



Technical Manual

EHC-6

NEXSTAR III



Serial No. _____

366800223-0417-A

Mailing Address:
P.O. Box 580697
Tulsa, OK 74158

Phone: 1-800-777-2760
Fax: (918) 269-6688
<http://www.autocrane.com>

Physical Address:
4707 N. Mingo Rd.
Tulsa, OK 74117-5904

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

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

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1 Safety Tips and Precautions

DANGER

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

WARNING

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

CAUTION

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

NOTICE

Indicates information considered important, but not hazard-related.

WARNING

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

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 EHC-6 crane for your protection.

For your convenience the overall dimensions of the EHC-6 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 EHC-6 cranes are attached to your 12-volt truck electrical system through the vsu provided. The EHC-6 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.

2 Introduction

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 DIMENSIONS

- Width: 22.375 in. (0.55 m)
- Height: 34.88 in. (0.91 m)
- Length: 13 ft. 1 in. (4.58 m), stored length.
- Weight: 1,670 lbs. (758 kg)

3.2 CAPACITY

- 36,000 ft-lbs (4.98 ton-m)
- Ft-lbs = horizontal distance from center line of rotation to free hanging weight (feet) x amount of weight (pounds).

3.3 REACH

- Second boom reach: 10 ft. 4 in. to 16 ft. 4 in.
- Third boom reach: 16 ft. 4 in. to 20 ft. 4 in.

3.4 CABLE

- 95 ft. (28.9 m) of 3/8 in. (9.5 mm) diameter aircraft quality cable. This cable has a single line breaking strength of 14,400 lbs. (6,531 kg).

3.5 CHASSIS AND MOUNTING REQUIREMENTS

- 14,500 lbs. (8,845 kg) GVWR minimum.
- 360,000 in-lbs. Resistive Bending Moment (RBM)
- 7/8", Grade 8-UNF Bolts. Tightened to 475 ft. lbs.
- 13-1/2" Mounting hole to run hydraulic and electrical lines to the crane from the body.

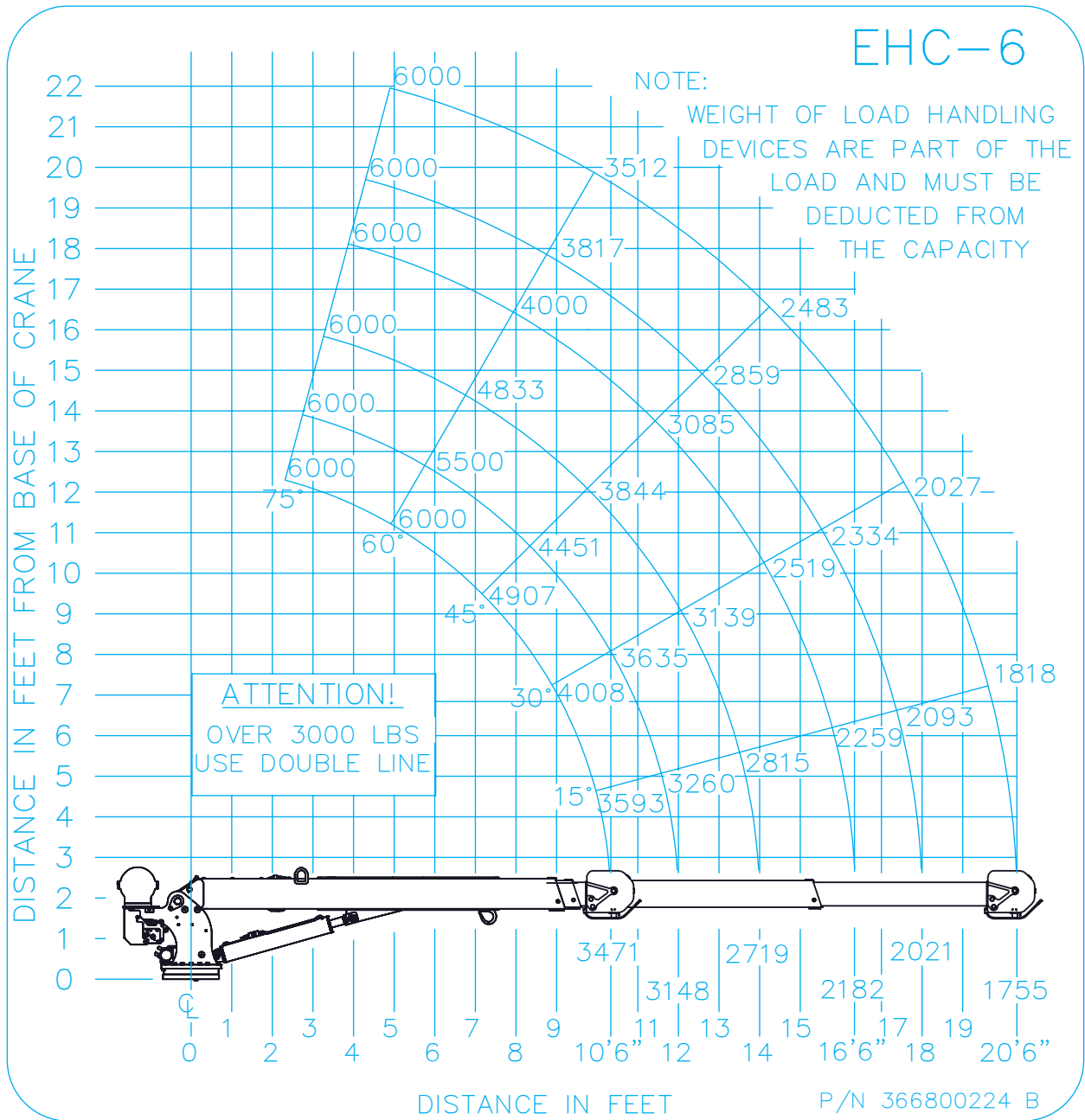
3.6 ELECTRICAL SYSTEM REQUIREMENTS

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

3.7 ROTATION

- 370° Rotation with electrical stop continuous rotation with slip ring

4 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.

Qualifications and Operating Practices 5

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

5.1 OPERATORS

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

5.2 QUALIFICATIONS FOR OPERATORS

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

5 Qualifications and Operating Practices

5.3 CONDUCT OF OPERATORS

1. The operator shall not engage in any practice, which will divert his attention while actually operating the crane.
2. Each operator shall be responsible for those operations under the operator's direct control. Whenever there is any doubt as to safety, the operator shall consult with the supervisor before handling the loads.
3. The operator should not leave a suspended load unattended unless specific precautions have been instituted and are in place.
4. If there is a warning sign on the switch or engine starting controls, the operator shall not close the switch or start the engine until the warning sign has been removed by the appointed person.
5. Before closing the switch or starting the engine, the operator shall see that all controls are in the "OFF" or neutral position and all personnel are in the clear.
6. If power fails during operation, the operator shall:
 - A. Move power controls to the "OFF" or neutral position.
 - B. Land the suspended load and boom, if practical.
7. The operator shall be familiar with the equipment and its proper care. If adjustments or repairs are necessary, the operator shall report the same promptly to the appointed person, and shall also notify the next operator.
8. The operator at the start of each shift shall test all controls. If any controls do not operate properly, they shall be adjusted or repaired before operations are begun.
9. Stabilizers shall be visible to the operator while extending or setting unless a signal person assists operator.

5.4 OPERATING PRACTICES/HANDLING THE LOAD



CAUTION

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

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

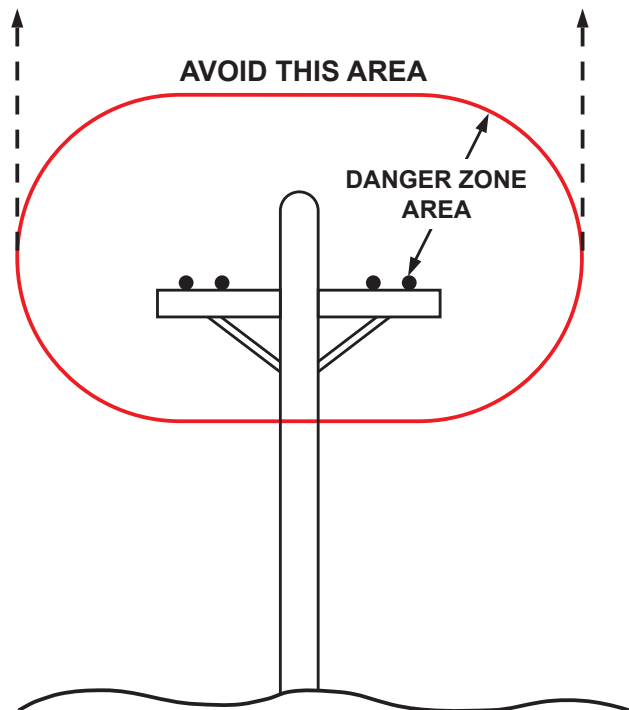
Qualifications and Operating Practices 5

- B. When rotating the crane, sudden starts and stops shall be avoided. Rotational speed shall be such that the load does not swing out beyond the radius at which it can be controlled.
- C. Load, boom or other parts of the crane do not contact any obstruction.
- D. Cranes shall not be used for dragging loads sideways.
- E. This standard recognizes that telescopic boom cranes are designed and intended for handling materials. They do not meet personnel lift or elevator requirements. Therefore, no lifting, lowering, swinging or traveling shall be done while a person is on the hook or load. Hook attached suspended work platforms (baskets) shall not be used with cranes covered by this standard.
- F. The operator should avoid carrying loads over people.
- 5. When the crane is so equipped, the stabilizers shall be fully extended and set. Blocking under stabilizers shall meet the requirements as follows:
 - A. Strong enough to prevent crushing.
 - B. Of such thickness, width and length as to completely support the stabilizer pad.
 - C. Firm footing under all tires, or individual stabilizer pads should be level. Where such a footing is not otherwise supplied, timbers, cribbing, or other structural members to distribute the load so as to not exceed allowable bearing capacity or the underlying material should provide it.
- 6. In transit, the boom shall be carried in stowed position.
- 7. The crane shall not be transported with a load on the hook.

5.5 OPERATING NEAR ELECTRICAL POWER LINES



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



5 Qualifications and Operating Practices

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

EXCEPTIONS:

- A. The Danger Zone may be entered after confirmation by an appointed person 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.
 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.

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

Qualifications and Operating Practices 5

5.6 PREPARING THE CRANE FOR OPERATION

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

NOTICE

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

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

5 Qualifications and Operating Practices

9. Remove the remote control from the cab or storage area. Power the remote control on. Detach the hook from the dead man.
10. The crane is now ready for operation.

DURING OPERATION

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

AFTER OPERATION

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

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

WARNING

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

WARNING

Never drive with a load suspended from the crane.

WARNING

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

6.1 GENERAL

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

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

6.2 REMOTE CONTROL UNIT

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

6.3 REMOTE CONTROL INITIALIZATION

After powering on the remote control, the LCD Display Screen turns on and will perform a self-test. During the self-test, the Nexstar III remote control scans for any switches, buttons, and joysticks are in the OFF position. If any switches, buttons, or joysticks are on, the failure displays on the Display Screen and the remote control powers down.

After a successful self-test, the Nexstar III remote control will enter the Normal Operating Mode. See 5.4 DISPLAY SCREEN LAYOUT.

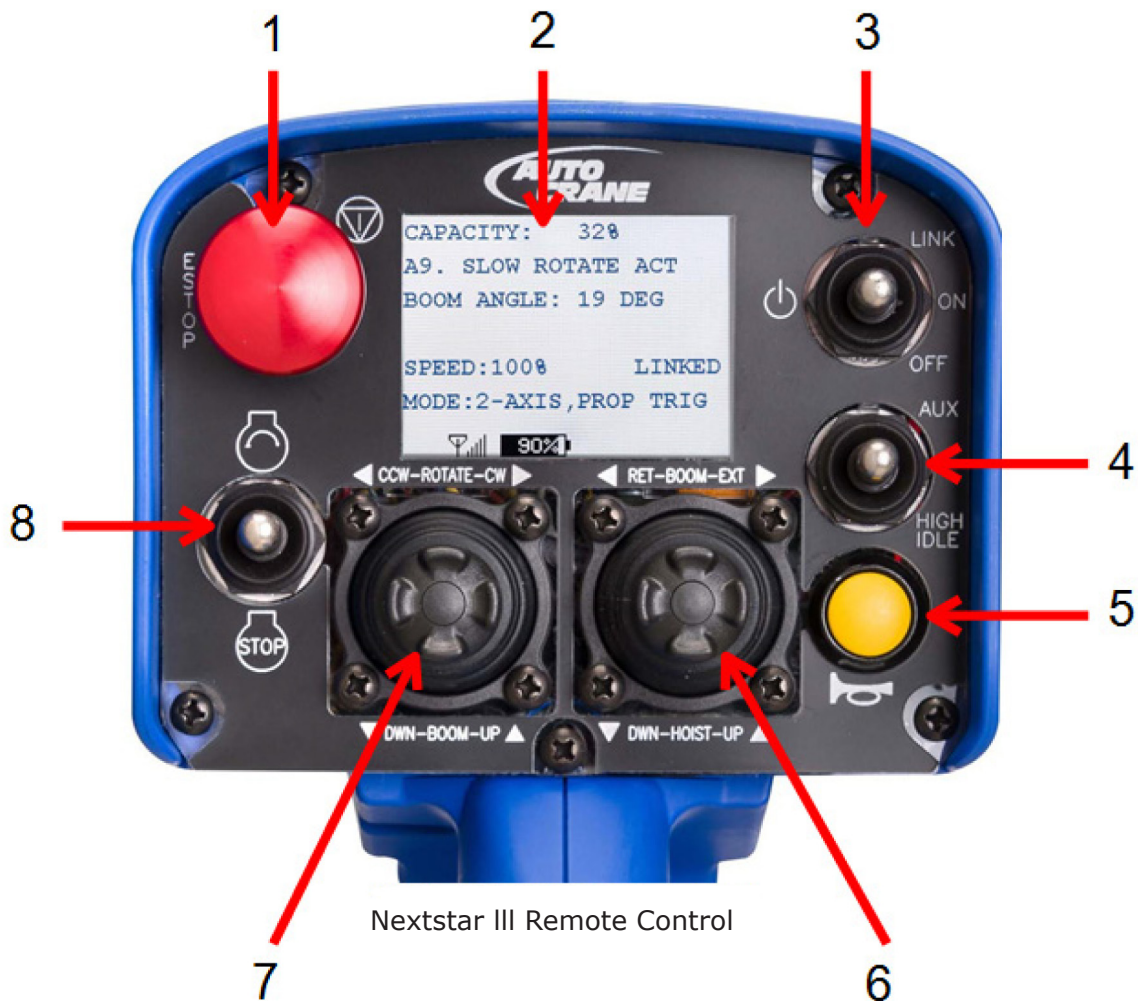
6.4 PRE-OPERATION TEST

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

- Test all warning devices.
- Test all functions.
- Test the Remote Control E-Stop function.

6 NexStar III Operation

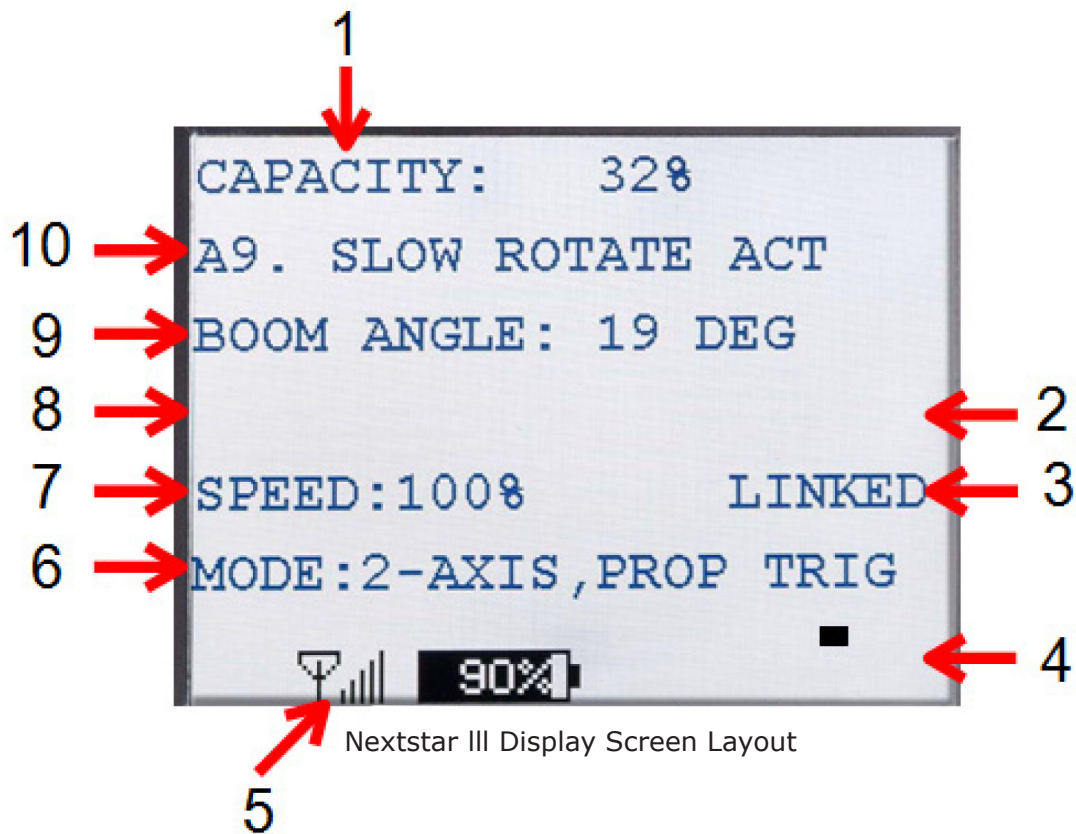
6.5 REMOTE CONTROL LAYOUT



Nextstar III Remote Control

1. Emergency Stop Button – Push to activate. Pull to release. When activated the emergency stop button stops all outputs from the receiver.
2. Display Screen – LCD screen that displays many crane operating parameters. 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.

