

OPERATION & MAINTENANCE MANUAL

CK1600
(LUFFING)

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EXPLANATION OF WARNING LABELS

Since the warning labels are installed in the machine and indicated with the three stages in the same way as the warning description, confirm the positions and contents of all warning labels first. Put them to the practical use to secure safety when operating, checking and performing maintenance.

HANDLING OF WARNING LABELS

1. When the warning label is damaged or stained, order it to the designated service shop.
2. Do not remove the warning labels.
3. When the surface of the warning label is soiled and difficult to be seen, wipe it cleanly.

PLANNING THE JOB

Most accidents can be avoided by careful job planning. The person in charge must have a clear understanding of the work to be done and equipment capabilities. He must consider all dangers at the jobsite, develop a plan to do the job safely, and then explain the plan to all concerned. Factors such as these should be considered:

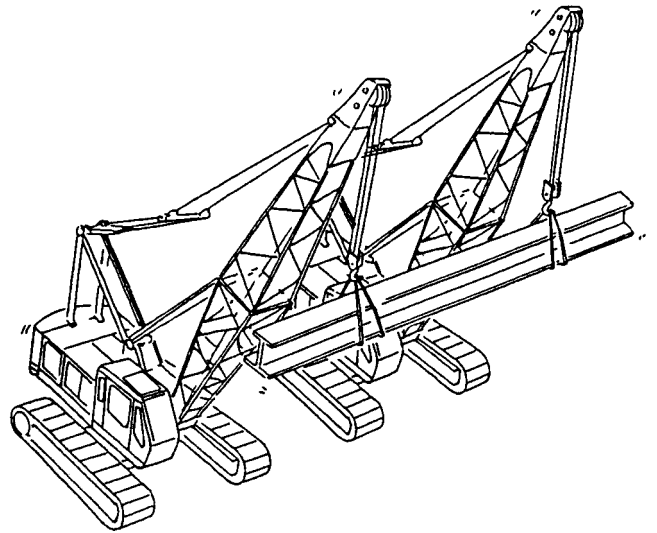
- What crew members are needed and what responsibilities will they be given?
- What is the weight of the load to be lifted, the lift radius, boom angle, and the rated capacity of the crane?
- How will the signalmen communicate with the operator?
- What equipment is required to do the job safely? Is a crane the best equipment for the job?
- How can the equipment be safely transported to the jobsite?
- Are there gas lines, electrical power lines or structures that must be moved or avoided?
- Is the surface strong enough to support the machine and load?
- How will loads be rigged?
- What special safety precautions must be taken if a crane must travel with a suspended load or if more than one crane is needed to lift a load?
- Are unusual weather conditions such as winds or extreme cold expected?
- What steps will be taken to keep unnecessary people and equipment safely away from the work area?
- How can the crane be positioned to use the shortest boom and radius possible?

1. SAFE OPERATING PRACTICES FOR MOBILE CRANES

28. Using two or more cranes to lift a load involves many hazards not normally encountered in single crane lifts.

Multi-crane lifts must be carefully engineered, keeping the following points in mind.

- Since the load is not freely suspended, careful engineering studies must be made to ensure that the load carried by each machine is less than its rated capacity.
- Make sure slings are arranged to divide the load as planned.
- Review the lifting plan with operators, signalmen and other crew members before beginning the lift.
- Carefully coordinate crane movements through every stage of the lift.
- Avoid boom side loading (see #16).



29. Leaving a machine unattended can be very dangerous. Before leaving his seat, the operator must take the following steps to prevent his machine from moving:

- Lower the load or bucket to the ground. Lower the boom when necessary.
- Set the swing brake or lock.
- Set all drum locks.
- Set parking brakes.
- Set propel brakes or locks on crawler machines.
- Disengage the engine clutch or shut off the engine.
- Place the function lock lever in the shut down position.

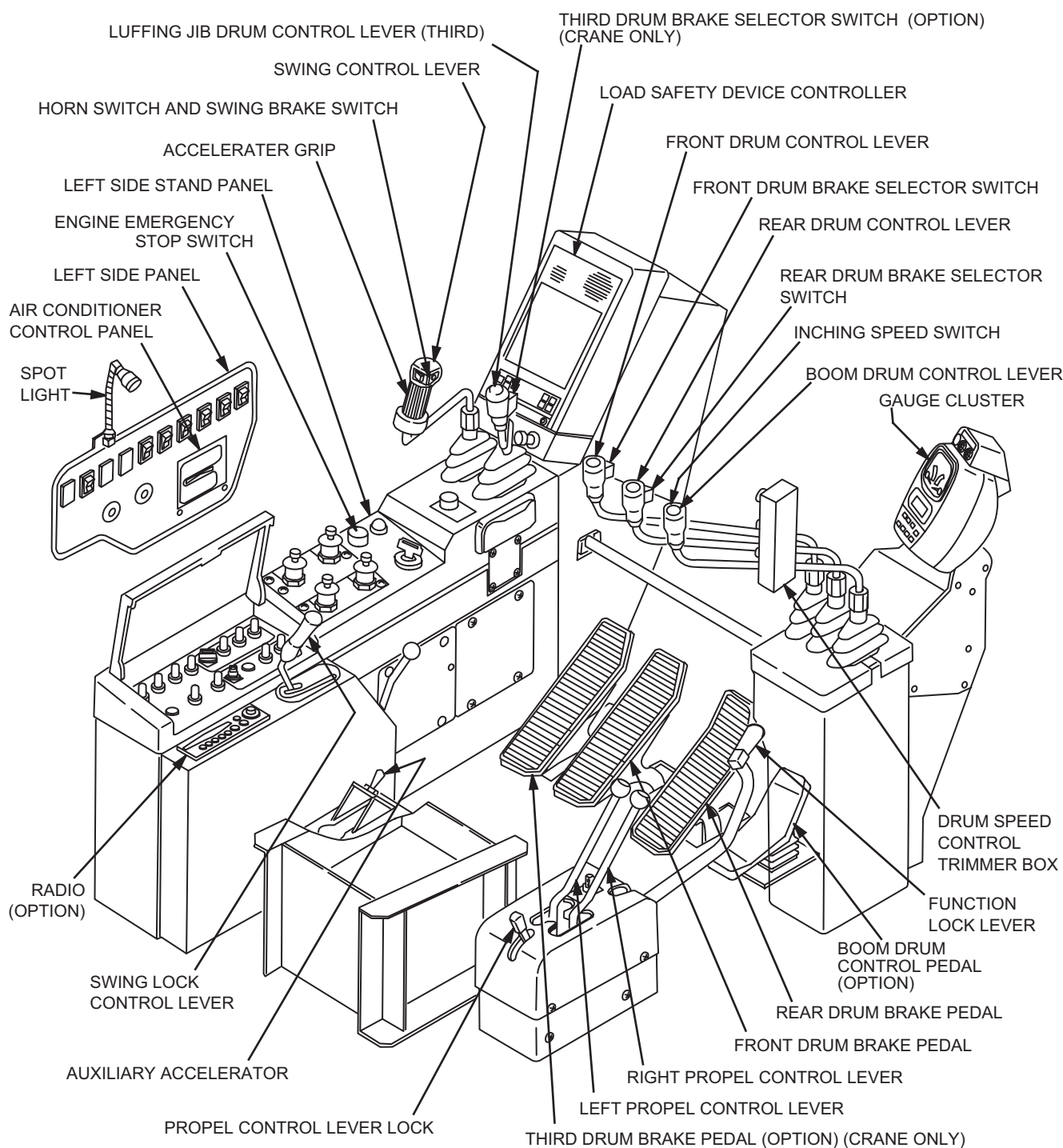
2.2 LOCATIONS AND TERMS OF OPERATING CONTROLS



Do not use the devices and equipment provided in this machine for any purpose other than the purposes specified in this manual.
Failure to observe this precaution may result in serious injury or death.

Note

Optional items are also included in this figure.



- 27. REAR DRUM BRAKE SELECTOR SWITCH
- 28. FRONT DRUM BRAKE SELECTOR SWITCH
- 29. THIRD DRUM BRAKE SELECTOR SWITCH (OPTION) (CRANE ONLY)

For details of free fall operation, refer to the "2.5 FREE FALL OPERATION".

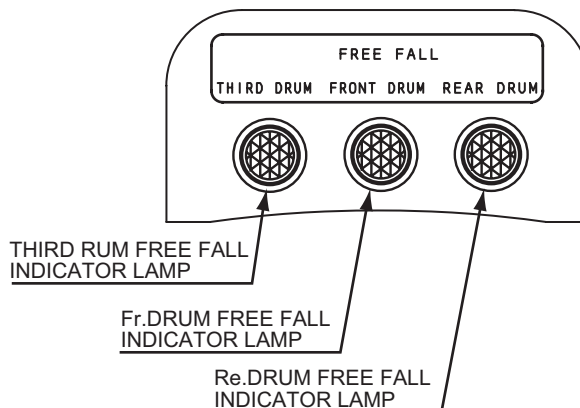
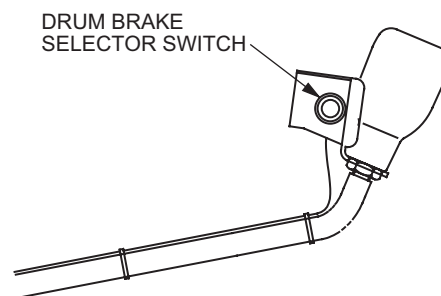
(1) FREE FALL MODE

To select the free fall mode, set the free fall lock switch to the "RELEASE" position, fully depress the drum brake pedal, and push the switch. Then, the free fall indicator lamp lights up to show that the free fall mode is selected (braking can be actuated with the brake pedal).

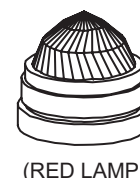
(2) NEUTRAL BRAKE MODE

To select the neutral brake mode, fully depress the drum brake pedal, and push the switch again.

Then, the free fall indicator lamp goes out (braking is automatically actuated).

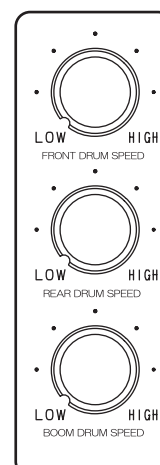



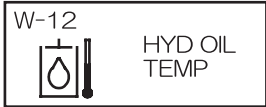








- 30. REAR DRUM FREE FALL INDICATOR LAMP
This lamp lights up when the rear drum is in free fall mode.
- 31. FRONT DRUM FREE FALL INDICATOR LAMP
This lamp lights up when the front drum is in free fall mode.
- 32. THIRD DRUM FREE FALL INDICATOR LAMP (OPTION) (CRANE ONLY)
This lamp lights up when the third drum is in free fall mode.



- 33. FRONT DRUM SPEED ADJUSTING KNOB
- 34. REAR DRUM SPEED ADJUSTING KNOB
- 35. BOOM DRUM SPEED ADJUSTING KNOB

RIGHT TURN	The rotating speeds of the front drum, rear drum and boom hoist drum are accelerated.
LEFT TURN	The rotating speeds of the front drum, rear drum and boom hoist drum are decelerated.

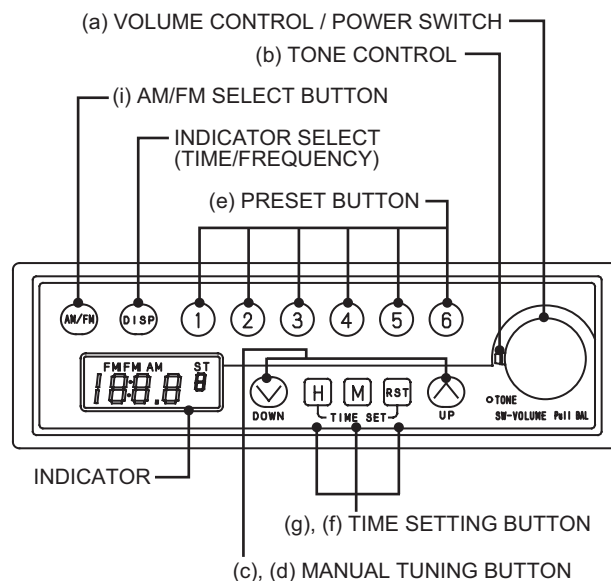


Displayed items	Descriptions and remedies	Buzzer
	<p>The fuel level is insufficient. Refuel.</p>	
	<p>The hydraulic oil temperature is excessively high. Adjust the engine speed to the medium level to lower the oil temperature, and consult with your nearest KOBELCO authorize distributor.</p>	
	<p>The temperature of clutch cooling oil of the front drum is excessively high. Idle the engine at a high speed to lower the oil temperature. If this item frequently appears during normal operations, consult with your nearest KOBELCO authorize distributor. At the same time, inform the KOBELCO service of the details of the operation (lifting load, free fall distance, speed, and duration).</p>	○
	<p>The temperature of clutch cooling oil of the rear drum is excessively high. Idle the engine at a high speed to lower the oil temperature. If this item frequently appears during normal operations, consult with your nearest KOBELCO authorize distributor. At the same time, inform the KOBELCO service of the details of the operation (lifting load, free fall distance, speed, and duration).</p>	○
	<p>The winch cooling line filter is clogged. Replace the filter cartridge. This item may appear during cold weather even when the filter is not clogged. If the item disappear during warm-up, the cartridge does not need to be replaced.</p>	○
	<p>The front drum clutch emergency system is actuated. The free fall of the front drum cannot be normally performed. Place a load and the hook onto the ground, and turn the key switch to the OFF position. Then, consult your nearest KOBELCO authorize distributor. DO NOT operate the key switch with a load or the hook hung in the air, since it may cause drop of the load or the hook.</p>	○
	<p>The rear drum clutch emergency system is actuated. The free fall of the rear drum cannot be normally performed. Place a load and the hook onto the ground, and turn the key switch to the OFF position. Then, consult your nearest KOBELCO authorize distributor. DO NOT operate the key switch with a load or the hook hung in the air, since it may cause drop of the load or the hook.</p>	○
	<p>The third drum clutch emergency system is actuated. The free fall of the third drum cannot be normally performed. Place a load and the hook onto the ground, and turn the key switch to the OFF position. Then, consult your nearest KOBELCO authorize distributor. DO NOT operate the key switch with a load or the hook hung in the air, since it may cause drop of the load or the hook.</p>	○
	<p>The hook block Anti-two-block (overhoist) stop status is released. Stop the release, and operate in the normal status.</p>	△
	<p>The boom overhoist stop status is released. Stop the release, and operate in the normal status.</p>	△

2.2.4 AM/FM RADIO (OPTION)

1. To Hear the Radio Broadcasting

- (1) Place the key switch in the ON or ACC position.
- (2) Push power switch (a) to power on.
Push the switch again to turn power off.
- (3) Turn volume control (a) to the right to turn volume high.
- (4) Choose your desired radio station by operating the manual tuning button (c), (d) or the preset button (e).
(Refer to the method of tuning.)
When pushing preset button (e), push the button within 1 seconds.
- (5) After adjusting the volume properly, adjust tone control (b) as desired.
Turn to the right to make the tone high, and turn to the left to make the tone low.



