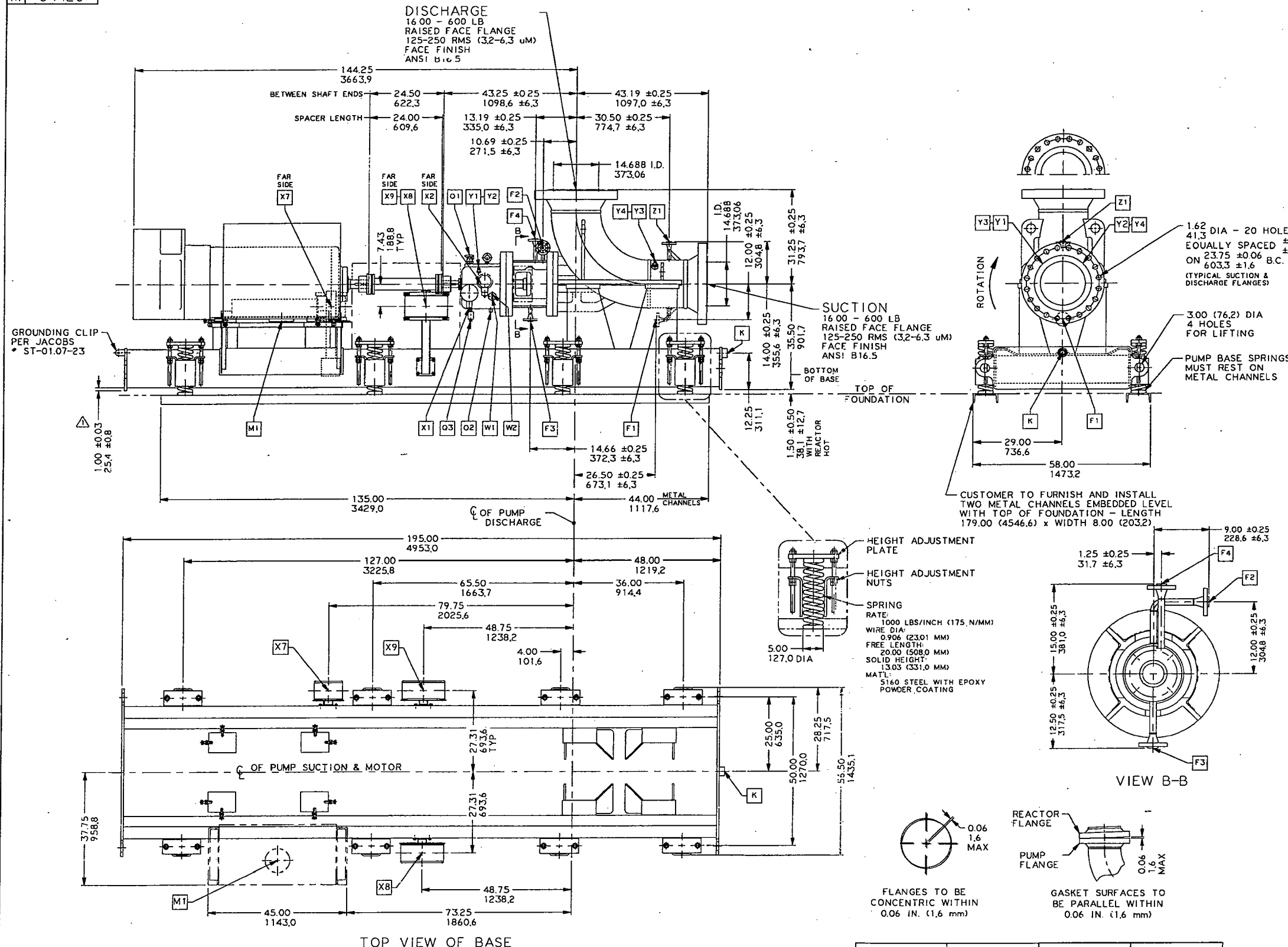




NOTES:

- FOR PUMP CROSS SECTION SEE DRAWING NO.: M64421
- FOR LIST OF COMPONENTS SEE LOC92214
- FOR LIST OF CONNECTIONS SEE DRAWING NO.: M64420-SHEET 4
- ALL FLANGES CONFORM TO ANSI B16.5. ALL FLANGE DRILLING TO STRADDLE CENTERLINES EQUALLY
- PRIMARY SEAL OIL SYSTEM (API PLAN 53) TO BE DIS-ASSEMBLED FROM PUMP (BY L.P.I.) FOR SHIPMENT AND RE-INSTALLED AT SITE BY CUSTOMER PER DRAWING NO.: M64420-SHEET 2
- SAFETY SEAL OIL SYSTEM (API PLAN 52) TO BE DIS-ASSEMBLED FROM PUMP (BY L.P.I.) FOR SHIPMENT AND RE-INSTALLED AT SITE BY CUSTOMER PER DRAWING NO.: M64420-SHEET 3
- L.P.I. TO WIRE ALL INSTRUMENTATION LEADS FOR PUMP. PRIMARY SEAL OIL SYSTEM, SAFETY SEAL OIL SYSTEM AND MOTOR MONITORING SYSTEMS TO COMMON JUNCTION BOXES MOUNTED ON PUMP BASE. FOR JUNCTION BOX TERMINAL CONNECTION DIAGRAMS SEE DRAWING NO.: C64441 - ANALOG SYSTEMS
C64442 - DC SYSTEMS
C64443 - TEMPERATURE SYSTEMS
- ALL INTERNAL PROCESS WETTED PASSAGES OF PUMP TO HAVE A SURFACE FINISH OF 63 RMS (1.6 μm) MAX.
- FOR PIPING & INSTRUMENT DIAGRAM (P&ID) OF PUMP & MOTOR SYSTEMS SEE DRAWING NO.: D64444
- OPERATING TEMPERATURE OF PUMP BEARING OIL NOT TO EXCEED 180° F (82° C).
- LEVEL SWITCH FOR PUMP BEARING HOUSING OIL LEVEL IS PERMANENTLY SET AT 300" (76.2 MM) BELOW CENTERLINE OF PUMP SHAFT
- PUMP CASING ELBOW IS DESIGNED, BUILT AND "U" STAMPED PER ASME SECTION VIII, DIV. 1

WEIGHTS:

PUMP (LESS BASE):	6000 LBS	2722 KGS
BASE:	5200 LBS	2359 KGS
COUPLING:	51 LBS	23 KGS
COUPLING GUARD:	35 LBS	16 KGS
MOTOR:	4400 LBS	1996 KGS
PRIMARY SEAL OIL SYSTEM:	300 LBS	136 KGS
SAFETY SEAL OIL SYSTEM:	350 LBS	159 KGS

TOTAL: 16336 LBS 7411 KGS

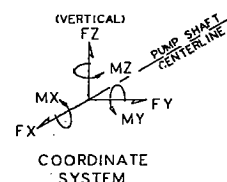
MOTOR ROTOR: 930 LBS 422 KGS
PUMP ROTATING ELEMENT: 210 LBS 96 KGS

DRIVER DATA:

MFR: SIEMENS
FRAME SIZE: 509SY
POWER: 250 HP (186 KW)
SPEED: 1800 RPM
VOLTAGE: 4000
PHASE: 3
HERTZ: 60
ENCLOSURE: TEFC
AREA CLASS: CL1, GR.C/D, DIV.2

JACOBS ENGINEERING GROUP INC - CENTRAL REGION			
PROJECT NO. 58-KA8160	P.O. NO. HH011749	SERIAL NO.	
SIGNATURE/DATE <i>[Signature]</i> 1/5/07	ITEM NO. 67-5295	SUSPENSE DATE	
P.S. COMMENTS NOTED-REVISE, RESUBMIT, PROCEED WITH FABRICATION D.C. UNACCEPTABLE - DO NOT PROCEED WITH FABRICATION D.R. FOR INFORMATION ONLY Review of this drawing by Jacobs Engineering Group does not relieve the supplier of his responsibility to supply the materials in accordance with the procurement documents.			

FORCE/MOMENT	SUCTION FLANGE	DISCHARGE FLANGE
FX	2300 LBS	10230 N
FY	1900 LBS	8450 N
FZ	1500 LBS	6670 N
FR	3300 LBS	14850 N
MX	5400 FT-LBS	7320 N-M
MY	2700 FT-LBS	3660 N-M
MZ	4000 FT-LBS	5420 N-M
MR	7200 FT-LBS	9820 N-M



JACOBS P.O. 58-KA8160-HH011749
ITEM #67-5295
RL3 REACTOR CIRCULATION PUMP
SAP # 10547852

92214	58-KA8160-HH011749	67-5295 10547582	30-5295 10547578
PUMP SERIAL NO.	CUSTOMER ORDER NO.	PUMP ITEM NO. SAP NO.	MOTOR ITEM NO. SAP NO.
CUSTOMER:	JACOBS ENGINEERING		
USER:	CHEVRON PHILLIPS		
PLANT:	CPCHEM		
LOCATION:	PASADENA, TEXAS, USA		
SERVICE:	RL3 CIRCULATION PUMP		
PROJECT NO.:	58-KA81-60		
PROJECT:	LOW GEL		

DIMENSIONS ARE IN INCHES
MILLIMETERS
INTOLERANCED DIMENSIONS
ARE FOR REFERENCE ONLY
DO NOT USE FOR CONSTRUCTION
PURPOSES UNLESS CERTIFIED

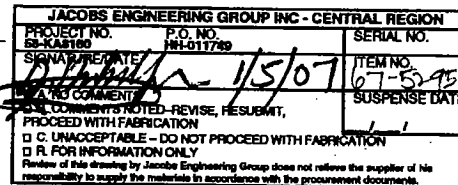
3	RAR	1/2/07	GM		PG. 2, 3 & 4 CHANGED PIPING ARRANGEMENT PER CUSTOMERS REQUEST
2	RAR	11/22/06	GM		PG. 2, 3 & 4 CHANGED PIPING ARRANGEMENT PER CUSTOMERS REQUEST
1	RAR	10/24/06	GM		P1-MOVED GROUNDING CLIP AND 1.00 DIM. P2-ADDED P1-52050PSV-51066, TE-57674, TE-57675, PG. 3 ADDED FLOW ARROWS, RO-54496, RO-54497, L-G-54495PT-54529, PS-51067LT-55494DI-52051DIM'S 28.00 & 6.25 & HIGH AND LOW VISIBLE LEVEL.
NO.	BY	DATE	CHKD.		DESCRIPTION
REVISIONS					
DIMENSIONAL OUTLINE (G.A.) OF 16 x 16 SERIES 9500 HORIZONTAL REACTOR CIRCULATION PUMP					
DWN	CZ	CHKD:	K2	6-16	 LAWRENCE PUMPS INC. LAWRENCE, MASS.
DATE	6-16-06	ENG:	GCM		
SCALE:	NONE				
CAD DATABASE					DRAWING NUMBER
ORIG. FILE NO. M62929 D/R: DFT. ELE					M 64420
					SHEET 1 OF 4

LAWRENCE PUMPS INC.
LAWRENCE, MASS.

JACOBS P.O. 58-KA8160-HH011749
ITEM #67-5295
RL3 REACTOR CIRCULATION PUMP
SAP # 10547852



1. FOR PUMP DIMENSIONAL OUTLINE (G.A.) SEE DRAWING NO: M64420-SHEET 1
 2. FOR LIST OF CONNECTIONS & COMPONENT DATA SEE DRAWING NO: M64420-SHEET 4
 3. ALL FLANGES CONFORM TO ANSI B16.5
- ALL FLANGE DRILLING TO STRADDLE CENTERLINES EQUALLY



92214	58-KA8160- HH011749	67-5295 10547582	30-5295 10547578
PUMP SERIAL NO.	CUSTOMER ORDER NO.	PUMP ITEM NO. SAP NO.	MOTOR ITEM NO. SAP NO.
CUSTOMER: USER: PLANT: LOCATION: SERVICE: PROJECT NO.: PROJECT:	JACOBS ENGINEERING CHEVRON PHILLIPS CPCHEM PASADENA, TEXAS, USA RL3 CIRCULATION PUMP 58-KA81-60 LOW GEL		

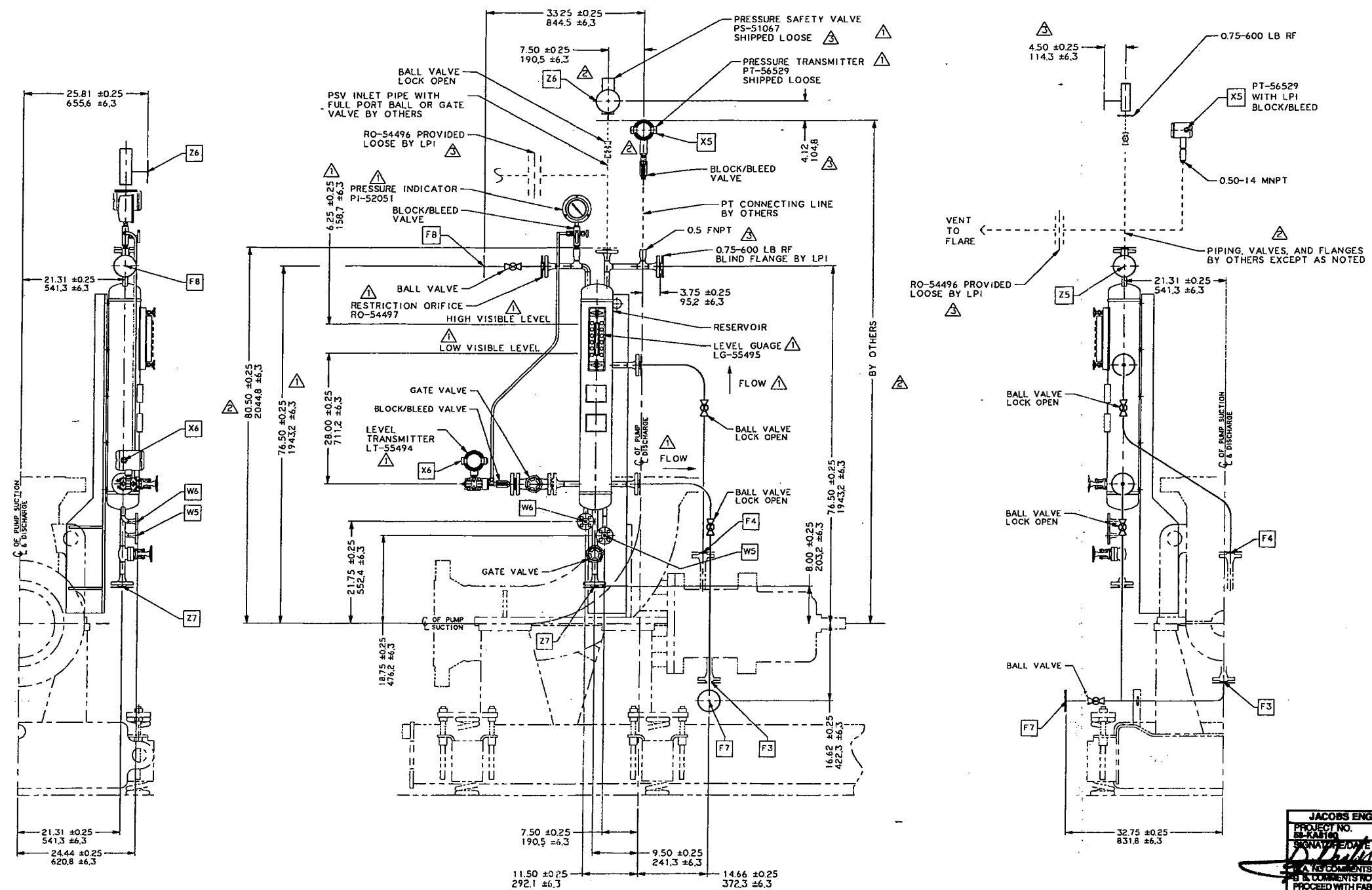
DIMENSIONS ARE IN INCHES
MILLIMETERS

UNTOLERANCED DIMENSIONS
ARE FOR REFERENCE ONLY

DO NOT USE FOR CONSTRUCTION
PURPOSES UNLESS CERTIFIED

CURRENT REVISION HISTORY LEVEL 3 SEE SHEET 1									
NO.	BY	DATE	CHK'D		DESCRIPTION				
REVISIONS									
DIMENSIONAL OUTLINE (G.A.) OF PRIMARY SEAL OIL SYSTEM FOR 16 x 16 SERIES 9500 REACTOR CIRCULATION PUMP									
OWN:		CZ			CHK'D Kz 6-16		LAWRENCE PUMPS INC.		
DATE: 6-16-06		ENG: GCM					LAWRENCE, MASS.		
SCALE: NONE									
CAD DATABASE					DRAWING NUMBER				
C316 FFF NO. M62929 DIR: DETEIT					M	64420		SHEET 4	

