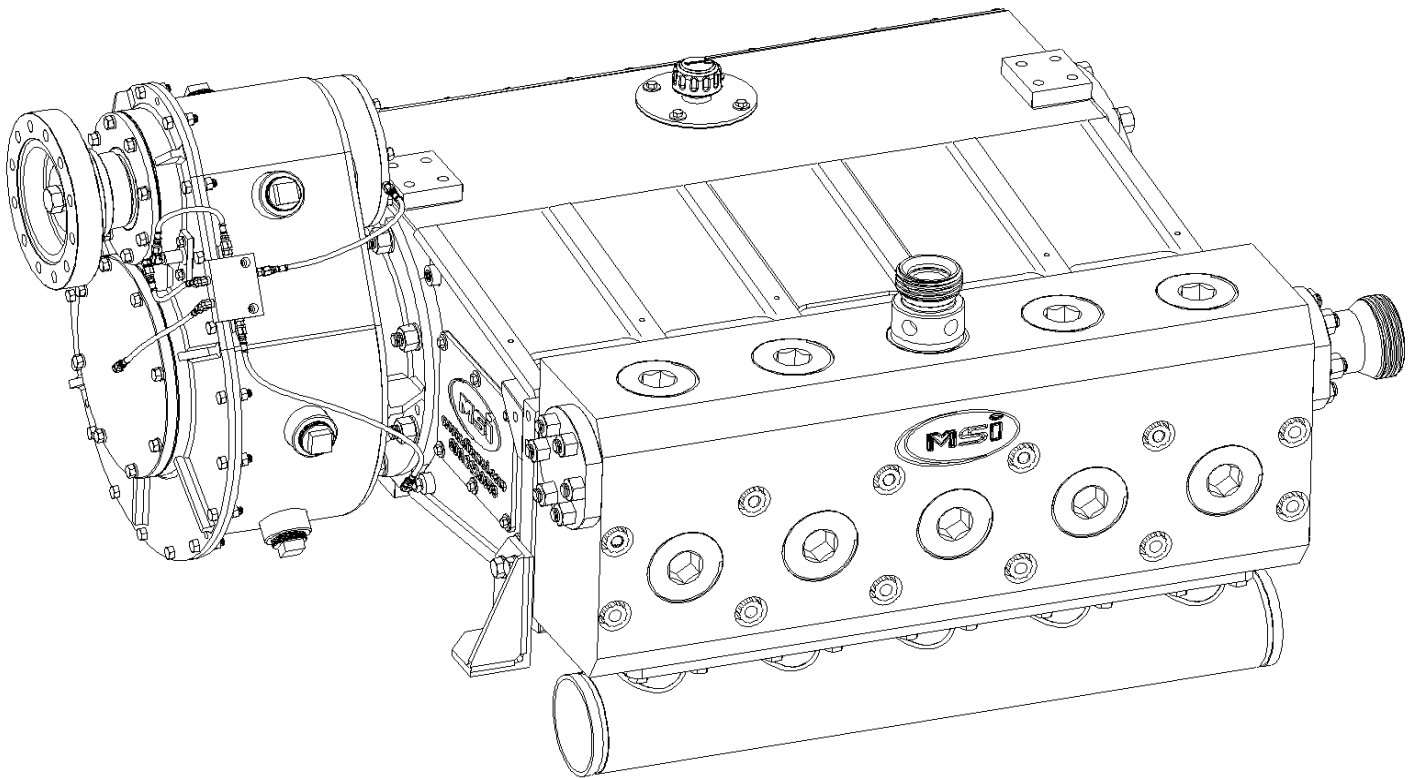


**Dixie Iron Works, Ltd.**  
**300 W. Main St.**  
**Alice, TX 78332**  
[www.diwmsi.com](http://www.diwmsi.com)  
**(800) 242-0059**  
**(361) 664-6597**



## **MSI QI-1000**

### **Technical Manual for 1000 HP Quintuplex MSI QI-1000 Pump**

# 1.20 Complete Pump Assembly

								8
								7
								6
								5
								4
								3
								2
								1
A								
B								
C								
D								
E								
F								
G								

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	PEA0002	POWER FRAME ASSEMBLY
2	12	HC0136	1-3/8 x 11 CAP SCREW
3	8	HC0087	FLAT WASHER, 7/8" STD
4	8	HC0085	HEX NUT, 7/8"-9
5	1	FEA0010	FLUID END ASSEMBLY
6	1	GRA0003	GEAR REDUCER ASSEMBLY

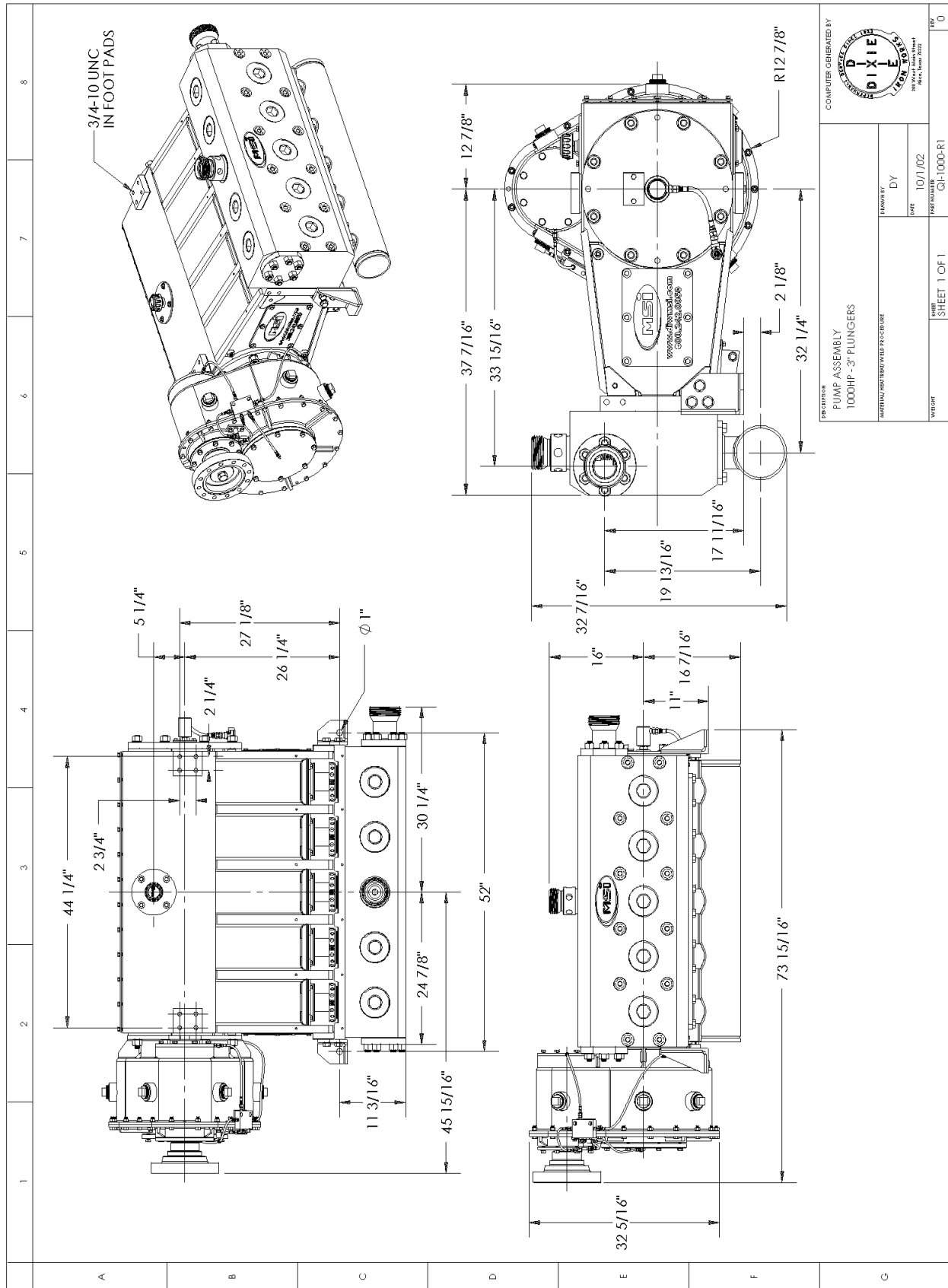
The diagram shows an exploded view of a pump assembly. Part 1 is the main power frame assembly. Part 2 consists of 12 cap screws. Part 3 consists of 8 flat washers. Part 4 consists of 8 hex nuts. Part 5 is the fluid end assembly. Part 6 is the gear reducer assembly. The diagram is oriented vertically on the page.

COMPUTER GENERATED BY

DATE: 10/11/02  
 DRAWN BY: DY  
 PART NUMBER: QH-1000-S-3-R13-001

WEIGHT: SHEET 1 OF 2 REV: 0

# 1.30 Pump Assembly Overall Dimensions



### 3.10.1 Power Frame to Fluid End Make-Up – 2.75 Plunger

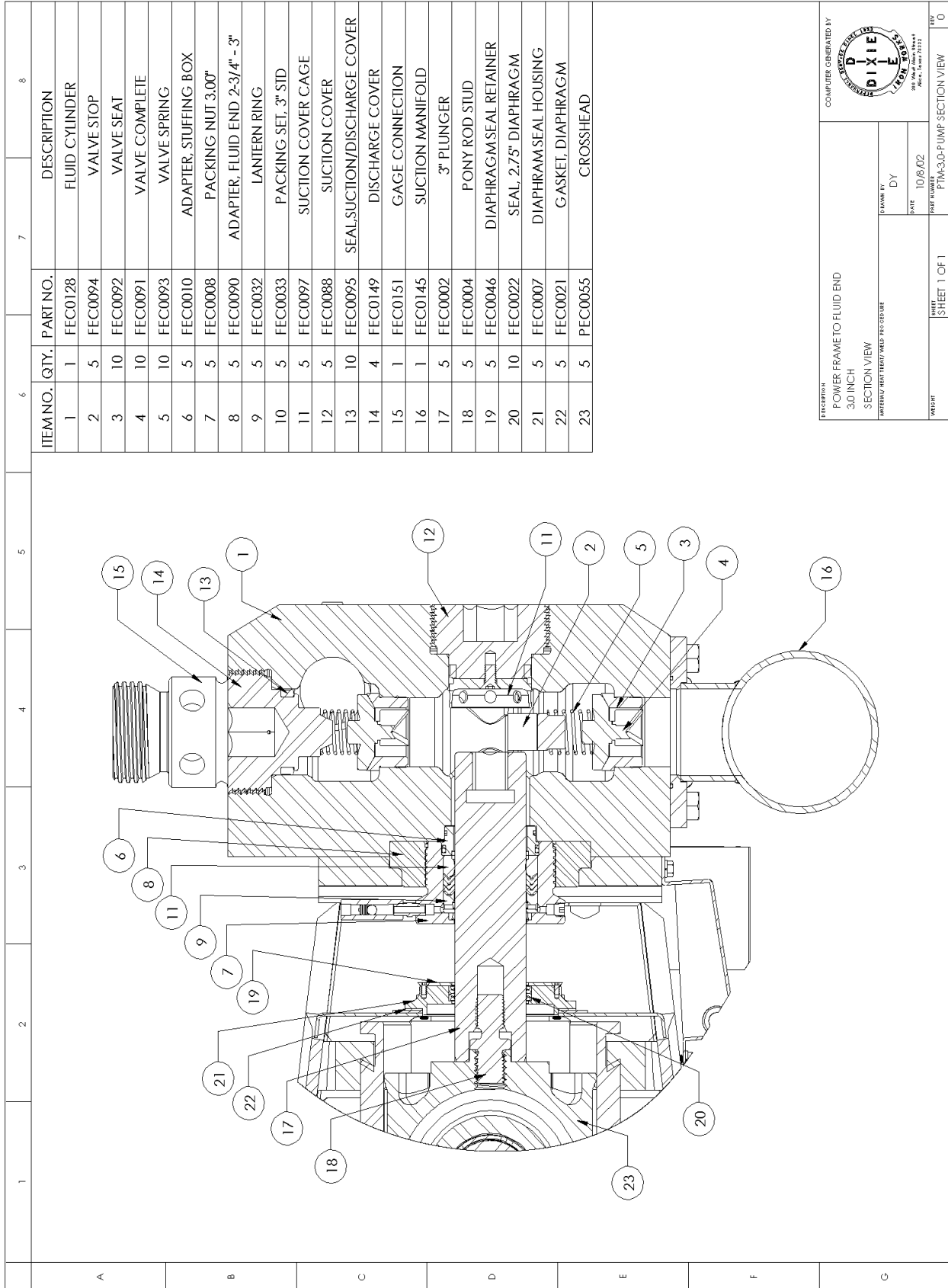
		6		7		8	
ITEM NO.	QTY.	PART NO.	DESCRIPTION				
1	5	FEC0055	CROSSHEAD				
2	5	FEC0004	PONY ROD STUD				
3	5	FEC0063	2.75" PLUNGER				
4	5	FEC0021	GASKET, DIAPHRAGM				
5	5	FEC0070	DIAPHRAGM SEAL RETAINER				
6	10	FEC0067	SEAL, 2.75" DIAPHRAGM				
7	5	FEC0064	DIAPHRAM SEAL HOUSING				
8	1	FEC0128	FLUID CYLINDER				
9	5	FEC0094	VALVE STOP				
10	10	FEC0092	VALVE SEAT				
11	10	FEC0091	VALVE COMPLETE				
12	10	FEC0093	VALVE SPRING				
13	5	FEC0090	ADAPTER, FLUID END 2-3/4" - 3"				
14	5	FEC0085	PACKING NUT 2.75"				
15	5	FEC0068	LANTERN RING				
16	5	FEC0066	ADAPTER, STUFFING BOX 2.75				
17	5	FEC0069	PACKING SET, 2.75" STD				
18	5	FEC0097	SUCTION COVER CAGE				
19	5	FEC0088	SUCTION COVER				
20	10	FEC0095	SEAL, SUCTION/DISCHARGE COVER				
21	4	FEC0149	DISCHARGE COVER				
22	1	FEC0151	GAGE CONNECTION				
23	1	FEC0145	SUCTION MANIFOLD				

