



PRELIMINARY

OPERATOR'S MANUAL

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

900H Series Cranes

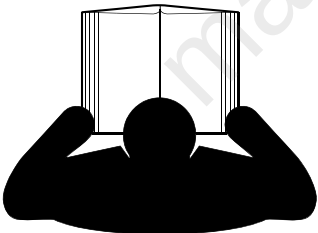
This Manual is divided into the following sections:

SECTION 1	INTRODUCTION
SECTION 2	SAFETY PRECAUTIONS
SECTION 3	CONTROLS AND OPERATING PROCEDURES
SECTION 4	SET-UP
SECTION 5	LUBRICATION PROCEDURE AND CHARTS
SECTION 6	MAINTENANCE CHECKLIST
SECTION 7	LOAD MOMENT INDICATOR
OPTIONS	PERSONNEL BASKET

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 right side of the turret. **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.

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ELECTROCUTION HAZARD

Federal law [29CFR1910.180 and 29CFR1926.550] prohibits the use of cranes closer than 10 ft (3 m) to all power sources of up to 50,000 volts. For higher voltages, one additional foot (30 cm) for each 30,000 volts of additional voltage is required.

Keep all personnel away from this machine if it is being operated near electrical power lines or equipment.

Before operating this crane in the vicinity of electrical power lines or equipment, notify the power utility company. Obtain positive and absolute assurance that the power has been turned off.

This machine is NOT INSULATED. Always consider all parts of the load and the crane, including the wire rope, winch cable, pendant cables, and tag lines, as conductors.

Most overhead power lines ARE NOT insulated. Treat all overhead power lines as being energized unless you have reliable information to the contrary from the utility company or owner.

The rules in this manual must be followed at all times, even if the electrical power lines or equipment have been de-energized.

Crane operation is dangerous when close to an energized electrical power source. Exercise extreme caution and prudent judgement. Operate slowly and cautiously when in the vicinity of power lines.

If the load, wire rope, crane boom, or any portion of the crane contacts or comes too close to an electrical power source, everyone in, on, and around the crane can be seriously injured or killed.

The safest way to avoid electrocution is to stay away from electrical power lines and electrical power sources.

You, the operator, are responsible for alerting all personnel of dangers associated with electrical power lines and equipment. The crane is not insulated. Do not allow unnecessary personnel in the vicinity of the crane while operating. Permit no one to lean against or touch the crane. Permit no one, including riggers and load handlers, to hold the load, load lines, tag lines, or rigging gear.

Even if the crane operator is not affected by an electrical contact, others in the area may become seriously injured or killed.

It is not always necessary to contact a power line or power source to become electrocuted. Electricity, depending on magnitude, can arc or jump to any part of the load, load line, or crane boom if it comes too close to an electrical power source. Low voltages can also be dangerous.

Thoroughly read, understand, and abide by all applicable federal, state, and local regulations.

diagram, and winch data sheet. In the examples shown here, the information for the outriggers fully extended is used.

- The load chart (Figure 3-7) is used to determine the weight limit of the load based on the load radius and boom angle. All lifting devices must be included when determining the weight of the load.
- The range diagram (Figure 3-8) shows the operating radius and the height from horizontal of the unloaded boom.
- The winch data chart (Figure 3-9) shows winch capacity and multipart line reeving. The correct reeving for all loads listed in the load chart is also shown.

Before you can determine the crane configuration you need to know:

- the weight of the load to be lifted.
- the lifting devices and weights needed.
- the height of the lift.
- the horizontal distance from the center of rotation (load radius) to where the load is to be placed.

To determine the safe operating parameters you need to:

1. Get the weight of the load to be lifted.
2. Approximate the load radius. This is the horizontal distance from crane center of rotation to where the payload is to be placed.

3. Determine the lifting devices and hook block reeving using the winch data chart.
4. Calculate the combined weight of the lifting devices and load to be lifted.
5. Determine the boom angle and length from the range diagram using the height and load radius of the lift.
6. In the load chart, take the load radius and boom angle/length column over to the weight column and check the weight. If the weight is between two values, use the lower value.

