



# HC-12S NEXSTAR III OWNERS MANUAL



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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 the warranty pages at the end of the manual.

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# 1.1 WARNINGS



## 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. This sale is made with the express understanding there is no warranty the goods are fit for the purpose of lifting or moving persons or other improper use. There is no implied warranty or responsibility for such uses.*

# 2.1 INTRODUCTION

## NOTICE

*Keep this manual with the crane at all times.*

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

To assist you in obtaining the best service from your crane and to avoid untimely crane and/or vehicle failure, this manual provides 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 HC-12S crane for your protection.

For your convenience the overall dimensions of the HC-12S 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 HC-12S cranes are attached to your 12-volt truck electrical system through the relay provided. The HC-12S 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.

# 3.1 GENERAL SPECIFICATIONS

## DIMENSIONS

- Width: 24.5 in. (0.62 m)
- Height: 36.0 in. (0.91 m)
- Length: 14 ft. 8 in. (4.47 m), stored length.
- Weight: 2,023 lbs. (918 kg)

## CAPACITY

- 60,000 ft-lbs (8.3 ton-m)
- Ft-lbs = horizontal distance from centerline of rotation to free hanging weight (feet) x amount of weight (pounds).

## REACH

- Second boom reach: 12 ft. 4 in. to 20 ft. 4 in.
- Third boom reach: 20 ft. 4 in. to 25 ft. 4 in.

## CABLE

- 120 ft. (36.6 m) of 7/16 in. (12.7 mm) diameter aircraft quality cable. This cable has a single line breaking strength of 26,600 lbs. (4,445.2 kg).

## 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 hydraulic and electrical lines to the crane from the body.

## HYDRAULIC REQUIREMENTS

- 10 gpm flow @ 3,000 psi.
- Pressure and return hoses are not furnished with this crane. The installer must provide hoses and determine proper lengths at installation.
  - **RETURN LINE:** The Return Line from the crane to the reservoir (in compartment) must be **-10 SAE 100R2** or equivalent. The installer will determine the hose length. Return lines longer than 6 ft. must be **-12** in size. Hose end fittings are **-10JIC female swivel**.
  - **PRESSURE LINE:** The Pressure Line from the pump to the crane must be **-8SAE R100R2** or equivalent. The installer will determine the hose length. Hose end fittings are **-8JIC female swivel**.

## ELECTRICAL SYSTEM REQUIREMENTS

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

## ROTATION

- 370° rotation with electric stop



## 3.2 HC-12S NEXSTAR III, GENERAL DIMENSIONS

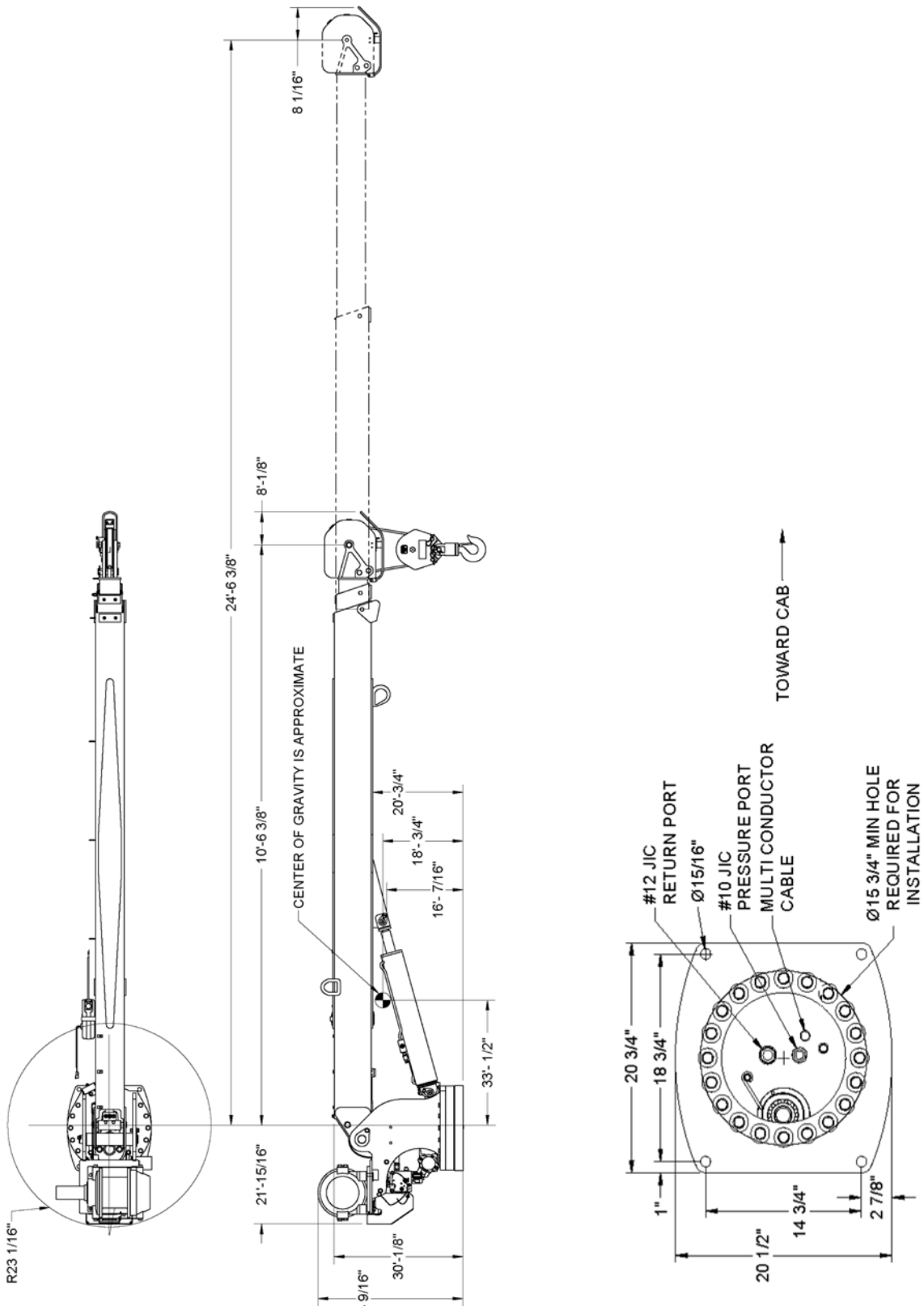


Figure 1. General Dimensions

## 3.3 LOAD CHART

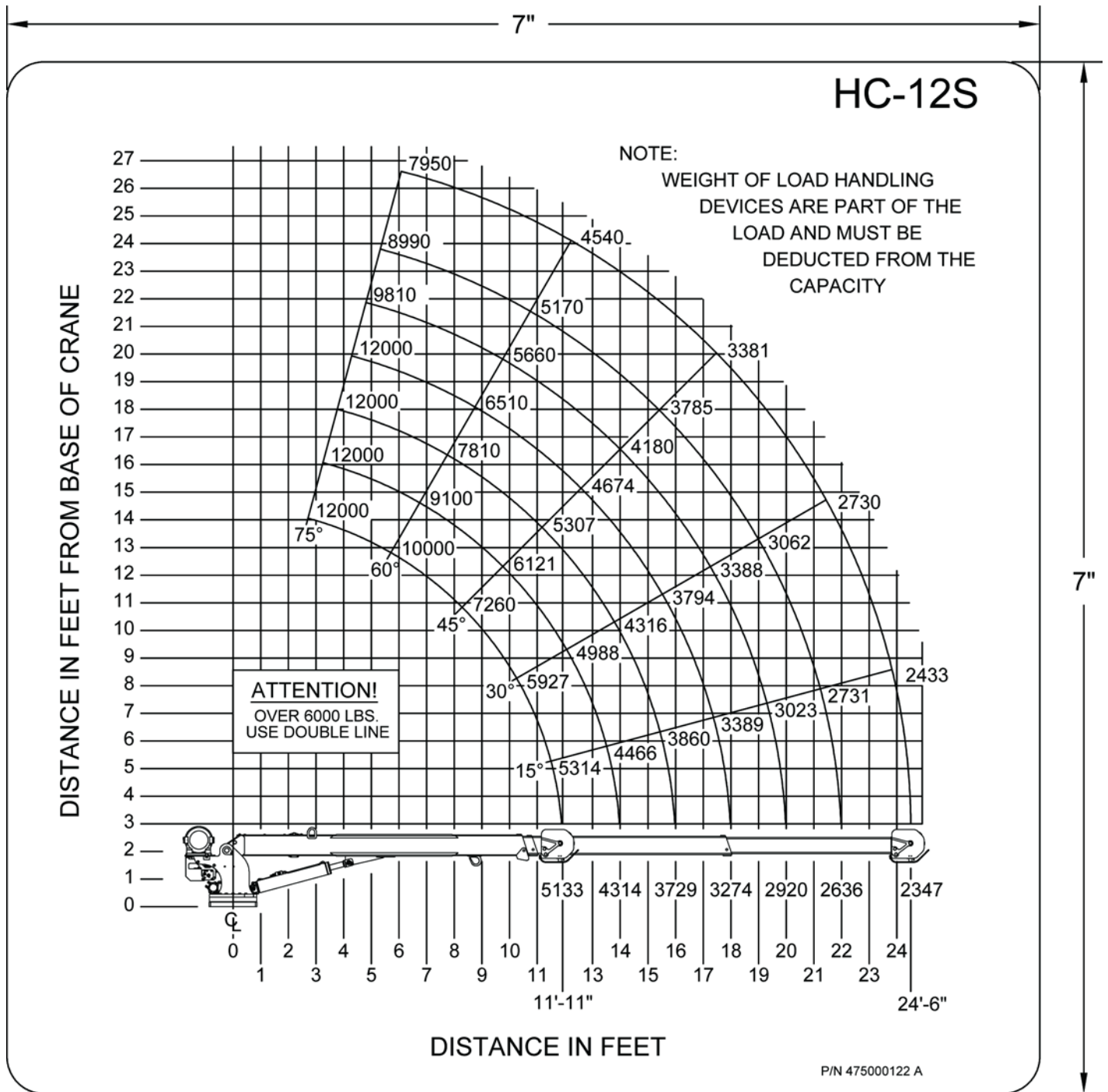


Figure 2. Load Chart



### WARNING

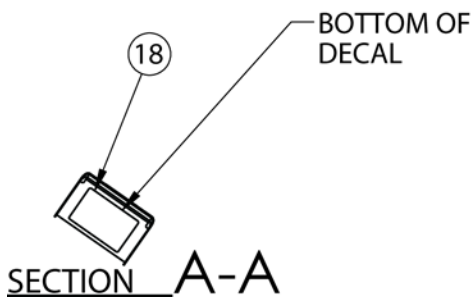
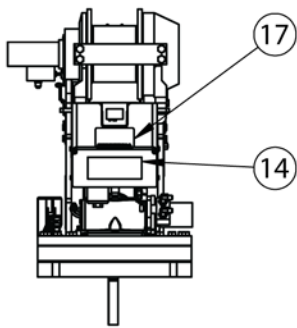
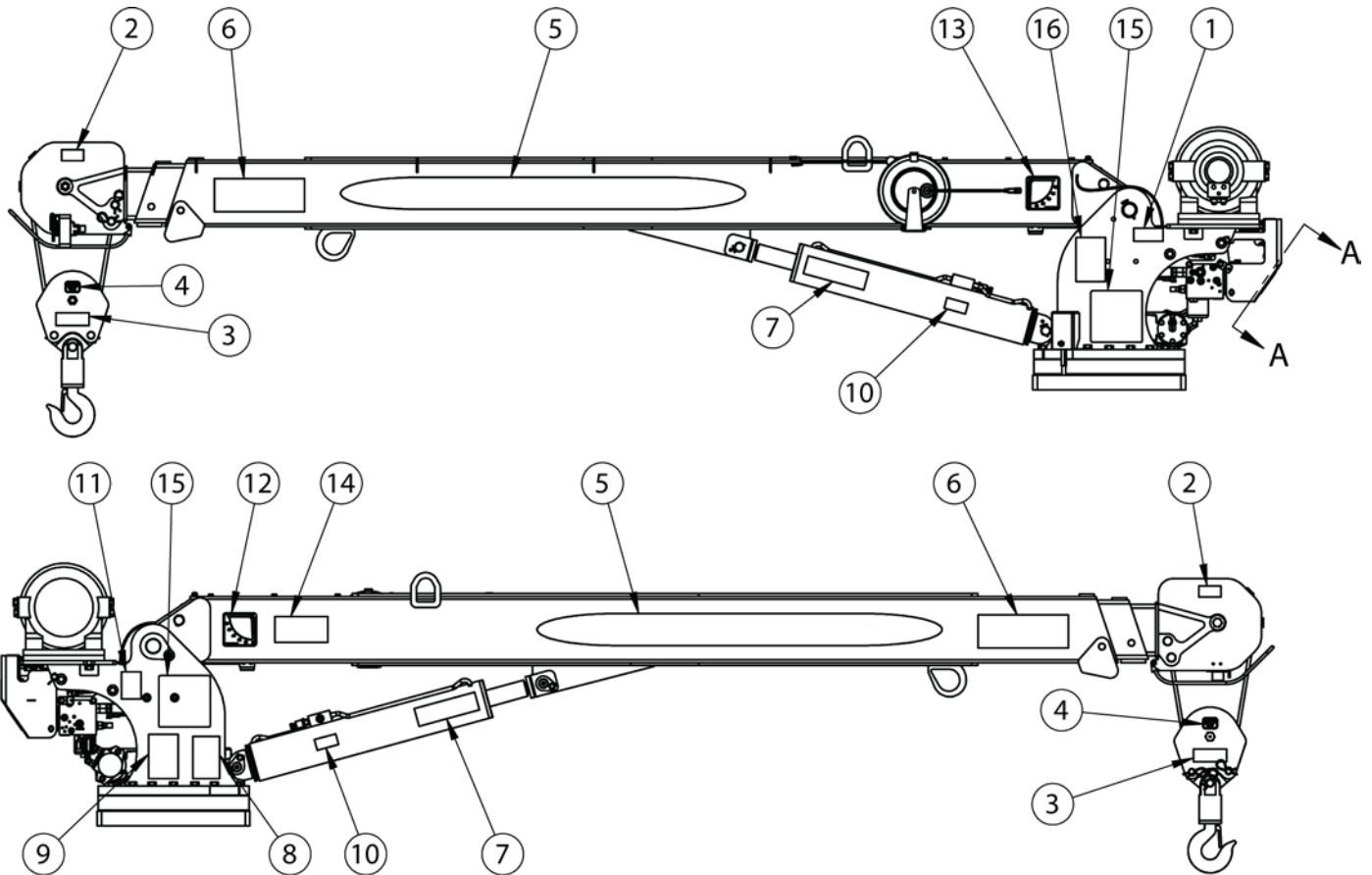
All load ratings are based on crane capacity, not the vehicle stability. When lifting a heavy load, the weight can create enough tipping moment to overturn the vehicle. DO NOT USE the overload shutdown device to determine maximum rated loads, if the crane is equipped with this type of device.



### WARNING

Always comply with load chart capacities.

