

NATIONAL OILWELL
Drilling Technologies

PARTS LIST

FC-1600
TRIPLEX MUD PUMP

NATIONAL-OILWELL
P.O. BOX 4638
HOUSTON, TEXAS 77210-4638

As used herein, any references to CONTINENTAL-EMSCO shall be deemed to mean NATIONAL-OILWELL

Printed in U.S.A.

ITEM	QTY.		PART NO.	DESCRIPTION	MATERIAL CODE	WEIGHT	EO
1	1		6316-0599-00	FRAME ASSY			
2	1		6316-0310-40	MAIN SKID			
3	1		6316-0099-00	CRANKSHAFT ASSY			
4	1		6316-0098-00	PINION SHAFT ASSY			
5	1		6316-0183-00	CROSSHEAD ASSY			
6	1		6316-0617-00	FLUID END ASSY			
7	1		6316-0227-00	LUBRICATION ASSY			
8	2		6397-0668-00	OIL LEVEL INDICATOR ASSY			
9	3		6397-0264-00	CLEAN OUT COVER			
10	1		6397-0186-00	BREATHER CAP			
11	1		6316-0259-00	SHIM SET (AS REQ'D)			
12	1		6316-0127-00	GASKET, DOOR			
13	4		7502-0581-00	GASKET, CLEAN OUT COVER			
14	1		7602-5940-19	GASKET, GEAR CASE COVER			
15	2		7502-0103-00	GASKET, INSPECTION DOOR			
16	2		7506-0032-00	OIL LEVEL NAMEPLATE			
17	1		7602-1070-13	COPPER WOOL (2 OZ)			
18	1		6316-0126-00	COVER PLATE			
19	1		7507-0200-00	BREATHER CAP STUD			
20	6		7601-0338-08	CAPSCREW HX HD 1-8 X 3.50			
21	16		7601-0330-51	CAPSCREW HX HD 1/2-13 X 1.50			
22	6		7601-1060-06	DRIVE SCREW #6 X .38 P.K.			
23	8		7601-1060-09	DRIVE SCREW #8 X .63 P.K.			
24	6		7601-0720-17	NUT HVY HX LOCK 1-8			
25	16		7601-1330-04	WASHER, PLAIN 1/2			

THIS DRAWING IS OWNED BY AND CONTAINS PROPRIETARY INFORMATION OF CONTINENTAL EMSCO CO. IT IS CONDITIONALLY LOANED AND IS TO BE RETURNED UPON COMPLETION OF WORK OR UPON EARLIER REQUEST. THE BORROWER BY RECEIVING IT HAS AGREED NOT TO REPRODUCE NOR TO COPY IT IN WHOLE OR IN PART NOR TO FURNISH INFORMATION FROM IT TO OTHERS NOR TO MAKE ANY USE OF IT OR THE INFORMATION CONTAINED THEREIN EXCEPT FOR OR UNDER SPECIFIC LICENSE FROM CONTINENTAL EMSCO CO.

Continental Emsco Company
Houston, Texas

SYM	DATE	E.O. NO.	REVISION	BY
B	12-14-94	108164	CHG ITEMS 31 AND 32	DO
A	11-3-94	108016	REMOVED ITEM 34	DO

MANUFACTURE & FINISH IN ACCORDANCE WITH LATEST REVISION OF DRAWING 7515-0001-00.

DWN BY	CHK BY	APP BY	FILE NUMBER
OLSON	MRL	WA	401-10004-14
DATE 10-28-94	DATE 10-28-94	DATE 12-14-94	ACAD NUMBER E061800A

TITLE
GENERAL ASSY
TRIPLEX PUMP
FC-1600

SIZE	DRAWING NO.	SHEET
D	6316-0618-00	1/2

ITEM	QTY.	PART NO.	DESCRIPTION	MATERIAL CODE	WEIGHT	EO
26	4	7601-0330-77	CAPSCREW HX HD 5/8-11 X 1.75			
27	4	7601-0610-12	NUT HX 5/8-11			
28	4	7601-1320-30	WASHER, LOCK 5/8			
29	1	6316-0349-00	CLEAN OUT COVER WITH COUPLING			
30	1	6317-0164-00	90 GAL RECIRCULATING TANK			
31	2	6316-0569-10	MOUNTING FOOT			B
32	1	6316-0539-20	SERVICE CRANE			B
33	6	7601-1430-03	WASHER, HARDENED 1.00			
34						A
R1	1	6316-0068-00	GEAR CASE COVER			
R2	2	7510-0201-00	INSPECTION DOOR			
R3	2	7506-0419-61	NAMEPLATE			
R4	4	7601-0331-34	CAPSCREW HX HD 1-8 X 3.25			
R5	4	7601-0610-18	NUT HX 1-8			
R6	8	7601-1320-33	WASHER, LOCK 1.00			
R7	2	6316-0279-00	SPACER			
R8	1	7601-2070-08	1/4 GREASE FITTING			

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Continental Emsco Company
Houston, Texas

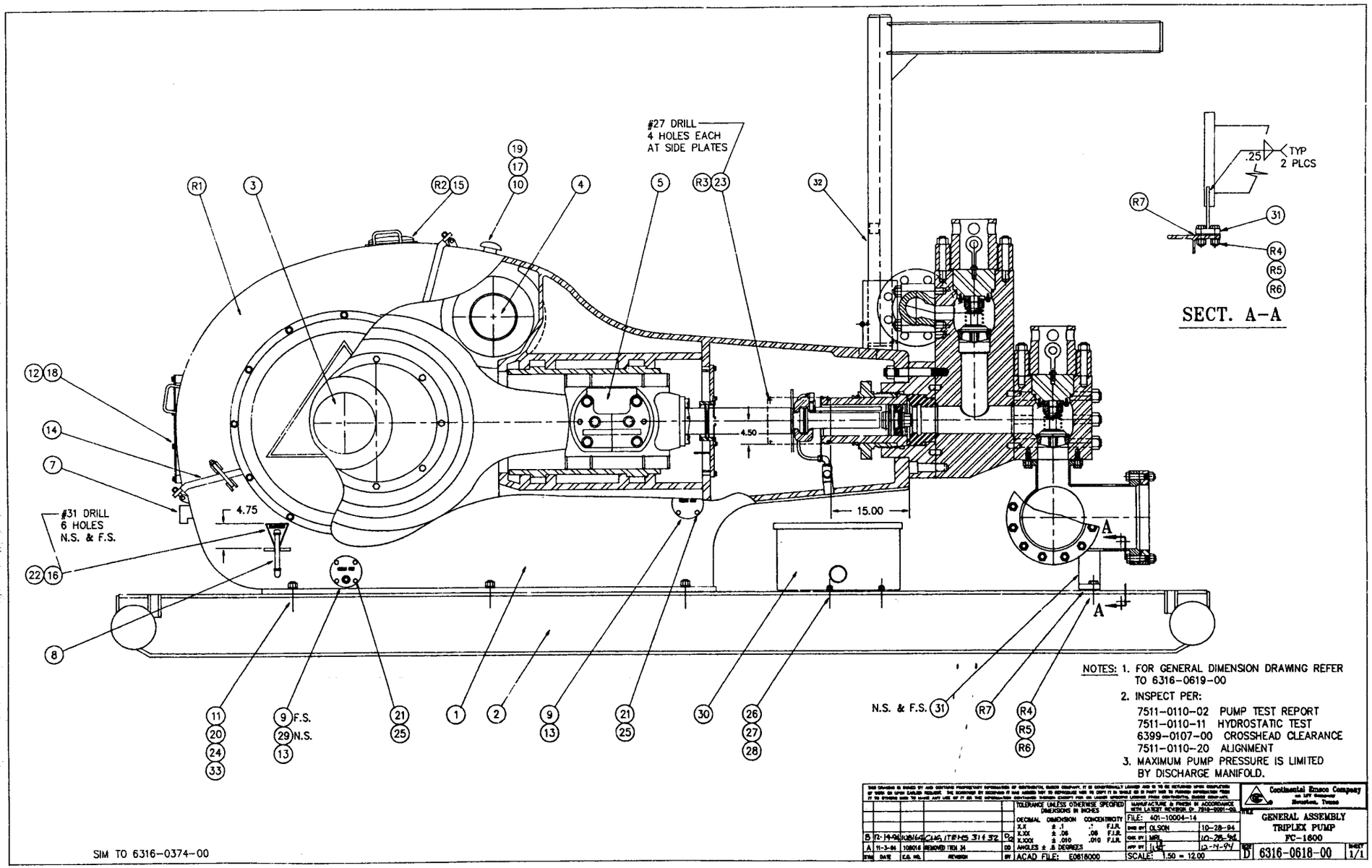
MANUFACTURE & FINISH IN ACCORDANCE WITH LATEST REVISION OF DRAWING 7515-0001-00.

SYM	DATE	E.O. NO.	REVISION	BY
B	12-14-94	108164	CHG ITEMS 31 AND 32	DO
A	11-3-94	108016	REMOVED ITEM 34	DO

DWN BY	CHK BY	APP BY	FILE NUMBER
OLSON	MRL		401-10004-14
DATE 10-28-94	DATE 10-28-94	DATE 12-14-94	ACAD NUMBER E061800B

TITLE
GENERAL ASSY
TRIPLEX PUMP
FC-1600

SIZE	DRAWING NO.	SHEET
D	6316-0618-00	2/2



NOTES: 1. FOR GENERAL DIMENSION DRAWING REFER TO 6316-0619-00

2. INSPECT PER:
   7511-0110-02 PUMP TEST REPORT
   7511-0110-11 HYDROSTATIC TEST
   6399-0107-00 CROSSHEAD CLEARANCE
   7511-0110-20 ALIGNMENT

3. MAXIMUM PUMP PRESSURE IS LIMITED BY DISCHARGE MANIFOLD.

SIM TO 6316-0374-00

STAT	DATE	E.O. NO.	REVISION
B	12-14-94	108166	CHG ITEMS 31 & 32
A	11-3-94	108016	REVISED ITEM 31

TOLERANCE UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES

DECIMAL	DIMENSION	CONCENTRICITY
X.X	± .1	F.I.R.
X.XX	± .05	.08 F.I.R.
X.XXX	± .010	.010 F.I.R.

