



3203 PR/PRX/ PRD/PRXD OWNERS MANUAL

Manual No. 320950000

Rev. 9/2/2003

Serial No. _____

Mailing Address:

P.O. Box 580697

Tulsa, OK 74158-0697

Physical Address:

4707 N. Mingo Rd.

Tulsa, OK 74117-5904

Phone (918) 836-0463

Fax (918) 834-5979

<http://www.autocrane.com>



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

3203 PR PRX PRD PRXD SERIES
OWNER'S MANUAL – REVISION RECORD

Revision Date	Section(s) Or Page(s)	Description of Change
09/02/03	Last page	New 2-year warranty policy to replace 1-year warranty policy

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.

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INTRODUCTION

3203 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 3203 PR/PRX Series cranes for your protection.

For your convenience the overall dimensions of the 3203 PR/PRX Series crane are included on the General Dimension Drawing. Rotation and turning radius are also listed on that drawing.

Remember, the crane adds weight to the vehicle. Adding weight may change the driving and riding characteristics of the vehicle unless the appropriate overload spring(s) are installed on the truck. The payload of the vehicle is reduced by the weight of the crane. The operator should exercise care when loading the vehicle. Distributing the payload on the vehicle evenly will greatly improve the driving and riding characteristics of the vehicle.

The 3203 PR/PRX cranes are attached directly to your 12 volt truck electrical system. The power cable is included with the crane. The use of a maintenance-free battery is not recommended for use on any Auto Crane product. The recommended alternator and battery that will give the longest life with the most useful duty cycle is a 60 amp alternator with a 500 cold cranking amp battery. These specifications should be considered minimum.

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

It has always been Auto Crane Company policy to handle all warranty claims we receive as promptly as possible. If a warranty claim involves discrepant material or workmanship, Auto Crane will take immediate corrective action. It is understandable that Auto Crane Company cannot assume responsibility of liability when it is obvious that our products

have been abused, misused, overloaded or otherwise damaged by inexperienced persons trying to operate the equipment without reading the manual.

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

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

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 ---

OPERATING PRACTICES AND 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. Hydraulic hoses need to be inspected frequently for signs of deterioration, and be replaced as required.
12. 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.
13. **ALWAYS** store outriggers before road travel.
14. **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.
15. **WARNING! NEVER EXCEED** load chart capacities (centerline of rotation to hoist hook).
16. **WARNING! NEVER** un-reel last 5 wraps of cable from drum!
17. **WARNING! NEVER** wrap cable around load!
18. **WARNING! NEVER** attempt to lift or drag a load from the side! The boom can fail far below its rated capacity.
19. **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.
20. **WARNING! NEVER** place a chain link on the tip of the hook and try to lift a load!
21. **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!
22. **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. Switch on that will cause unsafe operating conditions!
WARNING! NEVER hold any Control 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 ---
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 ---

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 the transmitter/pendant from cab or storage area. Power transmitter/pendant on. 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 to stowed position on the boom support. Avoid unneeded pressure on the boom support.
12. Store transmitter in proper location (in cab or storage area).
13. Return outriggers to stowed position. Make sure they are pinned in place or jacklegs are returned to compartment.
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.

OPERATION OF

OUTRIGGERS

For hydraulic outriggers:

1. Shift crane/outrigger control valve to "outrigger" position.
2. Operate the outrigger control valves (located on the outrigger cylinders) to position the outriggers.
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 jack leg or 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.

CONTROLLER OPERATIONS

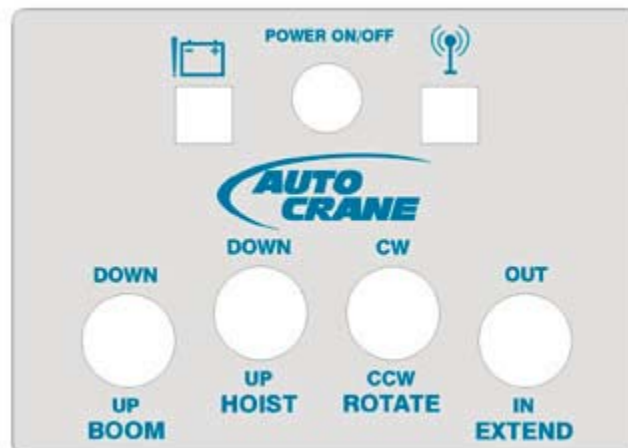
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Power: The power switch for both the hardwire pendants and the FM receiver is located on the rear of the relay panel which is on the street side of the crane.

Transmitter Layout: The red light to the left of the Power On/Off button indicates low transmitter battery. As the battery runs down, the light will begin to flash. It will flash increasingly faster as the battery power decreases. (see “Charging the Transmitter”)

The green light to the right of the Power On/Off button indicates that the unit is transmitting. This light will flash when a function is activated.

In addition to the two lights mentioned above there are four function toggle switches (three on PR models). These functions from left to right are used to raise and lower the boom, raise and lower the hoist cable, rotate the crane and extend and retract the boom.



Power On/Off Button: To turn the transmitter on, press and release the Power On/Off button. To turn the unit off, press and release the power button again. When this button is pressed both the red battery low and the green transmit light will flash alternately and stop flashing once the unit is either on or off.

Function Switches: To operate a function, toggle one of the function switches with either the thumb of the hand holding the unit or the thumb or fingers of the opposite hand.

Operation Failure:

If the crane does not operate as expected, observe the red light on the receiver and refer to the front panel for explanation. The codes are further explained in the Diagnostics section of this manual.

Charging the Transmitter:

The transmitter can be charged using one of three methods. It can be charged with the cigarette lighter charger, the pendant cable or the optional AC adapter (P/N 366505000). To charge the transmitter with the pendant cable, the crane must have electrical power. The crane can be operated by pendant or by FM remote therefore the battery can be charged without suspending operation of the crane.

CONTROLLER OPERATIONS

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The transmitter should be fully charged after approximately 6 to 8 hours of charging. It is not recommended to leave the transmitter charging for extended periods of time (3 or 4 days). Doing so will eventually degrade the battery and it will not keep a good charge.

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.

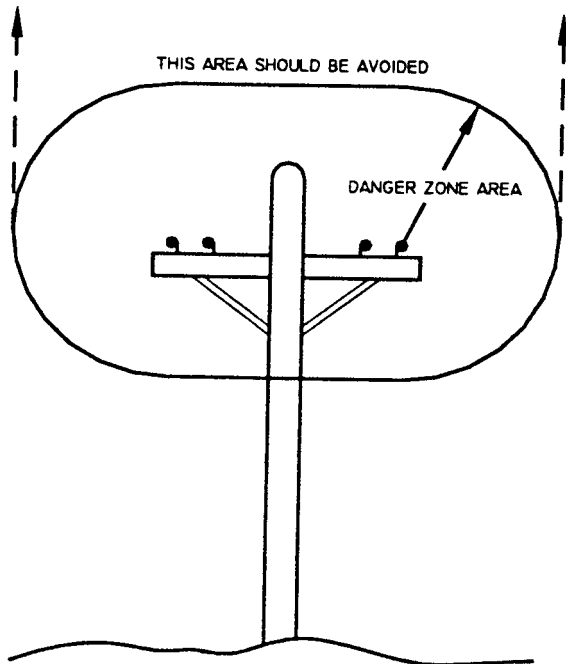
O. No person should be permitted to stand or pass under a suspended load.

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 (phase to phase)		minimum required clearance	
		ft	(m)
<u>when operating near high voltage power lines</u>			
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)
<u>while in transit with no load and boom lowered</u>			
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)

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 it's 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 an 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.

SAFETY DECAL SECTION

3203 SERIES

PART NO.:	040579000
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.

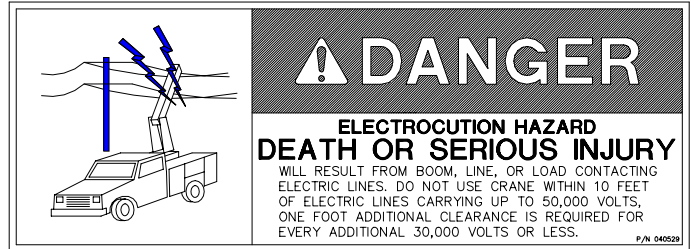
OVERLOAD PROTECTION DEVICE CANNOT FUNCTION WITH BOOM BELOW HORIZONTAL (0°). HOIST UP, BOOM DOWN, AND EXTEND OUT WILL BE INOPERATIVE WHEN CRANE IS IN OVERLOAD CONDITION.

P/N 040632

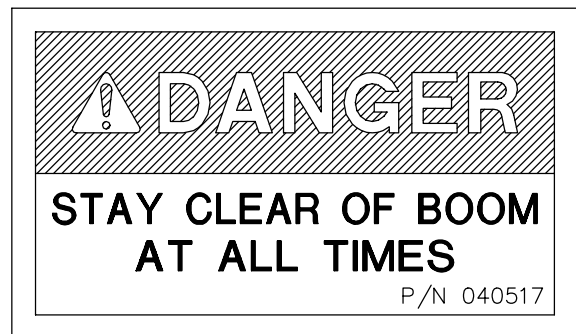
SAFETY DECAL SECTION

3203 SERIES

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 load during operation.
 USED ON: All Cranes
 QUANTITY: 2
 PLACEMENT: Both sides of crown



SAFETY DECAL SECTION

3203 SERIES

PART NO.: 040587000

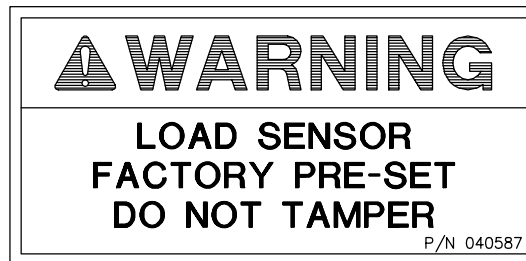
USED ON: All cranes equipped with a load sensor.

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

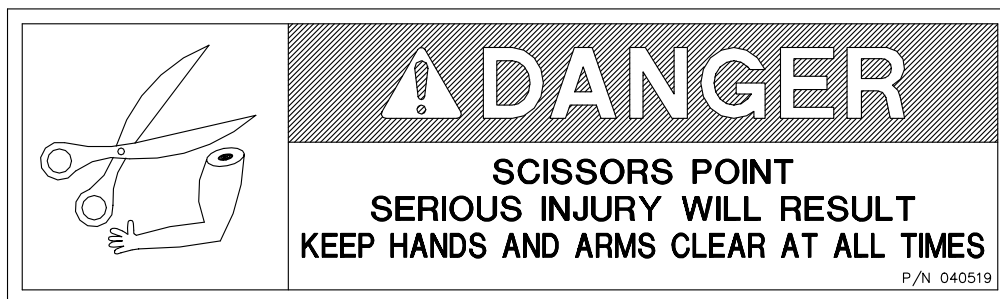
USED ON: All cranes.

