



650 Top Drive TDS-4H

with pipe Handler new shaft, rebuilt HPU and
New Certification and Plates.

Rebuilt, unused, tested, and certified at NOV









SUPERIOR MANUFACTURING

4225 HWY 90 EAST
BROUSSARD LA 70518
(337) 837-8847

Customer No.: DIAMOND O/S

Order No.: 62369

Bill To: DIAMOND OFFSHORE
P.O. BOX 4558
HOUSTON, TX 77210

Ship To: DIAMOND OFFSHORE
6501 FREETOWN ROAD
NEW IBERIA, LA 70560

Date	Ship Via	F.O.B.	Terms	
08/22/13	OUR TRUCK	Origin	Net 30	32972 MAR 13
Purchase Order Number	Required Date	Sales Person	Our Order Number	
099-033168W	08/22/13	HYDRAULICS - MICHAEL COATES	62369	
Quantity	Item Number	Description	Unit Price	Amount
Required Shipped B.O.				

REBUILD OF VARCO PH60
PIPE HANDLER
DO#43186-OCEAN SUMMIT

1.000

**DIAMOND OFFSHORE
CENTRAL WAREHOUSE**
RECEIVED SUBJECT TO
INTERNAL INSPECTION
RIG: O. SUMMIT
PO#: 099-033168 W
DATE: 23-AUGUST-2013
BY: Jack Simon

LABOR TO REPAIR PH60 PIPE HANDLER	20100.00	20100.00
PARTS TO REBUILD PH60 PIPE HANDLER	13400.00	13400.00
PH60 DATABOOK	0.00	0.00
REPLACE CLAMP BODY	12701.85	12701.85

WO# 041434
CM:417-070968
FR099-003168

Order subtotal	46201.85
Order total	46201.85

*** WE APPRECIATE YOUR BUSINESS ***

This order is subject to the Terms and Conditions of Superior Manufacturing & Hydraulics that can be located at <http://www.mccoysglobal.com/tcs.pdf>. Purchaser acknowledges that those Terms and Conditions will control and take precedence as to any contrary term or unless agreed to in writing by a duly authorized officer of Superior Manufacturing & Hydraulics.

SIGNATURE

DATE

DELIVERY TICKET

SUPERIOR MANUFACTURING & HYDRAULICS

4225 HIGHWAY 90 EAST
BROUSSARD LOUISIANA 70518

DT 35630

SOLD TO: _____

SHIP TO: Diamond O/S

ORDERED BY: _____

TAG FOR Ocean Summit

CUSTOMER ORDER NO. 099-033168W

SHIP VIA OT

DATE ENTERED _____ DATE SHIPPED _____

INVOICE DATE _____ TERMS: Net 30 days

TERRITORY	HOW ORDERED	NO. OF INVOICE	TYPE	WRITTEN BY	FILLED BY	COLL.	PPD.	C.O.D.	REQ. SHIPPING DATE												
ORD'D	QUANTITY		B.O.	DESCRIPTION	UNIT PRICE	AMOUNT															
	PREV. SHIP	THIS SHIP																			
	1			PH60 DCA 43186																	
	1			Scotter Lifting Rod WO# 041434																	
				Replaced Lifting Rod with correct size																	
<table border="1" style="margin: auto;"> <tr> <td colspan="2" style="text-align: center;">DIAMOND OFFSHORE CENTRAL WAREHOUSE</td> </tr> <tr> <td colspan="2" style="text-align: center;">RECEIVED SUBJECT TO INTERNAL INSPECTION</td> </tr> <tr> <td>RIG:</td> <td><u>O. Summit</u></td> </tr> <tr> <td>PO#:</td> <td><u>99-32160W</u></td> </tr> <tr> <td>DATE:</td> <td><u>27 AUG 2013</u></td> </tr> <tr> <td>BY:</td> <td><u>Jack Simon</u></td> </tr> </table>										DIAMOND OFFSHORE CENTRAL WAREHOUSE		RECEIVED SUBJECT TO INTERNAL INSPECTION		RIG:	<u>O. Summit</u>	PO#:	<u>99-32160W</u>	DATE:	<u>27 AUG 2013</u>	BY:	<u>Jack Simon</u>
DIAMOND OFFSHORE CENTRAL WAREHOUSE																					
RECEIVED SUBJECT TO INTERNAL INSPECTION																					
RIG:	<u>O. Summit</u>																				
PO#:	<u>99-32160W</u>																				
DATE:	<u>27 AUG 2013</u>																				
BY:	<u>Jack Simon</u>																				

MSDE. SUB-TOTAL

"STATE" SALES TAX "CITY"

FRT. CHGS.

PAY THIS AMOUNT

White Copy - Original
Yellow Copy - Customer
Pink Copy - Packing List
Goldenrod Copy - Files

DIAMOND OFFSHORE

RIG: OCEAN SUMMIT

EQUIPMENT: VARCO PIPE HANDLER

PART NUMBER: PH60

S/N: DO# 43186

PO# 099-033168W

SUPERIOR JOB NUMBER: 041434



DRELLING &
COMPLETIONS

PIPE
REPAIRS
SUPERIOR MANUFACTURING & HYDRAULICS

TO: Diamond O/S

June 19, 2013

Quote# 1193

Attn: Charley Breedlove

cc: M. Coates

Rig: Ocean Summit

SUBJECT: Varco PH60 Pipe Handler,
WO# 041434

Superior Manufacturing & Hydraulics, Inc. respectfully submits the following estimate for your consideration regarding the unit described above:

This unit will be sandblasted and all welds inspected for cracks using wet mag techniques, completely disassembled and evaluated. The following are our recommendations to rebuild this unit to nearly new condition:

Item #1 Clamp Cylinder

Cylinder seal surface pitted beyond repair

Option 1

Remanufactured clamp cylinder supplied by McCoy

\$12,701.85

Or

Option 2

Diamond o/s to supply clamp cylinder.

MCCOY

MOONING & CO. INC. 1400 W. 14TH AVENUE
DENVER, CO 80202

DRILLING &
COMPLETIONS

THE
ASSOCIATED TOOL SERVICES
SPECIALTY MANUFACTURING & TOOLING

Item #2

Torque Cylinder #1

Hone barrel
Replace rod
Replace piston
Replace gland
Rework gland retainer plate reuse
Replace tie rods
Replace nylocks
Rework end plates reuse
Replace Shcs
Tap Bolts holes
Replace all seals & packing
Rework trunions

Reassemble & test

Item #3

Torque Cylinder#2

Hone barrel
Replace rod
Replace gland
Replace piston
Rework trunions
Replace tie rods
Replace nylocks
Rework gland retainer plate reuse
Replace all seals
Replace shcs
Rework end plates reuse
Replace bushing in rod eye

Reassemble & test

MCCOY

MOOREHEAD, ALABAMA

WELDING &
COMPLETION

PIPE
FITTING TECHNOLOGIES
SUPERIOR MANUFACTURING & TECHNOLOGIES

Item #4

Lift Cylinder

Hone Barrel

Tap Bolt holes

Replace rod clevis

Replace piston

Replace gland

Rework gland retainer plate reuse

Replace tie rods

Replace nylocks

Replace seals

Rework end plates reuse

Replace rod

Reassemble & test

Item #5

Air Cylinder #1

Hone barrel

Replace rod

Replace piston

Rework gland reuse

Rework rod eye reuse

Replace all seals

Rework threads on barrel and gland

Reassemble & test

Item #6

Air Cylinder #2

Hone barrel

Replace rod

Replace piston

Rework gland reuse

Replace all seals

Rework rod eye reuse

Rework threads on barrel and gland

Reassemble & test

- Item #7 Relief Manifold
Replace valve cartridges
Replace Torque gauge
Replace check valves
Replace seals
Rework block reuse
Reassemble, adjust valve settings to OEM specifications & test
- Item #8 Diverter Valve
Replace check valve
Replace orings
Rework detent fitting
Replace spool

Reassemble & test
- Item #9 Torque Tube
Rework spline chamfers
Line bore pin holes; install bushings
Rework worn areas, machine to size
Rework bolt holes
- Item #10 Pipe Guide
Replace with new 7 3/4"
- Item #11 Safety Actuator Arms
Rework worn surfaces and machine to size
Replace cam followers
Rework pin holes; install bushings
- Item #12 Safety Arm Mounting Bracket
Rework worn surfaces and machine to size
Rework bolt holes
- Item #13 Die Holders
Replace die holders
Replace dies
Replace die clips

MCCOY

EXCITING & COOL PROJECTS

PAINTING &
COMPLETIONS

TOP
PERFORMANCE TECHNOLOGIES
SUPERIOR MANUFACTURING SOLUTIONS

- Item #14 Air Cylinder Mounting Bracket
Rework pin holes; install bushings
- Item #15 Torque tube stabilizer
Rework worn areas and machine to size
Rework bolt holes
Replace stabilizer springs
- Item #16 Stop Tubes
Replace long stop tubes
Rework short stop tubes
- Item #17 Miscellaneous:
Replace grease zerts
Replace safety wire
Replace 3-way air valves
Replace air exhaust
Replace all stainless steel pins
Replace quick disconnects
Replace all hoses & spring guards
Replace assorted nuts, bolts, fittings, cotter pins, etc.
- Item #18 Body:
Rework bolt holes
Line bore pin holes; install bushings
Rework worn areas and machine to size
- Item #19 Frame
Replace Frame (bent)
Reuse bottom plate and torque tube stabilizer plate
Rebushing trunion pin holes on bottom plate
- Item #20 Secondary Retention
Install secondary retention to meet Superior Mfg. specifications



MOCKING & CRANE ENERGY SERVICES

DRILLING & COMPLETIONS

3801
2100 W. 10TH AVENUE
DENVER, CO 80202-1000

Item #21 Lifting rod
Replace lifting rod

Customer to specify length

Item # 22 Bell housing
Rework worn areas and machine to size
Rework guide arms
Replace springs
Rework bolt holes

Parts to rebuild PH-60 pipe handler	\$15,600.00
Labor to rebuild PH-60 pipe handler	\$16,900.00

Reassemble all components; hydraulically test as a unit & paint, using high build epoxy paint.

Prepare documentation package.

Estimated cost to rebuild this unit (standard)	\$33,500.00
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Remanufactured clamp cylinder	\$12,701.85
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Total with McCoy supplying clamp cylinder	\$46,201.85
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Delivery = approximately 5 - 6 weeks Standard

Crating (optional)	\$650.00
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Pallet (optional)	\$275.00
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We appreciate the opportunity to submit this quote for your consideration, and look forward to working with you,

Respectfully Submitted,

Marcus Curry



**DIAMOND
OFFSHORE**

P.O. Box 4809, Houston, Texas 77210-4809
Phone: 281-492-5300 Fax: 281-647-2202

P.O. NUMBER	099-033168W
DATE	18-JUL-2013
REVISION	1
AFE NUMBER	

**PURCHASE ORDER
Change Order**

V SUPERIOR MANUFACTURING & HYDRAULICS, INC.
E HYDRAULICS
N 4225 HIGHWAY 90 E
D BRDUSSARD, LA 70518
O

S New Iberia Warehouse
H Attn: Receiving
I 6501 Freetown Road
P New Iberia, LA 70560
T 337-365-5180
O

Well: MEXICO
Lease:

Rig: Dcean Summit

TERMS	DEL.PROM.	INCO Terms	SHIP VIA	ULTIMATE DEST	PRICE	TAX STATUS
NET 30	14-AUG-2013	EX - WORKS	MOTOR FREIGHT	MEXICO	FIRM	EXEMPT
CONFIRMING TO. & PHONE NUMBER			NOTE TO VENDOR			
MIKE COATES 337-837-8847			W/O# 041434			
ITEM	QTY.	UNIT	DESCRIPTION	UNIT PRICE	EXTENSION	
1	1	EACH	Account Reference: 7350000 117322-650 - HANDLER, PIPE, PH-60D, 650 TON, DUAL CRANK MODEL: PH-60D PIPE HANDLER (REPAIR AS PER DODI MSR-24) 18-JUL-13 - PO REVISED TO REFLECT ADDITIONAL COST TO REPLACE CLAMP BODY FOUND DEFECTIVE DURING INSPECTION REPAIR TO OEM SPECIFICATIONS, TOLERANCES AND DODI REPAIR SPECIFICATION MSR-24 REPAIRS INCLUDE TOTAL REFURBISHMENT OF FOLLOWING CLAMP CYLINDER BOTH TORQUE CYLINDERS LIFT CYLINDER TO BE REPLACED WITH NEW AIR CYLINDERS RELIEF MANIFOLD DIVERter VALVE TDRQUE TUBE PIPE GUIDE SAFETY ACTUATOR ARMS SAFETY ARM MOUNTING BRACKET	46,201.85	46,201.85	
			**NOTE **Country of Origin must be stated on each line item of Packing List or Commercial Invoice for material destined for export. If Country of Origin is not provided, Diamond Offshore reserves the right to cancel the order and return material to vendor at vendor's expense without incurring cancellation or restocking charges.			
Remit Invoices To: DIAMOND OFFSHORE COMPANY P.O. Box 4809 Houston, Texas 77210				Purchase is exempt from sales and use tax per the following: Offshore Drilling Equipment Exemption -- Louisiana R.S. 47:305(l) First Use Offshore Exemption -- Louisiana R.S. 47:305.10 Vessel Exemption -- Louisiana R.S. 47:305.1		US Total 46,201.85

Charlie Breedlove

ACCEPTANCE OF THIS ORDER BY THE SELLER'S COMMENCEMENT OF PERFORMANCE OR OTHERWISE SHALL CONSTITUTE FULL ACCEPTANCE BY THE SELLER OF DIAMOND OFFSHORE'S STANDARD TERMS AND CONDITIONS OF PURCHASE AND ALL TERMS AND CONDITIONS CONTAINED HEREIN OR ATTACHED HERETO. THE P.O. NUMBER MUST LEGIBLY APPEAR ON ALL INVOICES, PACKAGES AND CORRESPONDENCE RELATED TO THIS ORDER. BUYER REQUIRES FREIGHT DOCUMENTATION. ORIGINAL FREIGHT INVOICE MUST ACCOMPANY ALL FREIGHT CHARGES EXCEEDING \$500. MATERIAL SAFETY DATA SHEETS MUST ACCOMPANY ALL HAZARDOUS MATERIAL SHIPMENTS



**DIAMOND
OFFSHORE**

P.O. NUMBER	099-033168W
DATE	18-JUL-2013
AFE NUMBER	1

PURCHASE ORDER

V E N D O R	SUPERIOR MANUFACTURING & HYDRAULICS, INC. HYDRAULICS 4225 HIGHWAY 90 E BROUSSARD, LA 70518	S H I P T O	New Iberia Warehouse Attn: Receiving 6501 Freetown Road New Iberia, LA 70560
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Well: MEXICO
Lease:

Rig: Ocean Summit

TERMS	DEL.PROM.	INCO Terms	SHIP VIA	ULTIMATE DEST	PRICE	TAX STATUS
NET 30	14-AUG-2013	EX-WORKS	MOTOR FREIGHT	MEXICO	FIRM	EXEMPT
CONFIRMING TO. & PHONE NUMBER			NOTE TO VENDOR			
MIKE COATES 337-837-8847			W/O# 041434			
ITEM	QTY.	UNIT	DESCRIPTION	UNIT PRICE	EXTENSION	
			DIE HOLDERS AIR CYLINDER MOUNTING BRACKET BELL HOUSING STOP TUBES TORQUE TUBE STABLIZER FRAME & GUARD TO BE REPLACED WITH NEW			
				US Total	46,201.85	

Remit Invoices To:
DIAMOND OFFSHORE COMPANY
P.O. Box 4809
Houston, Texas 77210

Charlie Breedlove

**Diamond Offshore Company
Terms and Conditions of Purchase**

The party to which this Purchase Order ("Order") is addressed (herein referred to as the "Seller") by acceptance of this Order agrees that the purchase by Diamond Offshore Company or its affiliated companies (individually and collectively referred to herein as "Buyer") of the goods and services covered by the Order shall be governed by the following terms and conditions:

1. ACCEPTANCE; OTHER TERMS; CHANGE ORDERS

1.1 Commencement of Performance. Seller's commencement of performance of this Order shall constitute acceptance of all of the terms and conditions of this Order without reservation, whether or not Seller has signed and returned a written acknowledgement.

1.2 Terms of Purchase. This Order is an offer by Buyer to purchase the goods and services described in the Order only upon the terms and conditions contained in this Order without regard to any conflicting terms and conditions contained in Seller's quote or proposal for the goods or services the subject of this Order, even if such quote or proposal is referred to or attached to this Order, and Seller's acceptance of this Order shall be limited to such terms and conditions contained in this Order. Any terms set forth or contained in Seller's quotation, acceptance or otherwise which are additional to or different from those contained herein shall be of no force and effect and shall not be binding upon Buyer unless expressly agreed in writing by Buyer.

1.3 Other Agreements. In the event there is any other written agreement between Buyer and Seller in existence between Buyer and Seller with respect to Buyer's purchase of the goods or services described in this Order, then such other agreement shall govern such purchase only to the extent of any conflict between the terms and conditions contained in this Order and the terms and conditions contained in such other agreement.

1.4 Buyer's Changes; Change Orders. Buyer may, at any time, unilaterally change the terms and conditions of this Order, including, without limitation changes in (i) the technical specifications of the goods and/or services covered by the Order, (ii) quantities, (iii) methods of shipping and/or packaging; (iv) inspection standards, and (v) place of delivery ("Buyer's Changes"). The change, together with any such adjustments, shall be set forth in a written Change Order issued by Buyer and acknowledged by Seller either in writing or by Seller's commencement of performance pursuant to the written Change Order, whether or not Seller has signed and returned a written acknowledgement. If any such change affects the purchase price or delivery date, then Buyer and Seller shall mutually agree upon adjustment of the same.

2. REIMBURSEMENT OF EXPENSES

2.1 Reimbursement of Expenses. If this Order provides for reimbursement of Seller's expenses, such expenses must be incurred in accordance with our corporate policies, which are available upon request.

3. SHIPPING; INSURANCE; TRANSFER OF TITLE; DUTY DRAWBACKS

3.1 Incoterms. All shipping terms in this Order refer to International Chamber of Commerce, *Incoterms 2000*. Title to goods will pass to Buyer when delivery is complete according to section A4 of the applicable Incoterm as described in *incoterms 2000*. If the designated incoterm requires cargo insurance, Seller must purchase insurance under Clause A of the applicable Incoterm.

3.2 Overshipments and Early Shipments. If Seller ships more goods than ordered, or if Seller delivers the goods earlier than ordered, Buyer may purchase some or all of the goods or return some or all of the goods to Seller at Seller's risk and expense.

3.3 Duty Drawbacks. Buyer reserves the right to any duty drawbacks.

4. PACKAGING AND LABELLING. Seller must package all goods in accordance with good commercial practice and in a manner acceptable to common carriers for shipment at the lowest rate for the goods involved, and adequate to insure safe arrival of the goods to their destination. Each shipment must be adequately labeled to identify it with this Order.

5. TIME IS OF THE ESSENCE; CANCELLATION

5.1 Time is of the Essence. Time is of the essence under this Order.

5.2 Cancellation. Buyer may cancel this Order in whole or in part if Seller does not deliver the goods or perform the services in full and in conformity with this Order within the time specified in this Order or, if no time period is specified, within a reasonable time. If Buyer cancels this Order for default and it is later determined that Seller was not in default, Seller's rights will be construed as if the cancellation was for Buyer's convenience. Buyer may cancel this Order, in whole or in part, at any time for its convenience. If Buyer cancels this Order for its convenience and Buyer gives Seller less than ten (10) days' notice of cancellation, Buyer will reimburse Seller's actual reasonable out-of-pocket costs that are not capable of being mitigated. To be reimbursed, Seller must submit its written request for reimbursement within thirty (30) days after Buyer's notice of cancellation. Upon receipt of Buyer's notice of cancellation, regardless of the reason for the cancellation, Seller must immediately stop all work in progress and use its best efforts to mitigate any costs associated with the cancellation. Buyer has the option to purchase Seller's work in progress, including any raw materials Seller may have obtained to use in Seller's work. Buyer's price to purchase Seller's work in progress will be a prorated price based on the percentage of work remaining to be completed. Buyer's price to purchase any raw materials will be Seller's actual cost. Seller is not entitled to any other remedy for cancellation of this Order except as provided in this Subsection 5.2.

6. WARRANTIES

6.1 Warranty Period. Except for latent defects, fraud or such gross mistakes of Seller as amount to fraud, notice of any claim based on the warranties under this Order must be given by Buyer to the Seller within eighteen (18) months following delivery to the Buyer or twelve (12) months from commencement of use or receipt of satisfactory qualification test reports, whichever is later.

6.2 Warranty - Goods. Seller warrants that (a) the goods shall be of high quality and workmanship within recognized industry standards, free from defect, of merchantable quality and fit for the intended purpose or use for which they are

purchased to the extent such purpose or use is known, or reasonably known, to Seller; (b) the goods shall fully comply with any data, reference to data or specifications provided by Buyer and/or any samples or documentation provided by Seller; (c) the goods shall be conveyed with clear title, free of lien or encumbrance of security interest upon delivery of the goods to Buyer or other party authorized by Buyer; and (d) the goods shall not violate any intellectual property rights of any third party.

6.3 Warranty – Services. Seller warrants that: (a) any services provided under this Order shall be performed in a professional and a workmanlike manner and in full conformance with any specifications or requirements provided by Buyer or any documentation provided by Seller; and (b) the performance of the services will not violate any intellectual property rights of any third party or any duty of confidentiality Seller owes to a third party.

6.4 Other Warranties. The warranties listed above are in addition to any other warranties made by Seller or imposed by law, whether expressed or implied, and such warranties shall survive inspection, testing acceptance of, and payment for the goods and shall accrue to and be assignable to Buyer's successors and assigns.

6.5 Remedies. If any goods or services do not comply with the warranties, Buyer may, at its option, and without additional cost to it, (a) require Seller to repair or replace the goods such that the goods will conform to the warranties, (b) require Seller to re-perform any services until the services conform to the warranties, (c) return any non-conforming goods to Seller at Seller's expense for a full refund, (d) correct the non-conformance and charge Seller for the cost to make the correction, and/or engage a third party to provide substitute goods or services and charge Seller for the costs of obtaining the substitute goods or services from the third party. The remedies listed above are in addition to any other remedies available to Buyer at law or in equity. Buyer's review and/or approval of Seller's materials or designs shall not relieve Seller of its responsibilities hereunder.

7. INTELLECTUAL PROPERTY INDEMNIFICATION

7.1 Intellectual Property Indemnification. Seller will defend and indemnify (including attorneys fees) Buyer, its parent and affiliates against any claim alleging that Seller's goods or services infringe or violate a patent, copyright, trademark, trade secret, or any other contractual right, proprietary right or intellectual property right of any third party.

8. LIENS AND RELATED CLAIMS

8.1 Liens and Related Claims. Seller agrees to pay or cause to be paid all valid claims for payment arising out of or in connection with labor, material, supplies and/or services provided by Seller in connection with this Order. Seller agrees that it will not permit and agrees to fully release, defend,

indemnify (including attorney's fees, filing fees and other related expenses) and hold harmless Buyer, its parent and affiliates and each party for which Buyer is working, from and against any and all claims, liens, encumbrances, demands, causes of action, liabilities and damages of every kind and character ("Liens") of any kind that are asserted, affixed or filed against any property of Buyer (including, without limitation, any vessel) or the lease on which operations are conducted by Buyer or any property of others, including any party for which Buyer is working, arising out of or in connection with, labor, material, supplies and/or services provided by Seller and/or its subcontractors in connection with this Order. If Seller fails or refuses to pay any such claim and/or if any such Lien is asserted, affixed or filed, Buyer has the right to withhold the amount of the claim and/or Lien from any money due or to become due to Seller and pay such claim and/or discharge any such Lien. Before any payment is made to Seller under this Order, Buyer may require that Seller furnish evidence satisfactory to Buyer that there are no unsatisfied claims for labor, materials, equipment, and supplies or for injuries to persons or property not covered by insurance in connection with this Order.

9. MISCELLANEOUS

9.1 Governing Law. This Order shall be governed by the law of the State of Texas, without regard to its conflict of law rules which would refer to another jurisdiction. The United Nations Convention on Contracts for the International Sale of Goods shall not apply to this Order.

9.2 Venue. The sole and exclusive venue for the resolution of any and all disputes arising from or relating to this Agreement is in the state or federal courts located in Harris County, Texas.

9.3 Compliance with Laws. Seller must comply with all applicable laws in performance of its obligations under this Order.

9.4 Assignment. Seller may not assign its rights or delegate its obligations under this Order without the prior written consent of Buyer.

9.5 Incorporation of Executive Orders by Reference. The Equal Employment Opportunity Clause required under Executive Order 11246, the affirmative action commitment for disabled veterans and veterans of the Vietnam era, set forth in 41 CFR 60-250.4, the affirmative action clause for disabled workers, set forth in 41 CFR 60-741.5(a), and the related regulations of the Secretary of Labor, 41 CFR Chapter 60, are incorporated by reference in this Order. By accepting this Order, Seller certifies that it is in compliance with the authorities cited above, and that Seller does not maintain segregated facilities or permit its employees to perform services at locations where segregated facilities are maintained, as required by 41 CFR 60-1.8.

VARCO PIPE HANDLER DATA

Work Order #: 041434 Date: 8-22-13

Rig Ocean Summit

Serial #: 2043186 Ship Date: _____


FAT Date: 8-22-13

Test Conducted By: Douglas Broussard

Test Witnessed By: Brian Pierce

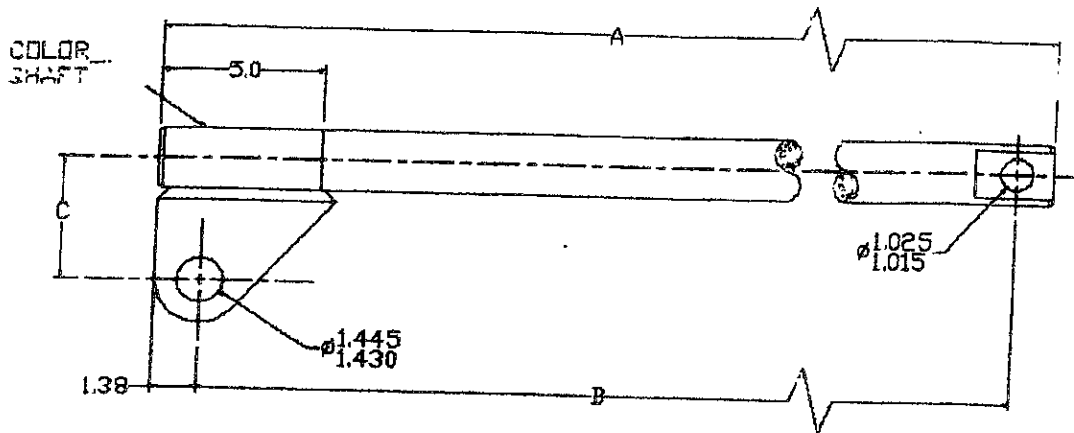
Supervisor [Signature]

Location: Broussard

 **DIAMOND OFFSHORE**
Brian Pierce
Superintendent
Equipment & Repair Q/A

Pipe Handler Hanging Shaft (Lifting Rod) Identification Guide

Pipehandler Model	Rotating Head Configuration	Load Rating (ton)	Dim. A (inches)	Dim. B (inches)	Dim. C (inches)	Color Coding
PH 85	7-port w/o BX	650/750	37.06	34.56	3.5	Red
PH 85	7-port w/o BX	500	39.56	37.06	4	Black
PH 85	10-port w/BX	650/750	35.46	32.96	3.5	White
PH 85	10-port w/BX	500	37.96	35.46	4	Green
PH 60	7-port	500	42.6	40.1	3.5	Blue
PH 60	7-port	650	40.1	37.6	3	Orange



NOTE

SEQUENCE VALVES HAVE *NOT* BEEN SET

THEY MUST BE SET PER MANUFACTURER SPECS BEFORE OPERATION

UPON INSTALLATION, CYCLE UNIT FOR APPROXIMATELY 15 - 20 MINUTES TO REMOVE ANY AIR FROM LINES



CUSTOMER: Diamond O/S MODEL: PH 60 pipe handler
 RIG: Ocean Summit W/O: 041434 S/N: 0043186
(IF APPLICABLE)
 DATE: 6-19-13 TECH.(S): Derland SUPERVISOR: [Signature]

1. VISUAL EXAMINATION / DOCUMENTATION

(Attach "As Received" digital photos, note and document any shipping damage.)

- A. Stop Tube installed? Yes / No Long / Short old style
- B. Stop Tube stored? Yes / No Long / Short
- C. Lift Cylinder Shims? Yes / No Number: 54 Height: 1 1/2
- D. Air Cylinder Adjustment Distance: _____ (Not applicable for PH60)
- E. Die Holders installed? Yes / No Record Thickness: Front 2 1/4 Rear 2 1/4
- F. Torque Tube Guide Ring: ID 7 3/4
- G. Length of Lifting Rod Center Line to Center Line: 42 5/8 w/ long pad eye
- H. Drift Test: Install Drift Mandrel (7" OD f/PH60, 8 5/8" OD f/PH85).

Pressurize clamp cylinder to 2000 psi. *Note:* Depending on condition of Pipe Handler in As Received condition, it may be necessary to connect power unit directly to clamp circuit. If clamp cylinder will not hold pressure, indicate clamp cylinder failed this initial test. Pass / Failed Initial _____

If clamp cylinder holds 2000 psi, measure distance between mandrel and torque tube spline ID on side adjacent to frame _____, and side opposite of frame _____.

- 2. Disassemble Pipe Handler per Varco instructions. *Ref. Varco Manual pages 67-79.*
- 3. Disassemble and evaluate all cylinders, clamping jaws, pins, and structural components, etc., by completing the Pipe Handler Evaluation Report.
(Attach digital photos of worn or damaged areas on components.)

Forwarded information to Customer Service on date: _____ *(Attach Proposal)*

Job Approval Date: _____ PO Number: _____

Blast structure, torque tube, frame, body, clamp cylinder body, stabbing guide, mounting shaft, clamping jaws, etc.

Magnetic Particle Inspection Results - Indicate: No Faults / Faults found *(Describe)*

Date: _____ Report No.: _____ *(Attach Report)*

4. COMPONENT TEST DATA SUMMARY

Repair / Rebuild all cylinders using new seals. Test cylinders using block & monitor technique. Replace all cartridges. Attach test report for:

<u>Item</u>	<u>Test Pressure</u>	<u>Tested By</u>	<u>Work Order</u>
A. Lift Cylinder	2500	<u>[Signature]</u>	<u>041434</u>
B. Torque Cylinder #1	2500	<u>[Signature]</u>	<u>041434</u>
C. Torque Cylinder #2	2500	<u>[Signature]</u>	<u>041434</u>
D. Clamp Cylinder	2500	<u>[Signature]</u>	<u>041434</u>
E. Air Cylinder #1	120	<u>[Signature]</u>	<u>041434</u>
F. Air Cylinder #2	120	<u>[Signature]</u>	<u>041434</u>
G. Valve Manifold	2500	<u>[Signature]</u>	<u>041434</u>

5. Reassemble unit per Varco instructions, manual pages 69-79. Do not install Lift Cylinder Stop Tube. Torque bolts & connectors. Ref. Varco manual pages 69 and 77.

	<u>Torque</u>	<u>Tech Initials</u>
Cylinder rod end to cylinder rod* * The torque cylinder rod ends are threaded into the rods with loctite and cross pinned.	944 ft/lbs	<u>[Signature]</u>
Frame to clamp cylinder body	250 ft/lbs	<u>[Signature]</u>
Stabbing guide to body	250 ft/lbs	<u>[Signature]</u>
Die retainer screws	380 ft/lbs	<u>[Signature]</u>
Body hinge pin retainer screws	150 ft/lbs	<u>[Signature]</u>
Stabbing guide spring retainer screws	75 ft/lbs	<u>[Signature]</u>
Jaw retaining screws	110 ft/lbs	<u>[Signature]</u>
Install safety wire and/or cotter pins		<u>[Signature]</u>

6. OPERATIONAL TESTING (Use 30-35 gpm, 2500 psi Pressure Compensated Power Supply.)

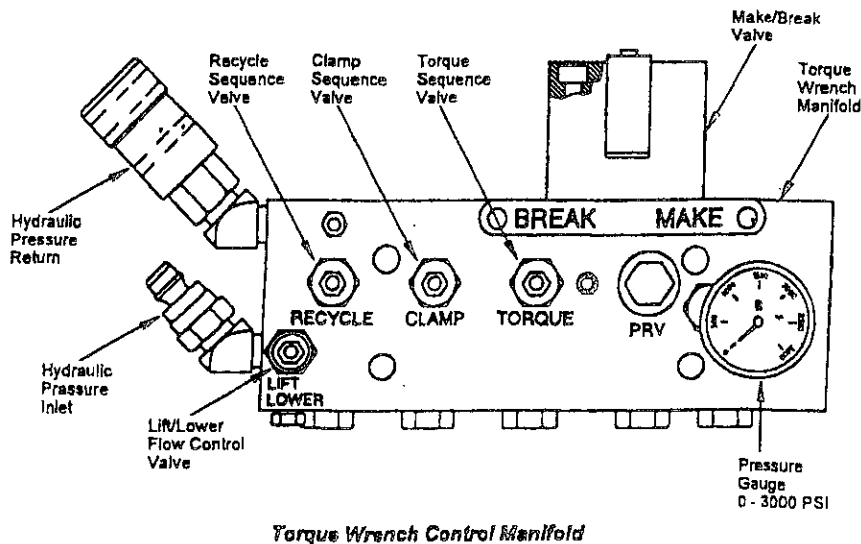
See Adjustment Procedures doc. March 18, 1994 with manifold illustration, schematic doc. 107530 sht 3 of 3, and Varco Manual page 4-28 (Figure 4-23 / PH85 Torque Wrench Hyd. Operation Schematic).

- A. Suspend Pipe Handler from lifting eye. Connect a pup joint or joint of drill pipe to the saver sub and makeup hand tight. Be sure to use the correct thread compound when making up. (Alternately install Superior test sub. Operational testing requires use of 2-position 4-way valve. Connect test hoses to Pipe Handler manifold so that normally pressured line is connected to "A" port.)
NOTE: When adjusting torque wrench manifold needle valves, loosen the locknut around the valve stem and use a 5/32" hex wrench to adjust the valve. After obtaining desired setting tighten locknut around valve stem.
- B. Turn off the HPU, screw in the RECYCLE, CLAMP, and TORQUE sequence valves on the torque wrench manifold.
- C. Fully back out the pressure reducing valve (PRV), then screw in one turn.
- D. Turn the lift/lower flow control valve fully in, and then back it out three turns. Turn on the hydraulic power unit. Confirm lift cylinder extends to lower Pipe Handler. Confirm clamp cylinder retracts or remains retracted. If these results are not observed, contact supervisor.

Record Pressure 1000
Pipe Handler moves Up / Down
Initial [Signature] CIRCLE ONE

- E. If the torque cylinders are in their full clockwise position, set the Make/Break valve to MAKE. If they are in their full counterclockwise position, set Make/Break valve to BREAK. Note that torque cylinders should not move if the recycle sequence valve is fully in.
- F. Slowly back out the recycle sequence valve until torque cylinders just start to move, then screw out an additional full turn.
Record pressure 1500
- G. Move the Make/Break valve to BREAK. Set the pressure reducing valve to 750 psi to adjust makeup torque.
(22,500 ft/lbs f/PH60 or 31,875 ft/lbs f/PH85)
- H. Switch the lever between Make and Break to adjust recycle sequence valve until full rotation in each direction takes six to eight seconds. Tighten the locknut around the recycle sequence valve adjustment screw.
Record pressure 1500
Verify full travel of both torque cylinders.
- I. Set the MAKE/BREAK valve to MAKE.
- J. Depress and hold the torque wrench operating button on the driller's console. (Alternately shift test valve.) Confirm the lift cylinder retracts, the pipe handler should lift, and the clamp jaws should remain retracted.
Initials WB
- K. Slowly back out the clamp sequence valve until the clamp jaws just begin to clamp onto the tool joint. Screw out an additional half turn.
Record pressure 1200
Lock the clamp sequence valve adjustment screw in position by tightening the locknut.
- L. Back out the torque sequence valve until the torque cylinders just begin to stroke, then back out an additional half turn. Tighten the locknut around the torque sequence valve adjustment screw.
Record pressure 1800
- M. Release the torque wrench operating button on the driller's console. (Alternately release test valve.) Confirm the torque wrench should start to unclamp and drop, then the torque cylinders should recycle.
Initials WB
- N. If the torque cylinders recycle *before* the clamp cylinders retract, screw in the recycle sequence valve until the torque cylinders do not move before clamp cylinders have fully retracted. Tighten the recycle sequence valve adjustment screw locknut.
- O. Cycle the torque wrench as many times as required to make up the connection.
Note: Do not switch the MAKE/BREAK valve to BREAK until completing the makeup sequence-which may require repeating the makeup sequence several times.
Verify the torque pressure regulating valve setting after every makeup sequence before releasing the makeup switch. Repeat the makeup sequence until the torque cylinders do not stroke more than one inch during the final makeup sequence-repeat the sequence if uncertain. Varco recommends that the driller operating the pipe handler verify that the torque cylinders do not stroke more than one inch on the last makeup cycle.
Varco also recommends checking the torque gauge on the pipe handler while making connections to make sure the torque wrench applies the correct amount of torque to the connection.
Stop and verify correct operation whenever the operator observes unsteady or inconsistent hydraulic pressure readings, or finds it difficult to adjust set points.
Varco recommends that a second individual assist the driller when making connections with the top drive torque wrench. The second person can verify that the torque wrench applies the correct torque to connections.
- P. Set the MAKE/BREAK Valve to BREAK.
- Q. Verify the torque wrench correctly breaks out the drill pipe from the saver sub, without breaking out the saver sub or lower IBOP. (Alternately, break out Superior test sub.)
- R. Operate pipe handler to verify both torque cylinders cycle through their full stroke.
- S. Reset MAKE/BREAK valve to MAKE position. The torque wrench is ready for operation.

7. Increase PRV setting to 2000 psi and makeup/breakout test sub to full torque (60,000 ft/lbs f/PH60 or 85,000 ft/lbs f/PH85). Activate test valve to makeup joint. Confirm final makeup cylinder is 1" or less. Hold full system pressure of 2000 psi for 5 minutes. Visually inspect for leaks.
Initial DB
8. Switch MAKE/BREAK valve to BREAK position. Slowly activate test valve to breakout joint while monitoring for leaks.
Initial DB
9. Return MAKE/BREAK valve to MAKE position.
10. Reset PRV to 750 psi. Repeat M/B Cycle. Initial DB
11. Air Cylinder IBOP Actuator Test:
Activate Air Cylinders using 120 psi air pressure to verify full and free movement. Record distance from Torque Stabilizer to centering of Actuator Arm Cam Follower.
- | | | |
|-------------------|--------------------|---------------------|
| Raised Position: | Left <u>13 1/4</u> | Right <u>13 1/4</u> |
| Lowered Position: | Left <u>8 1/2</u> | Right <u>8 1/2</u> |
12. Remove test sub.
13. Install Stop Tube as noted in 1.A, or as otherwise instructed.
14. DRIFT INSPECTION - Inspect to insure rear dies are fully retracted beyond line extending between Torque Tube Insert ID and Stabbing Guide ID.
Initial DB
15. Stamp WO number on frame. Initial DB
16. Install Lock Nuts and Seal Wire.
17. Paint all exposed metal with appropriate paint per customer spec. NOTE: Protect all critical surfaces, hoses, hydraulic quick disconnects, etc.
18. Attach set of spacers.
19. Pallet unit for storage/shipping.
20. COMPLETE TEST REPORT DOCUMENTS. (Attach digital photos of final completed assembly before palletizing.)



Torque Wrench Control Manifold

(Reproduced from Varco Operating Manual)

CYLINDER TEST REPORT

(For lift cylinders, backup cylinders, and industrial cylinders)

Customer: Diamond O/S Description: Torque Cyl #1
 Date: 7-24-13 Work No: 041434 Serial No: _____
 Technician: Derland Previous WO No's: 37899
 Test Pressure: 2,5000 Piston Seal Type *: polypack

* For all seal types except piston rings and leather packing, cylinder must pass 5 minute hold in both directions without pressure loss when tested using the pressurize, block, and monitor technique.

