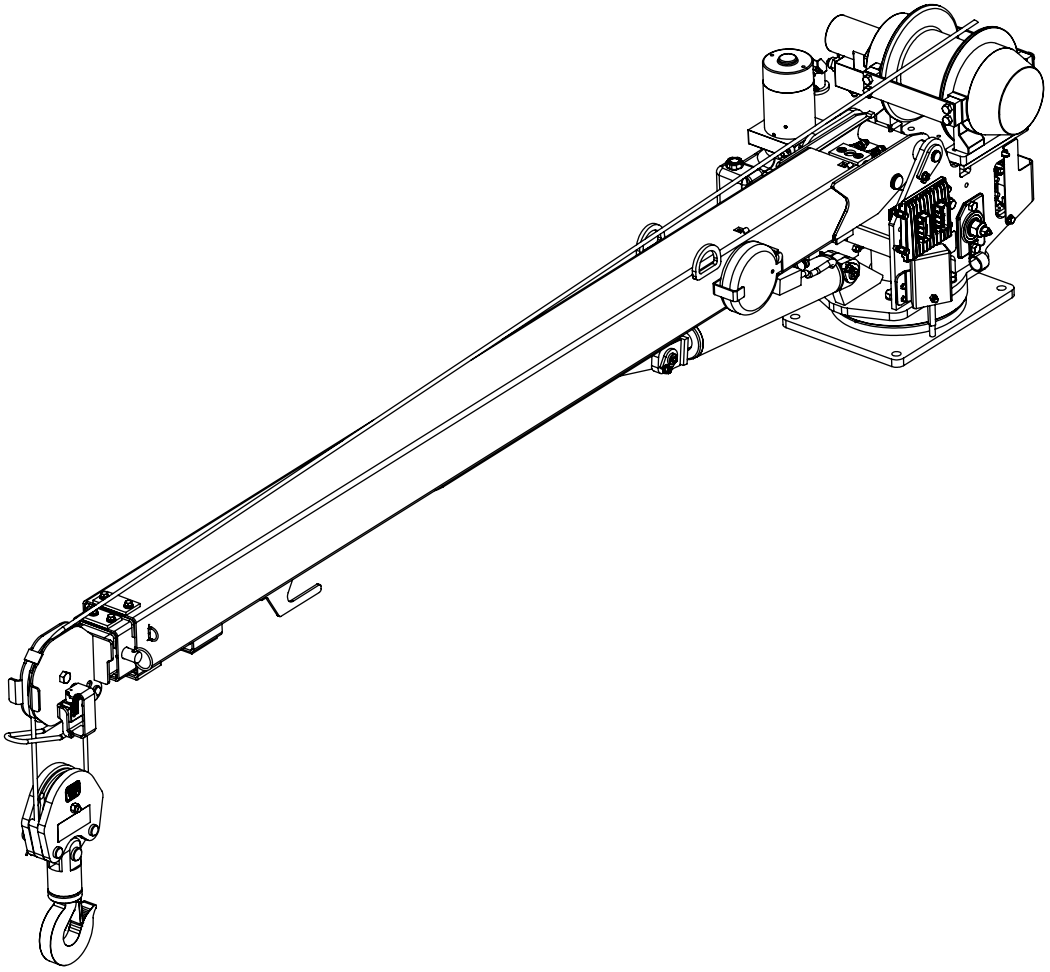
OWNER'S MANUAL
EHC-4 NEXSTAR



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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 for 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.

Table Of Contents

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

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

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

NOTICE Indicates information considered important, but not hazard-related.

WARNING 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.

WARNING 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.

WARNING 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.

WARNING 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.

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

WARNING 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 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

Dimensions

- Width: 20.63 in. (0.52 m)
- Height: 24.00 in. (0.50 m)
- Length (16’ Boom): 9 ft 8 in. (2.95 m), stored length.
- Length (20’ Boom): 11 ft 9 in. (3.58 m), stored length.
- Weight (16’ Boom): 960 lb (435 kg)
- Weight (20’ Boom): 1040 lb (472 kg)

Rating

- Crane Capacity: 4,000 lb
  Double Line: 4,000 lb maximum
  Single Line: 2,000 lbs maximum
- 16,000 ft-lb (2.21 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 (16’ Boom): 8 ft. to 12 ft.
- Third boom reach (16’ Boom): 12 ft. to 16. ft.
- Second boom reach (20’ Boom): 10 ft. 4 in. to 16 ft. 4 in.
- Third boom reach (20’ Boom): 16 ft. 4 in. to 20 ft. 4 in.

Cable

- 80 ft. (24.4 m) of 5/16” in. (8 mm) diameter aircraft quality cable. This cable has a single line breaking strength of 9,800 lb (4,445 kg).

Line Speed

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

Chassis and Mounting Requirements

- 10,500 lb (4,763 kg) GVWR minimum
- 201,600 in-lb Resistive Bending Moment (RBM)
- 3/4”, Grade 8-UNF Bolts. Tightened to 315 ft-lb
- 9” Mounting hole to run electrical lines to the crane from the body

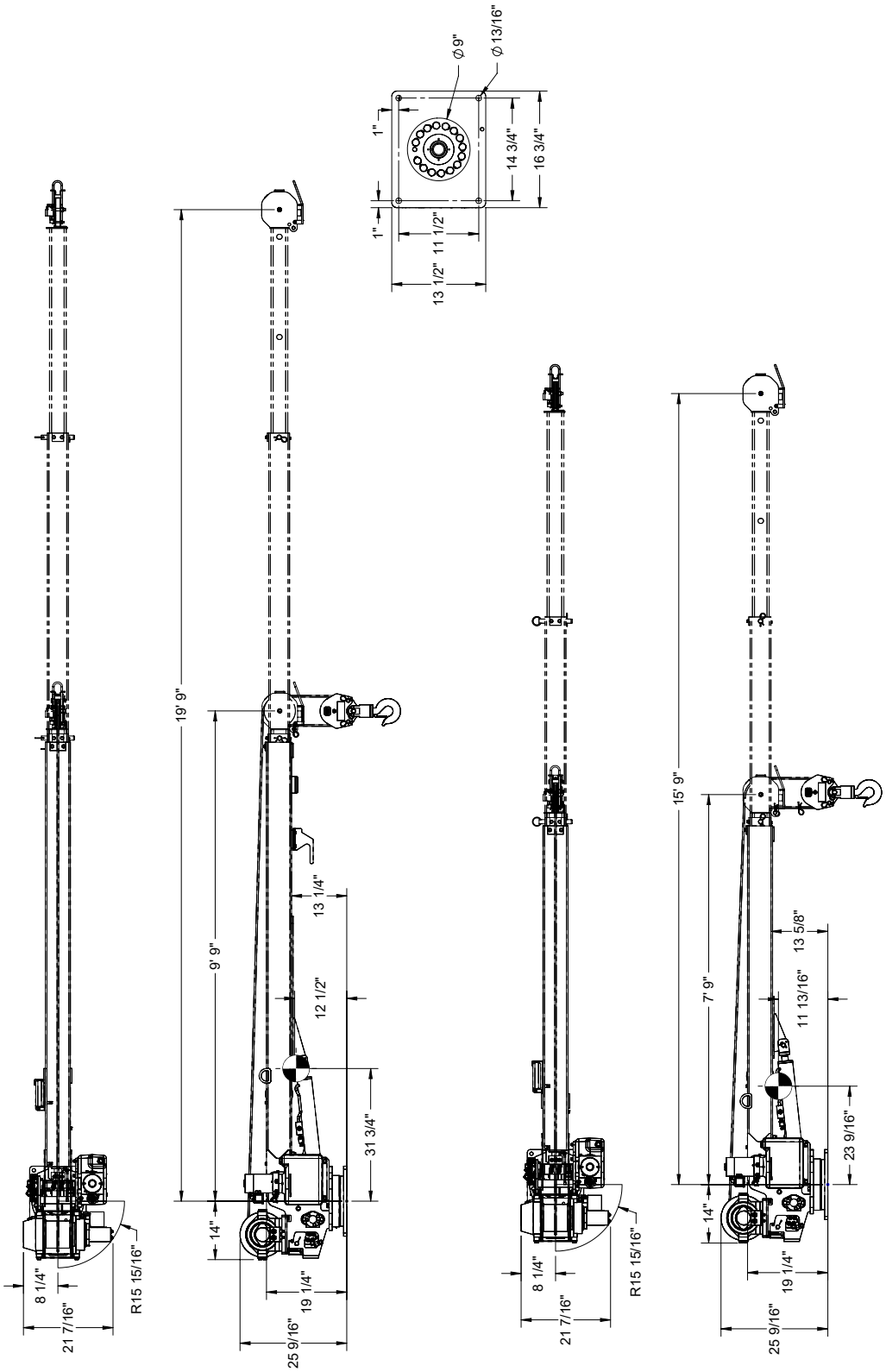
Electrical System Requirements

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

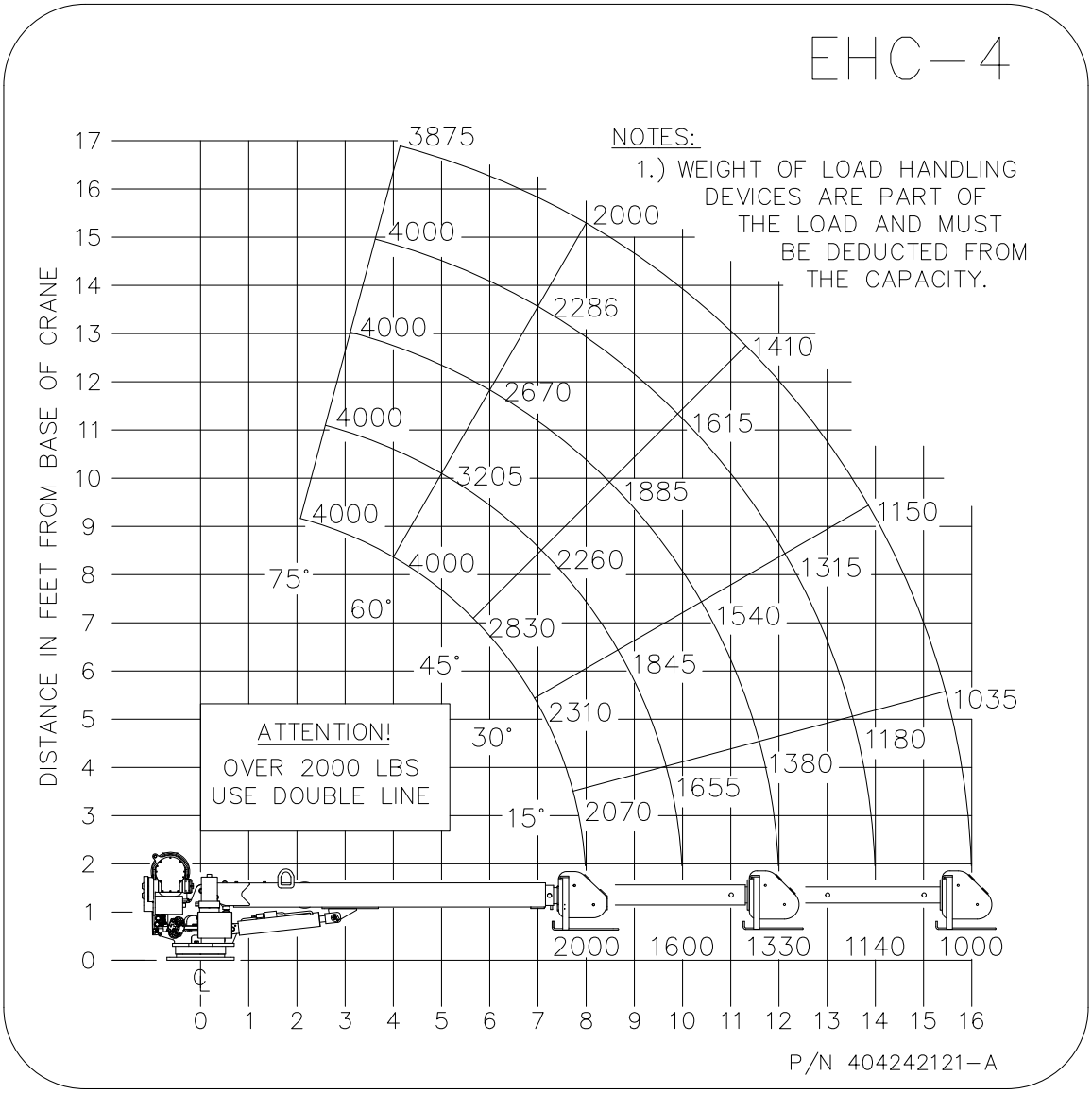
Rotation

- 370º range

General Dimensions



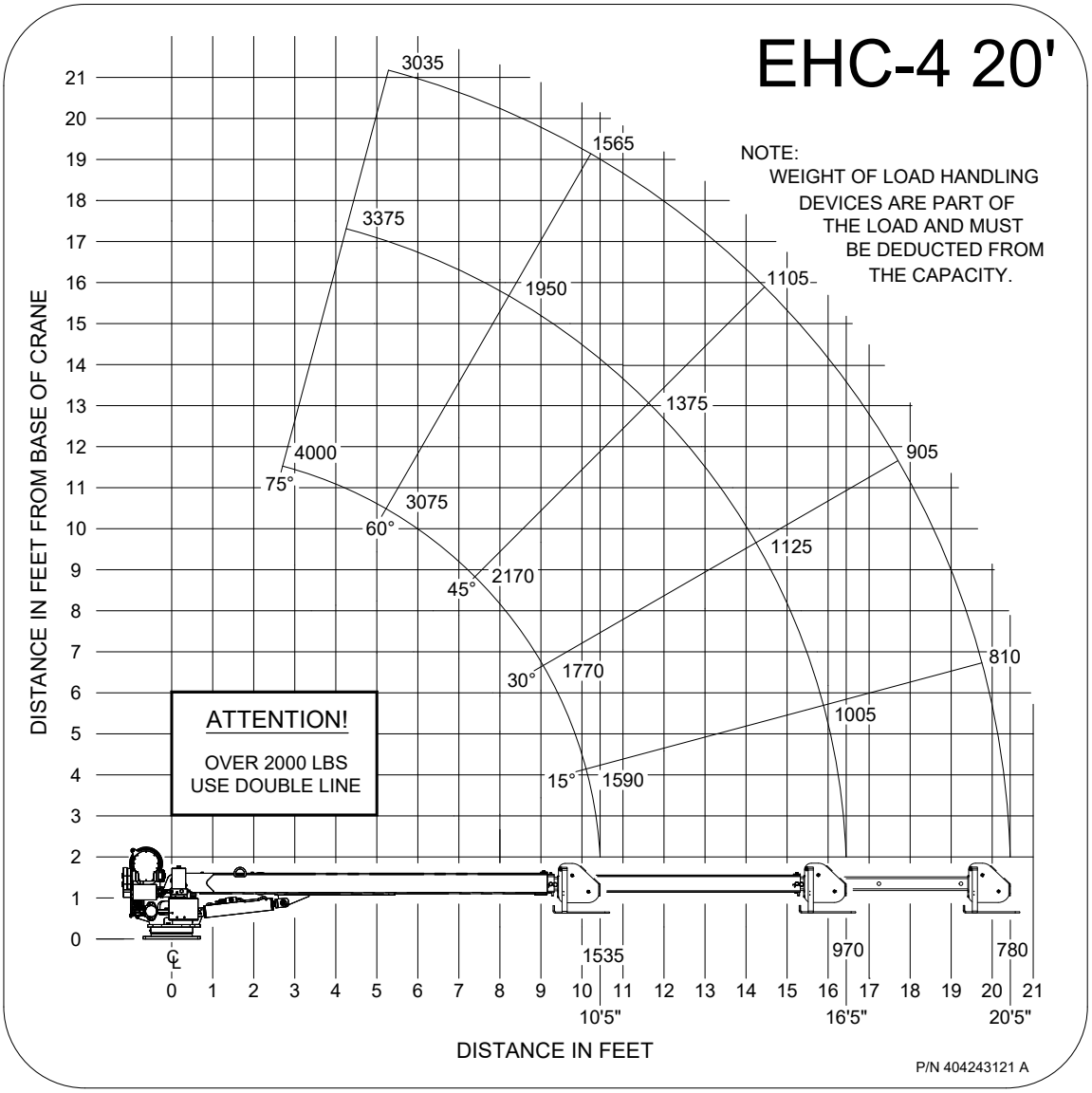
Load Chart - P/N 404242121



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.

Load Chart - P/N 404243121



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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 to 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 as 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.
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:
7. Move power controls to the "OFF" or neutral position.
8. Land the suspended load and boom, if practical.
9. 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.
10. 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.
11. Stabilizers shall be visible to the operator while extending or setting unless a signal person assists operator.

Operating Practices/Handling The Load

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

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

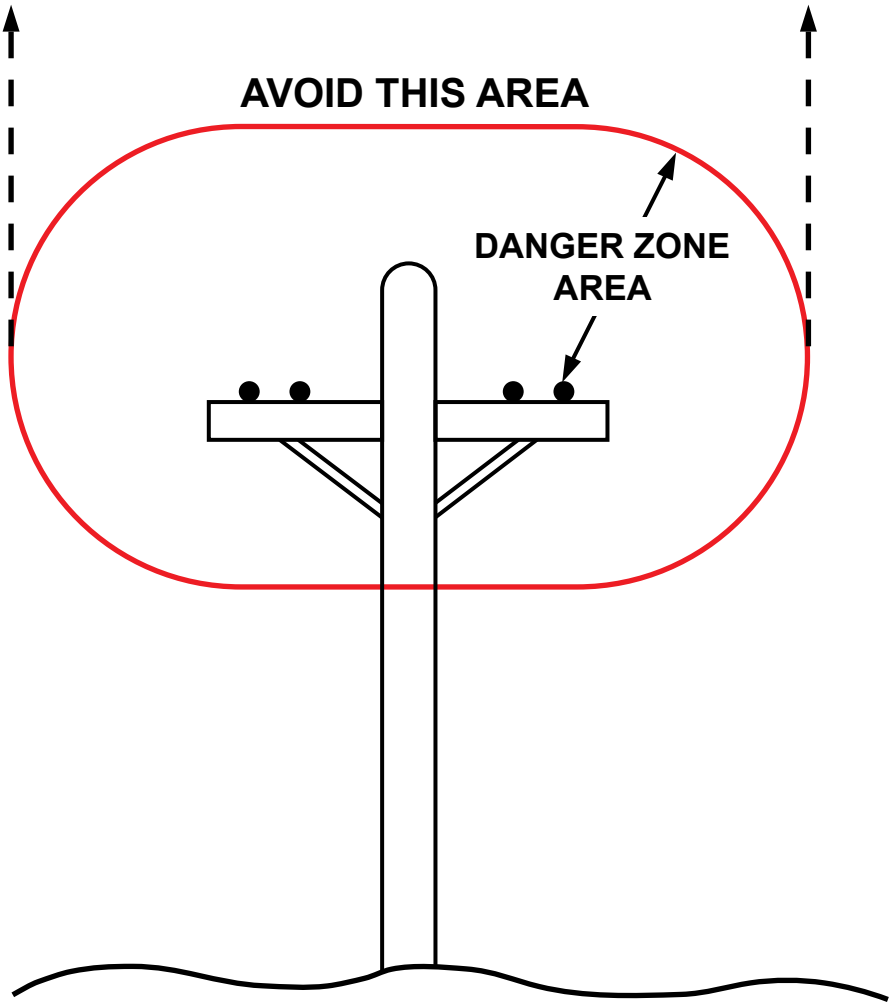
handling personnel (Refer to ASME B30.23). Hook attached suspended work platforms (baskets) shall not be used with Auto Crane cranes.

F. The operator should avoid carrying loads over people.

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

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



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 the electrical distribution and transmission lines are de-energized and visibly grounded at the point 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.

Preparing The Crane For Operation

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)

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 begin 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 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.

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 safe policies and procedures during crane operation.
4. Always use slow and smooth movements with the crane to avoid causing the load to swing like a pendulum.

After Operation

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

This section describes the general operation for cranes with the 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.