LIFTING THE LOAD

The following general guidelines outline the proper procedure for making a lift after the crane has been properly set up.

1. Position the crane in the work area and set the outriggers. See page 4-1 for outrigger setup.
2. Program the LMI. Use the load chart to estimate the values.
3. Position the boom nose over the load. Do not try and drag the load with the boom or winch.
4. Perform the lift. Meter the controls when moving the load to avoid sudden stops.
5. Retract and lower the boom after the lift is complete.

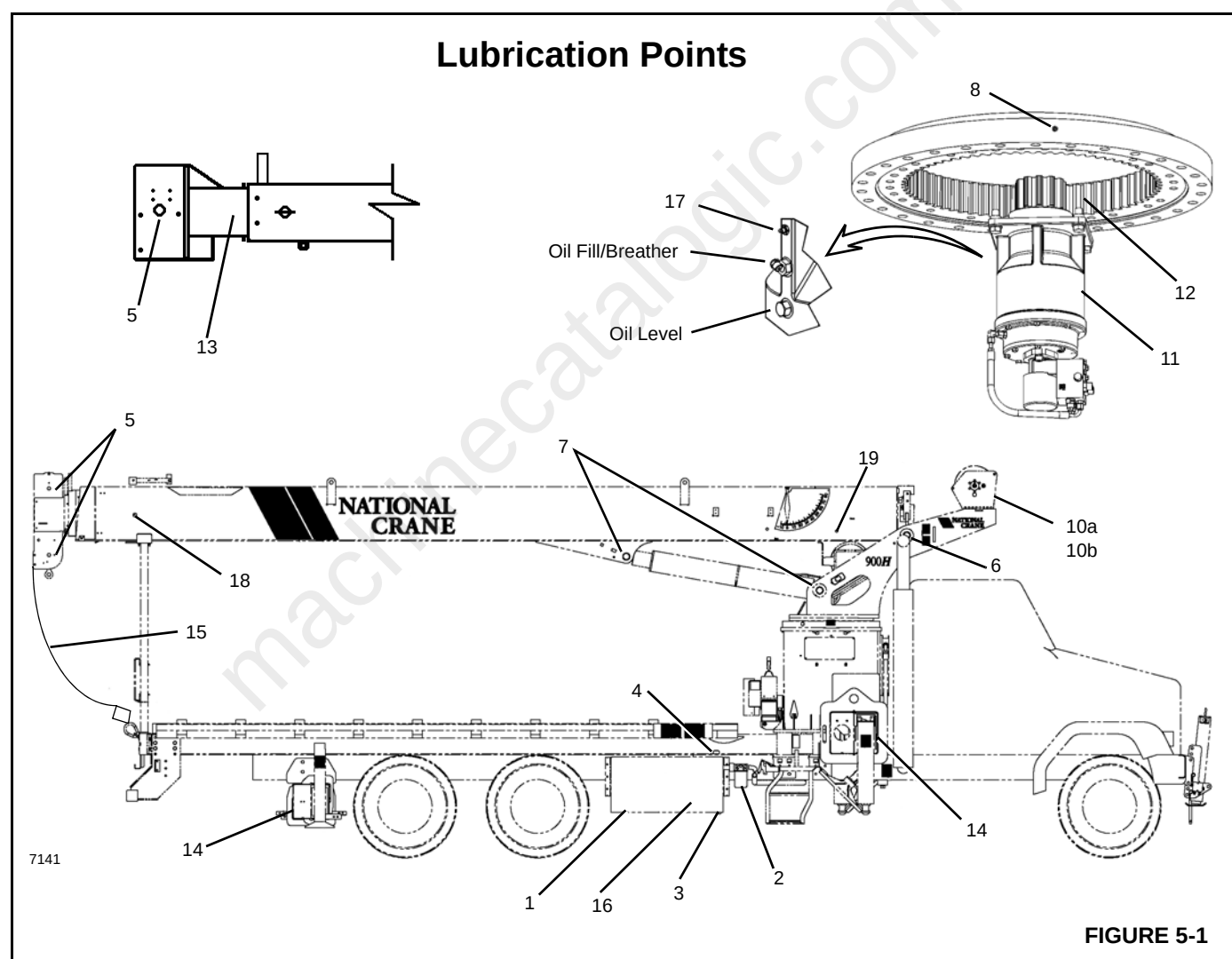
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LOADED RADIUS (ft)	LOADED BOOM ANGLE (deg)	27 FT BOOM (lb)	LOADED BOOM ANGLE (deg)	41 FT BOOM (lb)	LOADED BOOM ANGLE (deg)	54 FT BOOM (lb)	LOADED BOOM ANGLE (deg)	66 FT BOOM (lb)	LOADED BOOM ANGLE (deg)	78 FT BOOM (lb)	LOADED BOOM ANGLE (deg)	90 FT BOOM (lb)
5	77	40,000										
8	70	25,750										
10	66	21,400	74	20,950								
12	61.5	18,450	71	17,750	76	17,000						
14	57	16,400	68	15,250	74	15,000	77.5	14,450				
16	51	14,750	65.5	13,300	71.5	13,200	75	12,000				
20	40	11,250	58.5	10,800	67.5	10,300	72	9,950	76	9,700	77.5	7,850
25	19	7,500	50	9,050	61.5	8,500	67	7,900	71.5	7,750	74.5	7,550
30			40	7,550	55	7,000	62.5	6,450	68	6,250	71.5	6,150
35			26.5	5,250	48	5,000	58	5,450	63.5	5,200	68	5,050
40					40	4,800	52	4,550	59.5	4,400	64.5	4,200
45						4,350	46.5	3,850	54.5	3,700	61	3,550
50						3,900	42.5	3,450	50	3,150	57	3,000
55							31	2,550	44.5	2,650	53.0	2,550
60							21.5	1,800	39.5	2,250	48.5	2,150
65									32.5	1,750	44	1,850
70									24	1,250	39	1,500
75									11	450	33	1,150
80											26.5	800
	0	4,150	0	1,950	0	850						

