



## LIFTING CHARTS - Crawler Cranes

### MANITOWOC MODEL 999 - 275 TON CAPACITY

#### BOOM RIGGING GUIDE MODEL 999 #82 HEAVY LIFT BOOM

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### General

This folio contains installation and removal instructions for all parts of the boom except the boom butt. Boom butt installation and removal instructions are contained in the Crane Assembly and Disassembly Guide in your Operator's Manual.

Refer to the Jib Rigging Guide in your Operator's Manual for jib installation and removal instructions.

### Assist Crane Requirements

An assist crane is not required to assemble and disassemble boom components. The 999 can be used to assemble and disassemble its own boom and jib. Refer to the Crane Weights folio in your Operator's Manual for weights of boom components.

The 999 must be in the following configuration to assemble its own boom and jib. Refer to Figure 1 and the Crane Assembly and Disassembly Guide in your Operator's Manual.

- Counterweight installed.
- Gantry fully raised.
- Mast arms fully raised.
- Boom butt and assembly block installed.
- Crane setup mode selected and confirmed.
- Mast operated between fully extended mast arms and 150° (29 ft [8.8 m] radius). *Mast angles are measured from transport position which is 0°.*
- Capacity limited to 50,000 lb (22 680 kg).

### WARNING

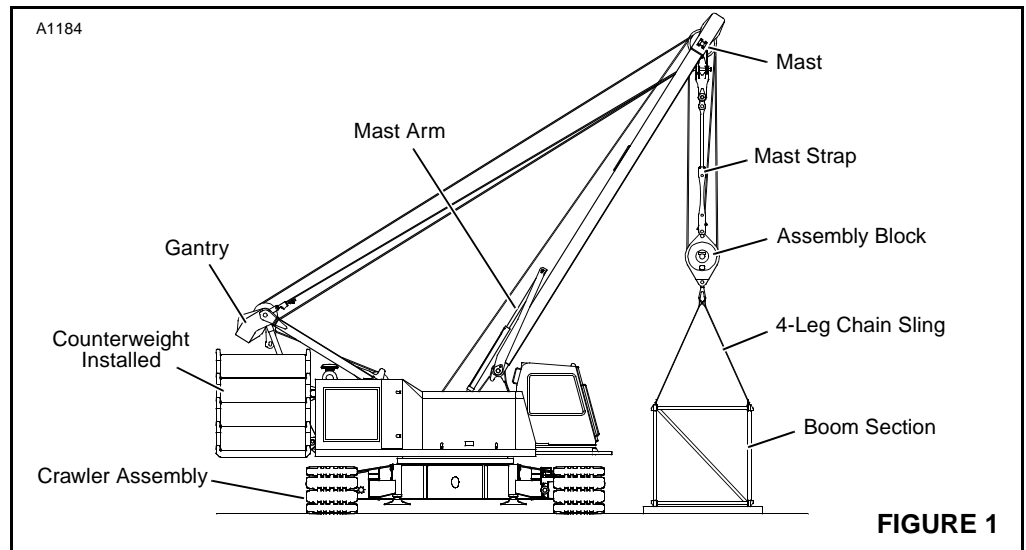


**Falling Load Hazard!** Prevent crane from tipping, wire rope from breaking, or mast from collapsing:

- Do not exceed 29 ft (8.8 m) radius. Wire rope will hit lacing in mast.
- Do not lift more than 50,000 lb (22 680 kg). Tipping or structural damage may occur.

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### Accessing Parts

Some parts of the crane and attachment cannot be reached from the ground. Take necessary precautions to prevent falling off the crane and attachment during component installation and removal.

Owner/user must provide workers with approved ladders or personnel hoists in order to access those areas of the crane and attachment that cannot be reached from the ground. Adhere to all regulatory safety standards.

Optional boom ladders (stored in boom butt) are available from Manitowoc. If your crane has ladders, refer to Boom Ladder Assembly folio in your Operator's Manual for instructions.

### Installation and Removal Notes

The boom shall be installed and removed by experienced personnel trained in erection and operation of construction cranes.

Read and become thoroughly familiar with the instructions in this folio and in Crane Assembly and Disassembly Guide before attempting to install or remove the boom.