M 64420



NOTES:

1. FOR PUMP DIMENSIONAL OUTLINE (G.A.) SEE DRAWING NO: M64420-SHEET 1
 2. FOR LIST OF CONNECTIONS & COMPONENT DATA SEE DRAWING NO: M64420-SHEET 4
 3. ALL FLANGES CONFORM TO ANSI B16.5
- ALL FLANGE DRILLING TO STRADDLE CENTERLINES EQUALLY

JACOBS P.O. 58-KA8160-HH011749
ITEM #67-5295
RL3 REACTOR CIRCULATION PUMP
SAP # 10547852

92214	58-KA8160-HH011749	67-5295 10547582	30-5295 10547578
PUMP SERIAL NO.	CUSTOMER ORDER NO.	PUMP ITEM NO. SAP NO.	MOTOR ITEM NO. SAP NO.
CUSTOMER: JACOBS ENGINEERING			
USER: CHEVRON PHILLIPS			
PLANT: CPCHM			
LOCATION: PASADENA, TEXAS, USA			
SERVICE: RL3 CIRCULATION PUMP			
PROJECT NO: 58-KA81-60			
PROJECT: LOW GEL			

DIMENSIONS ARE IN INCHES
 MILLIMETERS
 UNTOLERANCED DIMENSIONS
 ARE FOR REFERENCE ONLY
 DO NOT USE FOR CONSTRUCTION
 PURPOSES UNLESS CERTIFIED

CURRENT REVISION HISTORY LEVEL 3 SEE SHEET 1			
NO.	BY	DATE	DESCRIPTION
REVISIONS			
DIMENSIONAL OUTLINE (G.A.) OF SAFETY SEAL OIL SYSTEM FOR 16 x 16 SERIES 9500 REACTOR CIRCULATION PUMP			
DWN:	CZ	CHKD: Kz 6-16	LAWRENCE PUMPS INC. LAWRENCE, MASS.
DATE:	6-16-06	ENG: GCM	
SCALE:	NONE		
CAD DATABASE			DRAWING NUMBER
ORIG. FILE NO: M62929 DIR: DFT.ELE			M 64420
			SHEET 3 OF 4

JACOBS ENGINEERING GROUP INC - CENTRAL REGION			
PROJECT NO.	P.O. NO.	SERIAL NO.	
58-KA8160-HH011749	HH011749		
DATE	DATE	ITEM NO.	
6/15/07	6/15/07	67-5295	
REVISIONS	REVISIONS	SUSPENSE DATE	
1. COMMENTS: REVISE, RESUBMIT, PROCEED WITH FABRICATION			
2. C. UNACCEPTABLE - DO NOT PROCEED WITH FABRICATION			
3. R. FOR INFORMATION ONLY			

COMPONENT DATA:

RESERVOIRS:	JOHN CRANE LEMCO 5 GALLON (18.9 LITERS) MAWP = 1000 PSIG (68.9 BARG) AT 302 F (150 C) MDMT = -49 F (-45 C) AT 1000 PSIG (68.9 BARG) 316L SS (ASTM SA312, SA403)
PIPING:	SCH 80 (BUTT WELDED & FLANGED) 316/316L SS (ASTM A312 SEAMLESS)
FITTINGS:	SCH 80 (BUTT WELD) 316/316L SS (ASTM A403)
GASKETS:	SPIRAL WOUND STAINLESS STEEL
FASTENERS:	HEX CAPSCREWS - CARBON STEEL (DIN 934 CL. 8.8) HEX NUTS - CARBON STEEL (DIN 934 CL. 8) STUD BOLTS - CARBON STEEL (DIN 975 CL. 8.8)
FLANGES:	SCH 80 (WELD NECK) 316/316L SS (ASTM A182)
BALL VALVES:	NELES-JAMESBURY, INC. SERIES 4000 - FIRE-TITE 316L SS (ASTM A351-GR.CF8M) BODY 316 SS BALL AND STEM XTREME TM SEAT STAINLESS STEEL BODY FASTENERS (ASTM A193-GR.B8, A194-GR.8 SERIES)
GATE VALVES:	SUPPLIED WITH RESERVOIRS (SEE JOHN CRANE LEMCO DRAWINGS)
BLOCK/BLEED VALVES:	SUPPLIED WITH RESERVOIRS (SEE JOHN CRANE LEMCO DRAWINGS)
PRESSURE SAFETY VALVES:	MERCER VALVE CO. 9100 SERIES - FLANGED 316 SS WETTED MATERIALS SET AT 1000 PSIG (68.9 BARG) ASME CERTIFIED
LEVEL GAUGE:	SUPPLIED WITH RESERVOIRS (SEE JOHN CRANE LEMCO DRAWINGS)
LEVEL TRANSMITTER:	SUPPLIED WITH RESERVOIRS (SEE JOHN CRANE LEMCO DRAWINGS)
PRESSURE INDICATORS:	SUPPLIED WITH RESERVOIRS (SEE JOHN CRANE LEMCO DRAWINGS)
PRESSURE TRANSMITTER:	SUPPLIED WITH RESERVOIRS (SEE JOHN CRANE LEMCO DRAWINGS)
LEVEL SWITCH:	MAGNETROL THERMATEL MODEL: TDL THERMAL DISPERSION TWIN TIP SENSOR WITH ATEX CERTIFICATION
TEMPERATURE ELEMENTS (RTD'S):	OMEGA MODEL: PR-12 INDUSTRIAL RTD PROBE WITH CAST IRON HEAD 100 OHM - 3 WIRE CONFIGURATION
VIBRATION ELEMENT:	BENTLY NEVADA MODEL: 330525 VELOMITOR XA PIEZO VELOCITY SENSOR WITH CENELEC CERTIFICATION

LIST OF CONNECTIONS:

F1	3/4" - 600 LB RF FLANGE - INLET TO PRIMARY SEAL AND INBOARD RADIAL BEARING BARRIER FLUID: ROYAL PURPLE FDA GRADE BF-910 FLOW RATE: 1.0 - 2.0 USGPM (0.23 - 0.45 M3/H) PRESSURE: 10X ABOVE PRESSURE AT CONNECTION: Z1 (BY PISTON POT)	X1	3/4" NPT - CONDUIT ENTRY TO THRUST BEARING HOUSING OIL LEVEL SWITCH (SEE SHEET 1, NOTE 11)
F2	3/4" - 600 LB RF FLANGE - OUTLET FROM PRIMARY SEAL AND INBOARD RADIAL BEARING	X2	1/2" NPT - CONDUIT ENTRY TO THRUST BEARING TEMPERATURE ELEMENT (RTD) (SEE SHEET 1, NOTE 10)
F3	3/4" - 600 LB RF FLANGE - INLET TO SAFETY SEAL BUFFER FLUID: ROYAL PURPLE FDA GRADE BF-910 FLOW RATE: 0.5 - 1.0 USGPM (0.11 - 0.23 M3/H) PRESSURE: ATMOSPHERIC	X3	1/2" NPT - CONDUIT ENTRY TO PRIMARY SEAL OIL FEED LINE TEMPERATURE ELEMENT (RTD)
F4	3/4" - 600 LB RF FLANGE - OUTLET FROM SAFETY SEAL	X4	1/2" NPT - CONDUIT ENTRY TO PRIMARY SEAL OIL RETURN LINE TEMPERATURE ELEMENT (RTD)
F5	3/4" - 600 LB RF FLANGE - PRIMARY SEAL OIL SYSTEM FILL/DRAIN (WITH BLIND FLANGE)	X5	1/2" NPT - CONDUIT ENTRY TO SAFETY SEAL OIL RESERVOIR PRESSURE TRANSMITTER (SEE JOHN CRANE LEMCO DRAWINGS)
F6	3/4" - 600 LB RF FLANGE - OIL INLET TO PRIMARY SEAL OIL RESERVOIR	X6	1/2" NPT - CONDUIT ENTRY TO SAFETY SEAL OIL RESERVOIR LEVEL TRANSMITTER (SEE JOHN CRANE LEMCO DRAWINGS)
F7	3/4" - 600 LB RF FLANGE - SAFETY SEAL OIL SYSTEM DRAIN (WITH BLIND FLANGE)	X7	CABLE GLAND FOR 11.1mm TO 19.9mm O.D. CABLE - INLET TO INSTRUMENTATION JUNCTION BOX FOR DC SYSTEMS
F8	3/4" - 600 LB RF FLANGE - OIL INLET TO SAFETY SEAL OIL RESERVOIR	X8	CABLE GLAND FOR 11.1mm TO 19.9mm O.D. CABLE - INLET TO INSTRUMENTATION JUNCTION BOX FOR TEMPERATURE ELEMENTS
K	2" NPT - BASE DRIP RIM DRAIN	X9	CABLE GLAND FOR 11.1mm TO 19.9mm O.D. CABLE - INLET TO INSTRUMENTATION JUNCTION BOX FOR ANALOG SYSTEMS
M1	MOTOR CONDUIT BOX ENTRY FOR MAIN POWER LEADS	Y1	1/2" NPT - MOUNTING CONNECTION FOR THRUST BEARING VIBRATION ELEMENT (ELEMENT SUPPLIED BY L.P.I.)
O1	1 1/4" NPT - THRUST BEARING HOUSING OIL FILLER CAP AND BREATHER LUBRICANT: TURBINE QUALITY MINERAL OIL VISCOSITY: 150 68 CAPACITY: 5.5 QUARTS (5.2 LITERS) OPERATING TEMPERATURE: 180 F (82 C) MAX	Y2	1/2" NPT - MOUNTING CONNECTION FOR THRUST BEARING VIBRATION ELEMENT (ELEMENT SUPPLIED BY L.P.I.)
O2	3/4" NPT - THRUST BEARING HOUSING OIL DRAIN (PLUGGED)	Y3	1/2" NPT - MOUNTING CONNECTION FOR INBOARD RADIAL BEARING VIBRATION ELEMENT (ELEMENT SUPPLIED BY L.P.I.)
O3	1/2" NPT - THRUST BEARING HOUSING OIL SAMPLING LINE (WITH SIGHT BOTTLE & PETCOCK VALVE)	Y4	1/2" NPT - MOUNTING CONNECTION FOR INBOARD RADIAL BEARING VIBRATION ELEMENT (ELEMENT SUPPLIED BY L.P.I.)
W1	1/4" NPT - COOLING WATER INLET TO THRUST BEARING OIL HEAT EXCHANGER	Z1	3/4" - 600 LB RF FLANGE - FLUSH INLET TO SEAL THROAT BUSHING FLUSHING FLUID: CLEAN DILUENT FLOW RATE: 3.0-5.0 USGPM (0.68-1.14 M3/H) PRESSURE: 25 PSIG (1.7 BARG) ABOVE PUMP DISCHARGE PRESSURE
W2	1/4" NPT - COOLING WATER OUTLET FROM THRUST BEARING OIL HEAT EXCHANGER	Z2	3/4" - 150 LB RF FLANGE - VENT FROM PRIMARY SEAL OIL RESERVOIR (TO FLARE)
W3	1/2" - 150 LB RF FLANGE - COOLING WATER INLET TO PRIMARY SEAL OIL RESERVOIR HEAT EXCHANGER	Z3	1" - 150 LB RF FLANGE - VENT FROM PRIMARY SEAL OIL RESERVOIR PRESSURE SAFETY VALVE (TO FLARE)
W4	1/2" - 150 LB RF FLANGE - COOLING WATER OUTLET FROM PRIMARY SEAL OIL RESERVOIR HEAT EXCHANGER	Z4	3/4" - 600 LB RF FLANGE - DRAIN FROM PRIMARY SEAL OIL RESERVOIR (WITH BLIND FLANGE)
W5	1/2" - 150 LB RF FLANGE - COOLING WATER INLET TO SAFETY SEAL OIL RESERVOIR HEAT EXCHANGER	Z5	3/4" - 600 LB RF (WITH BLIND FLANGE) - VENT FROM SAFETY SEAL OIL RESERVOIR (UNUSED CONNECTION)
W6	1/2" - 150 LB RF FLANGE - COOLING WATER OUTLET FROM SAFETY SEAL OIL RESERVOIR HEAT EXCHANGER	Z6	1" - 150 LB RF FLANGE - VENT FROM SAFETY SEAL OIL RESERVOIR PRESSURE SAFETY VALVE (TO FLARE)
		Z7	3/4" - 600 LB RF FLANGE - DRAIN FROM SAFETY SEAL OIL RESERVOIR (WITH BLIND FLANGE)

JACOBS P.O. 58-KA8160-HH011749
ITEM #67-5295
RL3 REACTOR CIRCULATION PUMP
SAP # 10547852

NOTES:

1. FOR DIMENSIONAL OUTLINE (G.A.) OF PUMP SEE DRAWING NO.: M64420-SHEET 1
2. FOR DIMENSIONAL OUTLINE (G.A.) OF PRIMARY SEAL OIL SYSTEM SEE DRAWING NO.: M64420-SHEET 2
3. FOR DIMENSIONAL OUTLINE (G.A.) OF SAFETY SEAL OIL SYSTEM SEE DRAWING NO.: M64420-SHEET 3
4. ALL FLANGES CONFORM TO ANSI B16.5
ALL FLANGE DRILLING TO STRADDLE CENTERLINES EQUALLY

JACOBS ENGINEERING GROUP INC - CENTRAL REGION			
PROJECT NO. 58-KA8160	P.O. NO. HH011749	SERIAL NO.	
SIGNATURE <i>[Signature]</i>	DATE 1/5/07	ITEM NO. 67-5295	SUSPENSE DATE 1/1
REVISIONS			
D. COMMENTS NOTED-REUSE, RESUBMIT, PROCEED WITH FABRICATION			
D. C. UNACCEPTABLE - DO NOT PROCEED WITH FABRICATION			
D. R. FOR INFORMATION ONLY			
Review of this drawing by Jacobs Engineering Group does not relieve the supplier of his responsibility to supply the materials in accordance with the procurement documents.			

92214	58-KA8160-HH011749	67-5295 10547852	30-5295 10547878
PUMP SERIAL NO.	CUSTOMER ORDER NO.	PUMP ITEM NO. SAP NO.	MOTOR ITEM NO. SAP NO.
CUSTOMER:	JACOBS ENGINEERING		
USER:	CHEVRON PHILLIPS		
PLANT:	CPCHEM		
LOCATION:	PASADENA, TEXAS, USA		
SERVICE:	RL3 CIRCULATION PUMP		
PROJECT NO.:	58-KA81-60		
PROJECT:	LOW GEL		

DIMENSIONS ARE IN INCHES
MILLIMETERS

UNTOLERANCED DIMENSIONS
ARE FOR REFERENCE ONLY

DO NOT USE FOR CONSTRUCTION
PURPOSES UNLESS CERTIFIED

CURRENT REVISION HISTORY LEVEL 3 SEE SHEET 1			
NO.	BY	DATE	CHKD
DESCRIPTION			
REVISIONS			
LIST OF CONNECTIONS & COMPONENT DATA FOR 16 x 16 SERIES 9500 REACTOR CIRCULATION PUMP			
DWN:	CZ	CHKD: K2	6-16
DATE:	6-16-06	ENG:	GCM
SCALE:	NONE		
CAD DATABASE		DRAWING NUMBER	
ORIG. FILE NO.: M62929	JIR: DF1.ELC	M	64420
		SHEET 4 OF 4	

NOTES:

1. MAIN CONDUIT BOX IS FREE STANDING AND MUST BE SUPPORTED FROM BELOW BY CUSTOMER.
2. APPROXIMATE WEIGHT OF BOX: 423#
3. APPROXIMATE WEIGHT OF MOTOR: 4,400#
4. THIS MOTOR IS SUITABLE FOR DIRECT CONNECTION ONLY.
5. THIS MOTOR IS SUITABLE FOR ROTATION IN EITHER DIRECTION.
6. WHEN LIFTING MOTOR, LIFT BY TWO DIAGONALLY OPPOSITE TRUNNIONS AT THE SAME TIME.
7. NON-DRIVE END BEARING IS INSULATED, INSULATE ANY CONNECTIONS TO THIS BEARING.
8. SHIMS MAY BE NECESSARY UNDER MOTOR FEET.
9. THE NORMALLY CLOSED THERMOSTATS IN THIS MOTOR SHOULD BE CONNECTED TO CAUSE THE STARTER TO OPEN WHEN THEIR PRESET TEMPERATURE IS REACHED. THE CONTACT RATING IS 360 VA @ 120-600 VOLTS AC.
10. TO ACCESS TAPPED HOLES 1.375-24 UNF-2B1 FOR B/N PROBE PROVISIONS, REMOVE TOP HALF OF THE BEARING HOUSING. GOING IN THROUGH UPPER BEARING BRACKET, HOLES ARE LOCATED ON UPPER REAR OF BEARING CAPSULE. THE DISTANCE BETWEEN THE B/N MOUNTING SURFACE & THE SURFACE OF THE SHAFT IS 1.15.

