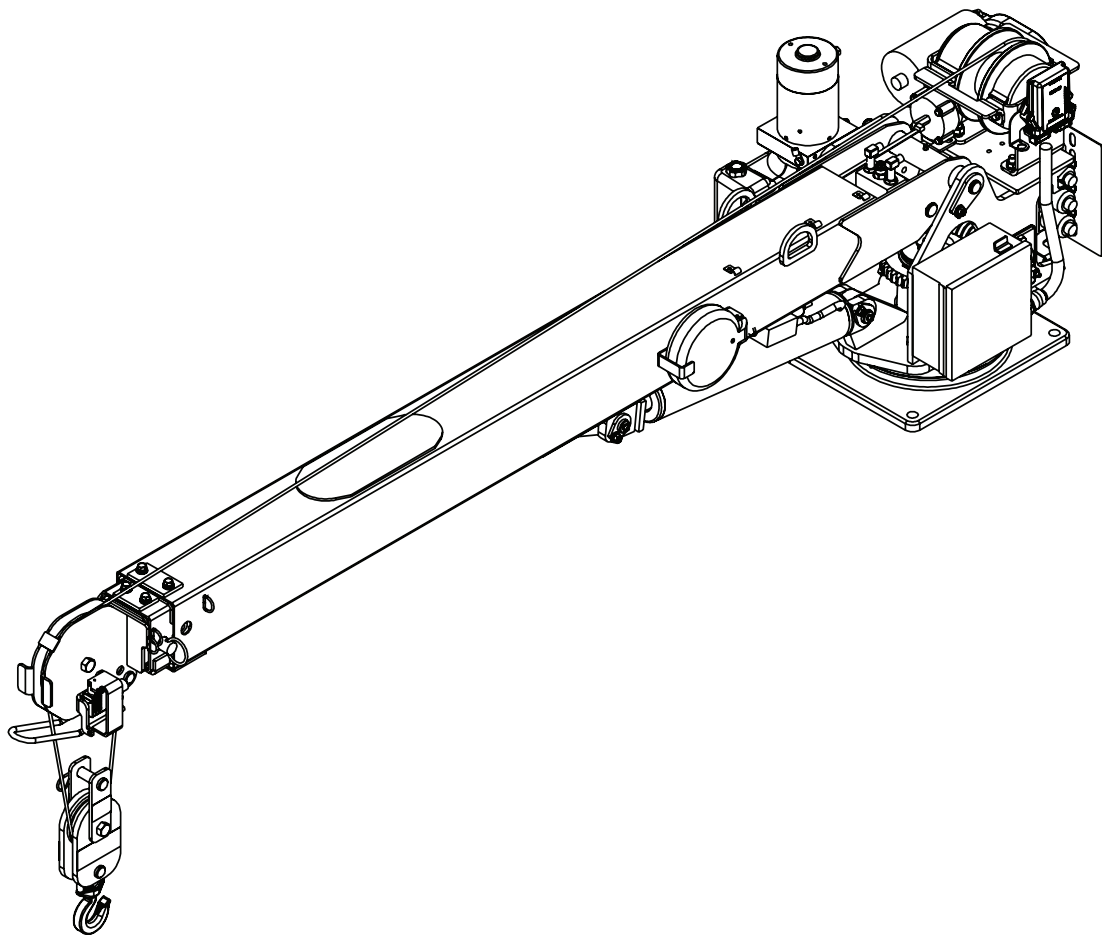




OWNER'S MANUAL EHC-3.2 WIRELESS



320950002-0226-B

Phone: 1-800-777-2760
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<http://www.autocrane.com>
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4707 N. Mingo Rd.
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Product Registration

Thank you for purchasing an Auto Crane® product and taking a few moments to register it online at <https://www.autocrane.com/product-registration/>. Your registration helps us keep you up to date on product information and gives you one of the strongest manufacturer's limited warranties available.

By completing the product registration, you may be eligible for valuable supplemental coverage under Auto Crane's Limited Warranty. For more information and a list of eligible products, visit our Warranty page found at <https://www.autocrane.com/warranty/>.

Before You Register

What do I need to get started?

We'll ask for:

- The product model and serial number for each product you purchased
- Your contact information so we can send confirmation of your registration and communicate product bulletins
- The date you purchased the product, date of installation or in-service (e.g. copy of bill of sale)
- Truck VIN (if applicable)
- The name, address and phone number of the dealer who sold and installed your equipment

NOTE: Much of this information will be on the invoice provided by your dealer. If you need help, please contact your installing dealer.

At the time of publishing this manual is accurate to the best of our knowledge. Auto Crane reserves the right to change any or all items, components and parts, necessary for any reason. This right does not obligate Auto Crane to immediately update the manual. Please call your local Auto Crane distributor for the most up-to-date information.

Auto Crane Company issues a limited warranty with each unit sold. See warranty pages at the end of the manual.

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Safety Tips and Precautions



Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



Indicates information considered important, but not hazard-related.



Federal law (49 CFR part 571) requires that the Final Stage Manufacturer of a vehicle certify that the vehicle complies with all applicable federal regulations. Any modifications performed on the vehicle prior to the final state are also considered intermediate stage manufacturing and must be certified as to compliance. The installer of this crane and body is considered one of the manufacturers of the vehicle. As such a manufacturer, the installer is responsible for compliance with all applicable federal and state regulations and is required to certify that the vehicle is compliant.



It is the further responsibility of the installer to comply with the OSHA Truck Crane Stability Requirements as specified by 29 CFR part 1910.180 (C) (1). In applications, where the rotation of the load is hazardous, a tag or restraint line should be used, (ref. OSHA 1910.180(h)(3)(xvi)). To reduce the potential for the load to rotate or rope twist, operate at minimal boom angles and extension.



This crane is designed for vertical lifts only. Do not attempt to lift or drag a load from the side! The boom can fail far below its rated capacity.



Do not weld, modify, or use unauthorized components on any Auto Crane unit as failure of the crane may occur. This will void any warranty or liability.



Failure to correctly plumb and wire crane can cause inadvertent operation and damage to crane and/or personnel!



Auto Crane Company remote controlled cranes are not designed or intended for use for any applications involving the lifting or moving of personnel when not using authorized Auto Crane Company personnel attachments. Any such unauthorized use is considered to be improper and the seller shall not be responsible for any claims arising from such use. There is no implied warranty or responsibility for such uses.

NOTICE

Keep this manual with the crane at all times.

Auto Crane products are designed to provide many years of safe, trouble-free, dependable service when properly used and maintained.

To assist you in obtaining the best service from your crane and to avoid untimely crane and/or vehicle failure, this manual provides proper operating and service instructions. It is specifically recommended that all operating and service personnel consider this manual as mandatory material for reading and study before operating or servicing Auto Crane products. It is highly recommended that crane owners, equipment managers, and supervisors also read this manual.

In addition, the overall dimensions, rotation, and turning radius of the crane are included on the General Dimension Drawing.

Remember, the crane adds weight to the vehicle which may change the driving and riding characteristics of the vehicle unless the appropriate overload spring(s) are installed. The payload of the vehicle is reduced by the weight of the crane. The operator should exercise care when loading the vehicle. Distributing the payload on the vehicle evenly will greatly improve the driving and riding characteristics of the vehicle.

The cranes are electrically powered by a 12-volt DC electrical system. The use of a maintenance-free battery is not recommended on any Auto Crane product. The recommended alternator and battery that will give the longest life with the most useful duty cycle is a 60-amp alternator with a 500 cold cranking amp battery. These specifications should be considered minimum.

It has always been Auto Crane Company policy to handle all warranty claims we receive as promptly as possible. If a warranty claim involves discrepant material or workmanship, Auto Crane will take immediate corrective action. It is understandable that Auto Crane Company cannot assume responsibility of liability when it is obvious that our products have been abused, misused, overloaded or otherwise damaged by inexperienced persons trying to operate the equipment without reading the manual.

Auto Crane will not assume responsibility or liability for any modifications or changes made to the unit, or installation of component parts without authorization.

Auto Crane maintains a strong distributor network and a knowledgeable Customer Service Department. In most cases, an equipment problem is solved via phone conversation with our customer service department. This department also has the ability to bring in a local distributor, regional sales manager, or factory serviceman to help determine the solution to an equipment problem.

Auto Crane Company's extensive Research and Development Program allow our customers to use the best equipment on the market. Our engineering staff and knowledgeable salespeople are always available to our customers in solving crane and service body application problems. When in doubt, call the Auto Crane factory.

Should you require any assistance not given in this manual, we recommend that you consult your nearest Auto Crane Distributor. Our distributors sell authorized parts and have service departments that can solve almost any needed repair. This manual does not cover all maintenance, operating, or repair instructions pertinent to all possible situations.

If you require additional information, please contact the Auto Crane Company at the following telephone number: 1-800-777-2760

General Specifications

Dimensions

- Width: 20.63 in. (0.52 m)
- Height: 24.00 in. (0.50 m)
- Length: 9 ft. 1-3/8 in. (2.78 m), stored length.
- Weight: 786 lb (356 kg)

Rating

- Crane Capacity: 3,200 lb
 - Double Line: 3,200 lb maximum
 - Single Line: 1,600 lbs maximum
- 10,000 ft-lb (1.38 ton-m)
- Ft-lb = horizontal distance from center line of rotation to free hanging weight (feet) x amount of weight (pounds).

Reach

- Second boom reach: 7 ft. 4 in. to 11 ft. 4 in.
- Third boom reach: 11 ft. 4 in. to 15 ft. 4 in.

Cable

- 62 ft. (18.9 m) (5.5 mm) diameter aircraft quality cable. This cable has a single line breaking strength of 5,600 lb (2,540 kg).

Line Speed

- 20 ft. per minute (single line, no load)

Chassis and Mounting Requirements

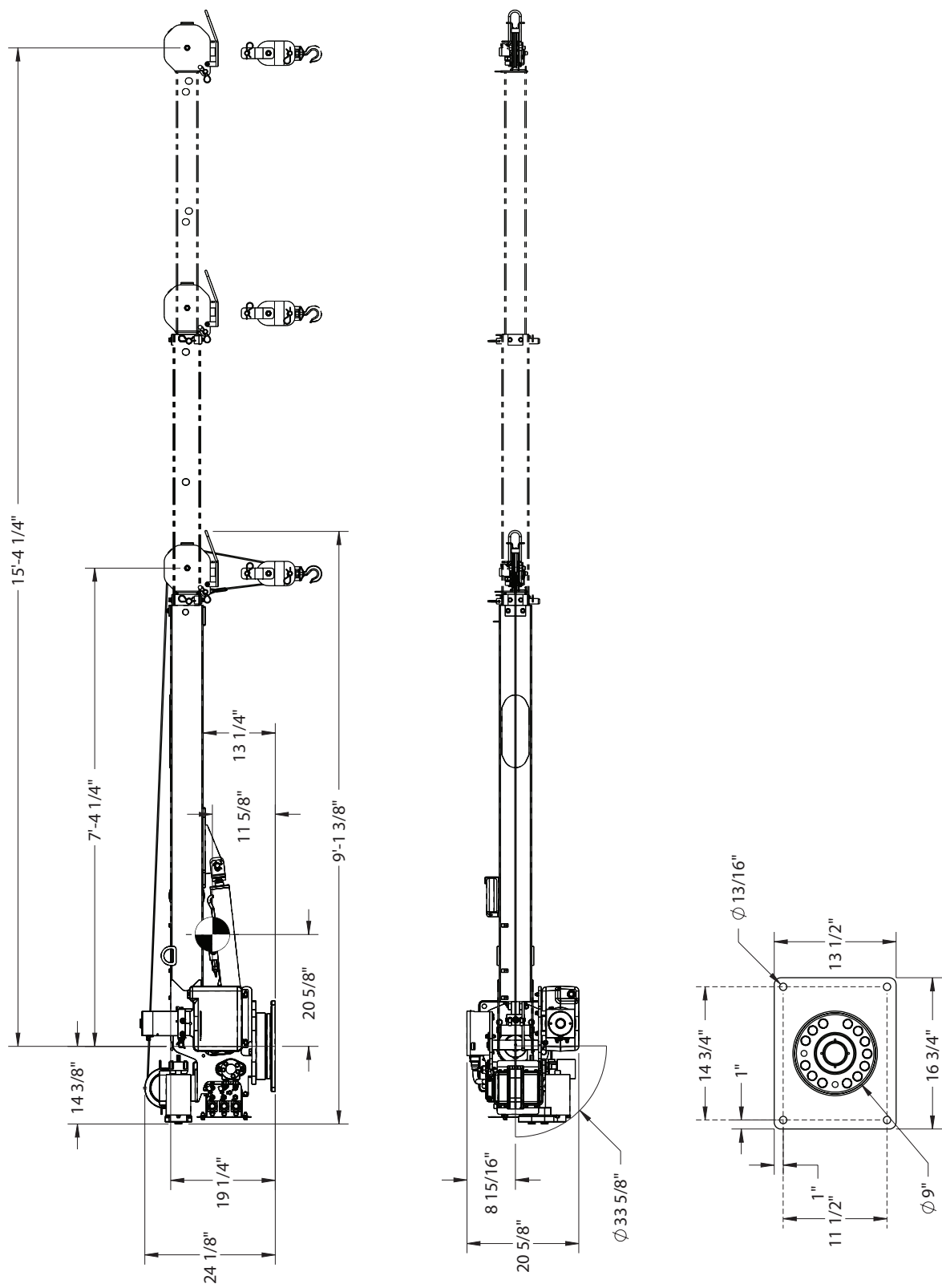
- 8,800 lb (3,992 kg) GVWR minimum
- 201,600 in-lb Resistive Bending Moment (RBM)
- 3/4", Grade 8-UNF Bolts. Tightened to 315 ft-lb
- 9" Mounting hole to run electrical lines to the crane from the body

Electrical System Requirements

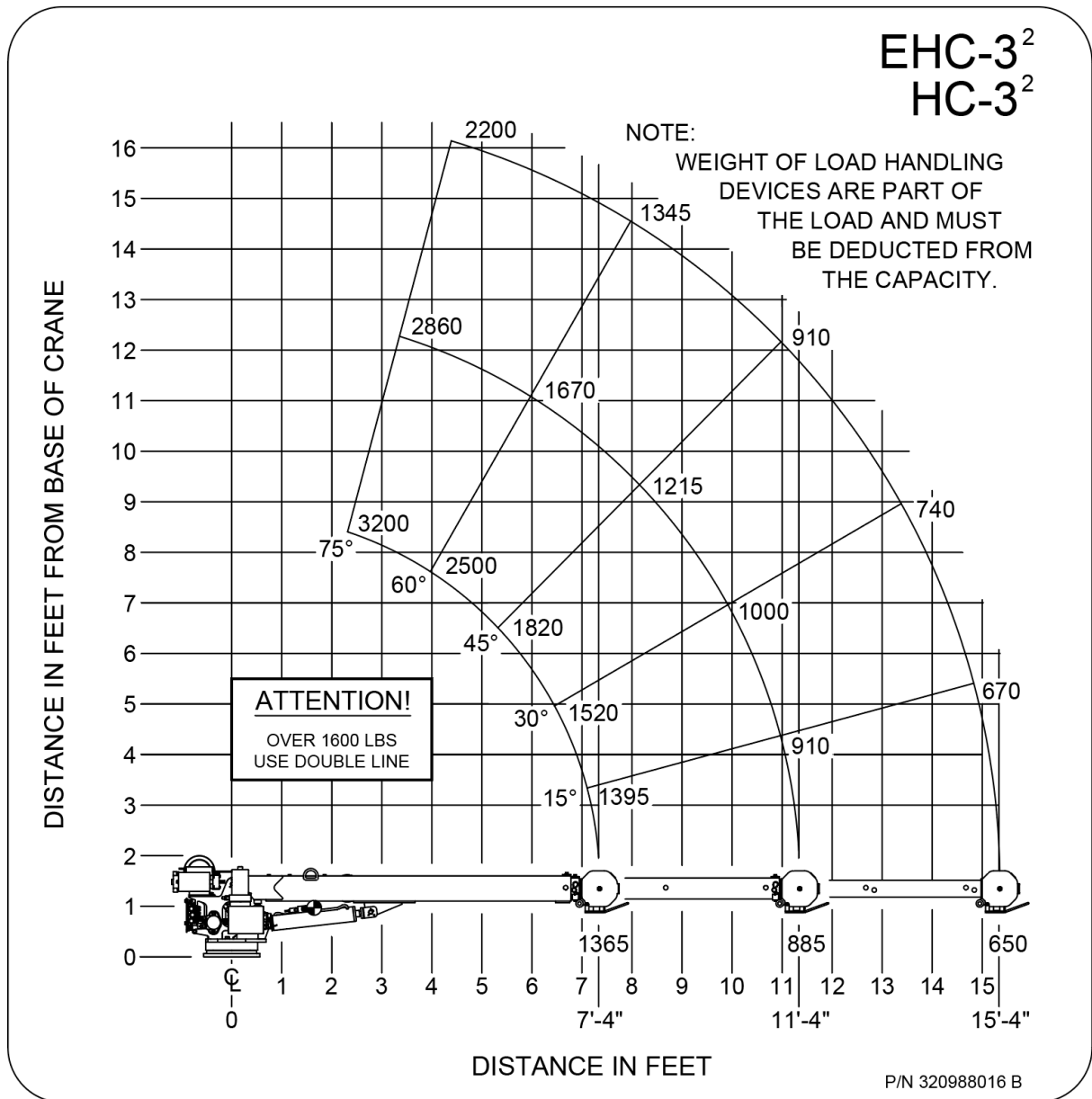
- Voltage: 12 VDC
- Alternator: 125 amps minimum
- Battery: 130 minute reserve capacity minimum. Maintenance Type battery
An auxiliary battery may be installed to augment battery capacity.

Rotation

- 360° continuous



Load Chart - P/N 320988016



WARNING

All load ratings are based on crane capacity, not vehicle stability. When lifting a heavy load, the weight can create enough tipping moment to overturn the vehicle. DO NOT USE the overload shutdown device to determine maximum rated loads.



WARNING

Always comply with load chart capacities. Weight of load handling devices (i.e. traveling block, hook, clevis, etc.) are part of the load and must be deducted from the crane capacity.

Qualifications and Operating Practices

THIS IS ONLY AN OVERVIEW OF ALL APPLICABLE QUALIFICATION REQUIREMENTS. REFERENCE ASME B30.5 AND OSHA 1910.180 FOR COMPLETE QUALIFICATION REQUIREMENTS.

Operators

1. Crane operation shall be limited to personnel with the following minimum qualifications:
 - A. Designated persons.
 - B. Trainees under the direct supervision of a designated person.
 - C. Maintenance and test personnel (when it is necessary in the performance of their duties).
 - D. Inspectors (crane).
2. No one other than the personnel specified above shall enter the operating area of a crane with the exception of persons such as oilers, supervisors, and those specified persons authorized by supervisors whose duties require them to do so, and then only in the performance of their duties and with the knowledge of the operator or other persons.

Qualifications For Operators

1. Operators shall be required by the employer to pass a practical operating examination.
2. Qualifications shall be limited to the specific type of equipment for which examined.
3. Operators and operator trainees shall meet the following physical qualifications:
 - A. Vision of at least 20/30 Snellen in one eye and 20/50 in the other, with or without corrective lenses.
 - B. Ability to distinguish colors, regardless of position, if color differentiation is required for operation.
 - C. Adequate hearing with or without hearing aid for the specific operation.
4. Evidence of physical defects or emotional instability, which render a hazard to operator or others, which in the opinion of the examiner could interfere with the operator's performance, may be sufficient cause for disqualification. In such cases, specialized clinical or medical judgment and tests may be required.
5. Evidence that operator is subject to seizures or loss of physical control shall be sufficient reason for disqualification. Specialized medical tests may be required to determine these conditions.
6. Operators and operator trainees should have normal depth perception, coordination, and no tendencies towards dizziness or similar undesirable characteristics.
7. In addition to the above listed requirements, the operator shall:
 - A. Demonstrate the ability to comprehend and interpret all labels, operator's manuals, safety codes, and other information pertinent to correct crane operation.
 - B. Possess the knowledge of emergency procedures and be able to implement them.
 - C. Demonstrate to the employer the ability to operate the specific type of equipment.
 - D. Be familiar with the applicable safety regulations.
 - E. Understand the operating procedures as outlined by the Auto Crane.
 - F. Be thoroughly familiar with the crane and its control functions.

Conduct Of Operators

1. The operator shall not engage in any practice which will divert his attention while operating the crane.
2. Each operator shall be responsible for those operations under the operator's direct control. Whenever there is any doubt related to safety, the operator shall consult with the supervisor before handling the loads.
3. The operator should not leave a suspended load unattended unless specific precautions have been instituted and are in place.
4. If there is a warning sign on the switch or engine starting controls, the operator shall not close the switch or start the engine until the warning sign has been removed by the appointed person.

Qualifications and Operating Practices

5. Before closing the switch or starting the engine, the operator shall see that all controls are in the "OFF" or neutral position and all personnel are in the clear.
6. If power fails during operation, the operator shall:
 - A. Move power controls to the "OFF" or neutral position.
 - B. Land the suspended load and boom, if practical.
7. The operator shall be familiar with the equipment and its proper care. If adjustments or repairs are necessary, the operator shall report the same promptly to the appointed person and shall also notify the next operator.
8. At the start of each shift, the operator shall test all controls. If any controls do not operate properly, they shall be adjusted or repaired before operations are begun.
9. Stabilizers shall be visible to the operator while extending or setting unless a signal person assists operator.

Operating Practices/Handling The Load



Never use two cranes to support a load too large for either crane.

1. Size of load.
 - A. No crane shall be loaded beyond the rated load except for test purposes.
 - B. The load to be lifted is to be within the rated load of the crane and its existing configuration.
 - C. Know the weight of the rigging and deduct from the load rating to prevent overloading the crane.
 - D. When loads that are not accurately known are to be lifted, the person responsible for the job shall determine the weight of the load does not exceed the crane rated load at the radius at which the load is to be lifted.
2. Attaching the load.
 - A. Ensure the load is properly attached to the hook by means of slings or other devices of sufficient capacity.
 - B. Ensure the vehicle is in a level position when loading or unloading.
 - C. Hoist rope shall not be wrapped around the load.
3. The operator shall determine that:
 - A. The crane is level and, where necessary, the vehicle/carrier is blocked properly.
 - B. The load is well secured and balanced in the sling or lifting device before it is lifted more than a few inches.
 - C. Means are provided to hold the vehicle stationary while operating the crane.
 - D. Before starting to lift, the hook shall be positioned over the load in such a manner as to minimize swinging.
4. During lifting care shall be taken that:
 - A. There is no sudden acceleration or deceleration of the moving load.
 - B. When rotating the crane, sudden starts and stops shall be avoided. Rotational speed shall be such that the load does not swing out beyond the radius at which it can be controlled.
 - C. Load, boom or other parts of the crane do not contact any obstruction.
 - D. Cranes shall not be used for dragging loads sideways.
 - E. ASME B30.5 recognizes that mobile and locomotive cranes are designed and intended for handling materials and not generally personnel. However, personnel are permitted to ride in an Auto Crane authorized, boom-mounted, personnel platform when used in accordance with the requirements of ASME B30.23 and Auto Crane's instructions. The crane shall not be used for other purposes while handling personnel (Refer to ASME B30.23). Hook attached suspended work platforms (baskets) shall not be used with Auto Crane cranes.
 - F. The operator should avoid carrying loads over people.

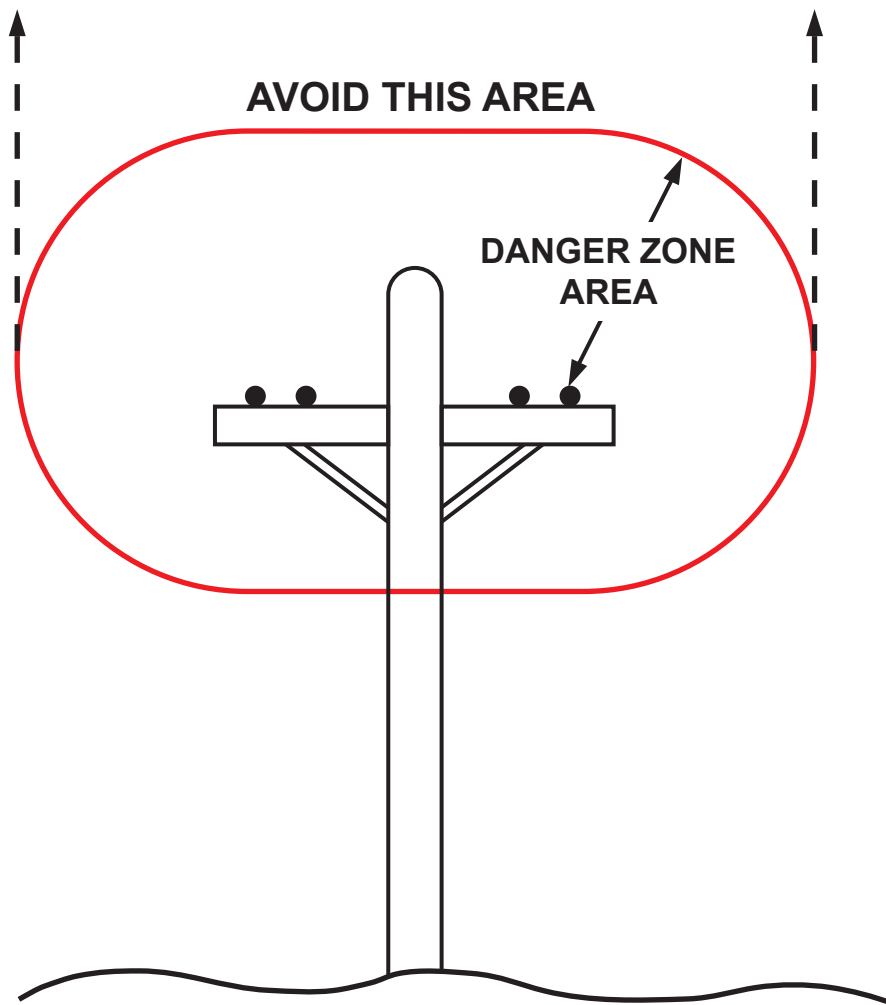
Qualifications and Operating Practices

5. When the crane is so equipped, the stabilizers shall be fully extended and set. Blocking under stabilizers shall meet the requirements as follows:
 - A. Sufficient strength to prevent crushing, bending, or shear failure.
 - B. Of such thickness, width and length as to completely support the stabilizer pad.
 - C. Firm footing under all tires, or individual stabilizer pads should be level. Where such a footing is not otherwise supplied, timbers, cribbing, or other structural members to distribute the load so as to not exceed allowable bearing capacity or the underlying material should provide it.
6. In transit, the boom shall be carried in stowed position.
7. The crane shall not be transported with a load on the hook.

Operating Near Electrical Power Lines



Never operate the crane near electrical lines or in the danger zone area.



Qualifications and Operating Practices

1. Do not place any part of the crane or load inside the Danger Zone.

Exceptions:

- A. The Danger Zone may be entered after confirmation by an appointed person that electrical distribution and transmission lines are de-energized and visibly grounded at the point of work.
 - B. The Danger Zone may be entered if insulating barriers are erected to prevent physical contact with the lines. These can't be a part of or attached to the crane.
2. For the minimum safe distance between electrical lines and any part of the crane or load (including handling appendages), or while in the transit with the boom stowed, see Safe Operating Distance Table below.
 3. Exercise caution when working near overhead lines. They can move horizontally and vertically due to wind, shifting the location of the Danger Zone.
 4. Assign a qualified, signal person to observe the clearance and warn the crane operator before approaching the Safe Operating Distance limits.
 - A. Treat all overhead wires as energized until the person or utility owning the line verifies it is not energized.
 - B. Exceptions ensuring equivalent protection are allowed, if approved by the administrative or regulatory authority in writing.
 - C. Install durable signs at the operator's station and on the outside of the crane, warning that electrocution or serious bodily injury may occur if the Safe Operating Distance Table limits are not adhered to.

Safe Operating Distance for Cranes Near Electrical Lines	
Normal Voltage, kv (Phase to Phase)	Specified Clearance, ft (m)
During Operation	
Up to 50	10 (3)
Over 50 to 200	15 (4.6)
Over 200 to 350	20 (6.1)
Over 350 to 500	25 (7.6)
Over 500 to 750	35 (10.7)
Over 750 to 1,000	45 (13.7)
Over 1,000	Determine specific clearance after consultation with utility owner/operator
During Transit or Travel With No Load and Boom or Mast Lowered	
Up to 0.75	4 (1.2)
Over 0.75 to 50	6 (1.8)
Over 50 to 345	10 (3.1)
Over 345 to 750	16 (4.9)

Qualifications and Operating Practices

Preparing The Crane For Operation

1. Ensure the manual has been thoroughly read by all crane operating and maintenance personnel, and supervisors.
2. Perform a routine inspection of the crane before operation each day, correcting any defects immediately.
3. At the job site, position the vehicle so the crane can reach the load within the rated capacity (center line of rotation to hoist hook).
4. Keep the vehicle as level as possible during operation.

