LeTourneau TECHNOLOGIES™ DRILLING SYSTEMS

Parts Catalogue

Schahin Engenharia, S.A.
Baerfield Drilling
W2215-159
Triplex Pump

Read this manual completely before ordering spare parts for this pump

Caution

Pumps are shipped dry.
Fill with proper lubricant before operating.
See Maintenance Manual.

6500 Brittmoore, Houston, Texas 77041 PO Box 41343, Houston, Texas 77241-1343
832-872-6500 1-866-946-5333 FAX: 832-782-6627
www.letourneau-inc.com/drilling pumps@let-tech.com

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Introduction

Serial Number and Ordering Information

Configuration Drawing Number

- Unitization W2215-159
- Bareshaft Pump Assembly D164015
- Crankshaft Assembly D164224
- Pinion Shaft Assembly D164507
- Crosshead Assembly D164400
- Fluid End Assembly D164758
- Frame Assembly D164101
- Lube Oil Schematic D105362

Introduction

This manual is intended to be a valuable service tool. Before placing the mud pump in service, study this manual thoroughly. Your familiarity with the contents will help to complete any service work quickly and correctly.

Qualified personnel should immediately check all equipment shipped. Pay particular attention to those parts that were unprotected in shipment and susceptible to damage. Inspect all surfaces and immediately correct any damage prior to installing the equipment. Small, separately packed items should be inspected for damage and missing parts. After inspection, these items should be safely repacked until needed.

Serial Number

Model: ***W2215***

Serial Number: ***159***

Ordering Information

When ordering parts for a machine, be sure to furnish both the model and serial number of the pump.

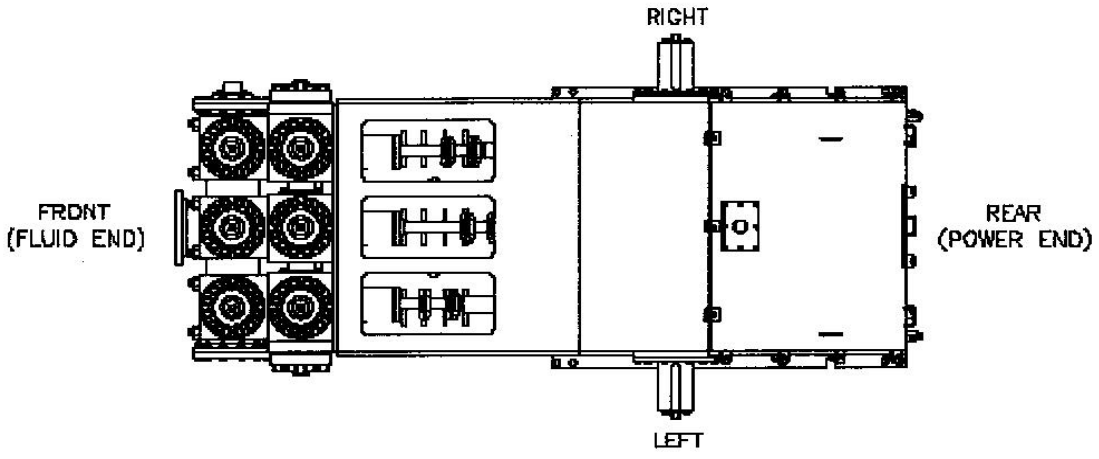
Please provide the following information:

- the name and number of the part,
- the number of the assembly drawing where the part is listed,
- the quantity of parts required,
- complete shipping instructions including destination and carriers.

We strive to give the best possible service to you, our customer. Should you encounter some difficulty, a clear statement of facts will enable us to analyze the problem and make a helpful recommendation about parts and servicing.

Contact: partsales@letourneautechnologies.com, or partsales@let-tech.com

For the sake of clarification of terminology in service work or parts ordering, use the diagram provided below to differentiate between RIGHT, LEFT, FRONT, and REAR of the pump.



Parts list for :

W2215-159



PUMP-MUD, W2215 BAERFIELD

SEQ	PART	QUANTITY	DESCRIPTION
1	D164015	1.00	PUMP-BARESHAFT, W2215 7.5K
2	D106034	1.00	SKID-MASTER, W2200 TOP MNT DRV
3	400-9544	16.00	BOLT HX 1.250 7NC 3.75 G8
4	EN115	16.00	NUT-HEX,HVY 1.250 7 NC A194-2H
5	002-1554	16.00	WASHER-FLAT, 1.250" WIDE
6	002-1545	16.00	WASHER-LOCK, 1.250"
7	M33HM28ZZZZ00Z002	1.00	MOTOR ASSY,1150HP,SCHAHIN,
8	M33HM18ZZZZ00Z001	1.00	MOTOR ASSY,1150HP,SCHAHIN,
9	400-9605	8.00	CSCR HEX 1.500 6NC 3.25 G8
10	002-5776	8.00	WASHER-LOCK, 1.500"
11	D106048	1.00	GUARD-BELT, LH W2215
12	D106049	1.00	GUARD-BELT, RH W2215
13	108-1225	2.00	BELT KEVLAR 12 RIB 8V 2240
14	B107019	2.00	SHEAVE-V BELT, 12-8V 4500 S E7
15	108-0040	2.00	BUSHING-QD, 9-3/4 S 2 X 1/4
16	B107022	2.00	SHEAVE-V BELT, 12-8V 22.5 752
17	D106036	1.00	STRUCTURE-TOP FRAME
18	EC208	24.00	CSCR SK 1-14 UNS 2.50 G8
19	B164716	1.00	TANK-LINER WASH, W-2200 TALL
20	B164717	2.00	LID-LINER WASH TANK, W-2200
21	EP237	1.00	PUMP-LINER WASH, 1X1-1/2C 3HP
22	B105512	1.00	MOUNT-OIL FILTER
23	C167540	2.00	CROSS-STRAINER,7.5K 5 1/8"
24	B167545	2.00	STRAINER-CAGE,SS 5K & 10K 1700
25	ES407	120.00	STUD 1.125 12UNF 6.00 1.50 B7
26	EN143	120.00	NUT-HEX,HVY 1.125 12 NF A194-2

Parts list for :

W2215-159

PUMP-MUD, W2215 BAERFIELD

SEQ	PART	QUANTITY	DESCRIPTION
27	108-0100	8.00	GASKET-RING,BX-169S
28	EG199	2.00	GASKET-RING,BX-169SS
29	EG197	1.00	GASKET-RING,BX-152SS
30	108-0103	3.00	FLANGE-BLIND, 5-1/8" 10000 PSI
31	A105286	1.00	FLANGE-W/N, 5-1/8 (5" ID) 10K
32	108-0117	1.00	FLANGE-W/N, 5-1/8 3XXH 10K
33	B105280	1.00	ELBOW-FLANGED, 5-1/8 X 2-1/16
34	ES427	8.00	STUD .750 10NC 5.25 B7
35	EN110	16.00	NUT-HEX,HVY .750 10 NC A194-2H
36	C305026	2.00	DAMPENER-PULSATION, L20 7-1/2K
37	108-0618	2.00	BLADDER L-20 DIAPHRAGM 20 GAL
38	A305015	2.00	NAMEPLATE, DAMPENER SERIAL NO.
39	B167542	2.00	SPOOL 7½K PSI 5 1/8X4 1/16
40	108-1322	1.00	VALVE-RELIEF, 7.5 KSI RRV
41	EG230	1.00	GAUGE 2" 10K FLNG'D #8 SSINLAY
42	B105102	1.00	DAMPENER-SUCTION, W-2200
43	B105063	1.00	FLANGE-SUCTION DAMPENER, 12"
44	108-0120	1.00	FLANGE-BLIND, 12" 150 LB RF
45	EG163	2.00	GASKET 150# RF FLANGE 12"
46	002-1664	24.00	BOLT HX .875 9NC 4.00 G8
47	002-1543	24.00	WASHER-LOCK, 0.875"
48	002-1529	24.00	NUT-HEX, .875 9 NC G8
49	108-1054	1.00	EXCHANGER-HEAT, M6-MFG 16 PLT
50	108-1055	1.00	EXCHANGER-HEAT, M3-FG 36 PLT
51	108-0764	1.00	SWITCH-LOW PRESSURE
52	D105135	1.00	CRANE-JIB, W2200

Parts list for :

W2215-159



PUMP-MUD, W2215 BAERFIELD

SEQ	PART	QUANTITY	DESCRIPTION
53	108-1041	1.00	TROLLEY, ½TON F/6" WIDE BEAM
54	108-1040	1.00	HOIST-CHAIN, 1/2 TON 12' LIFT
55	002-1644	16.00	BOLT HX .750 10NC 2.00 G8
56	002-1542	24.00	WASHER-LOCK, 0.750" ZINC
57	108-0089	1.00	NAMEPLATE, "LEWCO" 3" X 5"
58	108-0083	1.00	NAMEPLATE, ROTATION CW 2¼X6
59	108-0084	1.00	NAMEPLATE, ROTATION CCW 2¼X6
60	108-0776	1.00	NAMEPLATE, OP/SERVICE WARNING
61	108-0090	1.00	NAMEPLATE, WARNING KEV BLT
62	A105510	1.00	NAMEPLATE, MAIN LUBE MANIFOLD
63	A105511	1.00	NAMEPLATE, XHEAD LUBE MANIFOLD
64	108-1196	2.00	NAMEPLATE, HIGH VOLTAGE WARN
65	108-1197	2.00	NAMEPLATE, DISCONNECT SERVICE
66	B106084	1.00	ASSEMBLY-LUBE PUMP, #3
67	B105658	2.00	PLATE-STRAINER CROSS SUPPORT
68	400-9523	8.00	BOLT HX .750 10NC 1.50 G8
69	A105245	4.00	PAD-MOUNTING
70	A105246	4.00	PAD-TAPPED
71	500-2568	2.00	PAD-TAPPED
72	082-7222	4.00	BOLT HX .500 13NC 2.00 G8
73	080-1181	4.00	WASHER-LOCK, 0.500"
74	C105679	1.00	MOUNT-PRESSURE SWITCH
75	B105680	1.00	MOUNT-PRESSURE SWITCH
76	108-0609	1.00	COUNTER-STROKE, MAG MD TOTCO
77	002-1630	4.00	BOLT HX .625 11NC 2.00 G8
78	019-8721	4.00	NUT-HEX, .625 11 NC G8

Parts list for :

W2215-159

PUMP-MUD, W2215 BAERFIELD

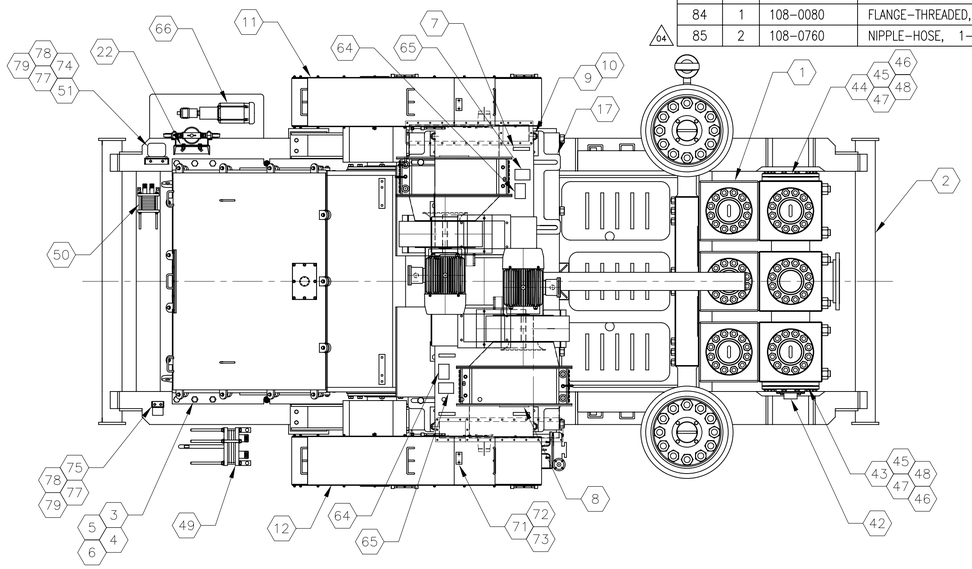
SEQ	PART	QUANTITY	DESCRIPTION
79	002-1541	4.00	WASHER-LOCK, 0.625"
80	ES452	1.00	SWITCH-LOW PRESSURE
81	108-0081	1.00	FLANGE-THREADED, 1" 150 LB
82	EF124	1.00	PIPE STRAINER WATTS 1-1/4"
83	EG130	1.00	GAUGE 2.5 LIQ 0-60 SS BTM MNT
84	108-0080	1.00	FLANGE-THREADED, 1-1/2" 150 LB
85	108-0760	2.00	NIPPLE-HOSE, 1-1/2" NPT KING