6.6 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.

6 NexStar III Operation

SPEED AND MODE SELECTION

6.7 SPEED SELECTION

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

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

6.8 MODE SELECTION

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

6.9 MODE DESCRIPTION

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

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

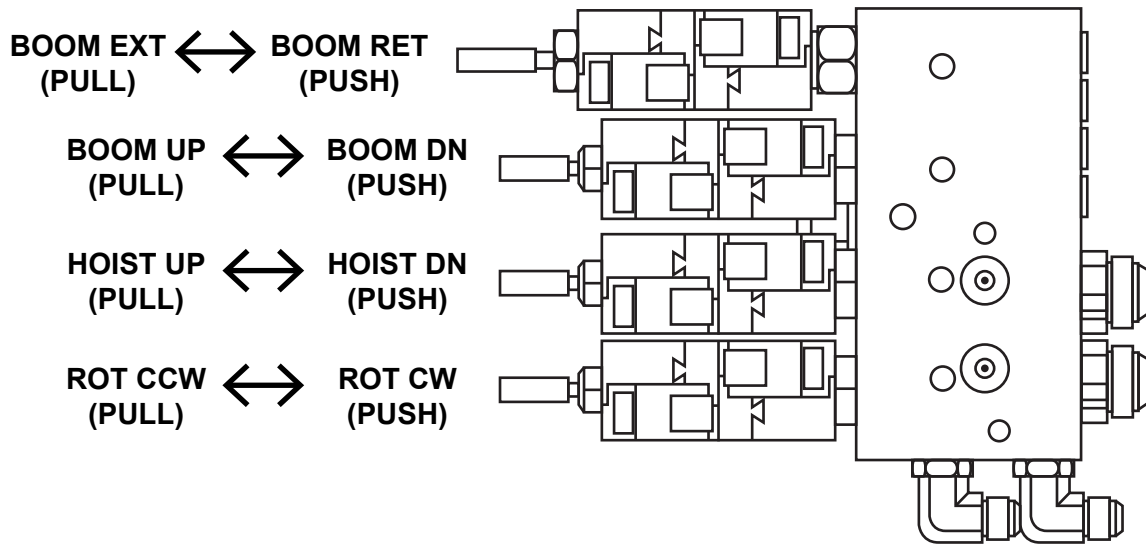
1-AXIS, TRIGGER PROP – Allows only one function to operate on each joystick. The joysticks are on-off and only need to be moved in the direction of the desired function. The speed control is located in the trigger. The more the trigger is pulled, the faster the function will operate.

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

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

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














6.10 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 NexStar III Operation

6.11 Transmitter Layout

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

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

7.1 TROUBLESHOOTING FLOW CHART

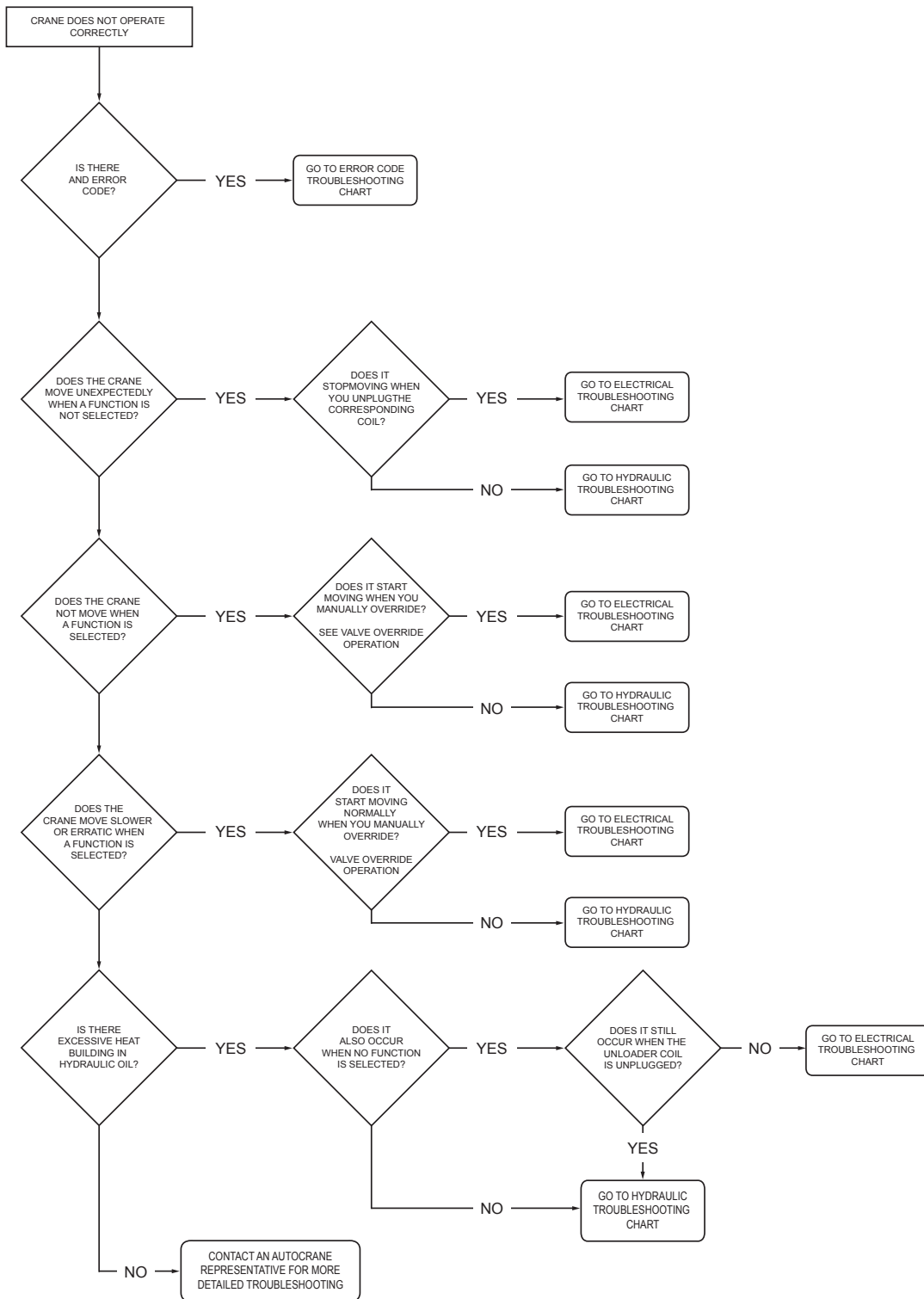


Table 1. Troubleshooting Table Chart

7 NexStar III Troubleshooting

7.2 NEXSTAR III REMOTE CONTROL TROUBLESHOOTING TABLE

Problem	Possible Reason	Action
REMOTE CONTROL WILL NOT TURN ON	Remote control emergency stop switch is down or pressed.	Ensure the E-Stop switch is pulled up.
	Batteries are dead or installed backwards; battery holder is damaged.	Ensure all switches, buttons, and joysticks are in the off position.
	Remote control momentarily powers-up and displays an error code prior to turning off.	Ensure all switches, buttons, and joysticks are in the off position.
REMOTE CONTROL WILL NOT RESPOND WITH THE RECEIVER	Incorrect system RF channel.	Ensure the remote control and the receiver are set to the same RF channel.
	Incorrect system access code.	Ensure the tether cable is installed and secured correctly. Inspect the tether cable and connectors for damage.
	System out of range.	Ensure the startup procedure is initiated within 300 ft. from the receiver. Ensure the signal strength indicator level is greater than 0%.
REMOTE CONTROL WILL NOT TURN ON IN TETHER MODE	The connecting tether cable is not installed, installed improperly, or is damaged.	Ensure the tether cable is installed and secured correctly. Inspect the tether cable and connectors for damage.
	Remote control is failing switch scan.	Ensure all switches, buttons, and joysticks are in the off position.
	Remote control emergency stop switch is pressed down.	Ensure the E-Stop switch is pulled up.
REMOTE CONTROL WILL NOT RESPOND WITH RECEIVER IN TETHER MODE	System not in tether mode.	Ensure the startup procedure is initiated with the tether cable attached.
	The tether cable or connectors are damaged.	Inspect the tether cable and connectors for damage.
REMOTE CONTROL WILL NOT RESPOND WITH THE RECEIVER IN WIRELESS MODE	System not in wireless mode.	Ensure the startup procedure is initiated within 300 ft. from the receiver. Ensure the signal strength indicator level is greater 0%.

7.3 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	When the output was activated, a current of more than 3.5a was being drawn	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 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 cw 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 ccw rotation	Rotate cw to clear the error. Once the switch is deactivated the alarm will clear.
A4. TRK TILT WARN	Truck angle exceeds 5.7 degrees or 10% slope	All functions will only operate at 50% of speed	Move vehicle to level ground.
A5 TRK TILT ALARM	Truck angle exceeds 8.5 degrees or 15% slope	LL 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.

7 NexStar III Troubleshooting

7.3 NEXSTAR III ERROR CODE TABLE

Error Code	Cause	Effect	Solution
A8. 100% LOAD ALARM	Reached 100% of rated capacity	Disables boom down, extend, and hoist up	Reduce the load by retracting the boom, lowering the booo, 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.
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.

7.4 NEXSTAR III MECHANICAL TROUBLESHOOTING TABLE

Problem	Cause	Effect	Solution
CRANE MOVES UNEXPECTEDLY	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.
	Contaminant in cartridge	Valve sticks in certain positions.	See cartridge maintenance for cleaning procedure.
NO FUNCTION OPERATES ON THE CRANE	Crane diverter valve not engaged	Is using Auto Crane outriggers, check the crane diverter valve located at the outrigger valve.	Engage crane diverter valve
	Vehicle is not running	Verify engine is running.	Start the vehicle.
ALL FUNCTIONS OPERATE SLOWLY	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.
EXCESSIVE HEAT DURING OPERATION	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.	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.
CRANE MOVES UNEXPECTEDLY	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.

7 NexStar III Troubleshooting

7.4 NEXSTAR III MECHANICAL TROUBLESHOOTING TABLE

Problem	Cause	Effect	Solution
NO FUNCTION OPERATES ON THE CRANE	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.

7.5 NEXSTAR III ELECTRICAL TROUBLESHOOTING TABLE

Problem	Cause	Effect	Solution
CRANE MOVES UNEXPECTEDLY	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 multi-meter in line with coil. It should be no more than 100ma.	Verify there is not 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.
NO FUNCTION OPERATES ON THE CRANE	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.

NexStar III Troubleshooting 7

7.5 NEXSTAR III ELECTRICAL TROUBLESHOOTING TABLE

Problem	Cause	Effect	Solution
NO FUNCTION OPERATES ON THE CRANE	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.
BOOM DOWN, EXTEND, AND HOIST UP ARE INOPERABLE	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.
EXTEND, RETRACT, HOIST UP, BOOM UP, ROTATE CW, ROTATE CCW ARE INOPERABLE	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.
ROTATE CW IS INOPERABLE	Reached limit for cw rotation	Reached limit for cw rotation.	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.
ROTATE CCW IS INOPERABLE	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.
ALL FUNCTIONS ARE INOPERABLE EXCEPT BOOM DOWN AND HOIST DOWN	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.

7 NexStar III Troubleshooting

7.5 NEXSTAR III ELECTRICAL TROUBLESHOOTING TABLE

Problem	Cause	Effect	Solution
ANY PARTICULAR FUNCTION IS NOT OPERABLE.	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.
CRANE ROTATES SLOWLY	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.
ALL FUNCTIONS OPERATE SLOWLY	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.

8.1 INSPECTION REQUIREMENTS

NOTICE

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



WARNING

All inspections shall be performed by the designated personnel only.

8.2 INSPECTION CLASSIFICATION

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

8.3 FREQUENT INSPECTION

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

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

8 Maintenance

- B. General corrosion.
- C. Broken or cut strands.
- D. Use care when inspecting sections of rapid deterioration around flange points crossover points, and repetitive pickup points on drums.
- E. Inspect number, distribution, and type of visible broken wires.

NOTICE

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

8.4 PERIODIC INSPECTION

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

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

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

8.5 CRANES NOT IN REGULAR USE

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

8.6 INSPECTION RECORDS

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

8.7 TESTING REQUIREMENTS

NOTICE

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

8 Maintenance



WARNING

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

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

8.8 GENERAL REPAIRS AND MAINTENANCE

NOTICE

Reference ASME B30.5a 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.

8.9 MAINTENANCE PRECAUTIONS

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

8.10 ADJUSTMENTS AND REPAIRS

1. Any hazardous conditions disclosed by the inspection requirement shall be corrected before operation of crane is resumed.
2. Adjustments shall be maintained to assure correct of functioning of components, the following are examples:
 - A. Function operating mechanism.
 - B. Safety devices.
 - C. Control systems.
3. Repairs or replacements shall be provided as needed for operation, the following are examples:
 - A. Critical parts of functional operating mechanisms which are cracked, broken, corroded, bent, or excessively worn.

- B. Critical parts of the crane structure which are cracked, bent, broke, or excessively corroded.
 - C. Crane hooks showing cracks, damage, or corrosion shall be taken out of service. Repairs by welding are recommended.
4. If bleeding the hydraulic system is required, run each crane function until smooth operation of that particular function is noticeable.

8.11 LUBRICATION

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

8.12 ROPE REPLACEMENT

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

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

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

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

8.13 ROPE INSTALLATION AND MAINTENANCE

1. Rope should be stored to prevent damage and deterioration.
2. Unreeling or uncoiling of rope shall be done as recommended by the rope manufacturer and with care to avoid kinking or inducing twist.
3. Before cutting a rope, seizing shall be placed on each of the place where the rope is to be cut to prevent unlaying of the strands. On 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.

8 Maintenance

4. During installation care should be exercised to avoid dragging of the rope in the dirt or around objects that will scrape, nick, crush, or induce sharp bends in it.
5. Rope should be maintained in a well-lubricated condition. It is important that lubricant applied as a part of the maintenance program shall be compatible with the original lubricant and to this end the rope manufacturer should be consulted. Lubricant applied shall be the type that does not hinder visual inspection. Those sections of rope that are located over sheaves or otherwise hidden during inspection and maintenance procedures require special attention when lubricating rope. The object of rope lubrication is to reduce internal friction and to prevent corrosion.
6. When an operating rope shows greater wear or well-defined localized areas than on the remainder of the rope, rope life can be extended in some cases by shifting the wear to different areas of the rope.

8.14 PAINT FINISH MAINTENANCE

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

1. Sand the damaged area to bare metal.
2. Use a solvent to clean the sanded area to remove sanding debris and residue.
3. Wipe dry with a clean cloth to remove any remaining debris and residue.
4. Use a primer compatible with Sherwin Williams E2W932 epoxy primer.
5. Prime the sand areas to a minimum 2 mm dry film thickness per the primer manufacturer's instructions.
6. Use a paint compatible with Sherwin Williams E2W932 epoxy primer and Sherwin Williams Genesis polyurethane top coat paint.
7. Apply the top coat paint to a minimum 2 mm dry film thickness within 24 hours of applying the primer.
8. The final primer and top coat should have approx. a 4 mm dry film thickness.

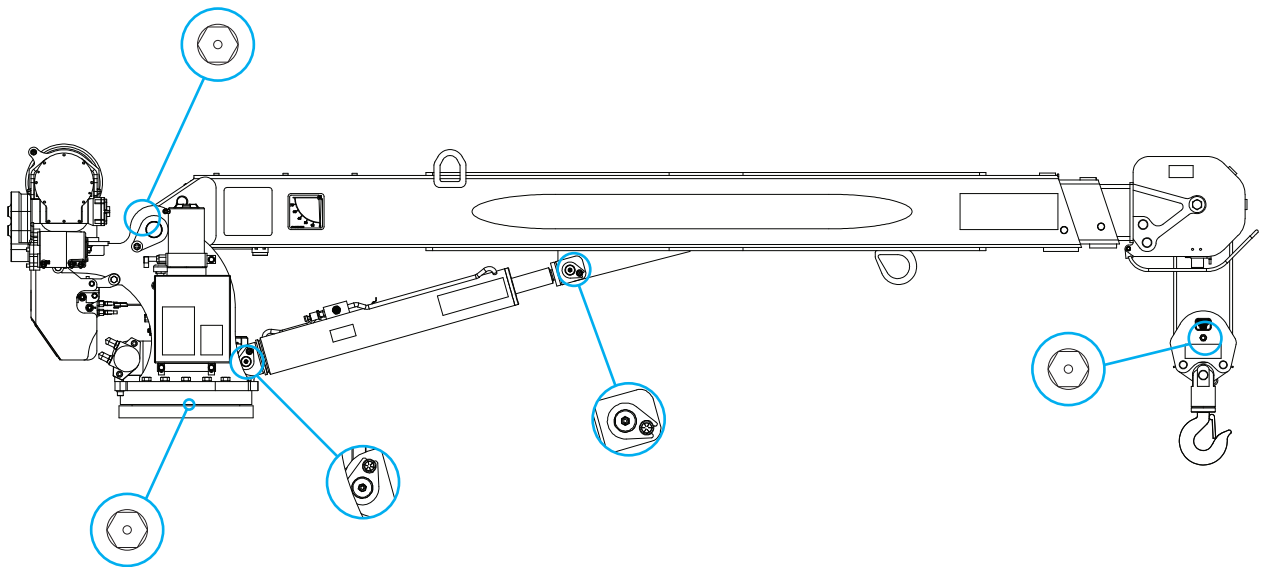
8.15 LUBRICATION AND MAINTENANCE SCHEDULE

Service Performed	Instructions	Daily	Weekly	3 Months	6 Months	Yearly
Load Hook	Inspect hook and latch for deformation, cracks, and corrosion.	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 475 ft-lbs as required.		X			
Rotating Ring Gear	Lube with MobileTac LL or Lubriplate.		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		
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.						