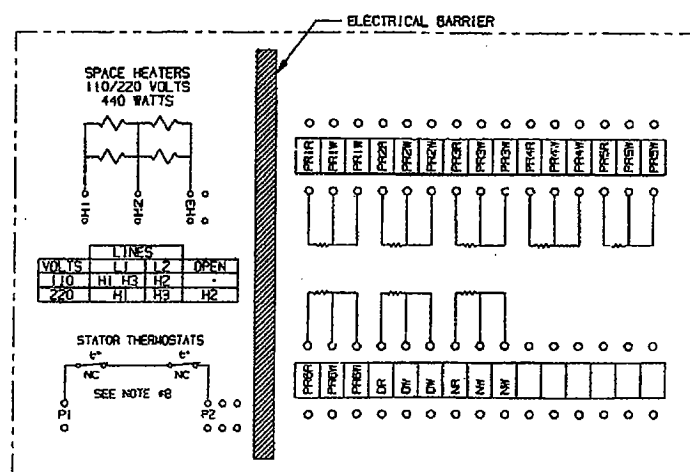
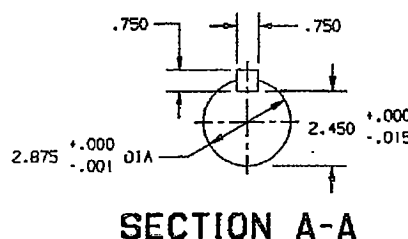
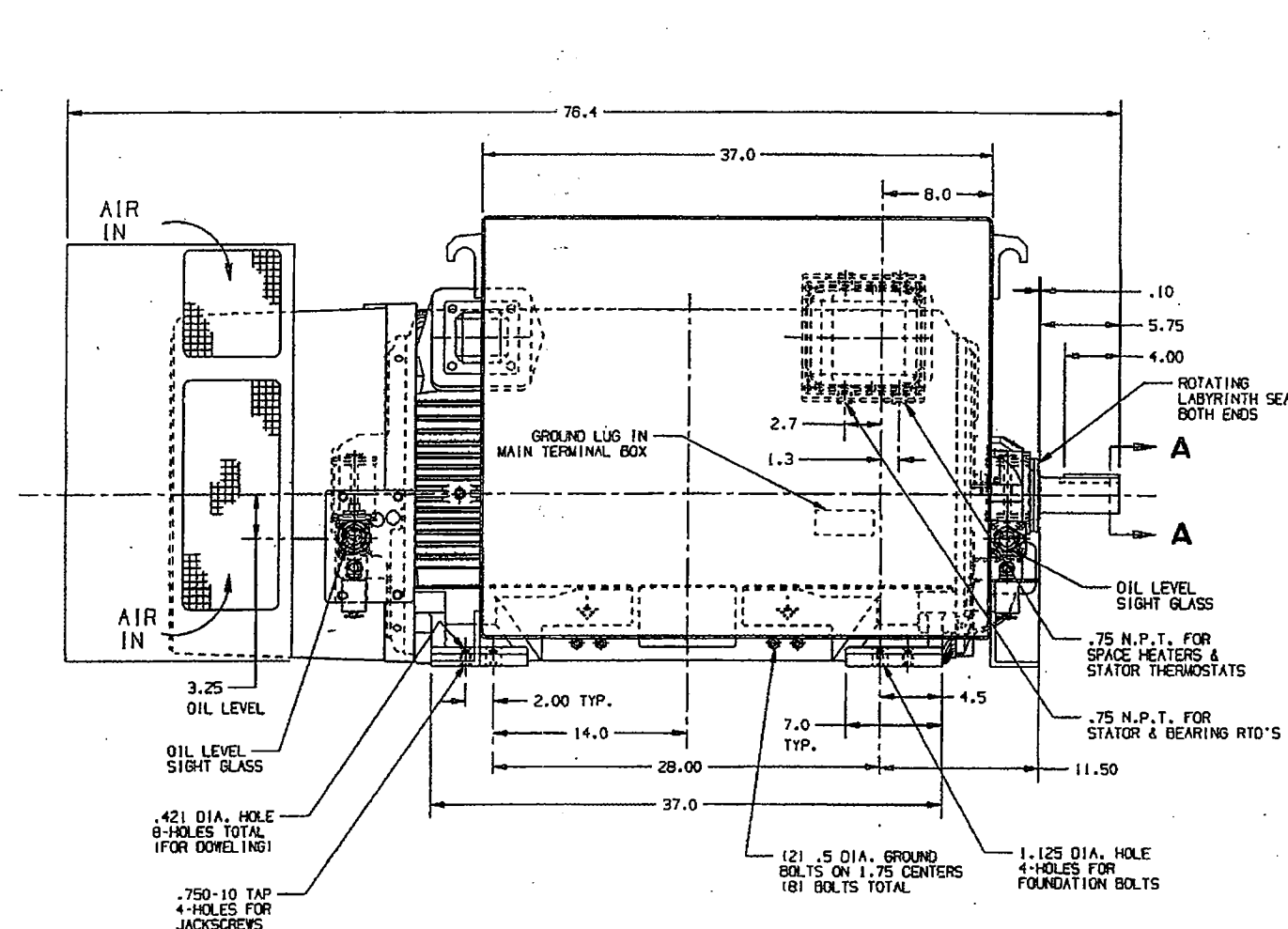
MOTOR DATA:

ROTOR END FLOAT: .50"
END FLOAT OF LTD END FLOAT CPLG: .19"
OIL CAPACITY PER BEARING: 1.7 QT DRIVE END, 1.8 QT NON-DRIVE END.
USE A HIGH QUALITY TURBINE OIL HAVING A VISCOSITY OF 300 TO 350 SUS @ 100°F (150 VG 68)
FOR ALIGNMENT REQUIREMENTS SEE THE INSTRUCTION BOOK.

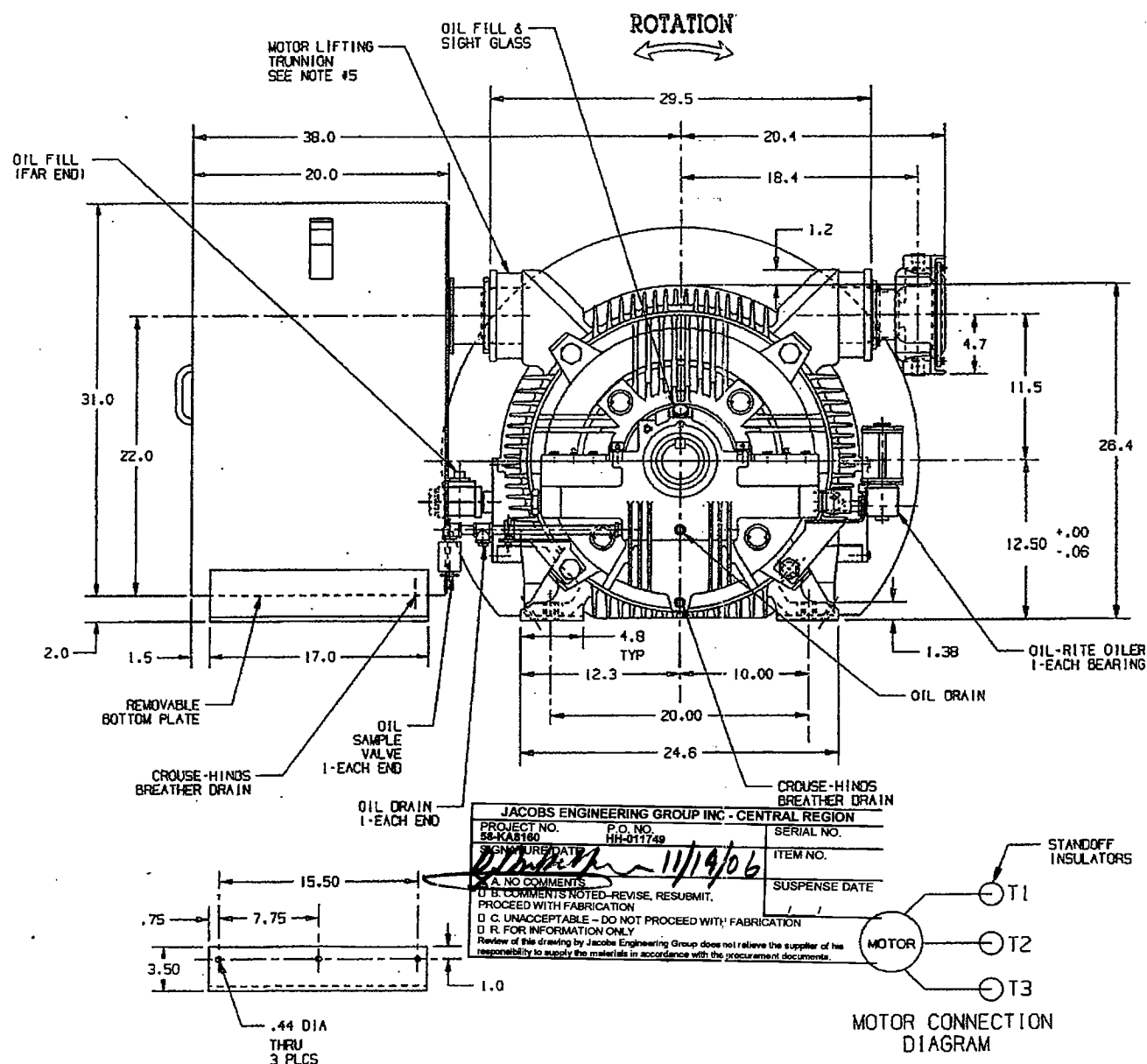
JACOBS P.O. 58-KA8160-HH011749
ITEM # 30-5295
RL3 REACTOR CIRCULATION
PUMP MOTOR
SAP # 10547578

00 08-04-06

THIS IS A CAD DRAWING NO. MANUAL CHANGES ARE ALLOWED



TERMINAL BOARD ARRANGEMENT IN AUXILIARY BOX FOR SPACE HEATERS & STATOR THERMOSTATS, 100-OHM STATOR & BEARING RTD'S



JACOBS ENGINEERING GROUP INC. - CENTRAL REGION
PROJECT NO. 58-KA8160 P.O. NO. HH-011749
SIGNATURE DATE 11/14/06
A. NO COMMENTS
B. COMMENTS NOTED-REVISE, RESUBMIT, PROCEED WITH FABRICATION
C. UNACCEPTABLE - DO NOT PROCEED WITH FABRICATION
D. R. FOR INFORMATION ONLY
Review of this drawing by Jacobs Engineering Group does not relieve the supplier of his responsibility to supply the materials in accordance with the procurement documents.

SIEMENS

CERTIFIED PRINT
CUSTOMER INITIATED CHANGES MAY AFFECT PRICE AND DELIVERY
PRODUCTION WILL PROCEED ON THE BASIS OF THIS DRAWING
CUSTOMER LAWRENCE PUMPS INC.
P.O.# 763601
S.O.# 0351454-010
HP 250 RPM 1800 FRAME 508SY TYPE CZ VOLTS 4000 PH 3 Hz 60

0351454-010

CONFIDENTIAL-PROPERTY OF
Siemens Energy & Automation, Inc.
POWER CONVERSION DIVISION
NORWOOD PLANT

OUTLINE
TEFC

ROTATING LABYRINTH SEAL, BOTH ENDS
STANDARD SHAFT EXTENSION 2.875 X 5.75 4-POLE SLV BRG

JAK 08-04-06

72-117-824-011

CZ 509S

SCALE 1:166

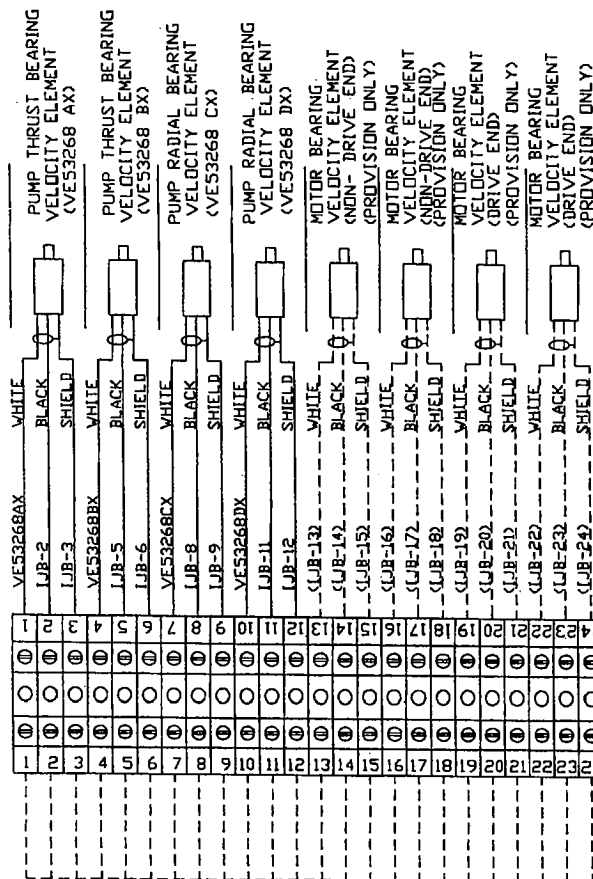
SHEET 1-F

PART NO.

82-401-424-017

ISSUE 00

82-401-424-017



SPARE TERMINALS

JACOBS ENGINEERING GROUP INC - CENTRAL REGION	
PROJECT NO. 58-KA8130	P.O. NO. 7/27/06
SIGNATURE/DATE <i>[Signature]</i> 7/27/06	SERIAL NO. ITEM NO. 675295
NO COMMENTS	
☐ A. COMMENTS NOTED - REVISE, RESUBMIT, PROCEED WITH FABRICATION ☐ C. UNACCEPTABLE - DO NOT PROCEED WITH FABRICATION ☐ R. FOR INFORMATION ONLY	
SUSPENSE DATE 1 / 1	
Review of this drawing by Jacobs Engineering Group does not relieve the supplier of his responsibility to supply the material in accordance with the procurement documents.	

THIS TERMINAL IS RESERVED FOR SHIELD WHEN REQUIRED

IJB

CONTRACTOR CABLE

92214	58-KA8160-HH 011749	67-5295 10547582	30-5295 10547578
PUMP SERIAL NO.	CUSTOMER ORDER NO.	PUMP ITEM NO. SAP NO.	MOTOR ITEM NO. SAP NO.
CUSTOMER: JACOBS ENGINEERING USER: CHEVRON PHILLIPS PLANT: CPCHEM LOCATION: PASADENA, TEXAS, USA SERVICE: RL3 CIRCULATION PUMP PROJECT NO: 58-KA8160 PROJECT: LOW GEL			

UNLESS OTHERWISE SPECIFIED
 DR BY: J.O.
 CK BY: CZ
 APP ENG: GCM
 REL ENG:
 APP QA:
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 ALL RIGHTS RESERVED. This document is the property of Lawrence Pumps, Inc. and is not to be reproduced or transmitted in any form or by any means electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without the prior written permission of Lawrence Pumps, Inc.