*Contact Service Department at factory for assistance if any procedure is not fully understood.*

The installation/removal area must be firm, level, and free of ground and overhead obstructions. The area selected must be large enough to accommodate the selected length of boom and jib (if attached), in addition to movement of the 999.

### WARNING



**Read Capacity Charts!** Crane must be rigged and operated according to instructions in capacity charts provided with crane. Failing to comply with instructions in capacity charts and in this folio can result in tipping or structural failure of boom and jib.

### Retaining Connecting Pins

All connecting pins are retained with cotter pins, safety pins, or keeper plates.

Do not operate crane until:

- All cotter pins are installed and opened.
- All safety pins are installed and properly retained.
- All keeper plates are installed and connecting screws are securely tightened.

### Blocked Crawlers

To prevent crane from tipping, some boom and jib lengths must be raised and lowered over blocked crawlers. Refer to capacity charts for blocked crawler requirements and to Crawler Blocking Diagram folio in your Operator's Manual for instructions.

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#### DANGER



**Tipping Hazard!** Do not attempt to raise or lower boom and jib from or to ground until crawlers are blocked, if required. Otherwise, crane will tip.

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### Handling Components

Handle boom sections with care to avoid damaging lacings and chords. All boom sections have lifting lugs (in top chords) designed to provide a balanced load and to prevent damage during lifting.

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#### WARNING



**Falling Load Hazard!** Lifting lugs on each insert are designed only for lifting that insert. Do not attempt to lift two or more inserts with lifting lugs on one insert. Lifting lugs may break allowing inserts to fall.

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When lifting lugs are not used:

- *Lift against chords only, never against lacings.*
- Use nylon lifting slings. If wire rope or chain slings are used, install protective covering (such as sections of rubber tire) between slings and chords.

*Boom handling with mast straps pinned to wire rope guide on boom butt is limited. Refer to Boom Rigging Assembly Drawing for limitations.*

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#### WARNING



**Falling Boom Hazard!** Do not attempt to handle more boom with mast than specified on Boom Rigging Assembly Drawing. Structural failure of components can occur, possibly allowing boom to fall.

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### Boom Rigging Assembly Drawing

Boom components (top, inserts, butt, straps) must be assembled in proper sequence according to this folio and to Boom Rigging Assembly Drawing in your Operator's manual. Refer to Figure 5 to determine the quantity and length of inserts and straps required for various boom lengths.

A minimum boom length of 90 ft (27.4 m) is required for jib attachment (refer to Liftcrane Jib Capacity Chart for boom and jib length limitations).

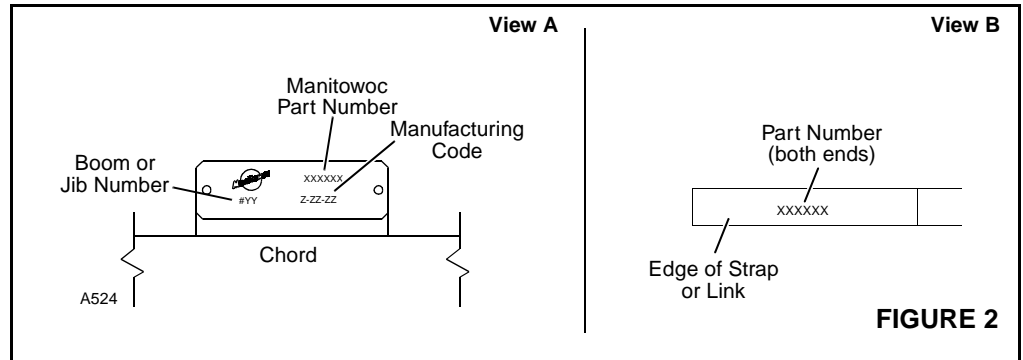
# STERLING CRANE

## BOOM RIGGING GUIDE

### Identifying Boom Sections and Pendants

Boom sections are marked for proper identification as shown in Figure 2, View A.

Boom straps and links are marked for proper identification as shown in Figure 2, View B.



### Boom Installation

The crane must be in the setup mode as shown in Figure 1 to assemble its own boom.

#### General

1. Before you start assembling boom, determine if a fixed jib will be installed. If so, install insert with backstay lugs (Figure 3, View D) next to boom top.
2. Read all notes on Boom Rigging Assembly drawing. Refer to Figure 5 for assistance.