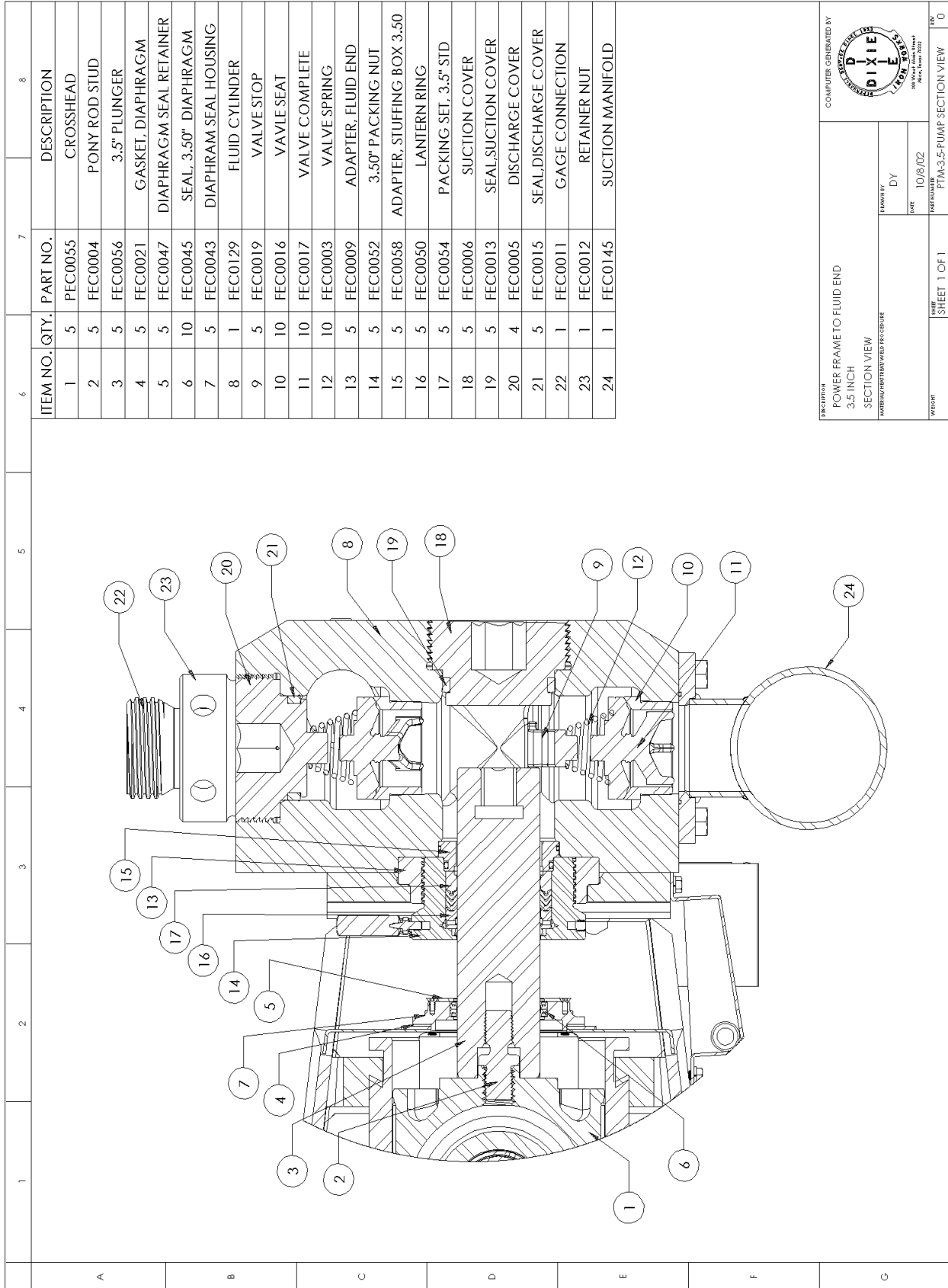
DESCRIPTION  
POWER FRAME TO FLUID END  
2.75 INCH  
SECTION VIEW  
PARTIAL PART TIGHTLY WELDED TO COVER

COMPUTER GENERATED BY  
  
 DRAWN BY  
K.B.  
 DATE  
10/08/02  
 PART NUMBER  
PTM-275-PUMP SECTION VIEW  
 WEIGHT  
SHEET 1 OF 1  
 REV  
0

### 3.10.2 Power Frame to Fluid End Make-Up – 3.00 Plunger



### 3.10.3 Power Frame to Fluid End Make-Up – 3.50 Plunger



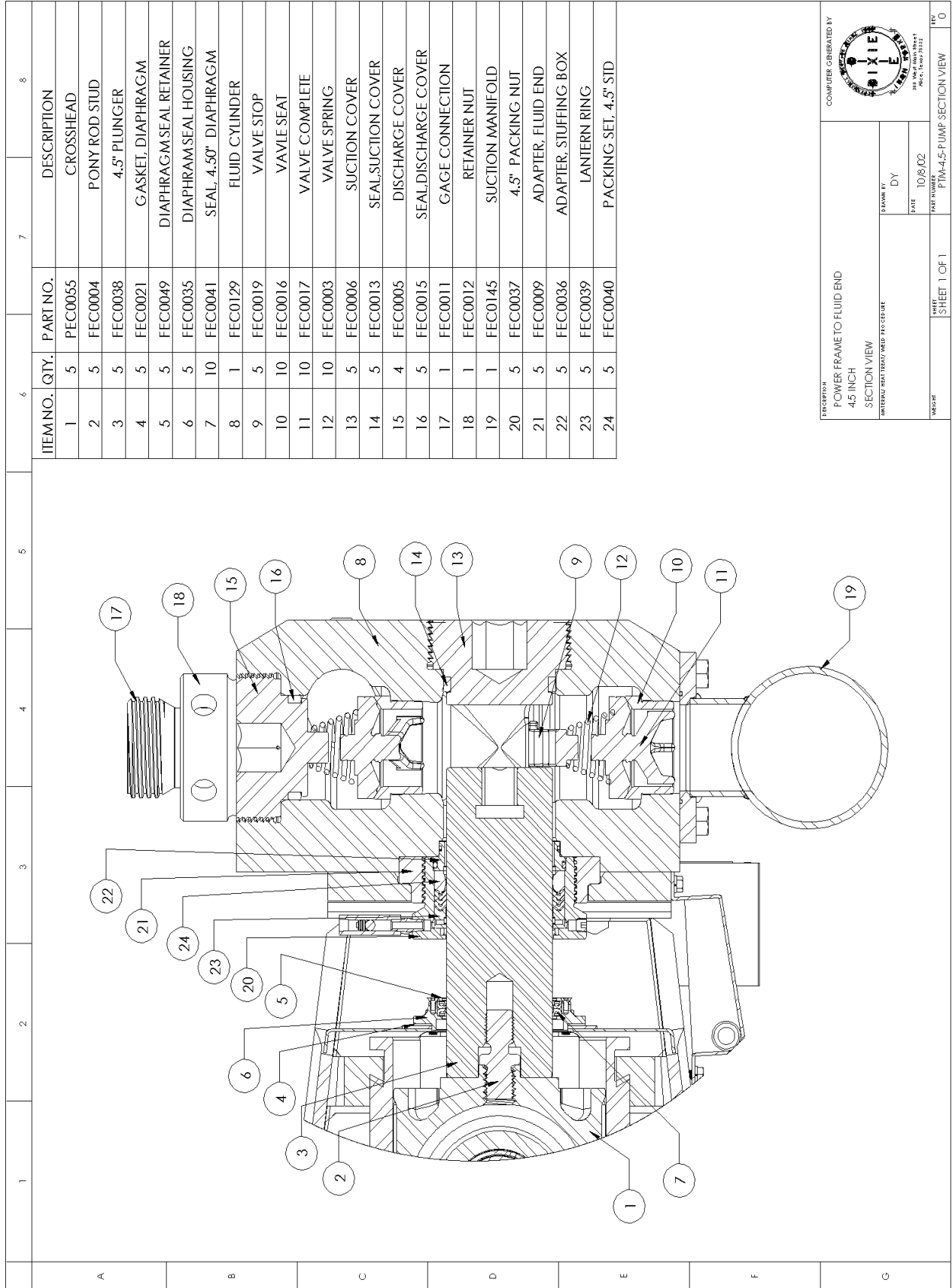
### 3.10.4 Power Frame to Fluid End Make-Up – 4.00 Plunger

		6		7		8	
		ITEM NO.	QTY.	PART NO.	DESCRIPTION		
		1	5	FEC0055	CROSSHEAD		
		2	5	FEC0004	PONY ROD STUD		
		3	5	FEC0021	GASKET, DIAPHRAGM		
		4	1	FEC0129	FLUID CYLINDER		
		5	5	FEC0019	VALVE STOP		
		6	10	FEC0016	VALVE SEAT		
		7	10	FEC0017	VALVE COMPLETE		
		8	10	FEC0003	VALVE SPRING		
		9	5	FEC0009	ADAPTER, FLUID END		
		10	5	FEC0006	SUCTION COVER		
		11	5	FEC0013	SEAL,SUCTION COVER		
		12	4	FEC0005	DISCHARGE COVER		
		13	5	FEC0015	SEAL,DISCHARGE COVER		
		14	1	FEC0011	GAGE CONNECTION		
		15	1	FEC0012	RETAINER NUT		
		16	1	FEC0145	SUCTION MANIFOLD		
		17	5	FEC0053	4.00" PACKING NUT		
		18	5	FEC0059	ADAPTER, STUFFING BOX		
		19	5	FEC0051	LANTERN RING		
		20	5	FEC0055	PACKING SET, 4" STD		
		21	5	FEC0057	4" PLUNGER		
		22	5	FEC0048	DIAPHRAGM SEAL RETAINER		
		23	10	FEC0044	SEAL, 4.00" DIAPHRAGM		
		24	5	FEC0042	DIAPHRAM SEAL HOUSING		


  
  

DESCRIPTION		COMPUTER GENERATED BY	
POWER FRAME TO FLUID END			
4.0 INCH		DATE 10/8/02	
SECTION VIEW		DRAWN BY DY	
WATERWAY TEST THERM WELD PROCEDURE		PART NUMBER PTM-4.0-PUMP SECTION VIEW	
WHO/DT	SHEET	REV	REV
	1 OF 1		0

### 3.10.5 Power Frame to Fluid End Make-Up – 4.50 Plunger



DESCRIPTION  
POWER FRAME TO FLUID END  
4.5 INCH  
SECTION VIEW  
ARTWORK REVISIONS/REVISION PROCEDURE

COMPUTER GENERATED BY  
  
DATE: 10/8/02  
PART NUMBER: PTM-45-PUMP SECTION VIEW

DESIGNED BY: DY  
DATE: 10/8/02  
PART NUMBER: PTM-45-PUMP SECTION VIEW

TWEIGHT: SHEET 1 OF 1 REV: 0



### **3.20 Fluid End Assembly-Exploded View**

Drawings below are for the two different sizes of Fluid Ends that MSI manufactures. See Section 6.20 for the different Packing Assembly Drawings.

### 3.20.1 Fluid End Assembly for 2.75 & 3.00 Plungers – Exploded View

1	2	3	4	5	6	7	8
ITEM NO.	QTY.	PART NO.	DESCRIPTION				
1	1	FEC0128	FLUID CYLINDER				
2	5	FEC0094	VALVE STOP				
3	10	FEC0092	VALVE SEAT				
4	10	FEC0091	VALVE COMPLETE				
5	10	FEC0093	VALVE SPRING				
6	5	FEC0097	SUCTION COVER CAGE				
7	5	FEC0088	SUCTION COVER				
8	5	HC0132	RECESSED SOC. HD, 1/2"-13 x 1.00"				
9	10	FEC0095	SEAL,SUCTION/DISCHARGE COVER				
10	4	FEC0149	DISCHARGE COVER				
11	1	FEC0151	GAGE CONNECTION				
12	1	FEC0146	DISCHARGE FLANGE				
13	2	FEC0148	SEAL, DISCHARGE FLANGE				
14	12	HC0085	HEX NUT, 7/8"-9				
15	1	FEC0147	DISCHARGE FLG, 3" BLANK				
16	1	FEC0145	SUCTION MANIFOLD				
17	5	OC0009	O-RING, 1.75" ADJ NUT STD				
18	20	HC0090	HEX HD, 3/4"-10 x 2.00"				
19	5	PACKING ASSEMBLY	PACKING ASSEMBLY				
20	12	HC0084	STUD, 7/8"-9 x 3.00" B7				

DESCRIPTION	FLUID END ASSEMBLY 2.75" - 3" MSI 1000 MATERIAL PART NUMBER FE000000	COMPUTER GENERATED BY DIXIE DIXIE TOOL & DIE CO. 1000 W. 10th Street Muskogee, Okla. 74401
WEIGHT	2422 LBS.	DATE
SHEET	1 OF 1	DRAWN BY
		DATE
		PART NUMBER
		REV
		PTM-FA0010-EXPLODED
		0

### 3.20.2 Fluid End Assembly for 3.50, 4.00 & 4.50 Plungers – Exploded View

	1	2	3	4	5	6	7	8
						ITEM NO. QTY.	PART NO.	DESCRIPTION
A						1	FEC0129	FLUID CYLINDER
						2	FEC0019	VALVE STOP
						3	FEC0016	VALVE SEAT
						4	FEC0017	VALVE COMPLETE
						5	FEC0003	VALVE SPRING
						6	FEC0006	SUCTION COVER
B						7	FEC0013	SEAL,SUCTION COVER
						8	FEC0005	DISCHARGE COVER
						9	FEC0015	SEAL,DISCHARGE COVER
						10	FEC0011	GAGE CONNECTION
						11	FEC0012	RETAINER NUT
						12	FEC0145	SUCTION MANIFOLD
C						13	OC0009	O-RING, 1.75" ADJ NUT STD
						14	HC0090	HEX HD, 3/4"-10 x 2.00"
						15	FEC0146	DISCHARGE FLANGE
						16	FEC0148	SEAL, DISCHARGE FLANGE
						17	HC0084	STUD, 7/8"-9 x 3.00" B7
D						18	HC0085	HEX NUT, 7/8"-9
						19	FEC0147	DISCHARGE FLG, 3" BLANK
E						20		PACKING ASSEMBLY
F								
G								

DESCRIPTION	FLUID END ASSEMBLY 3.5" - 4.5" MSI 1000 WATER/VAULT TREATMENT PROCEDURE	DESIGNED BY	KB
DATE	10/4/02	PART NUMBER	FEA0014
WEIGHT	2236	SHEET	SHEET 1 OF 1
REV	0	COMPILED ORIGINATED BY	

