

Installation and Operation Manual

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Yacht Crane Assembly

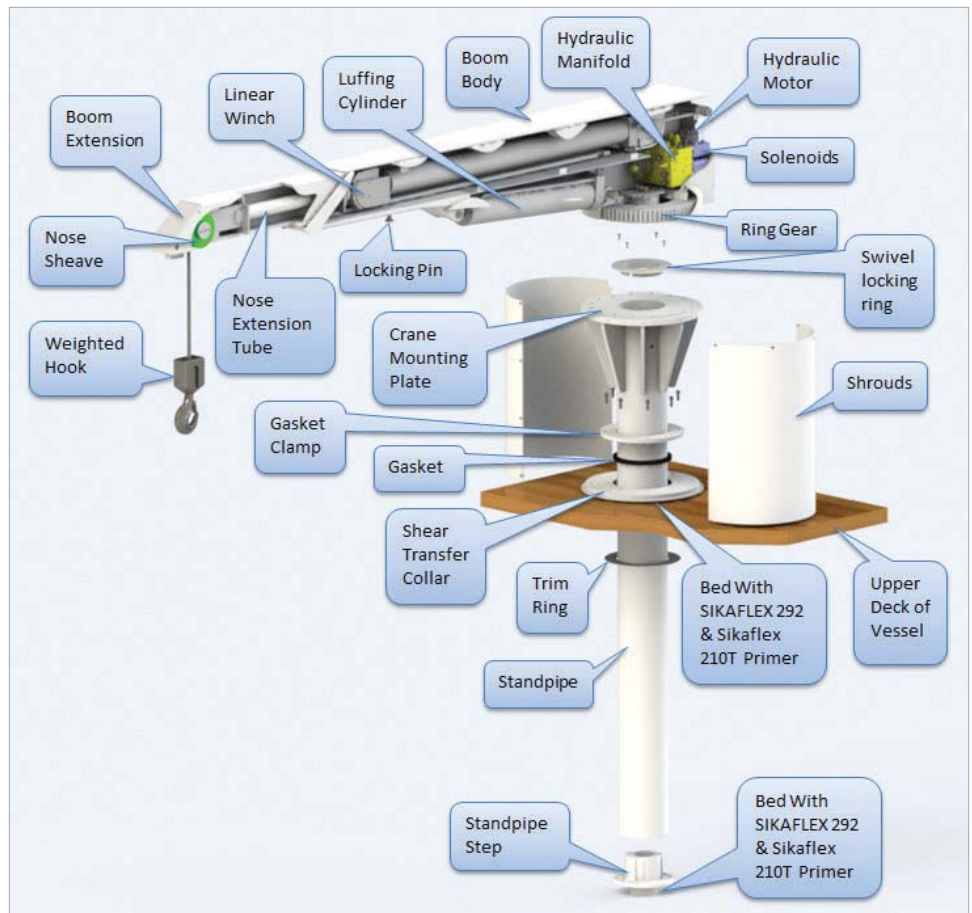



Figure 1a: Standpipe Mounted



Figure 1b: Square Base Mounted

Notice to Installer

Throughout this publication, Warnings and Cautions accompanied by the International Hazard Symbol  are used to alert the manufacturer or installer to special instructions concerning a particular service or operation that may be hazardous if performed incorrectly or carelessly.

Observe Them Carefully!

These “safety alerts” alone, cannot eliminate the hazards that they signal. Strict compliance to these special instructions when performing the installation and maintenance plus “common sense” operation are major accident prevention measures.

DANGER

Immediate hazards which WILL result in severe personal injury or death.

WARNING

Hazards or unsafe practices which COULD result in severe personal injury or death.

CAUTION

Hazards or unsafe practices which COULD result in minor injury or product or property damage.

NOTICE

Information which is important to proper installation or maintenance, but is not hazard-related.

Required Equipment and Tools

This section describes the equipment and tools needed or recommended for the yacht crane installation.

Supplied Equipment List

Your yacht crane comes with the following standard equipment: Crane assembly, complete with:

- bearing assembly installed
- hydraulic and electrical system installed
- composite rope, hook and weight assembly installed
- 360 degree rotary swivel **c/w 2 male #6 JIC connections and 3 conductor electric swivel (if required)**
- 4-function, hand-held, pendant control
- Owner's Handbook and Installation Manual
- (16) 1/2" x 3 1/2" 316 SS FHSS (Flat head socket screws, high strength) c/w nuts, FW & LW

Optional Equipment List

- Customized base assembly (built to your specification)
- OR** • Standpipe assembly containing:
 - 6 5/8" standpipe (adjustable height to suit your requirements).
 - shear transfer collar
 - standpipe step
 - trim ring
 - Set of shrouds
- Hydraulic power pack, available in 24VDC, 12VDC, 240V AC
- Hydraulic supply manifold (required on load sensing systems)
- 5/16" Amsteel replacement rope kit c/w eye splices (includes installation instructions)

Recommended Materials (not supplied)

You will need all or most of the following materials for the crane installation:

- (8) 3/8-16 Socket cap screw (sheer transfer collar)
- (8) 1/2" FHMS (standpipe step)
- (6) #10 OHST screws (trim ring)
- Sikaflex 292, Sikaflex 210T primer
- anti-corrosion paste (Tef-Gel)
- marine corrosion control grease
- heat-shrink-type electrical connectors
- 16-3 AWG electrical cable, length as required
- electrical breakers
- deck pad-eye

Required Tools

You should have the following tools on hand for installation:

- tape measure
- masking tape
- caulking gun
- drill motor
- portable band saw, or Sawzall power saw
- Phillips screwdrivers
- utility knife
- level
- holesaw (3 3/4")
- assorted drill bits
- wire strippers/cutters
- heat shrink tubing and gun
- wet/dry vacuum
- safety goggles and/or face shield

Planning the Installation

Choosing the Installation method

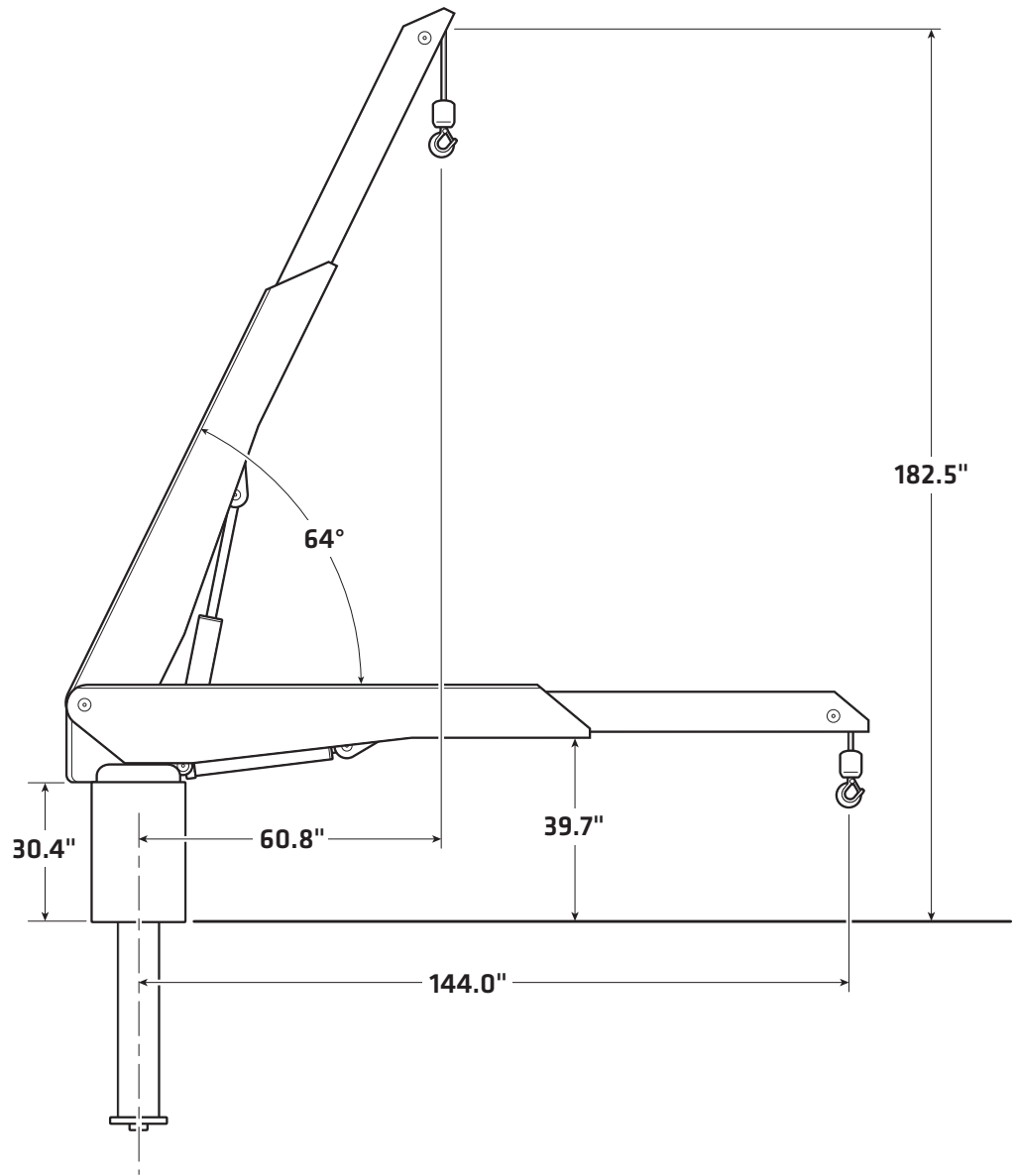
There are three ways to install the crane:

1. **Bolting Directly Onto Deck** – The crane can be bolted directly onto the deck if the yacht structure has been designed and built to accommodate the load. The rotary swivel prevents any hose rotation. A paper template can be supplied if requested.
2. **Custom Base Assembly** – Steelhead Marine can design and build custom base assemblies to your specific requirements, to be installed by an experienced shipyard. Contact Steelhead for more information.
3. **Standpipe Assembly** – To install the optional standpipe assembly, see procedure on page 9 (max step to mounting plate height 133 3/4").