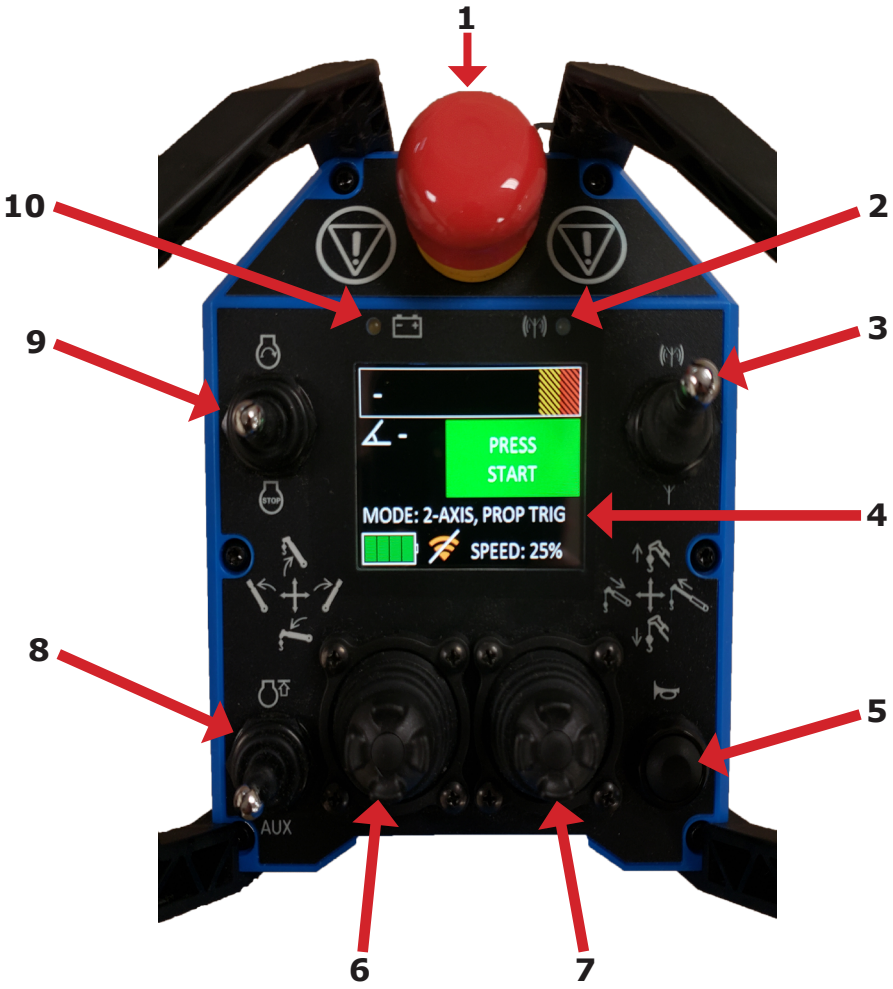
Remote Control Initialization

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

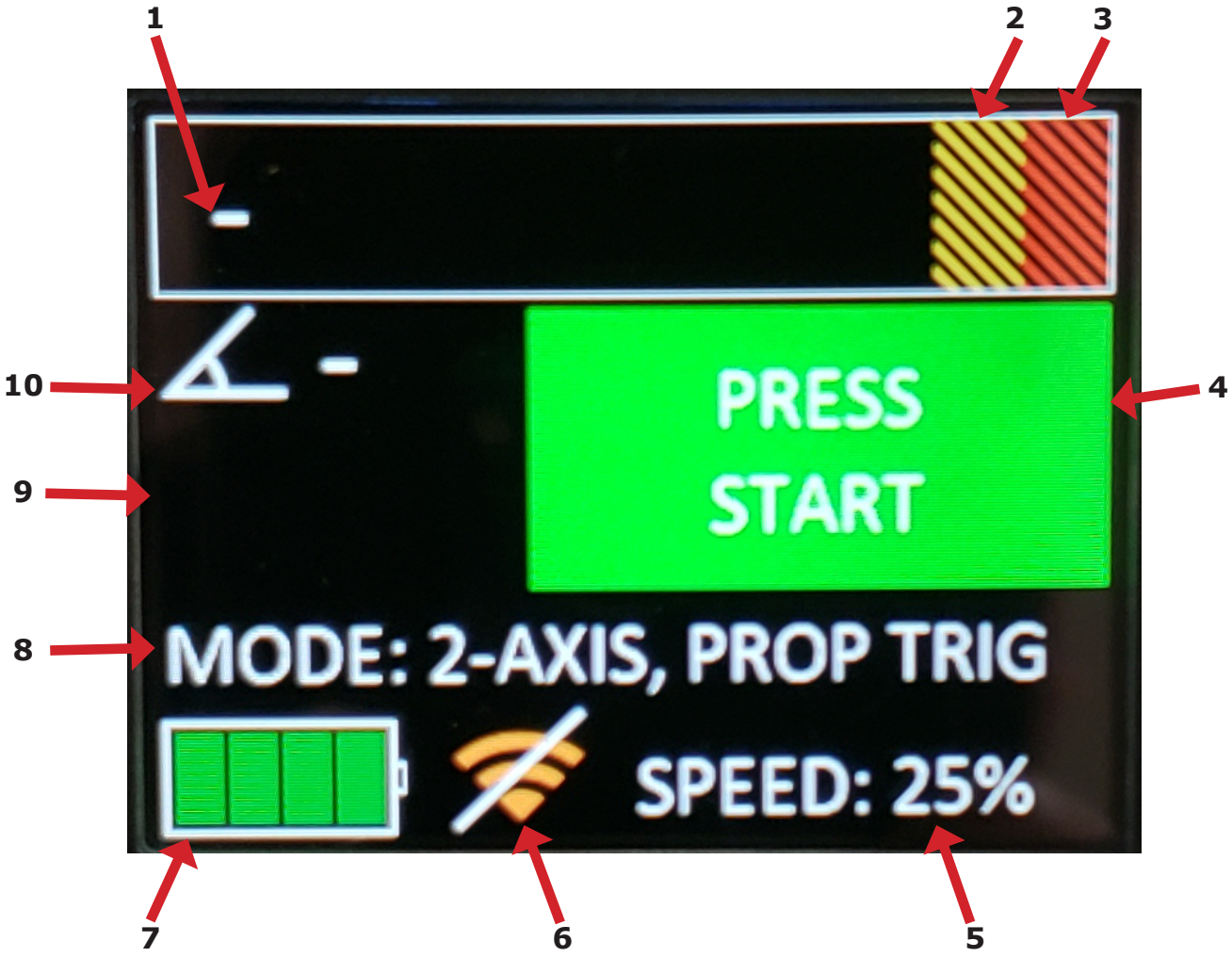
Before operating the crane, or when a new operator takes control of the equipment, operators should perform the following checks of the equipment before making a lift:
- Test all warning devices.
- Test all functions.
- Test the remote control E-Stop function.

Remote Control Layout



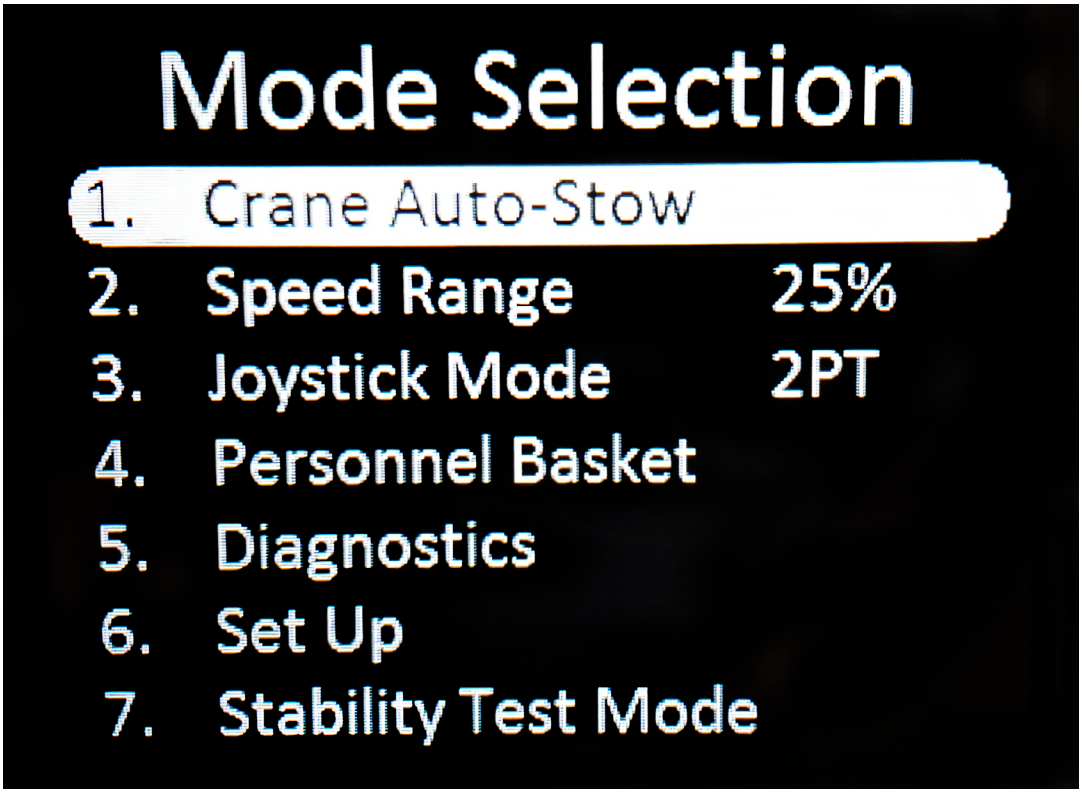
1. **Emergency Stop** - Push to activate, pull to release, then cycle remote power to reset. When activated, E-Stop stops all outputs from receiver.
2. **Link LED** - Off during normal operation. Solid yellow if offline, slow flash if remote battery is low.
3. **On/Off Switch** - Turns remote on and 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.

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.

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.

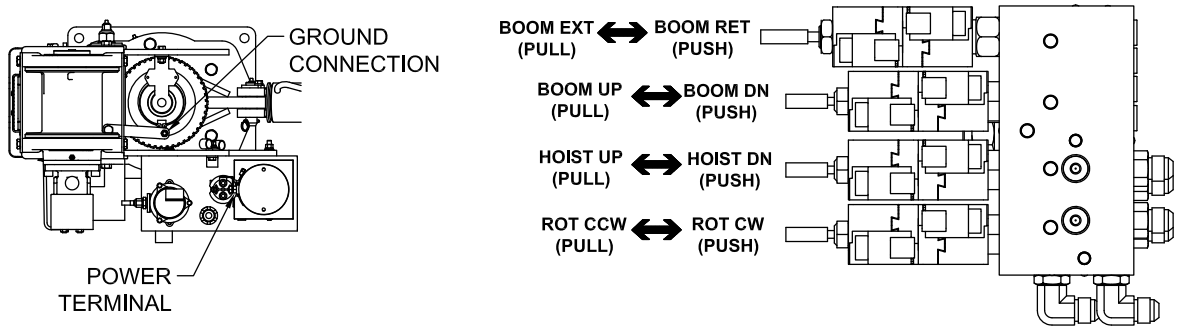
NOTICE

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!

Control Valve Override Procedures



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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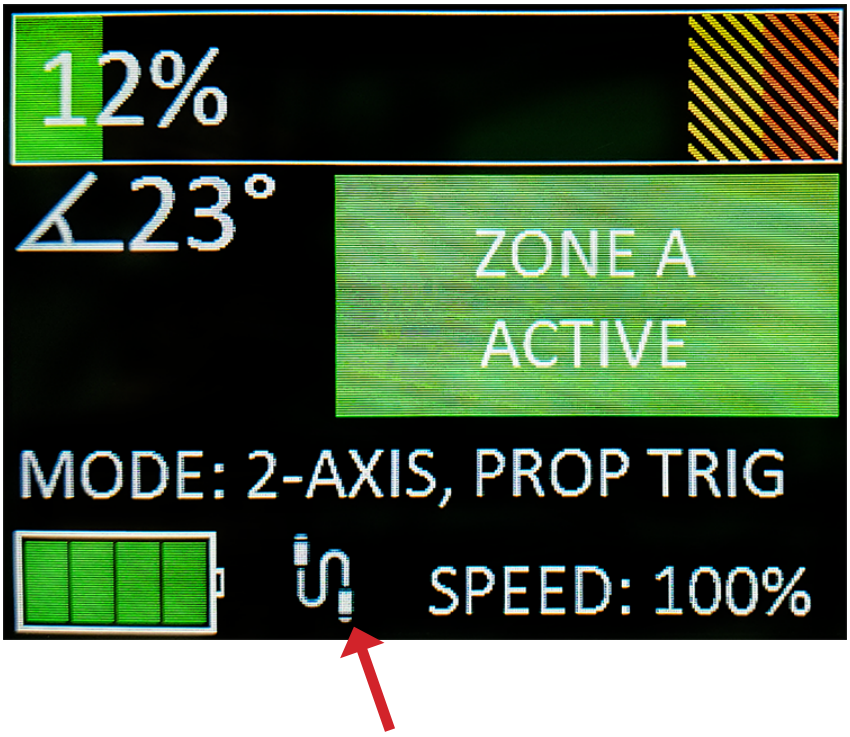
Tether Connection

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 +12VDC. 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.

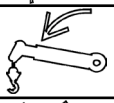
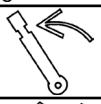
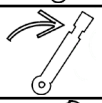
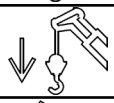
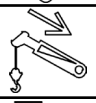
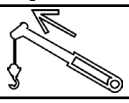
To use the auxiliary battery pack, first install 3 AA alkaline batteries into their respective places, paying attention to how they should be oriented in the pack. The battery pack can then be slid into place.

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.

Remote Layout

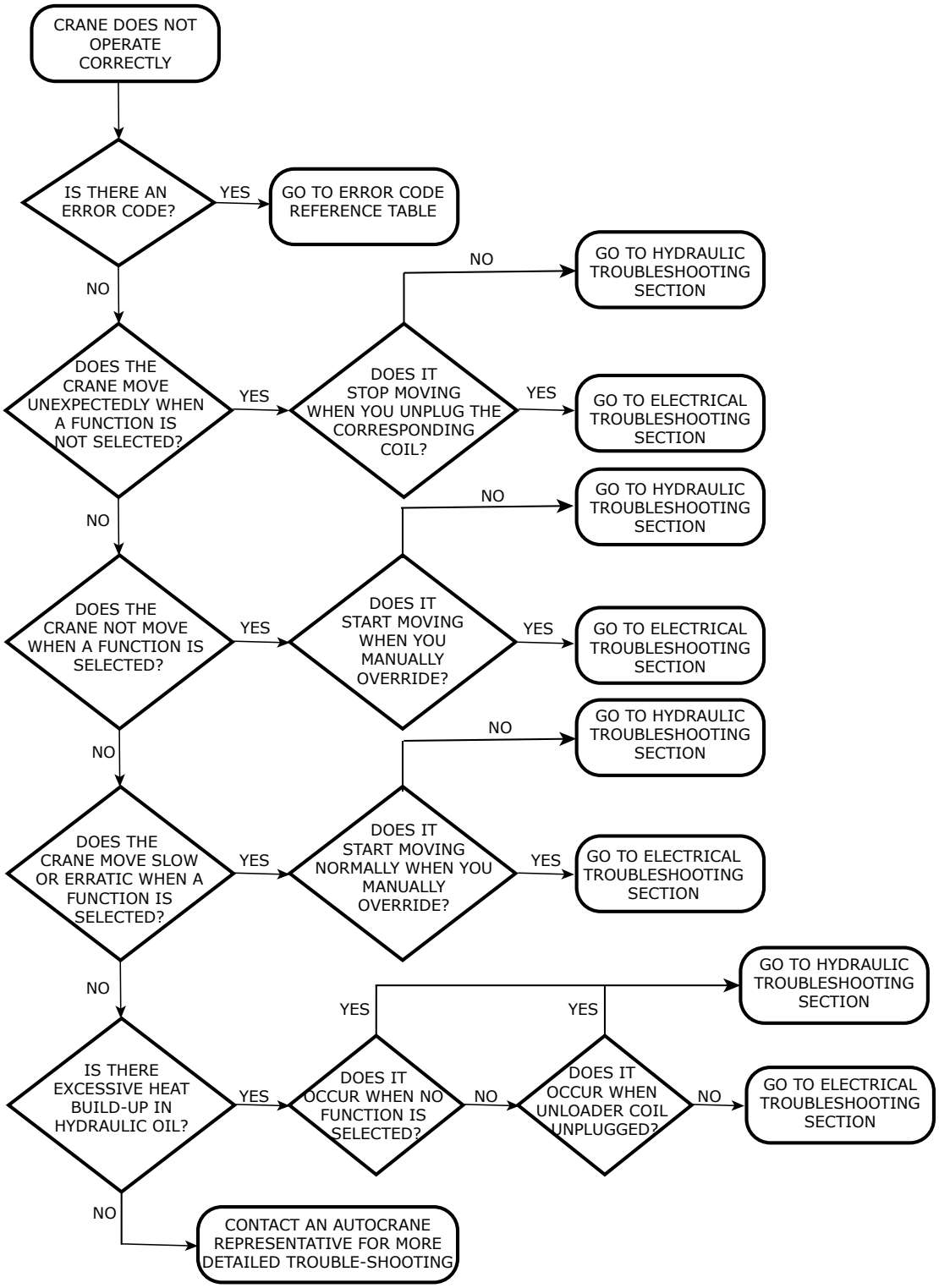
DIRECTION	FUNCTION	GRAPHIC	DESCRIPTION
Up	Engine Start		Sends a 12 VDC+ signal to start vehicle
Down	Engine Stop		Sends a 12 VDC+ signal to stop vehicle
Up	Boom Up		Moving the joystick up activates boom up function
Down	Boom Down		Moving the joystick down activates boom down function
Left	Rotate CCW		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 Remote Troubleshooting Table



NexStar Troubleshooting

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 withing 100 feet from the base station. Ensure the signal strength indicator is greater than one bar.

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 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 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 wint 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 Error Code Table

INFO BOX	CAUSE	EFFECT	SOLUTION
CWW ROT INTO A8	Crane wint 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.

NexStar Troubleshooting

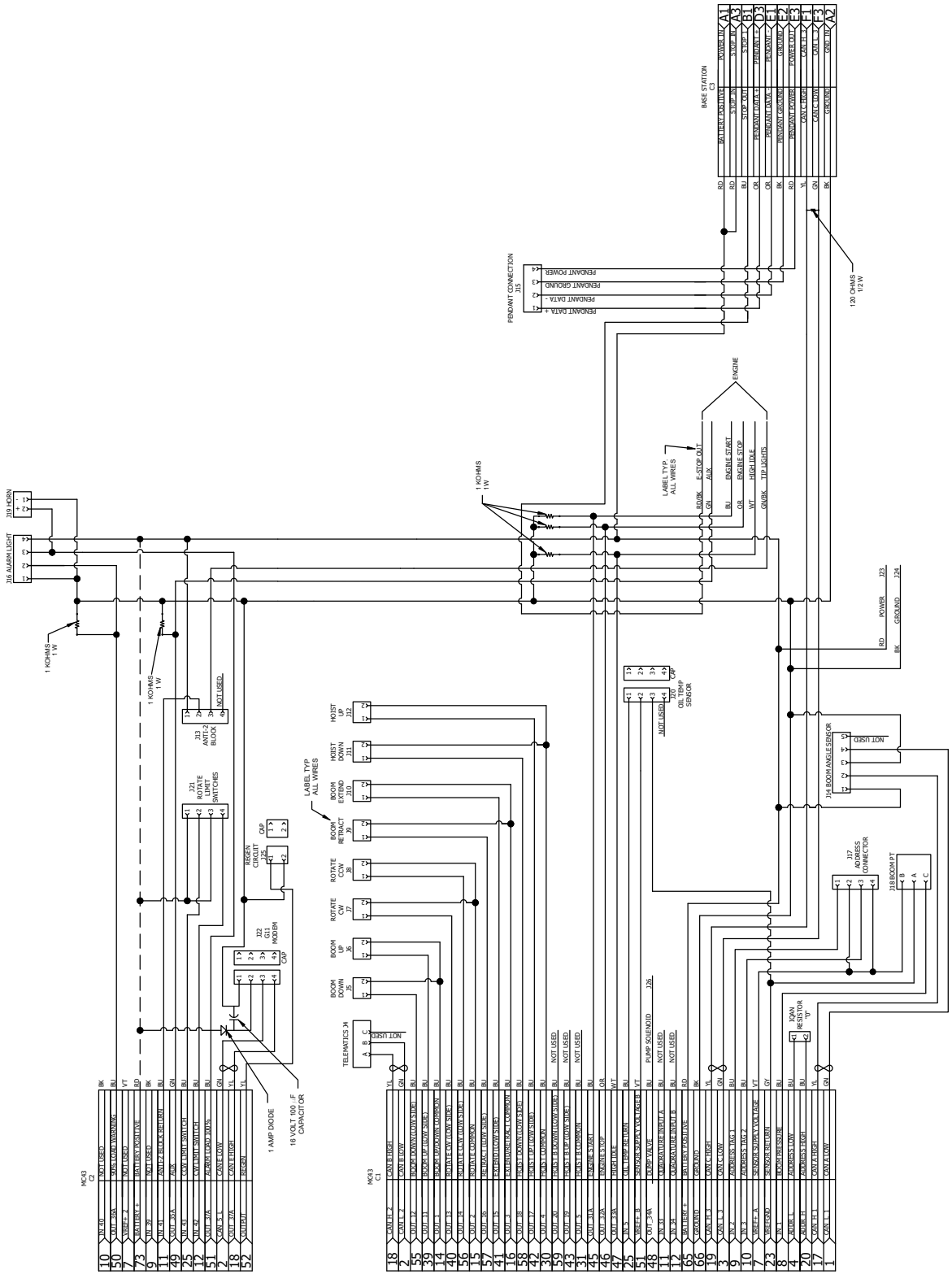
Electrical Troubleshooting Table

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 postion.	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 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 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.

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 gound 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.

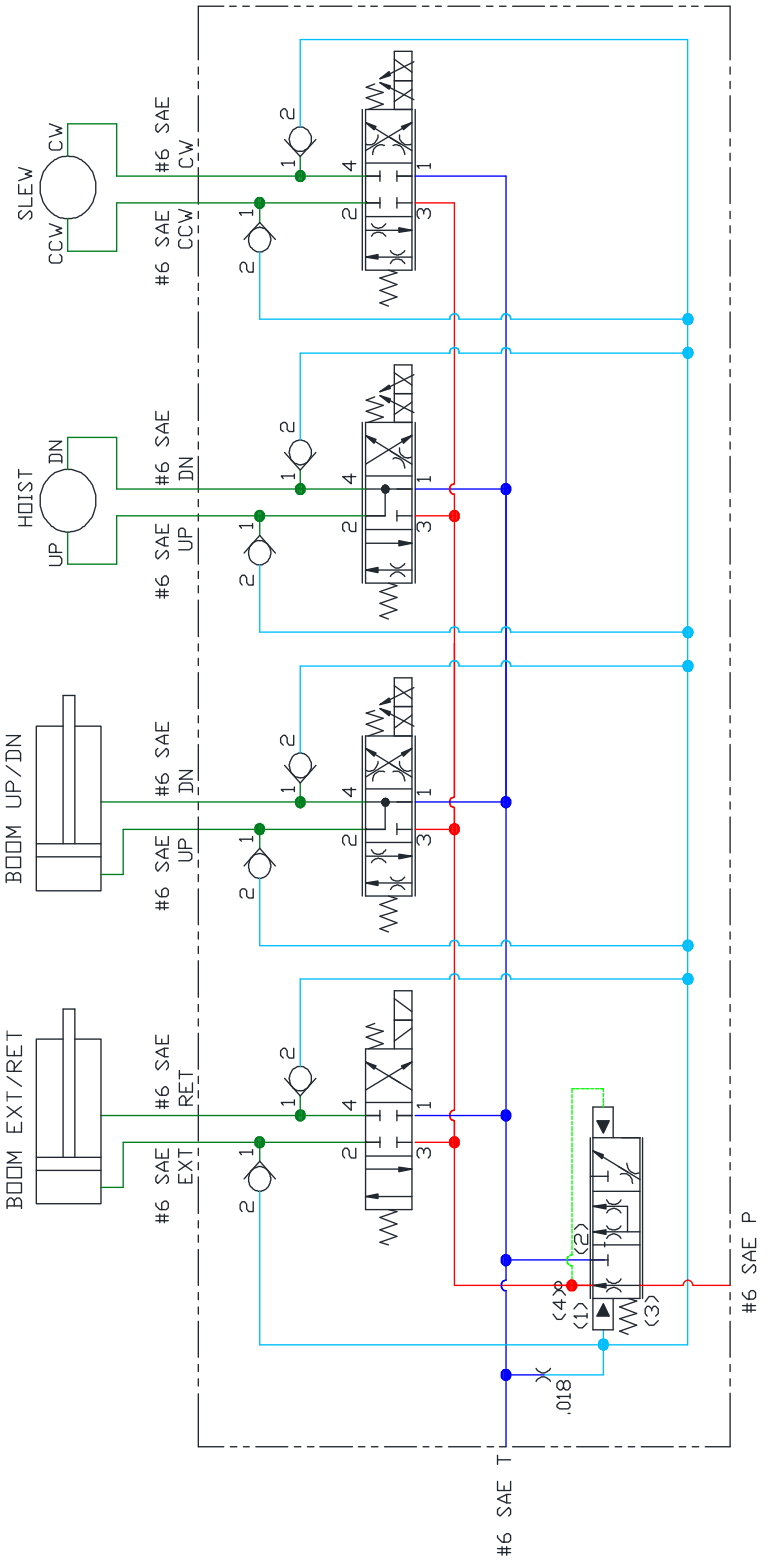
Electrical Harness Schematic



Hydraulic Troubleshooting Table

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

Hydraulic Schematic



Inspection Requirements

NOTICE

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

WARNING

All inspections shall be performed by designated personnel only.