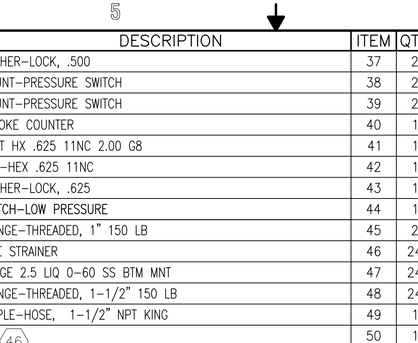
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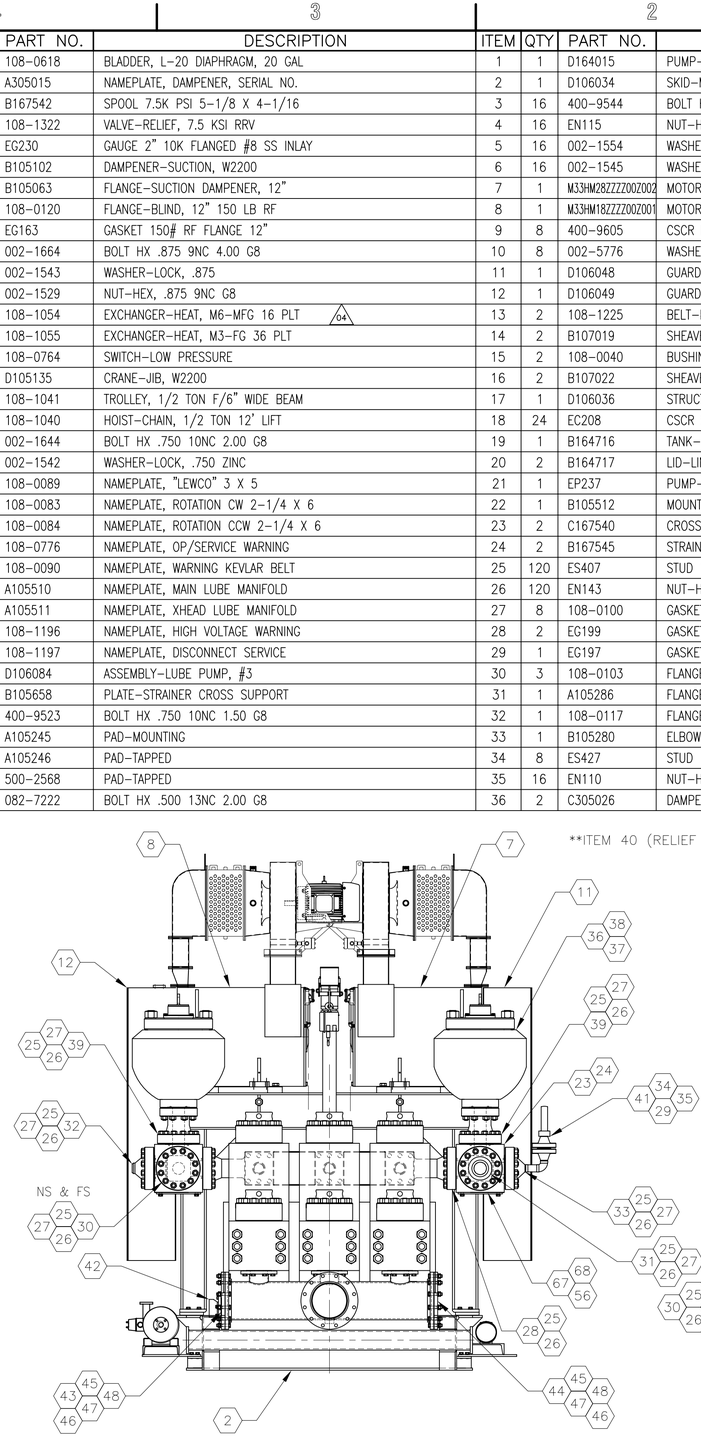
ITEM	QTY	PART NO.	DESCRIPTION
73	4	080-1181	WASHER-LOCK, .500
74	1	C105679	MOUNT-PRESSURE SWITCH
75	1	B105680	MOUNT-PRESSURE SWITCH
76	1	108-0609	STROKE COUNTER
77	4	002-1630	BOLT HX .625 11NC 2.00 G8
78	4	019-8721	NUT-HEX .625 11NC
79	4	002-1541	WASHER-LOCK, .625
80	1	ES452	SWITCH-LOW PRESSURE
81	1	108-0081	FLANGE-THREADED, 1" 150 LB
82	1	EF124	PIPE STRAINER
83	1	EG130	GAUGE 2.5 LIQ 0-60 SS BTM MNT
84	1	108-0080	FLANGE-THREADED, 1-1/2" 150 LB
04	85	2	108-0760	NIPPLE-HOSE, 1-1/2" NPT KING

ITEM	QTY	PART NO.	DESCRIPTION
37	2	108-0618	BLADDER, L-20 DIAPHRAGM, 20 GAL
38	2	A305015	NAMEPLATE, DAMPENER, SERIAL NO.
39	2	B167542	SPOOL 7.5K PSI 5-1/8 X 4-1/16
40	1	108-1322	VALVE-RELIEF, 7.5 KSI RRV
41	1	EG230	GAUGE 2" 10K FLANGED #8 SS INLAY
42	1	B105102	DAMPENER-SUCTION, W2200
43	1	B105063	FLANGE-SUCTION DAMPENER, 12"
44	1	108-0120	FLANGE-BLIND, 12" 150 LB RF
45	2	EG163	GASKET 150# RF FLANGE 12"
46	24	002-1664	BOLT HX .875 9NC 4.00 G8
47	24	002-1543	WASHER-LOCK, .875
48	24	002-1529	NUT-HEX, .875 9NC G8
49	1	108-1054	EXCHANGER-HEAT, M6-MFG 16 PLT 04
50	1	108-1055	EXCHANGER-HEAT, M3-FG 36 PLT
51	1	108-0764	SWITCH-LOW PRESSURE
52	1	D105135	CRANE-JIB, W2200
53	1	108-1041	TROLLEY, 1/2 TON F/6" WIDE BEAM
54	1	108-1040	HOIST-CHAIN, 1/2 TON 12' LIFT
55	16	002-1644	BOLT HX .750 10NC 2.00 G8
56	24	002-1542	WASHER-LOCK, .750 ZINC
57	1	108-0089	NAMEPLATE, "LEWCO" 3 X 5
58	1	108-0083	NAMEPLATE, ROTATION CW 2-1/4 X 6
59	1	108-0084	NAMEPLATE, ROTATION CCW 2-1/4 X 6
60	1	108-0776	NAMEPLATE, OP/SERVICE WARNING
61	1	108-0090	NAMEPLATE, WARNING KEVLAR BELT
62	1	A105510	NAMEPLATE, MAIN LUBE MANIFOLD
63	1	A105511	NAMEPLATE, XHEAD LUBE MANIFOLD
64	2	108-1196	NAMEPLATE, HIGH VOLTAGE WARNING
65	2	108-1197	NAMEPLATE, DISCONNECT SERVICE
66	1	D106084	ASSEMBLY-LUBE PUMP, #3
67	2	B105658	PLATE-STRAINER CROSS SUPPORT
68	8	400-9523	BOLT HX .750 10NC 1.50 G8
69	4	A105245	PAD-MOUNTING
70	4	A105246	PAD-TAPPED
71	2	500-2568	PAD-TAPPED
72	4	082-7222	BOLT HX .500 13NC 2.00 G8

ITEM	QTY	PART NO.	DESCRIPTION
1	1	D164015	PUMP-BARESHAFT, W2215 7.5K
2	1	D106034	SKID-MASTER, W2200 TOP MOUNT DRIVE
3	16	400-9544	BOLT HX 1.250 7NC 3.75 G8
4	16	EN115	NUT-HEX, HVY 1.250 7NC A194-2H
5	16	002-1554	WASHER-FLAT, 1.250 WIDE
6	16	002-1545	WASHER-LOCK, 1.250
7	1	M33HM28ZZZZ00Z002	MOTOR-ELEC., OEM TT1150
8	1	M33HM18ZZZZ00Z001	MOTOR-ELEC., OEM TT1150
9	8	400-9605	CSCR HEX 1.500 6NC 3.25 G8
10	8	002-5776	WASHER-LOCK, 1.500
11	1	D106048	GUARD-BELT, LH W2215
12	1	D106049	GUARD-BELT, RH W2215
13	2	108-1225	BELT-KEVLAR 12 RIB 8V 2240
14	2	B107019	SHEAVE-V BELT, 12-8V 4500 S E7
15	2	108-0040	BUSHING-QD, 9-3/4 S 2 X 1/4
16	2	B107022	SHEAVE-V BELT, 12-8V 22.5 752
17	1	D106036	STRUCTURE-TOP FRAME
18	24	EC208	CSCR SK 1-14 UNS 2.50 G8
19	1	B164716	TANK-LINER WASH, W2200 TALL
20	2	B164717	LID-LINER WASH TANK, W2200
21	1	EP237	PUMP-LINER WASH, 1 X 1-1/2C 3HP
22	1	B105512	MOUNT-OIL FILTER
23	2	C167540	CROSS-STRAINER, 7.5K 5-1/8
24	2	B167545	STRAINER-CAGE, SS 5K & 10K 1700
25	120	ES407	STUD 1.125 12UNF 6.00 1.50 B7
26	120	EN143	NUT-HEX, HVY 1.125 12NF A194-2H
27	8	108-0100	GASKET-RING, BX169S
28	2	EG199	GASKET-RING, BX169SS
29	1	EG197	GASKET-RING, BX-152SS
30	3	108-0103	FLANGE-BLIND, 5-1/8 10K PSI
31	1	A105286	FLANGE-W/N, 5-1/8 (5 ID) 10K
32	1	108-0117	FLANGE-W/N, 5-1/8 3XXH 10K
33	1	B105280	ELBOW-FLANGED, 5-1/8 X 2-1/16
34	8	ES427	STUD .750 10NC 5.25 B7
35	16	EN110	NUT-HEX, HVY .750 10NC A194-2H
36	2	C305026	DAMPENER-PULSATION, L20 7.5K







**ITEM 40 (RELIEF VALVE) TO BE SHIPPED LOOSE

REVISIONS	ZONE	REV	DESCRIPTION	ECN	DATE	CHG	CHK	APP
		00	RELEASE	RL11190-02	11/2/06	WMA	CRS	JLS
		01	CHANGE ITEMS 36, 37, & 38, SEE ECN	7-0335	5/21/07	JSM	WMA	JLS
		02	ADDE ITEM #80	7-0533	6/11/07	SWN	JBG	JLS
		03	CHANGES MADE TO B.O.M	7-0779	8/2/07	SWN	JBG	JLS
		04	CHANGES MADE TO B.O.M.	7-0842	8/20/07	SWN	JBG	JLS

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HOUSTON, TEXAS

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UNLESS OTHERWISE SPECIFIED:
- DIMENSIONS ARE IN INCHES & APPLY BEFORE PLATING OR FINISH COATINGS.
- TOLERANCES ON: ANGLES ±1° FRACTIONS ±1/16 .XX DECIMAL ±.03 .XXX DECIMAL ±.015
- MACHINED CORNERS 1/64 X 45°
- WELD PROPERTIES SHALL MEET THE MINIMUM REQUIREMENTS OF THE BASE MATERIAL.

