

OWNER'S MANUAL

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

1400H Series Telescoping Crane

Crane Model Number

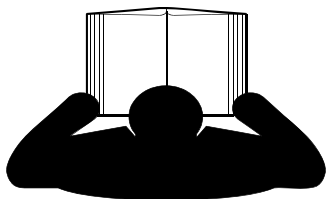
This Manual is divided into the following sections:

INTRODUCTION AND TABLE OF CONTENTS
SAFETY INFORMATION
OPERATING CONTROLS AND PROCEDURES
MAINTENANCE INSPECTION
LUBRICATION
SERVICE
SPECIFICATIONS
INSTALLATION CONFIGURATIONS
INSTALLATION PROCEDURES
OPTIONS

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 Load Chart supplied with crane.
- Store Operator's Manual in holder provided on crane.

SHUTTING DOWN AND PREPARING FOR ROAD TRAVEL

1. Completely retract boom and place securely in boom rack.
2. Secure loadline block so that the block and the boom cannot swing freely. Slowly meter the winch up function to apply slight cable tension. It may be necessary to override the anti-two-block function to tension the cable.
3. Retract all outriggers/stabilizers. The optional front stabilizer should always be retracted first, before main outriggers are retracted. Use a signal person if all outriggers are not visible from the control station.
4. Stow outrigger pads on stow pegs provided if travel is planned on a road with 8 feet (2.44m) maximum width or leave pads pinned on stabilizer legs if travel will occur on a road with 8.5 feet (2.59m) maximum width.
5. Secure any loads or lifting devices on truck bed or body.
6. Disengage Power Take Off (PTO).
7. Release park brake before moving truck.
8. When traveling on the road, check all underpasses to be sure there is sufficient clearance for the unit. Check all road axle laws to insure compliance.

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SERVICE

SERVICE AND REPAIR

The information supplied in this section of the manual is designed to assist you in service and repair of your National Crane. Inspection, lubrication and general maintenance information are found in two previous sections of this manual. Before attempting to perform any service work, the machine must be shut down as outlined under Maintenance Procedure in the Maintenance section of this book.

Generally, a study of the hydraulic schematics in conjunction with a systematic procedure to locate and correct the problem will enable a skilled mechanic to determine the problem and correct it. If at any time you cannot find or correct the problem, contact your local distributor or National Crane Product Support Department. ***Be sure you have your parts and service book, model number and serial number at hand when you call.*** This information is on the serial number placard located on the crane frame.

The following general suggestions should be helpful in analyzing and servicing your crane. Use the following systematic approach should be helpful in finding and fixing problems:

1. Determine the problem.
2. List possible causes.
3. Devise checks.
4. Conduct checks in a logical order to determine the cause.
5. Consider the remaining service life of components against the cost of parts and labor necessary to replace them.
6. Make the necessary repair.
7. Recheck to ensure that nothing has been overlooked.
8. Functionally test the new part in its system.

Note: Your safety and that of others is always the number one consideration when working around cranes. Safety is a matter of thoroughly understanding the job to be done and the application of good common sense. It is not just a matter of "Do's" and "Don'ts". Stay clear of all moving parts.

CLEANLINESS

An important item in preserving the long life of the crane is keeping dirt out of working parts. Enclosed compartments, seals, and filters have been provided to keep the supply of air, fuel and lubricants clean. It is important that these enclosures be maintained.

Whenever hydraulic, fuel, lubricating oil lines are disconnected, clean the adjacent area as well as the point of disconnect. As soon as the disconnection is made, cap, plug or tape each line or opening to prevent entry of foreign material. The same recommendation for clean-

ing and covering apply when access covers or inspection plates are removed.

Clean and inspect all parts. Be sure all passages and holes are open. Cover all parts to keep them clean. Be sure parts are clean when they are installed. Leave new parts in their containers until ready for assembly.

HYDRAULIC SYSTEMS

Contaminants in a hydraulic system affect operation and will result in serious damage to the system components. Dirty hydraulic systems are a major cause of component failures.

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.

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

When installing metal hydraulic 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. The hose should be installed so any bend is with this curvature.

