DEPARTMENT OF PUBLIC UTILITIES
NICHOLAS C. GORNICK
PHONE: 815/724-3675
ngornick@joliet.gov

CITY OF JOLIET, IL

May 9, 2023

Well 10D Rehabilitation-2023
CONTRACT NO. 2723-0623

ADDENDUM NO. 1

TO: PROSPECTIVE BIDDERS

THE ATTENTION OF ALL PROSPECTIVE BIDDERS ON THE ABOVE REFERENCED PROJECT IS CALLED TO THE FOLLOWING LISTED MODIFICATION IN THE CONTRACT DOCUMENTS:

PROSPECTIVE BIDDERS SHALL ACKNOWLEDGE RECEIPT OF THE APPROPRIATE ADDENDUM NUMBER(S) BY STATING THIS ON THE OUTSIDE OF THE SEALED ENVELOPE CONTAINING THE BID PROPOSAL FOR THE ABOVE MENTIONED CONTRACT. FURTHER, BID PROPOSALS SHALL NOT BE OPENED WITHOUT ACKNOWLEDGEMENT OF RECEIPT OF ALL ADDENDUMS FOR THE GIVEN CONTRACT.

Be Aware: The Sealed Bids for this Project are due at the Office of the City Clerk for the City of Joliet [150 West Jefferson Street, Joliet, IL 60432-4156] no later than **10:00 am on Thursday May 11, 2023**, at which time they will be opened publicly and read aloud.

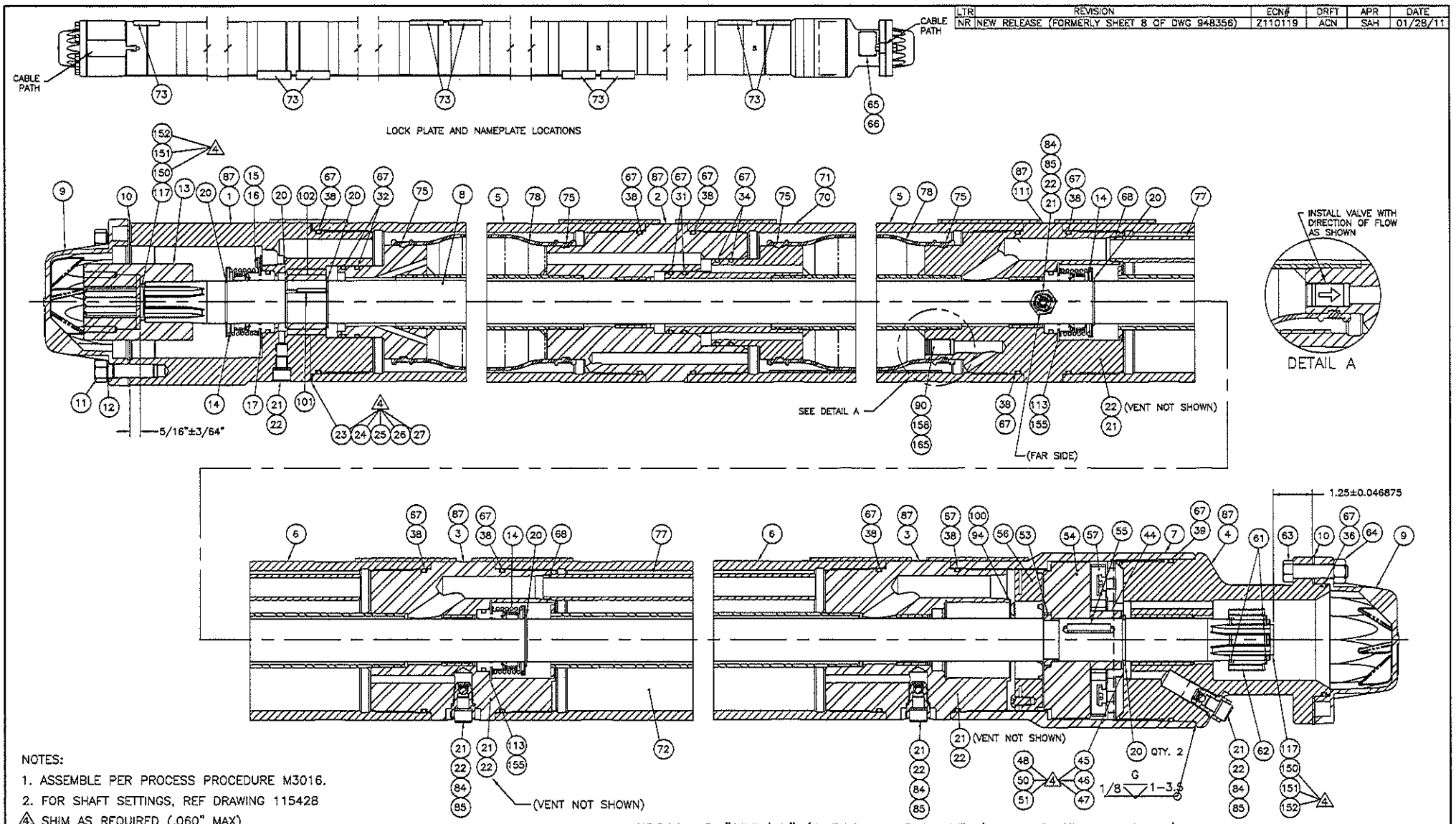
CHANGE #1 of 1:

Attachments

A. Proposed Baker Hughes Seal Specification
B. Proposed Baker Hughes Motor Data Sheet

PROSPECTIVE BIDDERS SHALL ACKNOWLEDGE RECEIPT OF THE APPROPRIATE ADDENDUM NUMBER(S) BY STATING THIS ON THE OUTSIDE OF THE SEALED ENVELOPE CONTAINING THE BID PROPOSAL FOR THE ABOVE MENTIONED CONTRACT. FURTHER, BID PROPOSALS SHALL NOT BE OPENED WITHOUT ACKNOWLEDGEMENT OF RECEIPT OF ALL ADDENDUMS FOR THE GIVEN CONTRACT.

LTR	REVISION	ECN#	DRFT	APR	DATE
NR	NEW RELEASE (FORMERLY SHEET 8 OF DWG 548356)	Z110119	ACN	SAH	01/28/11



NOTES:

1. ASSEMBLE PER PROCESS PROCEDURE M3016.
2. FOR SHAFT SETTINGS, REF DRAWING 115428
3. ⚠ SHIM AS REQUIRED (.060" MAX)

TR562-AR "2BP/2L" (2 BAGS IN PARALLEL/2 LABYRINTH CHAMBERS)

CONFIDENTIAL DRAWING

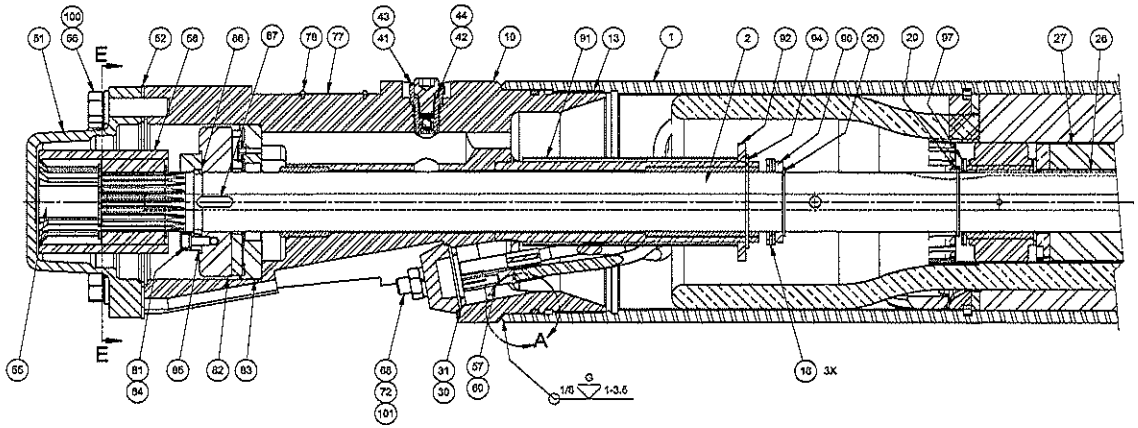
Wood Group ESP, Inc
OKLAHOMA CITY, OK.

