LeTourneau Ellis Williams Company, Inc.

PARTS CATALOGUE FOR
W-446 TRIPLEX PUMP

The Balance of Power℠

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
1.888.MUD-PUMP (683.7867)~Fax: 713.856.5341
www.lewco-equip.com~Email: pumps@lewco-equip.com

LeTourneau Ellis Williams Company, Inc.

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FLUID END ASSEMBLY.....D155300

FRAME ASSEMBLY.....D155110

BOLT TORQUE CHART

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INTRODUCTION

This manual has been prepared with the intention of supplying the user with a valuable service tool. Before placing the mud pump in service, study this manual thoroughly. Your familiarity with the contents will prove a great aid in performing any service work on the pump correctly the first time and as quickly as possible.

A general check of all equipment shipped should be made immediately upon delivery by qualified personnel. Pay particular attention to those parts which were unprotected in shipment and susceptible to damage. Take into consideration any unsatisfactory conditions that are not immediately apparent from surface inspections and immediately correct any damage prior to installing the equipment. Small, separately packed items, should be inspected for damage and missing parts. Safely repack these items, after inspecting them, until proper installations procedures are taken.

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SERIAL NUMBER AND ORDERING INFORMATION

MODEL: W-446 SERIAL NO:

When ordering parts for a machine, be sure to furnish both the model number and serial number. Give the quantity of parts required, part number, assembly number and name where parts are found.

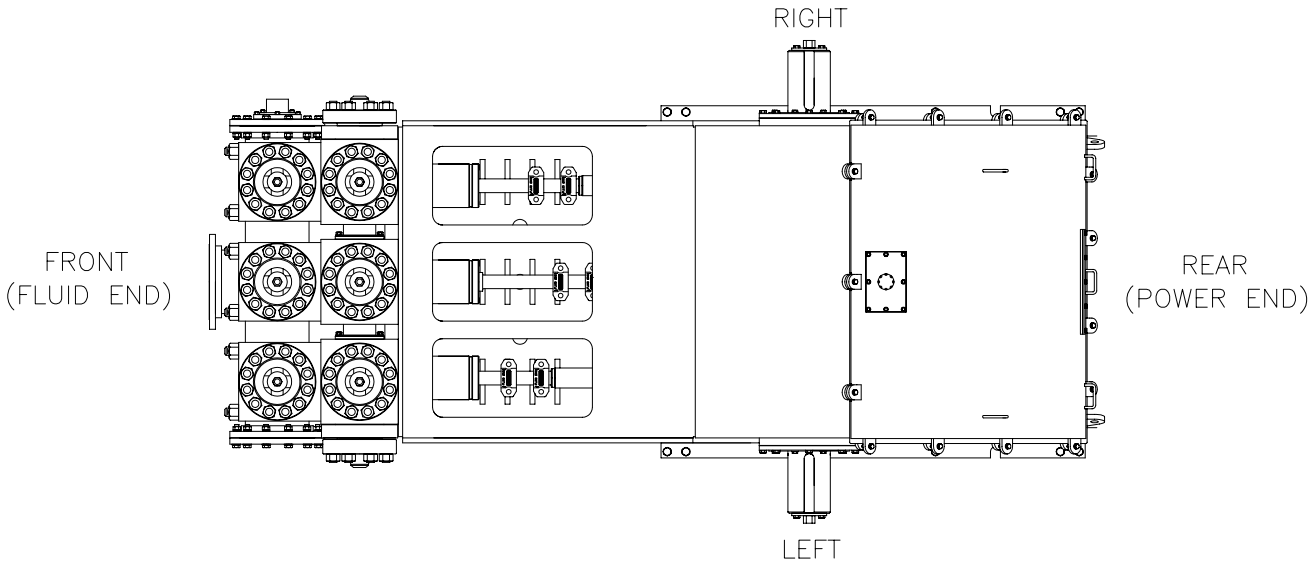
Furnish complete shipping instructions as to destination and carriers.

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.

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LeTourneau Ellis Williams Company, Inc.

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.



DWG NO. D155014

REVISIONS	ZONE	REV	DESCRIPTION	ECN	DATE	CHG	CHK	APP
		00	RELEASE	4-0039RL	2/25/04	RJP	JBP	JLS

ITEM	QTY	PART NO.	DESCRIPTION
7	2	A105032	NAMEPLATE
6	1	D155015	LUBRICATION ASSEMBLY
5	1	D155300	FLUID END ASSEMBLY, SMALL BORE
4	1	D155400	CROSSHEAD ASSEMBLY
3	1	D155001	PINION SHAFT ASSEMBLY
2	1	D155200	CRANKSHAFT ASSEMBLY
1	1	D155110	FRAME ASSEMBLY

LEWCO
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.
- ALL MACHINED SURFACES TO HAVE A FINISH OF 125 UNLESS OTHERWISE NOTED

USED ON

		DATE
DWN	RJP	1/26/04
CHK	JBP	2/25/04
ENGR	JBP	2/25/04
MATL		

THIRD ANGLE PROJECTION

W-446SF BARESHAFT PUMP ASSEMBLY

SMALL BORE, FLUID ENDS

SIZE		DWG NO.	REV
A	DO NOT SCALE	D155014	00
SCALE N.T.S.	EST WT	SHEET 1 OF 1	

Parts list for :

D155200

6500 Brittmoore Rd. * Houston, Texas 77041-5109
Phone (281) 931-8550 * Fax (713) 855-5320
Email: pumps@elliswilliams.com

ASSEMBLY-CRANKSHAFT, W446SF

SEQ	PART	QUANTITY	DESCRIPTION
1	D155530	1.00	CRANKSHAFT-MACHINED, W446
2	D155010	1.00	GEAR-MAIN, W-446 DBL HLX
3	D155620	3.00	ROD-CONNECTING, W446SF
4	EB166	3.00	BEARING-ECCENTRIC, W-446-SF
5	C155528	1.00	CARRIER-MAIN BEARING, LH
6	C155527	1.00	CARRIER-MAIN BEARING, RH
7	EB170	2.00	BEARING-SPHERICAL ROLLER
8	B155223	12.00	RETAINER-OUTER ECC BEARING
9	A155224	12.00	RETAINER-INNER ECC BEARING
10	A155526	2.00	RETAINER-MAIN BEARING INNER
11	B155428	1.00	RETAINER-MAIN BEARING,OUTER
12	A155525	2.00	SHIM SET-MAIN BEARING
13	B155141	2.00	COVER-MAIN BEARING, W446
14	B155144	2.00	GASKET-MAIN BEARING COVER
15	B155252	2.00	GASKET-MAIN BEARING CARRIER
16	002-1646	12.00	BOLT HX .750 10NC 2.50 G8
17	411-6072	96.00	CSCR 12PT .500 13NC 1.25 G8 DH
18	EB401	6.00	BOLT HX .500 13NC 1.25 G8 DH
19	413-8276	12.00	BOLT HX .625 11NC 2.00 G8 DH
20	002-1631	16.00	BOLT HX .625 11NC 2.25 G8
21	400-9752	12.00	BOLT HX .500 13NC 1.25 G8
22	401-6018	12.00	NUT-LOCK, NYL HX .750 NC G8
23	EW109	0.00	SAFETY WIRE .047 SS
24	EW106	12.00	WASHER-STATO SEAL, .500"
25	002-1541	16.00	WASHER-LOCK, 0.625"

