



# 4004 EH OWNERS MANUAL

Manual No. 999980

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

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# Auto Crane Warranty Registration

Fax Transmission

To: Warranty Department Fax: (918) 834-5979  
 From: \_\_\_\_\_ Date: \_\_\_\_\_  
 Re: Product Registration Pages: \_\_\_\_\_

**End User Information:** (Required for Warranty Activation)

Name: \_\_\_\_\_ Phone: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
 Contact: \_\_\_\_\_ E-mail Address: \_\_\_\_\_

**Distributor Information:** (Required for Warranty Activation)

Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
 Contact: \_\_\_\_\_ E-mail Address: \_\_\_\_\_

**Product Information:** (Required for Warranty Activation)

Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_  
 Date Product Delivered: \_\_\_\_\_ Date Processed:\* \_\_\_\_\_  
 VIN # \_\_\_\_\_ \* For Auto Crane use only

## ONE REGISTRATION FORM PER UNIT (CRANE OR BODY)

Registration form must be mailed or faxed within 15 days of customer installation.

Mail to:  
 Warranty Department  
 Auto Crane Company  
 P.O. Box 581510  
 Tulsa, OK 74158-0697

**4004EH SERIES**  
**OWNER'S MANUAL – REVISION RECORD**

| Revision Date | Section(s)<br>Or<br>Page(s)   | Description of Change  |
|---------------|-------------------------------|--|
| 09/02/03      | Last page                     | New 2-year warranty policy to replace 1-year warranty policy |
| 05/19/04      | Sect. 3, 4, 5, 6, 7,<br>8 & 9 | General configuration updates to Sect 3 thru 9               |
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# WARNINGS

**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).

**WARNING! NEVER OPERATE THE CRANE NEAR ELECTRICAL POWER LINES!**

**Death** or serious injury will result from boom, line, or load contacting electric lines. Do not use crane within 10 feet (3.05m) of electric power lines carrying up to 50,000 volts. One foot additional clearance is required for every additional 30,000 volts or less. **SEE DANGER DECAL (P/N 040529)** in this Owner's Manual.

**WARNING! NEVER.....**

- ◆ **EXCEED** load chart capacities (centerline of rotation to hoist hook).
- ◆ Un-reel last 5 wraps of cable from drum!
- ◆ Wrap cable around load!
- ◆ Attempt to lift or drag a load from the side! The boom can fail far below its rated capacity.
- ◆ 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.
- ◆ Place a chain link on the tip of the hook and try to lift a load!
- ◆ Use a sling bar or anything larger than the hook throat that could prevent the hook latch from closing, thus negating the safety feature!
- ◆ Hold on any pendant Select Switch that will cause unsafe operating conditions!

**WARNING!** In using a hook with latch, **ALWAYS** make sure that the hook throat is closed before lifting a load! Proper attention and common sense applied to the use of the hoist hook and various slings will prevent possible damage to material being hoisted and may prevent injury to personnel.

**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 to be used for any applications involving the lifting or moving of personnel.

**WARNING! ALWAYS** operate the crane in compliance with the load capacity chart. **DO NOT USE** the overload shutdown device to determine maximum rated loads, if the crane is equipped with this type of device.

**READ THIS PAGE**

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# ***INTRODUCTION***

## ***4004EH SERIES***

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** that crane owners, equipment managers and supervisors also read this manual.

Auto Crane has incorporated several safety features in the 4004EH series cranes for your protection. The choice of materials and the design of the electrical system minimizes weight and lengthens durability. The hydraulic components meet or exceed a **3.5:1 safety factor**. Holding valves prevent the load from dropping if a hose should fail. The reservoir has a **40µ air filter** in the filler cap. The pump has a **100 mesh strainer** in the suction line.

For your convenience the overall dimensions of the 4004EH series crane are in the General Dimension Section. Maximum turning radius at both the hoist motor and the rotation motor are also 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. **A minimum G.V.W. of 10,500 lbs. is recommended for mounting the 4004EH series cranes.**

The 4004EH series cranes are attached directly to your 12 volt truck electrical system. The power cable and retaining clips are included with the crane. A typical power cable mounting and hookup is shown in the installation section. The performance of your new crane depends on the truck electrical system. The use of maintenance free batteries is **NOT** recommended for use with 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 120 minute reserve capacity, deep cycle battery. These specifications should be considered minimum.

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

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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, mis-used, overloaded or otherwise damaged by inexperienced persons trying to operate the equipment without reading the manual.

***Auto Crane will not assume responsibility or liability for any modifications or changes made to unit, or installation of component parts done 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.

### **DISTRIBUTOR ASSISTANCE:**

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.

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***NOTE: THIS MANUAL SHOULD REMAIN WITH THE CRANE AT ALL TIMES.***

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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: **(918) 836-0463**. 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.

# **--- IMPORTANT ---**

## ***SAFETY TIPS AND PRECAUTIONS***

1. No unqualified or unauthorized person shall be allowed to operate the crane.
2. **WARNING:** Never weld, modify, or use unauthorized components / parts on any Auto Crane unit. This will void any warranty or liability. Also, failure of the crane may result.
3. Make certain the vehicle meets minimum chassis requirements. (These requirements do not guarantee unit stability.)
4. Make certain the crane is installed per factory specifications. Contact your local distributor or the Auto Crane factory if any questions arise.
5. Visual inspections and tests should be conducted at the beginning of each shift each day to ensure that the crane and all its operating systems are in good condition and working order before it is used.
6. Inspect hydraulic hoses frequently for signs of deterioration, and replace them as required.
7. If a hydraulic break occurs, leave the area of the break and do not attempt to stop the break by hand as the hydraulic oil may be hot and under high pressure which can cause serious injury. Shut the system down as soon as possible.
8. Check the hook at least every thirty days for distortions or cracks and replace it as required.
9. Oil gears as required.
10. Stop all operations when cleaning, adjusting or lubricating the machine.
11. Keep dirt and grit out of moving parts by keeping a crane clean. Make sure machine is free of excess oil, grease, mud and rubbish, thus reducing accidents and fire hazards.
12. When a new cable is installed, operate first with a light load to let the cable adjust itself.
13. Locate the vehicle at the work site for the best stability possible.
14. Keep the vehicle in a level position while loading or unloading.
15. Observe operating area for obstructions and/or power lines that might be a hazard
16. **WARNING: NEVER OPERATE THE CRANE NEAR ELECTRICAL POWER LINES.** Auto Crane Company recommends that the crane never be any closer to a power line (including telephone lines) than 10 feet at any point.
17. Allow the vehicle engine to warm up before operating crane.
18. Know the weight of your rigging and load to avoid overloading the crane.
19. Deduct the weight of the load handling equipment from the load rating to determine how much weight can be lifted.
20. All load ratings are based on crane capacity, NOT the vehicle stability. Remember in lifting a heavy load, the weight can create enough tipping moment to overturn the vehicle
21. Always comply with load chart capacities, (centerline of rotation to hook).
22. Secure all loads before lifting.
23. Always set the emergency brake before beginning operation.
24. Keep objects and personnel clear of crane path during operation.
25. Operate control levers slowly and smoothly in order to meter oil flow for safe operation.
26. Always use outriggers from vehicle to the ground during crane operation. Ensure that they are firmly positioned on solid footings. Stand clear of outriggers while they are being extended.
27. If any outrigger, when extended, rests on a curb or other object that prevents it from extending to its maximum distance, shorten bearing or fulcrum point and reduce the maximum load accordingly.
28. When an outrigger will not reach the ground due to holes or grades, it shall be blocked up to provide level and firm support for the truck.
29. When working in soft earth, use wide pads under outrigger feet to prevent sinking.
30. Always store outriggers before transportation.

## **WARNING!**

Auto Crane Company cranes are not designed or intended for use in lifting or moving persons. Any such use shall be considered to be improper and the seller shall not be responsible for any claims arising there from. This sale is made with the express understanding that there is no warranty that the goods shall be fit for the purpose of lifting or moving persons or other improper use and there is no implied warranty or responsibility for such purposes.

## **--- IMPORTANT ---**

# ***SAFETY TIPS AND PRECAUTIONS***

31. Always store the crane in its stowed position for transportation.
32. Remember the overall height of the entire unit for garage door clearance or when moving under objects with low overhead clearance
33. Disengage power takeoff (PTO) before moving the vehicle.
34. Always walk around the vehicle before moving.
35. Never drive with a load suspended from crane.
36. Do not take your eyes off a moving load. Look in the direction you are moving.
37. Never swing a load over people.
38. Do not stop the load sharply in midair so that it swings like a pendulum. Meter the control levers to avoid this situation.
39. Crane boom length should be kept as short as possible for maximum lifting capacity and greater safety. Longer booms require additional care in accelerating and decelerating the swing motion, and thus slow down the working cycle and reduce productivity.
40. Keep the load directly and vertically under the boom point at all times. Crane booms are designed primarily to handle vertical loads, not side lifts.  

WARNING: Never attempt to lift, drag, tow or pull a load from the side. The boom can fail far below its rated capacity.
41. Do not push down on anything with boom extensions, lift or outer boom function.
42. Do not lift personnel with any wire rope attachment or hook. There is no implied warranty or responsibility for such purposes.
43. WARNING: In using a safety hook, ALWAYS close the hook throat before lifting a load. Proper attention and common sense applied to the use of the hook and various slings will prevent possible damage to material being hoisted and may prevent injury to personnel.
44. WARNING: Never place a chain link on the tip of the hook and try to lift a load with the hoist.
45. WARNING: Never use a sling bar or anything larger than the hook throat which could prevent the safety latch from closing, thus negating the safety feature.
46. If the crane is equipped with an optional winch:
  - do NOT allow personnel to ride on loadline, hook, load, or any other device attached to winch line.
  - do NOT extend boom without reeling off line at the same time when using winch.
  - do pull load-block up against the boom tip.
47. Do not wrap the wire rope around sharp objects when using winch.
48. WARNING: Never unreel last 5 wraps of cable from drum.



# **--- IMPORTANT ---**

## **OPERATING PRACTICES & WARNINGS**

1. Make certain the vehicle meets minimum chassis requirements. (These requirements do not guarantee unit stability)
2. Make certain the crane is installed per factory specifications. Contact your local Distributor or the Auto Crane factory if any questions arise.
3. Keep the vehicle in as level a position as possible while loading or unloading.
4. **ALWAYS** set the vehicle emergency brake before beginning crane operations.
5. **ALWAYS** use outriggers from vehicle to the ground during crane operation. Make sure they are firmly positioned on solid footings.
6. All load ratings are based on crane capacity, **NOT** truck/crane stability.
7. Keep objects and personnel clear of crane path during operation.
8. Keep hoist cable pulled tight at all times.
9. **REMEMBER**, in lifting a heavy load, the weight can create enough tipping momentum to overturn the vehicle.
10. **ALWAYS** keep load as close to ground as possible.
11. Oil gears as required.
12. Periodic adjustment of hoist worm brake may be required (see automatic safety brake drawing in this manual).
13. Hydraulic hoses need to be inspected frequently for signs of deterioration, and be replaced as required.
14. The hoist hook is an important item that an operator should consider and use properly. It should be checked on a daily basis for distortion or cracks.
15. **ALWAYS** store outriggers before road travel.
16. **WARNING! NEVER OPERATE THE CRANE NEAR ELECTRICAL POWER LINES!** Death or serious injury will result from boom, line, or load contacting electric lines. Do not use crane within 10 feet (3.05m) of electric power lines carrying up to 50,000 volts. One foot additional clearance is required for every additional 30,000 volts or less.
17. **WARNING! NEVER EXCEED** load chart capacities (centerline of rotation to hoist hook).
18. **WARNING! NEVER** un-reel last 5 wraps of cable from drum!
19. **WARNING! NEVER** wrap cable around load!
20. **WARNING! NEVER** attempt to lift or drag a load from the side! The boom can fail far below its rated capacity.
21. **WARNING! NEVER** 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.
22. **WARNING! NEVER** place a chain link on the tip of the hook and try to lift a load!
23. **WARNING! NEVER** use a sling bar or anything larger than the hook throat that could prevent the hook latch from closing, thus negating the safety feature!
24. **WARNING!** In using a hook with latch, **ALWAYS** insure that the hook throat is closed before lifting a load! Proper attention and common sense applied to the use of the hoist hook and various slings will prevent possible damage to material being hoisted and may prevent injury to personnel.
25. **WARNING! NEVER** hold any pendant Select Switch on that will cause unsafe operating conditions!

### **WARNING!**

**Auto Crane Company remote controlled, stiff boom cranes are not designed or intended to be used for any applications involving the lifting or moving of personnel.**

## **--- IMPORTANT --- OPERATION OF UNIT**

1. Make sure this manual has been thoroughly read by all crane operating personnel and supervisors.
2. A routine inspection of the crane should be mandatory before each operating day. Any defects should be corrected immediately.
3. At a job site the vehicle should be positioned so that the crane can adequately reach the load within the rated capacity (centerline of rotation to hoist hook).
4. Keep the vehicle as level as possible during operation.
5. For electric cranes, **engage emergency brake** and leave ignition on with transmission in neutral (or in park for automatic transmissions). Activate any crane power switches. For Auto Crane units requiring battery and hydraulic operation, **engage emergency brake**, place gear selector in neutral, press clutch, activate PTO, release clutch and after hydraulic fluid is warm, set throttle control to proper engine speed.
6. Always use outriggers from the truck to the ground. Be sure these are firm and adequately positioned. When rotating, **keep load as low to the ground as possible**.
7. Remove pendant control from cab or storage area. On smaller units, plug pendant into receptacle on crane. On larger units, remove pendant control from guard and unwrap cable from boom. Do not operate crane until cable is unwound completely. On all cranes, detach hook from dead man. Crane is now ready for operation.
8. Always boom up before rotating so the boom will clear the required boom support.
9. When extending the boom, always maintain clearance between the boom crown and the traveling block or hoist hook.
10. Always observe safe and practical operation to avoid possible accidents. Refer to Safety Tips and Precautions.
11. After completing lifting operations, return the boom and traveling block to stowed position on the boom support. Avoid unneeded pressure on the boom support.
12. Store pendant control on proper location (in cab or on crane).
13. Return outriggers to stowed position. Make sure they are pinned in place.
14. Check work area for any tools or equipment not stored.
15. Release throttle control, depress clutch and disengage PTO. deactivate any crane power switches.
16. Report any unusual occurrence during crane operation that may indicate required maintenance or repair.
17. **NEVER use two cranes to support a load too large for either crane.**
18. Spray all electrical equipment with special corrosion resistant coating. This eliminates rust or corrosion due to melting and freezing action of condensation.

## **OPERATION OF OUTRIGGER**

For hydraulic outriggers:

1. Shift crane/outrigger control valve to "outrigger" position.
2. While operating the outrigger control valves (near the outrigger cylinders) simultaneously operate the boom-up control switch. This will allow the hydraulic system to build pressure.
3. After outriggers are positioned, return crane/outrigger selector to "crane" position.
4. Crane is now ready to operate.

For manual outriggers:

1. Pull lock pins to release drop down outrigger and move to outermost lock position.
2. Make sure lock pins are reinstalled properly.
3. Lower outrigger pad to firm ground and adjust foot to take out slack.
4. Crane is now ready to operate.

# ***QUALIFICATIONS FOR AND CONDUCT OF OPERATORS AND OPERATING PRACTICES***

## **OPERATORS**

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

## **QUALIFICATIONS FOR OPERATORS**

- 3. Operators shall be required by the employer to pass a practical operating examination. Qualifications shall be limited to the specific type of equipment for which examined.**
- 4. 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 colors differentiation is required for operation.
  - C. Adequate hearing with or without hearing aid for the specific operation.
- 5. 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.**
- 6. Evidence that the 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.**
- 7. Operators and operator trainees should have normal depth perception, coordination, and no**

- tendencies to dizziness or similar undesirable characteristics.
- 8. 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 knowledge of emergency procedures and implementation of same.
    - C. Demonstrate to the employer the ability to operate the specific type of equipment.
    - D. Be familiar with the applicable safety regulations.
    - E. Understand responsibility for maintenance requirements of crane.
    - F. Be thoroughly familiar with the crane and its control functions.
    - G. Understand the operating procedures as outlined by the manufacturer.

## **CONDUCT OF OPERATORS**

- 9. The operator shall not engage in any practice, which will divert his attention while actually operating the crane.**
- 10. 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.**
- 11. The operator should not leave a suspended load unattended unless specific precautions have been instituted and are in place.**
- 12. 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.**
- 13. 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.**
- 14. 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.

# ***QUALIFICATIONS FOR AND CONDUCT OF OPERATORS AND OPERATING PRACTICES***

15. 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.
16. All controls shall be tested by the operator at the start of each shift. If any controls do not operate properly, they shall be adjusted or repaired before operations are begun
17. Stabilizers shall be visible to the operator while extending or setting unless operator is assisted by a signal person.

## **OPERATING PRACTICES**

### **HANDLING THE LOAD**

#### **18. 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. When loads which are not accurately known are to be lifted, the person responsible for the job shall ascertain that the weight of the load does not exceed the crane rated load at the radius at which the load is to be lifted.

#### **19. Attaching the load**

- A. The load shall be attached to the hook by means of slings or other devices of sufficient capacity.
- B. Hoist rope shall not be wrapped around the load.

#### **20. Moving the load**

- A. The operator shall determine that:
- B. The crane is level and, where necessary, the vehicle/carrier is blocked properly.
- C. The load is well secured and balanced in the sling or lifting device before it is lifted more than a few inches.
- D. Means are provided to hold the vehicle stationary while operating the crane.
- E. Before starting to lift, the hook shall be brought over the load in such a manner as to minimize swinging.
- F. During lifting care shall be taken that:

1. There is no sudden acceleration or deceleration of the moving load.
2. Load, boom or other parts of the crane do not contact any obstruction.

