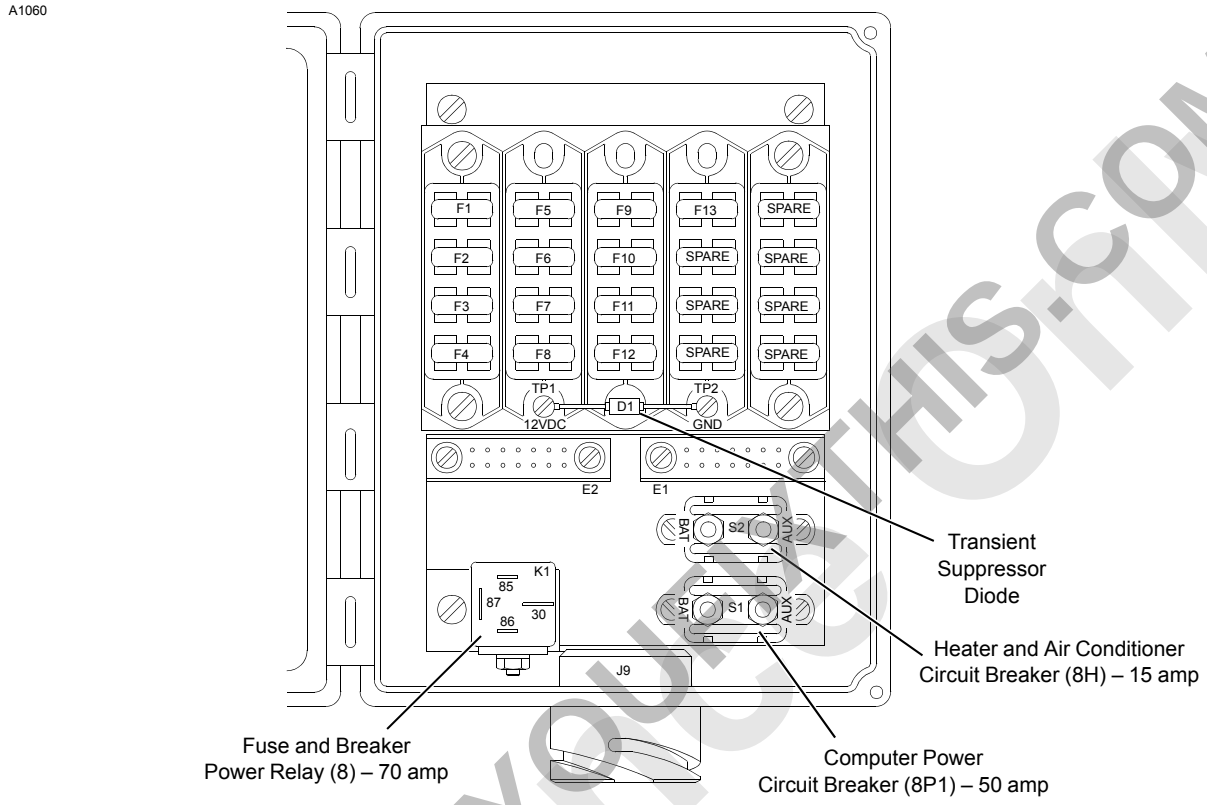
Fuses – Past Production

The fuse box is located in the right rear corner of the operator's cab (Figure 3-36).



Fuse Identification

Item	Description	Item	Description
F1	Cab Power (5D) –10 amp	F11	Overhead Wiper (8W2) – 10 amp
F2	Horn (5H) – 10 amp	F12	10 VDC Regulated (87FA) – 3 amp
F3	LMI and Gauges (8A) – 10 amp	F13	Hyd. Clutch Solenoid (8C) – 10 amp
F4	Computer Inputs (8D) – 10 amp	F14	Spare – 15 amp
F5	Defogger Fan (8F) – 10 amp	F15	Spare – 10 amp
F6	Boom and Jib Top (8B) – 10 amp	F16	Spare – 3 amp
F7	Swing Lock/Park (8S) – 15 amp	F17	Spare – 10 amp
F8	Press. Transducers and Encoders (8T) – 10 amp	F18	Spare – 10 amp
F9	Front Console (8X) – 10 amp	F19	Spare – 10 amp
F10	Front Wiper (8W1) – 10 amp	F20	Spare – 10 amp

FIGURE 3-36

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Remove Crane from Trailer

See Figure 4-5 for the following procedure.

WARNING

Moving Part Hazard!

Avoid serious crushing injury:

- Warn all personnel to stand clear of jacks.

Tipping Hazard!

Avoid tipping crane over:

- Keep crane level while jacking

1. Untie crane from trailer.
2. Position each carbody jack as follows:
   a. Remove connecting pin (View F).
   b. Swing jack out (View E).
   c. Install connecting pin (View E).
3. Remove jack pads from storage position (View D) and connect to jack rods with U-shaped pins.
4. Perform pre-start checks and start engine.

