



PARTS LIST

12-P-160 Triplex Mud Pump With Forged Crankshaft

REFERENCE 1292900-001	REFERENCE DESCRIPTION Top Level Assembly
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REVISION HISTORY

Rev	Date (dd.mm.yyyy)	Reason for issue	Prepared	Checked	Approved
01	29-03-2005	First issue	TMH		

CHANGE DESCRIPTION

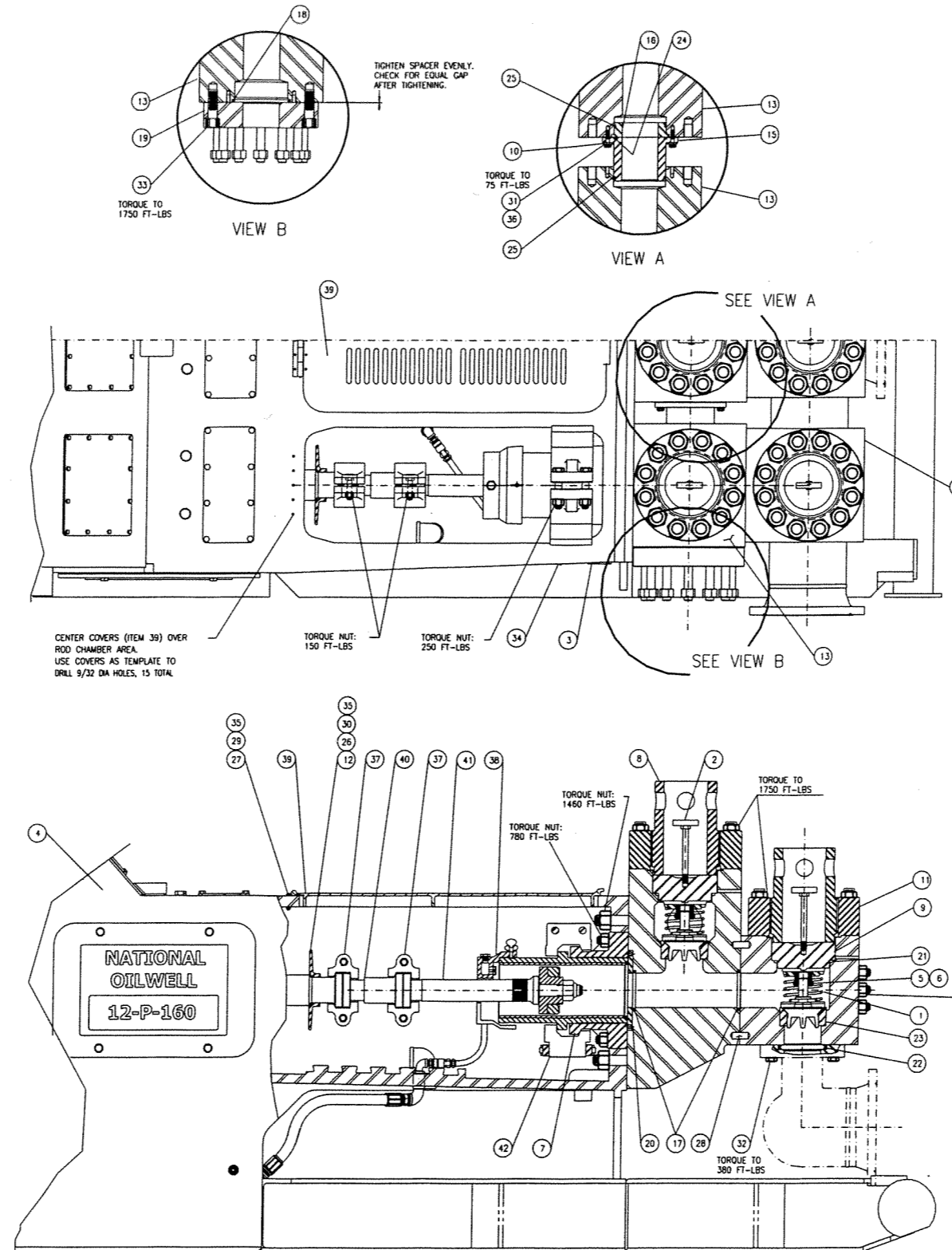
Revision	Change Description
01	First issue

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—	1292900-001	12-P-160 PUMP COMPLETE WITH FORGED CRANKSHAFT (CONSISTS OF THE FOLLOWING)	—
QTY REQ'D	PART NO.	DESCRIPTION	ITEM NO.
BILL OF MATERIAL			

NOTES:

1. TEST PUMP PER PROCEDURE 1290410.
2. MEASURE AND RECORD PISTON ROD LINER BUSHING ECCENTRICITIES PER 1292345. VERTICAL AND HORIZONTAL ECCENTRICITY NOT TO EXCEED .035".
3. PAINT PUMP PER SPECIFICATION CS-3007 SYSTEM D SURFACE PREPARATION SP6.

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NATIONAL OILWELL VARCO

NATIONAL OILWELL, L.P.
1630 WEST SAM HOUSTON PARKWAY NORTH
HOUSTON, TEXAS 77043, USA

TITLE: **PUMP COMPLETE WITH FORGED CRANKSHAFT 12-P-160 TRIPLEX MUD PUMP**

DRAWING NUMBER: **PL 1292900-001** SHEET: **1 OF 1** REV.: **A**

ESTIMATED WEIGHT: 49,426 LBS.

NOTES:

- ASSEMBLE SPACER (19) IN FRAME AND INSERT SHIMS (52) AND (53) AS REQUIRED TO OBTAIN AN .003" TO .005" LOOSE GAP BETWEEN SPACER AND FRAME. TIGHTEN NUT ON STUD (35) UNTIL SPACER TOUCHES FRAME METAL TO METAL. CHECK BY TAPPING SPACER LIGHTLY WITH HAMMER. MARK POSITION OF NUT AND TIGHTEN AN ADDITIONAL TWO FLATS (1/3 TURN).
- INSTALL SHIMS EQUAL TO INNER RACE STAND OFF BEYOND SHAFT, LESS .003" TO .005".
- TORQUE SCREW (117) TO 100 FT-LB. MEASURE GAP BETWEEN RETAINER (114) AND CROSSHEAD. INSERT REQUIRED THICKNESS OF SHIM (110) TO FIT MEASURED SHIM GAP. TORQUE SCREW (117) TO 250 FT-LB AT FINAL ASSEMBLY.
- THESE ITEMS AND QUANTITIES ARE FOR THE NO. 1 AND NO. 3 CROSSHEADS. PART NOS. AND QUANTITIES FOR THE NO. 2 CROSSHEAD (CENTER) ARE ON THE CRANKSHAFT AND GEAR ASSEMBLY.
- STAMP PUMP SERIAL NUMBER ON PUMP FRAME IN 2 LOCATIONS: BETWEEN CENTER TWO STUDS ON LOWER FLANGE OF MAIN FRAME COVER BELOW NAME/INSTRUCTION PLATE, ITEM 63 USE 3/8" HIGH LETTERS. SERIAL NO. SHOULD INCLUDE THE PRE-FIX LETTER (S) OF THE MANUFACTURING LOCATION.