# 4.10 Power Frame Lube Lines- Dual Lube Pipe

1	2	3	4	5	6	7	8
				ITEM NO. QTY. PART NO.		DESCRIPTION	
A				1 1 PEC0064		SPACER	
				2 2 UC0050		BLANK PLUG, 1/2" NPT STD(SOCKET)	
				3 1 PEC0052		ROTOSEAL, LUBRICATOR	
				4 1 TC0094		TEE BODY, 1/2"NPT FFF	
				5 2 FC0146		NIPPLE, 1/2"NPT HEX x 02"	
B				6 1 PEC0051		HOSE ASSEMBLY, LUBRICATOR (1000HP) INTERNAL x 12"	
				7 1 PEC0054		HOSE ASSEMBLY, LUBRICATOR (1000HP) INTERNAL x 9.50"	
				8 1 PEC0053		HOSE ASSEMBLY, LUBRICATOR (1000HP) INTERNAL x 16.50"	
C	<p>NOTE: ITEM 2 (HIDDEN) IS THE PLUG USED IN THE TOP AND BOTTOM LUBE PIPES</p> <p>NOTE: LONG HOSE (PEC0053) SHOULD ALWAYS BE MOUNTED ON THE OPPOSITE SIDE OF WRIST PIN RETAINER.</p>						
D	ORDER COMPLETE LUBE ASSEMBLY AS PEC0050.						
E	<p>COMPUTER GENERATED BY</p> <p>POWER FRAME LUBE LINES DUAL LUBE PIPE</p> <p>WATER/HEAT TREAT/HEAT PRE-TREATURE</p> <p>DRAWN BY: DY DATE: 10/1/02 PART NUMBER: PEAD002</p> <p>WEIGHT: SHEET 1 OF 1 REV: 0</p>						

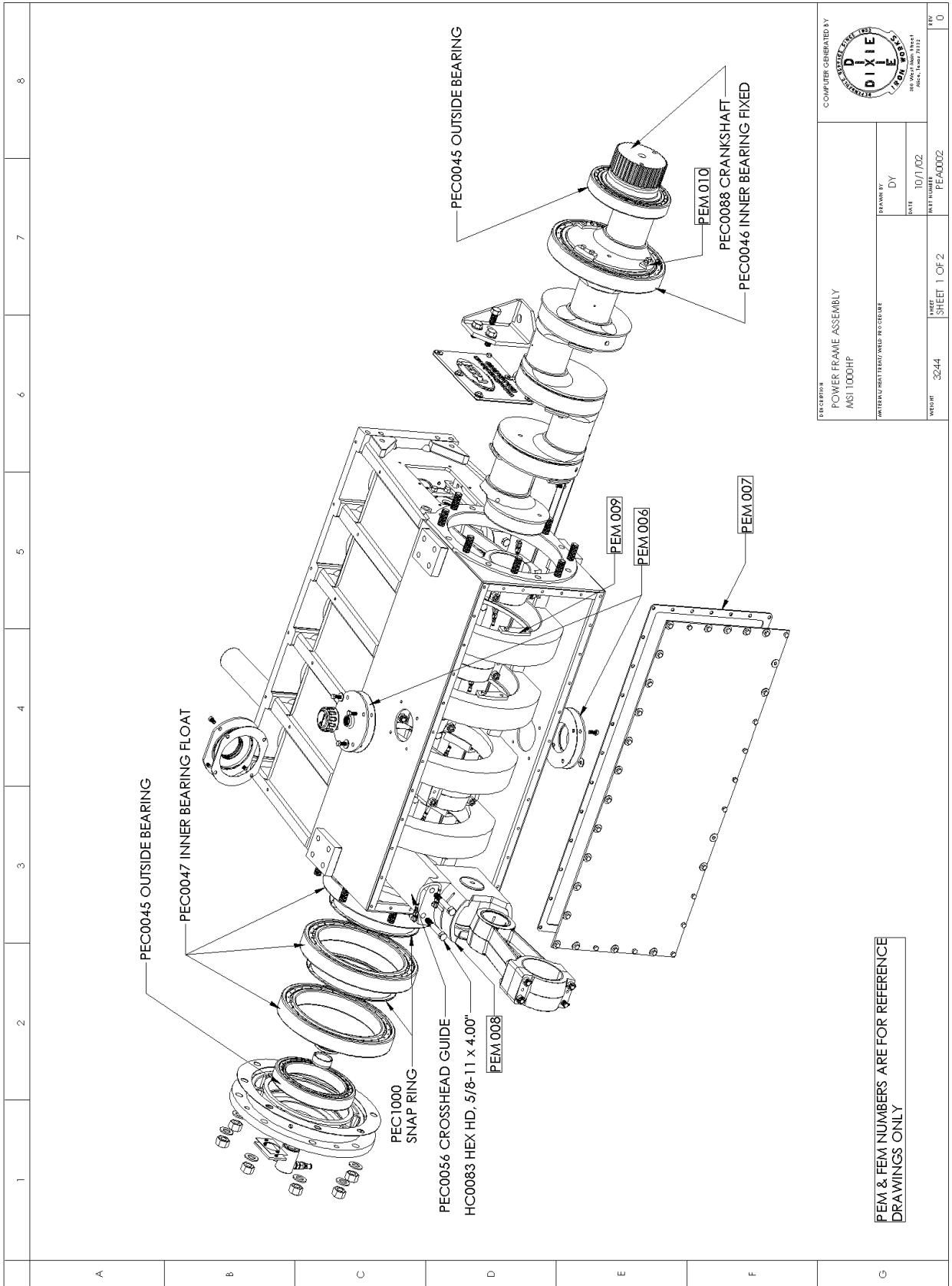
## 4.20 Gear Reducer Lube Lines

1	2	3	4	5	6	7	8
				ITEM NO.	QTY.	PART NO.	DESCRIPTION
A				1	1	GRC0045	MANIFOLD BRACKET
				2	1	GRC0044	MANIFOLD BLOCK, 1/4"NPT x 6
				3	1	UC0301	BLANK PLUG, 1/4"NPT STD (SOCKET TYPE)
				5	2	HC0054	SOC. HD, 3/8"-16 x 0.75
				6	1	GRC0028	HOSE ASSEMBLY, LUBE PIPE (1000HP) x 10"
				7	1	GRC0029	HOSE ASSEMBLY, PINION CAP (1000HP) x 15"
				8	1	GRC0030	HOSE ASSEMBLY, PINION RETAINER (1000HP) x 9.5"
				9	1	GRC0031	HOSE ASSEMBLY, BEARING COVER (1000HP) x 13.5"
B							
C							
D	<p>ORDER COMPLETE LUBE ASSEMBLY AS GRC0019</p>						
E	<p>DESCRIPTION: GEAR REDUCER LUBE LINES GRC0003 ANSI 1000HP WATERPLUG TEST READY WELD PROCEEDURE</p>						
F	<p>COMPUTER GENERATED BY  </p>						
G	<p>DESIGNED BY: DY DATE: 1/31/02 PART NUMBER: GRC0003</p>						
<p>WEIGHT: 1172 LBS. SHEET 1 OF 1</p>							REV: 0



5.10.1

Power Frame Assembly-Exploded View



PEM & FEM NUMBERS ARE FOR REFERENCE  
DRAWINGS ONLY

DESCRIPTION		COMPUTER GENERATED BY	
POWER FRAME ASSEMBLY		DIXIE	
ANSI 100DHP		RESEARCH & DEVELOPMENT	
DRAWN BY		DATE	
DY		10/1/02	
WEIGHT		SHEET NUMBER	
3244		SHEET 1 OF 2	
PART NUMBER		REV	
PEA0002		0	

5.10.2

Power Frame Assembly-Exploded View 2.75 Plunger Reference

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	FEC0021	GASKET, DIAPHRAGM MSI 600/1000
2	1	FEC0064	DIAPHRAGM PLATE, 2.75"
3	1	FEC0067	SEAL, 2.75" DIAPHRAGM
4	1	FEC0070	DIAPHRAGM SEAL RETAINER, 2.75" (600/1000HP)
5	1	FEC0174	SEAL, DIAPHRAGM 2.75" NEW
6	4	HC0004	HEX HD, 3/8"-16 x 0.75"
7	4	HC0099	LOCK WASHER, 3/8" STANDARD
8	4	HC0122	SOC HD, 1/4"-20 x 0.50" FLAT HEAD

### FEM-A 001

**DIAPHRAGM SEAL HOUSING FOR 2.75" PLUNGER**  
 MSI 500  
WATER/FLUID TIGHT / WELD PROTECTIVE

DESIGNER: DYP  
DATE: 3/22/01  
PART NUMBER: PTM-2.75-SEAL-HOUSING-EXPLODED  
WEIGHT: 3.7 LBS.  
SHEET: 1 OF 1  
REV: A



5.10.3

Power Frame Assembly-Exploded View 3.00 Plunger Reference

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	FEC0007	DIAPHRAGM PLATE, 3"
2	1	FEC0021	GASKET, DIAPHRAGM MSI 600/1000
3	1	FEC0022	SEAL, DIAPHRAGM 3" (600/1000HP)
4	1	FEC0046	DIAPHRAGM SEAL RETAINER, 3" (600/1000HP)
5	1	FEC0166	SEAL, DIAPHRAGM 3" (600/1000HP) * NEW
6	4	HC0004	HEX HD, 3/8"-1.6 x 0.75"
7	4	HC0099	LOCK WASHER, 3/8" STANDARD
8	4	HC0122	SOC HD, 1/4"-20 x 0.50" FLAT HEAD

### FEM-B 001

**MSI**  
 500 West 74th Street  
 A166, TX 76032  
 www.dwmisi.com  
 800.242.0059  
 19313.3.FEM-B.001.2010.001

DIAPHRAGM SEAL HOUSING  
 FOR 3" PLUNGER  
 MSI 600  
 WATER-TIGHT TIGHT WELD PROCEDURE

DATE: 3/22/01  
 DRAWN BY: DY

WEIGHT: 3.0 LBS.  
 SHEET: 1 OF 1  
 PART NUMBER: PTM-30-SEAL-HOUSING-EXPLODED

5.10.4

Power Frame Assembly-Exploded View 3.50 Plunger Reference

1	2	3	4	5	6	7	8
A	B	C	D	E	F	G	

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	FEC0021	GASKET, DIAPHRAGM MSI 600/1000
2	1	FEC0043	DIAPHRAGM PLATE, 3.5" MSI 600/1000
3	1	FEC0045	SEAL, DIAPHRAGM 3.5" MSI 600/1000
4	1	FEC0047	DIAPHRAGM SEAL RETAINER, 3.50" MSI 600/1000
5	1	FEC0175	SEAL, DIAPHRAGM 3.5" NEW, MSI 600/1000
6	4	HC0004	HEX HD, 3/8"-1.6 x 0.75"
7	4	HC0099	LOCK WASHER, 3/8" STANDARD
8	4	HC0122	SOC HD, 1/4"-20 x 0.50" FLAT HEAD

## FEM-C 001

<p><b>DESCRIPTION</b></p> <p>DIAPHRAGM SEAL HOUSING FOR 3.50" PLUNGER</p> <p>MSI 600</p> <p><small>WATERBURY HEAT TREAT / WELD PROCEDURE</small></p>	<p><b>DRAWN BY</b></p> <p>DY</p>	<p><b>DATE</b></p> <p>3/22/01</p>
<p><b>WEIGHT</b></p> <p>3.5 LBS.</p>	<p><b>SHEET</b></p> <p>SHEET 1 OF 1</p>	<p><b>PART NUMBER</b></p> <p>PTM-3.5-SEAL-HOUSING-EXPLODED</p>
		<p><b>REV</b></p> <p>A</p>



5.10.5

Power Frame Assembly-Exploded View 4.00 Plunger Reference

1	2	3	4	5	6	7	8
A	B	C	D	E	F	G	

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	FEC0021	GASKET, DIAPHRAGM MSI 600/1000
2	1	FEC0042	DIAPHRAGM PLATE, 4.00"
3	1	FEC0044	SEAL, DIAPHRAGM, 4.0"
4	1	FEC0048	DIAPHRAGM SEAL RETAINER, 4.0"
5	1	FEC0176	SEAL, DIAPHRAGM 4.0" NEW
6	4	HC0004	HEX HD, 3/8"-16 x 0.75"
7	4	HC0099	LOCK WASHER, 3/8" STANDARD
8	4	HC0122	SOC HD, 1/4"-20 x 0.50" FLAT HEAD

## FEM-D 001

<p><b>DESCRIPTION:</b> DIAPHRAGM SEAL HOUSING FOR 4" PLUNGER MSI 600 WARRANTY FROM TIGHT/RELO PROCEEDURE</p>	<p><b>DRAWN BY:</b> DY</p> <p><b>DATE:</b> 3/22/01</p>	<p><b>REV:</b> A</p> <p><b>PINW-4.0-SEAL-HOUSING-EXPLODED</b></p>
<p><b>MSI</b></p> <p>300 West Main Street Alicia, TX 78332 www.dhmsi.com 800.224.0059 MSI is a Division of 3M Company, Inc.</p>	<p><b>QC OFF:</b> 3.2 LBS.</p>	<p><b>SHEET 1 OF 1</b></p>

5.10.6

Power Frame Assembly-Exploded View 4.50 Plunger Reference

1	2	3	4	5	6	7	8
ITEM NO.	QTY.	PART NO.	DESCRIPTION				
1	1	FEC0021	GASKET, DIAPHRAGM MSI 600/1000				
2	1	FEC0035	DIAPHRAGM PLATE, 4.5"				
3	1	FEC0041	SEAL, DIAPHRAGM, 4.50"				
4	1	FEC0049	DIAPHRAGM SEAL RETAINER, 4.5" (600/1000HP)				
5	1	FEC0177	SEAL, DIAPHRAGM 4.5" NEW				
6	4	HC0004	HEX HD, 3/8"-16 x 0.75"				
7	4	HC0099	LOCK WASHER, 3/8" STANDARD				
8	4	HC0122	SOC HD, 1/4"-20 x 0.50" FLAT HEAD				

## FEM-E 001

<p><b>DESCRIPTION:</b> DIAPHRAGM SEAL HOUSING FOR 4.5" PLUNGER MSI 600</p> <p><small>UNITS: U.S. / METRIC / HELP / PC PACKAGE</small></p> <p><b>WEIGHT:</b> 2.8 LBS.</p>	<p><b>MSI</b></p> <p>300 West Main Street Alice, TX 78532 www.dvmmsi.com 800.242.0059 <small>MSI is a Division of Dresser Industries, Inc.</small></p> <p><small>DATE PLOTTED:</small> 3/22/01 <small>DATE FILED:</small> 3/22/01 <small>PLANT:</small> P1M-4.5-SEAL-HOUSING-EXPLODED</p>
<p><b>SHEET 1 OF 1</b></p>	<p><b>REV</b></p>