Locating the Crane System

1. Choose the best storage location for your tender considering the following factors:
 - clearance needs to allow for rotation and storage of crane (check walk-around space, hatch, railing, and other clearances)
 - deck strength
 - standpipe base location on lower deck
 - accessibility for easy operation and maintenance
2. Determine the balance point of the tender, and mark this balance spot on the deck. The reach requirement of the crane is a horizontal measurement from the optimum crane location to the balance point of the tender.
3. To ensure the tender does not hit the side of the vessel during a launch and retrieval, allow 9" more than the tender's half beam measurement for clearance (i.e., half the width of the tender).
4. Check crane hook height vs. reach table at various luffing angles to ensure at least 8" of clearance between the tender and vessel (railings) during operation.
5. Double-check the reach and height requirements against the specifications of the crane to ensure the crane will meet your installation requirements.

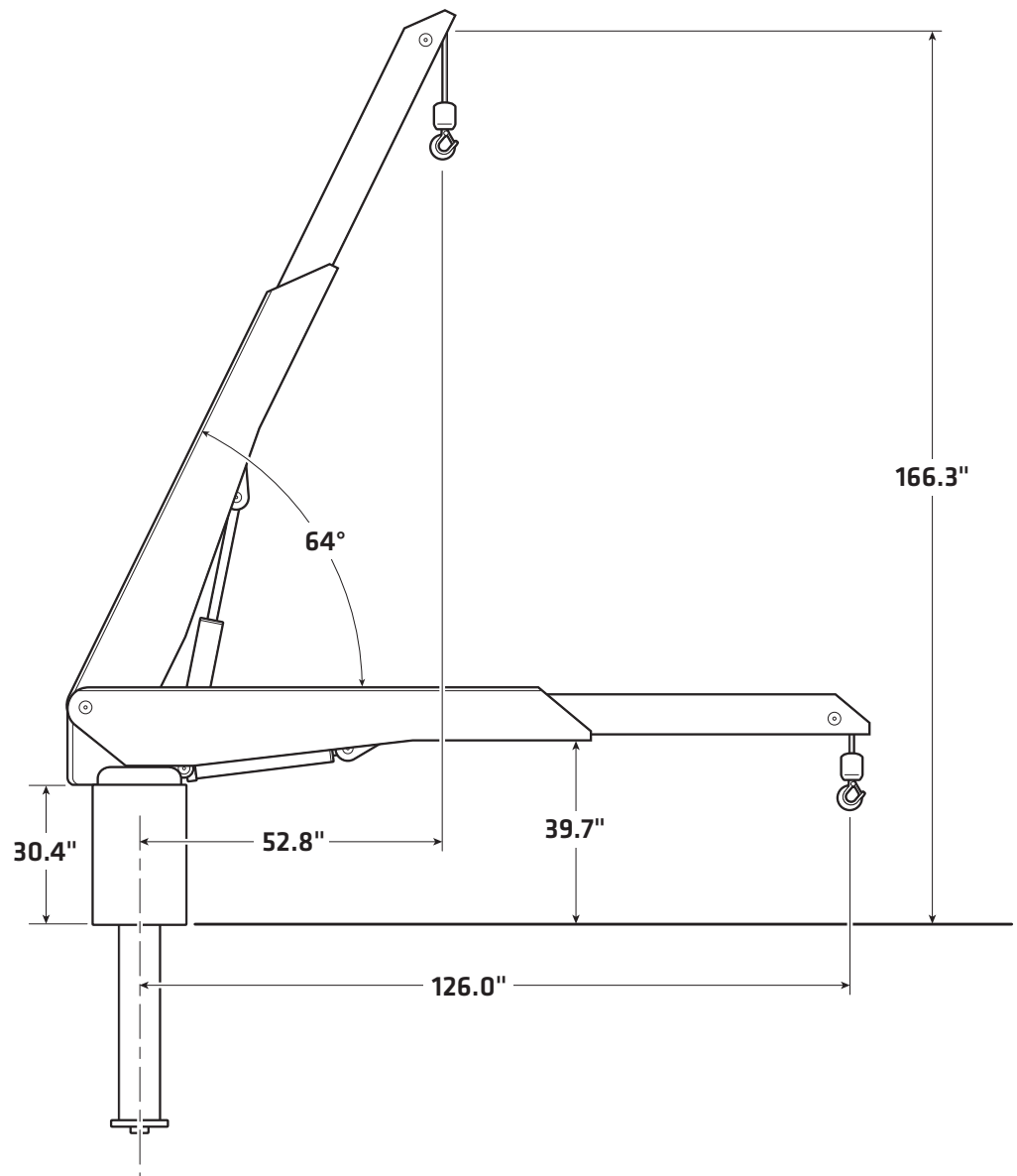
12ft Extended Reach Table



Angle	Length	Height
0°	144.0"	39.7"
10°	142.0"	66.7"
20°	135.5"	93.1"
30°	124.6"	118.0"
40°	109.8"	140.8"
50°	91.4"	160.6"
60°	69.9"	177.0"
64°	60.8"	182.5"

Figure 2a: Reach Table - 12ft Reach

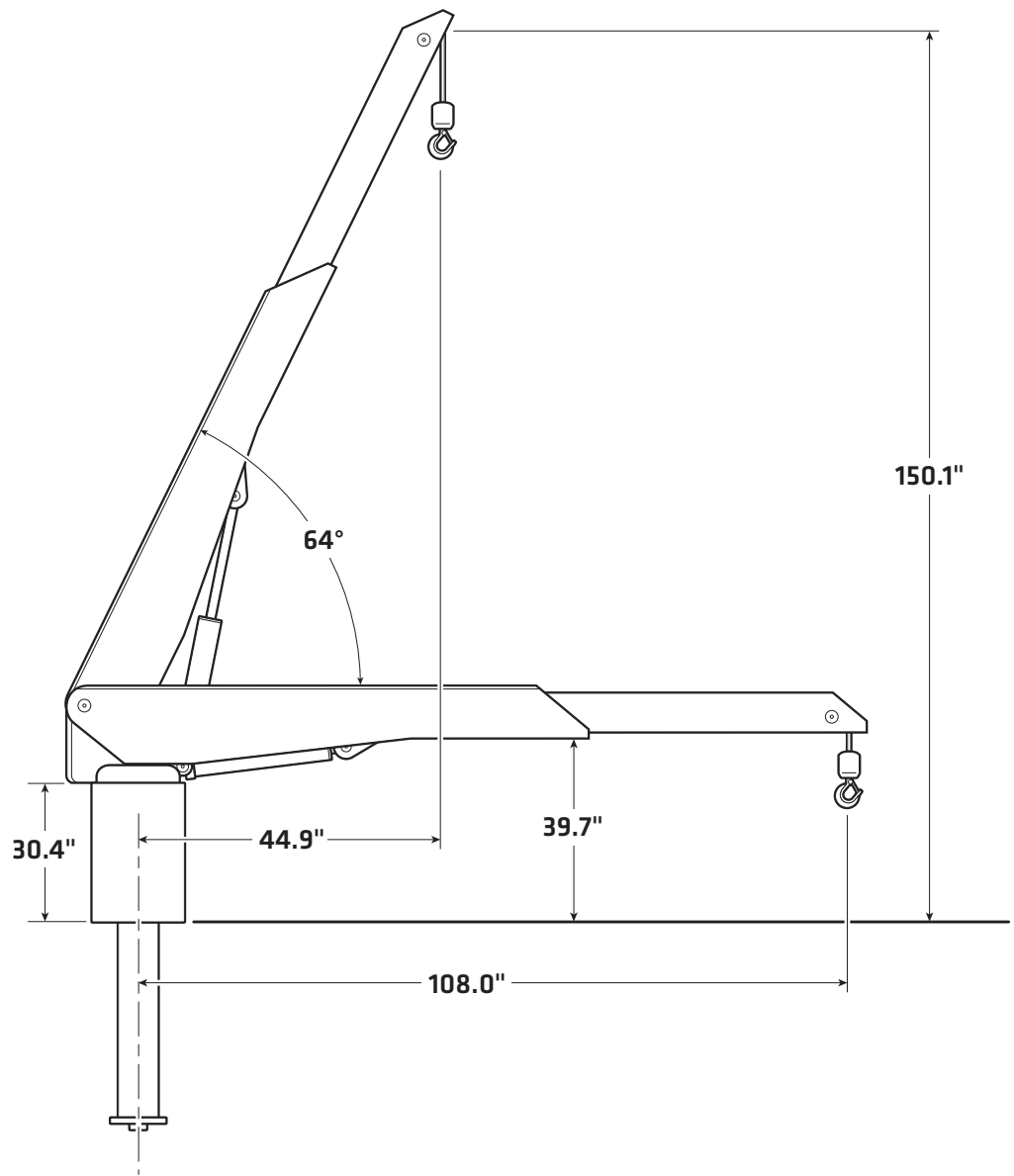
10.5ft Extended Reach Table



Angle	Length	Height
0°	126.0"	39.7"
10°	124.3"	63.6"
20°	118.6"	86.9"
30°	109.0"	109.0"
40°	96.0"	129.2"
50°	79.8"	146.8"
60°	60.9"	161.4"
64°	52.8"	166.3"

Figure 2b: Reach Table - 10.5ft Reach

9ft Extended Reach Table



Angle	Length	Height
0°	108.0"	39.7"
10°	106.6"	60.4"
20°	101.7"	80.8"
30°	93.5"	100.0"
40°	83.2"	117.6"
50°	68.3"	133.1"
60°	51.9"	145.8"
64°	44.9"	150.1"

Figure 2a: Reach Table - 9ft Reach

Installing the Standpipe

NOTICE

There are three parts to the shear transfer collar: a 16" diameter base, a rubber gasket, and an 11" diameter gasket clamp