#### WARNING



**Falling Load Hazard!** Prevent crane from tipping, wire rope from breaking, or mast from collapsing when handling loads with mast:

- Do not exceed 29 ft (8.8 m) radius. Wire rope will hit lacing in mast.
- Do not lift more than 50,000 lb (22 680 kg). Tipping or structural damage to mast may occur.

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## BOOM RIGGING GUIDE

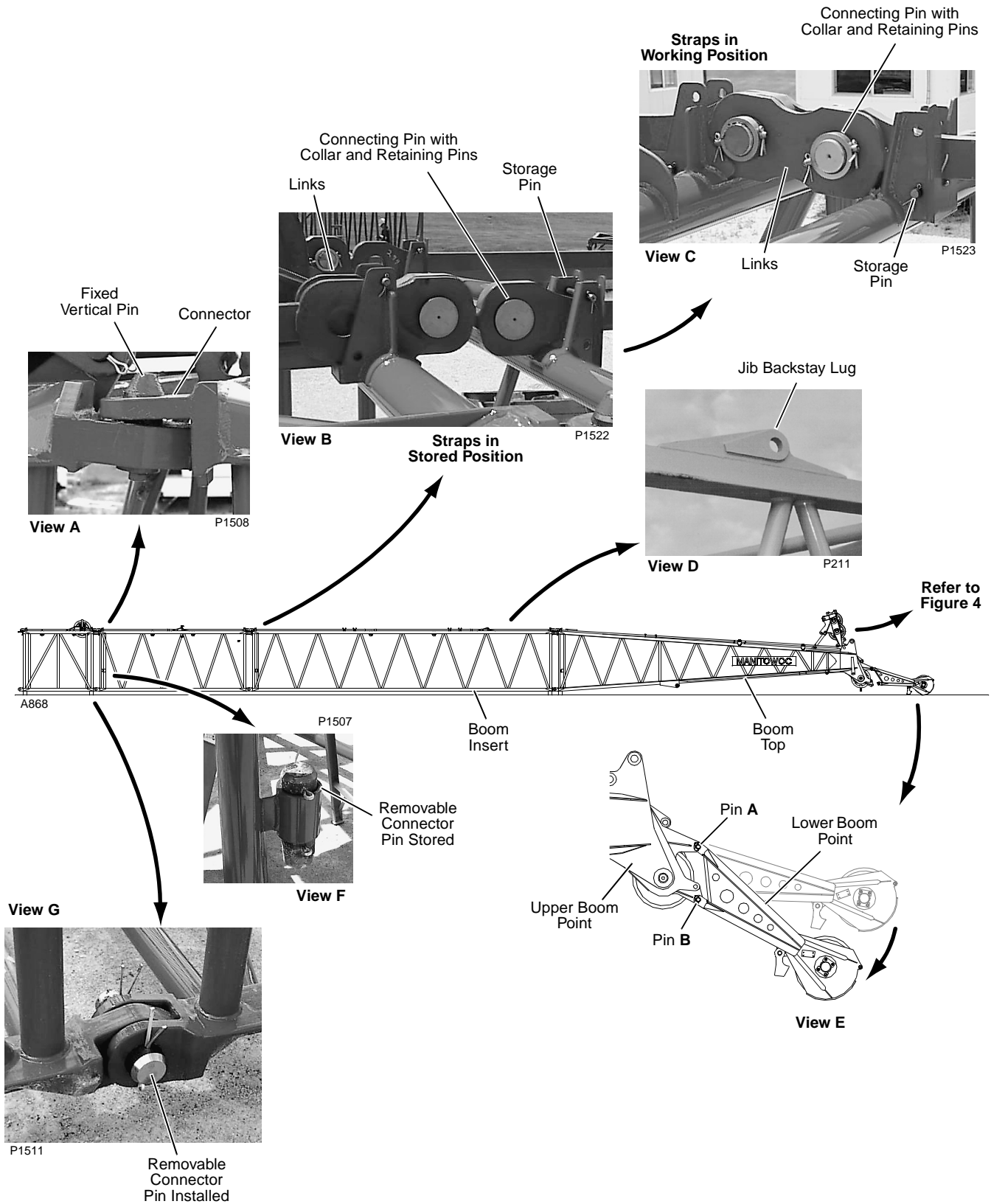


FIGURE 3

### DANGER



**Collapsing Boom Hazard!** To prevent death or serious injury, do not stand on, inside, or under boom sections during assembly. Always stand outside boom sections when installing connecting pins.