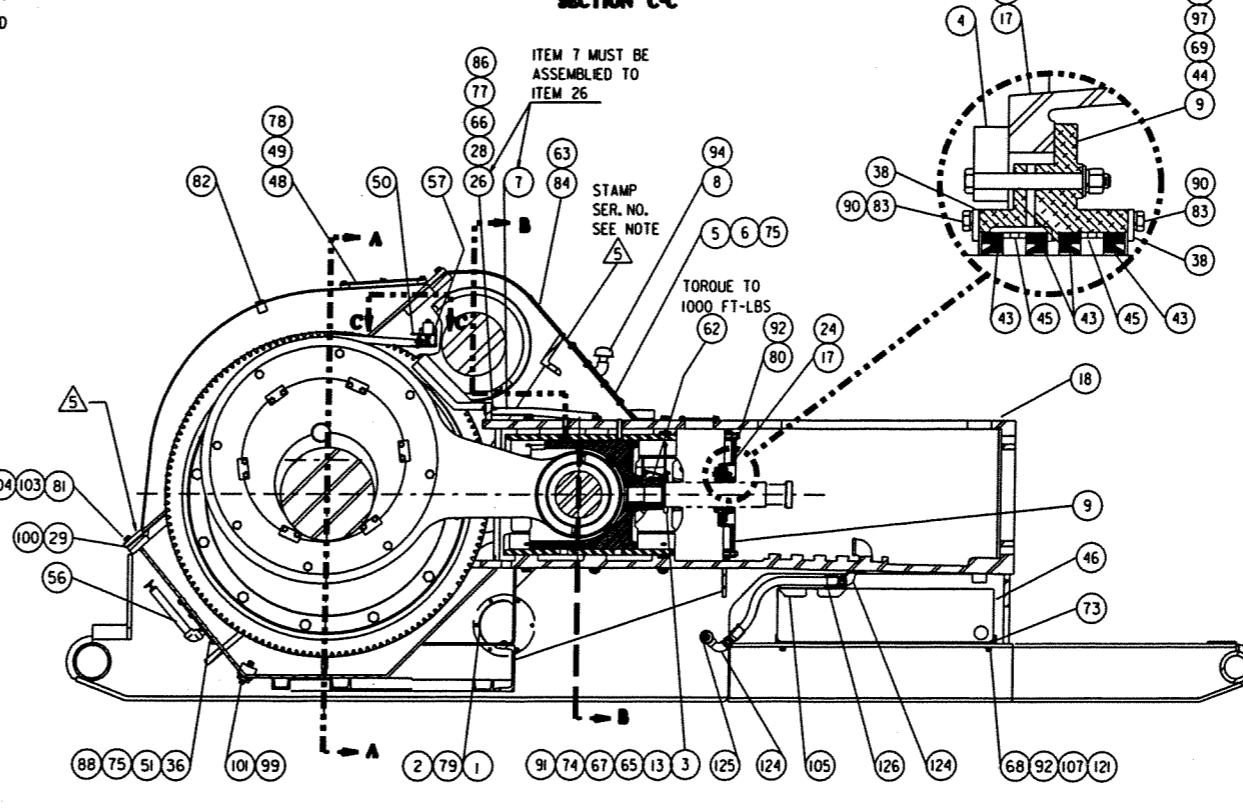
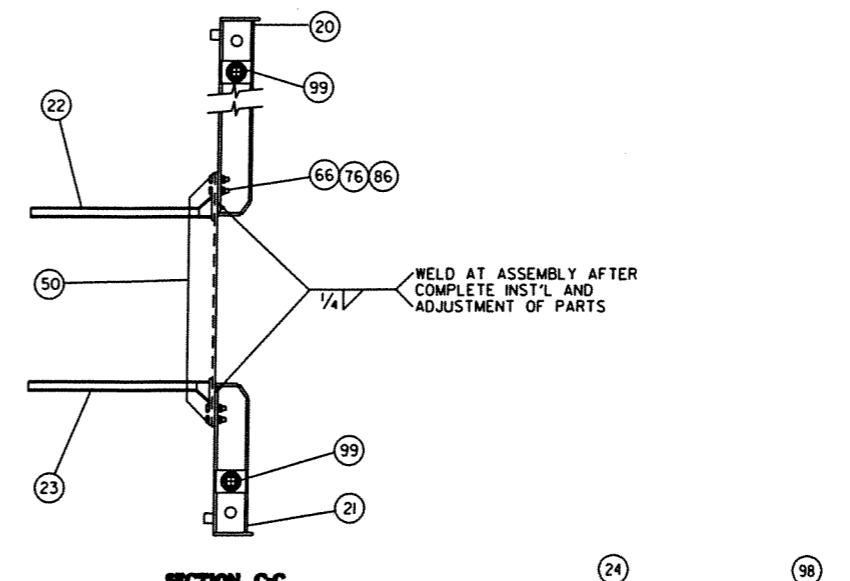
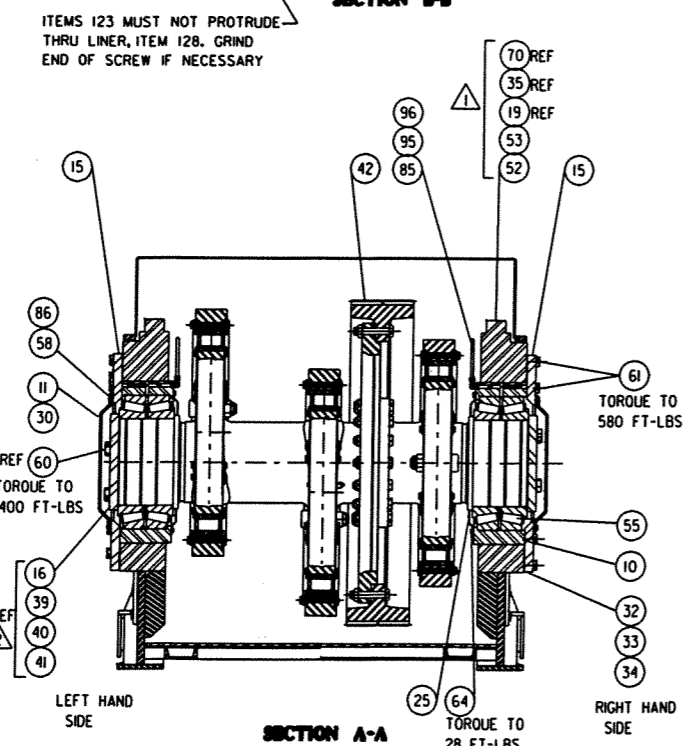
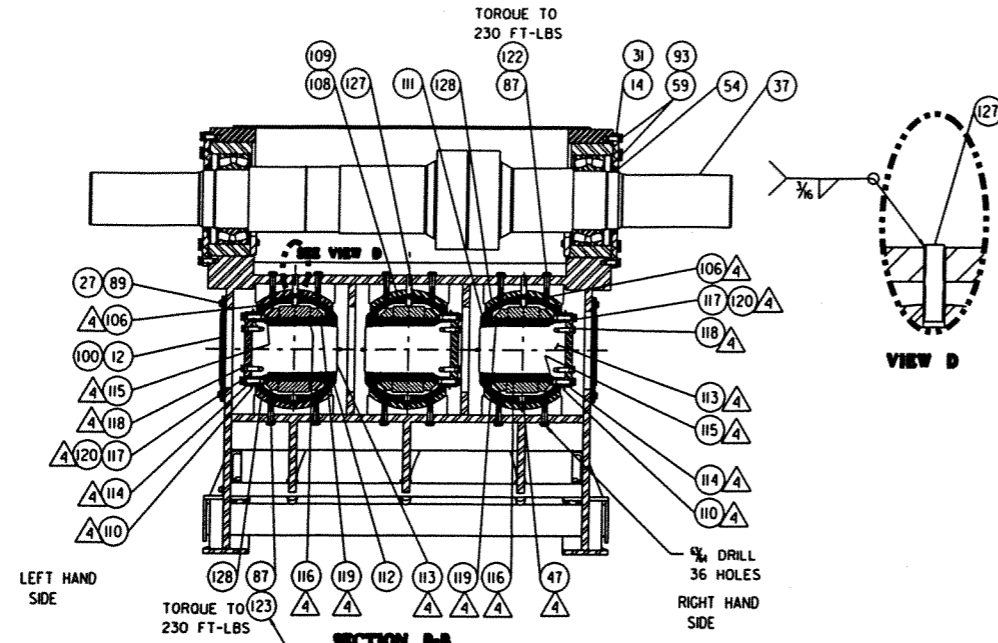
DATA FOR NAME AND INSTRUCTION PLATE

MODEL	12-P-160	SERIAL NO.	
MAXIMUM LINER SIZE	7/4"	STROKE	12"
RATED MAXIMUM INPUT	1600 HP	AT	120 SPM
RATED MAXIMUM OUTPUT	1440 HP	AT	120 SPM
GEAR RATIO	3.439	HYDROSTATIC TEST	10,000 PSI
LINER SIZE			
7/4"	772	3200	
7"	720	3430	
6 3/4"	669	3690	
6 1/2"	621	3980	
6 1/4"	574	4305	
6"	529	4670	
5 3/4"	486	5000	
5 1/2"	444	5000	

QTY	PART NO.	DESCRIPTION	REF NO.
6	1292017	LINER, CROSSHEAD	128
6	6700400	PIPE 1/2" X 3-3/8" L.G. SCH. 40 PIPE	127
3	1282036	HOSE ASSEMBLY, 1" X 2'-6" L.G.	126
1	6873008	PLUG, 1" CORED PIPE	125
3	6829008	ELBOW, 1" X 90° STREET	124
18	2405023	CAPSCREW 1/2" X 3" L.G. DRD.D. HEX HEAD	123
18	2405022	CAPSCREW 1/2" X 4" L.G. DRD.D. HEX HEAD	122
8	7035305	SCREW 1/2" X 1-1/2" L.G. CAD PLTD. FLAT HEAD MACHINE	120
4	761036	WASHER 1/2" X 1-1/2" L.G. PLATE	119
2	692093	RING, RETAINING	118
4	5506714	BOLT 1/2" X 2-1/2" L.G. PLATE	117
4	2402470	CAPSCREW 1/2" X 3" L.G. DRD.D. HEX HEAD	116
2	ZB-8253	BEARING, CROSSHEAD PIN	115
4	1287109	RING, CROSSHEAD PIN BEARING SNAP	114
2	1292112	RETAINER, CROSSHEAD PIN	113
2	1292028	PIN, CROSSHEAD	112
1	1292090	CROSSHEAD, LEFT HAND	111
1	1292095	CROSSHEAD, RIGHT HAND	110
4	1290014	SHIM, CROSSHEAD PIN RETAINER	109
6	1292174	SHIM, FRONT CROSSHEAD LINER	108
12	1292173	SHIM, REAR/CENTER CROSSHEAD LINER	107
8	7619050	WASHER 1/2" REG CAD PLATED SPRING LOCK	106
2	1290089	CONDUCTOR, OIL	105

QTY	PART NO.	DESCRIPTION	REF NO.
1	1292295	STRAINER, SUMP PUMP	105
34	7621040	WASHER 1/2" X .625 OD CAD PLTD. TYPE A NARROW PLAIN	104
34	7619058	WASHER 1/2" REG CAD PLATED SPRING LOCK	103
2	6829066	ELBOW, 2" X 90° PIPE	102
1	6800663	BUSHING, 2" X 1" HEX HEAD PIPE	101
2	7817170	RUBBER 1/2" X 2" X 19" L.G. NEOPRENE SPONGE	100
3	7815057	PLUG, MAGNETIC POST	99
3	64016226	GREASE FITTING, 1/2"	98
3	7805052	GREASE FITTING, 1/2" STRAIGHT	97
2	IG-1804202	ELBOW 1/2" T. 2 1/2" PT X 45° MALE	96
2	1804146	ELBOW 1/2" T. 2 1/2" PT X 90° FEMALE	95
1	7802020	CAP. BREATHER	94
32	7621044	WASHER 1/2" X 1.469 OD CAD PLTD. TYPE A NARROW PLAIN	93

