

SERVICE MANUAL

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

1300H Telescoping Crane

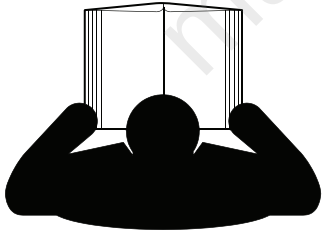
This Manual is Divided into the following Sections:

SECTION 1	INTRODUCTION
SECTION 2	HYDRAULIC SYSTEM
SECTION 3	ELECTRIC SYSTEM
SECTION 4	BOOM MAINTENANCE
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.

SECTION 1 INTRODUCTION

GENERAL

This manual has been compiled to assist you in properly operating and maintaining your Model 1300H Series National Crane (Figure 1-1).

Before placing the crane in to service, all operators and persons working around the crane must thoroughly read and understand the contents of the Operators Manual. Before moving a vehicle equipped with a crane, information relating to transporting the vehicle must be read and observed.

This manual must be retained with the machine for use by subsequent operating personnel.

Information this manual does not replace federal, state or local regulations, safety codes or insurance requirements

The National Crane has been designed for maximum performance with minimum maintenance. With proper care, years of trouble-free service can be expected.

National Crane reserves the right to make specification and equipment changes without notice because of product improvements.

National Crane and our Dealer Network want to ensure your satisfaction with our products and customer support. Your local dealer is the best equipped and most knowledgeable to assist you for parts, service, and warranty issues. They have the facilities, parts, factory trained personnel, and the

information to assist you in a timely manner. We request that you first contact them for assistance. If you feel you need factory assistance, please ask the dealer's service management to coordinate the contact on your behalf.

Supplemental Information

Supplemental information for options such as remote controls, augers, varying control configurations, baskets, grapples, etc. is included in separate manuals.

Whenever a question arises regarding your National product or this publication, please consult your National Dealer for the latest information. Your National Dealer is equipped with the proper tools, necessary National parts, and trained service personnel to maintain and service your crane.

Safety Information

A Safety Compact Disc (CD) which includes sections on Operation, Safety and Maintenance for National Crane operators and owners is supplied when the crane is purchased new. Additional copies are available from your local distributor.

Basic Nomenclature

The nomenclature used to describe parts of a National Crane are described in Figure 1-2. This nomenclature is used throughout this manual.



FIGURE 1-1

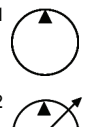
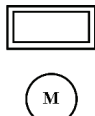
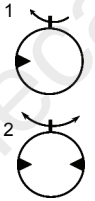
SECTION 2

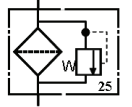
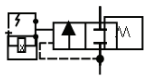
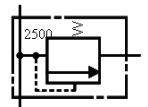
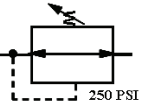
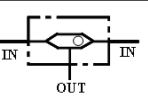
HYDRAULIC SYSTEM

This section describes the hydraulic system, the components which make up the hydraulic system, and the components dependent upon the hydraulic system for their operation. This includes descriptions of the supply pressure and return circuit, pumps, valves, and cylinders. Detailed

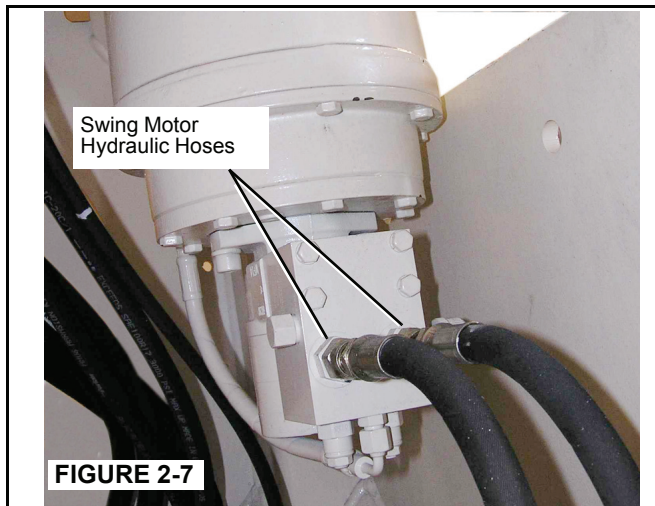
descriptions and operation of individual hydraulic circuits are discussed within their individual sections as applicable. A chart titled Hydraulic Symbols contains all hydraulic symbols used in the hydraulic schematics contained in this manual.