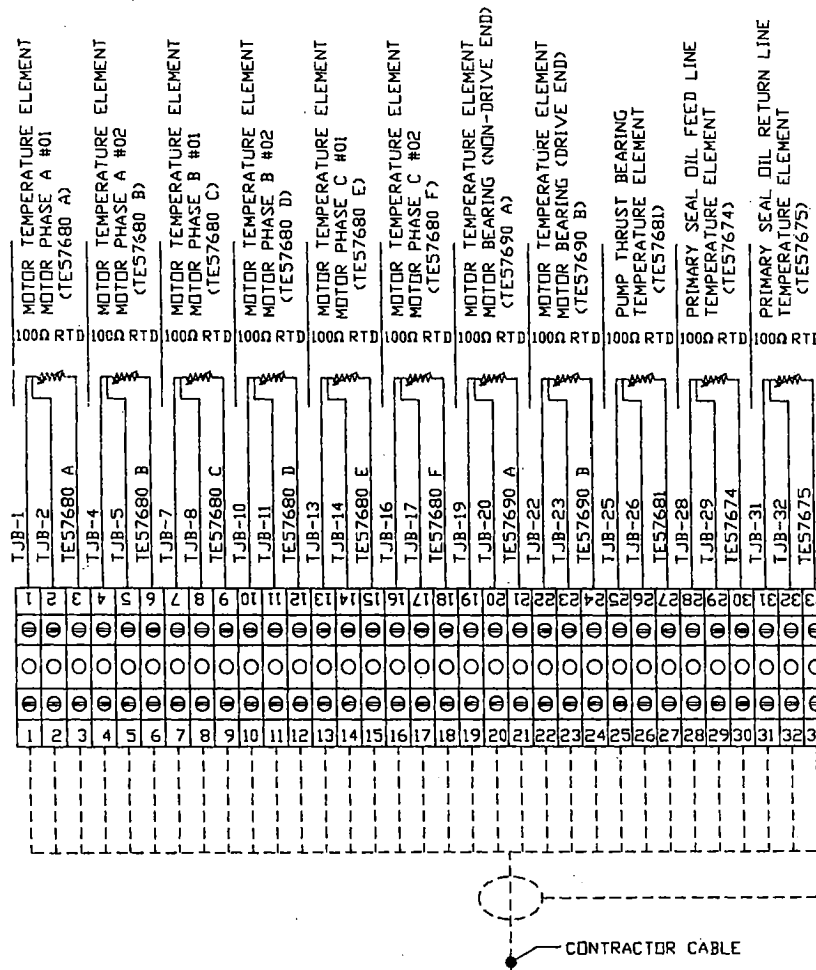
NO	BY	DATE	CHK'D	DESCRIPTION
REVISIONS				
1	J.O.	6/23/06		LAWRENCE PUMPS INC. 371 MARKET STREET LAWRENCE MA.
2	CZ	6/29/06		JUNCTION BOX TERMINAL DIAGRAM ANALOG SIGNAL JUNCTION BOX (IJB)
3	GCM	7/3/06		
TOLERANCES				SIZE C DWG NO 64441
.XX DECIMALS ±.01 (±0.0) .XXX DECIMALS ±.005 (±0.13) ☒ ANGULARITY ☐ PERPENDICULARITY ☒ SURFACE FINISHES				REF DWG C62985 SCALE NONE SHEET 1 OF 1

A-11



I	JO	2/2/07	GM	UPDATED LEVEL SWITCH WIRING COLOR CODES	
NO	BY	DATE	CHK'D		DESCRIPTION
REVISIONS					
DR BY: J.O		6/23/06			LAWRENCE PUMPS INC. 371 MARKET STREET LAWRENCE MA. JUNCTION BOX TERMINAL DIAGRAM 120V AC JUNCTION BOX (AJB)
CK BY: CZ		7/3/06			
APP ENG: GCM		7/5/06			
REL. ENG:					
APP QA:					
© 2006 LAWRENCE PUMPS, INC. NOTED: This unit is the property of Lawrence Pumps Inc. and is loaned to you by L.P.I. and is not to be sold, transferred, or otherwise disposed of without the written consent of Lawrence Pumps Inc. Any unauthorized use of this unit is prohibited. The user assumes all liability for any damage to the unit or any injury to persons or property resulting from the use of this unit. The user agrees to indemnify and hold Lawrence Pumps Inc. harmless from any and all claims, damages, or expenses for the period of the loan.					
SIZE		DWG NO		64442	
REF. ENG.		C62984		SCALE: NONE	
				SHEET: 1 OF 1	

SUPPLIED WITH MOTOR
WIRED TO JUNCTION
BOX BY LPI



JACOBS ENGINEERING GROUP INC - CENTRAL REGION			
PROJECT NO.	58-KAB160	SERIAL NO.	
SIGNATURE/DATE	7/27/06	ITEM NO.	67-5295
NO COMMENTS		SUSPENSE DATE	
☐ NO COMMENTS NOTED - REVISE, RESUBMIT, PROCEED WITH FABRICATION ☐ C. UNACCEPTABLE - DO NOT PROCEED WITH FABRICATION ☐ R. FOR INFORMATION ONLY Review of this drawing by Jacobs Engineering Group does not relieve the supplier of his responsibility to supply the materials in accordance with the procurement documents.			

92214	58-KAB160-HH 011749	67-5295 10547582	30-5295 10547578
PUMP SERIAL NO.	CUSTOMER ORDER NO.	PUMP ITEM NO. SAP NO.	MOTOR ITEM NO. SAP NO.
CUSTOMER:	JACOBS ENGINEERING		
USER:	CHEVRON PHILLIPS		
PLANT:	CPCHEM		
LOCATION:	PASADENA, TEXAS, USA		
SERVICE:	RL3 CIRCULATION PUMP		
PROJECT NO.:	58-KAB1-60		
PROJECT:	LOW GEL		

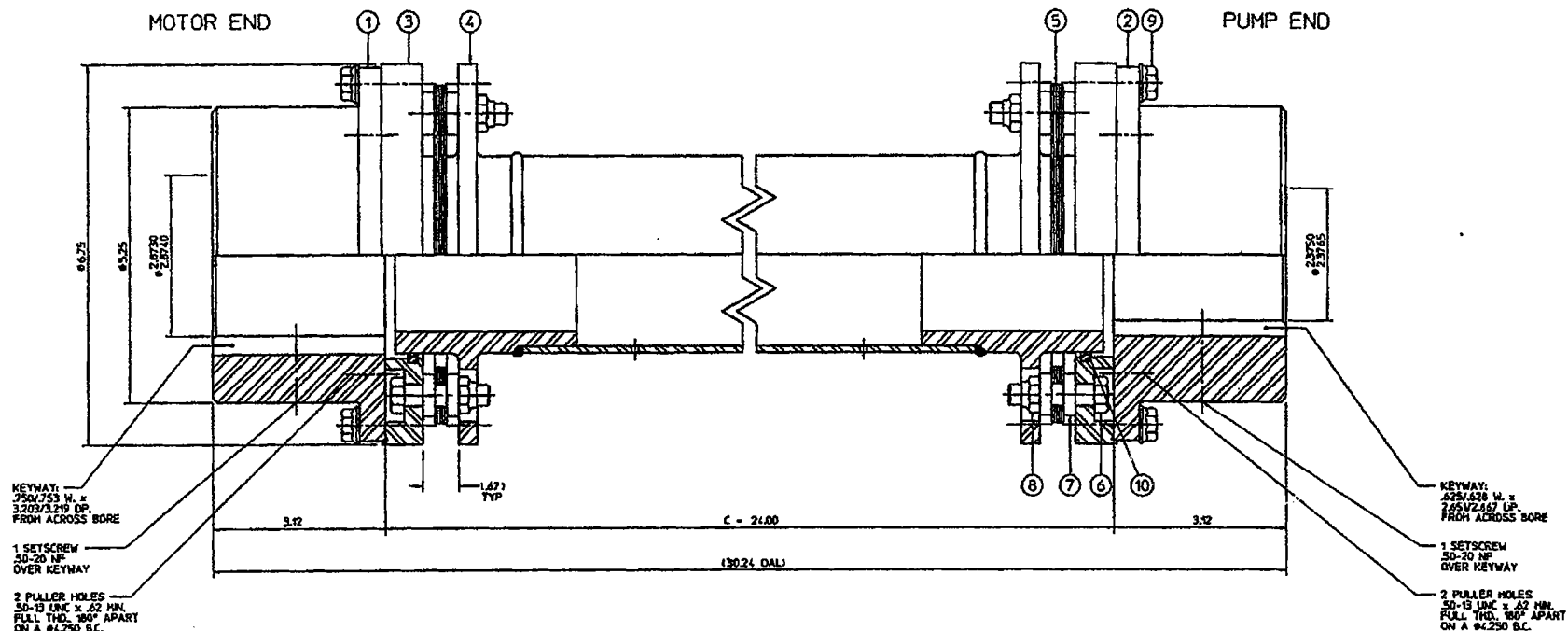
UNLESS OTHERWISE SPECIFIED
 (R) ALL EXTERNAL CORNERS
 INTERNAL CORNER RADIUS: .032 (0.8) MAX
 PART TO BE FREE OF BURRS
 SYMBOLS FOR ASME Y14.5M-1994
 TOLERANCES
 .XX DECIMALS ±.XX (+0.0)
 .XXX DECIMALS ±.005 (+0.01)
 ANGLE
 .X PERCENT
 .X PERCENT
 .X PERCENT
 SURFACE FINISHES

NO	BY	DATE	CHK'D	DESCRIPTION
REVISIONS				
DR BY:	J.O	6/25/06		
CK BY:	CZ	7/3/06		
APP ENG:	GCM	7/5/06		
REL ENG:				
APP QA:				
© 2006 LAWRENCE PUMPS, INC. NOTICE: This document is the property of Lawrence Pumps Inc. and is intended for use by the customer only. It is not to be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of Lawrence Pumps, Inc.				
LAWRENCE PUMPS INC.				371 MARKET STREET LAWRENCE MA.
JUNCTION BOX TERMINAL DIAGRAM RTD JUNCTION BOX (TJB)				
SIZE	C	QWC NO	64443	
REV QWC	C62986	SCALE	NONE	SHEET: 1 OF 1

A-11

CAUTION NOTE:
THESE LOCKNUTS HAVE BEEN FACTORY
TIGHTENED. DO NOT DISTURB THESE
LOCKNUTS WHEN ASSEMBLING OR
DISASSEMBLING ON EQUIPMENT.

REV	DESCRIPTION



A. GENERAL NOTES:
1. COUPLING FURNISHED WITH STAINLESS STEEL
DISC PACKS.

B. OPERATING DATA:
POWER: 250 HP
SPEED: 1600 RPM

JACOBS ENGINEERING GROUP INC - CENTRAL REGION		
PROJECT NO. 58-KA8160	P.O. NO. HH011749	SERIAL NO.
SIGNATURE/DATE <i>[Signature]</i> 8/28/06	ITEM NO. 67-5295	SUSPENSE DATE
A. NO COMMENTS B. COMMENTS NOTED-REVISE, RESUBMIT, PROCEED WITH FABRICATION C. UNACCEPTABLE - DO NOT PROCEED WITH FABRICATION D. R. FOR INFORMATION ONLY Review of this drawing by Jacobs Engineering Group does not relieve the supplier of his responsibility to supply the materials in accordance with the procurement documents.		

ITEM NO.	DESCRIPTION	QTY.	DWG. NO.	COMMENTS
10	BUFFER RINGS	2	10754-04	
9	HEX HD. CAPSCREWS	12	49189-02	
8	LOCKNUTS	12	16506	SEE CAUTION NOTE
7	WASHERS	24	17789-06	
6	BOLTS	12	42908	
5	DISC PACKS	2	42907	LAMINATION TYP. 216/249
4	TUBE	1	COMMERCIAL	350 O.D. x .120 WALL
3	INTERMEDIATE HUBS	2	51692	
2	CHUB SUB-ASSY. CONSISTING OF:	1	51691	
1	ADAPTERS	2	42904	
2	HUB	1	42902	PKD
1	HUB	1	42904	PKD

PARTS LIST

JACOBS P.O. 58-KA8160-HH011749
ITEM # 67-5295
RL3 REACTOR CIRCULATION
PUMP
SAP # 10547852

LAWRENCE PUMPS, INC.
LAWRENCE, MA

REV. UNLESS OTHERWISE SPECIFIED	DATE
ASSEMBLY	TRW 6-9-93
2 PLACE DECIMALS	SCALE
3 PLACE DECIMALS	1 : 1
4 PLACE DECIMALS	

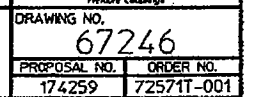
CERTIFIED DRAWING	
REV. 0 PER: JGL	DATE: 6-14-05
SECTIONAL ASSEMBLY STANDARD NO. 350 SERIES 72 COUPLERS	
DRAWING NO. 56651T001 PROPOSAL NO. ORDER NO.	

