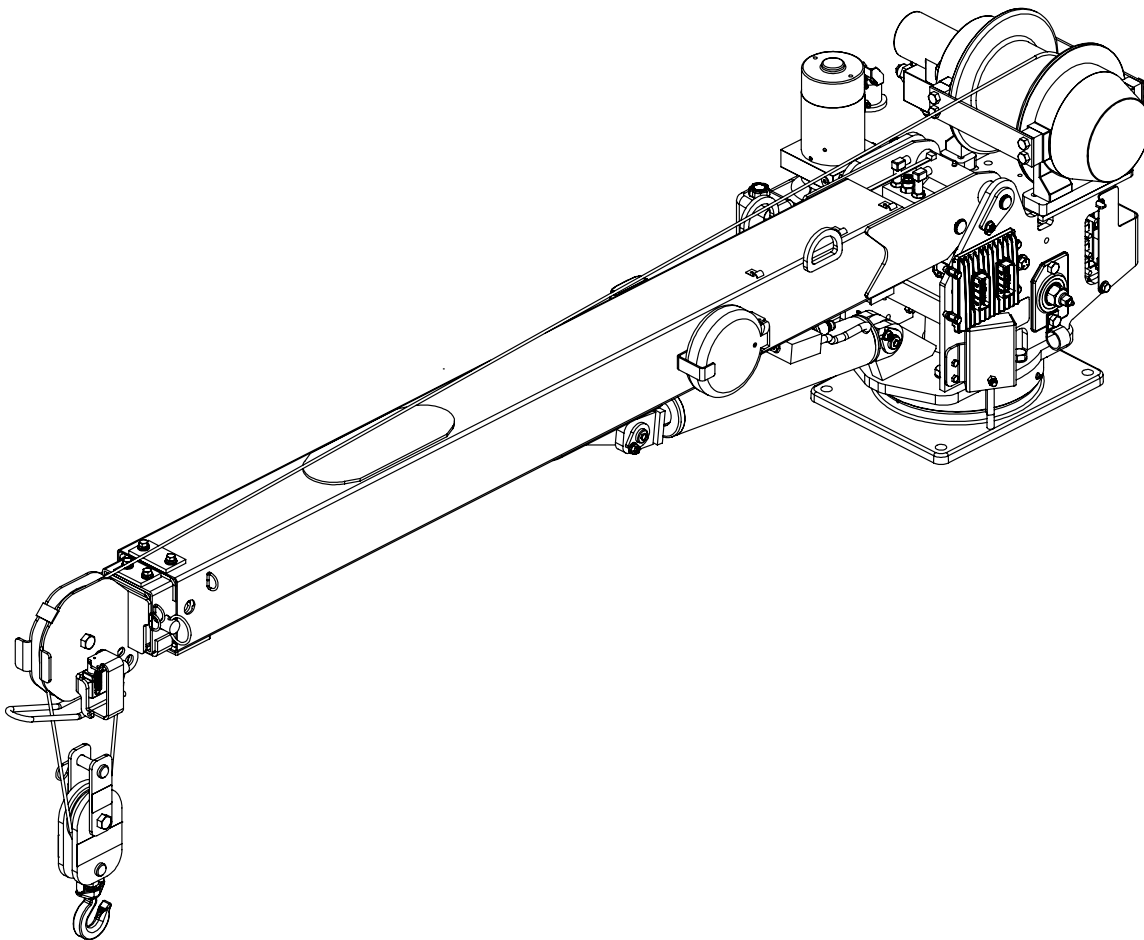




OWNER'S MANUAL EHC-3.2 NEXSTAR



990800002-0526-D

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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.

Introduction

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: 7 ft 4 in. (4.68 m), stored length.
- Weight: 847 lb (384 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) of 7/32" in. (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
- 210,600 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

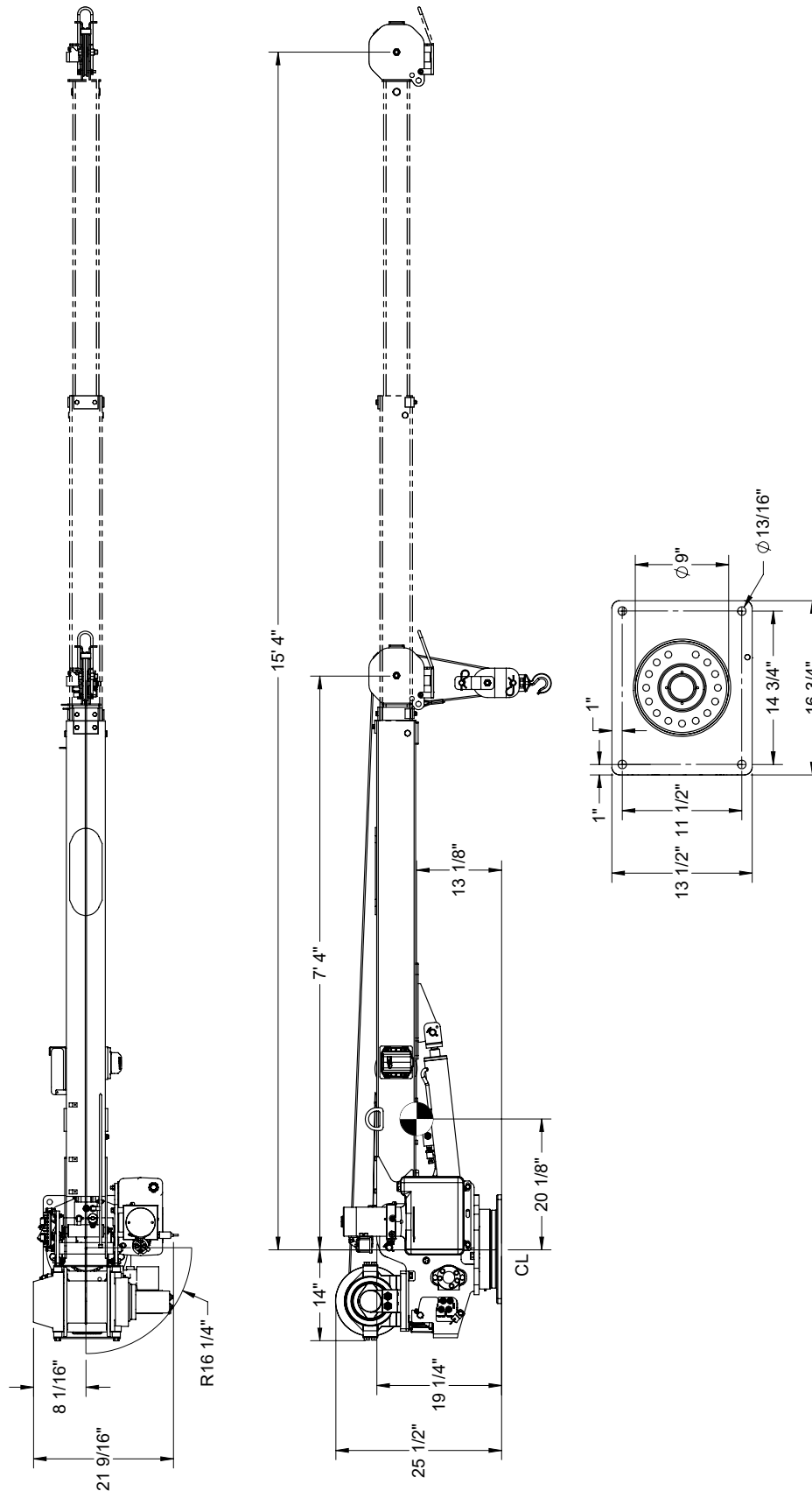
Electrical System Requirements

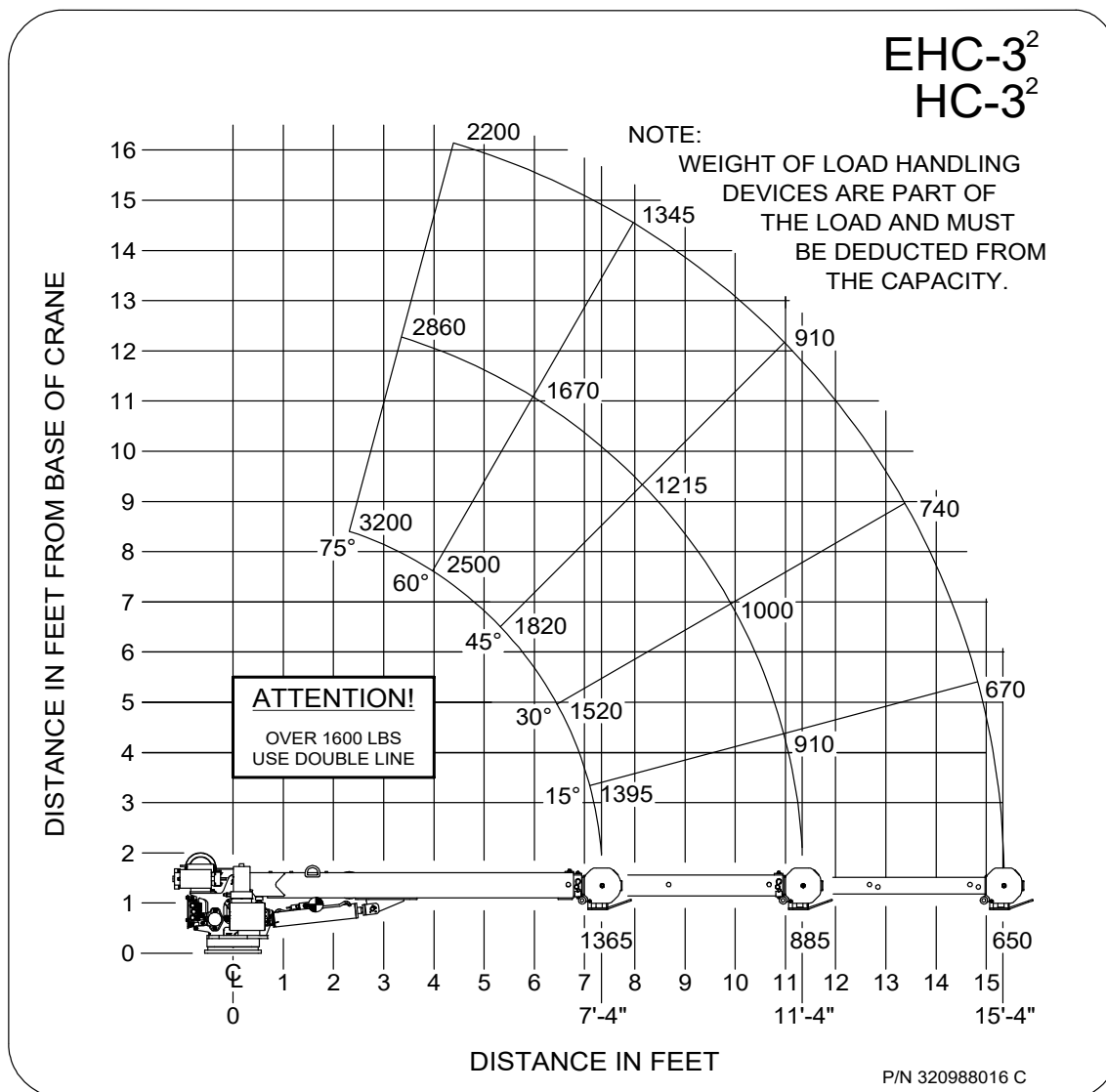
- Voltage: 12 VDC
- Alternator: 165 amps minimum
- Battery: 130 minute reserve capacity minimum. Maintenance Type battery
An auxiliary battery may be installed to augment battery capacity.

Rotation

- 370° range

General Dimensions





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 of 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.

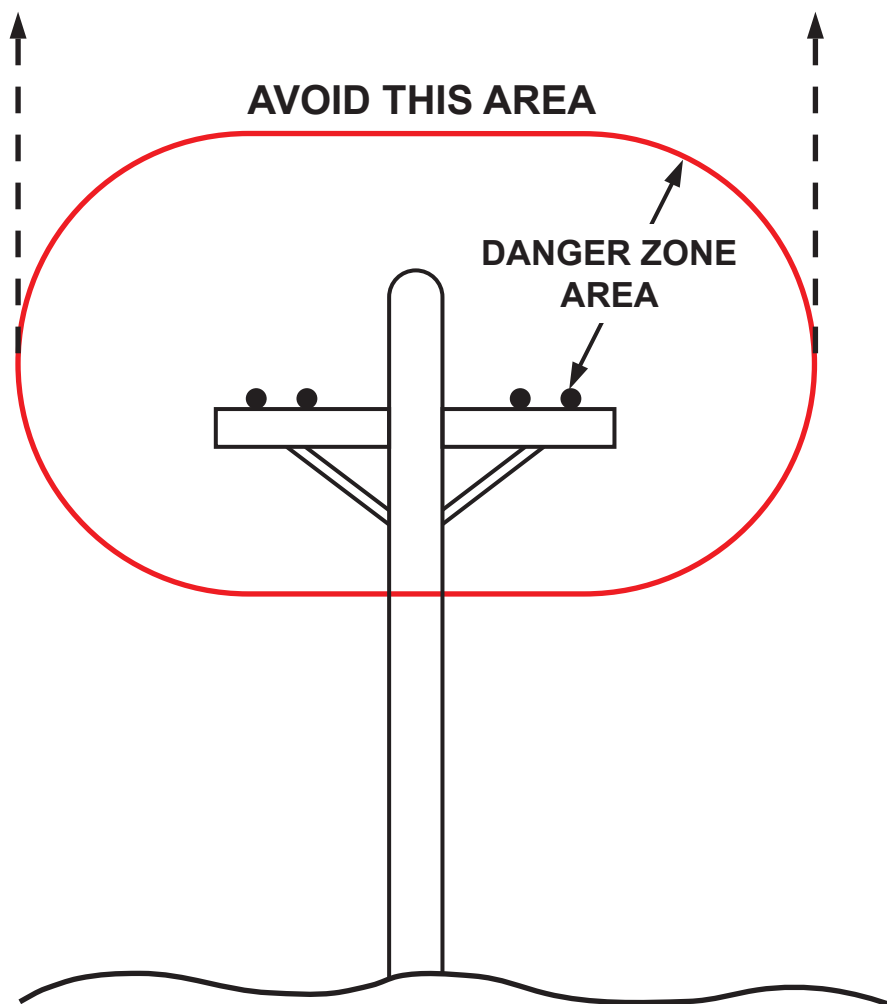
Qualifications and Operating Practices

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 the 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.

NexStar Operation

This section describes the general operation for cranes with the NEXSTAR 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

After powering on the remote control, the LCD display screen turns on and will perform a self-test. During the self-test, the NexStar remote control scans for any switches, buttons, triggers that are in the OFF position. If any switches, buttons, or triggers are on, the "E002 ACTIVITY" failure displays on the display screen and the remote control powers down.

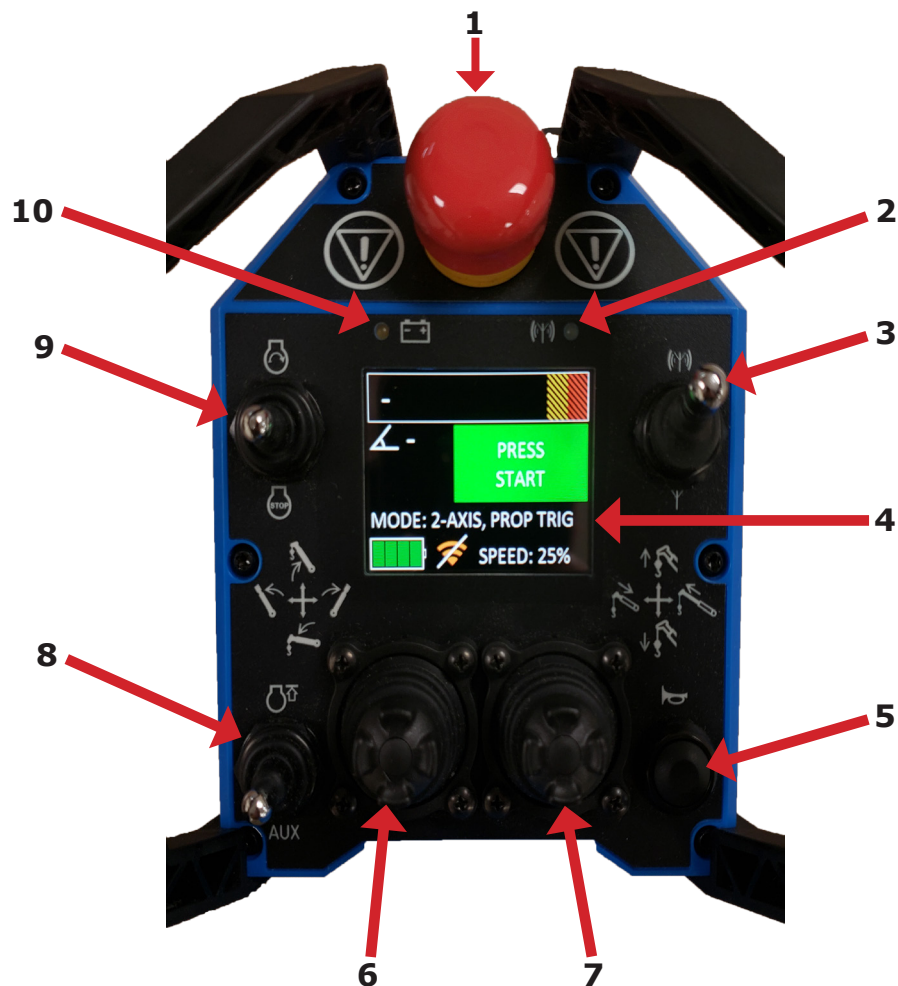
After a successful self-test, the NexStar remote control will enter the Normal Operating Mode.

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.

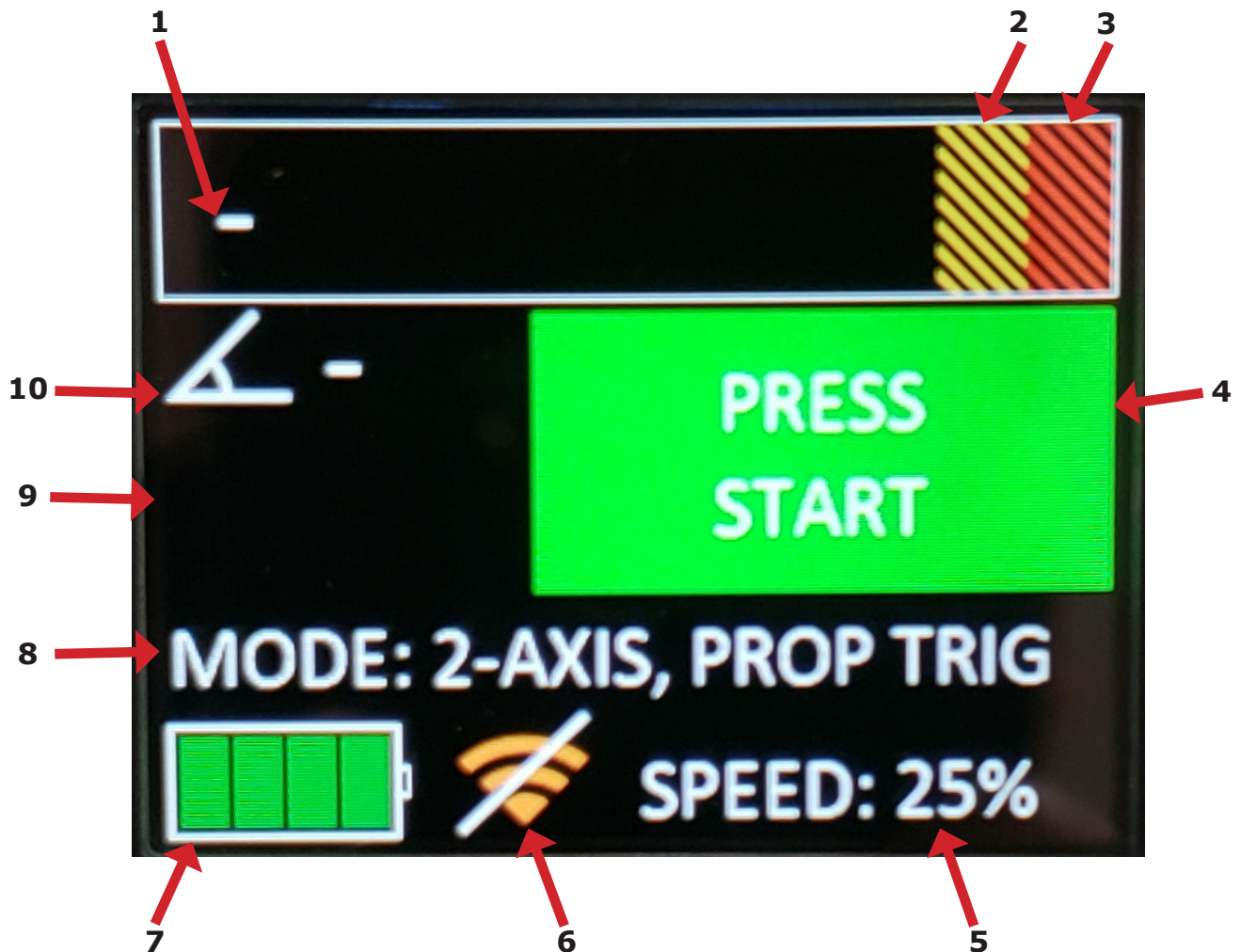
Remote Control Layout



- 1. Emergency Stop** - Push to activate, pull to release, then cycle remote power to reset. When activated, E-Stop stops all outputs from receiver.
- 2. Link LED** - Off during normal operation. Solid yellow if offline, slow flash if remote battery is low.
- 3. On/Off Switch** - Turns remote on and off. Pull locking lever out prior to lever up (On) or down (Off).
- 4. Display Screen** - LED screen that displays many crane operating parameters, codes, and functions.
- 5. Horn/Start Button** - Used to activate horn once remote is linked, used to link remote to receiver.
- 6. Right Joystick** - Press the joystick up to raise the hook. Press the joystick down to lower the hook. Press the joystick right to extend the boom. Press the joystick left to retract the boom.
- 7. Left Joystick** - Press the joystick up to raise the boom. Press the joystick down to lower the boom. Press the joystick right to rotate the crane clockwise. Press the joystick left to rotate the crane counterclockwise.
- 8. High Idle/Aux Switch** - Press the switch up to activate vehicle high idle. Press the switch up once more to deactivate vehicle high idle. Press the switch down to activate an optional feature (air compressor, etc.). Press the switch down once again to deactivate the optional feature.
- 9. Engine Start/Engine Stop Switch** - Press the switch up to start the vehicle engine. Press the switch down to turn off the vehicle engine.
- 10. Battery LED** - Solid green if online, slow flash if remote battery is low.

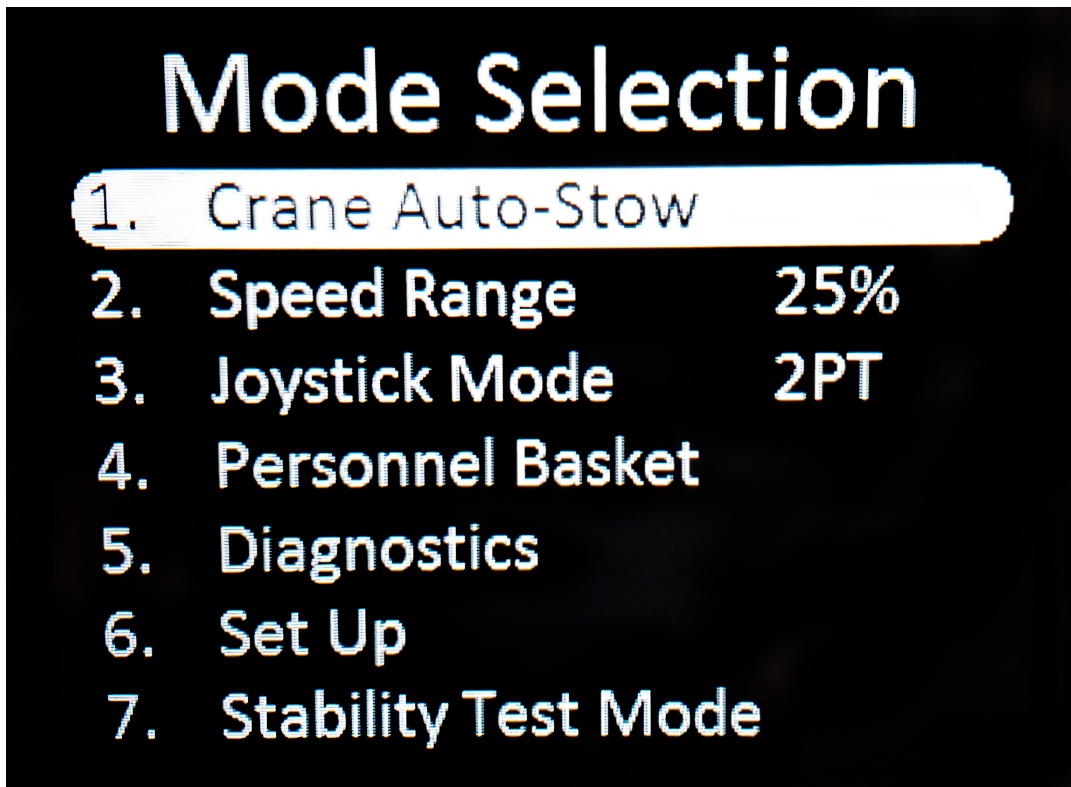
NexStar Operation

Display Screen Layout



1. **Load Ribbon** - Displays current crane load as a percentage of total capacity. Ribbon will be green between 0% and 90% capacity. The value displayed when the crane is unloaded may be higher than 0% due to the weight of the boom.
2. **90% Load** - Between 90% and 100% load ribbon will display yellow indicating crane is nearing full capacity.
3. **100% Load** - Will display red if load meets or exceeds 100% of crane capacity.
4. **Info-Box** - Will display green with text upon start-up. Once the Horn/Start button has been pressed and remote is linked with receiver, it will display green with no text. Any alarms or warnings will be displayed here. Box will be red with no text if there is no link between the remote and receiver.
5. **Speed Setting** - Displays current maximum crane operation speed setting.
6. **Transmitter Icon** - Will have line through if no link is present. Will display cord if remote is tethered.
7. **Battery Level** - Will display remaining transmitter battery in increments of 25%.
8. **Joystick Mode** - Displays current control configuration selected.
9. **High Idle/Aux** - Displays respective icon if High Idle and/or Aux has been activated.
10. **Boom Angle** - Displays the current boom angle in degrees.

Menu Screen Layout



To enter the menu screen, first fully depress and hold the trigger, then press the Engine Start/Stop switch down to Engine Stop and then release the trigger. The screen above will be displayed. The left joystick is used to navigate through the menu. To enter into the Diagnostics and Set Up sub menus, highlight them and depress the trigger. To back out of the menu(s), Engine Start/Stop switch down to Engine Stop (unless directed otherwise via on-screen instructions).

1. **Crane Auto-Stow** – Automatically stows the crane back to home position. Reference Auto Stow section in NexStar Operation.
2. **Maximum Speed Setting** - Displays the current maximum speed setting.
3. **Joystick Mode** - Displays the current mode selected.
4. **Personnel Basket** – For use when Auto Crane Personnel Basket is attached to crane. Reference Personnel Basket Mode section in NexStar Operation.
5. **Diagnostics** - Displays four options (Active Alarms, Joystick Inputs, Switch Inputs, and Outputs) to help aid in troubleshooting.
6. **Set Up** - Displays two usable options: Adjust Brightness of screen and Adjust Sleep Timer for remote auto shut-off. "Set Home Position" is part of the Crane Auto Stow program. Reference Auto Stow section in NexStar Operation.
7. **Stability Test Mode** – For dealer use only.

NexStar Operation

Speed and Control Mode



Speed Selection

Highlight "Speed Range" in the menu screen with the Left Joystick.

Depress the trigger to cycle through the maximum speed settings of 25%, 50%, 75%, and 100%.

Once the desired speed is displayed, back out of the menu using by pressing the Engine Start/Stop switch down to Engine Stop.

Mode Selection

Highlight "Joystick Range" in the menu screen with the Left Joystick.

Depress the trigger to cycle through the joystick mode settings of 1PT, 2PT, 1PJ, and 2PJ.

Once the desired mode is displayed, back out of the menu using by pressing the Engine Start/Stop switch down to Engine Stop.

Mode Selection

In 1-AXIS operation, once the joystick is moved in the direction of the desired function, the other functions are locked out until the joystick returns to the center position. For example, if you are booming up, you cannot rotate at the same time. But one function of the other joystick will be available to use.

In 2-AXIS operation, each joystick can perform two functions simultaneously.