Bore 6 Rod Diameter 2 1/2 Stroke 4
 Check for External Leaks Test Minimum of 5 cycles:
 Check for Internal Leaks Test Minimum of 5 cycles:
 Pressure held 30 Minutes (minimum of 5) in each direction. Initial DB
 No pressure drops observed. Initial DB

Piston/Retainer to Rod Torque N/A or _____ ft/lbs
 Pinned Yes No Loctited Yes No
 Rod End to Rod End N/A or _____ ft/lbs

Pinned Yes No Loctited Yes No
 Tie Rod Size OD: 1 Thread: 14 Length: 14 3/8 Qty: 4

Tie Rod Torque 520 ft/lbs N/A Initial DB
 Fittings Installed Yes No N/A
 Mounting Hardware Installed Yes No N/A
 Pins Installed Yes No N/A
 Grease Zerts Installed Yes No N/A
 Bushings Inspected Yes No N/A
 Breather Installed Yes No N/A

Painted: yellow Tagged: _____
 Comments: cylinder test good no bypass

TESTED BY: Derland Broussard SIGNATURE SUPERVISOR: Don Jones SIGNATURE
Derland Broussard PRINT NAME Don Jones PRINT NAME

CYLINDER TEST REPORT

(For lift cylinders, backup cylinders, and industrial cylinders)

Customer: Diamond Description: Torque Cyl #2

Date: 7-24-13 Work No: 041434 Serial No: _____

Technician: Derland Previous WO No's: 37899

Test Pressure: 2,500 Piston Seal Type *: poly pack

* For all seal types except piston rings and leather packing, cylinder must pass 5 minute hold in both directions without pressure loss when tested using the pressurize, block, and monitor technique.

Bore 6 Rod Diameter 2 1/2 Stroke 4

Check for External Leaks Test Minimum of 5 cycles:

Check for Internal Leaks Test Minimum of 5 cycles:

Pressure held 30 Minutes (minimum of 5) in each direction. Initial DB

No pressure drops observed. Initial DB

Piston/Retainer to Rod Torque N/A or _____ ft/lbs

Pinned Yes No Loctited Yes No

Rod End to Rod End N/A or _____ ft/lbs

Pinned Yes No Loctited Yes No

Tie Rod Size OD: 1 Thread: 14 Length: 14 5/8 Qty: 4

Tie Rod Torque 520 ft/lbs N/A Initial DB

Fittings Installed Yes No N/A

Mounting Hardware Installed Yes No N/A

Pins Installed Yes No N/A

Grease Zerts Installed Yes No N/A

Bushings Inspected Yes No N/A

Breather Installed Yes No N/A

Painted: yellow Tagged: _____

Comments: cylinder test good no bypass

TESTED BY: Derek Broussard SIGNATURE SUPERVISOR: Ben Jones SIGNATURE

Derland Broussard PRINT NAME Ben Jones PRINT NAME

CYLINDER TEST REPORT

(For lift cylinders, backup cylinders, and industrial cylinders)

Customer: Diamond Description: Lift Cylinder
 Date: 7-25-13 Work No: 041434 Serial No: _____
 Technician: Derland Previous WO No's: 37899
 Test Pressure: 2,500 Piston Seal Type *: UCUP

* For all seal types except piston rings and leather packing, cylinder must pass 5 minute hold in both directions without pressure loss when tested using the pressurize, block, and monitor technique.

Bore 3 1/4 Rod Diameter 1 3/8 Stroke 13 1/2

Check for External Leaks Test Minimum of 5 cycles:
 Check for Internal Leaks Test Minimum of 5 cycles:

Pressure held 30 Minutes (minimum of 5) in each direction. Initial DB

No pressure drops observed. Initial DB

Piston/Retainer to Rod Torque N/A or _____ ft/lbs
 Pinned Yes No Loctited Yes No

Rod End to Rod End N/A or _____ ft/lbs
 Pinned Yes No Loctited Yes No

Tie Rod Size OD: 5/8 Thread: 18 Length: 18 1/2 Qty: 4
 Tie Rod Torque 150 ft/lbs _____ N/A Initial DB

Fittings Installed Yes No _____ N/A

Mounting Hardware Installed Yes No _____ N/A

Pins Installed Yes No _____ N/A

Grease Zerts Installed Yes No _____ N/A

Bushings Inspected Yes No N/A

Breather Installed Yes No N/A

Painted: yellow Tagged: _____

Comments: cylinder test good no bypass

TESTED BY: Derland Broussard SIGNATURE SUPERVISOR: Don Jones SIGNATURE
Derland Broussard PRINT NAME Don Jones PRINT NAME

CYLINDER TEST REPORT

(For lift cylinders, backup cylinders, and industrial cylinders)

Customer: Diamond o/s Description: Air Cyl #1
Date: 7-26-13 Work No: 041434 Serial No: _____

Technician: Derland Previous WO No's: 37899

Test Pressure: 120 psi Piston Seal Type*: poly packs

* For all seal types except piston rings and leather packing, cylinder must pass 5 minute hold in both directions without pressure loss when tested using the pressurize, block, and monitor technique.

Bore 3 3/4 Rod Diameter 1 1/4 Stroke 5

Check for External Leaks Test Minimum of 5 cycles:

Check for Internal Leaks Test Minimum of 5 cycles:

Pressure held 30 Minutes (minimum of 5) in each direction. Initial DS

No pressure drops observed. Initial DS

Piston/Retainer to Rod Torque N/A or _____ ft/lbs

Pinned Yes No Loctited Yes No

Rod End to Rod End _____ N/A or _____ ft/lbs

Pinned Yes No Loctited Yes No

Tie Rod Size OD: N/A Thread: N/A Length: N/A Qty: N/A

Tie Rod Torque _____ ft/lbs N/A Initial _____

Fittings Installed Yes No _____ N/A

Mounting Hardware Installed Yes No N/A

Pins Installed Yes No _____ N/A

Grease Zerts Installed Yes No _____ N/A

Bushings Inspected Yes No N/A

Breather Installed Yes No _____ N/A

Painted: yellow Tagged: _____

Comments: cylinder test good no by pass

TESTED BY: Derland Brossard SUPERVISOR: Ben Jones

SIGNATURE

SIGNATURE

PRINT NAME

PRINT NAME

CYLINDER TEST REPORT

(For lift cylinders, backup cylinders, and industrial cylinders)

Customer: Diamond o/s Description: Air Cyl #2
 Date: 7-25-13 Work No: 041434 Serial No: _____
 Technician: Werland Previous WO No's: 37899
 Test Pressure: 120 psi Piston Seal Type *: _____

* For all seal types except piston rings and leather packing, cylinder must pass 5 minute hold in both directions without pressure loss when tested using the pressurize, block, and monitor technique.

Bore 3 3/4 Rod Diameter 1 1/4 Stroke 5

Check for External Leaks Test Minimum of 5 cycles:

Check for Internal Leaks Test Minimum of 5 cycles:

Pressure held 30 Minutes (minimum of 5) in each direction.

No pressure drops observed. Initial WB Initial WB

Piston/Retainer to Rod Torque N/A or _____ ft/lbs

Pinned Yes No Loctited Yes No

Rod End to Rod End N/A or _____ ft/lbs

Pinned Yes No Loctited Yes No

Tie Rod Size OD: N/A Thread: N/A Length: N/A Qty: N/A

Tie Rod Torque _____ ft/lbs N/A Initial _____

Fittings Installed Yes No _____ N/A

Mounting Hardware Installed Yes No N/A

Pins Installed Yes No _____ N/A

Grease Zerts Installed Yes No N/A

Bushings Inspected Yes No _____ N/A

Breather Installed Yes No N/A

Painted: yellow Tagged: _____

Comments: cylinder test good nobypass

TESTED BY: Werland Broussard SUPERVISOR: Don JBRWS

SIGNATURE
Werland Broussard
PRINT NAME

SIGNATURE
Don JBRWS
PRINT NAME

CYLINDER TEST REPORT

(For lift cylinders, backup cylinders, and industrial cylinders)

Customer: Diamond O/S Description: Clamp Cyl

Date: 7-26-13 Work No: 041434 Serial No: _____

Technician: Derland Previous WO No's: 37899

Test Pressure: 2,500 Piston Seal Type *: Varco

* For all seal types except piston rings and leather packing, cylinder must pass 5 minute hold in both directions without pressure loss when tested using the pressurize, block, and monitor technique.

Bore 10 Rod Diameter 8 Stroke 3

Check for External Leaks Test Minimum of 5 cycles:

Check for Internal Leaks Test Minimum of 5 cycles:

Pressure held 30 Minutes (minimum of 5) in each direction.

No pressure drops observed. Initial DB Initial DB

Piston/Retainer to Rod Torque _____ N/A or _____ ft/lbs

Pinned Yes No Loctited Yes No

Rod End to Rod End _____ N/A or _____ ft/lbs

Pinned Yes No Loctited Yes No

Tie Rod Size OD: N/A Thread: N/A Length: N/A Qty: N/A

Tie Rod Torque _____ ft/lbs _____ N/A Initial DB

Fittings Installed Yes No _____ N/A

Mounting Hardware Installed Yes No _____ N/A

Pins Installed Yes No _____ N/A

Grease Zerts Installed Yes No _____ N/A

Bushings Inspected Yes No _____ N/A

Breather Installed Yes No N/A

Painted: yellow Tagged: _____

Comments: cylinder test good no bypass

TESTED BY: Derland Broussard SUPERVISOR: Don Evans

SIGNATURE _____ SIGNATURE _____
PRINT NAME Derland Broussard PRINT NAME Don Evans



Parker Hannifin Corporation
Hose Products Division
30240 Lakeland Blvd.
Wickliffe, Ohio 44092

Type: HOSE SPECIFICATION	Page 1 of 8
Title: HYDRAULIC HOSE - NO-SKIVE TYPE - DOUBLE WIRE BRAID REINFORCED - RUBBER COVERED - ISO 1436-1 TYPE 2SN - PARKER HOSE STYLE 302	Specification GHS-302

1. **SCOPE:** This specification covers a double wire braid reinforced and rubber covered hose. In addition to the qualification test requirements outlined within this specification, the hose shall meet or exceed all the requirements specified in ISO 1436-1 standard for hose style 2SN.
2. **APPLICATION:** The hose is designed for use with:
 - petroleum base hydraulic fluids and lubricating oils within a temperature range of -40°C to +100°C (-40°F to +212°F)
 - water, water/oil emulsion and water/glycol hydraulic fluids up to +85°C (+185°F)
 - air up to +70°C (+158°F)
3. **CONSTRUCTION:** The hose shall consist of an extruded inner tube of oil resistant Nitrile synthetic rubber, two braids of high tensile steel wire reinforcement and an oil and weather resistant, black, wrapped finish synthetic rubber cover.
4. **QUALIFICATION:** All hose shall be qualified by the Parker Hose Products Division or its designee. The qualification shall consist of tests listed under "QUALIFICATION TEST REQUIREMENTS". The manufacturing plant shall supply test data indicating compliance with all the test requirements of ISO 1436-1 standard for hose style 2SN.
5. **QUALIFICATION TEST REQUIREMENTS:** The hose shall meet the following qualification requirements. Unless otherwise indicated, the test procedures shall be in accordance with ISO 6605 standard.
 - 5.1 **DIMENSIONS:** The hose shall meet the dimensional requirements specified in Table I.
 - 5.2 **CHANGE IN LENGTH:** The length change shall not exceed +2% to -4% when pressurized to the maximum working pressure listed in Table I.
 - 5.3 **BURST TEST:** There shall be no leakage, hose burst or any other indication of failure below the specified minimum burst pressure listed in Table I. A minimum of two hose assemblies shall be tested.
 - 5.4 **IMPULSE TEST:** The hose assemblies shall meet the requirements of ISO 1436-1 standard for 2SN hose. A minimum of four unaged hose assemblies shall be tested.
 - 5.5 **ADHESION TEST:** The hose shall meet the adhesion requirements specified in HS-L23.
 - 5.6 **COLD BEND TEST:** After exposure to -40°C (-40°F) for 24 hours, a hose assembly, not containing any fluid, except traces of assembly lubricant, if used, shall be bent to the minimum bend radius listed in Table I. The hose assembly shall exhibit no cover cracks, and shall not leak when subjected to the proof pressure (twice the maximum working pressure listed in Table I).
 - 5.7 **VACUUM TEST:** There shall be no evidence of hose blistering or collapse after exposure for 5 minutes at the vacuum rating listed in Table I.

Issue Date 24-JUN-2005	E.C.N. Number: 70600	Revision Letter: C	Revision Date: 03-AUG-2006	Specification GHS-302
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Parker Hannifin Corporation
 Hose Products Division
 30240 Lakeland Blvd.
 Wickliffe, Ohio 44092

Type: HOSE SPECIFICATION	Page 2 of 8
Title: HYDRAULIC HOSE - NO-SKIVE TYPE - DOUBLE WIRE BRAID REINFORCED - RUBBER COVERED - ISO 1436-1 TYPE 2SN - PARKER HOSE STYLE 302	Specification GHS-302

5.8 ABRASION TEST: Three hose samples shall not lose more than 0.5 g of weight each after 2 000 abrasion cycles when subjected to the abrasion test per ISO 6945, with a vertical force of $25 \pm 0,5$ Newtons (5.62 ± 0.11 lb).

6. FITTING COMPATIBILITY: All hose assemblies shall meet the requirements of this specification when tested with all applicable Parker fittings listed in HS-D02.

7. IDENTIFICATION: Layline marking shall conform to HS-302 pages 4 or 5, HS-C31 and HS-C25. Marking shall be applied by means of transfer tape that yields a black background with white letters, except the Parker logo shall be white with black letters, unless otherwise permitted in the purchase order. Additionally, a colored yarn shall be incorporated in the hose wall identifying the manufacturer by color code as designated by the Rubber Manufacturers Association.

8. INSPECTION TESTS: Inspection tests listed as follows shall be performed on two samples representing each lot of 150 to 3 000 m (500 to 10 000 ft) of bulk hose. Lots of less than 150 m (500 ft) of hose need not be subjected to these tests if a lot has been tested and met the requirements within the previous 12 month period.

8.1 DIMENSIONAL CHECK TEST: The hose shall meet the specified dimensional requirements.

8.2 PROOF TEST: There shall be no leakage or any other indication of failure when subjected to the proof pressure (twice the maximum working pressure listed in Table I). Two unaged hose assembly samples shall be tested.

8.3 CHANGE IN LENGTH TEST: The length change of one unaged hose assembly sample shall not exceed +2% to -4% when pressurized to the maximum working pressure listed in Table I.

8.4 BURST TEST: There shall be no leakage, hose burst or any other indication of failure below the specified minimum burst pressure listed in Table I. Two unaged hose assembly samples shall be tested.

8.5 VISUAL EXAMINATION: The hose shall not exhibit any imperfections as described in HS-D98 when visually examined and shall be properly marked in accordance with section 7.

9. REFERENCE SPECIFICATIONS:

ISO 1436-1

ISO 6605

ISO 6945

Parker HS-C24

Parker HS-C25

Parker HS-C31

Parker HS-D02

Parker HS-D98

Parker HS-L23

Issue Date 24-JUN-2005	E.C.N. Number: 70600	Revision Letter: C	Revision Date: 03-AUG-2006	Specification GHS-302
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TABLE I

HOSE SIZE				HOSE I.D.		WIRE O.D.		I.D. TO WIRE WALL THICKNESS		HOSE O.D.		COVER THICKNESS		I.D. TO WIRE CONCENTRICITY	
dash	mm	EN	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
-3	5	5	3/16	4.6 5.4	0.181 0.213	10.6 11.6	0.417 0.457	2.7 min.	0.106 min.	12.7 14.1	0.500 0.555	0.8 1.5	0.031 0.059	0.4	0.016
-4	6.3	6	1/4	6.2 7.0	0.244 0.276	12.1 13.3	0.476 0.524	2.8 min.	0.108 min.	14.3 15.7	0.563 0.618	0.8 1.5	0.031 0.059	0.4	0.016
-5	8	8	5/16	7.7 8.5	0.303 0.335	13.7 14.9	0.539 0.587	2.8 min.	0.110 min.	15.9 17.3	0.626 0.681	0.8 1.5	0.031 0.059	0.8	0.024
-6	10	10	3/8	9.3 10.1	0.366 0.398	16.1 17.3	0.634 0.681	3.2 min.	0.126 min.	18.3 19.7	0.720 0.776	0.8 1.5	0.031 0.059	0.6	0.024
-8	12.5	12	1/2	12.3 13.5	0.484 0.531	19.0 20.6	0.748 0.811	3.2 min.	0.124 min.	21.5 23.0	0.846 0.906	0.8 1.5	0.031 0.059	0.6	0.024
-10	16	16	5/8	15.5 16.7	0.610 0.657	22.2 23.8	0.874 0.937	3.2 min.	0.124 min.	24.7 26.2	0.972 1.031	0.8 1.5	0.031 0.059	0.6	0.024
-12	19	20	3/4	18.6 19.8	0.732 0.780	26.2 27.8	1.031 1.094	3.6 min.	0.142 min.	28.6 30.1	1.126 1.185	0.8 1.5	0.031 0.059	0.6	0.024
-16	25	25	1	25.0 26.4	0.984 1.039	34.1 35.7	1.343 1.406	4.4 min.	0.171 min.	37.3 38.9	1.469 1.531	1.0 2.0	0.039 0.079	0.8	0.030
-20	31.5	32	1 1/4	31.4 33.0	1.236 1.299	43.3 44.8	1.705 1.764	5.1 min.	0.201 min.	46.3 47.9	1.824 1.886	1.0 2.0	0.039 0.079	0.8	0.030
-24	38	40	1 1/2	37.7 39.3	1.484 1.547	49.6 52.0	1.953 2.047	5.7 min.	0.222 min.	53.5 55.4	2.106 2.181	1.3 2.5	0.051 0.098	0.8	0.030
-51	50	50	2	50.4 52.0	1.984 2.047	62.3 64.7	2.453 2.547	5.7 min.	0.222 min.	66.2 68.1	2.606 2.681	1.3 2.5	0.051 0.098	0.8	0.030

HOSE SIZE				I.D. TO O.D. CONCENTRICITY		MAXIMUM WORKING PRESSURE		MINIMUM BURST PRESSURE		MAXIMUM VACUUM RATING		MINIMUM BEND RADIUS		WEIGHT	
dash	mm	EN	inch	mm	inch	MPa (*)	psi	MPa (*)	psi	kPa (**)	In of Hg	mm	inch	kg/m	lb/ft
-3	5	5	3/16	0.8	0.030	42.0	6 000	168.0	24 000	95	28	90	3 1/2	0.31	0.21
-4	6.3	6	1/4	0.8	0.030	40.0	5 800	160.0	23 200	95	28	100	4	0.39	0.26
-5	8	8	5/16	1.0	0.040	35.0	5 000	140.0	20 000	95	28	115	4 1/2	0.42	0.28
-6	10	10	3/8	1.0	0.040	33.0	4 750	132.0	19 000	95	28	130	5	0.55	0.37
-8	12.5	12	1/2	1.0	0.040	28.0	4 000	112.0	16 000	95	28	180	7	0.67	0.45
-10	16	16	5/8	1.0	0.040	25.0	3 600	100.0	14 400	95	28	200	8	0.77	0.52
-12	19	19	3/4	1.0	0.040	21.5	3 100	85.0	12 400	80	24	240	9 1/2	1.00	0.67
-16	25	25	1	1.3	0.050	16.5	2 400	65.0	9 600	80	24	300	12	1.49	1.00
-20	31.5	31	1 1/4	1.3	0.050	12.5	1 800	50.0	7 200	80	24	420	16 1/2	1.73	1.16
-24	38	38	1 1/2	1.3	0.050	9.0	1 300	36.0	5 200	80	24	500	20	2.14	1.44
-32	51	51	2	1.3	0.050	8.0	1 150	32.0	4 600	80	24	630	25	2.96	1.99

(*) For pressure values in bars, multiply the MPa value times 10.
 For pressure values in kPa, multiply the MPa value times 1 000.
 For pressure values in kgf/cm², multiply the MPa value times 10.2.

(**) Value listed is for negative gage pressure in kPa. For kPa absolute subtract kPa gage from 101 kPa.
 For negative gage pressure in bar, divide the kPa value by 100.

Issue Date 24-JUN-2005	E.C.N. Number: 70600	Revision Letter: C	Revision Date: 03-AUG-2006	Specification GHS-302
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MAGNETIC PARTICLE INSPECTION REPORT



Owensby & Kritikos, Inc.

NEW ORLEANS DIVISION
 671 Whitney Ave., Bldg. B
 Gretna, La 70056
 Telephone 504/368-3122
 Fax 504/362-4546
 E-mail gretna@ok-insp.com
 Internet www.ok-insp.com

LAFAYETTE DIVISION
 111 Lafferty Drive
 Lafferty Industrial Park
 Broussard, La 70518
 Telephone 337/837-9721
 Fax 337/637-1316
 E-mail lafayette@ok-insp.com

MT _____
 CHECK
 JSA Attached
 JSA Not Required
 Utilized Client's JSA

PAGE _____ OF _____
 DATE _____

CUSTOMER _____ LOCATION _____
 JOB DESCRIPTION _____
 CONTRACTOR _____ JOB NO. _____
 CUSTOMER ORDER NO. _____ SPECIFICATION _____
 EQUIPMENT I.D. _____ MODEL NO. _____ SERIAL NO. _____

TECHNIQUE CHECK ONLY THOSE APPLICABLE	SKETCH OF ITEM / WELD			
WET METHOD <input type="checkbox"/>				
FLUORESCENT <input type="checkbox"/>				
DRY METHOD <input type="checkbox"/>				
VISIBLE <input type="checkbox"/>				
MAGNETIC METHOD <input type="checkbox"/>				
PROD METHOD <input type="checkbox"/>				
CABLES/COIL <input type="checkbox"/>				
CURRENT AC <input type="checkbox"/> DC <input type="checkbox"/>				
AMPERAGE <input type="checkbox"/>				
ITEM/WELD I.D.	DESCRIPTION	ACCEPT	REJECT	COMMENTS

INSPECTOR _____ WORK HRS _____ MATERIALS USED: _____
 ASSISTANT _____ TRAVEL HRS _____
 CLIENT _____ MILEAGE _____
 VEH # _____

MAGNETIC PARTICLE INSPECTION REPORT

Owensby & Kritikos, Inc.



NEW ORLEANS DIVISION
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 Gretna, La 70056
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 Fax 337/837-1316
 E-mail lafayette@ok-insp.com

MT

- CHECK
 JSA Attached
 JSA Not Required
 Utilized Client's JSA

PAGE _____ OF _____

DATE _____

CUSTOMER Alouy LOCATION Gretna, La

JOB DESCRIPTION MT inspection of 2" dia. pipe

CONTRACTOR WACO JOB NO. _____

CUSTOMER ORDER NO. WACO 00100 SPECIFICATION ASME

EQUIPMENT I.D. 10" dia MODEL NO. 1000 SERIAL NO. 1000

TECHNIQUE CHECK ONLY THOSE APPLICABLE	SKETCH OF ITEM / WELD			
WET METHOD <input checked="" type="checkbox"/>				
FLUORESCENT <input type="checkbox"/>				
DRY METHOD <input type="checkbox"/>				
POLE <input checked="" type="checkbox"/>				
YOKE METHOD <input checked="" type="checkbox"/>				
PROD METHOD <input type="checkbox"/>				
CABLES/COIL <input type="checkbox"/>				
CURRENT AC <input checked="" type="checkbox"/> DC <input type="checkbox"/>				
AMPERAGE <u>200</u>				
ITEM/WELD I.D.				DESCRIPTION
<u>2" dia. pipe</u>	<u>Welds</u>	<u>✓</u>	<u>✓</u>	<u>MT inspection</u>
<u>2" dia. pipe</u>	<u>Welds</u>	<u>✓</u>	<u>✓</u>	<u>MT inspection</u>
<u>2" dia. pipe</u>	<u>Welds</u>	<u>✓</u>	<u>✓</u>	<u>MT inspection</u>

INSPECTOR Bob... WORK HRS 4 MATERIALS USED: _____
 ASSISTANT _____ TRAVEL HRS _____
 CLIENT WACO MILEAGE _____ VEH # _____

FORUM

1196 Petroleum Pkwy
Broussard, LA 70518
Phone: (337) 837-1676
Fax: (337) 837-6599
www.fot.com

Calibration Verification

Report No. AOI/CAL.101

This document serves to verify that the following equipment(s) has been tested and calibrated to standards laid down by Acadiana Oilfield Instruments.

Customer: SUPERIOR MANUFACTURING

Vessel: PH-60

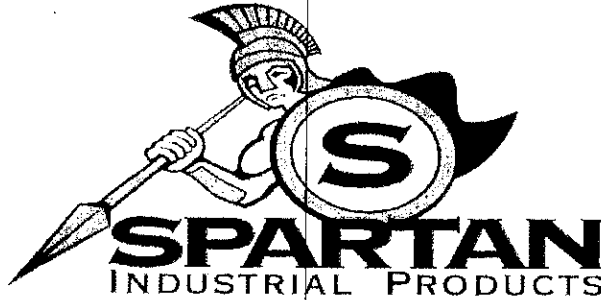
Report Date: 2/15/2013
Job No: S54647
Model/Description: GAUGE, PH60
Serial No: 237
Capacity: 2,500 PSI X 75,000 FT. LBS
Room Temperature: 72
Date of Calibration: 2/15/2013
Date of Next Calibration: 8/15/2013

Note: THE ABOVE IS CALIBRATED TO 2,500 PSI AT FULL SCALE

Method of Calibration

The Described item was calibrated using Pressure Gauge S/N AC-1048001 with certificate no. 6257 which is Traceable back to the National Institute of Technology.

Calibrated By: BRADY COMEAUX
BRADY COMEAUX - Service Technician



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0637BR- 3 INVOICE# 309186

DESCRIPTION 3/8" X 48" 3-K HOSE W/ MNPT E/E
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

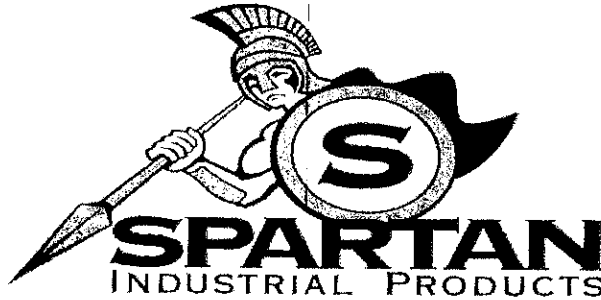
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0637BR- 4 INVOICE# 309186

DESCRIPTION 3/8" X 48" 3-K HOSE W/ MNPT E/E
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

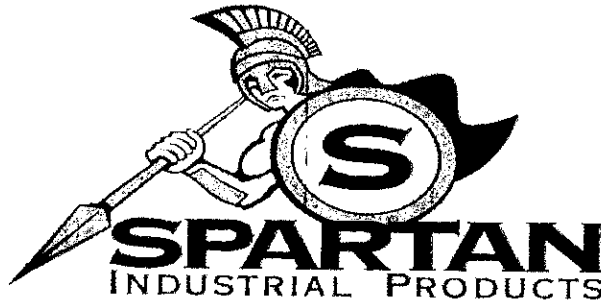
BURST PRESSURE 12000 SERVICE HYDRAULIC

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ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0638BR- 3 INVOICE# 309186

DESCRIPTION 1/2" X 10' 3-K HOSE W/ MNPT E/E
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

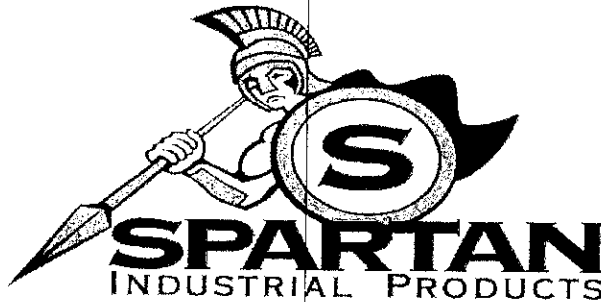
BURST PRESSURE 12000 SERVICE HYDRAULIC

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ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
SERIAL # 0638BR- 4 PD# S54950
INVOICE# 309186

DESCRIPTION 1/2" X 10' 3-K HOSE W/ MNPT E/E
W/ HDSE GUARD AND TAG

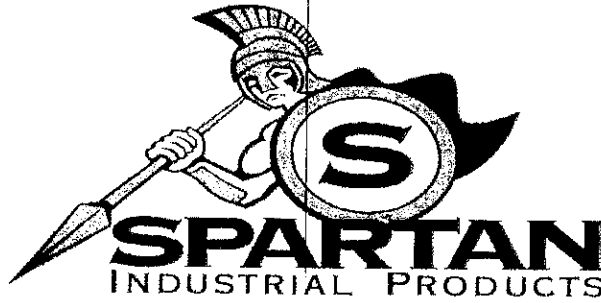
WORKING PRESSURE 3,000 TEST PRESSURE 4,500
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0639BR- 2 INVOICE# 309186

DESCRIPTION 1/4" X 30" 3-K HOSE W/ MPT X FJIC90
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

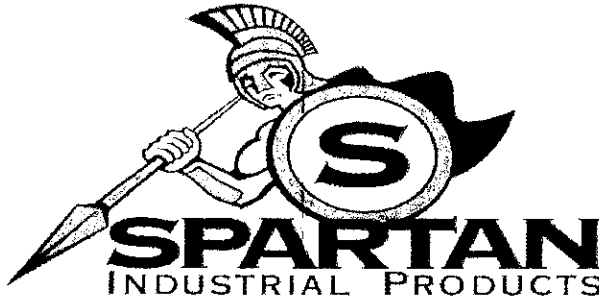
BURST PRESSURE 12000 SERVICE HYDRAULIC

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ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0640BR- 3 INVOICE# 309186

DESCRIPTION 1/4" X 16" 3-K HOSE W/ FJIC E/E
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

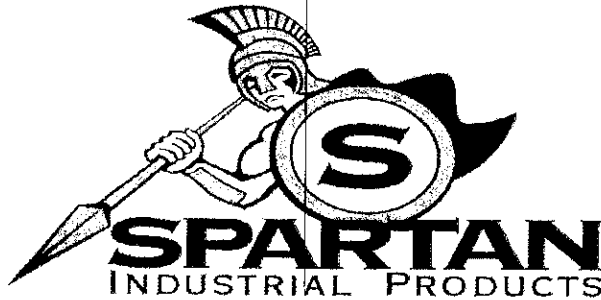
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0640BR- 4 INVOICE# 309186

DESCRIPTION 1/4" X 16" 3-K HOSE W/ FJIC E/E
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

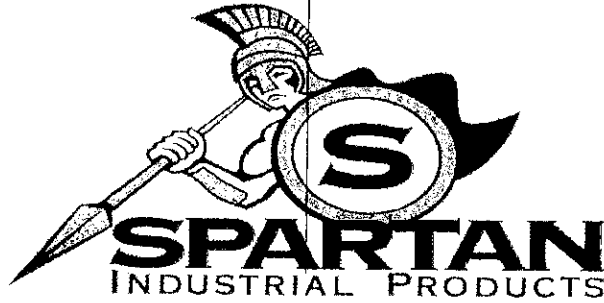
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0641BR- 2 INVOICE# 309186

DESCRIPTION 1/4" X 46" 3-K HOSE W/ FJIC X FJIC90
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

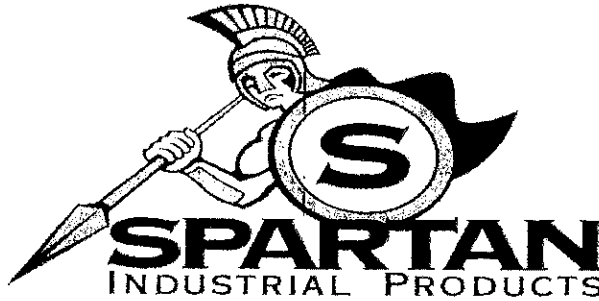
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0642BR- 2 INVOICE# 309186

DESCRIPTION 1/4" X 53" 3-K HOSE W/ FJIC E/E
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

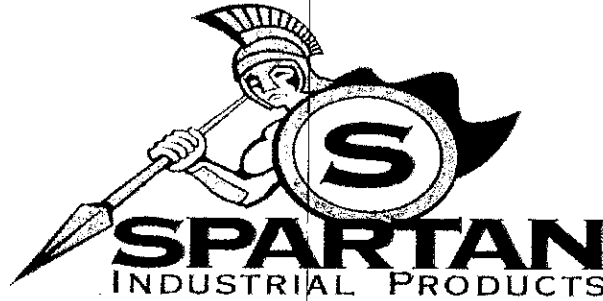
BURST PRESSURE 12000 SERVICE HYDRAULIC

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ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

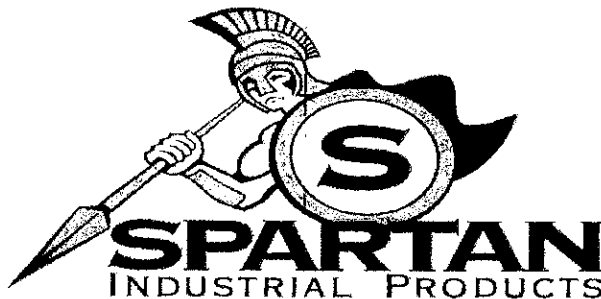
CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0643BR- 3 INVOICE# 309186
DESCRIPTION 3/8" X 13" 3-K HOSE W/FJIC X FJIC90
W/ HOSE GUARD AND TAG
WORKING PRESSURE 3,000 TEST PRESSURE 4,500
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0643BR- 4 INVOICE# 309186

DESCRIPTION 3/8" X 13" 3-K HOSE W/FJIC X FJIC90
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

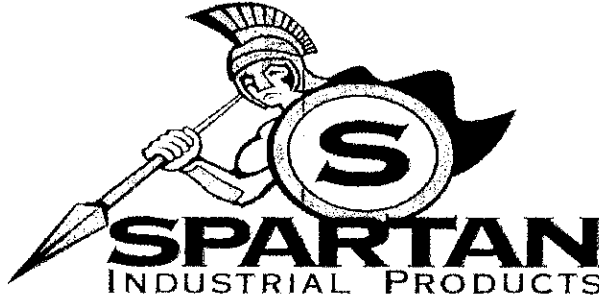
BURST PRESSURE 12000 SERVICE HYDRAULIC

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ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0644BR- 3 INVOICE# 309186

DESCRIPTION 3/8" X 17.5" 3-K HOSE W/FJIC, X FJIC90
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

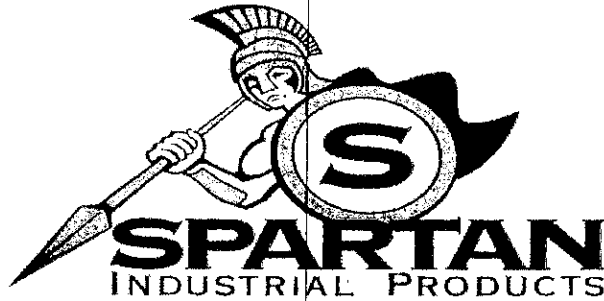
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0644BR- 4 INVOICE# 309186

DESCRIPTION 3/8" X 17.5" 3-K HOSE W/FJIC X FJIC90
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

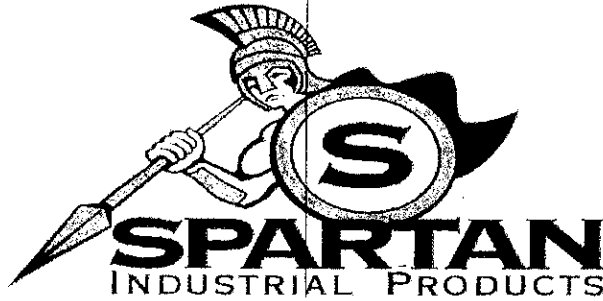
BURST PRESSURE 12000 SERVICE HYDRAULIC

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ELECTRICAL CONDUCTIVITY TESTED OK

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WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

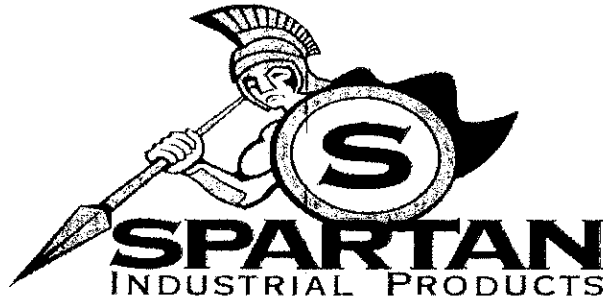
CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0645BR- 2 INVOICE# 309186
DESCRIPTION 3/8" X 55" 3-K HOSE W/FJIC X FJIC90
W/ HOSE GUARD AND TAG
WORKING PRESSURE 3,000 TEST PRESSURE 4,500
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0646BR- 2 INVOICE# 309186

DESCRIPTION 3/8" X 64.5" 3-K HOSE W/FJIC X FJIC90
W/ HOSE GUARD AND TAG

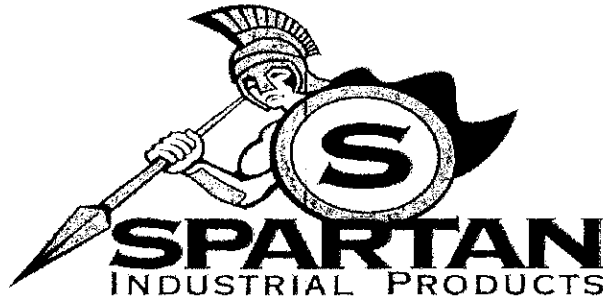
WORKING PRESSURE 3,000 TEST PRESSURE 4,500
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0647BR- 2 INVOICE# 309186

DESCRIPTION 3/8" X 24" 3-K HOSE W/ FJIC X 1/2" FJ90
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

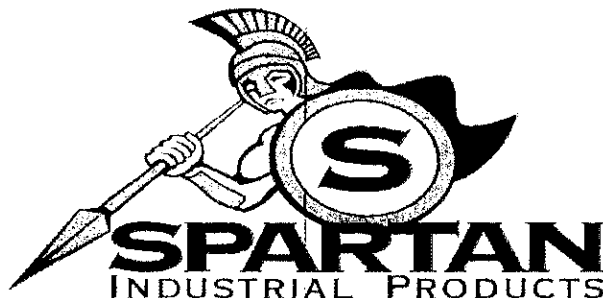
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0648BR- 3 INVOICE# 309186

DESCRIPTION 1/2" X 12.5" 3-K HOSE W/FJIC X FJIC90
W/ HOSE GUARD AND TAG

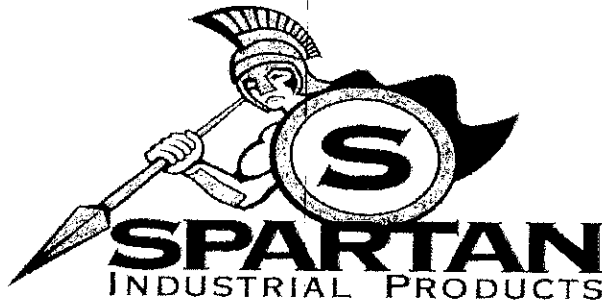
WORKING PRESSURE 3,000 TEST PRESSURE 4,500
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

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TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0648BR- 4 INVOICE# 309186
DESCRIPTION 1/2" X 12.5" 3-K HOSE W/FJIC X FJIC90
WI HOSE GUARD AND TAG
WORKING PRESSURE 3,000 TEST PRESSURE 4,500
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



DRELLING &
COMPLETIONS

PIPE
REPAIRS
SUPERIOR MANUFACTURING & HYDRAULICS

TO: Diamond O/S

June 19, 2013

Quote# 1193

Attn: Charley Breedlove

cc: M. Coates

Rig: Ocean Summit

SUBJECT: Varco PH60 Pipe Handler,
WO# 041434

Superior Manufacturing & Hydraulics, Inc. respectfully submits the following estimate for your consideration regarding the unit described above:

This unit will be sandblasted and all welds inspected for cracks using wet mag techniques, completely disassembled and evaluated. The following are our recommendations to rebuild this unit to nearly new condition:

Item #1 Clamp Cylinder

Cylinder seal surface pitted beyond repair

Option 1

Remanufactured clamp cylinder supplied by McCoy

\$12,701.85

Or

Option 2

Diamond o/s to supply clamp cylinder.