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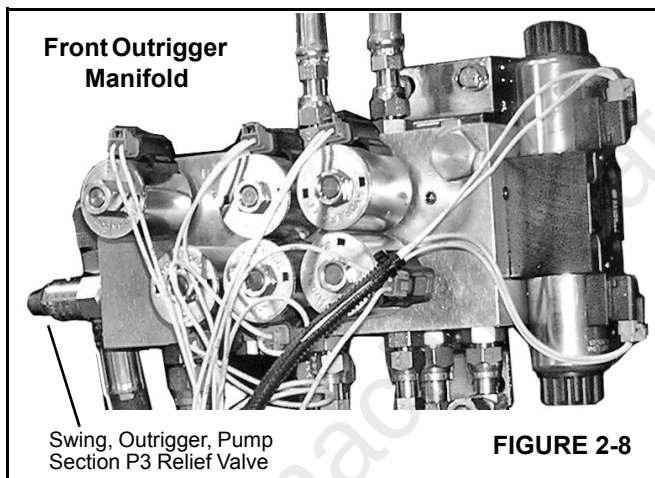
Description	Symbol
Hydraulic Reservoir - Stores, cools, and cleans machines hydraulic fluid supply.	
Hydraulic Return Lines - Terminated at (1) below fluid level (2) above fluid level.	
Hydraulic Pump - (1) fixed displacement (2) variable displacement.	
Power Source - Powers hydraulic pump (1) combustion engine, (2) electric motor.	
Hydraulic Motors - (1) unidirectional, (2) bidirectional.	
Pump Disconnect - Disconnects pump from power source.	
Continuous Line - Supply or return lines.	
Connecting Lines - Branch lines connected to main line.	
Dashed Line - Pilot pressure.	
Dotted Line - Case drain or load sense.	
Chain Line - Enclosure of two or more functions contained in one unit.	
Pressure Transducer - Hydraulic/ electrical located in lift cylinder circuit for cranes LMI circuit.	

Description	Symbol
Filter - Removes contamination from hydraulic fluid.	
Filter with Bypass Valve - Bypass valve allows hydraulic fluid to bypass the filter if the filter becomes clogged.	
Accumulator - Used to either develop flow or absorb shock.	
Check Valve - Creates back pressure.	
Orifice - In-line fixed restriction.	
Adjustable Orifice - In-line restriction used for control device.	
Hydraulic Oil Cooler - Cools hydraulic fluid.	
Temperature Switch - Regulates the hydraulic fluid temperature.	
Hydraulic Pressure Switch - Senses hydraulic pressure to energize electrical components.	
Flow Switch - Illuminates indicator light to indicate a fault.	
Relief Valve - Protects system from being over pressurized.	
Pressure Reducing Valve - Regulates maximum pressure.	
Shuttle Valve - Used to direct maximum pressure to components.	

3. Start the engine and set the throttle to governed rpm.

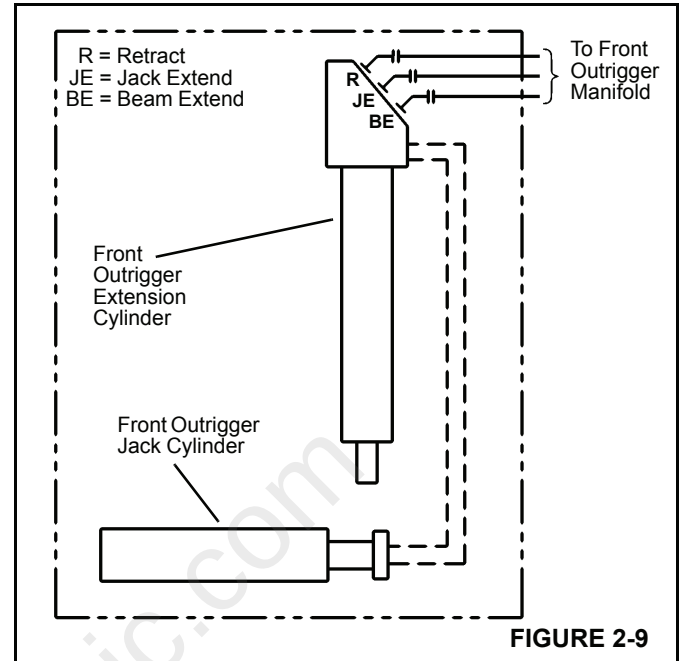


4. Activate the swing control lever and set the relief valve to 3000 +100/-0 psi (20.68 +689/-0 MPa).
5. Shutdown the engine, disconnect the pressure gauge and reconnect the hydraulic hoses at the swing motor.



Swing, Outriggers, and Pump Section P3 Alternate Method

1. Select a front outrigger and remove the retract line from the outrigger extend cylinder.
2. Install a tee connector with a pressure gauge in the retract line (Figure 2-9).
3. Start the engine and set the throttle to governed rpm.
4. Activate the retract function for the selected outrigger and adjust the relief valve for the swing, outriggers, and pump section P3 to 3000 (+100/-0) psi (20684 kPa) (+689/-0).
5. Shutdown the engine and disconnect the pressure gauge and reconnect the stabilizer retract line.