1-AXIS, TRIGGER PROP (1PT) – Allows only one function to operate on each joystick. The joysticks are on-off and only need to be moved in the direction of the desired function. The speed control is located in the trigger. The more the trigger is pulled, the faster the function will operate.

2-AXIS, TRIGGER PROP (2PT) – Allows two functions to operator on each joystick. The joysticks are on-off and only need to be moved in the direction of the desired function. The speed control is located in the trigger. The more the trigger is pulled, the faster the function will operate.

1-AXIS, TRIGGER EN (1PJ) – Allows only one function to operate on each joystick. The speed is controlled by the joystick. The more the joystick is moved in the direction of the desired function, the faster the function will operate.

2-AXIS, TRIGGER EN (2PJ) – Allows two functions to operate on each joystick. The speed is controlled by the joystick. The more the joystick is moved in the direction of the desired function, the faster the function will operate.

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.

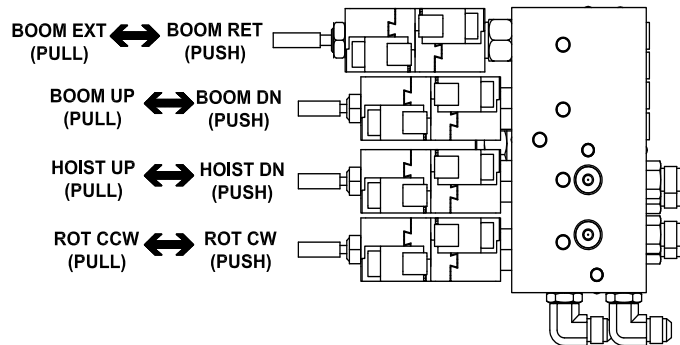
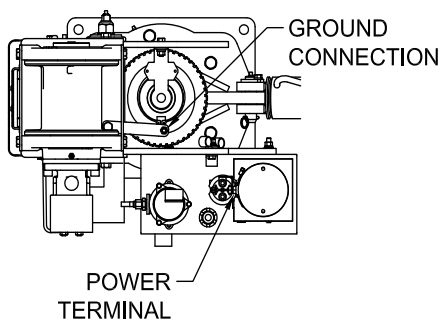
1. Ensure the boom will lower onto a proper support.
2. Loosen the lock nut and slowly turn adjustment screw clockwise until the boom begins to slowly lower, counting the number of turns it takes to begin seeing movement.
3. Remove hand/arm/fingers from cranes while boom is lowering.
4. After boom is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



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 CLOSE THE GAP BETWEEN COLLAR AND THE END ON THE OVERRIDE BUTTON. (NOTE: BOOM EXTEND/RETRACT DOES NOT HAVE A COLLAR)
- 4) PUSH OR PULL THE OVERRIDE BUTTON FOR THE DESIRED DIRECTION OF MOVEMENT. THE FARTHER THE BUTTON IS DEPRESSED OR PULLED, THE FASTER THE FUNCTION WILL OPERATE.

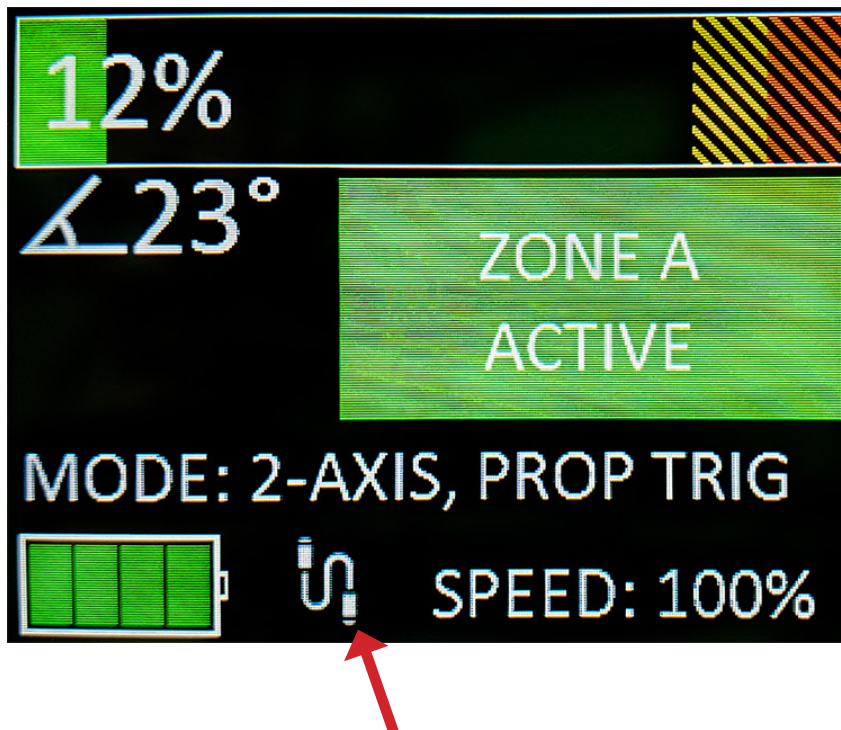
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NexStar Operation

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 top of the remote.

If the tether connection is properly established, a cable icon will replace the transmitter icon on the main screen.



NOTICE

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

Low Remote Battery

The NexStar remote uses a rechargeable, internal lithium-ion battery which is usually charged when the remote is placed in the docking station that is powered by +12 VDC. In the event that the remote battery has been sufficiently drained, the remote can be recharged by placing it in the docking station, tethering it to the crane, or using the auxiliary battery pack.

To use the auxiliary battery pack, first install 3 AA alkaline batteries into their respective places, paying attention to how they should be oriented in the pack. The battery pack can then be slid into place.



CAUTION

Use only alkaline batteries, size AA in the auxiliary battery pack.

NOTICE

If the remote battery has been discharged to the point that the remote turns off, it may be necessary to allow the remote to charge (docking station, tether, or battery pack) for a time before wireless use can continue.

NOTICE

If immediate use of a discharged remote is needed, it is recommended to use the tether connection. This will allow for both use of the transmitter as well as charging the remote battery.

NexStar Operation

Remote Layout

DIRECTION	FUNCTION	GRAPHIC	DESCRIPTION
Up	Engine Start		Sends a 12 VDC+ signal to start vehicle
Down	Engine Stop		Sends a 12 VDC+ signal to stop vehicle
Up	Boom Up		Moving the joystick up activates boom up function
Down	Boom Down		Moving the joystick down activates boom down function
Left	Rotate CCW		Moving the joystick to the left activates counterclockwise rotation function
Right	Rotate CW		Moving the joystick to the right activates clockwise rotation function
Up	Hoist Up		Moving the joystick up activates hoist up function
Down	Hoist Down		Moving the joystick down activates hoist down function
Left	Boom Retract		Moving the joystick to the left activates boom retract function
Right	Boom Extend		Moving the joystick to the right activates boom extend function
Up	Auxiliary	AUX	Sends a signal that activates an auxiliary output to operate an external component
Down	High Idle		Sends a signal that activates High Idle on the vehicle
Up	On		Turns remote on*
Down	Off		Turns remote off

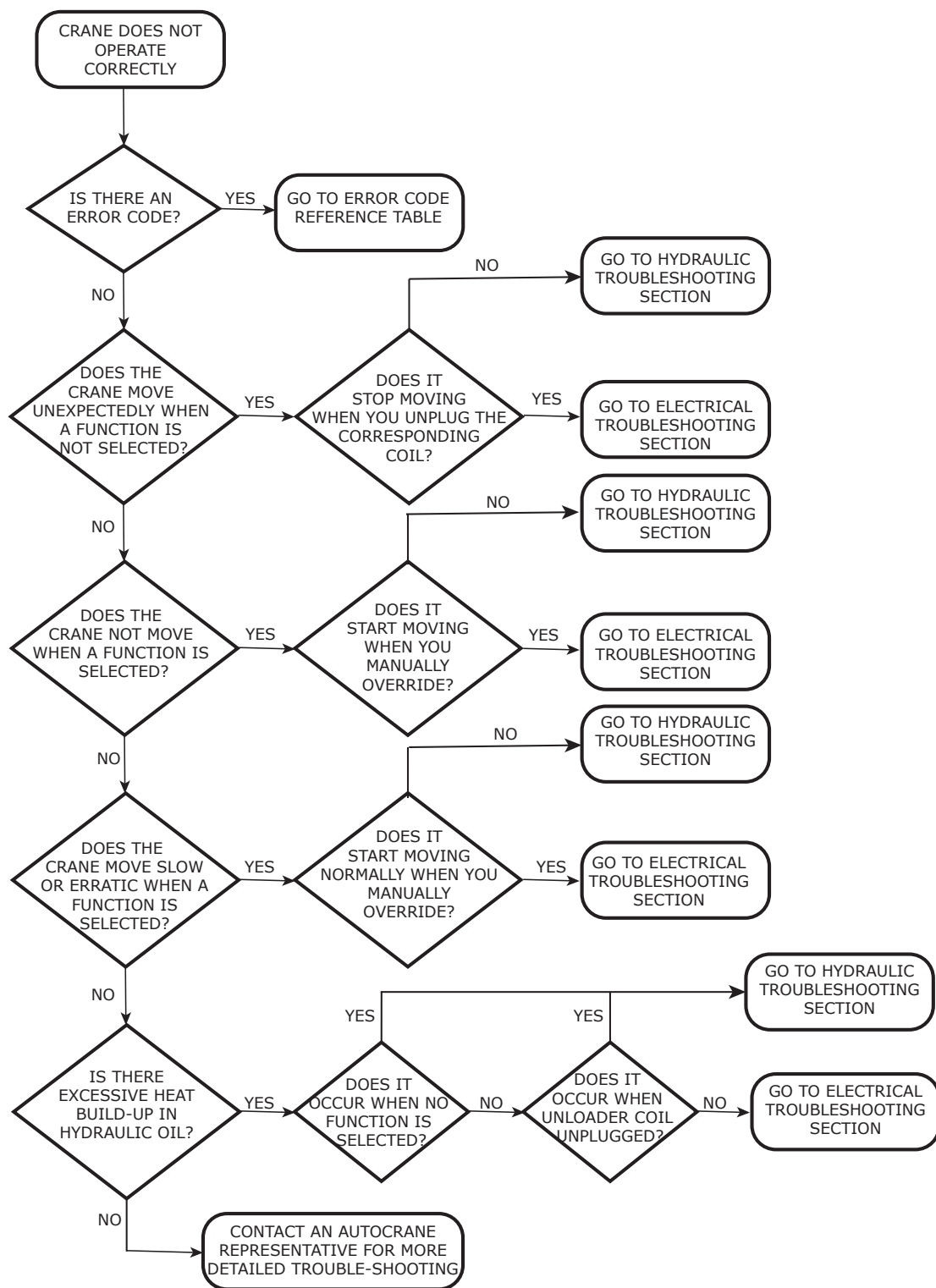
* Although the power switch maybe in the "On" position, it does not necessarily mean that there is communication between the remote and the crane. The remote goes to sleep after a certain amount of time. If the remote goes to sleep, it can be "woken up" by depressing the trigger, or moving either joystick in any direction.

Remote Layout

DIRECTION	FUNCTION	GRAPHIC	DESCRIPTION
In	Emergency Stop Activated		Activates Emergency Stop
Out	Emergency Stop Deactivated		Deactivated Emergency Stop
In	Horn/Link		Momentarily activates an audible signal and red light

NexStar Troubleshooting

NexStar Remote Troubleshooting Table



NexStar Remote Troubleshooting Table

PROBLEM	POSSIBLE REASON	ACTION
Remote control will not turn on	Remote control Emergency Stop switch is engaged.	Ensure the Emergency Stop switch is pulled out.
	Internal battery has discharged below operating level.	Attach backup alkaline battery pack or tether cable. Allow time for internal battery to charge (approx. 15 minutes) then cycle power.
Remote control will not communicate with the base station	Incorrect system RF channel.	Ensure the remote control and the base station are set to the same RF channel by synching the remote to the base station.
	System out of range.	Ensure the startup procedure is initiated within 100 feet of the receiver. Ensure the signal strength indicator level is greater than one bar.
Remote control will not respond with base station when tethered	System not in tether mode.	Ensure the remote is started up and initiated with the tether cable attached.
	The tether cable or connectors are damaged	Inspect the tether cable and/or connectors for damage.
Remote control will not turn on in tether mode.	Remote control Emergency Stop switch is engaged.	Ensure the Emergency Stop switch is pulled.
	The connecting tether cable is not installed, installed improperly, or is damaged.	Ensure the tether cable is installed and secured correctly. Inspect the tether cable and connectors for damage.
	Remote control is failing switch scan.	Ensure all switches, buttons, and joysticks are in the off position.
Remote control will not communicate with the base station in wireless mode	System not in wireless mode.	Ensure that the startup procedure is initiated within 100 feet from the base station. Ensure the signal strength indicator is greater than one bar.

NexStar Troubleshooting

NexStar Error Code Table

INFO BOX	CAUSE	EFFECT	SOLUTION
BOOM PSI LOW	Boom pressure is below 80 PSI	Disables all functions except boom up and hoist down.	Hoist down (if applicable) and raise boom off any supports. Alarm will clear once pressure in cylinder is restored.
CW LIMIT	Crane has reached the limit of rotation in the clockwise direction	Disables clockwise rotation.	Rotate counter-clockwise to clear error. Once switch is deactivated the alarm will clear.
CCW LIMIT	Crane has reached the limit of rotation in the counter-clockwise direction	Disables counter-clockwise rotation.	Rotate clockwise to clear error. Once switch is deactivated the alarm will clear.
TRK TILT WARN	Truck angle exceeds warning angle (if applicable)	All functions will only operate at 50% of speed.	Move vehicle to level ground. Once vehicle is on level ground the alarm will clear.
TRK TILT ALARM	Truck angle exceeds alarm angle (if applicable)	All functions disabled.	Move vehicle to level ground. Once vehicle is on level ground the alarm will clear.
ANTI-2-BLOCK	Anti 2-Block is activated. Traveling block has come into contact with boom tip.	Disables boom down, extend, and hoist up.	Move load away from boom tip either by retracting, hoisting down, or booming up.
90% LOAD WARN	Reached 90% of rated capacity	Reduces speed of all functions by 50%.	Reduce load to clear alarm.
100% LOAD WARN	Reached 100% of rated capacity	Disables boom down, extend, and hoist up.	Reduce load by either retracting, booming up, or hoisting down to clear alarm.
SLOW ROTATE ACT	Lift cylinder has exceeded 600 psi.	Reduces rotate functions by 50%.	This is a safety feature that prevents excessive swinging of heavy loads. Alarm will reset when load decreases and function is deactivated.
BOOM SENSOR ERR	Boom angle sensor signal failed	All functions are reduced by 50%.	Check connections to boom angle sensor. Verify lights are on at sensor base.
BOOM ANGLE RANGE	Boom angle sensor is out of range	Operates normally.	Boom angle sensor is mounted incorrectly. Check mounting. The arrow should be facing the tip of the crane.
BOOM PT ERR	Boom pressure transducer error	All functions are disabled except boom down and hoist down.	Check connections to pressure transducer located on lift cylinder. Check wiring harness for breaks.

NexStar Error Code Table

INFO BOX	CAUSE	EFFECT	SOLUTION
DIRTY FILTER	Filter is dirty if oil temperature is at least 100 °F	Operates normally.	Replace filter. Auto Crane part number is 366823910.
ADDRESS TAG ERROR	Crane does not recognize address tag	All outputs are disabled.	Check connection at address tag. Check for water in connection. Dry out if necessary.
AUTOSTOW ACTIVE	Crane is currently in auto stow mode	Crane will move into preset stow position while trigger is active.	Selecting any function will disengage auto stow mode.
PERSONNEL BASKET ACTIVE	Crane is currently in personnel basket mode	Disables hoist functions and remaining functions by 50%.	Disengage through mode selection screen. Reference NexStar Operations section for more detail.
STABILITY TEST EXCEEDED	Number of operations in stability test mode has exceeded limit	Disables stability test mode.	If stability test mode is required, please contact Auto Crane technical support.
OIL TEMP WARNING	Oil temperature has exceeded 180 °F (if applicable)	Normal Operation.	Disengage PTO to allow oil to cool. If the problem persists, add oil cooler to hydraulic system.
OIL TEMP ALARM	Oil temperature has exceeded 200 °F (if applicable)	Normal Operation.	Disengage PTO to allow oil to cool. If the problem persists, add oil cooler to hydraulic system.
ZONE A ACTIVE	Crane is currently located in Zone A base on stability chart (if applicable)	Overload based on Zone A load chart.	Reference stability chart for zone locations. Reference load chart for crane capacities in that zone.
ZONE B ACTIVE	Crane is currently located in Zone B base on stability chart (if applicable)	Overload based on Zone B load chart.	Reference stability chart for zone locations. Reference load chart for crane capacities in that zone.
CW ROT INTO A8	Crane went into overload while rotating clockwise from Zone A to Zone B (if applicable)	Disables clockwise rotation, boom down, and hoist up.	Rotate counter-clockwise to return to Zone A or reduce load to clear alarm.

NexStar Troubleshooting

NexStar Error Code Table

INFO BOX	CAUSE	EFFECT	SOLUTION
CWW ROT INTO A8	Crane went into overload while rotating counter-clockwise from Zone A to Zone B (if applicable)	Disables counter-clockwise rotation, boom down, and hoist up.	Rotate clockwise to return to Zone A or reduce load to clear alarm.
E002 ACTIVITY	Switch or trigger was active when linking transmitter	Disables all functions.	Disengage switch or trigger then push horn button to relink transmitter.
E004 LOW BATTERY	Transmitter batteries are low	Disables all functions and shuts down transmitter.	Charge or tether transmitter.
E006 INACTIVITY	Transmitter has been inactive for a set time and will go to sleep.	All non latching functions will be disabled until transmitter awakens.	Press and release trigger to awaken transmitter.
E007 ESTOP ACTIVE	E-Stop has been depressed	Disables all functions.	Pull E-Stop to release. Turn transmitter off then back on. Press horn button to relink.

Electrical Troubleshooting Table

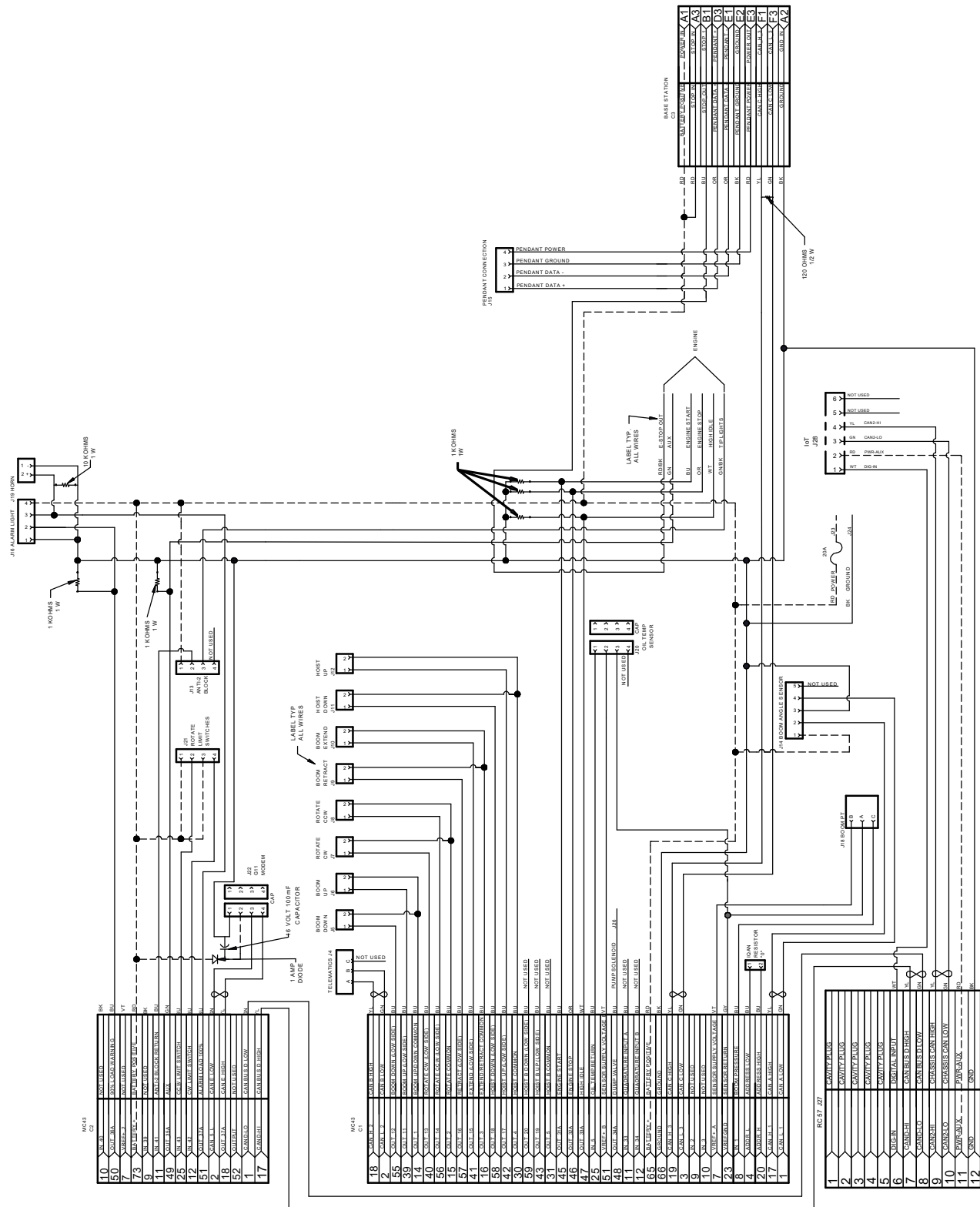
PROBLEM	POSSIBLE CAUSE	DIAGNOSIS	SOLUTION
Crane moves unexpectedly	Jammed transmitter button	Activate E-Stop to see if movement stops	Verify that nothing had depressed the button as the time of movement. If it was not depressed then replace transmitter.
	Short in harness	Unplug coil to see if movement stops.	Trace wire back to receiver. Verify wire harness is not damaged. Check connectors. They should be clear of debris and water.
	Base station locked up	Turn off transmitter and disconnect base station from harness to see if movement stops.	Turn off crane. Leave off for 2 minutes then turn power back on. If the problem persists contact Auto Crane technical support.
	Controller locked up	Disconnect controller to see if movement stops.	Turn off crane. Leave off for 2 minutes then turn power back on. If the problem persists, contact Auto Crane technical support.
No function operates on the crane.	Transmitter turned off	Verify the power switch is in the on position.	Turn on transmitter
	E-Stop is active	Check LCD screen. If E007 error code is shown, then E-Stop is active	Pull E-Stop to release. Turn transmitter off then back on. Press horn button to relink.
	Crane turned off	Check crane status light. It should be green.	Most cranes have a toggle switch to turn on crane. This is usually located in the cab or crane box.
	Low battery	Check LCD screen. If E004 error code is shown then transmitter is low on battery life.	Charge or tether transmitter.
	Receiver communication	Left LED light on base station should be solid green.	Turn off crane. Leave off for 2 minutes then turn power back on. If the problem persists, contact Auto Crane technical support.
	Controller communication	Status light on controller should be blinking amber only.	Turn off crane. Leave off for 2 minutes then turn power back on. If the problem persists, contact Auto Crane technical support.
	Truck tilt alarm active	Check screen for error code. It should read "TRK TILT ALARM"	Move vehicle to level ground. Once vehicle is on level ground the alarm will clear.
The following functions are inoperable extend, boom down, hoist up.	Anti-2-Block	Check screen for error code. It should read "ANTI-2-BLOCK"	Move load away from boom tip either by retracting, hoisting down, or booming up.
	Crane overload	Check screen for error code. It should read "100% LOAD WARN"	Reduce load by either retracting, booming up, or hoisting down to clear alarm.

NexStar Troubleshooting

Electrical Troubleshooting Table

PROBLEM	POSSIBLE CAUSE	DIAGNOSIS	SOLUTION
The following functions are inoperable extend, retract, hoist up, boom up, rotate CW, and rotate CCW	Low boom pressure	Check screen for error code. It would read "BOOM PSI LOW"	Hoist down (if applicable) and raise boom off any supports. Alarm will clear once pressure in cylinder is restored.
Rotate CW is inoperable	Reached limit for clockwise rotation.	Check screen for error code, it would read "CW LIMIT"	Verify the CW limit switch is not activated. It should be normally closed.
	Bad coil, or damaged wire	Switch coil with another function coil and check operation. Inspect wire to coil	Replace coil or repair wiring.
Rotate CCW is inoperable	Reached limit for clockwise rotation.	Check screen for error code, it would read "CCW LIMIT"	Verify the CCW limit switch is not activated. It should be normally closed.
	Bad coil, or damaged wire	Switch coil with another function coil and check operation. Inspect wire to coil	Replace coil or repair wiring.
All functions are inoperable except boom down and hoist down.	Pressure transducer is disconnected	Check LCD screen. It would read "BOOM PT ERR"	Verify that pressure transducer located on the lift cylinder valve block is plugged into harness. Inspect wiring going to harness for damage.
Any one function is not operable	Cut in wire or bad coil	Switch coil with another function coil and check operation. Inspect wire to coil	Replace coil or repair wiring.
Crane operates slowly	Slow rotate activated	Check screen for error code. It would read "SLOW ROTATE ACT"	This is a safety feature that prevents excessive swinging of heavy loads. Alarm will reset when load decreases and function is deactivated.
	Close to max crane load	When the truck is tilted and under high load a decrease in rotation speed is possible	Bring load in closer to decrease the moment load.
All functions operate slowly	Truck tilt warning is active	Check screen for error code. It would read "TRK TILT WARN"	Move vehicle to level ground. Once vehicle is on level ground the alarm will clear.
	90% load alarm is activated.	Check screen for error code. It would read "90% LOAD WARN".	Reduce load to clear alarm.
	Boom angle sensor error	Check screen for error code. It would read "BOOM SENSOR ERR"	Check connections to boom angle sensor. Verify lights are on at sensor base.
	Max speed function is lower than 100%	Check screen for speed setting in bottom right of screen. The value shown is the max speed	Reference section 6.8 of this operations manual to change speed selection.

Electrical Harness Schematic

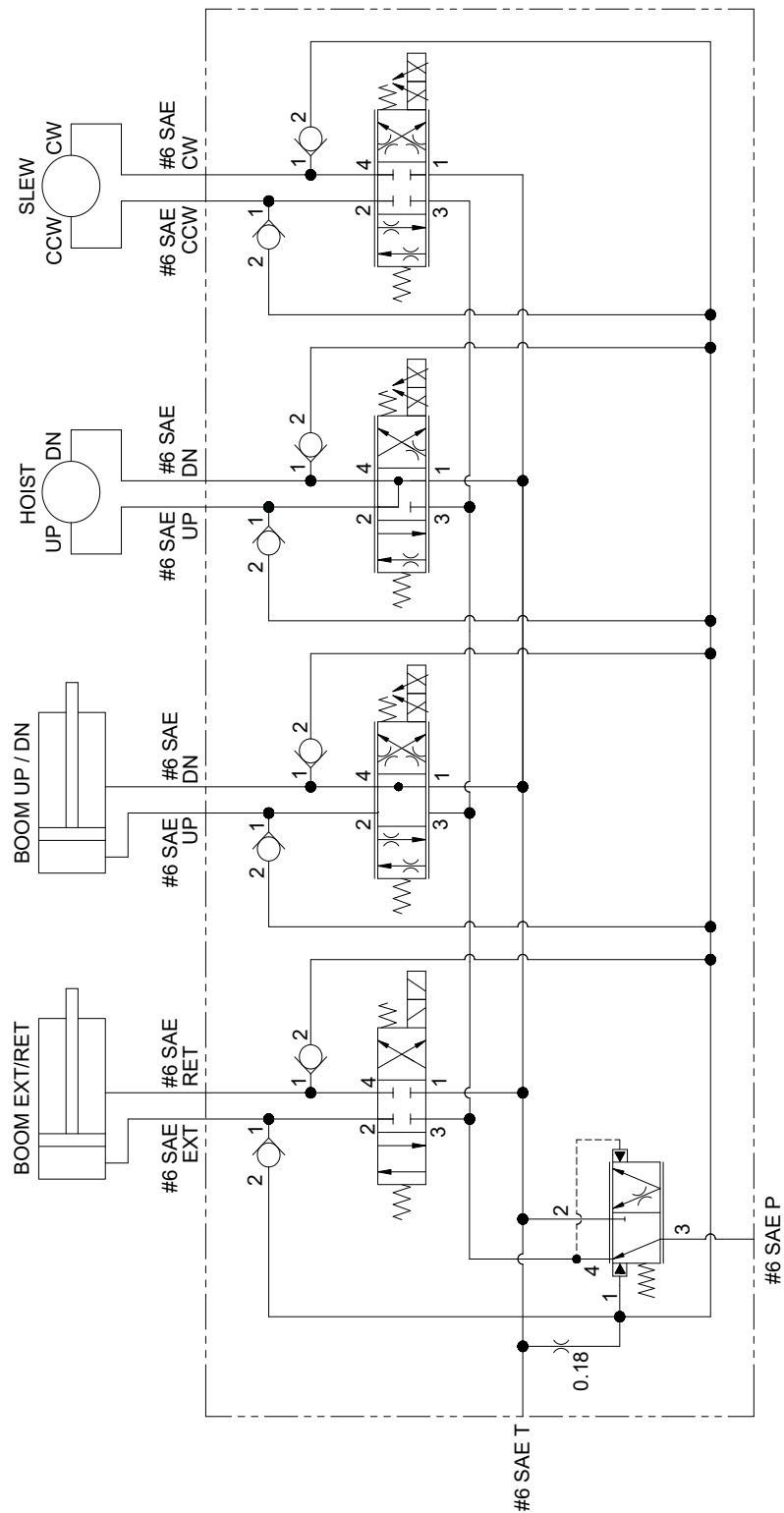


NexStar Troubleshooting

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 the problem persists, add hydraulic oil cooler to system.

