

SERVICE MANUAL

This Manual has been prepared for and is considered part of -

600H Telescoping Crane

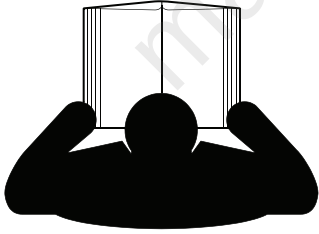
This Manual is Divided into the following Sections:

SECTION 1	INTRODUCTION
SECTION 2	HYDRAULIC SYSTEM
SECTION 3	ELECTRIC SYSTEM
SECTION 4	BOOM
SECTION 5	WINCH
SECTION 6	SWING
SECTION 7	OUTRIGGERS
SECTION 8	LUBRICATION
SECTION 9	CRANE INSTALLATION
SECTION 10	SCHEMATICS

NOTICE

The crane serial number is the only method your distributor or the factory has of providing you with correct parts and service information.

The crane serial number is identified on the builder's decal attached to the crane frame. ***Always furnish crane serial number*** when ordering parts or communicating service problems with your distributor or the factory.



WARNING

To prevent death or serious injury:

- Avoid unsafe operation and maintenance.
- This crane must be operated and maintained by trained and experienced personnel. National Crane is not responsible for qualifying these personnel.
- Do not operate or work on this crane without first reading and understanding Operator's Manual and Rating Plate supplied with crane.
- If Operator's Manual or Capacity Charts are missing from crane, contact your distributor for new ones.

Keep The System Clean

When removing components of a hydraulic system, cover all openings on both the component and the crane.

If evidence of foreign particles is found in the hydraulic system, flush the system.

Disassemble and assemble hydraulic components on a clean surface.

Clean all metal parts in a nonflammable cleaning fluid. Then lubricate all components to aid in assembly.

Sealing Elements

Inspect all sealing elements (O-ring, gaskets, etc.) when disassembling and assembling the hydraulic system components. Installation of new elements is recommended.

Hydraulic Lines

When disconnecting hoses, tag each one to ensure proper identification during assembly.

When installing metal tubes, tighten all bolts finger-tight. Then, in order, tighten the bolts at the rigid end, the adjustable end, and the mounting brackets. After tubes are mounted, install the hoses. Connect both ends of the hose with all bolts finger-tight. Position the hose so it does not rub the machine or another hose and has a minimum of bending and twisting. Tighten bolts in both couplings.

Due to manufacturing methods there is a natural curvature to a hydraulic hose. Reinstall the hose so any bend is with this curvature.

Electrical**Batteries**

Clean the batteries with a solution of baking soda and water. Rinse with clear water and dry. Clean the battery terminals with fine sandpaper and coat the terminals dielectric grease. Do not use a non-dielectric grease.

Remove the batteries If the machine is not used for an extended period of time. Store the batteries in a warm, dry place, preferably on wooden shelves. Never store on concrete. A small charge should be introduced periodically to keep the specific gravity rating at recommended level.

CAUTION

Disconnect batteries prior to working on the electrical system.

When disconnecting wires, tag each one to ensure proper identification during reassembly.

Connectors, Harnesses, Wires, and Connectors

Visually inspect all electrical harnesses, cables, and connectors every month or 250 hours for the following:

- Damaged, cut, blistered, or cracked insulation.
- Exposed bare wires.
- Kinked or crushed wires and cables.
- Cracked or corroded connectors, battery terminals, and ground connections.

If any the above conditions exist, evaluate and replace as necessary.

The climate in which the crane operates affects the service life of the electrical components. The climate zones are defined in the table on page 1-5. Recommended replacement of harness and cables is as follows:

- Climate zone C after 10,000 hours of service.
- Climate zones A and C with high ambient temperatures and duty cycles after 8000 hours of service.
- Climate zones D and E after 10,000 hours of service.
- Salt water conditions after 8,000 hours of service.