Follow this procedure if you are installing the optional standpipe assembly

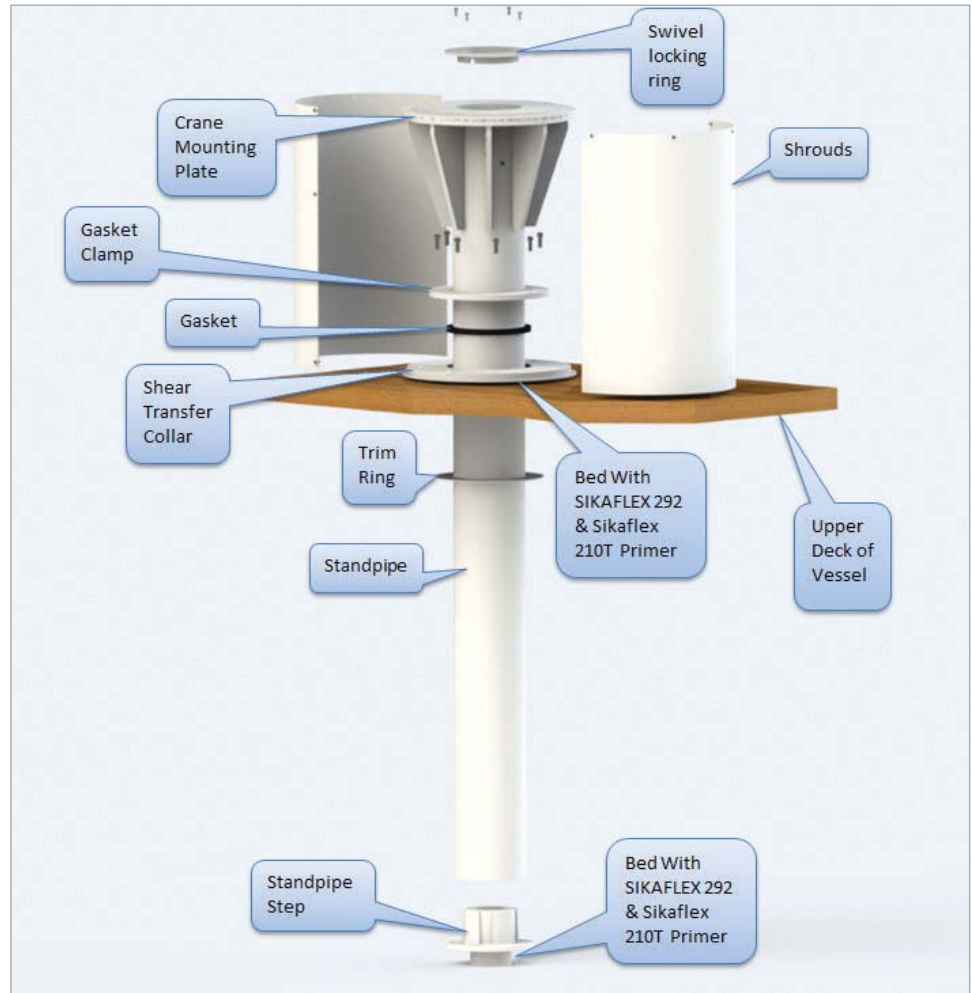


Figure 3: Exploded View of Standpipe

NOTICE

When the standpipe is installed correctly, there will be a 1/4" gap between the shroud and the shear transfer collar. The shroud will be screwed to the underside of the crane mounting plate, but not until the end of the installation. You must take the measurement described in Step 7 when the standpipe is placed over top of the standpipe step on the lower deck. The measurement must be 1/4" longer than the length of the shroud and the bottom of the standpipe will need to be trimmed accordingly.

1. Locate the standpipe in the chosen location for the tender and mark its centerline on both upper and lower decks. The standpipe must be installed vertically plumb without contacting the vessel between decks while flexing under load.
2. Drill 1/4" pilot hole in upper deck and re-check centers for clearance. The upper deck must be leveled 90 degrees to standpipe or shroud will have to be trimmed to fit.
3. Cut 7" (or according to diameter of standpipe) hole through upper deck.
4. Mount shear transfer collar to upper deck by drilling through the upper deck (drill clearance holes for thru-bolting as per bolt pattern on shear transfer collar).
5. Clean deck surface and mount shear transfer collar by bedding with Sikaflex 292 and Sikaflex 210T Primer and installing fasteners through holes on shear transfer collar.
6. Seal deck core material and clean off excess sealant.
7. With assistance from below, lower standpipe through collar to lower deck. Mark location of standpipe step on lower deck.
8. On lower deck, drill hole through center of standpipe step location for standpipe step spigot.

9. Drill holes for small bushings.
10. Seal deck core material as directed by shipyard, chock standpipe step spigot with FRP filler material and bed standpipe step with Sikaflex 292 and Sikaflex 210T Primer.
11. Install step fasteners to secure step onto deck floor.
12. With assistance from below, reinstall standpipe, sliding trim ring over bottom of standpipe before placing over step (the trim ring will attach to ceiling of lower deck). Ensure that the standpipe contacts standpipe step evenly all the way around, with outer lip of step protruding.
13. Mount trim ring to ceiling of lower deck using #10 screws.

Hydraulic and Electrical Connections

To install the crane's hydraulic and/or electrical connections:

1. Lead two #6 hydraulic lines from ship's hydraulics (or power pack), to top of standpipe mounting plate. Add 12" extra length for connection.
2. Lead 16-3 AWG electrical wire from ship's main breaker and power pack or hydraulic manifold to crane mounting plate. Again, add 12" extra length for connections.
3. Remove access covers from crane assembly base.
4. Lower crane to within 12" of mounting plate (on standpipe, deck, or custom base assembly), then make hydraulic connections by connecting pressure line to P port on hydraulic swivel.
5. Complete electrical connections as per wiring diagram on page 11, and use heat shrink to seal connections from corrosion.
6. Complete hydraulic and electrical connections at ship.
7. Connect pendant hand control by plugging it into connection on boom.