DECAL: SCISSORS POINT

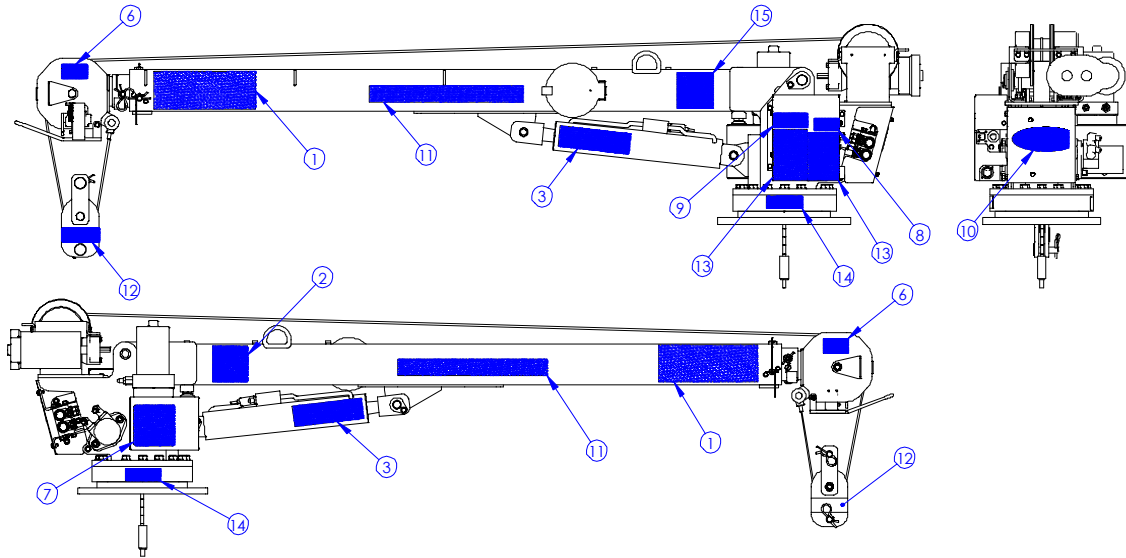
QUANTITY: 1

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

PLACEMENT: Both sides of the lift cylinder

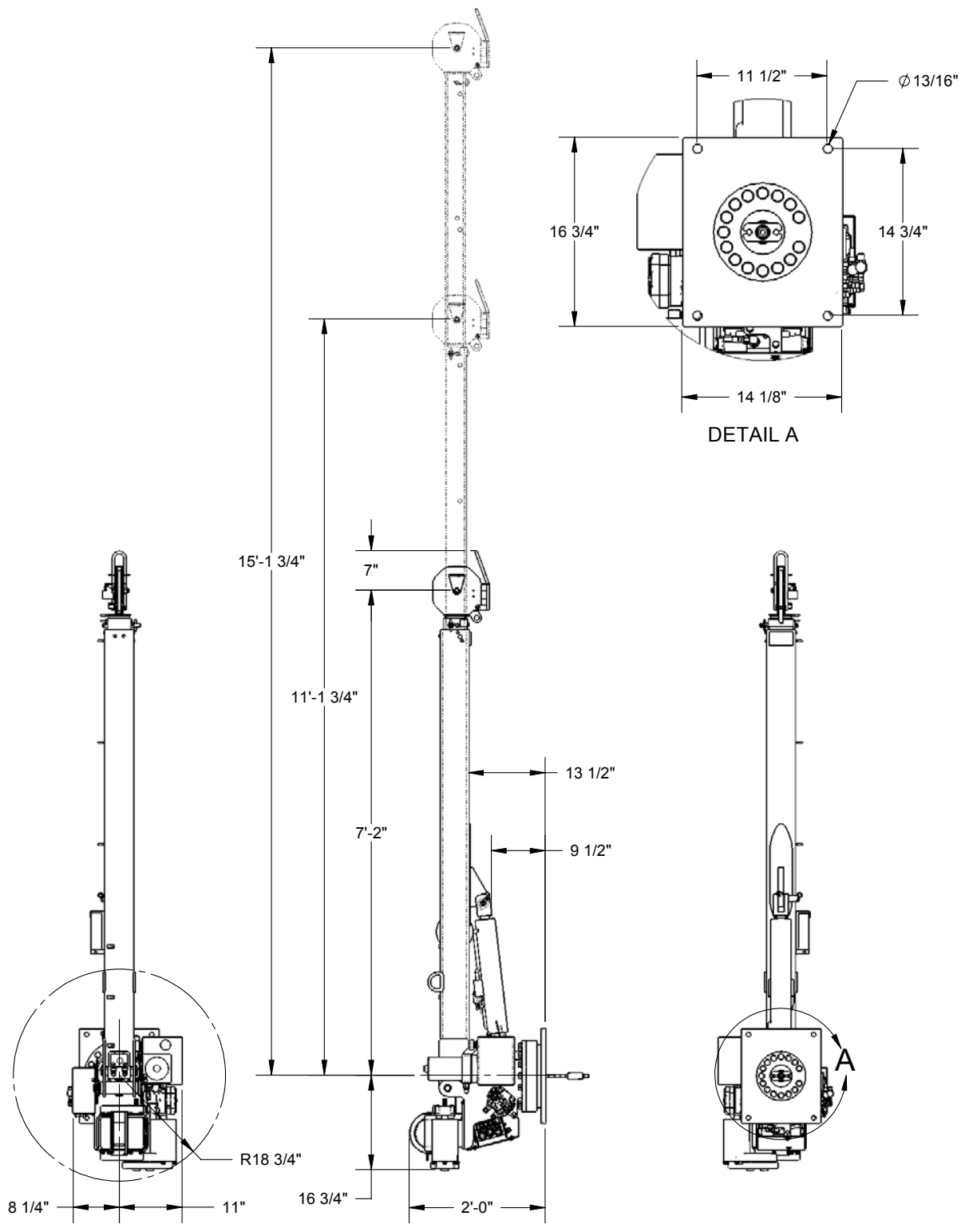


DECAL LAYOUT 3203 SERIES



ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	2	040529	DECAL POWER LINE HAZARD
2	1	320318	DECAL ANGLE IND RIGHT
3	2	040519	DECAL DANGER SCISSOR POINT
4	1	040580	DECAL TRAINED OPERATOR
5	1	040579	DECAL OPERATION INSTRUCTIONS
6	2	040517	DECAL STAY CLEAR OF BOOM
7	1	320321000	DECAL 3203 LOAD CHART
8	1	040587	DECAL WARNING LOAD SENSOR
9	1	330622	DECAL SERIAL NO
10	1	360034	DECAL AUTO CRANE LOGO
11	2	600047000	DECAL AUTO CRANE
12	2	040518	DECAL STAY CLEAR OF LOAD
14	2	320918000	DECAL 3203 HORIZONTAL
15	1	320318001	DECAL ANGLE IND RIGHT

GENERAL DIMENSIONS 3203 SERIES



NOTES

MOUNTING AND INSTALLATION

3203 SERIES

1. Check to make sure the following items are with your crane.

Common Parts

ITEM	QTY	PART NO.	DESCRIPTION
1	1	320433000	TRAVELING BLOCK
2	6	083800000	CLIP NO 838
3	4	404226000	SCREW HX HD 3/4-16 UNF X 3"LG GRADE 8
4	4	404227000	NUT, HEX 3/4-16 UNF
5	4	022101000	WASHER SP LK. 3/4
6	4	022102000	WASHER FL 3/4
7	1	320950000	OWNER'S MANUAL 3203
8	1	600425000	CABLE POWER TWECO
9	1	320806000	CONDUCTOR ASSY 10 GA X 48"LG BLACK

Model Specific Parts

MODEL	QTY	PART NO.	DESCRIPTION
PR	1	320922000	PENDANT ASSEMBLY PR
PRX	1	320921000	PENDANT ASSEMBLY PRX
PRXD	1	320920007	TRANSMITTER 3203 PRXD
PRD	1	320920008	TRANSMITTER 3203 PRD
PRD/ PRXD	1	366500009	PENDANT CABLE
PRD/ PRXD	1	366504000	CIGARETTE LIGHTER CHARGER

2. Vehicle should meet minimum GVW rating of 8,800 pounds. (does not include bodies or accessories)
3. Make sure mounting surface is properly reinforced to withstand 9,600 ft-lb capacity loading of crane and that outriggers are used to provide total stability for the truck.
4. A 9" dia. hole should be cut out of mounting location (centered with mounting bolts) for access. Reference general dimensions for bolt pattern.
5. Make sure the mounting bolts are 3/4"-16UNF, grade 8. Torque bolts to 335 ft-lbs (dry).
6. When crane is not in operation, a boom support should always be used. Traveling block should be connected to hook loop.
7. See following page for installation.
8. See the following pages for additional electrical installation.
9. Load test the crane to ensure proper functioning and truck stability
10. Make certain the owner's manual is delivered to the customer.
11. For additional help: call the service department at the Auto Crane Company. (918) 836-0463 (Tulsa, Oklahoma)

MOUNTING AND INSTALLATION

3203 SERIES

WARNING

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

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

LUBRICATION & MAINTENANCE SCHEDULE

3203 SERIES

SERVICE PERFORMED	DAILY	WEEKLY	3 MOS	6 MOS	YEARLY	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
HYD. HOSES	X					VISUAL INSPECTION
HYD. FLUID	X					CHECK FLUID LEVEL
MOTOR CONNECTIONS		X				CHECK TERMINALS FOR TIGHT CONNECTIONS
MOUNTING BOLTS		X				CHECK-TORQUE TO 85 FT-LBS (DRY) AS REQUIRED
SHEAVE BEARINGS		X				SEALED BEARING, REPLACE IF ROUGH OR LOOSE
ALL OTHER BOLTS		X				CHECK-TIGHTEN AS REQUIRED
ROTATION GEAR		X				WATERPROOF BEARING GREASE OR DRY MOLYLUBE IF DUSTY
ROTATION BEARING			X			GREASE WITH MOBILEPLEX EP-2 OR EQUIVALENT @ ZERKS
POWER CABLE			X			CHECK INSULATION FOR DAMAGE OR DETERIORATION
ROTATION BEARING BOLTS			X			CHECK TORQUE TO 150 FT-LBS (DRY) AS REQUIRED
ROTATION GEAR BOX				X		EP GEAR LUBE SAE 80-90
HOIST GEARBOX				X		WORM GEAR-EP GEAR LUBE SAE 80-90; SPUR GEARS-SAE 30 OIL
ROTATION WORM BEARINGS				X		GREASE WITH MOBILEPLEX EP-2 OR EQUIVALENT @ ZERKS
HYDRAULIC FLUID					X	DRAIN, FLUSH, AND REFILL WITH SUN 2105 HYD. OIL, SAE 5W-20
BOOM SLIDE PADS	PADS GREASED WHEN REPLACED					
FOR ADDITIONAL INFORMATION SEE:	1) OWNER'S MANUAL, 2) OSHA SECTION 1910.180, 3) ANSI B30.5-1993					

LUBRICATION & MAINTENANCE SCHEDULE

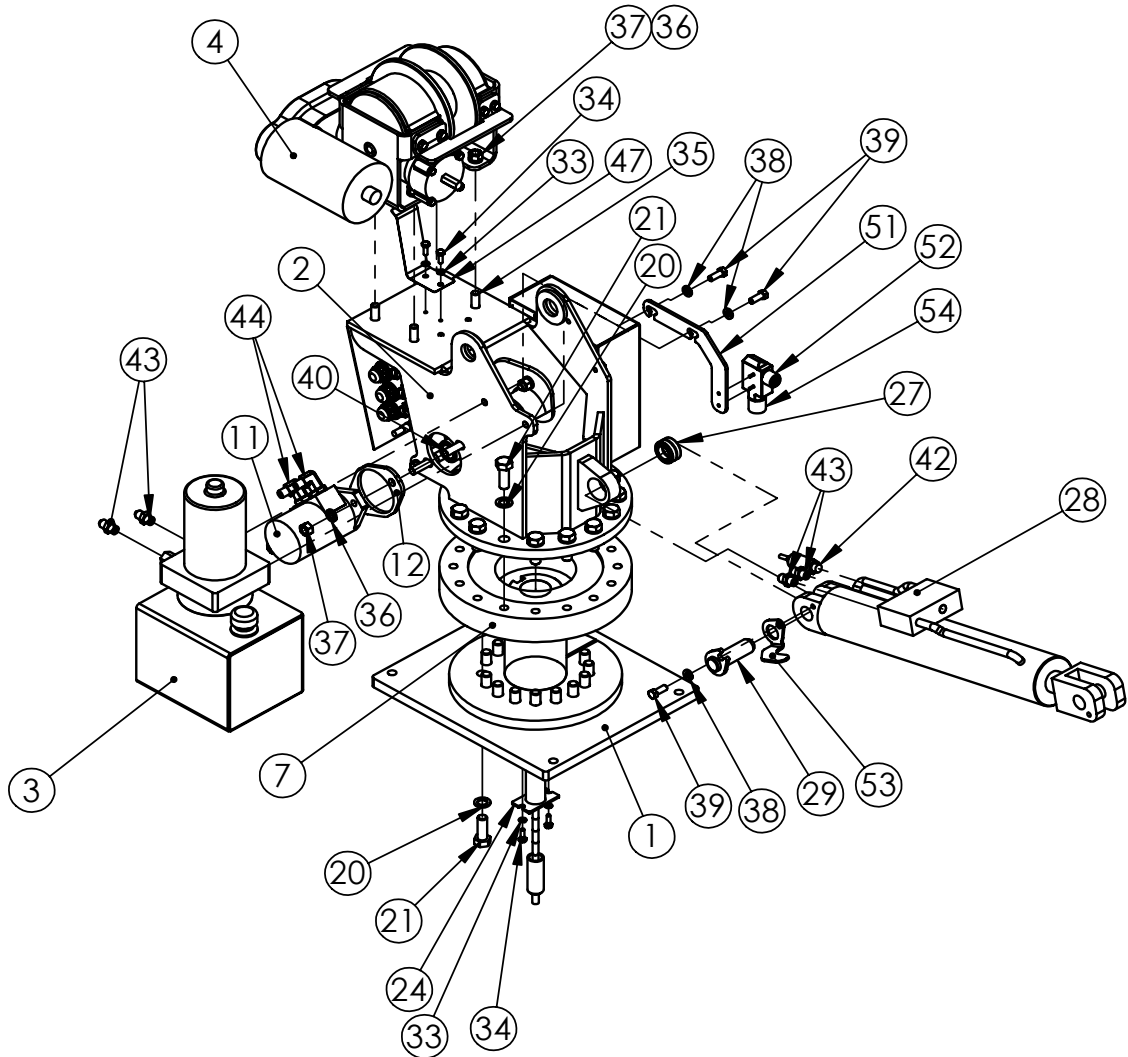
3203 SERIES

CAUTION: Routine maintenance insures trouble-free operation and protects your investment. All warranties are void if maintenance is neglected.

NOTES:

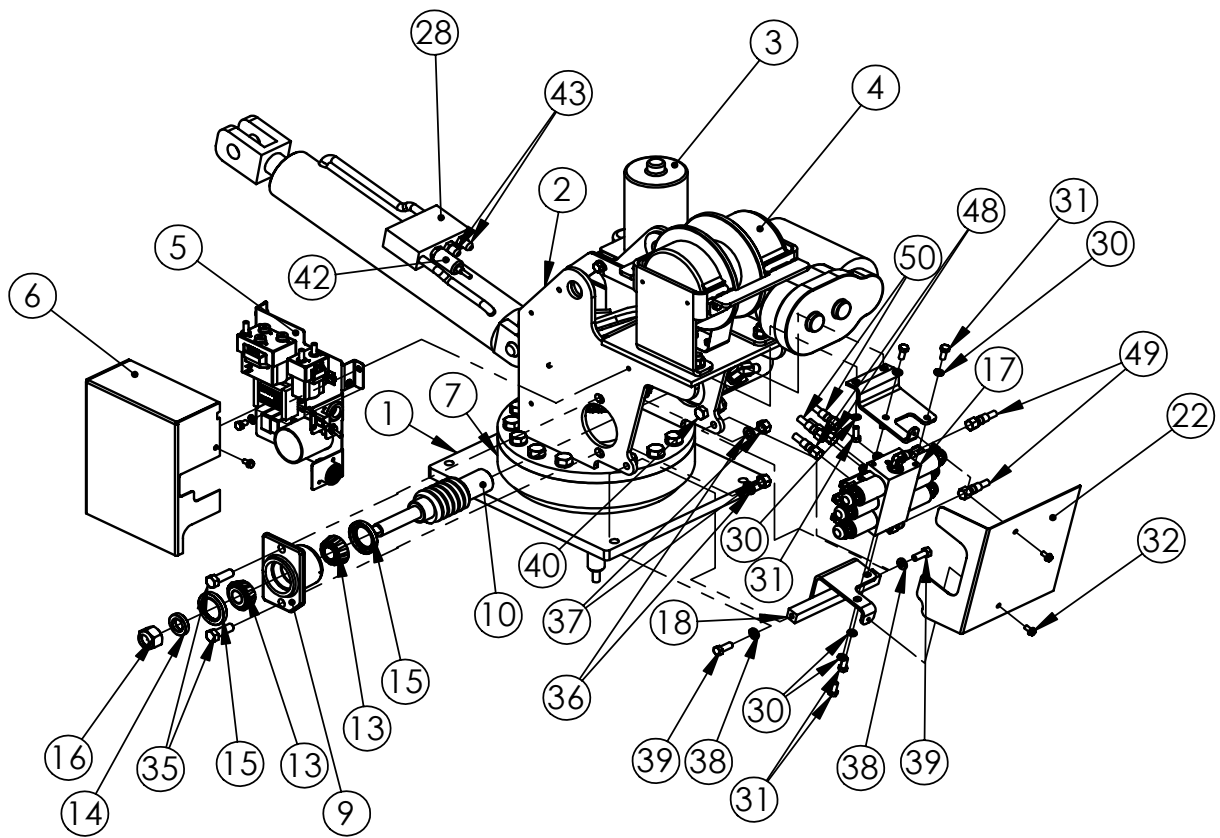
1. Use only authorized parts. Any damage or malfunction caused by the use of unauthorized parts is not covered by Warranty or Product Liability
2. Once a bolt has been torqued to its rated capacity and then removed; the bolt should be replaced with a new one.
3. Auto Crane Company recommends that this 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.