QTY	PART NO.	DESCRIPTION	REF NO.
20	7621032	WASHER 1/2" X .625 OD CAD PLTD. TYPE A NARROW PLAIN	92
12	7621016	WASHER 1/2" X .625 OD CAD PLTD. TYPE A NARROW PLAIN	91
18	7619025	WASHER, NO. 10 REG CAD PLATED SPRING	90
8	7618022	WASHER 1/2" X 1" L.G. DRD.D. HEX HEAD	89
12	7618014	WASHER 1/2" X 1" L.G. DRD.D. HEX HEAD	88
36	7618026	WASHER 1/2" X 1" L.G. DRD.D. HEX HEAD	87
40	7600024	WASHER 1/2" X .812 OD TYPE A NARROW PLAIN	86
2	7400842	TUBING 1/2" OD X 1/4" X 32" L.G. CD. S.M.S. STEEL	85
2	7178025	SCREW, NO. 2 X 1 1/4" L.G. TYPE U ROUND HEAD DRIVE	84
18	IG-708109-17	SCREW, NO. 10 X 1 1/2" L.G. TRK. PLTD. SOCKET HEAD SET	83
2	7027393	SCREW 3/4" X 1" L.G. CUP POINT SOCKET HEAD SET	82
34	7000397-11	CAPSCREW 3/4" X 2" L.G. GR 5 CAD PLTD. HEX HEAD	81
12	7000309-11	CAPSCREW 1/2" X 2-1/4" L.G. GR 5 CAD PLTD. HEX HEAD	80
12	7000304-11	CAPSCREW 1/2" X 1-1/4" L.G. GR 5 CAD PLTD. HEX HEAD	79
44	7000303-11	CAPSCREW 1/2" X 1" L.G. GR 5 CAD PLTD. HEX HEAD	78
4	7000213-11	CAPSCREW 3/4" X 2-1/4" L.G. GR 5 CAD PLTD. HEX HEAD	77
4	7000210-11	CAPSCREW 3/4" X 1-1/2" L.G. GR 5 CAD PLTD. HEX HEAD	76
48	7000208-11	CAPSCREW 3/4" X 1" L.G. GR R CAD PLTD. HEX HEAD	75
6	700014-11	CAPSCREW 1/2" X 2-1/2" L.G. GR 5 CAD PLTD. HEX HEAD	74
2	1292080	RAIL, SUMP SUPPORT	73
3	1292076	GASKET, TOP ACCESS	72
3	1292075	COVER, TOP ACCESS	71
1	REF 63300361	NUT, 2-1/4" -BUNC HEAVY HEX	70
9	6541612	PIN 1/2" X 1-1/2" L.G. GROOVE ANSITYPE C	69
8	6300081	NUT, 1/2" CAD PLATED HEX	68
3	6320062	NUT, 3/4" HEX JAM	67
8	6310060	NUT, 3/4" -16UNC FLEBLOC	66
6	6310040	NUT, 1/2" -20UNC FLEBLOC	65
16	5506202	BOLT, 3/8" X 2 1/2" L.G. PLACE	64
1	2407100	PLATE, NAME & INSTRUCTION	63
6	7000612-107	CAPSCREW 1-1/4" X 4-1/2" L.G. GR 5 C.P. DRD.D. HEX HD	62
32	2400180	CAPSCREW 1" X 3" L.G. GR 5 CAD PLTD. DRD.D. HEX HEAD	61
REF	2405024	CAPSCREW 1-3/8" X 3-1/2" L.G. GR 5 C.P. DRD.D. HEX HEAD	60
32	2405016	CAPSCREW 1/2" X 2" L.G. GR 5 C.P. DRD.D. HEX HEAD	59
24	2405093	CAPSCREW 3/4" X 1" L.G. GR 5 C.P. DRD.D. HEX HEAD	58
8	2400040	CAPSCREW 3/4" X 1-1/2" L.G. GR 5 C.P. DRD.D. HEX HEAD	57
1	2400029	DIPSTICK, OIL LEVEL	56
2	ZT-15000	BEARING, MAIN	55
2	ZS-10004	SEAL, PINION BEARING OIL	54
4	1283147	SHIM .0005" THICK, BEARING SUPPORT	53
2	1283148	SHIM .001" THICK, BEARING SUPPORT	52
1	1284106	GASKET, OIL GAUGE PLATE	51
1	1292069	BRACE, TROUGH, OIL	50
1	1279157	COVER, GEAR INSPECTION	49
2	1271558	GASKET, GEAR INSPECTION COVER	48
2	6875003	PLUG, 3/4" COUNTERSUNK	47
1	1292282	SUMP, PISTON LINER LUBE	46
6	1292269	SPACER, OIL WIPER	45
3	1292227	GASKET, OIL WIPER RETAINER	44
12	1292182	WIPER, INTERMEDIATE ROD OIL	43
1	1292192	GEAR ASSEMBLY, FORGED CRANKSHAFT AND	42
REF	1292671	SHIM .0005" THICK, MAIN BEARING RETAINER	41
REF	1292670	SHIM .001" THICK, MAIN BEARING RETAINER	40
REF	1292669	SHIM .003" THICK, MAIN BEARING RETAINER	39
6	1292639	PLATE, OIL WIPER RETAINER	38
1	1292119	PINION SHAFT SUB-ASSEMBLY	37
1	1292114	PLATE, OIL GAUGE	36
REF	1292024	STUD, MAIN AND PINION BEARING SUPPORT	35
8	1292104	SHIM .002" THICK, MAIN BEARING LOCK RING	34
10	1292105	SHIM .0015" THICK, MAIN BEARING LOCK RING	33
14	1292106	SHIM .0005" THICK, MAIN BEARING LOCK RING	32
2	1292097	GASKET, RETAINER, PINION BEARING	31
2	1292096	GASKET, MAIN BEARING END CAP	30
1	1292095	GASKET, MAIN FRAME COVER	29
1	1292092	WIPER (RIGHT HAND), GEAR & PINION OIL	28
8	7000396-11	CAPSCREW 1/2" X 1-3/4" L.G. GR 5 CAD PLTD. HEX HEAD	27
1	1292082	WIPER (LEFT HAND), GEAR & PINION OIL	26
2	1292081	RETAINER, GEAR, MAIN BEARING	25
3	1292079	GASKET, RETAINER PLATE	24
1	1292073	WIPER (RIGHT HAND), GEAR OIL	23
1	1292072	WIPER (LEFT HAND), GEAR OIL	22
1	1292071	TROUGH (RIGHT HAND), PINION BEARING OIL	21
1	1292070	TROUGH (LEFT HAND), PINION BEARING OIL	20
REF	1292014	SPACER, MAIN & PINION BEARING SUPPORT	19
1	1292104	FRAME COMPLETE, MAIN	18
3	1292023	PLATE, INTERMEDIATE ROD WIPER RETAINER	17
REF	1292672	PLATE, RETAINER, MAIN BEARING	16
2	1292021	RING, RETAINER, MAIN BEARING	15
2	1292020	RETAINER, PINION BEARING OIL SEAL	14
3	1292016	SHIELD, INTERMEDIATE ROD OIL	13
2	1292013	COVER, CROSSHEAD HAND HOLE	12
2	1292012	CAP, END, MAIN BEARING	11
2	1292011	CAGE, MAIN BEARING	10
3	1292009	RETAINER, OIL WIPER	9
1	1292110	COVER, CENTER WRENCH HOLE	8
1	1292089	TROUGH, LEFT HAND CROSSHEAD LUBE OIL	7
2	1292077	COVER, WRENCH HOLE	6
3	1292064	GASKET, WRENCH HOLE	5
9	1290714	BOLT, WIPER RETAINER HOOK	5
3	1290251	SCREW, OIL PASSAGE	3
2	1283191	GASKET, CLEAN-OUT PLATE	2
1	1283190	PLATE, CLEAN-OUT	1
—	1292904	POWER END COMPLETE WITH FORGED CRANKSHAFT (CONSISTS OF THE FOLLOWING)	—



ESTIMATED WEIGHT: 36,665 LBS.