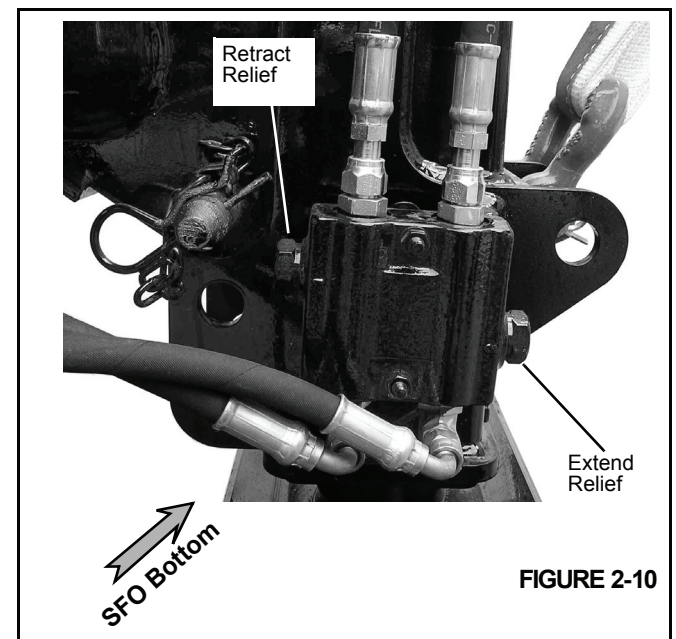


Center Front Stabilizer

1. Disconnect the front stabilizer extend and retract lines (Figure 2-10). Cap the retract line and install a gauge in the extend line.

NOTE: Install a gauge in each line and set the extend and retract pressures as described below with extend/retract switch.

2. Start engine and set at governed rpm.



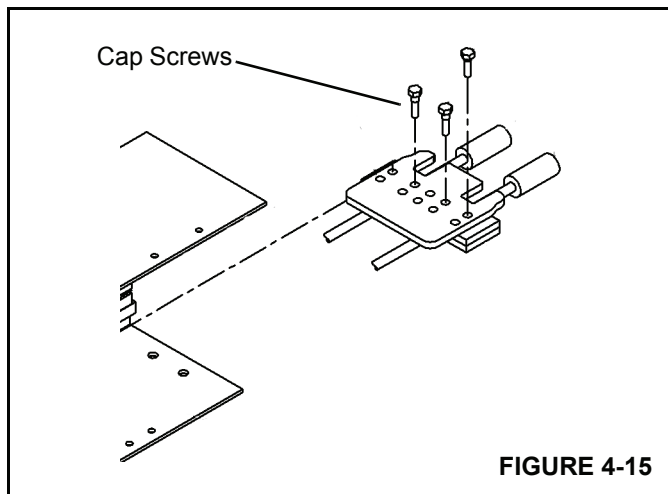


FIGURE 4-15

6. Install the telescope cylinder the rest of the way into the boom assembly.
7. Insert the extend cable anchor assembly into the base end of the 2nd section (Figure 4-16).
8. Thread the extend cable through the extend cable anchor assembly.
9. Install the following onto the extend cable in the following order:
 - a. Spacer
 - b. Round washer
 - c. Hex nut
 - d. Jam nut
 - e. Cable protector
 - f. Retainer plate
 - g. Two cap screws

