LOAD KING

CUSTOM TRUCK ONE SOURCE™

INSTALLATION MANUAL

LOAD KING

25-92

REV A

MARCH 16, 2020

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LOAD KING WARRANTY

Load King (herein after referred to as the COMPANY) warrants all products manufactured by it and purchased by you to be free from defects in material and manufacture at the time of shipment, for one

(1) year from date of delivery. The COMPANY will furnish replacements for such parts as the COMPANY finds to have been defective at the time of delivery or, at the COMPANY's option, will make or authorize repairs to such parts, provided that, upon request, such parts are returned, transportation is prepaid to the factory from which they were shipped.

This warranty shall not apply to any Product which has been subjected to misuse, misapplication, overloading, neglect (including but not limited to use of unauthorized parts or attachments), adjustments or repair. Engines, motor, tires, wheels, suspensions, axles, etc. and any accessories furnished with or used in the COMPANY's products, but which are not manufactured by the COMPANY, are not warranted by the COMPANY but are sold only with the express warranty, if any, or the manufacturers thereof. This warranted is limited to the first purchaser/user and is not transferable.

THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESSED OR IMPLIED (INCLUDING, WITHOUT LIMITATIONS, OF MERCHANTABILITY AND FITNESS OF ANY PRODUCT FOR A PARTICULAR PURPOSE), AND OF ANY OTHER OBLIGATION OR LIABILITY ON THE PART OF THE COMPANY. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION OF THE FACE THEREOF.

LIMITATION OF LIABILITY

It is expressly understood and agreed by you that the COMPANY's liability for its products, whether due to breach of warranty, or otherwise is limited to the furnishing of such replacement parts, F.O.B.

factory, and the COMPANY will not be liable for any other injury, loss, damage, or expense, whether direct or consequential, including but not limited to loss of use, income, profit, or production, injury to person or increase in cost of operation, spoilage of or damage to material, arising out of or in connection with the sale, installation, use or inability to use, or the repair or replacement of the COMPANY's products.

All used vehicles and/or bodies are sold in the "AS IS" condition and no expressed or implied warranty is made.

All of COMPANY'S Products are of high quality and are manufactured in conformity with the best commercial practices in the various lines. The COMPANY guarantees all Products manufactured by it to be free from defects in material and manufactured at the time of shipment, for one (1) year from date of delivery. In addition, the COMPANY guarantees the portion of the product to be considered structural for one (1) year from date of manufacture.

While Load King, LLC. designs and manufactures its specific equipment configurations to industry standards, it is ultimate responsibility of the buyer/operator to assure that all loads are properly loaded and distributed. All loads must comply with the applicable state and federal load limits.

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INTRODUCTION

Owners, Users, and Operators:

Load King Cranes appreciates your choice of our machine for your application. Our number one priority is user safety, which is best achieved by our joint efforts. We feel that you make a major contribution to safety if you, as the equipment users and operators:

1. **Comply** with OSHA, Federal, State, and Local Regulations.

2. **Read, Understand, and Follow** the instructions in this and other manuals supplied with this machine.

3. **Use Good, Safe Work Practices**.

4. **Only have trained operators** - directed by informed and knowledgeable supervision - running the machine.

NOTE: OSHA prohibits the alteration or modification of this crane without written manufacturers approval. Use only factory approved parts to service or repair this unit.

If there is anything in this manual that is not clear or you believe should be added, please send your comments to Load King Cranes, 7701 Independence Ave, Kansas City, MO 64125; or contact us by telephone at Parts: (816) 241- 8387 Service: (833) 281-7911
Email: CIC@customtruck.com.

WARRANTY REGISTRATION INFORMATION

When assembly and testing is completed, and all forms in section 4 have been filled out with proper signatures and documentation, copies of these documents should be returned to your crane dealer for warranty registration.

Also necessary for warranty registration will be two photos, one of each side of the completed and tested machine, sent along with your warranty registration information.

Without these documents and complete information, your crane will not be registered and will not be eligible for warranty.

Documents required for proper registration: Stability Test Record, Truck Weights and Dimensions, Crane Information and Photographs

SPECIFIC POINTS OF SAFETY

It is important that this crane be installed properly and securely, if not, it is possible that the crane could pose a danger to the operator, surrounding property and bystanders.

Correct stability verification is necessary for proper and reliable operation.

During assembly, it is important that proper and sufficient lifting equipment be used.

Complete knowledge and understanding of your local and national transportation laws is necessary to ensure that your crane is road worthy.

It is important that any welding done during this installation follow the standards listed in the manual.

SYMBOLS

The symbols below are used to inform the operator of important information concerning the operation of this unit.

Safety Definitions Used in this Manual

The following table describes text and symbols used to highlight important information.

Signal Word	Symbol	Explanation
DANGER		Danger is used to alert readers about an immediate and serious hazard that will likely be fatal.
WARNING		Warning is used to alert readers about the potential for serious injury or death or serious damage to equipment.
CAUTION		Caution is used to alert readers about the potential for anything from moderate injury to serious equipment damage or destruction.
READ		Read is used to alert readers of information to be read on machinery
NOTE		Note is used for a tip or suggestion to help readers carry out a procedure successfully.

THIS MANUAL MUST BE READ TO COMPLETION BEFORE BEGINNING ASSEMBLY OF THE CRANE.

It is the installer's responsibility to ensure that the installation is in full compliance with the requirements of the truck manufacturer.

SEQUENCE OF ASSEMBLY

It is highly important that your crane is assembled and installed following the sequence of instructions set in this manual. This will ensure that the crane performs as intended and that it is valid for warranty registration.

APPLICABLE STANDARDS

Many aspects of crane operation and testing are discussed in standards published by the American National Standards Institute. These standards are updated on an annual basis with addenda, which are sent by ASME to the original purchasers of the standard. Load King recommends that you purchase and refer to the following standards.

ANSI/ASME B30.5 - Mobile & Locomotive Crane (Latest Version)

This standard can be purchased from:

American Society of Mechanical Engineers
United Engineering Center
345 East 47th Street
New York, NY 10017

Although there is minimal welding required for the assembly of this crane. The welding that is required will need to match those established welding standards that follow:

AWS D1.1 Structural Welding Code - Steel
AWS D14.3 Specification for Welding Earthmoving and Construction Equipment

These standards can be purchased from:

AWS Store
2671 West 81st Street
Miami, Florida 33016

www.awspubs.com

INSTALLER RESPONSIBILITIES

The installer is the first party to operate the complete machine. Installers are responsible for validation of the machine and that it operates properly. While Load King cycles the boom and main-frame assemblies at the factory, some additional work may be required once the machine is operational.

During PTO and pump installation it is critical that the installer makes sure they have the right rotation components to match the chassis. Incorrect rotation of the pump will result in little or no oil flow and will likely cause pump failure. For detailed information on proper PTO and pump installation see Section 2-5: PTO Selection, and Section 3-1: Hydraulic Pump Installation.

Once the boom has been cycled on the machine the boom assembly will require additional adjustments which include but are not limited to:

- extend and retract cable adjustments
- pad alignment adjustments

For machines with jib options: the jib must be adjusted on a completed machine after the boom has been cycled and the machine tested to ensure that all air is removed from the boom extend cylinder. This adjustment will include the jib brackets and boom cables to get the jib to pin to the boom head and stow properly. For detailed information on jib installation, see Section 3-28: Erecting the Jib, and Section 3-31: Stowing the Jib.

Relief valve pressures have been factory preset. The installer should do quick pressure checks on the machine. Section 5 has good information on pressures, both validation and adjustment.

If you have any questions with installation or need help please contact Load King at 855-548-2336.

CHASSIS REQUIREMENTS

Failure to meet any of the following chassis requirements will void Load King warranty

If there are any terms you are unfamiliar with in this manual, please refer to the chassis and crane nomenclature glossaries at the end of this installation manual.

	25-92 CDL (MIN VALUES)
Wheel Base (**WB**)*	250 inches (6350 mm)
Cab After (**CA**)	186 inches (4725 mm)
After Frame (**AF**)	114 in (2440mm)
Cab Height	70 in (1780mm)
RBM 180° Config**	2,800,000 lb-in (316,000 Nm)
RBM 360° Config**	2,800,000 lb-in (316,000 Nm)
Bare Chassis Weights	
Front	8000 lbs (3630 kg)
Rear	8000 lbs (3630 kg)
Suspension Capacities	
Front	18,000 lbs (8170 kg)
Rear	34,000 lbs (15,425 kg)
Horsepower Requirements	210 ft-lbs (285Nm) or 40hp (30kw) per 1000 rpm of PTO shaft speed

* Although CA is the determining factor as to whether or not the crane will fit on the chassis, a change in wheelbase will affect the overall package in two ways:
  1) Variations in the wheelbase of the truck will change the position of the center of gravity and thus the final stability of the machine, as well as axle loading.
  2) The GVWR of the truck may be affected, according to the federal bridge law.

** A 360° configuration requires that the entire truck frame from front bumper to rear outrigger have this RBM, a 180° configuration requires this RBM between the main and auxiliary outriggers.

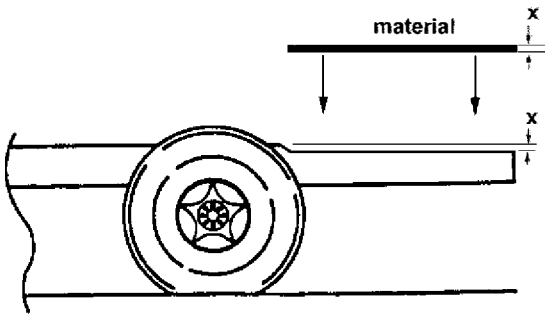
CHASSIS PREPARATION

Before the crane is mounted, Load King Cranes recommends that instal-lation personnel give the truck a thorough inspection to ensure that everything is up to expectations. We expect the installer/dealer to inspect the truck for the items listed in Steps 1 through 3. These checks will make sure the truck is what you ordered and is in condi-tion to accept the crane package. Trucks not in proper working order, or not to specification, make for unreliable and sometimes even dangerous crane operation.

1. With the truck on a flat, horizontal surface check the truck frame for twist. Both rear corners should be at the same level with no drooping. The height of both frame rails, directly behind the cab, should measure out the same as well. If problems with frame align-ment are encountered, the truck should be returned to the dealer for service before the crane is mounted.

2. Inspect the truck carefully for items such as fuel tanks, air tanks, and battery carriers that will have to be relocated.

3. The top surface of the frame rails must be flat from the cab to the rear end of the truck. If there is an offset in the frame, it must have material added to low spots to raise this area even with the rest of the frame. This material can usually be a 1/4in x 3in (6mm x 75mm) flat bar tacked to the truck frame. DO NOT weld on radius of frame.



PTO SELECTION

Class 8 trucks with manual transmissions normally have an SAE 8-bolt bottom opening PTO aperture located on the driver's side of the chassis. Class 8 trucks with automatic transmissions normally have a 10-bolt opening on either side of the chassis.

The crane pump is designed to rotate only when the truck is stationary with the transmission in neutral or park. Therefore, the PTO must have a shift function and NOT be constant mesh. PTO shift options for manual transmission include cable, direct air, electric over air, and clutch shift (hot shift). PTO shift options for automatic transmissions are limited to clutch shift.

Diesel engines in many late model trucks have increased crankshaft torsional vibration that is transmitted through the transmission and PTO and can cause fretting corrosion of the spline teeth on the pump input shaft. Initial application of grease, as well as regular greasing during use are the only deterrents to fretting corrosion.

IT IS HIGHLY RECOMMENDED THAT THE PTO BE SPECIFIED WITH AN EXTERNAL LUBE PROVISION (greese zerk) FOR THE OUTPUT SHAFT.

The maximum allowable pump speed for Load King 25-92 cranes is 2300 rpm.

Correct PTO % selection is critical for optimum crane performance and preventing pump damage from over speeding. PTO % (sometimes denoted as Engine %) can be summarized as the overall gear reduction between the engine crankshaft and the PTO output shaft.

The relationship can be expressed with the following formula:

$$\frac{\text{MAX PUMP SPEED X 100}}{\text{PTO \%}} = \text{ENGINE SPEED}$$

Class 8 trucks normally have engine horsepower and torque ratings in excess of the crane operating requirements, therefore, to reduce fuel consumption, engine wear and operational noise a PTO% in the range of 115% to 135% should be selected so that the maximum pump speed can be obtained by operating the engine in a range of 1700 rpm to 2000 rpm

Sample Calculation:

A Muncie PTO model number TG8S-U6809-C1KG is selected for installation on an Eaton/ Fuller model RT-8908LL transmission. Transmission/PTO combination provides a PTO % of 127%. Using the above formula and maximum allowable pump speed, the maximum engine rpm is calculated as follows:

$$\frac{\text{2300 rpm x 100}}{\text{127\%}} = \text{1811 rpm}$$

The crane throttle control must be adjusted so that the maximum engine rpm is limited to 1800 rpm.

The PTO torque rating requirement is based on the crane pump displacement and the operating pressures of the hydraulics circuits. The Load King 25-92 minimum PTO torque rating is 210 ft-lbs
(285Nm) or 40 HP (30kw) per 1000 rpm of PTO shaft speed.

PTO SELECTION

PTO ROTATION:

The rotation direction of a PTO is defined while looking at the output shaft of the PTO.

PUMP ROTATION:

The rotation direction of a pump is defined while looking at the input shaft of the pump.

EXAMPLE:

A PTO with an output shaft that rotates CW (clockwise) requires a CCW (counter-clock wise) pump.

When ordering your PTO, be sure to know the rotation direction of your pump, this will aid your PTO selection.

It is imperative that the rotation direction of the Load King supplied pump match the PTO out-put shaft rotation direction. Either CW or CCW rotation pumps are available form Load King .If the pump supplied with your crane is the wrong rotation direction, contact Load King customer ser-vice.

Do not attempt to rotate the pump in the wrong direction. Pump failure will result.

The Load King supplied pump has an SAE - B 2-Bolt mounting flange and a 7/8" (22.225mm) x 13 spline x 1.62in (41mm) long splined input shaft. Specify the PTO with this output mounting provision.

Before installing the PTO, test fit the pump into the PTO output mounting flange to verify that the pump housing seats on the PTO mount housing before the pump shaft bottoms in the PTO output shaft. Failure to check for adequate pump shaft end clearance may damage both pump and PTO.

The PTO manufacturer will supply installation instruction specific to the PTO model being installed. Follow these instructions and direct any installation questions to the PTO manufacturer's customer service department.

Note: Keep the protective covers on the pump inlet and outlets until the hoses are ready to be installed to keep dirt out!

CONTACT WITH A ROTATING DRIVELINE COMPONENT WILL CAUSE

SERIOUS INJURY OR DEATH

KEEP CLEAR OF ROTATING DRIVE SHAFT

NEVER WORK ON AN INSTALLED POWER TAKE-OFF WITH THE ENGINE RUNNING

TYPICAL STATE RESTRICTIONS

To ensure that the final, assembled configuration of the boom truck is road legal, it is important that the assembler understand the user's state laws as well as the weight distribution of the components to be assembled on the truck chassis. Before beginning installation, **AXLE WEIGHT CALCULATIONS** should be done to ensure the legality of your finished crane.

A note on NON-CDL truck requirements:

Under the Commercial Motor Vehicle Safety Act of 1986, Operators of vehicles having a GVWR of 26,001 lbs or more, must have a Commercial Driver's License (CDL). States may establish standards that are above and beyond the Federal Standards, check with you individual State for their exact CDL requirements

The following restrictions are typical of most states:

Maximum overall length: 40ft (12200mm)- Some states are less restrictive but 40ft (12200) should be the most restrictive overall length requirement.

Front Overhang 3ft (920mm)
Rear Overhang 4ft (1220mm)
3ft (920mm) and 4ft (1220mm) respectively should be the most restrictive front and rear overhang restrictions. State and local laws should still be consulted. Also keep in mind that in most states, the 3ft (920mm) and 4ft(1220mm) are taken within the overall length restriction.

Front Axle : Many states have a 20,000lb (9075kg) GAWR single axle restriction which also holds true for steer axles, but some states have a 12,000lb (5445kg) GAWR steer axle restriction. Check state and local laws.

Rear Tandem Axle: All states allow at least 34,000lb (15425kg) GAWR on the rear tandem axles.

Overall spacing between the front and rearmost axles could limit the truck to less than the sum of the tandem and front axle limits. Check with the Federal Bridge Formula for clarification.

It is recommended that the primary installer of this crane unit be familiar with the relationship between wheelbase and GVWR before a chassis is purchased, to ensure that the finished installation complies with local and national road transportation laws

CALCULATING AXLE LOADING

The following pages in this section contain information for your crane installation as well as directions, a worksheet, and examples to assist you in calculating the final axle loading of your installed crane.

Please read and understand the installation process before calculating these values.

The Installed Component Weights Reference Table at the end of this section includes the weights of the most common components used in your crane assembly. Reference the appropriate model number and utilize the information to fill out the **Axle Loading Calculations** worksheet to determine the axle loading of your crane before assembly begins.

AXLE LOADING CALCULATION NOTES

EXAMPLE CALCULATION:

A completed **Axle Loading Calculation Example** sheet is included for reference only. Use the included example as a reference if you experience any issues during your calculations. also included is a **C.G. Measurement Diagram**, use this to see how to measure component placement.

WEIGHT DISTRIBUTION:

By changing the location of components, you can change the axle loading of each axle. Keep in mind that when weight is shifted off of one axle, a proportional amount will be added to the other.

COMPONENT PLACEMENT:

It is important that you understand the placement of each component in relationship to the other components. Read and understand all of the assembly steps contained in this manual before beginning calculations.

NEGATIVE WEIGHTS:

For components installed in front of the front axle, you should see a negative weight for the rear axle, and for components behind the rear axle you should see a negative weight for the front axle.

SPARE LOADBLOCK OR OVERHAUL BALL:

If you plan on carrying either of these on the crane, you must enter its weight and stow position on the calculation sheet.

AXLE LOADING CALCULATION PROCEDURE

1. Bare chassis axle weights.

Weigh both the front and rear axles of the bare chassis to determine initial axle loading, enter these figures at the top of the **Axle Loading Calculation Worksheet.**

Note: a tandem axle is treated as one axle during calculations. Rear axle weight is measured with entire tandem on the scale in this case. Wheelbase is measured from center of front axle to center of rear tandem.

2. Determine location of subframe

You must pick a location for your subframe to begin calculations. This is expressed as distance from the truck cab. Refer to the **C.G. Measurement Diagram** for clarification. Typical Subframe locations are shown in the following table.

CAB TO SUBFRAME DISTANCE 25-92: 15"

Note: Truck frame cross member placement must also be taken into account before determining subframe placement. Using the subframe as a guide, determine if there will be any interference between truck frame cross members and the mainframe tiedowns. Adjust subframe location as necessary.

3. Measure front axle to subframe distance.

Every truck model has a different cab length, therefore you must measure the distance from the center of the front axle to the front of the subframe location you have just determined.

Note: if there is a component listed in the worksheet that is not part of your particular installation, ignore it and leave it out of any calculations you make.

4. Installed crane and jib CG locations:

These locations are calculated by adding the given CG location figures to the measured distance from the center of the front axle to the leading edge of the subframe.

CG Location (from fold-out table)
+ Front axle to Subframe distance (measured)
= Installed CG Location

Use the Installed CG Location figure to calculate the rear axle weight for each of these components. Refer to the **C.G. Measurement Diagram** for reference. This is also shown in the **Axle Loading Calculation Example**.

5. Measure component distances.

Using Section 3 of this manual as a guide, measure the distance from the center of the front axle to the proposed location for each component listed in the **Axle Loading Calculation-Worksheet** and enter the values into the worksheet per the **Axle Loading Calculation Example**.

Note: components that are located in front of the front axle should be calculated using a negative distance. This will result in a negative weight on the rear axle for that component. This is correct and the value should be sub-tracted when totaling the rear axle weight. You will also get a negative front axle weight for items located behind the rear axle

6. Enter component weights.

Locate your crane model on the **Component Weight Reference Table** and enter the component weights from this column into the **Axle Loading Calculation Worksheet** in the appropriate blank of the rear axle column.

AXLE LOADING CALCULATION PROCEDURE

7. Copy the component weights.

Copy the values you just entered to the appropriate blanks in the Front Axle column.

8. Calculate rear axle component weights.

Using the values entered in the Rear Axle column on the worksheet calculate the rear axle weight for each component and enter this into the rear axle Results column on the worksheet. Reference the **Axle Loading Calculation Example** for clarification

9. Copy the rear axle component weights.

Copy the values you just entered to the appropriate blanks in the Front Axle column.

10. Rear axle weight totals.

Add all of the weights from the rear axle Results column of the worksheet and enter this value in the Rear Axle Total at the bottom of the worksheet.

11. Calculate front axle component weights.

Using the figures already entered into the Front Axle column on the worksheet (component weight and component rear axle weight) calculate the front axle weight for each component and enter this into the Results column.

12. Front axle weight totals.

Add all of the weights from the front axle Results column of the worksheet and enter this value in the Front Axle Total at the bottom of the worksheet.

The final axle weight values should be compared to local, state, and federal laws to help ensure legality of your completed crane. Also, make sure the values match your own expectations. If you experience issues with your calculations, contact Load King service for assistance.

AXLE LOADING CALCULATION WORKSHEET

Crane Model Number _____

Component	Instructions	Rear Axle		Results	Front Axle		Results
Truck (Bare Chassis)	**Front Axle Weight** = front axle bare chassis weight (**customer supplied**) **Rear Axle Weight** = rear axle bare chassis weight (**customer supplied**)			Truck Rear Axle Weight _____ lbs			Truck Front Axle Weight _____ lbs
Crane	**Crane Weight** = appropriate model crane weight from chart **Installed Crane CG** = distance from center of front axle to front of subframe + applicable **Crane CG** distance from chart	Crane Weight X Installed Crane CG / Wheelbase	_____ X _____ / _____	Crane Rear Axle Weight _____ lbs	Crane Weight — Crane Rear Axle Weight	_____ — _____	Crane Front Axle Weight _____ lbs
Auxiliary Outrigger	**Auxiliary Outrigger Weight** = appropriate weight from chart **Auxiliary Outrigger CG** = distance from center of front axle to center of proposed auxiliary outrigger placement	Aux O/R Weight X Aux O/R CG / Wheelbase	_____ X _____ / _____	Aux O/R Rear Axle Weight _____ lbs	Aux O/R Weight — Aux O/R Rear Axle Weight	_____ — _____	Aux O/R Front Axle Weight _____ lbs
Hydraulic Tank	**Hydraulic Tank Weight** = appropriate weight from chart **Hydraulic Tank CG** = distance from center of front axle to center of hydraulic tank	Hyd Tank Weight X Hyd Tank CG / Wheelbase	_____ X _____ / _____	Hyd Tank Rear Axle Weight _____ lbs	Hyd Tank Weight — Hyd Tank Rear Axle Weight	_____ — _____	Hyd Tank Front Axle Weight _____ lbs
Overhaul Ball	**Overhaul Ball Weight** = appropriate weight from chart **Overhaul Ball CG** = distance from center of front axle to center of overhaul ball when in stow position	Ball Weight X Ball CG / Wheelbase	_____ X _____ / _____	Ball Rear Axle Weight _____ lbs	Ball Weight — Ball Rear Axle Weight	_____ — _____	Ball Front Axle Weight _____ lbs
Load Block	**Load Block Weight** = appropriate weight from chart **Load Block CG** = distance from center of front axle to center of Load Block when in stow position	Block Weight X Block CG / Wheelbase	_____ X _____ / _____	Block Rear Axle Weight _____ lbs	Block Weight — Block Rear Axle Weight	_____ — _____	Block Front Axle Weight _____ lbs
Jib	**Jib Weight** = appropriate weight from chart **Installed Jib CG** = distance from center of front axle to front of subframe + applicable **Jib CG** distance from chart	Jib Weight X Installed Jib CG / Wheelbase	_____ X _____ / _____	Jib Rear Axle Weight _____ lbs	Jib Weight — Jib Rear Axle Weight	_____ — _____	Jib Front Axle Weight _____ lbs
Flatbed	**Flatbed Weight** = appropriate weight from chart **Flatbed CG** = distance from center of front axle to center of the flatbed	Flatbed Weight X Flatbed CG / Wheelbase	_____ X _____ / _____	Flatbed Rear Axle Weight _____ lbs	Flatbed Weight — Flatbed Rear Axle Weight	_____ — _____	Flatbed Front Axle Weight _____ lbs
Front Bumper Outrigger	**FBO Weight** = appropriate weight from chart **FBO CG** = distance from center of front axle to the center of front jack (in most cases the front jack is mounted 12 inches in front of radiator)	FBO Weight X FBO CG / Wheelbase	_____ X _____ / _____	FBO Rear Axle Weight _____ lbs	FBO Weight — FBO Rear Axle Weight	_____ — _____	FBO Front Axle Weight _____ lbs
Pump and PTO	**PumpPTO Weight** = appropriate weight from chart **PumpPTO CG** = distance from center of front axle to pump mounting flange	PumpPTO Weight X PumpPTO CG / Wheelbase	_____ X _____ / _____	PumpPTO Rear Axle Weight _____ lbs	PumpPTO Weight — PumpPTO Rear Axle Weight	_____ — _____	PumpPTO Front Axle Weight _____ lbs
Toolbox	**Toolbox Weight** = appropriate weight from chart **Toolbox CG** = distance from center of front axle to pump mounting flange	Toolbox Weight X Toolbox CG / Wheelbase	_____ X _____ / _____	Toolbox Rear Axle Weight _____ lbs	Toolbox Weight — Toolbox Rear Axle Weight	_____ — _____	Toolbox Front Axle Weight _____ lbs
		Rear Axle Total _____ lbs			**Front Axle Total** _____ lbs		

AXLE LOADING CALCULATION EXAMPLE

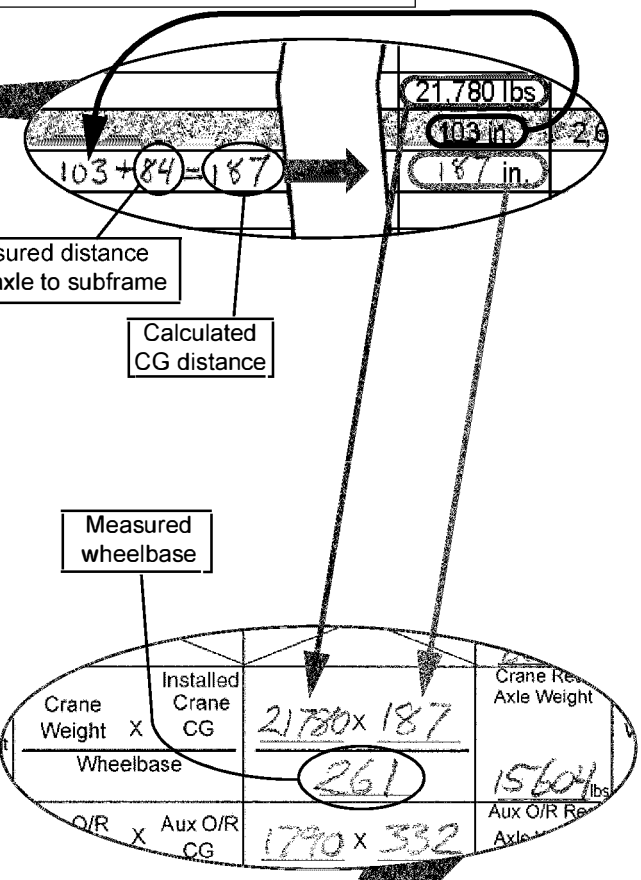
Excerpt from Component Weight Reference Table

Component Weight Reference Table

		BT4792	
Crane *			
	Weight	21,780 lbs	9,888 kg
	Crane CG	103 in.	2,616 mm
	Installed Crane CG†† 103+84=187	187 in.	mm
Auxiliary Outrigger		1,790 lbs	813 kg
Hydraulic Tank			
	70 Gallon	N/A	N/A
	90 Gallon	650 lbs	295 kg
Overhaul Ball			
	Swivel (Standard Rope)	166 lbs	75 kg
	Non-Swivel (Rotation Resistant Rope)	172 lbs	78 kg
Load Block			
	1 Sheave	179 lbs	81 kg
	2 Sheaves	202 lbs	92 kg
	4 Sheaves	N/A	N/A
Jib (One-piece length/Two-piece length)		26/44 ft.	7.9/13.4 m
	One-piece	970 lbs	440 kg
	One-piece CG†	198 in.	5,029 mm
	Installed One-piece CG	in.	mm
	Two-Piece	1,300 lbs	590 kg
	Two-piece CG	194 in.	4,940 mm
	Installed Two-piece CG††	in.	mm
Flatbed (*length in ft.*)		21 ft.	6.4 m
	Heavy Duty Steel	2,053 lbs	957 kg
	Heavy Duty Wood	1,472 lbs	668 kg
	Heavy Duty Steel over Wood	3,301 lbs	1,498 kg
	Super Duty Steel	2,917 lbs	1,324 kg
	Super Duty Wood	2,288 lbs	1,038 kg
	Super Duty Steel over Wood	3,315 lbs	1,505 kg
Front Bumper Outrigger		400 lbs	182 kg
Pump and PTO		110 lbs	50 kg
Toolbox			
	Toolbox - 36" Under Bed	85 lbs	39 kg
	Toolbox - Crossover (BT28SV Only)	N/A	N/A

N/A Not Available
* Crane weight and CG is comprised of Subframe, Main
** For RS models the flatbed is factored into the crane we
† **CG locations** are measured from the front of the subframe
For RS models the CG locations are measu
†† ***Installed* CG locations** are found by taking into account

FOR EXAMPLE ONLY



AXLE WEIGHT CALCULATIONS

Crane Model Number BT4792

Component	Instructions	Rear Axle		Results	Front Axle		Results
Truck (Bare Chassis)	Front Axle Weight = front axle bare chassis weight (customer supplied) Rear Axle Weight = rear axle bare chassis weight (customer supplied)			Truck Rear Axle Weight 5620 lbs			Truck Front Axle Weight 5620 lbs
Crane	Crane Weight = appropriate model crane weight from chart Installed Crane CG = distance from center of front axle to front of subframe + applicable Crane CG distance from chart	Crane Weight X Installed Crane CG / Wheelbase	21780 x 187 / 261	Crane Rear Axle Weight 15604 lbs	Crane Weight − Crane Rear Axle Weight	21780 − 15604	Crane Front Axle Weight 6176 lbs
Auxiliary Outrigger	Auxiliary Outrigger Weight = appropriate weight from chart Auxiliary Outrigger CG = distance from center of front axle to center of proposed auxiliary outrigger placement	Aux O/R Weight X Aux O/R CG / Wheelbase	1790 x 332 / 261	Aux O/R Rear Axle Weight 2276 lbs	Aux O/R Weight − Aux O/R Rear Axle Weight	1790 − 2276	Aux O/R Front Axle Weight −486 lbs
Hydraulic Tank	Hydraulic Tank Weight = appropriate weight from chart Hydraulic Tank CG = distance from center of front axle to center of hydraulic tank	Hyd Tank Weight X Hyd Tank CG / Wheelbase	650 x 171.5 / 261	Hyd Tank Rear Axle Weight 427 lbs	Hyd Tank Weight − Hyd Tank Rear Axle Weight	650 − 427	Hyd Tank Front Axle Weight 223 lbs
Overhaul Ball	Overhaul Ball Weight = appropriate weight from chart Overhaul Ball CG = distance from center of front axle to center of overhaul ball when in stow position	Ball Weight X Ball CG / Wheelbase	166 x 403 / 261	Ball Rear Axle Weight 257 lbs	Ball Weight − Ball Rear Axle Weight	166 − 257	Ball Front Axle Weight −91 lbs
Load Block	Load Block Weight = appropriate weight from chart Load Block CG = distance from center of front axle to center of Load Block when in stow position	Block Weight X Block CG / Wheelbase	323 x 170 / 261	Block Rear Axle Weight 132 lbs	Block Weight − Block Rear Axle Weight	202 − 132	Block Front Axle Weight 71 lbs
Jib	Jib Weight = appropriate weight from chart Installed Jib CG = distance from center of front axle to front of subframe + applicable Jib CG distance from chart	Jib Weight X Installed Jib CG / Wheelbase	970 x 282 / 261	Jib Rear Axle Weight 1048 lbs	Jib Weight − Jib Rear Axle Weight	970 − 1048	Jib Front Axle Weight −78 lbs
Flatbed	Flatbed Weight = appropriate weight from chart Flatbed CG = distance from center of front axle to center of the flatbed	Flatbed Weight X Flatbed CG / Wheelbase	1472 x 252 / 261	Flatbed Rear Axle Weight 1426 lbs	Flatbed Weight − Flatbed Rear Axle Weight	1472 − 1426	Flatbed Front Axle Weight 46 lbs
Front Bumper Outrigger	FBO Weight = appropriate weight from chart FBO CG = distance from center of front axle to the center of front jack (in most cases the front jack is mounted 12 inches in front of radiator)	FBO Weight X FBO CG / Wheelbase	400 x −42 / 261	FBO Rear Axle Weight −65 lbs	FBO Weight − FBO Rear Axle Weight	400 − (−63)	FBO Front Axle Weight 463 lbs
Pump and PTO	PumpPTO Weight = appropriate weight from chart PumpPTO CG = distance from center of front axle to pump mounting flange	PumpPTO Weight X PumpPTO CG / Wheelbase	110 x 14 / 261	PumpPTO Rear Axle Weight 5.8 lbs	PumpPTO Weight − PumpPTO Rear Axle Weight	110 − 5.8	PumpPTO Front Axle Weight 104 lbs
Toolbox	Toolbox weight=appropriate weight from chart Toolbox CG = distance from center of front axle to center of toolbox	Toolbox Weight X Toolbox CG / Wheelbase	85 x 171.5 / 261	Toolbox Rear Axle Weight 55.8 lbs	Toolbox Weight − Toolbox Rear Axle Weight	85 − 55.8	Toolbox Front Axle Weight 30 lbs
		Rear Axle Total 29717 lbs		ADD RESULTS	Front Axle Total 14738 lbs		

FOR EXAMPLE ONLY

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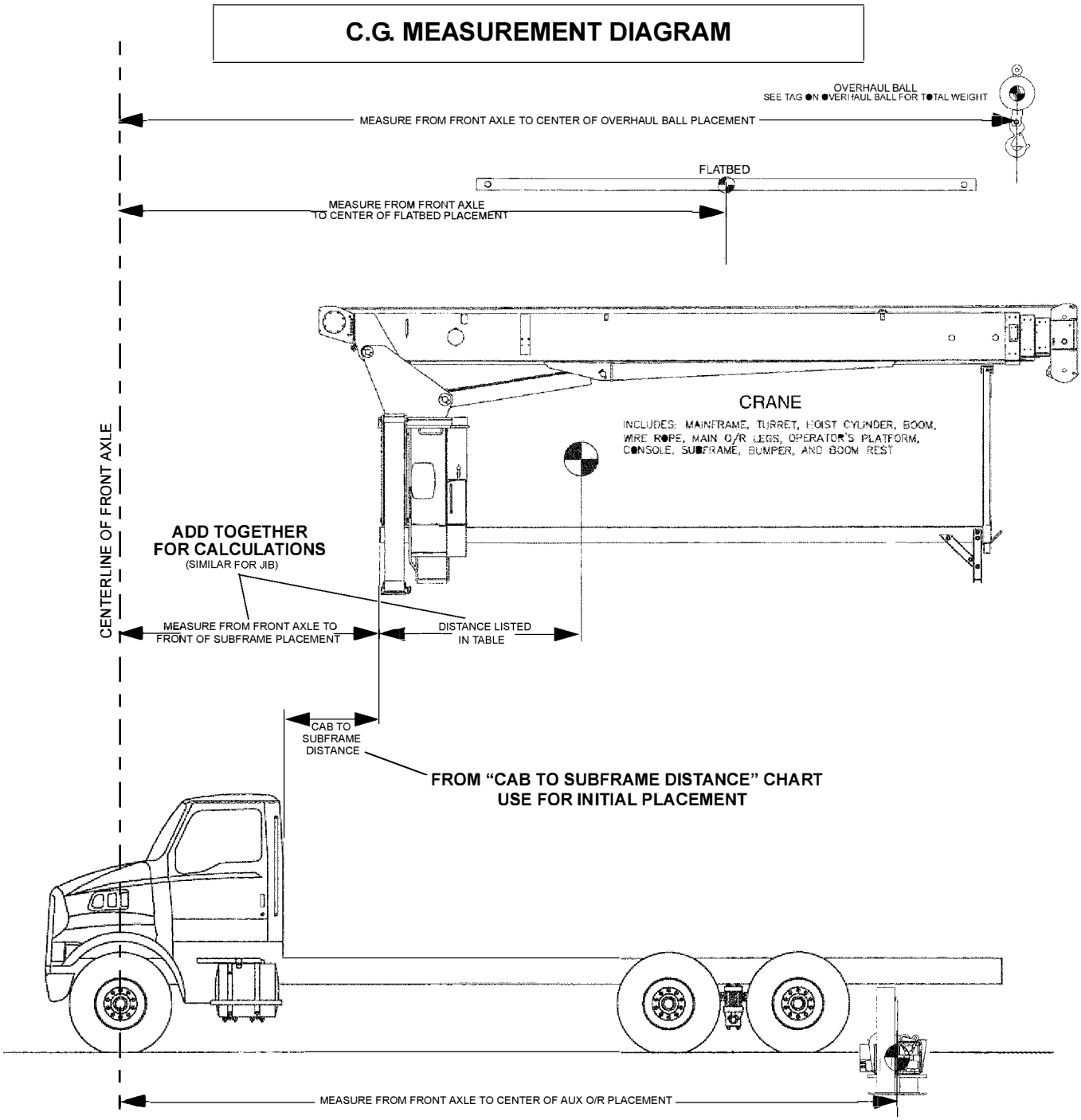
INSTALLATION REQUIREMENTS

C.G. MEASUREMENT DIAGRAM



All measurements made from centerline of front axle.

COMPONENT WEIGHT REFERENCE TABLE

Component Weight Reference Table

		BT2047		BT2057		BT2857		BT3063		BT3470		TM3851		BT4792/BT5092		BT7077		BT70100		RS70100	
Crane *																					
	Weight	10,700 lbs	4,858 kg	11,250 lbs	5,108 kg	10,600 lbs	4,812 kg	14,050 lbs	6,379 kg	15,000 lbs	6,810 kg	12,880 lbs	5,848 kg	21,780 lbs	9,888 kg	24,350 lbs	11,055 kg	25,600 lbs	11,622 kg	29,200 lbs	13,257 kg
	Crane CG†	84 in.	628 mm	99 in.	1,753 mm	75 in.	1,905 mm	75 in.	1,905 mm	83 in.	2,108 mm	79 in.	2,007 mm	109 in.	2,616 mm	113 in.	2,845 mm	120 in.	3,048 mm	72 in.	1,829 mm
	Installed Crane CG††	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
Auxiliary Outrigger		890 lbs	404 kg	890 lbs	404 kg	N/A	N/A	890 lbs	404 kg	890 lbs	404 kg	800 lbs	363 kg	1,790 lbs	813 kg	1,790 lbs	813 kg	1,790 lbs	813 kg	N/A	N/A
Hydraulic Tank																					
	70 Gallon	500 lbs	227 kg	500 lbs	227 kg	500 lbs	227 kg	500 lbs	227 kg	500 lbs	227 kg	500 lbs	227 kg	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	90 Gallon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	860 lbs	295 kg	860 lbs	295 kg	860 lbs	295 kg	650 lbs	295 kg
Overhaul Ball																					
	Swivel (Standard Rope)	108 lbs	49 kg	108 lbs	49 kg	108 lbs	49 kg	108 lbs	49 kg	108 lbs	49 kg	108 lbs	49 kg	166 lbs	75 kg	239 lbs	109 kg	239 lbs	109 kg	239 lbs	109 kg
	Non-Swivel (Rotation Resistant Rope)	98 lbs	44 kg	98	44 kg	98 lbs	44 kg	98 lbs	44 kg	98	44 kg	98 lbs	44 kg	172 lbs	78 kg	240 lbs	109 kg	240 lbs	109 kg	260 lbs	109 kg
Load Block																					
	1 Sheave	130 lbs	59 kg	130 lbs	59 kg	130 lbs	59 kg	179 lbs	81 kg	179 lbs	81 kg	179 lbs	81 kg	179 lbs	81 kg	200 lbs	91 kg	200 lbs	91 kg	200 lbs	91 kg
	2 Sheaves	170 lbs	77 kg	170 lbs	77 kg	170 lbs	77 kg	203 lbs	92 kg	203	92 kg	203 lbs	92 kg	203 lbs	92 kg	299 lbs	136 kg	299 lbs	136 kg	298 lbs	136 kg
	4 Sheaves	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	690 lbs	313 kg	690 lbs	313 kg	690 lbs	313 kg
Jib (One-piece length/Two-piece length)		18/30 ft.	5.5/9.1 m	22/36 ft.	6.7/11.0 m	22/36 ft.	6.7/11.0 m	24/40 ft.	7.3/12.2 m	24/40 ft.	7.3/12.2 m	N/A	N/A	26/44 ft.	7.9/13.4 m	31/55 ft.	9.5/16.8 m	31/55 ft.	9.5/16.8 m	31/55 ft.	9.5/16.8 m
	One-piece	400 lbs	182 kg	490 lbs	223 kg	490 lbs	222 kg	560 lbs	254 kg	560 lbs	254 kg	N/A	N/A	970 lbs	440 kg	1,290 lbs	585 kg	1,290 lbs	585 kg	1,290 lbs	585 kg
	One-piece CG†	139 in.	3,531 mm	155 in.	3,937 mm	155 in.	3,937 mm	198 in.	5,055 mm	198 in.	5,055 mm	N/A	N/A	198 in.	5,029 mm	207 in.	5,245 mm	207 in.	5,245 mm	145 in.	3,683 mm
	Installed One-piece CG††	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	N/A	N/A	in.	mm	in.	mm	in.	mm	in.	mm
	Two-Piece	700 lbs	318 kg	805 lbs	365 kg	805 lbs	365 kg	850 lbs	386 kg	850 lbs	386 kg	N/A	N/A	1,300 lbs	590 kg	1,950 lbs	885 kg	1,950 lbs	885 kg	1,950 lbs	885 kg
	Two-piece CG†	134 in.	3,404 mm	150 in.	3,797 mm	150 in.	3,797 mm	193 in.	4,902 mm	193 in.	4,902 mm	N/A	N/A	195 in.	4,946 mm	201 in.	5,105 mm	201 in.	5,105 mm	140 in.	3,556 mm
	Installed Two-piece CG††	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	N/A	N/A	in.	mm	in.	mm	in.	mm	in.	mm
Flatbed (*length in ft.*)		16 ft.	4.9 m	16 ft.	4.9 m	16 ft.	4.9 m	18 ft.	5.5 m	20 ft.	6.1 m	N/A	N/A	21 ft.	6.4 m	22 ft.	6.7 m	22 ft.	6.7 m		
	Heavy Duty Steel **	1,584 lbs	719 kg	1,584 lbs	719 kg	1,584 lbs	719 kg	1,773 lbs	805 kg	1,966 lbs	892 kg	N/A	N/A	2,663 lbs	1,208 kg	2,145 lbs	973 kg	2,166 lbs	978 kg	**	**
	Heavy Duty Wood	1,115 lbs	506 kg	1,115 lbs	506 kg	1,115 lbs	506 kg	1,246 lbs	566 kg	1,402 lbs	637 kg	N/A	N/A	1,472 lbs	668 kg	1,533 lbs	696 kg	1,533 lbs	696 kg	**	**
	Heavy Duty Steel over Wood	1,899 lbs	862 kg	1,899 lbs	862 kg	1,899 lbs	862 kg	2,162 lbs	984 kg	2,382 lbs	081 kg	N/A	N/A	2,501 lbs	1,135 kg	2,611 lbs	1,185 kg	2,611 lbs	1,185 kg	**	**
	Super Duty Steel	2,268 lbs	1,030 kg	2,268 lbs	1,030 kg	2,268 lbs	1,030 kg	2,521 lbs	1,145 kg	2,778 lbs	1,261 kg	N/A	N/A	2,917 lbs	1,324 kg	3,020 lbs	1,371 kg	3,020 lbs	1,371 kg	**	**
	Super Duty Wood	1,783 lbs	809 kg	1,783 lbs	809 kg	1,783 lbs	809 kg	1,966 lbs	892 kg	2,177 lbs	988 kg	N/A	N/A	2,356 lbs	1,069 kg	2,370 lbs	1,075 kg	2,370 lbs	1,075 kg	**	**
	Super Duty Steel over Wood	2,567 lbs	1,165 kg	2,567 lbs	1,165 kg	2,567 lbs	1,165 kg	2,862 lbs	1,299 kg	3,157 lbs	1,433 kg	N/A	N/A	3,316 lbs	1,506 kg	3,460 lbs	1,571 kg	3,460 lbs	1,571 kg	**	**
Front Bumper Outrigger		400 lbs	182 kg	400 lbs	182 kg	400 lbs	182 kg	400 lbs	182 kg	400 lbs	182 kg	400 lbs	182 kg	400 lbs	182 kg	400 lbs	182 kg	400 lbs	182 kg	400 lbs	182 kg
Pump and PTO		110 lbs	50 kg	110 lbs	50 kg	110 lbs	50 kg	110 lbs	50 kg	110 lbs	50 kg	110 lbs	50 kg	110 lbs	50 kg	110 lbs	50 kg	110 lbs	50 kg	110 lbs	50 kg
Toolbox																					
	Toolbox - 36" Under Bed	85 lbs	39 kg	85 lbs	39 kg	85 lbs	39 kg	85 lbs	39 kg	85 lbs	39 kg	85 lbs	39 kg	85 lbs	39 kg	85 lbs	39 kg	85 lbs	39 kg	85 lbs	39 kg
	Toolbox - Crossbox (BT2857 Only)	N/A	N/A	N/A	N/A	185 lbs	84 kg	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A Not Available

* Crane weight and CG is comprised of Subframe, Mainframe, Turret, Main O/R legs, Boom, and Wire Rope

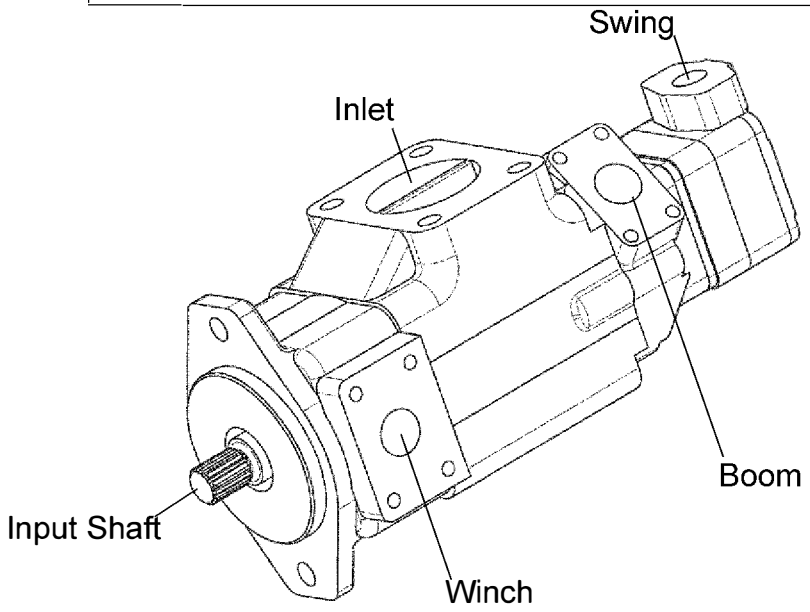
** For RS models the flatbed is factored into the crane weight

† **CG locations** are figured from the front of the subframe for BT models (positive is to the rear of the chassis and negative is toward the front)
For RS models the CG locations are measured from the centerline of rotation (positive is to the front of the vehicle and negative is toward the rear)

†† ***Installed* CG locations** are found by taking into account the distance from the front axle to the subframe

All Assembly prints are located in Section 8 of this manual. Use this collection of prints as a reference for proper assembly of your crane.

HYDRAULIC PUMP INSTALLATION



Pump Port descriptions:

Inlet Port -	Largest Port located on the largest section of the pump (SKF 40)
Winch Port-	Port closest to pump input shaft (SKF 16)
Boom Port -	Second output Port from Input Shaft (SKF12)
Swing Port -	Last output port from Input Shaft (#8 O-ring)

Pump preparation.

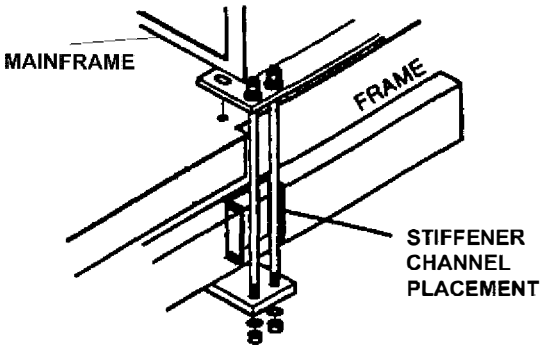
1. Remove port covers and loosely install one half of each split flange clamp on each port. Fully Install the 90° #8 elbow in the last section of the pump facing away from the body of the pump.

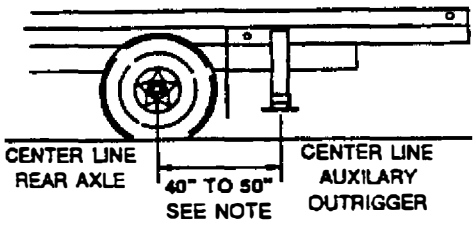
Pump Installation.

1. Lift pump into place, aligning pump input shaft and PTO output shaft. Check Alignment and full seating of input shaft before securing with the supplied bolts, torqued according to the “Torque Chart for Installation Hardware” in section 6.

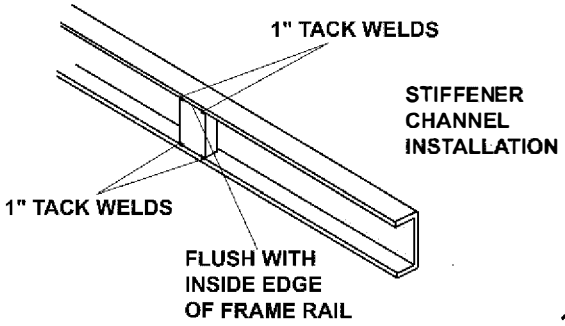
2. Using hoses from kit, attach hoses to corresponding pump ports. These hoses can be left hanging from pump until connection to valve bodies at a later step.

FRAME STIFFENER INSTALLATION



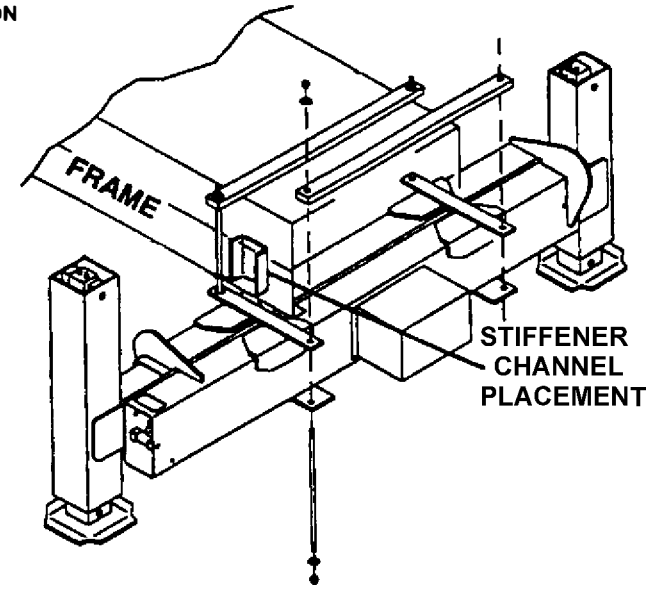


NOTE:
CENTERLINE OF AUXILARY OUTRIGGERS TO BE LOCATED AND MOUNTED AS CLOSE TO 40" BEHIND CENTER LINE OF REAR AXLE AS POSSIBLE. LOCATION OF OUTRIGGERS WILL BE LIMITED BY LOCATION OF CROSS MEMBERS IN FLATBED.



Frame stiffeners must be of the following dimensions, and be cut to length to fit snuggly into the trucks frame rails.

6” (152mm) width
2 5/32” (55mm) deep
7/16” (11mm) material

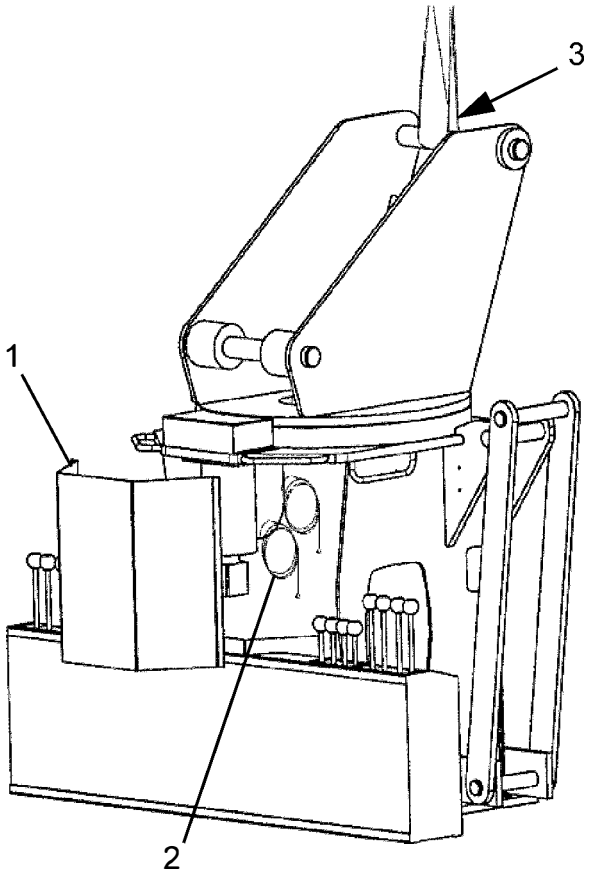


Using the subframe and flatbed as a guide, carefully layout the truck frame and determine location of the tiedown bolts for the mainframe and auxiliary outriggers. This will detemine stiffener channel placement. Stiffener channel placement for auxiliary outrigger is determined by measuring 40-50 inches (1000-1270mm) from the the **rearmost axle** to the center of the auxiliary outrigger mount points.

The frame stiffener channels must be centered under the mainframe and auxiliary outrigger tiedown locations.
Location of flatbed cross members must also be taken into account when installing auxiliary outriggers. Measure to check that flatbed cross members will clear auxiliary outrigger clamp plate.

The stiffeners must be physically driven into the frame until the surface is flush with the inside edge of the frame rail. These channels should have 1” tack welds in each corner, on the inside edge of the frame rail. Do not weld on radius of frame.

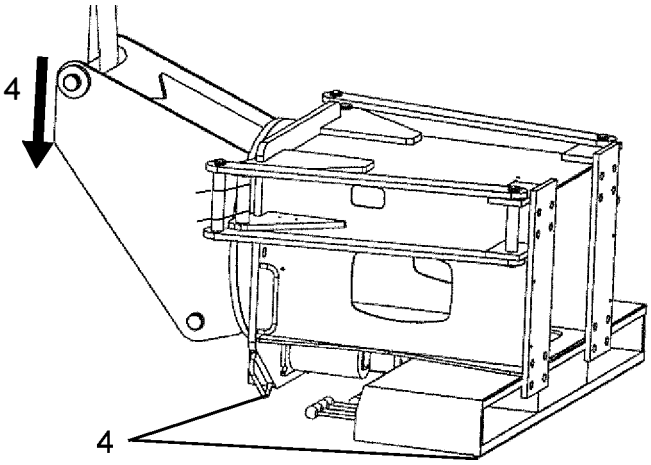
MAIN OUTRIGGER LEG INSTALLATION



1 Remove swing drive cover from mainframe assembly.

2. Feed RCI display cable from inside mainframe to top of console.

3. Attach hoist sling to turret boom pivot pin making sure to center the sling to balance the mainframe assembly.



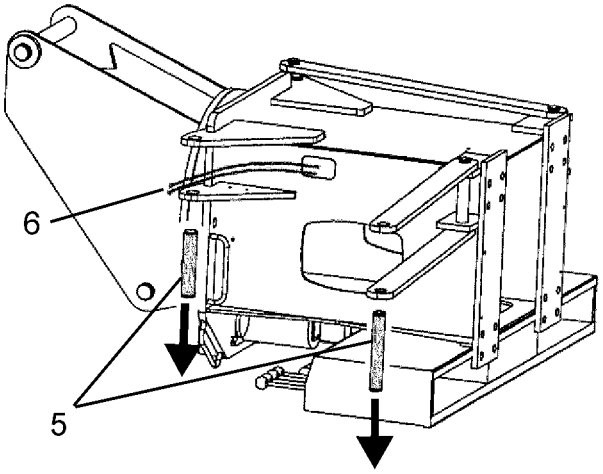
4. Lower mainframe assembly (while making sure cables and hoses do not get pinched) until it rests on the console and mainframe grab handles.

Note: It may be helpful to use some type of heavy duty padding under the console to minimize damage to the paint during this procedure.

MAIN OUTRIGGER LEG INSTALLATION

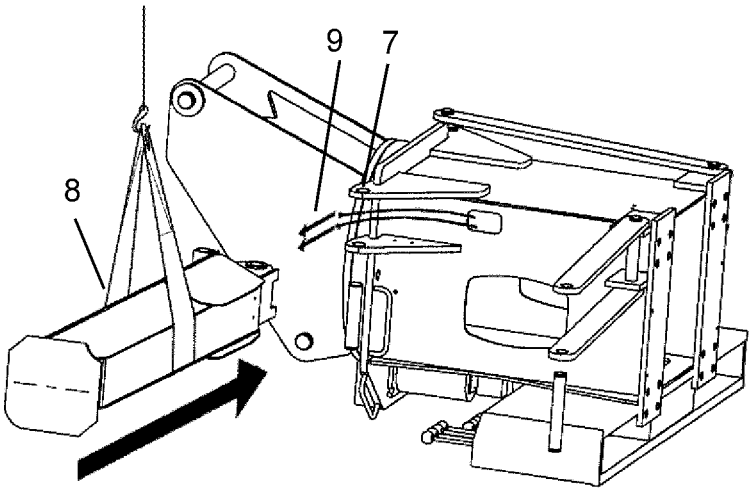
5. Remove snap rings from outrigger pins. Remove outrigger-link pins from links, as well as outrigger pivot pin from mainframe. It may be necessary to remove retaining zip ties by cutting them. Discard zip ties. (plywood links may also be used in this position, remove and discard)

6. Uncap outrigger hoses on mainframe, they contain hydraulic fluid, be sure to catch this as they drain and protect the exposed ends. Note that the hoses are marked with R and E, for Retract and Extend.

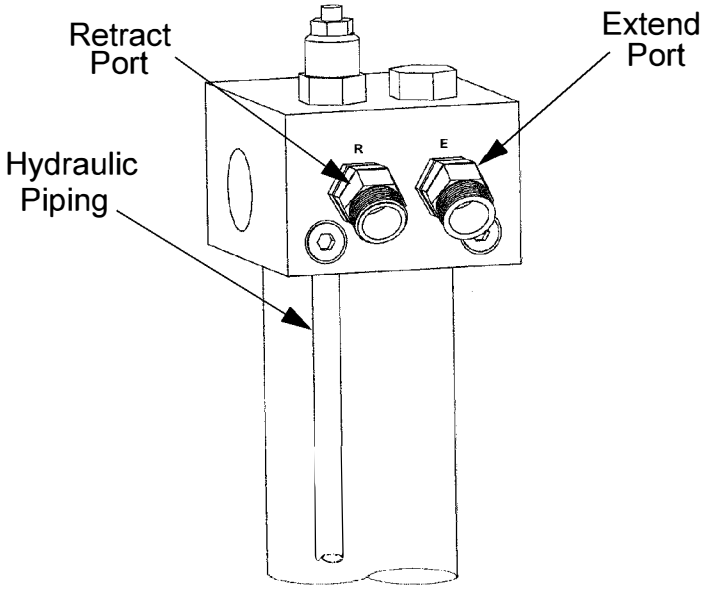


7. Check pivot pin bores for paint residue, this will need to be removed before inserting the pins.

8. Using a single, wide lift strap, hoist the outrigger leg into position, paying attention to the orientation of the leg and make sure it balances level.



9. After removing the hydraulic caps from the top of the cylinder, immediatly connect the Extend and Retract hoses to the proper ports on the outrigger cylinder. These ports should be marked with a E and R, if these are not visible, the port closest to the hydraulic piping on the side of the cylinder is the retract port.

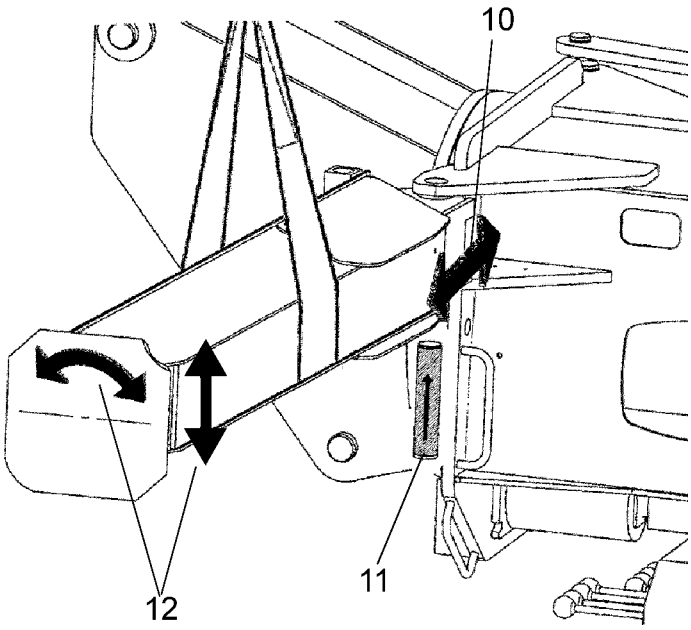


MAIN OUTRIGGER LEG INSTALLATION

10. Slowly swing the leg into place, aligning the upper pivot pin holes of the leg and mainframe. With the leg at 90 degrees to the mainframe, align the pivot pin holes of the mainframe, leg and hydraulic cylinder cap. This may require the use of a pry bar.

11. Insert the pivot pin from the bottom side, this helps when aligning and driving the pin into position. Driving the pin may require a large, soft blow hammer.

12. It can sometimes be difficult to align the pin bores during insertion. Use the hoist to adjust the vertical alignment (continued use of a pry bar may also be required). Make sure to avoid scarring the pivot pin or pivot pin bores.



13. Once the pin is fully inserted and the snap ring groove is clear of the hole, the hoist can be lowered in order to bind the pin in place, at this point reinstall the snap ring on the pivot pin.

14. Once the snap ring is in place, it should be possible to completely remove the hoist from the outrigger leg (see caution).

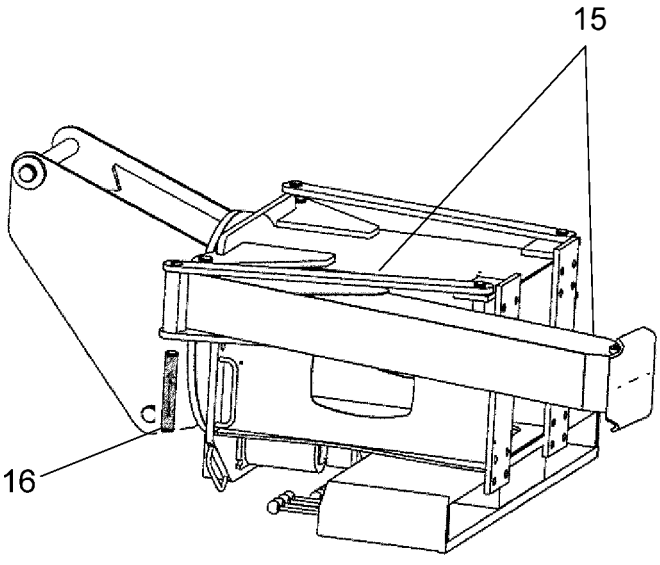
Be very careful about tipping the assembly at this point, it is possible to do significant damage to the unit in this position, and physical harm is possible.

15. The outrigger leg needs to be pivoted back towards the mainframe assembly at this point and the outrigger links should be brought into position. By pivoting both the leg and the links, align the bores in the outer leg assembly and the outer end of the links.

16. Insert the pin from the bottom. Use of a large soft blow hammer may be needed.

17. Install the snap ring to secure the pin.

18. Repeat steps 5 through 17 for the remaining outrigger leg.



WIRING AND HOSE ROUTING

Before placing the subframe on the truck's frame rails, it is recommended that you decide on placement of the six auxiliary outrigger hoses and wiring. There are typically two methods of routing these:

1. Draped across the truck frame cross members. Using large cable ties to secure them loosely to each cross member.

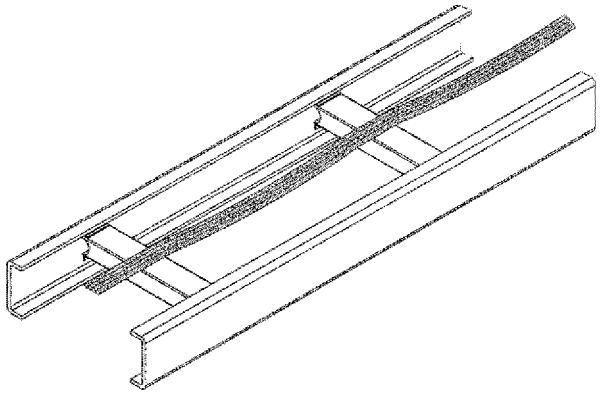
2. Routed inside the frame rails and through each cross member.

The preferred method will depend on the type of cross members on the chassis, and clearance between the cross members and the top of the frame rails.

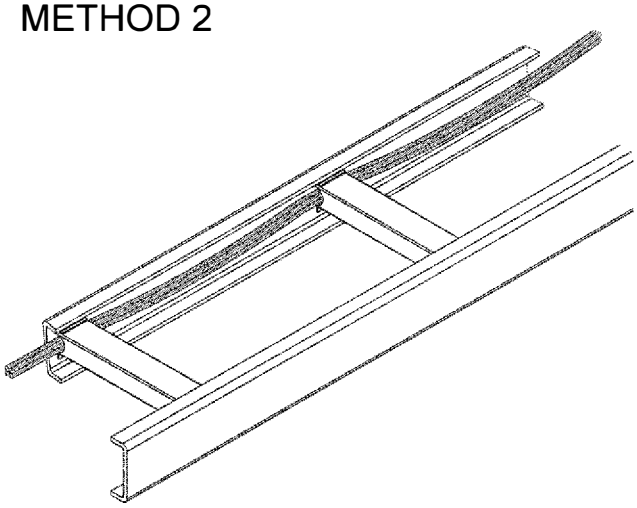
These hoses may need to be marked on both ends to make identifying easier during connection

If the second method is used, there is a possibility of pinching the hoses or wiring between the subframe and cross members. The clearance between the truck frame cross members and the top of the frame rails must be greater than the diameter of the largest hose.

METHOD 1



METHOD 2



CRANE INSTALLATION

Mainframe and subframe are very heavy components (7000lbs and 3000lbs respectively) and caution should be used as well as proper lifting devices.

1. Assemble the mounting tiedown bolts for each corner of the mainframe and for the auxiliary outriggers. Assembly includes: tiedowns, hardened flat washers, jam nuts, and lock nuts. Drive the lock nuts onto the tiedown bolts and lock into place with the jam nut on top of the lock nut.

An acceptable method of getting the lock nuts on the bolt is to clamp the bolt in a vise and turn the nut with an impact wrench.

Note: Make sure the threads are free of contamination and damage, and are properly lubricated, or galling may occur.

2. When all mounting preparation is complete, the subframe should be placed on the truck frame as determined by your frame stiffener placement.

3. Install the auxiliary outriggers as illustrated on the Aux. Outrigger Install drawing. Make sure to center on the frame stiffeners. The outrigger assembly can be lifted into place with two lifting straps, one on either side of the subframe. The auxiliary outrigger clamp plates are installed over the top of the subframe. Using an impact wrench, snug the tiedown bolts evenly.

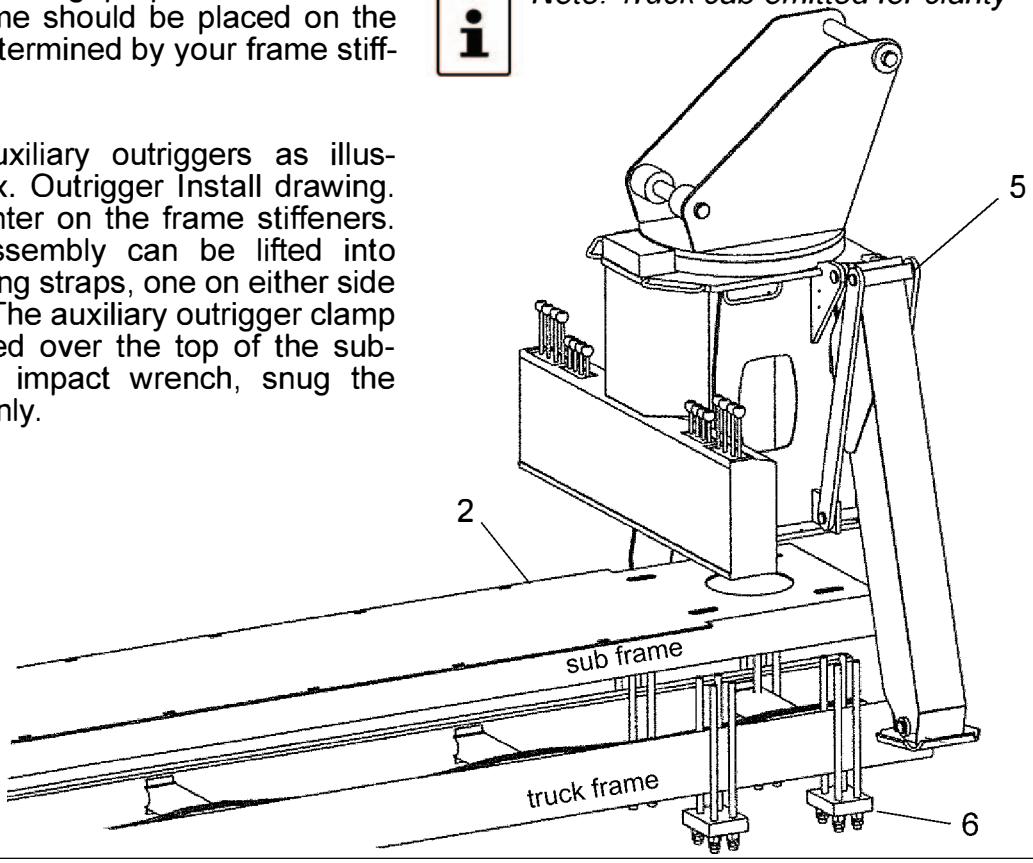
4. Connect the auxiliary outrigger hoses to the vertical outrigger jacks and the electric selector valve. These typically consist of 3/8" hoses for the jacks, 3/8" for the selector valve supply and 1/2" for the selector valve return.

Keep track of each hose and it's connection to be sure of connecting them correcty during mainframe installation

5. Bring in mainframe and place in position on subframe as per the M/F Turret installation drawing. The use of alignment pins in the tiedown holes will facilitate mainframe placement and hole alignment.

6. Insert the tiedown bolts into the clamp bars, and insert the assembly , from the bottom of the truck frame, and through the mainframe mounting holes as shown below. Thread a lock nut onto each tiedown bolt. When all four clamp bar assemblies are installed, snug up the tiedown nuts.