MCCOY

MOONVILLE, OHIO 45068-1000

DRILLING &
COMPLETIONS

THE
ASSOCIATED TECHNOLOGIES
SERVICE MANUFACTURING & TOOLING

Item #2 Torque Cylinder #1
Hone barrel
Replace rod
Replace piston
Replace gland
Rework gland retainer plate reuse
Replace tie rods
Replace nylocks
Rework end plates reuse
Replace Shcs
Tap Bolts holes
Replace all seals & packing
Rework trunions

Reassemble & test

Item #3 Torque Cylinder#2
Hone barrel
Replace rod
Replace gland
Replace piston
Rework trunions
Replace tie rods
Replace nylocks
Rework gland retainer plate reuse
Replace all seals
Replace shcs
Rework end plates reuse
Replace bushing in rod eye

Reassemble & test

MCCOY

MOOREHEAD, ALABAMA 36586-1000

WELDING &
COMPLETION

PIPE
FITTING TECHNOLOGIES
SUPERIOR MANUFACTURING & TECHNOLOGIES

Item #4 Lift Cylinder
Hone Barrel
Tap Bolt holes
Replace rod clevis
Replace piston
Replace gland
Rework gland retainer plate reuse
Replace tie rods
Replace nylocks
Replace seals
Rework end plates reuse
Replace rod

Reassemble & test

Item #5 Air Cylinder #1
Hone barrel
Replace rod
Replace piston
Rework gland reuse
Rework rod eye reuse
Replace all seals
Rework threads on barrel and gland

Reassemble & test

Item #6 Air Cylinder #2
Hone barrel
Replace rod
Replace piston
Rework gland reuse
Replace all seals
Rework rod eye reuse
Rework threads on barrel and gland

Reassemble & test

Item #7

Relief Manifold

Replace valve cartridges

Replace Torque gauge

Replace check valves

Replace seals

Rework block reuse

Reassemble, adjust valve settings to OEM specifications & test

Item #8

Diverter Valve

Replace check valve

Replace orings

Rework detent fitting

Replace spool

Reassemble & test

Item #9

Torque Tube

Rework spline chamfers

Line bore pin holes; install bushings

Rework worn areas, machine to size

Rework bolt holes

Item #10

Pipe Guide

Replace with new 7 3/4"

Item #11

Safety Actuator Arms

Rework worn surfaces and machine to size

Replace cam followers

Rework pin holes; install bushings

Item #12

Safety Arm Mounting Bracket

Rework worn surfaces and machine to size

Rework bolt holes

Item #13

Die Holders

Replace die holders

Replace dies

Replace die clips

- Item #14 Air Cylinder Mounting Bracket
Rework pin holes; install bushings
- Item #15 Torque tube stabilizer
Rework worn areas and machine to size
Rework bolt holes
Replace stabilizer springs
- Item #16 Stop Tubes
Replace long stop tubes
Rework short stop tubes
- Item #17 Miscellaneous:
Replace grease zerts
Replace safety wire
Replace 3-way air valves
Replace air exhaust
Replace all stainless steel pins
Replace quick disconnects
Replace all hoses & spring guards
Replace assorted nuts, bolts, fittings, cotter pins, etc.
- Item #18 Body:
Rework bolt holes
Line bore pin holes; install bushings
Rework worn areas and machine to size
- Item #19 Frame
Replace Frame (bent)
Reuse bottom plate and torque tube stabilizer plate
Rebushing trunion pin holes on bottom plate
- Item #20 Secondary Retention
Install secondary retention to meet Superior Mfg. specifications



DRILLING & COMPLETIONS

WSP
FELICIANO TECNICO ASSOCIADOS
SUPERIOR INDUSTRIAL EQUIPMENT & SERVICES

Item #21 Lifting rod
Replace lifting rod

Customer to specify length

Item # 22 Bell housing
Rework worn areas and machine to size
Rework guide arms
Replace springs
Rework bolt holes

Parts to rebuild PH-60 pipe handler \$15,600.00
Labor to rebuild PH-60 pipe handler \$16,900.00

Reassemble all components; hydraulically test as a unit & paint, using high build epoxy paint.

Prepare documentation package.

Estimated cost to rebuild this unit (standard) \$33,500.00

Remanufactured clamp cylinder \$12,701.85

Total with McCoy supplying clamp cylinder \$46,201.85

Delivery = approximately 5 - 6 weeks Standard

Crating (optional) \$650.00

Pallet (optional) \$275.00

We appreciate the opportunity to submit this quote for your consideration, and look forward to working with you,

Respectfully Submitted,

Marcus Curry

**Diamond Offshore Company
Terms and Conditions of Purchase**

The party to which this Purchase Order ("Order") is addressed (herein referred to as the "Seller") by acceptance of this Order agrees that the purchase by Diamond Offshore Company or its affiliated companies (individually and collectively referred to herein as "Buyer") of the goods and services covered by the Order shall be governed by the following terms and conditions:

1. ACCEPTANCE; OTHER TERMS; CHANGE ORDERS

1.1 Commencement of Performance. Seller's commencement of performance of this Order shall constitute acceptance of all of the terms and conditions of this Order without reservation, whether or not Seller has signed and returned a written acknowledgement.

1.2 Terms of Purchase. This Order is an offer by Buyer to purchase the goods and services described in the Order only upon the terms and conditions contained in this Order without regard to any conflicting terms and conditions contained in Seller's quote or proposal for the goods or services the subject of this Order, even if such quote or proposal is referred to or attached to this Order, and Seller's acceptance of this Order shall be limited to such terms and conditions contained in this Order. Any terms set forth or contained in Seller's quotation, acceptance or otherwise which are additional to or different from those contained herein shall be of no force and effect and shall not be binding upon Buyer unless expressly agreed in writing by Buyer.

1.3 Other Agreements. In the event there is any other written agreement between Buyer and Seller in existence between Buyer and Seller with respect to Buyer's purchase of the goods or services described in this Order, then such other agreement shall govern such purchase only to the extent of any conflict between the terms and conditions contained in this Order and the terms and conditions contained in such other agreement.

1.4 Buyer's Changes; Change Orders. Buyer may, at any time, unilaterally change the terms and conditions of this Order, including, without limitation changes in (i) the technical specifications of the goods and/or services covered by the Order, (ii) quantities, (iii) methods of shipping and/or packaging; (iv) inspection standards, and (v) place of delivery ("Buyer's Changes"). The change, together with any such adjustments, shall be set forth in a written Change Order issued by Buyer and acknowledged by Seller either in writing or by Seller's commencement of performance pursuant to the written Change Order, whether or not Seller has signed and returned a written acknowledgement. If any such change affects the purchase price or delivery date, then Buyer and Seller shall mutually agree upon adjustment of the same.

2. REIMBURSEMENT OF EXPENSES

2.1 Reimbursement of Expenses. If this Order provides for reimbursement of Seller's expenses, such expenses must be incurred in accordance with our corporate policies, which are available upon request.

3. SHIPPING; INSURANCE; TRANSFER OF TITLE; DUTY DRAWBACKS

3.1 Incoterms. All shipping terms in this Order refer to International Chamber of Commerce, *Incoterms 2000*. Title to goods will pass to Buyer when delivery is complete according to section A4 of the applicable Incoterm as described in *incoterms 2000*. If the designated incoterm requires cargo insurance, Seller must purchase insurance under Clause A of the applicable Incoterm.

3.2 Overshipments and Early Shipments. If Seller ships more goods than ordered, or if Seller delivers the goods earlier than ordered, Buyer may purchase some or all of the goods or return some or all of the goods to Seller at Seller's risk and expense.

3.3 Duty Drawbacks. Buyer reserves the right to any duty drawbacks.

4. PACKAGING AND LABELLING. Seller must package all goods in accordance with good commercial practice and in a manner acceptable to common carriers for shipment at the lowest rate for the goods involved, and adequate to insure safe arrival of the goods to their destination. Each shipment must be adequately labeled to identify it with this Order.

5. TIME IS OF THE ESSENCE; CANCELLATION

5.1 Time is of the Essence. Time is of the essence under this Order.

5.2 Cancellation. Buyer may cancel this Order in whole or in part if Seller does not deliver the goods or perform the services in full and in conformity with this Order within the time specified in this Order or, if no time period is specified, within a reasonable time. If Buyer cancels this Order for default and it is later determined that Seller was not in default, Seller's rights will be construed as if the cancellation was for Buyer's convenience. Buyer may cancel this Order, in whole or in part, at any time for its convenience. If Buyer cancels this Order for its convenience and Buyer gives Seller less than ten (10) days' notice of cancellation, Buyer will reimburse Seller's actual reasonable out-of-pocket costs that are not capable of being mitigated. To be reimbursed, Seller must submit its written request for reimbursement within thirty (30) days after Buyer's notice of cancellation. Upon receipt of Buyer's notice of cancellation, regardless of the reason for the cancellation, Seller must immediately stop all work in progress and use its best efforts to mitigate any costs associated with the cancellation. Buyer has the option to purchase Seller's work in progress, including any raw materials Seller may have obtained to use in Seller's work. Buyer's price to purchase Seller's work in progress will be a prorated price based on the percentage of work remaining to be completed. Buyer's price to purchase any raw materials will be Seller's actual cost. Seller is not entitled to any other remedy for cancellation of this Order except as provided in this Subsection 5.2.

6. WARRANTIES

6.1 Warranty Period. Except for latent defects, fraud or such gross mistakes of Seller as amount to fraud, notice of any claim based on the warranties under this Order must be given by Buyer to the Seller within eighteen (18) months following delivery to the Buyer or twelve (12) months from commencement of use or receipt of satisfactory qualification test reports, whichever is later.

6.2 Warranty - Goods. Seller warrants that (a) the goods shall be of high quality and workmanship within recognized industry standards, free from defect, of merchantable quality and fit for the intended purpose or use for which they are

purchased to the extent such purpose or use is known, or reasonably known, to Seller; (b) the goods shall fully comply with any data, reference to data or specifications provided by Buyer and/or any samples or documentation provided by Seller; (c) the goods shall be conveyed with clear title, free of lien or encumbrance of security interest upon delivery of the goods to Buyer or other party authorized by Buyer; and (d) the goods shall not violate any intellectual property rights of any third party.

6.3 Warranty – Services. Seller warrants that: (a) any services provided under this Order shall be performed in a professional and a workmanlike manner and in full conformance with any specifications or requirements provided by Buyer or any documentation provided by Seller; and (b) the performance of the services will not violate any intellectual property rights of any third party or any duty of confidentiality Seller owes to a third party.

6.4 Other Warranties. The warranties listed above are in addition to any other warranties made by Seller or imposed by law, whether expressed or implied, and such warranties shall survive inspection, testing acceptance of, and payment for the goods and shall accrue to and be assignable to Buyer's successors and assigns.

6.5 Remedies. If any goods or services do not comply with the warranties, Buyer may, at its option, and without additional cost to it, (a) require Seller to repair or replace the goods such that the goods will conform to the warranties, (b) require Seller to re-perform any services until the services conform to the warranties, (c) return any non-conforming goods to Seller at Seller's expense for a full refund, (d) correct the non-conformance and charge Seller for the cost to make the correction, and/or engage a third party to provide substitute goods or services and charge Seller for the costs of obtaining the substitute goods or services from the third party. The remedies listed above are in addition to any other remedies available to Buyer at law or in equity. Buyer's review and/or approval of Seller's materials or designs shall not relieve Seller of its responsibilities hereunder.

7. INTELLECTUAL PROPERTY INDEMNIFICATION

7.1 Intellectual Property Indemnification. Seller will defend and indemnify (including attorneys fees) Buyer, its parent and affiliates against any claim alleging that Seller's goods or services infringe or violate a patent, copyright, trademark, trade secret, or any other contractual right, proprietary right or intellectual property right of any third party.

8. LIENS AND RELATED CLAIMS

8.1 Liens and Related Claims. Seller agrees to pay or cause to be paid all valid claims for payment arising out of or in connection with labor, material, supplies and/or services provided by Seller in connection with this Order. Seller agrees that it will not permit and agrees to fully release, defend,

indemnify (including attorney's fees, filing fees and other related expenses) and hold harmless Buyer, its parent and affiliates and each party for which Buyer is working, from and against any and all claims, liens, encumbrances, demands, causes of action, liabilities and damages of every kind and character ("Liens") of any kind that are asserted, affixed or filed against any property of Buyer (including, without limitation, any vessel) or the lease on which operations are conducted by Buyer or any property of others, including any party for which Buyer is working, arising out of or in connection with, labor, material, supplies and/or services provided by Seller and/or its subcontractors in connection with this Order. If Seller fails or refuses to pay any such claim and/or if any such Lien is asserted, affixed or filed, Buyer has the right to withhold the amount of the claim and/or Lien from any money due or to become due to Seller and pay such claim and/or discharge any such Lien. Before any payment is made to Seller under this Order, Buyer may require that Seller furnish evidence satisfactory to Buyer that there are no unsatisfied claims for labor, materials, equipment, and supplies or for injuries to persons or property not covered by insurance in connection with this Order.

9. MISCELLANEOUS

9.1 Governing Law. This Order shall be governed by the law of the State of Texas, without regard to its conflict of law rules which would refer to another jurisdiction. The United Nations Convention on Contracts for the International Sale of Goods shall not apply to this Order.

9.2 Venue. The sole and exclusive venue for the resolution of any and all disputes arising from or relating to this Agreement is in the state or federal courts located in Harris County, Texas.

9.3 Compliance with Laws. Seller must comply with all applicable laws in performance of its obligations under this Order.

9.4 Assignment. Seller may not assign its rights or delegate its obligations under this Order without the prior written consent of Buyer.

9.5 Incorporation of Executive Orders by Reference. The Equal Employment Opportunity Clause required under Executive Order 11246, the affirmative action commitment for disabled veterans and veterans of the Vietnam era, set forth in 41 CFR 60-250.4, the affirmative action clause for disabled workers, set forth in 41 CFR 60-741.5(a), and the related regulations of the Secretary of Labor, 41 CFR Chapter 60, are incorporated by reference in this Order. By accepting this Order, Seller certifies that it is in compliance with the authorities cited above, and that Seller does not maintain segregated facilities or permit its employees to perform services at locations where segregated facilities are maintained, as required by 41 CFR 60-1.8.

VARCO PIPE HANDLER DATA

Work Order #: 041434 Date: 8-22-13

Rig Ocean Summit

Serial #: 2043186 Ship Date: _____


FAT Date: 8-22-13

Test Conducted By: Douglas Broussard

Test Witnessed By: Brian Pierce

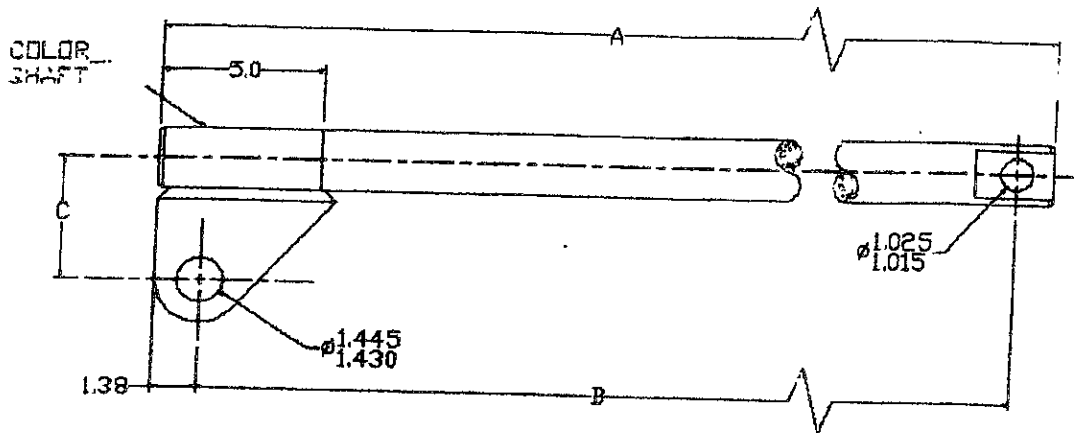
Supervisor [Signature]

Location: Broussard

 **DIAMOND OFFSHORE**
Brian Pierce
Superintendent
Equipment & Repair Q/A

Pipe Handler Hanging Shaft (Lifting Rod) Identification Guide

Pipehandler Model	Rotating Head Configuration	Load Rating (ton)	Dim. A (inches)	Dim. B (inches)	Dim. C (inches)	Color Coding
PH 85	7-port w/o BX	650/750	37.06	34.56	3.5	Red
PH 85	7-port w/o BX	500	39.56	37.06	4	Black
PH 85	10-port w/BX	650/750	35.46	32.96	3.5	White
PH 85	10-port w/BX	500	37.96	35.46	4	Green
PH 60	7-port	500	42.6	40.1	3.5	Blue
PH 60	7-port	650	40.1	37.6	3	Orange



NOTE

SEQUENCE VALVES HAVE *NOT* BEEN SET

THEY MUST BE SET PER MANUFACTURER SPECS BEFORE OPERATION

UPON INSTALLATION, CYCLE UNIT FOR APPROXIMATELY 15 - 20 MINUTES TO REMOVE ANY AIR FROM LINES



CUSTOMER: Diamond O/S MODEL: PH 60 pipe handler
 RIG: Ocean Summit W/O: 041434 S/N: 0043186
 (IF APPLICABLE)
 DATE: 6-19-13 TECH.(S): Derland SUPERVISOR: [Signature]

1. VISUAL EXAMINATION / DOCUMENTATION

(Attach "As Received" digital photos, note and document any shipping damage.)

- A. Stop Tube installed? Yes / No Long / Short old style
- B. Stop Tube stored? Yes / No Long / Short
- C. Lift Cylinder Shims? Yes / No Number: 54 Height: 1 1/2
- D. Air Cylinder Adjustment Distance: _____ (Not applicable for PH60)
- E. Die Holders installed? Yes / No Record Thickness: Front 2 1/4 Rear 2 1/4
- F. Torque Tube Guide Ring: ID 7 3/4
- G. Length of Lifting Rod Center Line to Center Line: 42 5/8 w/ long pad eye
- H. Drift Test: Install Drift Mandrel (7" OD f/PH60, 8 5/8" OD f/PH85).

Pressurize clamp cylinder to 2000 psi. Note: Depending on condition of Pipe Handler in As Received condition, it may be necessary to connect power unit directly to clamp circuit. If clamp cylinder will not hold pressure, indicate clamp cylinder failed this initial test. Pass / Failed Initial _____

If clamp cylinder holds 2000 psi, measure distance between mandrel and torque tube spline ID on side adjacent to frame _____ and side opposite of frame _____

- 2. Disassemble Pipe Handler per Varco instructions. Ref. Varco Manual pages 67-79.
- 3. Disassemble and evaluate all cylinders, clamping jaws, pins, and structural components, etc., by completing the Pipe Handler Evaluation Report.
(Attach digital photos of worn or damaged areas on components.)

Forwarded information to Customer Service on date: _____ (Attach Proposal)

Job Approval Date: _____ PO Number: _____

Blast structure, torque tube, frame, body, clamp cylinder body, stabbing guide, mounting shaft, clamping jaws, etc.

Magnetic Particle Inspection Results - Indicate: No Faults / Faults found (Describe)

Date: _____ Report No.: _____ (Attach Report)

4. COMPONENT TEST DATA SUMMARY

Repair / Rebuild all cylinders using new seals. Test cylinders using block & monitor technique. Replace all cartridges. Attach test report for:

<u>Item</u>	<u>Test Pressure</u>	<u>Tested By</u>	<u>Work Order</u>
A. Lift Cylinder	2500	<u>[Signature]</u>	<u>041434</u>
B. Torque Cylinder #1	2500	<u>[Signature]</u>	<u>041434</u>
C. Torque Cylinder #2	2500	<u>[Signature]</u>	<u>041434</u>
D. Clamp Cylinder	2500	<u>[Signature]</u>	<u>041434</u>
E. Air Cylinder #1	120	<u>[Signature]</u>	<u>041434</u>
F. Air Cylinder #2	120	<u>[Signature]</u>	<u>041434</u>
G. Valve Manifold	2500	<u>[Signature]</u>	<u>041434</u>

5. Reassemble unit per Varco instructions, manual pages 69-79. Do not install Lift Cylinder Stop Tube. Torque bolts & connectors. Ref. Varco manual pages 69 and 77.

	<u>Torque</u>	<u>Tech Initials</u>
Cylinder rod end to cylinder rod* * The torque cylinder rod ends are threaded into the rods with loctite and cross pinned.	944 ft/lbs	<u>[Signature]</u>
Frame to clamp cylinder body	250 ft/lbs	<u>[Signature]</u>
Stabbing guide to body	250 ft/lbs	<u>[Signature]</u>
Die retainer screws	380 ft/lbs	<u>[Signature]</u>
Body hinge pin retainer screws	150 ft/lbs	<u>[Signature]</u>
Stabbing guide spring retainer screws	75 ft/lbs	<u>[Signature]</u>
Jaw retaining screws	110 ft/lbs	<u>[Signature]</u>
Install safety wire and/or cotter pins		<u>[Signature]</u>

6. OPERATIONAL TESTING (Use 30-35 gpm, 2500 psi Pressure Compensated Power Supply.)

See Adjustment Procedures doc. March 18, 1994 with manifold illustration, schematic doc. 107530 sht 3 of 3, and Varco Manual page 4-28 (Figure 4-23 / PH85 Torque Wrench Hyd. Operation Schematic).

- A. Suspend Pipe Handler from lifting eye. Connect a pup joint or joint of drill pipe to the saver sub and makeup hand tight. Be sure to use the correct thread compound when making up. (Alternately install Superior test sub. Operational testing requires use of 2-position 4-way valve. Connect test hoses to Pipe Handler manifold so that normally pressured line is connected to "A" port.)
NOTE: When adjusting torque wrench manifold needle valves, loosen the locknut around the valve stem and use a 5/32" hex wrench to adjust the valve. After obtaining desired setting tighten locknut around valve stem.
- B. Turn off the HPU, screw in the RECYCLE, CLAMP, and TORQUE sequence valves on the torque wrench manifold.
- C. Fully back out the pressure reducing valve (PRV), then screw in one turn.
- D. Turn the lift/lower flow control valve fully in, and then back it out three turns. Turn on the hydraulic power unit. Confirm lift cylinder extends to lower Pipe Handler. Confirm clamp cylinder retracts or remains retracted. If these results are not observed, contact supervisor.

Record Pressure 1000
Pipe Handler moves Up / Down
Initial [Signature] CIRCLE ONE

- E. If the torque cylinders are in their full clockwise position, set the Make/Break valve to MAKE. If they are in their full counterclockwise position, set Make/Break valve to BREAK. Note that torque cylinders should not move if the recycle sequence valve is fully in.
- F. Slowly back out the recycle sequence valve until torque cylinders just start to move, then screw out an additional full turn.
Record pressure 1500
- G. Move the Make/Break valve to BREAK. Set the pressure reducing valve to 750 psi to adjust makeup torque.
(22,500 ft/lbs f/PH60 or 31,875 ft/lbs f/PH85)
- H. Switch the lever between Make and Break to adjust recycle sequence valve until full rotation in each direction takes six to eight seconds. Tighten the locknut around the recycle sequence valve adjustment screw.
Record pressure 1500
Verify full travel of both torque cylinders.
- I. Set the MAKE/BREAK valve to MAKE.
- J. Depress and hold the torque wrench operating button on the driller's console. (Alternately shift test valve.) Confirm the lift cylinder retracts, the pipe handler should lift, and the clamp jaws should remain retracted.
Initials WB
- K. Slowly back out the clamp sequence valve until the clamp jaws just begin to clamp onto the tool joint. Screw out an additional half turn.
Record pressure 1200
Lock the clamp sequence valve adjustment screw in position by tightening the locknut.
- L. Back out the torque sequence valve until the torque cylinders just begin to stroke, then back out an additional half turn. Tighten the locknut around the torque sequence valve adjustment screw.
Record pressure 1800
- M. Release the torque wrench operating button on the driller's console. (Alternately release test valve.) Confirm the torque wrench should start to unclamp and drop, then the torque cylinders should recycle.
Initials WB
- N. If the torque cylinders recycle *before* the clamp cylinders retract, screw in the recycle sequence valve until the torque cylinders do not move before clamp cylinders have fully retracted. Tighten the recycle sequence valve adjustment screw locknut.
- O. Cycle the torque wrench as many times as required to make up the connection.
Note: Do not switch the MAKE/BREAK valve to BREAK until completing the makeup sequence-which may require repeating the makeup sequence several times.
Verify the torque pressure regulating valve setting after every makeup sequence before releasing the makeup switch. Repeat the makeup sequence until the torque cylinders do not stroke more than one inch during the final makeup sequence-repeat the sequence if uncertain. Varco recommends that the driller operating the pipe handler verify that the torque cylinders do not stroke more than one inch on the last makeup cycle.
Varco also recommends checking the torque gauge on the pipe handler while making connections to make sure the torque wrench applies the correct amount of torque to the connection.
Stop and verify correct operation whenever the operator observes unsteady or inconsistent hydraulic pressure readings, or finds it difficult to adjust set points.
Varco recommends that a second individual assist the driller when making connections with the top drive torque wrench. The second person can verify that the torque wrench applies the correct torque to connections.
- P. Set the MAKE/BREAK Valve to BREAK.
- Q. Verify the torque wrench correctly breaks out the drill pipe from the saver sub, without breaking out the saver sub or lower IBOP. (Alternately, break out Superior test sub.)
- R. Operate pipe handler to verify both torque cylinders cycle through their full stroke.
- S. Reset MAKE/BREAK valve to MAKE position. The torque wrench is ready for operation.

7. Increase PRV setting to 2000 psi and makeup/breakout test sub to full torque (60,000 ft/lbs f/PH60 or 85,000 ft/lbs f/PH85). Activate test valve to makeup joint. Confirm final makeup cylinder is 1" or less. Hold full system pressure of 2000 psi for 5 minutes. Visually inspect for leaks.

Initial DB

8. Switch MAKE/BREAK valve to BREAK position. Slowly activate test valve to breakout joint while monitoring for leaks.

Initial DB

9. Return MAKE/BREAK valve to MAKE position.

10. Reset PRV to 750 psi. Repeat M/B Cycle. Initial DB

11. Air Cylinder IBOP Actuator Test:

Activate Air Cylinders using 120 psi air pressure to verify full and free movement. Record distance from Torque Stabilizer to centering of Actuator Arm Cam Follower.

Raised Position: Left 13 1/4 Right 13 1/4
 Lowered Position: Left 8 1/2 Right 8 1/2

12. Remove test sub.

13. Install Stop Tube as noted in 1.A, or as otherwise instructed.

14. DRIFT INSPECTION - Inspect to insure rear dies are fully retracted beyond line extending between Torque Tube Insert ID and Stabbing Guide ID.

Initial DB

15. Stamp WO number on frame. Initial DB

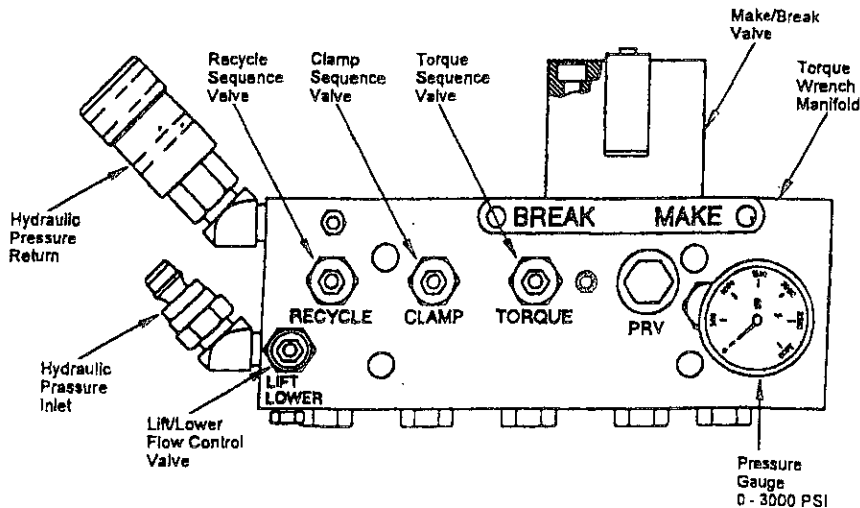
16. Install Lock Nuts and Seal Wire.

17. Paint all exposed metal with appropriate paint per customer spec. NOTE: Protect all critical surfaces, hoses, hydraulic quick disconnects, etc.

18. Attach set of spacers.

19. Pallet unit for storage/shipping.

20. COMPLETE TEST REPORT DOCUMENTS. (Attach digital photos of final completed assembly before palletizing.)



Torque Wrench Control Manifold

(Reproduced from Varco Operating Manual)

CYLINDER TEST REPORT

(For lift cylinders, backup cylinders, and industrial cylinders)

Customer: Diamond O/S Description: Torque Cyl #1
 Date: 7-24-13 Work No: 041434 Serial No: _____
 Technician: Derland Previous WO No's: 37899
 Test Pressure: 2,5000 Piston Seal Type *: polypack

* For all seal types except piston rings and leather packing, cylinder must pass 5 minute hold in both directions without pressure loss when tested using the pressurize, block, and monitor technique.

Bore 6 Rod Diameter 2 1/2 Stroke 4
 Check for External Leaks Test Minimum of 5 cycles:
 Check for Internal Leaks Test Minimum of 5 cycles:
 Pressure held 30 Minutes (minimum of 5) in each direction. Initial DB
 No pressure drops observed. Initial DB

Piston/Retainer to Rod Torque N/A or _____ ft/lbs
 Pinned Yes No Loctited Yes No
 Rod End to Rod End N/A or _____ ft/lbs

Pinned Yes No Loctited Yes No
 Tie Rod Size OD: 1 Thread: 14 Length: 14 3/8 Qty: 4
 Tie Rod Torque 520 ft/lbs N/A Initial DB

Fittings Installed	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Initial <u>DB</u>
Mounting Hardware Installed	<input type="checkbox"/> Yes	<input type="checkbox"/> No	N/A
Pins Installed	<input type="checkbox"/> Yes	<input type="checkbox"/> No	N/A
Grease Zerts Installed	<input type="checkbox"/> Yes	<input type="checkbox"/> No	N/A
Bushings Inspected	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	N/A
Breather Installed	<input type="checkbox"/> Yes	<input type="checkbox"/> No	N/A

Painted: yellow Tagged: _____
 Comments: cylinder test good no bypass

TESTED BY: Derland Broussard SUPERVISOR: Don Jones
SIGNATURE SIGNATURE
Derland Broussard Don Jones
PRINT NAME PRINT NAME

CYLINDER TEST REPORT

(For lift cylinders, backup cylinders, and industrial cylinders)

Customer: Diamond Description: Torque Cyl #2

Date: 7-24-13 Work No: 041434 Serial No: _____

Technician: Derland Previous WO No's: 37899

Test Pressure: 2,500 Piston Seal Type *: poly pack

* For all seal types except piston rings and leather packing, cylinder must pass 5 minute hold in both directions without pressure loss when tested using the pressurize, block, and monitor technique.

Bore 6 Rod Diameter 2 1/2 Stroke 4

Check for External Leaks Test Minimum of 5 cycles:

Check for Internal Leaks Test Minimum of 5 cycles:

Pressure held 30 Minutes (minimum of 5) in each direction. Initial DB

No pressure drops observed. Initial DB

Piston/Retainer to Rod Torque N/A or _____ ft/lbs

Pinned Yes No Loctited Yes No

Rod End to Rod End _____ N/A or _____ ft/lbs

Pinned Yes No Loctited Yes No

Tie Rod Size OD: 1 Thread: 14 Length: 14 5/8 Qty: 4

Tie Rod Torque 520 ft/lbs _____ N/A Initial DB

Fittings Installed Yes _____ No _____ N/A

Mounting Hardware Installed _____ Yes _____ No N/A

Pins Installed _____ Yes _____ No N/A

Grease Zerts Installed _____ Yes _____ No N/A

Bushings Inspected _____ Yes _____ No N/A

Breather Installed _____ Yes _____ No N/A

Painted: yellow Tagged: _____

Comments: cylinder test good no bypass

TESTED BY: [Signature] SUPERVISOR: [Signature]

Derland Broussard Ben Jones
PRINT NAME PRINT NAME

CYLINDER TEST REPORT

(For lift cylinders, backup cylinders, and industrial cylinders)

Customer: Diamond Description: Lift Cylinder
 Date: 7-25-13 Work No: 041434 Serial No: _____
 Technician: Derland Previous WO No's: 37899
 Test Pressure: 2,500 Piston Seal Type *: UCUP

* For all seal types except piston rings and leather packing, cylinder must pass 5 minute hold in both directions without pressure loss when tested using the pressurize, block, and monitor technique.

Bore 3 1/4 Rod Diameter 1 3/8 Stroke 13 1/2

Check for External Leaks Test Minimum of 5 cycles:
 Check for Internal Leaks Test Minimum of 5 cycles:

Pressure held 30 Minutes (minimum of 5) in each direction. Initial DB

No pressure drops observed. Initial DB
 Piston/Retainer to Rod Torque N/A or _____ ft/lbs
 Pinned Yes No Loctited Yes No

Rod End to Rod End N/A or _____ ft/lbs
 Pinned Yes No Loctited Yes No

Tie Rod Size OD: 5/8 Thread: 18 Length: 18 1/2 Qty: 4
 Tie Rod Torque 150 ft/lbs N/A Initial DB

Fittings Installed	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	N/A	Initial <u>DB</u>
Mounting Hardware Installed	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	N/A	
Pins Installed	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	N/A	
Grease Zerts Installed	<input type="checkbox"/> Yes	<input type="checkbox"/> No	N/A	
Bushings Inspected	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	N/A	
Breather Installed	<input type="checkbox"/> Yes	<input type="checkbox"/> No	N/A	

Painted: yellow Tagged: _____

Comments: cylinder test good no bypass

TESTED BY: Derland Broussard SIGNATURE: _____ SUPERVISOR: Don Jones SIGNATURE: _____
 PRINT NAME: Derland Broussard PRINT NAME: Don Jones

CYLINDER TEST REPORT

(For lift cylinders, backup cylinders, and industrial cylinders)

Customer: Diamond o/s Description: Air Cyl #1
Date: 7-26-13 Work No: 041434 Serial No: _____

Technician: Derland Previous WO No's: 37899
Test Pressure: 120 psi Piston Seal Type*: poly packs

* For all seal types except piston rings and leather packing, cylinder must pass 5 minute hold in both directions without pressure loss when tested using the pressurize, block, and monitor technique.

Bore 3 3/4 Rod Diameter 1 1/4 Stroke 5

Check for External Leaks Test Minimum of 5 cycles:

Check for Internal Leaks Test Minimum of 5 cycles:

Pressure held 30 Minutes (minimum of 5) in each direction. Initial DS
No pressure drops observed. Initial DS

Piston/Retainer to Rod Torque N/A or _____ ft/lbs

Pinned Yes No Loctited Yes No

Rod End to Rod End _____ N/A or _____ ft/lbs

Pinned Yes No Loctited Yes No

Tie Rod Size OD: N/A Thread: N/A Length: N/A Qty: N/A

Tie Rod Torque _____ ft/lbs _____ N/A Initial _____

Fittings Installed Yes No _____ N/A

Mounting Hardware Installed Yes No N/A

Pins Installed Yes No _____ N/A

Grease Zerts Installed Yes No _____ N/A

Bushings Inspected Yes No N/A

Breather Installed Yes No _____ N/A

Painted: yellow Tagged: _____

Comments: cylinder test good no bypass

TESTED BY: Derland Broussard SIGNATURE SUPERVISOR: Ben Jones SIGNATURE
Derland Broussard PRINT NAME Ben Jones PRINT NAME

CYLINDER TEST REPORT

(For lift cylinders, backup cylinders, and industrial cylinders)

Customer: Diamond o/s Description: Air Cyl #2
 Date: 7-25-13 Work No: 041434 Serial No: _____
 Technician: Werland Previous WO No's: 37899
 Test Pressure: 120 psi Piston Seal Type*: _____

* For all seal types except piston rings and leather packing, cylinder must pass 5 minute hold in both directions without pressure loss when tested using the pressurize, block, and monitor technique.

Bore 3 3/4 Rod Diameter 1 1/4 Stroke 5
 Check for External Leaks Test Minimum of 5 cycles:
 Check for Internal Leaks Test Minimum of 5 cycles:
 Pressure held 30 Minutes (minimum of 5) in each direction. Initial WB

No pressure drops observed. Initial WB

Piston/Retainer to Rod Torque N/A or _____ ft/lbs
 Pinned Yes No Loctited Yes No

Rod End to Rod End _____ N/A or _____ ft/lbs
 Pinned Yes No Loctited Yes No

Tie Rod Size OD: N/A Thread: N/A Length: N/A Qty: N/A
 Tie Rod Torque _____ ft/lbs N/A Initial _____

Fittings Installed Yes No _____ N/A

Mounting Hardware Installed Yes No N/A

Pins Installed Yes No _____ N/A

Grease Zerts Installed Yes No N/A

Bushings Inspected Yes No _____ N/A

Breather Installed Yes No N/A

Painted: yellow Tagged: _____

Comments: cylinder test good noby pass

TESTED BY: Werland Broussard SIGNATURE SUPERVISOR: Don JBRWS SIGNATURE
Werland Broussard PRINT NAME Don JBRWS PRINT NAME

CYLINDER TEST REPORT

(For lift cylinders, backup cylinders, and industrial cylinders)

Customer: Diamond O/S Description: Clamp Cyl

Date: 7-26-13 Work No: 041434 Serial No: _____

Technician: Derland Previous WO No's: 37899

Test Pressure: 2,500 Piston Seal Type *: Varco

* For all seal types except piston rings and leather packing, cylinder must pass 5 minute hold in both directions without pressure loss when tested using the pressurize, block, and monitor technique.

Bore 10 Rod Diameter 8 Stroke 3

Check for External Leaks Test Minimum of 5 cycles:

Check for Internal Leaks Test Minimum of 5 cycles:

Pressure held 30 Minutes (minimum of 5) in each direction.

No pressure drops observed. Initial DB Initial DB

Piston/Retainer to Rod Torque _____ N/A or _____ ft/lbs

Pinned Yes No Loctited Yes No

Rod End to Rod End _____ N/A or _____ ft/lbs

Pinned Yes No Loctited Yes No

Tie Rod Size OD: N/A Thread: N/A Length: N/A Qty: N/A

Tie Rod Torque _____ ft/lbs _____ N/A Initial DB

Fittings Installed Yes No _____ N/A

Mounting Hardware Installed Yes No _____ N/A

Pins Installed Yes No _____ N/A

Grease Zerts Installed Yes No _____ N/A

Bushings Inspected Yes No _____ N/A

Breather Installed Yes No N/A

Painted: yellow Tagged: _____

Comments: cylinder test good no bypass

TESTED BY: Derland Broussard SUPERVISOR: Derland Broussard

SIGNATURE _____ SIGNATURE _____
PRINT NAME Derland Broussard PRINT NAME Derland Broussard



Parker Hannifin Corporation
Hose Products Division
30240 Lakeland Blvd.
Wickliffe, Ohio 44092

Type: HOSE SPECIFICATION	Page 1 of 8
Title: HYDRAULIC HOSE - NO-SKIVE TYPE - DOUBLE WIRE BRAID REINFORCED - RUBBER COVERED - ISO 1436-1 TYPE 2SN - PARKER HOSE STYLE 302	Specification GHS-302

1. **SCOPE:** This specification covers a double wire braid reinforced and rubber covered hose. In addition to the qualification test requirements outlined within this specification, the hose shall meet or exceed all the requirements specified in ISO 1436-1 standard for hose style 2SN.
2. **APPLICATION:** The hose is designed for use with:
 - petroleum base hydraulic fluids and lubricating oils within a temperature range of -40°C to +100°C (-40°F to +212°F)
 - water, water/oil emulsion and water/glycol hydraulic fluids up to +85°C (+185°F)
 - air up to +70°C (+158°F)
3. **CONSTRUCTION:** The hose shall consist of an extruded inner tube of oil resistant Nitrile synthetic rubber, two braids of high tensile steel wire reinforcement and an oil and weather resistant, black, wrapped finish synthetic rubber cover.
4. **QUALIFICATION:** All hose shall be qualified by the Parker Hose Products Division or its designee. The qualification shall consist of tests listed under "QUALIFICATION TEST REQUIREMENTS". The manufacturing plant shall supply test data indicating compliance with all the test requirements of ISO 1436-1 standard for hose style 2SN.
5. **QUALIFICATION TEST REQUIREMENTS:** The hose shall meet the following qualification requirements. Unless otherwise indicated, the test procedures shall be in accordance with ISO 6605 standard.
 - 5.1 **DIMENSIONS:** The hose shall meet the dimensional requirements specified in Table I.
 - 5.2 **CHANGE IN LENGTH:** The length change shall not exceed +2% to -4% when pressurized to the maximum working pressure listed in Table I.
 - 5.3 **BURST TEST:** There shall be no leakage, hose burst or any other indication of failure below the specified minimum burst pressure listed in Table I. A minimum of two hose assemblies shall be tested.
 - 5.4 **IMPULSE TEST:** The hose assemblies shall meet the requirements of ISO 1436-1 standard for 2SN hose. A minimum of four unaged hose assemblies shall be tested.
 - 5.5 **ADHESION TEST:** The hose shall meet the adhesion requirements specified in HS-L23.
 - 5.6 **COLD BEND TEST:** After exposure to -40°C (-40°F) for 24 hours, a hose assembly, not containing any fluid, except traces of assembly lubricant, if used, shall be bent to the minimum bend radius listed in Table I. The hose assembly shall exhibit no cover cracks, and shall not leak when subjected to the proof pressure (twice the maximum working pressure listed in Table I).
 - 5.7 **VACUUM TEST:** There shall be no evidence of hose blistering or collapse after exposure for 5 minutes at the vacuum rating listed in Table I.