2. Method of Each Tuning

(1) Method of Auto Tuning

By pushing the manual tuning button (c) or (d) for 0.5 seconds or longer, the radio station of higher frequency is selected, and the tuning is automatically stopped when receiving the radio wave. At this time, the received frequency is indicated on the indicator.

(2) Method of Manual Tuning

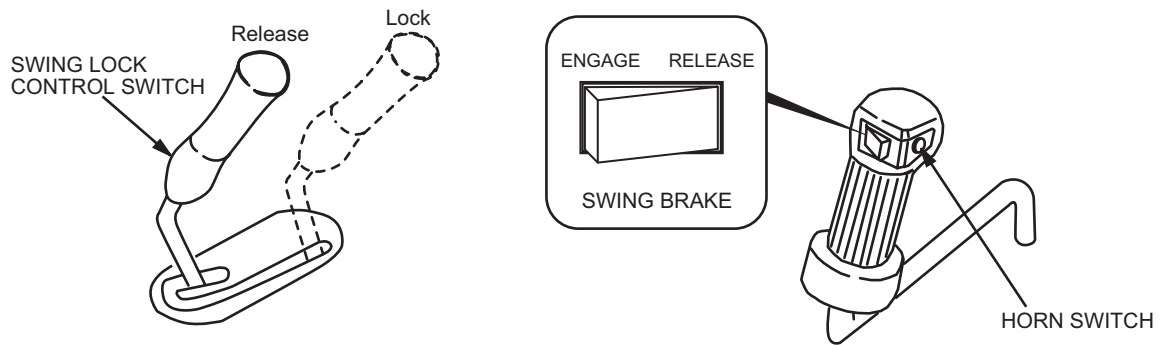
When selecting a high frequency broadcasting, push the "UP" button (d) of manual tuning button, and when selecting a low frequency broadcasting, push the "DOWN" button (c). At this time, indicator indicates the received frequency.

Method of Manual Tuning

(3) Method of Preset (Setting the Selecting Button)

- (a) Choose AM or FM by pushing the AM/FM selector button (i).
- (b) Adjust the frequency to that of the radio station, which you desire to memorize, by pushing the "UP" button (d) and "DOWN" button (c).
(The received frequency is indicated on the indicator.)
- (c) By pushing the preset button (e) for 1 second or longer, the selected frequency is memorized.
(In the AM/FM radio, six broadcasting frequencies can be set respectively in AM and FM.)

3. Release the swing lock pin and swing brake.



CAUTION

Since the machine may swing naturally due to the wind or ground inclination, pay attention to release the swing brake. When the operator shut off lever is moved from the lock position to the work position, care should be taken because the machine also may swing naturally. (Regardless of positions of the swing brake switch, if the operator shut off lever is set at the lock position, it means that the swing brake has been engaged.)

CAUTION

DO NOT set the swing brake switch to the "Engaging" side during swinging (while the lever is operated).

2.4.2 HOOK HOIST DRUM CONTROL

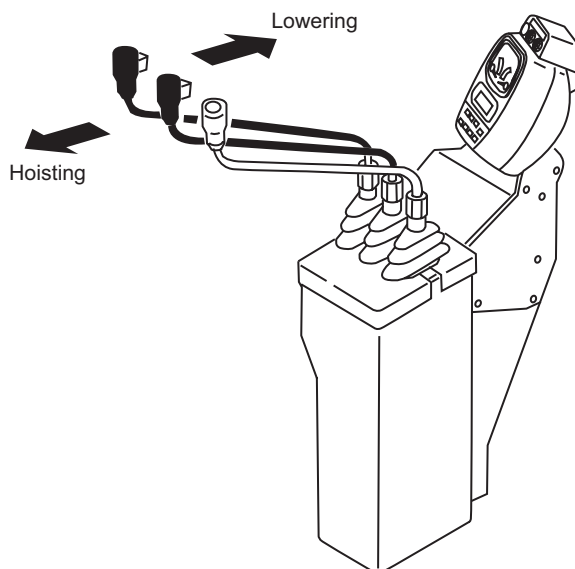
CAUTION

When hoisting load, always observe the provided rated load chart.

Hoisting and lowering speed can be adjusted by the accelerator grip and/or the drum control lever.

Maximum hoisting and lowering speed can be set with the hoist drum speed select switch.

1. Release the drum lock.

**HOOK HOIST DRUM CONTROL**

1. RAISE

Pull the hook hoist drum lever backward to raise the load.

2. LOWER

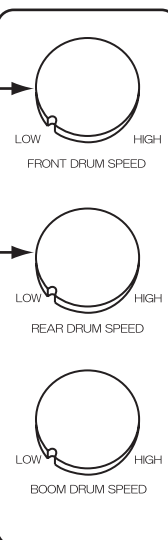
Push the hook hoist drum lever forward to lower the load.

Even when the hook hoist drum lever is pushed forward and load is not lowered, the drum lock pawl may be engaged with the ratchet of the drum. In this case move the lever slightly for the raising side and then for the lowering side.

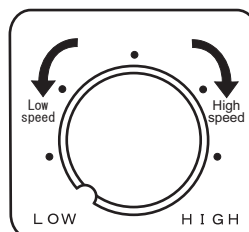
3. STOP

Return the hook hoist drum control lever to the neutral position to set the brake automatically and to hold the load. Set the drum pawl lock when the load will be suspended in the air for the long time.

FRONT DRUM SPEED ADJUSTING KNOB



REAR DRUM SPEED ADJUSTING KNOB

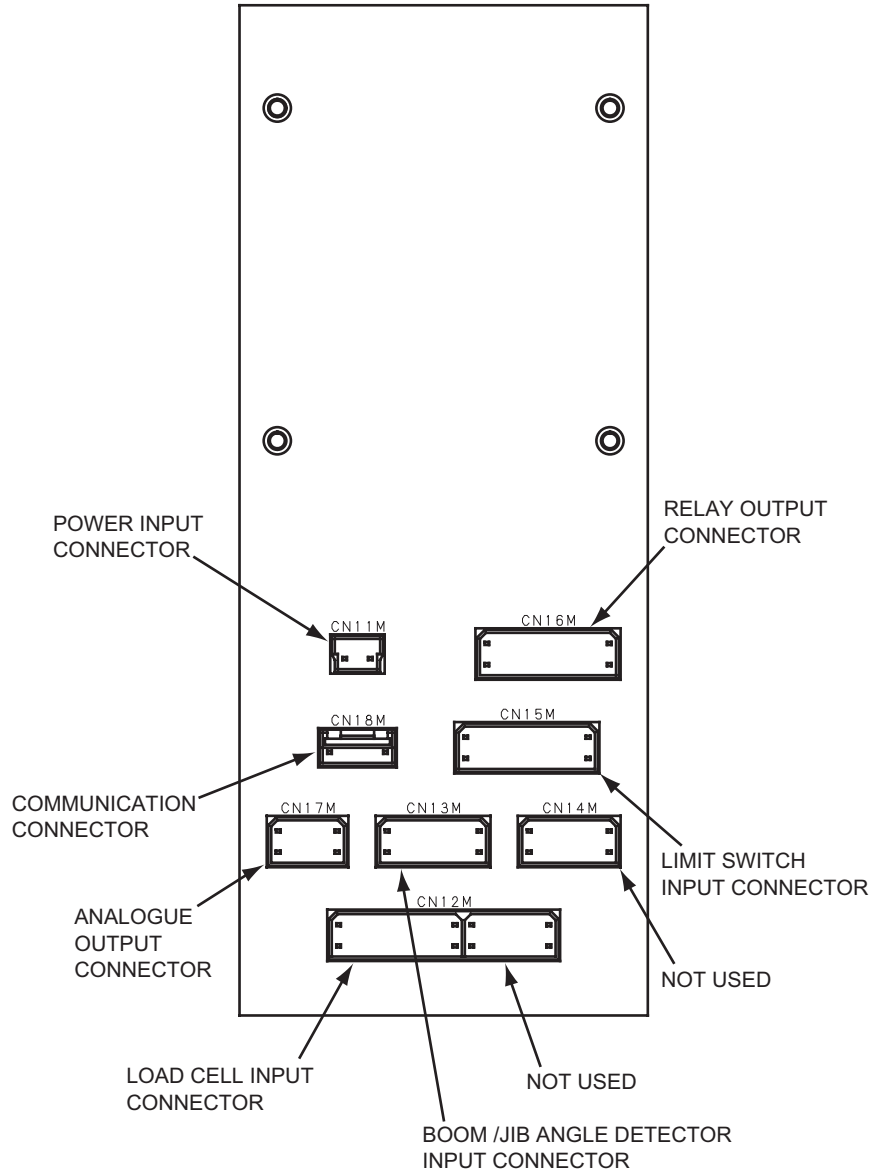
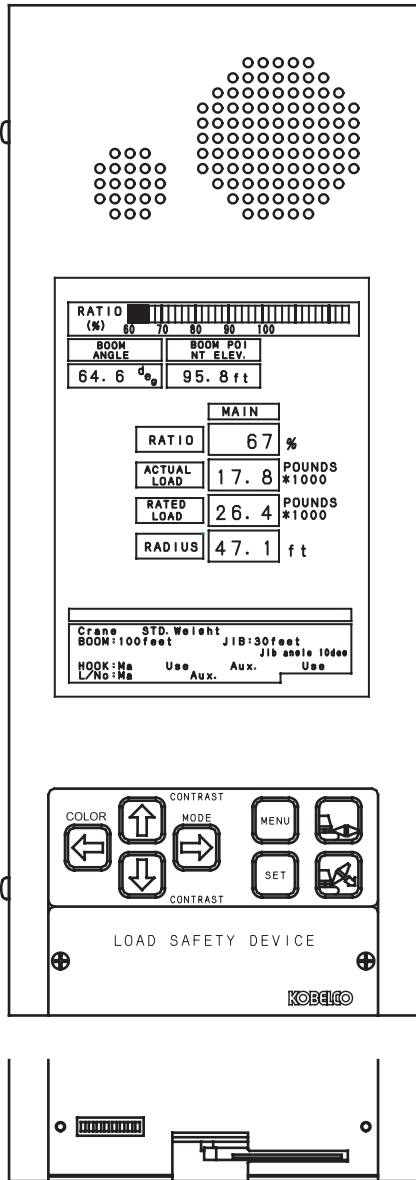


HOOK RAISING/LOWERING SPEED ADJUSTING KNOB

3.2 TYPE AND FUNCTIONS OF EQUIPMENTS

CONTROLLER/MONITOR (1)

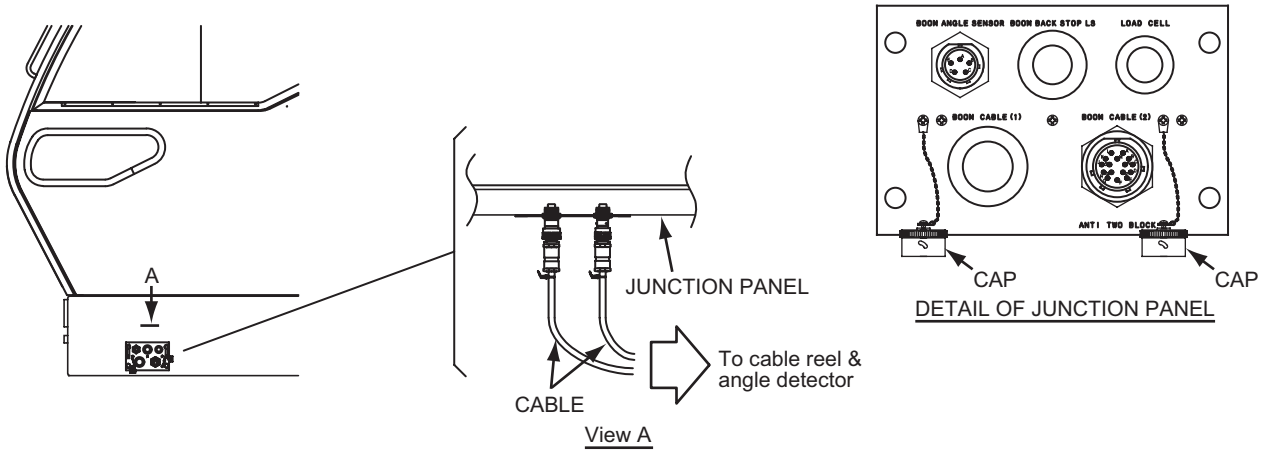
This figure indicates the machine condition, and issues the signals for the alarms and stop.



Note

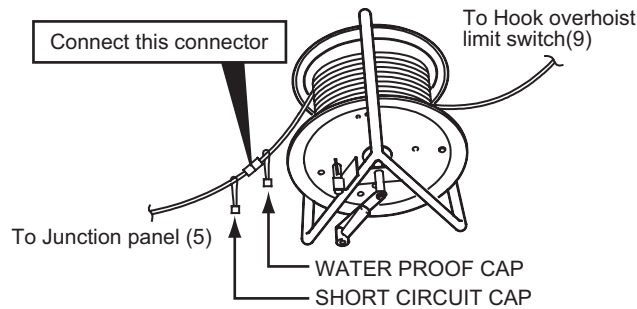
All numeral value in the (1) DISPLAY in the chapter 3. LOAD SAFETY DEVICE give an example only.