### 3.4 HC-12S NEXSTAR III DECAL LAYOUT, P/N 460179026



ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	330622	DECAL SERIAL NO
2	2	040517	DECAL STAY CLEAR OF BOOM
3	2	040518	DECAL STAY CLEAR OF LOAD
4	2	475000220	DECAL MAX BLOCK LOAD
5	2	460179029	DECAL, BOOM, HC-12S, NEXSTAR
6	2	040529	DECAL DANGER "ELECTROCUTION HAZARD" POWER LINE
7	2	040519	DECAL DANGER SCISSOR POINT
8	1	040579	DECAL OPERATION INSTRUCTIONS
9	1	040580	DECAL TRAINED OPERATOR
10	2	040587	DECAL WARNING LOAD SENSOR
11	1	040632	DECAL WARNING - OVERLOAD
12	1	320318	DECAL ANGLE INDICATOR CS
13	1	320318001	DECAL ANGLE INDICATOR SS
14	2	360034	DECAL AUTO CRANE LOGO
15	2	475000122	DECAL, LOAD CHART, HC-12S
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

# 4.1 QUALIFICATIONS AND OPERATING PRACTICES

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

## 4.2 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.

## 4.3 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.

## 4.4 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.

## 4.5 OPERATING PRACTICES/HANDLING THE LOAD



### CAUTION

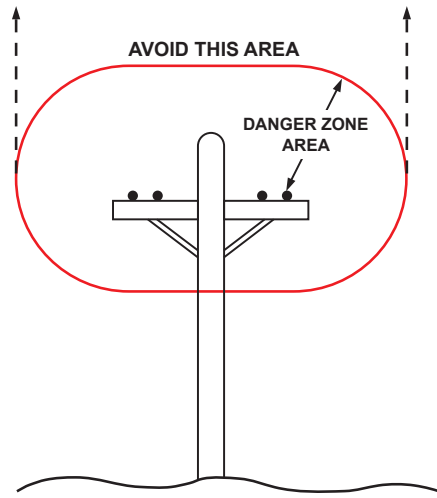
*Never use two cranes to support a load too large for either crane.*

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

## 4.6 OPERATING NEAR ELECTRICAL POWER LINES



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



**Figure 3. Danger Zone**

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 Table 1. Safe Operating Distance.

<b>Safe Operating Distance for Cranes Near Electrical Lines</b>		
<b>When operating near high voltage power lines</b>		
<b>Normal Voltage, kV - (phase to phase)</b>	<b>Minimum required clearance</b>	
	<b>Ft.</b>	<b>(m)</b>
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. 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.

## 4.7 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 (centerline 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 begin 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.
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.
3. Always observe all relevant safe policies and procedures during crane operation.
4. Always use slow and smooth movements with the crane to avoid causing the load to swing like a pendulum.

## **AFTER OPERATION**

1. After completing the lifting operations, return the boom to the stowed position on the boom support.
2. Replace remote control to its storage location.
3. Return the Outriggers to the stowed position. Ensure they are pinned in place or jacklegs 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.



# 5.1 NEXSTAR III OPERATION

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.*

## 5.2 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.

### 5.2.1 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.

### 5.2.2 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. See 5.4 DISPLAY SCREEN LAYOUT.

### 5.2.3 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.

## 5.3 REMOTE CONTROL LAYOUT

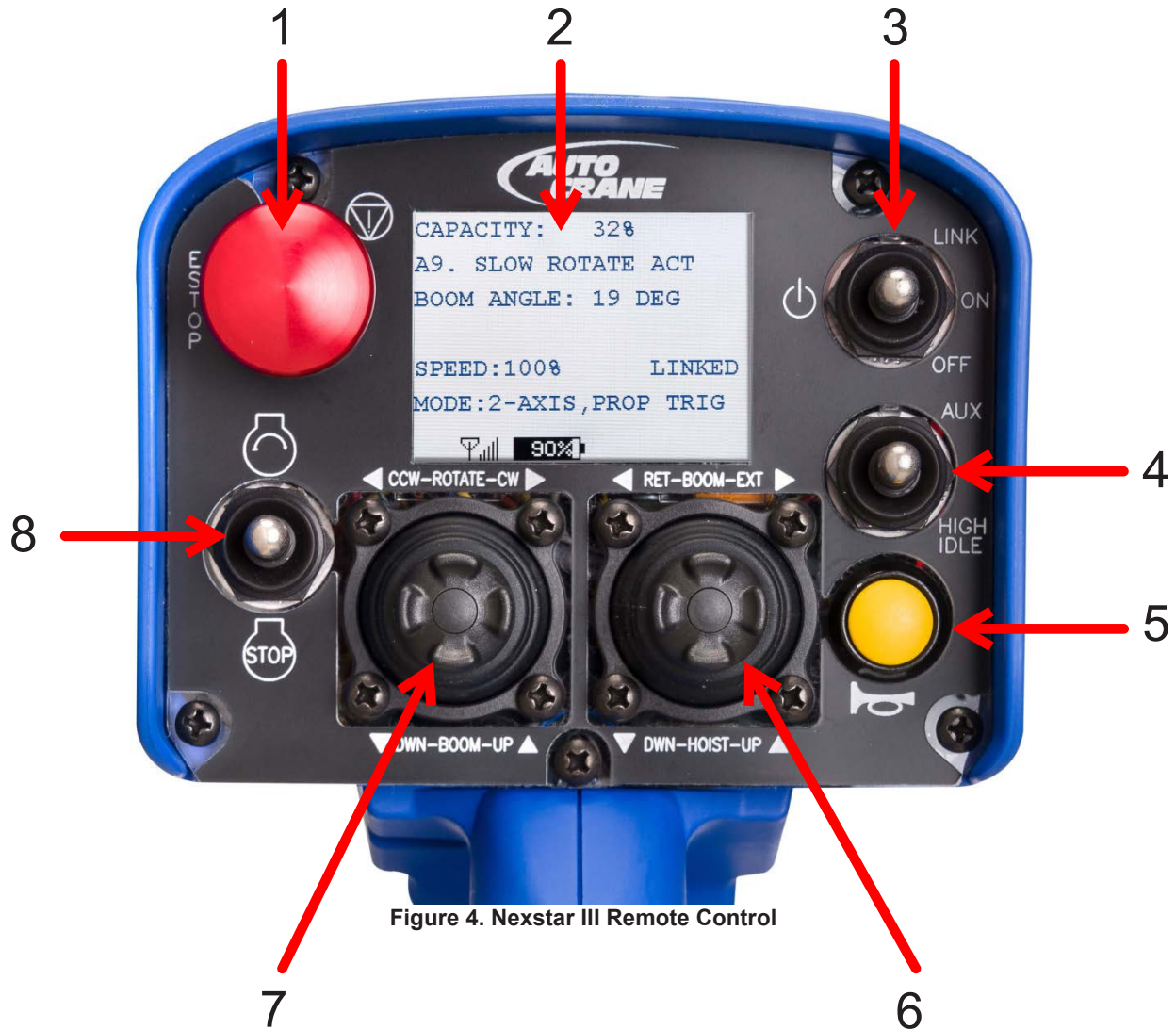


Figure 4. Nexstar III Remote Control

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. See Figure 4.
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 vehicle.
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.

## 5.4 DISPLAY SCREEN LAYOUT

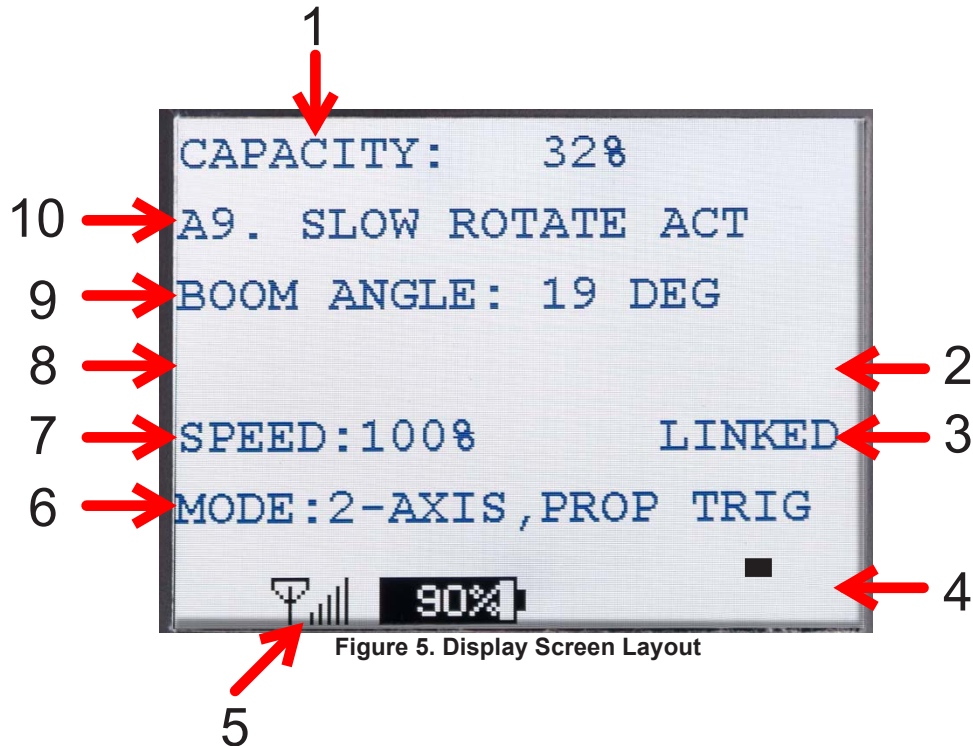


Figure 5. Display Screen Layout

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. See 5.5 SPEED AND MODE SELECTION for details.
7. **Max Speed Setting** - Displays the current max speed setting. See 5.5 SPEED AND MODE SELECTION for details.
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.

## 5.5 SPEED AND MODE SELECTION

### 5.5.1 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.

### 5.5.2 MODE SELECTION

1. Press and hold the Link Switch in the up position.
2. 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.

### 5.5.3 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.

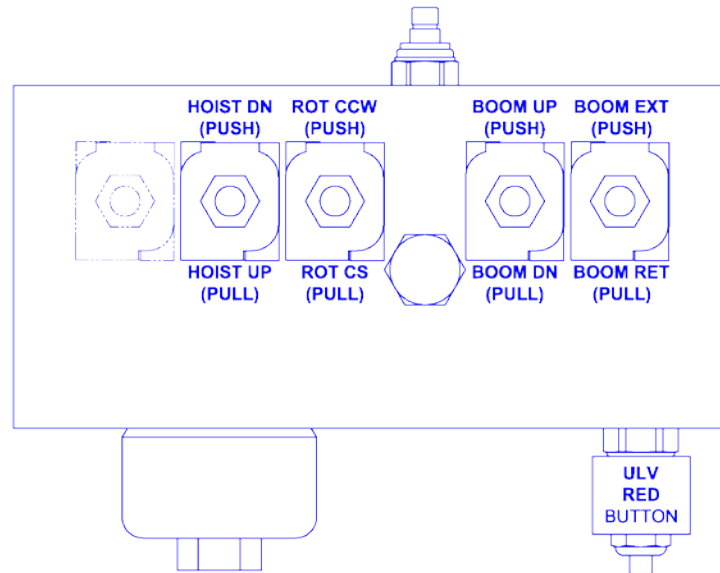
**1 AXIS, TRIGGER PROP** - Allows only one function to operate on each joystick. The joysticks are on- off and only need to be moved in the direction of the desired function. The speed control is located in the trigger. The more the trigger is pulled, the faster the function will operate.

**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.

## 5.6 OPERATION - VALVE OVERRIDE



1. Push the unloader valve (ULV) red button. This will send hydraulic fluid to the valve block.
2. Select the desired function.
3. Close the gap between the collar and the end on the override button.
4. Push or pull the override button for the desired direction of movement. The farther the button is pressed or pulled, the faster the function will operate.
5. When the manual operation is complete, release the ULV to its original position.
6. Ensure the collar is returned to the locked position. If not, the function may move on its own.

# 6.1 NEXSTAR III TROUBLESHOOTING

## 6.1.1 TROUBLESHOOTING FLOW CHART

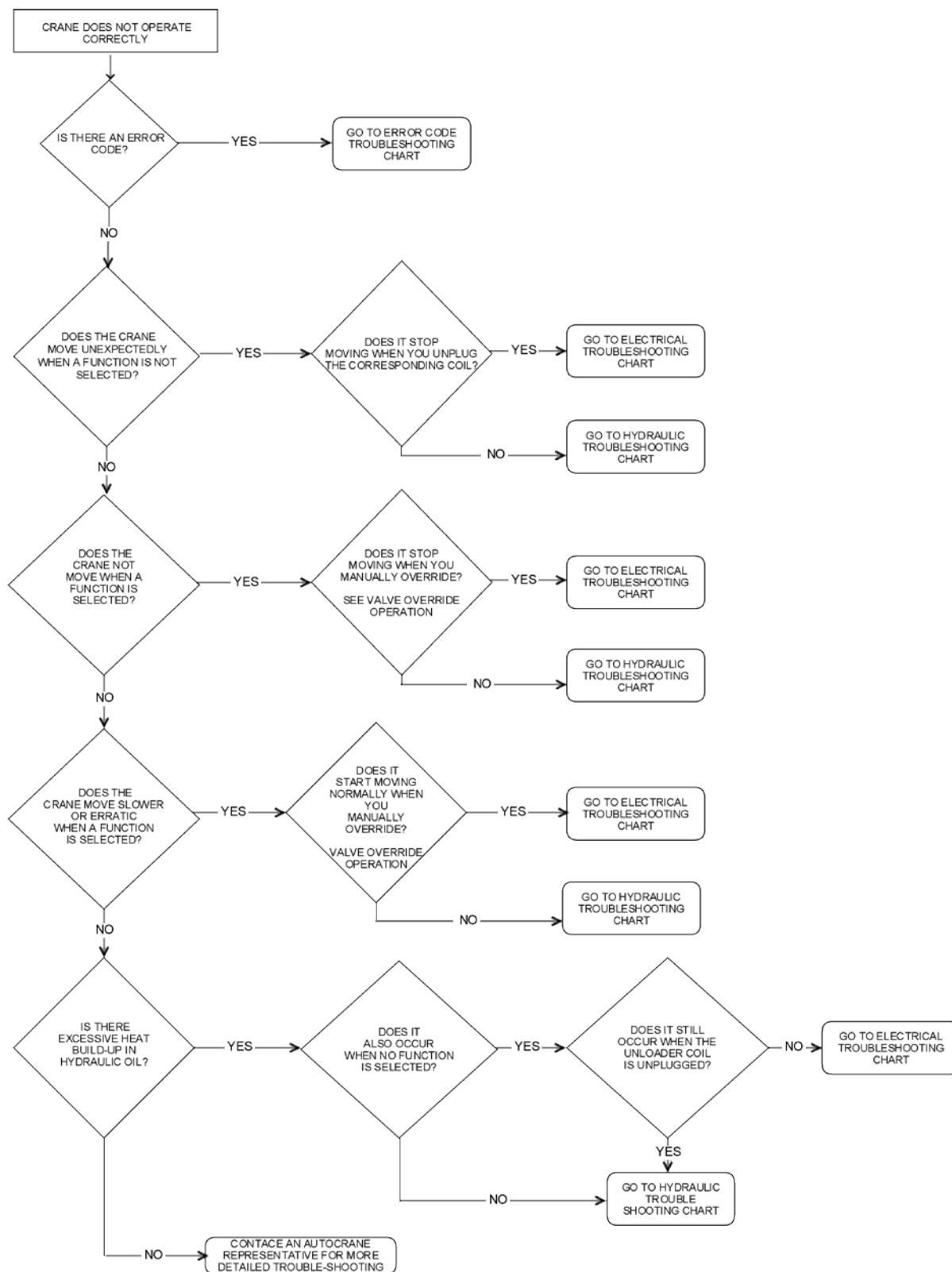


Table 2. Troubleshooting Flow Chart

## 6.1.2 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.	Replace the battery pack with the label facing out. This ensures it is installed properly. Inspect all battery pack contents for damage.
	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 remote control and the receiver have the same access code.
	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%.