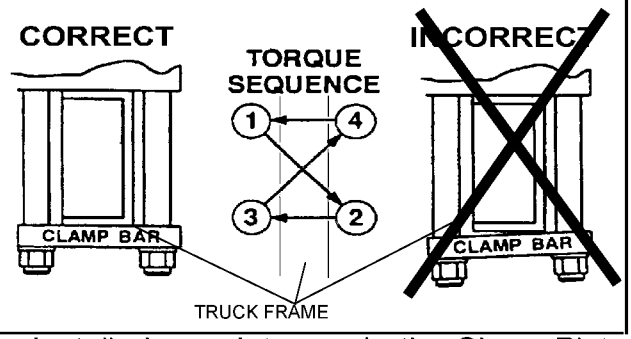
Note: Truck cab omitted for clarity



CRANE INSTALLATION

7. Recheck to ensure that the subframe and mainframe are still positioned correctly on the centerline of the chassis. Torque all mounting tiedown bolts as per the Torque Values chart in Section 6. It is best to torque in an X pattern alternating from inner-front corner to outer-rear corner, etc.

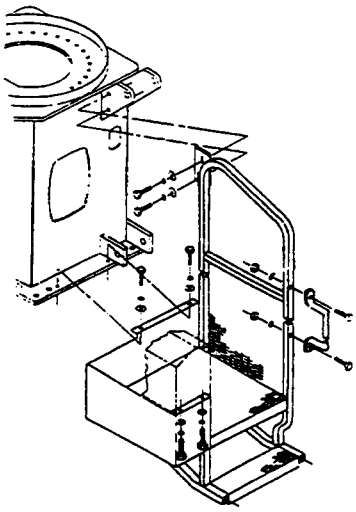
The clamp bars must be kept level and centered on the truck frame. If this is not done, it may weaken the tiedown bolts or cause failure.



8. Install shear plates as in the Shear Plate Installation drawing.

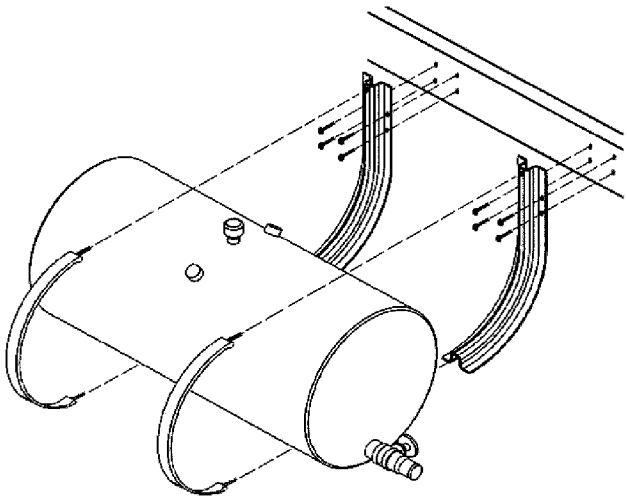
9. Install outrigger warning horn and lighting as shown in the Subframe Installation drawing.

10. Install operator's platform as shown in Platform Installation drawing.



11. Install filter head assembly to console as per the Hydraulic Reservoir Installation drawing.

12. Drill mounting holes and install Hydraulic Reservoir as per drawing making sure to provide clearance for the filter head assembly as well as rear tire clearance of 14 inches (355mm) or greater.



13. Install hydraulic plumbing as shown in drawings and hydraulic schematics. This includes the pump supply and return lines, as well as the aux O/R hoses.

Fill hydraulic tank with a premium grade anti-wear hydraulic oil, check with your oil supplier for suggestions on ISO rating suitable for your climate (factory installed Load King boom trucks are filled with an ISO 32).

System capacity for a 70 gallon tank will be approximately 100 gallons. Capacity for a 90 gallon tank will be approximately 160 gallons.

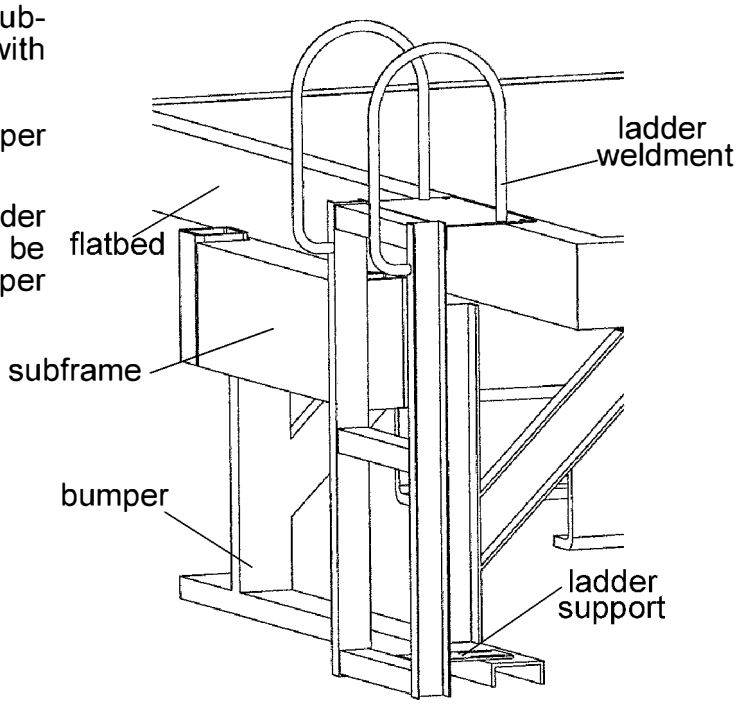
Initially, add only enough oil to fill the tank. Top off tank after running the machine.

CRANE INSTALLATION

14. Install the flatbed placing it on the sub-frame and aligning its mounting holes with those along the edge of the subframe.

13. Install the rear bumper per the Bumper Guard Assembly drawing.

14. Install flatbed ladder according to Ladder Kit Installation drawing. Holes will need to be drilled in flatbed and/or bumper for proper mounting.



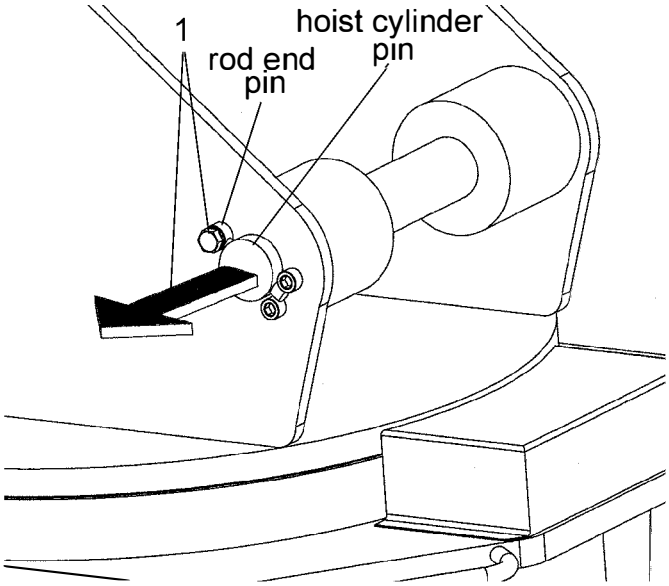
BOOM INSTALLATION

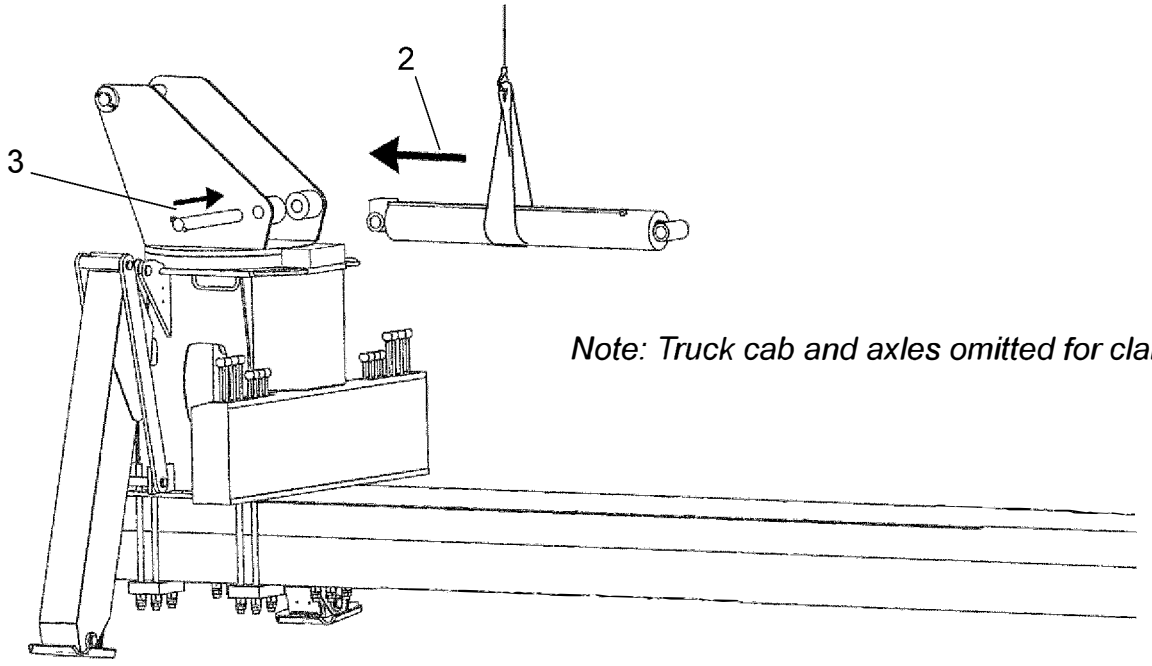
Make sure your lifting device is capable of handling the weight of the boom. this component is very heavy. (Approximately 9500lbs)

1. Remove boom hoist cylinder pin from turret by removing the bolt securing the rod end pin and withdrawing the hoist cyilinder pin.

2. Lift the hoist cyilinder into place as shown. Lifting should be done by a single strap in either a sling or noose configuration. This allows alignment of the cylinder pin bores.

3. Insert the cylinder pin through the turret and hoist cylinder and fasten with rod end pin and bolt. Lower the hoist cylinder, using a wood block on the turret base to support it during boom installation.





Note: Truck cab and axles omitted for clarity

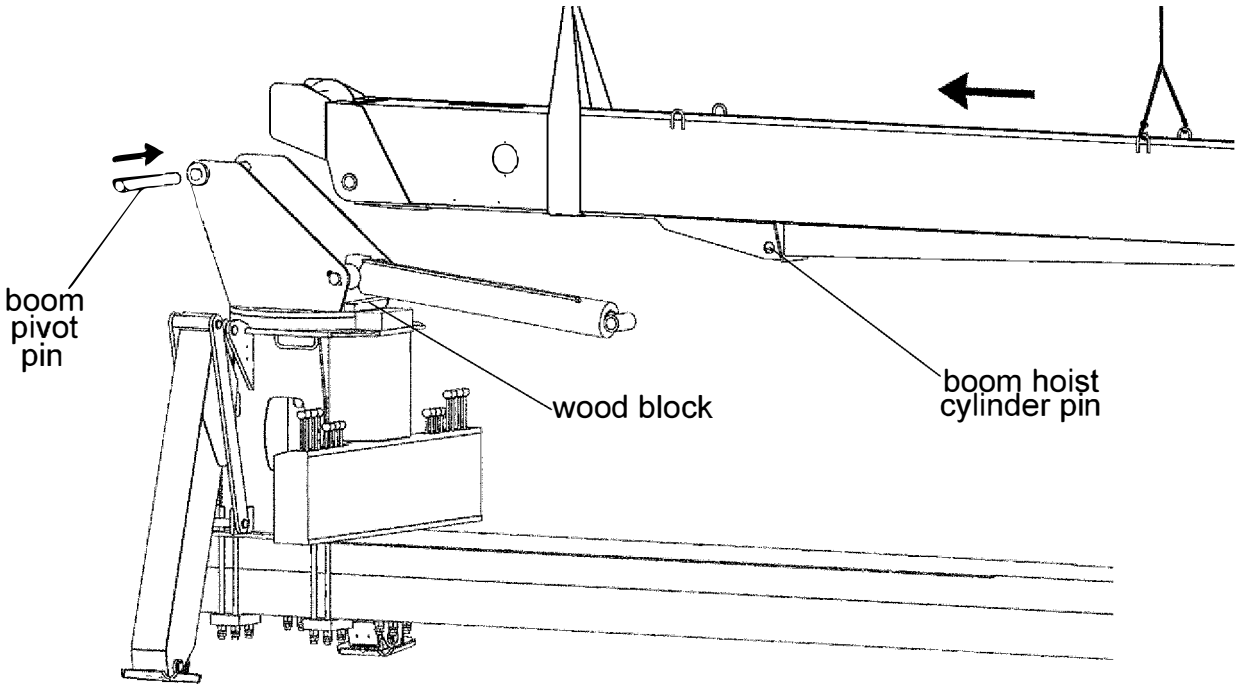
BOOM INSTALLATION

4. Remove the boom pivot pin in the same manner as the hoist cylinder pin. Also remove the boom's hoist cylinder pin.

NOTE: Boom installation, ideally, should be done with two hoists; one at each lift point. This allows fine adjustment of boom pivot pin alignment. Before aligning the boom pin bores, check clearance fit of boom pin bore, some cleanup of the bushing may be necessary

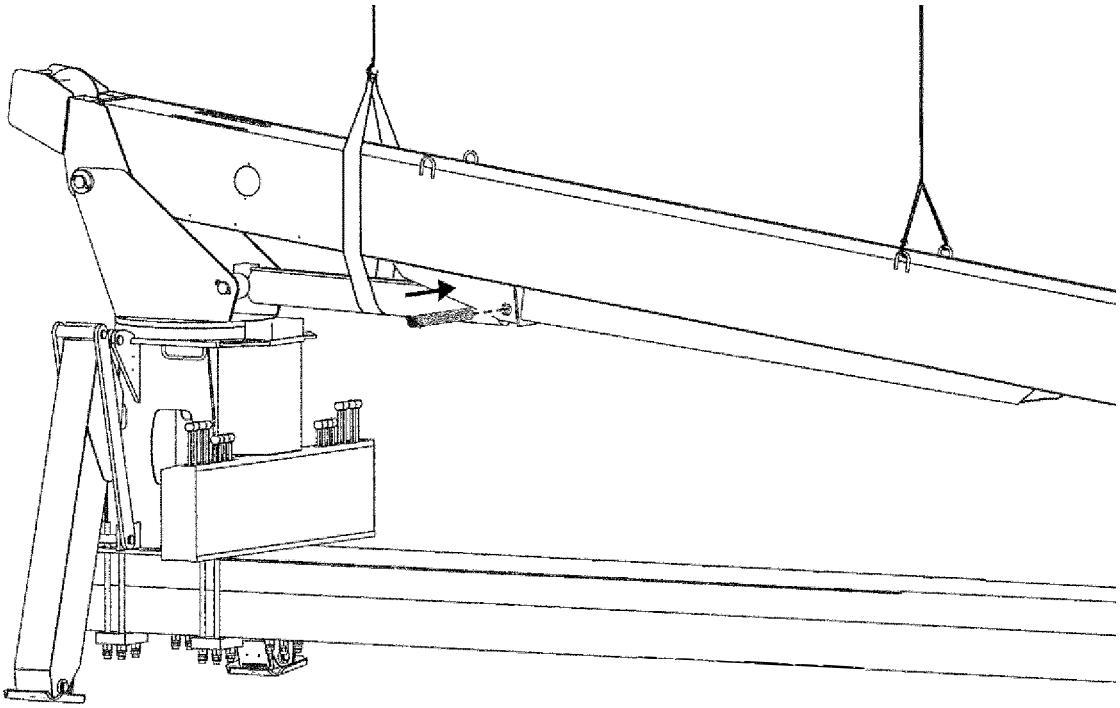
5. Using slings or straps, either hooked at the lift points or wrapped around the boom, move the boom into position to insert the boom pin. Once alignment is achieved, drive the pin through turret and boom bores, and secure with rod end pin and bolt.

Note: Truck cab and axles omitted for clarity



BOOM INSTALLATION

6. Once the boom pivot pin is secured, release the lift strap closest to the turret. This will leave the boom supported by the boom pivot pin and the remaining hoist. Using a long lift strap (wrapped around the boom and under the hoist cylinder) will allow alignment of the hoist / boom pin bores. Once alignment is achieved, secure the hoist cylinder pin as before.



7. The hoses for the boom functions should be routed as in the Hydraulic Piping drawings.

8. Attach Anti-Two Block (ATB) System as per drawing.

9. Assemble boom rest assembly per Boom Rest Assembly drawing and insert into sockets at rear of subframe.

ELECTRICAL WIRING

1. Install Foot Throttles at each operator's console per drawing.

2. Complete crane electrical wiring as per Electrical Schematic.

When wiring the engine controls, it may be necessary to consult a dealer or certified technician to ensure the correct connections are properly made.

Foot throttles should be set so the hydraulic pump shaft turns a maximum of 2,000 RPM. This throttle setting should correspond to the previously calculated value. Refer to the PTO Selection Section for explanation on calculating Maximum Pump RPM.

PRE-START INSPECTION

It is best at this point to run a pre-start inspection to ensure the installation is complete. Check the following:

1. Throttle linkage and cables must have:
   A. Freedom of movement.
   B. Proper securing.
   C. No excess cable or sharp bends.
   D. Clearance from exhaust system and moving parts.

2. PTO cable must have:
   A. Freedom of movement.
   B. Proper securing.
   C. No excess cable or sharp bends.
   D. Clearance from exhaust system and moving parts.

3. Pump and hydraulic lines must have:
   A. Freedom of movement.
   B. Clearance from exhaust system, drive lines, and/or moving linkage.
   C. Hoses must have no sharp bends or kinks.
   D. Pump hoses *must* be properly secured.

This unit is equipped with a suction line shutoff valve as standard equipment. Care should be taken to ensure that all fittings are tight and properly installed before adding oil to the reservoir and opening this valve.

4. Mounting bolts:
   A. Rear outrigger tiedown bolts must be properly installed and properly torqued .
   B. Mainframe tiedown bolts must be properly torqued.

5. External walk-around:
   A. All clearance lights must be installed properly and working. Check brake lights and turn signals.
   B. Proper warning placards (decals) must be installed; see the Placard Installation locations at the end of this manual.

6. Check oil levels:
   A. Check oil reservoir. Suction line shutoff MUST BE OPEN.

Serious pump damage may occur if PTO is engaged with suction line gate valve closed. It is recommended to check that hydraulic oil has actually reached the pump by loosening one of the pressure lines on the pump.

   B. Check swing gearbox oil level.
   C. Check winch gearbox oil level.

7. Miscellaneous checks:
   A. Optional Equipment - Correctly installed and connected.
   B. Flatbed - Securely bolted on. Rear mudflaps installed.
   C. All appropriate Operator's Manuals *MUST* be in the truck cab.
   D. Initial service hydraulic oil filters should be in truck cab.
   (Refer to Operator's Manual for inital service interval on filters)

RCI / ATB INSTALLATION

Refer to ATB / LMI Installation Drawing, For proper installation of RCI/LMI system.

Refer to the Greer Microguard 586 Operation/ Setup Manual for explanations of operation and initial setup procedures.

WINCH CABLE INSTALLATION

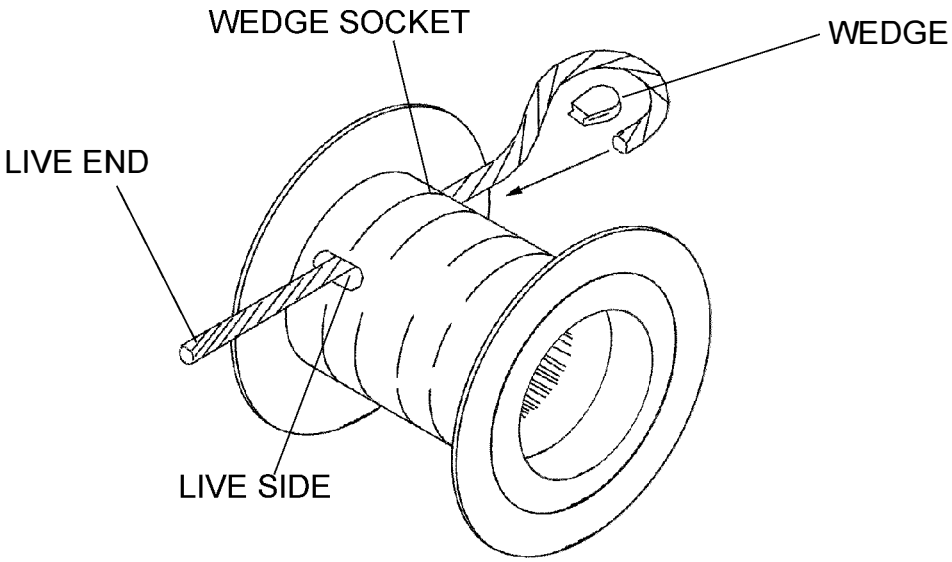
1. Feed the cable through the boom tip and back along the top of the boom to the top side of the winch.

2. Push about two feet of cable through the winch wedge socket.

3. Bend the end of the cable around and stick it back into the hole forming a loop (the cable end should be fully inserted into the drum, but not protruding from the *live* side).

4. Install the wedge into the cable loop.

5. Pull on the *live* end of the cable until the wedge and cable have fully seated in the winch drum.



WINCH CABLE INSTALLATION

The first time the cable is spooled onto the drum it must be done under tension, and it must be guided into place so that it spools smoothly.

SUGGESTIONS FOR SPOOLING CABLE UNDER TENSION

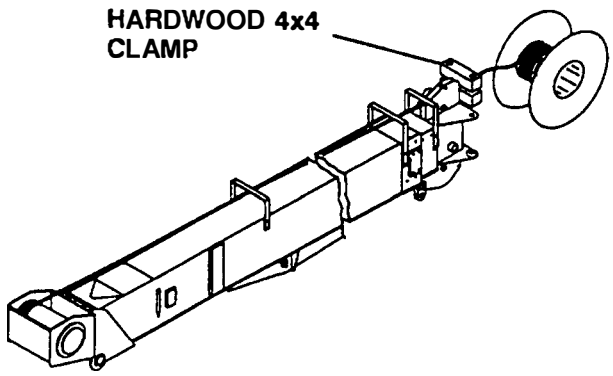
PREFERRED METHOD

1. String the cable out straight from the boom and attach to a heavy object and drag across the ground to put tension on the cable while winding the winch drum.

OR

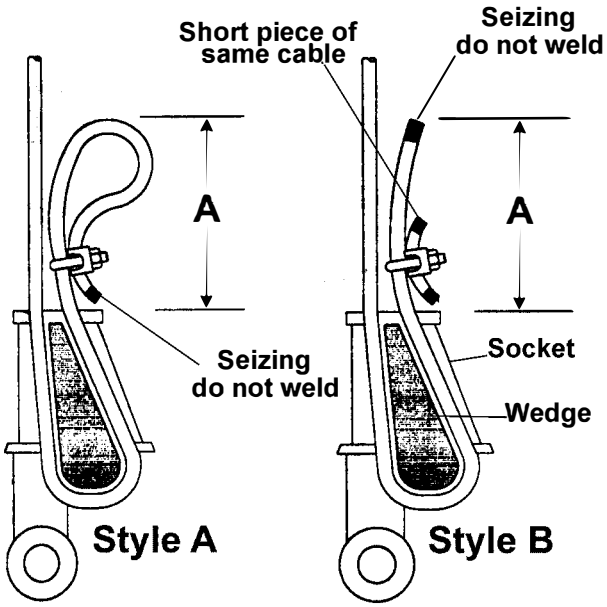
2. Clamp the cable between two (2) hard-wood boards 4" x 4" x 2' (100mm x 100mm x 50mm) at the boom tip. As the winch is turned, the board will be drawn up against the boom tip putting tension on the cable.

Physical harm could result if any part of your person or clothing should get caught in the spooling wire rope. Spool the cable on slowly. The first layer on the winch drum is critical. Pack the wraps tightly together with a mallet. Do not use a standard hammer, this could result in wire rope damage.



WIRE ROPE	STANDARD	ROTATION RESISTANT
DIA.	9/16 in.(14mm)	9/16 in.(14mm)
LENGTH	315 FT (96000mm).	315 FT (96000mm)
DESIGNATION	6 x 25 IWRC EEIPS	19 x 19 Compacted Strand EEIPS
WORK LBS.	10,500lb (4760kg)	7,400lb (3355kg)

STYLE A IS PREFERRED TERMINATION METHOD FOR ATTACHING WEDGE AND SOCKET



WIRE ROPE	STANDARD	ROTATION RESISTANT
DIA.	9/16 in (14mm)	9/16 in (14mm)
Dimension A	Greater than 3.5 inches (90mm)	Greater than 11.25 inches (290mm)

FRONT BUMPER STABILIZER INSTALLATION

DO NOT attach the front bumper stabilizer to the bumper itself. The front bumper stabilizer jack MUST be attached to the truck frame rails. This will require adapter brackets either procured from Load King or manufactured by the installer.

Mounting Bracket Information

If Load King currently manufactures a mounting bracket appropriate for the truck you are mounting the crane on, these should have been specified during the order process and you will have received them with your installation kit.

However, due to the variety of truck designs, it maybe necessary to design and construct custom bracketry to suit your vehicle.

Requirements of custom constructed bracketry:

- The mounting bolts for the jack require that there be approximately 1 3/4 inches (45mm)of clearance between the bumper and the rear of your jack.
- Taking into account the clearance necessary for mounting hardware, the jack should be installed as closely as possible to the end of the frame rails.
- When fully retracted, the foot of the jack should have 12-15 inches (300-380mm) of ground clearance.
- Clearance must also be provided for the truck hood to swing into the open position.
- Attaching the brackets to the frame rails should be done with no less than 4 GR8 5/8-11 bolts per bracket
- Please refer to the Front Bumper Stabilizer installation drawing for reference.

Stablizer Information

1. Remove the front bumper from the truck.
2. Trial fit the front bumper stabilizer brackets, checking for clearance of frame rails and bumper. Take into account the applicable requirements listed for custom constructed bracketry. These brackets should be directly mounted to the frame rails.
3. After proper positioning has been established, mount the bracketry for the front bumper stabilizer to the frame rails.
4. Trial fit the front bumper, it may require significant trimming to clear the new bracketry.
5. Mount the front bumper
6. Mount the front bumper stabilizer.

When routing hoses and wire harnesses:
a. Allow slack for any movement required when the stabilizer is pivoted.
b. Avoiding any moving suspension components.
c. When routing across an exposed edge of metal, some type of edge protection should be used to protect hoses and harnesses

7. Route and connect front bumper stabilizer harness and hoses per Front Bumper O/R Assembly and Electrical Schematics.

LIFT CAPACITY CHART CHECK

Before making the first pick, the crane must be started with full equipment installed. During this startup, The Greer RCI box will display the crane model and the Lift Capacity Chart number that it is set to match. The displayed model and lift capacity chart numbers must match the lift capacity chart affixed to the mainframe of the crane.

If these numbers do not match, contact Load King Service before proceeding with the stability test.

STABILITY TEST PREPERATION

Each fully assembled crane requires testing to ensure stability during lifts.

SETUP:

Testing shall be performed using the proper testing parameters for your machine located on the “Stability Test Parameters” page. Locate your model number on the chart and note: The Test Weight, Boom Length and Load Radius.

The weight used must be within 1% of the given value. It is the responsibility of the testing personnel to obtain and verify the weight used during stability testing.

Stability testing should be performed on a solid, level surface, with the crane in a level position. Outriggers should be extended and supporting the weight of the crane. Any boom accessories should be removed, including jib.

If this crane is installed on a truck chassis with less than the minimum specifications identified in section 2, it becomes the installer’s responsibility to conduct a full stability test in accordance with SAE J-765 (current) and to use the results of that test to validate that the crane can safely handle the capacities listed in the lift capacity chart supplied with this crane. In this situation it is also the installer’s resposibility to verify that the truck has adequate structural and other capabilities to safely handle all the loads imposed on it by this crane.

It is of the utmost importance that the test parameters SPECIFIC to your machine be selected on the “Stabilty Test Parameters” page.

If, at any point during the testing procedure, the weight should contact the ground, and can not be lifted with a WINCH UP action, cease the test. Your crane has failed the stability test. Contact Load King service.

Refer to section 3 of the Operator’s Manual for proper use of load charts and operating procedures of this crane

The RCI will cut out the crane controls durring overload conditions. When this occurs the RCI must be overridden by using the CANCEL button on the RCI display. This must be done to complete the test.

Any time an extend action is performed, a corresponding winch down action will be needed to avoid a two-block condition. This is especially crucial during the Stability Test as the ATB system will be disabled by the use of the Cancel button. Damage to the boom tip and load line is possible in this situation.

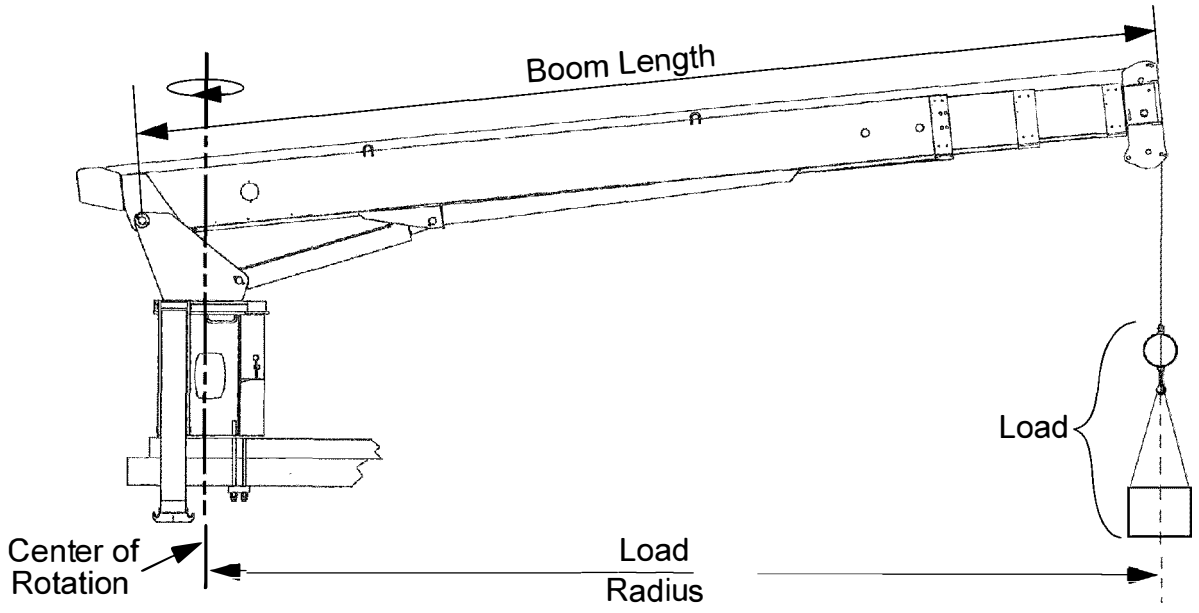
STABILITY TEST PARAMETERS

It is of the utmost importance that the test parameters specific to your machine be selected from this table.

Actual test values of the stability verification load and the load radius must be within 1% of the values given on this table

MODEL	BOOM LENGTH	*LOAD RADIUS	**LOAD FOR STABILITY VERIFICATION
10-47	47 ft (14.32 m)	45 ft (13.71 m)	1800 lbs (816 kg)
25-92	92 ft (28.04 m)	90 ft (27.43 m)	647 lbs (293 kg)

*for accuracy, this should be physically measured from the center of rotation to the load line.
**this weight includes everything attached to the load line during the lift (lifted load, overhaul ball, slings, chains, etc).
Fuel tank should be between 1/4 and 1/2 full during testing procedures.



STABILITY TEST CRITERIA

For a succe ssful completion of the stabiltiy test, three outriggers must maintia n ground contact while the machine completes all of the applicable steps contained on the procedure page.

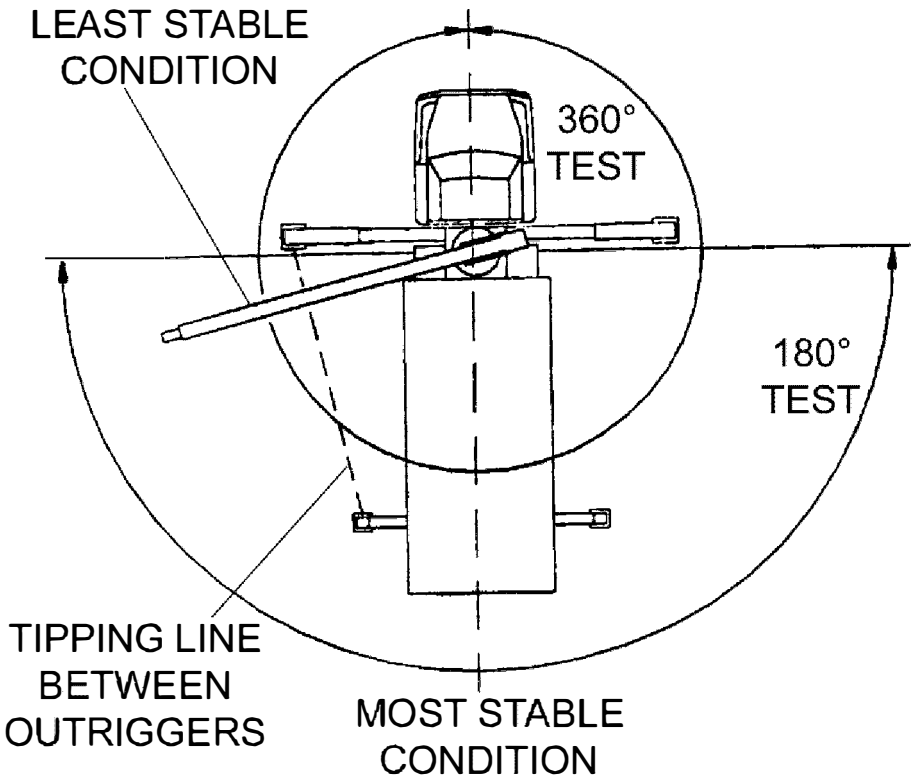
Note: An outrigger momentarily leaving the ground (in response to a sudden or unsteady movement), followed by an immediate return to the ground, is considered remaining on the ground.

Load Height and Load Radius should be monitored at all times during the testing procedure.

*Note: If the **distance of the load from the ground** should exceed six inches or the load should contact the ground, use a **winch** up or down action to maintain the load height.*

*Note: if the **load radius** should move outside of the given parameters during the test proce-dure, use a **boom** up or down movement to maintain load radius.*

Record the actual testing parameters used during this testing procedure in section 4.



STABILITY TEST PROCEDURE

Continuous attention must be paid to both Load Radius and Load Ground Clearance during these procedures.

PROCEDURE

1. Locate your machine in the table on the Stabilty Test Parameters page, the values listed to the right of your machine model number must be used during the testing procedure.
2. With the boom directly over the rear of the truck, set a boom inclination angle of 35° or greater.
3. Attach the hook block to the Stability Verification Load and lift to a height of six inches.
4. Slowly extend the boom to the test boom length.
5. When test boom length is reached, the boom angle should be slowly decreased while monitoring the load radius, until the load radius matches that specified for your machine.

Once this first lift has been successfully completed, you are ready to move onto the swing portion of the test, please use the instructions that most closely represent your machine.

180° Operation: A machine equipped in such a manner that it can only be used for 180° operation per it's lift capacity chart (NOT equipped with a front bumper stabilizer) will need a 180° swing test.

180° TEST

6. Start with the boom directly over the rear of the truck in its most stable condition.
7. With Stabilty Verification Load set, and while monitoring the load radius, slowly swing the boom until it is perpendicular (90°) to the centerline of the truck chassis.
8. Proceed to slowly swing the boom 180° over the rear of the truck, while monitoring the load radius and the height of the Stability Verification Load.

360° Operation: A machine equipped for 360° operation per it's lift capacity chart (equipped with a front bumper stabilizer) will need a 360° swing test.

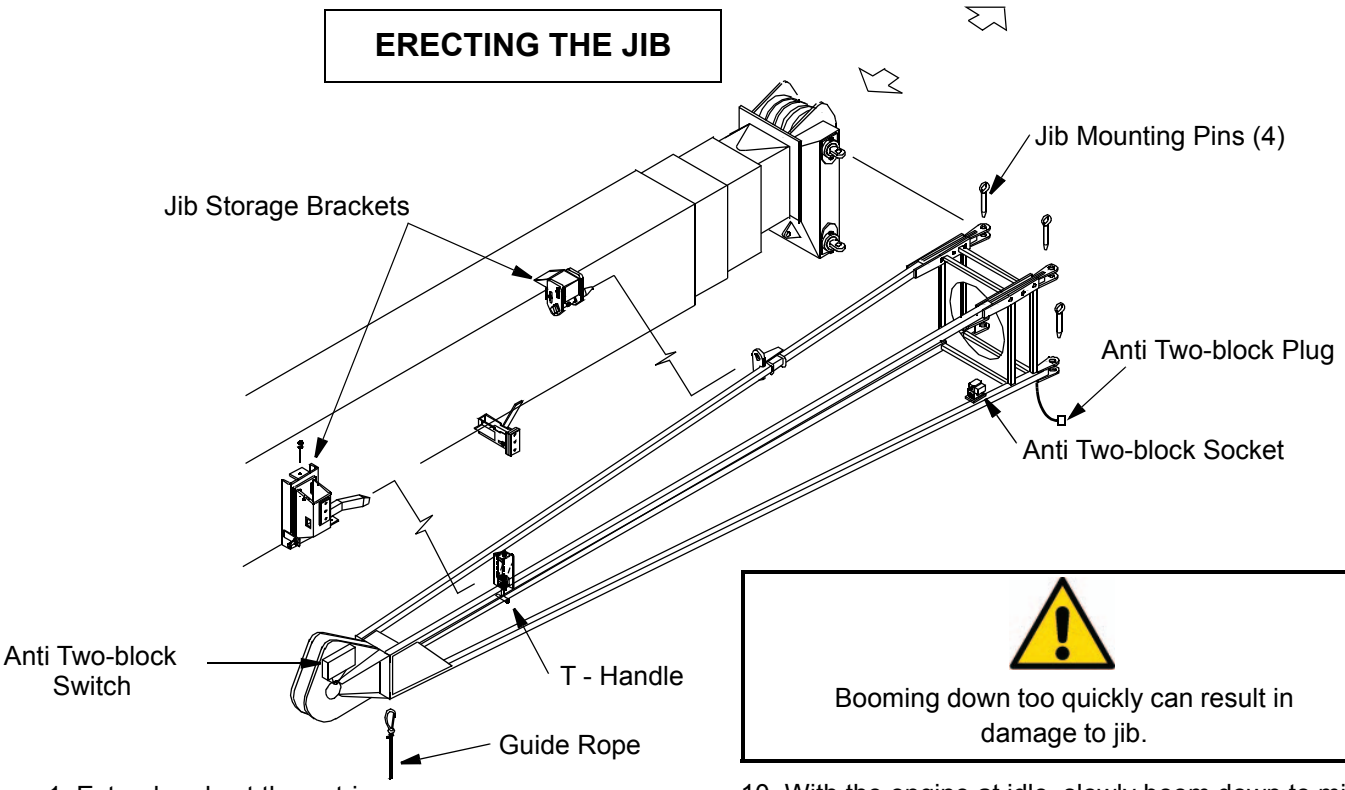
Note: If the machine is not equipped for continuous rotation, the swing stop must be kept in mind. This will stop the swinging action of the boom at 370°.

360° TEST

6. Start with the boom directly over the rear of the truck in its most stable condition.
7. With Stabilty Verification Load set, and while monitoring the load radius, slowly swing the boom until it is over the front of the truck and parallel to the centerline of the truck.
8. Reversing direction, slowly swing the boom 360° over the rear of the truck, while monitoring the load radius and the height of the test weight.

Record the actual testing parameters used during this testing procedure in section 4. If you experience any difficulties while performing this test, contact Load King Service at 855-548-2336

ERECTING THE JIB



Booming down too quickly can result in damage to jib.

1. Extend and set the outriggers.

2. Rotate the upper structure to the “over front” position.

3. Retract the boom completely.

4. Boom down to minimum boom angle to allow ease of installation of the jib pins. If necessary retract the front outrigger jacks until the boom head can be reached from ground level.

5. Install the upper and lower jib mounting pins in the right side of the boom head.

6. Attach a guide rope to the eye on the bottom tip of the jib.

7. Extend outrigger if retracted, to bring crane back to level. Raise the boom to horizontal.

8. Pull down and rotate the T - handle to unlock the jib from the storage bracket.

9. With the engine at idle, slowly extend the boom 2-3 feet (.6-1 m). As the jib clears the storage brackets, the jib will swing out approximately 45°.

10. With the engine at idle, slowly boom down to minimum boom angle while another operator uses the guide rope to control the speed of the jib rotation. The jib will swing around until the left side mounting holes line up.

11. If cable from main boom is to be used on jib, remove cable from boom head load sheaves and swing over top left jib cord before pinning jib to boom. Install the left upper and lower jib mounting pins.

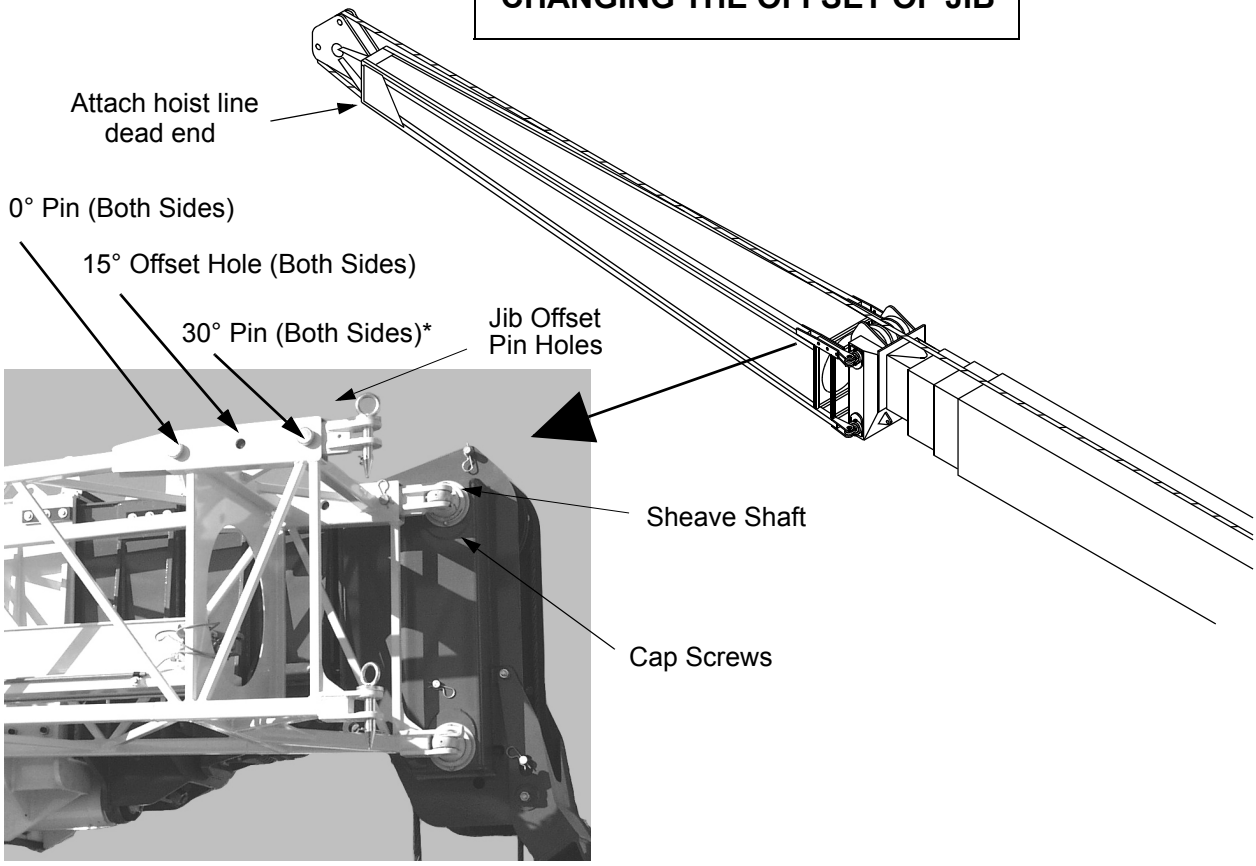
12. Remove the guide rope.

13. Disconnect the anti two-block plug from the jib anti two-block socket and connect it to the socket on the boom head. Move the dummy plug from the boom head socket to the anti two-block socket on the jib.

14. Reeve the hoist line over the jib sheave.

15. Test the anti two-block system by lifting the anti two-block weight. The light and audible alarms should be actuated in the cab and the boom down, boom extend, and winch up controls should disconnect.

CHANGING THE OFFSET OF JIB



INCREASING OFFSET

1. Retract the boom and set the outriggers.

2. Boom down to minimum boom angle.

3. Loosen the two (2) cap screws on the left side of the upper and lower sheave shafts. This will require a 3/4 inch hex wrench.

4. Reeve the hoist line over the top center sheave on the boom head, around the jib sheave, and attach to the eye on the bottom of the jib tip.

5. Winch up to take the slack out of the hoist line and to take the weight of the jib off of the jib offset pins.

NOTE: To prevent damaging the jib, do not winch up any more than is necessary to loosen the jib offset pins.

6. Remove the jib offset pins from the 0° offset hole and place in the 15° hole or if you are using 30° offset then place pins in tool box.

**** Never Remove Either 30° Pin***

7. With the engine at idle, slowly winch down to pay out hoist cable. This will lower the tip of the jib until the jib comes in contact with the jib offset pins.

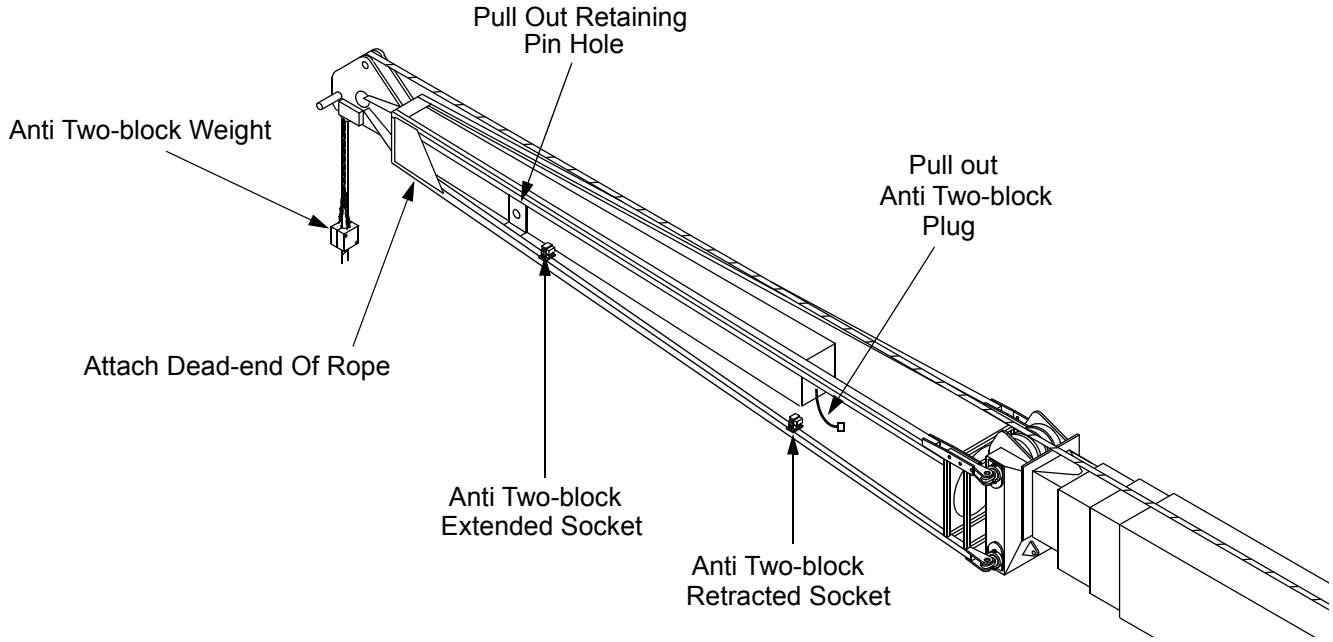
NOTE: While lowering the tip of the jib, it may be necessary to raise the boom to prevent the tip of the jib from touching the ground.

8. Remove the hoist line from the tip of the jib and reeve the hoist line as needed.

DECREASING OFFSET

1. Reverse above procedure to return jib to 0° offset position.

EXTENDING AND RETRACTING THE JIB PULLOUT SECTION



EXTENDING THE PULLOUT SECTION

NOTE: The jib must be erected before extending thepullout section. Do not attempt to extend the pullout section while the jib is stowed.

1. Retract the boom completely and boom down to minimum boom angle.

2. Attach the dead end of the wire rope to the eye on the bottom of the jib tip. This is done to prevent the pullout from extending uncontrollably.

3. Unplug the pull out anti two-block plug from the anti two-block ***Retracted*** socket. Move the dummy plug from the extended socket to the retracted socket.

4. Remove pullout retaining pin from the retaining pin hole.

5. Pay out cable and extend the pullout until the retaining pin holes line up. Install retaining pin.

6. Plug the anti two-block plug into the anti two-block ***Extended*** socket.

7. Test the anti two-block system by lifting the anti two-block weight. The light and audible alarms should be actuated in the cab and the boom down, boom extend, and winch up controls should disconnect.

RETRACTING THE PULLOUT SECTION

1. Retract the boom completely and boom down to minimum boom angle.

2. Unplug the anti two-block plug from the anti two-block ***Extended*** socket. Move the dummy plug from the retracted socket to the extended socket.

3. Attach the dead end of the wire rope to the eye on the bottom of the jib tip.

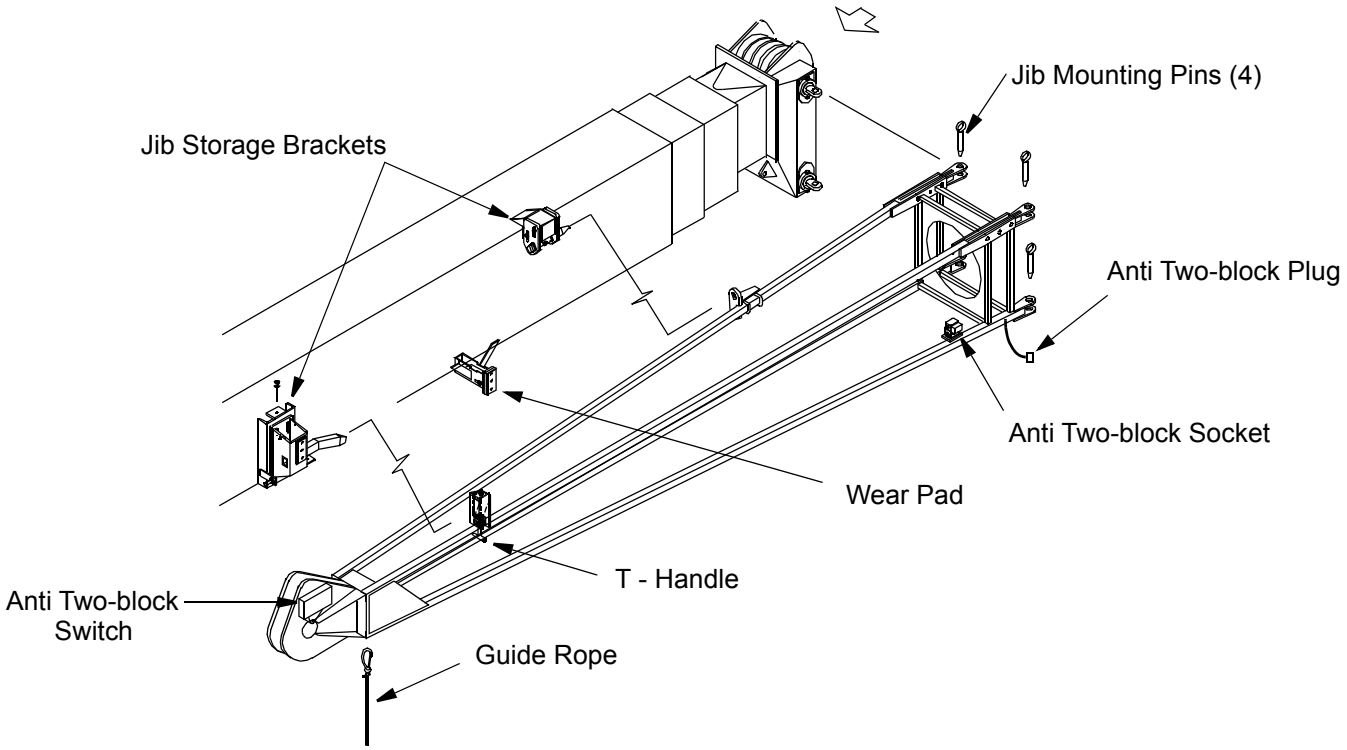
4. Remove pullout retaining pin from the erected retaining pin hole.

5. Winch up slowly to retract the pullout until the retracted retaining pin holes line up and install retaining pin.

6. Plug the anti two-block plug into the anti two-block ***Retracted*** socket.

7. Test the anti two-block system by lifting the anti two-block weight. The light and audible alarms should be actuated in the cab and the boom down, boom extend, and winch up controls should disconnect.

STOWING THE JIB



STOWING THE JIB

Before erecting or stowing the jib, ensure that no personnel or obstacles are in the swing path of the jib.

1. Extend and set the outriggers.

2. Rotate the upper structure to the “over rear” position.

3. Make sure the stinger is in the stowed position and the jib offset is at 0° offset.

4. Boom down to minimum boom angle.

5. Remove the hoist line from jib sheave and lay to left side.

6. Disconnect the anti two-block plug from the boom head and plug it in to the jib anti two-block socket. Move the dummy plug from the jib anti two-block socket to the boom head anti two-block socket.

7. Extend the boom to 2-3 feet (.6-1 m).

8. Attach the guide rope to the eye on the bottom tip of the jib.

9. Remove the left upper and lower jib mounting pins. With guide rope, pull left jib ears out of left boom head ears.

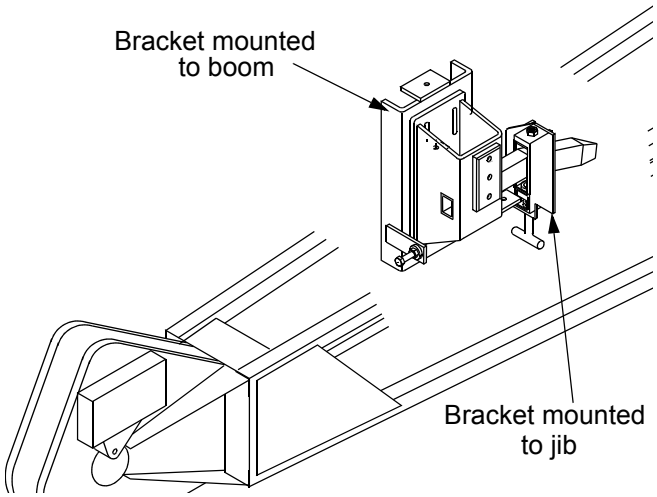
10. With the engine at idle, slowly boom up while a second operator holds the guide rope to control the rotating speed of the jib.

11. Boom up to approximately 30°. Allow the jib to swing around until the jib contacts the wear pad on the boom. As the jib gets close to the side of the boom, make sure the jib does not strike the side of the boom.

STOWING THE JIB

12. With the engine at idle, slowly retract the boom completely. The jib will engage the jib storage brackets as the boom is retracted.

13. Remove the guide rope from the tip of the jib.



14. As the boom is retracted, verify that the stowage bracket mounted to the jib is engaging properly with the stowage bracket mounted to the boom.

15. Rotate and release the T-handle to lock the jib to the storage brackets.

16. Remove the right upper and lower jib mounting pins.

17. Test the anti two-block system at the boom head by lifting the anti two-block weight. The light and audible alarms should be actuated in the cab and the boom down, boom extend, and winch up controls should disconnect.

STABILITY TEST RECORD

Test Information:

Date of Test:_____ Installation Supervisor:_____

Crane Model:_____ Testing Supervisor:_____

Serial Number:_____ Testing Witness: _____

Test Lift Weight:_____ Boom Extension:_____

Boom Angle:_____ Swing Angle (180 or 360):_____

Load Radius:_____

Signatures:

Testing Supervisor:_____

Testing Witness: _____

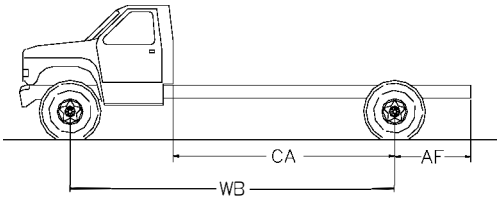
RETURN TO DEALER UPON COMPLETION OF INSPECTION AND STABILTYTEST
Copies of these documents must be inclued in Warranty Registration Submission

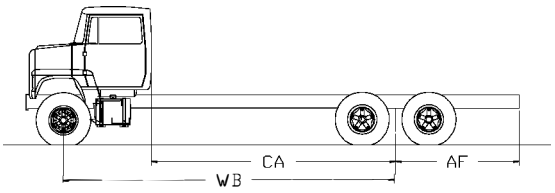
TRUCK WEIGHTS AND DIMENSIONS

Part 1: Bare Chassis as Delivered

Make:_____ Model:_____

VIN:_____ Fuel Level:_____





CA:_____ AF:_____

WB:_____

Axle Weights
(Weigh without brakes applied, block wheels not on scale)
Weigh all three weights!
DO NOT calculate any weights, All must be directly measured.

Front:_____ Rear:_____

Gross:_____

Truck Options

Engine Make:_____ Engine Model:_____

Transmission Make:_____ Transmission Model:_____

Exhaust Position:

Orientation	Position
☐ Horizontal	☐ Right
☐ Vertical	☐ Left

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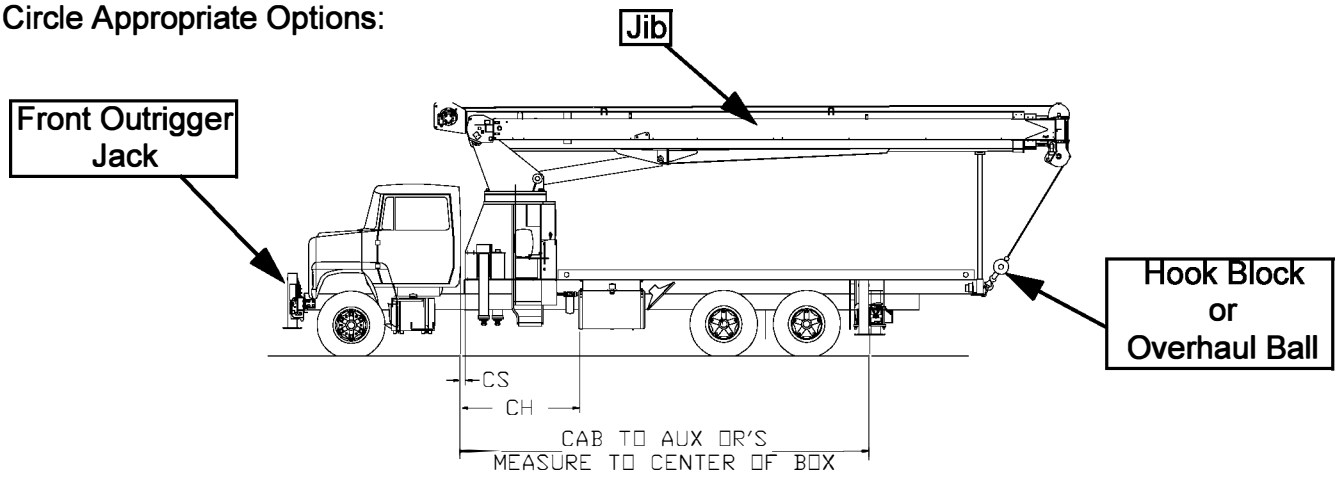
CRANE INFORMATION

Part 2: Completed Unit

Completion Date:_____

Crane Model:_____ Serial Number:_____

Circle Appropriate Options:



List All Miscellaneous Options (Propane Heater, Toolboxes, Etc.) _____

_____

_____

_____

Crane Installation Dimensions

CS - Cab to Subframe CH - Cab to Hydraulic Tank

CS:_____ Cab to Aux. O/R's:_____

CH: _____

Axle Weights

(Weigh without brakes applied, block wheels not on scale)
Weigh all three weights!
DO NOT calculate any weights, All must be directly measured.

Front:_____ Rear:_____

Gross:_____ Fuel Level:_____

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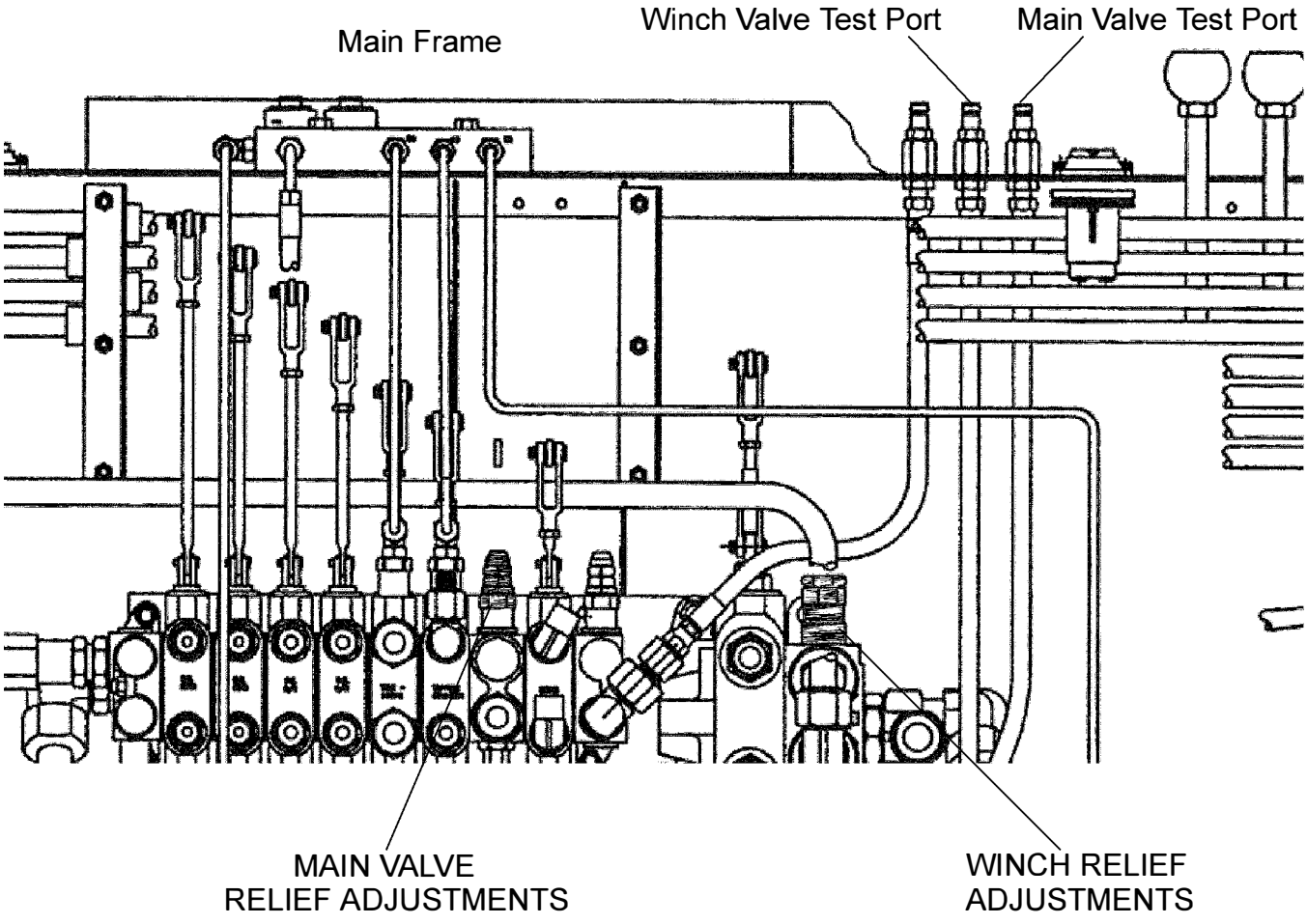
VALIDATION OF RELIEF VALVE PRESSURES

TESTPORT IDENTIFICATION

Main Valve test port - The test port farthest from the Mainframe.

Winch Valve test port - The center test port.

All test ports are male Parker PD series quick connect fittings



VALIDATION OF RELIEF VALVE PRESSURES

Relief valve pressure validation should be performed with the crane in operating configuration, i.e. outriggers down and truck set level. Refer to operator's manual for instruction.

Obtain a dead lift weight for setting the winch relief valve pressure. This will be approximately 12,000lbs (5445kg) for a 25-92. The lift cable should be in a single line configuration with an overhaul ball attached (alternately, you may cap the winch ports instead of performing a dead lift).

The system reliefs should be checked only when the oil in the hydraulic system is warm or at operating temperature.

Main Valve Testing Procedure

1. Attach pressure gage to Main Valve Test Port as shown on the previous page.
2. With the control levers in neutral position, raise pump RPM to 2,300.
3. Slowly retract the boom extension cylinder until it reaches the end of the stroke and forces the system pressure upward to relief pressure.

LEAVE ALL OTHER CONTROL LEVERS IN THE NEUTRAL POSITION.

4. Check the reading on the test gauge. See pressure table below for proper settings.

Note: Move the lever to the neutral position immediately after taking the pressure reading to avoid excessive heat.

Winch Valve Testing Procedure

1. Attach pressure gage to W inch Valve Test Port as shown on the previous page.
2. With control levers in neutral position, raise pump RPM to 2,300.
3. With either the winch engaged in a deadman pull, or the winch-up workport capped and plugged, move the winch lever to t he up direction. Hold the lever until the system goes over relief.

LEAVE ALL OTHER CONTROL LEVERS IN THE NEUTRAL POSITION.

4. Check the reading on the test gauge. See pressure table below for proper settings.

Note: Move the lever to the neutral position immediately after taking the pressure reading to avoid excessive heat.

Proper Relief Valve Settings:

Winch Valve:	2800 +/- 50psi (19,200 +/- 350kPa)
Swing Valve:	1500 +/- 50psi (10,300 +/- 350kPa)
Main Valve:	3000 +/- 50psi (20,500 +/- 350kPa)

SEE NEXT PAGE FOR ADJUSTMENT PROCEDURE

ADJUSTMENT OF RELIEF VALVE PRESSURES

If the pressure seen at the test port fails to change after adjusting the relief valve, check to see that the test port you are checking is properly plumbed to the relief valve that you are adjusting. Failure to do so can result in pump damage.

If the value read from the pressure gage is outside of the acceptable pressure range, use the adjustment screw on the relief valve to change the relief setting. Turning the adjustment screw clockwise will increase the pressure setting. Turning the adjustment screw counterclockwise will decrease the pressure setting.

Always adjust the pressure relief valves such that the final adjustment made is an adjustment from a lower pressure setting to a higher pressure setting. Read below for further clarification.

Note: one quarter turn of adjustment screw equals approximately 200-500 psi

Scenario 1:
Gage Reading: The pressure read from the gage is below the acceptable setting.

Action: Bring the pressure up to the acceptable level by making small clockwise adjustments and checking the pressure in between each adjustment.

Scenario 2:
Gage Reading: The pressure read from the gage is above the acceptable level.

Action: First take the pressure below the acceptable pressure setting by making a few large counterclockwise adjustments. After it has been verified that the pressure setting is below the acceptable level, bring the pressure up to the acceptable level by making small clockwise adjustments and checking the pressure in between each adjustment.

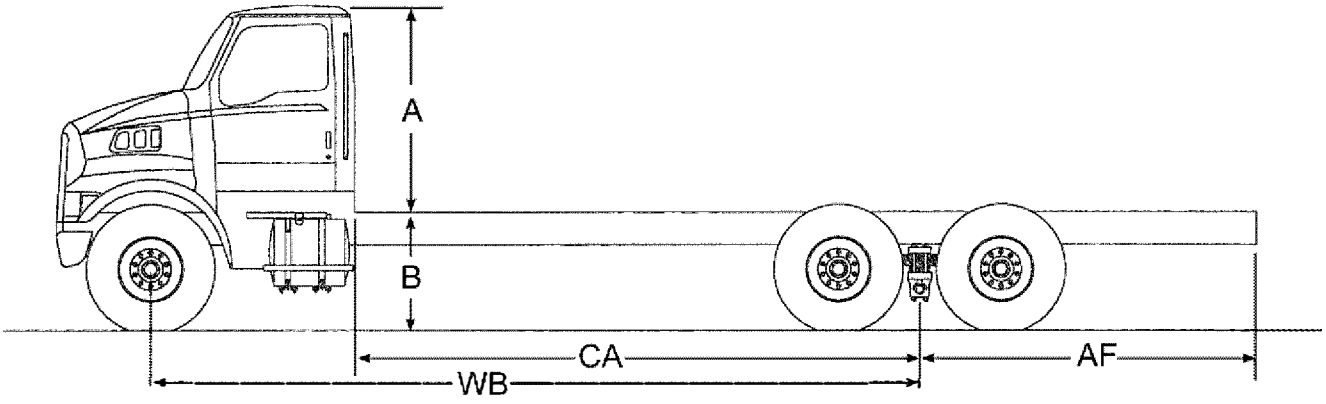
Repeat this procedure on each valve until both are set at the correct pressure.

TORQUE CHART FOR INSTALLATION HARDWARE

USE	SIZE	TORQUE
Mainframe Tiedowns	1.25” - 12 UNF	650-680 ft-lbs (880-920Nm)
Auxiliary O/R Tiedowns	1” - 14 UNF	225-235 ft-lbs (305-320Nm)
Flatbed Installation Bolts	1/2” - 13 UNC GR5	55 ft-lbs (75Nm)
Hyd. Reservoir Bracket Bolts	5/8” - 11 UNC GR8	160 ft-lbs (215Nm)
Rod End Bolts - Boom Pins	5/8” - 11 UNC GR5	110 ft-lbs (150Nm)
Pump Mounting Bolts	1/2” - 13 UNC GR5	55ft-lbs (75Nm)
Shear Plate Bolts	5/8” - 11 UNC GR5	110 ft-lbs (150Nm)

CHASSIS NOMENCLATURE

KEY	DESCRIPTION
A	CAB HEIGHT
B	TRUCK FRAME HEIGHT
AF	AXLE TO END OF FRAME
CA	CAB TO AXLE DIMENSION
WB	WHEEL BASE OF TRUCK



CHASSIS NOMENCLATURE

AF

Axle to end of Frame - Distance from the center line of the rear axle(s) to rear of vehicle frame.

BBC

Bumper to Back of Cab - Front bumper to rear of cab dimension.

BOC

Back Of Cab - Rearmost face of a truck's cab structure.

CA

Cab to Axle - Distance from the rear of the cab to the centerline of the rear axle(s).

Cab Height

Distance from top of frame rails to top of cab.

Chassis Weight

Also known as tare weight. The bare chassis weight, excluding fuel, tools, driver and payload. Does include lubricants and coolant.

Federal Bridge Law

Law governing axle loading of vehicles.

GAWR

Gross Axle Weight Rating - Maximum weight capacity of an axle system.

GVWR

Gross Vehicle Weight Rating - Maximum weight capacity of a chassis assembly.

Payload

Weight of cargo placed on chassis, does not include vehicle components.

RBM

Resisting Bending Moment - A measure of a frame's ability to resist bending under load. Based on **Section Modulus** and **Yield Strength**.

Section Modulus

Indicates the relative strength of a given cross sectional frame shape.

Transmission

Assembly of gears, that allows for changing ratios between the engine and drive axles.

Truck Frame Height

Distance from a level ground plane on which a truck's wheels rest, to the top of the frame rails.

WB

Wheelbase - Distance from the centerline of the front axle to the centerline fo the rear axle(s).

Yield Strength

Strength of material used, in Pounds per Square Inch. Refers to permenant deformation of material. Less than the Ultimate Strength, which refers to breaking point of material.

CRANE NOMENCLATURE

ATB

Anti-Two-Block - Weighted switch which prevents the **Overhaul Ball** or **Load Block** from colliding with the **Boom Tip.**

Boom

Telescoping, lifting component of the crane assembly.

Boom Rest

Typically an A-frame weldment with a “saddle” on which the **Boom** can rest during transportation.