REXNORD P/N: 585602

Rexnord
COUPLING OPERATION
WARREN, PA 15060

67246

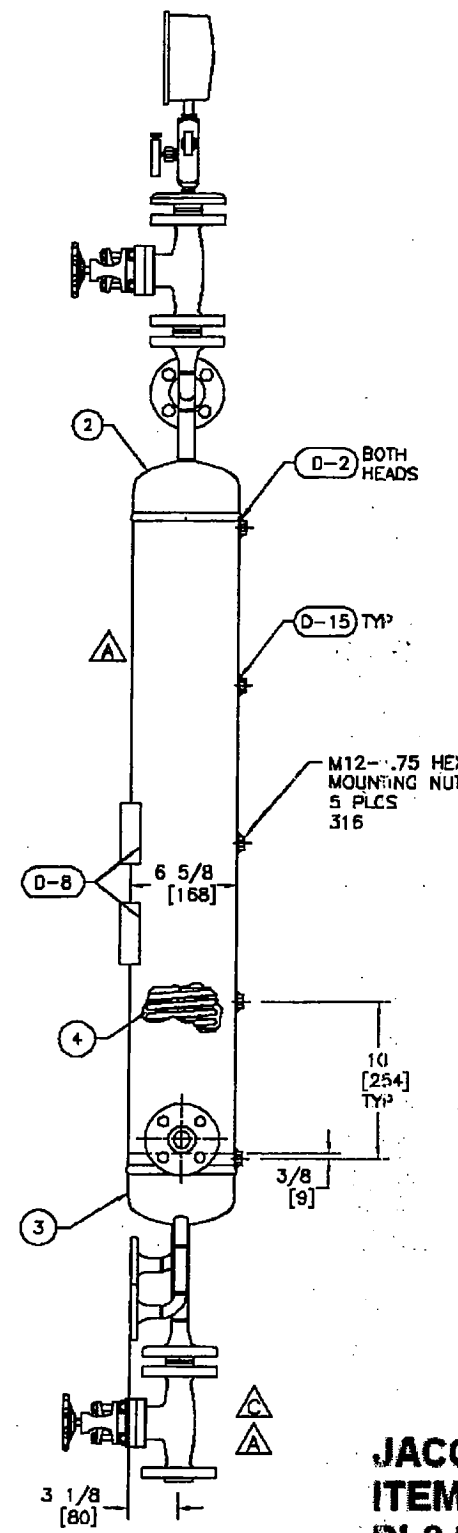
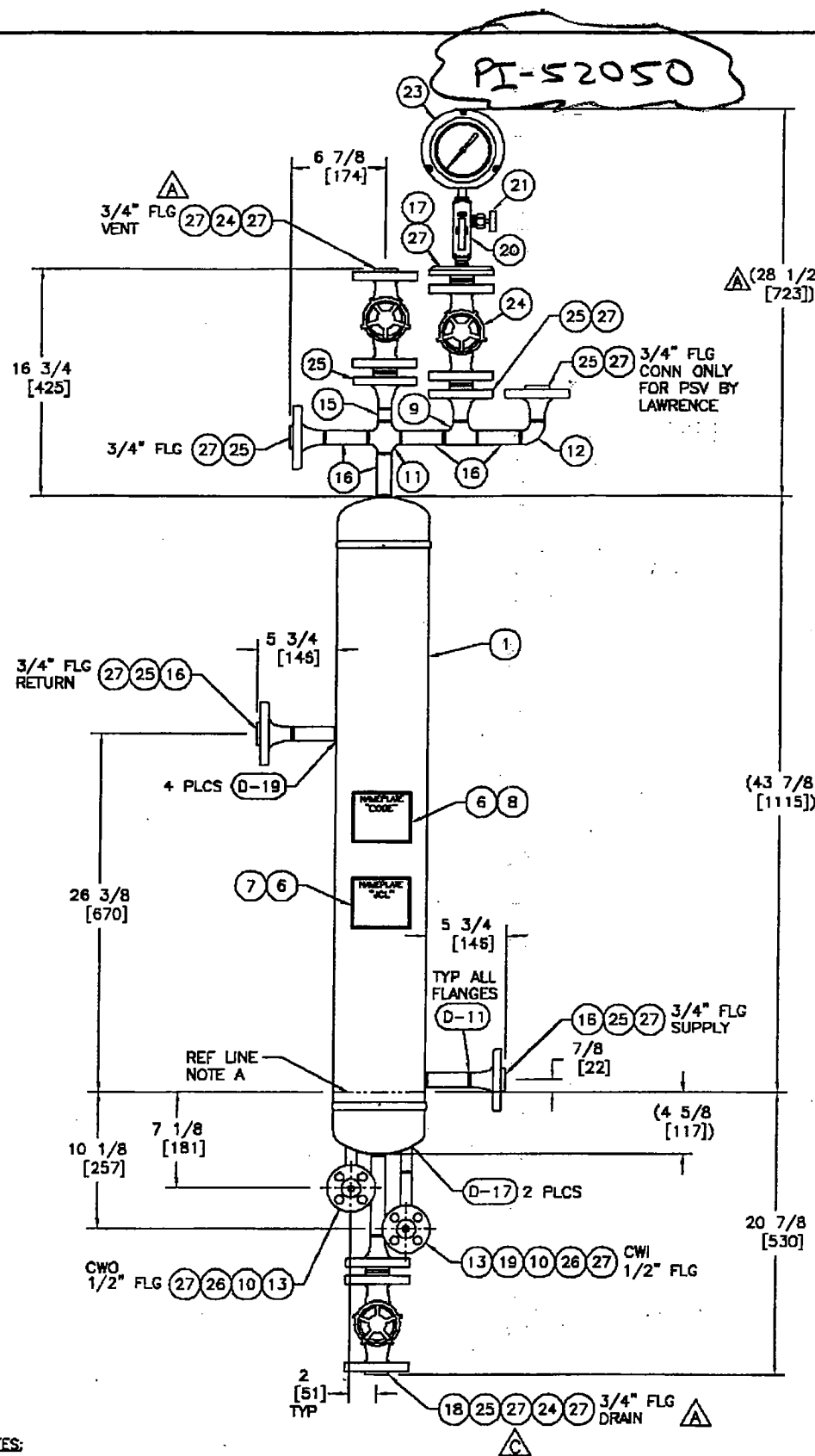
REVISIONS



THE INFORMATION AND DESIGN DISCLOSED HEREON IS THE PROPERTY OF REYNOLD INDUSTRIES, L.L.C. COUPLING GROUP AND MUST NOT BE REPRODUCED OR FORN MOBILE, TRADE MILEAGE, OR ANY OTHER.

Rexnord
COUPLING GROUP
WARREN, PA 16365
Thomas
Flexible Couplings

97246



BILL OF MATERIALS				
ITEM	QTY	DESCRIPTION	PART NO.	MATERIAL
1	1	SHELL: 6" SCH 80 x 41 1/4" LG SNLS	MPI-JBS7	SA-312 316/L
2	1	TOP HEAD: 6" FOR SCH 80	L30-32705-002	SA-403 316/L WP-S
3	1	BOTTOM HEAD: 6" FOR SCH 80	L30-32705-001	SA-403 316/L WP-S
4	1	COIL: 1/2" OD x .065" WALL x 20' LG ERW	L31-4656-20W	SA-249 316/L
5		DELETED		
6	2	BRACKET: NAMEPLATE	L33-0006-004	SA-240 316
7	1	JCL NAME PLATE:	L35-0004-005	304 SS
8	1	JCL NAMEPLATE: CODE	L35-0004-101	304 SS
9	1	TEE: 3/4" BW SCH 160	L10-6DT7-NW1	SA-403 316/L
10	2	ELBOW: 1/2" BW SCH 80	L10-48E7-NW1	SA-403 316/L
11	1	CROSS: 3/4" BW SCH 160	L10-6DC7-NW1	SA-403 316/L
12	1	ELBOW: 3/4" BW 90° SCH 160	L10-6DE7-NW1	SA-403 316/L
13	2	TUBE x 1/2" BW PIPE COUPLING x 2 1/2" LG	L13-32705-001	SA-312 316/L
14		DELETED		
15	1	PIPE: 3/4" BW x 7/8" LG SCH 160	MPI-6DS7	SA-312 316/L
16	6	PIPE: 3/4" BW x 3" LG SCH 160	L13-68B7-304	SA-312 316/L
17	1	BLIND FLG: 3/4" 600# W/ 1/2" NPT IN CTR	L14-6807-BL1	SA-182 316/L
18	1	PIPE: 3/4" BW x 5 7/8" LG SCH 160	MPI-6DS7	SA-312 316/L
19	1	PIPE: 1/2" BW x 3" LG SCH 80	L13-48B7-303	SA-312 316/L
20	1	BLOCK VALVE: 1/2" NPT MULTI PORT	LVI-4BK6-G01	316 SS
21	1	BLEED VALVE: 1/2" NPT	LVI-4BD6-G01	316 SS
22		DELETED		
23	1	PRESSURE GAUGE: 4 1/2" DIAL 0-1500 PSI	LPI-1K56-301	316 WT'D
24	3	GATE VALVE: 3/4" FLG CLASS 600	LVG-6FF7-F02	316L SS
25	7	FLANGE: 3/4" RFWN CLASS 600 SCH 160	L14-6607-WN2	SA-182 F316/L
26	2	FLANGE: 1/2" RFWN CLASS 150 SCH 80	L14-4157-WN1	SA-182 F316/L
27	AR	SPIRAL WOUND TYPE 316/L W/GRAPHITE FILLER		
28		DELETED		

John Crane Lemco
TULSA, OKLAHOMA 74110 U.S.A.

68.9 BARG at 150 °C
MAXIMUM ALLOWABLE WORKING PRESSURE
-50 °C at 68.9 BARG
MINIMUM DESIGN METAL TEMPERATURE
37751-1
MFG. S.N. LC53-32705-001 2006
PART NUMBER YEAR BUILT
67-5095-1

Certified by
John Crane Lemco
TULSA, OKLAHOMA 74110 U.S.A.

RT-1 MAMP: 1000 PSI at 302 °F
MDMT: -58 °F at 1000 PSI
MFG. S.N. 37751-1
YEAR BUILT 2008

MATERIAL CERTIFIED CORRECT BY
(WELDER) _____
HYDRO TEST 1500 PSI AT 50° TO 80°
RADIOGRAPH EXAM: FULL
POST WELD HEAT TREAT: NONE
CORROSION ALLOWANCE: NONE
BUILT IN ACCORDANCE WITH THE ASME
CODE SECTION VIII DIVISION 1
2004 (YEAR) 2005 (ADDENDA (DATE))
CERTIFIED AS BUILT:
(Q.A. MGR.) _____

- NOTES:**
1. PRESSURE RELIEF DEVICES ARE NOT PROVIDED BY THE MANUFACTURER (SEE THE ASME CODE SECTION VIII, DIVISION 1, PARAGRAPH UG-125 FOR USER RESPONSIBILITIES).
 2. THE RESERVOIR SHELL, HEADS & ALL COMPONENTS WELDED TO THE SHELL AND HEADS ARE PER ASME CODE SECTION VIII, DIVISION 1. ALL OTHERS ARE NON-CODE.
 3. MTR'S REQUIRED ON THE VESSEL (SHELL, HEADS AND ALL PRESSURE PARTS WELDED TO THE SHELL & HEADS), FITTINGS, PIPE & FLANGES.
 4. 100% RADIOGRAPHY (RT) OF HEAD TO SHELL WELD SEAMS AND ALL BUTT WELDS REQUIRED.
 5. 100% DYE PENETRANT TEST (PT) ALL OTHER WELDS.

- SHOP NOTES:**
- A. REFERENCE LINE IS 1.00" FROM END OF SHELL.
 - B. ALL DIMENSIONS IN () ARE REFERENCE DIMENSIONS.
 - C. ALL DIMENSIONS ARE IN INCHES.
 - D. ALL DIMENSIONS IN [] ARE IN MILLIMETERS.
 - E. DRILL HOLES IN SHELL PER LES-2002 UNLESS OTHERWISE NOTED.
 - F. FLANGE FINISH PER ASME B16.5-1996 PARA 6.4.4. (125 TO 250 MICRO-INCH AVERAGE ROUGHNESS)
 - G. FLANGE BOLT PATTERN TO STRADDLE NORMAL CENTER LINE. STUDS, NUTS & GASKETS PER LES-2012-150 & 600.

ASSEMBLY TOLERANCES (UNLESS OTHERWISE NOTED)		REV	DATE
GENERAL VESSEL ± 1/4"		REV	DATE
PIPING STRING ± 1/2"		REV	DATE
REF. DIMS. ± 1/2"		REV	DATE
ANGULAR ± 2 DEG		REV	DATE
A. REVISED VENT & DRAIN LINES TO FLANGED GATE VALVES.		BY	DATE
B. CHANGED ITEM 22 PART NUMBER.		BY	DATE
C. UPDATED TO CUSTOMER'S MARK-UP DRAWING		BY	DATE

JACOBS P.O. 58-KA8160-HH011749
ITEM # 67-5295
RL3 REACTOR CIRCULATION PUMP
SAP # 10547852



John Crane Lemco
2931 East Apache Street
Tulsa, Oklahoma 74110
Telephone: 918 835 7325
Facsimile: 918 835 5823

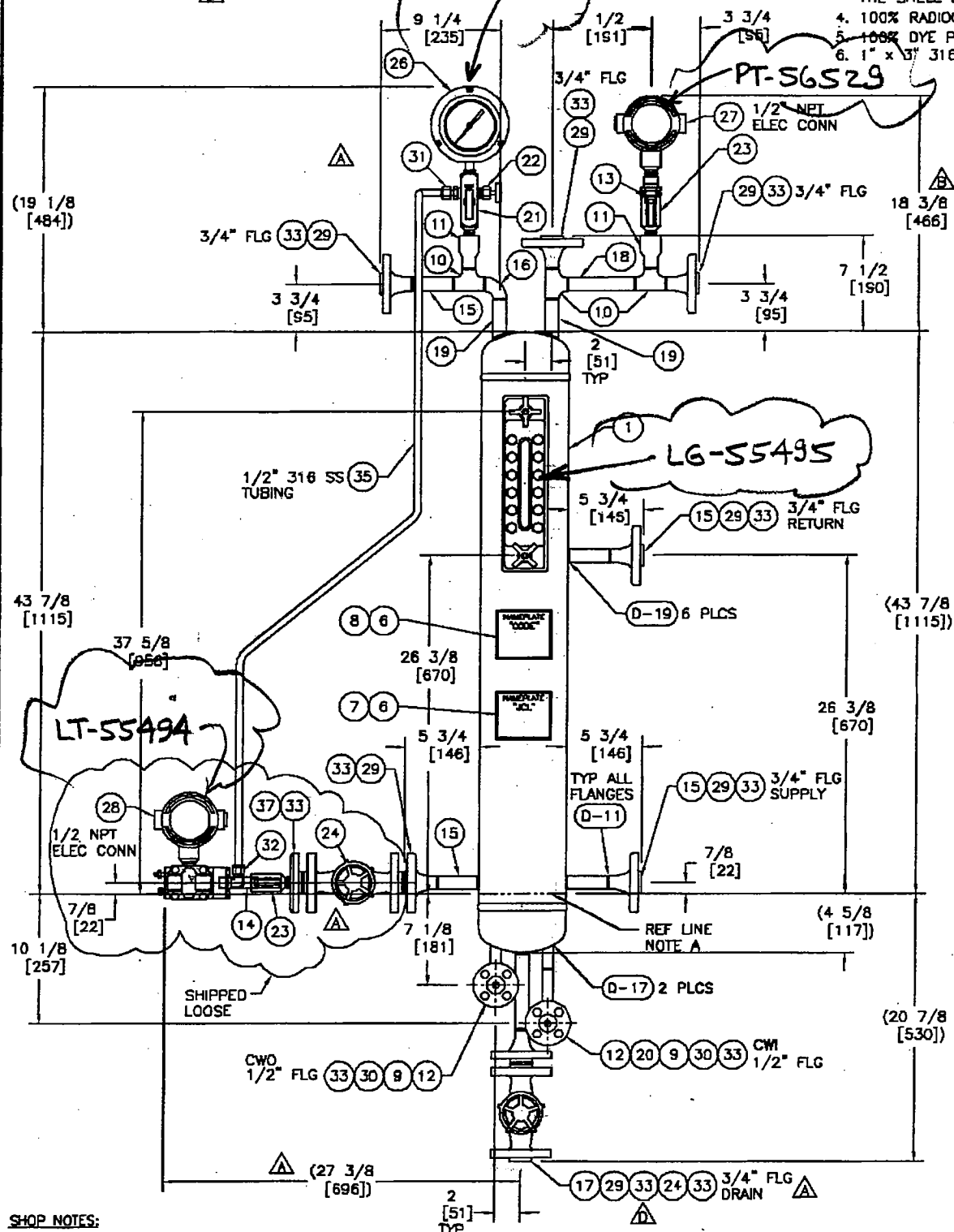
W-10EX & W-11EX PIPE ON SHELL	W-11EX MTG NUTS	W-11EX COIL PIPE	W-11EX RFWN FLGS	W-10EX NMPL BRKTS	W-11EX HEADS & BW PIPE
D-16	D-15	D-17	D-11	D-8	D-2

John Crane Lemco
2931 East Apache Street
Tulsa, Oklahoma 74110
Telephone: 918 835 7325
Facsimile: 918 835 5823

RE-1518 5 GAL RES ASSY PRIMARY RESERVOIR
LAWRENCE PUMPS
CUST P.O. NO.: 763607
JCL JOB NO.: 37751
DRAWING NO.: LC53-32705-001

INSTRUMENT TAG NUMBER CHART	
PRESS. GAUGE	PI-52038
PRESS. TRANSMITTER	PT-56518X
LEVEL TRANSMITTER	LT-55003

- NOTES: 1. PRESSURE RELIEF DEVICES ARE NOT PROVIDED BY THE MANUFACTURER (SEE THE ASME CODE SECTION VIII, DIVISION 1, PARAGRAPH UG-125 FOR USER RESPONSIBILITIES).
2. THE RESERVOIR SHELL, HEADS & ALL COMPONENTS WELDED TO THE SHELL AND HEADS ARE PER ASME CODE SECTION VIII, DIVISION 1. ALL OTHERS ARE NON-CODE.
3. MTR'S REQUIRED ON THE VESSEL (SHELL, HEADS AND ALL PRESSURE PARTS WELDED TO THE SHELL & HEADS), FITTINGS, PIPE & FLANGES.
4. 100% RADIOGRAPHY (RT) OF HEAD TO SHELL WELD SEAMS AND ALL BUTT WELDS REQUIRED.
5. 100% DYE PENETRANT TEST (PT) ALL OTHER WELDS.
6. 1" x 3" 316SS TAGS REQUIRED FOR INSTRUMENTS PER CHART.