Table 3. Remote Control Troubleshooting Table



## 6.1.3 NEXSTAR III ERROR CODE TABLE

Error Code	Cause	Effect	Solution
S1 CAN RX TO	Reception of a can message timed out	All outputs will be disabled	Determine why messages are not being received. When problem is corrected the alarm will clear
S2 TEMP OUT OF RANGE	Outside of operating temperature - 40° c to 85° c	All outputs will be disabled	Get temperature into acceptable range and alarm will clear after 1 minute
S16-S31 OUT X OVER-CURRENT ERR	When the output was activated, a current of more than 3.5a was being drawn.	That output will be disabled	Cycle power to receiver. If problem continues. Find what caused the overcurrent 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 will be disabled	Determine the cause of the short. Fix the cause and cycle power to the receiver
S32-S47 OUT X □ VB SHORT	When the output was supposed to be a positive voltage, it had a ground.	That output will be disabled	Determine the cause of the short. Fix the cause and cycle power to the receiver
A1 BOOM PSI LOW	Lift cylinder pressure below 50 psi	Disables all functions except boom up and hoist down	Hoist down load if applicable. 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 the error. Once the switch is deactivated the alarm will clear.
A3. CCW LIMIT	Crane has reached the limit of rotation in the ccw direction	Disables counterclockwise rotation	Rotate cw to clear the error. Once the switch is deactivated the alarm will clear.
AA. 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
AS TRK TILT ALARM	Truck angle exceeds 8.5 degrees or 15% slope	LI functions are disabled	Move vehicle to level ground
A6. ANTI 2-BLOCK	Anti 2-block is activated. The boom has contacted the traveling block.	Disables boom down, extend, and hoist up	Move load away from the boom by either retracting, hoisting down, or booming up. If there is no load near the tip of the boom check function of the bail weldment, it must come into contact with the switch plunger under normal conditions
A7 90% LOAD WARN	Reached 90% of rated capacity	All functions will only operate at 50% of speed	Reduce load to clear the alarm
AS. 100% LOAD ALARM	Reached 100% of rated capacity	Disables boom down, extend, and hoist up	Reduce the load by retracting the boom, lowering the boo, or raising the boom.
A9 SLOW ROTATE AC	Lift cylinder has exceeded 600 psi	Reduces rotation speed by 50%	This is a safety feature that prevents excessive swinging of heavy loads. It will reset when the load decreases and function is deactivated.
A10. BOM SENSOR ERR	Boom angle sensor signal failed	All functions will only operate at 50% of speed	Check connections to boom angle sensor. Verify lights are on at sensor base.
A11 BOOM ANGLE RANGE	Angle sensor is out of range	Operates normally	Boom angle sensor is mounted incorrectly. Check the 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 and hoist down	Check connections to pressure transducer located on the lift cylinder. Check the wiring harness for damage
A13 DIRTY FILTER	Filter is dirty if temperature of oil is at least 100°	Operates normally	Replace filter. Part number is 366823910

Table 4. Error Code Table



## 6.1.4 NEXSTAR III MECHANICAL TROUBLESHOOTING TABLE

Problem	Cause	Effect	Solution
<b>CRANE MOVES UNEXPECTEDLY</b>	Jammed cartridge	Try to manually override the valve. If unable to move stem, cartridge is jammed.	Replace the cartridge
	Counter-balance set too low (boom up and boom down)	Adjust the counter-balance out to see if movement stops.	Contact Auto Crane for proper setting of counter-balance. Counter-balance valve may need to be replaced.
	Contaminant in cartridge	Valve sticks in certain positions	See cartridge maintenance for cleaning procedure
<b>NO FUNCTION OPERATES ON THE CRANE</b>	Pto not engaged	Check PTO activation light, usually located in the cab	Engage PTO
	Crane diverter valve not engaged	Is using Auto Crane outriggers, check the crane diverter valve located at the outrigger valve	Engage crane diverter valve
	Hydraulic tank is low or empty	Inspect the hydraulic oil level in the tank	Fill tank to proper level
	Vehicle is not running	Verify engine is running	Start the vehicle
<b>ALL FUNCTIONS OPERATE SLOWLY</b>	Fast idle not activated	If vehicle is manual transmission, verify fast idle is shown in the LCD screen	Activate fast idle
	Filter clogged	Check LCD screen	Replace filter
<b>EXCESSIVE HEAT DURING OPERATION</b>	Operation time	Crane operation is generally designed for intermittent duty. 2 hours before oil gets hot	Reduce use of crane, increase hydraulic tank size, or add oil cooler
	Unloader valve overridden	Check the unloader valve and verify the manual override is not activated ref. Page.	Deactivate unloader valve
	Undersized hydraulic tank	Hydraulic tank should be at least 2 x gpm = gallons. This includes any other accessories that operate from the same tank	This is a general rule. Many factors affect heat: ambient temperature pressure loss, operation time. For example, a smaller tank could be used with more intermittent use or in cold environments
<b>CRANE MOVES UNEXPECTEDLY</b>	Jammed cartridge	Try to manually override the valve. If unable to move stem, cartridge is jammed.	Replace the cartridge
	Counter-balance set too low (boom up and boom down)	Adjust the counter-balance out to see if movement stops.	Contact autocrane for proper setting of counter-balance. Counter-balance valve may need to be replaced.
	Contaminant in cartridge	Valve sticks in certain positions	See cartridge maintenance for cleaning procedure
<b>NO FUNCTION OPERATES ON THE CRANE</b>	PTO not engaged	Check PTO activation light, usually located in the cab	Engage PTO
	Crane diverter valve not engaged	Is using Auto Crane outriggers, check the crane diverter valve located at the outrigger valve	Engage crane diverter valve
	Hydraulic tank is low or empty	Inspect the hydraulic oil level in the tank	Fill tank to proper level

Table 5. Mechanical Troubleshooting Table

## 6.1.5 NEXSTAR III ELECTRICAL TROUBLESHOOTING TABLE

Problem	Cause	Effect	Solution
<b>CRANE MOVES UNEXPECTEDLY</b>	Jammed transmitter button	Activate e-stop to see if movement stops	Verify that nothing had depressed the button at the time of movement. If it was not depressed, replace the transmitter
	Short in wiring harness	Unexpected movement would only occur when multi-functioning. Unplug the coil to see if movement stops. Check amperage to coil using multimeter in line with coil. It should be no more than 100ma	Verify there is no damage to the wiring harness. Verify the connectors are free of debris and water
	Receiver locked up	Bottom right corner is a circle with an arrow. This should be rotating at all times when the crane is turned on	If the arrow stops rotating, shut power off to the crane for two minutes before turning the power back on. If the problem persists, contact technical support.
<b>NO FUNCTION OPERATES ON THE CRANE</b>	Transmitter turned off	Screen on transmitter is off	Turn on transmitter. Pull e-stop button out.
	E-stop active	Check LCD screen. Error stating e-stop is active displays on screen.	Pull e-stop button out.
	Receiver turned off	Check the LCD screen, if it is blank, the receiver is turned off.	Most cranes have a toggle switch to turn on the crane. This is usually located in the cab or crane box.
	Low battery	While the transmitter is turned on, the battery indicator on the LCD screen should be at least 10%.	Replace transmitter batteries. It requires 4 aa batteries.
	Receiver locked up	Bottom right corner is a circle with an arrow. This should be rotating at all times when the crane is turned on.	If the arrow stops rotating, shut power off to the crane for two minutes before turning the power back on. If the problem persists, contact technical support.
	Truck tilt alarm active	Check the LCD screen for the error code "trk tilt alarm"	This error occurs when the truck angle exceeds a 15% slope (8.5°). Relocate the truck to a flatter surface.
<b>BOOM DOWN, EXTEND, HOIST UP</b>	Anti-two block	Check screen for error code. It will display "anti 2 block error."	Verify the traveling block is not contacting the bail. If hoist down and check function again. Inspect end of boom to verify bail is in contact with anti-2 block switch. Check bail spring. Check cord reel and wire on side of crane for damage.
	Crane overload	Check screen for error code. It will display 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.
<b>EXTEND, RETRACT, HOIST UP, BOOM UP, ROTATE CW, ROTATE CCW ARE INOPERABLE</b>	Low boom pressure	Check screen for error code. It will display "boom psi low."	Verify boom is not supported by anything except the lift cylinder. This includes the boom support on the vehicle.

<b>Problem</b>	<b>Cause</b>	<b>Effect</b>	<b>Solution</b>
<b>ROTATE CW IS INOPERABLE</b>	Reached limit for cw rotation	Check screen for error code. It will display "CW limit"	Verify the CW limit switch is not activated. This should normally be closed.
	Bad coil or damaged wire	Screen will display 0% next to sp but the rotate CW function will be shown.	Switch coil with another function. Replaced coil if bad. Check wiring for any damage.
<b>ROTATE CCW IS INOPERABLE</b>	Reached limit for CCW rotation	Check screen for error code. It will display "CCW limit"	Verify the CCW limit switch is not activated. This should normally be closed.
	Bad coil or damaged wire	Screen will display 0% next to sp but the rotate CCW function will be shown.	Switch coil with another function. Replaced coil if bad. Check wiring for any damage.
<b>ALL FUNCTIONS ARE INOPERABLE EXCEPT BOOM DOWN AND HOIST DOWN</b>	Pressure transducer is unplugged	Check LCD screen. It will display "boom pt error"	Verify pressure transducer located on the lift cylinder valve block is plugged into the harness.
<b>ANY PARTICULAR FUNCTION IS NOT OPERABLE.</b>	Bad coil or wiring harness damage	Check LCD screen when the function is selected, it should show the function operating but at 0%	Switch coil with another function. Replace coil if bad. Check wiring harness for damage
<b>CRANE ROTATES SLOWLY</b>	Slow rotate activated	Check LCD screen, it will display "slow rotate act"	This is a safety feature to prevent getting the load into 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	Retract the boom to decrease the load
<b>ALL FUNCTIONS OPERATE SLOWLY</b>	Wrong speed setting is selected	Check the transmitter. There should be a green led directly below the current speed selected.	Adjust the speed to the preferred speed. See mode and speed selection.
	Boom angle sensor error	Check LCD screen for error code. It will display "boom sensor err"	Verify the boom sensor is plugged into the harness. Check connection between harness and sensor
	90% load activated	Crane is at or over 90% of its rated capacity	This is a safety feature to prevent getting into an unsafe condition (sudden movement of heavy load). 90% load 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 will display "trk tilt warn."	Move vehicle or raise outrigger to a more stable, level position.

**Table 6. Electrical Troubleshooting Table**

# 7.1 MAINTENANCE

## 7.1.1 INSPECTION REQUIREMENTS

### NOTICE

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



### WARNING

*All inspections shall be performed by designated personnel only.*

## 7.1.2 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.

## 7.1.3 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.*

## 7.1.4 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.
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.

### 7.1.5 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.

### 7.1.6 INSPECTION RECORDS

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

## 7.2 TESTING REQUIREMENTS

### NOTICE

*Reference ASME B30.5a 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.

## 7.3 GENERAL REPAIRS AND MAINTENANCE

### NOTICE

*Reference ASME B30.5a 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.

### 7.3.1 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.



### **7.3.2 ADJUSTMENTS AND REPAIRS**

1. Any hazardous conditions disclosed by the inspection requirement shall be corrected before operation of crane is resumed.
2. Adjustments shall be maintained to assure correct of functioning of components, the following are examples:
  - a. Function operating mechanism.
  - b. Safety devices.
  - c. Control systems.
3. Repairs or replacements shall be provided as needed for operation, the following are examples:
  - a. Critical parts of functional operating mechanisms which are cracked, broken, corroded, bent, or excessively worn.
  - b. Critical parts of the crane structure which are cracked, bent, broke, or excessively corroded.
  - c. Crane hooks showing cracks, damage, or corrosion shall be taken out of service. 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.

### **7.3.3 LUBRICATION**

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

### **7.3.4 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.

### **7.3.5 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 pre-formed 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.

### **7.3.6 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.



## 7.4 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.	X				
Cable Drum	Ensure cable is wound evenly on drum.	X				
Hoist/Boom Cable	Check for flattening, kinks, broken strands.	X				
Hyd. Hoses	Visual inspection.	X				
Hyd Fluid	Check fluid level.	X				
Pin Retaining Bolts	Check torque to 23 ft lbs(Grade 5) 35 ft-lbs (Grade 8) as required	X				
Mounting Bolts	Check torque to 501 ft-lbs as required		X			
Rotating Ring Gear	Lube with MobileTac LL or Lubriplate P/N 15263, or equivalent		X			
Sheave Bearings	Sealed bearing, replace if rough or loose		X			
All Other Bolts	Check and tighten as required		X			
Lift Cylinder Bearings	Grease with MobilePlex EP-2 or equivalent at zerk fittings			X		
Rotation Bearing	Grease with MobilePlex EP-2 or equivalent at zerk fittings			X		
Rotation Bearing Bolts	Check torque to 170 ft-lbs (hex head) 180 ft-lbs (socket head) as required			X		
Rotation Gear Box	Check torque to 90 ft-lbs (socket head) and 55 ft-lbs (hex head) as required			X		
Rotation Gear Box	EP gear lube, SAE 80-90				X	
Hydraulic Fluid	Drain, flush, and refill with Mobile DTE 13 oil					X
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 B30.5a.						

**Table 7. Lubrication and Maintenance Schedule**

## 7.5 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.
2. Once a bolt has been tightened to specification then removed, the bolt should be replaced with a new one.
3. Auto Crane Company recommends this crane be serviced per the "Crane Inspection Log" P/N 999978. Fill these logs in at the intervals noted and kept as a permanent record. Additional copies are available from your local distributor.