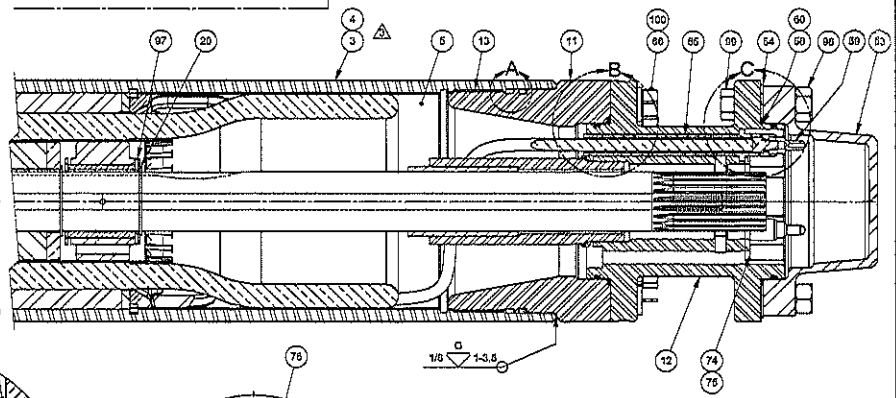
UNLESS OTHERWISE SPECIFIED:
DO NOT SCALE DRAWING FOR DIMENSIONS
PRIMARY DIMENSIONS ARE IN INCHES
DIMENSIONS IN BRACKETS [ ] ARE IN MILLIMETERS (in x 25.4 = mm)
DIMENSIONS ARE PER ASME Y 14.5M
REMOVE ALL BURRS.
BREAK SHARP EDGES MAX. 1/64
MACHINE SURFACE

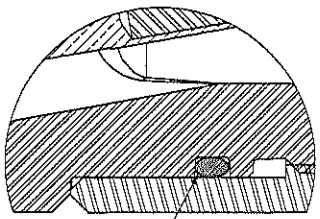
TOLERANCE NOT SHOWN:
FRACTIONAL ± 1/64
DECIMAL .X ± .03
.XX ± .015
.XXX ± .005
ANGULAR ± 1/2°
CONCENTRIC Ø .010 DIA TO DIA

TITLE	SEAL,TR562
MATERIAL	SEE PARTS LIST
DRAWING NO.	548301
REV	NR
PART NO.	SEE SYMIX
SHT	1 OF 1
DRAWN BY	ACN
DATE	01/27/11
CHECKED BY	JPA
DATE	01/28/11
PROD. ENGR.	SAH
DATE	01/28/11

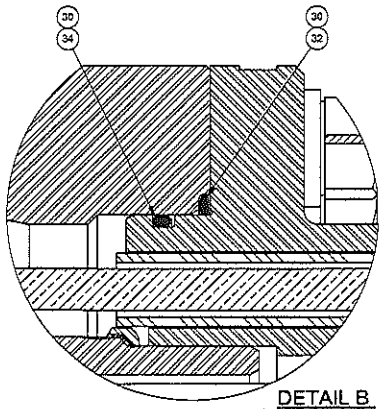
LTR	REVISION	ECN NO.	DRFT	APR	DATE
B	ADDED NOTE 3.	E02450	JSW	EJF	12/02/13



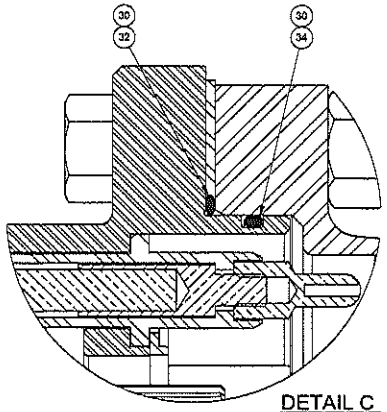




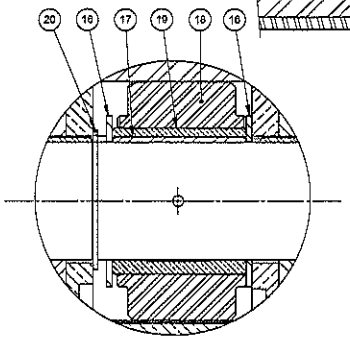
DETAIL A
2 PLACES



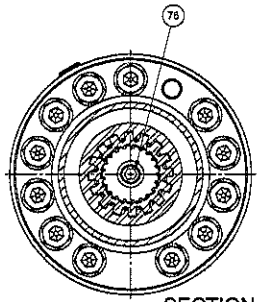
DETAIL B
SCALE: 2.5 : 1



DETAIL C
SCALE: 2.5 : 1



DETAIL D
TYP ALL BEARINGS



SECTION E-E
SCALE: 1 : 1.4

NOTES:

1. FOR ASSEMBLY REF WORK INSTRUCTION M1006.
2. FOR SHAFT SETTINGS REF DRAWING 115428.

(B) (3) ITEMS 3 & 4, PAINT AND THINNER, ARE NOT REQUIRED FOR ALL REGIONS AND CAN BE DELETED AT THE REQUEST OF CUSTOMER SERVICE.