Climate Zone Classification

Zone	Classification
A (Tropical Moist)	Latitude 15° - 25° North and South (All months average above 64° F [18° C])
B (Dry or Arid)	Latitude 20° - 35° North and South (Deficient of precipitation most of the year)
C (Moist Mid-Latitude)	Latitude 30° - 50° North and South (Temperate with mild winters)
D (Moist Mid-Latitude)	Latitude 50° - 70° North and South (Cold winters)
E (Polar)	Latitude 60° - 75° North and South (Extremely cold winters and summers)

Fatigue Of Welded Structures

Highly stressed welded structures are subject to cracking (fatigue) when repeatedly subjected to varying stresses caused by twisting, shock, bending, and overloads. Inspect

equipment periodically for weld fatigue. The frequency of inspections depends on the age of the equipment, the severity of the application, and the experience of the operators and the maintenance personnel. The following are

HYDRAULIC SYSTEM TROUBLESHOOTING CHART

Condition	Possible Cause	Possible Solution
No Flow from Pump (If pump does not prime in 30 seconds STOP!)	Pump not installed correctly.	Check proper drive rotation. Make sure pump shaft is turning (i.e. drive coupling is engaged). Check for sources of suction leaks, inlet flange tight? Pinched o-rings?
	Pump not getting oil.	Make sure reservoir is full of oil.
	Can't Build Any Pressure Flow has an unrestricted path.	Is it an open circuit to the reservoir.
	Internal leakage in cylinders, valves, motors or pumps.	Repair component.
No response to control	Overload system inoperative.	Insure overload system is working properly and Anti-Two-Block/Overload solenoid is powered.
	Load too heavy.	Check Capacity Chart.
	PTO not engaged.	Engage PTO.
	Low hydraulic fluid supply.	Check and fill as required.
	Suction line blocked.	Drain tank and hose and remove blockage.
	Broken hydraulic pressure line.	Replace as required.
	Defective hydraulic pump.	See Pump Service Manual.
	Incorrect relief valve setting.	Adjust relief.
	Relief valve sticking.	Clean relief.
Poor hydraulic system performance	Pump not operating at proper speed.	Check PTO ratio, pump size and engine speed for proper oil flow
	Low hydraulic fluid supply.	Check and fill as required.
	Relief valve sticking.	Remove and clean.
	Relief setting too low.	Readjust to proper setting.
	Worn pump, motor or cylinder.	Replace bad part.
	Plugged filter.	Change filter.
	Valve spools not fully open.	Adjust linkage so valve has full throw.
	Boom holding valves out of adjustment.	Adjust or clean as required.
	Oil temperature too high.	Reduce engine speed, slow cycle time to cool oil or add oil cooler option.
	Hydraulic oil too cold or dirty.	Warm oil or use less viscous oil.
	Line restricted.	Check lines; clean and repair as necessary.
	Internal control valve crack.	Replace valve.
	Load too heavy.	Check Capacity Chart and reduce load.

SIX SECTION BOOM

The six section boom is powered by a four-stage double/single-acting hydraulic cylinder. The cylinder is anchored to the 1ST section, and attached to and extends the 2ND, 3RD, 4TH, and 5TH boom sections.

Extend and retract cables in the boom, extend and retract the 6TH section. Synchronization (sync) cables are attached to the 2ND, 3RD, 4TH, and 5TH boom sections. The sync cables keep the boom sections equally proportioned as the boom is extended and retracted.