G. Cranes shall not be used for dragging loads sideways.

H. This standard recognizes that articulating 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. Work platforms attached to the boom must be approved by crane manufacturer.

I. The operator should avoid carrying loads over people.

J. When the crane is so equipped, the stabilizers shall be fully extended and set. Blocking under stabilizers shall meet the requirements as follows:

1. Strong enough to prevent crushing.
2. Of such thickness, width and length as to completely support the stabilizer pad.

K. Firm footing under all tires, or individual stabilizer pads should be level. Where such a footing is not otherwise supplied, it should be provided by timbers, cribbing, or other structural members to distribute the load so as to not exceed allowable bearing capacity or the underlying material.

L. In transit, the boom shall be carried in stowed position.

M. 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.

N. The crane shall not be transported with a load on the hook unless recommended by the manufacturer.

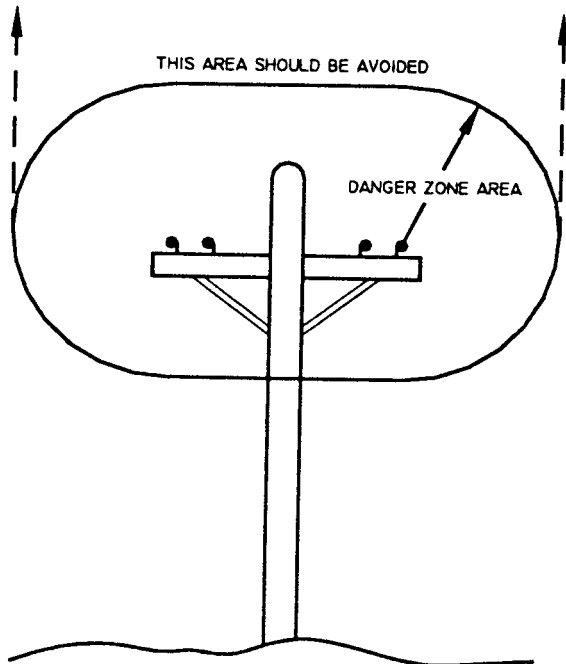
O. No person should be permitted to stand or pass under a suspended load.

#### **21. Stowing procedure. Follow the manufacturer's procedure and sequence when stowing and unstowing the crane**

# ***QUALIFICATIONS FOR AND CONDUCT OF OPERATORS AND OPERATING PRACTICES***

## **MISCELLANEOUS**

### **OPERATING NEAR ELECTRICAL POWER LINES**



22. Cranes shall be operated so that no part of the crane or load enters into the danger zone shown above.

### **EXCEPTIONS**

- A. The danger zone may be entered after confirmation by an appointed person that the electrical distribution and transmission lines have been de-energized and visibly grounded at the point of work; or
- B. The danger zone may be entered if insulating barriers (not a part of nor an attachment to the crane) have been erected to prevent physical contact with the lines.

23. For lines rated 50 kV or below, minimum clearance between the lines and any part of the crane or load (including handling appendages) shall be 10-ft. (3m). For higher voltages, see Table 1.
24. Caution shall be exercised when working near overhead lines, because they can move horizontally or vertically due to wind, moving the danger zone to new positions.

25. In transit with no load and boom lowered the clearance shall be specified in Table 1.
26. A qualified signalperson shall be assigned to observe the clearance and give warning before approaching the above limits.
- A. Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities verify that it is not an energized line.
- B. Exceptions to this procedure, if approved by the administrative or regulatory authority if the alternate procedure provides equivalent protection and set forth in writing.
- C. Durable signs shall be installed at the operator's station and on the outside of the crane, warning that electrocution or serious bodily injury may occur unless a minimum clearance of 10 ft. (3.0m) between the crane or the load being handled and energized power lines. Greater clearances are required because of higher voltage as stated above. These signs shall be revised but not removed when local jurisdiction requires greater clearances.

**TABLE 1**

| normal voltage, kV<br>(phase to phase)                       |             | minimum required<br>clearance |         |
|--|-------------|-------------------------------|---------|
|  |             | ft                            | (m)     |
| <b><u>when operating near high voltage power lines</u></b>   |             |                               |         |
| over   | to 50       | 10                            | (3.50)  |
| over   | 50 to 200   | 15                            | (4.6)   |
| over   | 200 to 350  | 20                            | (6.1)   |
| over   | 350 to 500  | 25                            | (7.62)  |
| over   | 500 to 750  | 35                            | (10.67) |
| over   | 750 to 1000 | 45                            | (13.72) |
| <b><u>while in transit with no load and boom lowered</u></b> |             |                               |         |
| over   | to 0.75     | 4                             | (1.22)  |
| over   | 0.75 to 50  | 6                             | (1.83)  |
| over   | 50 to 345   | 10                            | (3.83)  |
| over   | 345 to 750  | 16                            | (4.87)  |
| over   | 750 to 1000 | 20                            | (6.1)   |

# *NOTES*

# ***INSPECTION, TESTING AND MAINTENANCE GENERAL***

## **INSPECTION CLASSIFICATION**

1. **Initial inspection. Prior to initial use, all new, altered, modified or extensively repaired cranes shall be inspected by a designated person to insure compliance with provisions of this standard.**
2. **Regular inspection. Inspection procedure for cranes in regular service is divided into two general classifications based upon the intervals at which inspection should be performed. The intervals in turn are dependent upon the nature of the components of the crane and the degree of their exposure to wear, deterioration, or malfunction. The two general classifications are herein designated as "frequent" and "periodic" with respective intervals between inspections as defined below.**
  - A. frequent inspection - daily to monthly intervals
  - B. periodic inspection - one to twelve intervals or as specifically recommended by the manufacturer

## **FREQUENT INSPECTION**

3. **Inspection shall be performed by designated personnel.**
  - A. control mechanisms for maladjustment interfering with proper operation - daily, when used
  - B. control mechanisms for excessive wear of components and contamination by lubricants or other foreign matter
  - C. safety devices for malfunction
  - D. all hydraulic hoses, particularly those which flex in normal operation of crane functions, should be visually inspected once every working day, when used
  - E. hooks and latches for deformation, chemical damage, cracks, and wear. Refer to ANSI/ASME B30.10
  - F. rope reeving for compliance with crane manufacturer's specifications, if optional winch is used

- G. electrical apparatus for malfunctioning, signs of excessive deterioration, dirt and moisture accumulation
- H. hydraulic system for proper oil level and leaks daily
- I. tires for recommended inflation pressure, cuts and loose wheel nuts
- J. connecting pins and locking device for wear and damage

## **PERIODIC INSPECTION**

4. **Deformed, cracked or corroded members in the crane structure and carrier**
5. **Loose bolts, particularly mounting bolts.**
6. **Cracked or worn sheaves and drums.**
7. **Worn, cracked, or distorted parts such as pins, bearings, shafts, gears, rollers and devices.**
8. **Excessive wear on brake and clutch system parts and lining.**
9. **Crane hooks inspected for cracks.**
10. **Travel steering, braking, and locking devices, for malfunction.**
11. **Excessively worn or damaged tires.**
12. **Hydraulic and pneumatic hose, fittings, and tubing inspection.**
  - A. evidence of leakage at the surface of the flexible hose or its junction with metal and coupling
  - B. A. blistering, or abnormal deformation to the outer covering of the hydraulic or pneumatic hose
  - C. A. leakage at threaded or clamped joints that cannot be eliminated by normal tightening or recommended procedures
  - D. A. evidence or 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

# ***INSPECTION, TESTING AND MAINTENANCE GENERAL***

## **13. Hydraulic and pneumatic pumps and motors inspection.**

- A. loose bolts or 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 the fluid
- G. loss of pressure

## **14. Hydraulic and pneumatic valves inspection**

- 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

## **15. Hydraulic and pneumatic cylinders inspection.**

- A. drifting 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

## **16. Hydraulic filters. Evidence of rubber particles on the filter elements may indicate hose, "O" ring, or other rubber component deterioration. Metal chips or pieces on the filter may denote failure in pumps, motors, or cylinders. Further checking will be necessary to determine origin of the problem before corrective action can be taken.**

## **17. Labels are to be in place and legible.**

## **CRANES NOT IN REGULAR USE**

## **18. A crane which has been idle for a period of over one month or more, but not less than six months, shall be given an inspection conforming with the initial-regular- frequent inspections**

## **19. A crane which has been idle for a period of over six months shall be given a complete inspection conforming with the initial-regular-frequent inspection requirements.**

## **INSPECTION RECORDS**

## **20. Dated records for periodic inspection should be made on critical items such as brakes, crane hooks, rope, hydraulic and pneumatic cylinders, and hydraulic and pneumatic relief pressure valves. Records should be kept available to an appointed person.**

## **OPERATIONAL TESTS**

## **21. Prior to initial use, all new, altered, modified, or extensively repaired cranes shall be tested for compliance with the operational requirements of this section, including functions such as the following:**

- A. load lifting and lowering mechanisms
- B. boom lifting and lowering mechanisms
- C. boom extension and retraction mechanisms
- D. swing mechanisms
- E. safety devices
- F. operating controls comply with appropriate function labels

## ***Operational crane test results shall be made available to an appointed person.***

## **RATED TEST LOAD**

## ***Prior to initial use, altered, modified, or extensively repaired cranes shall be load tested by or under the direction of an appointed person.***



# ***INSPECTION, TESTING AND MAINTENANCE GENERAL***

22. Test loads shall not exceed 110% of the manufacturer's load ratings.
23. Written reports shall be maintained showing test procedures and confirming the adequacy of repairs.

## **MAINTENANCE**

### **PREVENTIVE MAINTENANCE**

24. Before adjustment and repairs are started on a crane, the following precautions shall be taken as applicable:
- A. crane placed where it will cause the least interference with other equipment or operations
  - B. all controls at the "off" position
  - C. starting means rendered inoperative
  - D. boom lowered to the ground if possible or otherwise secured against dropping
  - E. relieve hydraulic oil pressure from all hydraulic circuits before loosening or removing hydraulic components
25. Warning or "OUT OF ORDER" signs shall be placed on the crane controls.
26. After adjustments and repairs have been made, the crane shall not be returned to service until all guards have been reinstalled, trapped air removed from hydraulic system (if required), safety devices reactivated, and maintenance equipment removed.

### **ADJUSTMENTS AND REPAIRS**

27. Any hazardous conditions disclosed by the inspection requirements shall be corrected before operation of crane is resumed, Adjustments and repairs shall be done only by designated personnel.
28. Adjustments shall be maintained to assure correct functioning of components, The following are examples:
- A. functional operating mechanism
  - B. safety devices
  - C. control systems

29. 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, broken, or excessively corroded
  - C. crane hooks showing cracks, damage, or corrosion shall be taken out of service. Repairs by welding are not recommended
30. Instructions shall be provided by the manufacturer for the removal of air from hydraulic circuits.

## **LUBRICATION**

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

## **ROPE INSPECTION**

31. Frequent Inspection
- A. All running ropes in service should be visually inspected once each working day. A visual inspection shall consist of observation of all rope which can be in use during the days operations. These visual observations should be considered with discovering gross damage such as listed below, which may be an immediate hazard.
    - 1. distortion of the rope 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
    - 2. general corrosion
    - 3. broken or cut strands;
    - 4. number, distribution and type of visible broken wires. When such damage is discovered, the rope shall either be removed from service or given as inspection.

# ***INSPECTION, TESTING AND MAINTENANCE GENERAL***

- B. Care shall be taken when inspecting sections of rapid deterioration such as flange points, crossover points, and repetitive pickup points on drums.

## **32. Periodic inspection**

- A. The inspection frequency shall be determined by a qualified person and shall be based on such factors as
  1. expected rope life as determined by experience on the particular installation or similar installations
  2. severity of environment
  3. percentage of capacity lifts
  4. frequency rates of operation
  5. exposure to shock loads

***Inspection need not be at equal calendar intervals and should be more frequent as the rope approaches the end of its service life. This inspection shall be made at least annually.***

- B. Periodic inspection shall be performed by a designated person. This inspection shall cover the entire length of the rope. Only the surface wires need be inspected. No attempt should be made to open the rope. Any deterioration results in appreciable loss of original strength, such as described below, shall be noted and determination made as to whether use of the rope would constitute a hazard: points listed above reduction of rope diameter below nominal diameter due to loss of core support, internal or external corrosion, or wear of outside wires; severely corroded, cracked, bent, worn or improperly applied connections;
- C. Care shall be taken when inspecting sections subject to rapid deterioration such as the following:
  1. sections in contact with saddles, equalizer sheaves, or other sheaves where rope travel is limited
  2. sections of the rope at or near terminal ends where corroded or broken wires may protrude

## **ROPE REPLACEMENT**

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

***Continued use in this respect depends upon good judgement 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.***

- 34. **Conditions such as the following shall be reason for questioning continued use of the rope or increasing the frequency of inspection:**

- A. in running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay
- B. 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
- C. wear of one third of the original diameter of the outside individual wire
- D. kinking, crushing, birdcaging, or any other damage resulting in distortion of the rope structure
- E. evidence of any heat damage from any cause
- F. reduction from nominal diameter of more than 1/64 in. (0.4mm) for diameters up to and including 5/16 in. (8 mm), 1/32 in. (0.8 mm) for diameter 3/8 in. (9.5 mm) to and including 1/2 in. (13 mm), 3/64 in. (1.2 mm) for diameter 9/16 in. (14.5 mm) to and including 3/4 in. (19 mm), 1/16 in. (1.6 mm) for diameter 7/8 in. (22 mm) to and including 1 1/8 in. (29 mm), 3/32 in. (2.4 mm) for diameters 1 1/4 in. (32 mm) to and including 1 1/2 in. (38 mm)
- G. 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.

# ***INSPECTION, TESTING AND MAINTENANCE***

## ***GENERAL***

- H. Replacement rope shall have a strength rating at least as great as the original rope furnished or recommended by the crane manufacturer. Any deviation from the original size, grade, or construction shall be specified by a rope manufacturer, or a qualified person.
35. Rope not in regular use: all rope which has been idle for a period of a month or more due to shutdown or storage of a crane on which it is installed, shall be given and inspection in accordance with above information before it is placed in service. This inspection shall be for all types of deterioration and shall be performed by a qualified person.
36. Inspection records
- A. A. frequent inspection- no records required
  - B. A. periodic inspections- in order to establish data as a basis for judging the proper time for replacement, a dated report condition at each periodic inspection should be kept on file. This report shall cover points of deterioration listed above.
- ROPE MAINTENANCE**
37. Rope should be stored to prevent damage or deterioration.
38. Unreeling or uncoiling of rope shall be done as recommended by the rope manufacturer and with care to avoid kinking or inducing twist.
39. Before cutting a rope, seizing shall be placed on each side 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 in. (22 mm) diameter or smaller, two seizings on each side of the cut are required, and for non-preformed rope 1 in. (25 mm) diameter or larger, three seizings on each side of the cut are required.
40. During installation care should be exercised to avoid dragging of the rope in the dirt or around objects which will scrape, nick crush or induce sharp bends in it.
41. Rope should be maintained in a well-lubricated condition. It is important that lubricant applied as a part of a 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 which does not hinder visual inspection. Those sections of rope which 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.
42. 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 cases where a section at the worn end, and thus shifting the wear to different areas of the rope.

# MAINTENANCE OF BATTERIES

Maintenance of Auto Crane unit batteries differs very little from the generally prescribed maintenance of any lead acid battery. All batteries must be kept *properly charged, properly filled with water, and relatively clean.*

## **Keep Properly Charged**

Many things affect the proper charge to a battery, such as:

- 1 Regulator settings
- 2 Proper tightness of belts on the alternator or generator
- 3 Good, clean connections of all cables and wires at the following places:
  - A. Battery
  - B. Regulator
  - C. Starting motor
  - D. Alternator or generator
  - E. Ground connections (most important)

It is of extreme importance to keep the battery as fully charged as possible without overcharging, especially when vehicles are left outside for extended periods in extremely cold climates. A battery *can* freeze. Freezing points for various specific gravities of acid are as follows:

| Specific Gravity<br>(Corrected to 80°F) | Freezing Temp.<br>Degrees F. |
|---|------------------------------|
| 1.280                                   | -90°F                        |
| 1.250                                   | -62°F                        |
| 1.200                                   | -16°F                        |
| 1.150                                   | 5°F                          |
| 1.100                                   | 19°F                         |

As shown, a half-charged battery (about 1.200 specific gravity) cannot stand for any length of time at 20°F or it will freeze.

The *main reason* for keeping the battery as fully charged as possible without over-charging is to ensure that power is available even though the vehicle has been standing for some time.

## **Keep Properly Filled with Water**

The battery should *always* be properly filled with water. If the electrolyte level is allowed to fall below the top of the plates, the results become threefold:

- 1 The exposed portion of the plate will become sulfated.
- 2 The portion of the plate exposed is not usable.
- 3 That portion of the acid remaining becomes more concentrated and may cause more rapid deterioration of the remaining parts of the battery.

## **Keep A Relatively Clean Battery**

The battery should be kept clean. Batteries filled with acid and which are not in use self-discharge to a limited degree because of the nature of the materials within the battery. If dirt is allowed to collect on the top of the battery (and this dirt absorbs moisture) and electrical path can be set up between the various terminals of the battery and the ground. Once such a path has been established, the self-discharge of the battery is accelerated. This also accelerates corrosion of the battery cables at the terminals.

## **Periodic Maintenance is Needed**

A definite program of periodic maintenance of all batteries should be conducted on a regular basis. Periodic maintenance includes:

- 1 Checking belts for tightness on the charging equipment
- 2 Checking battery electrolyte levels
- 3 Checking cables for good connections
- 4 Cleaning where corrosion is apparent

When corrosion is cleaned off, the cable terminals and battery terminals should be coated with a light coating of petroleum jelly before they are replaced. When terminals are cleaned, the top of the battery should be cleaned with a mild solution of soda water.