In case of replacement hoses with angled stem reusable fittings, the hose curvature must be taken into consideration when assembling and positioning the angled stem.

FASTENERS AND TORQUE VALUES

Use bolts of the correct length. A bolt which is too long may bottom before the head is tight against the part it is to hold. If a bolt is too short, there may not be enough threads engaged to hold the part securely. Threads can be damaged. Inspect them and replace fasteners as necessary. (See Maintenance Section for Torque Chart.)

Torque values must correspond to the size and grade bolts, studs, and nuts being used.

The torque tables are provided in the Maintenance Section for reference when performing maintenance.

Use of proper torque values is extremely important. Improper torquing can seriously affect performance and reliability.

are .06 inch (1.5mm) off center in the plate and .03 inch (.8mm) off center in the wear pad. Various combinations of rotation of these parts allow the adjustment plates function as rear side clearance adjustment.

22. Position sheave and sheave pin located in cable loop on top of 3rd to allow capscrew installation, through top plate of 2nd. Install capscrews and torque to specification, clamping sheave pin and sheave to the bottom of the 2nd section top plate.
23. Assemble retract sheaves, retract sheave pins and cable keeper plates in rear of 2nd section. Coat surfaces of bearings with grease before assembly.
24. Place retract cables anchored to 3rd over top of retract sheaves attached to rear of 2nd. Install keeper capscrew above sheave to hold retract cables in place.
25. Reeve cables over retract sheave and install keeper/wear pad to bottom rear of 2nd section. This pad acts as a side pad, bottom pad, and a cable retainer.
26. Assemble exterior extend cylinder components. Install and center sheave pin sheave case end of extend cylinder. Install bearings into extend cable sheaves. Coat surface of bearings with grease and assemble extend sheaves on sheave pin.
27. Wrap approximately 10 feet (300 cm) of each 7/8 inch (22.22 mm) diameter 2/3/4 extend cable around extend sheaves and install 4th section extend cable anchor around cables at button end. Do not tighten capscrews clamping anchor together completely. These capscrews if tightened completely will not allow cable anchor to install into 4th section.
28. Install wear pad over extend cylinder sheave side plates. This serves as a wear pad to keep the end of the extend cylinder centered in the boom, as well as an extend cable retainer.
29. Slide extend cylinder/extend cables into 2nd-3rd-4th boom assembly enough to assemble extend cable anchor into bottom rear of 4th section. Be aware of extend cable location when inserting cylinder into boom sections, inadvertent crushing or other damage to cables will warrant replacement.
30. Tighten capscrews clamping extend cable anchor together. This will also lock anchor in place in the anchor cutouts in the 4th section.
31. Visually verify that the extend cables are properly routed on their sheaves and continue to slide with the extend cylinder and cables into the boom sections. Keep extend cables supported and slightly tensioned during insertion of cylinder to maintain proper cable placement.
32. As the extend cylinder nears complete insertion into the 2nd-3rd-4th section assembly, adjust the

height of the cylinder to allow the cylinder anchor collars to access the cylinder keeper cut-outs in the doubler plates on the sides of the 2nd and 3rd sections.

33. Drop the cylinder down into the vertical cutouts in the doubler plates on the sides of the 2nd and 3rd sections. Cylinder length or boom section placement may have to be adjusted to allow cylinder collars to drop into their proper position.
34. Install lock bar and capscrews to the extend cylinder collar in the 3rd section.
35. Install large extend cable anchor into anchor cut-outs in the doubler plates in the rear of the 2nd by routing the 7/8 inch (22.22 mm) extend cables through the anchor and the small 7/16 inch (11.11 mm) cable over the anchor. Slide anchor fully into cutout.
36. Install keeper plates and hardware. This keeper plate retains both the horizontal movement of the extend anchor and the vertical movement of the extend cylinder.
37. Install 2nd-3rd-4th section boom assembly into 1st section boom, use caution when sliding sections together, 3rd retract cables must maintain their position to prevent damage, do not let boom rest on cables. Damage will result.
38. Assemble bottom front wear pads for 1st section and Teflon plugs.
39. Using appropriate lifting device, lift 2nd-3rd-4th section assembly to allow for wear pad installation in front of 1st. Install wear pads. Slide sections together within 12 inches (30 cm) of full retraction.
40. Install upper spacer to front of 1st section.
41. Install front side wear pads with appropriate shims between 2nd and 1st sections. If boom has been disassembled, and no sections have been replaced, use same shim quantity and location as was previously used. If locations are in question, refer to shim calibration section in this book.
42. Push boom together until extend cylinder butt plate makes contact with the rear cylinder anchor plates in the rear of the 1st section. Install spacers, washers and capscrews, attaching cylinder to 1st section boom. If cylinder is misaligned with anchor points, cylinder butt plate can be rotated to achieve proper alignment (holding valve up, parallel with boom top plate).
43. Assemble top rear wear pads to the top of the 2nd boom section with the cam plates and install through the winch mount end of the boom. Install capscrew through holes in outer boom sections.