8 Maintenance

8.16 LUBRICATION POINTS

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



8.17 EHC-6 NEXSTAR III CARTRIDGE MAINTENANCE



Verify movement in ports while manually overriding cartridge



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

1. Clean the area around the valve spool before it is removed from the valve bank.
2. Remove the valve spool from the valve bank. Be careful not to touch any surrounding objects.
3. Use any off-the-shelf automotive brake cleaning fluid to remove any visible debris from the valve spool. Wear skin and eye protection while spraying the valve spool clean.
4. Inspect the O-rings for damage. Replace if necessary.
5. 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 Maintenance

8.18 ADJUSTING OIL COOLED WORM BRAKE

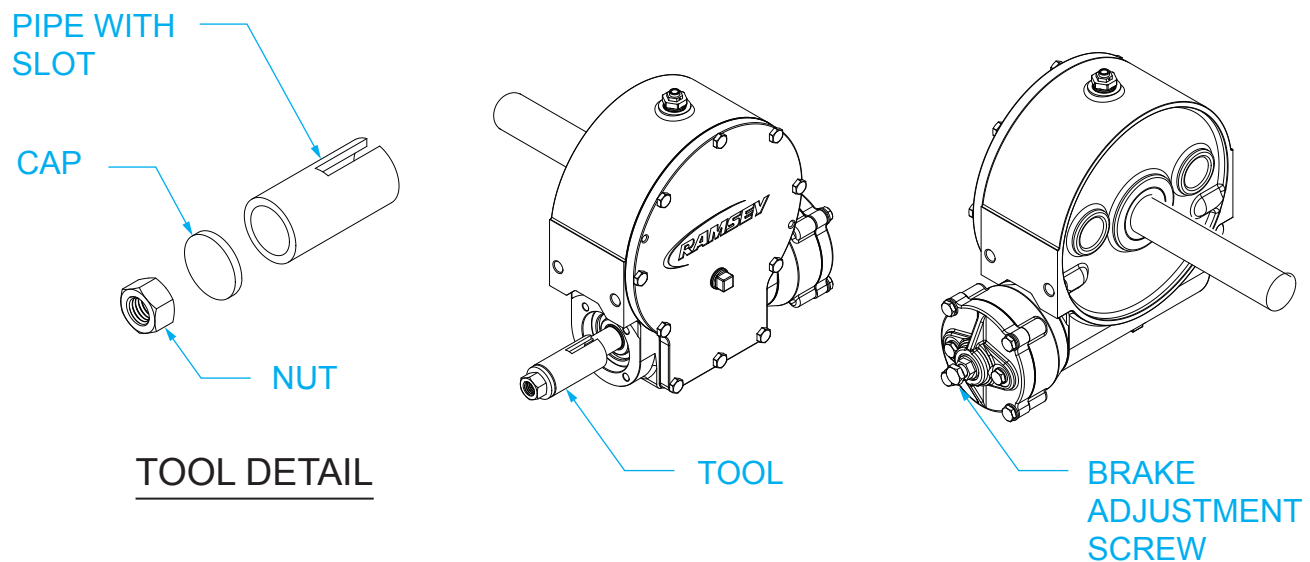
The oil-cooled, fully adjustable, automatic safety brake operates in the worm housing lubricant, all part being submerged in oil. When the brake wears to the point that the load begins to drift, the brake can be adjusted as follows:

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

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

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

8.19 EHC-6 Brake Adjustment



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

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

Crane Mounting and Installation 9

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

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

CAUTION

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

NOTICE

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

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

WARNING

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

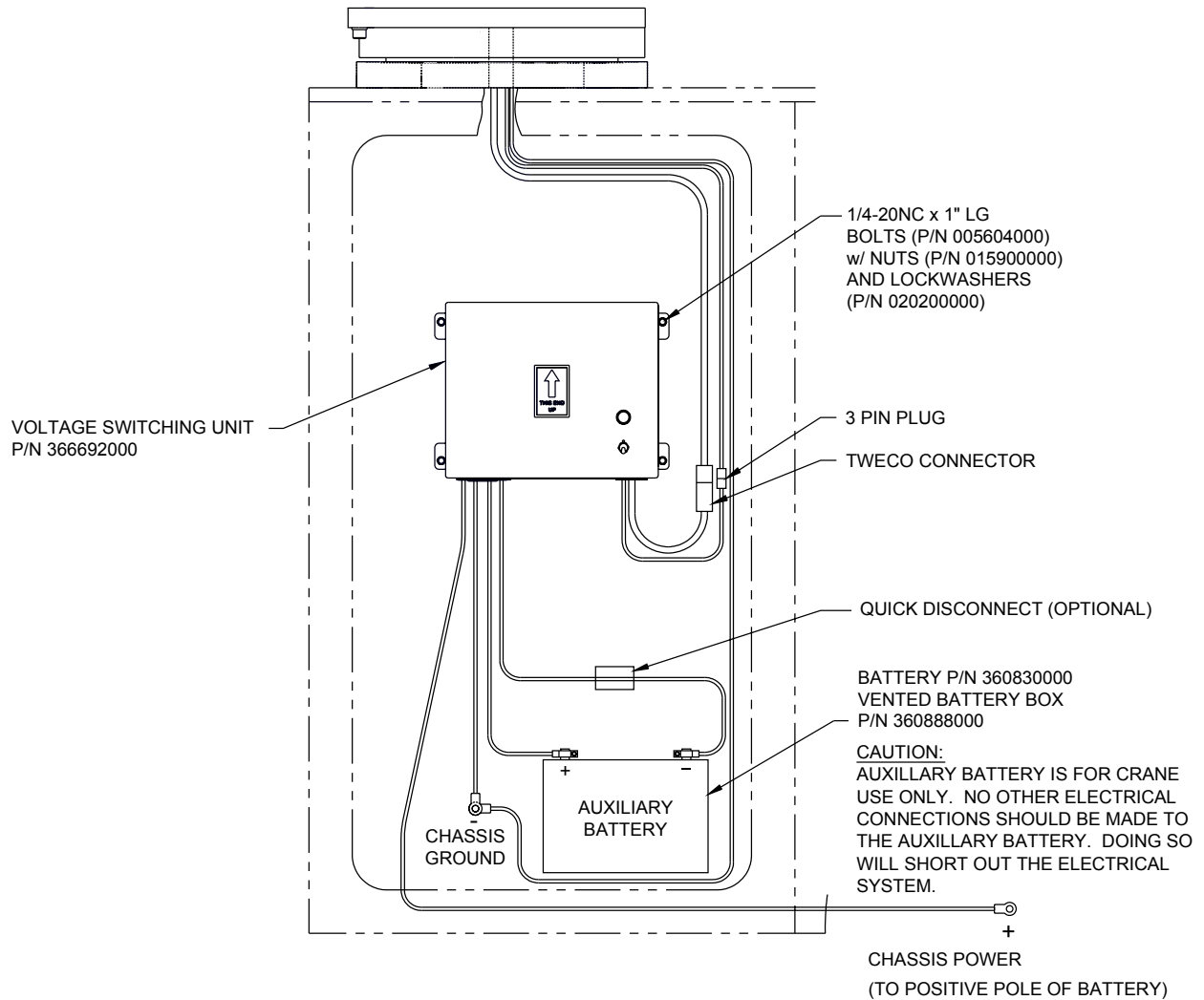
9. Ensure the Owner's Manual is delivered to the customer.
10. Install voltage switching unit inside compartment safe from weather and contamination.
11. See following page for additional electrical installation.
12. For additional help: Call the Service Department at the Auto Crane Company, 1-800-777-2760,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

IMPORTANT!

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

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

9 Crane Mounting and Installation



NOTICE:
WE RECOMMEND REPLACING ANY
NO-MAINTENANCE TRUCK BATTERY
WITH A MAINTENANCE TYPE
TRUCK BATTERY

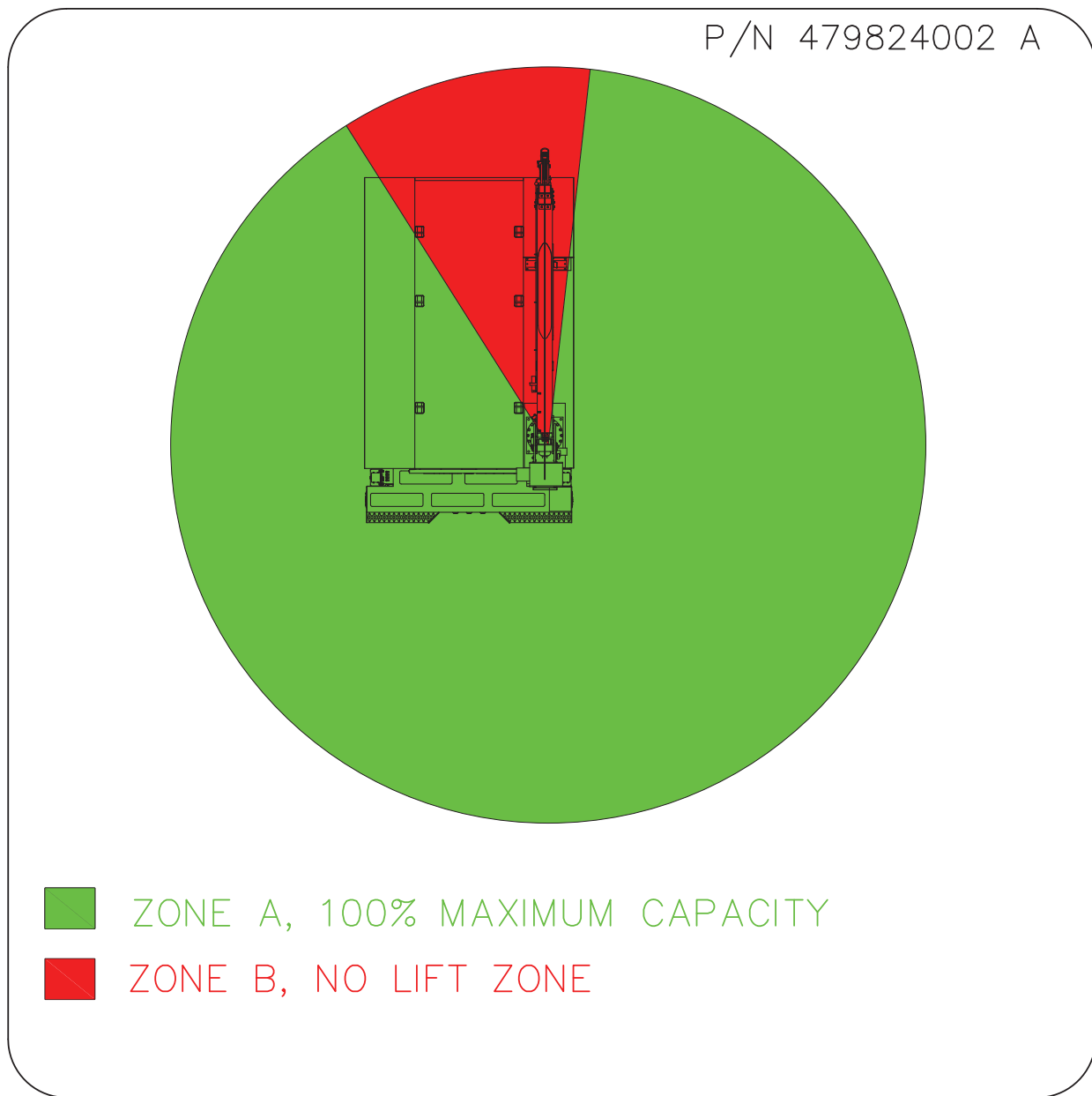
NOTE:
SEE ELECTRICAL SECTION
FOR WIRING DIAGRAMS

Crane Mounting and Installation 9

9.1 STABILITY CHART INSTALLATION

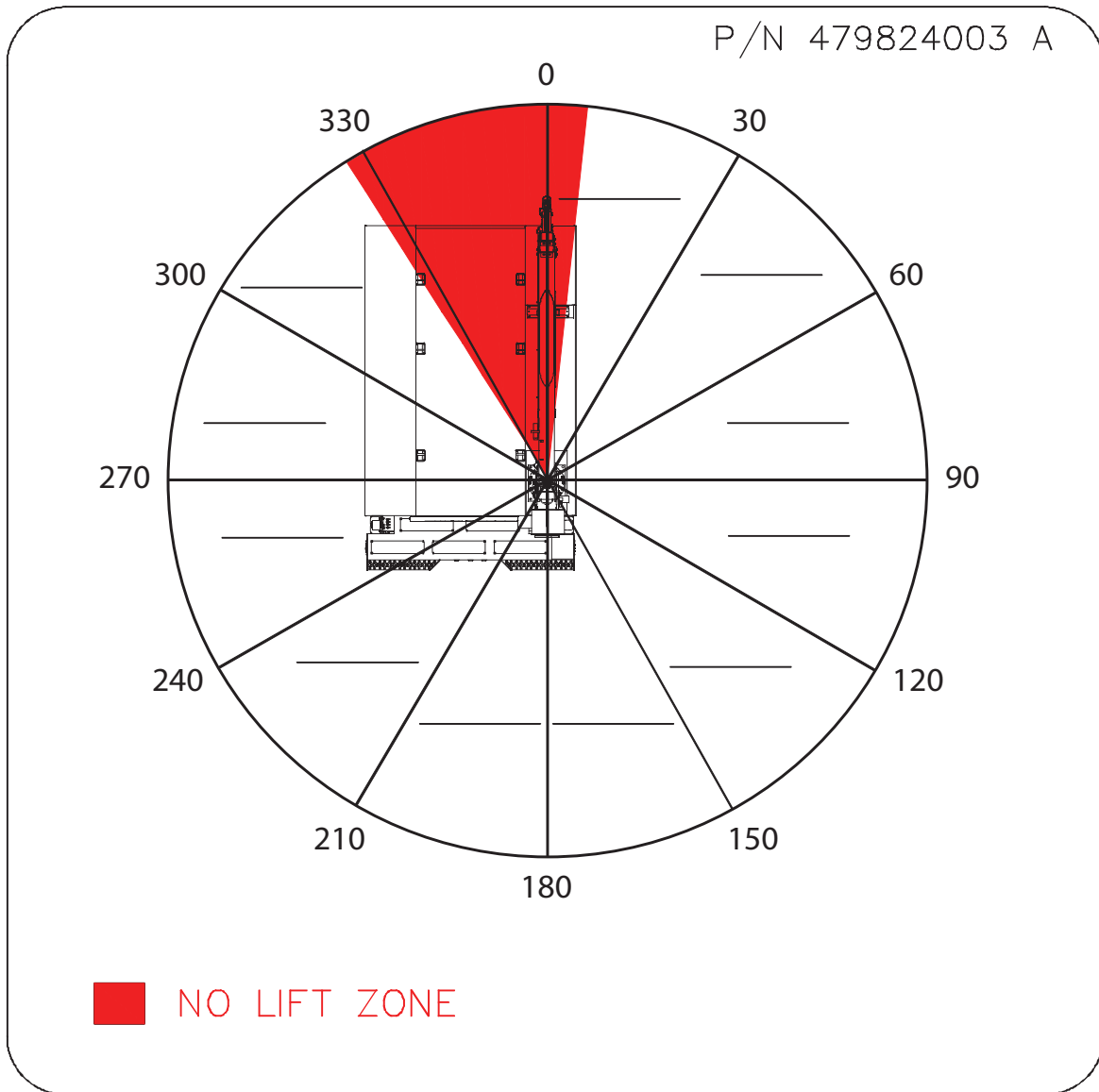
There is a stability chart included in the ship kit. This decal is typically installed on the inside of the door of the crane box. This decal is to alert the user of the available crane capacities around the vehicle.

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



9 Crane Mounting and Installation

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



9.2 EHC-6 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.

9.3 EMERGENCY CRANE OPERATION

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

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

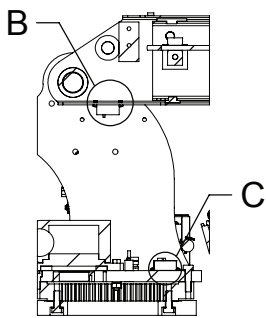
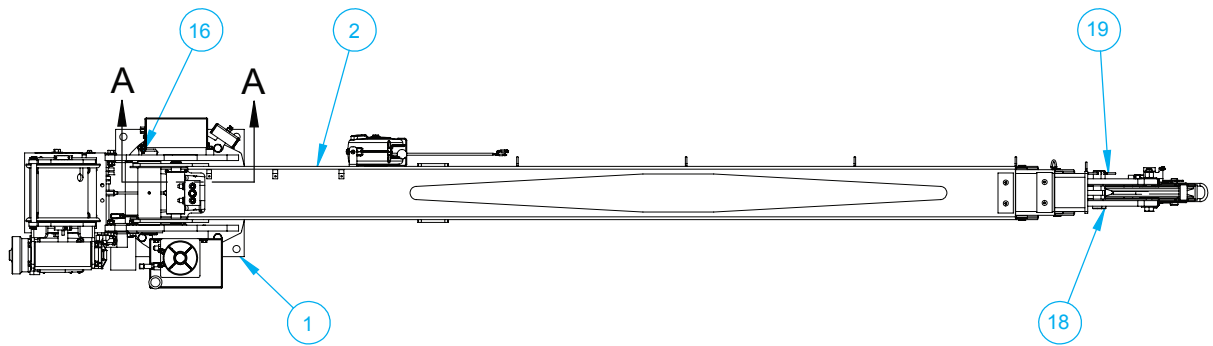
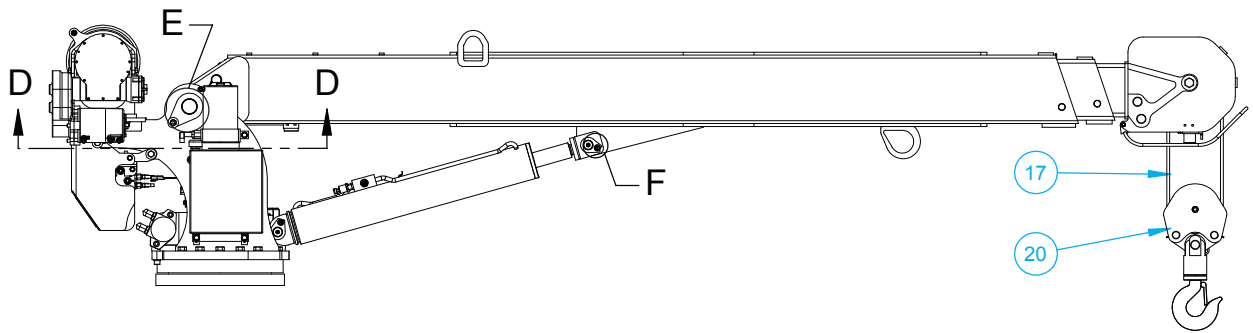


CAUTION

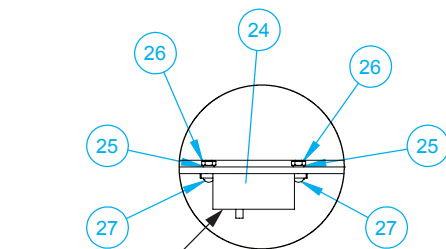
Remove any personnel from near the crane as the load is lowering.

