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OWNER'S MANUAL  
**HC-10**  
NEXSTAR III



Serial No. \_\_\_\_\_

460179111-0320-D

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

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



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# Safety Tips and Precautions 1

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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.

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## 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 in compliance.

## 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

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! This will void any warranty or liability. Also, failure of the crane may result.

## 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. Any such 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.

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## 2 Introduction

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### 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 the following 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 crane owners, equipment managers, and supervisors also read this manual.

Auto Crane has incorporated several safety features in the crane for your protection.

For your convenience the overall dimensions of the crane are included on the General Dimension Drawing. Rotation and turning radius are also listed on that drawing.

Remember, the crane adds weight to the vehicle. Adding weight may change the driving and riding characteristics of the vehicle unless the appropriate overload spring(s) are installed on the truck. 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.

Auto Crane Company issues a limited warranty certificate with each unit sold. See last page for warranty.

The cranes are attached to your 12-volt truck electrical system. The crane is another highly efficient Auto Crane product. 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.

### NOTICE

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. The customer service department also has the ability to bring a local distributor, a regional sales manager, or a factory serviceman into the solution of an equipment problem.

If, through no fault of Auto Crane Company, it is necessary to send an experienced factory serviceman on a field service call the rates stated in the Auto Crane Distributor's Flat Rate Manual will apply.

Auto Crane Company's extensive Research and Development Program allow our customers to use the best equipment on the market. Our engineering staff and our knowledgeable sales people are always available to our customers in solving crane and winch-type 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**

The information contained in the manual is in effect at the time of this printing. Auto Crane Company reserves the right to update this material without notice or obligation.

# 3 General Specifications

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## 3.1 DIMENSIONS

- Width: 24.5 in (0.62 m)
- Height: 35.5 in (0.90 m)
- Length: 14 ft 3 in (4.34 m), stored length.
- Weight: 1,900 lbs (862 kg)

## 3.2 RATING

- Crane Capacity: 10,000 lb
  - Double Line: 10,000 lb maximum
  - Single Line: 5,000 lb maximum
- 60,000 ft-lbs (8.30 ton-m)
- Ft-lbs = horizontal distance from center line of rotation to free hanging weight (feet) x amount of weight (pounds).

## 3.3 REACH

- Second boom reach: 11 ft. 11 in. to 19 ft.
- Third boom reach: 19 ft. to 24 ft. 6 in.

## 3.4 CABLE

- 120 ft. (36.6 m) of 7/16 in. (11.1 mm) diameter aircraft quality cable. This cable has a single line breaking strength of 20,400 lbs. (9,253 kg).

## 3.5 Line Speed

- 60 ft. per minute

## 3.6 CHASSIS AND MOUNTING REQUIREMENTS

- 26,000 lbs. (11,793 kg) GVWR minimum.
- 900,000 in-lbs. Resistive Bending Moment (RBM)
- 7/8", Grade 8-UNF Bolts. Tightened to 501 ft. lbs.
- 13-1/2" Mounting hole to run electrical lines to the crane from the body.

## 3.7 ELECTRICAL SYSTEM REQUIREMENTS

- Voltage: 12 VDC
- Alternator: 60 amps minimum
- Battery: 100 minute reserve capacity minimum. Maintenance Type battery

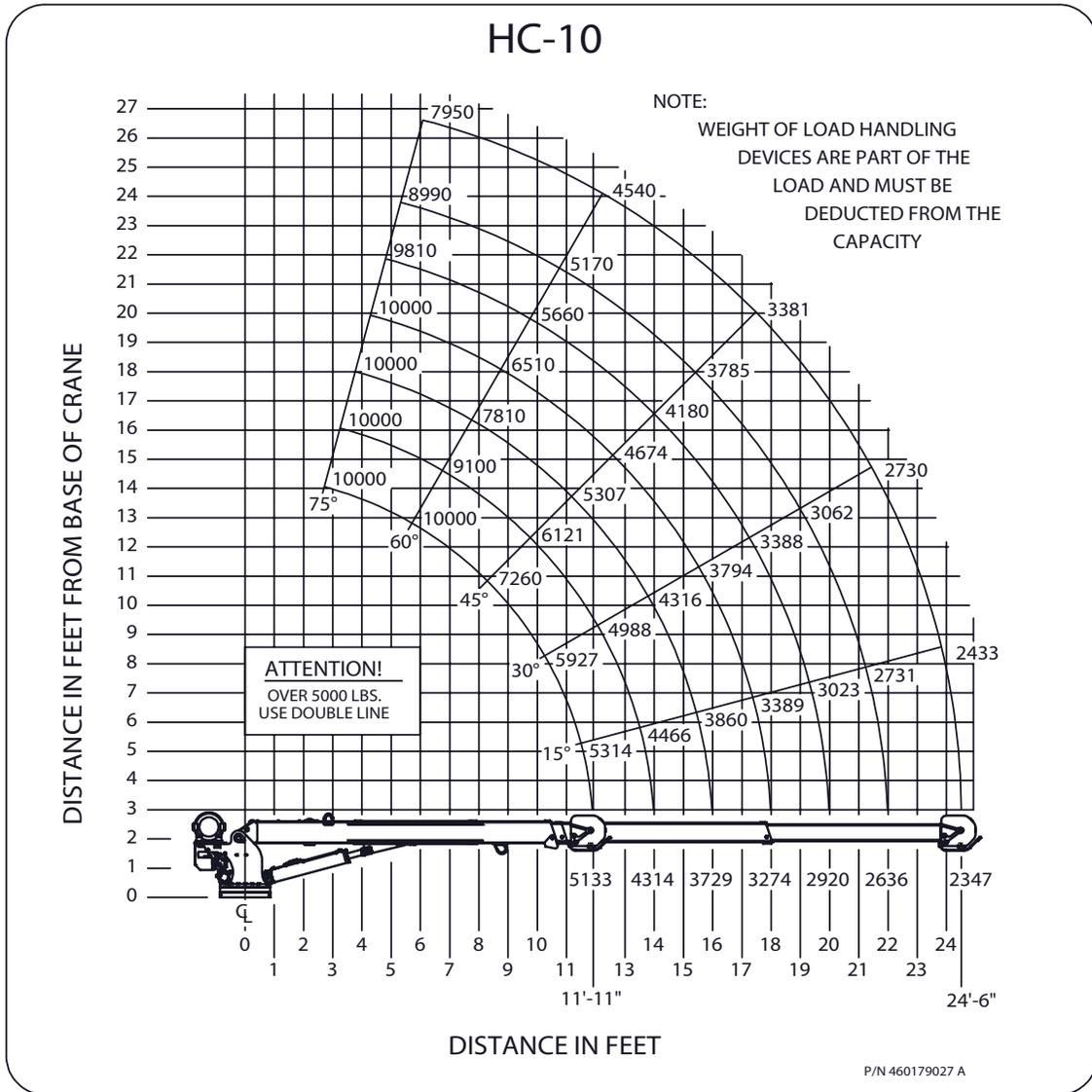
## 3.8 ROTATION

- 370° continuous rotation

## 3.9 HYDRAULIC SYSTEM REQUIREMENTS

- Flow: 10 GPM
- Pressure: 3000 PSI

# Load Chart 4



**WARNING**

All load ratings are based on crane capacity, not the 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, if the crane is equipped with this type of device.

**WARNING**

Always comply with load chart capacities.

# 5 Qualifications and Operating Practices

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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.

## 5.1 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.

## 5.2 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 operations.
  - B. Possess the knowledge of emergency procedures and implement it.
  - 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.

# Qualifications and Operating Practices 5

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## 5.3 CONDUCT OF OPERATORS

1. The operator shall not engage in any practice, which will divert his attention while actually 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:
  - A. Move power controls to the "OFF" or neutral position.
  - B. Land the suspended load and boom, if practical.
7. The operator shall be familiar with the equipment and its proper care. If adjustments or repairs are necessary, the operator shall report the same promptly to the appointed person, and shall also notify the next operator.
8. The operator at the start of each shift shall test all controls. If any controls do not operate properly, they shall be adjusted or repaired before operations are begun.
9. Stabilizers shall be visible to the operator while extending or setting unless a signal person assists operator.

## 5.4 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.

# 5 Qualifications and Operating Practices

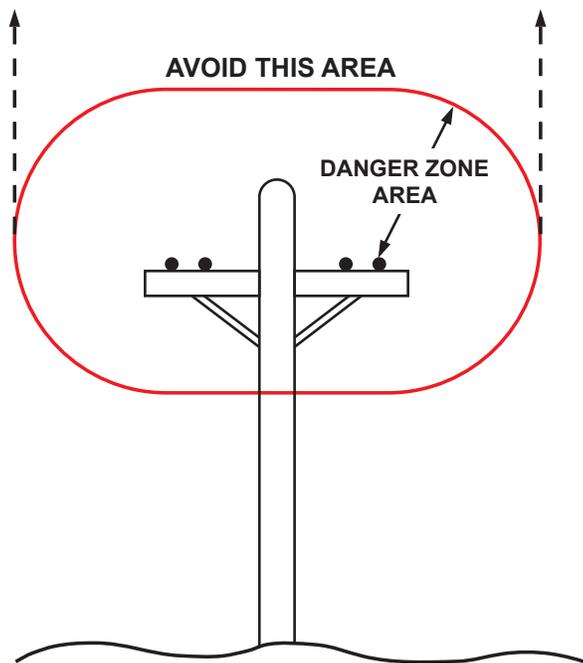
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4. During lifting care shall be taken that:
  - A. There is no sudden acceleration or deceleration of the moving load.
  - B. When rotating the crane, sudden starts and stops shall be avoided. Rotational speed shall be such that the load does not swing 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. This standard recognizes that telescopic boom cranes are designed and intended for handling materials. They do not meet personnel lift or elevator requirements. Therefore, no lifting, lowering, swinging or traveling shall be done while a person is on the hook or load. Hook attached suspended work platforms (baskets) shall not be used with cranes covered by this standard.
  - 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. Strong enough to prevent crushing.
  - 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.

## 5.5 OPERATING NEAR ELECTRICAL POWER LINES



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



# Qualifications and Operating Practices 5

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 below Table Safe Operating Distance.
  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 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 Table 1 Safe Operating Distance limits aren't adhered to.

<b>Safe Operating Distance for Cranes Near Electrical Lines</b>		
<b>When operating near high voltage power lines</b>		
Normal Voltage, kV - (phase to phase)	Minimum Required Clearance	
	Ft.	(m)
0 - 50	10	(3.5)
50 - 200	15	(4.6)
200 - 350	20	(6.1)
350 - 500	25	(7.62)
500 - 750	35	(10.67)
750 - 1000	45	(13.72)
<b>When in transit with no load and boom stowed</b>		
0 - 0.75	4	(1.22)
0.75 - 50	6	(1.83)
50 - 345	10	(3.83)
345 - 750	16	(4.87)
750 - 1000	20	(6.1)

TABLE 1

# 5 Qualifications and Operating Practices

---

## 5.6 PREPARING THE CRANE FOR OPERATION

1. Ensure the manual has been thoroughly read by all crane operating and maintenance personnel and supervisors.
2. Perform a routine inspection of the crane before operation each day. Correct 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 neutral (or park for automatic 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 neutral.
  - C. Press the clutch in.
  - D. Activate PTO (Power Take Off).
  - E. Release the clutch.
  - F. Allow sufficient time for the hydraulic fluid to warm up.
  - G. 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. Ensure they are firmly positioned on solid ground.
  - B. Stand clear of outriggers while being extended.
  - C. If a curb or other object prevents the outrigger from being fully extended, shorten the bearing or fulcrum point and reduce the maximum load accordingly.
  - D. 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.
  - E. If working in soft ground, use wide pads under the outrigger feet to prevent sinking.
  - F. 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.
      4. With the Outriggers properly positioned, return the diverter valve to the Crane position.

# Qualifications and Operating Practices 5

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9. Remove the remote control from the cab or storage area. Power the remote control on. Detach the hook from the dead man.
10. 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. 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, press the clutch in, and disengage the PTO. Deactivate any crane power switches.
6. Check vehicle surroundings before moving.
7. Record any unusual occurrence during crane operation which may indicate required maintenance or repair.

# 6 NexStar III Operation

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**This section describes the general operation for cranes with the NEXSTAR III control system.**



## **WARNING**

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.



## **WARNING**

Never drive with a load suspended from the crane.



## **WARNING**

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

## **6.1 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.

## **6.2 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.

## **6.3 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 III remote control scans for any switches, buttons, and joysticks are in the OFF position. If any switches, buttons, or joysticks are on, the failure displays on the display screen and the remote control powers down.

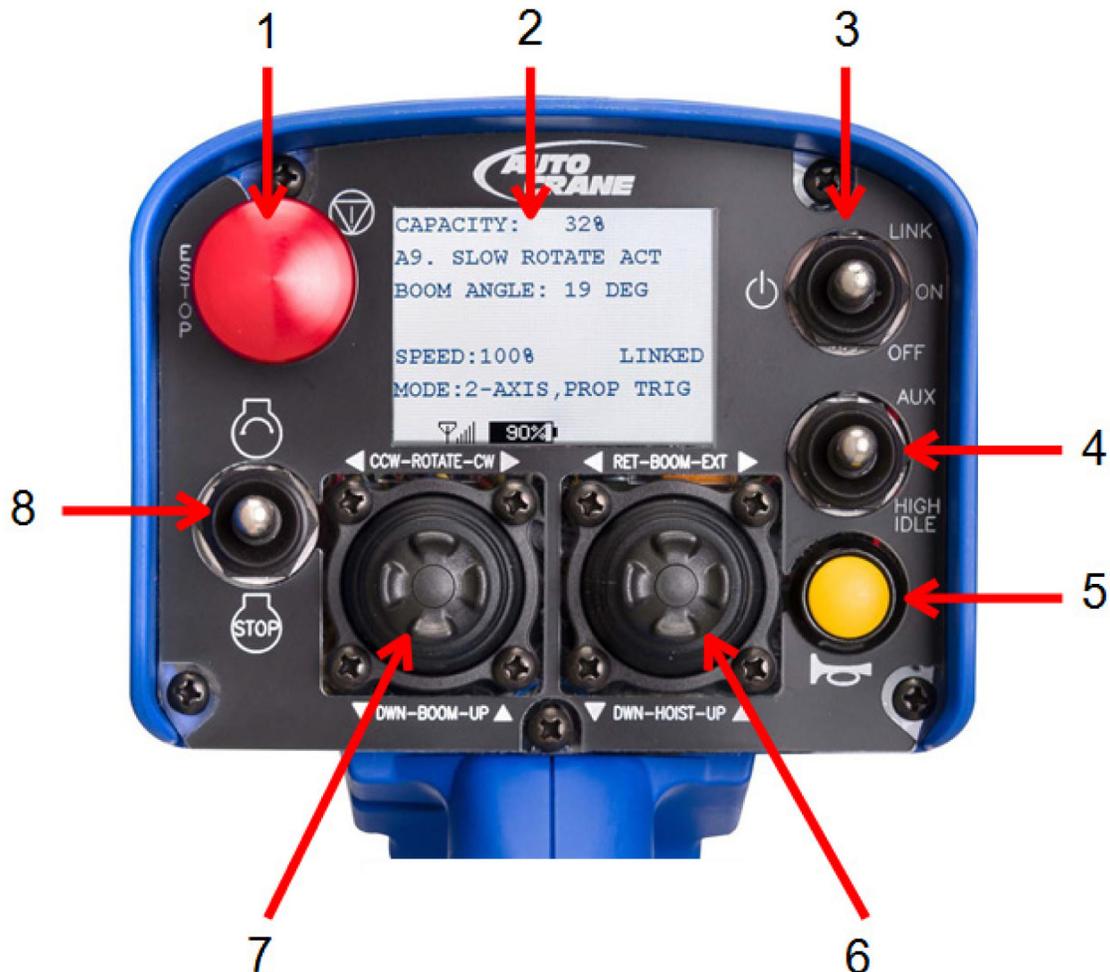
After a successful self-test, the Nexstar III remote control will enter the Normal Operating Mode.

## **6.4 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.

## 6.5 REMOTE CONTROL LAYOUT

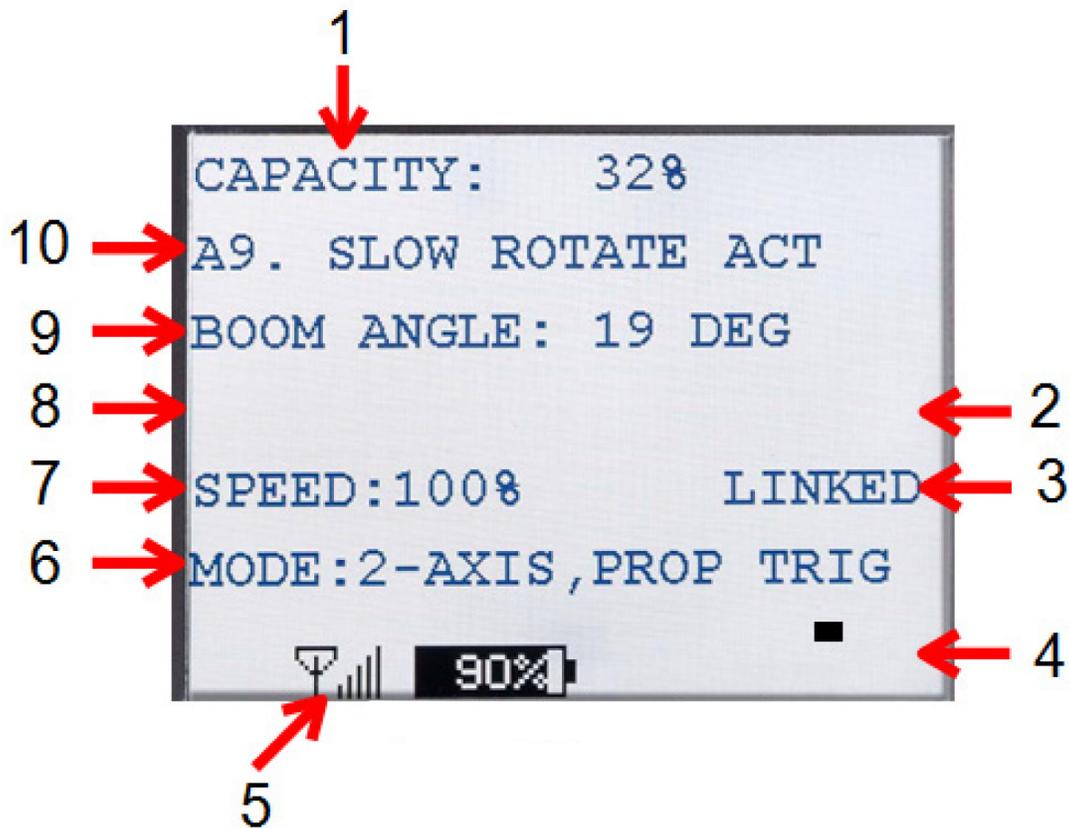


Nextstar III Remote Control

1. Emergency Stop Button – Push to activate. Pull to release. When activated, the emergency stop button stops all outputs from the receiver.
2. Display Screen – LCD screen that displays many crane operating parameters.
3. On/Off/Link Switch – Turns the remote control on and off. Press and release the switch up to link the remote control to the truck. “Link” the remote control to the truck every time it is turned on. Press and hold the switch up to access the speed and mode selection screen.
4. High Idle/Aux Switch – Press the toggle down to activate the high idle on the vehicle. Aux activates an optional feature.
5. Horn Button – Activates the horn on the crane.
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 and 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 boom clockwise. Press the joystick left to rotate the boom counterclockwise.
8. Start/Stop Switch – Press the switch up to start the engine of the vehicle. Press the switch down to turn off the engine of the vehicle.

# 6 NexStar III Operation

## 6.6 DISPLAY SCREEN LAYOUT



Nextstar III Display Screen Layout

1. Capacity – The current load on the boom as a percentage of total capacity. The unloaded value of the boom may be higher than 0% due to the boom weight beyond the retracted position.
2. Aux – AUX will display on the screen when active.
3. Communication Status – LINKED will display when the remote control is communicating with the crane.
4. Watchdog Timer – The black dot should always be moving in a diagonal. If the timer stops, contact your Auto Crane representative.
5. Signal Strength and Battery Life – Displays the signal strength coming from the crane. The approximate range is 300 ft. The battery displays the percent remote control battery life remaining.
6. Mode – Displays the current mode selected.
7. Max Speed Setting – Displays the current max speed setting.
8. High Idle – HIGH IDLE will display when activated.
9. Boom Angle – Displays the current boom angle in degrees.
10. Crane Status – Displays the current status of the crane. Alarms will be displayed here.