The wear pads on each side at the top/rear of the boom can be adjusted over a range of 3/16 inch (4.8mm) by rotating, end for end, the wear pad and plate or the wear pads and plate inde-

SERVICING THE OUTRIGGER, STABILIZER AND TURN CONTROL VALVE

Before servicing the control valve, please familiarize yourself with the valve, plumbing components, mounting area and environment. Only work on the valve in an environment free from contamination so that the stipulated contamination level of oil is not exceeded. All valve connections and plumbing components must be plugged until connections are made.

REPLACING SPOOL SEALS

1. Remove both capscrews and bonnet from spring end of spool.
2. Carefully remove the compressed spring package and spool (one side only).
3. Remove both capscrews from bracket on linkage end of spool and remove bracket.
4. Remove spool seals and thoroughly clean spool seal counterbores.
5. Lightly oil new spool seals and install in counterbores.
6. Reinstall all components in the same order as they were removed.

7. Torque spring spacing screw and capscrews to 50 in-lb (6 N·m) maximum.

REPLACING SECTION SEALS

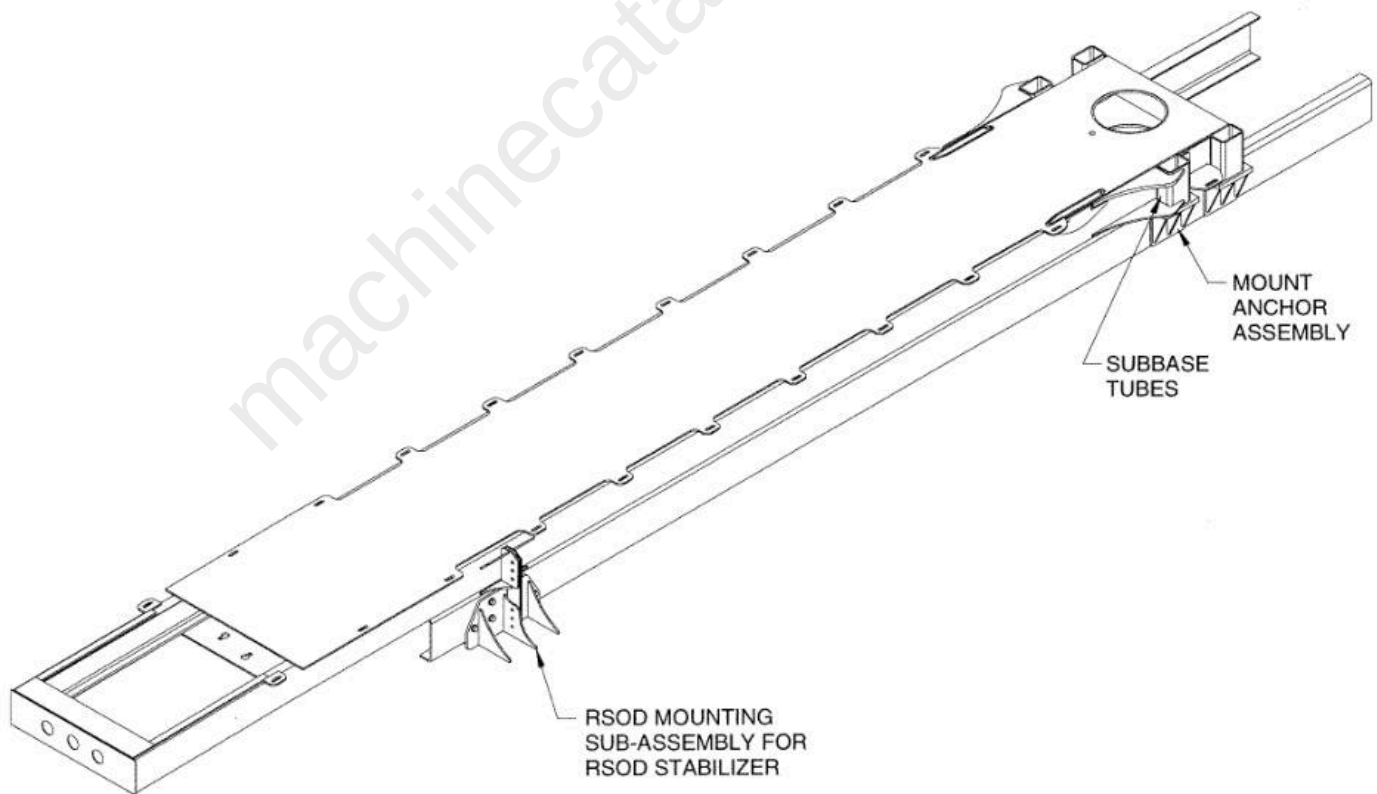
1. Remove the tie rods with a 17 mm open wrench or socket and pull the sections a part.
2. Thoroughly clean O-ring surfaces on each section. Replace section seals with the proper O-rings for tank gallery and Quad-rings for the pressure channels.
3. Reinstall the sections in same order as they where removed. Tighten tie-rods in two steps. Torque all three rods to 11 ft-lb (15 N·m) then torque all three rods to 20 ft-lb (27 N·m).