NOTE: It is normal for the system fault alert and the operating limit alert to come on when the engine is started. The system fault alert should go off as engine oil pressure and hydraulic oil temperature rise to normal. ***If alert does not go off soon after start-up, determine fault, stop engine, and correct cause of fault*** **(see Display Readings in Section 3).**

5. Using controls on front of carbody, extend carbody jacks fully to raise crane off trailer.

NOTE: A 2-way level is provided near controls on front of carbody (View C).

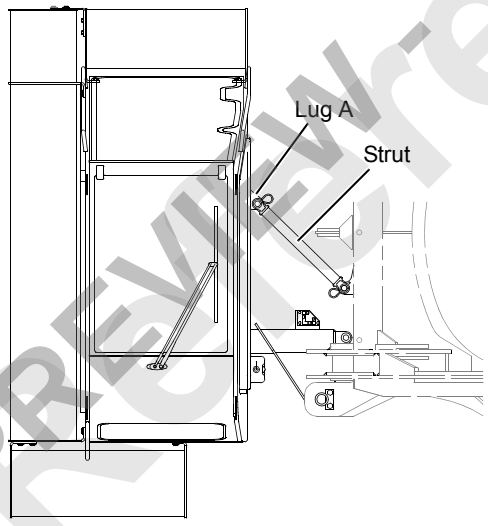
6. Remove blocking from between crane and trailer and slowly pull trailer out from under crane.
7. Lower jacks (keep crane level) until carbody is approximately 3 ft (0,9 m) above ground.

OPERATING NOTE

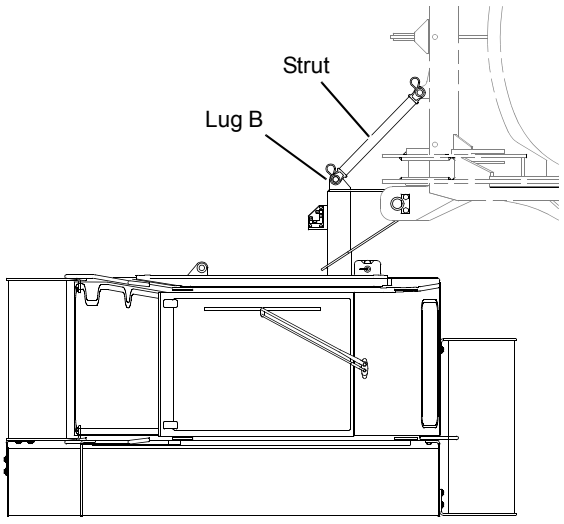
360° swing is permitted when crane is on jacks with gantry and mast in transport position.

8. Rotate operator's cab to operating position:
   a. Unpin strut from lug (A) on cab support (View A).
   b. Rotate cab 90°.
   c. Pin strut to lug (B) on cab support (View B).

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View A
Shipping Position

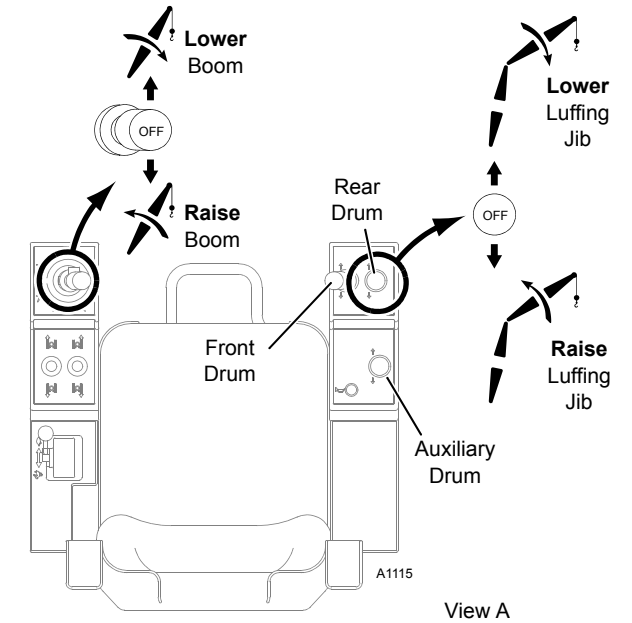


View B
Operating Position

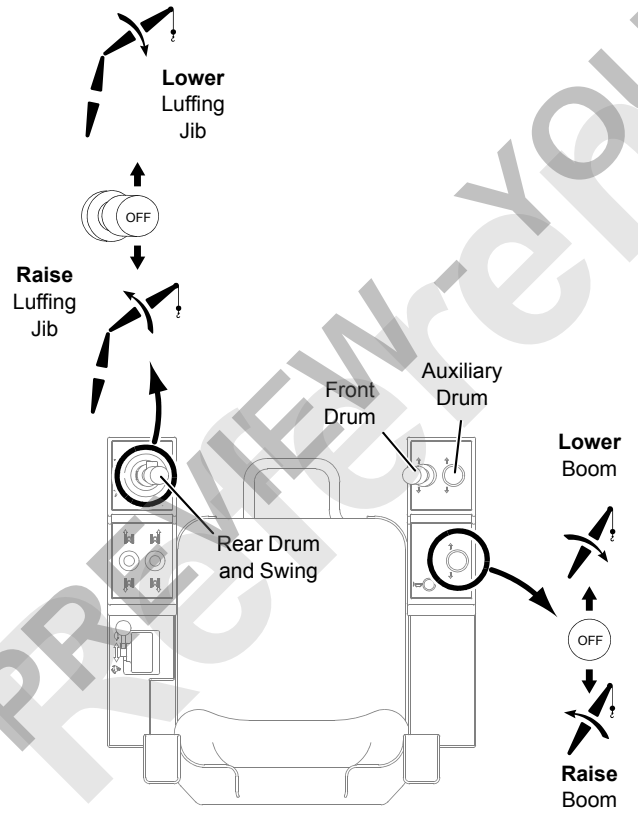
FIGURE 4-5

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View A
Standard Mode and
Normal Luffing Jib Mode