PEDESTAL ASSEMBLY 3203 SERIES

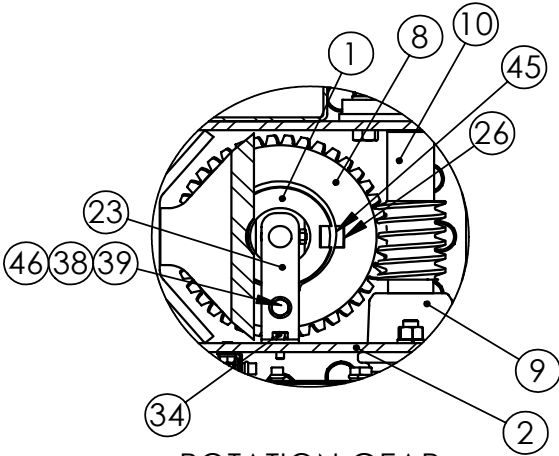


CYLINDER SEAL KIT: 320845001
COUNTERBALANCE CARTRIDGE: 480188000

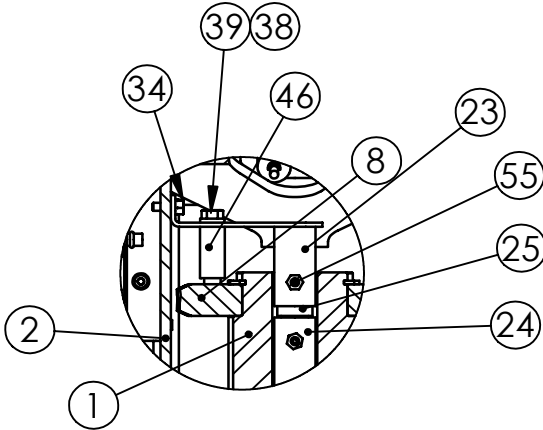
PEDESTAL ASSEMBLY 3203 SERIES



PEDESTAL ASSEMBLY
3203 SERIES



ROTATION GEAR
DETAIL



BRUSH/TWECO
DETAIL

PEDESTAL ASSEMBLY

3203 SERIES

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	320842000	BASE PLATE WELDMENT
2	1	320841000	PEDESTAL WELDMENT
3	1	320825000	POWER UNIT
4	1	110703	WINCH ASSEMBLY
5	1	320864000	RELAY PANEL ASSEMBLY
6	1	320870000	COVER, RELAY PANEL
7	1	320878000	ROTATION BEARING
8	1	320334	WORM GEAR
9	1	330472	CUP HOUSING W/CUPS
10	1	330420	WORM SHAFT
11	1	366440	ROTATION MOTOR
12	1	320879000	SPACER, ROTATION
13	2	330485	BEARING, CONE
14	1	330483	SPACER
15	2	330486	SEAL, OIL
16	1	019000	NUT HEX 0.8750-14 UNF NYLON LOCK
17	1	320826000	VALVE ASSEMBLY PRX
		320827000	VALVE ASSEMBLY PR
18	1	320881000	LOWER VALVE MOUNTING WELDMENT
19	1	320877000	BRACKET, UPPER VALVE MOUNTING PRX
		320897000	BRACKET, UPPER VALVE MOUNTING PR
20	29	023902	WASHER, 5/8 FLAT HARDENED
21	29	012198	CAPSCREW 5/8-11 X 1.75 GR8
22	1	320869000	COVER, REAR
23	1	320905000	TWECO BRACKET WELDMENT, UPPER
24	1	320890000	TWECO CABLE ASSY
25	1	669300	TWECO, MALE
26	1	340602	KEY, 3/4 SQ X 1
27	1	320858000	BEARING, SPHERICAL 1.00 ID
28	1	320845000	LIFT CYLINDER
29	1	320824000	PIN, LIFT CYLINDER
30	9	020601	WASHER 5/16 LOCK
31	6	330252	SCW HX 5/16 NC X 3/4
32	5	360493000	SCW WHIZ-LK 1/4NCX 1/2
33	5	020200	WASHER SPLIT LOCK 1/4
34	5	005500	SCW HH 0.25-20 X 0.75
35	6	010201	SCW HX 1/2 NC x 1 1/2
36	8	021500	WASHER SP LK 1/2
37	8	017701	NUT 1/2 NC

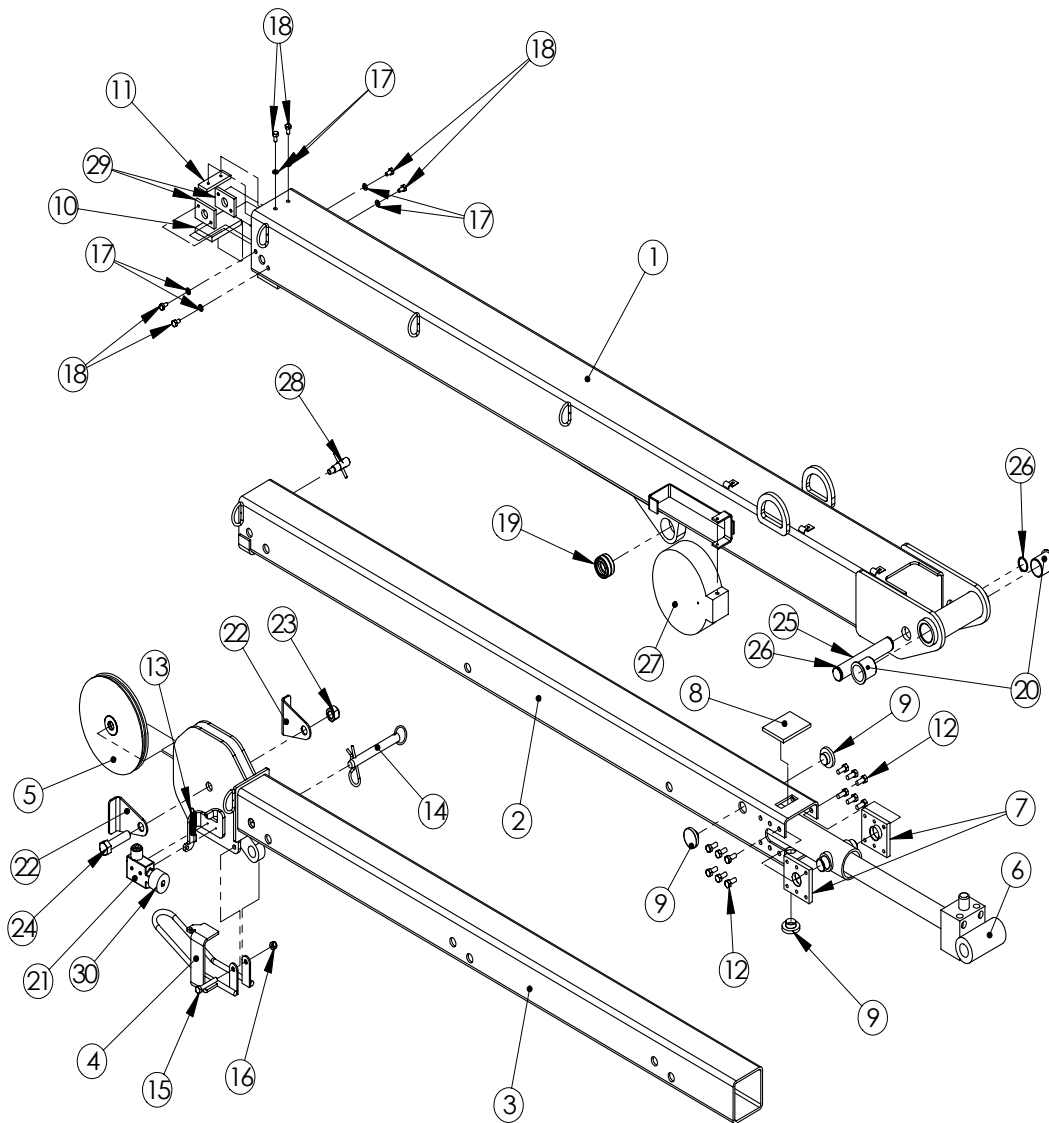
PEDESTAL ASSEMBLY

3203 SERIES

ITEM NO.	QTY.	PART NO.	DESCRIPTION
38	6	021100	WASHER SPLK 3/8
39	6	330371	SCW HX 3/8 UNC X 1 GR8
40	2	011603	SCREW HEX .5-13 X 1.75
41	3	007401	SCW 5/16-18 X 1/2 LG
42	1	320917000	PRESSURE SWITCH, N.C. 1,900 PSI
43	4	200876	FITTING 6 SAE/6 JIC STRAIGHT 6F5OX
44	2	490198	FITTING 10SAE(M)/6JIC ELBOW 90
45	1	320333	RETAINING RING, SNAP RING
46	1	320891000	BRUSH ASSEMBLY
47	1	320442	GUARD CABLE RETAINER
48	2	812026023	HOSE ASSY -4 HOSE -6 FEMALE JIC
49	4	812026016	HOSE ASSY -4 HOSE -6 FEMALE JIC
ITEM 50 ONLY USED ON PRX MODELS			
50	2	320927000	HOSE ASSY -4 HOSE -6JIC/-6JIC 90 X 20
51	1	320925000	BRACKET, BOOM LIMIT
52	1	646900	SWITCH, ANTI-TWO BLOCK
53	1	320926000	BRACKET, BOOM LIMIT STOP
54	1	642908	CORD CONNECTOR
55	1	002900	SCREW SET 0.25-20 X 0.25

NOTES

BOOM ASSEMBLY 3203 SERIES



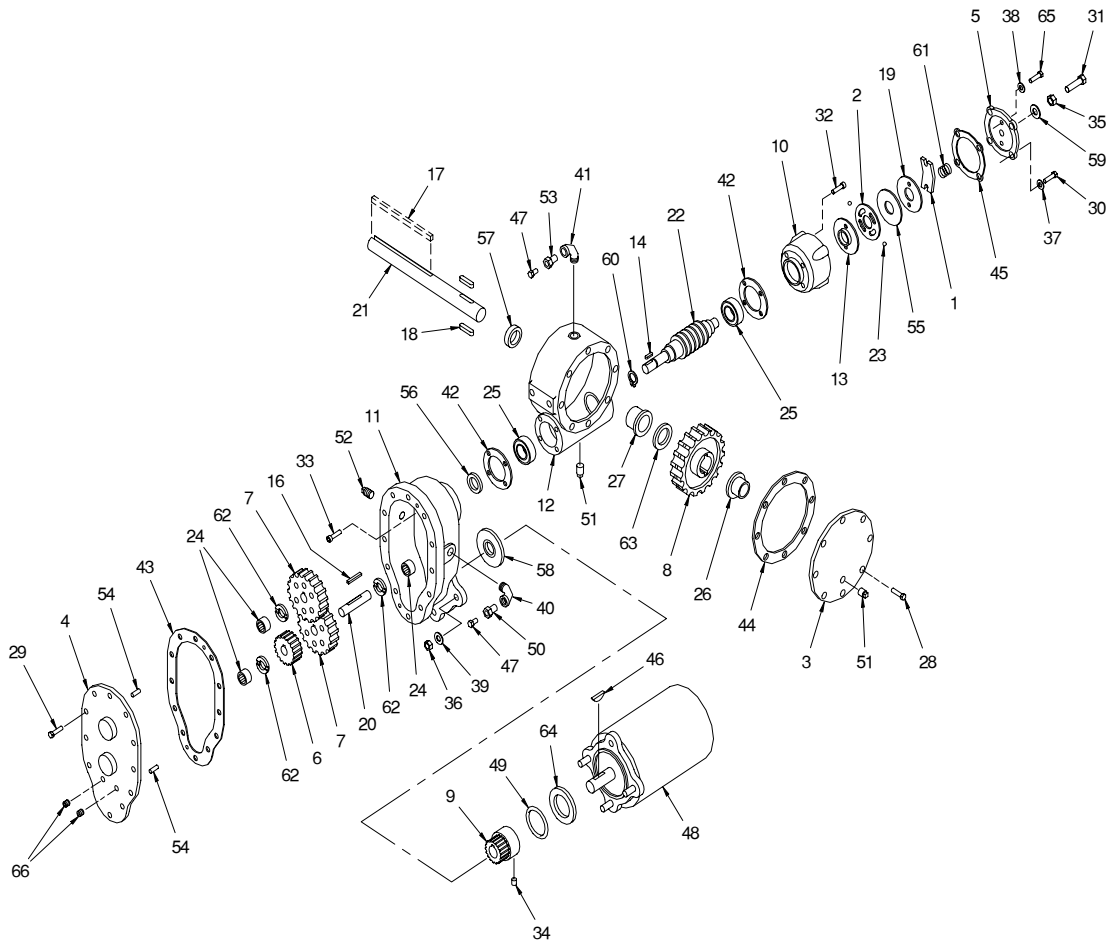
Cylinder Seal Kit - # 320835001
Counterbalance Cartridge - # 480188000