Inspection Classification

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

Frequent Inspection

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

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

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

NOTICE

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

Periodic Inspection

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

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

F. Loose or deformed rod eyes or connecting joints.

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

Cranes Not In Regular Use

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

Inspection Records

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

Testing Requirements

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

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

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

Maintenance

General Repairs and Maintenance

NOTICE

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

WARNING

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

Maintenance Precautions

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

Adjustments and Repairs

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

Lubrication

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

Rope Replacement

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

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.

NOTICE

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:

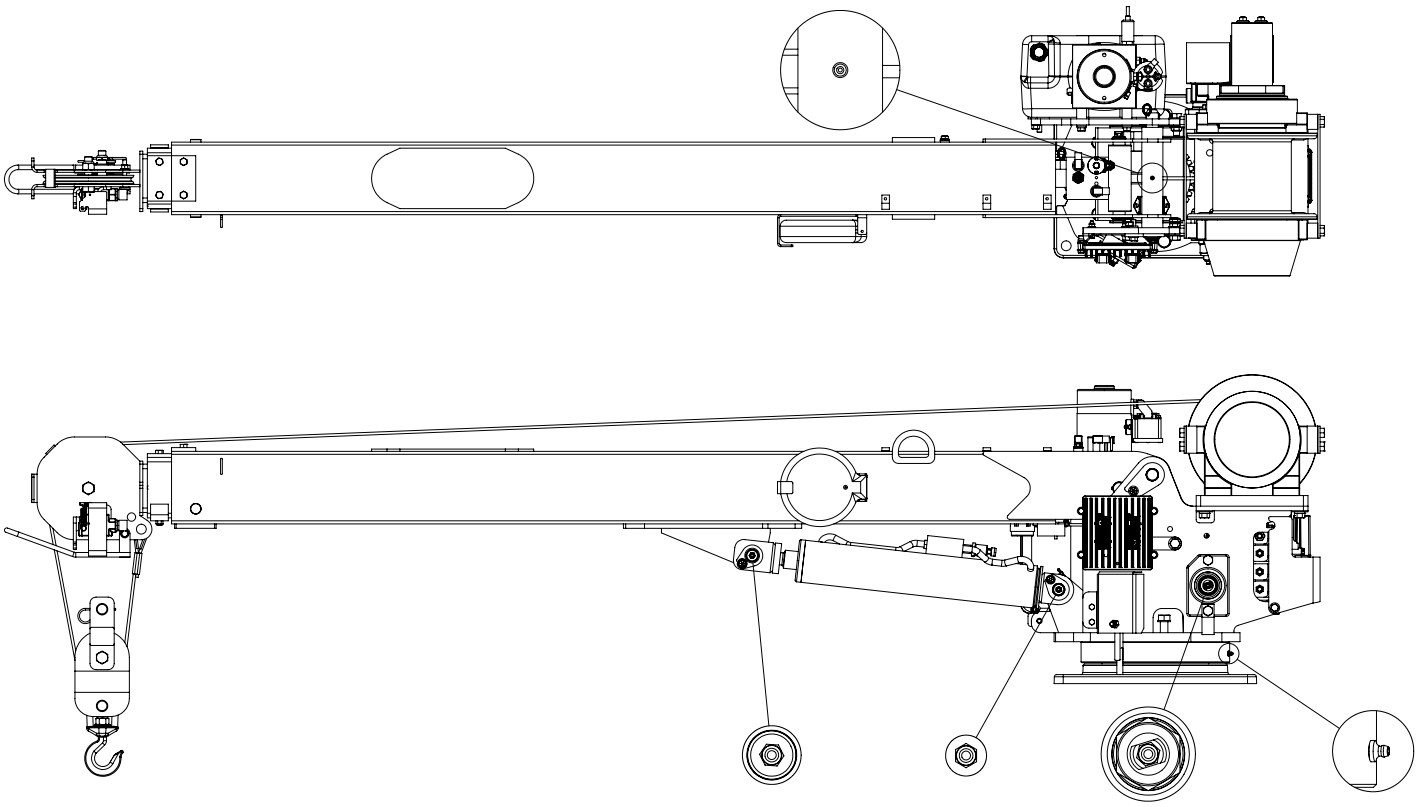
1. Sand the damaged area to bare metal.
2. Use a solvent to clean the sanded area to remove sanding debris and residue.
3. Wipe dry with a clean cloth to remove any remaining debris and residue.
4. Use a primer compatible with PPG Spectracron 573.
5. Prime the sanded areas to a minimum 2 mil dry film 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.

Lubrication and Maintenance Schedule

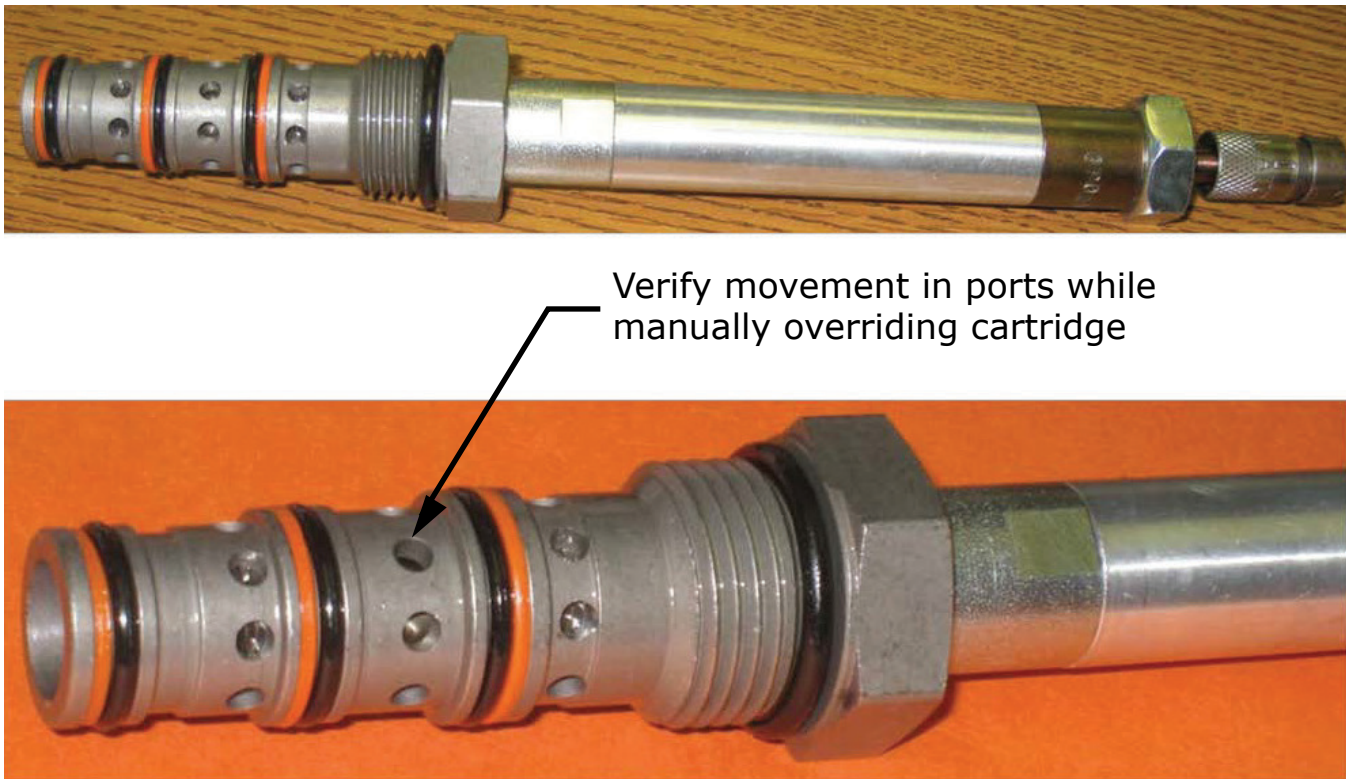
Service Performed	Instructions	Daily	Weekly	3 Months	Yearly
Load Hook	Inspect hook and latch for deformation, cracks, and corrosion	X			
Cable Drum	Ensure cable is wound evenly on drum	X			
Hoist Cable	Check for flattening, kinks, broken strands	X			
Hyd. Hoses	Visual inspection	X			
Hyd. Fluid	Check 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

Use only authorized parts/lubrication. Any damage or malfunction caused by the use of unauthorized parts is not covered by Warranty or Product Liability.



NexStar Control Valve Cartridge Maintenance



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

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

Hoist Operation

NOTICE

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

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:

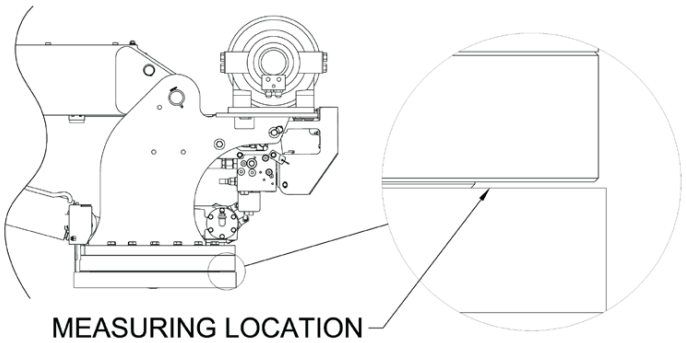
1. Any noticeable cracking in the bearing housing.
2. Damage to internal teeth.
3. Excessive axial play is present. See Axial Play Allowance Check Procedure.

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



General Installation

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

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

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

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

Installation

Each 16’ Boom crane arrives with a shipping tote that contains the following items:

Qty.	Part Number	Description
1	404211050	TRAVELING BLOCK ASSY, 4004
1	320988009	KIT, ALIGNMENT DECAL LOCATION
1	479824002	DECAL, STABILITY CHART
1	479824003	DECAL, STABILITY CHART, CUSTOM ZONE PERCENTAGES
1	404207001	LOAD CHART, EHC-4
1	990800003	MANUAL, EHC-4 NEXSTAR
6	083800000	CLIP, CABLE #838
4	404226000	SCR HX HD 3/4-16UNF x 3 LG GR 8
2	005604000	SCREW HX HD 1/4-20UNC X 1 LG
4	404227000	NUT HX 3/4-16UNF, GR 8
4	022102000	WASHER FL 3/4
4	022101000	WASHER SP LK 3/4
2	020200000	WASHER SP LK 1/4
2	020300000	WASHER FL 1/4
1	366823400	REMOTE, NEXSTAR
1	404223010	CABLE, POWER HEAVY-DUTY 25FT LG
1	404218200	MASTER SWITCH ASSEMBLY W/ REMOTE PENDANT
1	366823401	DOCKING STATION, REMOTE
1	366823406	BATTERY PACK, AA ALKALINE (X3), NEXSTAR
1	366823427	CABLE, TETHER, 10 M, NEXSTAR

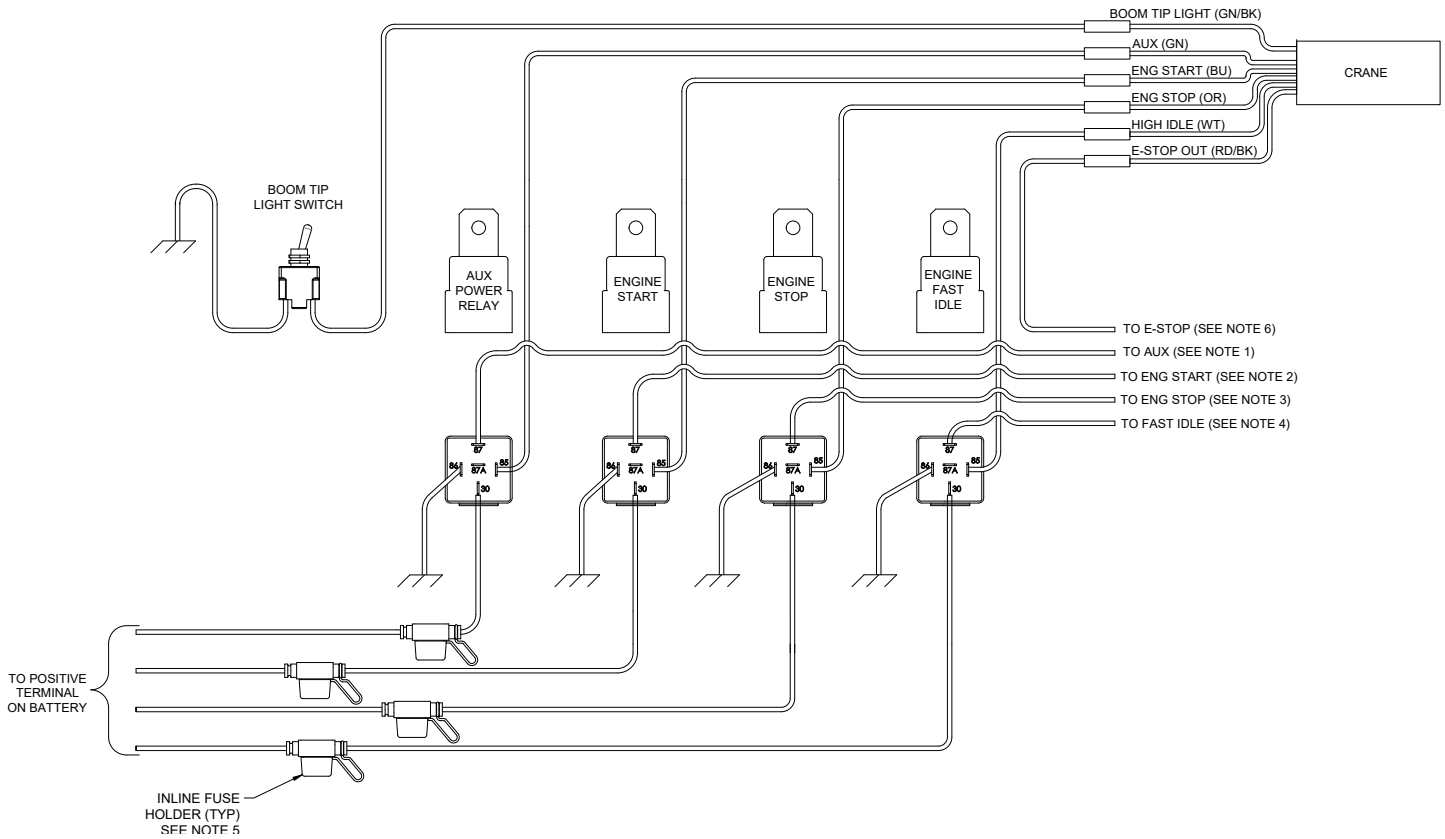
Please check to make sure the above items have been supplied with your crane. If any items are missing, please notify your dealer, or contact Auto Crane.

Each 20’ Boom crane arrives with a shipping tote that contains the following items:

Qty.	Part Number	Description
1	404211050	TRAVELING BLOCK ASSY, 4004
1	320988009	KIT, ALIGNMENT DECAL LOCATION
1	479824002	DECAL, STABILITY CHART
1	479824003	DECAL, STABILITY CHART, CUSTOM ZONE PERCENTAGES
1	404240018	LOAD CHART, EHC-4 20FT BOOM
1	990800003	MANUAL, EHC-4 NEXSTAR
6	083800000	CLIP, CABLE #838
4	404226000	SCR HX HD 3/4-16UNF x 3 LG GR 8
2	005604000	SCREW HX HD 1/4-20UNC X 1 LG
4	404227000	NUT HX 3/4-16UNF, GR 8
4	022102000	WASHER FL 3/4
4	022101000	WASHER SP LK 3/4
2	020200000	WASHER SP LK 1/4
2	020300000	WASHER FL 1/4
1	366823400	REMOTE, NEXSTAR
1	404223010	CABLE, POWER HEAVY-DUTY 25FT LG
1	404218200	MASTER SWITCH ASSEMBLY W/ REMOTE PENDANT
1	366823401	DOCKING STATION, REMOTE
1	366823406	BATTERY PACK, AA ALKALINE (X3), NEXSTAR
1	366823427	CABLE, TETHER, 10 M, NEXSTAR

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.

General electrical hookup

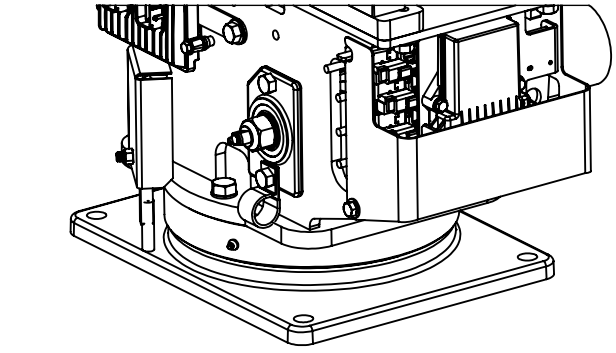


Notes:

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.

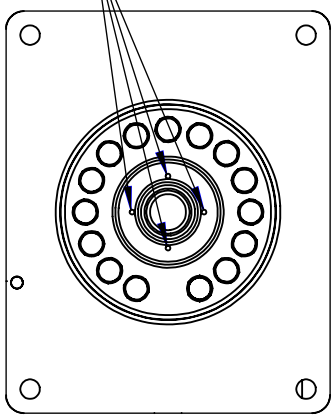
IMPORTANT: Follow all federal laws pertaining to final stage manufacturers and crane stability requirements. Reference the Safety Tips and Precautions section for specifics.