## 6.7 SPEED SELECTION

1. Press and hold the Link Switch in the up position.
2. While holding the Link Switch in the up position:
  - A. Move the Left Joystick up to increase the max speed.
  - B. Move the Left Joystick down to decrease the max speed.
3. Release the Link Switch when the desired speed is selected.

A slower speed setting decreases the maximum speed of the controls and allows more precise control of the load. The speed percentage on the screen shows the current speed setting of the remote control.

## 6.8 MODE SELECTION

1. Press and hold the link switch in the up position. While holding the link switch in the up position, press the right joystick up or down to place the remote control in the desired setting.
3. Release the Link Switch when the desired mode is selected.

## 6.9 MODE DESCRIPTION

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 – 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 – 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 – 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 – 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.

# 6 NexStar III Operation

## 6.10 COUNTERBALANCE VALVE ADJUSTMENT/OVERRIDE PROCEDURE

1. With PTO disengaged and boom properly supported, remove the plug on the counterbalance valve. Install a pressure gauge (0-3000 PSI) into the port.
2. Engage PTO and insure pump flow is 10 to 12 GPM. With no load on boom, boom up to an angle of 70 degrees. Boom down and note pressure. If pressure reading is not approximately 1300 PSI, the counterbalance valve requires adjustment.
  - A. To increase the CB valve setting, loosen nut and turn Allen head screw counter-clockwise.
  - B. To reduce the CB valve setting, loosen nut and turn Allen head screw clockwise.
3. Tighten nut on adjustment screw and repeat procedure if needed to obtain the proper pressure setting.
4. Disengage PTO, remove the pressure gauge and install plug. Crane is now ready for operation.

### NOTICE

In an emergency situation when it becomes necessary to lower the boom without flow present, the CB valve adjustment can be turned in until the boom begins to descend. Make sure the boom will lower onto a proper support. Loosen the lock nut and carefully turn adjustment screw clockwise! Count the number of turns. Turn slowly until the boom just begins to lower, and remove hand/arm/fingers from cranes while boom is lowering.

Turning adjustment screw too far will cause valve to come apart on the inside. This condition is not repairable.

After boom is lowered, turn adjustment screw counter-clockwise the approximate number of turns made during lowering procedure. After the problem is corrected, readjust the counterbalance valve using the procedure in this manual.

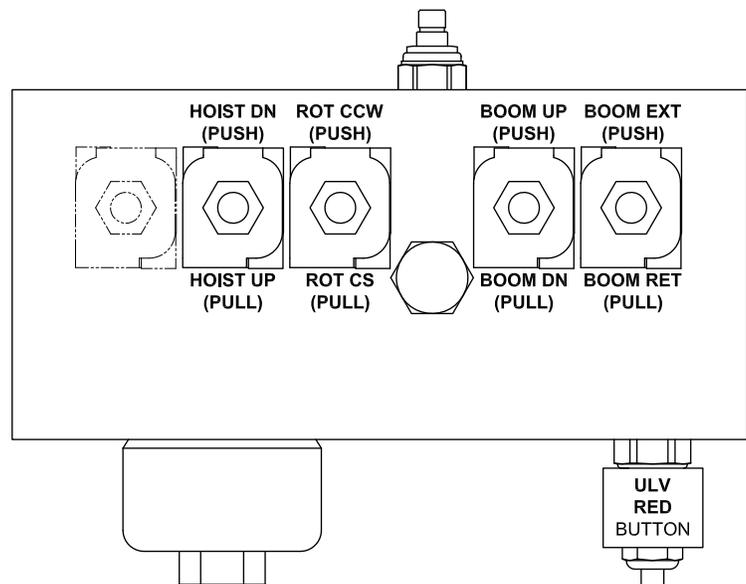


### WARNING

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

## Manual Override Procedures

1. Push in the unloader valve (ULV) red button. This will send hydraulic fluid to the valve block.
2. Select the function desired and close the gap between collar and the end on the override button.
3. 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.
4. When manual operation is complete, release the unloader valve button to its original position.



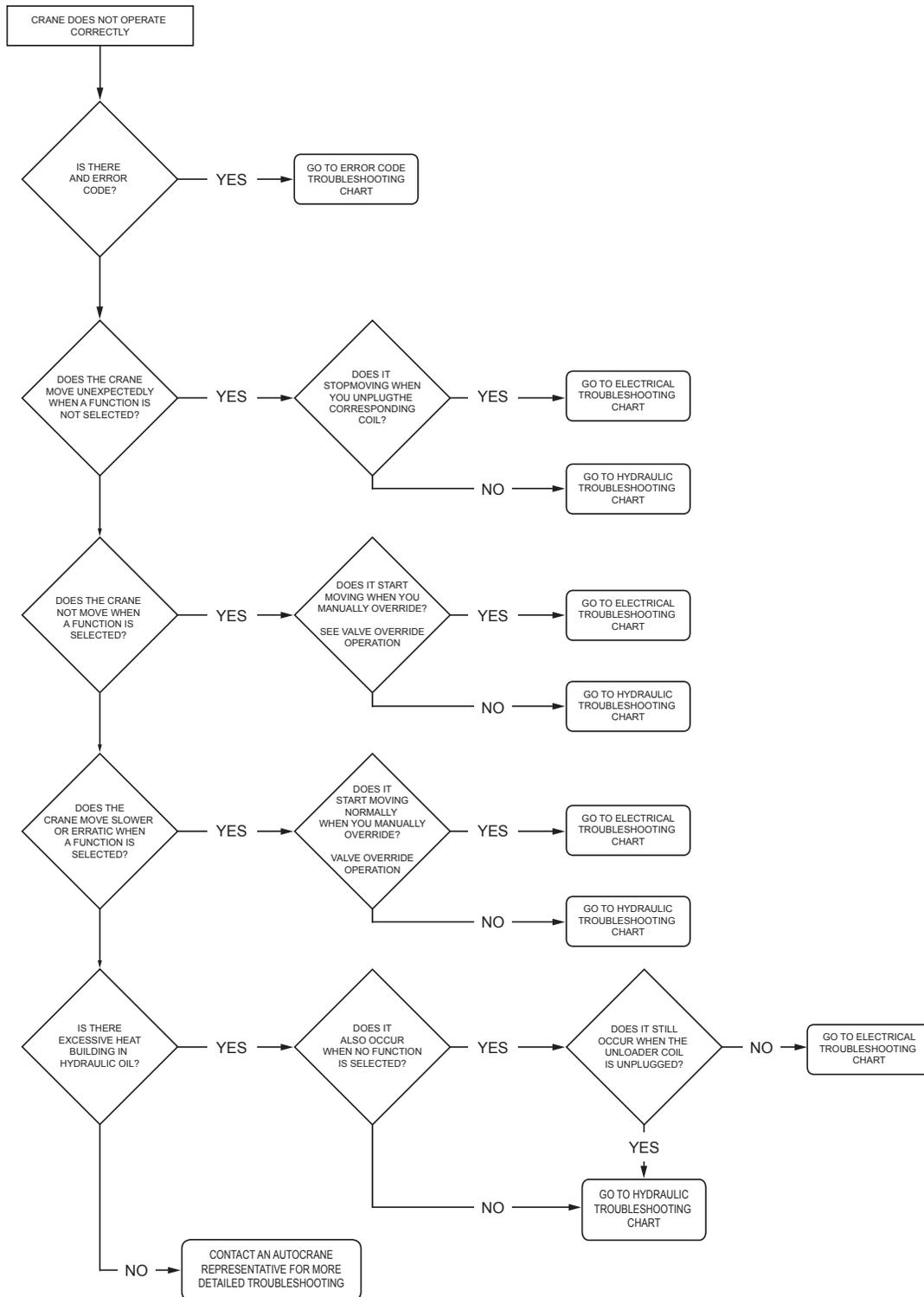
## 6.11 Transmitter Layout

LABEL	DIRECTION	FUNCTION	GRAPHIC	DESCRIPTION
SW1	Up	Engine Start		Sends a 12VDC signal from crane to start vehicle
	Down	Engine Stop		Sends a 12VDC signal from crane to stop vehicle
SW2	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 counter-clockwise rotation function
	Right	Rotate CW		Moving the joystick to the right activates clockwise rotation function
SW3	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 the boom retract function
	Right	Boom Extend		Moving the joystick to the right activates the boom extend function
SW4	Up	Auxiliary	AUX	Sends a Latching signal that activates an auxiliary output to operate an external component (i.e. compressor, worklights)
	Down	High Idle	HIGH IDLE	Sends a latching signal that activates High Idle on Vehicle
SW5	Up	Link, Speed & Mode Adjustment	Link	Links transmitter to crane (Press & Release) Access to the Speed & Mode Selection Screen (Press & Hold)
	Center	On		Transmitter is on*
	Down	Off	Off	Turns off Transmitter
PB1	In	E-stop Activated		Activates Estop
	Out	E-stop Deactivated		Deactivates Estop
PB2	In	Horn		Momentarily activates an audible signal device

\* Although switch maybe in the "On" position, it does not necessarily mean there is communication between the transmitter and the crane. The transmitter goes to sleep after a certain amount of time. If the unit goes to sleep, the transmitter will need to be turned back on. Reference the steps under "Turning On Transmitter" if this occurs.

# 7 NexStar III Troubleshooting

## 7.1 TROUBLESHOOTING FLOW CHART



# NexStar III Troubleshooting 7

## 7.2 NEXSTAR III REMOTE CONTROL TROUBLESHOOTING TABLE

PROBLEM	POSSIBLE REASON	ACTION
REMOTE CONTROL WILL NOT TURN ON	REMOTE CONTROL EMERGENCY STOP SWITCH IS DOWN OR PRESSED.	ENSURE THE E-STOP SWITCH IS PULLED UP.
	BATTERIES ARE DEAD OR INSTALLED BACKWARDS; BATTERY HOLDER IS DAMAGED.	ENSURE ALL SWITCHES, BUTTONS, AND JOYSTICKS ARE IN THE OFF POSITION.
	REMOTE CONTROL MOMENTARILY POWERS-UP AND DISPLAYS AN ERROR CODE PRIOR TO TURNING OFF.	ENSURE ALL SWITCHES, BUTTONS, AND JOYSTICKS ARE IN THE OFF POSITION.
REMOTE CONTROL WILL NOT RESPOND WITH THE RECEIVER	INCORRECT SYSTEM RF CHANNEL.	ENSURE THE REMOTE CONTROL AND THE RECEIVER ARE SET TO THE SAME RF CHANNEL.
	INCORRECT SYSTEM ACCESS CODE.	ENSURE THE TETHER CABLE IS INSTALLED AND SECURED CORRECTLY. INSPECT THE TETHER CABLE AND CONNECTORS FOR DAMAGE.
	SYSTEM OUT OF RANGE.	ENSURE THE STARTUP PROCEDURE IS INITIATED WITHIN 300 FT. FROM THE RECEIVER. ENSURE THE SIGNAL STRENGTH INDICATOR LEVEL IS GREATER THAN 0%.
REMOTE CONTROL WILL NOT TURN ON IN TETHER MODE	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 EMERGENCY STOP SWITCH IS PRESSED DOWN.	ENSURE THE E-STOP SWITCH IS PULLED UP.
REMOTE CONTROL WILL NOT RESPOND WITH RECEIVER IN TETHER MODE	SYSTEM NOT IN TETHER MODE.	ENSURE THE STARTUP PROCEDURE IS INITIATED WITH THE TETHER CABLE ATTACHED.
	THE TETHER CABLE OR CONNECTORS ARE DAMAGED.	INSPECT THE TETHER CABLE AND CONNECTORS FOR DAMAGE.
REMOTE CONTROL WILL NOT RESPOND WITH THE RECEIVER IN WIRELESS MODE	SYSTEM NOT IN WIRELESS MODE.	ENSURE THE STARTUP PROCEDURE IS INITIATED WITHIN 300 FT. FROM THE RECEIVER. ENSURE THE SIGNAL STRENGTH INDICATOR LEVEL IS GREATER 0%.

# 7 NexStar III Troubleshooting

## 7.3 ERROR CODE TABLE

ERROR CODE	CAUSE	DIAGNOSIS	SOLUTION
S0. E-STOP ACTIVE	E-STOP ACTIVATED	ALL OUTPUTS WILL BE DISABLED	DEACTIVATE E-STOP PER OPERATION PROCEDURES.
S1. CAN RX TO	RECEPTION OF A CAN MESSAGE TIMED OUT	ALL OUTPUTS WILL BE DISABLED	DETERMINE WHY MESSAGE(S) IS (ARE) NOT BEING RECEIVED. WHEN PROBLEM IS CORRECTED THE ALARM WILL CLEAR.
S2. TEMP OUT OF RANGE	OUTSIDE OPERATING TEMPERATURE -40C TO 85C	ALL OUTPUTS WILL BE DISABLED	GET TEMPERATURE INTO ACCEPTABLE RANGE. ALARM WILL CLEAR AFTER 1 MINUTE.
S16-S31 OUT X OVERCURRENT ERR	WHEN THE OUTPUT WAS ACTIVATED, A CURRENT OF OVER 3.5 A WAS BEING DRAWN	THAT OUTPUT IS DISABLED	CYCLE POWER TO RECEIVER. IF PROBLEM CONTINUES, FIND WHAT CAUSED OVER CURRENT DRAW AND CYCLE POWER.
S32-S47 OUT X+VB SHORT	WHEN THE OUTPUT WAS SUPPOSED TO BE A GROUND IT HAD A POSITIVE VOLTAGE	THAT OUTPUT IS DISABLED	DETERMINE THE CAUSE OF THE SHORT, FIX THE CAUSE, AND CYCLE POWER TO RECEIVER.
S32-S47 OUT X-VB SHORT	WHEN THE OUTPUT WAS SUPPOSED TO BE A POSITIVE VOLTAGE IT HAD A GROUND	THAT OUTPUT IS DISABLED	DETERMINE THE CAUSE OF THE SHORT, FIX THE CAUSE, AND CYCLE POWER TO THE RECEIVER.
A1. BOOM PSI LOW	LIFT CYLINDER PRESSURE BELOW 80 PSI	DISABLES ALL FUNCTIONS EXCEPT BOOM UP AND HOIST DOWN	HOIST DOWN LOAD IF APPLICABLE, AND RAISE BOOM OFF ANY SUPPORTS. ALARM WILL CLEAR ONCE PRESSURE IN CYLINDER IS RESTORED.
A2. CW LIMIT	CRANE HAS REACHED THE LIMIT OF ROTATION IN THE CW DIRECTION	DISABLES CLOCKWISE ROTATION	ROTATE CCW TO CLEAR ERROR. ONCE SWITCH IS DEACTIVATED THE ALARM WILL CLEAR.
A3. CCW LIMIT	CRANE HAS REACHED THE LIMIT OF ROTATION IN THE CCW DIRECTION	DISABLES COUNTER-CLOCKWISE ROTATION	ROTATE CW TO CLEAR ERROR. ONCE SWITCH IS DEACTIVATED THE ALARM WILL CLEAR.
A4. TRK TILT WARN	TRUCK ANGLE EXCEEDS 5.7 DEGREES OR 10% SLOPE	ALL FUNCTIONS WILL ONLY OPERATE AT 50% OF SPEED	MOVE VEHICLE TO LEVEL GROUND.
A5. TRK TILT ALARM	TRACK ANGLE EXCEEDS 8.5 DEGREES OR 15% SLOPE	ALL FUNCTIONS ARE DISABLED	MOVE VEHICLE TO LEVEL GROUND.
A6. ANTI 2-BLOCK	ANTI 2-BLOCK IS ACTIVATED. TRAVELING BLOCK HAS COME INTO CONTACT WITH BOOM	DISABLES BOOM DOWN, EXTEND, AND HOIST UP	MOVE LOAD AWAY FROM BOOM BY EITHER RETRACTING, HOISTING DOWN, OR BOOMING UP. IF THERE IS NO LOAD NEAR TIP OF BOOM CHECK FUNCTION OF THE BAIL WELDMENT. IT MUST COME INTO CONTACT WITH SWITCH PLUNGER UNDER NORMAL CONDITIONS.

## 7.3 ERROR CODE TABLE

ERROR CODE	CAUSE	EFFECT	SOLUTION
A7. 90% LOAD WARN	REACHED 90% OF RATED CAPACITY	REDUCES SPEED OF ALL FUNCTIONS BY 50%	REDUCE LOAD TO CLEAR ALARM.
A8. 100% LOAD ALARM	REACHED 100% OF RATED CAPACITY	DISABLES BOOM DOWN, EXTEND, AND HOIST UP	REDUCE LOAD BY EITHER RETRACTING, BOOMING UP, OR HOISTING DOWN.
A9. 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. WILL RESET WHEN LOAD DECREASES AND FUNCTION IS DEACTIVATED.
A10. BOOM SENSOR ERR	BOOM ANGLE SENSOR FAILED	ALL FUNCTIONS ARE REDUCED BY 50%	CHECK CONNECTIONS TO BOOM ANGLE SENSOR.
A11. BOOM ANGLE RANGE	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.
A12. BOOM PT ERR	BOOM PRESSURE TRANSDUCER ERROR	ALL FUNCTIONS ARE DISABLED EXCEPT BOOM DOWN & HOIST DOWN	CHECK CONNECTIONS TO PRESSURE TRANSDUCER LOCATED ON LIFT CYLINDER.
A13. DIRTY FILTER	FILTER IS DIRTY IF TEMPERATURE OF OIL IS AT LEAST 100 DEGREES	OPERATES NORMALLY	REPLACE FILTER
A14. ADDRESS TAG ERROR	CONTROLLER NOT RECOGNIZING ADDRESS TAG	ALL OUTPUTS ARE DISABLED	CHECK CONNECTION AT ADDRESS TAG. CHECK FOR WATER IN CONNECTION. DRY OUT IF REQUIRED.

# 7 NexStar III Troubleshooting

## 7.4 ELECTRICAL TROUBLESHOOTING TABLE

ERROR CODE	CAUSE	EFFECT	SOLUTION
CRANE MOVES UNEXPECTEDLY	JAMMED TRANSMITTER BUTTON	ACTIVATE E-STOP TO SEE IF MOVEMENT STOPS.	VERIFY THAT NOTHING WAS ACTIVATING THE FUNCTION AT THE TIME OF MOVEMENT. IF IT WAS NOT ACTIVATED THEN REPLACE TRANSMITTER.
	SHORT IN HARNESS	UNEXPECTED MOVEMENT WOULD ONLY OCCUR WHEN MULTI-FUNCTIONING. UNPLUG COIL TO SEE IF MOVEMENT STOPS. CHECK AMPERAGE TO COIL USING MULTI-METER IN LINE WITH COIL. IT SHOULD BE NO MORE THAN 100MA.	TRACE WIRE BACK TO RECEIVER. VERIFY NO DAMAGE TO THE WIRE. CHECK CONNECTORS, THEY SHOULD BE CLEAR OF DEBRIS AND WATER.
	RECEIVER LOCKED UP	BOTTOM RIGHT CORNER IS A CIRCLE WITH AN ARROW. THIS SHOULD BE ROTATING AT ALL TIMES.	IF THE ARROW STOPS ROTATING, SHUT POWER OFF TO THE CRANE. LET SET OF A COUPLE OF MINUTES AND TURN POWER BACK ON. IF THIS PROBLEM PERSISTS CONTACT TECHNICAL SUPPORT.
NO FUNCTION OPERATES ON THE CRANE.	TRANSMITTER TURNED OFF	NSII- THE STATUS LIGHT ON THE TRANSMITTER SHOULD BE FLASHING GREEN WHEN NO BUTTON IS DEPRESSED. NSIII-LCD SCREEN IS ON.	TURN ON TRANSMITTER. REFERENCE OPERATION SECTION OF MANUAL
	E-STOP ACTIVE	CHECK LCD SCREEN. YOU WOULD HAVE AN ERROR STATING E-STOP IS ACTIVE.	TURN ON TRANSMITTER. REFERENCE OPERATION SECTION OF MANUAL
	RECEIVER TURNED OFF	CHECK THE LCD SCREEN. IF IT IS BLANK, THE RECEIVER IS TURNED OFF.	CHECK MAIN POWER SWITCH LOCATED IN CRANE BOX DIRECTLY UNDER THE CRANE.
	LOW BATTERY	WHILE THE TRANSMITTER IS TURNED ON, CHECK THE LCD SCREEN ON RECEIVER. BATTERY INDICATOR SHOULD BE AT LEAST 10%.	REPLACE TRANSMITTER BATTERIES. NSII - REQUIRES (2) AA BATTERIES NSIII - REQUIRES (4) AA BATTERIES
	RECEIVER LOCKED UP	BOTTOM RIGHT CORNER IS A CIRCLE WITH AN ARROW. THIS SHOULD BE ROTATING AT ALL TIMES.	IF THE ARROW STOPS ROTATING, SHUT POWER OFF TO THE CRANE. LET SET OF A COUPLE OF MINUTES AND TURN POWER BACK ON. IF THIS PROBLEM PERSISTS CONTACT TECHNICAL SUPPORT.
	TRUCK TILT ALARM ACTIVE	CHECK SCREEN FOR ERROR CODE. IT WOULD READ TRK TILT ALARM.	THIS ERROR OCCURS WHEN THE TRUCK ANGLE EXCEEDS A 15% SLOPE (8.5 DEGREES). RELOCATE THE TRUCK TO A FLATTER SURFACE.
	POWER UNIT NOT ACTIVATING	IF RECEIVER HAS POWER BUT THE POWER UNIT DOESN'T TURN ON WHEN A FUNCTION IS SELECTED.	CHECK POWER UNIT RELAY CHECK GROUNDING WIRE FROM RELAY TO PUMP CHECK MAIN GROUNDING WIRE FROM PUMP TO GROUNDING BOLT ON PEDESTAL.

