



**STEELHEAD
MARINE**

ES1500 / 1750



Installation and Operation Manual

Table of Contents

Yacht Crane Assembly	1
Notice to Installer	3
Required Equipment and Tools	4
Supplied Equipment List	4
Optional Equipment List	4
Recommended Materials (not supplied)	4
Required Tools	5
Planning the Installation	6
Choosing the Installation Method	6
Locating the Crane System	6
Reach Table	7
Installing the Standpipe	8
Hydraulic and Electrical Connections (Pedestal Base)	9
Rotation Gear Installation	10
Completing and Testing the Installation	14
Operating Instructions	16
WARNING: REVIEW BEFORE OPERATING.	16
Misuse of the crane may result in injury or death.	16
Operating Instructions	16
Crane Storage	18
Maintenance	19
Maintenance Schedule	19
Safety Cautions	19
Troubleshooting	20
Specifications	21
Electrical System	21
Hydraulic System	21
Fittings, Hardware, and Cables	21
Equipment Dimensions	21
Important Safety Notice	22
2 Year Platinum Warranty	23
Contact Information	25
Appendix	27

Yacht Crane Assembly

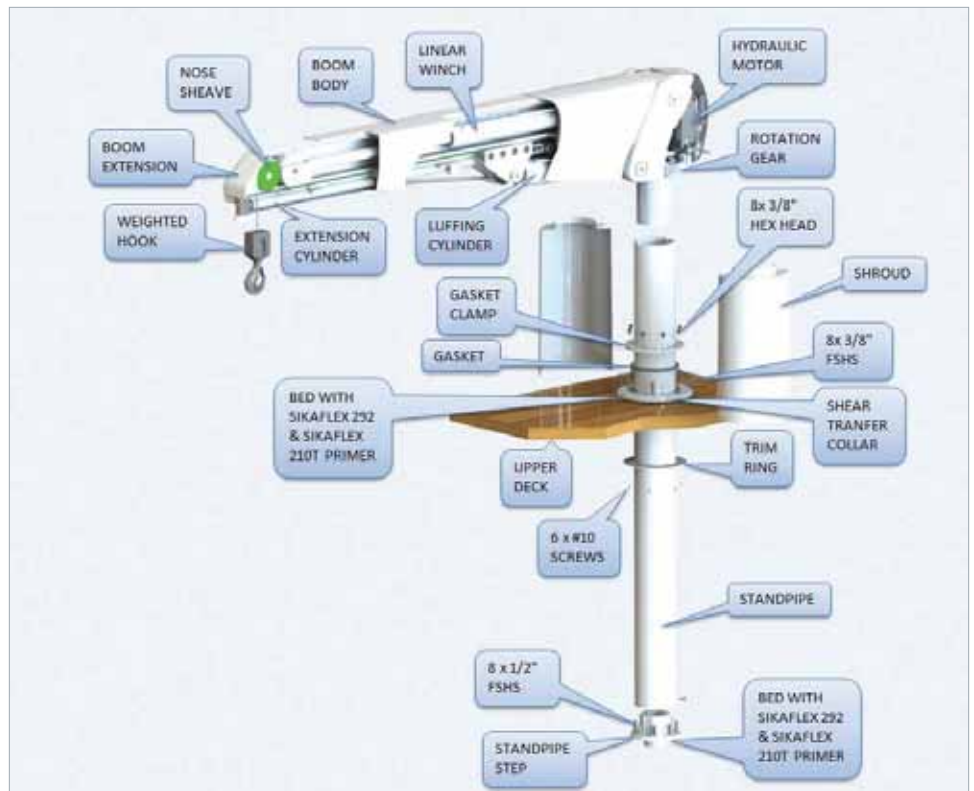


Figure 1a: Standpipe Mounting Option



Figure 1b: Square Base Mounting Option




Figure 2a: Yacht Crane Cut-Away (Boom Body)



Figure 2b: Round Base Mounting Option

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
- composite rope, hook and weight assembly installed
- Four-function, hand-held, pendant control c/w 15' cable (optional wireless control available)
- Owner's Handbook and Installation Manual
- Hydraulic hoses

Optional Equipment List

- **Customized base assembly** (built to your specification)
- OR**
- **Standpipe assembly containing:**
 - 9' standpipe
 - Shear Transfer Collar
 - Standpipe Step
 - Trim Ring
 - Hydraulic power pack, available in 12V or 24V
 - Tender lifting bridle (lift kit)
 - 5/16" Amsteel replacement rope kit c/w eye splices (includes installation instructions)
 - Canvas cover for crane

Recommended Materials (not supplied)

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

- (8) x 3/8" Flat socket head screws for thru-bolting (sheer transfer collar)
- (8) x 3/8" Hex head bolts for gasket clamp
- (8) x 1/2" Flat socket head screws for thru-bolting (standpipe step)
- (6) x #10 Oval head socket head screws (trim ring)
- Sikaflex 292, Sikaflex 210T primer
- anti-corrosion paste (Tef-Gel)
- marine corrosion control grease
- heat-shrink-type electrical connectors
- electrical breakers

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
- hole saw (5 1/2")
- assorted drill bits
- assorted metal-working files
- wire strippers/cutters
- heat shrink tubing and gun
- wet/dry vacuum
- safety goggles and/or face shield

Planning the Installation

Choosing the Installation Method

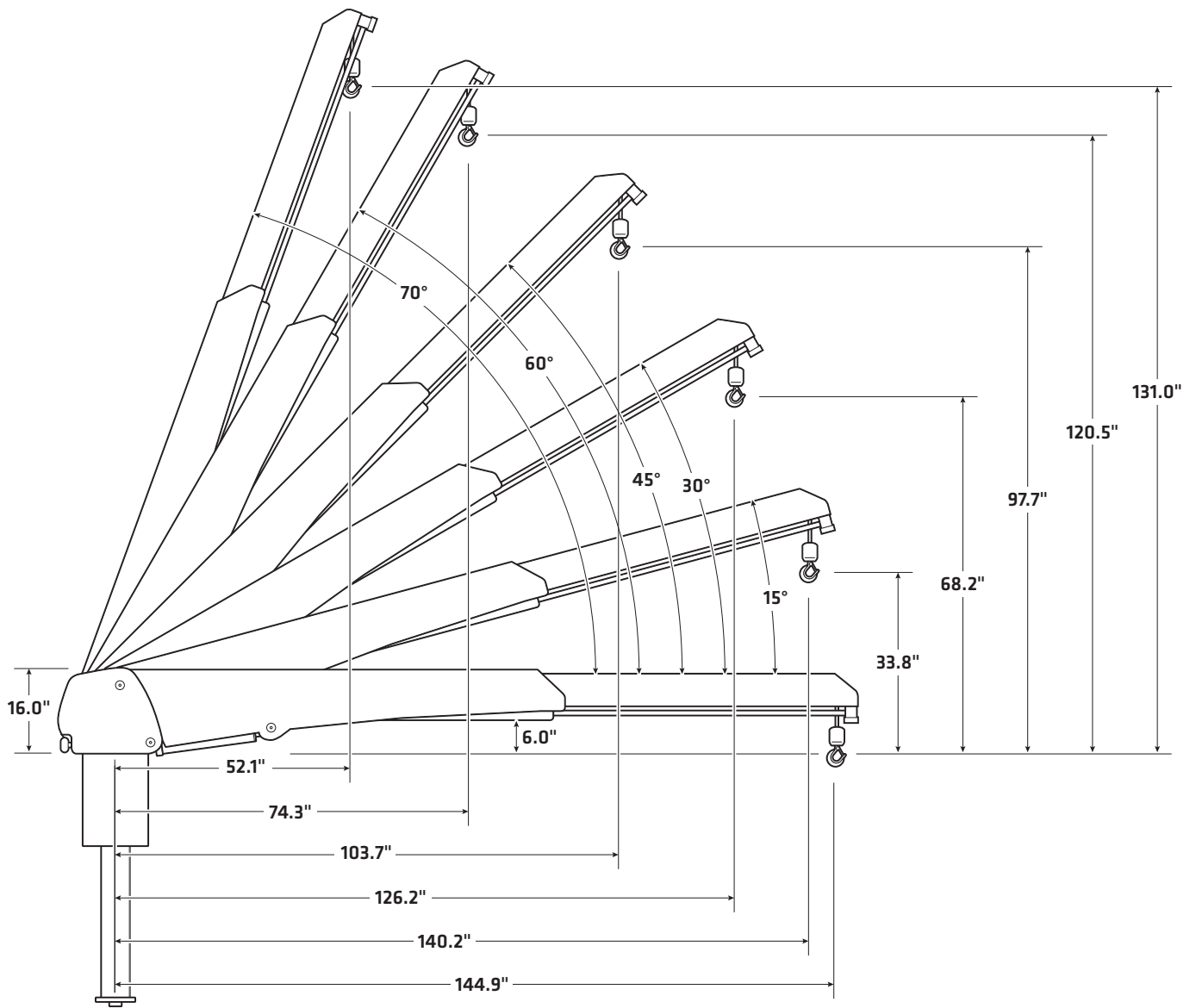
There are three ways to install the crane:

1. **Pedestal Base** – the crane base can be bolted directly onto the deck if the yacht structure has been designed and built to accommodate the load. A 20" x 30" paper template can be supplied if requested.
2. **Standpipe Assembly** – to install the standpipe assembly (*see procedure on page 8*), you must have a maximum deck-to-deck height of 96". Maximum standpipe length 108 ¾".

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.

Reach Table



Angle	Length	Height
0°	144.9"	0"
15°	140.2"	33.8"
30°	126.2"	68.2"
45°	103.7"	97.7"
60°	74.3"	120.5"
70°	52.1"	131.0"

Figure 3: Reach Table

Installing the Standpipe

NOTICE

There are three parts to the shear transfer collar: a 12" diameter base, a rubber gasket, and an 9 1/2" diameter gasket clamp.

Follow this procedure if you are installing the standard standpipe assembly.

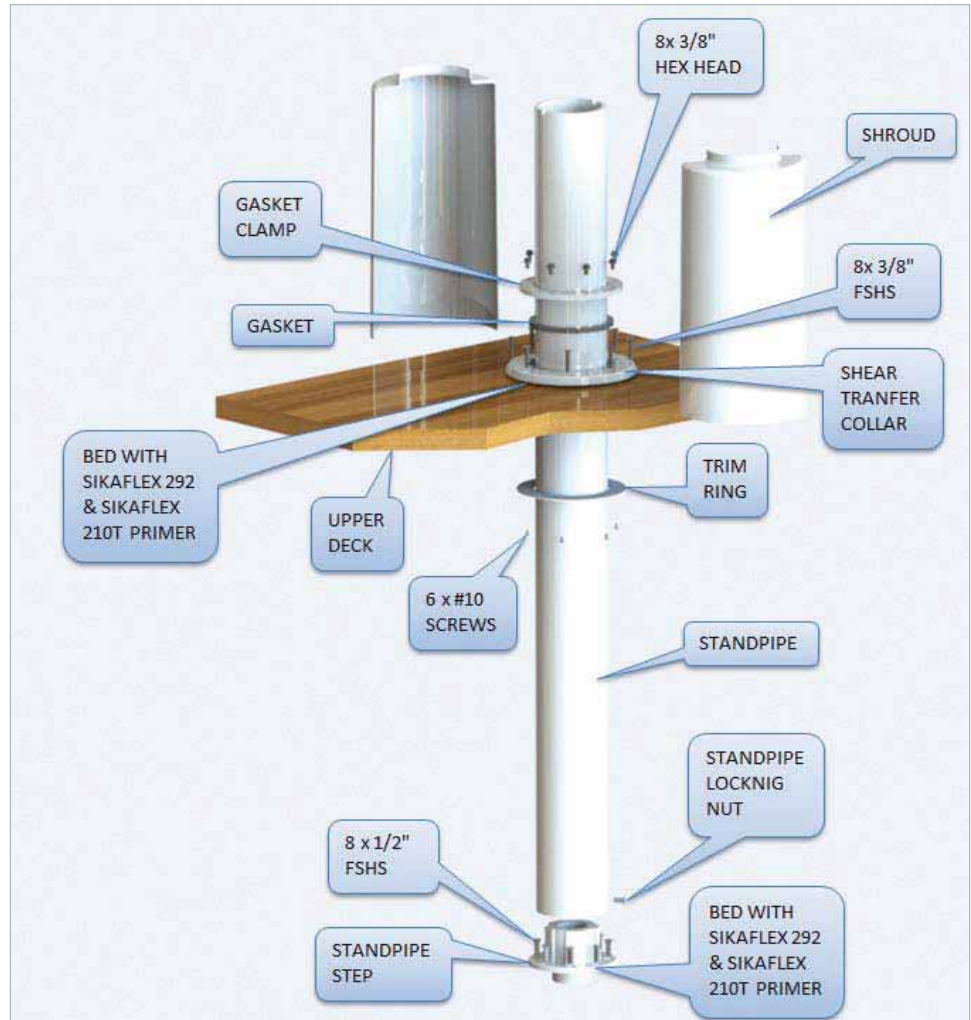


Figure 4a: Exploded View of Standpipe



Figure 4b

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 shear transfer collar will tolerate up to 3° of deck angle. If the deck to standpipe angle is greater than this, the deck should be leveled to 90° by creating a mounting platform.
3. Drill 7" hole through upper deck. Mount shear transfer collar to upper deck by drilling eight 3/8" clearance holes for thru-bolting through the upper deck:
4. Clean deck surface and mount shear transfer collar by bedding with Sikaflex 292 and Sikaflex 210T Primer and installing fasteners through holes on 12" diameter base of collar (*using bolts or screws as per Step 4*).
5. Seal deck core material and clean off excess sealant.
6. With assistance from below, lower standpipe through collar to lower deck. Mark location of standpipe step on lower deck.
7. On Lower deck, drill 3 5/8" hole through center of standpipe step location for exit of hydraulic hoses.
8. Drill eight 1/2" mounting holes.
9. Seal deck core material as directed by shipyard and bed standpipe step with Sikaflex 292 and Sikaflex 210T Primer.
10. Install step fasteners to secure step onto deck floor.
11. 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.
12. 2 notches in top of standpipe will ensure rotation gear cannot rotate inside the standpipe in the event of adhesive failure.
13. Install 1/2" bolt through standpipe into step to lock standpipe into position.
14. Secure collar clamp and gasket to shear transfer collar by tightening the eight 3/8" bolts evenly. These bolts compress sealing gasket on collar and lock standpipe into position on upper deck.
15. Mount trim ring to ceiling of lower deck using four screws.
16. Fit fiberglass standpipe shroud over top of standpipe, trimming to fit deck contour.
17. Glue gear assembly into top of standpipe with Plexis. (*Refer to installation directions in manual*)
18. Locate Crane and Base in desired location.
19. Lead hoses through center of standpipe step to power pack and connect hoses to marked ports on power pack.

Hydraulic and Electrical Connections (Pedestal Base)

Installation of Pedestal Base:

1. Locate Crane and Base in desired location.
2. Drill mounting holes, bed base with Sikaflex 292 and Sikaflex 210T Primer and then bolt down.
3. Complete electrical connections *as per wiring diagram on page 12 (Figure 5)*.
4. Connect pendant hand control by plugging it into connection on boom.
5. Crane is ready to operate.

NOTICE

The Yacht deck structure at the desired location of the Crane and Base must be designed to handle this load.

Rotation Gear Installation

Each ES series Steelhead Marine Crane is shipped with a 50ml tube of Plexus MA310. This is to be applied to the gear prior to the installation to the standpipe or base. See details below for correct application procedures.

1. Dry fit and check gear to standpipe or base tube. The gear should slide into the pipe section and bottom to allow the tabs to match



2. Steelhead Marine supplies the Plexus and mixing tube. Applying the entire tube will be required to ensure correct adhesion of the gear to the pipe section .