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### Assemble Boom Sections

*Refer to Figure 3 for following procedure.*

The boom sections have FACT™ connectors:

- The top connectors are joined by fixed vertical pins that hook into holes in the adjacent section (View A).
  - The bottom connectors are joined by removable connector pins (View G).
1. Assemble boom inserts in proper sequence (Figure 5), as follows, starting at butt end of boom:
    - a. Place first insert on blocking at least 6 in. (152 mm) high.
    - b. Lift next insert into position and engage top connector holes with fixed vertical pins (View A).
    - c. Lower insert until bottom connector holes are aligned and install removable connector pins (View G). Removable connector pins are stored in pockets on adjacent insert (View F).
    - d. Block under bottom chords at top end of insert.
  2. Repeat steps 1b – 1d until all inserts and boom top are installed.

### Connect Boom Straps

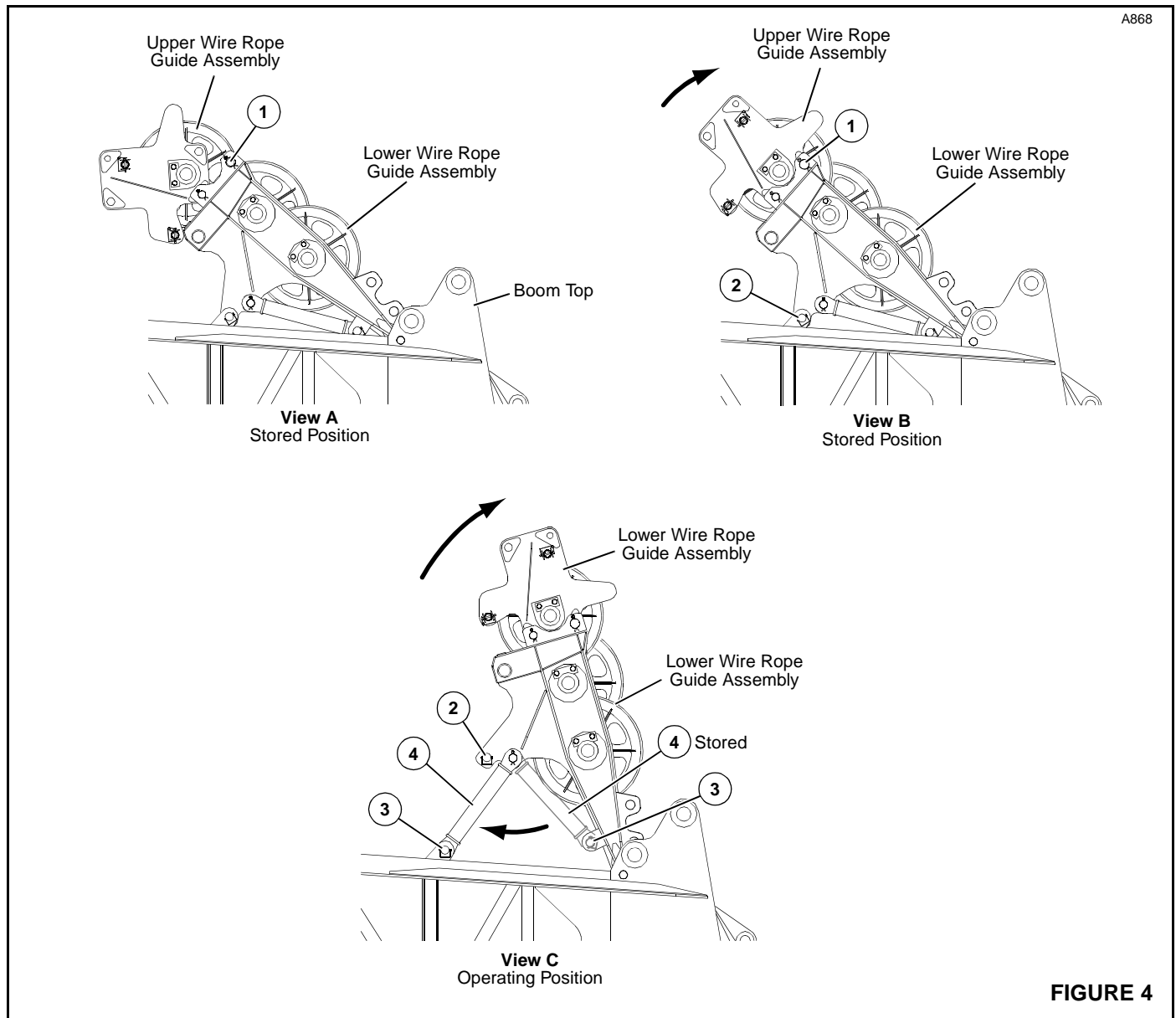
*Refer to Figure 3 for following procedure.*