USED ON

		DATE
DWN	WMA	10/24/06
CHK	CRS	11/3/06
ENGR	JBG	11/3/06
MATL	SEE BOM	

THIRD ANGLE PROJECTION

W2215 TOP MOUNT DRIVE UNITIZATION

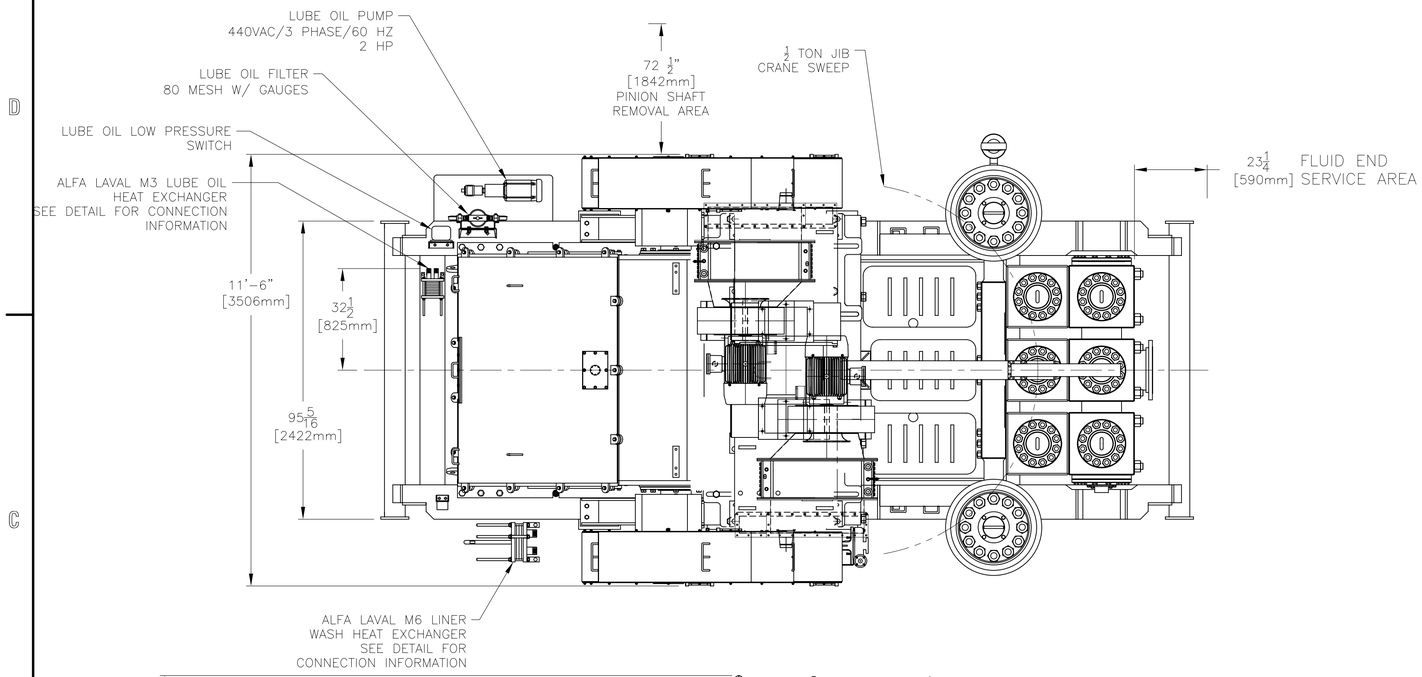
BAERFIELD

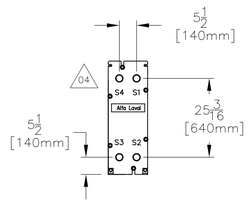
SIZE D | DO NOT SCALE | DWG NO. W2215-159 | REV 04

SCALE 1:25 | EST WT 121,000 LBS | SHEET 1 OF 2

DWG NO. W2215-159

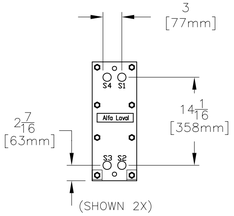
ITEM	QTY	PART NO.	DESCRIPTION





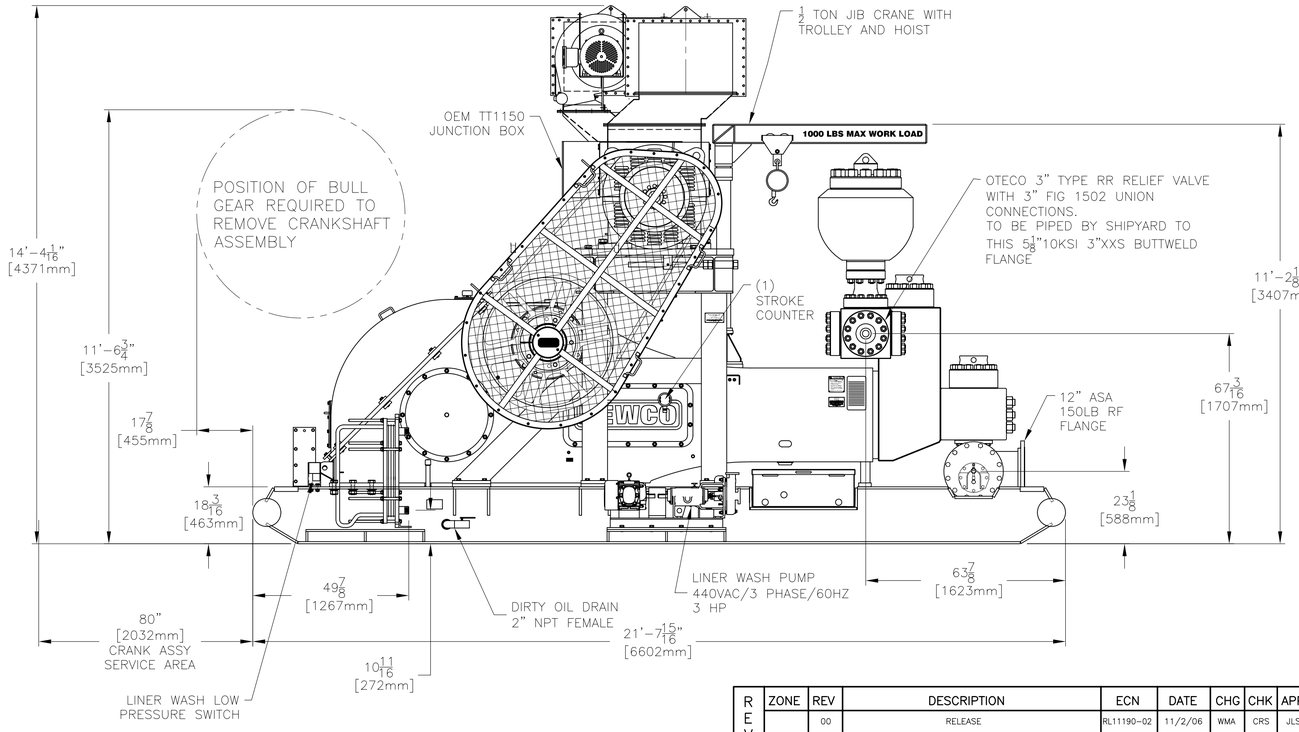
M6 LINERWASH HEAT EXCHANGER
ALL CONNECTIONS ARE 2" MALE NPT.
S1 LINER WASH (HOT) (BY LEWCO)
S2 LINER WASH (COLD) (BY LEWCO)
S3 SEA WATER (COLD)
S4 SEA WATER (HOT)

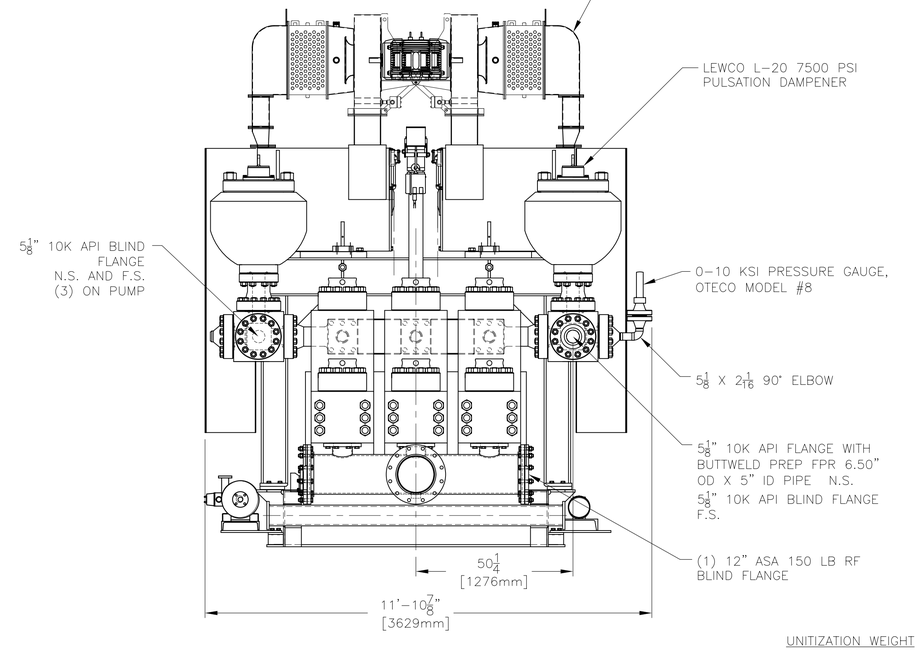
COOLING WATER
MAX PRESSURE 150 PSI
MAX TEMP 100° F
FLOW RATE 100 GPM
PRESSURE DROP 7 PSI



M3 LUBE OIL HEAT EXCHANGER
ALL CONNECTIONS ARE 1" MALE NPT.
S1 LUBE OIL (HOT) (BY LEWCO)
S2 LUBE OIL (COLD) (BY LEWCO)
S3 SEA WATER (COLD)
S4 SEA WATER (HOT)

COOLING WATER
MAX PRESSURE 150 PSI
MAX TEMP 100° F
FLOW RATE 12 GPM
PRESSURE DROP .75 PSI





UNITIZATION WEIGHT
DRY=121,000 LBS
WET=122,500 LBS

REVISIONS	ZONE	REV	DESCRIPTION	ECN	DATE	CHG	CHK	APP
		00	RELEASE	RL11190-02	11/2/06	WMA	CRS	JLS
		01	CHANGE ITEMS 36, 37, & 38, SEE ECN	7-0335	5/21/07	JSM	WMA	JLS
		02	ADDED ITEM #80	7-0533	6/11/07	SWN	JBG	JLS
		03	CHANGES MADE TO B.O.M.	7-0779	8/2/07	SWN	JBG	JLS
		04	CHANGES TO B.O.M.	7-0842	8/20/07	SWN	JBG	JLS

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UNLESS OTHERWISE SPECIFIED:
- DIMENSIONS ARE IN INCHES & APPLY BEFORE PLATING OR FINISH COATINGS.
- TOLERANCES ON: ANGLES ±1°, FRACTIONS ±1/16, .XX DECIMAL ±.03, .XXX DECIMAL ±.015
- MACHINED CORNERS 1/64 X 45°
- WELD PROPERTIES SHALL MEET THE MINIMUM REQUIREMENTS OF THE BASE MATERIAL.