ANGLES ± .5 DEGREES

ACAD FILE: E0618000

MANUFACTURE & PAINT IN ACCORDANCE WITH LATEST REVISION OF 7513-0001-00

FILE: 401-10004-14

DWN BY	OLSON	10-28-94
CHK BY	MRL	10-28-94
APP BY		12-14-94

SCALE: 1.50 = 12.00

Continental Emsco Company
an IVY Company
Houston, Texas

TITLE: GENERAL ASSEMBLY
TRIPLEX PUMP
FC-1600

SIZE D | 6316-0618-00 | SHEET 1/1

ITEM	QTY.		PART NO.	DESCRIPTION	MATERIAL CODE	WEIGHT	EO
1	3		6316-0610-00	STUDDED FLUID END (DISCH)			
2	3		6316-0611-00	STUDDED FLUID END (SUCTION)			
3	6		6316-0614-00	THREADED RETAINER			D
4	6		6316-0615-00	THREADED RING			
5	6		6316-0616-00	VALVE POT COVER			
6	6		6316-0585-00	VALVE GUIDE			
7	6		7601-0040-11	EYEBOLT, 3/4 X 4.50			
8	1		6316-0523-00	SUCTION MANIFOLD			
9	1		6316-0524-00	FLANGE, SUCTION			
10	1		6317-0074-90	FLANGE, BLIND			
11	1		6316-0043-90	DISCHARGE MANIFOLD			
12	3		6316-0612-00	WEAR PLATE			
13	3		6316-0613-00	SPACER, MODULE			
14							
15	3		6316-0367-20	LINER LOCK			
16	12		7601-0820-10	DOWEL PINS			
17							
18	6		6323-0093-00	RETAINER, VALVE, GUIDE			
19	3		6316-0565-00	SEAL, F.E. MODULE			
20	24		7601-0342-29	HX SOCKET HD CAPSCREW 1 1/2-6 X 5.00			A
21	6		6316-0583-00	BUSHING, VALVE GUIDE			
22	2		7602-1600-52	O-RING (SUCTION MANIFOLD)			
23	3		7602-1600-61	O-RING (SUCTION MANIFOLD TO F.E.)			
24	3		7602-1600-25	O-RING (DISCHARGE TO F.E.)			
25	24		7501-0051-00	SCREW RETAINER			

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Continental Emsco Company
Houston, Texas

SYM	DATE	E.O. NO.	REVISION	BY
D	7-1-96	110134	ITEM 3 WAS 6313-0614-00	DZ

MANUFACTURE & FINISH IN ACCORDANCE WITH LATEST REVISION OF DRAWING 7515-0001-00.

DWN BY	CHK BY	APP BY	FILE NUMBER
OLSON	WH		404-11229-00
DATE	DATE	DATE	ACAD NUMBER
12-5-94	12-5-94		E061700A

TITLE
FLUID END ASSY
FC-1600 PUMP
(LOW TEMP/5000 PSI)

SIZE	DRAWING NO.	SHEET
D	6316-0617-00	1/3

ITEM	QTY.		PART NO.	DESCRIPTION	MATERIAL CODE	WEIGHT	EO
26	1		7602-5280-72	WIRE, SOFT IRON .06 X 144.00			
27							
28	36		7601-0331-39	HHC SCREW 1"-8 X 5.00			
29	36		7601-0630-20	NUT, HX HVY 1"-8			
30							
31	18		7601-0333-30	HHC SCREW 7/8-9 X 2.50 GR5			
32	3		7601-2090-40	90° ADAPTER ELL			
33	3		7503-0230-49	1/2" HOSE ASSY			
34	3		7601-2570-89	1/2"-90° STR ELL (GALV)			
35	3		7601-2530-40	1" X 1/2" BUSHING (GALV)			
R1	6		6316-0092-00	SEAL VALVE POT			
R2	3		6316-0373-00	SEAL LINER			
R3	3		6316-0565-00	SEAL, WEAR PLATE			
R4							
R5	3		6316-0359-00	PISTON ROD			
R6	3		6316-0107-11	CLAMP			
R7	1		7601-2588-50	PIPE 3/8 NPT X 13.00 THD ONE END			
R8	3		7601-0720-58	NUT, LOCK, HVY, ESNA 1 1/2-8			
R9				MISCELL PARTS			
R10	3		6316-0606-00	FLUID END MODULE, DISCHARGE			
R11	3		6316-0607-00	FLUID END MODULE, SUCTION			
R12	3		6316-0164-00	COVER LINER END			
R13	3		6316-0333-00	LOCK RING, LINER			

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SYM	DATE	E.O. NO.	REVISION	BY
D	7-1-96	110134	ITEM 3 WAS 6313-0614-00	DZ

MANUFACTURE & FINISH IN ACCORDANCE WITH LATEST REVISION OF DRAWING 7515-0001-00.

DWN BY	CHK BY	APP BY	FILE NUMBER
OLSON	WH		404-11229-00
DATE	DATE	DATE	ACAD NUMBER
12-5-94	12-5-94		E061700B

Continental Emsco Company
Houston, Texas

TITLE
FLUID END ASSY
FC-1600 PUMP
(LOW TEMP/5000 PSI)

SIZE	DRAWING NO.	SHEET
D	6316-0617-00	2/3

ITEM	QTY.	PART NO.	DESCRIPTION	MATERIAL CODE	WEIGHT	EO
R14						
R15						
R16	3	6316-0093-00	BAFFLE DISC			
R17						
R18	3	7602-1600-44	O-RING, LOCK, RING			
R19	36	7601-0630-17	NUT, HX, HVY 1 1/2-8			
R20						
R21	60	7601-0630-24	NUT, HX, HVY 1 1/4-8			
R22						
R23						
R24						
			OPTIONAL PARTS			
R25	3	6316-0368-00	BASIC LINER			
R26	3		PISTON			
R27	6		VALVE AND SEAT			
R28	6		VALVE SPRING			

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Continental Emsco Company
Houston, Texas

SYM	DATE	E.O. NO.	REVISION	BY
D	7-1-96	110134	ITEM 3 WAS 6313-0614-00	DZ

MANUFACTURE & FINISH IN ACCORDANCE WITH LATEST REVISION OF DRAWING 7515-0001-00.

DWN BY	CHK BY	APP BY	FILE NUMBER
OLSON	WH		404-11229-00
DATE 12-5-94	DATE 12-5-94	DATE	ACAD NUMBER E061700C

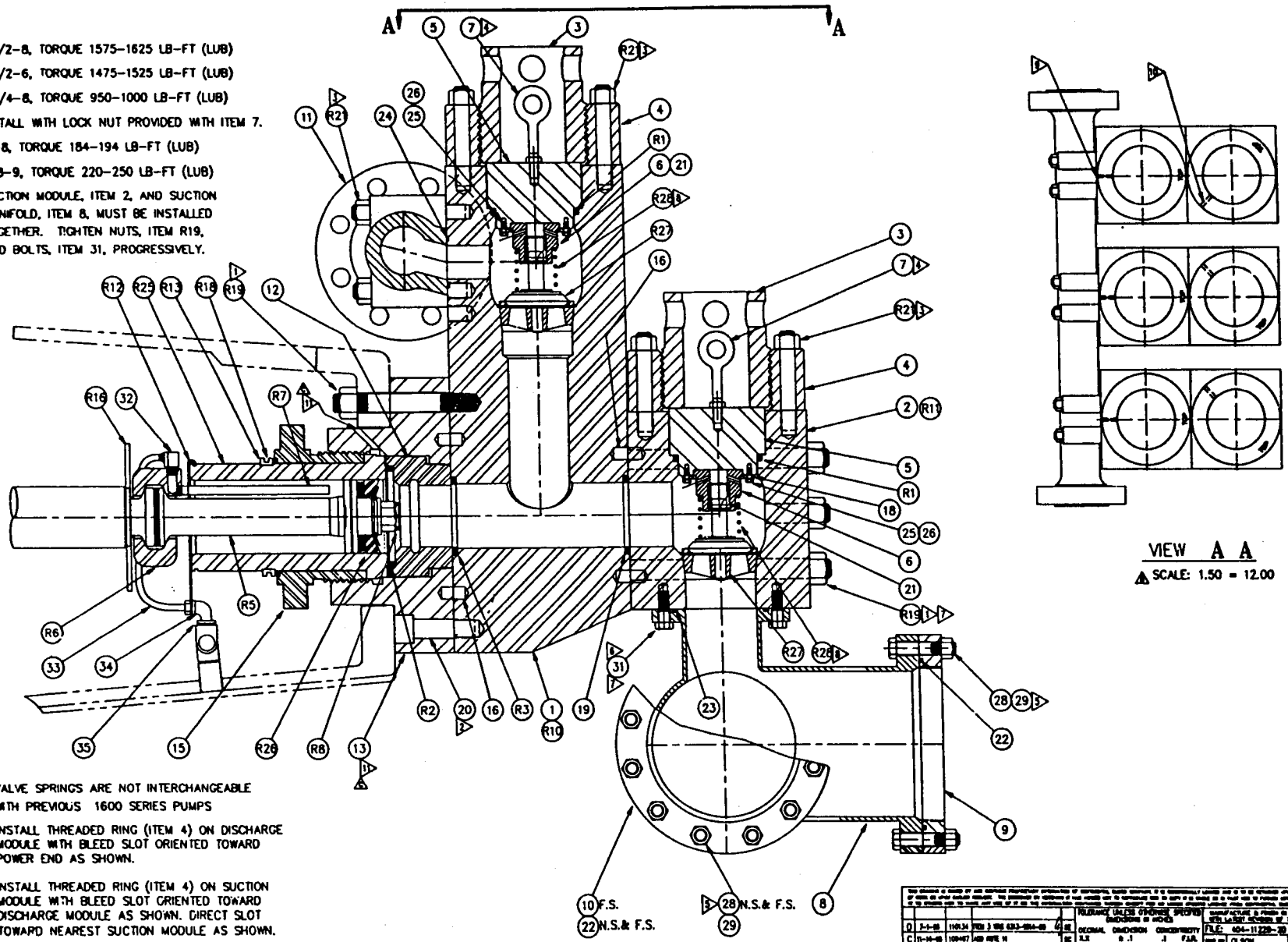
TITLE
FLUID END ASSY
FC-1600 PUMP
(LOW TEMP/5000 PSI)