Boom Tip

Arrangement of sheaves and support brackets at the unmounted end of the **Boom**, used to guide the **Wire Rope** during lift.

Cable

See **Wire Rope.**

Center of Rotation

The vertical line about which the upper structure of the crane swings.

Control Console

Control Center for the crane. Contains control levers and valves for operation of crane.

Curbside/Streetside

More definite terms than “right side” or “left side” of the crane. Curbside, refering to the side which would face the curb when parked properly on a typical U.S. street, and Streetside, the side facing the street.

Flatbed

Platform which mounts on top of **Subframe** and provides a surface for transportation of a payload.

FBO

Front Bumper Outrigger - See **FBS.**

FBS

Front Bumper Stabilizer - Frame-mounted jack located ahead of the front bumper. Intended to provide a stabilizing moment but not to relieve the wheels of weight. Sometimes referred to as FBO.

Hydraulic Reservoir

Large tank used to store hydraulic oil needed for extending hydraulic cylinders and powering hydraulic motors.

Hoist Cylinder

Hydraulic cylinder used to change the angle of the **Boom** of the crane.

Sometimes referred to as Topping Cylinder.

Hydraulic Oil Filter

Assembly through which hydraulic oil is fed to remove contaminants.

Hydraulic Pump

Provides motivational force for the crane through high pressure movement of hydraulic oil. Typically driven by the vehicle’s engine through a **PTO** unit.

Jib

Functional extension of the **Boom**. Deductions must be made from the load chart when in use. Sometimes referred to as a Stinger.

CRANE NOMENCLATURE

LMI

Load Moment Indicator - See **RCI.**

Load Block

Heavy assembly of **Sheaves** and plates, used to multiply the mechanical advantage of the **Winch** by allowing the user to reeve multiple parts of line.

Mainframe

Square pedestal that is used as a spacer to allow the winch to clear the cab of the chassis and allow for large items to be placed on the **Flatbed** without interference.

Main Valve

Hydraulic valve used to control the **Hoist**, and **Outrigger** cylinders.

Oil Cooler

Radiator like component through which hydraulic oil is moved to lower its tempurature.

Operator's Platform

Firm standing place from which to operate the crane, usually attached to **Mainframe** and **Control console**.

Outriggers, Main (O/R's)

Primary stability devices. Extend from the crane **Mainframe** assembly and contact the ground to relieve the wheels of weight and provide a rigid, stable base from which to operate the crane.

Outriggers, Auxiliary (O/R's)

Secondary stability devices, perform the same function as **Main Outriggers**, but are smaller and mounted further from the **Mainframe**.

Overhaul Ball

Heavy ball attached to the end of the **Wire Rope**, used to overcome friction and allow the unloaded Wire Rope to unspool and feed out properly. Sometimes called a Headache Ball.

Priority Valve

Solenoid valve used to redirect hydraulic pressure when a function outside of the main circuit needs to be activated. Commonly used for **Outrigger** activation on Load King cranes.

PTO

Power Take Off - Gear driven interface to a vehicles's engine or **Transmission**, used to power accessories, typically a **Hydraulic Pump.**

RCI

Rated Capacity Indicator - An oper-ational aid that warns a crane opera-tor of approaching overload or unstable conditions. Sometimes referred to as LMI.

Sheave

Wheel used for guiding **Wire Rope**, typically features a deep groove to cradle the Wire Rope.

Stinger

See **Jib.**

CRANE NOMENCLATURE

Subframe
Long, flat structure that attaches to the truck chassis and provides additional bending and torsional rigidity.

Super Structure
See **Turret.**

Swing Bearing
Geared bearing upon which the **Turret** is mounted. Allows the crane's upper structure to swing.

Swing Motor
Hydraulic motor with a stub gear mounted to its shaft enabling it to swing the upper structure of the crane.

Swing Valve
Hydraulic valve used to control the rotation direction of the **Swing Motor.**

Telescoping Cylinder
Cylinder, used in tandem with the extend and retract assemblies within the boom to control the overall length of the **Boom.**

Test Port
Hydraulic access ports which allow the operator to check the relief pressure of specific valves.

Topping Cylinder
See **Hoist Cylinder.**

Throttle
Pedal used to control the speed of the chassis' engine.

Turret
Rotating structure upon which the **Hoist Cylinder** and **Boom** pivot. Sometimes referred to as a Super-Structure.

Winch
Used to extend and retract the **Wire Rope** through use of a rotating drum. Typically powered by hydraulics.

Winch Valve
Hydraulic valve used to control the rotational direction and speed of the **Winch**.

Wire Rope
A flexible, multiple-stranded structure, usually made from high strength, cold-drawn steel wires. sometimes referred to as Cable.

SECTION 7

Load King Operation Manual

GREER COMPANY ®

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Introduction

The Greer Insight system is designed for use as an aid to crane operation.

Do not use this system without a properly trained operator who is knowledgeable in safety guidelines, crane capacity information, and the crane manufacturer’s specifications.

This manual describes the operation of the Greer Insight, hereinafter referred to as the system. Please read the contents and instructions contained in this manual.

Outline of Operation

The system is an aid to crane operation. Crane functions are monitored by a variety of sensors.

The system compares the load suspended below the boom head to the crane capacity chart stored within the computer’s memory.

At approach to overload, the system sends audible and visual warning signals. The system can be configured to cause function kick-out by sending a signal to function disconnect solenoids.

System Components

- Display Unit
- Computer Unit
- Pressure Sensors
- Reeling Drum Assembly, with Extension and Angle Sensors
- Anti-Two-Block Switches
- Cables
- Audible Alarm
- Installation/Operator Manuals

Display Unit

The display unit provides the operator with:

- Rated Capacity
- Actual Load
- Bar graph representation of Actual Load vs. Rated Capacity
- Radius of the Load
- Boom Angle
- Main Boom Length
- Working Area
- Crane Configuration

BOOM ANGLE SENSOR

The boom angle is measured by a potentiometer/pendulum assembly. It provides a voltage proportional to boom angle. This sensor is mounted inside the cable reeling drum assembly.

EXTENSION SENSOR

The extension sensor provides a voltage proportional to the extension of the boom. The extension sensor is mounted inside the cable reeling drum assembly.

PRESSURE SENSORS

There are two pressure sensors which measure pressure in the boom hoist cylinder. One sensor measures the rod-side pressure and one sensor measures the piston-side pressure.

ANTI-TWO-BLOCK (ATB)

A switch monitors the approach of the hookblock or overhaul ball to the boom head. The switch is held in the normal position until the hookblock or overhaul ball raises a weight that is mounted around the hoist rope. When the weight is raised it opens the switch. The resultant switch open signal is sent to the computer via the reeling drum. This results in the ATB alarm operating and a function kick-out to occur.

FUNCTION KICK-OUT

Electrically-operated hydraulic solenoids disconnect the control lever functions for boom hoist lower, telescope out, and winch up when an overload or ATB alarm condition occurs.

OPERATOR PROGRAMMABLE ALARMS

These alarms, when properly set by the operator, define the operating area. These alarms are programmable for each job site and allow the operator to work in a defined area.

- Minimum/Maximum Boom Angle Alarm
- Maximum Boom Length Alarm
- Maximum Tip Height Alarm
- Left and Right Swing Alarm
- Work Area Alarm

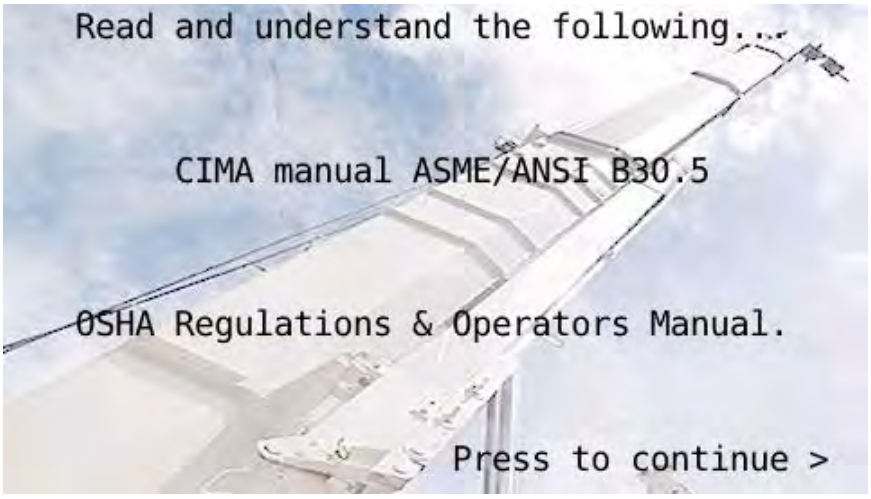
OUTRIGGER POSITION SENSING

This alarm alerts the operator, audibly and visually, when the selected outrigger position does not match the detected outrigger position.

Power Up Self-Test

Immediately following system power up, the system executes a system self-test which lasts for approximately 10 seconds. During this time the display shows the rating chart number, units in use, and load.

During this time, crane motions are disabled by the system function kick-out. Press the ***Press to Continue*** button to acknowledge the home display message and allow the system to start normal operation.

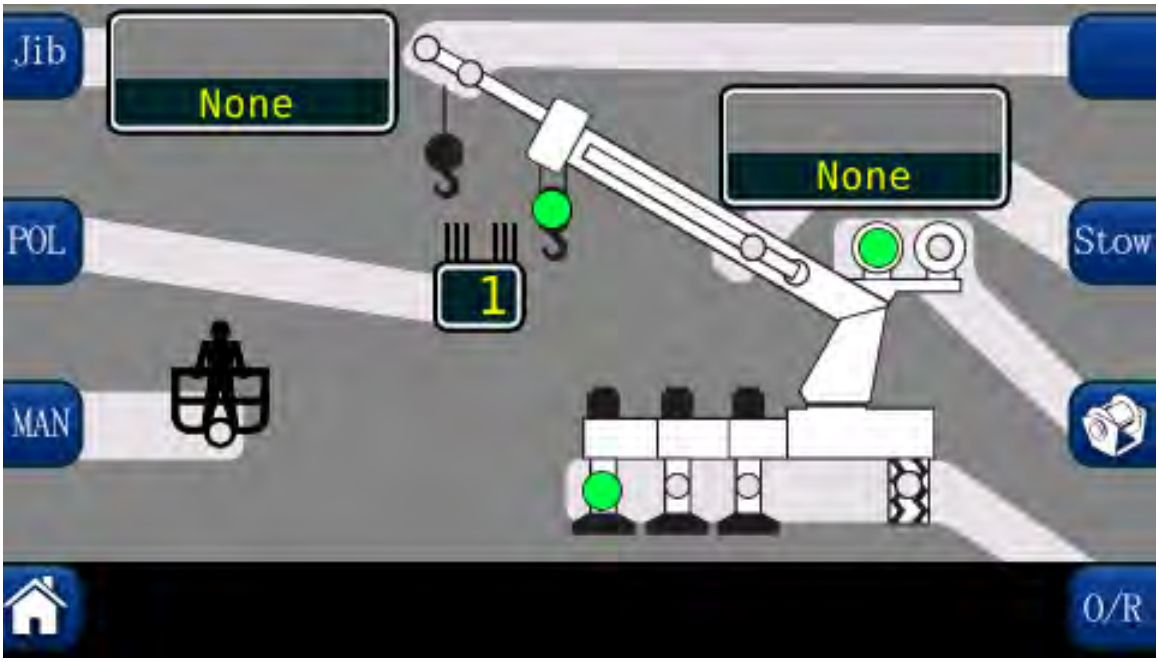


NOTE: *Not all applications will have this screen. In such applications, the home display will be shown without the need to select "CONTINUE".*

Home Display

The configuration display may be accessed from the home display by pressing the ***Configuration*** button.

The Configuration Display



NOTE: *The graphic above is only a representation of the system. The shaded areas may vary in configuration depending on the application.*

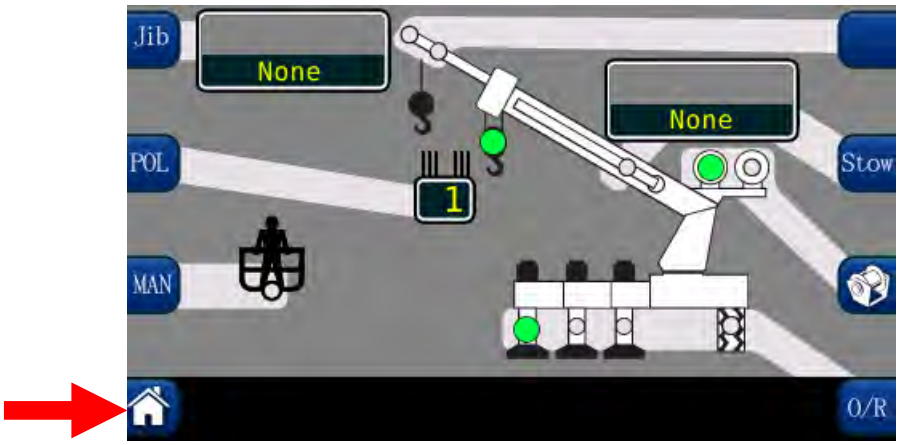
NOTE: *Always check the point of lift and parts of line upon selection of the winch.*

The configuration display gives a pictorial representation of the current system setup. Each shaded area contains one or more green indicators and a button to change the setup selection. In groups with multiple options, green indicators illuminate individually to indicate the selection. When the configuration is complete, press the ***Home*** button to return to the main operation screen.

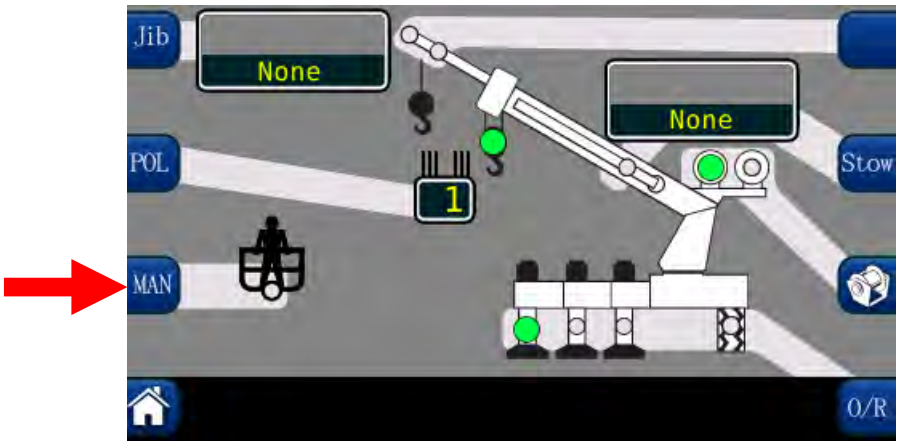
WARNING!!

THE DISPLAYED LOAD AND CAPACITY ARE BASED UPON THE CURRENT SELECTED POINT OF LIFT. NEITHER THE GREER INSIGHT SYSTEM, NOR THE CRANE CAPACITY CHART ALLOWS FOR LIFTING FROM MORE THAN ONE HOOK AT A TIME.

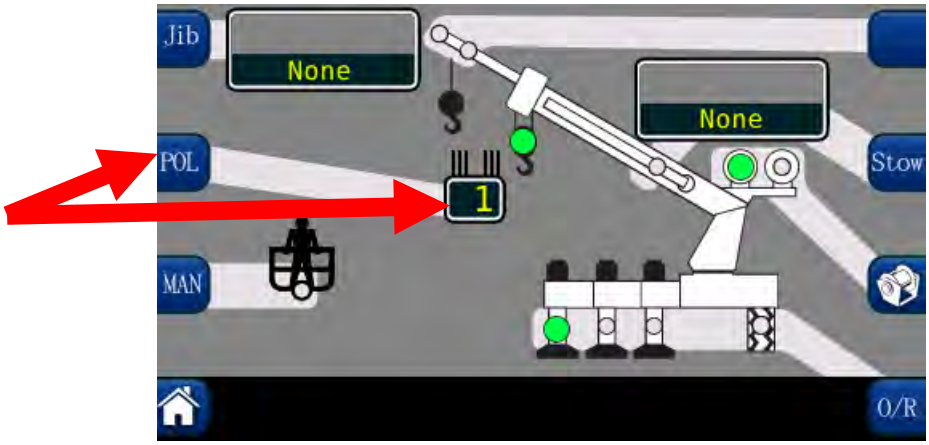
1. The ***HOME*** button will return the user to the Home display.



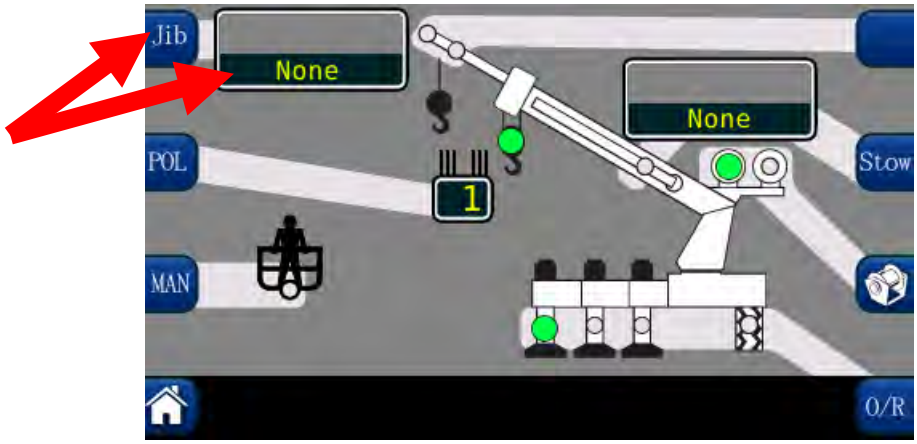
2. The ***MAN*** button enables the optional Personnel Platform.



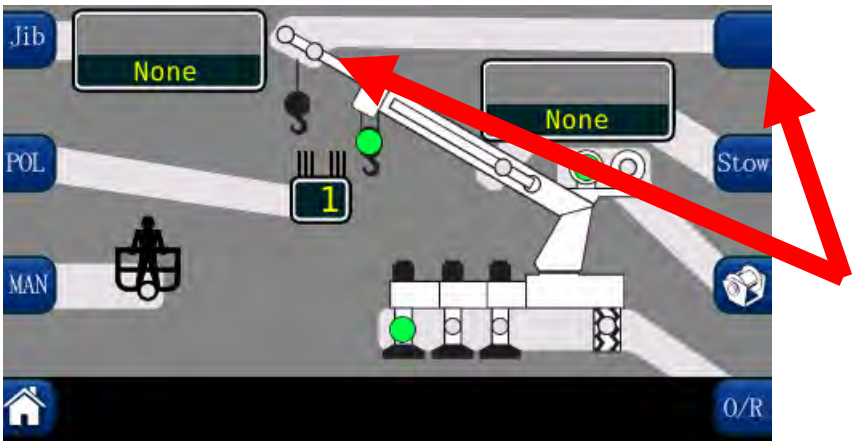
3. The ***POL*** button selects the current parts of line. Pressing the ***POL*** button will increment the parts of line. When the maximum parts of line for the equipment being used is reached, the indicator will rollover to one **POL**.



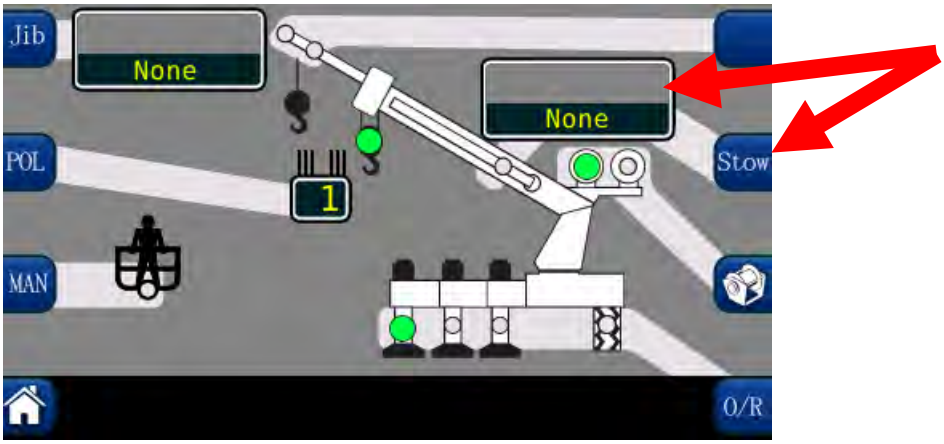
4. The **JIB OPTIONS** may be selected by pressing the ***Jib*** button multiple times to scroll through the jib options. If there are no options available, the display will show "**None**".



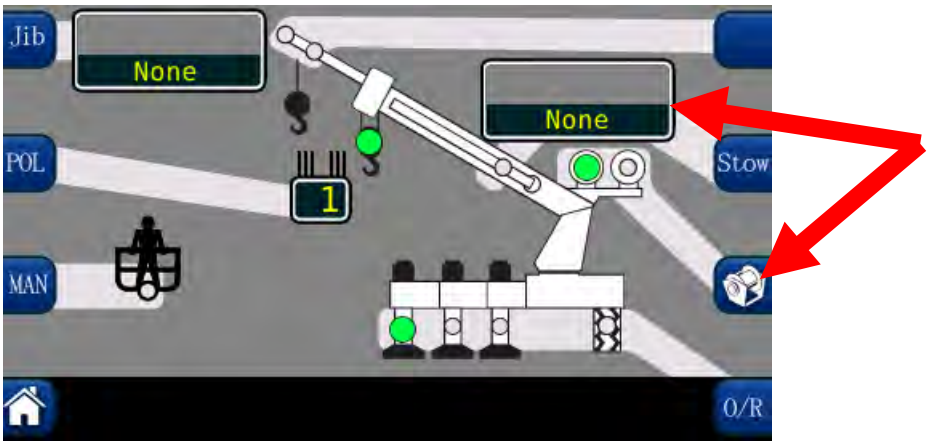
5. The **PICK LONG**, **PICK SHORT**, **PICK MAIN** selections are dependent upon the model of crane being used.



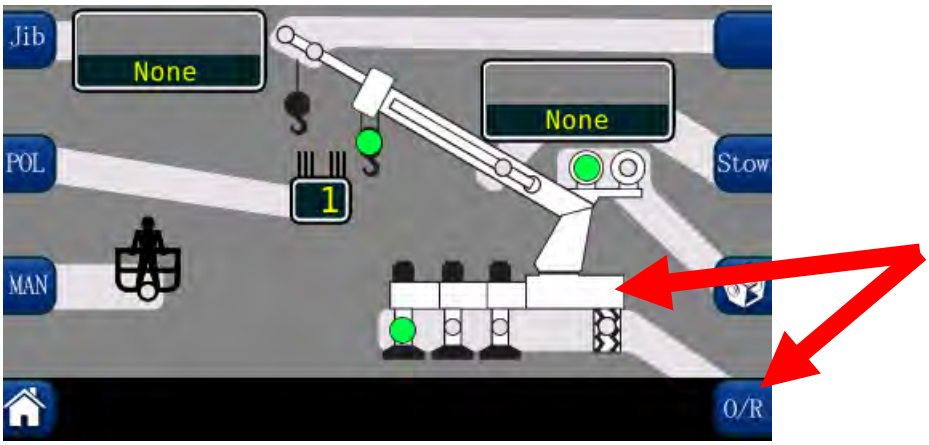
6. The **STOW (STOWED JIB)**, group contains one green indicator. This will illuminate when a jib is stowed on the boom. Press the ***Stow*** button multiple times to scroll through jib options. If there are no options available, the display will show "**None**".



7. The **WINCH** group contains two green indicators, which indicate the selection of front or rear winch. ***NOTE:*** *If the crane is equipped with two winches, always select the winch to be used for the lift, prior to selecting the parts of line selections for each winch.*



8. The **OUTRIGGER/TIRE** selections are made by pressing the ***O/R*** button. ***NOTE:*** *Some cranes will not have the option of selecting different outrigger positions*.



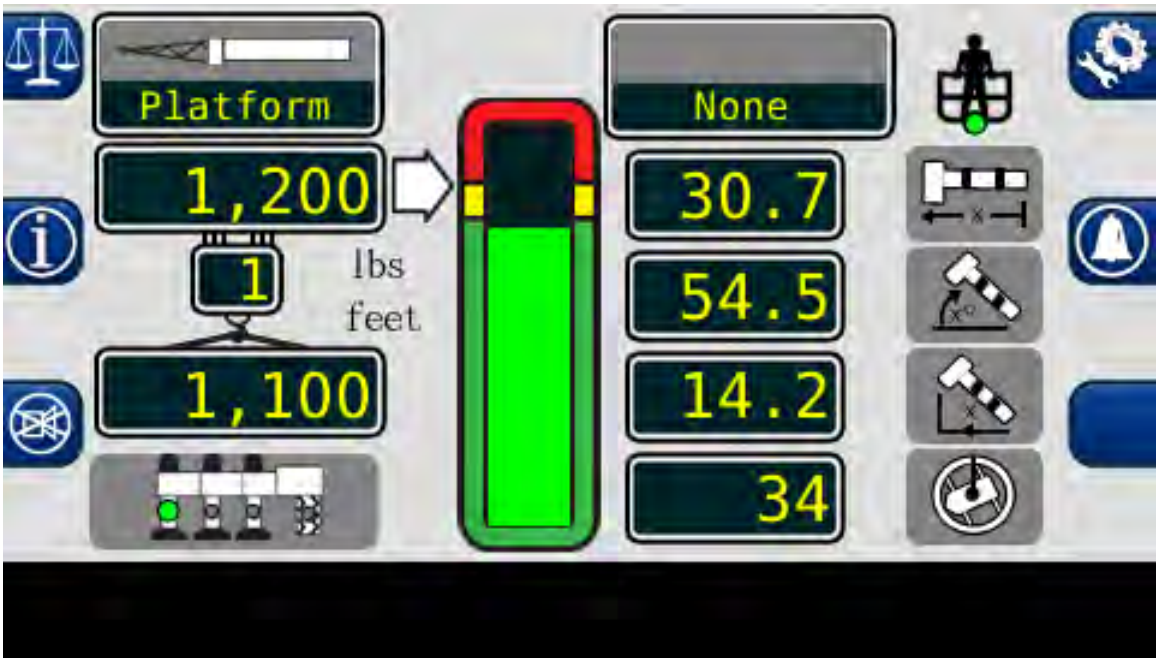
OUTRIGGER POSITION SENSING (IF EQUIPPED)

The operator will be warned if the selected outrigger position does not match the detected outrigger position.

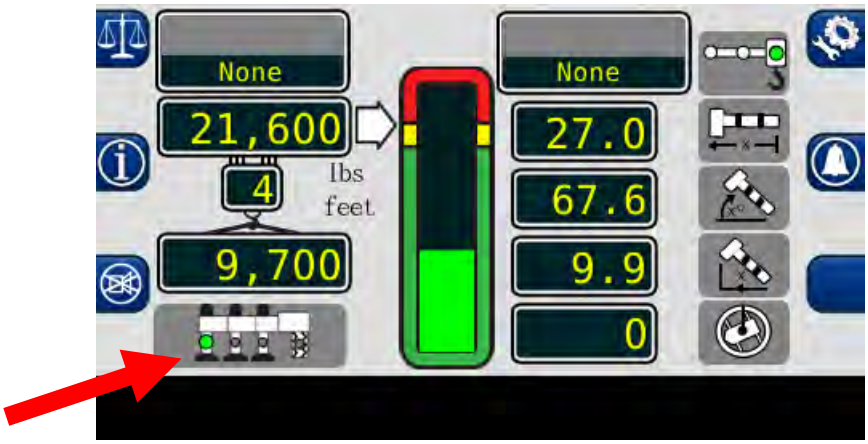
Correct Selection: The selection will have a solid green indicator, when the selected and detected outrigger positions match.

Incorrect Selection: The detected position will flash a red indicator and the selected position will be a solid yellow indicator. On the main screen, an audible alarm will sound if the selected position is greater than the detected position. The alarm will sound if the operator has selected fully extended outriggers, but the outriggers are in the intermediate or fully retracted position.

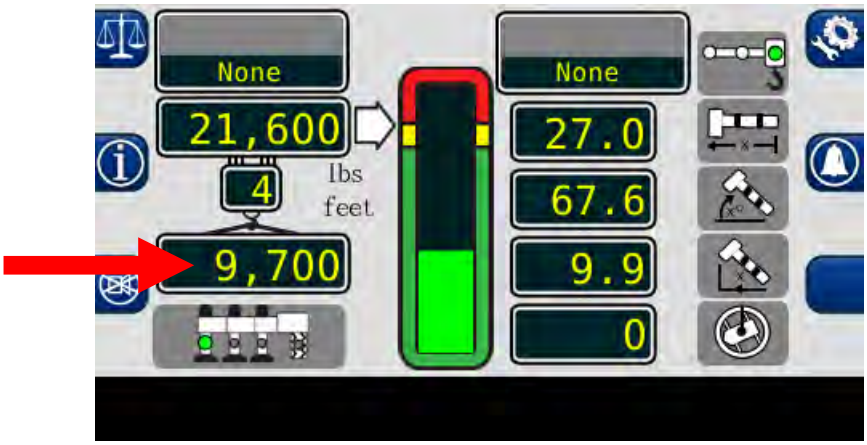
The Home Display



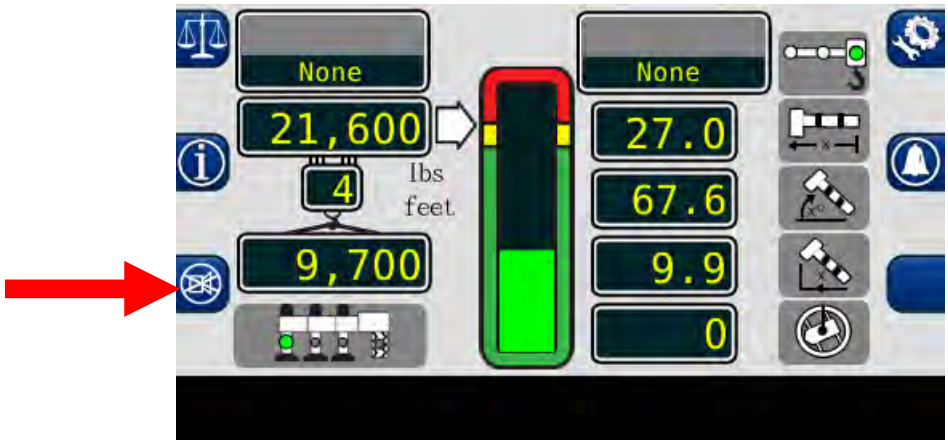
1. The **OUTRIGGER/TIRES** setting contains four green indicators. They indicate the selection of tires, full, intermediate, or retracted outriggers. The user must make the selection from the configuration display. ***NOTE:*** *OUTRIGGER/TIRE selections are dependent on the crane being used.*



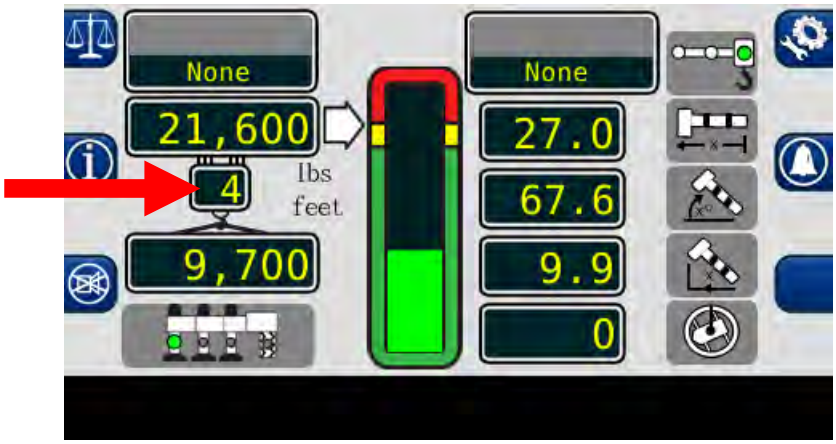
2. The **ACTUAL LOAD** value displays the total load, including slings, etc., suspended below the lifting point. ***NOTE:*** *The system load reading is most accurate in static situations. Due to system dynamic response, the load reading may vary when lifting or lower the load. Meter functions carefully, especially boom down to minimize the dynamic effects.*



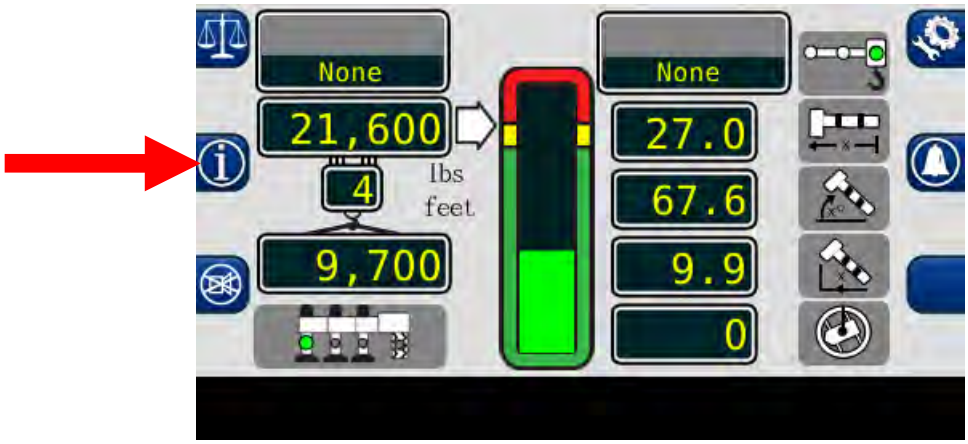
3. The ***CANCEL ALARM*** button is used to silence the audible alarm generated by an overload, ATB Alarm, operator programmable alarm, or outrigger position horizontal beam mismatch. The audible alarm remains cancelled until the condition causing the alarm has been resolved.



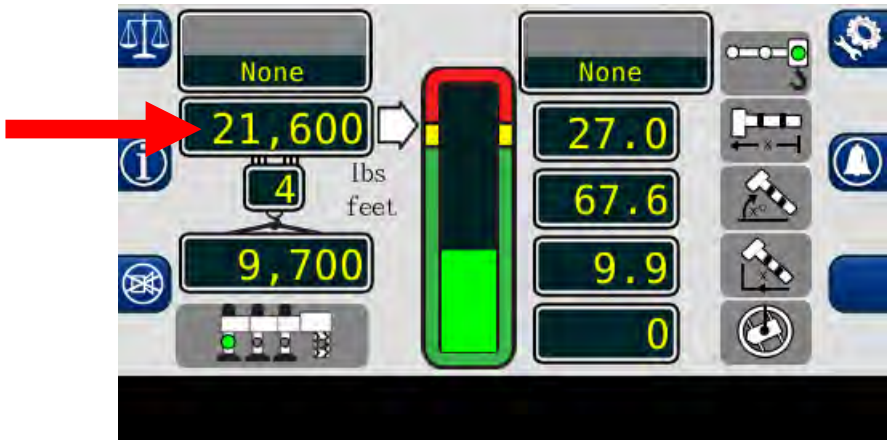
4. The **PARTS OF LINE** window displays the amount of line chosen for the configuration selected. It is adjustable from the configuration screen.



5. The ***INFORMATION*** button displays system generated messages regarding the software versions of the equipment and fault codes. Press and hold the ***Information*** button to display the data. The messages will remain on the screen until the button is released.

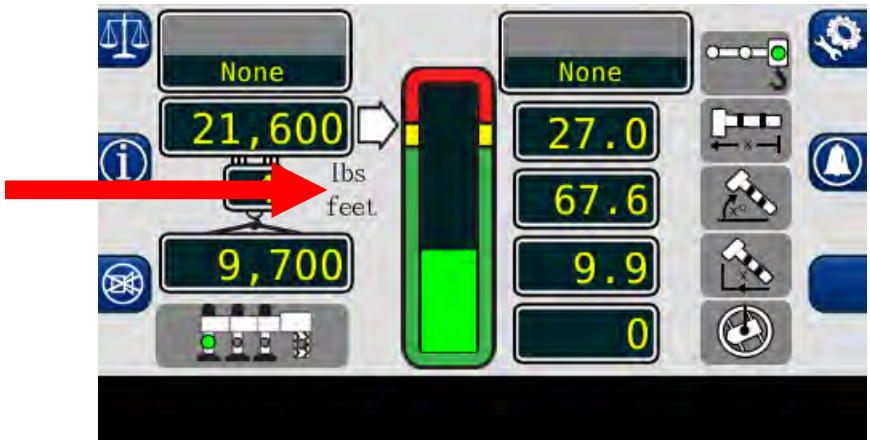


6. The **RATED CAPACITY** window displays the maximum rated capacity of the machine in the current configuration.

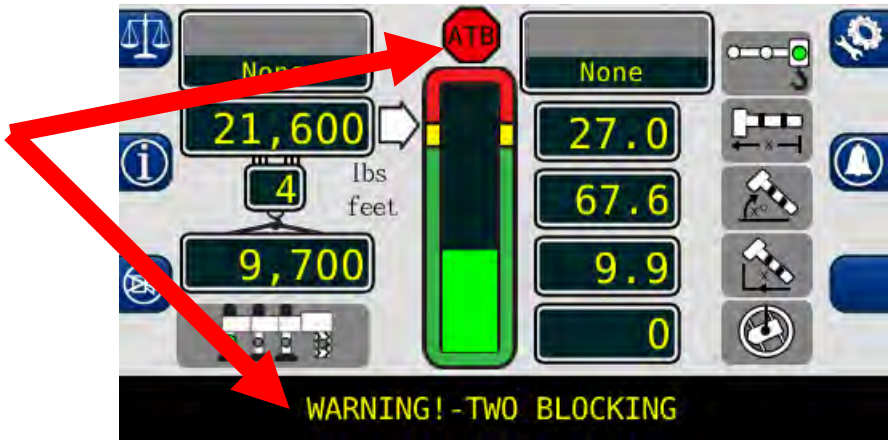


7. The **ERECTED JIB** window displays the jib option selected for the machine. If there are no jib options available, the display will show “**None**”.

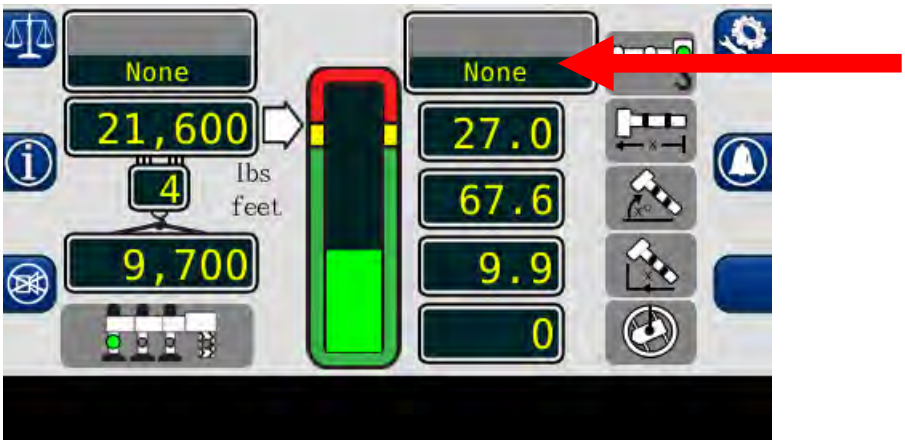
8. The **SYSTEM** has the capability of showing metric or imperial units. This can be changed in the calibration menu.



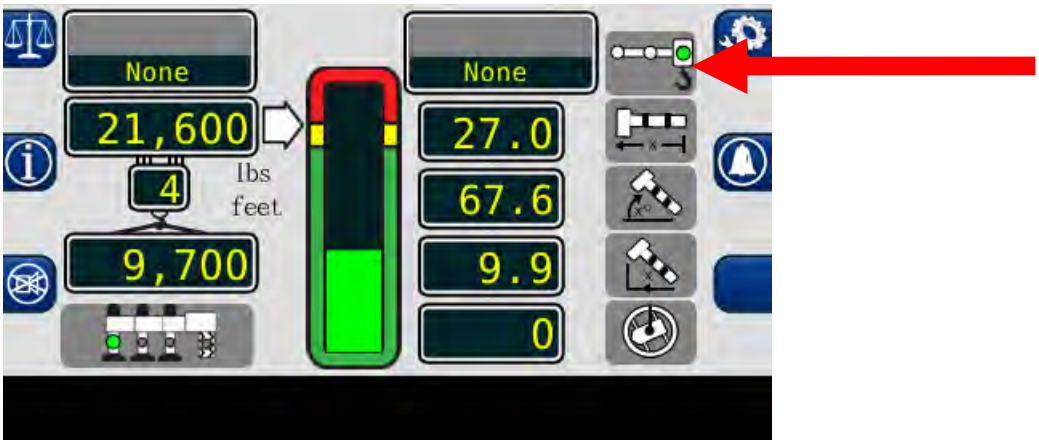
9. The **ANTI-TWO-BLOCK** indicator illuminates when the ATB limit switch detects an approach to a two-block condition.



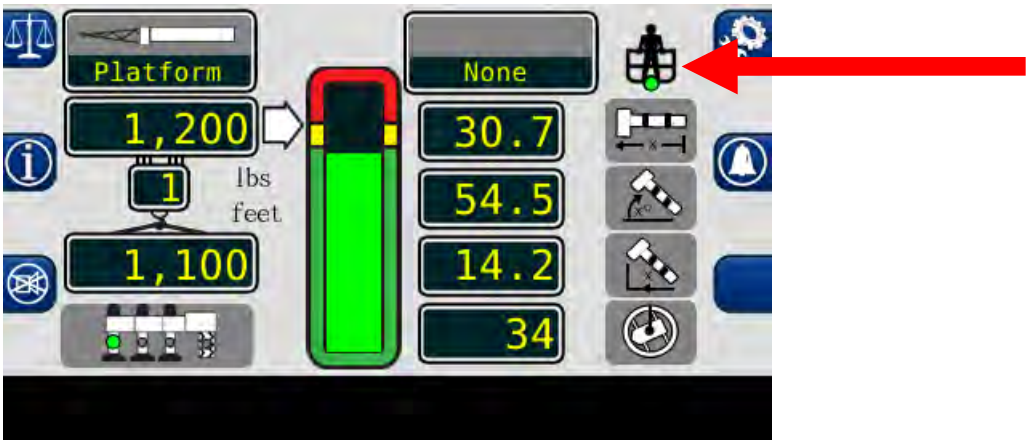
10. The **JIB STOWED** window displays the stowed jib from the configuration screen. The length and offset of the jib in use is also shown in the home display.



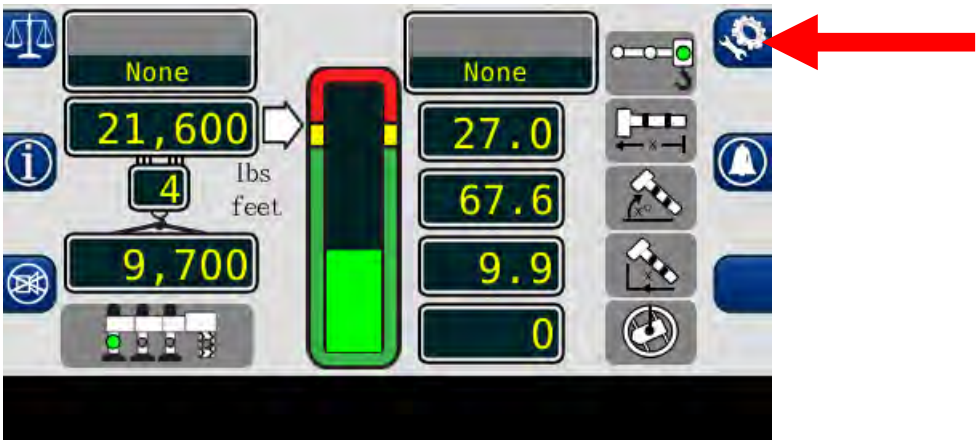
11. The **PICK POINT** icon displays the currently selected pick point chosen on the Configuration screen.



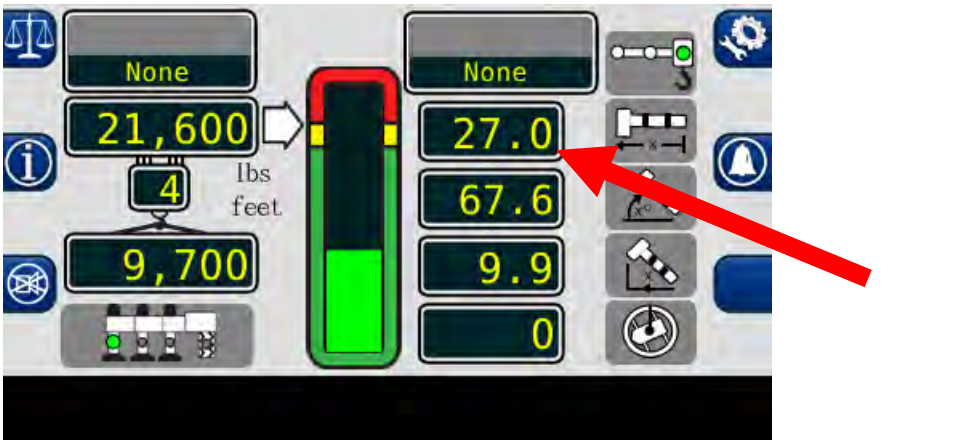
If the operator has chosen the Personnel Platform on the Configuration Screen, the main operating page will display the basket icon.



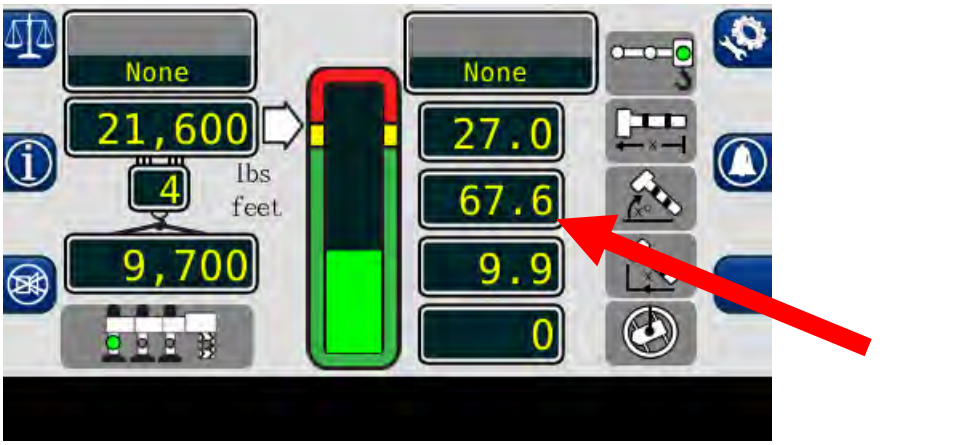
12. The ***CONFIGURATION*** button accesses the configuration display screen.



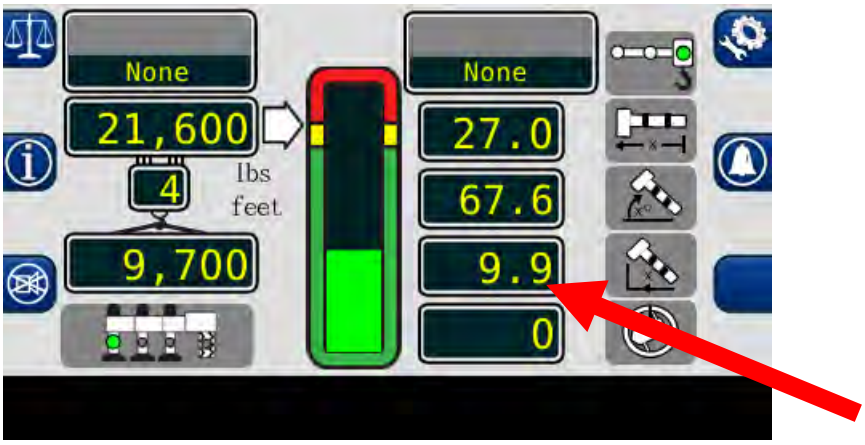
13. The **BOOM LENGTH** window displays the length of the main boom from the boom foot pin to the sheave pin of the main boom head machinery.



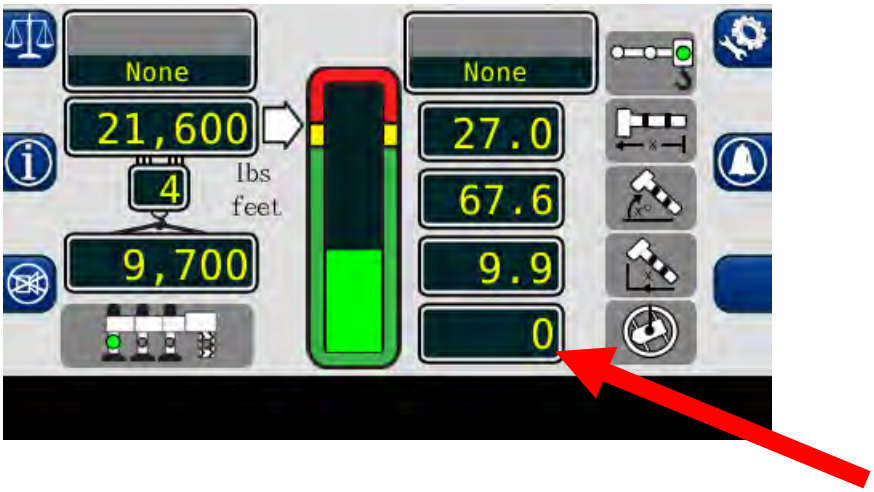
14. The **BOOM ANGLE** window displays the angle of the main boom in degrees relative to horizontal.



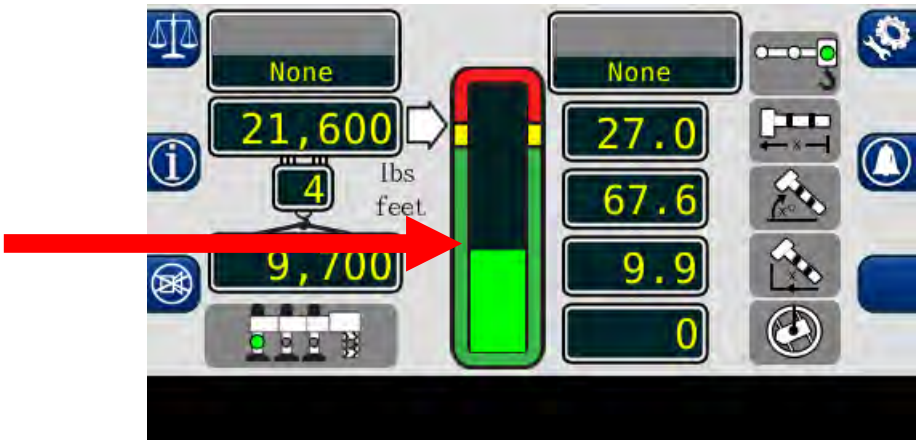
15. The **LOAD RADIUS** window displays the radius of the main boom.



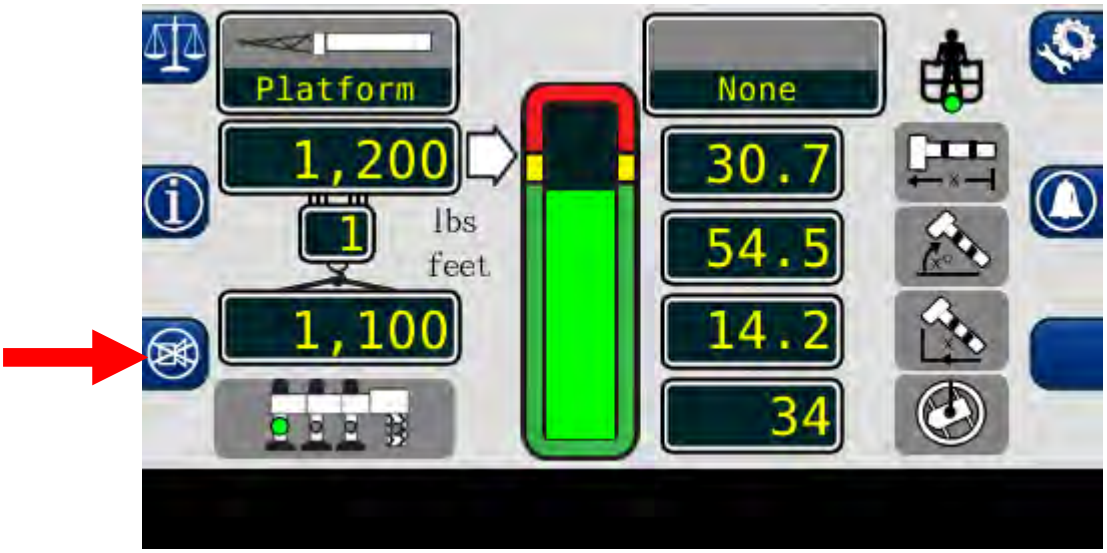
16. The **SWING ANGLE** window displays the swing of the boom relative to the zero point.



17. The **BAR GRAPH** indicates the actual load as a percent of the rated capacity of the current configuration of the machine.



Cancel Alarm Button



The ***Cancel Alarm*** button is used to silence the audible alarm. Press this button to cancel an audible alarm from an:

- Overload
- ATB Alarm
- Outrigger Horizontal Beam Mismatch
- Operator Programmable Alarm.

The audible alarm remains cancelled until the condition which caused the alarm has been resolved.

Reset Function Kick-Out

When rigging the machine, it may be necessary to place the boom in a position which could cause a function kick-out. In this situation, it would be necessary to use the ***Cancel Alarm*** button. The ***Cancel Alarm*** button is also used to reset the function disconnect relay. Press and hold the button for 5 seconds to reset the relay. A second beep is heard confirming the bypass. Continue to hold the button to maintain the function kick-out.

Should a different alarm condition occur while the relay is overridden, the new alarm will cause another function kick-out. When the condition which caused the alarm is no longer present, the function disconnect relay will reset to the normal condition.

WARNING!!

WHEN THE FUNCTION DISCONNECT RELAY IS RESET BY MEANS OF THE CANCEL ALARM BUTTON, THERE IS NO LONGER PROTECTION AGAINST THE CONDITION THAT CAUSED THE FUNCTION KICK-OUT.

Operator Programmable Alarms

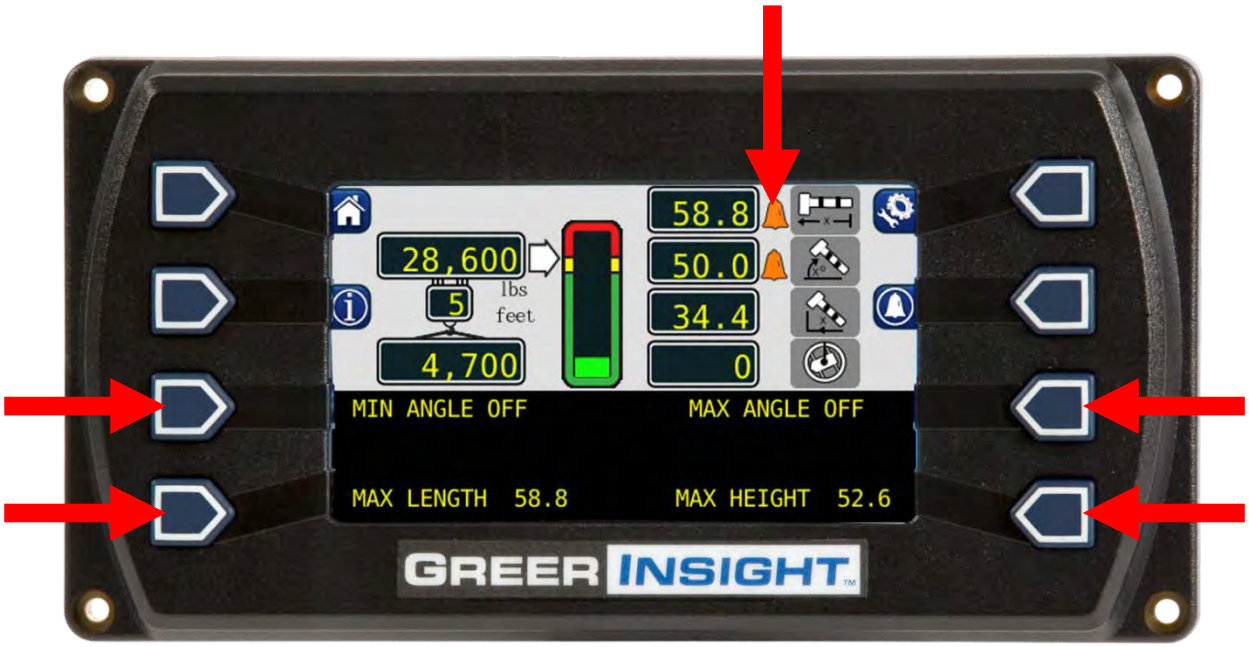
Setting the Operator Alarms

1. Press the ***Operator Alarm*** button. The information screen will show the current status of the operator alarms.

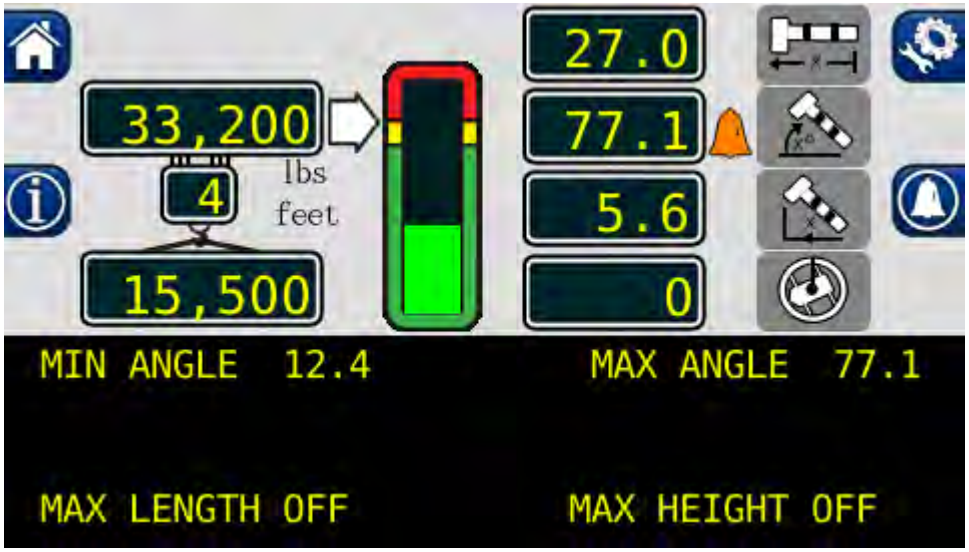
Each button corresponds to the displayed alarm. These buttons operate as a toggle switch. If the alarm to be set is OFF, pressing the button will turn the alarm ON. If the alarm to be set is ON, pressing the button will turn the alarm OFF.

NOTE: *Press the* ***Operator Alarm*** *button in order to cycle through the various user programmable alarms. Press the home button to return to the main screen. Exit at any time*.

When operator alarms are set, the orange alarm will appear. An example below:



Operator Programmable Alarms



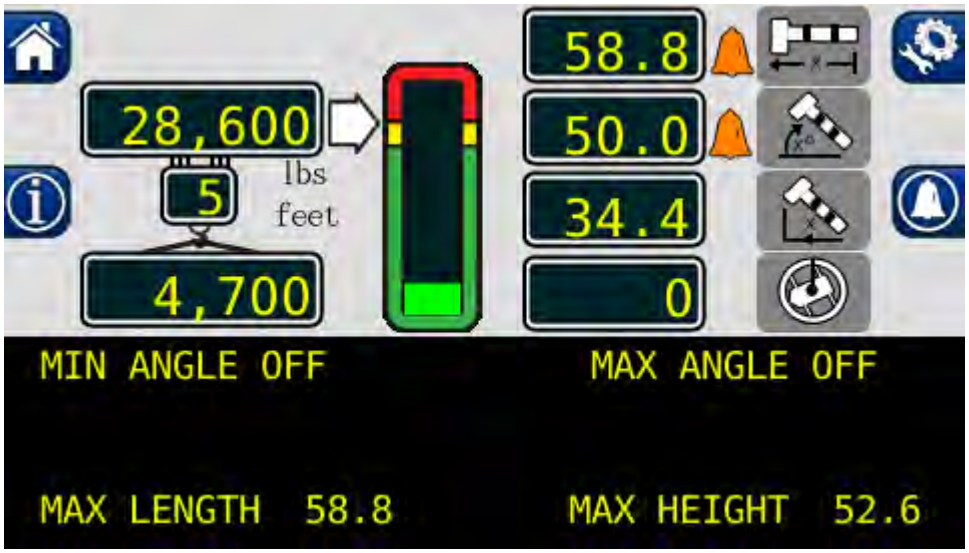
Setting the Minimum Boom Angle Alarm

1. Move the boom to the desired minimum angle, in this example, 12.4°.
2. Press the ***MIN ANGLE OFF*** button.
3. The display will show the desired minimum angle, in this example, 12.4°.
4. Press the ***MIN ANGLE*** button again to cancel the alarm. The display will read: **"MIN ANGLE OFF"**.

Setting the Maximum Boom Angle Alarm

1. Move the boom to the desired maximum angle, in this example, 77.1°.
2. Press the ***MAX ANGLE OFF*** button.
3. The display will show the desired maximum angle, in this example, 77.1°.
4. Press the ***MAX ANGLE*** button again to cancel the alarm. The display will read **"MAX ANGLE OFF"**.

Operator Programmable Alarms



Setting the Maximum Boom Length Alarm

1. Move the boom to the desired maximum length, in this example, 58.8 ft.
2. Press the ***MAX LENGTH OFF*** button.
3. The display will show the desired maximum length, in this example, 58.8 ft.
4. Press the ***MAX LENGTH*** button again to cancel the alarm. The display will read **"MAX LENGTH OFF"**.

Setting the Maximum Tip Height Alarm

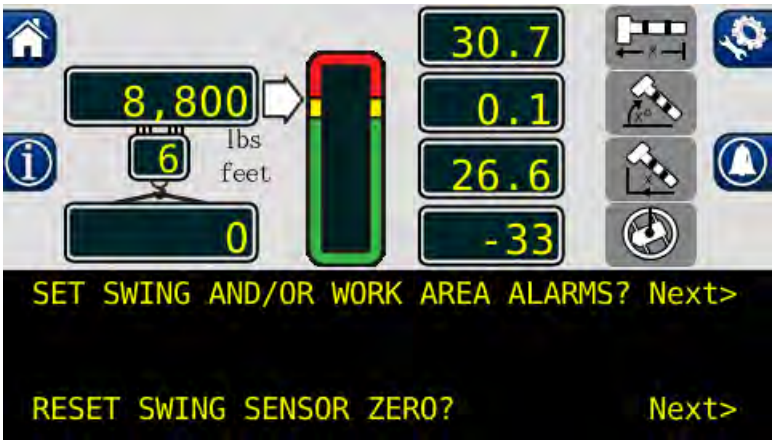
1. Move the boom to the desired maximum height, in this example 52.6 ft.
2. Press the ***MAX HEIGHT OFF*** button.
3. The display will show the desired maximum height, in this example 52.6 ft.
4. Press the ***MAX HEIGHT*** button again to cancel the alarm. The display will read **"MAX HEIGHT OFF"**.

Operator Programmable Alarms

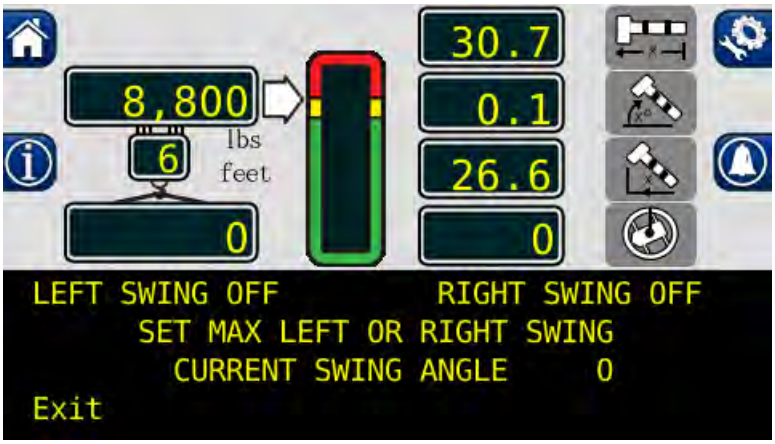
Setting the Swing Alarms

When the swing travels one degree past either set point, the operator will be visually and audibly warned. The display will show either, **“WARNING! – RIGHT SWING!”** or **“WARNING! – LEFT SWING!”** The alarm condition will once the crane is back into the working area.

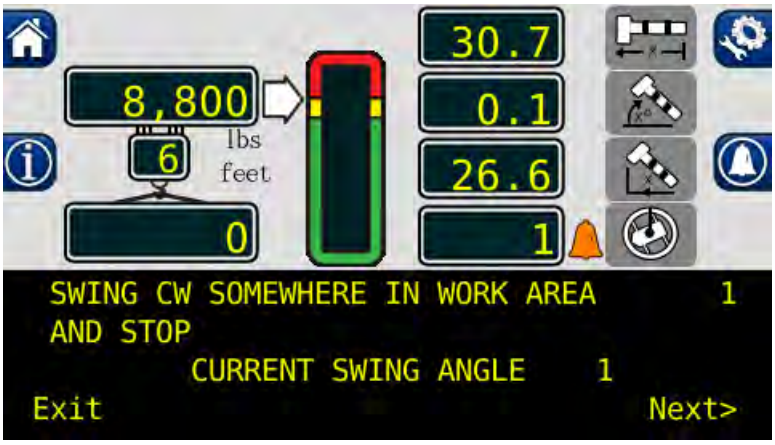
1. Press the ***Operator Alarm*** button twice.
2. Press ***Next*** button adjacent to **“SET SWING AND/OR WORK AREA ALARMS?”**



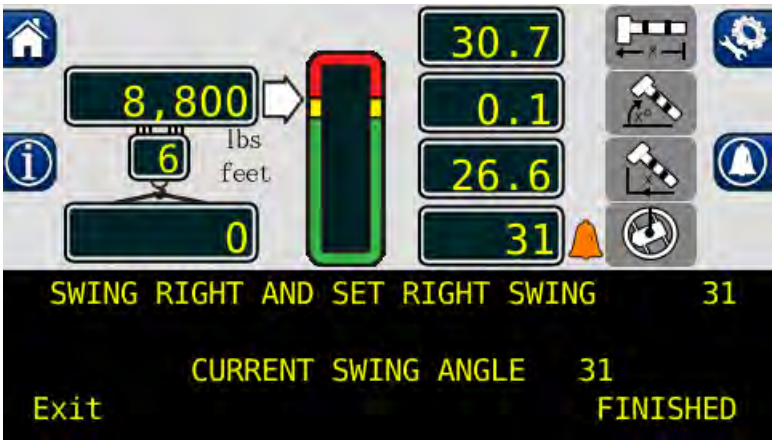
3. Press the ***Next*** button corresponding to **“SET LEFT AND RIGHT SWING ALARMS”**.
4. If a swing alarm is already set, press the ***LEFT SWING*** and ***RIGHT SWING*** buttons, to turn off the current alarms.



5. Swing the boom to the desired left swing point and press the ***LEFT SWING OFF*** button. This sets the left swing point value.
6. Press the ***Next*** button to continue.
7. Move the boom into the safe area and press the ***SET*** button.
8. Press the ***Next*** button.



9. Swing the boom to the desired right swing point and press the ***OFF*** button.



10. The swing alarms are now set. Press the ***Exit*** button to return to the calibration menu.

Operator Programmable Alarms

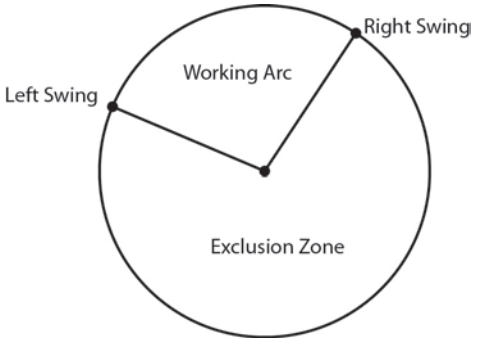
Swing Alarms Illustrated

These alarms permit the operator to define a working arc and an exclusion zone by two set points. The following diagram illustrates the working arc and exclusion zone.

A left swing alarm is activated when swinging to the left.

A right swing alarm is activated when swinging to the right.

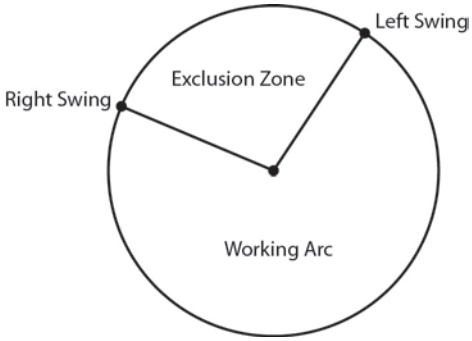
In this example the working arc is the smaller piece of the pie.



A left swing alarm is activated when swinging to the left.

A right swing alarm is activated when swinging to the right

In this example the working arc is the larger piece of the pie.



WARNING!

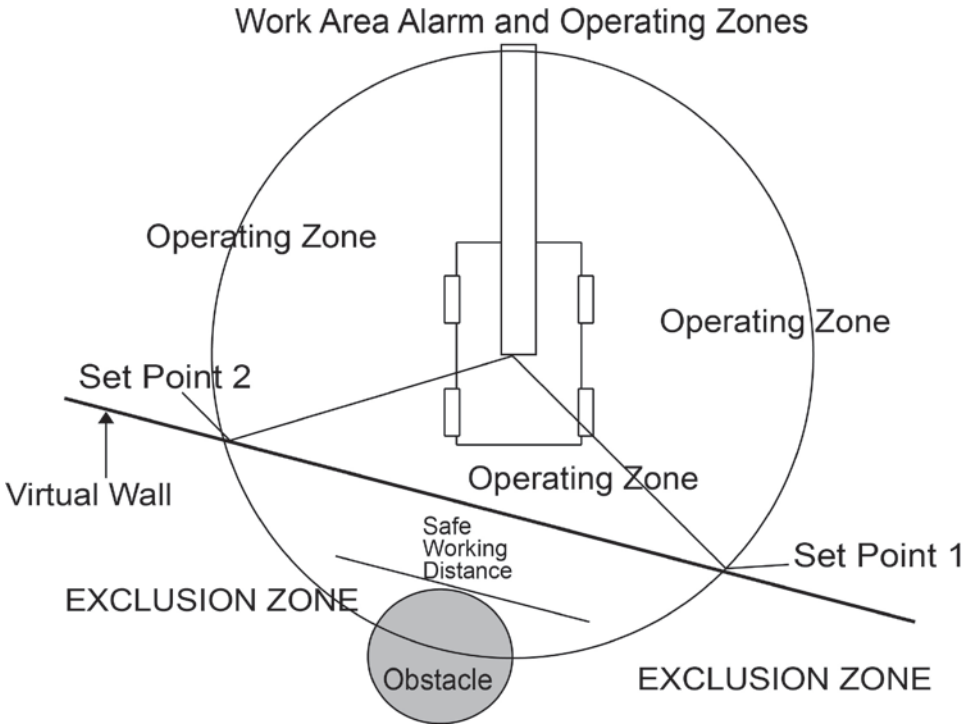
THE OPERATOR DEFINED SWING ALARM IS A WARNING DEVICE. ALL FUNCTIONS REMAIN OPERATIONAL WHEN ENTERING THE OPERATOR DEFINED EXCLUSION ZONE. IT IS THE RESPONSIBILITY OF THE OPERATOR TO SET SWING ALARMS THAT ENSURE THE CRANES BOOM, ATTACHMENT, LOAD, RIGGING, ETC. MAINTAIN A SAFE WORKING DISTANCE FROM THE OBSTACLE. AVOID POSITIONING THE BOOM, ATTACHMENT, LOAD, RIGGING ETC. IN THE EXCLUSION ZONE WHEN MOVING TO THE LEFT AND RIGHT SWING POINTS. WHEN SELECTING LEFT AND RIGHT SWING POINTS ENSURE THE LOAD WILL MAINTAIN A SAFE DISTANCE FROM THE OBSTACLE. RESET THE SWING ALARMS IF THE CRANE OR OBSTACLE IS MOVED OR IF A DIFFERENT SIZE LOAD IS LIFTED.