Hydraulic Schematic

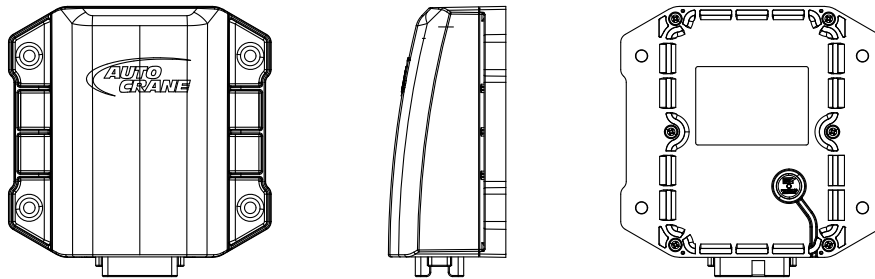
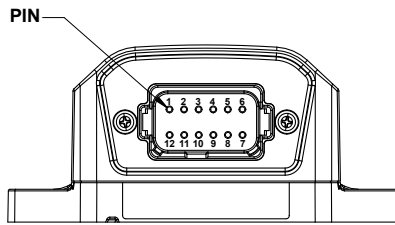
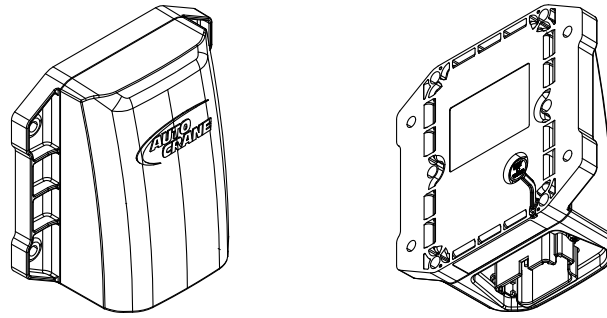


Internet of Things (IoT)

Ramsey Connect General Information

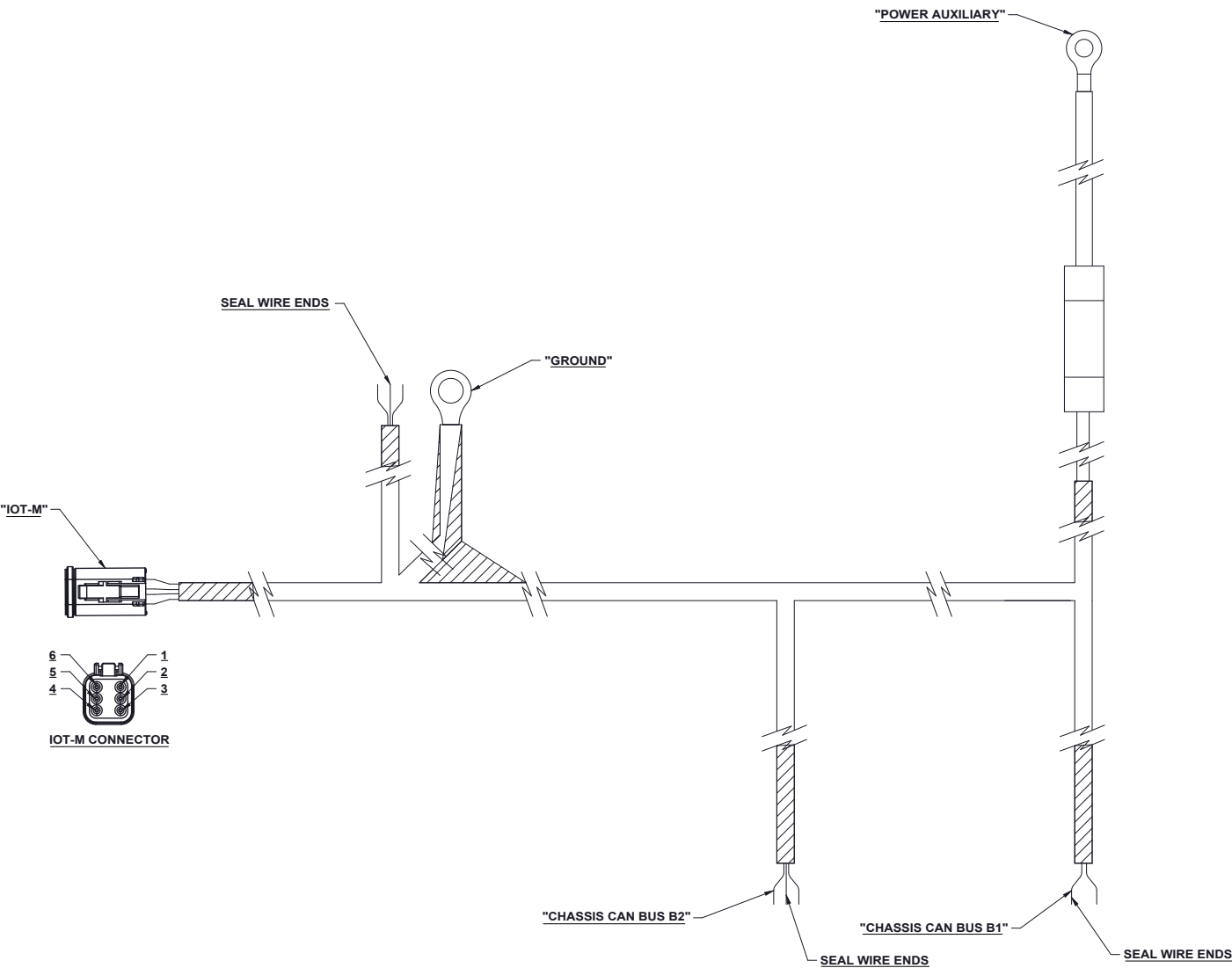
All NexStar 4–equipped cranes are now compatible with Ramsey Connect™ IoT functionality, providing enhanced visibility, diagnostics, and connectivity for your equipment. To begin using these features, customers must first register their device through the Ramsey Connect platform. Registration can be completed by downloading the Ramsey Connect mobile application or by navigating to the web portal at <https://ramseyconnect.com/login.aspx>. Once registered, users can access real-time equipment data, monitor usage, and leverage remote diagnostic capabilities designed to improve uptime and operational efficiency.

For customers with existing NexStar 4 cranes, Ramsey Connect IoT capability can be added through a retrofit solution. Retrofit Kit 475107000 is available for installation on compatible units, allowing legacy equipment to benefit from the same connected features as new production models. Please refer to the installation instructions provided with the retrofit kit or contact Auto Crane Technical Support for additional guidance on compatibility and installation requirements.



IOT CONTROL BOX

PINOUT	
PIN	DESCRIPTION
1	PROGRAMMING POWER
2	TX - OUT
3	BOOT ON
4	RX - IN
5	RESET
6	DIGITAL INPUT
7	CAN BUS A HIGH (MC43 BUS D, C2 PIN 17)
8	CAN BUS A LOW (MC43 BUS D, C2 PIN 1)
9	CAN BUS B HIGH (CHASSIS / PERIPHERALS)
10	CAN BUS B LOW (CHASSIS / PERIPHERALS)
11	RC57 POWER
12	GROUND



RC57 BODY HARNESS

Internet of Things (IoT)

CONNECTOR NAME: IOT-M				
PIN#	DESCRIPTION	CIRCUIT	COLOR	AWG
1	DIGITAL INPUT	DIG-IN	WHITE	18
2	POWER AUXILIARY	PWR-AUX	RED	16
3	CHASSIS CAN LOW	CAN2-LO	GREEN	20
4	CHASSIS CAN HIGH	CAN2-HI	YELLOW	20
5	CRANE ACTIVE	CRN-ACTV	OR/BK	18
6	CAVITY PLUG			

CONNECTOR NAME: RADIO SWITCH				
PIN#	DESCRIPTION	CIRCUIT	COLOR	AWG
BLUNT	DIGITAL INPUT	DIG-IN	WHITE	18
BLUNT	POWER AUXILIARY	PWR-AUX	RED	16
BLUNT	GROUND	GND	BLACK	10

CONNECTOR NAME: CHASSIS CAN BUS B1				
PIN#	DESCRIPTION	CIRCUIT	COLOR	AWG
BLUNT	CHASSIS CAN HIGH	CAN2-HI	YELLOW	20
BLUNT	CHASSIS CAN LOW	CAN2-LO	GREEN	20

CONNECTOR NAME: CHASSIS CAN BUS B2				
PIN#	DESCRIPTION	CIRCUIT	COLOR	AWG
BLUNT	CHASSIS CAN HIGH	CAN2-HI	YELLOW	20
BLUNT	CHASSIS CAN LOW	CAN2-LO	GREEN	20
BLUNT	CRANE ACTIVE	CRN-ACTV	OR/BK	18

CONNECTOR NAME: POWER				
END	DESCRIPTION	CIRCUIT	COLOR	AWG
3/8" EYELET	POWER AUXILIARY	PWR-AUX	RED	16

CONNECTOR NAME: GROUND				
END	DESCRIPTION	CIRCUIT	COLOR	AWG
3/8" EYELET	GROUND	GND	BLACK	10

Internet of Things (IoT)

RC57 Troubleshooting

SYMPTOMS	LIKELY CAUSE	RESOLUTION / CHECKS
No Power (No LEDs)	No supply voltage	Check Pin 11 (+12 –24 VDC) and Pin 12 (GND)
	Blown fuse	Verify inline fuse (0.75A slow-blow recommended)
	Connector not seated	Inspect Deutsch connector, bent pins
	Harness damage	Check continuity of power / ground wires
	Reverse polarity	Verify correct wiring
Blue LED OFF	No power	Verify supply voltage and ground
	Device not booting	Power cycle unit
	Internal failure	Replace device
Blue LED ON (Breathing)	Normal operation	No action required
	No CAN activity	Verify CAN traffic present
Red LED ON / Flashing	Fault condition	Power cycle device
	CAN fault	Check CAN bus wiring at the RC57, Chassis, and Accessories (HI / LO)
	Firmware / config issue	Reload firmware / config. Contact Ramsey Industries for assistance
	Internal hardware fault	Replace unit
No Cellular / No Cloud Link	Poor signal	Relocate Crane and/or RC57 to different location
	Antenna obstruction	*Verify internal antenna path
	SIM / provisioning issue	Confirm device activation
	Cloud / server issue	*Verify backend status
	Modem hung	Power cycle device
No CAN Data (Local)	No CAN traffic	*Verify ECU (MC43) transmitting
	Wiring issue	Check CAN A / B HI (Pin 7, 9), LO (Pin 8, 10)
	Termination issue	Verify 120 Ohm resistors present at both ends of CAN wires
	Baud rate mismatch	*Confirm bus speed (250k vs 500k)
	Wrong CAN channel	*Verify CAN A vs CAN B usage
No CAN Data (Remote)	No cellular upload	Verify connectivity
	PGN not configured	*Check PGN whitelist (~40 max)
	No data changes	Device logs on change or interval
	Upload delay	Allow ~15 min cycle

SYMPTOMS	LIKELY CAUSE	RESOLUTION / CHECKS
GUI Cannot Connect	Wrong interface	Verify COM / connection settings
	No power	Confirm device powered
	Firmware mismatch	*Update GUI / firmware
	Debug pins misused	Avoid reserved pins (boot / reset / tx / rx)
Data Present but Incorrect	Wrong SPN mapping	*Verify PGN / SPN setup
	Scaling issue	*Check J1939 scaling / offset
	Wrong source address	*Verify ECU source filtering
	Multiple ECUs	*Filter correct PGN source
Intermittent CAN / Link Drop	EMI / noise	Check routing near high current lines
	Loose connector	Inspect connector retention
	Harness interference	Inspect retrofit wiring, if applicable
	CAN overload	*Reduce PGN list
	Voltage drop	Check supply under load

* Contact your local dealer and/or Ramsey Industries for continued assistance as specific tool may be required.

Maintenance

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 classifications 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.
 - 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.

Maintenance

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.

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.

Maintenance

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.

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.

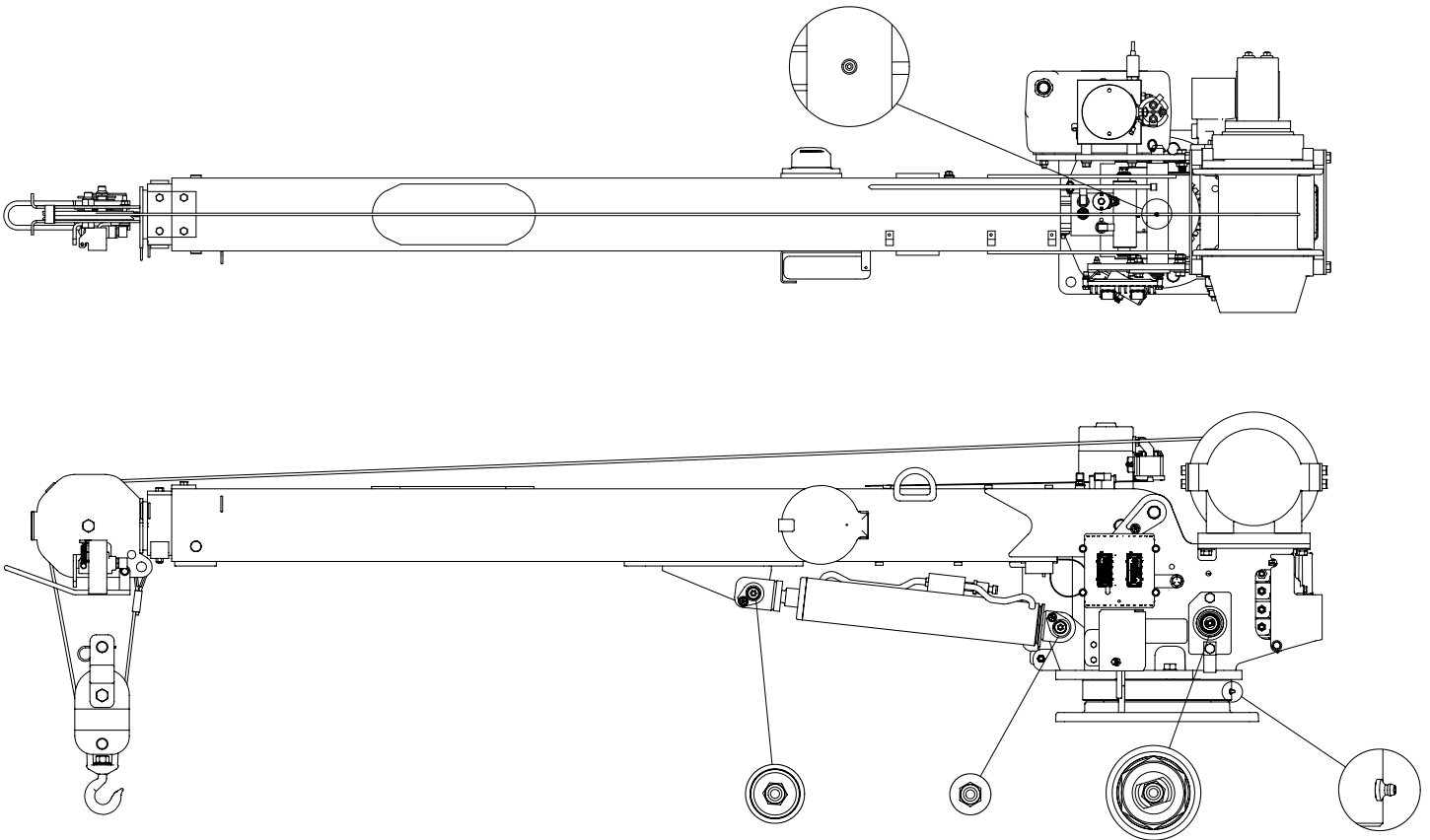
Maintenance

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					

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.



Maintenance

NexStar 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 of 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.

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.



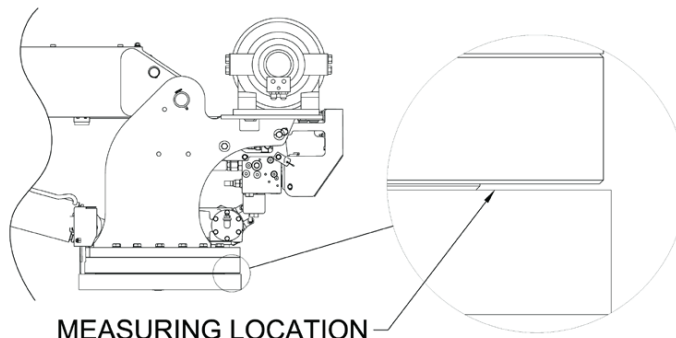
WARNING

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



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.

NOTICE

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

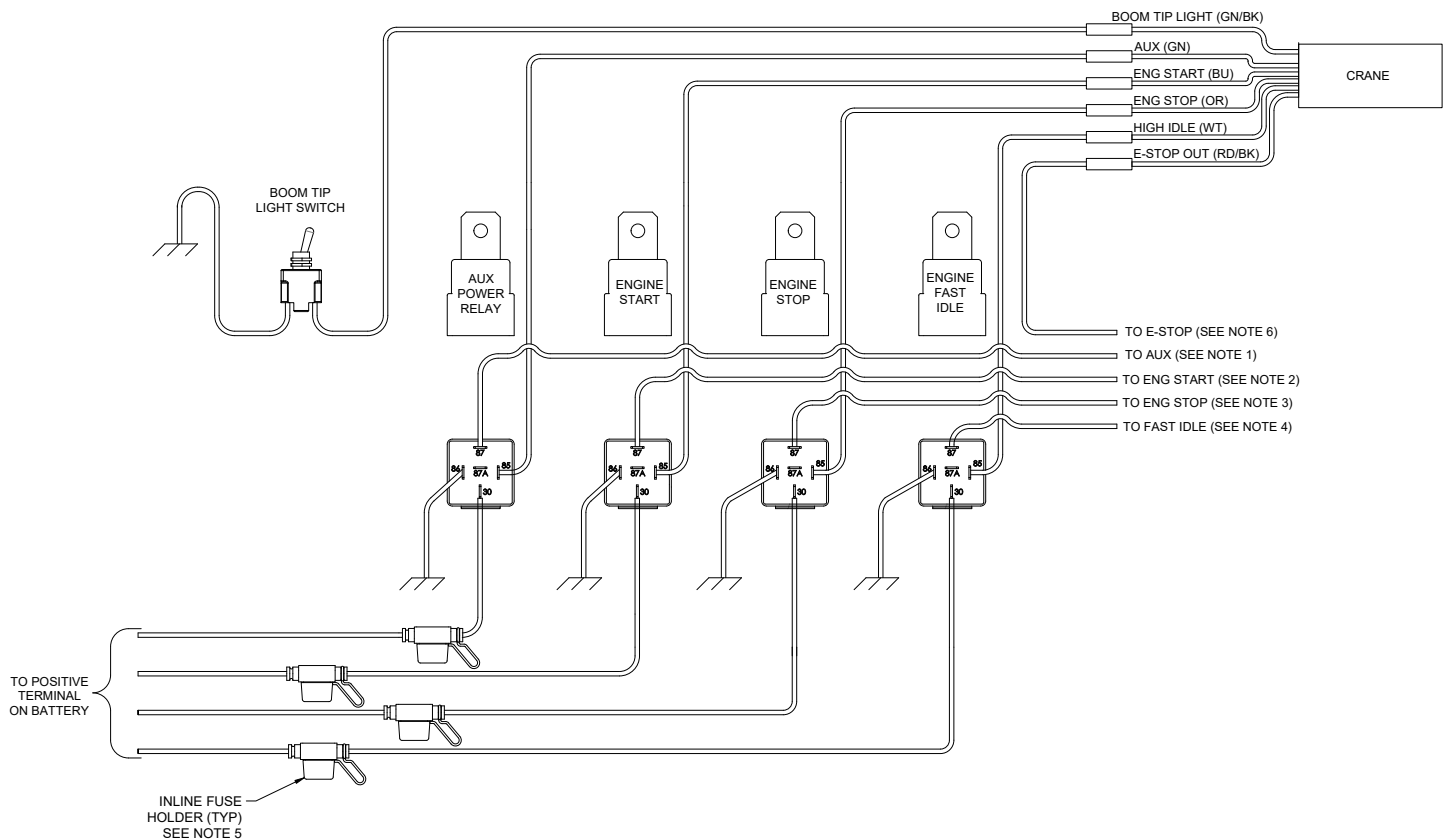
Each crane arrives with a shipping tote that contains the following items:

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	6	083800000	CLIP, CABLE #838
2	1	320988016	LOAD CHART, EHC-3^2
3	1	320433000	TRAVELING BLOCK ASSEMBLY
4	1	479824002	DECAL, STABILITY CHART
5	1	479824003	DECAL, STABILITY CHART, CUSTOM ZONE PERCENTAGES
6	1	320988009	KIT, ALIGNMENT DECAL LOCATION
7	1	715321032	SHIPPING TOTE, 15 GAL, BLACK / RACER RED
8	1	715064001	DECAL, BOOM STOW, CALIFORNIA
9	4	404227000	NUT HX 3/4-16 UNF, GR8
10	4	404226000	SCR HX HD 3/4-16 UNF X 3 LG GR8
11	2	005604000	SCREW HX HD 1/4-20 UNC X 1 LG
12	4	022102000	WASHER FL 3/4
13	4	022101000	WASHER SP LK 3/4
14	2	020200000	WASHER SP LK 1/4
15	2	020300000	WASHER FL 1/4
16	1	366823400	REMOTE, NEXSTAR
17	1	404223010	CABLE, POWER HEAVY-DUTY 25 FT LG
18	1	404218200	MASTER SWITCH ASSEMBLY W/ REMOTE PENDANT
19	1	475107020	BODY HARNESS, RC57

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

General Electrical Hookup



Notes:

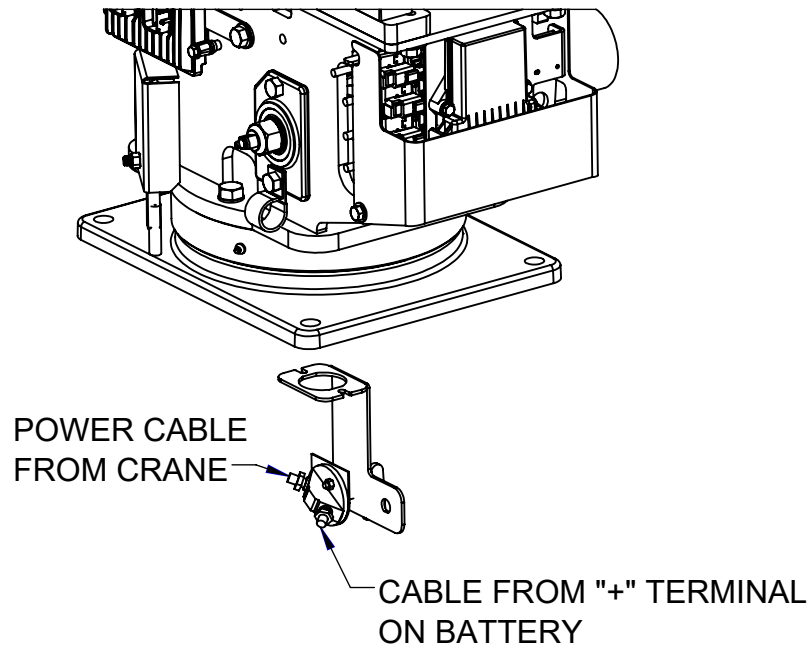
1. If using compressor, attach to switched power wire.
2. Attach to chassis wiring for remote engine start. Reference respective chassis' body builder's handbook for location and wiring requirements.
3. Attach to chassis wiring for remote engine stop. Reference respective chassis' body builder's handbook for location and wiring requirements.
4. Attach to chassis wiring for high idle. Reference respective chassis' body builder handbook for location and wiring requirements. Some chassis high idle when PTO is activated.
5. Can use fuse block in place of inline fuses.
6. E-Stop wire provides 12 VDC+ when emergency stop on remote is activated. If E-Stop out is not used, ensure that the wire end is sealed and/or away from anything it can ground to if the Emergency Stop is activated.



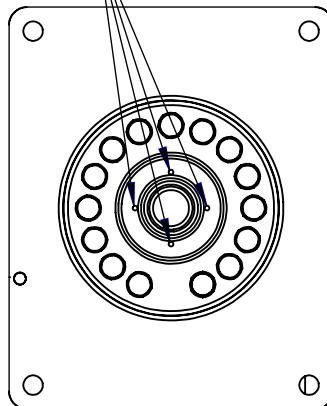
WARNING

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

IMPORTANT: Follow all federal laws pertaining to final stage manufacturers and crane stability requirements. Reference the Safety Tips and Precautions section for specifics.



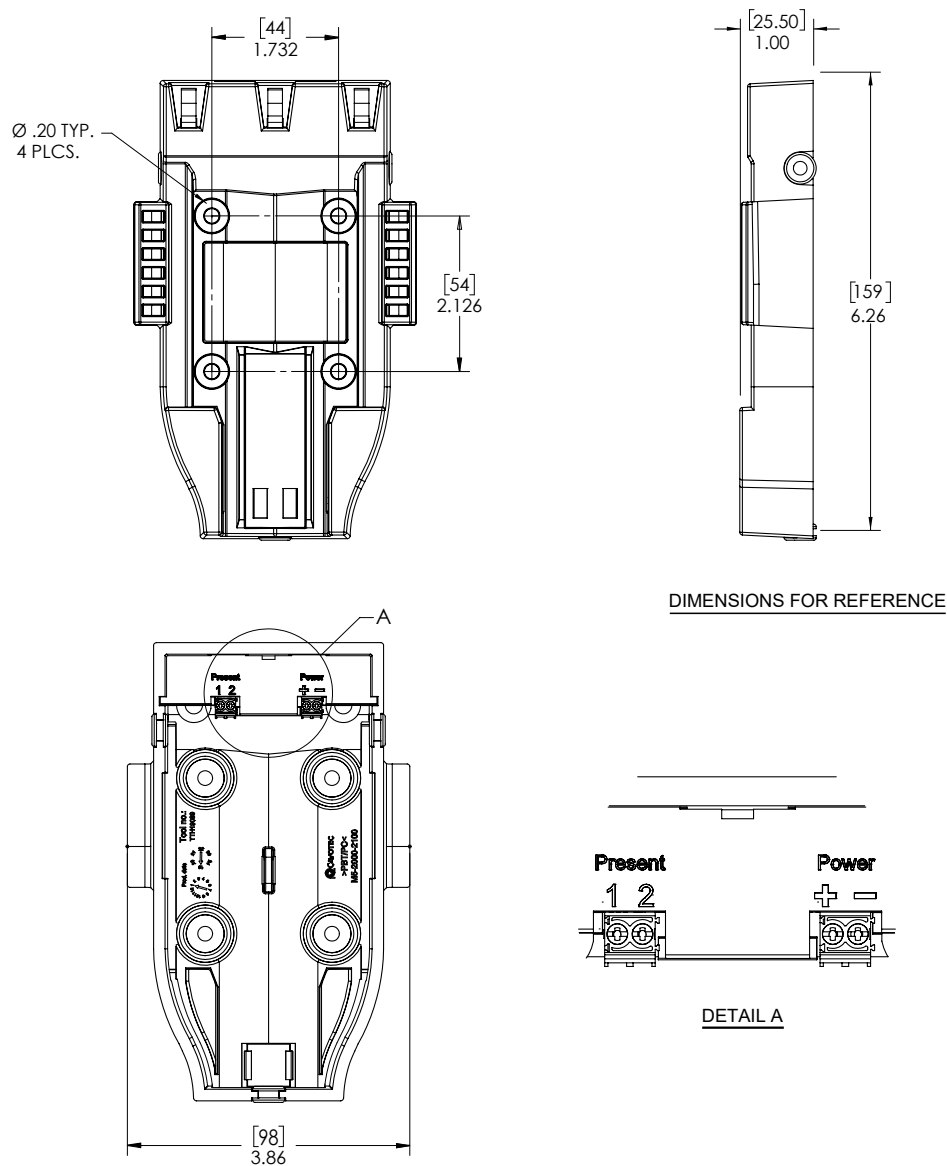
GROUND ATTACHMENT LOCATIONS*



*ATTACH OTHER END OF GROUND CABLE TO VEHICLE FRAME

Installation

Docking Station



To wire the docking station, use an unswitched and fused 12 VDC+ power source to ensure remote charging when the vehicle is off. Connect this power supply to the "Power +" terminal on the dock and ground the "Power -" terminal to the vehicle. Terminal 1 and Terminal 2 will be equal when the remote is not in the docking station. Terminal 2 is used only as a signal and should not be used with any type of load.