[2] CONNECTING ATTACHMENT HARNESS TO BODY HARNESS



[3] CONNECTING CABLE REEL (15)

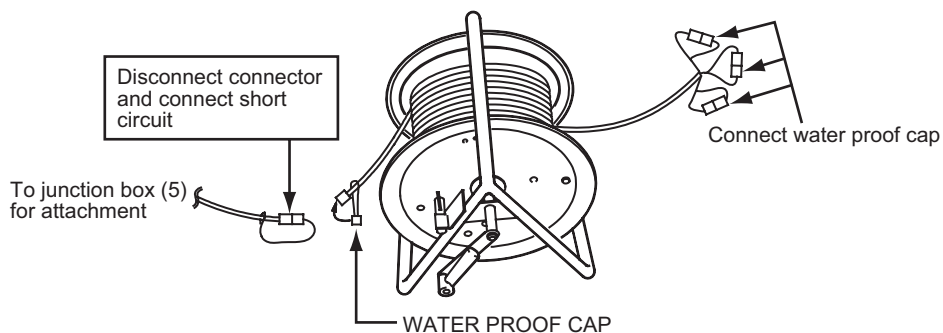
- FOR OPERATING CRANE




WARNING

Do not operate crane with short circuit cap, connect. Failure to observe this precaution may lead to automatic stop and alarm unable to work in event of hook overhoist and may lead to serious injury or death.

- FOR TRANSPORTATION



WARNING

Do not lift any load when lowering the boom with this switch .

Failure to observe this precaution may result in overturning and/or damage of the machine and may lead to serious injury or death.

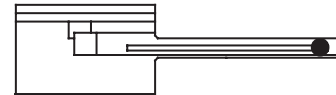
5. COVER

DO NOT open unless you need to load the memory card or operate the setting and adjusting switches.



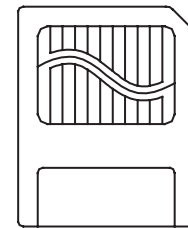
6 .MEMORY CARD SLOT

Insert the data memory card here.



7. MEMORY CARD

This card contains the data related to the crane capacity.

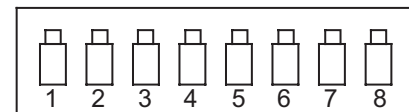


Note

Always keep this card in the memory card slot and do not remove or touch it.

8. SETTING AND ADJUSTING SWITCHES

This switches are used for upgrading of programs or adjustment only.

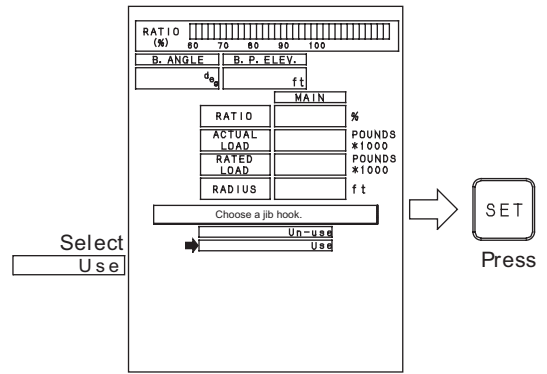


WARNING

Do not touch these switches unless approved by KOBELCO authorize distributor.

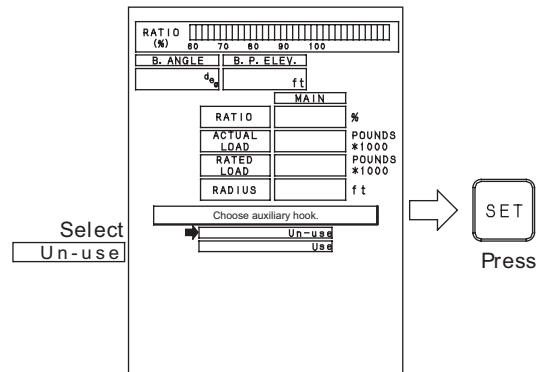
(F) Jib hook selection.

Select "Use".

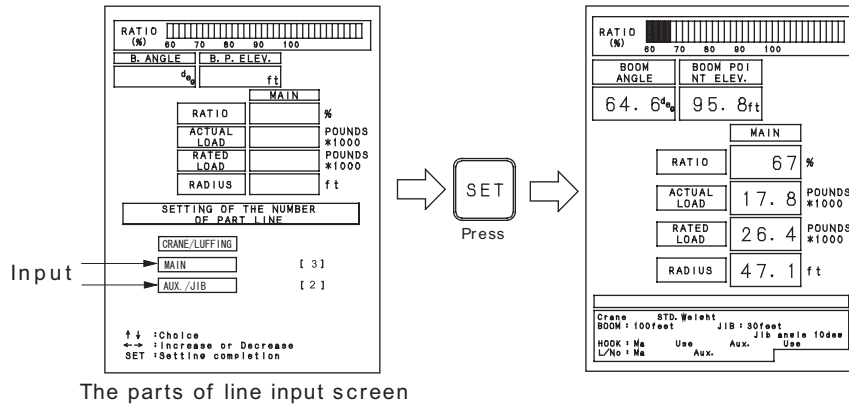


(G) Auxiliary hook selection.

Select "Un-use".



(H) Lastly, the number of part line input selection. Enter "3" for the main hook, and "2" for the auxiliary hook. Only the parts of line of wire rope on the hook for which "Use" is selected is displayed.



Check the settings

After all the settings and input are complete, the screen automatically returns to the main screen.


LUFFING

Hazardous Conditions	Indication and Stop										
	Color change in indicator							Code display **	Buzzer		Automatic stop
	Boom angle	Load-ing ratio	Actual load	Rated load	Operat-ing radius	Jib an-gle	Mode		Overload warning buzzer	Overhoist warning buzzer	
Loading ratio more than 90%	-	Yellow	-	-	-	-	-	(24)	Intermit-tent	-	-
Loading ratio more than 100%	-	Red	-	-	-	-	-	(05)	Continu-ous	-	Stop
Main hook block overhoist	-	-	-	-	-	-	Red	(17)	-	Continu-ous*	Stop
Jib and Aux. hook block overhoist	-	-	-	-	-	-	Red	(18)	-	Continu-ous*	Stop
Luffing boom overhoist	Red	-	-	-	-	-	-	(08)	-	Continu-ous*	Stop
Luffing boom overhoist (Right side limit)	Red	-	-	-	-	-	-	(21)	-	Continu-ous	Stop
Luffing boom overhoist (Left side limit)	Red	-	-	-	-	-	-	(60)	-	Continu-ous	Stop
Luffing boom overhoist	Red	-	-	0.0	-	-	-	(07)	Continu-ous	-	Stop
Luffing jib overhoist	-	-	-	-	-	Red	-	(14)	-	Continu-ous*	Stop
Luffing jib overhoist (limit)	-	-	-	-	Red	Red	-	(22)	-	Continu-ous	Stop
Luffing jib over-lowering	-	---	---	0.0	Red	Red	-	(13)	Continu-ous	-	Stop

(2) Release by Set up Mode

When the attachment is not installed and when the boom angle detector and hook overhoist limit switch cable are not completely connected, the automatic stop function operates.

The load safety device can be entered the SETUP/


mode by pressing the mode set up switch  once.

At this time, the automatic stop and alarm sounds are canceled. However, remember that the auto-

matic stop by the boom overhoist limit switch works.


When the load safety device enters the SETUP mode, the boom angle and messages to inform of the SETUP MODE are displayed on the screen.

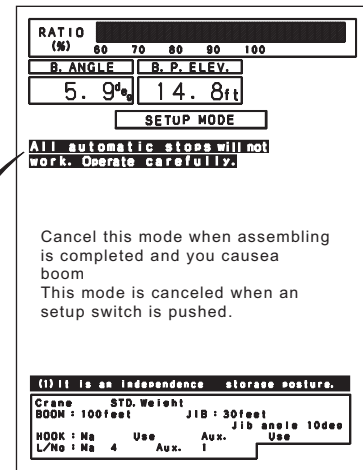
When the boom is raised after the assembly/disassembly is completed, the mode can be switched to the operation mode by pressing the SETUP switch

 once again. If the boom is raised during the SETUP mode, the SETUP mode is automatically switched to the operation mode when the boom angle is 15 degrees.

Therefore, the SETUP mode cannot be actuated while the boom is raised even when the SETUP switch is pushed.

The SETUP mode is cancelled when the power to the controller is shut down. Therefore, press the

 switch again to enter the SETUP mode when the power is supplied to the controller.

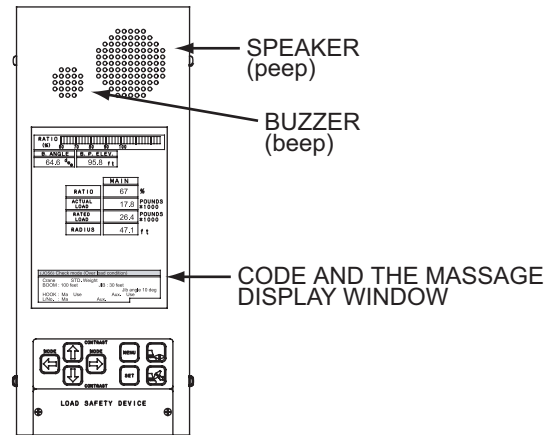


All automatic stops will not work. Operate carefully.

Screen displayed when the  switch is pressed.

3.10 INDICATION OF MESSAGE AND ALARM

Note that the machine is not malfunctioned when messages shown below are displayed depending on the conditions of the crane. These messages disappear when the control lever is operated to the safer side.

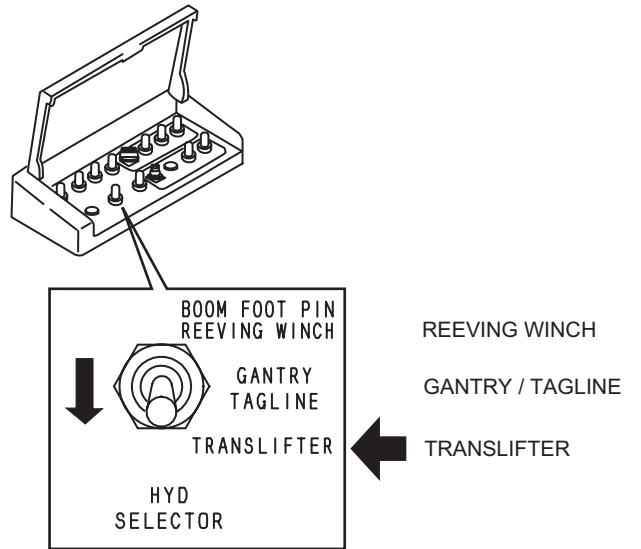


Message Table

Code and the Message	Buzzer	Display conditions (machine status)
(1) Out of angle.	-	Out of capacity set range
(2) Stop by the hook overhoist is canceled.	-	The hook overhoist automatic stop release switch is actuated.
(3) Stop by the boom/jib overhoist is canceled.	-	The boom overhoist automatic stop release switch is actuated.
(4) Stop by the overload is canceled.	-	Overload status is canceled.
(5) Overload condition.	beep	The loading ratio exceeds the specified level.
(6) Head wind is strong.	beep	The head wind alarm is issued.
(7) Boom is lowered too much.	beep	The boom is out of the maximum working radius area.
(8) Boom is raised too much.	peep *	The boom is out of the minimum working radius area.
(9)Jib is lowered too much.	peep	The jib is out of the maximum working radius areas.
(10)Jib is raised too much.	peep	The jib is out of the minimum working radius area.
(13)Jib is lowered too much.	beep	The jib offset angle is larger than the set value.
(14)Jib is raised too much.	peep	The jib offset angle is smaller than the set value.
(17) Hook overhoist.	peep *	The main hook overhoist limit switch is actuated.
(18) Hook overhoist.	peep *	The aux. hook overhoist limit switch is actuated.
(21) Boom overhoist.	peep	The boom overhoist limit switch is actuated.
(22)Jib overhoist.	peep	The jib overhoist limit switch is actuated.
(24) Overload forecast.	beep, beep ...	Loading ratio is 90% or more, and lower than the specified level.
(25) Reached the setup value of the load limitation.	beep	Lifting load exceeds the lifting load limit value set by operator.
(26) Reached 90% of the load limitation value.	beep, beep ...	Lifting load exceeds 90% of the lifting load limit value set by operator.
(27) Boom angle reached upper limitation value.	peep *	The boom reaches the boom angle upper limit point (stop point) set by operator.

6. Hydraulic Selector Switch (9)

This is the switch to select translifter operation, reeving winch operation, boom foot pin cylinder operation, and gantry cylinder operation. Place the hydraulic selector switch in DOWN position (inside) to operate translifter cylinders.

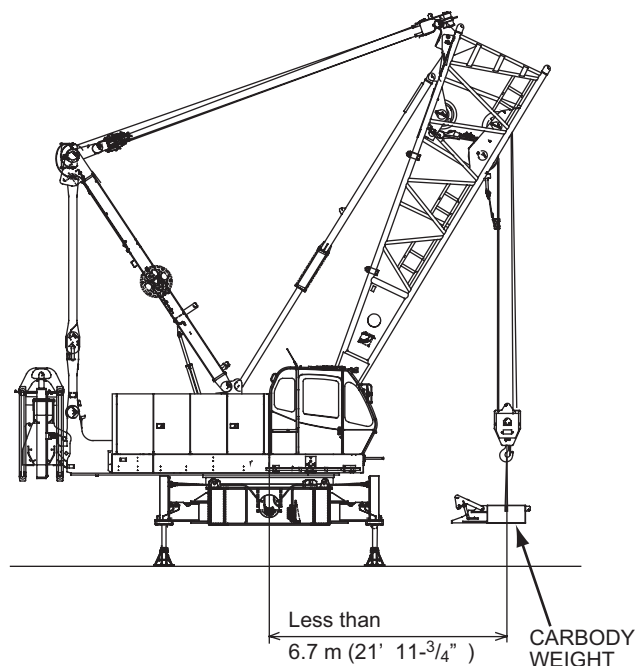


(9) HYDRAULIC SELECTOR SWITCH

4.4 INSTALLATION OF THE CARBODY WEIGHT (OPTION)

WARNING

Ensure that the working mode selector switch of the load safety device is set to the "SELF REMOVAL MODE" position.
Failure to observe this precaution may result in serious injury or death.