The boom straps are shipped from the factory in the stored position on the inserts. Connect the straps, as follows:

1. Remove storage pins from top holes in strap brackets (View B).
2. Store storage pins in bottom holes in strap brackets (View C).
3. Rotate strap links forward and pin to adjacent straps (View C).

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### Raise Boom Top Wire Rope Guide

Refer to Figure 4 for following procedure.

1. If equipped with three boom top sheaves, proceed as follows:
  - a. Support upper wire rope guide with a sling from assist crane and remove pins (1, View A).
  - b. Raise upper wire rope guide to operating position and install pins (1, View B).
2. Support lower wire rope guide with slings from assist crane and remove pins (2, View B).
3. Raise lower wire rope guide to operating position (View C) and store pins (2) in wire rope guide frame.
4. Remove pins (3) securing struts (4) in stored position and pin struts to lugs on boom top (View C).

### **Remove Lower Boom Point Sheaves**

If a luffing jib will be installed, it may be necessary to remove sheaves from the lower boom point. Refer to capacity chart in use to determine boom and jib raising limitations. Refer to Lower Boom Point Installation folio in your Operator's manual for sheave removal instructions.

### **Install Upper Boom Point**

*Refer to Figure 3 for following procedure.*

If required, install upper boom point as follows:

1. Lift upper boom point into position at end of boom top.
2. Align connecting holes and install pins (A, View E).
3. Install connecting pins (B, View E) after boom and lower boom point are raised clear of ground.

**NOTE:** Upper boom point must be removed prior to jib installation.

### **Install Jib**

If required, install jib. Refer to Jib Rigging Guide in your Operator's manual for jib assembly instructions.

### **Connect Boom Butt to Boom**

Remove assembly block, install boom butt, and connect boom butt to boom as instructed in Crane Assembly and Disassembly Guide in your Operator's Manual.

Connect mast straps to boom straps as instructed in Crane Assembly and Disassembly Guide.

Make sure you perform following steps as instructed in Crane Assembly and Disassembly Guide:

1. Lower mast arms.
2. Turn on desired crane mode (turn off setup mode) and turn mast bypass handle to off position.
3. Adjust mast straps to proper length.

### **Install Load Line**

Refer to Load Line Reeving folio in your Operator's manual for proper routing and reeving of load lines.

### **Install Block-Up Limit Control**

Refer to Block-Up Limit Installation and Adjustment folio in your Operator's Manual for block-up limit control installation and adjustment instructions.

### Connect Boom Wiring

Connect electric cord from crane to cable reel on boom butt (refer to Block-Up Limit Installation and Adjustment folio).

Connect electric cables from block-up limit switches and all load sensing sheaves to proper receptacles on boom and jib junction boxes. Refer to wiring diagrams on boom and jib sections or in Boom Wiring, Limits, and Load Indicator Electrical Assembly drawing in Section 7 of your Operator's Manual.