USED ON

		DATE
DWN	WMA	10/30/06
CHK	CRS	11/3/06
ENGR	JBG	11/3/06
MATL		

THIRD ANGLE PROJECTION

W2215 TOP MOUNT DRIVE INSTALLATION

BAERFIELD

SIZE	DWG NO.	REV
D	W2215-159	04

DO NOT SCALE

SCALE	EST WT	SHEET
N.T.S.	SEE NOTE	2 OF 2

DWG NO. D164015

REVISIONS

ZONE	REV	DESCRIPTION	ECN	DATE	CHG	CHK	APP
	00	RELEASE	RL11185-01	9/27/06	WMA	CRS	JLS

ITEM	QTY	PART NO.	DESCRIPTION
8	3	B164428	SUB ROD
7	2	B105028	NAMEPLATE
6	1	D105362	LUBRICATION ASSEMBLY
5	1	D164758	FLUID END ASSEMBLY
4	1	D164400	CROSSHEAD ASSEMBLY
3	1	D164507	PINION SHAFT ASSEMBLY
2	1	D164224	CRANKSHAFT ASSEMBLY
1	1	D164101	FRAME ASSEMBLY

LEWCO
HOUSTON, TEXAS

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- DIMENSIONS ARE IN INCHES & APPLY BEFORE PLATING OR FINISH COATINGS.
- TOLERANCES ON: ANGLES ±1° FRACTIONS ±1/16 .XX DECIMAL ±.03 .XXX DECIMAL ±.015
- MACHINED CORNERS 1/64 X 45°
- WELD PROPERTIES SHALL MEET THE MINIMUM REQUIREMENTS OF THE BASE MATERIAL.
- ALL MACHINED SURFACES TO HAVE A FINISH OF 125 UNLESS OTHERWISE NOTED

USED ON

		DATE
DWN	WMA	9/27/06
CHK	CRS	9/27/06
ENGR	JBG	9/27/06
MATL		

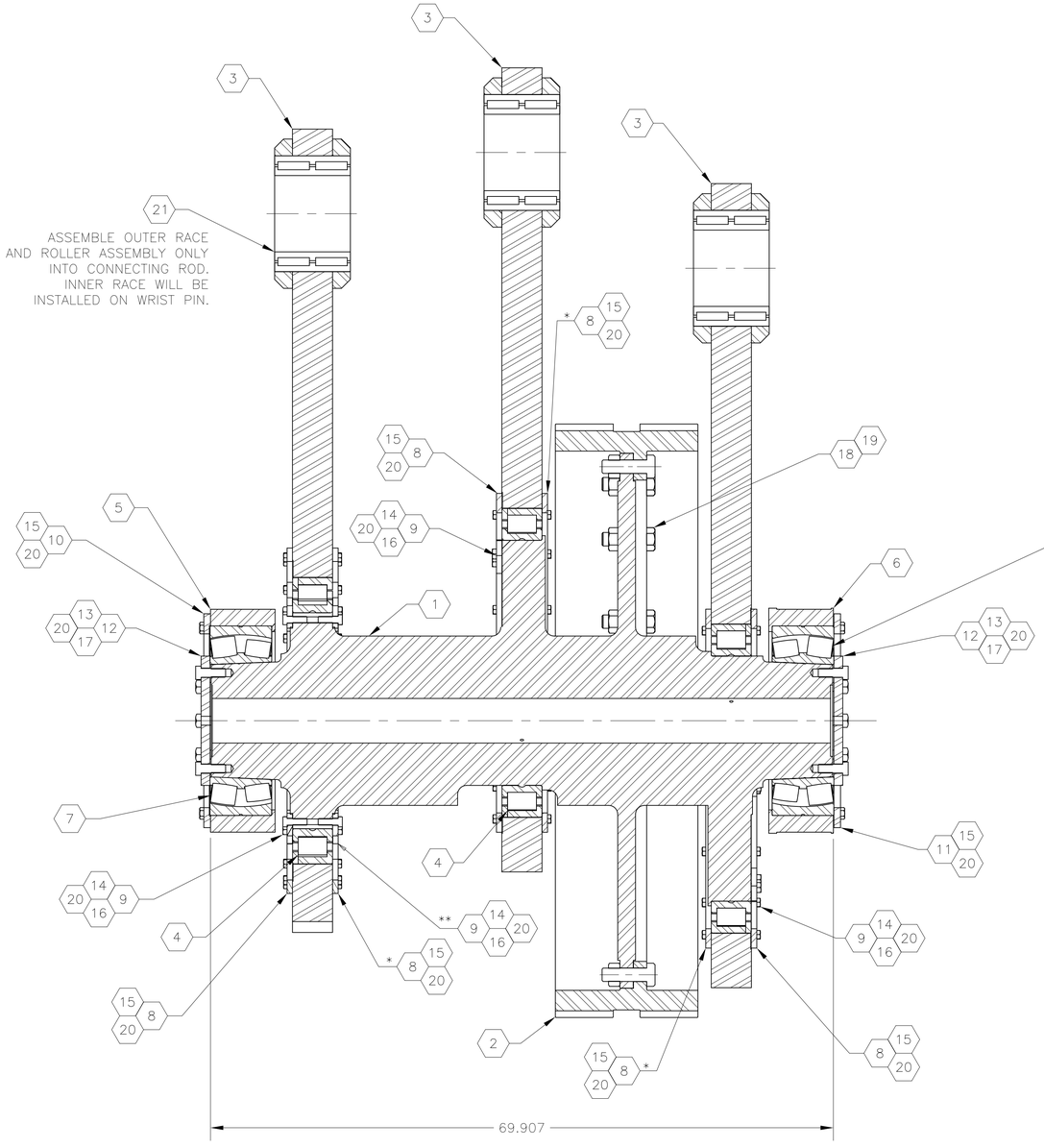
THIRD ANGLE PROJECTION

W-2215 BARE SHAFT PUMP ASSEMBLY

SSTL INLAY RING GROOVES - DISCHARGE

SIZE		DWG NO.	REV
A	DO NOT SCALE	D164015	00
SCALE N.T.S.	EST WT	SHEET 1 OF 1	

DWG NO. D164224



ITEM	QTY	PART NO.	DESCRIPTION
1	1	D164211	CRANKSHAFT MACHINED
2	1	C164223	GEAR MAIN DOUBLE HELIX
3	3	D164212	CONNECTING ROD
4	3	B164202	BEARING ECCENTRIC
5	1	B164213	CARRIER BRG LH
6	1	B164214	CARRIER BRG RH
7	2	EB119	BEARING MAIN
8	24	B164215	RETAINER ECC BRG OUTER
9	20	A167232	RETAINER ECC INNER
10	1	B164219	RETAINER BRG MAIN LH
11	1	B164204	RETAINER BRG MAIN RH
12	2	B164205	RETAINER BRG MAIN INNER
13	2	B164206	SHIM SET MAIN BRG
01 14	AR	A167244	SHIM SET ECC BRG
15	96	EB402	BOLT HX .625-11 UNC 2.250 G8 DH
16	56	EB404	BOLT HX .750-10 UNC 2.250 G8 DH
17	16	EB406	BOLT HX 1.000-8UNC 2.750 G8 DH
18	16	400-9609	BOLT HX 1.500-6UNC 5.000 G8
19	16	401-6021	NUT LOCK NYL INS 1.500-6UNC G8
20	AR	EW109	SAFETY WIRE SS .047
21	REF	B164402	BEARING WRIST PIN

MAIN BEARING INSTALLATION PROCEDURE:
1. PLACE MAIN BEARING ON SHAFT WITH HAND-TIGHT FIT (NO LOOSENESS AND NO PRESS).
2. MEASURE DISTANCE FROM END OF SHAFT TO FACE OF BEARING.
3. SUBTRACT .090 FROM DISTANCE MEASURED & ARRANGE SHIM PACK EQUAL TO RESULT.
4. INSTALL SHIMPACK (ITEM 13) TO THICKNESS DETERMINED ABOVE ±.005.
5. PRESS BRG ONTO SHAFT UNTIL END OF BRG IS FLUSH WITH SHIM PACK. FINAL DIAMETRAL CLEARANCE OF BRG MUST BE .006-.013.

BEARING FITS AND BEARING ASSEMBLY TEMPERATURE DIFFERENTIALS

ITEM NO.	BEARING DESC & TYPE	RACE	MATING PART	FIT*	NOMINAL FIT DIAMETER	MINIMUM ΔT REQD FOR SLIP FIT ASSY	REQUIRED RADIAL BRG CLEARANCE AFTER INSTALLATION
4	ECCENTRIC (CYLINDRICAL ROLLER)	INNER OUTER	SHAFT ECCENTRIC CONNECTING ROD	.0098T-.0138T .0020T-.0060T	35.500 28.500	60°F 30°F	.0030 .0110
21	WRIST PIN (NEEDLE ROLLER)	INNER OUTER	WRIST PIN CONNECTING ROD	.0020T-.0044T .0009T-.0045T	9.500 13.000	75°F 55°F	.0010 .0075
7	MAIN (SPHERICAL ROLLER)	INNER OUTER	CRANKSHAFT BEARING CARRIER	N/A .0000L-.0043L	N/A 21.260	N/A 0°F	.0060 .0130

* FIT ON DIAMETER IS SHOWN. T=TIGHT, L=LOOSE
BEARINGS MAY BE HEATED IN OIL BATH, OVEN, OR WITH INDUCTION HEATER, BUT NOT WITH TORCH.
NEVER ALLOW BEARING TEMPERATURE TO EXCEED 250°F.

* TIGHTLY INSTALL RETAINERS ON THIS SIDE OF BEARING PRIOR TO INSTALLING BEARING. INSTALL MACHINED SIDE OF RETAINER FACING BEARING.

** RETAINERS (ITEM 9) MUST BE INSTALLED & TORQUED ON THIS SIDE OF ROD PRIOR TO INSTALLING BEARING IN ROD

REVISIONS	ZONE	REV	DESCRIPTION	ECN	DATE	CHG	CHK	APP
		00	RELEASE	4-0016RL	1/28/04	RJP	WMA	JLS
		01	CHANGED QTY. TO ITEM 14 FROM: 1 TO: AR	5-0843	11/30/05	DY	WMA	JLS

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- TOLERANCES ON: ANGLES ±1° FRACTIONS ±1/16 .XX DECIMAL ±.03 .XXX DECIMAL ±.015
- MACHINED CORNERS 1/64 X 45°
- WELD PROPERTIES SHALL MEET THE MINIMUM REQUIREMENTS OF THE BASE MATERIAL.
- ALL MACHINED SURFACES TO HAVE A FINISH OF 125 UNLESS OTHERWISE NOTED