5.10.7

Power Frame Assembly-Exploded View Reference

1	2	3	4	5	6	7	8	
A	B	C	D	E	F	G		

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	2	HC0105	DOWEL PIN, 3/8" x 1.50"
2	4	pec0048	CONNECTING ROD BOLT, (600HP)
3	4	HC0086	HEX NUT, 5/8"-11 CASTELLATED
4	1	PEC0029	BEARING
5	1	PEC0044	BEARING, CONNECTING ROD (600HP)
6	4	HC0088	COTTER PIN
7	1	pec0057B	CONNECTING ROD
8	1	pec0057A	CONNECTING ROD

## PEM 001

FUNCTION  
CONNECTING ROD ASSEMBLY  
EXPLODED VIEW

DRAWING/REVISION/REVISED BY/DATE

DRAWN BY: K.B.  
DATE: 03/26/01  
PART NUMBER: PEC-SUB-PEC0057

WEIGHT: SHEET 1 OF 1

COMPUTER GENERATED BY

180 West 100th Street  
P.O. Box 1000  
P.O. Box 1000  
P.O. Box 1000

REV: 0

5.10.8

Power Frame Assembly-Exploded View Reference

1	2	3	4	5	6	7	8																																
A	B	C	D	E	F																																		
PEM 002																																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">ITEM NO.</th> <th style="width: 10%;">QTY.</th> <th style="width: 10%;">PART NO.</th> <th style="width: 70%;">DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>PEC0063</td> <td>MAIN BEARING HOUSING, (600HP)</td> </tr> <tr> <td>2</td> <td>1</td> <td>PEC0031</td> <td>GASKET</td> </tr> <tr> <td>3</td> <td>1</td> <td>PEC0043</td> <td>GASKET</td> </tr> <tr> <td>4</td> <td>1</td> <td>PEC0032</td> <td>TACH COVER</td> </tr> <tr> <td>5</td> <td>8</td> <td>HC0087</td> <td>FLAT WASHER, 7/8" STD</td> </tr> <tr> <td>6</td> <td>8</td> <td>HC0085</td> <td>HEX NUT, 7/8"-9</td> </tr> <tr> <td>7</td> <td>2</td> <td>HC0015</td> <td>HEX HD, 3/8"-16 x 1.00"</td> </tr> </tbody> </table>								ITEM NO.	QTY.	PART NO.	DESCRIPTION	1	1	PEC0063	MAIN BEARING HOUSING, (600HP)	2	1	PEC0031	GASKET	3	1	PEC0043	GASKET	4	1	PEC0032	TACH COVER	5	8	HC0087	FLAT WASHER, 7/8" STD	6	8	HC0085	HEX NUT, 7/8"-9	7	2	HC0015	HEX HD, 3/8"-16 x 1.00"
ITEM NO.	QTY.	PART NO.	DESCRIPTION																																				
1	1	PEC0063	MAIN BEARING HOUSING, (600HP)																																				
2	1	PEC0031	GASKET																																				
3	1	PEC0043	GASKET																																				
4	1	PEC0032	TACH COVER																																				
5	8	HC0087	FLAT WASHER, 7/8" STD																																				
6	8	HC0085	HEX NUT, 7/8"-9																																				
7	2	HC0015	HEX HD, 3/8"-16 x 1.00"																																				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center;">                 FUNCTION                  MAIN BEARING ASSEMBLY             </td> <td colspan="2" style="text-align: center;">                 DRAWING/REVISION/REVISED PROCEDURE             </td> <td colspan="2" style="text-align: center;">                 DRAWN BY                  K.B.             </td> <td colspan="2" style="text-align: center;">                 DATE                  03/27/01             </td> </tr> <tr> <td colspan="2" style="text-align: center;">                 WEIGHT             </td> <td colspan="2" style="text-align: center;">                 SHEET 1 OF 1             </td> <td colspan="2" style="text-align: center;">                 PART NO.                  PEC_SUB_BEARING HOUSING             </td> <td colspan="2" style="text-align: center;">                 REV.                  0             </td> </tr> </table>								FUNCTION MAIN BEARING ASSEMBLY		DRAWING/REVISION/REVISED PROCEDURE		DRAWN BY K.B.		DATE 03/27/01		WEIGHT		SHEET 1 OF 1		PART NO. PEC_SUB_BEARING HOUSING		REV. 0																	
FUNCTION MAIN BEARING ASSEMBLY		DRAWING/REVISION/REVISED PROCEDURE		DRAWN BY K.B.		DATE 03/27/01																																	
WEIGHT		SHEET 1 OF 1		PART NO. PEC_SUB_BEARING HOUSING		REV. 0																																	
COMPUTER GENERATED BY 																																							

5.10.9

Power Frame Assembly-Exploded View Reference

PEM 003

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	PEC0099	OIL COLLECTOR
2	12	HC0099	LOCK WASHER, 3/8" STD
3	12	HC0015	HEX HD, 3/8"-16 x 1.00"

DESCRIPTION: OIL PAN COLLECTOR

COMPUTER GENERATED BY: DIE

WATERPAU PART TREAT/NEED PROCEDURE: DRAWN BY: KB

DATE: 03/27/01

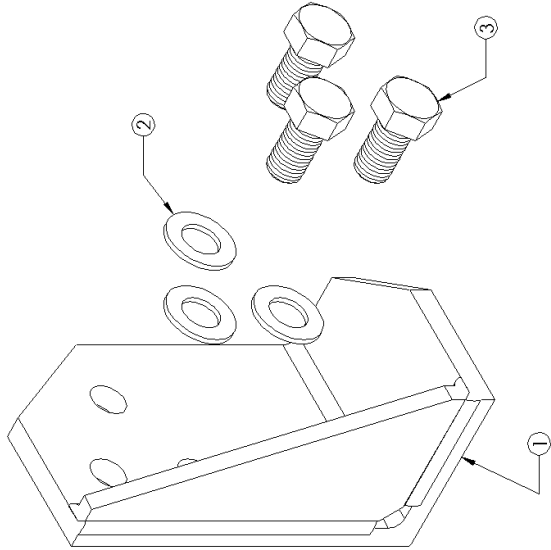
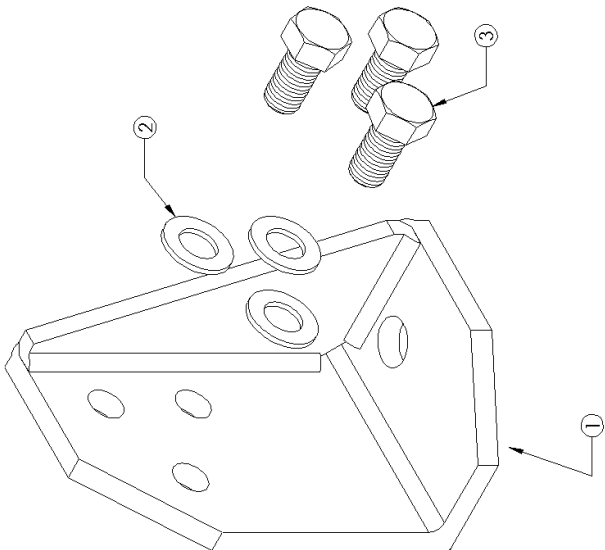

PART NUMBER: PEC\_SUB\_OIL PAN COLLECTOR-K

WEIGHT: SHEET 1 OF 1

REV: 0

5.10.10

Power Frame Assembly-Exploded View Reference

1	2	3	4	5	6	7	8																
A					<p style="margin: 0;">PEM 004</p>																		
E	<p style="margin: 0;">NOTE: PEC0022 WILL BE THE LEFT FOOT FOR LEFT-HAND DRIVE CONFIGURATION                  PEC0037 WILL BE THE RIGHT FOOT FOR LEFT-HAND DRIVE CONFIGURATION</p>																						
F	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">ITEM NO.</th> <th style="width: 10%;">QTY.</th> <th style="width: 40%;">PART NO.</th> <th style="width: 40%;">DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>PEC0037</td> <td>FRONT FOOT, LEFT (600HP)</td> </tr> <tr> <td>2</td> <td>3</td> <td>HC0134</td> <td>FLAT WASHER, 3/4" SAE "N"</td> </tr> <tr> <td>3</td> <td>3</td> <td>HC0108</td> <td>HEX HD., 3/4"-10 x 1.50"</td> </tr> </tbody> </table>							ITEM NO.	QTY.	PART NO.	DESCRIPTION	1	1	PEC0037	FRONT FOOT, LEFT (600HP)	2	3	HC0134	FLAT WASHER, 3/4" SAE "N"	3	3	HC0108	HEX HD., 3/4"-10 x 1.50"
ITEM NO.	QTY.	PART NO.	DESCRIPTION																				
1	1	PEC0037	FRONT FOOT, LEFT (600HP)																				
2	3	HC0134	FLAT WASHER, 3/4" SAE "N"																				
3	3	HC0108	HEX HD., 3/4"-10 x 1.50"																				
G	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">ITEM NO.</th> <th style="width: 10%;">QTY.</th> <th style="width: 40%;">PART NO.</th> <th style="width: 40%;">DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>PEC0022</td> <td>FRONT FOOT, RIGHT (600HP)</td> </tr> <tr> <td>2</td> <td>3</td> <td>HC0134</td> <td>FLAT WASHER, 3/4" SAE "N"</td> </tr> <tr> <td>3</td> <td>3</td> <td>HC0108</td> <td>HEX HD., 3/4"-10 x 1.50"</td> </tr> </tbody> </table>							ITEM NO.	QTY.	PART NO.	DESCRIPTION	1	1	PEC0022	FRONT FOOT, RIGHT (600HP)	2	3	HC0134	FLAT WASHER, 3/4" SAE "N"	3	3	HC0108	HEX HD., 3/4"-10 x 1.50"
ITEM NO.	QTY.	PART NO.	DESCRIPTION																				
1	1	PEC0022	FRONT FOOT, RIGHT (600HP)																				
2	3	HC0134	FLAT WASHER, 3/4" SAE "N"																				
3	3	HC0108	HEX HD., 3/4"-10 x 1.50"																				
<p style="margin: 0;">COMPUTER GENERATED BY</p> 																							
<p style="margin: 0;">BOLT ON FOOT ASSEMBLIES LEFT AND RIGHT HAND</p>																							
<p style="margin: 0;">DRAWING/REVISIONS PROCEDURE</p>																							
<p style="margin: 0;">DRAWN BY: KB</p>																							
<p style="margin: 0;">DATE: 3/27/01</p>																							
<p style="margin: 0;">REVISIONS</p>																							
<p style="margin: 0;">SHEET 1 OF 1</p>																							
<p style="margin: 0;">PART NO.: PEC_SUB_PEC0022</p>																							
<p style="margin: 0;">REV: 0</p>																							





5.10.12

Power Frame Assembly-Exploded View Reference

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	PEC0084	BREATHER PORT
2	2	PEC0083	GASKET
3	1	PEC0026	BREATHER, (600HP)
4	1	PEC0085	DRAIN PORT, (600HP)
5	8	HC0002	FLAT WASHER, 3/8" STD
6	8	HC0015	HEX HD, 3/8"-16 x 1.00"

PEM 006

FUNCTION  
BREATHER AND DRAIN PORT  
ASSEMBLY  
MSI 600

DATE 03/26/01

DESIGNED BY K.B.