POWER CABLE
FROM CRANE

CABLE FROM "+" TERMINAL
ON BATTERY

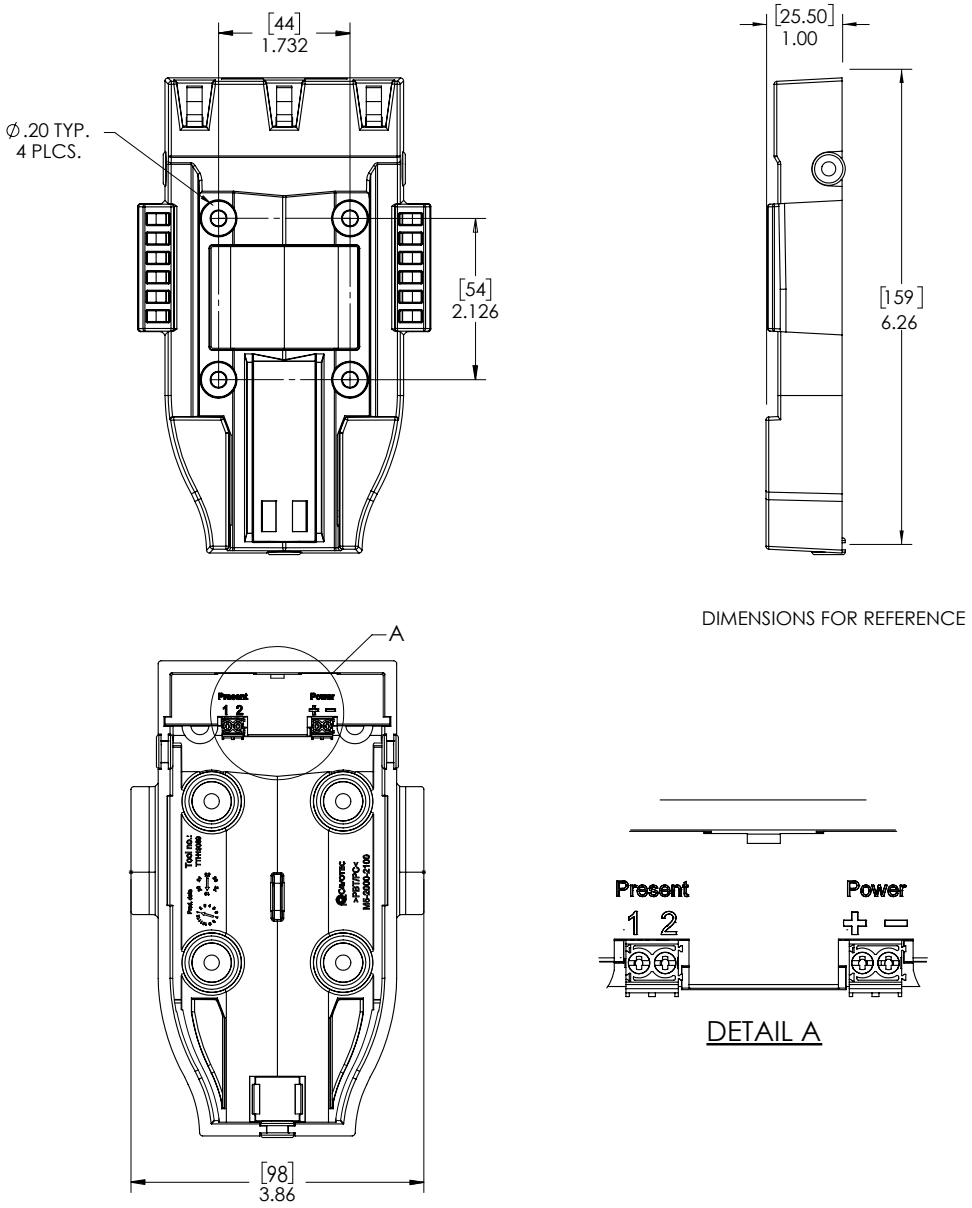
GROUND ATTACHMENT
LOCATIONS*



*ATTACH OTHER END OF GROUND CABLE TO VEHICLE FRAME

Installation

Docking Station



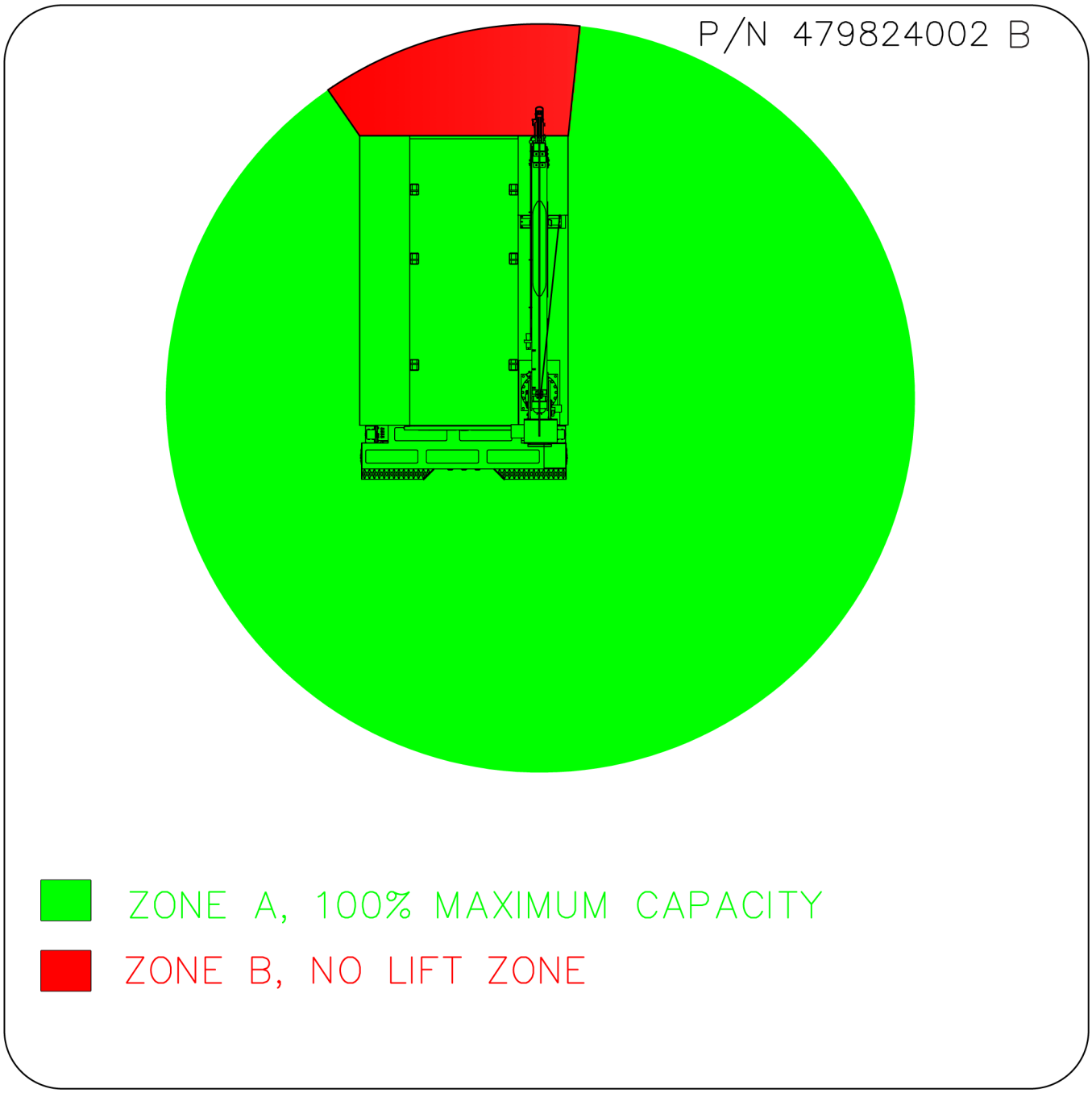
To wire the docking station, use an unswitched and fused 12 VDC+ power source to ensure remote charging when the vehicle is off. Connect this power supply to the "Power +" terminal on the dock and ground the "Power –" terminal to the vehicle. Terminal 1 and Terminal 2 will be equal when the remote is 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.

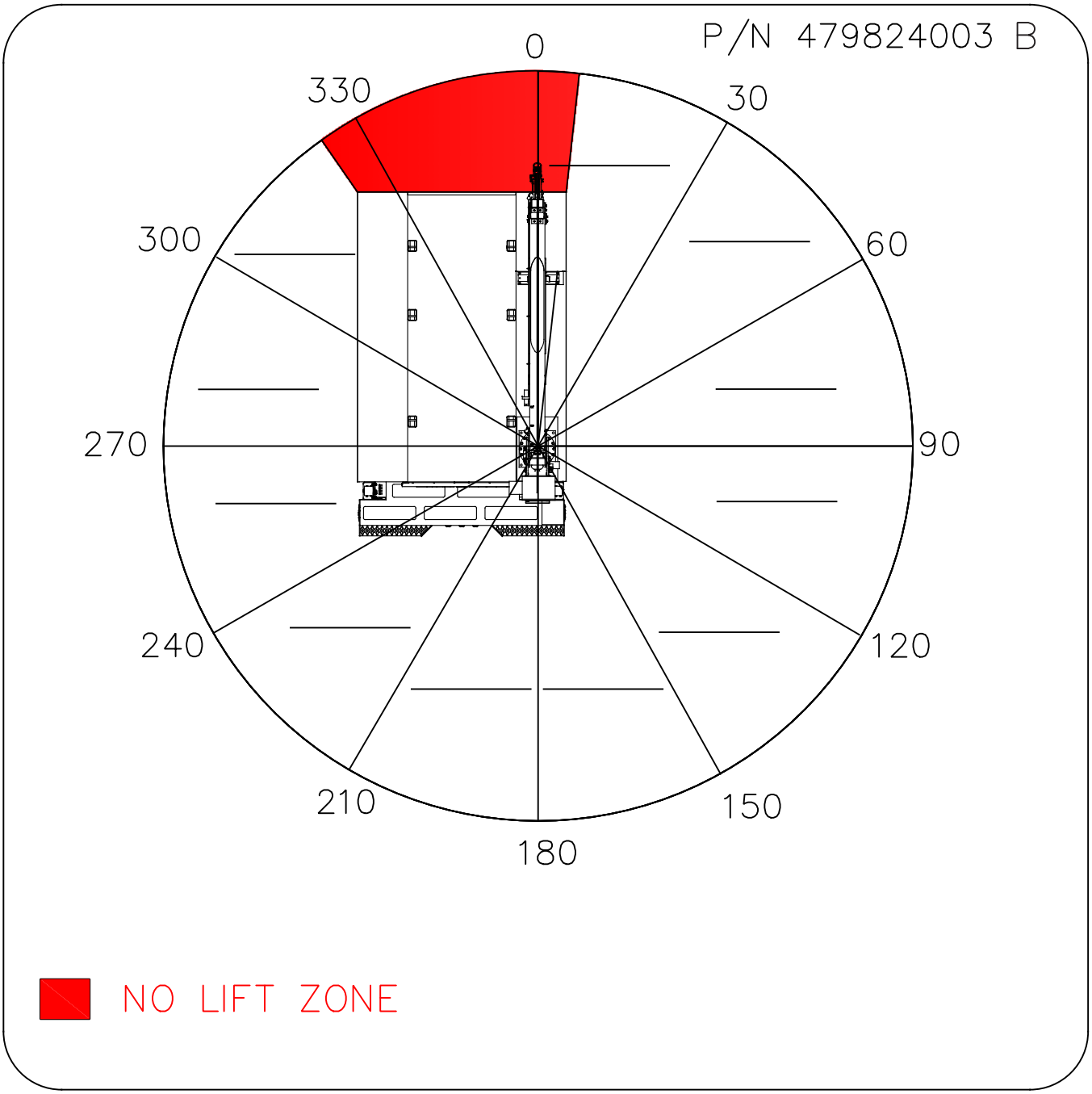
Stability Chart Installation

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:

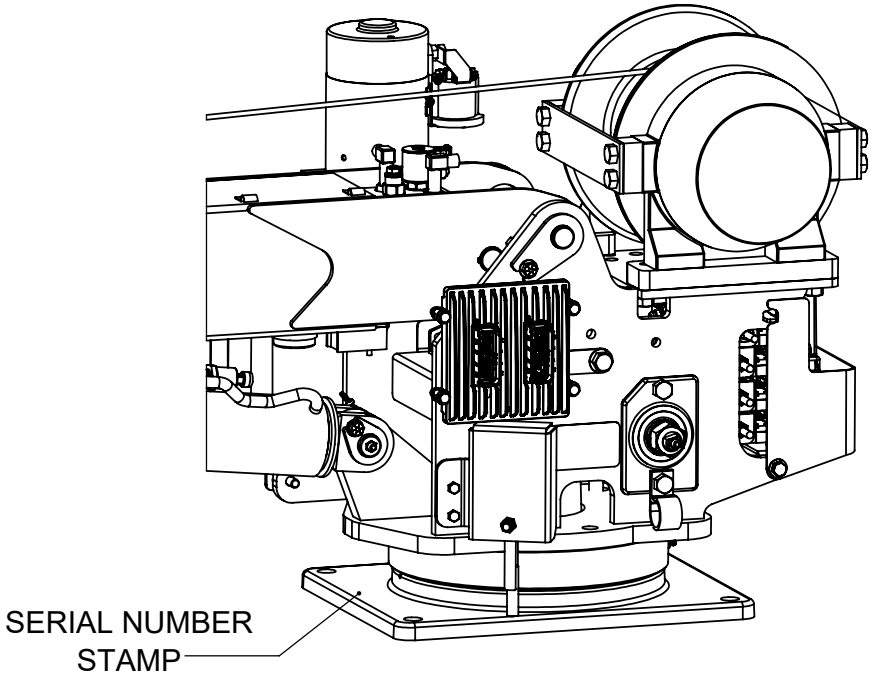


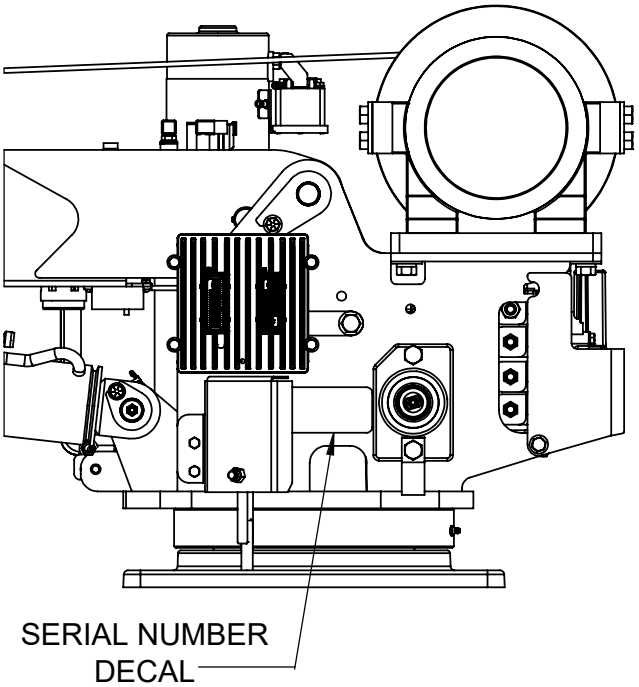
479824003 decal will be installed on an Auto Crane body that was not outfitted with an Auto Crane crane and Auto Crane outriggers. The stability chart provides lines to write in the tested stability percentage at each section below:



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.

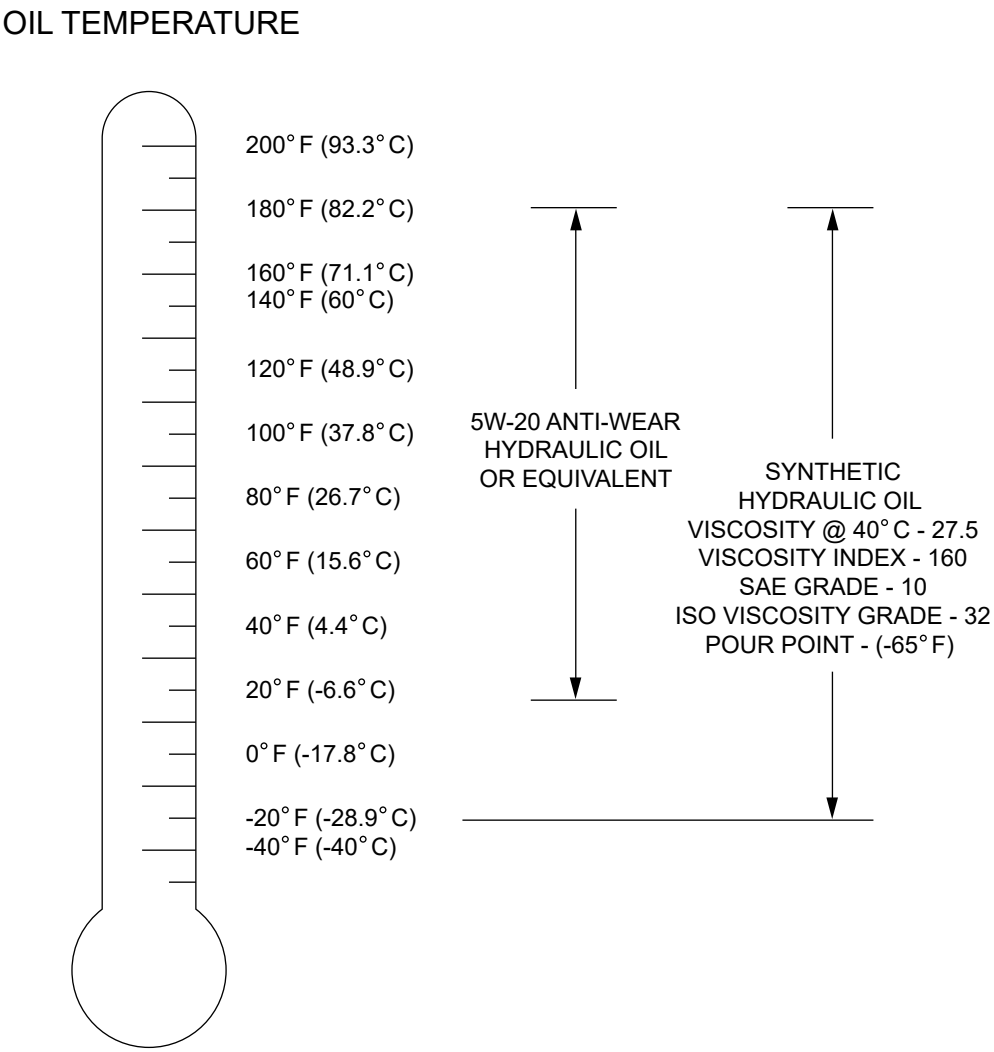




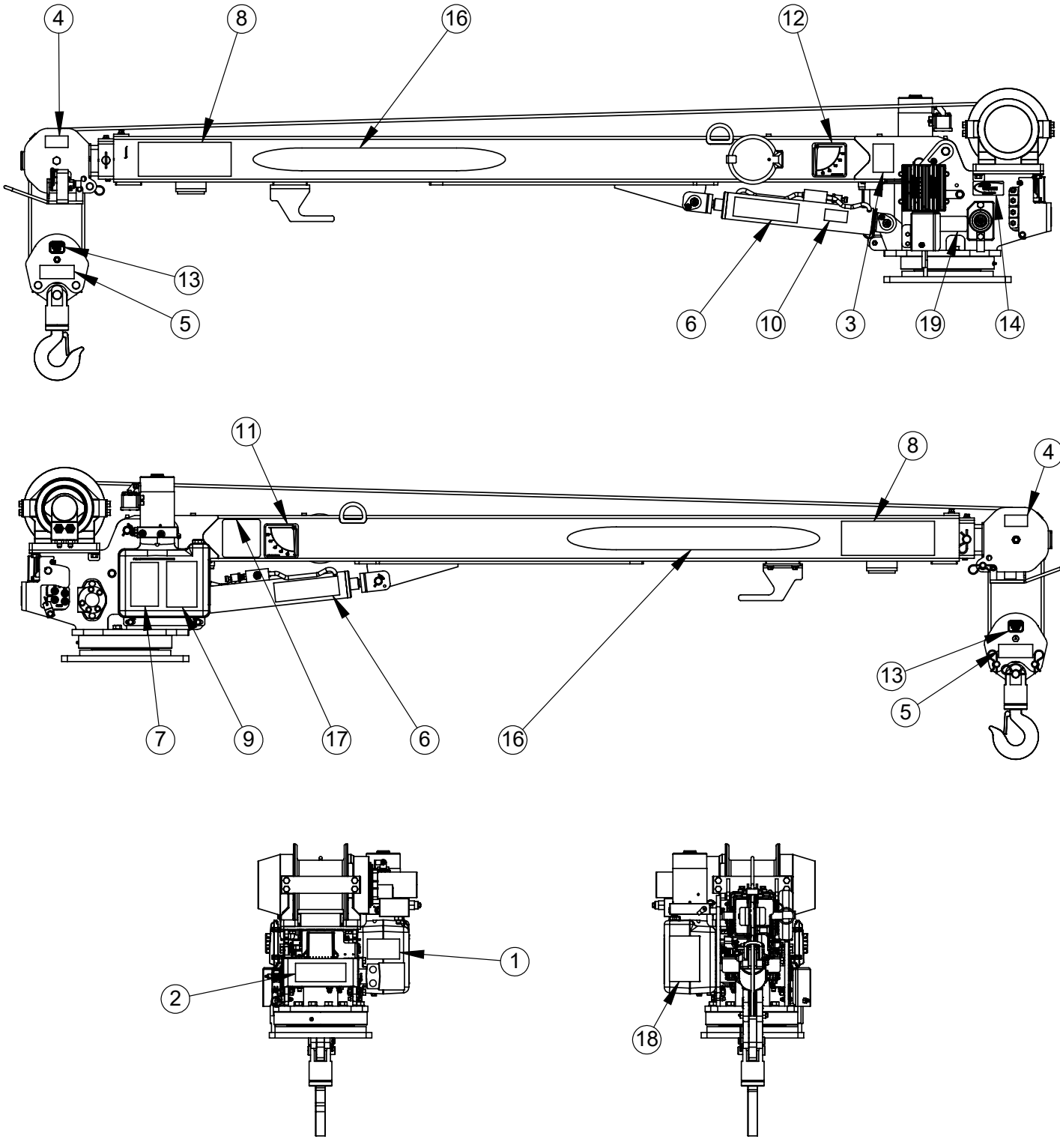
Recommended Operating Temperature

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.