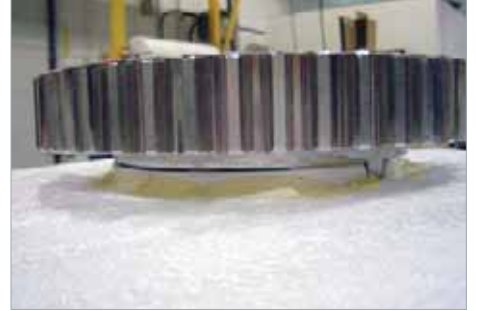
3. Apply Plexus to area shown below.



4. Once the Plexus has been applied you have a 10 minute working time so be sure to install the gear into the pipe section as soon as the Plexus adhesive has been applied.



5. Clean any excess Plexus adhesive with mineral spirits or Acetone.



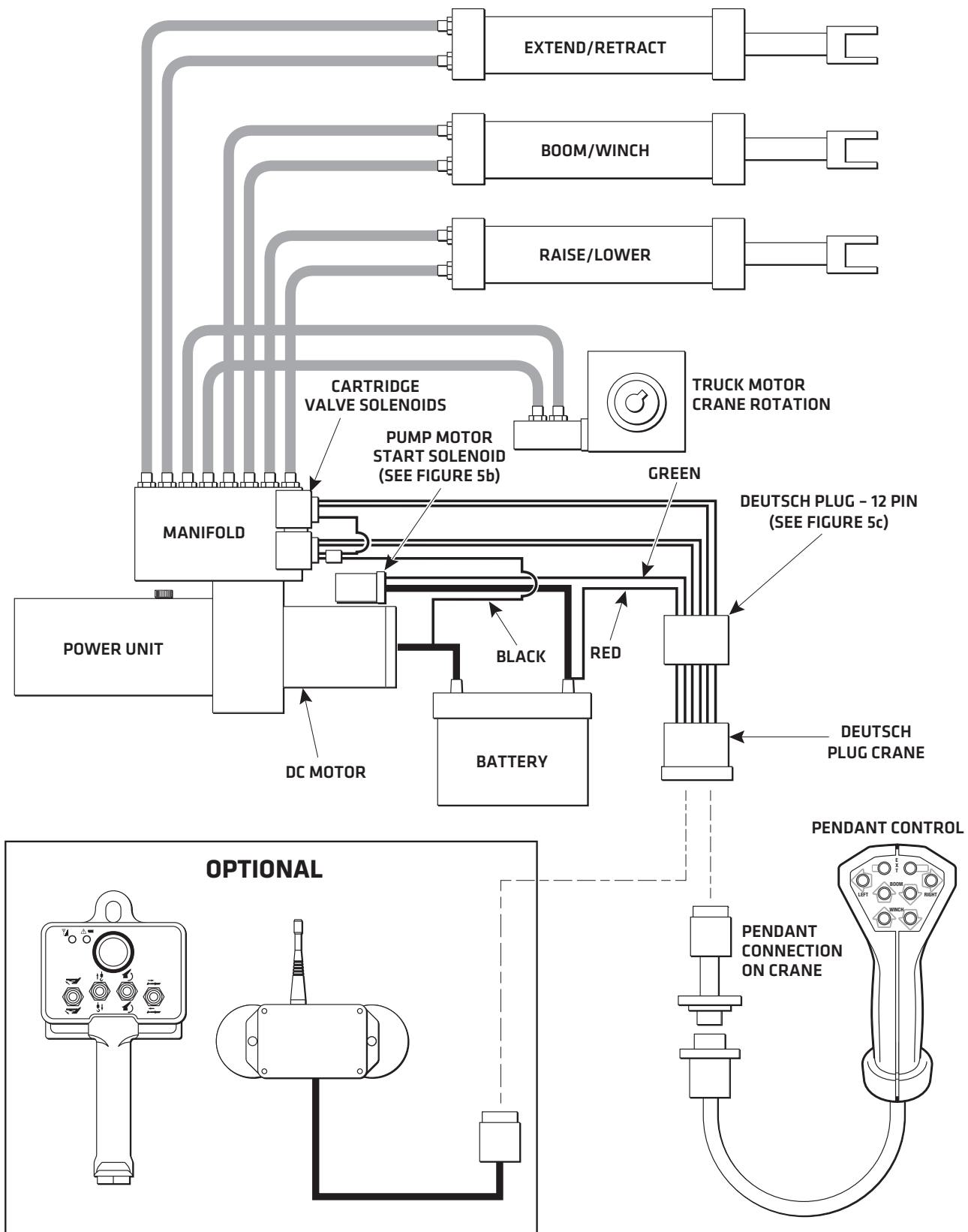


Figure 5a: Electrical and Hydraulic Connections

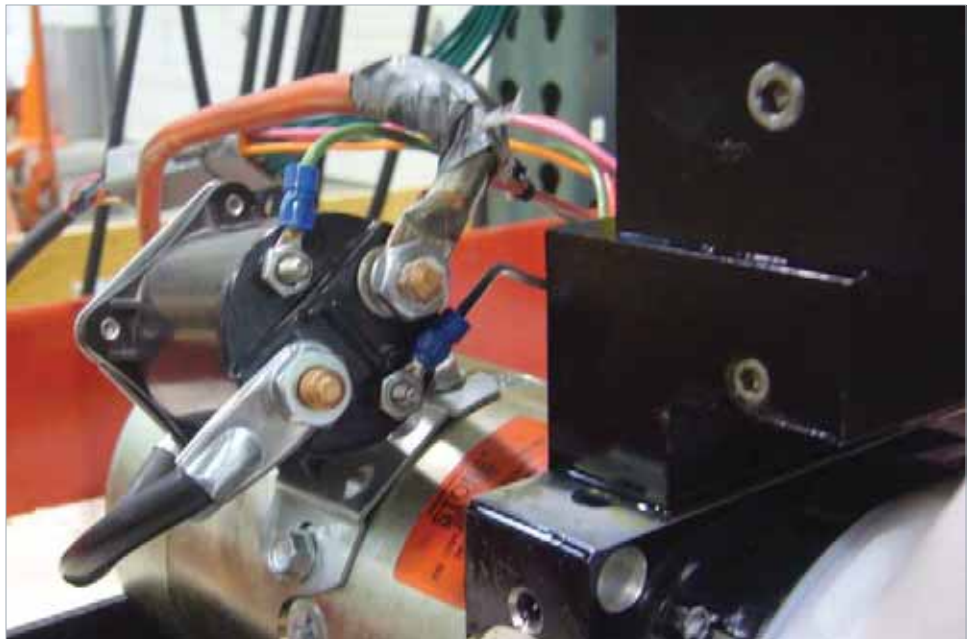


Figure 5b: Pump Motor Solenoid Wiring

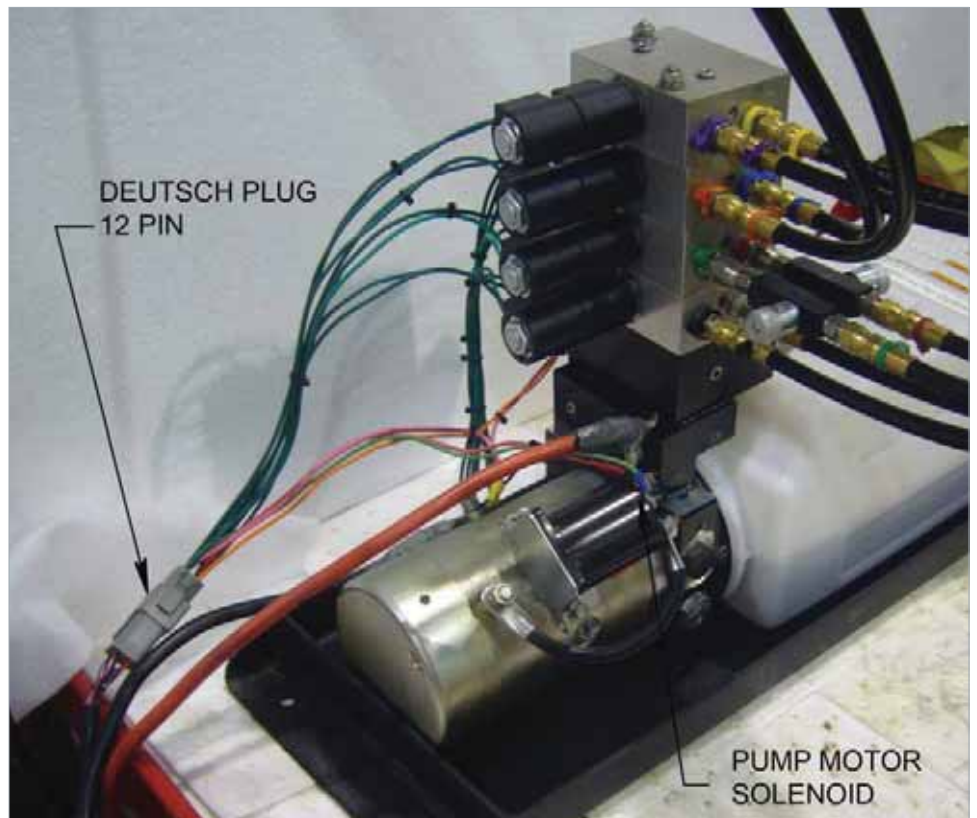


Figure 5c: Deutsch Plug on Manifold

Completing and Testing the Installation

To complete and test the installation of the crane:

1. Retract all hydraulic cylinders. (ie. rope all the way down / out, Boom down - horizontal and boom extension in.)
2. Fill hydraulic reservoir tank with **AW 32 Hydraulic Oil**. Test crane as follows:
 - Turn breakers on momentarily.
 - Ensure power unit turns on, by pressing a function on crane.
 - Check all wiring.
 - Turn on control breaker.
 - Lightly touch each button on the pendant hand control to make sure crane moves appropriately.
3. Check entire system for leaks and tighten fittings if necessary.
4. When systems are confirmed correct, move crane to down and retracted position, recheck oil level in reservoir and refill to 1" below top level.
5. 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.
6. Recheck oil level in reservoir to ensure 1" level has been maintained.

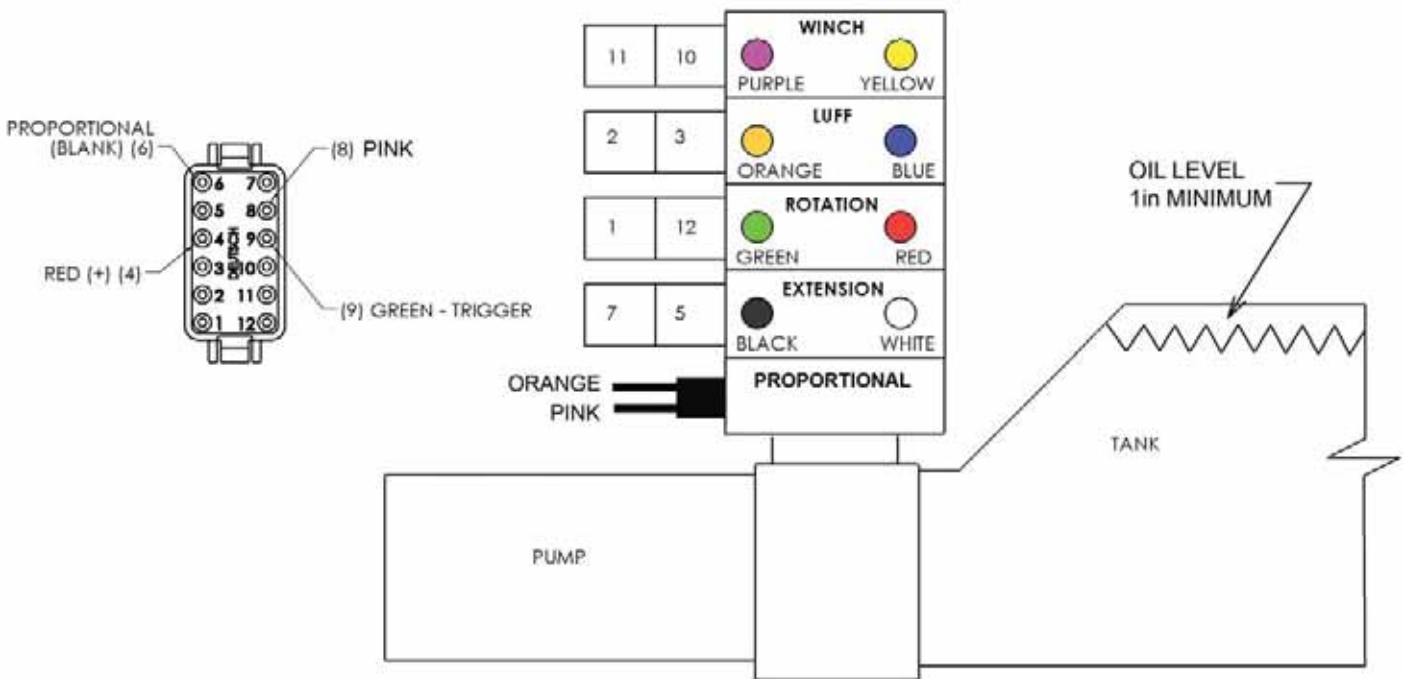


Figure 6a: 12/24 VDC Connection Detail



Fig 6b: General Wiring Connections

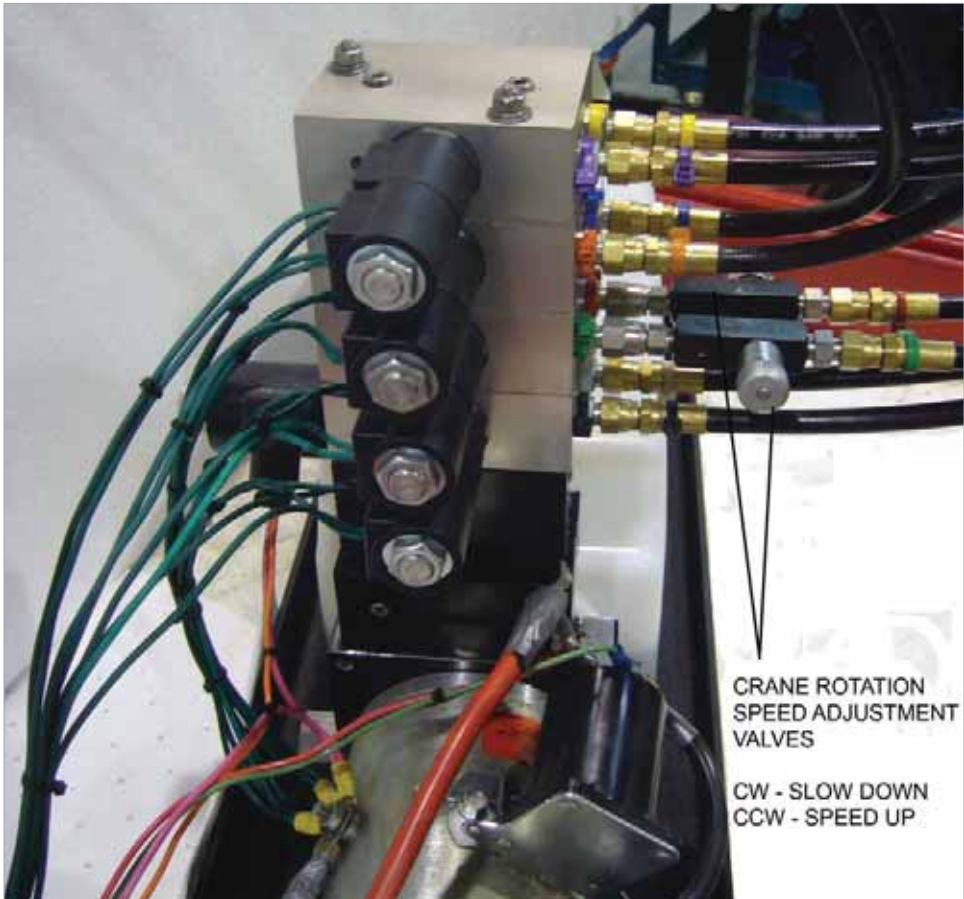


Fig 6c: Crane Rotation Speed Adjustment

Operating Instructions

WARNING

REVIEW BEFORE OPERATING.