- SHOP NOTES:
A. REFERENCE LINE IS 1.00" FROM END OF SHELL.
B. ALL DIMENSIONS IN () ARE REFERENCE DIMENSIONS.
C. ALL DIMENSIONS ARE IN INCHES.
D. ALL DIMENSIONS IN [] ARE IN MILLIMETERS.
E. DRILL HOLES IN SHELL PER LES-2002 UNLESS OTHERWISE NOTED.
F. FLANGE FINISH PER ASME B16.5-1996 PARA 6.4.4. (125 TO 250 MICRO-INCH AVERAGE ROUGHNESS)
G. FLANGE BOLT PATTERN TO STRADDLE NORMAL CENTER LINE. STUDS, NUTS & GASKETS PER LES-2012-150 & 600.

ASSEMBLY TOLERANCES
(UNLESS OTHERWISE NOTED)
GENERAL VESSEL ± 1/4"
PIPING STRING ± 1/2"
REF. DIMS. ± 1/2"
ANGULAR ± 2 DEG

REV	DATE	BY	DATE	BY
1	10 MAR 2005	LJE	10 MAR 2005	LJE
2	16 FEB 2005	LJE	16 FEB 2005	LJE
3	09 FEB 2005	LJE	09 FEB 2005	LJE
4	10 JAN 2005	JEF	10 JAN 2005	JEF

JACOBS P.O. 58-KA8160-HH011749
ITEM # 67-5295
RL3 REACTOR CIRCULATION PUMP
SAP # 10547852

John Crane
Seal Support Systems

John Crane Lemco
2931 East Apache Street
Tulsa, Oklahoma 74110
Telephone: 918 835 7325
Facsimile: 918 835 5823

BILL OF MATERIALS

ITEM	QTY	DESCRIPTION	PART NO.	MATERIAL	HEAT NO.
1	1	SHELL: 6" SCH 80 x 41 1/4" LG SMLS	MPI-JBS7	SA-312 316/L	
2	1	TOP HEAD: 6" FOR SCH 80	L30-32705-003	SA-403 316/L WP-S	
3	1	BOTTOM HEAD: 6" FOR SCH 80	L30-32705-001	SA-403 316/L WP-S	
4	1	COIL: 1/2" OD x .065" WALL x 20' LG ERW	L31-4656-20W	SA-249 316/L	
5	1	LEVEL GAUGE: LEMCO B-4 WP W/ISO VALVES	LUJ-14X7-113	SA-479 316/L WT'D	
5A	1	LEVEL GAUGE: WELD PAD COVER		SA-479 316/L	
5B	AR	WELD PAD GASKET: KLINGER C-4401			
6	2	BRACKET: NAMEPLATE	L33-0006-004	SA-240 316	
7	1	JCL NAME PLATE:	L35-0004-005	304 SS	
8	1	JCL NAMEPLATE: CODE	L35-0004-101	304 SS	
9	2	ELBOW: 1/2" BW SCH 80	L10-4BE7-NW1	SA-403 316/L	
10	3	TEE: 3/4" BW SCH 160	L10-6D17-NW1	SA-403 316/L	
11	2	TRANS FITG: 3/4" BW x 1/2" FNPT SPECIAL	L10-66N7-NW3	SA-479 316/L	
12	2	TUBE x 1/2" BW PIPE COUPLING x 2 1/2" LG	L13-32705-001	SA-312 316/L	
13	1	PIPE: 1/2" NPT x 1" LG SCH 160	L13-4NN7-104	SA-312 316/L	
14	1	PIPE: 1/2" NPT x 3" LG SCH 160	L13-4NN7-304	SA-312 316/L	
15	4	PIPE: 3/4" BW x 3" LG SCH 160	L13-6BB7-304	SA-312 316/L	
16	1	ELBOW: 3/4" BW SCH 160	L10-6DE7-NW1	SA-403 316/L	
17	1	PIPE: 3/4" BW x 5 7/8" LG SCH 160	MPI-6DS7	SA-312 316/L	
18	1	PIPE: 3/4" BW x 5" LG SCH 160	L13-6BB7-504	SA-312 316/L	
19	2	PIPE: 3/4" BW x 4" LG SCH 160 (TO TRIM)	L13-6BB7-504	SA-312 316/L	
20	1	PIPE: 1/2" BW x 3" LG SCH 80	L13-4BB7-303	SA-312 316/L	
21	1	BLOCK VALVE: 1/2" NPT MULTI PORT	LVI-4BK6-G01	316 SS	
22	1	BLEED VALVE: 1/2" NPT	LVI-4BD6-G01	316 SS	
23	2	BLOCK/ BLEED VALVE: 1/2" NPT SINGLE PORT	LVI-4SP6-G01	316 SS	
24	2	GATE VALVE: 3/4" FLG CLASS 600	LVG-6FF7-F02	316L SS	
25		DELETED			
26	1	PRESSURE GAUGE: 4 1/2" DIAL 0-1500 PSI	LPI-1K56-301	316 WT'D	
27	1	PRESSURE TRANSMITTER: HONEYWELL MODEL	LPT-32705-001	316 WT'D	
27A		STD97L-E1G-00000-SMTC1C 0-3000 PSI / 0-210 BAR			
28	1	LEVEL TRANSMITTER: HONEYWELL	LDT-32705-001	316 WT'D	
28A		MODEL NO. STD924-E1H-00000-S2SMTC1C			
29	7	FLANGE: 3/4" RFWN CLASS 600 SCH 160	L14-6607-WN2	SA-182 F316/L	
30	2	FLANGE: 1/2" RFWN CLASS 150 SCH 80	L14-4157-WN1	SA-182 F316/L	
31	1	TUBE FITTING: 1/2" MNPT x 1/2" TUBE	L17-NC46-404	316 SS	
32	1	TUBING ELBOW: 1/2" MNPT x 1/2" TUBE	L17-ME46-404	316 SS	
33	AR	SPIRAL WOUND TYPE 316/L W/GRAPHITE FILLER			
34		DELETED			
35	AR	TUBING: 1/2" OD x .065" WALL ERW	NTU-4657	SA-269 316	
36		DELETED			
37	1	BLIND FLG: 3/4" 600# W/1/2" NPT IN CTR	L14-6607-BL1	SA-182 316/L	

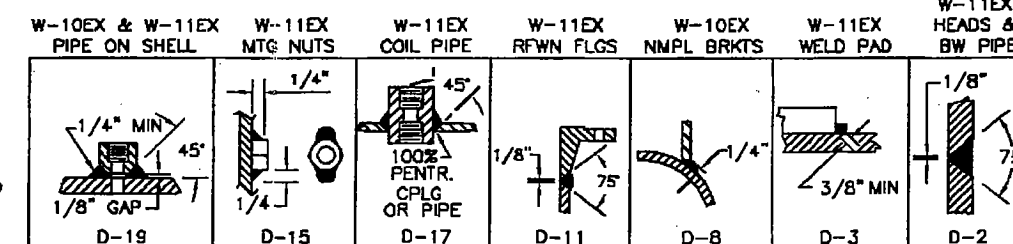
John Crane Lemco
TULSA, OKLAHOMA 74110 U.S.A.

68.9 BARG @ 150 °C
MAXIMUM ALLOWABLE WORKING PRESSURE
-50 °C @ 68.9 BARG
MINIMUM DESIGN METAL TEMPERATURE
37751-2
MFG. S.N.
LC53-32705-002 2006
PART NUMBER YEAR BUILT
67-5095-2

Certified by
John Crane Lemco
TULSA, OKLAHOMA 74110 U.S.A.

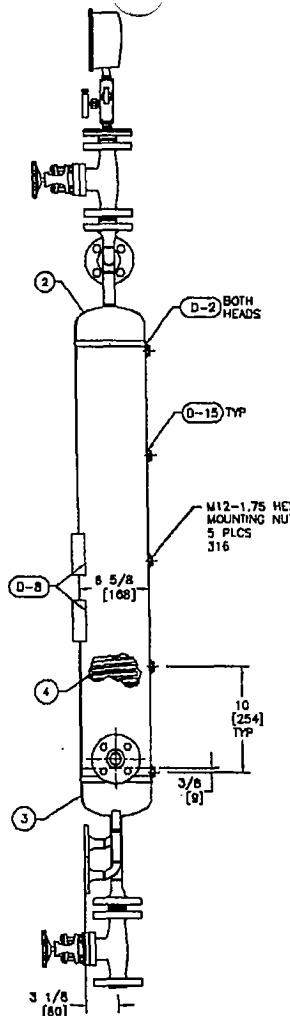
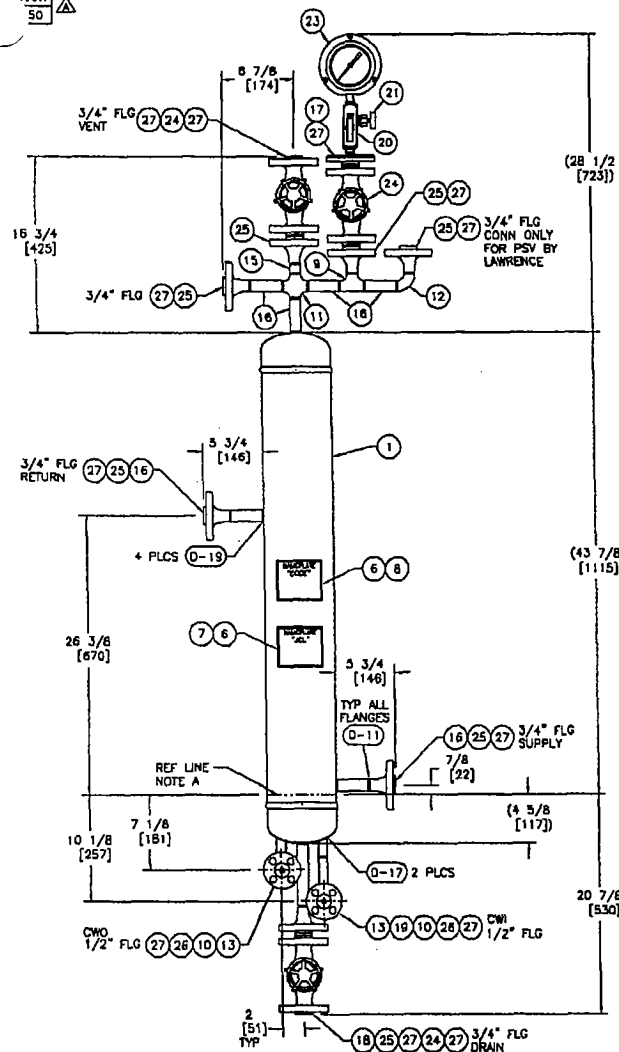
MAWP: 1000 PSI @ 302 °F
MDMT: -58 °F @ 1000 PSI
MFG. S.N. 37751-2
YEAR BUILT 2006

MATERIAL CERTIFIED CORRECT BY
(WELDER) _____
HYDRO TEST 1502 PSI AT 50° TO 80°
RADIOGRAPH EXAM: FULL
POST WELD HEAT TREAT: NONE
CORROSION ALLOWANCE: NONE
BUILT IN ACCORDANCE WITH THE ASME
CODE SECTION VIII DIVISION 1
2004 (YEAR) 2005 (ADDENDA (DATE))
CERTIFIED AS BUILT:
(Q.A. MGR.) _____



John Crane Lemco
2931 East Apache Street
Tulsa, Oklahoma 74110
Telephone: 918 835 7325
Facsimile: 918 835 5823

RE-1518 5 GAL RES ASSY SECONDARY RESERVOIR
LAWRENCE PUMPS
CUST P.O. NO.: 763607
JCL JOB NO.: 37751
DRAWING NO. LC53-32705-002



- SHOP NOTES:**
- REFERENCE LINE IS 1.00" FROM END OF SHELL
 - ALL DIMENSIONS IN () ARE REFERENCE DIMENSIONS.
 - ALL DIMENSIONS ARE IN INCHES.
 - ALL DIMENSIONS IN [] ARE IN MILLIMETERS.
 - DRILL HOLES IN SHELL PER LES-2002 UNLESS OTHERWISE NOTED.
 - FLANGE FINISH PER ASME B16.5-1996 PARA 6.4.4. (125 TO 250 MICRO-INCH AVERAGE ROUGHNESS)
 - FLANGE BOLT PATTERN TO STRADDLE NORMAL CENTER LINE.
 - STUDS, NUTS & GASKETS PER LES-2012-150 & 600.

ASSEMBLY TOLERANCES (UNLESS OTHERWISE NOTED)	
GENERAL VESSEL ± 1/4"	
PIPING STRING ± 1/2"	
REF. DIMS ± 1/2"	
ANGULAR ± 2 DEG	
REVISD WELD PROCEDURES	
ADDED TAG NUMBER CHART PER CUSTOMER REQUEST.	

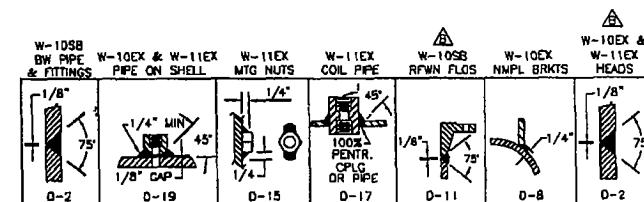
JACOBS ENGINEERING GROUP INC - CENTRAL REGION	
PROJECT NO. 58-KA8160	P.O. NO. 112-011749
SIGNATURE/DATE <i>[Signature]</i> 12/6/06	ITEM NO. 67-5295
NO COMMENTS	
D.B. COMMENTS NOTED-REVISE, RESUBMIT, PROCEED WITH FABRICATION	
C. UNACCEPTABLE - DO NOT PROCEED WITH FABRICATION	
R. FOR INFORMATION ONLY	
Review of this drawing by Jacobs Engineering Group does not relieve the supplier of his responsibility to supply the materials in accordance with the procurement documents.	

BILL OF MATERIALS

ITEM	QTY	DESCRIPTION	PART NO.	DATE	HEAT NO.
1	1	SHELL: 6" SCH 80 x 41 1/4" LG SNLS	MPI-J857	SA-312 316	
2	1	TOP HEAD: 6" FOR SCH 80	L30-32705-002	SA-403 316/L WP-S	
3	1	BOTTOM HEAD: 6" FOR SCH 80	L30-32705-001	SA-403 316/L WP-S	
4	1	COIL: 1/2" OD x .085" WALL x 20' LG ERW	L31-4858-20W	SA-249 316/L	
5		DELETED			
6	2	BRACKET: NAMEPLATE	L33-0006-004	SA-240 316	
7	1	JCL NAME PLATE:	L35-0004-005	304 SS	
8	1	JCL NAMEPLATE: CODE	L35-0004-101	304 SS	
9	1	TEE: 3/4" BW SCH 160	L10-6077-NW1	SA-403 316/L	
10	2	ELBOW: 1/2" BW SCH 80	L10-48E7-NW1	SA-403 316/L	
11	1	CROSS: 3/4" BW SCH 160	L10-60C7-NW1	SA-403 316/L	
12	1	ELBOW: 3/4" BW 90° SCH 160	L10-60E7-NW1	SA-403 316/L	
13	2	TUBE x 1/2" BW PIPE COUPLING x 2 1/2" LG	L13-32705-001	SA-312 316/L	
14		DELETED			
15	1	PIPE: 3/4" BW x 7/8" LG SCH 160	MPI-60S7	SA-312 316/L	
16	8	PIPE: 3/4" BW x 3" LG SCH 160	L13-68B7-304	SA-312 316/L	
17	1	BLIND FLG: 3/4" 600# W/ 1/2" NPT IN CTR	L14-6807-BL1	SA-182 316/L	
18	1	PIPE: 3/4" BW x 5 7/8" LG SCH 160	MPI-60S7	SA-312 316/L	
19	1	PIPE: 1/2" BW x 3" LG SCH 80	L13-48B7-303	SA-312 316/L	
20	1	BLOCK VALVE: 1/2" NPT MULTI PORT	LV-48K6-G01	316 SS	
21	1	BLEED VALVE: 1/2" NPT	LV-4806-G01	316 SS	
22		DELETED			
23	1	PRESSURE GAUGE: 4 1/2" DIAL 0-1500 PSI	LPI-1K36-301	316 WTD	
24	3	GATE VALVE: 3/4" FLG CLASS 600	LVG-6FF7-F02	316L SS	
25	7	FLANGE: 3/4" RFWN CLASS 600 SCH 160	L14-6807-WN2	SA-182 F316/L	
26	2	FLANGE: 1/2" RFWN CLASS 150 SCH 80	L14-4157-WN1	SA-182 F316/L	
27	AR	SPIRAL WOUND TYPE 316/L V/GRAPHITE FILLER			
28		DELETED			

John Crane Lemco TULSA, OKLAHOMA 74110 USA 88.9 BARG @ 150 °C MAXIMUM ALLOWABLE WORKING PRESSURE -50 °C @ 88.9 BARG MAXIMUM DESIGN METAL TEMPERATURE 37751-1 MFG. S.N. LC53-37751-001 2006 PART NUMBER 67-5295-1 YEAR BUILT	Certified by John Crane Lemco RT-1 MAWP: 1000 PSI @ 302 °F MDMT: -58 °F @ 1000 PSI MFG. S.N. 37751-1 YEAR BUILT 2006	MATERIAL CERTIFIED CORRECT BY (WELDER) _____ HYDRO TEST 1502 PSI AT 50° TO 80°F RADIOGRAPH EXAM: FULL POST WELD HEAT TREAT: NONE CORROSION ALLOWANCE: NONE BUILT IN ACCORDANCE WITH THE ASME CODE SECTION VIII DIVISION 1 2004 (YEAR) 2005 (ADDENDA (DATE)) CERTIFIED AS BUILT: (O.A. MGR.) _____
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- NOTES:**
- PRESSURE RELIEF DEVICES ARE NOT PROVIDED BY THE MANUFACTURER (SEE THE ASME CODE SECTION VIII, DIVISION 1, PARAGRAPH UG-125 FOR USER RESPONSIBILITIES).
 - THE RESERVOIR SHELL, HEADS & ALL COMPONENTS WELDED TO THE SHELL AND HEADS ARE PER ASME CODE SECTION VIII, DIVISION 1. ALL OTHERS ARE NON-CODE.
 - MTR'S REQUIRED ON THE VESSEL (SHELL, HEADS AND ALL PRESSURE PARTS WELDED TO THE SHELL & HEADS), FITTINGS, PIPE & FLANGES.
 - 100% RADIOGRAPHY (RT) OF HEAD TO SHELL WELD SEAMS AND ALL BUTT WELDS REQUIRED.
 - 100% DYE PENETRANT TEST (PT) ALL OTHER WELDS.