BOOM ASSEMBLY

3203 SERIES

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	320831000	LOWER BOOM WELDMENT
2	1	320832000	MID BOOM WELDMENT
3	1	320833000	UPPER BOOM WELDMENT
4	1	320871000	BAIL WELDMENT
5	1	320883000	SHEAVE ASSEMBLY
ITEMS 6, 25 & 26 NOT USED ON PR MODELS			
6	1	320835000	CYLINDER, EXTENSION
7	2	320888000	RETAINER EXTENSION CYLINDER
8	1	360765000	WEAR PAD 2 .50 X 3 .25
9	3	360767000	PAD BOOM 1.5 O.D.
10	1	360792000	WEAR PAD 2 X 3.5 X 3/8
11	1	320391	RETAINER MID BOOM
12	12	007807	SCW HEX 5/16-18 3/4LG GR5
13	1	320554	SPRING RETURN
14	1	320328	PIN ASSY .625 X 4.5 W/LANYARD
15	1	007800	SCREW HEX 0.3125-18 X 2
16	1	016801	NUT HEX-LOCK 5/16 NC
17	6	020200	WASHER SPLIT LOCK 1/4
18	6	005406	SCW HX 1/4-28 X 1/2
19	1	320858000	BEARING, SPHERICAL 1.00 ID
20	2	320868000	BEARING PIVOT
21	1	646900	SWITCH, ANTI-TWO BLOCK
22	2	320884000	PULL HANDLE, MANUAL BOOM
23	1	018200	NUT .625-11 NYLON LOCK
24	1	366393	HEX HEAD 5/8-11 X 2.5 GR8
25	1	320889000	PIN, EXTENSION CYLINDER
26	2	360122	RING RETAINING 5100-98
27	1	320899000	CORD REEL ASSY
28	1	320907000	PULL PIN ASSEMBLY
29	2	320912000	DOUBLER, INSIDE BOOM
30	1	642918	CORD CONNECTOR
IN ADDITION TO THE ABOVE, THE FOLLOWING IS NECESSARY ON PR MODELS			
31	1	320880000	PIN, LOWER/MID PR

HOIST ACTUATOR 3203 SERIES



HOIST ACTUATOR

3203 SERIES

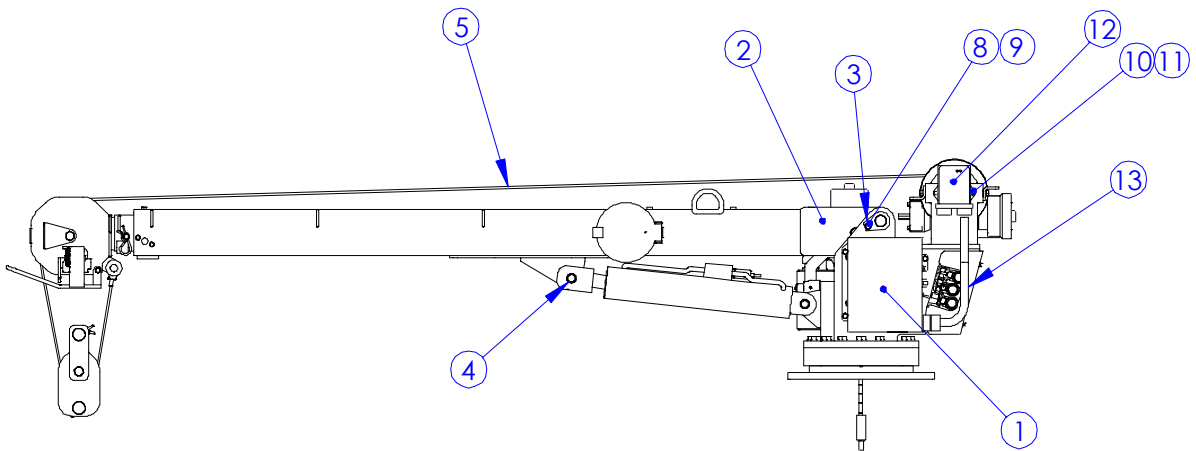
ITEM	QTY.	PART NO.	DESCRIPTION
1	1	360637	SPRING, FLAT
2	1	360331	PLATE, CAM
3	1	300041	COVER, GEAR HOUSING
4	1	300042	COVER, SPUR GEAR HOUSING
5	1	360450	COVER, BRAKE
6	1	300043	GEAR, IDLER
7	2	300044	GEAR, SPUR
8	1	300045	GEAR, WORM R.H.
9	1	300046	GEAR, PINION
10	1	360336	HOUSING, BRAKE
11	1	300047	HOUSING, SPUR GEAR
12	1	300048	HOUSING, GEAR
13	1	360339	HUB, BRAKE
14	1	300049	KEY, 3/16 SQ. x 1/2 LG.
15	1	-	-
16	1	300050	KEY, 3/16 SQ. x 1 9/16 LG.
17	1	800479-001	KEY, 1/4 SQ. x 2 3/4 LG.
18	2	300052	KEY, RD. 5/16 x 5/16 x 15/16 LG.
19	1	360342	PLATE, RETAINER
20	1	300053	SHAFT, SPUR GEAR
21	1	320323	SHAFT, OUTPUT
22	1	320312	WORM, R.H.
23	2	360345	BALL
24	3	300056	BEARING, NEEDLE
25	2	300057	BEARING, BALL
26	1	300058	BUSHING
27	1	300059	BUSHING
28	10	320313	SCREW, HEX HD 1/4-20NC x 3/4 LG. NYLOCK HVY PATCH
29	12	005500	SCREW, HEX HD 1/4-20NC x 3/4 LG.
30	4	005604	SCREW, HEX HD 1/4-20NC x 1" LG.
31	1	320311	SCREW, HEX HD 3/8-16NC x 1 1/2 LG. ALL THREAD
32	4	320310	SCREW, BUTTON HD 1/4-20NC x 1" LG.
33	4	300060	SCREW, SOC HD 1/4-20NC x 1 3/4 LG. LOC.-WEL.
34	1	300061	SETSCREW, 1/4-20NC x 5/16 LG. LOC.-WEL.
35	1	360353	NUT, HEX JAM 3/8-16NC
36	3	071012	NUT, HEX 3/8-24NF
37	4	360354	WASHER, SP LK 1/4 MED. SECT.
38	2	360455	WASHER, FLAT 1/4 ALUM.
39	3	021100	WASHER, SP LK 3/8
40	1	320314	ELBOW, 90° 3/8-18 NPT BOTH ENDS
41	1	320315	ELBOW, 90° 1/4-18 NPT BOTH ENDS
42	2	300062	GASKET BEARING
43	1	300063	GASKET, SPUR GEAR HOUSING
44	1	300064	GASKET, GEAR HOUSING COVER
45	1	360359	GASKET, BRAKE COVER
46	1	300065	KEY, WOODRUFF
47	2	300066	FITTING, RELIEF
48	1	300067	MOTOR, 12V

HOIST ACTUATOR

3203 SERIES

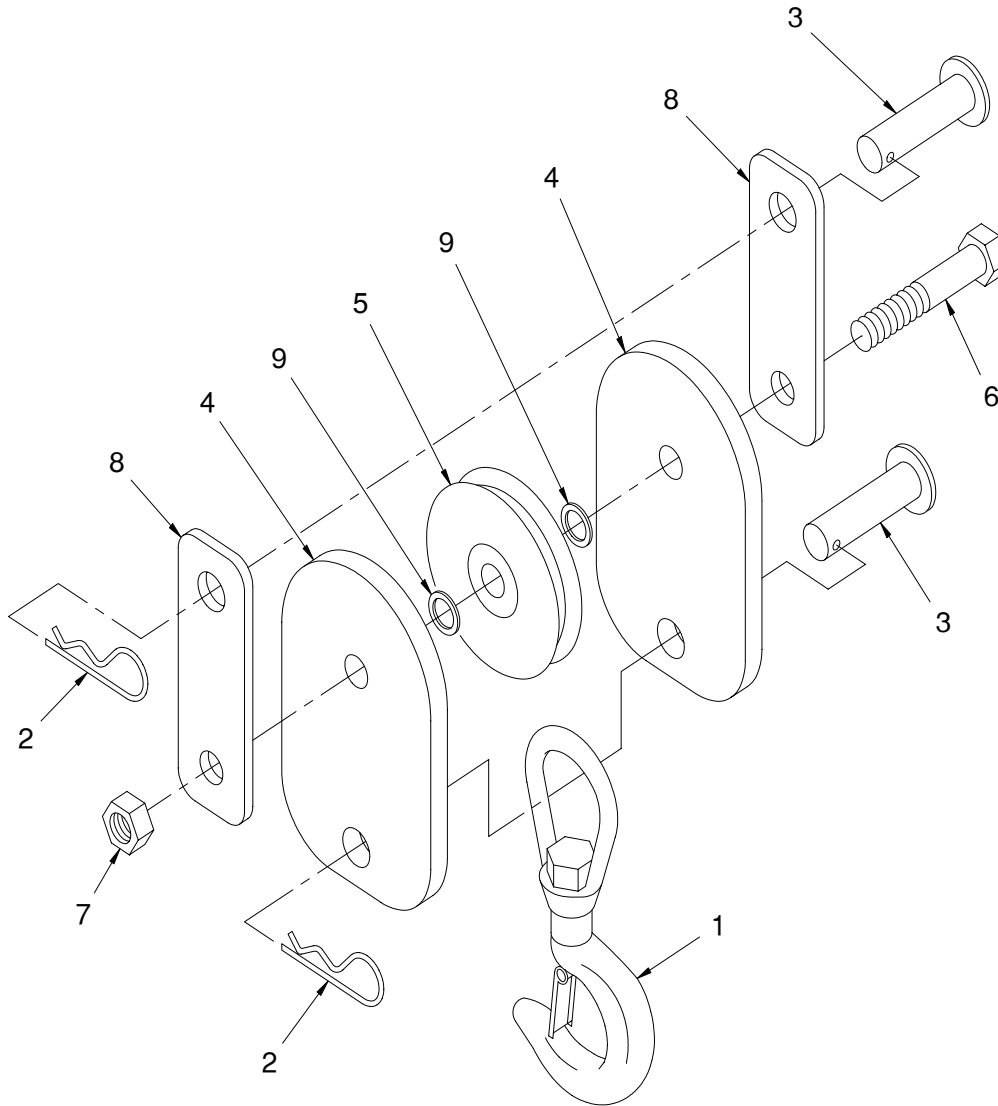
ITEM	QTY.	PART NO.	DESCRIPTION
49	1	300068	O-RING 1" O.D. x 1/8 THICK
50	1	300069	REDUCER, -6 NPT / -2 NPT
51	2	300070	PLUG, PIPE -4 NPT SQ HD
52	1	300073	PLUG, PIPE -6 NPT HEX SOC HEADLESS
53	1	300074	REDUCER, -4 NPT / -2 NPT
54	2	300075	PIN, DOWEL
55	1	360364	PLATE, THRUST
56	1	300076	SEAL, OIL 3/4 I.D. x 1 1/4 O.D. x 1/4 THICK
57	1	300077	SEAL, OIL 1 1/4 I.D. x 1 3/4 O.D. x 1/4 THICK
58	1	300078	SEAL, OIL 1 1/2 I.D. x 2 1/4 O.D. x 5/16 THICK
59	1	360371	SEAL, THREAD
60	1	300079	RING, SNAP
61	1	360368	SPRING
62	3	300080	WASHER, THRUST
63	1	300081	WASHER, THRUST
64	1	300082	WASHER, FIBER
65	2	360453	SCREW, 1/4-20NC x 1" LG. ALL THREAD
66	2	320382	PIPE PLUG

GENERAL ASSEMBLY 3203 SERIES



ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	320900000	PEDESTAL ASSEMBLY PR/PRD
		320840000	PEDESTAL ASSEMBLY PRX/PRXD
2	1	320910000	BOOM ASSEMBLY PR/PRD
		320830000	BOOM ASSEMBLY PRX/PRXD
3	1	320823000	PIVOT PIN
4	1	320824000	PIN, LIFT CYLINDER
5	1	320338	CABLE
6	1	320911000	DECAL LAYOUT 3203
7	1	320901000	SHIP KIT 3203 PR
		320902000	SHIP KIT 3203 PRD
		320915000	SHIP KIT 3203 PRX
		320916000	SHIP KIT 3203 PRXD
8	2	021100	WASHER SPLK 3/8
9	2	008400	SCW HEX HD 3/8-16 UNC X 3/4 GR 5
REMAINING ITEMS ON 'D' MODELS ONLY			
10	2	020200	WASHER SPLIT LOCK 1/4
11	2	005500	SCW HH 0.25-20 X 0.75
12	1	320920005	RECEIVER, KAR-TECH PRX
		320920006	RECEIVER, KAR-TECH PR
13	1	320920003	WIRE HARNESS, KAR-TECH RECEIVER