Operator Programmable Alarms

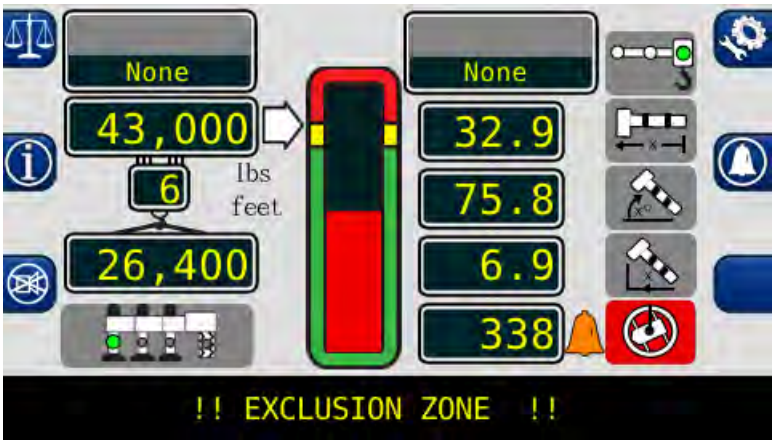
Work Area Alarms

This alarm permits the operator to define an operating zone by only two set points. The use of this method results in a more defined operating zone. The following diagram illustrates the operating zone and the exclusion zone.

The set points are calculated using the tip of the boom. This means the set point isn't determined just by the swing of the boom, but also the distance from the centerline of rotation to the tip of the boom.



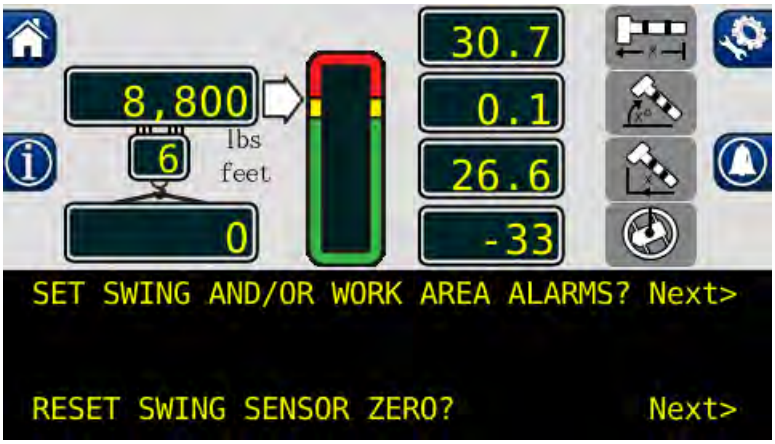
The work area alarm, defines an imaginary vertical plane between two set points. When the plane is passed the red warning indicator will be displayed, the alarm will sound, and the message **"!! EXCLUSION ZONE !!"** will flash as shown below.



Operator Programmable Alarms

Setting the Work Area Alarm

1. Press the ***Operator Alarm*** button twice. The information screen will show the current status of the swing and work area alarms. Press ***Next*** button adjacent to **"SET SWING AND/OR WORK AREA ALARMS?"**



2. Press the ***Next*** button.
3. To set a new swing area, the left and right points must be reset. Press the ***LEFT POINT*** and ***RIGHT POINT*** buttons. This will reset the set points

NOTE: *In order for the swing alarms to function properly both alarms must be set. If the procedure is aborted before both points are set, the alarms will default to* ***"OFF"****.*

4. The display will now show **"LEFT POINT OFF"** **"RIGHT POINT OFF"**.

5. Rotate the boom to the desired left point. This should be the point to the left of the obstacle facing the exclusion zone to be defined.
6. Press the ***LEFT POINT*** button. The left point will now be set.

7. Rotate the boom to the right, taking care to avoid the obstacle by raising or retracting the boom. Or rotate the boom to the left to avoid moving the boom through the exclusion zone.
8. Press the ***RIGHT POINT*** button.
9. The work area alarm set points are now set.
10. To deactivate the alarms, go back to the screen displaying the left and right set points.

11. Press the ***LEFT POINT*** and ***RIGHT POINT*** buttons to toggle the alarms OFF.

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As a leader in product innovation, Greer Company is committed to the ongoing improvement of its equipment. We reserve the right to make changes to our products without notice.

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Load King Operation Manual

GREER COMPANY ®

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Introduction

The Greer Insight system is an aid to crane operation. The operator must be knowledgeable in safety guidelines, crane capacity information, and the crane manufacturer's specifications.

This manual describes the setup, operation, and maintenance of the system. Read the instructions in this manual.

1.1 Overview and Preparation

This manual provides general information and methods for isolating problems that may happen during operation. Service personnel should have previous training and experience in the procedure for setup and operation of this system. Some problems may require replacing or returning parts to the factory for servicing.

Tools necessary:

- Tool kit consisting of wrenches and screwdrivers (flat and Phillips')
- Digital level accurate to 0.1°
- 150-200 ft tape measure graduated in tenths of a foot
- Digital multimeter

NOTE: Low-cost analog multimeters are not appropriate; their input impedance may give inaccurate readings.

2.1 System Self-Test

When the power is turned on, the system performs a self-test. This verifies the computer, display console, cable, and sensors are working properly. During the self-test, the display will show the expected crane model, load chart number and units of measurement.

When the display shows the following message, press the “PRESS TO CONTINUE” button.

If the above does not occur, refer to **Display Console Problems**.

2.2 Display Console Problems

Display console problems can be difficult to isolate due to the interaction between the display and the computer unit. Failure of either unit or the cabling connecting the units can cause a malfunction.

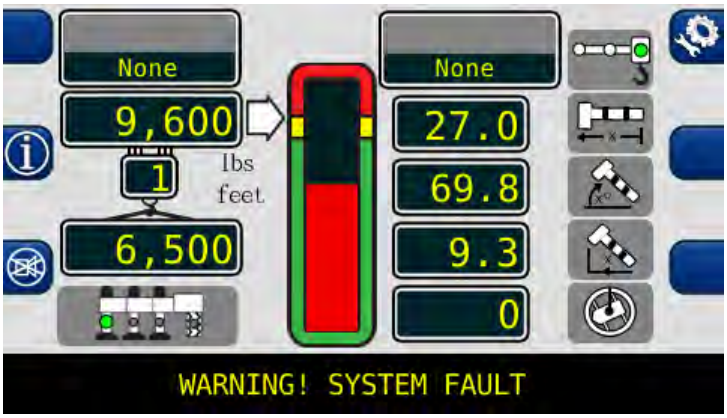
To solve problems using the display indications, observe the display at power up and through the self-test. Use the following chart to help with the diagnosis:

Problem	Action
There are no display indications in any of the windows when the power is turned on. Or a “No Communications” message appears.	Refer to **Internal Status Indicators**.
The display unit does not cycle through the self-test. The data in the display windows appears jumbled with missing segments.	Replace the display unit.

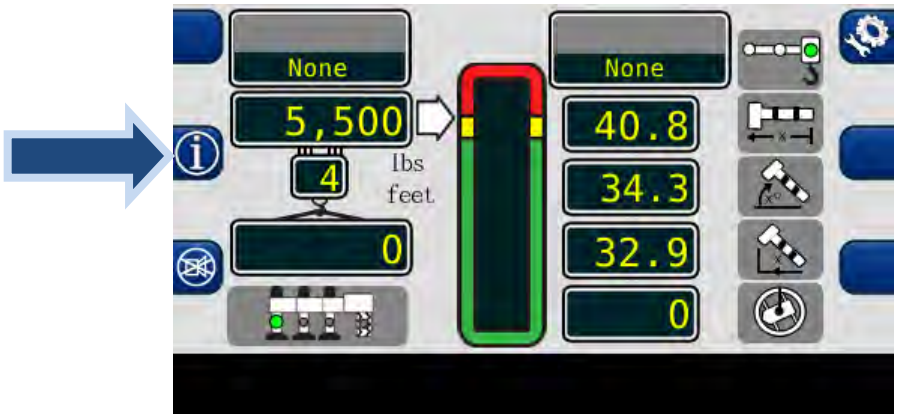
2.3 Fault Reporting and Fault Codes

System fault codes provide ways to locate and assess problems within the Insight system. Each time the system is turned on, it performs a self-test that lasts approximately 6 seconds. Faults detected during the self-test are indicated on the display console:

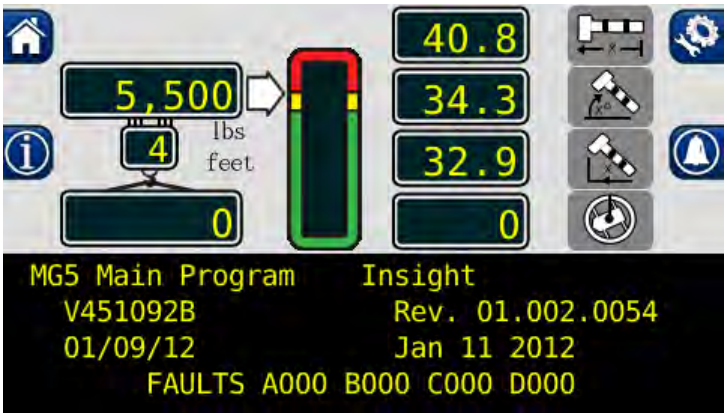
- “WARNING SYSTEM FAULT!” will display at the bottom of the text window.



To view the fault codes, press and hold the (i) button as shown.



The faults will be listed across the bottom of the text window.



2.3.1 Group “A” Fault Codes

Group “A” fault codes represent faults detected for analog sensors.

NOTE: Check and repair “B” and “C” group faults before investigating group “A” faults.

The following chart details all the available codes in the left column and the actions to take in the right column.

FAULT CODE	SWING SENSOR	BOOM ANGLE SENSOR	EXTENSION SENSOR	TDX 1 ROD PRESSURE	TDX 0 PISTON PRESSURE	ACTION
000	No Fault Found					None
001					X	Refer to Replacing the Computer
002				X		
003				X	X	
004			X			Refer to Calibrating the Extension Sensor Zero, Calibrating Span of Extension and Angle, and Reeling Drum Voltage Checks.
008		X				Refer to Calibrating the Angle Sensor Zero, Calibrating Span of Extension and Angle, and Reeling Drum Voltage Checks.
012		X	X			Refer to Calibrating the Angle Sensor Zero, Calibrating the Extension Sensor Zero, Calibrating Span of Extension and Angle, and Reeling Drum Voltage Checks.
016	X					Refer to Calibrating the Swing Potentiometer, and Reeling Drum Voltage Checks.

2.3.2 Group “B” Fault Codes

Group “B” fault codes represent faults detected for internal analog functions and power feeds to the function kickout and anti-two block switches.

FAULT CODE	FKO POWER FEED	A2B POWER FEED	DISPLAY CONSOLE	ADC 2 INTERNAL FAULT	ADC 1 INTERNAL FAULT	ACTION
000	No Fault Found					
008		X				Refer to sections 6.5 and 6.6 for Troubleshooting Information.
016	X					Check Crane Circuit Breakers

2.3.3 Group “C” Fault Codes

NOTE: Group “C” fault codes represent faults detected for internal computer memories.

The following chart details all the available codes in the left column and the actions to take in the right column.

FAULT CODE	SERIAL EEPROM	CRANE DATA	RAM	DUTY DATA	PROGRAM	ACTION
000	No Fault Found					NONE
001					X	Reprogram the MG5 computer.
008		X				Erase Crane Data
016	X					Replace Computer

2.3.4 Group “D” Fault Codes

NOTE: Group “D” fault codes represent faults detected for capacity chart selection.

The following chart details all the available codes in the left column and the actions to take in the right column.

FAULT CODE	WRONG SWING AREA	WRONG BOOM LENGTH	CHART NOT FOUND	ACTION
000	No Fault Found			NONE
001			X	Check other sensor faults first, Reselect CRANE SETUP
002		X		Boom length is out of range for selected chart. Check crane setup, boom length and extension.
003		X	X	Check other sensor faults first, Reselect CRANE SETUP
004	X			Swing to correct working area to select chart. Check swing sensor zero position.
005	X		X	Swing to correct working area to select chart. Check swing sensor zero position.
006	X	X		Check other sensor faults first, Reselect CRANE SETUP
007	X	X	X	Check other sensor faults first, Reselect CRANE SETUP

2.4 “No Fault Code” Problems

This section addresses problems not reported by the computer fault code system.

2.4.1 Anti-Two-Block Alarm (ATB)

This section gives aides diagnosing ATB alarm problems. For detailed information, schematic, and voltages, refer to **ANTI-TWO-BLOCK FUNCTION OVERVIEW**.

PROBLEM:

- *The Anti-Two-Block alarm is continuously ON. Operating the switch at the boom head does not deactivate the alarm.*

This problem suggests an open circuit between the computer ATB input and the ATB switch, or an open circuit between the computer ATB feed and the ATB switch. Check the reeling drum cable for damage. Ensure the two-block switches are correctly connected. Check the slip-ring and wiring inside the extension reel. Check the reel-to-computer cable. Check the connectors.

PROBLEM:

- *The Anti-Two-Block alarm is continuously OFF (safe). Opening the switch at the boom head, by lifting the A2B weight does not activate the alarm.*

This problem suggests a short circuit between the computer ATB input and the computer ATB feed somewhere between the computer and the ATB switch. Check the reeling drum cable for damage. Ensure the two-block switches are correctly connected. Check the slip-ring and wiring inside the extension reel. Check the reel-to-computer cable. Check the connectors.

2.4.2 Displayed Load or Radius Errors

This section gives direction to fault diagnosis of load and radius errors. Load or radius errors can cause early or late tripping of overload alarms. Accuracy of load is governed by the radius accuracy, and the extension, angle, and pressure sensors. Accuracy of radius (unloaded) is governed by the extension and angle sensors.

Ensure there are no system faults before continuing.

2.4.2.1 Check Boom Extension

1. Ensure the boom is fully retracted.
2. Ensure the reeling drum cable is correctly layered as a single layer across the extension reel surface. Any stacking of the cable will cause extension errors. This will cause the System to exceed the 0.5 ft tolerance allowed by the computer for boom mode selection. If the reeling drum cable is stacking on the reel, refer to **CHECKING THE REELING DRUM CABLE LAYERING**.

3. Check the zero of the extension sensor with the boom fully retracted. Enter the Calibration Mode and use the “SPAN” command. Select sensor No. 2 to view the extension value in feet. The value of extension must be between -0.2 and +0.2, with the boom fully retracted. If the extension value is incorrect, refer to **ENTERING THE CALIBRATION MODE**. Fully telescope the boom and ensure the displayed boom length value matches the maximum length of the boom. If the length value is incorrect, follow the EXTENSION SPAN procedure in **CALIBRATING SPAN OF EXTENSION AND ANGLE**.

2.4.2.2 Check Main Boom Radius

NOTE: The required accuracy of taped radius measurements is within 0.1 feet. When taking radius measurements use a good quality tape that does not stretch. The tape should be graduated in feet and tenths of a foot. Always measure between the swing center of the crane and the hook line, using a single part of line with the crane centered over front (rough terrain) or centered over rear (truck crane).

1. Fully retract the boom and ensure the crane configuration is correctly set up.
2. Raise the boom to about 45° and measure the radius. The measured radius must match the displayed radius within + 0.5 ft. If it does not match, refer to **CALIBRATING THE ANGLE SENSOR ZERO**.
3. Raise the boom to a high angle (at least 70°) and measure the angle with the inclinometer. Ensure the displayed angle matches the inclinometer reading within 0.2°. If the displayed angle is incorrect, follow the angle span calibration procedure in **CALIBRATING SPAN OF EXTENSION AND ANGLE**.

2.4.2.3 Check Boom Angle

NOTE: The required accuracy of measured angles is within 0.2°. When taking boom angle measurements use a good quality inclinometer. Many inclinometers are only accurate at 0° (level). Ensure the digital inclinometer is securely mounted to the boom.

1. Fully retract the boom.
2. Using an inclinometer, set the boom to 0° (zero) and ensure the displayed boom angle value is 0.0°. If the angle value is not 0.0°, refer to **CALIBRATING THE ANGLE SENSOR ZERO.**
3. Raise the boom to a high angle (at least 70°) and measure the angle with the inclinometer. Ensure the displayed angle matches the inclinometer reading within 0.2°. If the displayed angle is incorrect, refer to **CALIBRATING SPAN OF EXTENSION AND ANGLE**.

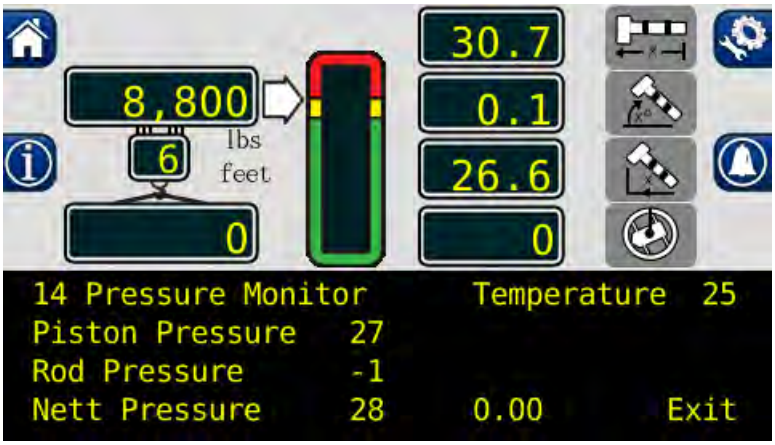
2.4.2.4 Check Pressure Sensors

There are two pressure sensors installed as part of the system. Both pressure sensors are mounted within the computer unit. One is connected to the piston side of the boom hoist cylinder via flexible hose; the other is connected to the rod side of the boom hoist cylinder via flexible hose. Both hoses are protected by velocity fuses within the boom hoist cylinder valve block on the end of the cylinder.

The pressure sensor located on the piston side, is subject to the hydraulic pressure needed to support the weight of the boom, any attachments, and the load. The pressure sensor on the rod side monitors the pressure necessary to control the down motion of the boom. The computer unit uses this information (along with other sensors such as extension, length, and angle), to compute the weight of the suspended load. The maximum continuous working pressure for the sensors is 250 bar (3625 PSI).

The pressure sensing system is calibrated at the factory. Pressure sensors may not be individually replaced. Any serious problem will necessitate changing the entire computer unit.

1. Lower the boom until the boom hoist cylinder is fully retracted and on its stop.
2. Loosen the hydraulic connections to the pressure sensors to ensure zero pressure is present on the sensors.
3. Enter the calibration mode and press “Menu Up” to access “14 PRESSURE MONITOR” to view both sensor pressures and net pressure.
4. Check the pressure values of both sensors. The pressure values should be between -75 and +75 PSI. If not, replace the computer unit.
5. Check the nett pressure values of both sensors. This should be between -35 and +35 psi. If not, replace the computer unit.



WARNING!

BOTH PRESSURE SENSORS ARE PRE-CALIBRATED FROM THE FACTORY AND SUPPLIED AS PART OF THE COMPUTER. THE PRESSURE SENSORS MAY NOT BE REPLACED. REMOVAL OR REPLACEMENT OF THE PRESSURE SENSORS FROM THE COMPUTER INVALIDATES THE WARRANTY AND WILL ADVERSELY AFFECT THE PRESSURE CALIBRATION.

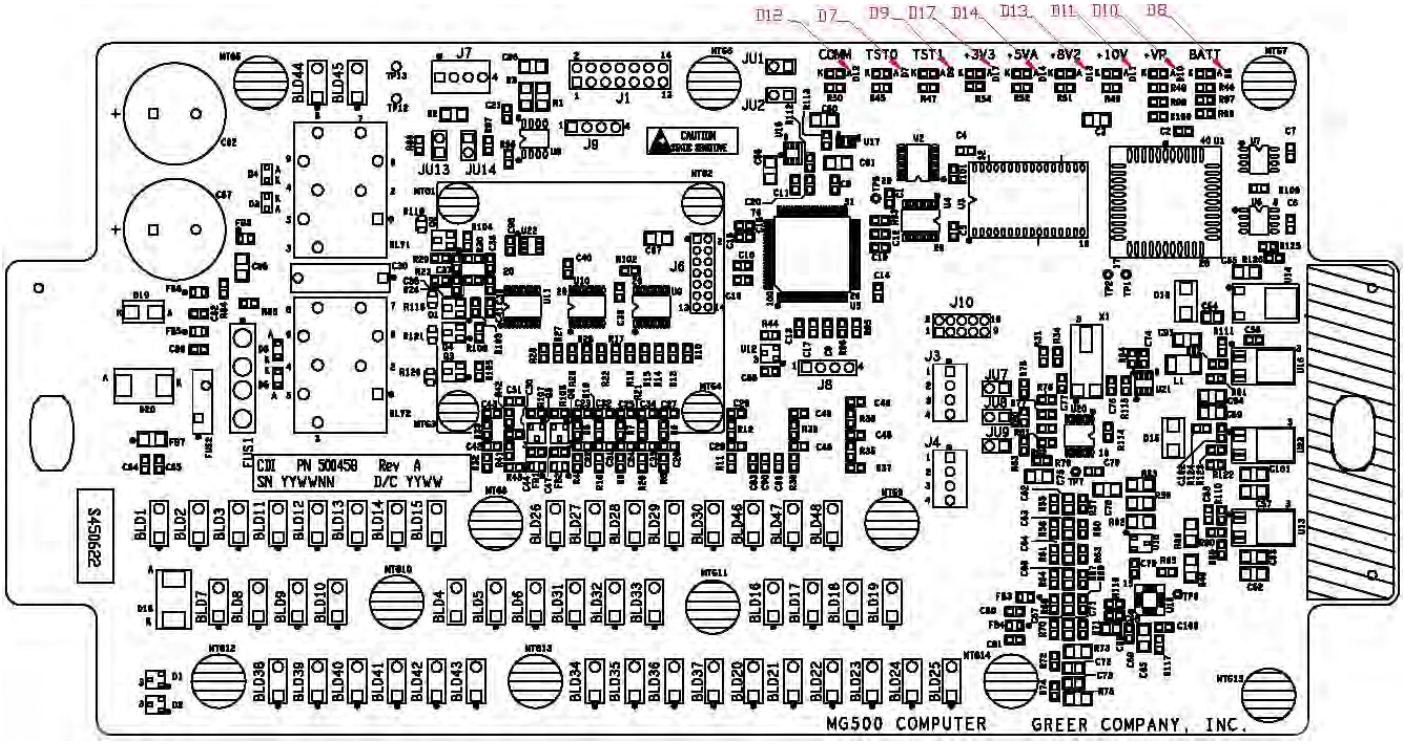
3.1 Computer Unit Overview

The computer unit is the center of the system. It reads the sensors, controls computations and disconnect functions, and communicates with the display console/internal bar graph.

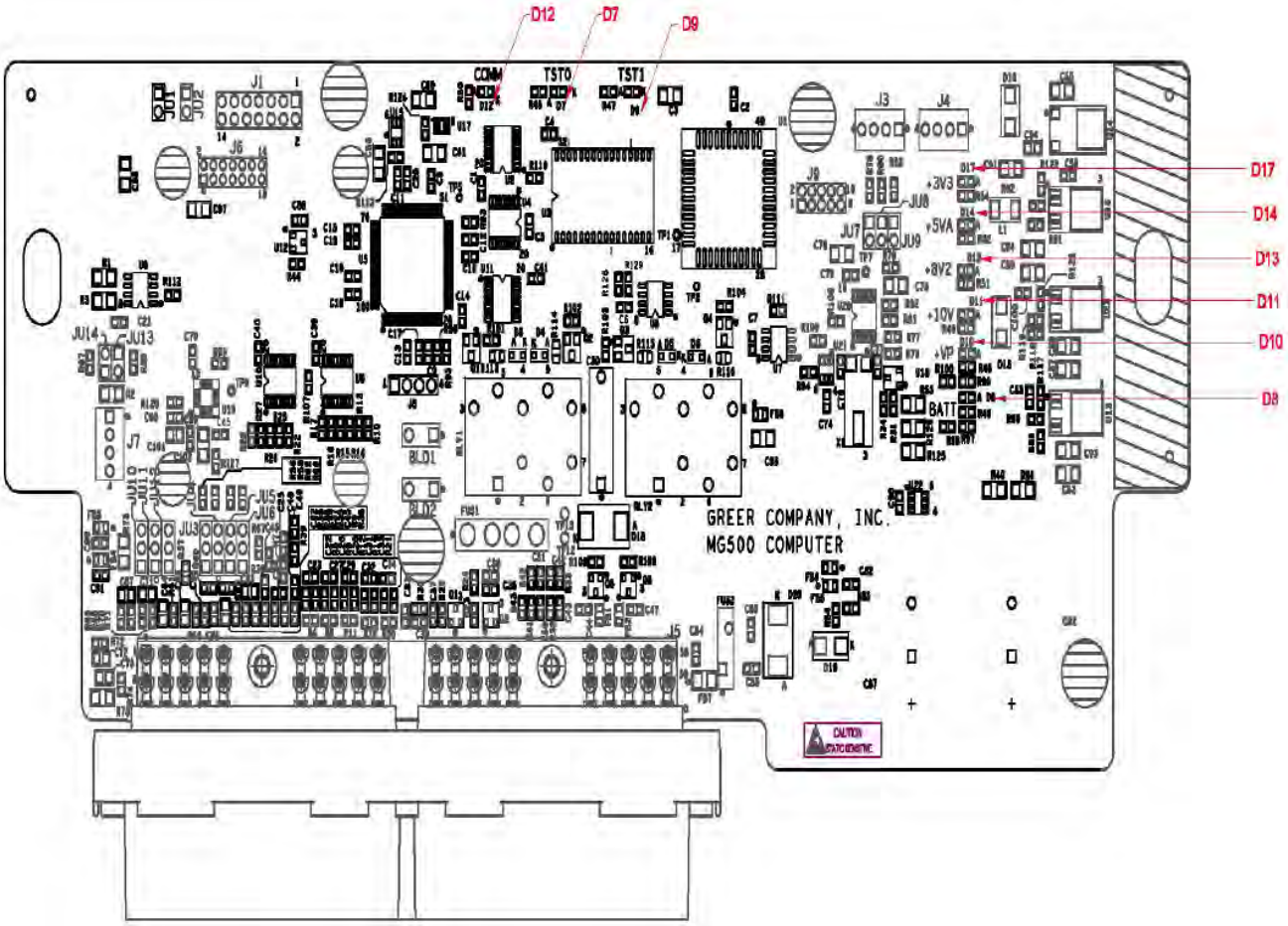
Two hydraulic pressure sensors are contained within the unit. These sensors, as well as the computer are factory pre-calibrated as a unit and may not be replaced in the field.

3.2 Computer Unit Layout

NOTE: Due to differences in computer unit configurations, the locations of board components may vary.



Blade Style Computer



Metri-Pack Style Computer

3.3 Internal Status Indicators

The computer unit contains a row of LED indicators for checking computer operation. During normal operation, all LEDs will be illuminated with the COMM indicator blinking. If not, please contact Technical Support for assistance. Use the following chart and preceding images for LED location.

LED Indicator	Function
D7	Communication Indicator TST0
D8	Battery Power_POS
D9	Communication Indicator TST1
D10	+VP
D11	+10V
D12	COMM (Communication Indicator)
D13	+8V2
D14	+5V
D17	+3V3

3.4 Function Kickout Fuse (Fus1)

The computer unit contains a standard 10 amp replaceable fuse. The fuse protects the function kickout circuit and relay contacts, if a short circuit occurs across the crane kickout solenoids. Replace the fuse, if the system error codes indicate that the function kickout power feed is missing. Ensure the crane circuit breaker is closed and power from the crane is present.

NOTE: Prior to replacing the fuse, ensure any electrical shorts which may have caused the failure of the original fuse have been removed.

3.5 Replacing the Computer Unit

COMPUTER REMOVAL

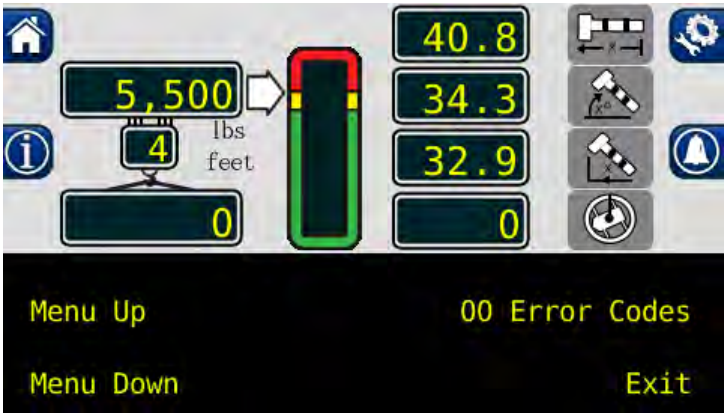
1. Lower the boom until the boom hoist cylinder is completely retracted and on its stop or the boom is firmly in the boom rest.
2. Disconnect the hydraulic connections at the computer unit.
3. Disconnect both electrical connectors at the computer unit.
4. Remove the hardware securing the computer to the cab wall.

COMPUTER INSTALLATION

1. Secure the computer unit to the cab wall with the mounting hardware.
2. Ensure the electrical connections face downward.
3. Connect the electrical connectors.
4. Remove the protective caps from the hydraulic ports.
5. Connect the base-side pressure (green band) hose to the piston pressure port.
6. Connect the rod-side pressure (red band) hose to the rod pressure port.

4.1 Display Console Overview

The Display Console allows the user to see the crane values and crane configuration selection. The display also provides calibration functions used for testing and fault diagnosis.



4.2 Checking the Display Console

When operated under extreme conditions the console can become damaged. The damage is not always apparent. To help identify subtle faults that are sometimes difficult to find, please review the Sections 4.3 through 4.6.

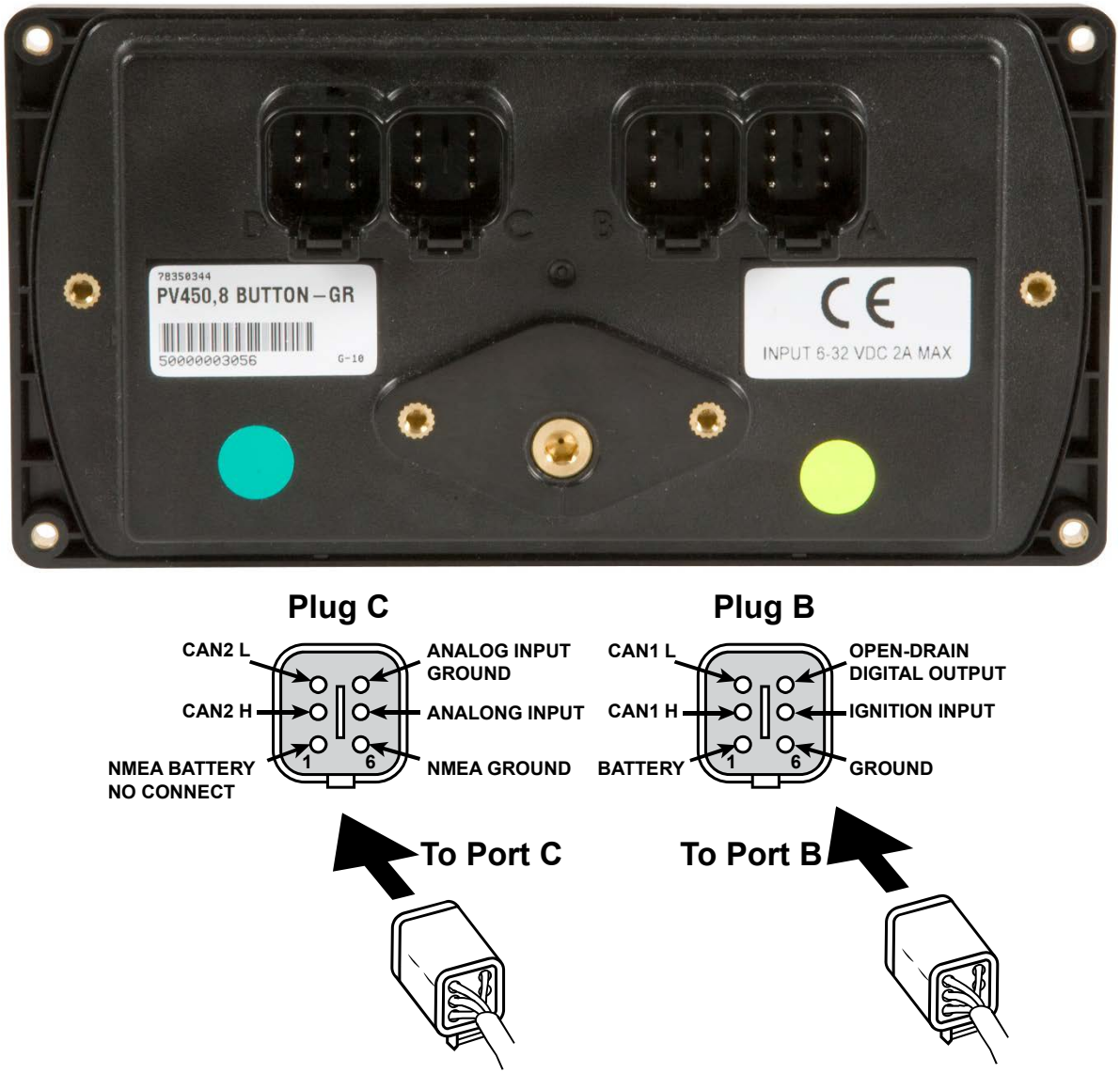
4.3 Unresponsive Buttons

All button options are not available for use at all times. It is important to verify that the non-responsive button:

- Is programmed to respond during the operation of the system.
- Being pressed in the center, pressing the printed symbol ‘at one end’ may not activate the switch underneath.
- Is not damaged or has a surface that is worn which may cause the switch underneath to operate improperly. In this case, refer to **REPLACING THE DISPLAY CONSOLE**.

4.4 Connectors

There are four, 6-pin Deutsch connectors on the rear of the Insight.



4.5 Horn

Ensure the horn is connected to the wiring harness via the two-pin Deutsch connector.

4.6 Moisture

The display console conforms to IP67 in protection against dust and water, when correctly installed.

4.7 Replacing the Display Console

REMOVAL

1. Disconnect the electrical cable from the rear of the Operator’s Display Console.
2. Remove the knob on each side of the console and retain for future use.
3. Remove the defective display console from the bracket in the cab.

INSTALLATION

1. Put the Operator’s Display Console on the bracket located in the cab, by positioning it between the bracket legs.
2. Insert and tighten the knob on each side of the console.
3. Connect the electrical cable to the rear of the console.

5.1 Calibration Mode

The Greer Insight system is an aid to crane operation. Use this system with an operator trained in safety guidelines, crane capacity information, and the crane manufacturer’s specifications.

When the computer is new, it has no zero or span calibrations. It is necessary to enter zero and span settings for accurate length and angle calculations.

TOOLS NEEDED:

- Digital level accurate to 0.1°
- 150-200ft. tape measure graduated in tenths of a foot
- Digital multimeter

PRE-REQUISITES FOR CALIBRATION

- The crane must be properly set on level ground per the manufacturer’s specifications.
- Maximum boom height will be needed. It is necessary the area is free of overhead obstructions.
- All options such as jibs, fly’s, and auxiliary heads must be configured in the computer.

5.2 Entering the Calibration Mode

Follow these steps to ensure proper calibration. The actual crane setup must be reflected on the display. Check the **Greer Insight Operator's Manual** for proper setup of the display unit.

1. To enter Calibration Mode, the display must be in "Normal Operating" mode.
2. Press and hold the buttons shown simultaneously until the display prompts the user for the security code.

3. Enter the Security Code within 5 seconds, or the system will revert to the "Normal Operating" mode. The numbers in parenthesis indicate the proper order to press the buttons.

5.3 Calibration Menus

After entering the calibration menu, press the “Menu Up” button until “02 Zero Sensors” is reached.

Scroll through the menu options by pressing the “Menu Up” or “Menu Down” buttons. To select an item, press the button adjacent to the menu listing as shown in the example.

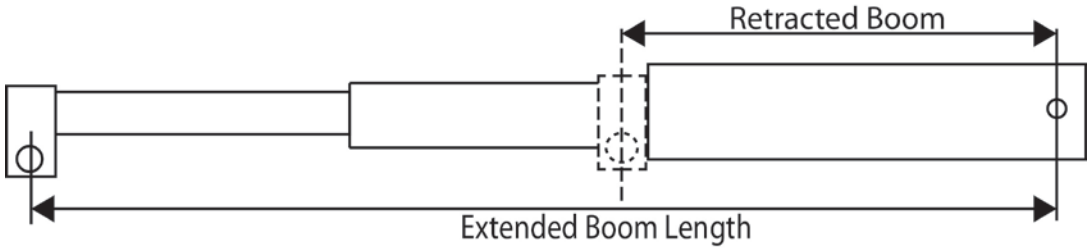
The main menu items used to calibrate the system are:

- 02 Zero Sensors
- 03 Span Sensors
- 04 Swing Potentiometer

The only calibrations needed are for the boom extension function and the boom angle function. They must be properly set to zero. On machines with string potentiometer style outrigger position sensors, if a sensor is replaced, it will need to be calibrated. Refer to **CALIBRATING THE OUTRIGGER POSITION SENSOR**.

The system is also equipped with a swing potentiometer. This is designed to track the turret in relation to the chassis.

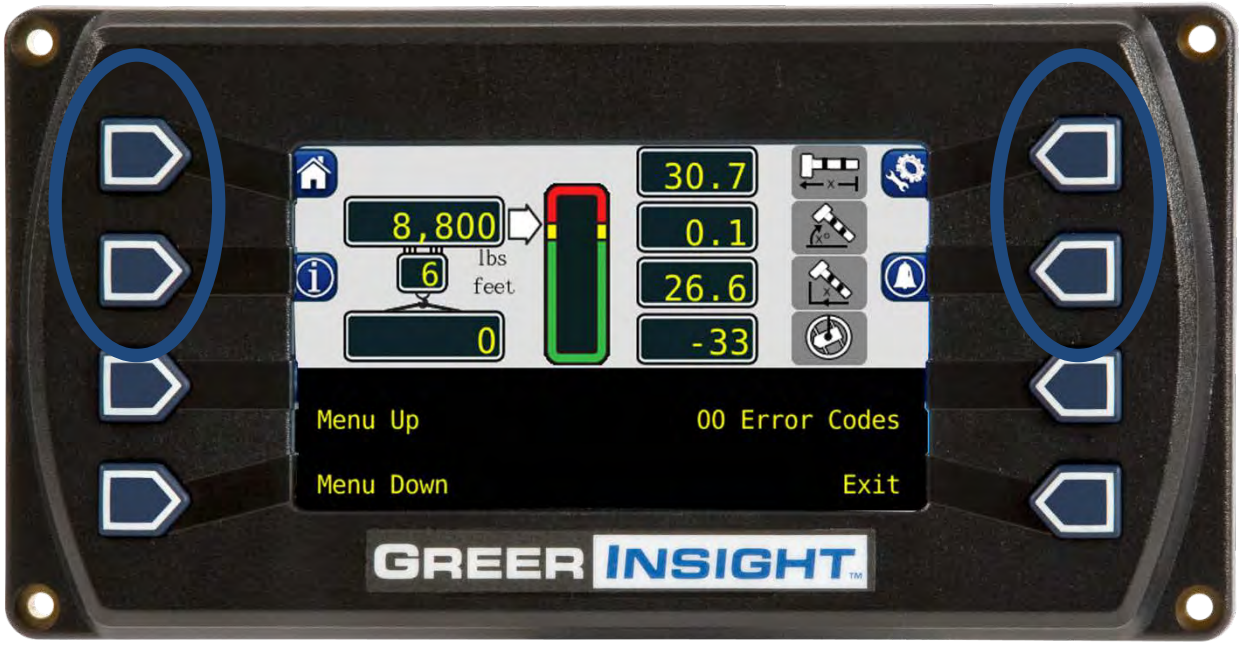
Boom extension and angle readings are dependent on the correct span values to be entered into the system. These span values are determined by using a digital level on the boom angle, and measuring the span of boom extension.



Extended Length – Retracted Length = Span

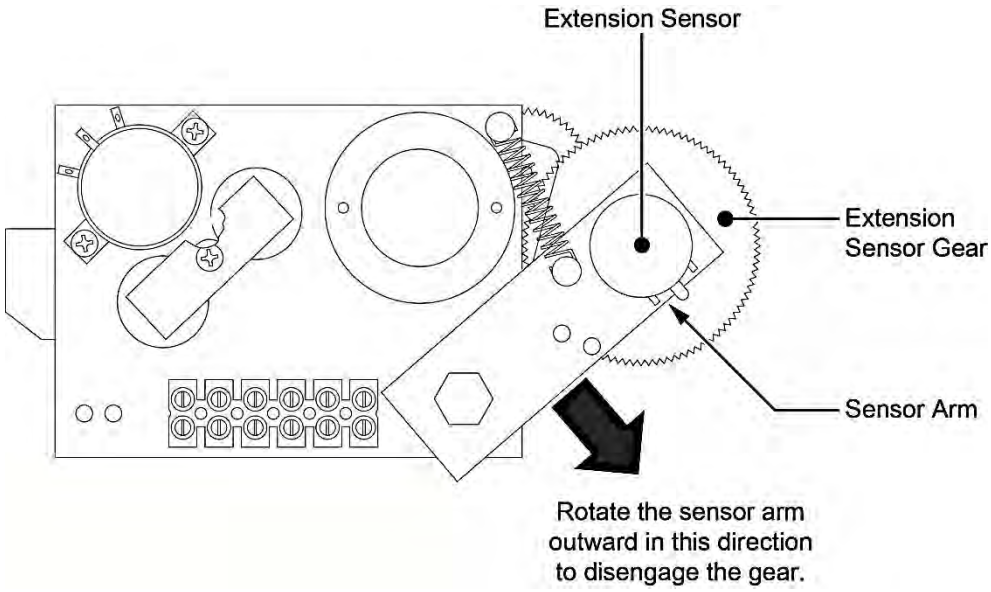
Inactive Buttons During Calibration Mode

Please note the following buttons are inactive when in the Calibration Mode. The functionality of the buttons will return when the display is no longer in the Calibration Mode.



5.4 Calibrating the Extension Sensor Zero

1. Fully retract and lower the boom to 0.0. Verify using a digital level.
2. Remove the reeling drum cover to expose the baseplate sensory assembly.
3. Rotate the extension sensor gear clockwise until the clutch drags/clicks, and rotate a ½ turn counterclockwise.
4. The voltage reading between the blue wire TB1-1 and the white wire TB1-3 on the terminal block should measure 0.15 to 0.35 volts. If outside this voltage, rotate the gear to attain proper voltage with the boom fully retracted.



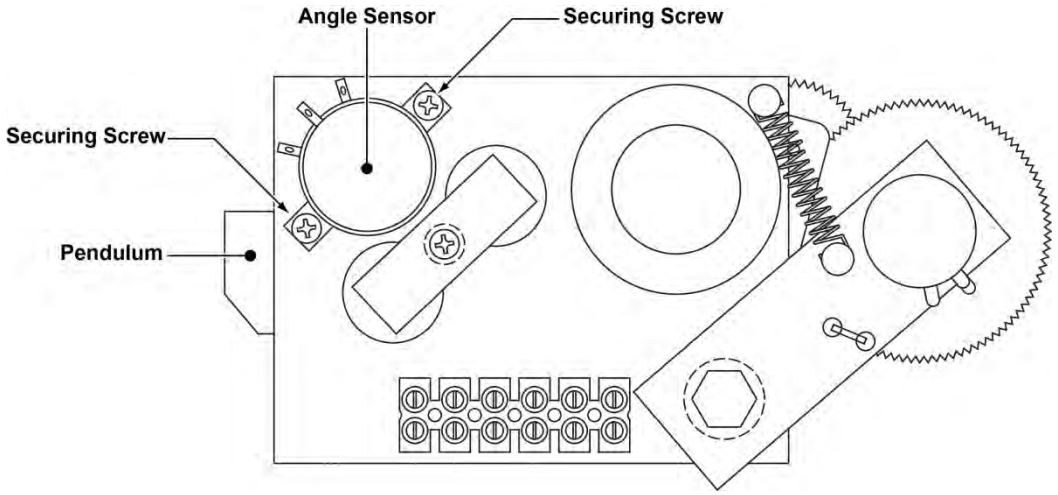
5. Press the “Menu Up” button until “02 Zero Sensors” is reached.
6. Press the “02 Zero Sensors” button.
7. Press the “Zero No. 2 =” and you will be prompted with “Yes! Calibrate!” Press the button a second time to calibrate the Zero.

8. The display will then read “Zero No. 2 = 0”. The retracted boom length will be displayed in the boom length window. Extension sensor zero calibration is complete.

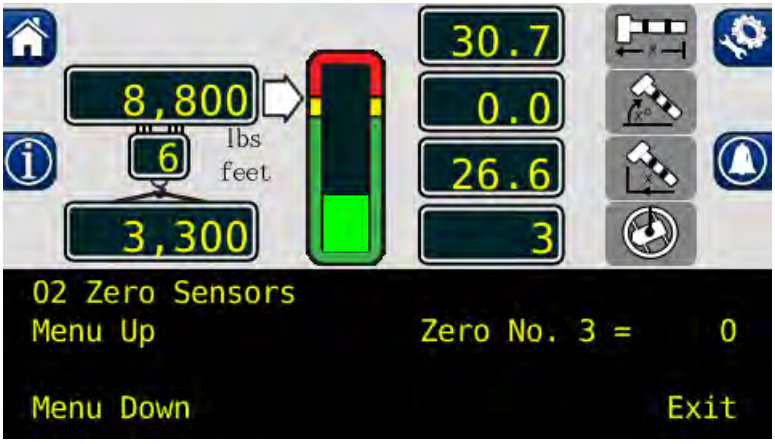
5.5 Calibrating the Angle Sensor Zero

The angle sensors are preset to zero on the potentiometer before leaving the factory. If the potentiometer is disturbed, the zero setting can be affected. If this happens, the angle sensor will be inaccurate.

If the factory setting has been disturbed, reestablish it by loosening the attaching screws, and rotating the pot until the desired voltage reading is attained.



1. Place the boom at 0.0 degrees. Verify using a digital level.
2. Check the voltage between TB1-1 and TB1-2. It should measure between 0.400 and 0.600.
3. Enter the “02 Zero Sensors” menu.
4. Press the “Menu Up” button to display “Zero No. 3 = 0.” The calibration screen and boom angle window should read “0”.



5. Press the “Zero No. 3 =” and you will be prompted with “Yes! Calibrate!” Press the button a second time to calibrate the zero. The angle sensor zero routine is complete.

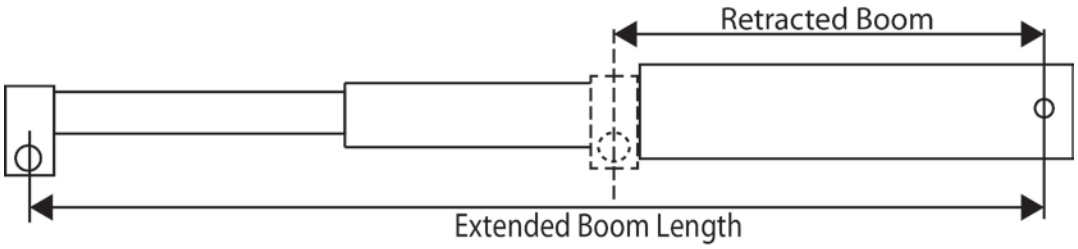
5.6 Calibrating Span of Extension and Angle

WARNING!

THE AREA OVERHEAD ABOVE THE CRANE MUST BE CLEAR OF OBSTRUCTIONS PRIOR TO CALIBRATING SPAN OF EXTENSION AND ANGLE!

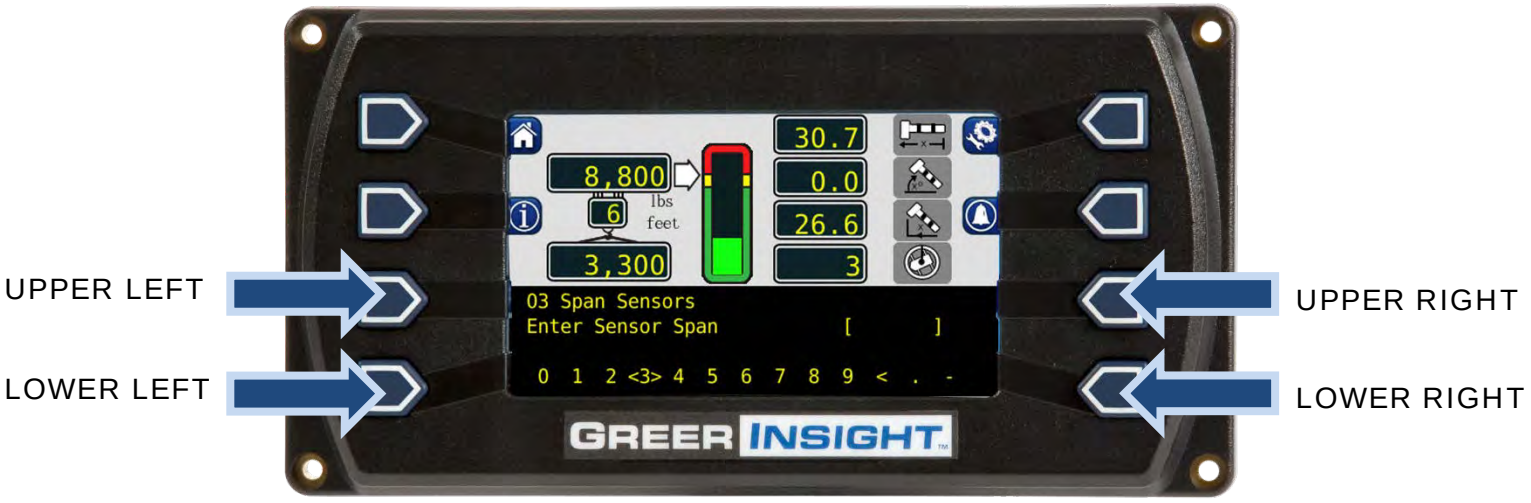
In order for the system to properly calculate the boom length and the boom angle, the “Span Number” must be entered into the system. Obtain the span number with the following steps:

1. Measure the boom from the base foot pin to the center of the head sheave pin. Record this measurement.

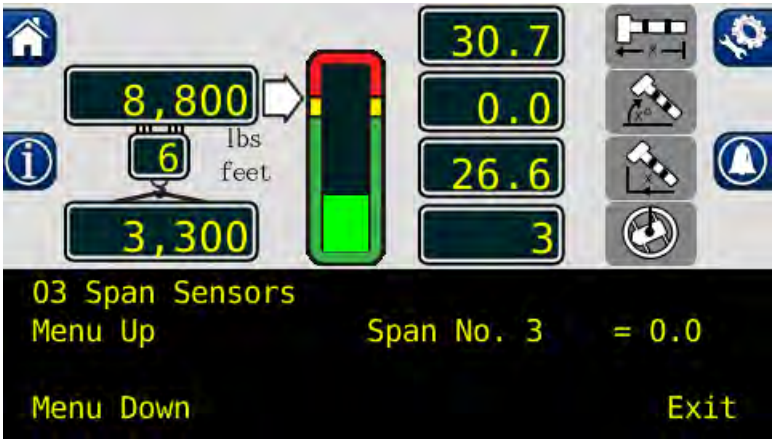


Extended Length – Retracted Length = Span

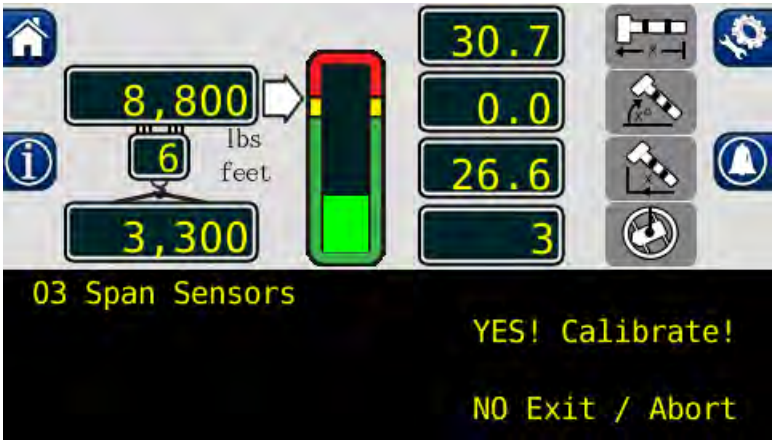
2. Raise the boom to between 60-65° and fully extend the boom. Record the measurement from the digital level, for entry into the system later in this procedure.
3. From the main screen, press the “Menu Up” button until “03 Span Sensors” and press the button.
4. Press the “Span No. 2 = X.X” button.
5. Press the button again to be prompted with “Yes Calibrate” or “No, Exit/Abort”. Press the “Yes! Calibrate!” button.
6. Use this screen to enter the span (Extended Length – Retracted Length = Span).



7. The lower left and lower right buttons are used to select the number. The number inside the brackets is the current selection, in the above image, the number 3 is between the brackets.
8. Use the upper left button to enter the numbers, one at a time.
9. When the number is entered, press the upper right button to enter the number into the system memory. Span of extension is now complete.
10. Press the “Menu Down” button to display “Span No. 3 = xx.xx”.



11. Press the “Span No. 3 = xx.xx” button.
12. Press the “Yes! Calibrate!” button.



13. You will be prompted with the same screen from step 6. Use this screen to enter the span of angle measurement from the digital level.
14. This calibration routine is now complete. Press the “Exit” button to return to the calibration menu.

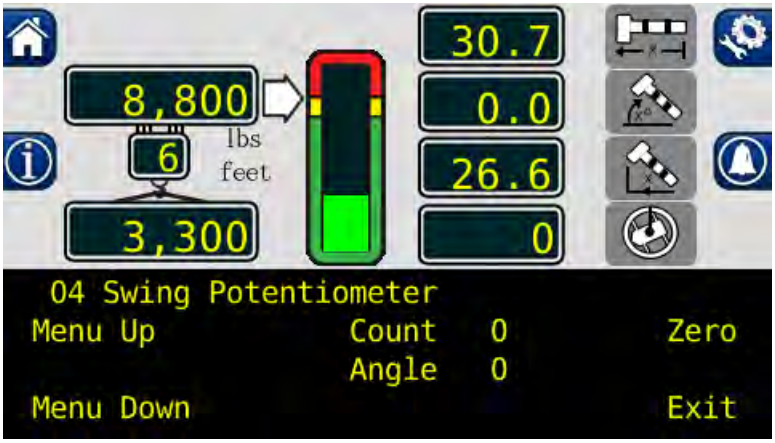
5.7 Calibrating the Swing Potentiometer

After completing the extension and angle span, exit back to the main calibration screen. Press the “Menu Up” button until “04 Swing Potentiometer” is reached. This menu will allow a 0.0 point to be set on the swing circle and a direction for the system to track the rotation angle.

1. The swing must be in the stowed position and the house lock engaged.

NOTE: Inaccuracy in the swing zero setting may result in the loss of load chart for pick and carry.

2. Press the “Zero” button to zero the swing potentiometer.

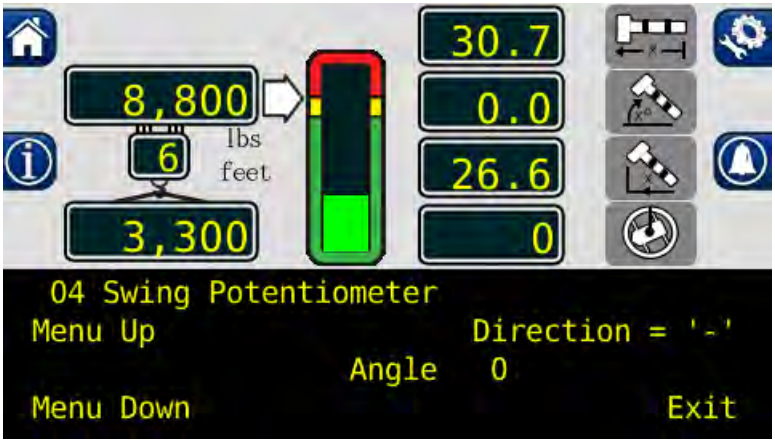


3. The swing sensor is now zeroed.

5.7.1 Calibrating Swing Direction

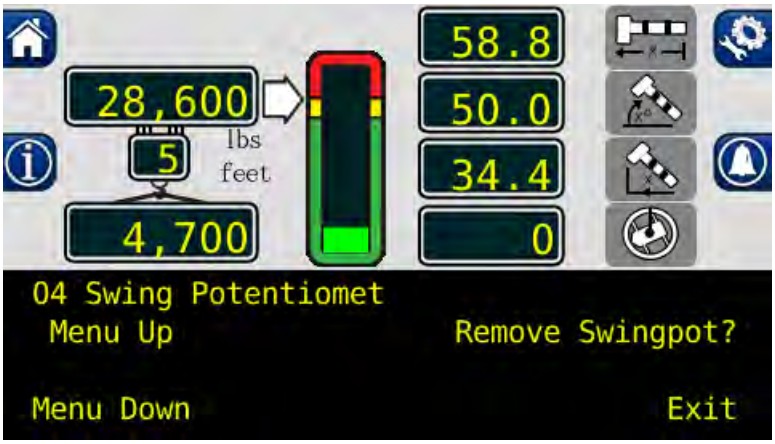
The swing potentiometer supplies data for either direction. For consistency, the swing should count upwards (0, 1, 2, 3, etc.) when rotating clockwise. The direction of the swing can be changed while using the Greer Insight display.

When the zero is calibrated and the swing direction is wrong, press the “Menu Up” button twice. Press the “Direction = ‘-‘ “ button to reverse the direction.



5.7.2 Cranes with Swing Switches

1. Enter the Calibration Mode and press the “Menu Up” button to “04 Swing Potentiometer”.
2. Enter the “04 Swing Potentiometer” menu and press the “Menu Up” button until the “Remove Swingpot?” option is displayed.



3. Press the “Remove Swingpot?” button.
4. The crane will now use the swing switches.

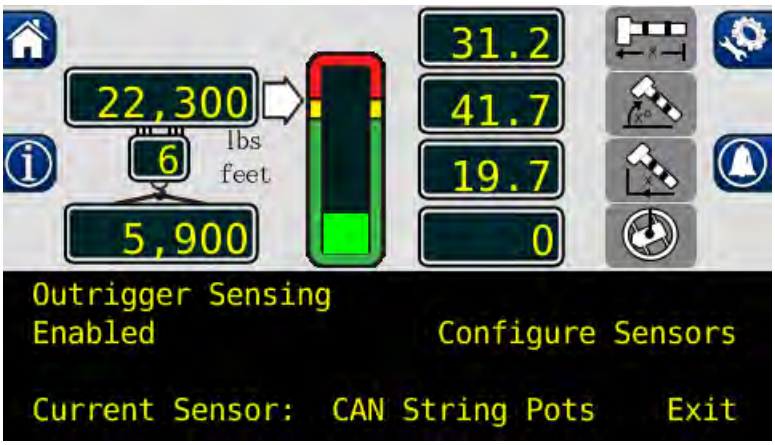
5.8 Calibrating the Outrigger Position Sensor

If an error code is displayed for a particular outrigger sensor, contact service for assistance.

For cranes with digital switch outrigger position sensors, contact service for assistance. No calibration is needed.

When directed by service to replace the string potentiometer outrigger position sensors, calibration is needed.

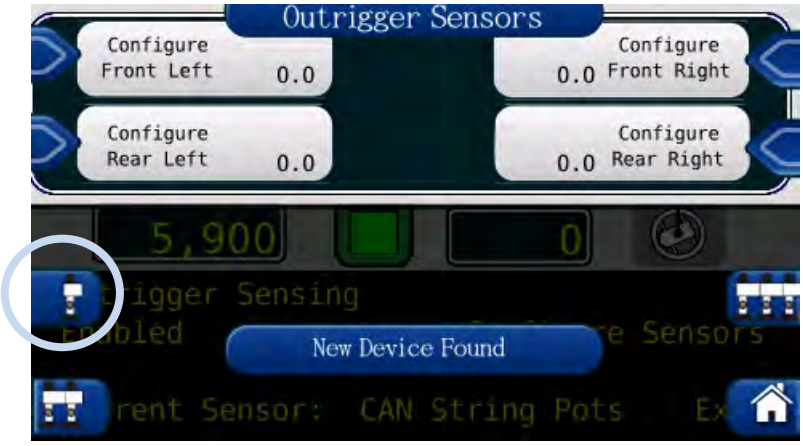
1. Enter the outrigger sensor calibration menu.
2. In the lower left portion of the screen, “Current Sensor: = CAN String Pots” will be displayed. If this is not correct, press the button once to toggle to “Current Sensor: = CAN String Pots”.



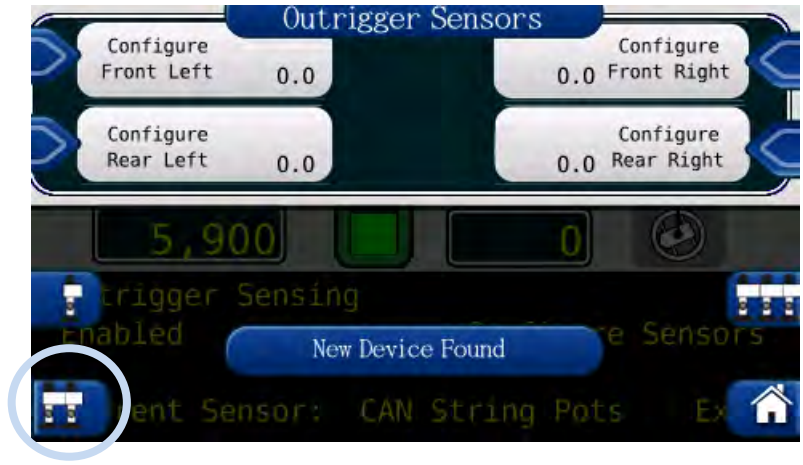
3. Press the “Configure Sensors” button.
4. Install the outrigger position sensors one at a time.
   a. Install the front left string potentiometer. “New device found” will appear on the display.

   b. Press the “Configure Front Left” button to identify the new sensor location in the computer.
   c. Repeat this for the three remaining sensors, pressing the configure button that corresponds to the sensors location.
   d. The message will change from “Configure” to “Reset” when calibration is finished.

5. With all sensors installed, ensure the outriggers are in the fully retracted position. Press the fully retracted position button to set the retracted position in the computer.



6. Move the outriggers to intermediate position and press the corresponding button to set the intermediate outrigger position.



7. Move the outriggers to fully extended position and press the corresponding button to set the fully extended outrigger position.

8. The outrigger position sensors are now calibrated.

5.9 After the Calibration Routine

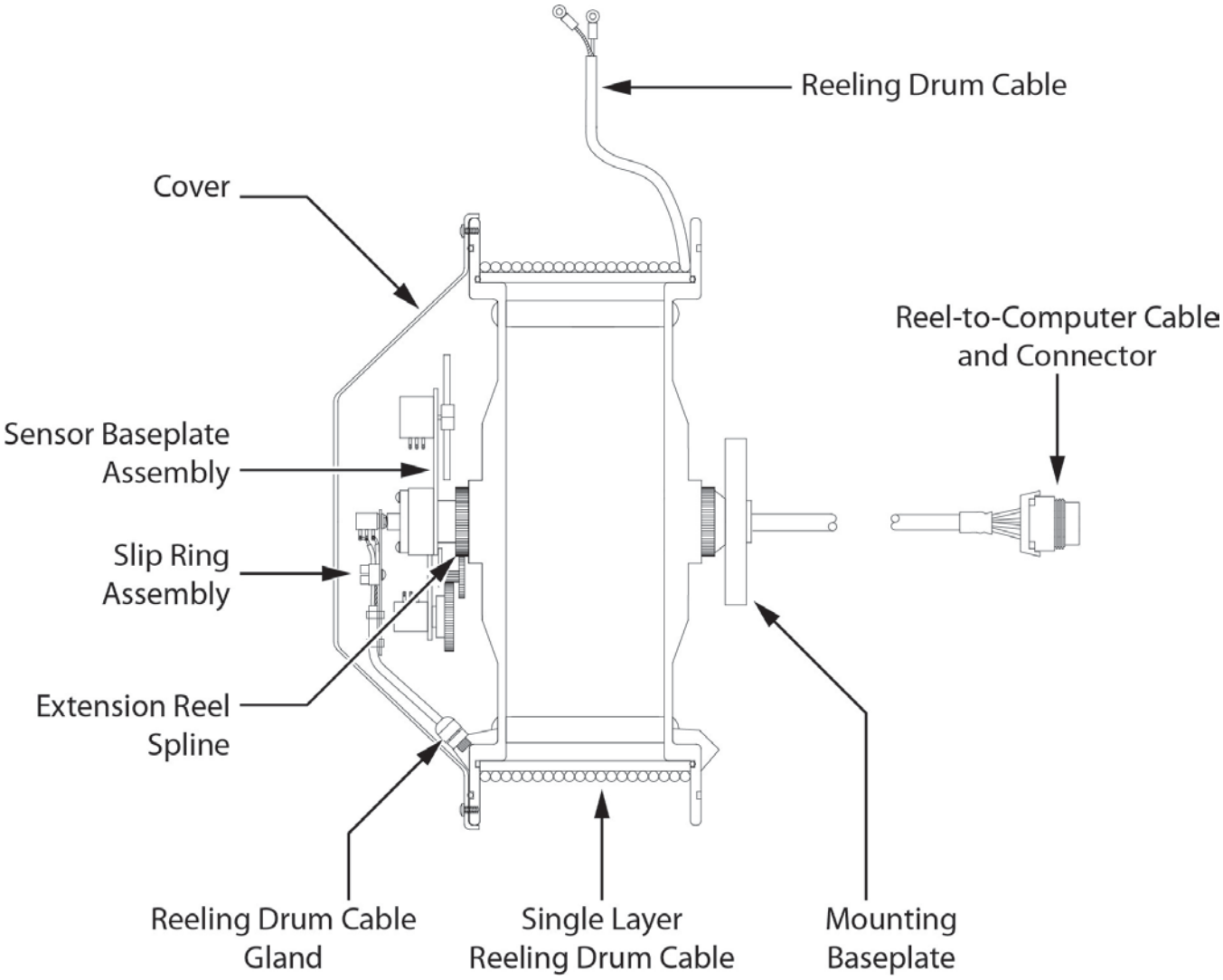
When the calibration routine is complete, thoroughly test the unit to ensure the radius on the unit is accurate to + .5 of a foot.

In order to perform load testing, a known weight is necessary. Perform testing from 2-3 different boom angles, as well as extensions.

The load shown must be within +10% when testing. If the load is outside these limits, the calibration should be rechecked for accuracy.

6.1 Reeling Drum Overview

The primary operation of the reeling drum is to measure the extension of the telescoping sections of the main boom. The reeling drum also includes an angle sensor to measure the main boom angle along with an electrical slip-ring which transfers the two-block signal from the reeling drum cable to the system computer. It is important the setup these devices is performed correctly. Incorrect maintenance can result in system calculation errors.

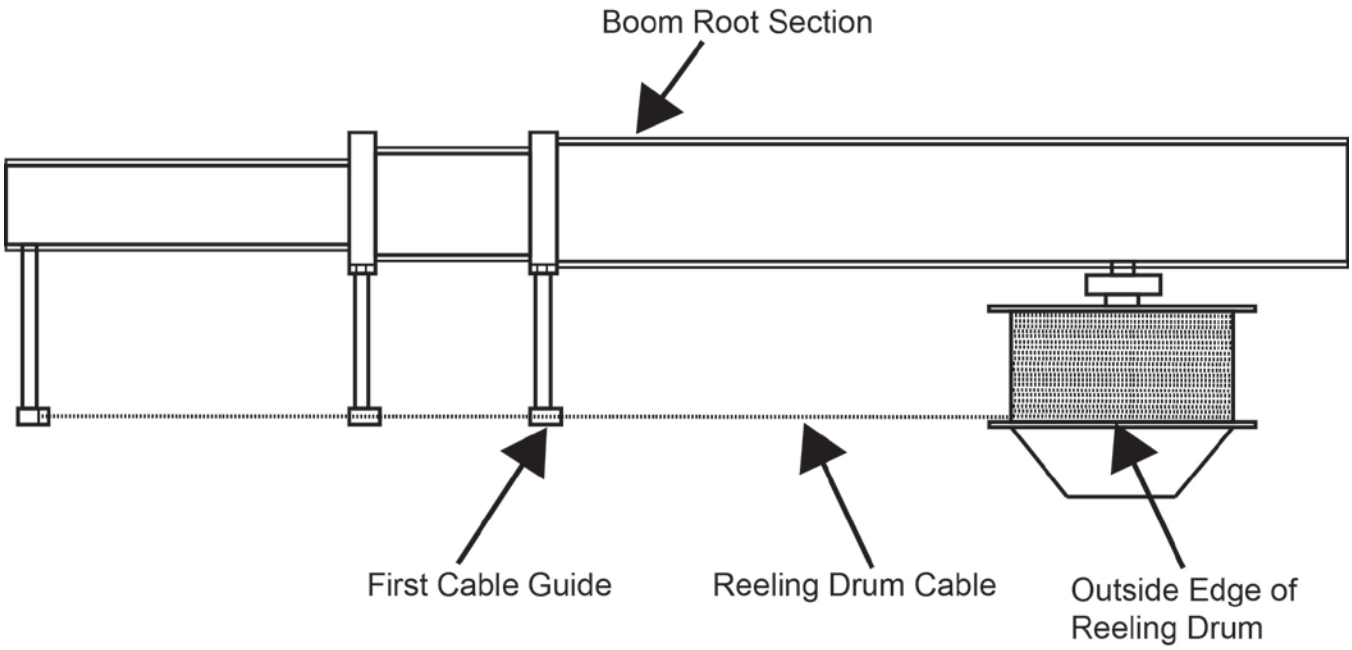


6.2 Checking the Reeling Drum Cable Layering

The extension reel is designed to provide accurate measurement of boom extension. To provide accurate measurement, the reeling drum cable must form a single flat layer across the surface of the extension reel as the boom is telescoped in and out. Any stacking of the cable will cause extension errors as the boom retracts.

1. Telescope the boom fully out and then fully in.
2. Ensure the reeling drum cable forms a flat single layer across the surface of the extension reel, with each successive turn of cable lying next to the last.

NOTE: If any stacking or build up of the cable occurs, ensure the first cable guide at the top of the boom root section is correctly aligned with the outside edge of the extension reel. Clean the reeling drum cable and lubricate it with a silicone spray.