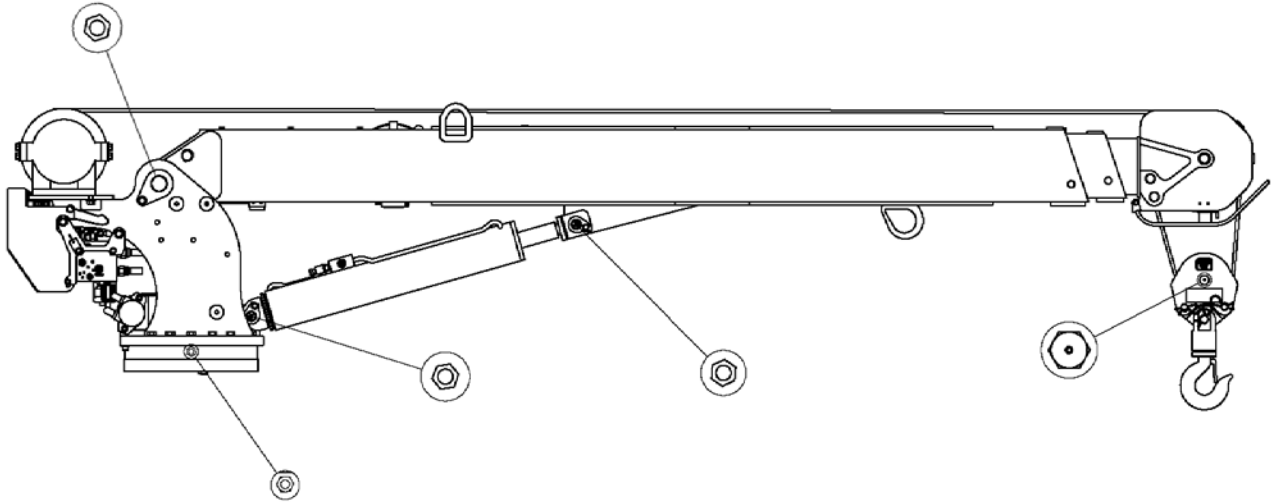


Figure 6. Lubrication Points

## 7.6 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.

### 7.6.1 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

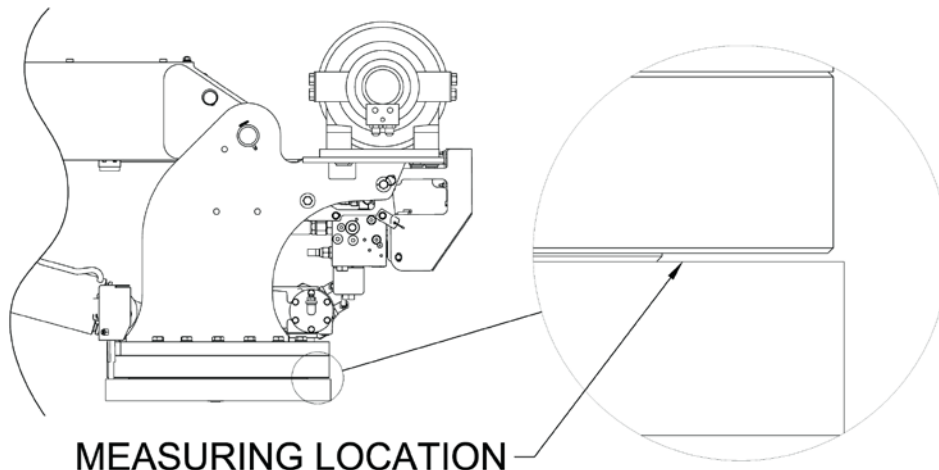
*Never try to repair a rotation bearing. For a replacement bearing contact your local authorized distributor.*

### 7.6.2 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. See Figure 1 for location.
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.

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

4. Rotate crane 45° then repeat steps 1 and 2 until you reach 360° of rotation.



MEASURING LOCATION

Figure 7. Rotation Bearing Replacement



#### WARNING

*When replacing rotation bearing, use the new hardware included in the kit.*

## 7.7 HC-12S NEXSTAR III, CARTRIDGE MAINTENANCE



VERIFY MOVEMENT IN PORTS WHILE  
MANUALLY OVERRIDING CARTRIDGE



**Table 8. Cartridge Maintenance**

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

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

# 8.1 CRANE MOUNTING AND INSTALLATION

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

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



## CAUTION

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

2. Install the correct sized and length of hydraulic hose. See General Dimensions.

## NOTICE

*The recommended hydraulic reservoir size for the average industry application CRANE ONLY installation is two times the crane hydraulic flow rate. For crane applications requiring more than 25% crane operation time while the PTO is engaged and/or additional equipment is operated by the same hydraulic system, install an appropriately sized larger hydraulic reservoir and/or forced air, hydraulic oil cooler.*



## CAUTION

*Hydraulic reservoir oil temperature must not exceed 180 °F or crane performance may be adversely affected.*

3. The crane has minimum hydraulic requirements. See General Dimensions.

## NOTICE

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

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

## NOTICE

*Use relays for all electrical connections between the crane and the vehicle. This will isolate the electrical systems as much as possible.*

- a. Connect the BLACK wire to the battery negative (ground).
- b. Connect the RED wire to fused 12VDC power. Supply 12VDC power through a dedicated switch that is only powered when the ignition switch is on.
  - i. Optional connections:

## NOTICE

*If you have a BROWN wire instead of a WHITE wire, use the colors in parenthesis.*

1. Connect the WHITE (BROWN) wire for engine fast/slow. 12VDC maintained- FM ONLY.
2. Connect the BLUE (YELLOW) wire for engine start.
3. Connect ORANGE (GREEN) wire for engine stop.
4. Connect the GREEN (BLUE) wire for auxiliary. 12VDC maintained- FM ONLY.



## WARNING

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

11. With crane installed and plumbed on the truck, fill the reservoir to the top of the sight glass using Mobile DTE 13 or equivalent.
12. Before operating the crane, connect the pressure and return hoses together with a JIC union.
13. Engage the PTO with the engine running and allow the oil to circulate for 15- 20 minutes. This will flush any contaminants from the system back to the return line filter.
14. Connect the pressure and return hoses to the correct locations on the crane.
15. Operate all cylinders to the fully extended and fully retracted positions at least six times to bleed air from the system.
16. Return all cylinders to the retracted and stored position.
17. Disengage the PTO.
18. Refill the reservoir to the top of the sight glass.
19. Install an in-line flow meter in the return hose between the crane and the reservoir. Ensure the crane is receiving the correct gallons per minute of flow based on your crane.
20. If there is sufficient flow to the crane, perform a load test to ensure proper operation of the crane and truck stability.
21. Ensure the Owner's Manual is delivered to the customer.
22. For additional help: Call the Service Department at the Auto Crane Company, 1- 800-777-2760, located in Tulsa,

OK

## IMPORTANT!

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**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).

## 8.1.1 HC-12S 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 approx. 70° angle.
7. Lower the boom and read the pressure gauge. If the pressure reading is not approx. 1300 psi, the counterbalance valve requires 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.

## 8.2 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

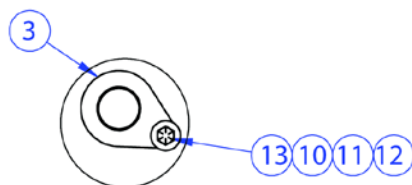
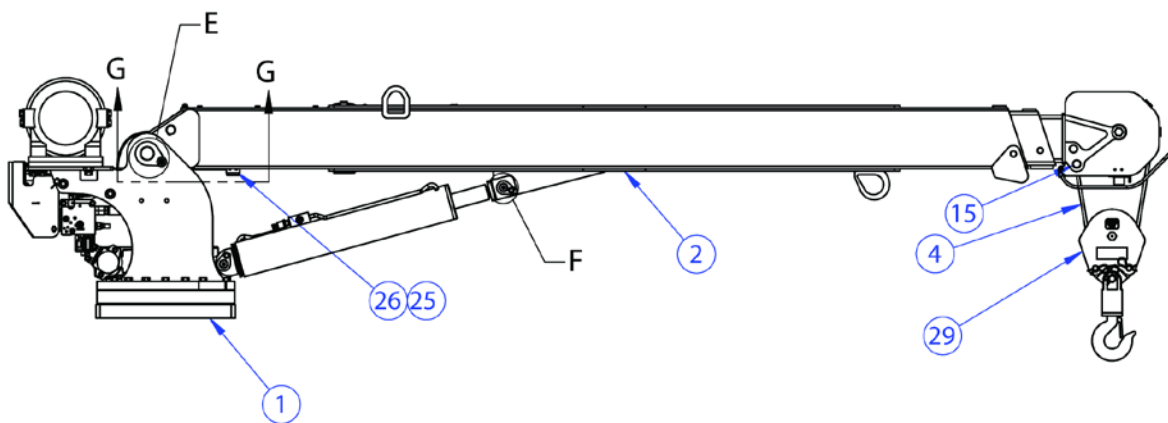
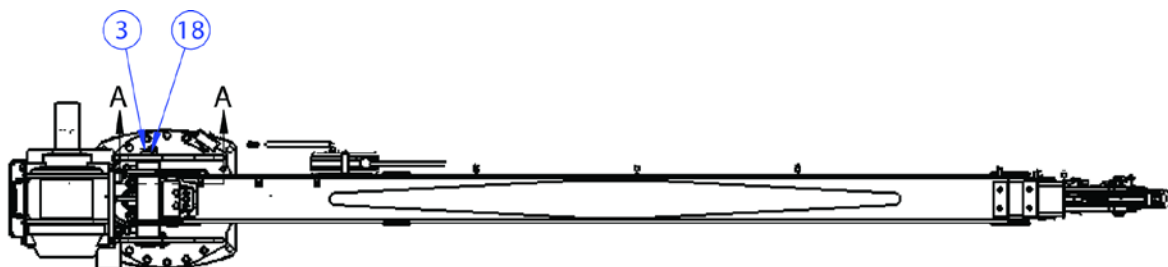
*Remove any personnel from near the crane as the load is lowering.*

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.

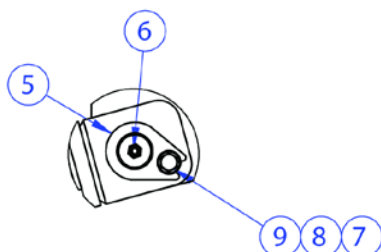


# 9.1 DRAWINGS AND ASSEMBLIES

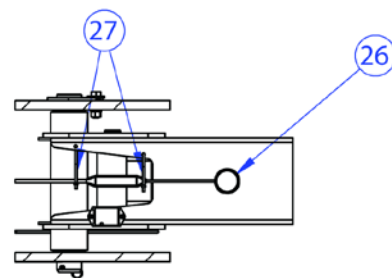
## HC-12S NEXSTAR III, GENERAL ASSEMBLY P/N: 475000003