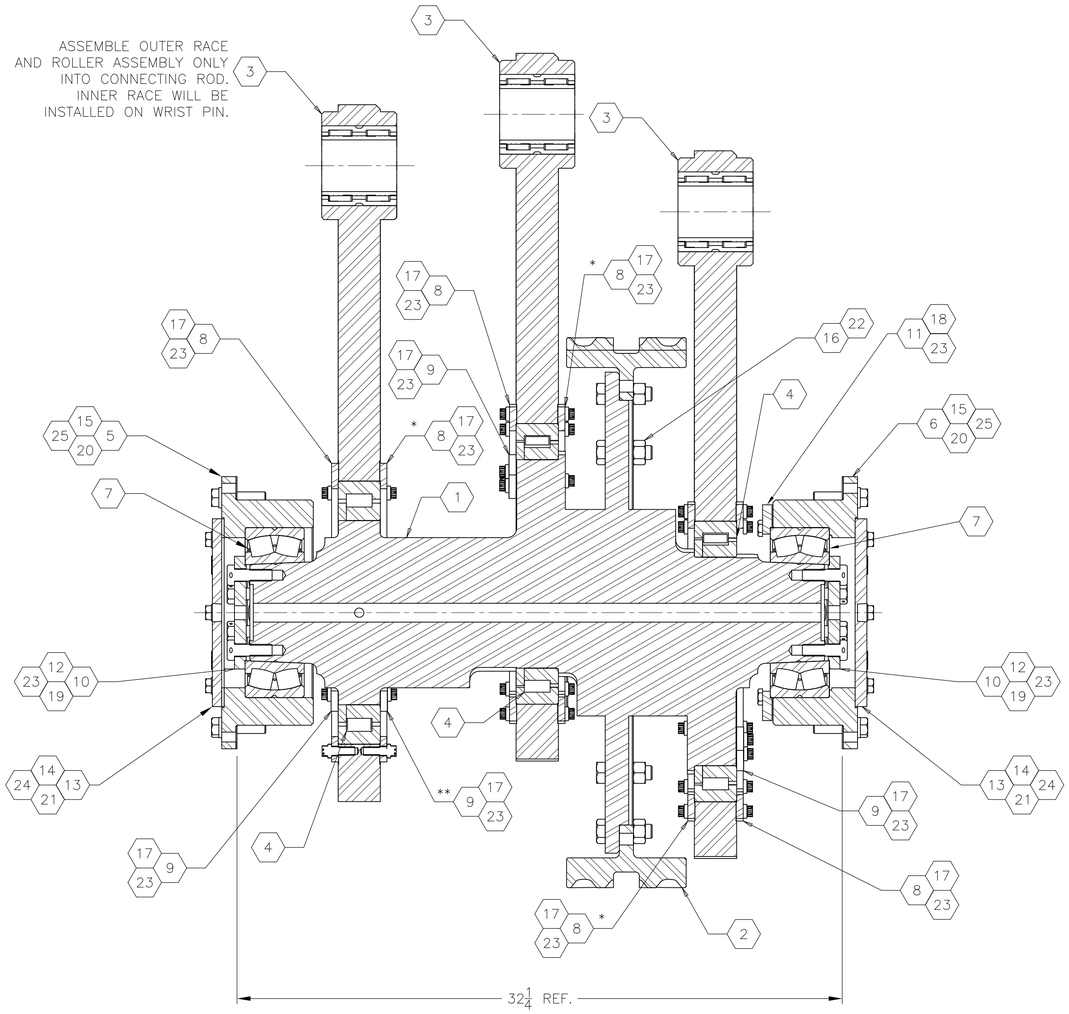
DWG NO. D155200

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	.0028T–.0054T .0000T–.0032T	11.500 15.250	55°F 45°F	.0010 .0078
	WRIST PIN (NEEDLE ROLLER)	INNER OUTER	WRIST PIN CONNECTING ROD	.0000T–.0009T .0003T–.0019T	2.750 4.250	50°F 70°F	.0020 .0060
7	MAIN (SPHERICAL ROLLER)	INNER OUTER	CRANKSHAFT BEARING CARRIER	N/A .0013L–.0041L	N/A 9.055	N/A 0°F	.0022 .0056

* 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.

ITEM	QTY	PART NO.	DESCRIPTION
1	1	D155530	CRANKSHAFT MACHINED
2	1	D155010	GEAR MAIN DOUBLE HELIX
3	3	D155620	CONNECTING ROD
4	3	EB166	BRG RL ASSY 11.500 15.250 2.250
5	1	C155528	CARRIER BRG LH
6	1	C155527	CARRIER BRG RH
7	2	EB170	BRG SP ASSY 5.118 9.021 3.150
8	12	B155223	RETAINER BRG OUTER ECC
9	12	A155224	RETAINER BRG INNER ECC
10	2	A155526	RETAINER BRG MAIN
11	1	B155428	RETAINER BRG MAIN
12	2	A155525	SHIM SET MAIN BRG
13	2	B155141	COVER MAIN BRG
14	2	B155144	GASKET COVER MAIN BRG
15	2	B155252	GASKET BRG CARRIER CRANKSHAFT
16	12	002–1646	BOLT HX .750 2.500 NC G8
17	96	411–6072	CSCR FH .500 1.250 NC G8 DHFT
18	6	EB401	BOLT HX .500 1.250 NC G8 DH
19	12	413–8276	BOLT HX .625 2.000 NC G8 DH
20 (04)	16	002–1631	BOLT HX .625 2.250 NC G8
21	12	400–9752	BOLT HX .500 1.250 NC G8 FT
22	12	401–6018	NUT LOCK NYL .750 NC
23	48	EW109	SAFTEY WIRE .041 SS 211'/LB
24	12	EW106	WASHER FLAT .500 SEAL
25	16	002–1541	WASHER LOCK SPR .625 1.08 .16



* 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

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 .033 & DEPTH OF BOSS ON ITEM 10 FROM MEASUREMENT FOR SHIMPACK THICKNESS.
4. INSTALL SHIMPACK (ITEM 17) TO THICKNESS DETERMINED ABOVE ±.005.
5. INSTALL RETAINER (ITEM 18) AND BOLTS (ITEM 19). TIGHTEN BOLTS TO ADVANCE BEARING ONTO SHAFT. FINAL DIAMETRAL CLEARANCE OF BEARING MUST BE .0022 TO .0056

REVISIONS	ZONE	REV	DESCRIPTION	ECN	DATE	CHG	CHK	APP
		04	ITEM 20 WAS 2 1/2 LONG	4–0780	11/18/04	WMA	JBP	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.