Auto Crane offers a cradle kit, P/N 366823460, that includes a chime that indicates that the remote has not been returned to its cradle when not in use.

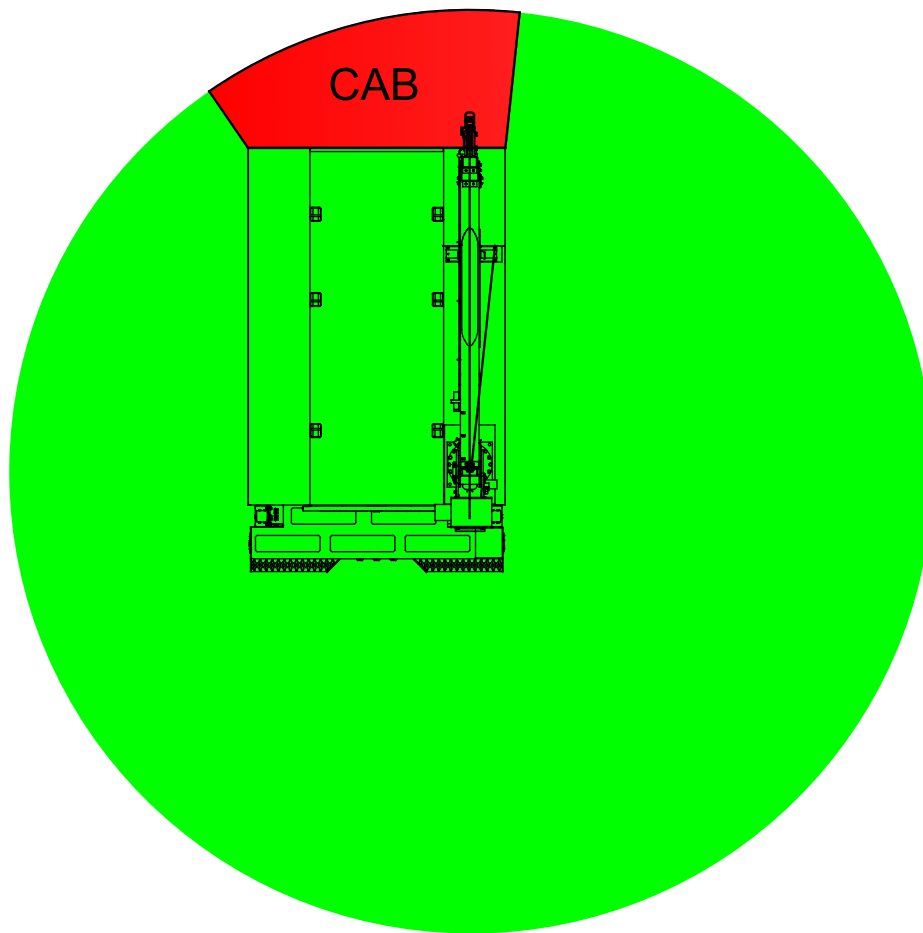
Stability Chart Installation

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 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

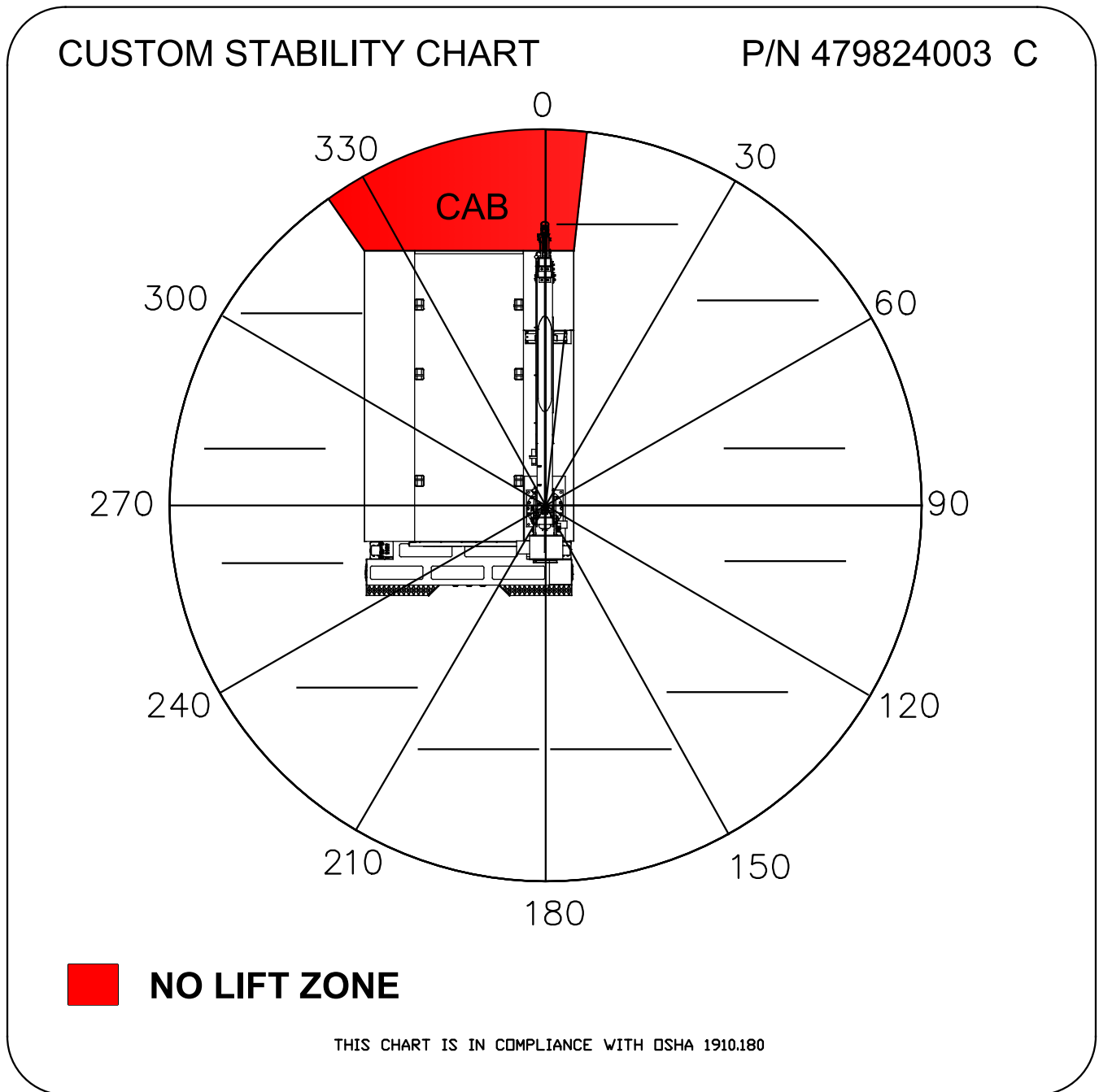


ZONE B, NO LIFT ZONE

THIS CHART IS IN COMPLIANCE WITH OSHA 1910.180

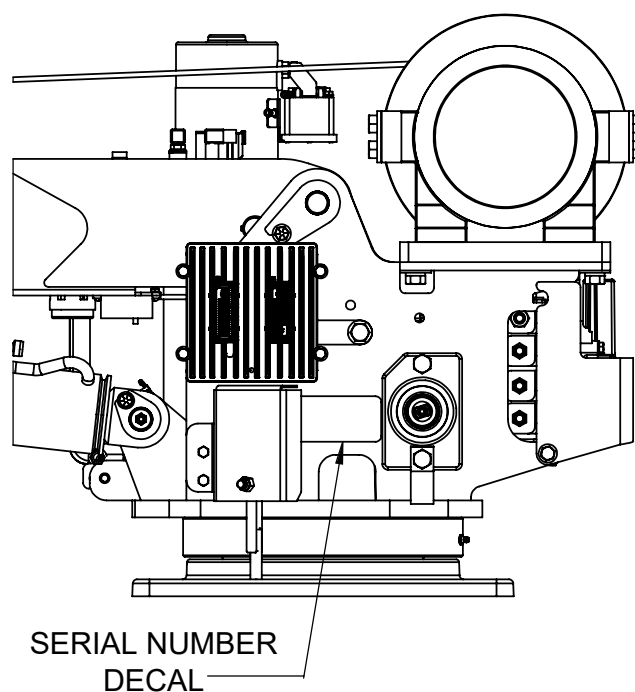
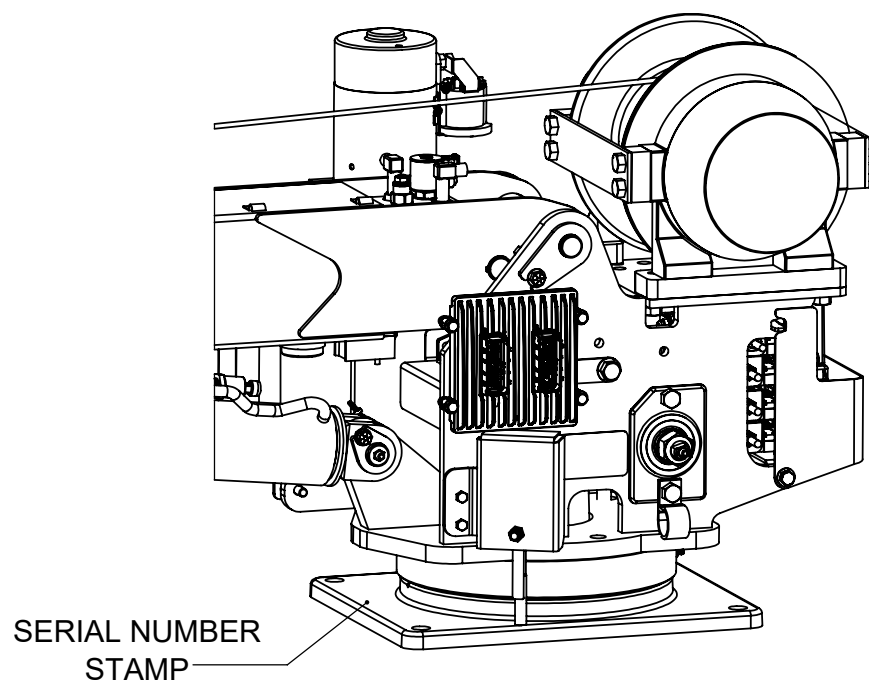
Installation

479824003 decal will be installed on an Auto Crane body that was not outfitted with an Auto Crane 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

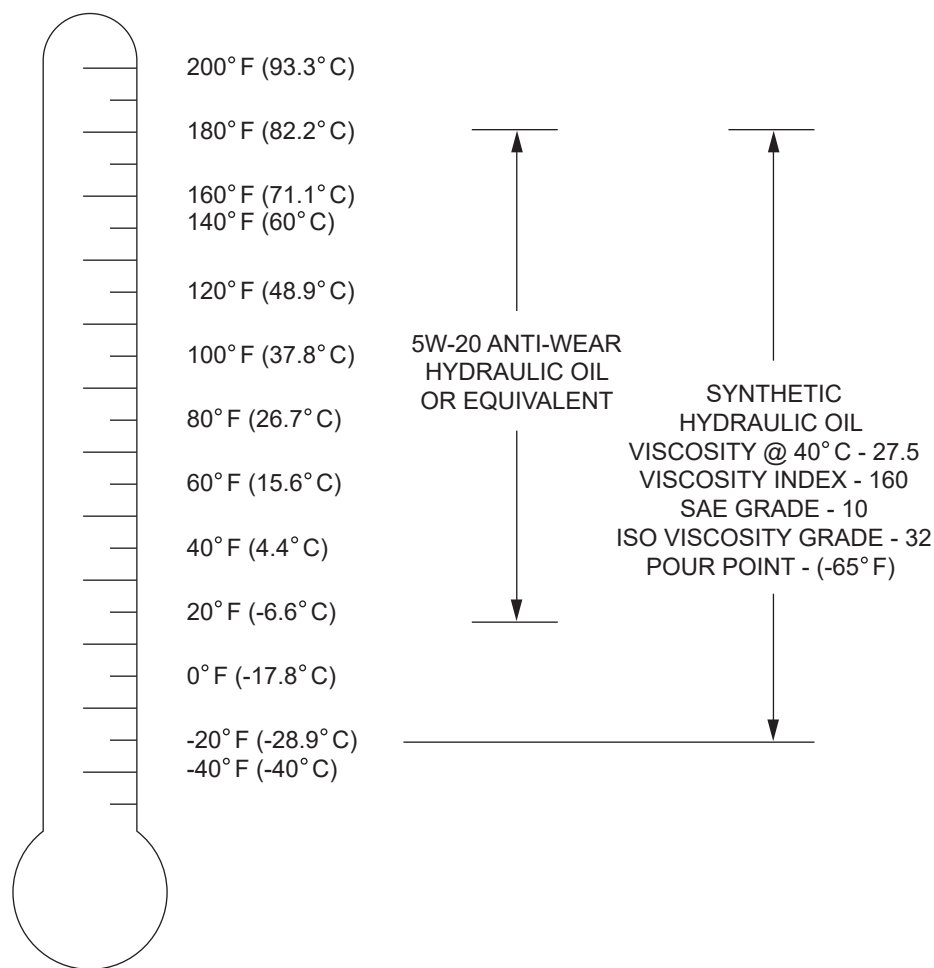
Recommended Operating Temperature

- 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.

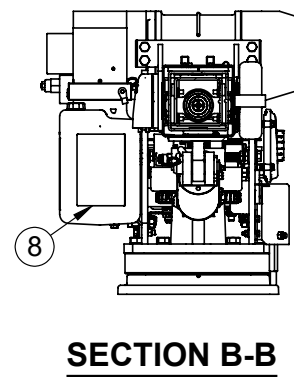
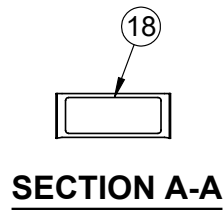
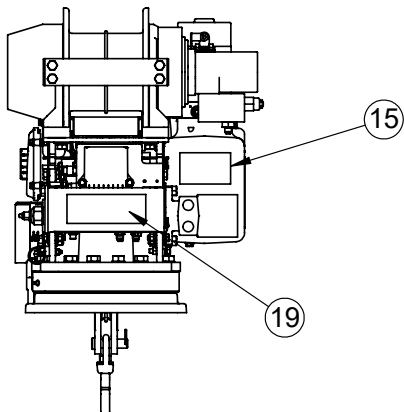
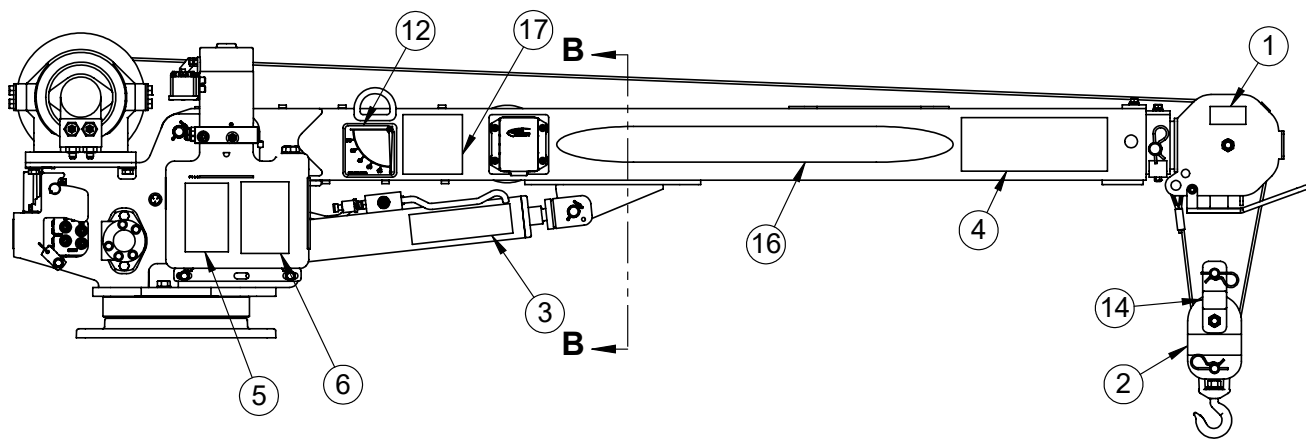
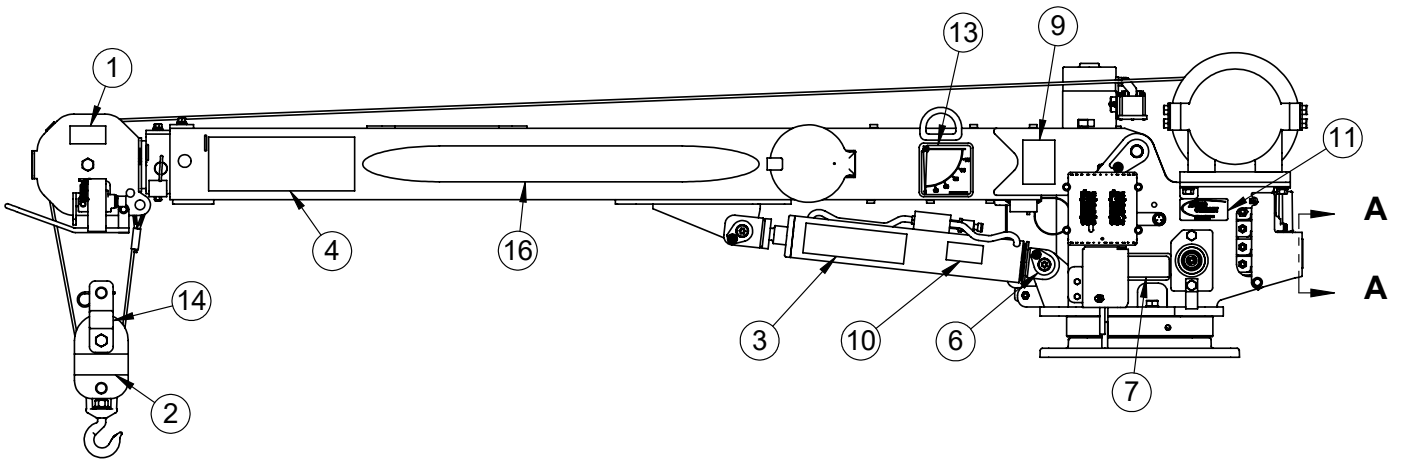


Hydraulic reservoir oil temperatures must not exceed 180° F or damage to crane may occur. This may affect crane warranty.

OIL TEMPERATURE



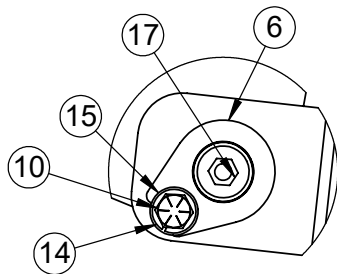
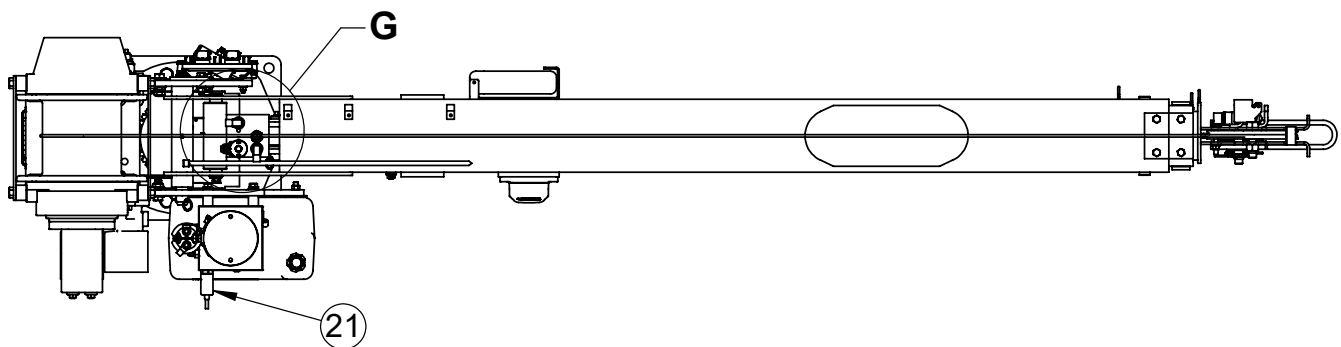
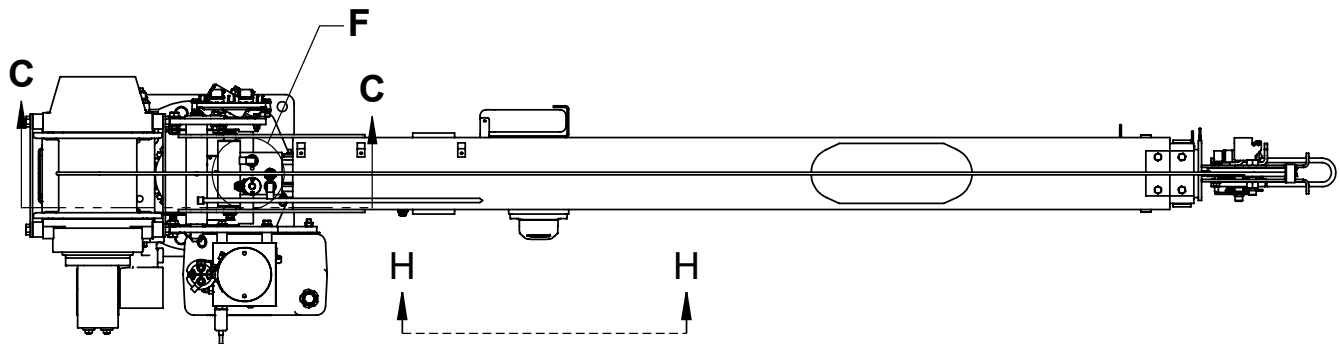
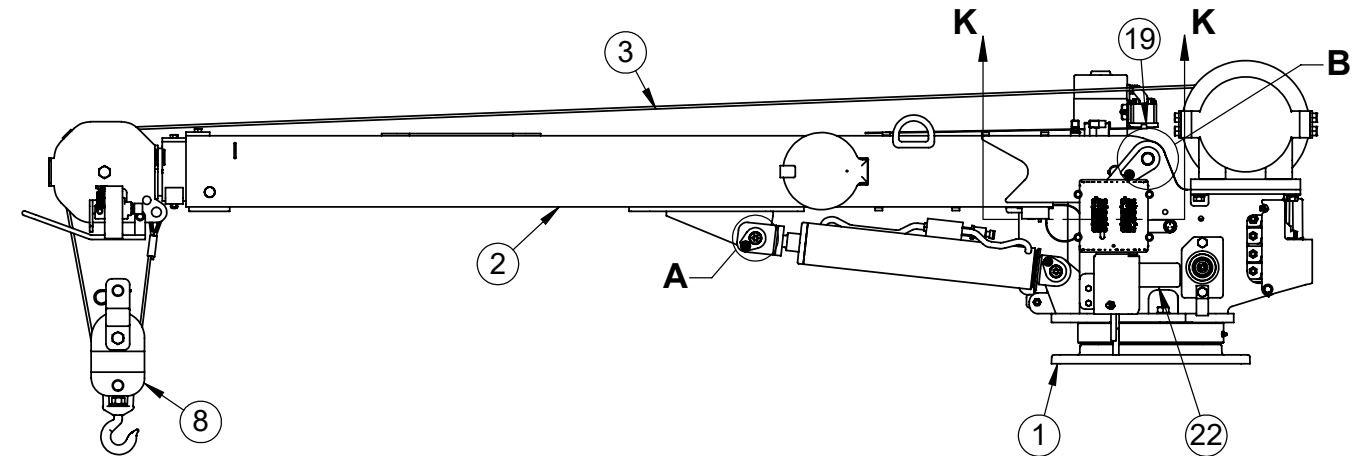
Decal Layout - P/N 320992120



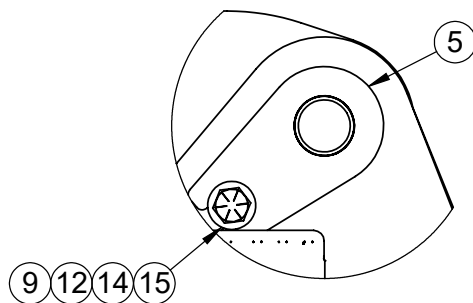
Decal Layout - P/N 320992120

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	330622000	DECAL, SERIAL NO.
8	1	460169000	DECAL WARNING, REMOTE CONTROL
9	1	040632000	DECAL WARNING - OVERLOAD
10	1	040587000	DECAL WARNING LOAD SENSOR
11	1	040619001	DECAL AUTO CRANE LOGO
12	1	320318000	DECAL ANGLE INDICATOR CS
13	1	320318001	DECAL ANGLE INDICATOR SS
14	2	320433100	DECAL, TRAVELING BLOCK 3203
15	1	040824000	DECAL, AMERICAN FLAG, MADE IN THE U.S.A.
16	2	600047015	DECAL, AUTO CRANE EHC-3^2 NEXSTAR LOGO, FLATTENED OVAL, 33.25 IN LONG
17	1	320988016	LOAD CHART, EHC-3^2
18	1	320992121	DECAL, MANUAL OVERRIDE PROCEDURES, SMALL EH-MODELS
19	1	360034000	DECAL AUTO CRANE LOGO

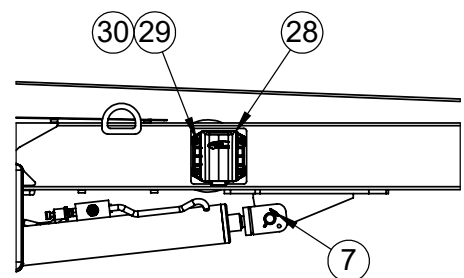
General Assembly - P/N 320992003



DETAIL A

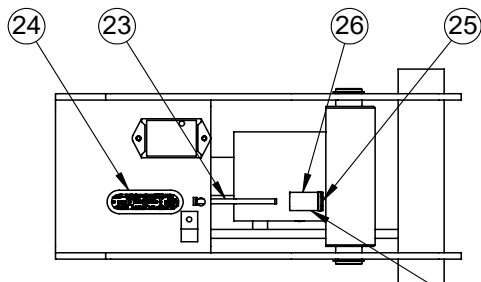


DETAIL B



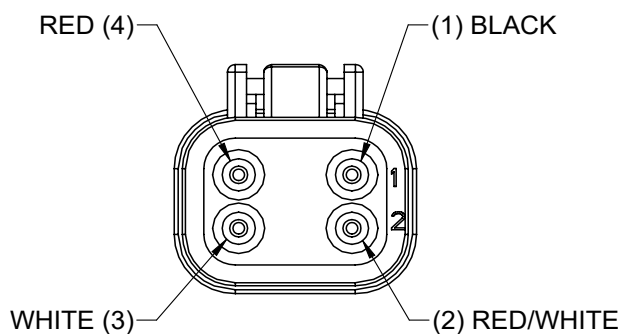
SECTION H-H

General Assembly - P/N 320992003

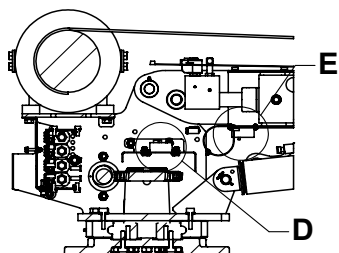
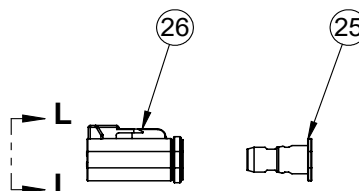