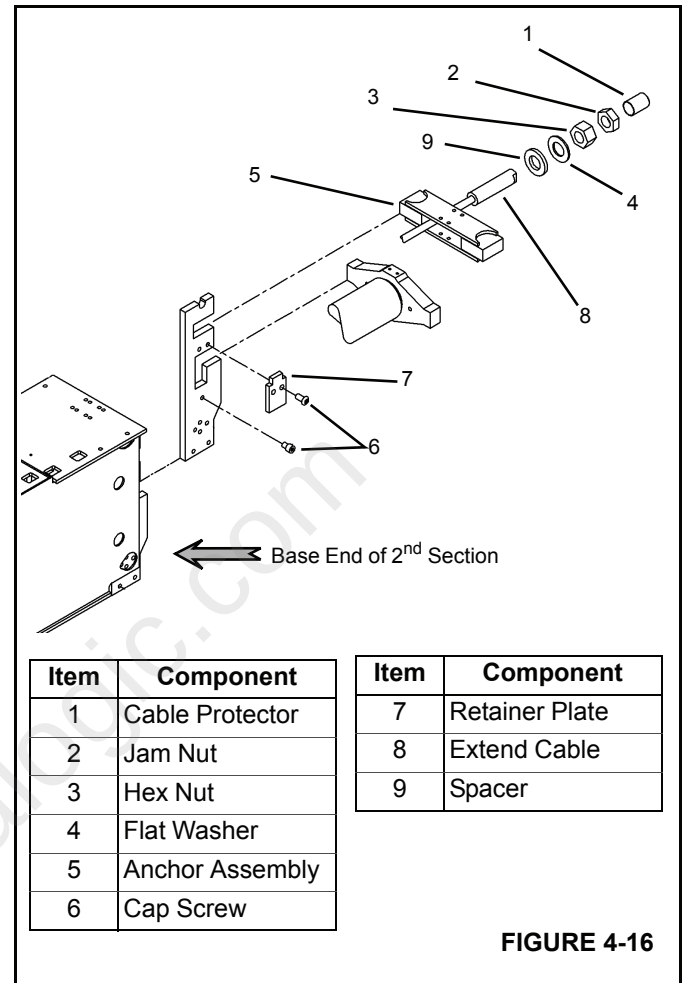


FIGURE 4-16

2nd, 3rd, 4th BOOM SECTION INSTALLATION

1. Slide the 2nd, 3rd, 4th section assemblies into the 1st section until 4 to 5 feet of the assembly is left.
2. Install the lower wear pads at the front end of the 1st section and secure with cap screws (Figure 4-17).
3. Install the side wear pads and shims as required. Secure with cap screws.
4. Install the upper wear pad and secure with a flat washer and cap screws.

Removal

CAUTION

The combined weight of the winch and 325 ft. of wire rope is 685 lbs (310 kg).

NOTE: See Figure 5-1 for item number (#) identification.

1. Remove the cable from the winch drum.
2. Tag and disconnect the winch hydraulic lines. Cap and plug all hydraulic openings.
3. Attach a lifting device to winch and take up the slack.
4. Remove the mounting bolts (5) from the winch.
5. Remove the winch from the crane with the lifting device.

Hydraulic Hoses

Inspect the hydraulic hoses and replace as required.

Winch Installation

1. Attach a lifting device to the winch.
2. Lift the winch with a lifting device onto the turret.
3. Install mounting bolts and washers.
4. Remove the lifting device.
5. Reinstall the hydraulic hoses as per removal tags.

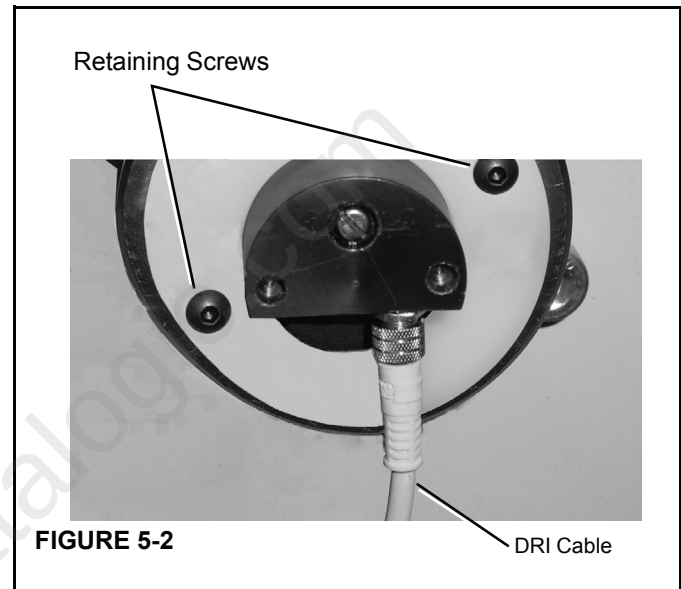
DRUM ROTATION INDICATOR

The drum rotation indicator (DRI) is located on the left side of the winch and transmits a rotation signal to a solenoid (thumb thumper) located in the winch control lever on the operator's seat.

The DRI transducer may have an integral optional Last Layer Indicator (LLI) which is programmed to notify the operator when there are three wraps of cable left on the drum.