## 7.4 ELECTRICAL TROUBLESHOOTING TABLE

ERROR CODE	CAUSE	EFFECT	SOLUTION
THE FOLLOWING FUNCTIONS ARE INOPERABLE BOOM DOWN, EXTEND, HOIST UP	ANTI-2 BLOCK	CHECK SCREEN FOR ERROR CODE. IT WOULD READ ANTI-2 BLOCK ERROR.	VERIFY THAT THE TRAVELING BLOCK IS NOT IN CONTACT WITH BAIL. IF SO, HOIST DOWN AND CHECK FUNCTIONS AGAIN. INSPECT END OF BOOM TO VERIFY BAIL IS IN CONTACT WITH ANTI-2 BLOCK SWITCH. CHECK BAIL SPRING. CHECK CORD REEL & WIRE ON SIDE OF CRANE FOR DAMAGE.
	CRANE OVERLOAD	CHECK SCREEN FOR ERROR CODE. IT WOULD READ 100% OVERLOAD.	VERIFY LOAD ON CRANE DOES NOT EXCEED MOMENT RATING. REFERENCE LOAD CHART. TAP HOIST DOWN OR RETRACT FUNCTION TO RESET OVERLOAD. CHECK OPERATION AGAIN.
ALL FUNCTIONS ARE INOPERABLE EXCEPT BOOM DOWN AND HOIST DOWN	PRESSURE TRANSDUCER IS UNPLUGGED	CHECK LCD SCREEN. IT WOULD READ "BOOM PT ERROR"	VERIFY THAT PRESSURE TRANSDUCER LOCATED ON THE LIFT CYLINDER VALVE BLOCK IS PLUGGED INTO THE HARNESS.
CRANE ROTATES SLOWLY	SLOW ROTATE ACTIVATED	CHECK LCD SCREEN. IT WOULD READ "SLOW ROTATE ACT"	THIS IS A SAFETY FEATURE TO PREVENT GETTING THE LOAD INTO AN UNSAFE CONDITION (EXCESSIVE SWINGING). SLOW ROTATE WILL REMAIN ACTIVE UNTIL THE LOAD IS REMOVED AND THE ROTATION FUNCTION IS DESELECTED.
	CLOSE TO MAX CRANE LOAD	WHEN THE TRUCK IS TILTED AND UNDER HIGH LOAD A DECREASE IN SPEED IS POSSIBLE.	BRING LOAD IN CLOSER TO DECREASE THE LOAD

# 7 NexStar III Troubleshooting

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## 7.4 ELECTRICAL TROUBLESHOOTING TABLE

<b>ERROR CODE</b>	<b>CAUSE</b>	<b>EFFECT</b>	<b>SOLUTION</b>
ALL FUNCTIONS OPERATE SLOWLY	90% OVERLOAD ACTIVATED	CRANE IS AT OR OVER 90% OF IT'S RATED CAPACITY	THIS IS A SAFETY FEATURE TO PREVENT GETTING INTO AN UNSAFE CONDITION (SUDDEN MOVEMENT OF HEAVY LOAD). 90% OVERLOAD WILL REMAIN ACTIVATED UNTIL LOAD IS DECREASED.
	TRUCK TILT WARNING	CRANE IS BETWEEN A 10% AND 15% SLOPE. CHECK LCD SCREEN FOR ERROR CODE, IT WOULD READ "TRK TILT WARN"	MOVE VEHICLE OR RAISE OUTRIGGER TO A MORE STABLE, LEVEL POSITION.
	LOW VOLTAGE	VOLTAGE WILL BE 10 VOLTS OR LOWER	VERIFY TRUCK IS RUNNING WHILE OPERATING CRANE. CHECK VEHICLE BATTERY FLUID LEVEL. CHECK FOR ADEQUATE WIRE SIZING FOR LENGTH AND AMPERAGE REQUIREMENTS

## 7.5 HYDRAULIC TROUBLESHOOTING TABLE

ERROR CODE	CAUSE	EFFECT	SOLUTION
CRANE MOVES UNEXPECTEDLY	JAMMED CARTRIDGE	TRY TO MANUALLY OVERRIDE VALVE IF UNABLE TO MOVE STEM. CARTRIDGE IS JAMMED.	REPLACE CARTRIDGE
	COUNTERBALANCE SET TOO LOW (BOOM-UP & BOOM-DN)	ADJUST THE COUNTER-BALANCE OUT TO SEE IF MOVEMENT STOPS.	CONTACT AUTO CRANE FOR PROPER SETTING OF COUNTERBALANCE. YOU MAY NEED TO REPLACE COUNTERBALANCE.
	CONTAMINATE IN CARTRIDGE	VALVE STICKS IN CERTAIN POSITIONS.	REFERENCE FOR 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.
ALL FUNCTIONS OPERATE SLOWLY	CONTAMINATION IN CARTRIDGES	VISUALLY INSPECT THE CARTRIDGE FOR CLOGGED PORTS.	REFERENCE FOR CLEANING PROCEDURE.
EXCESSIVE HEAT DURING OPERATION	OPERATION TIME	CRANE OPERATION IS GENERALLY DESIGNED FOR INTERMITTENT DUTY (7 MIN. LOADED / 30 MIN. COOL DOWN).	REDUCE USE OF CRANE TO ALLOW OIL TO COOL.

# 8 Maintenance

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## 8.1 INSPECTION REQUIREMENTS

### NOTICE

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



### WARNING

All inspections shall be performed by the designated personnel only.

## 8.2 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.

## 8.3 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.

### 8.4 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 manufacturers.

# 8 Maintenance

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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.

## 8.5 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.

## 8.6 INSPECTION RECORDS

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

## 8.7 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.

## 8.8 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.

## 8.9 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.

## 8.10 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.

# 8 Maintenance

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- 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. Repairs by welding are recommended.
4. If bleeding the hydraulic system is required, run each crane function until smooth operation of that particular function is noticeable.

## 8.11 LUBRICATION

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

## 8.12 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.

Conditions such as the following shall be reason for questioning continued 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.

## 8.13 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.

## **8.14 PAINT FINISH MAINTENANCE**

The paint finish on Auto Crane products can become damaged during normal use when chipped, scratch, 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 top coat paint.
7. Apply the top coat paint to a minimum 2 mil dry film thickness within 24 hours of applying the primer.
8. The final primer and top coat should have approximately a 4 mil dry film thickness.

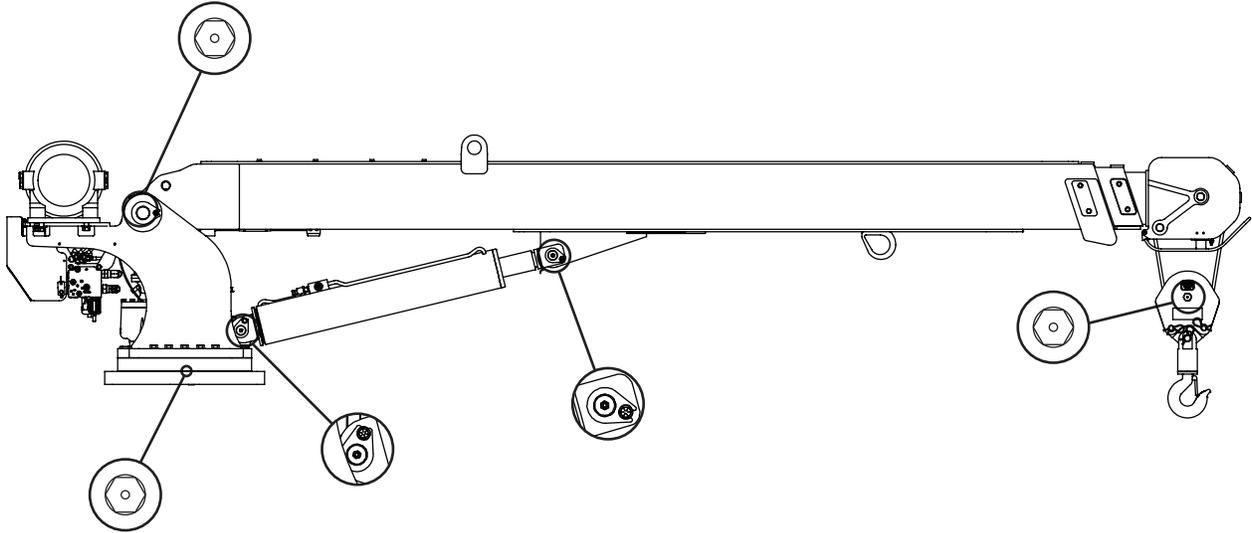
# 8 Maintenance

## 8.15 LUBRICATION AND MAINTENANCE SCHEDULE

Service Performed	Instructions	Daily	Weekly	3 Months	6 Months	Yearly
Load Hook	Inspect hook and latch for deformation, cracks, and corrosion.	<b>X</b>				
Cable Drum	Ensure cable is wound evenly on drum.	<b>X</b>				
Hoist/Boom Cable	Check for flattening, kinks, broken strands.	<b>X</b>				
Hyd. Hoses	Visual inspection.	<b>X</b>				
Hyd. Fluid	Check fluid level.	<b>X</b>				
Pin Retaining Bolts	Check torque to 23 ft-lbs (Grade 5) 35 ft-lbs (Grade 8) as required.	<b>X</b>				
Mounting Bolts	See torque specs.		<b>X</b>			
Rotating Ring Gear	Lube with MobileTac LL or Lubriplate.		<b>X</b>			
Sheave Bearings	Sealed bearing, replace if rough or loose.		<b>X</b>			
All Other Bolts	Check and tighten as required.		<b>X</b>			
Lift Cylinder Bearings	Grease with MobilePlex EP-2 or equivalent at zerk fittings			<b>X</b>		
Rotation Bearing	Grease with MobilePlex EP-2 or equivalent at zerk fittings			<b>X</b>		
Rotation Bearing Bolts	Check torque to 170 ft-lbs (hex head) 180 ft-lbs (socket head) as required			<b>X</b>		
Hydraulic Fluid	Drain, flush, and refill with Mobile DTE 13 oil					<b>X</b>
Hoist Main Gearbox	Drain, flush, and refill with EP-140					<b>X</b>
Spur Hoist Gearbox	Drain, flush, and refill with SAE 20					<b>X</b>
Boom Slide Pads	Pads greased when replaced.					
Filter, Valve Block	Replace annually or every 200 hours of operation as directed by the dirty filter sensor.					
For additional information, see OSHA 1910.180 and ASME B30.5						

## 8.16 LUBRICATION POINTS

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



# 8 Maintenance

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## 8.17 NEXSTAR III CARTRIDGE MAINTENANCE



Verify movement in ports while manually overriding cartridge



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

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

## 8.18 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. See Axial Play Allowance Check Procedure.



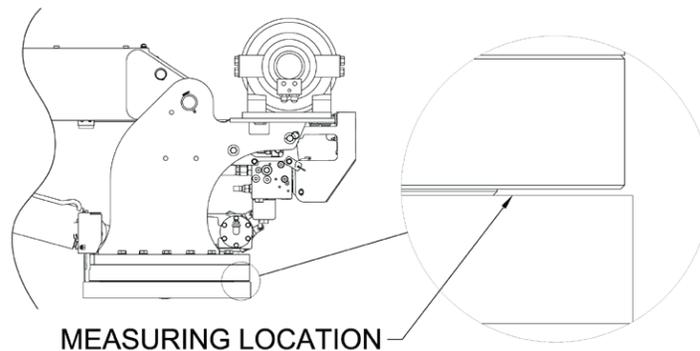
### WARNING

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

### AXIAL PLAY ALLOWANCE CHECK 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
2003/3203/4004	1.5 mm	320878010
HC-12S, HC-6, HC-7, HC-8, HC-9, 8406	1/16 in.	480023010
HC10	1.8 mm	372064010
HC-12, HC-14	2.3 mm	470001000



### WARNING

When replacing rotation bearing, use new hardware which is included in the kit above.

# 8 Maintenance

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## 8.19 HOIST MAINTENANCE

### NOTICE

Adhering to the following maintenance schedule will keep your hoist in top condition and performing as it should with a minimum of repair.

#### WEEKLY

1. Check the oil level and maintain it to the oil level plug. If oil is leaking out, determine location and repair.
2. Check the pressure relief plug in top of the gear housing. Be sure that it is in good operating condition so that hot oil gasses may escape.
3. Lubricate cable with light oil.

#### MONTHLY

1. Lubricate the various grease fittings located in the cable drum, end bearing, clutch housing or clutch operating linkage. Any good grade of moly-disulfide containing grease is acceptable.
2. Check the hoist mounting bolts. If any are missing, replace them and securely tighten any that are loose. Make sure to use only grade 5 bolts or better.
3. Check the torque setting of the oil cooled worm brake. Reference brake adjustment.
4. Inspect the cable. If the cable has become frayed with broken strands, replace immediately.

#### ANNUALLY

1. Drain the oil from the hoist annually or more often if winch is used frequently.
2. Refill the hoist to the oil level plug with all purpose EP 140 gear oil.
3. Inspect frame and surrounding structure for cracks or deformation.
4. Gear wear can be estimated by rocking the drum back and forth and if necessary drain oil and remove cover for closer inspection.

## 8.20 HOIST OPERATION

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.

Check oil level of hoist every six months. Replace oil annually or more often if hoist is used frequently. Use 3/4 pint of all purpose EP 140 oil in the worm gear housing and 1/2 pint SAE 20 for spur gearbox. If the oil is contaminated with metallic particles, inspect winch for cause of abnormal wear. Periodically check all electrical connections and mounting bolts. Tighten hardware if necessary.

## 8.21 ROTATION GEARBOX MAINTENANCE

1. Check the gearbox oil level to ensure gearbox is well lubricated and stays in good operating condition.
2. In order to extend gearbox operating life it is recommended that the gearbox oil is drained annually and refilled with 28 ounces of EP 140 gear oil.

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

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

## CAUTION

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

## NOTICE

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

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

## WARNING

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

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

## IMPORTANT!

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

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

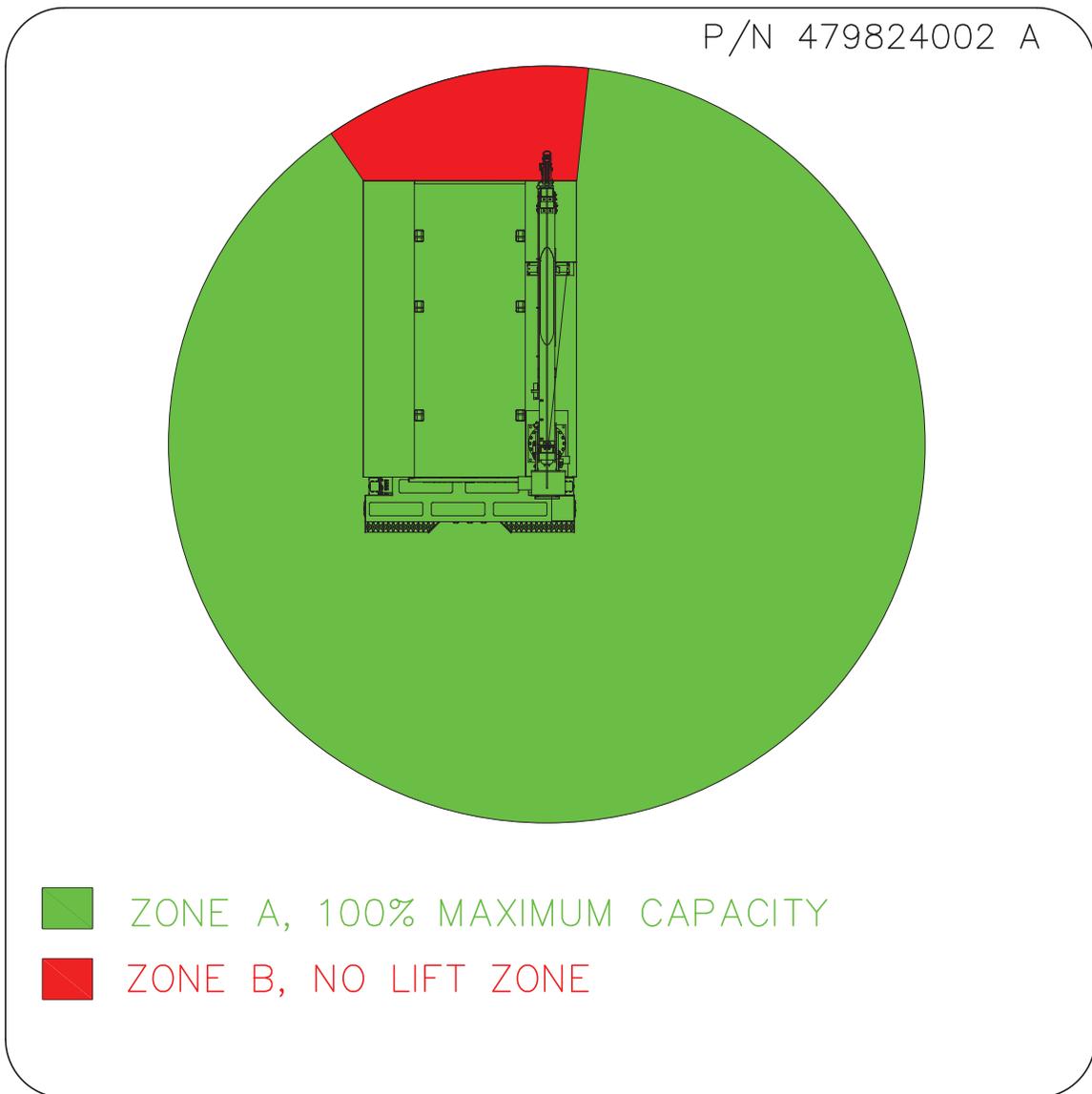
# 9 Installation

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## 9.1 STABILITY CHART INSTALLATION