SECTION K-K

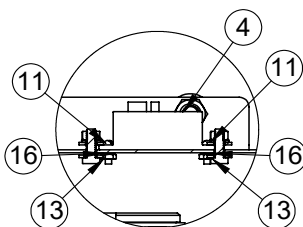
INSTALL 366823238 PIGTAIL THROUGH FORWARD HOLE, THEN ROUTE PIGTAIL THROUGH REAR HOLE AND FASTEN WITH 772043000. ONCE FASTENED, INSTALL 320931001 AND 320931002 PER SECTION L-L



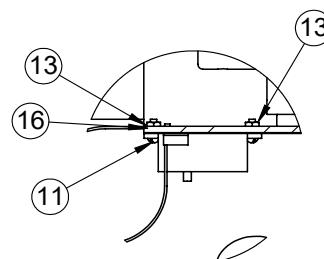
SECTION L-L



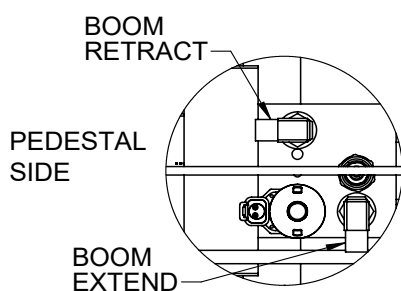
SECTION C-C



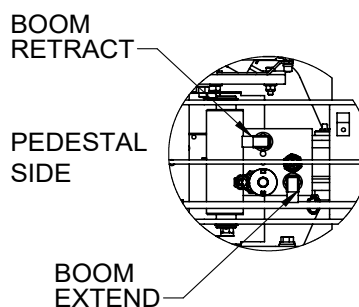
DETAIL D



DETAIL E



DETAIL F



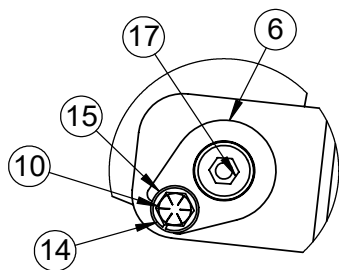
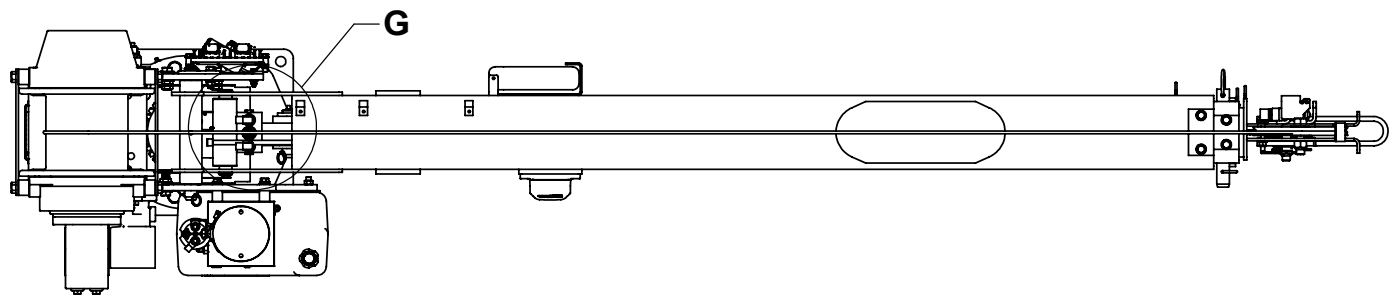
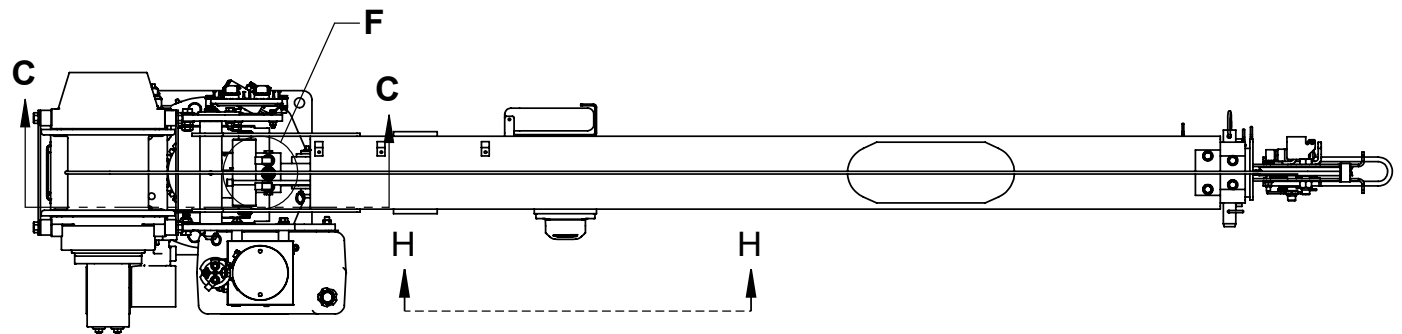
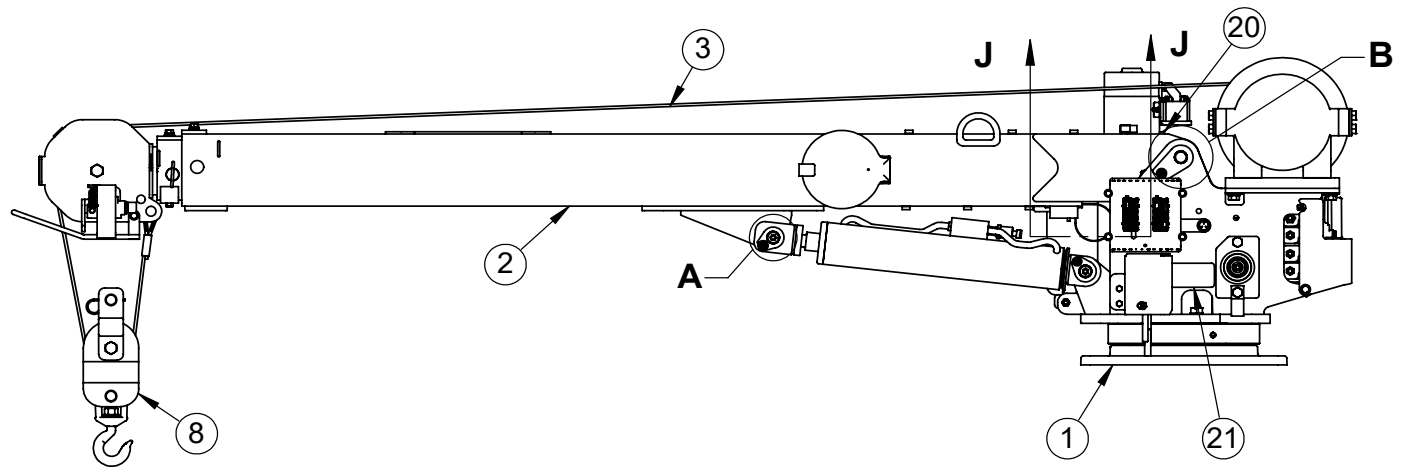
DETAIL G

PRX HOISING DETAIL

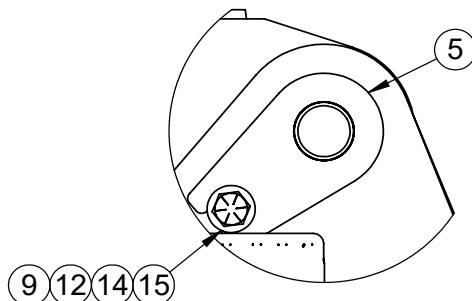
General Assembly - P/N 320992003

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	320992050	PEDESTAL ASSEMBLY, EHC-3.2 PRX / PRFX
2	1	320990100	BOOM ASSY 3203 PRFX
3	1	320338002	CABLE ASS'Y, 7/32" X 62 FT, THIMBLE END
4	1	366823254	SENSOR, TRI-AXIS
5	1	404220000	PIN WDMT BOOM / PED
6	1	320824000	PIN, LIFT CYLINDER
7	2	360678000	PIN, 3/16 COTTERLESS RING
8	1	320433000	TRAVELING BLOCK ASSEMBLY
9	1	366159000	SCREW HX HD 3/8-16 UNC X 1 1/2 LG GR8
10	1	330371000	SCREW HX HD 3/8-16 UNC X 1 LG GR8
11	4	001302000	SCREW RD HD #8-32 UNC X 1/2 LG
12	1	330372000	NUT HX 3/8 NC GR5
13	4	015500000	NUT HX #8-32 UNC CP
14	2	021100000	WASHER SP LK 3/8
15	2	021200000	WASHER FL 3/8
16	4	019700000	WASHER SP LK #8
17	1	239300000	ZERK, GREASE
18	1	320992270	KIT, SHIP EHC-3.2 NEXSTAR
19	1	663300001	CABLE TIE, 18"
20	1	320992120	DECAL LAYOUT, EHC-3.2, NEXSTAR IV
21	1	320990201	PRESSURE SWITCH, NC, 1450 PSI, 10 AMP
22	1	330622000	DECAL, SERIAL NO.
23	1	772043000	ZIP TIE STRAP, 12 IN, NYLON, BLACK
24	1	366823238	LIGHT, LED 3 INCH (RED, AMBER, GREEN)
25	1	320931002	WEDGE, DEUTSCH 4-PIN W4S
26	1	320931001	HOUSING, DEUTSCH PLUG 4-PIN DT06-4S
27	1	320990310	HARNESS, WIRE, REGENERATIVE CIRCUIT, 3203 PRFX
28	1	475107001	IOT CONTROL BOX, RC57
29	4	001701002	SCREW PN HD #10-24 UNC X 1/2 LG
30	4	020000000	WASHER FL #10 ZP

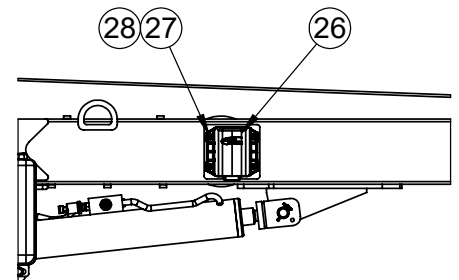
General Assembly - P/N 320992001



DETAIL A

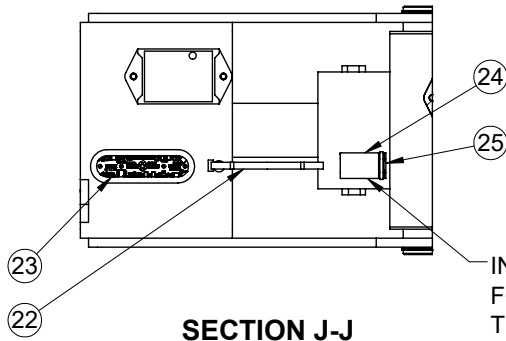


DETAIL B



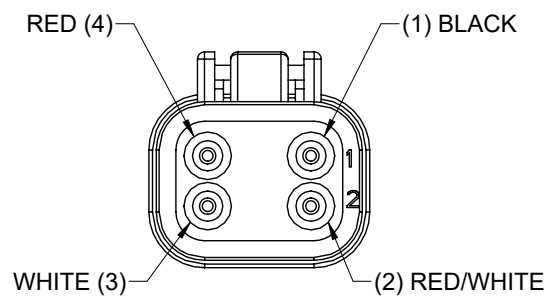
VIEW H-H

General Assembly - P/N 320992001

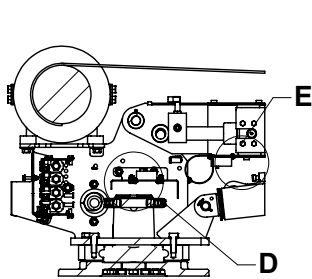
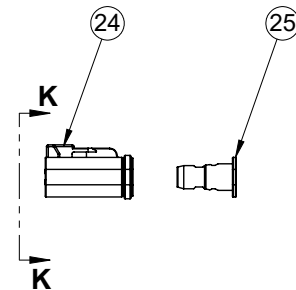


SECTION J-J

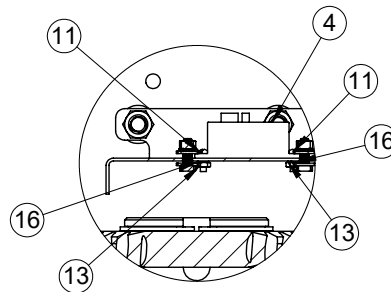
INSTALL 366823238 PIGTAIL THROUGH FORWARD HOLE, THEN ROUTE PIGTAIL THROUGH REAR HOLE AND FASTEN WITH 772043000. ONCE FASTENED, INSTALL 320931001 AND 320931002 PER SECTION K-K



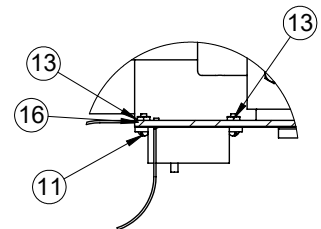
SECTION K-K



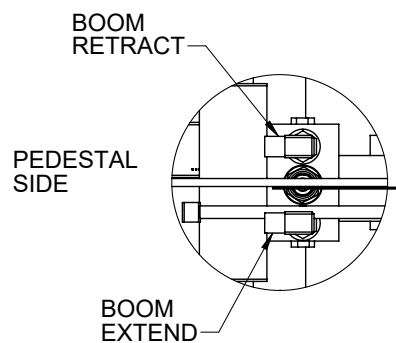
SECTION C-C



DETAIL D

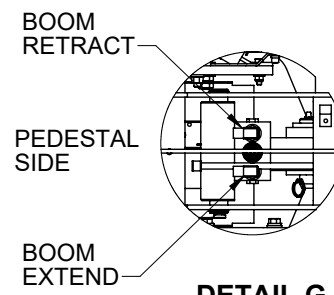


DETAIL E



DETAIL F

PRX HOISING DETAIL

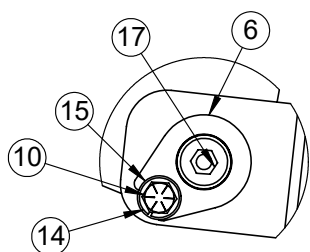
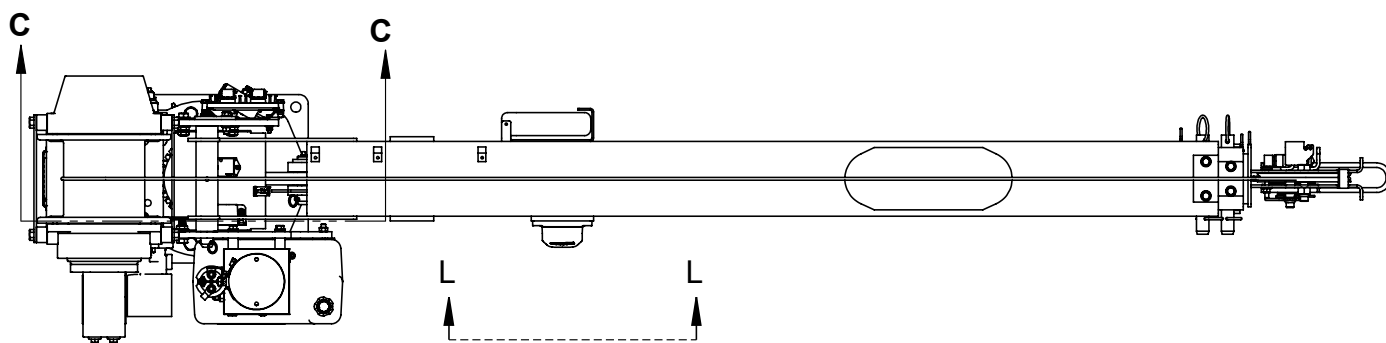
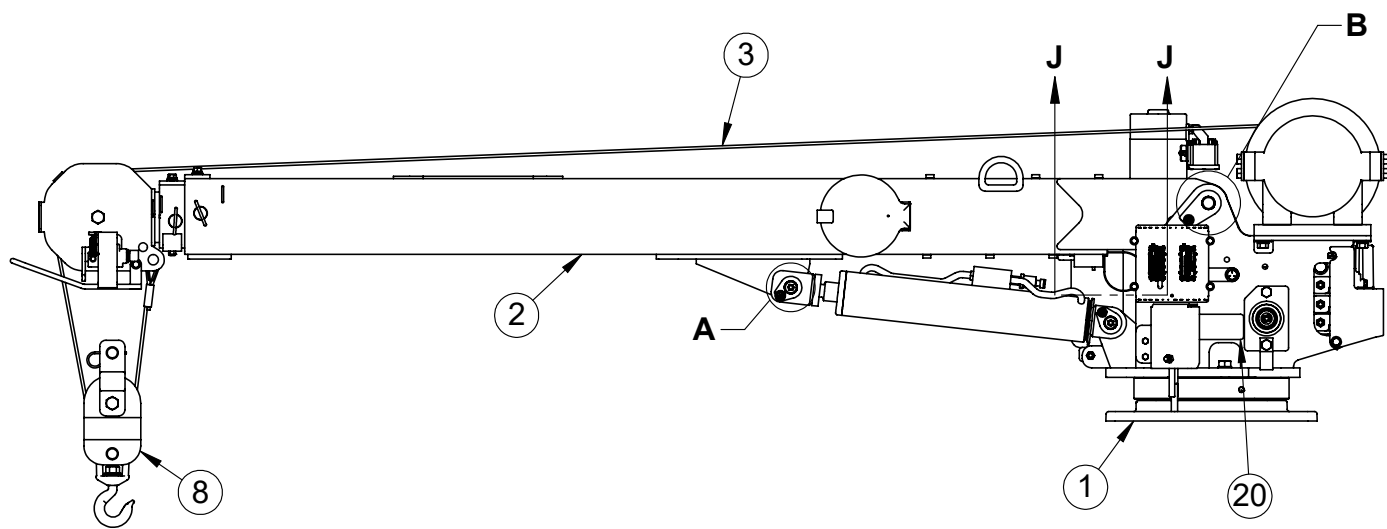


DETAIL G

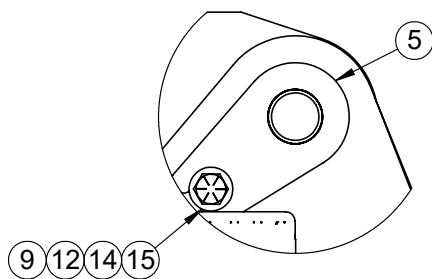
General Assembly - P/N 320992001

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	320992050	PEDESTAL ASSEMBLY, EHC-3.2 PRX / PRFX
2	1	320988102	BOOM ASSY 3203 PRX
3	1	320338002	CABLE ASS'Y, 7/32" X 62 FT, THIMBLE END
4	1	366823254	SENSOR, TRI-AXIS
5	1	404220000	PIN WDMT BOOM / PED
6	1	320824000	PIN, LIFT CYLINDER
7	2	360678000	PIN, 3/16 COTTERLESS RING
8	1	320433000	TRAVELING BLOCK ASSEMBLY
9	1	366159000	SCREW HX HD 3/8-16 UNC X 1 1/2 LG GR8
10	1	330371000	SCREW HX HD 3/8-16 UNC X 1 LG GR8
11	4	001302000	SCREW RD HD #8-32 UNC X 1/2 LG
12	1	330372000	NUT HX 3/8 NC GR5
13	4	015500000	NUT HX #8-32 UNC CP
14	2	021100000	WASHER SP LK 3/8
15	2	021200000	WASHER FL 3/8
16	4	019700000	WASHER SP LK #8
17	1	239300000	ZERK, GREASE
18	1	320992120	DECAL LAYOUT, EHC-3.2, NEXSTAR IV
19	1	320992270	KIT, SHIP EHC-3.2 NEXSTAR
20	1	663300001	CABLE TIE, 18"
21	1	330622000	DECAL, SERIAL NO.
22	1	772043000	ZIP TIE STRAP, 12 IN, NYLON, BLACK
23	1	366823238	LIGHT, LED 3 INCH (RED, AMBER, GREEN)
24	1	320931001	HOUSING, DEUTSCH PLUG 4-PIN DT06-4S
25	1	320931002	WEDGE, DEUTSCH 4-PIN W4S
26	1	475107001	IOT CONTROL BOX, RC57
27	4	001701002	SCREW PN HD #10-24 UNC X 1/2 LG
28	4	020000000	WASHER FL #10 ZP

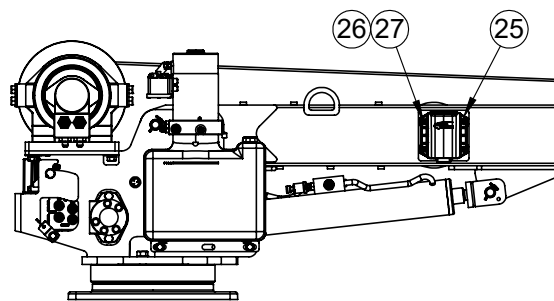
General Assembly - P/N 320992002



DETAIL A

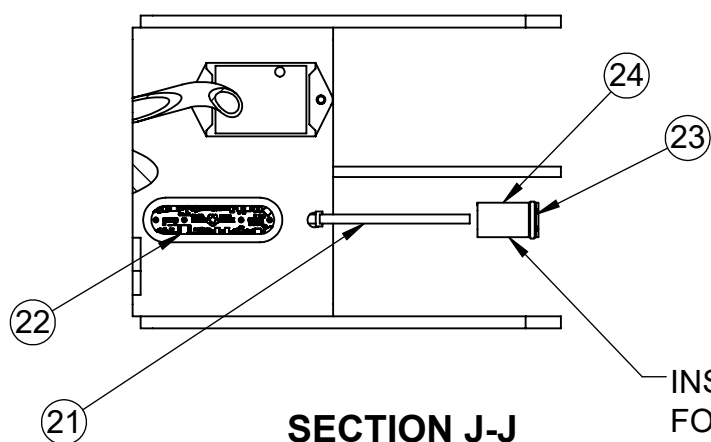


DETAIL B



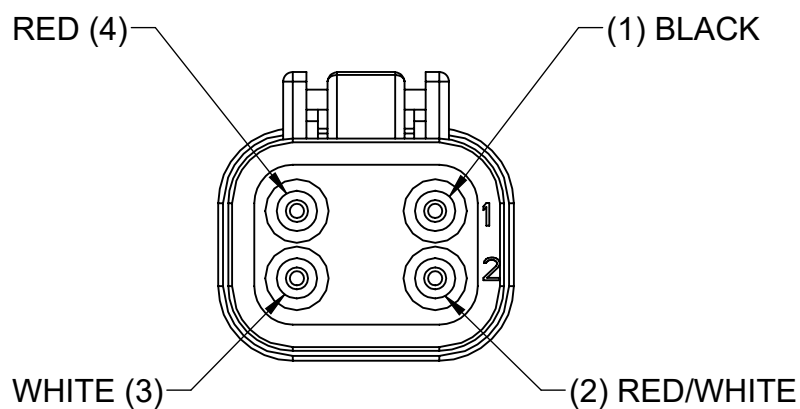
SECTION L-L

General Assembly - P/N 320992002



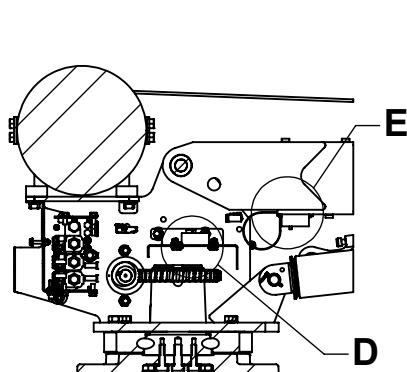
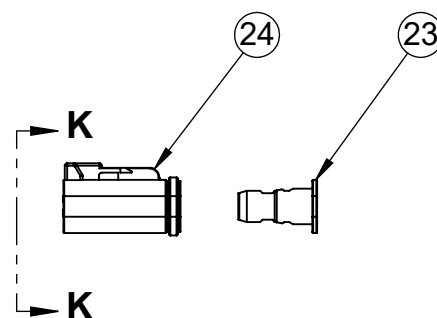
SECTION J-J

INSTALL 366823238 PIGTAIL THROUGH FORWARD HOLE, THEN ROUTE PIGTAIL THROUGH REAR HOLE AND FASTEN WITH 772043000. ONCE FASTENED, INSTALL 320931001 AND 320931002 PER SECTION K-K

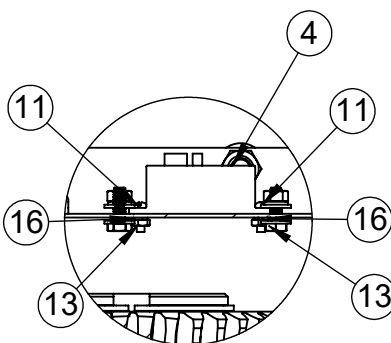


SECTION K-K

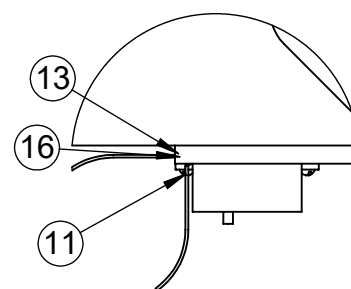
PIN OUT INFORMATION



SECTION C-C



DETAIL D

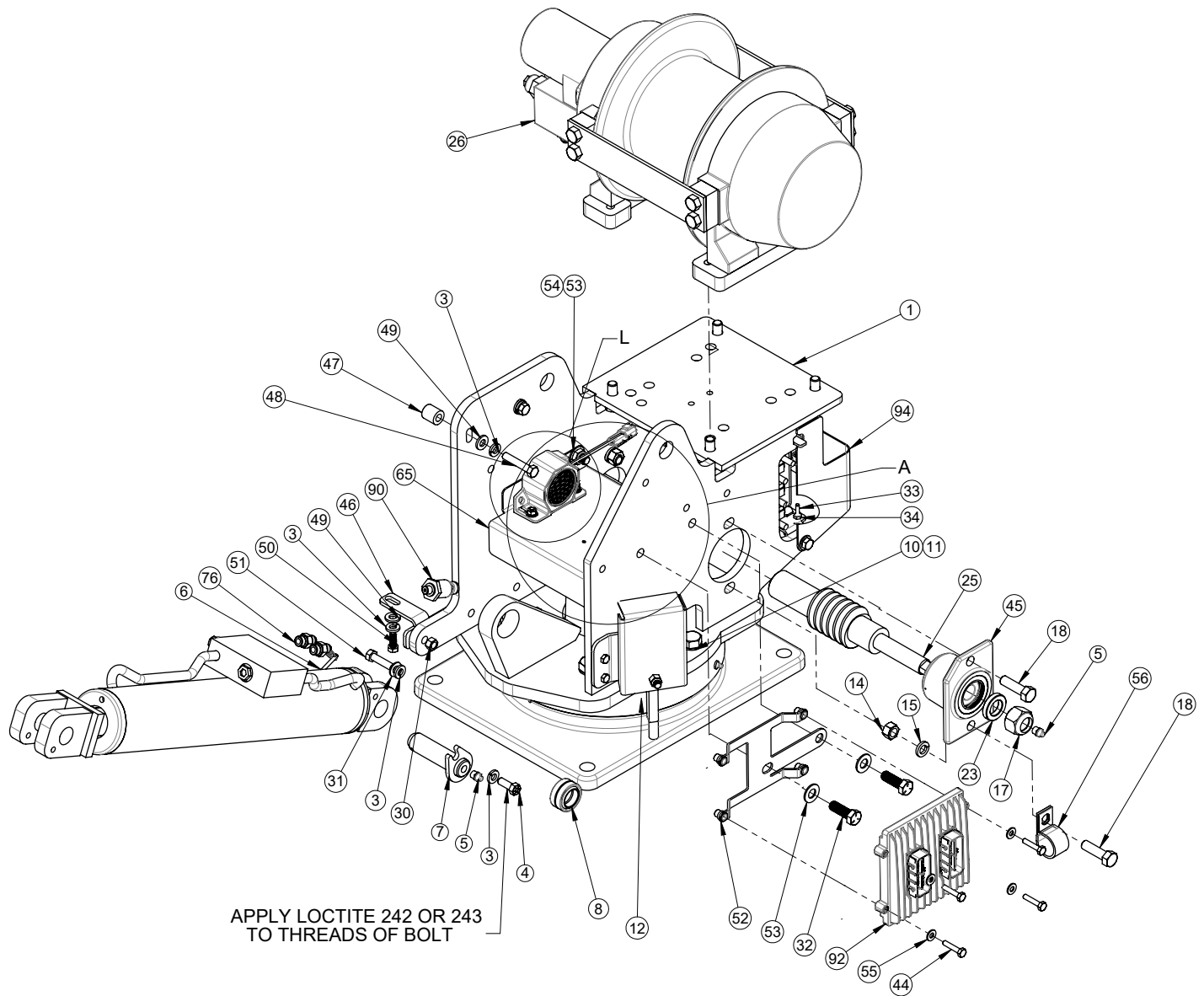


DETAIL E

General Assembly - P/N 320992002

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	320992051	PEDESTAL ASSEMBLY, EHC-3.2 PR
2	1	320988103	BOOM ASSY 3203 PR
3	1	320338002	CABLE ASS'Y, 7/32" X 62 FT, THIMBLE END
4	1	366823254	SENSOR, TRI-AXIS
5	1	404220000	PIN WDMT BOOM / PED
6	1	320824000	PIN, LIFT CYLINDER
7	2	360678000	PIN, 3/16 COTTERLESS RING
8	1	320433000	TRAVELING BLOCK ASSEMBLY
9	1	366159000	SCREW HX HD 3/8-16 UNC X 1 1/2 LG GR8
10	1	330371000	SCREW HX HD 3/8-16 UNC X 1 LG GR8
11	4	001302000	SCREW RD HD #8-32 UNC X 1/2 LG
12	1	330372000	NUT HX 3/8 NC GR5
13	4	015500000	NUT HX #8-32 UNC CP
14	2	021100000	WASHER SP LK 3/8
15	2	021200000	WASHER FL 3/8
16	4	019700000	WASHER SP LK #8
17	1	239300000	ZERK, GREASE
18	1	320992120	DECAL LAYOUT, EHC-3.2, NEXSTAR IV
19	1	320992270	KIT, SHIP EHC-3.2 NEXSTAR
20	1	330622000	DECAL, SERIAL NO.
21	1	772043000	ZIP TIE STRAP, 12 IN, NYLON, BLACK
22	1	366823238	LIGHT, LED 3 INCH (RED, AMBER, GREEN)
23	1	320931002	WEDGE, DEUTSCH 4-PIN W4S
24	1	320931001	HOUSING, DEUTSCH PLUG 4-PIN DT06-4S
25	1	475107001	IOT CONTROL BOX, RC57
26	4	020000000	WASHER FL #10 ZP
27	4	001701002	SCREW PN HD #10-24 UNC X 1/2 LG