TRAVELING BLOCK 3203 SERIES



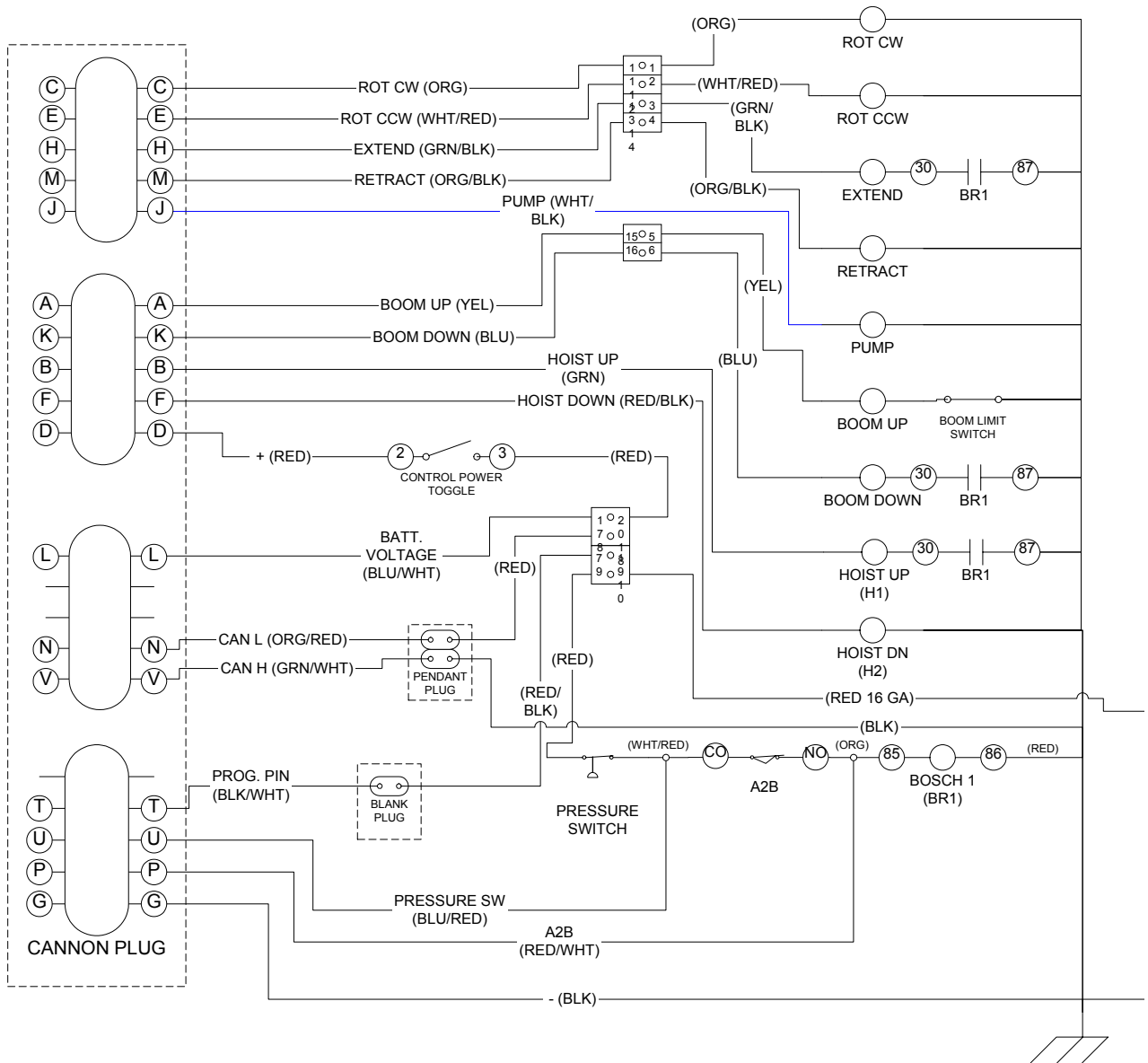
<u>ITEM</u>	<u>QTY</u>	<u>P/N</u>	<u>DESCRIPTION</u>	<u>ITEM</u>	<u>QTY</u>	<u>P/N</u>	<u>DESCRIPTION</u>
1	1	100309	SWIVEL HOOK	6	1	013512	SCW, HX HD 5/8NC x 3 1/2
2	2	360124	HITCH PIN	7	1	018200	NUT, HX HLF LK 5/8NC
3	2	320434	PIN, BLOCK	8	2	320404	BLOCK
4	2	320403	BLOCK, TRAVELING	9	2	330100	WASHER, FLAT
5	1	200909	SHEAVE ASSY				

NOTES

ELECTRICAL SCHEMATICS

3203 SERIES

GENERAL MACHINE SCHEMATIC

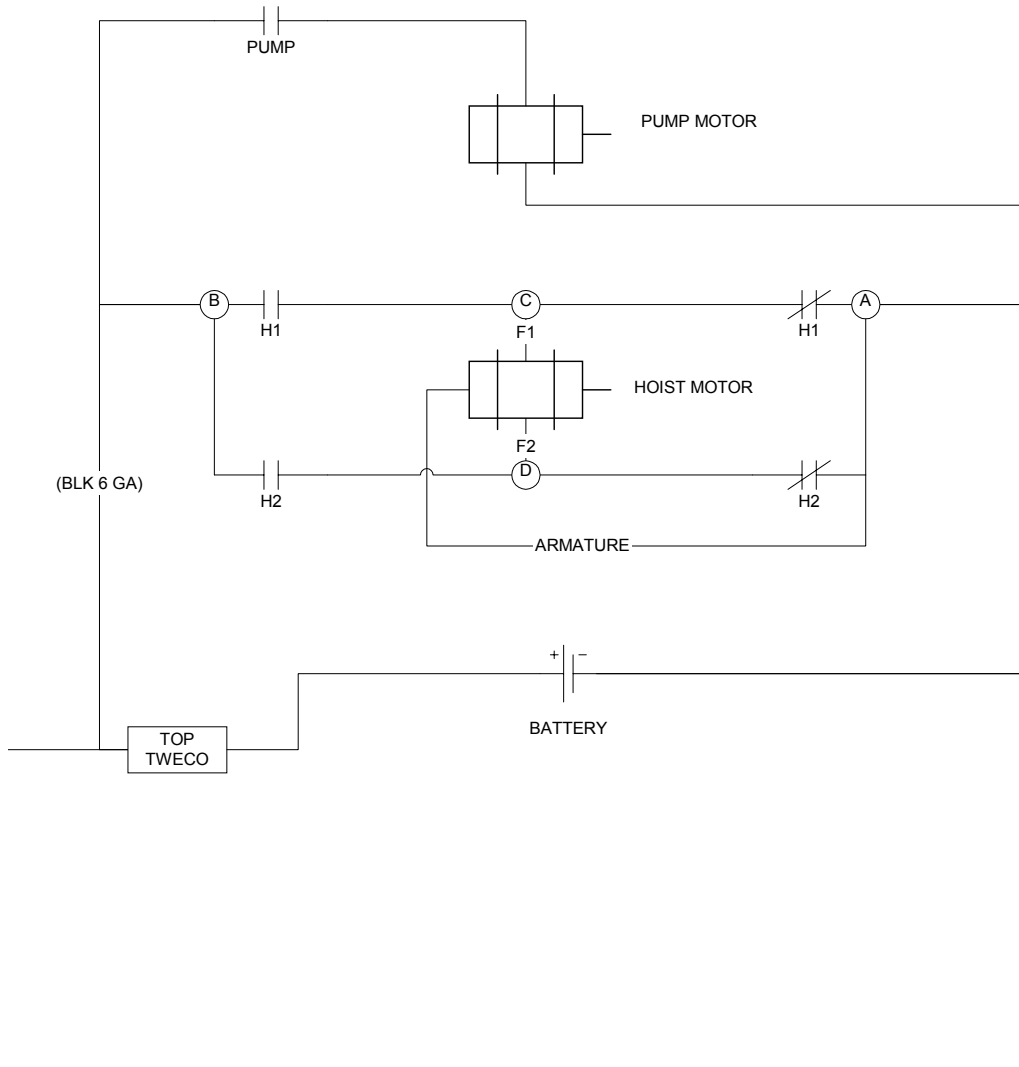


SCHEMATIC CONTINUED ON NEXT PAGE

ELECTRICAL SCHEMATICS

3203 SERIES

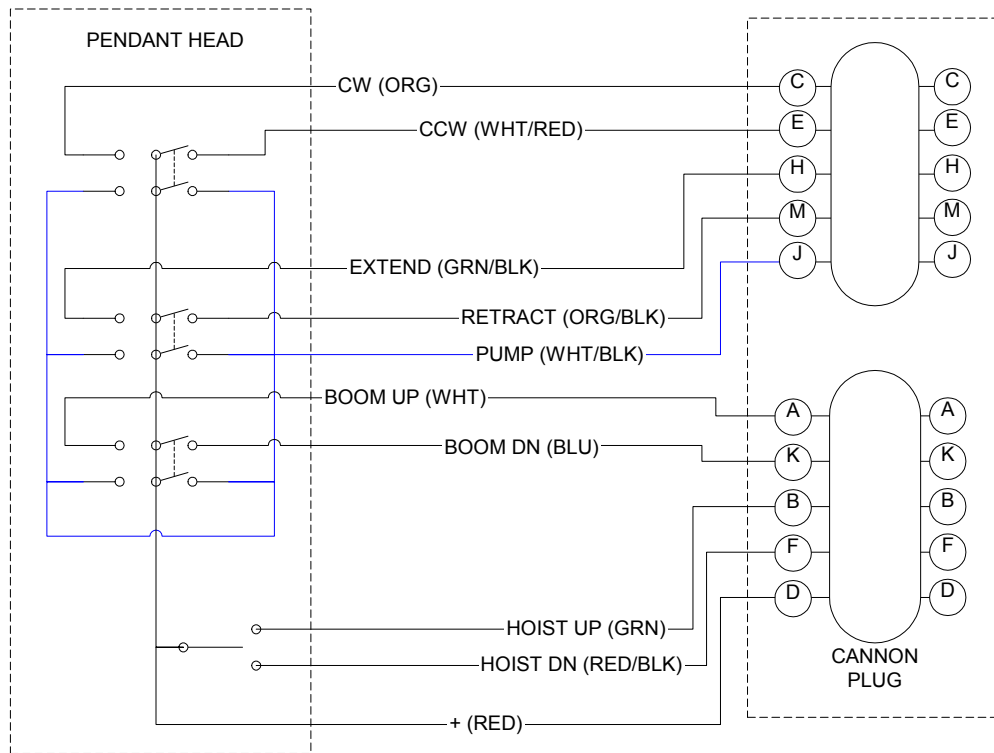
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ELECTRICAL SCHEMATICS