REVISIONS  
PEC\_SUB\_BREATH-DRAIN PORTS

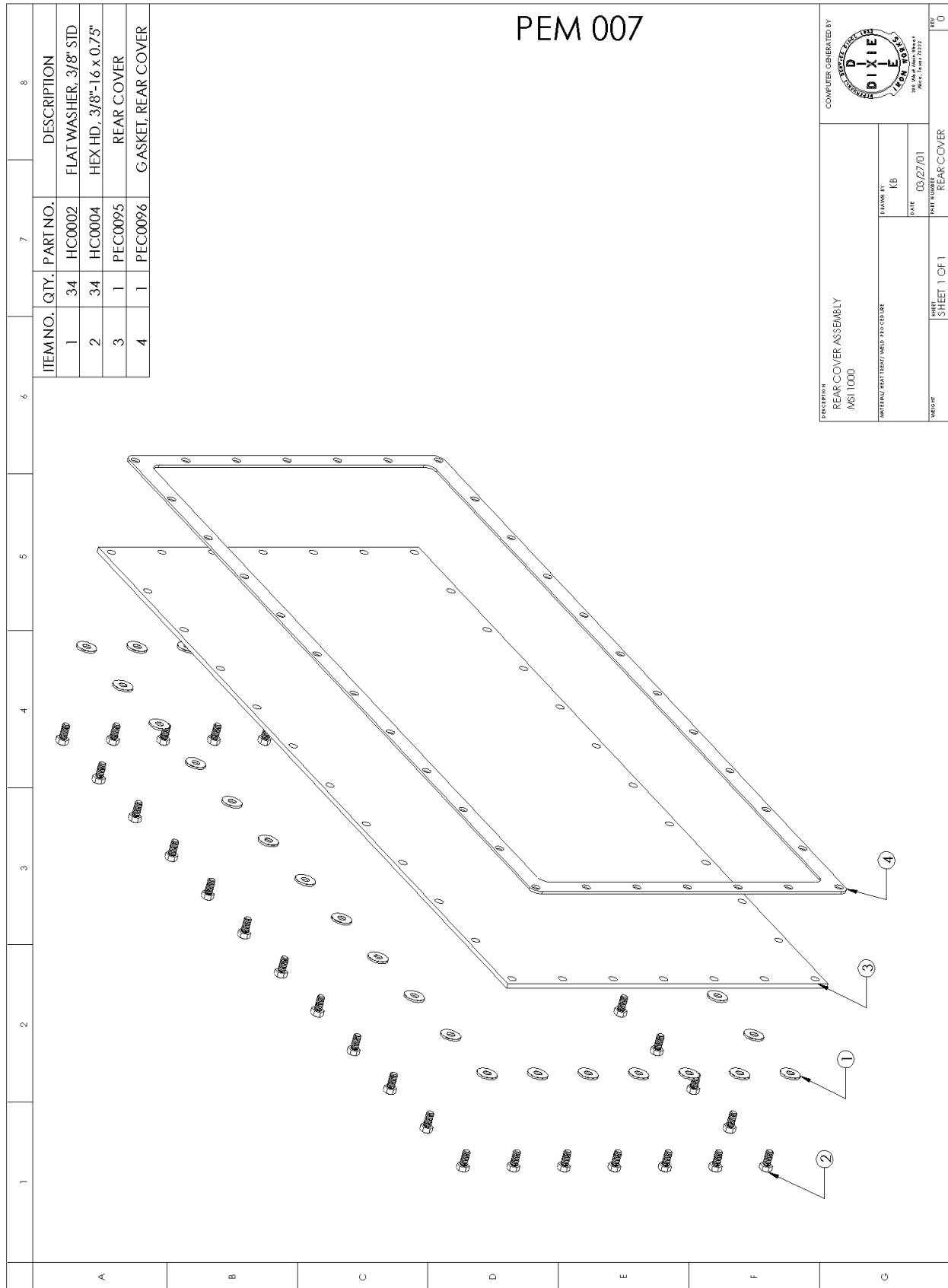
WEIGHT SHEET 1 OF 1

COMPUTER GENERATED BY  
DIXIE  
180 West 100th Street  
Aurora, Illinois 60504

REV 10

5.10.13

Power Frame Assembly-Exploded View Reference



5.10.14

Power Frame Assembly-Exploded View Reference

1	2	3	4	5	6	7	8																												
						PEM 008																													
						<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">ITEM NO.</th> <th style="width: 10%;">QTY.</th> <th style="width: 10%;">PART NO.</th> <th style="width: 70%;">DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">HC0024</td> <td>HEX HD, 1/2"-13 x 1.25"</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">1</td> <td style="text-align: center;">pec0021</td> <td>RETAINER, WRIST PIN</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">1</td> <td style="text-align: center;">PEC0004</td> <td>PONY ROD STUD</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">1</td> <td style="text-align: center;">PEC0013</td> <td>CROSSHEAD PIN</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">1</td> <td style="text-align: center;">PEC0055</td> <td>CROSSHEAD</td> </tr> </tbody> </table>		ITEM NO.	QTY.	PART NO.	DESCRIPTION	1	2	HC0024	HEX HD, 1/2"-13 x 1.25"	2	1	pec0021	RETAINER, WRIST PIN	3	1	PEC0004	PONY ROD STUD	4	1	PEC0013	CROSSHEAD PIN	5	1	PEC0055	CROSSHEAD				
ITEM NO.	QTY.	PART NO.	DESCRIPTION																																
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2	1	pec0021	RETAINER, WRIST PIN																																
3	1	PEC0004	PONY ROD STUD																																
4	1	PEC0013	CROSSHEAD PIN																																
5	1	PEC0055	CROSSHEAD																																
A	B	C	D	E	F	G																													
							<p>PRECISION CROSSHEAD ASSEMBLY EXPLODED</p> <p>WARRANTY NUMBER: PEC-CROSS</p> <p>DATE: 03/26/01</p> <p>PART NUMBER: PEC-SUB-CROSS-PLUNGER</p> <p>WROTE: SHEET 1 OF 1</p>	<p>COMPUTER GENERATED BY <b>DIXIE</b> 1997-2001 Mech. Dept. 2002</p>		ED	0																								

5.10.15

Power Frame Assembly-Exploded View Reference

1	2	3	4	5	6	7	8		
A	B	C	D	E	F	G			

## PEM 009

NOTE:  
SHIM SET USED AS REQUIRED TO MAINTAIN  
PROPER GAP

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	PEC0060	BEARING RETAINER
2	1	PEC0028	SHIM SET
3	2	HC0015	HEX HD, 3/8"-16 x 1.00"

COMPUTER GENERATED BY

BEARING RETAINER ASSEMBLY  
OUTER RACE  
MSI 600  
DRAWING/REVISION/REV DESCRIPTION  
DATE 03/29/01  
DRAWN BY K.B.  
REVISIONS  
PART NO. PEC\_SUB\_BEARING\_REIN\_OUTER  
WEIGHT  
SHEET 1 OF 1  
REV 0

# 5.20 Power Frame Assembly-Section View

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	PEC0088	CRANKSHAFT
2	1	PEC0046	BEARING, INSIDE MAIN BEARING-FIXED
3	3	PEC0047	BEARING, INSIDE MAIN BEARING-FLOAT
4	2	PEC1000	SPIRAL RETAINER RING, PUMP (1000HP)
5	5	PEC0086	CROSSHEAD
6	5	FEC0002	3" PLUNGER
7	5	PEC0013	CROSSHEAD PIN
8	5	FEC0004	PONY ROD STUD
9	5	PEC0021	RETAINER, WRIST PIN
10	5	PEC0057	CONNECTING ROD ASSEMBLY
11	12	PEC0060	BEARING RETAINER
12	10	PEC0056	CROSSHEAD GUIDE
13	5	FEC0046	DIAPHRAGM SEAL RETAINER
14	20	HC0122	SOC. HD. 1/4"-20 x 0.50" FLAT HEAD
15	5	FEC0007	DIAPHRAGM SEAL HOUSING
16	1	PEC0064	SPACER
17	1	PEC0063	MAIN BEARING HOUSING,
18	1	PEC0009	LUBE DRAIN, 3"NPT TANK FLANGE
19	2	UC0050	BLANK PLUG, 1/2" NPT STD(SOCKET)
20	1	PEC0052	ROTOSEAL LUBRICATOR
21	1	1C0094	TEE BODY, 1/2"NPT FFF
22	2	PEC0045	BEARING, OUTSIDE MAIN
23	12	PEC0027	BEARING RETAINER, INNER RACE

DESCRIPTION	POWER FRAME ASSEMBLY MS1 1000HP	COMPILED/CREATED BY	
WEIGHT		DESIGNED BY	DY
		DATE	10/1/02
		PART NUMBER	PEA0002
		SHEET	SHEET 1 OF 1
		REV	0

### 5.40 Connecting Rod Assembly- Exploded View

1	2	3	4	5	6	7	8																																					
A	B	C	D	E	F	G																																						
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">ITEM NO.</th> <th style="width: 10%;">QTY.</th> <th style="width: 10%;">PART NO.</th> <th style="width: 70%;">DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">HC0105</td> <td>DOWEL PIN, 3/8" x 1.50"</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">4</td> <td style="text-align: center;">pec0048</td> <td>CONNECTING ROD BOLT, (600HP)</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">HC0086</td> <td>HEX NUT, 5/8"-11 CASTELLATED</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">1</td> <td style="text-align: center;">PEC0029</td> <td>BEARING</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">1</td> <td style="text-align: center;">PEC0044</td> <td>BEARING, CONNECTING ROD (600HP)</td> </tr> <tr> <td style="text-align: center;">6</td> <td style="text-align: center;">4</td> <td style="text-align: center;">HC0088</td> <td>COTTER PIN</td> </tr> <tr> <td style="text-align: center;">7</td> <td style="text-align: center;">1</td> <td style="text-align: center;">pec0057B</td> <td>CONNECTING ROD</td> </tr> <tr> <td style="text-align: center;">8</td> <td style="text-align: center;">1</td> <td style="text-align: center;">pec0057A</td> <td>CONNECTING ROD</td> </tr> </tbody> </table>									ITEM NO.	QTY.	PART NO.	DESCRIPTION	1	2	HC0105	DOWEL PIN, 3/8" x 1.50"	2	4	pec0048	CONNECTING ROD BOLT, (600HP)	3	4	HC0086	HEX NUT, 5/8"-11 CASTELLATED	4	1	PEC0029	BEARING	5	1	PEC0044	BEARING, CONNECTING ROD (600HP)	6	4	HC0088	COTTER PIN	7	1	pec0057B	CONNECTING ROD	8	1	pec0057A	CONNECTING ROD
ITEM NO.	QTY.	PART NO.	DESCRIPTION																																									
1	2	HC0105	DOWEL PIN, 3/8" x 1.50"																																									
2	4	pec0048	CONNECTING ROD BOLT, (600HP)																																									
3	4	HC0086	HEX NUT, 5/8"-11 CASTELLATED																																									
4	1	PEC0029	BEARING																																									
5	1	PEC0044	BEARING, CONNECTING ROD (600HP)																																									
6	4	HC0088	COTTER PIN																																									
7	1	pec0057B	CONNECTING ROD																																									
8	1	pec0057A	CONNECTING ROD																																									
<p style="text-align: center; font-size: 24px; font-weight: bold;">PEM 001</p>																																												
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="font-size: 8px;">FUNCTION</td> <td colspan="2" style="text-align: center;">CONNECTING ROD ASSEMBLY</td> </tr> <tr> <td colspan="2" style="font-size: 8px;">DRAWING/REVISION</td> <td colspan="2" style="text-align: center;">EXPLODED VIEW</td> </tr> <tr> <td style="font-size: 8px;">DRAWN BY</td> <td style="font-size: 8px;">K.B.</td> <td style="font-size: 8px;">DATE</td> <td style="font-size: 8px;">03/26/01</td> </tr> <tr> <td style="font-size: 8px;">REVISION</td> <td style="font-size: 8px;">PEC-SUB PEC0057</td> <td style="font-size: 8px;">SHEET</td> <td style="font-size: 8px;">1 OF 1</td> </tr> <tr> <td style="font-size: 8px;">WEIGHT</td> <td></td> <td style="font-size: 8px;">REV</td> <td style="font-size: 8px;">0</td> </tr> </table>									FUNCTION		CONNECTING ROD ASSEMBLY		DRAWING/REVISION		EXPLODED VIEW		DRAWN BY	K.B.	DATE	03/26/01	REVISION	PEC-SUB PEC0057	SHEET	1 OF 1	WEIGHT		REV	0																
FUNCTION		CONNECTING ROD ASSEMBLY																																										
DRAWING/REVISION		EXPLODED VIEW																																										
DRAWN BY	K.B.	DATE	03/26/01																																									
REVISION	PEC-SUB PEC0057	SHEET	1 OF 1																																									
WEIGHT		REV	0																																									

# 5.50 Crosshead Assembly- Exploded View

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	2	HC0024	HEX HD. 1/2"-13 x 1.25"
2	1	pec0021	RETAINER, WRIST PIN
3	1	FEC0004	PONY ROD STUD
4	1	PEC0013	CROSSHEAD PIN
5	1	PEC0055	CROSSHEAD

## PEM 008

FUNCTION	CROSSHEAD ASSEMBLY
DATE	03/26/01
DESIGNED BY	K.B.
APPROVED BY	PEC-SUB-CROSS-PLUNGER
WEIGHT	SHEET 1 OF 1
REV	0



# 5.60 Diaphragm Seal Housing-Exploded View

1	2	3	4	5	6	7	8
A	B	C	D	E	F	G	

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	FEC0021	GASKET, DIAPHRAGM MSI 600/1000
2	1	FEC0064	DIAPHRAGM PLATE, 2.75"
3	1	FEC0067	SEAL, 2.75" DIAPHRAGM
4	1	FEC0070	DIAPHRAGM SEAL RETAINER, 2.75" (600/1000HF)
5	1	FEC0174	SEAL, DIAPHRAGM 2.75" NEW
6	4	HC0004	HEX HD, 3/8"-1.6 x 0.75"
7	4	HC0099	LOCK WASHER, 3/8" STANDARD
8	4	HC0122	SOC HD, 1/4"-20 x 0.50" FLAT HEAD

## FEM-A 001

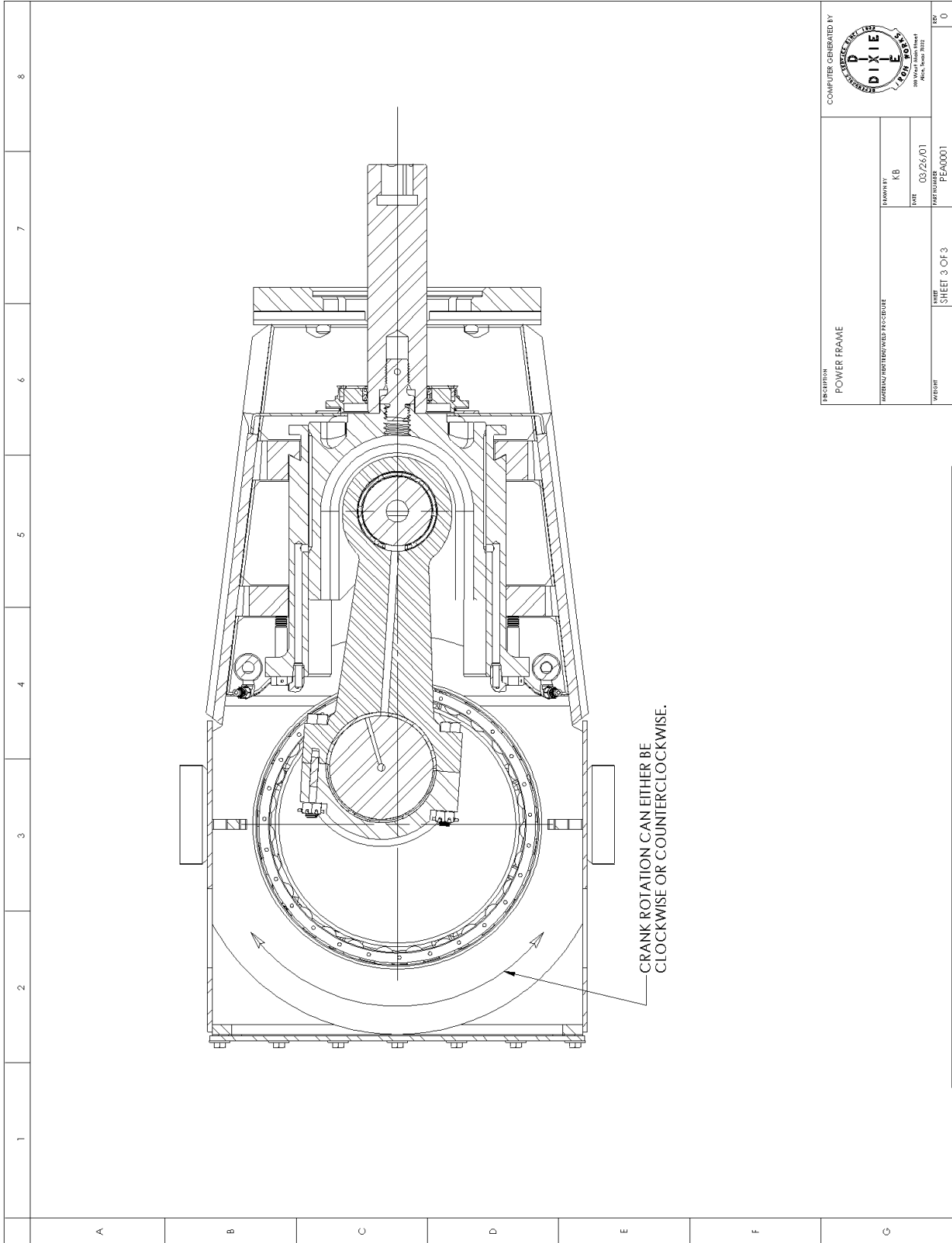
<p><b>DESCRIPTION:</b> DIAPHRAGM SEAL HOUSING FOR 2.75" PLUNGER MSI 600</p> <p><small>WARRANTY FOR TIGHT FIELD PROCEDURE</small></p>	<p><b>DRAWN BY:</b> DY</p> <p><b>DATE:</b> 3/22/01</p> <p><b>FILE NO.:</b> PFM-2.75-SEAL-HOUSING-EXPLODED</p>	<p><b>SCALE:</b> 3.7 LES.</p> <p><b>SHEET 1 OF 1</b></p>
		<p><small>300 West Main Street Alicia, TX 78332</small></p> <p><small>www.dhmsi.com 800.242.0059</small></p> <p><small>MSI is a Division of, 2001, Inc., Dallas, TX</small></p>
<p><small>W.C.O.F.</small></p>		<p><small>REV A</small></p>