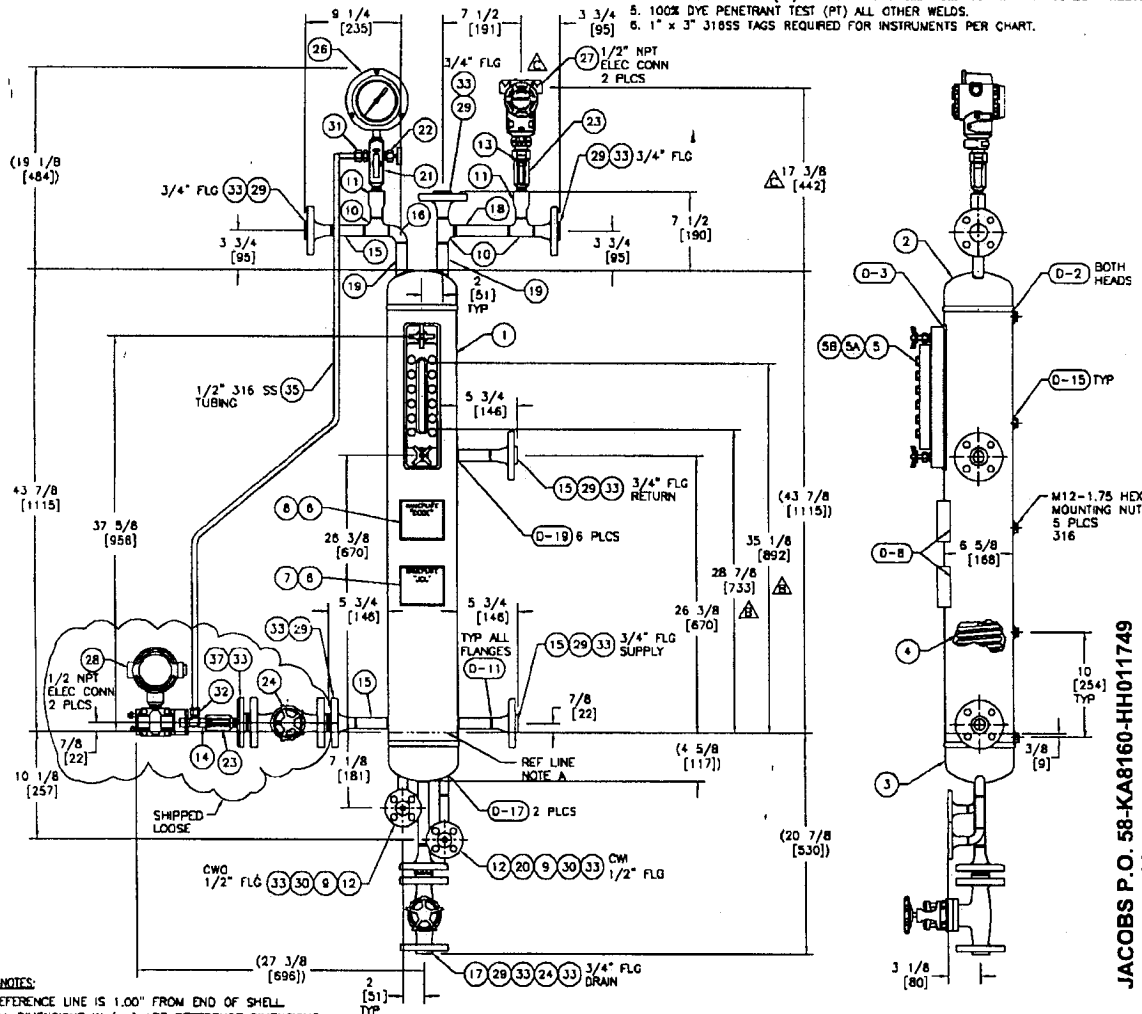


John Crane Lemco Seal Support Systems 2531 East Apache Street Tulsa, Oklahoma 74110 Telephone: 918 835 7325 Facsimile: 918 835 5823	DATE BY 28 SEPT 2006 DATE BY 28 SEPT 2006 DATE BY 28 SEPT 2006 DATE BY 28 SEPT 2006	RE-1518 5 GAL RES ASSY PRIMARY RESERVOIR LAWRENCE PUMPS CUST P.O. NO: 783607 JCL JOB NO: 37751 DRAWING NO: LC53-37751-001
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JACOBS P.O. 58-KA8160-HH011749
ITEM #67-5295
RL3 REACTOR CIRCULATION PUMP
SAP # 10547852

INSTRUMENT TAG NUMBER CHART	
PRESSURE GAUGE	52051
PRESSURE TRANSMITTER	8529
LEVEL TRANSMITTER	5494
LEVEL GAUGE	55495

- NOTES: 1. PRESSURE RELIEF DEVICES ARE NOT PROVIDED BY THE MANUFACTURER (SEE THE ASME CODE SECTION VIII, DIVISION 1, PARAGRAPH UG-103 FOR USER RESPONSIBILITIES).
2. THE RESERVOIR SHELL, HEADS & ALL COMPONENTS LOADED TO THE SHELL AND HEADS ARE PER ASME CODE SECTION VIII, DIVISION 1. WELDERS ARE NON-CODE.
3. WIT'S REQUIRED ON THE VESSEL (SHELL, HEADS AND ALL PRESSURE PARTS WELDED TO THE SHELL & HEADS), FITTINGS, PIPE & FLANGES.
4. 100% RADIOGRAPHY (RT) OF HEAD TO SHELL WELD SEAMS AND ALL BUTT WELDS REQUIRED.
5. 100% DYE PENETRANT TEST (PT) ALL OTHER WELDS.
6. 1" x 3" 316SS TAGS REQUIRED FOR INSTRUMENTS PER CHART.



SHOP NOTES:

- A. REFERENCE LINE IS 1.00" FROM END OF SHELL.
B. ALL DIMENSIONS IN () ARE REFERENCE DIMENSIONS.
C. ALL DIMENSIONS ARE IN INCHES.
D. ALL DIMENSIONS IN [] ARE IN MILLIMETERS.
E. DRILL HOLES IN SHELL PER LES-2002 UNLESS OTHERWISE NOTED.
F. FLANGE FINISH PER ASME B16.5-1996 PARA 8.4.4. (125 TO 250 MICRO-INCH AVERAGE ROUGHNESS)
G. FLANGE BOLT PATTERN TO STRADDLE NORMAL CENTER LINE. STUDS, NUTS & GASKETS PER LES-2012-150 & 800.

ASSEMBLY TOLERANCES (UNLESS OTHERWISE NOTED)

GENERAL VESSEL ± 1/4"
PIPING STRING ± 1/2"
REF. DIMS. ± 1/2"
ANGULAR ± 2 DEG

REV	DESCRIPTION	DATE
1	REVISED ITEM 27 PART NUMBER AND DESCRIPTION.	LJE 05 DEC 2006
2	REVISED WELD PROCEDURES & ADDED DIMENSIONS	DRJ 20 OCT 2006
3	REVISED TAG NUMBER CHART PER CUSTOMER REQUEST.	LJE 05 OCT 2006

BILL OF MATERIALS

ITEM	QTY	DESCRIPTION	PART NO.	MATERIAL	HEAT NO.
1	1	SHELL: 6" SCH 80 x 41 1/4" LG SMLS	WPI-857	SA-312 316/L	
2	1	TOP HEAD: 6" FOR SCH 80	L30-32705-003	SA-403 316/L	
3	1	BOTTOM HEAD: 6" FOR SCH 80	L30-32705-001	SA-403 316/L WP-S	
4	1	COIL: 1/2" OD x .063" WALL x 20' LG ERW	L31-4856-20W	SA-249 316/L	
5	1	LEVEL GAUGE: LEMCO B-4 WP W/ISO VALVES	LU-14X7-113	SA-479 316/L WT'D	
5A	1	LEVEL GAUGE: WELD PAD COVER		SA-479 316/L	
5B	AR	WELD PAD GASKET: KLINGER C-4401			
6	2	BRACKET: NAMEPLATE	L33-0008-004	SA-240 316	
7	1	JCL NAME PLATE:	L35-0004-005	304 SS	
8	1	JCL NAMEPLATE: CODE	L35-0004-101	304 SS	
9	2	ELBOW: 1/2" BW SCH 80	L10-48E7-NW1	SA-403 316/L	
10	3	TEE: 3/4" BW SCH 160	L10-80T7-NW1	SA-403 316/L	
11	2	TRANS FITG: 3/4" BW x 1/2" FNPT SPECIAL	L10-88N7-NW3	SA-479 316/L	
12	1	TUBE x 1/2" BW PIPE COUPLING x 2 1/2" LG	L13-32705-001	SA-312 316/L	
13	1	PIPE: 1/2" NPT x 1" LG SCH 160	L13-48N7-104	SA-312 316/L	
14	1	PIPE: 1/2" NPT x 3" LG SCH 160	L13-48N7-304	SA-312 316/L	
15	4	PIPE: 3/4" BW x 3" LG SCH 160	L13-68B7-304	SA-312 316/L	
16	1	ELBOW: 3/4" BW SCH 160	L10-80E7-NW1	SA-403 316/L	
17	1	PIPE: 3/4" BW x 5 7/8" LG SCH 160	WPI-8057	SA-312 316/L	
18	1	PIPE: 3/4" BW x 5" LG SCH 160	L13-68B7-504	SA-312 316/L	
19	2	PIPE: 3/4" BW x 4" LG SCH 160 (TO TRIM)	L13-68B7-504	SA-312 316/L	
20	1	PIPE: 1/2" BW x 3" LG SCH 80	L13-48B7-303	SA-312 316/L	
21	1	BLOCK VALVE: 1/2" NPT MULTI PORT	LW-48N6-001	316 SS	
22	1	BLEED VALVE: 1/2" NPT	LW-48B6-001	316 SS	
23	2	BLOCK/BLEED VALVE: 1/2" NPT SINGLE PORT	LW-45P6-001	316 SS	
24	2	GATE VALVE: 3/4" FLG CLASS 800	LW6-6FT7-F02	316L SS	
25		DELETED			
26	1	PRESSURE GAUGE: 4 1/2" DIAL 0-1500 PSI	LPI-1K56-301	316 WT'D	
27	1	PRESSURE TRANSMITTER: ROSEMOUNT MODEL	LPT-37751-001	316 WT'D	
27A		3051TQ3A2821BB4ESM5			
28	1	LEVEL TRANSMITTER: HONEYWELL	LDT-32705-001	316 WT'D	
28A		MODEL NO. STD924-ETH-00000-S2SMTC1C			
29	7	FLANGE: 3/4" RFWN CLASS 600 SCH 160	L14-6607-WN2	SA-182 F316/L	
30	2	FLANGE: 1/2" RFWN CLASS 150 SCH 80	L14-6157-WN1	SA-182 F316/L	
31	1	TUBE FITTING: 1/2" MNPT x 1/2" TUBE	L17-MC46-404	316 SS	
32	1	TUBING ELBOW: 1/2" MNPT x 1/2" TUBE	L17-ME46-404	316 SS	
33	AR	SPIRAL WOUND TYPE 316/L W/GRAPHITE FILLER			
34		DELETED			
35	AR	TUBING: 1/2" OD x .065" WALL ERW	MTU-4657	SA-269 316	
36		DELETED			
37	1	BUND FLG: 3/4" 600# W/1/2" NPT IN CTR	L14-6607-BL1	SA-182 316/L	

John Crane Lemco
REAL ORIGIN: 7118 USA

58.8 BARG = 150 °C
MAXIMUM ALLOWABLE WORKING PRESSURE
-50 °C = 86.9 BARG
MINIMUM DESIGN METAL TEMPERATURE
37751-2
MFG. S.N. 37751-002
YEAR BUILT 2008

John Crane Lemco
Certified by
RT-1 MAWP: 1000 PSI = 302 °F
MDMT: -58 °F = 1000 PSI
MFG. S.N. 37751-2
YEAR BUILT 2008

MATERIAL CERTIFIED CORRECT BY
(WELDER)
HYDRO TEST 1502 PSI AT 50° TO 80°F
RADIOGRAPHY EXAM: _____
POST WELD HEAT TREAT: NONE
CORROSION ALLOWANCE: NONE
BUILT IN ACCORDANCE WITH THE ASME CODE SECTION VIII DIVISION 1
2004 (YEAR)
2005 (ADDENDA (DATE))
CERTIFIED AS BUILT:
(D.A. MGR.)

