



The Name Behind Pump Performance

55243 Range Road 220, PO Box 3298
Fort Saskatchewan, AB Canada T8L 2T3
Phone: (780) 992-0100 Fax: (780) 992-0200

DOCUMENTATION PACKAGE

Customer: HUSKY



Location: PROVOST, AB

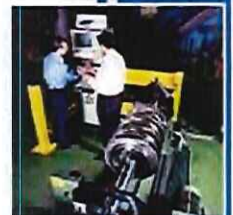


Equipment Manufacturer: SULZER



Equipment Model/Size: 3X6X9 MSD 10-STAGE
DESTAGED TO 9-STAGE

Hydro Job No.: 15072



Customer PO No.: 8400630212

Date Prepared: AUGUST 23, 2013





DATE: August 22, 2013

JOB # : 15072

W/O: 17744

CUSTOMER: HUSKY

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PURCHASE ORDER
&
WORKSCOPE



COMMERCIAL TRAVELER

JOB NUMBER		CUSTOMER NAME	ISSUE DATE	W/O REV NUMBER	REV REASON		
15072		HUSKY ENERGY - PROVOST	03/08/13				
W/O NO.		JOB SHIP DATE		W/O COMP DATE			
17744				04/19/13			
TOP LEVEL PART		DESCRIPTION					
W/O PART NUMBER		DESCRIPTION	QTY NEEDED	RAW MATERIAL	DRAWING NO.		
1059193		SULZER 3X6X9C MSD 10 STAGE DES TAGED TO 9 STAGE	1				
SEQ NUMBER	OPER NUMBER	OPERATION DESCRIPTION	DUE DATE	EST HOURS	COMP. DATE	SIGN-OFF	ACTUAL HOURS
001	705	SHIP/RECEIVE, PARTS/MATERIAL		0.0			
010	224	COMPONENT DISASSEMBLY		0.0			
020	227	COMPONENT CLEANING		0.0			
030	321	IN PROCESS INSPECTION		0.0			
040	321-1	IN PROCESS INSP. REPORT		0.0			
050	228	CUSTOMER APPROVAL OF QUOTE		0.0			
060	400	ENGINE LATHE		0.0			
070	442	MILL		0.0			
080	605	SMAW - STICK		0.0			
085	558	HAND DRESS		0.0			
090	541	IMPELLER BALANCE INDIV		0.0			
100	545	ROTOR BALANCE		0.0			
Traveler Prepared by (name and date)		QA Approval (name and date)		Engineering Approval (name and date)			
[Signature]		MAR 08 2013					

JOB NUMBER	CUSTOMER NAME	ISSUE DATE	W/O REV NUMBER	REV REASON			
15072	HUSKY ENERGY - PROVOST	03/08/13					
W/O NO.	JOB SHIP DATE		W/O COMP DATE				
17744			04/18/13				
TOP LEVEL PART	DESCRIPTION						
W/O PART NUMBER	DESCRIPTION	QTY NEEDED	RAW MATERIAL	DRAWING NO.			
1059193	SULZER 3X6X9C MSD 10 STAGE DES TAGED TO 9 STAGE	1					
SEQ NUMBER	OPER NUMBER	OPERATION DESCRIPTION	DUE DATE	EST HOURS	COMP. DATE	SIGN-OFF	ACTUAL HOURS
110	226	COMPONENT ASSEMBLY		0.0			
115	875	CLEAN AND PAINT		0.0			
120	341	FINAL DIMENSIONAL INSPECT PARTS AND VERIFY SIZES.		0.0			
130	381	FINAL INSPECTION REPORT		0.0			
999	705	SHIP/RECEIVE, PARTS/MATERIAL		0.0			
		S/N 4C005					
		CUSTOMER CONTACT FLORIAN GETTY					
		...					
TOTAL HOURS				0.0			



Hydro Scotford, Inc.
A Hydro Company

May 6, 2013

Husky Energy
5246- 40th street
Provost, AB
T0B-3S0

Attention: Florian Gette

Subject: Bingham 3 x 6 x 9 MSD 10 stage de-staged to 9
Repair estimate
JN 15072 / DM 0255-R

Dear Florian,

Hydro Scotford is pleased to offer the following Bingham 3 x 6 x 9 MSD 10 stage de-staged to 9 pump repair estimate. As indicated in the inspection report a through pump overhaul is required to ensure this pump performs as expected and has a sufficient run time.

Please do not hesitate to contact us, should you have any questions or concerns upon the review of the following repair estimate.

Sincerely,

Hydro Scotford Inc.