Issue Date 24-JUN-2005	E.C.N. Number: 70600	Revision Letter: C	Revision Date: 03-AUG-2006	Specification GHS-302
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Parker Hannifin Corporation
 Hose Products Division
 30240 Lakeland Blvd.
 Wickliffe, Ohio 44092

Type: HOSE SPECIFICATION	Page 2 of 8
Title: HYDRAULIC HOSE - NO-SKIVE TYPE - DOUBLE WIRE BRAID REINFORCED - RUBBER COVERED - ISO 1436-1 TYPE 2SN - PARKER HOSE STYLE 302	Specification GHS-302

5.8 ABRASION TEST: Three hose samples shall not lose more than 0.5 g of weight each after 2 000 abrasion cycles when subjected to the abrasion test per ISO 6945, with a vertical force of $25 \pm 0,5$ Newtons (5.62 ± 0.11 lb).

6. FITTING COMPATIBILITY: All hose assemblies shall meet the requirements of this specification when tested with all applicable Parker fittings listed in HS-D02.

7. IDENTIFICATION: Layline marking shall conform to HS-302 pages 4 or 5, HS-C31 and HS-C25. Marking shall be applied by means of transfer tape that yields a black background with white letters, except the Parker logo shall be white with black letters, unless otherwise permitted in the purchase order. Additionally, a colored yarn shall be incorporated in the hose wall identifying the manufacturer by color code as designated by the Rubber Manufacturers Association.

8. INSPECTION TESTS: Inspection tests listed as follows shall be performed on two samples representing each lot of 150 to 3 000 m (500 to 10 000 ft) of bulk hose. Lots of less than 150 m (500 ft) of hose need not be subjected to these tests if a lot has been tested and met the requirements within the previous 12 month period.

8.1 DIMENSIONAL CHECK TEST: The hose shall meet the specified dimensional requirements.

8.2 PROOF TEST: There shall be no leakage or any other indication of failure when subjected to the proof pressure (twice the maximum working pressure listed in Table I). Two unaged hose assembly samples shall be tested.

8.3 CHANGE IN LENGTH TEST: The length change of one unaged hose assembly sample shall not exceed +2% to -4% when pressurized to the maximum working pressure listed in Table I.

8.4 BURST TEST: There shall be no leakage, hose burst or any other indication of failure below the specified minimum burst pressure listed in Table I. Two unaged hose assembly samples shall be tested.

8.5 VISUAL EXAMINATION: The hose shall not exhibit any imperfections as described in HS-D98 when visually examined and shall be properly marked in accordance with section 7.

9. REFERENCE SPECIFICATIONS:

ISO 1436-1

ISO 6605

ISO 6945

Parker HS-C24

Parker HS-C25

Parker HS-C31

Parker HS-D02

Parker HS-D98

Parker HS-L23

Issue Date 24-JUN-2005	E.C.N. Number: 70600	Revision Letter: C	Revision Date: 03-AUG-2006	Specification GHS-302
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Parker Hannifin Corporation
 Hose Products Division
 30240 Lakeland Blvd.
 Wickliffe, Ohio 44092

Type: HOSE SPECIFICATION

Page 3 of 8

Title: HYDRAULIC HOSE - NO-SKIVE TYPE - DOUBLE WIRE BRAID REINFORCED - RUBBER COVERED - ISO 1436-1 TYPE 2SN - PARKER HOSE STYLE 302

Specification
 GHS-302

TABLE I

HOSE SIZE				HOSE I.D.		WIRE O.D.		I.D. TO WIRE WALL THICKNESS		HOSE O.D.		COVER THICKNESS		I.D. TO WIRE CONCENTRICITY	
dash	mm	EN	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
-3	5	5	3/16	4.6 5.4	0.181 0.213	10.6 11.6	0.417 0.457	2.7 min.	0.106 min.	12.7 14.1	0.500 0.555	0.8 1.5	0.031 0.059	0.4	0.016
-4	6.3	6	1/4	6.2 7.0	0.244 0.276	12.1 13.3	0.476 0.524	2.8 min.	0.108 min.	14.3 15.7	0.563 0.618	0.8 1.5	0.031 0.059	0.4	0.016
-5	8	8	5/16	7.7 8.5	0.303 0.335	13.7 14.9	0.539 0.587	2.8 min.	0.110 min.	15.9 17.3	0.626 0.681	0.8 1.5	0.031 0.059	0.8	0.024
-6	10	10	3/8	9.3 10.1	0.366 0.398	16.1 17.3	0.634 0.681	3.2 min.	0.126 min.	18.3 19.7	0.720 0.776	0.8 1.5	0.031 0.059	0.6	0.024
-8	12.5	12	1/2	12.3 13.5	0.484 0.531	19.0 20.6	0.748 0.811	3.2 min.	0.124 min.	21.5 23.0	0.846 0.906	0.8 1.5	0.031 0.059	0.6	0.024
-10	16	16	5/8	15.5 16.7	0.610 0.657	22.2 23.8	0.874 0.937	3.2 min.	0.124 min.	24.7 26.2	0.972 1.031	0.8 1.5	0.031 0.059	0.6	0.024
-12	19	20	3/4	18.6 19.8	0.732 0.780	26.2 27.8	1.031 1.094	3.6 min.	0.142 min.	28.6 30.1	1.126 1.185	0.8 1.5	0.031 0.059	0.6	0.024
-16	25	25	1	25.0 26.4	0.984 1.039	34.1 35.7	1.343 1.406	4.4 min.	0.171 min.	37.3 38.9	1.469 1.531	1.0 2.0	0.039 0.079	0.8	0.030
-20	31.5	32	1 1/4	31.4 33.0	1.236 1.299	43.3 44.8	1.705 1.764	5.1 min.	0.201 min.	46.3 47.9	1.824 1.886	1.0 2.0	0.039 0.079	0.8	0.030
-24	38	40	1 1/2	37.7 39.3	1.484 1.547	49.6 52.0	1.953 2.047	5.7 min.	0.222 min.	53.5 55.4	2.106 2.181	1.3 2.5	0.051 0.098	0.8	0.030
-51	50	50	2	50.4 52.0	1.984 2.047	62.3 64.7	2.453 2.547	5.7 min.	0.222 min.	66.2 68.1	2.606 2.681	1.3 2.5	0.051 0.098	0.8	0.030

HOSE SIZE				I.D. TO O.D. CONCENTRICITY		MAXIMUM WORKING PRESSURE		MINIMUM BURST PRESSURE		MAXIMUM VACUUM RATING		MINIMUM BEND RADIUS		WEIGHT	
dash	mm	EN	inch	mm	inch	MPa (*)	psi	MPa (*)	psi	kPa (**)	In of Hg	mm	inch	kg/m	lb/ft
-3	5	5	3/16	0.8	0.030	42.0	6 000	168.0	24 000	95	28	90	3 1/2	0.31	0.21
-4	6.3	6	1/4	0.8	0.030	40.0	5 800	160.0	23 200	95	28	100	4	0.39	0.26
-5	8	8	5/16	1.0	0.040	35.0	5 000	140.0	20 000	95	28	115	4 1/2	0.42	0.28
-6	10	10	3/8	1.0	0.040	33.0	4 750	132.0	19 000	95	28	130	5	0.55	0.37
-8	12.5	12	1/2	1.0	0.040	28.0	4 000	112.0	16 000	95	28	180	7	0.67	0.45
-10	16	16	5/8	1.0	0.040	25.0	3 600	100.0	14 400	95	28	200	8	0.77	0.52
-12	19	19	3/4	1.0	0.040	21.5	3 100	85.0	12 400	80	24	240	9 1/2	1.00	0.67
-16	25	25	1	1.3	0.050	16.5	2 400	65.0	9 600	80	24	300	12	1.49	1.00
-20	31.5	31	1 1/4	1.3	0.050	12.5	1 800	50.0	7 200	80	24	420	16 1/2	1.73	1.16
-24	38	38	1 1/2	1.3	0.050	9.0	1 300	36.0	5 200	80	24	500	20	2.14	1.44
-32	51	51	2	1.3	0.050	8.0	1 150	32.0	4 600	80	24	630	25	2.96	1.99

(*) For pressure values in bars, multiply the MPa value times 10.
 For pressure values in kPa, multiply the MPa value times 1 000.
 For pressure values in kgf/cm², multiply the MPa value times 10.2.

(**) Value listed is for negative gage pressure in kPa. For kPa absolute subtract kPa gage from 101 kPa.
 For negative gage pressure in bar, divide the kPa value by 100.

Issue Date 24-JUN-2005	E.C.N. Number: 70600	Revision Letter: C	Revision Date: 03-AUG-2006	Specification GHS-302
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MAGNETIC PARTICLE INSPECTION REPORT



Owensby & Kritikos, Inc.

NEW ORLEANS DIVISION
 671 Whitney Ave., Bldg. B
 Gretna, La 70056
 Telephone 504/368-3122
 Fax 504/362-4546
 E-mail gretna@ok-insp.com
 Internet www.ok-insp.com

LAFAYETTE DIVISION
 111 Lafferty Drive
 Lafferty Industrial Park
 Broussard, La 70518
 Telephone 337/837-9721
 Fax 337/637-1316
 E-mail lafayette@ok-insp.com

MT
 CHECK
 JSA Attached
 JSA Not Required
 Utilized Client's JSA

PAGE _____ OF _____
 DATE _____

CUSTOMER _____ LOCATION _____
 JOB DESCRIPTION _____
 CONTRACTOR _____ JOB NO. _____
 CUSTOMER ORDER NO. _____ SPECIFICATION _____
 EQUIPMENT I.D. _____ MODEL NO. _____ SERIAL NO. _____

TECHNIQUE CHECK ONLY THOSE APPLICABLE	SKETCH OF ITEM / WELD			
WET METHOD <input type="checkbox"/>				
FLUORESCENT <input type="checkbox"/>				
DRY METHOD <input type="checkbox"/>				
VISIBLE <input type="checkbox"/>				
MAGNETIC METHOD <input type="checkbox"/>				
PROD METHOD <input type="checkbox"/>				
CABLES/COIL <input type="checkbox"/>				
CURRENT AC <input type="checkbox"/> DC <input type="checkbox"/>				
AMPERAGE <input type="checkbox"/>				
ITEM/WELD I.D.	DESCRIPTION	ACCEPT	REJECT	COMMENTS

INSPECTOR _____ WORK HRS _____ MATERIALS USED: _____
 ASSISTANT _____ TRAVEL HRS _____
 CLIENT _____ MILEAGE _____
 VEH # _____

MAGNETIC PARTICLE INSPECTION REPORT

Owensby & Kritikos, Inc.



NEW ORLEANS DIVISION
 671 Whitney Ave., Bldg. B
 Gretna, La 70056
 Telephone 504/368-3122
 Fax 504/362-4546
 E-mail gretna@ok-insp.com
 Internet www.ok-insp.com

LAFAYETTE DIVISION
 111 Lafferty Drive
 Lafferty Industrial Park
 Broussard, La 70518
 Telephone 337/837-9721
 Fax 337/837-1316
 E-mail lafayette@ok-insp.com

MT

- CHECK
 JSA Attached
 JSA Not Required
 Utilized Client's JSA

PAGE _____ OF _____

DATE _____

CUSTOMER Alouy LOCATION Gretna, La
 JOB DESCRIPTION MT inspection on 2 welds on a 12" dia. pipe
 CONTRACTOR WACO JOB NO. _____
 CUSTOMER ORDER NO. WACO 00101 SPECIFICATION ASME B31.3
 EQUIPMENT I.D. 12" dia MODEL NO. 12" dia SERIAL NO. 12" dia

TECHNIQUE CHECK ONLY THOSE APPLICABLE	SKETCH OF ITEM / WELD			
WET METHOD <input checked="" type="checkbox"/>				
FLUORESCENT <input type="checkbox"/>				
DRY METHOD <input type="checkbox"/>				
POLE <input checked="" type="checkbox"/>				
YOKE METHOD <input checked="" type="checkbox"/>				
PROD METHOD <input type="checkbox"/>				
CABLES/COIL <input type="checkbox"/>				
CURRENT AC <input checked="" type="checkbox"/> DC <input type="checkbox"/>				
AMPERAGE <u>200</u>				
ITEM/WELD I.D.				DESCRIPTION
<u>2. 12" dia. pipe</u>	<u>Weld 1</u>	<u>✓</u>	<u>✓</u>	<u>MT inspection</u>
<u>2. 12" dia. pipe</u>	<u>Weld 2</u>	<u>✓</u>	<u>✓</u>	<u>MT inspection</u>
<u>3. 12" dia. pipe</u>	<u>Weld 3</u>	<u>✓</u>	<u>✓</u>	<u>MT inspection</u>

INSPECTOR Bob [unclear] WORK HRS 4 MATERIALS USED: _____
 ASSISTANT _____ TRAVEL HRS _____
 CLIENT WACO MILEAGE _____ VEH # _____

FORUM

1196 Petroleum Pkwy
Broussard, LA 70518
Phone: (337) 837-1676
Fax: (337) 837-6599
www.fot.com

Calibration Verification

Report No. AOI/CAL.101

This document serves to verify that the following equipment(s) has been tested and calibrated to standards laid down by Acadiana Oilfield Instruments.

Customer: SUPERIOR MANUFACTURING

Vessel: PH-60

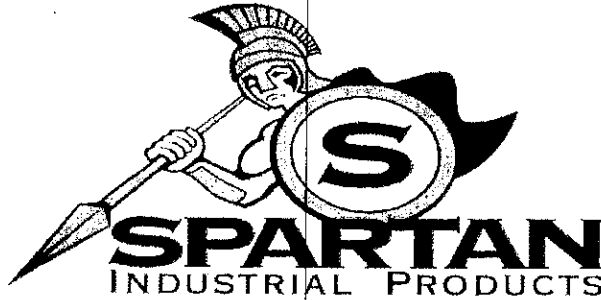
Report Date: 2/15/2013
Job No: S54647
Model/Description: GAUGE, PH60
Serial No: 237
Capacity: 2,500 PSI X 75,000 FT. LBS
Room Temperature: 72
Date of Calibration: 2/15/2013
Date of Next Calibration: 8/15/2013

Note: THE ABOVE IS CALIBRATED TO 2,500 PSI AT FULL SCALE

Method of Calibration

The Described item was calibrated using Pressure Gauge S/N AC-1048001 with certificate no. 6257 which is Traceable back to the National Institute of Technology.

Calibrated By: BRADY COMEAUX
BRADY COMEAUX - Service Technician



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0637BR- 3 INVOICE# 309186

DESCRIPTION 3/8" X 48" 3-K HOSE W/ MNPT E/E
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

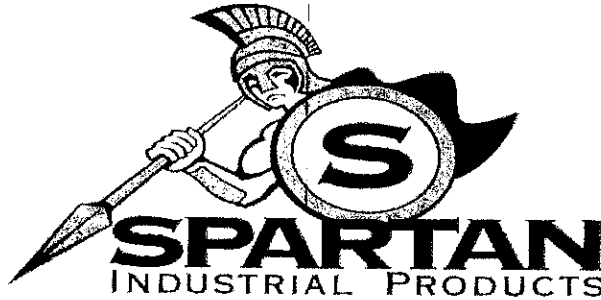
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0637BR- 4 INVOICE# 309186

DESCRIPTION 3/8" X 48" 3-K HOSE W/ MNPT E/E
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

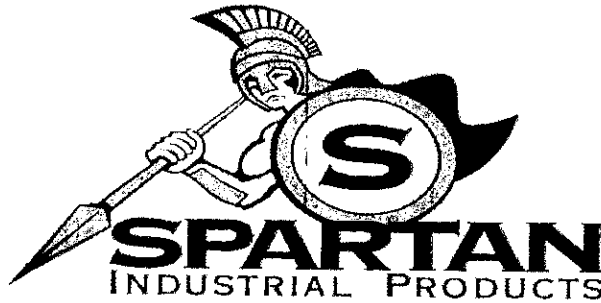
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0638BR- 3 INVOICE# 309186

DESCRIPTION 1/2" X 10' 3-K HOSE W/ MNPT E/E
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

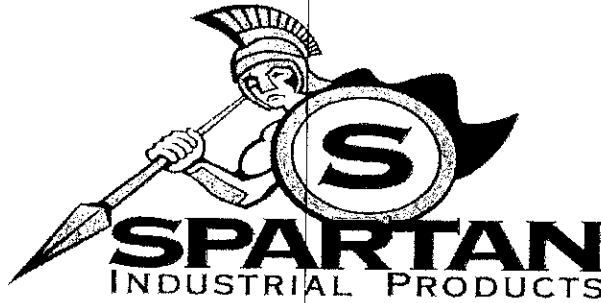
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
SERIAL # 0638BR- 4 PD# S54950
INVOICE# 309186

DESCRIPTION 1/2" X 10' 3-K HOSE W/ MNPT E/E
W/ HDSE GUARD AND TAG

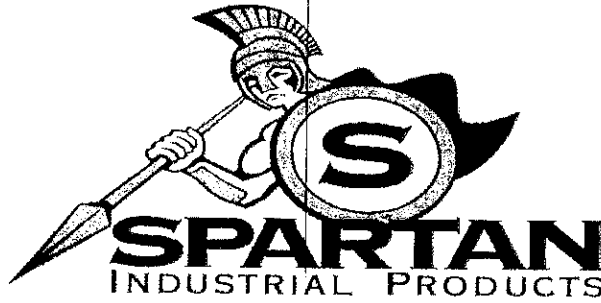
WORKING PRESSURE 3,000 TEST PRESSURE 4,500
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CDNDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0639BR- 2 INVOICE# 309186

DESCRIPTION 1/4" X 30" 3-K HOSE W/ MPT X FJIC90
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

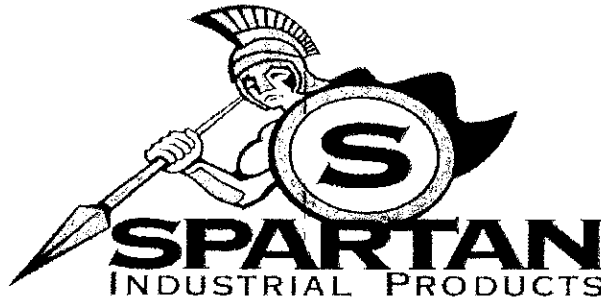
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0640BR- 3 INVOICE# 309186

DESCRIPTION 1/4" X 16" 3-K HOSE W/ FJIC E/E
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

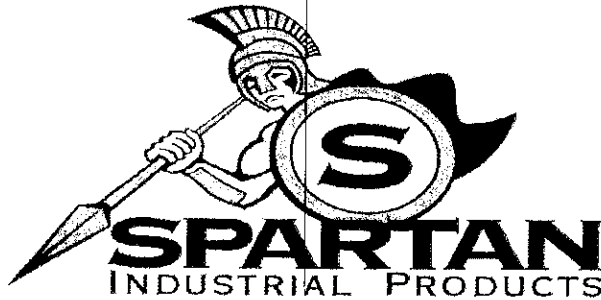
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0640BR- 4 INVOICE# 309186

DESCRIPTION 1/4" X 16" 3-K HOSE W/ FJIC E/E
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

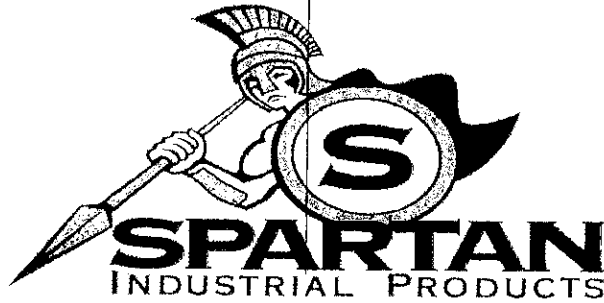
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0641BR- 2 INVOICE# 309186

DESCRIPTION 1/4" X 46" 3-K HOSE W/ FJIC X FJIC90
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

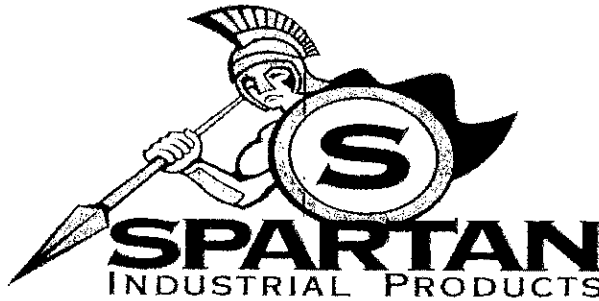
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0642BR- 2 INVOICE# 309186

DESCRIPTION 1/4" X 53" 3-K HOSE W/ FJIC E/E
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

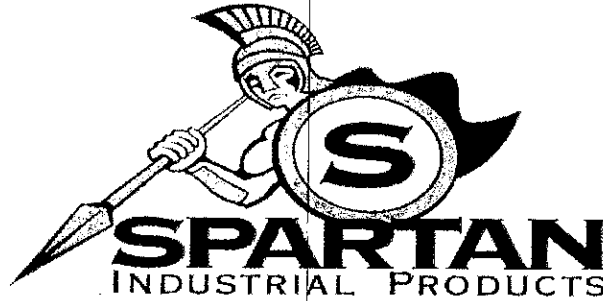
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

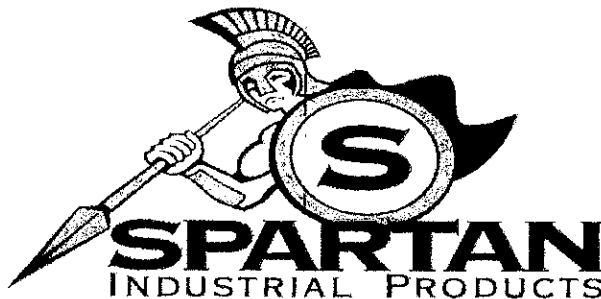
CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0643BR- 3 INVOICE# 309186
DESCRIPTION 3/8" X 13" 3-K HOSE W/FJIC X FJIC90
W/ HOSE GUARD AND TAG
WORKING PRESSURE 3,000 TEST PRESSURE 4,500
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0643BR- 4 INVOICE# 309186

DESCRIPTION 3/8" X 13" 3-K HOSE W/FJIC X FJIC90
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

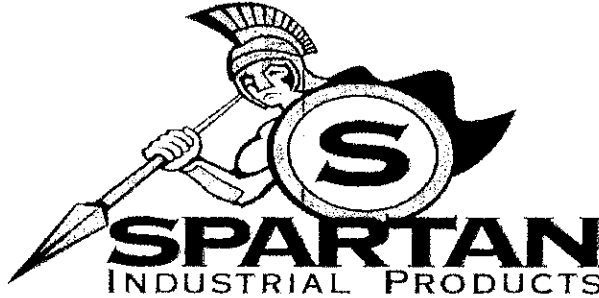
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0644BR- 3 INVOICE# 309186

DESCRIPTION 3/8" X 17.5" 3-K HOSE W/FJIC, X FJIC90
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

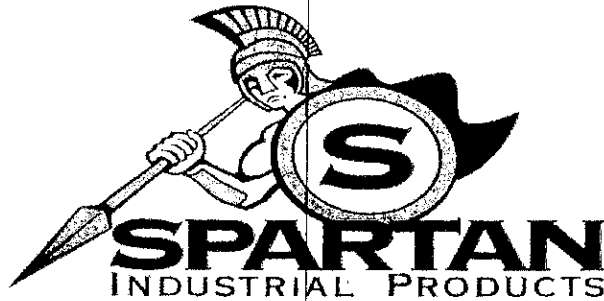
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

DATE 05/01/13

CUSTOMER NAME SUPERIOR MANUFACTURING PO# S54950

SERIAL # 0644BR- 4 INVOICE# 309186

DESCRIPTION 3/8" X 17.5" 3-K HOSE W/FJIC X FJIC90
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

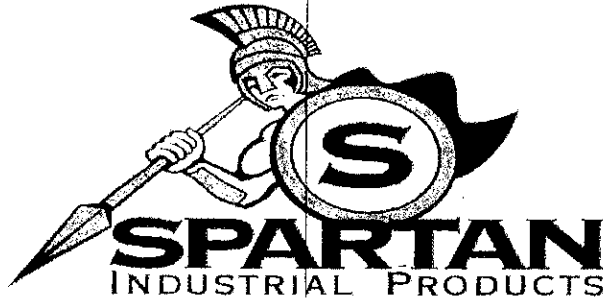
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

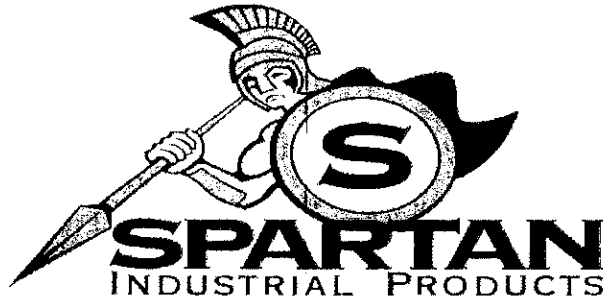
CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0645BR- 2 INVOICE# 309186
DESCRIPTION 3/8" X 55" 3-K HOSE W/FJIC X FJIC90
W/ HOSE GUARD AND TAG
WORKING PRESSURE 3,000 TEST PRESSURE 4,500
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
SERIAL # 0646BR- 2 PO# S54950
INVOICE# 309186

DESCRIPTION 3/8" X 64.5" 3-K HOSE W/FJIC X FJIC90
W/ HOSE GUARD AND TAG

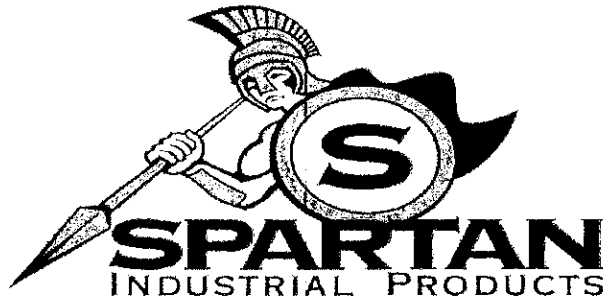
WORKING PRESSURE 3,000 TEST PRESSURE 4,500
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0647BR- 2 INVOICE# 309186

DESCRIPTION 3/8" X 24" 3-K HOSE W/ FJIC X 1/2" FJ90
W/ HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

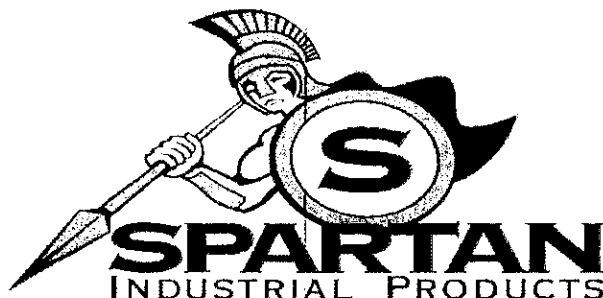
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0648BR- 3 INVOICE# 309186

DESCRIPTION 1/2" X 12.5" 3-K HOSE W/FJIC X FJIC90
W/ HOSE GUARD AND TAG

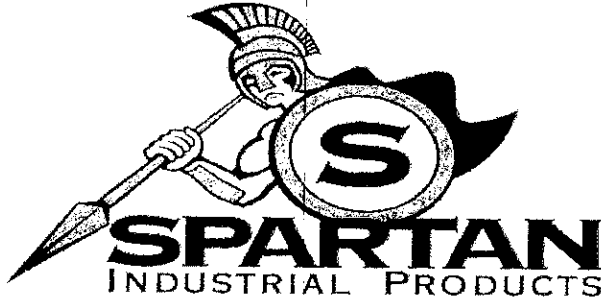
WORKING PRESSURE 3,000 TEST PRESSURE 4,500
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

WITNESSED BY KEN HAYNES



HYDROSTATIC HOSE TEST REPORT

CUSTOMER NAME SUPERIOR MANUFACTURING DATE 05/01/13
PO# S54950
SERIAL # 0648BR- 4 INVOICE# 309186

DESCRIPTION 1/2" X 12.5" 3-K HOSE W/FJIC X FJIC90
WI HOSE GUARD AND TAG

WORKING PRESSURE 3,000 TEST PRESSURE 4,500

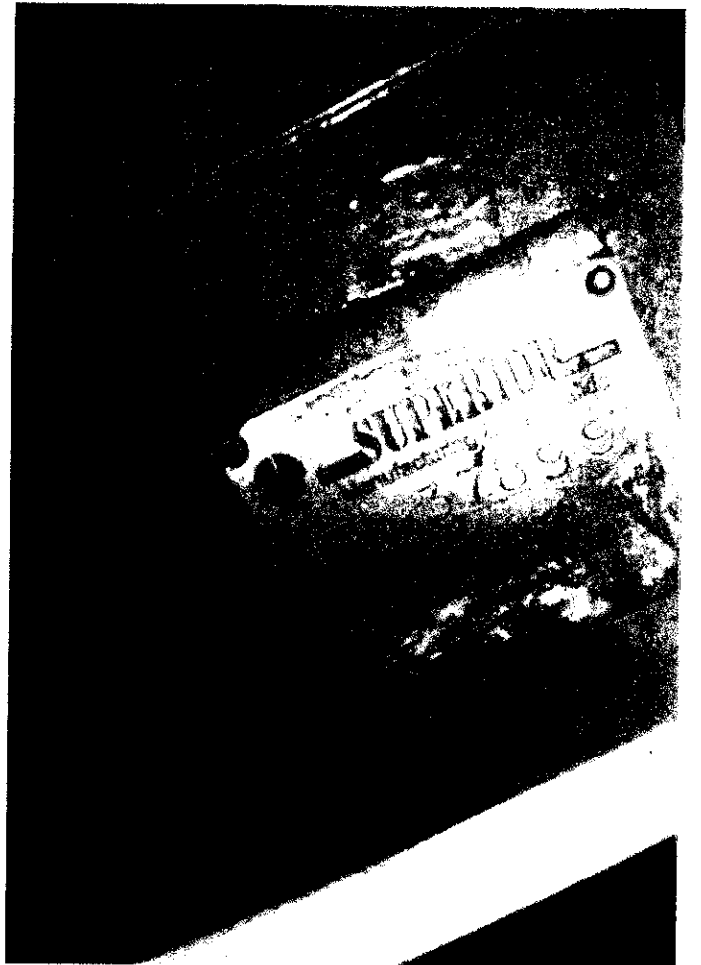
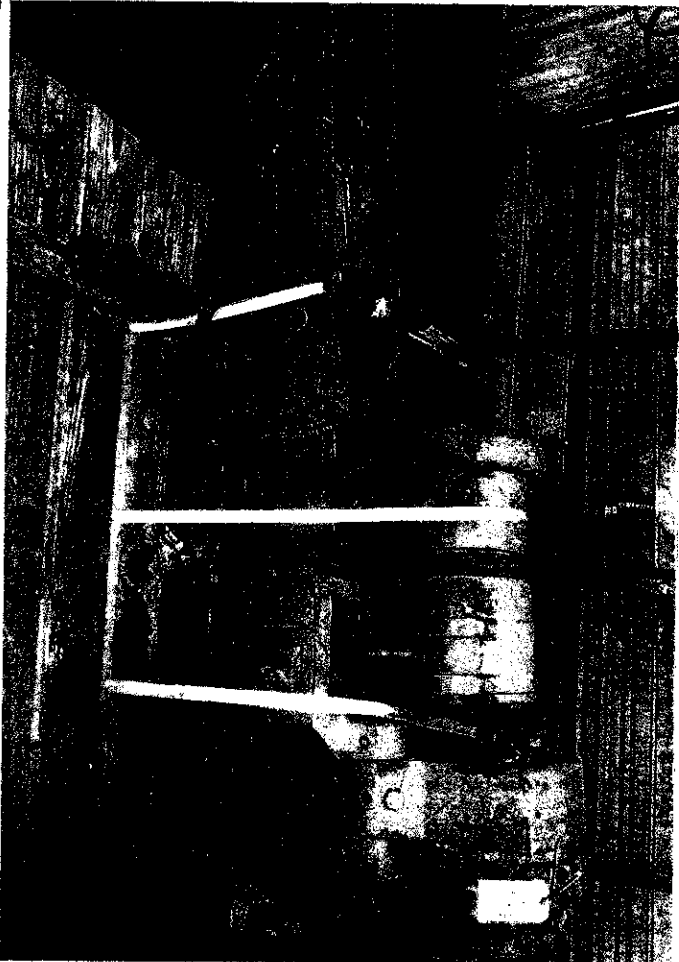
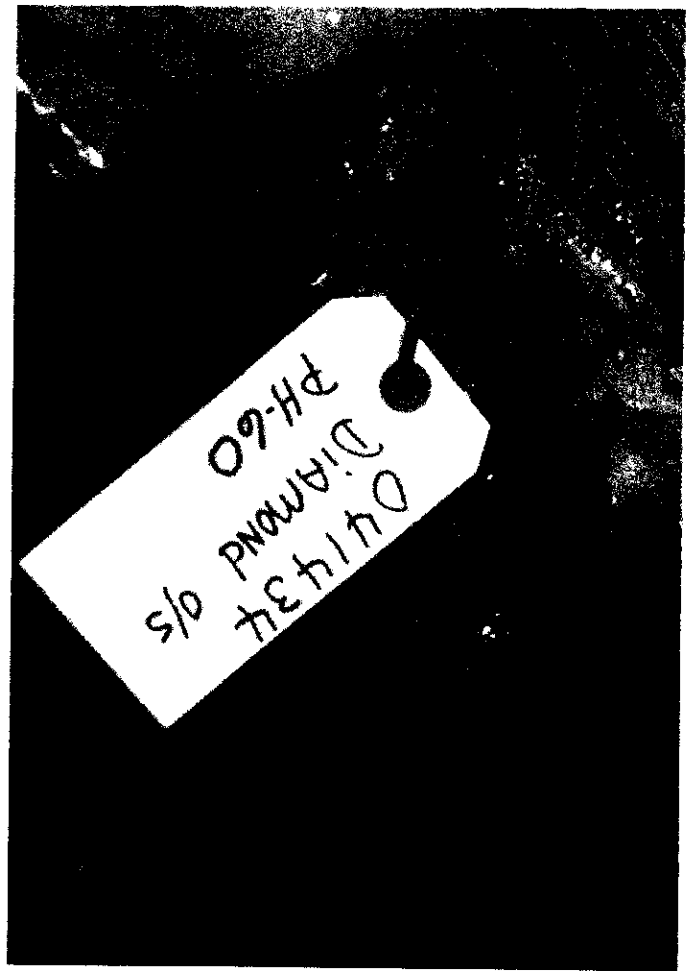
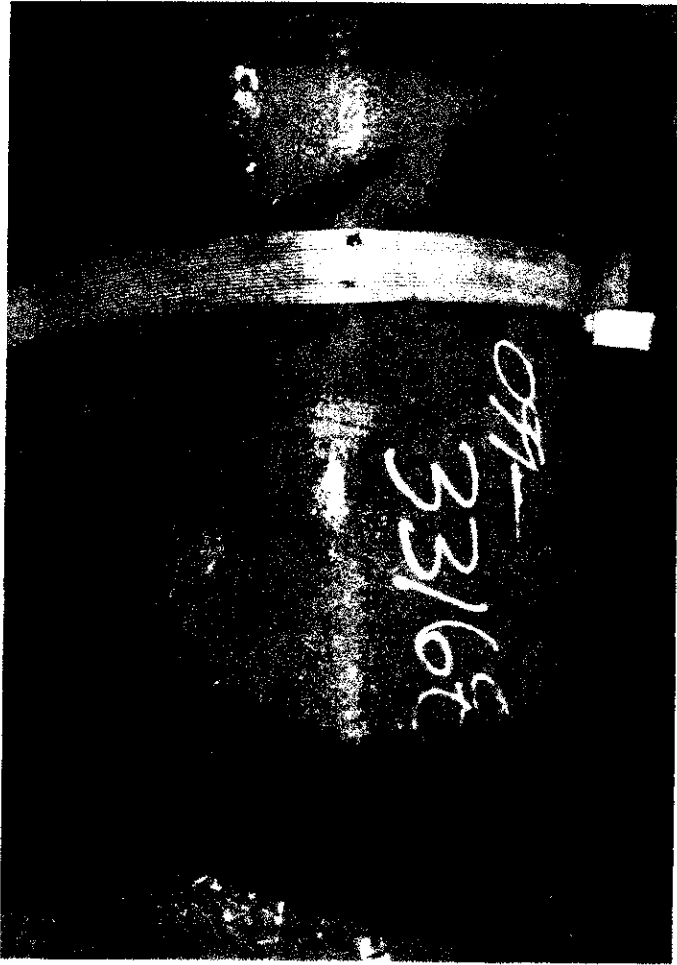
BURST PRESSURE 12000 SERVICE HYDRAULIC

Hose meets or exceeds the requirements as specified by Title 33 in Coast Guard Federal Register 154.500 which refers to CFR 75-124, 45 FR7121, Jan. 31, 1980

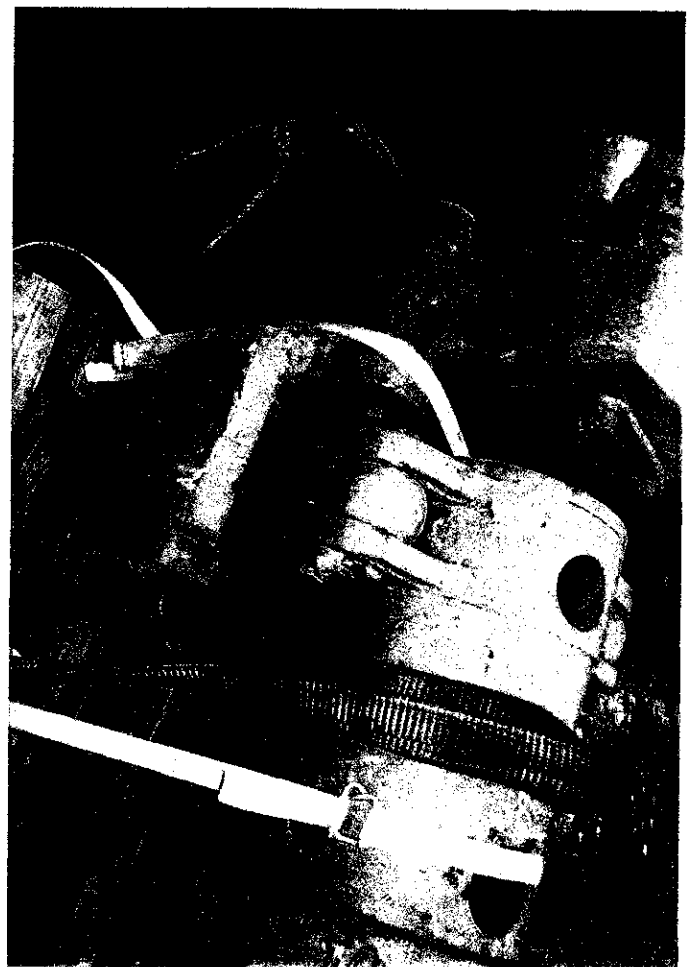
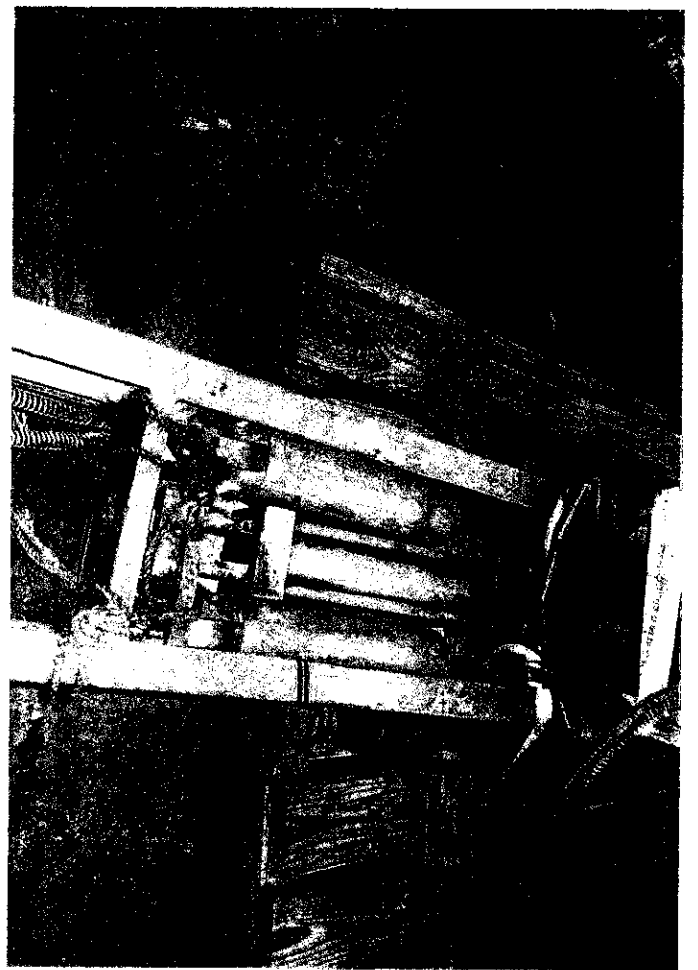
ELECTRICAL CONDUCTIVITY TESTED OK