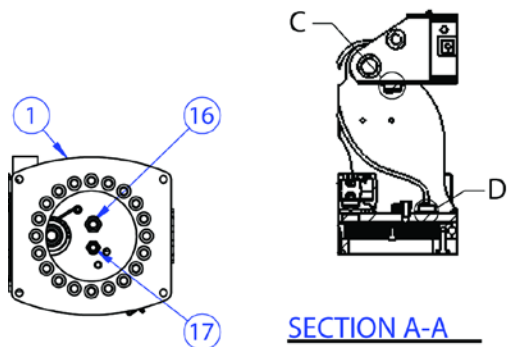
DETAIL E



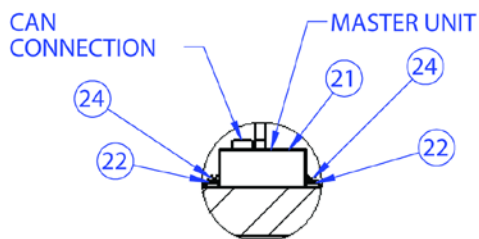
DETAIL F



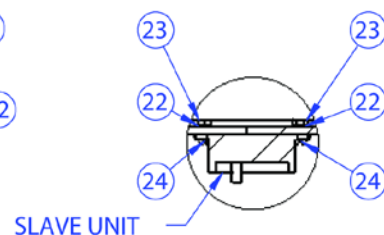
SECTION G-G



SECTION A-A



DETAIL D



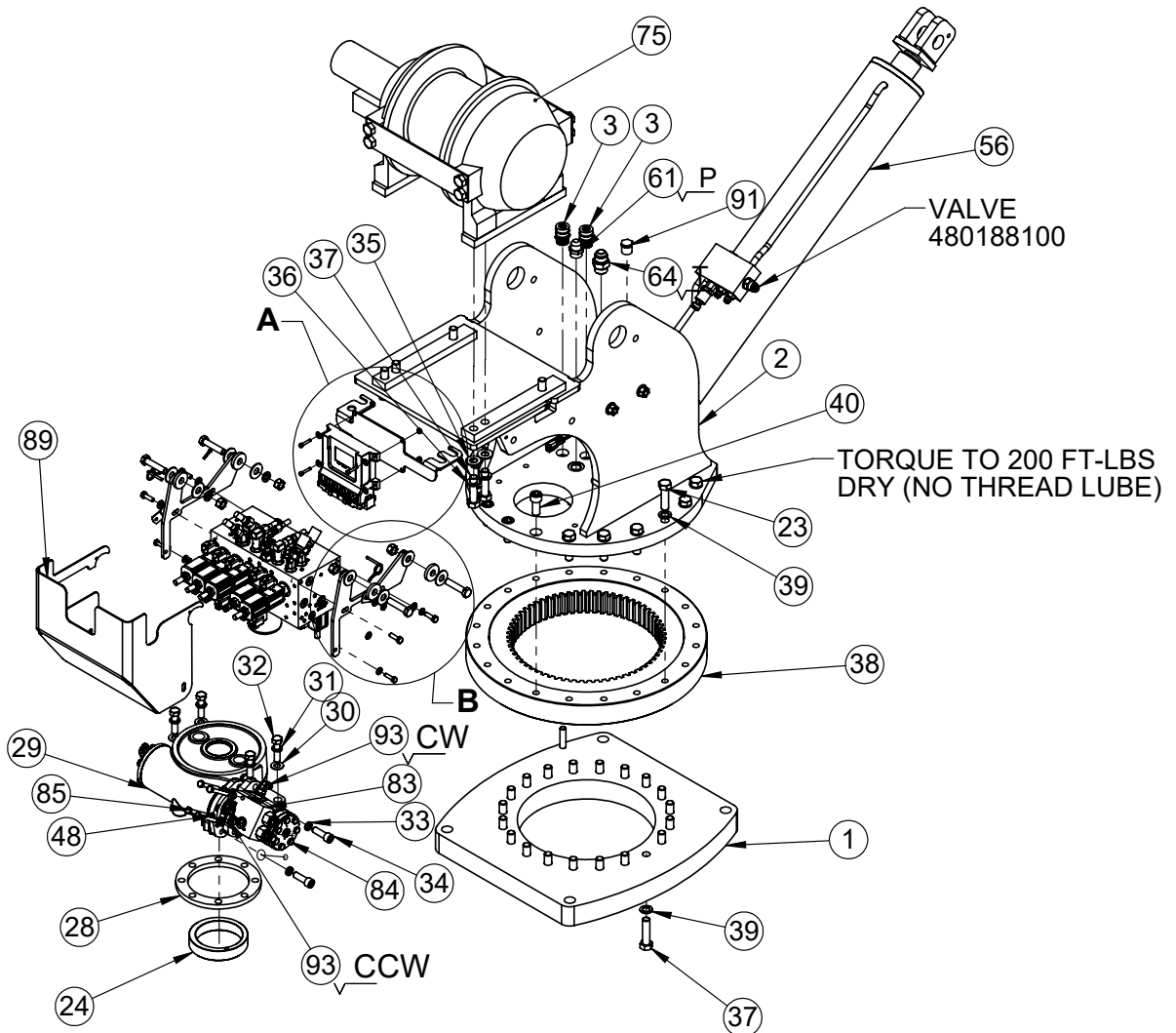
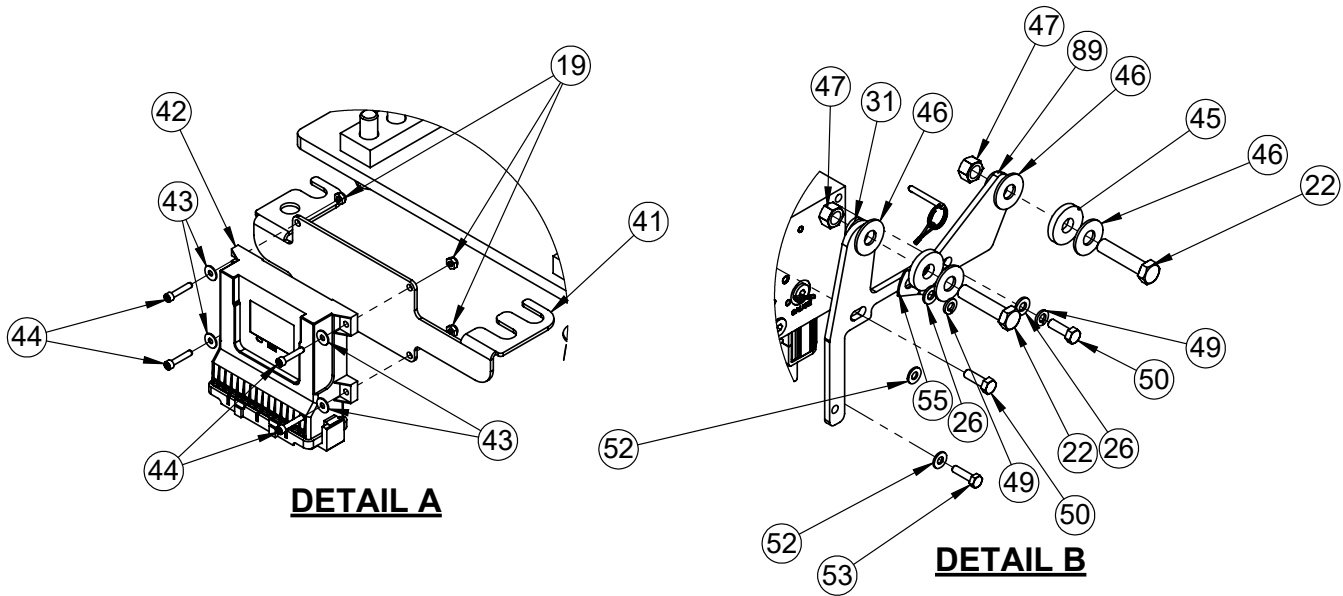
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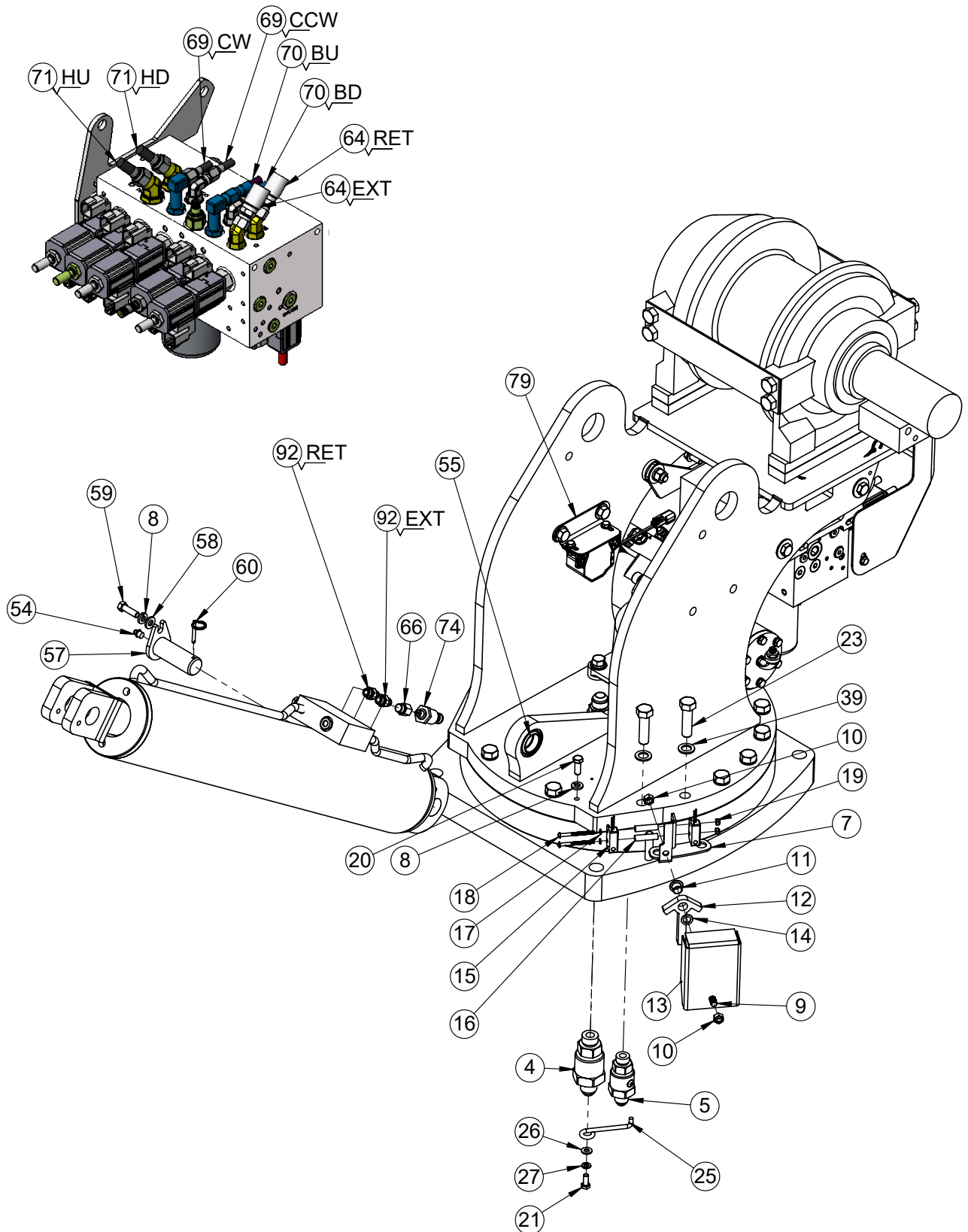
# **HC-12S      NEXSTAR III, GENERAL ASSEMBLY P/N: 475000003**

ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	475200003	PEDESTAL ASSY, HC-12S, NEXSTAR
2	1	460178100	BOOM ASSEMBLY, 10006H W/LIGHT
3	1	460177020	PIN, 2 IN OD, 13.25 IN GRIP, BOOM PIVOT
4	1	460090020	WIRE ROPE ASSY
5	1	360676000	PIN, CYLINDER
6	1	239300000	ZERK, GREASE
7	1	320976000	WASHER, FLAT, 3/8 SAE HARDENED
8	1	021100000	WASHER SP LK 3/8
9	1	008702000	SCREW HX HD 3/8-16UNC X 1 1/4 LG GR5
10	1	021600000	WASHER FL 1/2
11	1	021500000	WASHER, SP LK 1/2
12	1	017701000	NUT HX 1/2-13UNC
13	1	738642000	SCREW HX HD 1/2-13UNC X 1 3/4 LG GR8
14	1	360124000	PIN HITCH
15	1	470076000	PIN, 1 DIA 4-11/16 LG
16	1	750419000	CAP, 12 JIC
17	1	367238000	CAP, 10 JIC
18	1	360677000	PIN, 1/4 COTTERLESS RING
19	1	360678000	PIN, 3/16 COTTERLESS RING
20	1	460179025	SHIP KIT, HC-12S, NEXSTAR
21	1	366823254	SENSOR, TRI-AXIS
22	4	019700000	WASHER SP LK #8
23	2	015500000	NUT HX #8-32UNC CP
24	4	001302000	SCREW RD HD #8-32UNC X 1/2 LG
25	1	002902000	SCREW SOC HD 1/4UNC X 1/2 GR8
26	1	366823236	LIGHT, LED (RED, GREEN, YELLOW)
27	2	772043000	ZIP TIE STRAP, 12 IN, NYLON, BLACK
28	1	330622000	DECAL SERIAL NO
29	1	475000300	TRAVELING BLOCK ASSEMBLY 12006
30	1	460179026	DECAL LAYOUT, HC-12S, NEXSTAR

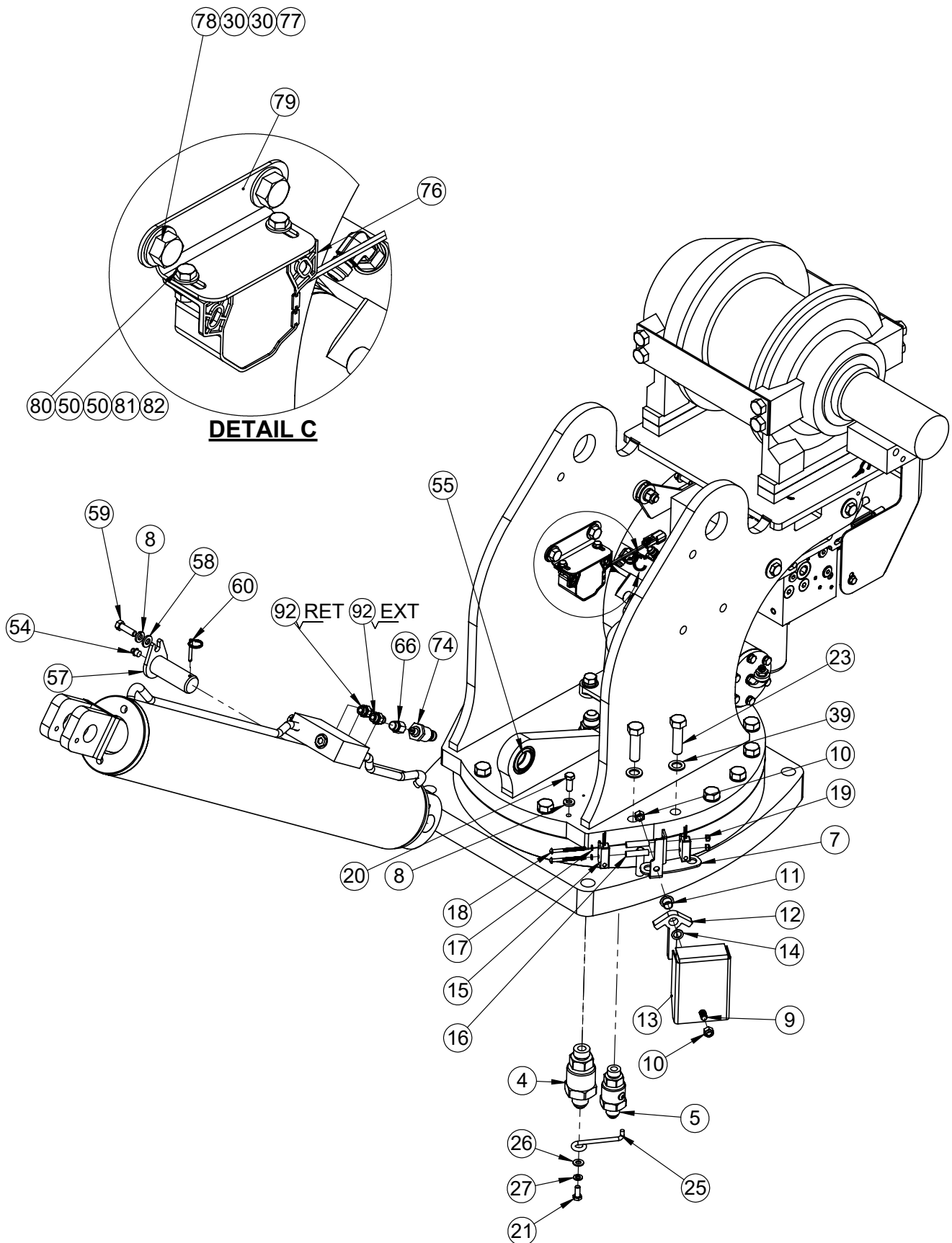
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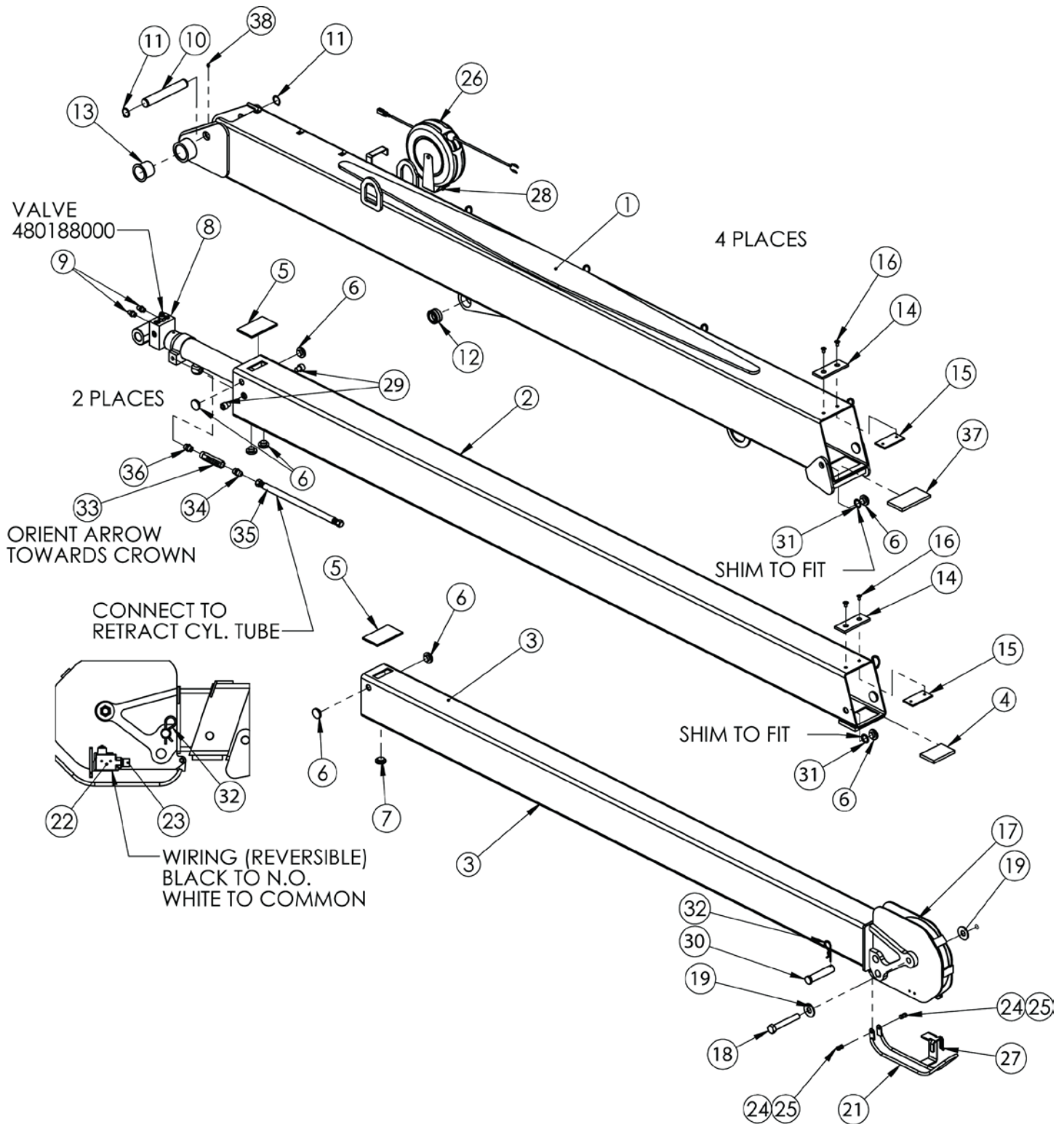
ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	460177224	BASE WELDMENT, HC-10
2	1	460177210	PEDESTAL WELDMENT, 10006
3	2	366698010	CORD GRIP .25-.38 3/4" HUB
4	1	460086000	FITTING, -12 SAE / -12 JIC, SWIVEL, STR
5	1	366358	FITTING, -10 SAE / -10 JIC, SWIVEL, STR
6	1	460178253	TAG, ID HC-10/12S
7	1	460177256	BRACKET, ROTATION STOP, HC-10
8	2	021100	WASHER SP LK 3/8
9	1	366673000	PIN, ROTATION STOP
10	2	017301	NUT HX NYLK 3/8-16UNC CP
11	1	460079000	BEARING, ROTATION STOP
12	1	366671000	ARM, ROTATION STOP
13	1	366676000	COVER, ROTATION STOP
14	1	366675000	WASHER, NYLON
15	2	739316142	SENSOR, FERROUS PROXIMITY N.C.
16	2	470035007	SPACER, UNTHREADED NYLON, .375 OD, .192 ID
17	2	020001000	WASHER IN LK #10
18	2	002609001	SCREW, RD HD, #10-24, 2.25 LG, ZINC PLATED
19	6	015801	NUT HX NYLK #10-24UNC ZP
20	1	330371000	SCREW HX HD 3/8UNC X 1 GR8
21	1	330252000	SCREW HX HD 5/16UNC X 3/4 ZP GR5
22	4	366391000	SCREW HX HD 1/2UNC X 2 1/4 ZP GR 5
23	14	490171	SCREW HX HD 5/8-11UNC X 2 1/4 LG GR8
24	1	360162	RING, ECCENTRIC, 5 IN DIA
25	1	360207	RETAINER ECCENTRIC RING
26	5	020901	WASHER FL 5/16
27	1	020601	WASHER SP LK 5/16
28	1	480011	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	011608	SCREW HX HD 1/2-13UNC X 2 LG
33	2	021502	WASHER SP LK 1/2 HI COLLAR
34	2	012197	SCREW SOC HD 1/2-13UNC X 1/2 LG
35	6	407314000	WASHER FL 5/8 X 1 5/16 OD HARDENED
36	6	023800	WASHER SP LK 5/8
37	26	366393	SCREW HX HD 5/8-11UNC X 2 1/2 LG GR8
38	1	372064	ROTATION BEARING
39	34	023902	WASHER FL 5/8 HARDENED
40	3	460098000	SCREW SOC HD 5/8-11UNC X 1 1/2 LG GR8
41	1	460178212	BRACKET, RECEIVER MTG, 10006H
42	1	366823252	RECEIVER, PROPORTIONAL W/LCD
43	4	020000	WASHER FL #10 ZP
44	4	460094000	SCREW, SOC HD, #10-24 X 1"L, ZPL
45	4	366823211	SPACER, VALVE BANK
46	8	021600	WASHER FL 1/2
47	4	017701	NUT HX 1/2-13UNC