### Pre-Raising Checks



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#### DANGER

**Falling Mast/Boom Hazard!** Prevent mast and boom from collapsing:

- Fully lower mast arms and turn off mast bypass handle before raising boom. *Mast will buckle and collapse if it contacts arms with a fully rigged boom attached.*
- 

Perform following pre-raising checks prior to raising boom and jib:

- Crane on firm, level surface with crawlers blocked if required per capacity chart.
- Boom and jib inserts installed in proper sequence per rigging drawing.
- Strap links securely pinned to straps.
- All insert and pendant connector pins installed and cotter pins installed and spread.
- Gantry fully raised.
- Mast arms fully lowered.
- Mast arms bypass handle turned off.
- Setup mode turned off (desired operating mode selected and confirmed).
- Boom hoist wire rope spooled tightly onto drum and engaged with proper sheaves. Wire rope securely anchored to wedge socket at gantry.
- Load lines spooled tightly onto drums and engaged with proper sheaves. Load lines securely anchored to wedge sockets at boom and jib point or at load block and weight ball.
- All blocking, tools, and other items removed from boom and jib.
- Automatic boom stop properly installed and adjusted.
- Electric cable from crane control system connected to cable reel on boom butt.
- Electric cables in boom and jib connected to proper receptacles on junction boxes.
- Block-up limit control installed and operational.
- Load moment indicator installed and operational.
- Crane and attachment properly lubricated (refer to Lubrication Guide in your Operator's Manual).
- Wind within allowable limits for operation.
- Capacity chart reviewed to determine boom and jib raising limitations.

### Boom Removal

#### General

1. Prepare crane and boom as follows:
  - a. Position crane in disassembly area.
  - b. If required per capacity chart, travel front crawler roller and tumbler at boom end of crane onto blocking.  
Refer to Crawler Blocking Diagram folio in your Operator's Manual for blocking requirements.

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#### WARNING



**Tipping Hazard!** Prevent crane from tipping. Block crawlers if required per capacity chart before lowering boom.

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2. Lower boom to ground as follows:
  - **If equipped with a fixed jib**, disconnect jib stops before jib point contacts ground. Refer to Jib Rigging Guide for procedure.
  - **If equipped with a luffing jib**, disengage jib stop strut pins before maximum boom to luffing jib angle is reached. Refer to Luffing Jib Rigging Guide for procedure.
  - **If equipped with an upper boom point**, remove lower connecting pins (B, Figure 3, View E) before upper point contacts ground.

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#### CAUTION



**Avoid Damage!** Jib or boom point will be damaged if preceding steps are not performed.

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3. Install blocking approximately 6 in. (152 mm) high between ground and bottom connectors at end of boom top.
4. Continue to lower boom (and mast) onto blocking until boom straps are resting in brackets on boom inserts.
5. Disconnect load lines from load block and weight ball and spool load lines onto load drums.

#### Disconnect Boom Butt From Boom

Disconnect boom butt from boom, remove boom butt, and install assembly block as instructed in Crane Assembly and Disassembly Guide in your Operator's Manual.

### Disassemble Boom Sections

#### DANGER



**Collapsing Boom Hazard!** To prevent death or serious injury, do not stand on, inside, or under boom sections during disassembly. Always stand outside boom sections when removing connecting pins.

The crane must be in the setup mode as shown in Figure 1 to disassemble its own boom. Disassembly is the reverse of assembly.

#### WARNING



**Falling Load Hazard!** Prevent crane from tipping, wire rope from breaking, or mast from collapsing when handling loads with mast:

- Do not exceed 29 ft (8.8 m) radius. Wire rope will hit lacing in mast.
- Do not lift more than 50,000 lb (22 680 kg). Tipping or structural damage to mast may occur.

- Store boom top wire rope guide as shown in Figure 4, View A.
- Store boom straps and links as shown in Figure 3, View B.

#### Legend for Figure 5 — #82 Boom Components

Item	Description
1	Butt – 30' (9.1 m)
2	Top – 40' (12.2 m)
3	Insert – 10' (3.0 m) (refer to Note A and B)
4	Insert – 20' (6.1 m) with or without Jib Backstay Lugs (refer to Note A and C)
5	Insert – 40' (12.2 m) with or without Jib Backstay Lugs (refer to Note C)
6	Strap – 35' 7" (11.5 m)
7	Strap – 9' 5" (2.9 m) (refer to Note D)
8	Strap – 19' 5" (5.9 m) (refer to Note D)
9	Strap – 39' 5" (12.0 m) (refer to Note D)
Note A	Maximum number of inserts (3) is two. Maximum number of inserts (4) is two. Combination of inserts (3 and 4) must not exceed: <ul style="list-style-type: none"> <li>• Two inserts (3) and one insert (4) or</li> <li>• One insert (3) and two inserts (4).</li> </ul>
Note B	Must be equipped with wire guide if auxiliary drum is used
Note C	Insert with jib backstay lug must be installed next to top, if jib will be used.
Note D	Each strap has a pair of links.
M	Connect to Mast Straps