USED ON W–446 SF

		DATE
DWN	RJB	6/7/01
CHK	RJB	6/7/01
ENGR	DFO	6/12/01
MATL	SEE BOM	

THIRD ANGLE PROJECTION

CRANKSHAFT ASSEMBLY

W–446 SF

SIZE	DWG NO.	REV
D	D155200	04

SCALE 1/4 | EST WT X | SHEET 1 OF 1

Parts list for :

D155001

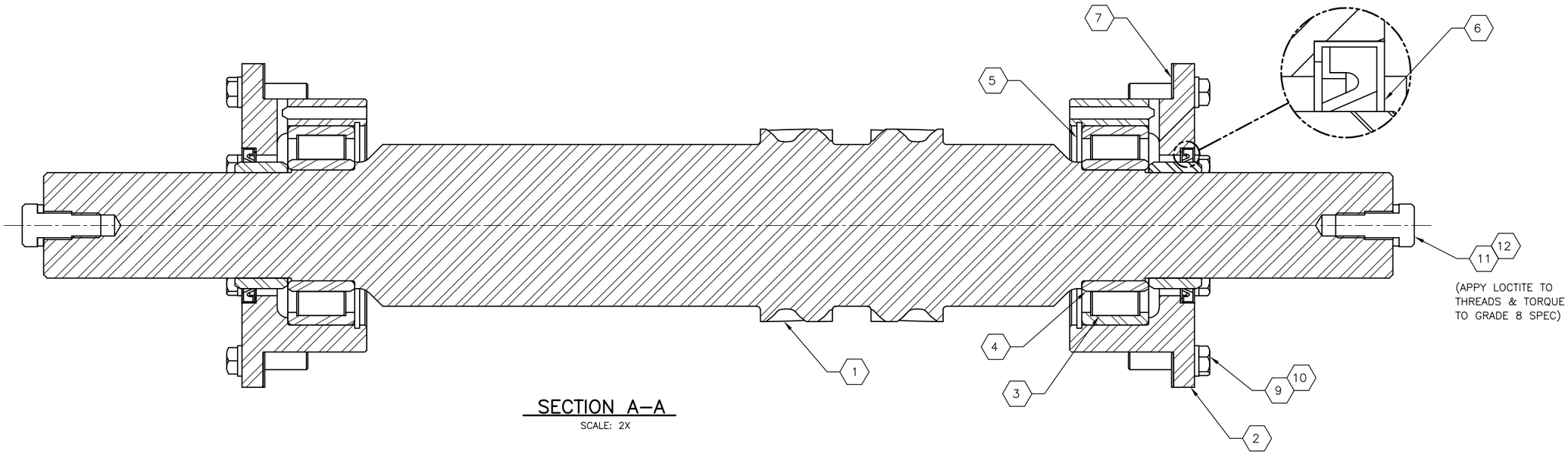
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6500 Brittmoore Rd. * Houston, Texas 77041-5109
Phone (281) 931-8550 * Fax (713) 855-5320
Email: pumps@elliswilliams.com

GROUP-PINION, W-446

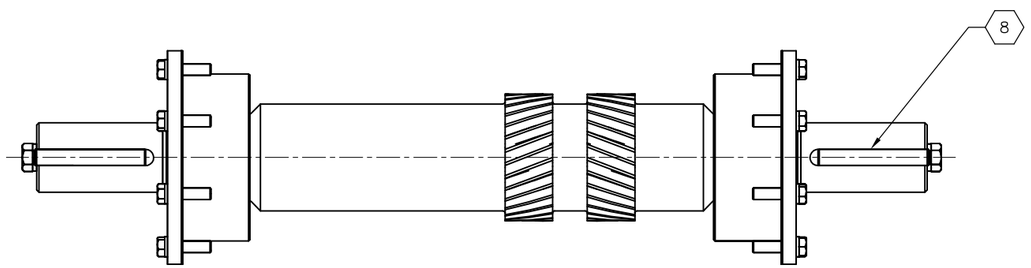
SEQ	PART	QUANTITY	DESCRIPTION
1	D155011	1.00	SHAFT-PINION, W-446 DBL HLX
2	C155229	2.00	CARRIER-PINION BEARING
3	EB104	2.00	BEARING-CYLINDERICAL ROLLER
4	B155232	2.00	RACE-PINION OIL SEAL, W446/440
5	ES108	2.00	RING-RETAINING, W-440
6	EO101	2.00	SEAL-OIL
7	B155242	2.00	GASKET-PINION BEARING CARRIER
8	A155236	2.00	KEY, 5/8 X 7/8 X 6
9	002-1631	16.00	BOLT HX .625 11NC 2.25 G8
10	002-1541	16.00	WASHER-LOCK, 0.625"
11	002-1543	1.00	WASHER-LOCK, 0.875"
12	002-1660	1.00	BOLT HX .875 9NC 2.25 G8

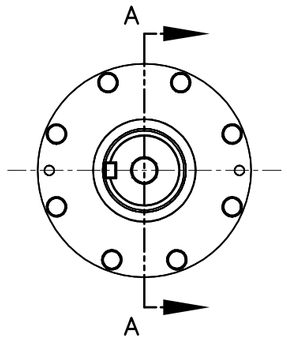
DWG NO. D155001

ITEM	QTY	PART NO.	DESCRIPTION
1	1	D155011	PINION, PUMP, 3.0 P 19T
2	2	C155229	BEARING CARRIER, PINION
3	2	EB104	BEARING RL ASSY, 3.937 7.087 2.375
4	2	B155232	RACE SEAL, PINION
5	2	ES108	RETAINING RING, SNAP, 7.315
6	2	E0101	OIL SEAL, 4.5 X 5.5, GARLOCK
7	2	B155242	GASKET, BEARING CARRIER
8	2	A155236	KEY, PINION
01 9	16	002-1631	BOLT, HEX, 5/8-11UNC X 2 1/4 LG, G8
10	16	002-1541	WASHER, SPR LOCK, ø5/8
11	1	002-1543	WASHER, SPR LOCK, ø7/8
12	1	002-1660	BOLT, HEX, 7/8-9UNC X 2 1/4 LG, G8



SECTION A–A
SCALE: 2X





REVISIONS	ZONE	REV	DESCRIPTION	ECN	DATE	CHG	CHK	APP
		01	ITEM 9 WAS 2 1/2 LONG	4–0781	11/18/04	WMA	JBP	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.