3203 SERIES

HARDWIRE PENDANT SCHEMATIC

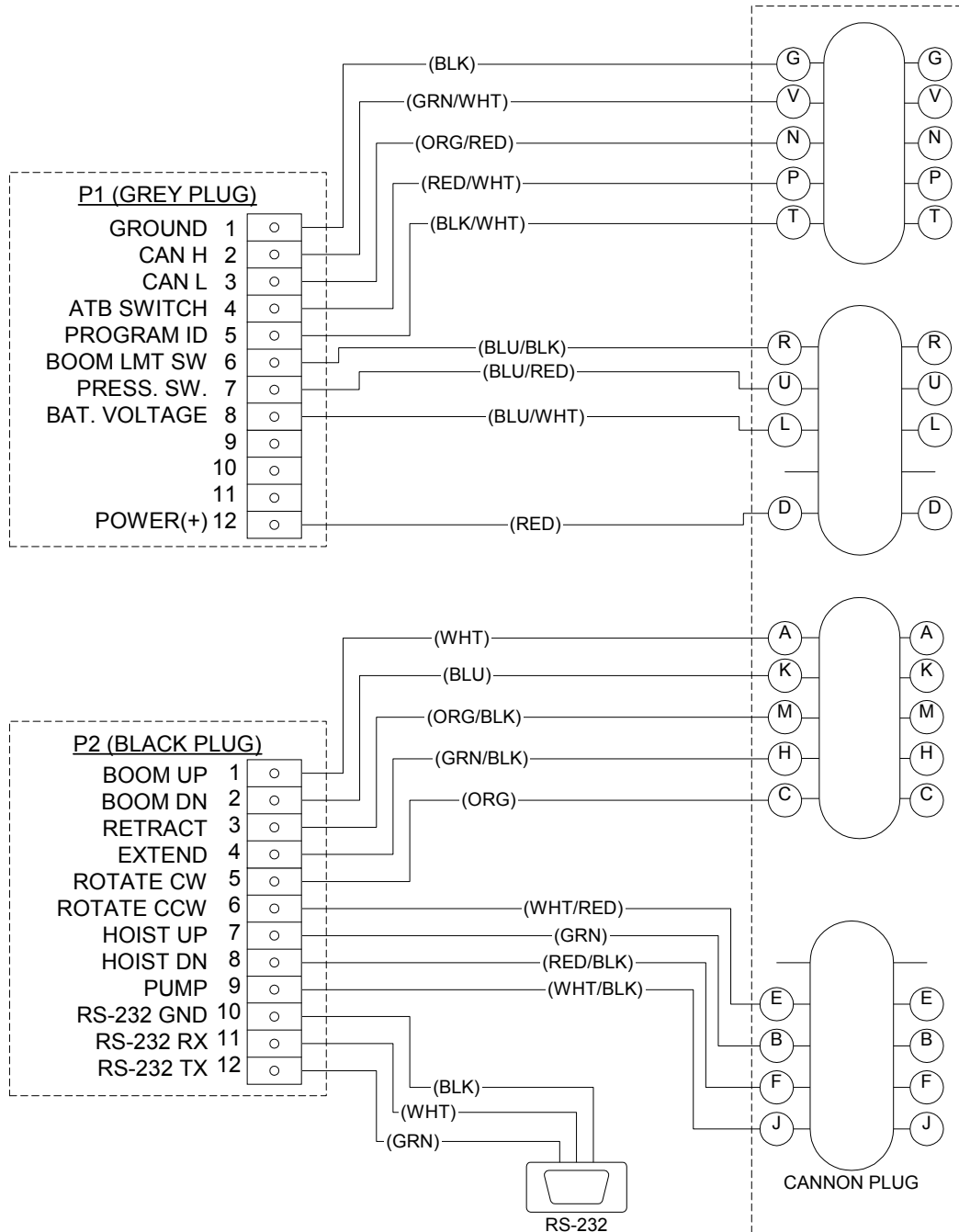


NOTE: PRX MODEL DOES NOT HAVE EXTEND AND RETRACT SWITCH

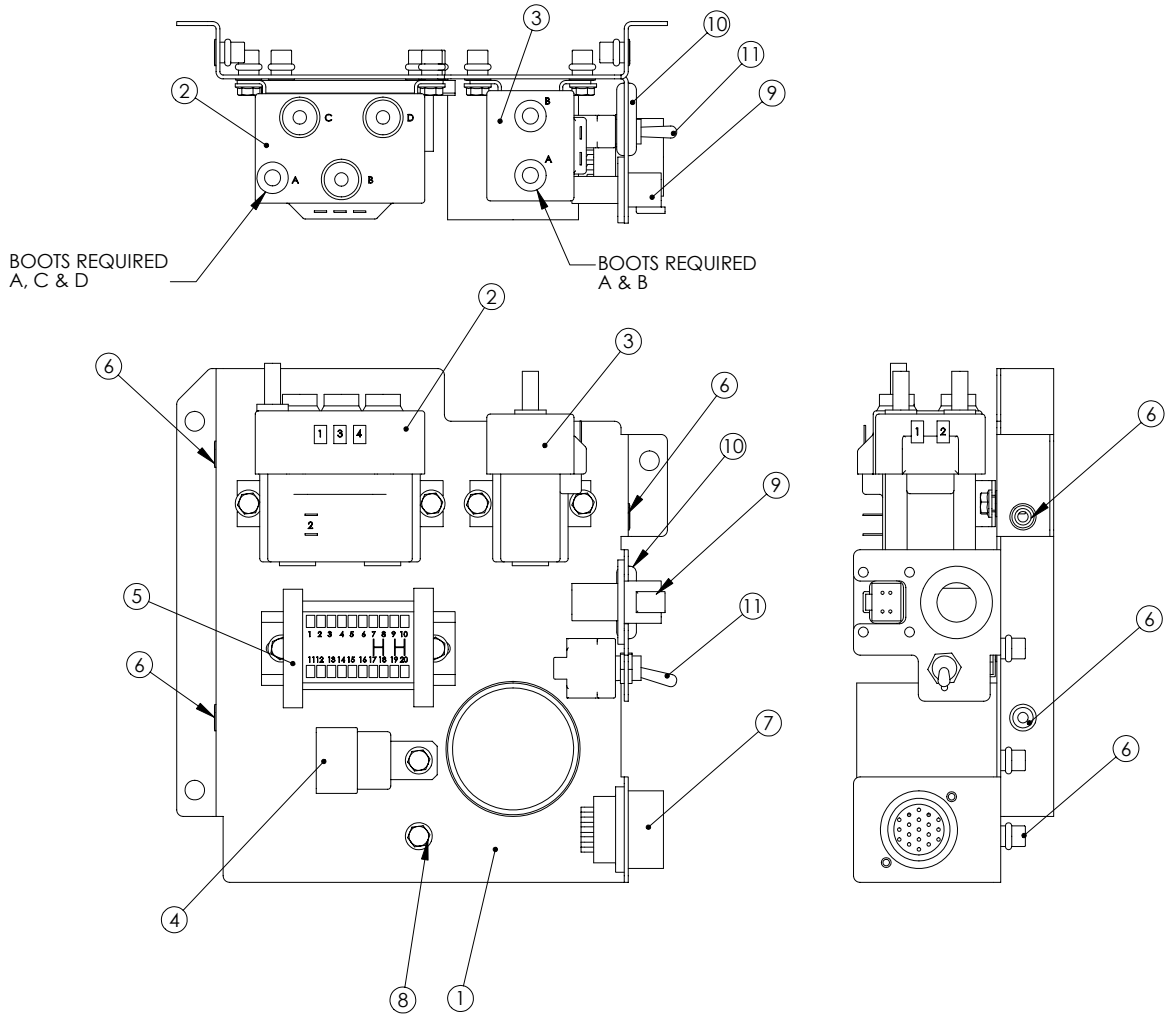
ELECTRICAL SCHEMATICS

3203 SERIES

FM HARNESS SCHEMATIC (RS-232 Optional)



RELAY PANEL ASSEMBLY 3203 SERIES



ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	320919000	RELAY PANEL WELDMENT
2	1	320589	RELAY, HOIST
3	1	320584	RELAY, POWER UNIT
4	1	320355	RELAY, BOSCH
5	1	320804 MODIFIED	TERMINAL STRIP 10
6	11	736272	NUTSERT .25UNC X .027-.165 GRIP
7	1	366095	PLUG, 19 PIN
8	8	360493000	SCW WHIZ-LK 1/4NCX 1/2
9	1	360768001	DEUTSCH DT04-4P-L012
10	1	371024	GROMET 3/4" I.D.
11	1	750090	TOGGLE SWITCH (ON-ON)

RELAY PANEL ASSEMBLY

3203 SERIES

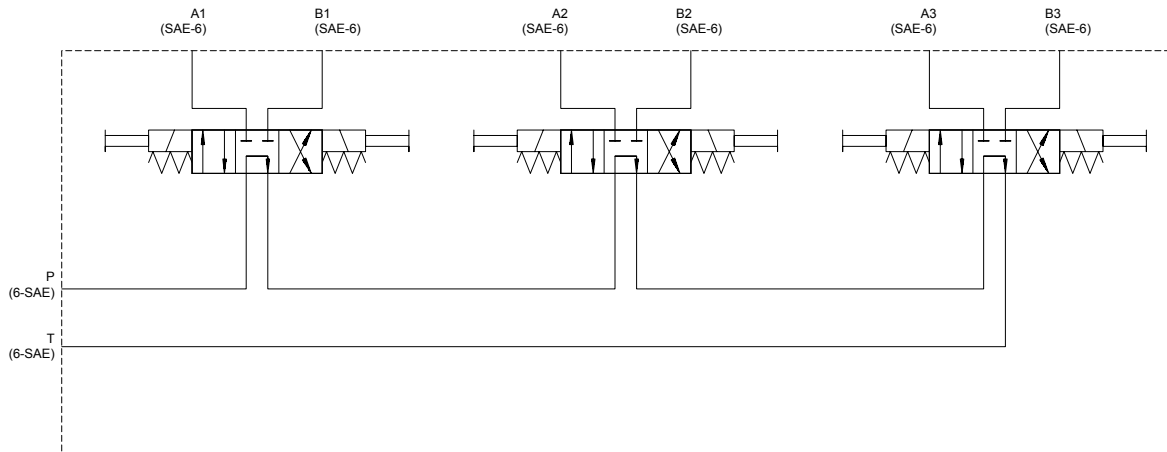
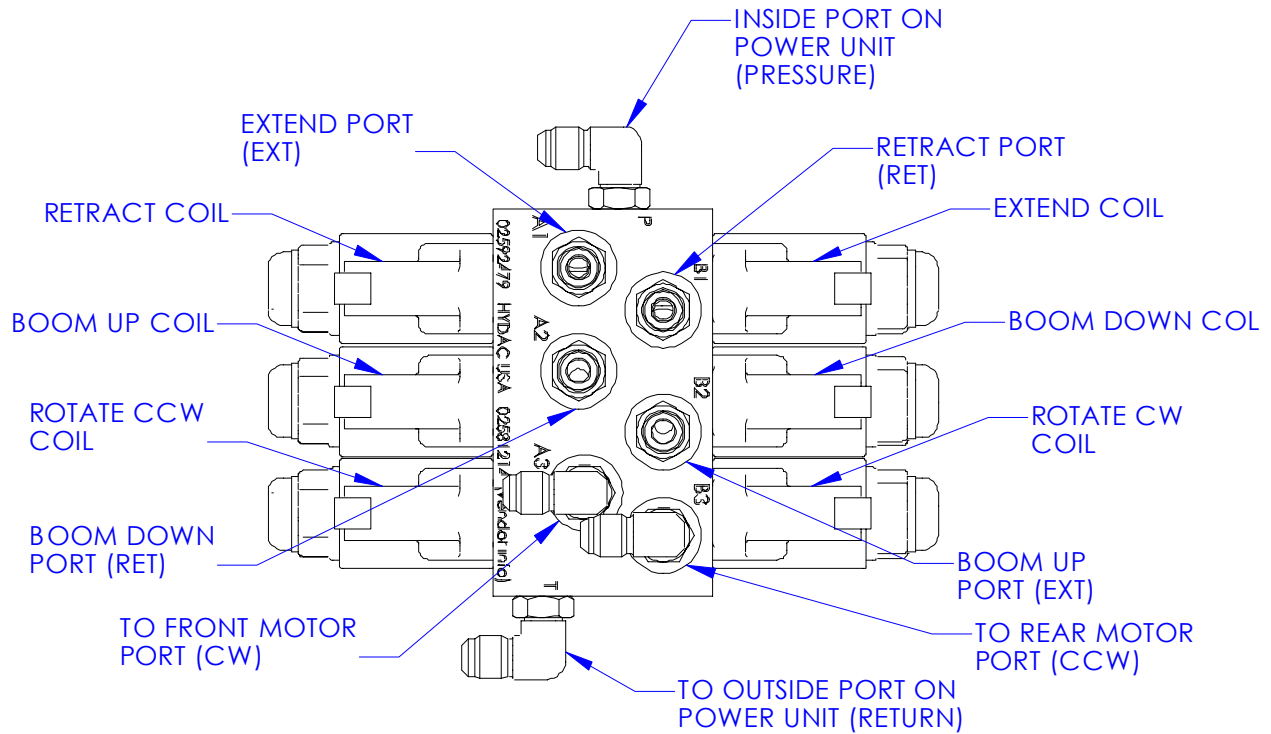
FROM	FROM END	COLOR	GAGE	LENGTH	TO END	TO	TO LABEL
CANNON PLUG - A	SOLDER	YELLOW	16	8.5	STRIP	TERMINAL BLOCK - 15	N/A
TERMINAL BLOCK - 5 DEUTSCH DT06-2S, PIN - 2, VALVE BOOM UP COIL	STRIP	YELLOW	16	22	DEUTSCH CONTACT - 0462-201- 16141	DEUTSCH DT06-2S, PIN - 1, VALVE BOOM UP COIL	BOOM UP
	DEUTSCH CONTACT - 0462-201-16142	WHITE	16	20	SOLDER	BLACK WIRE BOOM LIMIT CORD	N/A
CANNON PLUG - B	SOLDER	GREEN	16	16	FEMALE SPADE	HOIST RELAY - 1	HOIST UP
CANNON PLUG - C	SOLDER	ORANGE	16	8.5	STRIP	TERMINAL BLOCK - 11	N/A
TERMINAL BLOCK - 1	STRIP	ORANGE	16	24	DEUTSCH CONTACT - 0462-201- 16141	DEUTSCH DT06-2S, PIN - 1, VALVE ROTATION CW COIL	ROT CW
DEUTSCH DT06-2S, PIN - 2, VALVE ROTATE CW COIL	DEUTSCH CONTACT - 0462-201-16141	WHITE	16	22	1/4" RING TERMINAL	GROUND	N/A
CANNON PLUG - D	SOLDER	RED	16	14.5	#6-8 RING TERMINAL	TOGGLE SWITCH - 3	N/A
TOGGLE SWITCH - 2	#6-8 RING TERMINAL	RED	16	4	STRIP	TERMINAL BLOCK - 20	N/A
CANNON PLUG - E	SOLDER	WHITE/RED	16	8.5	STRIP	TERMINAL BLOCK - 12	N/A
TERMINAL BLOCK - 2	STRIP	WHITE/RED	16	24.5	DEUTSCH CONTACT - 0462-201- 16141	DEUTSCH DT06-2S, PIN - 1, VALVE ROTATION CCW COIL	ROT CCW
DEUTSCH DT06-2S, PIN - 2, VALVE ROTATE CCW COIL	DEUTSCH CONTACT - 0462-201-16142	WHITE	16	22	1/4" RING TERMINAL	GROUND	N/A
CANNON PLUG - F	SOLDER	RED/BLACK	16	17	FEMALE SPADE	HOIST RELAY - 4	HOIST DN
CANNON PLUG - G	SOLDER	BLACK	16	4	1/4" RING TERMINAL	GROUND	N/A
CANNON PLUG - H	SOLDER	GREEN/BLACK	16	8.5	STRIP	TERMINAL BLOCK - 13	N/A
TERMINAL BLOCK - 3	STRIP	GREEN/BLACK	16	22	DEUTSCH CONTACT - 0462-201- 16141	DEUTSCH DT06-2S, PIN - 1, VALVE EXTEND COIL	EXTEND
DEUTSCH DT06-2S, PIN - 2, VALVE EXTEND COIL	DEUTSCH CONTACT - 0462-201-16141	WHITE	16	22	FEMALE SPADE	HOIST RELAY - 2	N/A
CANNON PLUG - J	SOLDER	WHITE/BLACK	16	20	FEMALE SPADE	PUMP RELAY - 1	N/A
CANNON PLUG - K	SOLDER	BLUE	16	8.5	STRIP	TERMINAL BLOCK - 16	N/A
TERMINAL BLOCK - 6	STRIP	BLUE	16	22	DEUTSCH CONTACT - 0462-201- 16141	DEUTSCH DT06-2S, PIN - 1, VALVE BOOM DOWN COIL	BOOM DN
DEUTSCH DT06-2S, PIN - 2, VALVE BOOM DOWN COIL	DEUTSCH CONTACT - 0462-201-16141	WHITE	16	22	#6-8 RING TERMINAL	HOIST RELAY - 2	N/A
CANNON PLUG - L	SOLDER	BLUE/WHITE	16	8.5	STRIP	TERMINAL BLOCK - 17	N/A
CANNON PLUG - M	SOLDER	ORANGE/BLACK	16	8.5	STRIP	TERMINAL BLOCK - 14	N/A
TERMINAL BLOCK - 4	STRIP	ORANGE/BLACK	16	23	DEUTSCH CONTACT - 0462-201- 16141	DEUTSCH DT06-2S, PIN - 1, VALVE RETRACT COIL	RETRACT
DEUTSCH DT06-2S, PIN - 2, VALVE RETRACT COIL	DEUTSCH CONTACT - 0462-201-16141	WHITE	16	20	1/4" RING TERMINAL	GROUND	N/A
CANNON PLUG - N	SOLDER	ORANGE/RED	16	15	DEUTSCH CONTACT - 0460-202- 16141	DEUTSCH DT04-4P-L012, PIN - 4, PENDANT PLUG, CAN L	N/A
DEUTSCH DT04-4P- L012, PIN - 1, PENDANT PLUG, +	DEUTSCH CONTACT - 0460-202-16141	RED	16	5.5	STRIP	TERMINAL BLOCK - 8	N/A
CANNON PLUG - P	SOLDER	RED/WHITE	16	8	FEMALE SPADE (BOSCH PLUG)	BOSCH RELAY - 85	N/A
CANNON PLUG - T	SOLDER	BLACK/WHITE	16	12	DEUTSCH CONTACT - 0460-202- 16141	DEUTSCH DT04-2P, PIN - 1, PROGRAM PIN	PROGRAM PIN
CANNON PLUG - U	SOLDER	BLUE/RED	16	16	SOLDER	WHITE/RED WIRE (PRESSURE SWITCH TO A2B)	N/A
CANNON PLUG - V	SOLDER	GREEN/WHITE	16	16	DEUTSCH CONTACT - 0460-202- 16141	DEUTSCH DT04-4P-L012, PIN - 3, PENDANT PLUG, CAN H	N/A
DEUTSCH DT04-4P- L012, PIN - 2, PENDANT PLUG, -	DEUTSCH CONTACT - 0460-202-16141	BLACK	16	4.5	1/4" RING TERMINAL	GROUND	N/A