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

10 General Assembly

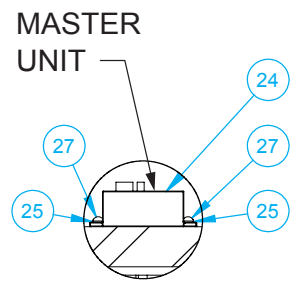


SECTION A-A



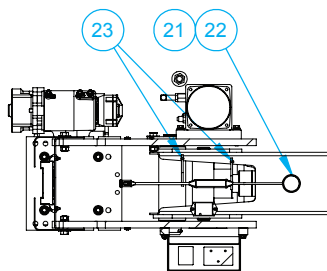
SLAVE UNIT

DETAIL B

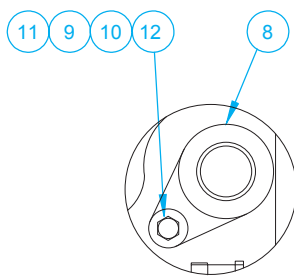


MASTER UNIT

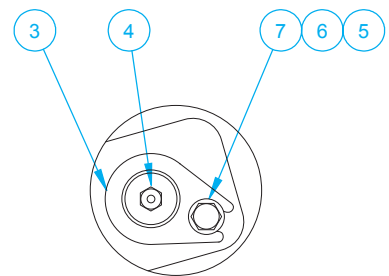
DETAIL C



SECTION D-D



DETAIL E

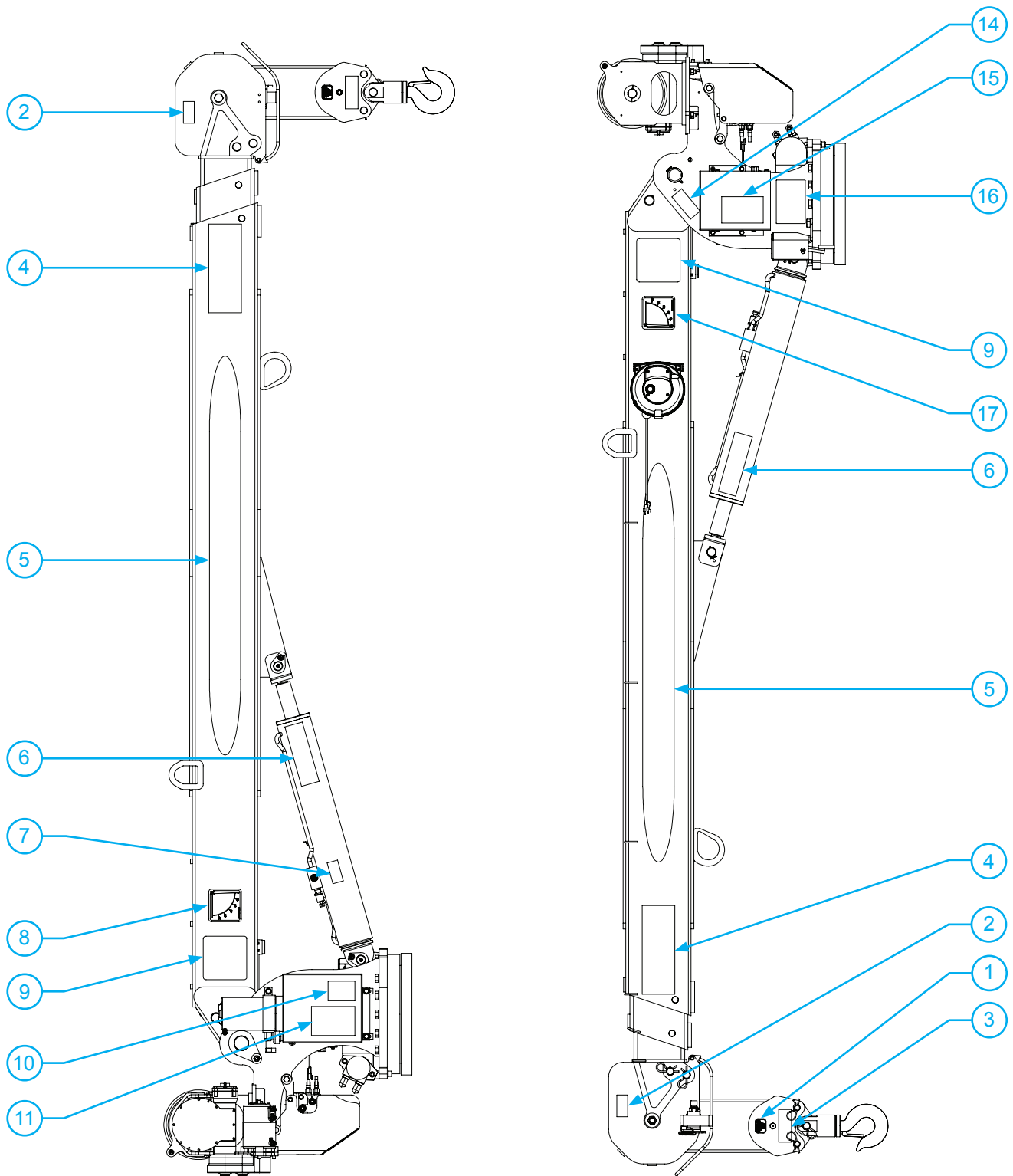


DETAIL F

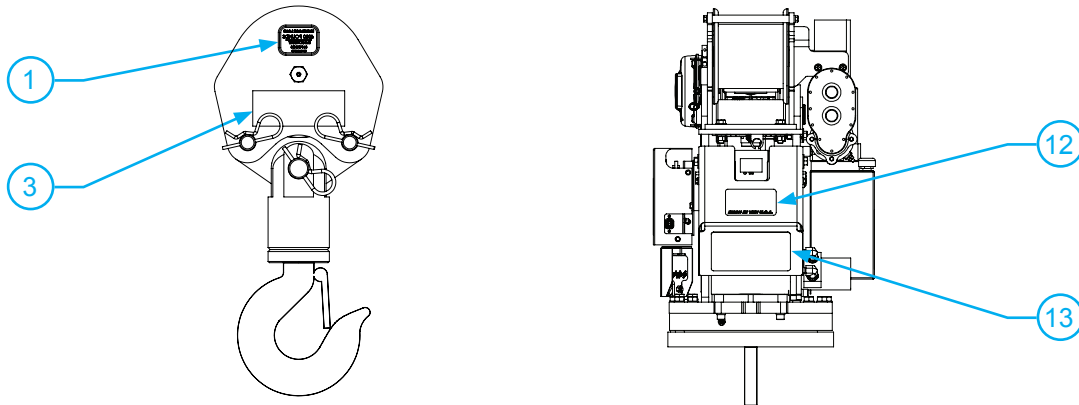
General Assembly 10

ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	366800200	PEDESTAL ASSEMBLY, EHC-6 NEXSTAR III
2	1	480988101	BOOM ASSEMBLY, 8406H & 6406H W/LIGHT
3	1	360676000	PIN, CYLINDER
4	1	239300000	ZERK, GREASE
5	1	320976000	WASHER, FLAT, 3/8 SAE HARDENED
6	1	021100000	WASHER SP LK 3/8
7	1	366159000	SCREW HX HD 3/8-16UNC X 1 1/2 LG GR8
8	1	480988020	PIN, PIVOT, 8406H
9	1	021500000	WASHER, SP LK 1/2
10	1	021600000	WASHER FL 1/2
11	1	017701000	NUT HX 1/2-13UNC
12	1	738642000	SCREW HX HD 1/2-13UNC X 1 3/4 LG GR8
13	1	366800222	SHIP KIT, EHC-6, NEXSTAR III
14	1	366800030	DECAL LAYOUT, EHC-6, NEXSTAR
15	1	360678000	PIN, 3/16 COTTERLESS RING
16	1	360677000	PIN, 1/4 COTTERLESS RING
17	1	480031000	WIRE ROPE ASSEMBLY 3/8"
18	1	470076000	PIN, 1 DIA 4-11/16 LG
19	1	360124000	PIN HITCH
20	1	366066000	TRAVELING BLOCK ASSY LESS 2-BLOCK BAR 6006EH
21	1	002902000	SCREW SOC HD 1/4UNC X 1/2 GR8
22	1	366823236	LIGHT, LED (RED, GREEN, YELLOW)
23	2	772043000	ZIP TIE STRAP, 12 IN, NYLON, BLACK
24	1	366823254	SENSOR, TRI-AXIS
25	4	019700000	WASHER SP LK #8
26	2	015500000	NUT HX #8-32UNC CP
27	4	001302000	SCREW RD HD #8-32UNC X 1/2 LG
28	1	330622000	DECAL SERIAL NO

11 Decal Layout



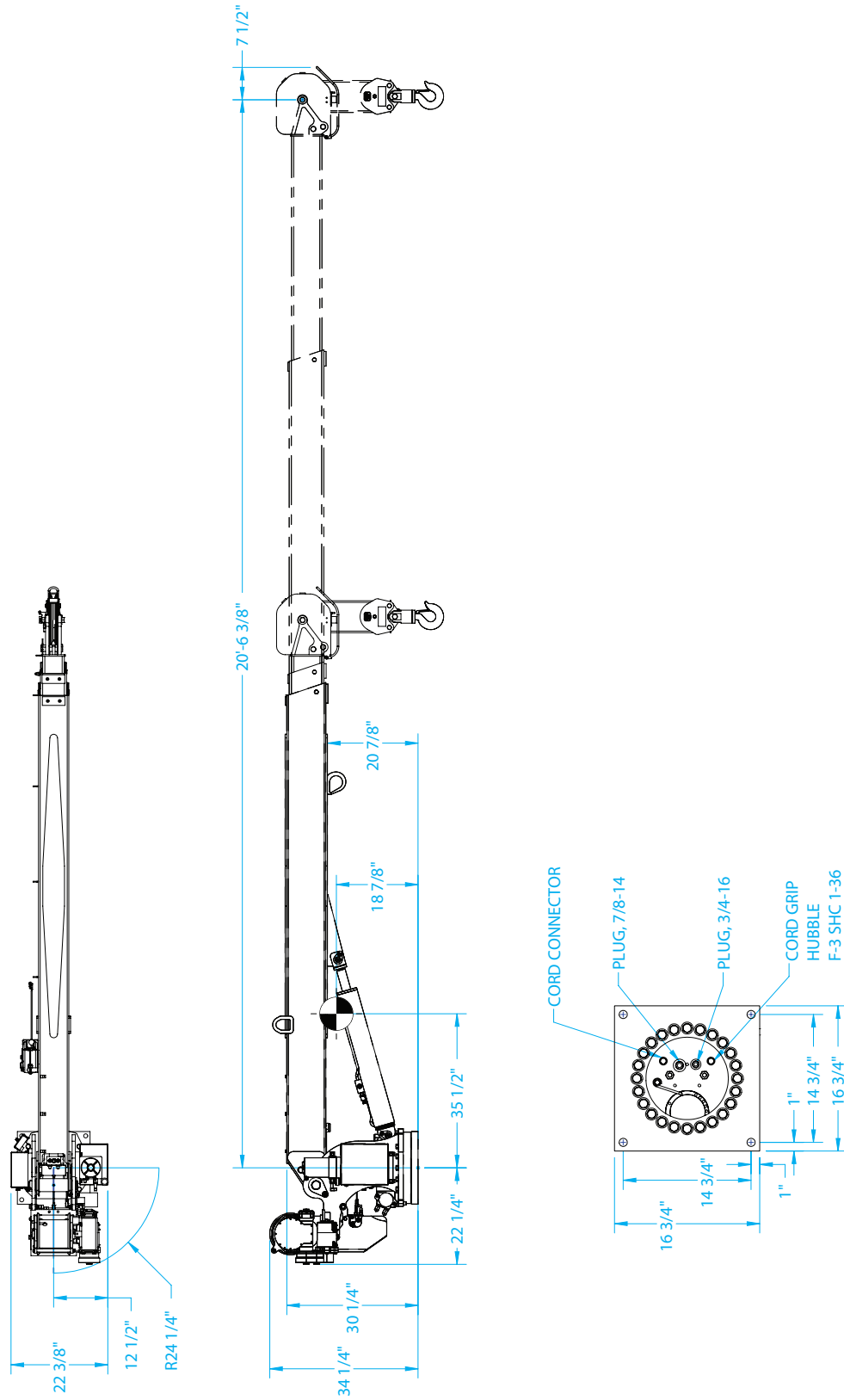
Decal Layout 11



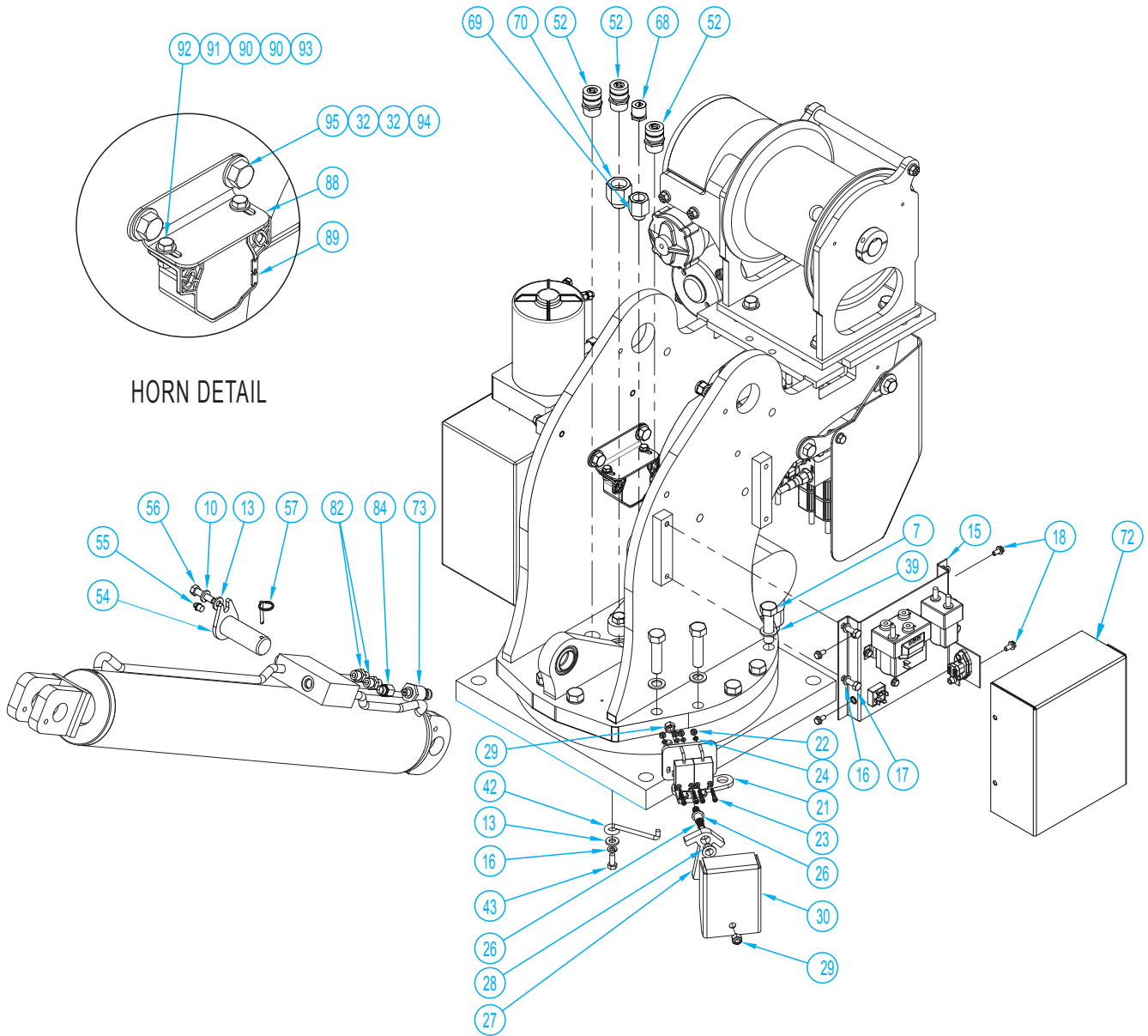
DECAL LAYOUT, EHC-6, NEXTSTAR

ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	2	366063100	DECAL, TRAVELING BLOCK 6006H
2	2	045051700	DECAL STAY CLEAR OF BOOM
3	2	045051800	DECAL STAY CLEAR OF LOAD
4	2	040529000	DECAL DANGER "ELECTROCUTION HAZARD" POWER LINE
5	2	366800035	DECAL, BOOM, EHC-6, NEXTSTAR
6	2	040519000	DECAL DANGER SCISSOR POINT
7	1	040587000	DECAL WARNING LOAD SENSOR
8	1	320318000	DECAL ANGLE INDICATOR CS
9	2	366800224	DECAL, LOAD CHART, EHC-6
10	1	040632000	DECAL WARNING - OVERLOAD
11	1	040580000	DECAL TRAINED OPERATOR
12	1	040824000	DECAL, AMERICAN FLAG, MADE IN THE U.S.A.
13	1	366800208	DECAL, MANUAL OVERRIDE PROCEDURES, GS HYDRAULICS, LARGE EH CRANES
14	1	330622000	DECAL SERIAL NO.
15	1	040579000	DECAL OPERATION INSTRUCTIONS
16	1	460169000	DECAL WARNING, REMOTE CONTROL
17	1	320318001	DECAL ANGLE INDICATOR SS