FIGURE 3-7

Symbol	Description	Manitowoc Lube Specification	
		Standard	Cold Weather -40° F (-40° C)
EP-MPG	Extreme Pressure Multipurpose Grease	A6-829-003477	A6-829-104275
GL-5	Extended Service Interval Gear Lubricant	A6-829-012964	A6-829-014058
HYDO	Hydraulic Oil	A6-829-006444	A6-829-101559
EP-OGL	Open Gear Lubricant, CEPLATTYN 300 Spray, NLGI Grade 1-2	A6-829-102971	Standard
AGMA EP-4	Extreme Pressure Gear Lubricant.	A6-829-100213	A6-829-103636
WRL	Wire Rope Lubricant	A6-829-015236	Standard

NOTE: Cold weather lubricants are not sufficient for temperatures below -40° F (40° C). Use hydraulic tank heaters and insulate where appropriate.



Daily Inspections

All cable in continuous service must be inspected at the beginning of each work day. Inspect the eye end and length of cable that is used in daily operation. The end should be inspected for abrasion, corrosion, broken wires, and loose or broken servings. Inspect the remainder of the cable length used for daily operations for points showing kinks, sharp bends, or any other evidences of damage or excessive wear.

Monthly Inspections

Inspect the eye end and length of cable normally used in daily operations. Examine the rest of the cable for kinked, crushed or otherwise damaged points.

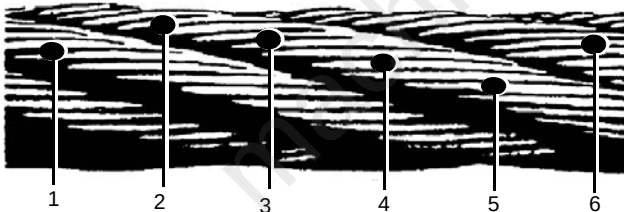
Periodic Inspections

Inspect the eye end of the cable for greater wear than the rest of the cable. If the cable is in good condition, reverse the cable on the drum so that the wear is equalized along the total length of the cable.