SIZE	DRAWING NO.	SHEET
D	6316-0617-00	3/3

ITEM	QTY	PART NO.	PART NAME	MATERIAL DESCRIPTION	MATERIAL CODE	REV

NOTES:

1. ▷1 1/2-8, TORQUE 1575-1625 LB-FT (LUB)
2. ▷2 1 1/2-6, TORQUE 1475-1525 LB-FT (LUB)
3. ▷3 1 1/4-8, TORQUE 950-1000 LB-FT (LUB)
4. ▷4 INSTALL WITH LOCK NUT PROVIDED WITH ITEM 7.
5. ▷5 1"-8, TORQUE 184-194 LB-FT (LUB)
6. ▷6 7/8-9, TORQUE 220-250 LB-FT (LUB)
7. ▷7 SUCTION MODULE, ITEM 2, AND SUCTION MANIFOLD, ITEM 8, MUST BE INSTALLED TOGETHER. TIGHTEN NUTS, ITEM R19, AND BOLTS, ITEM 31, PROGRESSIVELY.



VIEW A A

▲ SCALE: 1.50 = 12.00

8. ▷8 VALVE SPRINGS ARE NOT INTERCHANGEABLE WITH PREVIOUS 1600 SERIES PUMPS
9. ▷9 INSTALL THREADED RING (ITEM 4) ON DISCHARGE MODULE WITH BLEED SLOT ORIENTED TOWARD POWER END AS SHOWN.
10. ▷10 INSTALL THREADED RING (ITEM 4) ON SUCTION MODULE WITH BLEED SLOT ORIENTED TOWARD DISCHARGE MODULE AS SHOWN. DIRECT SLOT TOWARD NEAREST SUCTION MODULE AS SHOWN.
11. ▲ ▷11 INSTALL SPACER FLANGE (ITEM 13) WITH WEEP HOLE ORIENTED TO TOP AS SHOWN.

SIM TO 6316-0452-00

REV	DATE	DESCRIPTION
D	7-1-98	ITEM 3 WAS 6313-0064-00
C	11-14-95	ADD NOTE 11
B	9-14-95	NOTE 11 WAS NOTE 10
A	1-25-95	ITEM 31 WAS 6313-0040-00

TOLERANCE UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES
DECIMAL DIMENSION CONCENTRICITY
X.X ± .1 .3 T.I.R.
X.XX ± .05 .08 T.I.R.
X.XXX ± .010 .010 T.I.R.
ANGLES ± 3 DEGREES
ACAD FILE: C0017000

FILE: 404-11228-20
DWN BY: G.SON 12-8-94
DES BY: BH 12-8-94
APP BY:
SCALE: 3.00 = 12.00

Continental Emsco Company

FLUID END ASSY
FC-1600 PUMP
(LOW TEMP/5000 PSI)

D 6316-0617-00 SHEET 1/1

ITEM	QTY.		PART NO.	DESCRIPTION	MATERIAL CODE	WEIGHT	EO
1	3		6316-0610-01	STUDDED FLUID END (DISCH)			
2	3		6316-0611-00	STUDDED FLUID END (SUCTION)			
3	6		6316-0614-00	THREADED RETAINER			
4	6		6316-0615-00	THREADED RING			
5	6		6316-0616-00	VALVE POT COVER			
6	6		6316-0585-00	VALVE GUIDE			
7	6		7601-0040-11	EYEBOLT, 3/4 X 4.50			
8	1		6316-0523-00	SUCTION MANIFOLD			
9	1		6316-0524-90	FLANGE, SUCTION			A,E
10	1		6317-0074-90	FLANGE, BLIND			
11	1		6316-0566-01	DISCHARGE MANIFOLD			
12	3		6316-0668-00	WEAR PLATE			
13	3		6316-0613-00	SPACER FLANGE			B
14							
15	3		6316-0367-20	LINER LOCK			
16	12		7601-0820-10	DOWEL PINS			
17							
18	6		6323-0093-00	RETAINER, VALVE, GUIDE			
19	3		6316-0565-00	SEAL, F.E. MODULE			
20	24		7601-0342-29	HX SOCKET HD CAPSCREW 1 1/2-6 X 5.00			
21	6		6316-0583-00	BUSHING, VALVE GUIDE			
22	3		7602-1600-52	O-RING (SUCTION MANIFOLD)			C
23	3		7602-1600-61	O-RING (SUCTION MANIFOLD TO F.E.)			
24	3		7602-1600-25	O-RING (DISCHARGE TO F.E.)			
25	24		7501-0051-00	SCREW RETAINER			

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SYM	DATE	E.O. NO.	REVISION	BY
D	12-2-96	110851	CHANGED NOTE 7	DZ
C	11-20-96	110842	ITEM 22 WAS 2 REQD	DZ
B	10-08-96	110628	CHGD P/N ITEM 9, DESC ITEM 13	JEA
A	9-11-96	110500	(IT. 9) 6316-0524-90 WAS -00	JEA

MANUFACTURE & FINISH IN ACCORDANCE WITH LATEST REVISION OF DRAWING 7515-0001-00.

DWN BY	CHK BY	APP BY	FILE NUMBER
JEAshworth	WHagemeister	WH	FC-1600
DATE 8-19-96	DATE 8-20-96	DATE 12-2-96	ACAD NUMBER E045210A

Continental Emsco Company
Houston, Texas

TITLE
FLUID END ASSEMBLY
FC-1600 PUMP
7500 PSI/-20° C (-4° F)

SIZE	DRAWING NO.	SHEET
D	6316-0452-10	1/3

ITEM	QTY.		PART NO.	DESCRIPTION	MATERIAL CODE	WEIGHT	EO
26	1		7602-5280-72	WIRE, SOFT IRON .06 X 144.00			
27							
28	36		7601-0331-39	HHC SCREW 1"-8 X 5.00			
29	36		7601-0630-20	NUT, HX HVY 1"-8			
30							
31	18		7601-0333-30	HHC SCREW 7/8-9 X 2.50 GR5			
32	3		7601-2090-40	90° ADAPTER ELL			
33	3		7503-0230-49	1/2" HOSE ASSY			
34	3		7601-2570-89	1/2"-90° STR ELL (GALV)			
35	3		7601-2530-40	1" X 1/2" BUSHING (GALV)			
*							
R1	6		6316-0092-00	SEAL, VALVE POT			
R2	3		6316-0373-00	SEAL, LINER			
R3	3		6316-0565-00	SEAL, WEAR PLATE			
R4							
R5	3		6316-0359-00	PISTON ROD			
R6	3		6316-0107-11	CLAMP			
R7	1		7601-2588-50	PIPE 3/8 NPT X 13.00 THD ONE END			
R8	3		7601-0720-58	NUT, LOCK, HVY, ESNA 1 1/2-8			
R9				MISCELLANEOUS PARTS			
R10	3		6316-0606-00	FLUID END MODULE, DISCHARGE			
R11	3		6316-0607-00	FLUID END MODULE, SUCTION			
R12	3		6316-0575-00	COVER LINER END			
R13	3		6316-0333-00	LOCK RING, LINER			

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SYM	DATE	E.O. NO.	REVISION	BY
D	12-2-96	110851	CHANGED NOTE 7	DZ
C	11-20-96	110842	ITEM 22 WAS 2 REQD	DZ
B	10-08-96	110628	CHGD P/N ITEM 9, DESC ITEM 13	JEA
A	9-11-96	110500	(IT. 9) 6316-0524-90 WAS -00	JEA

MANUFACTURE & FINISH IN ACCORDANCE WITH LATEST REVISION OF DRAWING 7515-0001-00.

DWN BY	CHK BY	APP BY	FILE NUMBER
JEAshworth	WHagemeister	WH	FC-1600
DATE 8-19-96	DATE 8-20-96	DATE 12-2-96	ACAD NUMBER E045210B

Continental Emsco Company
Houston, Texas

TITLE
FLUID END ASSEMBLY
FC-1600 PUMP
7500 PSI/-20° C (-4° F)

SIZE	DRAWING NO.	SHEET
D	6316-0452-10	2/3

ITEM	QTY.		PART NO.	DESCRIPTION	MATERIAL CODE	WEIGHT	EO
R14							
R15							
R16	3		6316-0093-00	BAFFLE DISC			
R17							
R18	3		7602-1600-44	O-RING, LOCK, RING			
R19	36		7601-0630-17	NUT, HX, HVY 1 1/2-8			
R20							
R21	72		7601-0630-24	NUT, HX, HVY 1 1/4-8			
R22							
R23							
R24							
				OPTIONAL PARTS			
R25	3		6316-0368-00	BASIC LINER			
R26	3			PISTON			
R27	6			VALVE AND SEAT			
R28	6			VALVE SPRING			

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SYM	DATE	E.O. NO.	REVISION	BY
D	12-2-96	110851	CHANGED NOTE 7	D7
C	11-20-96	110842	ITEM 22 WAS 2 REQD	DZ
B	10-08-96	110628	CHGD P/N ITEM 9, DESC ITEM 13	JEA
A	9-11-96	110500	(IT. 9) 6316-0524-90 WAS -00	JEA

MANUFACTURE & FINISH IN ACCORDANCE WITH LATEST REVISION OF DRAWING 7515-0001-00.