# ***MAINTENANCE OF BATTERIES***

## **Low Maintenance Batteries (Maintenance Free)**

**Low maintenance batteries should not be used on Auto Cranes or trucks equipped with Auto Cranes. The batteries are not designed for "deep" discharge.**

### **Testing Your Battery**

If the condition of the battery is in question, it should be removed from the vehicle, taken to the shop, and allowed to reach room temperature. It should then be recharged until specific gravity readings taken at one-half hour intervals. If the specific gravity readings are fairly uniform, the battery should be checked with a high rate tester. Use the tester in accordance with the manufacturer's instructions. The high rate tester is the best method to test a questionable battery.

If, after charging, it is noted that the specific gravity reading of one cell is 30 points less than any of the other cells, it may be assumed that the cell is bad and that the battery should be replaced. If all cells are uniform but not up to full charge, a low rate of charge should be attempted for an extended time. This usually will recover a badly sulfated battery.

## **Replacing a Battery**

If it is necessary to replace a battery, and a dry charge battery is used, the following procedure applies:

- 1 Fill the battery with electrolyte of the proper specific gravity.
- 2 Place the battery on charge according to the manufacturer's instructions.

It is essential that the second step above be followed to ensure that the battery going on the vehicle is fully charged.

It is also very important that the battery hold-downs be checked periodically to ensure that the batteries are properly positioned to avoid vibration problems, breakage of cables or terminals. Care must be taken to avoid cracking or breaking containers or covers by tightening hold-down fixtures excessively. They also must not be so loose that breakage results from a hold-down that is too loose.

# *NOTES*

# SAFETY DECAL SECTION

## 4004EH

PART NO.: 40579000  
 DECAL: OPERATING INSTRUCTIONS  
 FUNCTION: To inform the operator of the proper procedure to follow for safe operation of the crane.  
 USED ON: All Cranes  
 QUANTITY: 1  
 PLACEMENT: Right side plate

**⚠ CAUTION**

1. INSPECT VEHICLE AND CRANE INCLUDING OPERATION, PRIOR TO USE DAILY.
2. DO NOT USE THIS EQUIPMENT EXCEPT ON SOLID, LEVEL SURFACE WITH OUTRIGGERS PROPERLY EXTENDED AND CRANE MOUNTED ON FACTORY-RECOMMENDED TRUCK.
3. BEFORE OPERATING THE CRANE, REFER TO MAXIMUM LOAD (CAPACITY) CHART ON CRANE FOR OPERATING (LOAD) LIMITATIONS.
4. OPERATE ALL CONTROLS SLOWLY AND SMOOTHLY.
5. KEEP LOAD UNDER BOOM TIP. DO NOT SIDE LOAD BOOM OR DRAG LOADS. AVOID FREE SWINGING LOADS.
6. DO NOT OPERATE, WALK OR STAND BENEATH BOOM OR A SUSPENDED LOAD.
7. KEEP AT LEAST 5 WRAPS OF LOADLINE ON HOIST DRUM.
8. FOR TRAVELING, BOOM AND OUTRIGGERS MUST BE IN THE STOWED POSITION.
9. ALL REMOVABLE PENDANTS MUST BE STORED IN CAB OR TOOL COMPARTMENT WHEN CRANE IS NOT IN USE.

P/N 040579

PART NO.: 040580000  
 DECAL: OPERATING TRAINING  
 FUNCTION: To inform the operator of the need to receive proper training before using the crane.  
 USED ON: All Cranes  
 QUANTITY: 1  
 PLACEMENT: Right side plate

**⚠ DANGER**

AN UNTRAINED OPERATOR  
SUBJECTS HIMSELF AND  
OTHERS TO

**DEATH OR SERIOUS INJURY**

- 1.) YOU MUST HAVE BEEN TRAINED IN THE OPERATION OF THIS CRANE, AND
- 2.) YOU MUST KNOW AND FOLLOW THE SAFETY AND OPERATING RECOMMENDATIONS CONTAINED IN THE MANUFACTURER'S MANUAL, YOUR EMPLOYER'S WORK RULES AND APPLICABLE GOVERNMENT REGULATIONS.

P/N 040580

PART NO.: 040632000  
 DECAL: TAMPERING WITH OVERLOAD DEVICE  
 FUNCTION: To inform the operator that tampering with the overload device may cause a unit failure or possible personal injury.  
 USED ON: All Cranes equipped with a load sensor  
 QUANTITY: 1  
 PLACEMENT: Right side of valve sensor.

**⚠ WARNING**

TAMPERING WITH OVERLOAD DEVICE VOIDS WARRANTY. OVERLOADED CRANE MAY HYDRAULICALLY RELEASE AND LET LOAD DOWN TO GROUND.

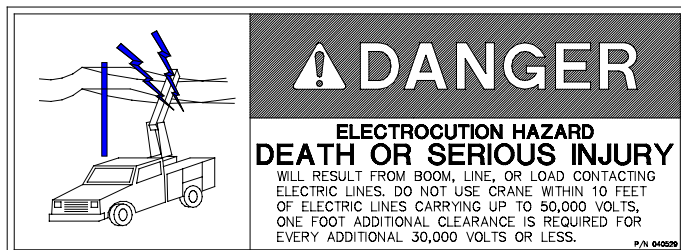
OVERLOAD PROTECTION DEVICE CANNOT FUNCTION WITH BOOM BELOW HORIZONTAL (0°). HOIST UP, BOOM DOWN, AND EXTEND OUT WILL BE INOPERATIVE WHEN CRANE IS IN OVERLOAD CONDITION.

P/N 040632

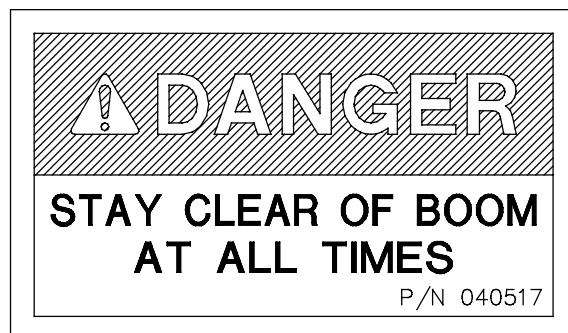
# SAFETY DECAL SECTION

## 4004EH

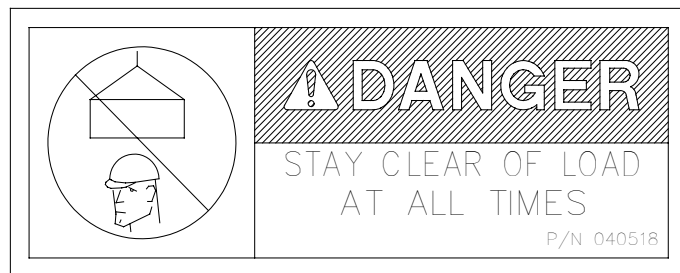
PART NO.: 040529000  
 DECAL: ELECTROCUTION HAZARD  
 FUNCTION: To inform the operator of the hazard involved with contacting electrical power lines with crane boom.  
 USED ON: Articulated & Stiff Boom Cranes  
 QUANTITY: 2  
 PLACEMENT: Both sides of end of lower boom



PART NO.: 040517000  
 DECAL: STAY CLEAR OF BOOM  
 FUNCTION: To inform the operator of the hazard of proximity or contact with the crane boom during operation.  
 USED ON: All Cranes  
 QUANTITY: 2  
 PLACEMENT: Both sides of crown



PART NO.: 040518000  
 DECAL: STAY CLEAR OF LOAD  
 FUNCTION: To inform the operator of the hazard of proximity or contact with the crane boom during operation.  
 USED ON: All Cranes  
 QUANTITY: 2  
 PLACEMENT: Both sides of crown plate





# ***SAFETY DECAL SECTION***

## ***4004EH***

PART NO.: 040587000

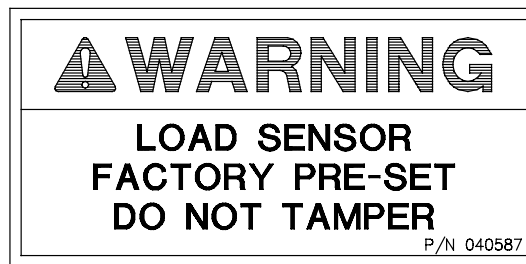
USED ON: All cranes equipped with a load sensor.

DECAL: LOAD SENSOR, DON'T TAMPER

QUANTITY: 1

FUNCTION: To inform the operator that the load sensor is pre-set and that tampering with the sensor may cause potentially hazardous situation.

PLACEMENT: On the lift cylinder near the load sensor



PART NO.: 040519000

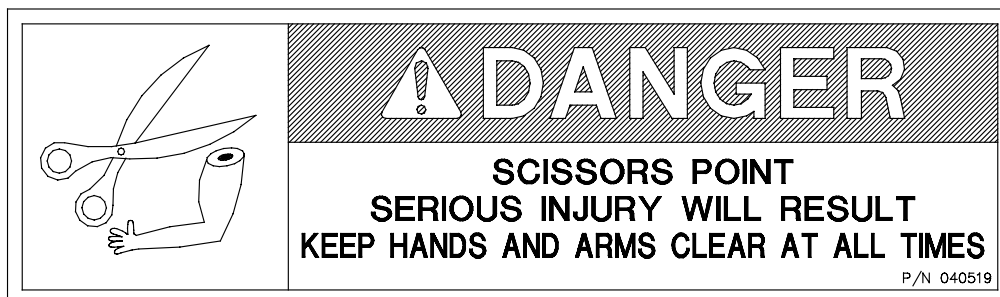
USED ON: All cranes.

DECAL: SCISSORS POINT

QUANTITY: 1

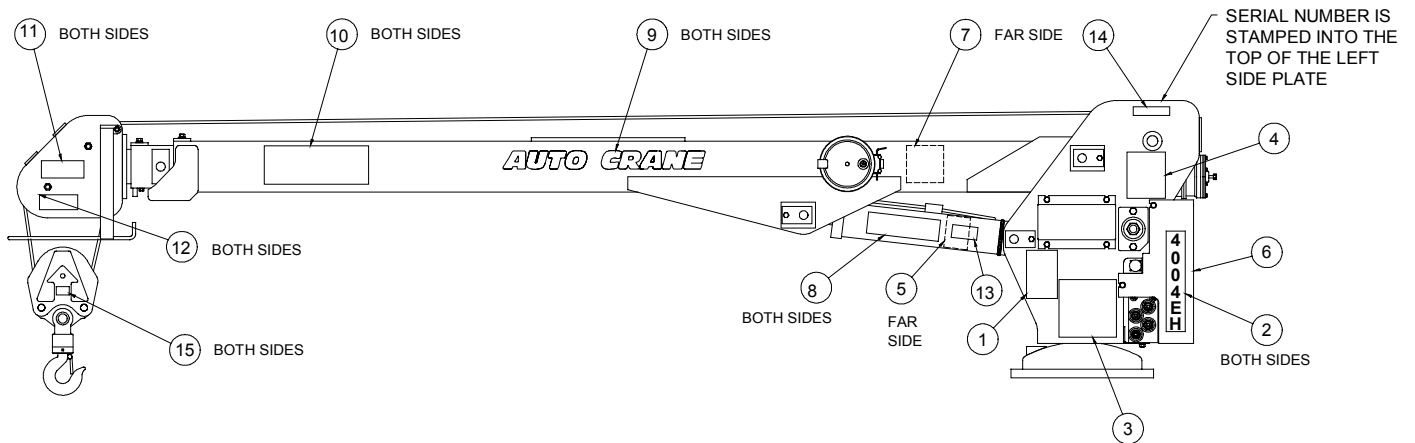
FUNCTION: To inform the operator of possible danger at scissors point on crane.

PLACEMENT: Both sides of the lift cylinder



# DECAL DRAWING

## 4004EH 8-12-16 BOOM - P/N: 404009000



| ITEM NO | QTY | PART NO.  | DESCRIPTION                                |
|---------|-----|-----------|--|
| 1       | 1   | 040579    | CAUTION "INSPECT VEHICLE..." DECAL         |
| 2       | 2   | 404051    | 4004EH DECAL                               |
| 3       | 1   | 404050    | 4004EH LOAD CHART (8-12-16) DECAL          |
| 4       | 1   | 040580    | DANGER "AN UNTRAINED OPERATOR..." DECAL    |
| 5       | 1   | 040632    | WARNING "TAMPERING WITH OVERLOAD..." DECAL |
| 6       | 1   | 360034    | LOGO DECAL                                 |
| 7       | 1   | 320318    | ANGLE INDICATOR DECAL                      |
| 8       | 2   | 040519    | DANGER "SCISSORS POINT" DECAL              |
| 9       | 2   | 600047    | AUTO CRANE DECAL                           |
| 10      | 2   | 040529    | DANGER "ELECTROCUTION HAZARD" DECAL        |
| 11      | 2   | 040517    | DANGER "STAY CLEAR OF BOOM" DECAL          |
| 12      | 2   | 040518    | DANGER "STAY CLEAR OF LOAD" DECAL          |
| 13      | 1   | 040587    | WARNING "LOAD SENSOR PRESET" DECAL         |
| 14      | 1   | 330622    | SERIAL NUMBER DECAL                        |
| 15      | 2   | 360480100 | DECAL, BLOCK WEIGHT & MAX. LOAD            |

# ***GENERAL SPECIFICATIONS***

## ***4004EH SERIES***

### **DIMENSIONS**

**Width:** 21 in (.53 m)  
**Height:** 32.50 in (.83 m)  
**Length:** 11 ft 8 5/16 in (3.35 m)  
**Weight:** 950 lbs (430 kg)  
[Add 5 lbs (2.25 kg) for cable length  
of 75 feet (23 m)]

### **CAPACITY**

16,000 ft lbs (2.31 ton/m)  
[ft lbs = horizontal distance from centerline of  
rotation to free hanging weight (feet) x amount  
of weight (pounds)]  
See **Load Chart** section.

### **REACH**

Main boom reaches 8 ft  
Power boom will extend to 12 ft  
Manual boom will extend to 16 ft

### **CABLE**

80 ft (24.3 m) of 5/16 in (7.93 mm) diameter  
aircraft quality cable is standard [75 ft (22.86  
m) optional].