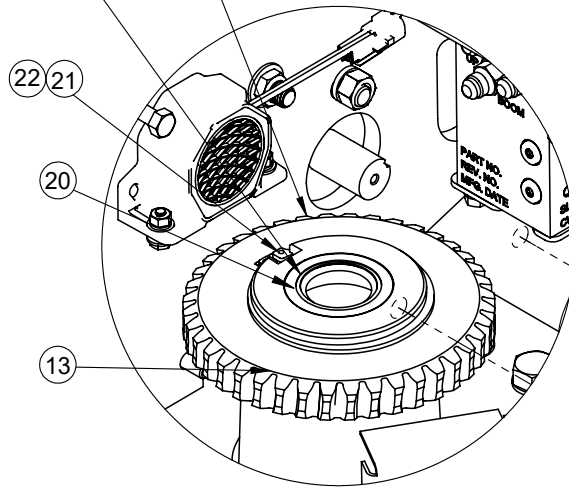
Pedestal Assembly - P/N 320992050



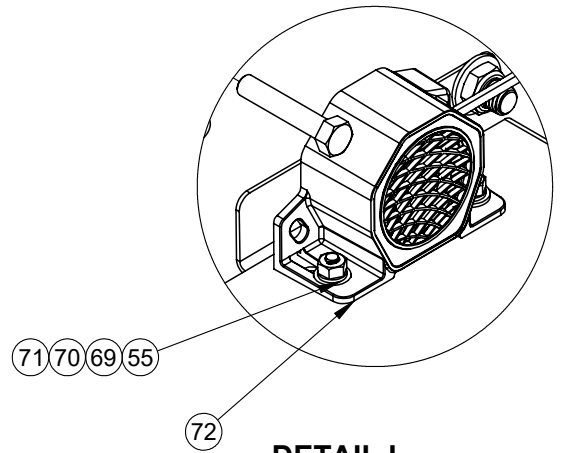
Pedestal Assembly - P/N 320992050

USE CAULK TO FILL
HOLE AROUND ALL
CABLES IN QUILL

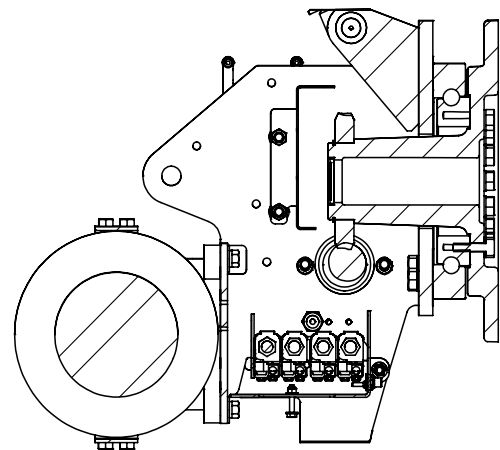
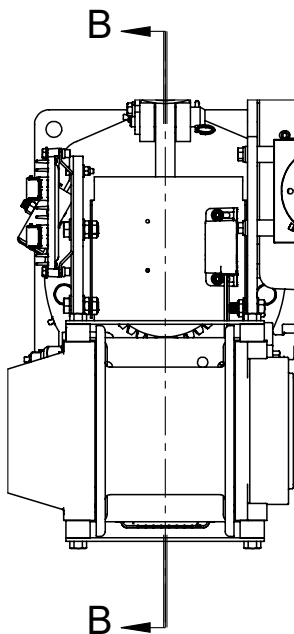
APPLY THIN LAYER OF
GREASE TO WORM GEAR



DETAIL A

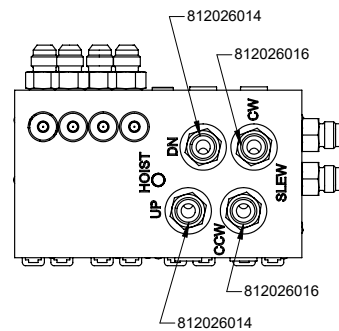
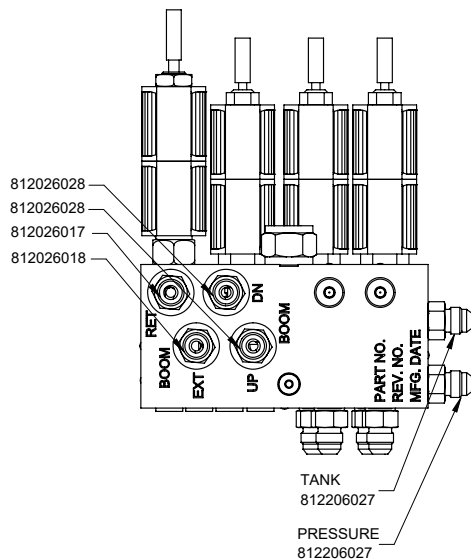
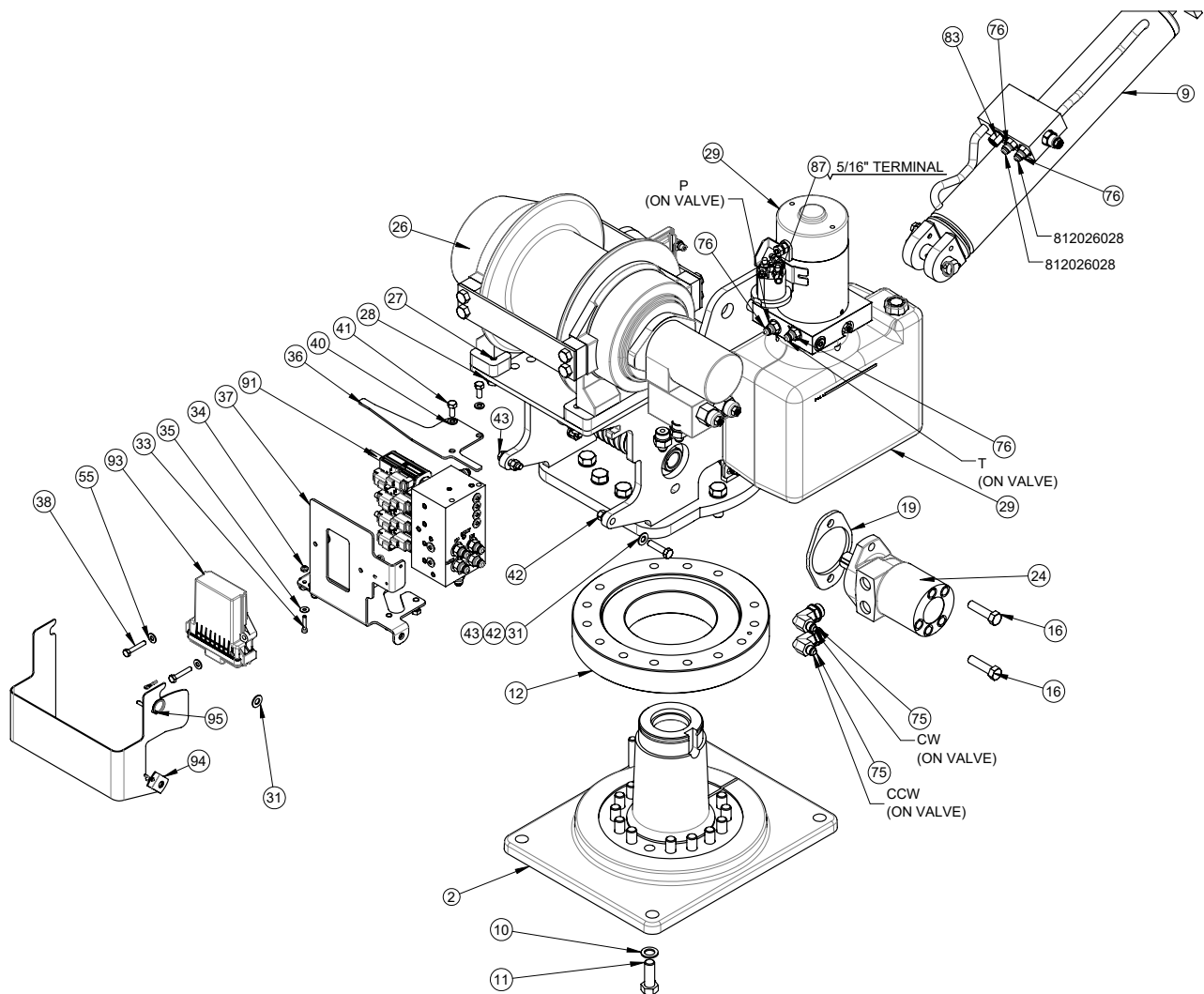


DETAIL L

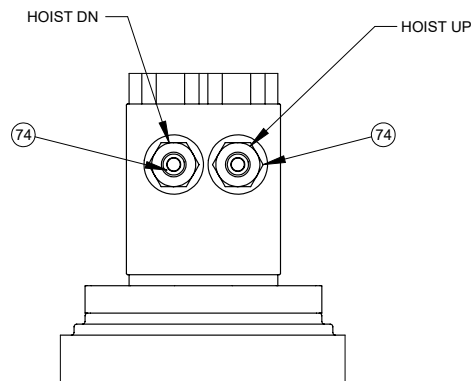
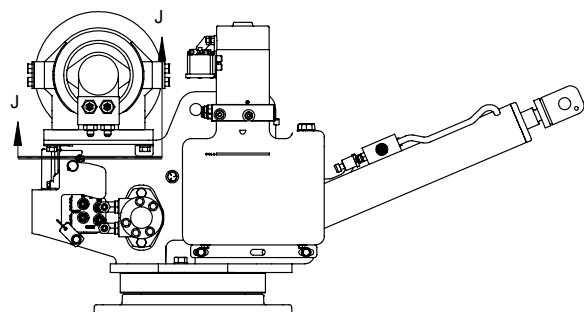


SECTION B-B

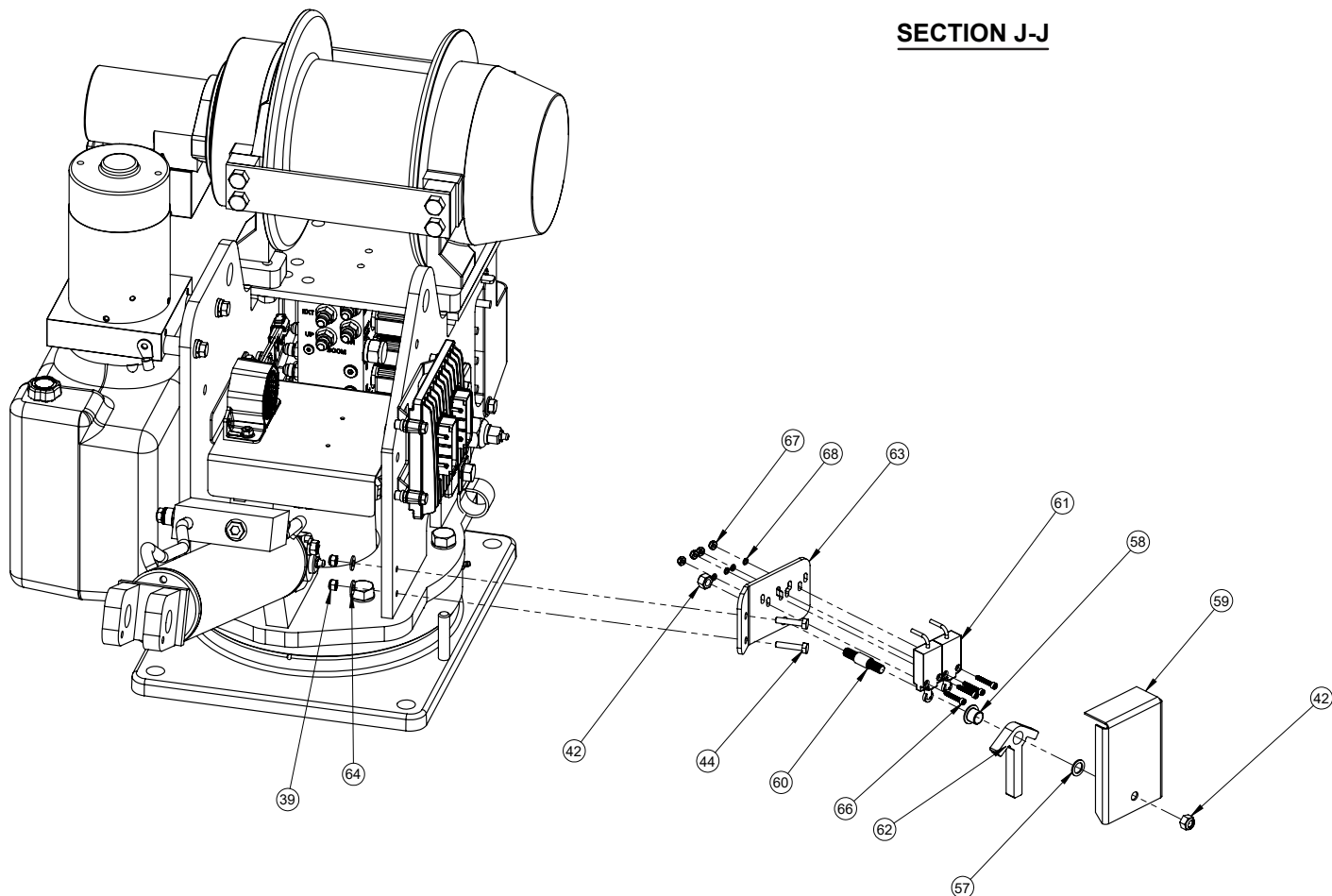
Pedestal Assembly - P/N 320992050



Pedestal Assembly - P/N 320992050



SECTION J-J



Pedestal Assembly - P/N 320992050

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	320992150	PEDESTAL WELDMENT, 3.2 / 4 EHC
2	1	320992140	BASE PLATE ASSEMBLY, EHC-3.2 NS
3	7	021100000	WASHER SP LK 3/8
4	1	330371000	SCREW HX HD 3/8-16 UNC X 1 LG GR8
5	2	239300000	ZERK, GREASE
6	1	360678000	PIN, 3/16 COTTERLESS RING
7	1	320824000	PIN, LIFT CYLINDER
8	1	320858000	BEARING, SPHERICAL 1.00 ID
9	1	320845000	CYLINDER, LIFT, 3.00 BORE, 15.875 STROKE, 25.00 RETRACTED LENGTH
10	23	023902000	WASHER FL 5/8 HARDENED
11	23	012198000	SCREW HX HD 5/8-11 UNC X 1 3/4 LG GR8
12	1	320878000	ROTATION BEARING
13	1	320988253	GEAR, WORM, 4.00 ID, .75 KEY, 3203
14	4	017701000	NUT HX 1/2-13 UNC
15	8	021500000	WASHER, SP LK 1/2
16	2	011608000	SCREW HX HD 1/2-13 UNC X 2 LG
17	1	019000000	NUT HX NYLK 7/8-14 UNF
18	2	011603000	SCREW HX HD 1/2-13 UNC X 1 3/4 LG
19	1	320879000	SPACER ROTATION
20	1	404213000	SEAL, 2.50 OD X 1.5 ID
21	1	404028000	RETAINING RING, SNAP RING
22	1	340602000	KEY, 3/4 SQ X 1
23	1	330483000	SPACER
24	1	404241285	MOTOR, HYD 8.0 CU IN, SAE 2-BOLT 1" SHAFT
25	1	404015000	WORM SHAFT
26	1	123331000	WINCH RPH 2000 WITH BLOCKED CLUTCH, AUTO CRANE
27	4	738647000	SCREW HX HD 1/2-13 UNC X 1 1/4 LG GR8
28	4	021600000	WASHER FL 1/2
29	1	320991316	POWER UNIT, NEXSTAR 3203 / 4004 EH LESS FILTER, PLASTIC TANK
30	2	330372000	NUT HX 3/8 NC GR5
31	6	021200000	WASHER FL 3/8
32	3	010201000	SCREW HX HD 1/2 UNC X 1 1/2 GR5
33	1	460094000	SCREW, SOC HD, #10-24 X 1" L, ZPL
34	1	015801000	NUT HX NYLK #10-24 UNC ZP
35	1	020000000	WASHER FL #10 ZP
36	1	320991222	BRACKET, UPPER VALVE 3203 / 4004 EH

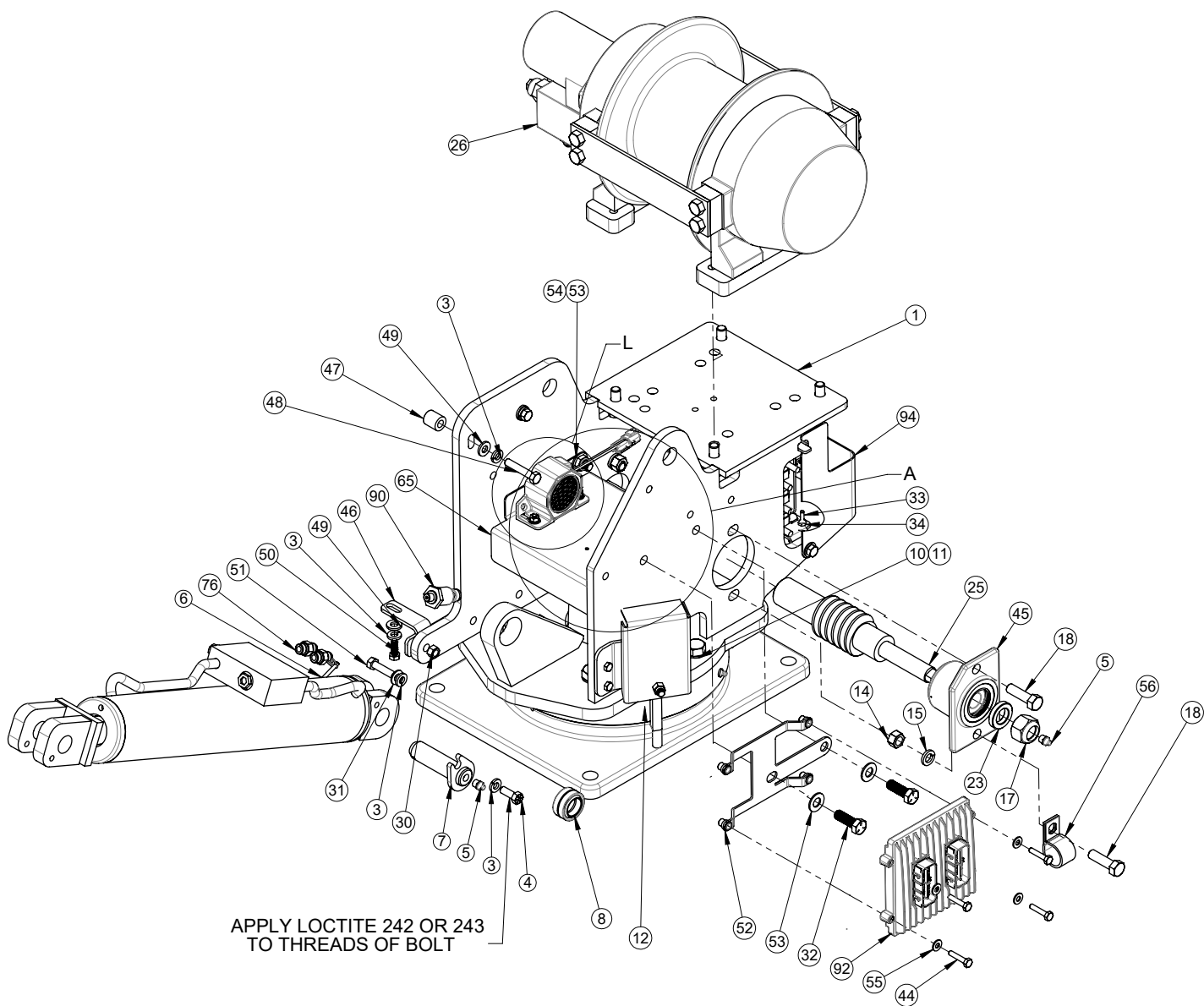
Pedestal Assembly - P/N 320992050

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
37	1	320992131	BRACKET, BASE STATION, NEXSTAR, EHC-3.2
38	2	005804000	SCREW HX HD 1/4-20 UNC X 1-1/2 LG
39	4	016300000	NUT HX NYLK 1/4-20 UNC
40	4	020600000	WASHER 5/16 LOCK SS
41	4	007807000	SCREW HX HD 5/16-18 UNC X 3/4 LG GR5
42	4	017301000	NUT HX NYLK 3/8-16 UNC CP
43	2	009109000	SCREW HX HD 3/8-16 UNC X 1 1/2 LG
44	6	006200000	SCREW HX HD 1/4-20 UNC X 1 1/4 LG
45	1	330478000	BEARING HOUSING ASSY
46	1	320991312	LOWER BRACKET, POWER UNIT
47	2	320991315	SPACER, UNTHREADED, 13/16" OD 7/16" ID, 7/8" LG, NYLON
48	2	009116000	SCREW HX HD 3/8-16 UNC X 2 GR5
49	4	320976000	WASHER, FLAT, 3/8 SAE HARDENED
50	2	320991314	HEX HEAD SCREW, 5/16"-18 X 7/8"
51	2	330394000	SCW HX 3/8 NC X 1 1/2
52	1	366823428	ASSEMBLY, BRACKET, CONTROLLER, NEXSTAR, HC-5, 6, 7, 8, 9, 10,12S
53	6	320588000	WASHER, FL 1/2, HARDENED
54	5	605001257	NUT, THIN, NYLON LOCK, 1/2-13
55	12	020400000	WASHER FL SAE 1/4
56	1	200982020	HOSE CLAMP, 1-3/16" ID
57	1	366675000	WASHER, NYLON
58	1	460079000	BEARING, ROTATION STOP
59	1	320989207	COVER, ROTATION STOP, 3203H
60	1	366673000	PIN, ROTATION STOP
61	1	320989214	ROTATION STOP SWITCH ASSEMBLY, 11"
62	1	366671000	ARM, ROTATION STOP
63	1	320989206	BRACKET, SWITCH MNT, ROT STOP, 3203H
64	2	020300000	WASHER FL 1/4
65	1	320992171	WIRE COVER BRACKET, EHC-3.2 / 4
66	4	006210000	CAPSCREW - #8-32 X 7/8 LG SOC HD Z/P
67	4	725321000	NUT HX NYLK #8-32 UNC
68	4	019700000	WASHER SP LK #8
69	2	005500000	SCREW HX HD 1/4 UNC X 3/4 GR5
70	2	015900000	NUT HX 1/4-20 UNC SS
71	2	020200000	WASHER SP LK 1/4
72	1	366823223	KIT, ALARM, CONSTANT TONE, W/ DEUTSCH PLUG
73	1	320991246	KIT, HOSE NEXSTAR 3203 PRX / 4004 EH

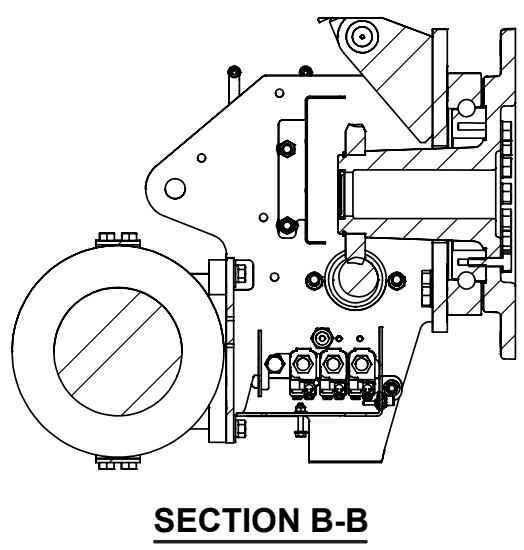
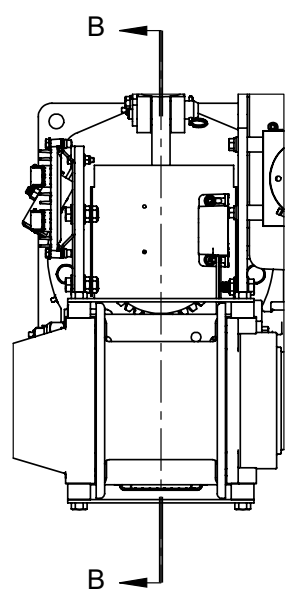
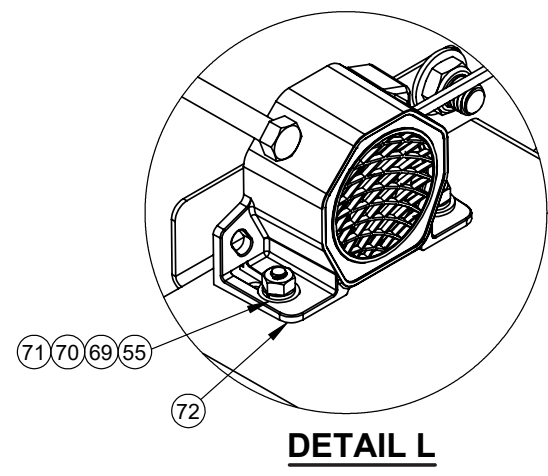
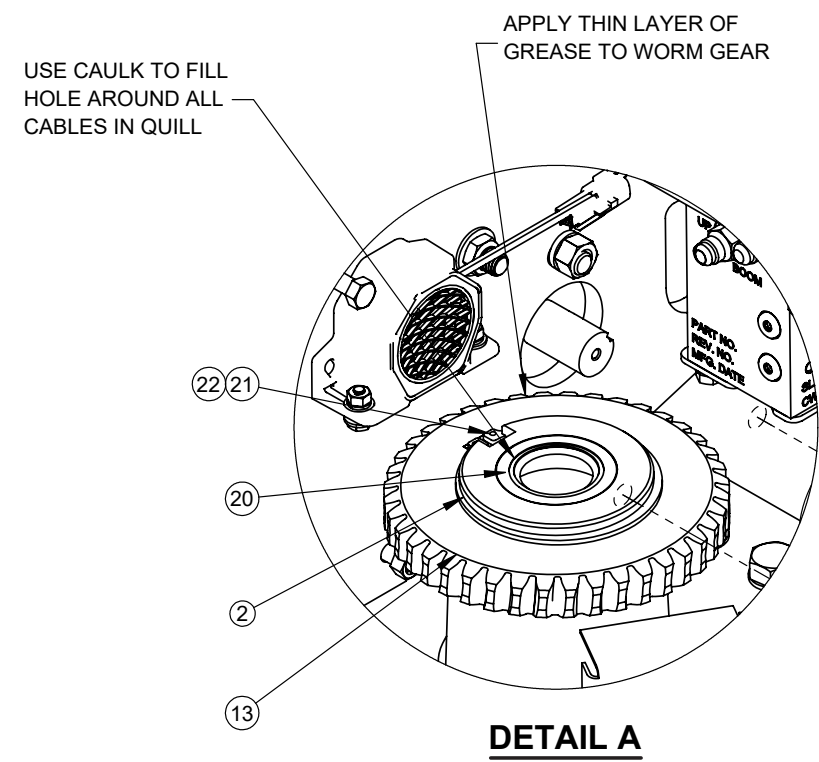
Pedestal Assembly - P/N 320992050