USED ON D164002

		DATE
DWN	RJP	1/28/04
CHK	WMA	1/29/04
ENGR	JBP	1/29/04
MATL		

THIRD ANGLE PROJECTION

CRANKSHAFT ASSEMBLY

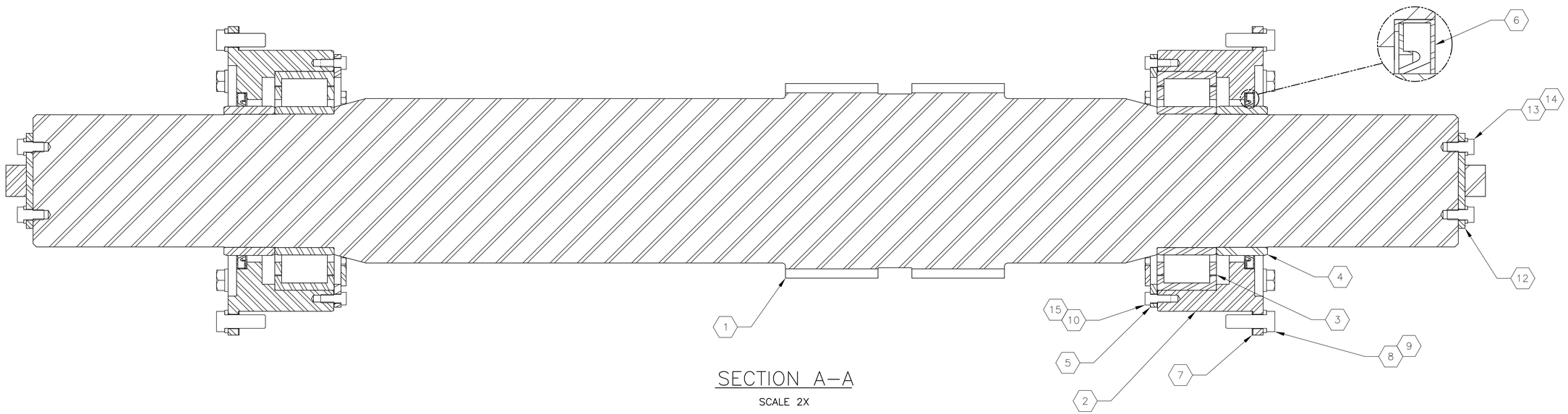
W-2200 - 30° HELIX

SIZE D | DO NOT SCALE | DWG NO. D164224 | REV 01

SCALE 1/8 | EST WT 18,000 LBS | SHEET 1 OF 1

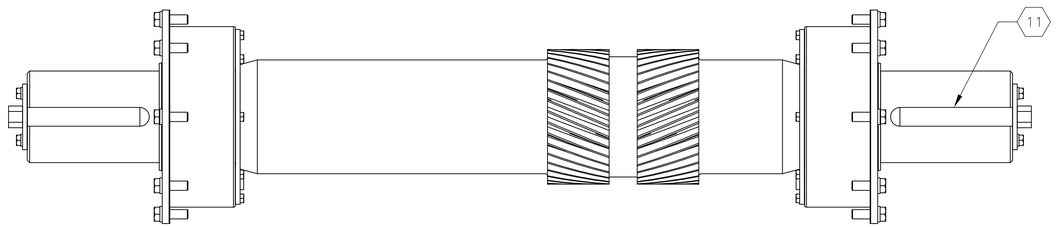
DWG NO. D164507

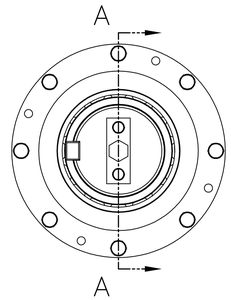
ITEM	QTY	PART NO.	DESCRIPTION
1	1	D164533	PINION SHAFT
2	2	C164529	CARRIER PINION BEARING
3	2	EB120	BEARING PINION
4	2	A164504	SPACER PINION SHAFT
5	2	A164530	RETAINER PINION BEARING STR
6	2	ES194	SEAL-OIL
7	2	A164505	GASKET PINION BEARING CARRIER
8	16	002-1544	WASHER LOCK SPR 1.000 1.66 .25
9	16	002-1668	BOLT HX 1.000-8UNC 3.000 G8
10	16	413-8337	BOLT HX .625-11 UNC 1.50 G8 DR
11	2	EK103	KEY PINION 1.500 2.000 12.000
12	2	A167314	PINION TURNING PLATE STR
13	4	400-9523	BOLT HX .750-10 UNC 1.500 G8 FT
14	4	002-1542	WASHER LOCK SPR .750 1.27 .19
15	AR	EW109	WIRE SAFETY SS .047



SECTION A-A

SCALE 2X





REVISIONS	ZONE	REV	DESCRIPTION	ECN	DATE	CHG	CHK	APP
		00	RELEASE	4-0016RL	1/29/04	RJP	WMA	JLS

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- MACHINED CORNERS 1/64 X 45°
- WELD PROPERTIES SHALL MEET THE MINIMUM REQUIREMENTS OF THE BASE MATERIAL.
- ALL MACHINED SURFACES TO HAVE A FINISH OF 125 UNLESS OTHERWISE NOTED

USED ON D164002

		DATE
DWN	RJP	01/29/04
CHK	WMA	1/29/04
ENGR	JBP	1/29/04
MATL		

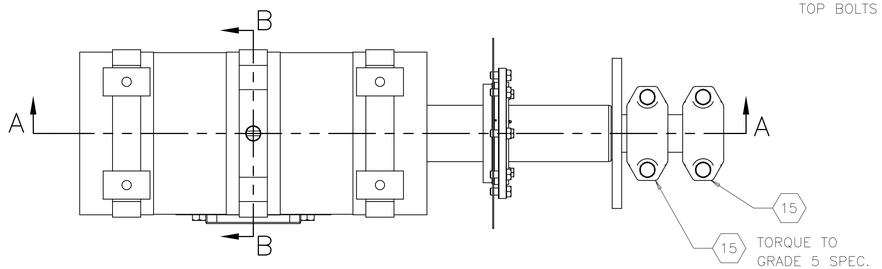
THIRD ANGLE PROJECTION

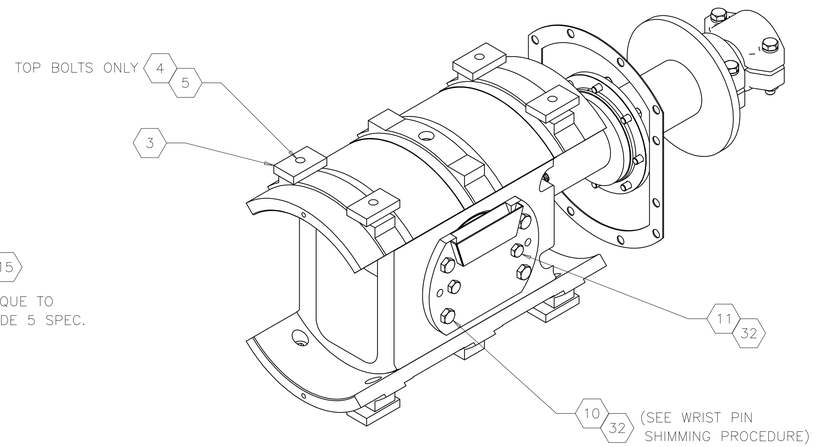
PINION SHAFT ASSEMBLY

W-2200 - 30° HELIX

SIZE D | DO NOT SCALE | DWG NO. D164507 | REV 00

SCALE 1/8 | EST WT 3700 LBS. | SHEET 1 OF 1

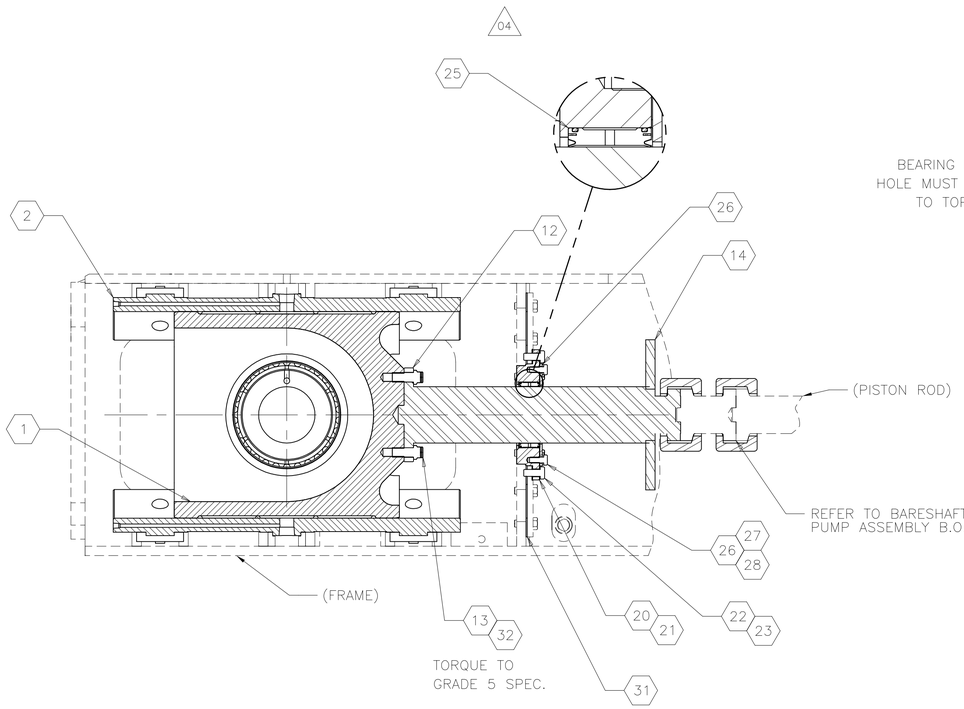




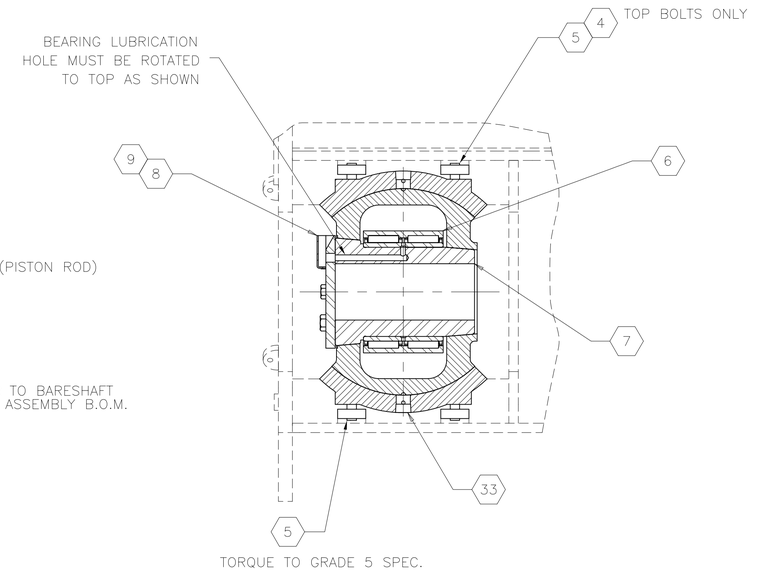
NOTE:
1. TORQUE ALL FASTENERS TO GRADE 8 SPEC UNLESS OTHERWISE NOTED.

WRIST PIN SHIMMING PROCEDURE

1. INSERT WRIST PIN (ITEM 7) INTO TAPERED BORE OF CROSSHEAD (ITEM 1)
2. INSTALL WRIST PIN RETAINER PLATE (ITEM 9) ONTO WRIST PIN USING BOLTS (ITEM 11). TORQUE BOLTS TO GRADE 8 SPEC (TORQUE ONLY THE BOLTS THAT THREAD INTO THE WRIST PIN).
3. INSTALL BOLTS (ITEM 10) THROUGH RETAINER PLATE INTO CROSSHEAD. TORQUE THE BOLTS TO 50 FT–LBS. BUMP THE WRIST PIN WITH A BRASS BAR TO SEAT IT AGAINST THE TAPER AND RE–TORQUE TO 50 FT–LBS.
4. WITH A FEELER GAUGE OR DEPTH MIC, MEASURE CLEARANCE BETWEEN WRIST PIN RETAINER PLATE AND FACE OF CROSSHEAD. THE CLEARANCE SHOULD BE APPROXIMATELY .125 INCH.
5. ASSEMBLE SHIMS FROM SHIMPACK (ITEM 8) TO THE THICKNESS MEASURED IN STEP 4, +.000/–.005. INSTALL SHIMS BETWEEN RETAINER PLATE AND CROSSHEAD.
6. TORQUE BOLTS HOLDING RETAINER PLATE TO CROSSHEAD TO GRADE 5 SPEC.
7. SAFETY WIRE ALL BOLTS.