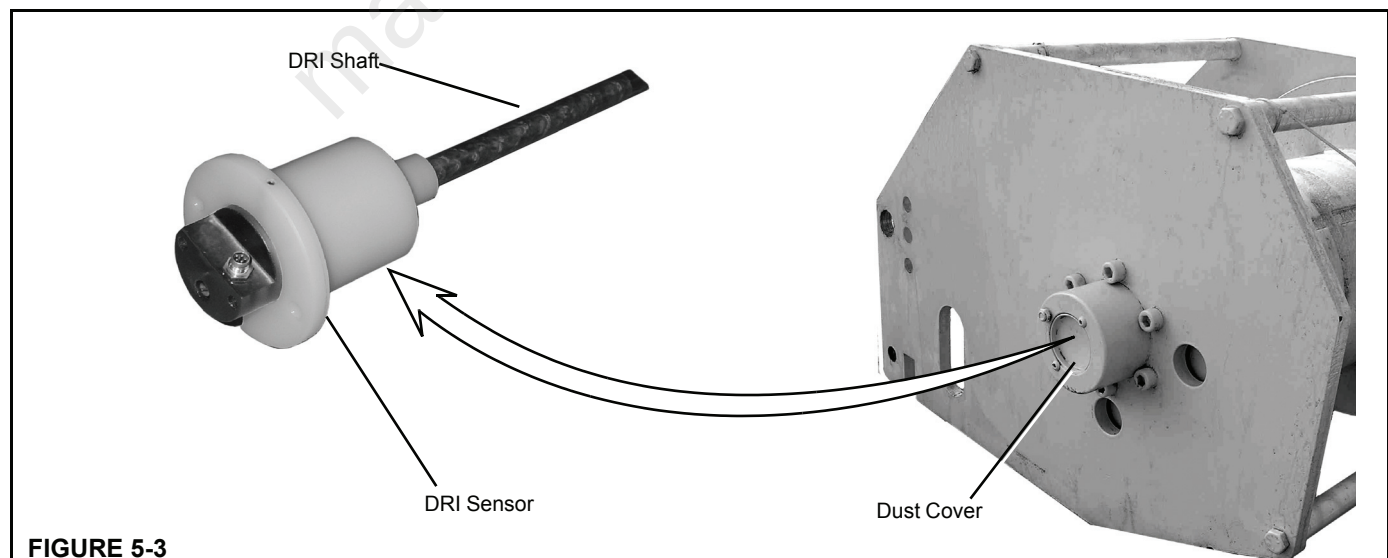
Removal

- Loosen the collar on the connector and unplug the DRI cable.
- Remove the two retaining screws.
- Remove the DRI unit from the winch.



Installation

The DRI is installed on the left side of the drum. For initial installations, remove the dust cover from the center of the drum.

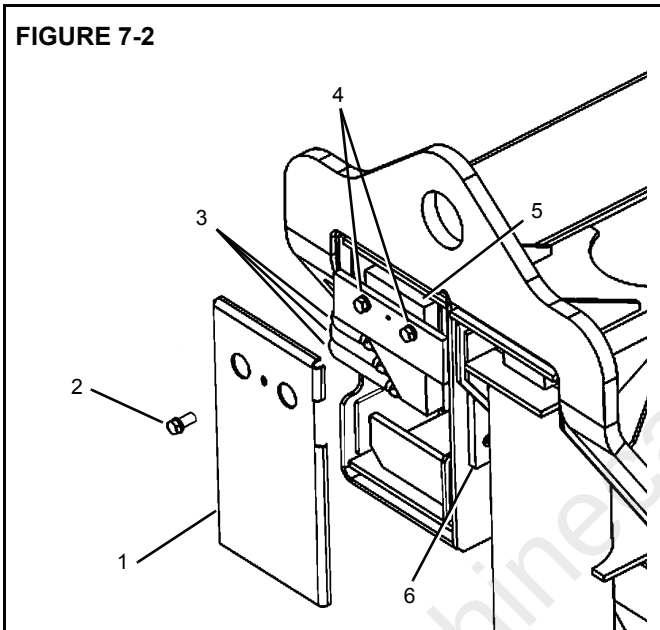


Removal

1. Check that the stabilizer cylinder (1) is fully retracted and the float removed.
2. On the stabilizer cylinder end of the beam, remove the side wear pad set screw in the outrigger box and back off the side wear pad (2) See figure Figure 7-6.
3. Extend the outrigger beam (10) slightly so that a lifting strap (Figure 7-3) can be attached to the outrigger beam.

NOTE: To prevent nicks and gouges to the bottom of the outrigger beam, do not attach chains to the outrigger beam.

FIGURE 7-2



Item	Component
1	Outrigger End Plate
2	End Plate Bolt
3	Outrigger Hydraulic Hoses
4	Extension Cylinder Bolts
5	Barrel End of Extension Cylinder
6	Nonadjustable Wear Pad

4. Tag and remove the hydraulic hoses connected to the extension cylinder (3) (Figure 7-2).
5. Unbolt (2) and remove the end plate (1).
6. Remove the extension cylinder bolts (4) and lower the base of the extension cylinder (5) to the bottom of the outrigger beam.
7. Remove the wear pad set screws in the top of the outrigger beam and back off the top wear pads (7) (Figure 7-1).

8. Remove the wear pad set screws on the side of the outrigger beam and back off the side wear pads (8) (Figure 7-1).
9. Place blocking material under the outrigger beam (Figure 7-3).