DWN BY	CHK BY	APP BY	FILE NUMBER
JEAshworth	WHagemeister	WH	FC-1600
DATE 8-19-96	DATE 8-20-96	DATE 12-2-96	ACAD NUMBER E045210C

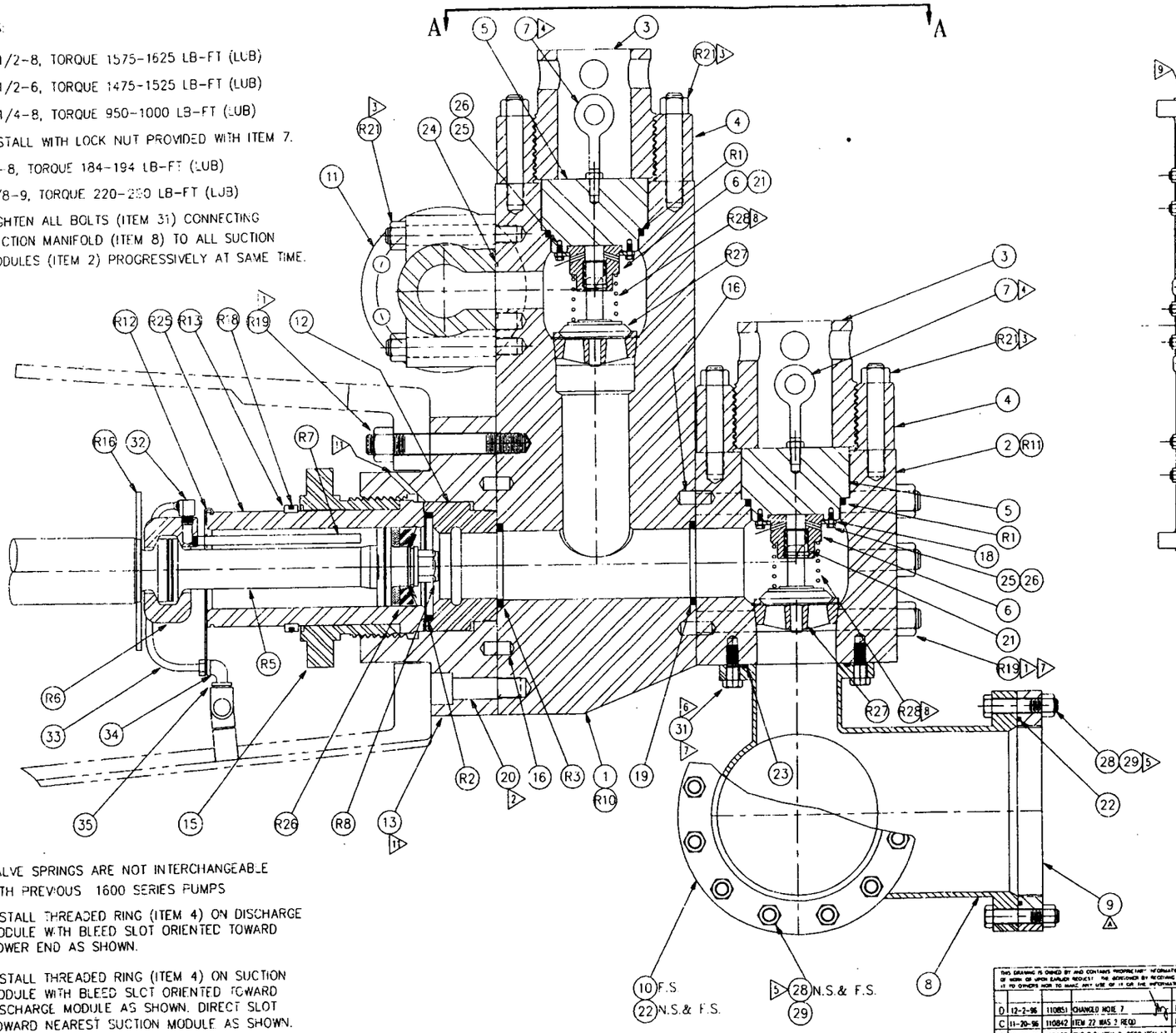
Continental Emsco Company
Houston, Texas

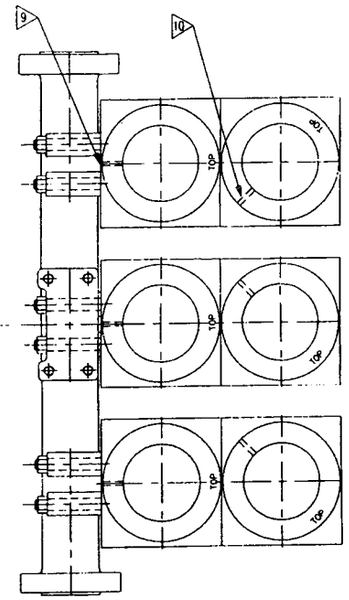
TITLE
FLUID END ASSEMBLY
FC-1600 PUMP
7500 PSI/-20° C (-4° F)

SIZE	DRAWING NO.	SHEET
D	6316-0452-10	3/3

NOTES:

1. 1 1/2-8, TORQUE 1575-1625 LB-FT (LUB)
2. 1 1/2-6, TORQUE 1475-1525 LB-FT (LUB)
3. 1 1/4-8, TORQUE 950-1000 LB-FT (LUB)
4. INSTALL WITH LOCK NUT PROVIDED WITH ITEM 7.
5. 1"-8, TORQUE 184-194 LB-FT (LUB)
6. 7/8-9, TORQUE 220-250 LB-FT (LUB)
7. TIGHTEN ALL BOLTS (ITEM 31) CONNECTING SUCTION MANIFOLD (ITEM 8) TO ALL SUCTION MODULES (ITEM 2) PROGRESSIVELY AT SAME TIME.





VIEW A A
SCALE: 1.50 = 12.00

8. VALVE SPRINGS ARE NOT INTERCHANGEABLE WITH PREVIOUS 1600 SERIES PUMPS
9. INSTALL THREADED RING (ITEM 4) ON DISCHARGE MODULE WITH BLEED SLOT ORIENTED TOWARD POWER END AS SHOWN.
10. INSTALL THREADED RING (ITEM 4) ON SUCTION MODULE WITH BLEED SLOT ORIENTED TOWARD DISCHARGE MODULE AS SHOWN. DIRECT SLOT TOWARD NEAREST SUCTION MODULE AS SHOWN.
11. INSTALL SPACER FLANGE (ITEM 13) WITH WEEP HOLL ORIENTED TO TOP AS SHOWN.

SIM TO 6316-0452-00

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SYM	DATE	ECO. NO	REVISION	BY
D	12-2-96	110851	CHANGED NOTE 7	DZ
C	11-20-96	110842	ITEM 22 WAS 2 REQD	DZ
B	10-08-96	110628	CHG P/N ITEM 9, DESC ITEM 13	JEA
A	9-11-96	110500	CHANGED P/N ITEM 9	JEA

TOLERANCE UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES

DECIMAL	DIMENSION	CONCENTRICITY
X.X	± .1	.1 F.I.R.
X.XX	± .06	.06 F.I.R.
X.XXX	± .010	.010 F.I.R.

ANGLES ± 5 DEGREES

ACAD FILE: E0452100

MANUFACTURE & FINISH IN ACCORDANCE WITH LATEST REVISION OF 7315-0001-00

FILE: FC-1600

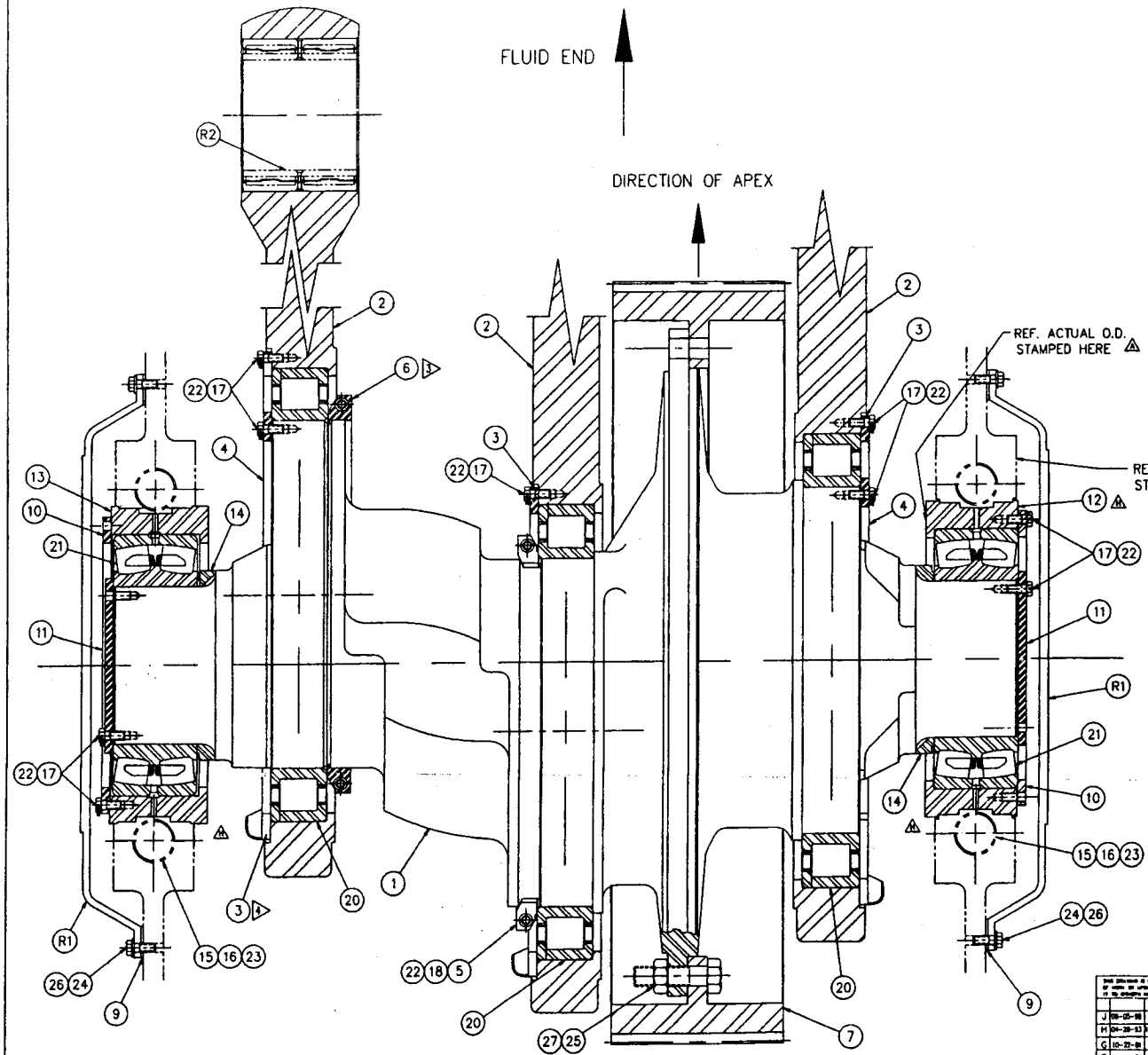
DWG BY	JEAshworth	8-19-96
CHK BY	Whiggemeister	8-20-96
APP BY		12-3-96