TESTED BY NOLAN ROBIN

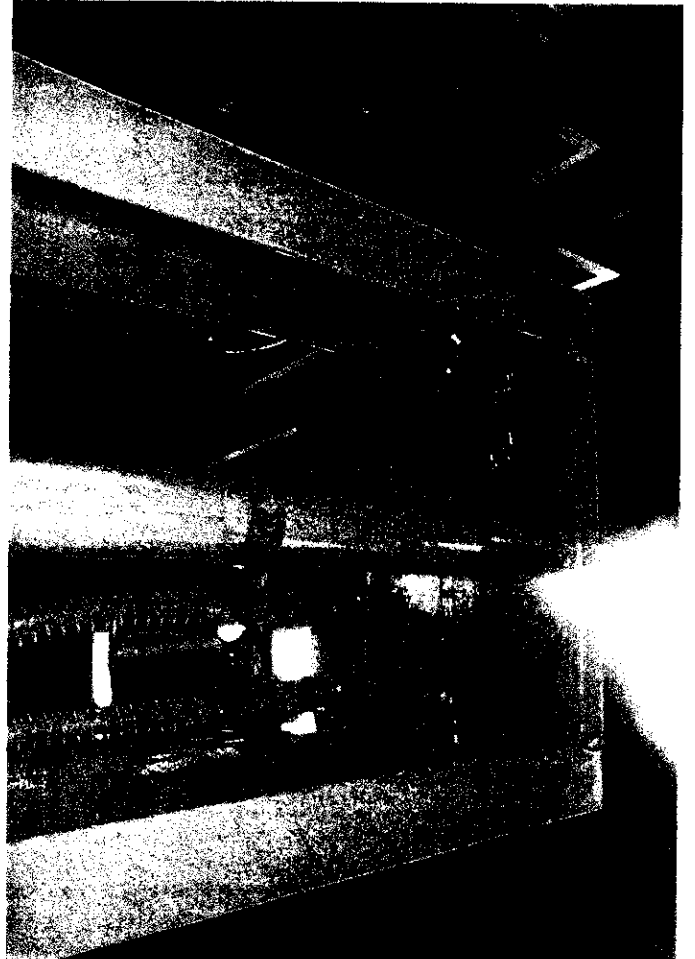
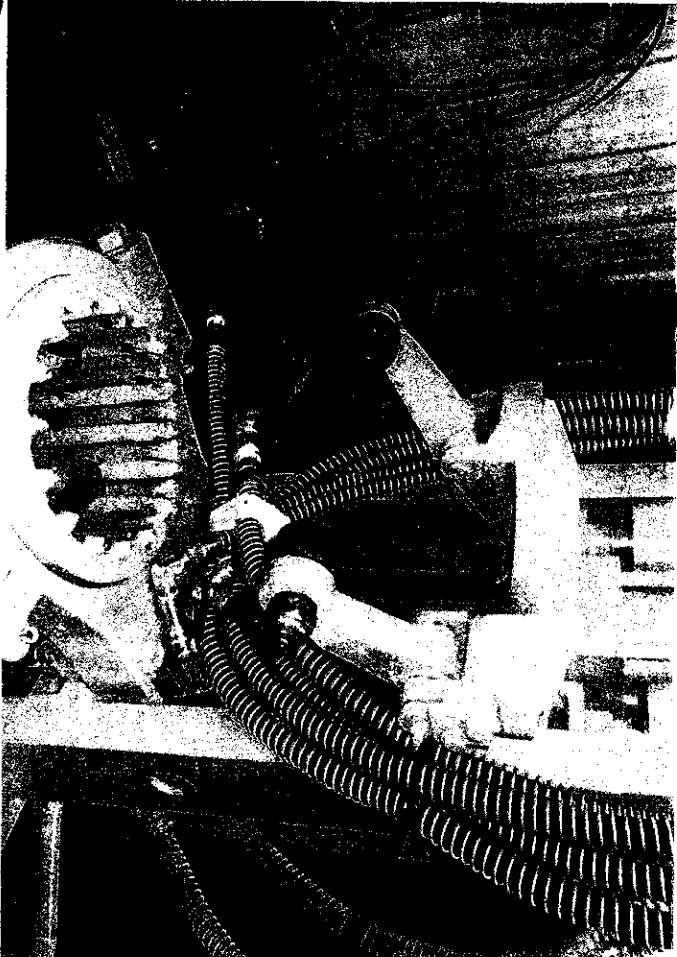
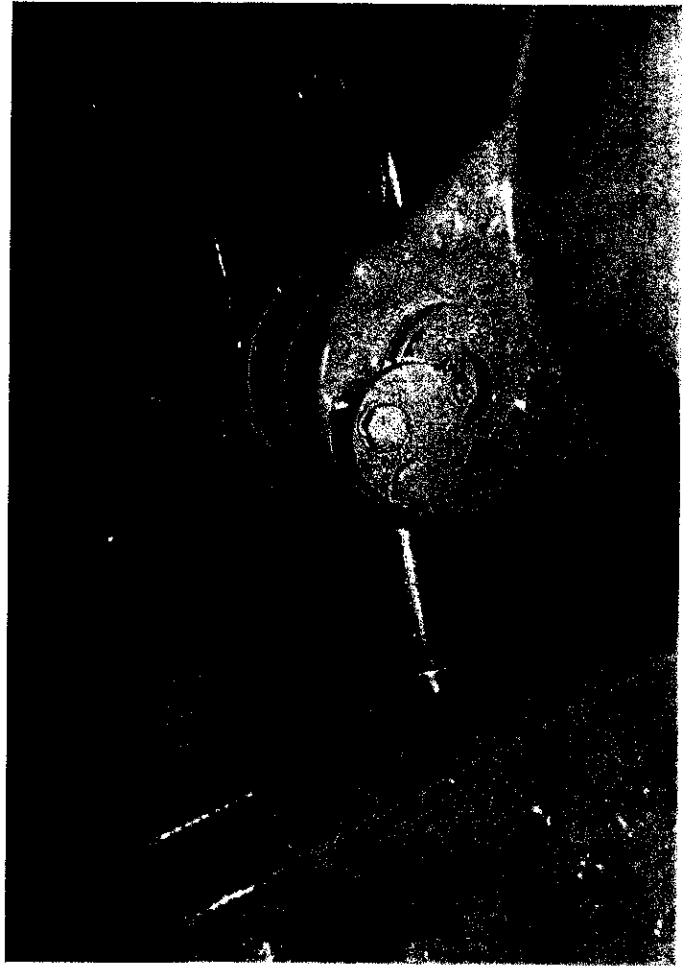
WITNESSED BY KEN HAYNES

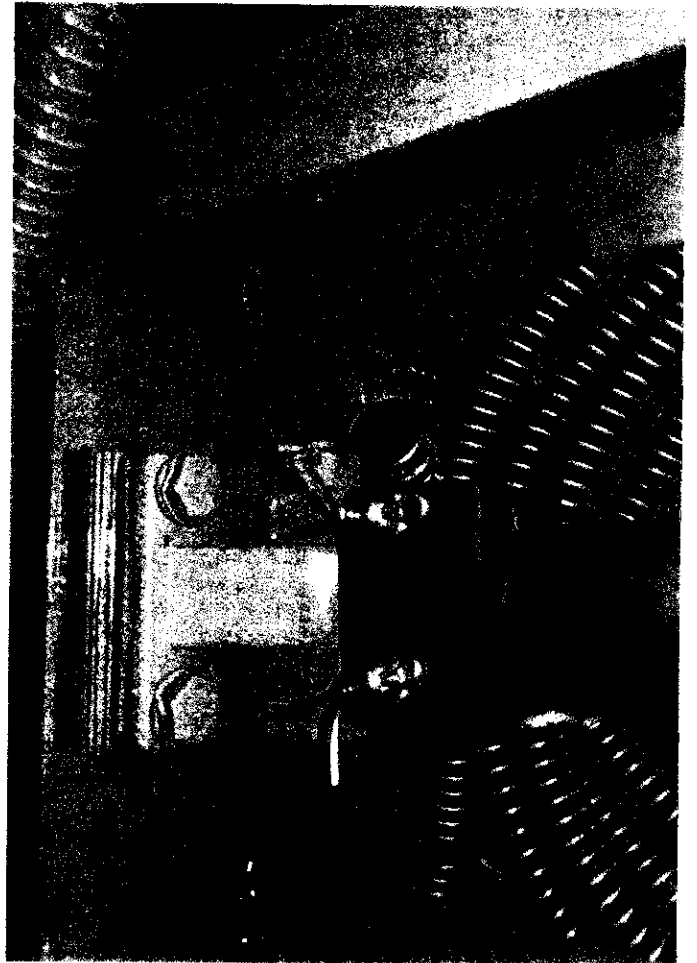
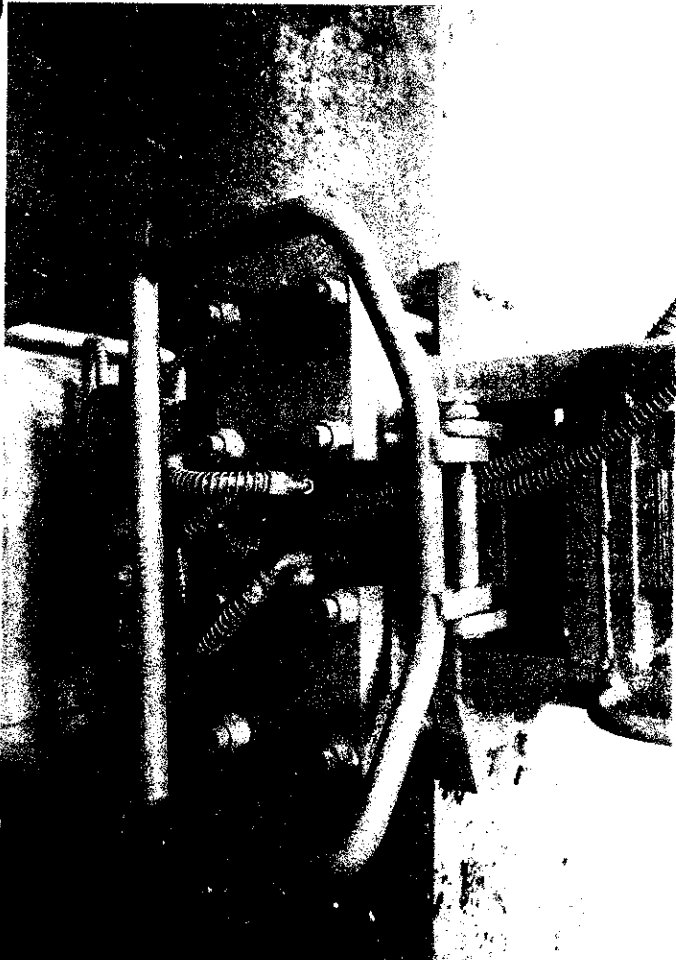
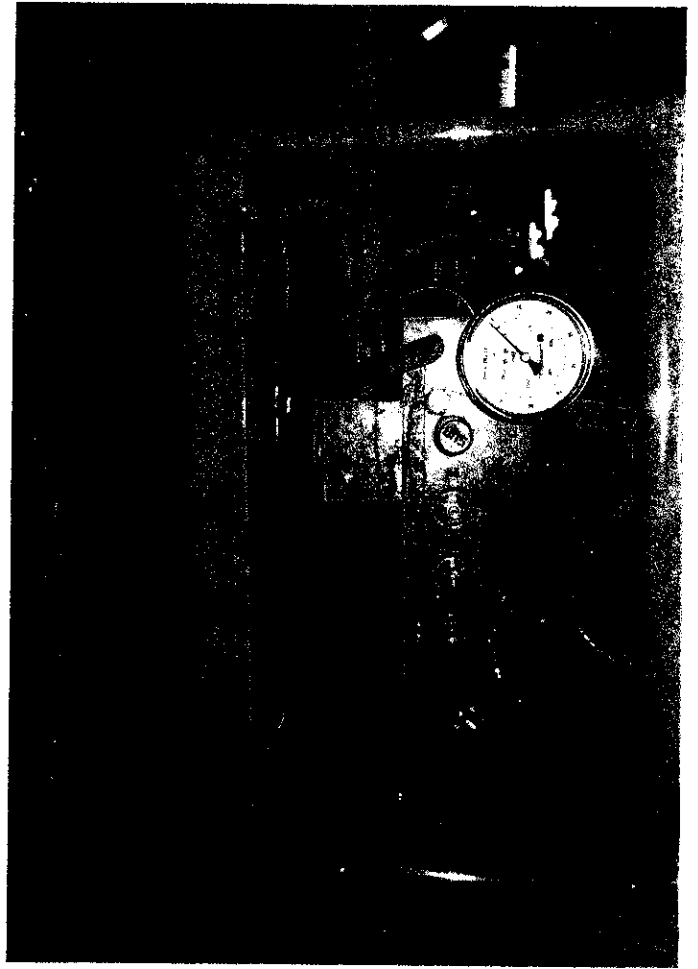


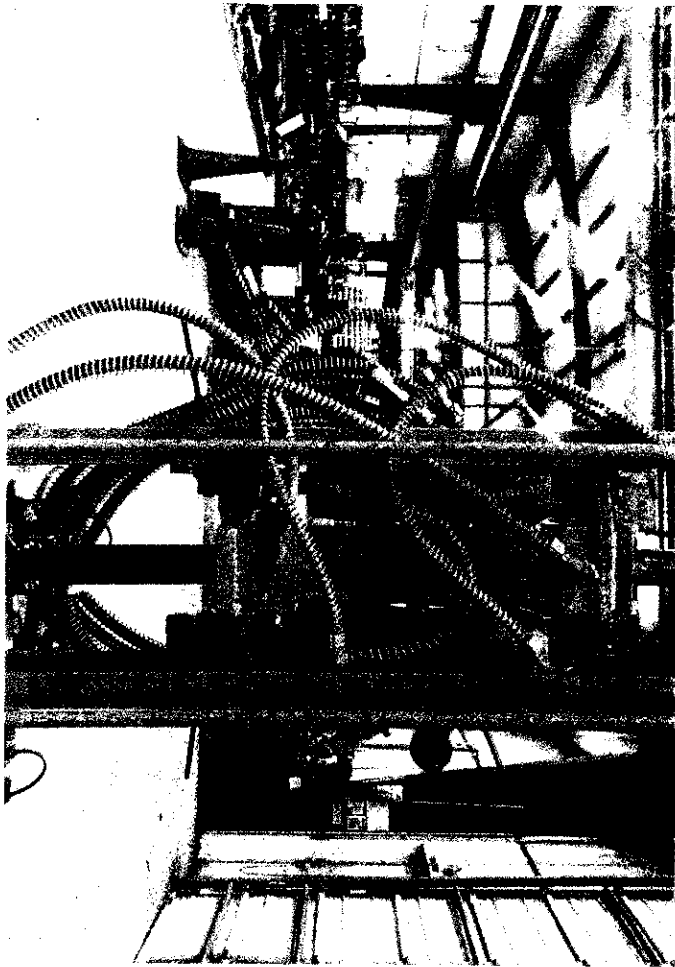


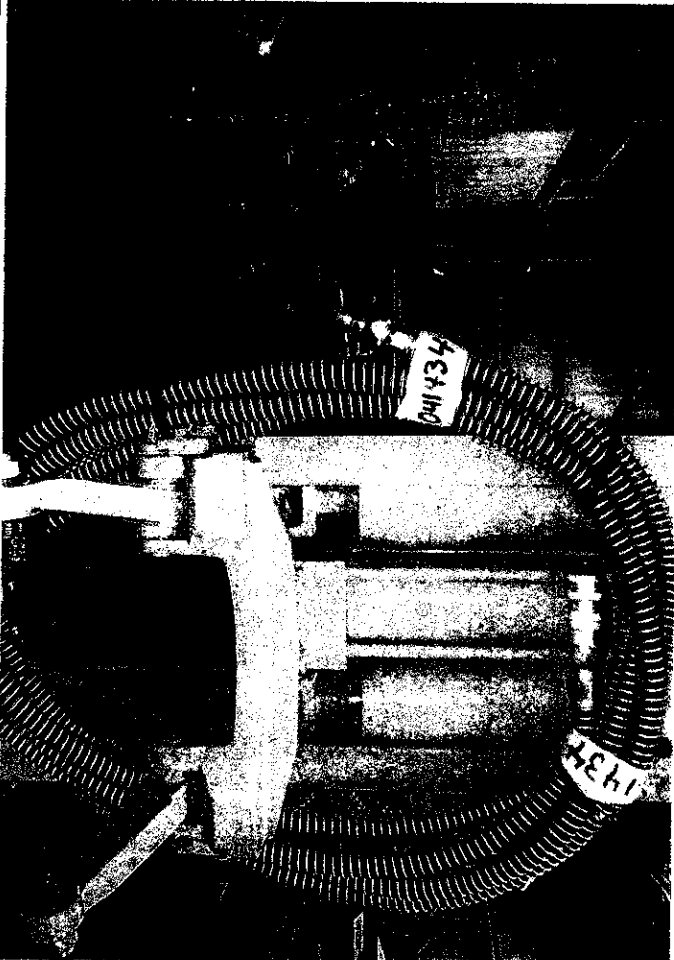
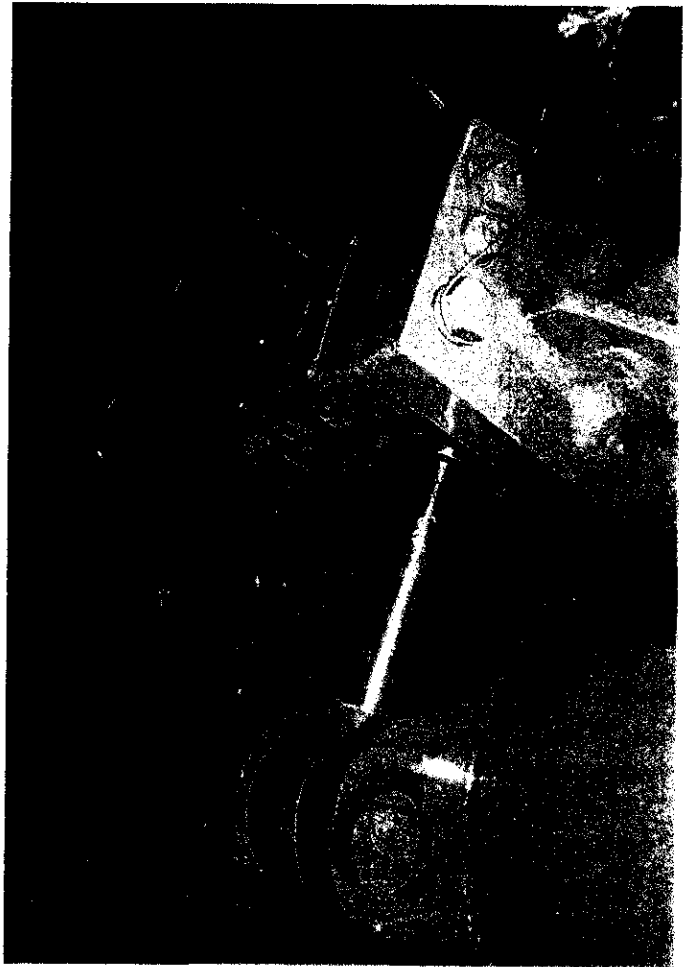
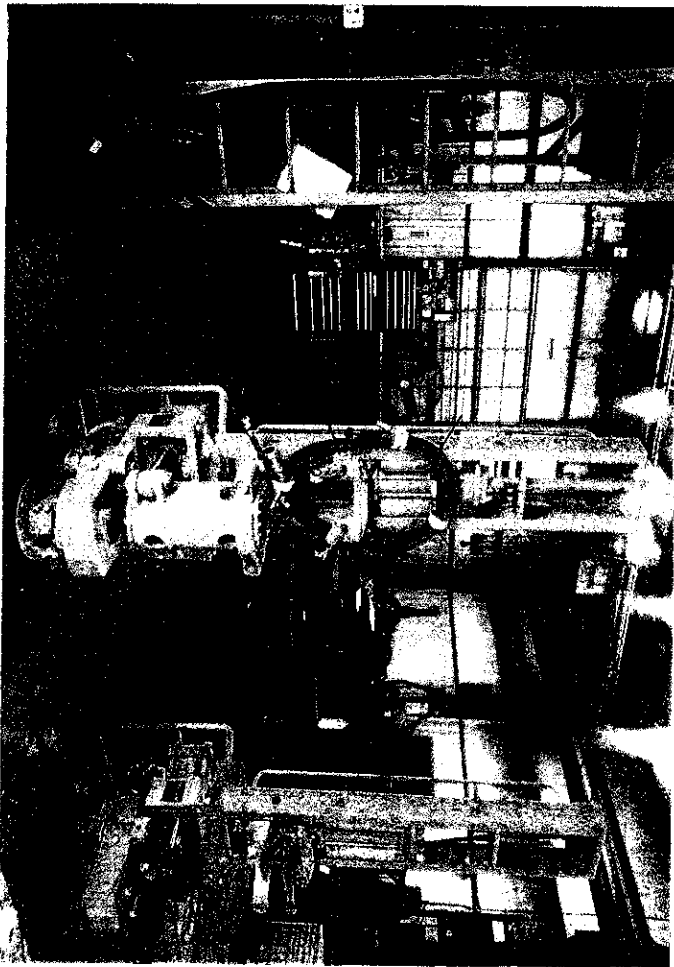












THIS SHIPPING ORDER must be legibly filled in, in ink, in Indelible Pencil or in Carbon, and retained by the Agent.

RECEIVED, subject to the classifications and tariffs in effect on the date of issue of this shipping order.

Shipper's No. 482217
 Company Agent's No. LAC

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated below, which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Uniform Freight Classification in effect on the date hereof, if this is a rail or a railwater shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment.
 Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted by himself and his assigns.

From **NATIONAL OILWELL VARCO**
SA 12 Hwy 90 W New Iberia, LA 70560 At NIARC 12-28 2014
 (Mail or street address of consignee—For purposes of notification only.)

Consigned to DIAMOND OFFSHORE OCEAN TITAN

Destination _____ State _____ Country _____

Routing _____ 53 154
Dec 13

Delivering Carrier W.O. Rail-ACME Vehicle or Car Initial _____ No. _____

No. of Units & Container Type	HM	Proper Shipping Name, Hazard Class Identification Number (UN or NA) per 172.101, 172.202, 172.203	TOTAL QUANTITY (Weight, Volume, Gallons, etc.)	WEIGHT (Subject to Correction)	RATE	CHARGES (For Carrier Use Only)
1-skid		1-VARCO TDS-4H TOP DRIVE TRANSMISSION MOUNTED ON A SHIPPING SKID WITH PUC'S SERIAL # TDS4A28X36 DO 31062 PART # 88584-AIC A W.O.# NEW-526059 CUST.# 153-029628W				

**DIAMOND OFFSHORE
 CENTRAL WAREHOUSE**
 RECEIVED SUBJECT TO
 INTERNAL INSPECTION
 RIG: 153
 PO#: 153-29628W
 DATE: 22 DEC-14
 BY: [Signature]

PLACARDS TENDERED: YES NO

FOR EMERGENCIES CONCERNING HAZARDOUS MATERIAL CALL 1-800-732-9876 DAY OR NIGHT.	I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packaged, marked and labeled, and are in all respects in proper condition for transport by <input type="checkbox"/> Rail <input type="checkbox"/> Highway <input type="checkbox"/> Water (DELETE NON-APPLICABLE MODE OF TRANSPORTATION) according to applicable international and national governmental regulations.	REMIT C.O.D. TO: ADDRESS C.O.D. FEE PREPAID <input type="checkbox"/> COLLECT <input type="checkbox"/> C.O.D. AMT \$ _____	TOTAL CHARGES \$ _____ FREIGHT CHARGES ARE PREPAID UNLESS MARKED COLLECT. CHECK BOX IF CHARGES ARE COLLECT. <input type="checkbox"/>
	Signature _____	Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.	(SIGNATURE OF CONSIGNOR) _____

* If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is carrier's or shipper's weight.
 NOTE—Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.

The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding _____ per _____

NATIONAL OILWELL VARCO

Per Walter Notine
 Permanent post office address of shipper: _____

2

[Signature]

Agent must detach and retain this Shipping Order and must sign the Original Bill of Lading.



NATIONAL OILWELL VARCO

National Oilwell Varco
5212 W. Hwy 90, New Iberia, LA, 70560
Tel. 337.347.1400

CERTIFICATE OF CONFORMANCE

This document certifies that the following equipment has been inspected / repaired in accordance with National Oilwell Varco requirements API Spec 16D and other applicable specifications and procedures.

Exceptions to this certificate are noted in the exclusions section

CUSTOMER NAME	Diamond Offshore
CUSTOMER PO NUMBER	153-029628W
N.O.V. JOB NUMBER	526059
ITEM / EQUIPMENT	TDS-4H Transmission
PART NUMBER	88584-A1CA
SERIAL NUMBER	TDS4A28X36
CUSTOMER I.D. NUMBER	


Exclusions

All material acceptances, dimensional inspections, NDT inspections, repair operations and functional tests were performed by National Oilwell Varco Quality Control Inspectors and / or National Oilwell Varco approved sources and laboratories and meet National Oilwell Varco specifications and where required by API

All documents submitted in this pack are confidential between National Oilwell Varco and customer.
Any information which is deemed as proprietary is withheld.

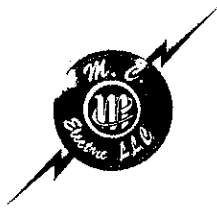
For and on behalf of National Oilwell Varco

SIGNED
BY:


Toby Webre

CERTIFICATION
DATE:

December 18, 2014



M C ELECTRIC, LLC.

PO BOX 930
 AMELIA, LA 70340
 Phone: (985)-631-2851
 Fax: (985)-631-3536
 Email: contact@mcelectricinc.com
 Web: www.mcelectricinc.com

1-PC1
 (TR) (WHSE)

Delivery Ticket

Job No.:	106158
Received Date:	01/02/14
Page:	1

Sold To:	Customer Number: 016513 DIAMOND OFFSHORE COMPANY ATTN. ACCTS PAYABLE P.O. BOX 4809 HOUSTON, TX 77210	Ship To:	Ship To Number: 000099 DIAMOND OFFSHORE NEW IBERIA WAREHOUSE 6501 FREETOWN ROAD NEW IBERIA, LA 70560
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23175
Feb 14

Job No.	Rec'vd Date	Sales Code	Ship Date	Ship Via	Terms
106158	01/02/14	CRC	03/28/14	M C TRUCK	NET 30 DAYS

Customer PO	114-027617A	PO Release	CHARLEY BREEDLOVE	Misc Number	LEXINGTON
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Quantity	Description	Unit Price	Extension
	<p>Nameplate Data: MANUF.:GE TOP DRIVE MOTOR, MOD. #:GE752US2, TYPE:HIGH TORQUE SHUNT, SER. #:EE96010058, STYLE:DO# 28407</p> <p>TAKE & RECORD DIGITAL PICTURES OF UNIT. REMOVE BRAKE HUB & 21 TOOTH PINION FROM SHAFT SEND PIINION TO NOV. FOR TESTING. DISASSEMBLE MOTOR AND INSPECT. REMOVE ALL COILS FROM STATOR HOUSING. SANDBLAST & PRIME BOTH INTERIOR AND EXTERIOR OF STATOR. REINSULATOR REINSULATE COILS WITH NOMEX & INSTALL IN IN STATOR HOUSING. RETEST STATOR WINDING AND RECORD RESULTS. V.P.I. STATOR ASSEMBLY. INSTALL NEW 16' LEADS IN STATOR. REPLACE ARMATURE WITH NEW REASSEMBLE MOTOR REPLACING ALL DEFECTIVE ITEMS AS ITEMIZED BELOW. TEST RUN MOTOR FOR A MINIMUM OF 8 HOURS IN THE VERTICAL TEST RUN MOTOR FOR A MINIMUM OF 8 HOURS IN THE VERTICAL POSITION CHECKING BEARINGS & SHAFT ENDPLAY. INSTALL COVERS AND SAFETY WIRE ALL</p>		

DIAMOND OFFSHORE
 CENTRAL WAREHOUSE
 RECEIVED SUBJECT TO
 INTERNAL INSPECTION
 RIG: 114
 PO#: 114-27617-19
 DATE: 31 MAR 14
 BY: [Signature]

Sub Total	Continued ...
Discount	
Tax	
Freight	
Total	

Received By: _____ Date: _____

Customer



M C ELECTRIC, LLC.

PO BOX 930
 AMELIA, LA 70340
 Phone: (985)-631-2851
 Fax: (985)-631-3536
 Email: contact@mcelectricinc.com
 Web: www.mcelectricinc.com

Delivery Ticket

Job No.:	106158
Received Date:	01/02/14
Page:	2

Sold To:	Customer Number: 016513	Ship To:	Ship To Number: 000099
	DIAMOND OFFSHORE COMPANY ATTN. ACCTS PAYABLE P.O. BOX 4809 HOUSTON, TX 77210		DIAMOND OFFSHORE NEW IBERIA WAREHOUSE 6501 FREETOWN ROAD NEW IBERIA, LA 70560

Job No.	Rec'vd Date	Sales Code	Ship Date	Ship Via	Terms
106158	01/02/14	CRC	03/28/14	M C TRUCK	NET 30 DAYS

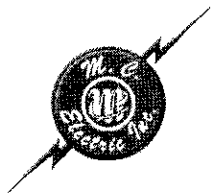
Customer PO	114-027617A	PO Release	CHARLEY BREEOLOVE	Misc Number	LEXINGTON
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Quantity	Description	Unit Price	Extension
	REQUIRED BOLTS. PAINT EXXTERIOR AND INSTALL STAINLESS STEEL ID TAG. CLEAN AND INSTALL BRAKE HUB DN SHAFT. INSTALL 21 TOOTH PINION AS NEEDED. TAKE & RECORD DIGITAL PICTURES OF UNIT. AS PER ESTIMATE (3) CD'S REC'D BY: _____		59,982.77

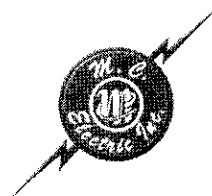
Sub Total	59,982.77
Discount	.00
Tax	.00
Freight	.00
Total	59,982.77

Received By: _____ Date: _____

Customer



M.C. ELECTRIC, L.L.C.
326 DEGRAVELLE ROAD
AMELIA, LA. 70340



QUALITY ASSURANCE REPORT

DIAMOND OFFSHORE

P.O. # 114-027617A

D.O. # 28407

MOTOR S/N EE96010058

M.C. ELECTRIC JOB # 106158

**M C ELECTRIC, LLC.**

PO BOX 930
 AMELIA, LA 70340
 Phone: (985)-631-2851
 Fax: (985)-631-3536
 Email: contact@mcelectricinc.com
 Web: www.mcelectricinc.com

Job Estimate

01/21/14
 2/12/14 - working on
 02/24/14

Job No.:	106158
Recv'd Date:	01/02/14
Page:	1

Sold To:	Customer Number: 016513 DIAMOND OFFSHORE COMPANY ATTN. ACCTS PAYABLE P.O. BOX 4809 HOUSTON, TX 77210 Contact: CHARLEY BREEDLOVE Telephone: 800-848-1980 Fax: 713-647-2100	Ship To:	Ship To Number: 000099 DIAMOND OFFSHORE NEW IBERIA WAREHOUSE 6501 FREETOWN ROAD NEW IBERIA, LA 70560 Fax: - -
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Job Number	Recv'd Date	Sales Code	Location	Ship Via	Terms
106158	01/02/14	CRC			NET 30 DAYS

Customer PO	FR114-027617	PO Release	CHARLEY BREEDLOVE	Misc Number	LEXINGTON
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Units	Item #	Description	Unit Price	Extension
	114-027617A	<p>Nameplate Data: MANUF.:GE TOP DRIVE MOTOR, MOD. #:GE752US2, TYPE:HIGH TORQUE SHUNT, SER. #:EE96010058, STYLE:DO# 28407</p> <p>PLEASE NOTE THE COMMUTATOR IS SEVERELY PITTED AND DAMAGED. DUE TO THE SEVERITY OF DAMAGE, THE QUOTE BELOW INCLUDES REPLACING THE ARMATURE WITH NEW.</p> <p>TAKE & RECORD DIGITAL PICTURES OF UNIT. REMOVE BRAKE HUB & 21 TOOTH PINION FROM SHAFT. SEND PINION TO NOV FOR TESTING. DISASSEMBLE MOTOR AND INSPECT. REMOVE ALL COILS FROM STATOR HOUSING. SANDBLAST AND PRIME BOTH INTERIOR AND EXTERIOR OF STATOR. REINSULATE COILS WITH NOMEMX & INSTALL IN STATOR HOUSING. RETEST STATOR WINDINGS & RECORD RESULTS. V. P. I. STATOR ASSEMBLY. INSTALL NEW 16' LEADS IN STATOR. REPLACE ARMATURE WITH NEW.</p>		

Repair estimate valid for 30 calendar days from the above date.

Total is plus sales tax if applicable.
 Based Upon Our Standard Terms And Conditions.

Total	Continued ...
--------------	---------------

Received By: _____ Date: _____

Customer



M C ELECTRIC, LLC.
 PO BOX 930
 AMELIA, LA 70340
 Phone: (985)-631-2851
 Fax: (985)-631-3536
 Email: contact@mcelectricinc.com
 Web: www.mcelectricinc.com

Job Estimate

Job No.:	106158
Recv'd Date:	01/02/14
Page:	2

Sold To:	Customer Number: 016513 DIAMOND OFFSHORE COMPANY ATTN. ACCTS PAYABLE P.O. BOX 4809 HOUSTON, TX 77210	Ship To:	Ship To Number: 000099 DIAMOND OFFSHORE NEW IBERIA WAREHOUSE 6501 FREETOWN ROAO NEW IBERIA, LA 70560 Fax: - -
	Contact: CHARLEY BREEDLOVE Telephone: 800-848-1980 Fax: 713-647-2100		

Job Number	Recv'd Date	Sales Code	Location	Ship Via	Terms
106158	01/02/14	CRC			NET 30 DAYS

Customer PO	FRI14-027617	PO Release	CHARLEY BREEDLOVE	Misc Number	LEXINGTON
--------------------	--------------	-------------------	-------------------	--------------------	-----------

Units	Item #	Description	Unit Price	Extension
		REASSEMBLE MOTOR REPLACING ALL DEFECTIVE ITEMS AS ITEMIZED BELOW. TEST RUN MOTOR FOR A MINIMUM OF 12 HOURS IN EACH DIRECTION SEATING BRUSHES AND CHECKING BEARINGS. TEST RUN MOTOR FOR A MINIMUM OF 8 HOURS IN THE VERTICAL POSITION CHECKING BEARINGS & SHAFT ENDPLAY. INSTALL HEATER CORD & PLUG ASSEMBLY. INSTALL COVERS AND SAFETY WIRE ALL REQUIRED BOLTS. PAINT EXTERIOR AND INSTALL STAINLESS STEEL ID TAG. CLEAN AND INSTALL BRAKE HUB ON SHAFT. INSTALL 21 TOOTH PINIDN AS NEEDED. TAKE & RECORD DIGITAL PICTURES OF UNIT.		
		ESTIMATE FOR THE ABOVE		17,770.00
1.0	2135	NU330 BEARING GE # 8864951P167	840.00	840.00
1.0	2136	6326M/C4 BALL BEARING GE # 8864950P195SP	900.00	900.00
4.0	7300	GE 41C632667G6 BRUSHHOLDER	185.63	742.52

Total	Continued ...
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Repair estimate valid for 30 calendar days from the above date.
 Total is plus sales tax if applicable.
 Based Upon Our Standard Terms And Conditions.



TRACTION MOTOR NAMEPLATE INFORMATION

DATE January 02, 2014

M.C. ELECTRIC JOB # 106158

MANUF. GE Top Drive

SERIAL# EE96010058

MODEL GE752U32

STYLE _____

TYPE High Torque Shunt

FRAME _____

VOLTS _____

AMPS _____

DIGITAL PICTURES TAKEN? YES OR NO (CIRCLE ONE) NO

CUSTOMER NAME Diamond Offshore

CONTACT PERSON Charley Breedlove PHONE/FAX _____

REC'D VIA MC Trucks (Clyde)

POINT OF ORIGIN _____

COMMENTS Ocean Lexington DO# 28407

FR 114-027617

Old MCE # 96516



Diamond Offshore Drilling, Inc.
Proforma Invoice / Packing List
New Iberia Central Warehouse

CM: 417-071865

Issued: 02-JAN-14

Rev #:

Rev

Date:

Ship Via: THEIR TRUCK

Last Updated By: HULINR

Cargo Manifest
Ocean Lexington

Ultimate Dest: M. C. ELECTRIC, L.L.C. 326 DEGRAVELE STREET AMELIA, LA 70340 ROBERT CARDINAL 985-631-2851	Intermediate Dest:
---	---------------------------

Item	Quan	U-O-M	Description	Ref.Document	Unit Price	Tot.Weight
1	1	EA	MOTOR, TRACTION HIGH TORQUE DC, SHUNT WOUND, FOR TDS-4S, PINION OR HUB FITTED SERIAL NUMBER - 50109-5482 - FROM UNION SUPPLIES ABZ Model: TDS-4S S/N: TDS4SF12X03 DODI P/N: 720-02422 MFG P/N: GE752US2	FR114-027617	500.00	0.00

Manifest Totals: 500.00 0.00

Rlg Comments: *** CM 632-0111 ***

Whse Comments
NF#/RT#:

I certify that the above material was accepted this date from New Iberia Central Warehouse for delivery to M. C. ELECTRIC, L.L.C..

Received material described above at M. C. ELECTRIC, L.L.C..

Date: 1/2/14

By: *Clyde P. ...*

Date:

By:

Cody Cardinale

From: "Breedlove, Charley" <CBREEDLOVE@DODI.com>
To: "Cody Cardinale" <ccardinale@mcelectricinc.com>
Sent: Tuesday, January 07, 2014 8:12 AM
Subject: RE: FR114-027617 Top Drive Motor Initial Inspection Request

Cody,

Please proceed with tear down, evaluation and quote. No one will be present for tear down.

Thanks,
Charley

From: Cody Cardinale [mailto:ccardinale@mcelectricinc.com]
Sent: Thursday, January 02, 2014 2:16 PM
To: Breedlove, Charley
Subject: FR114-027617 Top Drive Motor Initial Inspection Request

Good Afternoon Charley,

The GE752 top drive motor for the Ocean Lexington is ready for tear down and evaluation. Please advise if a DODI representative need be present. If you have any questions please advise.

Thank You,
Cody Cardinale
ccardinale@mcelectricinc.com
M.C. Electric L.L.C.
Phone:(985)-631-2851
Fax:(985)-631-3536
www.mcelectricinc.com



**DIAMOND
OFFSHORE**

DIAMOND OFFSHORE COMPANY
P.O. Box 4809, Houston, Texas 77210-4809
Phone: 281-492-5300 Fax: 281-647-2202

Page 1 Of 1

P.O. NUMBER	114-027617A
DATE	10-MAR-2014
REVISION	
AFE NUMBER	1411408

PURCHASE ORDER

VENDOR
M. G. ELECTRIC, L.L.C.
P O BOX 930
AMELIA, LA 70340-0930

SHIP TO
New Iberia Warehouse
Attn: Receiving
6501 Freetown Road
New Iberia, LA 70560
337-365-5180

Well:
Lease:

Rig: Ocean Lexington

TERMS NET 30	DEL.PROM. 21-APR-2014	INCO Terms EX-WORKS	SHIP VIA MOTOR FREIGHT	ULTIMATE DEST TRINIDAD	PRICE FIRM	TAX STATUS EXEMPT
CONFIRMING TO. & PHONE NUMBER CODY CARDINALE 985-631-2851			NOTE TO VENDOR JOB# 108158			

ITEM	QTY.	UNIT	DESCRIPTION	UNIT PRICE	EXTENSION
1	1	EACH	Account Reference: 5411000 88585-HTR - MOTOR, TRACTION HIGH TORQUE DC , SHUNT WOUND, WITH 21 TOOTH PINION AND BRAKE HUB, DO# 28407, REPAIR AS PER MSR-09 & OEM SPECIFICATIONS, MODEL: TDS-4S	59,982.77	59,982.77
			NOTE Country of Origin must be stated on each line item of Packing List or Commercial Invoice for material destined for export. If Country of Origin is not provided, Diamond Offshore reserves the right to cancel the order and return material to vendor at vendor's expense without incurring cancellation or restocking charges.		
				US Total	59,982.77

Remit Invoices To:
DIAMOND OFFSHORE COMPANY
P.O. Box 4809
Houston, Texas 77210

Purchase is exempt from sales and use tax per the following:
Offshore Drilling Equipment Exemption -- Louisiana R.S. 47:305(1)
First Use Offshore Exemption -- Louisiana R.S. 47:305.10
Vessel Exemption -- Louisiana R.S. 47:305.1

Charlie Breedlove

ACCEPTANCE OF THIS ORDER BY THE SELLER'S COMMENCEMENT OF PERFORMANCE OR OTHERWISE SHALL CONSTITUTE FULL ACCEPTANCE BY THE SELLER OF DIAMOND OFFSHORE'S STANDARD TERMS AND CONDITIONS OF PURCHASE AND ALL TERMS AND CONDITIONS CONTAINED HEREIN OR ATTACHED HERETO. THE P.O. NUMBER MUST LEGIBLY APPEAR ON ALL INVOICES, PACKAGES AND CORRESPONDENCE RELATED TO THIS ORDER. BUYER REQUIRES FREIGHT DOCUMENTATION. ORIGINAL FREIGHT INVOICE MUST ACCOMPANY ALL FREIGHT CHARGES EXCEEDING \$500. MATERIAL SAFETY DATA SHEETS MUST ACCOMPANY ALL HAZARDOUS MATERIAL SHIPMENTS

Cody Cardinale

From: "Breedlove, Charley" <CBREEDLOVE@DODI.com>
To: "Cody Cardinale" <ccardinale@mcelectricinc.com>
Sent: Monday, March 24, 2014 9:53 AM
Subject: RE: Ocean Lexington GE752 Top Drive Motor Final Inspection Request
No inspection by DODI required. Please proceed with testing and deliver when ready.