Misuse of the crane may result in injury or death.

Always follow carefully these safety cautions:

- Never load the crane system beyond its capacity of 1500/1750 lb.
- 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.

NOTICE

The crane is designed to lift the tender at the maximum boom extension. For maximum operator control while lifting and rotating the tender, the objective is to keep the tender as close to the crane as possible. Maximum control is achieved by having the minimum boom extension and having a minimum rope length.

Operating Instructions

1. Unlock the rotation brake by turning knob CCW (*See Figure 8*)
2. Turn on hydraulic supply by turning on the crane's DC breaker to supply the crane's power pack.
3. Remove waterproof plug on crane body and plug in pendant control. (or turn on optional wireless controller)
4. Disconnect weighted hook from storage mount and allow it to hang freely.
5. Attach the tender's lifting bridle to the weighted hook. Using the pendant control (*Figure 7*), position the lifting bridle to enable attachment to the tender.
6. Raise the lifting bridle just enough to remove any slack from the cables. Check all attachments to the tender.
7. Remove the tender's attachments to the deck, and ensure the tender's drain plug is installed.
8. Attach the handling lines to the bow and stern of the tender.
9. Raise the tender high enough to clear all deck obstructions and railings.
10. Rotate the load outboard, controlling the tender position with bow and stern lines.
11. Lower the load to the water. Pay out enough cable so that the tender does not load the cable and crane as it rides waves or swells.
12. 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.
13. Secure the weighted hook so that it does not swing into the side of the vessel.

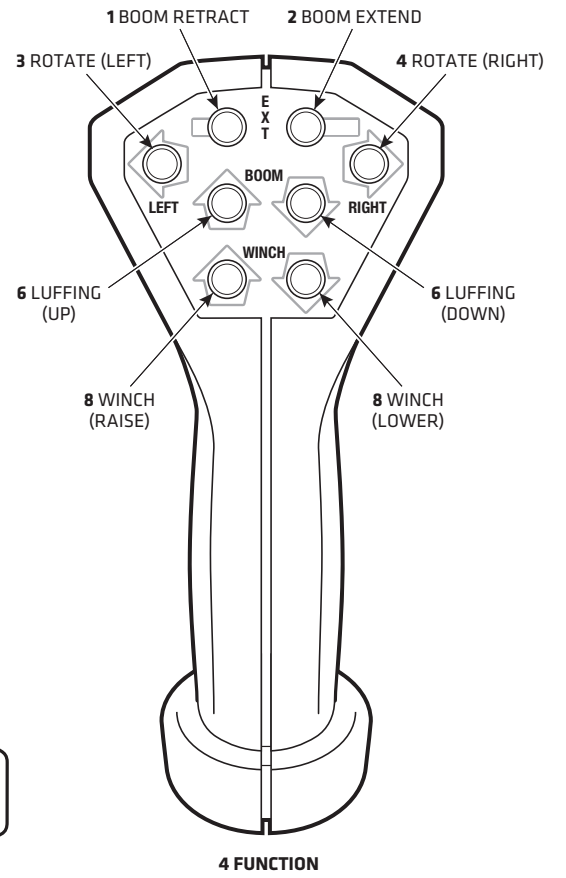
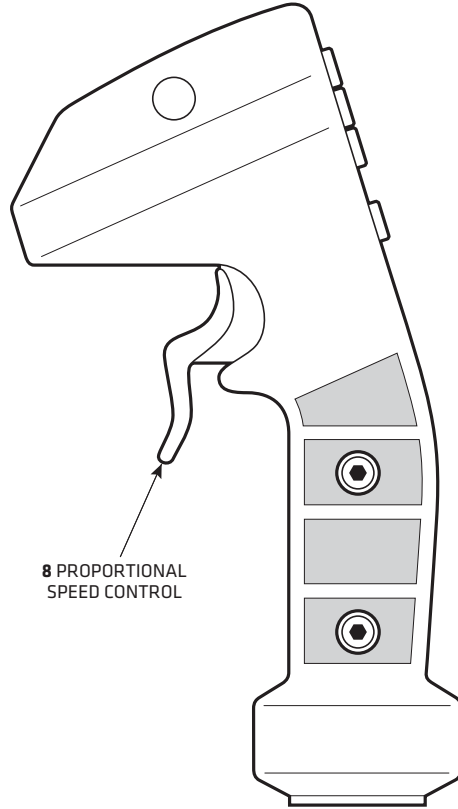


Figure 7: Pendant Control

CAUTION

The crane must be stored with the boom fully retracted to prevent corrosion to the linear winch rod, which would result in damage to the cylinder seals.

Crane Storage

To properly store the crane after use:

1. Luff crane to horizontal position.
2. Slide weighted hook onto hook mount.
3. Retract (DOWN button) linear winch and boom extension until crane is stowed.
4. Detach pendant control and attach waterproof cap.
5. Lock crane rotation by turning knob CW (See Figure 8).



Figure 8: Crane Rotation Brake

Maintenance

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

	Monthly	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.	✓		
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

Review before commencing maintenance.

Death, 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.

Troubleshooting

PROBLEM	PROBABLE CAUSE	SOLUTION
Boom will not extend	Wrong button pressed	<i>See Figure 7 on Page 17</i>
Crane will not luff	No power (control)	Turn control breaker on
Linear winch does not raise or lower	Wrong button pressed	<i>See Figure 7 on Page 17</i>
	Hook still attached to hook hanger	Disconnect
	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

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 in 2 voltages: 12 volt, 3.5 amps 24 volt, 2 amps
- Hand held pendant with 15' extendable cord provides 2-way, 4-function control and connects to crane body with waterproof plug and cap (Optional wireless control). Low voltage output automatically starts hydraulic power pack or ship's hydraulics.

Hydraulic System

- Operational pressure is 2,600 psi.
- Hydraulic power is supplied by ship's hydraulics or Steelhead Marine power packs, which are available in the following voltages. 12 volt, 275 amps (350 amp Breaker) 24 volt, 147 amps (180 amp Breaker)
- **Luffing** – boom elevation, a counterbalance cylinder locks boom at any angle between 0 and 70 degrees
- **Winch** – 8 to 1 linear winch provides quiet lowering and hoisting 9:1 Safety Factor

Fittings, Hardware, and Cables

- The hook and weight are an integrated assembly constructed of 316 stainless steel.
- The hoist rope is 5/16" diameter and made of Amsteel composite. It provides a 10:1 safety factor.

Equipment Dimensions

	HEIGHT	WIDTH	LENGTH	WEIGHT
Hydraulic power pack, 4 Function	15 3/16"	9 3/8"	28 3/4"	50 lb
Standpipe assembly with Gear		6 5/8" diameter	110" std	94 lb
Crane assembly	16" at truck	12"	100 1/2" retracted	560 lb
			159" extended	
Control cable			15'	

Important Safety Notice

WARNING

**PLEASE READ CAREFULLY
BEFORE OPERATING.**

In an effort to offer additional flexibility for launching and retrieving please note there is no mechanical rotation stop with the Steelhead ES1500/ES1750 Yacht Cranes.

It is of critical importance that the crane operators not rotate the crane beyond 360° (one complete rotation).

Rotating the crane beyond its safe operating limits may damage the hydraulic system which could result in serious property damage and personal injury.

If the crane has been rotated in a complete circle during operation, rotate it back in the opposite direction to return it to the stowed position.

If the crane has rotated beyond 1 and 1/2 rotation (540°), the following steps should be completed after returning the crane to the stowed position in order to ensure damage has not occurred.

1. Check all hoses to ensure none of them have developed kinks, leaks, or damage at the connection points on the crane.
2. Check the connections to the Hydraulic Power Unit to ensure they are still properly connected and have not developed kinks, leaks, or damage to the fittings.

If you have any questions regarding this safety notice or the operation of your crane, please contact us at 604-607-0091.