### **CHASSIS REQUIREMENTS**

10,500 lbs (4,763 kg) GVWR minimum

### **HYDRAULIC SYSTEM**

**Pressure:** 2200psi (15,169 kPa) relief setting

**Flow:** 0.7 GPM (2.65 lpm)

**Filtration:** System has 100 mesh strainer in  
suction line.

**Oil Type:** 10w Hydraulic Oil- Mobile DTE  
13M, Exxon Unis N-32, Fina  
Diekan.

### **ELECTRICAL SYSTEM REQUIREMENTS**

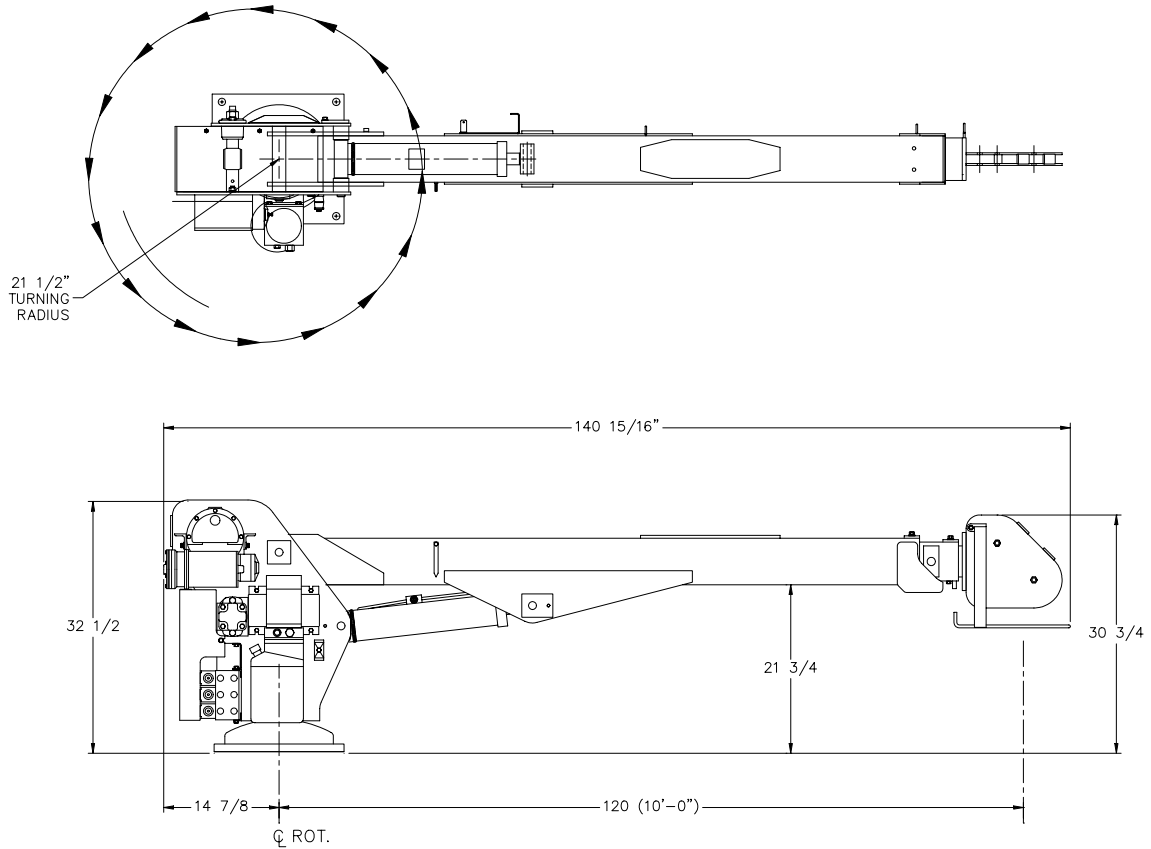
**Control voltage:** 12 volt DC

**Alternator:** 70 amp (minimum)

**Battery:** 130 minute reserve  
capacity (minimum)  
Maintenance type

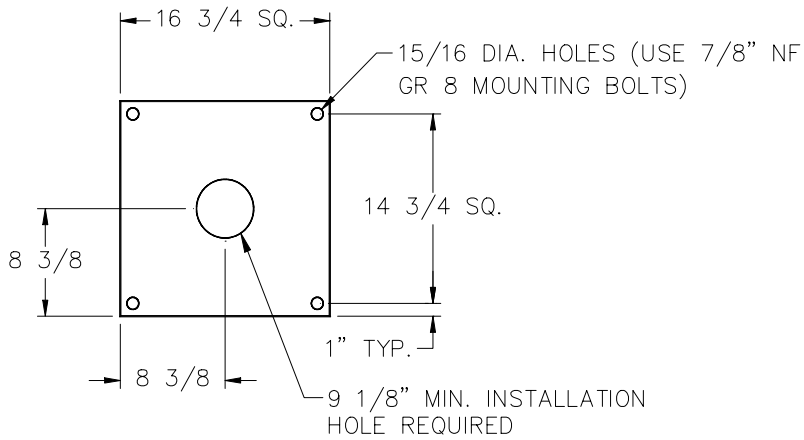
# GENERAL DIMENSIONS

## 4004EH (8-12-16)



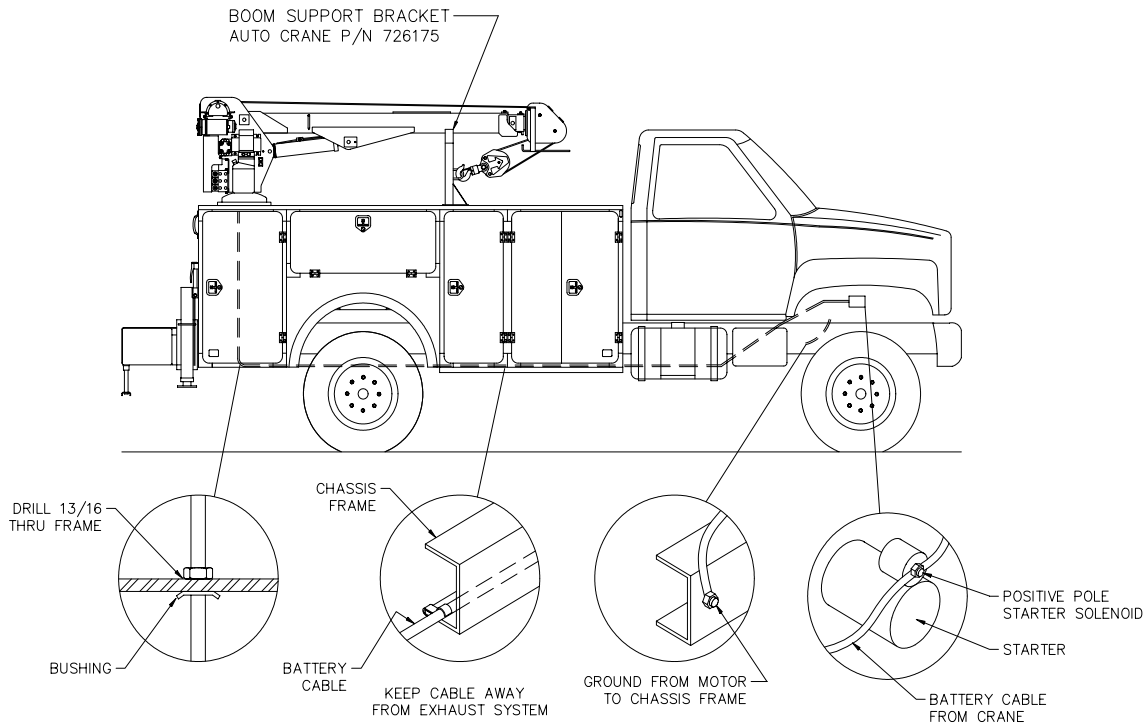
**NOTES:**

- A. MAX TURNING RADIUS AT ROTATION MOTOR = 13"
- B. MAX TURNING RADIUS AT HOIST ACTUATOR = 20 1/2"



# ASSEMBLY & INSTALLATION INSTRUCTIONS

## 4004EH SERIES



### INSTALLATION – BATTERY CABLE

1. Drill 13/16" hole in floor. Install bushing, which is connected to cable, so it fits hole snug.
2. Run cable to positive battery terminal. Connect black cable to negative battery terminal or suitable chassis ground point. Locate cables so that they will be protected. Avoid sharp edges. Use the No. 083800 frame clips provided to hold cables securely in place.
3. If the battery is grounded to the engine it is necessary to add an additional ground cable, from the engine to the chassis frame. In order to obtain maximum power to the crane.
4. **NOTICE:** We recommend replacing any no—maintenance truck battery with a maintenance type truck battery.
5. **CAUTION:** Boom must be properly secured in place, on a boom support bracket, when crane is not in use. This will prevent gear damage.
6. **NOTE:** For mounting bolt hole pattern – see GENERAL DIMENSIONS.

# ***LUBRICATION & MAINTENANCE SCHEDULE for 4004EH***

| SERVICE PERFORMED    | DAILY   | WEEKLY | 6 MOS | YEAR | NOTES   |
|----------------------|---|--------|-------|------|---|
| LOAD HOOK            | X   |        |       |      | INSPECT HOOK & LATCH FOR DEFORMATION, CRACKS, & CORROSION             |
| CABLE DRUM           | X   |        |       |      | MAKE SURE CABLE IS WOUND EVENLY ON DRUM                               |
| HOIST CABLE          | X   |        |       |      | CHECK FOR FLATTENING, KINKS, & BROKEN STRANDS, SEE MANUAL             |
| HYDRAULIC HOSES      | X   |        |       |      | VISUAL INSPECTION   |
| HYDRAULIC FLUID      | X   |        |       |      | CHECK FLUID LEVEL   |
| MOUNTING BOLTS       |   | X      |       |      | CHECK-TORQUE TO 440 FT-LBS AS REQUIRED                                |
| ROTATION WORM GEAR   |   | X      |       |      | LUBE WITH MOBILTAC LL, OR LUBRIPLATE P/N 15263, OR EQUIVALENT         |
| SHEAVE BEARINGS      |   | X      |       |      | SEALED BEARING, REPLACE IF ROUGH OR LOOSE                             |
| ALL OTHER BOLTS      |   | X      |       |      | CHECK-TIGHTEN AS REQUIRED   |
| BOOM PIVOTS          |   | X      |       |      | GREASE WITH MOBILPLEX EP-2 OR EQUIVALENT AT ZERKS                     |
| BOOM CYLINDER        |   | X      |       |      | CHECK AROUND CYLINDER ROD FOR EXCESS FLUID LEAKAGE                    |
| BOOM CYLINDER PINS   |   | X      |       |      | GREASE WITH MOBILPLEX EP-2 OR EQUIVALENT AT ZERKS                     |
| EXTENSION DETENT PIN |   | X      |       |      | LUBE DETENT SPRING & BALL w/ WD-40                                    |
| HOIST GEARBOX        |   |        | X     |      | WORM GEAR-EP GEAR LUBE SAE 80-90, SPUR GEAR SAE 30 OIL                |
| HYDRAULIC FLUID      |   |        |       | X    | DRAIN, FLUSH, & REFILL WITH MOBEL DTE-13M, EXXON UNIVIS N-32 OR EQUAL |
| BOOM SLIDE PADS      | PADS GREASED WHEN REPLACED  |        |       |      |   |
| <b>CAUTION</b>       | { Routine maintenance insures trouble-free operation and protects your investment. All warranties are void if maintenance is neglected. |        |       |      |   |

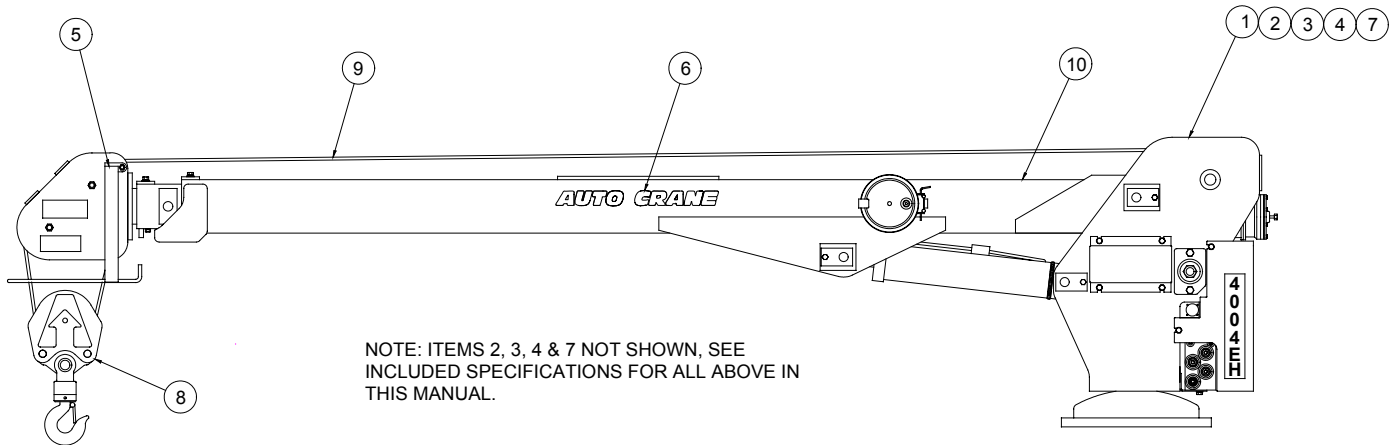
**NOTES:**

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

# *NOTES*

# 4004EH TOP ASSEMBLY

## BOOM 8-12-16 – P/N: 404000001

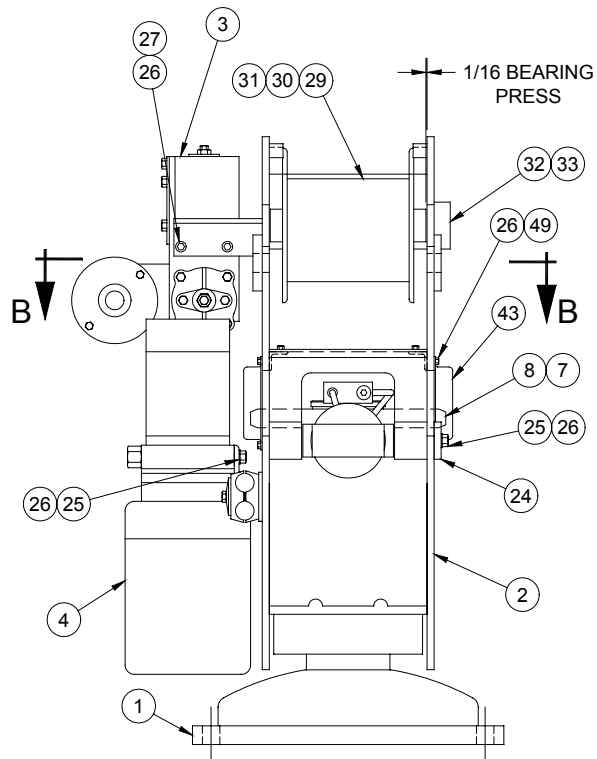
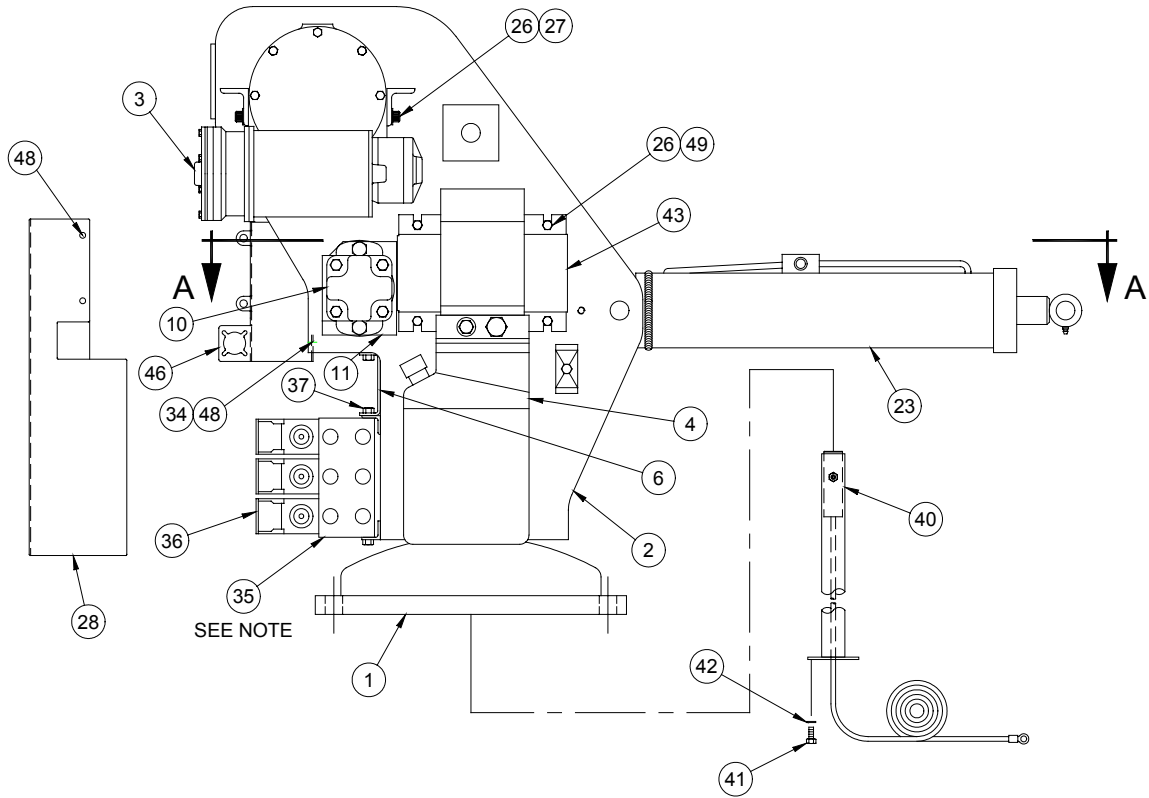


| ITEM NO. | QTY. | PART NO.  | DESCRIPTION           |
|----------|------|-----------|-----------------------|
| 1        | 1    | 404001001 | UNIT LESS BOOM        |
| 2        | 1    | 680073001 | ELECTRICAL ASSEMBLY   |
| 3        | 1    | 404003000 | HYDRAULIC ASSEMBLY    |
| 4        | 1    | 404004000 | SHIP KIT 4004EH       |
| 5        | 1    | 360822000 | 2 - BLOCK ASSEMBLY    |
| 6        | 1    | 404009000 | DECAL LAYOUT 4004EH   |
| 7        | 1    | 680065000 | PENDANT ASSEMBLY      |
| 8        | 1    | 360480000 | TRAVELING BLOCK SHORT |
| 9        | 1    | 360155000 | CABLE ASSEMBLY 5/16   |
| 10       | 1    | 404010000 | BOOM ASSEMBLY         |



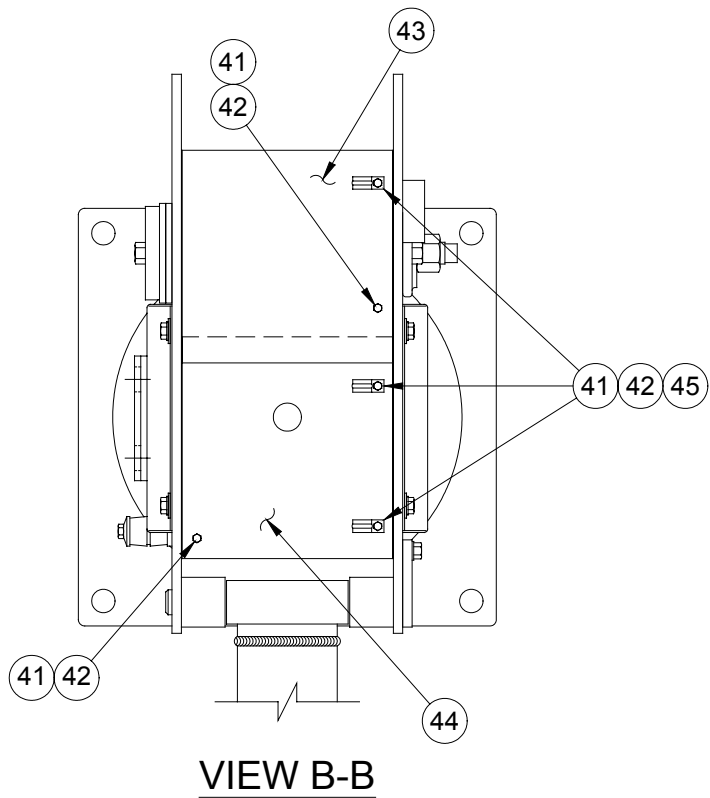
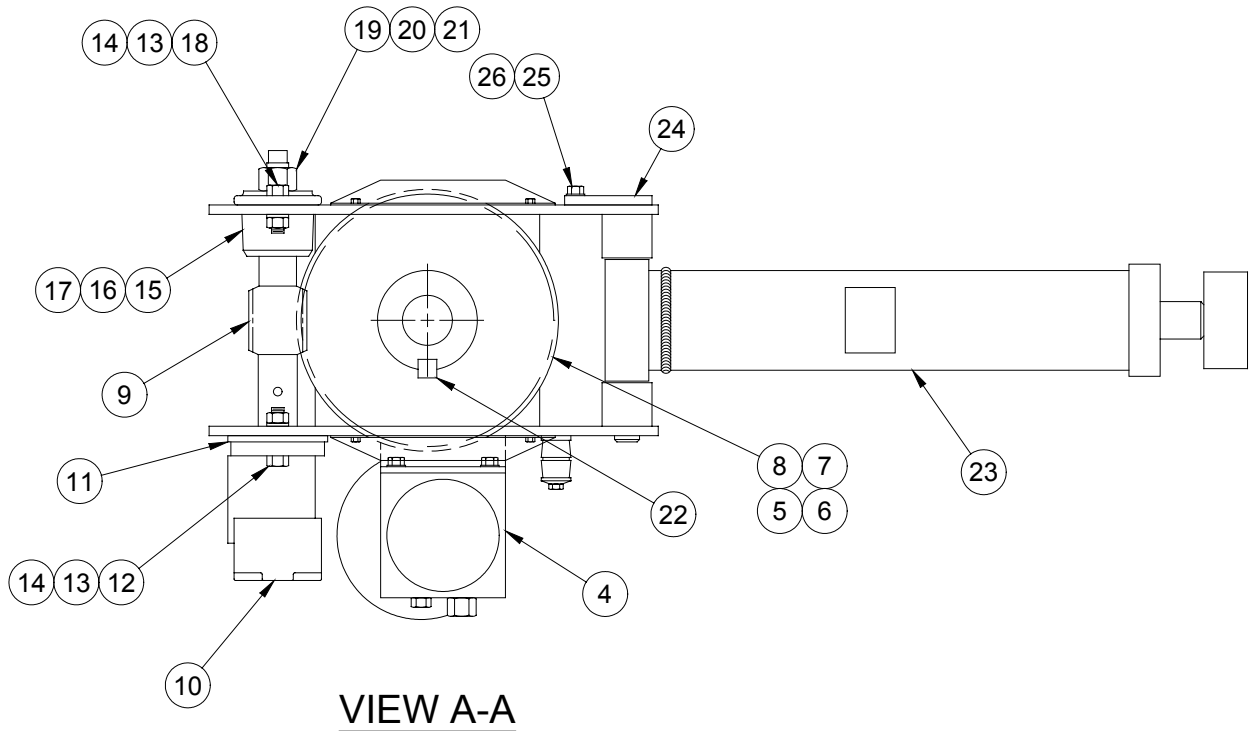
# UNIT LESS BOOM