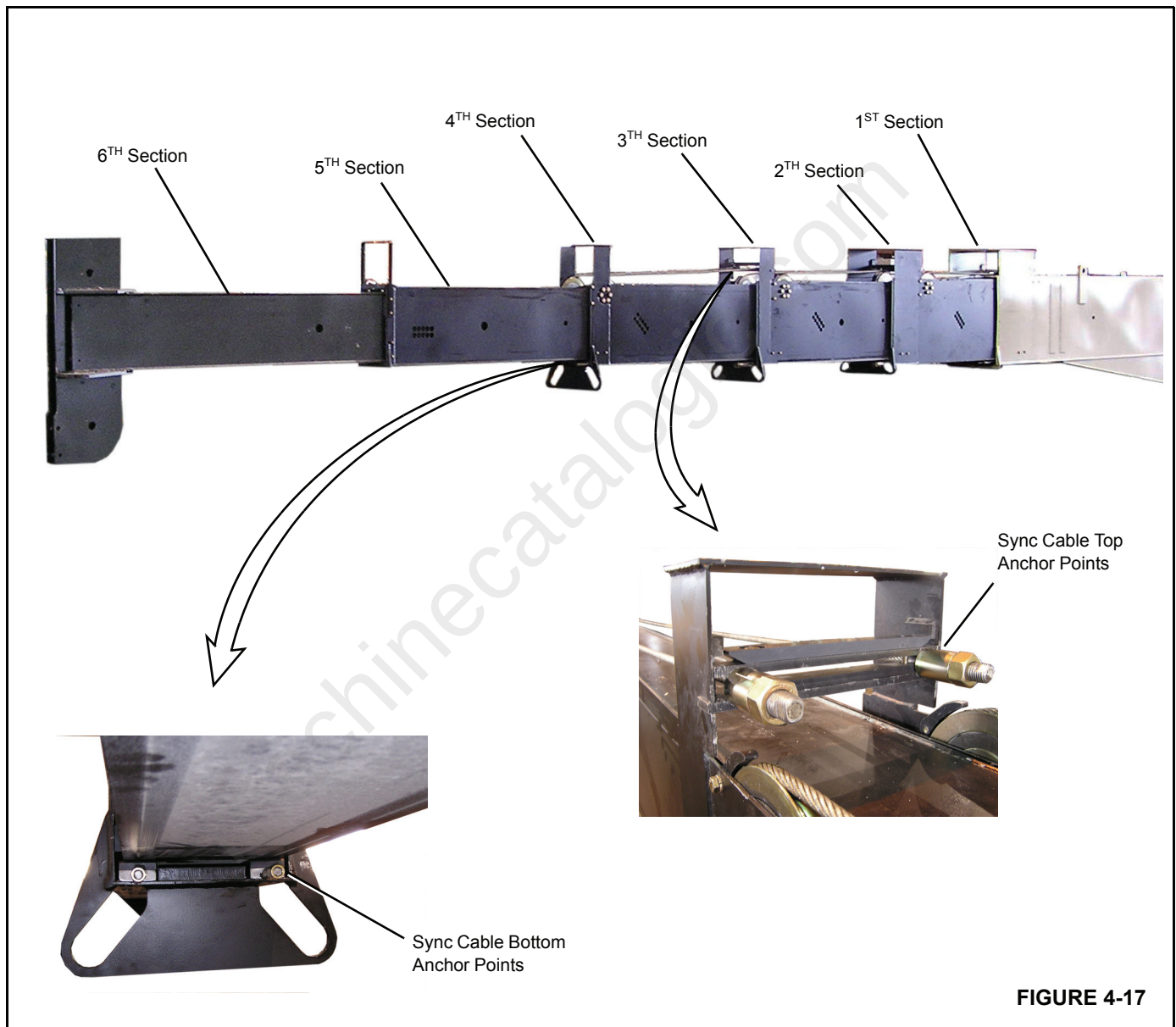
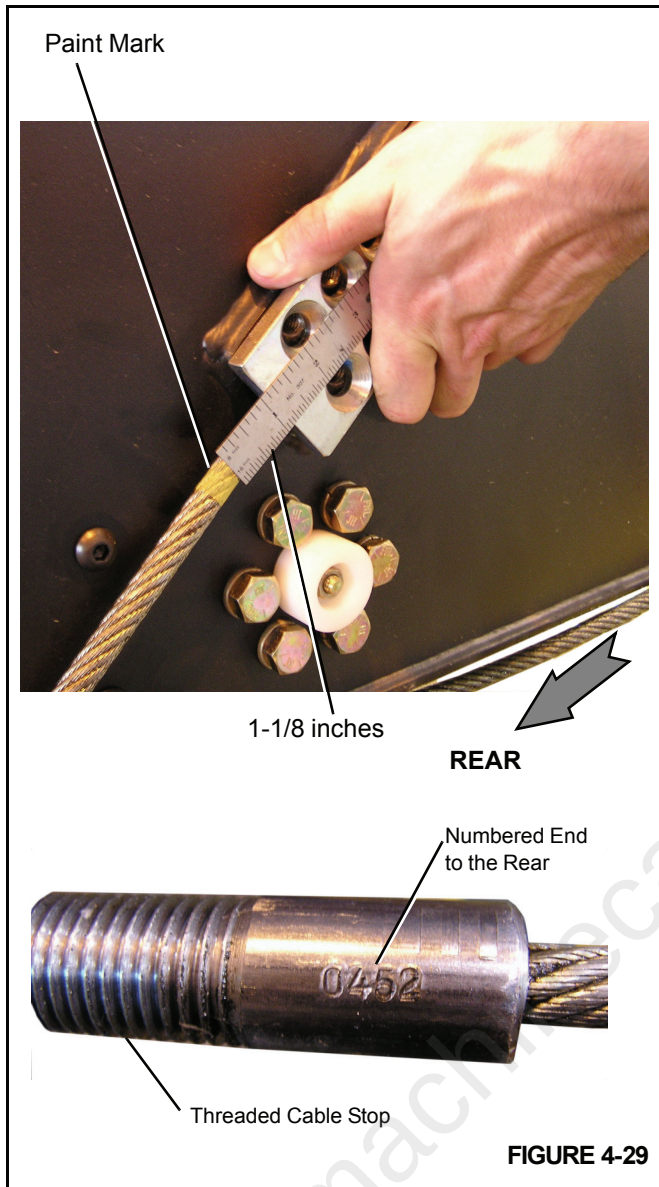
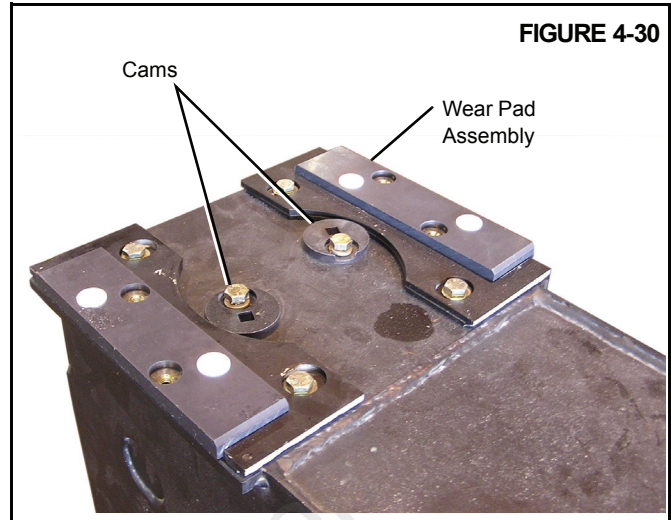