# HC-12S NEXSTAR III PEDESTAL ASSEMBLY P/N: 475200003

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
48	6	020600	WASHER 5/16 LOCK SS
49	4	007811000	SCREW HX HD 5/16-18UNC X 1 LG GR5
50	8	020400	WASHER FL SAE 1/4
51	2	005604	SCREW HX HD 1/4-20UNC X 1 LG
52	2	016300	NUT HX NYLK 1/4-20UNC
53	2	366823240	PIN, 3/16 W/LANYARD
54	1	239300	ZERK, GREASE
55	1	366333	BEARING, SPHERICAL 1.25 ID
56	1	460177240	CYLINDER, LIFT
57	1	360676000	PIN, CYLINDER
58	1	320976000	WASHER, FLAT, 3/8 SAE HARDENED
59	1	008702000	SCREW HX HD 3/8-16UNC X 1 1/4 LG GR5
60	1	360678000	PIN, 3/16 COTTERLESS RING
61	1	490199	FITTING STR 10-SAE/10-JIC
62	2	812203023	HOSE ASS'Y 6JIC-6JIC, STR 23 LG
63	1	374086	NYLON HOSE SLEEVE, 1.81" ID, 5" LONG
64	1	750420000	FITTING, STR 12 SAE ORB - 12 JIC
65	2	770055000	FITTING 8 SAE/8 JIC STRAIGHT
66	1	369611000	ADAPTER, STR -6 ORM/ -4 ORF
67	2	480205000	HOSE ASSY (ROTATION)
68	2	812203038	HOSE ASSY 6 STR
69	2	480203000	HOSE ASSY 8 STR X 24.75
70	1	812503023	HOSE ASSY, -12 HOSE, -12JICF/-12JICF, 23" LG
71	1	812403019	HOSE ASSY 10 JIC STR
72	1	813015000	KIT, HOSE, 10006H, FOR 46017800X
73	1	480989255	KIT, ELEC/HYD NEXSTAR III, 9 GPM AND ABOVE
74	1	366823255	TRANSDUCER, PRESSURE 0-3000 PSI
75	1	123449	HOIST, RPH 6000, 3000 PSI
76	1	366823223	KIT, ALARM, CONSTANT TONE, W/ DEUTSCH PLUG
77	2	738058008	NUT HX 1/2-13UNC
78	2	010201	SCREW HX HD 1/2-13UNC x 1 1/2 LG
79	1	366823224	BRACKET, ALARM, HC-6 TO HC-10
80	2	005500	SCREW HX HD 1/4-20UNC X 3/4 LG
81	2	020200	WASHER SP LK 1/4
82	2	015900000	NUT HX 1/4-20UNC SS
83	1	320989435	MOTOR CONTROL COUNTERBALANCE MANIFOLD
84	1	320989436	MOTOR, 5.87 IN^3/REV MANIFOLD PORTING
85	4	414159	CAPSCREW-5/16-18NC X 2.50 LG HX HD Z/P NYLON PATCH
86	1	739316143	HARNESS, ADAPTER, PROXIMITY ROTATION SWITCHES
87	2	460178218	BRACKET, VALVE MTG, 10/12S (LONG BOWL)
88	1	480989251	VALVE BANK, 15 GPM W/FILTER SENSOR
89	1	460178025	COVER, VALVE REAR MTD FM 10006H/12S
90	1	366823228	HARNESS, NEXSTAR III HYD. CRANES W/TELEMATICS
91	1	642908	CORD CONNECTOR
92	2	200876	FITTING STR 6 SAE/6 JIC
93	2	241175	FITTING 90 6 SAE/6 JIC



# HC-12S NEXSTAR III, BOOM ASSEMBLY P/N: 460178100

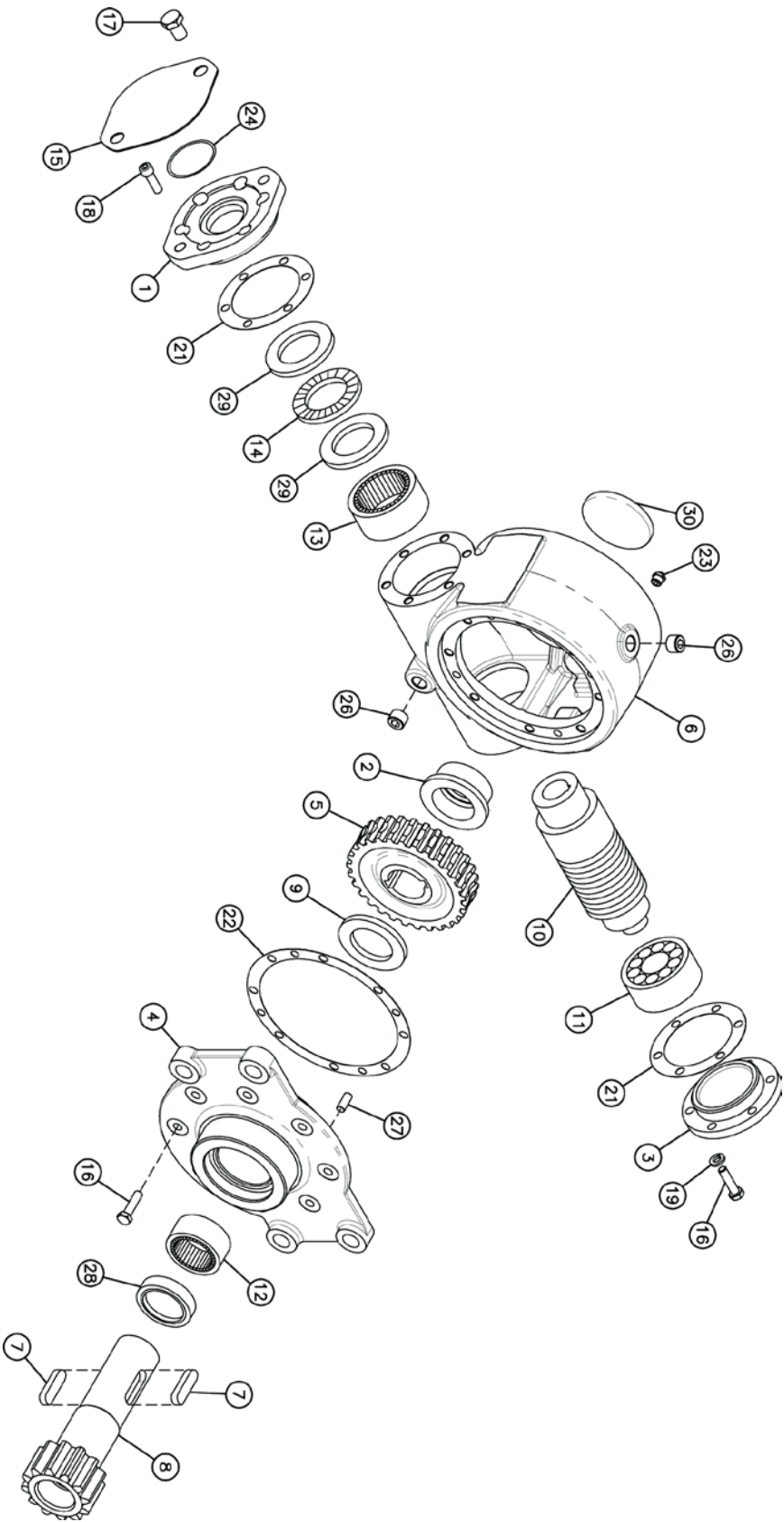




# HC-12S NEXSTAR III, BOOM ASSEMBLY P/N: 460178100

ITEM NO.	QTY	PART NUMBER	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, 5.13X3X.25, BOSS 1X3
6	10	360767000	PAD BOOM 1.5 O.D.
7	1	407277000	PAD BOOM 1.5 O.D.
8	1	460177150	EXTENSION CYLINDER, 2.75/2.50 BORE
9	2	200876	FITTING 6 SAE/6 JIC STRAIGHT
10	1	460177161	PIN, 1.25OD, 7.81 GRIP
11	2	480029	RING RETAINING
12	1	366333	BEARING, SPHERICAL 1.25 ID
13	2	366394	BEARING, PIVOT
14	2	460081000	WEAR PAD, CABLE
15	2	460082000	PLATE, WEAR PAD RETAINER
16	4	460177163	SCREW SOC HD CTRSNK 5/16-24UNF X 5/8 LG
17	1	466130	SHEAVE ASSY 3/8
18	1	014400	SCREW HX HD 3/4-16UNF X 5 LG GR5
19	2	022102	WASHER FL 3/4
20	1	018600	NUT HX NYLK 3/4-16UNF
21	1	470110165	LONG TAB BAIL WELDMENT W/ 2 IN TRIP BAR
22	1	646900	SWITCH, LIMIT ANTI-TWO BLOCK
23	1	642918	CORD CONNECTOR
24	2	007807	SCREW HX HD 5/16-18UNC X 3/4 LG GR5
25	2	016801	NUT HX NYLK 5/16-18UNC CP
26	1	360759001	CORD REEL ASSY
27	1	366678000	SPRING, EXTENSION
28	1	360882000	NUT, PUSH-ON TYPE (.161-.164DIA)
29	2	460177162	SCREW SOC HD 5/8-11UNC X 3/4 LG
30	1	470076000	PIN, 1 DIA 4-11/16 LG
31	4	460177164	SHIM, 1.31 OD X 0.9 ID X 0.04 TH, NYLON
32	1	360124	PIN HITCH
33	1	460177180	VALVE, IN-LINE RELIEF, 400PSI
34	1	770055000	FITTING 8 SAE/8 JIC STRAIGHT
35	1	812234017	HOSE ASSY, -8 JICF/-8 JICF, -6 HOSE, 17LG
36	1	374400000	FITTING, -8 ORB, -8 ORB, STRAIGHT
37	1	366669000	WEAR PAD, BOTTOM MID
38	1	239000	ZERK DRIVE GR

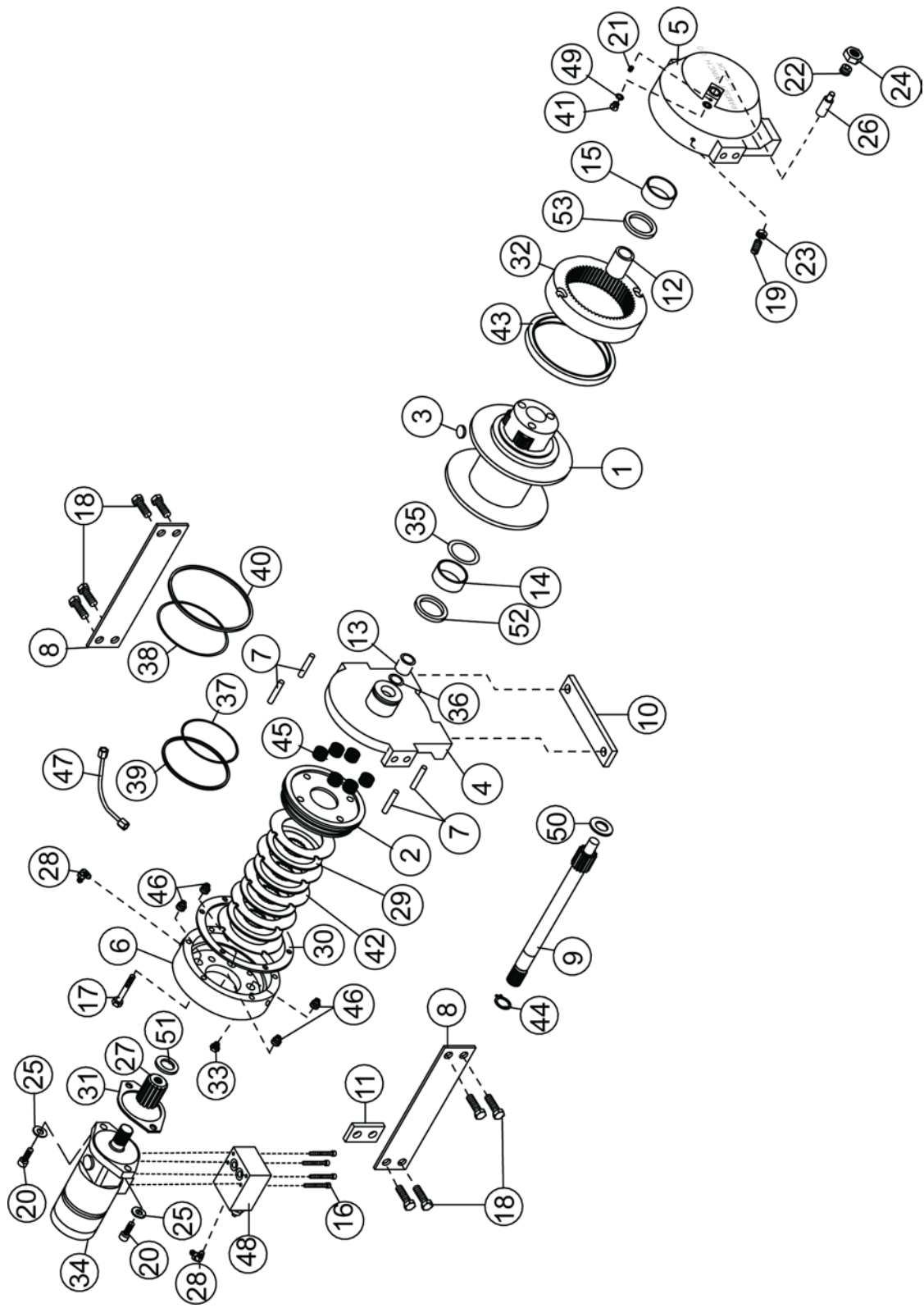
**HC-12S      NEXSTAR III, ROTATION GEARBOX P/N:  
160414**