NOTICE

At a 10% slope, all crane functions are limited to 50% speed. At a 15% slope, all crane functions are disabled.

5. Allow the vehicle engine to warm up before operation.
6. For Auto Crane units using only electric operation:
 - A. Engage the emergency brake.
 - B. Leave the ignition on with the transmission in park (or neutral for manual transmissions).
 - C. Activate any crane power switches.
7. For Auto Crane units using electric and hydraulic operation:
 - A. Engage the emergency brake.
 - B. Place the transmission in park (automatic trans.) or neutral (manual trans.).
 - C. Activate PTO (Power Take Off).
 - D. Allow sufficient time for the hydraulic fluid to warm up.
 - E. Set the throttle control to the proper engine speed.
8. For all outrigger usage:
 - A. Always extend the outriggers from the vehicle to the ground before crane operation.
 - B. Ensure they are firmly positioned on solid ground.
 - C. Stand clear of outriggers while being extended.
 - D. If a curb or other object prevents the outrigger from being fully extended, shorten the bearing or fulcrum point and reduce the maximum load accordingly.
 - E. If an outrigger will not reach the ground because of holes or grades, block up the outrigger pad to provide level and firm support to the vehicle.
 - F. If working in soft ground, use wide pads under the outrigger feet to prevent sinking.
 - G. Always store the outriggers before transportation.
 - i. For Auto Crane units with Manual Outriggers:
 1. Pull the lock pins to release the jackleg or drop down outrigger. Move to the outermost lock position.
 2. Ensure lock pins are reinstalled properly.
 3. Lower the Outrigger pad to firm ground and adjust the foot to remove slack.
 - ii. For Auto Crane units with Hydraulic Outriggers:
 1. Shift the diverter valve to the Outrigger position.
 2. Extend the Outriggers to their horizontal limit.
 3. Extend the Outriggers vertically until they make solid contact with the ground and the truck is approximately level side-to-side.
9. With the Outriggers properly positioned, return the diverter valve to the "Crane" position.
10. Remove the remote control from the cab or storage area. Power the remote control on. Detach the hook from the hook stow.
11. The crane is now ready for operation.

Qualifications and Operating Practices

During Operation

1. Always boom up before rotating so the boom will clear the boom support.
2. Always maintain clearance between the boom crown and the traveling block or hook hoist during boom extension.
3. Always observe all relevant safety policies and procedures during crane operation.
4. Always use slow and smooth movements with the crane to avoid causing the load to swing like a pendulum.

After Operation

1. After completing the lifting operations, return the boom to the stowed position on the boom support.
2. Replace remote control to its storage location.
3. Return the Outriggers to the stowed position (ensure they are pinned in place or jack legs are returned to the storage compartment).
4. Always store the crane in its stowed position for transportation.
5. Release the throttle control.
6. Press the clutch in (manual trans.).
7. Disengage the PTO.
8. Deactivate any crane power switches.
9. Check vehicle surroundings before moving.
10. Record any unusual occurrence(s) during crane operation which may indicate required maintenance or repair.

This section describes the general operation for cranes with the Wireless control system.



Before operating the remote control, read and understand all safety information in this manual, any manual supplements, and any applicable local, state, or federal rules and regulations.



Never drive with a load suspended from the crane.



Ensure personnel and objects are clear of the crane path during operation. Do not move loads over personnel.

General

Radio controlled equipment operates in several directions. Frequently there are other pieces of equipment and personnel in close proximity. The operator must exercise extreme caution at all times.

Only properly trained operators should operate the radio controlled equipment. This includes knowing and following all applicable operating and maintenance manuals, safety procedures, regulatory requirements, and industry standards and codes.

Remote Control Unit

Never mechanically block the switches ON or OFF. When not in use, turn the remote control OFF. Always store the remote control in a secure space when not in use. Store spare remote controls in a secure space and only remove after the current remote control has been turned OFF, taken out of the service area, and secured. Before disposing of batteries, consult local and governmental regulatory requirements for instructions on proper disposal.

Remote Control Initialization

Power to the handheld is available when you twist the mushroom-style Machine Stop button clockwise until it springs UP, but the remote is not yet enabled. The unit does not transmit or receive until it is enabled.

Enable the standard pistol grip remote by operating the TX ON toggle switch UP following Stop button release. Initial toggle switch operation following handheld power-up does not send a command to the base unit.

If a switch is held before the Stop button is released (enable the remote), the red ER LED begins to flash. The handheld will not operate until the condition is remedied.

Pre-Operation Test

Before operating the crane, or when a new operator takes control of the equipment, operators should perform the following checks of the equipment before making a lift:

- Test all warning devices.
- Test all functions.
- Test the remote control E-Stop function.

Wireless Operation

Remote Control Layout



STOP – Machine Stop, push button IN to power down (OFF). Pull button OUT to power up (ON). When activated, E-Stop terminates all outputs from receiver.

S1 – TX ON, hold switch UP to activate the handheld remote.

S2 – Extension IN/OUT, hold this switch UP or DOWN to activate the extension or retraction of the middle or upper booms. This will extend the overall reach of the crane.

S3 – Rotation CCW/CW, hold this switch UP or DOWN to activate the rotation or slewing mechanism for the crane. This will rotate the crane clockwise or counterclockwise.

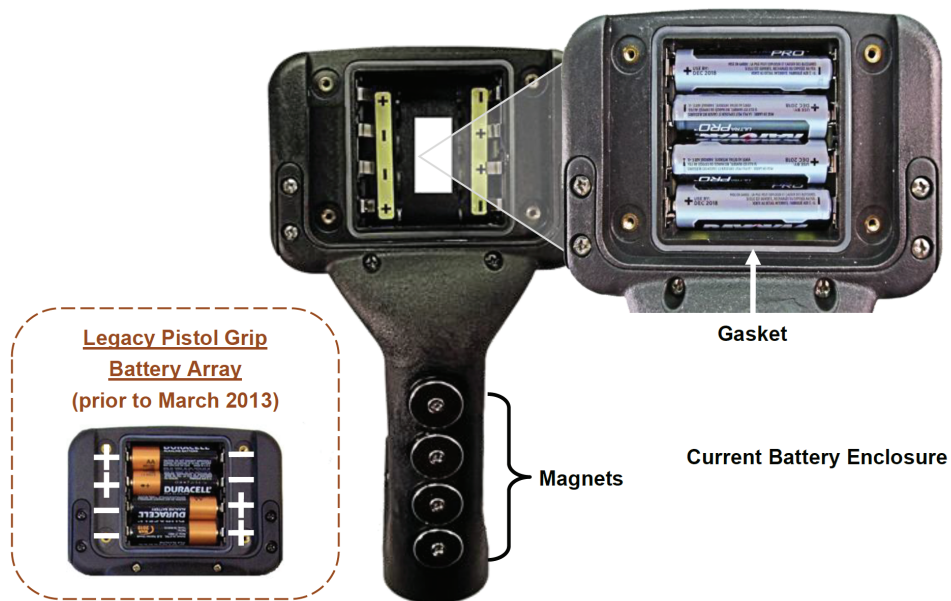
S4 – Winch DOWN/UP, hold this switch UP or DOWN to activate the winch UP/DOWN functions of the crane. This will raise and lower the crane rope.

S5 – Boom DOWN/UP, hold this switch UP or DOWN to activate the boom UP/DOWN functions of the crane. This will raise and lower the boom angle.

S6 – ASSOCIATE 1, alternate associate switch. Not used.

S7 – ASSOCIATE 2, hold switch UP to associate the remote with the receiver in conjunction with S1 up. Hold S7 DOWN to dissociate remote from crane with S1 up.

Remote Battery Installation



Four size AA cell batteries power the remote. When installing batteries, be sure to observe proper polarity – as marked on the inside of the compartment – to avoid damaging the unit. To replace or install batteries:

1. Loosen the four Phillips battery compartment cover screws on the rear of the remote and lift the cover from the handheld.
2. Install (or replace with) four AA cell batteries. Observe proper polarity by positioning the batteries as shown.
3. Replace the compartment cover and tighten the four Phillips screws. Do not over-tighten these screws, but make sure they are tight enough to ensure the gasket provides a proper watertight seal.
4. The remote will shut down at 1.6 VDC when batteries are low. The "BA" battery amber LED on the remote will indicate low voltage.
5. There is a four-minute Auto-Shutdown due to inactivity to preserve battery life.

Wireless Operation

Counterbalance Override Procedures

If, in an emergency situation, it becomes necessary to lower the boom without hydraulic flow available, the counterbalance valve located on the lift cylinder can be used to carefully perform this action.

1. Ensure the boom will lower onto a proper support.
2. Loosen the lock nut and slowly turn adjustment screw clockwise until the boom begins to slowly lower, counting the number of turns it takes to begin seeing movement.
3. Remove hand/arm/fingers from cranes while boom is lowering.
4. After boom is lowered, turn adjustment screw counter-clockwise the approximate number of turns made during lowering procedure and tighten lock nut.

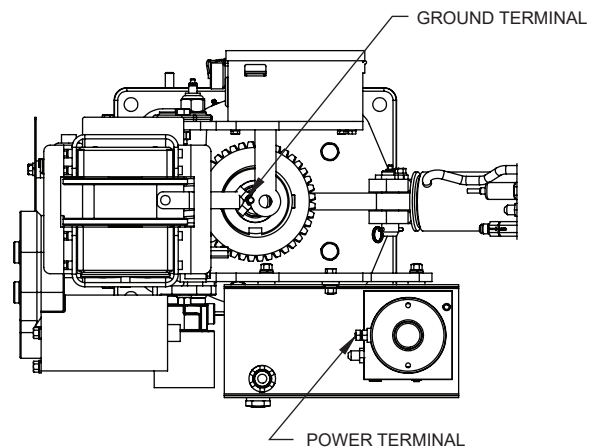
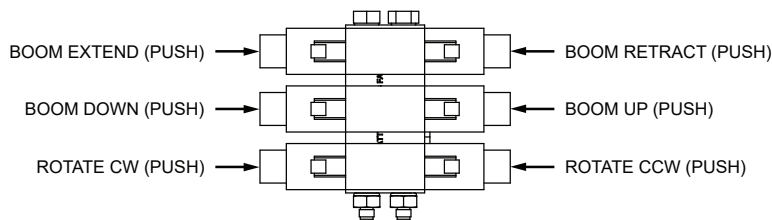
NOTICE

Turning adjustment screw too far will cause valve to come apart on the inside. This condition is not repairable, and the counterbalance valve must be replaced.

WARNING

Do not try to adjust any valves while boom is moving. Doing so may result in personal injury!

Control Valve Override Procedures



CAUTION

Manually overriding crane bypasses all safety features. During operation make sure load does not exceed crane capacity and the traveling block does not come into contact with boom tip.

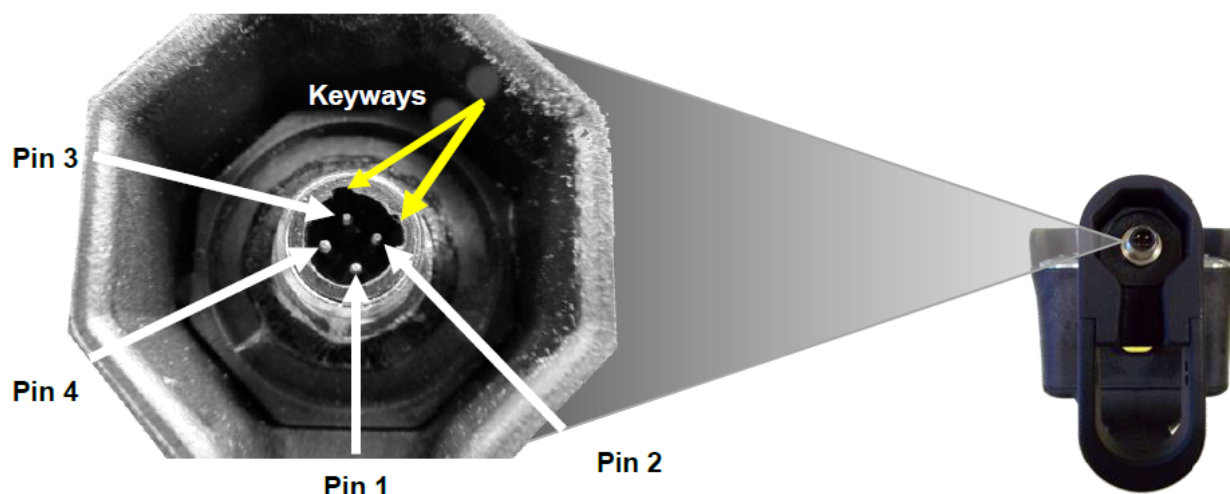
Manual Override Procedures

1. Apply 12VDC from battery to pump power terminal.
2. Apply ground from battery to grounding connection.
3. Select the function desired, then push in override located on the end of the coil using a punch or other small object.

Tether Connection

If a tether connection is wanted (or necessary), connect one end of the cable that is supplied (Part Number: 366823427) to the crane tether connection (located in either the crane box, or on the crane itself), and the other to the tether connection located on the bottom of the remote.

A cap is attached to the handheld remote with a chain which can be unscrewed to allow access to tether connection on the remote. When not in use, the tether cap should be attached to prevent damage. The RF is disabled whenever the tether is attached to the handheld remote and the receiver. When the tether is attached, all controls signals are transmitted via the tether.



NOTICE

FM radio transmission/reception is disabled when remote is tethered to crane.

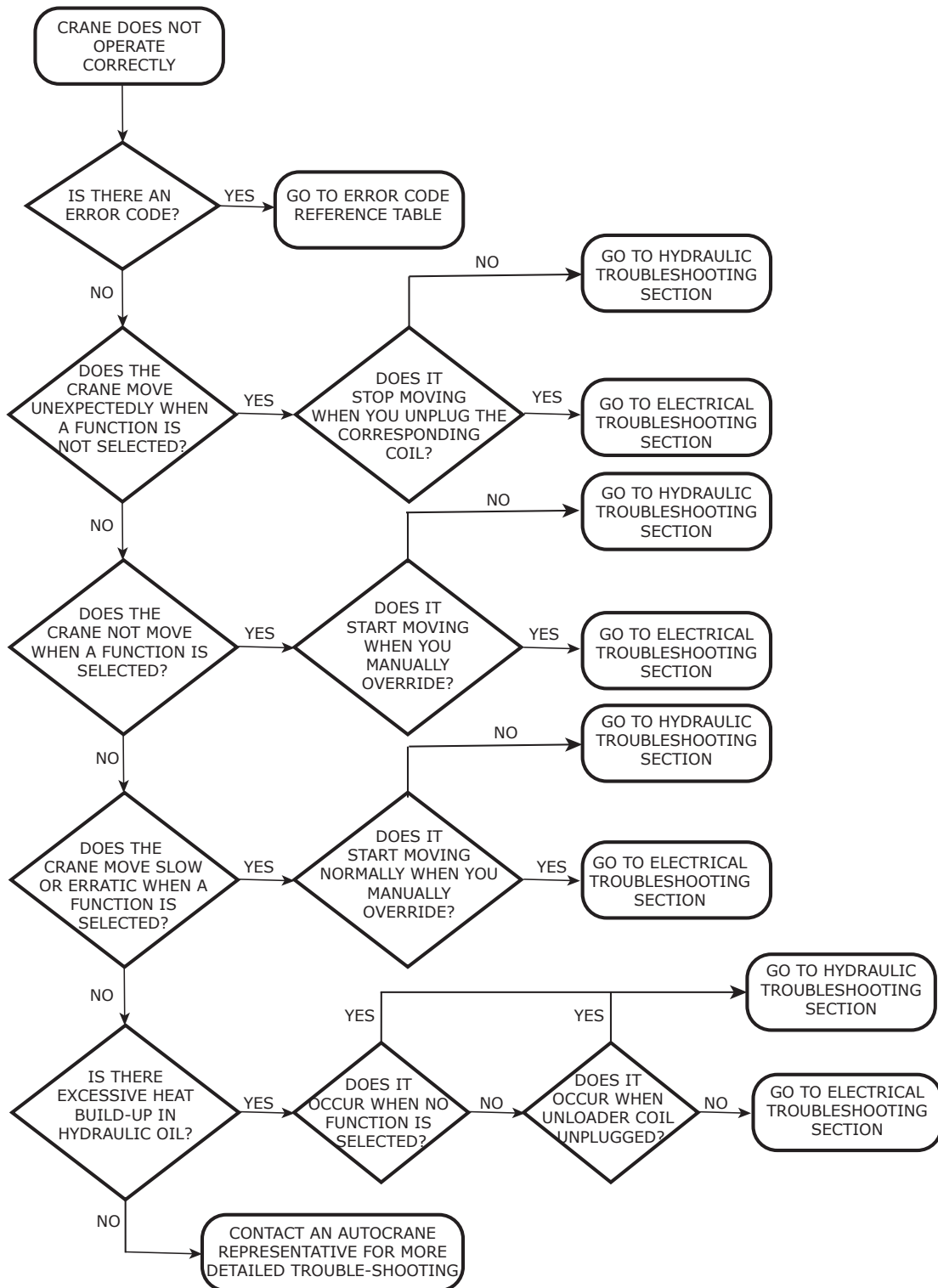
Wireless Operation

Remote Switch Descriptions

SWITCH DIRECTION	FUNCTION	DESCRIPTION
UP	BOOM UP	Moving toggle switch up increases angle of boom relative to ground
DOWN	BOOM DOWN	Moving toggle switch down decreases angle of boom relative to ground
UP	BOOM EXTENSION	Moving toggle switch up increases the overall length of the boom
DOWN	BOOM RETRACTION	Moving toggle switch down decreases the overall length of the boom
UP	WINCH UP	Moving toggle switch up raises the load
DOWN	WINCH DOWN	Moving toggle switch down lowers the load
UP	ROTATE CW	Moving toggle switch up rotates crane clockwise
DOWN	ROTATE CCW	Moving toggle switch down rotates crane counterclockwise
IN	E-STOP ACTIVATED	Pressing red E-Stop in turns the remote off
OUT	E-STOP DEACTIVATED	Twisting clockwise releases the E-Stop
UP	TX ON	Turns remote on, associates with crane (used with S7)
DOWN	TX ON	No function
UP	S7	Associates remote with crane (used with TX ON)
DOWN	S7	Dissociates remote from crane (used with TX ON)
UP	S6	No function
DOWN	S6	No function
TRIGGER COMPRESSED	PROPORTIONALITY INCREASED	Increase speed of crane functions. Not used for non-proportional cranes
TRIGGER DECOMPRESSED	PROPORTIONALITY DECREASED	Decrease speed of crane functions. Not used for non-proportional cranes

Each remote comes with a yellow trigger on the backside of the handle. This yellow trigger is not used for non-proportional cranes. The yellow trigger is only for commonality between models.

Wireless Remote Troubleshooting Table

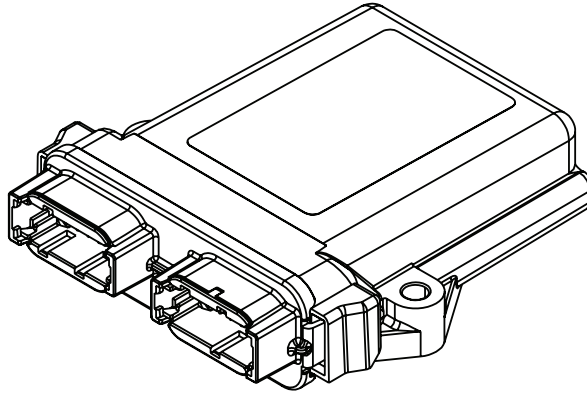


Wireless Troubleshooting

Wireless Remote Troubleshooting Table

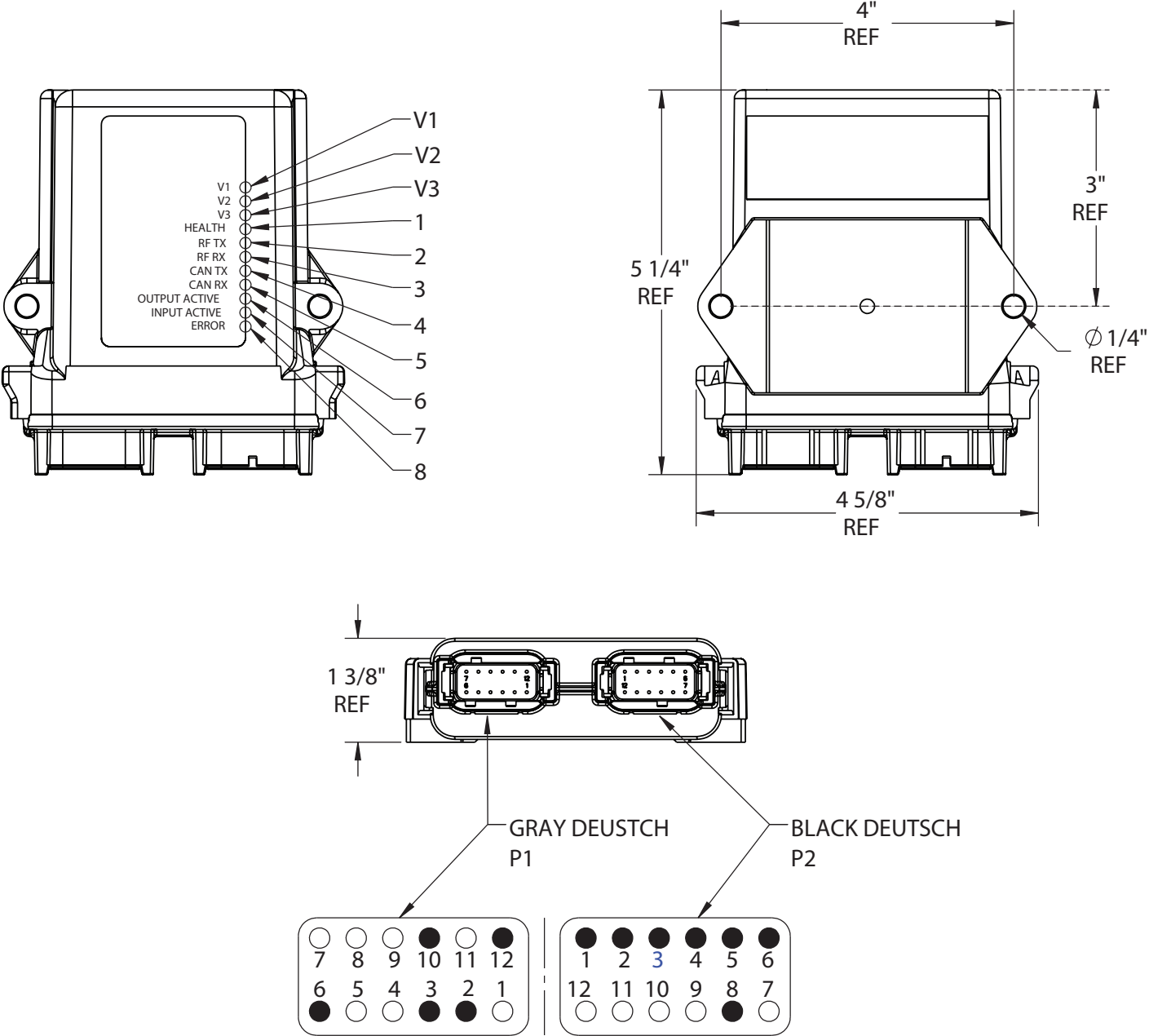
PROBLEM	POSSIBLE REASON	ACTION
Remote control will not turn on	Remote control E-Stop and TX ON haven't been used and the remote is off	Turn the remote on by twisting the E-Stop clockwise then moving the TX ON toggle switch UP.
	Dead batteries	Replace batteries.
Remote control will not communicate with the receiver/crane	Remote is not associated to crane	Follow association steps to properly link crane and remote.
	Remote is out of range	Ensure the startup procedure is initiated within 100 ft of the receiver.
Remote will not respond when tethered to crane	Tether is not connected properly or is damaged	Check all pin terminals in the tether and crane wire harness. Remove any debris is present. Replace tether if damaged.
	Crane power is off or low	Ensure crane has power going to the receiver. Receiver needs at least +7VDC.

LED Diagnostic Troubleshooting Table



Indication	Cause	Solution†
Unmarked LED active	Input power polarity is reversed.	Adjust wiring connections to achieve correct polarity.
+V1, +V2, +V3 Power LED not active	Electrical signals not activating the LEDs.	- Is +VDC input power present? - Check input power polarity.
RTX/RRX not active		- Check for obstructions preventing line-of- sight transmission. - Check that the remote unit is active. - Re-associate the remote unit with the base unit.
CTX/CRX not active		- Check CAN wiring. - Check that the remote unit is active. - Re-associate the remote unit to the base unit.
Out LED not active		- Check that the remote unit LEDs are active when the appropriate buttons are pushed. - Check that startup sequence was followed.
ERR LED active	Over-temperature or over- current channel indication.	- Check the outputs for loose wiring, etc. - Active channel current consumption less than 1 A typical. (This is not a problem in cases where less than 1 A draw is a normal condition.)
Health LED blinking rapidly	Indicates an internal problem.	Contact Auto Crane service department.
† – If the recommended solutions do not resolve the issue, contact the Auto Crane service department.		