12 General Dimensions



Pedestal Assembly P/N: 366800200 13



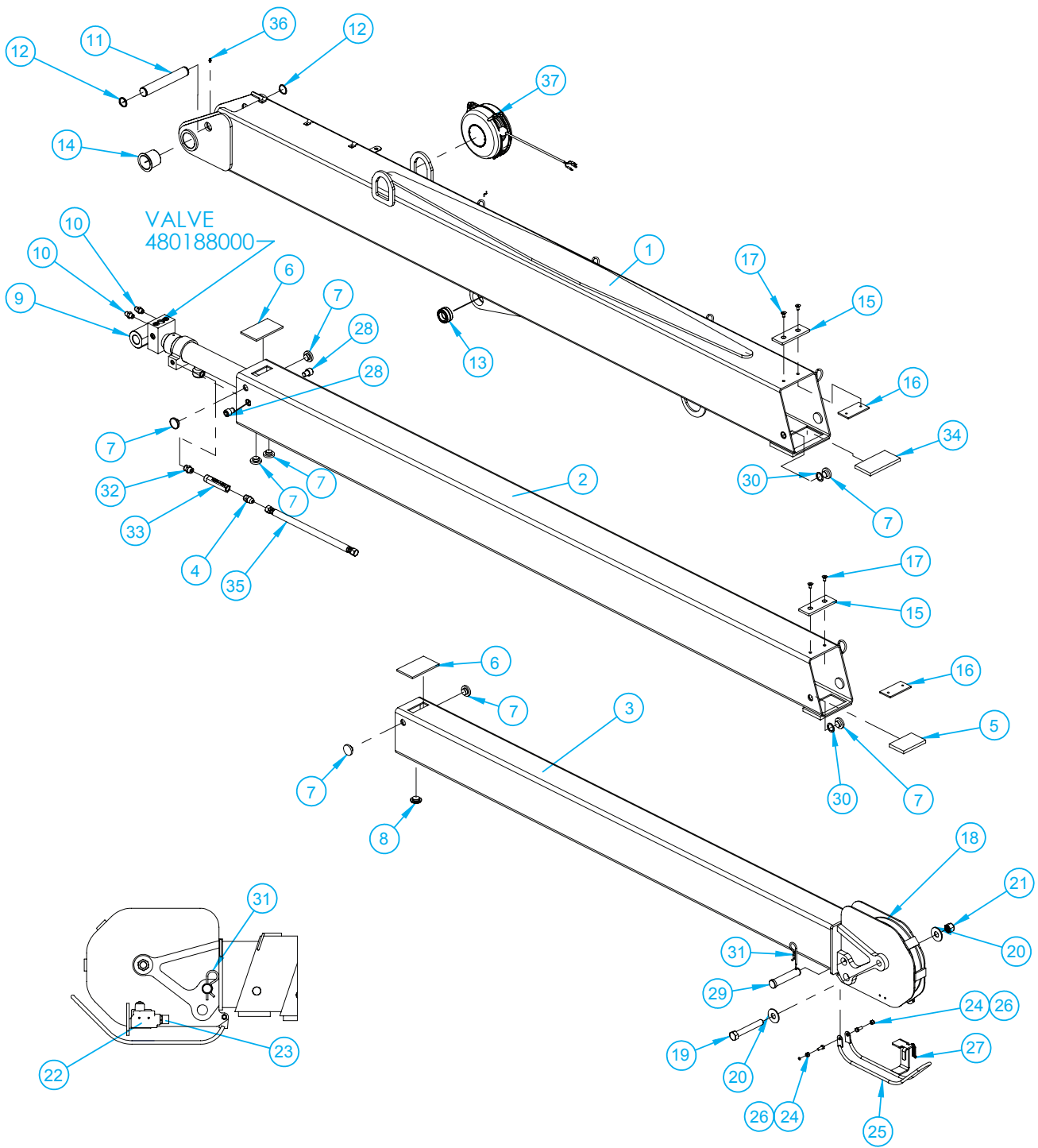
Pedestal Assembly P/N: 366800200 13

ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	366832100	BASE PLATE WELDMENT
2	1	360648300	PEDESTAL WELD, EH LARGE CRANE
3	1	480023002	BEARING ROTATION 5005-8005
4	36	023902000	WASHER FL 5/8 HARDENED
5	24	012198000	SCREW HX HD 5/8-11UNC X 1 3/4 LG GR8
6	2	366393000	SCREW HX HD 5/8-11UNC X 2 1/2 LG GR8
7	10	490171000	SCREW HX HD 5/8-11UNC X 2 1/4 LG GR8
8	4	006205000	SCREW SOC HD 5/8-11UNC X 1 1/4 LG
9	1	366651000	BAR, POWER UNIT MOUNT
10	7	021100000	WASHER SP LK 3/8
11	2	008702000	SCREW HX HD 3/8-16UNC X 1 1/4 LG GR5
12	1	366650000	HYDRAULIC POWER UNIT
13	6	320976000	WASHER, FLAT, 3/8 SAE HARDENED
14	4	009116000	SCREW HX HD 3/8-16UNC X 2 GR5
15	1	366800211	RELAY PANEL ASSEMBLY, EH CRANES, NEXSTAR III
16	5	020601000	WASHER SP LK 5/16
17	4	007400000	SCREW HX HD 5/16-18UNC X 1 LG GR5
18	4	360493000	SCREW HX WHIZ-LK 1/4-20UNC X 1/2 LG
19	1	366800215	HARNES, LARGE EH CRANES, NEXSTAR III
20	1	460110100	ROTATION STOP SWITCH ASSEMBLY, 24"
21	1	366832200	BRACKET, ROTATION STOP
22	4	725321000	NUT HX NYLK #8-32UNC
23	4	006210000	CAPSCREW-#8-32 X 7/8 LG SOC HD Z/P
24	4	019700000	WASHER SP LK #8
25	1	366675000	WASHER, NYLON
26	1	366673000	PIN, ROTATION STOP
27	1	366671000	ARM, ROTATION STOP
28	1	460079000	BEARING, ROTATION STOP
29	2	017301000	NUT HX NYLK 3/8-16UNC CP
30	1	366676000	COVER, ROTATION STOP
31	1	113001	HOIST, DCG24-246R W/ FRAME
32	12	320588000	WASHER, FL 1/2, HARDENED
33	12	021500000	WASHER, SP LK 1/2
34	8	017701000	NUT HX 1/2-13UNC
35	4	011608000	SCREW HX HD 1/2-13UNC X 2 LG
36	1	480011000	SEAL ROTATION BOX
37	1	160407000	GEAR BOX, ROTATION
38	2	017704000	NUT HX HVY 1/2-20UNF
39	2	009118000	SCREW SOC HD 1/2-13UNC X 2 LG
40	2	011202000	SCREW HX HD 1/2-20UNF X 2 3/4 LG GR5
41	1	360162000	RING, ECCENTRIC
42	1	360207000	RETAINER ECCENTRIC RING
43	1	007807000	SCREW HX HD 5/16-18UNC X 3/4 LG GR5
44	1	366440000	ROTATION MOTOR
45	2	021502000	WASHER SP LK 1/2 HI COLLAR
46	2	012197000	SCREW SOC HD 1/2-13UNC X 1/2 LG
47	4	011603000	SCREW HX HD 1/2-13UNC X 1 3/4 LG
48	1	366800205	VALVE BLOCK, LARGE EH CRANE, NEXSTAR

13 Pedestal Assembly P/N: 366800200

ITEM NO.	QTY	PART NO.	DESCRIPTION
49	4	002614000	SCREW HX HD 5/16UNC X 5/8 CP GR3 SELF TAP
50	1	366800206	BRACKET, VALVE BLOCK AND RECEIVER
51	1	366333000	BEARING, SPHERICAL 1.25 ID
52	3	366698000	CORD GRIP .375-.500 3/4" HUB
53	1	366822250	CYLINDER, LIFT, 6406H, STROKE - 27.81
54	1	360676000	PIN, CYLINDER
55	1	239300000	ZERK, GREASE
56	1	366159000	SCREW HX HD 3/8-16UNC X 1 1/2 LG GR8
57	1	360678000	PIN, 3/16 COTTERLESS RING
58	4	015801000	NUT HX NYLK #10-24UNC ZP
59	4	020000000	WASHER FL #10 ZP
60	4	460094000	SCREW, SOC HD, #10-24 X 1"L, ZPL
61	1	366823963	TRANSCEIVER, NEXSTAR III
62	1	366800207	COVER, VALVE
63	4	021600000	WASHER FL 1/2
64	4	020901000	WASHER FL 5/16
65	2	020600000	WASHER 5/16 LOCK SS
66	2	016500000	NUT HX 5/16-18UNC
67	2	007811000	SCREW HX HD 5/16-18UNC X 1 LG GR5
68	1	642908000	CORD CONNECTOR
69	1	366800209	PORT ADAPTER, STRAIGHT, -8 MALE SAE-ORB TO 1/2 NPTF
70	1	366800210	PORT ADAPTER, STRAIGHT, -8 MALE SAE-ORB TO 1/2 NPTF
71	1	366823272	KIT, ELEC/HYD NEXSTAR III, LARGE EH CRANES
72	1	366800218	COVER, RELAY PANEL
73	1	366823255	TRANSDUCER, PRESSURE 0-3000 PSI
74	1	680160000	CABLE ASSY, 4 GA, GROUND 72in LG
75	1	366509001	COND ASS'Y 4GA,15LG,3/8-5/16 W/BOOT
76	1	366509000	GROUND WIRE ASSY
77	1	366800221	KIT, HOSE, LARGE EH CRANES, NEXSTAR
78	1	812203018	HOSE ASSY 6 STR
79	1	812203019	HOSE ASSY 6 STR
80	2	812203024	HOSE ASSY 6 JICF STR
81	1	330645000	FITTING 90 6-SAE/6-JIC LONG
82	3	200876000	FITTING 6 SAE/6 JIC STRAIGHT
83	2	812203033	HOSE ASSY -6 X 33" LG.
84	1	369611000	ADAPTER, STR -6 ORM/ -4 ORF
85	2	812209019	HOSE ASSY, -6 HOSE, -6 JICF / -6 JICF 90DEG SHORT, 19" LONG
86	2	490198000	FITTING 90 10 SAE/6 JIC
87	52"	374086000	NYLON HOSE SLEEVE, 1.81" ID, 5" LONG
88	1	366823224	BRACKET, ALARM, HC-6 TO HC-10
89	1	366823223	KIT, ALARM, CONSTANT TONE, W/ DEUTSCH PLUG
90	4	020400000	WASHER FL SAE 1/4
91	2	020200000	WASHER SP LK 1/4
92	2	015900000	NUT HX 1/4-20UNC SS
93	2	005500000	SCREW HX HD 1/4-20UNC X 3/4 LG
94	2	738058008	NUT HX 1/2-13UNC
95	2	010201000	SCREW HX HD 1/2-13UNC x 1 1/2 LG

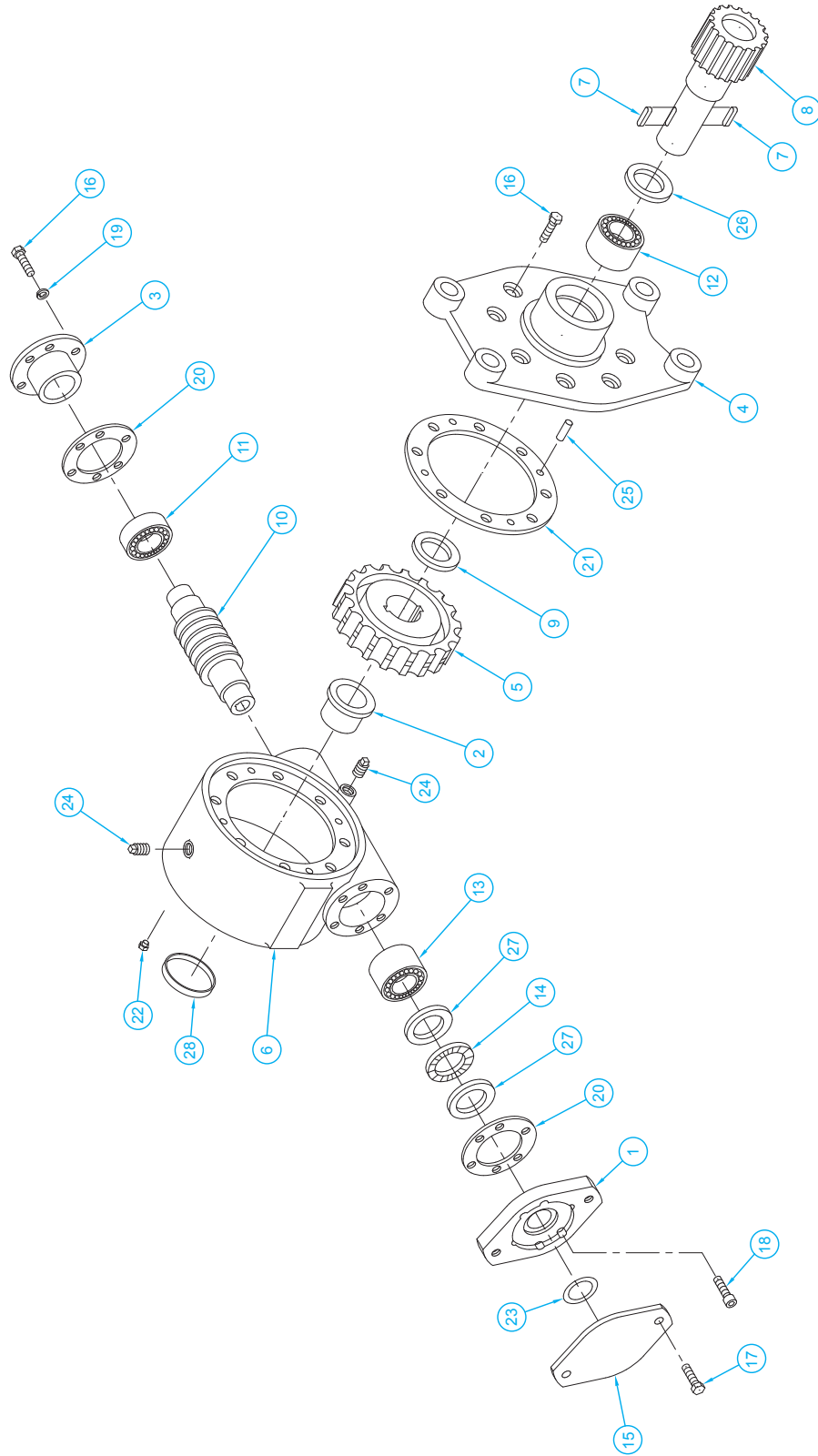
14 Boom Assembly P/N: 480988101



Boom Assembly P/N: 480988101 14

ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	480988115	LOWER BOOM WELD, 8406H W/LIGHT
2	1	480988120	MID BOOM WELD, 8406H
3	1	480988130	UPPER BOOM WELD, 8406H
4	1	770055000	FITTING 8 SAE/8 JIC STRAIGHT
5	1	460053000	WEAR PAD, BOTTOM UPPER
6	2	460177160	WEAR PAD, 5.13X3X.25, BOSS 1X3
7	10	360767000	PAD BOOM 1.5 O.D.
8	1	407277000	PAD BOOM 1.5 O.D.
9	1	480988150	CYLINDER, EXTENSION, STROKE - 48/72
10	2	200876000	FITTING 6 SAE/6 JIC STRAIGHT
11	1	460177161	PIN, 1.25OD, 7.81 GRIP
12	2	480029000	RING RETAINING
13	1	366333000	BEARING, SPHERICAL 1.25 ID
14	2	366394000	BEARING, PIVOT
15	2	460081000	WEAR PAD, CABLE
16	2	460082000	PLATE, WEAR PAD RETAINER
17	4	460177163	SCREW SOC HD CTRS NK 5/16-24UNF X 5/8 LG
18	1	366198000	SHEAVE ASSY 3/8
19	1	014400000	SCREW HX HD 3/4-16UNF X 5 LG GR5
20	2	022102000	WASHER FL 3/4
21	1	018600000	NUT HX NYLK 3/4-16UNF
22	1	646900000	SWITCH, LIMIT ANTI-TWO BLOCK
23	1	642918000	CORD CONNECTOR
24	2	016801000	NUT HX NYLK 5/16-18UNC CP
25	1	470110168	LONG TAB BAIL WELDMENT W/ 2 IN TRIP BAR STAINLESS STEEL
26	2	007807000	SCREW HX HD 5/16-18UNC X 3/4 LG GR5
27	1	366678000	SPRING, EXTENSION
28	2	460177162	SCREW SOC HD 5/8-11UNC X 3/4 LG
29	1	470076000	PIN, 1 DIA 4-11/16 LG
30	4	460177164	SHIM, 1.31 OD X 0.9 ID X 0.04 TH, NYLON
31	1	360124000	PIN HITCH
32	1	374400000	FITTING, -8 ORB, -8 ORB, STRAIGHT
33	1	460177180	VALVE, IN-LINE RELIEF, 400PSI
34	1	366669000	WEAR PAD, BOTTOM MID
35	1	812234017	HOSE ASSY, -8 JIC/-8 JIC, -6 HOSE, 17LG
36	1	239000000	ZERK DRIVE GR
37	1	360759003	CORD REEL ASSY