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 2 years 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
contact **Jake Burns***

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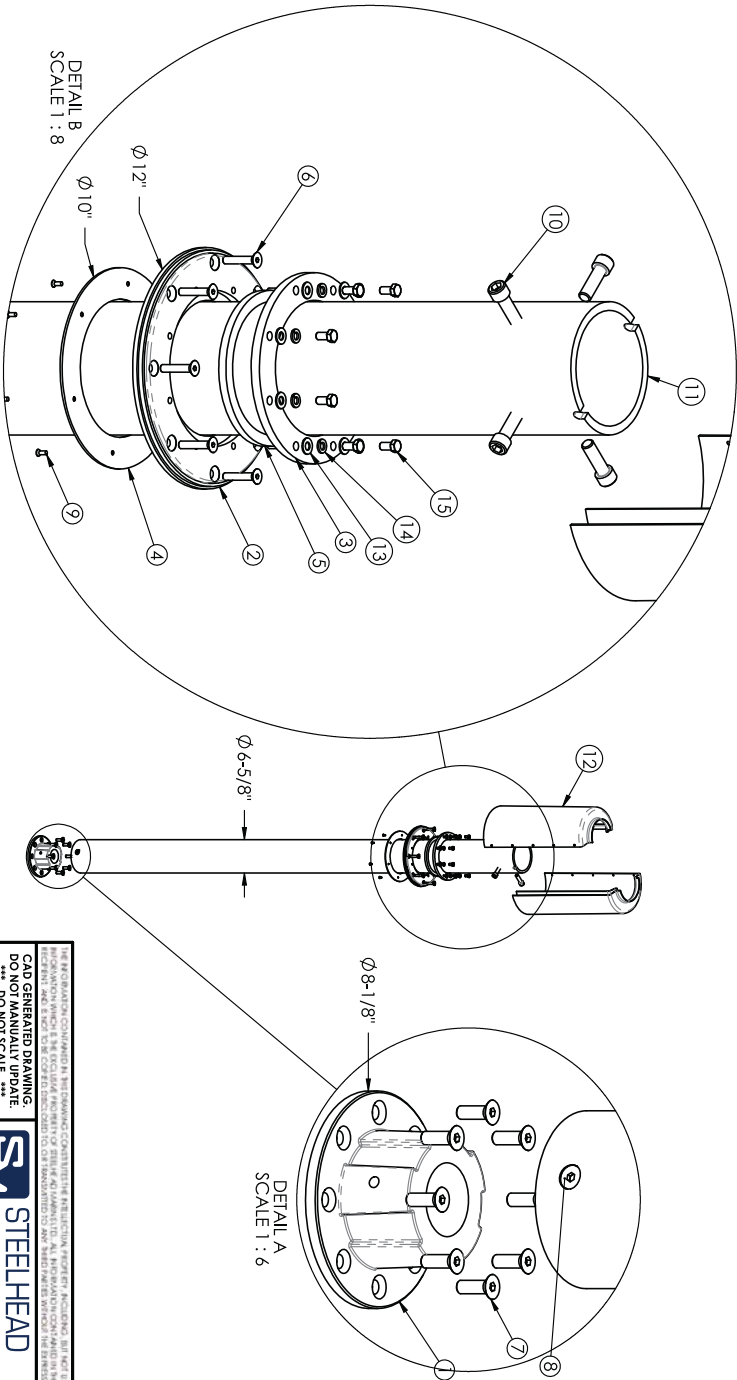
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Hamble, Southampton SO 31 4NB
United Kingdom

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

Appendix – Stanpipe Assembly

BILL OF MATERIAL					
ITEM NO.	QTY	PART NUMBER	DESCRIPTION	Material	Grade
1	1	SM1-5-S0101	S/P STEP	A356 CAST ALUMINUM	
2	1	ES15-S0105	S/P SHEAR TRANSFER COLLAR	6061-T6 ALUMINUM	
3	1	ES15-S0106	S/P GASKET CLAMP	6061-T6 ALUMINUM	
4	1	SM1-5-S0107	SP TRIM RING	1/8" PLATE 6061-T6 AL	
5	1	SM1-5-S0113	STANDPIPE GASKET		
6	8	FAST-FHS0145	SCREW, FLAT HEAD, ALLEN, 3/8-16 x 2"		
7	8	FAST-FHS0200	SCREW, FLAT HEAD, ALLEN, 1/2-13 x 1-1/2"		
8	1	FAST-FHS0180	SCREW, FLAT HEAD, ALLEN, 1/2-13 x 1"		
9	6	FAST-FH0080	FLAT HEAD PHILLIPS SCREW, #10-32 x 1/2"		
10	4	FAST-HCIOC-16A	SOCKET CAP SCREW 5/8-11 X 2" - 316		
11	1	ES15-S0110	STANDPIPE-STEP SLEEVE WELDMENT		
12	2	ES15-S0111 A	S/P SHROUD	FIBERGLASS	
13	8	FAST-FW0040	WASHER, FLAT, 316SS, 3/8"		
14	8	FAST-LW0030	LUFFING CYLINDER ASSY.		
15	8	FAST-HH0210	HEX CAP SCREW 3/8-16 x 3/4"	316 STAINLESS	



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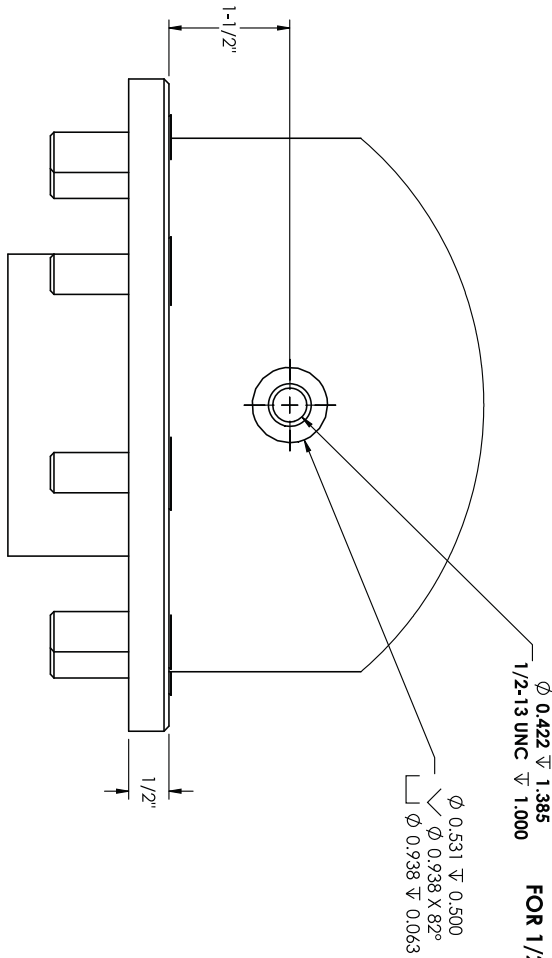
DRAWN: G.R.
 DATE: 07/17/2008
 CHECKED:
 APPROVED: D. THAIN
 SCALE: 1:32

EST500 STANDPIPE ASSEMBLY PROJECT: EST500
 DWG. NO.: EST15-S0100

SHEET: 1 OF 3
 REV.:

BILL OF MATERIAL

MACHINING INSTRUCTIONS FOR THE STEP SCREW



FOR 1/2" FLAT HEAD SOCKET SCREW

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3rd ANGLE PROJ.