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
74	2	202755000	FITTING, -10 SAE / -6 JIC, STR
75	2	490198000	FITTING 90 10 SAE / 6 JIC
76	4	200876000	FITTING STR 6 SAE / 6 JIC
77	2	812026014	HOSE ASSY
78	2	812026016	HOSE ASSY
79	1	812026017	HOSE ASSY -4 HOSE -6 FEMALE JIC
80	1	812026018	HOSE ASSY, -4 HOSE, -6 JICF / -6 JICF, 18" LONG
81	2	812206027	HOSE, 3/8" X 3/8" JICF X 3/8" JICF 90 27 LG
82	2	812026028	HOSE ASSY, -6 JICF / -6 JICF X -4 HOSE X 28" LONG
83	1	369611000	ADAPTER, STR -6 ORM / -4 ORF
84	1	320992260	KIT, HARNESS SMALL EH NEXSTAR
85	1	320992354	HARNESS, NEXSTAR SMALL EH CRANES
86	1	320992264	CABLE, 2GA, 1/4-5/16 TERM, 72" LG
87	1	320992265	CABLE, 2GA 5/16-3/8 TERM, RED, 36" LG
88	1	320991293	CABLE, 2GA, 1/4-3/8 TERM, 72" LG
89	1	320992258	KIT, ELEC / HYD 3.2 PRX / 4 NS
90	1	366823409	TRANSDUCER, PRESSURE, 0-4000 PSI
91	1	320991251	VALVE BLOCK, 3203 PRX / 4004 EH PROPORTIONAL
92	1	366823402	CONTROLLER, NEXSTAR
93	1	366823403	BASE STATION, NEXSTAR
94	1	320992172	COVER, VALVE / RECEIVER NEXSTAR
95	1	366823240	PIN, 3/16 W/ LANYARD

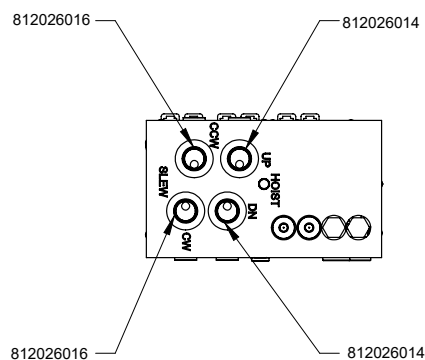
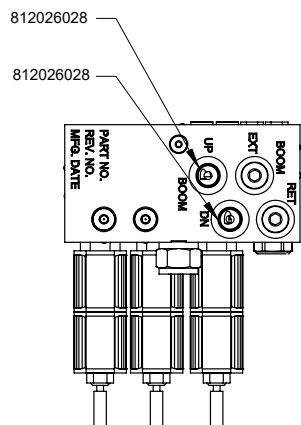
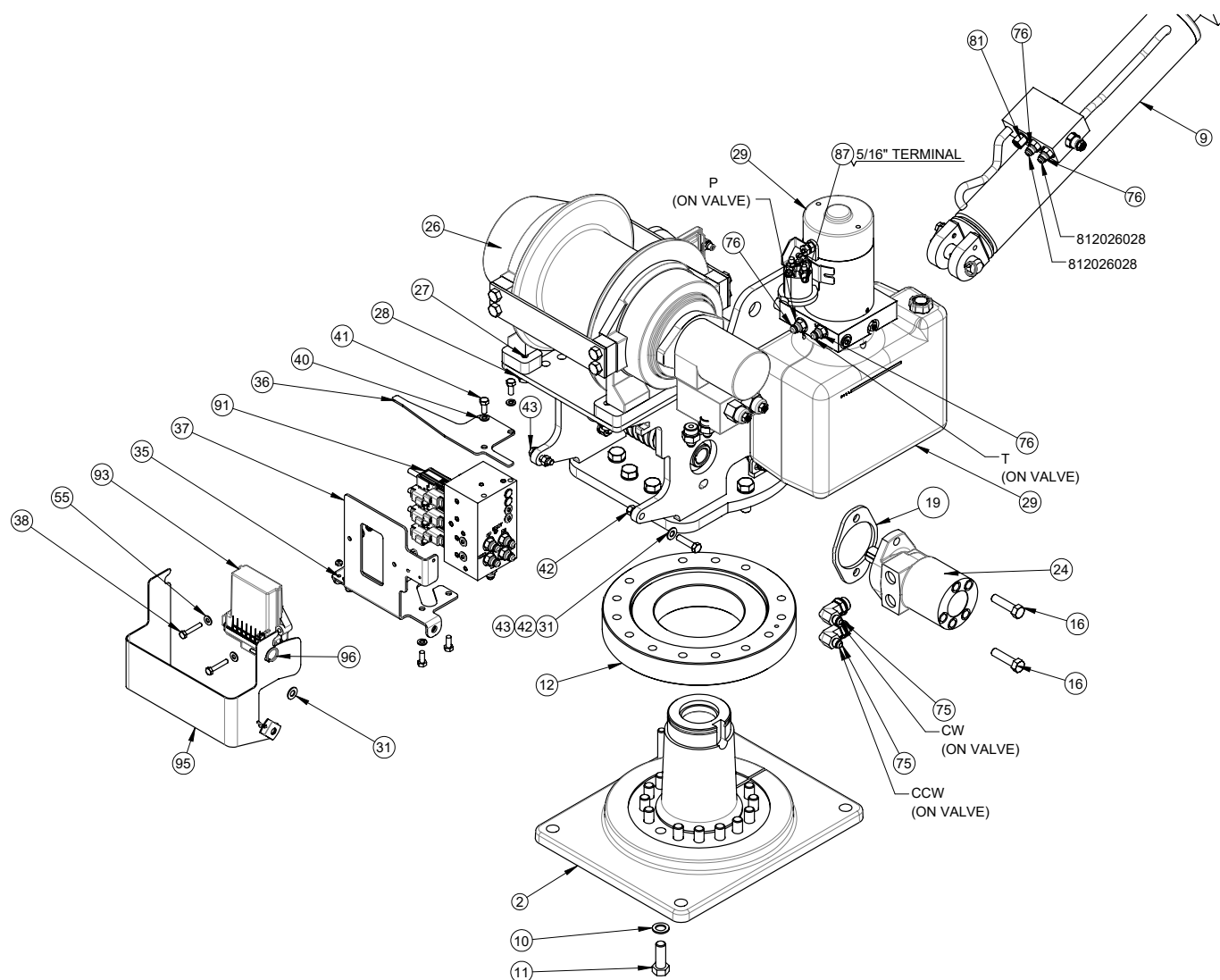
Pedestal Assembly - P/N 320992051



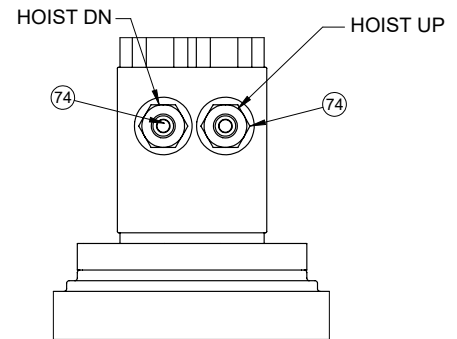
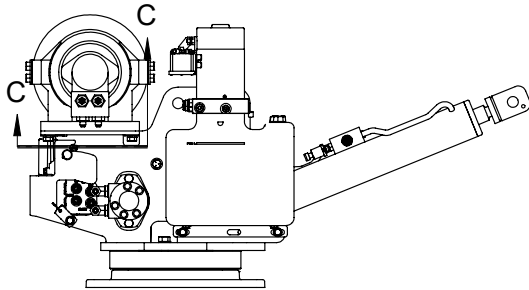
Pedestal Assembly - P/N 320992051



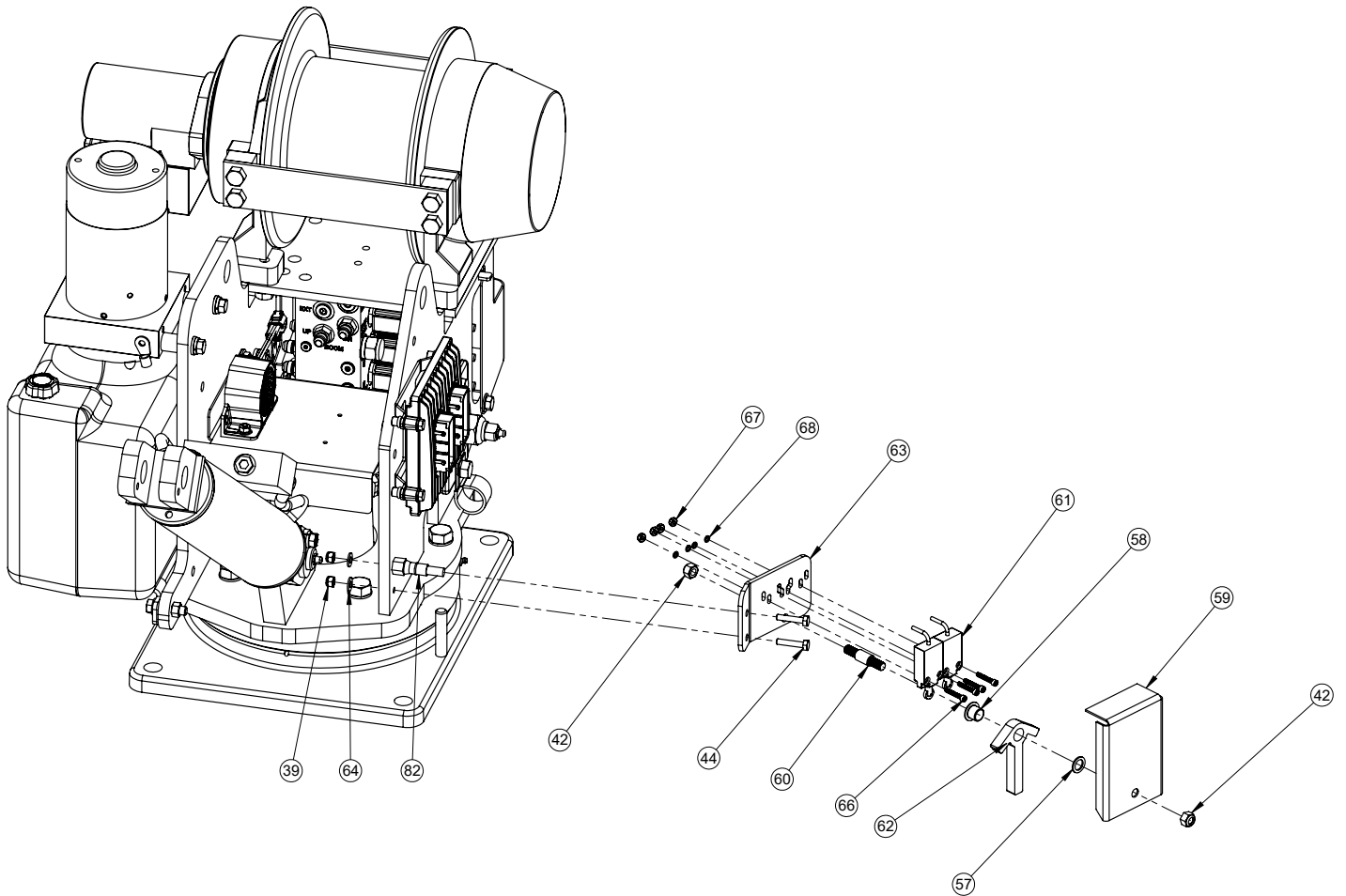
Pedestal Assembly - P/N 320992051



Pedestal Assembly - P/N 320992051



SECTION C-C



Pedestal Assembly - P/N 320992051

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	320992150	PEDESTAL WELDMENT, 3.2 / 4 EHC
2	1	320992140	BASE PLATE ASSEMBLY, EHC-3.2 NS
3	7	211000000	WASHER SP LK 3/8
4	1	330371000	SCREW HX HD 3/8-16 UNC X 1 LG GR8
5	2	239300000	ZERK, GREASE
6	1	360678000	PIN, 3/16 COTTERLESS RING
7	1	320824000	PIN, LIFT CYLINDER
8	1	320858000	BEARING, SPHERICAL 1.00 ID
9	1	320845000	CYLINDER, LIFT, 3.00 BORE, 15.875 STROKE, 25.00 RETRACTED LENGTH
10	23	239020000	WASHER FL 5/8 HARDENED
11	23	121980000	SCREW HX HD 5/8-11 UNC X 1 3/4 LG GR8
12	1	320878000	ROTATION BEARING
13	1	320988253	GEAR, WORM, 4.00 ID, .75 KEY, 3203
14	4	177010000	NUT HX 1/2-13 UNC
15	8	215000000	WASHER, SP LK 1/2
16	2	116080000	SCREW HX HD 1/2-13 UNC X 2 LG
17	1	190000000	NUT HX NYLK 7/8-14 UNF
18	2	116030000	SCREW HX HD 1/2-13 UNC X 1 3/4 LG
19	1	320879000	SPACER ROTATION
20	1	404213000	SEAL, 2.50 OD X 1.5 ID
21	1	404028000	RETAINING RING, SNAP RING
22	1	340602000	KEY, 3/4 SQ X 1
23	1	330483000	SPACER
24	1	404241285	MOTOR, HYD 8.0 CU IN, SAE 2-BOLT 1" SHAFT
25	1	404015000	WORM SHAFT
26	1	123331000	WINCH RPH 2000 WITH BLOCKED CLUTCH, AUTO CRANE
27	4	738647000	SCREW HX HD 1/2-13 UNC X 1 1/4 LG GR8
28	4	216000000	WASHER FL 1/2
29	1	320991316	POWER UNIT, NEXSTAR 3203 / 4004 EH LESS FILTER, PLASTIC TANK
30	2	330372000	NUT HX 3/8 NC GR5
31	6	212000000	WASHER FL 3/8
32	3	102010000	SCREW HX HD 1/2 UNC X 1 1/2 GR5
33	1	460094000	SCREW, SOC HD, #10-24 X 1" L, ZPL
34	1	158010000	NUT HX NYLK #10-24 UNC ZP
35	1	200000000	WASHER FL #10 ZP
36	1	320991222	BRACKET, UPPER VALVE 3203 / 4004 EH

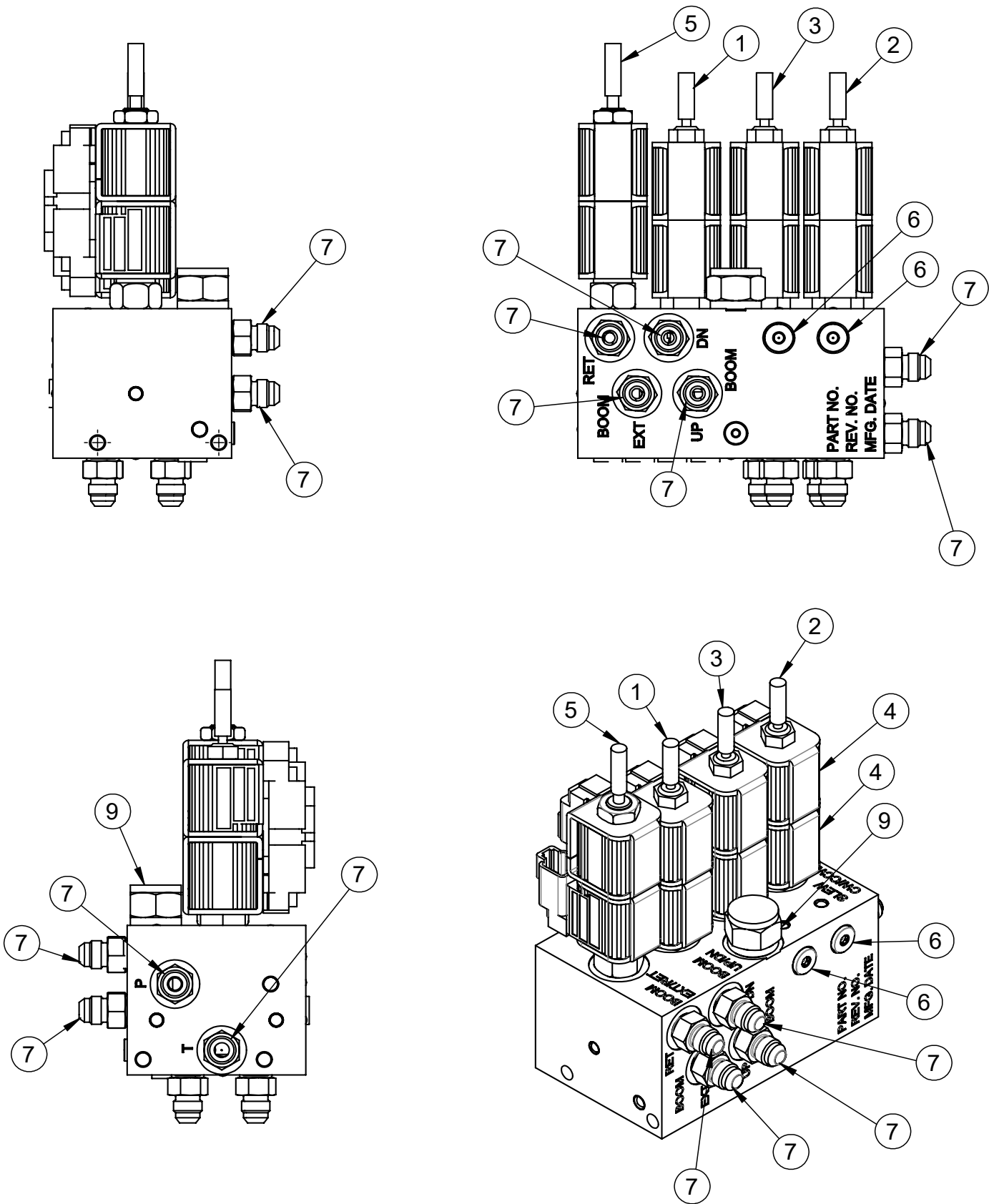
Pedestal Assembly - P/N 320992051

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
37	1	320992131	BRACKET, BASE STATION, NEXSTAR, EHC-3.2
38	2	580400000	SCREW HX HD 1/4-20 UNC X 1-1/2 LG
39	4	910900000	NUT HX NYLK 1/4-20 UNC
40	4	206000000	WASHER 5/16 LOCK SS
41	4	780700000	SCREW HX HD 5/16-18 UNC X 3/4 LG GR5
42	4	173010000	NUT HX NYLK 3/8-16 UNC CP
43	2	910900000	SCREW HX HD 3/8-16 UNC X 1 1/2 LG
44	6	620000000	SCREW HX HD 1/4-20 UNC X 1 1/4 LG
45	1	330478000	BEARING HOUSING ASSY
46	1	320991312	LOWER BRACKET, POWER UNIT
47	2	320991315	SPACER, UNTHREADED, 13/16" OD 7/16" ID, 7/8" LG, NYLON
48	2	911600000	SCREW HX HD 3/8-16 UNC X 2 GR5
49	4	320976000	WASHER, FLAT, 3/8 SAE HARDENED
50	2	320991314	HEX HEAD SCREW, 5/16"-18 X 7/8"
51	2	330394000	SCW HX 3/8 NC X 1 1/2
52	1	366823428	ASSEMBLY, BRACKET, CONTROLLER, NEXSTAR, HC-5, 6, 7, 8, 9, 10, 12S
53	6	320588000	WASHER, FL 1/2, HARDENED
54	5	605001257	NUT, THIN, NYLON LOCK, 1/2-13
55	12	204000000	WASHER FL SAE 1/4
56	1	200982020	HOSE CLAMP, 1-3/16" ID
57	1	366675000	WASHER, NYLON
58	1	460079000	BEARING, ROTATION STOP
59	1	320989207	COVER, ROTATION STOP, 3203H
60	1	366673000	PIN, ROTATION STOP
61	1	320989214	ROTATION STOP SWITCH ASSEMBLY, 11"
62	1	366671000	ARM, ROTATION STOP
63	1	320989206	BRACKET, SWITCH MNT, ROT STOP, 3203H
64	2	203000000	WASHER FL 1/4
65	1	320992171	WIRE COVER BRACKET, EHC-3.2 / 4
66	4	621000000	CAPSCREW - #8-32 X 7/8 LG SOC HD Z/P
67	4	725321000	NUT HX NYLK #8-32 UNC
68	4	197000000	WASHER SP LK #8
69	2	550000000	SCREW HX HD 1/4 UNC X 3/4 GR5
70	2	159000000	NUT HX 1/4-20 UNC SS
71	2	202000000	WASHER SP LK 1/4
72	1	366823223	KIT, ALARM, CONSTANT TONE, W/ DEUTSCH PLUG
73	1	320991247	KIT, HOSE NEXSTAR 3203PR

Pedestal Assembly - P/N 320992051

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
74	2	202755000	FITTING, -10 SAE / -6 JIC, STR
75	2	490198000	FITTING 90 10 SAE / 6 JIC
76	4	200876000	FITTING STR 6 SAE / 6 JIC
77	2	812026014	HOSE ASSY
78	2	812026016	HOSE ASSY
79	1	812206027	HOSE, 3/8" X 3/8" JICF X 3/8" JICF 90 27 LG
80	2	812026028	HOSE ASSY, -6 JICF / -6 JICF X -4 HOSE X 28" LONG
81	1	369611000	ADAPTER, STR -6 ORM / -4 ORF
82	1	812206019	HOSE, 3/8" X 3/8" JICF X 3/8" JICF 90 19" LG
83	1	241175000	FITTING 90 6 SAE / 6 JIC
84	1	320992260	KIT, HARNESS SMALL EH NEXSTAR
85	1	320992354	HARNESS, NEXSTAR SMALL EH CRANES
86	1	320992264	CABLE, 2GA, 1/4-5/16 TERM, 72" LG
87	1	320992265	CABLE, 2GA 5/16-3/8 TERM, RED, 36" LG
88	1	320991293	CABLE, 2GA, 1/4-3/8 TERM, 72" LG
89	1	320992257	KIT, ELEC / HYD 3.2 PR / 4 NS
90	1	366823409	TRANSDUCER, PRESSURE, 0-4000 PSI
91	1	320991261	VALVE BLOCK, 3203PR PROPORTIONAL
92	1	366823402	CONTROLLER, NEXSTAR
93	1	366823403	BASE STATION, NEXSTAR
94	1	366823406	BATTERY PACK, AA ALKALINE (X3), NEXSTAR
95	1	320992172	COVER, VALVE / RECEIVER NEXSTAR
96	1	366823240	PIN, 3/16 W/ LANYARD

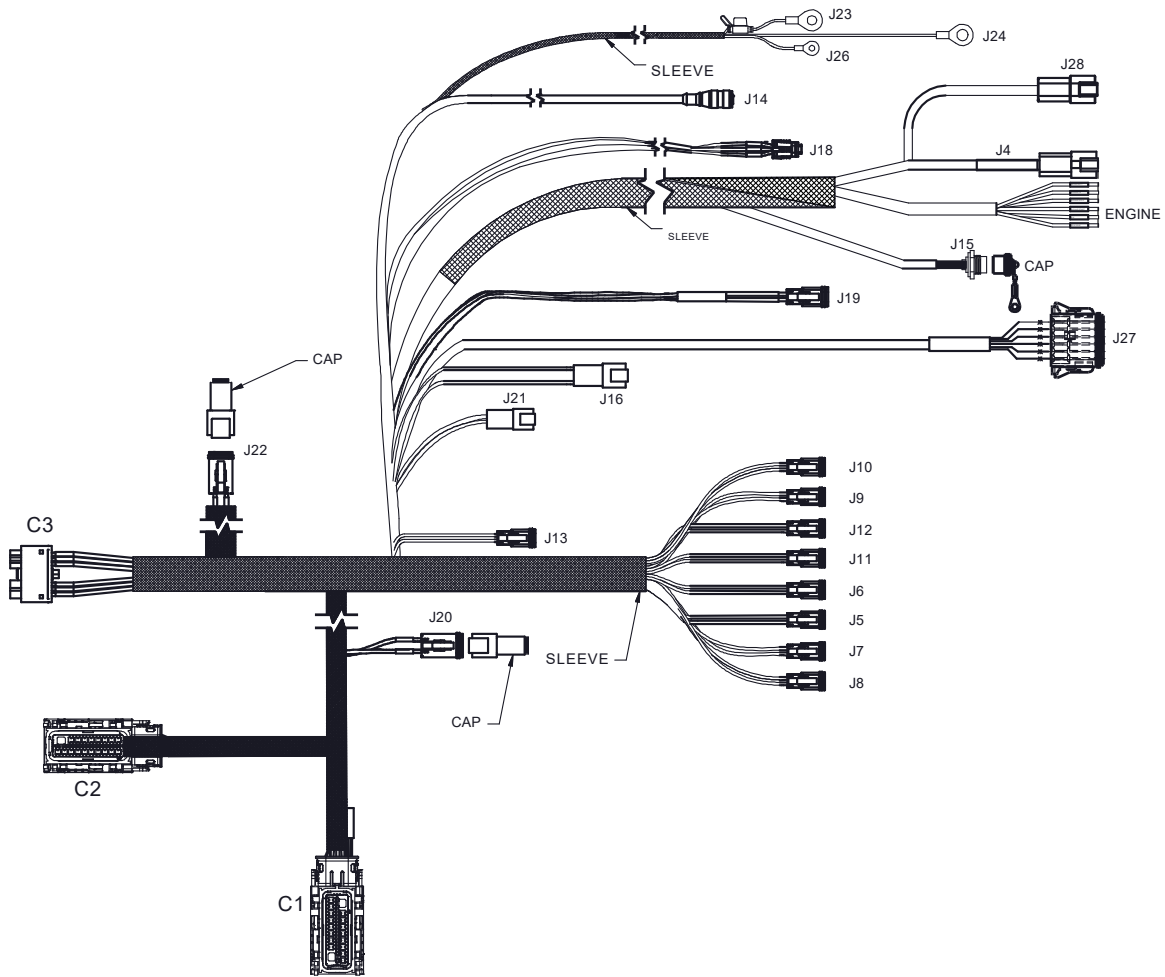
Hydraulic Valve Bank - P/N 320991251



Hydraulic Valve Bank - P/N 320991251

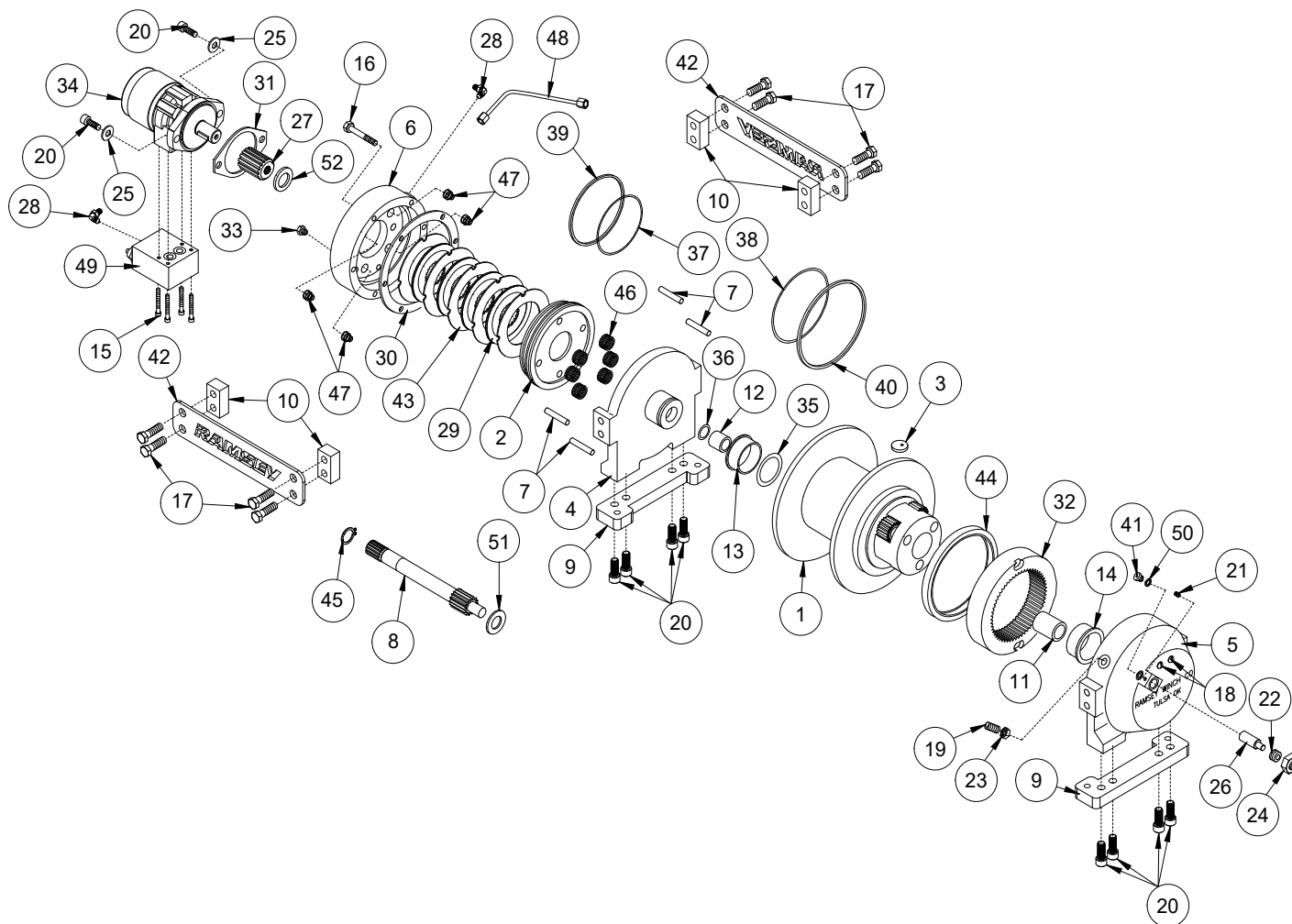
ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	320991914	VALVE, CARTRIDGE PROPOTIONAL 3203 / 4004 NEXSTAR FLOAT CENTER
2	1	320991912	VALVE, CARTRIDGE PROPOTIONAL 3203 / 4004 NEXSTAR CLOSED CENTER
3	1	320991913	VALVE, CARTRIDGE PROPOTIONAL 3203 / 4004 NEXSTAR FLOATING CENTER
4	8	320991901	COIL, SOLENOID 12 VDC 1/2" DIA
5	1	320991902	VALVE, CARTRIDGE 3203 / 4004 NEXSTAR
6	8	320991905	VALVE, CHECK SIZE 04
7	10	200876000	FITTING STR 6 SAE / 6 JIC
8	1	320991904	ORIFICE, 1/4-20 UNC 3/8 LG 0.018 DIA
9	1	320991903	VALVE, LOGIC