View B
Special Luffing Jib Mode

FIGURE 3-15

Swing Operation

WARNING

Tipping Hazard!

To prevent crane from tipping, adhere to the swing limitations given in the capacity charts.

DANGER!

Moving Crane Hazard!

Counterweights can strike personnel in area of swing path! Warn personnel to stay clear of swing path. Sound horn prior to swinging.

1. Turn off swing park.

CAUTION

Boom/Swing Drive Damage!

Do not apply swing holding brake or turn on swing park while swinging. Brake will bring rotating bed to an abrupt stop. This action could cause damage to boom and luffing jib from side loading or damage to swing drive from shock loading. Bring rotating bed to smooth stop with swing handle and then apply swing holding brake or turn on park.

2. Increase engine speed to desired RPM with hand throttle. Press foot throttle to momentarily increase engine speed when more power is required.
3. See Figure 3-16.

   Push swing handle to LEFT from off to SWING LEFT or pull handle to RIGHT from off to SWING RIGHT
4. Start swing motion with a smooth acceleration. Continue handle motion to swing at desired speed.
5. Stop swinging by releasing swing handle to off. Swing speed will decrease to off and rotating bed will coast to a stop. If a faster stop is desired, move swing handle slightly past off to opposite swing direction.
6. Once rotating bed stops, apply swing holding brake to hold rotating bed in position for short periods during operating cycle.
7. To hold rotating bed in position for long periods, turn on swing park.

Swing Speed/Torque Adjustment

Swing speed and torque can be adjusted to suit operator need, as follows:

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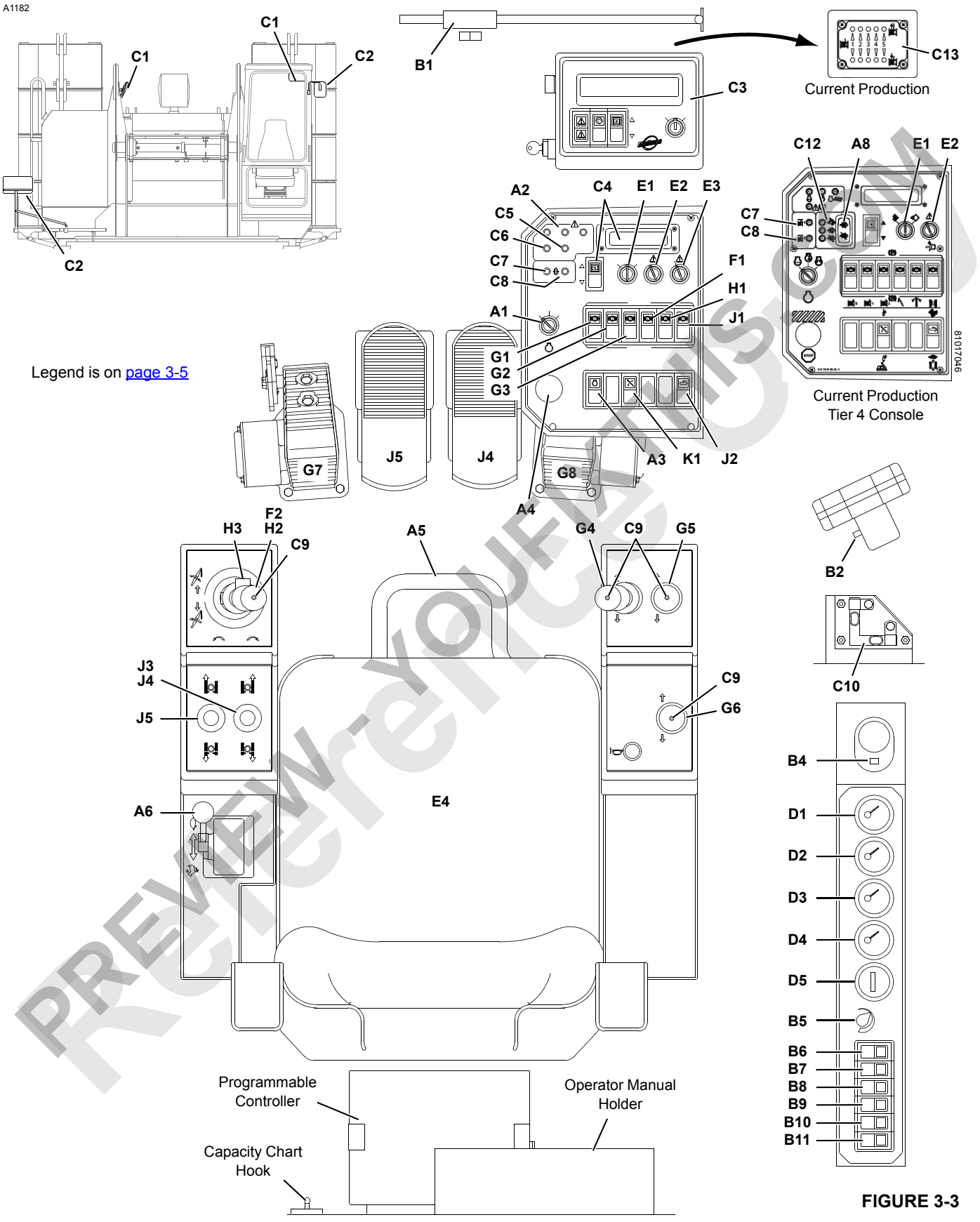