Thanks,
Charley

From: Cody Cardinale [mailto:ccardinale@mcelectricinc.com]
Sent: Monday, March 24, 2014 8:16 AM
To: Breedlove, Charley
Subject: Ocean Lexington GE752 Top Drive Motor Final Inspection Request

Good Morning Charley,
The GE752US2 Top Drive Motor for the Ocean Lexington on PO#114-027617A is currently running and is ready for final inspection. Please advise if a DODI representative need be present.

Thank You,
Cody Cardinale
ccardinale@mcelectricinc.com
M.C. Electric L.L.C.
Phone:(985)-631-2851
Fax:(985)-631-3536
www.mcelectricinc.com

3/24/2014

JOB CARD - QUALITY ASSURANCE

Job: 106158	Department: SH SHOP	Job Desc: GE TOP DRIVE MOTOR Type: TM TRACTION MTR./GEN.
Customer: 016513	S DIAMOND OFFSHORE COMPANY	Ship To #: 000099
O ATTN. ACCTS PAYABLE	L P.O. BOX 4809	S DIAMOND OFFSHORE
D HOUSTON, TX 77210		H NEW IBERIA WAREHOUSE
		I 6501 FREETOWN ROAD
		P NEW IBERIA, LA 70560

Nameplate Data:

MANUF.:GE TOP DRIVE MOTOR, MOD. #:GE752US2, TYPE:HIGH TORQUE SHUNT, SER. #:EE96010058, STYLE:DO# 28407

(QA) QUALITY ASSURANCE

00 INITIAL MEGGER READINGS	[]
01 ARMATURE	[GROUND _____]
02 FIELDS	[INFINITY @ 1000 VOLTS _____]
03 INTERPOLES	[GROUND _____]
04 -----	[]
05 FINAL VOLTAGE DROP READINGS	[]
06 FIELDS	[10/10/10/10 @ 40 VOLTS, 37 A _____]
07 INTERPOLES	[11/11/11/11 @ 44 VOLTS, 159 A _____]
08 -----	[]
09 FINAL MEGGER READINGS	[]
10 ARMATURE CIRCUIT	[INFINITY @ 1000 VOLTS _____]
11 FIELD CIRCUIT	[INFINITY @ 1000 VOLTS _____]
12 -----	[]
13 FINAL HIGH POT. READINGS	[]
14 ARMATURE CIRCUIT	[1.6 MICROAMPS @ 3000 VOLTS _____]
15 FIELD CIRCUIT	[1.2 MICROAMPS @ 3000 VOLTS _____]
16 -----	[]
17 SHAFT ENDPLAY	[.012" _____]
18 -----	[]
19 INITIAL D.E. BALANCE READING	[NEW _____]
20 INITIAL O.D.E. BALANCE READING	[NEW _____]
21 -----	[]
22 FINAL D.E. BALANCE READING	[NEW _____]
23 FINAL O.D.E. BALANCE READING	[NEW _____]
24 -----	[]
25 SHUNT FIELD RESISTANCE:	[1.2 OHMS _____]
26 DRIVE END BEARING TEMPERATURE	[119 F _____]
27 COMMUTATOR END BEARING TEMP.	[89 F _____]
28 -----	[]
29 COMPASS CHECK TESTED BY	[CODY I. _____]
30 COMPASS CHECK WITNESSED BY	[CODY C. _____]
31	[]
32 HEATER VOLTAGE & AMPERAGE TEST	[117 VOLTS, 3.18 AMPS _____]
33	[]
34 M.C. ELECTRIC REPRESENTATIVE	[JARED _____]

JOB CARD - QUALITY ASSURANCE

Job: 106158	Department: SH SHOP	Job Desc: GE TOP DRIVE MOTOR Type: TM TRACTION MTR./GEN.
Customer: 016513	S DIAMOND OFFSHORE COMPANY	Ship To #: 000099
O ATTN. ACCTS PAYABLE	L P.O. BOX 4809	S DIAMOND OFFSHORE
D HOUSTON, TX 77210		H NEW IBERIA WAREHOUSE
		I 6501 FREETOWN ROAD
		P NEW IBERIA, LA 70560

Nameplate Data:

MANUF.:GE TOP DRIVE MOTOR, MOD. #:GE752US2, TYPE:HIGH TORQUE SHUNT, SER. #:EE96010058, STYLE:DO# 28407

(SW) SPECIAL WORK

00 D.E. JOURNAL DIMENSIONS	[]
01 MEASUREMENT 1	[NEW _____]
02 MEASUREMENT 2	[NEW _____]
03 MEASUREMENT 3	[NEW _____]
04 -----	[]
05 O.D.E. JOURNAL DIMENSIONS	[]
06 MEASUREMENT 1	[NEW _____]
07 MEASUREMENT 2	[NEW _____]
08 MEASUREMENT 3	[NEW _____]
09 -----	[]
10 D.E. HOUSING DIMENSIONS	[]
11 MEASUREMENT 1	[5.119" _____]
12 MEASUREMENT 2	[5.119" _____]
13 MEASUREMENT 3	[5.119" _____]
14 -----	[]
15 O.D.E. HOUSING DIMENSIONS	[]
16 MEASUREMENT 1	[NEW _____]
17 MEASUREMENT 2	[NEW _____]
18 MEASUREMENT 3	[NEW _____]
19 -----	[]
20 FINAL COMMUTATOR DIAMETER	[]
21 MEASUREMENT 1	[NEW _____]
22 MEASUREMENT 2	[NEW _____]
23 MEASUREMENT 3	[NEW _____]
24 -----	[]
25 FINAL COMMUTATOR T.I.R.	[.000"]
26 -----	[]
27 1300 RPM VIBRATION READINGS	[]
28 DRIVE END # 1 READING	[0.0 MILS @ 1300 RPM _____]
29 DRIVE END # 2 READING	[0.0 MILS @ 1300 RPM _____]
30 DRIVE END # 3 READING	[0.4 MILS @ 1300 RPM _____]
31 COMMUTATOR END # 1 READING	[0.0 MILS @ 1300 RPM _____]
32 COMMUTATOR END # 2 READING	[0.0 MILS @ 1300 RPM _____]
33 COMMUTATOR END # 3 READING	[0.2 MILS @ 1300 RPM _____]
34 -----	[]
35 D.E. BEARING FACE RUNOUT	[.000" _____]
36 O.D.E. BEARING FACE RUNOUT	[.000" _____]

JOB CARD - QUALITY ASSURANCE

Job: 106158	Department: SH SHOP	Job Desc: GE TOP DRIVE MOTOR Type: TM TRACTION MTR./GEN.
Customer: 016513	S DIAMOND OFFSHORE COMPANY	Ship To #: 000099
O ATTN. ACCTS PAYABLE	L P.O. BOX 4809	S DIAMOND OFFSHORE
D HOUSTON, TX 77210		H NEW IBERIA WAREHOUSE
		I 6501 FREETOWN ROAD
		P NEW IBERIA, LA 70560

Nameplate Data:

MANUF.:GE TOP DRIVE MOTOR, MOD. #:GE752US2, TYPE:HIGH TORQUE SHUNT, SER.
#:EE96010058, STYLE:DO# 28407

37 -----	[]
38 D.E. BEARING MANUFACTURER-OLD	[F.A.G. _____]
39 D.E. BEARING PART NUMBER-OLD	[55830C _____]
40 O.D.E. BEARING MANUF. - OLD	[F.A.G. _____]
41 O.D.E. BEARING PART NUMBER-OLD	[6326M.C4 _____]
42 -----	[]
43 D.E. BEARING MANUFACTURER-NEW	[F.A.G. _____]
44 D.E. BEARING PART NUMBER-NEW	[558830C _____]
45 O.D.E. BEARING MANUF. - NEW	[F.A.G. _____]
46 O.D.E. BEARING PART NUMBER-NEW	[558320C _____]
49 DRIVE COUPLING DATA	[]
50 COUPLING TYPE	[21 TOOTH PINION _____]
51 COUPLING FIT ON SHAFT (COLD)	[.072" _____]
52 COUPLING FIT ON SHAFT (HOT)	[.014" _____]
53 COUPLING ADVANCE	[.086" _____]
57 O.D.E. COUPLING DATA	[]
58 COUPLING TYPE	[BRAKE HUB _____]
59 COUPLING FIT ON SHAFT (COLD)	[3.637" _____]
60 COUPLING FIT ON SHAFT (HOT)	[3.509" _____]
61 COUPLING ADVANCE	[0.128" _____]

TRACTION MOTOR FINAL QA CHECKLIST

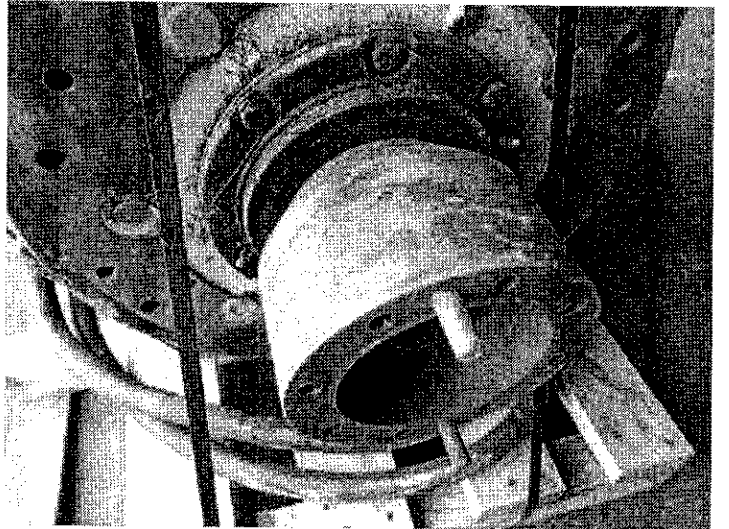
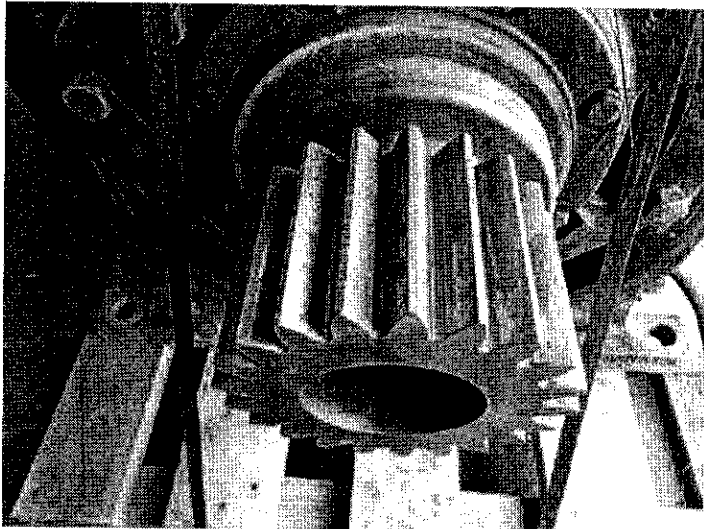
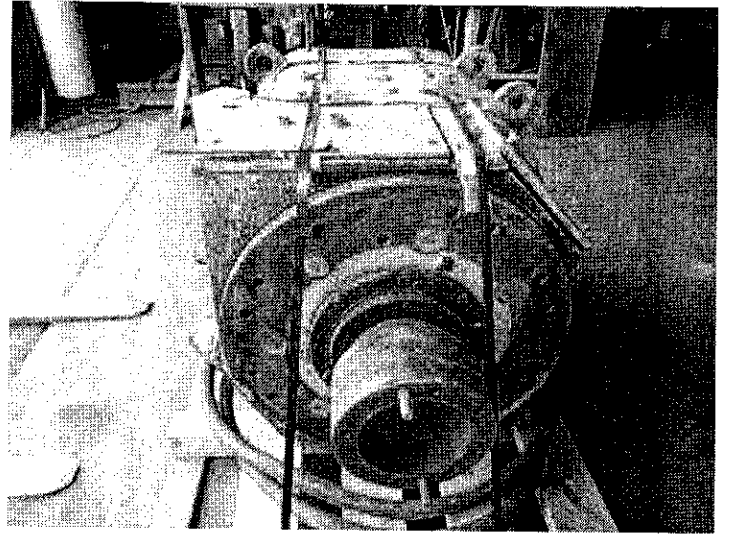
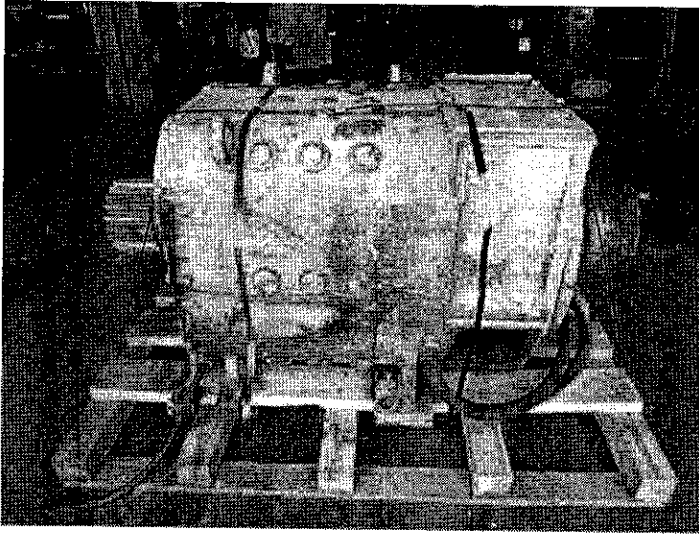
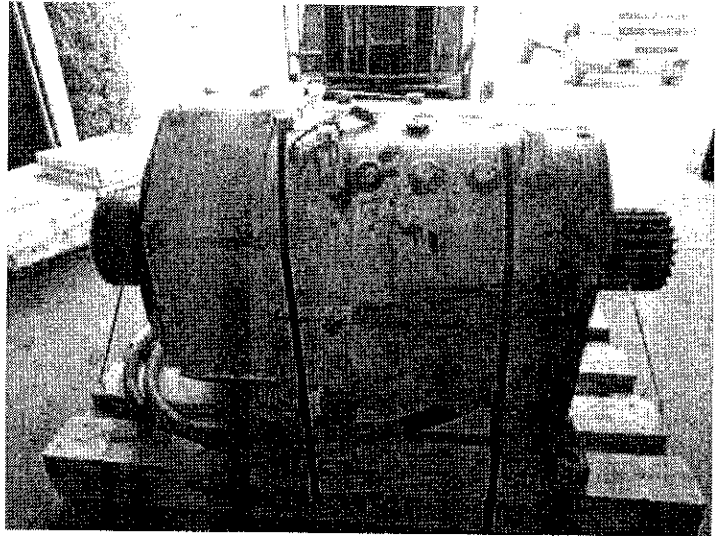
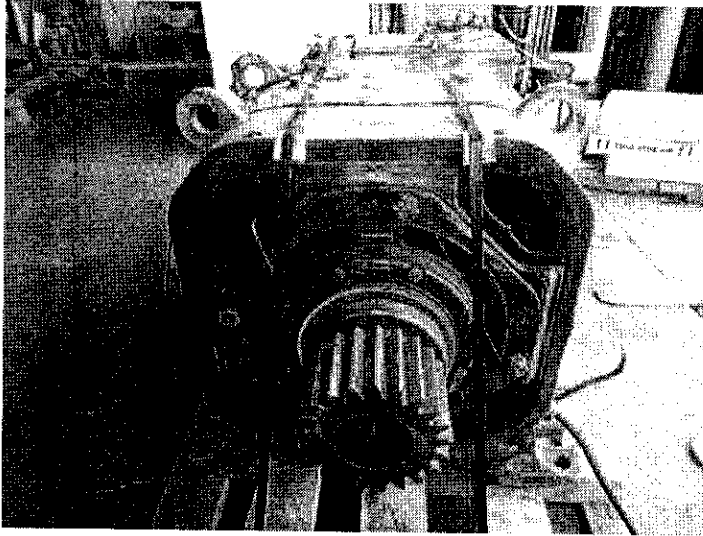
THIS INSPECTION TO BE INITIATED JUST PRIOR TO INSTALLING COVERS & COMPLETED JUST BEFORE SHIPMENT.
(ALL ITEMS TO BE INITIALED BY PERSON PERFORMING TASK)

- 1) CHECK ALL BRUSHES TO INSURE NONE ARE STUCK IN HOLDER AND THAT ALL ARE PROPERLY SEATED. CPD
- 2) CHECK COMMUTATOR FOR PROPER MACHINING. CPD
- 3) CHECK COMMUTATOR FOR ANY CONTAMINANTS. CPD
- 4) INSPECT OVERALL PAINT JOB. MAKE CERTAIN GREASE FITTINGS, NAMEPLATES, ETC. ARE NOT PAINTED. CPD
- 5) TURN SHAFT AND CHECK FOR PROPER END PLAY, BINDING OR UNDUE NOISES. CPD
- 6) CHECK TO INSURE LEADS ARE PROPERLY TAGGED AND THE PROPER TERMINALS ARE INSTALLED. CPD
- 7) CHECK TO INSURE THE PROPER NAMEPLATES, STAINLESS STEEL ID TAG, D.O. #, OR ANY APPLICABLE TAGS ARE INSTALLED. CPD
- 8) VERIFY THAT ALL THE PROPER ACCESSORIES HAVE BEEN INSTALLED (COUPLINGS, J-BOX, ETC.) CPD
- 9) VERIFY THAT ALL REQUIRED BOLT HOLES ARE PROPERLY TAPPED AND MACHINED SURFACES PROPERLY COATED WITH A RUST INHIBITER. CPD
- 10) VERIFY UNIT IS PROPERLY SECURED ON A HEAVY DUTY PALLET (IF APPLICABLE) AND MARKED WITH ALL THE PERTINENT DATA. CPD
- 11) VERIFY THAT UNIT HAS A HEATER CORD & PLUG ASSEMBLY (IF APPLICABLE). CPD
- 12) VERIFY SHAFT HAS PASSED M.P.I. & U.T. TESTING FOR CRACKS. New Armature
- 13) REVIEW MECHANICS FINAL TEST RESULTS AND Q/A TEST RESULTS TO INSURE ALL REQUIRED DATA IS PROPERLY DOCUMENTED. CPD
- 14) INSURE GREASE TUBES ARE PURGED CPD
- 15) VERIFY THAT SHAFT TURNS AT LOAD OUT TIME FOR DELIVERY. (TO BE PERFORMED BY M.C.E. TRUCK DRIVER OR M.C.E. LOAD OUT PERSON). CPD

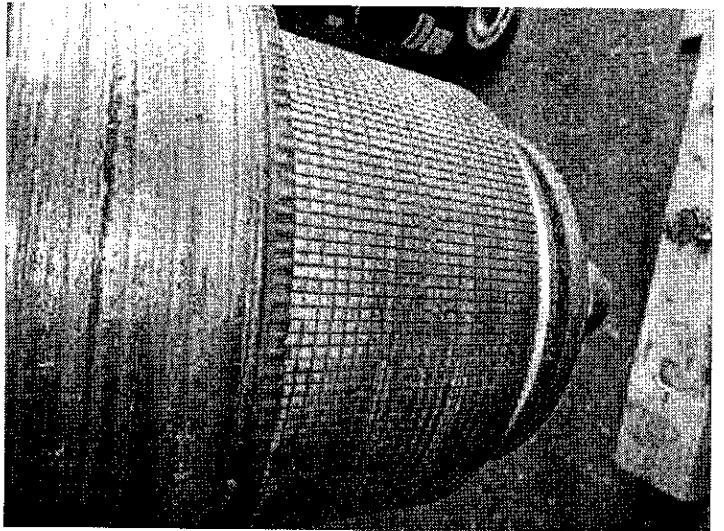
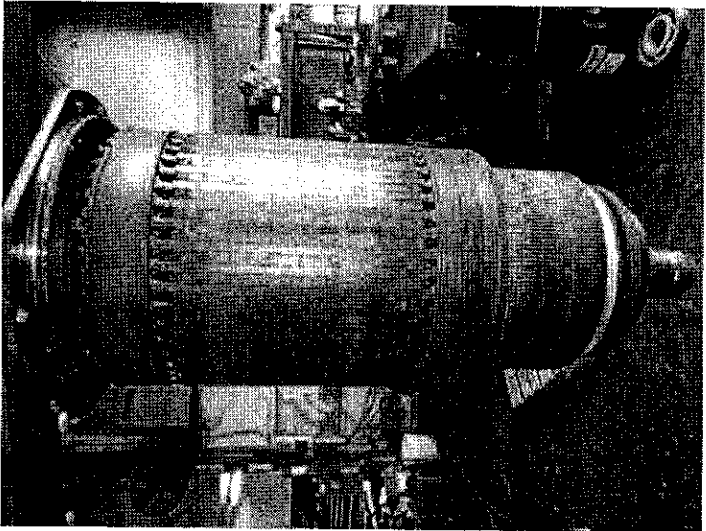
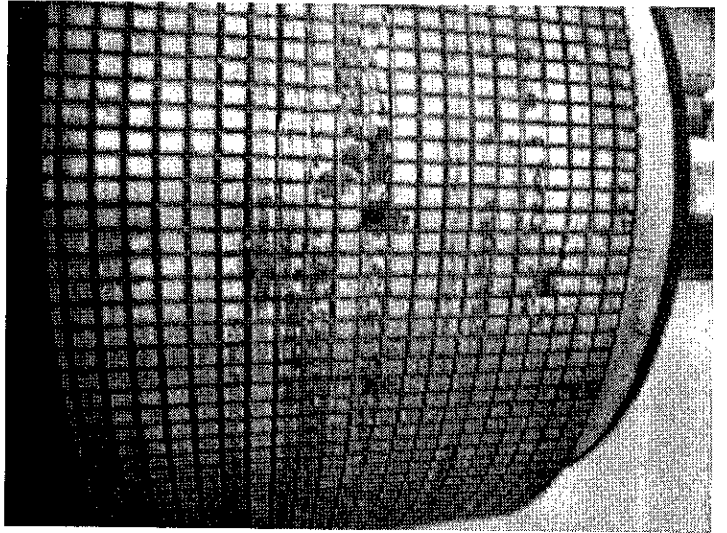
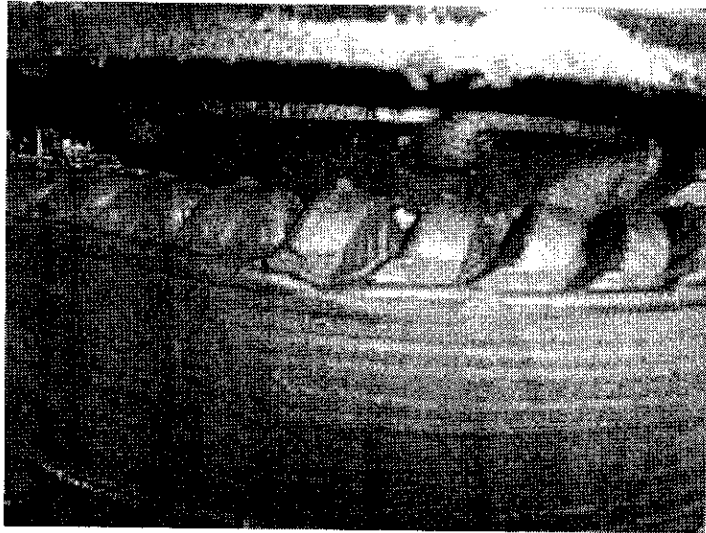
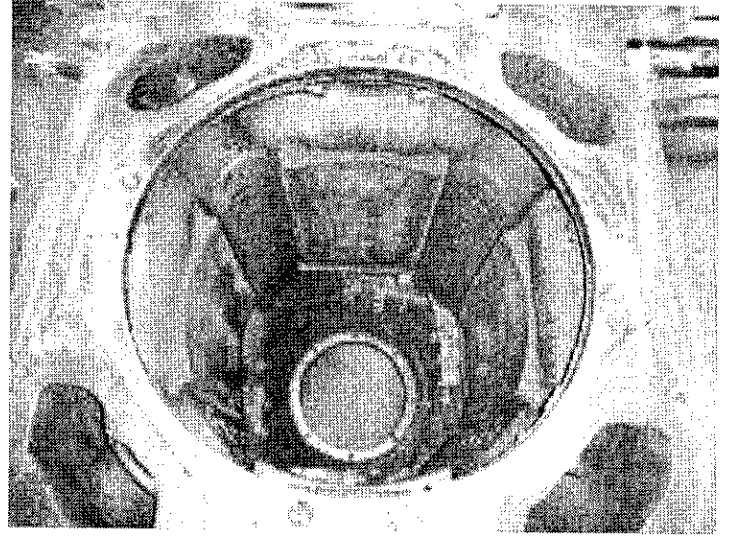
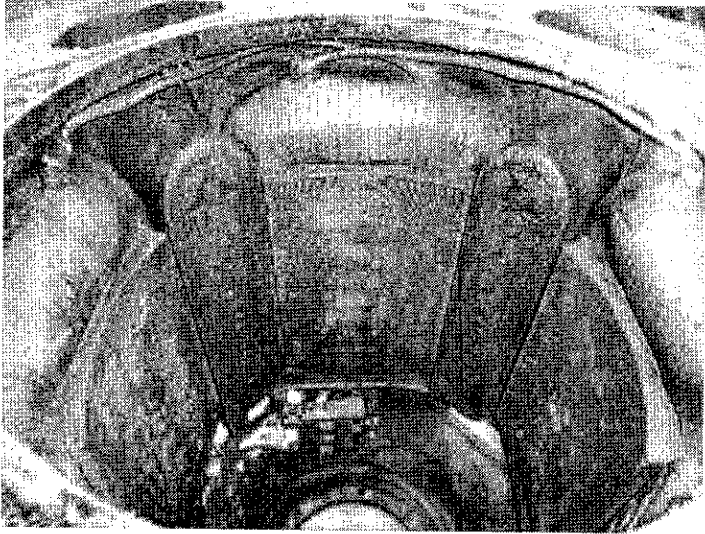
JOB # 106158

DATE 03/28/14

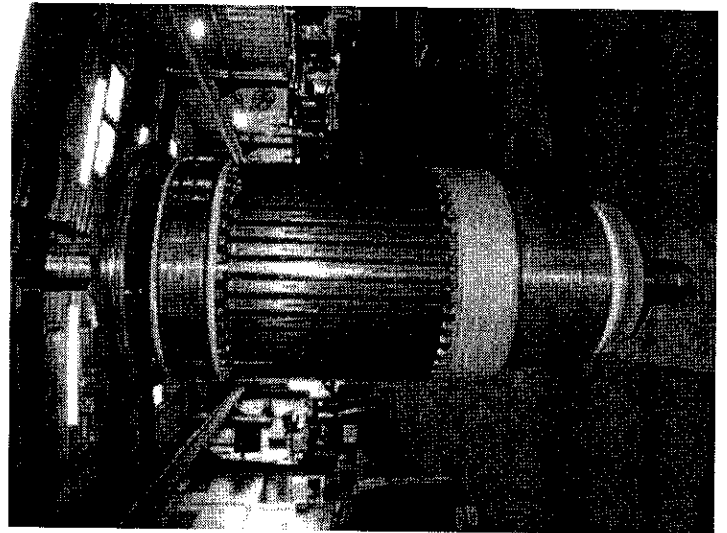
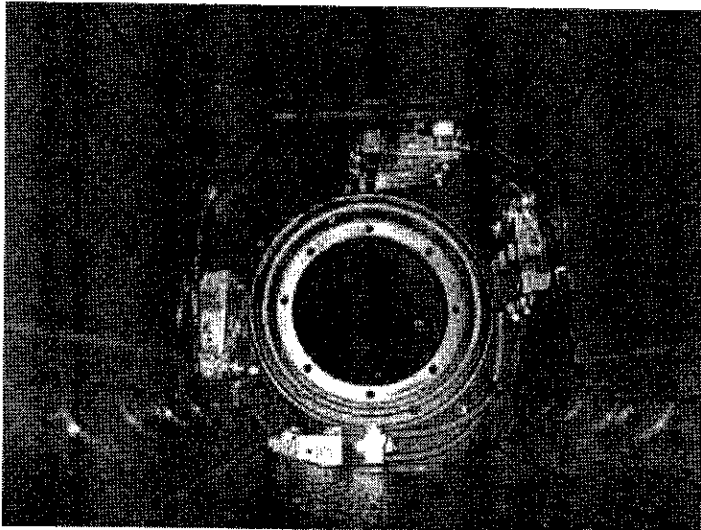
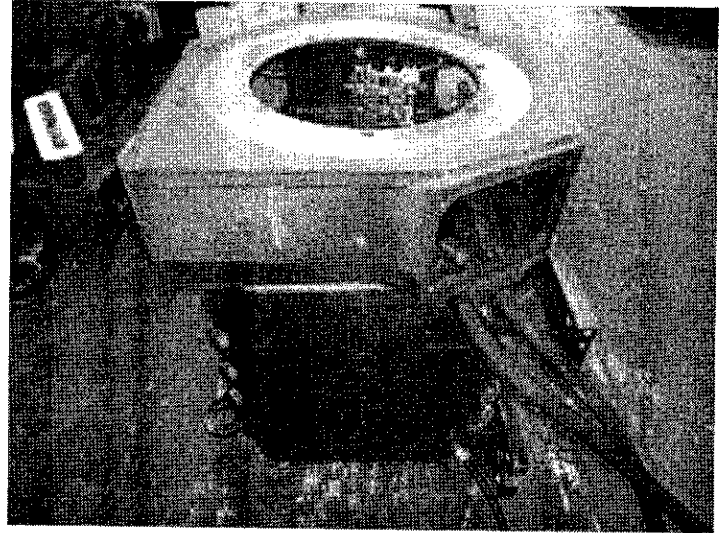
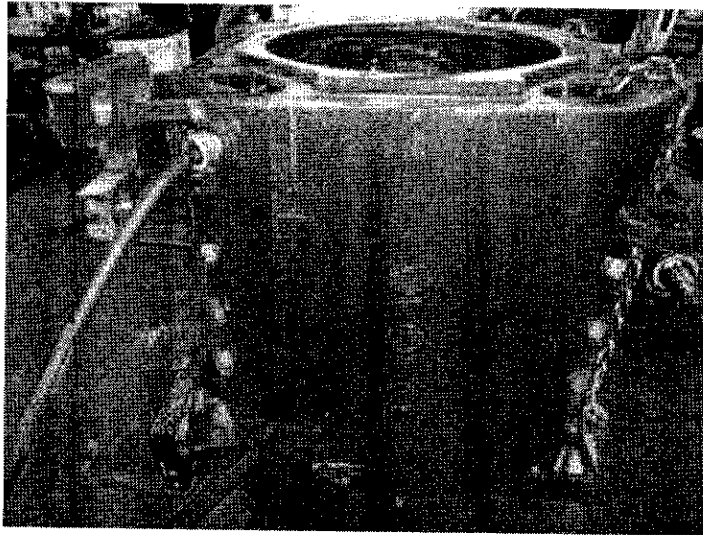
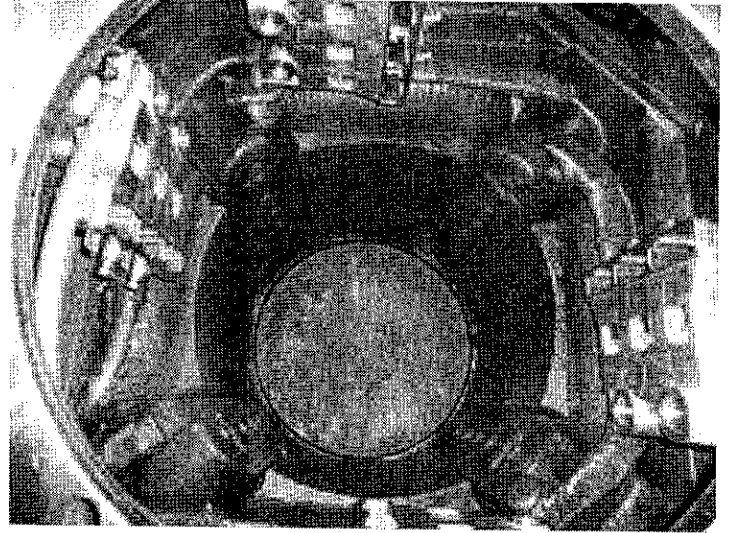
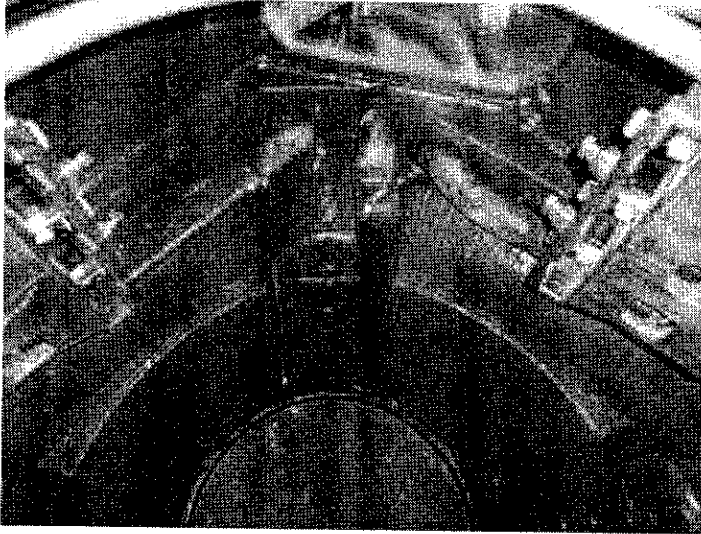
JOB # 106158 - INITIAL PICTURES



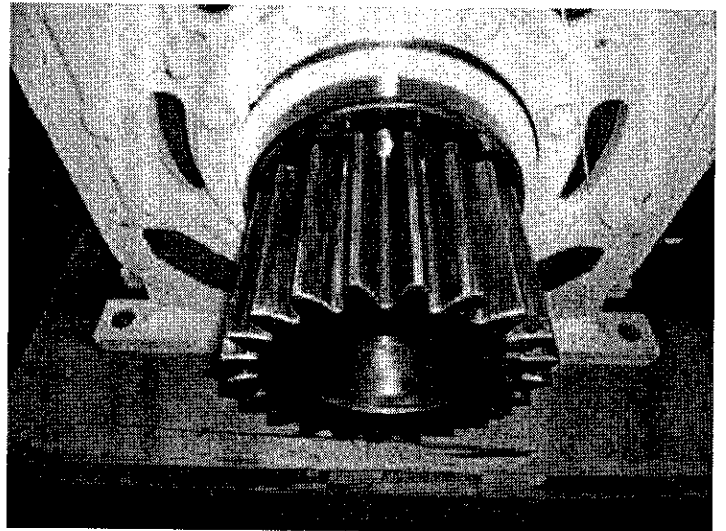
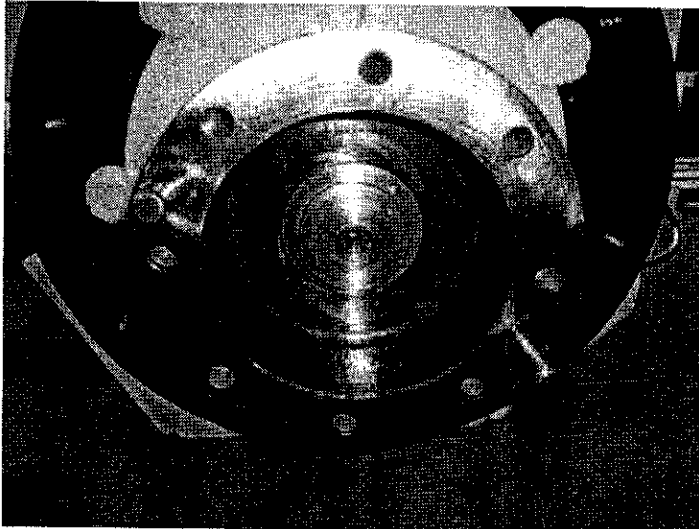
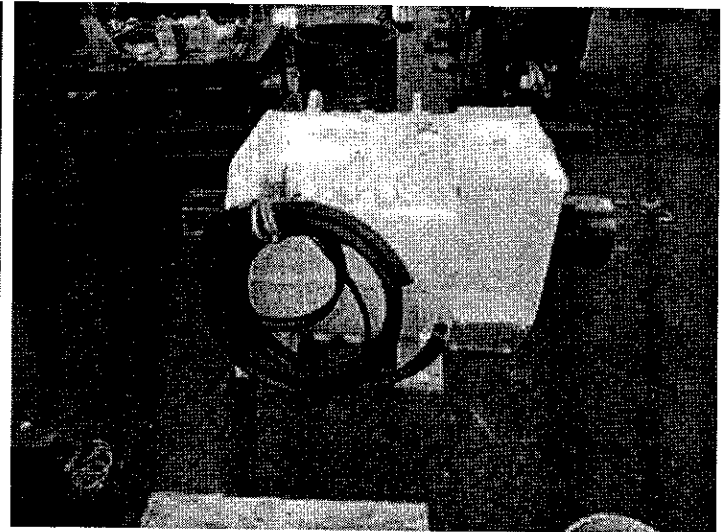
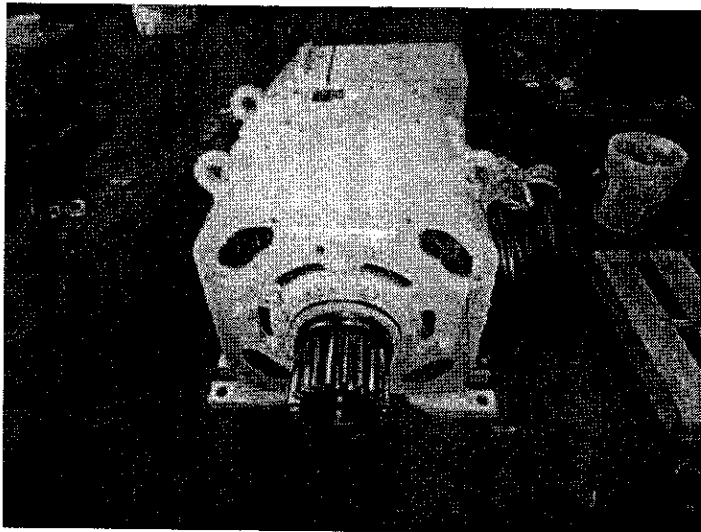
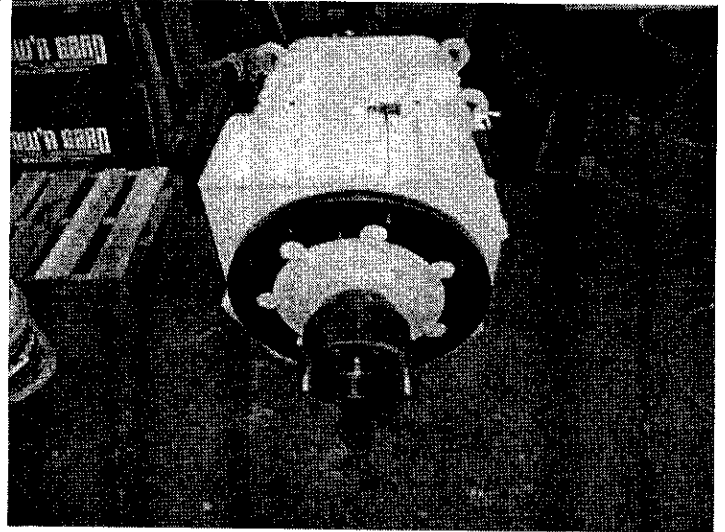
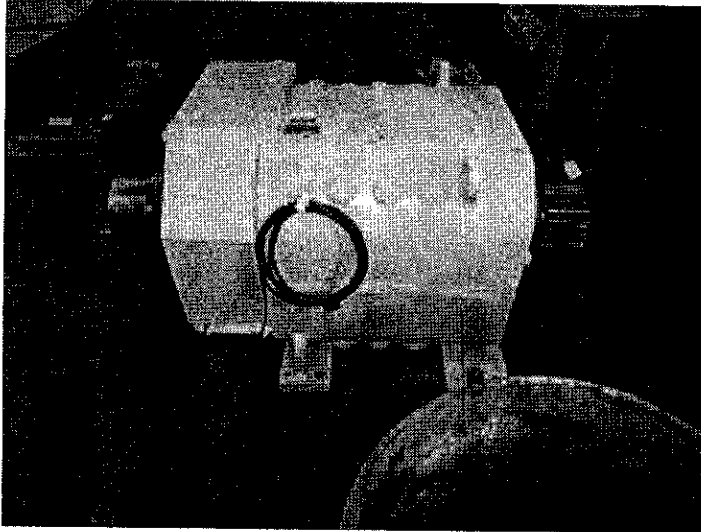
JOB # 106158 - DISASSEMBLY PICTURES



JOB # 106158 - ASSEMBLY PICTURES



JOB # 106158 - FINAL PICTURES





1520 Flower Avenue
 Duarte, CA 91010
 TEL: 626-303-0740
 FAX: 626-359-7109

PACKING LIST

Shipping No. 351065

Special Instructions

Cert. Enclosed Partial Ship Complete Ship

Goods Received in Good Condition

By: _____

Date: _____

SOLD TO: CHELSIE LLC
 P.O. BOX 29721
 LAUGHLIN NV 89028
 832-326-0587

BD

SHIP TO: LÉTOURNEAU TECHNOLOGIES INC.
 6500 BRITTMOORE RD.
 HOUSTON TX 77041

ATTN: LANA WILLIAMS *BD*

Sales Order	Ship Num	Cust No	Order Date	Tax	Promised	Sales Rep	Customer P. O. Number	Mark Shipment
140849	0000	CHE500	03/29/10	E	04/02/10	NOVA HOUSE	P993126-00	CHARLES BREAUX
Sales BR	F.O.B. Point	Ship Date	Shipped Via	Cartons	Weight	Waybill Number	Ins	
AZ DU	OUR DOCK	04/08/10	TBD				N	

Item	T	QUANTITY			Unit	Part Number/Revision	Description
		Order	B/O	Ship			
001	S	1.00		1.00	EA	N13350-B5D25AHNPT J	HPU, S50, 480VAC, 50HP, UL ELEC Cust Part SI-000390
						<i>Pln # SI-000390</i>	HPU N13350 S50 W/OPTIONAL WATER/HYD HEAT EXCHANGER AND HIGH PRESSURE FILTER 460/60 Hz W/STARTER. SET FOR HIGH TEMP 37 GPM/2500 PSI/40 HP*
					Qty	1.00	Bin STGFIN
<p><i>Loc. Central</i></p> <p>RECEIVED</p> <p>APR 12 2010</p> <p>Per <i>[Signature]</i></p>							<p>*** EMAIL INVOICE TO: *** Angelina_z@dfmail.net ***</p> <p>*****CERTIFICATION REQUIRED**** *****TAGS REQUIRED*****</p>
							<p>PACKING LIST TO NOTE: PO# P993126-00 ITEM 1 SI-000390 ATTACHED C OF C ATTACHED TS COMPLETE WITH SAME INFO. ATTACHED UPDATED MANUAL WITH LONG TERM STORAGE</p>

BD

IN WING

CONDITIONAL SALES AGREEMENT: TITLE TO PRODUCTS REMAIN IN THE SELLER UNTIL INVOICE IS PAID. MATERIALS MAY NOT BE RETURNED WITHOUT SPECIFIC AUTHORIZATION FROM DELAFIELD CORPORATION. CLAIMS FOR SHORTAGES OR DEFECTIVE MATERIAL MUST BE MADE WITHIN 30 DAYS FROM RECEIPT OF GOODS. CERTIFICATE OF COMPLIANCE: MATERIALS AND/OR PARTS FURNISHED ON THIS ORDER HAVE BEEN MANUFACTURED IN ACCORDANCE WITH ALL APPLICABLE INSTRUCTIONS AND SPECIFICATIONS. PHYSICAL AND CHEMICAL DATA PERTAINING TO THIS ORDER MAY BE AVAILABLE FROM THE ORIGINAL MANUFACTURERS.