Note: See 5.10.2 through 5.10.5 for other sizes

# 5.70 Power Frame Lube Lines-Dual Lube Pipe

1	2	3	4	5	6	7	8		
A				ITEM NO. QTY. PART NO. DESCRIPTION					
				1 1 PEC0064 SPACER					
				2 2 UC0050 BLANK PLUG, 1/2" NPT SID(SOCKET)					
				3 1 PEC0052 ROTOSEAL, LUBRICATOR					
				4 1 TC0094 TEE BODY, 1/2"NPT FFF					
				5 2 FC0146 NIPPLE, 1/2"NPT HEX x 02"					
				6 1 PEC0051 HOSE ASSEMBLY, LUBRICATOR (1000HP) INTERNAL x 12"					
				7 1 PEC0054 HOSE ASSEMBLY, LUBRICATOR (1000HP) INTERNAL x 9.50"					
				8 1 PEC0053 HOSE ASSEMBLY, LUBRICATOR (1000HP) INTERNAL x 16.50"					
B	<p>NOTE: ITEM 2 (HIDDEN) IS THE PLUG USED IN THE TOP AND BOTTOM LUBE PIPES</p>								
C									
D	<p>NOTE: LONG HOSE (PEC0053) SHOULD ALWAYS BE MOUNTED ON THE OPPOSITE SIDE OF WRIST PIN RETAINER.</p>								
E	<p>ORDER COMPLETE LUBE ASSEMBLY AS PEC0050.</p>								
F									
G	<p>DESCRIPTION: POWER FRAME LUBE LINES DUAL LUBE PIPE</p> <p>DATE: 10/1/02</p> <p>DESIGNED BY: DY</p> <p>DRAWN BY: DY</p> <p>REVISION: 10/1/02</p> <p>PART NUMBER: PE40002</p> <p>WEIGHT: SHEET 1 OF 1</p> <p>COMPUTER GENERATED BY: DIXIE TOOL &amp; DIE CO. INC. (Logo)</p> <p>REV: 0</p>								

# 5.80 Power Frame Crosshead & Crank Rotation



FUNCTION POWER FRAME		DRAWN BY K.B.		DATE 03/26/01		PART NUMBER FEA0001		REV 0	
TOLERANCE/STANDARD/STRENGTH		WEIGHT		SHEET 3 OF 3		COMPUTER GENERATED BY DIXIE 280 West 130th Street Aurora, Illinois 60504			

### 6.10.1 Fluid End Assembly for 2.75 & 3.00 Plungers – Exploded View

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	FEC0128	FLUID CYLINDER
2	5	FEC0094	VALVE STOP
3	10	FEC0092	VALVE SEAT
4	10	FEC0091	VALVE COMPLETE
5	10	FEC0093	VALVE SPRING
6	5	FEC0097	SUCTION COVER CAGE
7	5	FEC0088	SUCTION COVER
8	5	HC0132	RECESSED SOC HD, 1/2"-13 x 1.00"
9	10	FEC0095	SEAL,SUCTION/DISCHARGE COVER
10	4	FEC0149	DISCHARGE COVER
11	1	FEC0151	GAGE CONNECTION
12	1	FEC0146	DISCHARGE FLANGE
13	2	FEC0148	SEAL, DISCHARGE FLANGE
14	12	HC0085	HEX NUT, 7/8"-9
15	1	FEC0147	DISCHARGE FLG, 3" BLANK
16	1	FEC0145	SUCTION MANIFOLD
17	5	OC0009	O-RING, 1.75" ADJ NUT STD
18	20	HC0090	HEX HD, 3/4"-10 x 2.00"
19	5	PACKING ASSEMBLY	PACKING ASSEMBLY
20	12	HC0084	STUD, 7/8"-9 x 3.00" B7

DESCRIPTION	FLUID END ASSEMBLY 2.75"-3" ANSI 1000 HP WATER/VAULT TERTIARY WEP PROCEDURE	DATE	10/1/02
DESIGNED BY	DY	DRAWN BY	DY
WEIGHT		PART NUMBER	FEA0010
SHEET	SHEET 1 OF 1	REV	0

### 6.10.2 Fluid End Assembly for 3.50, 4.00 & 4.50 Plungers – Exploded View

	1	2	3	4	5	6	7	8
						ITEM NO. QTY.	PART NO.	DESCRIPTION
A						1	FEC0129	FLUID CYLINDER
						2	FEC0019	VALVE STOP
						3	FEC0016	VALVE SEAT
						4	FEC0017	VALVE COMPLETE
						5	FEC0003	VALVE SPRING
						6	FEC0006	SUCTION COVER
B						7	FEC0013	SEAL,SUCTION COVER
						8	FEC0005	DISCHARGE COVER
						9	FEC0015	SEAL,DISCHARGE COVER
						10	FEC0011	GAGE CONNECTION
						11	FEC0012	RETAINER NUT
						12	FEC0145	SUCTION MANIFOLD
C						13	OC0009	O-RING, 1.75" ADJ NUT STD
						14	HC0090	HEX HD, 3/4"-10 x 2.00"
						15	FEC0146	DISCHARGE FLANGE
						16	FEC0148	SEAL, DISCHARGE FLANGE
						17	HC0084	STUD, 7/8"-9 x 3.00" B7
D						18	HC0085	HEX NUT, 7/8"-9
						19	FEC0147	DISCHARGE FLG, 3" BLANK
E						20	PACKING ASSEMBLY	PACKING ASSEMBLY
F								
G								

DESCRIPTION	FLUID END ASSEMBLY 3.5" - 4.5" MSI 1000 WATER/VAPE/HEAVY WELD PROCESSOR	DESIGNED BY	KB
DATE	10/4/02	COMPIER GENERATED BY	DIXIE
WEIGHT	2236	PART NUMBER	FEA0014
SHEET	SHEET 1 OF 1	REV	0

# 6.20.1 Packing Assembly 2.75 Plunger-Exploded View

1	2	3	4	5	6	7	8	
A	B	C	D	E	F	G		
ITEM NO.	QTY.	PART NO.	DESCRIPTION					
1	1	FEC0090	ADAPTER, FLUID END 2-3/4" - 3"					
2	1	FEC0065	PACKING NUT 2.75"					
3	1	FEC0068	LANTERN RING					
4	1	FEC0066	ADAPTER, STUFFING BOX 2.75					
5	2	OC0077	PAR-BACK, 2.75" STUFFING BOX - NUT SIDE					
6	2	OC0076	O-RING, 2.75" STUFFING BOX - NUT SIDE					
7	1	FEC0108	CHECK VALVE, GREASE PLUNGER LUBE					
8	1	DC0307	ADPT BDY, 1/4"NPT x 1/4"NPT HEX NIPPLE					
9	7	UC0301	BLANK PLUG, 1/4"NPT STD. (SOCKET TYPE)					
10	1	FEC0069	PACKING SET, 2.75" STD					

## FEM-A 002

NOTE:  
THIS ITEM IS INCLUDED WITH ITEM 8

<p>DESCRIPTION PACKING-ASSEMBLY 2.75 INCH MSI 600 MATERIAL: FEM1007/MSI600-CE-0000</p>	<p>DESIGNED BY DY</p> <p>DATE 3/28/01</p>	<p>COMPUTER GENERATED BY <b>DIXIE</b> L EARN 3000 118 New York Street Rocky Mount, NC 27853</p>
<p>WEIGHT 30.653 LBS.</p>	<p>SHEET 1 OF 1</p>	<p>PART NUMBER FEM-2.75-PACKING-EXPLODED</p>
		REV 0



### 6.20.3 Packing Assembly 3.00 Plunger-Exploded View

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	FEC0010	ADAPTER, STUFFING BOX
2	1	FEC0008	PACKING NUT 3.00"
3	1	FEC0090	ADAPTER, FLUID END 2-3/4" - 3"
4	1	FEC0032	LANTERN RING
5	1	FEC0033	PACKING SET, 3" STD
6	7	UC0301	BLANK PLUG, 1/4"NPT STD (SOCKET TYPE)
7	1	OC0076	O-RING, 2.75" STUFFING BOX - NUT SIDE
8	1	OC0077	PAR-BACK, 2.75" STUFFING BOX - NUT SIDE
9	1	OC0085	O-RING, 3" STUFFING BOX NUT SIDE
10	1	OC0064	PAR-BACK, 3" STUFFING BOX - NUT SIDE
12	1	FEC0108	CHECK VALVE, GREASE PLUNGER LUBE
13	1	DC0307	ADPT BDY, 1/4"NPT x 1/4"NPT HEX NIPPLE
9	1	OC0085	O-RING, 3" STUFFING BOX NUT SIDE

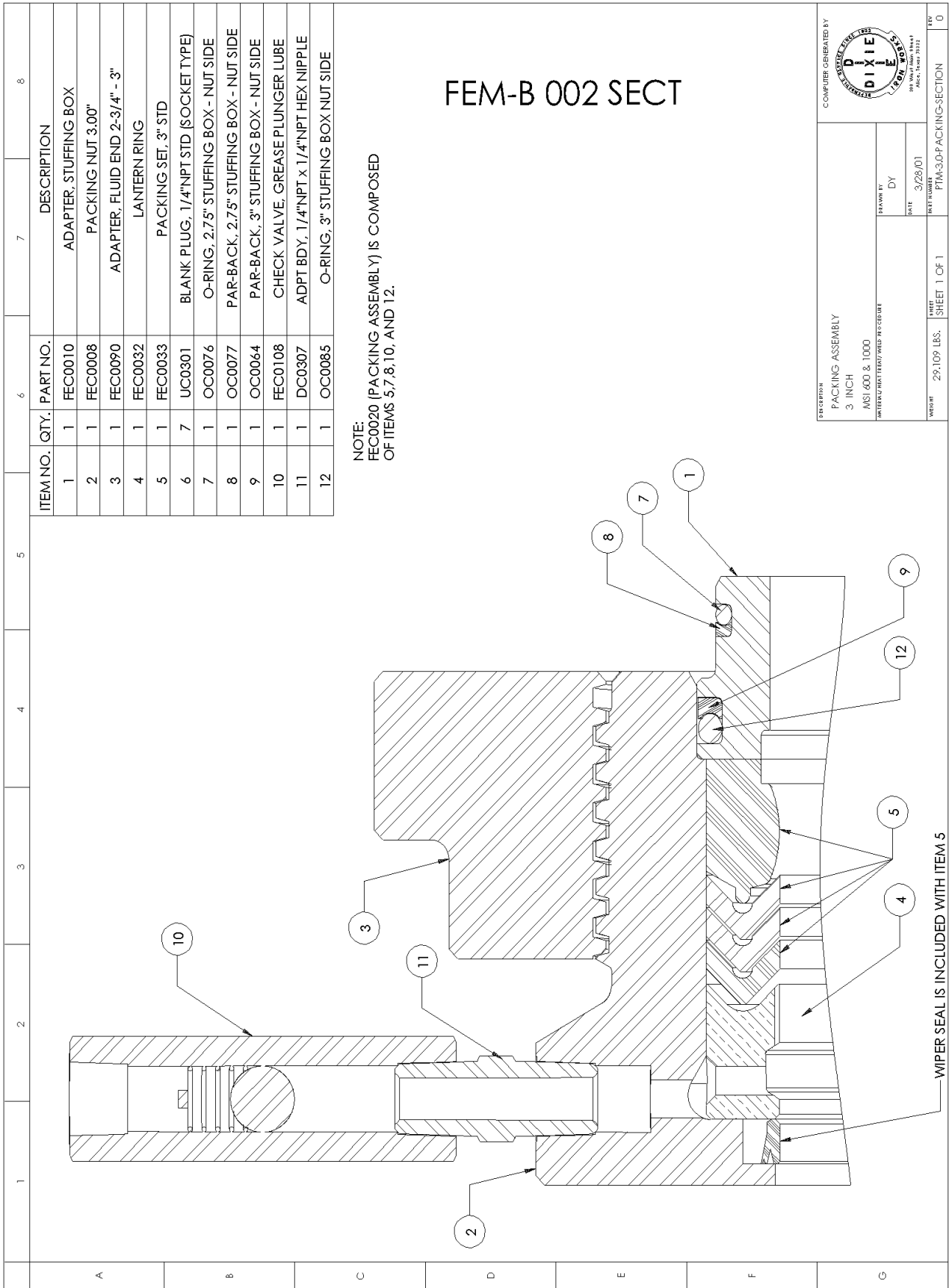
FEM-B 002

NOTE:  
THIS ITEM IS INCLUDED WITH ITEM 5

DESCRIPTION PACKING ASSEMBLY 3 INCH ANSI 600 & 1000 WATER/WATER TIGHT/WELD IN-CLOSURE		DRAWN BY DY	
WEIGHT 29.109 LBS.		DATE 3/25/01	
SHEET 1 OF 1		PART NUMBER PTM-3-0-PACKING-EXPLODED	
COMPUTER GENERATED BY 		FEED 0	



