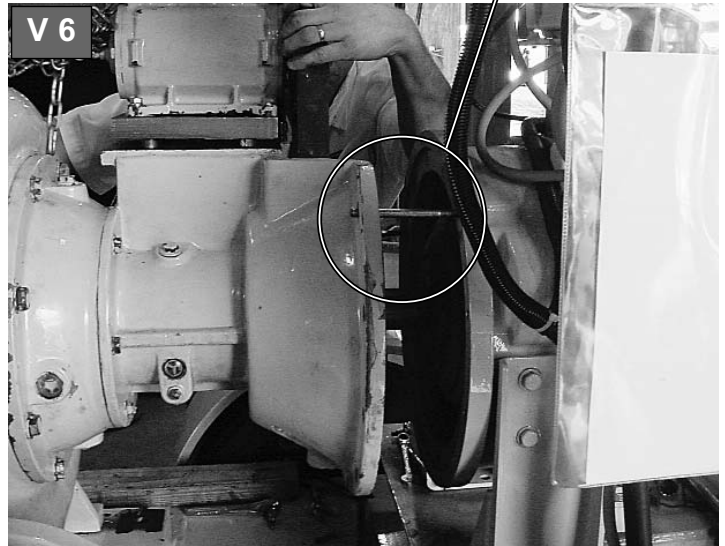
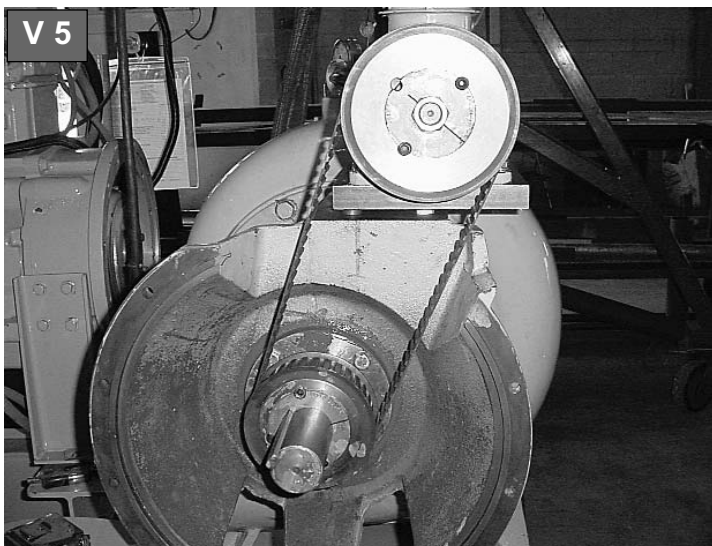
Pump Model No.	Center to Center Distance	Replacement Belt Part No.
CT004	12 inches	H33000
CT006	12 inches	H33000
CT008	13 inches	H33200
CT012	15 inches	H33400