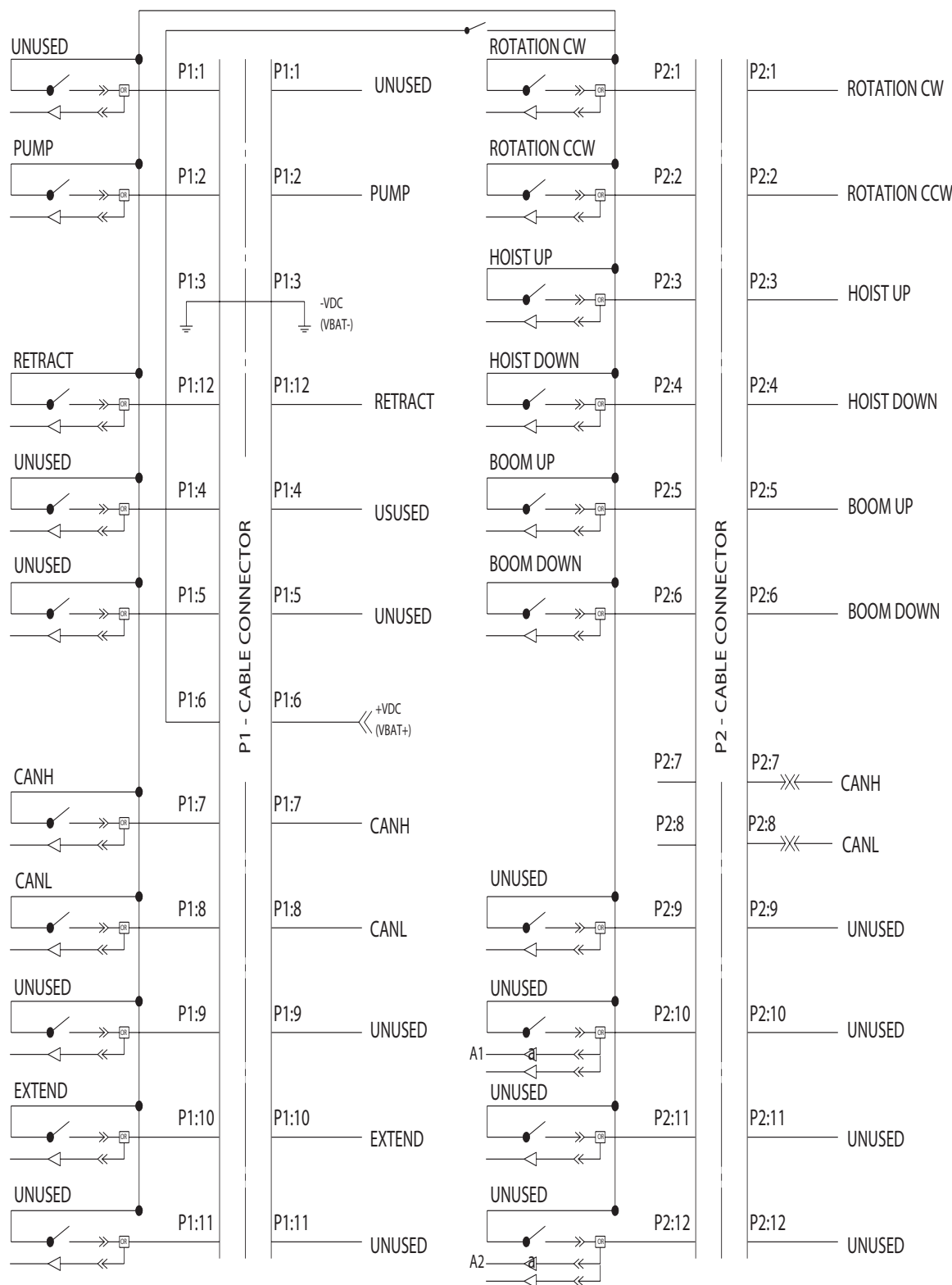
Wireless Receiver – P/N 361106581



Wireless Receiver – P/N 361106581

LED	ACTION	INDICATION
V1	VOLTAGES	VOLTAGES OK WHEN LIT
V2	VOLTAGES	VOLTAGES OK WHEN LIT
V3	VOLTAGES	VOLTAGES OK WHEN LIT
1	HEALTH	BLINKS 1X/SEC WHEN ACTIVE
2	RF TX	FLASHES WHEN ACTIVE
3	RF RX	FLASHES WHEN ACTIVE
4	CAN TX	FLASHES WHEN ACTIVE
5	CAN RX	FLASHES WHEN ACTIVE
6	OUTPUT	BLINKS 1X/SEC WHEN ACTIVE
7	INPUT	BLINKS 1X/SEC WHEN ACTIVE
8	ERROR	SOLID - CHANNELL OUTPUT LOW OR HIGH CURRENT

Wireless Receiver – P/N 361106581



Wireless Receiver – P/N 361106581

GRAY DEUTSCH CONNECTOR			
P1 PIN	ASSIGNED	P1 PIN	ASSIGNED
P1:1	UNUSED	P1:7	CANH
P1:2	PUMP	P1:8	CANL
P1:3	-VDC UMB COM	P1:9	UNUSED
P1:4	UNUSED	P1:10	EXTEND
P1:5	UNUSED	P1:11	UNUSED
P1:6	+VDC	P1:12	RETRACT
BLACK DEUTSCH CONNECTOR			
P2 PIN	ASSIGNED	P2 PIN	ASSIGNED
P2:1	ROTATION CW	P2:7	CANH
P2:2	ROTATION CCW	P2:8	CANL
P2:3	HOIST UP	P2:9	UNUSED
P2:4	HOIST DOWN	P2:10	UNUSED
P2:5	BOOM UP	P2:11	UNUSED
P2:6	BOOM DOWN	P2:12	UNUSED

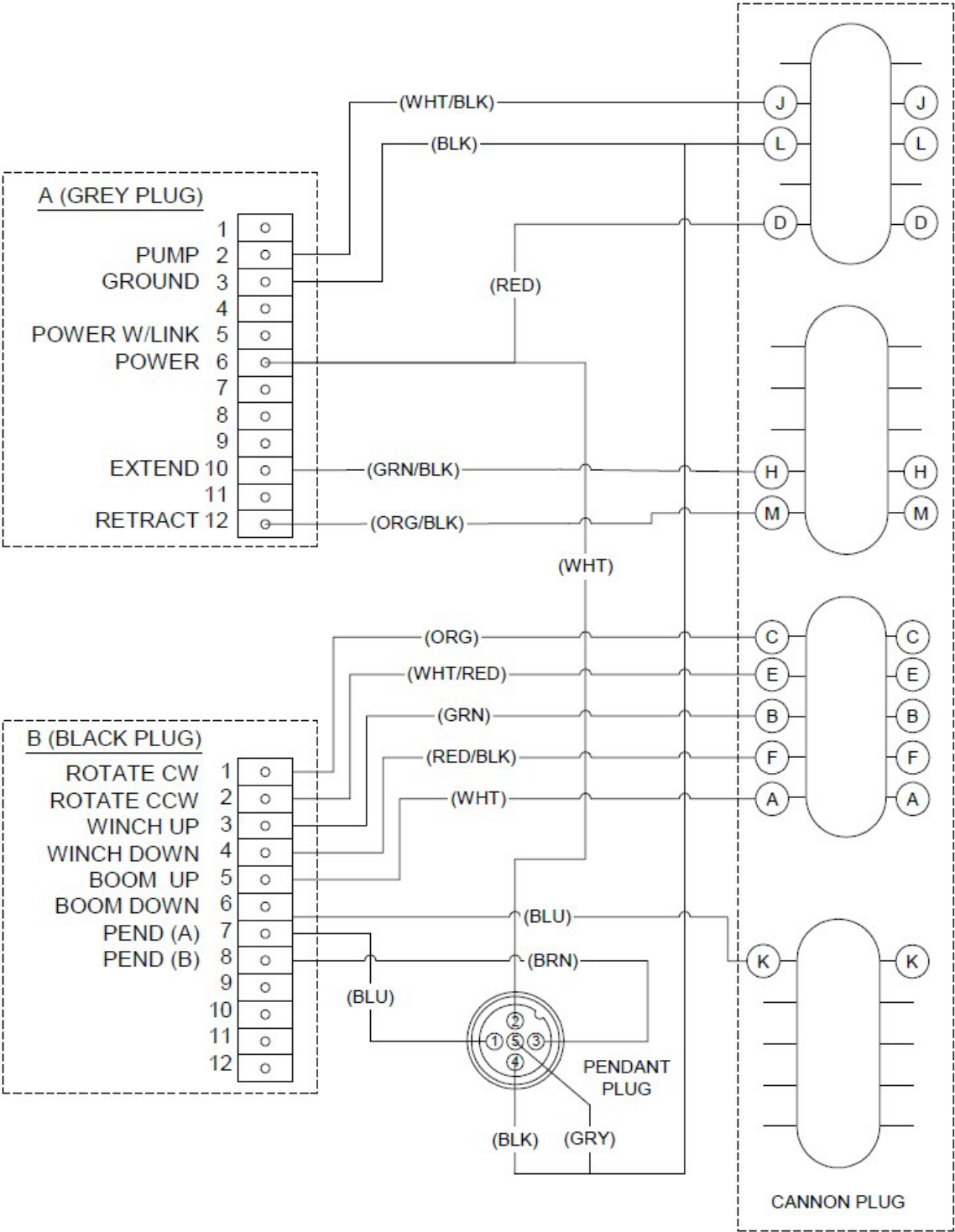
Wireless Troubleshooting

Electrical Troubleshooting Table

PROBLEM	POSSIBLE REASON	ACTION
Crane moves unexpectedly	Jammed remote button	Activate E-Stop and see if movement stops. Verify that nothing had depressed the button at the time of movement. If it was not depressed, then replace remote.
	Short in harness	Unplug coil. Trace wire back to receiver. Check connectors.
No function operates on the crane.	Remote turned off/not linked	Verify the power switch is in the on position. Turn remote on. Refer to the associate/dissociate section.
	Crane power turned off/ remote battery low	Most cranes have a toggle switch to turn on crane. This is usually located in the cab or crane box. Check remote batteries
The following functions are inoperable extend, boom down, hoist up.	Anti-2 Block activated	Visually inspect bail weldment and microswitch at the crown if possible. Inspect cord reel wires and connectors.
	Crane overloaded	Reduce load by either retracting, booming up, or hoisting down to return functions.
Any one function is not operable	Cut in wire or bad coil	Switch coil with another coil and check if broken function moves to a different function. Inspect wires to coil. Replace coil or repair wires.
	Toggle switch is bad on remote	Inspect remote switches for damage. Contact Auto Crane.

Electrical Harness Schematic

FM CONTROL TRANSMITTER WIRING SCHEMATIC
P/N: 680180000



Wireless Troubleshooting

Hydraulic Troubleshooting Table

ERROR	CAUSE	DIAGNOSTIC	SOLUTION
Crane moves unexpectedly	Jammed valve cartridge	Try to manually override valve. If unable to move stem, cartridge is jammed.	Replace valve cartridge.
	Counterbalance valve set too low (boom up and boom down)	Adjust the counterbalance out to see if movement stops.	Contact Auto Crane for proper adjustment and setting of counterbalance valve. Valve may need to be replaced.
	Contaminant in cartridge	Valve sticks in certain positions.	Clean valve to remove debris. Reference Maintenance section for valve cleaning procedure.
No Function Operates On Crane	Hydraulic tank is low or empty	Visually inspect the hydraulic oil level in the tank.	Fill tank to proper level.
	Vehicle is not running	Verify engine is running.	Start vehicle.
	PTO is not engaged	Verify PTO is engaged.	Engage PTO.
All functions operate slowly	Contamination in cartridges	Visually inspect the cartridges for clogged ports.	Clean valves to remove debris. Reference Maintenance section for valve cleaning procedure.
	Relief valve set too low	Install pressure gauge in control valve block. Fully extend boom to induce full pressure. Verify relief pressure.	Adjust relief valve to proper pressure.
Excessive heat during operation	Crane operated too long	Crane operation is generally designed for intermittent duty (15 minutes loaded / 30 minutes cooldown)	Reduce use of crane to allow oil to cool. If problem persists, add hydraulic oil cooler to system.

Inspection Requirements

NOTICE

Reference ASME B30.5 and OSHA 1910.180 for complete inspection requirements.

! WARNING

All inspections shall be performed by designated personnel only.

Inspection Classification

1. Initial Inspection
 - A. Prior to initial use, all new, altered, modified, or extensively repaired cranes shall be inspected by a designated person to ensure compliance with provisions of this standard.
2. Regular Inspection
 - A. Inspection procedures for cranes in regular service are divided into two general classifications based upon the intervals at which the inspection should be performed. The intervals, in turn, are dependent upon the nature of the components of the crane and the degree of their exposure to wear, deterioration, or malfunction. The two general classification are herein designated as "frequent" and "periodic" with respective intervals as defined below:
 - i. Frequent Inspection – daily or before each use.
 - ii. Periodic Inspection – one to twelve-month intervals or as specifically recommended by the manufacturer or qualified person.

Frequent Inspection

Inspections should also occur during operation for any deficiencies that might appear between regular inspections. Any deficiencies, such as those listed below, shall be carefully examined and a determination made as to whether they constitute a hazard:

1. Inspect control mechanisms for maladjustment that interferes with proper operation.
2. Inspect control mechanisms for excessive wear of components and contamination by lubricants or other foreign matter.
3. Inspect safety devices for malfunction.
4. Visually inspect all hydraulic hoses, particularly those that flex in normal operation of crane functions.
5. Inspect hooks and latches for deformation, chemical damage, cracks, and wear.
6. Inspect for proper rope reeving.
7. Inspect electrical wiring and components for malfunctioning, signs of excessive deterioration, dirt and moisture accumulation.
8. Inspect hydraulic system for proper oil level and leaks.
9. Inspect tires for recommended inflation pressure, cuts, and loose wheel nuts.
10. Inspect connecting pins and locking device for wear damage and loose retaining bolts.
11. Inspect rope for gross damage, such as listed below, which may be an immediate hazard.
 - A. Distortion such as kinking, crushing, un-stranding, birdcaging, main strand displacement, or core protrusion. Loss of rope diameter in a short length or unevenness of outer strands should be replaced.
 - B. General corrosion.
 - C. Broken or cut strands.

Maintenance

- D. Use care when inspecting sections of rapid deterioration around flange points, crossover points, and repetitive pickup points on drums.
- E. Inspect number, distribution, and type of visible broken wires.

NOTICE

Continued use of rope depends upon good judgment by a designated person in evaluating remaining strength in a used rope after allowance for deterioration disclosed by inspection. Continued rope operation depends upon this remaining strength.

Periodic Inspection

Any deficiencies, such as those listed below, shall be carefully examined and determination made as to whether they constitute a hazard:

1. Inspect for deformed, cracked or corroded members in the crane structure and entire boom.
2. Inspect for loose bolts, particularly mounting bolts.
3. Inspect for cracked or worn sheaves and drums.
4. Inspect for worn, cracked, or distorted parts such as pins, bearings, shafts, gears, rollers and devices.
5. Inspect for excessive wear on brakes and clutch system parts and linings.
6. Inspect crane hooks for cracks.
7. Inspect travel steering, braking, and locking devices for malfunction.
8. Inspect for excessively worn or damaged tires.
9. Inspect hydraulic hose, fittings, and tubing for the following problems:
 - A. Evidence of leakage at the surface of the flexible hose or its junctions with the metal and coupling.
 - B. Blistering, or abnormal deformation to the outer covering of the hydraulic or pneumatic hose.
 - C. Leakage at threaded or clamped joints that cannot be eliminated by normal tightening or recommended procedures.
 - D. Evidence of excessive abrasion or scrubbing on the outer surface of a hose, rigid tube, or fitting. Means shall be taken to eliminate the interference of elements in contact or otherwise protect the components.
10. Inspect hydraulic pumps and motors for the following problems:
 - A. Loose bolts and fasteners.
 - B. Leaks at joints between sections.
 - C. Shaft seal leaks.
 - D. Unusual noises or vibrations.
 - E. Loss of operating speed.
 - F. Excessive heating of fluid.
 - G. Loss of pressure.
11. Inspect hydraulic valves for the following:
 - A. Cracks in valve housing.
 - B. Improper return of spool to neutral position.
 - C. Leaks at spools or joints.
 - D. Sticking spools.
 - E. Failure of relief valves to attain or maintain correct pressure setting.
 - F. Relief valve pressure shall be checked as specified by the manufacturer.
12. Inspect hydraulic cylinders for the following problems:
 - A. Driving caused by fluid leaking across piston.
 - B. Rod seals leaking.
 - C. Leaks at welding joints.
 - D. Scored, nicked, or dented cylinder rods.
 - E. Damaged case (barrel).
 - F. Loose or deformed rod eyes or connecting joints.

13. Inspect hydraulic filters for evidence of rubber particles on the filter elements indicating possible hose, O-ring, or other rubber component deterioration. Metal chips or pieces on the filter may denote failure in pumps, motors, or cylinders. Further inspection will be necessary to determine the origin of the problem before corrective action can be taken.
14. Inspect labels to confirm correct location and legibility. Reference decals layout in this manual for proper location of decals.
15. Rope inspections need not be at equal calendar intervals and should be more frequent as the rope approaches the end of useful life. A qualified person shall inspect the wire rope based on such factors as:
 - A. Expected rope life as determined by experience on the particular installation or similar installations.
 - B. Severity of environment.
 - C. Percentage of capacity lifts.
 - D. Frequency rates of operation.
 - E. Exposure to shock loads.
 - i. This inspection shall cover the entire length of the rope. Only the surface wires need to be inspected and no attempt should be made to open the rope. Any deterioration resulting in appreciable loss of original strength shall be noted and determination made as to whether use of the rope would constitute a hazard. A few notable deterioration points are listed below:
 1. Reduction of rope diameter below nominal diameter due to loss of core support.
 2. Internal or external corrosion.
 3. Wear of outside wires.
 4. Severely corroded, cracked, bent, worn, or improperly applied connections.

Cranes Not In Regular Use

A crane, which has been idle for a period of more than one month or more, shall be given an inspection conforming to the "initial" and "periodic" inspection requirements of this section.

Inspection Records

Dated records of periodic inspection should be made on critical items such as brakes, crane hooks, rope, cylinders, and relief pressure valves.

Testing Requirements

NOTICE

Reference ASME B30.5 and OSHA 1910.180 for complete testing requirements.



WARNING

All testing shall be performed by designated personnel only. Prior to initial use, all new, altered, modified, or extensively repaired cranes shall be inspected by a designated person to ensure compliance with provisions of this standard.

1. Test all functions to verify speed and operation.
2. Ensure all safety devices are working properly.
3. Confirm operating controls comply with appropriate function labels.
4. Test loads shall not exceed 110% of the manufacturer's load rating.
5. Written reports shall be maintained showing test procedures and confirming the adequacy of repairs.

Maintenance

General Repairs and Maintenance

NOTICE

Reference ASME B30.5 and OSHA 1910.180 for complete maintenance and repair requirements.

WARNING

All repairs and maintenance shall be performed by designated personnel only. Establish a preventative maintenance program based on this section. Obtain all replacement parts from your local authorized distributor.

Maintenance Precautions

1. Place crane where it will cause the least interference with other equipment or operations.
2. Verify all controls are in the OFF position and all operating features secured from inadvertent motion by brakes, pawls, or other means.
3. The means for starting the crane shall be rendered inoperative.
4. The boom should be secured in place before maintenance.
5. Relieve hydraulic oil pressure from all hydraulic circuits before loosening or removing hydraulic components.
6. WARNING or OUT OF ORDER signs shall be placed on all crane controls.
7. After adjustments and repairs have been made, the crane shall not be returned to service until all guards have been reinstalled, trapped air removed from hydraulic system (if required), safety devices reactivated, and maintenance equipment removed.

Adjustments and Repairs

1. Any hazardous conditions disclosed by the inspection requirement shall be corrected before operation of crane is resumed.
2. Adjustments shall be maintained to assure correct of functioning of components, the following are examples:
 - A. Function operating mechanism.
 - B. Safety devices.
 - C. Control systems.
3. Repairs or replacements shall be provided as needed for operation; the following are examples:
 - A. Critical parts of functional operating mechanisms which are cracked, broken, corroded, bent, or excessively worn.
 - B. Critical parts of the crane structure which are cracked, bent, broke, or excessively corroded.
 - C. Crane hooks showing cracks, damage, or corrosion shall be taken out of service.
4. If bleeding the hydraulic system is required, run each crane function until smooth operation of that particular function is noticeable.

Lubrication

All moving parts of the crane, for which lubrication is specified, should be regularly lubricated per the manufacturer's recommendations and procedures.

Rope Replacement

No precise rules can be given for determination of the exact time for replacement of rope, since many variable factors are involved.

NOTICE

Replacement rope shall have a strength rating at least as great as the original rope furnished or recommended by Auto Crane. A rope manufacturer, Auto Crane, or a qualified person shall specify any deviation from the original size, grade, or construction.

Conditions such as the following shall be reason for questioning continued use of the rope or increasing the frequency of inspection:

1. In running ropes, six randomly distributed broken wires in one strand in one lay.
2. One outer wire broken at the contact point with the core of the rope structure and protrudes or loops out of the rope structure. Additional inspection of this section is required.
3. Wear of one third of the original diameter of the outside individual wire.
4. Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure.
5. Evidence of any heat damage from any cause.
6. Reduction of nominal diameter of more than:
 - A. 1/64" (0.4mm) – for diameters up to and including 5/16" (8mm)
 - B. 1/32" (0.8mm) – for diameters 3/8" (9.5mm) through and including 1/2" (13mm)
 - C. 3/64" (1.2mm) – for diameters 9/16" (14.5mm) through and including 3/4" (19mm)
 - D. 1/16" (1.6mm) – for diameters 7/8" (22mm) through and including 1-1/8" (29mm)
 - E. 3/32" (2.4mm) – for diameters 1-1/4" (32mm) through and including 1-1/2" (38mm)
7. In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.

Rope Installation and Maintenance

1. Rope should be stored to prevent damage and deterioration.
2. Unreeling or uncoiling of rope shall be done as recommended by the rope manufacturer and with care to avoid kinking or inducing twist.
3. Before cutting a rope, seizing shall be placed on each of the place where the rope is to be cut to prevent unlaying of the strands. On preformed rope, one seizing on each side of the cut is required. On non-preformed ropes of 7/8" (22mm) or smaller, two seizings on each side of the cut are required. For non-preformed rope 1 in. (25mm) diameter or larger, three seizings on each side of the cut are required.
4. During installation care should be exercised to avoid dragging of the rope in the dirt or around objects that will scrape, nick, crush, or induce sharp bends in it.
5. Rope should be maintained in a well-lubricated condition. It is important that lubricant applied as a part of the maintenance program shall be compatible with the original lubricant, and to this end the rope manufacturer should be consulted. Lubricant applied shall be the type that does not hinder visual inspection. Those sections of rope that are located over sheaves or otherwise hidden during inspection and maintenance procedures require special attention when lubricating rope. The object of rope lubrication is to reduce internal friction and to prevent corrosion.
6. When an operating rope shows greater wear or well-defined localized areas than on the remainder of the rope, rope life can be extended in some cases by shifting the wear to different areas of the rope.

Maintenance

Paint Finish Maintenance

The paint finish on Auto Crane products can become damaged during normal use when chipped, scratched, exposed to harsh chemicals, cleaned with pressure washers, or similar. During periods when the truck is exposed to salt or other corrosive chemicals, wash Auto Crane products weekly. Inspect the paint finish monthly or when washed. Immediately repair any exposed bare metal or rust. Repair damaged paint on Auto Crane products with the following procedure:

1. Sand the damaged area to bare metal.
2. Use a solvent to clean the sanded area to remove sanding debris and residue.
3. Wipe dry with a clean cloth to remove any remaining debris and residue.
4. Use a primer compatible with PPG Spectracron 573.
5. Prime the sanded areas to a minimum 2 mil dry film thickness per the primer manufacturer's instructions.
6. Use a paint compatible with PPG Spectracron 573 epoxy primer and PPG Spectracron QT360HW topcoat paint.
7. Apply the topcoat paint to a minimum 2 mil dry film thickness within 24 hours of applying the primer.
8. The final primer and topcoat should have approximately a 4 mil dry film thickness.

Lubrication and Maintenance Schedule

Service Performed	Instructions	Daily	Weekly	3 Months	Yearly
Load Hook	Inspect hook and latch for deformation, cracks, and corrosion	X			
Cable Drum	Ensure cable is wound evenly on drum	X			
Hoist Cable	Check for flattening, kinks, broken strands	X			
Hyd. Hoses	Visual inspection	X			
Hyd. Fluid	Check fluid level	X			
Pin Retaining Bolts	Check torque to 23 ft-lb (Grade 5), 35 ft-lb (Grade 8) as required	X			
Mounting Bolts	Check torque to 501 ft-lb (Gr 8 hex head), 475 ft-lb (socket head)		X		
Rotating Ring Gear	Lube with MobileTac LL, Lubriplate or equivalent		X		
Sheave Bearings	Sealed bearing, replace if rough or loose		X		
All Other Bolts	Check and tighten as required		X		
Lift Cylinder Bearings	Grease with MobilePlex EP-2 or equivalent at zerk fittings			X	
Rotation Bearing	Grease with MobilePlex EP-2 or equivalent at zerk fittings			X	
Rotation Bearing Bolts	Check torque to 225 ft-lb			X	
Hoist Mounting Bolts (HC-10, 12S, 12, 14)	Check torque to 173 ft-lb			X	
Hoist Mounting Bolts (All others)	Check torque to 85 ft-lb			X	
Slewing Drive (HC-7x/8x)	Grease with MobilePlex EP-2 or equivalent at zerk fittings			X	
Hydraulic Fluid	Drain, flush, and refill with Superfilm 5W-20 or equivalent				X
Rotation Gearbox (HC-12/14)	Drain, flush, and refill with 52 oz of GL-5 EP-80/90 gear oil				X
Rotation Gearbox (All Others)	Drain, flush, and refill with 58 oz of EP-140 gear oil				X
Boom Slide Pads	Pads greased when replaced				
Filter, Valve Block	Replace annually, every 200 hours of operation, or as directed by the dirty filter sensor				
For additional information, see OSHA 1910.180 and ASME B30.5					

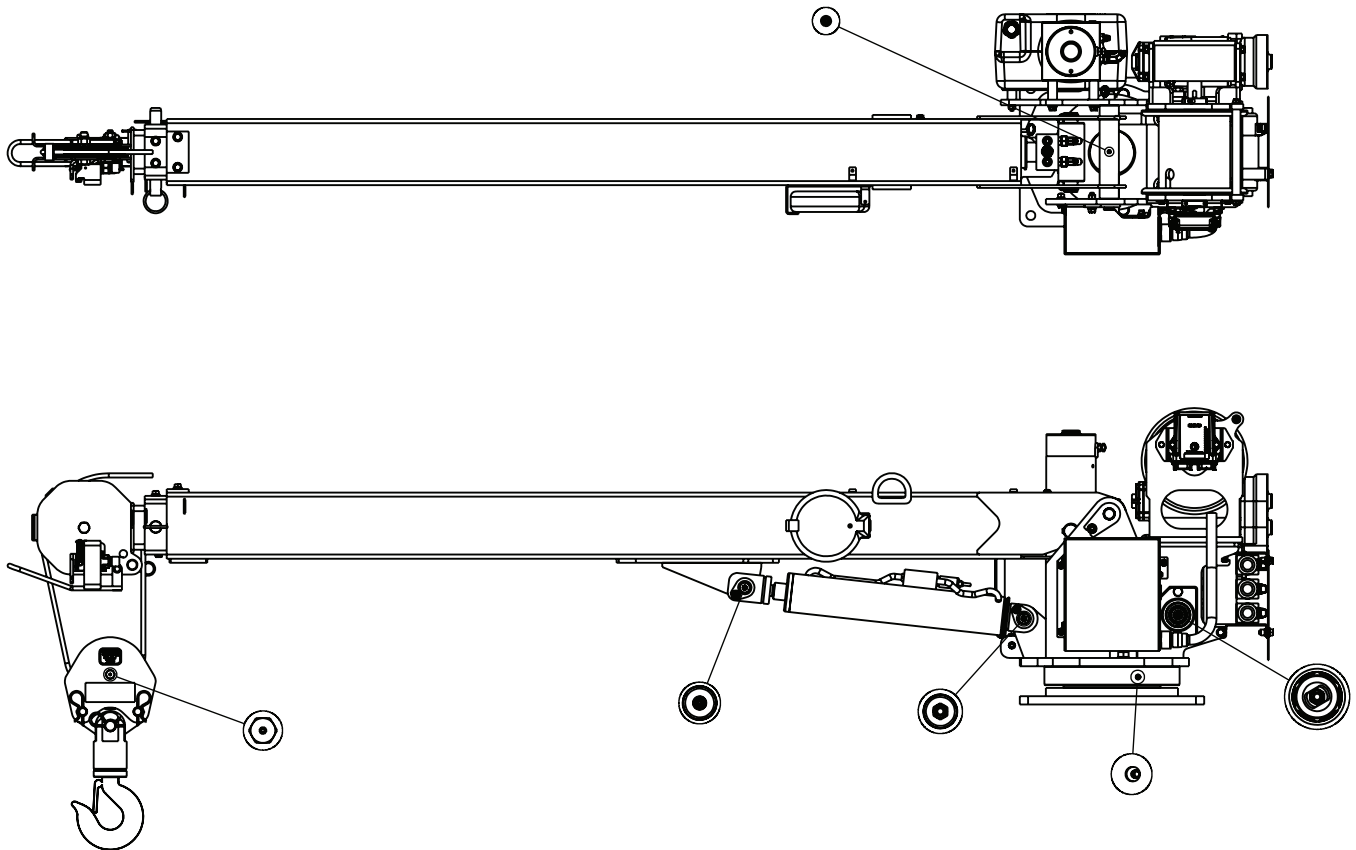
Maintenance

Lubrication Points

1. Use only authorized parts/lubrication. Any damage or malfunction caused by the use of unauthorized parts is not covered by Warranty or Product Liability.
2. Once a bolt has been tightened to specification then removed, the bolt should be replaced with a new one. Auto Crane Company recommends this crane be serviced per the "Crane Inspection Log" P/N 999978. Fill these logs in at the intervals noted and kept as a permanent record. Additional copies are available from your local distributor.

NOTE

- LUBRICATION POINTS FOR REFERENCE ONLY IN MANUAL



Wireless Control Valve Cartridge Maintenance



Verify movement in ports while manually overriding cartridge



Use the following procedure to inspect the cartridge for proper operation:

1. Clean the area around the valve spool before it is removed from the valve bank.
2. Remove the valve spool from the valve bank. Be careful not to touch any surrounding objects.
3. Use any off-the-shelf automotive brake cleaning fluid to remove any visible debris from the valve spool. Wear skin and eye protection while spraying the valve spool clean.
4. Inspect the O-rings for damage. Replace if necessary.
5. While collar is pulled back, valve should slide freely.
6. Dip the valve spool into fresh hydraulic fluid to lubricate and fill the cavities.
7. Install the valve spool into the valve block.
8. Validate the operation of the crane related to this valve spool.

Hoist Operation

NOTICE

The uneven spooling of cable, while pulling a load, is not a problem unless there is a cable pileup on one end of drum. If this happens, reverse the winch to relieve the load and move your anchor point further to the center of the vehicle. After the job is done you can unspool and rewind for a neat lay of the cable.