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



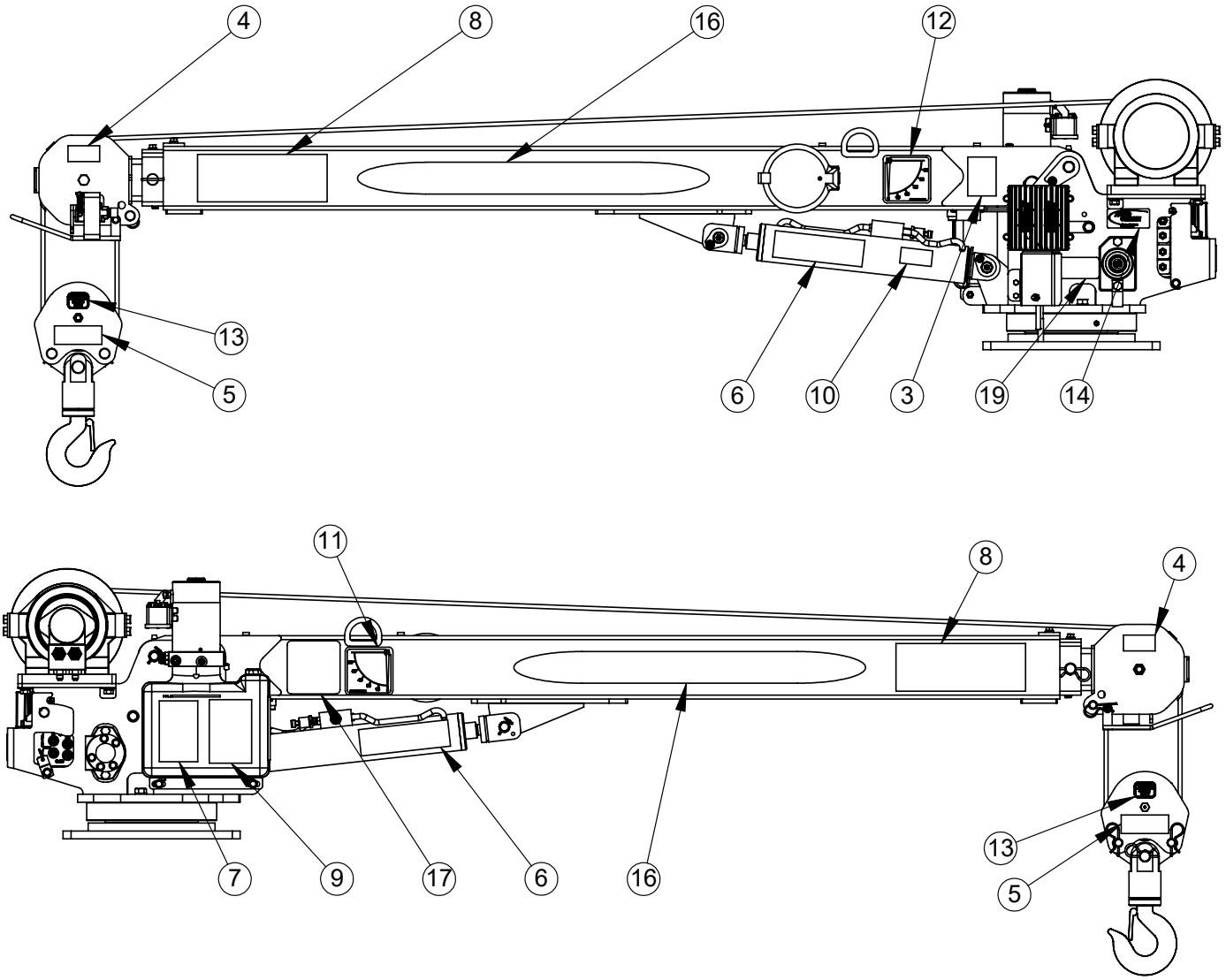
Decal Layout - P/N 404243120

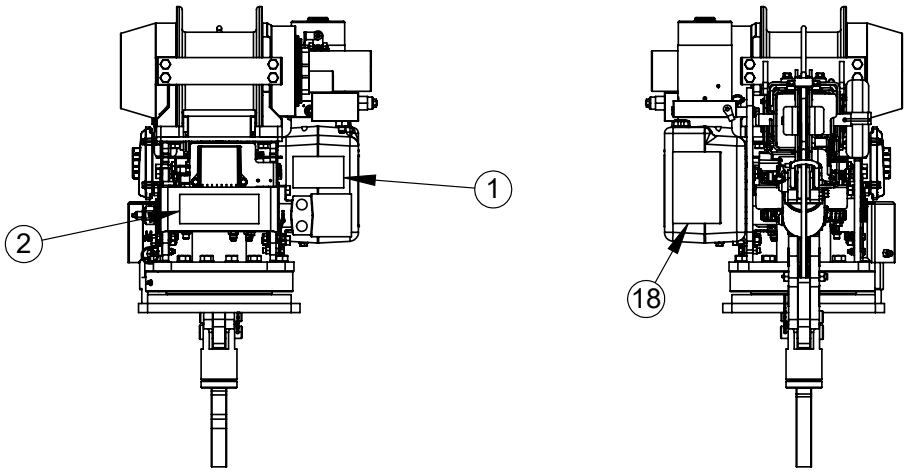


Decal Layout - P/N 404243120

ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	040824000	DECAL, AMERCIAN FLAG, MADE IN THE U.S.A.
2	1	360034000	DECAL AUTO CRANE LOGO
3	1	040632000	DECAL WARNING - OVERLOAD
4	2	040517000	DECAL STAY CLEAR OF BOOM
5	2	040518000	DECAL STAY CLEAR OF LOAD
6	2	040519000	DECAL DANGER SCISSOR POINT
7	1	040579000	DECAL OPERATION INSTRUCTIONS
8	2	040529000	DECAL DANGER “ELECTROCUTION HAZARD” POWER LINE
9	1	040580000	DECAL TRAINED OPERATOR
10	1	040587000	DECAL WARNING LOAD SENSOR
11	1	320318000	DECAL ANGLE INDICATOR CS
12	1	320318001	DECAL ANGLE INDICATOR SS
13	2	404212000	DECAL MAX BLOCK LOAD 4004
14	1	040619001	DECAL AUTO CRANE LOGO
15	1	320992121	DECAL, MANUAL OVERRIDE PROCEDURES, SMALL EH-MODELS
16	2	600047016	DECAL, AUTO CRANE EHC-4 NS LOGO, FLATTENED OVAL, 33.25 IN LONG
17	1	404243121	LOAD CHART, EHC-4 20’ BOOM
18	1	460169000	DECAL WARNING, REMOTE CONTROL
19	1	330622000	DECAL, SERIAL NO.

Decal Layout - P/N 404242120





Decal Layout - P/N 404242120

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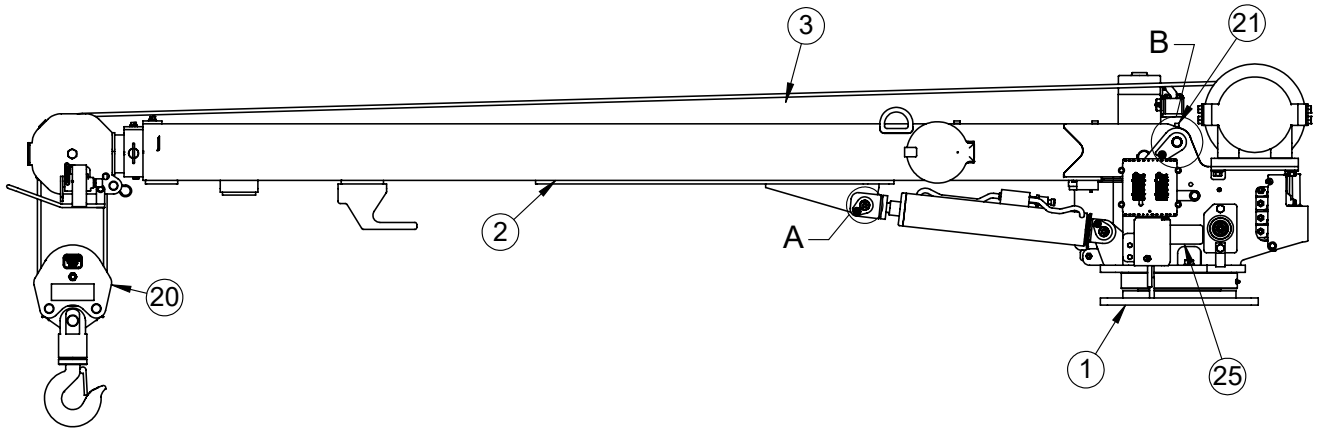
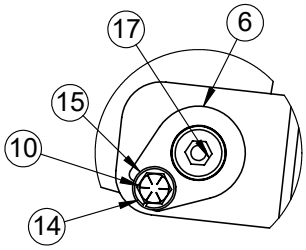
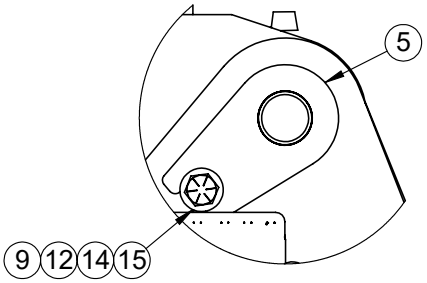
17	1	404242121	LOAD CHART, EHC-4
18	1	460169000	DECAL WARNING, REMOTE CONTROL
19	1	330622000	DECAL, SERIAL NO.

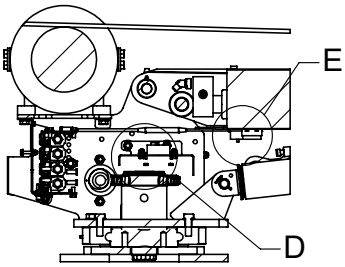




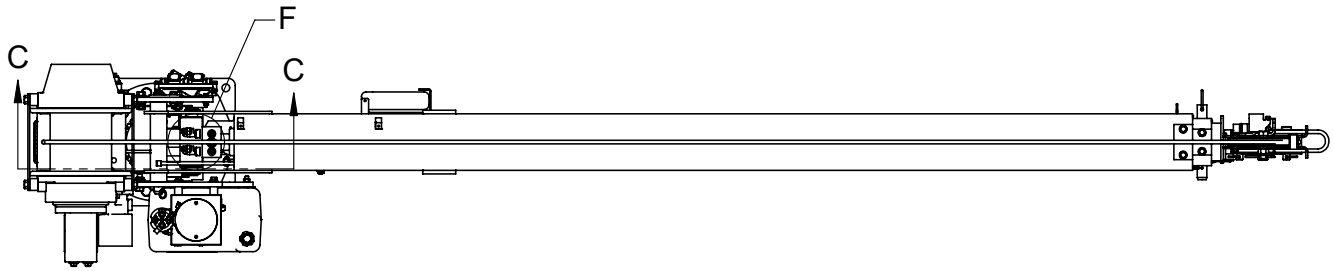
DETAIL A

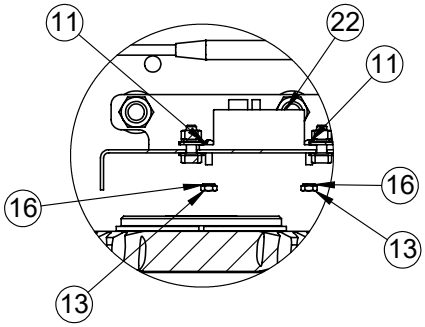


DETAIL B

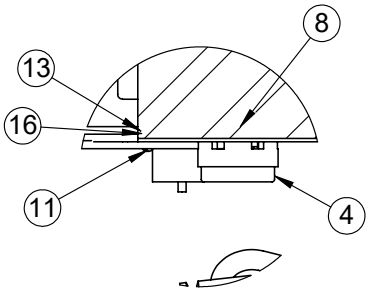


SECTION C-C

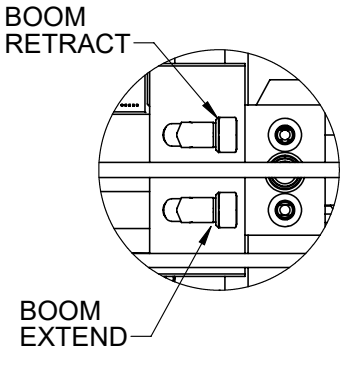




DETAIL D



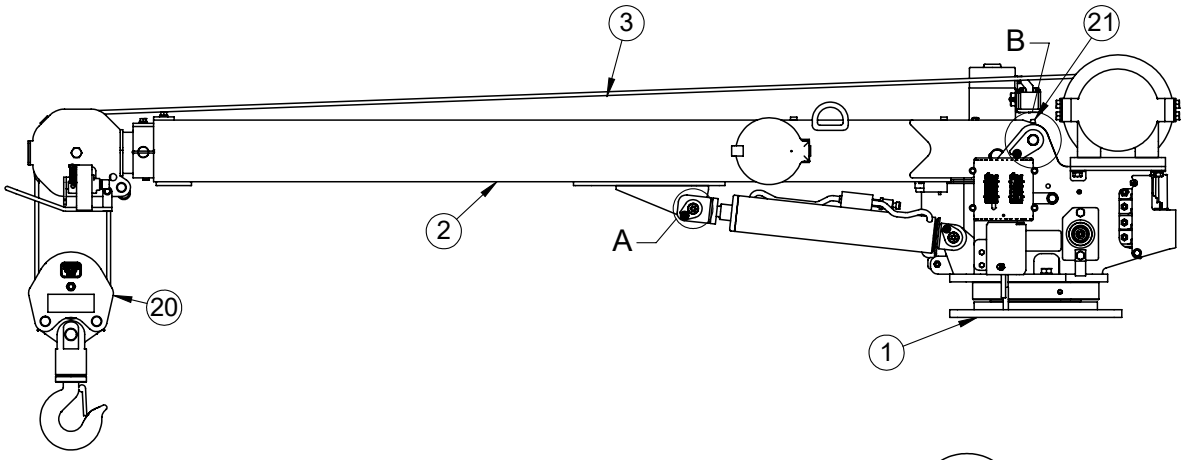
DETAIL E

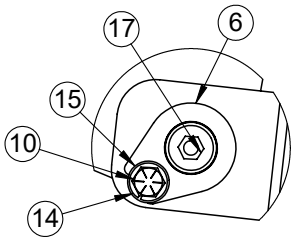


DETAIL F

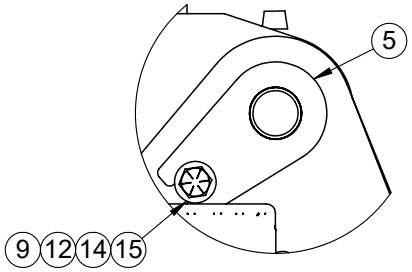
General Assembly - P/N 404243003

ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	404242050	PEDESTAL ASSEMBLY, EHC-4 NEXSTAR
2	1	404240100	EHC-4 BOOM (20FT) SINGLE SHEAVE
3	1	360758000	ROPE ASSY
4	1	366823236	LIGHT, LED (RED, GREEN, YELLOW)
5	1	404220000	PIN WDMT BOOM/PED
6	1	320824000	PIN, LIFT CYLINDER
7	2	360678000	PIN, 3/16 COTTERLESS RING
8	1	005901000	SCREW HX HD 1/4-20UNC X 1/2 LG
9	1	366159000	SCREW HX HD 3/8-16UNC X 1 1/2 LG GR8
10	1	330371000	SCREW HX HD 3/8-16UNC X 1 LG GR8
11	4	001302000	SCREW RD HD #8-32UNC X 1/2 LG
12	1	330372000	NUT HX 3/8 NC GR5
13	4	015500000	NUT HX #8-32UNC 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	404243120	DECAL LAYOUT, EHC-4 20’ BOOM, NEXSTAR IV
19	1	404243030	KIT, SHIP EHC-4 20FT NEXSTAR
20	1	404211050	TRAVELING BLOCK ASSY, 4004
21	1	663300001	CABLE TIE, 18”
22	1	366823254	SENSOR, TRI-AXIS
23	1	320434001	PIN, 3/4 X 2-3/4LG
24	1	366813000	PIN HITCH
25	1	330622000	DECAL, SERIAL NO.

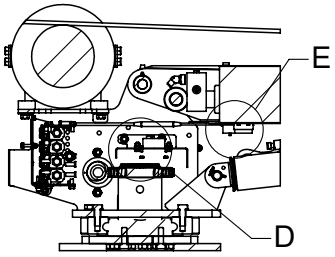




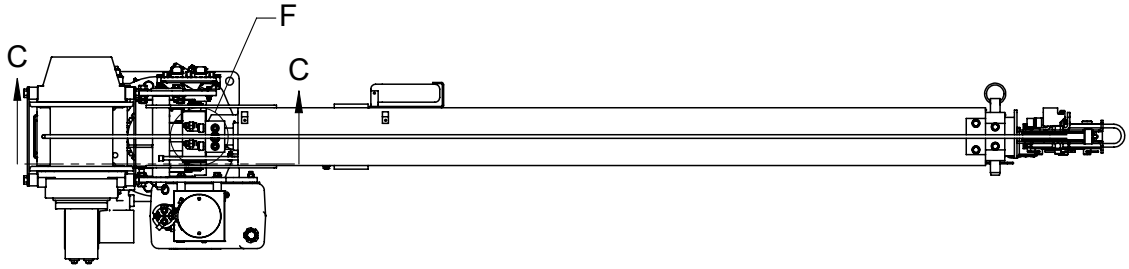
DETAIL A

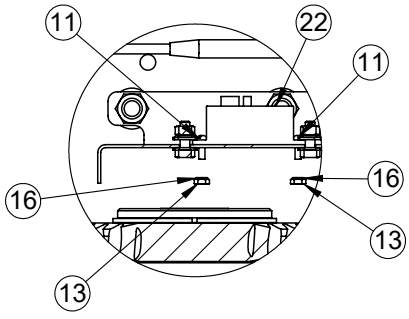


DETAIL B

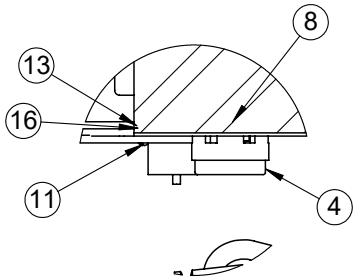


SECTION C-C

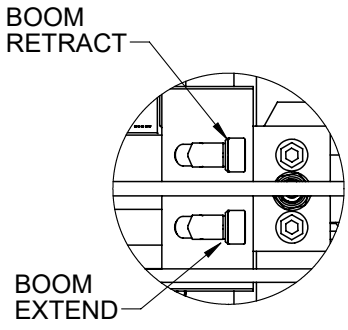




DETAIL D



DETAIL E

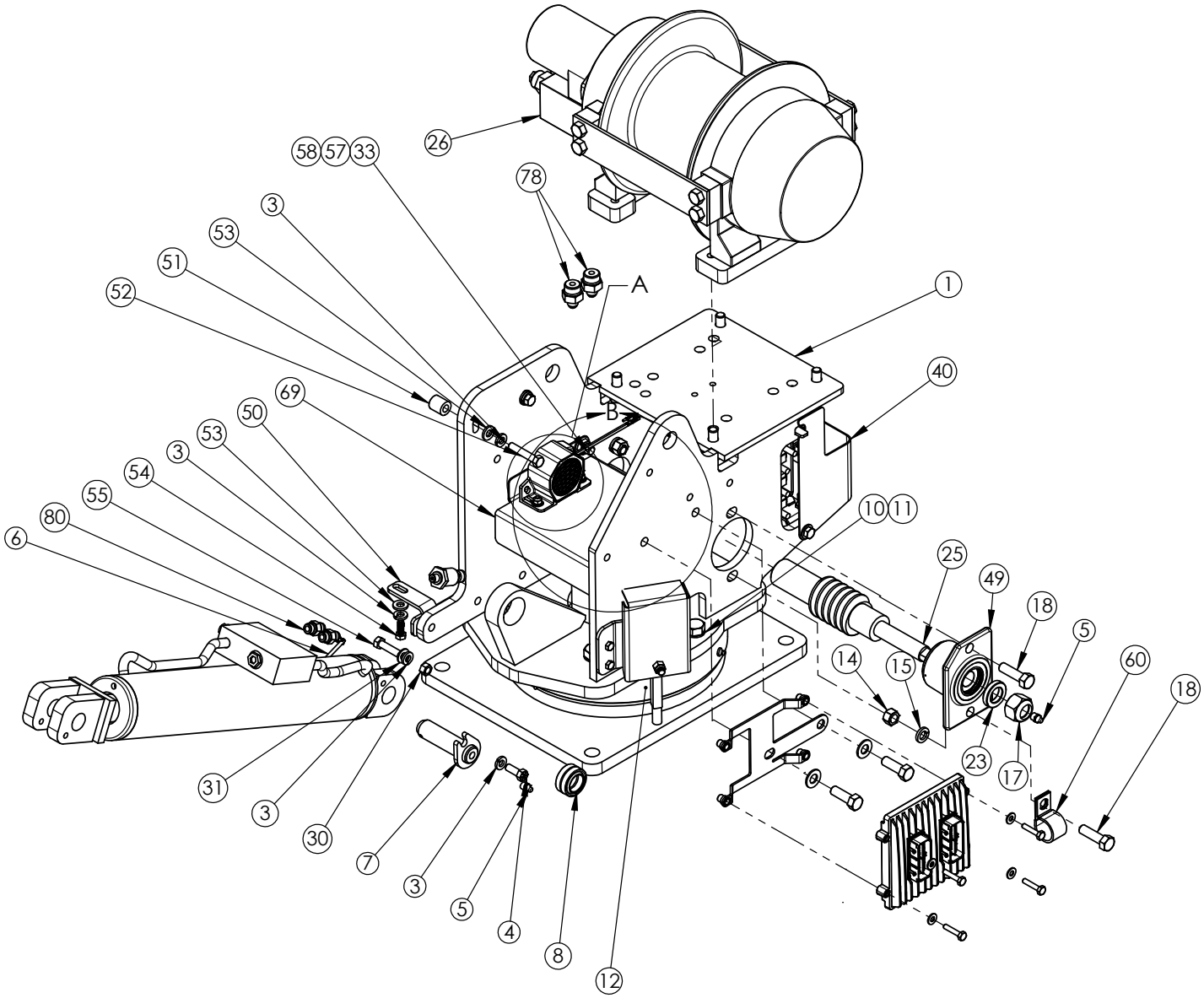


DETAIL F

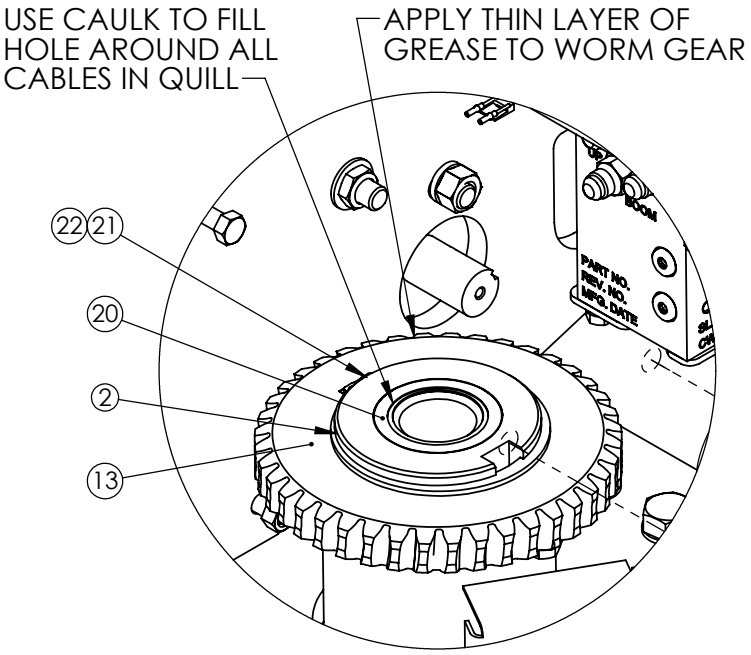
General Assembly - P/N 404242003

ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	404242050	PEDESTAL ASSEMBLY, EHC-4 NEXSTAR
2	1	404189010	BOOM ASSY 4004, SINGLE SHEAVE
3	1	360758000	ROPE ASSY
4	1	366823236	LIGHT, LED (RED, GREEN, YELLOW)
5	1	404220000	PIN WDMT BOOM/PED
6	1	320824000	PIN, LIFT CYLINDER
7	2	360678000	PIN, 3/16 COTTERLESS RING
8	1	005901000	SCREW HX HD 1/4-20UNC X 1/2 LG
9	1	366159000	SCREW HX HD 3/8-16UNC X 1 1/2 LG GR8
10	1	330371000	SCREW HX HD 3/8-16UNC X 1 LG GR8
11	4	001302000	SCREW RD HD #8-32UNC X 1/2 LG
12	1	330372000	NUT HX 3/8 NC GR5
13	4	015500000	NUT HX #8-32UNC 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	404242120	DECAL LAYOUT, EHC-4, NEXSTAR IV
19	1	404242030	KIT, SHIP EHC-4 NEXSTAR
20	1	404211050	TRAVELING BLOCK ASSY, 4004
21	1	663300001	CABLE TIE, 18”
22	1	366823254	SENSOR, TRI-AXIS
23	1	320434001	PIN, 3/4 X 2-3/4LG
24	1	366813000	PIN HITCH
25	1	330622000	DECAL, SERIAL NO.