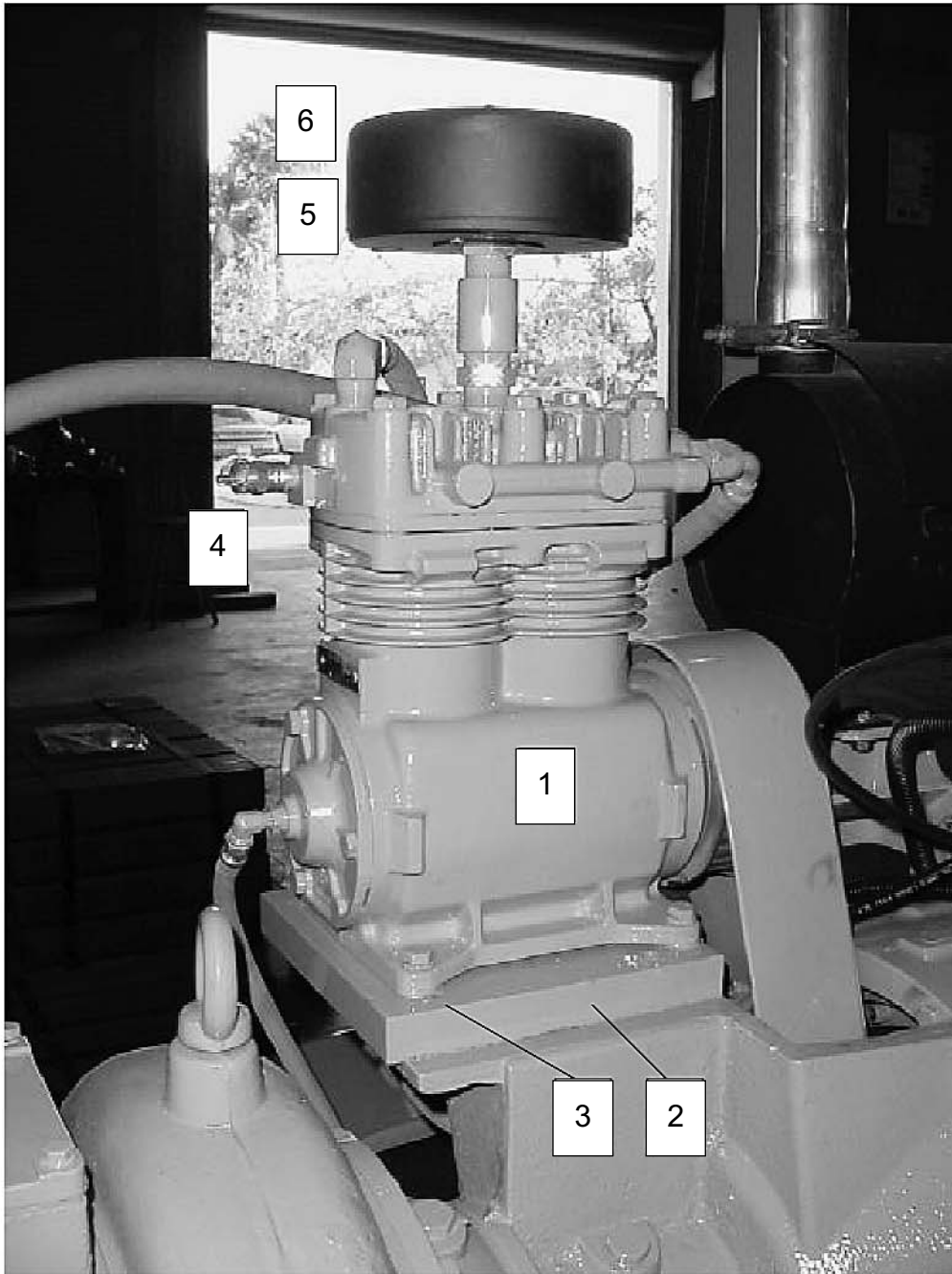




- 4) Once the shafts are properly aligned, tighten down the compressor to the plate.
 - 5) Slide the shaft drive pulley and bushing over the pump shaft, do not secure to pump shaft. Slide the belt over the compressor drive pulley and install the compressor drive pulley and bushing over the compressor shaft.
 - 6) Make sure pulleys are aligned with each other (V4).
 - 7) After the drive pulleys are aligned secure the pulley/bushing assembly to the respective shaft using the Allen screws (V5).
- * Note: Install the Allen screws into the pulley tapped holes.
- 8) Insert a few bolts into the pump flange to align the pump to the engine as you move the pump closer (V6). Bolt pump to engine.
 - 9) Tighten the bushing on shaft by using an extended Allen wrench (see S1 in Section IV).