Maintenance

Rotation Bearing Replacement

All bearings wear over time, including the main rotation bearing of the crane. There are no precise rules for replacing the main rotation bearing because of many variable factors. There are common symptoms during crane operation that may indicate rotation bearing wear. These include:

1. Excessive noise.
2. Rough rotation.
3. Increase drive power required to rotate.
4. Metal particles in grease.

Replace the Bearing If:

1. Any noticeable cracking in the bearing housing.
2. Damage to internal teeth.
3. Excessive axial play is present. See Axial Play Allowance Check Procedure.

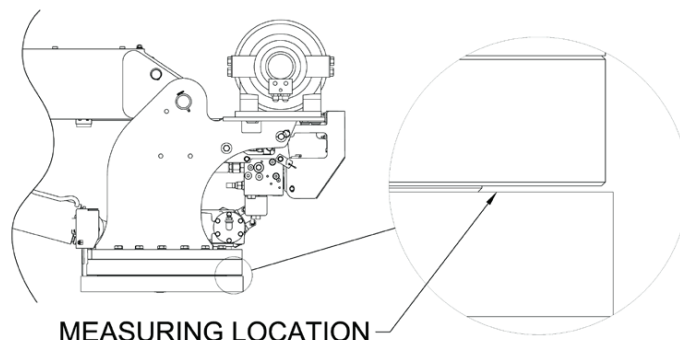


Never try to repair a rotation bearing. For a replacement bearing contact your local authorized distributor.

Axial Play Allowance Procedure

1. Raise the boom to the maximum angle and measure the clearance between base plate and the rotation bearing with a dial or filler gauge.
2. Lower the boom to the horizontal position and measure the clearance between the base plate and the rotation bearing with a dial indicator or feeler gauge.
3. If the difference between the two measurements exceeds the specification, replace the bearing.
4. Rotate crane 45°, then repeat steps 1 and 2 until you reach 360° of rotation.

Crane Model	Axial Play Allowance	Rotation Bearing Replacement Kit
EC-2X, EHC-3.2, HC-3.2, EHC-4	1.5 mm	320878010
EHC-5, EHC-6, HC-5, HC-6, HC-7, HC-8, 8406H, HC-9	1.6 mm	480023010
HC-7x, HC-8x	0.1 mm	479200220
HC-10, HC-12S	1.8 mm	372064010
HC-12, HC-14	2.3 mm	470001010
HC-5, HC-6, EHC-5, EHC-6	0.1 mm	492000322
HC-12	0.1 mm	475500011



Adjusting Oil Cooled Worm Brake

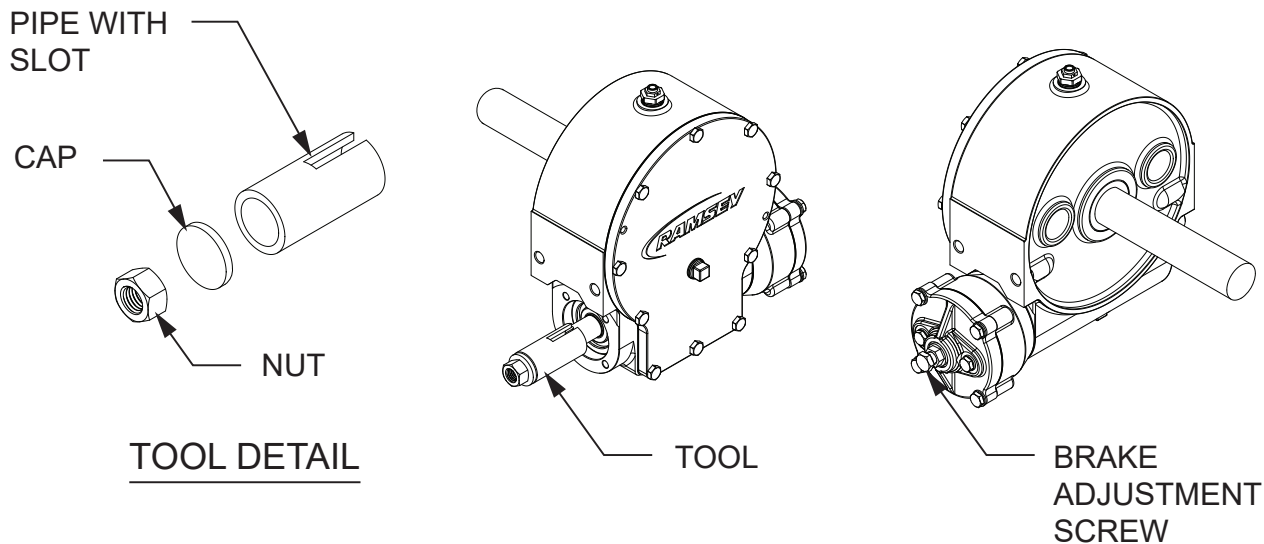
The oil-cooled, fully adjustable, automatic safety brake operates in the worm housing lubricant, all part being submerged in oil. When the brake wears to the point that the load begins to drift, the brake can be adjusted as follows:

1. Loosen the lock nut on the adjusting screw.
2. Tighten the brake by turning the adjusting screw clockwise.

CAUTION: Only $\frac{1}{4}$ turn is usually required to adjust the brake. Over-tightening can cause overheating, and damage to the brake parts. Tighten the lock nut after adjustment is completed

If the brake does not respond to adjustment then a new leaf spring and brake disc is needed. A torque wrench can be equipped with a special adapter to fit the input shaft (worm) of the winch. The adapter can be made by welding a nut to the end of a piece of tubing as shown in the following figure.

Brake Adjustment



After welding the cap and nut to the tubing, slot the tubing as shown. This will allow the special adapter to slide over the keyway and then act as a large socket. A torque wrench can then be used to apply the proper torque. Turn the torque wrench so that the drum turns in the spool out direction or lowering direction. The torque ratings should be between 8-13 ft-lbs.

If the torque wrench does not show the proper value as it turns, then the worm brake adjusting bolt should be turned clockwise $\frac{1}{4}$ turn. Each time the adjusting bolt is turned, check the torque reading. Continue this procedure until the proper torque reading is achieved. Then tighten the lock nut.

Installation

General Installation

For information specific to your crane, such as mounting hole diameter, bolt size and grade, and hydraulic requirements, see General Dimensions.

1. Reference General Dimensions for minimum chassis GVWR needed for crane.
2. The vehicle must be equipped with an engine speed control and tachometer.
3. Ensure the mounting surface is properly reinforced to withstand the capacity loading of the crane. Ensure the outriggers are used to provide total stability for the truck.
4. If not using an Auto Crane body, cut the proper sized hole in the mounting location (centered with mounting bolts) for access to hydraulic connections.
5. Ensure the mounting bolts are the proper size and grade and torque to 315 ft-lb.
6. Pressure and return hoses are not furnished with the crane and must be supplied by the installer with lengths determined at installation. Reference General Specifications for pressure and flow requirements.



Maintain ISO 18/16/13 fluid cleanliness levels. Failure to use clean hydraulic hoses and components may contaminate the crane and hydraulic system and void warranty.



Excess flow will cause erratic operation and too little flow will cause poor crane operation.

Emergency Crane Operation

If for any reason hydraulic flow or pressure is lost to the crane, use the following procedure to lower the boom until the problem can be fixed.

1. In an emergency situation when it becomes necessary to lower the boom without hydraulic assistance, the counterbalance valve can be used to lower the boom.
2. Ensure the boom will be lowered onto an appropriate support.
3. Loosen the lock nut and slowly turn the Allen head screw clockwise.
4. Count the number of turns and continue to slowly turn the Allen head screw clockwise until the boom just begins to lower.



Remove any personnel from near the crane as the load is lowering.

5. If the Allen head screw is turned too far, the internal valve will come apart. This condition is not repairable.
6. After the boom is lowered onto the boom support, turn the Allen head screw the same number of turns counterclockwise into the counterbalance valve.
7. After the problem is corrected, readjust the counterbalance valve to ensure proper operation.

Each crane arrives with a shipping tote that contains the following items:

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	2	005500000	SCREW HX HD 1/4-20UNC X 3/4 LG
2	2	020200000	WASHER SP LK 1/4
3	4	022101000	WASHER SP LK 3/4
4	4	022102000	WASHER FL 3/4
5	6	083800000	CLIP, CABLE #838
6	1	320433000	TRAVELING BLOCK ASSEMBLY
7	1	320950002	OWNER'S MANUAL, 3^2 FM, CERVIS
8	1	320988009	KIT, ALIGNMENT DECAL LOCATION
9	1	320988016	LOAD CHART, EHC-3^2
10	1	361106580	REMOTE, NON-PROPORTIONAL, CERVIS
11	1	404218000	TWECO CABLE ASSY, W/ MASTER SWITCH
12	1	404223010	CABLE, POWER HEAVY-DUTY 25FT LG
13	1	404223020	COND ASSY 4GA X 48 BLK
14	4	404226000	SCR HX HD 3/4-16UNF X 3 LG GR 8
15	4	404227000	NUT HX 3/4-16UNF, GR 8
16	1	460159000	TETHER CABLE, TRANSMITTER
17	1	479824002	DECAL, STABILITY CHART
18	1	479824003	DECAL, STABILITY CHART, CUSTOM ZONE PERCENTAGES
19	1	715064001	DECAL, BOOM STOW, CALIFORNIA
20	1	715321032	SHIPPING TOTE, 15 GAL, BLACK / RACER RED

Please check to make sure the above items have been supplied with your crane. If any items are missing, please notify your dealer, or contact Auto Crane.

Installation

For information specific to your crane, such as mounting hole diameter, bolt size and grade, and hydraulic requirements, see General Dimensions.

1. Refer to the Bill of Materials included with your ship kit. Ensure all items listed on the Bill of Materials are included with your crane.



Failure to use clean hydraulic hoses and components may contaminate the crane and hydraulic system and void warranty.



Excess flow will cause erratic operation and too little flow will cause poor crane operation.

2. Vehicle shall meet minimum GVWR dependent on crane model:
3. The vehicle must be equipped with an engine speed control and tachometer.
4. Ensure the mounting surface is properly reinforced to withstand the capacity loading of the crane. Ensure the outriggers are used to provide total stability for the truck.
5. Cut the proper sized hole in the mounting location (centered with mounting bolts) for access to hydraulic connections.
6. Ensure the mounting bolts are the proper size and grade. Tighten to the correct specification. See General Dimension.
7. Use a boom support when the crane is not in operation. Connect the traveling block to the hook loop.
8. Electrical hookup:



Failure to correctly plumb and wire crane can cause inadvertent operation and damage to crane and/or personnel.

9. Ensure the Owner's Manual is delivered to the customer.
10. Install voltage switching unit inside compartment safe from weather and contamination.
11. See following page for additional electrical installation.
12. For additional help: Call the Service Department at the Auto Crane Company, 1-800-777-2760, located in Tulsa, OK.

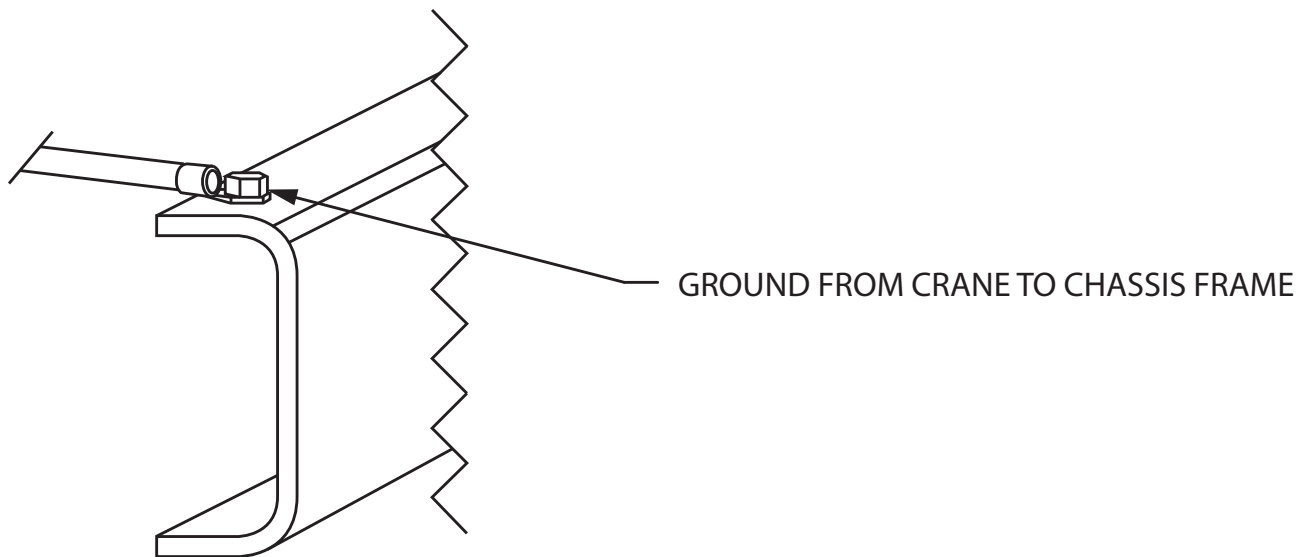
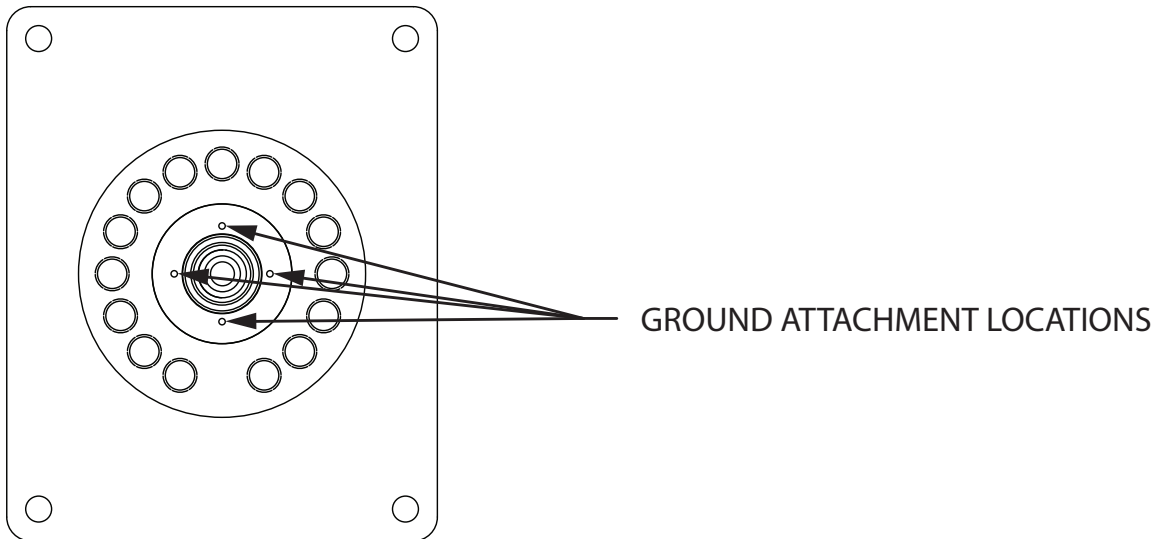
IMPORTANT!

FEDERAL LAW (49 CFR PART 571) REQUIRES THAT THE FINAL STAGE MANUFACTURER OF A VEHICLE CERTIFY THAT THE VEHICLE COMPLIES WITH ALL APPLICABLE FEDERAL REGULATIONS. ANY MODIFICATIONS PERFORMED ON THE VEHICLE PRIOR TO THE FINAL STAGE ARE ALSO CONSIDERED INTERMEDIATE STAGE MANUFACTURING AND MUST BE CERTIFIED AS TO COMPLIANCE. THE INSTALLER OF THIS CRANE AND BODY IS CONSIDERED ONE OF THE MANUFACTURERS OF THE VEHICLE. AS SUCH A MANUFACTURER, THE INSTALLER IS RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE FEDERAL AND STATE REGULATIONS, AND IS REQUIRED TO CERTIFY THAT THE VEHICLE IS IN COMPLIANCE.

IT IS THE FURTHER RESPONSIBILITY OF THE INSTALLER OF THE CRANE TO COMPLY WITH THE OSHA TRUCK CRANE STABILITY REQUIREMENTS AS SPECIFIED BY 29 CFR PART 1910.180 (C) (1).

Grounding Instructions

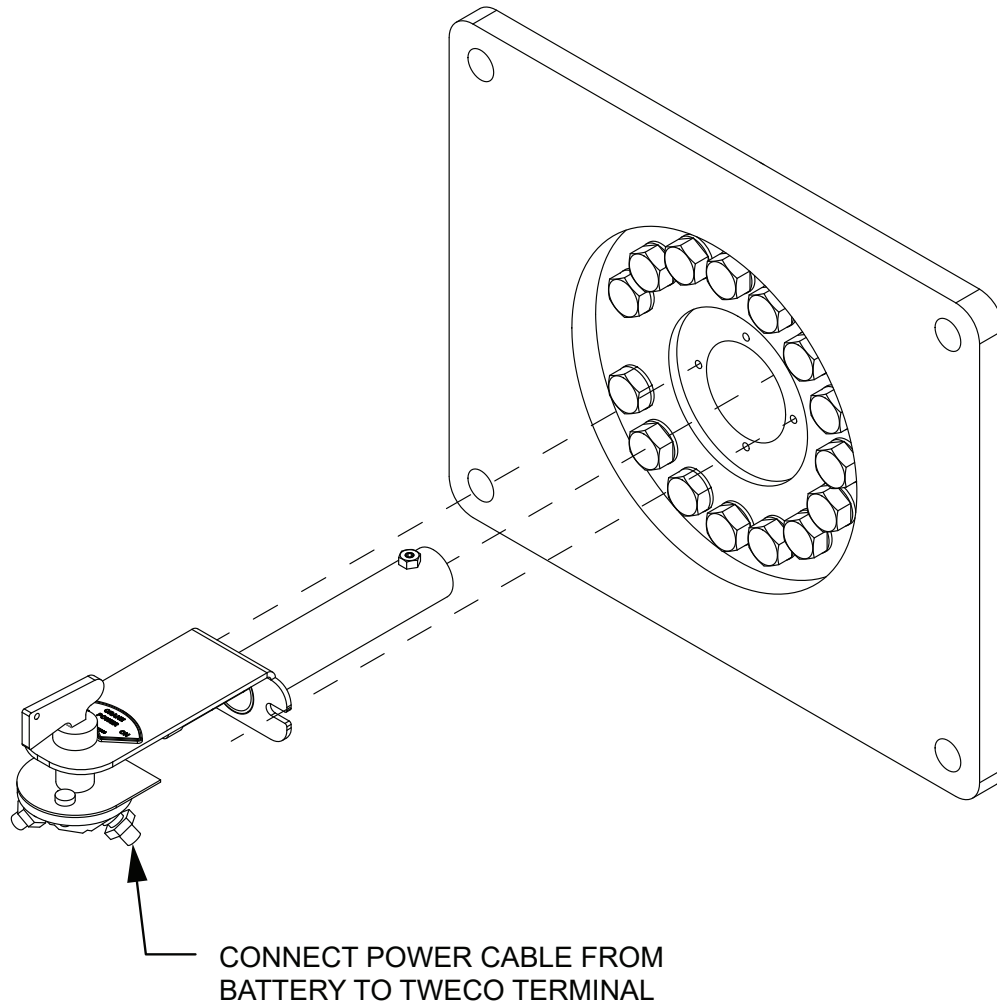
Attach ground wire to bottom of the crane. Run the ground wire down through the crane box. Locate cable so that it will be protected and avoid sharp edges. Attach ground from crane to chassis frame.



Installation

TWECO Connection

Insert TWECO to bottom of crane. Connect power cable from battery to terminal post on Tweco.



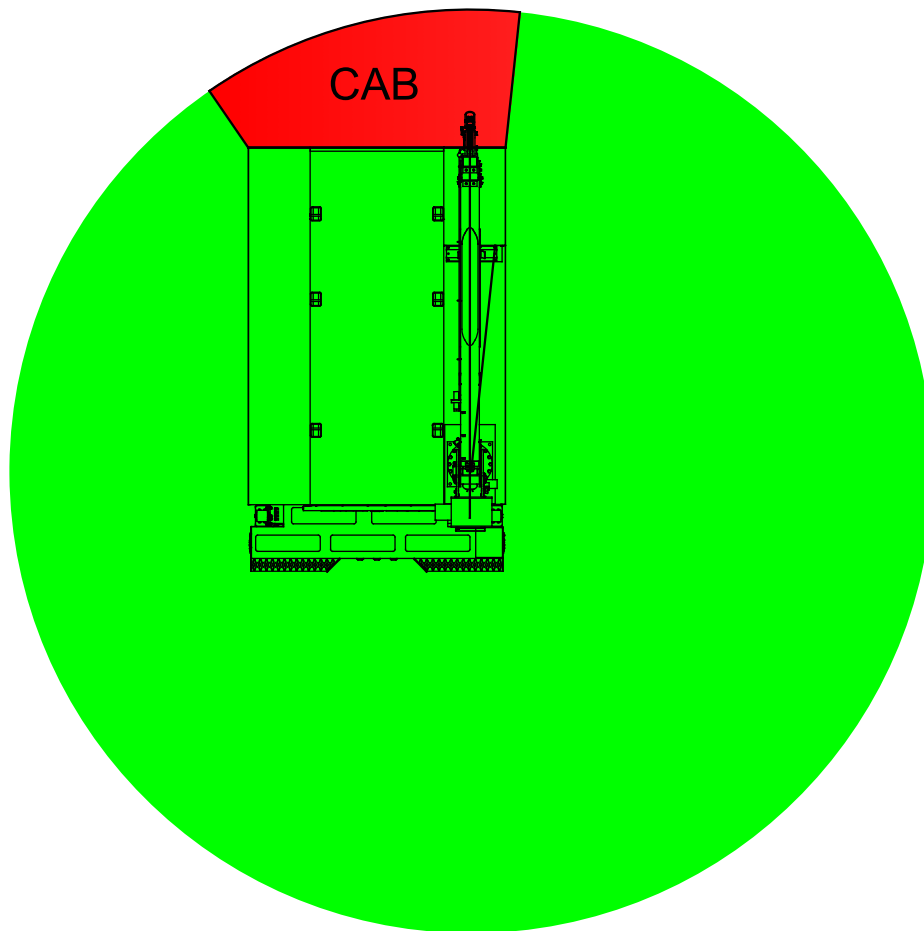
Stability Chart Installation

There is a stability chart included in the ship kit. This decal is typically installed on the inside of the door of the crane box. This decal is to alert the user of the available crane capacities around the vehicle.

479824002 decal will be installed on an Auto Crane body that was outfitted with an Auto Crane and Auto Crane outriggers. Auto Crane has designed the body, crane and outrigger to have stability based on the chart below:

STABILITY CHART

P/N 479824002 C



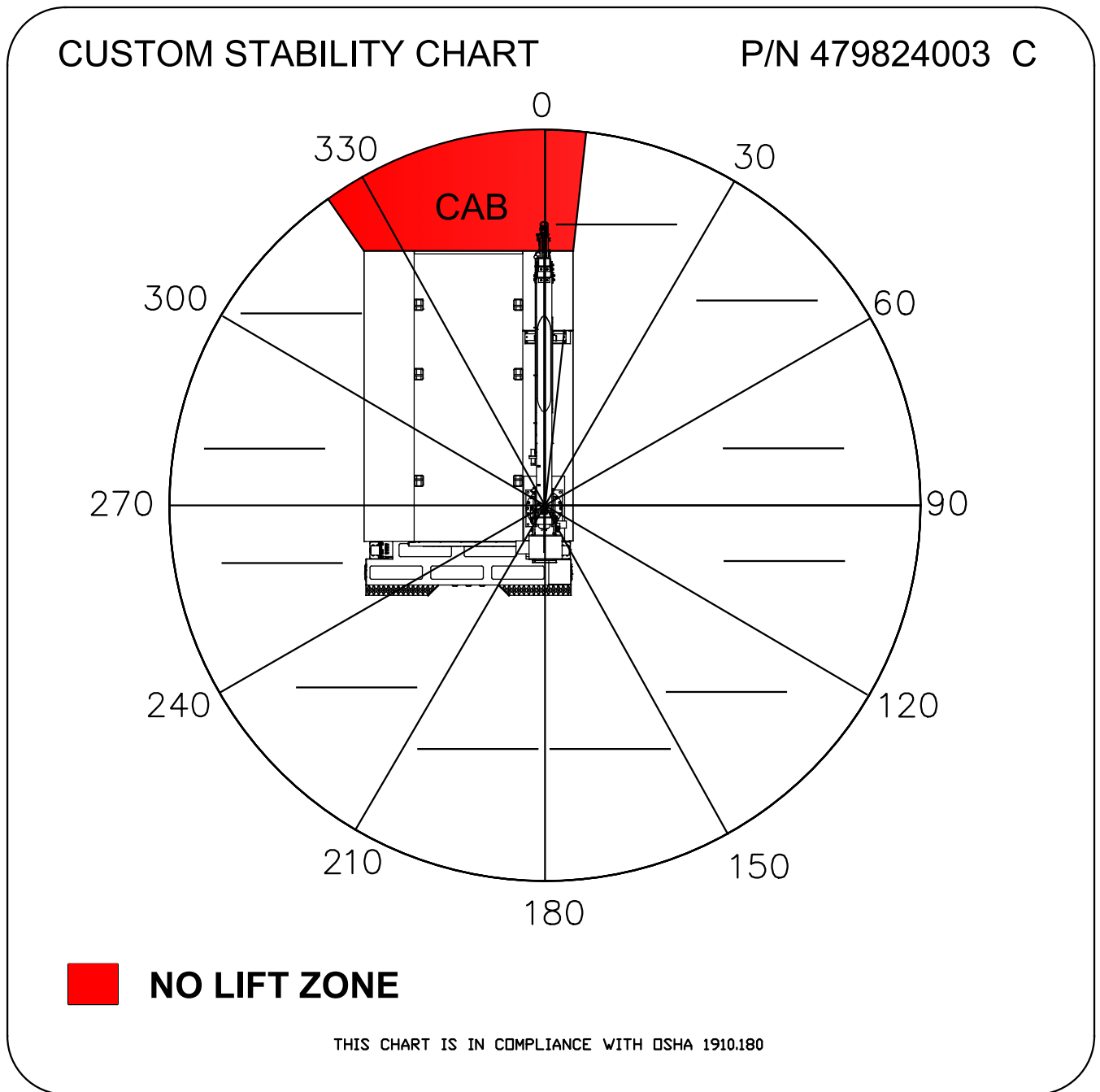
 **ZONE A, 100% MAXIMUM CAPACITY**

 **ZONE B, NO LIFT ZONE**

THIS CHART IS IN COMPLIANCE WITH OSHA 1910.180

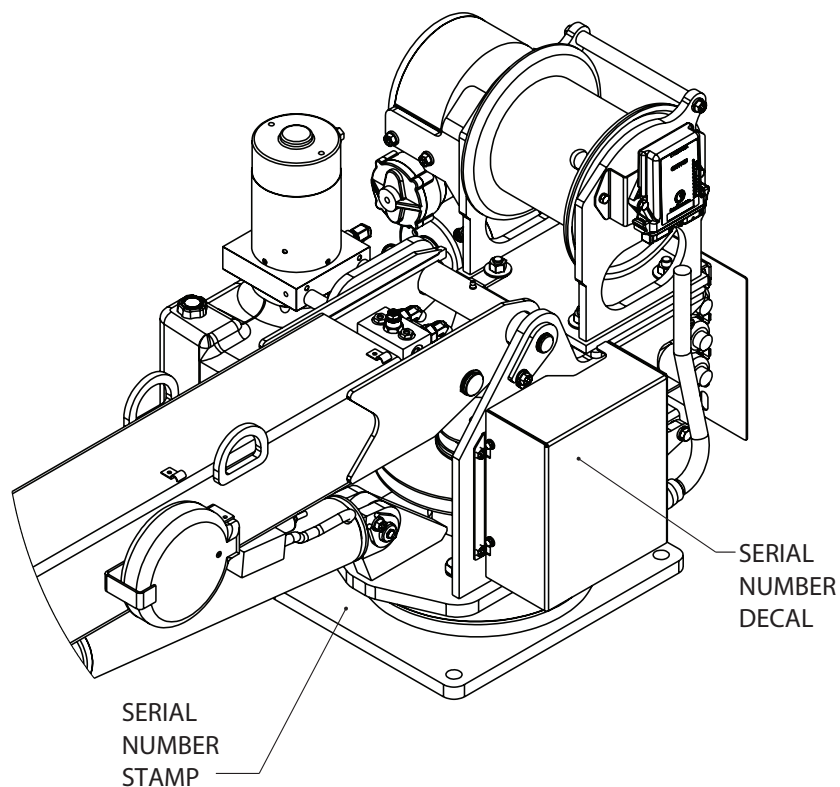
Installation

479824003 decal will be installed on an Auto Crane body that was not outfitted with an Auto Crane and Auto Crane outriggers. The stability chart provides lines to write in the tested stability percentage at each section below:



Small EH Crane Serial Number Location

The serial number is stamped into top of the of the baseplate weldment as well as the decal on left side plate as shown below.