## 4004EH - P/N: 404001001



# *UNIT LESS BOOM*

## *4004EH - P/N: 404001001*



**UNIT LESS BOOM**  
**4004EH - P/N: 404001001**

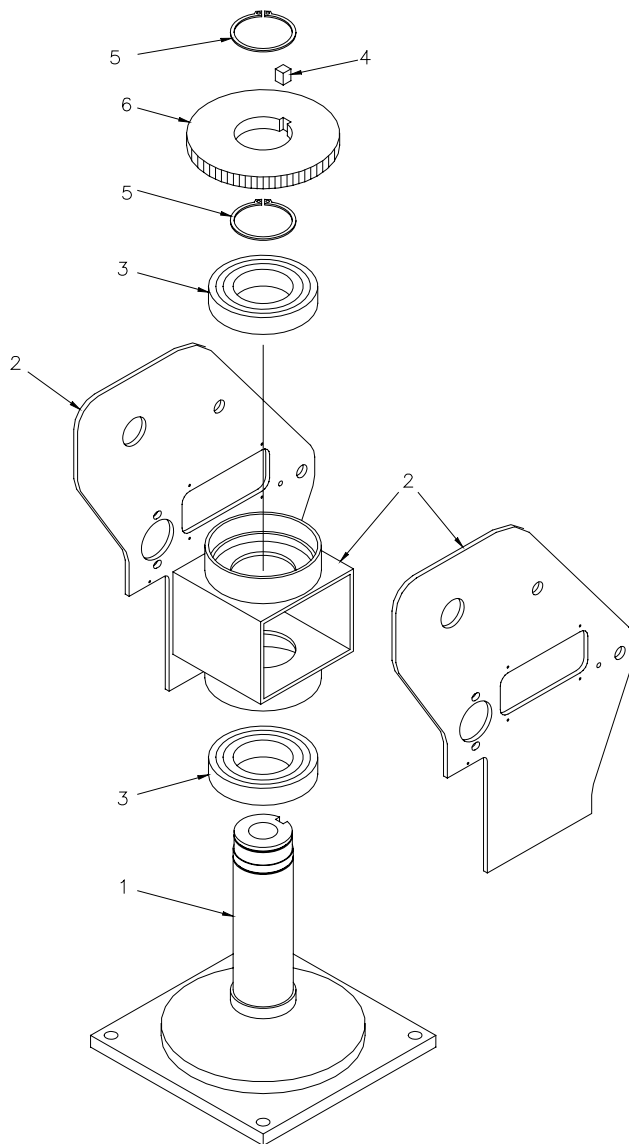
| ITEM NO. | QTY. | PART NO.  | DESCRIPTION                        |
|----------|------|-----------|------------------------------------|
| 1        | 1    | 404025    | PEDESTAL WELDMENT                  |
| 2        | 1    | 404020001 | SIDE PLATES/QUILL HOUSING WELDMENT |
| 3        | 1    | 404168    | HOIST ACTUATOR                     |
| 4        | 1    | 320336    | POWER UNIT                         |
| 5        | 2    | 404017    | BEARING ROTATION                   |
| 6        | 1    | 404124    | VALVE BANK BRACKET                 |
| 7        | 2    | 404028    | RETAINING RING GEAR                |
| 8        | 1    | 404016    | WORM GEAR                          |
| 9        | 1    | 404015    | WORM                               |
| 10       | 1    | 480027    | ROTATION MOTOR                     |
| 11       | 2    | 330484    | SPACER                             |
| 12       | 2    | 011603    | CAPSCREW 1/2 NC X 1 3/4            |
| 13       | 4    | 021500    | LOCKWASHER 1/2                     |
| 14       | 4    | 017701    | NUT 1/2 NC                         |
| 15       | 2    | 330486    | OIL SEAL                           |
| 16       | 2    | 330485    | BEARING                            |
| 17       | 1    | 330472    | HOUSING                            |
| 18       | 2    | 010201    | CAPSCREW 1/2 NC X 1 1/2            |
| 19       | 1    | 330483    | SPACER                             |
| 20       | 1    | 019000    | LOCKNUT 7/8 NF                     |
| 21       | 1    | 239300    | GREASE ZERK                        |
| 22       | 1    | 340602    | KEY 3/4 SQ X 1                     |
| 23       | 1    | 404005    | BOOM UP CYLINDER                   |
| 24       | 1    | 360624    | PEDESTAL /CYLINDER PIN             |
| 25       | 3    | 366158    | CAPSCREW 3/8 NC X 3/4 GR8          |
| 26       | 12   | 021100    | LOCKWASHER 3/8                     |
| 27       | 4    | 404081    | SOCKET HEAD SCREW 3/8 NC X 7/8     |
| 28       | 1    | 320429002 | COVER VALVE                        |
| 29       | 1    | 404092    | HOIST DRUM                         |
| 30       | 1    | 480094    | KEY 5/16 SQ X 8 1/8                |
| 31       | 2    | 480073    | WINCH SHAFT SPACER                 |
| 32       | 2    | 400500    | BEARING                            |
| 33       | 2    | 330468    | SPLIT-LOCK COLLAR                  |
| 34       | 4    | 736272    | NUTSERT 1/4NC                      |
| 35       | 1    | 202710    | MANIFOLD                           |
| 36       | 3    | 300204    | DIRECTIONAL CONTROL VALVE          |
| 37       | 6    | 002614    | SCW HX HD 5/16-18 UNC X 5/8        |
| 38       | 1    | 002900    | SCW SET 1/4-20 UNC X 1/4           |
| 39       | 1    | 404057    | POWER CABLE ASSY TO HOIST          |
| 40       | 1    | 404056    | POWER CABLE ASSY                   |

**UNIT LESS BOOM**  
**4004EH - P/N: 404001001**

| ITEM NO.                                | QTY. | PART NO.  | DESCRIPTION                          |
|---|------|-----------|--------------------------------------|
| 41                                      | 7    | 005401    | SCW HX HD 1/4-20 UNC X 5/8           |
| 42                                      | 7    | 020200    | WASHER SP LK 1/4                     |
| 43                                      | 2    | 404094    | COVER WORM GEAR                      |
| 44                                      | 1    | 404140    | COVER PEDESTAL WELDMENT RIGHT HAND   |
| 45                                      | 3    | 000115    | CLIP #115 JIFFY CLIP                 |
| 46                                      | 1    | 404170    | RELAY PANEL ASSY (NOT SHOWN)         |
| 47                                      | 1    | 751138    | RECTIFIER BRIDGE 25 AMP              |
| 48                                      | 8    | 005510    | SCW WIZ LOCK 1/4-20 UNC X 3/4        |
| 49                                      | 8    | 008401    | SCW HX HD 3/8-16 UNC X 1/2           |
| 50                                      | 2    | 021200    | WASHER FL 3/8                        |
| 51                                      | 1    | 404098001 | COVER PEDESTAL WELDMENT LEFT         |
| *52                                     | 4    | 015100    | SCW HX HD 7/8 NF X 4 GR8 (NOT SHOWN) |
| *53                                     | 4    | 022200    | WASHER LK 7/8 (NOT SHOWN)            |
| *54                                     | 4    | 018900    | NUT 7/8 NF GR8 (NOT SHOWN)           |
| * REFERENCE ITEMS FOUND IN THE SHIP KIT |      |           |                                      |

# *NOTES*

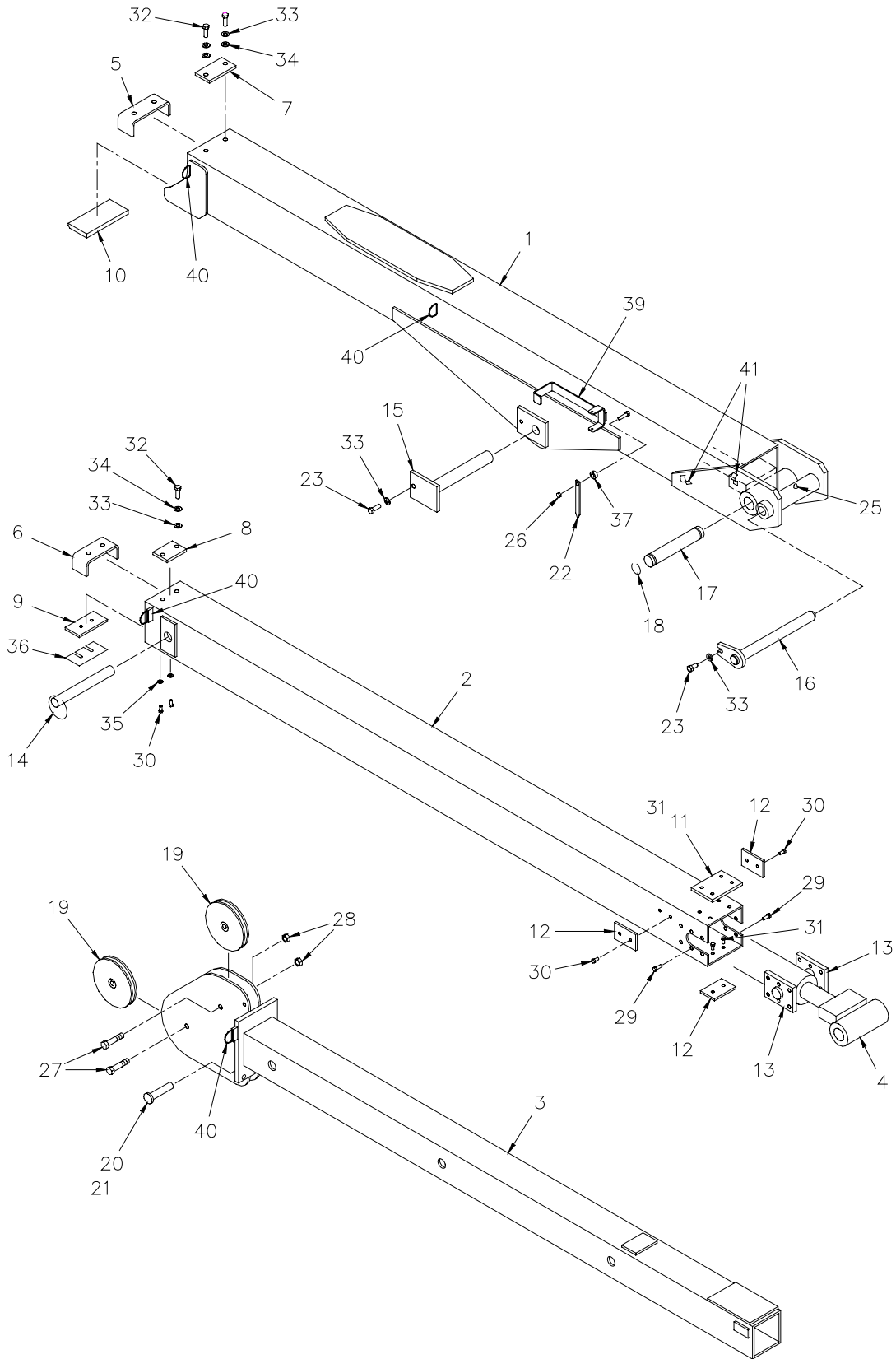
# **PEDESTAL ASSEMBLY 4004EH**



| ITEM NO. | QTY. | PART NO.  | DESCRIPTION               |
|----------|------|-----------|---------------------------|
| 1        | 1    | 404025    | PEDESTAL                  |
| 2        | 1    | 404020001 | SIDE PLATES/QUILL HOUSING |
| 3        | 2    | 404017    | ROTATION BEARING          |
| 4        | 1    | 340602    | KEY 3/4 SQ X 1"LG         |
| 5        | 2    | 404028    | GEAR RETAINING RING       |
| 6        | 1    | 404016    | WORM GEAR                 |

# **BOOM ASSEMBLY (8-12-16)**

## **4004EH - P/N 404010000**

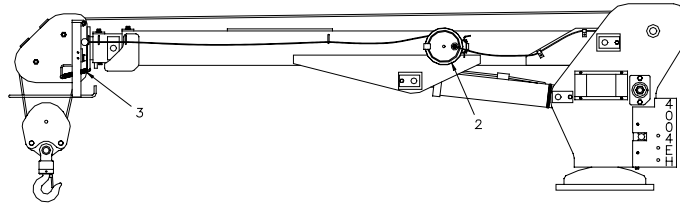


**BOOM ASSEMBLY (8-12-16)**  
**4004EH - P/N 404010000**

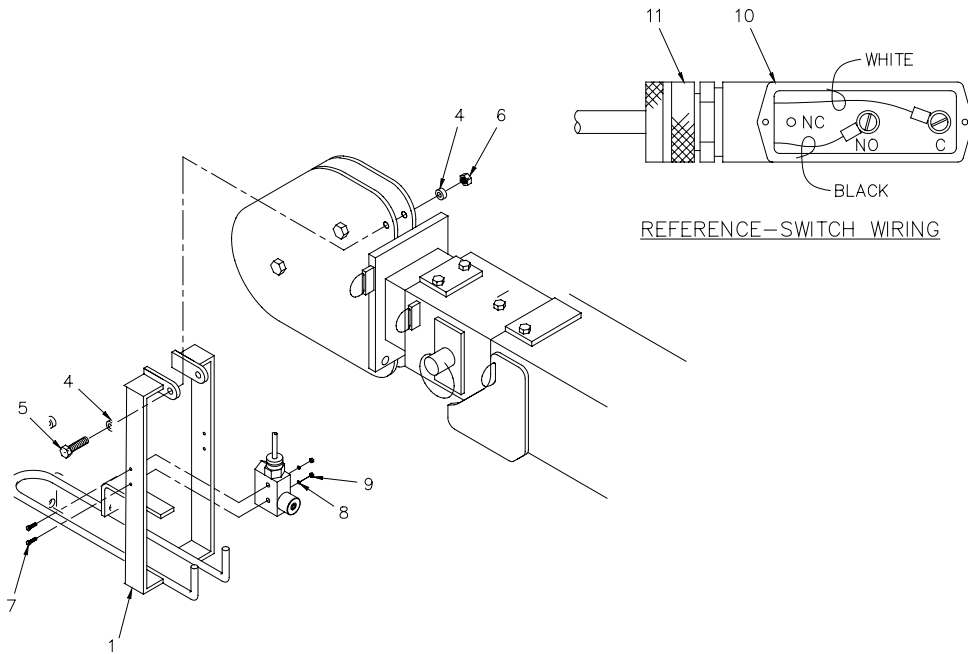
| ITEM NO. | QTY. | PART NO. | DESCRIPTION                 |
|----------|------|----------|-----------------------------|
| 1        | 1    | 404030   | LOWER BOOM                  |
| 2        | 1    | 404032   | CENTER BOOM                 |
| 3        | 1    | 404035   | MANUAL BOOM                 |
| 4        | 1    | 404006   | BOOM EXTENSION CYLINDER     |
| 5        | 1    | 366183   | CENTER BOOM STOP            |
| 6        | 1    | 366112   | UPPER BOOM STOP             |
| 7        | 1    | 366201   | BOOM TOP PAD                |
| 8        | 1    | 366202   | BOOM TOP PAD                |
| 9        | 1    | 366199   | BOOM PAD                    |
| 10       | 1    | 366187   | RETAINER LOWER PAD          |
| 11       | 2    | 480036   | CENTER BOOM TOP PAD         |
| 12       | 2    | 366186   | CENTER BOOM PAD             |
| 13       | 2    | 366184   | EXTENSION CYLINDER RETAINER |
| 14       | 1    | 366190   | PIN ASSEMBLY w/LANYARD      |
| 15       | 1    | 360819   | BOOM CYLINDER PIN           |
| 16       | 1    | 360625   | LOWER BOOM PIVOT PIN        |
| 17       | 1    | 366193   | EXTENSION CYLINDER PIN      |
| 18       | 2    | 480029   | RETAINING RING              |
| 19       | 2    | 480130   | SHEAVE ASSEMBLY             |
| 20       | 1    | 360814   | CROWN PIN                   |
| 21       | 1    | 360124   | HITCH PIN                   |
| 22       | 1    | 360038   | ANGLE INDICATOR             |
| 23       | 2    | 366158   | CAPSCREW 3/8NC X 3/4 GR8    |
| 24       | 1    | 480120   | BOOM PAD                    |
| 25       | 1    | 239000   | GREASE ZERK                 |
| 26       | 1    | 016300   | LOCK NUT 1/4NC              |
| 27       | 2    | 011511   | CAPSCREW 1/2NF X 2 1/4      |
| 28       | 2    | 017700   | LOCK NUT 1/2NF              |
| 29       | 12   | 008400   | CAPSCREW 3/8NC X 3/4        |
| 30       | 6    | 007808   | CAPSCREW 5/16NC X 1/2       |
| 31       | 6    | 005406   | CAPSCREW 1/4NF X 1/2        |
| 32       | 4    | 008800   | CAPSCREW 3/8NC X 1          |
| 33       | 6    | 021100   | LOCK WASHER 3/8             |
| 34       | 4    | 021200   | FLAT WASHER 3/8             |
| 35       | 2    | 020600   | LOCK WASHER 5/16            |
| 36       | A/R  | 480037   | SHIM                        |
| 37       | 1    | 360849   | PLASTIC SPACER 1/4 DIA.     |