1. Swing the upper structure to orient toward the carbody weight.
2. Lift the carbody weight 5,000 kg X 2 (11,025 lbs X 2)

DANGER

Do not operate the machine abruptly when the machine is standing with translifters.
Failure to observe this precaution may result in serious injury or death.

DANGER

Do not stand under lifted or between carbody weight and the basic machine to avoid accident or drop or being caught.
Failure to observe this precaution may result in serious injury or death.

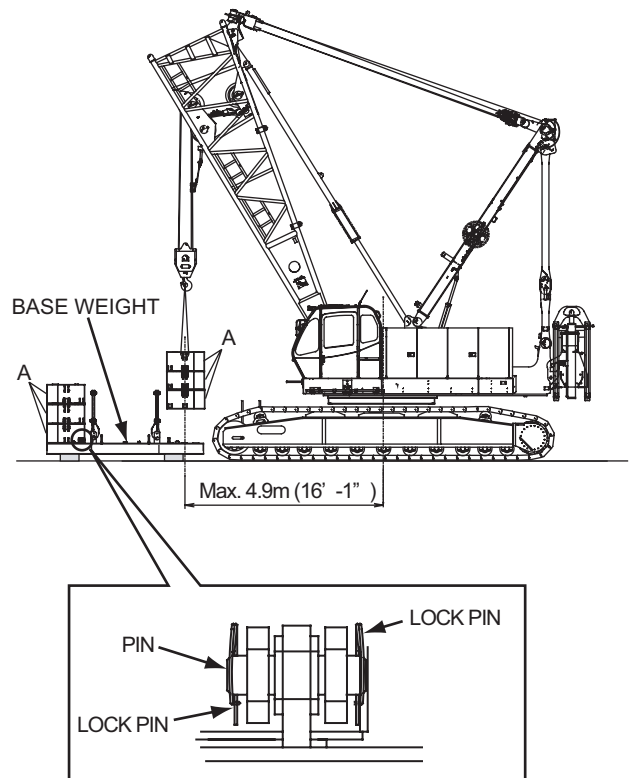
WARNING

The load line can break if the hook block contacts the end of the boom. This is called "two blocking". Two blocking can be caused by lowering the boom without paying out load line. Two blocking can pull jibs and lattice crane booms over backwards or cause damage to the tip.

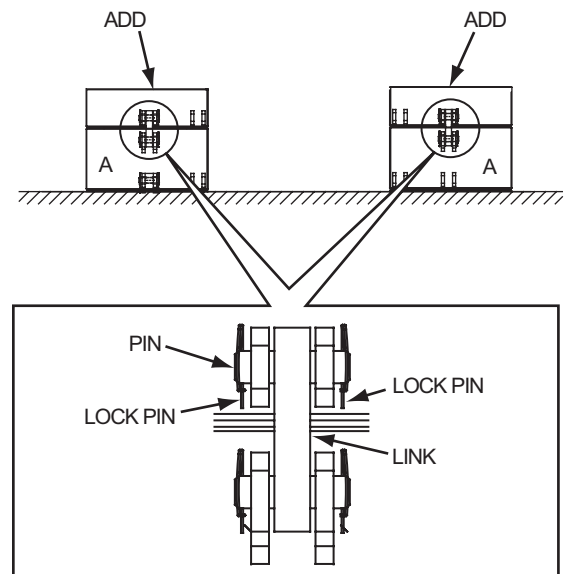
Always keep adequate space between the hook block and boom point. Lower the hook when lowering the boom. Failure to observe this precaution may result in serious injury or death.

4. ASSEMBLY OF THE MACHINE

4. Fix two sets of counterweights on the base counterweight with pins and lock pins.



5. Connect an additional counterweight to a counterweight "A" with a link, pins and lock pins. Make two sets.



4. ASSEMBLY OF THE MACHINE

Boom Length m (ft)	Boom and Guy Line Arrangement Charts (2/2) (Without 30A Insert Boom)	With Aux. Sheave	Main Hoist	Aux. Hoist
			No. of Line STD./ADD	No. of Line
38.8 (127)		O	4/5	2
41.8 (137)		O	4/4	2
44.8 (147)		O	4/4	2
47.9 (157)		O	4/4	2

O : Attachable X : Not Attachable

- When storing the spreader guide, slowly stretch the boom hoist wire rope. When clearance is generated between the spreader and the spreader guide, draw out pin "A", and return the spreader guide to the storage position.

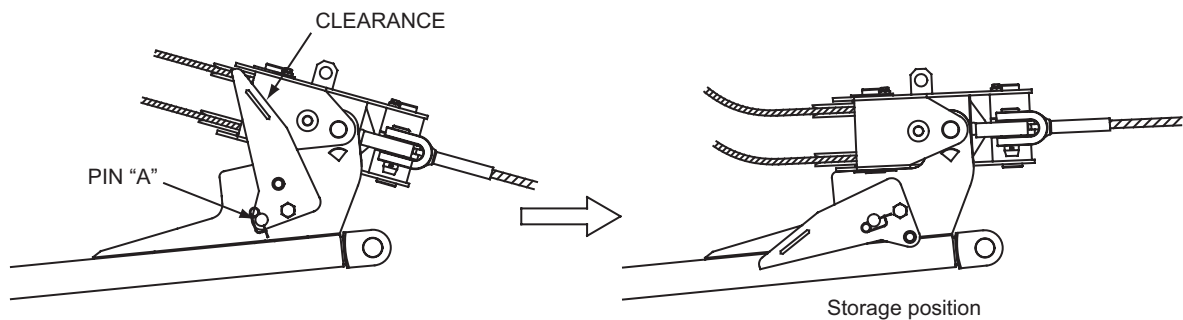
Since the clearance is not be generated with boom base section only, perform before disassembling the boom.

CAUTION

- When the gantry is in the lowered condition, be sure to set the guide in the storage position. If the guide is left in the work position, the guide could be damaged by boom hoisting.
- When the gantry is lowered and the upper spreader is connected to the boom base section, set the guide in the storage position. At this time, do not raise the boom to more than 20 degrees. If the boom is raised to more than 20 degrees, the winch wire rope has possibility to be damaged.

WARNING

Be sure to hold the guide end with hands. Only then, remove the pin, and stow the spreader guide. Failure to observe this precaution may result in serious injury or death.



4.7.6 REEVING REAR DRUM WIRE ROPE TO AUXILIARY SHEAVE

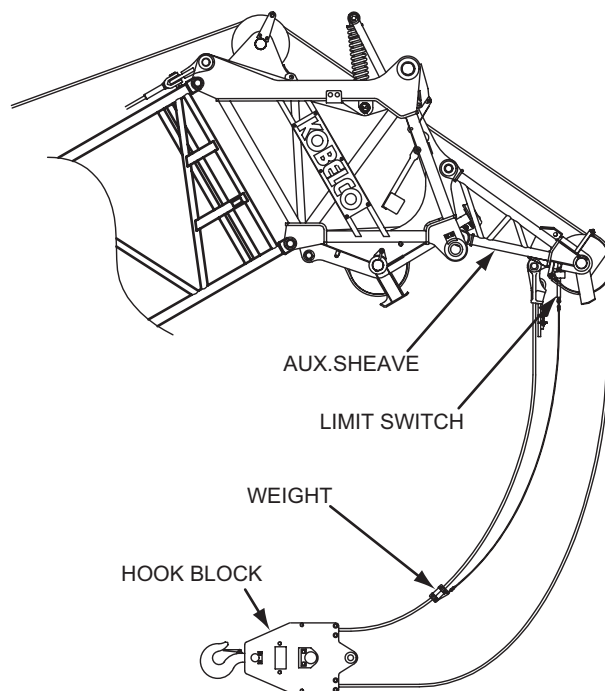
1. Place the ball hook near the tip of the auxiliary sheave.
2. Push the rear drum control lever to the lowering side to pay out the rear drum wire rope to the tip end of the boom, and pass the wire rope through the idler sheave and auxiliary sheave.

WARNING

- **Do not touch a wire rope directly with bare hands. Protruding wires could cause serious injury. Working gloves are recommended.**
- **Keep away from rope end when removing the wire rope. It may suddenly jump and cause injury.**
- **Keep hands and clothing clear of the rotating drum and running wire rope. Failure to observe this precaution may result in serious injury or death.**

The number of the wire rope part line for the auxiliary sheave must be always one.

3. Install the limit switch and weight to the auxiliary sheave.
4. Pass the wire rope end through the weight for the limit switch, and fix the end to the ball hook with the use of the rope socket.
5. Connect the wiring of the auxiliary hook anti-two-block (overhoist) limit switch, referring to Chapter 3. LOAD SAFETY DEVICE.



CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: www.heydownloads.com by clicking the link below



- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

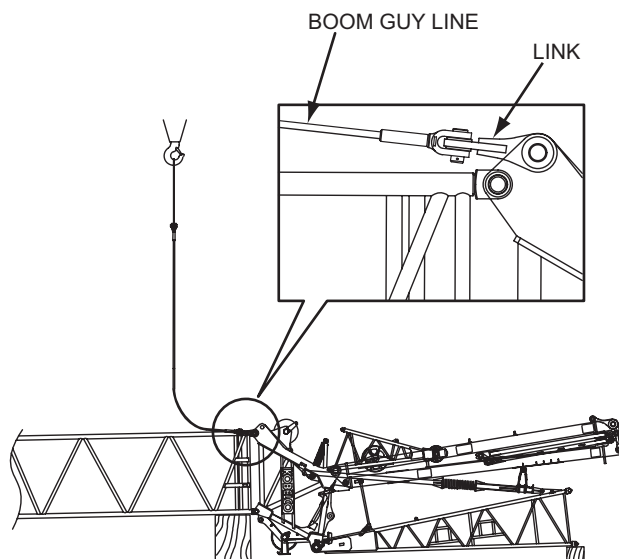
CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

4. Installation of the guy line

- (1) Prepare guy lines according to the guy line arrangement chart.
- (2) Connect the prepared guy lines from the boom top, to the machine side, one after another. When connecting the guy lines, be sure to remove the slack. Excessively slack guy lines make it impossible to connect with the upper spreader.

WARNING

When working at a high elevation, be sure to use a safety belt to prevent falling. Use a scaffolding board for working on the boom.



5. Connecting the insert jib

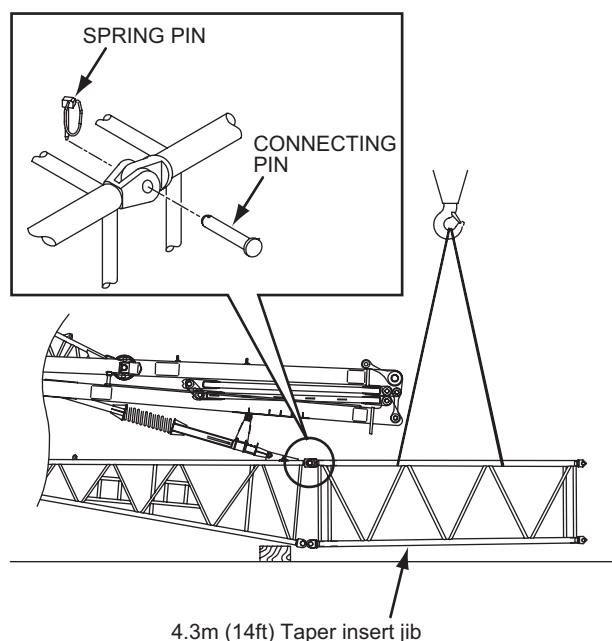
- (1) Referring to the boom and guy line arrangement chart, lift the required insert jib(s), being careful not to mistake the top for the bottom, and bring it near the jib base section.
- (2) Align the top connecting pin holes, insert the connecting pin in the lock pin holes facing up and down. Insert the spring pins to secure the connecting pins.

Note

Be sure to tap the connecting pins (pin with brim) from the outside to the inside.

WARNING

Do not insert your hand or finger into pin hole. Failure to observe this precaution may result in serious injury or death.



4.8.3 ASSEMBLING OF BOOM/JIB/GUY LINE (Self-election with boom base on the base machine)

DANGER

- Do not stand under the boom or inside the boom structure when removing the connecting pins.
- Do not climb, stand, or walk on boom.
- Use a ladder or similar device to reach only necessary areas.
Failure to observe this precaution may result in serious injury or death.

1. Connecting the insert boom

- (1) Referring to the boom and guy line arrangement chart, lift the required insert boom(s), being careful not to mistake the top for the bottom, and bring it near the boom base section.
- (2) Align the top connecting pin holes, insert the connecting pin in the lock pin holes facing up and down. Insert the spring pins to secure the connecting pins.

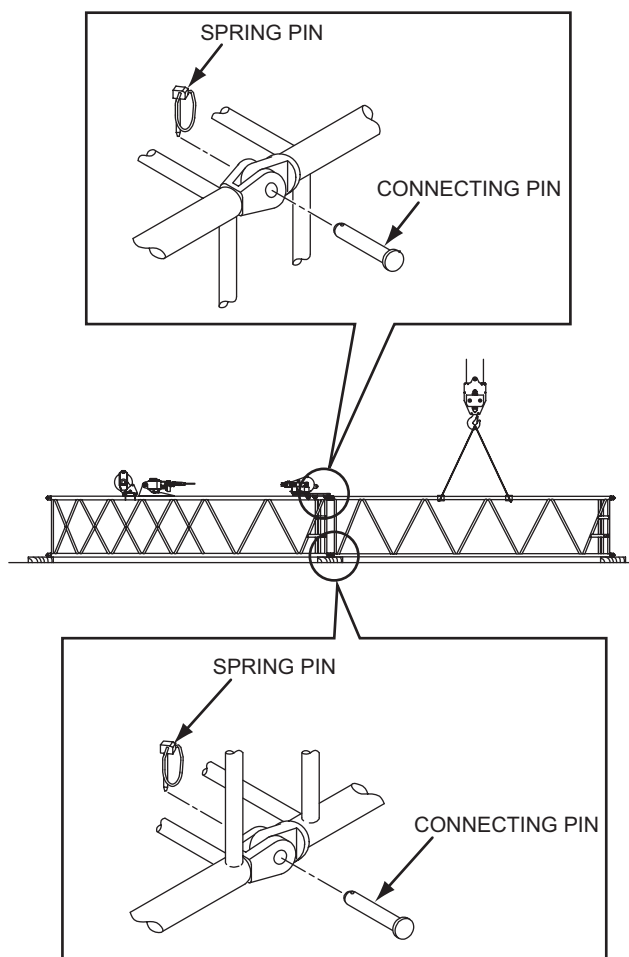
Note

Be sure to tap the connecting pins from the outside to the inside.