Dave Metz
Sales Representative
Ph: 780-992-0100
Fax: 780-992-0200
Cell: 780-887-9332
dmetz@hydroscotford.com

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Customer: Husky Energy
Location: Provost
Pump Type: Bingham 3 x 6 x 9 MSD
Hydro Scotford Ref: JN 15072 / DM-0255-R

Pump Repair Estimate:

Disassembly:

- Receive and completely dismantle pump
- Sand blast and clean all necessary pump components
- Positively identify the pump component materials
- Complete as found inspection to develop and provide the official pump repair estimate

Pump Casing:

- Completely sand blast pump casings
- Inspect split line mounting faces for flatness and document
- Inspect case bore diameters and document
- Liquid penetrate the balance line, inspecting for cracks
- Ultra sonic test the balance line determining the integrity of the balance line
- Map out the groove locations and sizes
- *Weld Repair:*
 - Weld repair the volute cut waters and the washed areas, hand dressing to final profile
 - Weld build up 3 NPT connections
 - Weld the pump case bores 2" below the split line
 - Weld the pressure side of the grooves
 - Weld the non-drive end stuffing box bore
 - Weld the mechanical seal stud holes and necessary pressure faces
 - Weld the dowel pin holes at the bearing housing mounting faces
- Inspect the mounting feet and lightly machine true if required
- Plane the pump cases split line mounting faces
- Line bore and machine the faces true then dowel the pump case
- Machine the suction and discharge gasket surfaces
- Re-drill and tap the 3 NPT connections
- Drill all the pump lid stud holes to ensure case stud clearance
- Bi-metal / hand dress the two pump case halves to ensure the same profile
- De-burr and clean the pump case
- Hydro-test the pump case
- Replace pump case studs
- Replace dowel pins

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Bearing Housings:

- Glass bead blast bearing housings and covers
- Clean and inspect bearing housings for concentricity, skim machine as required
- Weld the dowel pin holes
- Lightly skim machine the radial bearing outside diameters to acceptable tolerance
- Repair the inside diameters of both radial sleeve bearings by re-babbiting and grinding to acceptable tolerance
- Glyptol bearing housing internals
- Replace the roller thrust bearing assemblies
- Inspect the oil flinger rings for roundness, replace if necessary
- Clean and re-use labyrinth seals

Rotating Element:

- Dismantle and glass bead blast rotating element components and inspect
- Pump shaft:
 - Manufacture and install Nitronic 50 pump shaft
 - Burnish the
- Impellers:
 - Remove all the impeller hub side wear rings
 - Remove all the impeller eye side wear rings
 - Determine if enough wall thickness is available for the wear ring lands can be lightly machined. If wall thickness is not enough welding and extra cost's will be required
 - Weld repair the damaged impeller vanes and hand-dress back to an acceptable profile
 - Completely weld the impeller bores and keyways
 - Re-machine the impeller bores to acceptable dimension concentric with the wear ring land surfaces
 - Re-cut the impeller keyways in the original position
 - Manufacture 316 Stainless steel impeller hub side wear rings with a Stellite overlay
 - Manufacture 316 SS impeller eye side wear rings with a Stellite overlay
 - Install and tack weld all the wear rings in position
 - As needed skim high spots on finished wear rings to ensure concentricity
 - Individually balance impellers to meeting a 4W/N tolerance
- Stationary case-wear rings:
 - Manufacture 316 SS hub side case wear rings with a Stellite overlay
 - Manufacture 316 SS eye side case wear rings with Stellite overlay
- De-staged ring:
 - Manufacture 316 SS ring
- Throttle bushing:
 - Manufacture 316 SS throttle bushing with Stellite overlay

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- Throttle sleeve:
 - Manufacture 316 SS sleeve with Stellite overlay
- Throat bushings:
 - Manufacture 316 SS throat bushings
- Center bushing:
 - Manufacture 316 SS center stage bushing with Stellite overlay
- Center sleeve:
 - Manufacture 316 SS center stage sleeve with Stellite overlay
- Manufacture 316 SS impeller keys and impeller split thrust rings
- Assemble rotating element
- Balance rotating element meeting a 2W/N tolerance

Pump Assembly:

- Cut new case gasket
- Install repaired rotating element
- Install customer supplied mechanical seals
- Air test the pump case
- Complete bearing housing assembly
- Document running clearances
- Paint pump, prepare for shipment
- Complete final documentation package

Pump coupling:

- Confirm coupling contact at assembly, ensuring 85% contact surface

Repair estimate: \$

Delivery: (From approval) 10 Weeks

The one mechanical seal that came with the pump is beyond repairable condition. The price for new mechanical seals is \$ each. The mechanical seal cost is not included in the above estimate.

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