## 2 – BLOCK ASSEMBLY 4004EH

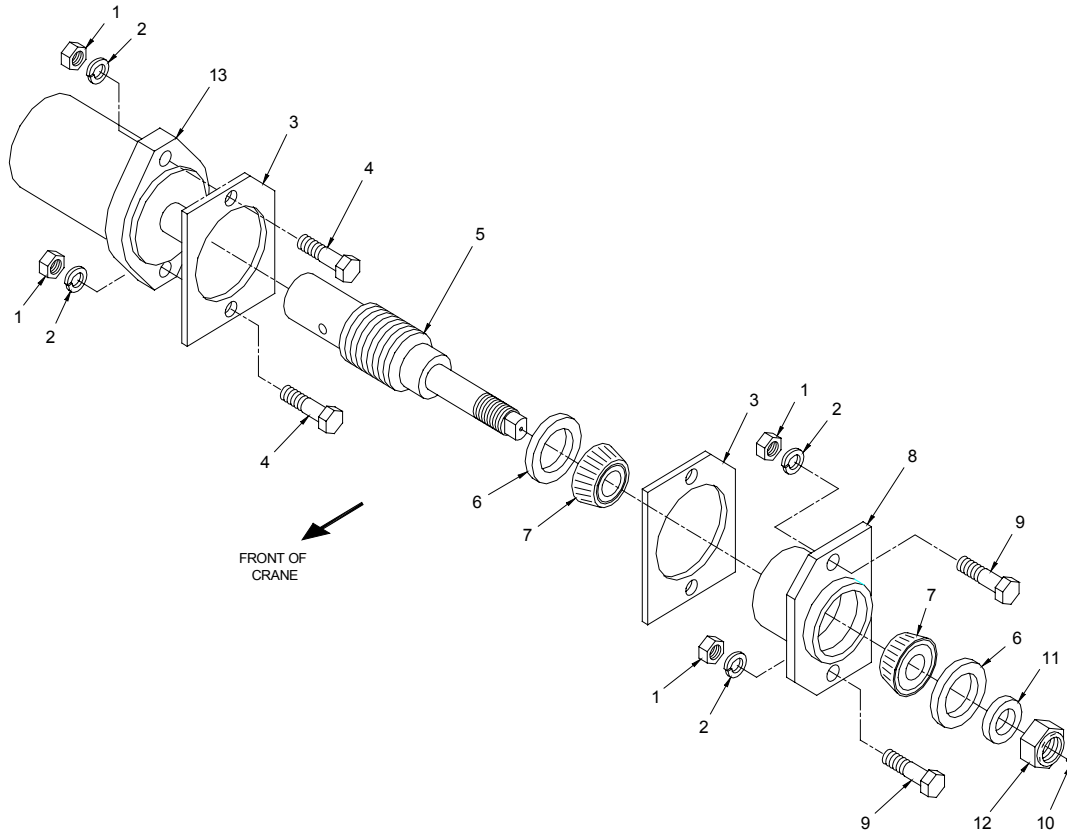


CORD REEL & 2-BLOCK ASS'Y



| ITEM NO. | QTY. | PART NO.  | DESCRIPTION                       |
|----------|------|-----------|-----------------------------------|
| 1        | 1    | 360823    | 2-BLOCK WELDMENT                  |
| 2        | 1    | 366973001 | CORD REEL ASSEMBLY w/WEATHER PACK |
| 3        | 1    | 360824    | 2-BLOCK SPRING                    |
| 4        | 2    | 360852    | PLASTIC SPACER 3/8 DIA.           |
| 5        | 1    | 009800    | CAPSCREW 3/8NF X 3 1/2            |
| 6        | 1    | 017400    | LOCK NUT 3/8NF                    |
| 7        | 2    | 000610    | ROUND HEAD SCREW #6NC X 1 1/2     |
| 8        | 2    | 019600    | LOCK WASHER #6                    |
| 9        | 2    | 015400    | NUT #6NC                          |
| 10       | 1    | 646900    | SWITCH                            |
| 11       | 1    | 642918    | CORD CONNECTOR                    |

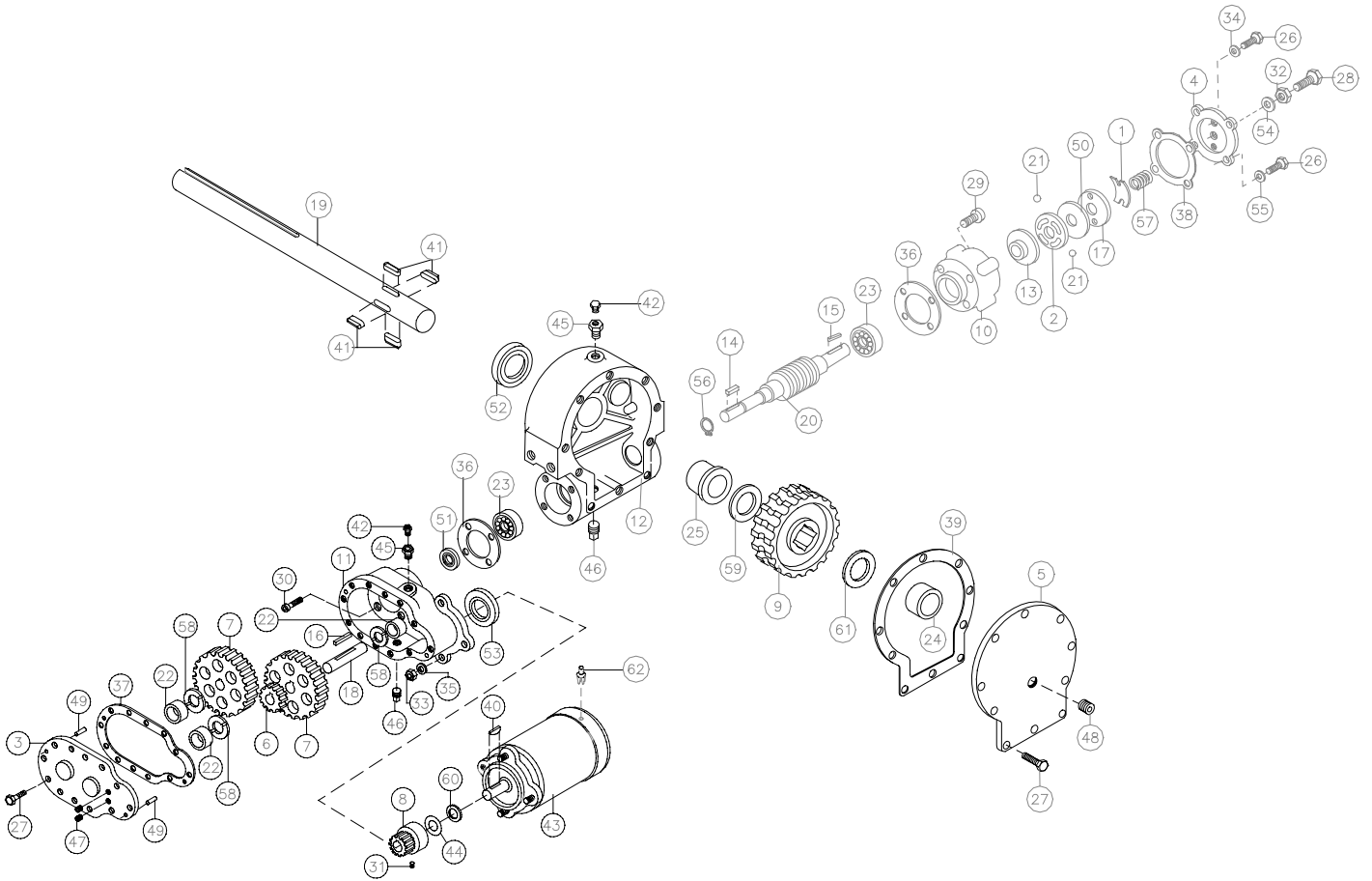
# HYDRAULIC TURNER ASSEMBLY 4004EH



| ITEM NO. | QTY. | PART NO. | DESCRIPTION            |
|----------|------|----------|------------------------|
| 1        | 4    | 017701   | NUT 1/2NC              |
| 2        | 4    | 021500   | LOCK WASHER 1/2        |
| 3        | 2    | 330484   | SPACER                 |
| 4        | 2    | 011603   | CAPSCREW 1/2NC X 1 3/4 |
| 5        | 1    | 404015   | WORM SHAFT ASSEMBLY    |
| 6        | 2    | 330486   | OIL SEAL               |
| 7        | 2    | 330485   | BEARING                |
| 8        | 1    | 330472   | BEARING HOUSING        |
| 9        | 2    | 010201   | CAPSCREW 1/2NC X 1 1/2 |
| 10       | 1    | 239300   | GREASE ZERK            |
| 11       | 1    | 330483   | SPACER                 |
| 12       | 1    | 019000   | LOCK NUT 7/8NF         |
| 13       | 1    | 366440   | ROTATION MOTOR         |

# HOIST ACTUATOR

## P/N 160411 – MODEL 4004EH



***HOIST ACTUATOR***  
***P/N 160411 – MODEL 4004EH***

| ITEM NO. | QTY. | PART NO. | DESCRIPTION                           |
|----------|------|----------|---------------------------------------|
| 1        | 1    | 306034   | SPRING FLAT                           |
| 2        | 1    | 314008   | PLATE CAM                             |
| 3        | 1    | 328106   | COVER SPUR GEAR HOUSING               |
| 4        | 1    | 328128   | COVER BRAKE                           |
| 5        | 1    | 324134   | COVER WORM GEAR HOUSING               |
| 6        | 1    | 334001   | IDLER GEAR                            |
| 7        | 2    | 334003   | SPUR GEAR                             |
| 8        | 1    | 334129   | PINION GEAR                           |
| 9        | 1    | 334165   | 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 SQUARE END                        |
| 15       | 1    | 342027   | KEY ROUND END                         |
| 16       | 1    | 342033   | KEY SQUARE END                        |
| 17       | 1    | 352022   | PLATE RETAINER                        |
| 18       | 1    | 356901   | SHAFT SPUR                            |
| 19       | 1    | 357172   | SHAFT OUTPUT                          |
| 20       | 1    | 368200   | WORM R.H. 30:1                        |
| 21       | 2    | 400003   | BALL                                  |
| 22       | 3    | 402001   | BEARING NEEDLE                        |
| 23       | 2    | 402002   | BEARING BALL                          |
| 24       | 1    | 412044   | BUSHING COVER                         |
| 25       | 1    | 412045   | BUSHING HOUSING                       |
| 26       | 6    | 414021   | CAPSCREW 1/4-20NC X 1" LG HEX HD Z.P. |
| 27       | 22   | 414038   | CAPSCREW 1/4-20NC X 3/4" LG HEX HD    |
| 28       | 1    | 414224   | CAPSCREW 3/8-16NC X 1 1/2" LG HEX HD  |
| 29       | 4    | 414821   | CAPSCREW 1/4-20NC X 7/8" LG SOC HD    |
| 30       | 4    | 414845   | CAPSCREW 1/4-20NC X 1" LG SOC HD      |
| 31       | 1    | 416029   | SETSCREW                              |
| 32       | 1    | 418036   | NUT JAM 3/8-16NC                      |
| 33       | 3    | 418040   | NUT HEX 3/8-24NF REG Z.P.             |
| 34       | 3    | 418154   | WASHER 1/4 FLAT ALUM.                 |

***HOIST ACTUATOR***  
***P/N 160411 – MODEL 4004EH***

| ITEM NO. | QTY. | PART NO. | DESCRIPTION         |
|----------|------|----------|---------------------|
| 35       | 3    | 418177   | LOCKWASHER          |
| 36       | 2    | 442184   | GASKET              |
| 37       | 1    | 442185   | GASKET              |
| 38       | 1    | 442189   | GASKET              |
| 39       | 1    | 442205   | GASKET              |
| 40       | 1    | 450001   | KEY WOODRUFF        |
| 41       | 4    | 450016   | KEY BARTH           |
| 42       | 2    | 456008   | RELIEF FITTING      |
| 43       | 1    | 458108   | MOTOR - 12V         |
| 44       | 1    | 462015   | O - RING            |
| 45       | 2    | 468002   | REDUCER             |
| 46       | 2    | 468011   | PIPE PLUG SQ. HEAD  |
| 47       | 2    | 468017   | PIPE PLUG SOC. HEAD |
| 48       | 1    | 468018   | PIPE PLUG SOC. HEAD |
| 49       | 2    | 470001   | PIN                 |
| 50       | 1    | 474001   | PLATE THRUST        |
| 51       | 1    | 486009   | OIL SEAL            |
| 52       | 1    | 486017   | OIL SEAL            |
| 53       | 1    | 486023   | OIL SEAL            |
| 54       | 1    | 486069   | THREAD SEAL         |
| 55       | 4    | 486070   | THREAD SEAL         |
| 56       | 1    | 490003   | SNAP RING           |
| 57       | 1    | 494007   | SPRING              |
| 58       | 3    | 518002   | THRUST WASHER       |
| 59       | 1    | 518015   | THRUST WASHER       |
| 60       | 1    | 518018   | FIBER WASHER        |
| 61       | 1    | 518040   | THRUST WASHER       |
| 62       | 1    | 480015   | PLASTIC RIVET       |

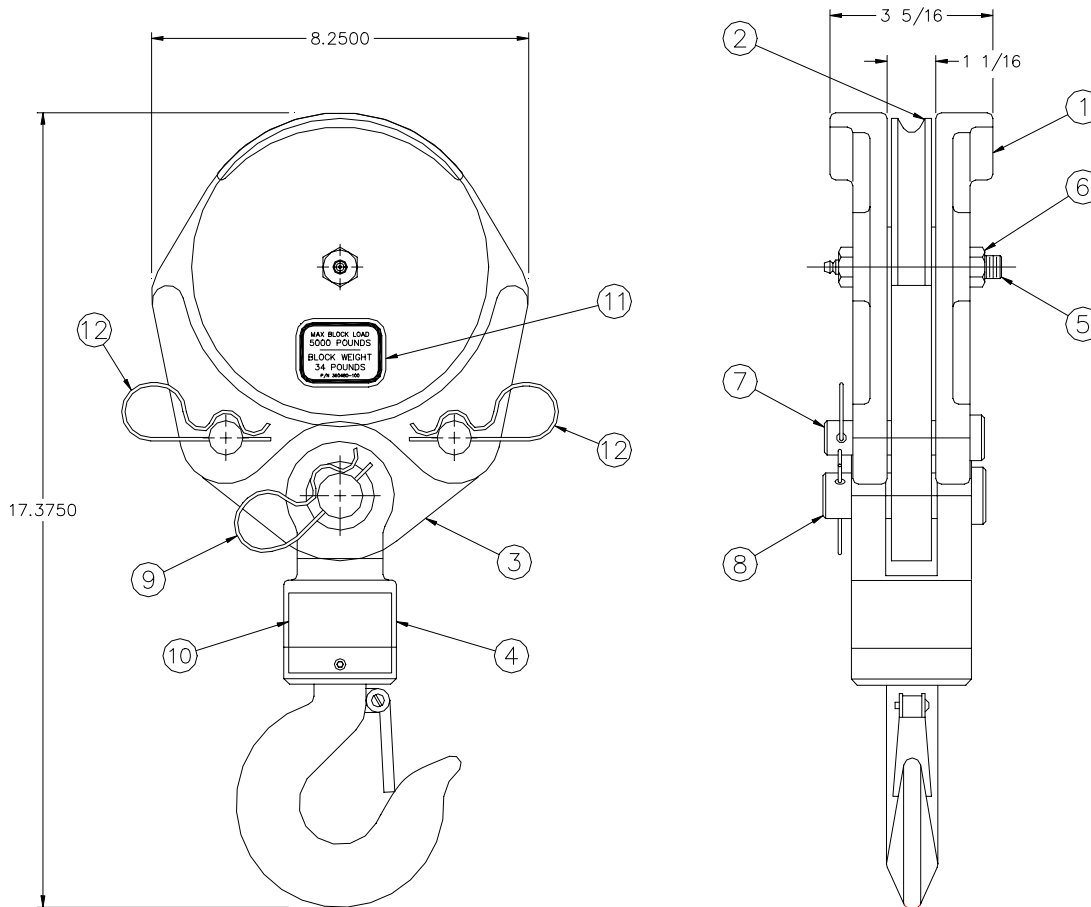
# ***AUTOMATIC SAFETY BRAKE ASSEMBLY (OIL COOLED) HOIST***

## **ASSEMBLY INSTRUCTIONS:**

1. Winch has right hand worm and gear. Cable spools over drum. Use number one slots for brake balls (21) in cam plate (2).
2. Install brake hub (13) through brake housing (10) on winch worm with key.
3. Assemble balls (21) in cam plate (2) using hard grease to hold balls in place.
4. Place cam plate (2) on brake hub (13), matching its holes with the balls.
5. Install thrust plate (50).
6. Thread capscrew (28) with jam nut (32) and thread seal (11) through housing cover (4).
7. Place gasket (38) on housing cover (4).
8. Install coil spring (57) on capscrew (28).
9. Install flat spring (1) on capscrew (28).
10. Secure retainer plate (17) and flay spring (1) to housing cover (4) using capscrews (26) and washers (34).
11. Using capscrews (26) and thread seals (55) attach housing cover (4) to brake housing (10).
12. Test brake by shifting wich to **UP** then **DOWN** to see if brake is working in proper rotation. If not, remove housing cover (4) and locate brake balls (21) in opposite set of slots of cam plate (2).
13. Adjust to suit by tightening or loosening capscrew (28) on outside of housing cover (4). When proper adjustment is obtained< secure capscrew (28) with jam nut (32).