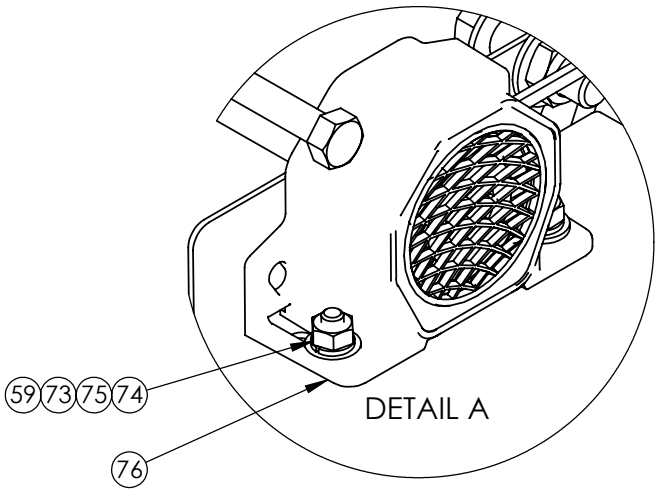
Pedestal Assembly - P/N 404242050



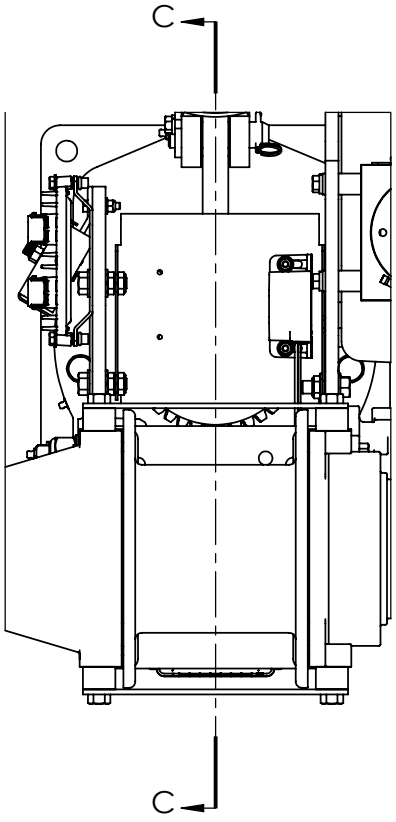
Pedestal Assembly - P/N 404242050

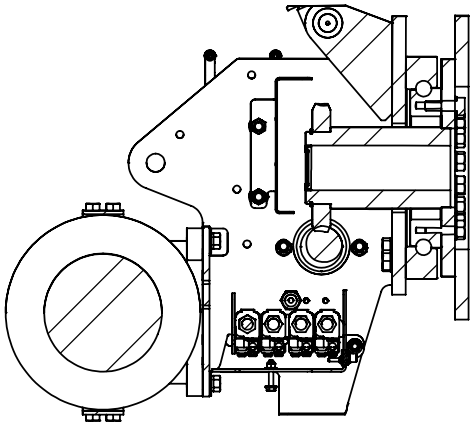


DETAIL B



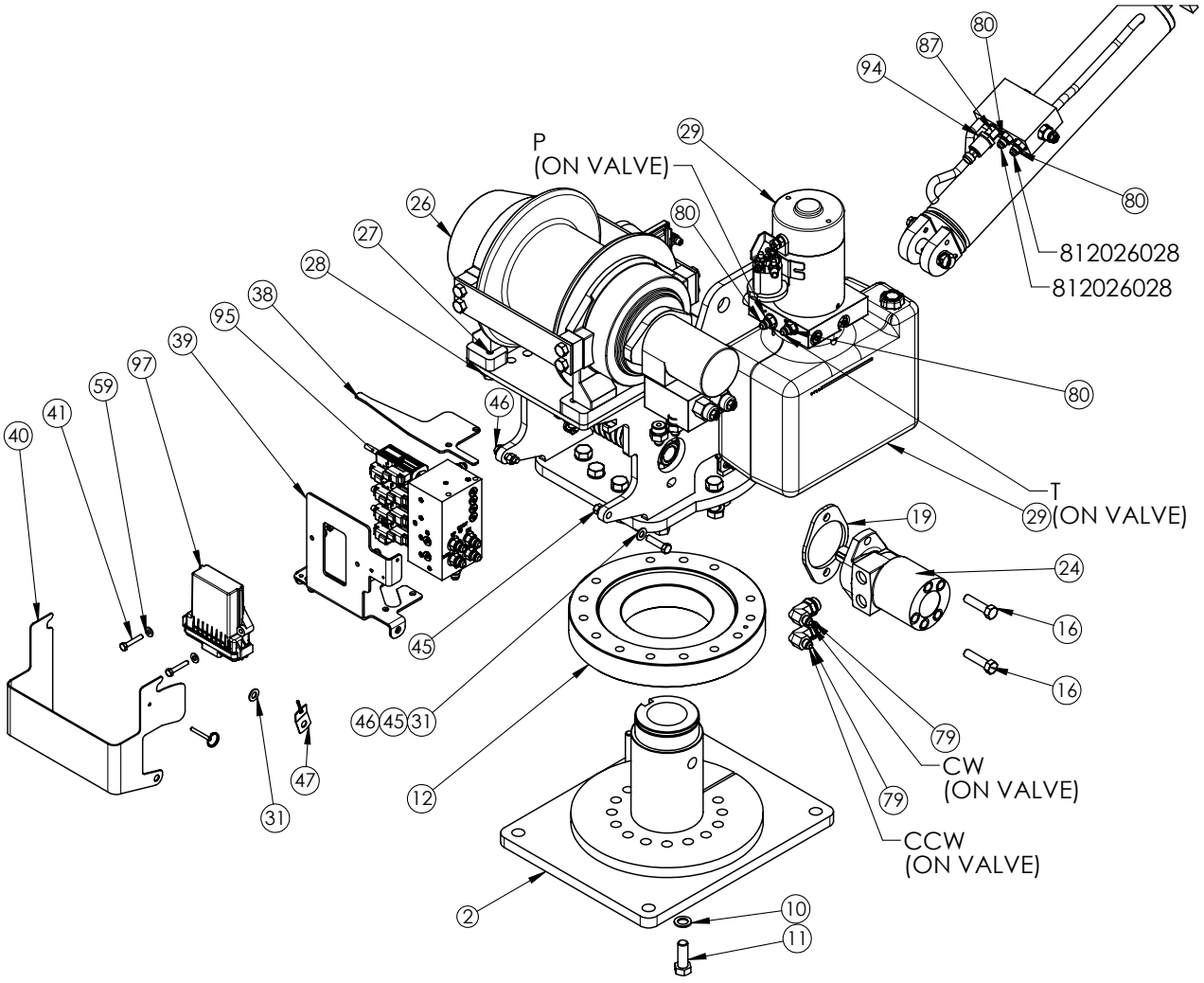
DETAIL A

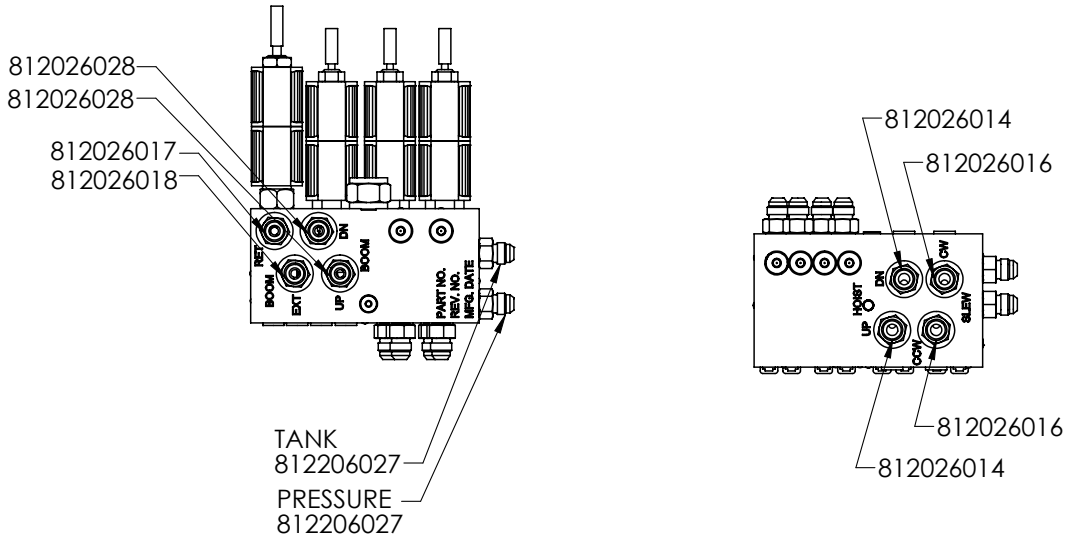




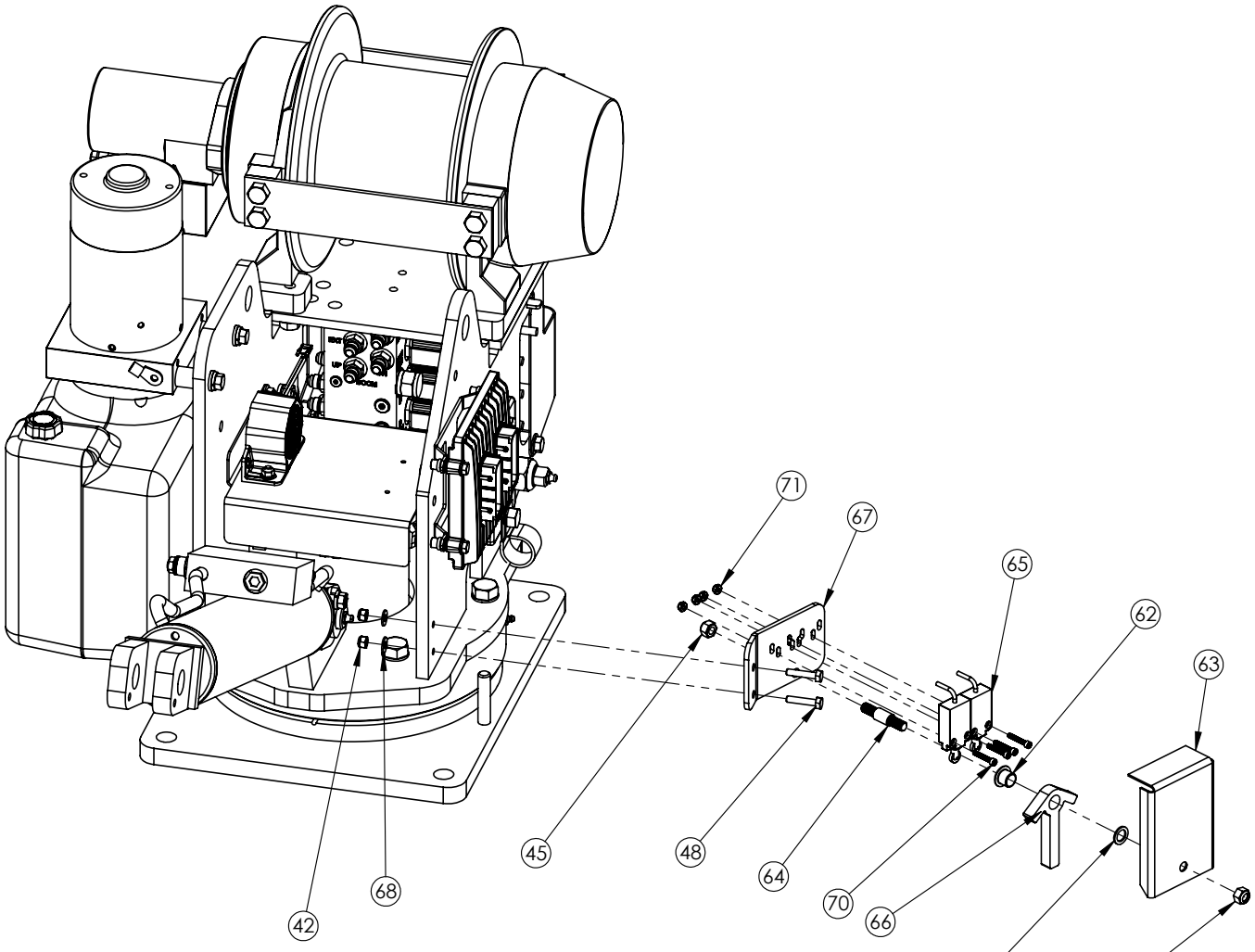
SECTION C-C

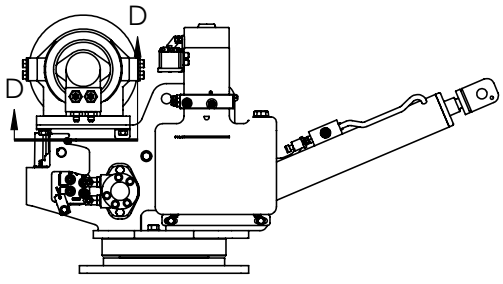
Pedestal Assembly - P/N 404242050

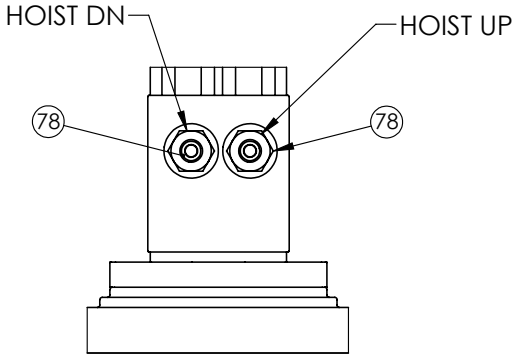




Pedestal Assembly - P/N 404242050







SECTION D-D

Pedestal Assembly - P/N 404242050

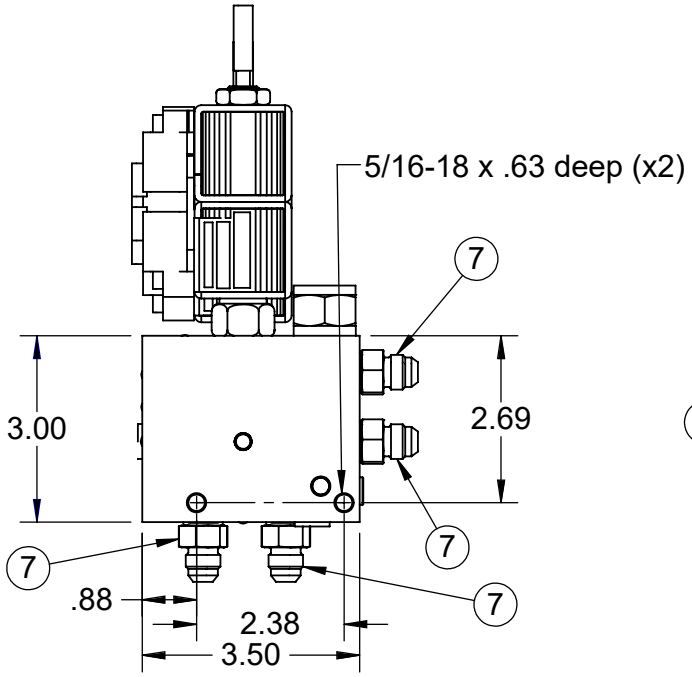
ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	320992150	PEDESTAL WELDMENT, 3.2/4 EHC
2	1	404242080	BASE WELDMENT, EHC-4
3	8	021100000	WASHER SP LK 3/8
4	1	330371000	SCREW HX HD 3/8-16UNC X 1 LG GR8
5	2	239300000	ZERK, GREASE
6	1	360678000	PIN, 3/16 COTTERLESS RING
7	1	320824000	PIN, LIFT CYLINDER
8	1	320858000	BEARING, SPHERICAL 1.00 ID
9	1	320845000	CYLINDER, LIFT
10	23	023902000	WASHER FL 5/8 HARDENED
11	23	012198000	SCREW HX HD 5/8-11UNC X 1 3/4 LG GR8
12	1	320878000	ROTATION BEARING
13	1	320991282	GEAR, WORM, 6.667PD, 4.00 ID, w/GROUND, 3203
14	4	017701000	NUT HX 1/2-13UNC
15	8	021500000	WASHER, SP LK 1/2
16	2	011608000	SCREW HX HD 1/2-13UNC X 2 LG
17	1	019000000	NUT HX NYLK 7/8-14UNF
18	2	011603000	SCREW HX HD 1/2-13UNC 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	123331	HOIST, RPH2000
27	4	738647000	SCREW HX HD 1/2-13UNC 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	1	008400000	SCREW HX HD 3/8-16UNC X 3/4 LG GR 5
33	3	010201000	SCREW HX HD 1/2-13UNC x 1 1/2 LG
34	1	404241253	TAG, ID 4004EH
35	1	460094000	SCREW, SOC HD, #10-24 X 1”L, ZPL
36	3	015801000	NUT HX NYLK #10-24UNC ZP

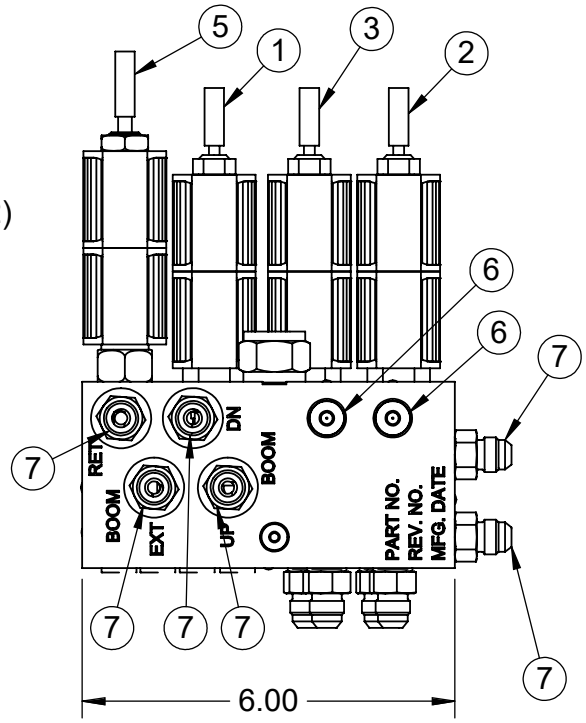
Pedestal Assembly - P/N 404242050

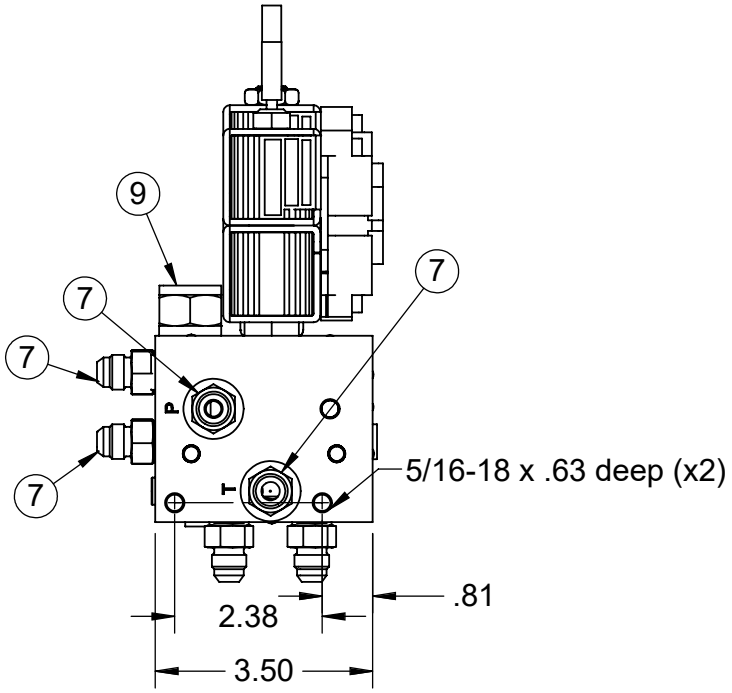
ITEM NO.	QTY	PART NUMBER	DESCRIPTION
37	1	020000000	WASHER FL #10 ZP
38	1	320991222	BRACKET, UPPER VALVE 3203/4004 EH
39	1	320992131	BRACKET, BASE STATION, NEXSTAR, EHC-3.2
40	1	320992172	COVER, VALVE/RECEIVER NEXSTAR
41	2	005804000	SCREW HX HD 1/4-20UNC X 1-1/2 LG
42	4	016300000	NUT HX NYLK 1/4-20UNC
43	4	020600000	WASHER 5/16 LOCK SS
44	4	007807000	SCREW HX HD 5/16-18UNC X 3/4 LG GR5
45	4	017301000	NUT HX NYLK 3/8-16UNC CP
46	2	009109000	SCREW HX HD 3/8-16UNC X 1 1/2 LG
47	1	366823240	PIN, 3/16 W/LANYARD
48	6	006200000	SCREW HX HD 1/4-20UNC X 1 1/4 LG
49	1	330478000	BEARING HOUSING ASSY
50	1	320991312	LOWER BRACKET, POWER UNIT
51	2	320991315	SPACER, UNTHREADED, 13/16” OD 7/16” ID, 7/8” LG, NYLON
52	2	009116000	SCREW HX HD 3/8-16UNC X 2 GR5
53	4	320976000	WASHER, FLAT, 3/8 SAE HARDENED
54	2	320991314	HEX HEAD SCREW, 5/16” - 18 X 7/8”
55	2	330394000	SCW HX 3/8 NC X 1 1/2
56	1	366823428	ASSEMBLY, BRACKET, CONTROLLER, NEXSTAR, HC-5,6,7,8,9,10,12S
57	6	320588000	WASHER, FL 1/2, HARDENED
58	5	605001257	NUT, THIN, NYLON LOCK, 1/2-13
59	12	020400000	WASHER FL SAE 1/4
60	1	200982020	HOSE CLAMP, 1-3/16” ID
61	1	366675000	WASHER, NYLON
62	1	460079000	BEARING, ROTATION STOP
63	1	320989207	COVER, ROTATION STOP, 3203H
64	1	366673000	PIN, ROTATION STOP
65	1	320989214	ROTATION STOP SWITCH ASSEMBLY, 11”
66	1	366671000	ARM, ROTATION STOP
67	1	320989206	BRACKET, SWITCH MNT, ROT STOP, 3203H
68	2	020300000	WASHER FL 1/4
69	1	320992171	WIRE COVER BRACKET, EHC-3.2/4
70	4	006210000	CAPSCREW-#8-32 X 7/8 LG SOC HD Z/P
71	4	725321000	NUT HX NYLK #8-32UNC
72	4	019700000	WASHER SP LK #8