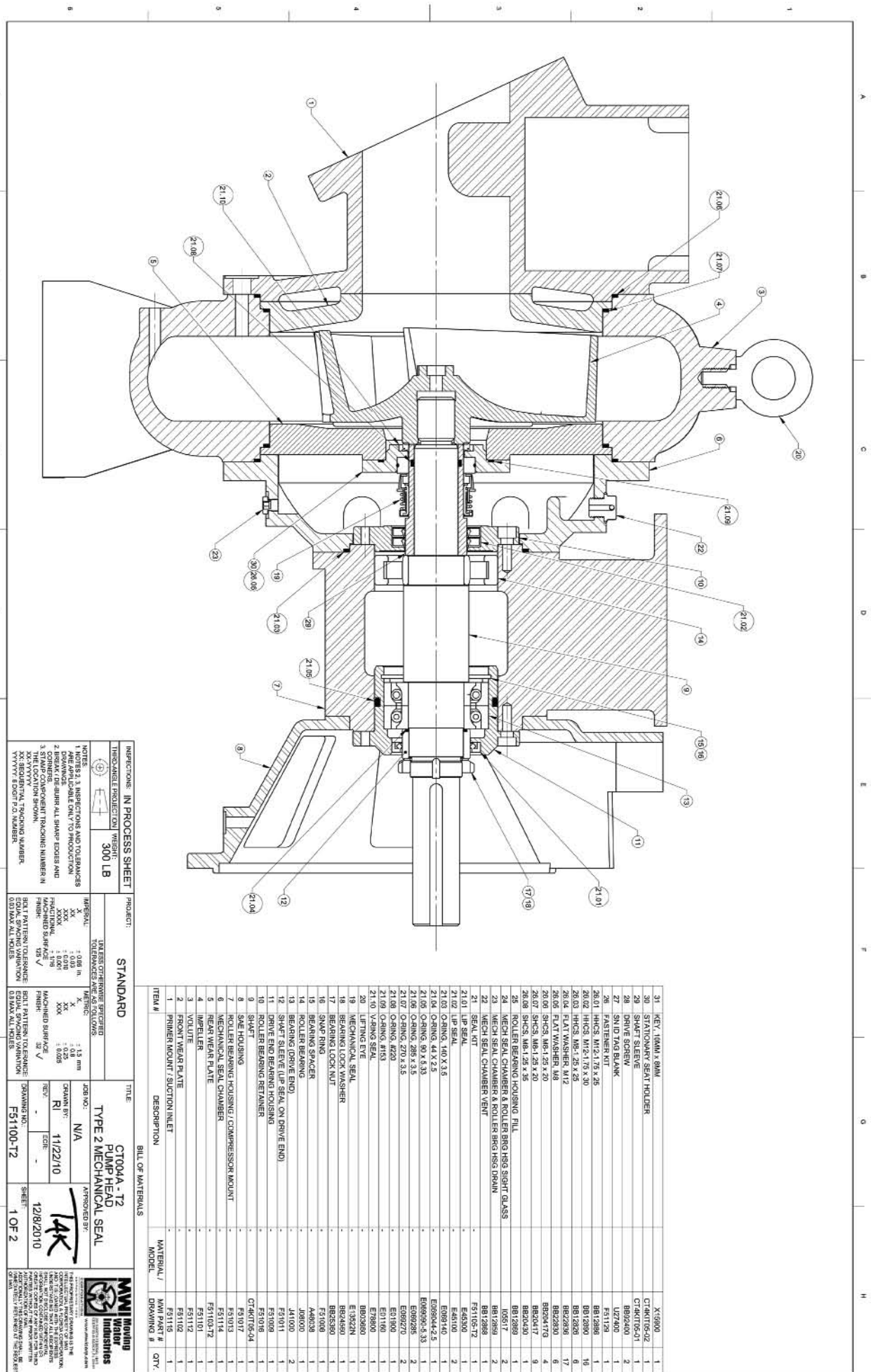
Insert Bolts to align pump to motor





Item Number	Component Description	MWI Part Number*
1	Compressor	COM00600
2	Compressor Mount Plate	A76200
3	Compressor Gasket	COM00600G
4	Compressor Head Safety Relief Valve	G00015
5	Compressor Filter Assembly (Includes Element)	R02580
6	Compressor Filter Element	R02580E

* MWI Part Number Applicable To All MWI PrimeRite™ CI Models



INSPECTIONS - IN PROCESS SHEET

MANUFACTURE PROJECT NO. **300 LB**

WEIGHT **300 LB**

DATE **11/22/10**

BY **TAK**

REVISIONS:

1. NOTES & 1. INSPECTIONS AND TOLERANCES

2. DIMENSIONS SHALL BE TO PRODUCTION

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ITEM #	DESCRIPTION	MATERIAL	QTY.
1	PRIMER MOUNT / SUCTION INLET	F31115	1
2	FRONT WEAR PLATE	F31112	1
3	VOLUTE	F31112	1
4	IMPELLER	F31112	1
5	REAR WEAR PLATE	F31112	1
6	MECHANICAL SEAL CHAMBER	F31114	1
7	ROLLER BEARING HOUSING / COMPRESSION MOUNT	F31013	1
8	SHAFT HOUSING	F31017	1
9	SHAFT	CR461705-04	1
10	DRIVER BEARING REPAIRER	F31028	1
11	DRIVER BEARING HOUSING	F31028	1
12	SHAFT SLEEVE (LIP SEAL ON DRIVE END)	F31011	1
13	BEARING (DRIVE END)	J41000	2
14	ROLLER BEARING	J41000	2
15	BEARING SPACER	A48029	1
16	SNAP RING	F31006	1
17	BEARING LOCK WASHER	BB2580	1
18	MECHANICAL SEAL	BB2580	1
19	MECHANICAL SEAL	BB2580	1
20	MECHANICAL SEAL	BB2580	1
21	MECHANICAL SEAL	BB2580	1
22	MECH SEAL CHAMBER & ROLLER BRG HSG DRAIN	BB2580	1
23	MECH SEAL CHAMBER & ROLLER BRG HSG SIGHT GLASS	BB2580	1
24	MECH SEAL CHAMBER & ROLLER BRG HSG DRAIN	BB2580	1
25	ROLLER BEARING HOUSING	BB2580	1
26	FLAT WASHER	BB2580	1
27	SN ID TAG BLANK	BB2580	1
28	DRIVE SCREW	BB2580	1
29	SHAFT SLEEVE	BB2580	1
30	STATIONARY SEAT HOLDER	BB2580	1
31	KEY, 1/8MM X 8MM	BB2580	1