Installation

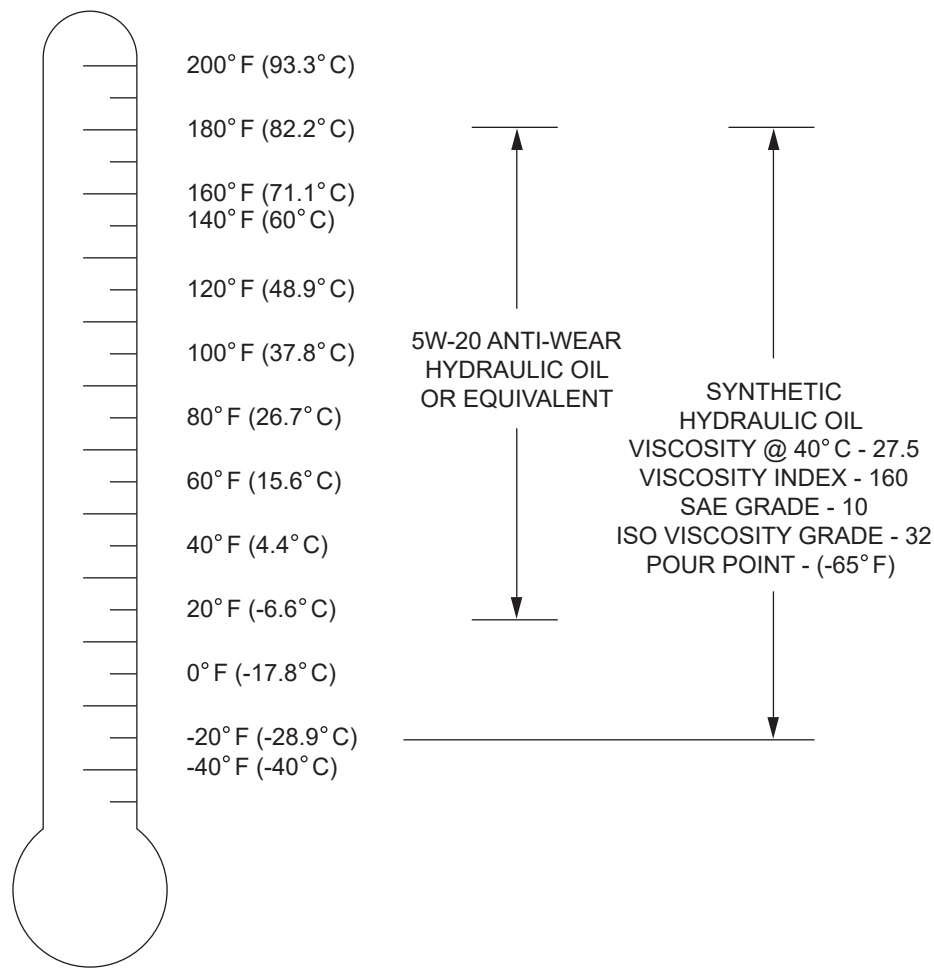
Recommended Operating Temperature

- 1. In applications where low oil temperatures may exist (below -20° F), an external heating system may be required.
- 2. A symptom of excessively low oil temperatures is hydraulic pump/PTO operation but no fluid flow from tank.

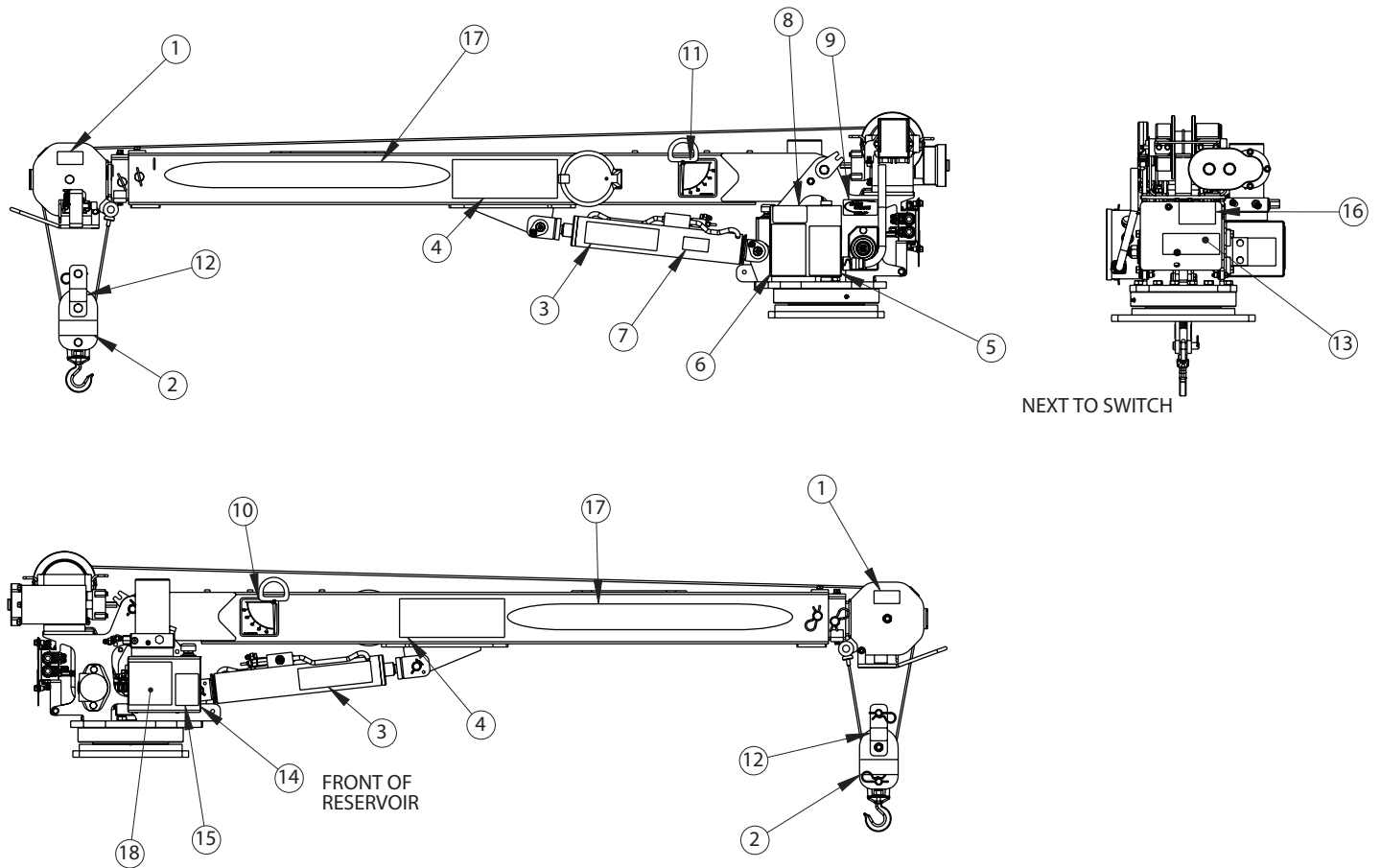


Hydraulic reservoir oil temperatures must not exceed 180° F or damage to crane may occur. This may affect crane warranty.

OIL TEMPERATURE



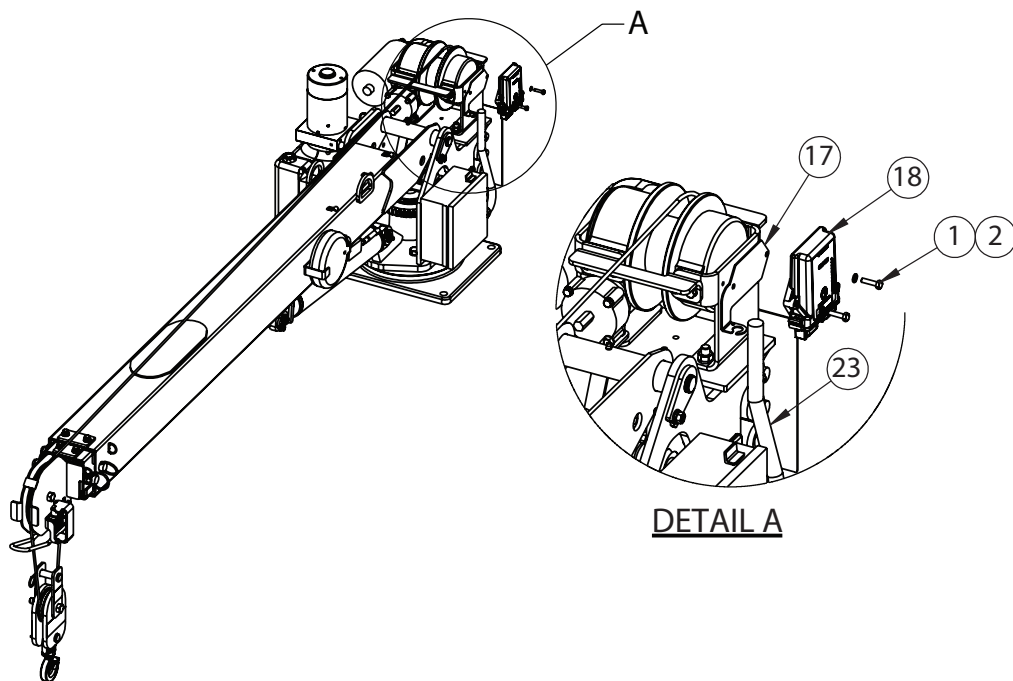
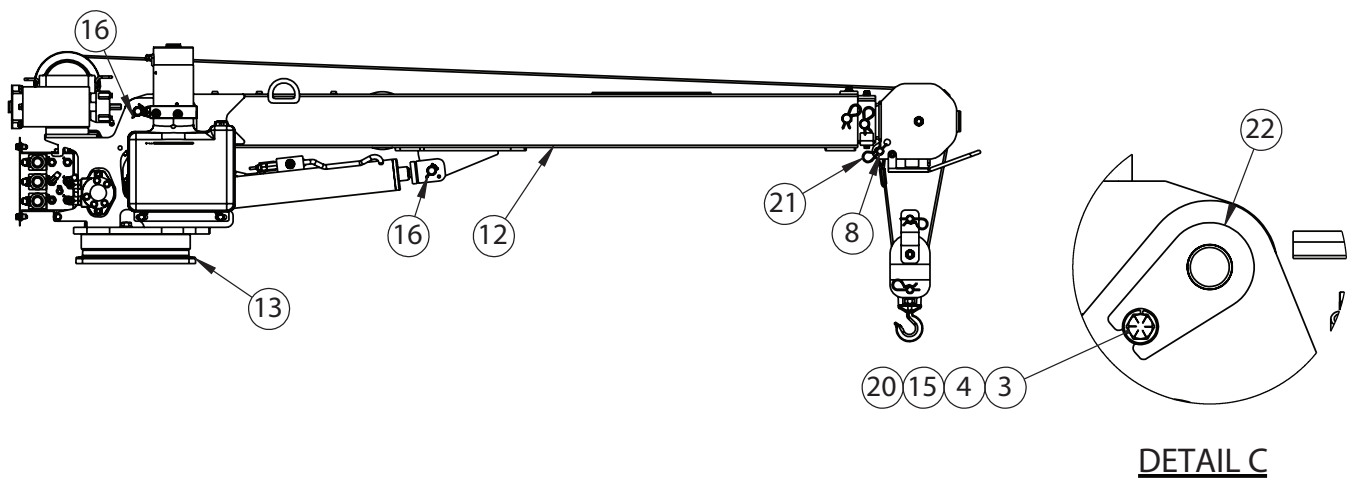
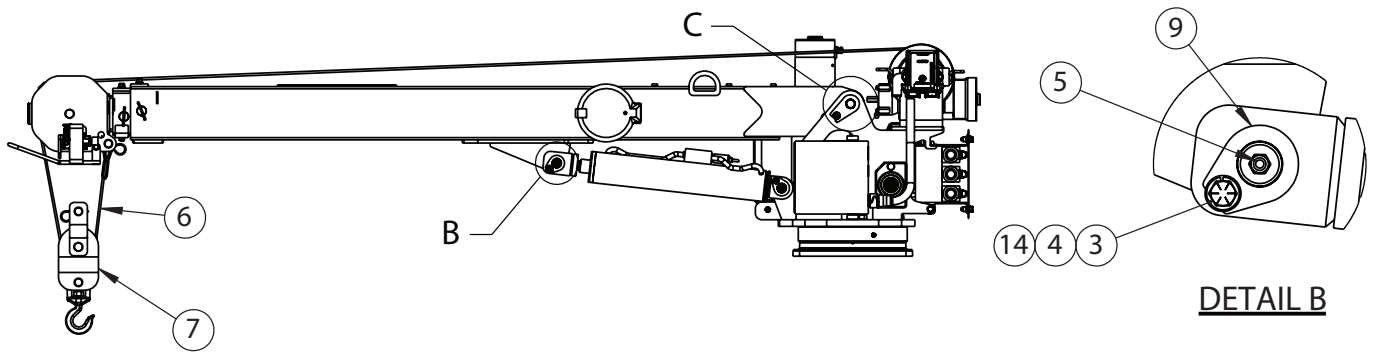
Decal Layout - P/N 320988004



Decal Layout - P/N 320988004

ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	2	040517000	DECAL STAY CLEAR OF BOOM
2	2	040518000	DECAL STAY CLEAR OF LOAD
3	2	040519000	DECAL DANGER SCISSOR POINT
4	2	040529000	DECAL DANGER "ELECTROCUTION HAZARD" POWER LINE
5	1	040579000	DECAL OPERATION INSTRUCTIONS
6	1	040580000	DECAL TRAINED OPERATOR
7	1	040587000	DECAL WARNING LOAD SENSOR
8	1	330622000	DECAL, SERIAL NO.
9	1	040619001	DECAL AUTO CRANE LOGO
10	1	320318000	DECAL ANGLE INDICATOR CS
11	1	320318001	DECAL ANGLE INDICATOR SS
12	2	320433100	DECAL, TRAVELING BLOCK 3203
13	1	360034000	DECAL AUTO CRANE LOGO
14	1	460169000	DECAL WARNING, REMOTE CONTROL
15	1	040632000	DECAL WARNING - OVERLOAD
16	1	040824000	DECAL, AMERICAN FLAG, MADE IN THE U.S.A.
17	2	600047012	DECAL, AUTO CRANE EHC-3^2 LOGO, FLATTENED OVAL, 33.25 IN LONG
18	1	320988016	LOAD CHART, EHC-3^2

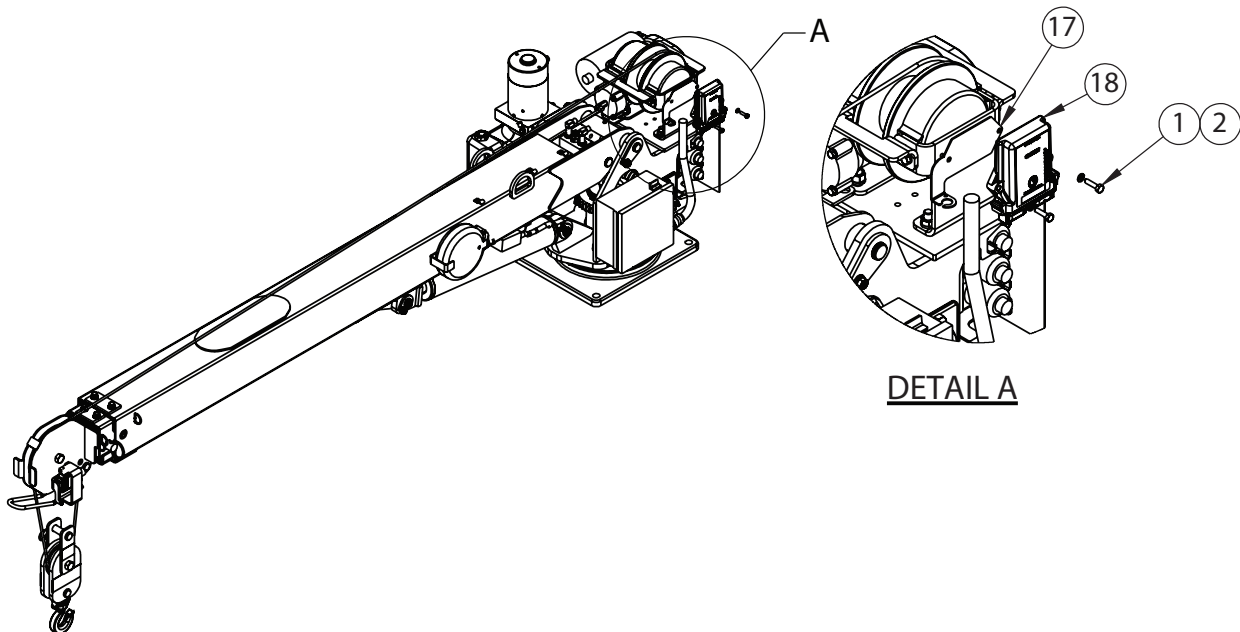
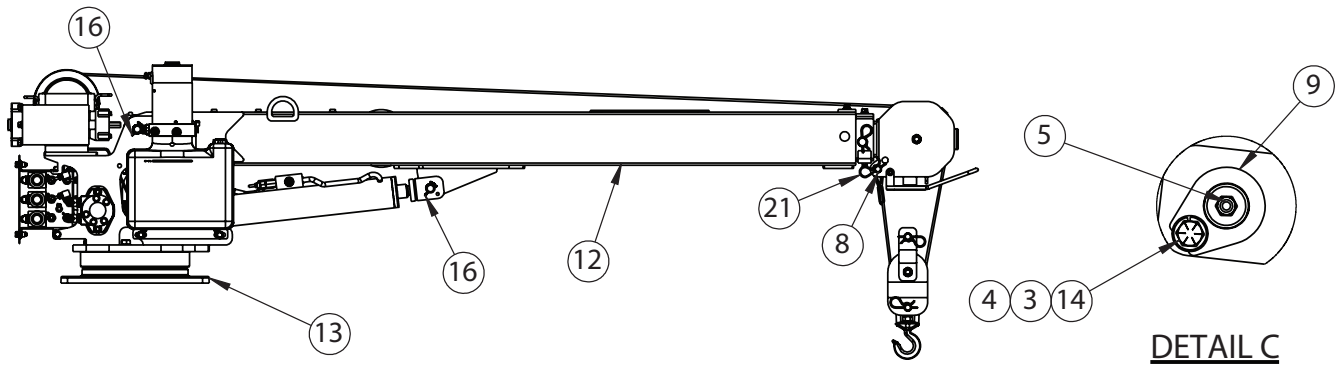
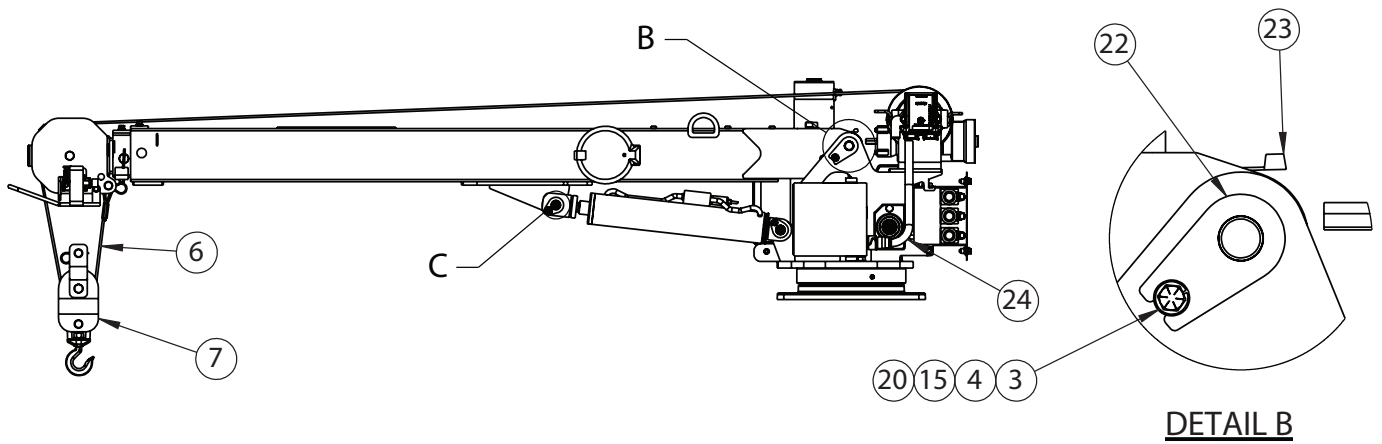
General Assembly PR - P/N 320989023



General Assembly PR - P/N 320989023

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	2	005604000	SCREW HX HD 1/4-20UNC X 1 LG
2	2	020200000	WASHER SP LK 1/4
3	2	021100000	WASHER SP LK 3/8
4	2	021200000	WASHER FL 3/8
5	1	239300000	ZERK, GREASE
6	1	320338002	CABLE ASS'Y, 7/32" x 62FT, THIMBLE END
7	1	320433000	TRAVELING BLOCK ASSEMBLY
8	1	320434001	PIN, 3/4 X 2-3/4LG
9	1	320824000	PIN, LIFT CYLINDER
10	1	320988004	DECAL LAYOUT, 3203
11	1	320988042	SHIP KIT, EHC-3^2, FM, CERVIS
12	1	320988103	BOOM ASSY 3203 PR
13	1	320988204	PEDESTAL ASSEMBLY, 3203 PR
14	1	330371000	SCREW HX HD 3/8-16UNC X 1 LG GR8
15	1	330372000	NUT HX 3/8 NC GR5
16	2	360678000	PIN, 3/16 COTTERLESS RING
17	1	361102001	MOUNTING BRACKET, OMNEX PENDANT PLUG
18	1	361106581	RECEIVER, NON-PROPORTIONAL, CERVIS
19	1	361106582	KIT, NON-PROPORTIONAL EHC WIRELESS, CERVIS
20	1	366159000	SCREW HX HD 3/8-16UNC X 1 1/2 LG GR8
21	1	366813000	PIN HITCH
22	1	404220000	PIN WDMT BOOM/PED
23	1	680180000	HARNESS, FM, 3203PR(X)

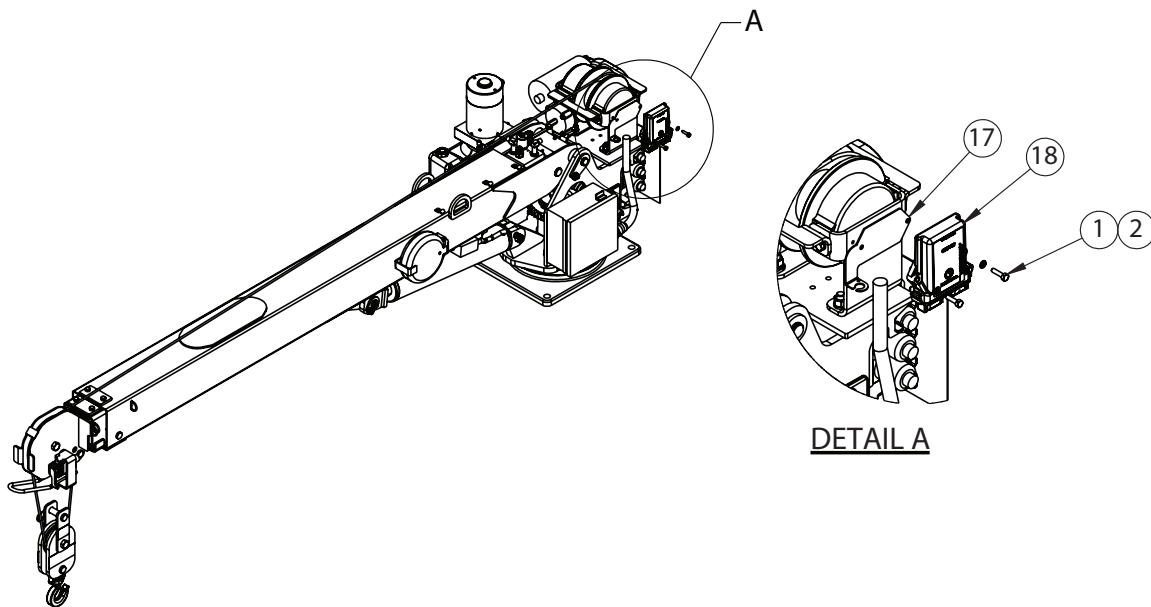
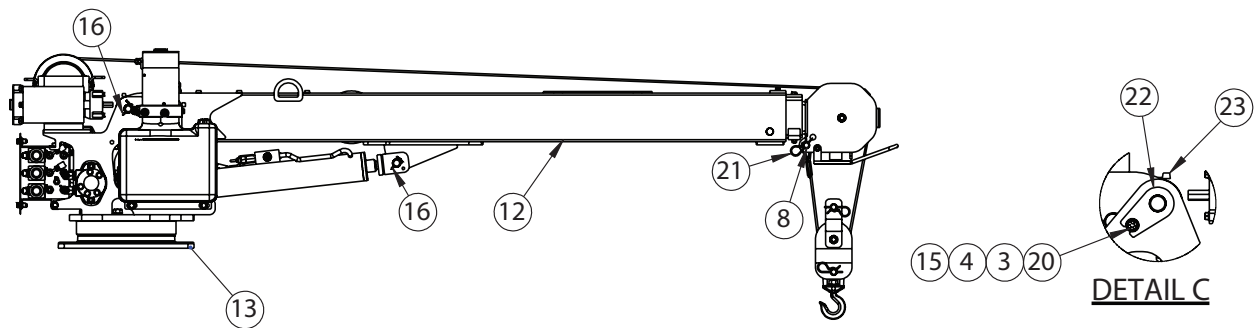
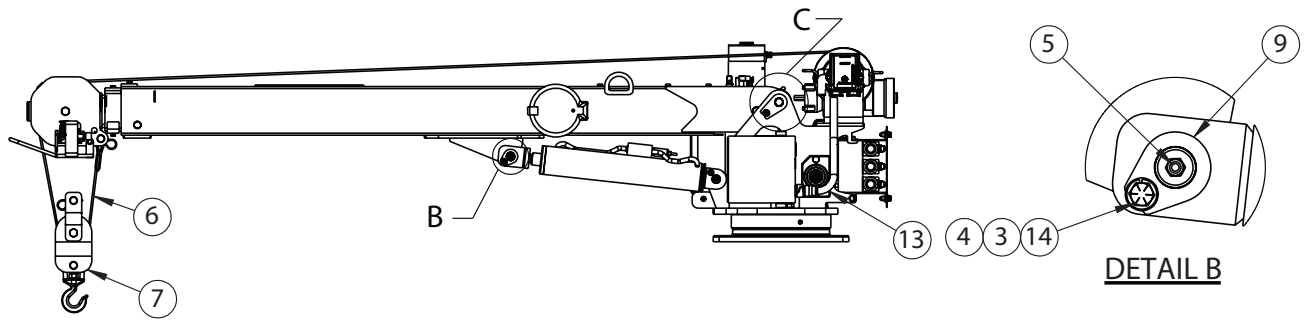
General Assembly PRX - P/N 320989024



General Assembly PRX - P/N 320989024

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	2	005604000	SCREW HX HD 1/4-20UNC X 1 LG
2	2	020200000	WASHER SP LK 1/4
3	2	021100000	WASHER SP LK 3/8
4	2	021200000	WASHER FL 3/8
5	1	239300000	ZERK, GREASE
6	1	320338002	CABLE ASS'Y, 7/32" x 62FT, THIMBLE END
7	1	320433000	TRAVELING BLOCK ASSEMBLY
8	1	320434001	PIN, 3/4 X 2-3/4LG
9	1	320824000	PIN, LIFT CYLINDER
10	1	320988004	DECAL LAYOUT, 3203
11	1	320988042	SHIP KIT, EHC-3^2, FM, CERVIS
12	1	320988102	BOOM ASSY 3203 PRX
13	1	320988203	PEDESTAL ASSEMBLY, 3203 PRX
14	1	330371000	SCREW HX HD 3/8-16UNC X 1 LG GR8
15	1	330372000	NUT HX 3/8 NC GR5
16	2	360678000	PIN, 3/16 COTTERLESS RING
17	1	361102001	MOUNTING BRACKET, OMNEX PENDANT PLUG
18	1	361106581	RECEIVER, NON-PROPORTIONAL, CERVIS
19	1	361106582	KIT, NON-PROPORTIONAL EHC WIRELESS, CERVIS
20	1	366159000	SCREW HX HD 3/8-16UNC X 1 1/2 LG GR8
21	1	366813000	PIN HITCH
22	1	404220000	PIN WDMT BOOM/PED
23	1	663300001	CABLE TIE, 18"
24	1	680180000	HARNESS, FM, 3203PR(X)