WARNING

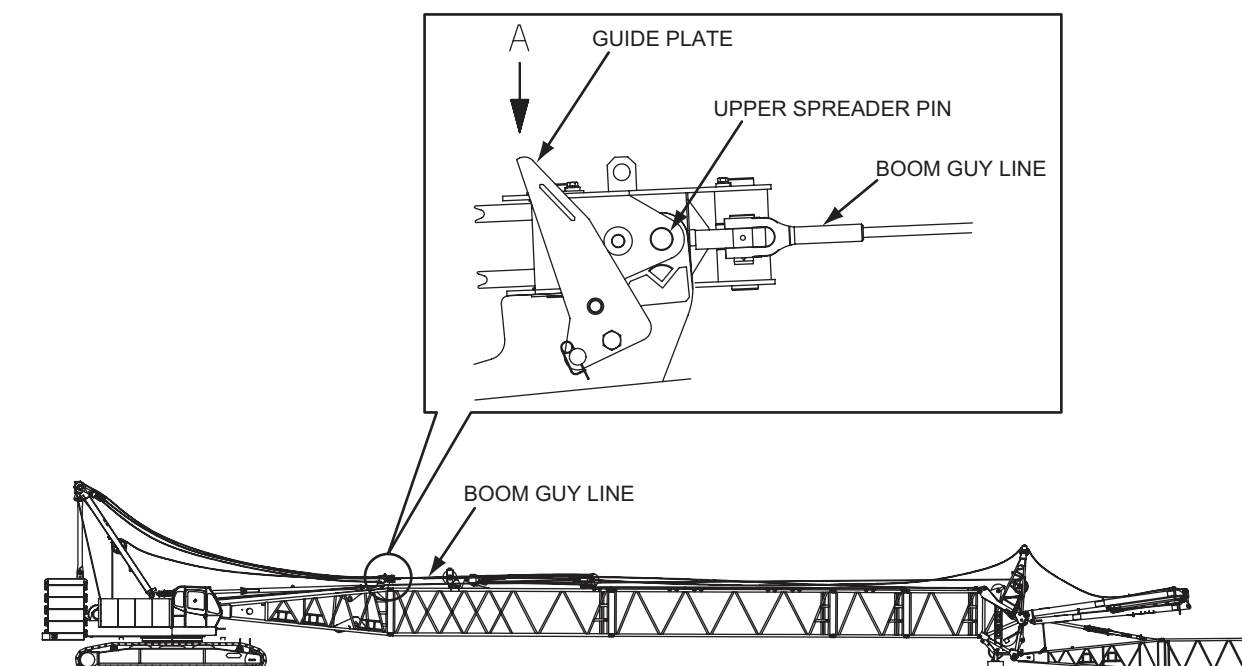
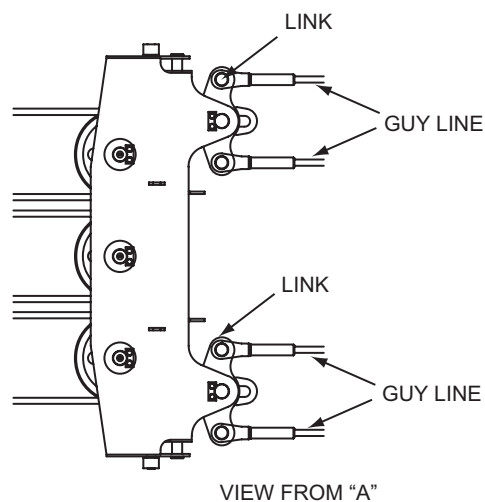
Do not insert your hand or finger into pin hole. Failure to observe this precaution may result in serious injury or death.

- (3) Referring to the boom and guy line arrangement chart, connect the insert booms in order in the same way.



12. Connecting the guy lines to the upper spreader

Connect the guy lines to the links of the upper spreader, referring to the drawing.



13. Remove the upper spreader from the boom base

For the notes on the spreader guide, refer to page 4-46.

- (1) Loosen the boom hoist wire rope enough.
- (2) Use the guide plate to remove the upper spreader pin.
- (3) Wind the boom raising wire rope onto the boom drum paying attention not making rough winding.



Place an signal man to avoid accident of being caught.

Failure to observe this precaution may result in serious injury or death.

4.9.6 ERECTING THE LUFFING ATTACHMENT

⚠ WARNING

To prevent possible serious injury or death from being caught in a suddenly lowered attachment, do not enter the area under attachment.

Post a watchman, if necessary.

⚠ WARNING

To prevent possible serious injury or death from being dragged or struck by a suddenly moving hook, keep clear from the area near the hook when the attachment is erected.

⚠ CAUTION

1. Erect the attachment to the front or rear side of the crawlers; Not over the sides.
 2. Operate the attachment slowly and avoid abrupt starting or stopping.
 3. Prevent the wire rope at the top of the boom or jib from being caught in or kinked.
 4. Ensure that the ground is flat and level in the area where the jib point rollers move. Place steel plates between the machine and the ground if the ground is not flat or level.
 5. Keep all personnel from in front of or behind the jib point rollers.
 6. DO NOT erect the attachment in windy weather.
 7. Keep the hook block placed on the ground until the attachment angle reaches the workable range.
-

5.2.1 LOWERING THE ATTACHMENT

WARNING

To prevent possible serious injury or death from being caught in a suddenly lowered attachment, do not enter the area under attachment. Post a watchman if necessary.

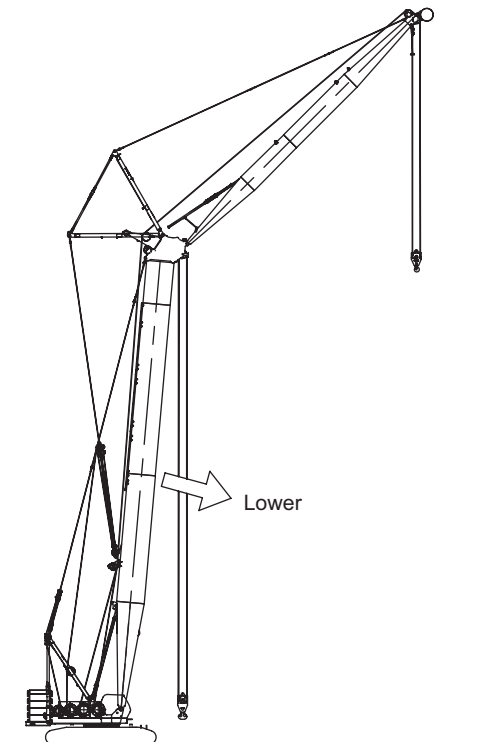
CAUTION

Precautions for lowering the luffing attachment

1. Lower the attachment to the front or rear of the crawlers; Not over the side.
2. Operate the attachment slowly and avoid abrupt starting or stopping.
3. Prevent the wire rope at the top of the boom or jib from being caught in or kinked.
4. Ensure that the ground is flat and level in the area where the jib point rollers move. Place steel plates between the machine and the ground if the ground is not flat or level.
5. Keep all personnel from in front of or behind the jib point rollers.

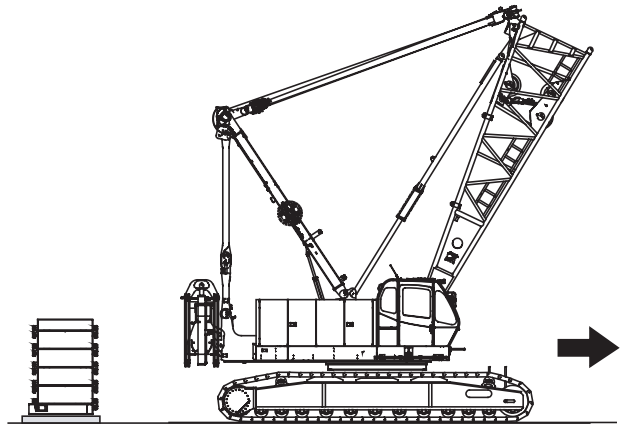
1. Preparation before Lowering the Attachment

- (1) Set the boom angle to the minimum working angle in the luffing working angle.
- (2) Return the boom hoist lever to the neutral position.

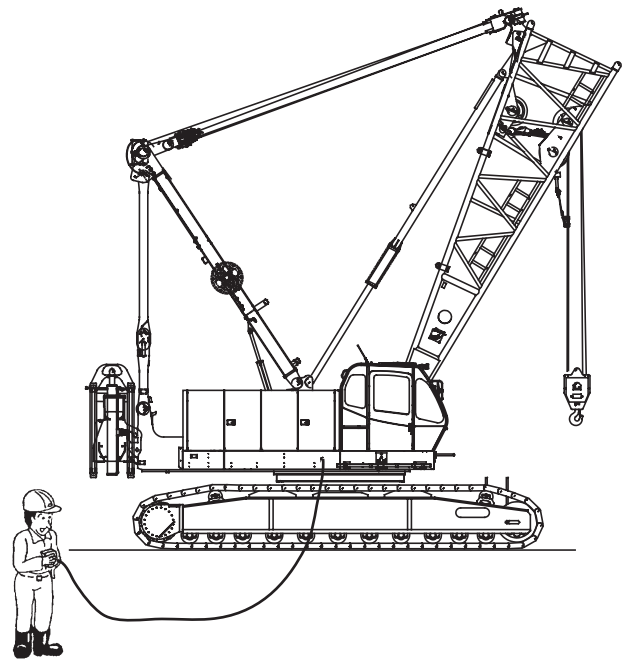


5. DISASSEMBLY OF THE MACHINE

- Travel straight to keep the base machine away from the counterweights.

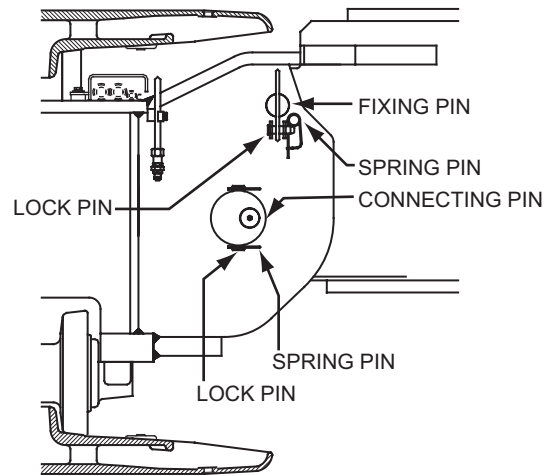


- Disconnect the remote control cable from the base machine.

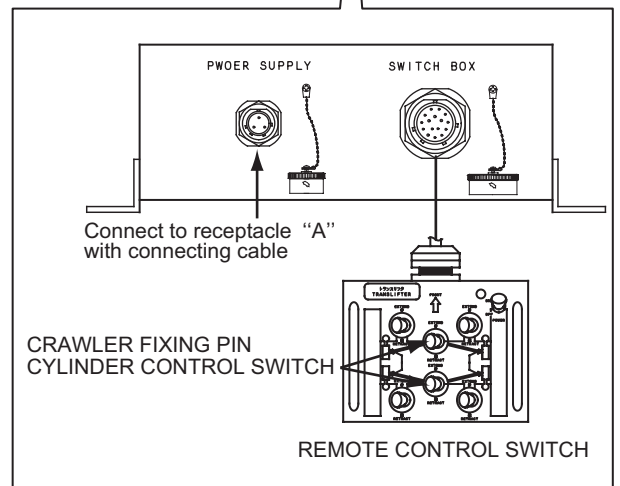
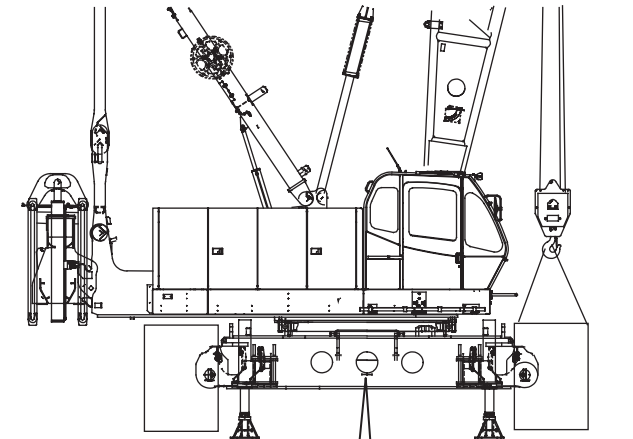


5. DISASSEMBLY OF THE MACHINE

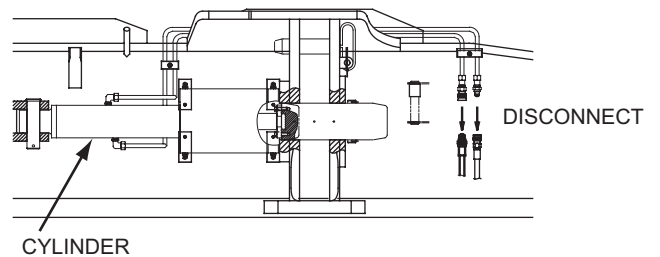
- Remove the lock pin for the connecting pin.
- Remove the fixing pins (2 pos.).
If they are hardly removed, align the pin holes.