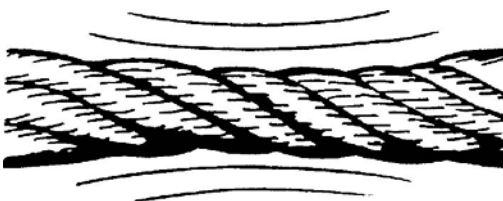
Wire Rope Replacement

It is difficult to determine the exact time for replacement of wire rope (winch cable) since many variable factors are involved. Proper determination of the condition of a rope depends upon the judgment of an experienced person. The following reasons are sufficient for consideration of rope replacement:

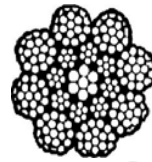
Six randomly distributed broken wires in one rope lay or three broken wires in one strand in one lay. The rope is unsafe for further use if there are either three broken wires in one strand (Breaks 2, 3, 4) or a total of six broken wires in all strands in any one lay.



- Wear of one-third the original diameter of outside individual wires. Worn rope, usually indicated by flat spots on the outer wires as shown is unsafe for further use when less than two-thirds the thickness of the outer wire remains.
- Necking down of the rope indicates core failure.



- Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure.
- Evidence of heat damage.
- Reductions from nominal diameter of more than 1/64inch (.4mm) for diameters to 5/16inch (8mm), 1/32inch (.8mm) for diameters 3/8inch (9.5mm) to 1/2inch (12.7mm), 3/64inch (1.2mm) for diameters 9/16inch (14.3mm) to 3/4inch (19.1mm) and 1/16inch (1.6mm) for diameters 7/8inch (22.2mm) to 1-1/8inch (28.6mm).
- One outer wire broken at its point of contact with the core of the rope which has worked its way out of, and protrudes or loops out from the rope structure. Additional inspection of this section is required.



Care of Wire Rope

Handle wire rope with care to prevent damage to the individual wires which affect the overall strength and performance of the rope. Do not allow the formation of kinks, because this displaces the strands of wire from their original position and relation to each other causing severe bending and unequal tensions in the strands. This distortion and wire displacement cannot be corrected even under high tension and a permanent weak point remains in the rope. Displaced or raised wires indicate a previous kink, but does not show the damaged condition of the inner rope wires.

Never pull wire rope over a non-rotating support such as a spindle bar, a pin, or an inoperative sheave. This practice causes severe abrasion to the outer strand wires. A properly operating sheave or snatch block is essential to safety and long service life of the rope.

Do not use worn sheaves or sheaves with flat grooves because they do not provide sufficient support to prevent the distortion and flattening of the rope. Sheaves with nicked or broken flanges can cut or otherwise damage the rope.