SECTION A–A
SCALE 1X



SECTION B–B
SCALE 1X
ROTATE 90° CW

BOM QUANTITY REFLECTS (3) CROSSHEAD ASSEMBLIES

ITEM	PART NO.	QTY	DESCRIPTION
33	003–1423	3	1 1/4–NPT PLUG
32	EW109	AR	SAFTEY WIRE .047 SS
31	B164425	3	GASKET DIAPHRAM PLATE
30	EG131	3	GREASE FITTING PRESS RELIEF
29	018–4186	3	GREASE FITTING 1/8–NPT 45 DEG
28	002–1541	18	WASHER LOCK SPR .625 1.08 .16
27	002–5762	18	BOLT HX .625 1.500 NC G8
26	B164414	3	RETAINER PONY ROD SEAL
04 25	ES211	3	SEAL–STUFFING BOX, W–2200
24			
04 23	EW108	60	WASHER FLAT .750 1.322 .064 SL
22	400–9524	24	BOLT HX .750 1.750 NC G8 FT
21	A164415	3	GASKET STUFFING BOX
20	C164412	3	STUFFING BOX
19			
18			
17			
16			
15	C164323	6	CLAMP PISTON ROD
14	B164407	3	BAFFLE DISC
13	416–0813	18	CSCR 12 PT. 1.000 2.250 NC G8 DH
12	C164434	3	PONY ROD
11	A167243	6	BOLT HX .875 2.500 NC G8 DH
10	A300212	12	BOLT HX 1.000 2.500 NC G8 DH
9	C164416	3	RETAINER WRIST PIN
8	B164441	6	SHIM SET WRIST PIN
7	C164409	3	WRIST PIN
6	B164402	3	BEARING WRIST PIN
5	EC194	24	CSCR 12 PT. 1.000 NC 2.50 G8
4	EW112	12	1" LOCK WASHER INTERNAL
3	A164420	24	GUIDE CLAMP BAR
2	D164408	6	CROSSHEAD GUIDE
1	D164401	3	CROSSHEAD

REVISIONS	ZONE	REV	DESCRIPTION	ECN	DATE	CHG	CHK	APP
		A	RELEASE	RL01–1035		RJB	DS	DS
		02	SEE ECN 2–0075	2–0075	03/21/02	JBP	DS	DS
		03	PER ECN	4–0040	01/16/04	RJP	WMA	JLS
		04	REVISED PER ECN	4–0468	6/07/04	RJP	WMA	JLS

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THIRD ANGLE PROJECTION

USED ON W–2200

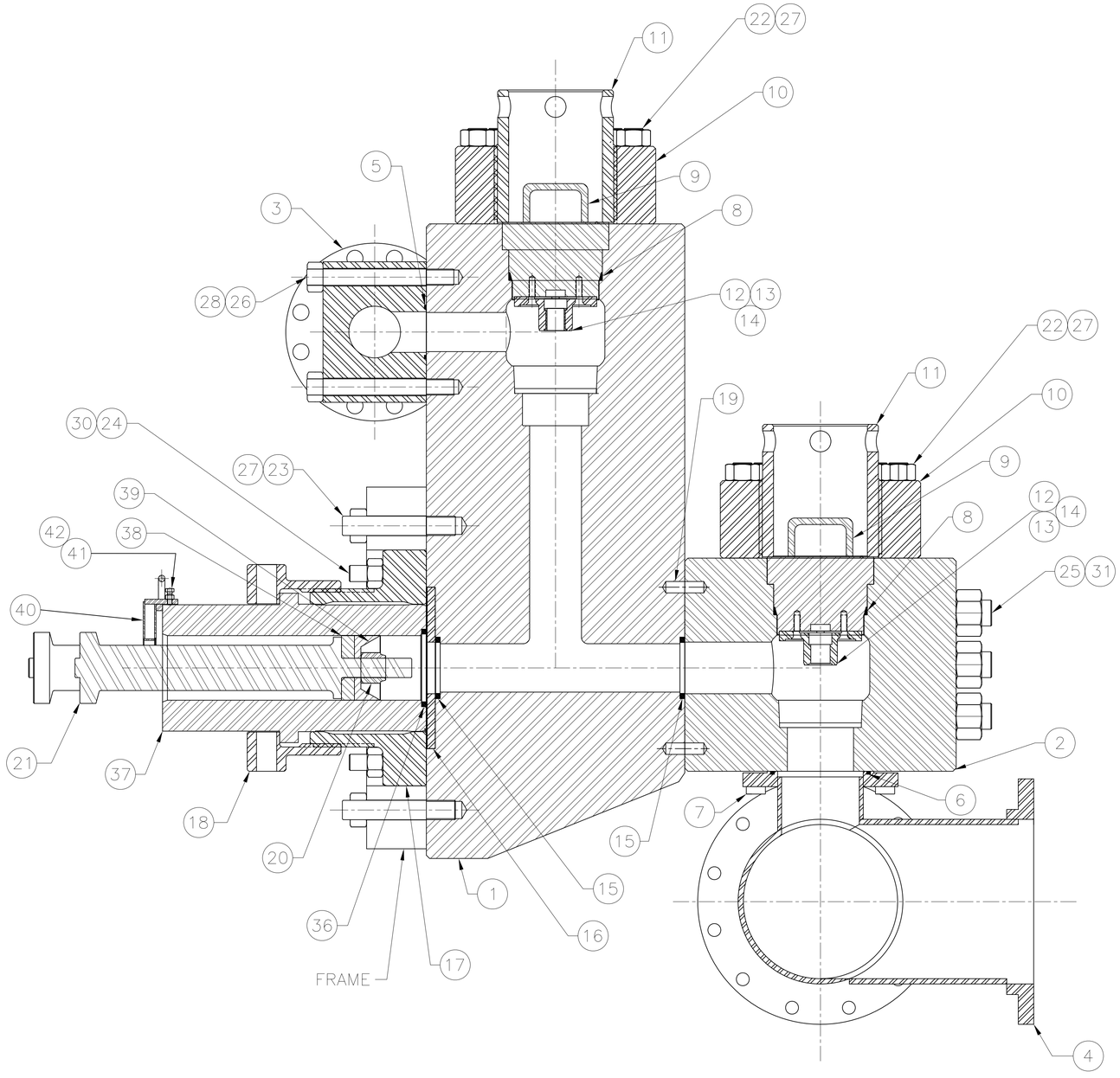
		DATE
DWN	RJB	12–14–01
CHK	DS	12–14–01
ENGR	DS	12–14–01
MATL		

CROSSHEAD ASSEMBLY

SIZE D | DO NOT SCALE | DWG NO. D164400 | REV 04

SCALE 1/8 | EST WT 2158 LBS | SHEET 1 OF 1

DWG NO. D164758



ITEM	QTY	PART NO.	DESCRIPTION
1	3	D164720	DISCHARGE MODULE
2	3	D164721	SUCTION MODULE
3	1	D164759	DISCHARGE MANIFOLD W/SSTL RING GROOVE INLAY
4	1	D164709	SUCTION MANIFOLD
5	3	E0175	ORING, DISCHARGE MANIFOLD TO FLUID END
6	3	E0301	O-RING, SUCTION MANIFOLD TO FLUID END
7	24	002-1660	BOLT HX 7/8 NC 2-1/4" G8, SUCTION MANIFOLD
8	6	A164705	GASKET, VALVE COVER
9	6	C164704	VALVE COVER
10	6	C164435	FLANGE,VALVE COVER
11	6	B164436	LOCK, VALVE COVER
12	6	C164718	VALVE GUIDE
13	6	A167708	BUSHING, VALVE GUIDE
14	12	EC220	CSCR FLAT SK .500 UNC 1.00
15	6	A167702	GASKET, MODULE & WEAR RING
16	3	B164706	WEAR PLATE
17	3	D164438	LINER LOCK FLANGE
18	3	D164439	LINER LOCK RING
19	6	A167722	DOWEL PIN 7/8 X 2" LONG, HARDENED
20	3	EN101	NUT LOCK NYLON HX 1-1/2 8UN G8, PISTON ROD
21	3	C164708	PISTON ROD
22	72	ES418	STUD 1-1/2 6NC 10" B7, VALVE COVER
23	30	ES417	STUD 1-1/2 6NC 9" B7, FLUID END
24	18	ES421	STUD 1-1/2 7NC 7" B7, LINER LOCK FLANGE
25	18	ES419	STUD 2 8UN 26-1/2" B7, SUCTION MODULE
26	18	ES420	STUD 1-1/4 6NC 11-1/4" B7, DISCHARGE MANIFOLD
27	102	002-5784	NUT HVY HX 1-1/2 6 NC, VALVE COVER
28	18	EN115	NUT HVY HX 1-1/4 7 NC, DISCHARGE MANIFOLD
29			
30	18	EN152	NUT COUPLING 1.25 7NC 2.50
31	18	EN114	NUT HVY HX 2 8UN, SUCTION MODULE
** 32	6	EV116	VALVE SPRING
** 33	REF.	EV142	VALVE INSERT
** 34	6	EV190	VALVE SEAT
** 35	6	EV178	VALVE
36	3	SEE CHT	LINER GASKET
37	3	SEE CHT	LINER
38	3	SEE CHT	PISTON
39	3	SEE CHT	PISTON RUBBER
40	3	C164440	BAFFLE STRUCTURE
41	9	081-0971	BOLT-HX .375 16NC 1.00 G8
42	9	EN125	NUT-HEX, .375 16NC G8

** THESE ITEMS NOT SHOWN

SIZE	LINER P/N	PISTON P/N	PISTON RUBBER	LINER GASKET
5	EL238	EP159	EP165	EG132
5½	EL220	EP160	EP114	EG138
6	EL221	EP117	EP115	EG139
6½	EL222	EP118	EP116	EG140
7	EL223	EP150	EP147	EG136
7½	EL224	EP151	EP148	EG142
8	EL240	EP152	EP149	EG144
# 9	EL254	EP209	EP210	EG187

REQUIRES SPECIAL RETENTION SYSTEM

REVISIONS	ZONE	REV	DESCRIPTION	ECN	DATE	CHG	CHK	APP
		00	RELEASE	RL11185-01	9/27/06	WMA	CRS	JLS

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- MACHINED CORNERS 1/64 X 45°
- WELD PROPERTIES SHALL MEET THE MINIMUM REQUIREMENTS OF THE BASE MATERIAL.