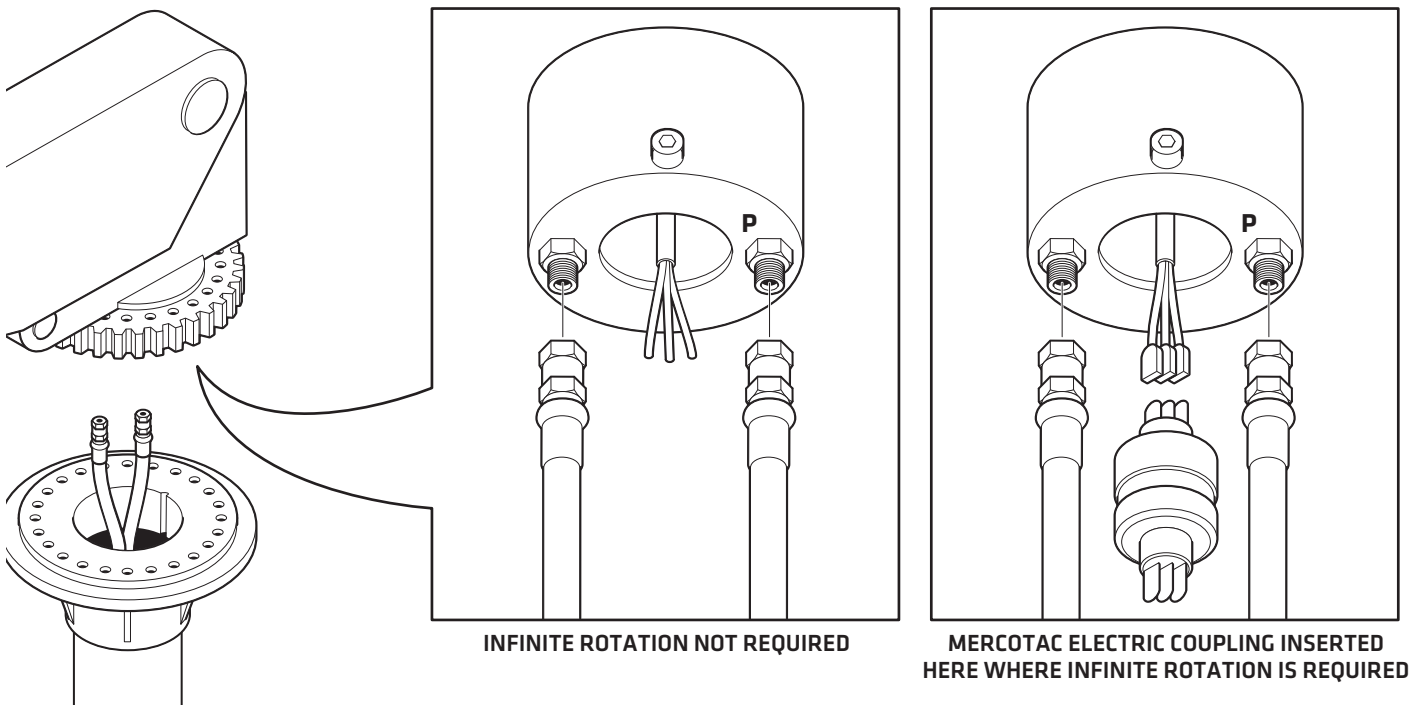


Figure 4: Crane Hydraulic Connections

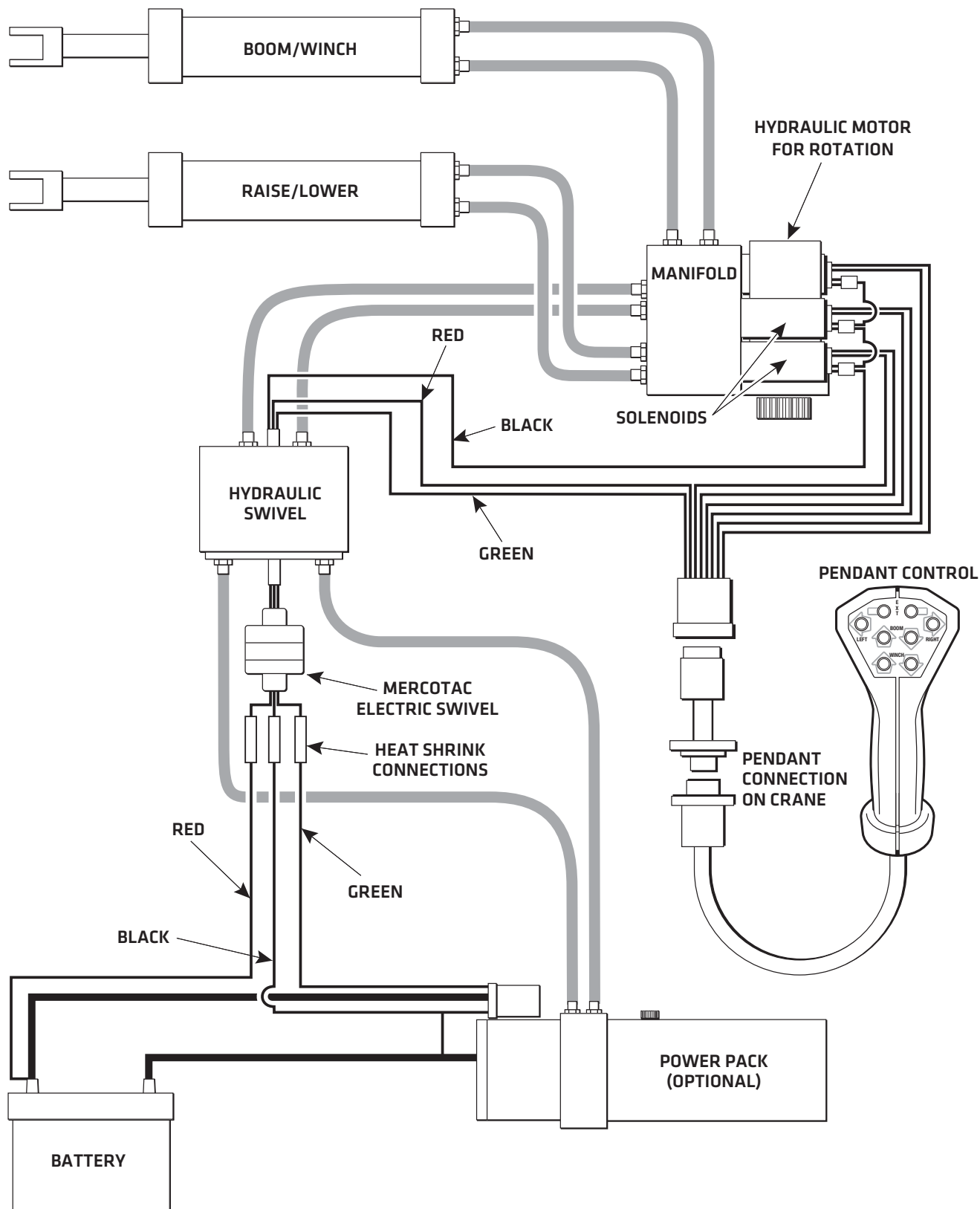


Figure 5: Electrical and Hydraulic Connections

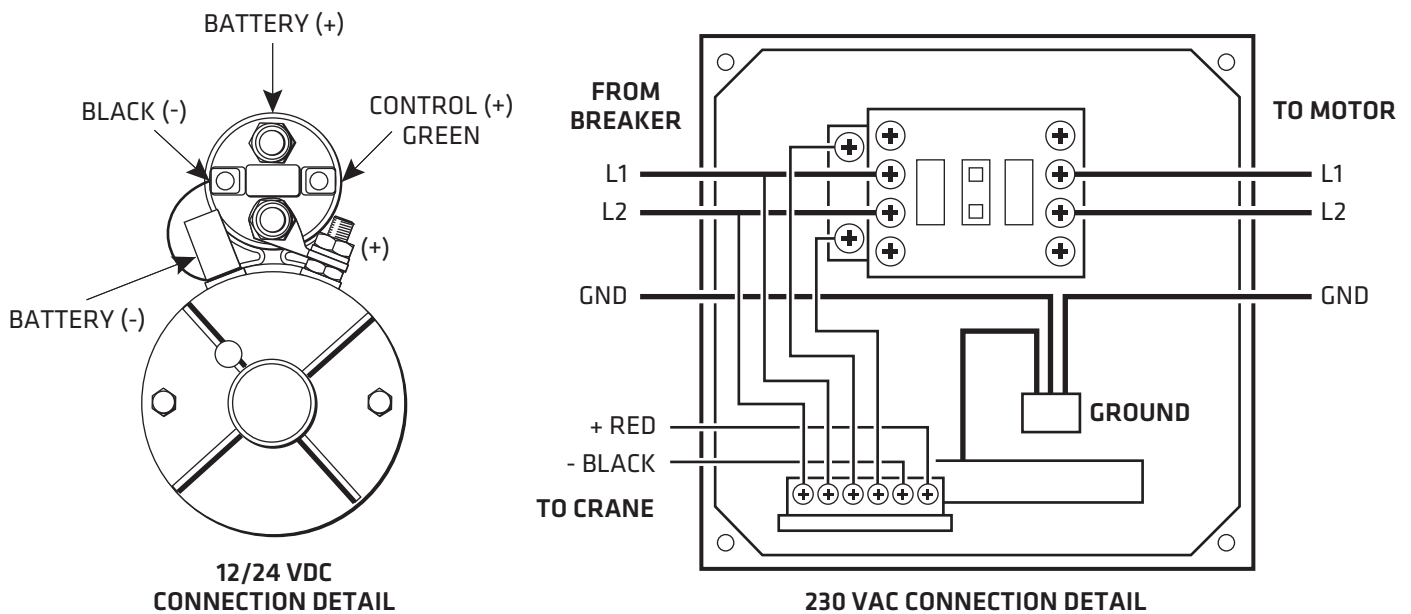



Figure 6: Wiring Connections

Completing and Testing the Installation

To complete and test the installation of the crane:

1. Lower crane onto mounting plate, ensuring that the hydraulic swivel fits correctly into the hole and retaining notch in center of mounting plate.
2. Install mounting 10 bolts and torque to recommended values (see below).
3. Retract both hydraulic cylinders. Fill hydraulic reservoir tank with AW 32 Hydraulic Oil.
4. Test crane as follows:
 - Turn breakers on momentarily.
 - Ensure power unit turns on.
 - Check all wiring.
 - Check hydraulic source and ensure correct pressure from pressure port.
 - Turn on control breaker.
 - Lightly touch each button on the pendant hand control to make sure crane moves appropriately.
5. When systems are confirmed correct, recheck oil level in reservoir and refill to 1" level.
6. Rotate crane 90° and turn power off.
7. Install 6 remaining mounting bolts on crane mounting plate and tighten as previously directed. (Crane always covers 6 bolts, so crane must be rotated to expose them.)
8. Reinstall crane access covers.

- 
9. Slide shroud over the crane mounting plate and attach it to the underside of the plate using $\frac{8}{32}$ " screws. Use Tef-Gel where stainless screws contact painted aluminum surfaces to prevent paint blistering and corrosion.
 10. During shipment, air may have collected in hydraulic system. To bleed, operate all boom functions through their full travel capacity 3 or 4 times, using pendant hand control. This will remove any air in the system.
 11. Recheck oil level in reservoir to ensure 1" level has been maintained.

Bolt Torque Recommendations

1. Use thread lubricant (ie. moly disulfide grease) on threads before beginning to torque bolts.
2. Apply snugging torque of 30 lb-ft in a cross or star pattern.
3. Optional: Apply torque of 45 lb-ft in a second pass using same order.
4. Apply final torque of 60 lb-ft using the same order.

Operating Instructions

WARNING

REVIEW BEFORE OPERATING.

Misuse of the crane may result in injury or death.

Always follow carefully these safety cautions:

- Do not begin hoisting until the boom has been fully extended and the stainless steel plunger (Locking Pin) locked into position.
- Never load the crane system beyond its capacity.
- Be sure the area around and under the tender is clear of people and obstacles before lowering, including lower decks and water level.
- Remove all cargo and excess water from the tender before raising or lowering.
- Ensure all passengers leave tender before raising and lowering—this crane is not a personnel lift.
- Position the crane directly over the load when operating—the crane is designed for vertical hoisting only.
- Do not launch or retrieve a tender in rough sea conditions, or while underway.
- Be aware that yachts tend to list when launching a tender. Use caution when rotating a load.
- Do not allow children to operate the crane.
- Keep hands away from all moving parts.
- Turn the crane's power supply off when not in use.
- Detach crane from tender and retract boom to stow.
- Detach pendant control when not in use.

WARNING

Hook must be in stored position on hook hanger before operating the crane.

Operating Procedure

- Turn on hydraulic supply by:
 - activating the ship's hydraulics, OR
 - turning on the ship's main breaker to supply the crane's power pack.
- Remove waterproof plug on crane body and plug in pendant control.
- Fully extend the boom extension by pressing the Extend button (#1) on pendant control until stainless locking pin snaps into locked position.
- Disconnect weighted hook from hook hanger and allow it to hang freely.
- Attach the tender's lifting bridle to the weighted hook. Using the pendant control, position the lifting bridle to enable attachment to the tender.
- Raise the lifting bridle just enough to remove any slack from the cables. Check all attachments to the tender.
- Remove the tender's attachments to the deck, and ensure the tender's drain plug is installed.
- Attach the handling lines to the bow and stern of the tender.
- Raise the tender high enough to clear all deck obstructions and railings.
- Rotate the load outboard, controlling the tender position with bow and stern lines.
- Lower the load (using button #3) to the water. Pay out enough cable so that the tender does not load the cable and crane as it rides waves or swells.

- Using the load-handling lines, pull the tender to a point near the vessel where it may be boarded. Disconnect the lifting bridle from the tender.
- After use, retract the rope all the way in (using winch button #4). While retracting, maintain tension on the rope. Luff the crane back to horizontal position.
- Secure the weighted hook on hook hanger so that it does not swing into the side of the vessel.
- Now unlock (Pull) the locking pin & retract the boom extension completely (using button #2) to store the crane.