SCALE: 3.00 = 12.00

Continental Emsco Company
Houston, Texas

TITLE
FLUID END ASSEMBLY
FC-1600 PUMP
7500 PSI/-20° C (-4° F)

SIZE D | 6316-0452-10 | SHEET 1/1



ITEM	QTY	PART NO.	PART NAME	MATERIAL DESCRIPTION	MATERIAL CODE	REV
1	1	6316-0021-01	CRANKSHAFT			
2	3	6316-0023-00	ECCENTRIC STRAP			
3	3	6316-0034-00	OUTER RACE RETAINER			
4	2	6316-0070-00	INNER RACE RETAINER			
5	1	6316-0071-00	INNER RACE RETAINER (CENTER)			
6	1	6317-0176-00	INNER BRG. RETAINER			
7	1	6316-0030-00	ECCENTRIC RING GEAR			
8						
9	2	6316-0049-00	MAIN BRG COVER GASKET			
10	2	6316-0032-00	OUTER RACE RETAINER, MAIN	BRG		
11	2	6316-0031-00	INNER RACE RETAINER, MAIN	BRG		
12	1	6316-0037-00	BEARING CARRIER, LEFT			
13	1	6316-0288-00	BEARING CARRIER, RIGHT			
14	2	6316-0091-00	MAIN BEARING SPACER			
15	4	6316-0077-00	MAIN BEARING HSG BOLT			
16	4	6316-0097-00	MAIN BRG HSG SHIM SET			
17	70	7501-0004-00	DR. HEAD CAP SCREW	5/8" X 1.50 LG		
18	2	7501-1256-00	DR. SOCKET HEAD CAP SCR	5/8" X 4.50 LG		
19						
20	3	7602-0212-68	ECCENTRIC BEARING			
21	2	7602-0201-37	MAIN BEARING			
22	1	7602-5289-60	SOFT IRON WIRE	1/16" DIA. X 80'-0" LG		
23	1	7602-5200-60	SOFT IRON WIRE	11 GA. X 5'-0" LG		
24	24	7601-0330-77	HEX HEAD CAP SCREW	5/8-11UNC X 1.75 LG		
25	12	7601-0335-97	HEX HEAD CAP SCREW GR. 5	1 1/2"-6UNC X 5.50 LG		
26	24	7601-1330-05	PLAIN WASHER	5/8" SMALL O.D.		
27	12	7601-0720-20	HEAVY HEX LOCK NUT	1 1/2"-6		
28						
R1	2	6316-0042-00	MAIN BRG COVER, C.E. CO.			
R2	3	6301-0038-00	CROSSHEAD BEARING			
R3	1	7602-3010-47	MAIN BRG BOLT WRENCH			

DEC 1998
ISSUED BY
NATIONAL-OILWELL
ENGINEERING

NOTES:

1. SHIM TO OBTAIN NET FIT OF .004" TIGHT BETWEEN CARRIERS AND FRAME. REFER TO 6399-0066-00 FOR DETAILS.
2. TORQUE MAIN BEARING BOLTS TO 9,750 FT. LBS. CHECK ROLLERS TO BE SURE NO MORE THAN 4 ARE TIGHT (EXCEPT AT BOTTOM DUE TO WEIGHT) . ZERO TIGHT ROLLERS IS OK.

△ ▷ 1. ASSEMBLE RETAINER ITEM 6 SNUG.
2. INSTALL BEARING HARD AGAINST RETAINER.
3. LET BEARING COOL TO ROOM TEMPERATURE.
4. TIGHTEN SAFTEY WIRE RETAINER BOLTS.

△ ▷ INSTALL WITH OIL SCOOP AT BOTTOM. TYP. 3 PLACES.

J	08-05-98	113302	REDRAWN IN AUTOCAD	DLS		
H	04-28-93	03477	REV. PICTURE ITEM 12 & 13	WC		
G	10-22-91	03478	7602 BMS 7001	GA		
F	08-04-76	57174	ADDED NOTE	DP		
SYM	DATE	E.O. NO.	REVISION	BY		

TOLERANCE UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES

DECIMAL	DIMENSION	CONCENTRICITY
X.X	± .1	.1 F.I.R.
X.XX	± .08	.08 F.I.R.
X.XXX	± .010	.010 F.I.R.

ANGLES ± .5 DEGREES

ACAD FILE: 6316-0099-00

MANUFACTURE & PAINT IN ACCORDANCE WITH LATEST REVISION OF 7313-0000-00

FILE:

DRN BY	D.A.J	6-20-68
CHK BY	C.W.	8-20-68
APP BY		11-3-98

SCALE: 3.00 = 12.00

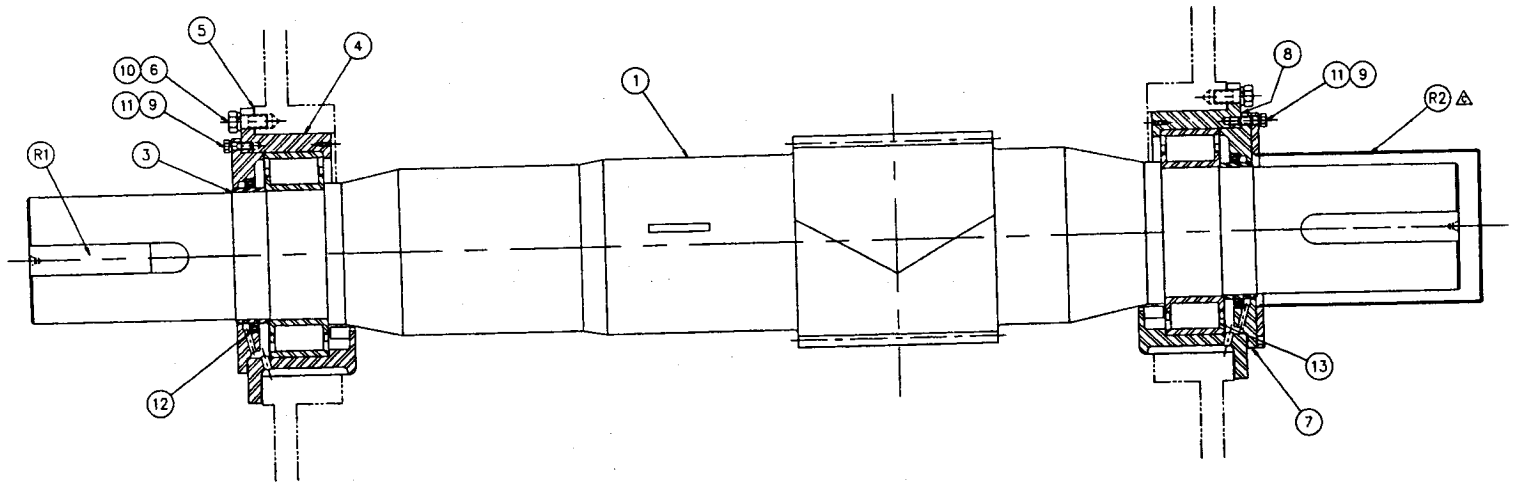
Continental Emsco Company
Houston, Texas

TITLE: CRANKSHAFT ASSEMBLY F-1600 TRIPLEX PUMP

SIZE D | 6316-0099-00 | SHEET 1/1

ITEM	QTY	PART NO.	PART NAME	MATERIAL DESCRIPTION	MATERIAL CODE	REV
1	1	6316-0027-00	PINION SHAFT			C
2						
3	2	6301-0002-00	OIL SEAL WEAR RING			
4	2	6317-0024-00	PINION BEARING CARRIER			
5	2	7502-0840-00	PINION BRG CARRIER GASKET			
6	16	7601-0336-00	HEX HEAD CAP SCREW	7/8-9UNC X 2.00 LG. GR. 5		
7	2	6317-0023-00	OIL SEAL CARRIER			
8	2	7502-0841-00	OIL SEAL CARRIER GASKET			
9	12	7601-0332-20	HEX HEAD CAP SCREW	1/2-13UNC X 1.50 LG. GR.5		
10	16	7601-1320-19	LOCK WASHER	7/8"		
11	12	7601-1320-16	LOCK WASHER	1/2"		
12	2	7602-2131-18	OIL SEAL			
13	2	7602-0212-67	BEARING			
14						
R1		7504-7501-00	KEY			C
R2		6317-0103-00	COVER			

FLUID END



DEC 1999
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ENGINEERING

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SYM	DATE	E.O. NO.	REVISION
D	08-11-98	113949	REDRAWN ON AUTOCAD
C	8-8-88	10497	DELETE ITEM 2
B	3-25-83	86865	ADDED ITEM 2