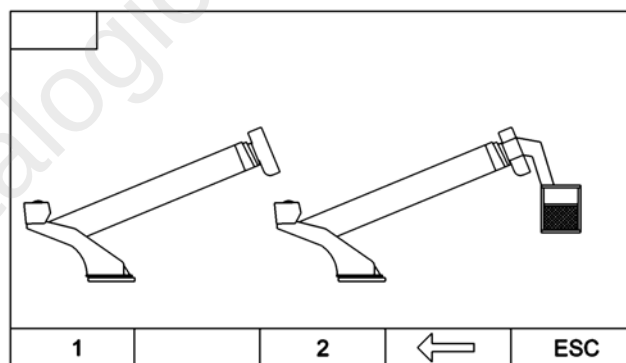
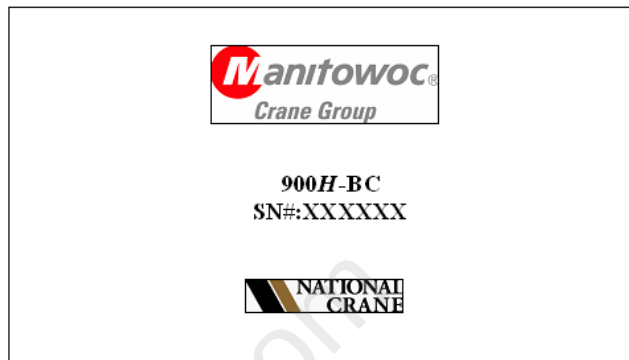
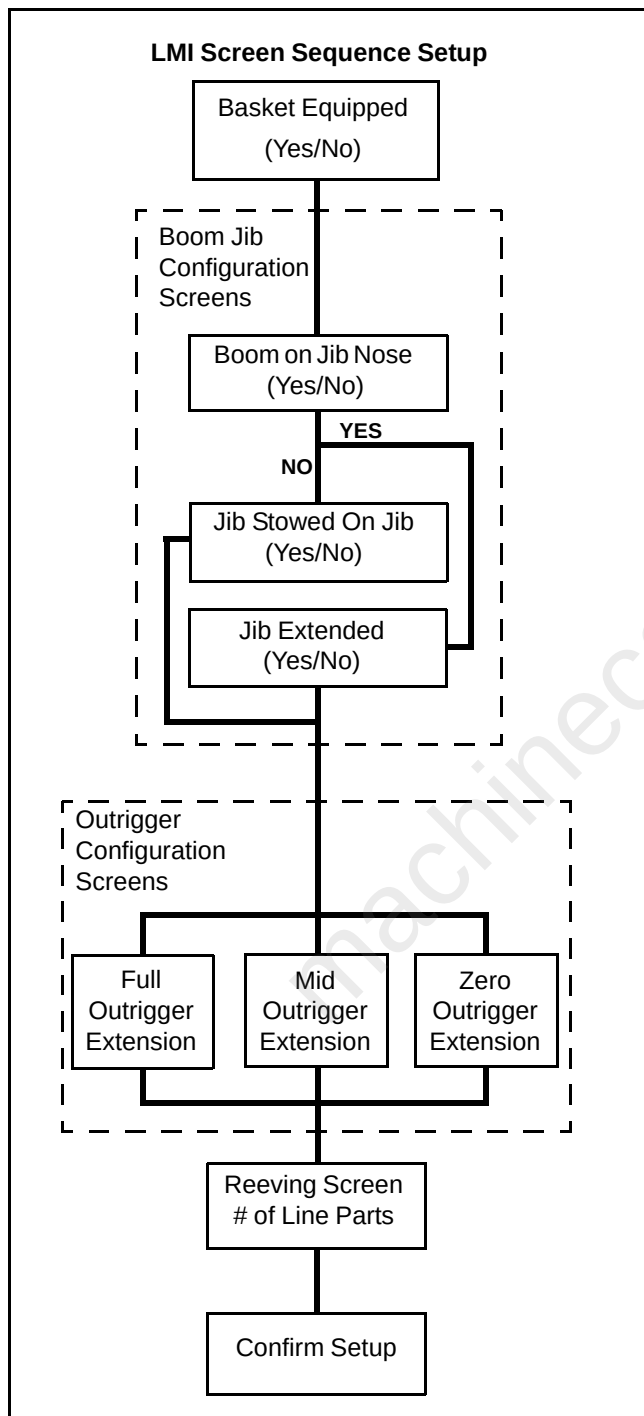
An even distribution of rope coils over the winch drum is essential to smooth operation. This prevents the rope from cutting down through or crushing other coils on the drum resulting in damage to and difficulty in unwinding the rope.

REPLACEMENT CABLE

If the winch cable needs to be replaced, care should be taken in selecting a suitable replacement cable. The cable strength requirements are shown on the crane load chart. The types of cable are optional with 6 x 25 and Dyform being the most common. A high strength, rotation resistant cable is preferred and is furnished as standard by National Crane.

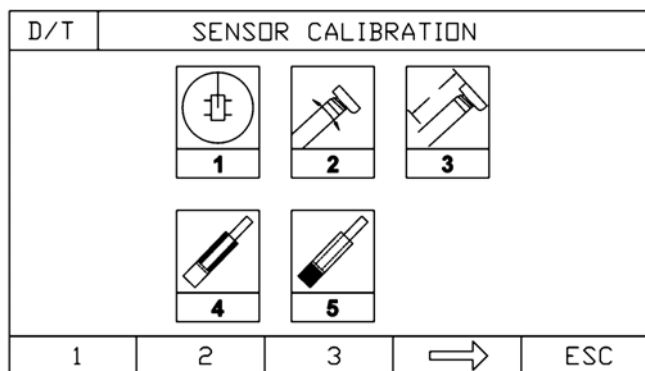
LMI SETUP

The LMI setup is where the lift configuration of the crane is entered into the system. The LMI setup is required before the crane can be operated. When the crane ignition switch is turn on, the LMI powers up and displays the crane model and serial number for a few seconds and then displays the first screen in the LMI setup sequence.