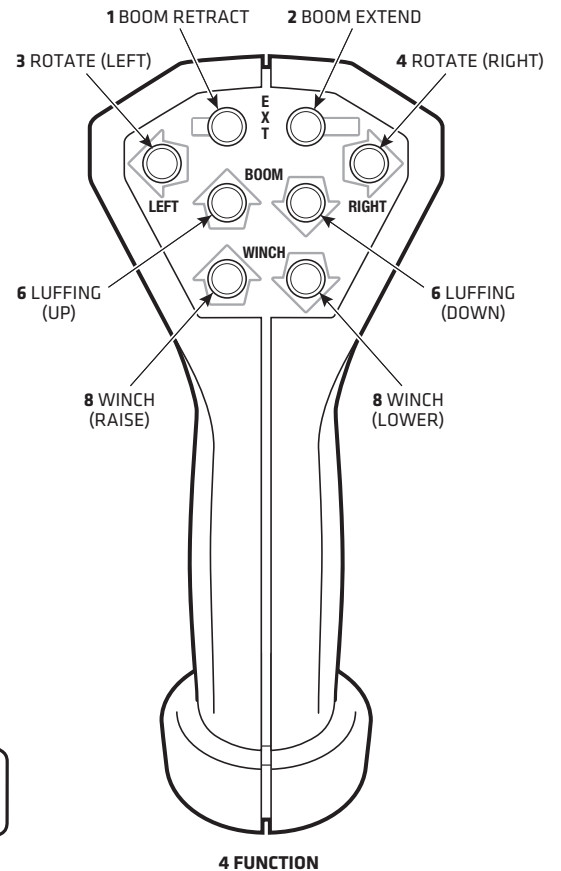
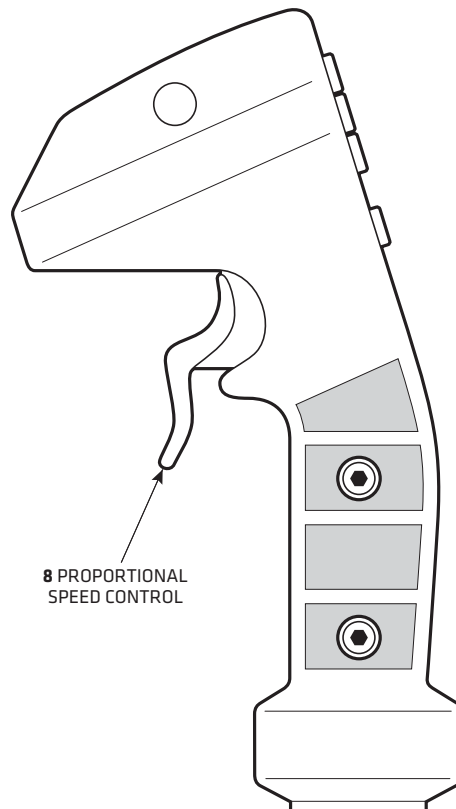
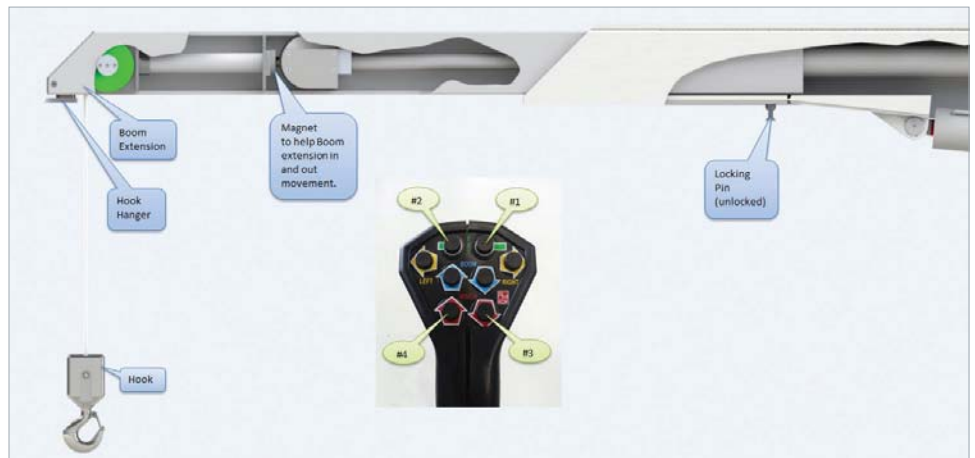


Figure 7: Pendant Control



Programming Procedure for Handles manufactured after 2008

- 1.** Within 5 seconds of powerup, press #2, #2, #2, #4, #4, #2 (Extend, Extend, Extend, Right, Right, Extend). The proportional solenoid will engage 50%.
- 2.** Pull trigger fully in (pause) and out (pause). Do this twice. The solenoid will go to 80% with trigger in, 20% when trigger out.
- 3.** Leave trigger out to adjust low speed, pressing left to slow, right to speed up. Ensure that the crane is clear and does not strike objects while programming (pressing any key except right will reduce speed. Only pressing right will increase it.)
- 4.** Squeeze trigger fully in to adjust high speed, left to slow, right to speed up. Mid-speeds do not work while in program mode, only slowest and fastest.
- 5.** To exit program mode, pull trigger in quickly 5 times. All mid speeds should now work on all buttons.

Maintenance

Maintenance Schedule *(please refer to Figure 1a)*

	Monthly	Quarterly	Annually	As Required
Inspect main hoist cable. Replace upon first sign of frays, fish hooks, flattening, kinks, corrosion, audible pinging or snapping sounds.	✓			
Inspect all cables and hydraulic hoses and fittings. Replace at first sign of corrosion or excessive wear.	✓			
Inspect crane and its hardware components for signs of damage or malfunctioning parts.			✓	
Touch-up any paint damage to preserve the crane's finish.				✓
Wash crane with soap and water including top sheave and manifold area.	✓			
When cleaning the crane, inspect for hydraulic leaks at the power unit and cylinders. Tighten the fittings as required to stop any leaks.	✓			
Inspect and lubricate the crane rotation bearings.		✓		
Inspect the sheaves.	✓			
Service the hydraulic system annually or after 50 hours of use, whichever comes first.			✓	
Maintain fluid levels at 1" below the top of the reservoir on the crane power unit. Use AW-32 or equivalent non-foaming hydraulic fluid only.				✓
Apply white lithium grease between the rotation gear (ring gear) and pinion gear.			✓	

⚠ Safety Cautions

eath, injury, or damage may result if the crane's cable is not inspected regularly, and replaced as needed.

Counter balances have been factory set for optimal performance; crane safety may be jeopardized by unauthorized adjustments.

If the boom is in a 62° position during maintenance, the boom must be supported to prevent injury to personnel.

Troubleshooting

PROBLEM	PROBABLE CAUSE	SOLUTION
Boom will not extend	Wrong button pressed	See Figure 7 on Page 15
Crane will not luff	No power (control)	Turn control breaker on
Crane will not rotate	No power (ships hydraulic) or No power (powerpack)	Is engine driving the hydraulics running? Turn control breaker or reset if req.
	Breaker (fuse) blown	Check Breaker.
	Pendant Control connection (loose) Battery Connection (loose)	Check all connections (ship side). Call electrician if it persists.
	Low hydraulic oil	Check for leaks and oil level top up if necessary
	Hydraulic control valve (not shifting)	Clean or Replace cartridge valve. Call dealer for instructions
	Control solenoid burnt out	Replace solenoid. Call dealer for instructions
Linear winch does not raise or lower	Wrong button pressed	See Figure 7 on Page 15
	Hook still attached to hook hanger	Disconnect
	Pin not locked in position (boom not fully extended)	Fully extend boom until locking pin engages
	Tender not disconnected	Release tender tie downs
	Overload on crane	Check tender for equipment and excess water
	Hook travel exceeded	Max travel 20' hook retracts to within 8" of outer sheave
	Cable jammed inside linear winch	Call Dealer for service or instructions
Winch does not hold weight	Hydraulic components need servicing	Call Dealer for service or instructions
Boom settles under load	Hydraulic components need servicing	Call Dealer for service or instructions
Boom rotates when not under power	Hydraulic components need servicing	Call Dealer for service or instructions
Boom not retracting, black bands become visible on anodized boom extension	Boom pushed past engagement position by pulling pin too early during crane storage sequence	Lower the hoist cable approx 12" Pull locking pin down and push boom tip in a minimum of 4" Extend linear winch until locking pin snaps into place

Customer Service

For service, contact the dealer from which you purchased the yacht crane. Contact information is on the last page of this manual.

Specifications

Electrical System

- The control system is available as 24 volt, 3 amps
- Hand held pendant with cable provides 2-way, 3-function control and connects to crane body with waterproof plug and cap. Low voltage output automatically starts hydraulic power pack or ship's hydraulics.

Hydraulic System

- Operational pressure is 2,500 psi.
- Hydraulic power is supplied by ship's hydraulics or Steelhead Marine power packs, which are available in the following voltages:
- 24VDC HPU pump with tank, 160 amps (200 amp breaker required)
- 12VDC HPU pump with tank
- 240 VAC
- **Slewing** – rotation is powered by a hydraulic motor driving a pinion gear on the main bearing. The motor is counterbalanced to lock when not operational.
- **Luffing** – boom elevation, a hydraulic cylinder with counterbalance valve locks boom at any angle between 0 and 64 degrees.
- **Winch** – 6 to 1 linear winch provides quiet lowering and hoisting.

Equipment Dimensions

	HEIGHT	WIDTH	LENGTH	WEIGHT
Hydraulic power pack, 24VDC	8"	9 3/8"	28 3/4"	45 lb
Hydraulic power pack, 230VAC	8"	9 3/8"	28 3/4"	45 lb
Standpipe assembly	133 3/4" max. O/A	6 5/8" diameter		200 lb
Shroud and transfer collar	24"	16" diameter		20 lb
Crane assembly	15"	16" diameter base		
12ft Extended		8 5/8" boom	144" retracted	680 lb
10.5ft Extended		8 5/8" boom	126" extended	640 lb
9ft Extended		8 5/8" boom	108" extended	610 lb
Control cable			15'	
Shipping Crate				100 lb

2 Year Platinum Warranty

Steelhead Marine Ltd. (“SML”) warrants to the original end-user (the “Buyer”) only that the “equipment” and its components are free from defective materials and workmanship for a period of two years from the date of purchase by the Buyer when purchased from SML. In the case of a new vessel, from the commissioning date of the vessel, or 1 year from the date the equipment leaves SML possession (whichever is less).

This Limited Warranty covers the cost of shop labor and materials when the defective equipment or its component(s) are delivered to SML.

Examination of the Crane: The Buyer (or representative) must examine the Crane upon delivery, and must report all defects to SML within ten (10) days of said delivery, failing which it shall be conclusively agreed between SML and the Buyer that the Crane has been delivered as specified in the contract. The Buyer shall report all visible shipping damage to the delivering shipping agent forthwith upon delivery. Failure to report shipping damage as provided above shall result in any and all shipping damage repair costs becoming the responsibility of the Buyer without recourse to SML or the shipping agent.

Making a Warranty Claim: The Buyer shall establish its warranty claim by delivering to SML, within the period of this Limited Warranty, a statement in clear and concise terms, setting forth the basis of the warranty claim together with proof of purchase, the make and model of the equipment, the date on which the equipment was installed, the name and return address of the party making the claim, and the name of the person or company installing the equipment.