USED ON W–446

		DATE
DWN	S. MURRY	6/7/01
CHK	JB	6/8/01
ENGR	DS	6/8/01
MATL	SEE BOM	

THIRD ANGLE PROJECTION

PINION SHAFT ASSEMBLY

W–446

SIZE	DWG NO.	REV
D	D155001	01

SCALE 1/4 | EST WT 395 LBS | SHEET 1 OF 1

DO NOT SCALE

Parts list for :

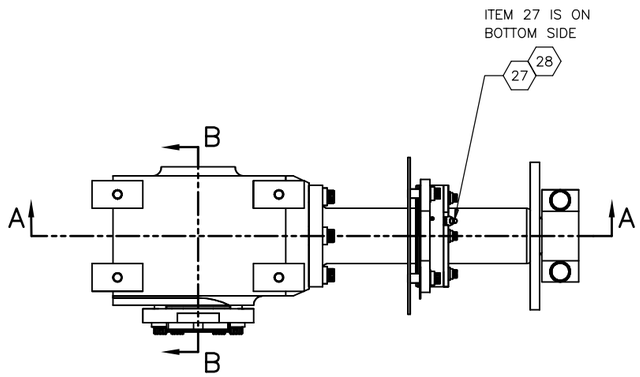
D155400

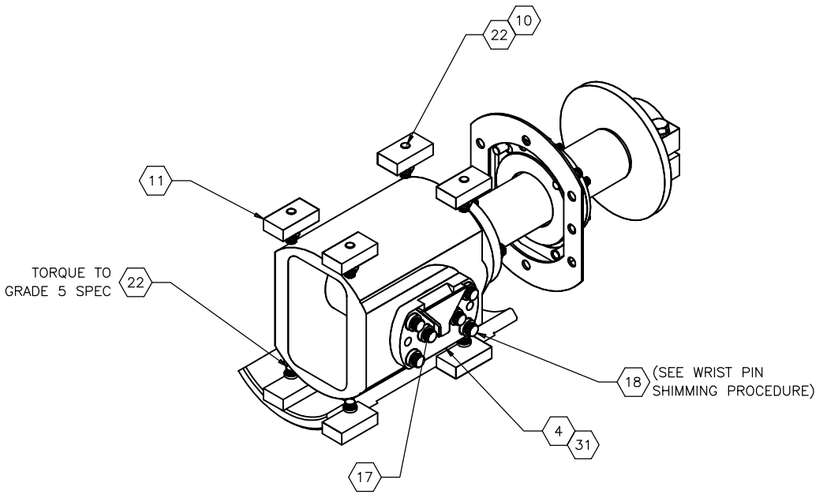
6500 Brittmoore Rd. * Houston, Texas 77041-5109
Phone (281) 931-8550 * Fax (713) 855-5320
Email: pumps@elliswilliams.com

GROUP-CROSSHEAD, W446

SEQ	PART	QUANTITY	DESCRIPTION
1	D155007	3.00	XHEAD, W-446 PRESSURIZED
2	C155006	6.00	GUIDE-XHEAD, PRESSURIZED W-446
3	B155219	3.00	PIN-WRIST, W446
4	B155222	3.00	RETAINER-WRIST PIN
5	EB103	3.00	BEARING-WRIST PIN,W250/440/446
6	B155226	3.00	ROD-PONY, W446/440
7	B155460	3.00	BOX-STUFFING, W446 NEW
8	B155235	3.00	RETAINER-PONY ROD SEAL, W446
10	EW110	12.00	WASHER-LOCK, INT .500
11	A155234	24.00	NUT-PLATE, XHEAD GUIDE
12	ES209	3.00	SEAL-STUFFING BOX, W446
13	B155253	3.00	GASKET-DIAPHRAM PLATE,W440/446
14	B155243	3.00	GASKET-STUFFING BX 440/446 OLD
15	B155227	3.00	CLAMP-PISTON ROD, W440/446
16	B155244	3.00	DISC-BAFFLE
17	A155238	6.00	CSCR 12PT .625 11NC 1.50 G8 DH
18	A155249	12.00	CSCR 12PT .625 11NC 2.00 G8 DH
21	415-1056	12.00	CSCR 12PT .625 11NC 1.75 G8 DH
22	400-1870	24.00	CSCR 12PT .500 13NC 1.50 G8
23	400-1834	18.00	CSCR 12PT .375 16NC 1.00 G8
25	075-3123	18.00	WASHER-LOCK, 0.375"
26	EW109	0.00	SAFETY WIRE .047 SS
27	EG131	3.00	RELIEF-GREASE, 1/8" NPT
28	018-4186	3.00	FITTING-GREASE, .125 NPT 45°
29	EW106	36.00	WASHER-STATO SEAL, .500"
30	400-1869	12.00	CSCR 12PT .500 13NC 1.25 G8 FT
31	ES166	6.00	SHIM SET-WRIST PIN, W446