Is a basket attached to the boom or jib nose? Select 1 or 2.

NOTE: The ESC function here takes you to the Main Menu.

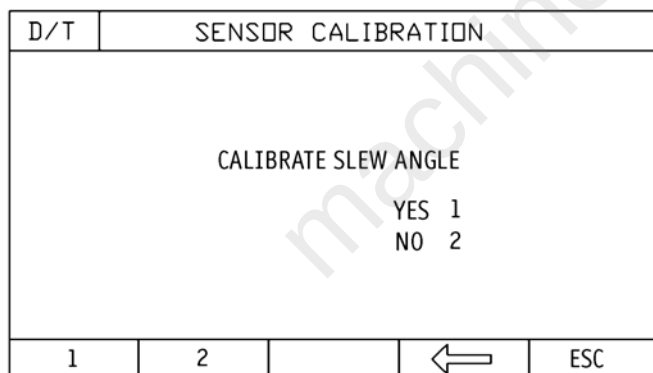


The sensors are displayed in the sensor calibration screen. Choices are:

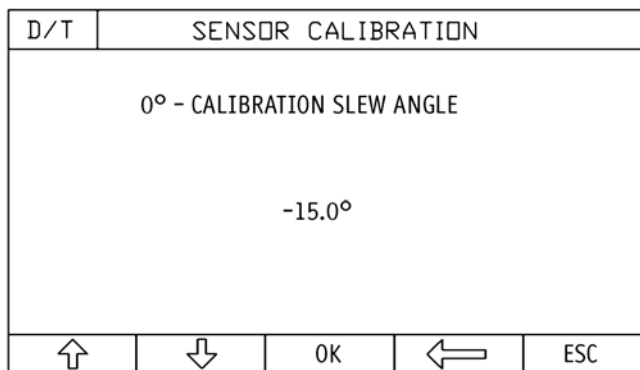
1. Slew Angle
2. Boom Angle
3. Boom Length
4. Lift Cylinder Rod Pressure
5. Lift Cylinder Piston Pressure

Slew Potentiometer Calibration

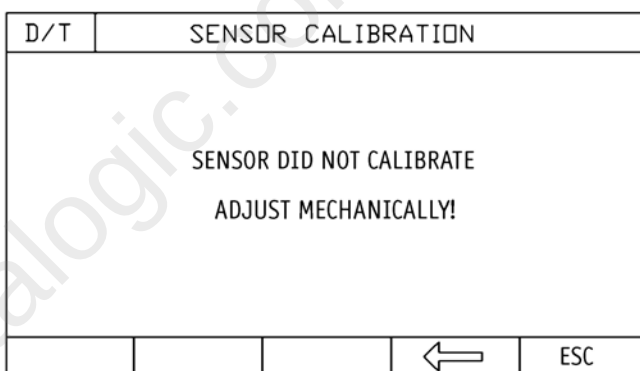
Position the boom on the truck centerline in the boom rest and select 1 from the main calibration screen