STANDARD

INSPECTIONS: IN PROCESS SHEET

MANUFACTURE PROJECT NO. **300 LB**

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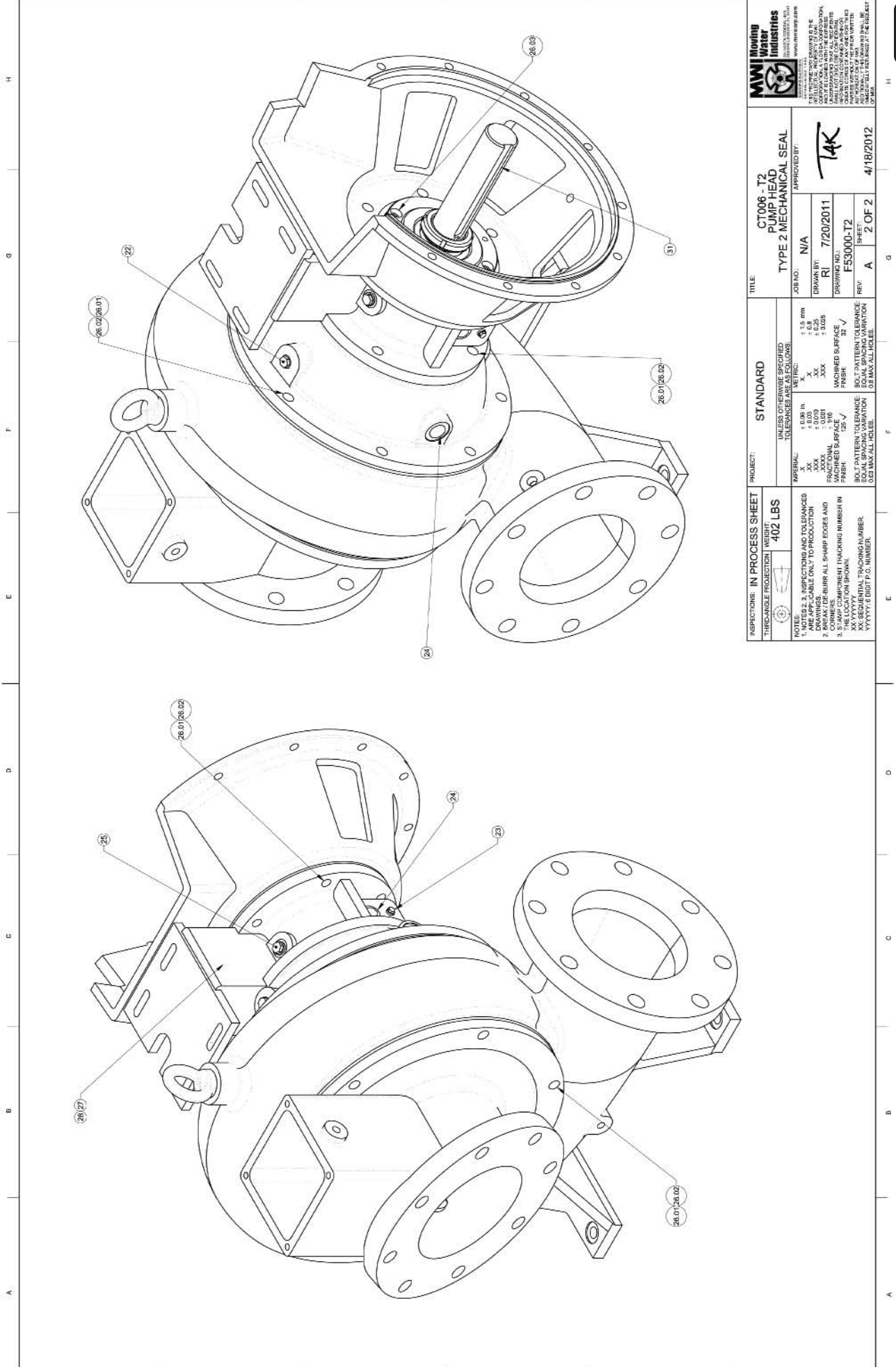
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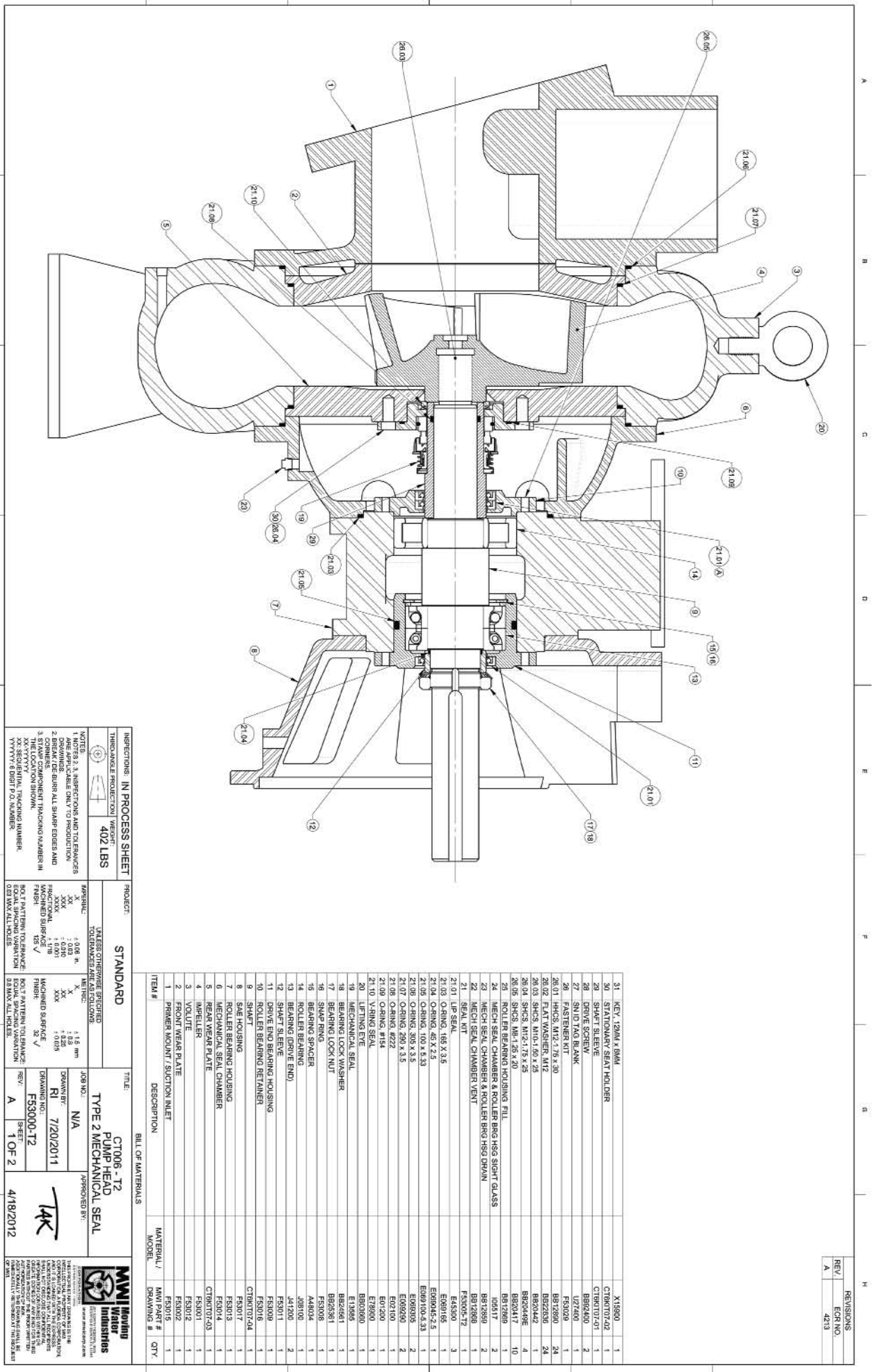