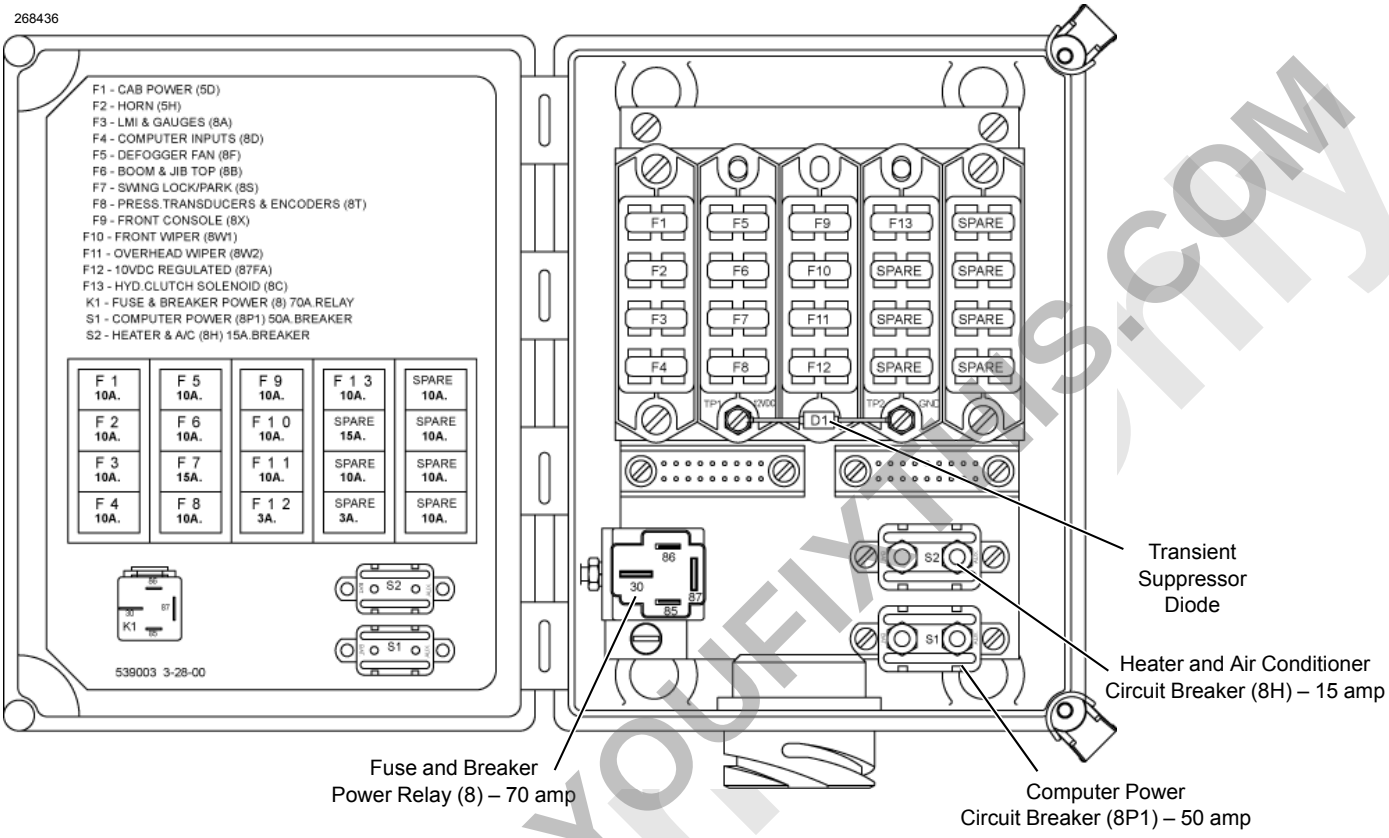
FIGURE 3-3

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Fuses – Current Production

The fuse box is located in the right rear corner of the operator's cab (Figure 3-37).