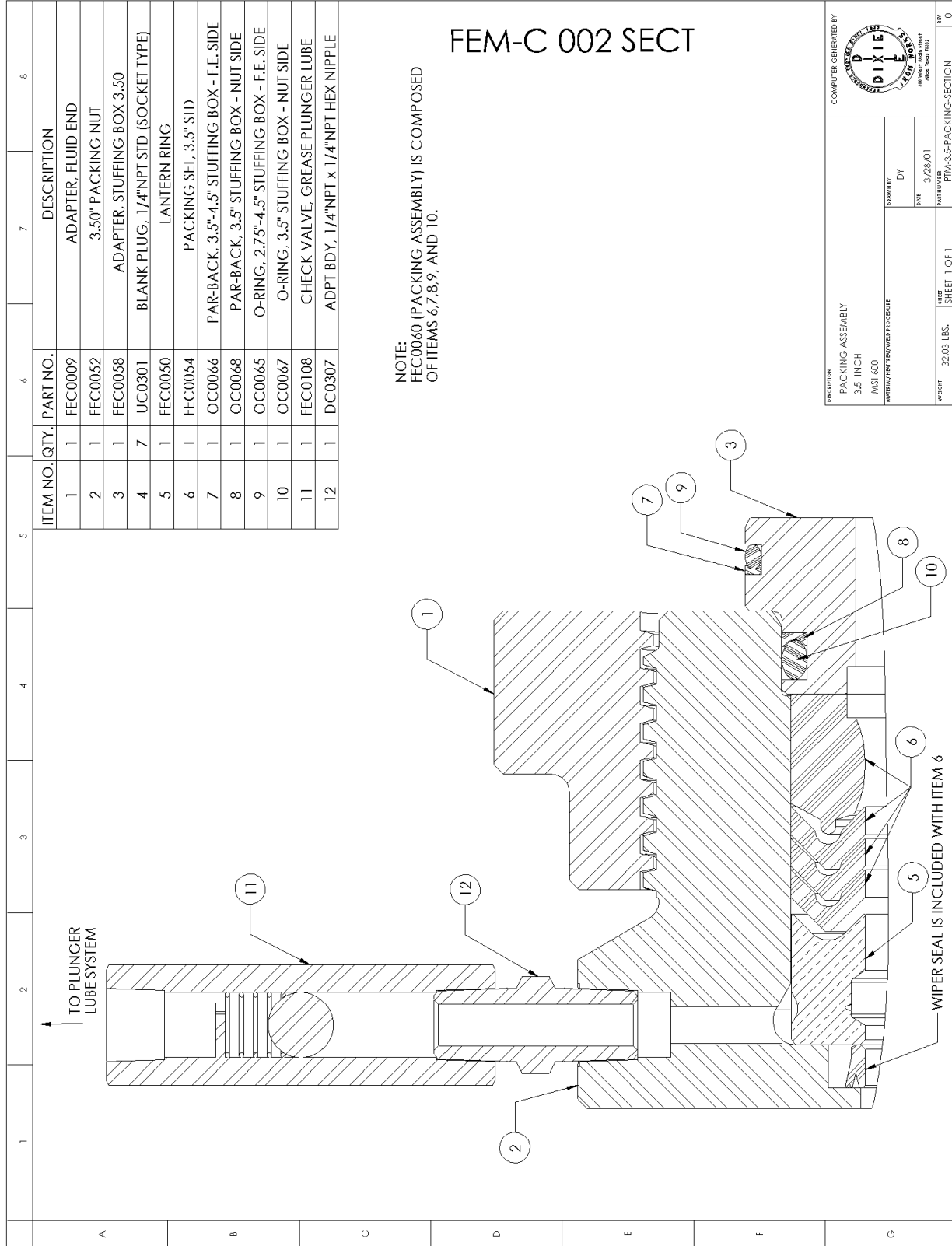
### 6.20.4 Packing Assembly 3.00 Plunger-Section View



### 6.20.5 Packing Assembly 3.50 Plunger-Exploded View

1	2	3	4	5	6	7	8																																																					
A	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">ITEM NO.</th> <th style="width: 10%;">QTY.</th> <th style="width: 30%;">PART NO.</th> <th style="width: 50%;">DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>FEC0009</td> <td>ADAPTER, FLUID END</td> </tr> <tr> <td>2</td> <td>1</td> <td>FEC0052</td> <td>3.50" PACKING NUT</td> </tr> <tr> <td>3</td> <td>1</td> <td>FEC0058</td> <td>ADAPTER, STUFFING BOX 3.50</td> </tr> <tr> <td>4</td> <td>7</td> <td>UC0301</td> <td>BLANK PLUG, 1/4"NPT STD (SOCKET TYPE)</td> </tr> <tr> <td>5</td> <td>1</td> <td>FEC0050</td> <td>L ANIERN RING</td> </tr> <tr> <td>6</td> <td>1</td> <td>FEC0054</td> <td>PACKING SET, 3.5" STD</td> </tr> <tr> <td>7</td> <td>1</td> <td>OC0066</td> <td>PAR-BACK, 3.5"-4.5" STUFFING BOX - F.E. SIDE</td> </tr> <tr> <td>8</td> <td>1</td> <td>OC0068</td> <td>PAR-BACK, 3.5" STUFFING BOX - NUT SIDE</td> </tr> <tr> <td>9</td> <td>1</td> <td>OC0065</td> <td>O-RING, 2.75"-4.5" STUFFING BOX - F.E. SIDE</td> </tr> <tr> <td>10</td> <td>1</td> <td>OC0067</td> <td>O-RING, 3.5" STUFFING BOX - NUT SIDE</td> </tr> <tr> <td>11</td> <td>1</td> <td>FEC0108</td> <td>CHECK VALVE, GREASE PLUNGER LUBE</td> </tr> <tr> <td>12</td> <td>1</td> <td>DC0307</td> <td>ADPT BDY, 1/4"NPT x 1/4"NPT HEX NIPPLE</td> </tr> </tbody> </table>						ITEM NO.	QTY.	PART NO.	DESCRIPTION	1	1	FEC0009	ADAPTER, FLUID END	2	1	FEC0052	3.50" PACKING NUT	3	1	FEC0058	ADAPTER, STUFFING BOX 3.50	4	7	UC0301	BLANK PLUG, 1/4"NPT STD (SOCKET TYPE)	5	1	FEC0050	L ANIERN RING	6	1	FEC0054	PACKING SET, 3.5" STD	7	1	OC0066	PAR-BACK, 3.5"-4.5" STUFFING BOX - F.E. SIDE	8	1	OC0068	PAR-BACK, 3.5" STUFFING BOX - NUT SIDE	9	1	OC0065	O-RING, 2.75"-4.5" STUFFING BOX - F.E. SIDE	10	1	OC0067	O-RING, 3.5" STUFFING BOX - NUT SIDE	11	1	FEC0108	CHECK VALVE, GREASE PLUNGER LUBE	12	1	DC0307	ADPT BDY, 1/4"NPT x 1/4"NPT HEX NIPPLE		
ITEM NO.	QTY.	PART NO.	DESCRIPTION																																																									
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12	1	DC0307	ADPT BDY, 1/4"NPT x 1/4"NPT HEX NIPPLE																																																									
B	<div style="text-align: center;"> </div>						<p style="font-size: 24pt; margin: 0;">FEM-C 002</p>																																																					
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G	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;">                 FACEBOOK                  PACKING ASSEMBLY                  3.5 INCH                  MSI 600                  WATER/TREAT/TREAT/WELD PROCEDURE             </td> <td style="width: 50%; vertical-align: top;">                 COMPUTER GENERATED BY                    DATE 3/25/01                  PART NO PTM-3.5-PACKING-EXPLODED             </td> </tr> </table>						FACEBOOK PACKING ASSEMBLY 3.5 INCH MSI 600 WATER/TREAT/TREAT/WELD PROCEDURE	COMPUTER GENERATED BY  DATE 3/25/01 PART NO PTM-3.5-PACKING-EXPLODED																																																				
FACEBOOK PACKING ASSEMBLY 3.5 INCH MSI 600 WATER/TREAT/TREAT/WELD PROCEDURE	COMPUTER GENERATED BY  DATE 3/25/01 PART NO PTM-3.5-PACKING-EXPLODED																																																											
WEIGHT 32.03 LBS.						SHEET 1 OF 1																																																						
						REV 0																																																						

### 6.20.6 Packing Assembly 3.50 Plunger-Section View



COMPUTER GENERATED BY

380 West 10th Street  
Muskogee, Texas 75602

DRAWING NUMBER: M/S 600 PART NUMBER: M/S 600	DRAWN BY: DY DATE: 3/28/01 PART NUMBER: FEM-3.5-PACKING-SECTION
WEIGHT: 32.03 LBS. SHEET: 1 OF 1	REV: 0

### 6.20.7 Packing Assembly 4.00 Plunger-Exploded View

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	FEC0053	4.00" PACKING NUT
2	1	FEC0009	ADAPTER, FLUID END
3	1	FEC0059	ADAPTER, STUFFING BOX
4	1	FEC0051	LANTERN RING
5	1	FEC0055	PACKING SET, 4" STD
6	7	UC0301	BLANK PLUG, 1/4"NPT STD (SOCKET TYPE)
7	1	OC0065	O-RING, 2.75"-4.5" STUFFING BOX - F.E. SIDE
8	1	OC0070	PAR-BACK, 3.5"-4.5" STUFFING BOX - F.E. SIDE
9	1	OC0066	PAR-BACK, 3.5"-4.5" STUFFING BOX - F.E. SIDE
10	1	OC0069	O-RING, 4" STUFFING BOX, NUT SIDE
11	1	FEC0108	CHECK VALVE, GREASE PLUNGER LUBE
12	1	DC0307	ADPT BDY, 1/4"NPT x 1/4"NPT HEX NIPPLE

## FEM-D 002

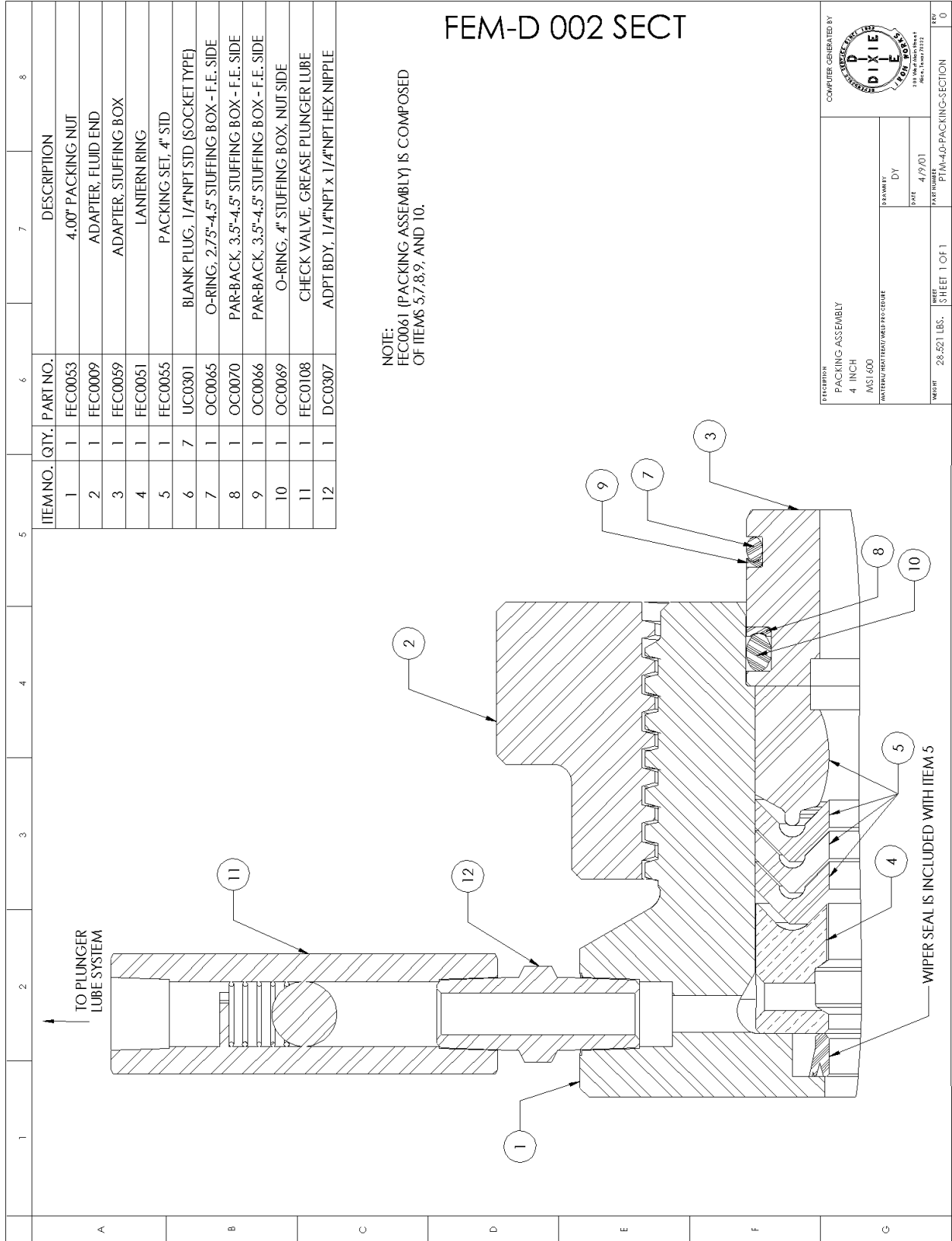
NOTE: THIS ITEM IS INCLUDED WITH ITEM 5

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	FEC0053	4.00" PACKING NUT
2	1	FEC0009	ADAPTER, FLUID END
3	1	FEC0059	ADAPTER, STUFFING BOX
4	1	FEC0051	LANTERN RING
5	1	FEC0055	PACKING SET, 4" STD
6	7	UC0301	BLANK PLUG, 1/4"NPT STD (SOCKET TYPE)
7	1	OC0065	O-RING, 2.75"-4.5" STUFFING BOX - F.E. SIDE
8	1	OC0070	PAR-BACK, 3.5"-4.5" STUFFING BOX - F.E. SIDE
9	1	OC0066	PAR-BACK, 3.5"-4.5" STUFFING BOX - F.E. SIDE
10	1	OC0069	O-RING, 4" STUFFING BOX, NUT SIDE
11	1	FEC0108	CHECK VALVE, GREASE PLUNGER LUBE
12	1	DC0307	ADPT BDY, 1/4"NPT x 1/4"NPT HEX NIPPLE

<small>FIGURE NO.</small>	PACKING ASSEMBLY	<small>DATE</small>	4/9/01	<small>REV</small>	0
<small>DESCRIPTION</small>	4 INCH	<small>BY</small>	DY	<small>APP'D</small>	
<small>MANUFACTURED TO</small>	MSI 600	<small>DATE</small>	4/9/01	<small>REV</small>	
<small>WEIGHT</small>	28.521 LBS.	<small>PART NO.</small>	PTM-40-PACKING-EXPLODED	<small>REV</small>	
<small>SHEET</small>	SHEET 1 OF 1	<small>DATE</small>		<small>REV</small>	