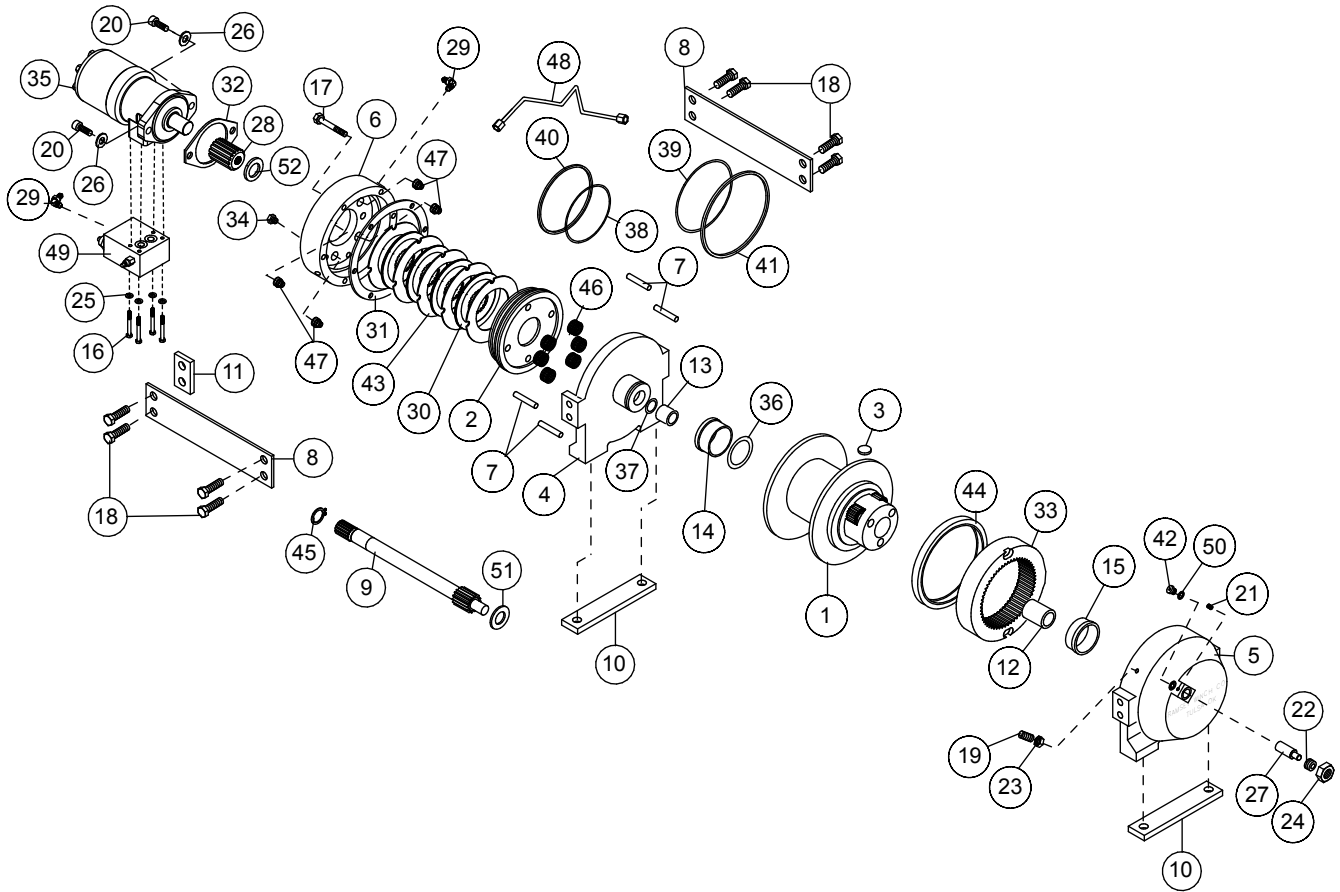
# HC-12S      NEXSTAR III, ROTATION GEARBOX P/N: 160414

Item	Quantity	Part No.	Description
1	1	300058	ADAPTER
2	1	308085	BUSHING
3	1	316004	CAP BEARING
4	1	328165	COVER
5	1	334016	GEAR R.H.
6	1	338261	HOUSING GEAR
7	2	342120	KEY
8	1	357139	SHAFT- OUTPUT
9	1	366019	WASHER THRUST
10	1	368183	WORM R.H.
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
17	2	414581	CAPSCREW
18	6	414869	CAPSCREW
19	6	418163	WASHER LK 5/16 MED SECT
21	2	442182	GASKET
22	1	442187	GASKET
23	1	456008	FITTING - RELIEF
24	1	462029	O-RING
26	2	468018	REDUCER
27	4	470062	PLUG PIPE
28	1	486071	PIN DOWEL
29	2	518026	WASHER THRUST
30	1	472088	PLUG

HC-12S      NEXSTAR III, HOIST ASSEMBLY P/N:  
123435



# HC-12S NEXSTAR III, HOIST ASSEMBLY P/N: 123449

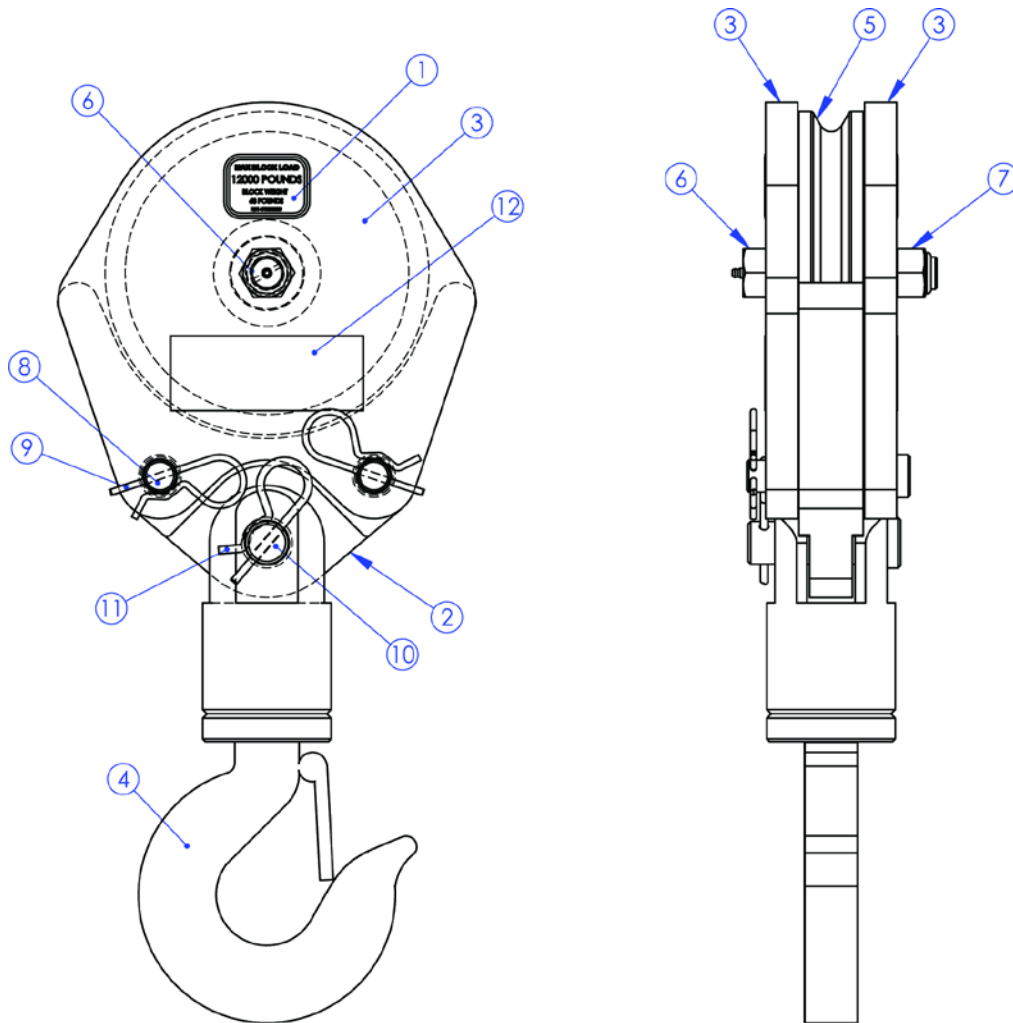


ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	234255	DRUM ASSEMBLY
2	1	306042	PISTON-BRAKE
3	1	315004	ANCHOR- CABLE
4	1	338345	END BEARING-MOTOR END
5	1	338414	END BEARING-GEAR HOUSING
6	1	338302	HOUSING-BRAKE
7	4	346045	PIN-BRAKE
8	2	350704	TIE PLATE
9	1	357517	SHAFT- INPUT
10	2	362297	SPACER-FOOT
11	4	362288	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

# HC-12S NEXSTAR III, HOIST ASSEMBLY P/N: 123449

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

# HC-12S NEXSTAR III, TRAVELING BLOCK ASSEMBLY P/N: 475000300



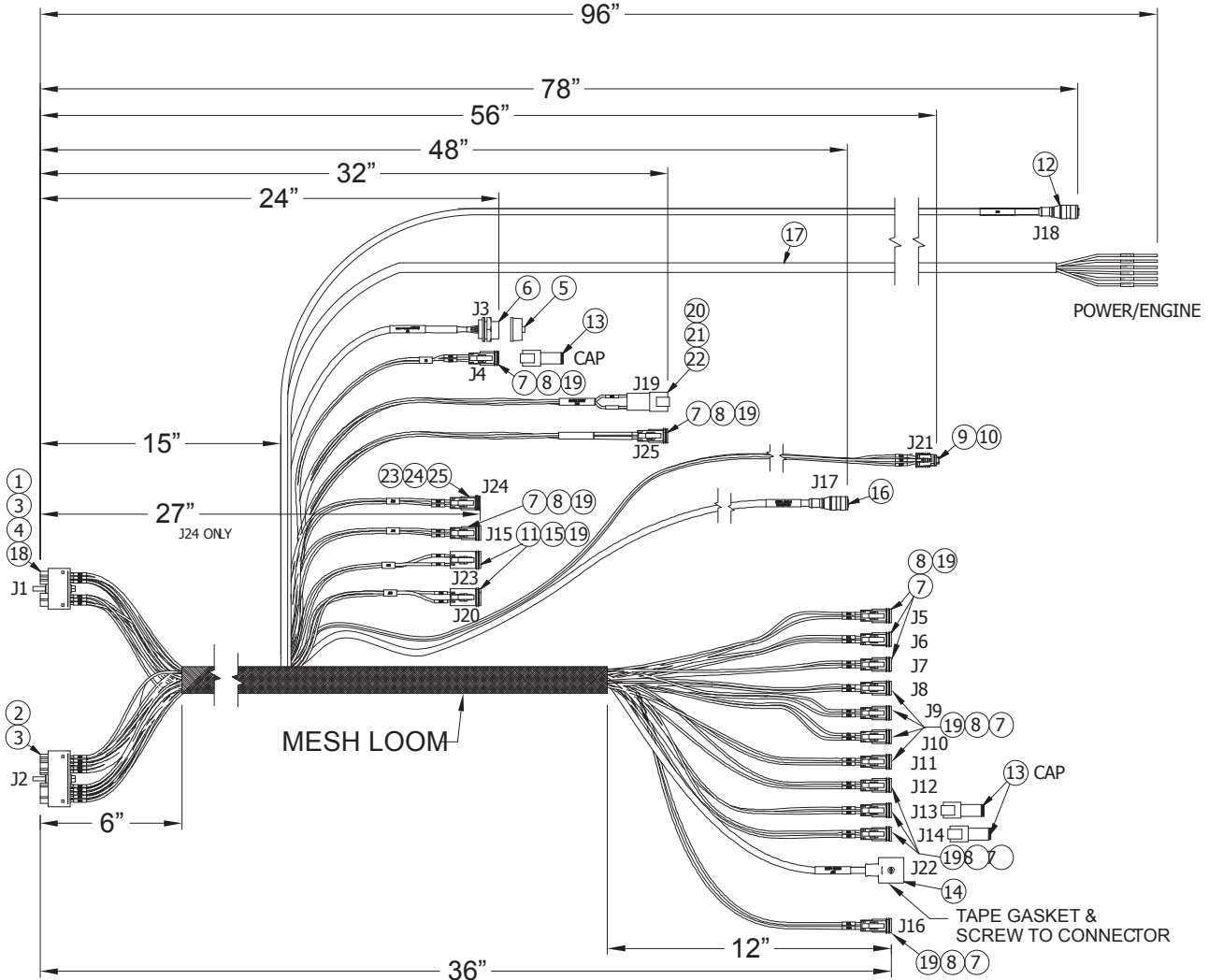
ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	2	475000220	DECAL MAX BLOCK LOAD
2	1	460127000	TACKLE LOWER
3	2	460126000	SIDE PLATE TRAVELING BLOCK
4	1	480366	HOOK SWIVEL 6 METRIC TON
5	1	490256000	SHEAVE ASSY 7/16 ROPE
6	1	490313	BOLT, SHEAVE W/ZERK FITTING
7	1	018600	NUT HX NYLK 3/4-16UNF CP
8	2	360605000	PIN, BLOCK
9	2	366813	PIN HITCH
10	1	480368	PIN SWIVEL HOOK
11	1	360124	PIN HITCH
12	2	040518	DECAL STAY CLEAR OF LOAD