Fuse Identification

Item	Description	Item	Description
F1	Cab Power (5D) –10 amp	F11	Overhead Wiper (8W2) – 10 amp
F2	Horn (5H) – 10 amp	F12	10 VDC Regulated (87FA) – 3 amp
F3	LMI and Gauges (8A) – 10 amp	F13	Hyd. Clutch Solenoid (8C) – 10 amp
F4	Computer Inputs (8D) – 10 amp	F14	Spare – 15 amp
F5	Defogger Fan (8F) – 10 amp	F15	Spare – 10 amp
F6	Boom and Jib Top (8B) – 10 amp	F16	Spare – 3 amp
F7	Swing Lock/Park (8S) – 15 amp	F17	Spare – 10 amp
F8	Press. Transducers and Encoders (8T) – 10 amp	F18	Spare – 10 amp
F9	Front Console (8X) – 10 amp	F19	Spare – 10 amp
F10	Front Wiper (8W1) – 10 amp	F20	Spare – 10 amp

FIGURE 3-37

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Raise Mast To Operating Position

See Figure 4-6 for the following procedure.

The following controls (located in operator's cab) are used to raise the mast and gantry. See Section 3 for identification and operation of these controls.

1. CRANE MODE SELECTOR to select setup mode.
   - Mast and gantry controls will not operate until setup mode is selected and confirmed.
   - Mast operating limits remain off until setup mode is selected and confirmed
2. MAST ARMS CONTROL to raise and lower the mast arms independently of the mast.
3. BOOM HOIST CONTROL (Past Production) or GANTRY CONTROL (Current Production) to raise and lower the mast (and gantry) while using mast as a boom.
4. DIGITAL DISPLAY to monitor mast angles and operating limits.

   See Figure 4-6 for identification of mast operating limits.

DANGER

Falling Mast Hazard!

Prevent mast from falling over backwards or forward:

- Read and thoroughly understand mast raising instructions.
- Select and confirm SETUP MODE before raising mast and using it as a boom. Mast operating limits remain off until this step is performed.

Raising Procedure

1. Move mast arms bypass handle in right enclosure to ON (fully down) (View B) and ***leave in this position for remainder of assembly procedure.***
2. Select and confirm SETUP MODE.
3. Scroll to MAST ANGLE on digital display to monitor mast angles during raising procedure.

CAUTION

Mast Damage!

Make sure mast angle indicator is properly installed and calibrated prior to raising gantry and mast.

Mast will be damaged if this precaution is not observed.

4. Increase engine speed to desired RPM.
5. BOOM DOWN with boom hoist control to raise mast to operating position.
   - The gantry (with mast) will rise to its operating position and stop. Then, the mast cylinders will extend automatically to raise the mast with the mast arms.
6. Mast arms will stop automatically when cylinders are fully extended (at approximately 120°) (View D).

DANGER

Falling Mast Hazard!

Do not lower mast arms until mast is connected to boom rigging. Mast will fall over backwards if raised to vertical when arms are down.

CAUTION

Mast Damage!

Stop operating immediately (release boom hoist handle to off) if MAST SYSTEM fault comes on during mast raising procedure.

Determine cause of fault and take corrective action before resuming operation.

Mast will be damaged if this precaution is not observed.

7. Proceed to use mast as a boom (View E) with boom hoist control for remainder of assembly procedure.

NOTE: The mast will stop lowering, the operating limit alert will come on, and MAST TOO FAR FWD will appear on the digital display if the mast is lowered to 175°.

DANGER

Falling Mast Hazard!

Prevent mast from falling:

- Do not use limit bypass to lower mast below 175°. Mast will fall suddenly.
- Do not lower mast arms until mast is connected to boom rigging. Mast will fall over backwards if raised to vertical when arms are down.

Operating Note

360° swing is permitted when crane is on jacks with gantry up and mast lowered to 175°.

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1. Stop swinging and apply swing parking brake.
2. Access diagnostic screens:
   a. Turn limit bypass key clockwise and scroll up.
   b. Scroll up at least one screen, release key, and scroll up or down through diagnostic screens until swing speed/swing torque screen appears (Figure 3-17).
3. Rotate crane mode selector back-and-forth from center position to SELECT position until cursor (*) appears next to SWING SPEED.
4. Scroll up and down to change swing speed to desired percentage between 25% and 100%.
5. Repeat steps 3 and 4 for SWING TORQUE.
6. Rotate crane mode selector back-and-forth from center position to SELECT position until cursor (*) disappears.
7. Adjustment is complete. The selected swing speed and torque will remain in computer memory, even after engine is stopped.