FIGURE 4-17

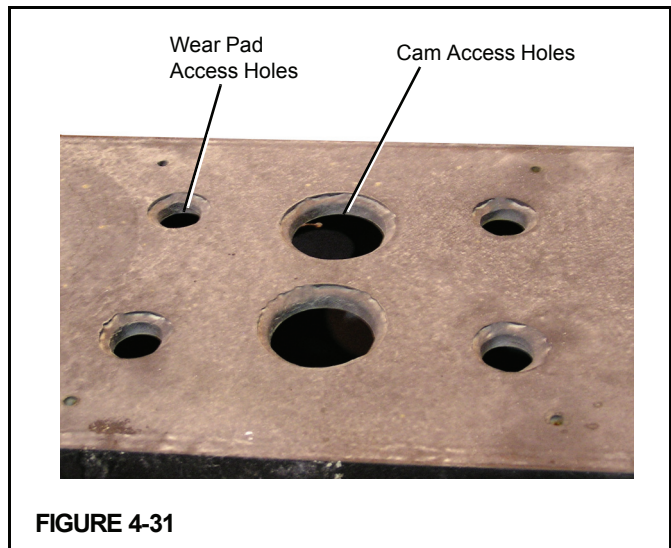


3. Assemble the top rear wear pad on the back of the 5TH section and finger tighten the bolts. Lay the wear pad in the cam plate (Figure 4-30).
4. Insert a locator bar through the hole on the side of the 4TH section boom (Figure 4-22).



5. Place the sync cables attached to the 5TH section inside the 4TH section.
6. Slide the 6TH-5TH assembly into the 4TH section until it comes in contact with the locator bar.
7. Remove the locator bar.
8. With a 3/8 inch socket extension, adjust the cams until the rear of the 5TH section is centered in the 4TH section (Figure 4-23). Tighten the wear pad and cam bolts.

NOTE: To aid in wear pad adjustment, it may be necessary to jiggle the front of the boom side to side.