- Connect remote control switch.
- Operate the remote control switch, and completely remove the two crawler connecting pins.

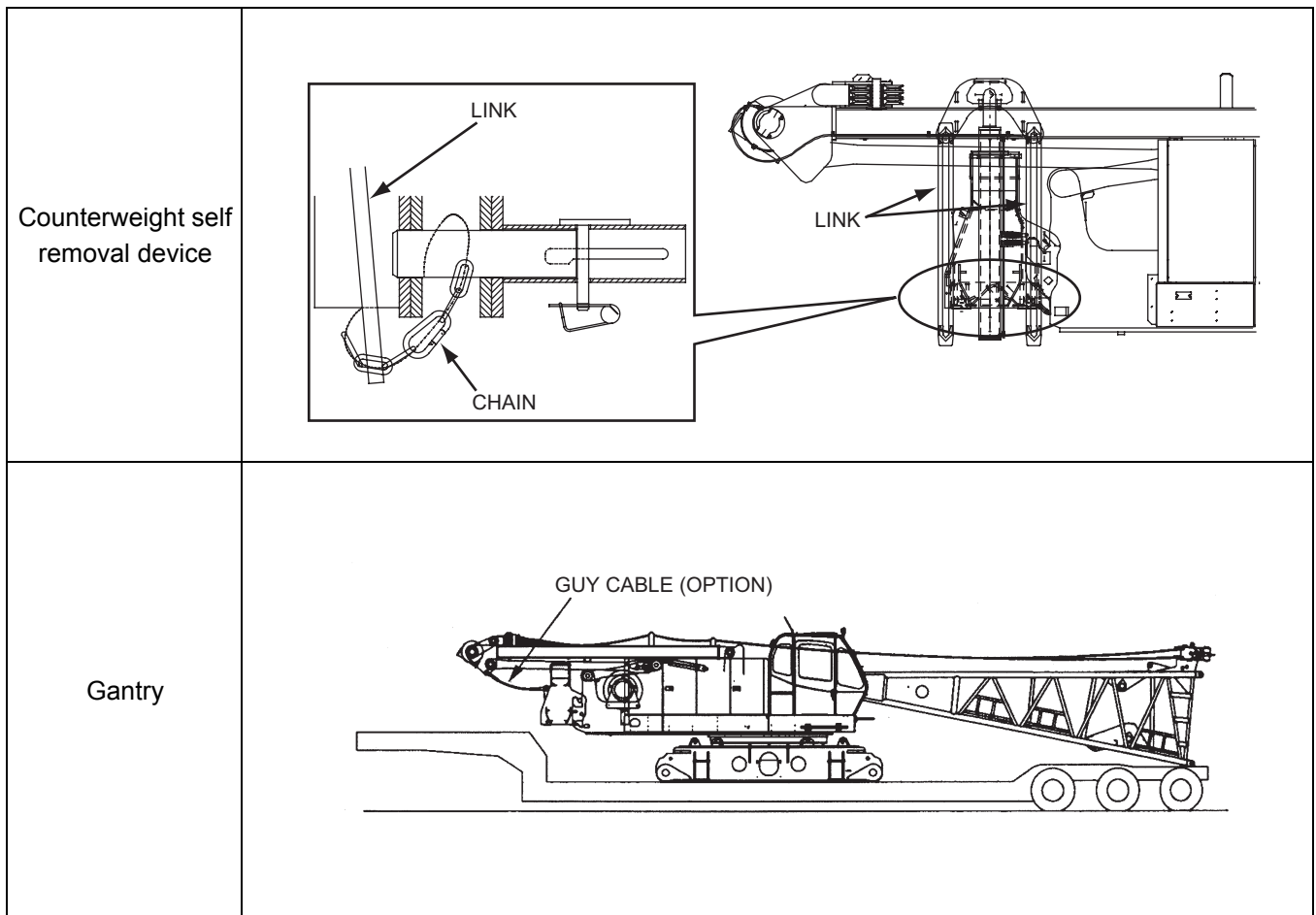


- Ensure that the connecting pins are completely removed, and stop the engine.
- Remove the hydraulic hose for the connecting pin cylinder with quick coupler.



5.12.5 CAUTION WHEN TRANSPORTING THE BASE MACHINE

When transporting the base machine, fix the counterweight removal links with the chain and secure the gantry with the guy cables.

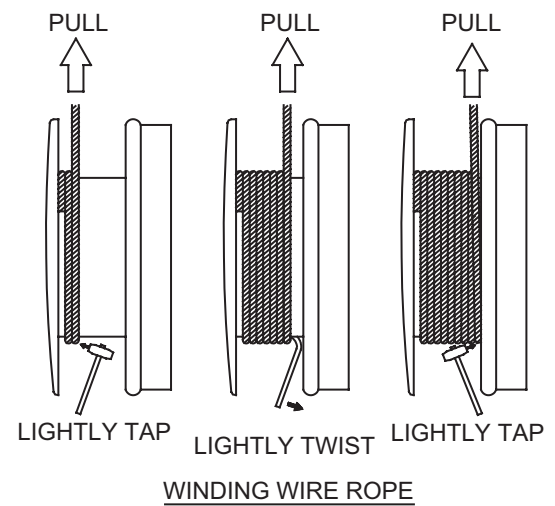


- Lightly tap the rope for proper alignment while slowly winding it onto the drum. Pull slightly on the rope, with a constant pressure, to ensure it winds tightly onto the drum.

WARNING

- Keep hands and clothing clear of the rotating drum and running wire rope.

Failure to observe this precaution may result in serious injury or death.



7.1.1 CHECKS OF THE UPPER

Check Interval	Item No.	Identification	Check Item	Check Method	Reference page
Daily or every 8 hours	1	Fuel and hydraulic system hose	Damage	Visual check	7-8
	2	Engine	Starting, leak, unusual noise	Starting, check by hearing	7-8
	3	Hose, piping, connector	Oil leak	Visual check	7-8
	4	Swing brake	Effectiveness	Operation	7-8
	5	Swing lock	Performance	Operation	7-9
	6	Control lever	Play, deformation	Operation, visual check	7-9
	7	Gantry	Deformation, crack	Visual check	7-9
	8	Horn, head light, wiper	Performance	Operation, visual check	7-9
	9	Air cleaner	Clogging(indicator)	Visual check	7-10
	10	Pin, link, cotter pin	Damage, falling off	Visual check	7-10
	11	Bolt, nut	Looseness, falling off	Visual check	7-10
	12	Hook overhoist preventive device	Performance	Operation	7-10
	13	Boom overhoist preventive device	Performance	Operation	7-10
	14	Load safety device	Performance	Operation	7-10
	15	Drum lock knob	Performance	Operation	7-11
	16	Window glass, step, handle, guard	Damage, crack, falling off	Visual check	7-11
	17	Swing neutral free indicator lamp	Filament is gone	Operation, visual check	7-11
	18	Drum brake free fall indicator lamp	Filament is gone	Visual check	7-12
	19	Drum brake disk	Wear	Visual check	7-12
Weekly or every 50 hours	33	Fuel pre-filter (Option)	Water level	Visual check	7-18
Monthly or every 100 hours	20	Fan belt	Looseness, damage	Push with finger, visual check	7-13
	21	Radiator, oil cooler	Oil leak, damage	Visual check	7-13
	22	Engine mounting bolt, rubber mount	Looseness, damage	Visual check, test hammer	7-13
	23	Power divider	Oil leak, unusual noise	Visual check, check by hearing	7-14
	24	Hydraulic motor, Reduction unit	Oil leak, unusual noise	Visual check, check by hearing	7-14
	25	Valve, etc.	Oil leak	Visual check	7-15
	26	Hydraulic pump	Oil leak, unusual noise	Visual check, check by hearing	7-15
	27	Gantry cylinder , Counterweight self removal cylinder	Oil leak, damage	Visual check	7-15
	28	Drum lock	Wear, damage	Visual check	7-15
	29	Fuel supply pump, hose	Performance, damage	Operation, visual check	7-16
	30	Swing alarm lamp	Alarm sound, Filament is gone	Operation, visual check	7-16

7.1.1.3 CHECK OF UPPER SEMI-ANNUALLY OR EVERY 600 HOURS**31 ACCUMULATOR**

Check the accumulator for oil leak.

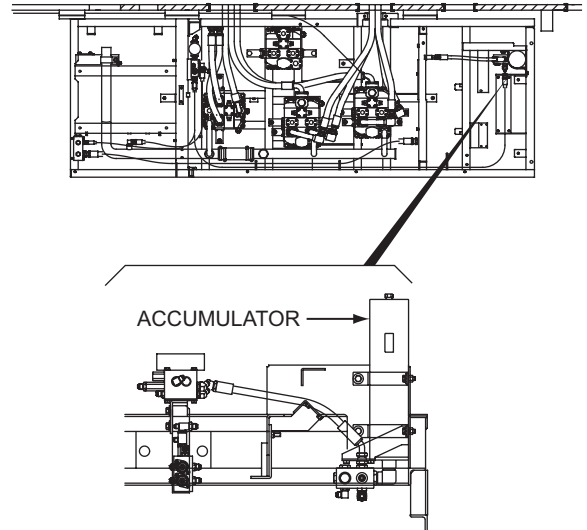
WARNING

1. Do not handle the accumulator roughly.
2. Do not store or handle the accumulator near the heat of fire.
3. Do not weld or machine the accumulator.
4. Do not remove valve cap except when charging or discharging gas.
5. Do not step on or place heavy material on the accumulator installed on the machine.
6. Check the accumulator for gas pressure every two years.
7. Ask our authorized KOBELCO authorize distributor to charge the gas.
8. Do not disassemble the accumulator.

The accumulator is charged with Nitrogen gas under pressure of 3.4 to 3.7 MPa.

32 FRAME

Check the frame for crack and deformation.



7. MAINTENANCE

Check Interval	Item No.	Identification	Check Item	Check Method	Reference page
Daily or every 8 hours	1	Upper spreader, lower spreader	Deformation, crack	Visual check	7-28
	2	Cable roller	Damage, deformation, wear	Visual check	7-28
	3	Sheave	Damage, deformation, wear	Visual check	7-29
	4	Boom, Jib	Damage, deformation	Visual check	7-29
	5	Pin, link, cotter pin	Damage, falling off	Visual check	7-30
	6	Bolt, nut	Looseness, falling off	Visual check	7-30
	7	Backstop (Boom and jib)	Damage, deformation	Visual check	7-30
	8	Wire rope, guy line	Damage, deformation, wear	Visual check	7-30
	9	Strut	Damage, deformation	Visual check	7-31
	10	Hoist wire rope clamp bolt	Looseness, falling off	Visual check	7-31

* The item number in the above table correspond to numbers in the following description.

* The item numbers, 5 and 6 are not indicated in the drawing.

KOBELCO Genuine Lubricant Chart

Kind	Symbol	Specification	Part Number
Hydraulic oil	HO	KW46 (for general use)	20 ltr. can →2421R157D5 200 ltr. can→2421R157D6
		KW32S (for cold region)	20 ltr. can →2421R157D3 200 ltr. can→2421R157D4
Extreme pressure grease	EPG	-	2121Z183
High temperature grease	HPG	-	2421Z183D2
Molybdenum disulphide grease	GL	-	2421Z183D3
Gear oil	GO	#90 or 80W-90	20 ltr. can →KSPSP90020 200 ltr. can→KSPSP90200
Engine oil	MO	SAE #30 (Class CD in API)	20 ltr. can →2421Z353D1 200 ltr. can→2421Z353D2
		SAE #10W (Class CD in API)	20 ltr. can →2421Z354D1 200 ltr.f can→2521Z354D2
		#10W-30 (CF4/DH-1)	20 ltr. can →YN01T01053D1 200 ltr. can →YN01T01053D2
Antifreeze	-	Long life coolant	18 ltr. can→KSPLLC95-18 20 ltr. can→KSPLLC95-20
		Permanent	18 ltr. can→KSPPT95-18 20 ltr. can→KSPPT95-20

LUBRICATION CHART

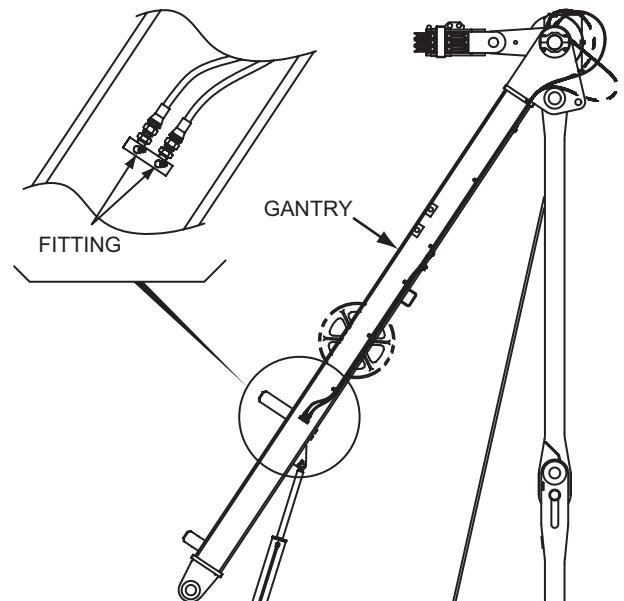
Lubricant	Symbol	Recommended Lubricant (Initial Factory Fill)			
Hydraulic Oil	HO	Hydraulic oil with anti-wear, anti-oxidant an anti-harmful foaming			
		55 °C to 5 °C	40 °C to 5 °C	30 °C to -25 °C	15 °C to -30 °C
		ISO VG68	ISO VG46	ISO VG32	ISO VG22
Gear Oil	GO	Extreme pressure gear oil #90 Grade GL-4 by API classification			
Grease	EPG	Extreme pressure Multipurpose grease NLGI No.2 Lithium base grease EP type			
	GL	NLGI No.1 Lithium base with Mo52 grease			
Engine Oil	MO	Above 40 °C	40 °C to 0 °C	40 °C to -30 °C	
		SAE40	SAE30	SAE10W-30	

2. GANTRY LINK

Grease through the grease fitting provided on the front member.