W-105B BW PIPE & FITTINGS	W-105X & W-11EX PIPE ON SHELL	W-11EX MITG NUTS	W-11EX COIL PIPE	W-105B RFWN FLGS	W-105X NMPL BRKTS	W-11EX WELD PAD	W-105X & W-11EX HEADS
D-2	D-19	D-15	D-17	D-11	D-8	D-3	D-2

JACOBS P.O. 58-KA8160-HH011749
ITEM #67-5295
RL3 REACTOR CIRCULATION PUMP
SAP # 10547852



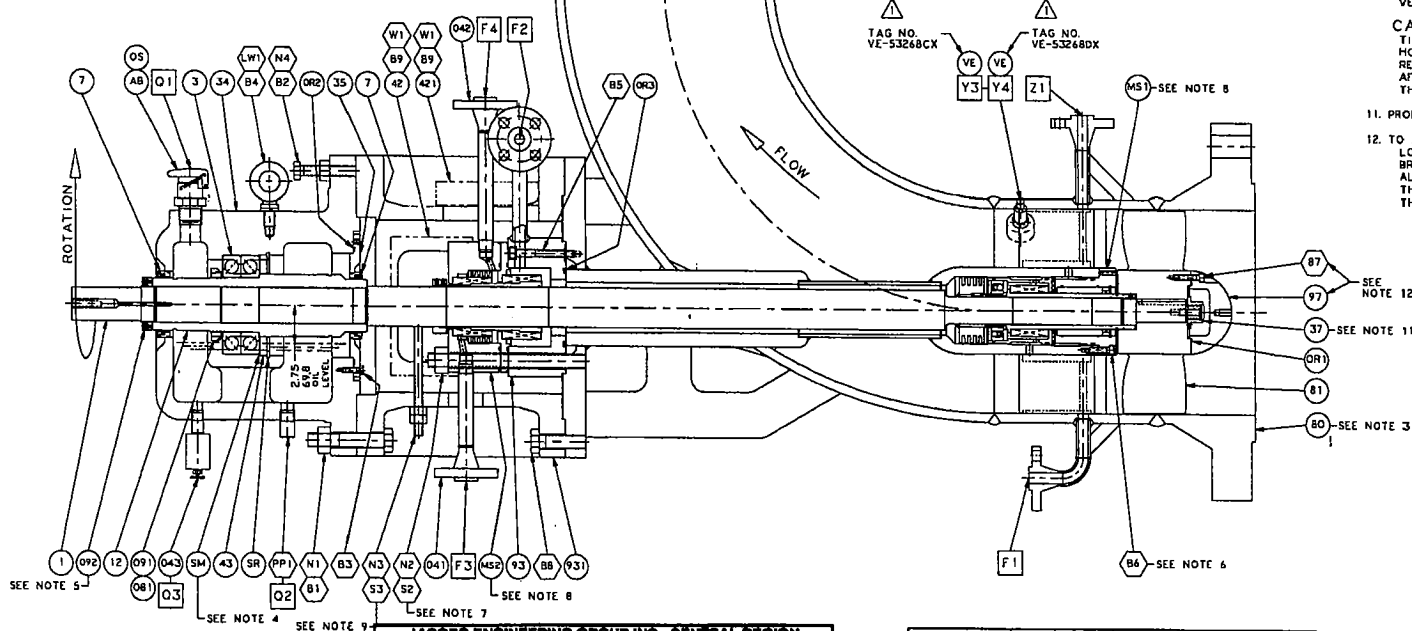
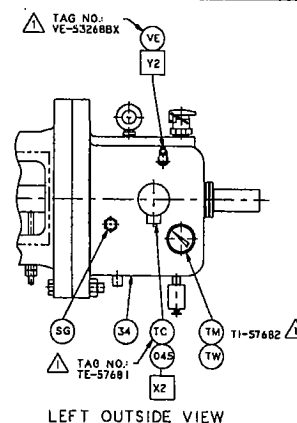
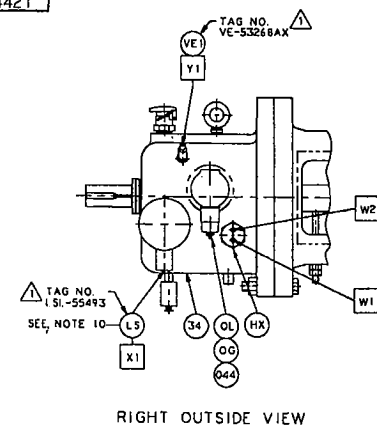
John Crane Lemco

2931 East Apache Street
Tulsa, Oklahoma 74110
Telephone: 918 835 7325
Facsimile: 918 835 5823

RE-1518 5 GAL RES ASSY SECONDARY RESERVOIR
LAWRENCE PUMPS
CUST P.O. NO.: 763607
JCL JOB NO.: 37751
LC53-37751-002

JACOBS ENGINEERING GROUP INC - CENTRAL REGION
PROJECT NO. 58-KA8160
P.O. NO. HH-011749
DATE 12/21/06
ITEM NO. 67-5295
SUSPENSE DATE
D.B. COMMENTS: REVISE, RESUBMIT.
PROCEED WITH FABRICATION
D.C. UNACCEPTABLE - DO NOT PROCEED WITH FABRICATION
D.R. FOR INFORMATION ONLY
Review of this drawing by Jacobs Engineering Group does not relieve the supplier of his responsibility to supply the materials in accordance with the procurement documents.

M 64421



NOTES:

- FOR LIST OF PARTS SEE "PUMP PARTS LIST" PL64421
- FOR LIST OF CONNECTIONS SEE DIMENSIONAL OUTLINE (O.A.) DRAWING NO. M64420-SHEET 4
- ALL INTERNAL CASING WELDS TO BE GROUND FLUSH TO BASE METAL. THE ENTIRE INTERNAL SURFACE OF THE CASING TO BE GROUND SMOOTH TO A ROUGHNESS NOT EXCEEDING 63 RMS (1.6 μ m).
- PEEL LAMINATED SHIM (P/NMS1) AS REQUIRED TO OBTAIN 0.005 TO 0.008 INCH (0.13 TO 0.20 mm) SHAFT END PLAY. VERIFY END PLAY AFTER SHIM THICKNESS IS FINALIZED AND ASSEMBLED.
- TIGHTENING TORQUE FOR SLEEVE LOCKNUT (P/N092) SCREWS IS 35 INCH-LBS (4 N-M).
- TIGHTENING TORQUE FOR INBOARD PRIMARY SEAL (P/NMS1) BOLTING (F/NB6) IS 12 FT-LBS (16 N-M).
- TIGHTENING TORQUE FOR OUTBOARD PRIMARY SEAL (P/NMS2) BOLTING (F/NM2) IS 150 FT-LBS (203 N-M).
- SEATING TORQUE FOR INBOARD SEAL (P/NMS1) & OUTBOARD SEAL (P/NMS2) DRIVE COLLAR SETSCREWS IS 165 INCH-LBS (19 N-M).
- REMOVE SHAFT SUPPORTS (F/N53) PRIOR TO STARTING PUMP. STUDS (F/N53) ARE USED ONLY FOR ASSISTING IN DISASSEMBLY.
- OIL LEVEL SWITCH (P/NLS) TO BE INSTALLED WITH THE TWIN TIPS OF THE SENSOR PROBE IN A HORIZONTAL PLANE. IN THIS POSITION THE FLOW ARROWS ON ONE OF THE FLATS OF THE SENSOR PROBE WILL BE IN A VERTICAL PLANE.

CAUTION: DO NOT USE THE INSTRUMENT HEAD TO TIGHTEN THE SWITCH INTO THE THRUST BEARING HOUSING. ROTATION OF THE INSTRUMENT HEAD WITH RESPECT TO THE SENSOR PROBE CAN ONLY BE DONE AFTER REMOVING THE SENSOR PROBE WIRING FROM THE INSTRUMENT HEAD.

- PROPELLER NUT (P/N37) IS LEFT HAND THREADED.
- TO REMOVE PROPELLER CAP (P/N97), FIRST PARTIALLY LOOSEN ALL CAP BOLTS (F/NB7) APPROX 2-3 TURNS. BREAK CAP O-RING SEAL AWAY FROM PROPELLER HUB TO ALLOW THE SAFE RELEASE OF ANY RESIDUAL PRESSURE THAT MAY BE TRAPPED INSIDE THE PROPELLER HUB. THEN COMPLETELY REMOVE BOLTS & CAP.

JACOBS P.O. 58-KA8160-HH011749
ITEM #67-5295
RL3 REACTOR CIRCULATION PUMP
SAP # 10547852

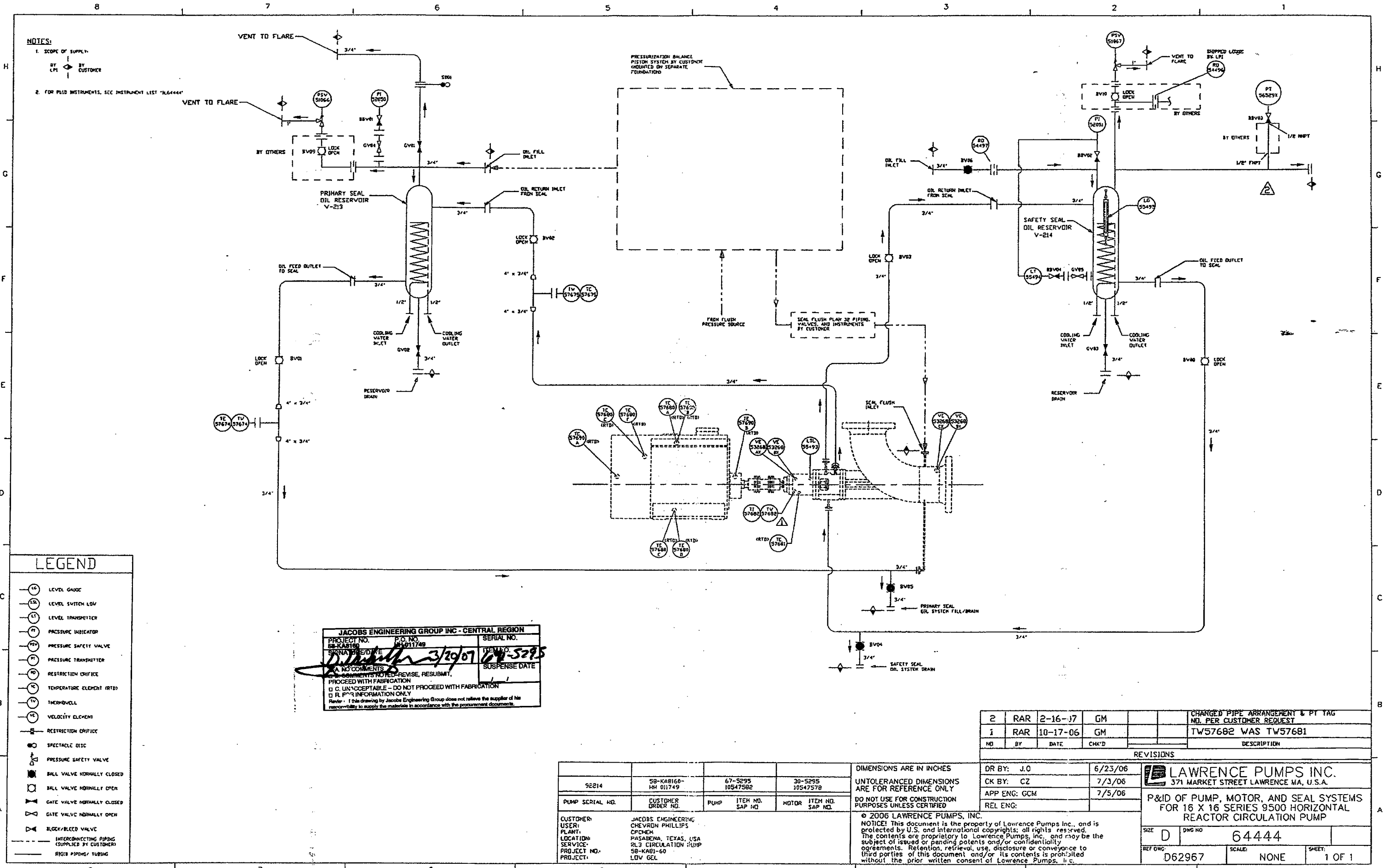
LEGEND	
○	PUMP PART
○	FASTENER
□	CONNECTION

JACOBS ENGINEERING GROUP INC - CENTRAL REGION			
PROJECT NO. 58-KA8160	P.O. NO. HH-011749	SERIAL NO.	
DATE 12/21/06	ITEM NO. 67-5295	SUSPENSE DATE	
NO COMMENTS IF COMMENTS NOTED-REVISE, RESUBMIT, PROCEED WITH FABRICATION ☐ C. UNACCEPTABLE - DO NOT PROCEED WITH FABRICATION ☐ R. FOR INFORMATION ONLY Review of this drawing by Jacobs Engineering Group does not relieve the supplier of his responsibility to supply the materials in accordance with the procurement documents.			

PUMP SERIAL NO. 92214	CUSTOMER ORDER NO. 58-KA8160-HH011749	PUMP ITEM NO. 67-5295	MOTOR ITEM NO. 30-5295
CUSTOMER: JACOBS ENGINEERING USER: CHEVRON PHILLIPS PLANT: PASADENA, TEXAS, USA SERVICE: RL3 CIRCULATION PUMP PROJECT NO.: 58-KA81-60 PROJECT: LOW GEL			

DIMENSIONS ARE IN INCHES
UNLESS OTHERWISE SPECIFIED
DO NOT USE FOR CONSTRUCTION
PUMPERS UNLESS CERTIFIED

1. RAR	TOTY	GM	ADDED TAG NO. IDENTIFIERS
NO. BY	DATE	CHKD	DESCRIPTION
REVISES			
CROSS SECTION OF 16 x 16 SERIES 9500 HORIZONTAL REACTOR CIRCULATION PUMP			
OWN: C2	CHD: K1	6-16	
DATE: 6-16-06	END: GCM		
SCAD: NONE			
SAP DATABASE		DRAWING NUMBER	
SAP FILE NO. M62130		DWT ASSY	
M 64421		1 of 1	



NOTES:
1. SCOPE OF SUPPLY:
BY LPI BY CUSTOMER
2. FOR P&ID INSTRUMENTS, SEE INSTRUMENT LIST "K64444"

LEGEND

- LEVEL GAUGE
- LEVEL SWITCH LOW
- LEVEL TRANSMITTER
- PRESSURE INDICATOR
- PRESSURE SAFETY VALVE
- PRESSURE TRANSMITTER
- RESTRICTION ORIFICE
- TEMPERATURE ELEMENT (RTD)
- THERMOWELL
- VELOCITY ELEMENT
- RESTRICTION ORIFICE
- SPECTACLE DISC
- PRESSURE SAFETY VALVE
- BALL VALVE NORMALLY CLOSED
- BALL VALVE NORMALLY OPEN
- GATE VALVE NORMALLY CLOSED
- GATE VALVE NORMALLY OPEN
- BLOCK/BLEED VALVE
- INTERCONNECTING PIPING (SUPPLIED BY CUSTOMER)
- RIGID PIPING/TUBING

JACOBS ENGINEERING GROUP INC - CENTRAL REGION		
PROJECT NO.	P.O. NO.	SERIAL NO.
58-KAB160	1011749	
SIGNATURE/DATE	DATE	ITEM NO.
<i>[Signature]</i>	3/29/07	67-5295
NO COMMENTS		SUSPENSE DATE
IF NO COMMENTS NOTED, REVISE, RESUBMIT, PROCEED WITH FABRICATION		
IF C. UNACCEPTABLE - DO NOT PROCEED WITH FABRICATION		
IF R. R. INFORMATION ONLY		
I, the undersigned, do hereby certify that the above information is true and correct to the best of my knowledge and belief, and that I am not aware of any circumstances which might render this information misleading or incomplete.		

92214	58-KAB160-HH 011749	67-5295 10547582	30-5295 10547578
PUMP SERIAL NO.	CUSTOMER ORDER NO.	PUMP ITEM NO. SAP NO.	MOTOR ITEM NO. SAP NO.
CUSTOMER USER: JACOBS ENGINEERING	PLANT: CHEVRON PHILLIPS	LOCATION: PASADENA, TEXAS, USA	SERVICE: RLS CIRCULATION PUMP
PROJECT NO.: 58-KAB160	PROJECT: LOW GEL		

DIMENSIONS ARE IN INCHES
UNTOLERANCED DIMENSIONS ARE FOR REFERENCE ONLY
DO NOT USE FOR CONSTRUCTION PURPOSES UNLESS CERTIFIED

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2	RAR	2-16-17	GM		CHANGED PIPE ARRANGEMENT & PT TAG NO. PER CUSTOMER REQUEST
1	RAR	10-17-06	GM		TW57682 WAS TW57681
NO	BY	DATE	CHK'D		DESCRIPTION
REVISIONS					
DR BY:	J.O	6/23/06			
CK BY:	CZ	7/3/06			
APP ENG:	GCM	7/5/06			
REL ENG:					
LAWRENCE PUMPS INC. 371 MARKET STREET LAWRENCE MA, U.S.A.					
P&ID OF PUMP, MOTOR, AND SEAL SYSTEMS FOR 16 X 16 SERIES 9500 HORIZONTAL REACTOR CIRCULATION PUMP					
SIZE	D	DWG NO	64444		
REF DWG	D62967	SCALE	NONE	SHEET	1 OF 1