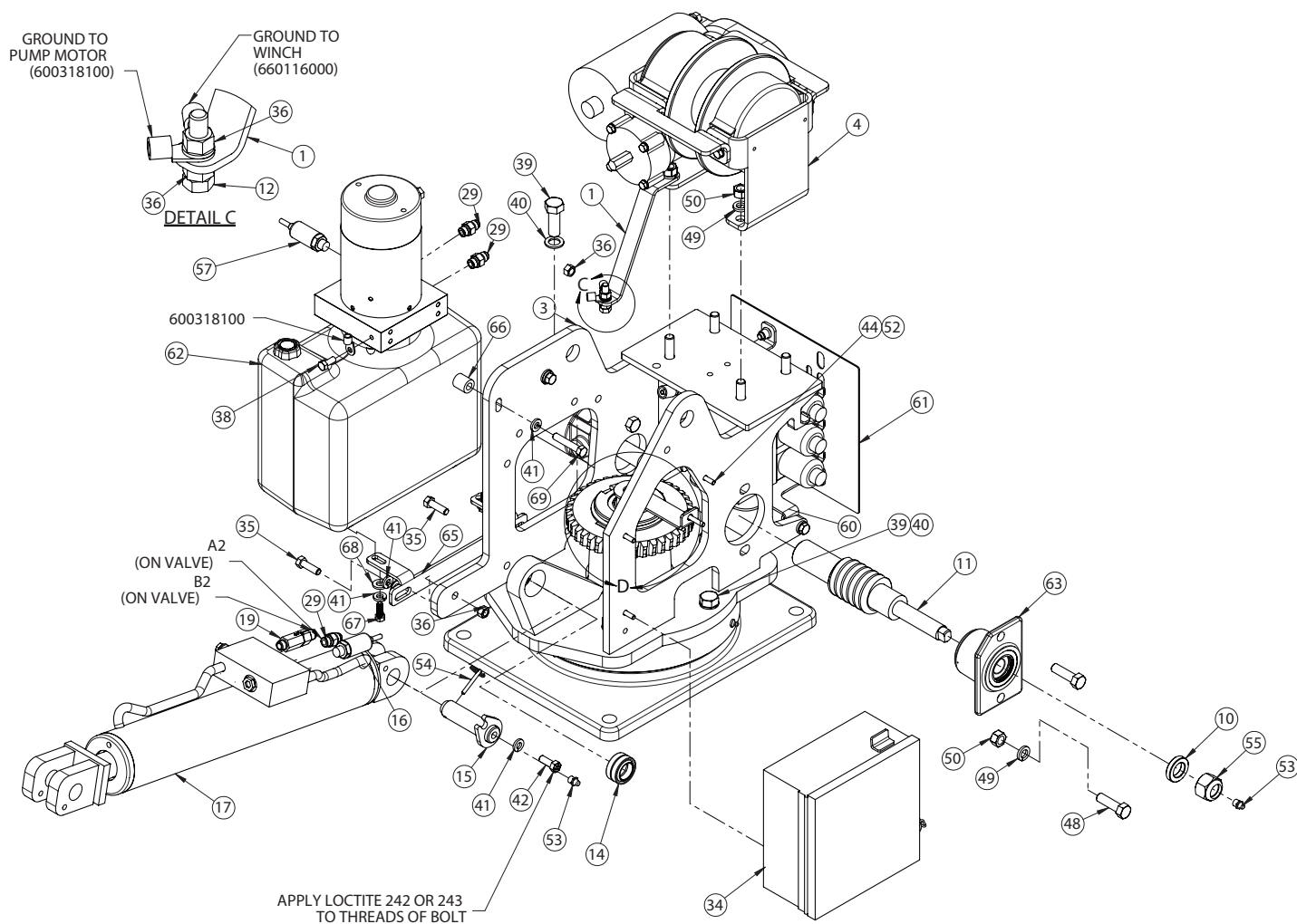
General Assembly PRFX- P/N 320990004



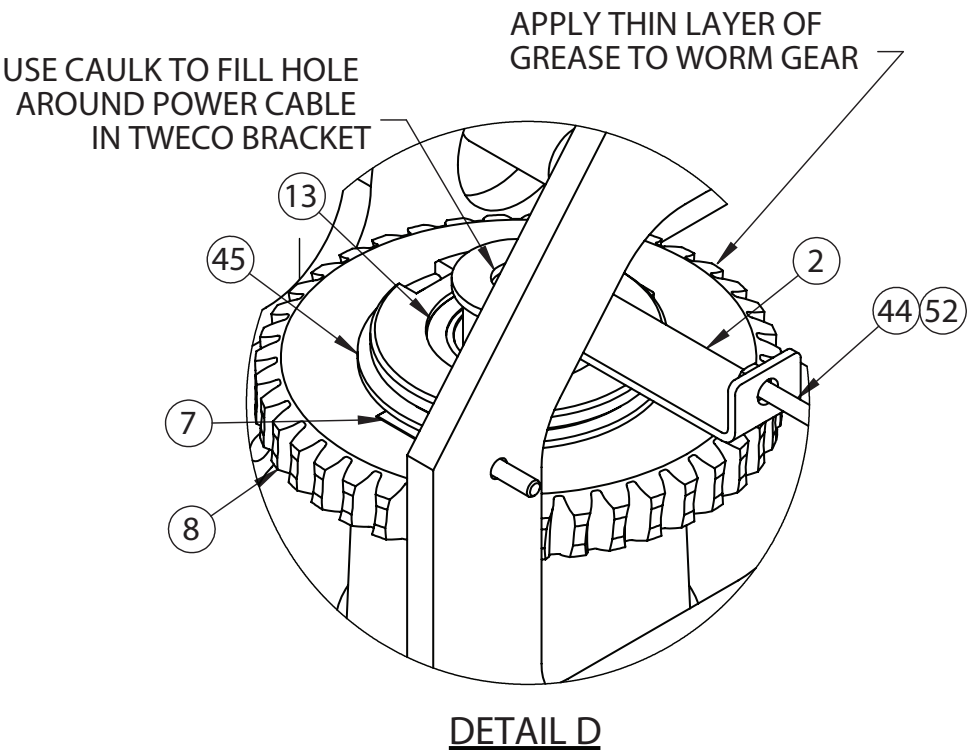
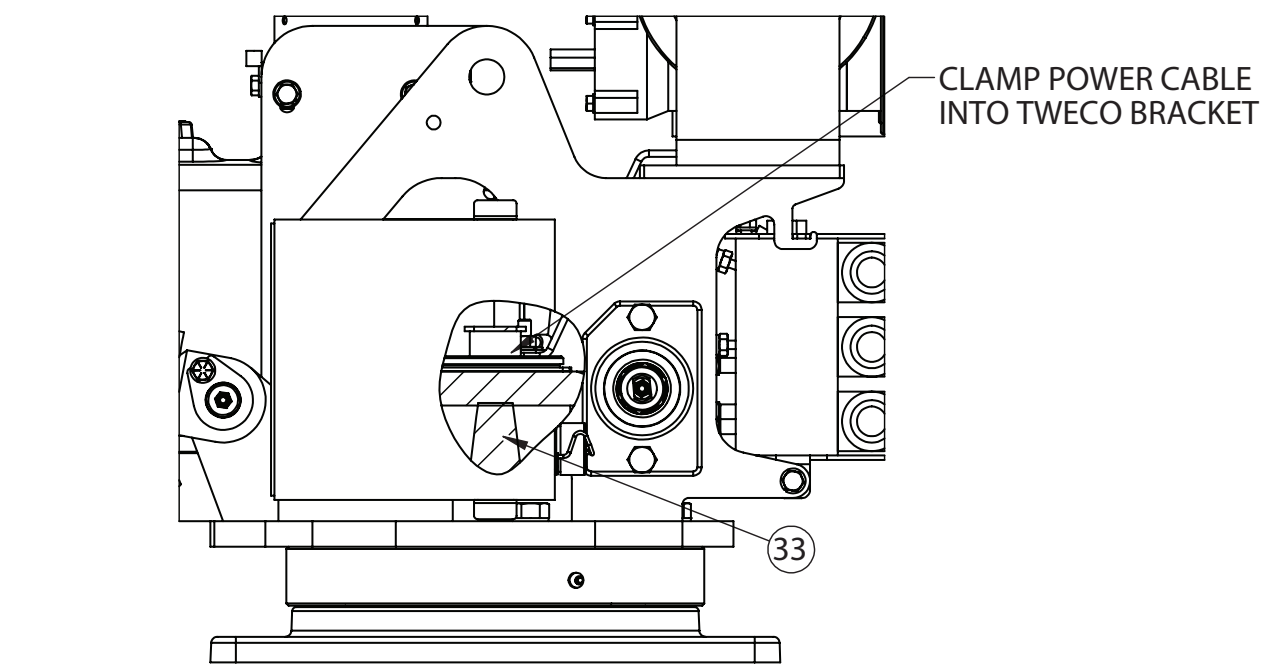
General Assembly PRFX- P/N 320990004

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	2	005604000	SCREW HX HD 1/4-20UNC X 1 LG
2	2	020200000	WASHER SP LK 1/4
3	2	021100000	WASHER SP LK 3/8
4	2	021200000	WASHER FL 3/8
5	1	239300000	ZERK, GREASE
6	1	320338002	CABLE ASS'Y, 7/32" x 62FT, THIMBLE END
7	1	320433000	TRAVELING BLOCK ASSEMBLY
8	1	320434001	PIN, 3/4 X 2-3/4LG
9	1	320824000	PIN, LIFT CYLINDER
10	1	320988004	DECAL LAYOUT, 3203
11	1	320988042	SHIP KIT, EHC-3^2, FM, CERVIS
12	1	320990100	BOOM ASSY 3203PRFX
13	1	320990200	PEDESTAL ASSEMBLY, 3203 PRFX
14	1	330371000	SCREW HX HD 3/8-16UNC X 1 LG GR8
15	1	330372000	NUT HX 3/8 NC GR5
16	2	360678000	PIN, 3/16 COTTERLESS RING
17	1	361102001	MOUNTING BRACKET, OMNEX PENDANT PLUG
18	1	361106581	RECEIVER, NON-PROPORTIONAL, CERVIS
19	1	361106582	KIT, NON-PROPORTIONAL EHC WIRELESS, CERVIS
20	1	366159000	SCREW HX HD 3/8-16UNC X 1 1/2 LG GR8
21	1	366813000	PIN HITCH
22	1	404220000	PIN WDMT BOOM/PED
23	1	663300001	CABLE TIE, 18"
24	1	680180000	HARNESS, FM, 3203PR(X)

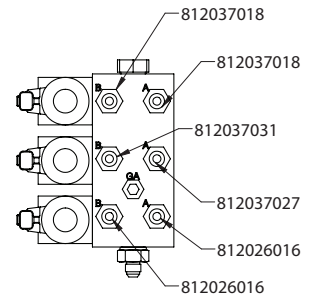
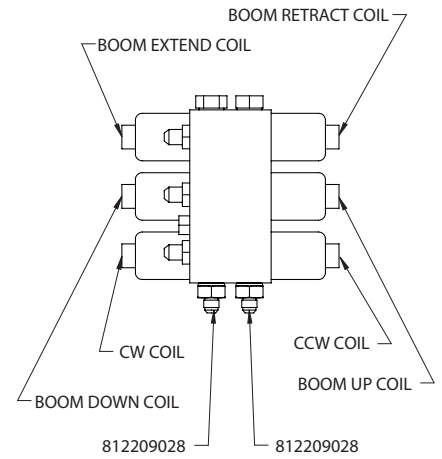
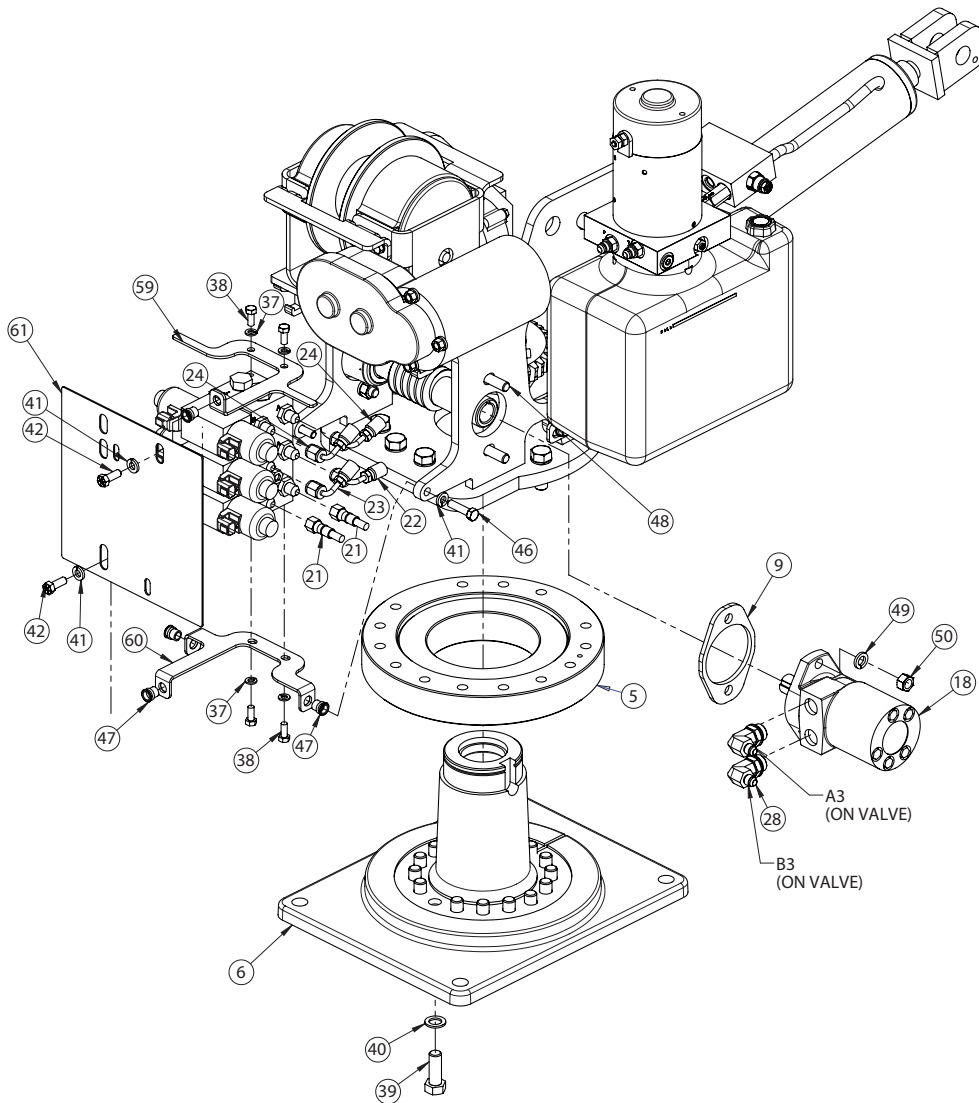
Pedestal Assembly PRFX - P/N 320990200



Pedestal Assembly PRFX - P/N 320990200



Pedestal Assembly PRFX - P/N 320990200



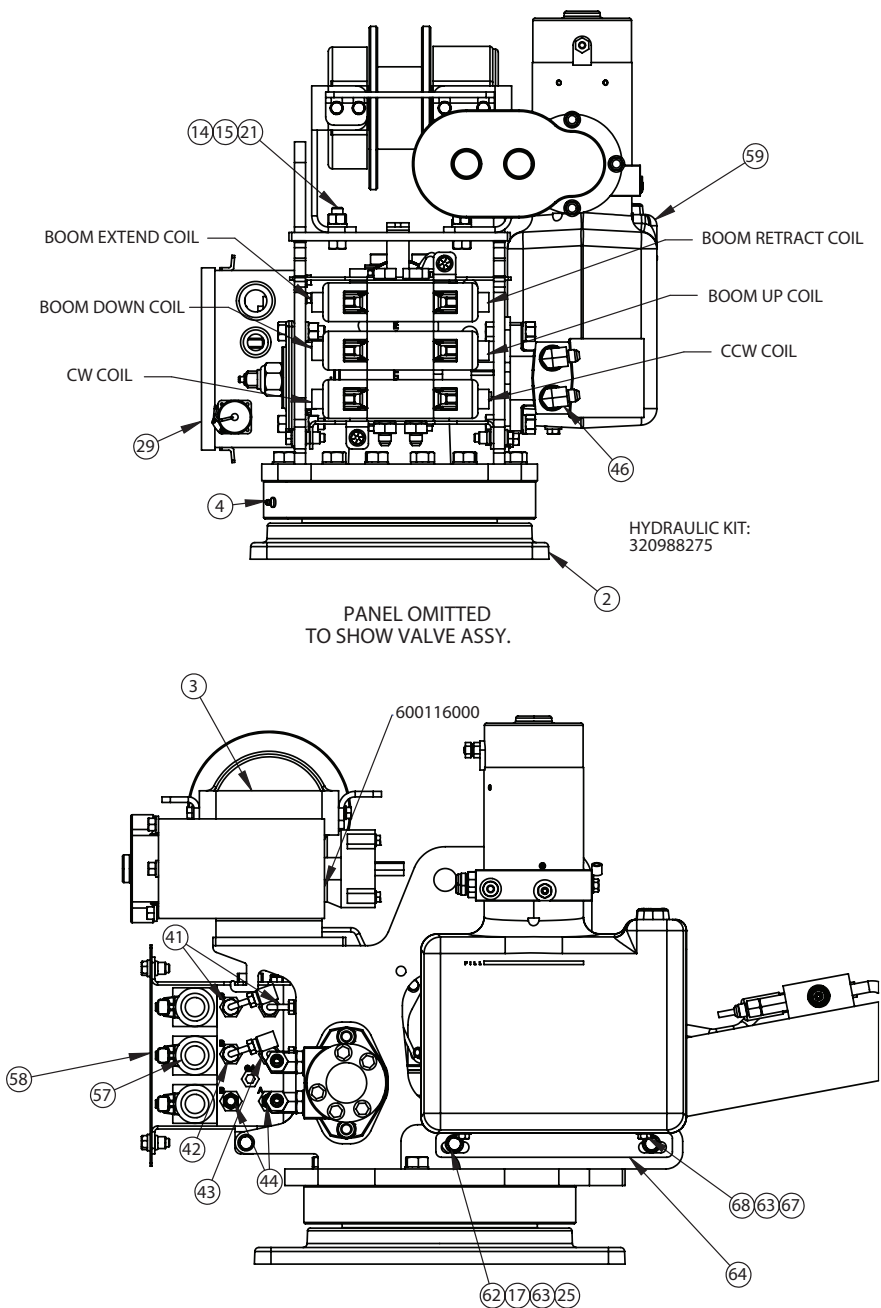
Pedestal Assembly PRFX - P/N 320990200

ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	404187000	SPRING PLATE, GROUND BRUSH, 4004
2	1	320988258	UPPER TWECO BRACKET WLDMT, 3203
3	1	320988220	PEDESTAL WELDMENT, 3203 PR / PRX / H
4	1	110703000	WINCH-DCG8R FOR AUTOCRANE #3203 PRX
5	1	320878000	ROTATION BEARING
6	1	320991237	BASE PLATE MACH 3203 LESS GROUND HOLE
7	1	340602000	KEY, 3/4 SQ X 1
8	1	320988253	GEAR, WORM, 4.00 ID, .75 KEY, 3203
9	1	320879000	SPACER ROTATION
10	1	330483000	SPACER
11	1	404015000	WORM SHAFT
12	1	404198000	SCREW HX HD 3/8-16UNC X 1 1/2 LG, BRONZE
13	1	404213000	SEAL, 2.50 OD X 1.5 ID
14	1	320858000	BEARING, SPHERICAL 1.00 ID
15	1	320824000	PIN, LIFT CYLINDER
16	1	320917000	PRESSURE SWITCH, N.C. 1,900 PSI
17	1	320845000	CYLINDER, LIFT
18	1	404241285	MOTOR, HYD 8.0 CU IN, SAE 2-BOLT 1" SHAFT
19	1	320988261	VALVE, FLOW REGULATOR, IN-LINE
20	2	812209028	HOSE ASSY, -6 HOSE, -6 JICF / -6 JICF 90DEG SHORT, 28" LONG
21	2	812026016	HOSE ASSY -4 HOSE -6 FEMALE JIC
22	1	812037027	HOSE ASSY, -6 JICF/ -6 90 DEG ELL, -4 HOSE x 27" LG
23	1	812037031	HOSE ASSY, -6 JICF/ -6 90 DEG ELL, -4 HOSE x 31" LG
24	2	812037018	HOSE ASSEMBLY, -6 JIC 90/-4 HOSE
25	1	374085000	NYLON HOSE SLEEVE
26	1	480194000	FITTING 6JIC/6JIC ELBOW 90
27	1	320988275	KIT, HYDRAULIC, 3203 PRX/ 4004
28	2	490198000	FITTING 90 10 SAE/6 JIC
29	3	200876000	FITTING STR 6 SAE/6 JIC
30	1	680156100	KIT-ELECTRICAL, 3203 PR/PRX
31	1	660116000	CABLE ASSY, 6 AWG, 16 1/4" WIRE LGTH, ø3/8 TMNL, ø5/16 TMNL
32	1	600318100	CABLE ASSY, 6 AWG, 24" WIRE LGTH, ø3/8 TMNL, ø5/16 TMNL
33	1	645000000	TWECO, MALE MODIFIED
34	1	320988300	RELAY PANEL ASSEMBLY, 3203
35	2	008702000	SCREW HX HD 3/8-16UNC X 1 1/4 LG GR5
36	4	330372000	NUT HX 3/8 NC GR5
37	4	020601000	WASHER SP LK 5/16
38	5	330252000	SCREW HX HD 5/16-18UNC X 3/4 LG GR5

Pedestal Assembly PRFX - P/N 320990200

ITEM NO.	QTY	PART NUMBER	DESCRIPTION
39	23	012198000	SCREW HX HD 5/8-11UNC X 1 3/4 LG GR8
40	23	023902000	WASHER FL 5/8 HARDENED
41	11	021100000	WASHER SP LK 3/8
42	3	330371000	SCREW HX HD 3/8-16UNC X 1 LG GR8
43	1	002900000	SCREW SET 0.25-20 X 0.25
44	4	006200000	SCREW HX HD 1/4-20UNC X 1 1/4 LG
45	1	404028000	RETAINING RING, SNAP RING
46	2	009109000	SCREW HX HD 3/8-16UNC X 1 1/2 LG
47	4	736274000	NUTSERT 3/8-16UNC X .027-.15 GRIP
48	5	011603000	SCREW HX HD 1/2-13UNC X 1 3/4 LG
49	8	021500000	WASHER, SP LK 1/2
50	8	017701000	NUT HX 1/2-13UNC
51	3	010201000	SCREW HX HD 1/2-13UNC x 1 1/2 LG
52	4	020200000	WASHER SP LK 1/4
53	2	239300000	ZERK, GREASE
54	1	360678000	PIN, 3/16 COTTERLESS RING
55	1	019000000	NUT HX NYLK 7/8-14UNF
56	1	320990310	HARNESS, WIRE, REGENERATIVE CIRCUIT, 3203PRFX
57	1	320990201	PRESSURE SWITCH, NC, 1450 PSI, 10 AMP
58	1	320989420	VALVE ASSY, 3 SPOOL, NON-PROP., 12 VOLT
59	1	320989204	UPPER VALVE BRACKET, 3203H
60	1	320989203	LOWER VALVE BRACKET, 3203H
61	1	366688000	COVER, REAR
62	1	320991317	POWER UNIT W/ PLASTIC TANK, ENTRY LEVEL3203/4004 EH LESS FILTER
63	1	330478000	BEARING HOUSING ASSY
64	2	021200000	WASHER FL 3/8
65	1	320991312	LOWER BRACKET, POWER UNIT
66	2	320991315	SPACER, UNTHREADED, 13/16" OD 7/16" ID, 7/8" LG, NYLON
67	2	320991314	HEX HEAD SCREW, 5/16" - 18 X 7/8"
68	4	320976000	WASHER, FLAT, 3/8 SAE HARDENED
69	2	009116000	SCREW HX HD 3/8-16UNC X 2 GR5

Pedestal Assembly PRX- P/N 320988203



HOSE FROM KITS	FUNCTION
812209028	PRESSURE LINE
812209028	RETURN LINE
812026016	ROTATE
812037031	LIFT CYLINDER EXT
812037027	LIFT CYLINDER RET
812037018	BOOM EXTEND/RETRACT

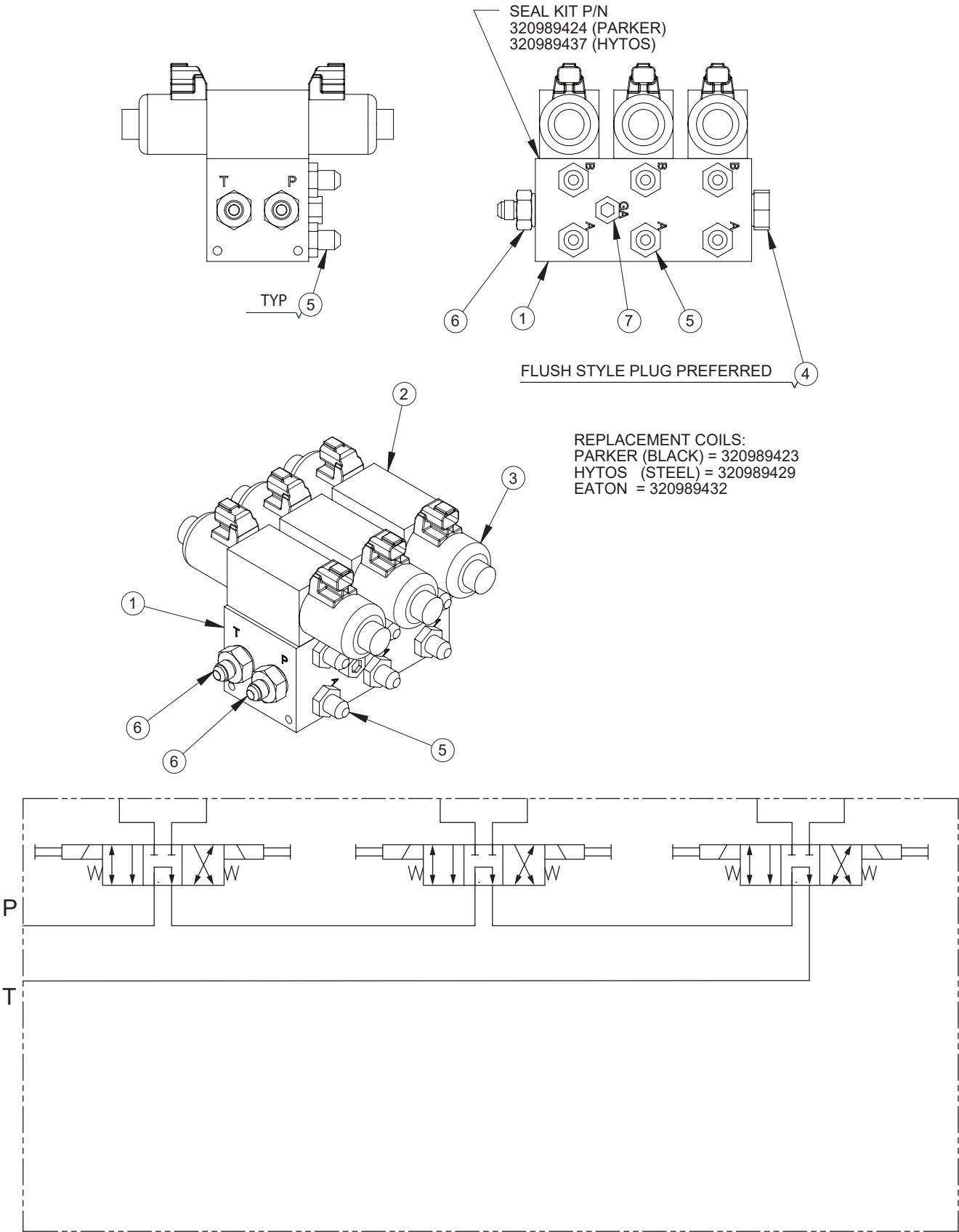
Pedestal Assembly PRX- P/N 320988203

ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	320988220	PEDESTAL WELDMENT, 3203 PR / PRX / H
2	1	320991237	BASE PLATE MACH 3203 LESS GROUND HOLE
3	1	110703000	WINCH-DCG8R FOR AUTOCRANE #3203 PRX
4	1	320878000	ROTATION BEARING
5	1	340602000	KEY, 3/4 SQ X 1
6	1	320988253	GEAR, WORM, 4.00 ID, .75 KEY, 3203
7	1	404241285	MOTOR, HYD 8.0 CU IN, SAE 2-BOLT 1" SHAFT
8	1	320879000	SPACER ROTATION
9	1	330483000	SPACER
10	1	404015000	WORM SHAFT
11	22	023902000	WASHER FL 5/8 HARDENED
12	22	012198000	SCREW HX HD 5/8-11UNC X 1 3/4 LG GR8
13	5	011603000	SCREW HX HD 1/2-13UNC X 1 3/4 LG
14	8	021500000	WASHER, SP LK 1/2
15	8	017701000	NUT HX 1/2-13UNC
16	2	009109000	SCREW HX HD 3/8-16UNC X 1 1/2 LG
17	12	021100000	WASHER SP LK 3/8
18	4	736274000	NUTSERT 3/8-16UNC X .027-.15 GRIP
19	5	330252000	SCREW HX HD 5/16-18UNC X 3/4 LG GR5
20	4	020601000	WASHER SP LK 5/16
21	3	010201000	SCREW HX HD 1/2-13UNC x 1 1/2 LG
22	4	006200000	SCREW HX HD 1/4-20UNC X 1 1/4 LG
23	4	020200000	WASHER SP LK 1/4
24	2	239300000	ZERK, GREASE
25	5	330372000	NUT HX 3/8 NC GR5
26	1	360678000	PIN, 3/16 COTTERLESS RING
27	3	330371000	SCREW HX HD 3/8-16UNC X 1 LG GR8
28	1	019000000	NUT HX NYLK 7/8-14UNF
29	REF	320988300	RELAY PANEL ASSEMBLY, 3203
30	1	320988258	UPPER TWECO BRACKET WLDMT, 3203
31	1	404187000	SPRING PLATE, GROUND BRUSH, 4004
32	1	404198000	SCREW HX HD 3/8-16UNC X 1 1/2 LG, BRONZE
33	1	404213000	SEAL, 2.50 OD X 1.5 ID
34	1	320858000	BEARING, SPHERICAL 1.00 ID
35	1	404028000	RETAINING RING, SNAP RING
36	1	320845000	CYLINDER, LIFT
37	1	320824000	PIN, LIFT CYLINDER
38	1	320917000	PRESSURE SWITCH, N.C. 1,900 PSI
39	REF	374085000	NYLON HOSE SLEEVE
40	REF	812209028	HOSE ASSY, -6 HOSE, -6 JICF / -6 JICF 90DEG SHORT, 28" LONG