UNLESS OTHERWISE SPECIFIED:
PRIMARY DIMENSIONS ARE IN INCHES
SECONDARY DIMENSIONS ARE IN MM
INTERPRET DIMENSIONS PER ASME Y 14.5M-1994
REMOVE ALL BURRS
BREAK SHARP EDGES, MAX 1/64" [.4]
MACHINE SURFACES Ra 125 µ IN

INSPECTION DIMENSIONS:
★ SYMBOLS REPRESENT THE REQUIRED INSPECTION OF BOTH SIZE/LOCATION DIMENSIONS AND ASSOCIATED TOLERANCES INCLUDING GD&T.

TOLERANCE NOT SHOWN:
FRACTIONAL ± 1/32" [.8]
DECIMAL .X ± .03 [.8]
.XX ± .010 [.25]
.XXX ± .005 [.13]
ANGULAR ± 1/2°
CONCENTRICITY .010 [.25]

TITLE	MOTOR,E56-12 HDY UT		GE Oil & Gas
MATERIAL	SEE BOM		
DRAWN BY: AON	CHECKED BY: JPA	ENGR APPVL: JPD	THIRD ANGLE PROJECTION
DATE: 02/14/13	DATE: 03/14/13	DATE: 03/14/13	DRAWING No. 153628 SIZE D
			SHEET 1 OF 1 SCALE: 1:12 REV B
			DO NOT SCALE

675 Series Seal

Centrilift

HS Seal Model

6.75 Inch O.D.

Materials of Construction

Item Number	Description	Common Name	ASTM No.
S1	Head	HR Steel 1040	A576
S3	Housing	1025/1030EW - DOM TUBE	A513 - 84A
S6	Shaft	Steel Alloy	A479, XM19
S7	Base	HR Steel 1040	A576
S9	Coupling	Nickel Chromium Steel	582, TYPE 303
S11	Mechanical Seal	Crane Type 2	
S12	Seal Bag	HSN	
S13	Guide	HR Steel 1040	A576
S14	Shaft Bushing	Copper Base Alloy	B505
S15	Thrust Runner	Cast Iron	A48, NO. 40C
S16	Thrust Shoes	Copper Base Alloy	B505

Features

Flexible Shoe Thrust Bearing
Silicone Carbide on Silicone Carbide Mechanical Seal Face Material
1145 Max Shaft Brake HP @ 60 Hz Standard
Corrosion Resistant Fasteners
Elastomer Type Offers Permanent Barrier with Well Fluid Stainless Steel Check Valves on Elastomer Type

Configurations Available

Model	Description	Length		Weight	
		Ft.	M.	Lbs.	Kg.
HSB3	Elastomer Type, 3 Chamber, Carbon Steel	6.80	2.07	477	216
HSC3	Labyrinth Type, 3 Chamber, Carbon Steel	6.80	2.07	477	216
HST3	Tandem, Elastomer Type, 6 Chamber, Carbon Steel	13.60	4.15	957	434
HSCT3	Tandem, Labyrinth Type, 6 Chamber, Carbon Steel	13.60	4.15	957	434