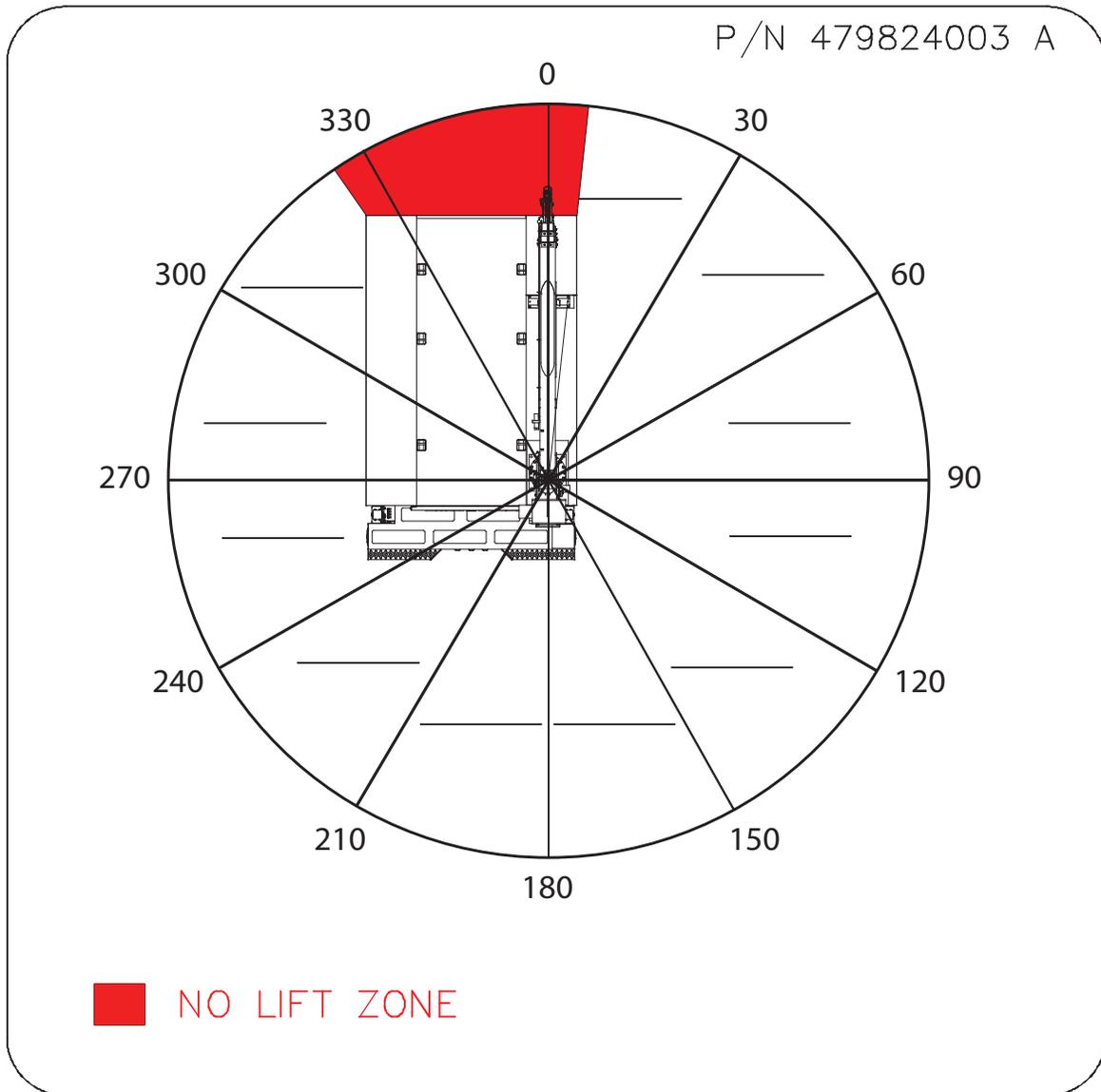
There is a stability chart included in the ship kit. This decal is typically installed on the inside of the door of the crane box. This decal is to alert the user of the available crane capacities around the vehicle.

- 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:



# Installation 9

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



# 9 Installation

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## 9.2 NEXSTAR III COUNTERBALANCE VALVE ADJUSTMENT



### WARNING

Do not try to adjust valves while the boom is moving

1. Ensure the PTO is disengaged and the boom is properly supported.
2. Remove the plug on the counterbalance valve.
3. Install a pressure gauge (0-3000 psi) into the port.
4. Use an in-line flow meter to ensure pump flow is eight to nine gallons per minute.
5. Engage the PTO.
6. With no load on the boom, raise to boom to an approximately 70° angle.
7. Lower the boom and read the pressure gauge. If the pressure reading is not approximately 1300 psi, the counterbalance valve will require adjustment.
  - A. To increase the pressure, loosen the nut on the adjustment screw, and turn the Allen head screw counterclockwise.
  - B. To decrease the pressure, loosen the nut on the adjustment screw, and turn the Allen head screw clockwise.
8. Tighten the nut on the adjustment screw and repeat steps 6 and 7 until the proper pressure reading is obtained.



### CAUTION

If the proper pressure reading cannot be obtained, please contact your Auto Crane distributor for assistance.

9. Disengage the PTO.
10. Remove the pressure gauge and install the plug. The crane is now ready for operation.

## 9.3 EMERGENCY CRANE OPERATION

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

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



### CAUTION

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

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

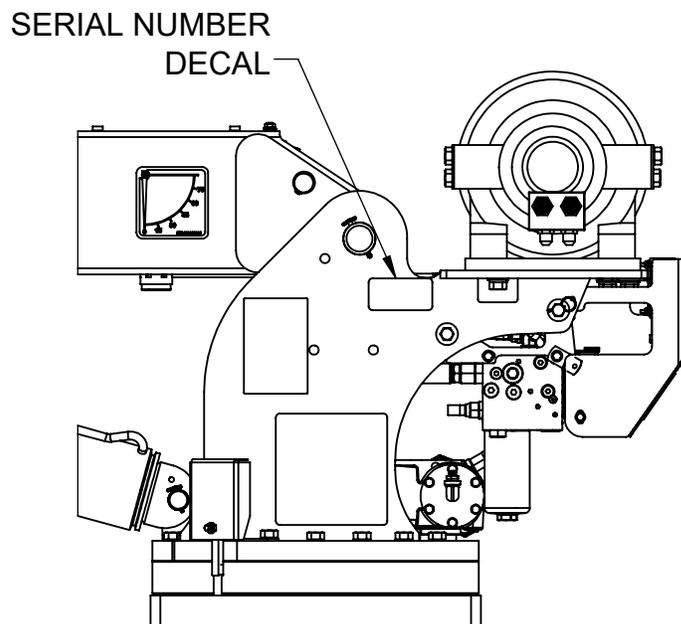
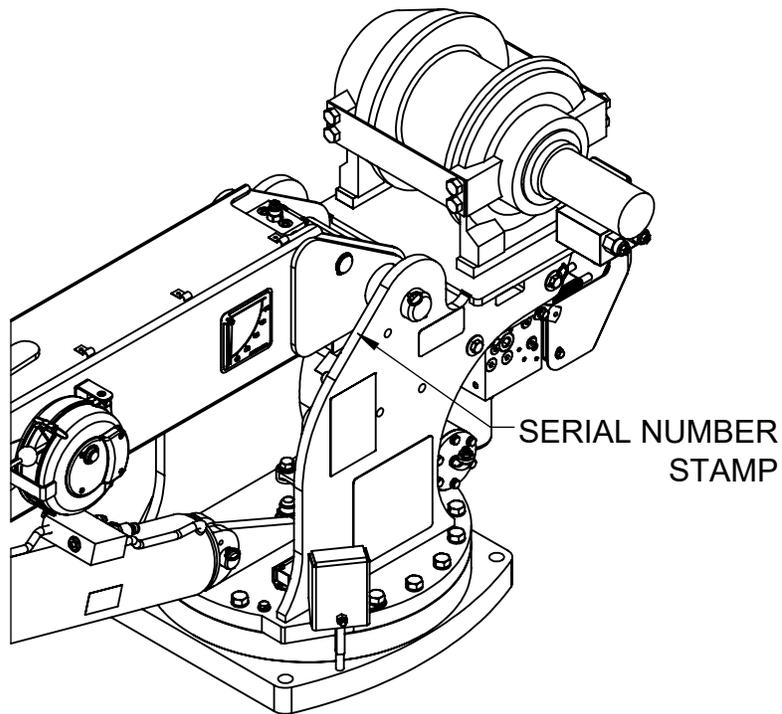
# Serial Number Identification and Location 10

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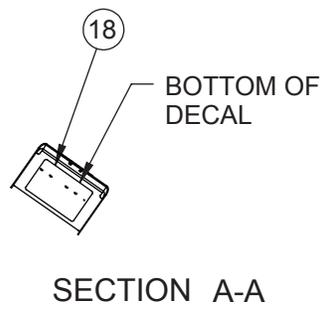
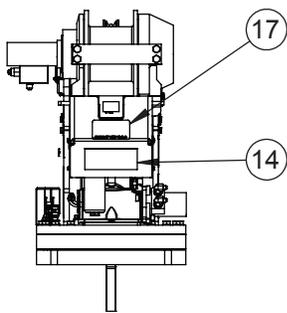
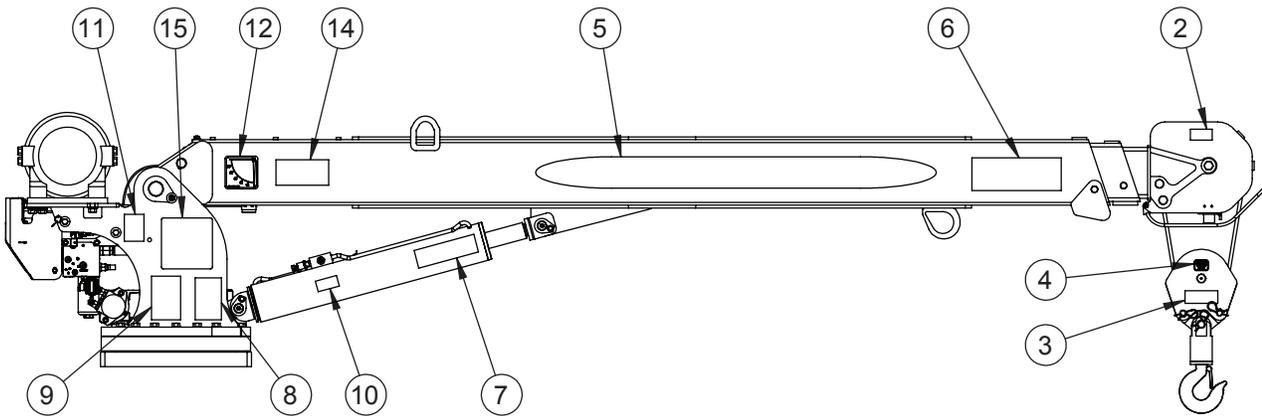
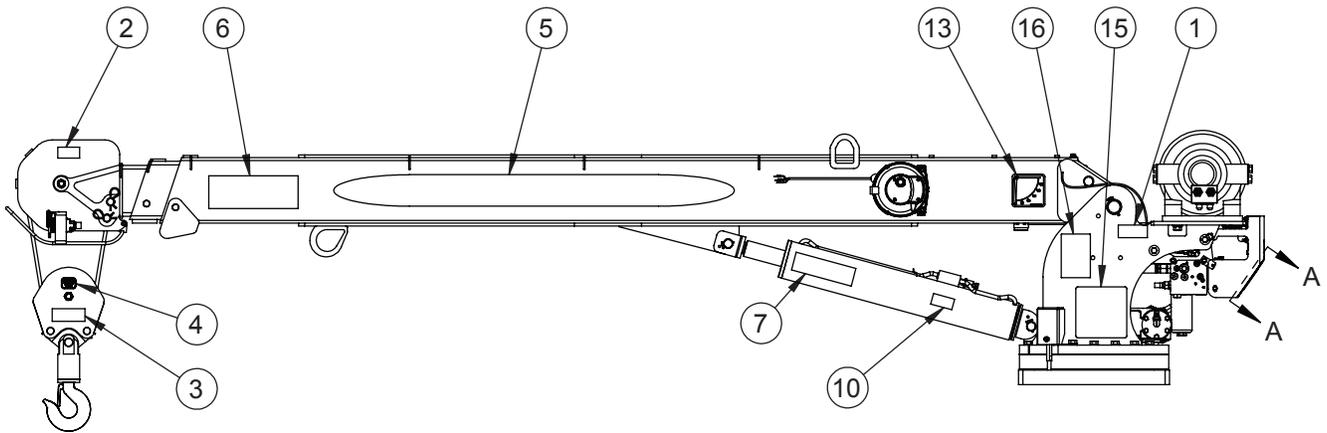
## 9.4 SERIAL NUMBER LOCATION

### LARGE CRANE

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



# 11 Decal Layout P/N: 460179021

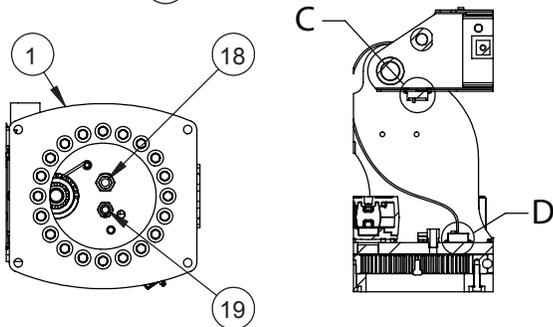
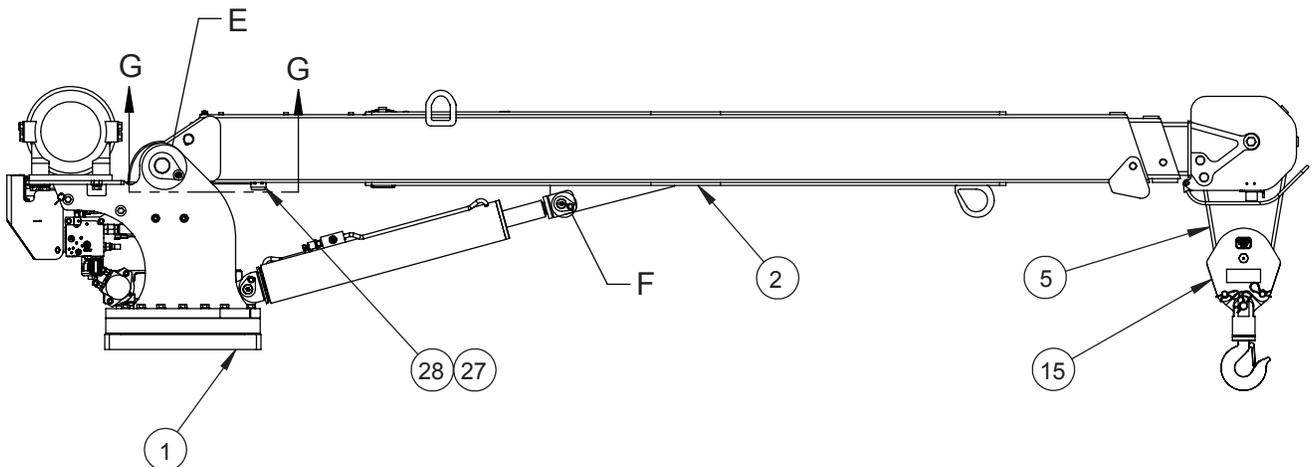
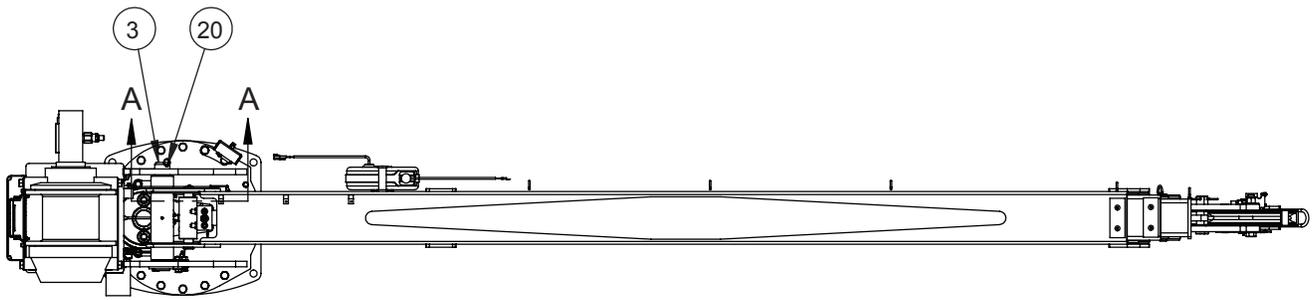


# Decal Layout P/N: 460179021 11

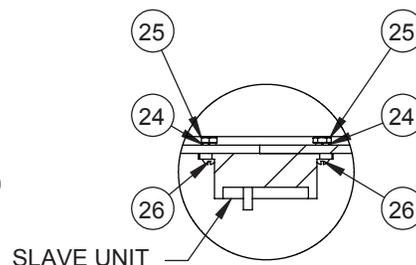
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ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	330622000	DECAL SERIAL NO
2	2	040517000	DECAL STAY CLEAR OF BOOM
3	2	040518000	DECAL STAY CLEAR OF LOAD
4	2	460128000	DECAL MAX BLOCK LOAD
5	2	460179022	DECAL, BOOM, HC-10, NEXSTAR
6	2	040529000	DECAL DANGER "ELECTROCUTION HAZARD" POWER LINE
7	2	040519000	DECAL DANGER SCISSOR POINT
8	1	040579000	DECAL OPERATION INSTRUCTIONS
9	1	040580000	DECAL TRAINED OPERATOR
10	2	040587000	DECAL WARNING LOAD SENSOR
11	1	040632000	DECAL WARNING - OVERLOAD
12	1	320318000	DECAL ANGLE INDICATOR CS
13	1	320318001	DECAL ANGLE INDICATOR SS
14	2	360034000	DECAL AUTO CRANE LOGO
15	2	460179027	DECAL, LOAD CHART, HC-10
16	1	460169000	DECAL WARNING, REMOTE CONTROL
17	1	040824000	DECAL, AMERICAN FLAG, MADE IN THE U.S.A.
18	1	366823302	DECAL, MAN OR PROCEDURES, GS HYD, LRG H-MODS, PUSH BUTTON

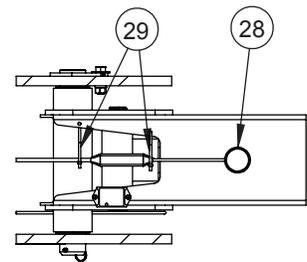
# 12 General Assembly P/N: 479000001



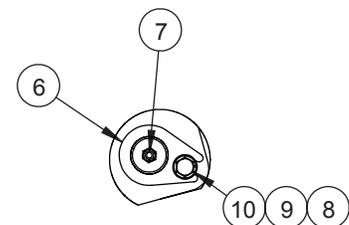
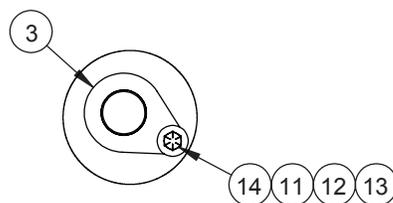
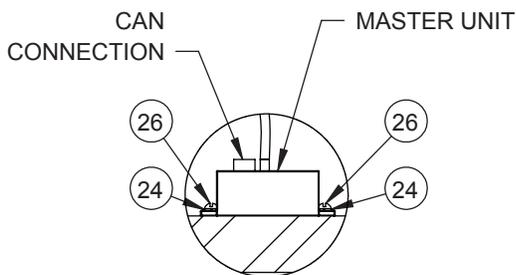
SECTION A-A