WARNING

Before climbing on machine make certain that the guard and walk ways are clean and dry, and use life belt in order to prevent falls due to slippery surface. Failure to observe this precaution may result in serious injury or death.

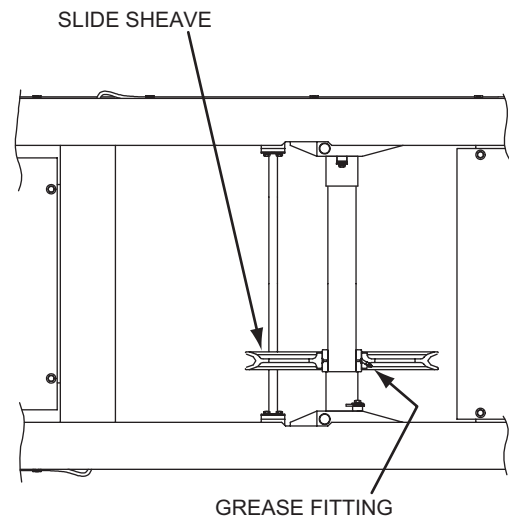


3. GANTRY SLIDE SHEAVE

Grease from the grease fittings provided on the sheave.

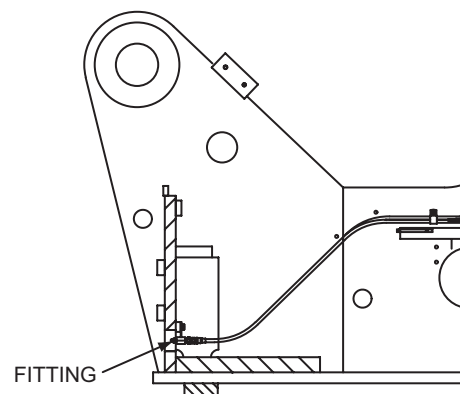
WARNING

Before climbing on machine make certain that the guard and walk ways are clean and dry, and use life belt in order to prevent falls due to slippery surface. Failure to observe this precaution may result in serious injury or death.



4. DRUM LOCK

To grease the front, rear and third (jib) drum locks, grease through the grease fittings provided in the front of the revolving frame (three places).



3. CHANGE OF HYDRAULIC OIL

 WARNING

Do not drain the oil when it is hot.

The hot oil may spout out which could result in personal injury. After the oil has cooled, drain the oil.

Failure to observe this precaution may result in serious injury or death.

 CAUTION

Extra care must be taken to insure that all the hydraulic tank is completely filled with oil before the engine is restarted.

Failure to properly prime the hydraulic pumps could result in a catastrophic failure of the pumps.

It is standard to replace hydraulic oil every 2000 hours of the hourmeter, but if the oil is remarkably contaminated or deteriorated, replace the oil regardless of operating hours.

- (1) Prepare a container of approx. 460 ltr.. (121.4 gal)
- (2) Remove the cap of the filler port and filter cover.
- (3) Loosen the drain plug and drain the hydraulic oil into the prepared container.
- (4) Replace the drain plug, fill the tank with the specified hydraulic oil through the filler port up to the specified level.
- (5) Reinstall the filter cover and oil supply cap.
- (6) Start and run the engine for about 1 minute, then extend the crawler extend/retract cylinders.
Check the oil level again.

When changing hydraulic oil, change the filter also of the same time.

Procedure of replacing the return filter

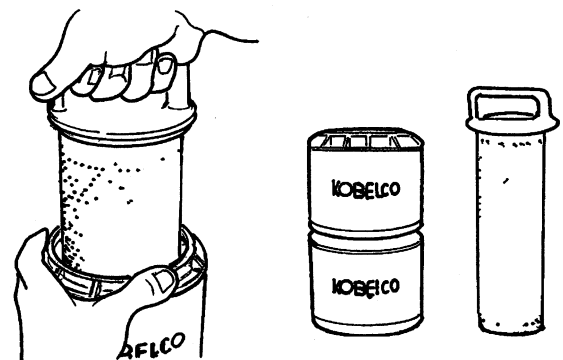
(1) Remove the filter assembly and place it on the flat surface.



(2) Hold the top mold plate and loosen the grip.



(3) Pull out the grip assembly.



(4) Turn over the filter.



(5) Hold the plate on which the end plate is attached.



2. CHECKING CHARGE CONDITION

The charge condition is judged by measuring the specific gravity of the battery electrolyte.

The normal specific gravity is 1.25 to 1.27 at 20°C (68°F) of electrolyte temperature. If the specific gravity is lower than 1.25, charge the battery.

If the battery is not used for a long time, remove the battery from the machine and store it in a cold and dark place.



NEVER use the battery when the battery electrolyte level is lower than the lower level.

Doing so will cause deterioration of the battery inside, but could also cause the battery to explode.

Failure to observe this precaution may result in serious injury or death.



Do not add battery electrolyte until the battery electrolyte level exceeds the upper level.

Otherwise, excess electrolyte leaks, causing corrosion of the periphery of the battery.



If the battery will not be used for an extended period of time, remove the battery, clean it thoroughly and store it in a cool, dry location where the temperature will not fall below 0°C (32°F).

If the battery cannot be removed and stored, then disconnect the terminals to avoid draining the battery.

Note

If the level of battery electrolyte exceeds the upper level or lower level of the sleeve, remove excess electrolyte with a syringe until the level is at the upper level or lower level of the sleeve.

To treat the removed electrolyte, neutralize it with sodium bicarbonate, and pour it out with a great deal of water, or consult with the manufacturer of the battery.

7.10.2 ADJUSTMENT OF BOOM DRUM LOCK

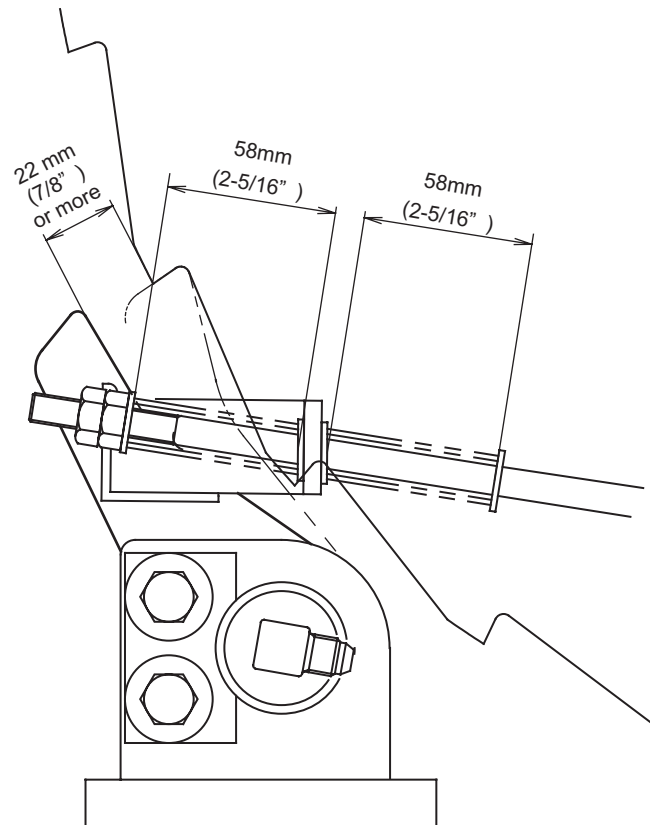
WARNING

Do not adjust the boom hoist drum lock until the boom has been lowered to the ground. Failure to observe this precaution may result in serious injury or death.

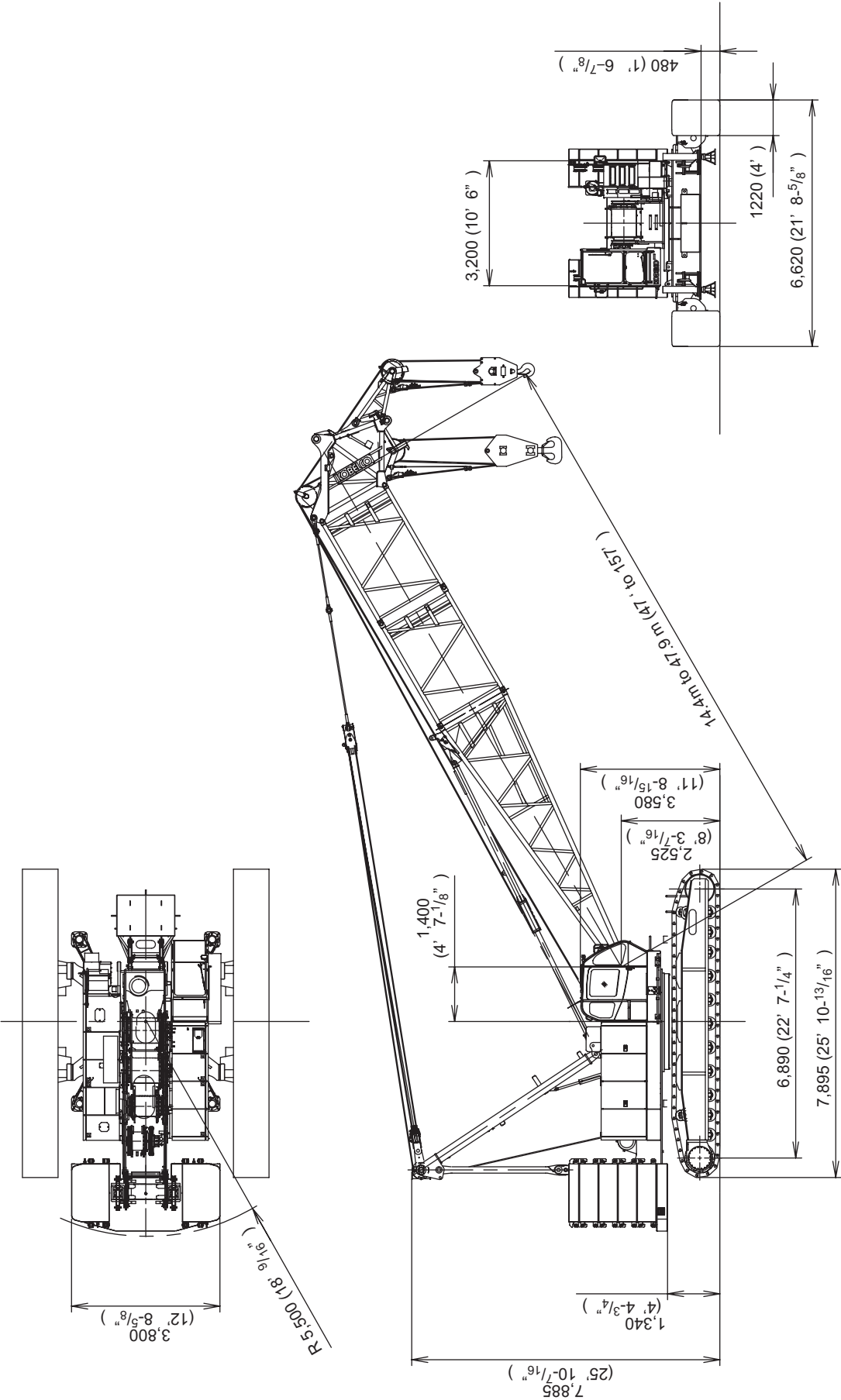
1. Pull the drum lock knob in the LOCK position and check to see that the pawl is engaged in the bottom of the drum ratchet with the drum lock condition. If the pawl is not engaged in the bottom of the ratchet, adjust the spring dimension to allow the pawl to be engaged.
2. With the RELEASE position, adjust the respective dimension as shown in the figure to the right.
3. Push the drum lock knob in the RELEASE position, and check to see that the pawl is clear of the ratchet by at least 22 mm (7/8"). Operate the knob to the LOCK position, and to the RELEASE position, and confirm that the pawl moves smoothly.

WARNING

Keep hands and clothing clear of the rotating drum. Failure to observe this precaution may result in serious injury or death.

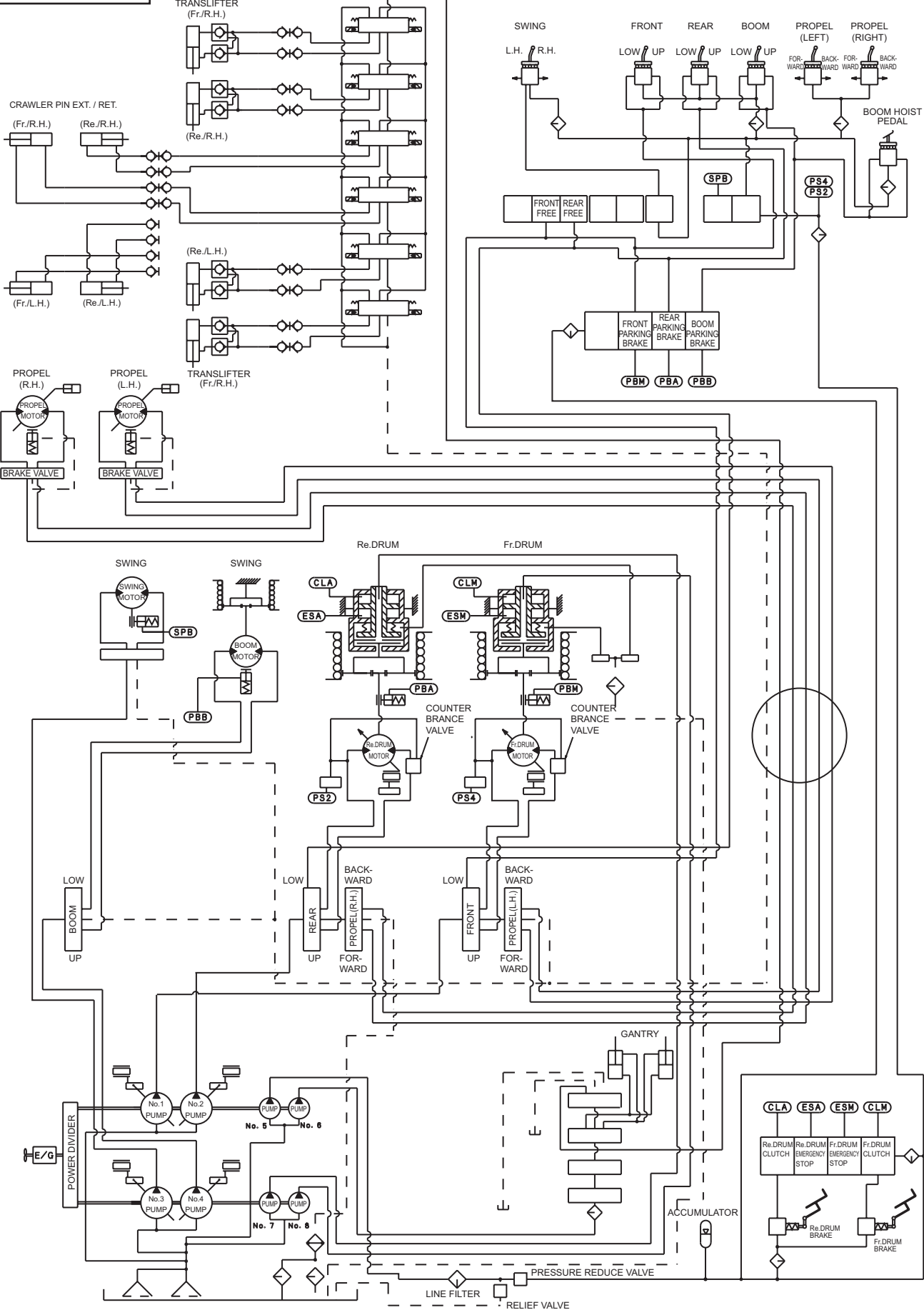


LUFFING UPPER BOOM



UNIT : mm (ft-inch)