# HC-12S

## NEXSTAR III, MAIN HARNESS P/N:

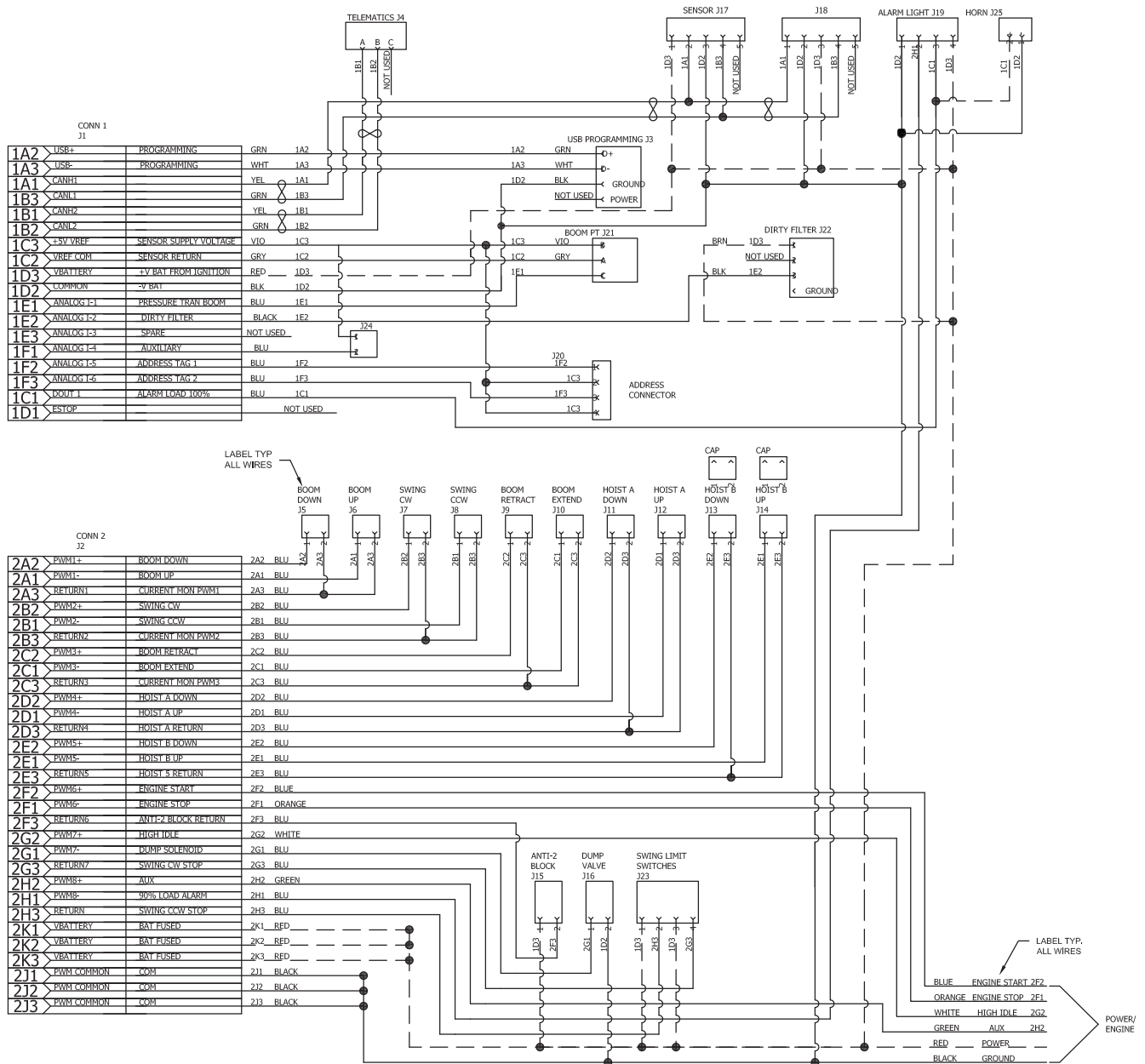
**366823220**



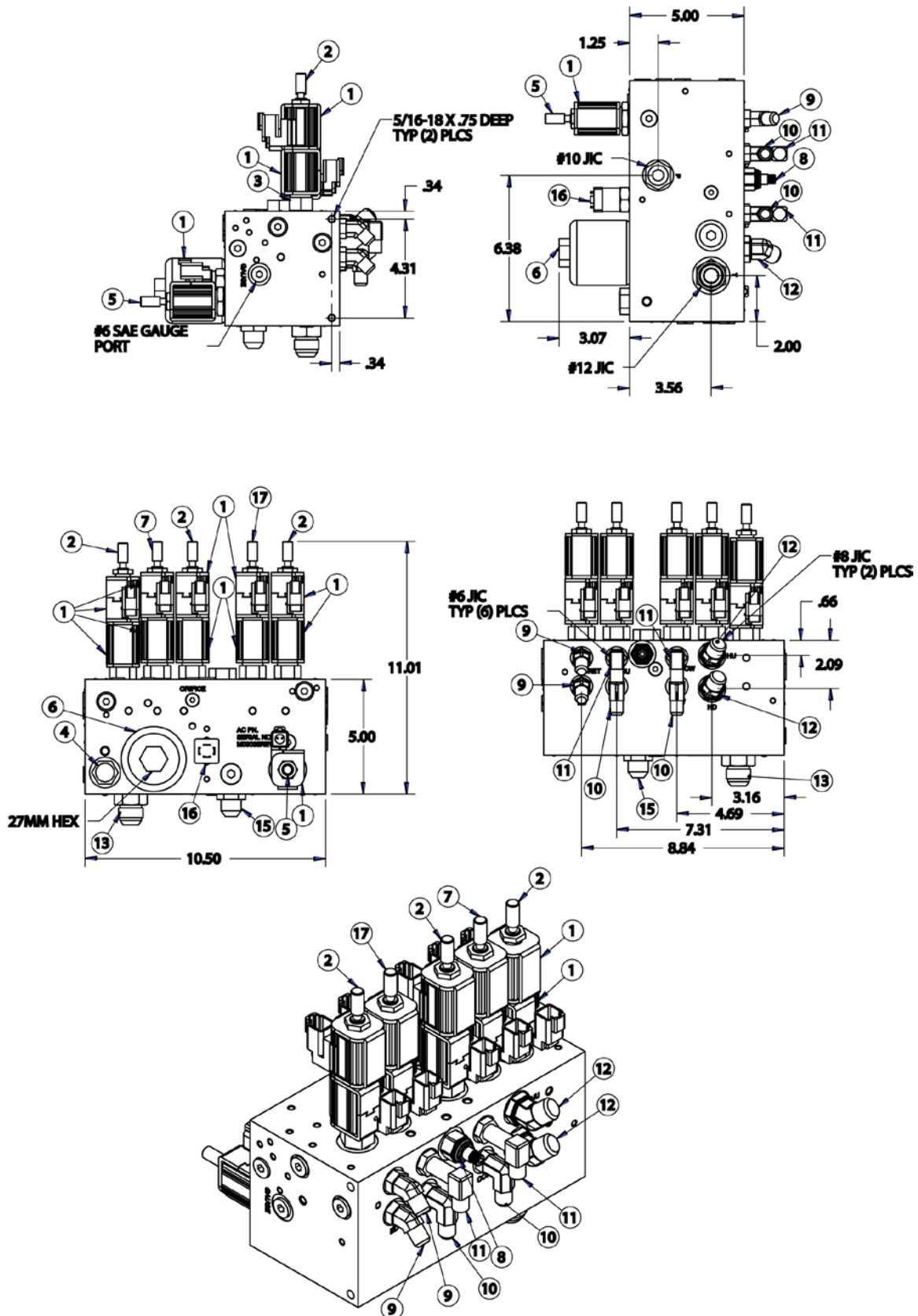
CONNECTOR ID	
CONNECTOR	DESCRIPTION
J1	RECEIVER 18 PIN CONNECTION
J2	RECEIVER 30 PIN CONNECTION
J3	USB CONNECTION
J4	CAN CONNECTOR
J5	BOOM DOWN
J6	BOOM UP
J7	SWING CW
J8	SWING CCW
J9	BOOM RETRACT
J10	BOOM EXTEND
J11	HOIST A DOWN
J12	HOIST A UP
J13	HOIST B DOWN
J14	HOIST B UP
J15	ANTI-2 BLOCK
J16	DUMP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

# HC-12S NEXSTAR III, ELECTRICAL SCHEMATIC

## P/N: 366823221



# HC-12S NEXSTAR III, HYDRUALIC CONTROL P/N: 480989251



# HC-12S      NEXSTAR III, HYDRUALIC CONTROL P/N: 480989251

ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	11	366823901	COIL, 5/8" DIA 12VDC DEUTSCH
2	3	366823902	CARTRIDGE, SIZE 4W 3P CLSD CTR
3	1	366823906	VALVE, LOGIC SPOOL TYPE 290 PSI
4	1	366823914	VALVE, CHECK 100 PSI
5	1	366823960	CARTRIDGE, 2-WAY UNLOADER, EXTENDED MANUAL OVERRIDE
6	1	366823909	BOWL, FILTER
7	1	366823903	CARTRIDGE, SIZE 4W 3P FLOAT CTR
8	1	366823905	VALVE, RELIEF DIRECT-ACTING (2750PSI)
9	2	480195	FITTING 45 6-SAE/6-JIC
10	2	241175	FITTING 90 6-SAE/6-JIC
11	2	330645	FITTING 90 6-SAE/6-JIC LONG
12	2	374017	FITTING 45 8-SAE/8-JIC
13	1	750420000	FITTING, STR 12 SAE ORB - 12 JIC
14	1	366823910	FILTER, 20 MICRON
15	1	490199	FITTING STR 10-SAE/10-JIC
16	1	366823913	INDICATOR, CLOGGING FILTER 101.5 PSI
17	1	366823911	CARTRIDGE, SIZE 4W 3P FLOAT CTR - 6GPM

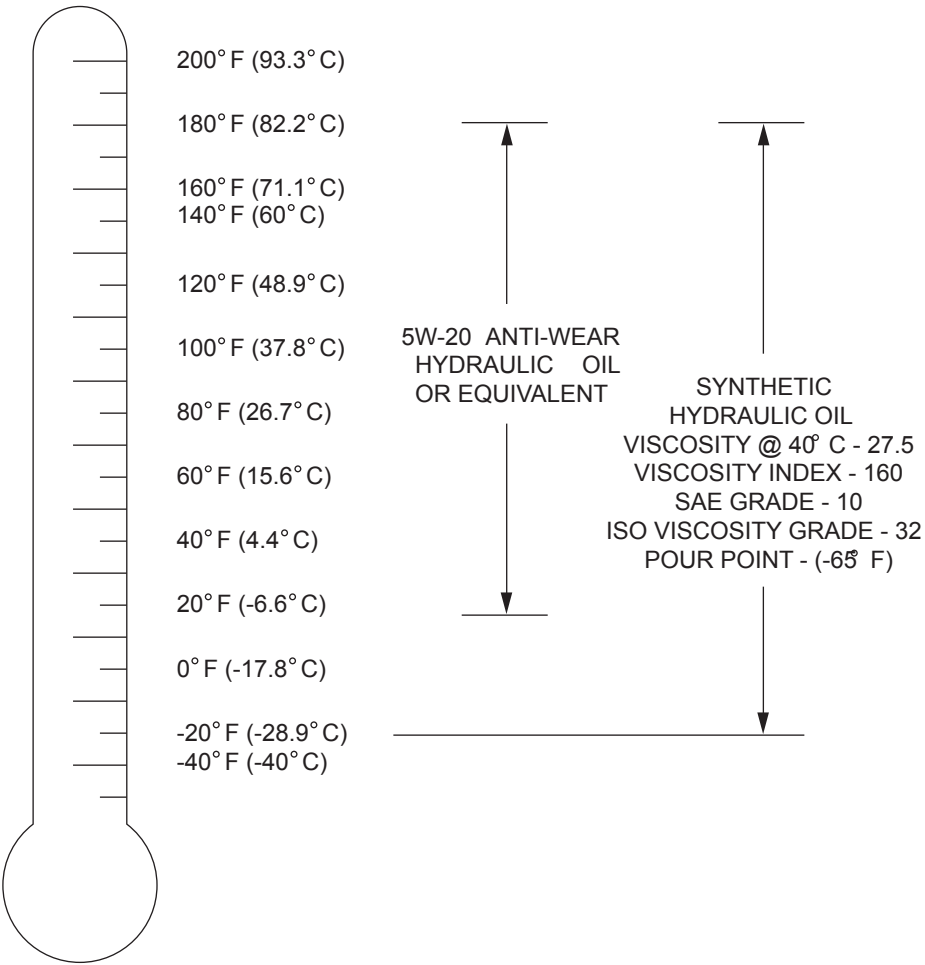
ANNEX A

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.

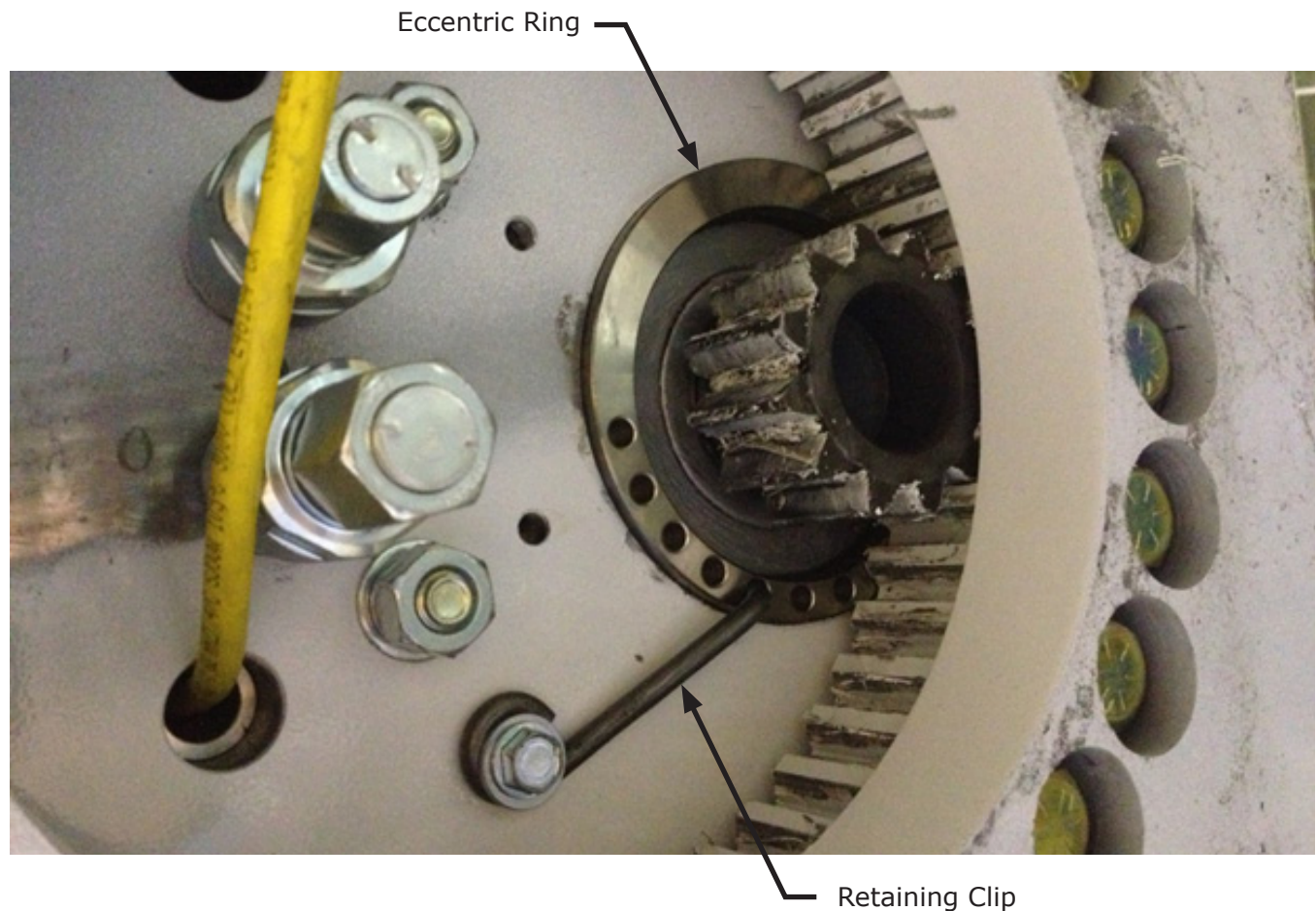
#### NOTICE

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