DETAIL C



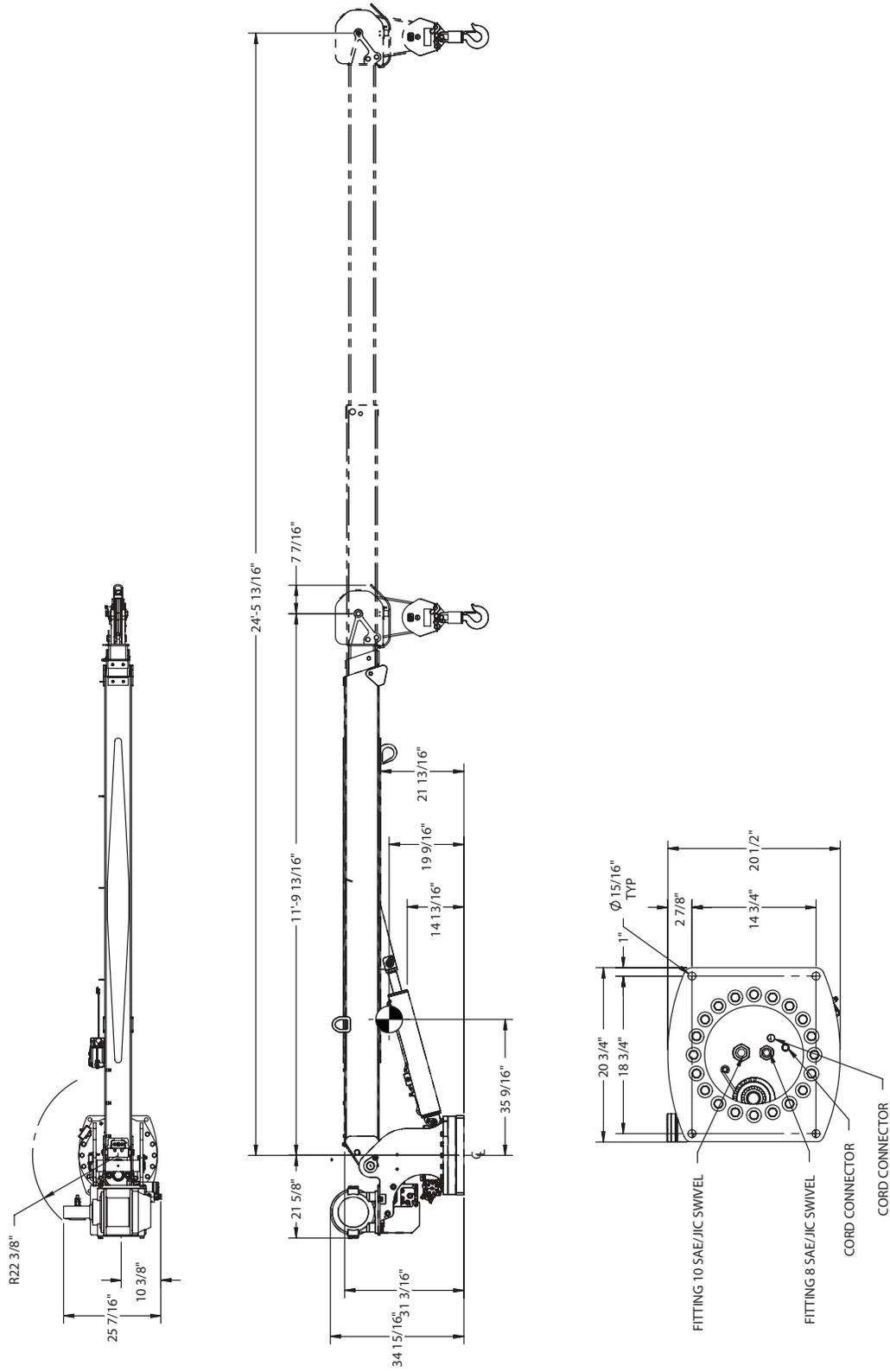
SECTION G-G



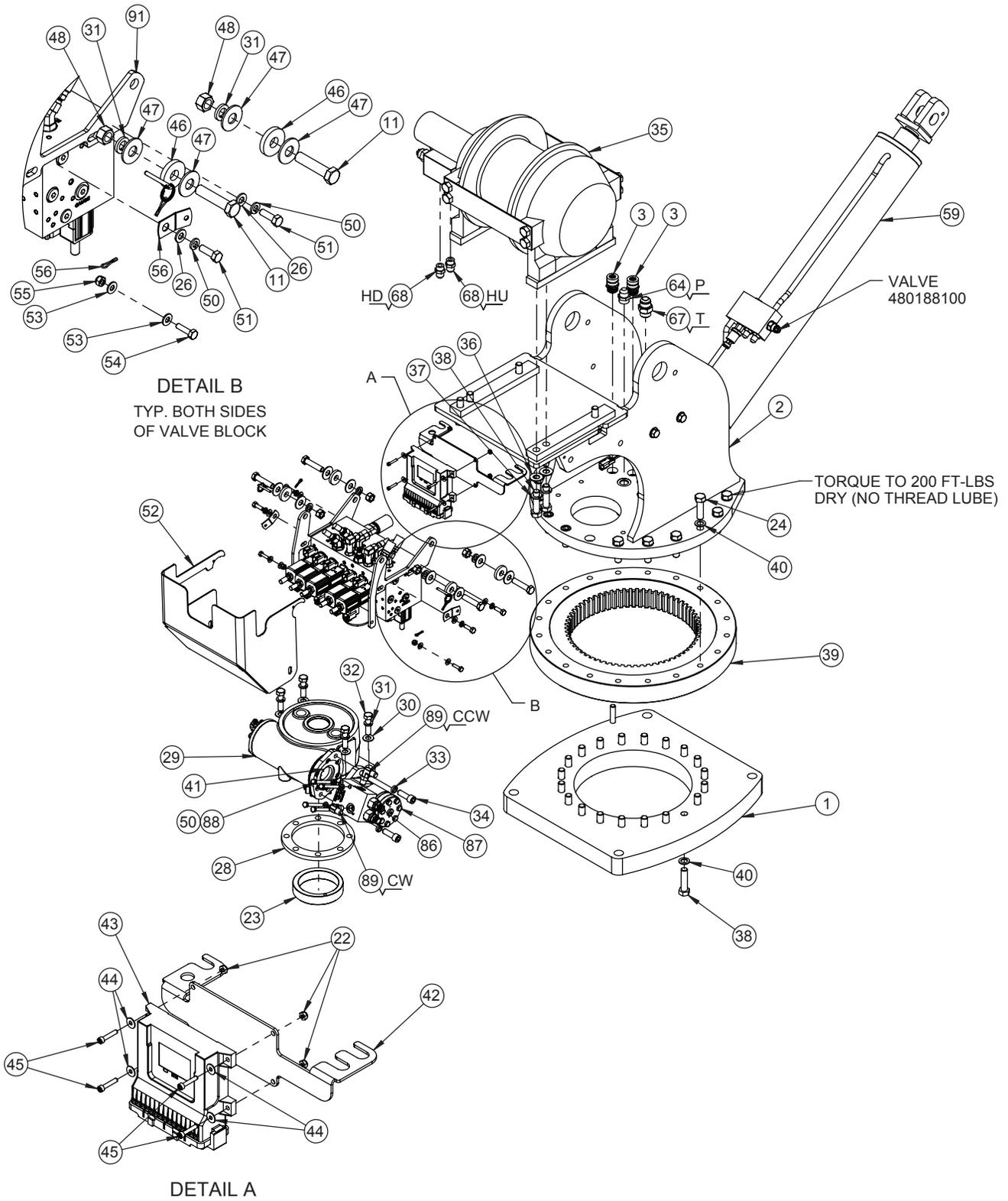
# General Assembly P/N: 460179001 12

ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	460179201	PEDESTAL ASSY, HC-10, FM, NEXSTAR III
2	1	460178100	BOOM ASSEMBLY, 10006H W/LIGHT
3	1	460177020	PIN, 2 IN OD, 13.25 IN GRIP, BOOM PIVOT
4	1	460179021	DECAL LAYOUT, HC-10, NEXSTAR
5	1	460090000	WIRE ROPE ASSY
6	1	360676000	PIN, CYLINDER
7	1	239300000	ZERK, GREASE
8	1	320976000	WASHER, FLAT, 3/8 SAE HARDENED
9	1	021100000	WASHER SP LK 3/8
10	1	008702000	SCREW HX HD 3/8-16 UNC X 1-1/4 LG GR5
11	1	021600000	WASHER FL 1/2
12	1	021500000	WASHER, SP LK 1/2
13	1	017701000	NUT HX 1/2-13 UNC
14	1	738642000	SCREW HX HD 1/2-13 UNC X 1-3/4 LG GR8
15	1	460125000	TRAVELING BLOCK ASSEMBLY
16	1	360124000	PIN HITCH
17	1	470076000	PIN, 1 DIA 4-11/16 LG
18	1	750419000	CAP, 12 JIC
19	1	367238000	CAP, 10 JIC
20	1	360677000	PIN, 1/4 COTTERLESS RING
21	1	360678000	PIN, 3/16 COTTERLESS RING
22	1	460179024	SHIP KIT, HC-10, FM, NEXSTAR III
23	1	366823254	SENSOR, TRI-AXIS
24	4	019700000	WASHER SP LK #8
25	2	015500000	NUT HX #8-32 UNC CP
26	4	001302000	SCREW RD HD #8-32 UNC X 1/2 LG
27	1	002902000	SCREW SOC HD 1/4 UNC X 1/2 GR8
28	1	366823236	LIGHT, LED (RED, GREEN, YELLOW)
29	2	772043000	ZIP TIE STRAP, 12 IN, NYLON, BLACK
30	1	330622000	DECAL SERIAL NO