RELAY PANEL ASSEMBLY 3203 SERIES

FROM	FROM END	COLOR	GAGE	LENGTH	TO END	TO	TO LABEL
HOIST RELAY - 2	FEMALE SPADE	WHITE	16	6	FEMALE SPADE (BOSCH PLUG)	BOSCH RELAY - 30	N/A
HOIST RELAY - 3	FEMALE SPADE	WHITE	16	6	1/4" RING TERMINAL	GROUND	N/A
HOIST RELAY - A	5/16" RING TERMINAL	BLACK	6	23	5/16" RING TERMINAL	HOIST MOTOR - A	N/A
HOIST RELAY - B	5/16" RING TERMINAL	BLACK	6	21	STRIP	TWECO	N/A
HOIST RELAY - B	5/16" RING TERMINAL	BLACK	6	3	5/16" RING TERMINAL	PUMP RELAY - A	N/A
HOIST RELAY - C	5/16" RING TERMINAL	BLACK	6	26	5/16" RING TERMINAL	HOIST MOTOR - F2	N/A
HOIST RELAY - D	5/16" RING TERMINAL	BLACK	6	24	5/16" RING TERMINAL	HOIST MOTOR - F1	N/A
PUMP RELAY - B	5/16" RING TERMINAL	BLACK	6	18	5/16" RING TERMINAL	PUMP MOTOR	N/A
PUMP RELAY - 2	FEMALE SPADE	WHITE	16	3.5	1/4" RING TERMINAL	GROUND	N/A
TERMINAL BLOCK - 10	STRIP	RED	16	21	STRIP	TWECO	N/A
TERMINAL BLOCK - 7	STRIP	RED/BLACK	16	7	DEUTSCH CONTACT - 0460-202-16141	DEUTSCH DT04-2P, PIN - 2, PROGRAM PIN	PROGRAM PIN
TERMINAL BLOCK - 9	STRIP	RED	16	28	DEUTSCH CONTACT - 0460-202-16141	DEUTSCH DT04-2P, PIN - 1, PRESSURE SWITCH	PRESS SW
DEUTSCH DT04-2P, PIN - 2, PRESSURE SWITCH	DEUTSCH CONTACT - 0460-202-16141	WHITE/RED	16	25	SOLDER	WHITE/RED WIRE (A2B) & BLUE/RED WIRE (CANNON - U)	N/A
DEUTSCH DT06-2S, PIN - 2, A2B SWITCH	DEUTSCH CONTACT - 0462-201-16141	WHITE/RED	16	23	SOLDER	WHITE/RED WIRE (PRESSURE SWITCH) & BLUE/RED WIRE (CANNON - U)	N/A
DEUTSCH DT06-2S, PIN - 1, A2B SWITCH	DEUTSCH CONTACT - 0462-201-16141	ORANGE	16	32	FEMALE SPADE (BOSCH PLUG) (WITH RED/WHITE WIRE)	BOSCH RELAY - 85	N/A
BOSCH RELAY - 86	FEMALE SPADE (BOSCH PLUG)	RED	16	6.5	1/4" RING TERMINAL	GROUND	N/A
BOSCH RELAY - 87	FEMALE SPADE (BOSCH PLUG)	WHITE	16	6.5	1/4" RING TERMINAL	GROUND	N/A
BOOM LIMIT SWITCH COMMON	#6-8 RING TERMINAL	WHITE (2-COND CORD)	16		1/4" RING TERMINAL	GROUND	N/A
BOOM LIMIT SWITCH N.C.	#6-8 RING TERMINAL	BLACK (2-COND CORD)	16		SOLDER	BOOM UP COIL WHITE WIRE	N/A
TERMINAL BLOCK - 18	STRIP	RED	16	2	STRIP	TERMINAL BLOCK - 19	N/A

NOTES

HYDRAULIC CONTROL VALVE 3203 SERIES



QTY	DESCRIPTION	A/C P/N	HYDAC P/N
3	SPOOL VALVE, 4WK06G-12X-0-0-N	320826001	
6	SOLENOID COIL, 12DN-50-1836	320826002	03091665

COUNTER BALANCE ADJUSTMENT

3203 SERIES

Counterbalance Valve Adjustment

- ◆ With pump system disengaged and boom properly supported, remove the plug on the counterbalance valve. Install a pressure gauge (0-2,500 PSI) into the port.
- ◆ With no load on boom, boom up to an angle of 70 degrees. Boom down and note pressure. If pressure reading is not approximately 1,000 PSI, the counterbalance valve requires adjustment.
 - To increase the CB valve setting, loosen nut and turn Allen head screw counter clockwise.
 - To reduce the CB valve setting, loosen nut and turn Allen head screw clockwise.
- ◆ Tighten nut on adjustment screw and repeat procedure if needed to obtain the proper pressure setting.
- ◆ Disengage pump system, remove the pressure gauge and install plug. Crane is now ready for operation.

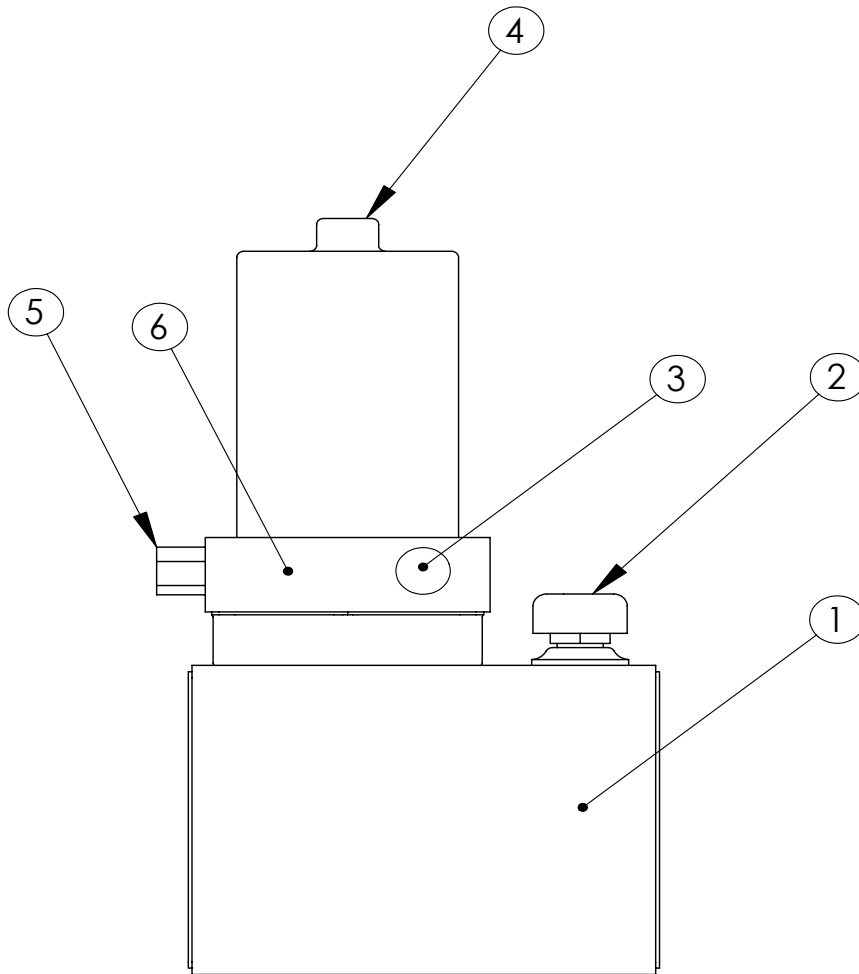
Notice:

- ◆ In an EMERGENCY situation when it becomes necessary to lower the boom without flow present, the CB valve adjustment can be turned in until the boom begins to descend. Make sure the boom will lower onto a proper support. Loosen the lock nut and carefully turn adjustment screw clockwise! Count the number of turns. *Turn slowly until the boom just begins to lower, and remove hand/arm/fingers from cranes while boom is lowering.*
- ◆ Turning adjustment screw too far will cause valve to come apart on the inside. This condition is not repairable
- ◆ After boom is lowered, turn adjustment screw counter clockwise the approximate number of turns made during lowering procedure. After the problem is corrected, readjust the counterbalance valve using the procedure in this manual.

WARNING:

**DO NOT TRY TO ADJUST VALVES WHILE BOOM IS MOVING.
Failure to do so may result in personal injury!**

POWER UNIT 3203 SERIES



ITEM	QTY	P/N	DESCRIPTION
1	1	320825001	RESERVOIR KIT
2	1	200545000	BREATHER CAP
3	1	320825002	RELIEF VALVE KIT
4	1	320335005	MOTOR
5	1	320336002	RETURN PORT PLUG KIT
6	1	320825003	ADAPTER KIT
7	1	320335003	PUMP KIT
8	1	320335010	O-RING

TROUBLESHOOTING GUIDE

3203 SERIES

1 CRANE FAILS TO OPERATE (ALL FUNCTIONS)

A. Check power to crane - 12v to ground at upper left power terminal of pump relay

1. If ok go to B.

2. If not check continuity back to battery at Tweco and battery connections.

b. If there is power at pump relay (left side) and no functions are operable the most likely cause is in the control circuits (pendant or receptacle).

1. Verify by touching jumper from hot side of pump relay to left side control terminal (small) on pump relay. Pump should run but crane should not move unless a valve is stuck open. Also test by jumping from hot side of pump relay to left side control terminal of hoist down relay. hoist should operate down.

c. If previous tests are ok, then remove pendant and check at receptacle on crane with jumper and test light.

1. Check for voltage from pin "D" of socket to ground.

i. If not successful, then receptacle assembly is bad.

ii. If ok, jumper from "D" to "F" (hoist down), or "D" to "J" (pump). Other functions can be checked also by probing receptacle with jumper. See P/N 680065 page 7-6.0.0. Hydraulic functions require that pump and valve are both activated.

d. If receptacle tests are ok, then fault is in pendant hot wire. Either a break in the wire or it is not attached inside of the pendant (goes to center terminal of rotation switch from pin "D").

2 HOIST UP, BOOM DOWN, & EXTEND (OUT) DON'T OPERATE BUT ALL OTHER FUNCTIONS OPERATE. PUMP RUNS WHEN BOOM DOWN AND EXTEND FUNCTIONS ARE TRIED. THESE FUNCTIONS ARE TIED INTO THE ANTI-TWO BLOCK AND CRANE OVERLOAD SENSOR SYSTEMS. THE CRANE IS SHUT DOWN WHEN THE SENSORS OPEN THE GROUND CIRCUIT FROM THE FUNCTIONS.

A. Check two-block bail and switch at end of boom to verify they move freely. Switch should make audible click when operated. Try operating crane while pulling cord out of cord reel to check for possible bad spots in cord reel slip rings.

b. If the three functions work, check both Pressure Switch's by taking an ohm reading on the two wires coming from each individual switch. The 2,350 psi Switch (P/N 320543) has normally open contacts, so the reading should be the minimum ("open"). If greater than the minimum ohm reading is indicated (usually a dead short), replace the switch. The 2,500 psi switch (P/N 366032) has normally closed contacts, so the reading should be maximum. If less than the maximum ohm reading is indicated (usually an "open") replace the switch.