# TRAVELING BLOCK ASSEMBLY

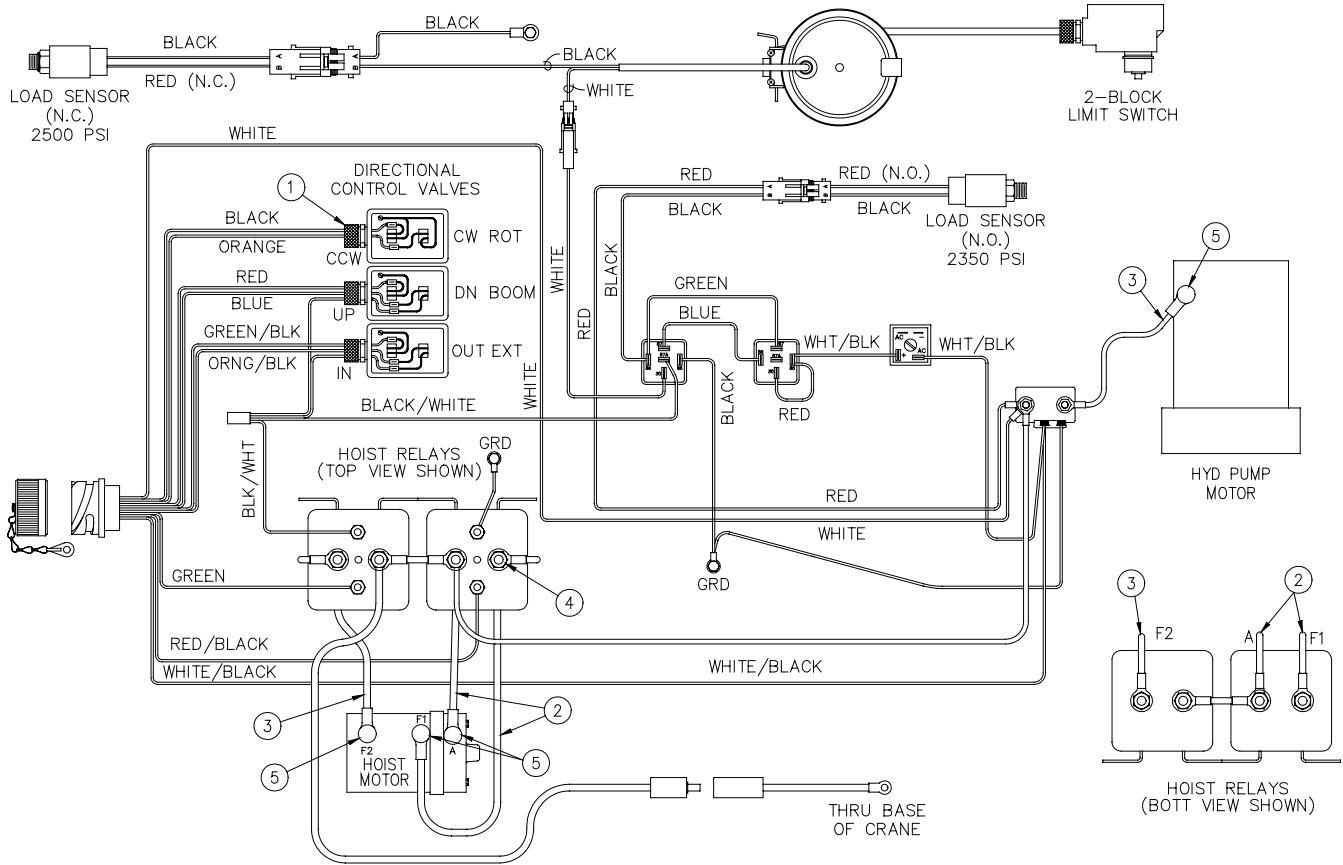
## P/N 360480



| ITEM | QTY | PART NO.   | DESCRIPTION                       |
|------|-----|------------|-----------------------------------|
| 1    | 2   | 480362     | SIDE PLATE, TRVLG BLOCK, MACHINED |
| 2    | 1   | 480130     | SHEAVE ASSEMBLY                   |
| 3    | 1   | 480364     | TACKLE, LOWER                     |
| 4    | 1   | 480371     | HOOK, SWIVEL, 3 TON               |
| 5    | 1   | 480372     | BOLT, SHEAVE W/ZERK               |
| 6    | 1   | 017800     | NUT, HEX, LOCK, 1/2-20 NF         |
| 7    | 2   | 480367     | PIN, BLOCK                        |
| 8    | 1   | 480368     | PIN, SWIVEL HOOK                  |
| 9    | 1   | 360124     | PIN, HITCH HAIR PIN               |
| 10   | 2   | 040518     | DECAL, DANGER STAY CLEAR/LOAD     |
| 11   | 2   | 360480-100 | DECAL, MAX LOAD                   |
| 12   | 2   | 366813     | PIN, HITCH CLIP                   |

# ***ELECTRICAL ASSEMBLY***

## ***P/N 680073-001 – MODEL 4004EH***

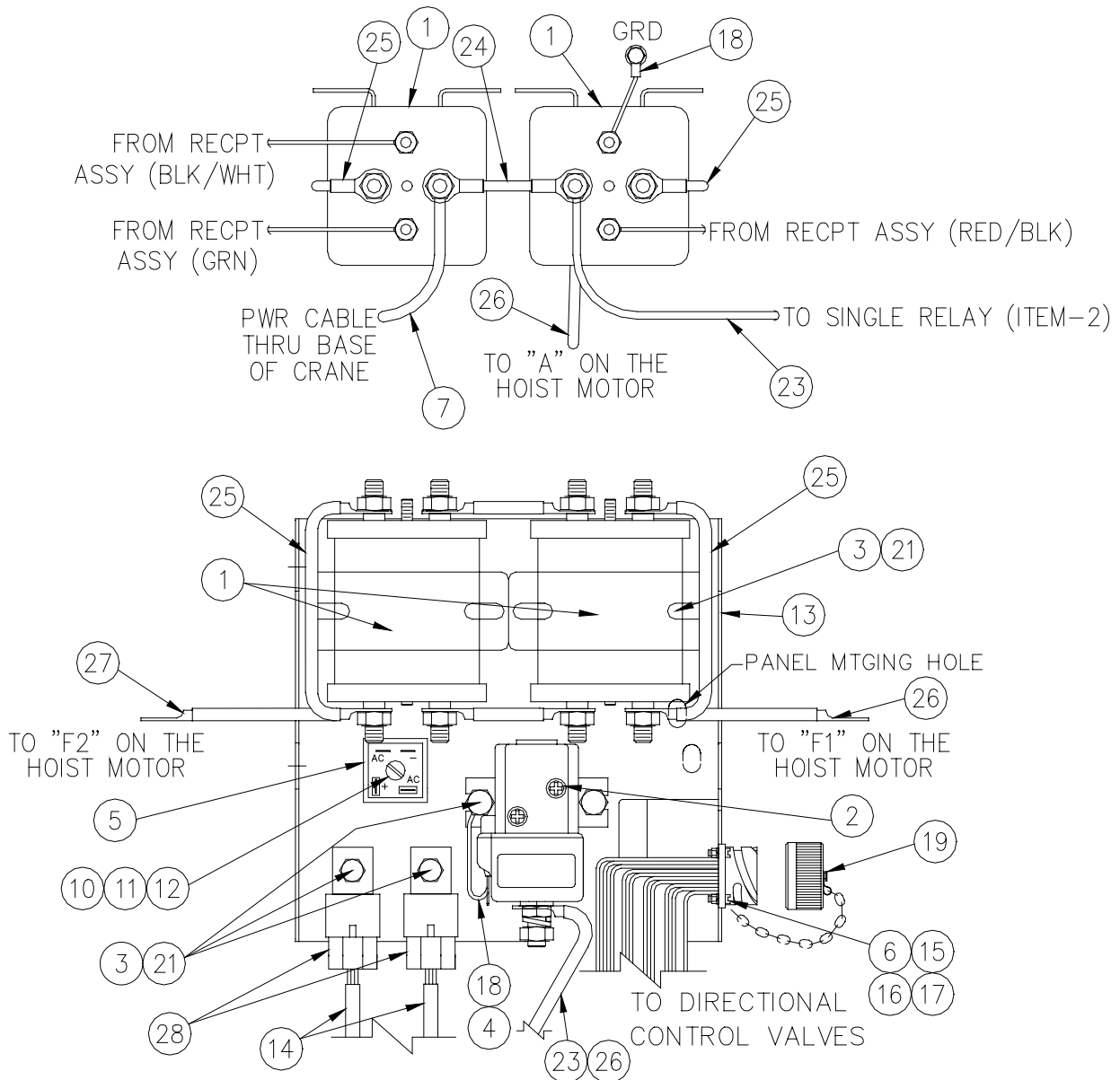


| ITEM NO. | QTY. | PART NO. | DESCRIPTION             |
|----------|------|----------|-------------------------|
| 1        | 3    | 642908   | CORD CONNECTOR          |
| 2        | 2    | 404165   | CONDUCTOR 4 GA X 22"    |
| 3        | 2    | 404166   | CONDUCTOR 4 GA X 24"    |
| 4        | 8    | 016600   | NUT HEX HD 5/16 - 24UNF |
| 5        | 4    | 270326   | INSULATOR BOOT BLACK    |



# ***ELECTRICAL PANEL ASSEMBLY***

## ***P/N 404170000 – MODEL 4004EH***



# ***ELECTRICAL PANEL ASSEMBLY***

## ***P/N 404170000 – MODEL 4004EH***

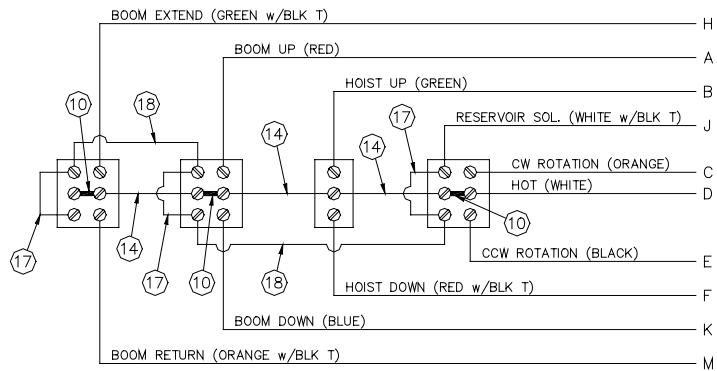
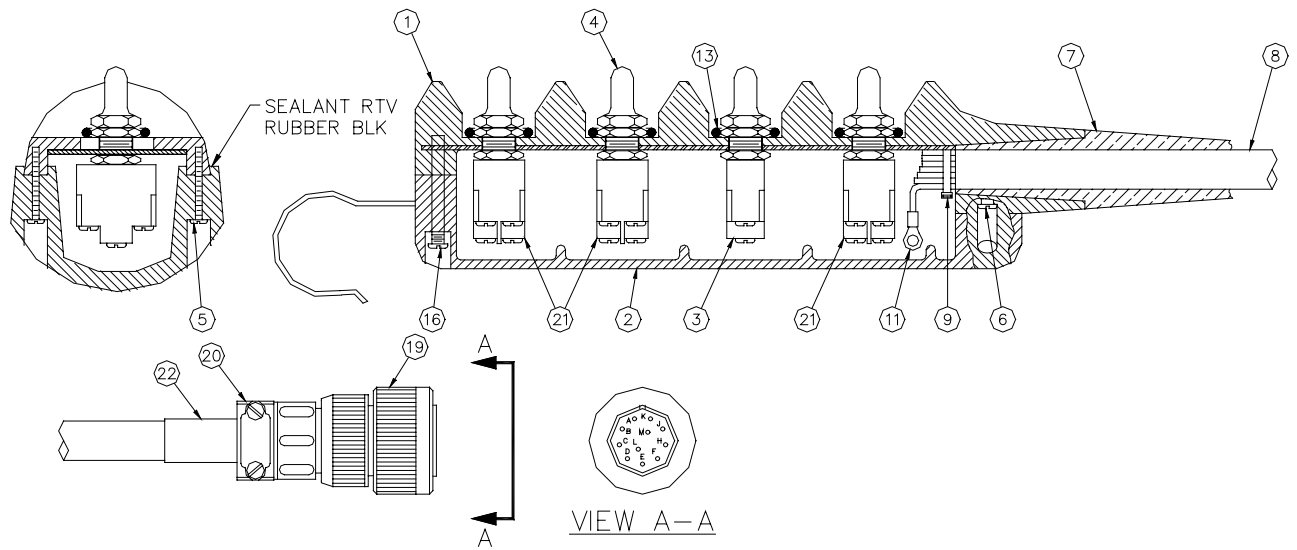
NOTE:

1. ✱ = NOT SHOWN
2. ✱✱ = SEE ELECTRICAL SCHEMATIC FOR WIRING CONNECTIONS (680073-001)

|   |      |     |     |            |                               |
|---|------|-----|-----|------------|-------------------------------|
|   | 28   | 2   | A   | 320355     | RELAY DROP OUT                |
|   | 27   | 2   | A   | 404166     | CABLE 4 GA x 24               |
|   | 26   | 2   | A   | 404165     | CABLE 4 GA x 22               |
|   | 25   | 1   | A   | 622327-004 | CABLE 4 GA x 6 1/4            |
|   | 24   | 1   | A   | 622327-003 | CABLE 4 GA x 2 7/16           |
|   | 23   | 1   | A   | 622327-002 | CABLE 4 GA x 9 1/2            |
| ✱ | 22   | 1   | A   | 366032     | LOAD SENSOR ASSY 2500 psi     |
|   | 21   | 12  | A   | 736272     | NUT INSERT 1/4 X 20           |
|   | 20   | 2   | A   | 000300     | TERM WIRE RB14 – 10           |
|   | 19   | 1   | B   | 320564     | CAP RECEP                     |
|   | 18   | 2   | A   | 622260-001 | WIRE ASSY 16 GA x 3 IN        |
|   | 17   | 2   | A   | 019600     | WASHER SP LK #6               |
|   | 16   | 1   | C   | 680074     | RECEP ASSY                    |
|   | 15   | 2   | A   | 015400     | NUT HEX #6 – 32 UNC           |
|   | 14   | 1   | C   | 404061     | HARNESS RELAY WIRING          |
|   | 13   | 1   | B   | 320805     | PANEL RELAY                   |
|   | 12   | 1   | A   | 019800     | WASHER LOCK #10               |
|   | 11   | 1   | A   | 015600     | NUT HX #10                    |
|   | 10   | 1   | A   | 002502     | SCR RD HD #10-32 x 1 1/4      |
| ✱ | 9    | 1   | B   | 320543     | LOAD SENSOR ASSY 2350 psi     |
| ✱ | 8    | 1   | B   | 404056     | PWR CABLE ASSY                |
| ✱ | 7    | 1   | B   | 404057     | PWR CABLE ASSY                |
|   | 6    | 2   | A   | 000404     | SCREW HEX 6-32 UNC X 5/8      |
|   | 5    | 1   | A   | 751138     | RECTIFIER BRIDGE 25 amp       |
|   | 4    | 2   | A   | 020201     | WASHER INT LOCK 1/4           |
|   | 3    | 8   | B   | 005510     | WHIZ LOCK SCR 1/4-20UNC x 3/4 |
|   | 2    | 1   | B   | 320584     | RELAY SINGLE SEALED 100 amp   |
|   | 1    | 2   | B   | 404167     | SOLENOID SEALED 4004EH        |
|   | ITEM | QTY | D/S | PART No.   | DESCRIPTION                   |