TOLERANCE UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES

DECIMAL	DIMENSION	CONCENTRICITY
X.X	± .1	.1 F.I.R.
X.XX	± .08	.08 F.I.R.
X.XXX	± .010	.010 F.I.R.
ANGLES	± .5 DEGREES	

ACAD FILE: 6316-0098-00

MANUFACTURE & FINISH IN ACCORDANCE WITH LATEST REVISION OF 7303-0001-00

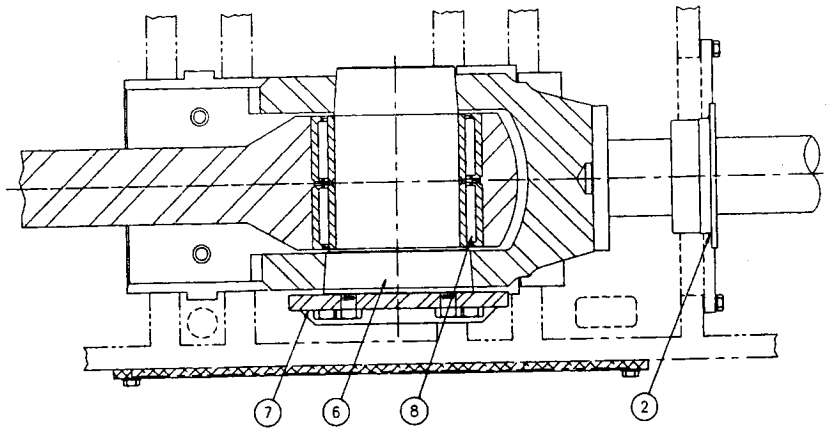
FILE:		
DWN BY	NDB	6-13-88
CHK BY	EW	6-13-88
APP BY		11-7-98

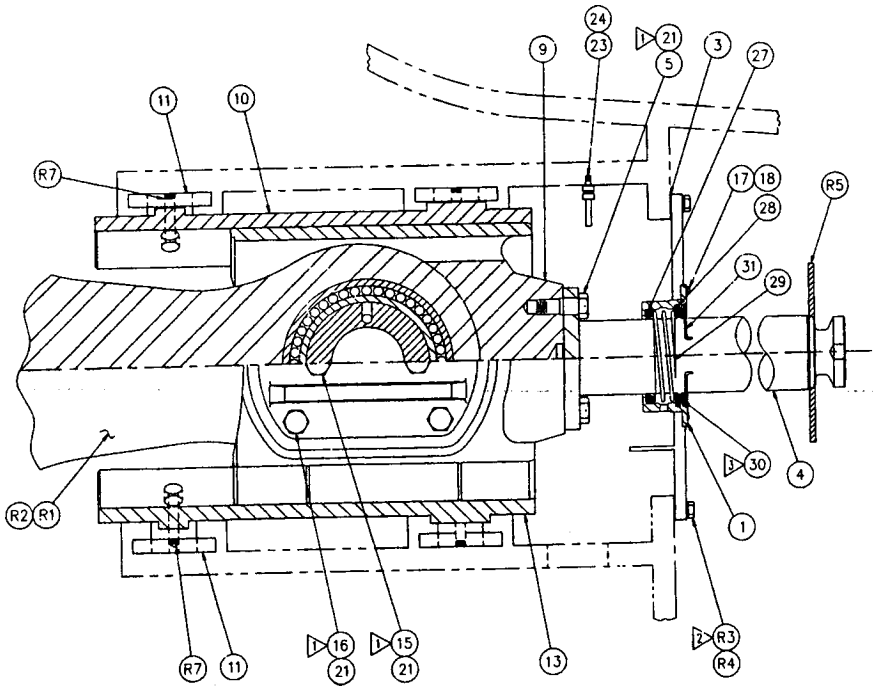
SCALE: 3.00 = 12.00

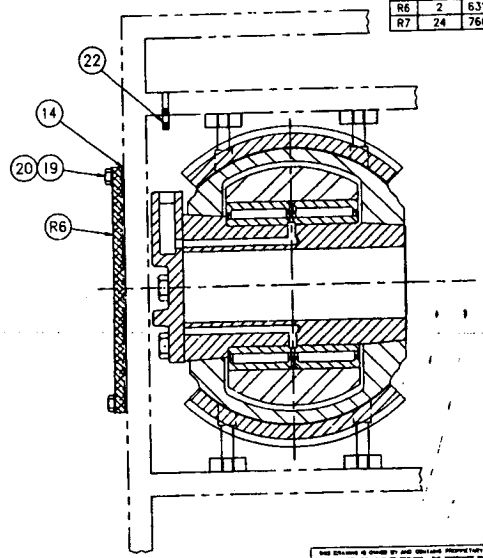
Continental Emsco Company
Houston, Texas

PINION SHAFT ASSEMBLY
F-1600 TRIPLEX PUMP

SIZE D | 6316-0098-00 | SHEET 1/1







ITEM	QTY	PART NO.	PART NAME	MATERIAL DESCRIPTION	MATERIAL CODE	REV
1	3	6397-0544-00	DIAPHRAGM STUFFING BOX			
2	3	7601-1610-22	O-RING			
3	3	6316-0081-00	DIAPHRAGM PLATE GASKET			
4	3	6316-0028-00	CROSSHEAD EXTENSION			
5	12	7501-1269-00	SKT HD CAPSCREW	1"-8UNC-2B X 2.50		
6	3	6316-0087-00	CROSSHEAD PIN			
7	3	6316-0026-00	CROSSHEAD PIN RETAINER			
8	3	6301-0038-00	CROSSHEAD BEARING			
9	3	6316-0022-00	CROSSHEAD			
10	3	6316-0687-00	CROSSHEAD GUIDE-UPPER ASSY			
11	24	6319-0131-00	LOCKING PLATE			
12						
13	3	6316-0688-00	CROSSHEAD GUIDE-LOWER ASSY			
14	2	6316-0047-00	CROSSHEAD DOOR GASKET			
15	6	7501-0141-00	DR HD CAPSCREW (GR. 5)	1"-8UNC X 2.25 LG.		
16	12	7501-0139-00	DR HD CAPSCREW (GR. 5)	1"-8UNC X 2.50 LG.		
17	12	7601-0330-29	HEX HD CAPSCREW	3/8"-16UNC X .88 LG.		
18	12	7601-1320-14	LOCKWASHER	3/8"		
19	28	7601-0330-76	HEX HD CAPSCREW	5/8"-11UNC X 1.50 LG.		
20	28	7601-1330-05	PLAIN WASHER - SMALL O.D.	5/8"		
21	1	7602-5312-40	STAINLESS STEEL WIRE	.06 DIA X 240.00 LG.		
22	4	7601-2580-68	PIPE NIPPLE	3/8" X 2.00		
23	3	7601-2730-07	3/8" MALE CONN.- 5/8"-16	X .375 MPT (WTHC 200-6-6)		
24	3	7508-9020-31	COPPER TUBING ASSY	3/8"		
25						
26						
27	3	7602-2131-47	SINGLE LIP OIL SEAL			
28	3	7602-1600-39	O-RING			
29	3	6397-0548-00	DIAPH. STUFF. BOX SPRING			
30	3	7602-2132-76	DOUBLE LIP OIL SEAL			
31	3	6397-0546-00	DIAPH. STUFF. BOX LOCK SPRING			
R1	3	6316-0023-00	ECCENTRIC STRAP-F-1600			
R2	3	6317-0026-00	ECCENTRIC STRAP-F-1300			
R3	24	7601-0330-77	HEX HD CAPSCREW	5/8"-11UNC X 1.75 LG.		
R4	24	7601-1370-49	LOCKWASHER	5/8"		
R5	3	6317-0093-00	FLUID BAFFLE DISCHARGE			
R6	2	6316-0045-00	CROSSHEAD DOOR CE-CO.			
R7	24	7601-0341-86	SKT HD CAPSCREW W/NYLOK	LOCK - 3/4"-10UNC X 2.50 LG.		

DEC 1999
ISSUED BY
NATIONAL-OILWELL
ENGINEERING

NOTES :

1. LOCTITE & TOPQUE PIN RETAINER BOLTS PER 6399-0066-02
2. PERMATEX BOTTOM 3 CAPSCREW ON EACH DIAPHRAGM.
3. INSTALL MAIN LIP TOWARD POWER END.

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M	12-3-98	11368	REDRAWN ON AUTOCAD		
SYM	DATE	E.O. NO.	REVISION	ZIP	BY

TOLERANCE UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES

DECIMAL	DIMENSION	CONCENTRICITY
X.X	± .1	.1 F.I.R.
X.XX	± .08	.08 F.I.R.
X.XXX	± .010	.010 F.I.R.

ANGLES ± .5 DEGREES

ACAD FILE: 6316-0183-00

MANUFACTURE & FINISH IN ACCORDANCE WITH LATEST REVISION OF 7310-0001-00.