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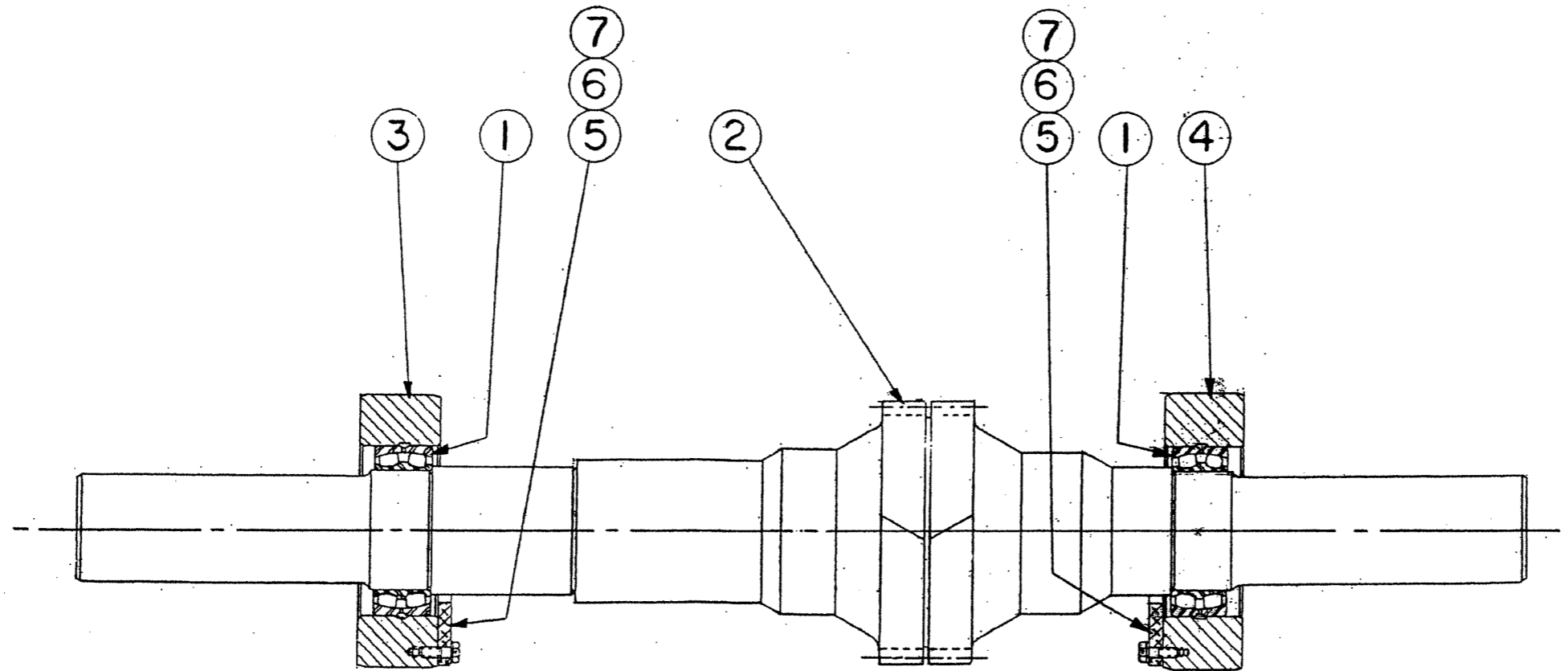
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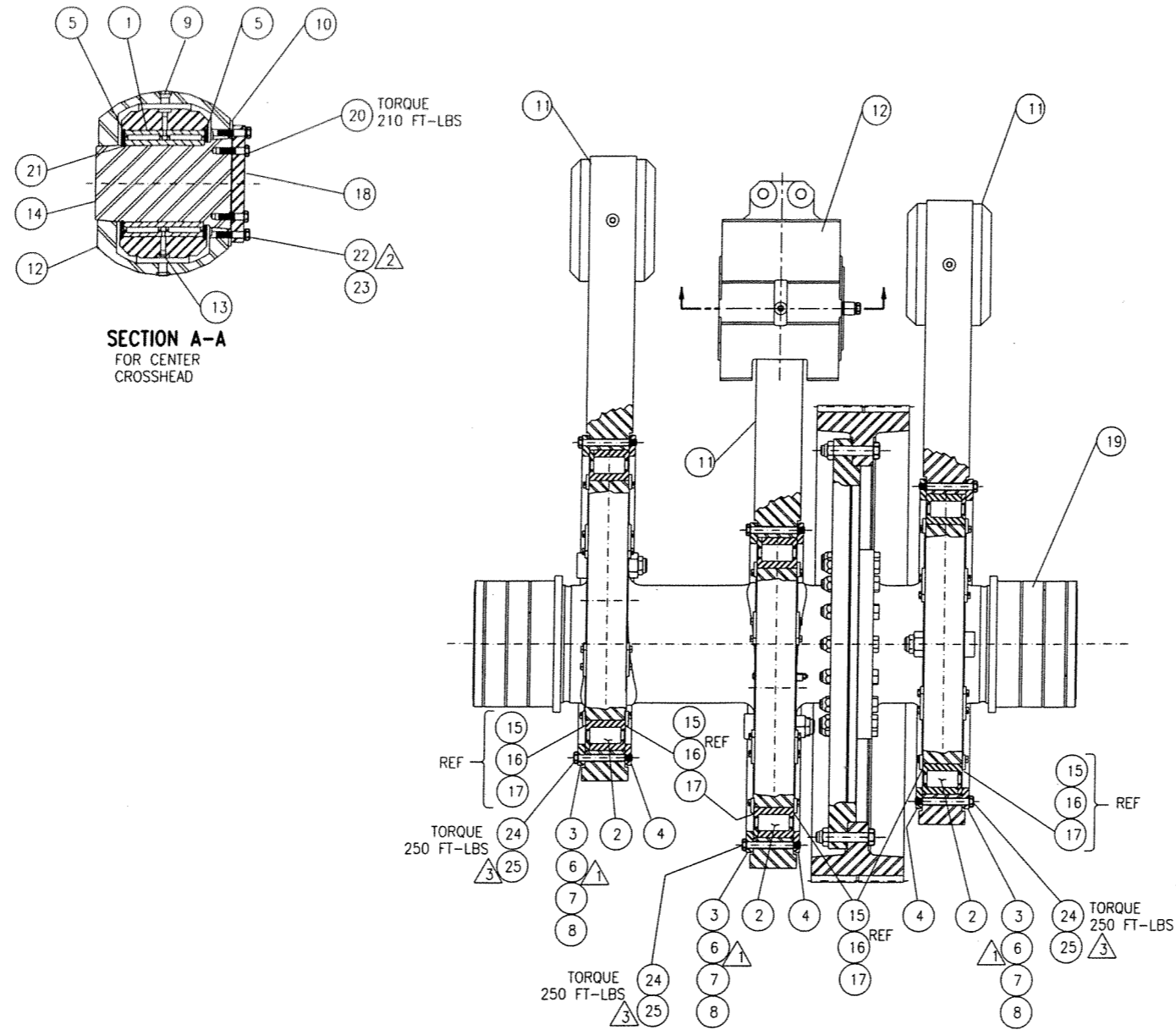
TITLE: POWER END COMPLETE
12-P-160 TRIPLEX MUD PUMP

DRAWING NUMBER: PL 1292901 SHEET: 1 OF 1 REV: B

BILL OF MATERIAL			
ITEM	REQ'D	PART NO.	DESCRIPTION
—	—	1292119	PINION SHAFT SUB-ASSEMBLY (CONSISTS OF THE FOLLOWING)
1	2	ZB-10236	BEARING, PINION
2	1	1292010	PINION
3	1	1292018	CAGE (LEFT HAND), PINION BEARING
4	1	1292019	CAGE (RIGHT HAND), PINION BEARING
5	2	1292027	PLATE, PINION BEARINGCAGE
6	8	2402680	CAPSCREW, 5/8" X 2" LG. DRILLED HEX HEAD
7	8	7600040	WASHER, 5/8" N TYPE "A" 1.312" O.D.



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	NATIONAL-OILWELL, L.P. 1530 WEST SAM HOUSTON PARKWAY NORTH HOUSTON, TEXAS 77043, USA	
TITLE: PINION SHAFT SUB-ASSEMBLY 12-P-160 TRIPLEX MUD PUMP		
DRAWING NUMBER: PL 1292119	SHEET: 1 OF 1	REV.



QTY REQD	PART NO.	DESCRIPTION	ITEM NO.
80	7822095	SAFETY WIRE	25
24	2405013	CAPSCREW, 3/4" X 6-1/2" LG. DRILLED HEX HEAD	24
2	7619068	WASHER, 3/4" EXTRA DUTY SPRING LOCK	23
2	2402470	SCREW, 3/4" X 3" LG. DRILLED HEAD	22
1	6912019	RING, RETAINING	21
2	5506714	BOLT, 3/4" X 2-1/2" LG. PLATE	20
1	1292903	GEAR SUB-ASSEMBLY, FORGED CRANKSHAFT AND	19
1	1292112	RETAINER, CROSSHEAD PIN	18
REF	1292677	SHIM (.005" THK.), CONN. ROD BEARING RETAINER PLATE	17
REF	1292678	SHIM (.0075" THK.), CONN. ROD BEARING RETAINER PLATE	16
REF	1292679	SHIM (.020" THK.), CONN. ROD BRG RETAINER PLATE	15
1	1292028	PIN, CROSSHEAD	14
1	6875003	PLUG, 3/8" COUNTERSUNK PIPE	13
1	1292015	CROSSHEAD, CENTER	12
3	1292007	ROD, CONNECTING	11
2	1290114	SHIM, PIN RETAINER	10
1	1290089	CONDUCTOR, OIL	9
9	1287151	SHIM (.005" THK.), CONN. ROD OUTER RETAINER	8
9	1287150	SHIM (.0075" THK.), CONN. ROD OUTER RETAINER	7
3	1287149	SHIM (.020" THK.), CONN. ROD OUTER RETAINER	6
2	1287109	RING, CROSSHEAD PIN BEARING SNAP	5
3	1286237	RETAINER, CONNECTING ROD INNER BEARING	4
3	1286230	RETAINER, CONNECTING ROD OUTER BEARING	3
3	ZB-28515	BEARING, CONNECTING ROD	2
1	ZB-8253	BEARING, CROSSHEAD PIN	1
—	1292902	FORGED CRANKSHAFT AND GEAR ASSEMBLY	—
—	—	BEARING, CROSSHEAD PIN	—
BILL OF MATERIAL			

NOTES:

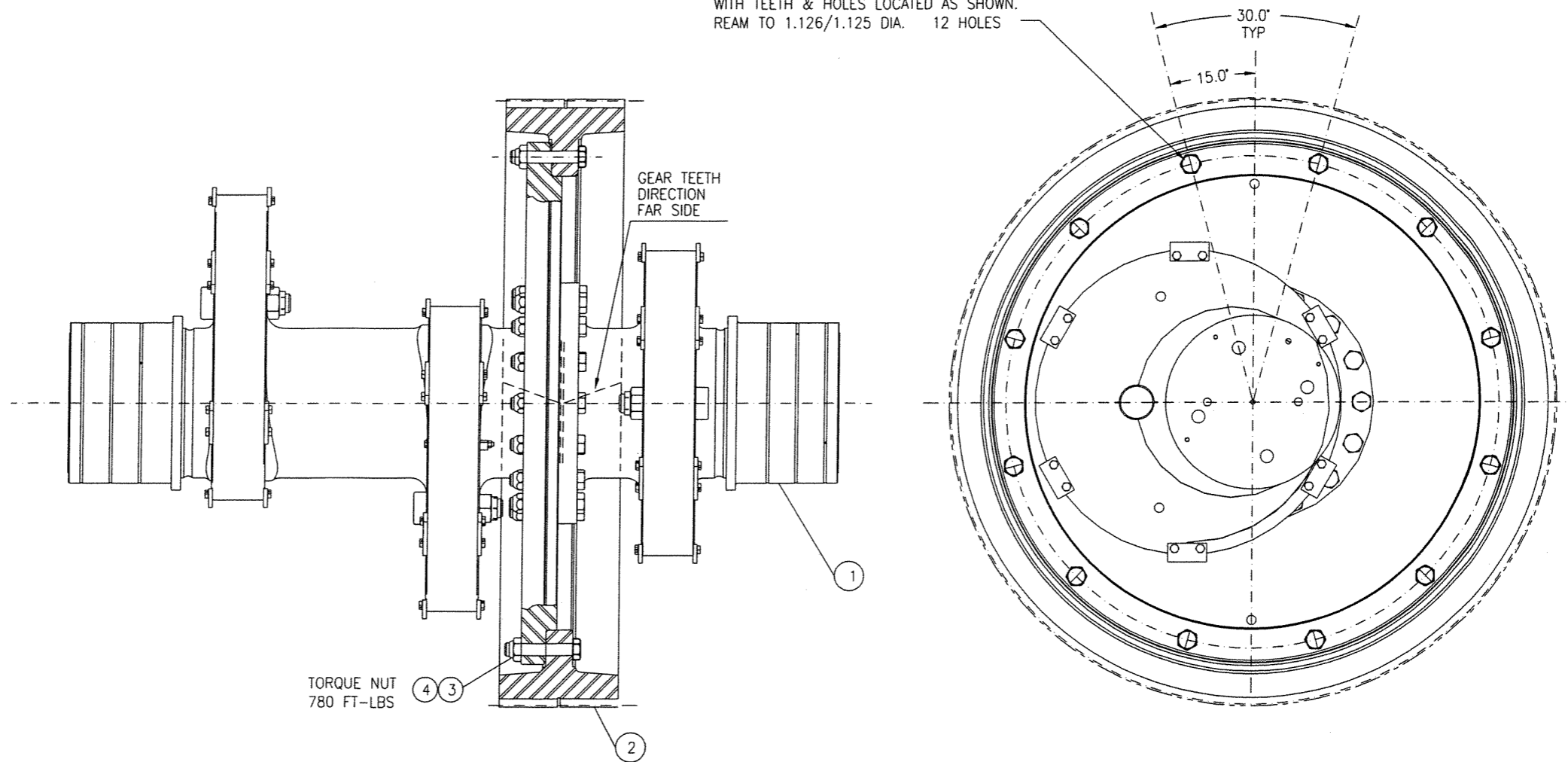
- △ SUBTRACT MEASURED WIDTH OF CONNECTING ROD BEARING AREA FROM MEASURED WIDTH OF BEARING OUTER RACE TO FIND SHIM GAP. SUBTRACT .003" TO .005" FROM SHIM GAP TO OBTAIN AMOUNT OF SHIMS REQUIRED.
- △ TORQUE SCREWS, ITEM 22, TO 100 FT-LBS. MEASURE GAP BETWEEN RETAINER, ITEM 18, AND CROSSHEAD, ITEM 12. INSERT REQUIRED THICKNESS OF SHIMS, ITEM 10, TO FIT MEASURED SHIM GAP. TORQUE SCREWS, ITEMS 22, TO 250 FT-LBS AT FINAL ASSEMBLY.
- △ SAFETY WIRE PER Y108-48 USING ITEM 25.

ESTIMATED WEIGHT: 15,013 LBS.

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<p>NATIONAL OILWELL, L.P. 1530 WEST SAM HOUSTON PARKWAY NORTH HOUSTON, TEXAS 77043, USA</p>	
<p>TITLE: FORGED CRANKSHAFT AND GEAR ASSEMBLY 12-P-160 TRIPLEX MUD PUMP</p>	
<p>DRAWING NUMBER: PL 1292902</p>	<p>SHEET: 1 OF 1</p>
<p>REV.:</p>	


12	6310181	NUT, 1-1/8" -7 FLEXLOC	4
12	1292006	BOLT, CRANKSHAFT GEAR	3
1	1292008	GEAR, CRANKSHAFT	2
1	1292667	CRANKSHAFT, FORGED	1
—	1292903	FORGED CRANKSHAFT AND GEAR SUB-ASSEMBLY (CONSISTS OF THE FOLLOWING)	—
QTY REQ'D	PART NO.	DESCRIPTION	ITEM NO.
BILL OF MATERIAL			

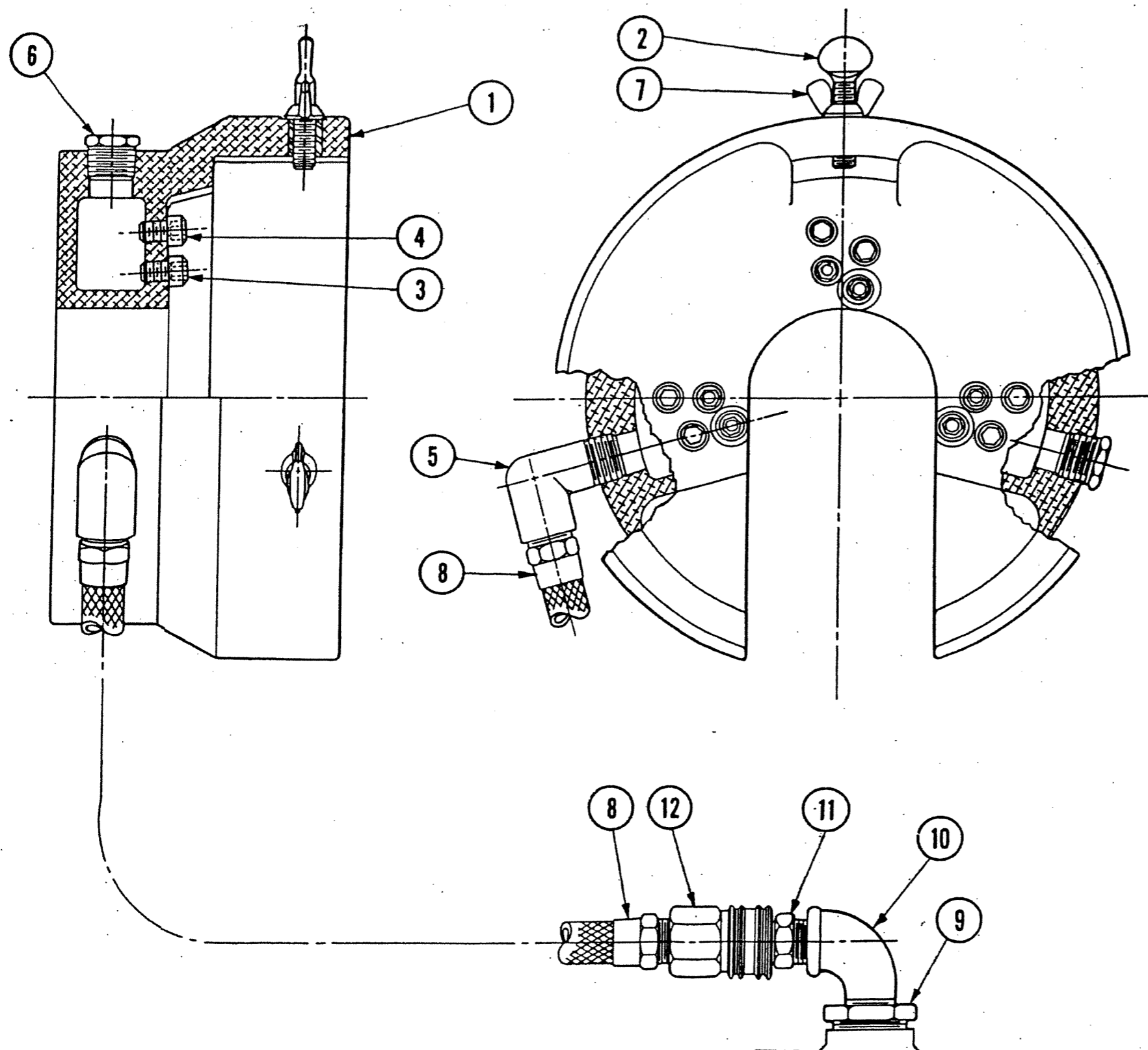
1 3/32 DRILL THRU CRANKSHAFT
 12 HOLES EQUALLY SPACED ON 46" DIA
 BOLT CIRCLE TO MATCH HOLES IN GEAR.
 GEAR MUST BE POSITIONED ON CRANKSHAFT
 WITH TEETH & HOLES LOCATED AS SHOWN.
 REAM TO 1.126/1.125 DIA. 12 HOLES