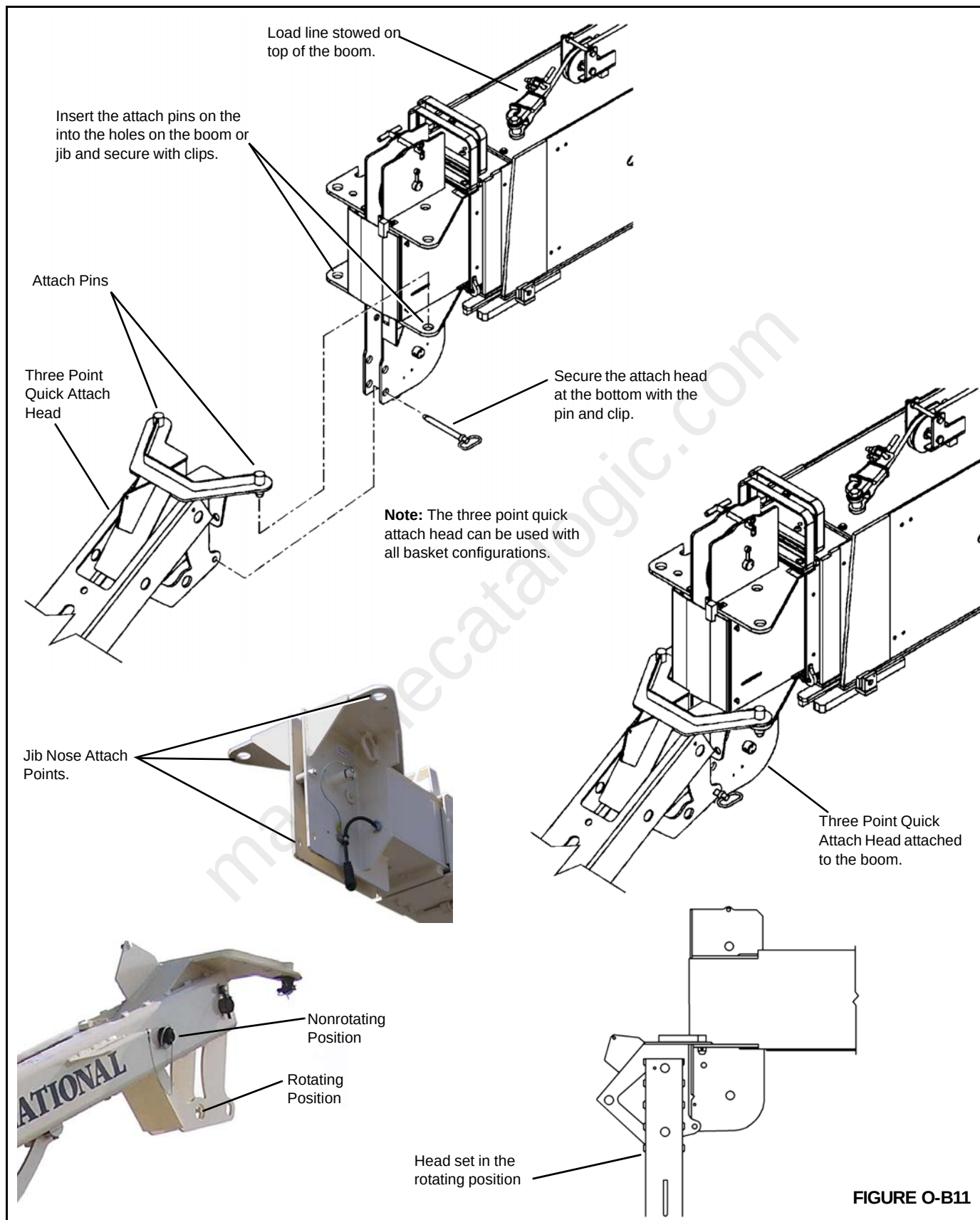
TIGHTENING TORQUES (MAXIMUMS)