	CT006 - T2 PUMP HEAD TYPE 2 MECHANICAL SEAL	APPROVED BY:
	JOB NO.: N/A DRAWN BY: RI DRAWN DATE: 7/20/2011 DESIGNED BY: F53000-T2 REP: A 2 OF 2	THIS DRAWING IS THE PROPERTY OF MWI INDUSTRIES. IT IS TO BE USED ONLY FOR THE PROJECT AND NOT FOR REPRODUCTION OR FOR OTHER PURPOSES WITHOUT THE WRITTEN PERMISSION OF MWI INDUSTRIES. UNAUTHORIZED REPRODUCTION IS PROHIBITED.

CT 006
 4/18/2012

PROJECT: STANDARD	
INSPECTIONS: IN PROCESS SHEET THERMANGLE PROJECTION WEIGHT: 402 LBS NOTES: 1. ALL DIMENSIONS AND TOLERANCES ARE APPLICABLE ONLY TO PRODUCTION 2. DRAWINGS SHALL BE SHARP EDGES AND CORNERS 3. SURFACE FINISH SHALL BE MACHINED SURFACE UNLESS OTHERWISE SPECIFIED IN THE DRAWING XX-YYYY (MATERIAL TRACKING NUMBER IN DRAWING) YY-ZZZZ (MATERIAL TRACKING NUMBER IN THIS DRAWING) YY-ZZZZ (JOB NO.)	UNLESS OTHERWISE SPECIFIED TOLERANCES ARE AS FOLLOWS: IMPERIAL: .XX ±.005 .XXX ±.001 .XXXX ±.001 FINISH MACHINED SURFACE 32 ✓ WORN SURFACE 125 ✓ BOLT PATTERN TOLERANCE EQUAL SPACING VARIATION 0.5 MAX ALL HOLES
METRIC: X ±.08 .XX ±.0125 .XXX ±.025 FINISH MACHINED SURFACE 32 ✓ WORN SURFACE 125 ✓ BOLT PATTERN TOLERANCE EQUAL SPACING VARIATION 0.5 MAX ALL HOLES	TOLERANCES ARE AS FOLLOWS: .XX ±.005 .XXX ±.001 .XXXX ±.001 FINISH MACHINED SURFACE 32 ✓ WORN SURFACE 125 ✓ BOLT PATTERN TOLERANCE EQUAL SPACING VARIATION 0.5 MAX ALL HOLES





INSTRUCTIONS: IN-PROCESS SHEET
THROATANCE PROJECTION W/ 402 LBS

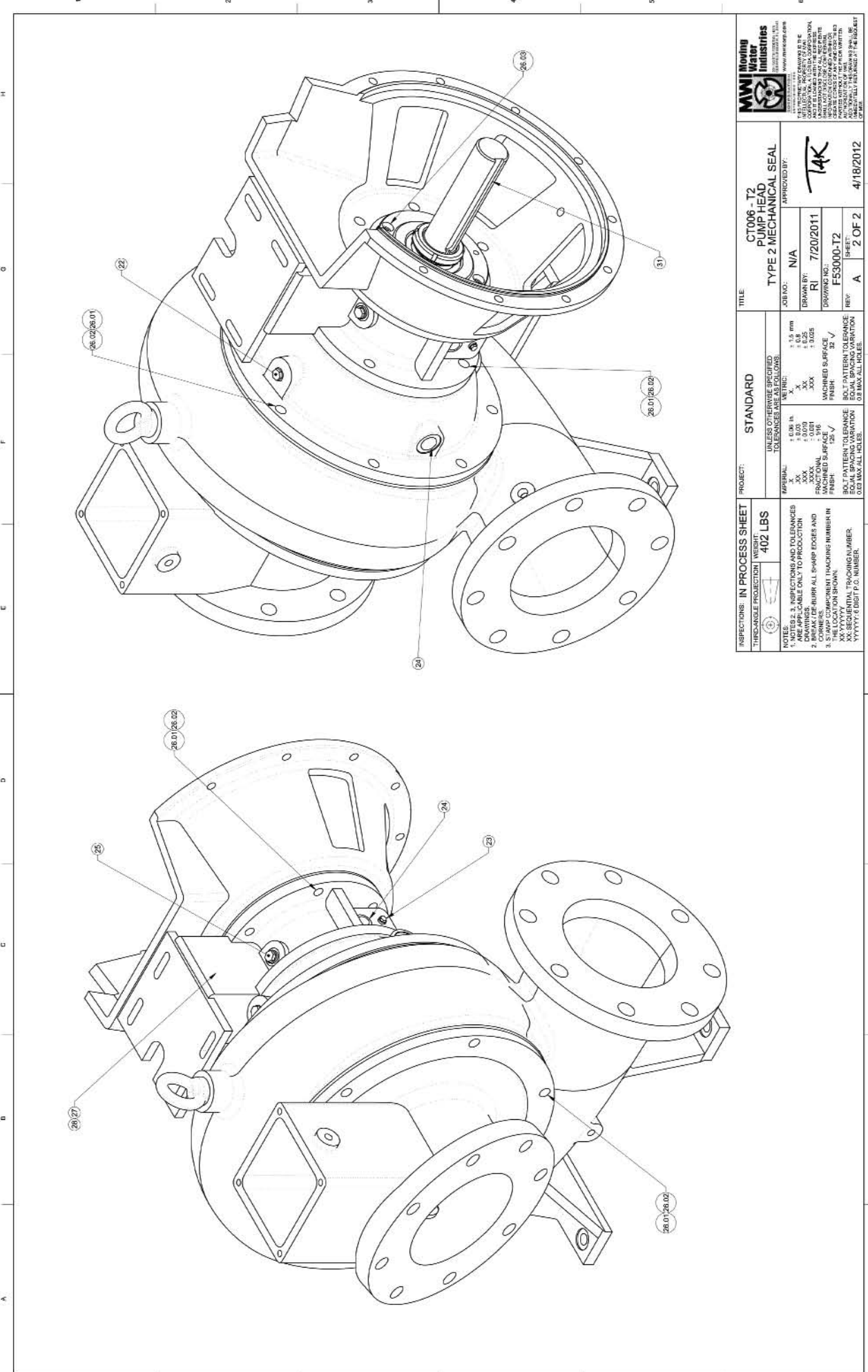
NOTES:
 1. NOTES 2 & 3 INSPECTIONS AND TOLERANCES
 2. BREAK / DE BURST ALL SHARP EDGES AND
 3. STAMP COMPONENT TRACING NUMBER IN
 THE LOCATION SHOWN.
 XX: SUBSTITUTIONAL TRACING NUMBER.
 YYY: 1/8 DIA. P.O. NUMBER.