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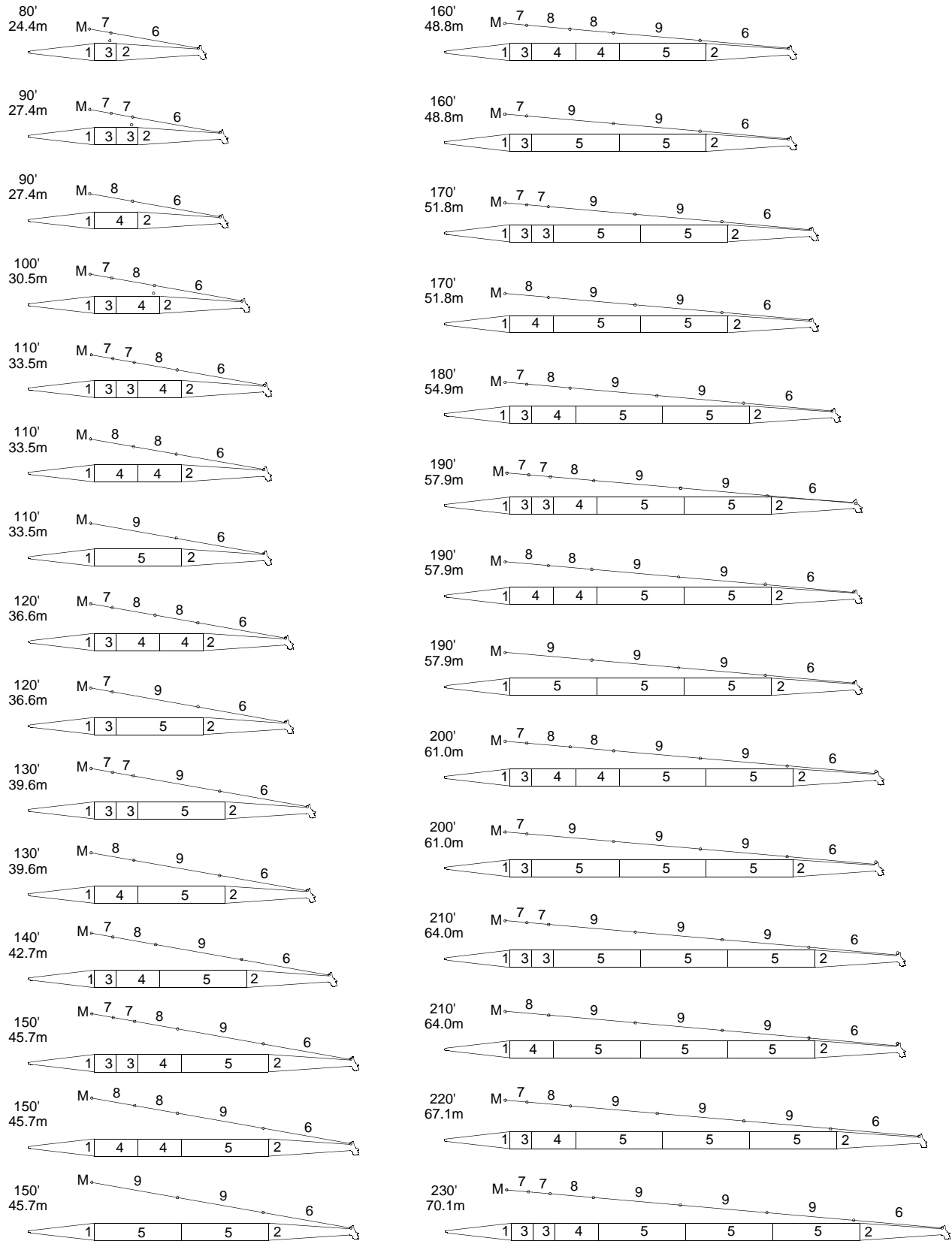