FILE:

DRN BY	TAB	11-1-71
CHK BY	JO	11-1-71
APP BY		

SCALE: 3.00 = 12.00

Continental Emsco Company
Houston, Texas

CROSSHEAD ASSEMBLY
F-1600
TRIPLEX PUMP

SIZE D | 6316-0183-00 | SHEET 1/1

ITEM	QTY.	PART NO.	DESCRIPTION	MATERIAL CODE	WEIGHT	EO
1	1	7602-1070-03	AIR MAZE OHN FILTER			
2	1	7602-1150-98	0-160# MARSH GAUGE			
3	1	7602-2914-78	LUNK 40# RELIEF VALVE			
4	2	6397-0316-01	OIL JET			
5	1	6920-0259-00	MANIFOLD			
6	1	7602-1830-82	#2S B & S PUMP W/O RELIEF VALVE			
7	1	6319-0095-00	SHIM SET			
8	1	6316-0124-00	OIL PUMP MOUNTING PLATE			
9	1	6316-0169-00	MANIFOLD (X-HEAD)			
10	13	7514-0212-00	3/8" TUBING CLAMP (SINGLE)			L
11	4	7514-0209-00	3/8" TUBING CLAMP (DOUBLE)			L
12	2	7514-0231-00	3/8" TUBING CLAMP (TRIPLE)			
13	4	7514-0007-00	1/2" TUBING CLAMP (SINGLE)			
14						
15						
16	4	7601-2590-94	1/4"-18 CTSK ALLEN HEAD PIPE PLUG			
17	4	7601-0330-03	1/4"-20 x 3/4" HX CAPSCREW			
18	4	7601-1320-38	1/4" LOCK WASHER			
19	4	7601-0330-32	3/8"-16 x 1 1/2" HX CAPSCREW			
20	4	7601-1320-14	3/8" LOCK WASHER			
21	2	7601-2730-08	WEATHERHEAD 200 x 8 INV. CONNECTOR			
22	1	6319-0094-00	OIL PUMP GEAR			
23	1	7504-0002-00	KEY 3/16" SQ. x 1"			
24	2	7601-2750-35	WEATHERHEAD MALE ELBOW - 90°			
25	1	7601-2550-27	1/2" PIPE COUPLING (3000#)			

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DATE	E.O. NO.	REVISION	BY
11-6-98	113738	REVISED ITEMS 28 & 29	RICK
10-20-98	113648	REDRAWN IN ACAD/REV. 10,11,28	RICK
4			

MANUFACTURE & FINISH IN ACCORDANCE WITH LATEST REVISION OF DRAWING 7515-0001-00.

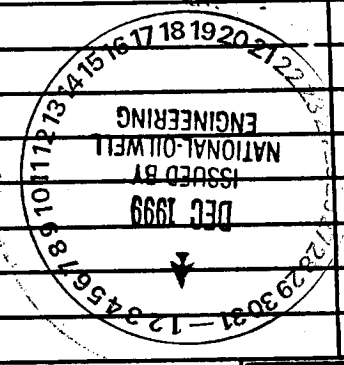
DWN BY	CHK BY	APP BY	FILE NUMBER
J.ORZO	JO	MRL	
DATE 5-10-72	DATE 5-10-72	DATE 11-6-98	ACAD NUMBER 6316-0227-00A

Continental Emsco Company
Houston, Texas

TITLE
FB-1600 POWER PUMP POWER END LUBRICATION ASSEMBLY

SIZE	DRAWING NO.	SHEET
D	6316-0227-00	1/3

ITEM	QTY.		PART NO.	DESCRIPTION	MATERIAL CODE	WEIGHT	EO
26	2		7601-2530-04	1/2" x 1/8" BUSHING			
27	2		7508-0240-37	1/2" COPPER TUBING ASSEMBLY			
28	1		7601-2550-85	1/2" STD. PIPE COUPLING			M
29	1		7601-2091-39	REDUCING ADAPTER 3/4 NPTF x 1/2 NPTM			M
30	1		7601-2590-76	1/4" PIPE PLUG			
31	1		7601-2810-03	WEATHERHEAD UNION			
32	5		7601-2730-04	WEATHERHEAD MALE CONNECTOR			
33	2		7601-2730-86	WEATHERHEAD MALE CONNECTOR			
34	2		7601-2752-00	WEATHERHEAD MALE ELBOW			
35	2		7601-2810-02	WEATHERHEAD UNION			
36	1		7601-2750-04	WEATHERHEAD MALE ELBOW			
37	14		7601-2750-05	WEATHERHEAD MALE ELBOW			
38	2		7601-2750-06	WEATHERHEAD MALE ELBOW			
39	2		7601-2750-27	WEATHERHEAD MALE ELBOW - 45°			
40	1		7508-0770-28	3/8" COPPER TUBING ASSEMBLY			
41	2		7508-0320-19	5/16" COPPER TUBING ASSEMBLY			
42	1		7508-0770-19	5/16" COPPER TUBING ASSEMBLY			
43	1		7508-0490-19	5/16" COPPER TUBING ASSEMBLY			
44	1		7508-0120-19	5/16" COPPER TUBING ASSEMBLY			
45	1		7508-0130-45	5/8" COPPER TUBING ASSEMBLY			
46	1		7508-0270-45	5/8" COPPER TUBING ASSEMBLY			
47	2		7508-0120-40	1/2" COPPER TUBING ASSEMBLY			
48	1		7508-0910-19	5/16" COPPER TUBING ASSEMBLY			
49	1		7508-0630-19	5/16" COPPER TUBING ASSEMBLY			
50	2		7508-0200-22	5/16" COPPER TUBING ASSEMBLY			



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SYM	DATE	E.O. NO.	REVISION	BY
M	11-6-98	113738	REVISED ITEMS 28 & 29	RICK
L	10-20-98	113648	REDRAWN IN ACAD/REV. 10,11,28	RICK

MANUFACTURE & FINISH IN ACCORDANCE WITH LATEST REVISION OF DRAWING 7515-0001-00.

DWN BY	CHK BY	APP BY	FILE NUMBER
J.ORZO	JO	MRL	
DATE 5-10-72	DATE 5-10-72	DATE 11-6-98	ACAD NUMBER 6316-0227-008

Continental Emsco Company
Houston, Texas

TITLE
FB-1600 POWER PUMP
POWER END
LUBRICATION ASSEMBLY

SIZE	DRAWING NO.	SHEET
D	6316-0227-00	2/3

ITEM	QTY.		PART NO.	DESCRIPTION	MATERIAL CODE	WEIGHT	EO
51	1		7508-0360-22	5/16" COPPER TUBING ASSEMBLY			
52	3		7508-0300-22	5/16" COPPER TUBING ASSEMBLY			
53	2		7508-0090-22	5/16" COPPER TUBING ASSEMBLY			
54	1		7508-0470-22	5/16' COPPER TUBING ASSEMBLY			
55	1		7508-0400-22	5/16" COPPER TUBING ASSEMBLY			
56	1		7508-0330-28	3/8" COPPER TUBING ASSEMBLY			
57							
58							
59							
60							
61							
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THIS DRAWING IS OWNED BY AND CONTAINS PROPRIETARY INFORMATION OF CONTINENTAL EMSCO CO. IT IS CONDITIONALLY LOANED AND IS TO BE RETURNED UPON COMPLETION OF WORK OR UPON EARLIER REQUEST. THE BORROWER BY RECEIVING IT HAS AGREED NOT TO REPRODUCE NOR TO COPY IT IN WHOLE OR IN PART NOR TO FURNISH INFORMATION FROM IT TO OTHERS NOR TO MAKE ANY USE OF IT OR THE INFORMATION CONTAINED THEREIN EXCEPT FOR OR UNDER SPECIFIC LICENSE FROM CONTINENTAL EMSCO CO.

SYM	DATE	E.O. NO.	REVISION	BY
M	11-6-98	113738	REVISED ITEMS 28 & 29	RICK
L	10-20-98	113648	REDRAWN IN ACAD/REV. 10,11,28	RICK

MANUFACTURE & FINISH IN ACCORDANCE WITH LATEST REVISION OF DRAWING 7515-0001-00.

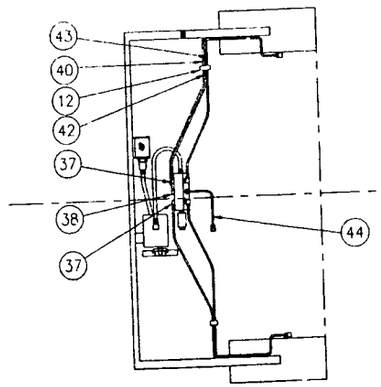
DWN BY	CHK BY	APP BY	FILE NUMBER
J.ORZO	MRL	MRL	
DATE 5-10-72	DATE 5-10-72	DATE 11-6-98	ACAD NUMBER 6316-0227-00C

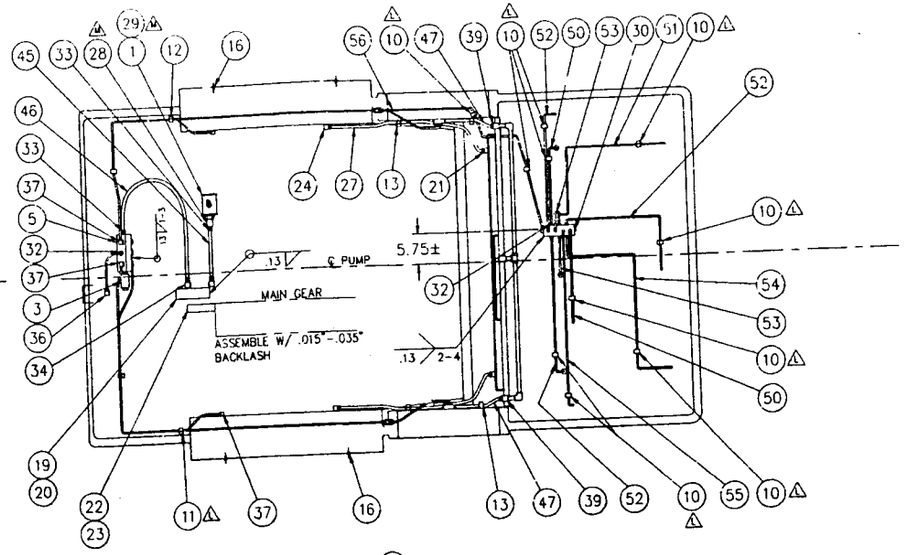
Continental Emsco Company
Houston, Texas

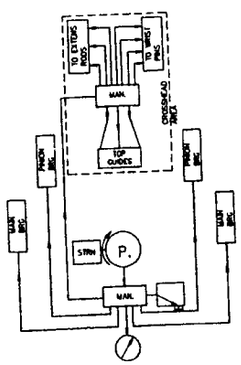
TITLE
FB-1600 POWER PUMP
POWER END
LUBRICATION ASSEMBLY