USED ON: W-2200

		DATE
DWN	WMA	9/27/06
CHK	CRS	9/27/06
ENGR	JBG	9/27/06
MATL	SEE BOM	

THIRD ANGLE PROJECTION

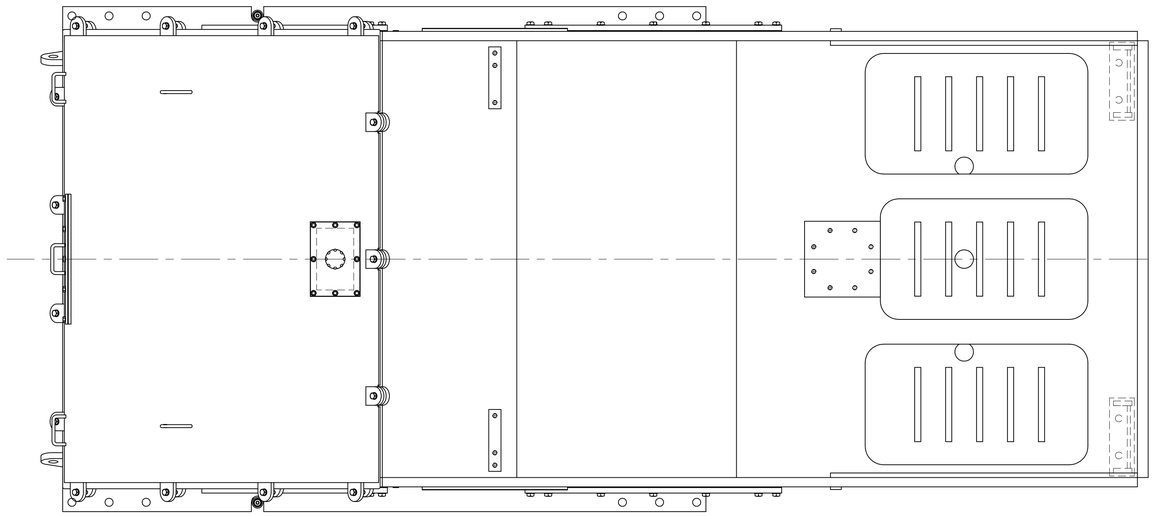
FLUID END ASSEMBLY

SW STYLE W-2200 W/SSTL RING GROOVE

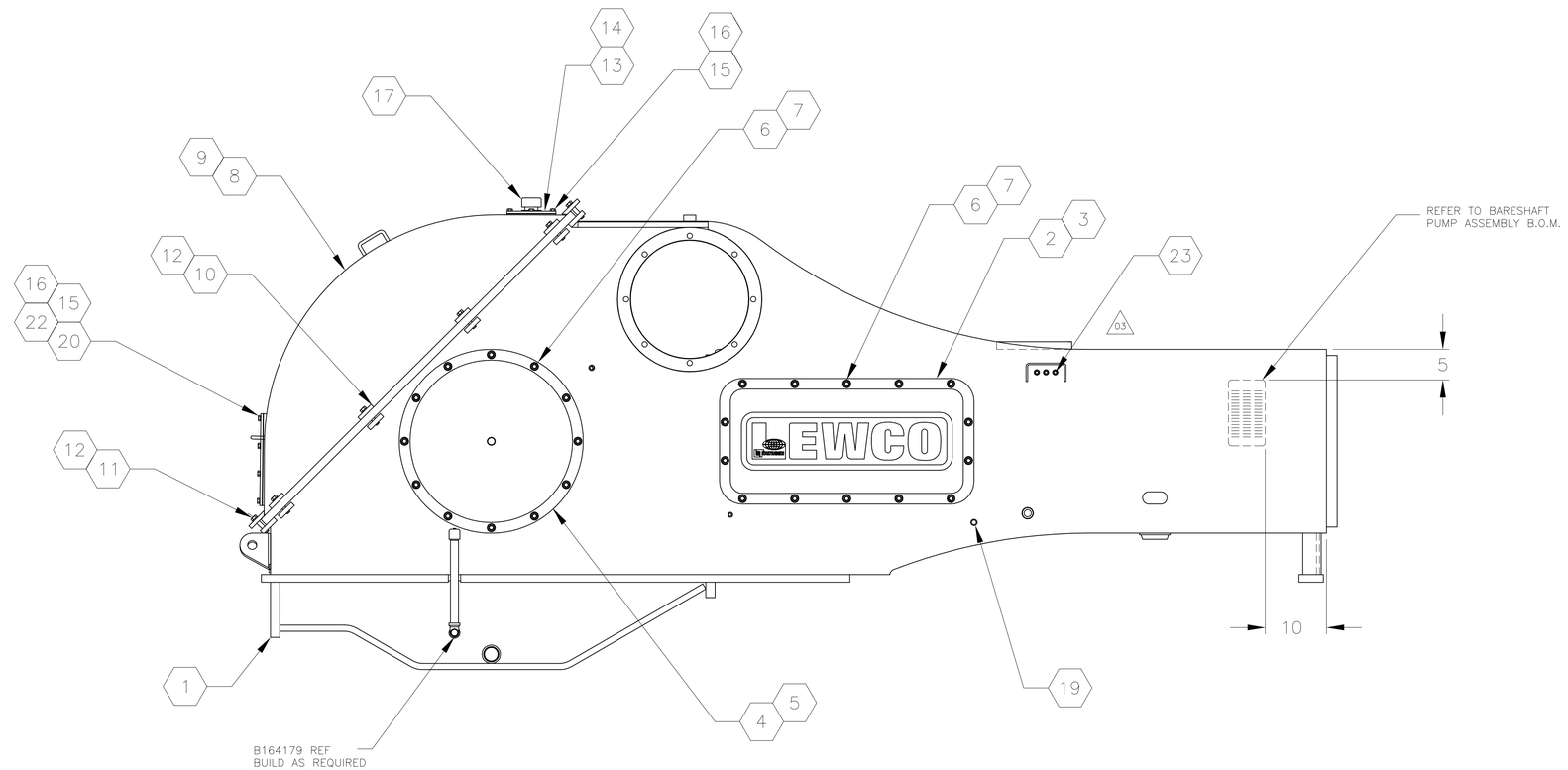
SIZE D | DO NOT SCALE | DWG NO. D164758 | REV 00

SCALE NTS | EST WT | SHEET 1 OF 1

DWG NO. D164101



ITEM	QTY	PART NO.	DESCRIPTION
1	1	D164171	FRAME, MACHINED, W-2200
2	2	B164403	COVER, CROSSHEAD
3	2	C164404	GASKET, COVER, CROSSHEAD
4	2	B164102	COVER, MAIN BEARING
5	2	A164103	GASKET, COVER, MAIN BEARING
6	52	002-1646	BOLT, HEX HD, 3/4-10UNC X 2-1/2 LG, G8
7	52	EW108	WASHER, FLAT, ø3/4
8	1	D164110	COVER, CRANKCASE
9	296''	EG170	GASKET-CLOSED CELL NEOPRENE 3/4 X 1-3/4
10	6	002-1635	BOLT, HEX HD, 5/8-11UNC X 3-1/4 LG, G8
11	7	002-1634	BOLT, HEX HD, 5/8-11UNC X 3 LG, G8
12	13	002-1541	WASHER, SPR LOCK, ø5/8
13	1	B167173	COVER, INSPECTION
14	1	A162209	GASKET, INSPECTION COVER
15	22	080-1180	BOLT, HEX HD, 1/2-13UNC X 1 LG, G8
16	22	EW106	WASHER, SEAL, ø1/2
17	1	108-1095	FILLER/BREATHER w/CAP
18			
19	2	401-3957	PIPE PLUG, 3/4 NPT, CS, SQ, MAGNETIC
20	1	B164184	INSPECTION COVER, LARGE, w/HANDLE
21			
22	1	A164185	GASKET, LARGE INSPECTION COVER
03 23	3	108-0244	FITTING-GREASE, .250 NPT 67.50°



REVISIONS	ZONE	REV	DESCRIPTION	ECN	DATE	CHG	CHK	APP
		A	RELEASE	RL01-0135	12-13-01	RJB	DS	DS
		01	REVISED PER ECN	3-1164	10/29/03	WMA	JBP	JLS
		02	REVISED PER ECN	4-0076	1/21/04	MGD	WMA	JLS
		03	ADDED ITEM 23	6-0670	9/28/06	WMA	JBG	JLS

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  FRACTIONS ±1/16
  .XX DECIMAL ±.03
  .XXX DECIMAL ±.015
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USED ON: W-2200

		DATE
DWN	RJB	12-13-01
CHK	DS	12-14-01
ENGR	DS	12-14-01
MATL	SEE BOM	

THIRD ANGLE PROJECTION

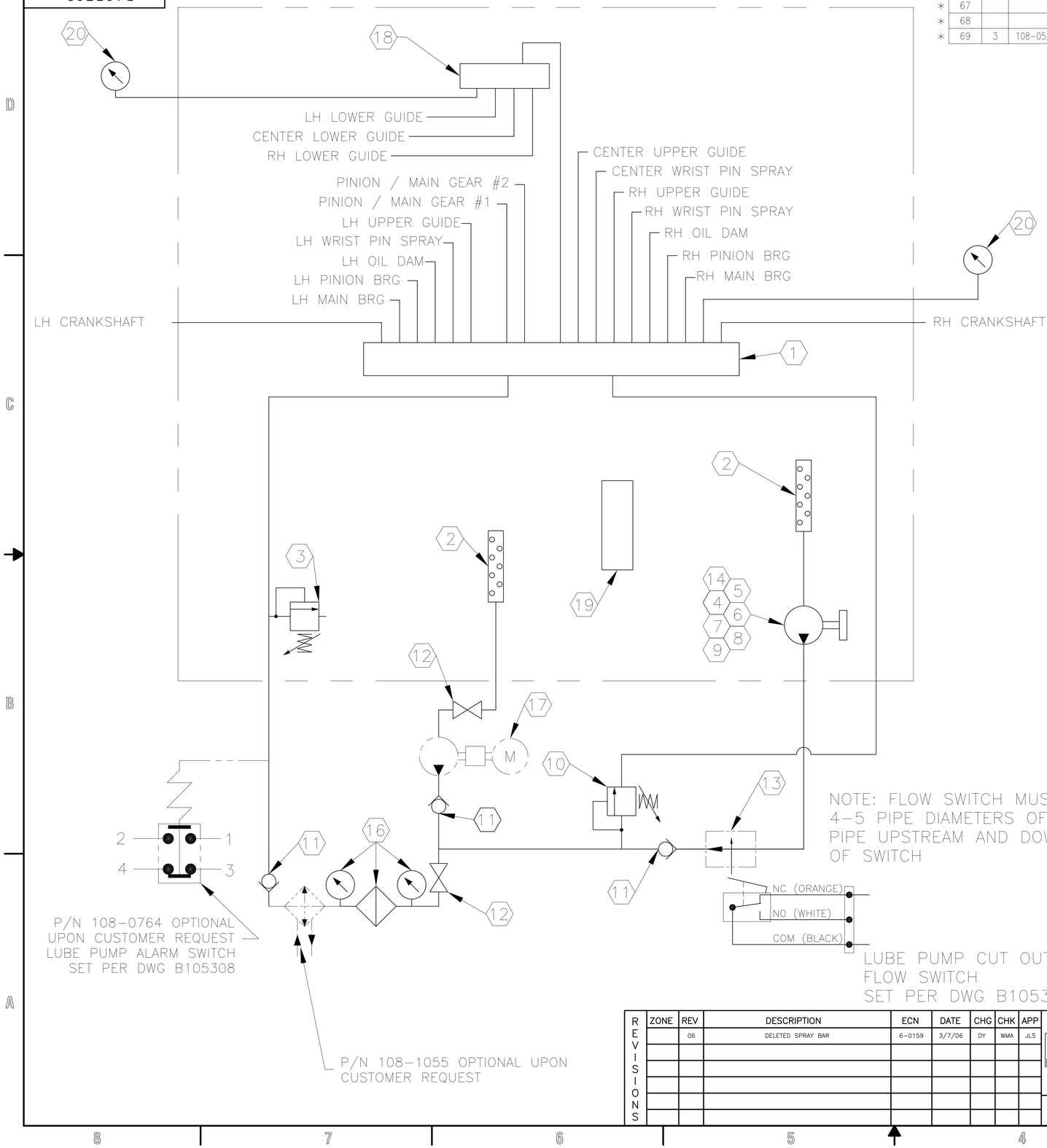
FRAME ASSEMBLY

W-2200

SIZE D | DO NOT SCALE | DWG NO. D164101 | REV 03

SCALE NTS | EST WT 20700 LBS | SHEET 1 OF 1

DWG NO. D105362



	ITEM	QTY	PART NO.	DESCRIPTION
*	67			DELETED
*	68			DELETED
*	69	3	108-0528	FITTING-GREASE, .125 NPT 0°

* ITEMS NOT SHOWN

NOTE:
LUBE OIL PUMP PART NO. IS CALLED OUT ON UNITIZATION B.O.M.