6.3 Sensor Baseplate Assembly

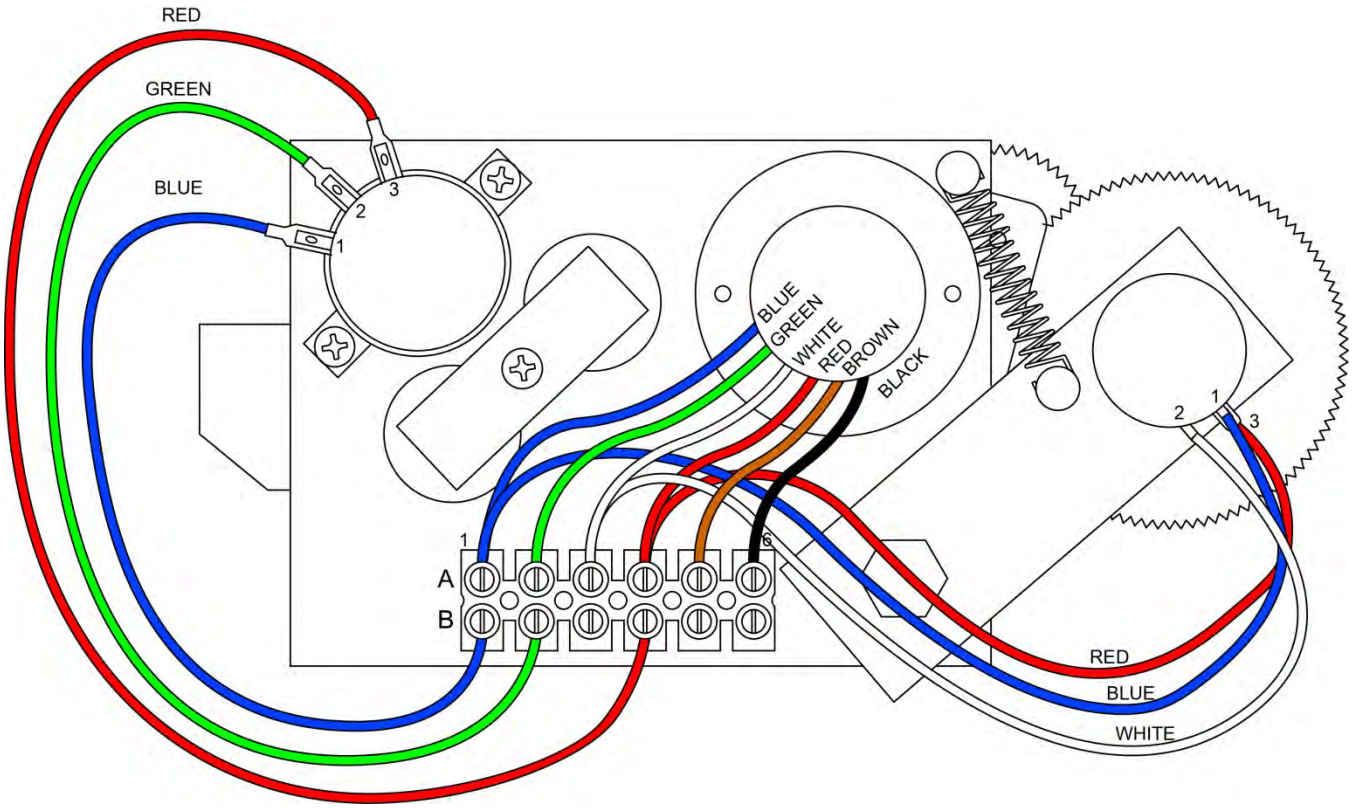
The sensor baseplate assembly supports and connects the extension and angles sensors. It also supports the two-block switch signal and signal cable to the computer.

Electrical or mechanical failure of either the angle sensor or the extension sensor potentiometers cannot be repaired in the field. The angle sensor pendulum is factory set on the potentiometer shaft and the extension potentiometer gear contains a protection clutch which is difficult to replace in the field. In the event of failure of either item, replace the entire sensor baseplate assembly.

The terminal block (TB1) mounted on the assembly provides wiring connection for all internal parts of the reeling drum and Reel-to-Computer cable. Most electrical diagnoses of the boom sensors can be made at this terminal block.

If problems occur with the two-block alarm operation, angle, or extension sensor, refer to the following chart. Follow the Boom Position/Action column before performing any voltage checks. Measure all voltages with a digital voltmeter set to DC volts range.

SIGNAL	BOOM POSITION/ ACTION	VOLTAGE		VOLTMETER CONNECTION	
		MIN	MAX	RED (+)	BLACK (-)
SENSOR DRIVE	-	+4.7V	+5.3V	RED	BLUE
ANGLE SENSOR OUTPUT	0 degrees	0.4V	0.6V	GREEN	BLUE
EXTENSION SENSOR OUTPUT	0 ft. FULL RETRACTED	0.15V	0.35V	WHITE	BLUE
TWO-BLOCK DRIVE	A2B WEIGHT DOWN	5.5V	7.5V	BLACK	BLUE
	A2B WEIGHT UP	9.5V	10.5V	BLACK	BLUE
TWO-BLOCK SIGNAL	A2B WEIGHT DOWN	5.5V	7.5V	BROWN	BLUE
	A2B WEIGHT UP	0V	2V	BROWN	BLUE


RED
GREEN
BLUE
1
2
3
BLUE
GREEN
WHITE
RED
BROWN
BLACK
1
6
A
B
1
2
3
RED
BLUE
WHITE

6.4 Anti-Two-Block Function Overview

The computer supplies a protected positive feed to the Anti-Two-Block switches at the boom/jib head via the extension reel signal cable, slip-ring, and reeling drum cable. With the Anti-Two-Block weight hanging freely on the switch, the switch contact is closed and the signal return to the computer is high. When the weight is lifted by the hook block, the switch contact is opened, and the computer will sense a low signal input from the A2B signal return.

Since the computer checks the protected feed voltage internally, the system is capable of detecting a short circuit of the feed (or the ATB signal return when the switch is closed) to the crane chassis. Fault codes are defined in **FAULT REPORTING AND FAULT CODES**.

Most problems with the ATB circuit may be identified through inspection of cables, switches, and the reeling drum. Damage to these parts may result in continuous or intermittent A2B alarms.

6.5 Checking the Reeling Drum Cable

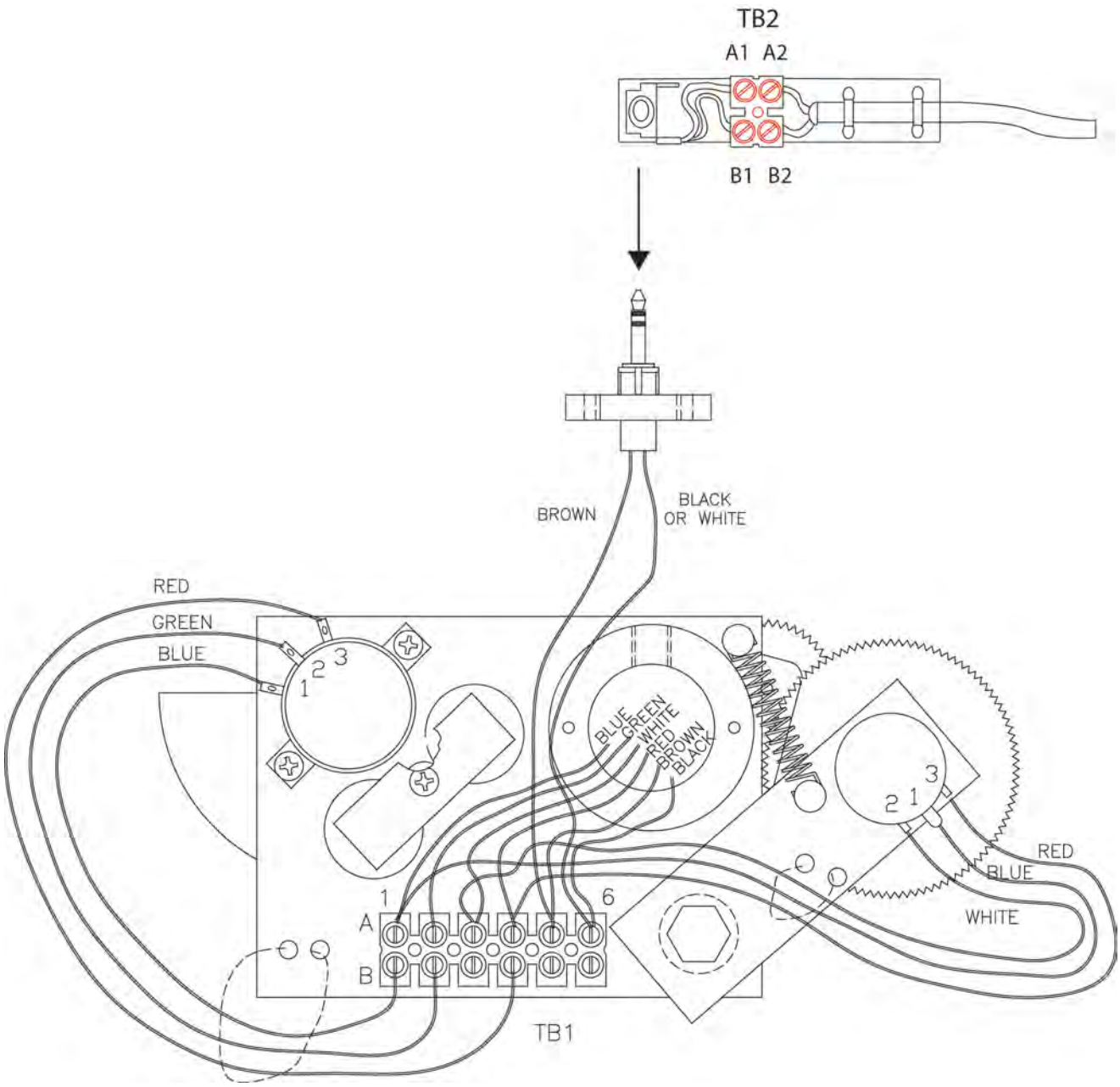
The outer braid of the cable carries the Anti Two-Block feed to the switches. If the cable sheath is damaged, this may cause a short circuit to the boom/chassis and indicate a fault code of “B008” (Refer to **GROUP “B” FAULT CODES**). The same fault code will be indicated if the A2B switch is closed and the inner core of the cable is shorted to the chassis at some point in the wiring.

1. Carefully inspect the reeling drum cable for wear.
2. Check for signs of damage to the outer sheath of the cable.
3. Check for any signs of severe “kinking” or crushing of the cable.

6.6 Checking the Anti-Two-Block Circuit

Before continuing, ensure the connectors are correctly connected to the A2B switches at the boom head/jib. This procedure checks the ATB circuit when no power is applied to the circuit, use the diagram on the following page.

1. Remove the extension reel cover.
2. Disconnect the slip-ring arm from the plug by pulling it away from the center of the reel.
3. Close the A2B switch at the boom head by suspending the weight from it or pulling on the chain.
4. Measure the resistance between TB2-1 & TB2-2 terminal connections on the sensor arm.
5. With the A2B switch closed, the resistance should be less than 300 ohms. If not, inspect the reel-off cable, A2B switch, and the boom head connectors for an open circuit.
6. Open the A2B switch at the boom head by lifting the weight.
7. Measure the resistance between TB2-1 & TB2-2 terminal connections on the sensor arm.
8. With the A2B switch open, the resistance should be greater than 10,000 ohms. If not, inspect the reel-off cable, A2B switch, and the boom head connectors for a short circuit.


TB2
A1 A2
B1 B2
BROWN
BLACK
OR WHITE
RED
GREEN
BLUE
1 2 3
BLUE
GREEN
WHITE
RED
BROWN
BLACK
3
2 1
RED
BLUE
WHITE
1
6
A
B
TB1

7.1 WAD/ISS

Overview

The WAD/ISS (Work Area Definition/Integrated Swing Sensor) incoporates a sensor housed in the swing drive of the crane that measures the angle of the upper structure of the crane relative to its carrier. The sensor measures the angle by counting electronic pulses on the target gear relative from the zero point (set by the operator) in either a positive or negative direction. The conditioning box translates the signal so it can be processed by the computer and shown in the information window of the display console.

WAD/ISS Conditioning Box

The advantage of the WAD/ISS over a typical swing potentiometer is the swing potentiometer is housed in the collector column and maintenance and/or removal is difficult. The WAD/ISS is a small unit mounted directly onto the swing drive and is easily accessible.

During normal operation, faults detected with the WAD/ISS will be shown on the display unit. During such fault conditions the red “Overload” LED will flash accomapnied by an intermittent audible beep. Additionally, the swing angle window will display “ERROR” as well as the information window showing an error condition message. All swing related operator alarms, work area alarms, etc, will be displayed.

7.2 WAD/ISS Troubleshooting Table

Error Message / Problem	Cause	Correction
“SWING SENSOR SIGNAL 1 ERROR!” “SWING SENSOR SIGNAL 2 ERROR!” “SWING SENSOR ERROR!” “SWING SENSOR LOGIC REPORT!”	Cable from sensor to condition box disconnected. Cable from sensor to conditiong box grounded.	Replace sensor.
“SWING SENSOR COMMS ERROR!”	Cable from conditioning box to computer disconnected at computer or conditiong box. Cable from condition box to computer grounded.	Check cable. Check connection at conditioning box and computer. Replace cable. If display shows load, angle, radius, etc, replace the conditioning box.
Intermittent, inaccurate, or no output activity	WAD/ISS too far from target within swing drive. WAD/ISS sensor too close to target within swing drive. WAD/ISS not responding normally but drawing normal current and providing normal outputs. WAD/ISS disconnected from computer.	Check sensor and sensor connection.

7.3 Replacing the Swing Sensor

Swing Sensor Removal

1. Place the boom in the rest (stowed position).
2. Turn off the power to the crane.
3. Disconnect the sensor cable from the conditioning box.
4. Loosen the sensor retaining nut.
5. Remove the sensor from the swing drive housing.

Swing Sensor Installation

1. Insert the threaded end of the sensor into the sensor port of the swing drive and screw it in until the end of the sensor contacts the gear inside the swing drive housing. Do not force the sensor any farther past this point.
2. Note the location of the index notch on the sensor. Rotate the sensor counterclockwise a ½ turn. (Illustrations on next page.)
3. Note the position of the index notch on the sensor and continue to rotate counterclockwise until the index notch reaches the ‘three o’clock’ or ‘nine o’clock’ position.
4. If the initial 180° turn puts the index notch on the ‘three o’clock’ or ‘nine o’clock’ position, continue to rotate counterclockwise until the next ‘three o’clock’ or ‘nine o’clock’ position is reached.
5. For calibration instructions, refer to **Swing Sensor Setup**.

7.4 Replacing the Conditioning Box

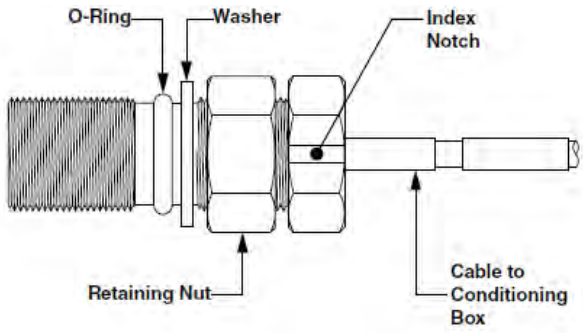
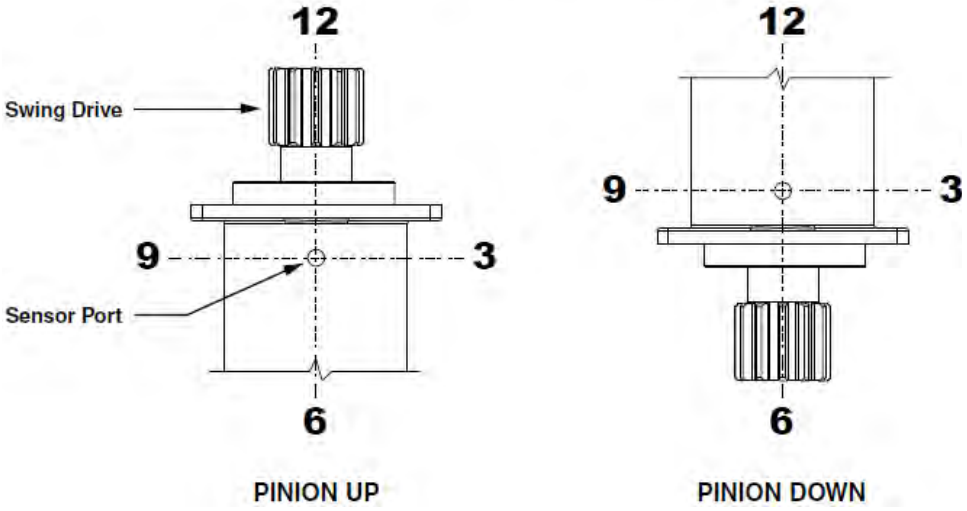
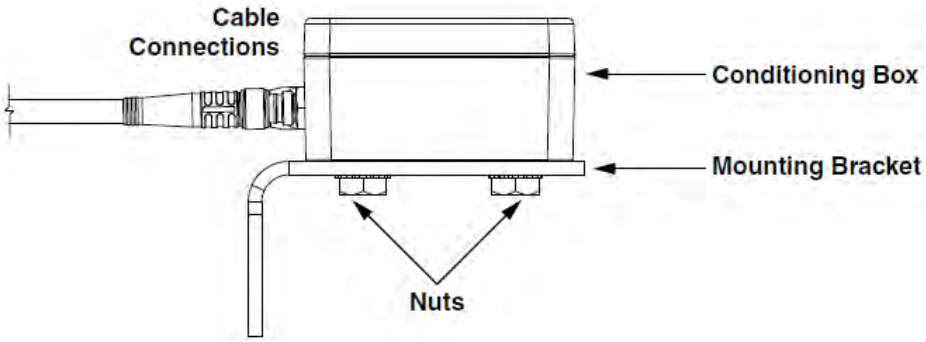


Figure 33 - Swing Sensor Diagram



Replacing the Conditioning Box

1. Place the boom in the rest (stowed position).
2. Turn of power to the crane.
3. Disconnect the cables from the conditioning box.
4. Remove the two nuts attaching the conditiong box to the mounting bracket.
5. Install the new conditioning box onto the mounting bracket.
6. Reconnect the cables to the new conditioning box.



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SECTION 8

TITLE	NUMBER	REVISION
M/F Turret Installation	700-00990	D
Shear Plate Installation	691-00003	D
Subframe Installation	691-00001	Q
Flatbed Installation Boom Truck Models	696-00032-1	C
Flatbed Installation, Super Duty	696-00032-2	D
Platform Installation	706-00022	E
Bumper Guard Assy	600-95010	B
ATB-LMI Install	508-00090-5	B
Boom Rest Assy	698-00063	B
Throttle Installation	600-40429	B
Throttle Install	600-40439	A
Aux Outrigger Installation	T121324	E
90 Gal Round Tank Installation	876-00060	R
Ladder Assembly	024-00008	B
BM/Winch/Top Cyl/Guide Installation	720-01007	Q
Hyd Piping, Mainframe Non-Continuous Rotation	500-01793-1	F
Hyd Piping, Mainframe Continuous Rotation	500-01794-1	F
Jib Stowage 4000/7000 Series	730-51331	G
Hydraulic Schematic	500-01809	A
Electrical Schematic	T135516	B

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NOTES:

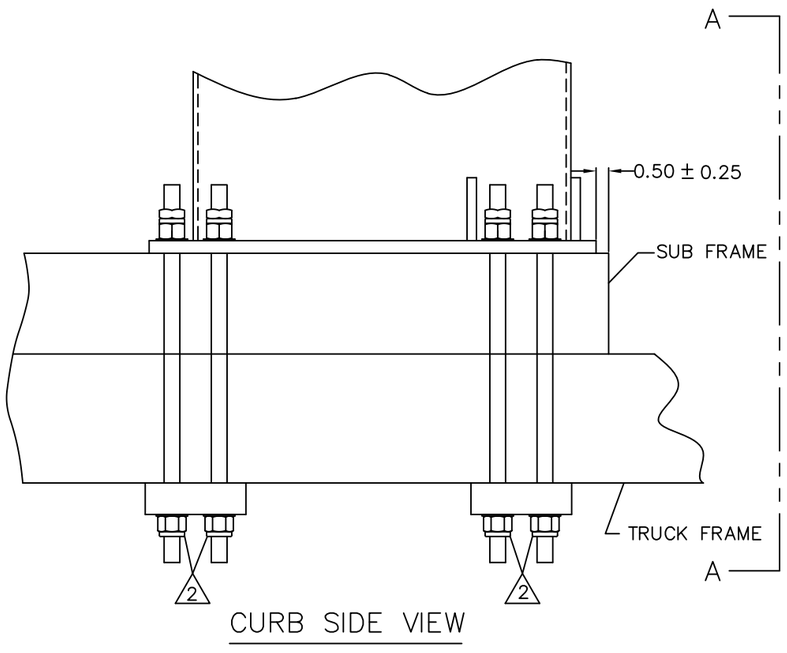
1. FRAME STIFFENERS TO BE CENTERED WITH TIE DOWN STUDS (ITEM 3) AND DRIVE-FIT INTO PLACE BETWEEN TOP AND BOTTOM FLANGES OF TRUCK FRAME. LOCATE & DRILL ø.75 HOLE TRUCK FRAME FOR ITEMS 11, 12 & 13. SEE 709-01902 FOR ALTERNATE FRAME STIFFENERS.

2. TORQUE 16 LOWER LOCK NUTS (ITEM 4) TO 650-680 FT-LBS.

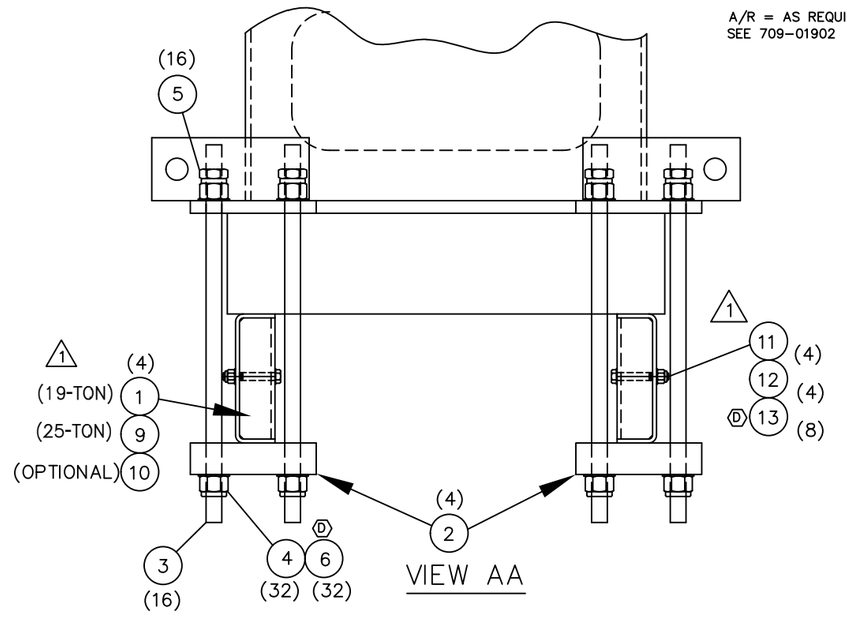
19-TON,25-TON

	Item	Part No.	Description		Qty.	Qty.
C	1	709-01902-1	FRAME STIFFENER 9.50" (021-40046)	4	A/R	A/R
	2	783-02895	CLAMP BAR	4	4	4
	3	220-09078	TIEDOWN STUD 1-1/4 NFX30	–	8	16
C	4	NYH-A25F000-22	NUT, NYL-INS HVY 1.25-12,ST SQC G2	32	32	32
C	5	N05-A25F000-Y8	NUT, HEX JAM 1.25-12,ST SQC G8	16	16	16
D C	6	WAH-A2NX000-20	WSH, FL HRD A-NRW 1.25, ST SQC	32	32	32
B	7	220-09111	TIEDOWN STUD 1-1/4 NFX46	–	8	–
A	8	220-09090	TIEDOWN STUD 1-1/4 NFX28	16	–	–
C	9	709-01902-2	FRAME STIFFENER 9.63" (021-40042)	A/R	4	4
C	10	709-01902-3	FRAME STIFFENER 9.75" (021-40051)	A/R	A/R	A/R
C	11	S01-625CD00-25	SCR, HHCS 0.625-11X4.00,ST SQC G5	4	4	4
C	12	NYL-625C000-25	NUT,HEX NYL-INS 0.625-11,ST SQC G5	4	4	4
D C	13	WAH-62NX000-20	WSH,FL HRD A-NRW 0.625 ST SQC	8	8	8
					700-00990-3	700-00990-2	700-00990-1
					19-TON SERIES	35-TON SERIES	25-TON SERIES

A/R = AS REQUIRED
SEE 709-01902 (KANBAN FOR PARTS)



CURB SIDE VIEW



VIEW AA

C	4-19-11	ITEM 1, 709-01902-1 WAS 021-40046 REMOVED 021-40046 FROM 700-00990-1 REMOVED 021-40046 FROM 700-00990-2 700-00990-2,ADD ITEM 9, 709-01902-2 700-00990-1,ADD ITEM 9, 709-01902-2 ADDED ITEM 10, 709-01902-3, OPTIONAL ADDED, A/R = AS REQUIRED SEE 709-01902 KANBAN FOR PARTS ADDED HARDWARE ITEMS 11, 12, & 13 UPDATED HARDWARE ITEMS 4, 5, & 6 REVISED NOTE 1 FROM WELD TO BOLT IN PLACE	296A101155
B	1-20-06	ITEM 7, REMOVE P/N 222-09111. ITEM 7, INSERT P/N 220-09111.	N517
A	6-07-05	ADDED BT3000 700-00990-3 TOBOM MISC. DRAWING CHANGES.	N833
--	1-18-05	PRODUCTION RELEASE	
REV. LET.	L.E.N. DATE	CHANGE ALL CHANGES MUST BE MADE ON CAD.	E.C.N.
D	11-06-17	CHANGED: WAH-A2NX000-20 WAS WAH-A2NX000-Y2, WAH-62NX000-20 WAS WAH-62NX000-Y2.	296A106113

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS IN INCHES
TOLERANCES-UNLESS NOTED:
.x = ±.12
.xx = ±.06
.xxx = ±.020
DO NOT SCALE DRAWING
MATERIAL
LISTED
FINISH
N/A

	NAME	DATE
DRAWN	LD	1/18/05
CHECKED	DS	1/20/05

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THIRD ANGLE PROJECTION

LOAD KING

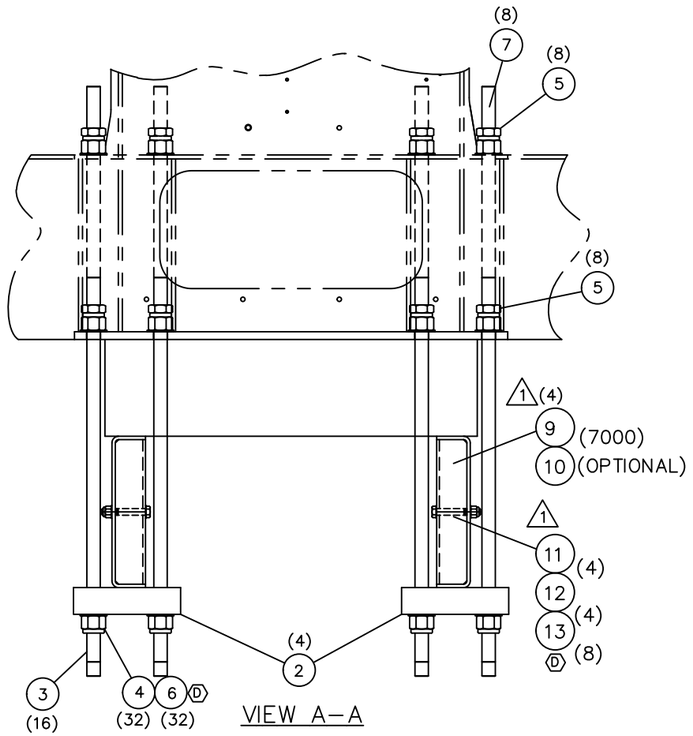
TITLE:
M/F TURRET INSTALLATION

SIZE	DWG. NO.	REV
B	700-00990	D

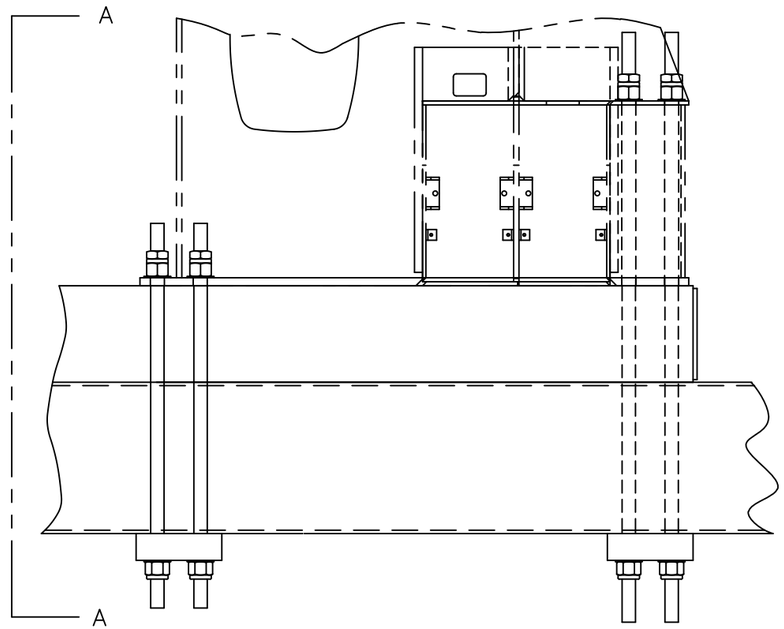
SCALE: NONE | WEIGHT: | SHEET 1 OF 2

Item	Part No.	Description	Qty.	Wt.

35-TON



VIEW A-A



CURB SIDE VIEW

NOTES:

1. FRAME STIFFENERS TO BE CENTERED WITH TIE DOWN STUDS (ITEM 3) AND DRIVE-FIT INTO PLACE BETWEEN TOP AND BOTTOM FLANGES OF TRUCK FRAME. LOCATE & DRILL ø.75 HOLE TRUCK FRAME FOR ITEMS 11, 12 & 13. SEE 709-01902 FOR ALTERNATE FRAME STIFFENERS.

2. TORQUE 16 LOWER LOCK NUTS (ITEM 4) TO 650-680 FT-LBS.

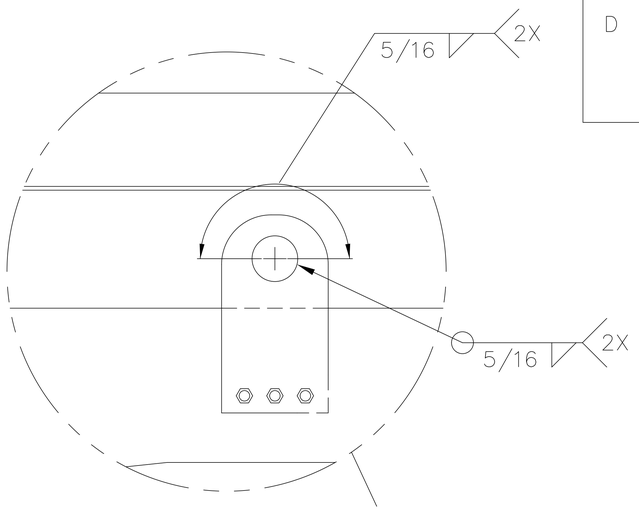
REV. LET.	L.E.N. DATE	CHANGE (ALL CHANGES MUST BE MADE ON CAD.)	E.C.N.
D	11-06-17	SEE SHEET 1	296A106113
C	4-9-11	SEE SHEET 1 OF 2.	296A101155
B	1-20-06	SEE SHEET 1 OF 2.	N517
A	6-07-05	CORRECTED STUD LENGTH	N833
--	1-18-05	PRODUCTION RELEASE	

LOAD KING

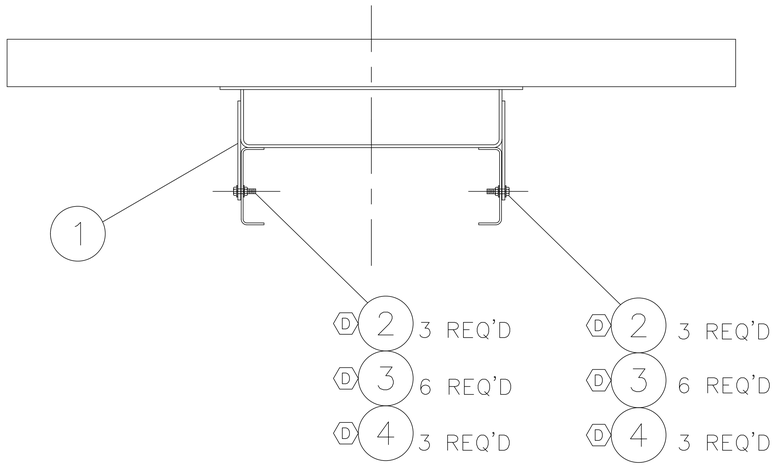
SIZE	DWG. NO.	REV
B	700-00990	D

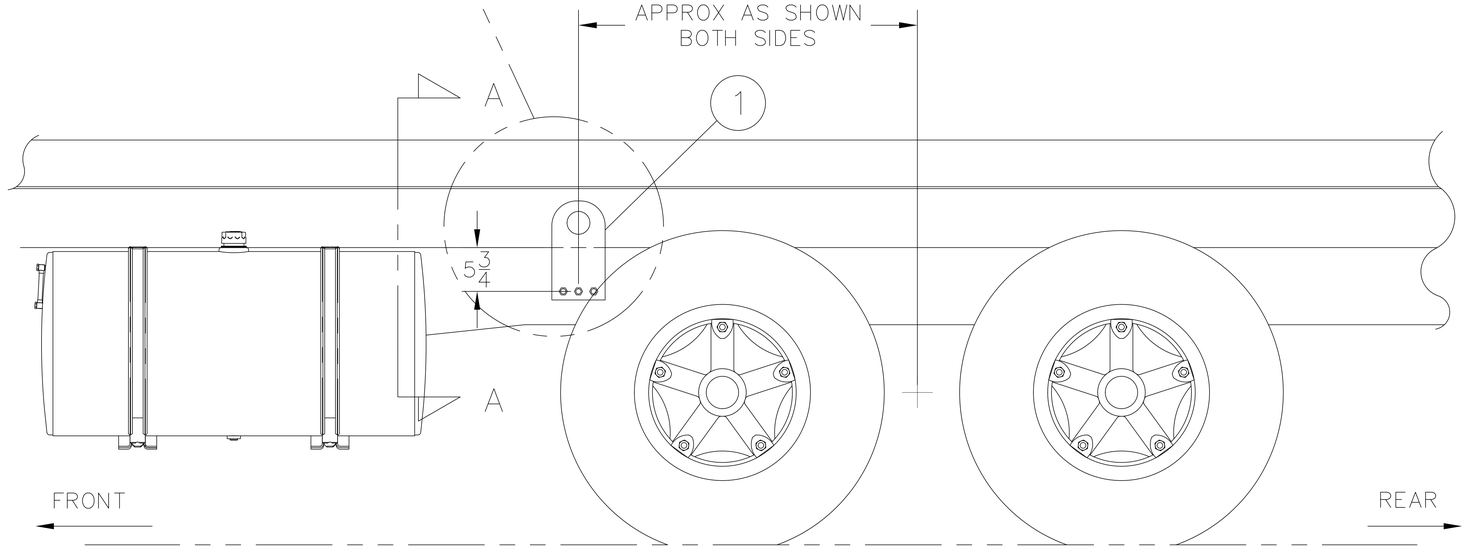
SCALE: NONE | SHEET 2 OF 2

REV	DESCRIPTION	BY	DATE	REL. NO.
A	REV DRW PER PART UPDATE; QTYS CHANGE TO REF; ADD IT5 & IT6	JWL	9/12	01-123
B	ITEM #5 MADE REF	RWS	10/30	01-136
C	APPROX AS SHOWN BOTH SIDES WAS 44 1/2", REMOVED ITEM 5, 210-00033, KIT, SHEAR PLATE PARTS, REMOVE REFERENCE FROM QTY ON ITEMS 1 THRU 4 REMOVED NOTE 6 PERTAINING TO ITEM 5 CLARIFIED WELDING OF ITEM 1 TO FRAME	REF	7/02/04	P278
D	CHANGED: NYH-625C000-22 WAS 221-96005 WAH-62NX000-20 WAS 222-06010 S01-625CB50-Y8 WAS 220-06032	SG@T	11/06/17	296A106121



VIEW A-A





NOTES:
1. LOCATE SHEAR PLATE (ITEM #1) AS SHOWN, WITH SHEAR PLATE SQUARE ON SUB-FRAME, AND WELD AS SHOWN.
2. USE EXISITING HOLES IN SHEAR PLATE (ITEM #1) AS TEMPLATE AND DRILL (3) 11/16 DIA HOLES IN TRUCK FRAME.
3. SECURE SHEAR PLATE (ITEM #1) TO TRUCK FRAME WITH HARDWARE (ITEMS 2, 3 & 4).
4. REPEAT STEPS 1-3 ABOVE FOR OPPOSITE SIDE SHEAR PLATE.
5. TORQUE BOLTS TO 160 FT-LBS.

ITEM	QTY	DESCRIPTION	PART NUMBER
5			
4	6	NUT,NYL-INS HVY 0.625-11,ST SQC G2	NYH-625C000-22
3	12	WSH,FL HRD A-NRW 0.625 ST SQC	WAH-62NX000-20
2	6	SCR, HHCS 0.625-11X2.50,ST SQC G8	S01-625CB50-Y8
1	2	SHEAR PLATE	709-01251

UNLESS OTHERWISE SPECIFIED:
TOLERANCE UNLESS OTHERWISE SPECIFIED
FRACTIONS ± 1/16
DECIMALS .XX ± .015
ANGLES ± 1°
MACHINE SURFACES 125

DO NOT SCALE DRAWING
MATERIAL
FINISH

	NAME	DATE
DRAWN	AGD	1-4
CHECKED	JMG	1-4

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THIRD ANGLE PROJECTION

LOAD KING

TITLE: SHEAR PLATE INSTALLATION

SIZE E | DWG. NO. 691-00003 | REV D

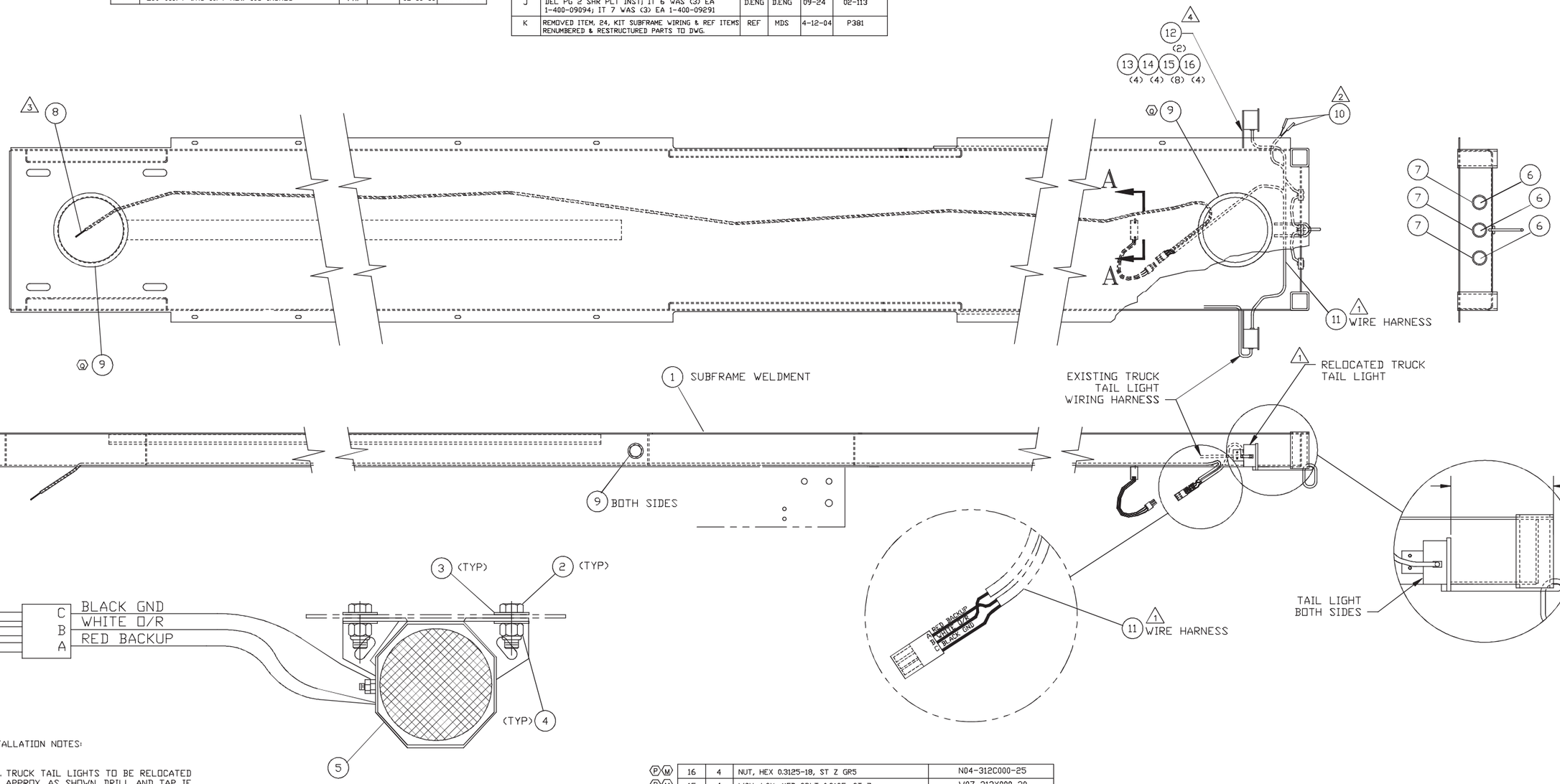
SCALE: 1:16 | WEIGHT: 20.8# | SHEET 1 OF 1

REV	DESCRIPTION	BY	CHK'D	DATE	REL NO.
L	CHGD TITLE FROM SUBFRAME INSTALLATION TO SUBFRAME ELECTRICAL INSTALL.	LD	DS	1-10-05	
M	ADDED ITEMS 12, 13, 14, 15, 16, & NOTE 4	REF	DW	1-23-07	N30
N	ITEMS 12,789-05681 WAS 789-05881	REF	MAN	8-03-12	296A102473
P	ITEM 2, SHF-250CA00-25 WAS 220-00003 UPDATED ALL HARDWARE PER NEW STANDARD	REF	MAN	1-15-13	296A103068
Q	209-00174 WAS 10FT NOW 106 INCHES	PMP		12-16-13	296A103893

REV	DESCRIPTION	BY	CHK'D	DATE	REL NO.
G	ITEM 8 QUAN WAS 2. ITEM 14 QUAN WAS 8 FT. ITEM 16 QUAN WAS 8. ITEM 18 QTY WAS 25 FT ITEM 20 QUAN WAS 8 FT. ITEM 21 QTY WAS 8 FT. ITEM 22 QUAN WAS 11 FT. ITEM 23 QTY WAS 23 FT.	RWS		10-02	00-095
H	ADDED ITEM 24 & NOTE #6.	RWS	SAL	10-22	01-135
I	ITEM #24 MADE REF	RWS	SAL	10-30	01-136
J	DEL PG 2 SHR PLT INST; IT 6 WAS (3) EA 1-400-09094; IT 7 WAS (3) EA 1-400-09291	D.ENG	D.ENG	09-24	02-113
K	REMOVED ITEM, 24, KIT SUBFRAME WIRING & REF ITEMS RENUMBERED & RESTRUCTURED PARTS TO DWG.	REF	MDS	4-12-04	P381

REV	DESCRIPTION	BY	CHK'D	DATE	REL NO.
D	ITEM 2 REQ'D WAS 6. ITEM 3 REQ'D WAS 7 ITEM 4 REQ'D WAS 7	RK	RLS	5-23	89-250
E	ITEM 5 WAS 1-400-05091; ITEM 15 WAS 32 FT. ITEM 16 WAS 7' ITEM 22 WAS 8' ADDED ITEM 23	JMG	DAS	7-21	89-335
F	ADDED DRAWING 2/2	RLH	SAL	7-19	00-032

REV	DESCRIPTION	BY	CHK'D	DATE	REL. NO.
A	IT. #3 WAS HHMS 1/4 x 3/4 SELF TAP P/N 0-223-1520B	CHH	RLS	2-13	89-096
B	ADDED VIEW D-D AND INSTALLATION NOTE # 5	DLB	JMG	3-30	89-189
C	REVISED NOTE 3. ADDED LOCATING DIM FOR TAIL LIGHTS	RK	RLS	5-17	89-247



SECTION A–A
(SCALE: NONE)

INSTALLATION NOTES:

1. TRUCK TAIL LIGHTS TO BE RELOCATED APPROX. AS SHOWN. DRILL AND TAP IF REQUIRED INTO SUB FRAME USING EXISTING TAIL LIGHT FASTENERS FOR MOUNTING. TRUCK CHASSIS HARNESS TO BE CONNECTED TO NEW TAIL LIGHT LOCATIONS. WIRE HARNESS ITEM 11 TO BE LOCATED APPROX. AS SHOWN.
2. CUT WIRES TO LENGTH & SPLICE INTO MARKER LIGHT WIRING ON SUB FRAME USING ITEM 10.
3. CUT WIRES TO LENGTH & ATTACH TERMINAL RING ITEM 6 TO OUTRIGGER TERMINAL IN CONTROL CONSOLE.
4. REPLACE ANY EXISTING TAIL LIGHT BRACKET WITH ITEM 12.

ITEM	QTY	DESCRIPTION	PART NUMBER
(P)(M) 16	4	NUT, HEX 0.3125-18, ST Z GR5	N04-312C000-25
(P)(M) 15	4	WSH, LCK, MED-SPLT 0.3125, ST Z	W07-312X000-20
(P)(M) 14	8	WSH, FL, TYPB-REG 0.3125, ST Z	WBR-31RX875-20
(P)(M) 13	4	SCR, HHCS, FL 0.312-18 X 1.25, ST Z G5	SHF-312CA25-25
(N)(M) 12	2	BRACKET, TAIL LIGHT	789-05681 4
(K) 11	1	WIRE HARNESS, TAIL LIGHT- ALARM - O/R	400-25163 1
(K) 10	2	TERMINAL-BUTT CONNECTION 16/14 GA	400-02230 2
(Q)(K) 9	8.8FT	SEAL TRIM (106 INCHES)	209-00174
(K) 8	1	TERMINAL RING, #8 - 16/14 GA	400-02323
(K) 7	3	GROMMET, 2 1/2" LITE & 3" HOLE TL#10704	400-09318
(K) 6	3	LIGHT, 2 1/2" RED REFLECTIZED TL#10205R	400-09113 3
(K) 5	1	HORN ASSY, ECCO #DF532	714A1432
(P)(K) 4	2	NUT, HEX, NYL-INS 0.25-20, ST Z G5	NYL-250C000-25
(P)(K) 3	2	WSH, FL TYPB-REG 0.25. ST Z	WBR-25RX734-20
(P)(K) 2	2	SCR, HHCS, FL 0.25-20 X 1.00, ST Z G5	SHF-250CA00-25
1	REF	SUBFRAME WELDMENT	BOOM TRUCKS

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS IN INCHES
TOLERANCES-UNLESS NOTED:
.x = ±.12
.xx = ±.06
.xxx = ±.020
DO NOT SCALE DRAWING
MATERIAL
LISTED
FINISH
N/A

	NAME	DATE
DRAWN	D. BELL	11/29
CHECKED	RLS	12/17

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THIRD ANGLE PROJECTION

LOAD KING

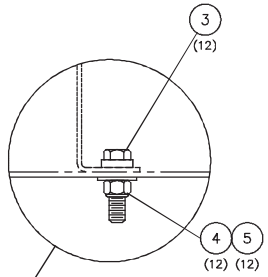
TITLE:
SUBFRAME ELECTRICAL INSTALL

SIZE	DWG. NO.	REV
B	691-00001	Q

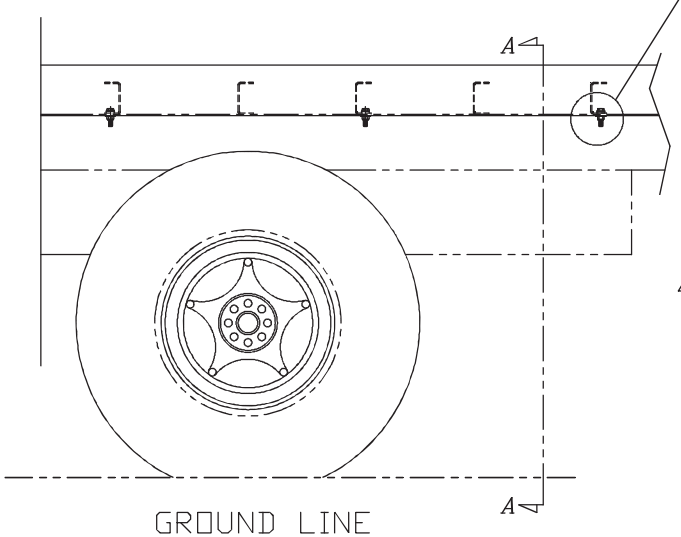
SCALE: 1:12 | WEIGHT: 5# | SHEET 1 OF 1

QTY.	ITEM	PART NO.	DESCRIPTION	WT.
	1			
	2			
12	3	709-01925	FLATBED BOLT WELDMENT	
12	4	NYL-500C000-25	NUT, HEX NYL-INS 0.50-13, ST Z	
12	5	WAN-50NX000-20	WSH, FLTYPA-NRW 0.50, ST Z	
	6			
	7			
	8			
	9			
	10			
	11			
	12			
	13			
(2)	14	783-03723	TRACK MOUNT BAR -LONG	

⚠1 SEE NOTE 1

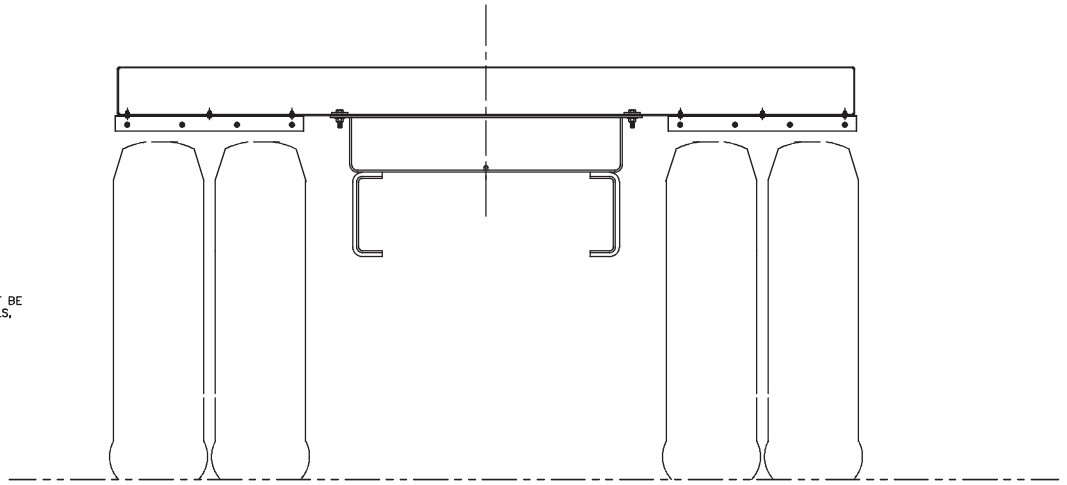


STD FLATBED
TYP MOUNTING
BOTH SIDES



GROUND LINE

⚠1 IF THE MUD FLAP MUST BE MOUNTED BETWEEN SILLS, USE ITEM (14). OR #783-03723



GROUND LINE
VIEW A-A

REV. LET.	L.E.N. DATE	DRAWN BY	CHANGE	E.C.N.
C	2/25/16	DAVI	REDRAWN IN AUTOCAD, DROP: 209-00461, S01-250CA25,NYL-25C000-25, WFD-250XAS0-25, WAN-25NX000-20, 785-00561	296A105238
-			PRODUCTION RELEASE	

ALL CHANGES MUST BE MADE ON CAD.

UNLESS OTHERWISE SPECIFIED:

ALL DIMENSIONS IN INCHES

TOLERANCES-UNLESS NOTED:

.x = ±.12

.xx = ±.06

.xxx = ±.020

DO NOT SCALE DRAWING

MATERIAL
LISTED

FINISH
N/A

	NAME	DATE
DRAWN	R FORD	
CHECKED	DS	

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THIRD ANGLE PROJECTION

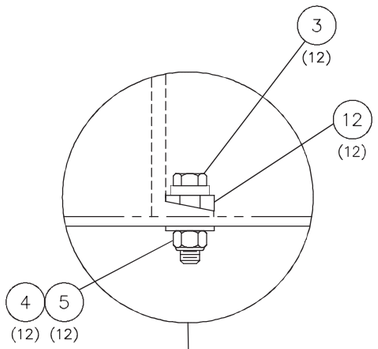
LOAD KING

TITLE:

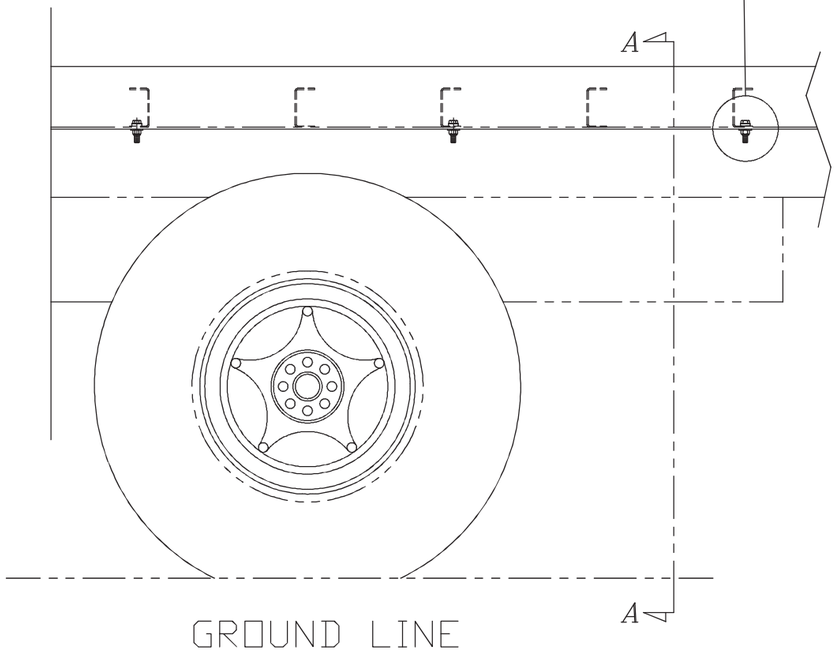
FLATBED INSTALL BT MODELS

SIZE	DWG. NO.	REV
A	696-00032-1	C

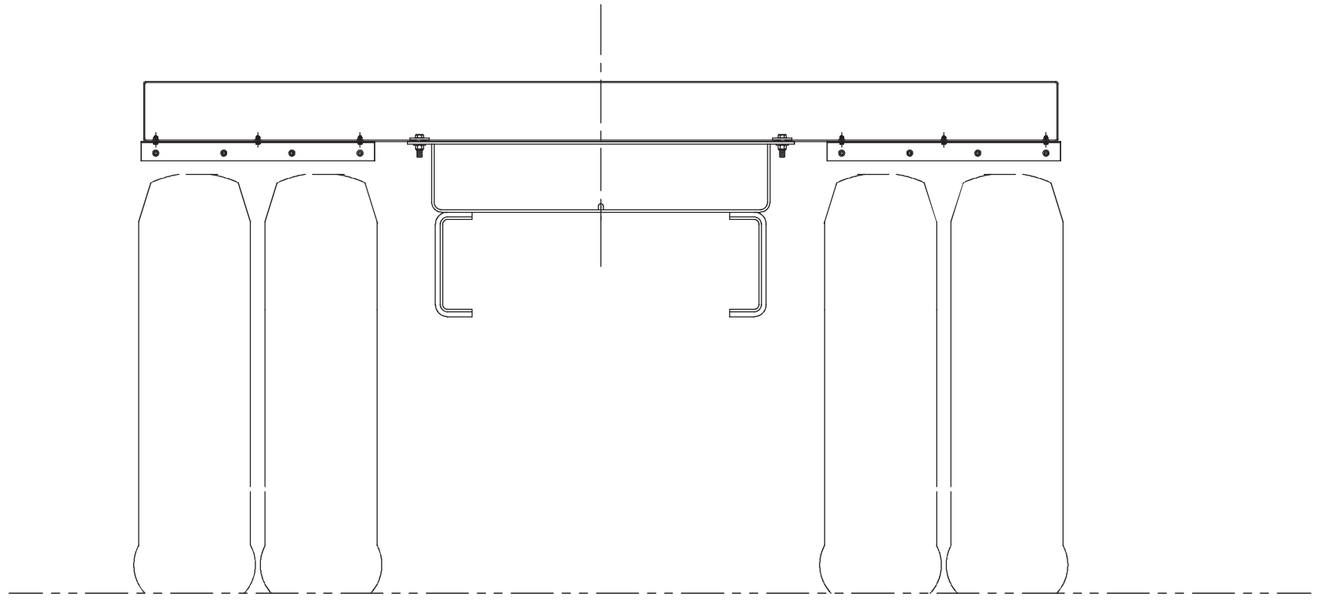
SCALE:	WEIGHT:	SHEET 1 OF 1



SUPER DUTY FLATBED
TYP MOUNTING
BOTH SIDES



GROUND LINE



GROUND LINE
VIEW A-A

QTY.	ITEM	PART NO.	DESCRIPTION	WT.
	1			
	2			
12	3	709-01925	FLATBED BOLT WELDMENT	
12	4	NYL-500C000-25	NUT, HEX NYL-INS 0.50-13, ST Z	
12	5	WAN-50NX000-20	WSH, FLTYPA-NRW 0.50, ST Z	
	6			
	7			
	8			
	9			
	10			
	11			
12	12	WBV-500X001	WASHER BEVELED 1/2" GALV	
	13			
	14			

REV. LET.	L.E.N. DATE	DRAWN BY	CHANGE	E.C.N.
D	2/30/16	DAVI	DROP: 783-03723	296A105323
C	2/25/16	DAVI	REDRAWN IN AUTOCAD, DROP: 209-00461, S01-250CA25,NYL-25C000-25, WFD-250XA50-25, WAN-25NX000-20. 785-00561. ADD: NYL-500C000-25	296A105238
–			PRODUCTION RELEASE	

ALL CHANGES MUST BE MADE ON CAD.

UNLESS OTHERWISE SPECIFIED:

ALL DIMENSIONS IN INCHES

TOLERANCES-UNLESS NOTED:

.x = ±.12

.xx = ±.06

.xxx = ±.020

DO NOT SCALE DRAWING

MATERIAL
LISTED

FINISH
N/A

	NAME	DATE
DRAWN	R FORD	
CHECKED	DS	

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THIRD ANGLE PROJECTION

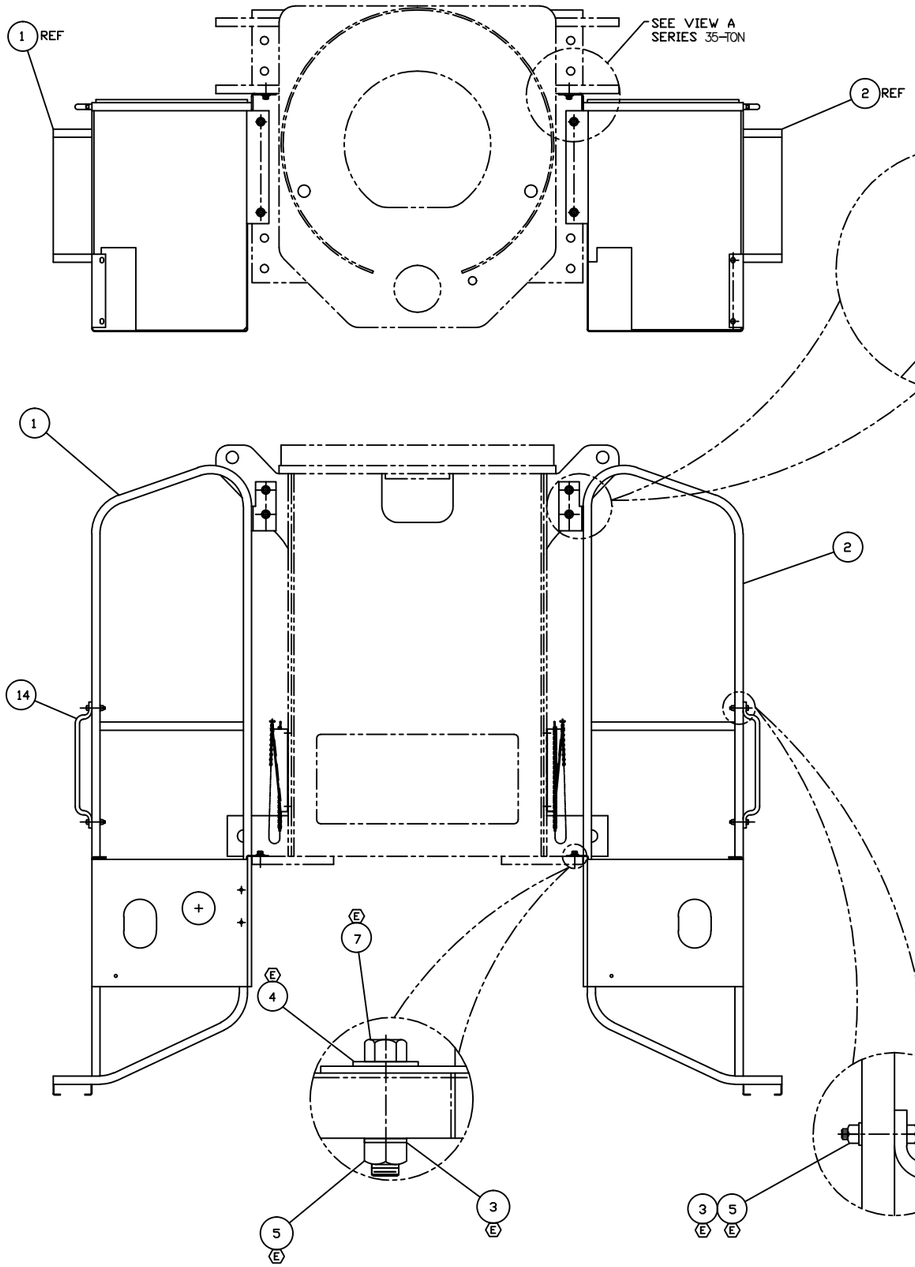
LOAD KING

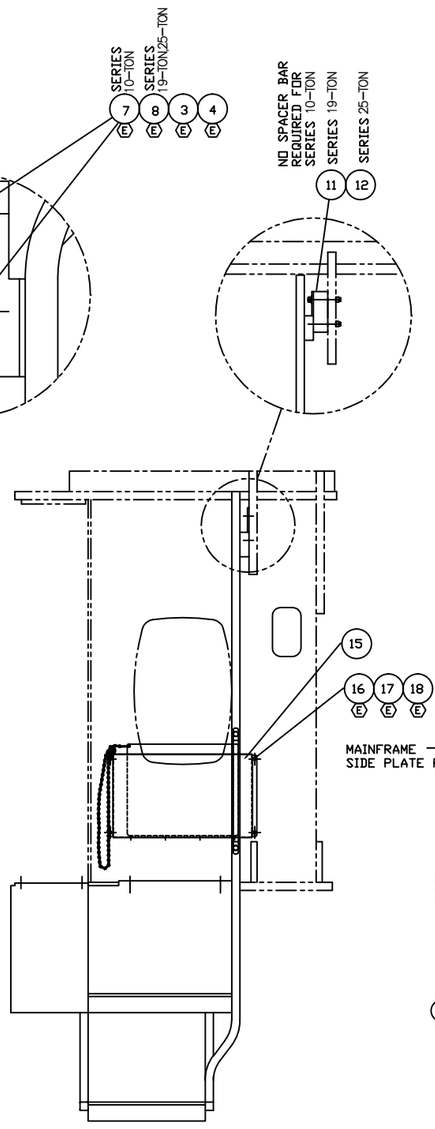
TITLE:

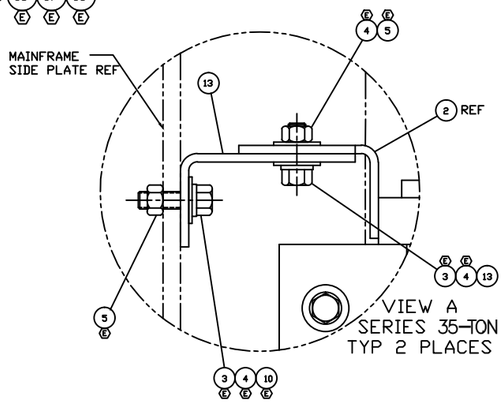
SUPER DUTY FLATBED INSTALL

SIZE	DWG. NO.	REV
B	696-00032-2	D

SCALE:	WEIGHT:	SHEET 1 OF 1







	QTY.	QTY.	QTY.	QTY.	QTY.	QTY.	QTY.	QTY.	ITEM	PART NO.	DESCRIPTION	KIT #
	1	1	1	1	1	1	1	1	1	709-01301	PLATFORM, WELD LH	
	1	1	1	1	1	1	1	1	2	709-01300	PLATFORM WELD RH	
E	(16)	(12)	(12)	(12)	16	12	12	12	3	W07-375X000-20	WSH, LCK, MED SPLT 0.375, ST SQC	19, 20, 21, 22
E	(16)	(8)	(8)	(8)	16	8	8	8	4	WAR-375X000-22	WSH, FL TYPA-REG 0.375, ST SQC G2	19, 20, 21, 22
E	(16)	(8)	(8)	(8)	16	8	8	8	5	N04-375C000-22	NUT, HEX 0.375-16, ST SQC G2	19, 20, 21, 22
E	(4)	(4)	(4)	(4)	4	4	4	4	6	S01-375CB00-25	SCR, HHCS 0.375-16X2.00,ST SQC G5	19, 20, 21, 22
E	(4)	(4)	(4)	(8)	4	4	4	8	7	S01-375CA75-25	SCR, HHCS 0.375-16X1.75,ST SQC G5	19, 20, 21, 22
E	–	(4)	(4)	–	–	4	4	–	8	S01-375CC50-25	SCR, HHCS 0.375-16X3.50,ST SQC G5	20, 21
E	(4)	–	–	–	4	–	–	–	9	SHF-375CA00-25	SCR,HHCS FT 0.375-16X1.00,ST SQC G5	22
E	(4)	–	–	–	4	–	–	–	10	SHF-375CA25-25	SCR,HHCS FT 0.375-16X1.25,ST SQC G5	22
	–	–	2 *	–	–	–	2	–	11	783-02896	SPACER BAR	
	–	2 *	–	–	–	2	–	–	12	783-03022	SPACER BAR	
	2 *	–	–	–	2	–	–	–	13	770-02492	BRACKET MOUNTING PLATFORM	
	2*	2 *	2 *	2 *	2	2	2	2	14	209-00444	GRAB HANDLE #2399-D	
A	2	–	–	–	2	–	–	–	15	209-00866	ASSY, CAP HOLDER W/ MTG PLT	
EB	10	–	–	–	10	–	–	–	16	N04-250C000-25	NUT, HEX 0.25-20, ST SQC G5	
EB	20	–	–	–	20	–	–	–	17	WBR-25RX734-20	WSH, FL TYPB-REG 0.25, ST SQC	
EB	10	–	–	–	10	–	–	–	18	SHF-250C750-25	SCR,HHCS FT 0.25-20X0.75,ST SQC G5	
C	–	–	–	–	–	–	–	–	19	210-00082-1	BT PLATFORM HARDWARD KIT (2000)	19
C	–	–	–	–	–	–	–	–	20	210-00082-2	BT PLATFORM HARDWARD KIT (3000)	20
C	–	–	–	–	–	–	–	–	21	210-00082-3	BT PLATFORM HARDWARD KIT (4000/5000)	21
C	–	–	–	–	–	–	–	–	22	210-00082-4	BT PLATFORM HARDWARD KIT (7000)	22
	706-00022-14	706-00022-13	706-00022-12	706-00022-11	706-00022-4	706-00022-3	706-00022-2	706-00022-1				
	35-TON SERIES SHIPOUT	25-TON SERIES SHIPOUT	19-TON SERIES SHIPOUT	10-TON SERIES SHIPOUT	35-TON SERIES PRODUCTION	25-TON SERIES PRODUCTION	19-TON SERIES PRODUCTION	10-TON SERIES PRODUCTION				
	C	C	C	C	E	E	E	E				

= BT PLATFORM SHIPOUT HARDWARE KIT

C * SHIPOUT PART MARKING: MARK BOX, BAG OR TAG WITH PART NUMBER APPROX AS SHOWN.