Wiring Harness - P/N 320992354



CONNECTOR ID	DESCRIPTION	CONNECTOR ID	DESCRIPTION
C1	MC43 CONNECTOR C1	J14	BOOM ANGLE SENSOR
C2	MC43 CONNECTOR C2	J15	PENDANT CONNECTION
C3	BASE STATION	J16	ALARM LIGHT
J4	TELEMATICS	J18	BOOM PT
J5	BOOM DN	J19	HORN
J6	BOOM UP	J20	OIL TEMPERATURE SENSOR
J7	ROTATE CW	J21	ROTATE LIMIT SWITCHES
J8	ROTATE CCW	J22	G11 MODEM
J9	BOOM RETRACT	J23	POWER
J10	BOOM EXTEND	J24	GROUND
J11	HOIST DN	J26	PUMP SOLENOID
J12	HOIST UP	J27	RC57
J13	ANTI-2 BLOCK	J28	IoT

Hoist Assembly - P/N 123331



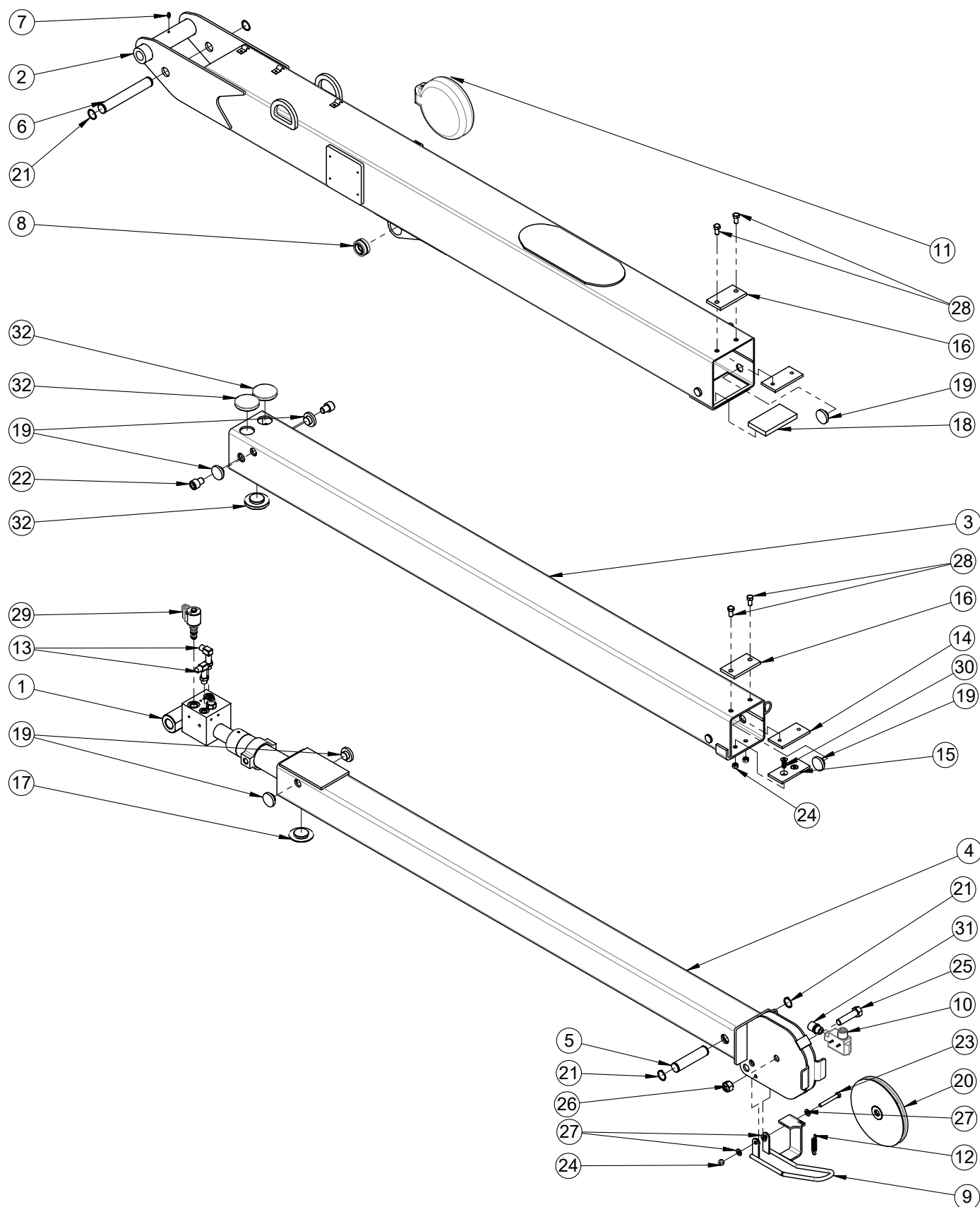
Hoist Assembly - P/N 123331

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	234189000	DRUM ASSEMBLY
2	1	306042000	PISTON-BRAKE
3	1	315004000	ANCHOR-CABLE
4	1	338300000	END BRG-MOTOR END
5	1	338301000	END BRG-GEAR HSG.
6	1	338302000	HSG-BRAKE
7	4	346045000	PIN-BRAKE
8	1	357513000	SHAFT-INPUT
9	2	408435000	SPACER-FOOT MOUNTING
10	4	362284000	SPACER-TIE PLATE
11	1	402120000	BEARING
12	1	402121000	BEARING
13	1	412084000	BUSHING-DRUM, MOTOR END
14	1	412085000	BUSHING-DRUM, GEAR END
15	4	414159000	CAPSCREW - 5/16-18 NC X 3 LG HX HD GR5
16	6	414303000	BOLT - 3/8-16 NC X 2 1/2, HX HD, GR5, Z/P
17	8	414548000	CAPSCREW - 1/2-13 NC X 1 1/2, HX HD, Z/P, G5
18	2	414854000	SCREW - 1/4-20 NC X 1/2 LG, RD HD, SLOT, Z/PL
19	1	414926000	SETSCREW - 3/8-16 NC X 1, SOCKET, NYLON
20	12	414948000	CAPSCREW - 1/2-13 NC X 1 1/4 LG, SOCKET HD
21	1	416016000	SETSCREW - 1/4-20 NC X 1/4 HX SOCK HD CUP
22	1	416080000	SETSCREW - 5/8-18 NF X 1 LG, HX SOC HD, CUP
23	1	418036000	NUT - 3/8-16 NC, HEX JAM, Z/P
24	1	418088000	NUT-JAM 5/8-18 NF HEX HD, ZINC PLT
25	2	418218000	LOCKWASHER - 1/2 ID MED SECT, ZINC PLT
26	1	426048000	PLUNGER-CLUTCH, BLOCKED
27	1	431015000	COUPLING-MOTOR
28	2	432018000	FITTING
29	4	438022000	DISC-BRAKE
30	1	442220000	GASKET-BRAKE HSG.
31	1	442223000	GASKET-MOTOR FLANGE
32	1	444140000	GEAR-RING, P/M
33	1	456038000	FITTING-VENT, BREATHER
34	1	458222000	MOTOR-HYDRAULIC (RPH-4900)
35	1	462046000	O-RING
36	1	462056000	O-RING

Hoist Assembly - P/N 123331

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
37	1	462057000	O-RING
38	1	462058000	O-RING
39	1	462059000	O-RING-BACK-UP
40	1	462060000	O-RING-BACK-UP
41	1	472052000	PLUG
42	2	395426000	TIE PLATE
43	5	474111000	PLATE-SEPARATOR, BRAKE
44	1	486080000	SEAL
45	1	490037000	SNAP RING
46	6	494110000	SPRING-BRAKE
47	4	494112000	SPRING
48	1	509009000	TUBE ASSY
49	1	516068000	VALVE-MOTOR CONTROL
50	1	518037000	THRUST WASHER
51	1	518047000	THRUST WASHER
52	1	518052000	THRUST WASHER

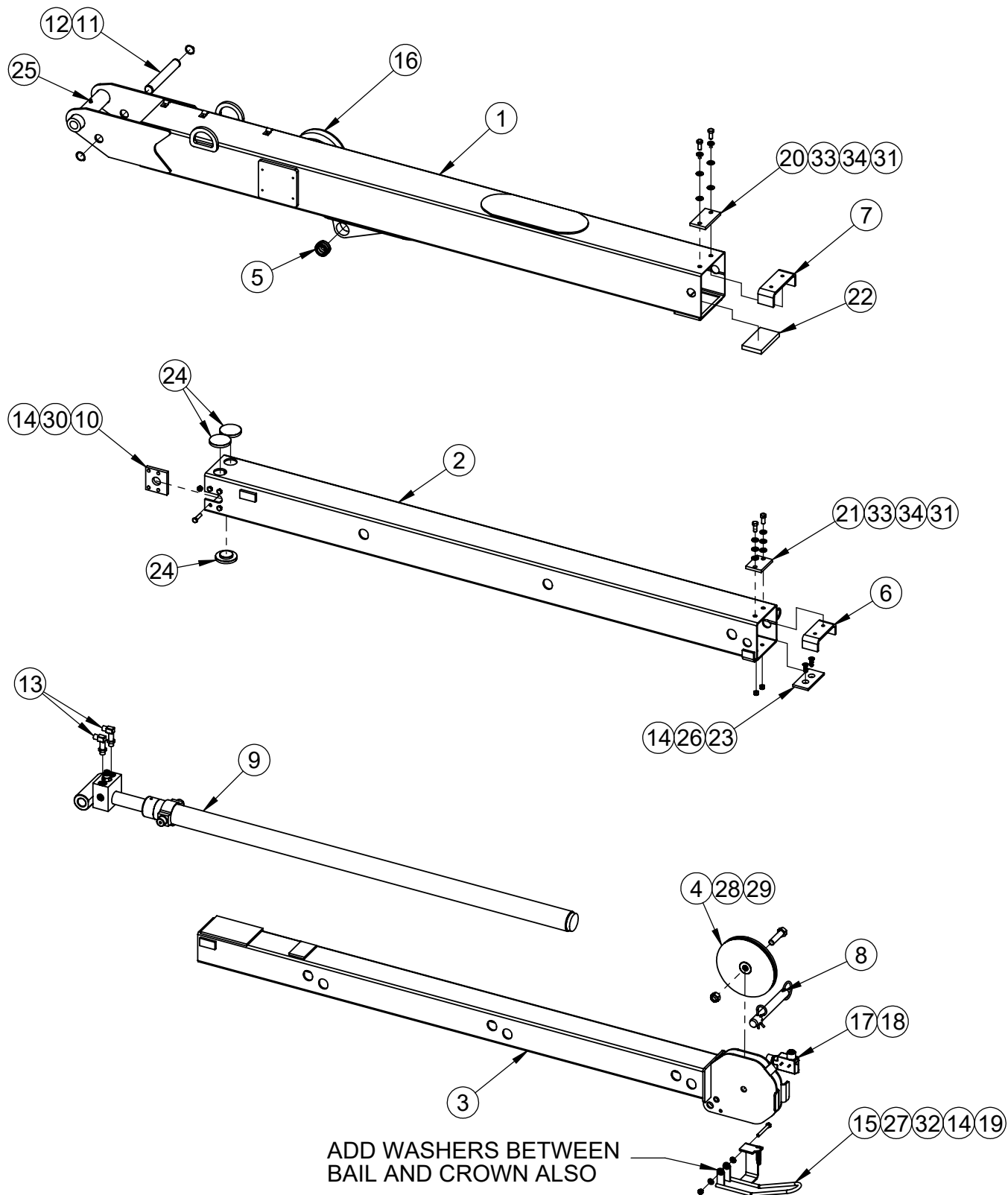
Boom Assembly - P/N 320990100



Boom Assembly - 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 1 DIA X 4.063 LG
6	1	320988115	PIN 1 DIA X 6.905 LG, 3203
7	1	239000000	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	404205000	CORD REEL ASSY
12	1	366678000	SPRING, EXTENSION
13	2	330645000	FITTING 90 6-SAE / 6-JIC LONG
14	2	366483000	PLATE, WEAR PAD .25 X 2 X 4
15	1	320990104	WEAR PAD, 2 X 4 X .25, W/ CSINK HOLES
16	2	366201000	WEAR PAD 3.75 X 2.00 X .313
17	1	470048000	PAD, BOOM 2.50 O.D. X 0.063 THICK
18	1	320988155	BOOM PAD 4.50 X 2.50 X .50, 3203
19	8	360767000	PAD BOOM 1.5 O.D.
20	1	320883000	SHEAVE ASSEMBLY
21	4	360122000	RING RETAINING 5100-98
22	2	460177162	SCREW SOC HD 5/8-11 UNC X 3/4 LG
23	1	811029000	SCREW HX HD 5/16-18 UNC X 2 1/2 LG
24	3	016801000	NUT HX NYLK 5/16-18 UNC CP
25	1	366393000	SCREW HX HD 5/8-11 UNC X 2 1/2 LG GR8
26	1	018200000	NUT HX NY LK 5/8-11 UNC
27	4	020901000	WASHER FL 5/16
28	4	738733000	SCREW HX HD 3/8-24 UNF X 3/4 LG
29	1	320990101	VALVE, SPOOL, 3-WAY, W/ COIL & DEUTSCH CONNECTION
30	2	320990105	SCREW, FLAT HEAD, 5/16-18 UNC X 1, ZP
31	1	642918000	CORD CONNECTOR
32	3	407203000	PAD, BOOM, 2.50 O.D. X .563 THK

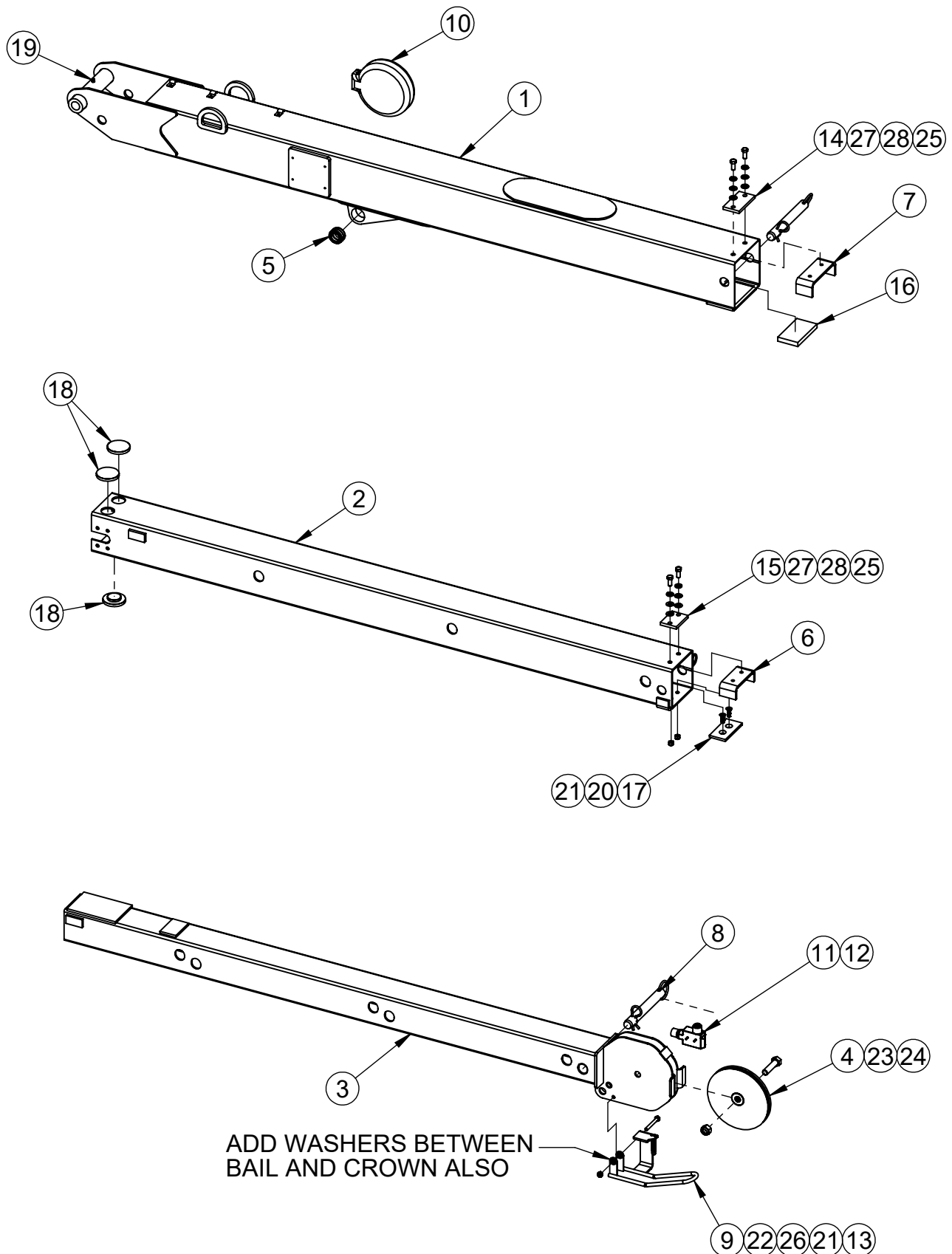
Boom Assembly - P/N 320988102



Boom Assembly - 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	320883000	SHEAVE ASSEMBLY
5	1	320858000	BEARING, SPHERICAL 1.00 ID
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 5/16-18 UNC 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 5/16-18 UNC X 2 1/2 LG
28	1	366393000	SCREW HX HD 5/8-11 UNC X 2 1/2 LG GR8
29	1	018200000	NUT HX NY LK 5/8-11 UNC
30	8	007804000	SCREW HX HD 5/16-18 UNC X 1 1/4 LG CP
31	4	738733100	SCREW HX HD 3/8-24 UNF 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

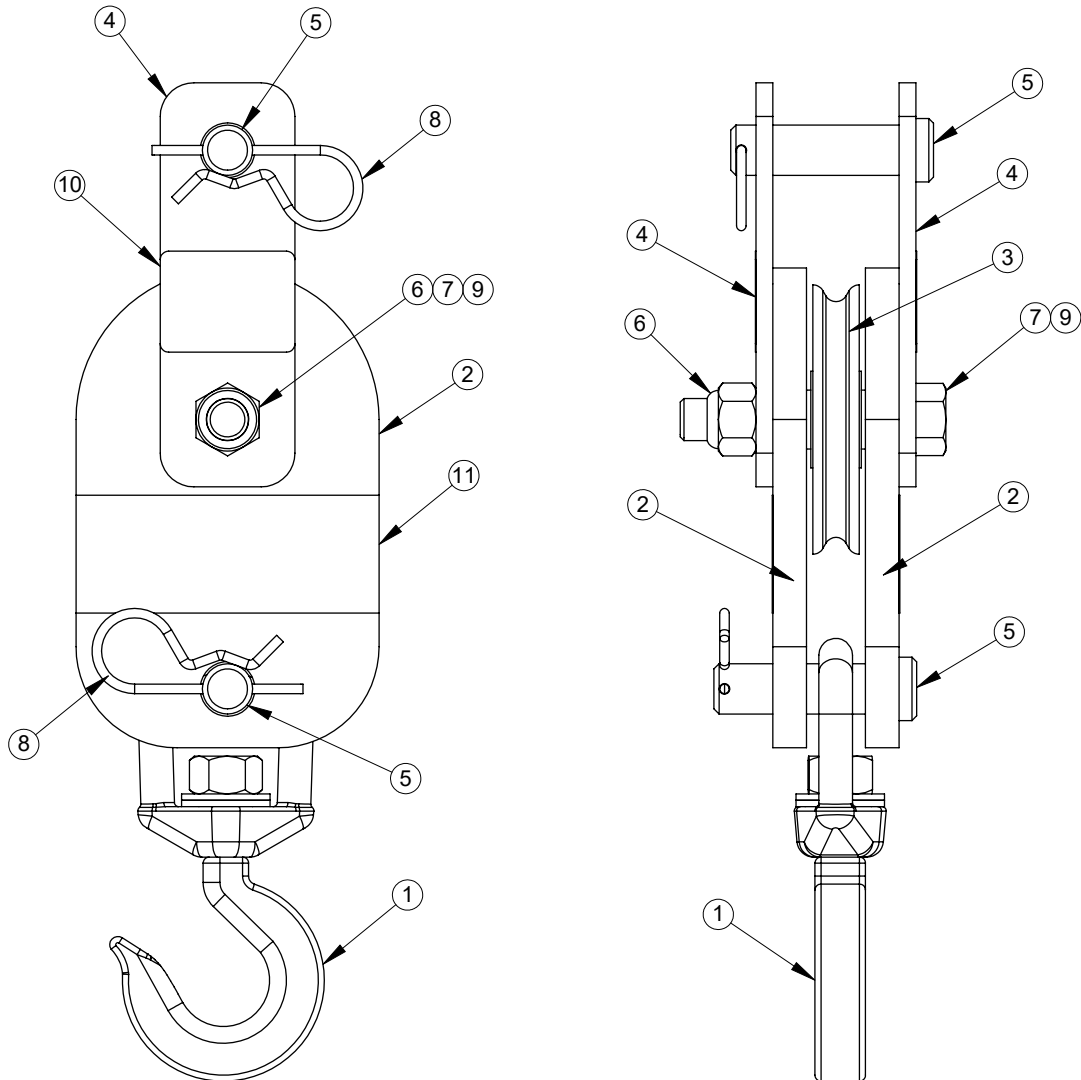
Boom Assembly - P/N 320988103



Boom Assembly - 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	320883000	SHEAVE ASSEMBLY
5	1	320858000	BEARING, SPHERICAL 1.00 ID
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 5/16-18 UNC CP
22	1	811029000	SCREW HX HD 5/16-18 UNC X 2 1/2 LG
23	1	366393000	SCREW HX HD 5/8-11 UNC X 2 1/2 LG GR8
24	1	018200000	NUT HX NY LK 5/8-11 UNC
25	4	738733100	SCREW HX HD 3/8-24 UNF 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

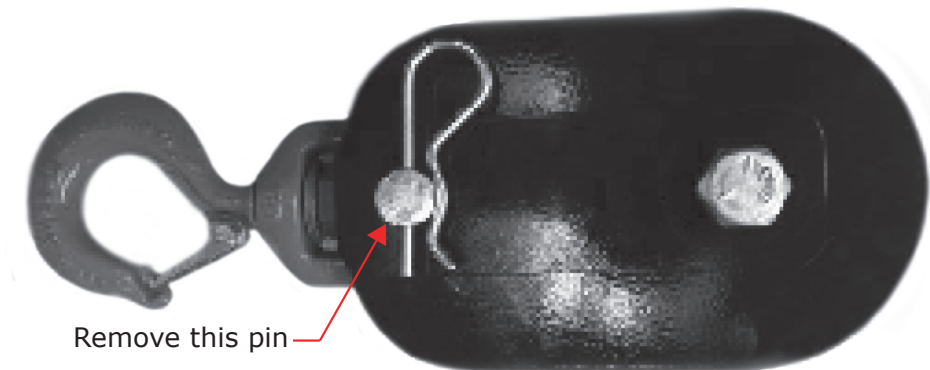
Traveling Block Assembly - P/N 320433000



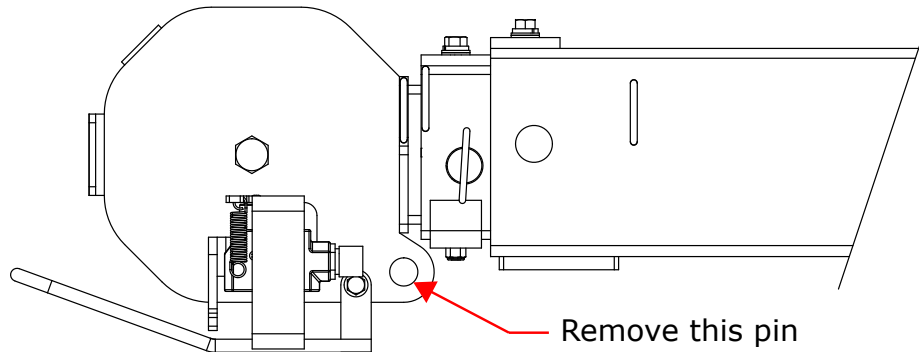
ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	100309000	SWIVEL HOOK, ASSEMBLY W/ LATCH
2	2	320403000	SIDE PLATE, 3203
3	1	200909000	SHEAVE ASSEMBLY
4	2	320404000	BLOCK TRAVELING
5	2	320434001	PIN, 3/4 X 2-3/4 LG
6	1	018200000	NUT HX NY LK 5/8-11 UNC
7	1	013512000	SCREW HX HD 5/8-11 UNC X 3 1/2 LG
8	2	366813000	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

Traveling Block Single Line Conversion

Remove hook from traveling block by removing pin.

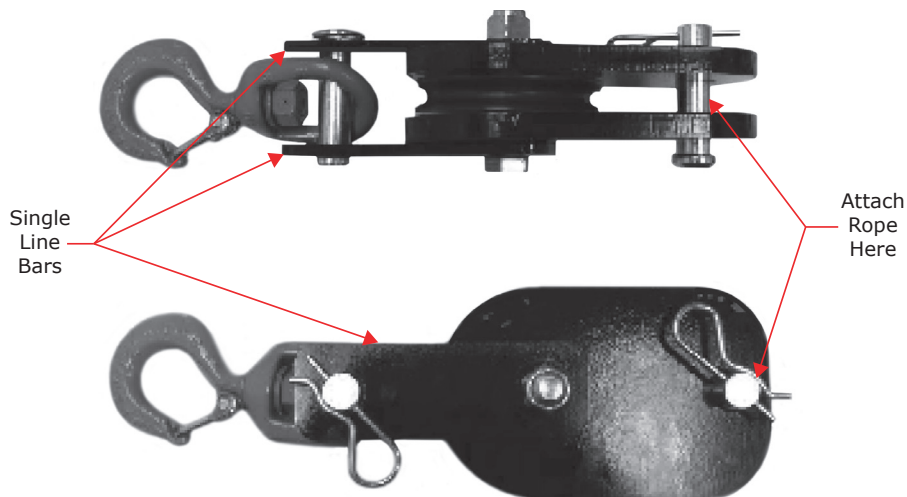


Remove traveling block from rope.
Disconnect the rope from the crown by removing pin.



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.