PACKED BY	DATE SHIPPED	# BOXES	TOTAL WEIGHT	SHIPPING/HANDLING CHARGES	INC. CHG. Y N
<i>[Signature]</i>	4-8-10				OUT CHG. Y N

DELAFIELD CORPORATION CERTIFICATE OF CONFORMANCE

1520 FLOWER AVE
DUARTE, CA 91010
PH: 626-303-0740
FX: 626-359-7109

10695 TREENA ST. SUITE #104
SAN DIEGO, CA 92131
PH: 619-547-1150
FX: 619-547-1160

CUSTOMER: CHELSIE LLC

PURCHASE ORDER NO.

SALES NO.

PAGE NO.

P993126-00

0140849

1 OF 1

ITEM	PART NUMBER	DESCRIPTION	DUE	U/M	QTY	ACCEPT	REJECT
001	N13350-B5D25AHNPT	HPU, S50, 480VAC, 50 HP	04/02/10	EA	1	1	0
	REV J	UL ELEC					
	S/N: DU10040022	TEST REPORTS ARE ATTACHED					

IT IS HEREBY CERTIFIED THAT ALL ARTICLES ON THE ABOVE SHIPMENT AND IN THE QUANTITIES AS CALLED FOR IN THE ABOVE PURCHASE ORDER NUMBER ARE IN CONFORMANCE WITH THE REQUIREMENTS, SPECIFICATIONS AND DRAWINGS APPLICABLE TO THAT ORDER.

INSPECTED BY: JOSE MARTINEZ
QUALITY CONTROL INSPECTOR

DATE: 04/08/2010

DELAFIELD CORPORATION

1520 FLOWER AVE
DUARTE, CA 91010
PH: 626-303-0740
FX: 626-359-7109

CERTIFICATE OF CONFORMANCE

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INSPECTED BY: JOSE MARTINEZ
QUALITY CONTROL INSPECTOR

DATE: 04/08/2010



QC APPROVED
SIG **QC 16**
DATE 4/12/10

S/N DU10040022



TEST PROCEDURE
FOR
HPU-S40/S50 HYDRAULIC POWER UNIT

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DELAFIELD CORPORATION

Title

**TEST PROCEDURE FOR
HPU-S40/S50 HYDRAULIC
POWER UNIT**

APPROVALS

DATE

DRAWN S.MUNOZ 4/7/07

CHECKED *JPSJ* 2010.04.07 08:25:50 -07'00'

RESP ENG *JPSJ* 2010.04.07 08:26:02 -07'00'

MFG ENG

QUAL ENG

Size
A

DWG

TP13350

REV
C

SCALE: NONE

SHEET 1 OF 10

This procedure defines the production of a single hydraulic power unit with one electric motor. Each unit is to be tested and inspected according to the following procedure. Unit preparation and setup shall be completed prior to starting this test.

Data sheet entries are required for each test step. Any discrepancy is cause for discontinuing the test until the discrepancy has been eliminated. In the event of a major discrepancy whose repair would affect items previously inspected or tested, the affected items shall also be retested after the discrepancy has been eliminated.

Reference Figure 1 (sheet 8) for the test loop.

1.0 VISUAL INSPECTION

- 1.1 Inspect the power unit to see that it has been assembled per applicable assembly drawing.
- 1.2 Check the orientation of Hand Pump and Return Filter check valves, such that it free flows per the appropriate hydraulic schematic.
- 1.3 Check electrical wiring for tight connections and proper circuitry per the appropriate electrical schematic.

2.0 UNIT PREPARATION

- 2.1 Connect test line as shown in Figure 1 (sheet 8). Flow control valve should open.
- 2.2 Fill Pump case with hydraulic oil (prime pump).
- 2.3 Ensure pump inlet valve is fully open.
- 2.4 Start motor and let it run for 20 seconds. At the end of this time period the pump should have cleared itself and the system of air and should have quieted down. If it does not, shut the unit down and locate the source of the noise and correct the problem.

Note: If quick starting is not obtained or excessive noise is heard from the pump, locate and correct the problem.

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	SIZE	DWG	REV
Title TEST PROCEDURE FOR HPU-S40/S50 HYDRAULIC POWER UNIT	A	TP13350	C
	SCALE: NONE		SHEET 2 OF 10

3.0 PRESSURE SETTINGS (see sheet 6 for specific values)

Note: All tests should be carried out with the oil temperature between 90-150° F unless otherwise noted.

- 3.1 With the system primed, and with the pump running, the flow meter should read at least the minimum flow specified on the data sheet.
- 3.2 (Note: This adjustment is for HPU's Equipped with overpressure relief valve.) With the pump off, turn System Overpressure Relief Valve all the way in. Close test loop valve, start pump, and increase pump output pressure to 3700 psi. Adjust System Overpressure Relief Valve to 3500 +/- 50 psi.
- 3.3 With pump running, adjust maximum pump output pressure to 3000 psi +100 psi / -0 psi.

4.0 HORSE POWER LIMITER SETTING

- 4.1 Run the pump. Open flow control valve and record the flow and pressure registered on the test loop gauges. Using an ampmeter, monitor motor current. Current should not exceed motor nameplate full load current.
- 4.2 Gradually close flow control valve while continually monitoring current for maximum amperage. Current should not exceed motor nameplate full load current in any of the three electrical phases. Record flow and current values for pressure as shown on data sheet.

5.0 TEMPERATURE SETTING

- 5.1 With the pump operating, fully open the flow control. Monitor fluid temperature and do not let it exceed 170° F. Take temperature switch bulb and place in a temperature bath that is below 160° F. Increase temperature of bath until motor shuts off. Motor should shut off when bath temperature reaches 165° +5°F / -0°F. Adjust switch as necessary to bring switch within limits.
- 5.2 When the temperature switch has shut the unit off, push the START button; the unit should start. Release the start button and the unit should shut down.

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DELAFIELD CORPORATION

Title

**TEST PROCEDURE FOR HPU-S40/S50
HYDRAULIC POWER UNIT**

SIZE

A

DWG

TP13350

REV

C

SCALE: NONE

SHEET 3 OF 10

6.0 **UNIT LEAKAGE**

- 6.1 With flow control valve closed, run pump and check for external leakage.
- 6.2 Open flow control valve with pump still running and check for leakage.

7.0 **OIL CLEANLINESS TEST**

- 7.1 Test oil cleanliness per NAS 1638, Level 8 (ISO 17/14 – up to 1300 particles at 5 micrometer and up to 160 particles at 15 micrometers per milliliter).

8.0 **REMOTE STOP/START TEST**

- 8.1 Turn unit off using the remote start/stop, then turn the unit back on using remote switch.

9.0 **PRESSURE GAUGE CHECK**

- 9.1 Turn on Pump. Raise system pressure to 1500 psig.
- 9.2 Pressure gauge on HPU should match test gauge pressure within +/- 100 psig.
- 9.3 Raise pressure to 3000 psig.
- 9.4 Pressure gauge on HPU should match test gauge pressure within +/- 100 psig.
- 9.5 Shutdown Pump.

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DELAFIELD CORPORATION

Title

**TEST PROCEDURE FOR HPU-S40/S50
HYDRAULIC POWER UNIT**

SIZE

DWG

REV

A

TP13350

C

SCALE: NONE

SHEET 4 OF 10

10.0 FLOAT SWITCH CHECK

- 10.1 Turn on pump. Drain fluid from reservoir while pump is running. Pump should shut off when fluid is within +/- 1" of the LOW position in the liquid level indicator window.
- 10.2 Push start button. Unit should run. Release the start button and the unit should shut down.
- 10.3 Shut unit down. Disconnect electrical power cord and the hydraulic lines. Replace filter with new element and drain reservoir fluid.

11.0 HEAT EXCHANGER AND THERMOSTATIC VALVE (if equipped)

- 11.1 Connect facility water to 1" NPT port located before the Thermostat Valve.
- 11.2 Confirm incoming water pressure is between 50 psi and 90 psi.
- 11.3 Place the Thermostat Valve probe in heated liquid bath.
- 11.4 Verify that the valve begins to open at 120 deg F +/- 5 deg F.
- 11.5 Valve should be fully open by 125 deg F (maximum). Record temperature.
- 11.6 Remove facility water lines and purge lines and heat exchanger of residual water. Record Temperature.

12.0 FINAL INSPECTION

- 12.1 Check to see that the reservoir is empty and clean.
- 12.2 Check to see that the labels and signs have been attached or applied per assembly drawing.
- 12.3 Install plugs on the pressure and return lines.

13.0 UNIT IS READY FOR SHIPMENT

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Title

**TEST PROCEDURE FOR HPU-S40/S50
HYDRAULIC POWER UNIT**

DELAFIELD CORPORATION

SIZE

DWG

REV

A

TP13350

C

SCALE: NONE

SHEET 5 OF 10

DATA SHEET FOR HPU-S40 HYDRAULIC POWER UNIT

P/N H13350-65025AHNPT Date of test 4-8-10

DC
193

S/N DV10040022

Name of tester JF KELLEMS

STEP NO.	TEST	READING	REQUIREMENT
1.0	<u>Visual Inspection</u>		<u>N1335065025AHNPT J</u>
1.1	Assembly Inspection	<u>✓</u>	Per Assembly Dwg. No. _____
1.2	Valve Orientation	<u>✓</u>	Per Hydraulic Schematic: <u>N/A</u>
		<u>✓</u>	Pump Valve
1.3	Electrical Wiring	<u>✓</u>	Per Electric Schematic: <u>N13527</u>
2.0	<u>Unit Preparation</u>		
2.1	Test Gauge	<u>✓</u>	Installed
	Flow Control Valve	<u>✓</u>	Open
2.2	Pump Inlet Valve	<u>✓</u>	Open
2.3	System Priming Pump	<u>✓</u>	Normal Operating Noise
		<u>✓</u>	Quick Start-up
3.0	<u>Pressure Setting</u>		
3.1	Normal Flow	<u>38.0</u> GPM	≥ 36 GPM
	Pressure	<u>750</u> psi	≤ Specified operating pressure: 750 psi
3.2	System Overpressure Relief	<u>3000</u> psi	3500 psi <u>3000</u>
3.3	Pump Pressure Setting	<u>2500</u> psi	3000 psi <u>2500</u>
4.0	<u>HP Limiter Setting</u>		
4.1	Nominal Load Flow	<u>30.0</u> GPM	19-24 GPM
		<u>47.3</u> amps	≤ Motor nameplate Full Load Current: <u>57.8</u>
		<u>2175</u> psi	

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DELAFIELD CORPORATION

Title
TEST PROCEDURE FOR HPU-S40/S50 HYDRAULIC POWER UNIT

SIZE	DWG	REV
A	TP13350	C
SCALE: NONE		SHEET 6 OF 10

4.2	<u>Pressure vs Flow</u>		
	2900 psi	<u>N/A</u> GPM	GPM (minimum)
	2500 psi	<u>21.5</u> GPM	1 GPM
	2000 psi	<u>32.0</u> GPM	20 GPM
	1500 psi	<u>37.5</u> GPM	27 GPM
	1000 psi	<u>38.0</u> GPM	34 GPM
	500 psi	<u>38.0</u> GPM	36 GPM
	Maximum Motor Current	<u>47.3</u> amps	≤ Motor nameplate Full Load Current: <u>57.8</u>
5.0	<u>Temperature Setting</u>		
5.1	Test Gauge Press. Setting	<u>1800</u> psi	1800 psi ± 50 psi
	Temp. Shutoff	<u>169</u> ° F	165° F + 5° F / -0° F
	Pump	<u>✓</u>	Off
5.2	Start Button		
	Push and Hold	<u>✓</u>	Motor Starts
	Release	<u>✓</u>	Motor Stops
6.0	<u>Unit Leakage</u>		
6.1	Hydraulic Leakage (closed)	<u>✓</u>	No Leakage
6.2	Hydraulic Leakage (open)	<u>✓</u>	No Leakage
7.0	<u>Oil Cleanliness</u>		
7.1	Varco Test Specification TS 00419	<u>✓</u>	Complete procedure
8.0	<u>Remote Start/Stop</u>		
8.1	Turn unit off using remote start/stop	<u>✓</u>	unit shuts off
8.2	Turn unit on using remote start/stop	<u>✓</u>	unit turns on
9.0	<u>Pressure gauge</u>		
9.1	System pressure to be 1500 psig	<u>1500</u> psi	
9.2	HPU gauge reading	<u>1500</u> psi	within +/- 100 psig
	within 100 psig	<u>YIN</u>	

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Title

**TEST PROCEDURE FOR HPU-S40/S50
HYDRAULIC POWER UNIT**

SIZE

A

DWG

TP13350

REV

C

SCALE: NONE

SHEET 7 OF 10

- 9.3 System pressure to be ²⁵⁰⁰~~3000~~ psig 2500 psi
- 9.4 HPU gauge reading 2500 psi within +/- 100 psig
within 100 psig Y/N
- 9.5 Shutdown HPU Y/N
- 10.0 Float switch
- 10.1 Lower oil level ✓ oil at "Low" Level ($\pm 1"$)
Pump ✓ Off
- 10.2 Start Button
Push and Hold ✓ Motor Starts
Release ✓ Motor Stops
- 10.3 Power Cord ✓ Disconnected
Hydraulic Lines ✓ Disconnected
Filter Element ✓ Replaced with new element
Oil & Tank ✓ Drained and Clean
- 11.0 Heat Exchanger and Thermostat Valve
- 11.1 Facility water connected ✓ connected
- 11.2 Water pressure between 50 and 90 psi 70 record pressure
- 11.3 Valve probe in heated bath ✓ confirm
- 11.4 Valve opens at 120 +/- 5 deg F 123°F record temp
- 11.5 Valve fully open by 125 deg F 126°F record temp
- 11.6 Purge water from lines and H.E. ✓ confirm

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SIZE	DWG	REV
A	TP13350	C
SCALE: NONE		SHEET 8 OF 10

Title

**TEST PROCEDURE FOR HPU-S40/S50
HYDRAULIC POWER UNIT**

12.0 Final Inspection

- 12.1 Reservoir ✓ Empty
- 12.2 Labels and Signs ✓ Per Assembly Drawing
- 12.3 Pressure and Return Lines Plugged ✓ Installed

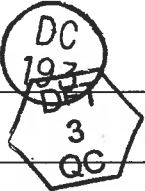
UNIT IS READY FOR SHIPMENT

OPERATION APPROVAL

QUALITY CONTROL APPROVAL

DATE

"*J.F. Kellems*"
Jose Martinez
 4-8-10



INSTRUMENT

ASSET #

CALIBRATION DATE

FLOW METER DF-FM-08 2-24-11

TEMPERATURE GAUGE DF-DTM-04 8-27-10

PRESSURE GAUGE DF-PG-11 9-29-10

AMP METER DF-0MM-03 6-12-10

.....
 Online log: 211
 FCU 2110 03.13

DELAFIELD CORP

Start: 25.03.2010 13:30

Averaging interval: 0 min

Test volume : 100 ml

Time	NAS	1638	Q
h:m 02...05...15...25 >25 ml			
0:00	<02	<02	<04 <06 100
0:00	<02	<02	<04 <06 101
0:00	<02	<02	<04 <06 101
0:00	<02	<02	<04 <06 101
0:00	<02	<02	<04 <06 101
0:00	<02	<02	<04 <06 102
0:00	<02	<02	<04 <06 104
0:00	<02	<02	<04 <06 100

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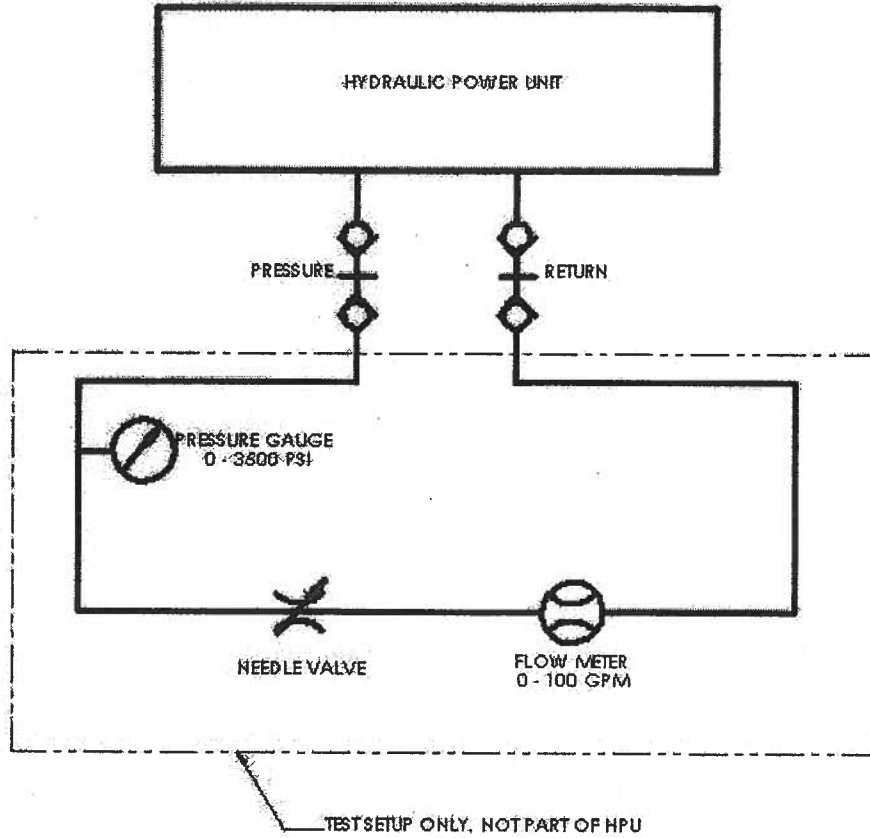
DELAFIELD CORPORATION

SIZE	DWG	REV
A	TP13350	C
SCALE: NONE		SHEET 9 OF 10

Title

**TEST PROCEDURE FOR HPU-S40/S50
 HYDRAULIC POWER UNIT**

FIGURE 1: HYDRAULIC POWER UNIT TEST SETUP



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Title

**TEST PROCEDURE FOR HPU-S40/S50
HYDRAULIC POWER UNIT**

SIZE

DWG

REV

A

TP13350

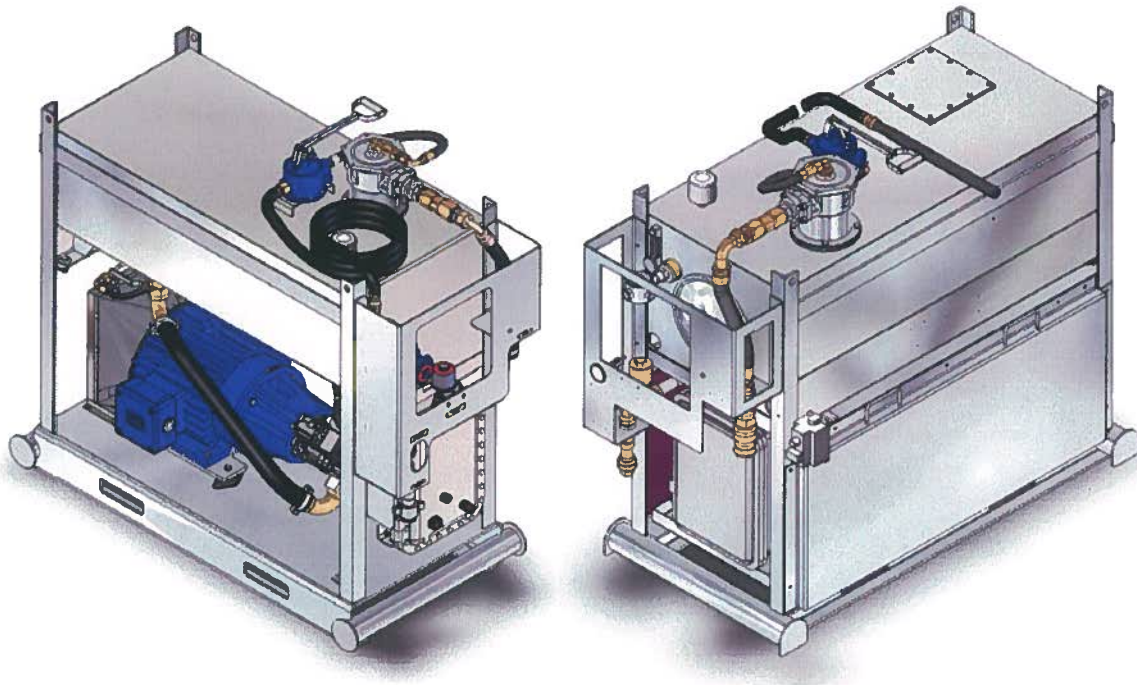
C

SCALE: NONE

SHEET 10 OF 10



HPU-S40/S50
Single Motor 40 or 50 Hp
HYDRAULIC POWER UNIT



SERVICE and MAINTENANCE
MANUAL

SM13350 rev C

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HPU-S40 SERVICE MANUAL

A) Introduction and General Information

-Caution-

To avoid injury to personnel or equipment, all personnel installing, operating, repairing, or maintaining this equipment should be trained in rig safety and machine operation. This includes any personnel in the vicinity of this equipment or any other hydraulically-operated equipment.

1) Safety Practices

- Isolate all energy sources before beginning any work on the Hydraulic Power Unit (HPU). Isolate and “lockout” all electrical, hydraulic, and tag all power and control stations. Notify personnel as required.
- Avoid performing any maintenance or repairs on the HPU while the HPU is in operation.
- Wear proper protective equipment during the installation, maintenance, inspection, or repair of this equipment.
- Before beginning work, familiarize yourself with electrical and hydraulic schematics, operational, maintenance, and safety procedures.
- Take precautions when bleeding down residual hydraulic pressure. Use bleed valves or equivalent techniques. Extreme care should be taken when servicing accumulators.
- Collect all residual hydraulic oil to prevent environmental contamination. Notify safety personnel of any oil spills.

2) General Maintenance Tips

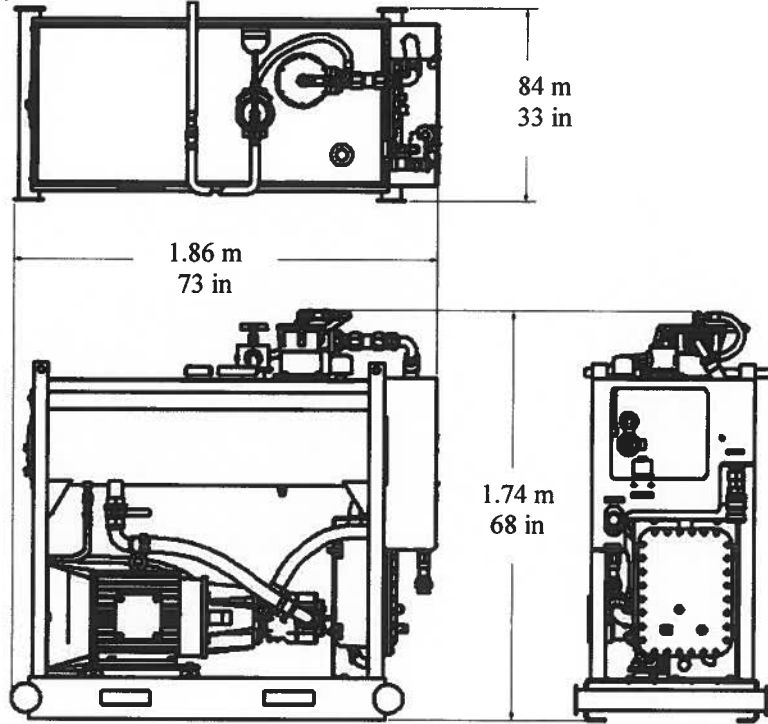
- When servicing components, verify component hoses and cables are clearly labeled to ensure correct re-installation.
- Replace failed, damaged, or lost components with Original Equipment Manufacturer (OEM) parts only.
- Replace or repair damaged parts as soon as possible to prevent further damage or hazards.
- Maintain equipments as recommended by the manufacturer and keep a maintenance log of all work performed.
- Only personnel fully trained in the maintenance and servicing of this equipment should perform any work.
- Keep in Stores a supply of all consumables and maintenance items. Restock before starting work.
- Clean-up any spilled fluids and dispose per standard rig procedures.
- Contact manufacturer if technical assistance is necessary. Don't guess.

3) Condition of HPU Driven Equipment

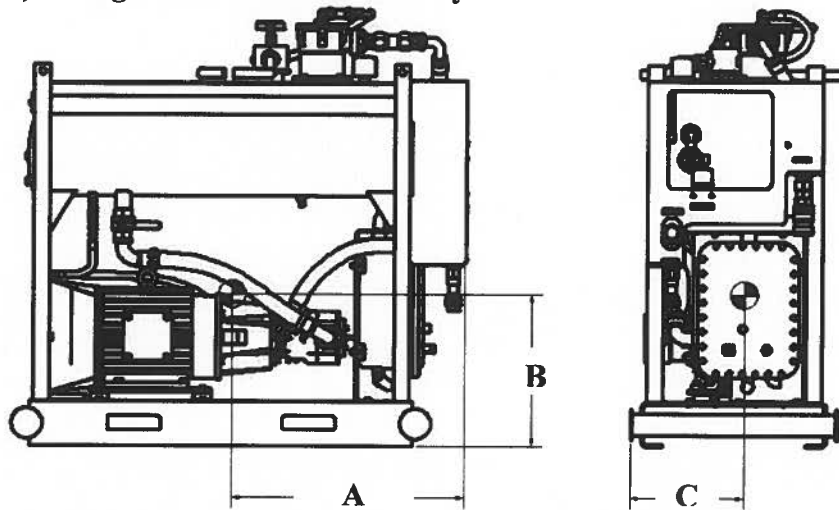
- All equipment connected to and powered by the HPU must be hydraulically clean, and in good working condition (no internal or external leaks). Confirm BEFORE connecting HPU to equipment.
- Hydraulic Relief Valves, Unloading Valves, and Over-pressure Valves on equipment connected to this HPU must be adjusted to pressures higher than the operating pressure of the HPU; otherwise overheating of HPU will result.
- Dirt, water, contamination, incorrect hydraulic fluid, and heat destroy hydraulic pumps. Failure to heed this warning will result in equipment breakdown.

B) Specifications

1) Overall Size



2) Weight and Center of Gravity



	A	B	C	WEIGHT (EST)
DRY	.97 m / 38 in	.64 m / 25 in	.40 m / 16 in	950 kg / 2100 lbs
WET	1.02 m / in 40 in	.81 mm / 32 in	.40 m / 16 in	1300 kg / 2900 lbs

3) Input Requirements

a) Electrical

- 40 Hp Motor – 440 - 480 VAC, 60 Hz, 3 Phase, 50 Ampere service minimum;
380 - 420 VAC, 50 Hz, 3 Phase, 60 Ampere service minimum.
- 50 Hp Motor – 440 - 480 VAC, 60 Hz, 3 Phase, 60 Ampere service minimum.

Typical motor full load current values are listed below:

324 TC (small frame motor)

40hp	60Hz	460VAC	47.6 A
30hp	50Hz	380VAC	43.9 A

326TC (large frame motor)

50hp	60Hz	460VAC	57.8 A
40hp	50Hz	380VAC	58.5 A
40hp	60Hz	460VAC	47.9 A (high temp 55 deg C)

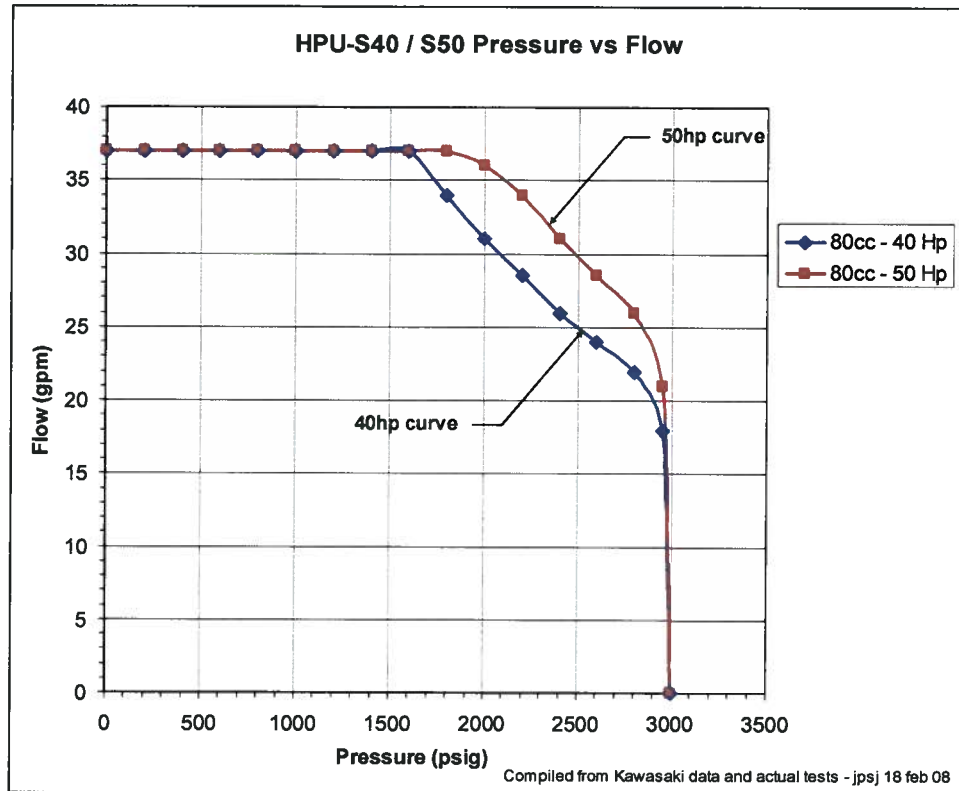
b) Hydraulic Oil

- Reservoir has a capacity of 100 gallons (380 liters) of petroleum based hydraulic oil. Oil should have anti-oxidants, anti-wear, and anti-foaming properties, and be suitable for the ambient operating temperatures. Note – More hydraulic oil will be needed to fill the equipment's piping and actuators.
- Mobil DTE 24 is the recommended hydraulic oil.

4) Output

a) Hydraulic

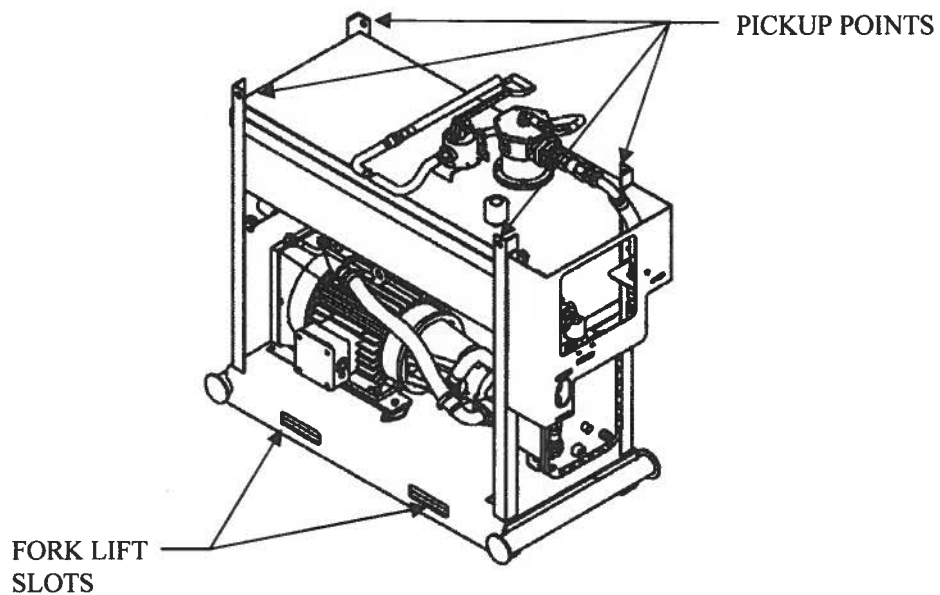
- Up to thirty-seven (37) gallons per minute (140 liters per minute). Maximum system pressure is 3000 psig (207 bar).



C) Installation

1) Moving the Hydraulic Power Unit

- The Hydraulic Power Unit (HPU) can be lifted by the four (4) lifting eyes permanently attached to the frame. HPU should only be lifted with a spreader beam that ensures vertical lifting at all four frame lifting eyes. Failure to use a spreader beam could result in damage to equipment and/or injury to personnel.
- HPU also has slots in Frame for lifting and moving utilizing a fork lift.



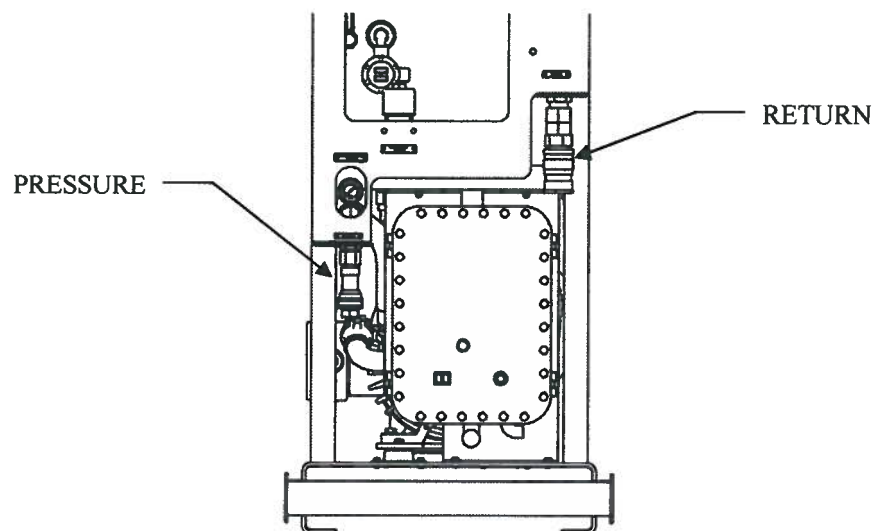
2) External Plumbing connections to Hydraulic Power Unit

- When routing plumbing, care should be taken to consider personnel access, servicing and maintenance, weight of piping, thermal expansion, environmental issues, system pressures, and rig motion.
- All piping connected to the HPU should be thoroughly cleaned to remove any contamination prior to connection to the HPU. Failure to do so could result in failure or damage to the unit. All piping should be pressure-tested prior to connection to the HPU.
- All equipment intended to be connected to or powered by the HPU should be checked to insure that the hydraulic oil in the equipment is compatible with Mobil DTE 24 oil.

Warning

**Residual oil in rig equipment
may contaminate, or may otherwise
be incompatible with the hydraulic oil
installed in the HPU.
Drain or perform tests on rig equipment oil,
before connection to the HPU**

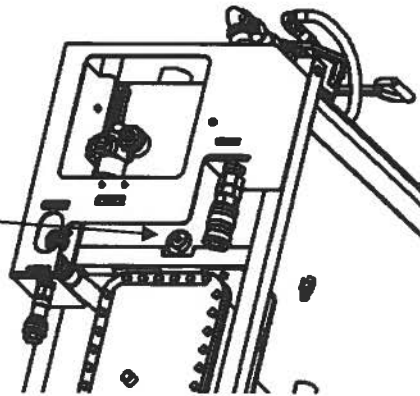
- Use only components rated equal to or greater than the pressures encountered.
Maximum output pressure is 3000 psi (207 bar).
Return connections should be rated for at least 150 psi (10 bar).



3) Electrical connections to Hydraulic Power Unit

- Route electrical cables to meet the HPU as shown below.
- When routing cables, care should be taken to consider personnel access, servicing, maintenance, and rig motion.
- All cables should be installed with “drip loops” to reduce water ingress into the enclosures.
- Cable glands must have hazardous area certifications to meet the area requirements.
- Megger AC-Motor and Motor Leads for faults. Ensure Frame is grounded.
- Mount Motor Control Station near Driller’s Console (workstation).