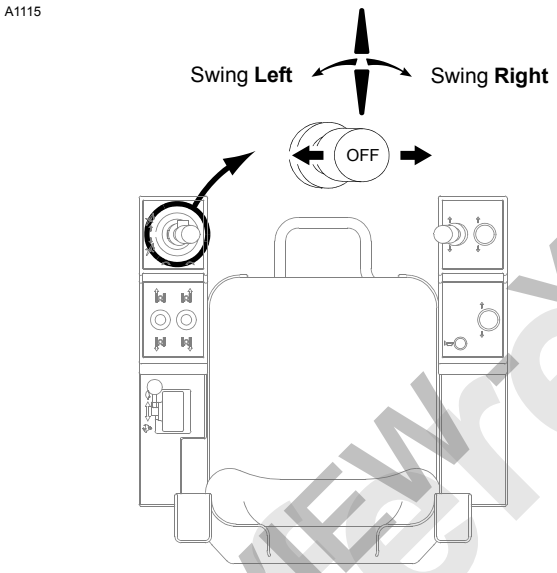


FIGURE 3-16

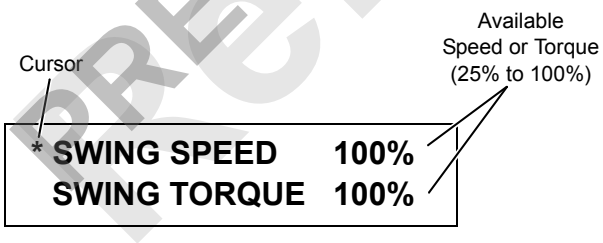


FIGURE 3-17

NOTE: See Drum and Lagging Chart in Capacity Chart Manual for load drum identification.

WARNING

Falling Load Hazard!

Prevent load on unused drum from falling. Turn on drum park for drum not in use.

Load Drum Operation – Liftcrane Full Power

1. Turn off free fall for drum to be operated (see procedure in this section).
2. Select and confirm desired crane mode.

NOTE: On free fall equipped cranes, the drum working brake pedals have no function and are inoperable while operating the drums in full power.

3. Turn off drum park for drum to be operated.

CAUTION

Boom or Luffing Damage!

Do not turn on drum park while raising or lowering load; brake will bring load to an abrupt stop. This action could cause shock load damage to boom, luffing jib, and load line. Bring load to smooth stop with drum handle and then turn on drum park.

4. Increase engine speed to desired RPM with hand throttle. Depress foot throttle to momentarily increase engine speed when more power is required.
5. See Figure 3-18.

   Pull drum handle BACK from off to RAISE load or push handle FORWARD from off to LOWER load.

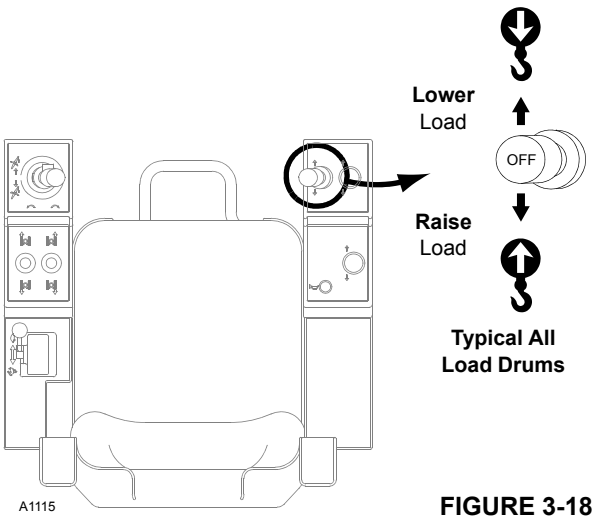
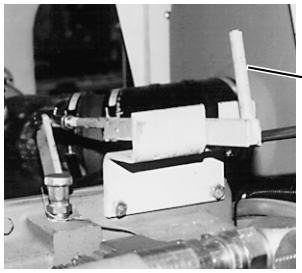


FIGURE 3-18

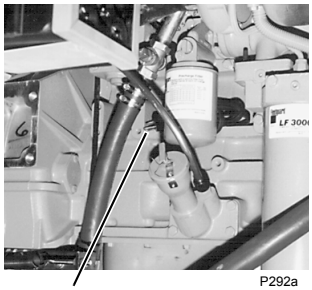
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Rear of Left Enclosure



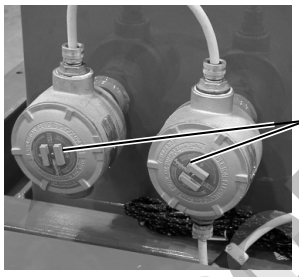
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Rear of Engine

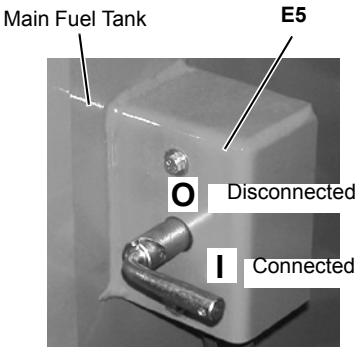


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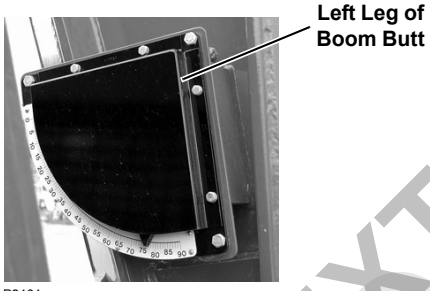
Front of Hydraulic Tank