Upon receipt of a valid warranty claim, SML reserves the right to either repair or replace the equipment or its components on board the vessel upon which it is installed, or require the Buyer to return the defective equipment or component(s) to SML transportation prepaid.


This Limited Warranty shall include the cost of materials and labor for the repair or replacement of the equipment or its components. This Limited Warranty also covers the equipment or its components to be repaired or replaced on board the vessel upon which it is installed, however, all expenses associated with transportation of product(s), transportation of field service technician(s), and all in-the-field collateral support (equipment service, welding service, painting service) are the Buyer’s responsibility.

Repaired or replaced products are warranted for the remaining portion of this original Limited warranty period as outlined above.

Exclusions: This Limited Warranty shall not be effective and shall be void, if the equipment or its components are:

- (i) Not installed or used under normal conditions and as recommended by SML;
- (ii) Subjected to abuse, neglect, or carelessness;
- (iii) Altered or repaired by anyone not authorized by Steelhead during the term of this Limited warranty;
- (iv) Subjected to lift weight in excess of rated capacity.; or
- (v) Subjected to persons being the load or part of the load during operation of the equipment.

This Limited Warranty does not cover, and SML is in no way responsible for any supporting or structural elements of the vessel upon which the Crane is installed, or any hoses, hydraulic fluids, filters, paint, or anodized finishes not supplied by SML.



Except as expressly provided in this Limited Warranty, SML is not responsible for the proper installation of the equipment or its supporting elements. It is the responsibility of the Buyer to ensure that the supporting and structural elements, and the equipment's connection thereto, are properly engineered and can withstand the loads of the equipment while in operation. The Buyer shall periodically inspect all structural and supporting elements of the vessel and equipment, all hoses and hydraulic assemblies for signs of wear, corrosion, and/or visible deterioration. The Buyer shall cease operation of the equipment at the first indication of deterioration.

This Limited Warranty shall not be valid except when delivered by an authorized representative of SML or installing shipyard, and the Buyer shall not be entitled to rely on any other representations or warranties, whether oral or written, except as provided in this limited warranty.

THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES. ANY WARRANTY IMPLIED BY STATUTE AND NOT EXCLUDED HEREIN, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, IS IN EFFECT ONLY DURING THE DURATION OF THE EXPRESS WARRANTY SET FORTH HEREIN.

This warranty gives the Buyer specific legal rights, and the Buyer may also have other rights which may vary from country to country or state to state. This warranty shall be construed pursuant to the laws of the Province of British Columbia.

Contact Information

Steelhead Marine Service Representatives

For distribution enquiries, please
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Email: info@ovamarine.com
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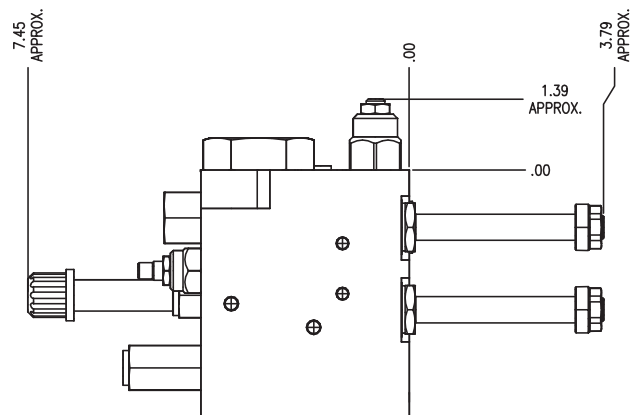
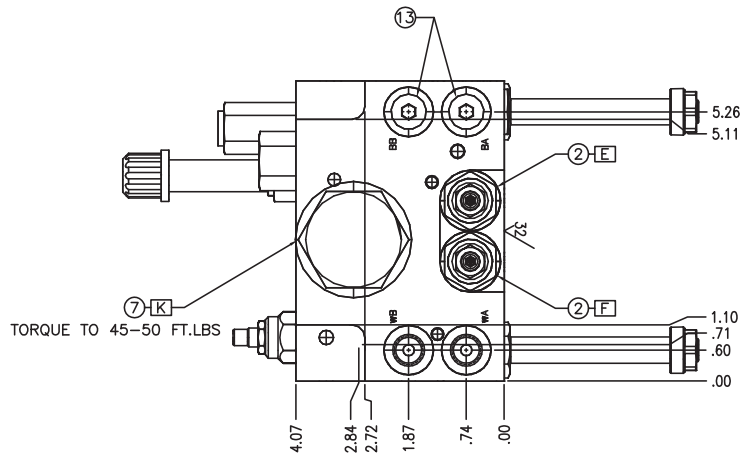
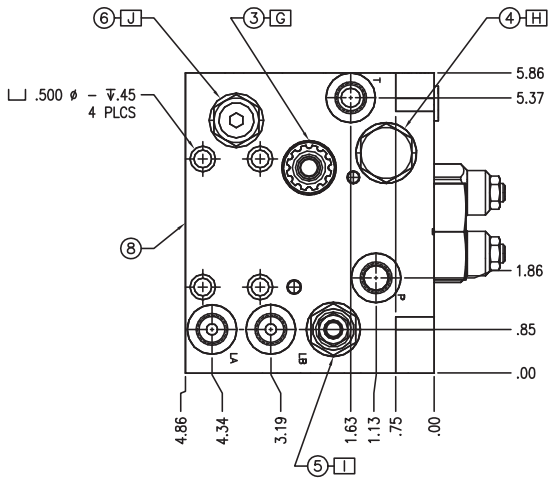
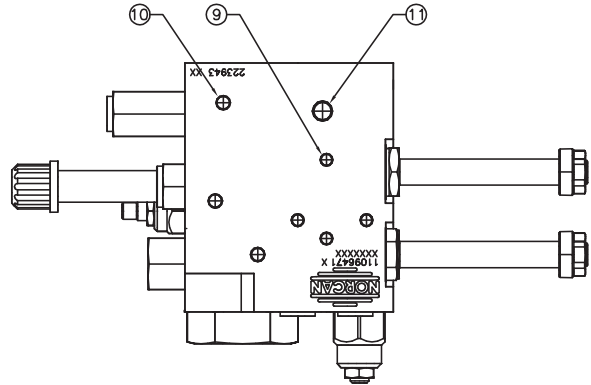
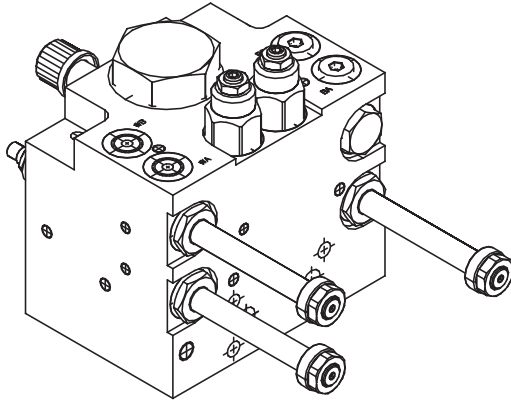
United Kingdom

MDS Marine Ltd.

Hamble Point Marina
Workshop 7, Firefly Road School Lane
Hamble, Southampton SO 31 4NB
United Kingdom

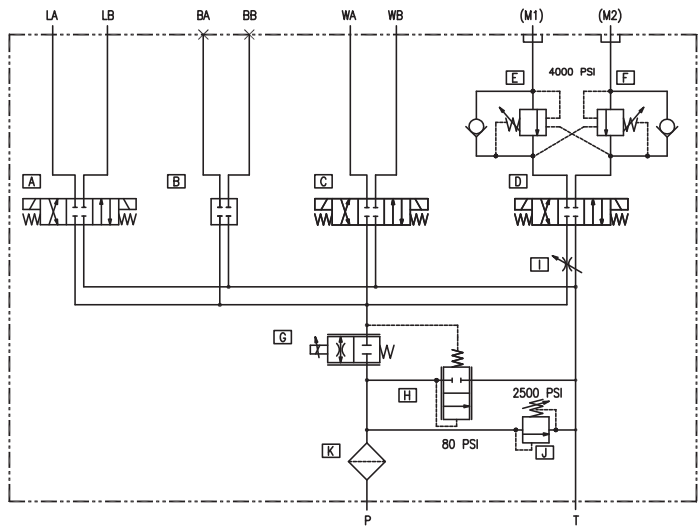
Tel: 44 (0) 2380 457656
Mobile: 44 (0) 7712 645551
Email: info@mdsmarine.co.uk www.mdsmarine.co.uk

Appendix – Manifold

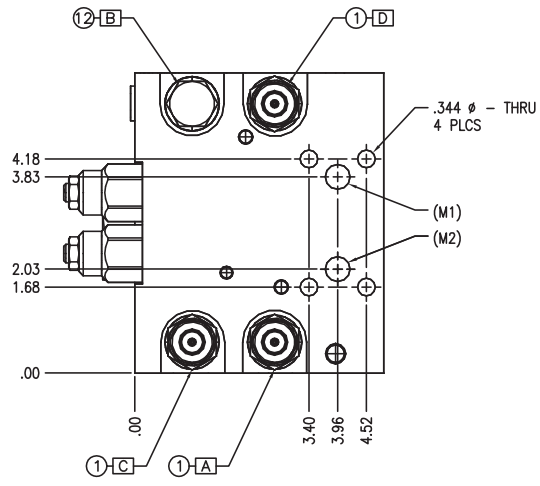


NOTES:

1. ALL PORTS SIZES ARE #6 SAE.
2. STAMP PART NO., REV# & DATE UNDER LOGO.
3. INSTALL EXPANSION PLUGS PER PC26.
4. INSTALL CARTRIDGES PER PC11.
5. TEST PER TEST PROCEDURE 11096471.