Pedestal Assembly PRX- P/N 320988203

ITEM NO.	QTY	PART NUMBER	DESCRIPTION
41	REF	812037018	HOSE ASSEMBLY, -6 JIC 90/-4 HOSE
42	REF	812037031	HOSE ASSY, -6 JICF/ -6 90 DEG ELL, -4 HOSE x31" LG
43	REF	812037027	HOSE ASSY, -6 JICF/ -6 90 DEG ELL, -4 HOSE x27" LG
44	REF	812026016	HOSE ASSY -4 HOSE -6 FEMALE JIC
45	REF	200876000	FITTING STR 6 SAE/6 JIC
46	REF	490198000	FITTING 90 10 SAE/6 JIC
47	1	320988275	KIT, HYDRAULIC, 3203 PRX/ 4004
50	REF	660116000	CABLE ASSY, 6 AWG, 16 1/4" WIRE LGTH, ø3/8 TMNL, ø5/16 TMNL
51	REF	600318100	CABLE ASSY, 6 AWG, 24" WIRE LGTH, ø3/8 TMNL, ø5/16 TMNL
52	1	002900000	SCREW SET 0.25-20 X 0.25
53	REF	645000000	TWECO, MALE MODIFIED
54	1	320988261	VALVE, FLOW REGULATOR, IN-LINE
55	1	320989204	UPPER VALVE BRACKET, 3203H
56	1	320989203	LOWER VALVE BRACKET, 3203H
57	1	320989420	VALVE ASSY, 3 SPOOL, NON-PROP., 12 VOLT
58	1	366688000	COVER, REAR
59	1	320991317	POWER UNIT W/ PLASTIC TANK, ENTRY LEVEL3203/4004 EH LESS FILTER
60	1	680156100	KIT-ELECTRICAL, 3203 PR/PRX
61	1	330478000	BEARING HOUSING ASSY
62	2	330394000	SCW HX 3/8 NC X 1 1/2
63	3	021200000	WASHER FL 3/8
64	1	320991312	LOWER BRACKET, POWER UNIT
65	2	320991315	SPACER, UNTHREADED, 13/16" OD 7/16" ID, 7/8" LG, NYLON
66	2	009116000	SCREW HX HD 3/8-16UNC X 2 GR5
67	4	320976000	WASHER, FLAT, 3/8 SAE HARDENED
68	2	320991314	HEX HEAD SCREW, 5/16" - 18 X 7/8"

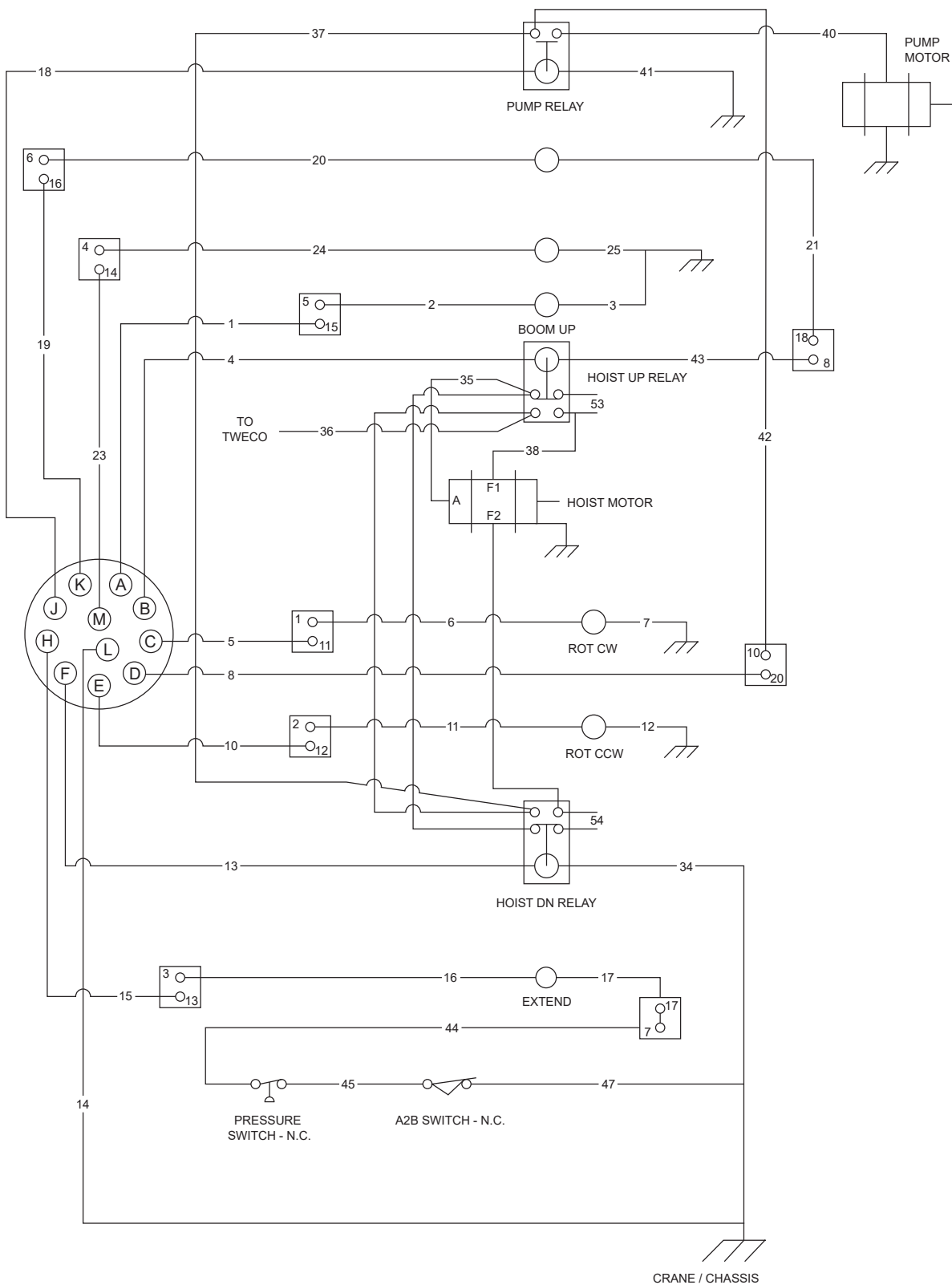
Hydraulic Control Valve - P/N 320989420



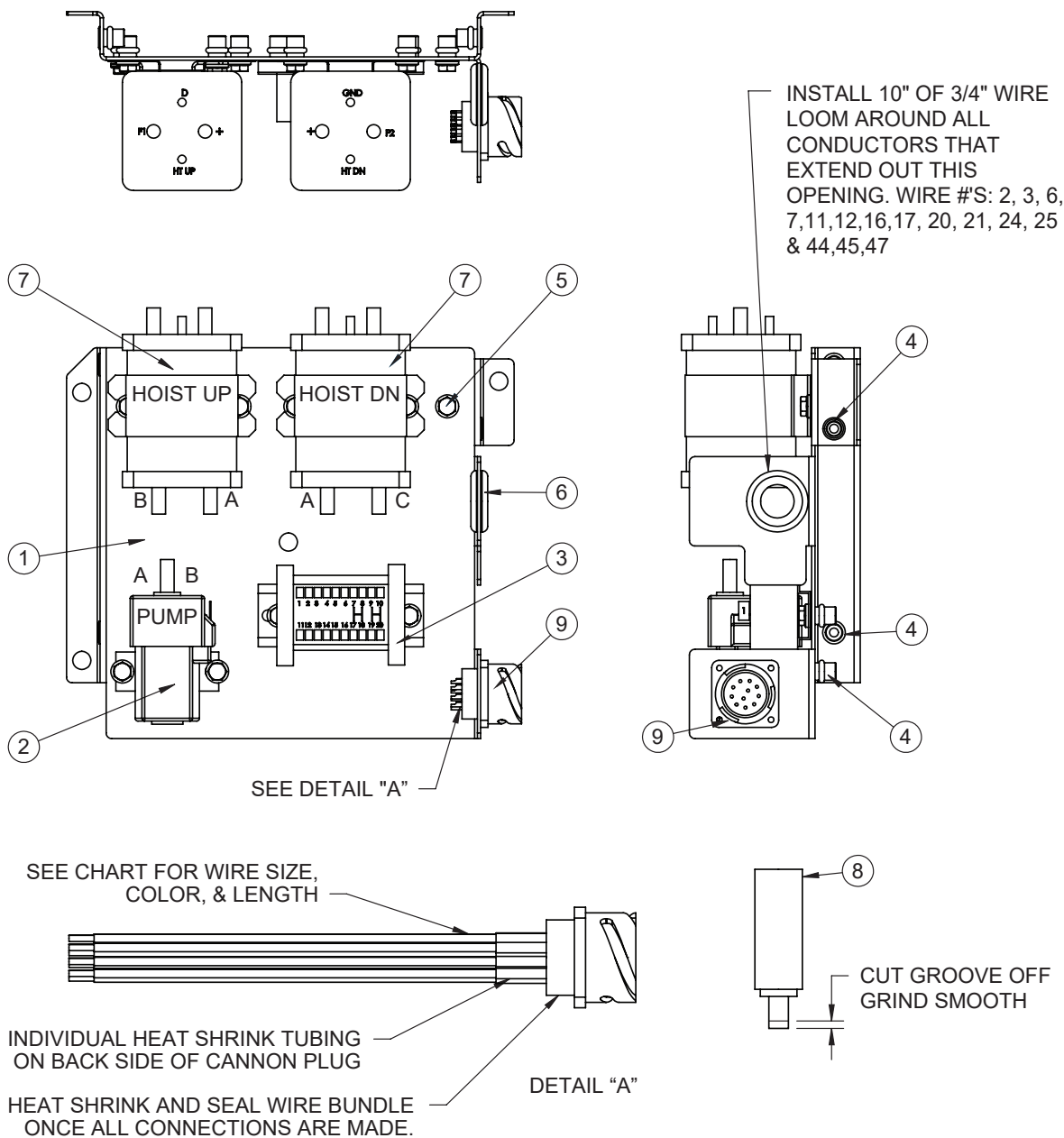
Hydraulic Control Valve - P/N 320989420

ITEM NO.	EATON QTY.	HYTOS QTY.	PARKER QTY.	AUTO CRANE PART NO.	DESCRIPTION
	1	-	-	320989430	MANIFOLD BLOCK
1	-	1	1	320989430	MANIFOLD BLOCK, DO3
	-	-	1	320989422	VALVE, DO3 STACK TYPE, PARKER
	-	3	3	320989428	VALVE, DO3 STACK TYPE, HYTOS
2	3	-	-	320989431	VALVE, DO3 STACK TYPE, EATON
	-	-	6	320989423	COIL, 12V-2.5A PARKER, FOR 320989420
	-	6	-	320989429	COIL, 12V-2.7A HYTOS, FOR 320989420
3	6	-	-	320989432	COIL, 12V-2.5A EATON, FOR 320989420
4	2	2	2	330072000	PLUG, #10 SAE
5	6	6	6	202756000	FITTING 6-8 STRAIGHT
6	2	2	2	202755000	FITTING, -10 SAE/-6 JIC, STR
7	1	1	1	751034000	PLUG, -6ORB

Relay Panel Assembly- P/N 404197001

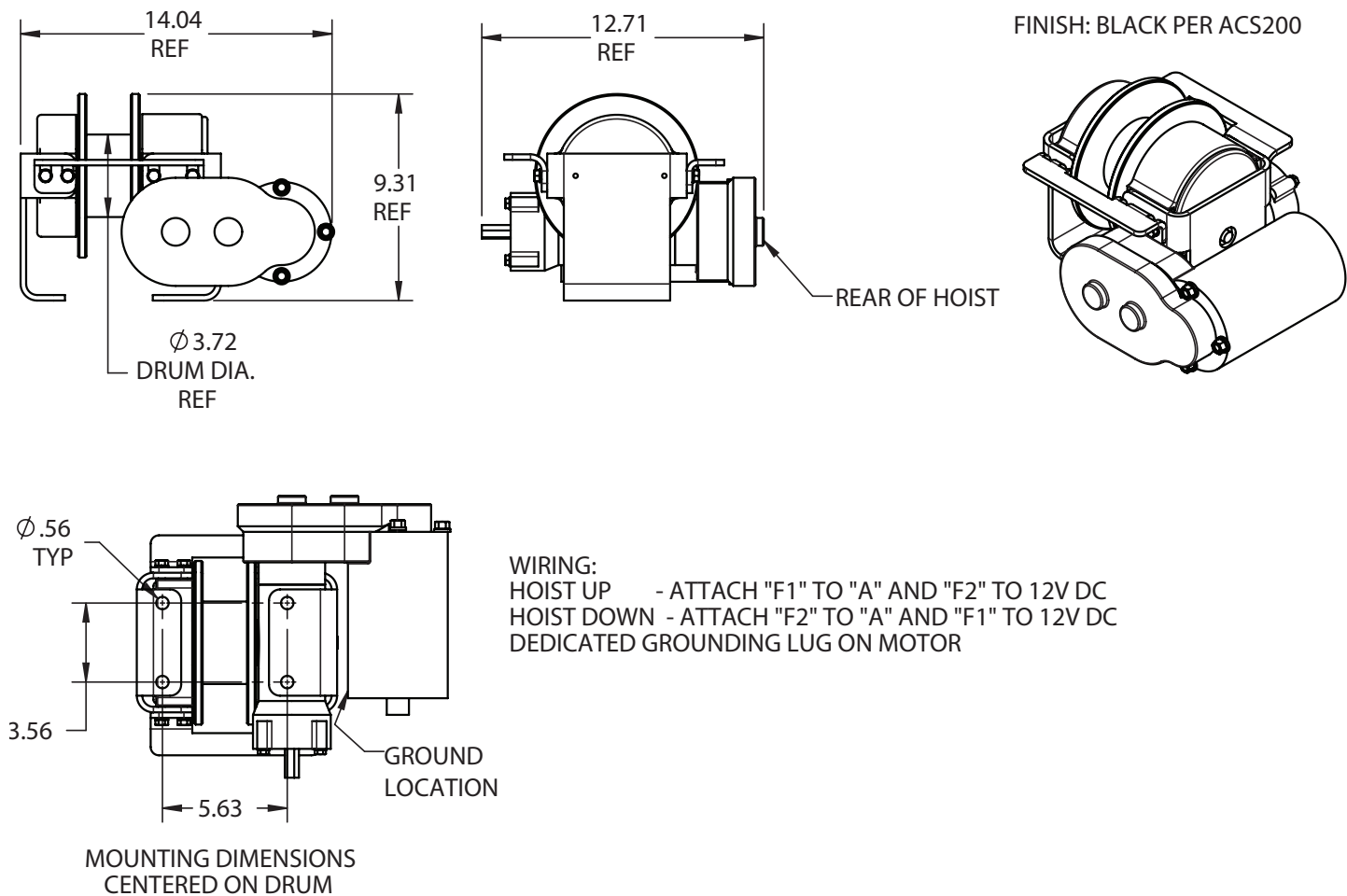


Relay Panel Assembly- P/N 404197001



ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	404203001	BRACKET, RELAY PANEL, 4004
2	1	320584000	RELAY, POWER UNIT
3	1	320803000	TERMINAL STRIP 10
4	12	736272000	NUTSERT 1/4-20UNC X .027-.165 GRIP
5	10	360493000	SCREW HX WHIZ-LK 1/4-20 UNC X 1/2 LG
6	1	371024000	GROMET 3/4" I.D.
7	2	404167000	SOLENOID, SEALED
8	1	645000000	TWECO, MALE MODIFIED
9	1	320562000	RECEPTACLE, 11 PIN BAYONET

Hoist Assembly- P/N 110703



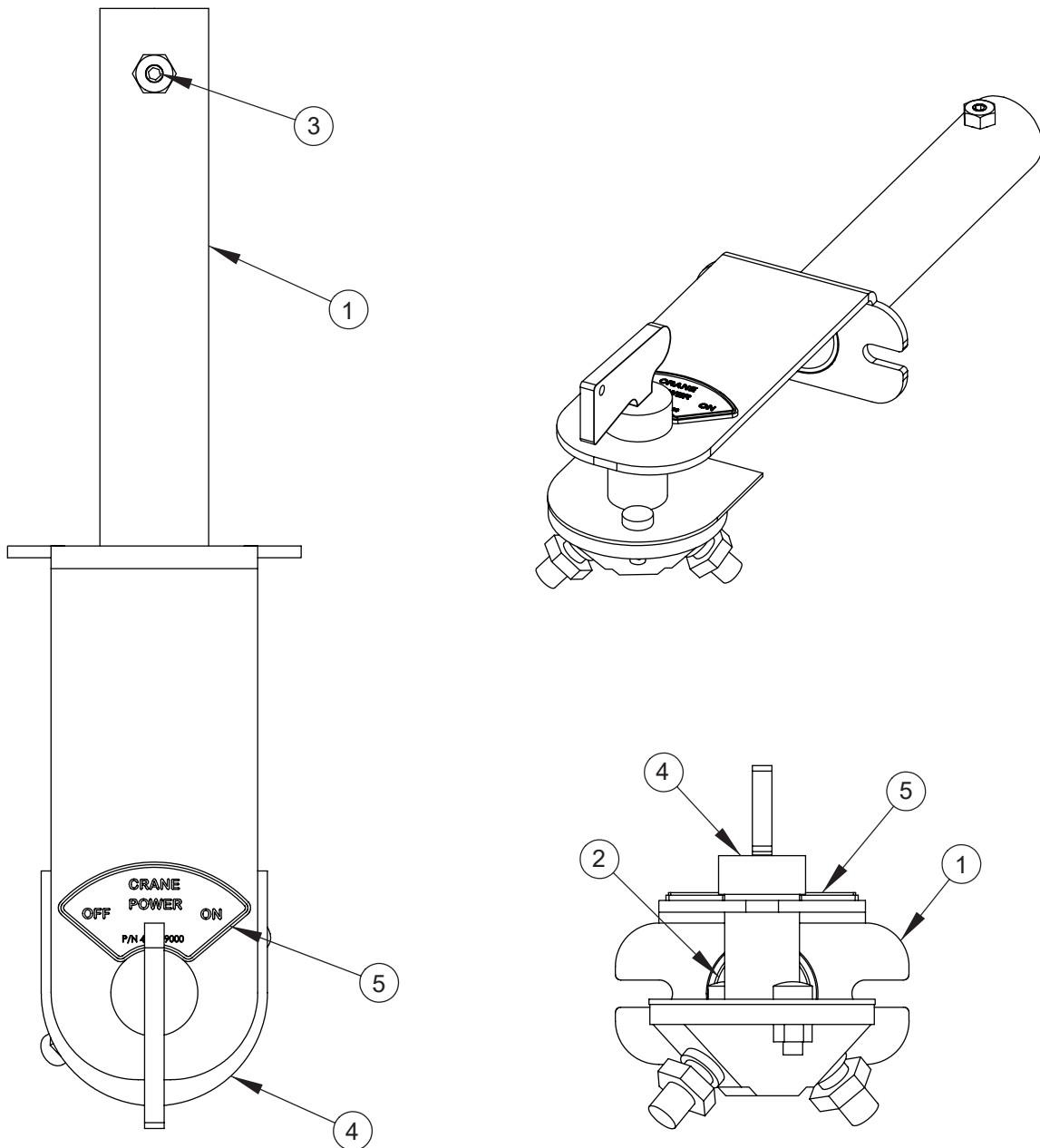
REVISIONS				
ECN#	REV	DESCRIPTION	DATE	BY
911	A	CHGD QTY P/N 320636 F:2 T:1	8/2/2005	ML
2064	B	REVISED AND REDRAWN	3/1/2012	CDS
701139	K	ADDED PERFORMANCE PARAMETERS AND GENERAL INFORMATION, MADE OVERALL DIMS REF, UPDATED REV TO MATCH ORACLE, UPDATED TITLE TO MATCH ORACLE	5/4/2023	SSC

Hoist Assembly- P/N 110703

Performance And Design Parameters

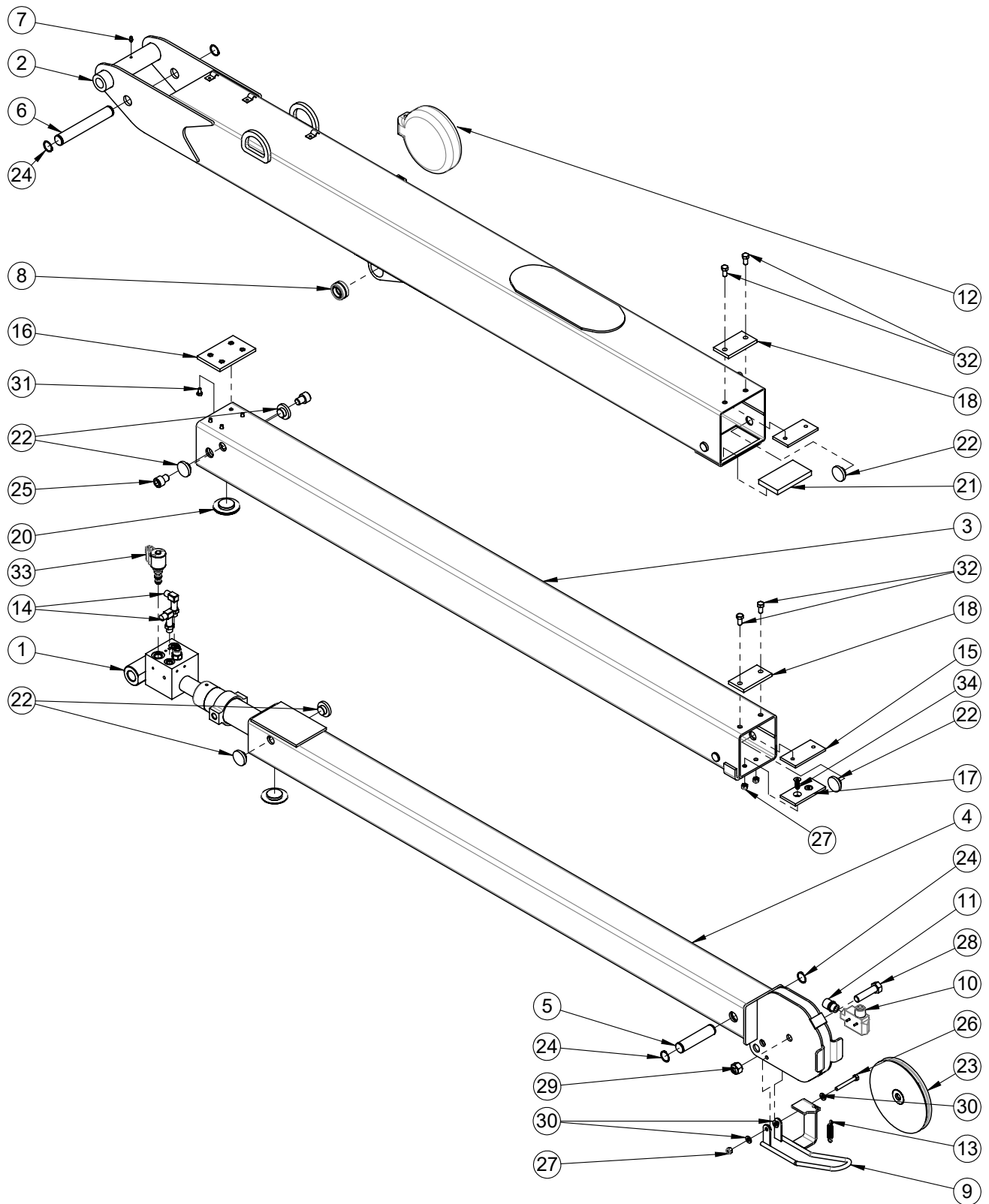
- MUST MEET ASME B30.5
- HOIST MUST LIFT MIN. OF 2000 LBS ON TOP LAYER, SINGLE LINED
- HOIST LINE SPEED: 8.6 FPM AT 1200 LBS ON TOP LAYER, 1.4 FPM (7/32" ROPE)
- MAXIMUM DRIFT: 2.4" AT TOP LAYER
- ROPE INFORMATION: MAX. 54' OF 7/32" DIAMETER, RIGHT LAY ROPE SPOOLED ON DRUM DURING OPERATION, OR 44' OF 1/4" DIAMETER (1/4" ROPE DOES NOT NEED TO MEET ASME B30.5)
- OVERWOUND
- 12 VDC
- INCLUDES TWO MOUNTING SPACERS (IF REQUIRED TO CLEAR SOLID MOUNTING SURFACE)
- MUST INCLUDE ALL COMPONENTS NECESSARY TO ATTACH ROPE TO DRUM
- MUST HAVE AUTOMATIC BRAKE CAPABLE OF SUPPORTING FULL LOAD AT ALL LAYERS
- EXPLODED VIEW WITH SERVICE PARTS AND PART NUMBERS REQUIRED

TWECO With Switch Mount - P/N 404218000



ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	404217000	LOWER TWECO WDLMT WITH SWITCH MOUNT
2	1	404224000	CABLE ASSY 11 IN, TWECO TO TERMINAL
3	1	290000000	SCREW SET 0.25-20 X 0.25
4	1	404216000	MASTER SWITCH
5	1	404219000	DECAL, CRANE POWER