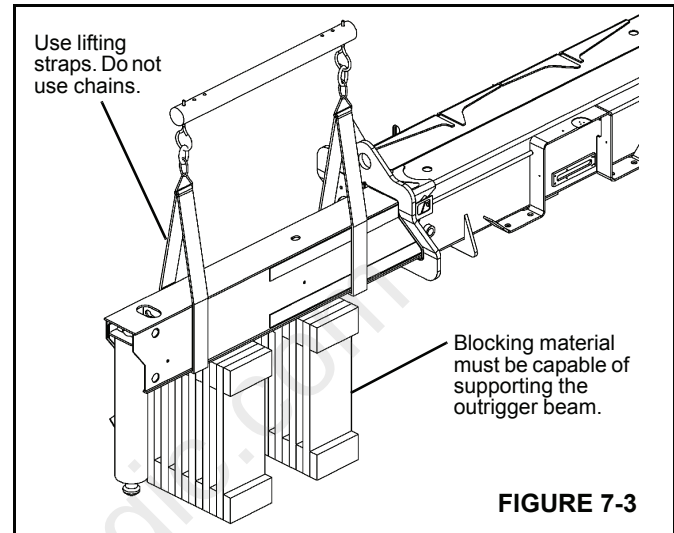


FIGURE 7-3

⚠ DANGER

Blocking material must be able to support the outrigger beam and not allow the beam to tilt or slide.

10. Pull the outrigger beam out of the outrigger box with the lifting device.
11. Position the outrigger beam on the blocking material.

Inspection

Inspect the outrigger beam for bends, evidence of cracks, or other damage. Check the outrigger beam internally for hydraulic fluid, which may indicate a leaking cylinder, loose connection, or damaged hydraulic line.

Installation

1. Apply grease (EP-MPG) to the bottom of the outrigger beam.
2. Screw the bottom wear pads on the outrigger box in until about 0.25 in (6.4 mm) is protruding. This keeps the beam off of the bottom of the outrigger box.
3. Slide the beam into the outrigger housing.
4. Adjust the wear pads as described in Wear Pad Adjustment on page 7-4.
5. Retract the outrigger.
6. Align the base of the extension cylinder barrel up with the holes in the end of the outrigger box.

TRUCK FRAME STRENGTH

For a truck frame to be suitable for a Series 1300H crane, the truck frame must:

- be rigid enough to prevent excessive boom movement due to truck frame deflection when lifting over the front of the unit.
- be strong enough to resist the loading induced by the crane.
- not permanently bend or deform.

The Section Modulus (S.M.), which determines the rigidity of the frame, is a measurement of the area of the truck frame. Resistance to bending moment (RBM) is a measurement of strength and is determined by multiplying the section modulus of each frame rail by the yield strength of the rail material.

The 1300H Series require a minimum of 3,300,000 in-lb (372,850 N-m) RBM and 30 in³ (492 cm³) S.M. from the rear of the truck frame to the front of the front outrigger boxes. The truck frame strength required from the front of the outrigger boxes to the front stabilizer attachment point is variable and is listed in the table below. Most truck frames

have reduced section properties through the front suspension due to truck frame cut outs or because outer channel reinforcement stops short of the front suspension. In these cases it is imperative that the truck frame is measured and the section modulus is calculated and compared to the table below to ensure adequate strength exists for front stabilizer loading.

Distance From Stabilizer Attachment Inches (centimeters)	Section Modulus Per Rail in. ³ (cm ³)
0 - 12 (0 - 30)	2.7 (44)
12 - 24 (30 - 61)	5.5 (90)
24 - 36 (61 - 91)	8.2 (134)
36 - 48 (91 - 121)	11.0 (180)
48 - 60 (121 - 152)	13.7 (224)
60 - 72 (152 - 182)	16.5 (270)
72 - 84 (182 - 213)	19.2 (315)
84 - 96 (213 - 243)	21.9 (359)
96 - 108 (243 - 274)	24.7 (405)
108 - 120 (274 - 304)	27.4 (449)
120+ (304 +)	30.0 (492)

NOTE: All dimensions are inches (centimeters)