TORQUE NUT
 780 FT-LBS

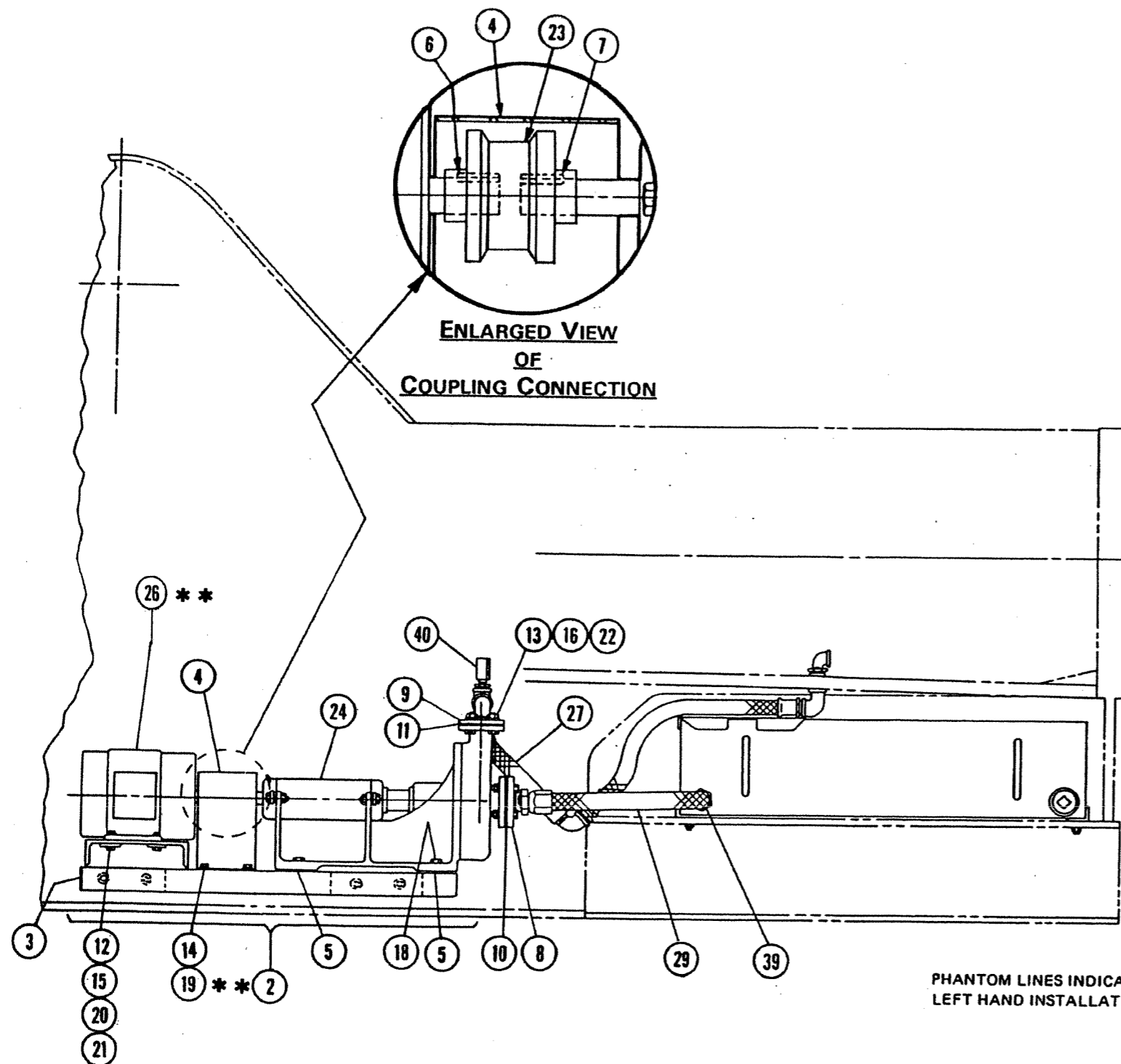
ESTIMATED WEIGHT: 9.037 LBS.

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	NATIONAL-OILWELL, L.P. 1530 WEST SAM HOUSTON PARKWAY NORTH HOUSTON, TEXAS 77043, USA	
TITLE: FORGED CRANKSHAFT AND GEAR SUB-ASSEMBLY		
DRAWING NUMBER: PL 1292903	SHEET: 1 OF 1	REV.:



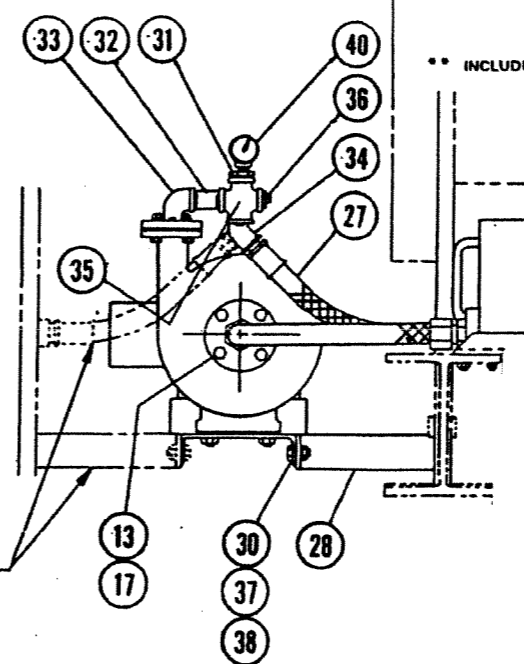
BILL OF MATERIAL			
ITEM	REQ'D	PART NO.	DESCRIPTION
--	--	1292120	SPRAY SYSTEM, LINER (CONSISTS OF THE FOLLOWING)
1	3	1292184	MANIFOLD, SPRAY (INCLUDES ITEMS 2 THRU 7)
2	9	G-7818256	SCREW, 3/8" - 16 X 1-3/4" STAINLESS STEEL THUMB
3	18	1291193	NOZZLE, SPRAY
4	18	7006204-30	CAPSCREW, 3/8" X 1/2" STAINLESS STEEL SOCKET HEAD
5	3	7804075	ELBOW, 1/2" X 90° 150# STAINLESS STEEL STREET
6	6	7815099	PLUG, 1/2 150# STAINLESS STEEL HEX HEAD PIPE
7	9	7813050	NUT, 3/8" - 16 STAINLESS STEEL WING
8	3	G2400075	HOSE, 1/2" X 16-1/2"
9	3	6800083	BUSHING, 1" X 1/2" M.I. HEX PIPE
10	3	6829004	ELBOW, 1/2" X 90° 150# M.I. STREET
11	3	7815094	PLUG, 1/2" M.P.T. QUICK CONNECT
12	3	7818282	SOCKET, 1/2" F.P.T. QUICK CONNECT

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	NATIONAL-OILWELL, L.P. 1530 WEST SAM HOUSTON PARKWAY NORTH HOUSTON, TEXAS 77043, USA	
TITLE: <h2 style="text-align: center;">LINER SPRAY SYSTEM</h2> <h3 style="text-align: center;">12-P-160 TRIPLEX MUD PUMP</h3>		
DRAWING NUMBER: <h2 style="text-align: center;">PL 1292120</h2>	SHEET: <h2 style="text-align: center;">1 OF 1</h2>	REV. <h2 style="text-align: center;">D</h2>



ENLARGED VIEW
OF
COUPLING CONNECTION

PHANTOM LINES INDICATE
LEFT HAND INSTALLATION.