REV. LET.	L.E.N. DATE	CHANGE	E.C.N.
E	11/02/17	CHANGED: W07-375X000-20 WAS 222-12001 WAR-375X000-22 WAS 222-02005 N04-375C000-22 WAS 221-02001 S01-375CB00-25 WAS 220-02011 S01-375CA75-25 WAS 220-02007 S01-375CC50-25 WAS 220-02008 SHF-375CA00-25 WAS 220-02004 SHF-375CA25-25 WAS 220-02002 N04-250C000-25 WAS 221-00001 WBR-25RX734-20 WAS 222-00006 SHF-250C750-25 WAS 220-00003	296A106101
D	12-20-05	ADDED ALTERNATE FILTER MOUNTING HOLE	296A100695
C	12-20-05	ADDED 706-00022-11 THRU 706-00022-14, SHIPOUTS ADDED ITEM 19 THRU 22, PROVIDED BT HARDWARE KITS	N530
B	6-14-05	CHANGE QTYS , ITEMS 16, 17, & 18	N815
A	5-26-05	ADDED ITEMS, 15, 16 17 & 18	N844
	3/25/04	PRODUCTION RELEASE	P566

UNLESS OTHERWISE SPECIFIED:

ALL DIMENSIONS IN INCHES

TOLERANCES-UNLESS NOTED:

.x = ±.12

.xx = ±.06

.xxx = ±.020

DO NOT SCALE DRAWING

MATERIAL: LISTED

FINISH: N/A

	NAME	DATE
DRAWN	R FORD	
CHECKED	DS	

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THIRD ANGLE PROJECTION

LOAD KING

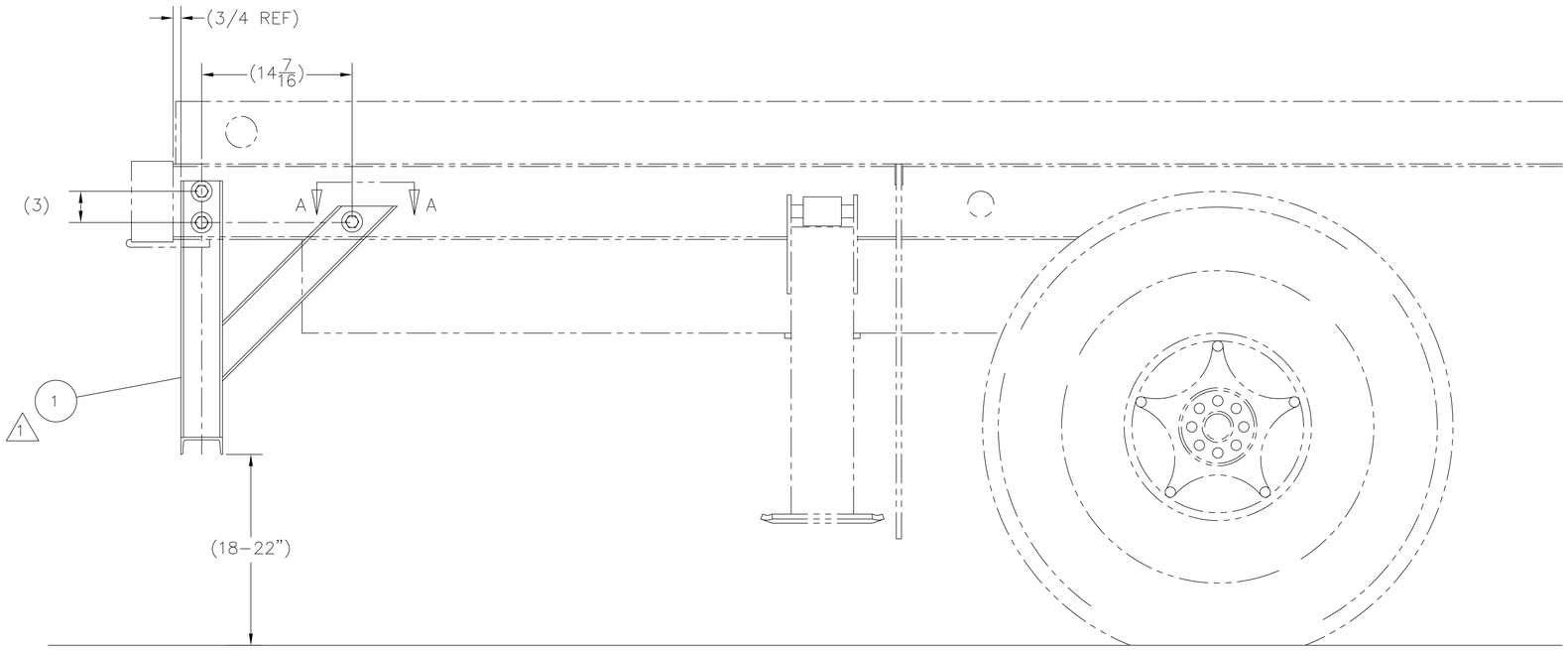
TITLE:

PLATFORM INSTALLATION

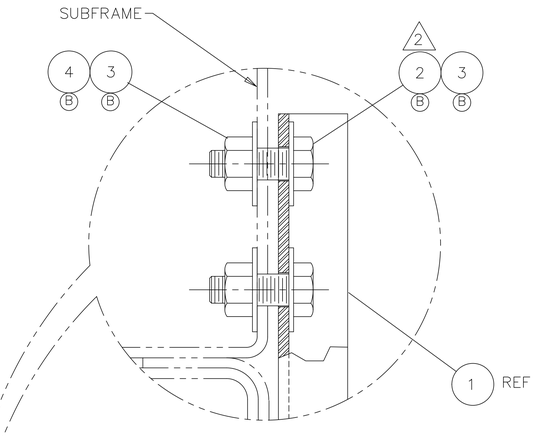
SIZE	DWG. NO.	REV
B	706-00022	E

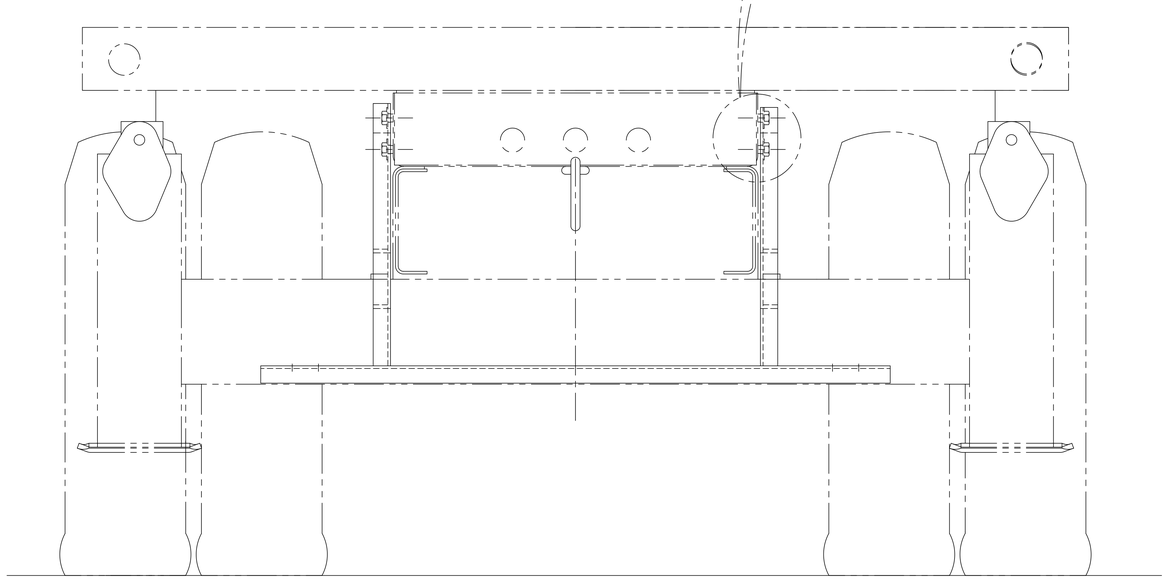
SCALE: NONE | WEIGHT: N/A | SHEET 1 OF 1

	Item	Part No.	Description	Qty.	Wt.
A	1	600-22111	BUMPER CHANNEL HORIZIONTAL	1	80.0#
B	2	SHF-750CB00-Y8	SCR,HHCS FT 0.75-10X2.00,ST SQC G8	6	
B	3	WAH-75NX000-20	WSH, FL HRD A-NRW 0.75 ST SQC	12	
B	4	NTP-750C000-25	NUT,HEX TPLCK 0.75-10,ST SQC G5	6	

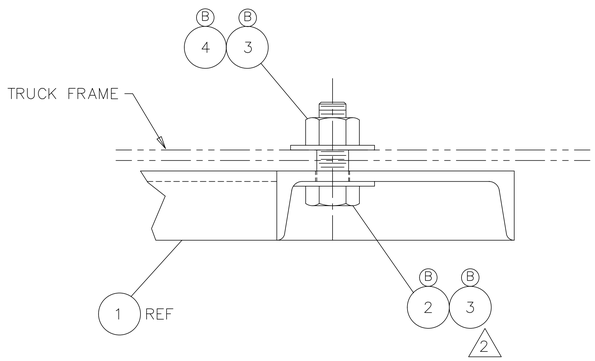


CURBSIDE VIEW





REAR VIEW



SECTION A-A

1:2 SCALE

NOTES:

1. BUMPER GUARD WELDMENT (1) IS TO BE POSITIONED AT END OF SUBFRAME - JUST FORWARD OF THE BOOM REST POCKETS. ALIGN MOUNTING HOLES WITH SUBFRAME AND INSTALL BOLT.
2. TORQUE BOLTS (2) TO 250-280 FT-LBS. (LUBED THDS).

SIMILAR TO: 600-95005

LET.	L.E.N. DATE	CHANGE REV.	E.C.N.
B	10/17/17	CHANGED: NTP-750C000-25 WAS 221-97002 WAH-75NX000-20 WAS 222-07003 SHF-750CB00-Y8 WAS 220-07020	296A106066
A	2/27/06	ITEM 1, 600-22111 WAS 600-22109	N430
		- 1/11/05 PRODUCTION RELEASE	P19
		ALL CHANGES MUST BE MADE ON CAD.	

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL +/- 1/16
ANGULAR: MACH ±2° BEND ±2°
TWO PLACE DECIMAL ±.03
THREE PLACE DECIMAL ±.010
INTERPRET GEOMETRIC
TOLERANCING PER: ASME Y14.5 2009

DO NOT SCALE DRAWING

MATERIAL: LISTED
FINISH: N/A

	NAME	DATE
DRAWN	R FORD	1/11/05
CHECKED	DS	1/11/05

PROPRIETARY AND CONFIDENTIAL
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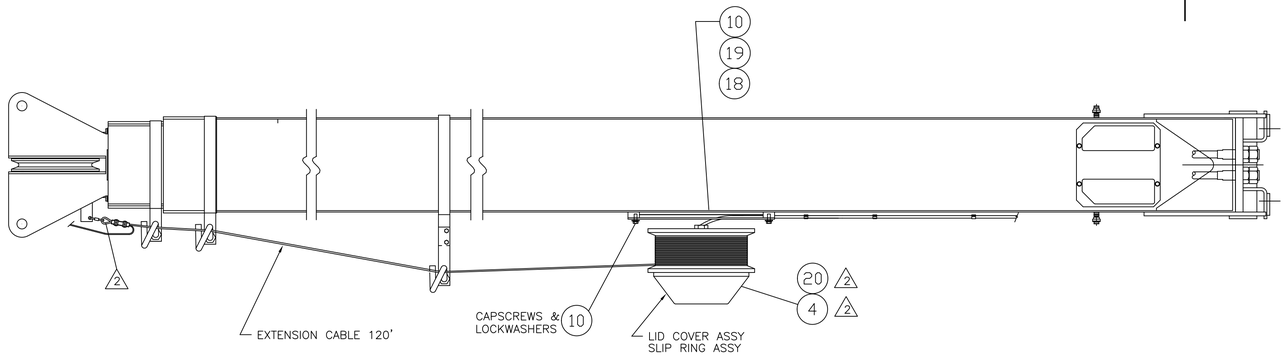
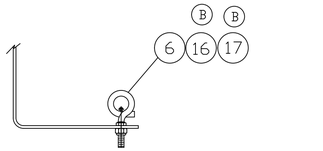
THIRD ANGLE PROJECTION

LOAD KING

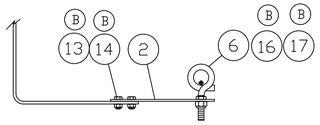
TITLE: BUMPER GUARD ASSY ASSEMBLY

SIZE	DWG. NO.	REV
E	600-95010	B
SCALE:	WEIGHT:	SHEET 1 OF 1

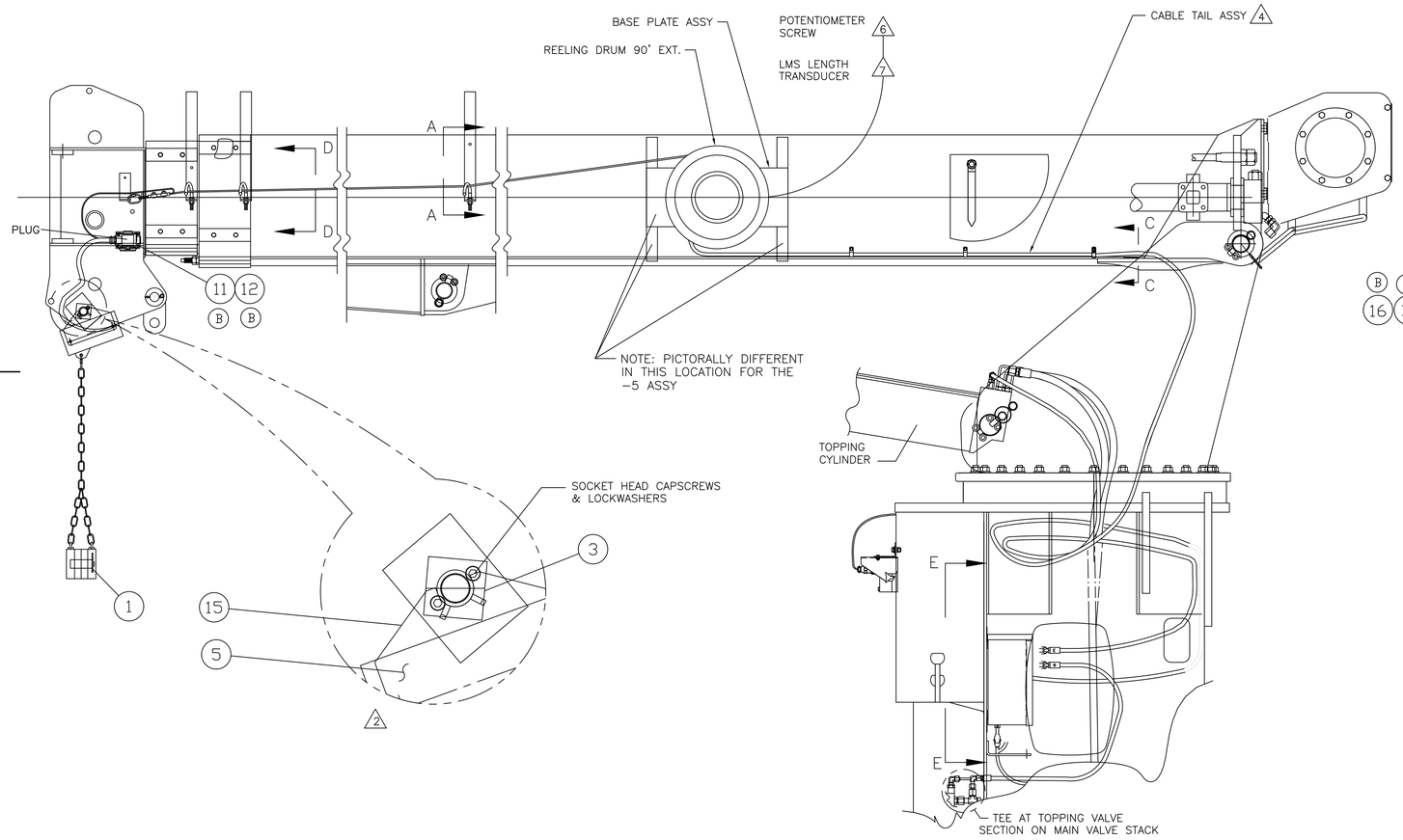


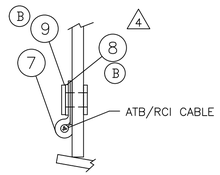


VIEW A–A

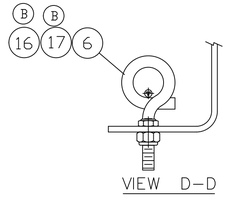


VIEW A–A OPTIONS





VIEW C–C



VIEW D–D

NOTES:

1. RCI CENTRAL UNIT CONTAINS PREWIRED PRESSURE TRANSDUCERS. VERIFY ELECTRICAL CONNECTIONS AS SHOWN ON ELECTRICAL BOX INSTALL DWG. WIRE HARNESS FOR DISPLAY WILL NEED TO BE ROUTED THRU HOLE IN COVER.
2. MOUNT ATB/RCI CABLE REEL (8) ON BOOM AND ATTACH END OF CABLE WITH CHAIN CONNECTOR TO CABLE GUIDE MOUNTING ANGLE ON BOOM TIP. ROUTE CABLE THROUGH GUIDES AS SHOWN. SEE VIEW A-A & VIEW D-D. MAKE SURE CABLE THIMBLE AND CLAMP ARE PROPERLY ATTACHED TO CABLE.
3. CABLE REEL IS TO HAVE NECESSARY TENSION TO WIND UP CABLE ON REEL WHEN BOOM IS FULLY RETRACTED. IF CABLE REEL TENSION IS NOT ADEQUATE THEN ROTATE REEL CCW AND WIND EXCESS CABLE BACK ONTO REEL FOR INCREASED CABLE TENSION. THIS IS TO BE DONE UNTIL TENSION IS ADEQUATE TO WIND UP CABLE ON CABLE REEL WHEN BOOM IS IN FULLY RETRACTED POSITION.
4. MOUNT ATB/RCI CABLE FROM CABLE REEL (8) ALONG THE SIDE OF BOOM USING CABLE CLAMPS (12). SEE VIEW C–C. SEE ELECTRICAL BOX INSTALL DWG. FOR ELECTRICAL CONNECTIONS.
5. ROUTE RCI DISPLAY CABLE THRU SWING COVER AND MOUNT DISPLAY TRACK AND BRACKETS AS SHOWN. MAKE SURE CABLE IS LONG ENOUGH SO THAT THE DISPLAY MAY MOUNT ON EITHER SIDE.
6. PLACE THE BOOM IN AN EXACT HORIZONTAL POSITION USING A DIGITAL LEVEL. ADJUST REEL BOOM ANGLE POTENTIOMETER SCREW TO SHOW 0° BOOM ANGLE ON 586 DISPLAY.
7. FOR LENGTH AND ANGLE SETUP SEE INSTALLATION MANUAL.
8. SEE ELECTRICAL SCHEMATIC FOR ELECTRICAL CONNECTIONS.
9. ALL HOSES AND FITTINGS SHALL REMAIN PLUGGED FOR SHIPOUTS.
10. 3 STAGE BOOMS ONLY REQUIRE THREE OF ITEM 6.

	QTY.	QTY.	ITEM	PART NO.	DESCRIPTION	WT.
	1	1	1	717 0882	CTWT W/CHAIN	
		1	2	400–16132	BRACKET, EXTEND	
	1	1	3	774–00054	BRACKET – ATB SWITCH	
(A)		1	4	861–90386	REEL/A–RCI/ATB	
	1	1	5	861–90434	ATB SWITCH ASSY HVY DTY	
	4	3	6	865–00029	ATB CABLE GUIDE	
	3	3	7	201–00141	CLAMP ø1/4 X .40 HOLE	
(B)	3	3	8	WBR–25RX734–20	WSH, FL TYPB–REG 0.25, ST SQC	
(B)	3	3	9	VBB–250X875–L5	RVT,BTNHD,BLND 0.250X0.875,AL	
(B)(A)	3	4	10	WAR–375X000–22	WSH, FL TYPA–REG 0.375, ST SQC G2	
(B)	4	4	11	SFS–190C500–25	SCR, HXFLG SERR #10–24X0.500 SQC G5	
(B)	4	4	12	W07–190X000–20	WSH, LCK, MED SPLT 10, ST SQC	
(B)	2	2	13	SHF–250C625–25	SCR,HHCS FT 0.25–20X0.625,ST SQC G5	
(B)	2	2	14	NTP–250C000–25	NUT,HEX TPLCK 0.25–20,ST SQC G5	
	1	1	15	729–02729	RCI/ATB SWITCH BRACKET, WELD	
(B)	4	3	16	N05–375C000–2A	NUT, HEX JAM 0.375–16,ST SQC GA	
(B)	4	3	17	NYL–375C000–25	NUT,HEX NYL–INS 0.375–16,ST SQC G5	
(A)	3		18	SHF–375C875–25	SCR,HHCS FT 0.375–16X0.875,ST SQC G5	
(A)	3		19	W07–375X00–20	WSH, LCK, MED SPLT 0.375, ST SQC	
(A)	1		20	861–90532	REEL/A–RCI/ATB	

508–00090–5	508–00090–1	B	12/26/17 — CHANGED: WBR–25RX734–20 WAS 222–00006, VBB–250X875–L5 WAS 226–00021, WAR–375X000–22 WAS 222–02005, SFS–190C500–25 WAS 223–04001. W07–190X000–20 WAS 222–10006, SHF–250C625–25 WAS 220–00021, NTP–250C000–25 WAS 221–90001, N05–375C000–2A WAS 221–00031–3, NYL–375C000–25 WAS 221–00032–3. — 296A106297
MODEL 25–92	MODEL 10–47	A	5/28/15 — ON THE –5 ASSY, QTY OF 222–02005 WAS (4). DROP: 861–90386, ADD: SHF–375C875–25, W07–375X00–20, 861–90532, ADDED NOTE ON DWG FIELD LOC D6 — 296A104885
		–	11/14/08 — PRODUCTION RELEASE — L917
		REV. LET.	L.E.N. DATE — CHANGE — ALL CHANGES MUST BE MADE ON CAD. — E.C.N.

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS IN INCHES
TOLERANCES-UNLESS NOTED:
.x = ±.12
.xx = ±.06
.xxx = ±.020
DO NOT SCALE DRAWING
MATERIAL: LISTED
FINISH: N/A

	NAME	DATE
DRAWN	REF	11/14/08
CHECKED	DAS	11/14/08

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THIRD ANGLE PROJECTION

LOAD KING

TITLE: CYL/BOOM CABLE GUIDE INSTALL

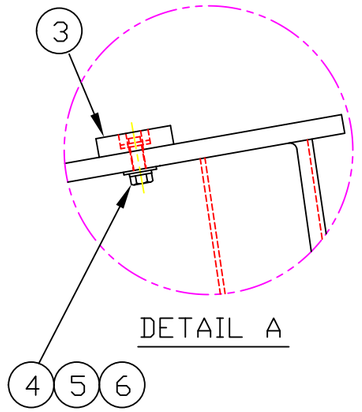
SIZE D | DWG. NO. 508–00090 | REV B

SCALE: NONE | WEIGHT: | SHEET 1 OF 1

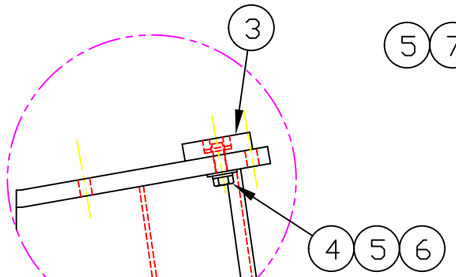
SIMILAR TO: 508–00083

INTERNAL RCI INSTALLATION

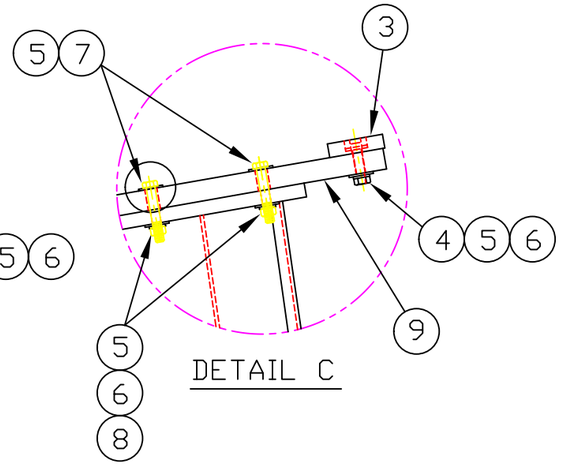
Item	Part No.	Description	Qty.	Qty.	Qty.	Wt.
1	709-01204	BOOM REST WELD-OFFSET	–	–	1	
2	709-01212	BOOM REST WELD	1	1	–	
3	729-02175	WEAR PAD 2X6 PLYSRT (00765)	2	2	2	
B A 4	S01-312CA25-25	SCR,HHCS,0.3125-18 X 1.25, ST Z G5	4	4	4	
A 5	WAN-31NX000-20	WSH ,FL ,TYPA-NRW 0.3125, ST Z	20	4	4	
A 6	W07-312X000-20	WSH, LCK, MED SPLT 0.3125, ST Z	12	4	4	
A 7	S01-312CB00-25	SCR,HHCS, 0.3125-18 X 2.00,ST Z G5	8	–	–	
A 8	N04-312C000-25	NUT,HEX, 0.3125-18, ST Z GR5	8	–	–	
9	709-01318	SUPPORT PLATE, BOOM REST	1	–	–	
			698-00063-3	698-00063-2	698-00063-1	
			25-TON,35-TON SERIES	19-TON SERIES	10-47	



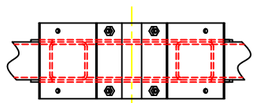
DETAIL A

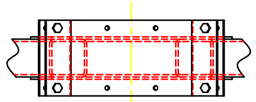


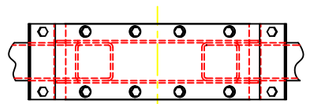
DETAIL B

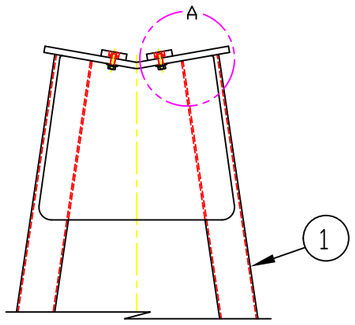


DETAIL C

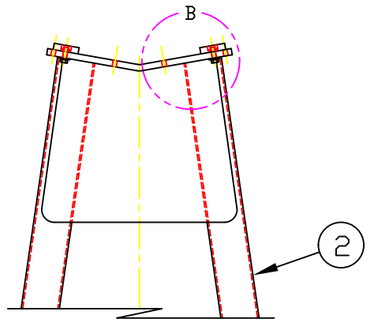




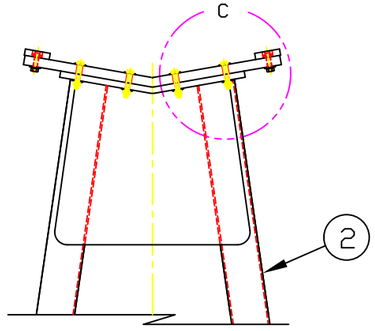




698-00063-1



698-00063-2



698-00063-3

REV. LET.	L.E.N. DATE	CHANGE	E.C.N.
B	1-22-13	ITEM 4, S01-312CA25-25 WAS S01-312CA00-25	296A102906
A	8-10-12	ITEM 7, S01-312CB00-25 WAS 220-01010 UPDATED TO NEW HARDWARE STD	296A102493
–	2-09-05	PRODUCTION RELEASE	N964

ALL CHANGES MUST BE MADE ON CAD.

UNLESS OTHERWISE SPECIFIED:

ALL DIMENSIONS IN INCHES

TOLERANCES-UNLESS NOTED:

.x = ±.12

.xx = ±.06

.xxx = ±.020

DO NOT SCALE DRAWING

MATERIAL

FINISH

	NAME	DATE
DRAWN	LD	2/09/05
CHECKED	DS	2/09/05

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THIRD ANGLE PROJECTION

LOAD KING

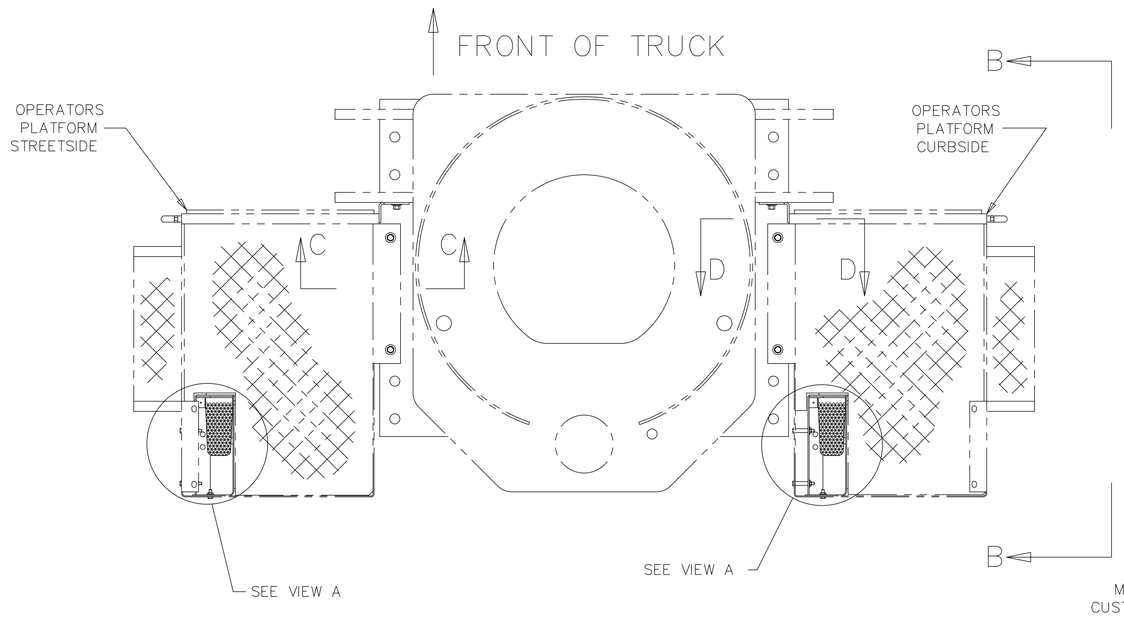
TITLE:

BOOM REST ASSY.

SIZE	DWG. NO.	REV
B	698-00063	B

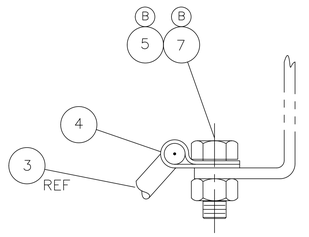
SCALE: 1:1 | WEIGHT: | SHEET 1 OF 1

REV	DESCRIPTION	BY	CHK'D	DATE	REL. NO.
A	ITEM 13 WAS 1-031-00038	DGL	SAL	10/4	99-108
B	CHANGED: S01-250CB00-25 WAS 220-00007 S01-250CA25-25 WAS 220-00004 NTP-250C000-25 WAS 221-90001 WBR-25RX734-20 WAS 222-00006 SHF-250C750-25 WAS 220-00003	SG@T	--	11/01/17	296A106094



TOP VIEW OF TRUCK

SCALE: 1:8

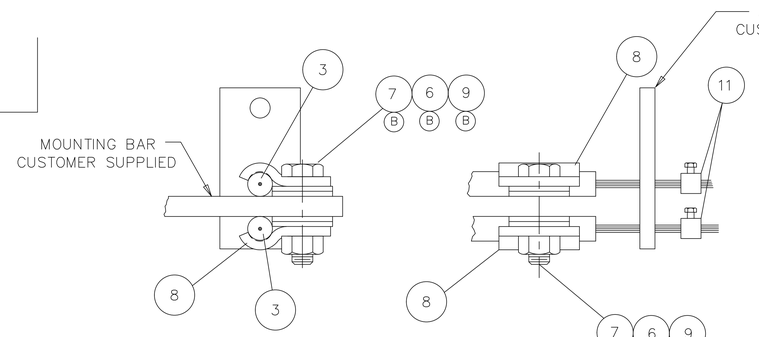


SECTION C-C

FULL SCALE

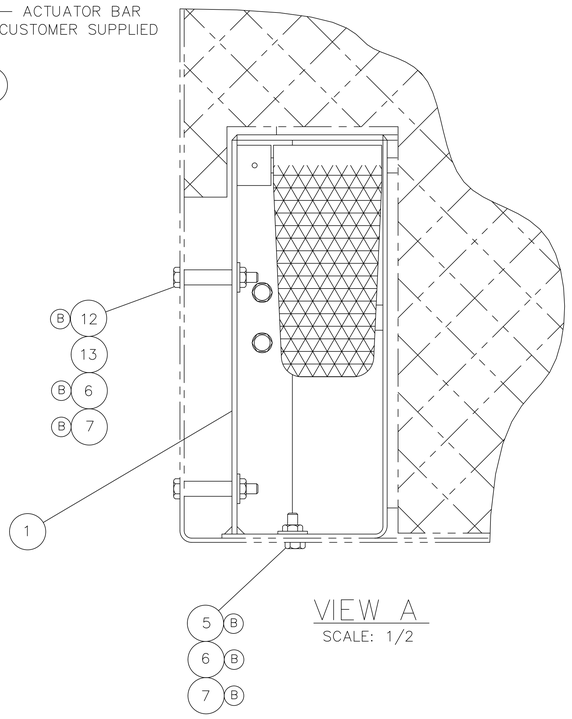
SECTION D-D

FULL SCALE
ROTATED 180°



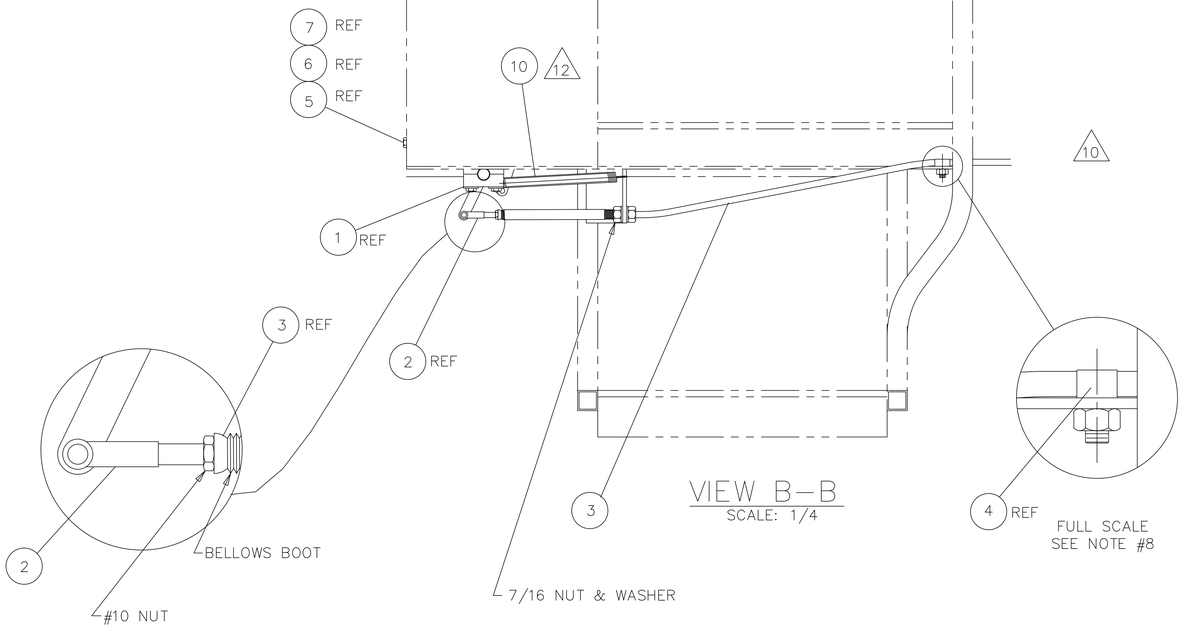
ENGINE COMPARTMENT

(SCALE: FULL)



VIEW A

SCALE: 1/2



VIEW B-B

SCALE: 1/4

NOTES:

1. INSTALL THROTTLE SUB-ASSEMBLIES INTO PLATFORMS AND SECURELY TIGHTEN FASTENERS.
2. REMOVE #10 NUT, BELLOWS BOOT, AND 7/16 NUT, AND WASHER FROM END OF THROTTLE CABLE (3).
3. INSERT THREADED END OF THROTTLE CABLE (3) THROUGH HOLE IN ANGLE (1), APPROXIMATELY TO MIDPOINT OF BULKHEAD. REINSTALL #10 NUT, BELLOWS BOOT, 7/16 NUT AND WASHER ONTO END OF THROTTLE CABLE (3).
4. THREAD CLEVIS ASSEMBLY (2) ONTO THREADED END OF THROTTLE CABLE (3).
5. INSTALL CLEVIS ASSEMBLY (2) TO LINK ON THROTTLE SUB-ASSEMBLY (1).
6. MAKE ADJUSTMENTS BETWEEN CLEVIS ASSEMBLY (2), THROTTLE CABLE (3), AND SUPPORT ANGLE (1) TO OBTAIN PROPER MOUNTING.
7. SECURELY TIGHTEN 7/16 NUTS AT BULKHEAD. SECURELY TIGHTEN #10 NUT.
8. INSTALL TUBE CLAMP (4) WITH THROTTLE CABLE (3) TO BOTTOM OF GRIP STRUT FLANGE. SECURELY TIGHTEN FASTENERS.
9. THROTTLE CABLE (3) TO BE ROUTED USING MAXIMUM POSSIBLE BEND RADIUS AND NOT TO BE HANGING LOOSE NEAR MOVING OR HOT PARTS.
10. FOR CUSTOMER SUPPLIED THROTTLE CONNECTION TO ENGINE THROTTLE. ATTACHING LINKAGE NOT SHOWN OR SUPPLIED.
11. THIS ASSEMBLY TO BE USED ON SERIES TC1600 THRU TC4700.
12. INSTALL RETURN SPRING (10) AND MAKE SURE THAT CABLE DOES NOT BIND WHEN PEDAL IS RELEASED.
13. FOR MECHANICAL ENGINES; USE #600-40348.

	ITEM	QTY	DESCRIPTION	PART NUMBER
A	13	4	SPACER TUBE 1/2 DIA NYLON	1-036-10040
B	12	4	SCR, HHCS 0.25-20X2.00,ST SQC G5	S01-250CB00-25
	11	2	SWIVEL STOP	0-209-00046
	10	2	THROTTLE PEDAL RETURN SPRING	2-202-10062
B	9	1	SCR, HHCS 0.25-20X1.25,ST SQC G5	S01-250CA25-25
	8	2	CABLE CLAMP	1-201-00143
B	7	9	NUT,HEX TPLCK 0.25-20,ST SQC G5	NTP-250C000-25
B	6	10	WSH, FL TYPB-REG 0.25, ST SQC	WBR-25RX734-20
B	5	4	SCR,HHCS FT 0.25-20X0.75,ST SQC G5	SHF-250C750-25
	4	2	TUBE CLAMP 1/4 x 5/16	1-201-00141
	3	2	CABLE THROTTLE	2-600-40329
	2	2	CLEVIS ASS'Y	1-809-00390
	1	2	THROTTLE SUBASS'Y	4-600-40347

UNLESS OTHERWISE SPECIFIED:
TOLERANCE UNLESS OTHERWISE SPECIFIED
FRACTIONS ± 1/16
DECIMALS .x ± .015
ANGLES ± 1°
MACHINE SURFACES 125
DO NOT SCALE DRAWING
MATERIAL
FINISH

	NAME	DATE
DRAWN	JMG	1-4
CHECKED	JMG	1-4

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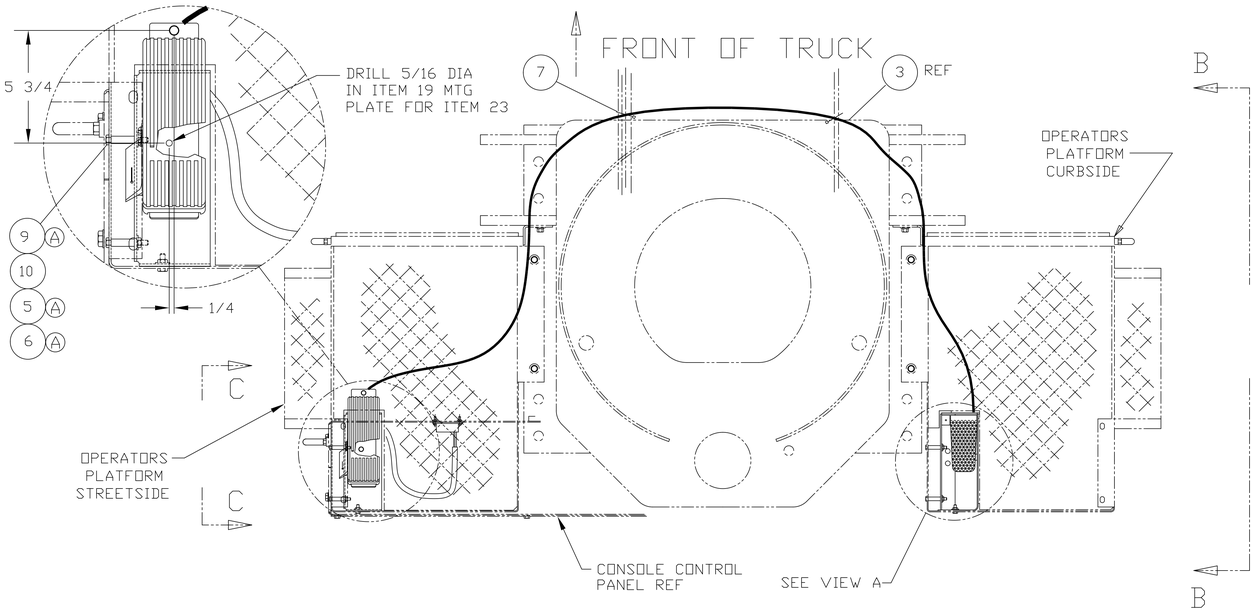
THIRD ANGLE PROJECTION

LOAD KING

TITLE: THROTTLE INSTALLATION

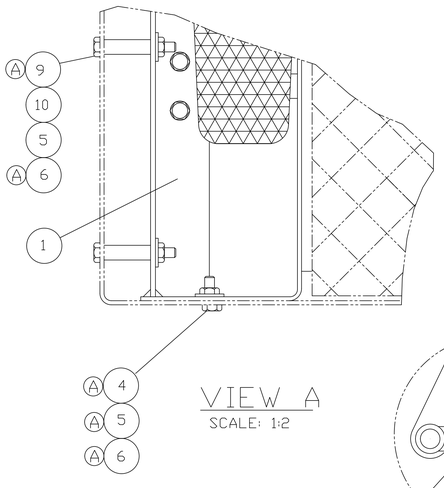
SIZE E | DWG. NO. 600-40429 | REV B

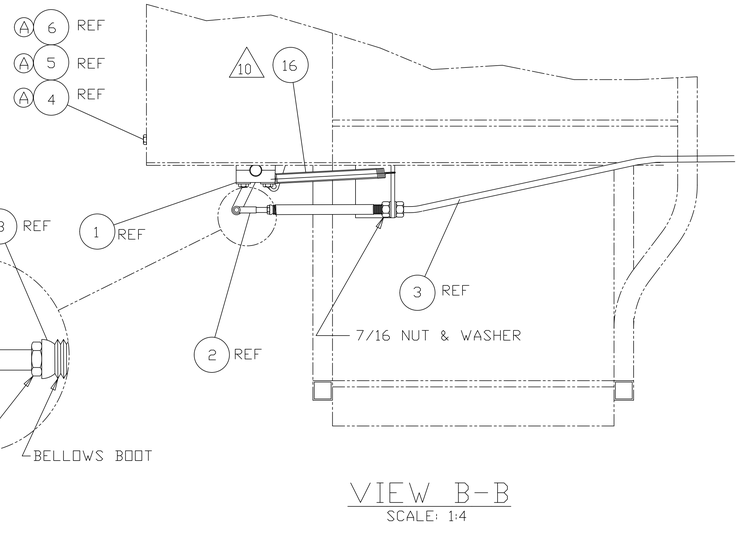
SCALE: 1:8 | WEIGHT: 19# | SHEET 1 OF 1

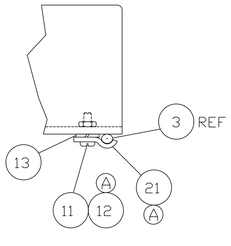


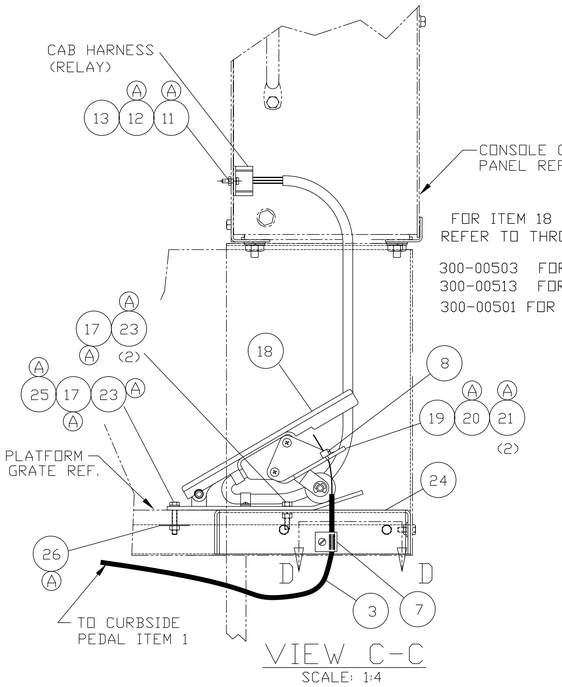
TOP VIEW OF TRUCK

SCALE: 1:8









FOR ITEM 18 THROTTLE PEDAL
REFER TO THROTTLE SELECT ON ORDER

300-00503 FOR CATERPILLAR ENGINE
300-00513 FOR CUMMINS AND DETROIT DDEC V
300-00501 FOR MERCEDES AND INTERNATIONAL ENGINE

ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	THROTTLE SUBASSY	600-40347
2	2	CLEVIS ASSEMBLY	809-00390
3	1	CABLE, ACCELERATOR	2-600-40329
A 4	4	SCR,HHCS FT 0.25-20X0.75,ST SQC G5	SHF-250C750-25
A 5	6	WSH, FL TYPB-REG 0.25, ST SQC	WBR-25RX734-20
A 6	6	NUT,HEXTPLCK0.25-20,STSQCG5	NTP-250C000-25
7	1	CLAMP THROTTLE CABLE	1-201-00143
8	1	SWIVEL STOP	0-209-00046
A 9	4	SCR, HHCS 0.25-20X2.00,ST SQC G5	S01-250CB00-25
10	4	SPACER TUBE 1/2 DIA NYLON	1-036-10040
A 11	3	RHMS 10-32 NF X .75 GR2 ZINC	SL4-190F750-22
A 12	3	NUT, HEX NYL-INS 10-32,ST SQC G2	NYL-190F000-22
13	2	FLAT WASHER #10 ZINC PLTD	0-222-00007
14	REF	ELECTRICAL SCHEMATIC	0-400-25170
15			
16	1	THROTTLE PEDAL RETURN SPRING	2-202-10062
A 17	2	WSH, LCK, MED SPLT 0.25, ST SQC	W07-250X000-20
18	REF		
19	1	PLATE, BRACKET THROTTLE PEDAL	2-789-05177
A 20	2	RHMC #10-32 NF X 1 1/4 GRD 2 ZINC	SL5-190FA25-20
A 21	3	WSH, LCK, MED SPLT 10, ST SQC	W07-190X000-20
22			
A 23	3	NUT, HEX 0.25-20, ST SQC G5	N04-250C000-25
24	1	MTG PLATE, THROTTLE PEDAL	2-789-05176
A 25	1	SCR, HHCS 0.25-20X1.75,ST SQC G5	S01-250CA75-25
A 26	1	WSH, FNDR 0.25X1.50, ST SQC	WFD-250XA50-20

NOTE:

1. INSTALL THROTTLE PEDAL SUB-ASSEMBIES INTO PLATFORMS AND SECURELY TIGHTEN FASTENERS.
2. REMOVE #10 NUT, BELLOWS BOOT, AND 7/16 NUT, AND WASHER FROM END OF THROTTLE CABLE (3).
3. INSERT THREADED END OF THROTTLE CABLE (3) THROUGH HOLE IN ANGLE (1), APPROXIMATELY TO MIDPOINT OF BULKHEAD. REINSTALL #10 NUT, BELLOWS BOOT, 7/16 NUT AND WASHER ONTO END OF THROTTLE CABLE (3).
4. THREAD CLEVIS ASSEMBLY (2) ONTO THREADED END OF THROTTLE CABLE (3).
5. INSTALL CLEVIS ASSEMBLY (2) TO LINK ON THROTTLE SUB-ASSEMBLY (1).
6. ADJUST CLEVIS ASSEMBLY (2), THROTTLE CABLE (3), AND SUPPORT ANGLE (1) TO OBTAIN PROPER MOUNTING
7. SECURELY TIGHTEN 7/16 NUTS AT BULKHEAD. SECURELY TIGHTEN #10 NUT.
8. ROUTE THROTTLE CABLE (3) USING MAXIMUM POSSIBLE BEND RADIUS AND DO NOT ALLOW IT TO HANG LOOSE NEAR MOVING OR HOT PARTS. ROUTE THRU M/F TIE DOWNS & TIE WRAP TO HOSES AND/OR WIRES BETWEEN TRUCK FRAMES & CONNECT AS SHOWN. SEE NOTE #11 FOR ADJUSTMENTS.

△9 FOLLOW ELECTRICAL SCHEMATIC FOR PROPER INSTALLATION. ROUTE WIRING CAREFULLY UNDER CAB TO FRONT FIRE WALL. WIRING MUST NOT INTERFERE WITH THROTTLE PEDAL ACTUATION OR ANY MOVING PARTS AND MUST BE PROTECTED FROM HEAT AND SHARP EDGES.

△10 ENGINE ECM PROGRAM WILL NEED PTO AND REMOTE THROTTLE TURNED ON. CONSULT YOUR LOCAL CHASSIS SUPPLIER.

△11 INSTALL RETURN SPRING (17) AND MAKE SURE THAT CABLE DOES NOT BIND WHEN PEDAL IS RELEASED.

△12 TEST FOR PROPER OPERATION. WITH PTO ENGAGED, CAB THROTTLE PEDAL SHOULD BE DISABLED AND ENGINE SPEED SHOULD BE CONTROLLED FROM CRANE PLATFORMS ONLY. ECM SHOULD HAVE MAX RPM IN PTO MODE SET TO 1750

△13 ATTACH GROUND HARNESS (28) TO GROUND SCREW FASTENING ELECTRICAL BOX TO MAINFRAME

REV. LET.	L.E.N. DATE	CHANGE	E.C.N.
A	11/01/17	CHANGED: WFD-250XA50-20 WAS 222-00019 S01-250CA75-25 WAS 220-00035 N04-250C000-25 WAS 221-00001 W07-190X000-20 WAS 222-10006 SL5-190FA25-20 WAS 223-01120 W07-250X000-20 WAS 222-10005 NYL-190F000-22 WAS 221-90003 SL4-190F750-22 WAS 223-011004 S01-250CB00-25 WAS 220-00007 NTP-250C000-25 WAS 221-90001 WBR-25RX734-20 WAS 222-00006 SHF-250C750-25 WAS 220-00003	296A106094
--	10/05/04	PRODUCTION RELEASE	P154

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS IN INCHES
TOLERANCES UNLESS NOTED:
.X = ±.12
.XX = ±.06
.XXX = ±.020
DO NOT SCALE DRAWING
MATERIAL: LISTED
FINISH: N/A

NAME DATE
DRAWN MDS
CHECKED MDS

PROPRIETARY AND CONFIDENTIAL
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THIRD ANGLE PROJECTION

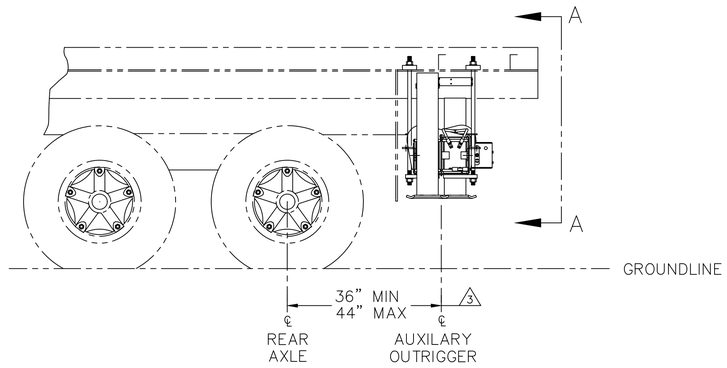
LOAD KING

TITLE: THROTTLE INSTALL

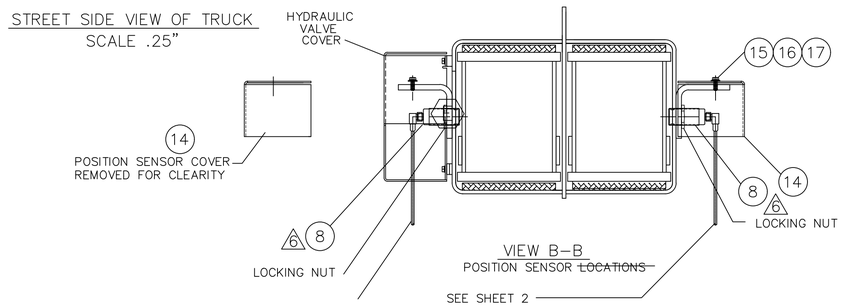
SIZE E | DWG. NO. 600-40439 | REV A

SCALE: N/A WEIGHT: SHEET 1 OF 1

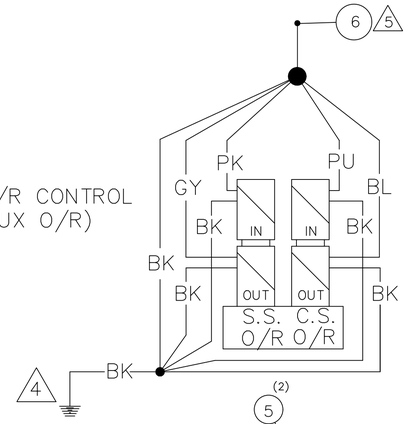
WIRE COLOR	FUNCTION
BLUE	C.S. AUX O/R–OUT
GREY	S.S. AUX O/R–OUT
PURPLE	C.S. AUX O/R–IN
PINK	S.S. AUX O/R–IN
BLACK	GROUND

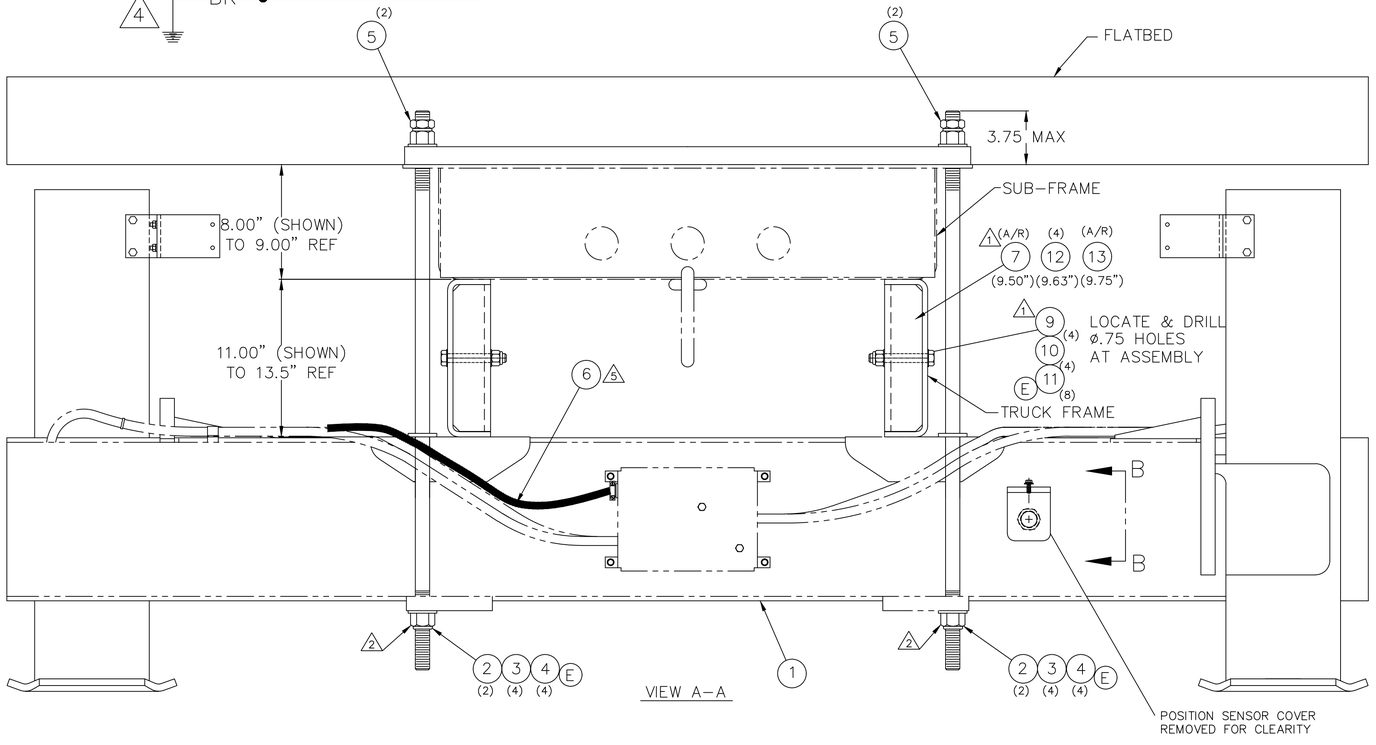


STREET SIDE VIEW OF TRUCK
SCALE .25"



HORIZONTAL O/R CONTROL SOL. VALVE (AUX O/R)





VIEW A–A

	Qty.	Item	Part No.	Description
	1	1	T120909	AUX O/R ASSEMBLY
	4	2	220–09123	STUD, 1.00–14 X 39.00 LG
	8	3	NYH–A00S000–22	NUT, NYL–INS HVY 1.00–14,ST SQC G2
E	8	4	WAH–A0NX000–20	WSH, FL HRD A–NRW 1.00, ST SQC
	4	5	N05–A00S000–Y8	NUT, HEX JAM 1.00–14,ST SQC G8
	1	6	400–25188	ELEC. HARNESS ASSY AUX O/R
D	A/R	7	709–01902–1	FRAME STIFFENER 9.50" (021–40046)
	2	8	T120217	POSITION SENSOR
	4	9	S01–625CD00–25	SCR, HHCS 0.625–11X4.00,ST SQC G5
	4	10	NYL–625C000–25	NUT,HEX NYL–INS 0.625–11,ST SQC G5
E	8	11	WAH–62NX000–20	WSH,FL HRD A–NRW 0.625 ST SQC
D	4	12	709–01902–2	FRAME STIFFENER 9.63" (021–40042)
	A/R	13	709–01902–3	FRAME STIFFENER 9.75" (021–40051)
	2	14	T120495	POSITION SENSOR COVER (GRAY)
	2	15	SHF–250C750–25	SCR,HHCS FT 0.25–20X0.75,ST SQC G5
	2	16	W07–250X000–20	WSH, LCK, MED SPLT 0.25, ST SQC
	2	17	WAW–25WX000–20	WSH, FL TYPA–WID 0.25, ST SQC
B	1	18	T121809	HARNESS AUX O/R SENSORS
B	1	19	T121221	HARNESS AUX C.S. O/R SENSOR
B	1	20	T121222	HARNESS AUX S.S. O/R SENSOR

A/R = AS REQUIRED
SEE 709–01902 (KANBAN FOR PARTS)

NOTES:

1. FRAME STIFFENERS TO BE CENTERED WITH TIE DOWN STUDS (IT #3) AND DRIVE–FIT INTO PLACE BETWEEN TOP AND BOTTOM FLANGES OF TRUCK FRAME. LOCATE & DRILL ø.75 HOLES IN THE TRUCK FRAME FOR ITEMS 9, 10 & 11. SEE 709–01902 FOR ALTERNATE FRAME STIFFENERS.
2. TORQUE FOUR LOWER LOCKNUTS TO 225–235 FT–LBS.
3. LOCATION OF OUTRIGGERS WILL BE LIMITED BY THE LOCATION OF CROSS MEMBERS IN THE FLATBED. CONSULT ENGINEERING FOR APPROVAL OF LOCATIONS OUTSIDE THIS RANGE.
4. INSTALL WIRE HARNESS (IT #6) THRU STRAIN RELIEF AT SOLENOID VALVE BOX ON OUTRIGGER HOUSING. CONNECT WIRES AS SHOWN IN SCHEMATIC. INSTALL GROUND WIRE UNDER MOUNTING BOLT WITH OTHER SOLENOID COIL GROUND WIRES.
5. ROUTE WIRE HARNESS (IT #6 & 18) ALONG FRAME TO CRANE MAINFRAME. SECURE IN PLACE AND PLUG INTO MATING CONNECTOR AT CONSOLE HARNESS.
6. POSITION SENSOR TO BE INSTALLED PER VIEW B–B. INSTALL SENSOR IN BRACKET UNTILL IT BOTTOMS OUT AND THEN BACK OFF TWO (2) FULL TURNS AND LOCK WITH NUT.

REV. LET.	L.E.N. DATE	CHANGE	ECN
E	02/05/18	UPDATED: SMART NUMBER DESCRIPTION CHANGED: WAH–A0NX000–20 WAS WAH–A0NX000–Y2. WAH–62NX000–20 WAS WAH–62NX000–Y2.	296A106449
D	1/11/16	709–01902–1 QTY WAS 4, 709–01902–2 QTY WAS A/R	296A105236
C	6/01/12	UPDATED PER HOSE BRACLET DETAILS	296A102305
B	9/14/11	ADDED SHEET TWO ADDED ITEM 18, T121809 QTY 1 ADDED ITEM 19, T121221 QTY 1 ADDED ITEM 20, T121222 QTY 1	296A101442
A	8–10–11	PRODUCTION RELEASE	296A101343

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS IN INCHES
TOLERANCES-UNLESS NOTED:
.x = ±.12
.xx = ±.06
.xxx = ±.020
DO NOT SCALE DRAWING
MATERIAL: LISTED
FINISH: N/A

	NAME	DATE
DRAWN	R FORD	8/10/11
CHECKED		

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THIRD ANGLE PROJECTION

LOAD KING

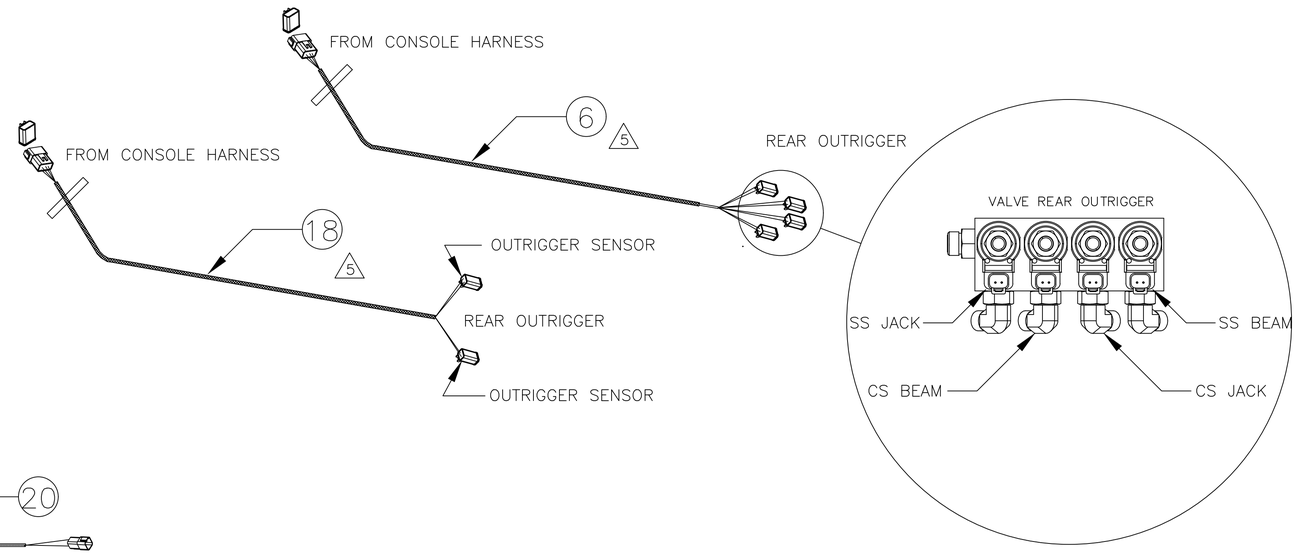
TITLE: (TEREX GRAY) AUX. OUTRIGGER INSTALL.

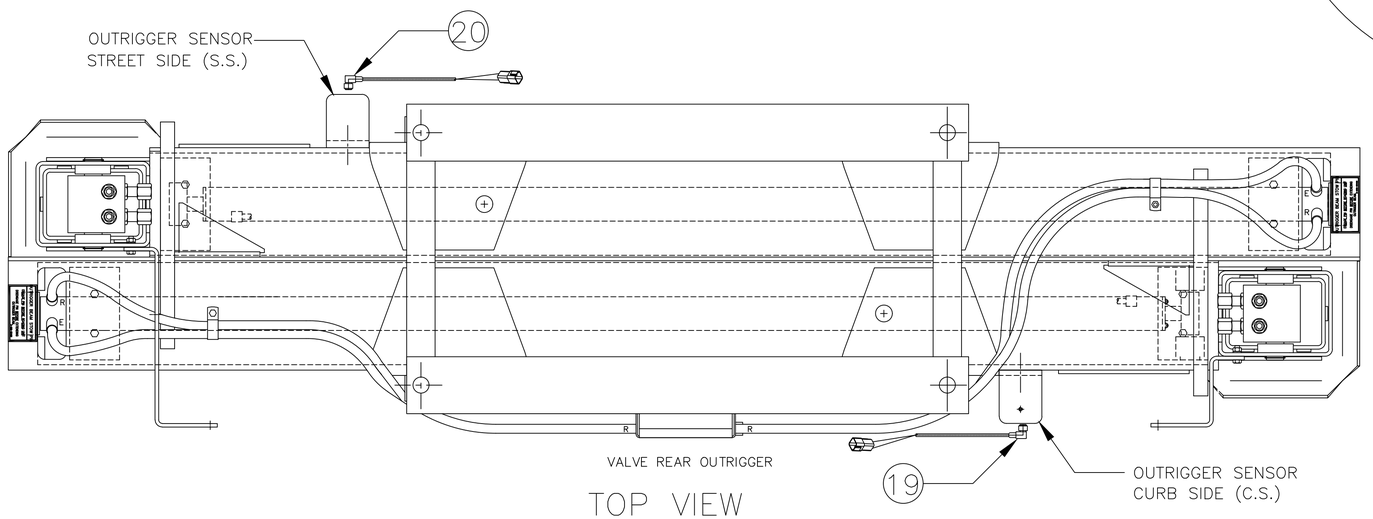
SIZE D | DWG. NO. T121324 | REV E

SCALE: 1:1 | WEIGHT: | SHEET 1 OF 2

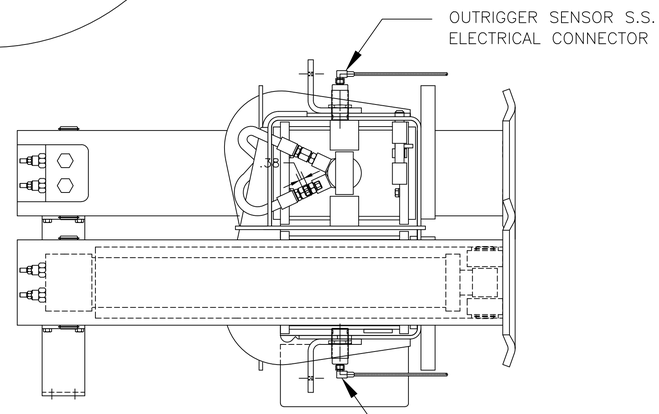
SIMILAR TO: T121325 (RED)
SIMILAR TO: 766–00036–P7

Qty.	Item	Part No.	Description





TOP VIEW
REAR OUTRIGGER



SEE PAGE 1

REV. LET.	L.E.N.	DATE	CHANGE	E.C.N.
A		8-10-11	PRODUCTION RELEASE	296A101343

ALL CHANGES MUST BE MADE ON CAD.

LOAD KING

SIZE	DWG. NO.	REV
D	T121324	E

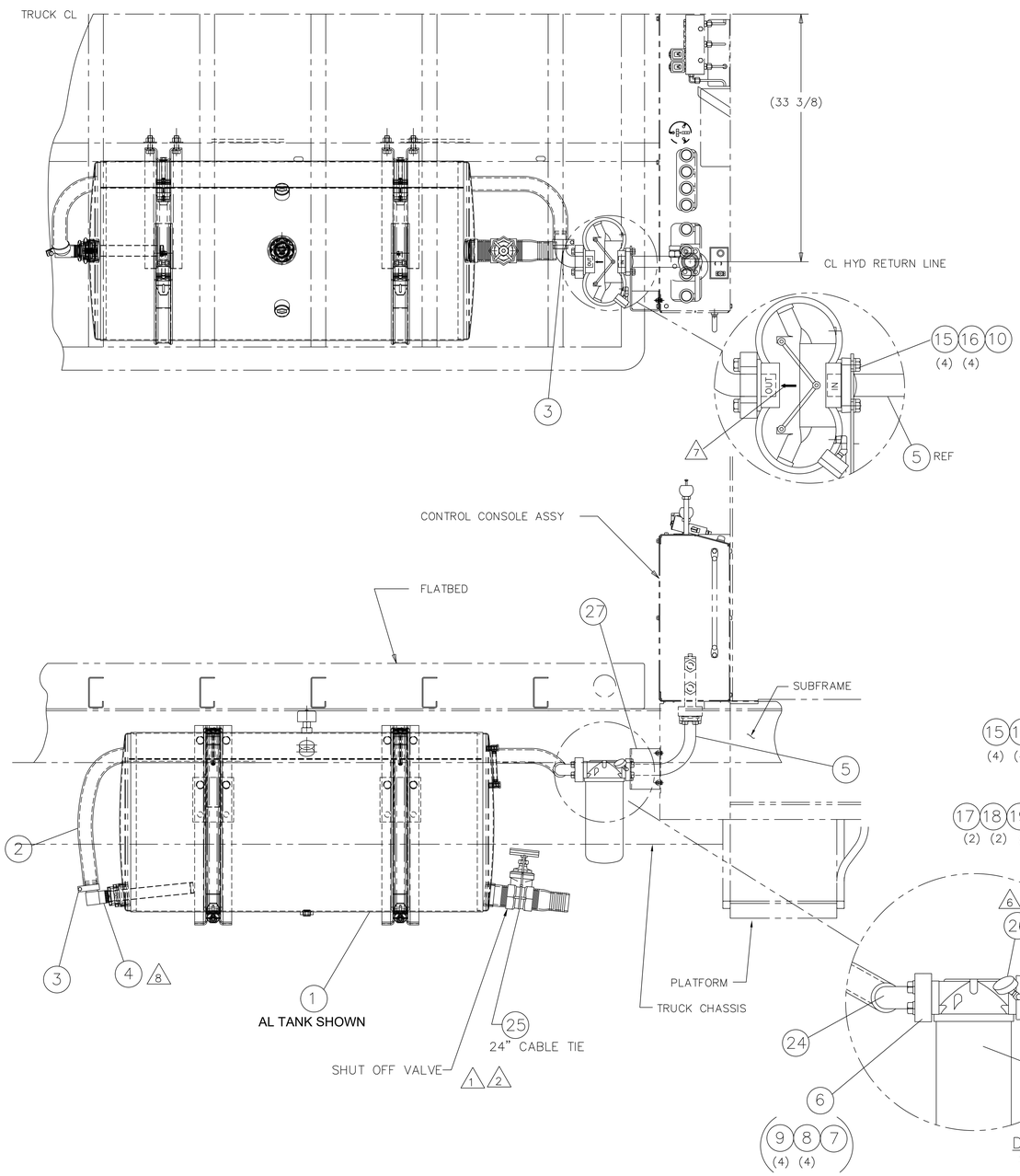
SCALE: 1:1 SHEET 2 OF 2

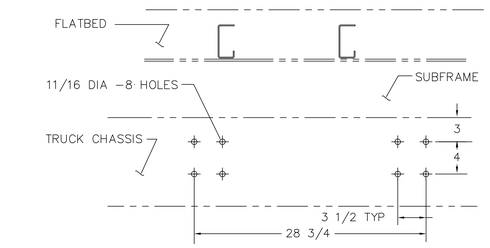
NOTES:

1. SHUTOFF VALVE IS TO BE FULLY OPEN TO AVOID DAMAGE TO PUMP. ADD A 24" CABLE TIE TO THE HANDLE TO INSURE THAT THE VALVE HAS NOT BEEN TURNED OFF.
2. IF SHUTOFF VALVE IS CLOSED FOR ANY REASON DURING ASSEMBLY; IT MUST BE TAGGED "CLOSED – OPEN BEFORE RUNNING PTO".
3. (NOTE 3 REMOVED)
4. DRAWING SHOWS INSTALLATION OF HYDRAULIC RESERVOIR ON CURBSIDE WHICH CORRESPONDS TO LOCATION OF RETURN MANIFOLD IN CONTROL CONSOLE. IF RETURN MANIFOLD IS LOCATED ON STREETSIDE THEN HYDRAULIC RESERVOIR IS TO BE MOUNTED ON STREETSIDE.
5. FILTER ELEMENT ITEM 35 TO BE PLACED IN CAB DURING INSTALLATION. FOUR ELEMENTS REQUIRED, 2 INSTALLED AND 2 SHIPPED AS SPARES.
6. BYPASS GAUGE TO BE MOUNTED ON INLET SIDE OF FILTER HOUSING. MAKE SURE UNUSED PORT IS PLUGGED. SEE DETAIL A.
7. FILTER TO BE INSTALLED WITH FLOW ARROW POINTING TOWARDS TANK.
8. APPLY PIPE THREAD SEALANT TO ALL PIPE THREADS. DO NOT OVERTIGHTEN.
9. ITEMS INCLUDED WITH FLANGE KIT ITEM 6.