Motor to Seal Adapter Kits

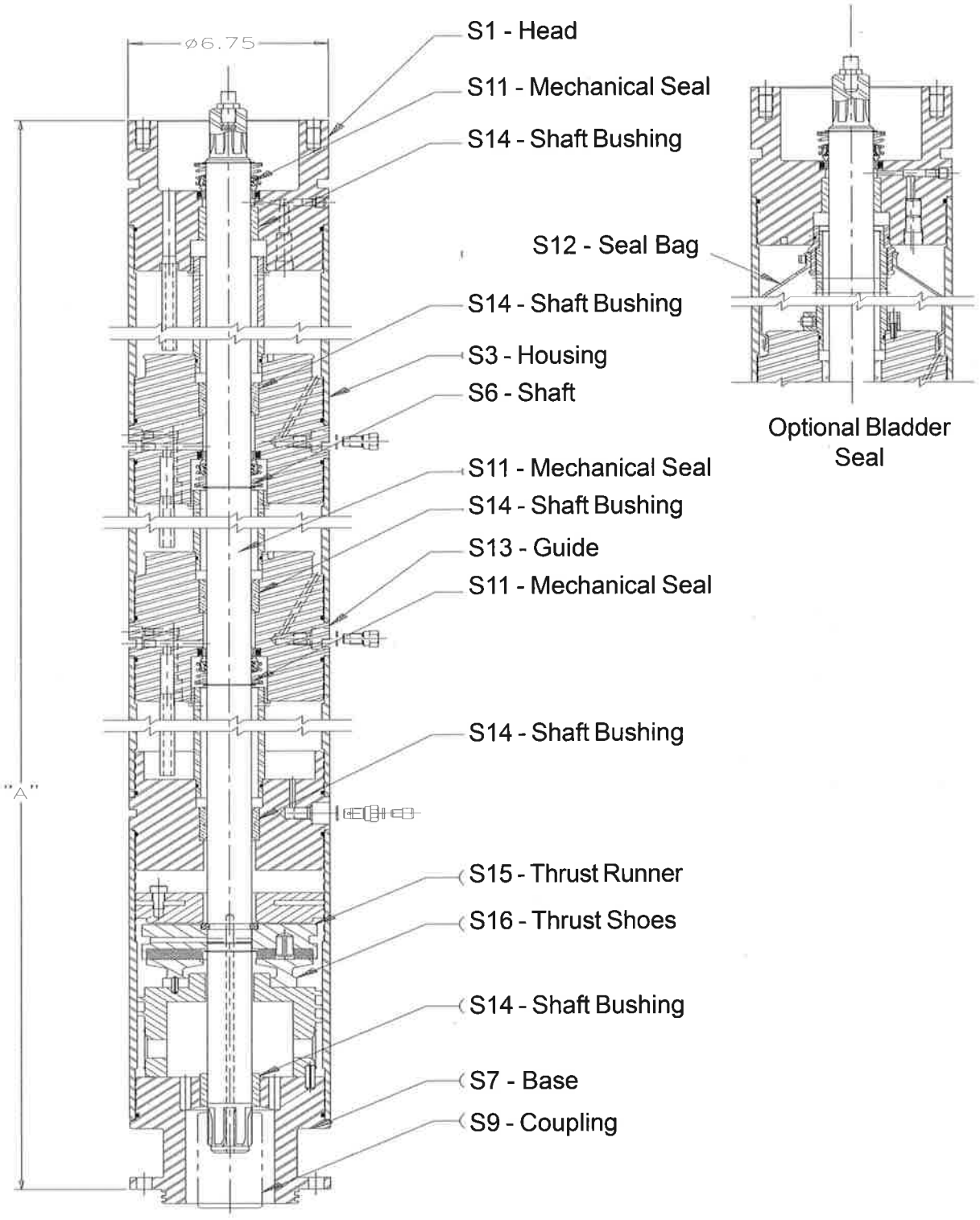
Model	Description	Length		Weight	
		Ft.	M.	Lbs.	Kg.
HS/GM	675 Seal-544 Motor, Standard Fasteners	0.46	0.14	36	16
HS/GMX	675 Seal-544 Motor, Corrosion Resistant Material	0.46	0.14	36	16
HS/KM	675 Seal-562 Motor, Standard Fastener	0.46	0.14	36	16
HS/KMX	675 Seal-562 Motor, Corrosion Resistant Material	0.46	0.14	36	16

Optional Features

Description
Corrosion Resistant Housing, Guides, Head and Base[1]
High Temperature Design Seal Sections
Corrosion Resistant Coating[1]
Various Thrust Bearings
High Strength Shaft - 1500 HP @ 60 Hz
Base to Adapt to 562 Motor
NSF Approved Coating & Motor Oil

Note:
1. Corrosion resistant refers to the use of 9 chrome 1 moly housing or monel flame spray coating.
2. For alternate materials, contact your Centrilift Water Systems Sales Representative.
3. Materials of Construction subject to change without notice.

Outline Drawing



725 Motor

725 motors meet the increasing demand for high horsepower, high production ESP systems with long runlife. While 725 motor technology delivers more horsepower at higher temperatures, the superior runlife engineered into the Centrilift 562 motor lives on in the 725.



450 562 725

The 725 motor outruns other conventional motors

Robust design and manufacture push the production envelope, allowing operators to produce far deeper wells with much higher flow rates. The 725 motor delivers a range of 450–1,600 hp.

Applications

The powerful 725 motor is designed for high production applications in demanding downhole environments. It is proven in oilfield applications as well as water management and geothermal renewable wells.

Oil Production

- Deep, long reach, high production wells onshore and offshore

Water Production

- Municipalities
- Process water supply
- Mine dewatering
- Irrigation

Geothermal

- Power generation
- Water injection

State-of-the-Art Features

Patented technology in the 725 motor delivers increased reliability and improved run times, even in harsh, high temperature environments. Every component was designed and tested by Centrilift engineers who create the widest range of ESP motors in the industry.