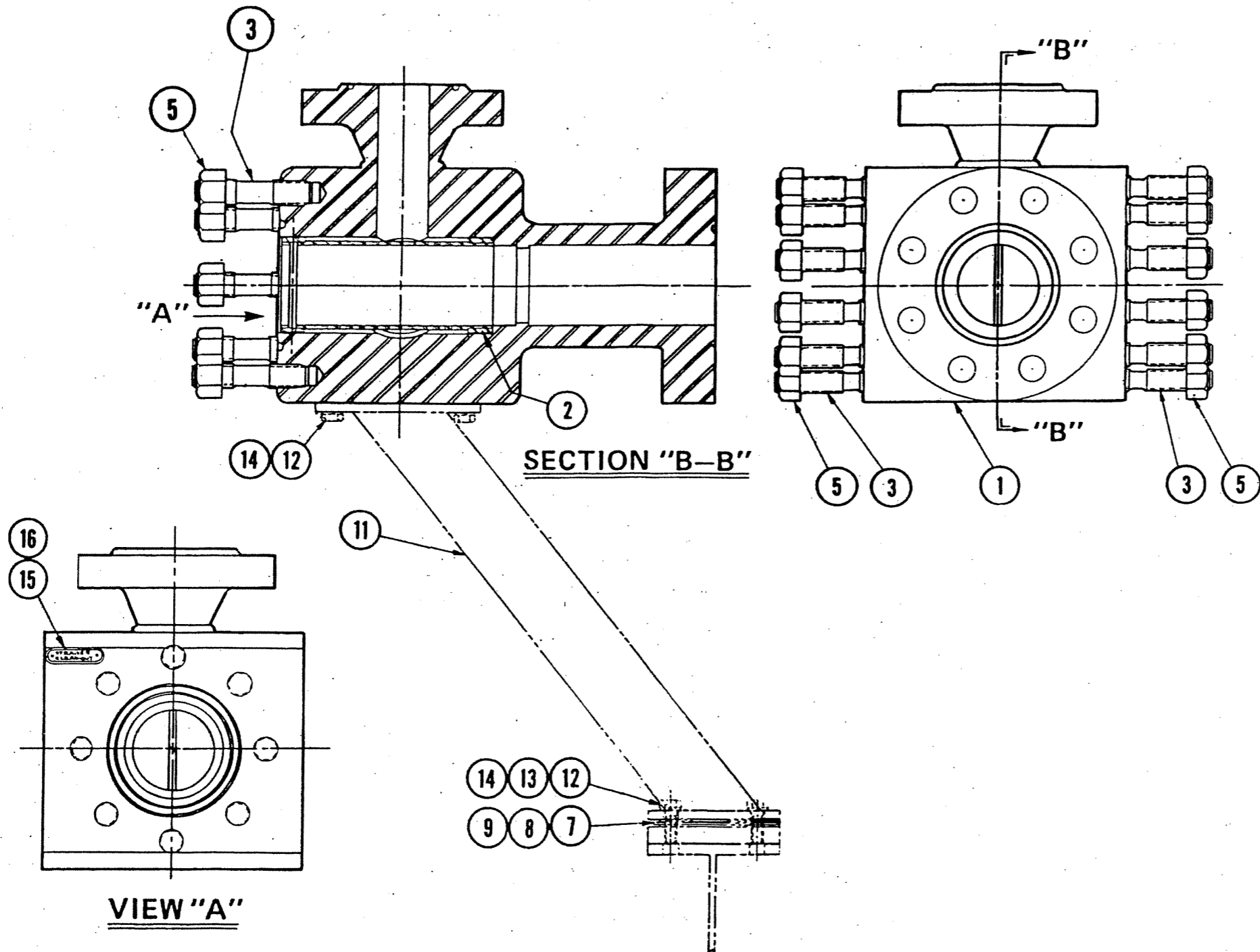


BILL OF MATERIAL			
ITEM	REQ'D	PART NO.	DESCRIPTION
--	--	1292290	LINER FLUSHING SYSTEM (INCLUDES THE FOLLOWING EXCEPT ITEMS 2 & 26)
1			
2**	1	1292309	PUMP COMPLETE (INCLUDES ITEMS 3 THRU 24 & 26)
3	1	1292285	BASE, PUMP AND MOTOR
4	1	1292286	GUARD, DRIVE SHAFT
5	4	1292283	SHIM, PUMP
6	1	2401860	KEY (1/4" X 1/4" X 1-1/4" LG.)
7	1	2401860	KEY (1/4" X 1/4" X 1-1/4" LG.)
8	1	5902172	FLANGE, 1-1/2" A.S.A. 150# THREADED FLAT FACE
9	1	5902091	FLANGE, 1" A.S.A. 150# THREADED FLAT FACE
10	1	6010036	GASKET, 1-1/2" 150# FULL FACE FLANGE
11	1	6010037	GASKET, 1" 150# FULL FACE FLANGE
12	4	6300082	NUT, 3/8" CAD. PLATED HEX
13	8	6300081	NUT, 1/2" CAD. PLATED HEX
14	4	7000207-11	CAPSCREW, 3/8" X 7/8" LG. CAD. PLTD GR5 HEX HEAD
15	4	7000211-11	CAPSCREW, 3/8" X 1-3/4" LG. CAD. PLTD GR5 HEX HEAD
16	4	7000307-11	CAPSCREW, 1/2" X 2" LG. CAD. PLTD GR5 HEX HEAD
17	4	7000309-11	CAPSCREW, 1/2" X 2-1/4" LG. CAD. PLTD. GR5 HEX HEAD
18	4	7000396-11	CAPSCREW, 5/8" X 1-3/4" LG. CAD. PLTD GR5 HEX HEAD
19	4	7600026	WASHER, 3/8" TYPE "A"
20	4	1292293	WASHER, 1/4" X 1-3/4" SQUARE
21	4	7619041	WASHER, 3/8" REG. CAD. PLTD SPRING LOCK
22	8	7619050	WASHER, 1/2" REG. CAD. PLTD SPRING LOCK
23	1	7802327	COUPLING
24	1	7815147	PUMP, 1" X 1-1/2" CENTRIFUGAL
25			
26**	1	7812009	MOTOR, ELECTRIC
27	1	1284036	HOSE, 1" X 18" LG. (FOR REAR MOUNT PUMP DRIVE)
	1	1282036	HOSE, 1" X 30" LG. (FOR TOP MOUNT PUMP DRIVE)
28	2	1292284	SUPPORT, MOTOR & PUMP
29	1	1292294	HOSE, 1-1/2" X 26" LG. (FOR REAR MOUNT PUMP DRIVE)
	1	1292292	HOSE, 1-1/2" X 37" LG. (FOR TOP MOUNT PUMP DRIVE)
30	4	6310120	NUT, 3/4" - 10 UNC FLEXLOC
31	1	6800081	BUSHING, 1" X 1/4" M.I. 150# BLK. HEX PIPE
32	1	6817077	NIPPLE, 1" X 3-1/2" STD. BLK. PIPE
33	1	6829008	ELBOW, 1" X 90° M.I. 150# STREET
34	1	6839008	ELBOW, 1" X 45° M.I. 150# STREET
35	1	6859008	CROSS, 1" 150# PIPE
36	1	6873008	PLUG, 1" CORED SQUARE HEAD PIPE
37	4	7000439-11	CAPSCREW, 3/4" X 1-3/4" GR. 5 CAD. PLTD HEX HEAD
38	4	7821044	WASHER, 3/4" TYPE "A" CAD. PLTD
39	1	7800070	ADAPTER, MALE PIPE
40	1	7806002	GAUGE (0-100 P.S.I.), 2-1/2" PRESSURE

** INCLUDES ELECTRIC MOTOR 7812009: 575 V., 3 H.P., 182 TC., 60 HZ & 1735 R.P.M.

NOTE: OPTIONAL EQUIPMENT,
SPECIFY WHEN ORDERING.

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	NATIONAL-OILWELL, L.P. 1530 WEST SAM HOUSTON PARKWAY NORTH HOUSTON, TEXAS 77043, USA	
TITLE: LINER FLUSHING SYSTEM 12-P-160 TRIPLEX MUD PUMP		
DRAWING NUMBER: PL 1292290	SHEET: 1 OF 1	REV. D



BILL OF MATERIAL			
ITEM	REQ'D	PART NO.	DESCRIPTION
--	--	1292225	CROSS COMPLETE, STRAINER * (WITH 5" - 5000# DISCHARGE FLANGE)
1	1	1292226	CROSS
2	1	1292219	STRAINER
3	24	2403070	STUD, 1-1/2" X 7-1/4" BOTTOM TAPER LOCK
5	24	6300240	NUT, 1-1/2" HEAVY HEX
7	4	102842-1	SHIM (.125" THICK)
8	3	102842-2	SHIM (.0625" THICK)
9	4	102842-3	SHIM (.0312" THICK)
10	1	1290221	PLATE, BASE
11	1	1292218	SUPPORT
12	4	7000439-11	CAPSCREW, 3/4" X 1-3/4" CAD PLT HEX HEAD GR5
13	4	7000440-11	CAPSCREW, 3/4" X 2" CAD PLT HEX HEAD GR5
14	8	7619066	WASHER, 3/4" CAD PLATED SPRING LOCK
15	1	G-2407004	TAG, STRAINER CLEAN-OUT
16	2	7178088	SCREW, No. 10 X 3/8" TYPE "U" ROUND HEAD DRIVE

* INCLUDES ITEMS 1 THRU 3, 5, & 7 THRU 16

APPLICABLE TO 1292225 STRAINER CROSS			
--	1	1292229	KIT, FLANGE AND GAIKET (CONSISTS OF THE FOLLOWING)
	1	1292222	FLANGE, STRAINER CLEAN-OUT
	2	5912391	FLANGE, 5" API 5000# RING JOINT WELD NECK
	1	6908033	RING, R39-S OVAL JHNT
	3	6908040	RING, R44-S OVAL JHNT

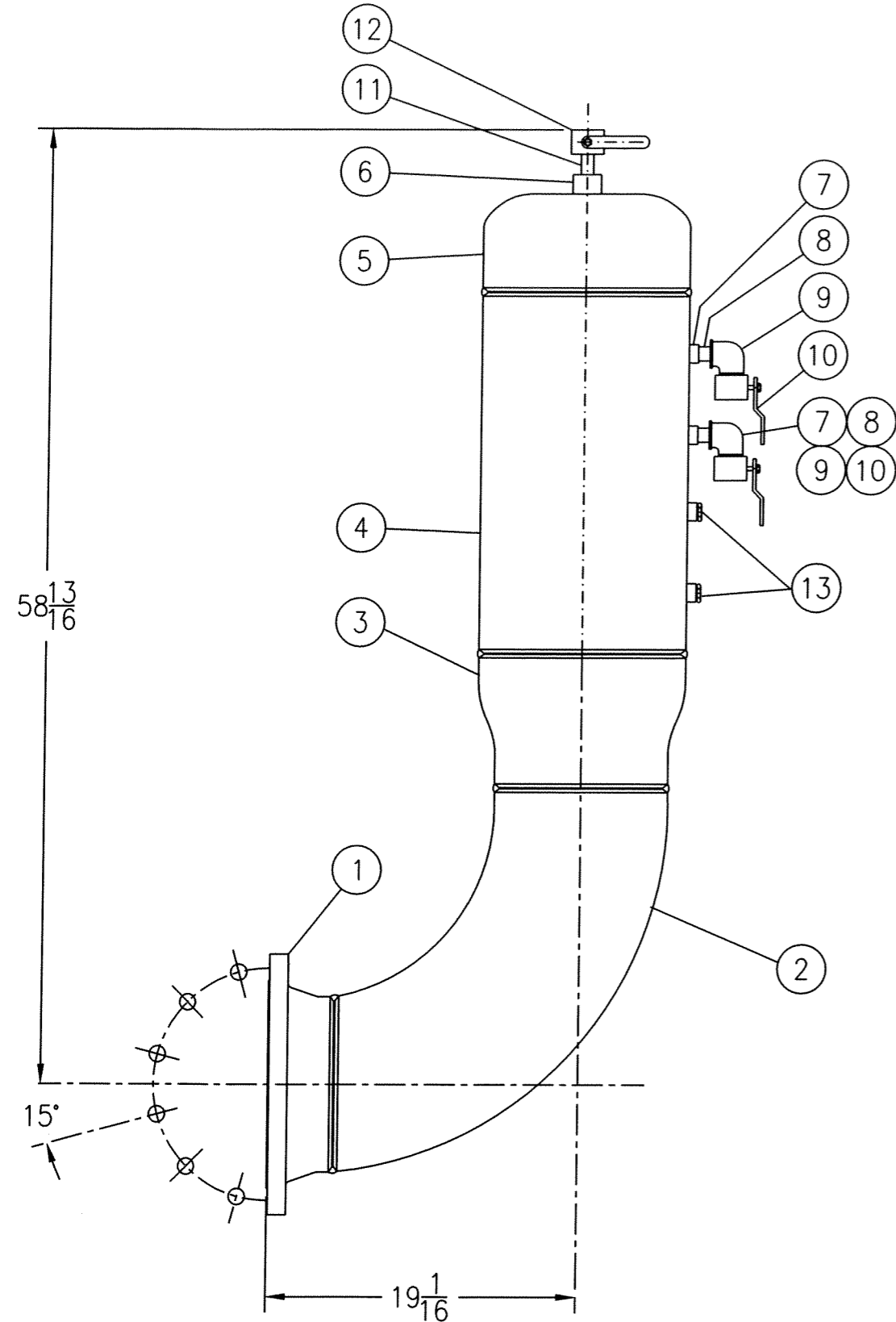
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NOV NATIONAL OILWELL VARCO
 NATIONAL-OILWELL, L.P.
 1530 WEST SAM HOUSTON PARKWAY NORTH
 HOUSTON, TEXAS 77043, USA

TITLE:
STRAINER CROSS ASSEMBLY
12-P-160 TRIPLEX MUD PUMP

DRAWING NUMBER: **PL 1292225** SHEET: **1 OF 1** REV. **C**

NOTE: OPTIONAL EQUIPMENT, SPECIFY WHEN ORDERING.