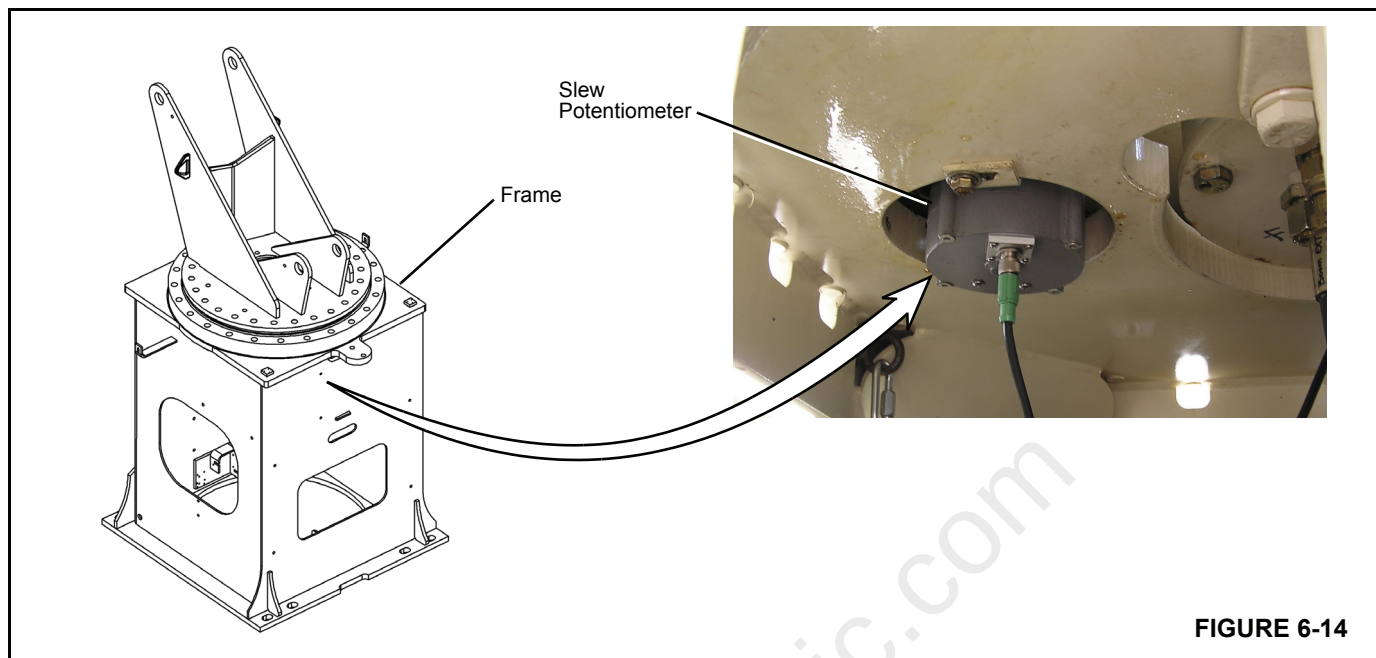


FIGURE 6-14

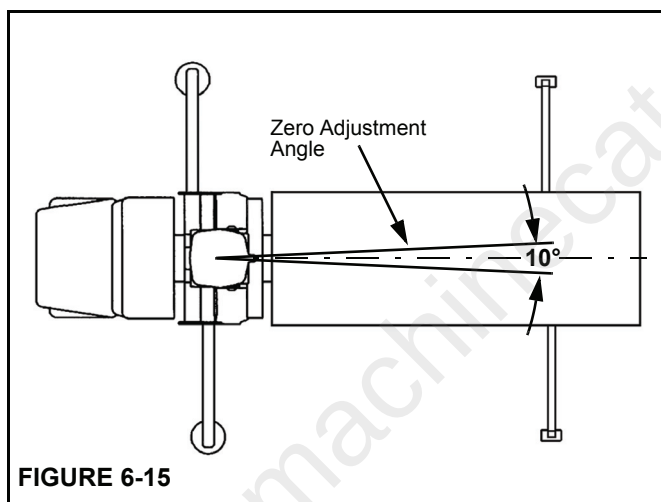


FIGURE 6-15

Slew Potentiometer Orientation

The slew potentiometer is located inside the turret and limits the swing to 410° (205° left and 205° right). The