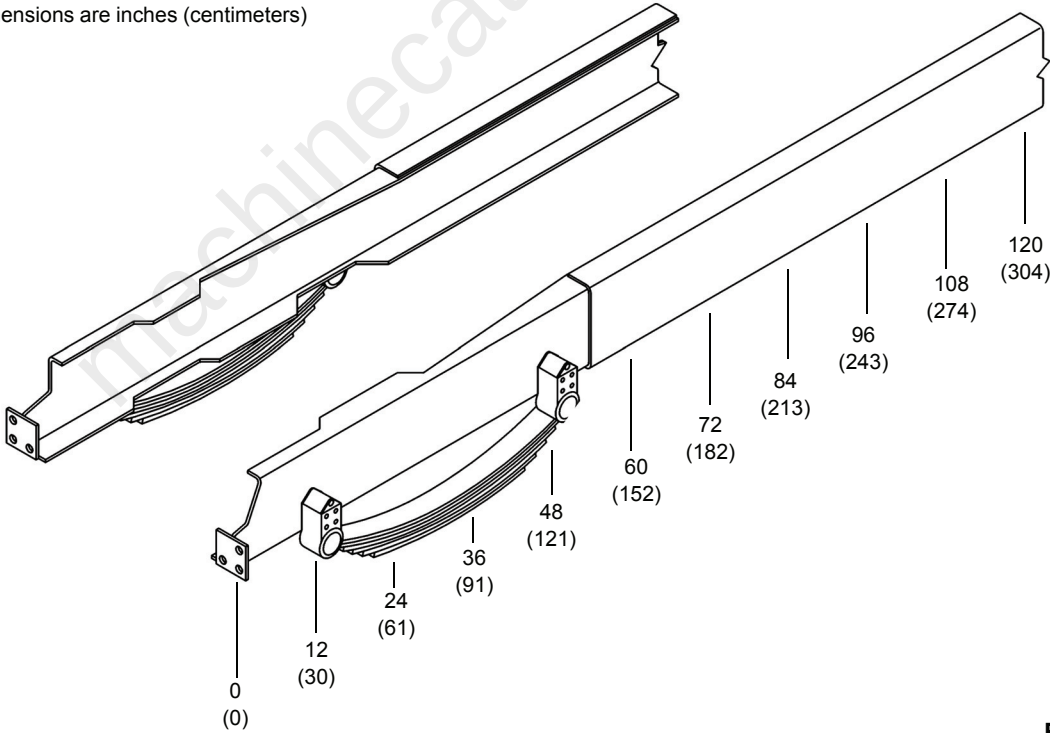
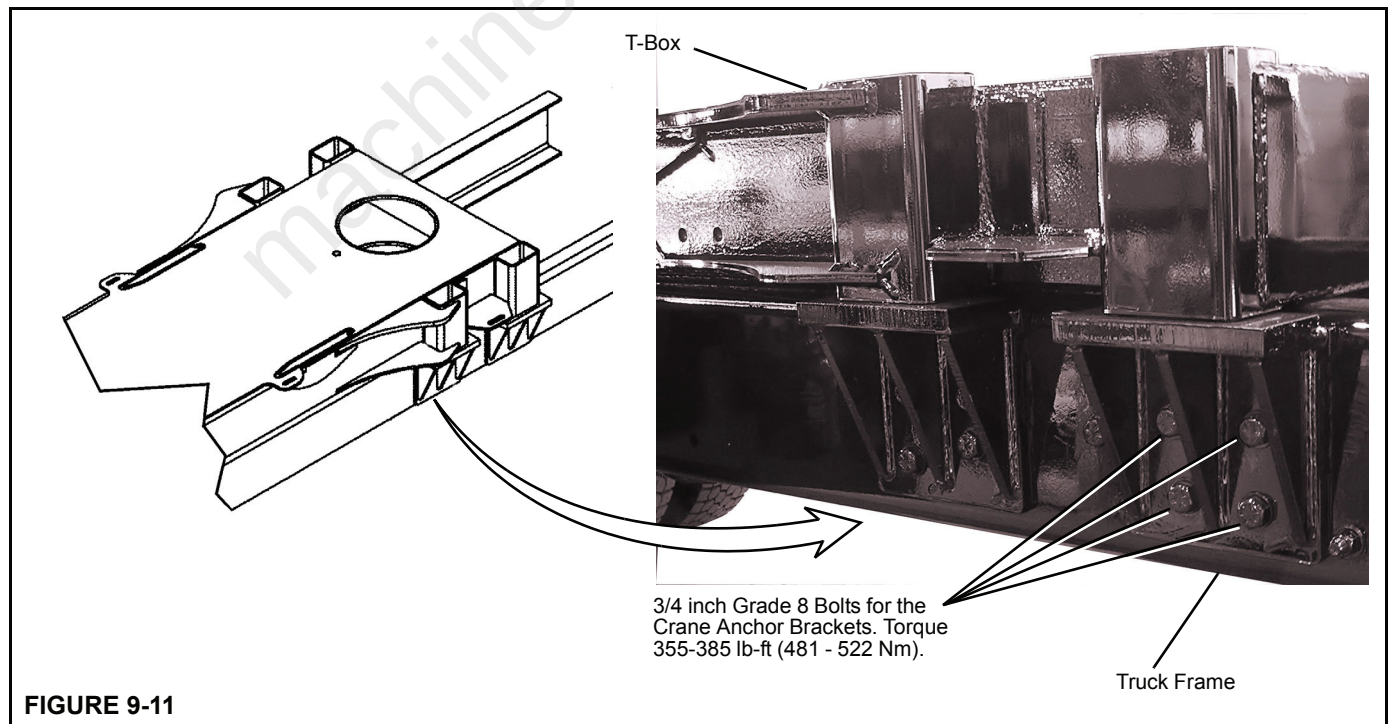
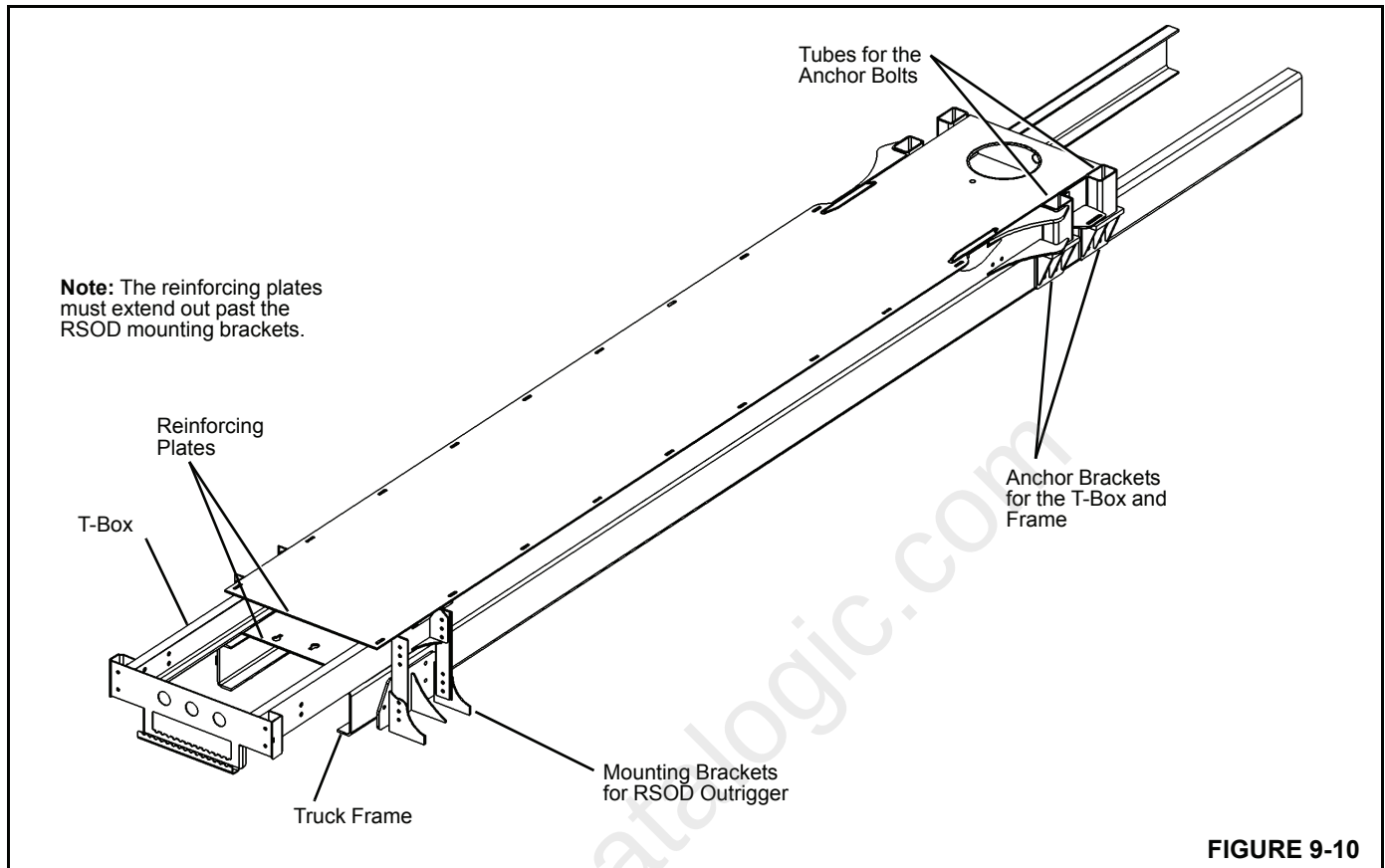


FIGURE 9-4



Full Version Available

National Crane 1300H Boom Truck Service Manual

National Crane 1300H boom truck service manual with repair procedures, adjustments and troubleshooting for the main systems. Instant PDF download.

VIEW THE FULL MANUAL

<https://machinecatalogic.com/national-crane-1300h-boom-truck-service-manual/>

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