FIGURE 5

# STERLING CRANE

## BOOM RIGGING GUIDE

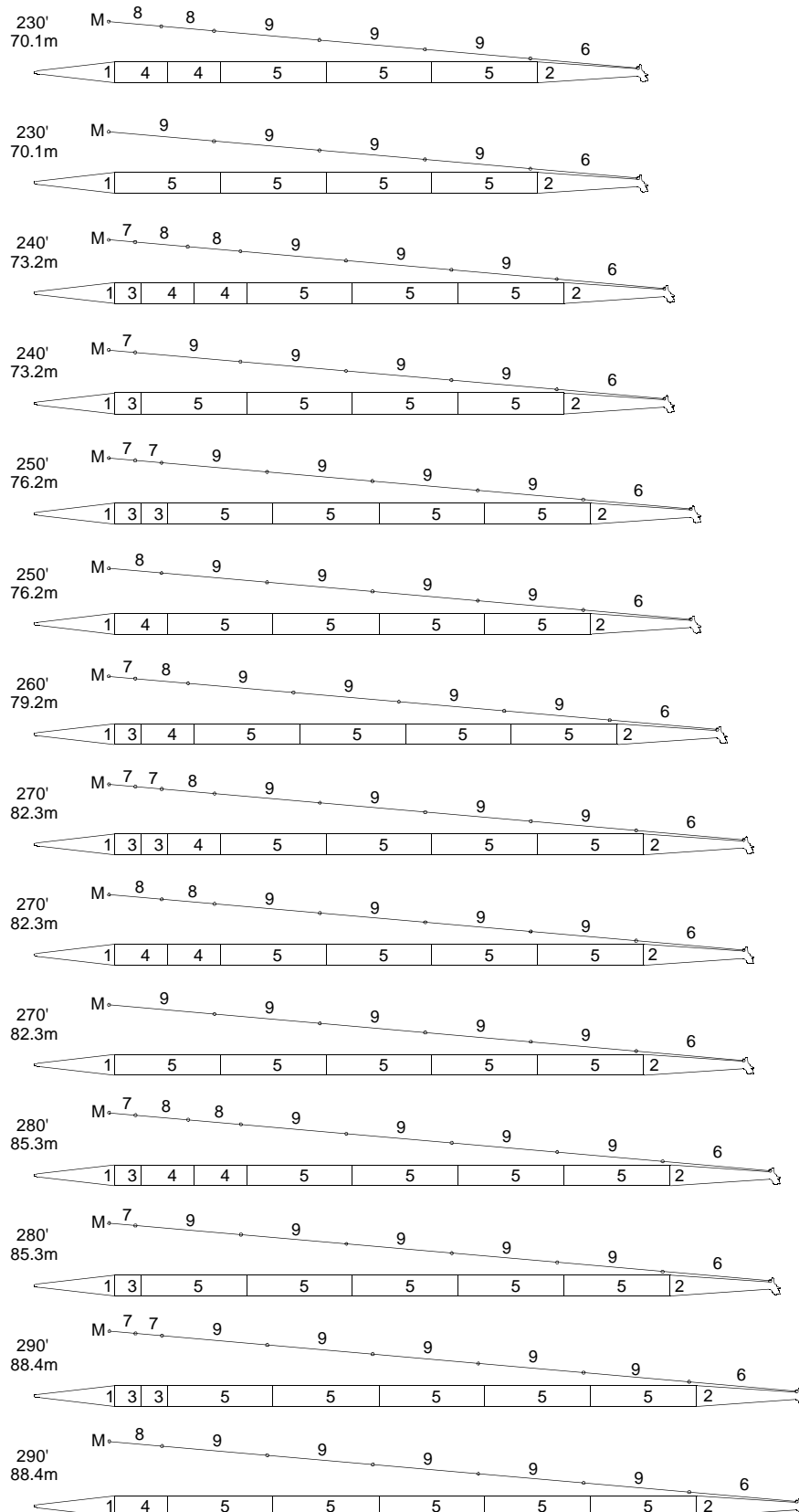


FIGURE 5  
continued