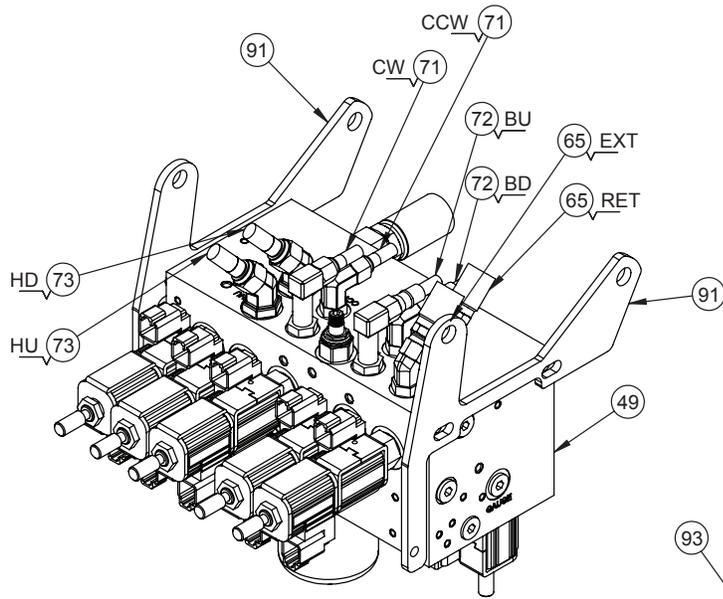
# 13 General Dimensions



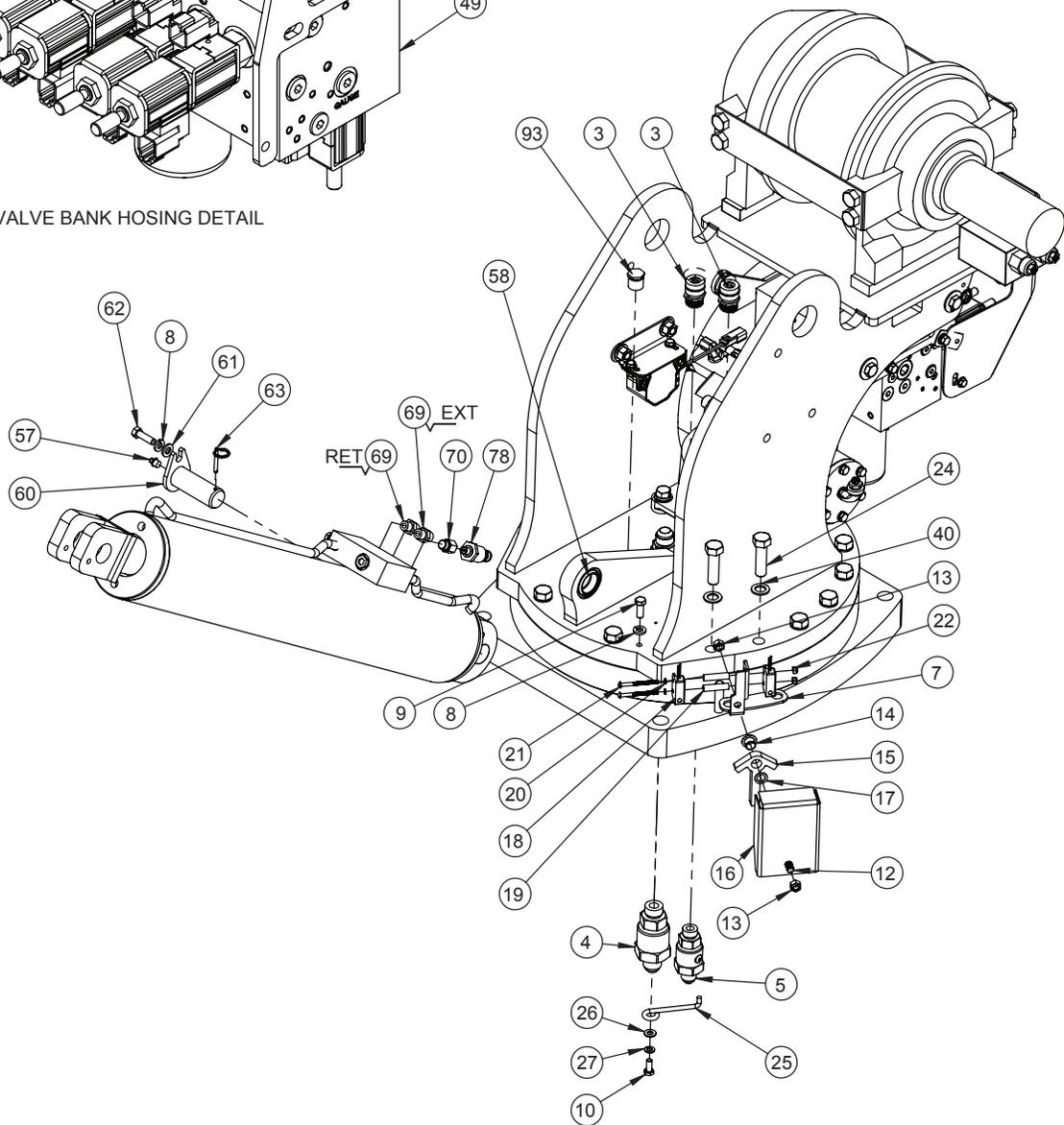
# Pedestal Assembly P/N: 460179201 14



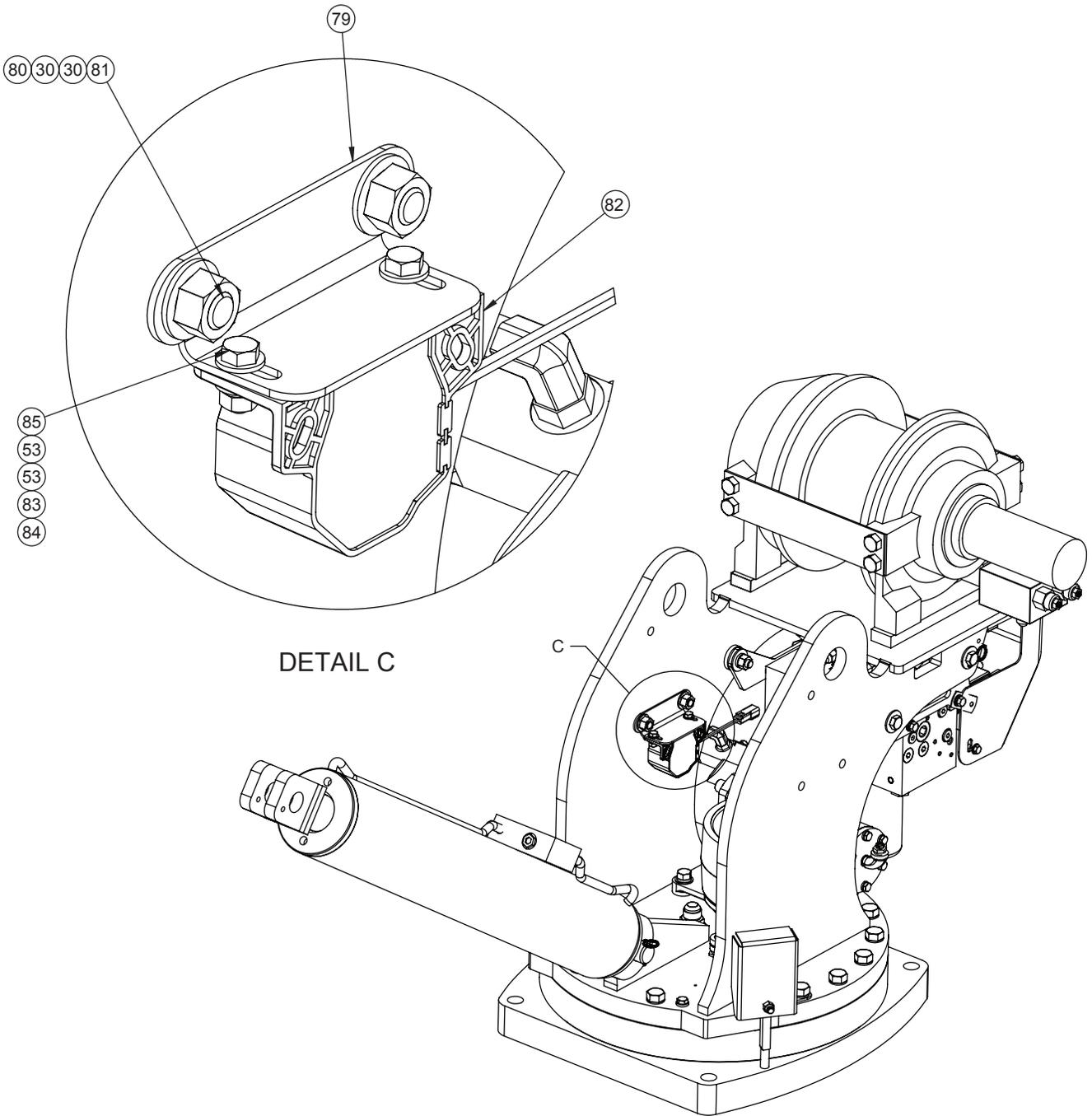
# 14 Pedestal Assembly P/N: 460179201



VALVE BANK HOISING DETAIL



# Pedestal Assembly P/N: 460179201 14



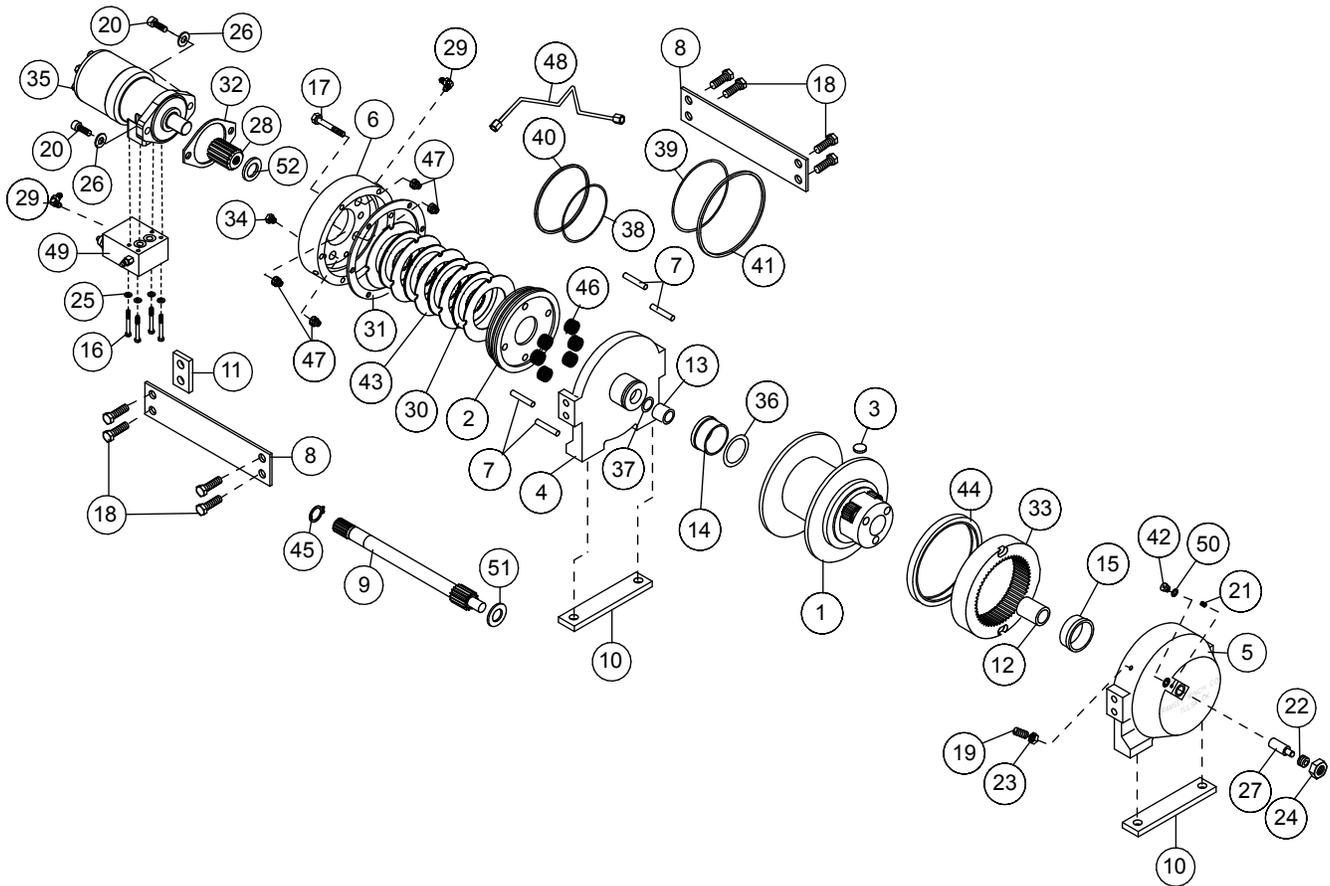
# 14 Pedestal Assembly P/N: 460179201

ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	460177224	BASE WELDMENT, HC-10
2	1	460177210	PEDESTAL WELDMENT, 10006
3	2	366698010	CORD GRIP .25-.38 3/4" HUB
4	1	460086000	FITTING, -12 SAE / -12 JIC, SWIVEL, STR
5	1	366358000	FITTING, -10 SAE / -10 JIC, SWIVEL, STR
6	1	460178253	TAG, ID HC-10/12S
7	1	460177256	BRACKET, ROTATION STOP, HC-10
8	2	021100000	WASHER SP LK 3/8
9	1	330371000	SCREW HX HD 3/8 UNC X 1 GR8
10	1	330252000	SCREW HX HD 5/16 UNC X 3/4 ZP GR5
11	4	366391000	SCREW HX HD 1/2 UNC X 2-1/4 ZP GR 5
12	1	366673000	PIN, ROTATION STOP
13	2	017301000	NUT HX NYLK 3/8-16 UNC CP
14	1	460079000	BEARING, ROTATION STOP
15	1	366671000	ARM, ROTATION STOP
16	1	366676000	COVER, ROTATION STOP
17	1	366675000	WASHER, NYLON
18	2	739316142	SENSOR, FERROUS PROXIMITY N.C.
19	2	470035007	SPACER, UNTHREADED NYLON, .375 OD, .192 ID
20	2	020001000	WASHER IN LK #10
21	2	002609001	SCREW, RD HD, #10-24, 2.25 LG, ZINC PLATED
22	6	015801000	NUT HX NYLK #10-24 UNC ZP
23	1	360162000	RING, ECCENTRIC
24	14	490171000	SCREW HX HD 5/8-11 UNC X 2-1/4 LG GR8
25	1	360207000	RETAINER ECCENTRIC RING
26	5	020901000	WASHER FL 5/16
27	1	020601000	WASHER SP LK 5/16
28	1	480011000	SEAL ROTATION BOX
29	1	160414	ROTATION GEARBOX, SLEW DRIVE
30	8	320588000	WASHER, FL 1/2, HARDENED
31	8	021500000	WASHER, SP LK 1/2
32	4	011608000	SCREW HX HD 1/2-13 UNC X 2 LG
33	2	021502000	WASHER SP LK 1/2 HI COLLAR
34	2	012197000	SCREW SOC HD 1/2-13 UNC X 1/2 LG
35	1	123449	HOIST, RPH 6000
36	6	407314000	WASHER FL 5/8 X 1-5/16 OD HARDENED
37	6	023800000	WASHER SP LK 5/8
38	26	366393000	SCREW HX HD 5/8-11 UNC X 2-1/2 LG GR8
39	1	372064000	ROTATION BEARING
40	34	023902000	WASHER FL 5/8 HARDENED
41	3	460098000	SCREW SOC HD 5/8-11 UNC X 1-1/2 LG GR8
42	1	460178212	BRACKET, RECEIVER MTG, 10006H
43	1	366823963	TRANSCIEVER, NEXSTAR III
44	4	020000000	WASHER FL #10 ZP
45	4	460094000	SCREW, SOC HD, #10-24 X 1"L, ZPL
46	4	366823211	SPACER, VALVE BANK

# Pedestal Assembly P/N: 460179201 14

ITEM NO.	QTY	PART NO.	DESCRIPTION
47	8	021600000	WASHER FL 1/2
48	4	017701000	NUT HX 1/2-13 UNC
49	1	480989251	VALVE BANK, 15 GPM W/FILTER SENSOR
50	8	020600000	WASHER 5/16 LOCK SS
51	4	007811000	SCREW HX HD 5/16-18 UNC X 1 LG GR5
52	1	460178025	COVER, VALVE REAR MTD FM 10006H/12S
53	8	020400000	WASHER FL SAE 1/4
54	2	005604000	SCREW HX HD 1/4-20 UNC X 1 LG
55	2	016300000	NUT HX NYLK 1/4-20 UNC
56	2	366823240	PIN, 3/16 W/LANYARD
57	1	239300000	ZERK, GREASE
58	1	366333000	BEARING, SPHERICAL 1.25 ID
59	1	460177240	CYLINDER, LIFT
60	1	360676000	PIN, CYLINDER
61	1	320976000	WASHER, FLAT, 3/8 SAE HARDENED
62	1	008702000	SCREW HX HD 3/8-16 UNC X 1-1/4 LG GR5
63	1	360678000	PIN, 3/16 COTTERLESS RING
64	1	490199000	FITTING STR 10-SAE/10-JIC
65	2	812203023	HOSE ASS'Y 6JIC-6JIC, STR 23 LG
66	47	374086000	NYLON HOSE SLEEVE, 1.81" ID, 5" LONG
67	1	750420000	FITTING, STR 12 SAE ORB - 12 JIC
68	2	770055000	FITTING 8 SAE/8 JIC STRAIGHT
69	2	200876000	FITTING 6 SAE/6 JIC STRAIGHT
70	1	369611000	ADAPTER, STR -6 ORM/ -4 ORF
71	2	480205000	HOSE ASSY (ROTATION)
72	2	812203038	HOSE ASSY 6 STR
73	2	480203000	HOSE ASSY 8 STR X 24.75
74	1	812503023	HOSE ASSY, -12 HOSE, -12JICF/-12JICF, 23" LG
75	1	812403019	HOSE ASSY 10 JIC STR
76	1	813015000	KIT, HOSE, 10006H, FOR 46017800X
77	1	480989255	KIT, ELEC/HYD NEXSTAR III, 9 GPM AND ABOVE
78	1	366823255	TRANSDUCER, PRESSURE 0-3000 PSI
79	1	366823224	BRACKET, ALARM, HC-6 TO HC-10
80	2	738058008	NUT HX 1/2-13 UNC
81	2	010201000	SCREW HX HD 1/2-13 UNC x 1-1/2 LG
82	1	366823223	KIT, ALARM, CONSTANT TONE, W/ DEUTSCH PLUG
83	2	020200000	WASHER SP LK 1/4
84	2	015900000	NUT HX 1/4-20 UNC SS
85	2	005500000	SCREW HX HD 1/4-20 UNC X 3/4 LG
86	1	320989435	MOTOR CONTROL COUNTERBALANCE MANIFOLD
87	1	320989436	MOTOR, 5.87 IN <sup>3</sup> /REV MANIFOLD PORTING
88	4	414159000	CAPSCREW-5/16-18 NC X 2.50 LG HX HD Z/P NYLON PATCH
89	2	241175000	FITTING 90 6-SAE/6-JIC
90	1	739316143	HARNESS, ADAPTER, PROXIMITY ROTATION SWITCHES
91	2	460178218	BRACKET, VALVE MTG, 10/12S (LONG BOWL)
92	1	366823228	HARNESS, NEXSTAR III HYD. CRANES W/TELEMATICS
93	1	642908000	CORD CONNECTOR

# 15 Hoist Assembly P/N: 123449

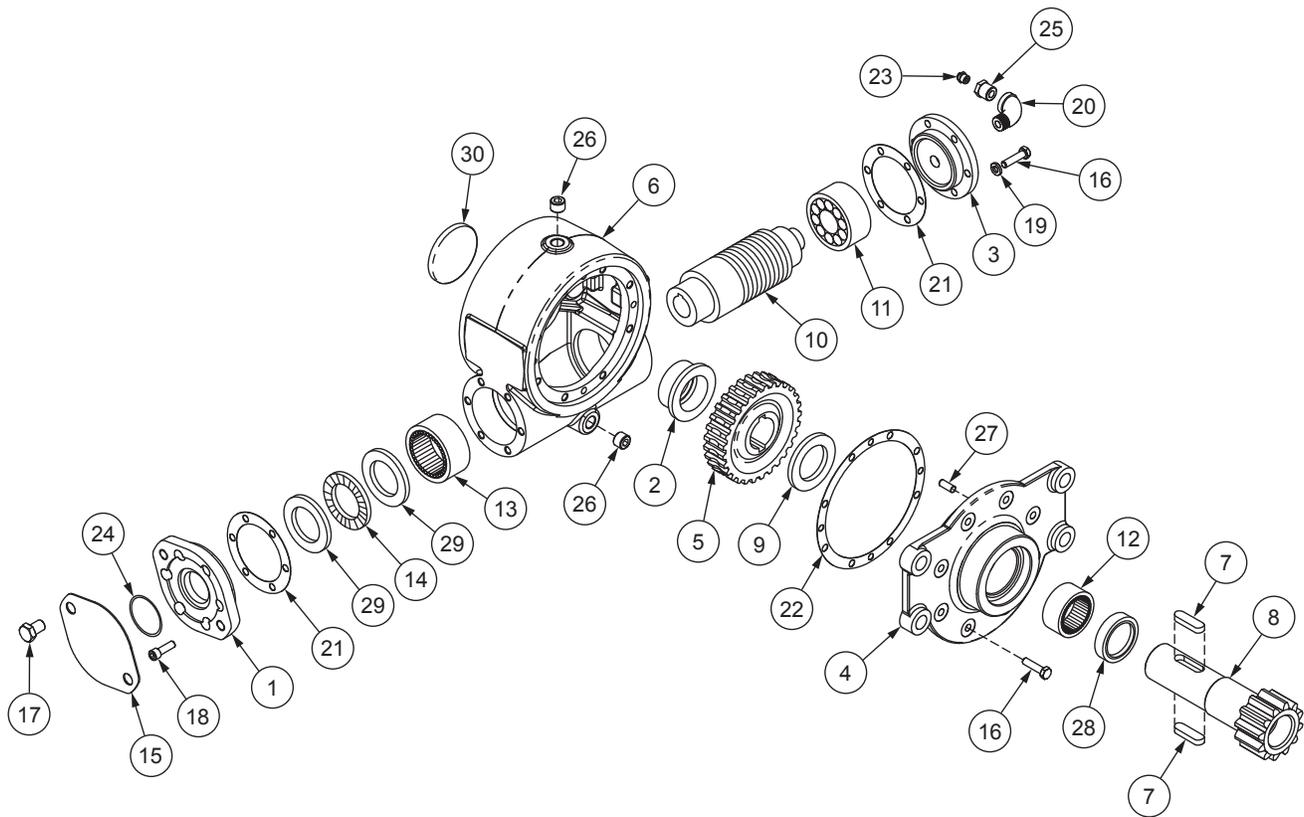


ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	234255	DRUM ASSEMBLY
2	1	306042	PISTON-BRAKE
3	1	315004	ANCHOR- CABLE
4	1	338345	END BEARING-MOTOR END
5	1	338414	END BEARING-GEAR HOUSING
6	1	338302	HOUSING-BRAKE
7	4	346045	PIN-BRAKE
8	2	350704	TIE PLATE
9	1	357517	SHAFT- INPUT
10	2	362297	SPACER-FOOT
11	4	362288	SPACER - TIE PLATE
12	1	402120	BEARING
13	1	402121	BEARING
14	1	412110	BUSHING-DRUM, GEAR END, RPH-15000
15	1	412111	BUSHING-DRUM, MOTOR END, RPH-15000
16	4	414088	CAPSCREW 5/16-18 NC X 2.75 LG HX HD NYLOK

# Hoist Assembly P/N: 123449 15

ITEM NO.	QTY	PART NO.	DESCRIPTION
17	6	414303	BOLT-3/8-16 NC X 2-1/2, HX HD, GR-5, ZINC
18	8	414658	CAPSCREW-5/8-11 NC X 1-1/2 LG HX HD ZINC GR5
19	1	414926	SETSCREW-3/8-16 NC X 1, SOCKET, NYLON
20	2	414952	CAPSCREW-1/2-13 NC X 1-1/2 LG SOC HD ZINC
21	1	416016	SETSCREW 1/4-20 NC X 1/4 HX SOCK HD CUP
22	1	416080	SETSCREW-5/8-18 NF X 1 LG, HX SOC HD, CUP
23	1	418036	NUT-3/8-16 NC, HEX JAM, ZINC
24	1	418088	NUT-JAM 5/8-18 NF HEX HD, ZINC
25	4	418173	WASHER-5/16 TYPE B, NARROW, Z/PLT.
26	2	418218	LOCKWASHER-1/2 ID MED SECT, ZINC PLT
27	1	426048	PLUNGER-CLUTCH, BLOCKED
28	1	431015	COUPLING-MOTOR
29	2	432018	FITTING
30	4	438022	DISC-BRAKE
31	1	442220	GASKET-BRAKE HSG.
32	1	442223	GASKET-MOTOR FLANGE
33	1	334256	RING GEAR
34	1	456038	FITTING-VENT, BREATHER
35	1	458119	MOTOR-HYD, 12.2 CU. IN.
36	1	462056	O-RING
37	1	462057	O-RING
38	1	462058	O-RING
39	1	462059	O-RING-BACK-UP
40	1	462060	O-RING-BACK-UP
41	1	462061	O-RING
42	1	472052	PLUG
43	5	474111	PLATE-SEPARATOR, BRAKE
44	1	486101	SEAL-V RING-SKF #402502
45	1	490037	SNAP RING
46	6	494110	SPRING-BRAKE
47	4	494112	SPRING
48	1	509126	TUBE-HYDRAULIC BRK REL
49	1	516069	VALVE-MTR CONTROL
50	1	518037	THRUST WASHER
51	2	518047	THRUST WASHER
52	1	518052	THRUST WASHER

# 16 Rotation Gearbox P/N: 160414



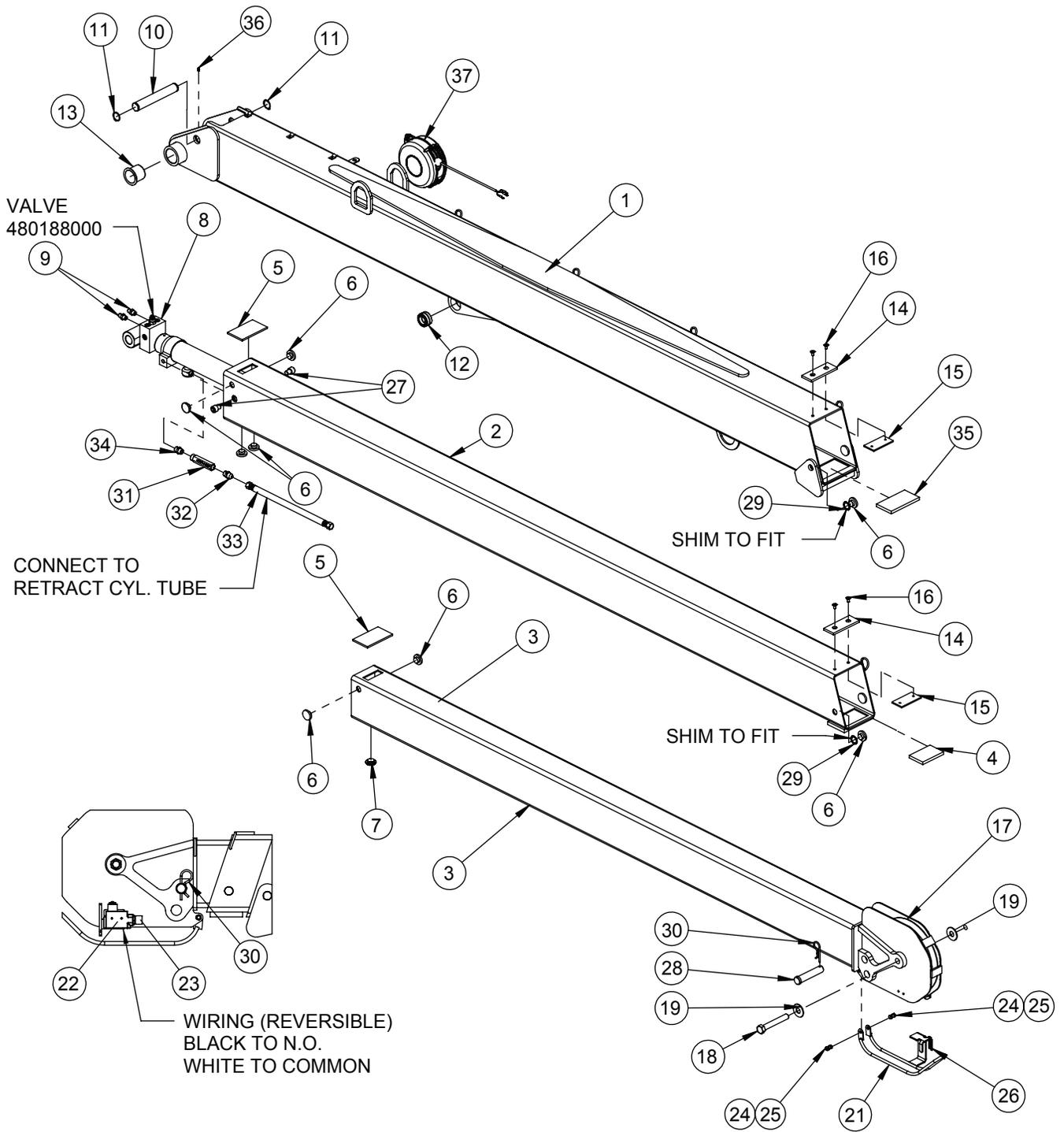
ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	300058	ADAPTER
2	1	308085	BUSHING
3	1	316092	CAP BEARING
4	1	328165	COVER
5	1	334016	GEAR RH
6	1	338261	HOUSING GEAR
7	2	342120	KEY
8	1	357139	SHAFT OUTPUT
9	1	366019	WASHER THRUST
10	1	368183	WORM RH
11	1	402044	BEARING BALL
12	1	402105	BEARING NEEDLE
13	1	402106	BEARING NEEDLE
14	1	402107	BEARING THRUST
15	1	413013	COVER
16	14	414143	CAPSCREW-5/16-18 NC X 1 .25 LG. HX. HD. GR5 NYLOK PATCH
17	2	414581	CAPSCREW-1/2-13 NC X .75 LG. HX. HD.
18	6	414869	CAPSCREW-5/16-18 NC X 1.0 LG. SOC. HD. LOC-WEL

# Rotation Gearbox P/N: 160414 16

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ITEM NO.	QTY	PART NO.	DESCRIPTION
19	6	418163	LOCKWASHER 5/16 MED. SECT. C.P.
20	1	432011	ELBOW 90 DEG.
21	2	442182	GASKET
22	1	442187	GASKET
23	1	456008	FITTING RELIEF
24	1	462029	O-RING
25	1	468002	REDUCER
26	2	468018	PLUG PIPE
27	4	470062	PIN DOWEL
28	1	486071	SEAL OIL
29	2	518026	WASHER THRUST
30	1	530101	PLUG EXPANSION