WITH FREE FALL



F U S E					
F-NO.	RATED	LINE NO.	U S E	SHEET NO.	KOBELCO PART NO.
F- 1	20A	1-11	ELECTRIC POWER SOURCE	1	2479Z281209
F- 2	5A	1-12	BACK-UP	1	2479Z281205
F- 3	5A	54-13	ENG. START	1	2479Z281205
F- 4	5A	3-14	HOURLY METER	1	2479Z281205
F- 5	10A	2-15	WINCH	1	2479Z281207
F- 6	10A	2-16	EACH SOLENOID	1	2479Z281207
F- 7	5A	2-17	CONTROL POWER SOURCE	2	2479Z281205
F- 8	5A	2-18	LMI OUT PUT POWER SOURCE	2	2479Z281205
F- 9	20A	2-19	WIPER	6	2479Z281209
F-10	20A	2-20	AIR CONDITIONER	6	2479Z281209
F-11	10A	52-21	ONE-WAY RADIO	6	2479Z281207
F-12	30A	2-22	TOTAL CONTROLLER	4	2479Z2812011
F-13	10A	2-23	GAUGE CLUSTER MONITOR-CAMERA	7	2479Z281207
F-14	10A	2-24	SWING FLASHER	6	2479Z281207
F-15	10A	2-25	FUEL PUMP-FUN	6	2479Z281207
F-16	10A	2-26	COUNTER WEIGHT SELF REMOVAL CONTROL BOX	7	2479Z281207
F-17	10A	2-27	REDUNDANCY CIRCUIT	7	2479Z281207
F-18	10A	2-28	SPARE	7	2479Z281207
F-19	10A	2-29	SPARE	7	2479Z281207
F-20	10A	2-30	HYDRAULIC SELECT	1	2479Z281207
F-21	1A	18-103	OVER HOIST	2	2479Z281201
F-26	15A	2-36	E/G CONTROL UNIT	8	2479Z281208

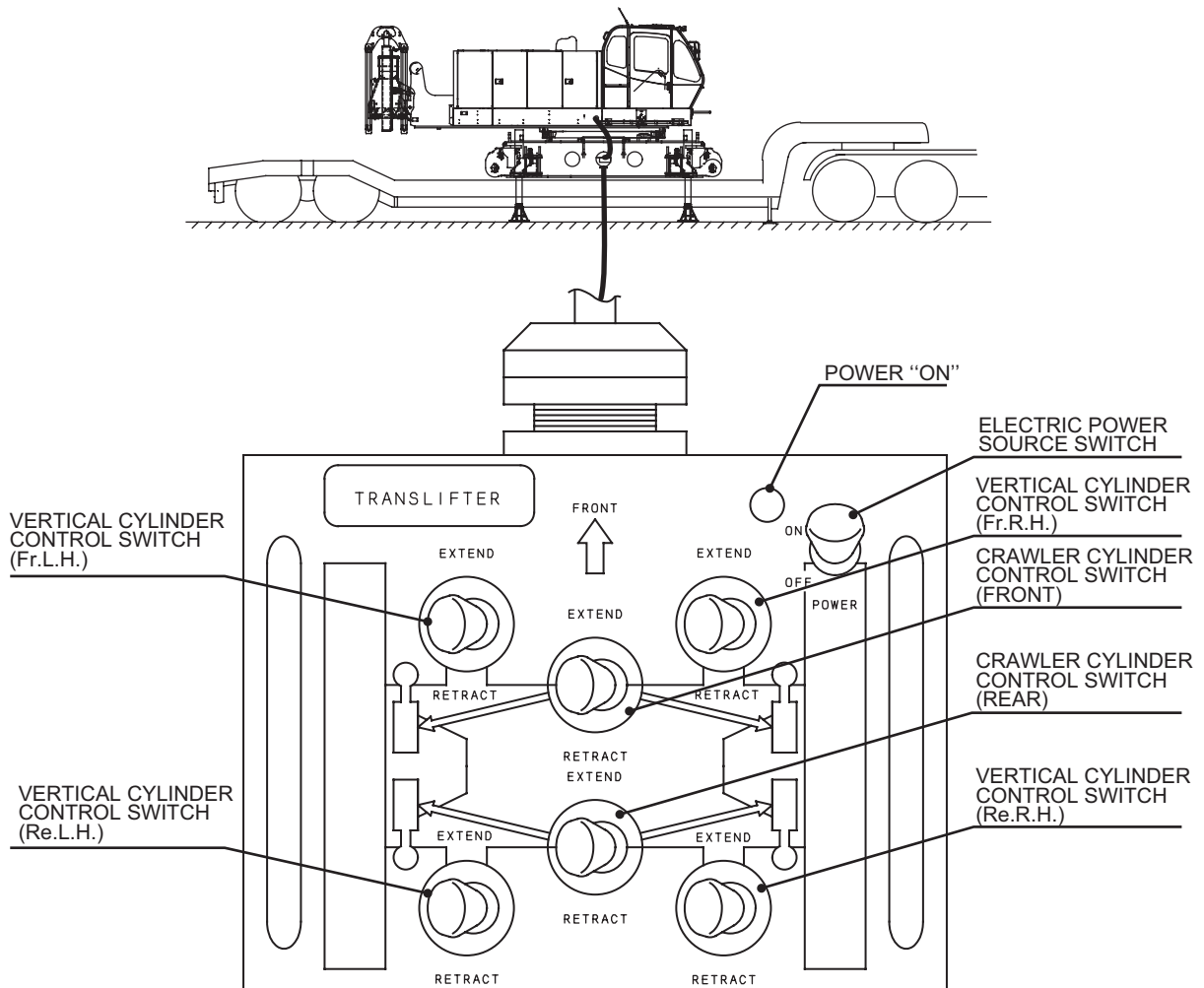
F U S E					
F-NO.	RATED	LINE NO.	U S E	SHEET NO.	KOBELCO PART NO.
F-27	10A	879-877	PCV1	8	2479Z281207
F-28	10A	879-878	PCV2	8	2479Z281207
F-29	2A	2-39	E/G CONTROL UNIT	8	2479Z281202

P R E S S U R E S E N S O R					
PT-NO.	LINE NO.	U S E	SHEET NO.	KOBELCO PART NO.	
PT- 1	351-350 349	SWING PUMP PRESSURE SENSOR	4	LC52S00012P1	
PT- 3	382-384 383	Fr. DRUM HOISTING PRESSURE SENSOR	4	LC52S00011P1	
PT- 4	385-384 386	Fr. DRUM LOWERING PRESSURE SENSOR	4	LC52S00011P1	
PT- 5	387-389 388	Re. DRUM HOISTING PRESSURE SENSOR	4	LC52S00011P1	
PT- 6	390-389 391	Re. DRUM LOWERING PRESSURE SENSOR	4	LC52S00011P1	
PT- 7	353-355 354	3rd. (J1B) DRUM HOISTING PRESSURE SENSOR	4	LC52S00011P1	
PT- 8	356-355 357	3rd. (J1B) DRUM LOWERING PRESSURE SENSOR	4	LC52S00011P1	
PT- 9	454-456 455	Fr. DRUM CLUTCH PRESSURE SENSOR	4	GN52S00002P1	
PT-10	457-456 458	Re. DRUM CLUTCH PRESSURE SENSOR	4	GN52S00002P1	
PT-11	459-472 460	3rd. DRUM CLUTCH PRESSURE SENSOR	4	GN52S00002P1	
PT-12	343-345 344	BOOM RAISE PRESSURE SENSOR	4	LC52S00011P1	
PT-13	369-345 370	BOOM LOWER PRESSURE SENSOR	4	LC52S00011P1	
PT-14	901-903 902	Re. DRUM CONTROL PROPORTIONAL PRESSURE SENSOR	4	LC52S00011P1	
PT-15	904-906 905	3rd. DRUM CONTROL PROPORTIONAL PRESSURE SENSOR	4	LC52S00011P1	

- (9) Extend the vertical cylinder by remote control switch until the lower surface of the translifter float just touches the floor.

WARNING

Make sure that the ground for vertical cylinder is flat and firm to avoid turnover of machine. Failure to observe this precaution may result in serious accident.



During work, watch the level and keep the basic machine always in leveled position. Make sure that the four floats sit on the ground firmly.

WARNING

Engage the swing brake and swing lock when operating translifter to avoid turn-over of machine. Failure to observe this precaution will result in serious accident.

9. INITIAL ASSEMBLY OF THE MACHINE

3. Slowly incline the gantry toward the rear of the basic machine, and install the tension member foot to the basic machine.

WARNING

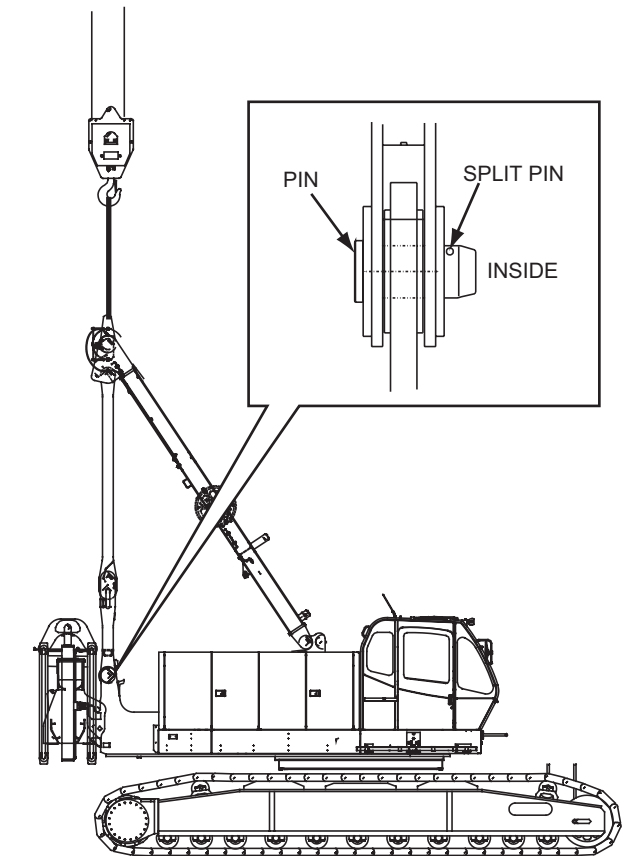
Do not stand under the gantry to avoid accident of being caught due to sudden drop of gantry. Failure to observe this precaution may result in serious injury or death.

WARNING

Do not put your finger into a pin hole.

Note

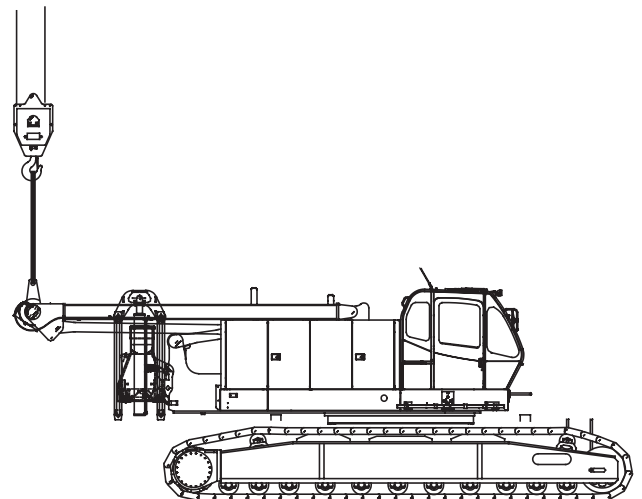
Generously apply grease to the pin hole.



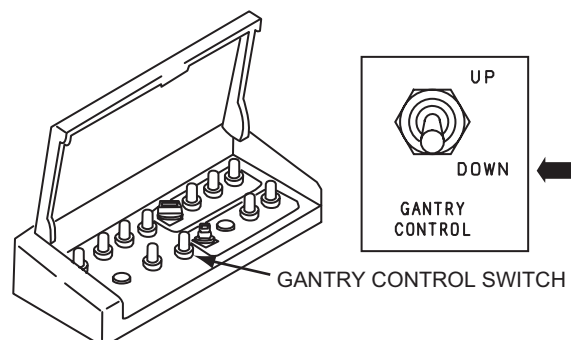
4. Further incline the gantry rearward fully.

WARNING

Do not stand under the gantry to avoid accident of being caught due to sudden drop of gantry. Failure to observe this precaution may result in serious injury or death.



5. Retract the cylinder by operating the control switch, and fully lower the gantry.



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