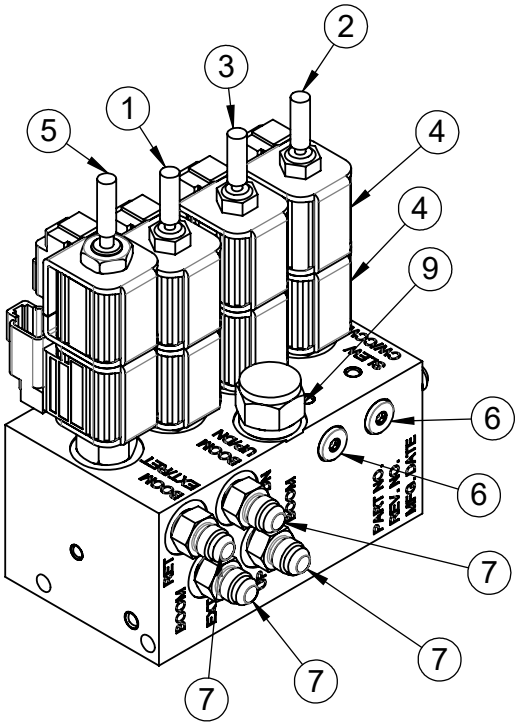
ITEM NO.	QTY	PART NUMBER	DESCRIPTION
73	2	005500000	SCREW HX HD 1/4-20UNC X 3/4 LG
74	2	015900000	NUT HX 1/4-20UNC SS
75	2	020200000	WASHER SP LK 1/4
76	1	366823223	KIT, ALARM, CONSTANT TONE, W/ DEUTSCH PLUG
77	1	320991246	KIT, HOSE NEXSTAR 3203PRX/4004EH
78	2	202755000	FITTING, -10 SAE/-6 JIC, STR
79	2	490198000	FITTING 90 10 SAE/6 JIC
80	4	200876000	FITTING STR 6 SAE/6 JIC
81	2	812026014	HOSE ASSY
82	2	812026016	HOSE ASSY
83	1	812026017	HOSE ASSY -4 HOSE -6 FEMALE JIC
84	1	812026018	HOSE ASSY, -4 HOSE, -6JICF / -6JICF, 18” LONG
85	2	812206027	HOSE, 3/8” X 3/8” JICF X 3/8” JICF 90 27 LG
86	2	812026028	HOSE ASSY, -6 JICF/-6 JICF X -4 HOSE X 28” LONG
87	1	369611000	ADAPTER, STR -6 ORM/ -4 ORF
88	1	320992260	KIT, HARNESS SMALL EH NEXSTAR
89	1	320992261	HARNESS, NEXSTAR SMALL EH CRANES
90	1	320992264	CABLE, 2GA, 1/4-5/16 TERM, 72”LG
91	1	320992263	CABLE, 2GA 5/16-3/8 TERM 36LG
92	1	320991293	CABLE, 2GA, 1/4-3/8 TERM, 72”LG
93	1	320992258	KIT, ELEC/HYD 3.2PRX/4 NS
94	1	366823409	TRANSDUCER, PRESSURE, 0-4000 PSI
95	1	320991251	VALVE BLOCK, 3203PRX/4004EH PROPORTIONAL
96	1	366823402	CONTROLLER, NEXSTAR
97	1	366823403	BASE STATION, NEXSTAR
98	1	366823406	BATTERY PACK, AA ALKALINE (X3), NEXSTAR

Hydraulic Valve Bank - P/N 320991251





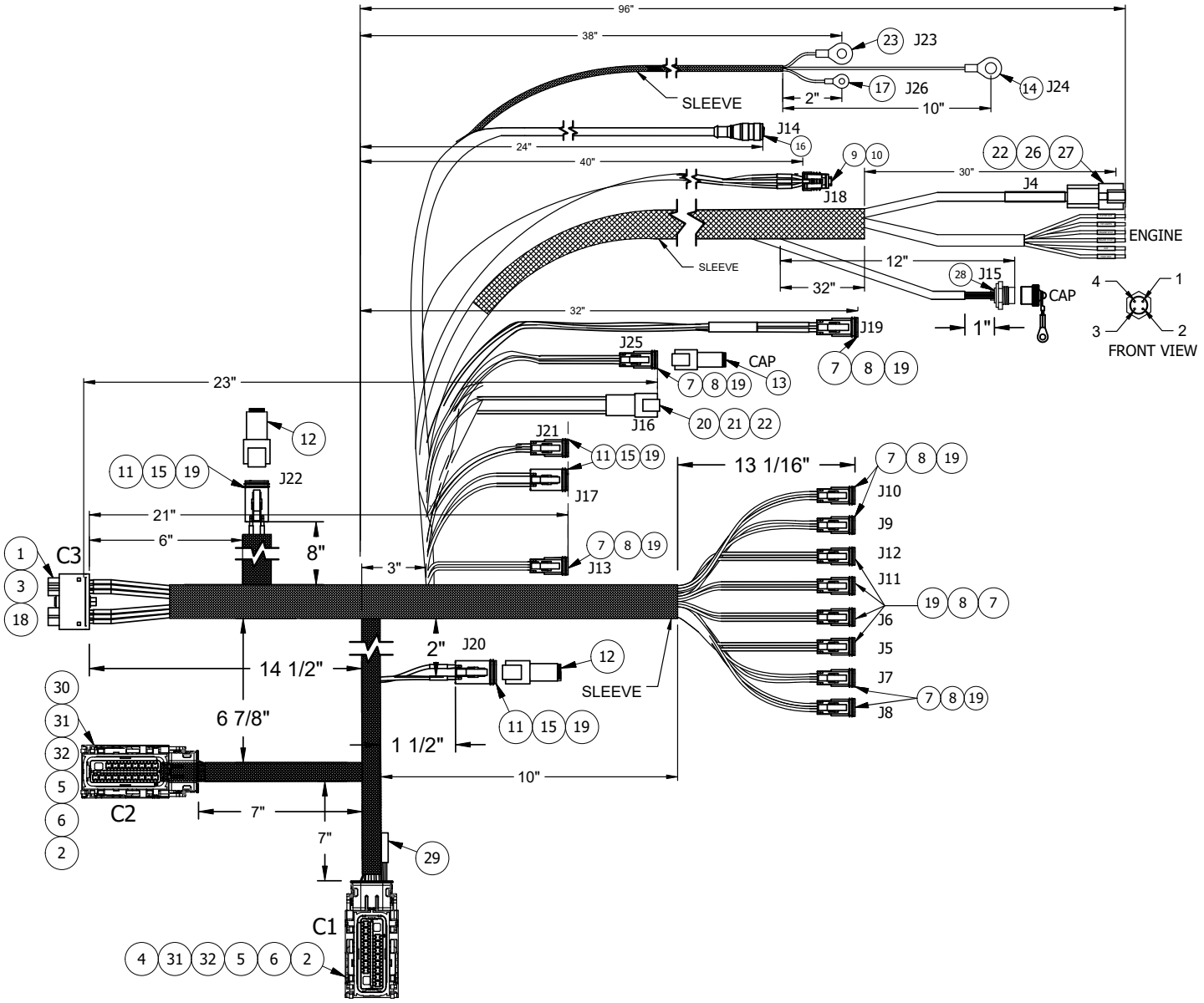




Hydraulic Valve Bank - P/N 320991251

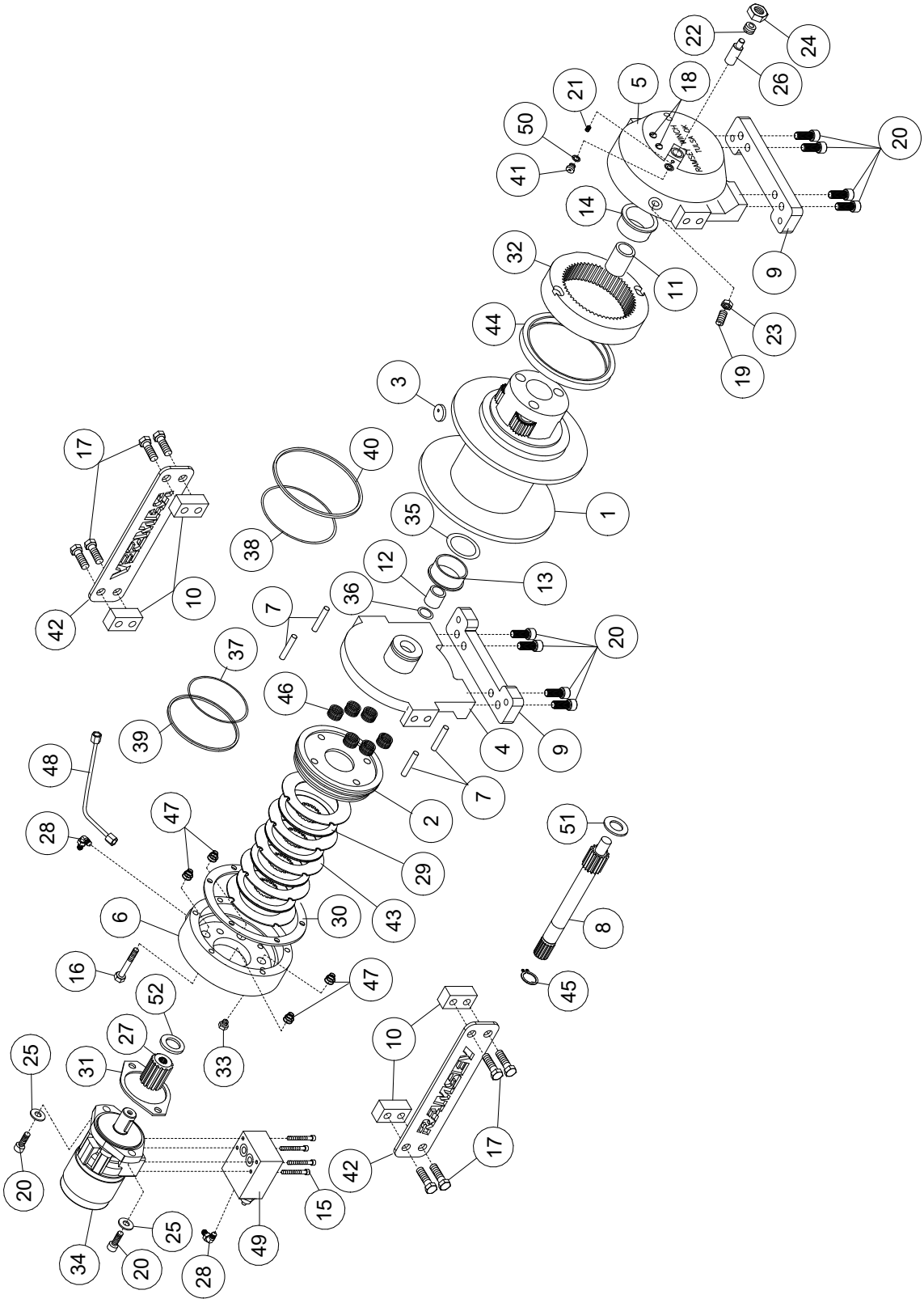
ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	320991914	VALVE, CARTRIDGE, PROPORTIONAL, 3203/4004 NEXSTAR,FLOAT CENTER
2	1	320991912	VALVE, CARTRIDGE, PROPORTIONAL, 3203/4004 NEXSTAR, CLOSED CENTER
3	1	320991913	VALVE, CARTRIDGE, PROPORTIONAL, 3203/4004 NEXSTAR, FLOATING CENTER
4	8	320991901	COIL, SOLENOID 12VDC 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, 1/4-20UNC 3/8LG 0.018 DIA
9	1	320991903	VALVE, LOGIC

Wiring Harness - P/N 320992261



CONNECTOR ID			
CONNECTOR	**DESCRIPTION**	**CONNECTOR**	**DESCRIPTION**
C1	MC43 CONNECTOR C1	J14	BOOM ANGLE SENSOR
C2	MC43 CONNECTOR C2	J15	PENDANT CONNECTION
C3	BASE STATION	J16	ALARM LIGHT
J4	TELEMATICS	J17	ADDRESS
J5	BOOM DOWN	J18	BOOM PT
J6	BOOM UP	J19	HORN
J7	SWING CW	J20	OIL TEMPERATURE SENSOR
J8	SWING CCW	J21	ROTATE LIMIT SWITCHES
J9	BOOM RETRACT	J22	G11 MODEM
J10	BOOM EXTEND	J23	POWER
J11	HOIST UP	J24	GROUND
J12	HOIST DN	J25	REGEN CIRCUIT
J13	ANTI-2 BLOCK	J26	PUMP SOLENOID

Hoist Assembly - P/N 123331

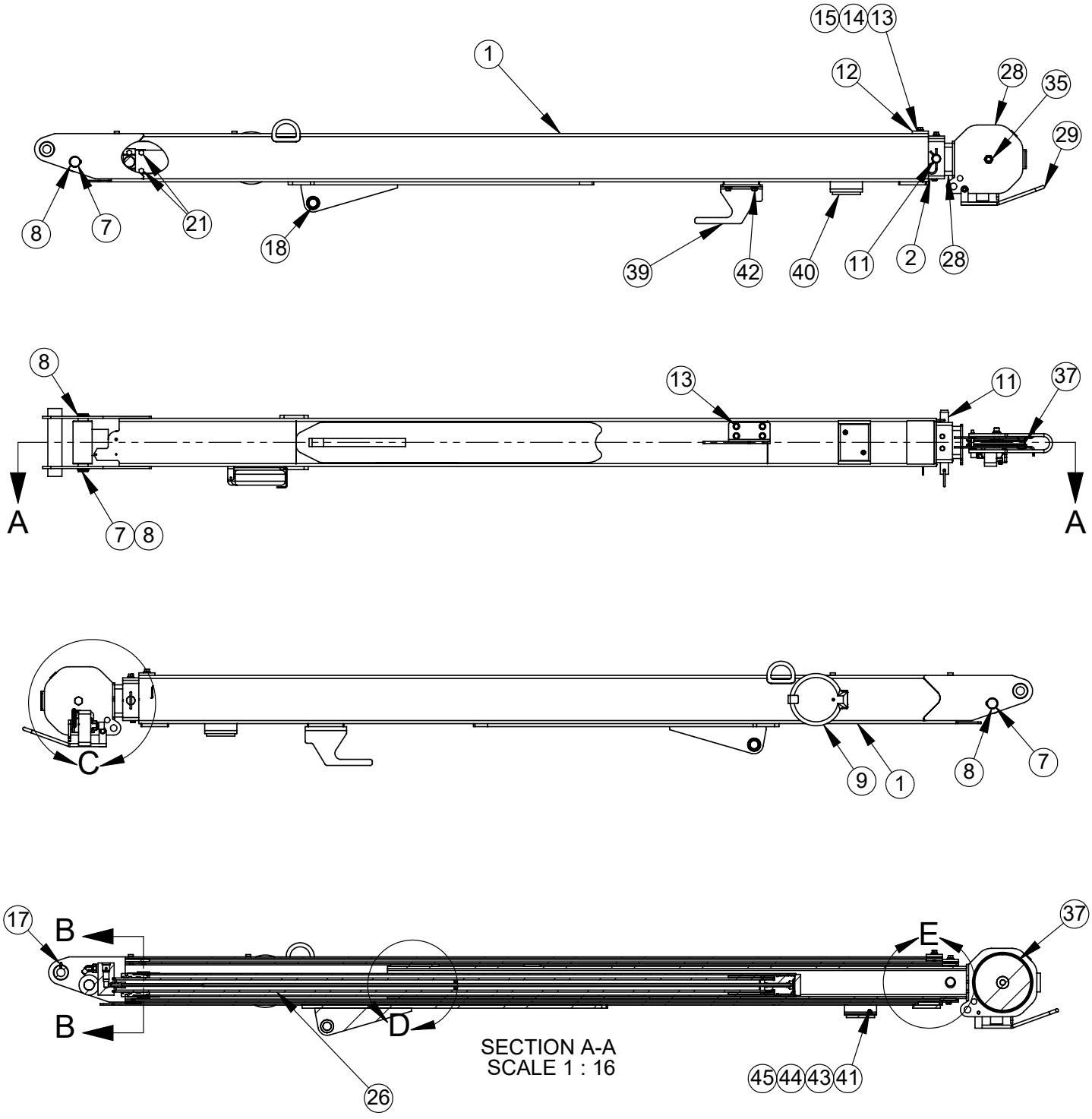


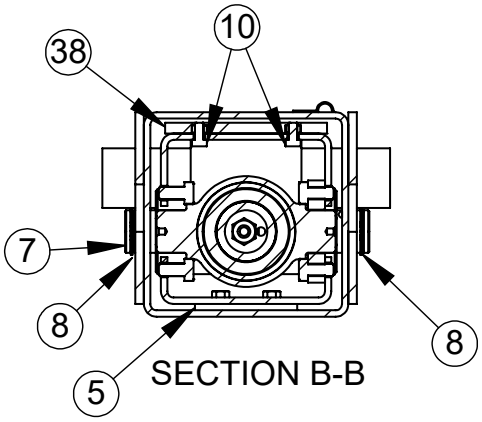
Hoist Assembly - P/N 123331

ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	234189	DRUM ASSEMBLY
2	1	306042	PISTON-BRAKE
3	1	315004	ANCHOR- CABLE
4	1	338300	END BRG-MOTOR END
5	1	338301	END BRG-GEAR HSG.
6	1	338302	HSG-BRAKE
7	4	346045	PIN-BRAKE
8	1	357513	SHAFT- INPUT
9	2	408435	SPACER - FOOT MOUNTING
10	4	362284	SPACER - TIE PLATE
11	1	402120	BEARING
12	1	402121	BEARING
13	1	412084	BUSHING-DRUM,MOTOR END
14	1	412085	BUSHING-DRUM,GEAR END
15	4	414159	CAPSCREW 5/16-18NCX3 LG HX HD GR-5
16	6	414303	BOLT-3/8-16NC X2 1/2,HXHD,GR-5, Z/P
17	8	414548	CAPSCREW-1/2-13NCX1 1/2,HXHD,Z/P,G5
18	2	414854	SCREW-1/4-20NCX1/2LG,RDHD,SLOT,Z/PL
19	1	414926	SETSCREW-3/8-16NC X1,SOCKET,NYLON
20	12	414948	CAPSCREW-1/2-13NCX1 1/4LG,SOCKET HD
21	1	416016	SETSCREW1/4-20NCX1/4 HX SOCK HD CUP
22	1	416080	SETSCREW-5/8-18NF X1 LG,HXSOCHD,CUP
23	1	418036	NUT-3/8-16 NC,HEX JAM,Z/P
24	1	418088	NUT-JAM 5/8-18NF HEX HD,ZINC PLT
25	2	418218	LOCKWASHER-1/2 ID MED SECT,ZINC PLT
26	1	426048	PLUNGER-CLUTCH,BLOCKED
27	1	431015	COUPLING-MOTOR
28	2	432018	FITTING
29	4	438022	DISC-BRAKE
30	1	442220	GASKET-BRAKE HSG.
31	1	442223	GASKET-MOTOR FLANGE
32	1	444140	GEAR-RING,P/M
33	1	456038	FITTING-VENT,BREATHER
34	1	458222	MOTOR-HYDRAULIC (RPH-4900)
35	1	462046	O-RING
36	1	462056	O-RING
37	1	462057	O-RING

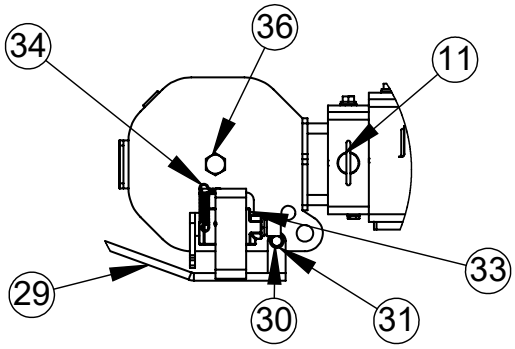
ITEM NO.	QTY	PART NUMBER	DESCRIPTION
38	1	462058	O-RING
39	1	462059	O-RING-BACK-UP
40	1	462060	O-RING-BACK-UP
41	1	472052	PLUG
42	2	395426	TIE PLATE
43	5	474111	PLATE-SEPARATOR, BRAKE
44	1	486080	SEAL
45	1	490037	SNAP RING
46	6	494110	SPRING-BRAKE
47	4	494112	SPRING
48	1	509009	TUBE ASSY
49	1	516068	VALVE-MOTOR CONTROL
50	1	518037	THRUST WASHER
51	1	518047	THRUST WASHER
52	1	518052	THRUST WASHER