DWG NO. D155400

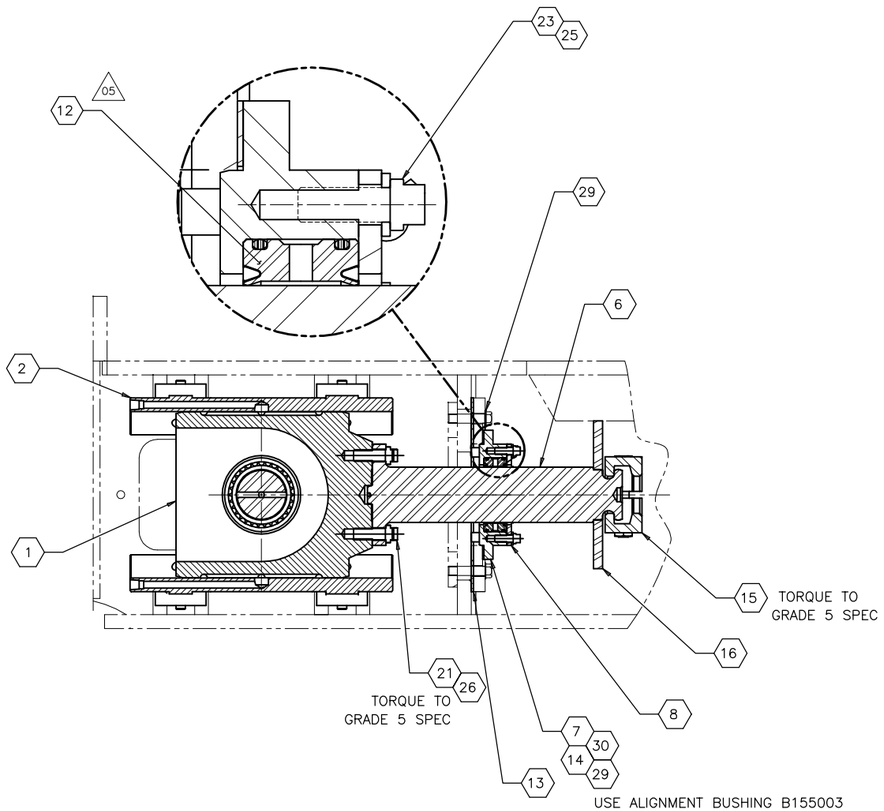




WRIST PIN SHIMMING PROCEDURE

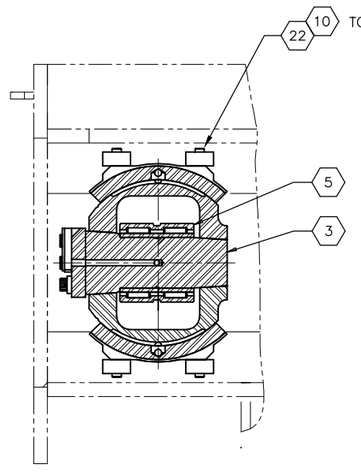
1. INSERT WRIST PIN (ITEM 3) INTO TAPERED BORE OF CROSSHEAD (ITEM 1)
2. INSTALL WRIST PIN RETAINER PLATE (ITEM 4) ONTO WRIST PIN USING CAPSCREWS (ITEM 17). TORQUE CAPSCREWS TO GRADE 8 SPEC (TORQUE ONLY THE CAPSCREWS THAT THREAD INTO THE WRIST PIN).
3. INSTALL CAPSCREWS (ITEM 18) THROUGH RETAINER PLATE INTO CROSSHEAD. TORQUE THE CAPSCREWS TO 50 FT–LBS. BUMP THE WRIST PIN WITH A BRASS BAR TO SEAL IT AGAINST THE TAPER AND RE–TORQUE TO 50 FT–LBS.
4. WITH A FEELER GAUGE, MEASURE CLEARANCE BETWEEN WRIST PIN RETAINER PLATE AND FACE OF CROSSHEAD. THE CLEARANCE SHOULD BE APPROXIMATELY .125 INCH.
5. ASSEMBLE SHIMS FROM SHIMPACK (ITEM 31) TO THE THICKNESS MEASURED IN STEP 4, +.005/–.000. INSTALL SHIMS BETWEEN RETAINER PLATE AND CROSSHEAD.
6. TORQUE CAPSCREWS HOLDING RETAINER PLATE TO CROSSHEAD TO GRADE 5 SPEC.
7. SAFETY WIRE ALL CAPSCREWS.

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



SECTION A–A

USE ALIGNMENT BUSHING B155003 TO CENTER STUFFING BOX ON PONY ROD. THEN BOLT STUFFING BOX IN PLACE AND INSTALL SHIMS.



SECTION B–B

ROTATE 90° CW

BOM QUANTITY REFLECTS (3) CROSSHEAD ASSEMBLIES

ITEM	PART NO.	QTY	DESCRIPTION
31	ES166	6	SHIM SET WRIST PIN
30	400–1869	12	CSCR FH .500 1.250 NC G8
29	EW106	36	WASHER FLAT .500 SEAL
28	018–4186	3	GREASE FITTING, .125 NPT 45°
27	EG131	3	GREASE FITTING RELIEF VALVE
26	EW109	AR	SAFTEY WIRE .041 SS 221'/LB
25	075–3123	18	WASHER LOCK SPR .375 .68. 09
24			
23	400–1834	18	CSCR 12 PT. .375 1.000 NC G8 FT
22	400–1870	24	CSCR 12 PT. .500 1.500 NC G8
21	415–1056	12	CSCR 12 PT. .625 NC 1.75 G8 DR
20			
19			
18	A155249	12	CSCR 12 PT. .625 NC 2.00 G8 DR
17	A155238	6	CSCR 12 PT. .625 NC 1.50 G8 DR
16	B155244	3	BAFFLE DISC
15	B155227	3	CLAMP PISTON ROD
14	B155243	3	GASKET STUFFING BOX X–HEAD
13	B155253	3	GASKET STUFFING BOX PLATE
12	ES209	3	SEAL–STUFFING BOX, W446
11	A155234	24	NUT PLATE CROSSHEAD
10	EW110	12	NUT PLATE CROSSHEAD
9			DELETED
8	B155235	3	COVER PLATE STUFFING BOX
7	B155460	3	STUFFING BOX X–HEAD
6	B155226	3	PONY ROD
5	EB103	3	BRG ND ASSY
4	B155222	3	WRIST PIN RETAINER
3	B155219	3	WRIST PIN
2	C155006	6	CROSSHEAD GUIDE PRESSURIZED
1	D155007	3	CROSSHEAD PRESSURIZED

05 05

REVISIONS	ZONE	REV	DESCRIPTION	ECN	DATE	CHG	CHK	APP
		05	REVISED PER ECN	4–0907	12/29/04	MGD	WMA	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–446 SF