PROJECT		STANDARD	
TOLERANCES OTHERWISE SPECIFIED	MILS	FINISHES OTHERWISE SPECIFIED	MILS
FRACTIONAL	XXX	PLATED SURFACE	XXX
DECIMAL	XXX	MACHINED SURFACE	XXX
ANGLES	XXX	MACHINED SURFACE	XXX
UNFINISHED SURFACE	XXX	ROLLING	XXX
ROLLING	XXX	ROLLING	XXX
ROLLING	XXX	ROLLING	XXX

TITLE	CT006 - T2 PUMP HEAD TYPE 2 MECHANICAL SEAL
JOB NO.	N/A
DRAWING BY	RI 7/20/2011
DRAWING NO.	F33000-T2
SHEET	1 OF 2
APPROVED BY:	<i>[Signature]</i>
DATE	4/18/2012

ITEM #	DESCRIPTION	MATERIAL / MODEL	QTY
31	KEY, 1/2MM X 6MM	X15900	1
30	STATIONARY SEAT HOLDER	CTR017-02	1
29	SHAFT SLEEVE	CTR017-01	1
28	DRIVE SCREW	BB92400	2
27	SN LTAG BLANK	U27460	1
26	FASTENER KIT	F33029	1
25	FHCS, M12-1.75 X 30	BB12800	24
24	FLAT WASHER, M12	BB22806	24
23	SPCS, M12-1.75 X 25	BB12806	4
22	SPCS, M12-1.75 X 25	BB12806	4
21	SPCS, M12-1.75 X 20	BB12806	10
20	ROLLER BEARING HOUSING FIL	BB12809	2
19	MECH SEAL CHAMBER & ROLLER BRG HSG SIGHT GLASS	BB12809	2
18	MECH SEAL CHAMBER & ROLLER BRG HSG DRAIN	BB12809	1
17	MECH SEAL CHAMBER VENT	BB12809	1
16	LIP SEAL	E43500	3
15	LIP SEAL	E43500	3
14	O-RING, 165 X 3.5	E43500	1
13	O-RING, 165 X 3.5	E43500	1
12	O-RING, 165 X 3.5	E43500	1
11	O-RING, #222	E02100	1
10	O-RING, #154	E02100	1
9	V-RING SEAL	E79000	1
8	LIFTING EYE	BB10000	1
7	MECHANICAL SEAL	E12965	1
6	BEARING LOCK WASHER	BB24681	1
5	BEARING LOCK NUT	BB25581	1
4	SNAP RING	F33008	1
3	BEARING SPACER	AA8004	1
2	ROLLER BEARING	J09106	2
1	ROLLER BEARING	E42700	1
0	SHAFT SLEEVE	F33009	1
-1	DRIVE END BEARING HOUSING	F33016	1
-2	ROLLER BEARING RETAINER	CTR017-04	1
-3	SHAFT	F33017	1
-4	SAE HOUSING	F33018	1
-5	ROLLER BEARING HOUSING	F33019	1
-6	MECHANICAL SEAL CHAMBER	CTR017-03	1
-7	REAR WEAR PLATE	F33001	1
-8	IMPELLER	F33002	1
-9	VOLUTE	F33002	1
-10	FRONT WEAR PLATE	F33002	1
-11	PRIMER MOUNT / SUCTION INLET	F33002	1