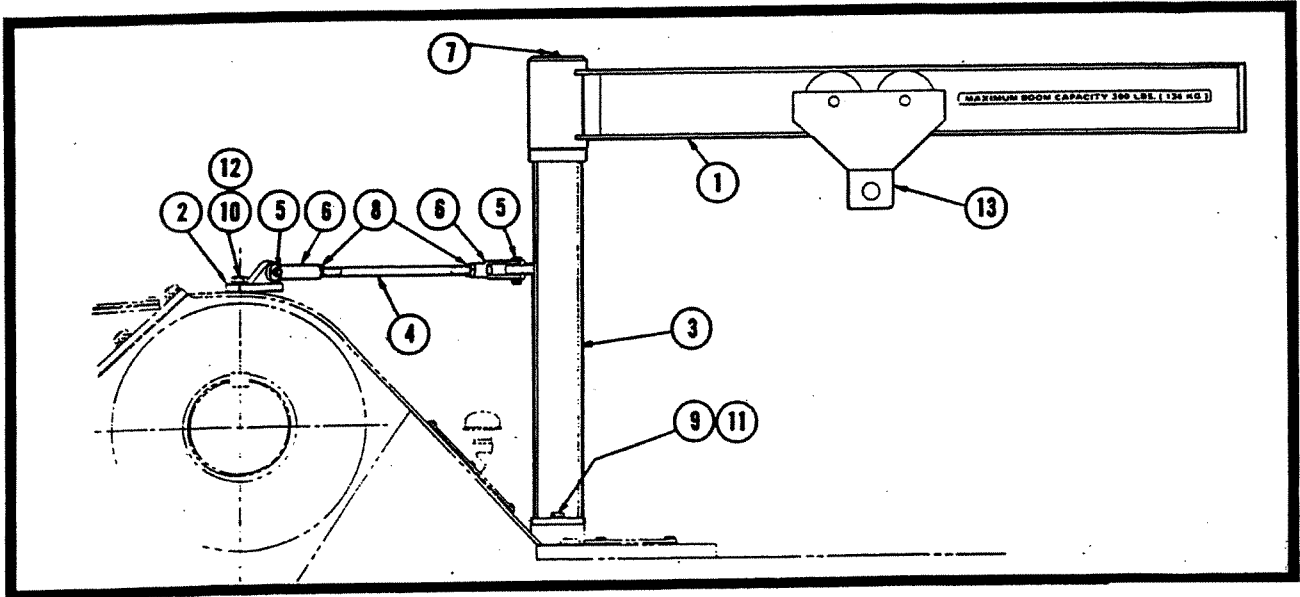


2	6875004	PLUG, 1/2" COUNTERSUNK HEX HEAD PIPE	13
1	78-101-082	VALVE, 3/4" ANSI BALL	12
1	86-425-013	NIPPLE, 3/4" SCH 40 X 4" LG. ASTM A120 BW STEEL PIPE	11
2	78-101-081	VALVE, 1/2" ANSI BALL	10
2	78-179-004	ELBOW, 1/2" X 90° 3000# ASTM A105 STREET	9
2	86-424-001	NIPPLE, 1/2" X CLOSE SCH 40 ASTM A120 BW STEEL PIPE	8
4	78-105-204	COUPLING, 1/2" 3000# ASTM A105 HALF	7
1	78-105-206	COUPLING, 3/4" 3000# ASTM A105 HALF	6
1	98-012-034	CAP, 12" SCH 40 ASTM A105	5
1	6709658B	PIPE, 12" SCH 40 ASTM A106-B SMLS. STEEL	4
1	98-052-100	REDUCER, 12" X 10" SCH 40 ASTM A234 WPB CONCENTRIC	3
1	98-016-232	ELBOW, 10" X 90° SCH 40 ASTM A234 WPB LONG RADIUS	2
1	5902487	FLANGE, 10" 150# ASTM A105 RJ WELD NECK	1
—	1292369	SUCTION STABILIZER ASSEMBLY (CONSISTS OF THE FOLLOWING)	—
QTY REQ'D	PART NO.	DESCRIPTION	ITEM NO.
BILL OF MATERIAL			

NOTE: OPTIONAL EQUIPMENT,
SPECIFY WHEN ORDERING.

ESTIMATED WEIGHT: 200 LBS.

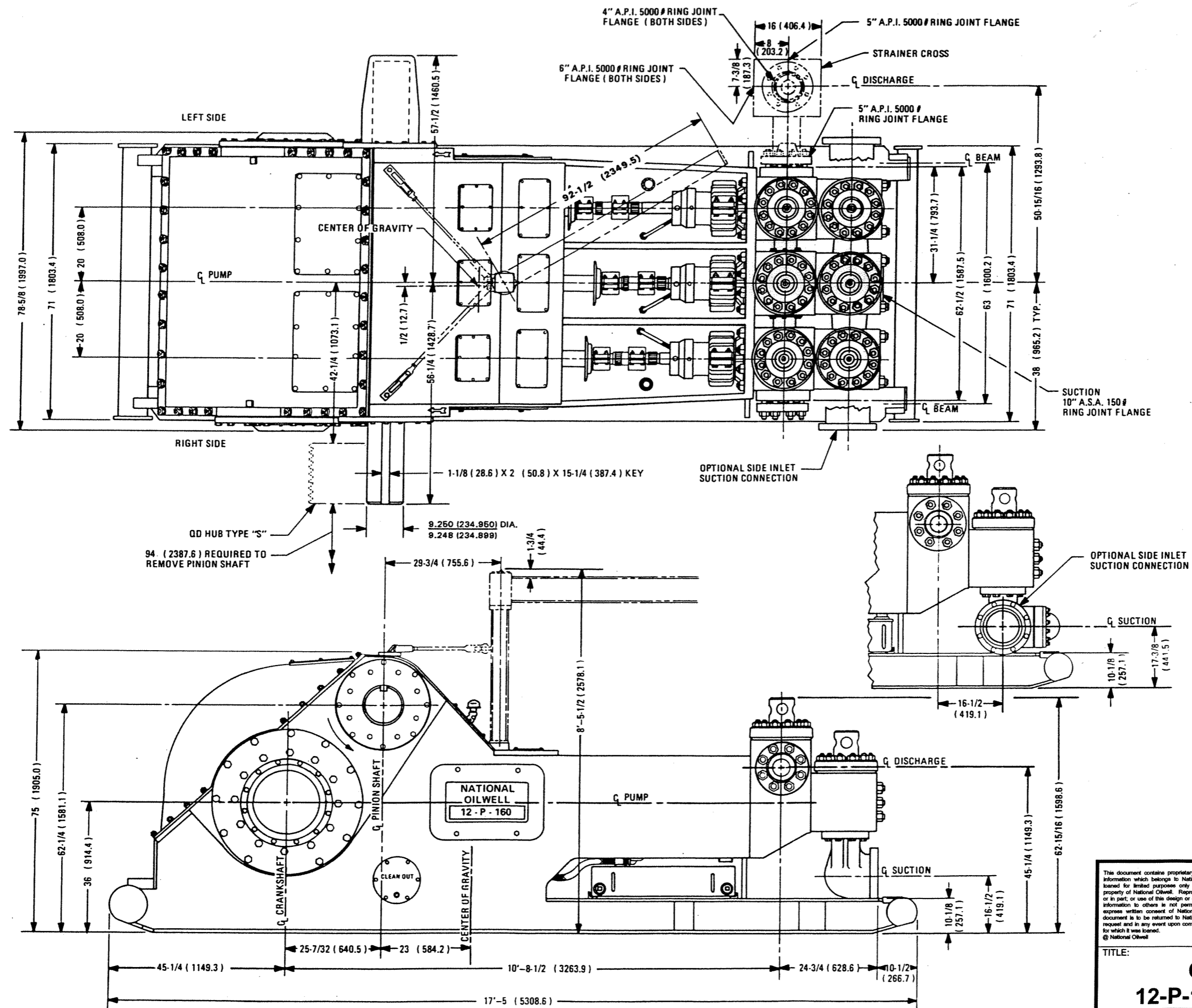
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		NATIONAL-OILWELL, L.P. 1530 WEST SAM HOUSTON PARKWAY NORTH HOUSTON, TEXAS 77043, USA	
TITLE: SUCTION STABILIZER 12-P-160 TRIPLEX MUD PUMP			
DRAWING NUMBER:	PL 1292369	SHEET:	1 OF 1
		REV.:	A



BILL OF MATERIAL			
ITEM	REQ'D	PART NO.	DESCRIPTION
--	1	1292125	HOIST COMPLETE (CONSISTS OF THE FOLLOWING)*
1	1	1292126	BOOM
2	1	1290127	BRACKET
3	1	1292128	MAST
4	2	1292129	ROD
5	4	7800044	PIN, YOKE
6	4	7804019	YOKE, ADJUSTABLE
7	1	7805052	FITTING, 1/8" HYDRAULIC GREASE
8	4	6320120	NUT, 3/4" HEX JAM
9	2	7000395-11	CAPSCREW, 5/8" X 1-1/2" HEX HEAD CAD. PLT GR5
10	2	7000440-11	CAPSCREW, 3/4" X 2" HEX HEAD CAD. PLT GR5
11	2	7619058	WASHER, 5/8" SPRING LOCK
12	2	7619066	WASHER, 3/4" SPRING LOCK
13	1	7819040	TROLLEY

* OPTIONAL EQUIPMENT, SPECIFY WHEN ORDERING.

NOTE: THESE DIMENSIONS ARE ACCURATE BUT SHOULD NOT BE USED FOR INSTALLATION UNLESS CERTIFIED. DIMENSIONS IN BRACKETS ARE MEASURED IN MILLIMETERS.



PUMP, AS SHOWN, IS FOR RIGHT HAND DRIVE. LEFT HAND DRIVE IS OPPOSITE THAT SHOWN.

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<p>TITLE: OUTLINE DRAWING 12-P-160 TRIPLEX MUD PUMP</p>			
<p>DRAWING NUMBER: PL 1292004</p>		<p>SHEET: 1 OF 1</p>	
		<p>REV. E</p>	