### 6.20.8 Packing Assembly 4.00 Plunger-Section View



### 6.20.9 Packing Assembly 4.50 Plunger-Exploded View

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	FEC0037	4.5" PACKING NUT
2	1	FEC0009	ADAPTER, FLUID END
3	1	FEC0036	ADAPTER, STUFFING BOX
4	1	FEC0039	LANTERN RING
5	1	FEC0040	PACKING SET, 4.5" STD
6	7	UC0301	BLANK PLUG, 1/4"NPT STD (SOCKET TYPE)
7	1	OC0065	O-RING, 2.75"-4.5" STUFFING BOX - F.E. SIDE
8	1	OC0066	PAR-BACK, 3.5"-4.5" STUFFING BOX - F.E. SIDE
9	1	OC0072	PAR-BACK, 4.5" STUFFING BOX - NUT SIDE
10	1	OC0071	O-RING, 4.5" STUFFING BOX - NUT SIDE
11	1	FEC0108	CHECK VALVE, GREASE PLUNGER LUBE
12	1	DC0307	ADPT BDY, 1/4"NPT x 1/4"NPT HEX NIPPLE

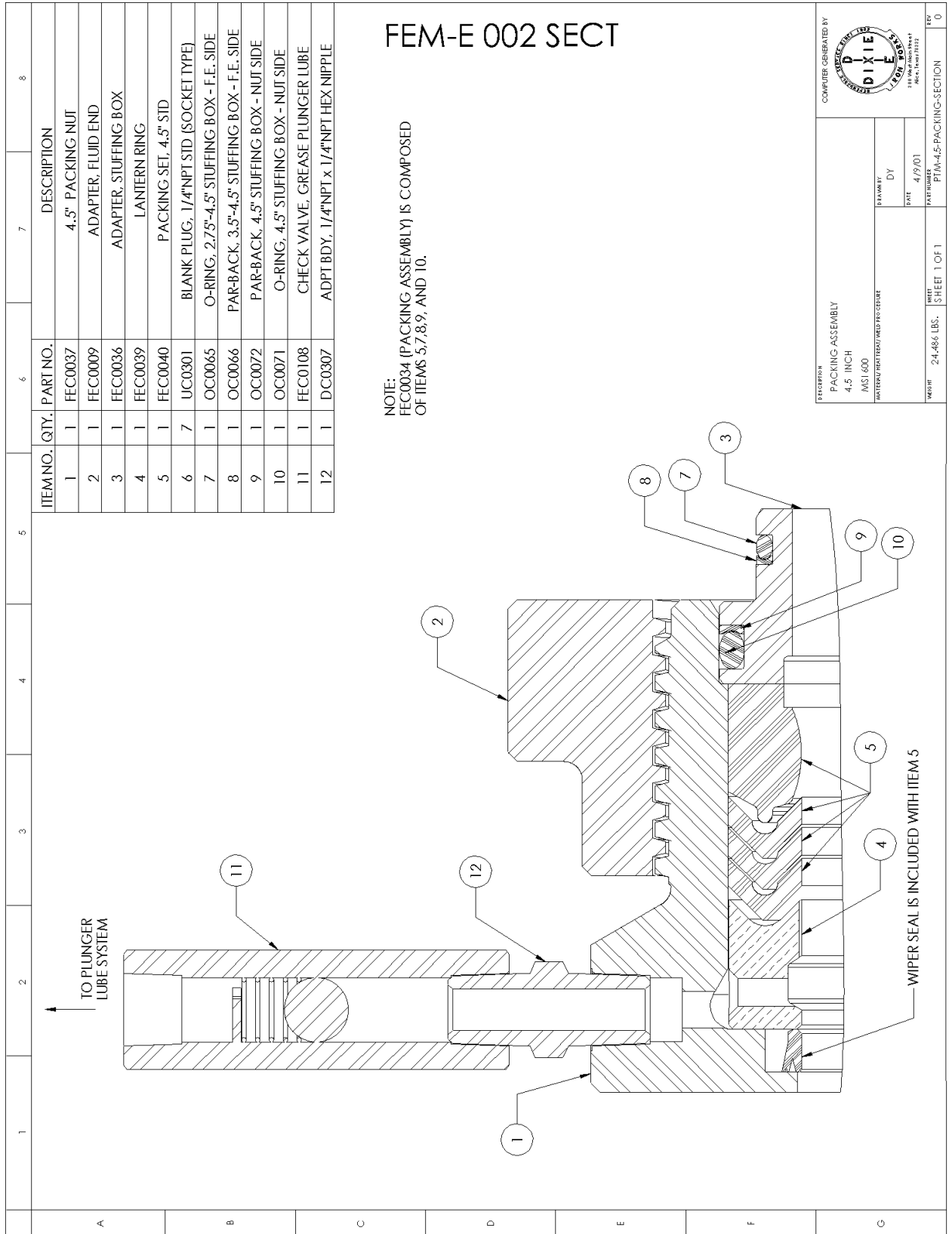
  

## FEM-E 002

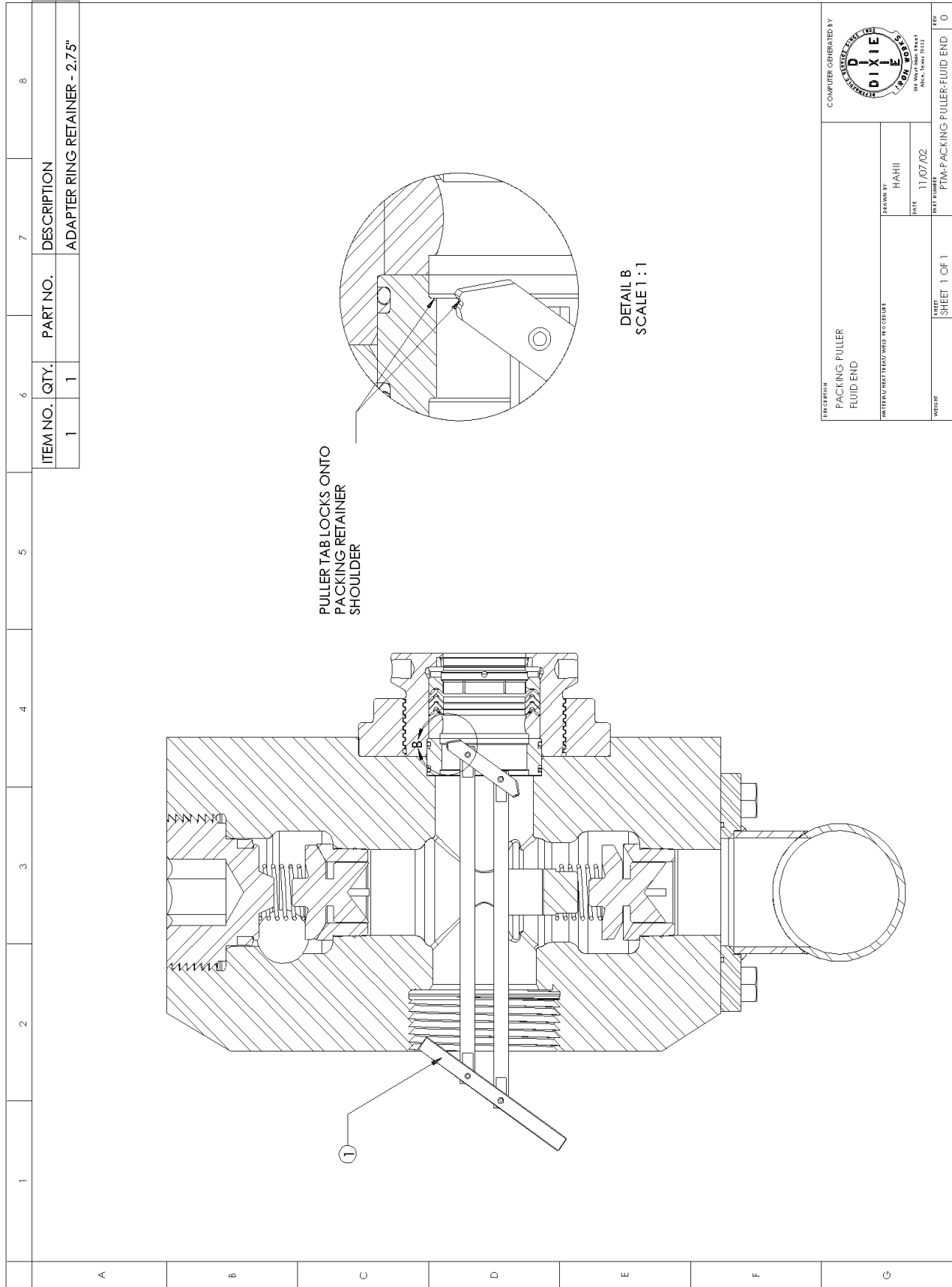
NOTE:  
THIS ITEM IS INCLUDED WITH ITEM 5

DESCRIPTION PACKING ASSEMBLY 4.5 INCH AMSI 600 ANTI-ROTARY TEST/WELD PROCEDURE	COMPUTER GENERATED BY DRAWN BY DATE 4/9/01
WEIGHT 24.486 LBS.	SHEET 1 OF 1
PART NUMBER PTM-4.5-PACKING-EXPLODED	
REV 0	

# 6.20.10 Packing Assembly 4.50 Plunger-Section View



# 6.31 Packing Tool Remover in Fluid End

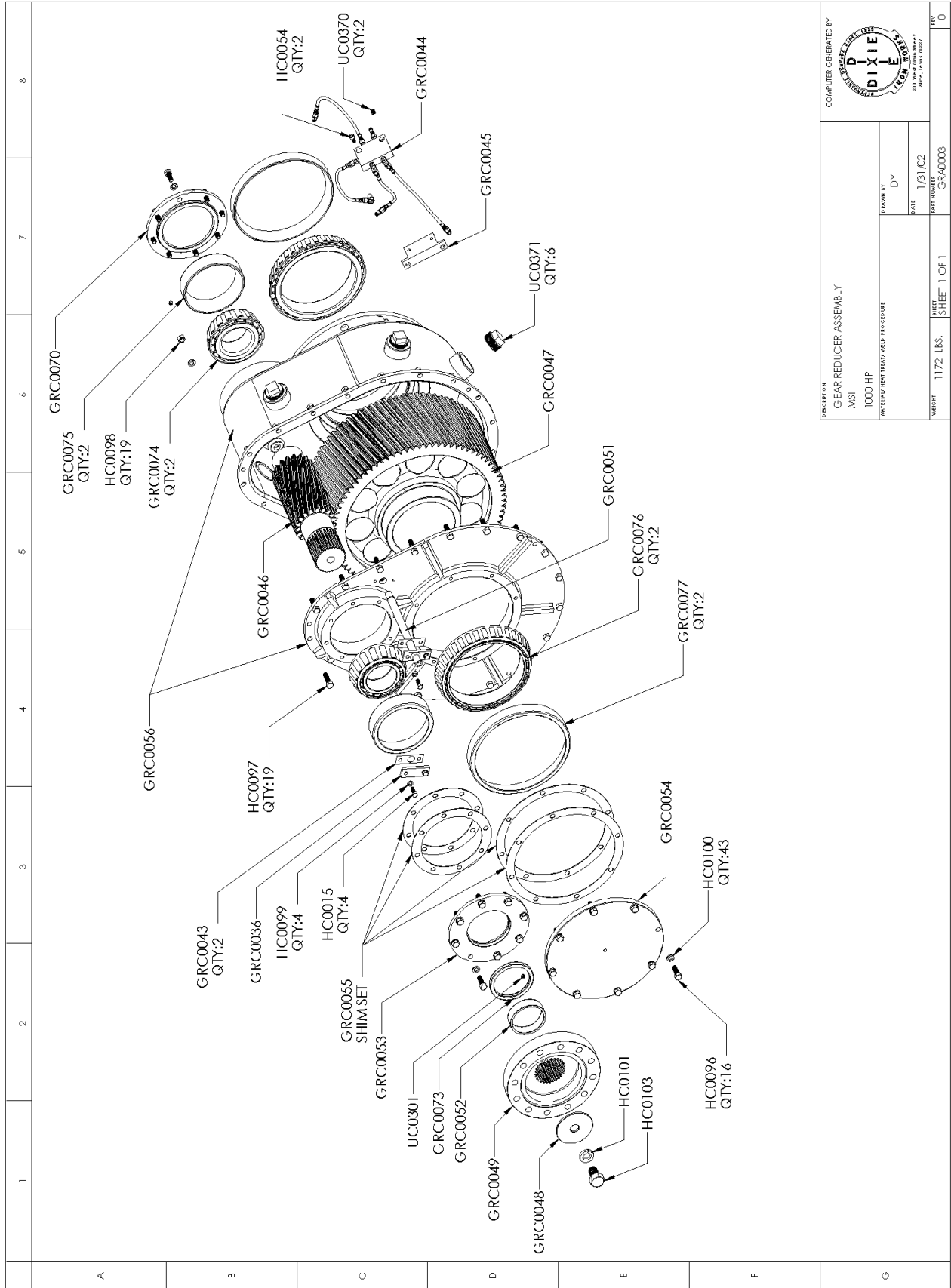





# 7.20 Gear Box Lube Lines

1	2	3	4	5	6	7	8
				ITEM NO. QTY. PART NO. DESCRIPTION			
A				1 1 GRC0045 MANIFOLD BRACKET			
				2 1 GRC0044 MANIFOLD BLOCK, 1/4"NPT x 6			
				3 1 UC0301 BLANK PLUG, 1/4"NPT STD. (SOCKET TYPE)			
				5 2 HC0054 SOC. HD, 3/8"-16 x 0.75			
				6 1 GRC0028 HOSE ASSEMBLY, LUBE PIPE (1000HP) x 10"			
				7 1 GRC0029 HOSE ASSEMBLY, PINION CAP (1000HP) x 15"			
				8 1 GRC0030 HOSE ASSEMBLY, PINION RETAINER (1000HP) x 9.5"			
				9 1 GRC0031 HOSE ASSEMBLY, BEARING COVER (1000HP) x 13.5"			
B							
C							
D	<p>ORDER COMPLETE LUBE ASSEMBLY AS GRC0019</p>						
E	<p>DESCRIPTION: GEAR REDUCER LUBE LINES GRC0003 ANSI 1000HP WATERWELD HOT TREAT WELD PROCEDURE</p>						
F	<p>COMPUTER GENERATED BY DIXIE STEEL FAB. CO. MILWAUKEE, WIS. 53212</p>						
G	<p>DESIGNED BY: DY DATE: 1/31/02 PART NUMBER: GRC0003</p>						
	<p>WEIGHT: 1172 LBS. SHEET 1 OF 1</p>						
	<p>REV: 0</p>						

# 7.30 Gear Box –Exploded View



COMPILES GENERATED BY			
DESCRIPTION		GEAR REDUCER ASSEMBLY IMSI 1000 HP WATERWAY TEST TIGHT W/EP. PRE-CEDURE	
DRAWN BY		DY	
DATE		1/31/02	
PART NUMBER		GRA0003	
WEIGHT		1172 LBS.	
SHEET		SHEET 1 OF 1	
REV		0	