Involute Spline Design

This unique shaft feature increases horsepower transmission torque rating while the self-centering design reduces vibration. It also makes the shaft compatible with existing ESP equipment.

Compensating Spring

Patented 725 compensating springs hold the rotor stack in place during shipment and start-up. They also allow the rotor stack to move in response to thermal growth, which improves system reliability.

Epoxy Encapsulation

All Centrilift motors are epoxy encapsulated, a cutting edge technology that increases mechanical stability for the windings and eliminates wire movement and insulation failure. Epoxy also creates a barrier against contaminants. The rapid heat transfer of epoxy encapsulation is superior to varnish-insulation for dissipating heat from motor windings, allowing motors to run cooler and dramatically improves their performance in high temperature environments.

Enhanced Winding Insulation

All 725 motors are wound with magnet wire completely encased in Kapton®.

Advanced Technology Rotor Bearings

Patented Centrilift rotor bearings improve axial stability and eliminate bearing spin during thermal expansion and contraction. This innovation increases reliability and run times during temperature cycling.

Steel Laminations

High grade steel laminations produce approximately 18% less stator core loss than standard electrical steels.

Magnum Plug-in Motor Lead Extensions

Plug-in power cable connections to the motor improve reliability. Performance is assured through rigorous factory testing and "clean room" manufacturing techniques.

Grounding Brush

This patented protection extends bearing life by discharging stray currents.



Cover photo courtesy of Derek McKay, www.offshorepictures.com

Extended Runlife

The 725 motor is designed and built for high volume production, reliable performance and maximum runlife. [illegible] motor is assembled in a [illegible]cated building at Centrilift headquarters under the strict supervision of electrical engineers and the Quality Assurance Team. When a motor is created, it receives a birth certificate that tracks components and manufacturing history.

Every 725 motor is rigorously tested on an automated horizontal test bench. Here, motor oil is circulated through absolute filters capable of removing particles as small as one micron. The computer enhanced analysis and filtration processes help detect potential problems and increase system runlife.

Specifications/Ratings

Application: 9⅝ in. or larger casings

Horsepower Ranges: 450–2000 hp

Voltage: 480-4500 V

Frequency: 50/60 Hz

[illegible]om Hole Temperature: Up to [illegible] F

Case Histories

Oil Production

Norsk Hydro Brage A24 was the first Norwegian North Sea field to use large volume ESPs to produce aquifer water for re-injection. The injected water provides pressure support for the Statfjord and Fensfjord reservoirs which were previously produced using traditional sea water injection systems. Aquifer water avoids scale precipitation problems that commonly plague sea water injection. When Norsk Hydro made the decision to switch to aquifer re-injection, it needed a way to produce the huge volumes of water required. Norsk Hydro chose a Baker Hughes solution featuring a Centrilift ESP system with a 725 1,150 hp motor. The ESP ran for almost four years until it was changed out during a maintenance program. By that time, it had produced more than 13 billion liters of water. Norsk Hydro now has eight wells with 725 motors in a range of 800 to 1,150 hp producing a total of 6,000,000 B/D. The result was significantly reduced OPEX charges as a result of scale and extended run time.

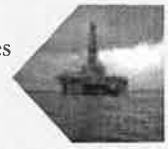
Mine Dewatering

The Cortez Gold Mine near Elko Nevada needed a reliable, high-horsepower ESP to exceed their current well setting depth of 1,200 ft. The existing line shaft equipment presented two problems:

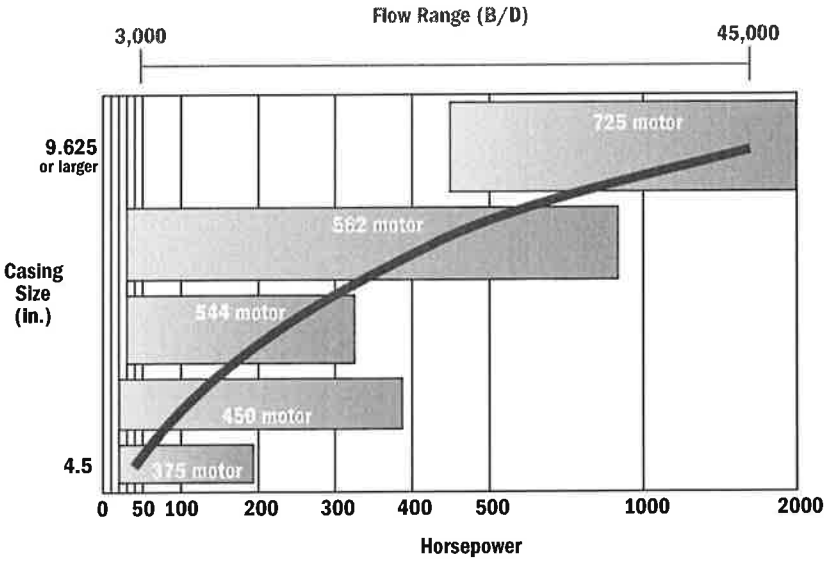
1) the surface driven pumps had short run times because the weight of the line shaft (driveline) exceeded available thrust ratings for the motor bearings;