Boom Assembly - P/N 404240100

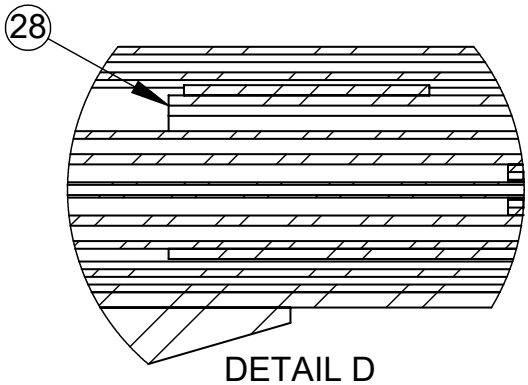




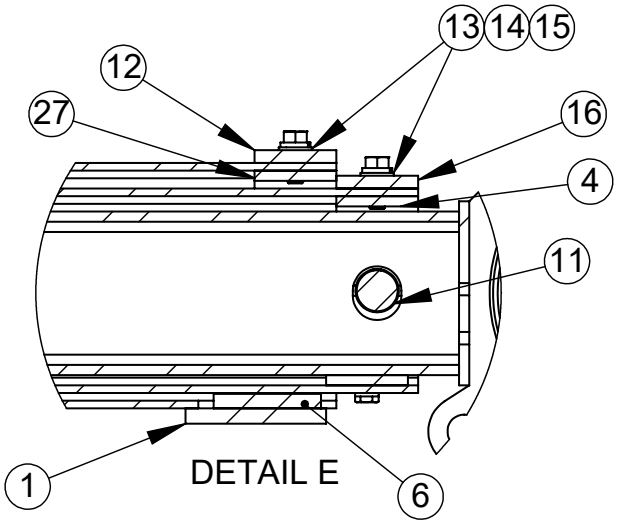
SECTION B-B



DETAIL C



DETAIL D



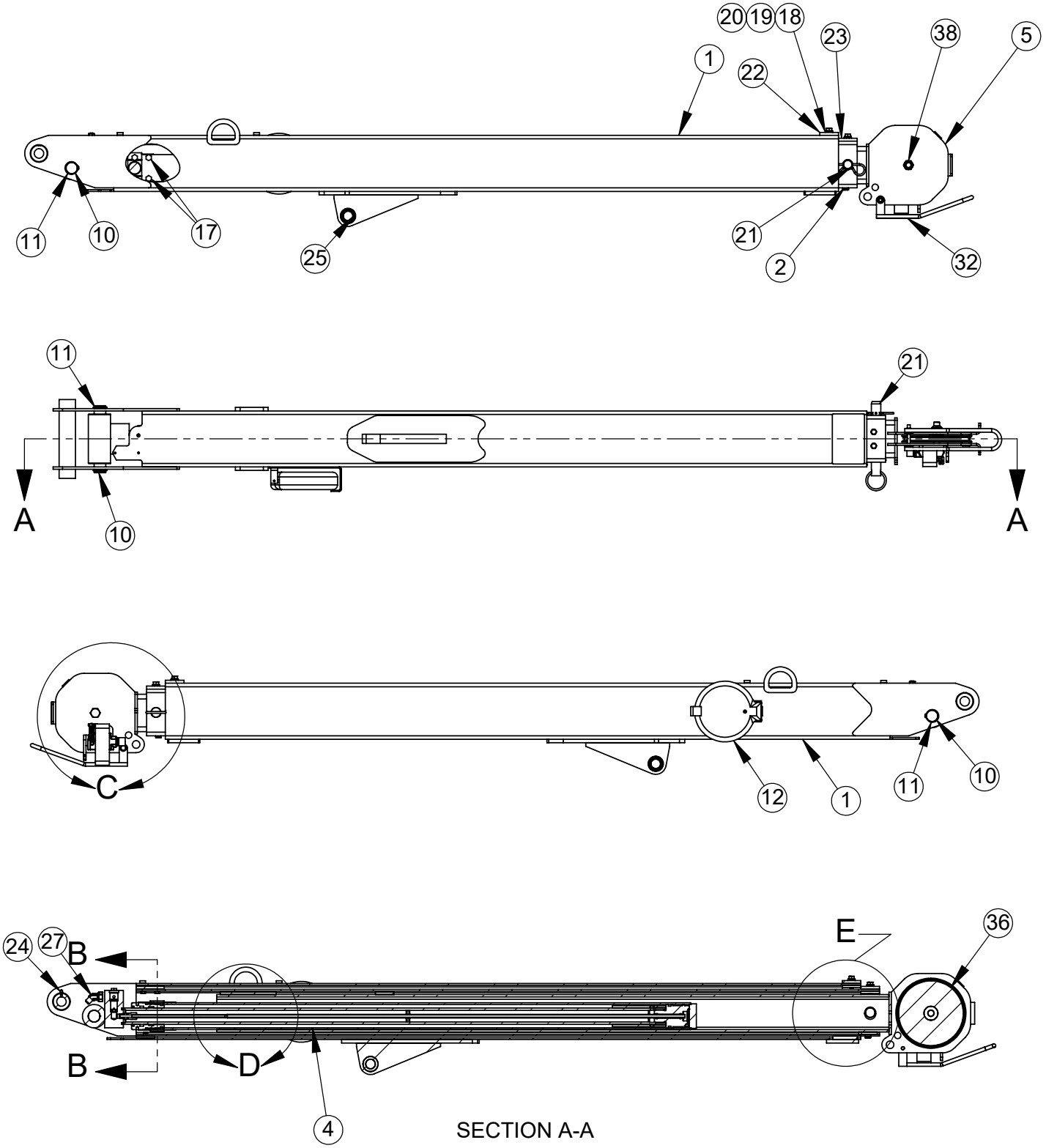
DETAIL E

Boom Assembly - P/N 404240100

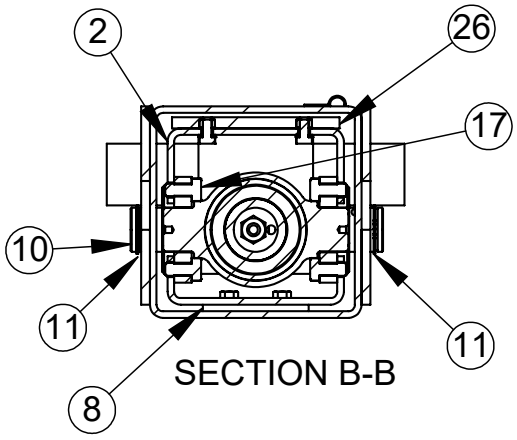
ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	404240002	LOWER BOOM WELDMENT, EHC-4 (20FT)
2	1	404240004	MID BOOM WELDMENT, 4004EH (20FT)
3	1	366184000	RETAINER, EXTENSION CYLINDER
4	1	366112000	STOP UPPER BOOM
5	1	480120000	KB PAD
6	1	360791000	WEAR PAD 4.5 X 2.63 X .35
7	1	404204000	PIN 1-1/4 DIA X 7.163 LG, 4004
8	2	480029000	RING RETAINING
9	1	404205000	CORD REEL ASSY
10	6	005406000	SCREW HX HD 1/4-28UNF X 1/2 LG
11	1	366190000	PIN ASSY W/LANYARD
12	1	366201000	WEAR PAD 3.75 X 2.00 X .313
13	8	021200000	WASHER FL 3/8
14	8	021100000	WASHER SP LK 3/8
15	4	008800000	SCREW HX HD 3/8-24UNF X 1 LG
16	1	366202000	PAD, BOOM TOP
17	1	239000000	ZERK DRIVE GR
18	1	320858000	BEARING, SPHERICAL 1.00 ID
19	2	020600000	WASHER 5/16 LOCK SS
20	2	007808000	SCREW 5/16-24UNF X 1/2 LG
21	12	008400000	SCREW HX HD 3/8-16UNC X 3/4 LG GR 5
22	2	200876000	FITTING STR 6 SAE/6 JIC
23	2	330647000	FITTING -6JIC SWIVEL NUT 45 DEG ELBOW
24	1	366199000	PAD BOOM
25	1	642918000	CORD CONNECTOR
26	1	404240010	CYLINDER, EXTENSION, 72 INCH STROKE
27	1	366183000	STOP CENTER BOOM
28	1	404186010	UPPER BOOM WLDMT 4004, SINGLE SHEAVE
29	1	320871000	BAIL WELDMENT
30	1	811029000	SCREW HX HD 5/16-18UNC X 2 1/2 LG
31	4	020901000	WASHER FL 5/16
32	1	016801000	NUT HX NYLK 5/16-18UNC CP
33	1	646900000	SWITCH, ANTI-TWO BLOCK
34	1	366678000	SPRING, EXTENSION
35	1	018200000	NUT HX NY LK 5/8-11UNC
36	1	366393000	SCREW HX HD 5/8-11UNC X 2 1/2 LG GR8
37	1	320883001	SHEAVE ASSEMBLY, 4004

ITEM NO.	QTY	PART NUMBER	DESCRIPTION
38	1	320988156	BOOM PAD WITH NUTS, 4.75 X 3 X .313, 3203
39	1	479200154	OPEN LOAD HOOK, BOLT-ON
40	1	479200152	WEAR PAD, TRAVELING BLOCK
41	2	016100001	SCREW, FLAT HEAD, 1/4-28 X 1, ZINC PLATED, GR 5
42	4	479200169	3/8-24 HHCS, 3/4 LG, ZINC PLATED, GR 5
43	2	020300000	WASHER FL 1/4
44	2	020200000	WASHER SP LK 1/4
45	2	016100000	NUT, 1/4-28, ZINC PLATED

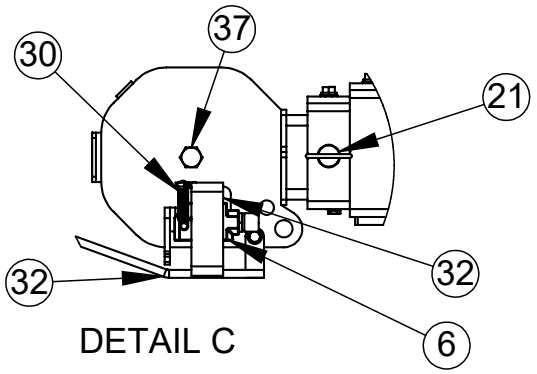
Boom Assembly - P/N 404189010



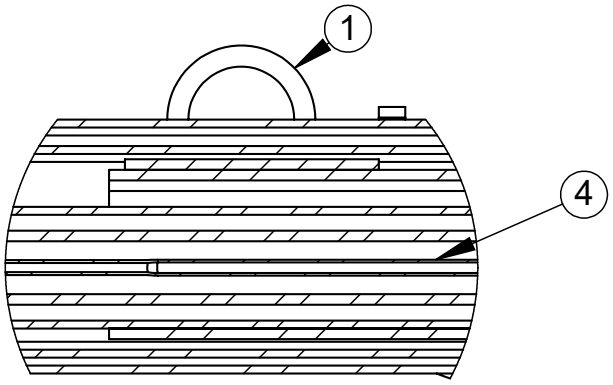
SECTION A-A



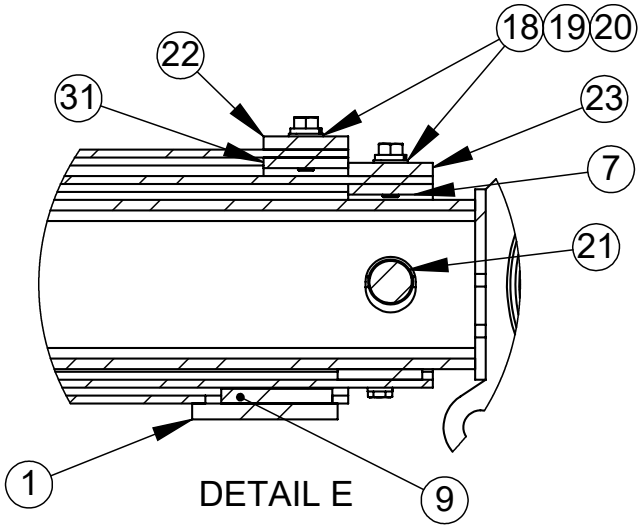
SECTION B-B



DETAIL C



DETAIL D

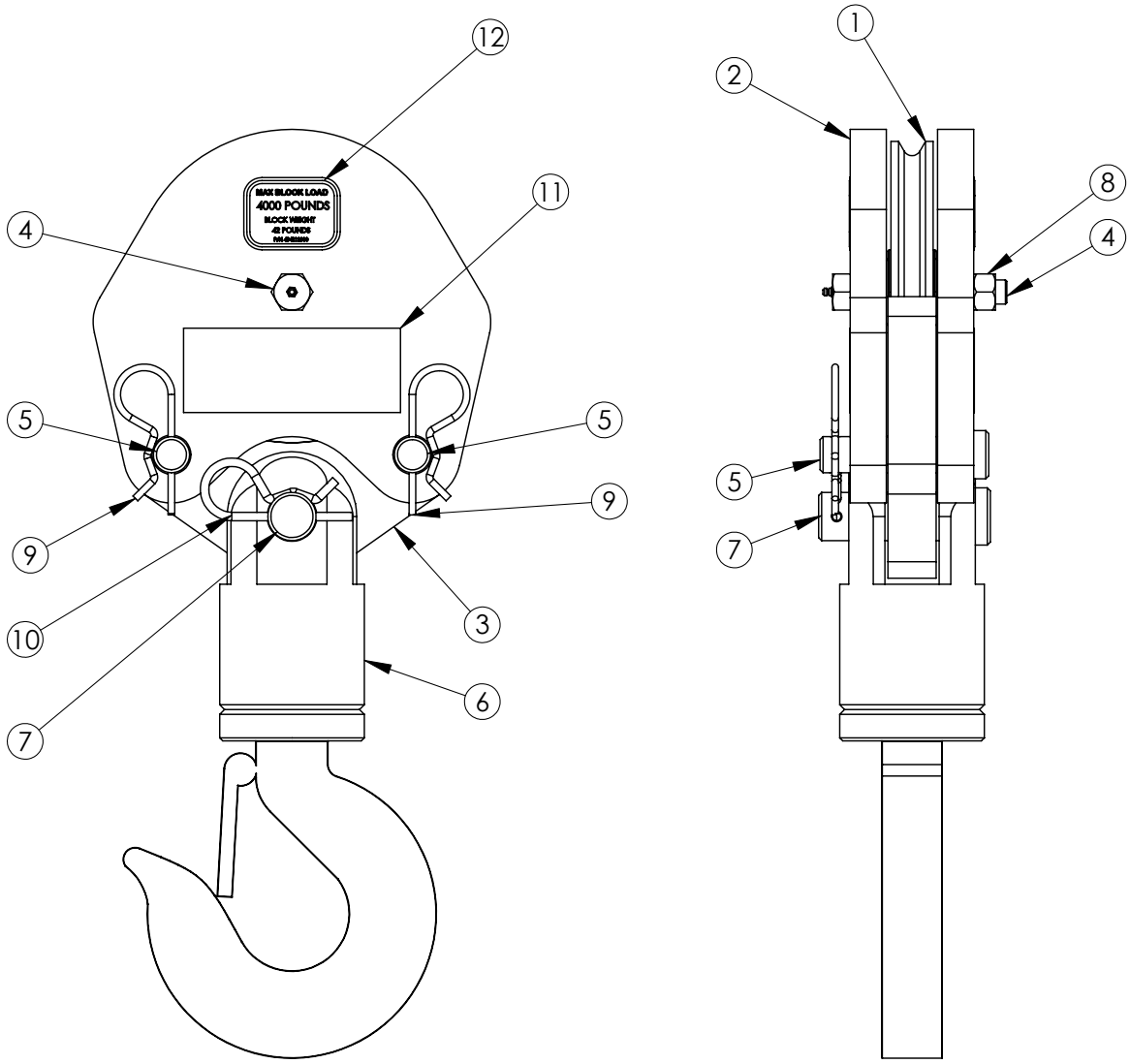


DETAIL E

Boom Assembly - P/N 404189010

ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	404184000	LOWER BOOM WELDMENT
2	1	404185000	MID BOOM WLDMNT 4004
3	2	366184000	RETAINER, EXTENSION CYLINDER
4	1	404196000	CYLINDER, EXTENSION
5	1	404186010	UPPER BOOM WLDMT 4004, SINGLE SHEAVE
6	1	646900000	SWITCH, LIMIT ANTI-TWO BLOCK
7	1	366112000	STOP UPPER BOOM
8	1	480120000	KB PAD
9	1	360791000	WEAR PAD 4.5 X 2.63 X .35
10	1	404204000	PIN 1-1/4 DIA X 7.163 LG, 4004
11	2	480029000	RING RETAINING
12	1	404205000	CORD REEL ASSY
13	6	005406000	SCREW HX HD 1/4-28UNF X 1/2 LG
14	4	020200000	WASHER SP LK 1/4
15	2	020600000	WASHER 5/16 LOCK SS
16	2	007808000	SCREW 5/16-24UNF X 1/2 LG
17	12	008400000	SCREW HX HD 3/8-16UNC X 3/4 LG GR 5
18	4	021200000	WASHER FL 3/8
19	4	021100000	WASHER SP LK 3/8
20	4	008800000	SCREW HX HD 3/8-24UNF X 1 LG
21	1	366190000	PIN ASSY W/LANYARD
22	1	366201000	WEAR PAD 3.75 X 2.00 X .313
23	1	366202000	PAD, BOOM TOP
24	1	239000000	ZERK DRIVE GR
25	1	320858000	BEARING, SPHERICAL 1.00 ID
26	1	320988156	BOOM PAD WITH NUTS, 4.75 X 3 X .313, 3203
27	2	330647000	FITTING -6JIC SWIVEL NUT 45 DEG ELBOW
28	1	366199000	PAD BOOM
29	1	642918000	CORD CONNECTOR
30	1	366678000	SPRING, EXTENSION
31	1	366183000	STOP CENTER BOOM
32	1	320871000	BAIL WELDMENT
33	4	020901000	WASHER FL 5/16
34	1	811029000	SCREW HX HD 5/16-18UNC X 2 1/2 LG
35	1	016801000	NUT HX NYLK 5/16-18UNC CP
36	1	320883001	SHEAVE ASSEMBLY, 4004
37	1	366393000	SCREW HX HD 5/8-11UNC X 2 1/2 LG GR8
38	1	018200000	NUT HX NY LK 5/8-11UNC

Traveling Block Assembly - P/N 404211050



ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	480130000	SHEAVE ASSY
2	2	480363000	SHORT BLOCK SIDE PLATE
3	1	480364000	TACKLE LOWER
4	1	480372000	BOLT, SHEAVE W/ ZERK FITTING
5	2	480367000	PIN BLOCK
6	1	480371000	HOOK SWIVEL 3 METRIC TON
7	1	480368000	PIN SWIVEL HOOK
8	1	017800000	NUT, HX LK 1/2-20UNF
9	2	366813000	PIN HITCH
10	1	360124000	PIN HITCH
11	2	040518000	DECAL STAY CLEAR OF LOAD
12	2	404212000	DECAL MAX BLOCK LOAD 4004

P.O. Box 580697 Phone: (918) 438-2760
4707 N. MIngo Rd. Tulsa, OK 74158-0697

LIMITED WARRANTY
1 YEAR PURCHASED REPLACEMENT PARTS

Auto Crane will warranty to the consumer for a period of (1) year from the date that a new Auto Crane replacement part was purchased from an authorized Auto Crane distributor. Each new Auto Crane part they sell will be free under normal use and service from defects in material and workmanship. Date of purchase will be honored as the date indicated on the Bill of Sale to the consumer.

The obligation of Auto Crane under this warranty does not apply to parts replaced under the limited warranty for a new Auto Crane product. The warranty for parts replaced under the limited warranty of a new Auto Crane product expires when the warranty for that product expires.

The obligation of Auto Crane under this warranty is limited to the replacement or repair of purchased replacement parts that appear to the manufacturer to be defective after review of documentation (Auto Crane Warranty Claim Form. photos. data etc.) provided by the Auto Crane distributor and/or inspection of parts returned to Auto Crane. This warranty does not obligate Auto Crane to bear labor costs to replace the defective parts or travel time charges in connection with the replacement or repair of defective parts. Responsibility for customer's claims arising from misapplication. abuse. misuse or alteration of equipment or parts lies with the distributor or user and no warranty obligation is assumed in these circumstances by Auto Crane.

Auto Crane will in no event be liable for any consequential damages or contingent liabilities arising out of the failure of any Auto Crane product or parts to operate properly

Auto Crane makes no warranty in respect to parts for component accessories. it being subject to the warranties of their respective manufacturers.

If field service. at the request of the distributor. is rendered and fault is found not to be with Auto Crane's product. the distributor shall pay the time and expense of the field representative.

Claims for service labor or other expenses that have incurred by the buyer without approval or authorization or Auto Crane will not be accepted

When applying for warranty claims may be handled by contacting your nearest authorized Auto Crane **Distributor. All claims are to be filed in writing on an Auto Crane Warranty Claim Form.**

Limited Parts Warranty 1 Year

Effective June 15, 2010

P.O. Box 580697 Phone: (918) 438-2760
4707 N. MIngo Rd. Tulsa, OK 74158-0697

LIMITED WARRANTY
2 YEAR PARTS AND LABOR

Auto Crane will warranty to the consumer for a period of (2) years parts and labor from the date of purchase. Each new Auto Crane unit they sell will be free under normal use and service from defects in material and workmanship. Date of purchase will be honored as the date indicated on the Bill of Sale, which must accompany the Warranty Registration and be on file with Auto Crane. Absent a valid Warranty Registration and appropriate documentation, the original date of manufacture, as indicated by the serial number on the product, will be used to determine the effective date of the 2 year warranty.

The obligation of Auto Crane under this warranty is limited to the replacement or repair of parts that appear to the manufacturer after review and/or inspection to be defective and paid flat rate labor for replacing defective parts. This warranty does not obligate Auto Crane to bear the travel time charges in connection with the replacement or repair of defective parts. Responsibility for customer's claims arising from misapplication, abuse, misuse or alteration of equipment or parts lies with the distributor or user and no warranty obligation is assumed in these circumstances by Auto Crane.

Auto Crane will in no event be liable for any consequential damages or contingent liabilities arising out of the failure of any Auto Crane Product or parts to operate properly.

Auto Crane makes no warranty in respect to component accessories, it being subject to the warranties of their respective manufacturers.

If field service, at the request of the distributor, is rendered and fault is found not to be with Auto Crane's product, the distributor shall pay the time and expense of the field representative.

Claims for service labor or other expenses that have incurred by the buyer without approval or authorization or Auto Crane will not be accepted.

When applying for warranty, claims may be handled by contacting your nearest authorized Auto Crane Distributor. All claims are to be filed in writing on an Auto Crane Warranty Claim Form.

AUTO CRANE COMPANY IS UNDER NO OBLIGATION TO EXTEND THIS WARRANTY TO ANY CUSTOMER FOR WHICH AN AUTO CRANE DELIVERY REPORT FORM HAS NOT BEEN COMPLETED AND ON FILE WITH AUTO CRANE COMPANY

Limited Warranty 2 Years Effective September 2, 2003