potentiometer needs to be oriented to $0^\circ (\pm 5^\circ)$ before the LMI can be calibrated for the swing parameters.

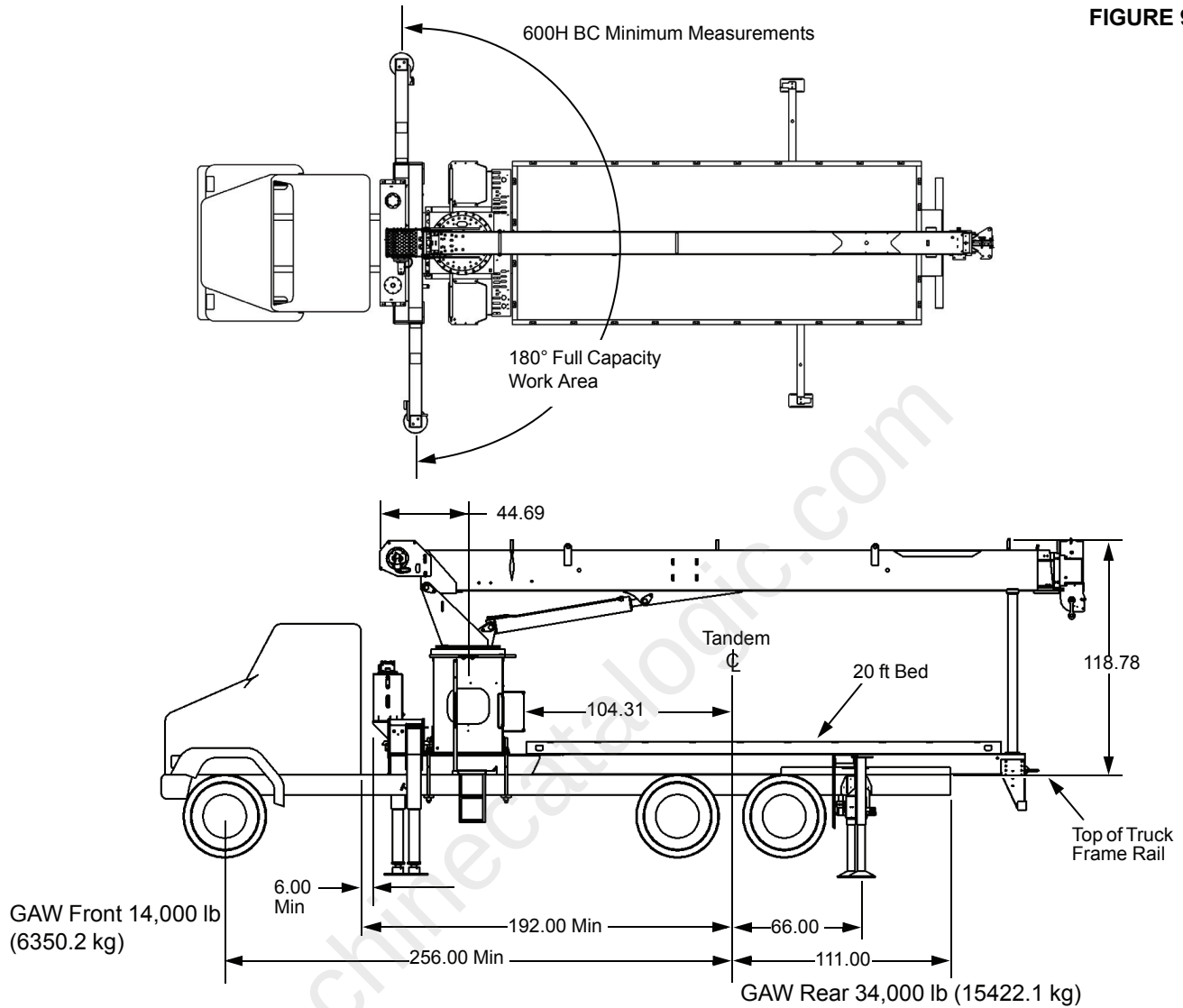
NOTE: Refer to the LMI manual for calibration of the slew angle and 0° orientation.