# PENDANT ASSEMBLY

## P/N 680065



VIEW FROM BOTTOM

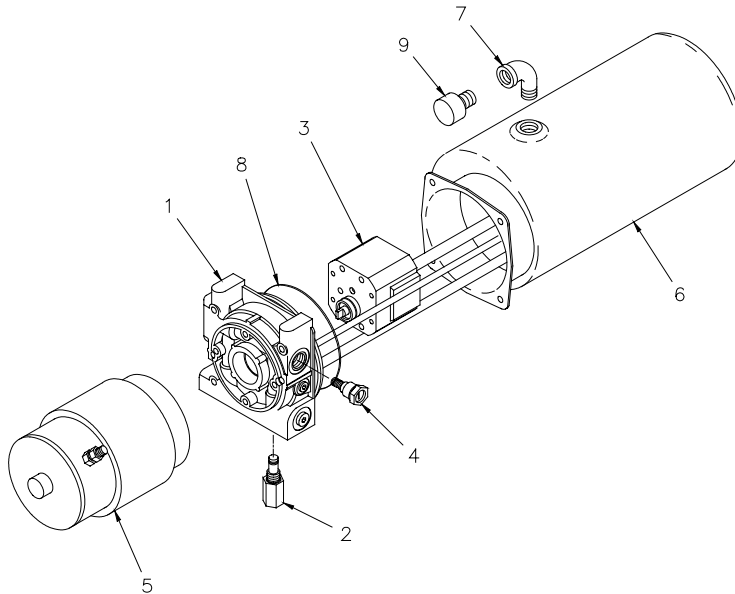
***PENDANT ASSEMBLY***  
***P/N 680065***

| ITEM | QTY  | PART NO | DESCRIPTION                  |
|------|------|---------|------------------------------|
| 1    | 1    | 631601  | PEND HSNG                    |
| 2    | 1    | 631700  | BTM COVER                    |
| 3    | 1    | 622000  | TGL SW                       |
| 4    | 4    | 640300  | BOOT TGL SW                  |
| 5    | 10   | 001004  | SCW ST SLT PAN HD #6 X 3/4   |
| 6    | 2    | 005101  | SCW ST SLT PAN HD #8 X 1 1/4 |
| 7    | 1    | 633801  | CBL ADPT                     |
| 8    | 18ft | 800632  | COND CBL                     |
| 9    | 2    | REF     | TY-RAP CBL TIE (634401)      |
| 10   | 3    | 636600  | JUMPER                       |
| 11   | 24   | 000101  | TERM'S T & B                 |
| 12   | 4    | 642100  | O-RING                       |
| 13   | 1ft  | 800592  | WIRE 16G 600V 1C WHT         |
| 14   | 1    | 004700  | SCW ST SLT PAN HD #8 X 1 1/2 |
| 15   | 3    | 622346  | COND ASSY X 2 1/8            |
| 16   | 2    | 622347  | COND ASSY X 3 1/8            |
| 17   | 1    | 320563  | PLUG 11 PIN BAYONET          |
| 18   | 1    | 480515  | CLP CBL                      |
| 19   | 3    | 634200  | TGL SW                       |
| 20   | 6in  | 490243  | TBG HEAT SHRINK              |

# *NOTES*

# **HYDRAULIC PUMP & RESERVOIR**

## **P/N 320336 --- 4004EH SERIES**



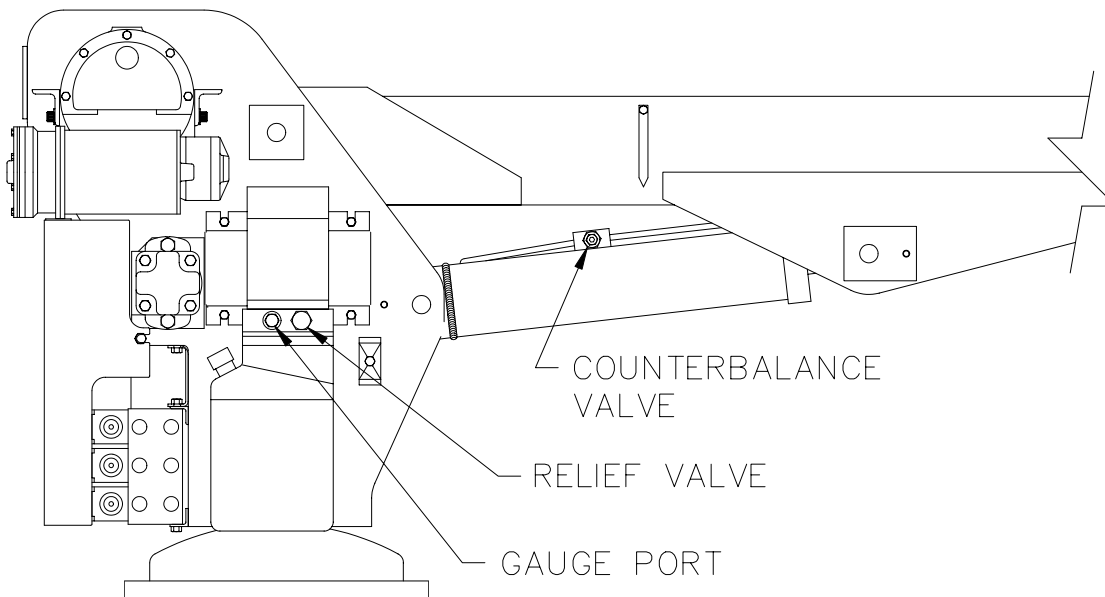
| ITEM NO. | QTY. | PART NO.   | DESCRIPTION          |
|----------|------|------------|----------------------|
| 1        | 1    | 320336-005 | ADAPTER KIT          |
| 2        | 1    | 320336-002 | RETURN PORT PLUG KIT |
| 3        | 1    | 320335-003 | PUMP KIT             |
| 4        | 1    | 320336-003 | RELIEF VALVE KIT     |
| 5        | 1    | 320335-005 | MOTOR                |
| 6        | 1    | 320336-004 | RESERVOIR KIT        |
| 7        | 1    | 320335-008 | ELBOW FITTING        |
| 8        | 1    | 320335-010 | O-RING               |
| 9        | 1    | 200545     | BREATHER CAP         |

# ***HYDRAULICS***

## ***4004EH SERIES***

### **Relief Valve Setting**

With crane boom supported, remove plug and insert 2500 PSI gauge (see diagram below). Remove from boom support and operate boom retract to end of stroke (fully in). Continue operation of the boom in function and read relief pressure on gage. It should read 2200 PSI. If not, readjust system pressure. Leave gauge installed for counterbalance setting procedure.



### ***RELIEF & COUNTERBALANCE VALVE ADJUSTMENT***

#### **Notice:**

If system pressure meets or exceeds the overload pressure switch of 2350 PSI, the boom will **LOCK IN THE FULL UP POSITION**. See overload system information in this manual. System pressure well below 2200 PSI will limit the load lifting capabilities of the crane

### **Counterbalance Valve Adjustment**

- { With no load on boom, boom up to an angle of 60 degrees. Then Boom-Down and note pressure reading. If pressure reading is not approximately 1000 PSI, the counterbalance valve requires adjustment. Repeat boom movement for each test.
- { Loosen nut on adjustment screw and do one of the following:
  - v To increase the counterbalance valve setting, turn the adjustment screw counter clockwise. Located on the front of counterbalance valve block towards end of boom. Loosen nut and adjust Allen head screw.

## ***HYDRAULICS***

### ***4004EH SERIES***

- v To reduce the counterbalance valve setting, turn the adjustment screw clockwise.
- { Tighten nut on adjustment screw and repeat pressure testing procedure if needed to obtain the proper pressure setting.
- { Support the boom and remove the pressure gauge and reinstall -6 plug. Crane is now ready for operation.

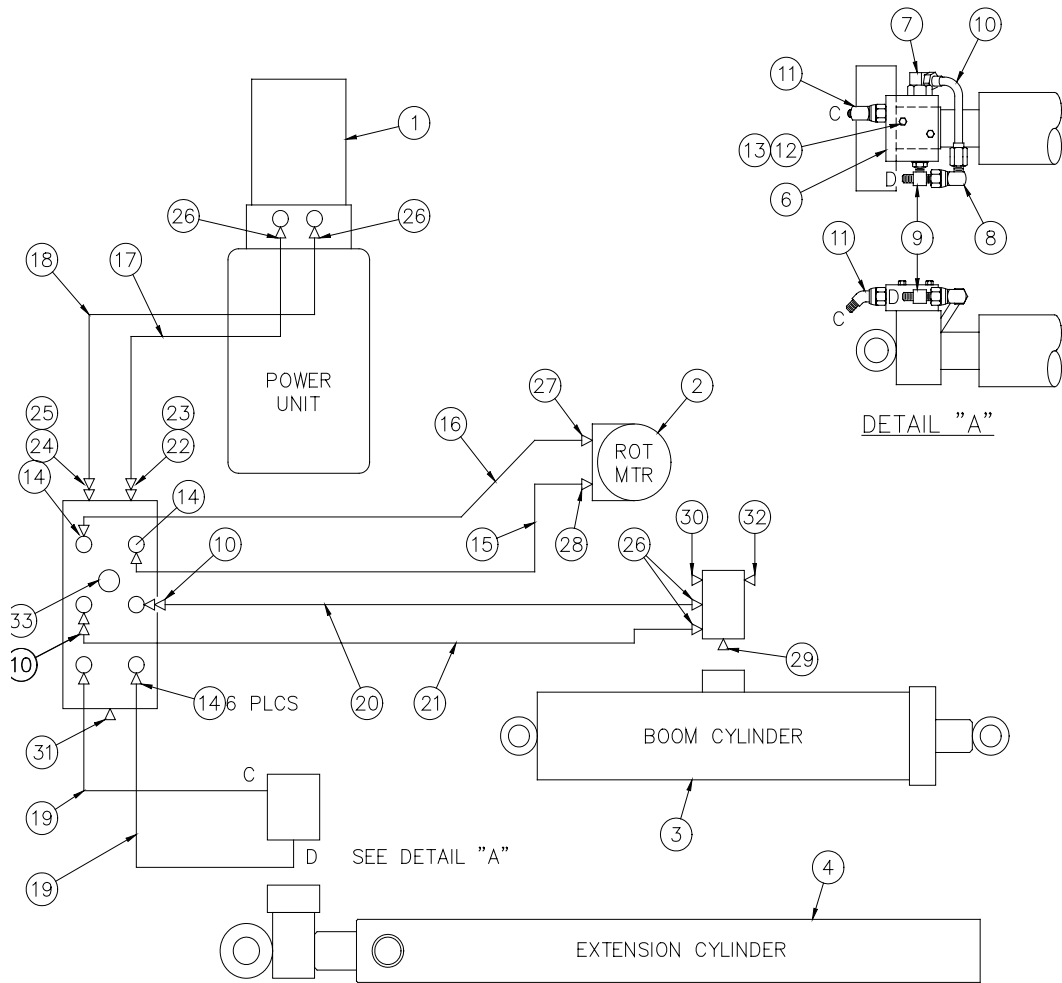
### **Emergency Lowering Procedure**

**In an emergency situation when it becomes necessary to lower the boom without flow present, the counterbalance valve adjustment can be turned clockwise until the boom begins to descend. Be careful when turning adjustment! Turning too far will cause valve to NOT operate again!**



# HYDRAULIC ASSEMBLY

## P/N 404003 – MODEL 4004EH



# **HYDRAULIC ASSEMBLY**

## **P/N 404003 – MODEL 4004EH**

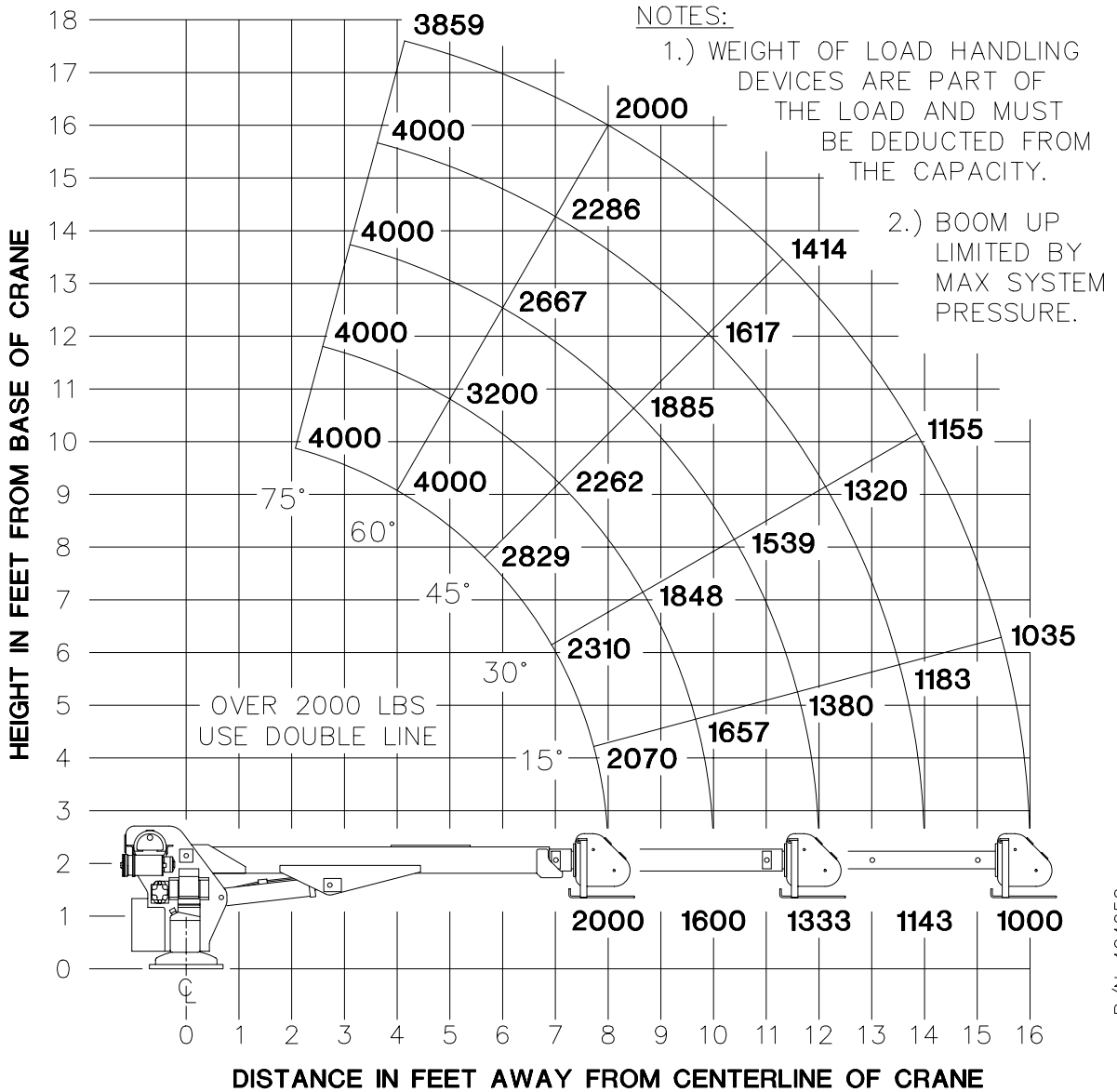
| ITEM NO. | QTY. | PART NO.  | DESCRIPTION                        |
|----------|------|-----------|------------------------------------|
| 1        | 1    | 320336    | POWER UNIT                         |
| 2        | 1    | 366440    | ROTATION MOTOR                     |
| 3        | 1    | 404005    | BOOM UP CYLINDER                   |
| 4        | 1    | 404006    | EXTENSION CYLINDER                 |
| 5        | 1    | 202710    | MANIFOLD                           |
| 6        | 1    | 330412    | COUNTERBALANCE VALVE               |
| 7        | 1    | 200892    | 90 DEG ELBOW -6 NPT/-6 JIC         |
| 8        | 1    | 480194    | 90 DEG ELBOW -6 JIC SWIVEL/ -6 JIC |
| 9        | 1    | 241168    | TEE -6 ORB/-6 JIC RUN              |
| 10       | 1    | 480212    | TUBE ASSEMBLY                      |
| 11       | 1    | 480195    | 45 DEG ELBOW -6 ORB/-6 JIC         |
| 12       | 2    | 005810    | CAPSCREW 1/4 NC X 1 3/4            |
| *13      | 4    | 020200    | LOCK WASHER 1/4                    |
| 14       | 6    | 202756    | REDUCER -8 ORB/-6 JIC              |
| 15       | 1    | 404066    | TUBE ASSEMBLY                      |
| 16       | 1    | 404067    | TUBE ASSEMBLY                      |
| 17       | 1    | 404068    | TUBE ASSEMBLY                      |
| 18       | 1    | 404069    | TUBE ASSEMBLY                      |
| 19       | 2    | 812203050 | HOSE ASSEMBLY                      |
| 20       | 1    | 812212027 | HOSE ASSEMBLY                      |
| 21       | 1    | 812215029 | HOSE ASSEMBLY                      |
| 22       | 1    | 330058    | REDUCER -10 ORB/-6 ORP             |
| 23       | 1    | 241175    | 90 DEG ELBOW -6 ORB/-6 JIC         |
| 24       | 1    | 330274    | REDUCER -10 ORB/-8 ORP             |
| 25       | 1    | 330272    | 90 DEG ELBOW -8 ORB/-6 JIC         |
| 26       | 4    | 200876    | ADAPTER -6 ORB/-6 JIC              |
| 27       | 1    | 360884    | 45 DEG ELBOW -6 JIC-10 O-RING      |
| 28       | 1    | 490198    | 90 DEG ELBOW -6 JIC-10 O-RING      |
| 29       | 1    | 366032    | COUNTERBALANCE VALVE CARTRIDGE     |
| 30       | 1    | 320543    | LOAD SENSOR ASSEMBLY               |
| 31       | 2    | 330072    | HEX HEAD PLUG -10 ORB              |
| 32       | 1    | 000209    | PLUG PIPE SOC 1/4                  |
| *33      | 2    | 480024    | CABLE CLAMP                        |
| *34      | 2    | 005604    | SCREW HX HD 1/4 X 1" LG            |
| *35      | 2    | 020400    | WASHER FLAT 1/4                    |
| 36       | 1    | 404005100 | SEAL KIT F/404005 BOOM UP CYL.     |
| 37       | 1    | 404006100 | SEAL KIT F/404006 EXTENSION CYL.   |
| 38       | 1    | 360490    | SEAL KIT F/480027 ROTATION MOTOR   |

\*NOTE: ITEMS 13,33,34 AND 35 ARE PARTS USED ON THE HOIST GEAR BOX COVER.

# LOAD CHART 8-12-16

## P/N 404050 – 4004EH SERIES

### MODEL 4004EH 8-12-16 MAXIMUM LOAD CHART





P.O. Box 580697 \* Tulsa, OK 74158-0697  
4707 N. Mingo Rd. \* Phone (918) 836-0463

## 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 OLIGATION 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**