SIZE	DRAWING NO.	SHEET
D	6316-0227-00	3/3

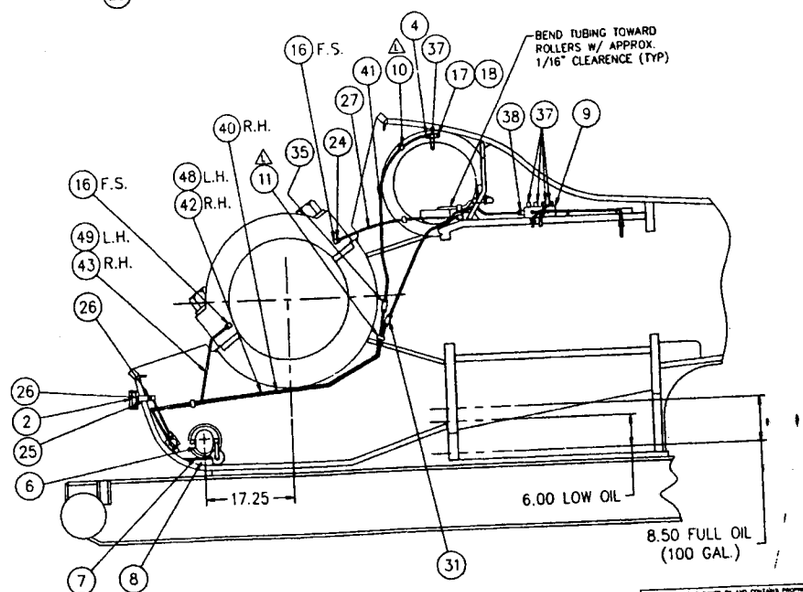
ITEM	QTY	PART NO	PART NAME	MATERIAL DESCRIPTION	MATERIAL CODE	REV







PRESSURE LUBE SCHEMATIC



DEC 1998
ISSUED BY
NATIONAL-OILWELL
ENGINEERING

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REV	DATE	E.O. NO.	REVISION	BY
M	11-6-98	113738	REVISED ITEMS 28 & 29	RCT
L	10-20-98	113648	REDRAWN IN ACAD/REV. 10,11,28	RCT

TOLERANCE UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES

DECIMAL	DIMENSION	CONCENTRICITY
X.X	± .1	.1 F.I.R.
X.XX	± .08	.08 F.I.R.
X.XXX	± .010	.010 F.I.R.
ANGLES ± .5 DEGREES		

ACAD FILE: 6316-0227-00

MANUFACTURE & FINISH IN ACCORDANCE WITH LATEST REVISION OF PS15-9001-00

FILE:		
DWG BY	J.ORZO	5-10-72
CHK BY	JO	5-10-72
APP BY		11-6-98

SCALE: 1.00 = 12.00

Continental Emsco Company
Houston, Texas

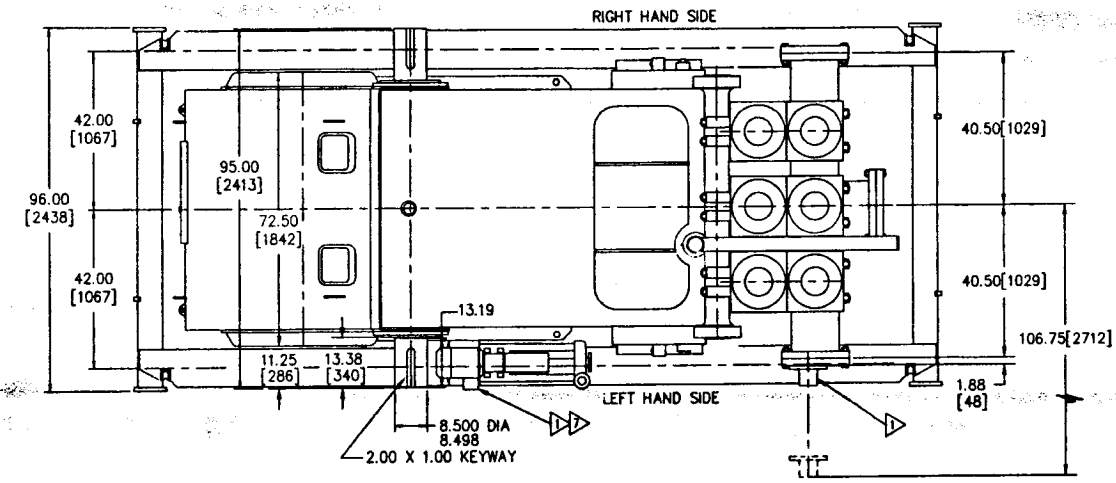
FB-1600 POWER PUMP
POWER END
LUBRICATION ASSEMBLY

SIZE D | 6316-0227-00 | SHEET 1/1

SIM: 6316-0125-00

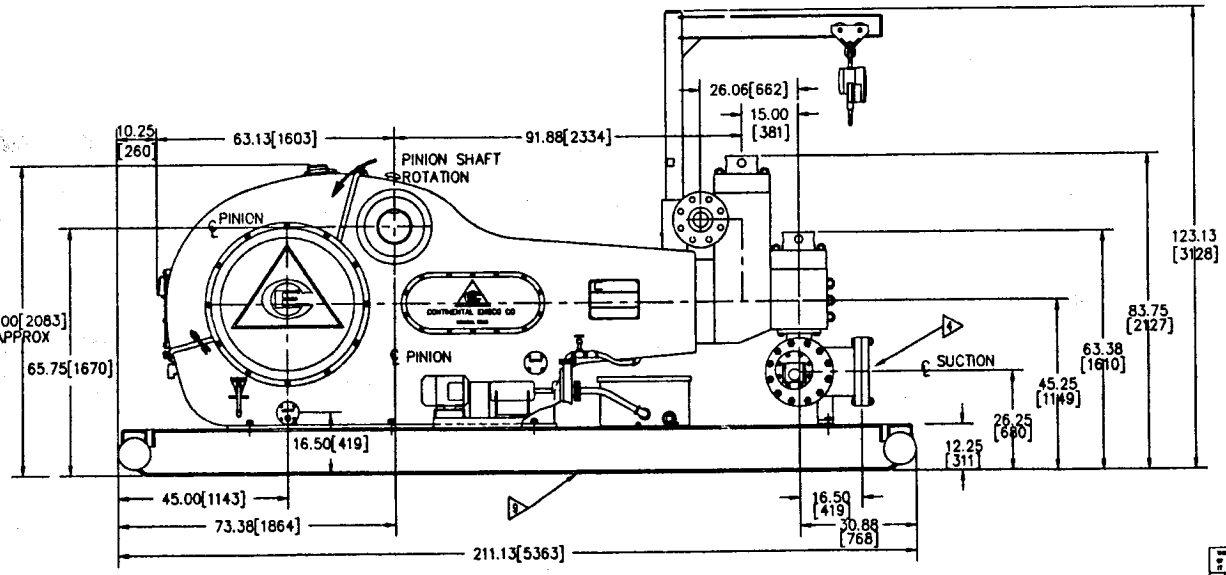
NOV 1998

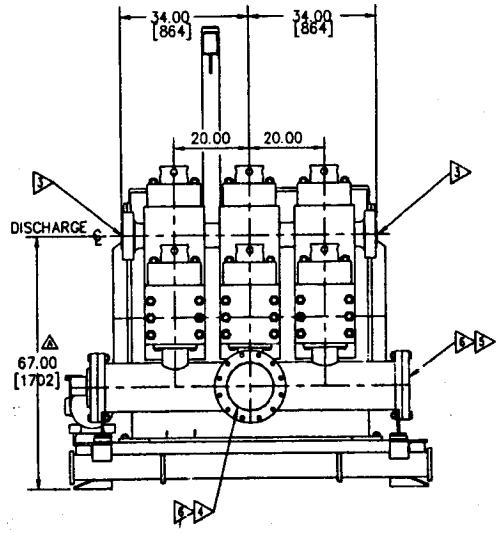
24X



NOTES:

1. LINER WASH PUMP, AND SUCTION DESURGER MAY BE MOUNTED RIGHT OR LEFT HAND SIDE.
2. VERTICAL DIMENSIONS SUBJECT TO SKID BEAM TOLERANCE $^{+.25}_{-.13}$
3. 5 1/8 5,000 PSI API TYPE 6B FLANGE
4. 12-8 NPT THREADED FLANGE
5. BLIND FLANGE
6. FLANGE LOCATIONS MAY BE SWITCHED TO PROVIDE INLET ON SIDE OF PUMP
7. LINER WASH PUMP AND MOTOR DIMENSIONS WILL VARY WITH EQUIPMENT SUPPLIED
8. [ ] DIMENSIONS ARE IN MILLIMETERS, EXCEPT AS NOTED
9. PUMP MAIN SKID BEAMS ARE W12 X 58#
10. STRUCTURAL SHAPES ARE SUBJECT TO MILL TOLERANCES PER ASTM A6





A	3-23-98	114162	DM	67.00 INCH	06.94	DJ			
DWG	DATE	E.O. NO.		REVISION		BY			

TOLERANCE UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES

DECIMAL	DIMENSION	CONCENTRICITY
X.X	± .1	.1 F.I.R.
X.XX	± .05	.05 F.I.R.
X.XXX	± .010	.010 F.I.R.

ANGLES ± .5 DEGREES

ACAD FILE: 6316-0619-00

MANUFACTURE & FINISH IN ACCORDANCE WITH LATEST REVISION OF 7313-5001-00

FILE: FC-1600

DWN BY	OLSON	12-14-94
CHK BY	DC	2-2-95
APP BY		8-26-99

SCALE: .75 = 12.00

Continental Emsco Company
Houston, Texas

TITLE: GENERAL DIMENSIONS FC-1600

SIZE D | 6316-0619-00 | SHEET 1/1

SIM TO 6316-0595-00