		DATE
DWN	RJB	06/01/01
CHK	RJB	06/01/01
ENGR	DFO	06/01/01
MATL		

THIRD ANGLE PROJECTION

CROSSHEAD ASSEMBLY

PRESSURIZED

SIZE D | DO NOT SCALE | DWG NO. D155400 | REV 05

SCALE NTS | EST WT 210 LBS | SHEET 1 OF 1

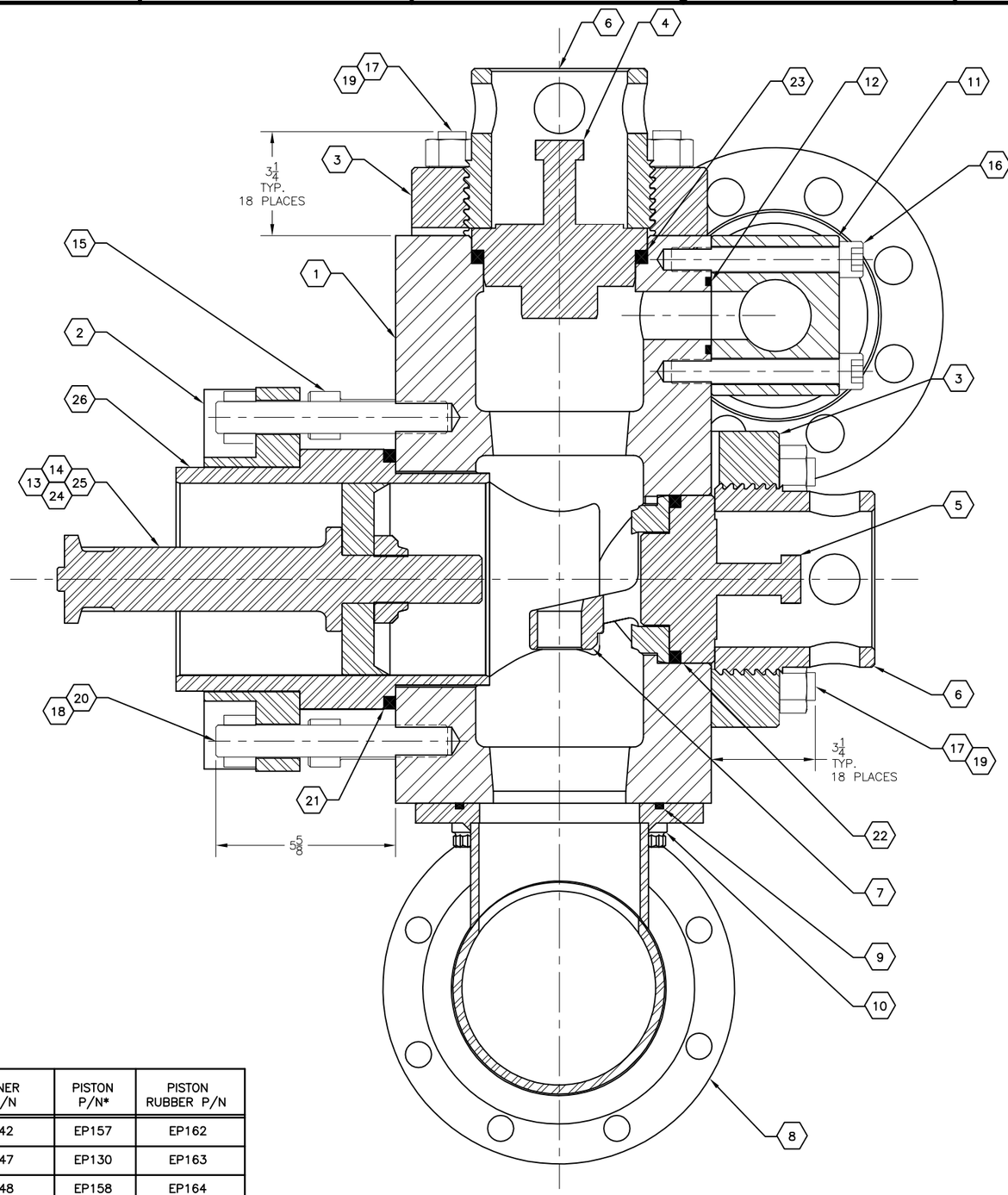
Parts list for :

D155300

EWCO
6500 Brittmoore Rd. * Houston, Texas 77041-5109
Phone (281) 931-8550 * Fax (713) 855-5320
Email: pumps@elliswilliams.com

GROUP-FLUID END, W446 SM BORE

SEQ	PART	QUANTITY	DESCRIPTION
1	D155628	3.00	MODULE-FLUID, SMALL BORE W-446
2	B155398	3.00	FLANGE-LINER LOCK, W-446
3	B155342	6.00	FLANGE-VALVE COVER
4	B155323	3.00	COVER-VALVE POT
5	B155309	3.00	COVER-VALVE POT, LOWER
6	B155343	6.00	LOCK-VALVE COVER
7	C155617	3.00	GUIDE-LOWER VALVE, W446
8	C155326	1.00	MANIFOLD-SUCTION, W446
9	EO169	3.00	O-RING .210 5.975 70D BU N
10	400-1908	12.00	CSCR 12PT .750 10NC 1.75 G8
11	C155441	1.00	MANIFOLD-DISCHARGE, W446 SBORE
12	EO148	3.00	O-RING .210 1.850 70D BU N
13	B155372	3.00	ROD-PISTON, W446
14	A155375	3.00	NUT-LOCK, NYL HX 1.50 8UN G8
15	EC160	12.00	CSCR SK 1-8 NC 3.25 G8
16	EC154	6.00	CSCR SK .750-10 NC 5.00 G8
17	A155332	36.00	STUD .875 9NC 4.50 1.50 B7
18	ES404	18.00	STUD 1.000 8NC 7.25 1.75 B7
19	EN112	36.00	NUT-HEX,HVY .875 9 NC A194-2H
20	943-3576	18.00	NUT-HEX,HVY 1.000 8 NC A194-2H
21	A156183	3.00	SEAL-LINER, W446/WH440
22	B155345	3.00	GASKET CYLINDER HEAD W440/446
23	B155344	3.00	SEAL-VALVE COVER, W440/446
27	EV150	6.00	VALVE SEAT 4
28	EV149	6.00	VALVE 4
29	EV151	6.00	VALVE SPRING 4



ITEM	QTY	PART NO.	DESCRIPTION
30	3	EV139	VALVE INSERT
29	6	EV151	VALVE SPRING
28	6	EV149	VALVE
27	6	EV150	VALVE SEAT
26	3	SEE CHT	LINER
25	3	SEE CHT	PISTON RUBBER
24	3	SEE CHT	PISTON
23	3	B155344	GASKET VALVE COVER
22	3	B155345	GASKET CYLINDER HEAD
21	3	A156183	GASKET LINER
20	18	943-3576	NUT HX 1.000-8UNC G8 HVY
19	36	EN112	NUT HVY HEX 7/8-9UNC G8
18	18	ES404	STUD 1.000-8UNC 7.25 B7
17	36	A155332	STUD .875-9UNC 4.500 B7
16	6	EC154	CSCR SK .750UNC 5.00 G8
15	12	EC160	CSCR SK 1.000 3.250 UNC G8
14	3	A155375	NUT LOCK NYL HX 1.50 8UN G8 SP
13	3	B155372	ROD-PISTON
12	3	E0148	O-RING .210 1.85 70D BUNA
11	1	C155441	MANIFOLD-DISCHARGE
10	12	400-1908	CSCR 12PT .750 1.750 UNC G8 FT
9	3	E0169	O-RING .210 5.98 70D BUNA
8	1	C155326	MANIFOLD, SUCTION
7	3	C155617	GUIDE, LOWER VALVE
6	6	B155343	LOCK, VALVE COVER
5	3	B155309	CYLINDER HEAD
4	3	B155323	COVER, VALVE POT
3	6	B155342	FLANGE, VALVE COVER
2	3	B155398	FLANGE, LINER LOCK
1	3	D155628	MODULE, FLUID, SMALL BORE

* THESE COMPONENTS NOT ASSEMBLED AT LONGVIEW

** ITEM NOT SHOWN

LINER SIZE	LINER P/N	PISTON P/N*	PISTON RUBBER P/N
3 1/2	EL242	EP157	EP162
4	EL147	EP130	EP163
4 1/2	EL148	EP158	EP164
5	EL149	EP159	EP165
5 1/2	EL150	EP160	EP114
6	EL193	EP117	EP115

* PISTON INCLUDES RUBBER

REVISIONS	ZONE	REV	DESCRIPTION	ECN	DATE	CHG	CHK	APP
		A	RELEASE	NL01-1509	6-15-01	RJB	RJB	DFO
		01	REDRAWN PER ECN	4-0168	2-9-04	RJP	WMA	JLS

LEWCO
HOUSTON, TEXAS

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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.