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WARNING: BE SURE BOOM IS SUPPORTED BEFORE REMOVING SWITCH OR BOOM WILL FALL.

C. Test Drop Out Relay - Pull socket off Relay. Test continuity with power on between 30 & 87. If no continuity then replace relay. With power off check continuity between 30 & 87a. If no continuity then replace relay.

3 HOIST FAILS TO OPERATE IN EITHER DIRECTION BUT ALL HYDRAULIC FUNCTIONS OPERATE.

A. Listen for relay click for hoist up and hoist down. If relay doesn't click check for voltage at left side control terminal (small) when function is selected, if no voltage then use procedure for checking receptacle and pendant given in 1.C.

b. Check terminal A2 of hoist motor for power when operating either hoist up or hoist down. If there is voltage but motor does not try to run or get hot then motor is bad. If motor tries to run or gets hot then voltage reading at A2 will be less than 12 volts and motor may be dirty or have oil in it from failed oil seal.

c. If there is no power at A2 only on hoist up, then put test light across bottom power terminals of hoist down relay. If light comes on when hoist up is picked, then hoist down relay is bad. If test light doesn't light, put light across upper power terminals of hoist up relay and pick hoist up. If light comes on, replace hoist up relay.

d. If there is no power at A2 only on hoist down then put test light across bottom power terminals of hoist up relay. If light comes on when hoist down is picked, then hoist up relay is bad. If test light doesn't light, put light across upper power terminals of hoist down relay and pick hoist down. If light comes on, replace hoist down relay.

NOTE: THERE ARE OTHER WAYS TO TEST FOR CIRCUIT CONTINUITY SUCH AS USING VOLT METER OR TEST LIGHT AND FOLLOWING CIRCUIT THROUGH BY TESTING AT EACH POINT FOR VOLTAGE TO GROUND.

1 ALL HYDRAULIC FUNCTIONS INOPERABLE.

A. Pump does not run, pump relay does not click. Jumper from upper left power terminal of pump relay to left side relay control terminal. If relay doesn't click, replace relay. If relay clicks and pump runs, check receptacle and pendant. (see 1.C.)

b. If relay clicks but pump doesn't run, check for voltage at pump motor terminal. If no voltage replace pump relay. If voltage is present, pump motor is bad or pump is locked. If pump is locked motor will get hot and voltage at motor terminal will be much lower than 12 volts.

2 PUMP RUNS BUT SINGLE HYDRAULIC FUNCTION DOESN'T WORK.

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A. Select inoperable function with pendant switch and push manual override of valve in question-if function works use procedure 1.C. to check receptacle and pendant. If receptacle checks out and function can not be run by using jumper at receptacle, then valve or harness may be bad. Check for 12 volt at valve junction box. If no voltage present-check for loose wire at back of receptacle or terminal strip.

b. If voltage is present at valve, then valve may be bad. This can be checked by swapping valve positions on manifold but leaving wiring attached. If trouble moves with valve, then valve is bad.

c. If boom retract or boom down functions don't work, then check for low hydraulic pressure at pump. These two functions have the highest pressure requirements for an unloaded crane because they must overcome the set pressures of the counter balance valves.

d. If hydraulic functions are more intermittent when cylinders are extended, then check hydraulic fluid level.

e. Boom locks up and won't come down when fully raised. This is caused by too high pump pressure which causes overload system to activate. Set relief pressure at 2100 psi. Unlock boom by disconnecting wire from terminal #6 of timing relay. Reconnect wire after boom is moved. If pressure is correct and problem continues, then replace overload pressure switch.

CONTROLLER DIAGNOSTICS

3203 SERIES

On the receiver the green light indicates that a signal is being received, the red indicates the status or error. Below are a list of the error codes both as they would be displayed on a Palm handheld and on the receiver.

- CODE (Receiver/Palm):** 1 Flash/EC01
- DESCRIPTION:** Signal problem
- POSSIBLE CAUSE(S):** No signal from transmitter/pendant or transmitter power off.
- POSSIBLE SOLUTION(S):** Check transmit light on transmitter, light should flash when function is activated. If light does not flash, make sure transmitter is on. If light flashes and red low battery light is flashes, charge unit. If transmitter is plugged in as a pendant and transmit light comes on but code remains, check cable connections and cable.
- CODE:** 2 Flashes/OVL
- DESCRIPTION:** Overload
- POSSIBLE CAUSE(S):** Pressure overload.
- POSSIBLE SOLUTION(S):** Retract boom, hoist down or otherwise alleviate overload condition. Refer to load chart for rated load. If the error persists with seemingly light loads, install pressure gage in plugged port of lift cylinder counterbalance valve to confirm pressures in excess of 1,900 psi.
- CODE:** 3 Flashes/A2B
- DESCRIPTION:** Anti-two block
- POSSIBLE CAUSE(S):** Anti-two block switch tripped.
- POSSIBLE SOLUTION(S):** Check switch, if not mechanically tripped, check continuity cross switch at plug. If switch has continuity check voltage across transmitter side of A2B plug. If low voltage is read, power to the A2B switch, the rotation switches or the pressure sensor may have a short.

CONTROLLER DIAGNOSTICS

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- CODE:** 4 Flashes/LBV
- DESCRIPTION:** Low battery
- POSSIBLE CAUSE(S):** Low battery power to receiver.
- POSSIBLE SOLUTION(S):** Check connections to the battery. Charge battery. NOTE: It is recommended that the crane be powered off if battery is charged with battery charger.
- CODE:** 5 Flashes/BLMT
- DESCRIPTION:** Boom limit
- POSSIBLE CAUSE(S):** Boom has reached maximum elevation.
- POSSIBLE SOLUTION(S):** This is not an error. It only indicates boom position. Lower the boom to deactivate the switch.
- CODE:** 6 Flashes/EC10
- DESCRIPTION:** Incorrect ID
- POSSIBLE CAUSE(S):** Signal received from transmitter with incorrect ID code.
- POSSIBLE SOLUTION(S):** Confirm that transmitter being used is for use with this unit. Follow 'New Transmitter' procedure in the transmitter operation section of this manual.
- CODE:** 7 Flashes/EC02
- DESCRIPTION:** Boom up
- POSSIBLE CAUSE(S):** Short or open connection on boom up output.
- POSSIBLE SOLUTION(S):** Check plug in boom up solenoid on hydraulic control valve. Check wires for damage that could cause break or short.
- CODE:** 8 Flashes/EC03
- DESCRIPTION:** Boom down
- POSSIBLE CAUSE(S):** Short or open connection on boom down output.

CONTROLLER DIAGNOSTICS

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POSSIBLE SOLUTION(S): Check plug in boom down solenoid on hydraulic control valve. Check wires for damage that could cause break or short.

CODE: 9 Flashes EC04

DESCRIPTION: Boom in (retract)

POSSIBLE CAUSE(S): Short or open connection on boom in output.

POSSIBLE SOLUTION(S): Check plug in boom in solenoid on hydraulic control valve. Check wires for damage that could cause break or short.

CODE: 10 Flashes/EC05

DESCRIPTION: Boom out (extend)

POSSIBLE CAUSE(S): Short or open connection on boom out output.

POSSIBLE SOLUTION(S): Check plug in boom out solenoid on hydraulic control valve. Check wires for damage that could cause break or short.

CODE: 11 Flashes/EC06

DESCRIPTION: Rotate CW

POSSIBLE CAUSE(S): Short or open connection on rotate CW output.

POSSIBLE SOLUTION(S): Check plug in rotate CW solenoid on hydraulic control valve. Check wire for damage that could cause break or short.

CODE: 12 Flashes/EC07

DESCRIPTION: Rotate CCW

POSSIBLE CAUSE(S): Short or open connection on rotate CCW output.

POSSIBLE SOLUTION(S): Check plug in rotate CCW solenoid on hydraulic control valve. Check wire for damage that could cause break or short.

CODE: 13 Flashes EC08

DESCRIPTION: Hoist up

CONTROLLER DIAGNOSTICS

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POSSIBLE CAUSE(S): Short or open connection on hoist up output.

POSSIBLE SOLUTION(S): Check plug in hoist up solenoid on hydraulic control valve.
Check wire for damage that could cause break or short.

CODE: 14 Flashes/EC09

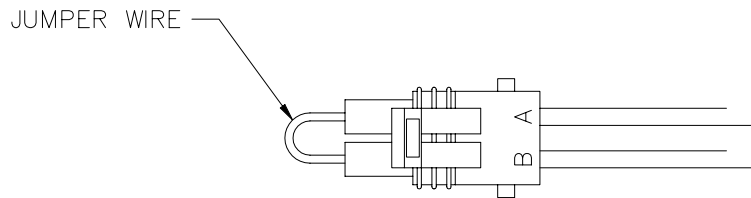
DESCRIPTION: Hoist down

POSSIBLE CAUSE(S): Short or open connection on hoist down output.

POSSIBLE SOLUTION(S): Check plug in hoist down solenoid on hydraulic control valve. Check wire for damage that could cause break or short.

TRANSMITTER / RECEIVER SYNCHRONIZATION

1. Power on the transmitter and receiver.
2. Locate the program plug on the crane. This will be the unused plug near where the cord reel plugs into the wire harness.
3. Using a jumper wire, as shown below, connect the two contacts in the plug.
4. While the jumper is installed and the transmitter is unplugged from the pendant cable, activate a function on the transmitter. **Note:** The crane must be electrically powered but it is not necessary to supply hydraulic power to complete synchronization.
5. Remove the jumper wire.
Important: The jumper wire should not be left installed. Doing so could cause the crane to be operated by another transmitter.



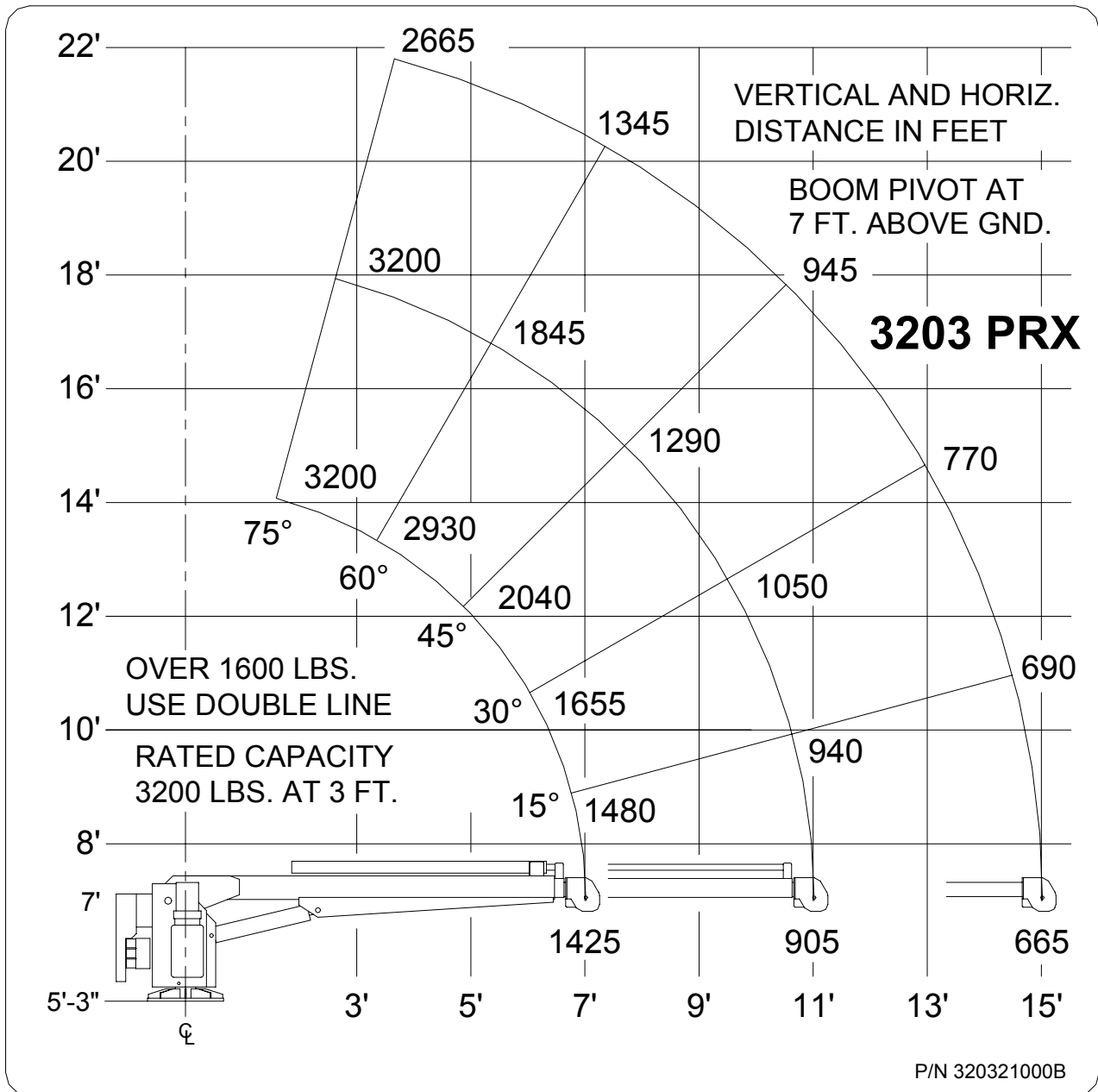
***REMOTE / PENDANT
PARTS AND ACCESSORIES***

<u>Component</u>	<u>Part Number</u>
Receiver	320920001
Transmitter PRX	320920002
Transmitter PR	320920004
Pendant Cable	366500009
Antenna	366500005
Cigarette Lighter Charger	366504000
A/C Charger	366505000
Palm Diagnostic Unit	366510000
Receiver Harness	320920003
Hardwire Pendant PRX	320921000
Hardwire Pendant PR	320922000

NOTES

LOAD CHART

3203 SERIES





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