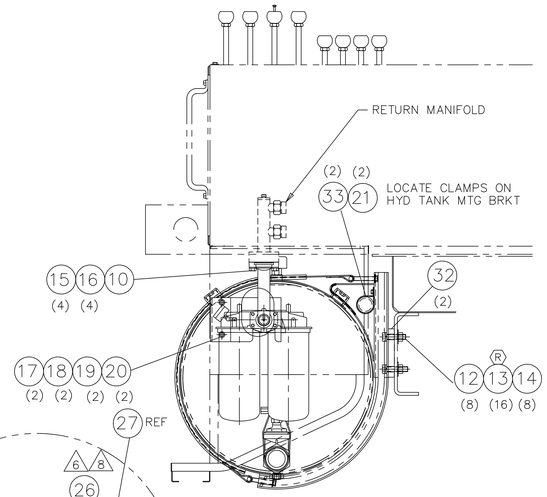
Qty.	Qty.	Item	Part No.	Description	Wt.
	1	1	875-90336	ASSY HYD RES RND STEEL	
	11 FT	2	503-03001	HOSE, 1 1/2 I.D. SAE 100R4	
(M)	2	3	201-00260	CLAMP, HOSE 1 1/2 T-BOLT	
	1	4	504-00706	COUPLING, HOSE 90°#4501-24-20	
	1	5	510-90279	TUBE ASSY-RETURN W/FLANGES	
	1	6	505-03003	SPLIT FLANGE HALF 1 1/2 W/HWARE	
9	(1)	7	260-30004	O-RING PARKER #224	
Q 9	(4)	8	W07-500X000-20	WSH, LCK, MED SPLT 0.50, ST SQC	
Q 9	(4)	9	S01-500CA50-25	SCR, HHCS 0.50-13X1.50,ST SQC G5	
	2	10	260-30004	O-RING PARKER #224	
		11			
Q	8	12	NYL-625C000-25	NUT,HEX NYL-INS 0.625-11,ST SQC G5	
R Q M	16	13	WAW-62WX000-20	WSH, FL TYPA-WID 0.625, ST SQC	
Q M	8	14	S01-625CB75-25	SCR, HHCS 0.625-11X2.75,ST SQC G5	
Q M	8	15	S01-500CA50-25	SCR, HHCS 0.50-13X1.50,ST SQC G5	
Q	8	16	W07-500X000-20	WSH, LCK, MED SPLT 0.50, ST SQC	
Q	2	17	SHF-312C750-25	SCR,HHCS FT 0.312-18X0.75,ST SQC G5	
Q	2	18	W07-312X000-20	WSH, LCK, MED SPLT 0.3125,ST SQC	
Q	2	19	WBR-31RX875-20	WSH, FL TYPB-REG 0.3125, ST SQC	
Q	2	20	N04-312C000-25	NUT, HEX 0.3125-18, ST SQC G5	
Q	2	21	SHS-312XA00-20	SCR, HEX, SLF DR, 5/16 X 1.00	
		22			
		23			
	1	24	504-03407	HOSE END 90° 1 1/2.1 1/2 3-776	
M	1	25	400-15187	CABLE TIE 24" HEAVY BLK NYLON	
	1	26	935-00113	FILTER BY-PASS GAUGE	
	1	27	770-02621	MTG BRACKET HYD FILTER	
	1	28	1219-4	ELBOW, 90° STREET	
	1	29	1219-59	ELBOW, 45° PARKER 2214P-2-2	
	1	30	1219-99	NIPPLE CLOSED PARKER 215PN-2	
	1	31	1219-134	COUPLING PARKER 207P-2-2	
	2	32	789-05507	PLATE, HYD TANK FRAME SPACER	
Q	2	33	1240-59	CLAMP, 2 INCH I.D	
	1	34	501-02012	RETURN LINE FILTER ASS'Y	
N	2	35	501-02018	FILTER ELEMENT	
	876-00060-1				
	90 GA TANK PRODUCTION				

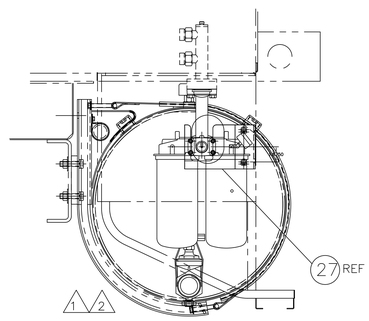
(M)





MOUNTING BOLT PATTERN
MAY BE ADJUSTED FOR FRAME CLEARANCE





OPPOSITE SIDE MOUNTING

REV. LET.	L.E.N. DATE	CHANGE	E.C.N.
R	11/06/17	CHANGED: WAW-62WX000-20 WAS WAR-625X000-22	296A106121
Q	1/15/2013	REV QTY ITEMS 18, 19, QTY 2 WAS QTY 5 ITEM 21, SHS-312XA00-20 WAS 223-15210 ITEM 33, 1240-59 WAS 201-00181 UPDATED HARDWARE TO NEW STANDARD	296A102890
P	9/14/2010	ADDED OPTIONAL TANK FOREWARD	296A100695
N	10/14/08	ITEM 35 WAS 501-02014	M058
M	1-09-06	REDRAWN, PROVIDING A NEW DRAWING FORMATE ADDED 876-00060-1, 90 GA TANK PRODUCTION ITEM 3, HOSE CLAMP, 201-00260 WAS 201-00146 ITEM 25, CABLE TIE, 400-15187 WAS 400-15088 REMOVED NOTE 3. ADDED 1219-99 & 1219-134 DROP, 220-04001(4), & 505-03001	N506
–	2/8/01	PRODUCTION RELEASE	XXX

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS IN INCHES
TOLERANCES-UNLESS NOTED:
.X = ±.12
.XX = ±.06
.XXX = ±.020
DO NOT SCALE DRAWING
MATERIAL: LISTED
FINISH: N/A

	NAME	DATE
DRAWN	DGL	
CHECKED	ENG	

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THIRD ANGLE PROJECTION

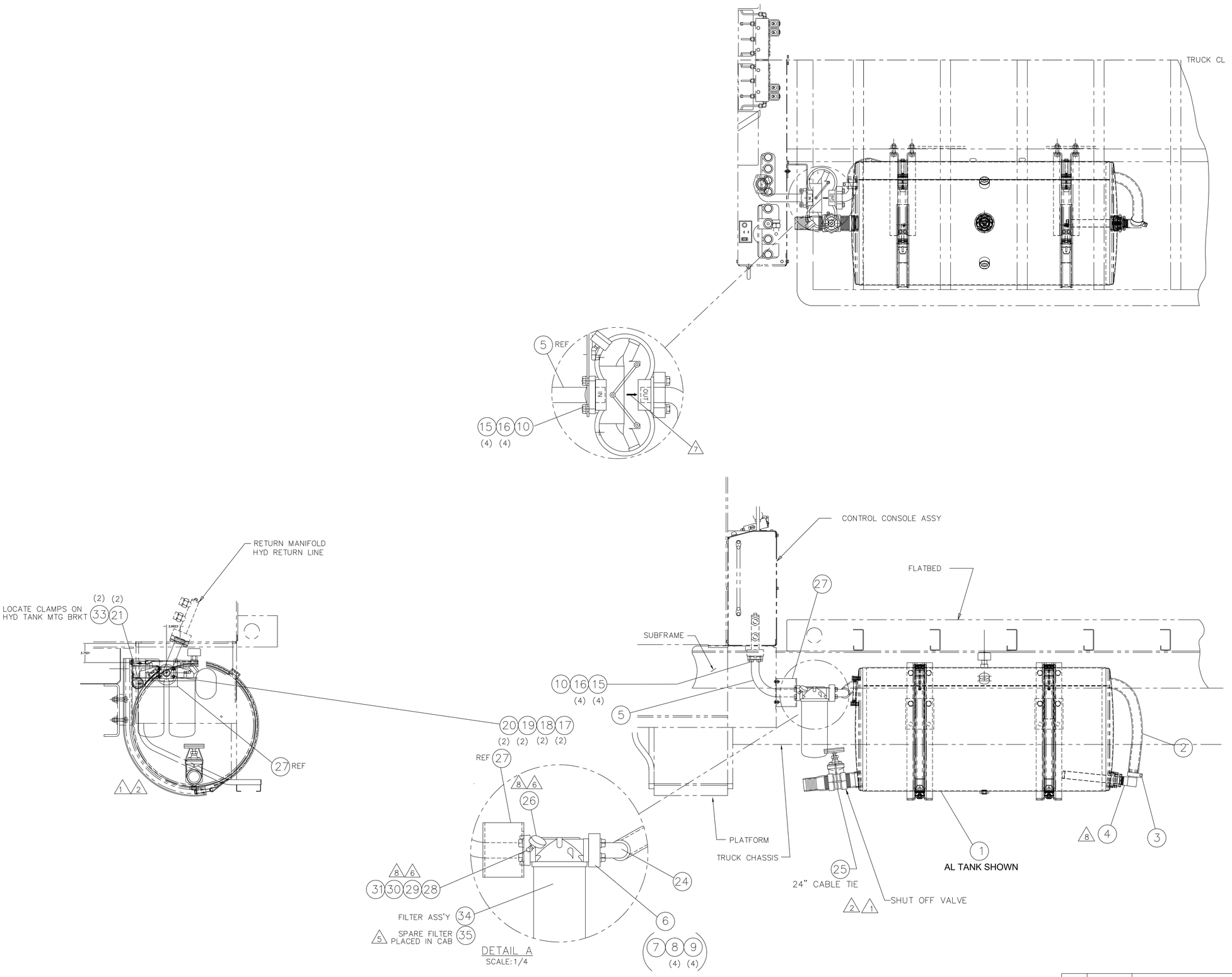
LOAD KING

TITLE: ROUND 90 GAL BT 90 GAL RND TANK INSTALL

SIZE E | DWG. NO. 876-00060 | REV R

SCALE: 1:8 | WEIGHT: | SHEET 1 OF 2

Qty.	Qty.	Item	Part No.	Description	Wt.



OPTIONAL FILTER AND TANK MOUNTING FOR SHORT WHEEL BASE TRUCKS ON STREET SIDE

REV. LET.	L.E.N. DATE	CHANGE	E.C.N.
R	11/06/17	SEE SHEET 1 FOR DETAILS	296A106121
Q	1/15/2013	SEE SHEET 1 FOR DETAILS	296A102890
P	9/14/2010	SEE SHEET 1 FOR DETAILS	296A100695
N	10/14/08	ITEM 35 WAS 501-02014	M058
M	1-09-06	REDRAWN, PROVIDING A NEW DRAWING FORMATE ADDED 876-00060-1, 90 GA TANK PRODUCTION ITEM 3, HOSE CLAMP, 201-00260 WAS 201-00146 ITEM 25, CABLE TIE, 400-15187 WAS 400-15088 REMOVED NOTE 3. ADDED 1219-99 & 1219-134 DROP, 220-04001(4), & 505-03001	N506
–	2/8/01	PRODUCTION RELEASE	XXX

ALL CHANGES MUST BE MADE ON CAD.

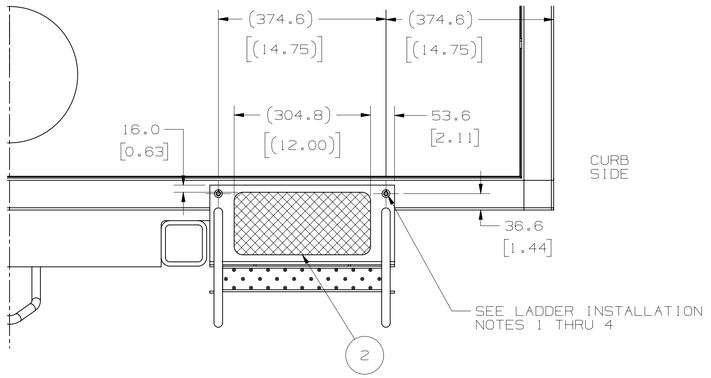
LOAD KING

SIZE	DWG. NO.	REV
E	876-00060	R

SCALE: 1:8 SHEET 2 OF 2

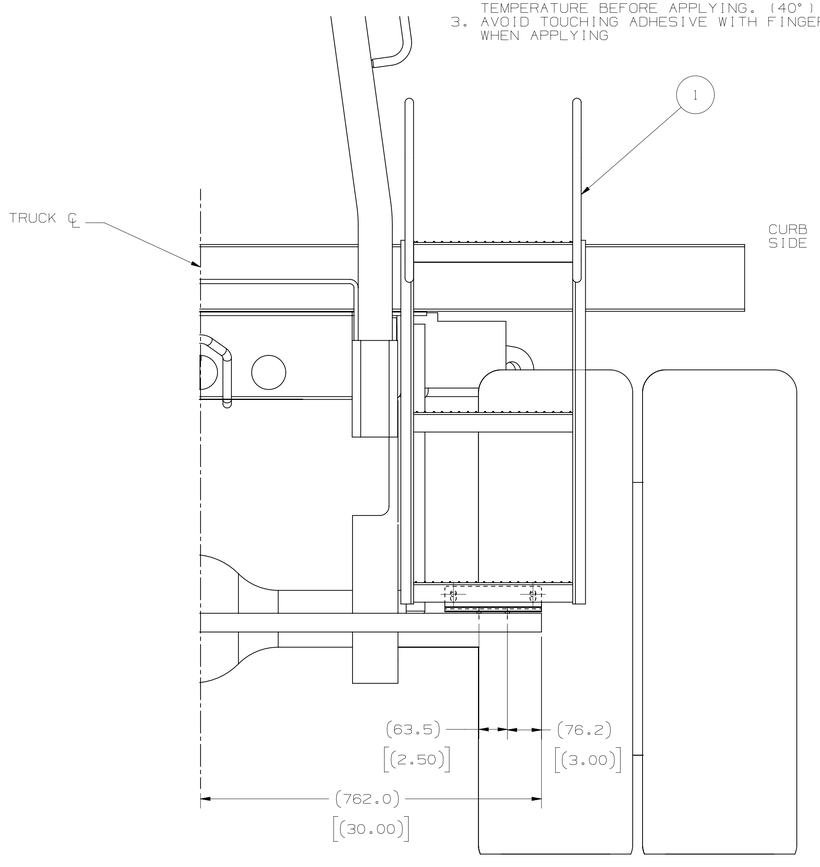
ITEM	PART NUMBER	DESCRIPTION	QTY	WEIGHT
1	024-00009	LADDER WELDMENT	1	-
2	209-00871	ANTI SLIP TAPE, LADDER	1	0.19
3	789-05812	LADDER SPT BRKT	1	3.30
4	N04-375C000-25	NUT, HEX 0.375-16, ST Z GR5	4	0.02
5	SHF-375CA00-25	SCR,HHCS FT 0.375-16X1.00,STZ G5	4	0.05
6	SHF-375CA50-25	SCR,HHCS FT 0.375-16X1.50,STZ G5	2	0.06
7	T11-375C000-CD	THREAD-SERT 0.375-16, ST CAD	2	
8	W07-375X000-20	WSH, LCK, MED SPLT 0.375, ST Z	6	0.01
9	WBR-37RXA00-20	WSH, FL TYPB-REG 0.375, ST Z	10	0.01

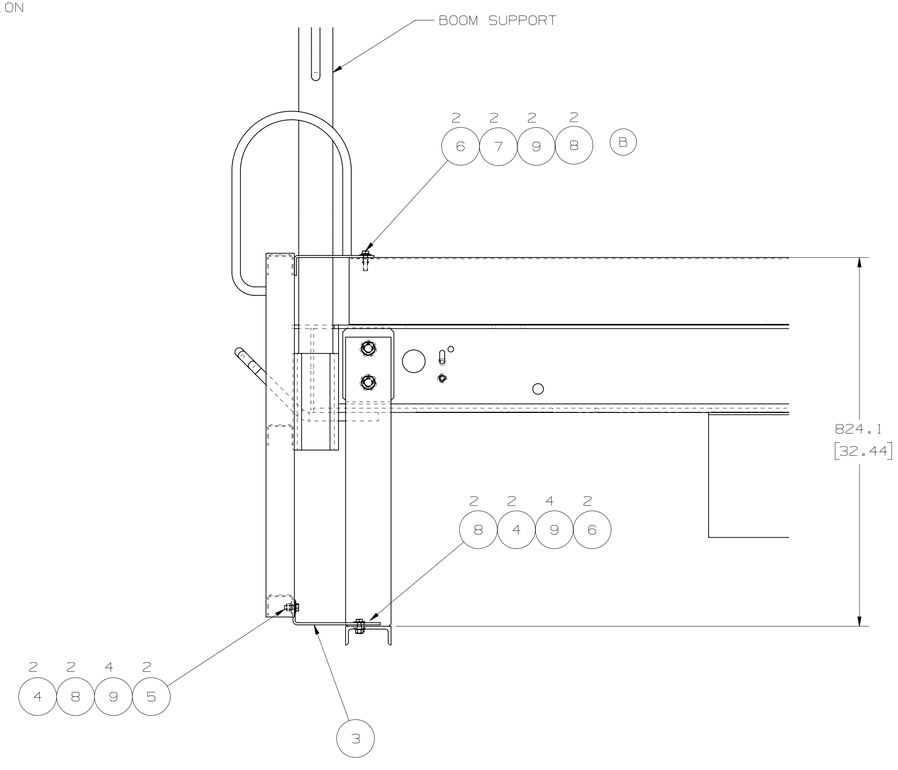
REV LTR	LEN DATE	CHANGE ALL CHANGES MUST BE MADE ON CAD	E.C.O.
A	08/26/10	REDRAWN IN NX, BOM REVISED, ASSEMBLY UPDATED	296A100611
B		DROP NYL-375C000-25, REMOVE 2X WBR-37RXA00-20, ADD 2X W07-375X000-20 AND 2X T11-375C000-CD, CHANGED DRILLED HOLE FROM .44 TO .531 Ø	296A101111



APPLICATION NOTES:

1. SURFACE MUST BE THOROUGHLY DRY BEFORE APPLYING ANTI-SLIP TAPE.
2. SURFACE MUST BE ABOVE MIMIMUM APPLICATION TEMPERATURE BEFORE APPLYING. (40°)
3. AVOID TOUCHING ADHESIVE WITH FINGERS WHEN APPLYING





LADDER INSTALLATION NOTES:

1. MOUNT BRACKET TO LADDER
2. LOCATE LADDER ON REAR LEDGE OF DECKING ALIGNING BRACKET WITH HOLES IN BUMPER
3. USING THE LADDER AS A TEMPLATE PUNCH MARK TWO HOLE LOCATIONS IN TOP OF DECK APROX AS SHOWN
4. (B) DRILL TWO 13.48 [.531] DIA HOLES AS MARKED,INSTALL ITEM 7.
5. INSTALL THE LADDER & INSTALL ITEMS 3, 4, 5, 6, 8 & 9 AS SHOWN.

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
ALL DIMENSIONS IN INCHES	DRAWN	JG	8/26/10
TOLERANCES-UNLESS NOTED: .x = ±1.5, .xx = ±0.6, .xxx = ±0.25	CHECKED	HAL	8/28/10
DO NOT SCALE DRAWING			
MATERIAL: N/A			
FINISH: N/A			

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THIRD ANGLE PROJECTION

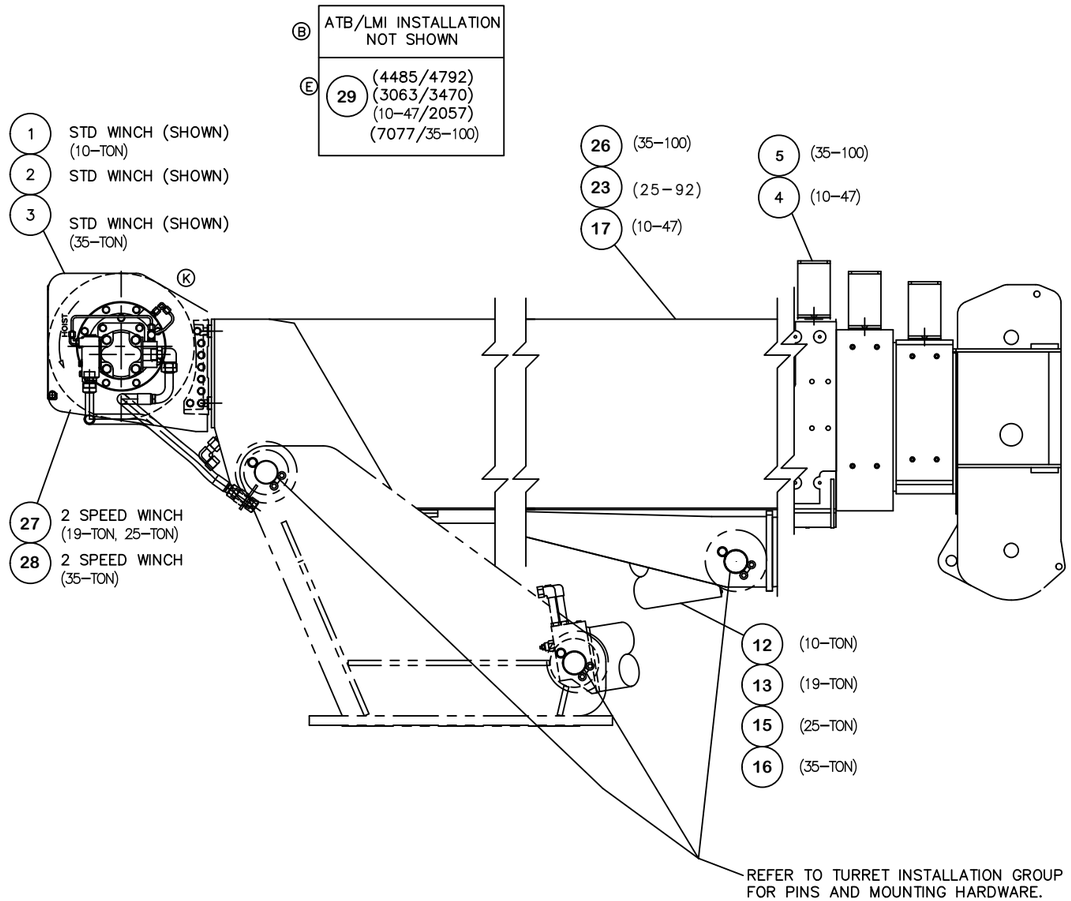
LOAD KING

TITLE: INSTALL, LADDER KIT, STEEL BED

SIZE	DWG. NO.	REV
D	024-00008	B

SCALE: NONE WEIGHT: SHEET 1 OF 1

NOTE:
Ⓒ 1. ITEMS 33 THROUGH 38, SEE DWG. 700–00979 FOR CONTROL CONSOLE CHART FOR ALL BT MODELS.



10–TON, 19–TON, 25–TON, 35–TON SERIES

QTY.	QTY.	QTY.	QTY.	QTY.	QTY.	QTY.	QTY.	QTY.	QTY.	QTY.	ITEM	PART NO.	DESCRIPTION	WT.
–	–	–	–	–	–	–	–	–	–	1	1	717–00052–1	WINCH INSTALLATION (10–TON)	
–	–	–	–	–	–	–	1	1	1	–	2	717–00052–2	WINCH INSTALLATION (19–TON, 25–TON)	
–	–	–	–	–	1	1	–	–	–	–	3	717–00052–3	WINCH INSTALLATION (35–TON)	
Ⓓ –	–	–	–	–	–	–	–	–	–	1	4	721–00234–1	CABLE GUIDE INSTALLATION (10–47/2057/2857)	
1	–	–	–	–	1	–	–	–	–	–	11	721–00238–3	CABLE GUIDE INSTALLATION (35–100)	
–	–	–	–	–	–	–	–	–	–	1	12	548–00054–1	TOPPING CYLINDER ASSY (10–TON)	
–	–	–	1	1	–	–	–	1	1	–	13	548–00054–2	TOPPING CYLINDER ASSY (19–TON)	
–	–	1	–	–	–	–	1	–	–	–	15	548–00054–3	TOPPING CYLINDER ASSY (25–TON)	
1	1	–	–	–	1	1	–	–	–	–	16	548–00054–5	TOPPING CYLINDER ASSY (35–TON)	
–	–	–	–	–	–	–	–	–	–	1	17	721–00236	BOOM ASSEMBLY (47 FT) (3 STAGE)	
Ⓗ –	–	1	–	–	–	–	1	–	–	–	23	721–00242–1	BOOM ASSY (92 FT)2 SHEAVE (4 STAGE)	
ⒽⒷ –	–	–	–	–	–	–	–	–	–	–	24	721–00242–2	BOOM ASSY (92 FT)3 SHEAVE (4 STAGE)	
Ⓛ 1	–	–	–	–	1	–	–	–	–	–	26	721–00244	BOOM ASSEMBLY (100 FT) (4 STAGE)	
–	–	1	1	1	–	–	–	–	–	–	27	717–00053–1	2 SPEED WINCH INSTALL	
ⓀⒺ 1	1	–	–	–	–	–	–	–	–	–	28	717–00053–3	2 SPEED WINCH INSTALLATION (35–TON)	
ⓃⒿ –	–	–	1	1	–	–	–	1	1	1	29	508–00090–1	ATB/LMI INSTALLATION (10–TON,19–TON)	
ⓃⒿ –	–	1	–	–	–	–	1	–	–	–	30	508–00090–5	ATB/LMI INSTALLATION	
ⒼⒷ 1	1	–	–	–	1	1	–	–	–	–	32	508–00087–1	ATB/LMI INSTALLATION (7077,	
Ⓒ –	–	–	–	–	–	–	–	1	1	1	33	800–50054–1	CONTROL CONSOLE STD WINCH (2K/3K)	⚠
Ⓒ –	–	–	–	–	–	–	1	–	–	–	34	800–50054–2	CONTROL CONSOLE STD WINCH (25–TON)	⚠
Ⓒ –	–	–	–	–	1	1	–	–	–	–	35	800–50054–3	CONTROL CONSOLE STD WINCH (35–TON)	⚠
Ⓒ –	–	–	1	1	–	–	–	–	–	–	36	800–50054–4	CONTROL CONSOLE 2SP WINCH (19–TON)	⚠
Ⓒ –	–	1	–	–	–	–	–	–	–	–	37	800–50054–5	CONTROL CONSOLE 2SP WINCH (25–TON)	⚠
Ⓒ 1	1	–	–	–	–	–	–	–	–	–	38	800–50054–6	CONTROL CONSOLE 2SP WINCH (35–TON)	⚠
720–01007–14	720–01007–13	720–01007–12	720–01007–10	720–01007–9	720–01007–8	720–01007–7	720–01007–6	720–01007–4	720–01007–3	720–01007–1				
MODEL 35–100 2 SPEED WINCH	MODEL BT 7077 2 SPEED WINCH	MODEL 25–92 2 SPEED WINCH			MODEL 35–100 STD WINCH	MODEL BT 7077 STD WINCH	MODEL STD WINCH			MODEL 10–47				
35–TON SERIES		25–TON SERIES	19–TON SERIES		35–TON SERIES		25–TON SERIES	19–TON SERIES		10–TON SERIES				

REV. LET.	L.E.N. DATE	CHANGE (ALL CHANGES MUST BE MADE ON CAD.)	E.C.N.
K	2/22/06	COVER GEOMETRY REMOVED ITEM 28 WAS 717–00053–2	N624
J	11/2/05	ITEM 30, ADDED 508–00083–5	N620
H	9/01/05	ITEM 23, 721–00242–1&–2 WAS 721–00214 ADDED SERIES 5000, BT 5292,STD&2 SP WINCH ITEM 31, ADDED 584–00054–7	N704
G	6/21/05	ITEM 32, 508–00087–1 WAS 508–00085–1	N813
F	06/15/05	CREATION OF TM3851	N837
E	1/25/05	ITEM 26, STANDARDIZED ATB–LMI INSTALL TO 508–00083–1 FOR 2000/3000/4000 ITEM 27, DROPPED 508–00083–3, MOVED QTY TO –1 ITEM 28, DROPPED 508–00083–4, MOVED QTY TO –1 ITEM 29, DROPPED 508–00083–5, MOVED QTY TO –1	P220
D	1/17/05	ITEM 4, ADDED QTY 1, FOR 720–01007–2 DROPPED ITEM 5, 721–00234–1, QTY 1	P221
C	1/10/05	ADDED ITEMS 33 THRU 38 ADDED NOTE 1 & UPDATED DWG.	P08
B	11/9/04	INTERNAL LMI CHANGES	P158
A	10/18/04	Added Items 26 – 31	P125
–	5/18/04	PRODUCTION RELEASE	P566

REV. LET.	L.E.N. DATE	CHANGE (ALL CHANGES MUST BE MADE ON CAD.)	E.C.N.
Q	6–15–12	SEE SHEET 2	296A102320
P	5–09–12	SEE SHEET 2	296A102000
N	11/14/08	ITEM 29, 508–00090–1 WAS 508–00083–1 ITEM 30, 508–00090–5 WAS 508–00083–5	L917
M	4/2/08	DRAWING SHEET 2 OF 2 ADDED TO DESCRIBE RED PLATED	M410
L	6/14/06	ITEM 26, 721–00244 WAS 721–00239 ITEM 25, 721–00246 WAS 729–00240	N280

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS IN INCHES
TOLERANCES-UNLESS NOTED:
.x = ±.12
.xx = ±.06
.xxx = ±.020
DO NOT SCALE DRAWING
MATERIAL
FINISH N/A

	NAME	DATE
DRAWN	REF	
CHECKED	DS	

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THIRD ANGLE PROJECTION

LOAD KING

TITLE:
BM/WINCH/TOP CYL/GUIDE INSTALLATION

SIZE	DWG. NO.	REV
B	720–01007	Q

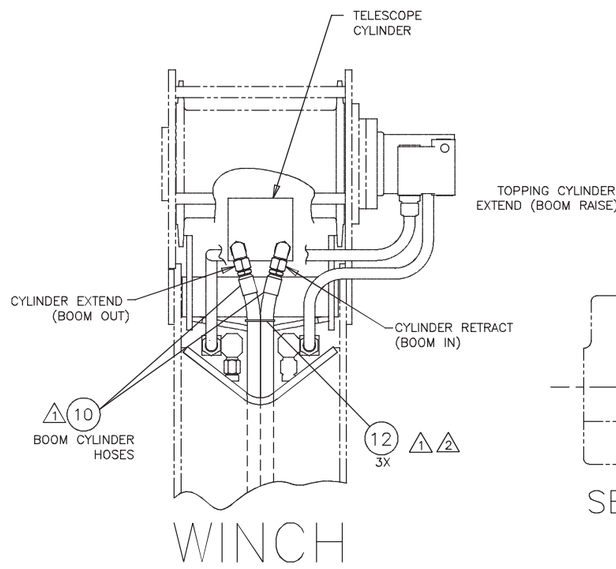
SCALE: NONE | WEIGHT: | SHEET 1 OF 1

ITEM	PART NO.	DESCRIPTION	WT.	QTY.	SEE NOTE
1	503-92031-1	HOSE KIT, M/F ASSY 2000/3000		1	1,B
2	514-62002	ELBOW 90 S.N. #4 OFS		1	C
3	513-50027	STR CONN. #8 OFS x #10 ORB		2	
4	502-11225	HOSE ASSY, GREER BASE/PRIORITY VALVE DRAIN		(1)	1
5	502-10916	HOSE ASSY, GREER BOX-ROD		(1)	1
6	502-30534	HOSE ASSY, MAIN OUTRIGGER EXT/RET		(4)	1
7	502-30557	HOSE ASSY, SWING MOTOR CW/CCW		(2)	1
8	502-35068	HOSE ASSY, TOPPING CYLINDER UP/DOWN		(2)	1
9	502-40928	HOSE ASSY, WINCH MOTOR RAISE/LOWER		(2)	1
10	502-35069	HOSE ASSY, BOOM CYLINDER EXT/RET		(2)	1
11	502-21002	HOSE ASSY, CAS DRAIN WINCH MOTOR		1	
12	400-15088	NYLON CABLE TIE		6	

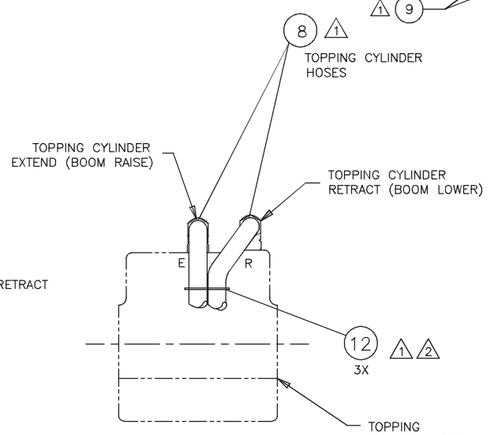
NOTES:

1. PART OF 503-92031-1 HOSE KIT (ITEM 1), SERIES 10-TON,19-TON MAINFRAME ASSY
2. ROTATE FITTINGS FOR ORIENTATION SHOWN AND TIE HOSES TOGETHER USING NYLON CABLE TIES 400-15088.
3. USE ONLY WITH CONTROL VALVE #550-00383 OR EQUAL WITH TOPPING CYLINDER/TELE BLEED SPOOLS.

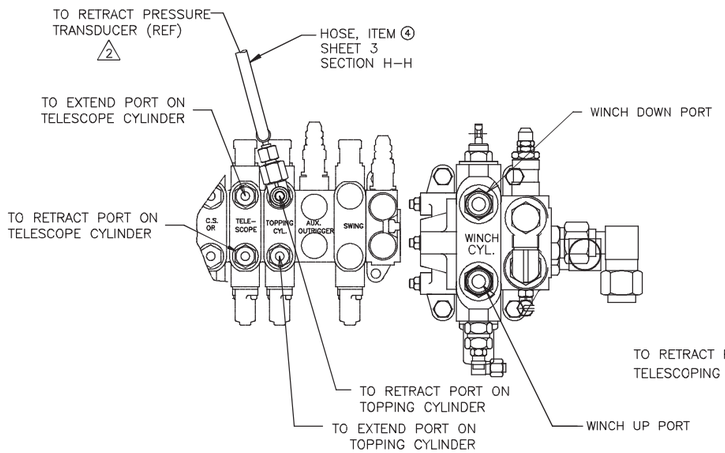
REV. LET.	L.E.N. DATE	CHANGE	ECO
–	03/16/04	PRODUCTION RELEASE	P566
A	09/07/05	ITEM 16 WAS 559-00146	N618
B	01/25/06	ITEM 1 WAS 503-92024-1 ITEM 2 WAS 503-92024-2 ITEM 3 WAS 502-11309 ITEM 13 WAS 513-20023 ITEM 23 WAS INCORRECTLY 513-50027	N624
C	01/25/07	FIX PICS & CALLOUTS PAGE 4 514-54004 WAS 513-40014, 519-40007 QTY WAS 1 514-62002 QTY WAS 2, ADD 516-84003 (1)	N15
D	09/23/08	UPDATED GEOMETRY FOR WAD SWING GEARBOX	M416
E		DELETED	
F	01/26/15	UPDATED: SECTION G-G AND NOTE IN SECTION G-G ON SHT 3.	296A104599



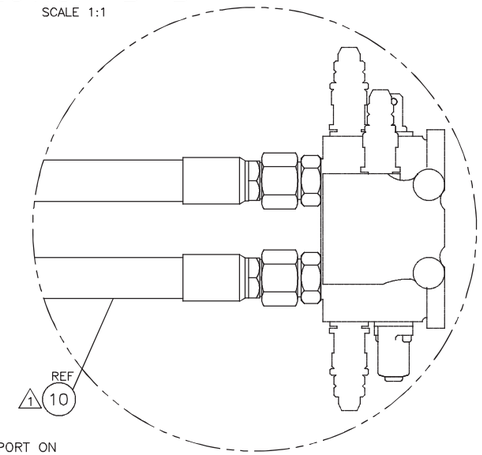
WINCH



SECTION B-B
SCALE 1:1

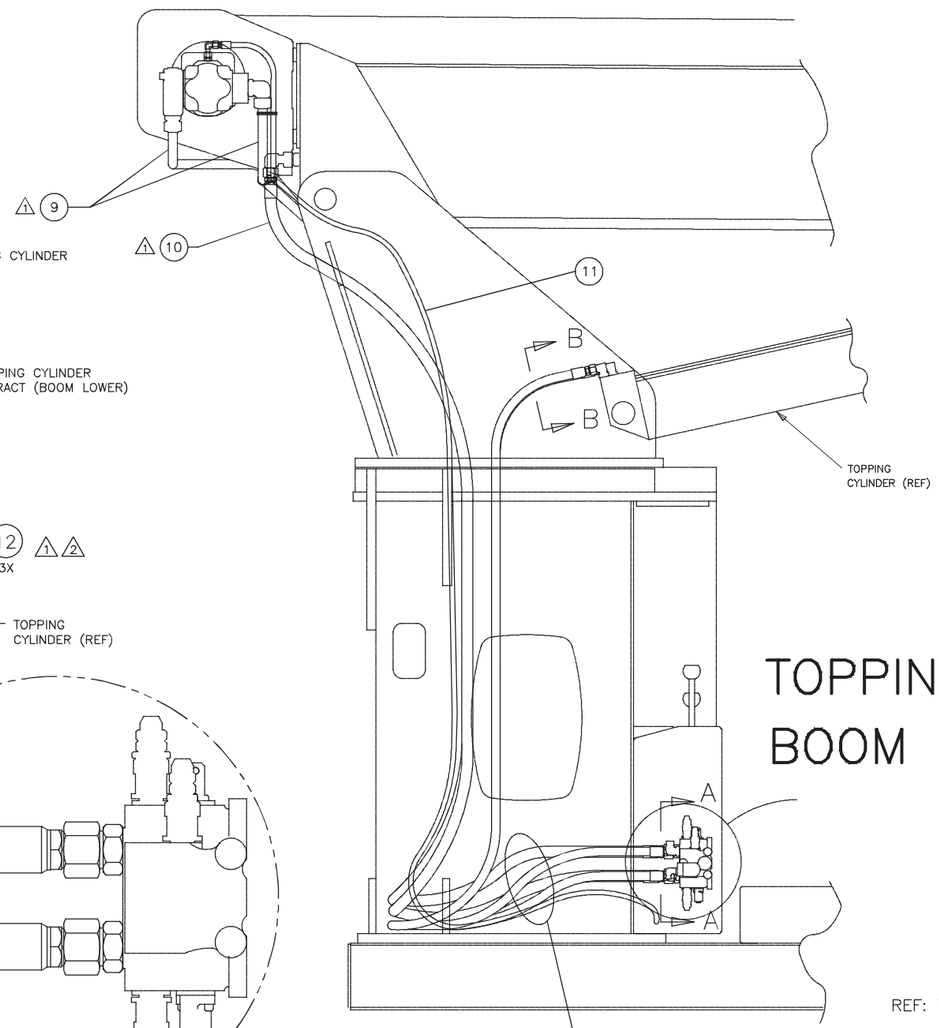


SECTION A-A
SCALE 1:1



DETAIL C
SCALE 2:1

NOTE:
BOOM HOIST EXTEND & WINCH HOSES AND FITTINGS ARE NOT SHOWN IN THIS VIEW.



TOPPING CYL.
BOOM CYL.

REF: 700-00979

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
ALL DIMENSIONS IN INCHES	DRAWN	R.FORD	3/16/04
TOLERANCES-UNLESS NOTED:	CHECKED	DS	3/16/04
.x = ±1.5			
.xx = ±0.6			
.xxx = ±0.25			
DO NOT SCALE DRAWING			
MATERIAL: LISTED			
FINISH: N/A			

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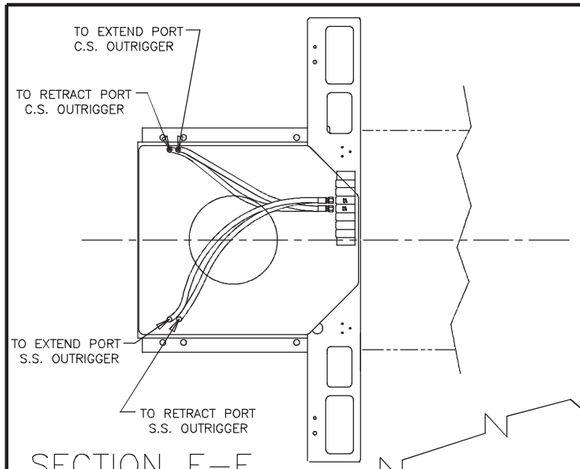
THIRD ANGLE PROJECTION

LOAD KING

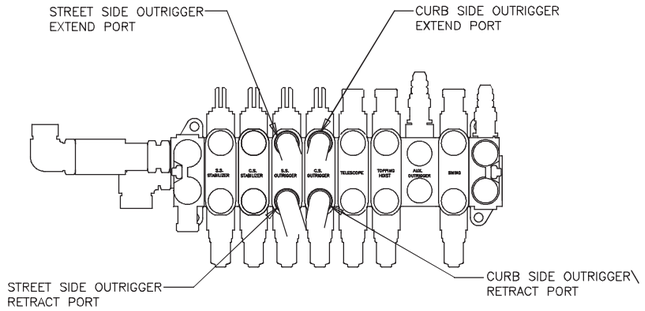
TITLE:
HYD PIPING, MAINFRAME
NON-CONTINUOUS ROTATION

SIZE	DWG. NO.	REV
B	500-01793-1	F

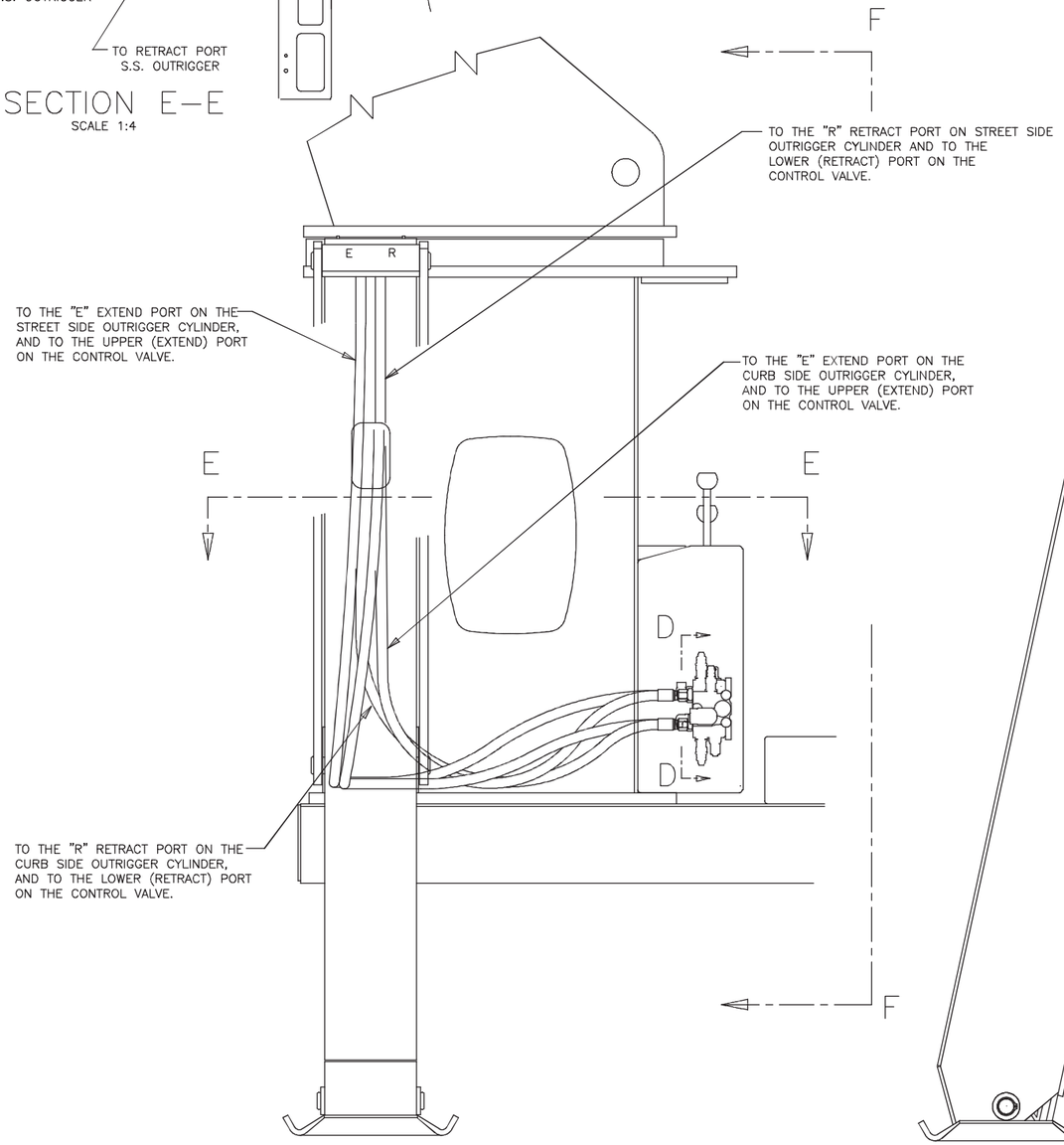
SCALE: 1:2 | WEIGHT: | SHEET 1 OF 4

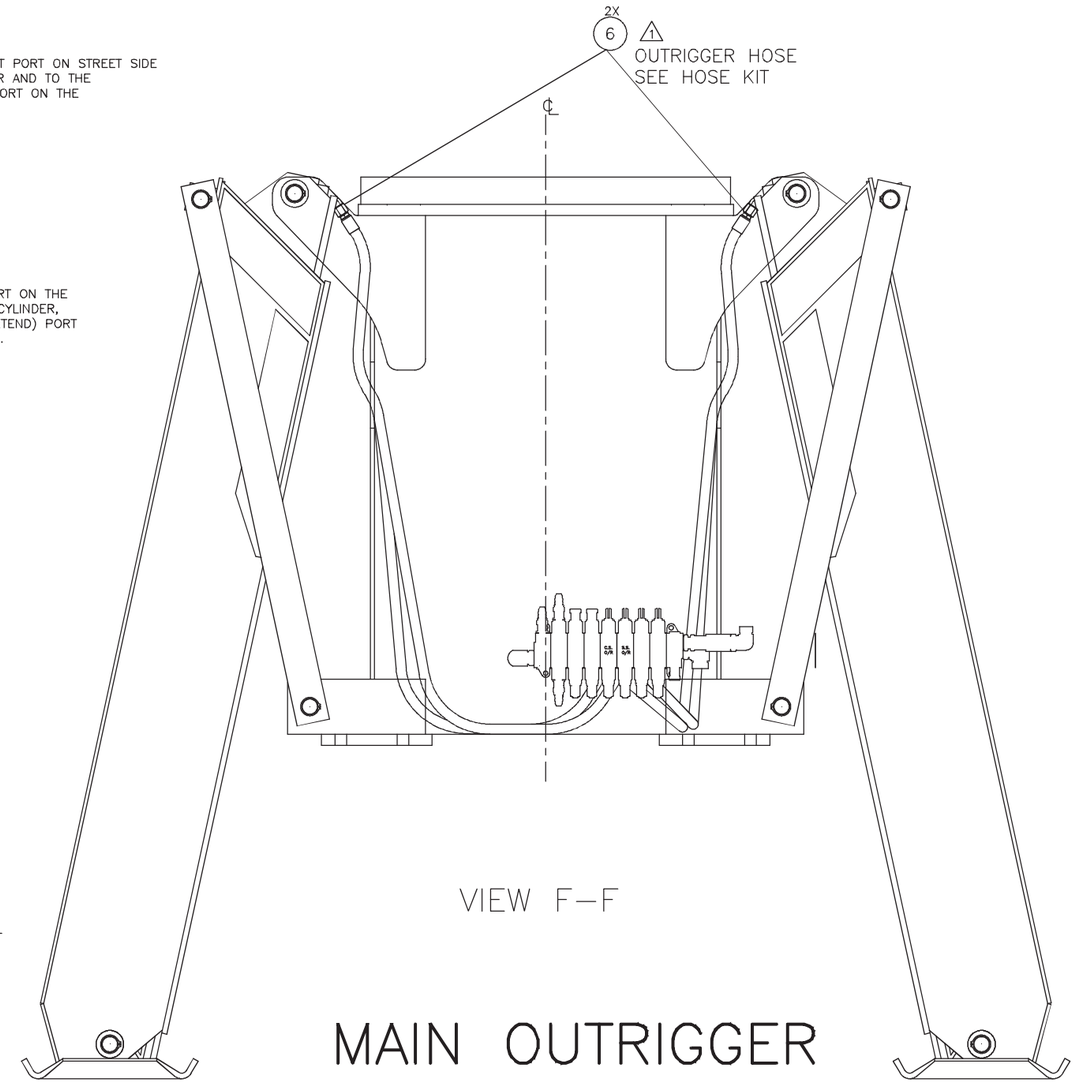


SECTION E–E
SCALE 1:4



SECTION D–D
SCALE 1:1

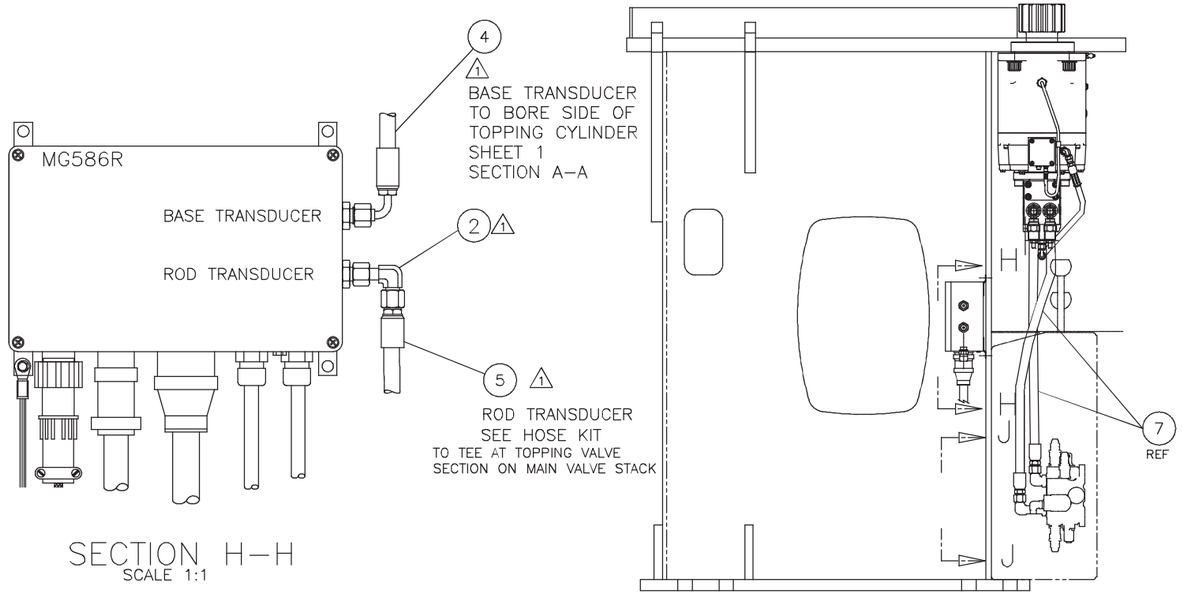




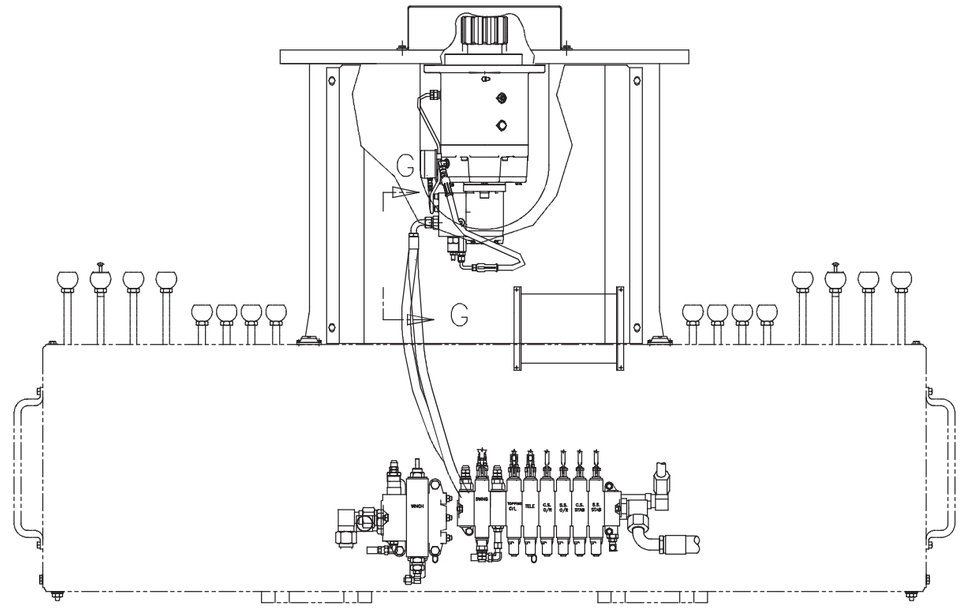
VIEW F–F

MAIN OUTRIGGER

LOAD KING		
SIZE B	DWG. NO. 500–01793–1	REV F
SCALE: 1:2	SHEET 2 OF 4	

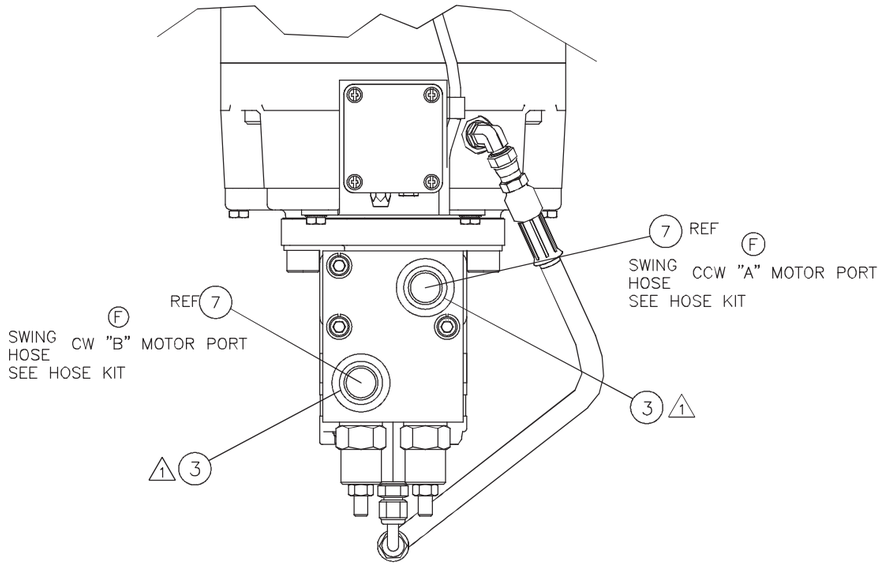


SECTION H–H
SCALE 1:1

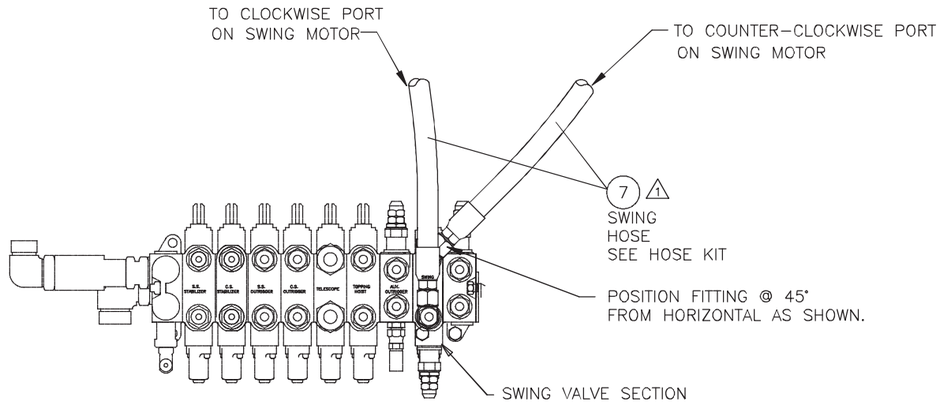


GREER BOX

SWING

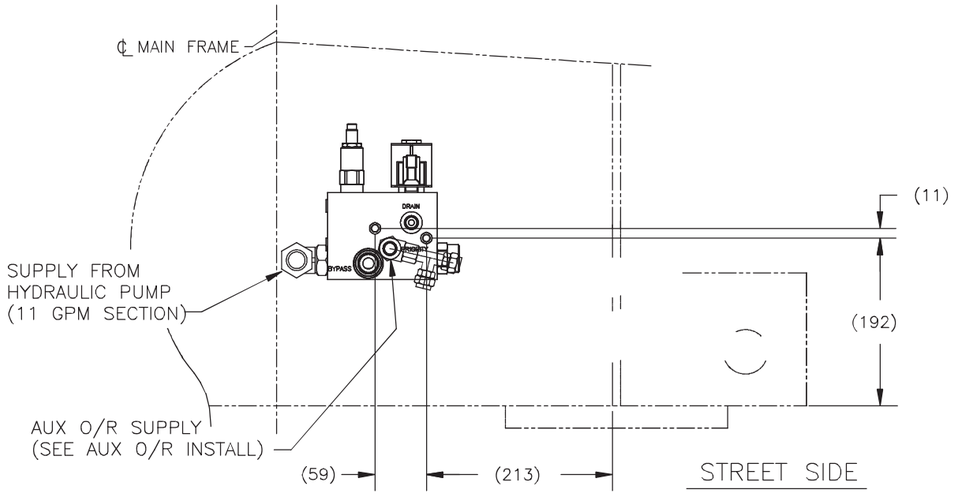


SECTION G–G
SCALE 1:1
Ⓕ

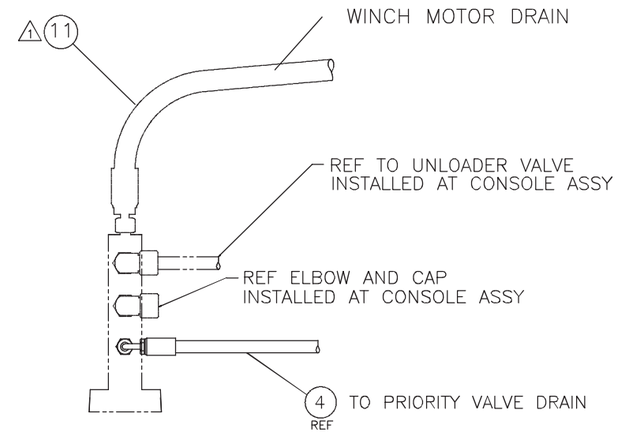


SECTION J–J
SCALE 1:1

LOAD KING		
SIZE **B**	DWG. NO. 500–01793–1	REV **F**
SCALE: 1:2		SHEET 3 OF 4



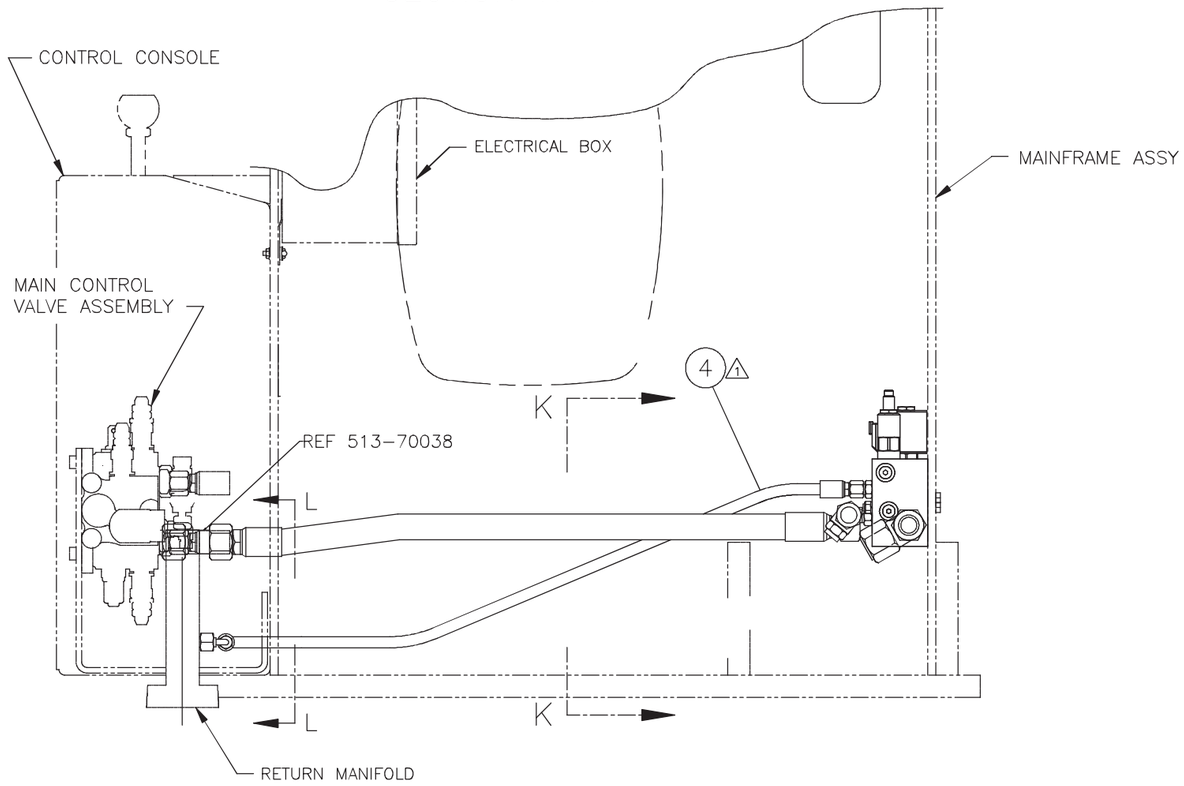
SECTION K–K



SECTION L–L

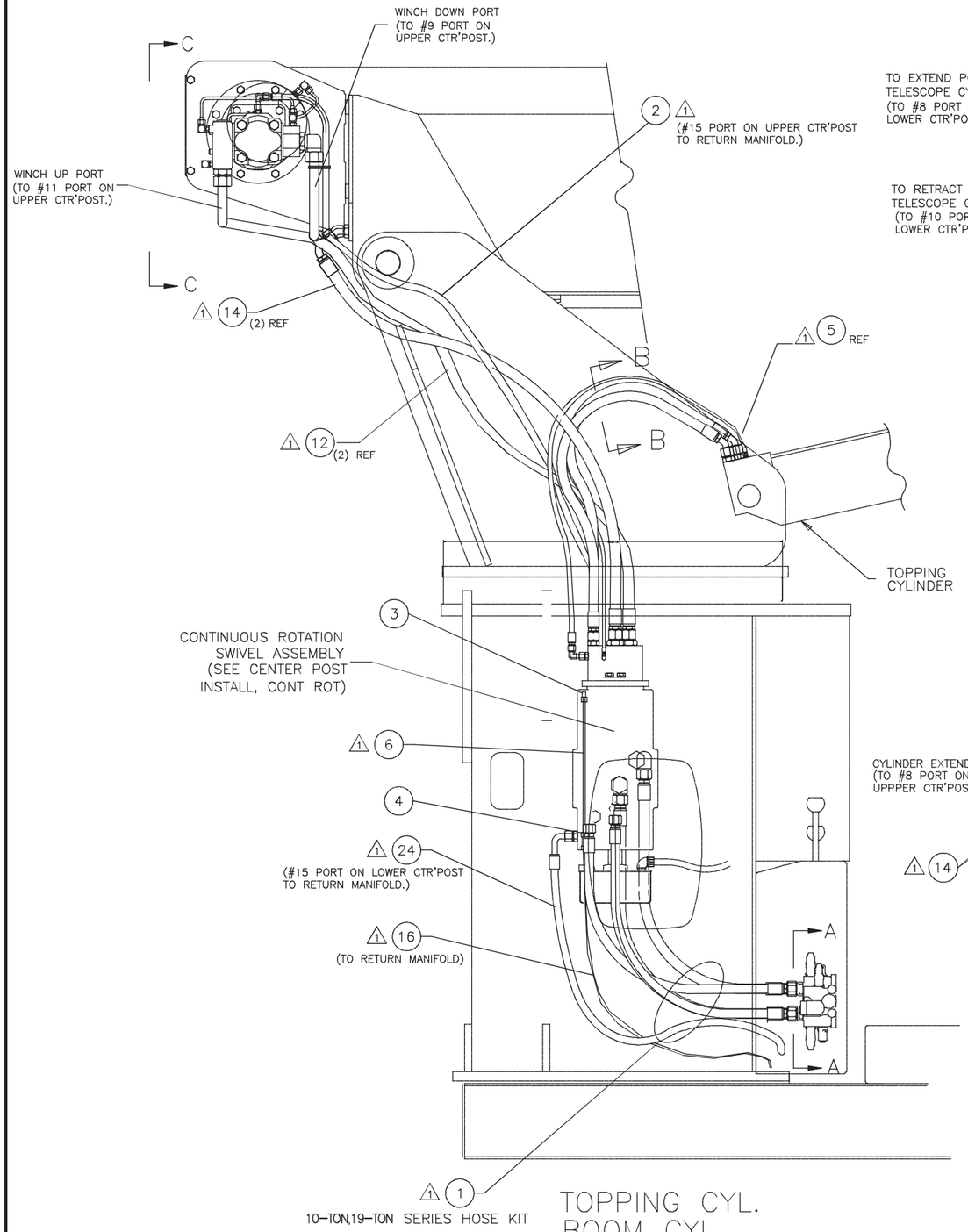
RETURN MANIFOLD FOR 500–01793–1 ONLY

SCALE 1:1

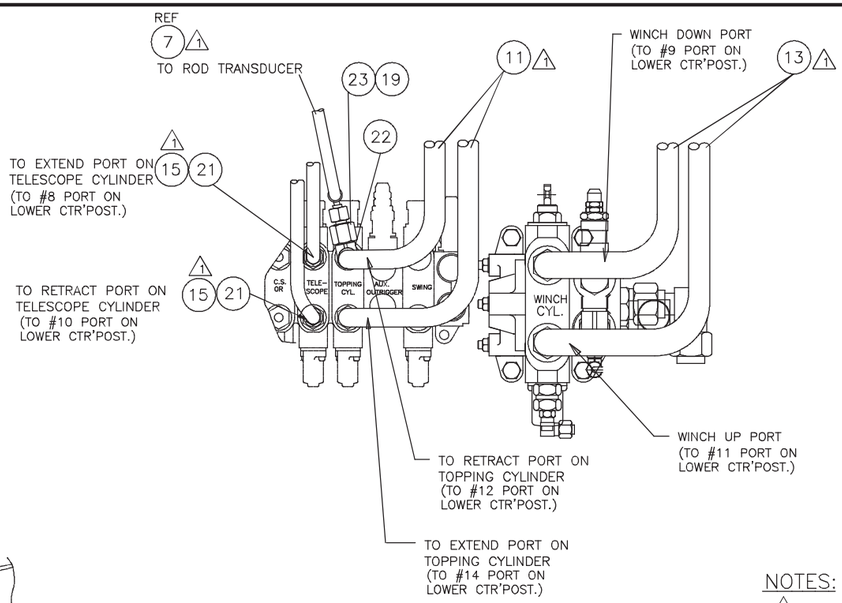


AUX O/R CONTROL VALVE INSTALLATION

LOAD KING		
SIZE B	DWG. NO. 500–01793–1	REV F
SCALE: 1:2		SHEET 4 OF 4



TOPPING CYL.
BOOM CYL.

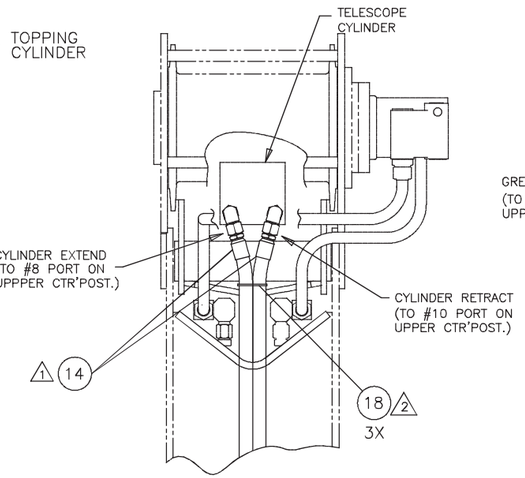


SECTION A–A
SCALE 1:1

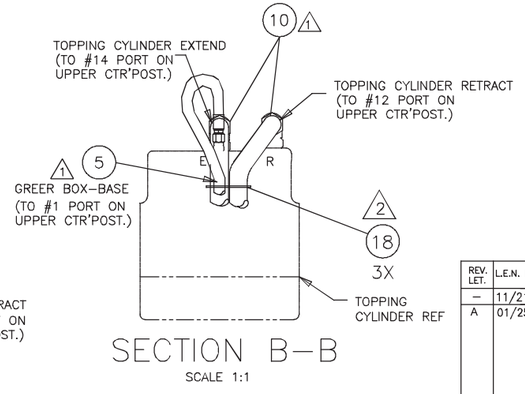
ITEM	PART NO.	DESCRIPTION	WT.	QTY.	SEE NOTE
1	503-92030-1	HOSE KIT, M/F ASSY 10-TON,19-TON		1	1,A
2	502-21012	HOSE, CASE DRAIN WINCH MOTOR (UPPER)		1	
3	514-52003	ELBOW, 90° #4 OFS X #4 ORB		1	
4	516-82005	TEE, BRANCH #4 OFS X #4 ORB		1	
5	502-11159	HOSE, GREER BOX-BASE (UPPER)		(1)	1
6	502-10974	HOSE, GREER BOX-BASE(LWR), C'POST DRN		(2)	1
7	502-10916	HOSE, GREER BOX-VALVE		(1)	1
8	502-30534	HOSE, MAIN OUTRIGGER EXT/RET		(4)	1
9	502-30557	HOSE, SWING MOTOR CW/CCW		(2)	1
10	502-35026	HOSE, TOPPING CYLINDER UP/DOWN (UPPER)		(2)	1
11	502-30628	HOSE, TOPPING CYLINDER UP/DOWN (LOWER)		(2)	1
12	502-40789	HOSE, WINCH MOTOR RAISE/LOWER (UPPER)		(2)	1
13	502-40787	HOSE, WINCH MOTOR RAISE/LOWER (LOWER)		(2)	1
14	502-35073	HOSE, TELESCOP CYLINDER EXT/RET (UPPER)		(2)	1
15	502-35074	HOSE, TELESCOP CYLINDER EXT/RET (LOWER)		(2)	1
16	502-11262	HOSE ASSY 1/4" I.D. (CTR'POST DRAIN)		(1)	1
17	513-50027	STR CONN. #10 ORB/#8 OFS		2	
18	400-15088	NYLON CABLE TIE		6	2
19	511-50004	TUBE NUT, #8 OFS		1	
20	514-62002	ELBOW 90 S.N. #4 OFS		1	A
21	513-50023	STR CONN. #8 ORB/#8 OFS		2	
22	516-85004	TEE, S.N. #8 OFS		1	
23	519-50012	REDUCER, #8 X #4 OFS		1	
24	502-21011	HOSE, CASE DRAIN WINCH MOTOR (LOWER)		1	

NOTES:

1. PART OF 503-92030-1 HOSE KIT (ITEM 1), SERIES 10-TON,19-TON MAINFRAME ASSY
2. ROTATE FITTINGS FOR ORIENTATION SHOWN AND TIE HOSES TOGETHER USING NYLON CABLE TIES 400-15088.