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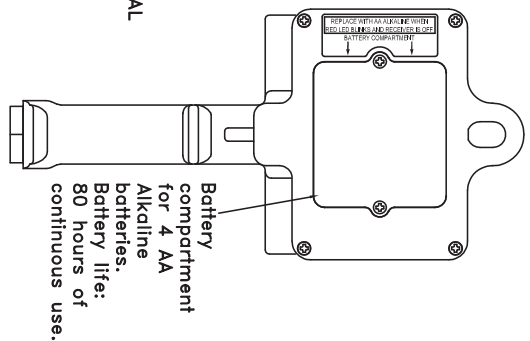
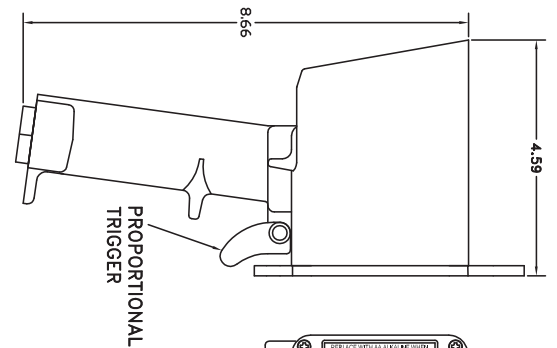
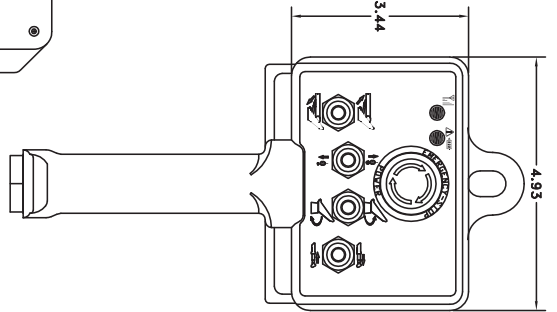
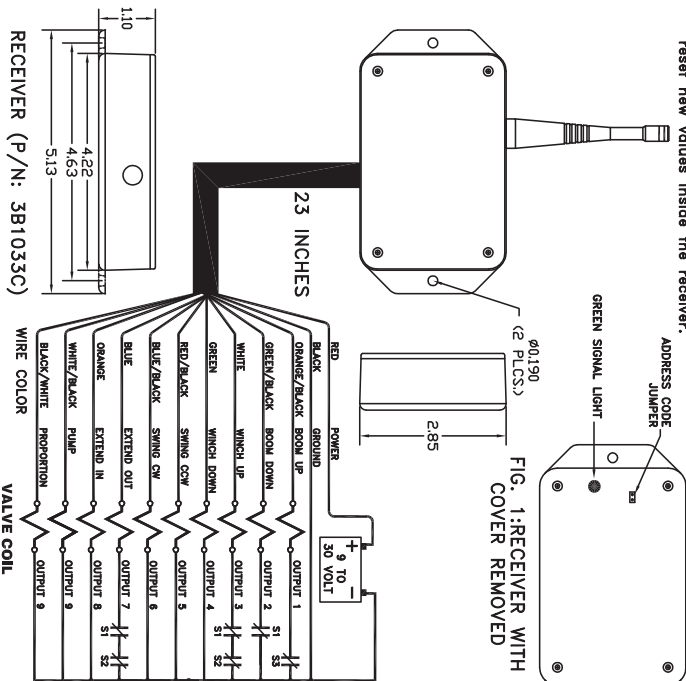
DRAWN:	G.R.	EST1500 STANDPIPE
DATE:	07/17/2008	ASSEMBLY
CHECKED:		PROJECT: EST1500
APPROVED:	D. THAIN	DWG. NO.: ES15-S01100
SCALE:	1:2	

SHEET: **3 OF 3** REV:

Appendix – Wireless Option

Proportional output calibration:
To calibrate the proportional output, make sure the transmitter and receiver are matched, then follow these procedures:

1. Turn receiver off.
2. Release the E-STOP switch on transmitter to turn transmitter on
3. Toggle BOOM UP, WINCH DOWN and ROTATION CW simultaneously. At this point, Red light blinks rapidly to indicate entering the calibration mode.
4. Apply power to the receiver.
5. Toggle EXTENSION OUT switch. Red lights blink slowly to indicate entering the Minimum calibration stage.
6. Toggle any function switch and slowly pull the trigger to set Minimum speed required for the crane or measure Voltage or current at the valve coil.
7. Toggle EXTENSION OUT, then release the function switch to save Minimum setting. At this point, Red light blinks rapidly to indicate entering the Maximum calibration stage.
8. Toggle any function switch and slowly pull the trigger to set Maximum speed required for the crane or measure Voltage or current at the valve coil.
9. Toggle EXTENSION OUT, then release function switch to save Maximum setting. At this point, Red light blinks slowly to indicate entering the valve differ frequency calibration stage.
10. Toggle BOOM UP once for 60 Hz, twice for 100 Hz and 3 times for 200 Hz.
11. Toggle EXTENSION OUT switch to save frequency. The Red light will turn off to indicate that calibration is complete.
12. Remove receiver power wait for 10 seconds then turn receiver on to reset new values inside the receiver.



Operation:

Release E-STOP/Power switch on the transmitter to turn transmitter on. To operate the crane, toggle a function switch, then pull trigger. If trigger is pulled more than halfway and then a toggle switch is activated, the output to valve will be disabled. This feature is designed to for smooth crane operation.

Transmitter is designed with power saving feature which turns the transmitter off after 15 minutes if none of the switches are activated. There is a Green and a Red light on the transmitter and a Green light inside the receiver. The green light on the transmitter and receiver blinks rapidly (3 times a second) if there is communication between the transmitter and the receiver. Transmitter green light blinks slowly (once a second) if there is no communication (i.e.: no power to the receiver). The transmitter red light blinks a number of times for different errors. For example, 2 blinks and a pause means output number 1 has a problem (there is a short to ground or no connection to that output), 1 blink and a pause means transmitter battery is low and needs to be replaced soon. Please see error code chart.

ID Code programming:

There are over 64000 different addresses (identified) for each transmitter and receiver. In most cases both transmitters and receivers are matched at the factory, if matching is required:

1. Remove receiver cover.
2. Apply power to the receiver.
3. Place a jumper across the address code jumper inside the receiver (see Fig. 1).
4. The green light will blink inside the receiver.
5. Toggle and hold BOOM UP and EXTENSION IN then release E-stop switch. At this point, both red and green lights will toggle on the transmitter.
6. Wait for 1 second or until the red and green lights stop toggling.
7. Remove Jumper.

Specifications:

RF: 900 MHz FHSS 10 mW
Temperature: Operation: -40° to +85° C
Storage: -55° to 100° C
Output Rating: 3 Amps max, each sourcing
Encapsulated electronics inside receiver.

CRANES WITH AIR AND OVERLOAD SWITCH	S1	S2
OVERLOAD PRESSURE SWITCH	S1	S2
ANTI TWO BLOCK SWITCH	S1	S2
CRANES WITH OPTIONAL BOOM UP SWITCH TO PREVENT PULSE OVERLOAD	S1	S2
ANTI TWO BLOCK SWITCH	S1	S2