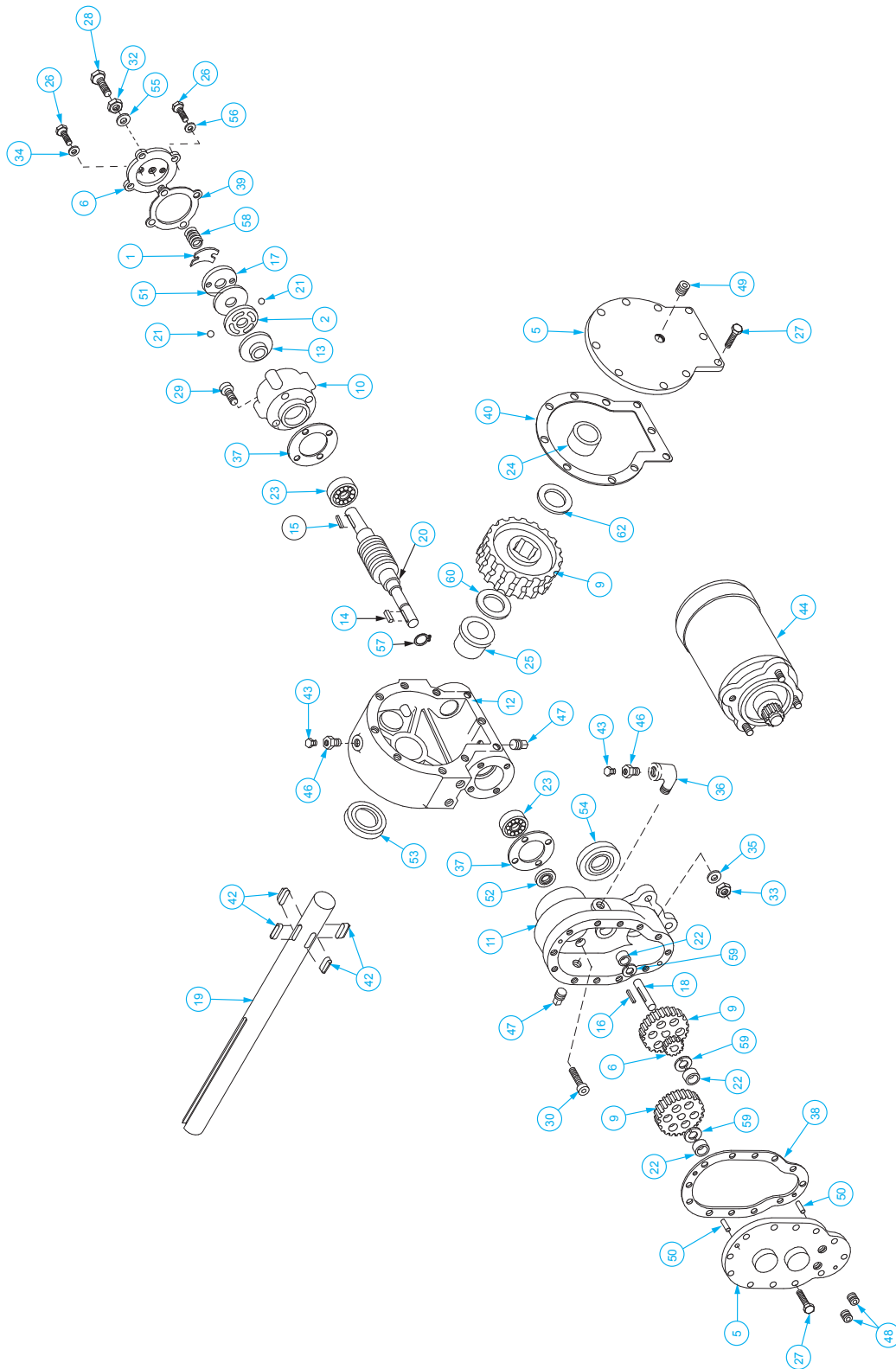
15 Rotation Gearbox P/N: 160407



Rotation Gearbox P/N: 160407 15

ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	300058	ADAPTER
2	1	308085	BUSHING
3	1	316004	CAP-BEARING
4	1	328126	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	LOCKWASHER
20	2	442182	GASKET
21	1	442187	GASKET
22	1	456008	FITTING-RELIEF
23	1	462029	O-RING
24	2	468018	PLUG-PIPE
25	4	470062	PIN-DOWEL
26	1	486071	SEAL-OIL
27	2	518026	WASHER-THRUST
28	1	472088	PLUG

16 Actuator Assembly P/N: 297025



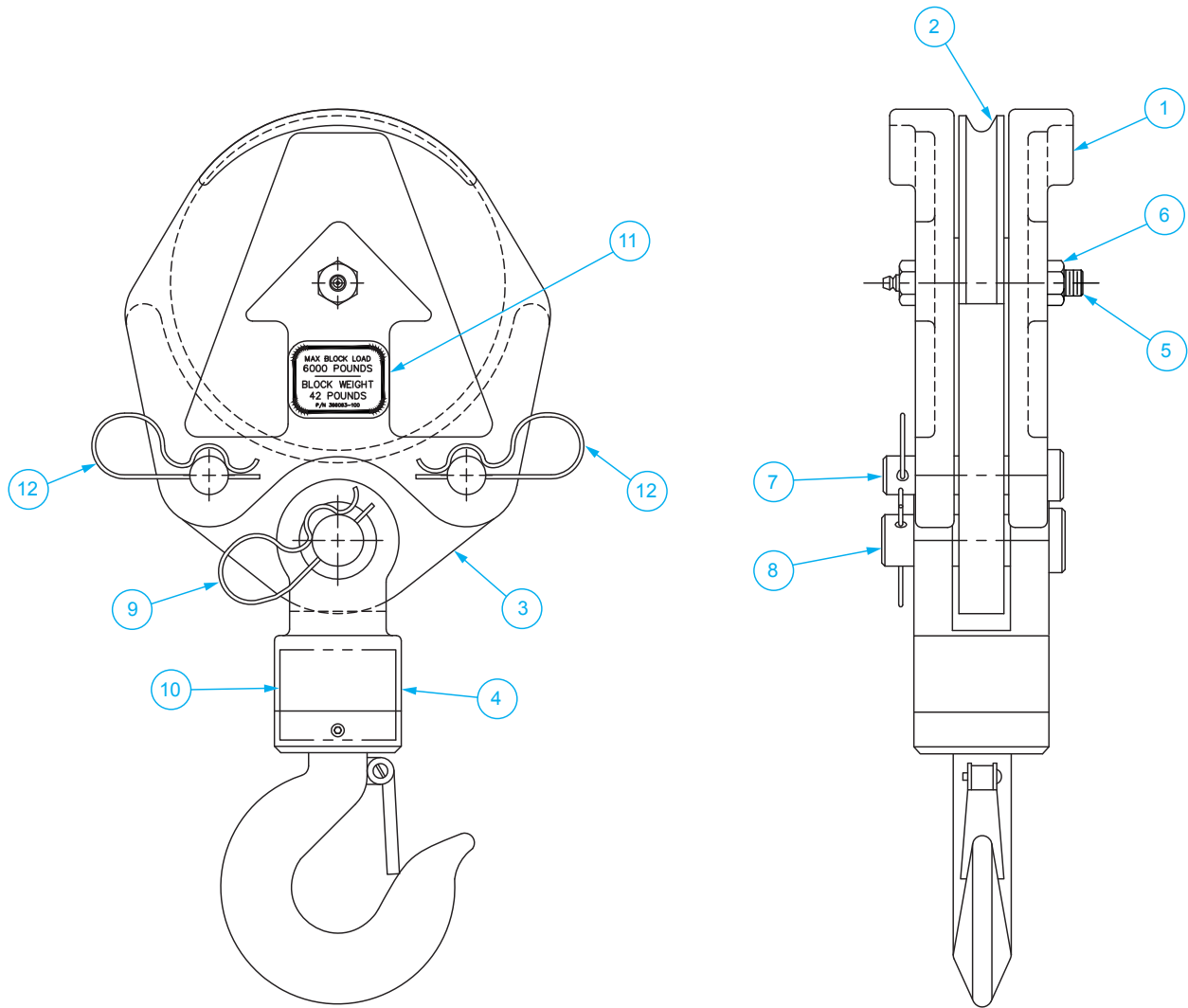
Actuator Assembly P/N: 297025 16

ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	306034	SPRING-FLAT
2	1	000314	PLATE-CAM
3	1	328106	COVER-SPUR GEAR HSG.
4	1	328128	COVER-BRAKE
5	1	328134	COVER-WORM GEAR HSG.
6	1	334001	IDLER GEAR
7	2	334003	SPUR GEAR
9	1	334163	GEAR-WORM, R.H.
10	1	338007	HOUSING-BRAKE
11	1	338203	SPUR GEAR HOUSING
12	1	338273	GEAR HOUSING
13	1	340002	HUB-BRAKE
14	1	342023	KEY-SQ. END
15	1	342027	KEY-RD. END
16	1	342033	KEY-SQ. END
17	1	352022	PLATE-RETAINER
18	1	356901	SHAFT-SPUR
19	1	357145	SHAFT-OUTPUT
20	1	368022	WORM-R.H. 46:1
21	2	400003	BALL
22	3	402001	BEARING-NEEDLE
23	2	402002	BEARING-BALL
24	1	412044	BEARING-COVER
25	1	412045	BEARING-HOUSING
26	6	414021	CAPSCREW 1/4-20NC X 1 LG. HX.HD. Z.P. GR.5 NYLOK HVY. PATCH
27	22	414038	CAPSCREW 1/4-20NC X 3/4 LG. HX.HD. GR.5
28	1	414224	CAPSCREW 3/8-16NC X 1-1/2 LG. HX.HD. GR.5 ALL-THRD.
29	4	414821	CAPSCREW 1/4-20NC X 7/8 LG. HX.SOC. BUTTON HD.
30	4	414845	CAPSCREW 1/4-20NC X 1 LG. SOC.HD. LOC-WEL
32	1	418036	NUT-JAM-3/8-16NC
33	3	418040	NUT 3/8-24NF HEX. REG. Z.P.
34	2	418154	WASHER 1/4 FLAT ALUM.
35	3	418177	LOCKWASHER
36	1	432011	ELBOW-90
37	2	442184	GASKET
38	1	442185	GASKET
39	1	442189	GASKET
40	1	442205	GASKET
42	4	450016	KEY-BARTH
43	2	456008	RELIEF FITTING
44	1	262036	MOTOR-24V
46	2	468002	REDUCER
47	2	468011	PIPE PLUG SQ.HD.
48	2	468017	PIPE PLUG SOC.HD.
49	1	468018	PIPE PLUG SOC.HD.
50	2	470001	PIN

16 Actuator Assembly P/N: 297025

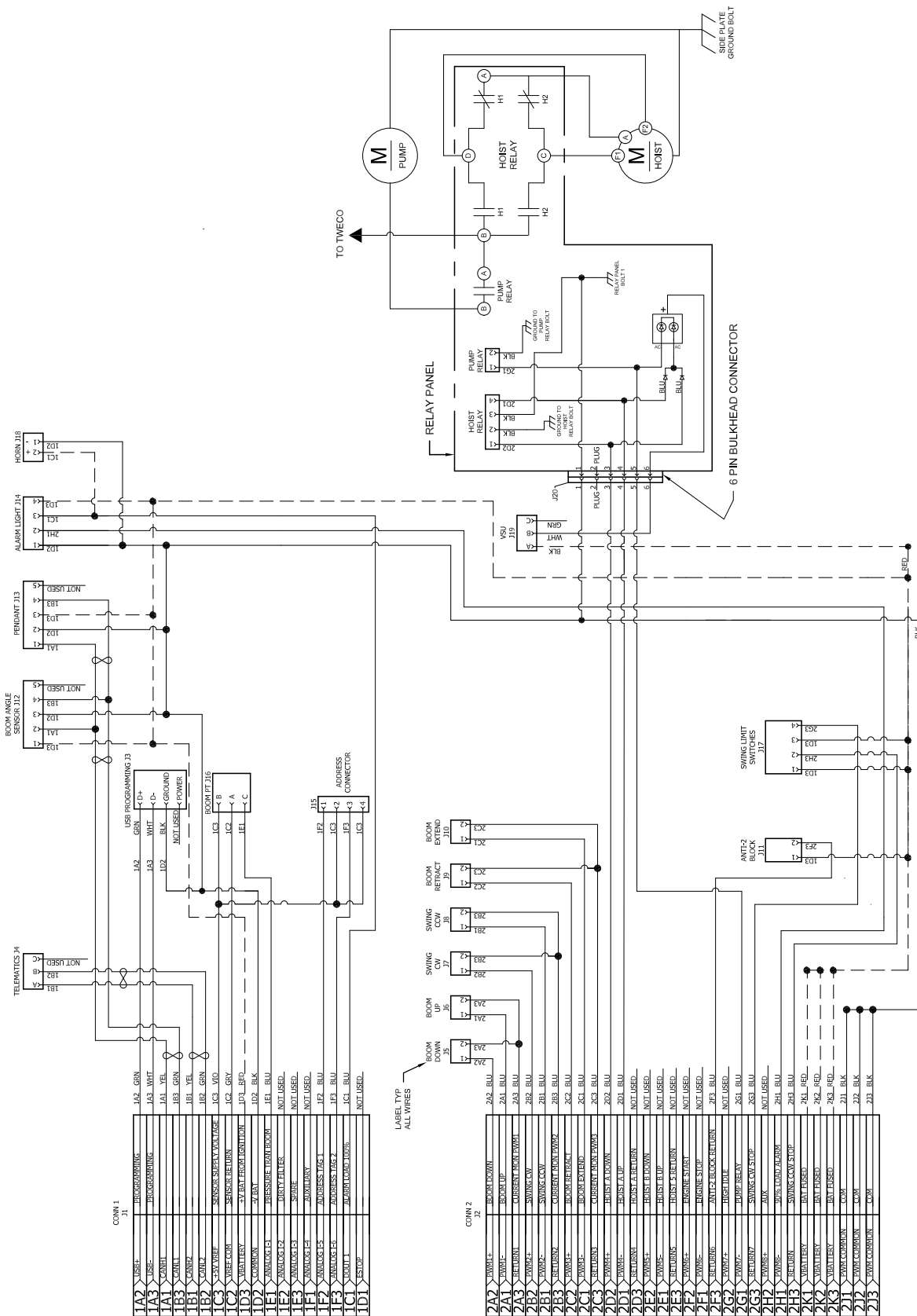
51	1	474001	PLATE-THRUST
52	1	486009	OIL SEAL
53	1	486009	OIL SEAL
54	1	486023	OIL SEAL
55	1	486069	THREAD SEAL
56	4	486070	THREAD SEAL
57	1	490003	SNAP RING
58	1	494007	SPRING
59	3	518002	THRUST WASHER
60	1	518015	THRUST WASHER
62	1	518040	WASHER-THRUST

Traveling Block Assembly P/N: 366063000 17

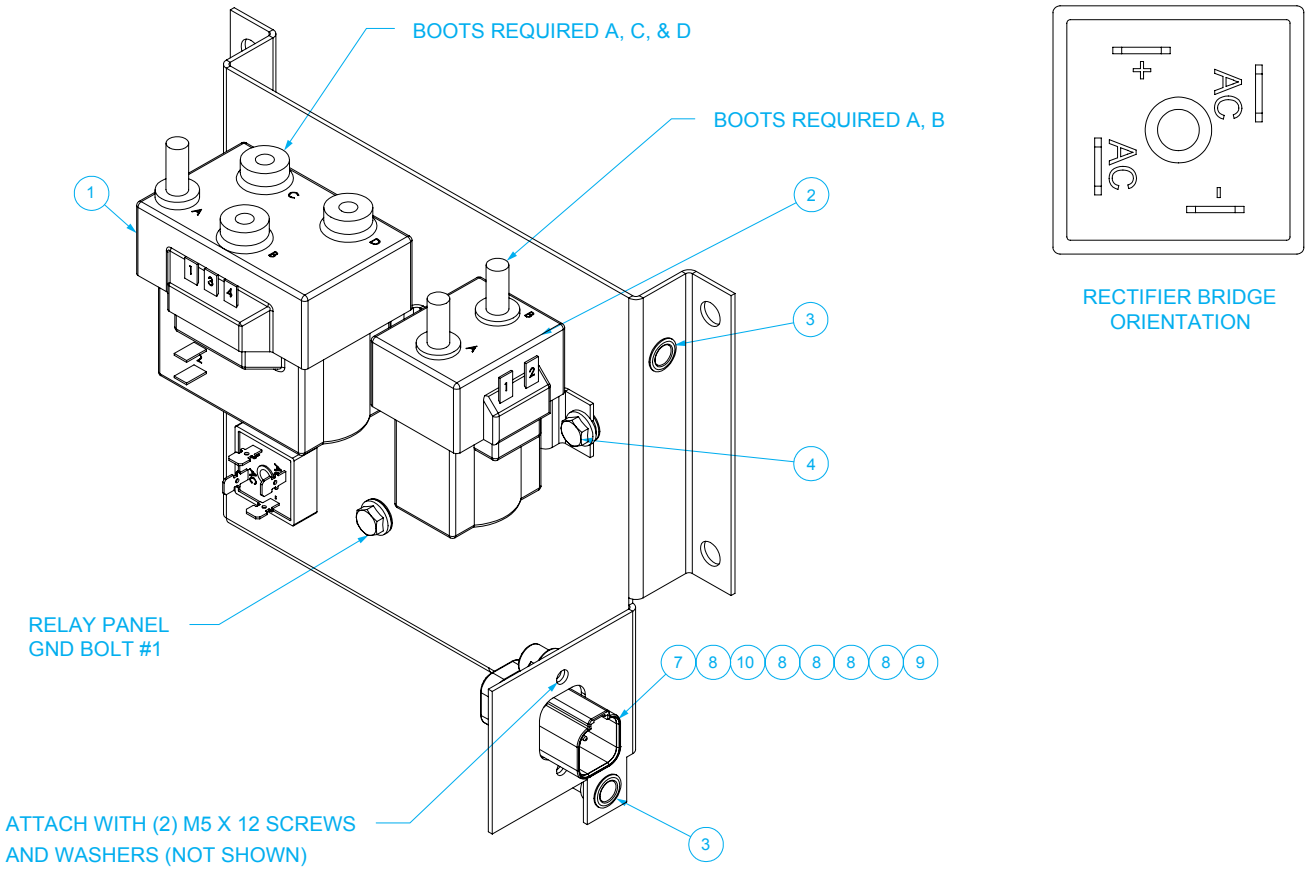


ITEM NO.	QTY	PART NO.	DESCRIPTION
1	2	480362000	SIDEPLATE, TRAVELING BLOCK (MACH.)
2	1	480130000	SHEAVE ASSY.
3	1	480364000	TACLE, LOWER
4	1	480371000	HOOK SWIVEL, 3 TON
5	1	480372000	BOLT, SHEAVE W/ ZERK
6	1	017800000	NUT, HEX-LOCK 1/2-20 NF
7	2	480367000	PIN, BLOCK
8	1	480368000	PIN, SWIVEL HOOK
9	1	360124000	PIN, HITCH (HAIR PIN)
10	2	040518000	DECAL, DANGER-STAY CLEAR/LOAD
11	2	366063100	DECAL, MAXIMUM LOAD
12	2	366813000	PIN, HITCH CLIP