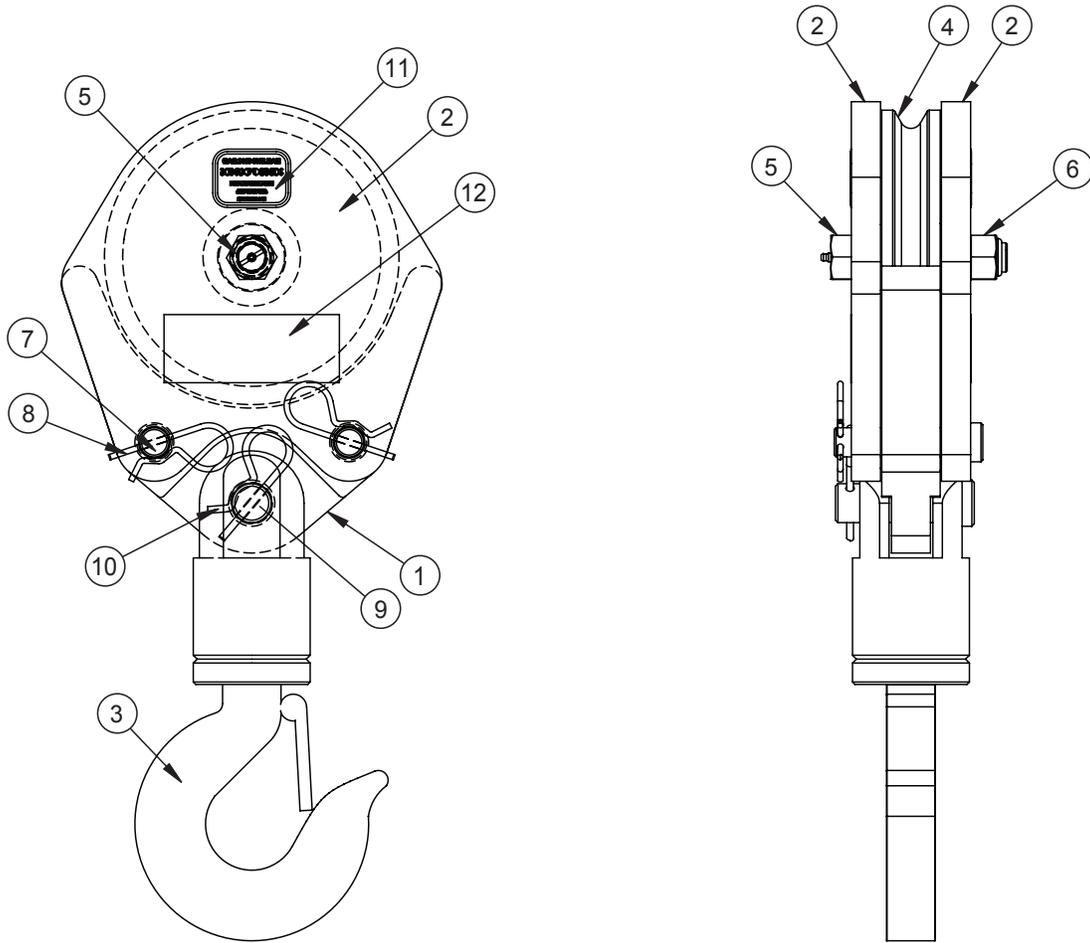
# 17 Boom Assembly P/N: 460178100



# Boom Assembly P/N: 460178100 17

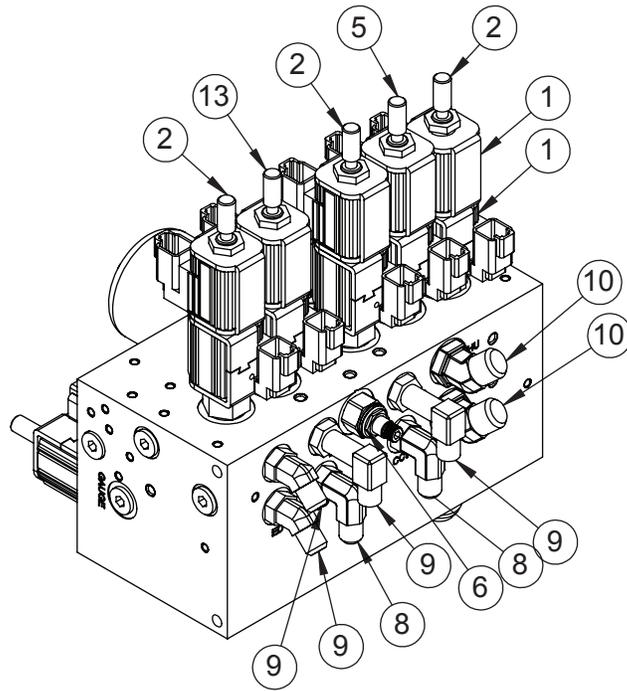
ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	460178110	LOWER BOOM WELDMENT, 10006H W/LIGHT MTG
2	1	460177120	MID BOOM WELDMENT, 10006
3	1	460177130	UPPER BOOM WELDMENT, 10006
4	1	460053000	WEAR PAD, BOTTOM UPPER
5	2	460177160	WEAR PAD, 5.13 X 3 X .25, BOSS 1 X 3
6	10	360767000	PAD BOOM 1.5 OD
7	1	407277000	PAD BOOM 1.5 OD
8	1	460177150	EXTENSION CYLINDER, 2.75/2.50 BORE
9	2	200876000	FITTING 6 SAE/6 JIC STRAIGHT
10	1	460177161	PIN, 1.25 OD, 7.81 GRIP
11	2	480029000	RING RETAINING
12	1	366333000	BEARING, SPHERICAL 1.25 ID
13	2	366394000	BEARING, PIVOT
14	2	460081000	WEAR PAD, CABLE
15	2	460082000	PLATE, WEAR PAD RETAINER
16	4	460177163	SCREW SOC HD CTRS NK 5/16-24 UNF X 5/8 LG
17	1	466130000	SHEAVE ASSY 3/8
18	1	014400000	SCREW HX HD 3/4-16 UNF X 5 LG GR5
19	2	022102000	WASHER FL 3/4
20	1	018600000	NUT HX NYLK 3/4-16 UNF
21	1	470110168	LONG TAB BAIL WELDMENT W/ 2 IN TRIP BAR STAINLESS STEEL
22	1	646900000	SWITCH, LIMIT ANTI-TWO BLOCK
23	1	642918000	CORD CONNECTOR
24	2	007807000	SCREW HX HD 5/16-18 UNC X 3/4 LG GR5
25	2	016801000	NUT HX NYLK 5/16-18 UNC CP
26	1	366678000	SPRING, EXTENSION
27	2	460177162	SCREW SOC HD 5/8-11 UNC X 3/4 LG
28	1	470076000	PIN, 1 DIA 4-11/16 LG
29	4	460177164	SHIM, 1.31 OD X 0.9 ID X 0.04 TH, NYLON
30	1	360124000	PIN HITCH
31	1	460177180	VALVE, IN-LINE RELIEF, 400PSI
32	1	770055000	FITTING 8 SAE/8 JIC STRAIGHT
33	1	812234017	HOSE ASSY, -8 JIC/-8 JIC, -6 HOSE, 17LG
34	1	374400000	FITTING, -8 ORB, -8 ORB, STRAIGHT
35	1	366669000	WEAR PAD, BOTTOM MID
36	1	239000000	ZERK DRIVE GR
37	1	360759003	CORD REEL ASSY

# 18 Traveling Block P/N: 460125000



ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	460127000	TACKLE LOWER
2	2	460126000	SIDE PLATE TRAVELING BLOCK
3	1	480366000	HOOK SWIVEL 6 METRIC TON
4	1	490256000	SHEAVE ASSY 7/16 ROPE
5	1	490313000	BOLT, SHEAVE W/ZERK FITTING
6	1	018600000	NUT HX NYLK 3/4-16 UNF CP
7	2	360605000	PIN, BLOCK
8	2	366813000	PIN HITCH
9	1	480368000	PIN SWIVEL HOOK
10	1	360124000	PIN HITCH
11	2	460128000	DECAL MAX BLOCK LOAD
12	2	040518000	DECAL STAY CLEAR OF LOAD

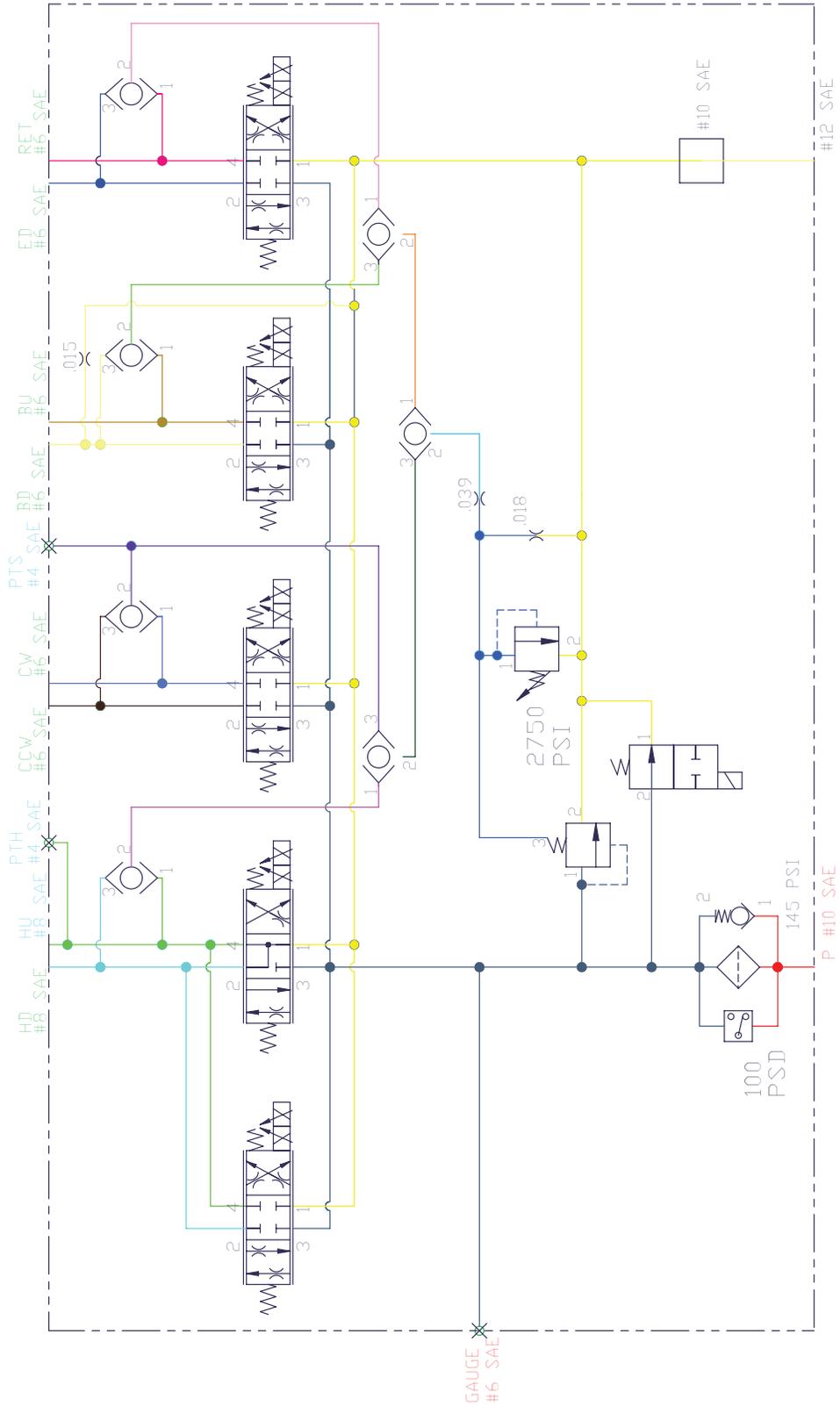
# Hydraulic Valve Bank P/N: 480989251 19



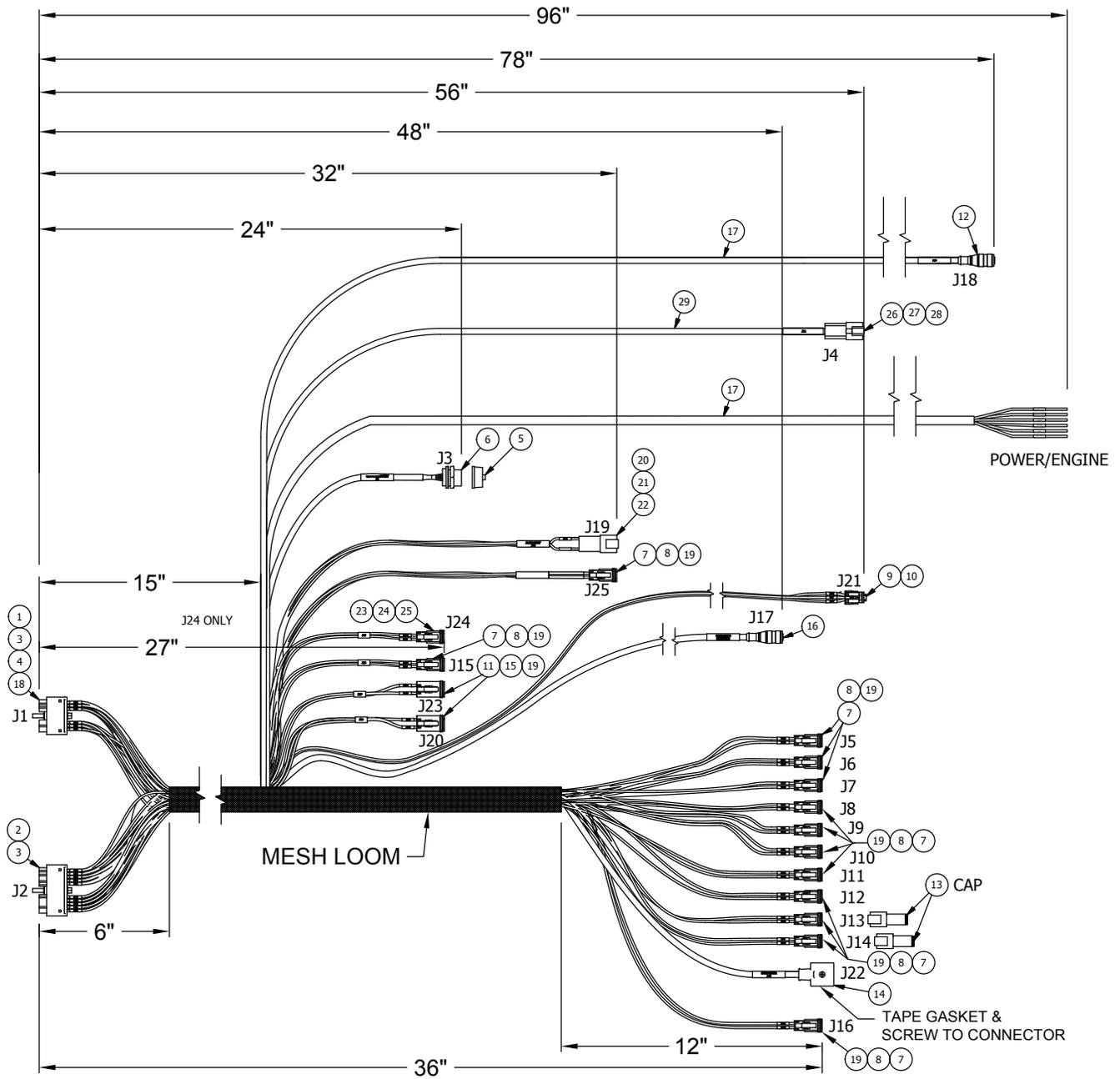
ITEM NO.	QTY	PART NO.	DESCRIPTION
1	9	366823901	COIL, 5/8" DIA 12 VDC DEUTSCH
2	2	366823902	CARTRIDGE, SIZE 4W 3P CLSD CTR
3	2	366823906	VALVE, LOGIC SPOOL TYPE, 218 PSI
4	1	366823960	CARTRIDGE, 2-WAY UNLOADER, EXTENDED MANUAL OVERRIDE
5	1	366823903	CARTRIDGE, SIZE 4W 3P FLOAT CTR
6	1	366823905	VALVE, RELIEF DIRECT-ACTING (2750PSI)
7	2	480195000	FITTING 45 6-SAE/6-JIC
8	2	241175000	FITTING 90 6-SAE/6-JIC
9	2	330645000	FITTING 90 6-SAE/6-JIC LONG
10	2	374017000	FITTING 45 8-SAE/8-JIC
11	1	750420000	FITTING, STR 12 SAE ORB - 12 JIC
12	1	490199000	FITTING STR 10-SAE/10-JIC
13	1	366823911	CARTRIDGE, SIZE 4W 3P FLOAT CTR - 6GPM
14	1	366823919	145 BYPASS CHECK
15	1	366823918	THERMAL DIRT ALARM
16	1	366823917	5 MICRON, 30 GPM FILTER
17	1	366823916	BOWL, FILTER, LONG