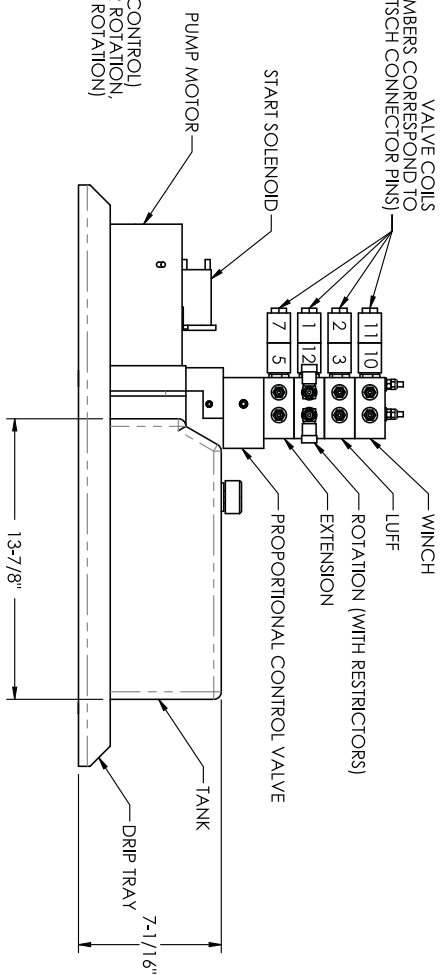
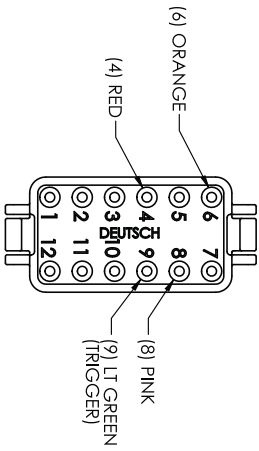
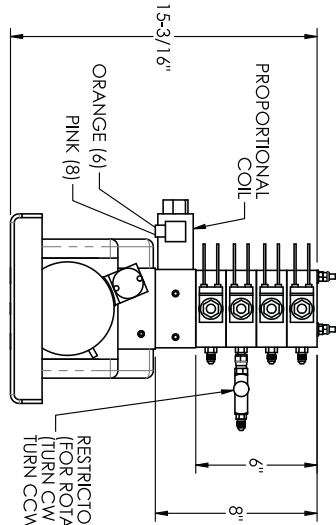
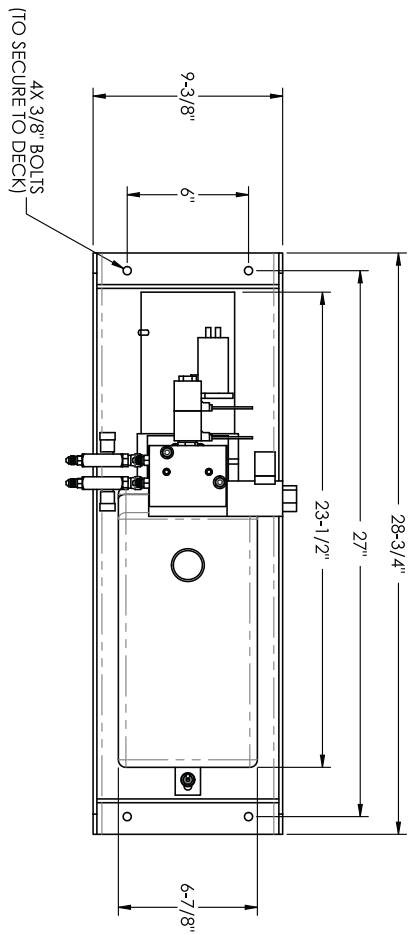
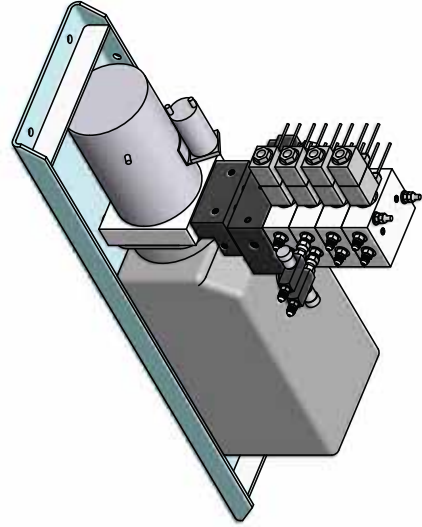
TRANSMITTER ERROR CODE CHART

ERROR CODE	PROBABLE CAUSE
1	LOW BATTERY
2	FAULTY CIRCUIT TO OUTPUT 1
3	FAULTY CIRCUIT TO OUTPUT 2
4	FAULTY CIRCUIT TO OUTPUT 3
5	FAULTY CIRCUIT TO OUTPUT 4
6	FAULTY CIRCUIT TO OUTPUT 5
7	FAULTY CIRCUIT TO OUTPUT 6
8	FAULTY CIRCUIT TO OUTPUT 7
9	FAULTY CIRCUIT TO OUTPUT 8
10	FAULTY CIRCUIT TO PROPORTIONAL OUTPUT

ERROR CODE NUMBERS IS THE NUMBER OF RED LIGHT BLINKS BETWEEN EVERY PAUSE

KAR-TECH Delfield, WI 53018		FIELD TELEPHONE	XX	1
PROPORTIONAL MINI CRANE GUIDER REMOTE		FACTORY	XX	65
CAD DRAWINGS DO NOT REVISE MANUALLY		REVISION	XX	05
DATE		REVISED	XX	1/8
FILE	NO.	DATE	BY	CHKD BY
3B-210-1-A-3		12-09-13		ES/SG

Appendix - HPU

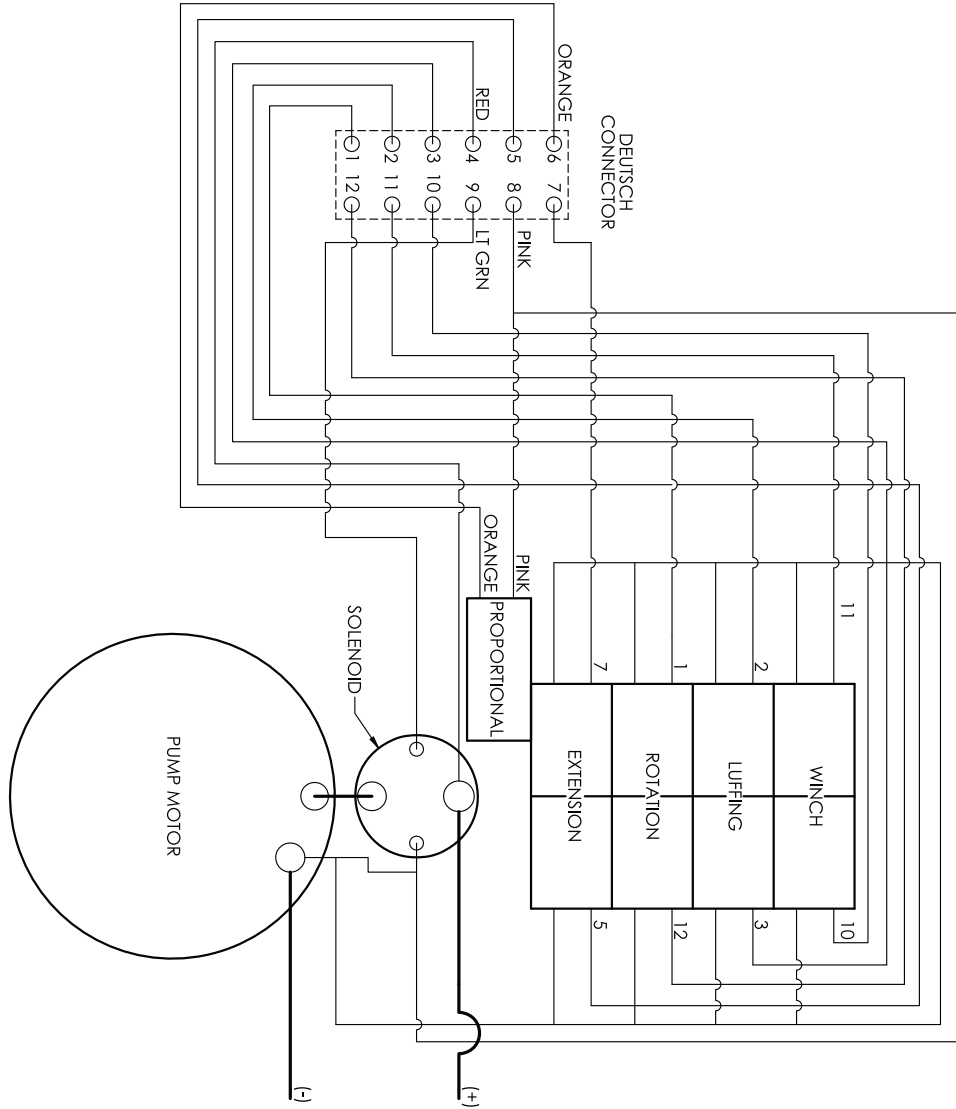


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DRAWN: _____ DATE: _____ CHECKED: _____ APPROVED: _____	SCALE: 1/8	DWG. NO.: EST1500 HPU ASSEMBLY	SHEET: 1 OF 2 REV:

Appendix - HPU Wiring



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PROJECT:
 ES1500 HPU WIRING DIAGRAM

DRAWN:	DATE:	CHECKED:	APPROVED:

DWG. NO.: ES1500 HPU ASSEMBLY SHEET: 2 OF 2 REV.:



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