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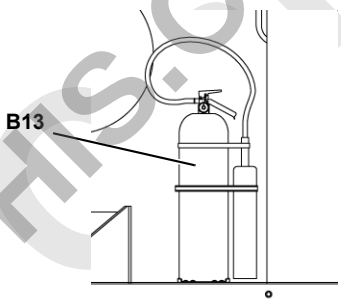


FIGURE 3-3 continued

Legend for Figure 3-3

A — Engine Controls

A1	Engine Ignition Switch
A2	Engine Warning/Diagnostic Lights
A3	Engine Maintain/Clear Switch
A4	Emergency Stop Switch
A5	Engine Foot Throttle
A6	Engine Hand Throttle
A7	Engine Clutch Lever
A8	DPF Switch

B — Accessory Controls

B1	Tinted Visor
B2	Overhead Fan Switch
B3	Horn Switch
B4	Dome Light Switch
B5	Air Conditioner Temperature Selector
B6	Heater/Air Conditioner Selector
B7	Blower Fan Switch
B8	Panel Lights Switch
B9	Front Windshield Washer Switch
B10	Front Windshield Wiper Switch
B11	Overhead Windshield Wiper Switch
B12	Machinery Heaters
B13	Fire Extinguishers

C — Indicators

C1	Drum Mirrors
C2	Rear View Mirrors
C3	Rated Capacity Indicator/Limiter
C4	Display and Selector Switch
C5	Operating Limit Alert
C6	System Fault Alert
C7	Front Drum Free-Fall Light
C8	Rear Drum Free-Fall Light
C9	Drum Rotation Indicators
C10	Level
C11	Boom Angle Indicator
C12	DPF Status Indicator
C13	Drum Direction Indicators

D — Gauges

D1	Fuel Level Gauge
D2	Engine Water Temperature Gauge
D3	Engine Oil Pressure Gauge
D4	Battery Voltage Gauge
D5	Engine Hourmeter

E — Special Controls

E1	Crane Mode Selector
E2	Limit By-pass Switch *
E3	Jib Up Limit By-pass Switch *
E4	Seat Switch (not shown)
E5	Battery Disconnect Switch

F — Boom Hoist Controls

F1	Boom Hoist Park Switch
F2	Boom Hoist Handle

G — Load Drum Controls

G1	Auxiliary Drum Park Switch
G2	Front Drum Park Switch
G3	Rear Drum Park Switch
G4	Front Drum Handle
G5	Rear Drum or Luffing Jib Handle
G6	Auxiliary Drum Handle
G7	Front Drum Working Brake Pedal
G8	Rear Drum Working Brake Pedal

H — Swing Controls

H1	Swing Park Switch
H2	Swing Handle
H3	Swing Holding Brake Switch

J — Travel Controls

J1	Travel Park Switch
J2	Travel Speed Selector
J3	Travel Detent Selector
J4	Right Crawler Handle or Pedal
J5	Left Crawler Handle or Pedal

K — Setup Controls

K1	Mast Arms Switch

L — Limit Devices

Not Shown

* ***When bypassing a limit, carefully follow instructions in Limit Devices section***.

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Install Assembly Block

See Figure 4-7 for the following procedure.

NOTE: Manitowoc suggests that the assembly block be shipped on the same trailer as one of the crawler assemblies. Assembly personnel can then stand on the deck of the trailer or the crawler when reeving the block.

1. Position crane and trailer as follows to provide access to mast point sheaves:
   a. Fully retract jacks (keep crane as level as possible while jacking).
   b. Raise jacks on side of carbody opposite mast ***not more than 8 in (203 mm)***. This step will tip mast down.
   c. BOOM DOWN to lower mast to 175°.

DANGER

Falling Mast Hazard!

Do not use limit bypass to lower mast below 175°. Mast will fall suddenly.

2. Position trailer as shown in View A.
3. Reeve wire rope from rear drum through two center sheaves in mast point and sheave in assembly block (View B).
4. Anchor wire rope to socket and wedge on block (View C) (see Wire Rope Installation on page 4-112 for instructions).
5. Extend jacks to level crane.
6. BOOM UP to raise assembly block off trailer and position mast in operating range (View D).

CAUTION

Wire Rope Damage!

Avoid damage to wire rope and mast:

- Do not operate rear load drum until wire rope is clear of lacing in mast (View A).

7. Connect 4-leg chain sling to assembly block (View D).
8. Raise carbody (extend jacks) so it is level and at least 3 ft (0,9 m) off ground (View D).

Operating Note

360° swing is permitted when crane is on jacks with gantry up, mast above 150°, and assembly block and chain sling installed.