# Hydraulic Valve Bank P/N: 480989251 19



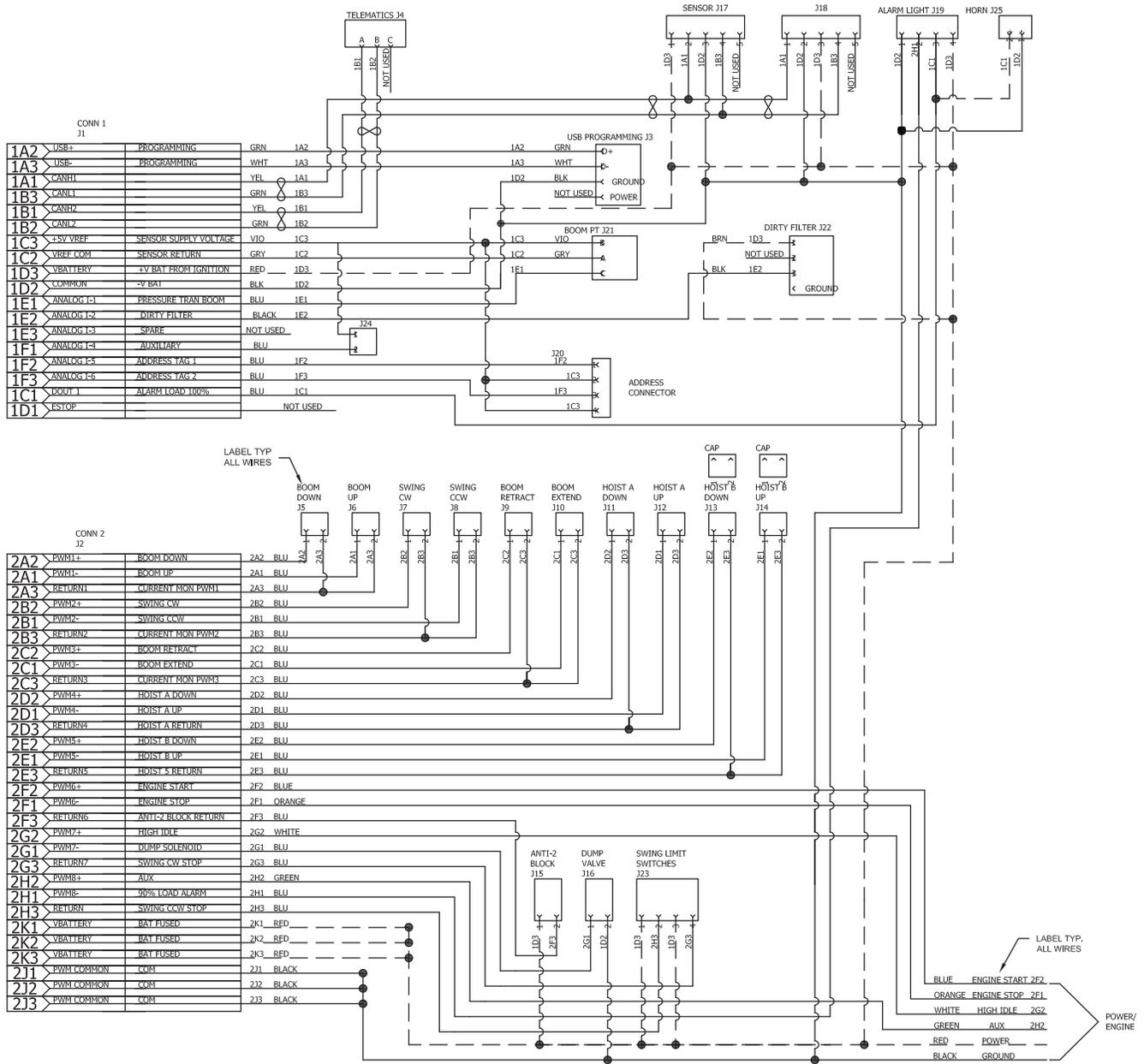
# 20 Wiring Harness P/N: 366823228



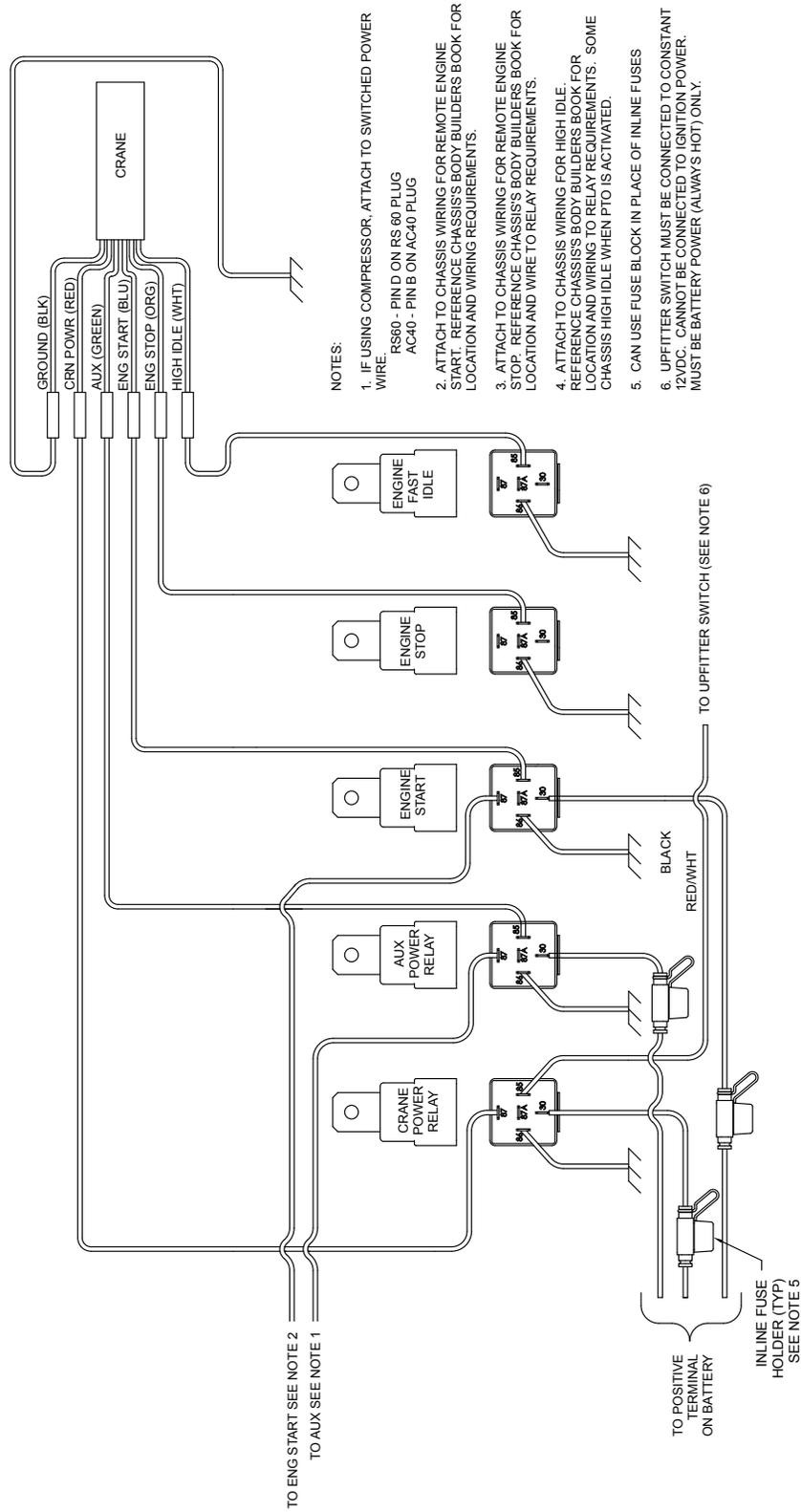
# Wiring Harness P/N: 366823228 20

CONNECTOR ID			
CONNECTOR	DESCRIPTION	CONNECTOR	DESCRIPTION
J1	RECEIVER 18 PIN CONNECTION	J14	HOIST B UP
J2	RECEIVER 30 PIN CONNECTION	J15	ANTI-2 BLOCK
J3	USB CONNECTION	J16	DUMP VALVE
J4	TELEMATICS	J17	BOOM ANGLE SENSOR
J5	BOOM DN	J18	PENDANT CONNECTION
J6	BOOM UP	J19	ALARM LIGHT
J7	SWING CW	J20	ADDRESS
J8	SWING CCW	J21	BOOM PT
J9	BOOM RETRACT	J22	DIRTY FILTER
J10	BOOM EXTEND	J23	SWING LIMIT SWITCHES
J11	HOIST A DN	J24	AUXILIARY
J12	HOIST A UP	J25	HORN
J13	HOIST B DN		

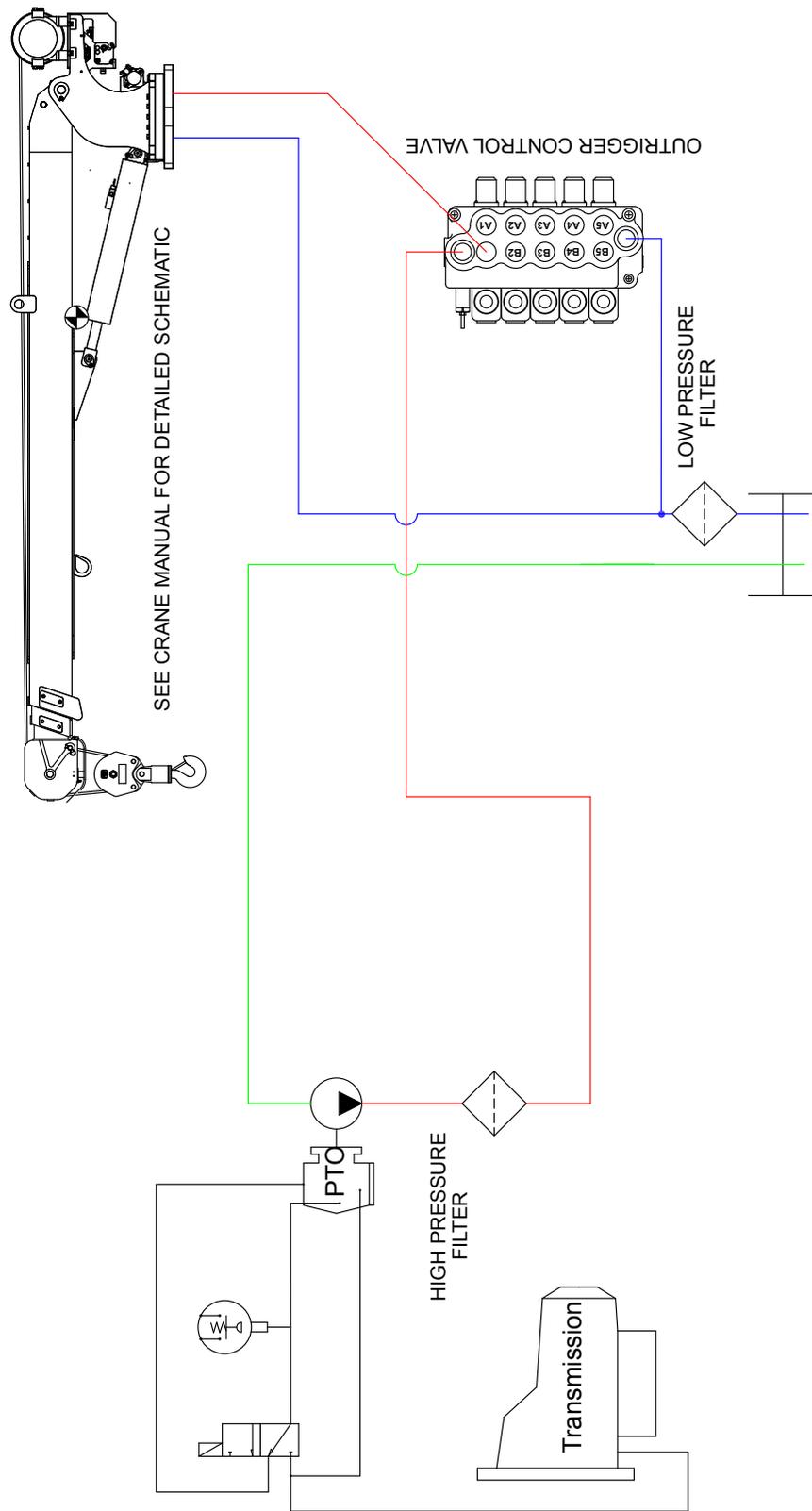
# 21 Electrical Schematic P/N: 366823229



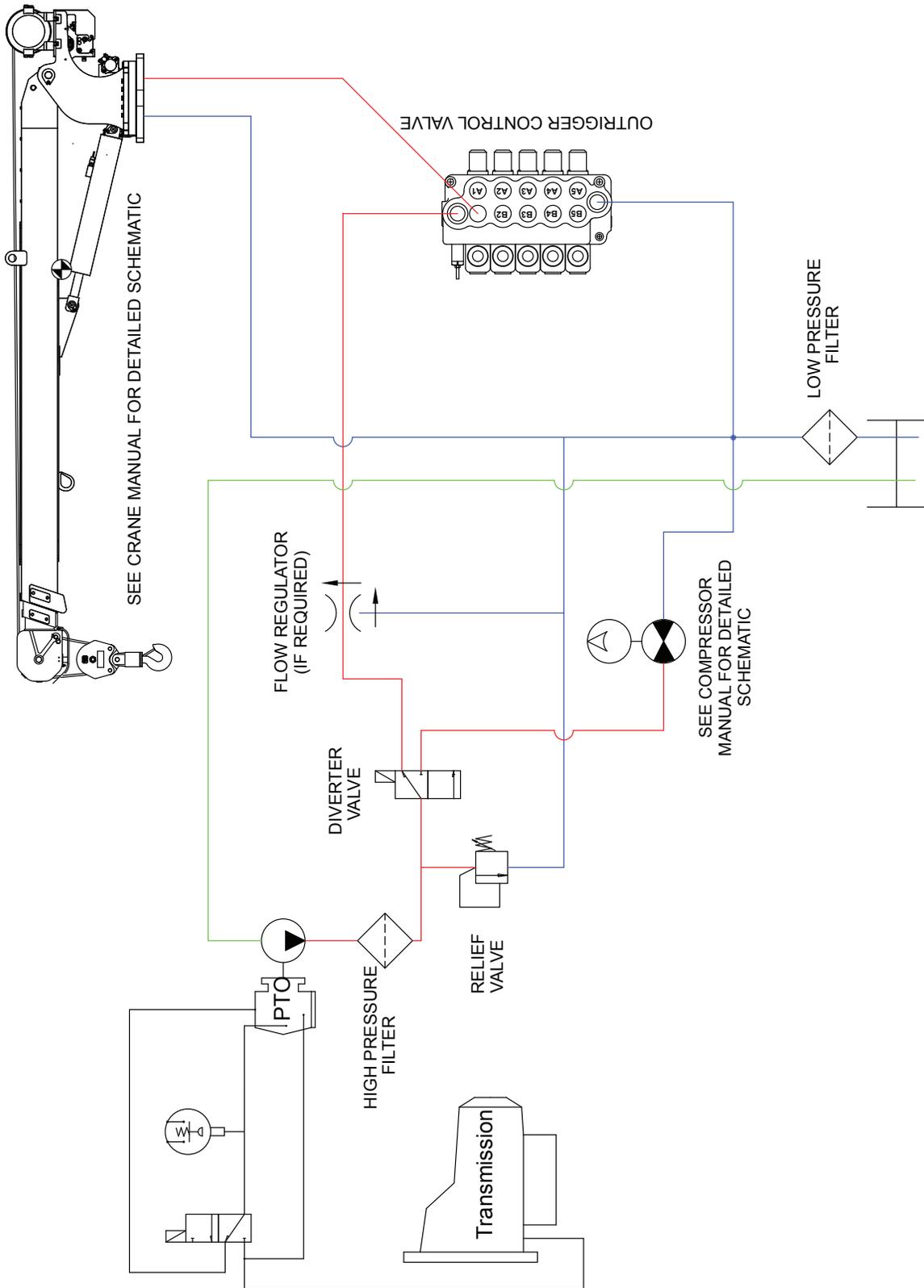
# General Electric Wire Schematic 22



# 23 Generic Hydraulic Schematic



# Generic Hydraulic Schematic w/Diverter Valve 24



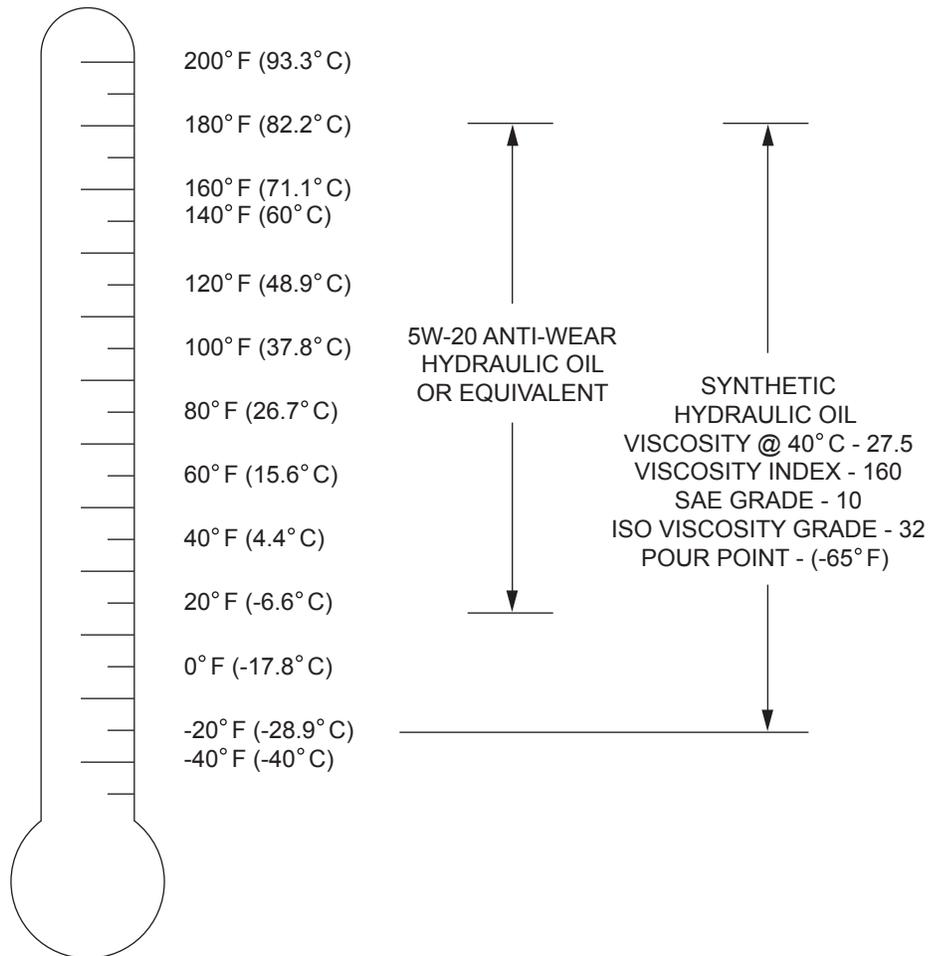
## ANNEX A

### 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 temperatures is hydraulic motor/PTO operation but no fluid flow from tank.

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

### OIL TEMPERATURE



## ANNEX B

### ECCENTRIC RING ADJUSTMENT

1. Remove retaining clip from bottom of crane
2. Rotate Eccentric Ring to tighten or loosen backlash.

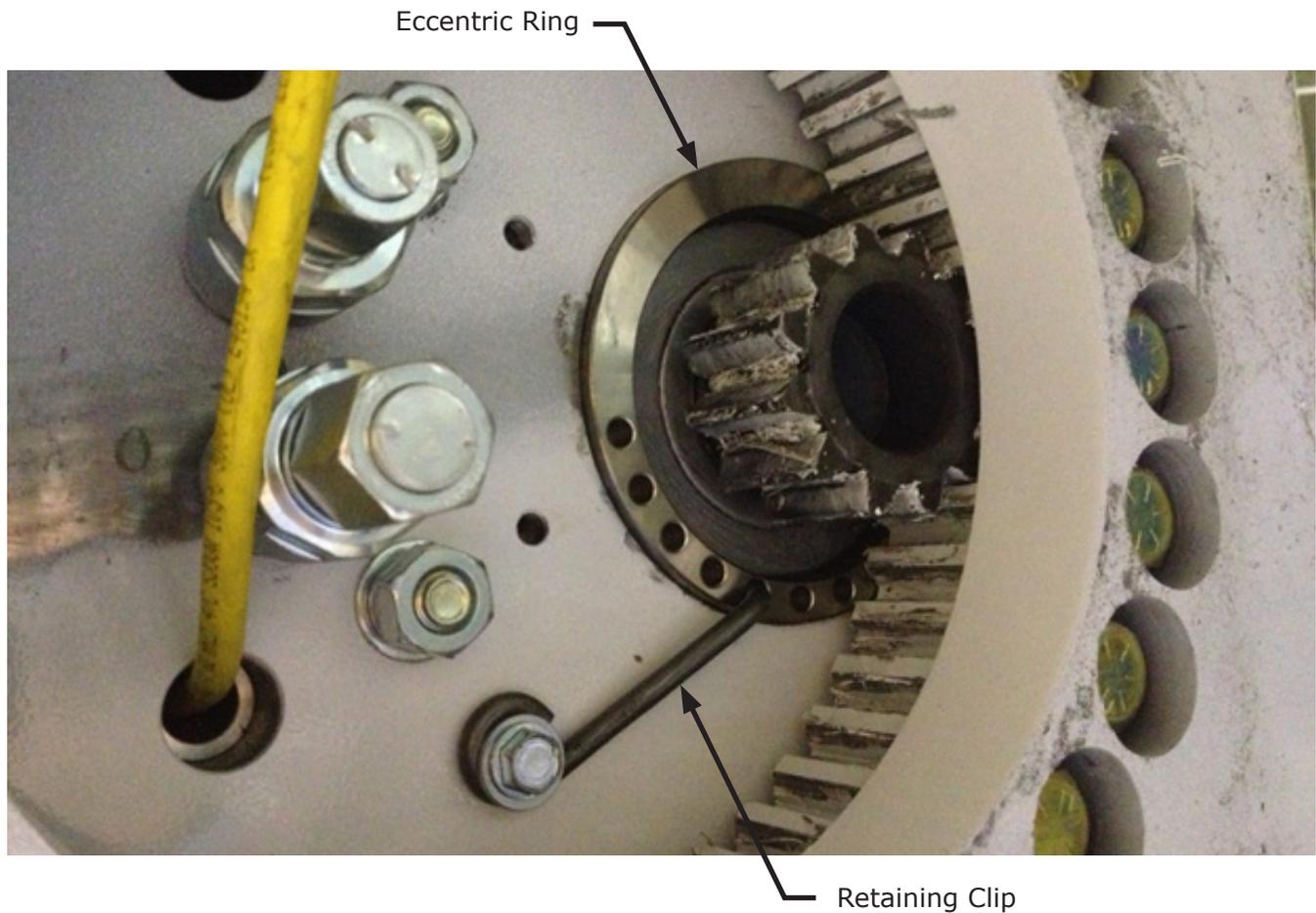
#### NOTICE

Eccentric ring hole is offset from the outside diameter by 1/16".) **IMPORTANT:** The tooth gap should be between 0.005 and 0.007 at the blue/green mark. This can be checked using Plastigage.

3. Once adjusted, reattach eccentric ring retainer pin by inserting into one of the holes on the eccentric ring.

#### NOTICE

On new units, metal shavings may develop during operation. This is considered normal gear wear-in.



View From Bottom of Crane



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.**



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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**