THIRD ANGLE PROJECTION

USED ON W-446 SF

		DATE
DWN	RJB	06/12/01
CHK	RJB	6-15-01
ENGR	DFO	6-15-01
MATL		

FLUID END, SMALL BORE

STRAIGHT PORT

SIZE D | DO NOT SCALE | DWG NO. D155300 | REV 1

SCALE 1/2 | EST WT 1900 LBS | SHEET 1 OF 1

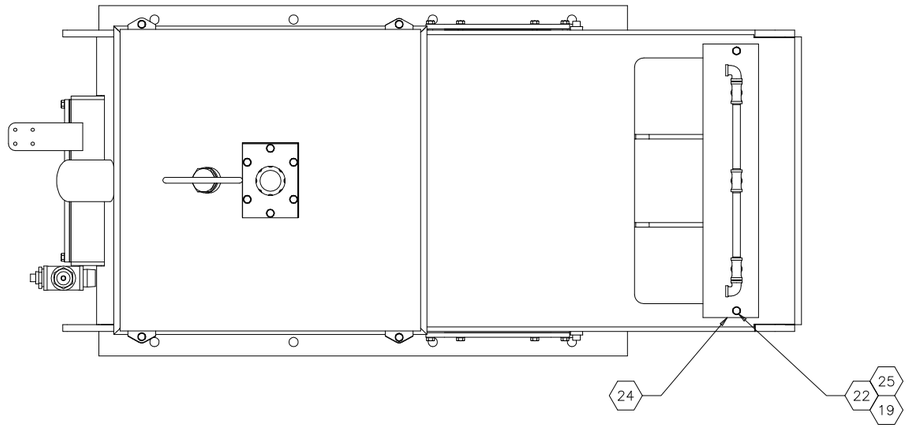
Parts list for :

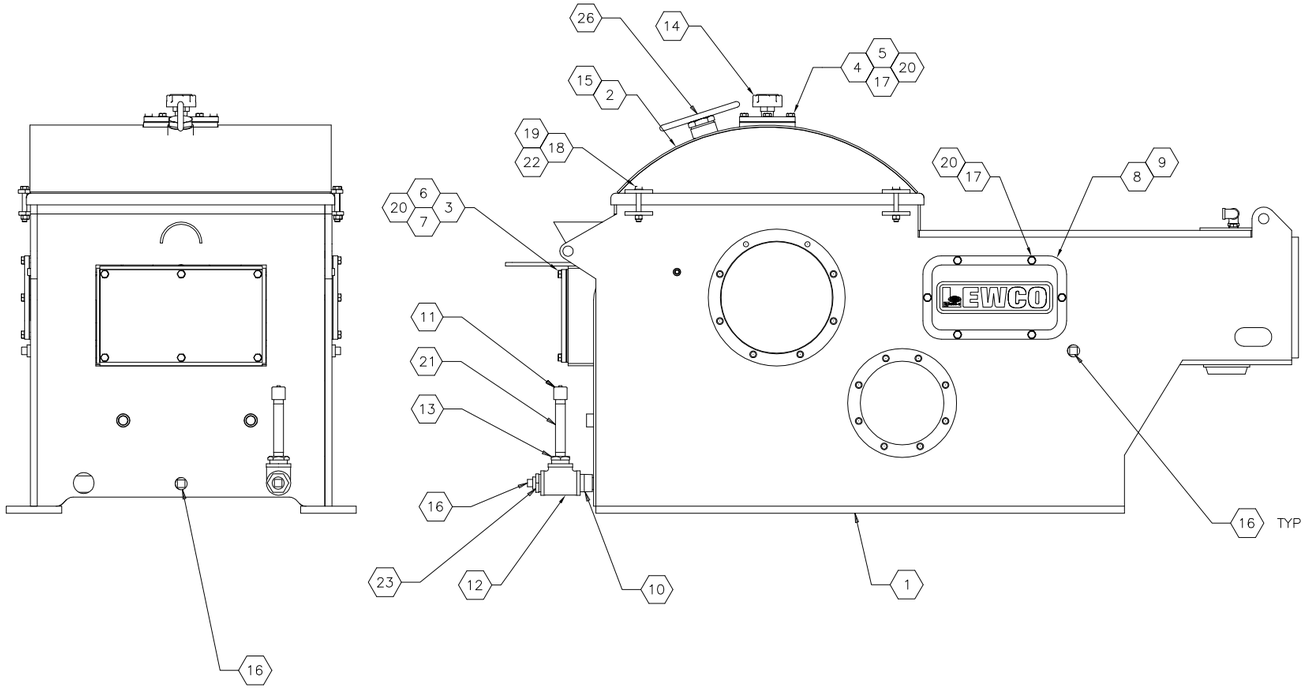
D155110

EWCO
6500 Brittmoore Rd. * Houston, Texas 77041-5109
Phone (281) 931-8550 * Fax (713) 855-5320
Email: pumps@elliswilliams.com