1. Main Studs - Initial Torque 11 ft-lb (15 N·m)
Final Torque 20 ft-lb (27 N·m)
2. Main Relief Valve 35 ft-lb (47 N·m)
3. Anti Cavitation Valve 40 ft-lb (54 N·m)
4. Bonnet and Bracket 50 in-lb (6 N·m)
5. Steel Plugs (SAE #10) 50 ft-lb (68 N·m)

CRANE INSTALLATION

1. Determine installation position for the crane considering the operating area of the crane, space for saddle tanks, truck frame crossmembers, or anything that might affect installation and be sure the frame is clear of any obstructions that might interfere with proper installation. The top and bottom subbase reinforcing plates must extend past the RSOD mounting sub-assembly. If this is not achievable, due to a long cab to tandem (CT) dimension or special mounting configuration, contact the factory before proceeding.
2. Center the subbase on the chassis at the proper location. Loosely assemble two mount anchor assemblies per side to subbase and look for interference with truck crossmembers.
3. If subbase does not fit tightly on truck frame at all locations, clamp them together to remove gaps.
4. Making certain that subbase is tight against truck frame and mount anchor assemblies are tight against bottom of subbase tubes, drill four 3/4 inch diameter holes through the truck frame at each mounting plate using the holes in the mount anchor assembly as pilot holes. Install 3/4 inch diameter Grade 8 bolts, washers and nuts in mounting plates.
5. With RSOD stabilizers retracted, determine the distance from the top of the stabilizer frame cross tube to ground level that will give you approximately 11 inches (28 cm) of ground clearance to the bottom of the stabilizer foot. This will give approximately 14 inches (35 cm) of stabilizer penetration. Before final mounting the RSOD brackets make sure that the tops of the stabilizer vertical cylinder are below the top of the torsion box. Keep in mind that the truck frame may settle slightly with the addition of the crane frame, boom, bed and payload. Using this determined vertical dimension, position the RSOD mounting sub-assembly approximately 12 inches (30 cm) behind the rear tires. Check for truck frame bolt or rivet interference. Cut clearance holes for rivet heads. Mark and drill six 3/4 inch diameter bolt holes as specified through RSOD mounting sub-assemblies and truck frame and install six 3/4 inch diameter Grade 8 bolts, washers and nuts per side. Tighten to proper torque.





Full Version Available

National Crane 1400H Boom Truck Operator Manual

National Crane 1400H boom truck operator manual covering controls, safe operation, setup and inspection. 2 PDF files, 328 pages. Instant PDF download.

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