2) other, high horsepower submersible pumps would require 24 in. casing — the wells currently had casings of only 20 in.

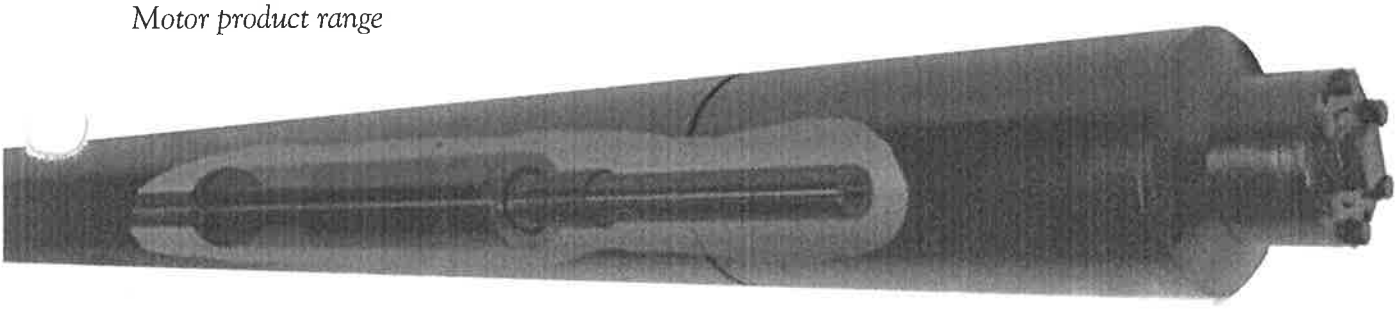
Cortez decided to install four ESP systems with 725 1,000 hp motors in the wells. The result was significant CAPEX savings from using existing wells with deeper settings. The ESPs with 725 motors maintained flow rates in excess of 3,200 gal/min with run times longer than five years.







Motor product range



725 Series Motor

MOTOR PERFORMANCE DATA
2 pole - 3600 rpm - 3 phase
7.25 inch diameter

HP	VOLTS	AMPS	IDLE AMPS	LENGTH "A"	WEIGHT
	@ 60 Hz			FT	LBS
100	460	135	48	7.9	488
	575	103	37		
	2300	26.5	9		
150	460	193	69	9.8	759
	575	153	55		
	2300	39.2	14		
200	460	261	93	11.7	1029
	575	211	75		
	2300	53.5	19		
	4160	28.6	10		
250	460	343	123	13.6	1300
	575	261	93		
	2300	64.3	23		
	4160	35.5	13		
300	460	404	144	15.6	1570
	575	300	107		
	2300	77.7	28		
	4160	43.9	16		
350	2300	90.8	32	17.5	1841
	4160	49.9	18		
400	2300	103	37	19.4	2111
	4160	57.6	21		
450	2080	127	45	21.3	2382
	2300	120	43		
	4160	64.3	23		
500	2080	143	51	23.3	2652
	2300	127	45		
	4160	72.6	26		

HMI Models

HP	VOLTS	AMPS	IDLE AMPS	LENGTH "A"	WEIGHT
	@ 60 Hz			FT	LBS
550	2080	154	55	25.2	2923
	2300	143	51		
	4160	77.9	28		
600	2080	178	64	27.1	3193
	2300	153	55		
	4160	86.9	31		
650	2080	193	69	29.0	3464
	2300	165	59		
	4160	94.3	34		
700	2080	195	70	30.9	3734
	2300	178	64		
	4160	103	37		
750	2080	212.0	76	32.9	4005
	2300	193	69		
	4160	108	39		
800	2080	233	83	34.8	4275
	2300	211	75		
	4160	114	41		
900	4160	127	45	41.7	4764
1000	4160	143	51	45.5	5304
1100	4160	154	55	49.4	5846
1200	4160	178	64	53.2	6386
1300	4160	193	69	57.0	6928
1400	4160	195	70	60.9	7468
1500	4160	212	76	64.7	8010