Testing

Activate the crane and check for proper function.

NOTE: If the turret does not turn freely after bearing and pinion replacement, contact your local dealer.

FIGURE 9-2



600H BC 180° Full Capacity Working Area

Working Area	180°
Gross Axle Weight (GAW) Rating	48,000 lb (21772.4 kg)
Wheel Base	256 in (650.2 cm)
Cab to Axle Trunnion (CT)	192 in (487.6 cm)
Frame Section Modulus Under Crane (110,000 psi)	15.9 in ³ (260.5 cm ³)
Frame Section Modulus Over Rear Stabilizers (110,000 psi)	13 in ³ (213 cm ³)
Frame Section Modulus Rear of Front Spring Hanger (110,000 psi)	11 in ³ (180.2 cm ³)
Frame Section Modulus FSO Attach Point (110,000 psi)	2 in ³ (32.7 cm ³)
Minimum Truck Weight Front	8,700 lb (3946.2 kg)*
Minimum Truck Weight Rear	8,600 lb (3900.8 kg)*
Estimated Final Weight (truck and crane)	30,000 lb (13607.7 kg)

* Weights are for bare truck. Final crane stability weight must include crane, stabilizers, sub-base, and 20 ft wood bed or be counterweighted accordingly.

Mount the Outrigger Box

NOTE: See Figure 9-13 and Figure 9-14 for stabilizer tube weldments.