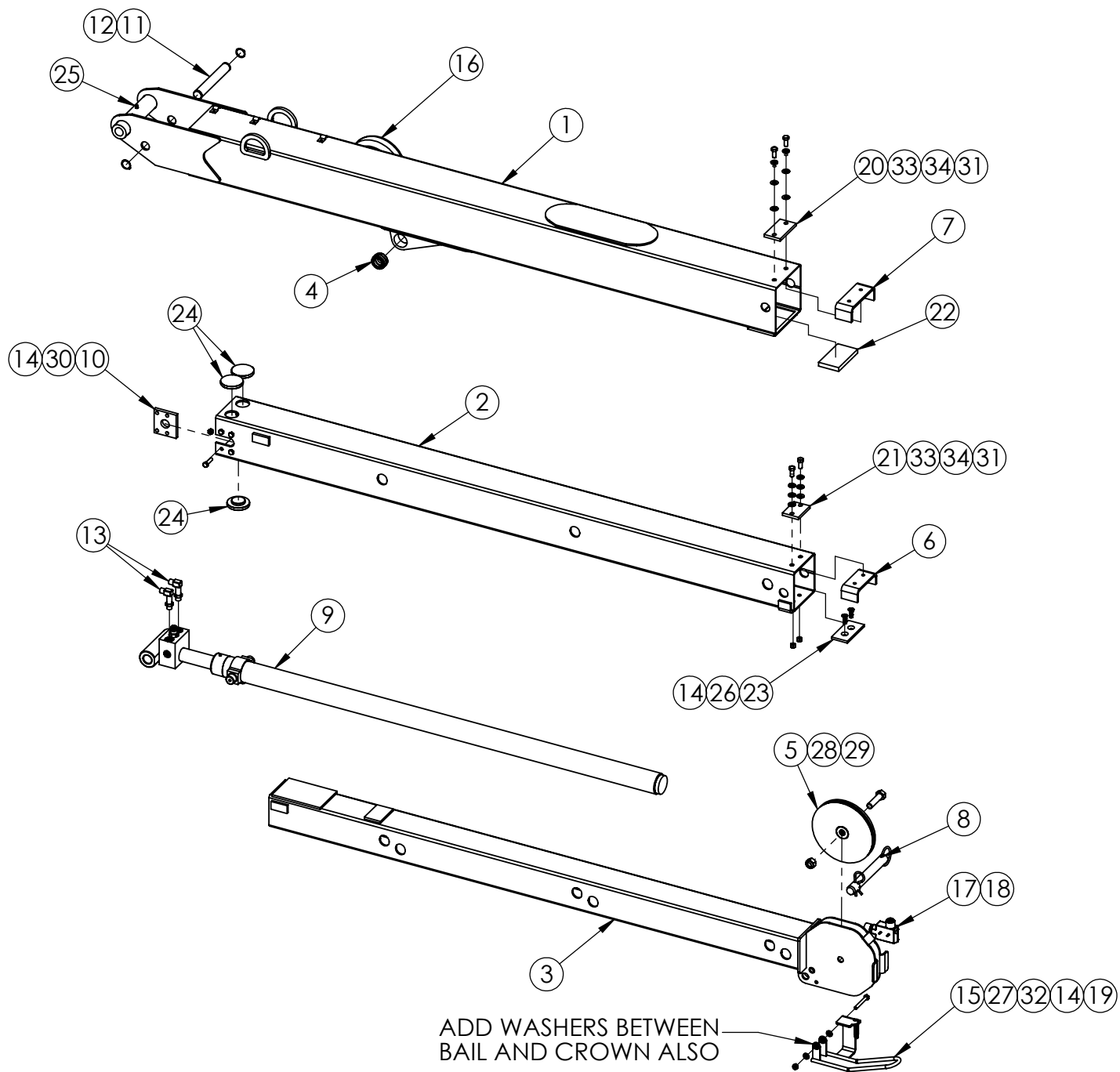
Boom Assembly PRFX - P/N 320990100



Boom Assembly PRFX - P/N 320990100

ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	320988145	CYLINDER, TELESCOPIC, 48" FIRST STAGE, 48" SECOND STAGE, 3-3/8 OD
2	1	320990110	LOWER BOOM WMT 3203 PRFX
3	1	320990120	MID BOOM WMT 3203 PRFX
4	1	320990140	UPPER BOOM WMT 3203 PRFX
5	1	738732000	PIN 1n X 4.063 LG
6	1	320988115	PIN 1 DIA X 6.905 LG, 3203
7	1	023900000	ZERK DRIVE GR
8	1	320858000	BEARING, SPHERICAL 1.00 ID
9	1	320871000	BAIL WELDMENT
10	1	646900000	SWITCH, ANTI-TWO BLOCK
11	1	642918000	CORD CONNECTOR
12	1	404205000	CORD REEL ASSY
13	1	366678000	SPRING, EXTENSION
14	2	330645000	FITTING 90 6-SAE/6-JIC LONG
15	2	366483000	PLATE, WEAR PAD .25 X 2 X 4
16	1	320988156	BOOM PAD WITH NUTS, 4.75 X 3 X .313, 3203
17	1	320990104	WEAR PAD, 2 X 4 X .25, W/ CSINK HOLES
18	2	366201000	WEAR PAD 3.75 X 2.00 X .313
19	1	470048000	PAD, BOOM 2.50 O.D. X 0.063 THICK
20	1	407202000	PAD BOOM 2.50 O.D.
21	1	320988155	BOOM PAD 4.50 X 2.50 X .50, 3203
22	8	360767000	PAD BOOM 1.5 O.D.
23	1	320883000	SHEAVE ASSEMBLY
24	4	360122000	RING RETAINING 5100-98
25	2	460177162	SCREW SOC HD 5/8-11UNC X 3/4 LG
26	1	811029000	SCREW HX HD 5/16-18UNC X 2 1/2 LG
27	3	016801000	NUT HX NYLK 5/16-18UNC CP
28	1	366393000	SCREW HX HD 5/8-11UNC X 2 1/2 LG GR8
29	1	018200000	NUT HX NY LK 5/8-11UNC
30	4	020901000	WASHER FL 5/16
31	4	005406000	SCREW HX HD 1/4-28UNF X 1/2 LG
32	4	738733000	SCREW HX HD 3/8-24UNF X 3/4 LG
33	1	320990101	VALVE, SPOOL, 3-WAY, W/ COIL & DEUTSCH CONNECTION
34	2	320990105	SCREW, FLAT HEAD, 5/16-18 UNC X 1, ZP

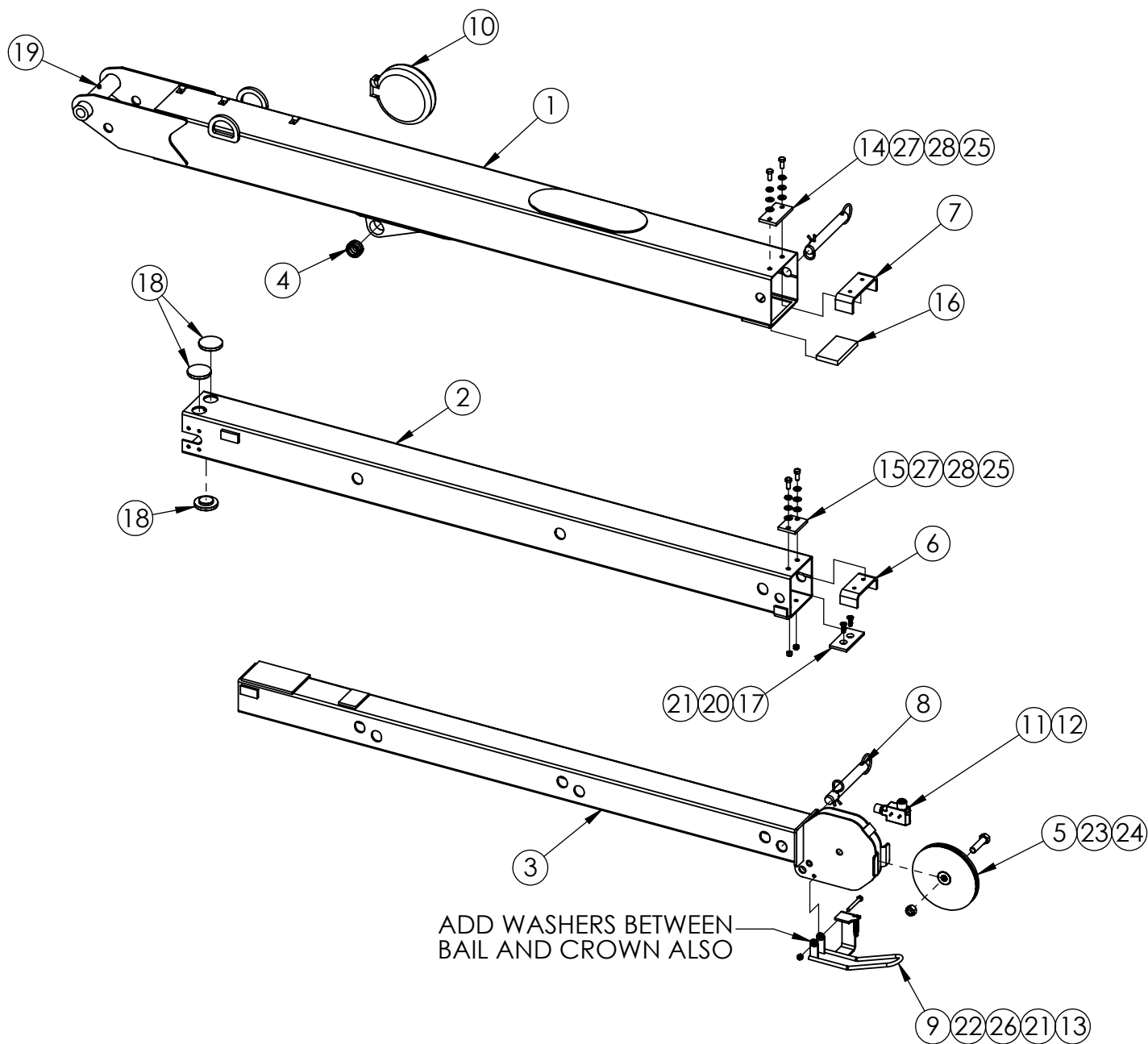
Boom Assembly PRX - P/N 320988102



Boom Assembly PRX - P/N 320988102

ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	320988110	LOWER BOOM WELDMENT, 3203 PR/PRX
2	1	320988165	MID BOOM WMT, 3203
3	1	320988160	UPPER BOOM WLDMT 3203
4	1	320858000	BEARING, SPHERICAL 1.00 ID
5	1	320883000	SHEAVE ASSEMBLY
6	1	366112000	STOP UPPER BOOM
7	1	366183000	STOP CENTER BOOM
8	1	366190000	PIN ASSY W/LANYARD
9	1	320988142	EXTENSION CYLINDER, 3203
10	2	320888001	RETAINER, EXTENSION CYLINDER
11	1	320988115	PIN 1 DIA X 6.905 LG, 3203
12	2	360122000	RING RETAINING 5100-98
13	2	330645000	FITTING 90 6-SAE/6-JIC LONG
14	11	016801000	NUT HX NYLK 5/16-18UNC CP
15	1	320871000	BAIL WELDMENT
16	1	404205000	CORD REEL ASSY
17	1	646900000	SWITCH, ANTI-TWO BLOCK
18	1	642918000	CORD CONNECTOR
19	1	366678000	SPRING, EXTENSION
20	1	366201000	WEAR PAD 3.75 X 2.00 X .313
21	1	366202000	PAD, BOOM TOP
22	1	320988155	BOOM PAD 4.50 X 2.50 X .50, 3203
23	1	320990104	WEAR PAD, 2 X 4 X .25, W/ CSINK HOLES
24	3	407203000	PAD, BOOM, 2.50 O.D. x .563 THK
25	1	239000000	ZERK DRIVE GR
26	2	320990105	SCREW, FLAT HEAD, 5/16-18 UNC X 1, ZP
27	1	811029000	SCREW HX HD 5/16-18UNC X 2 1/2 LG
28	1	366393000	SCREW HX HD 5/8-11UNC X 2 1/2 LG GR8
29	1	018200000	NUT HX NY LK 5/8-11UNC
30	8	007804000	SCREW HX HD 5/16-18UNC X 1 1/4 LG CP
31	4	738733100	SCREW HX HD 3/8-24UNF X 7/8 LG
32	4	020901000	WASHER FL 5/16
33	8	021200000	WASHER FL 3/8
34	4	021100000	WASHER SP LK 3/8

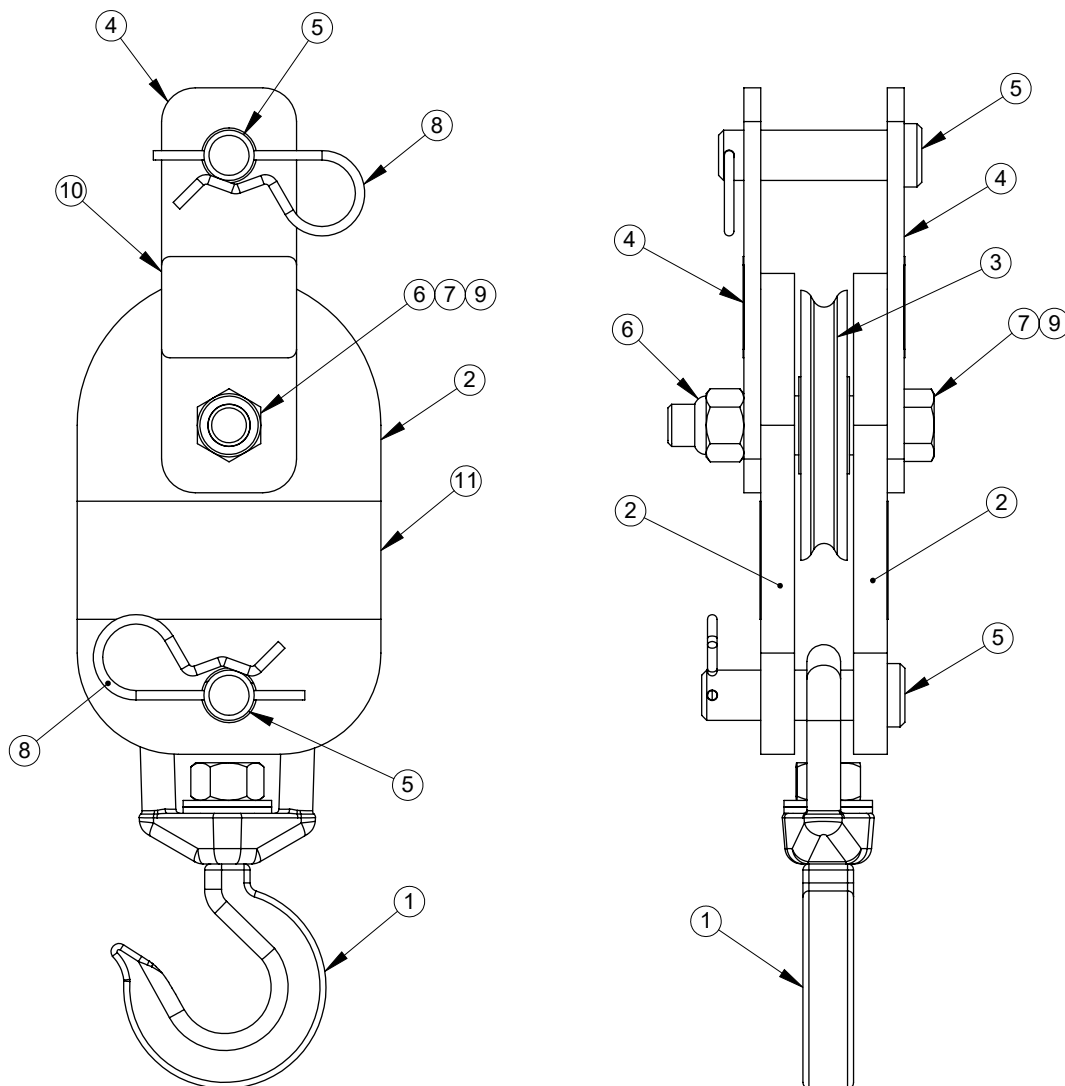
Boom Assembly PR - P/N 320988103



Boom Assembly PR - P/N 320988103

ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	320988110	LOWER BOOM WELDMENT, 3203 PR/PRX
2	1	320988165	MID BOOM WMT, 3203
3	1	320988160	UPPER BOOM WLDMT 3203
4	1	320858000	BEARING, SPHERICAL 1.00 ID
5	1	320883000	SHEAVE ASSEMBLY
6	1	366112000	STOP UPPER BOOM
7	1	366183000	STOP CENTER BOOM
8	2	366190000	PIN ASSY W/LANYARD
9	1	320871000	BAIL WELDMENT
10	1	404205000	CORD REEL ASSY
11	1	646900000	SWITCH, ANTI-TWO BLOCK
12	1	642918000	CORD CONNECTOR
13	1	366678000	SPRING, EXTENSION
14	1	366201000	WEAR PAD 3.75 X 2.00 X .313
15	1	366202000	PAD, BOOM TOP
16	1	320988155	BOOM PAD 4.50 X 2.50 X .50, 3203
17	1	320990104	WEAR PAD, 2 X 4 X .25, W/ CSINK HOLES
18	3	407203000	PAD, BOOM, 2.50 O.D. x .563 THK
19	1	239000000	ZERK DRIVE GR
20	2	320990105	SCREW, FLAT HEAD, 5/16-18 UNC X 1, ZP
21	3	016801000	NUT HX NYLK 5/16-18UNC CP
22	1	811029000	SCREW HX HD 5/16-18UNC X 2 1/2 LG
23	1	366393000	SCREW HX HD 5/8-11UNC X 2 1/2 LG GR8
24	1	018200000	NUT HX NY LK 5/8-11UNC
25	4	738733100	SCREW HX HD 3/8-24UNF X 7/8 LG
26	4	020901000	WASHER FL 5/16
27	8	021200000	WASHER FL 3/8
28	4	021100000	WASHER SP LK 3/8

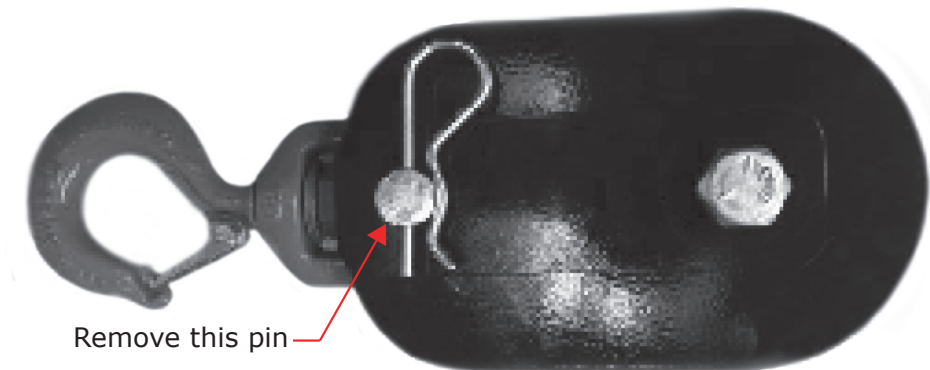
Travelling Block Assembly - P/N 320433000



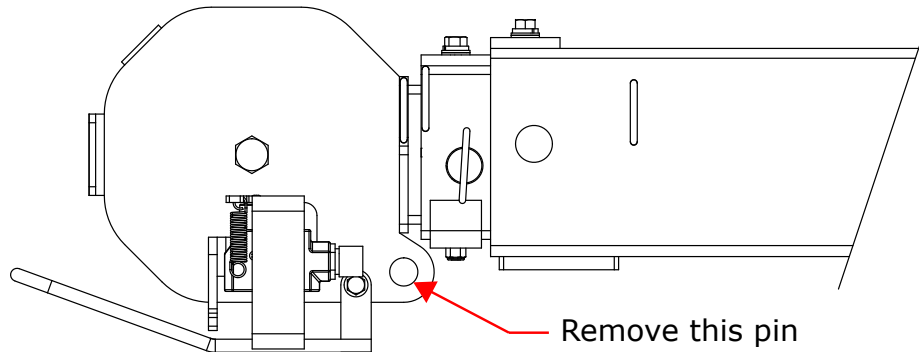
ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	100309000	SWIVEL HOOK ASSY W/LATCH
2	2	320403000	SIDE PLATE, 3203
3	1	200909000	SHEAVE ASSEMBLY
4	2	320404000	BLOCK TRAVELING
5	2	320434001	PIN, 3/4 X 2-3/4LG
6	1	018200000	NUT HX NY LK 5/8-11UNC
7	1	013512000	SCREW HX HD 5/8-11UNC X 3 1/2 LG
8	2	366813000	PIN HITCH
9	2	330100000	WASHER, FL 5/8 X 7/8 OD
10	2	320433100	DECAL, TRAVELING BLOCK 3203
11	2	040518000	DECAL STAY CLEAR OF LOAD

Travelling Block Single Line Conversion

Remove hook from traveling block by removing pin.

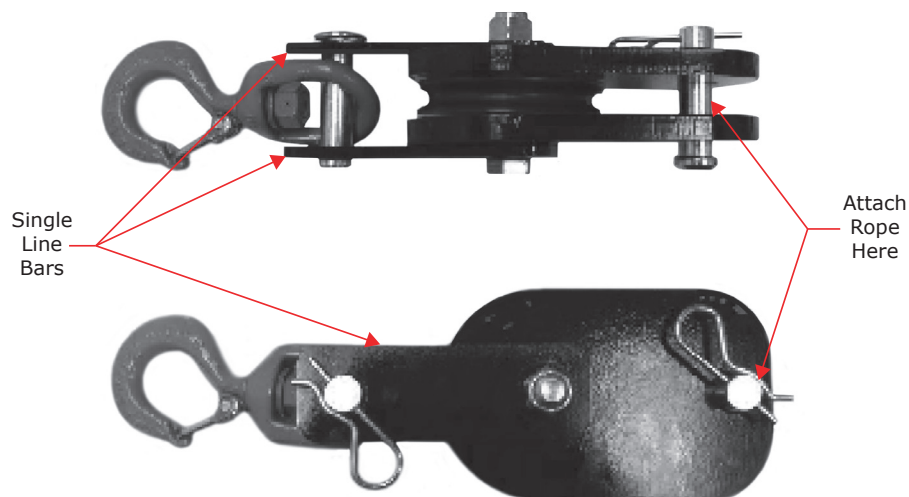


Remove traveling block from rope.
Disconnect the rope from the crown by removing pin.



Pivot single line bars 180 degrees then attach hook to the bars using the pin removed in Step 1.
Attach the rope to the traveling block side plates using the pin removed in Step 3.

Reference pictures below for proper configuration.



AUTO CRANE NEW CRANES LIMITED WARRANTY

1.1 **Scope of Warranty Coverage.** Upon the terms and subject to the conditions set forth in this limited warranty:

(a) AUTO CRANE (referred to herein as "**AUTO CRANE**" or the "**Manufacturer**") warrants to each initial end user customer (a "**Purchaser**") of a new crane together with any accessories manufactured and sold directly from AUTO CRANE (the "**Product**") that the Product shall be free from defects in material and workmanship, under normal working and service conditions, for a period of eighteen (18) months from the date the Product is shipped from AUTO CRANE. (the "**Warranty Term**"). A Purchaser shall be eligible for an additional eighteen (18) months of coverage in addition to the Warranty Term (also referred to as the "**Standard (+) PLUS benefit**") only if the Purchaser (i) complies with Section 1.2(a) and (ii) registers the Product during the Warranty Term at myproduct.autocrane.com.

(b) Notwithstanding the foregoing, this warranty does not cover components damaged by accident, abuse, misuse, neglect, untrained operators, collision, overloading, modification, disassembly, rework, misapplication, improper installation, lack of lubrication or maintenance, or improper service. This warranty does not cover the paint or material finish, removal or reinstallation of the crane or components, or normal wear and tear and loss of functionality due to aging of the Product (which may include but is not limited to bearings, bushings, seals, O-rings, gaskets, brake material, motor brushes, electrical cables and more).

1.2 **Eligibility of Warranty Coverage.**

(a) A Purchaser shall be eligible for warranty coverage under this Limited Warranty during the Warranty Term only if:

(i) Prior to placing a Product in service, and throughout use of the Product during the Warranty Term, the Purchaser provides (or causes to be provided) proper storage such that foreign objects (e.g. rain or debris) cannot enter any Product through entry ports which are normally closed during operation.; and

(ii) The Purchaser maintains, or causes to be maintained, the Product according to commercially reasonable standards and utilizes the Product for the purposes for which it was created; and

(iii) No repairs or alterations have been made by any party other than AUTO CRANE, including Purchaser, unless otherwise authorized in writing by AUTO CRANE.

1.3 **Transferability of Warranty.**

(a) This warranty is transferable only from the Purchaser to the first subsequent transferee (the "**Transferee**") of the Product from Purchaser upon (i) written notification to AUTO CRANE and (ii) registration of the transfer, both within 30 days of such Product transfer.

(b) Upon satisfaction of transfer requirements set forth in Section 1.3(a), the Transferee shall succeed to all the rights and obligations of the Purchaser set forth in this Limited Warranty.

1.4 **Certain Limitations on Scope of Warranty Service.**

(a) Any obligation of AUTO CRANE under this warranty, statutory or otherwise, is limited to the repair of the Product, at its factory or Authorized Service Centers. Notwithstanding the foregoing, if field service or repair is performed by AUTO CRANE at the request of the Purchaser and no defect is found with material or workmanship of the Product, the Purchaser shall compensate AUTO CRANE for its time and expenses within thirty (30) days of delivery of an invoice relating to the same. If repair is determined by AUTO CRANE in its sole, absolute and uncontrolled discretion to be impossible or impractical, then AUTO CRANE may satisfy this warranty by replacing the Product. AUTO CRANE will not provide any cash payment or credits for defective materials or workmanship.

(b) Purchaser shall be responsible for any and all freight charges for any Product receiving warranty service under this limited warranty. Any travel time, transportation charges, freight charges, or similar costs incurred by AUTO CRANE in connection with the replacement or repair of defective parts, shall, be the responsibility of the Purchaser. If applicable, AUTO CRANE shall invoice Purchaser for the total amount of such charges within sixty (60) days of fulfilling its duties under this warranty, payable within thirty (30) days of delivery of such invoice. In no event shall AUTO CRANE be liable for bills for service, labor or other expenses that have been incurred by the Purchaser without approval or prior authorization by AUTO CRANE for inspection, maintenance, or repair of the Product.

(c) If a Product is found to be operable upon inspection, the Product, at Purchaser's election, may be either (1) returned to the Purchaser with a service charge from AUTO CRANE for inspection, cleaning, and routine replacement of all rubber components and any other parts that show wear; or (2) AUTO CRANE can dispose of the product safely.

1.5 Limitations of Liability. AUTO CRANE shall in no event be liable for punitive, special or consequential damages relating to the Product or this Warranty. AUTO CRANE makes no warranty in respect to third-party accessories, upgrades, or additions to the Product.

1.6 Improving Product. AUTO CRANE reserves the right to improve the Product through changes in design or materials as it may deem desirable or necessary without being obligated to incorporate, upgrade, or otherwise modify previously manufactured products.

1.7 Limitations of Warranty.

(a) THE WARRANTY SET FORTH ABOVE IS THE ONLY EXPRESS WARRANTY. AUTO CRANE HEREBY DISCLAIMS AND EXCLUDES ANY OTHER EXPRESS, IMPLIED, OR STATUTORY WARRANTIES, ARISING BY OPERATION OF LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE, OF TRADE, OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND INTELLECTUAL PROPERTY RIGHTS OF A THIRD PARTY.

(b) ANY IMPLIED WARRANTY WHICH BY LAW MAY NOT BE EXCLUDED IS LIMITED IN DURATION TO ONE (1) YEAR FROM THE DATE OF ORIGINAL RETAIL PURCHASE OF THE PRODUCT.

(c) This warranty gives you specific legal rights, and you may also have other rights which vary from jurisdiction to jurisdiction.

(d) This warranty is valid only in the U.S.A. and Canada. For warranty outside the U.S.A. and Canada contact your nearest AUTO CRANE Distributor.

1.8 No Modifications to Warranty. No AUTO CRANE dealer, distributor, agent or employee is authorized to make any modification, extension or addition to this warranty.

1.9 How to Apply for Warranty Coverage.

All claims are handled by contacting your nearest Auto Crane Dealer. For questions, please contact customer support: accustomersupport@ramseyindustries.com.

Visit [Dealer Locator - Auto Crane](#) for Auto Crane Dealer locations and contact information.

Additional warranty, service support, product information, and parts information can be found on www.autocrane.com.