GROUP-FRAME, W446

SEQ	PART	QUANTITY	DESCRIPTION
1	D155370	1.00	FRAME-MACHINED, W-446
2	C155136	1.00	COVER-CRANKCASE, W446
3	400-9752	6.00	BOLT HX .500 13NC 1.25 G8
4	B155165	1.00	COVER-INSPECTION
5	B155166	1.00	GASKET-INSPECTION COVER
6	B155119	1.00	COVER-LUBE PUMP HOUSING
7	B155167	1.00	GASKET-LUBE PUMP HOUSING
8	C155129	2.00	COVER-XHEAD
9	B155142	2.00	GASKET-XHEAD COVER
10	027-5204	1.00	NIPPLE-PIPE, 1½ CLOSE SCH 40BL
11	A155146	1.00	DIPSTICK
12	201-3592	1.00	TEE-PIPE, 1-1/2" STD. BLACK
13	401-3783	1.00	BUSHING-PIPE, 1-1/2" X 3/4"STD
14	EB107	1.00	CAP-BREATHER, 10 MICRON
15	EG104	1.00	GASKET-CRANKCASE, W-446
16	EP403	4.00	PLUG-MAGNETIC, 1" NPT
17	400-9753	18.00	BOLT HX .500 13NC 1.50 G8
18	078-8967	4.00	BOLT HX .500 13NC 3.50 G8
19	080-8489	6.00	NUT-HEX, .500 13 NC G8
20	EW106	24.00	WASHER-STATO SEAL, .500"
21	A155463	1.00	PIPE, 3/4 NPT X 6-13/16 LONG
22	080-1181	6.00	WASHER-LOCK, 0.500"
23	027-5210	1.00	BUSHING-PIPE, 1-1/2" X 1" STD
24	C155475	1.00	STRUCTURE-BAFFLE, LINER WASH
25	082-4790	2.00	BOLT HX .500 13NC 1.75 G8
26	A150607	1.00	PLUG-PIPE, 2" T-HANDLE,OIL FIL





ITEM	PART NO.	QTY	DESCRIPTION
26	A150607	1	PLUG STR 2 NPT
25	082-4790	2	BOLT HX .500 1.750 NC
24	C155475	1	BAFFLE STR
23	027-5210	1	PIPE BSG 1 1/2 MPT - 1 FPT
22	080-1181	6	LOCK WASHER 1/2
21	A155463	1	PIPE .750 SCH 40 X 6.81 THREADED
20	EW106	24	WASHER
19	080-8489	6	NUT HX .500 NC G8 PL
18	078-8967	4	BOLT HX .500 3.500 NC G8
17	400-9753	18	BOLT HX .500 1.500 NC G8
16	EP403	4	MAGNETIC PLUG 1-11 1/2
15	EG104	1	CRANKCASE COVER GASKET
14	EB107	1	BREATHER CRANKCASE
13	401-3783	1	PIPE 1 1/2 MPT X 3/4 FPT BUSHING
12	201-3592	1	TEE 1 1/2
11	A155146	1	DIP STICK
10	027-5204	1	PIPE 1 1/2 NIPPLE CLOSE
9	B155142	2	COVER CROSSHEAD GASKET
8	C155129	2	COVER CROSSHEAD
7	B155167	1	COVER LUBE PUMP HSG GASKET
6	B155119	1	COVER LUBE PUMP HSG
5	B155166	1	COVER INSPECTION PLATE GASKET
4	B155165	1	COVER INSPECTION PLATE
3	400-9752	6	BOLT HX .500 1.250 NC G8
2	C155136	1	COVER STR CRANKCASE
1	D155370	1	FRAME MACHINED

REVISIONS

ZONE	REV	DESCRIPTION	ECN	DATE	CHG	CHK	APP
	K	REDRAWN/RELEASE	NL01-0661	01/19	RJB	RJB	DFO
	L	ITEM 16 EP403 QTY 4 WAS B155127 QTY1;					
	L	ADD ITEM 23	NL01-1501	06/06	DNB	RJB	DFO
	M	ITEM 22 QTY WAS 4; ADD ITEMS 24-26	NL01-1509	06/15	RJB	RJB	DFO
	N	ITEM 26 WAS 080-8482; ITEM 19 QTY WAS 4	NL01-1768	06/14	JAS	DFO	DFO
	P	ITEM 26 WAS 070-4691	NL01-1830	11/16	DFO	DFO	DFO

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  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

THIRD ANGLE PROJECTION

USED ON W-446

		DATE
DWN	RJB	FO
CHK	RJB	01/26/01
ENGR	DFO	01/26/01
MATL		

FRAME ASSEMBLY

SIZE D | DO NOT SCALE | DWG NO. D155110 | REV P

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

STEEL FASTENER TORQUE SPECIFICATIONS (LUBED)

FASTENER SIZE fractional (decimal)	THREAD SERIES		SAE GRADE 5 FASTENERS		SAE GRADE 8 FASTENERS		ASTM A193 GRADE B7 FASTENERS	
			USA UNITS (ft-lb)	METRIC UNITS (N-m)	USA UNITS (ft-lb)	METRIC UNITS (N-m)	USA UNITS (ft-lb)	METRIC UNITS (N-m)
1/4	20	UNC	6	9	9	12	7	10
0.250	28	UNF	7	10	10	14	8	11
5/16	18	UNC	13	18	18	25	15	20
0.3125	24	UNF	14	20	20	28	16	22
3/8	16	UNC	23	31	33	44	26	36
.375	24	UNF	26	35	37	50	30	40
7/16	14	UNC	37	50	52	71	42	57
0.4375	20	UNF	41	56	58	79	47	64
1/2	13	UNC	56	76	80	108	64	87
0.500	20	UNF	63	86	90	122	72	98
9/16	12	UNC	81	110	115	156	93	126
0.5625	18	UNF	91	123	128	174	103	140
5/8	11	UNC	112	152	158	215	128	173
0.625	18	UNF	127	172	179	243	145	196
3/4	10	UNC	199	270	281	381	227	308
0.750	16	UNF	222	301	314	425	253	343
7/8	9	UNC	321	435	453	614	366	496
0.875	14	UNF	354	480	500	678	404	547
1	8	UNC	481	652	679	921	549	744
1.000	14	UNF	539	731	762	1034	616	835
1-1/8	7	UNC	600	813	963	1305	778	1054
1.125	8	UN	621	842	997	1352	805	1092
	12	UNF	673	912	1079	1463	872	1182
1-1/4	7	UNC	846	1147	1358	1842	1097	1487
1.250	8	UN	873	1184	1401	1900	1132	1534
	12	UNF	937	1270	1504	2039	1215	1647
1-3/8	6	UNC	1109	1504	1781	2414	1438	1950
1.375	8	UN	1185	1607	1902	2578	1536	2083
	12	UNF	1263	1712	2027	2748	1637	2220
1-1/2	6	UNC	1473	1997	2363	3204	1909	2588
1.500	8	UN	1563	2120	2509	3402	2027	2748
	12	UNF	1657	2246	2659	3605	2148	2912
1-3/4								
1.750	8	UN					3300	4474
2								
2.000	8	UN					5018	6804
BOLT AND CAPSCREW MARKINGS ON HEAD							B7 Studs	

1) ALL TORQUE VALUES GIVEN ARE FOR LUBRICATED FASTENERS.
2) ALL STUDS USED ON LEWCO PUMPS ARE GRADE B7. NUTS ON STUDS SHOULD BE TORQUED TO GRADE B7 SPEC EVEN IF THE NUT ITSELF IS GRADE 8.

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