18 Electrical Schematic P/N: 366800214

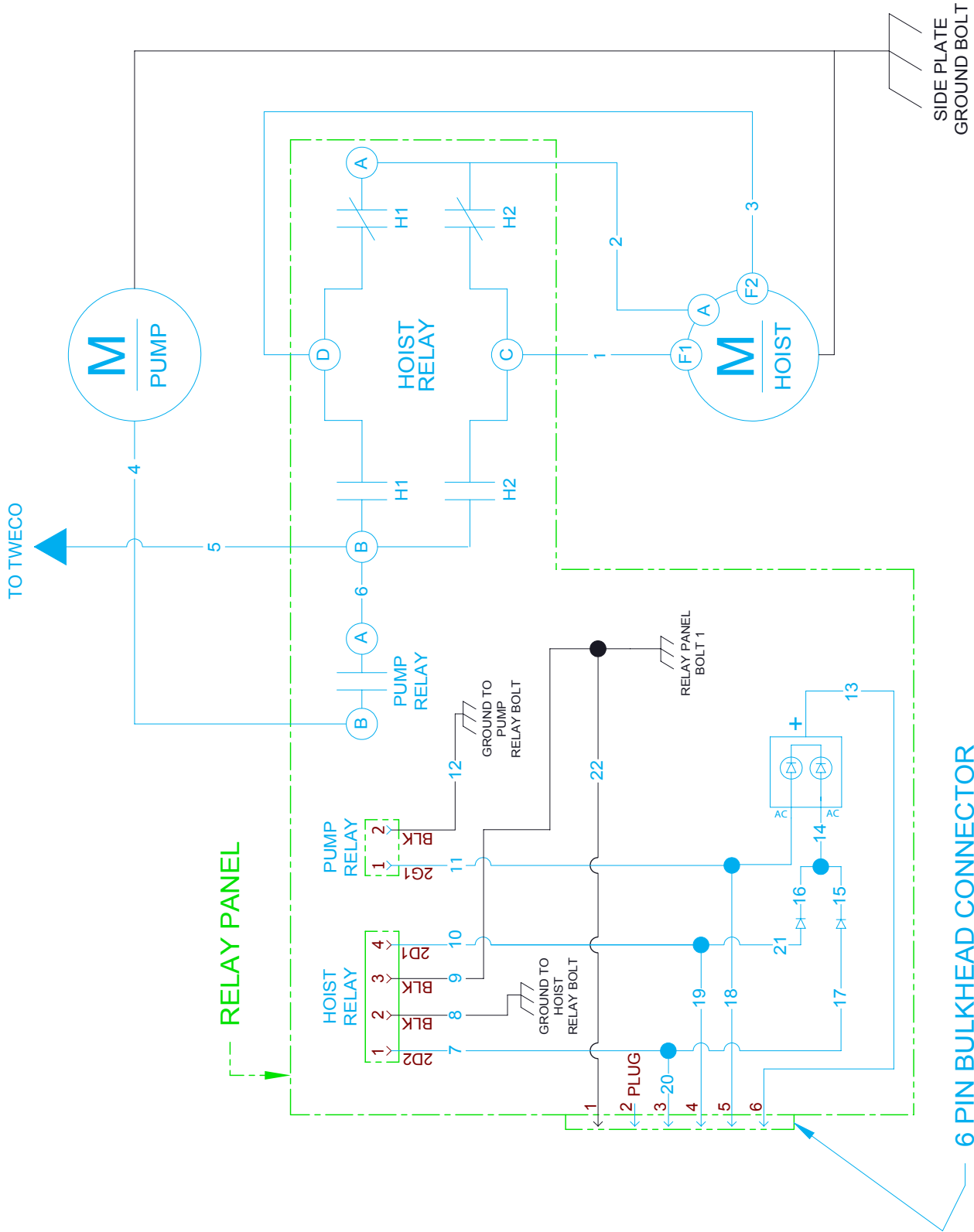


Relay Panel P/N: 366800211 19



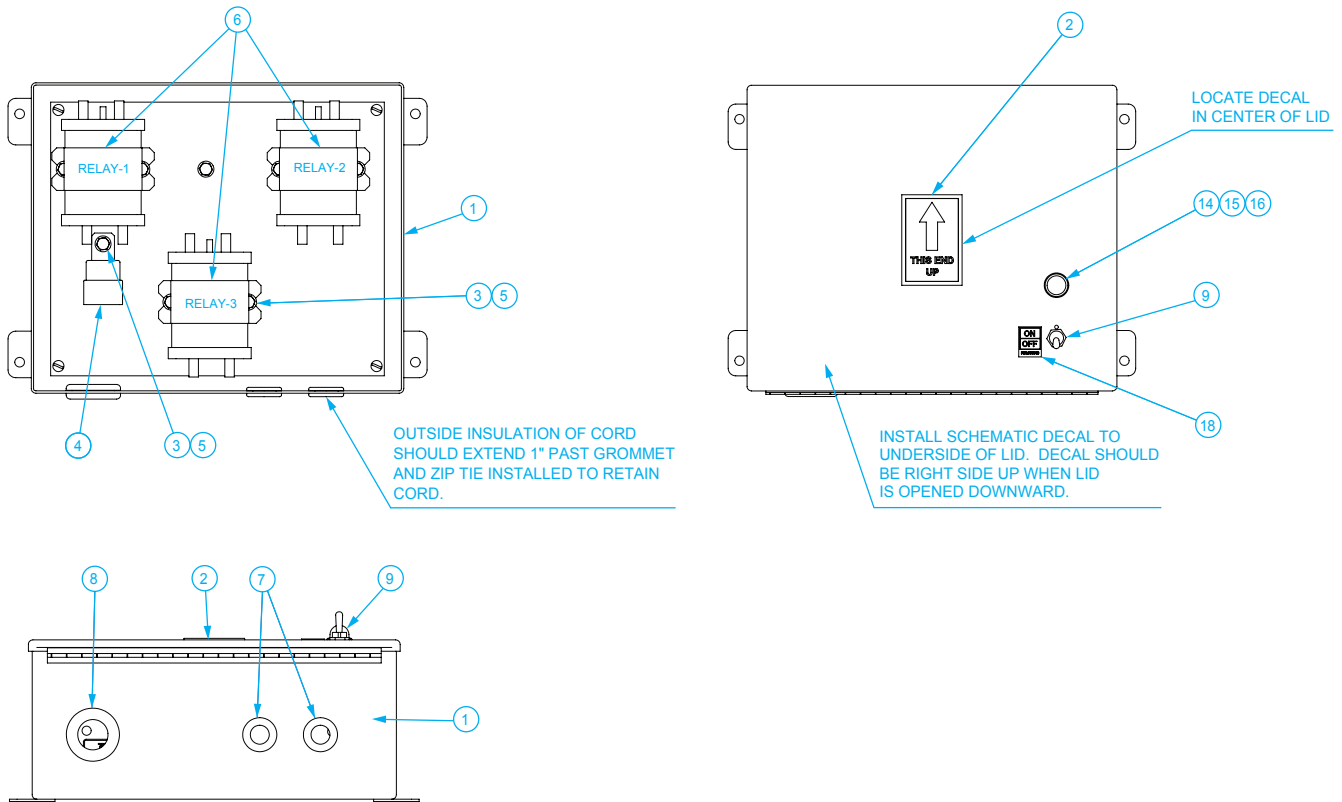
ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	320589000	RELAY, HOIST
2	1	320584000	RELAY, POWER UNIT
3	9	736272000	NUTSERT 1/4-20UNC X .027-.165 GRIP
4	5	360493000	SCREW HX WHIZ-LK 1/4-20UNC X 1/2 LG
5	1	751138000	RECTIFIER, BRIDGE 25 AMP
6	1	366800212	BACK PANEL, RELAY PANEL
7	1	366800216	HOUSING, DEUTSCH PLUG 6-PIN, DT04-6P-CL09
8	5	366376003	CONTACT, DEUTSCH 0460-202-16141
9	1	366800217	WEDGE, 6-PIN CONNECTOR, DEUTSCH W6P
10	1	360755000	CAVITY PLUG, DEUTSCH 114017

19 Relay Panel Wiring Detail P/N: 366800211



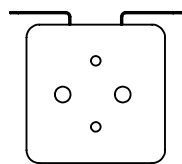
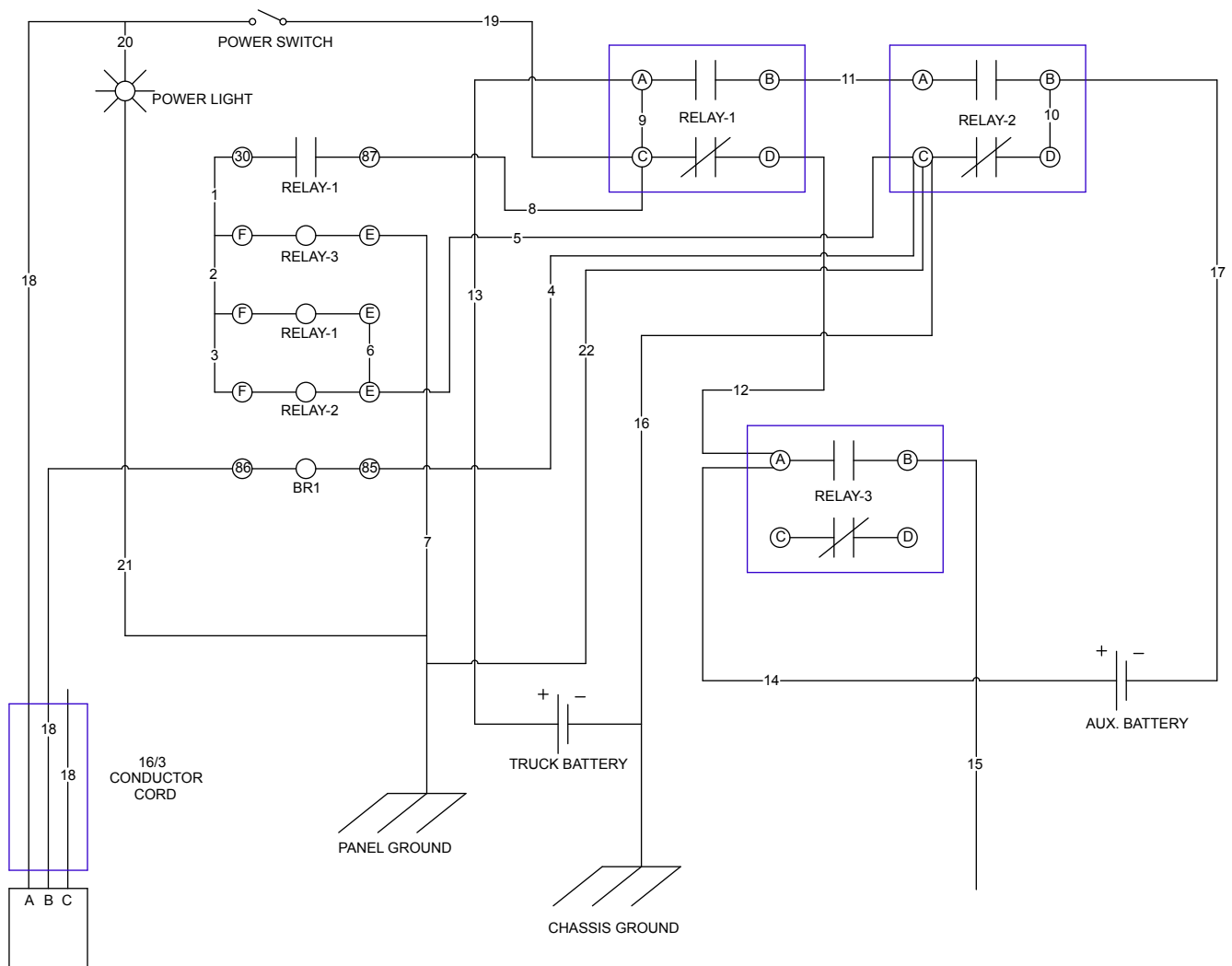
REFERENCE P/N 366800214 FOR FULL WIRING DETAILS

Voltage Switching Unit P/N: 366692000 20

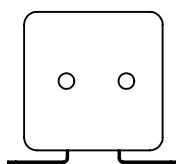


ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	366693000	ENCLOSURE, VOLTAGE SWITCHING UNIT
2	1	367242001	DECAL, THIS END UP
3	8	736272000	NUTSERT 1/4-20UNC X .027-.165 GRIP
4	1	320355000	RELAY, BOSCH
5	8	360493000	SCREW HX WHIZ-LK 1/4-20UNC X 1/2 LG
6	3	404167000	SOLENOID, SEALED
7	2	750169000	GROMMET, RUBBER
8	1	750282000	GROMMET, RUBBER, 1.375 OD, 1.00 ID
9	1	750090000	TOGGLE SWITCH, 1 POLE, 2 POSITION
10	1	360763001	HOUSING DEUTSCH 3-PIN
11	1	360763002	WEDGE, DEUTSCH 3-PIN
12	3	366367003	CONTACT, DEUTSCH SOCKET
13	1	366705000	DECAL, VSU SCHEMATIC
14	1	750171000	LAMP SOCKET, INDICATOR
15	1	750173000	BULB, 12V TYPE T-2
16	1	366707000	LENS, GREEN FLUTED
17	1	366717000	TWECO CONNECTOR, FEMALE 1MPC2
18	1	366717000	DECAL, ON/OFF

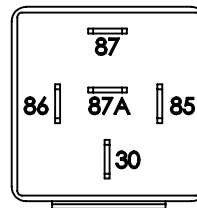
20 Voltage Switching Unit Wiring Detail



LARGE RELAY
TOP VIEW

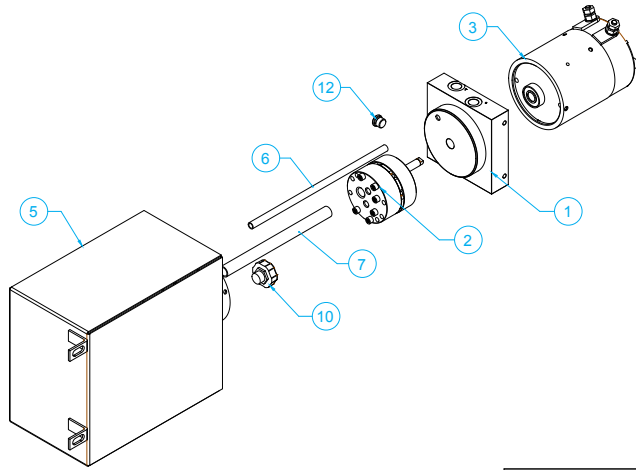


LARGE RELAY
BOTTOM VIEW

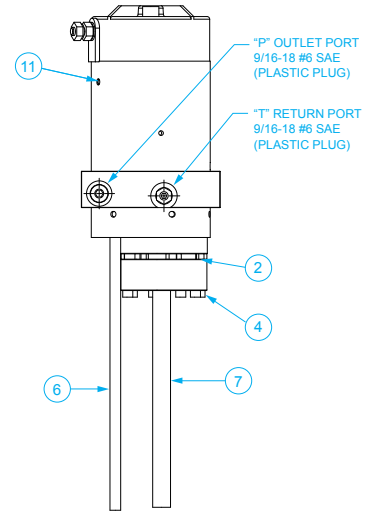
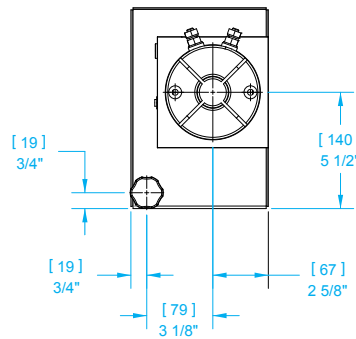