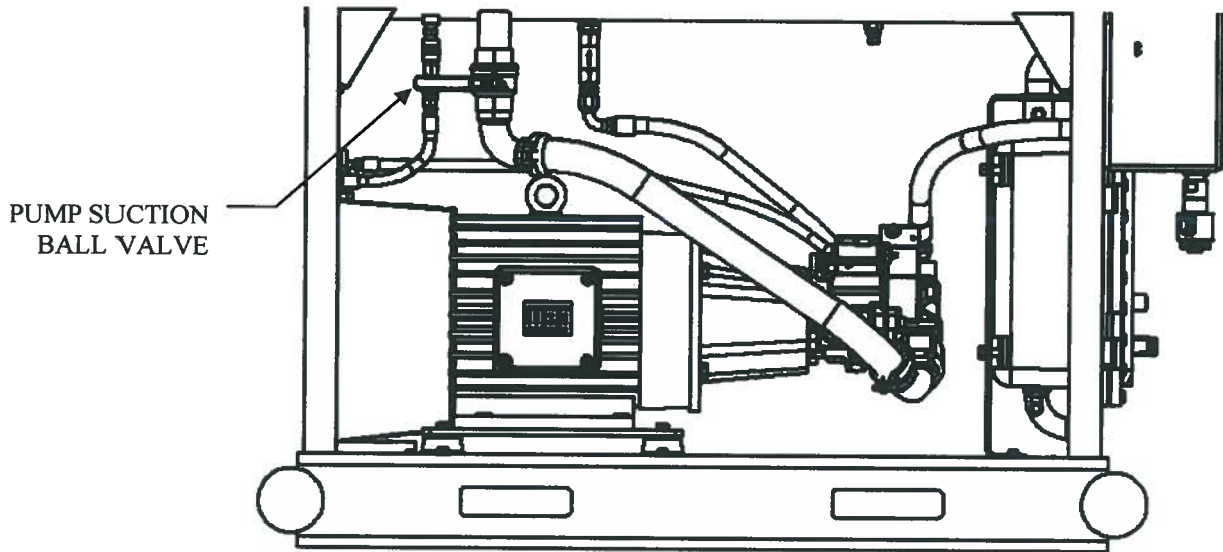
POWER
CABLE
ENTRY
(1 ½ NPT)



D) Commissioning and Startup

1) Pre-Startup Checkout Procedure

- Complete all Electrical and Hydraulic connections to the HPU.
- Remove and set aside the removable side sound panels (if equipped).
- Open suction ball valve (handle will be inline with body of valve).



- Check all cable glands insuring that they are tight and that cables are properly routed.
- Check for any loose bolts, clamps, or other hardware.
- If entire hydraulic system is to be commissioned, check to ensure all plumbing isolation valves are the proper position (open or closed, as required) and system is ready to be pressurized.

**Caution –
Do not proceed until
the integrity and soundness
of the plumbing can be assured.**

2) Commissioning and Startup

****WARNING****

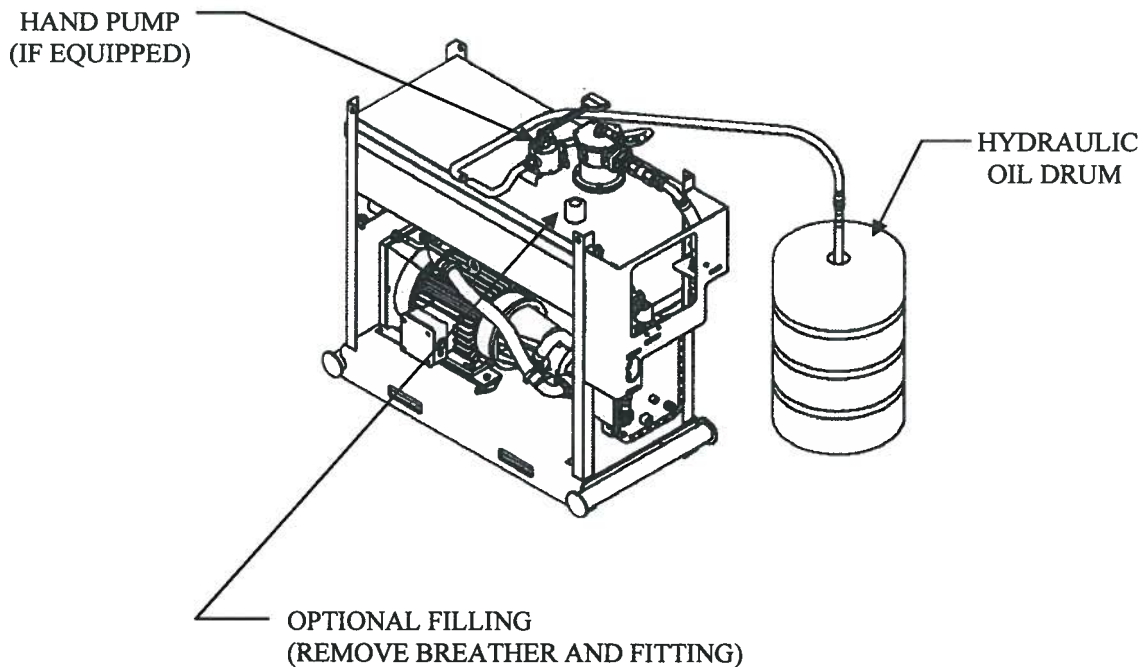
*****Severe Hazard*****

**Startup and operation of the HPU
may result in the unintentional motion of equipment.
Severe damage to equipment and / or
injury to personnel may result.
Hydraulically isolate any equipment
that may move or operate, prior to commissioning.**

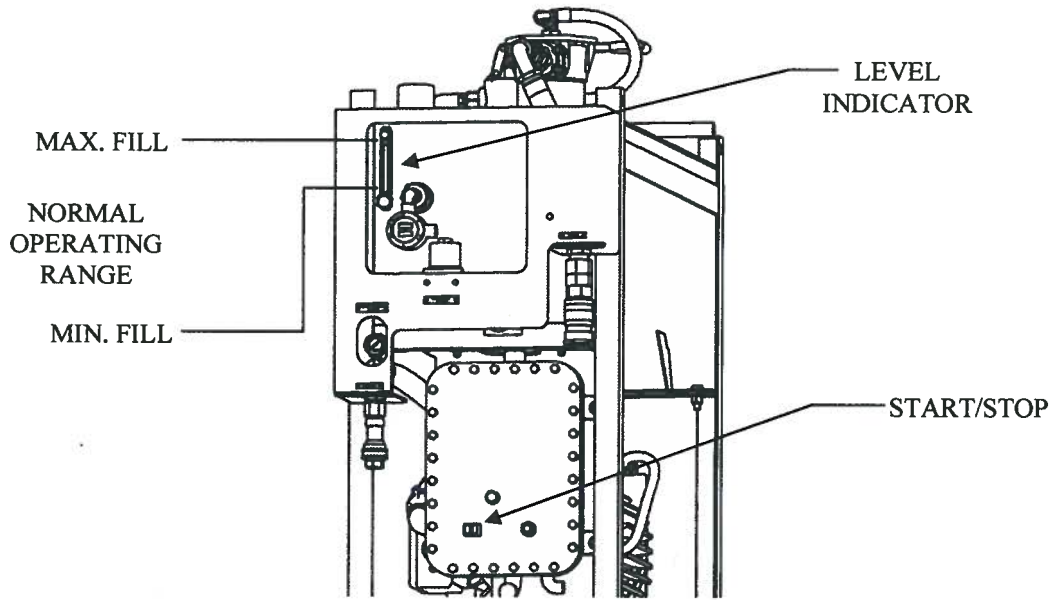
****WARNING****

Filling Tank

- Prepare to fill Tank with at least 100 gallons (380 liters) of hydraulic oil. Hydraulic oil should be filled via the Hand Pump (if equipped) located on the top surface of the Tank.
- Remove all contamination from the Fill Hose and Tube.



- Fill with Hydraulic Oil until the “FULL” level is reached on the Level Indicator mounted on end of the Tank.

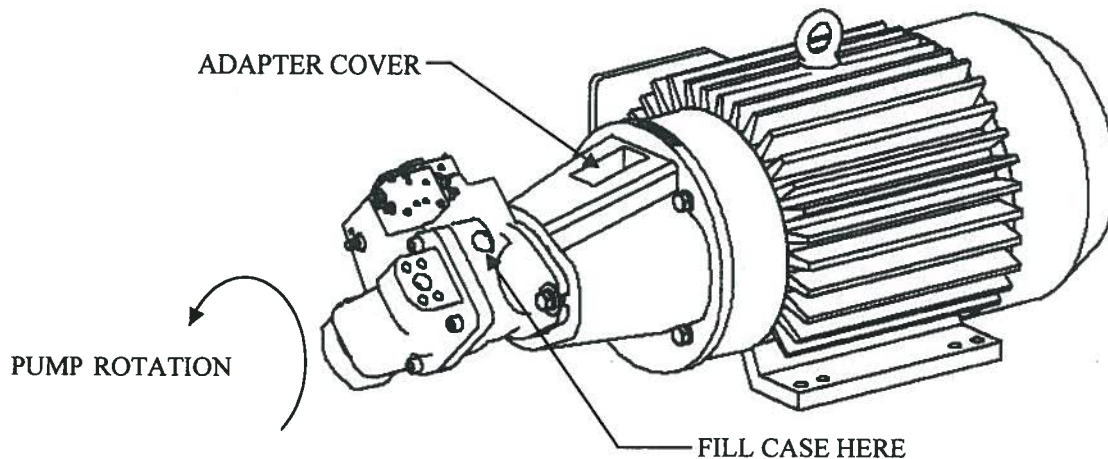


- After filling, remove hose from quick-disconnect fill port and keep hose close-by to add oil as needed. **Protect from contamination.**

Main Motor/Pump starting

- Fill Pump case with Hydraulic oil. Fill via drain port on top of pump.
- Check Motor Rotation - Remove Motor/Pump Adapter Cover to allow visual access to Coupling. Make sure that Suction Ball Valve is open. Use the Start/Stop controls on the Motor Starter to rapidly jog motor power to check motor rotation. Motor should rotate **clockwise** when viewed from the motor fan end. If motor rotates in opposite direction, remove power, and reverse any two motor leads.

**Caution –
Isolate power to motor before
attempting to reverse motor leads.**



- Replace Motor Adapter Cover.

****WARNING****

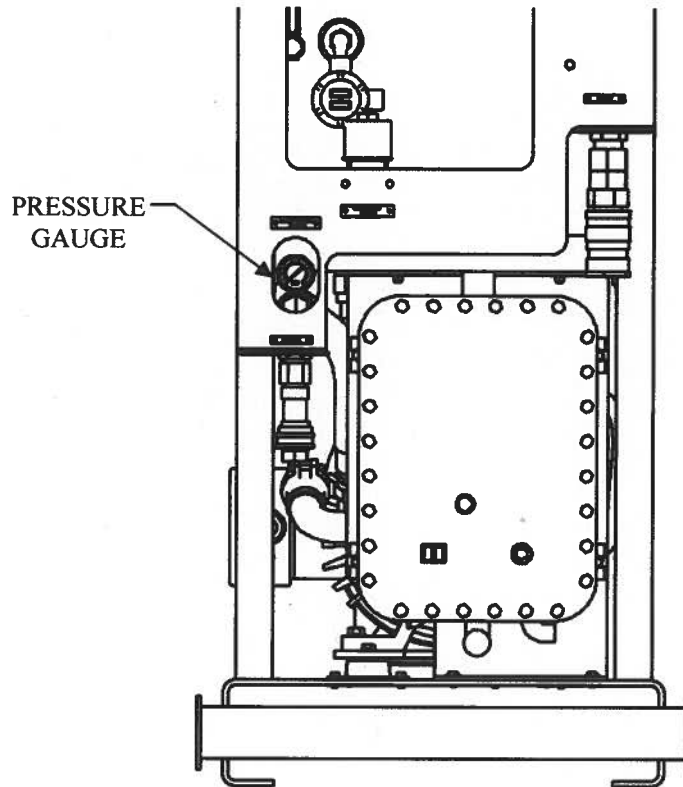
*****Severe Hazard*****

**Startup and operation of the HPU
may result in the unintentional motion of equipment.
Severe damage to equipment and / or
injury to personnel may result.
Hydraulically isolate any equipment
that may move or operate, prior to commissioning.**

****WARNING****

- Start Motor. Monitor oil level in the Tank. Add hydraulic oil as needed to maintain proper oil level. If oil level falls below the minimum level, shutdown Motor until the proper level can be obtained. Restart Motor, as needed.
- Check for leaks in and around the pump. Shutdown pump if leaks are found. Tighten or repair connections as required.

- Monitor the Pressure Gauge. If the pressure does not reach operating pressure (3000 psi max) within 10 seconds, there may be a leak in the overall plumbing system or a valve open to allow the hydraulic oil to return directly to tank. The reason for the lack of pressure needs to be determined and corrected before commissioning continues.



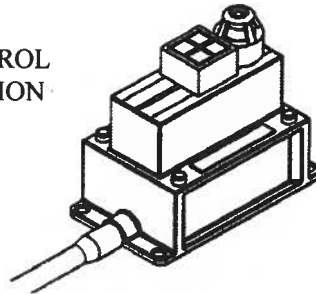
- Monitor amperage to motor and confirm that it is within nameplate specifications for all loads.
- Replace removable Sound Panels (if equipped).

Motor Control Station checkout

- Shutdown the motor on the HPU.
- Start and stop the motor on the HPU using the remote Control Station mounted at the Driller's Console. Green light will indicate that the motor is running.

- If motor does not operate properly, shutdown system, and isolate the problem.
- Important Note – If a low oil level or an over-temperature condition exists, the HPU-S40 control circuits are designed to allow the unit to continue to run as long as the START button on the Control Stations is depressed. This will allow any operation to be completed. Do not lock the START button on, as damage to the HPU will result.

CONTROL
STATION



Auxiliary Equipment checkout

- Confirm proper operation of Over-Temperature Switch.
Remove temperature probe from under Tank and test function of switch to insure that the contacts open at 165 +/- 5 deg F (73 +/- 3 deg C). Adjust as necessary.
- Confirm proper operation of Level Switch.
Drain hydraulic oil from Tank to lower level of oil. Switch contact should open when oil level reaches Low level indicated at the sight gauge. Refill Tank to proper level.

Check Hydraulic Oil for contamination after Commissioning

After commissioning, contamination (moisture) can collect in the Tank. The hydraulic oil should be checked for water contamination and the Return Filters checked for particle contamination.

- Drain approximately 1 quart (1 liter) of hydraulic oil from the Tank. Inspect sample for evidence of water contamination. *See Section "Maintenance and Servicing, Hydraulic Tank" for location of Drain.*
- Replace Return Filter Element. *See Section "Maintenance and Servicing, Return Filters" for proper procedure.*
- Check Hydraulic Oil level. Re-fill as necessary. *See Section "Commissioning and Startup, Filling Tank" for proper procedure.*

E) Maintenance and Servicing

****WARNING****

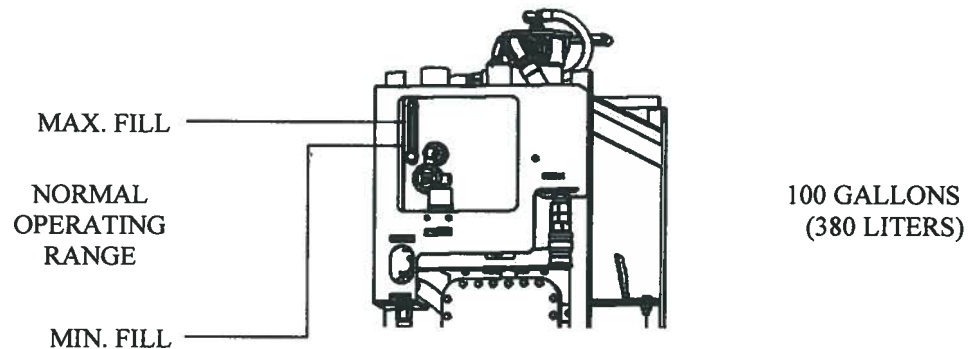
******Severe Hazard******

**Startup or shutdown of the HPU
may result in the unintentional motion of equipment.
Severe damage to equipment and / or
injury to personnel may result.
Hydraulically isolate any equipment
that may move or operate, prior to startup or shutdown.**

****WARNING****

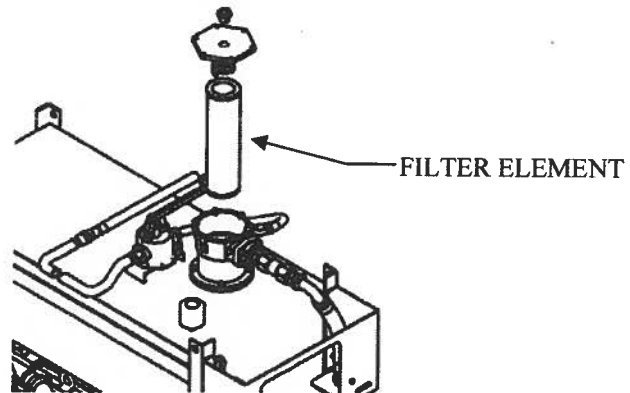
1) Hydraulic Oil Level

- Check oil level daily.
- Maintain the oil level in the normal operation range as shown on the Tank level indicator.
- Fill per Commissioning and Startup Procedures.
- Use only approved hydraulic oil (Mobil DTE 24 is recommended).



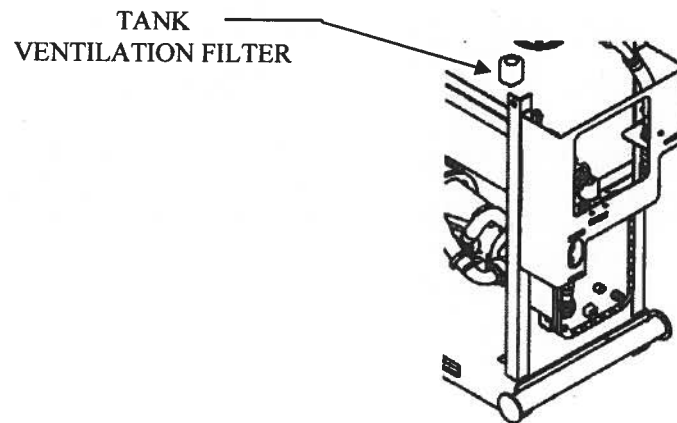
2) Return Filter

- Check Return Filter pressure gauge weekly (while unit is in use).
- Replace Filter every six months, regardless of Filter Gauge readings.
- If pressure gauge indicates excessive back pressure (in the red), the filter should be changed immediately.
- To change filter it is necessary to shutdown HPU:
 - 1) Remove Filter Housing Cover.
 - 2) Remove filter element from housing.
 - 3) Install new filter.
 - 4) Re-install Housing Cover and tighten cover bolts (10 lb-ft).
 - 5) Discard old filter elements (Do not reuse!).
 - 6) Cleanup spilled hydraulic oil.
 - 7) Check for leaks.
 - 8) Tag Housing with Element replacement date tag.



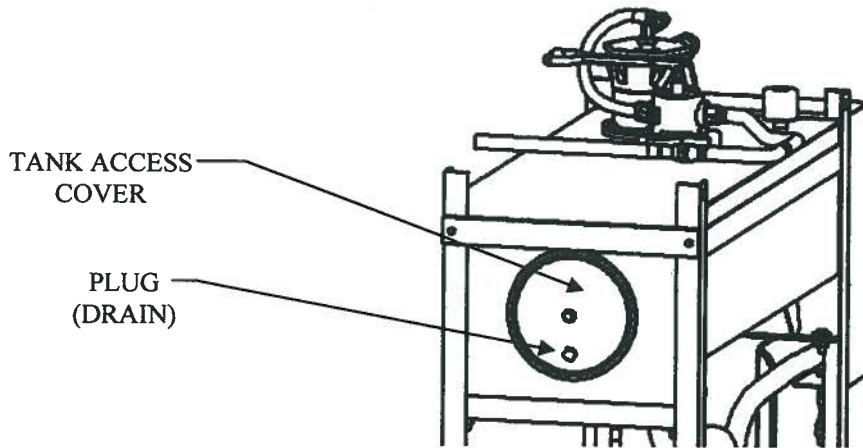
3) Tank Ventilation Filters

- Tank Ventilation Filter should be replaced every 6 months.
- Tank Ventilation Filter is located on top to the Tank
- Unscrew Filter and discard.
- Install new Filter.



4) Hydraulic Tank (Reservoir)

- Hydraulic Oil Tank should be cleaned every two (2) years.
Note - It is recommended that this service take place with other major inspections/servicing.
- Shutdown and isolate HPU. Shut pump suction ball valve.
- Remove power to HPU.
- Drain Tank via plug in Tank access cover. Oil should be recycled, or discarded, per rig's standard procedures.



- Remove Tank Access Cover
- Ventilate Tank using fans to remove any residual gases or vapors.

-Caution-

**Failure to ventilate Tank with fresh air
can result in unsafe or unhealthy conditions.**

**A second person should assist
to insure safety of first person.**

- Using clean hydraulic oil, the inside of the Tank should be wiped down with the residual oil forced to move towards the Tank Access Cover. All particles should be removed. The Tank should be visually inspected for corrosion or damage. All fittings should be checked for tightness. Suction strainers should be inspected and replaced as needed.
- Remove, disassemble and clean the Oil Level sight gauge.
- Inspect and replace the Tank Access Cover Gasket. Re-install Tank Access Cover. Torque Cover bolt to 15 lb-ft.
- Fill Tank with new Hydraulic Oil (Mobil DTE 24 is recommended) per Commissioning Procedure section.
- Open suction ball valve (handle will be inline with body of valve).
- Cleanup spilled hydraulic oil.
- Restart unit using procedure in *Commissioning and Startup* section.

5) Hydraulic Hoses and Fittings

- All HPU hoses and Fittings should be inspected every week for signs of leaks or possible failure (worn, abraded, or frayed hoses).
- Isolate and tighten, or replace all hoses immediately.

WARNING

Replacement Hoses and Fitting should be rated for the same pressure as the original parts.

- Cleanup spilled hydraulic oil.

6) Main Pump/Motor

- The Main Pump/Motor should be inspected every two (2) years.
Note - It is recommended that this service take place with other major inspections/servicing.

-WARNING-

Only qualified technicians should perform maintenance on rotating equipment. Lockout procedures should be followed before work begins.

- Remove Sound Panels (if equipped).
- Check Pump/Motor for unusual noise or vibration.
- Check for hydraulic leaks around the Pump seals.
- Megger Motor for internal faults.
- Shutdown unit and LOCKOUT.
- Check the condition of the Pump to Motor Coupling Spider. Replace as needed.
- Check rubber Isolation Mounts for wear or cracks. Replace as needed.
- Megger Motor Leads
- Restart unit, confirm direction of rotation.

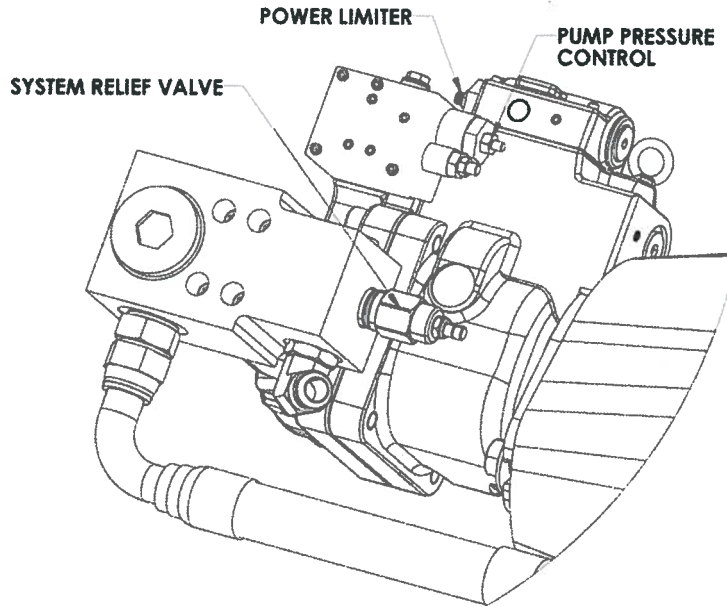
- Check Motor amperes to insure it is within nameplate rating.
- Check amperes on all three leads. All lead amperes should be within 10% of each other.

7) Pressure and Horsepower Settings (these adjustments should be performed when ever the pump has been replaced)

- **Adjust System Relief Valve**
 - a) Turn HPU off (both motors), and disconnect the Pressure and Return hoses from the HPU.

NOTE – this should be done by disconnecting the Quick-Disconnects at the HPU. Do not remove the hoses from the quick-disconnects as this will allow the HPU to pump oil out of the hose.

 - b) With Motor A off, turn System Relief Valve Adjusting Screw fully CCW (out).
 - c) Turn Pump A Pressure Adjusting Screw fully CW (in).
 - d) Start motor and monitor system pressure on gauge while increasing the System Relief Valve setting (adjusting screw CW).
 - e) When system pressure reaches 3500 psi \pm 50 psi. (Set System Relief Valve 500 psi above Pump Pressure Setting)
 - f) Secure System Relief Valve Adjusting Screw with locknut.
 - g) Shutdown Motor A.
 - h) Repeat steps a thru for Motor/Pump B.



- **Adjust Pump Pressure**

- a) With Motor A running, turn Pump Pressure Adjusting CCW (out) until system pressure reaches 3000 psi \pm 50 psi max. (or as specified by others)
- b) Secure System Pressure Adjusting Screw with locknut.
- c) Shutdown motor A.
- d) Repeat sets a thru c for the second motor (as required).

- **Adjust Horsepower Limiter**

- a) Determine the motor supply voltage (volts) and frequency (Hz) (usually it is 460 VAC, 60 Hz; however, it may be 380 VAC, 50 Hz or 575 VAC, 60Hz).
- b) Once the supply voltage and frequency has been determined, look on the AC-Motor nameplate for the Full Load Current rating (amps) for the motor (motor amperage rating). Record this number. Typical values are listed below:

324 TC (small frame motor)			
40hp	60Hz	460VAC	47.6 A
30hp	50Hz	380VAC	43.9 A

326TC (large frame motor)

50hp	60Hz	460VAC	57.8 A
40hp	50Hz	380VAC	58.5 A
40hp	60Hz	460VAC	47.9 A (high temp 55 deg C)

- c) Disconnect the Pressure and Return hoses from the Power Unit.
- d) Install a test Flow Control Valve between the pressure and return quick-disconnects on the Power Unit.

Note - The valve and hoses should have a minimum of 1-inch ports, rated for a minimum of 3000 psi, and utilize a needle valve for precise control of flow.

- e) Remove Motor A junction box cover, and place a clamp-on style ammeter on one of the motor power leads (maximum amp scale should be approximately 100 amps).
- f) Make sure the test Flow Control Valve is fully open, and then start Motor A.
- g) SLOWLY close the Flow Control Valve while monitoring the motor amperage on the ammeter. Record the maximum value reached on the ammeter.

Note – Maximum amps is usually reached around 1500 psi +/- 500 psi.

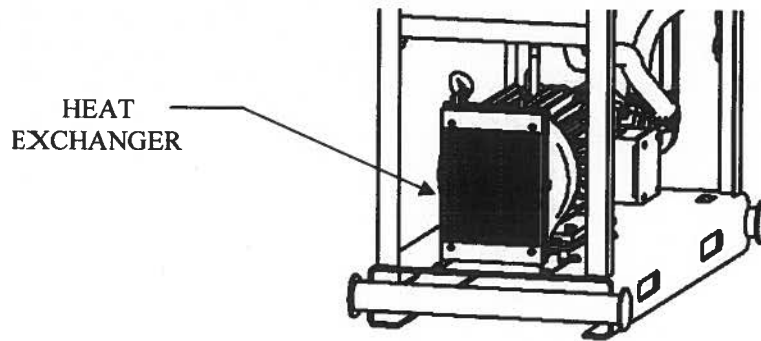
- h) Compare the value obtained in step 'g' above to the motor nameplate value recorded in step 'b' above.
- i) The Horsepower Limiter should be set to obtain a amperage value as close to the motor nameplate value as practical without going over. In other words, the value obtained in 'g' should be near, but always less than the value of 'b'.
- j) Adjusting the Limiter Screw in increases amperage, out decreases the amperage.
- k) Secure adjustment screw nut.
- l) Shutdown HPU.
- m) Repeat step a thru l for the second motor (as required).
- n) Remove test valve and reinstall hoses.

8) Frame

- Frame should be visually inspected for rust every six (6) months.
- Check welds.
- If rust is found, remove all rust to bare steel, and apply new zinc-based coating or other rust inhibitor.

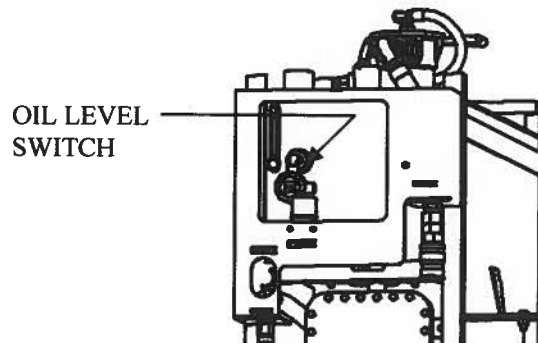
9) Air/Oil Heat Exchanger

- Inspect fins for a buildup of contamination or corrosion. Clean as necessary.



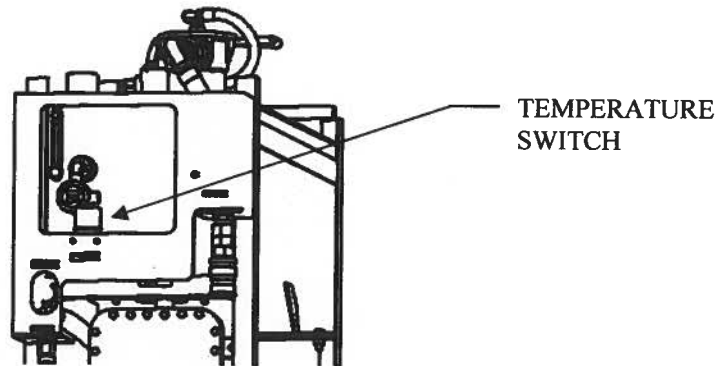
10) Oil Level Switch

- Oil Level Switch should be tested for proper operation every twelve (12) months.
- *See Commissioning and Startup, Auxiliary Equipment checkout for procedure.*



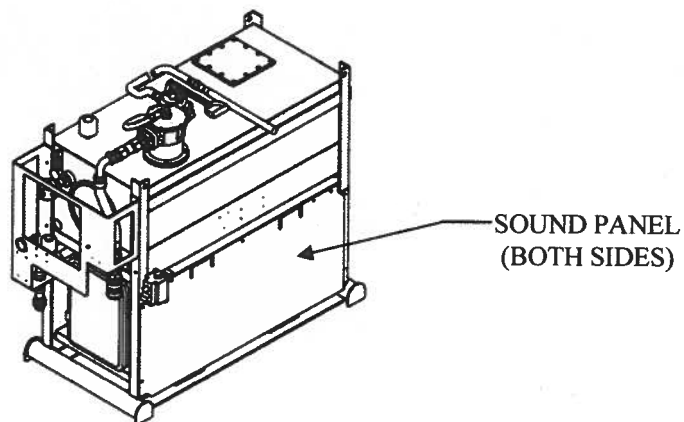
11) Temperature Switch

- Temperature Switch should be inspected every twelve (12) months.
- *See Commissioning and Startup, Auxiliary Equipment checkout* for procedure.



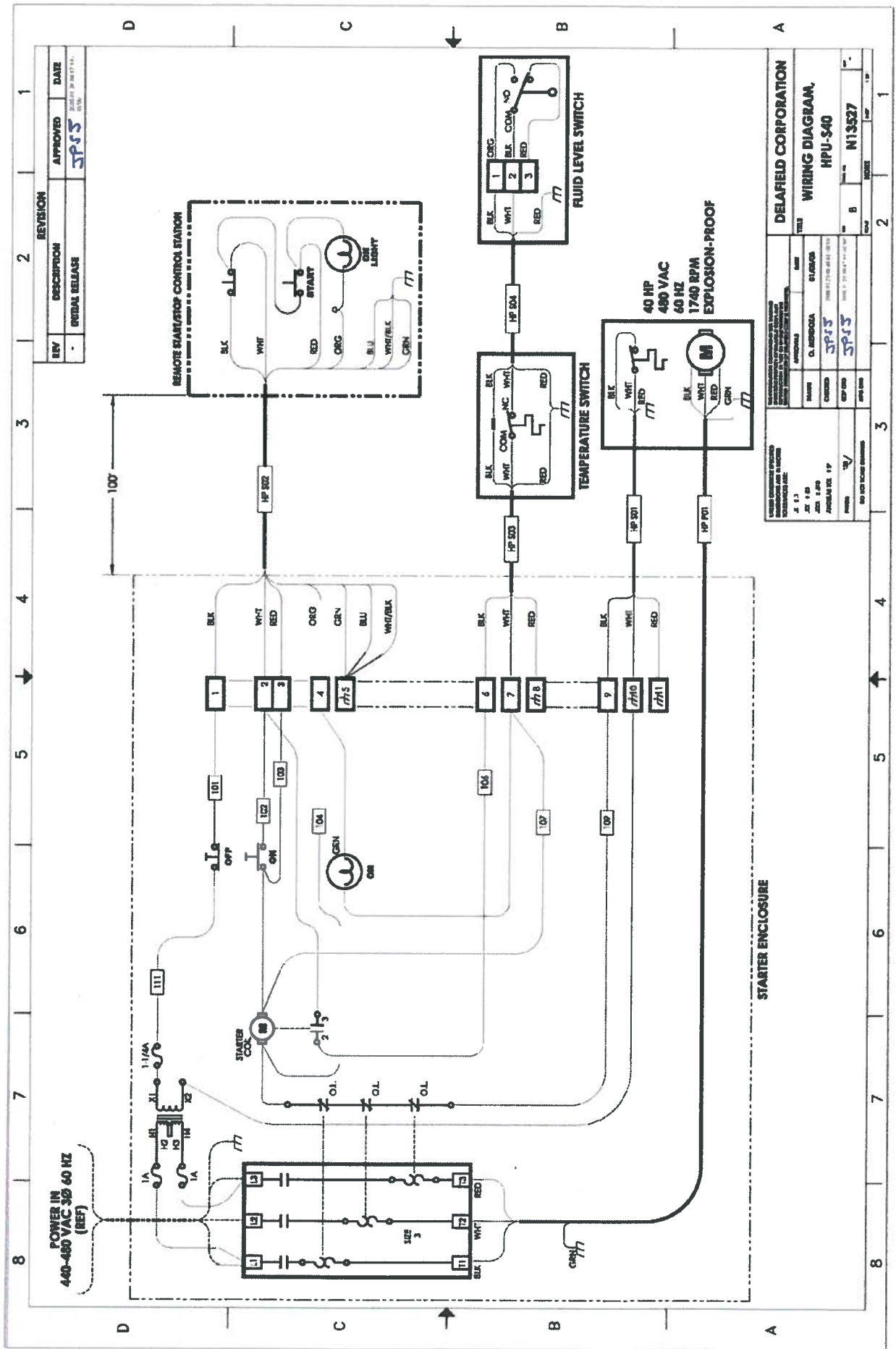
12) Sound Panels (if equipped)

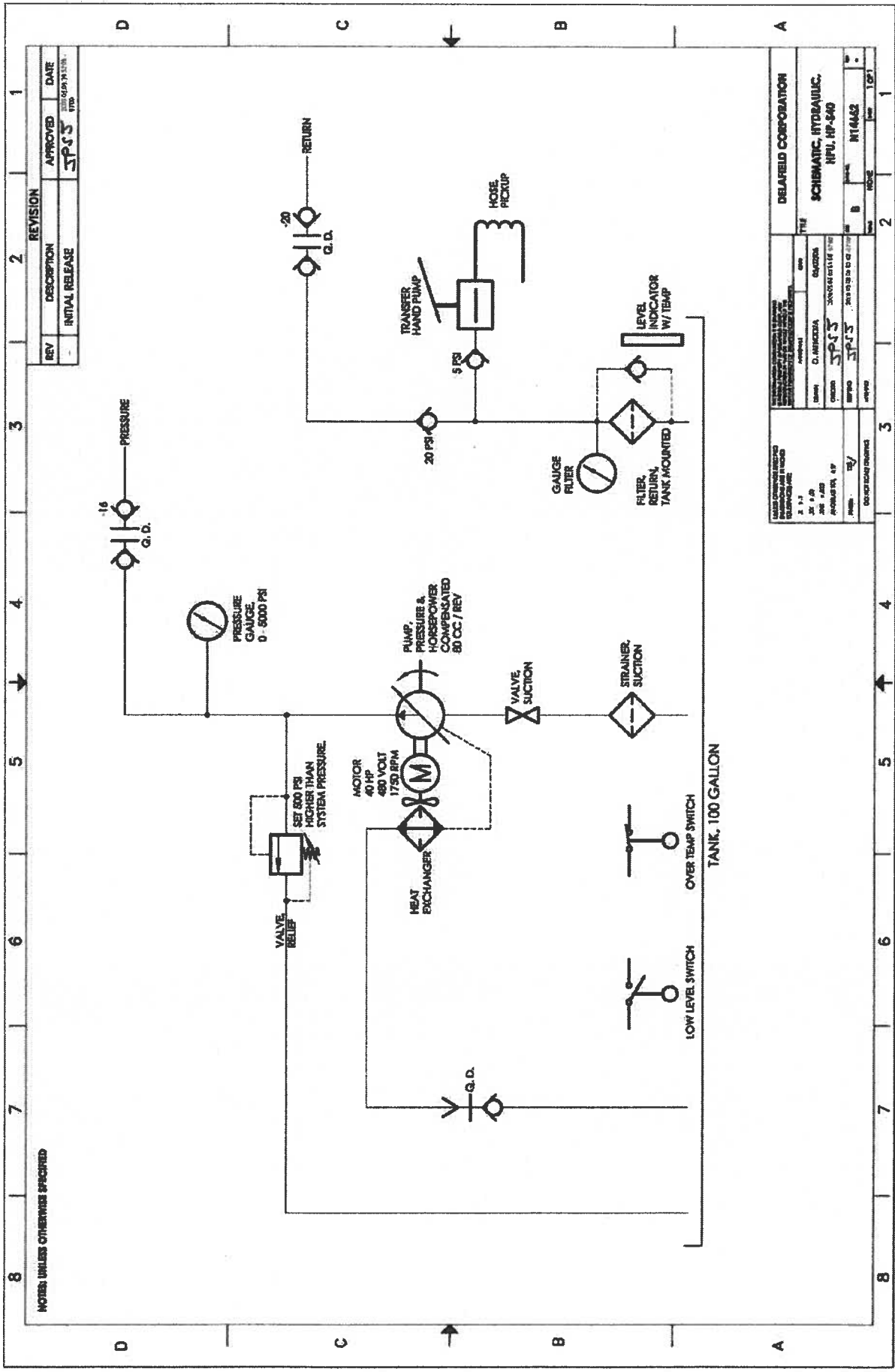
- Sound Panels should be visually inspected for rust every six (6) months.
- If rust is found, remove all rust to bare steel, and apply new zinc-based coating or other rust inhibitor.
- Inspect integrity of sound absorbing foam. If foam is missing or damaged replace.
- Replace any missing Panels.



13) General Service

- Every week the hydraulic oil level should be checked, and Return Filter cleanliness checked.
- Every month the hydraulic oil should be tested for contamination and depletion of additives.
- Every month, about one quart (1 liter) of oil should be drained from the bottom of the Tank and inspected for water contamination.
- Every month the Heat Exchanger should be cleaned.
- Every month, all the hardware on the HPU should be inspected and checked for tightness.
- Every year the Pressure Gauge, Temperature Switch, and Level Switch should be check for proper calibration.





HPU-S40/S50 Recommended Spare Parts				
Qty	Part Number	Description	Domestic	International
2	N15702-EL	Element, Filter, Return Line	X	
4	N15702-EL	Element, Filter, Return Line		X
2	FNQ-R-1	Fuse, 1 Amp	X	X
4	FNM-R-1-1/4	Fuse, 1-1/4 Amp	X	X
1	N13741	Pump, Hydraulic		X
1	685144-37264	Coupling, Pump		X
1	685144-12274	Spider, Coupling		X
1	H1RK06K06K-0432A	Hose, Pressure		X
1	25.500.5000PSI	Gauge, Pressure, 5000 psi	X	X
1	RDFA-LCN	Valve, Over-Pressure	X	X
2	SCU-1004	Breather, Tank	X	
3	SCU-1004	Breather, Tank		X
1	5RL-20	Gauge, Return Filter	X	X
1	D12204	Seal Kit, Return Filter	X	X
1	HC-LIPS-14	Seal, Access Cover	X	X
5	SR6S6/120V	Bulb, 'ON' Light, 120V	X	X
			Kit Part Number	
			N12500-RP1	N12500-RP2