NOTES:

1. Contact Water Systems Engineering for applications above 100 degree F.
2. Contact Water Systems Engineering for non-standard housing materials.
3. Motor data is based on a 100 degree F bottomhole temperature at nameplate voltages.
4. Other HP's and voltages are available as a standard.
5. NSF approved coating & motor oil available.
6. Materials of Construction subject to change without notice.

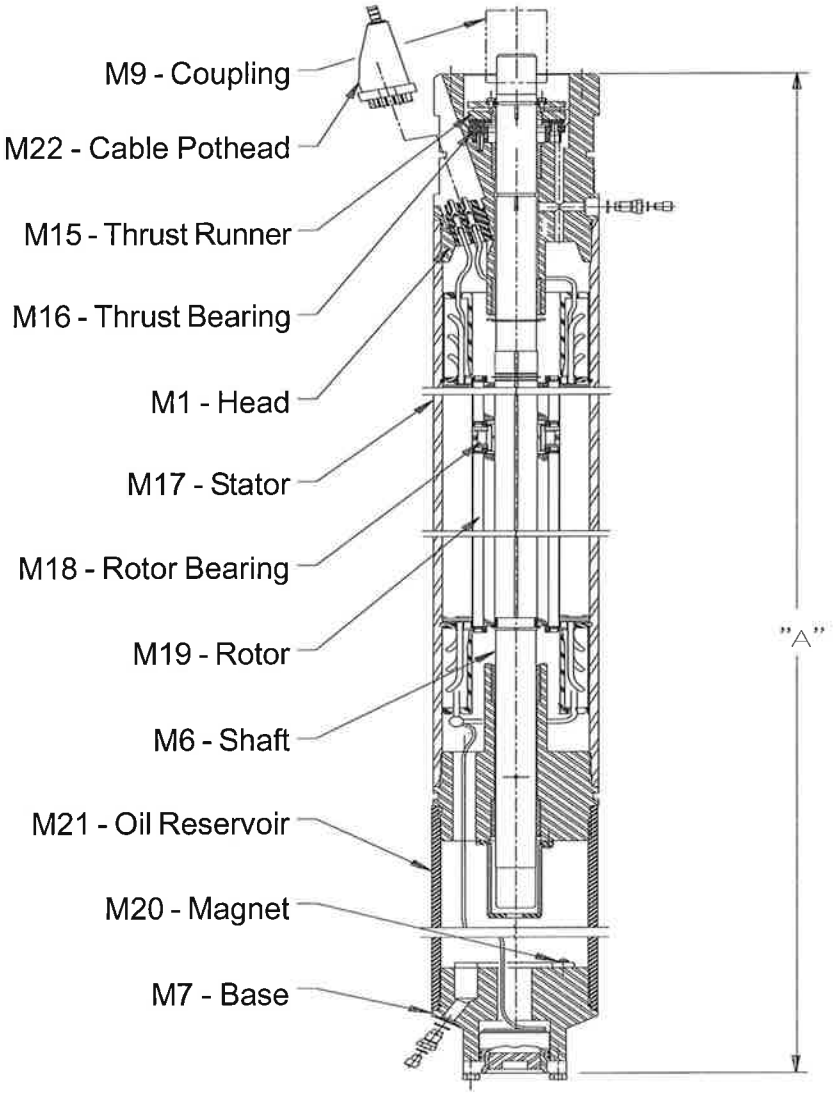
725 Series Motor

Centrilift

Materials of Construction **7.25 Dia.**

Item Number	Description	Common Name	ASTM No.
M1	Head	HR Steel 1040	A576
M6	Shaft	Alloy Steel	A519, GR4130
M7	Base	HR Steel 1040	A576
M9	Coupling	NI. CHR. Steel	582, TYPE 303
M15	Thrust Runner	Cast Iron	A48, NO.40C
M16	Thrust Bearing	Copper Alloy	B505
M17	Stator		
M18	Rotor Bearing	Alloy Steel	
M19	Rotor Assembly		
M21	Oil Reservoir	Carbon Steel	
M20	Magnet		
M22	Cable Pot Head		

Outline Drawing



725 Series HMI
Test Motor Performance Curves