BOSCH RELAY
BOTTOM VIEW

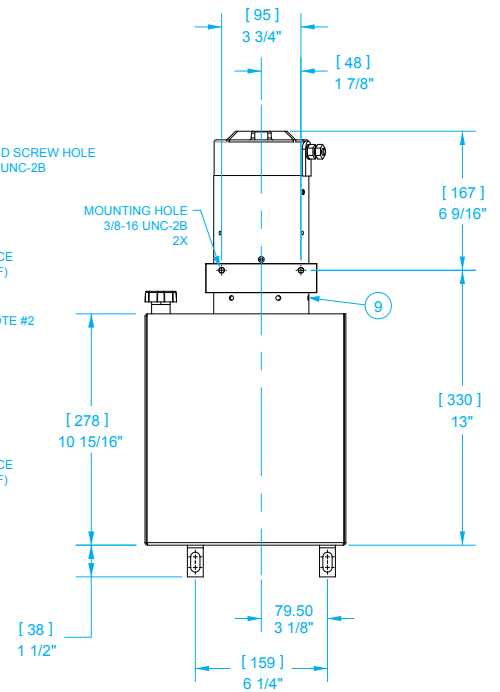
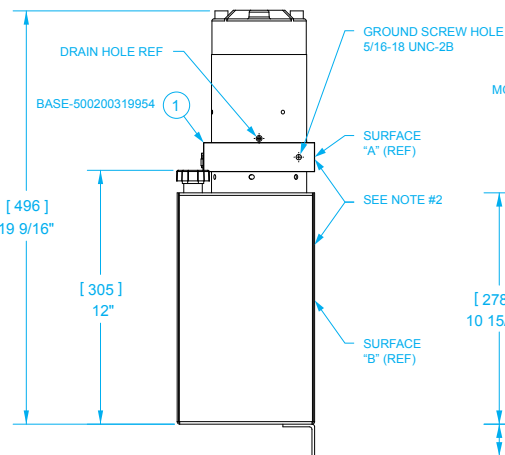
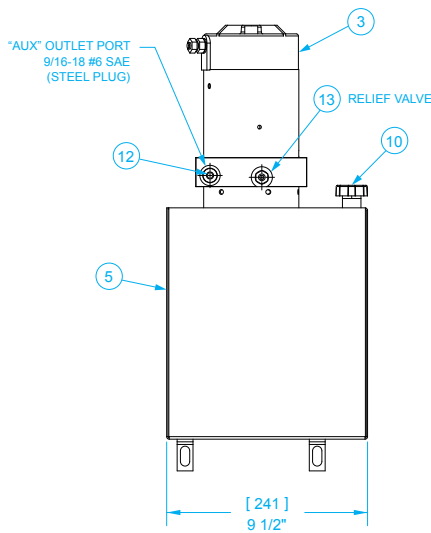
Hydraulic Power Unit P/N: 366650000 21



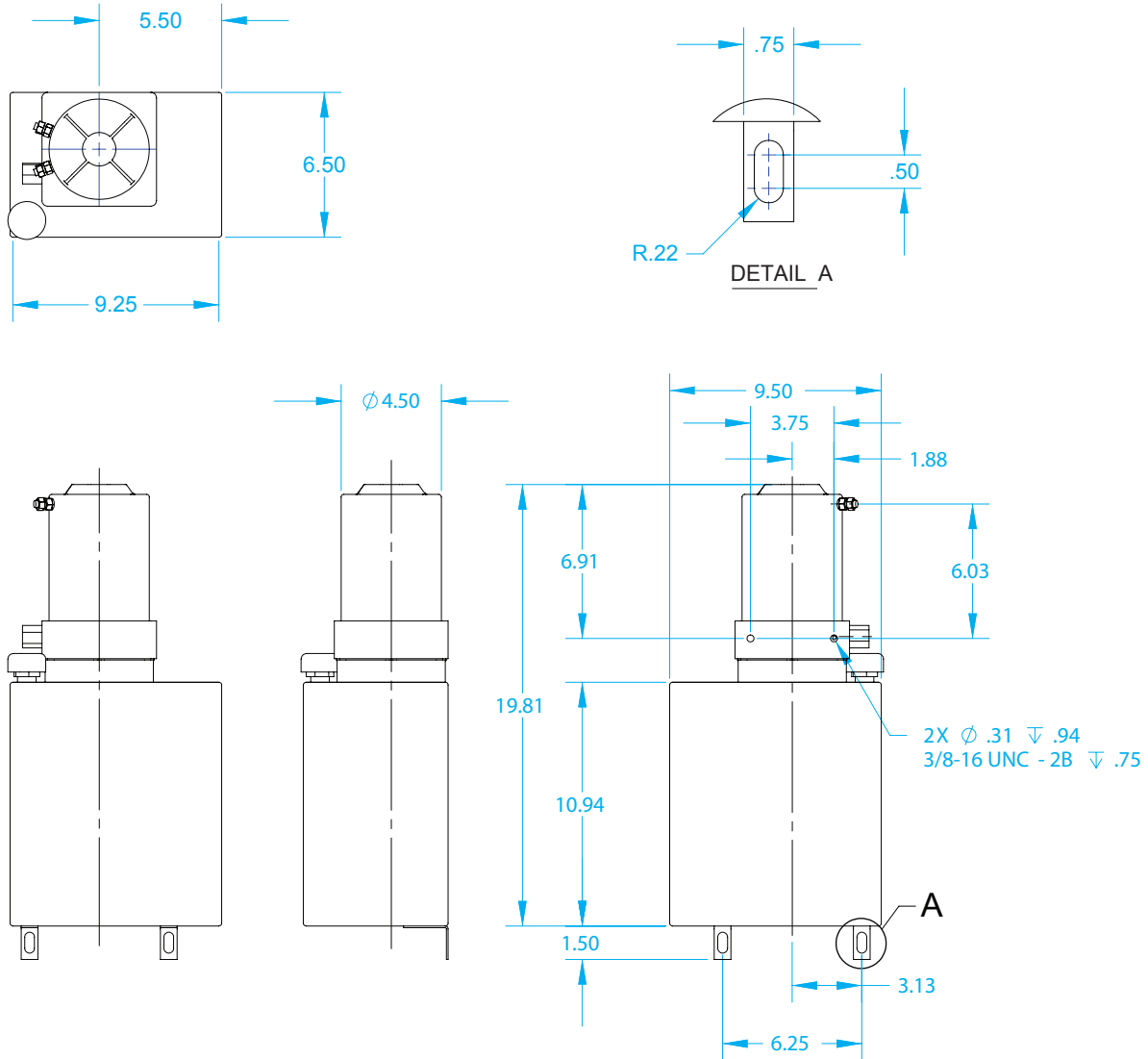
NOT ALL PARTS SHOWN



VIEW WITH RESERVOIR REMOVED

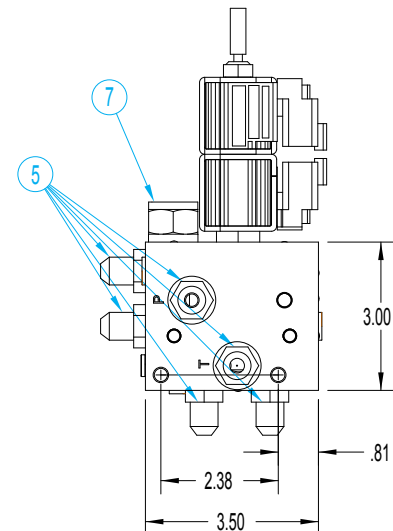
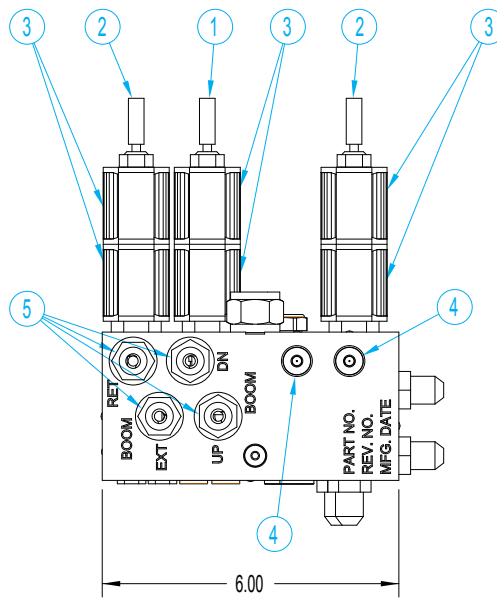
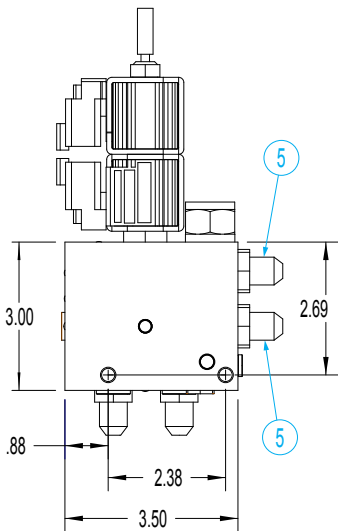
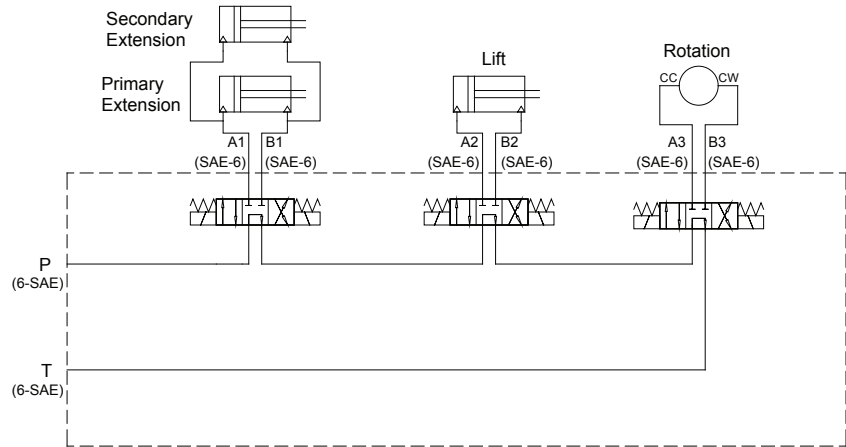
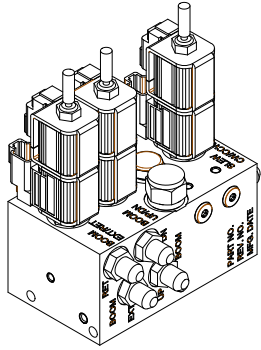


21 Hydraulic Power Unit P/N: 366650000



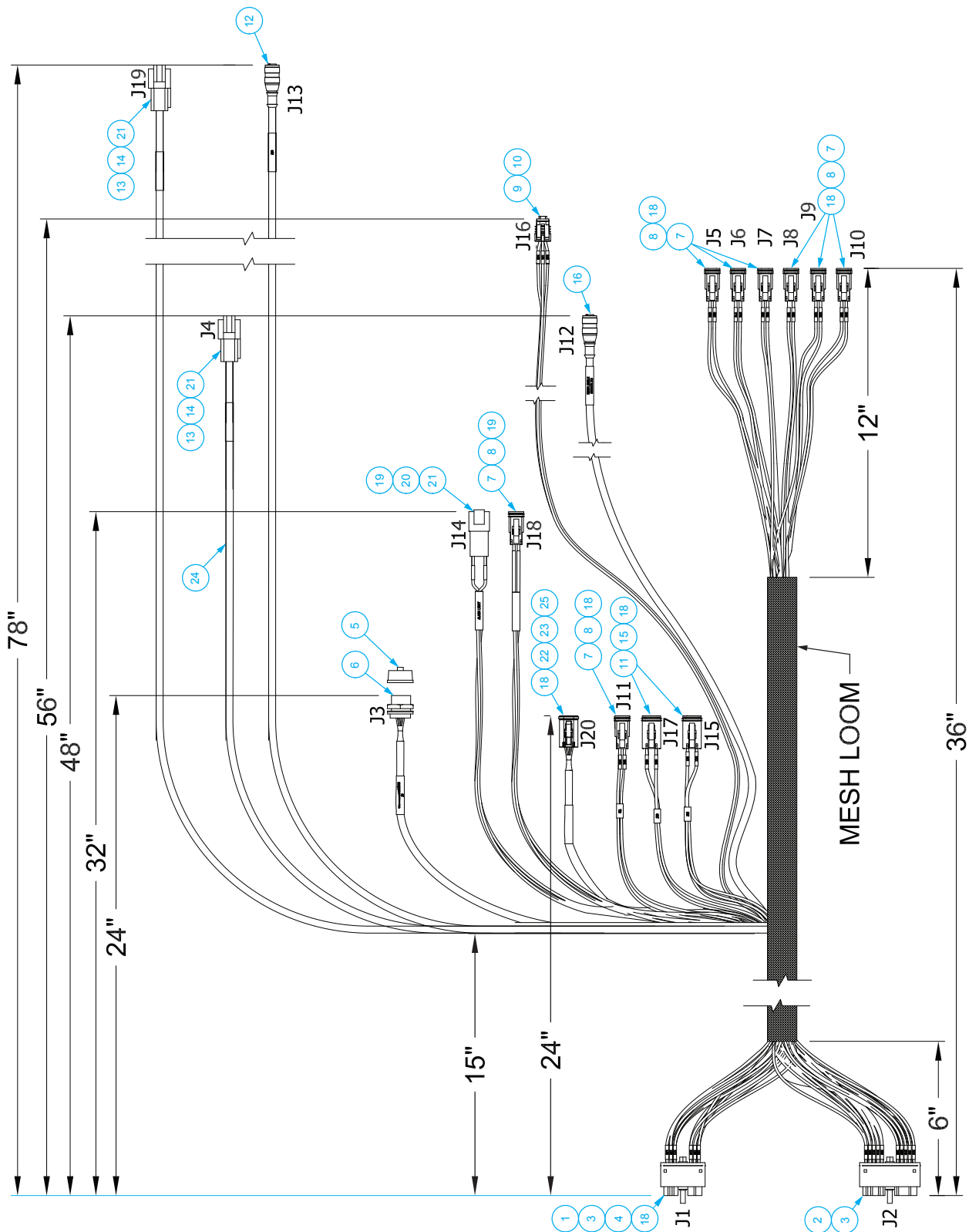
ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	320991284	BASE ASSY,M3504,MOD,W/MT,AUXP
2	1	366650011	P ASSY,QM,MDLR,DC,BRGS BLD RSV
3	1	366650006	MOTOR,DC, 24 VOLT 2 TERM
4	4	366650021	SCREW,SHC,1/4-20 X 3.0,BLK OX
5	1	366650013	RESV,10.94X6.5X9.5,V/MT,2-TAB,
6	1	366650014	TUBE,RTN,STR,1/8 NPT,NYLON
7	1	366650015	TUBE,SUCT,STR,3/8 NPT,NYLON
8	1	366650016	FILTER,SCREEN M-SERIES SUCT.
9	6	366650017	SCREW,SELF TAPPING,10-24 3/8
10	1	366650018	PLUG,RESV BREATHER FILL,3/8-18
11	2	366650019	PLUG,CAP,NYLON,PUSH-IN,MOTOR
12	1	760289000	PLUG,-6 ORB HOLLOW HEX
13	1	366650012	VALVE ASSY,R/V,1001 PSI AND UP

Hydraulic Control Valve P/N: 366800205 22



ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	320991914	VALVE, CARTRIDGE PROPOTIONAL 3203/4004 NEXSTAR FLOAT CENTER
2	2	320991912	VALVE, CARTRIDGE PROPOTIONAL 3203/4004 NEXSTAR CLOSED CENTER
3	6	320991901	COIL, SOLENOID 12VDC 1/2" DIA
4	6	320991905	VALVE, CHECK SIZE 04
5	8	200876	FITTING 6 SAE/6 JIC STRAIGHT
6	1	320991904	ORIFICE, 1/4-20UNC 3/8LG 0.018 DIA
7	1	320991903	VALVE, LOGIC

23 Harness P/N: 366800215



Harness P/N: 366800215 23

ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	581-01-18-023	18 POSITION CONN
2	1	581-01-30-029	30 POSITION CONN
3	36	425-00-00-873/PCS	SOCKET CONTACT 16-18 AWG GXL
4	2	425-00-00-872/PCS	SOCKET CONTACT 18-20 AWG TXL
5	1	WPCVR-USB-1394	WATERPROOF COVER, USB
6	1	SP44180	CABLE, WATERPROOF, USB-B-F, 2PR X 22 AWG
7	8	DT06-22	DEUTSCH DT PLUG, 2 POLE "A" KEY
8	8	W2S	DEUTSCH DT WEDGELOCK, 2-POLE
9	1	12065287-B	ASM CONNECTOR 3F M/P
10	3	12103881-L BIN STOCK	TERMIANL M/P 150
11	2	DT06-4S	RECEPTACLE, 4 WAY
12	1	804006C02M020	MALE PENDANT PLUG W/CORD
13	2	DT04-3P	DEUTSCH DT RECEPTACLE, 3 PIN
14	2	W3P	DEUTSCH WEDGELOCK
15	2	W4S	WEDGELOCK
16	1	RK 4.4T-1	MPS-CAN-M2 1 METER CAN CABLE
17	12	581-00-00-011	CAVITY PLUGS
18	27	0462-201-16141	SOCKET CONTACT
19	1	DT04-4P	DEUTSCH DT RECEPTACLE, 4 PIN
20	1	W4P	DEUTSCH WEDGELOCK
21	8	0460-202-16141	DEUTSCH TERM SIZE 16 PIN 16-20 AWG NICKE
22	1	DT06-6S-CE02	DEUTSCH DT POCKET, 6 PIN
23	1	W6S	DEUTSCH WEDGELOCK
24	56		18 GA CAN-BUS CABLE, SHIELDED DRAIN NO FILLER, .25" OD
25	1	114017	SEALING PLUG

CONNECTOR ID			
CONNECTOR	DESCRIPTION	CONNECTOR	DESCRIPTION
J1	RECIEVER 18 PIN CONNECTOR	J11	ANTI-2 BLOCK
J2	RECIEVER 30 PIN CONNECTOR	J12	BOOM ANGLE SNESOR
J3	USB CONNECTION	J13	PENDANT CONNECTION
J4	TELEMATICS	J14	ALARM LIGHT
J5	BOOM DOWN	J15	ADDRESS
J6	BOOM UP	J16	BOOM PT
J7	SWING CW	J17	SWING LIMIT SWITCHES
J8	SWING CCW	J18	HORN
J9	BOOM RETRACT	J19	VSU
J10	BOOM EXTEND	J20	RELAY PANEL



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

LIMITED WARRANTY

1 YEAR PURCHASED REPLACEMENT PARTS

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

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

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

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

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

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

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

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



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4707 N. Mingo Rd. Tulsa, OK 74158-0697

LIMITED WARRANTY 2 YEAR PARTS AND LABOR

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

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

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

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

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

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

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

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