WINCH
SECTION C–C



SECTION B–B
SCALE 1:1

REV. LET.	L.E.N. DATE	CHANGE	ECO
–	11/21/05	PRODUCTION RELEASE	P566
A	01/25/06	"BORE" WAS "ROD" CHANGE FOR 3/8 WINCH DRAIN HOSES. SWIVEL PORT USAGE CHANGED AS FOLLOWS: WINCH DRAIN WAS PORT #1 CHANGED TO #15. GREER BOX WAS PORT #3 CHANGED TO #1. ITEM 1 WAS 503-92023-1, ITEM 2 WAS 503-92023-2, ITEM 3 WAS 502-11098, ITEM 4 WAS 502-11097, ITEM 19 WAS 513-20023, ITEM 20 WAS QTY 2.	N624
B	02/22/07	FIX PICS & CALLOUTS PAGE 4 514-54004 WAS 513-40014, 519-40007 QTY WAS 1 ADD: 516-84003 (1)	N15
D	09/23/08	UPDATED GEOMETRY FOR WAD SWING GEAR BOX	M416
E		DELETED	
F	01/26/15	UPDATED: VIEW G-G & NOTE IN VIEW G-G, SHT 3	296A104601

REF: 700-00979

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
ALL DIMENSIONS IN INCHES	DRAWN	R.FORD	4/08/04
TOLERANCES-UNLESS NOTED:	CHECKED	DS	4/08/04
.x = ±1.5			
.xx = ±0.6			
.xxx = ±0.25			
DO NOT SCALE DRAWING			
MATERIAL: LISTED			
FINISH: N/A			

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THIRD ANGLE PROJECTION

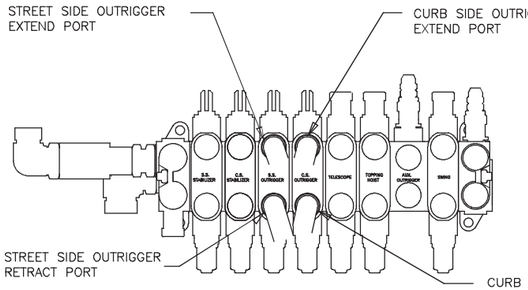
LOAD KING

TITLE:

HYD PIPING, MAINFRAME CONTINUOUS ROTATION

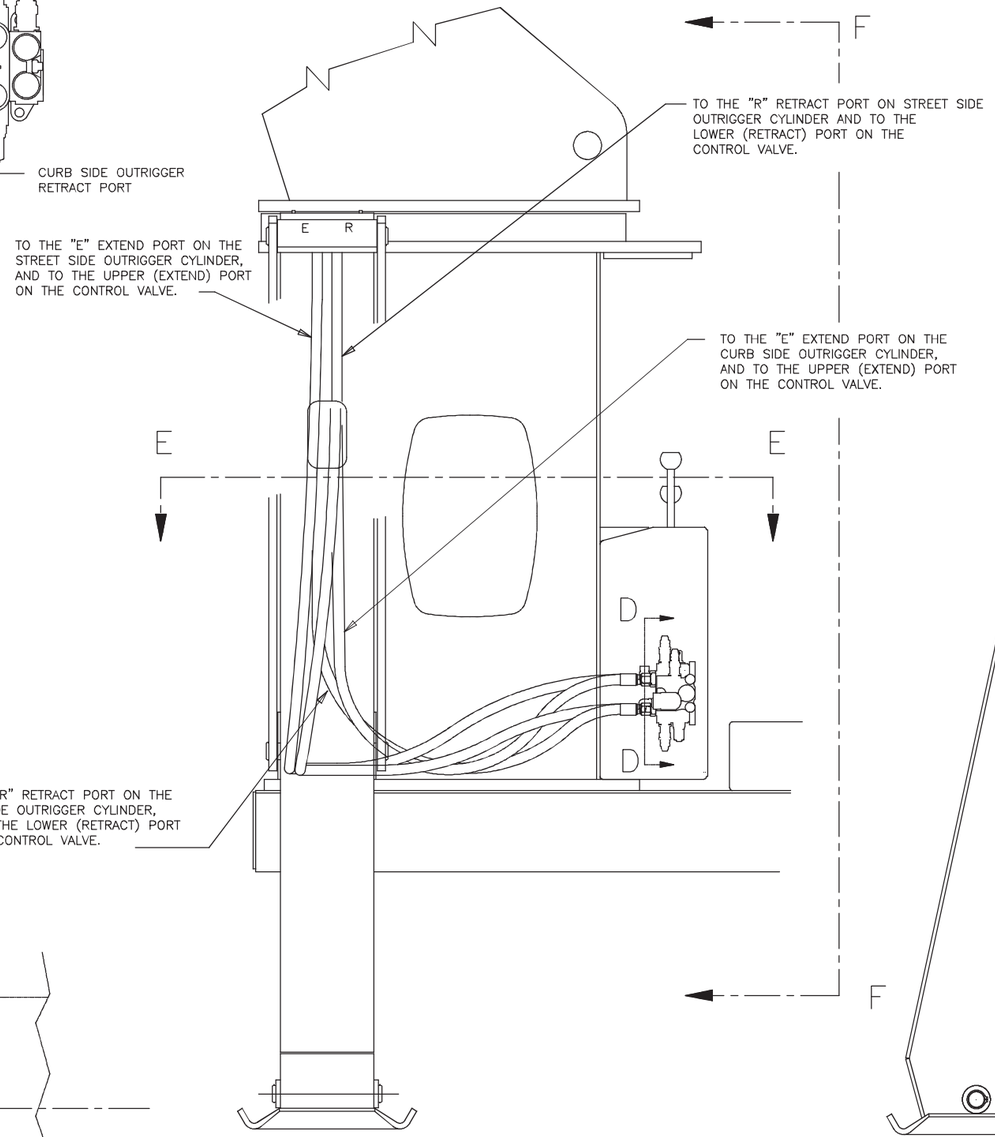
SIZE	DWG. NO.	REV
B	500-01794-1	F

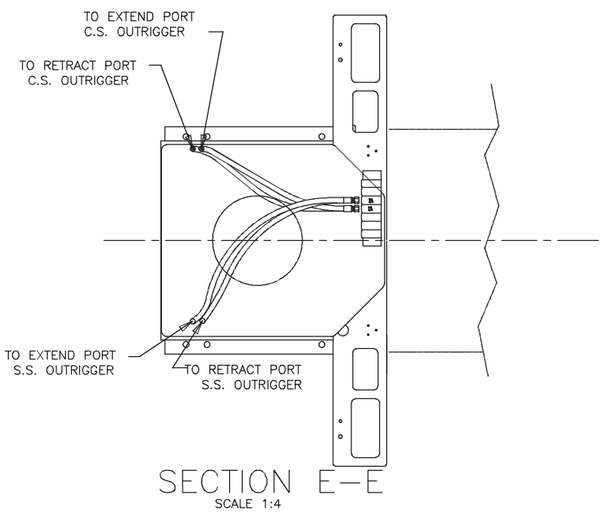
SCALE: 1:2 | WEIGHT: | SHEET 1 OF 4



SECTION D–D

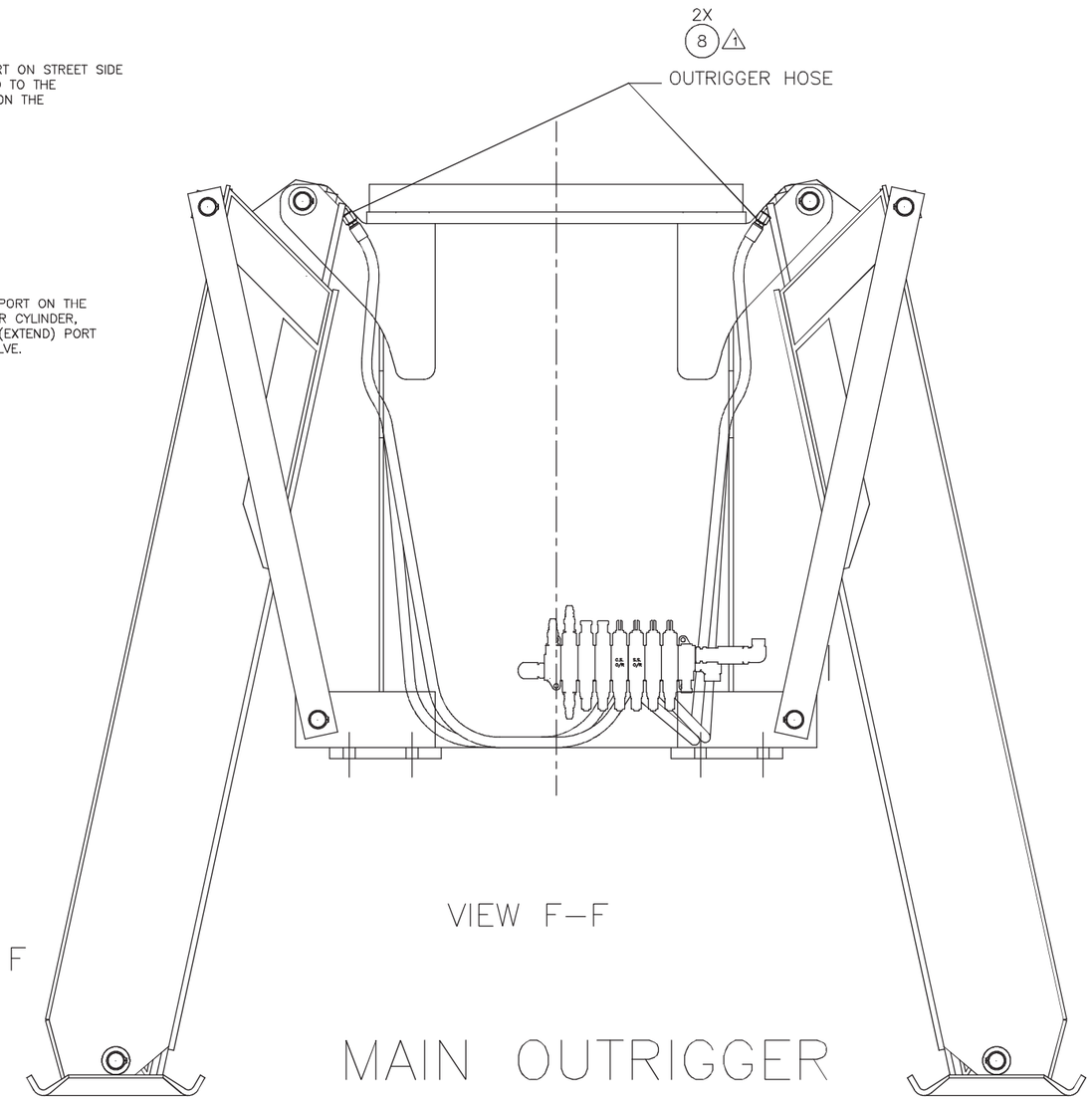
SCALE 1:1





SECTION E–E

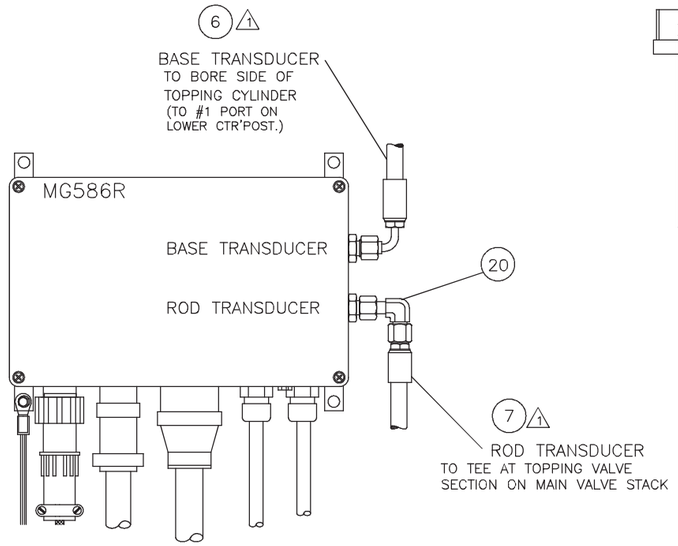
SCALE 1:4



VIEW F–F

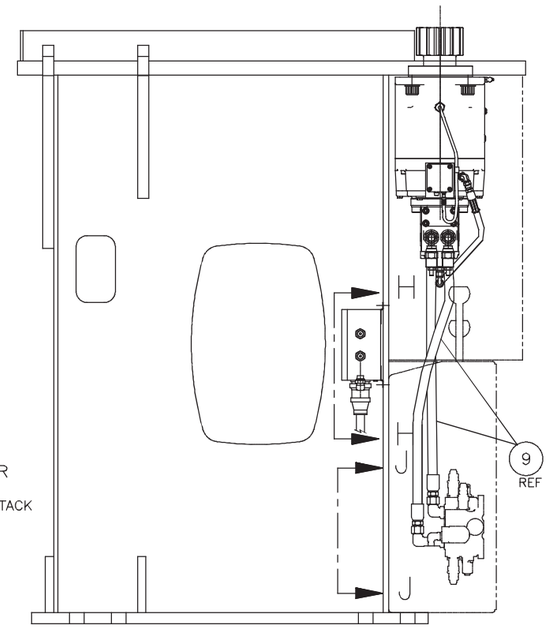
MAIN OUTRIGGER

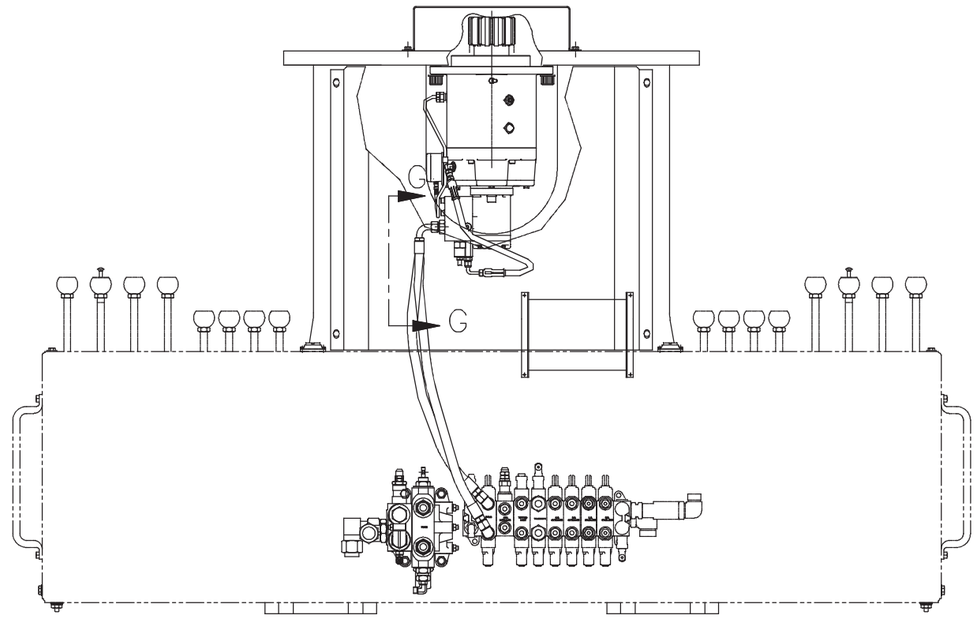
LOAD KING		
SIZE	DWG. NO.	REV
B	500–01794–1	F
SCALE: 1:2		SHEET 2 OF 4



VIEW H–H

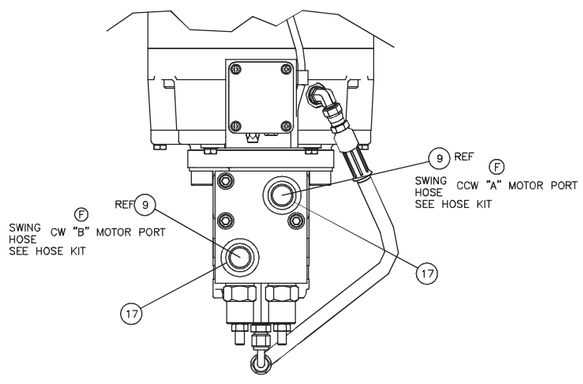
SCALE 1:1





SWING

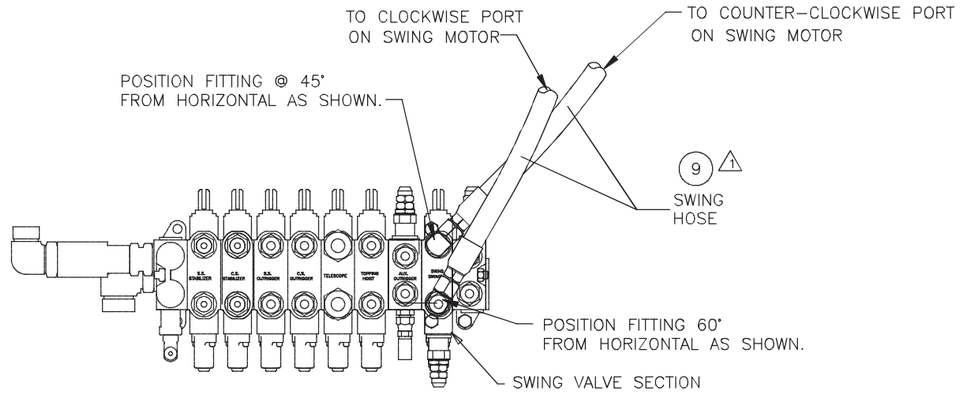
GREER BOX



VIEW G–G

SCALE 1:1

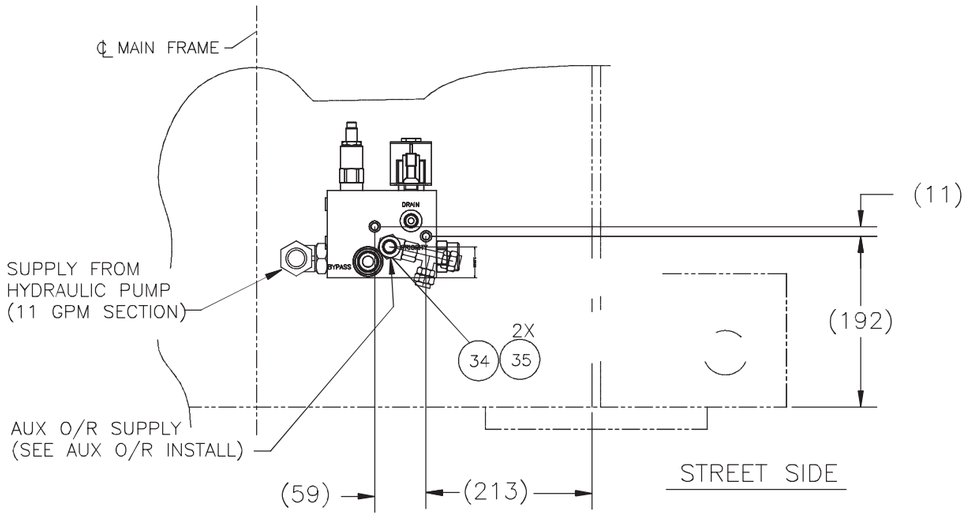
Ⓕ



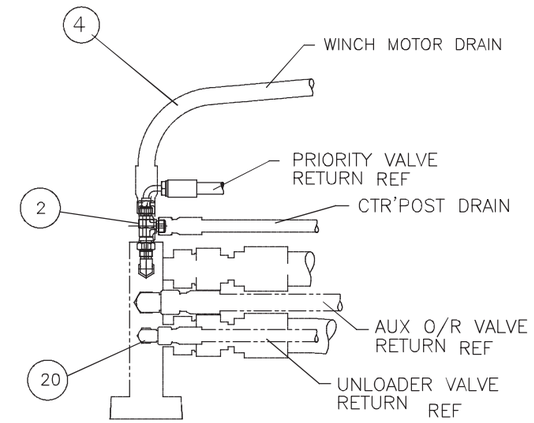
VIEW J–J

SCALE 1:1

LOAD KING		
SIZE B	DWG. NO. 500–01794–1	REV F
SCALE: 1:2		SHEET 3 OF 4



SECTION K–K

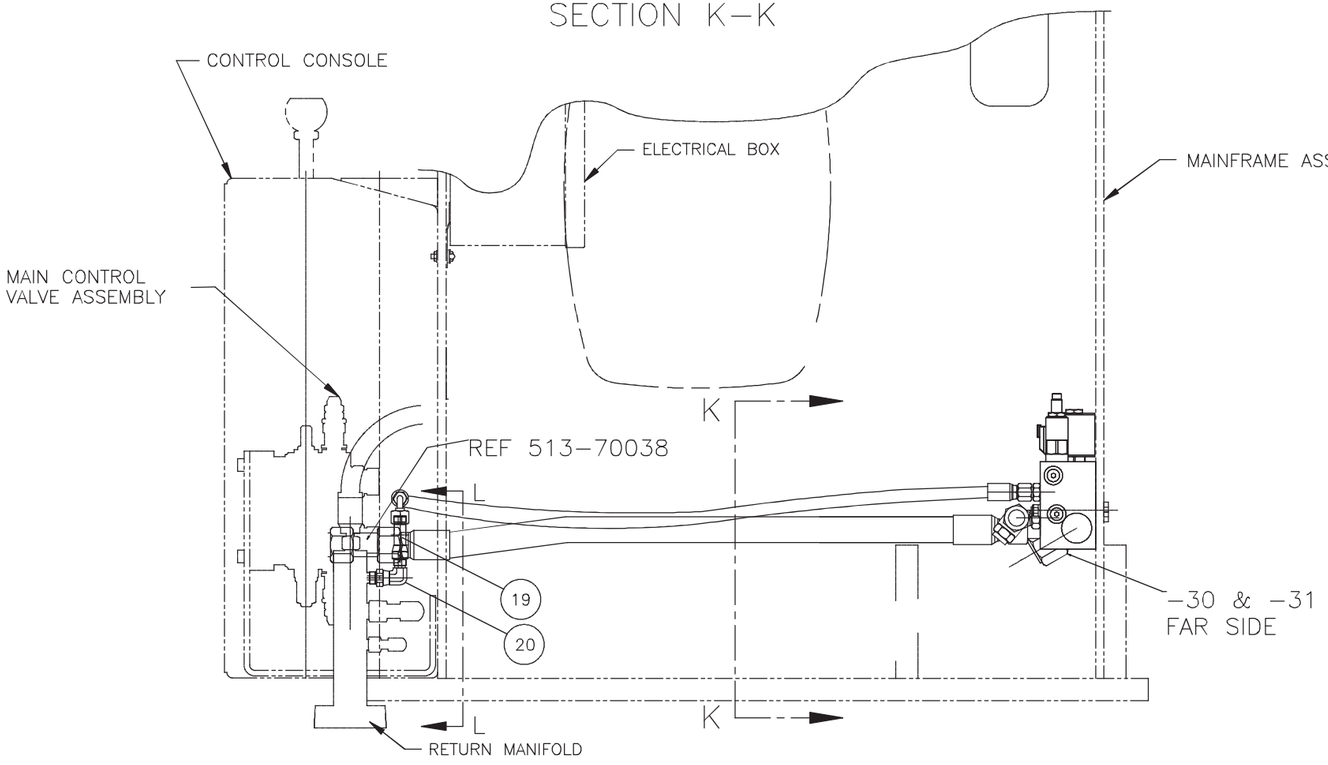


SECTION L–L

RETURN MANIFOLD

CURBSIDE LOCATION SHOWN

SCALE 1:1



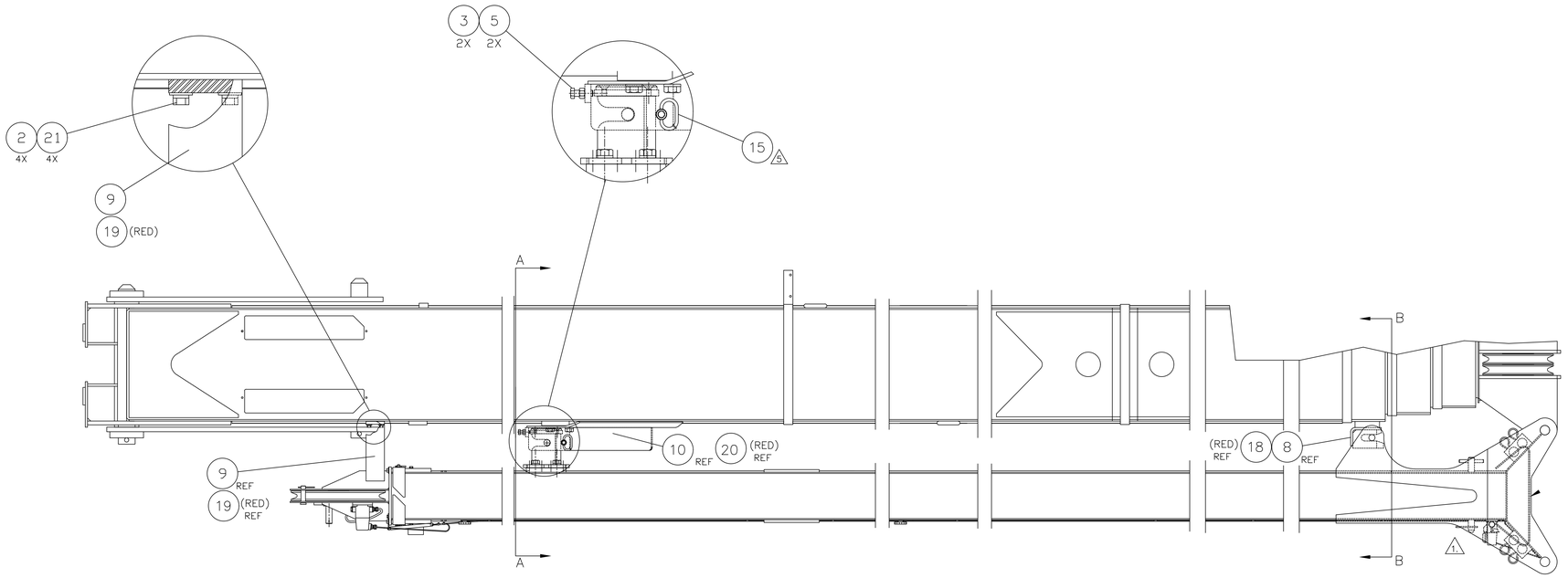
AUX O/R CONTROL VALVE INSTALLATION

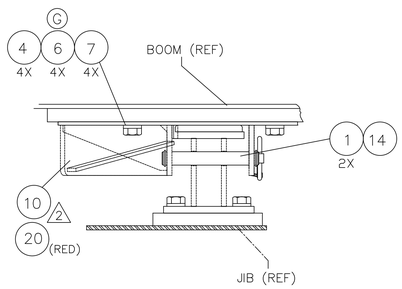
LOAD KING		
SIZE B	DWG. NO. 500–01794–1	REV F
SCALE: 1:2		SHEET 4 OF 4

	Qty.	Item	Part No.	Description
	2	1	200-10011	SNAP RING-TRUARC
(F)	4	2	SHF-375CA00-25	SCR,HHCS FT 0.375-16X1.00,ST SQC G5
(F)	2	3	SHF-500CA50-25	SCR,HHCS FT 0.50-13X1.50,ST SQC G5
(F)	8	4	SHF-625CA25-25	SCR,HHCS FT 0.625-11X1.25,ST SQC G5
(F)	2	5	N04-500C000-25	NUT, HEX 0.50-13, ST SQC G5
(G)(F)	8	6	WAW-62WX000-20	WSH, FL TYPA-WID 0.625, ST SQC
(F)	8	7	W07-625X000-20	WSH, LCK, MED SPLT 0.625, ST SQC
	1	8	770-01736	BRKT WELD, JIB STOW
	1	9	770-01822	BRKT, JIB STOP
	1	10	770-02322	BRKT WELD, STOW RAMP
	2	11	787-00226	SHIM .040x2-3/8x4
	2	12	787-00227	SHIM .063x2-3/8x4
	5	13	787-00228	SHIM .100x2-3/8x4
	1	14	870-20256	PIN, 1" DIA JIB STOW
	1	15	870-00152	HITCH PIN ASSY
(F)	4	21	W07-375X000-20	WSH, LCK, MED SPLT 0.375, ST SQC

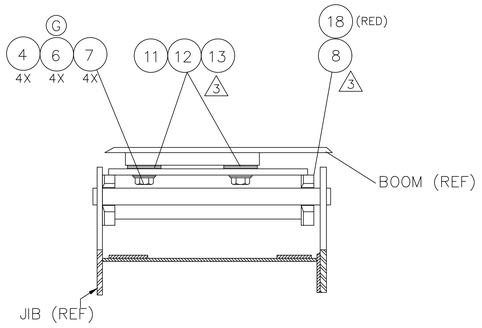
730-51331-1

(B)





SECTION A-A
1/2 SCALE



SECTION B-B
1/2 SCALE

NOTES:

1. JIB TO BE PINNED IN FULLY RETRACTED POSITION.
2. INSTALL JIB STOW BRACKET RAMP (10) AND ADJUST VERTICALLY TO ALLOW BEST APPROACH BY JIB STOW BRACKET.
3. INSTALL BOOM TIP JIB STOW BRACKET (8) AND ADJUST USING SHIMS (11,12 & 13) TO OBTAIN BEST FIT BEWEEN BRACKET (8) AND FIXED PIN AT BASE END OF JIB WHEN IN STOWED POSITION.
4. SECURELY TIGHTEN ALL FASTENERS AFTER MAKING FINAL ADJUSTMENTS.
5. INSTALL HITCH PIN ASSY (15). WHEN JIB IS IN STOWED POSITION.

REV. LET.	L.E.N. DATE	CHANGE	E.C.N.
G	12/06/17	CHANGED: WAW-62WX000-20 WAS WAR-625X000-22 UPDATED: SMART NUMBER DESCRIPTION.	296A106227
F	7/22/13	ADDED ITEM 18, T126536,JIB STOW BRKT (RED) ADDED ITEM 19, T126534, JIB STOP BRKT (RED) ADDED ITEM 20, T126535, JIB STOW RAMP BRKT (RED) ADDED ITEM 21, W07-375X000-20, QTY 4 UPDATED HARDWARE TO NEW STANDARD	296A103486
E	7/10/13	DROP 730-51331-3	296A103453
D	3-4-11	ITEM 15, T105648 WAS 653-00410-1 ITEM 16, T105650 WAS 653-00410-2	296A101037
A	12/7/05	ADDED ITEM 16, 653-00394, QTY 2	N551
—	8/17/04	PRODUCTION RELEASE	P154
		ALL CHANGES MUST BE MADE ON CAD.	

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS IN INCHES
TOLERANCES-UNLESS NOTED:
.X = ±.12
.XX = ±.06
.XXX = ±.020
DO NOT SCALE DRAWING
MATERIAL: LISTED
FINISH: N/A

	NAME	DATE
DRAWN	NB	
CHECKED	NB	

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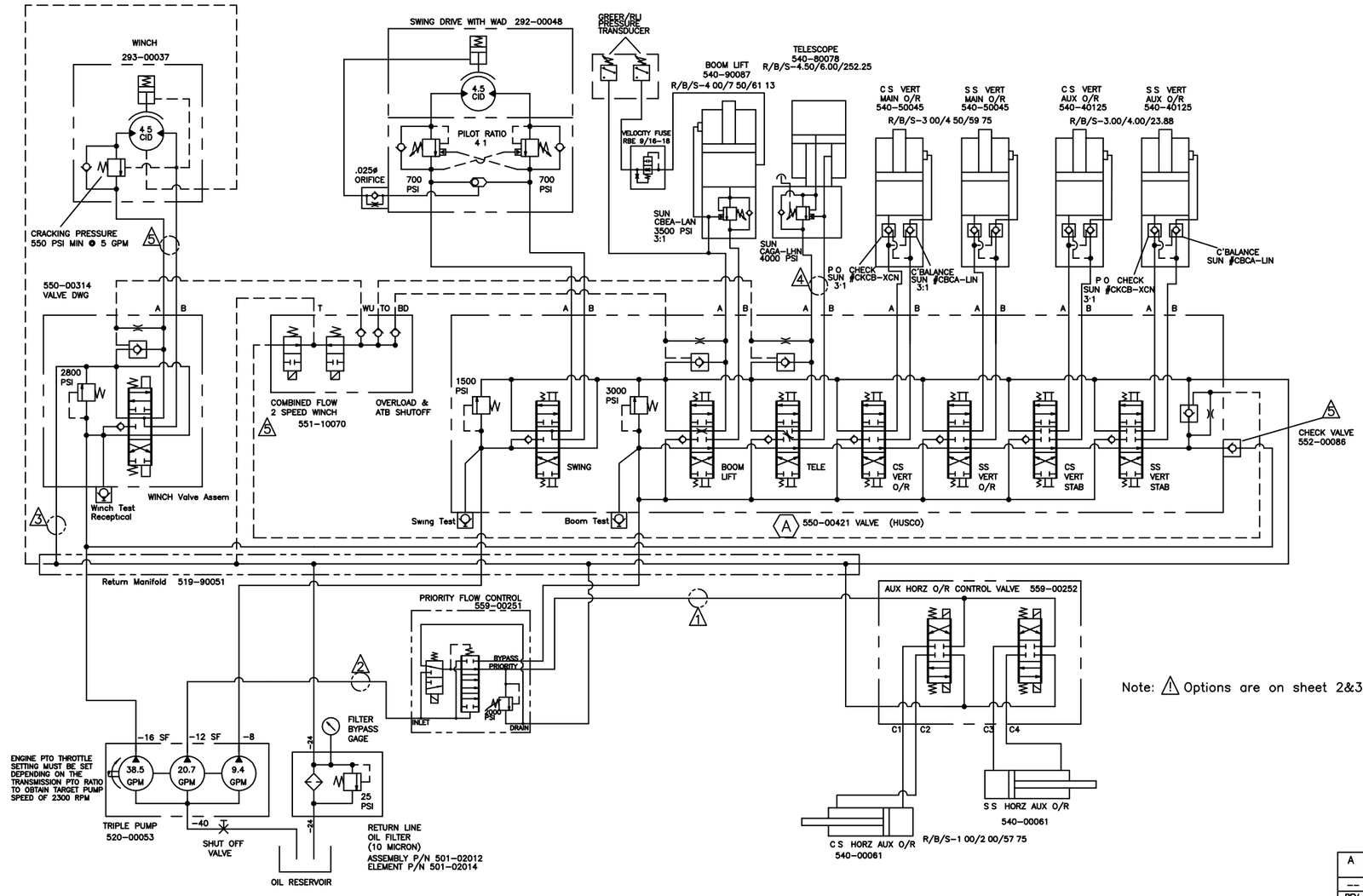
THIRD ANGLE PROJECTION

LOAD KING

TITLE: JIB STOWAGE
25-TON, 35-TON SERIES

SIZE E | DWG. NO. 730-51331 | REV G

SCALE: 1:16 | WEIGHT: | SHEET 1 OF 1



Note: ⚠ Options are on sheet 2&3.

REV LET	L.E.N. DATE	CHANGE — ALL CHANGES MUST BE MADE ON CAD	E.C.N.
A	11/21/06	UPDATED MAIN VALVE SWING & HOIST SPOOLS	N113
--		PRODUCTION RELEASE	N721

Item	Part No	Description	Qty	Wt	Item	Part No	Description	Qty	Wt	Item	Part No	Description	Qty	Wt	Item	Part No	Description	Qty	Wt	Item	Part No	Description	Qty	Wt

UNLESS OTHERWISE SPECIFIED:

ALL DIMENSIONS IN INCHES

TOLERANCES-UNLESS NOTED:

.x = ±.12

.xx = ±.06

.xxx = ±.020

DO NOT SCALE DRAWING

MATERIAL: LISTED

FINISH: N/A

	NAME	DATE
DRAWN		
CHECKED		

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THIRD ANGLE PROJECTION

LOAD KING

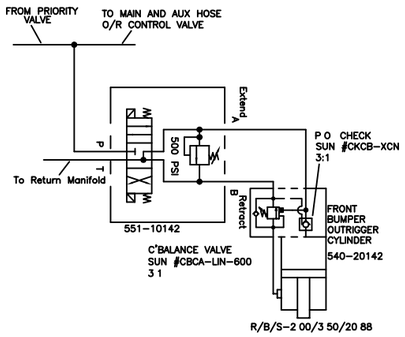
TITLE:

HYDRAULIC SCHMATIC

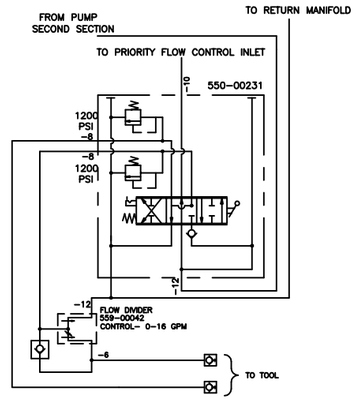
SIZE	DWG. NO.	REV
B	500-01809	A

SCALE: | WEIGHT: | SHEET 1 OF 3

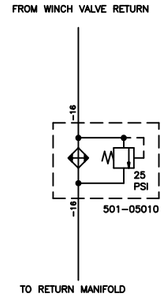
1 FRONT BUMPER OUTRIGGER 760-00437-2



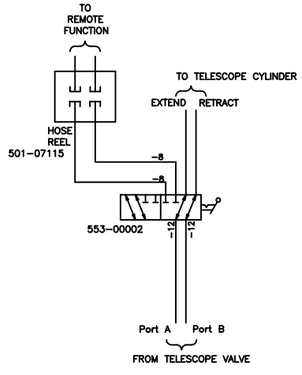
2 HYD AUX GROUND TOOL CIRCUIT 500-01544



3 OIL COOLER 526-00013

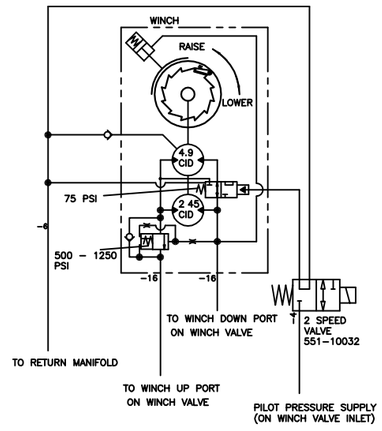


4 REMOTE FUNCTION SELECTOR (RFR PKG) 730-91017



5 MOTOR SHIFT 2 SPEED WINCH 293-00044

NOTE:
- -REMOVE CHECK AND HOSE (PLUG POWER BEYOND PORT)
- -MAINTAIN LINE FROM PILOT TO CLOSE CHECK IN MAIN VALVE OUTLET VALVE OUTLET TO TANK THROUGH OVERLOAD AND ATB VALVE 551-10070
- -DISCONNECT FLOW CONTROL 2 SPEED WINCH, 551-10070 ELECTRONICALLY



Item	Part No	Description	Qty	Wt	Item	Part No	Description	Qty	Wt	Item	Part No	Description	Qty	Wt	Item	Part No	Description	Qty	Wt	Item	Part No	Description	Qty	Wt

REV LET	L.E.N. DATE	CHANGE — ALL CHANGES MUST BE MADE ON CAD	E.C.N.
A	11/21/06	SEE SHEET 1	N113
--		PRODUCTION RELEASE	N721

LOAD KING

SIZE	DWG. NO.	REV
B	500-01809	A

SCALE: | SHEET 2 OF 3

WINCH
293-00037
4.5 CID
CRACKING PRESSURE
550 PSI MIN @ 5 GPM
BOOM LIFT
540-90087
R/B/S-4.00/7.50/61.13
VELOCITY FUSE
RBE 9/16-18
SUN
CBEA-LAN
3500 PSI
3:1
TELESCOPE
540-80078
R/B/S-4 50/6 00/252 25
SUN
CAGA-LHN
4000 PSI
SWING DRIVE WITH WAD 292-00048
4.5 CID
PILOT RATIO
4.1
.025#
ORIFICE
700
PSI
700
PSI
C S VERT
MAIN O/R
540-50045
S S VERT
MAIN O/R
540-50045
R/B/S-3.00/4.50/59.75
P O CHECK
SUN #CKCB-XCN
3:1
C'BALANCE
SUN #CBCA-LIN
3:1
C S VERT
AUX O/R
540-40125
S S VERT
AUX O/R
540-40125
R/B/S-3 00/4 00/23 88
P.O. CHECK
SUN #CKCB-XCN
3:1
C'BALANCE
SUN #CBCA-LIN
HYRAULIC
SWIVEL
560-00066
GREER/RLI
PRESSURE
TRANSDUCER
550-00314
VALVE DWG
2800
PSI
WINCH Valve Assem
Wnch Test
Receptical
COMBINED FLOW
2 SPEED WINCH
551-10070
OVERLOAD &
ATB SHUTOFF
1500
PSI
3000
PSI
SWING
BOOM
LIFT
TELE
CS
VERT
O/R
SS
VERT
O/R
CS
VERT
STAB
SS
VERT
STAB
CHECK VALVE
552-00086
Swing Test
Boom Test
550-00421 VALVE
Return Manifold 519-90051
PRIORITY FLOW CONTROL
559-00251
BYPASS
PRIORITY
4000
PSI
INLET
DRAIN
AUX HORZ O/R CONTROL VALVE 559-00252
C1
C2
C3
C4
S S HORZ AUX O/R
540-00061
R/B/S-1 00/2 00/57 75
C S HORZ AUX O/R
540-00061
FILTER
BYPASS
GAGE
ENGINE PTO THROTTLE
SETTING MUST BE SET
DEPENDING ON THE
TRANSMISSION PTO RATIO
TO OBTAIN TARGET PUMP
SPEED OF 2300 RPM
-16 SF
-12 SF
-8
38 5
GPM
20 7
GPM
9 4
GPM
TRIPLE PUMP
520-00053
-40
SHUT OFF
VALVE
-24
25
PSI
RETURN LINE
OIL FILTER
(10 MICRON)
ASSEMBLY P/N 501-02012
ELEMENT P/N 501-02014
OIL RESERVOIR

Note: ⚠ Options are on sheet 2&3.

NOTE: THIS SCHEMATICS IS SHOWING
CONTINOUS ROTATION OPTION.

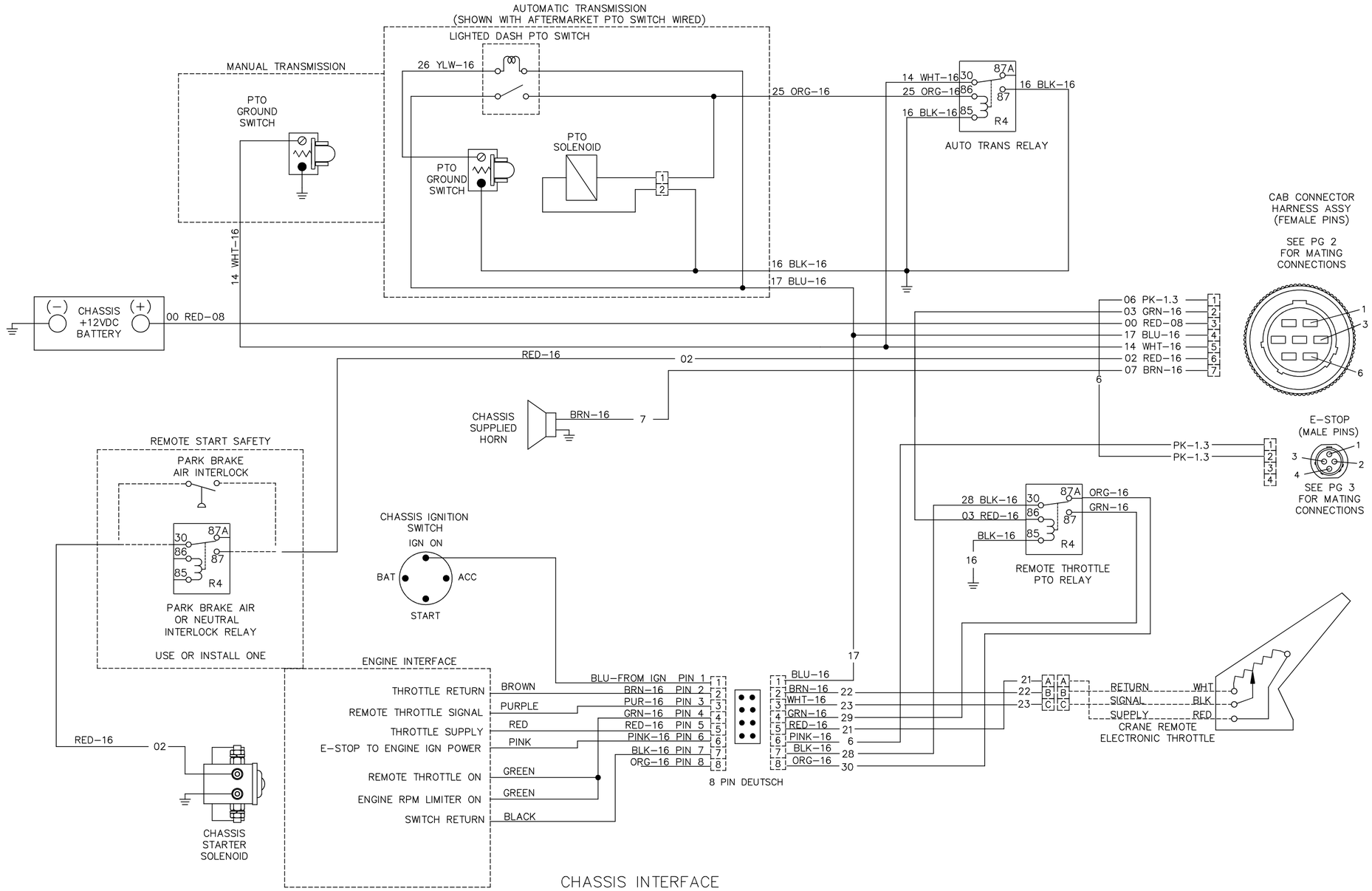
Item	Part No	Description	Qty	Wt	Item	Part No	Description	Qty	Wt	Item	Part No	Description	Qty	Wt	Item	Part No	Description	Qty	Wt	Item	Part No	Description	Qty	Wt

REV LET	L.E.N. DATE	CHANGE ALL CHANGES MUST BE MADE ON CAD	E.C.N.
A	11/21/06	SEE SHEET 1	N113
--		PRODUCTION RELEASE	N721

LOAD KING

SIZE	DWG. NO.	REV
B	500-01809	A
SCALE:		SHEET 3 OF 3

REV. LET.	L.E.N. DATE	CHANGE ALL CHANGES MUST BE MADE ON CAD.	E.C.N.
A	12/9/13	PRODUCTION RELEASE	296A103859
B	5/22/15	UPDATED PAGE 3	296A104830



CHASSIS INTERFACE

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
ALL DIMENSIONS IN INCHES	DRAWN	AAA	8/29/11
TOLERANCES-UNLESS NOTED:	CHECKED	AAA	8/29/11
.x = ±1.5 [0.06]			
.xx = ±0.6 [0.02]			
.xxx = ±0.25 [0.01]			
DO NOT SCALE DRAWING			
MATERIAL N/A			
FINISH N/A			

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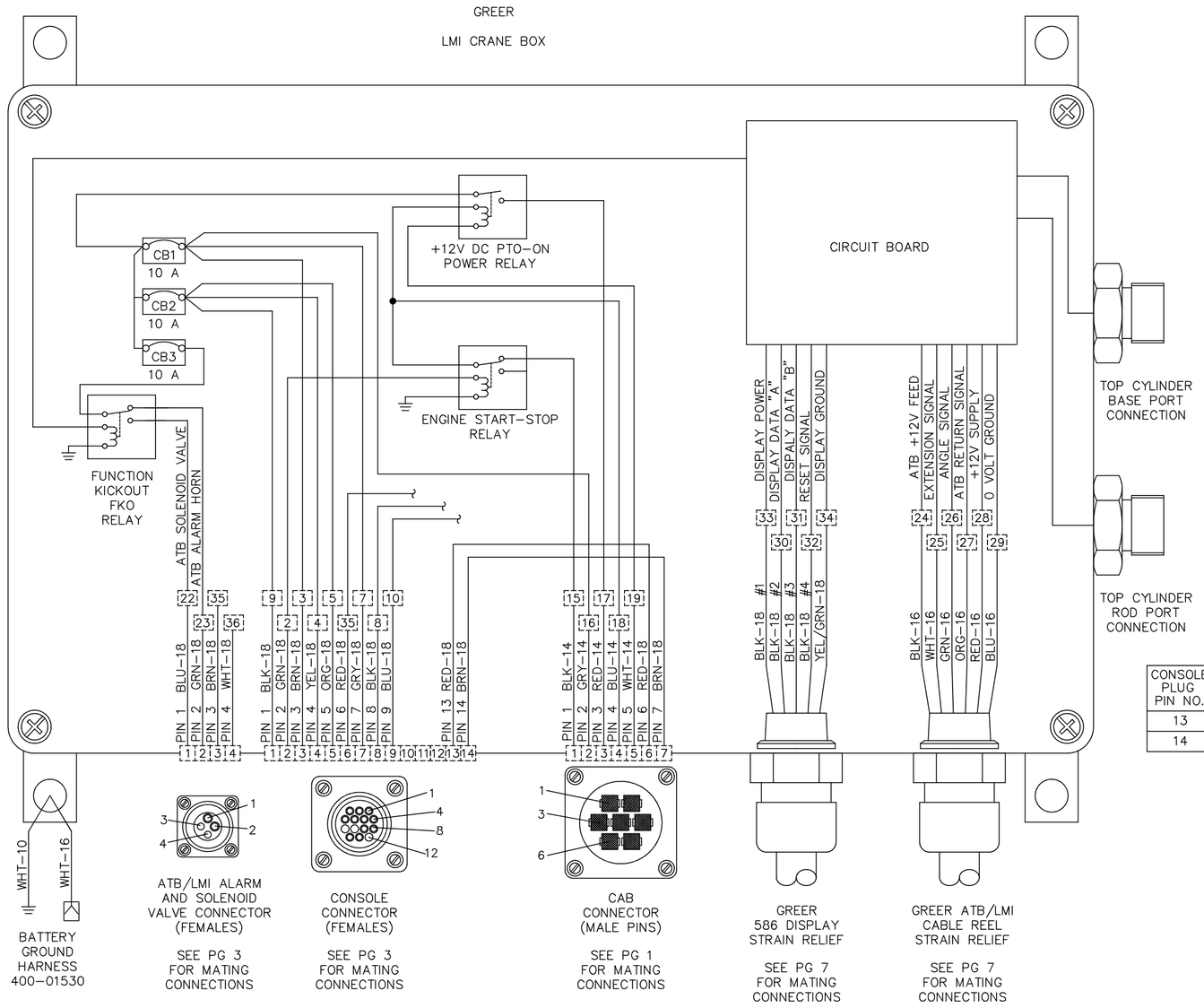
THIRD ANGLE PROJECTION

LOAD KING

TITLE: SCHEMATIC

SIZE	DWG. NO.	REV
C	T135516	B
SCALE: 1:4	WEIGHT:	SHEET 1 OF 8

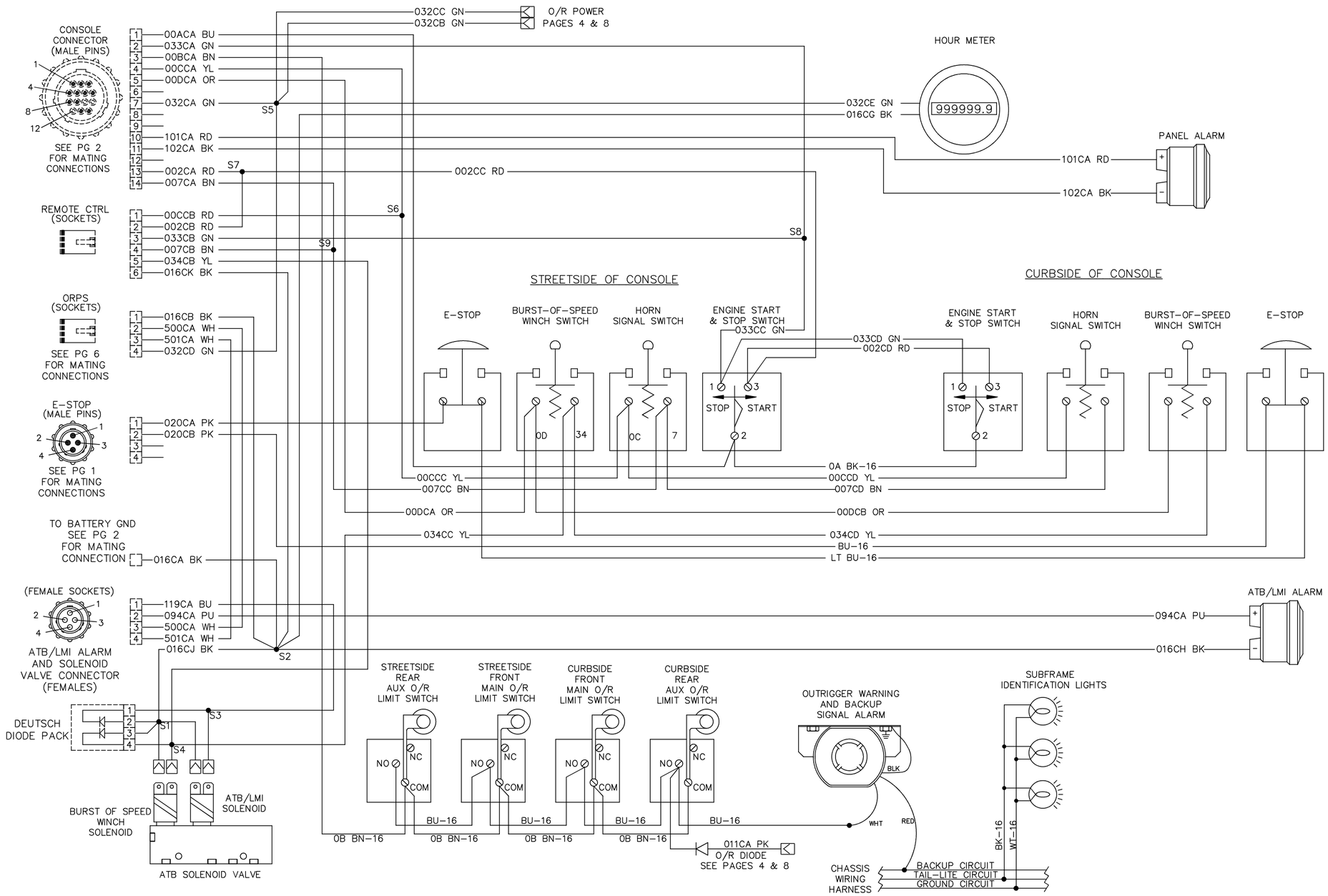


CIRCUIT BOARD TERMINAL	FUNCTION
2	CONSOLE SWITCH ENGINE STOP SIGNAL
3	O/R LIMIT SWITCHS +12V POWER
4	HORN SIGNAL SWITCH +12V POWER
5	2 SPEED WINCH SWITCH +12V POWER
7	O/R TOGGLE SWITCHS +12V POWER
8	E-STOP
9	ENGINE START/STOP SWITCH +12V POWER
10	ECA OPTION (NOT USED)
15	ENGINE SHUTDOWN POWER SIG TO ECM
16	PTO-ON INDICATOR LIGHT +12V SIGNAL
17	+12VDC BATTERY INPUT POWER TO BOX
18	+12VDC IGNITION-ON ECM POWER SIGNAL
19	PTO-ENGAGED GROUND SIGNAL
22	+12V ATB/LMI SOLENOID VALVE
23	+12V ATB/LMI ALARM HORN
24	ATB/LMI REEL +12V FEED TO ATB SWITCH
25	ATB/LMI REEL EXTENSION SIGNAL
26	ATB/LMI REEL ANGLE SIGNAL
27	ATB/LMI REEL +12V FEED
28	ATB/LMI REEL ATB SWITCH SIGNAL
29	ATB/LMI REEL GROUND
30	ATB/LMI DISPLAY DATA "A"
31	ATB/LMI DISPLAY DATA "B"
32	ATB/LMI DISPLAY RESET SIGNAL
33	ATB/LMI DISPLAY +12V POWER
34	ATB/LMI DISPLAY GROUND
35	E-STOP

CONSOLE PLUG PIN NO.	CAB PLUG PIN NO.	WIRE	FUNCTION
13	6	RED-18	ENGINE START SOLENOID SIGNAL
14	7	BRN-18	TRUCK HORN SIGNAL

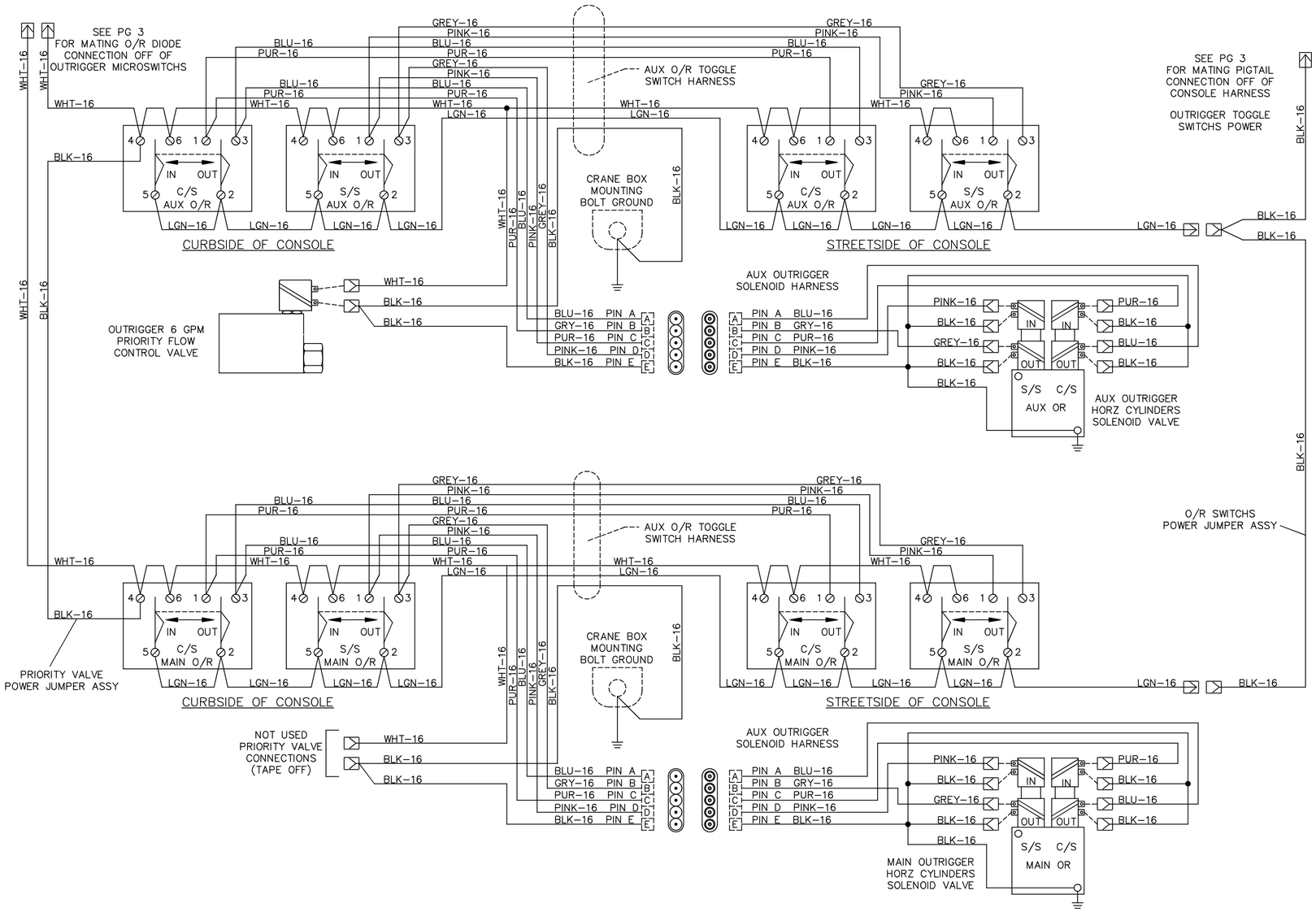
LOAD KING

SIZE	DWG. NO.	REV
C	T135516	B
SCALE:		SHEET 2 OF 8



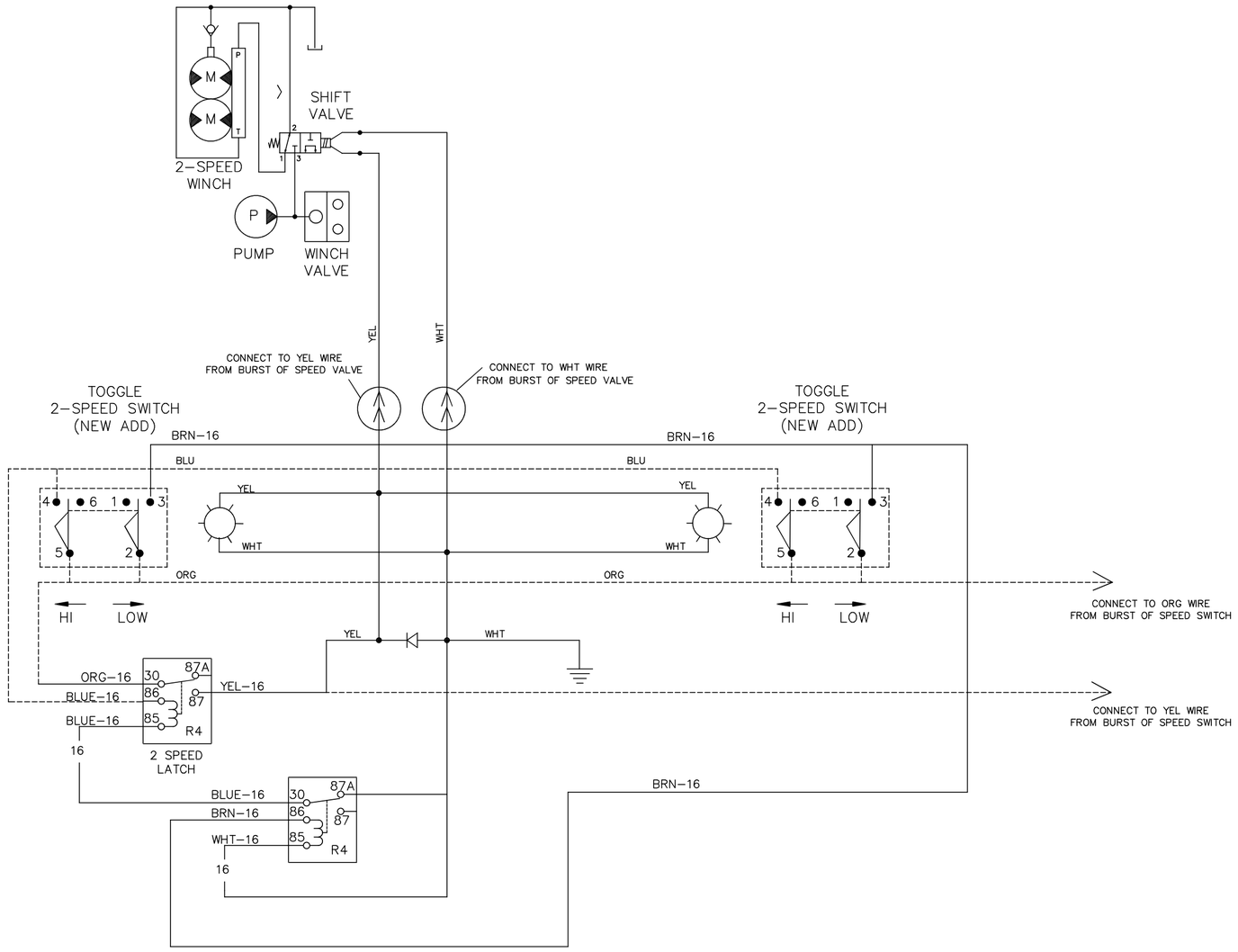
CRANE CONSOLE

LOAD KING		
SIZE	DWG. NO.	REV
C	T135516	B
SCALE:	SHEET 3 OF 8	



OPTIONAL OUTRIGGERS
(OUT AND DOWN)

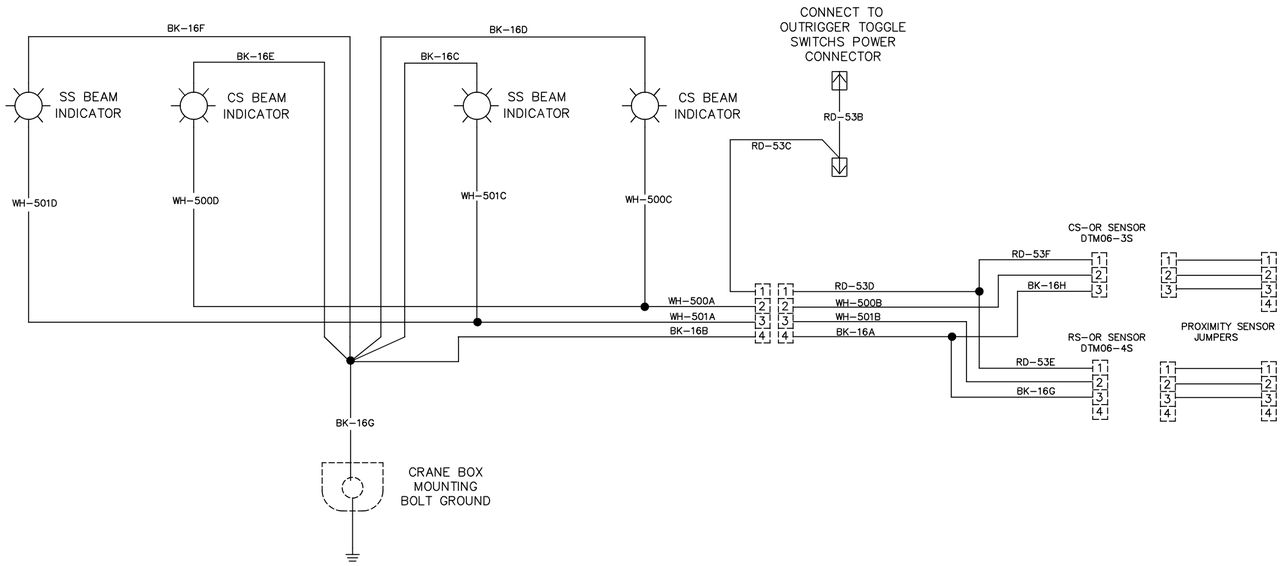
SIZE	DWG. NO.	REV
C	T135516	B
SCALE:		SHEET 4 OF 8



2 SPEED WINCH
ELECTRIC/HYD SCHEMATIC

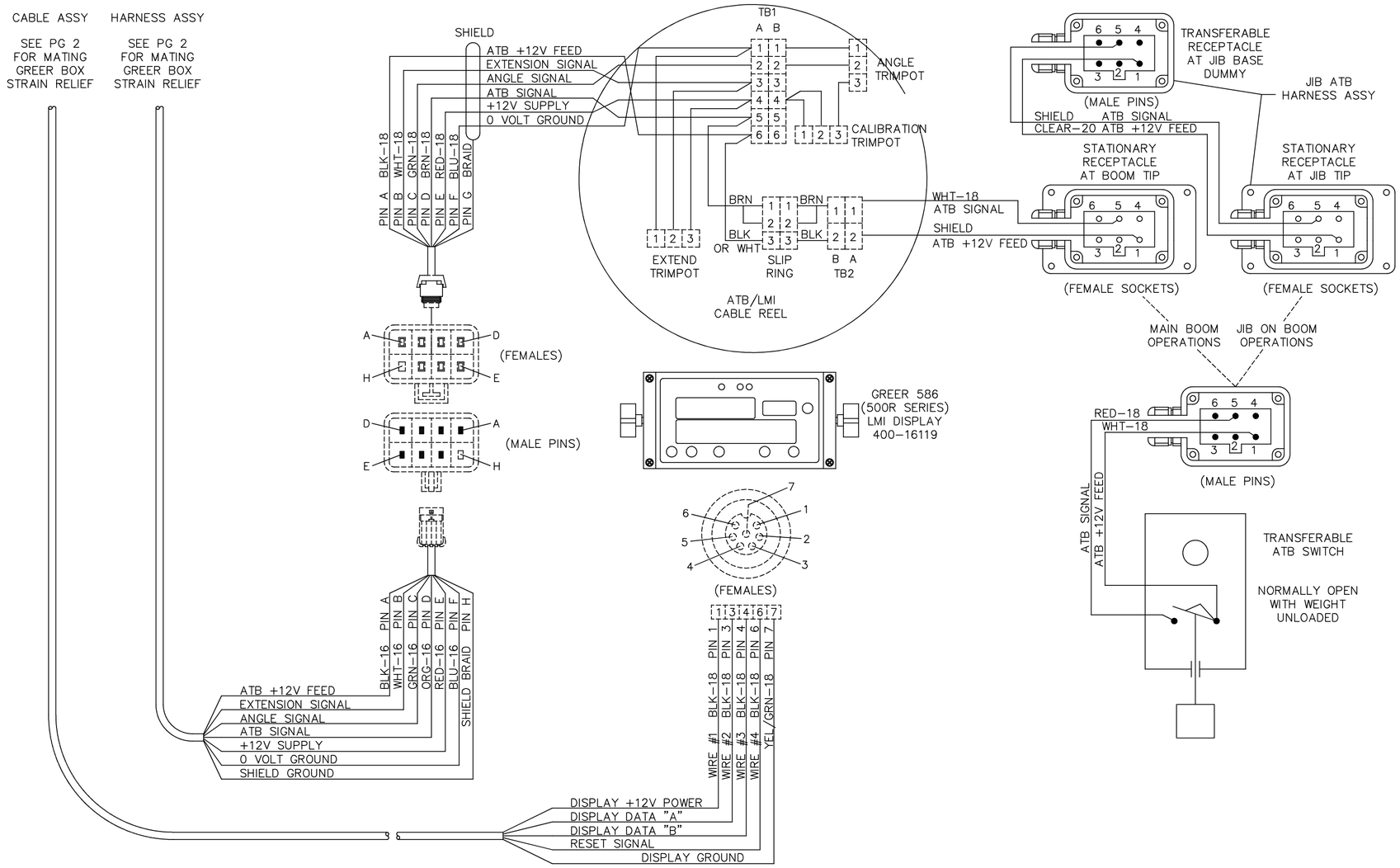
LOAD KING

SIZE	DWG. NO.	REV
C	T135516	B
SCALE:		SHEET 5 OF 8

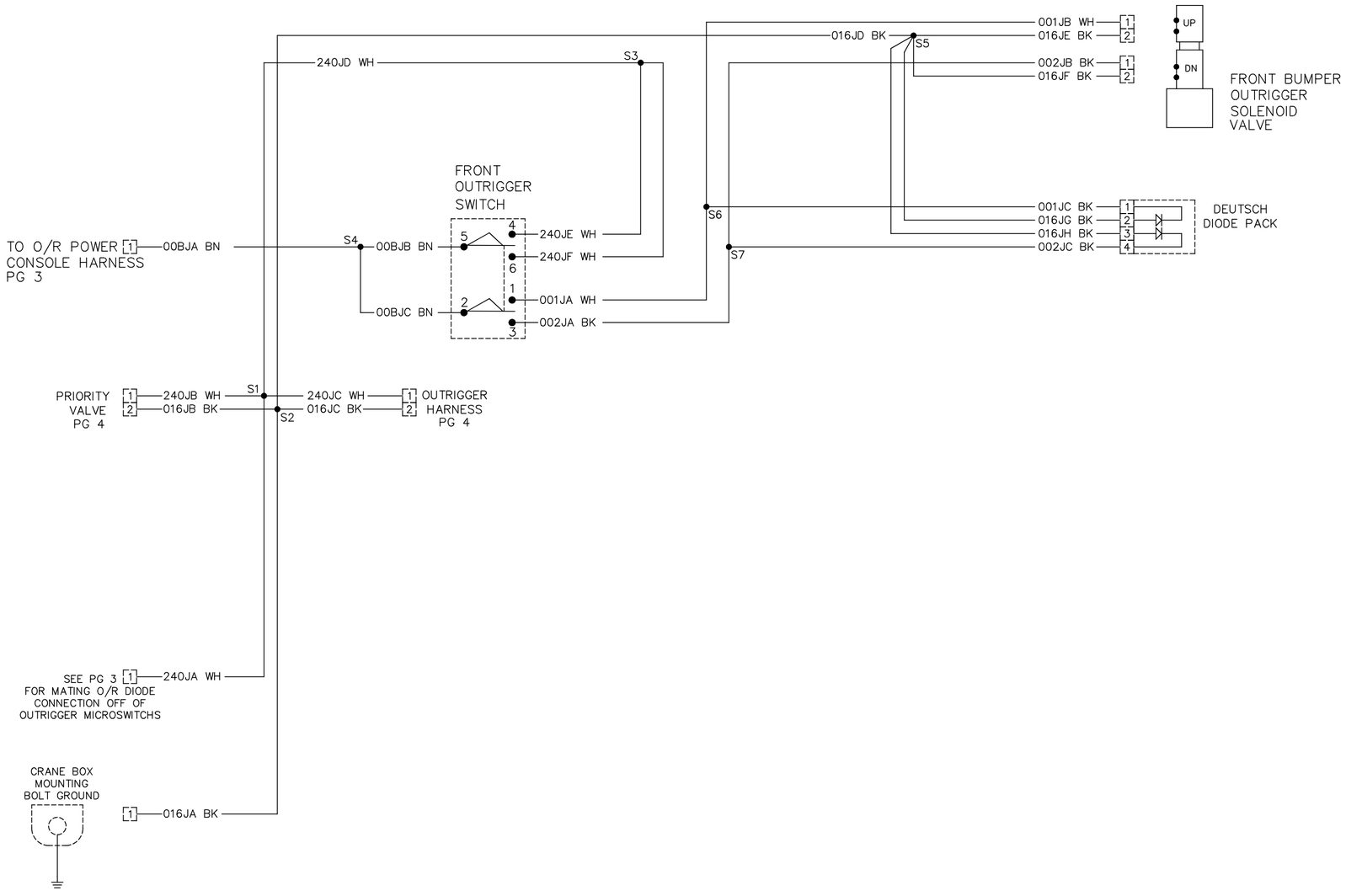


OUTRIGGER POSITION SENSING

SIZE	DWG. NO.	REV
C	T135516	B
SCALE:		SHEET 6 OF 8



LOAD KING		
SIZE C	DWG. NO. T135516	REV B
SCALE:	SHEET 7 OF 8	



OPTIONAL FRONT BUMPER OUTRIGGER

LOAD KING		
SIZE C	DWG. NO. T135516	REV B
SCALE:	SHEET 8 OF 8	