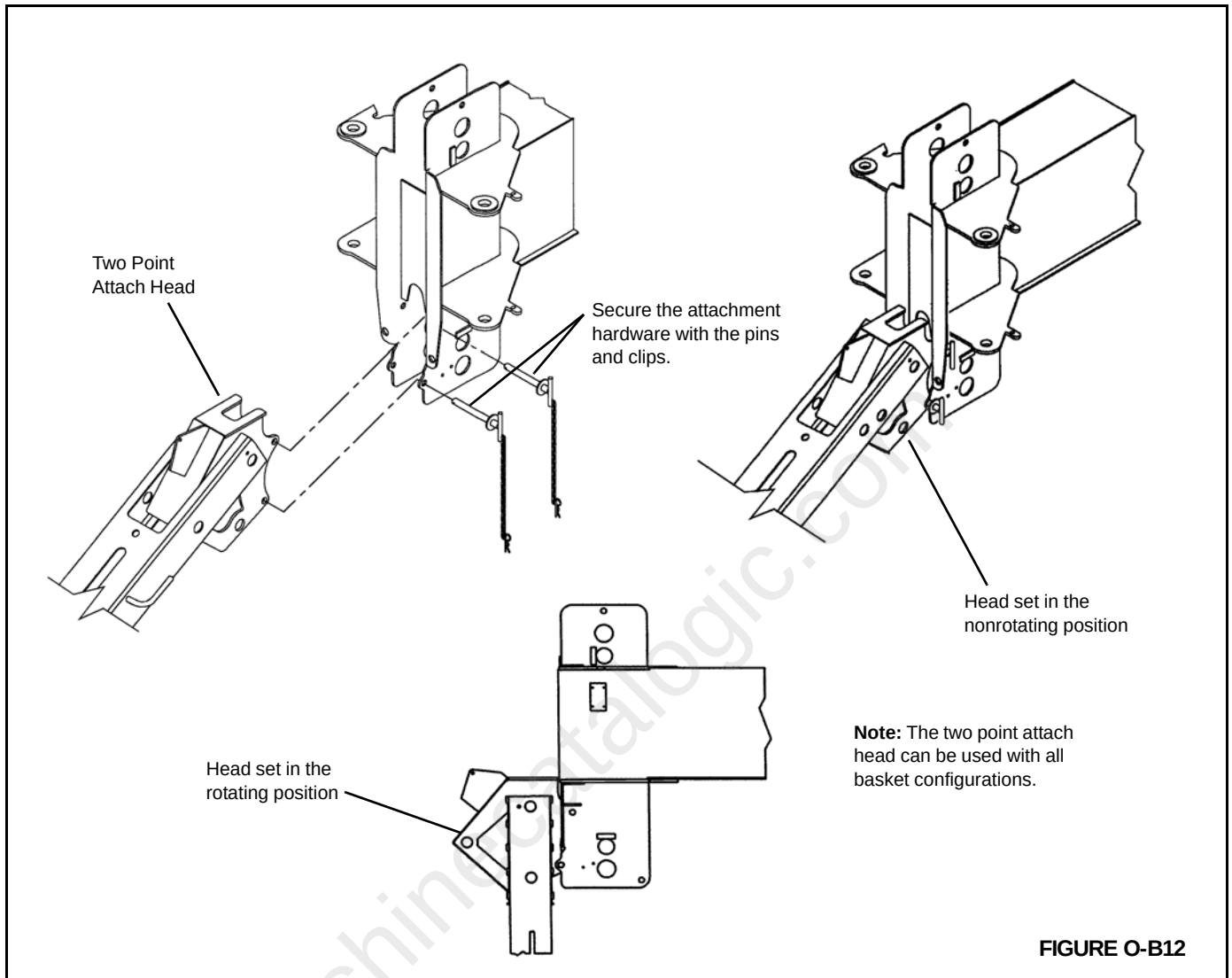
Select 1 to calibrate the slew angle



Increment or decrement to zero setting and select OK.



If the boom radius is not within $\pm 5^\circ$ of 0° the not calibrate screen is displayed. See the service manual for instructions on how to zero the slew pot mechanically.



Operation

1. To enter the basket, lower the gate.

NOTE: Operation of the gate is the same for all models of one and two person baskets.

- a. Push the release button in the center of the pin securing the gate (Figure O-B13).
- b. Pull the pin out and lower the gate.
2. Connect the safety harness and pull the gate up and reinstall the pin.
3. Loosen the brake on the attachment hardware so that the basket can swing freely as the basket is raised to the work location (Figure O-B13).
4. After the platform is raised into position, lock the brake.
5. For a BSA-R1 rotating basket, release the rotation locks and rotate the basket with the rotation handle (Figure O-B13).
6. After the platform is in position, set the rotation locks.

Full Version Available

National Crane 900H Boom Truck Operator Manual

National Crane 900H boom truck operator manual covering controls, safe operation, setup and travel preparation. Searchable PDF. Instant PDF download.

VIEW THE FULL MANUAL

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