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See end of this manual for Alphabetical Index

SECTION 1. . . . . Introduction
Crane Data 1-1
Crane/Attachment Identification 1-1
Change of Ownership Registration 1-1
Manitowoc Dealer 1-1
Crane Orientation 1-1
Identification and Location of Components 1-2
Boom Rigging 1-2
Tier 3 Engine Components 1-4
Tier 4 Engine Components 1-5
Rotating Structure and Mast 1-8
Lowerworks 1-15
Operator's Cab/Controls 1-16
Right Side with Free Fall 1-17
Outline Dimensions — From Side 1-18
Outline Dimensions — From Front 1-19
Crane Weights 1-20
English and Metric Conversions 1-27
Direct Conversion 1-27
Inverse Conversion 1-27

SECTION 2. . . . . Safety Information
Continuous Innovation 2-1
Nameplates and Decals 2-1
Safety Messages 2-1
General 2-1
Safety Alert Symbol 2-1
Signal Words 2-1
Symbol Identification 2-1
Safety and Information Signs 2-3
Maintaining Signs 2-3
Ordering Signs 2-3
Crane Access Points 2-5
General 2-5
Getting On or Off Crane 2-5
Operator Manual/Capacity Chart Storage 2-6
General 2-6
Storing Manuals 2-6
Safe Operating Practices 2-7
General 2-7
Read Operator Manual 2-7
Operator Qualifications 2-7
Operator Conduct 2-7
Handling Load 2-9
Signals 2-12
Safety Devices 2-13
Operational Aids 2-13
Category 1 Operational Aids 2-13
Category 2 Operational Aids 2-14
Assembling, Disassembling, or Operating Crane Near Electric Power and Transmission Lines 2-15
Electrocution Hazard 2-15
Set-Up and Operation 2-15
Electrocution Hazard Devices 2-16
Electrical Contact 2-16
Refueling 2-17

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SECTION 2
SAFETY INFORMATION

WARNING

California Proposition 65

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65warnings.ca.gov/diesel.

Battery posts, terminals, and related accessories contain chemical lead and lead compounds, chemicals known to the State of California to cause cancer, birth defects, and other reproductive harm. Wash hands after handling.

California Spark Arrestor

Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrestor may be required. The owner/operator should contact local fire agencies for laws or regulations relating to fire prevention requirements.

CONTINUOUS INNOVATION

Due to continuing product innovation, the information in this manual is subject to change without notice. If you are in doubt about any procedure, contact your Manitowoc dealer or the Manitowoc Crane Care Lattice Team.

NAMEPLATES AND DECALS

See drawing at the end of this section.

SAFETY MESSAGES

General

The importance of safe operation and maintenance cannot be over emphasized. Carelessness or neglect on the part of operators, job supervisors and planners, rigging personnel, and job site workers can result in their death or injury and costly damage to the crane and property.

To alert personnel to hazardous operating practices and maintenance procedures, safety messages are used throughout the manual. Each safety message contains a safety alert symbol and a signal word to identify the hazard's degree of seriousness.

Safety Alert Symbol

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. ***Obey all safety messages that follow this symbol to avoid possible death or injury.***

Signal Words

DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

CAUTION

Without the safety alert symbol, identifies potential hazards that could result in property damage.

NOTE: Highlights operation or maintenance procedures.

Symbol Identification

Many of the symbols used in the safety and information signs and nameplates on this crane are identified in Table 2-1 and Table 2-2.

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Fire Extinguishers . . . 2-17
Accidents . . . 2-17
Safe Maintenance . . . 2-17
Maintenance Instructions . . . 2-17
Safe Maintenance Practices . . . 2-17
Environmental Protection . . . 2-19
Boom Disassembly Safety . . . 2-20
General . . . 2-20
Location . . . 2-20
Pin Removal . . . 2-20
Disassembly Precaution — #82 Boom . . . 2-20
Disassembly Precaution — #22E/22EL Boom . . . 2-22
Personnel Handling Policy . . . 2-23
Pedestal/Barge Mounted Cranes . . . 2-26
Pedestal Mounted Crane . . . 2-26
Barge Mounted Crane . . . 2-27
Capacity Charts . . . 2-28
Shock Loading . . . 2-28
Operation On Barge . . . 2-28
Crane Inspection . . . 2-29
Transporting Crane on Barge . . . 2-29

SECTION 3 . . . Operating Controls And Procedures

Standard Hand Signals for Controlling Crane Operations . . . 3-2
Symbol Identification . . . 3-4
Front Window Operation . . . 3-11
Closing Window . . . 3-11
Opening Window for Ventilation . . . 3-11
Opening Window for Emergency Exit . . . 3-11
Operating Controls . . . 3-11
Controls Identification and Function . . . 3-14
Seat Controls . . . 3-30
Preparing Crane for Operation . . . 3-31
Operation . . . 3-31
Stopping Engine/ Leaving Crane Unattended . . . 3-44
Calibration Procedures . . . 3-44
Remote Controls . . . 3-47
Controls Identification and Operation . . . 3-47
Display Readings . . . 3-48
Operating Conditions . . . 3-48
Operating Limits . . . 3-48
System Faults . . . 3-49
Selecting Display Language . . . 3-49
Crane Diagnostics . . . 3-54
Drum 1 and 2 (Front and Rear Drum) . . . 3-54
Drum 4 (Boom Hoist) . . . 3-54
Drum 8 (Auxiliary) . . . 3-54
FFall . . . 3-54
Swing (Crane) . . . 3-55
Swing Speed/Torque . . . 3-55
Drum Slip . . . 3-55
Track . . . 3-55
RIN . . . 3-55
Accessory System . . . 3-56
Engine Throttle . . . 3-56
A1 (Handles) . . . 3-56

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