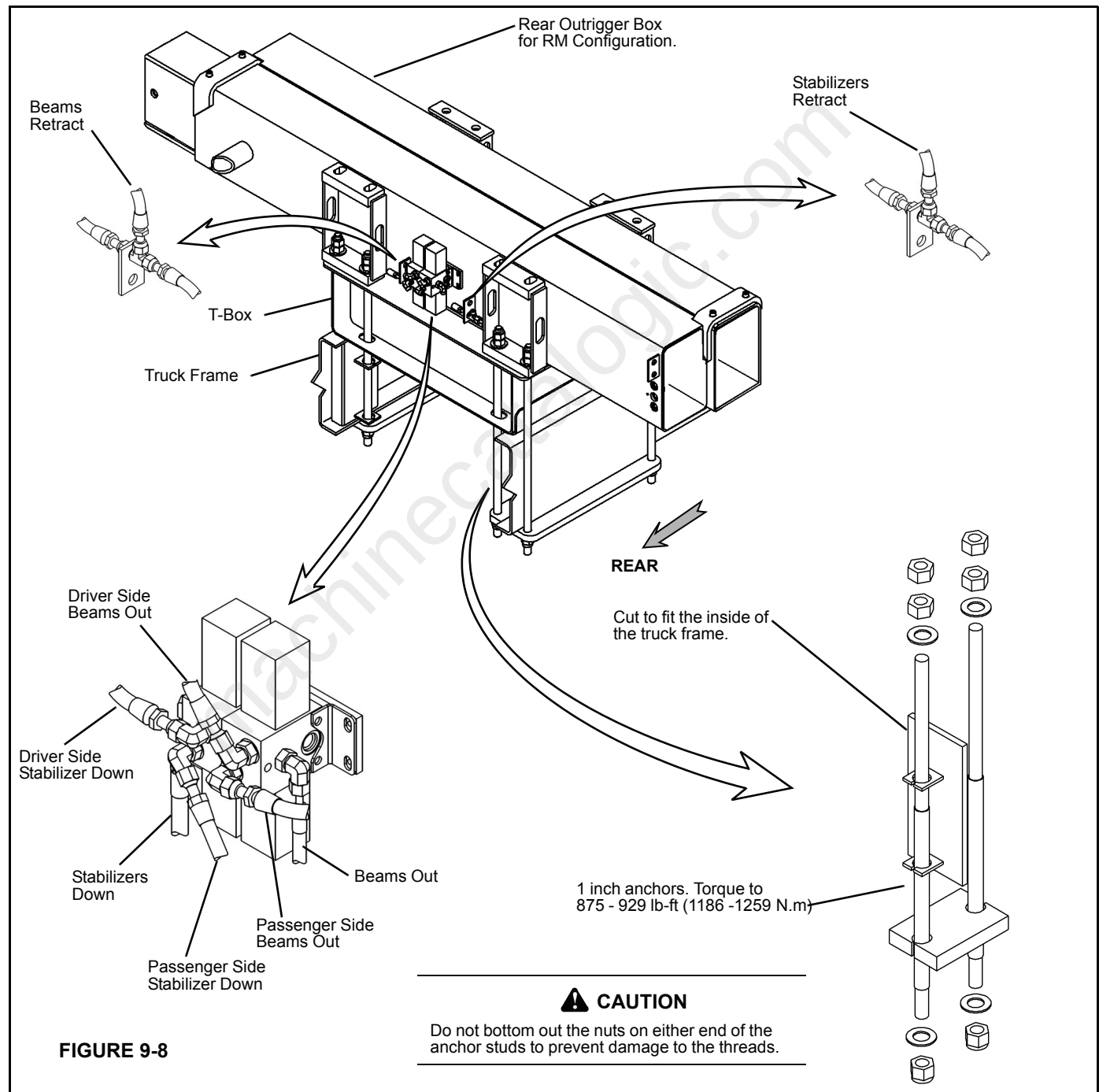
Position the front outriggers on the T-Box and bolt to the truck frame with the anchor bolts and brackets.

Position the rear outriggers on the T-Box and bolt to the truck frame with the anchor bolts brackets.

NOTE: The front outrigger boxes are integral to the T-box on cranes where the operators station is mounted behind the truck cab.

Assemble the Outriggers

Assemble the outriggers as shown in the parts manual and connect the hydraulics as per hydraulic schematics. Connect the solenoids to the outrigger selector switch on the control panel.



Full Version Available

National Crane 600H Boom Truck Service Manual

National Crane 600H boom truck service manual with repair procedures, adjustments and troubleshooting. Searchable 2-file PDF set. Instant PDF download.

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