REVISIONS				
SIDE	DESCRIPTION	DATE	ECN	REV
	RELEASED TO PRODUCTION	04APR2011	1025691	A
	CHGD COMATROL LOGO TO NORCAN	26JUL2011	1026338	B

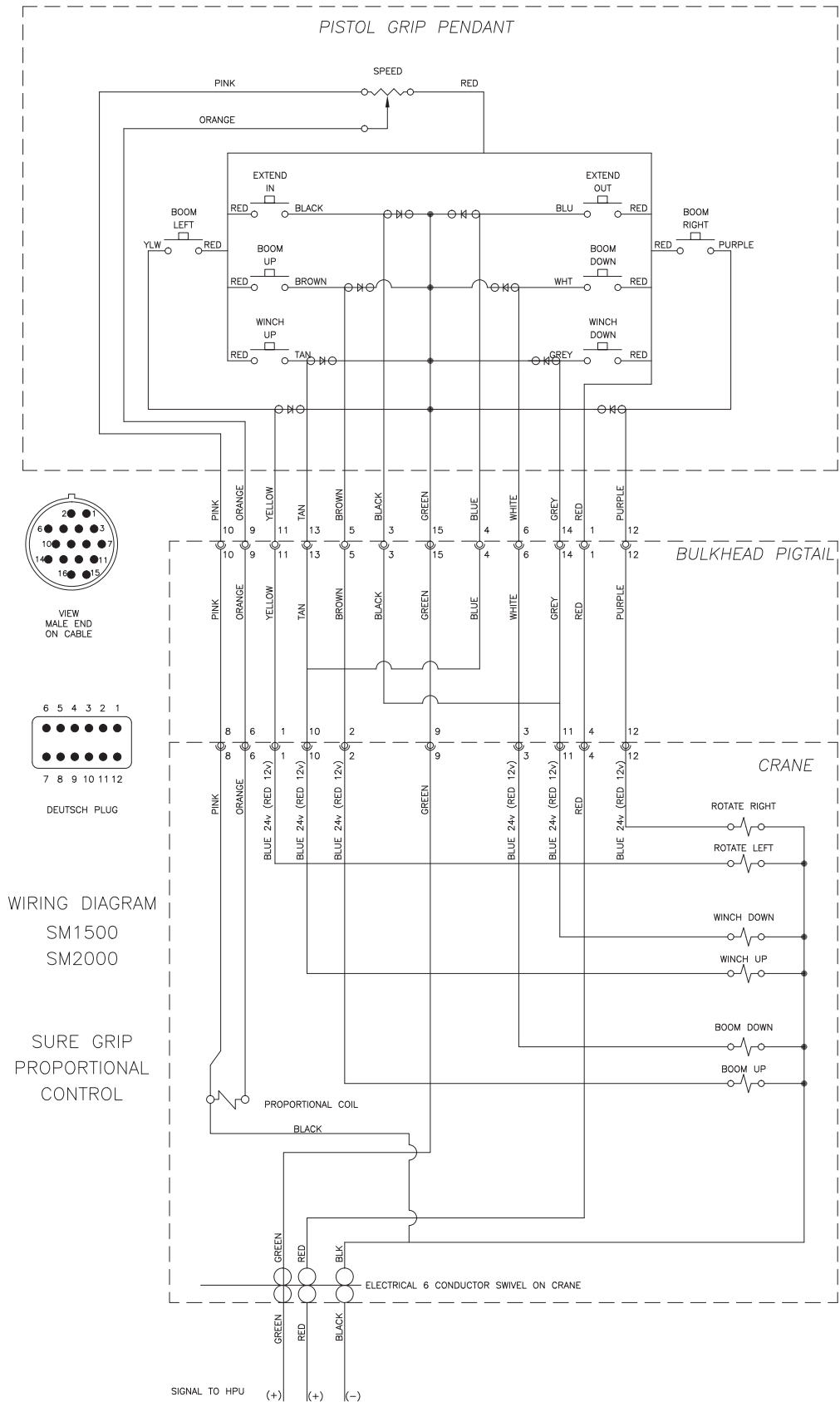


SIMILAR TO CP12756

	13	2	320054	#6 SAE PLUG
[B]	12	1	920608	CP08-B-4-B
	11	4	322804	10MM STAINLESS STEEL EXP. PLUG
	10	11	321451	.281# STAINLESS STEEL EXP. PLUG
	9	15	321450	.250# STAINLESS STEEL EXP. PLUG
	8	1	223943	BODY
[K]	7	1	139584	CPF20-3-B-0-PN-10
[J]	6	1	131125.250	CP208-1-B-0-A-C-250
[I]	5	1	138549	CP618-A05-B-0-E
[H]	4	1	140542	CP700-1L-B-0-080-020
[G]	3	1	11021953	CP518-PNC-U-0-4-H000-0
[F][F]	2	2	140756.400	CP440-A11-B-0-E-C-400-4.5-015
[A][C][D]	1	3	805313419	SV08-34-02-00-00-B-00

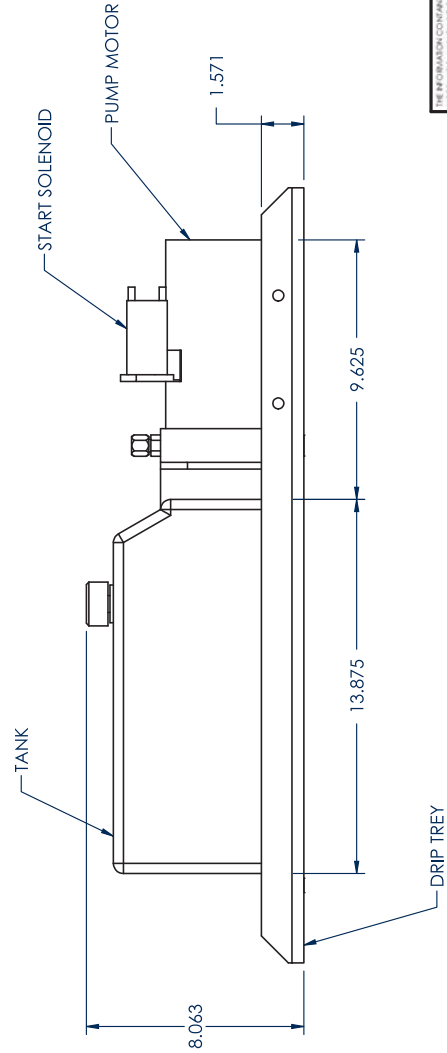
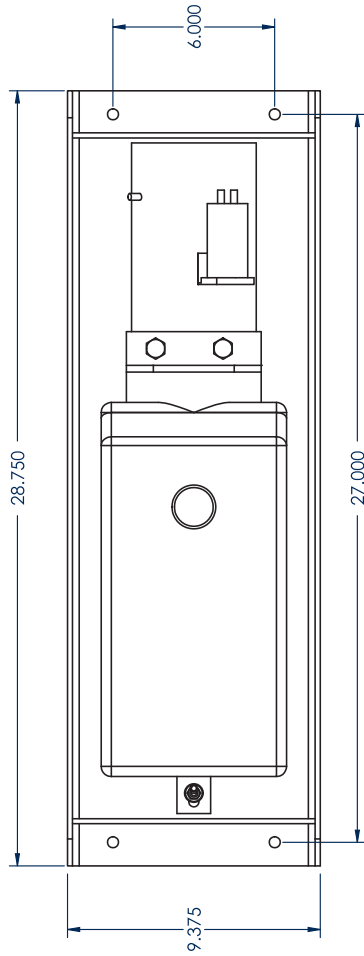
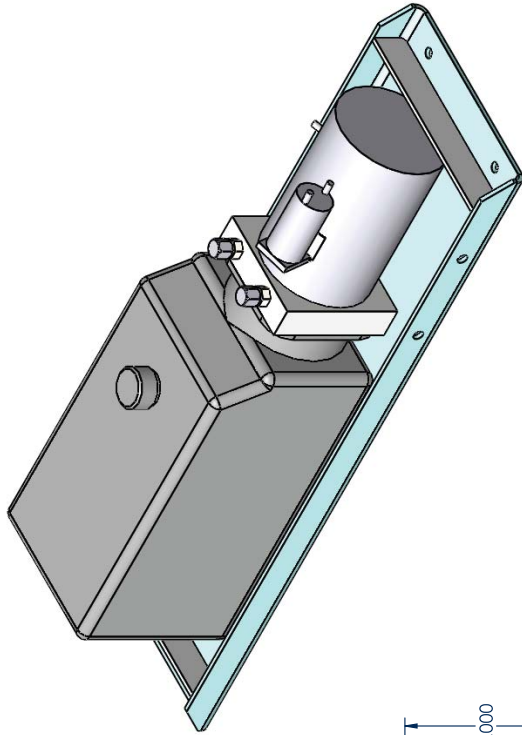
CARTRIDGE CODE	ITEM	QTY	P/N: 11096471	DESCRIPTION
MATERIAL				
BODY: ALUMINUM 6061-T6 5 X 6 X 4.070				
HEAT TREATMENT				
SURFACE TREATMENT				
BODY: BLACK ANODIZE				
UNLESS OTHERWISE SPECIFIED DO NOT SCALE DRAWING				
FINISH 125/ ANGES ± .2"				
2 PLACE DIM ± .02 3 PLACE DIM ± .010				
REMOVE ALL BURRS				
			The reproduction, distribution and utilization of this document as well as the communication of its contents to others without explicit authorization is prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design. (Per ISO 16016)	
DR. DMCINTOSH		SCALE 5:8	EC NO. 1025691	DATE 24MAR2011
TITLE PROP MOTOR MANIFOLD				
SIZE D	PART NO.	11096471		REV B
USED ON NORCAN/STEELHEAD			PAGE 1 OF 1	

Appendix – Wiring Diagram



Appendix - HPU

SM1500 HPU Assembly



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 Web: www.steelheadmarine.net
 E-mail: sales@steelheadmarine.com

DRAWN:	G.R.	PROJECT:	SM1500
DATE:	09/20/2013	DWG. NO.:	SM15-U0100
CHECKED:		SCALE:	1:6
APPROVED:		SHEET:	2 OF 2

SM1500 24V HPU ASSEMBLY

CAD GENERATED DRAWING. DO NOT MANUALLY UPDATE. ALL DIMENSIONS ARE IN INCHES.