	ITEM	QTY	PART NO.	DESCRIPTION
	1	1	C155485	LUBE MANIFOLD
	2	2	108-0699	LUBE SUCTION SCREEN
	3	1	108-0054	RELIEF VALVE 15 PSI
	4	1	B155121	SUPPORT PLATE
	5	1	A155122	NUT PLATE
	6	1	EP194	PUMP B&S #3S WO/RELIEF FT MNT
	7	4	002-1609	BOLT HX 7/16-14 UN X 1-1/2
	8	1	401-6009	SET SCREW 1/4-20 X 3/4
	9	1	B167645	DRIVE GEAR
	10	1	108-1088	RELIEF VALVE 65 PSI
	11	3	108-0135	CHECK VALVE 3/4"
	12	2	108-0059	VALVE-BALL, 3/4" NPT BRASS
	13	1	108-1257	FLOW SWITCH
	14	1	B300536	QD BUSHING
*	15	2	018-2986	ELL-PIPE 3/4" X 45° STD BLK
	16	1	B105204	LUBE STRAINER ASSY
	17	REF.	SEE NOTE	LUBE PUMP ASSY
	18	1	108-1099	MANIFOLD-LUBE, CROSSHEAD
	19	1	EM106	MAGNET-DIP TANK 70#
	20	2	EG105	GAUGE 2.5 LIQ 0-60 SS STD MNT
*	21	14	EF115	FTG HYD 0° #6 COMP X 1/4 MP
*	22	8	108-0414	FTG HYD 90° #6 COMP X 3/8 MP
*	23	6	021-4976	ELL-PIPE, 3/4" X 90° STD BLK
*	24	6	EF117	FTG HYD 0° #12 COMP X 3/4 MP
*	25	3	401-3082	FTG HYD 90° #12 COMP X 3/4 MP
*	26	3	021-1916	TEE-PIPE, 3/8" STD BLACK
*	27	1	008-6881	PIPE PLUG 1" SOCKET HEAD
*	28	5	027-2969	PIPE PLUG 1/4" SOCKET HEAD
*	29	8	077-8728	CLAMP CONDUIT TYPE B 3/8"
*	30	3	EF116	FTG HYD 90° #6 COMP X 1/4 MP
*	31	5	EF162	FTG HYD 45° #6 COMP X 1/4 MPSS
*	32	3	008-3374	ELL-PIPE, 3/8" X 90° STD BLK
*	33	6	086-1795	CLAMP CONDUIT TYPE B 1/2"
*	34	4	027-5168	TEE-PIPE, 3/4" STD BLACK
*	35	6	027-5203	NIPPLE-PIPE 3/4" CLOSE SCH 40 BLK
*	36	4	021-4975	NIPPLE-PIPE 3/4" X 2" SCH 40 BLK
*	37	4	EF158	FTG HYD 0° #4 COMP X 1/4 MP
*	38	100FT	ET136	TUBE HYD .375 OD .035 WALL
*	39	1	018-7766	ELL-PIPE 2" 90° STD BLK
*	40	4	027-5187	PIPE UNION HEX 3/4"
*	41	7	108-0003	FTG HYD 0° 6# COMP X 3/8 MP
*	42	1	403-4910	FTG UNION 3/4" COMP
*	43	1	108-0061	VALVE BALL BRASS 2" NPT
*	44			DELETED
*	45	1	108-0228	PIPE PLUG 2.00 HX HD
*	46			DELETED
*	47			DELETED
*	48			DELETED
*	49			DELETED
*	50	1	400-2422	FTG HYD 0° #12 MJ X 3/4" MP
*	51	1	400-2441	FTG HYD 90° #12 MJ X 3/4" MP
*	52	3	EF409	FTG CRIMP 0° 12H X 12 FJ SWIV
*	53			DELETED
*	54	2	401-3796	BUSHING-PIPE, 1" X 3/4" FS
*	55			DELETED
*	56	2	078-2042	PLUG-PIPE, 3/4 SOCKET HD
*	57	2	EB187	BUSHING-PIPE, 1" X 3/8" HVY
*	58	40FT	152-1518	PIPE .750 SCH 40 A53 GB SMLS
*	59	1	419-3421	PIPE CROSS 3/4"
*	60	2	401-3958	PLUG-PIPE, 1" NPT MAGNETIC
*	61			DELETED
*	62	30FT	ET135	TUBE-HYD, .250 OD X .035 WALL
*	63	4	006-6769	PIPE FTG 90° STREET 3/4"
*	64			DELETED
*	65	1	EF422	FTG CRIMP 90° 12H X 12 FJ SWIV
*	66			DELETED

REVISIONS	ZONE	REV	DESCRIPTION	ECN	DATE	CHG	CHK	APP
		06	DELETED SPRAY BAR	6-0159	3/7/06	DY	WMA	JLS

LEWCO
HOUSTON, TEXAS

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- MACHINED CORNERS 1/64 X 45°
- WELD PROPERTIES SHALL MEET THE MINIMUM REQUIREMENTS OF THE BASE MATERIAL.

USED ON		DATE
DWN	JBP	02/05/04
CHK	JDM	02/09/04
ENGR	JBP	02/09/04
MATL		

THIRD ANGLE PROJECTION

LUBE OIL SCHEMATIC

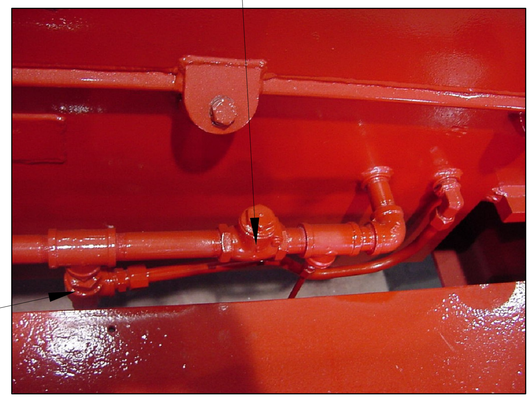
LUBE GEAR - 2.822P 20.00° 30.76°

SIZE	DO NOT SCALE	DWG NO.	REV
D		D105362	06

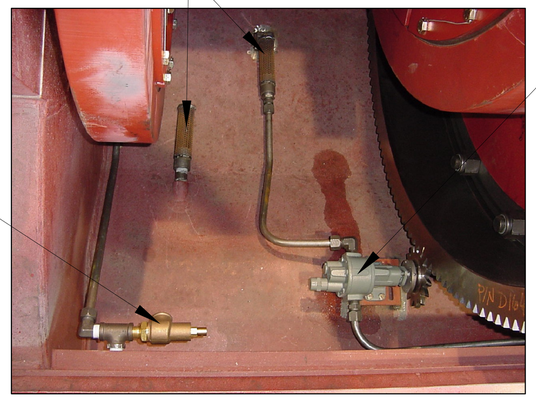
SCALE N.T.S. | EST WT | SHEET 1 OF 2

DWG NO. D105362

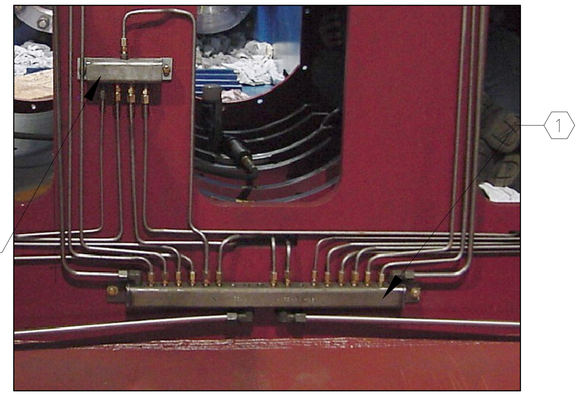
ITEM	QTY	PART NO.	DESCRIPTION



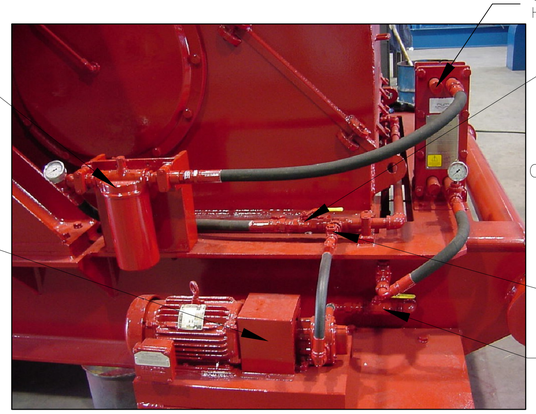
LUBE PIPING ON PUMP FRAME



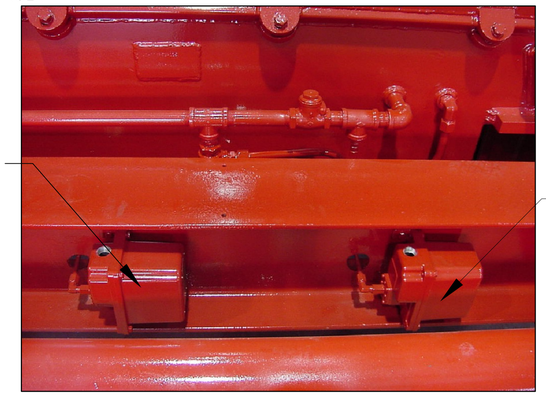
INTERNAL LUBE PUMP, SUCTION SCREENS AND RELIEF VALVE



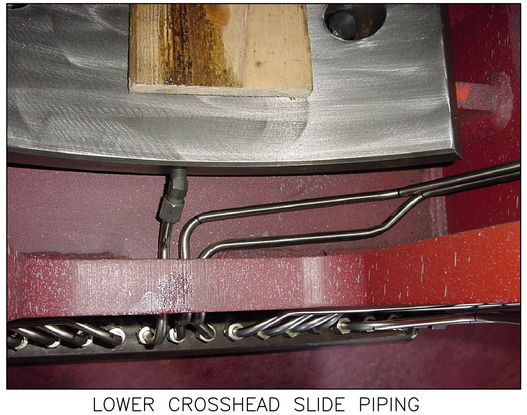
LUBE OIL DISTRIBUTION MANIFOLD



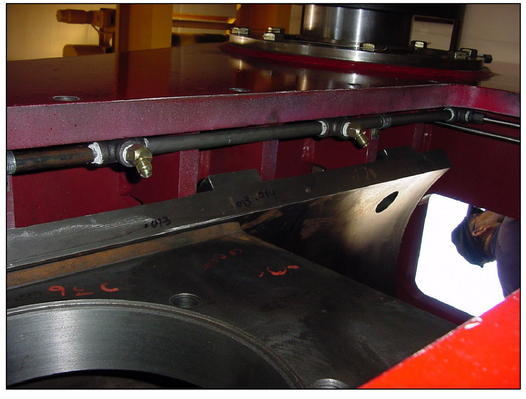
EXTERNAL LUBE PUMP, STRAINER AND HEAT EXCHANGER



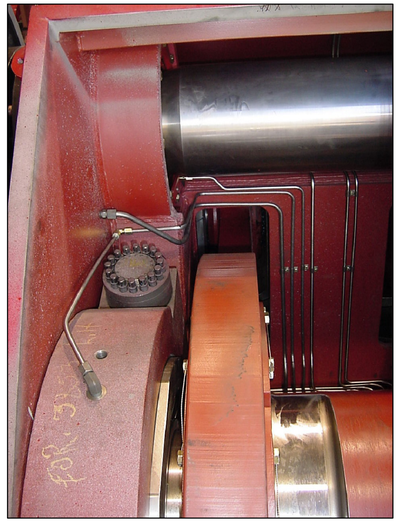
LUBE OIL PRESSURE SWITCHES (ALARM AND CUTOUT)



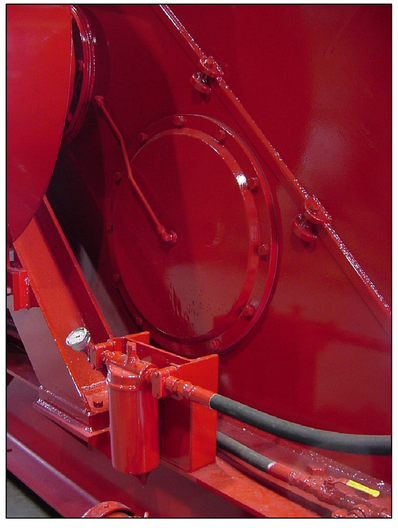
LOWER CROSSHEAD SLIDE PIPING



WRIST PIN SPRAY PIPING



MAIN BEARING, PINION BEARING PIPING



CRANKSHAFT LUBE PIPING

REVISIONS	ZONE	REV	DESCRIPTION	ECN	DATE	CHG	CHK	APP
		06	DELETED SPRAY BAR	6-0159	3/7/06	DY	WMA	JLS

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THIRD ANGLE PROJECTION

LUBE OIL SCHEMATIC

LUBE GEAR – 2.822P 20.00° 30.76°

SIZE	DWG NO.	REV
D	D105362	06

DO NOT SCALE

SCALE N.T.S. | EST WT | SHEET 2 OF 2