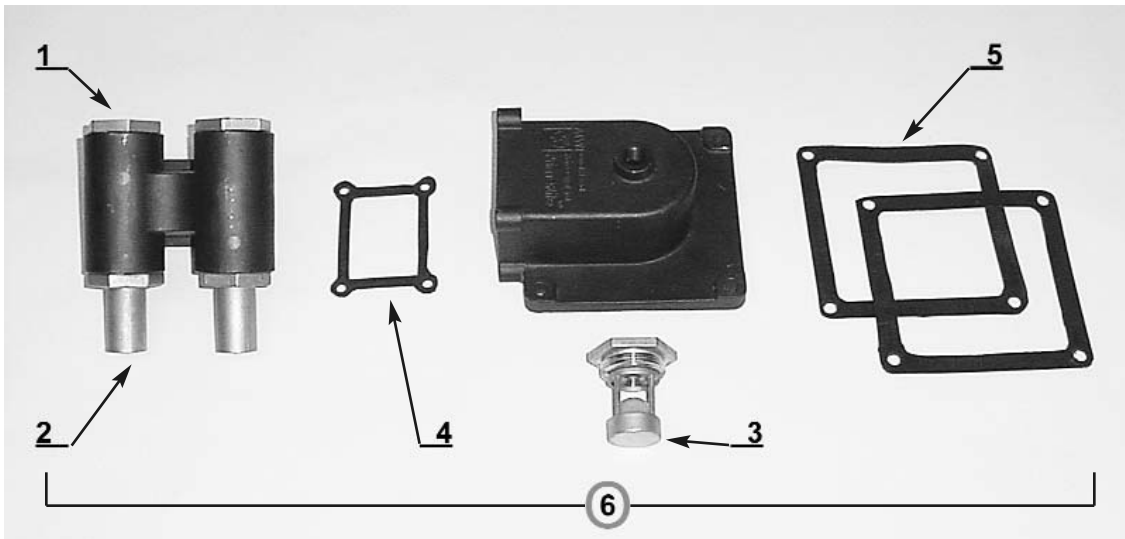
REV	REVISIONS
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INSPECTIONS IN PROCESS SHEET THREANGLE PROJECTION NOTES: 1. INSPECTIONS AND TOLERANCES ARE APPLICABLE ONLY TO PRODUCTION PARTS. 2. DIMENSIONS ARE SHOWN UNLESS OTHERWISE SPECIFIED. 3. ALL DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 4. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 5. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 6. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 7. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 8. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 9. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 10. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 11. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 12. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 13. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 14. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 15. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 16. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 17. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 18. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 19. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 20. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 21. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 22. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 23. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 24. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 25. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 26. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 27. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 28. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 29. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 30. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 31. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. XX-YYYYY PARTIAL TRACING NUMBER YYYYYY-6 DIGIT P.O. NUMBER		PROJECT: STANDARD UNLESS OTHERWISE SPECIFIED TOLERANCES ARE AS FOLLOWS: FINISH: 1. 1.5 mm 2. 0.8 3. 0.5 4. 0.3 5. 0.2 6. 0.1 7. 0.05 8. 0.025 9. 0.015 10. 0.01 11. 0.005 12. 0.0025 13. 0.0015 14. 0.001 15. 0.0005 16. 0.00025 17. 0.00015 18. 0.0001 19. 0.00005 20. 0.000025 21. 0.000015 22. 0.00001 23. 0.000005 24. 0.0000025 25. 0.0000015 26. 0.000001 27. 0.0000005 28. 0.00000025 29. 0.00000015 30. 0.0000001 31. 0.00000005 BOLT PATTERN TOLERANCE: EQUAL SPACING VARIATION ± 0.0005 ALL TOLES. BOLT PATTERN TOLERANCE: EQUAL SPACING VARIATION ± 0.0005 ALL TOLES.	TITLE: CT006 T2 PUMP HEAD TYPE 2 MECHANICAL SEAL APPROVED BY: 	JOB NO.: N/A DRAWN BY: RI DATE: 7/20/2011 ISSUED BY: F53000-T2 REV.: A 2 OF 2 4/18/2012
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VII. Spare Parts

Primer Assembly Parts



1.	Venturi Upper Nozzle (Inlet)	F54001
2.	Venturi Lower Nozzle (Outlet)	F54002
3.	Venturi Head Gasket	F54004
4.	Venturi Check Valve	F54003
5.	Venturi Assembly Mount Gasket	F54005
6.	Complete Primer Assembly	F54000