TOLERANCES = ±1/16
 FRACTIONS = ±0.030
 0.00 = ±0.010
 ANGLES = ±0.009
 3rd ANGLE PROJ. 30°

Appendix – Exploded View

BILL OF MATERIAL					
ITEM NO.	QUANTITY WITH EXPLODED VIEW	PART NUMBER	DESCRIPTION	MATERIAL	Grade
1	1	SM15-10100	TRUCK ASSEMBLY		
2	1	SM15-40100	LUFFING CYLINDER		
3	1	SM15-20108	MAIN HINGE PIN		17-4PH H150
4	2	SM15-20117	MAIN HINGE SPACER INSIDE		UHWW WHITE
5	1	SM15-A0100	BOOM BODY WELDMENT		6061-T6 ALUMINUM
6	1	SM15-20107	LUFF/CLEVIS PIN		17-4PH H150
7	2	SM15-20116	MAIN HINGE SPACER OUTSIDE		UHWW WHITE
8	4	SM15-20114	LUFFING CYL SPACER OUTSIDE		UHWW PE - WHITE
9	4	SHAR-20100	1/4" PIN CAP		316 Stainless
10	1	SM15-50100	BOOM EXTENSION ASSEMBLY		ALUMINUM
11	1	SM15-W0100	LINEAR WINCH ASSEMBLY		
12	1	5/16 ROPE SECTION	5/16 ROPE		NYLON
13	1	SHAR-R0400	HOOK WEIGHT ASSEMBLY		
14	2	SM15-20102	WINCH RETAINER BAR		316 STAINLESS
15	4	FAST-SHCD050	SOCKET HEAD CAP SCREW 1/4-20 x 1"		316 Stainless
16	1	SM15-20104	LUFFING/TRUCK PIN		17-4PH H150
17	4	FAST-LW0010	LOCK WASHER 1/4"		316 STAINLESS

ATTACH LINEAR WINCH RETAINING BAR TO SECURE LINEAR WINCH IN PLACE

DETAIL A
SCALE 1:4

3d ANGLE PROJ. SCALE: 1:12 SHEET: 1 OF 1

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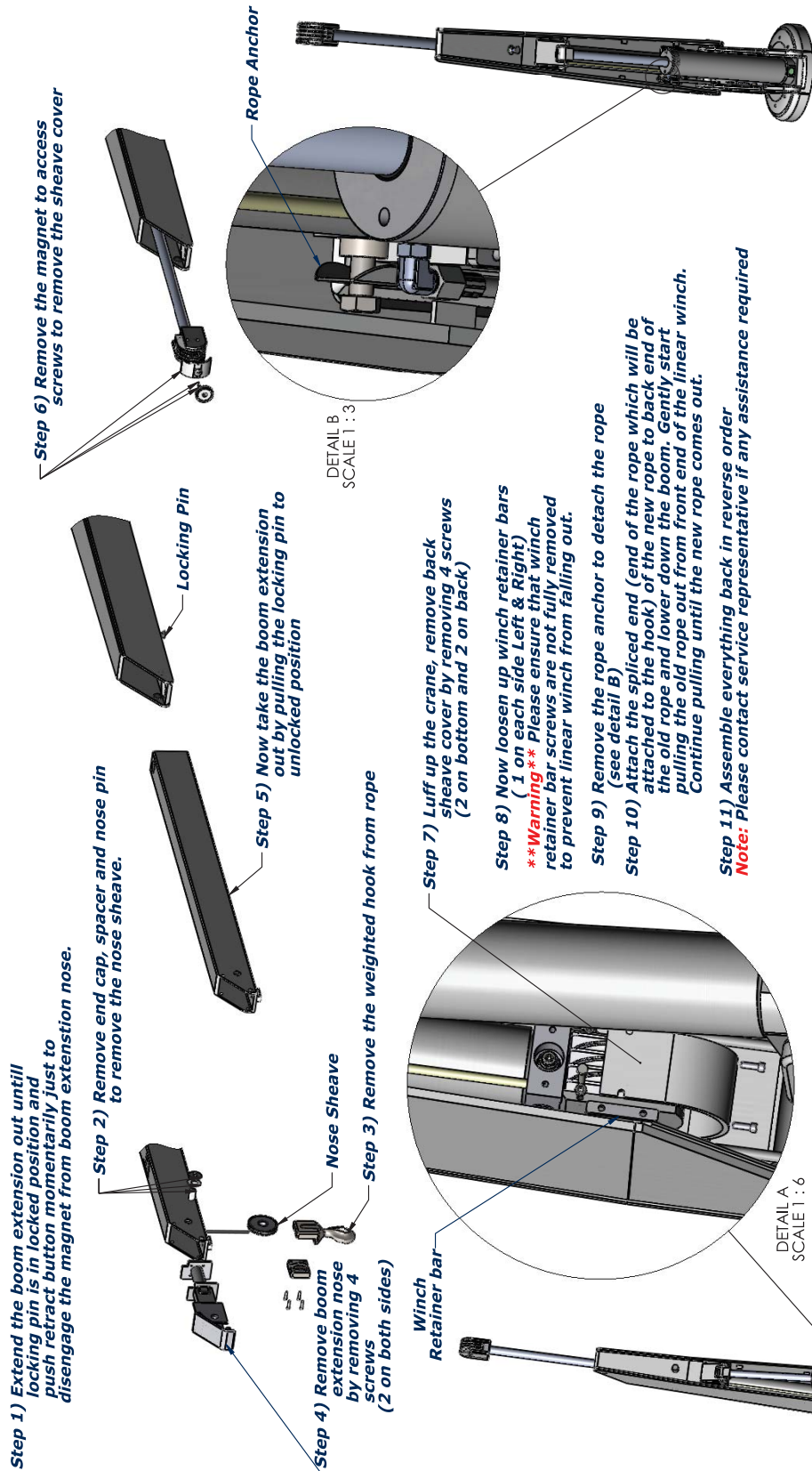
TOLERANCES:
FRACTIONS = ±1/16
0.00 = ±0.030
0.01 = ±0.010
0.000 = ±0.003
ANGLES = ±1.0

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DRAWN: G.B. PROJECT: SM1500/2000
DATE: 04/12/2014 EXPLODED VIEW
CHECKED: G.R.
APPROVED: DWG. NO.: SM1500 ASSEMBLY EXPLODED
SCALE: 1:12 SHEET: 1 OF 1

Appendix – Rope Replacement

ROPE REPLACEMENT INSTRUCTIONS SM SERIES CRANES



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 DECIMALS = ±0.010
 ANGLES = ±0.005
 UNLESS OTHERWISE SPECIFIED

3rd ANGLE PROJ.

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Rope replacement instructions for SM series cranes

PROJECT: SM Series
DATE: 19/12/2014
G.B.
G.R.
APPROVED:
SCALE: 1:24

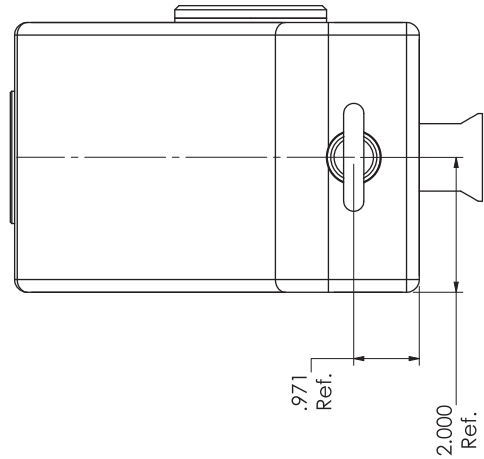
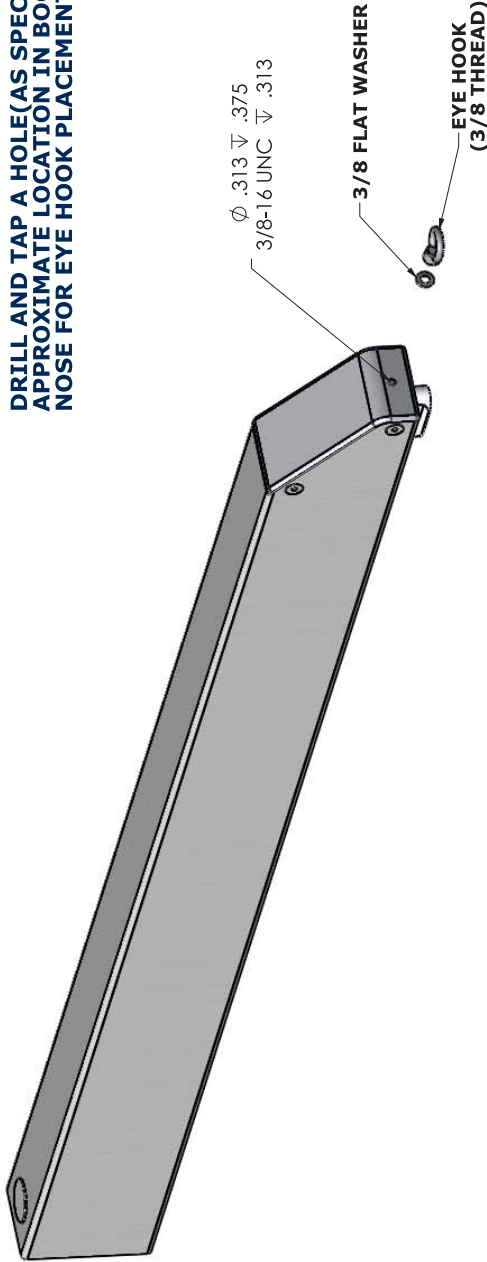
DWG. NO.:
SHEET:
REV.:

SM Series Rope Replacement 1

Appendix - Hook Installation

ROPE EYE HOOK INSTALLATION INSTRUCTIONS

DRILL AND TAP A HOLE (AS SPECIFIED) ON
APPROXIMATE LOCATION IN BOOM EXTENSION
NOSE FOR EYE HOOK PLACEMENT



APPROXIMATE LOCATION FOR ROPE EYE PLACEMENT

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TOLERANCES: FRACTIONS = $\pm 1/16$ 0.0 = ± 0.030 0.00 = ± 0.010 0.000 = ± 0.005 ANGLES = ± 1.0	
3rd ANGLE PROJ.	
SCALE: 1:6	
DWG. NO.: SM15-E0100 - MOD	
SHEET: 2 OF 2	
REV.:	
STEELHEAD MARINE	
2 - 6367 271 Street, Langley, B.C. Canada Tel: 604-826-1668 Fax: 604-826-6992 Web: www.steelheadmarine.net E-mail: sales@advancedmarine technologies.com	
BOOM EXTENSION ASSEMBLY	
PROJECT: SM1500	



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